Electronic Supplementary Information

1. Preparation of FT-IR samples:

The gold nanoshells samples were purified three times by centrifugation (1800 rpm × 5 mins) and re-suspension to remove most of the unbound glucose. A dialysis membrane with a molecular weight cutoff of 12400 (Sigma-Aldrich) was subsequently employed to further remove remaining trace amounts of glucose. Finally, the concentrated gold nanoshell sample was drop coated on a KBr pellet and kept under IR lamp for 20-30 mins to remove the traces of water/moisture. A pure KBr pellet was used as background and its signal was subtracted from the FT-IR spectra of the gold nanoshells sample. All the FT-IR spectra were recorded on a Nicolet MAGNA 550 spectrometer (Nicolet Instruments Corporation, USA). A total of 256 scans of each sample were recorded at a resolution of 4 cm^{-1}.

2. Preparation of TEM grid:

Samples for TEM were prepared by blotting a carbon coated Cu grid (200 mesh, Ted Pella Inc., USA) with 6 μL of the nanoshells colloidal dispersion and allowed to dry.

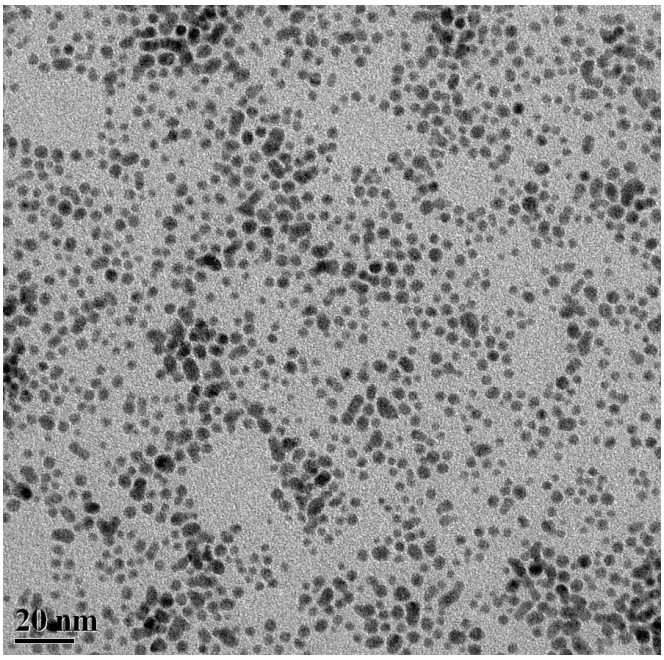

Fig. S-1: TEM image of seed gold nanoparticles (SGNP).

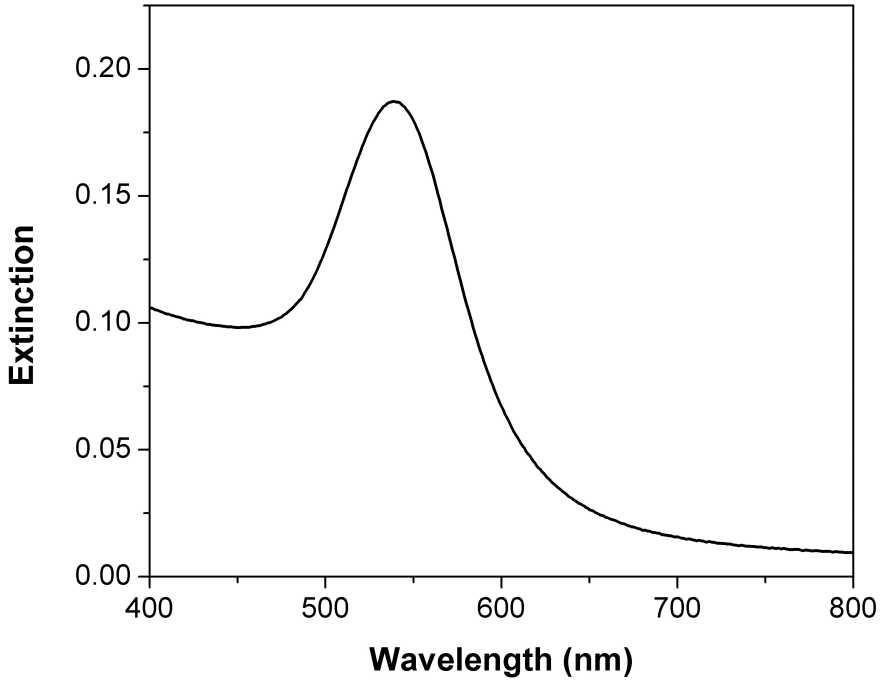

Fig. S-2 Extinction spectra of supernatant liquid collected during the purification of gold nanoshells synthesized using 15 molar ratio of glucose to gold.

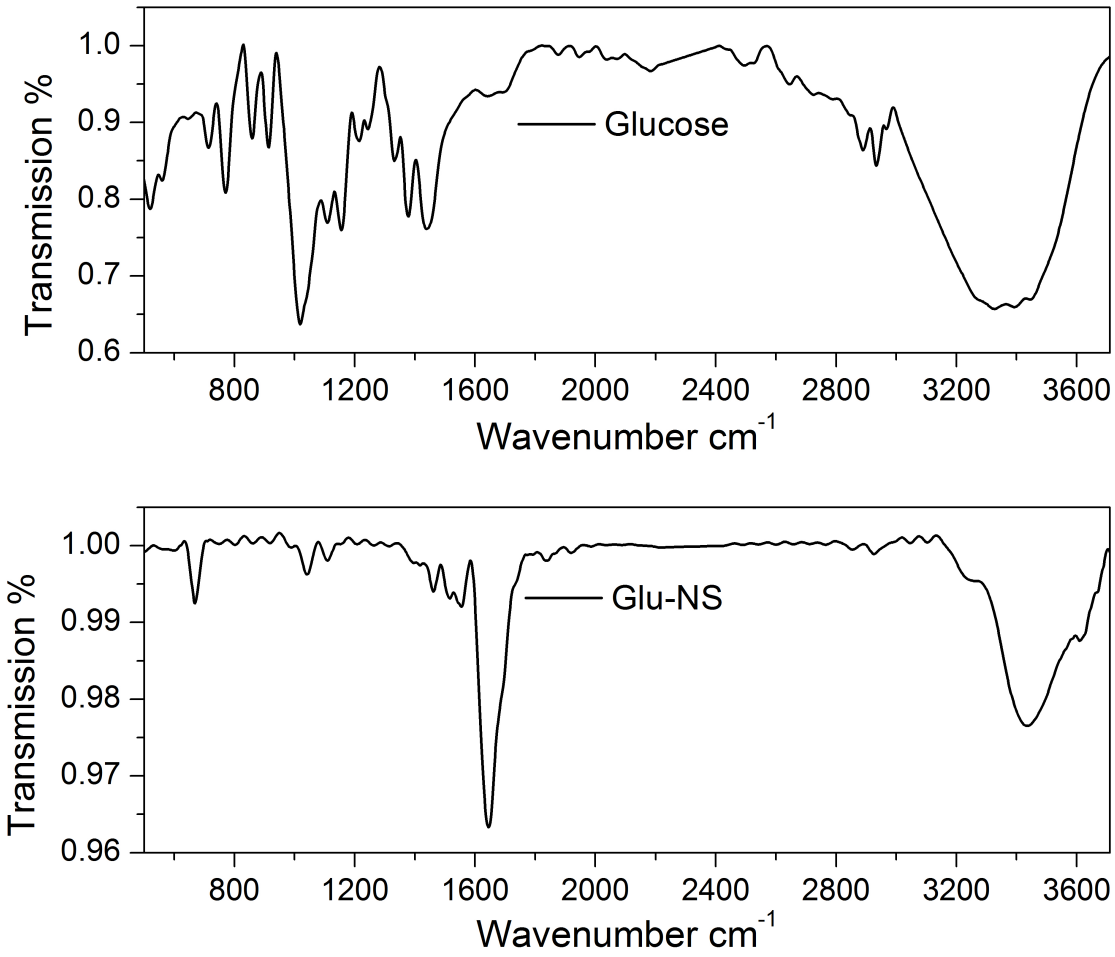

Fig. S-3 FTIR spectra of pure glucose and Glu-NS.

3. Preparation of optical fiber for SERS experiments

A 10 cm long piece of optical fiber (400µm core diameter, Thorlabs Inc.®, USA) was cut from the fiber spool. The terminal ends of optical fiber were polished by using polishing paper of 1µm roughness. A 1 cm length at one of the terminal end was decladded using surgical blade. This terminal part was functionalized with amine terminated poly(amidoamine) dendrimer (fourth generation) as described in reference 22. Further, nanoshells were immobilized by incubating dendrimerized optical fiber with GNS dispersion for 12 hrs which was followed by thorough rinsing with DI water. Thiophenol monolayer was formed on GNS coated optical fiber by dipping the nanoshells coated distal end in thiophenol solution (1mM, prepared in 1:1 v/v water-ethanol mixture) for 1 hr. Thereafter, probe was washed thrice with ethanol-water mixture (1:1) to remove any loosely bound thiophenol molecules. The probes were dried under nitrogen and then used for SERS measurements.

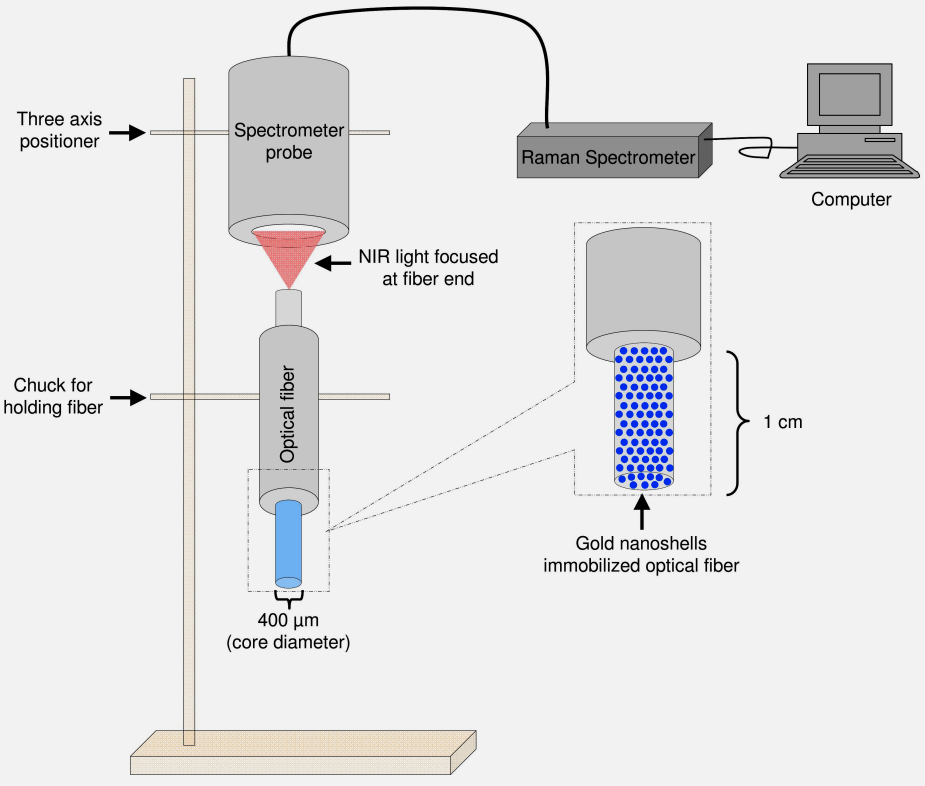

Fig. S-4 Schematic representation of the optical set-up used for acquiring SERS spectra from an optical fiber.