Electronic Supplementary Material (ESI) for Analyst.

Electronic Supplementary Information

for

Influence of the Capping Material on Pyridine-induced Chemical Interface Damping in Single Gold Nanorods

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This document contains additional supplementary figures (Fig. S1 to S12).

Supplementary Figures

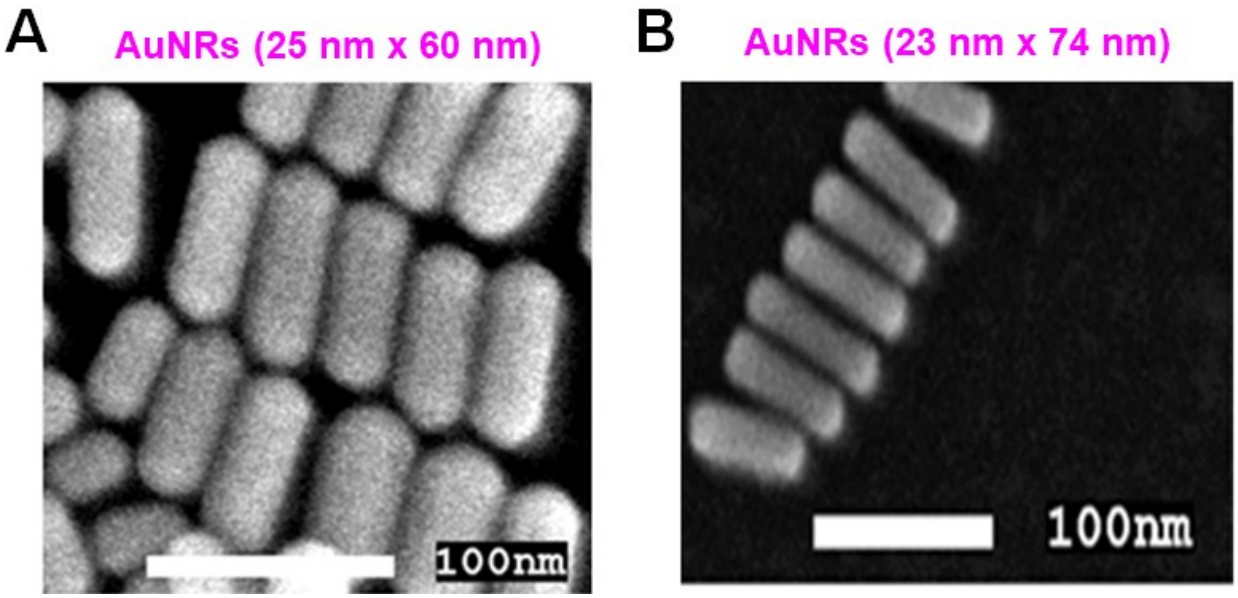

Fig. S1 SEM images of (A) AuNRs with an average size of 25 nm × 60 nm and (B) AuNRs with an average size of 23 nm × 74 nm.

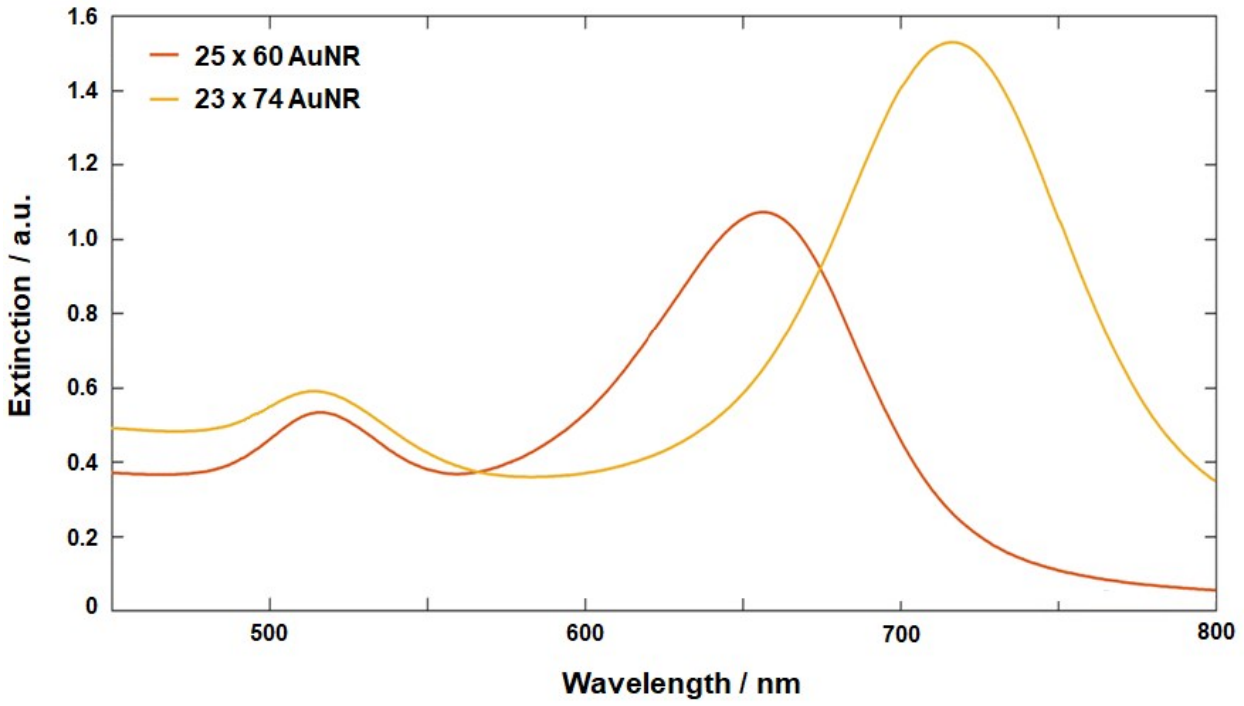

Fig. S2 UV-Vis extinction spectra of AuNRs with two different ARs of 2.40 (red-curve) and 3.22 (yellow-curve) dispersed in water.

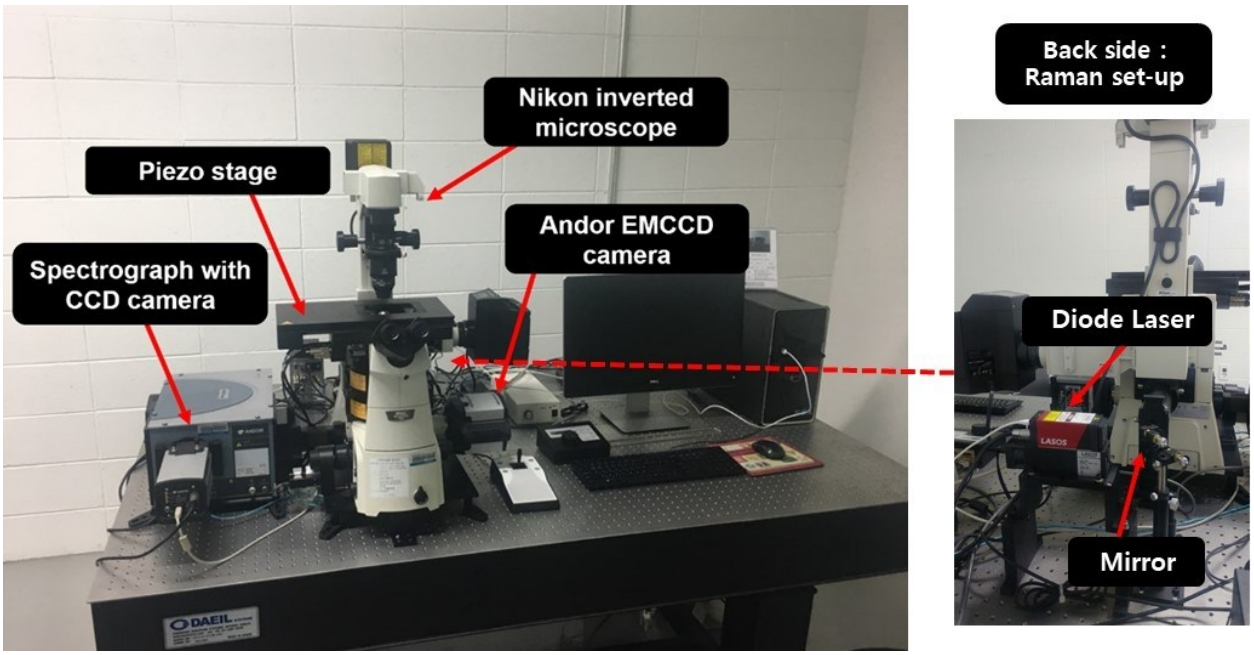

Fig. S3 A photograph to show the experimental setup for single particle spectroscopy and Raman spectroscopy.

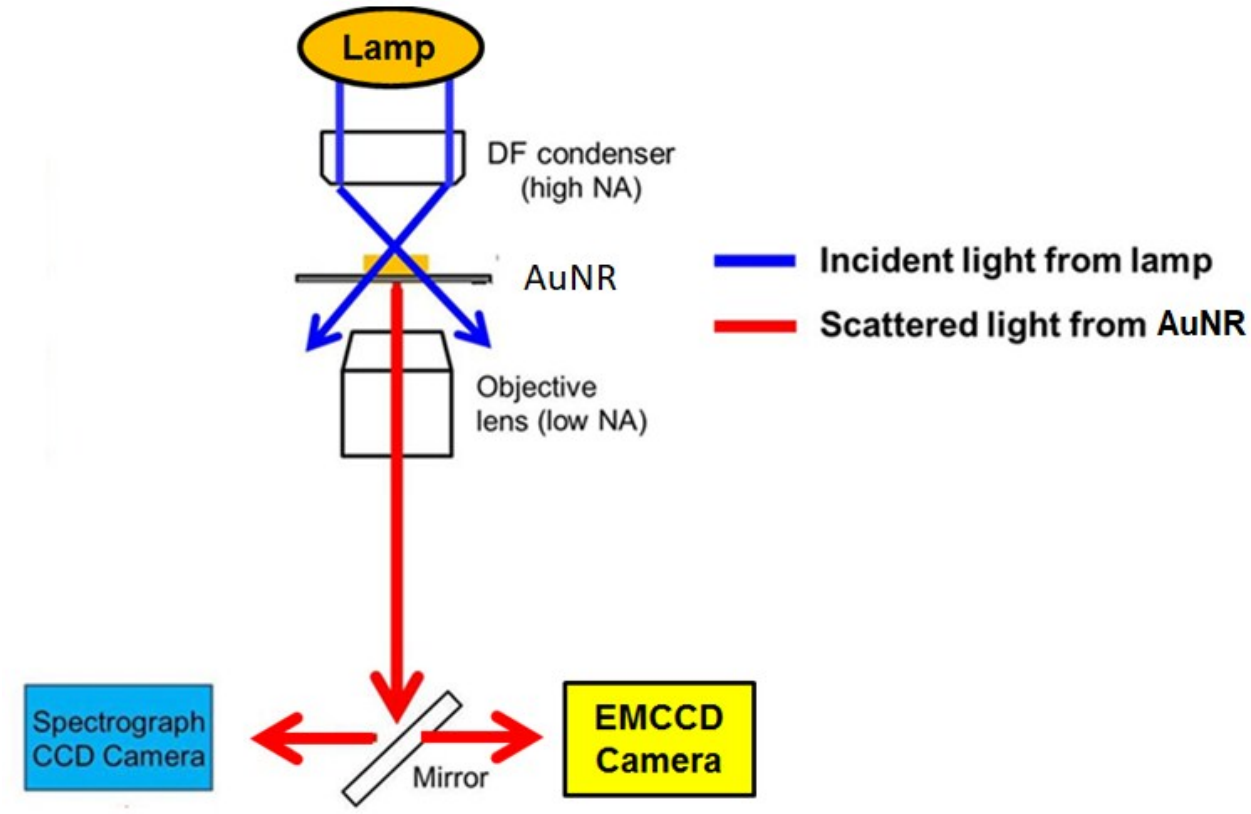

Fig. S4 Schematic depicting the working principle of scattering-based DF microscopy and spectroscopy.

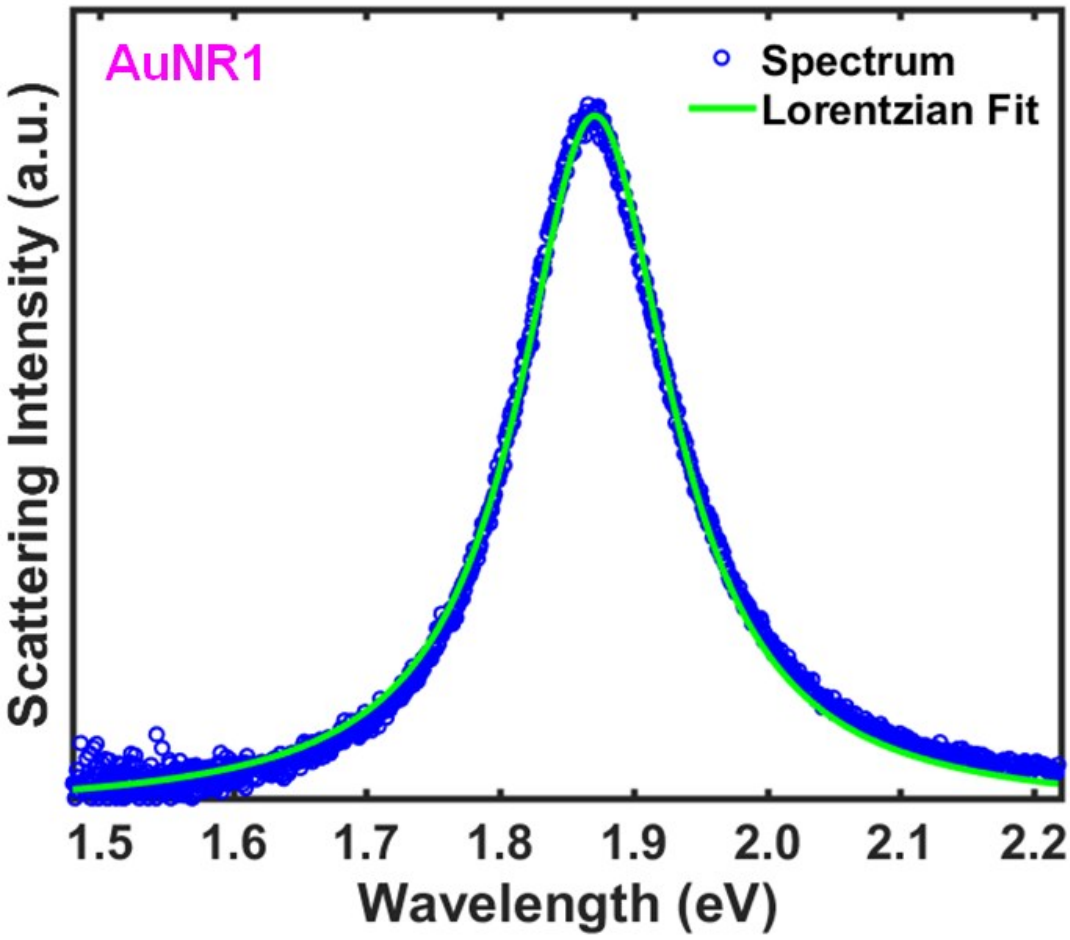

Fig. S5 Single particle scattering spectrum of AuNR1 in the energy unit (eV). The experimental spectrum (blue curve) fitted well with the Lorentzian function (green curve).

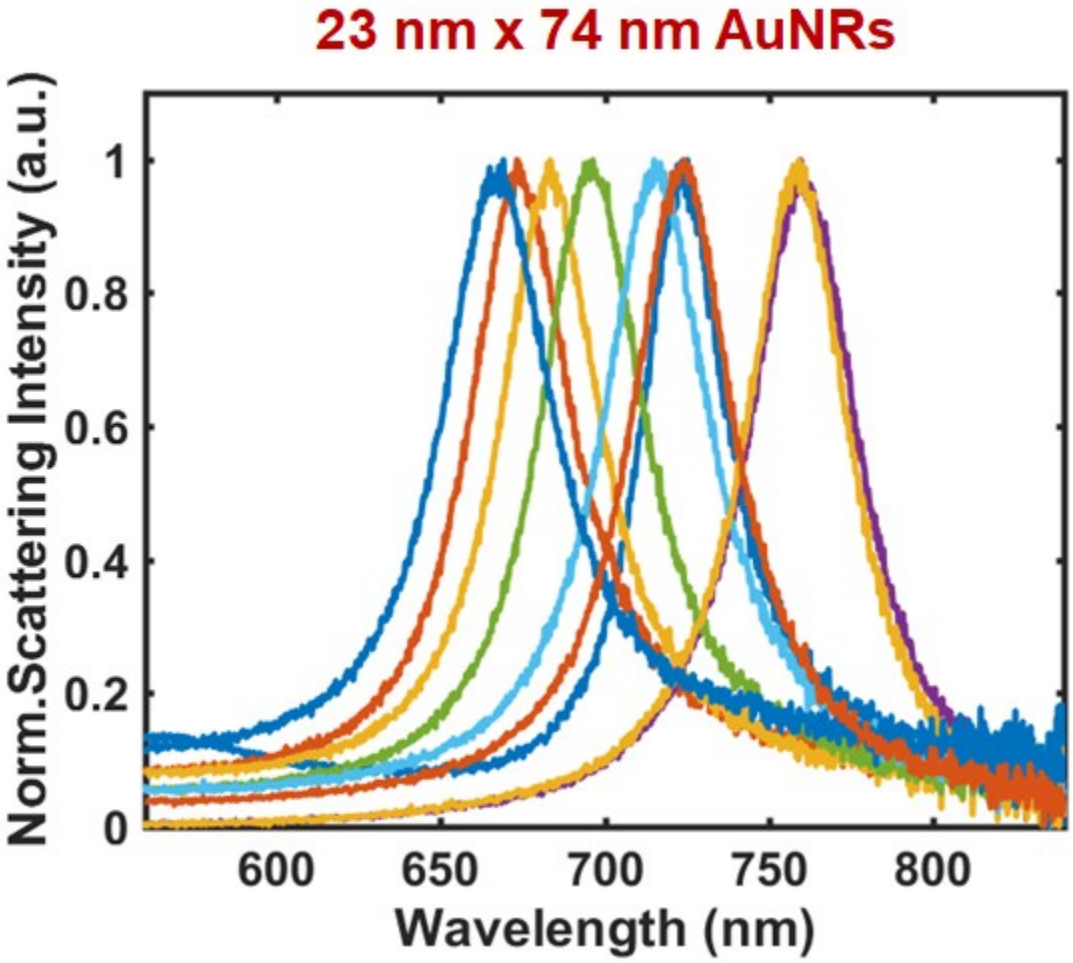

Fig. S6 Normalized single particle scattering spectra of AuNRs (23 nm × 74 nm, AR = 3.22) with CTAB on the AuNR surfaces. The DF scattering spectra recorded on the presence of CTAB on the AuNR surfaces showed that pyridine did not induce an increase in the linewidth indicating the absence of CID.

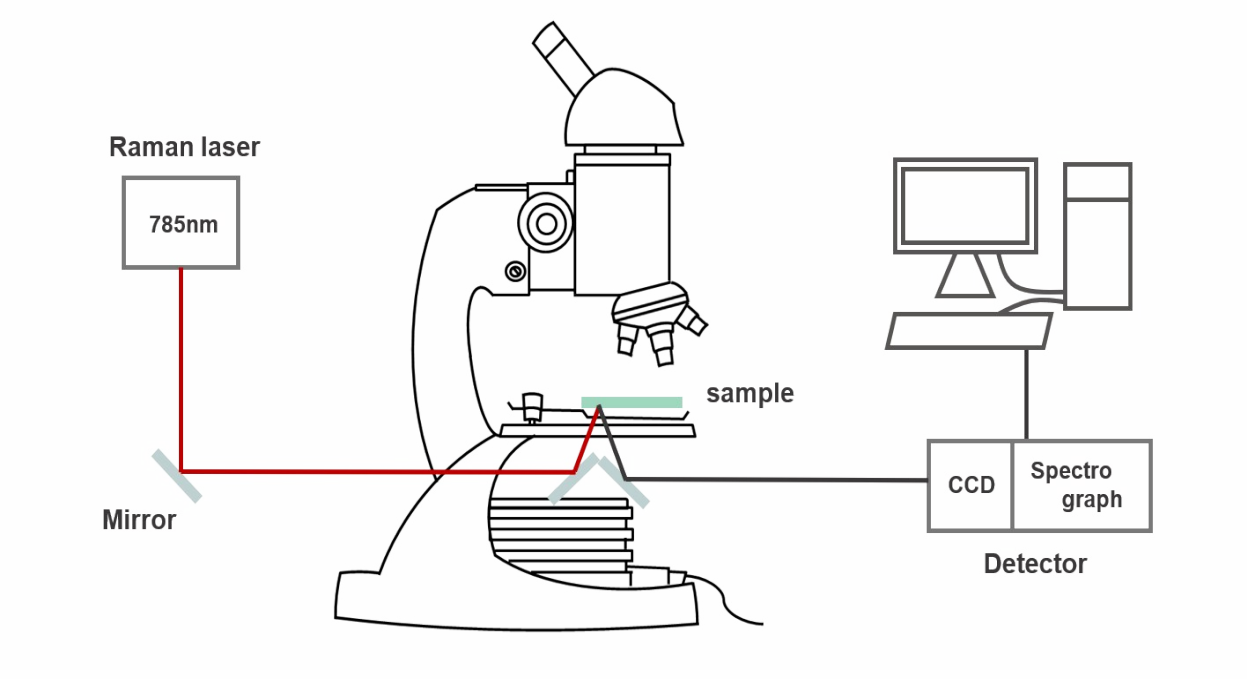

Fig. S7 Schematic depicting the experimental setup for surface-enhanced Raman spectroscopy

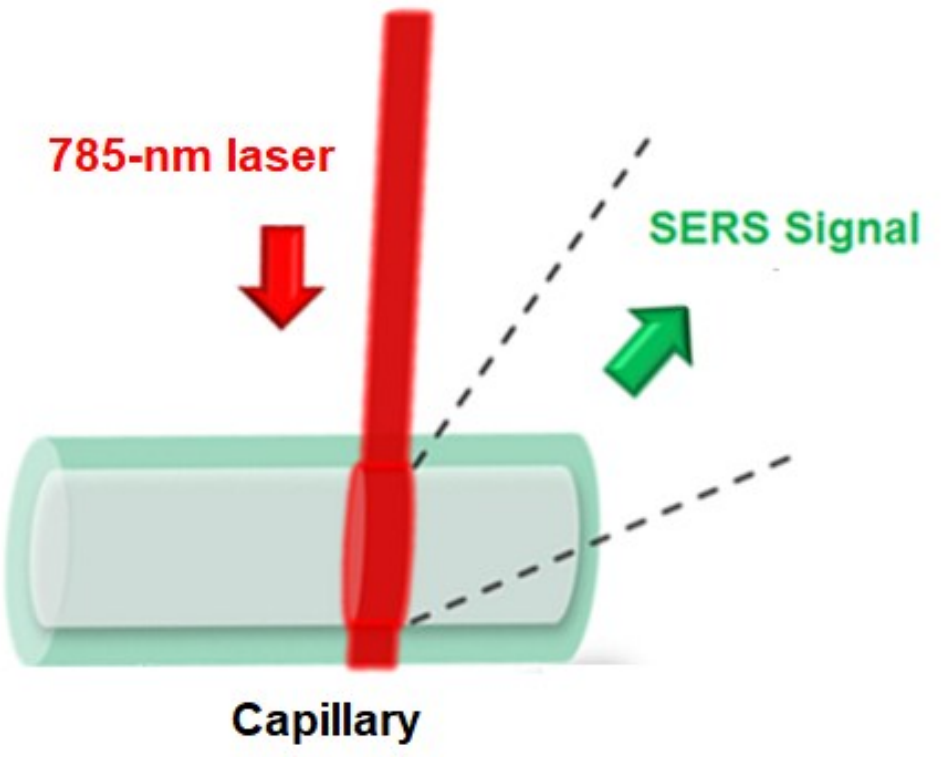

Fig. S8 Schematic depicting the SERS measurement of Raman probe molecules inside a capillary tube under 785-nm excitation. In the real-time experiments, 1-mM pyridine and AuNRs (23 nm × 74 nm, AR = 3.22) were mixed in water inside the capillary tube

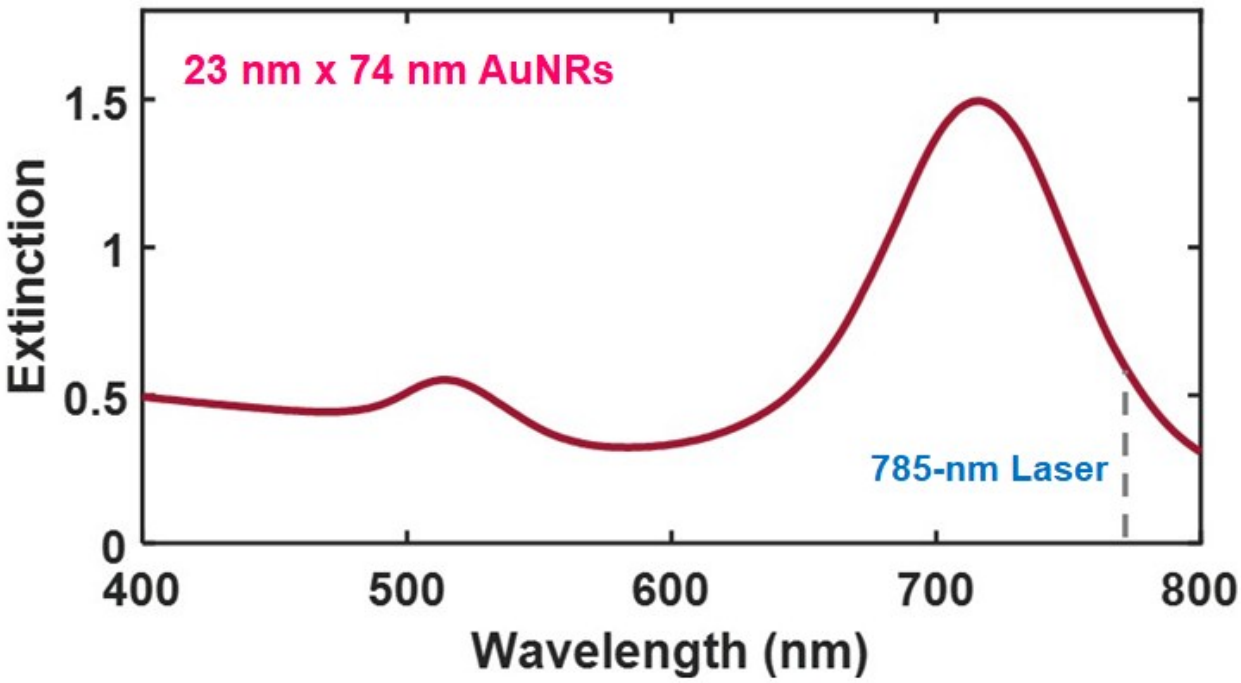

Fig. S9 UV-Vis extinction spectrum of AuNRs (23 nm × 74 nm, AR = 3.22) in water. The AuNRs having an AR of 3.22 were selected for these experiments because a 785-nm laser wavelength is located inside the longitudinal LSPR peak, which indicates that a resonance effect may still occur between the AuNRs and the Raman laser.

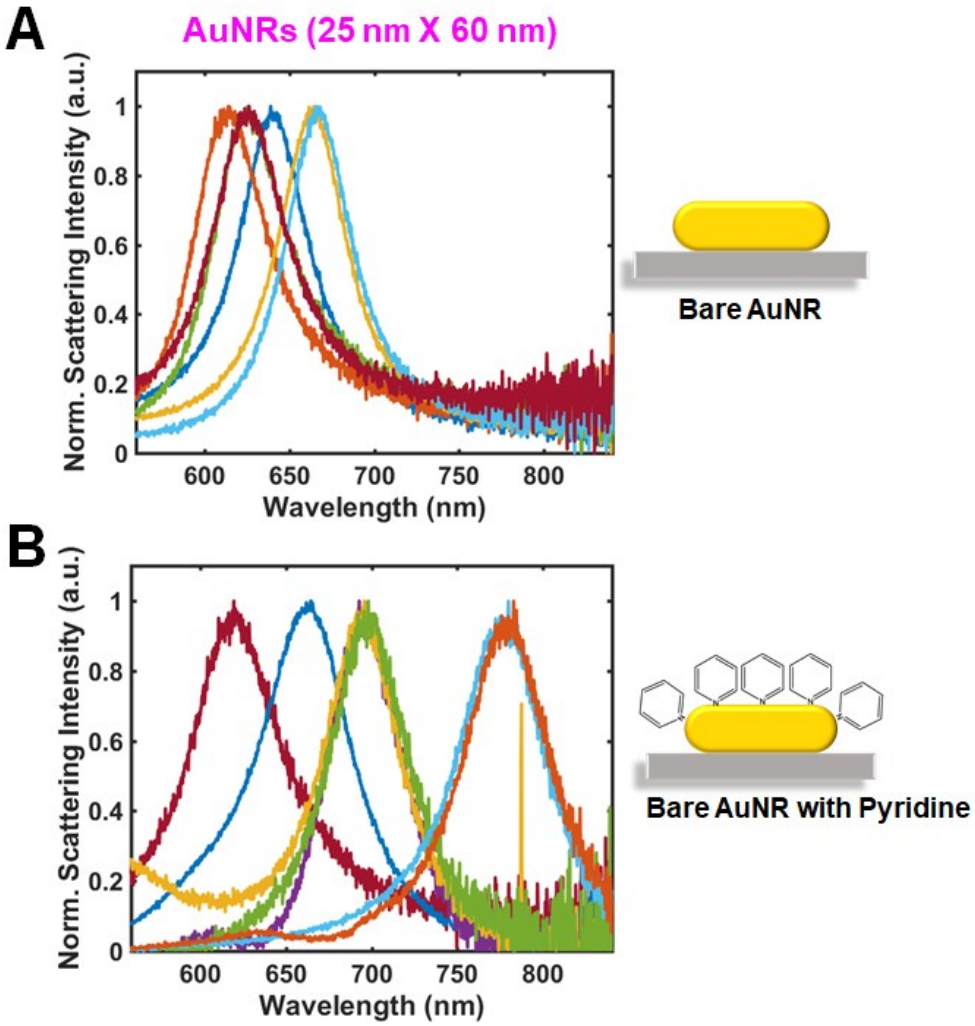

Fig. S10 (A) Single particle scattering spectra of bare AuNRs with a AR of 2.40 after removal of CTAB on the particle surfaces. (B) Single particle scattering spectra of the CTAB-free AuNRs after the adsorption of pyridine on the surfaces.

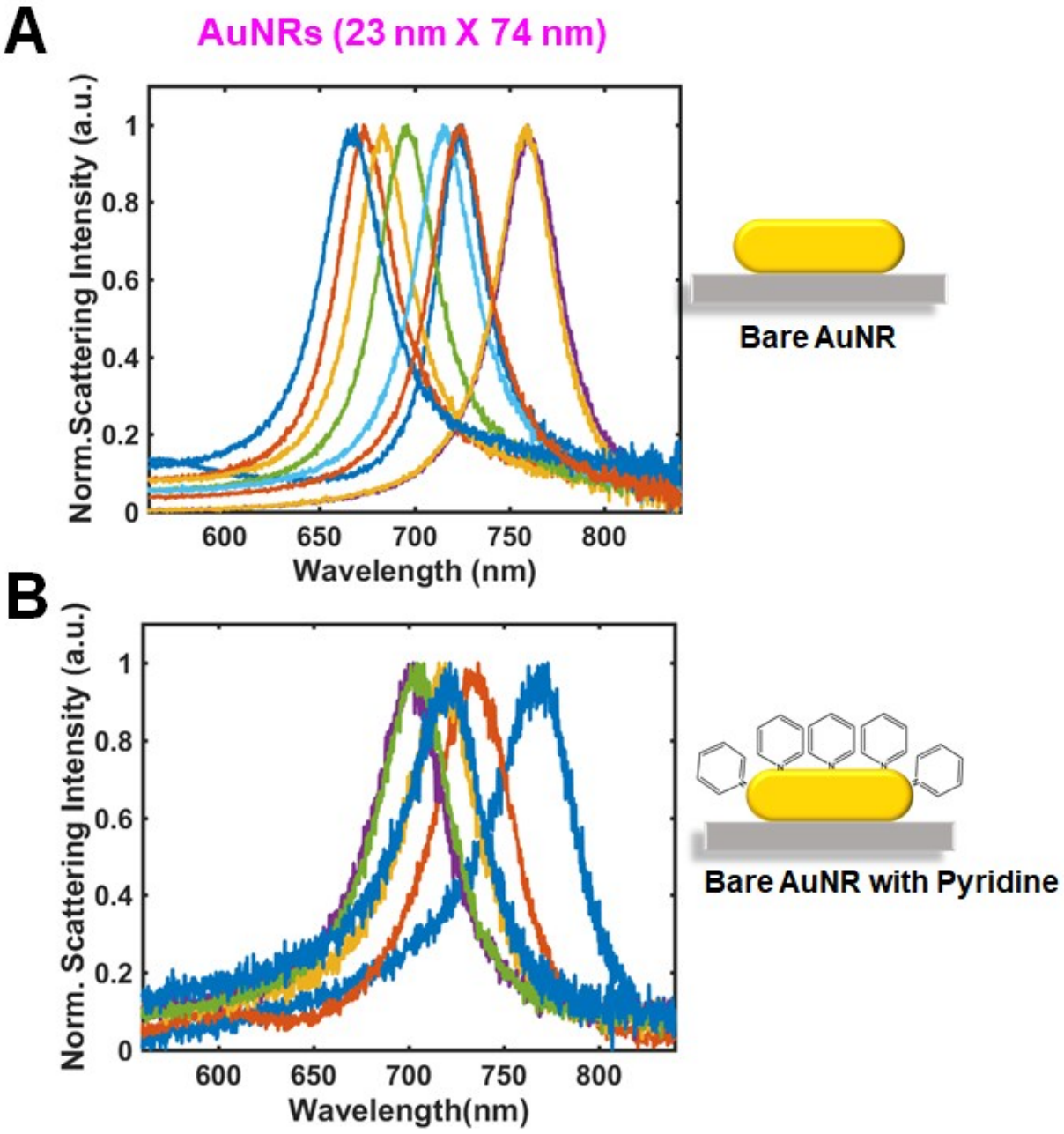

Fig. S11 (A) Single particle scattering spectra of bare AuNRs with a AR of 3.22 after removal of CTAB on the particle surfaces. (B) Single particle scattering spectra of the CTAB-free AuNRs after the adsorption of pyridine on the surfaces.

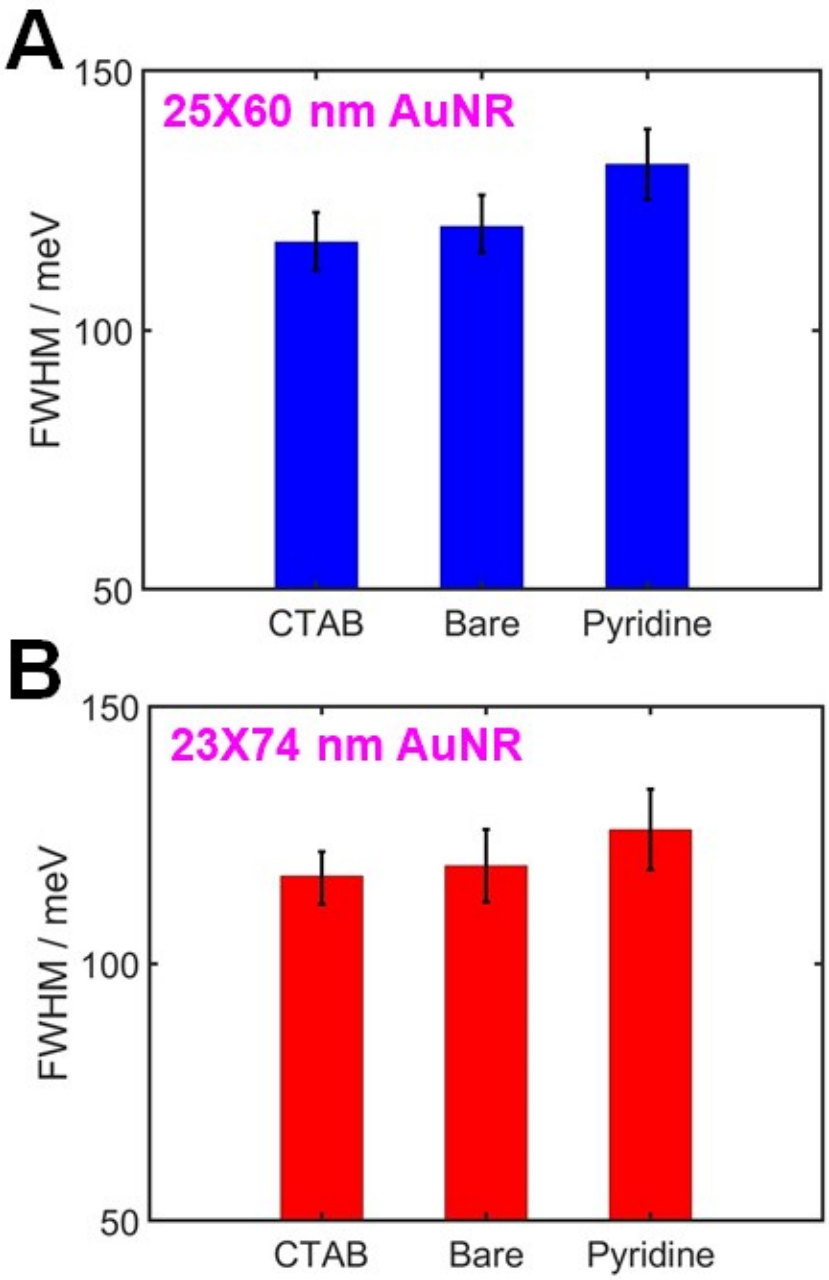

Fig. S12 (A) Comparison of FWHM (meV) obtained in the cases of CTAB, bare, and pyridine AuNRs with a AR of 2.40 (25 nm × 60 nm). (B) Comparison of FWHM obtained in the cases of CTAB, bare, and pyridine AuNRs with a AR of 3.22 (23 nm × 74 nm).