Electronic Supplementary Information

Investigating the Autophagic Pathway in Silver@Gold Core Shell Nanoparticles-Treated Cells Using Surface-Enhanced Raman Scattering

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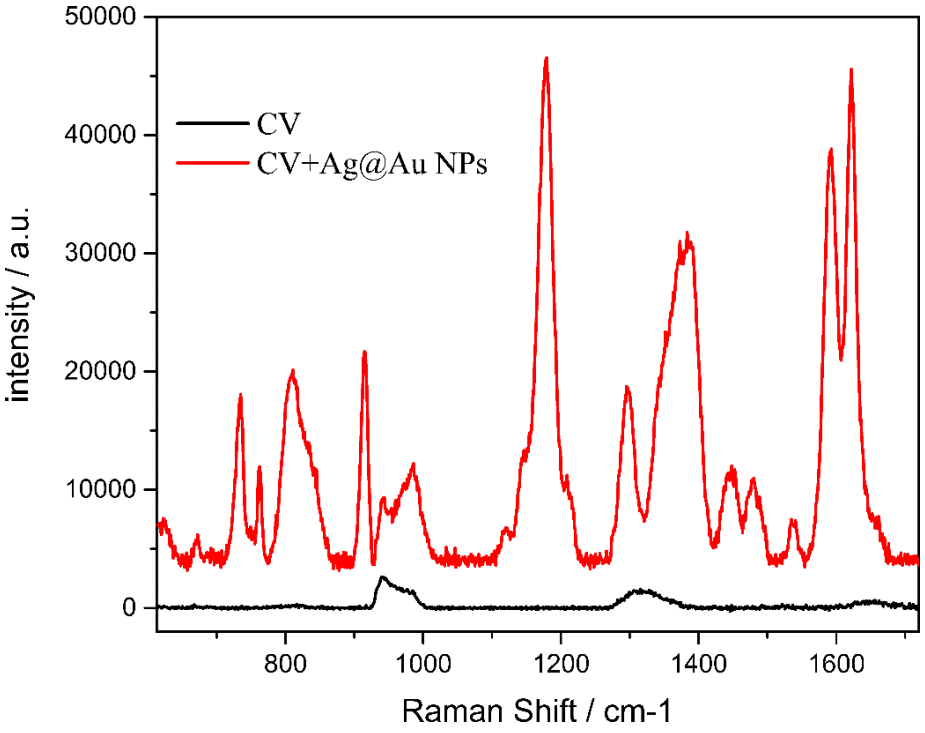

Fig. S1 SERS spectra of 0.1 mM CV in Ag@Au NPs aqueous solution and the normal Raman spectrum of CV aqueous solution at the same concentration.

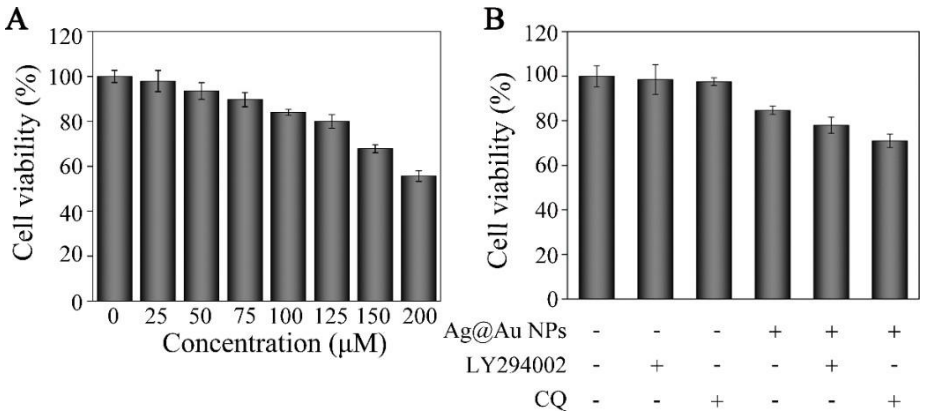

Fig. S2 (A) Cell viability of Hep G2 cells incubated with Ag@Au NPs (0–200 μM) for 12 h. (B) Relative cell viability of Hep G2 cells incubated for 12 hours under different conditions. Data are presented as means ± SD.

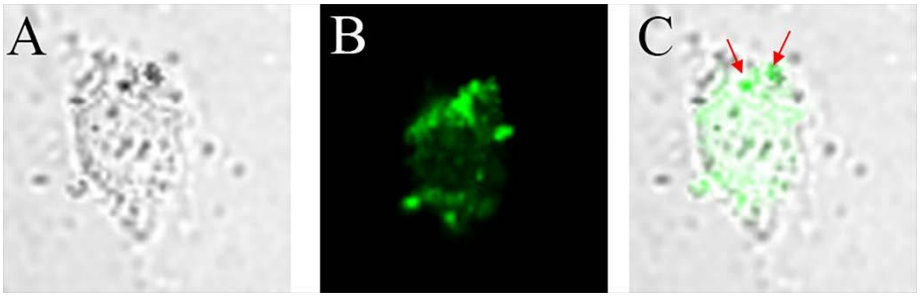

Fig. S3 (A-C) Bright-field, fluorescence, and merged images of Hep G2 cells cultured with 125 μM Ag@Au NPs for 12 hours. The red arrow points to the overlap of Ag@Au NPs and autophagosomes.

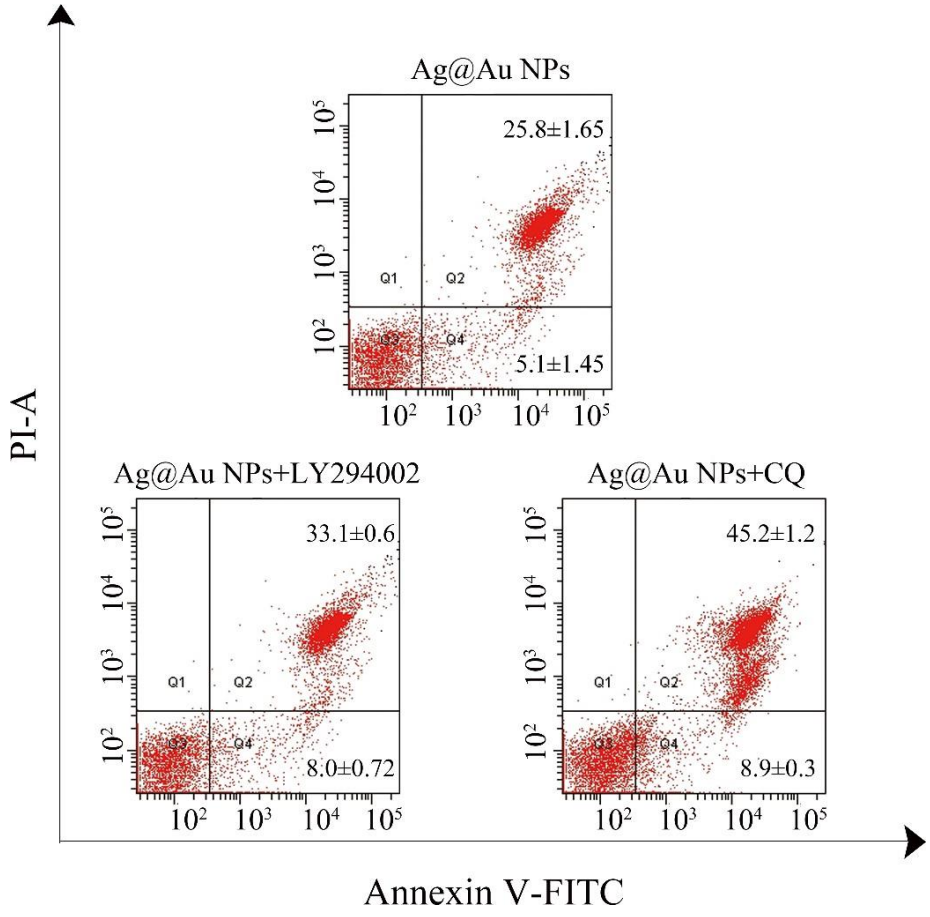

Fig. S4 Flow cytometry analysis of apoptosis of Hep G2 cells with different treatment. Ag@Au NPs (control), Ag@Au NPs+LY294002, Ag@Au NPs+CQ.

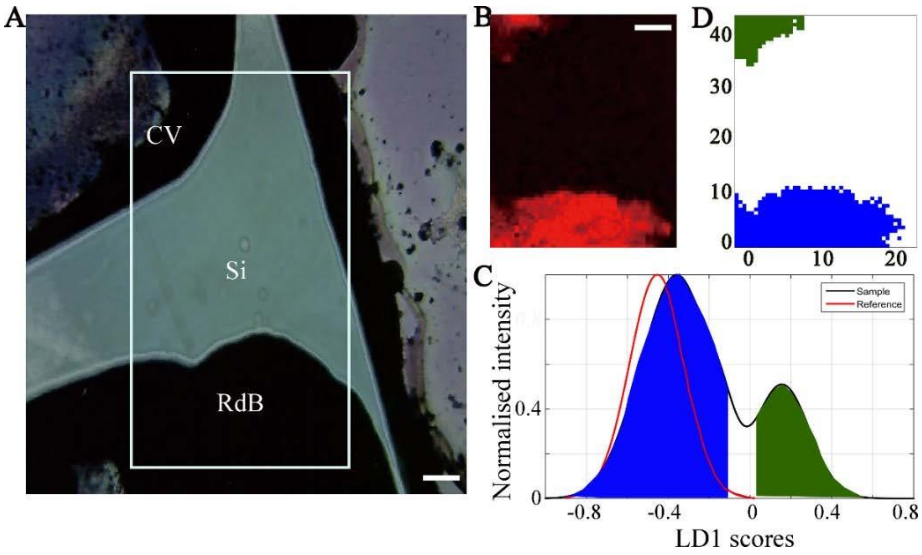

Fig. S5 (A) Bright-field image of Rhodamine (RdB) and CV dried on a Si surface. (B) SERS intensity maps in the range of 614-1724 cm^{-1}. (C) LD1 intensity curves of RdB (reference group) and RdB-CV (sample group). LD1 scores corresponding to the reference region are colored in blue and the non-corresponding area are colored in green.

(D) Color-coded LD1 scores map reveals the spatial distribution of CV (green) and RdB (blue) within the map. Scale

bar: 50 μm.

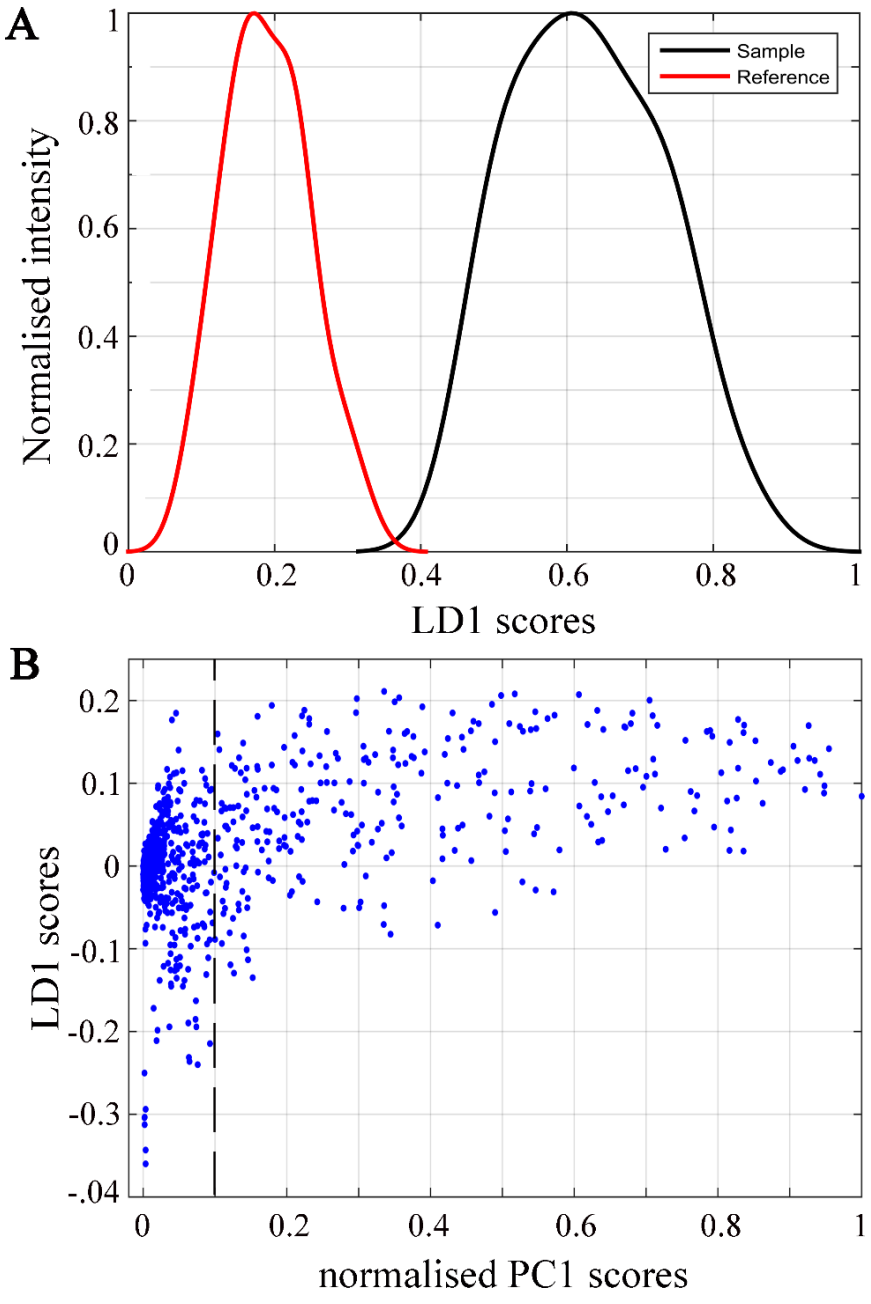

Fig. S6 (A) LD1 intensity curves of the cell sample (black line) and the reference (red line) showing almost non- overlap of reference and sample. (B) PC1 vs. LD1 scores plot of the sample (Fig. 5 in the main paper) served the spectra with lower 10% of the PC1 scores values as the sample background.

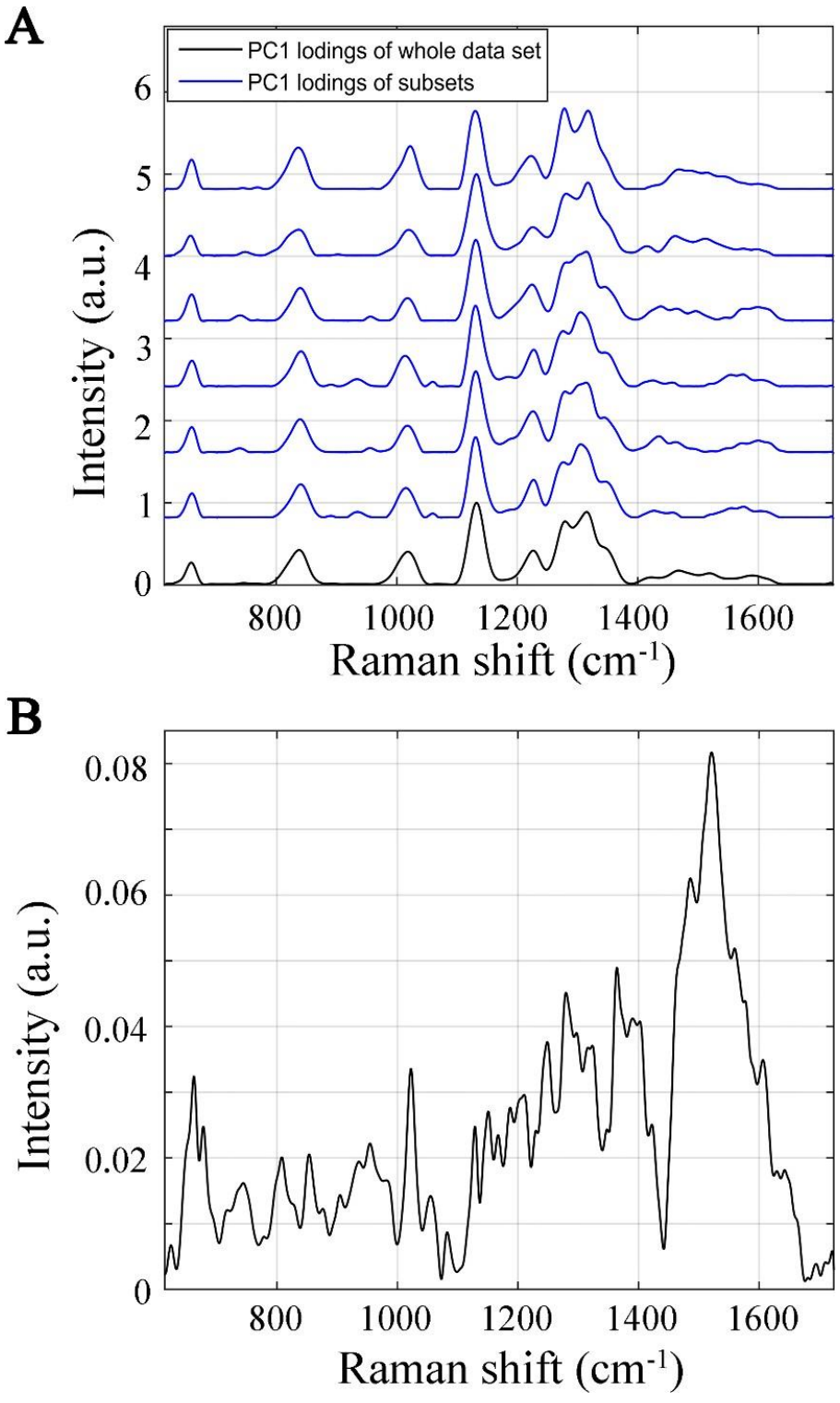

Fig. S7 (A) PC1 loadings of the whole data set (black) and six subsets (blue line). (B) The standard deviation of the PC1 loadings of the subsets.

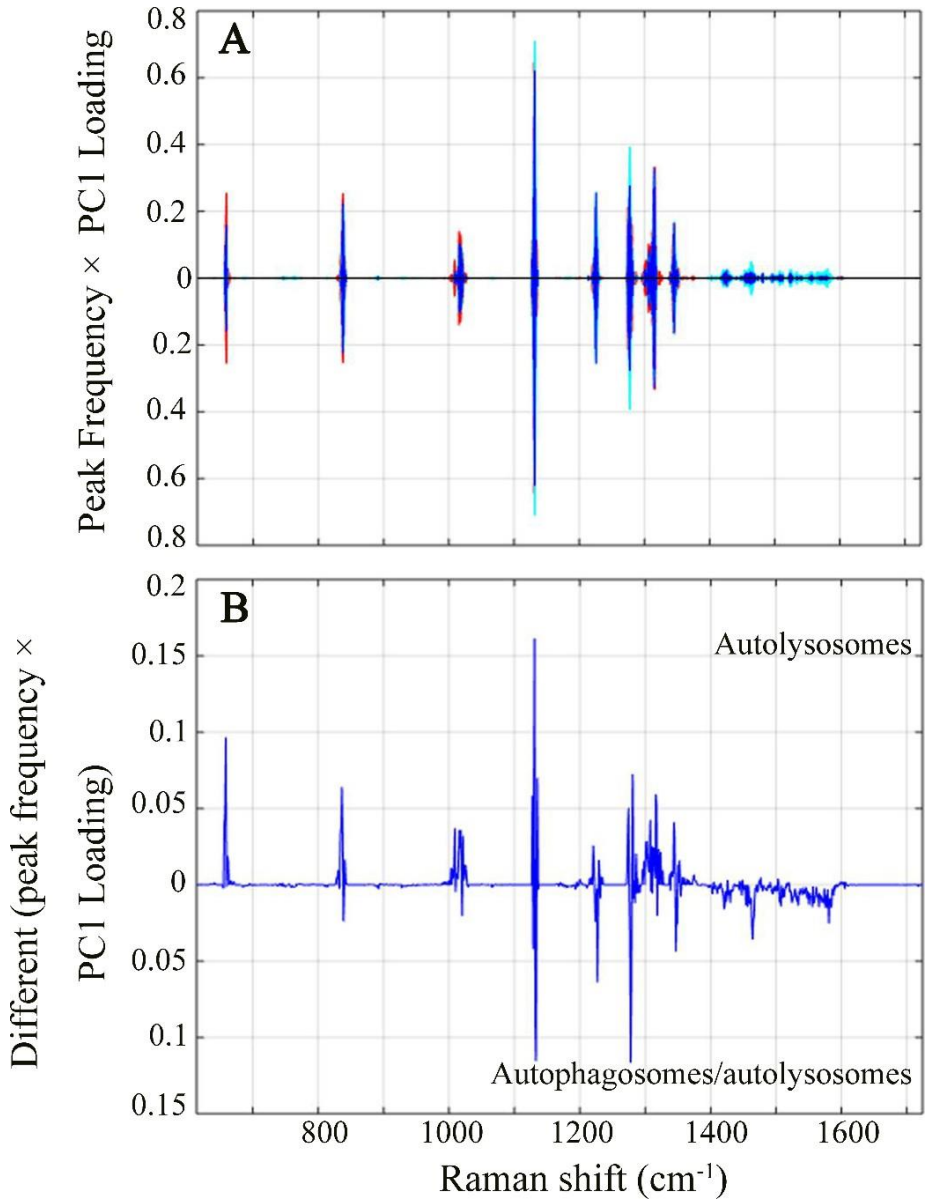

Fig.S8 (A) The PC1 loadings weighted by the frequency of peak occurrence are shown in red (autolysosomes), azure (autophagosomes/autolysosomes), and blue (the overlap of autolysosomes and autophagosomes/autolysosomes).

(B) Differences between the frequency-weighted PC1 loadings of autolysosomes and autophagosomes/autolysosomes.