Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Information

Imaging of intracellular protein aggregates through plasmon-assisted clusteroluminescence

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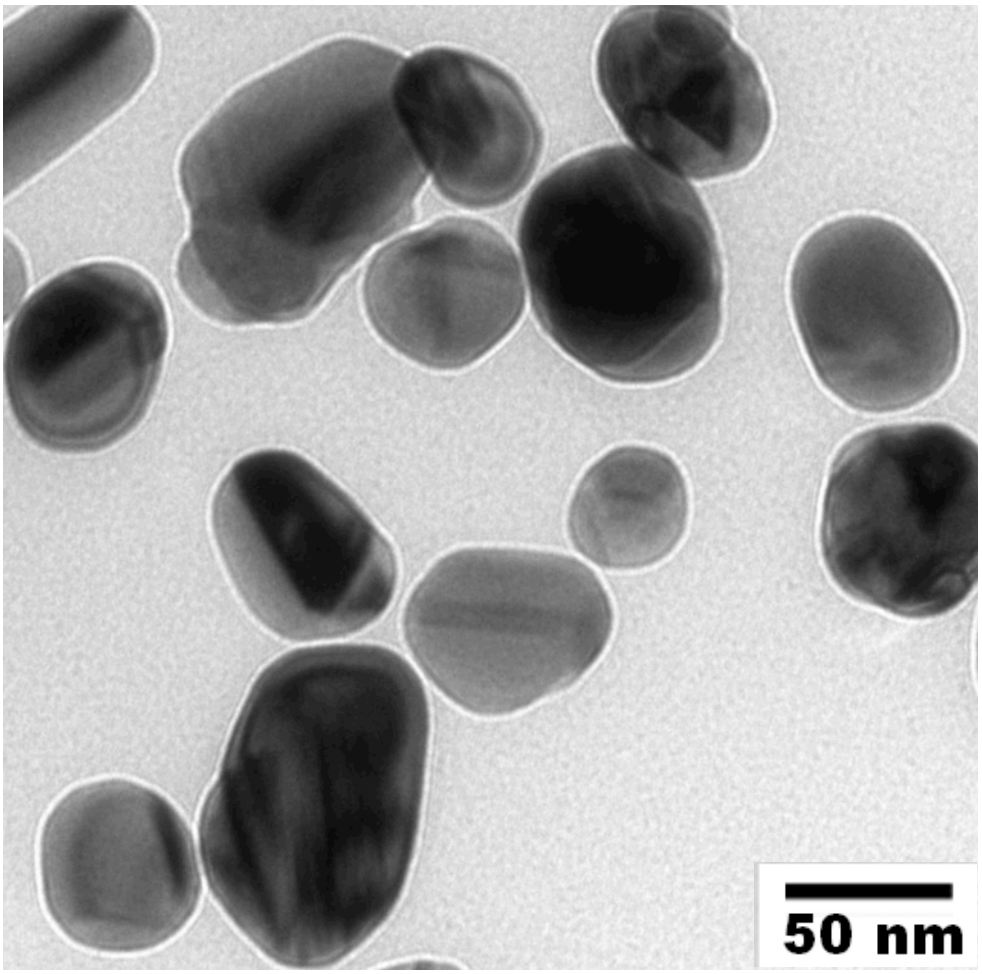

Figure S1: HR-TEM images of AgNP used in experiments.

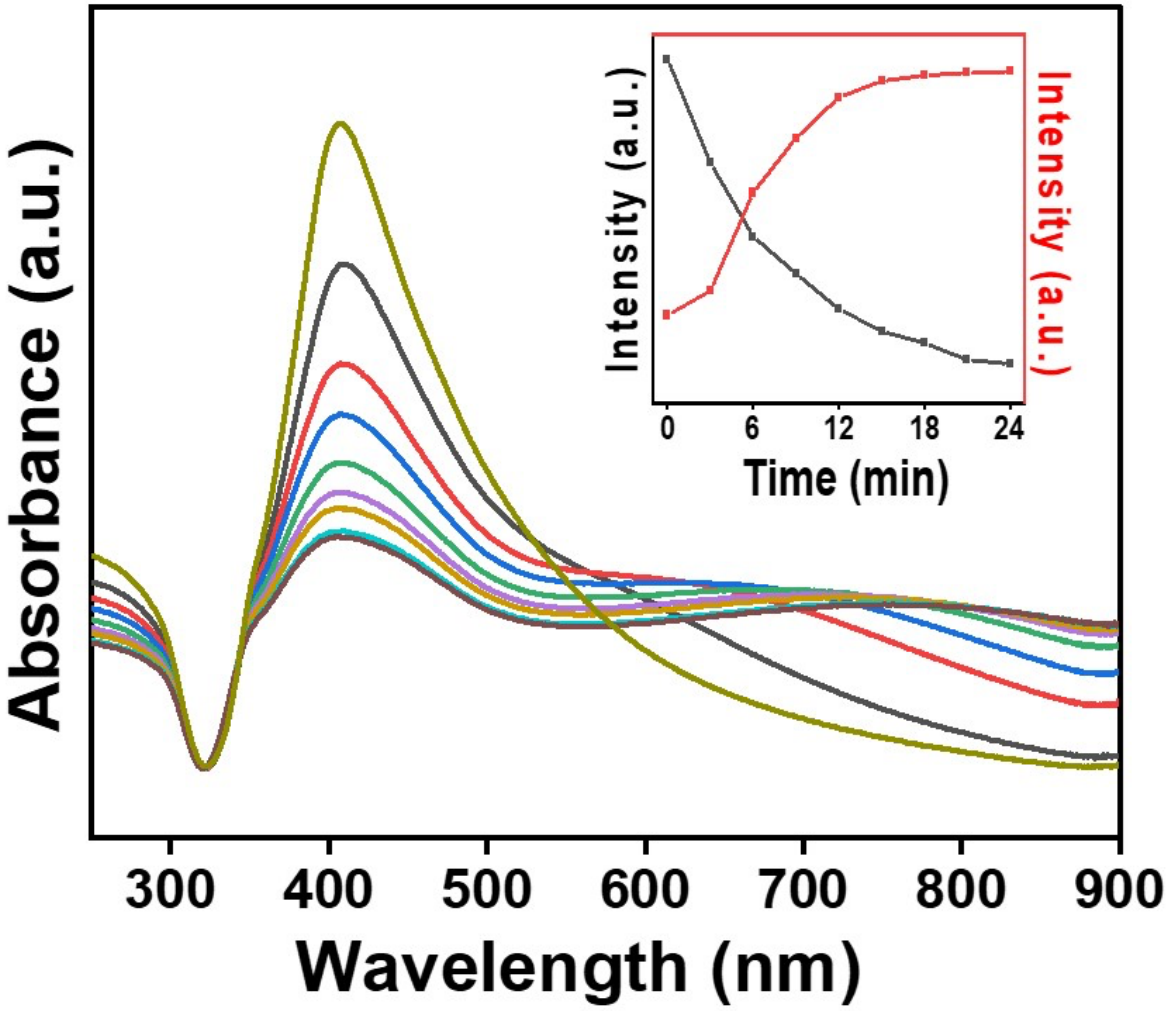

Figure S2: Time-dependent UV-Visible spectra of protamine sulphate-AgNP complex. (Inset) Variation of plasmonic peak intensity (Black) and longitudinal tail intensity (Red) with time.

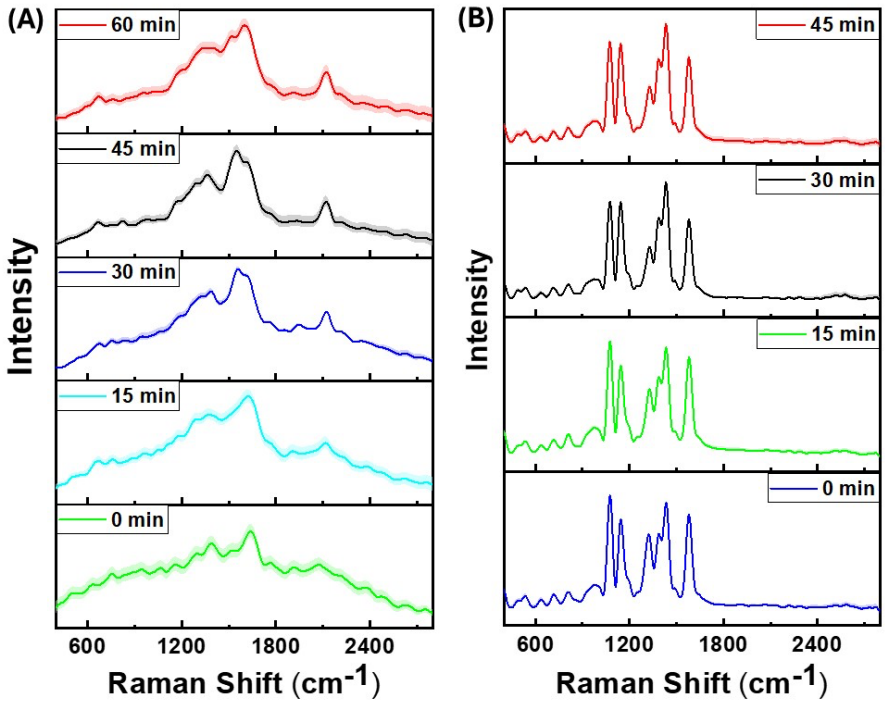

Figure S3: SERS spectra with statistical analysis (n =6) **(A)** lysozyme aggregated AgNP at different time points, and **(B)** salt aggregated AgNP with 4-NTP at different timepoints. The shaded area corresponds to the error bar.

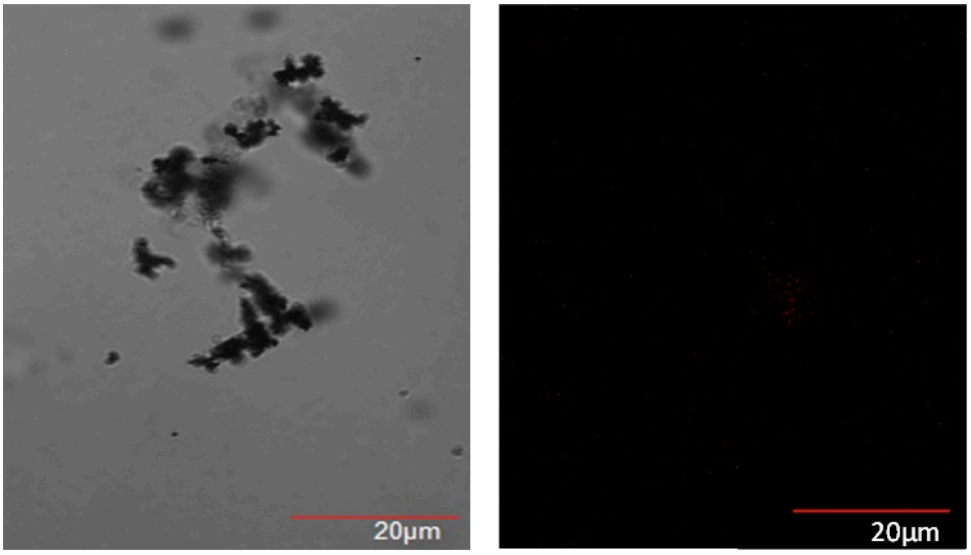

Figure S4: Confocal bright field image and corresponding fluorescence image of AgNP aggregates in the presence of thiophenol.

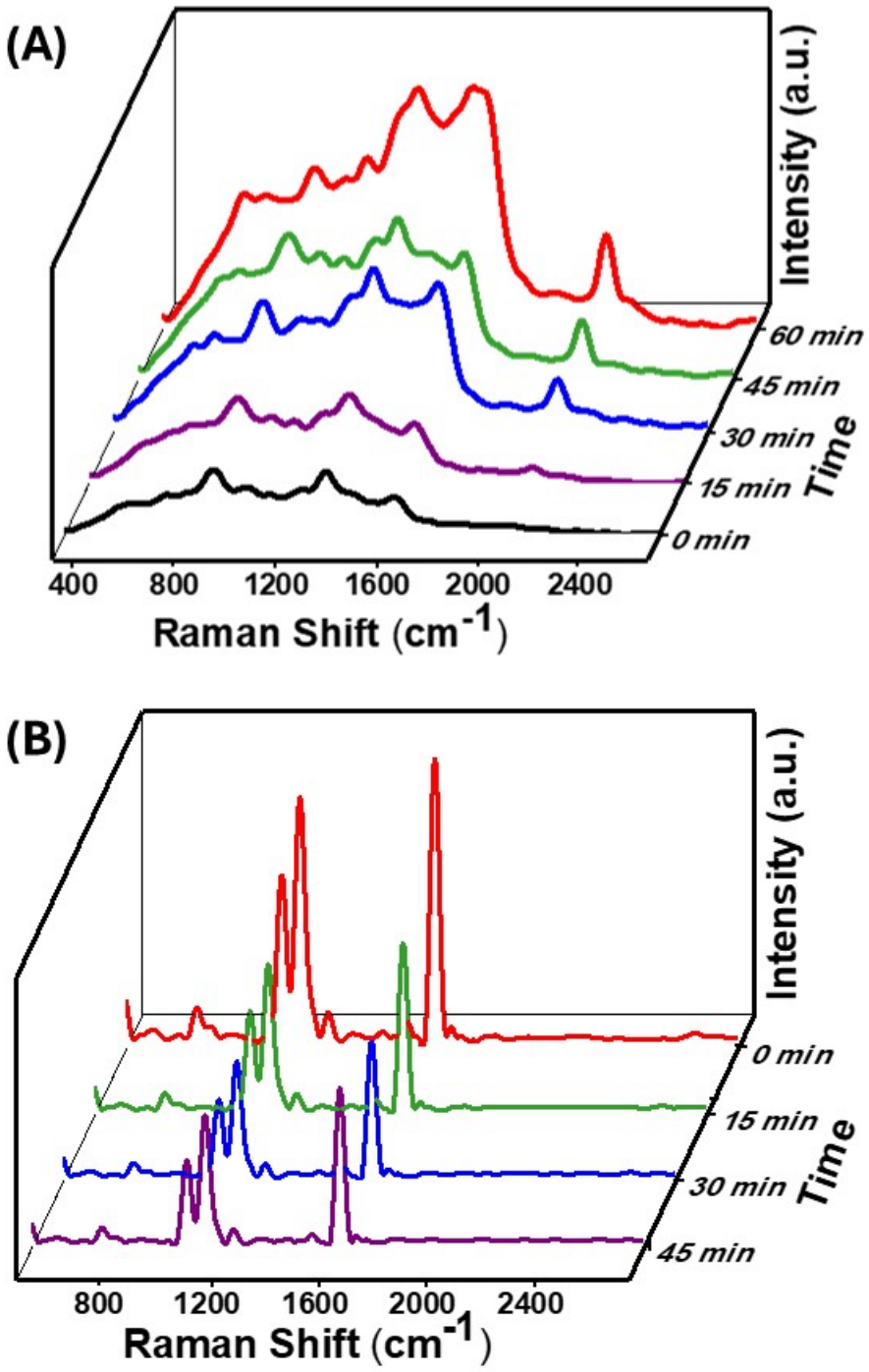

Figure S5: SERS spectra **(A)** Protamine sulphate aggregated AgNP, **(B)** Salt aggregated AgNP with Thiophenol.

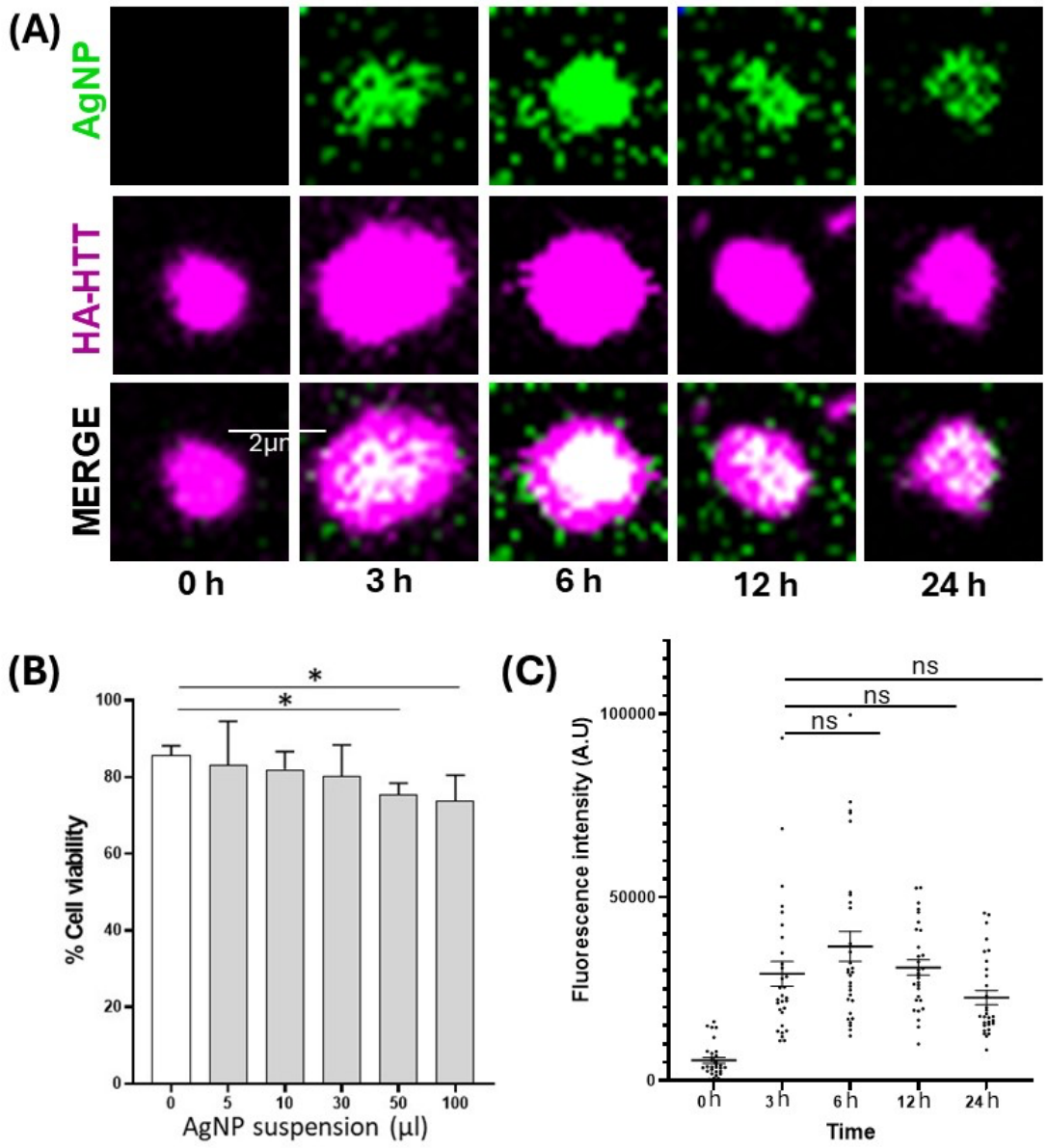

Figure S6: *AgNP cellular toxicity and in-cellulo clusteroluminescence with increasing time:* **(A)** HeLa cells expressing the aggregation prone HA-HTT were allowed to form the aggregate and then subsequently stained with AgNP for the indicated time before fixing to capture the clusteroluminescence shown in green. Anti-HA tag antibody was used to visualise the HA-HTT clusters shown in magenta. **(B)** HeLa cell viability was assessed by trypan blue staining across varying amounts of AgNP at the end of 24 h treatment and represented as a bar graph. **(C)** The clusteroluminescence intensity of the AgNP is quantified and represented as a dot plot showing the mean fluorescence intensity in arbitrary units (AU). Error bar represents SD of 30 individual cells under each condition. *P signifies values ≤ 0.05 while ns represents no statistical significance.