Supplementary Material (ESI) for Analyst

Supporting Information for

Fluorescent Gold Clusters as Nanosensors for Copper Ions in Live Cell

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7. Figure S 7. Fluorescent microscope images of live HeLa cells after incubation with 25 µL Au-BSA and then with 1mM copper.

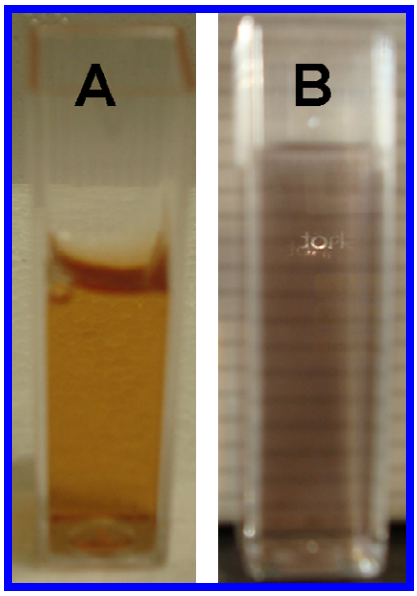


Figure S 1. The photographs show Au-BSA in the absence of copper (A) and in presence of alkaline solution of copper (B).

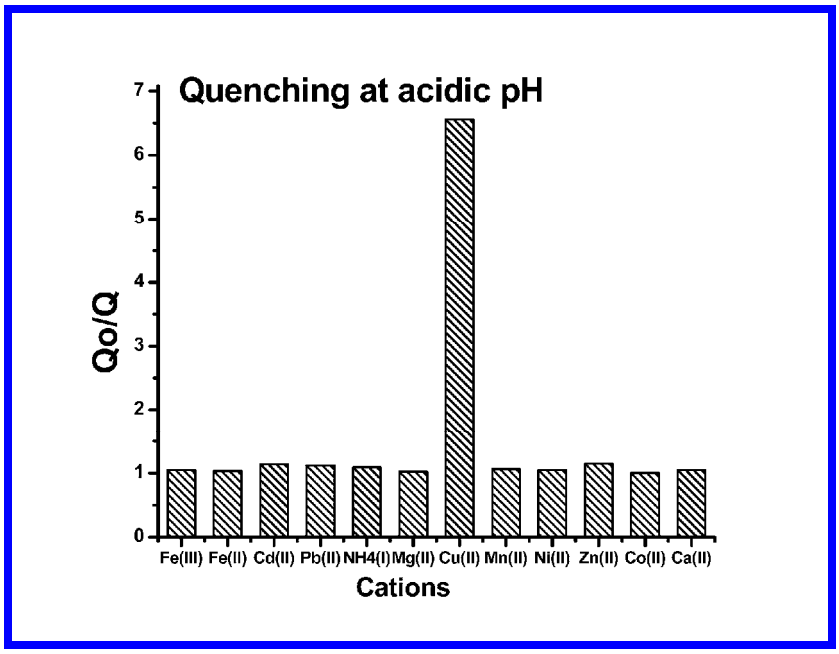


Figure S 2A

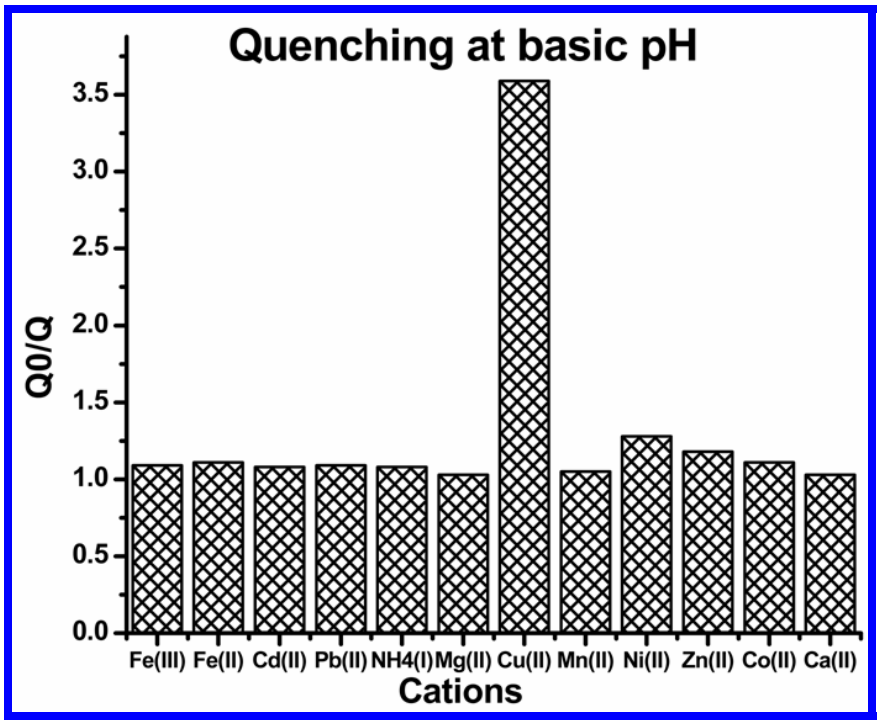


Figure S2 B.

Fluorescence quenching of the Au-BSA by cations at different pH conditions: Quenching of Au-BSA at acidic (pH 2) condition (Figure S 2.A) and at basic (pH

12) condition (Figure S 2.B). Q_0 and Q are the fluorescence intensities in the absence and presence of cations.

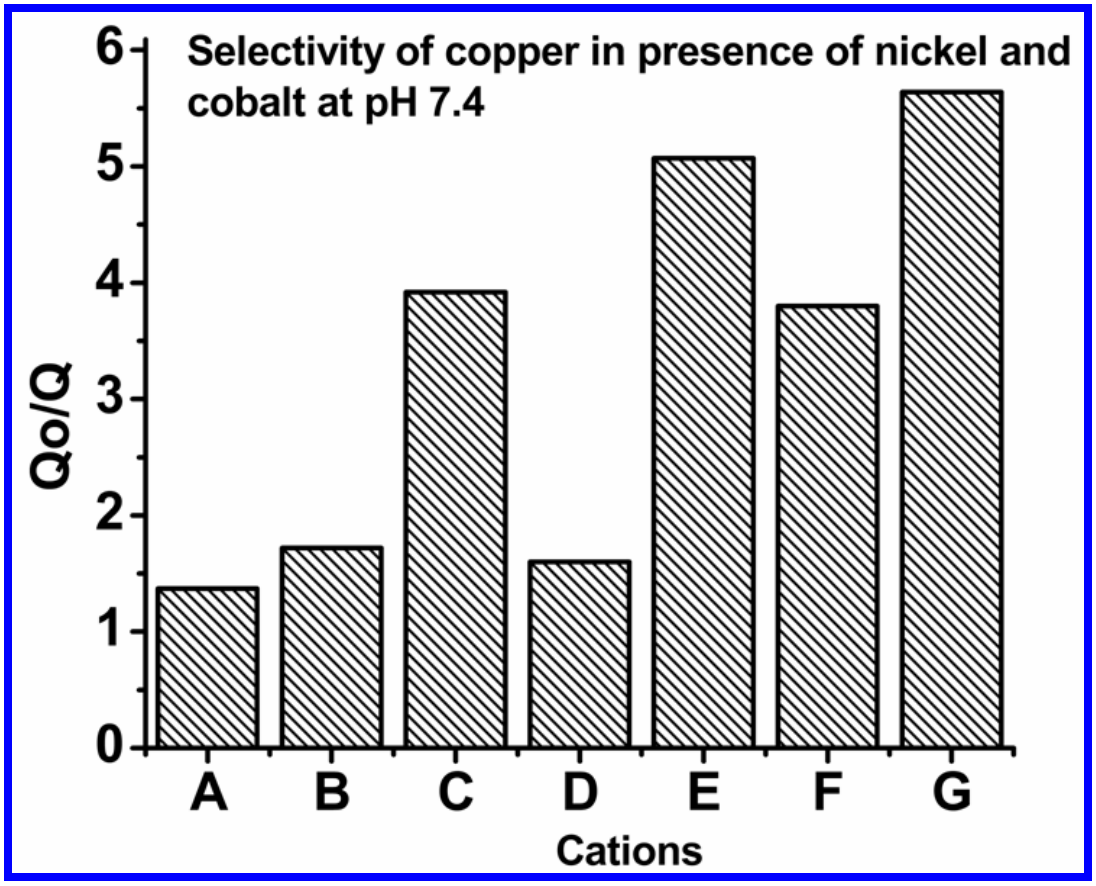


Figure S 3. Selectivity of Cu^{2+} in presence of Ni^{2+} and Co^{2+} at pH 7.4. A, B, C are the effect on the fluorescence in presence of Co^{2+}, Ni^{2+}, Cu^{2+} respectively. D represents the effect in the presence of both Co^{2+} and Ni^{2+}. E represents when both Ni^{2+} and Cu^{2+} are present. F is the effect due to the presence of Cu^{2+} and Co^{2+}. G shows the effect when Cu^{2+} was added in to the system containing both $Co^{2+}$and Ni^{2+}. Q_0 and Q are the fluorescence intensity in the absence and presence of cations. The plot indicates the excellent selectivity of Cu^{2+} in presence of other competing cations.

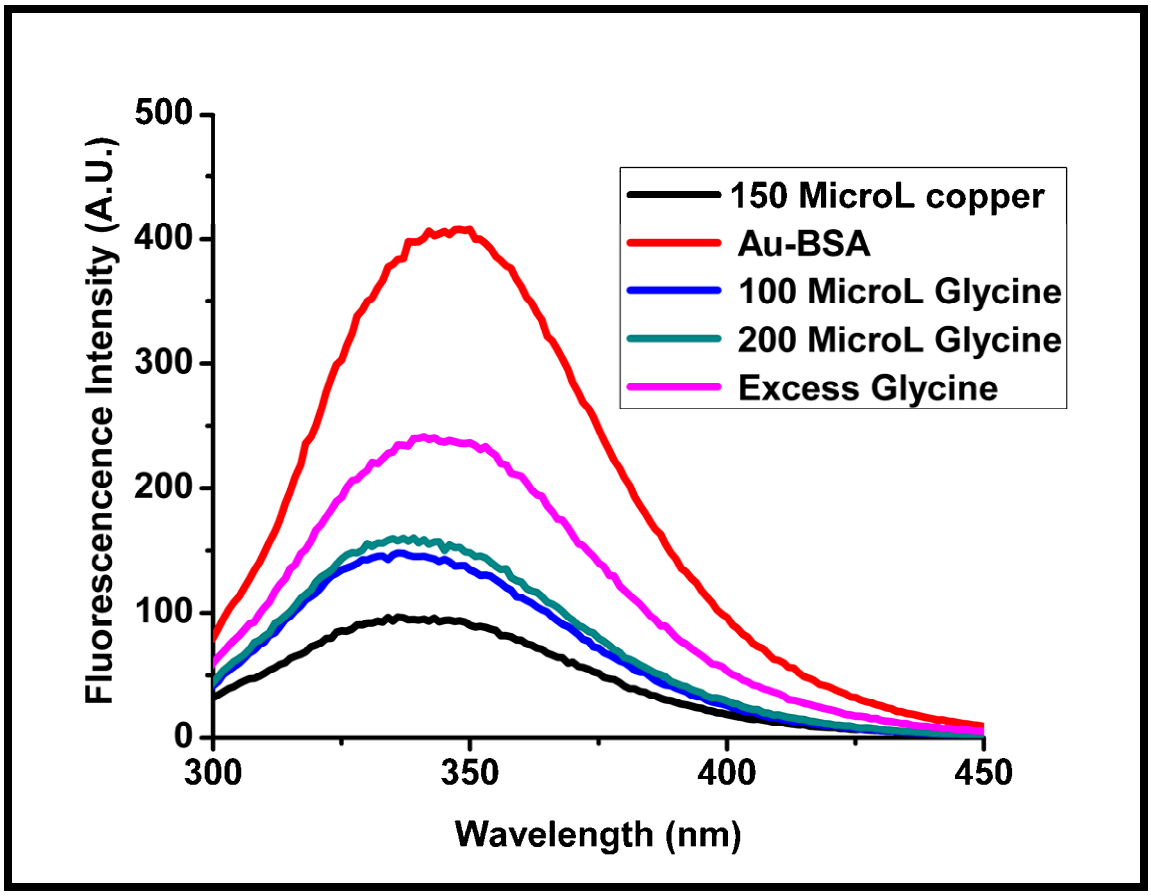
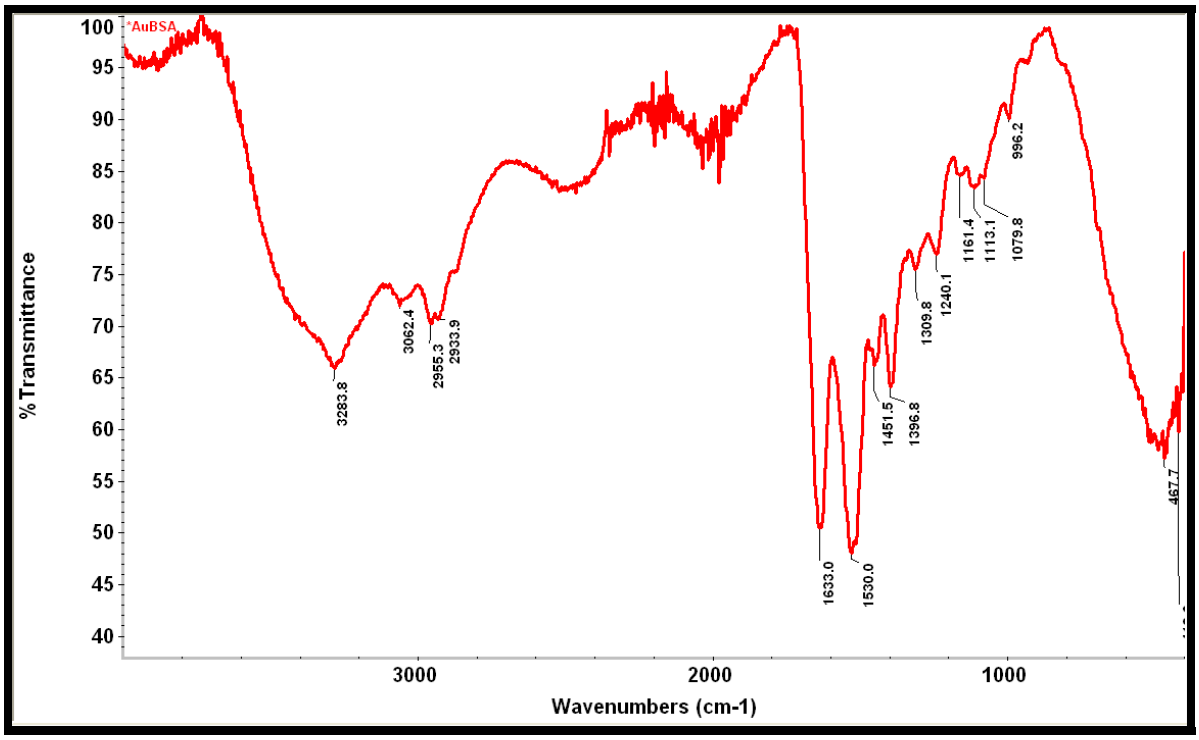
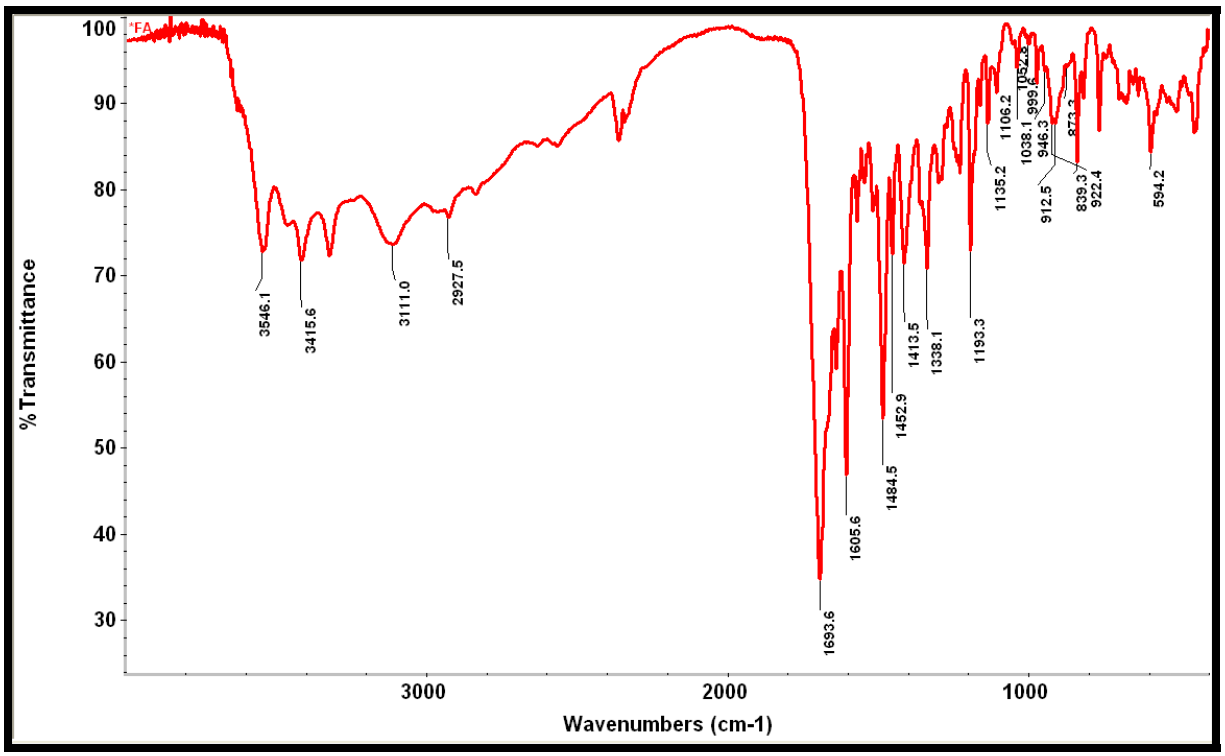


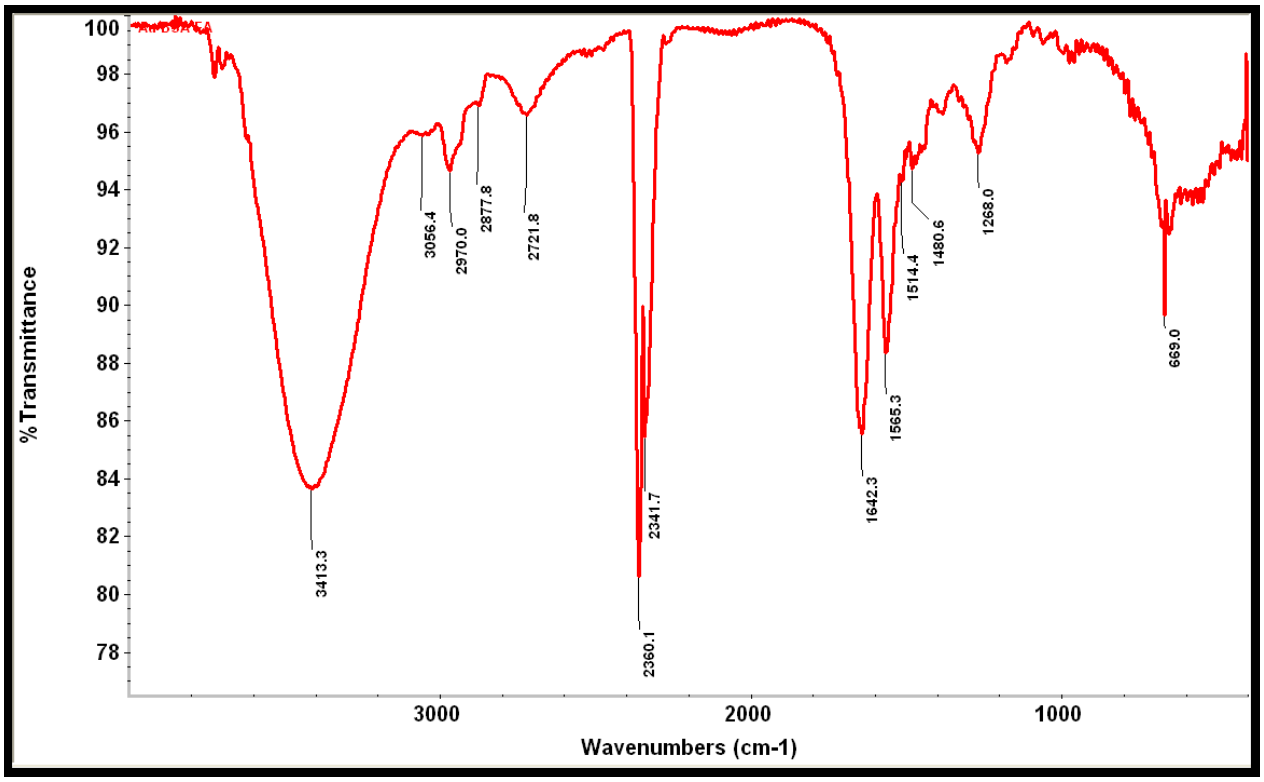
Figure S 4. The figure shows fluorescence recovery of the tryptophan (present in BSA) by the addition of glycine after quenching with Cu^{2+}.



(A) FT-IR spectrum of Au- BSA



(B) FT IR spectrum of Folic Acid (FA).



(C) FT-IR spectrum of Au- BSA- FA.

Figure S 5.

The FT-IR spectra of the Au- BSA nanoclusters (A), the free folic acid (B) and the Au- BSA- FA (C). The two characteristic amide peaks at 1642.3cm^{-1} and 1565.3cm^{-1} confirms the conjugation of the FA on to the Au- BSA cluster.

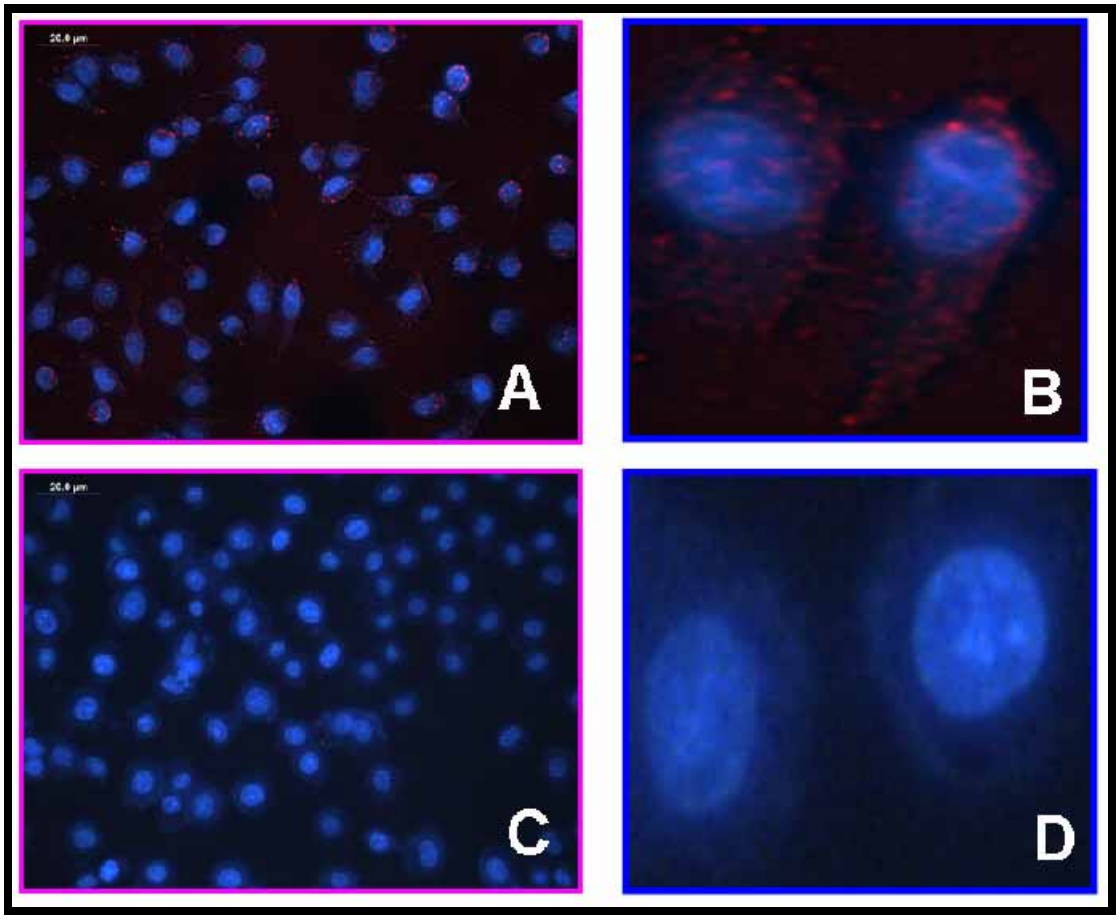


Figure S 6. Fluorescent microscope image of the HeLa cells incubated with 25 μLAu-BSA (A) and its higher magnification image (B). The samples were then incubated with 1mM Cu^{2+}(C) and its higher magnification image (D). The cell nuclei were stained with Hoechst. The red emission initially observed (B) due to Au-BSA was quenched after incubating with Cu^{2+} (D). The scale bar is 20μm.

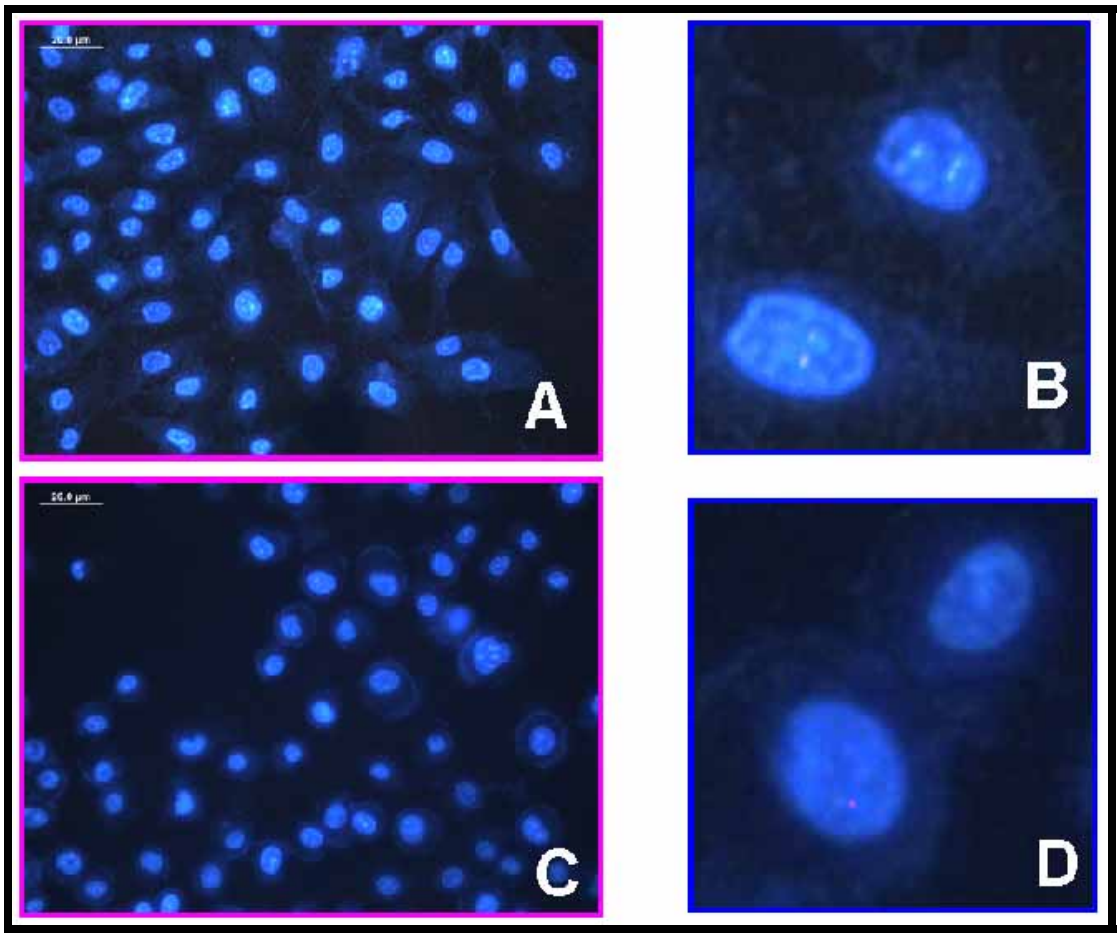


Figure S 7. Fluorescent microscope image of the HeLa cells incubated with 1mM copper (A) and its high magnification image (B). Incubation with 25 µL Au-BSA (C) and its high magnification image (D). The cell nuclei were stained with Hoechst. No red emission from the Au-BSA observed which were quenched by the presence of Cu^{2+}. The scale bar is 20 µm.