Supporting information

Initial Growth Kinetics of Luminescent Quantum Clusters of Silver Within Albumin Family Protein Templates

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Supporting figure 1

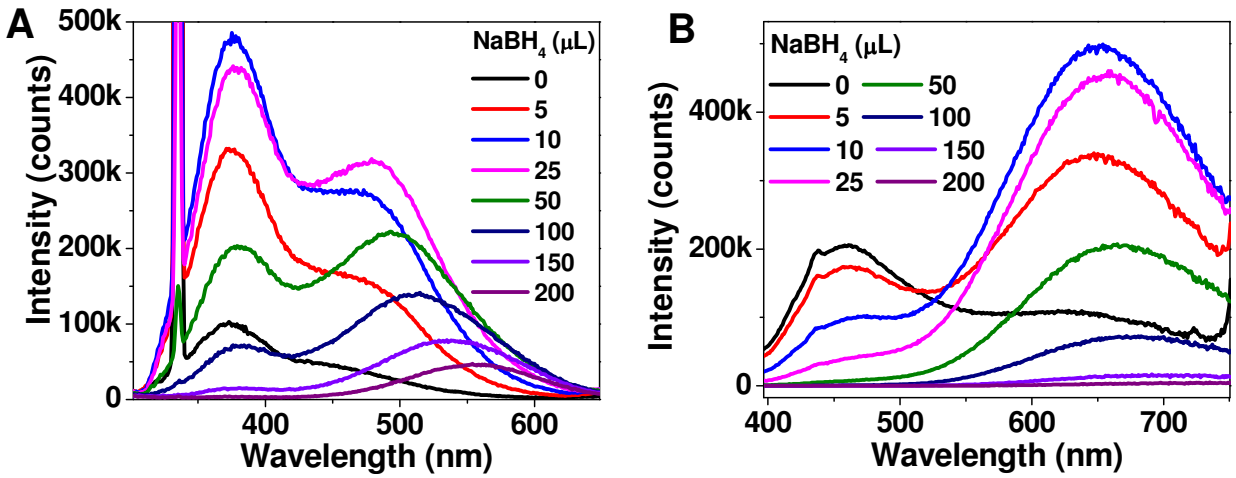

Fig S1: (A) Excitation spectra (Em – 670 nm) of AgQC@Ova. (B) Emission spectra (Ex – 380 nm) of AgQC@Ova.

Supporting figure 2

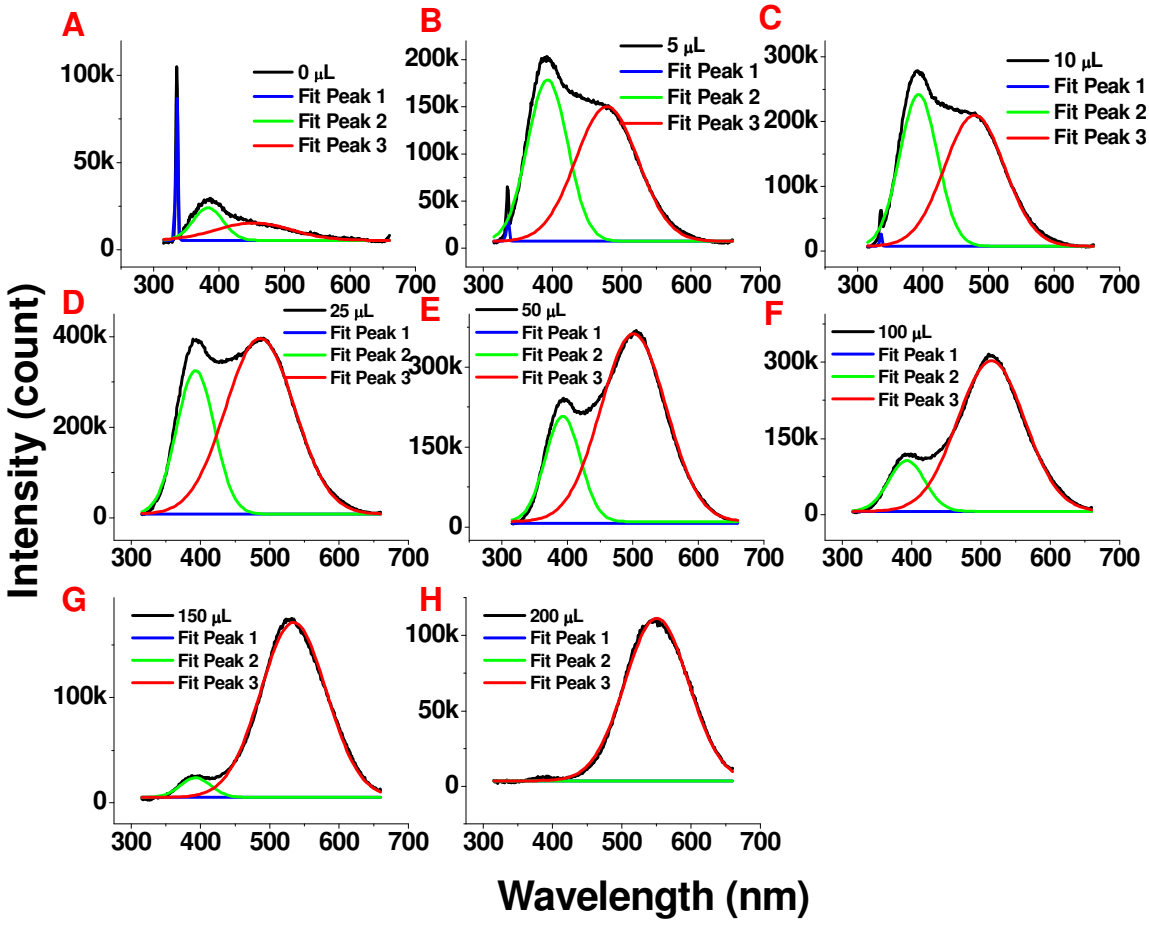

Fig S2: Gaussian peak fitting to excitation spectra (Em – 670 nm) of AgQC@BSA grown using different volumes of 10 mM $NaBH_4$. Peak 1 was accounted for second order peak of emission. Peak 2 is for the excitation of Ag-BSA conjugates and Peak 3 is for the excitation of AgQCs.

Supporting figure 3

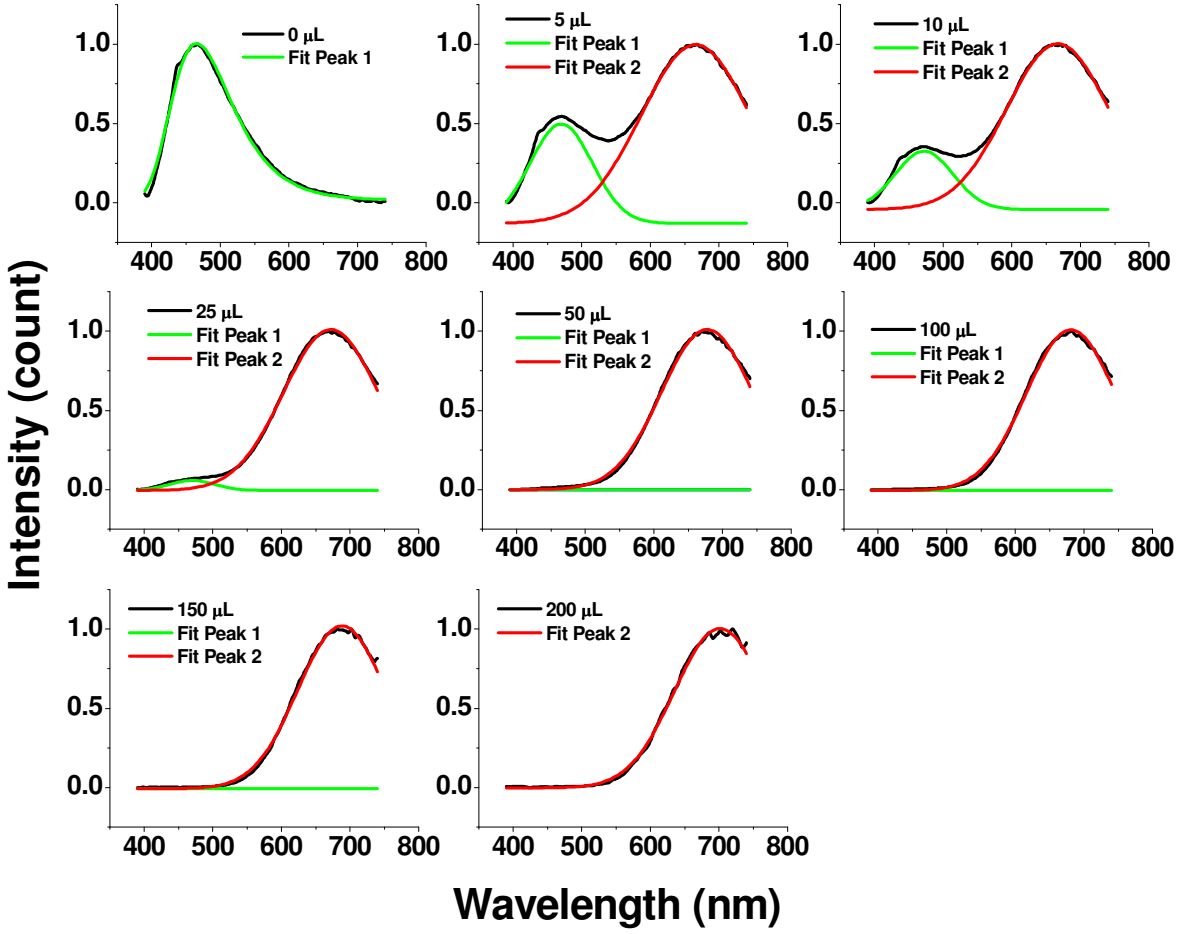

Fig S3: Gaussian peak fitting to emission spectra (Ex – 380 nm) of AgQC@BSA grown using different volumes of 10 mM $NaBH_4$. For the sample without $NaBH_4$ (0 µL), curve was fitted using extreme value (amplitude) function. Peak 1 is for the emission of Ag-BSA conjugates and Peak 2 is for the emission of AgQCs.

Supporting figure 4

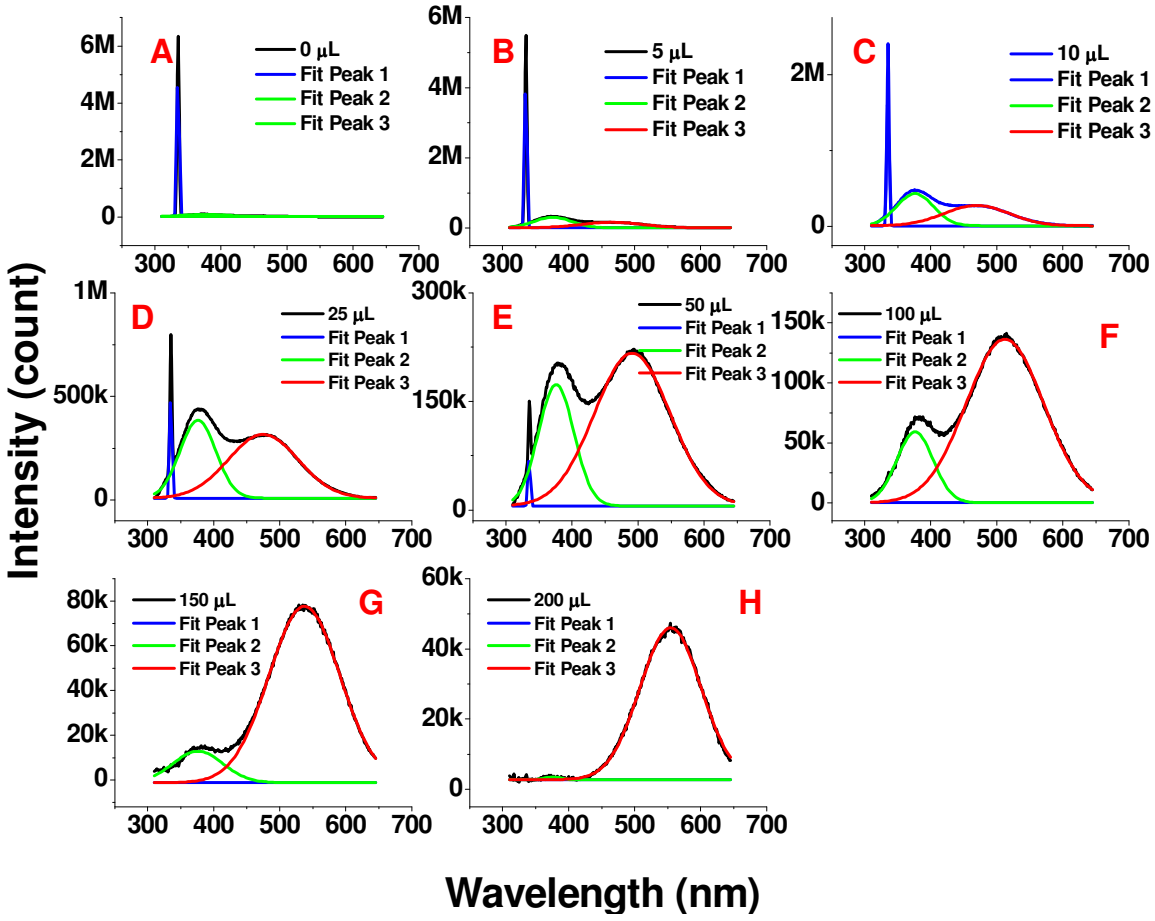

Fig S4: Gaussian peak fitting to excitation spectra (Em – 670 nm) of AgQC@Ova grown using different volumes of 10 mM $NaBH_4$. Peak 1 was accounted for second order peak of emission. Peak 2 is for the excitation of Ag-Ova conjugates and Peak 3 is for the excitation of AgQCs.

Supporting figure 5

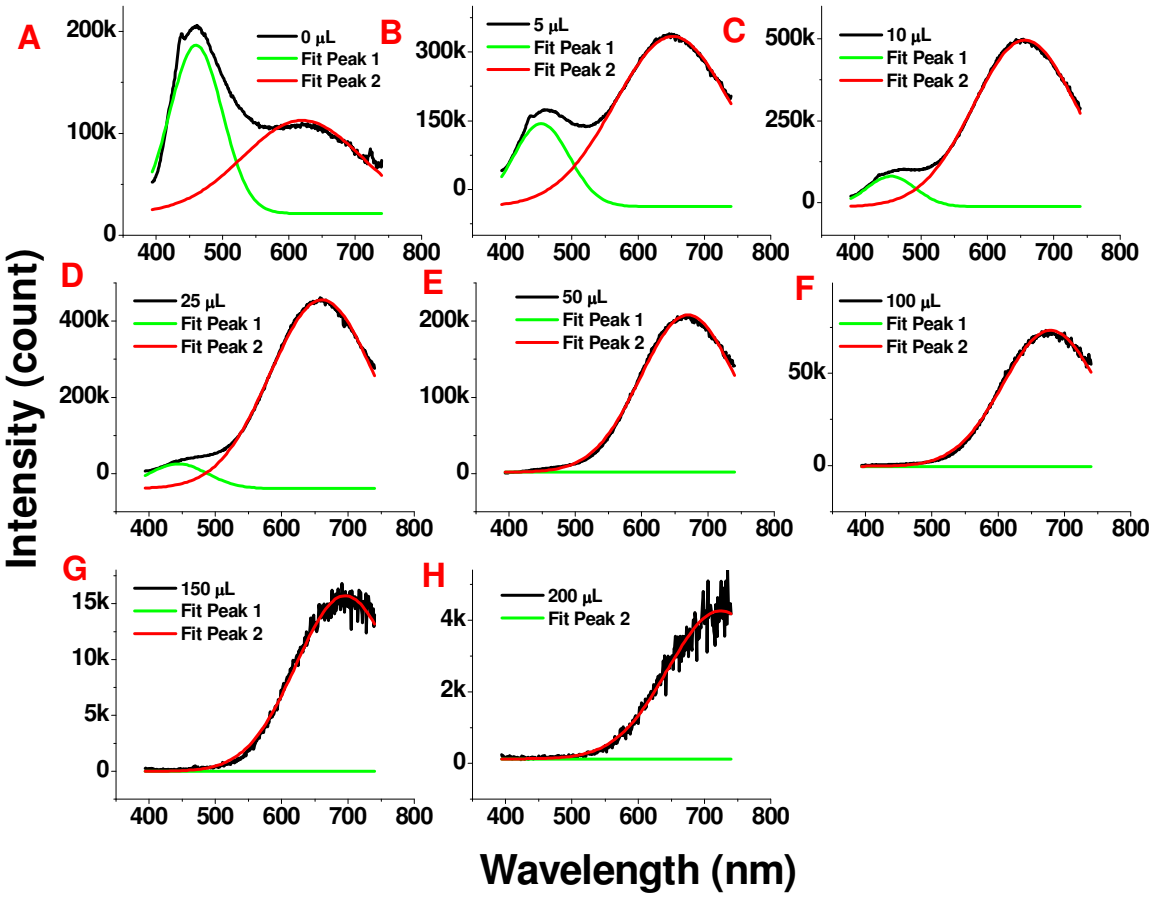

Fig S5: Gaussian peak fitting to emission spectra (Ex – 380 nm) of AgQC@Ova grown using different volumes of 10 mM $NaBH_4$. Peak 1 is for the emission of Ag-Ova conjugates and Peak 2 is for the emission of AgQCs.

Supporting figure 6

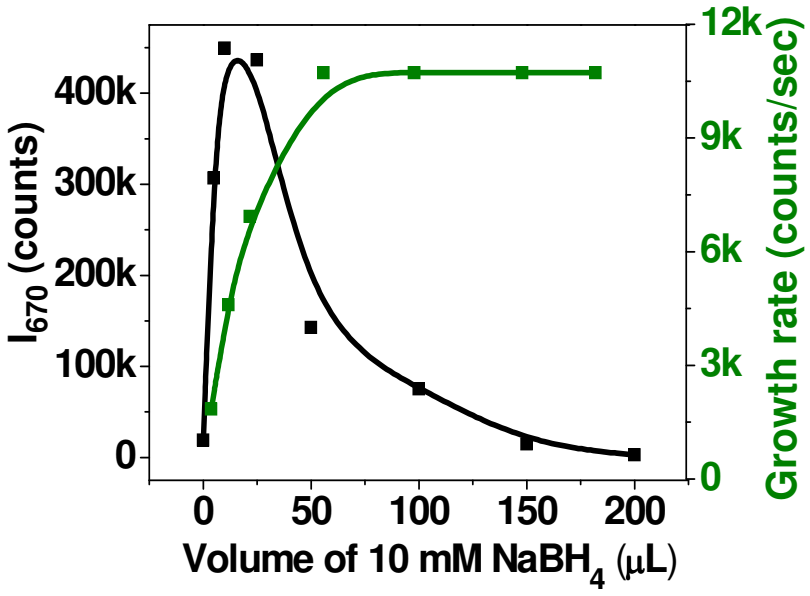

Fig S6: Changes in the emission intensity of AgQC@Ova after the addition of different volumes of 10 mM $NaBH_4$ after 500 seconds of reaction (black curve). Changes in the growth rate of AgQC@Ova (green curve).

Supporting figure 7

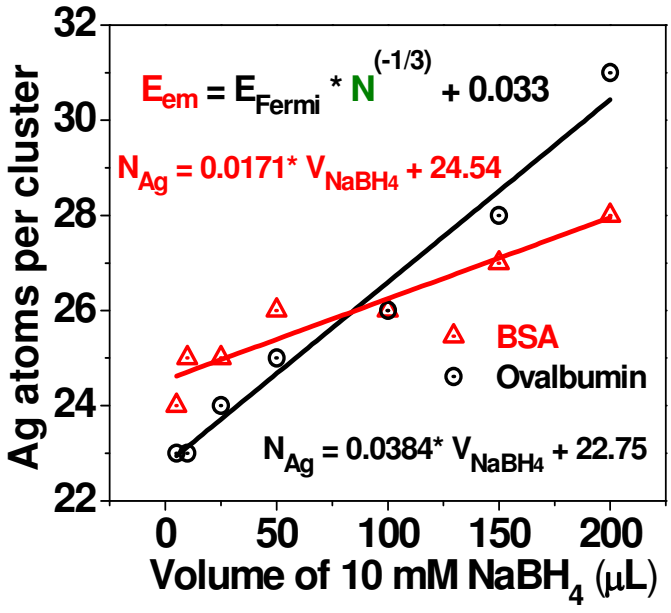

Fig S7: Jellium model[1-2] was applied to AgQC@BSA and AgQC@Ova and number of silver atoms (N_{Ag}) per clusters was extrapolated from the emission energy values of QCs grown using different volumes of 10 mM $NaBH_4$ (V_{NaBH4}). As shown by Zheng *et al.*, the anharmonicity parameter U = 0.033 has been added to the spherical jellium model equation.[2]

Supporting figure 8

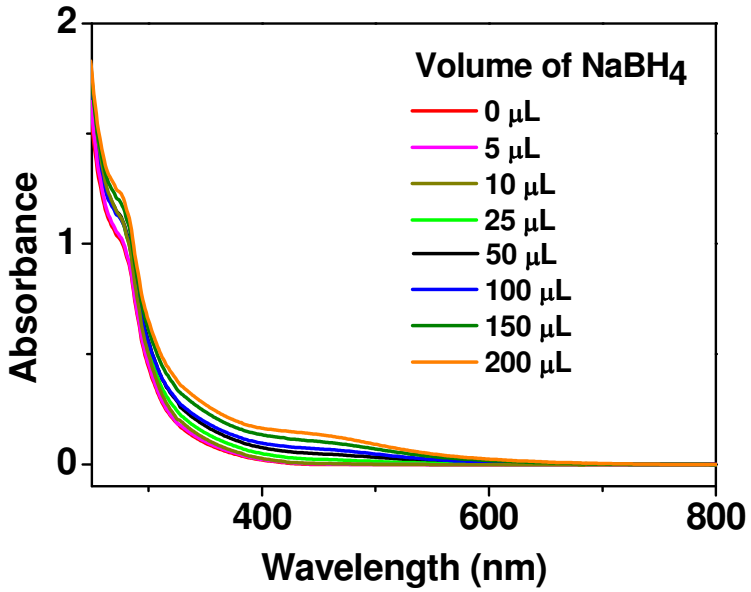

Fig S8: UV-Vis spectra of AgQC@BSA grown using different volumes of 10 mM $NaBH_4$.

Supporting figure 9

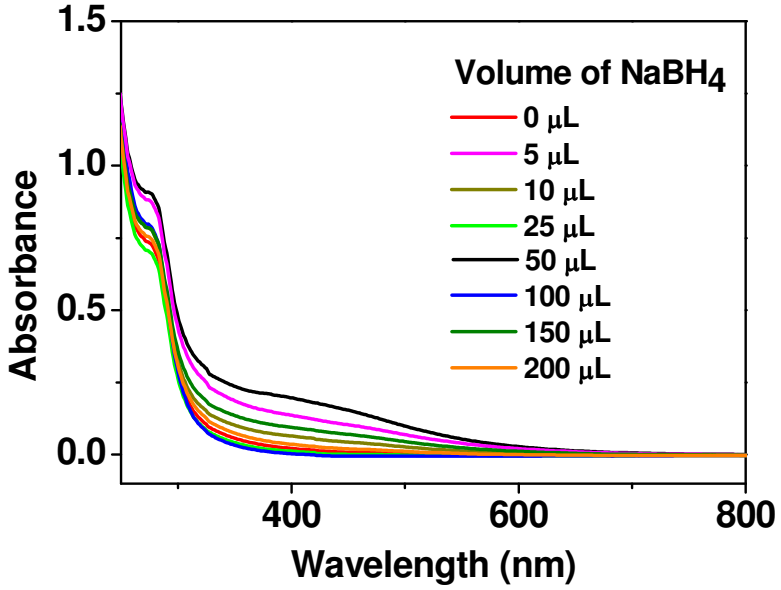

Fig S9: UV-Vis spectra of AgQC@Ova grown using different volumes of 10 mM $NaBH_4$.

Supporting table1

Concentration of $NaBH_4$ (µL)	τ for BSA	τ for Ova
5	-41.7534	-110.546
10	-24.7828	-79.5955
25	-6.33972	-55.6722
50	-42.8316	-6.2128
100	-70.3621	-37.7251
150	-31.8202	-23.355
200	-16.7114	-10.6371

Table 1: Growth curves of AgQC@BSA and AgQC@Ova for different volumes of 10 mM $NaBH_4$ were fitted using single component exponential growth function given below,

$$I_{670} = C + Ae^{(t/\tau)}$$

Where, I_{670} is the emission intensity at 670 nm in counts, C is offset value for constant baseline, A is amplitude, t is time in seconds and τ is the growth constant. Initial growth transients were removed while fitting the decay curves. Obtained values of growth constants are shown in the table above.

References

1. Zheng, J.; Zhang, C.; Dickson, R. M., Highly Fluorescent, Water-Soluble, Size-Tunable Gold Quantum Dots. *Phys. Rev. Lett.* 2004, ***93***, 077402.

2. Zheng, J.; Nicovich, P. R.; Dickson, R. M., Highly Fluorescent Noble-Metal Quantum Dots. *Annu. Rev. Phys. Chem.* 2007, ***58***, 409-431.