

Supplementary Information (SI)

**Selective and sensitive determination of antidote of heparin using
Ag-GQDs by optical methods**

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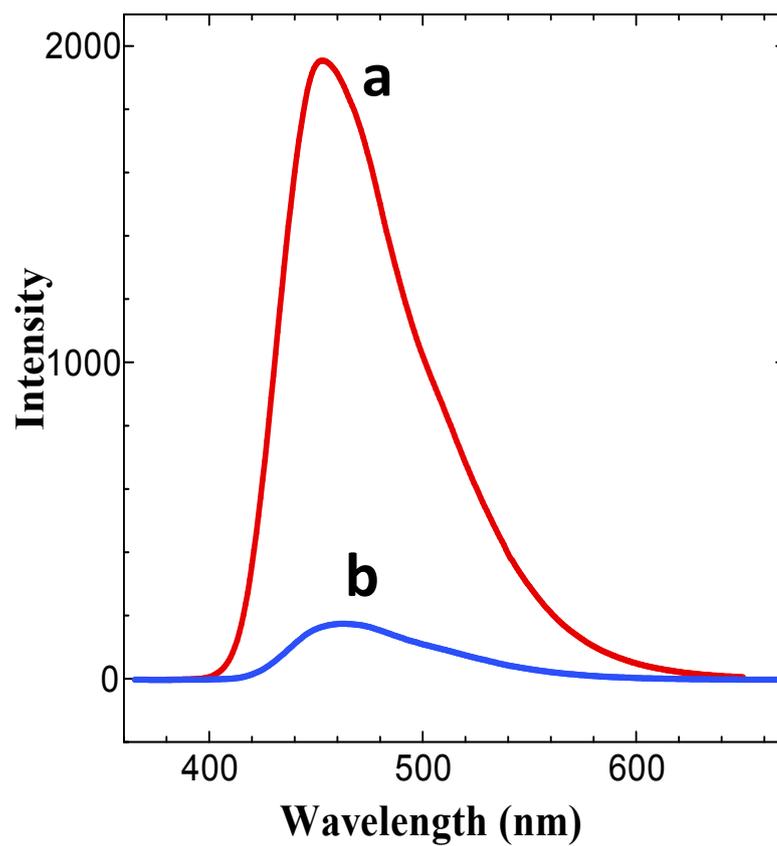


Fig. S1 Emission spectra obtained for the colloidal solution of (a) GQDs and (b) Ag-GQDs ($\lambda_{\text{ext}} = 365$ nm).

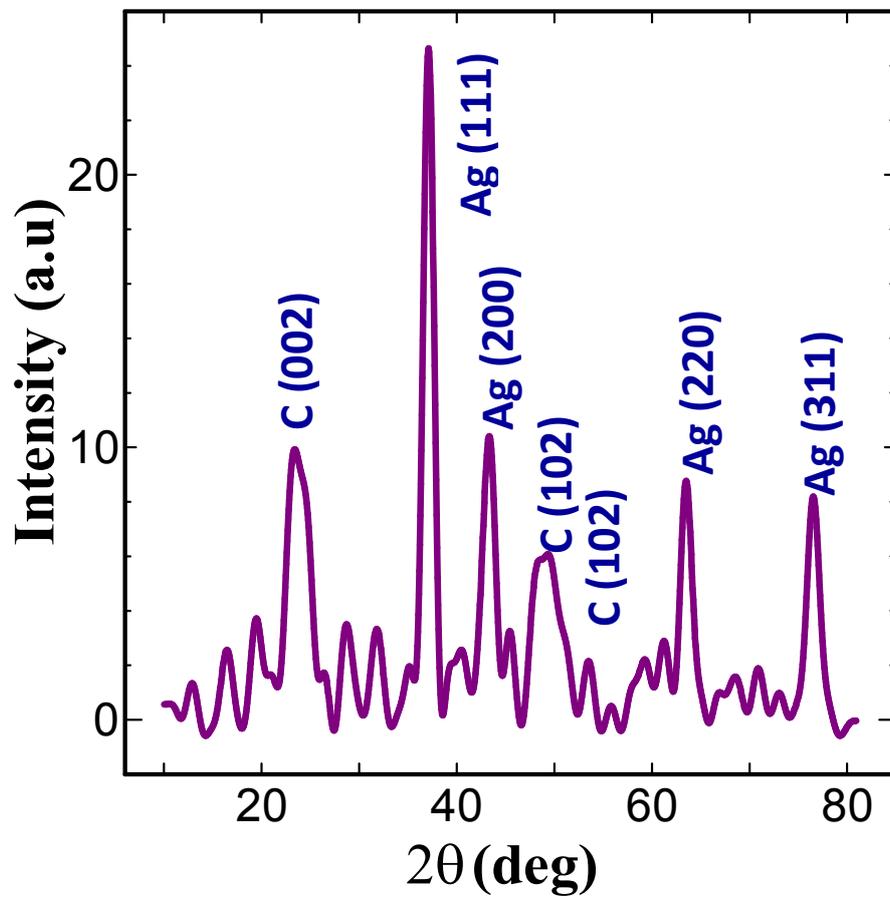


Fig. S2 XRD pattern of Ag-GQDs

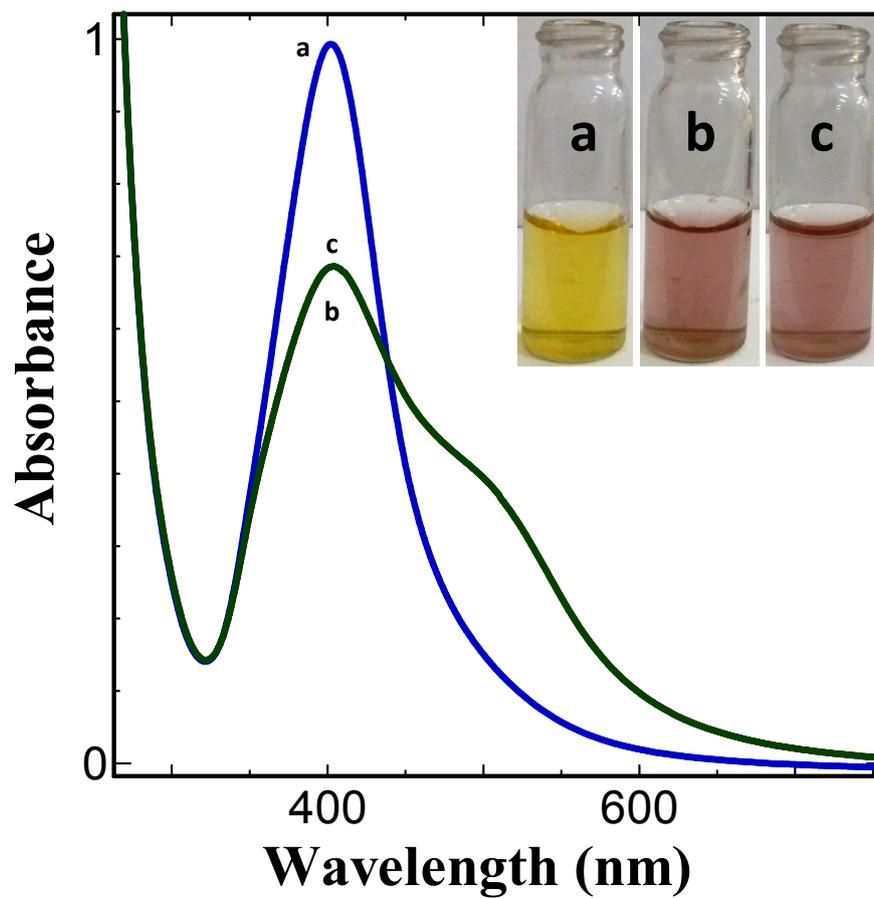


Fig. S3. UV-vis spectra of Ag-GQDs a) Ag-GQDs, (b) Ag-GQDs in the presence of 100 ng of protamine and (c) Ag-GQDs in the presence of 100 ng of protamine with 0.5 μ g of heparin. Inset shows their corresponding photographs

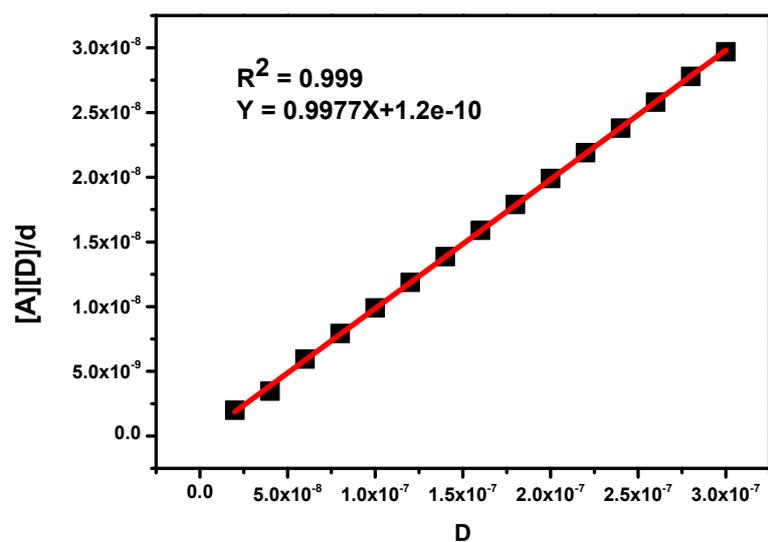


Fig. S4. Association constant plot for spectrophotometric determination of protamine using Ag-GQDs.

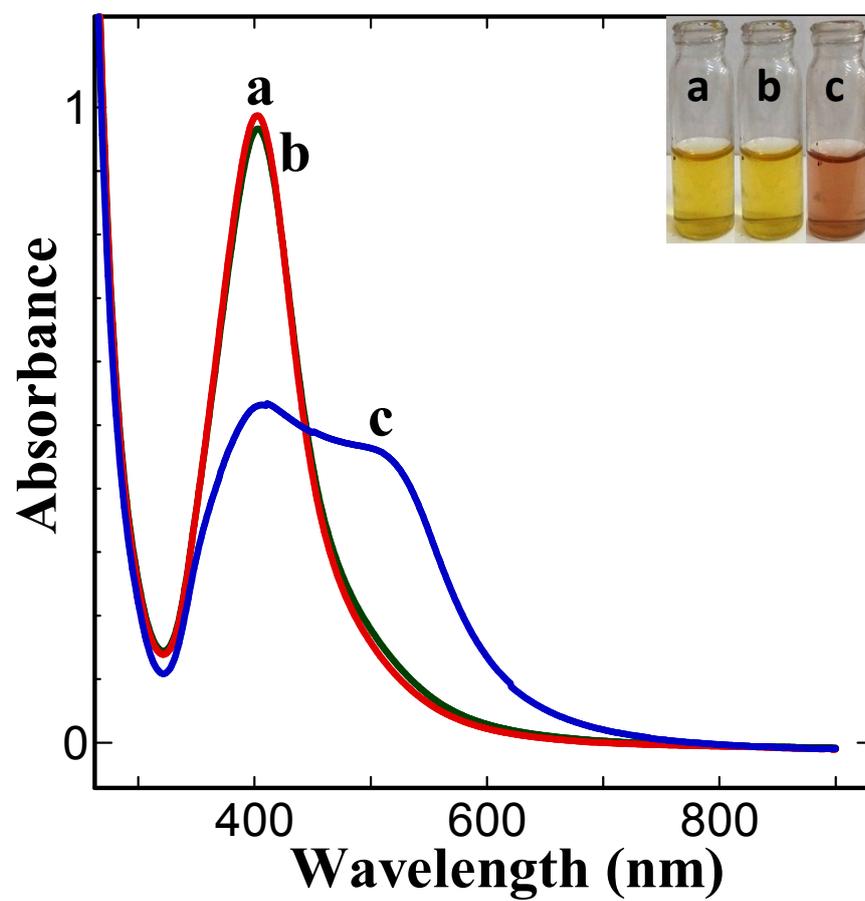


Fig. S5. UV-vis spectra of Ag-GQDs a) Ag-GQDs, (b) Ag-GQDs in the presence of 100 ng/mL heparin, (c) Ag-GQDs + 100 ng/mL heparin + 100 ng/mL protamine. Inset shows corresponding photographs.

Table S1Determination of protamine in blood serum samples^{a,b}

Blood serum	Protamine added ng/mL	Protamine found ng/mL	Recovery (%)
Sample 1	-	-	-
Sample 2	40	39.3	98.25
Sample 3	80	80.5	100.6
Sample 4	120	119.4	99.5