Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Electronic Supporting information

Highly selective and sensitive biosensing of dopamine based on glutathione coated silver nanoclusters enhanced fluorescence

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Effect of time

The effect of reaction time on the emission intensity of the GSH-AgNCs-DA system was tested. The effect of time depentent emission intensity of GSH-AgNCs in the presence of 20 nM DA is displayed in Fig. S1. The curve in Fig. S1 indicates that maximal emission enhancement value is reached with 10 min of reaction time and then retains a stable signal. Therefore, 10 min was preferred as the interaction time between the GSH-AgNCs and DA for this approach.

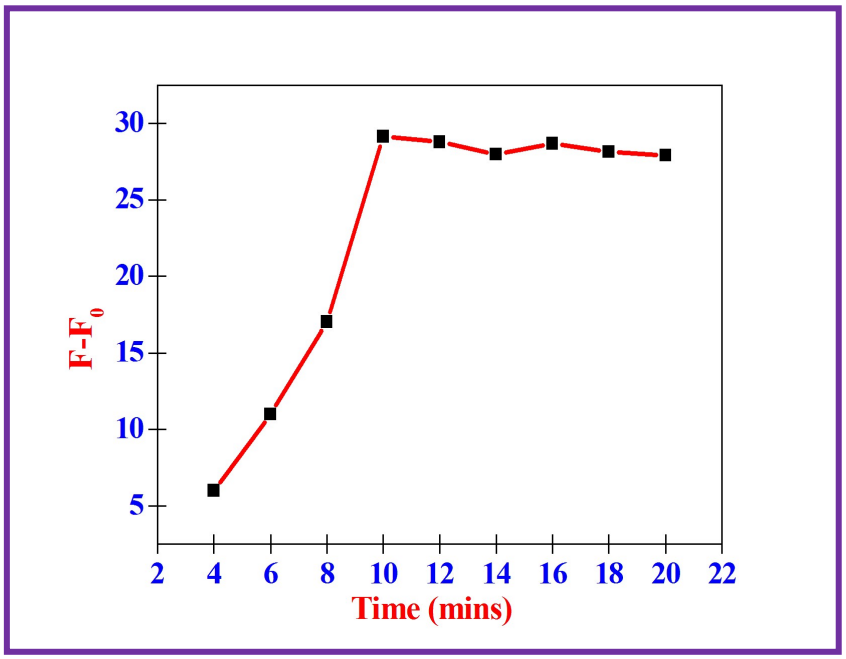

Fig. S1. The effect of incubation time on the emission intensity of GSH-AgNCs in the presence of DA.

Effect of pH

The emission intensity of GSH-AgNCs is usually influenced by the solution pH values. The emission intensity of GSH-AgNCs was studied by different pH values ranged from 5.0 to 9.5 and the corresponding results are shown in Fig. S2. It can be observed from Fig. S2, the stability and emission intensity of GSH-AgNCs is detrimentally affected at high pH values (>9.0) and low pH values (<6.0). Whereas, GSH-AgNCs are highly stable at pH=8.0 Hence, pH 8.0 was selected as the most favourable pH for the successful detection of DA.

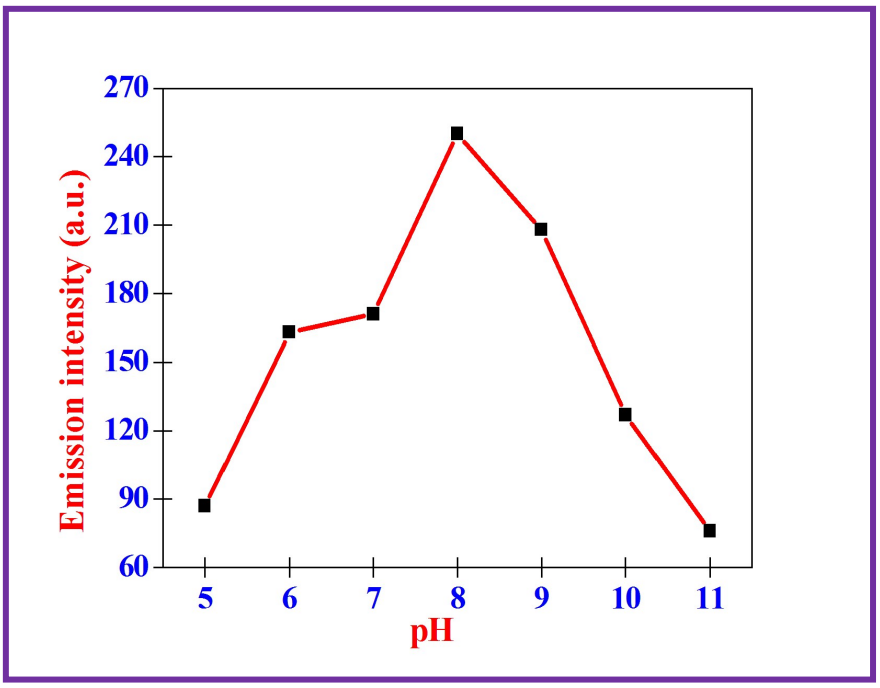

Fig. S2. The effect of pH on the emission intensity of GSH-AgNCs.

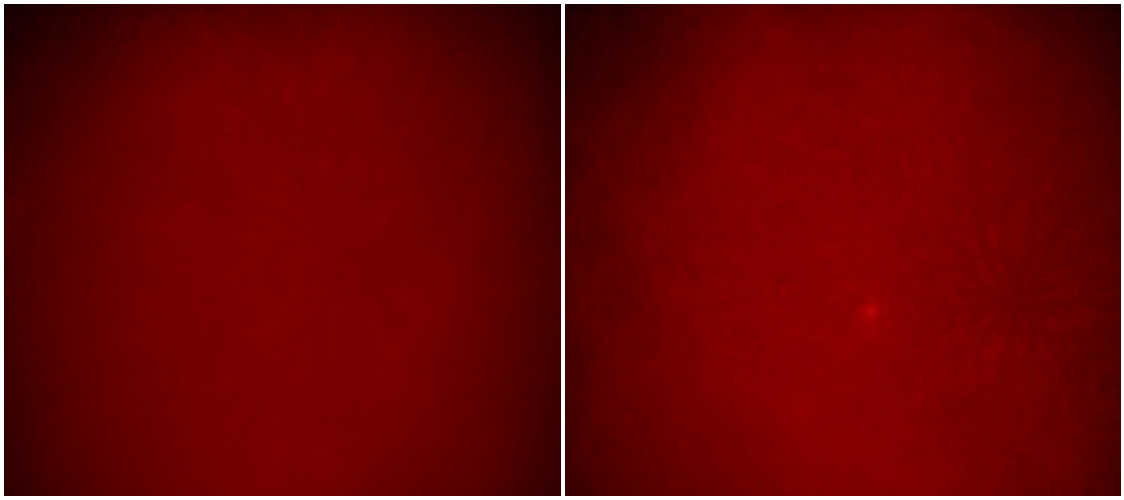

Fig. S3. Optical fluorescence microscopic images of GSH-AgNCs when excited at green emission.

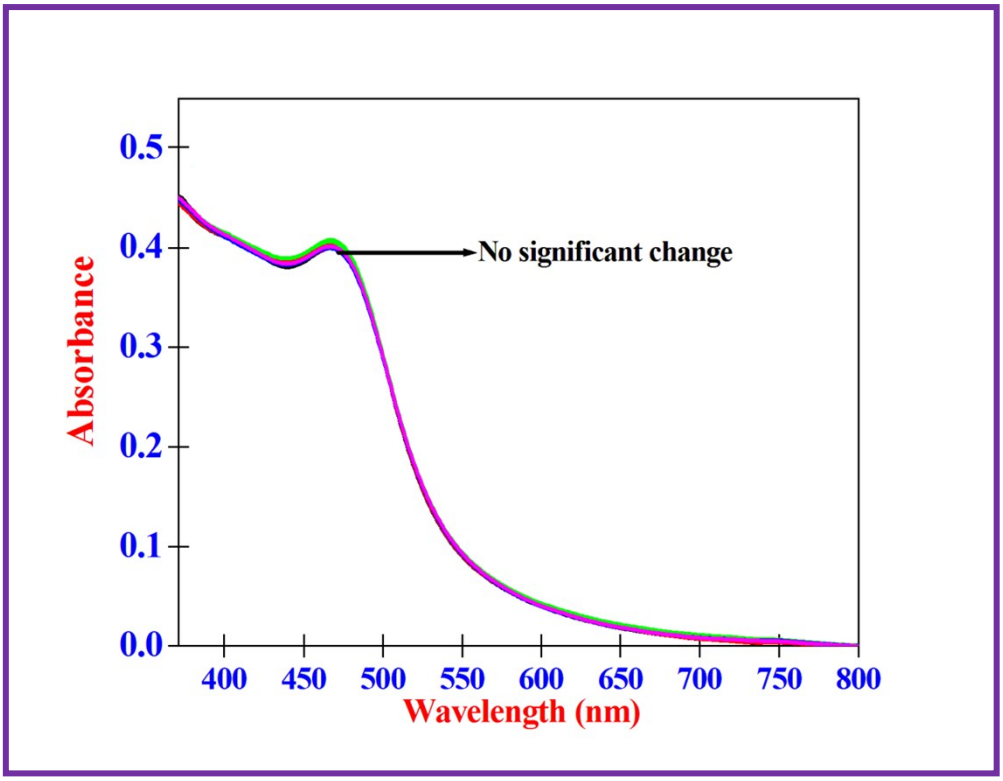

Fig. S4. Absorption spectra of GSH-AgNCs at low concentrations of DA. [DA]: (a) 0, (b) 20.00 × 10^{-9}, (c) 40.00 × 10^{-9}, (d) 60.00 × 10^{-9}, (e) 80.00 × 10^{-9}, (f) 100.00 x 10^{-9}, (g) 120.00 × 10^{-9}, (h) 160.00 ×10^{-9} (i) 180.00 × 10^{-9} and (j) 200.00 × 10^{-9} mol dm^{-3}.

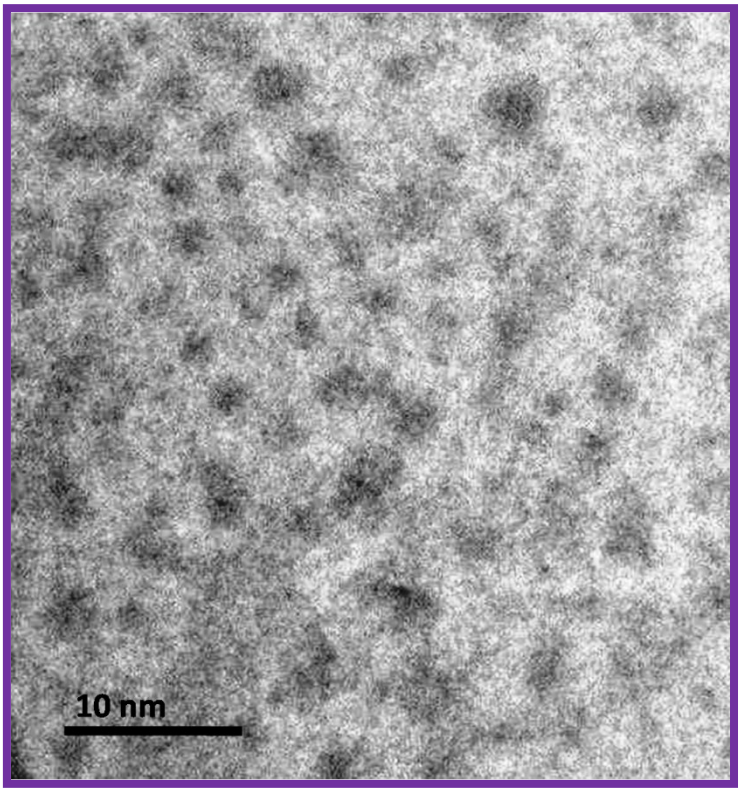

Fig. S5. HR-TEM image for GSH-AgNCs after the addition DA analyte.

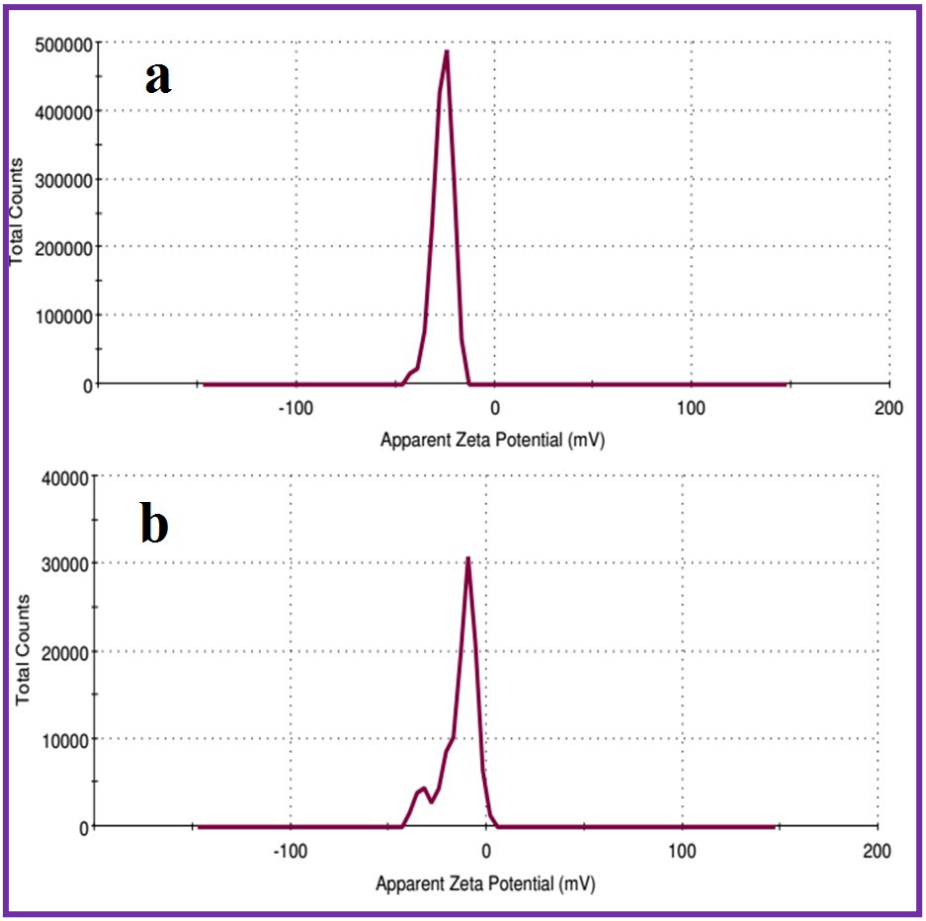

Fig. S6. Surface charge of Zeta potential results for before (a) GSH-AgNCs and (b) after the addition DA analyte.

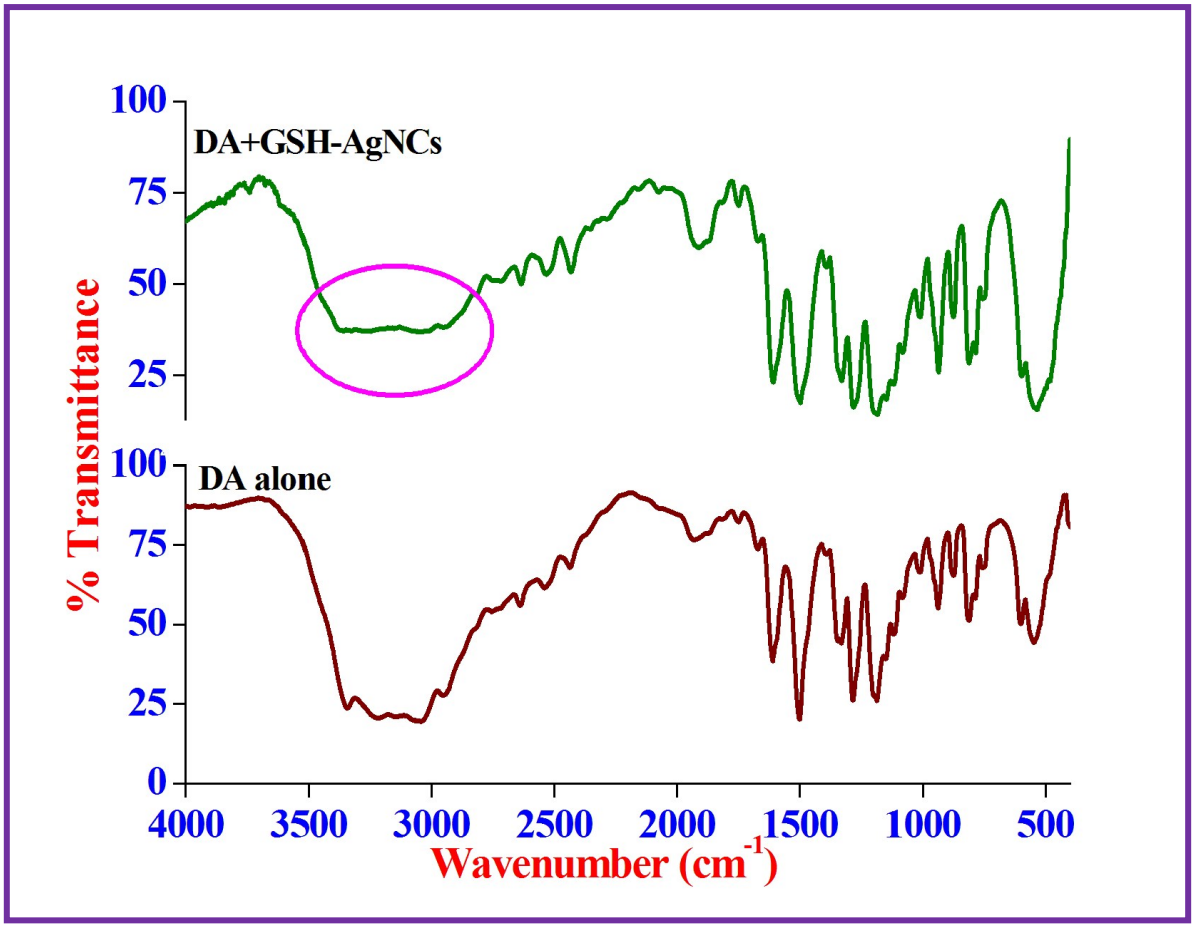

Fig. S7. FT-IR spectral results of DA alone and DA+GSH-AgNCs.

Table S1. Comparison of linear range, detection limit and real sample analysis collected in the current study towards the detection of DA with the reported methods.

S.No	Method	Nanomaterials	Linear Range $\times 10^{-9}$ mol dm^{-3}	LOD $\times 10^{-9}$ mol dm^{-3}	Real samples	Ref
1	Colorimetry	MA-AuNPs	33- 33300000	33	Serum samples	1
2	Colorimetry	AHMT - AuNPs	200-1100	70	----	2
3	Colorimetry	AuNPs	540-5300	360	----	3
4	Fluorescence	Cu^{2+}-BSA AuNCs	0-3500	100	Serum and urine samples	4
5	Fluorescence	β-CD-AuNCs	5-1000	2	Serum samples	5
6	Fluorescence	GF/*ds*DNA–silver nanohybrids	0–200	6	----	6
7	Fluorescence	BSA-stabilized Au nanoclusters	10–1000	10	Serum and PC12 cell samples	7
8	Fluorescence	Nitrogen- and iron-containing carbon dots	50-500	30	Serum samples	8
9	Fluorescence	Terbium (III) inorganic-organic network	2000-20000	820	Serum samples	9
10	**Fluorescence**	**GSH-AgNCs**	**20-220**	**0.35**	**Human urine samples**	**This work**

References

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