Supplementary Information

Carbon Dots Derived from *Averrhoa bilimbi* Fruit for the Detection of Cholesterol and Chromium(VI)

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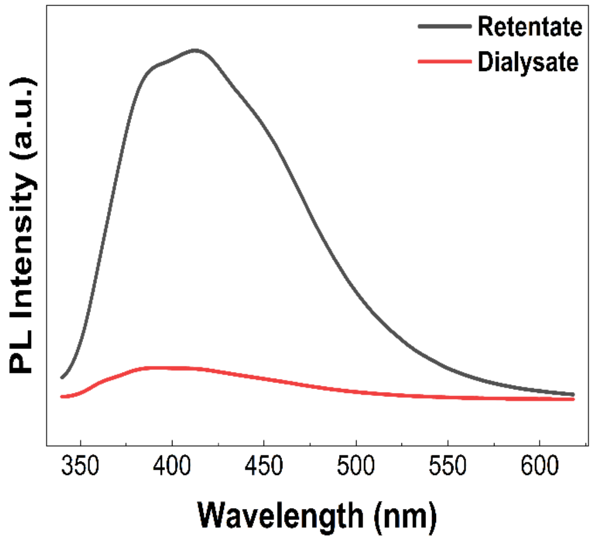

Fig. S1 PL response of the retentate and dialysate obtained after dialysis of AB-CDs.

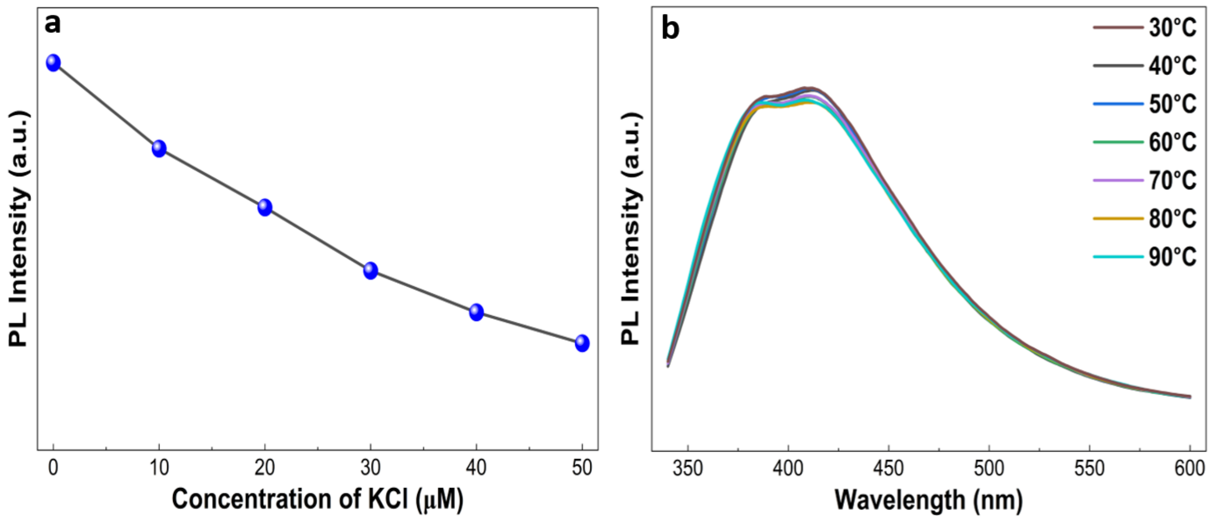

Fig. S2 (a) Plot showing the ionic strength dependence of PL intensity of AB-CDs, and (b) Temperature-dependent PL response demonstrating the thermal stability of AB-CDs.

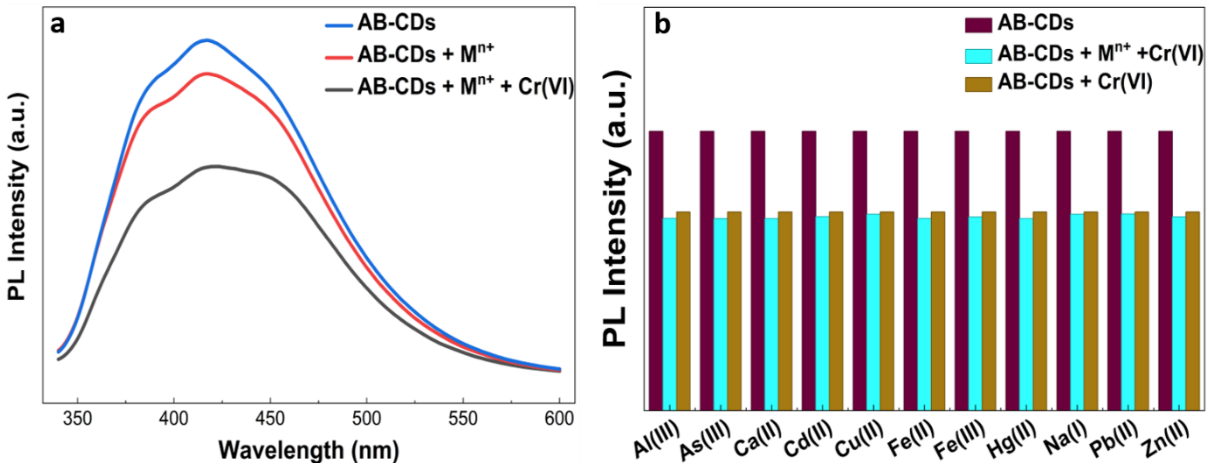

Fig. S3 (a) PL spectra of AB-CDs in the presence of a mixture of metal ions (Al(III), As(III), Ca(II), Cd(II), Cu(II), Fe(II), Fe(III), Hg(II), Na(I), Pb(II), and Zn(II)), recorded both in the absence and presence of Cr(VI) ions. (b) PL response of AB-CDs in the presence of individual metal ions, along with Cr(VI), and with Cr(VI) alone.

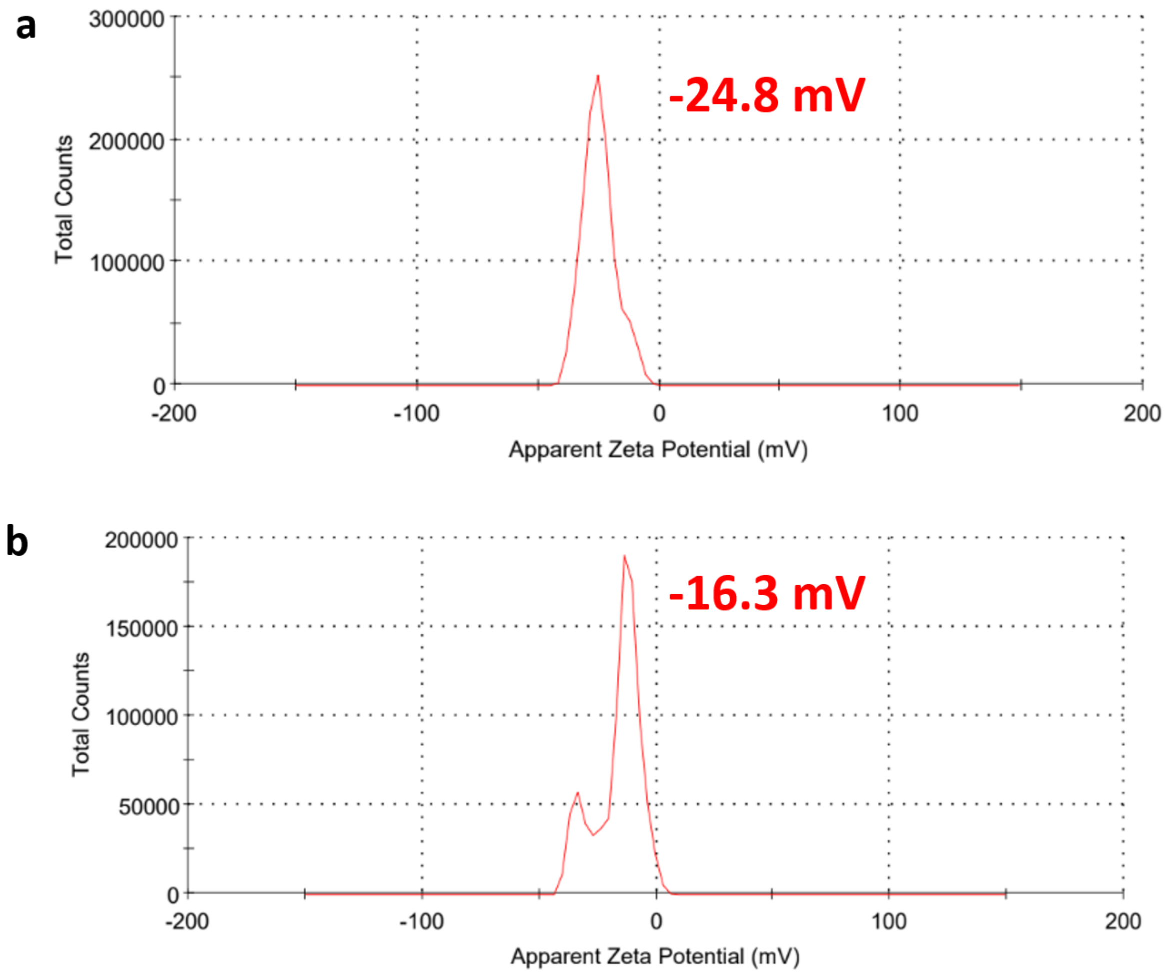

Fig. S4 Zeta potential measurements of (a) AB-CDs, and (b) AB-CDs after the addition of 20 μL of 0.01 M cholesterol.

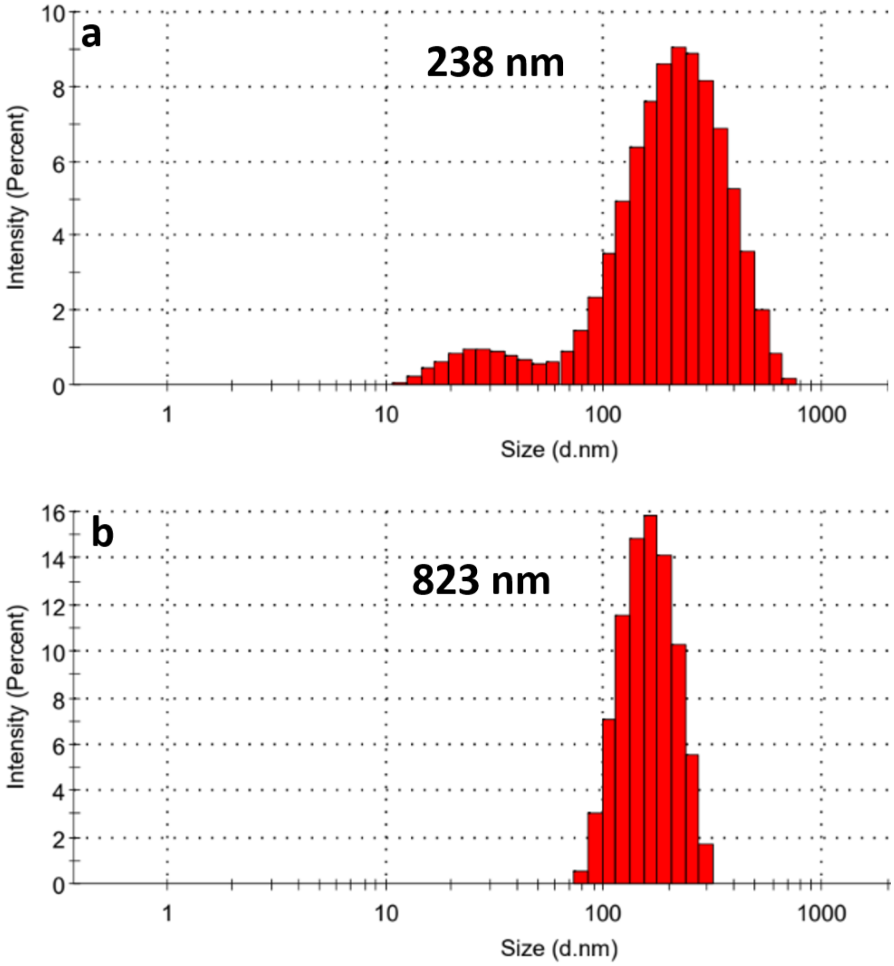

Fig. S5 Size distribution histogram obtained from DLS analysis of (a) AB-CDs, and (b) AB-CDs after the addition of 20 µL of 0.01 M cholesterol.

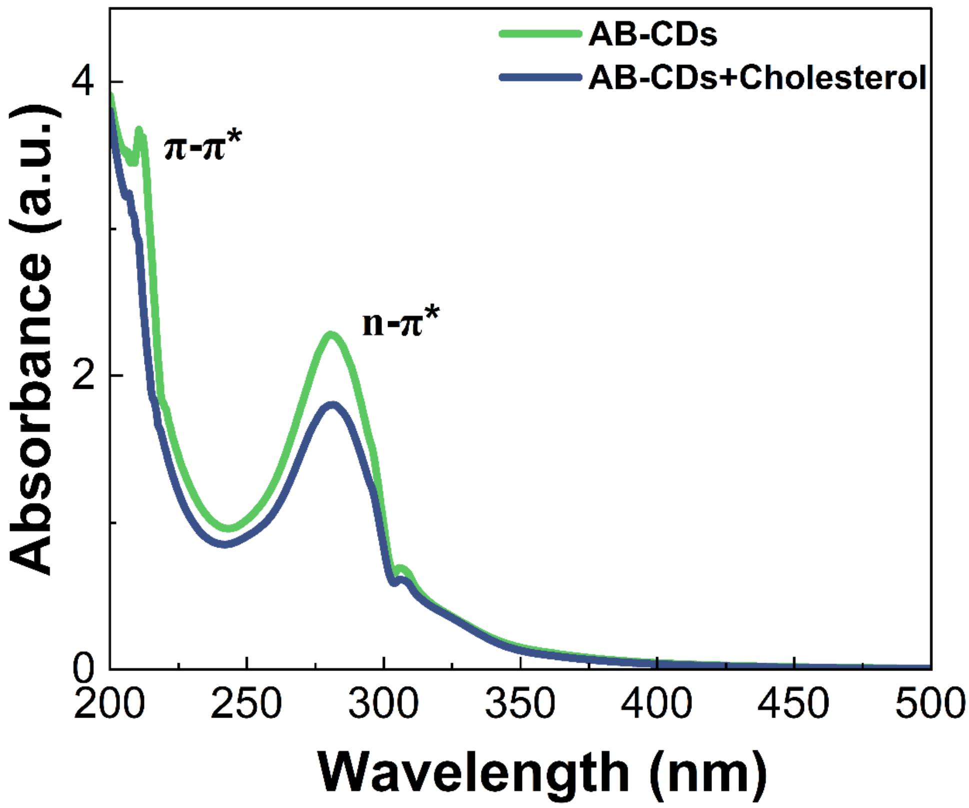

Fig. S6 UV-visible absorption of AB-CDs, and AB-CDs with cholesterol.

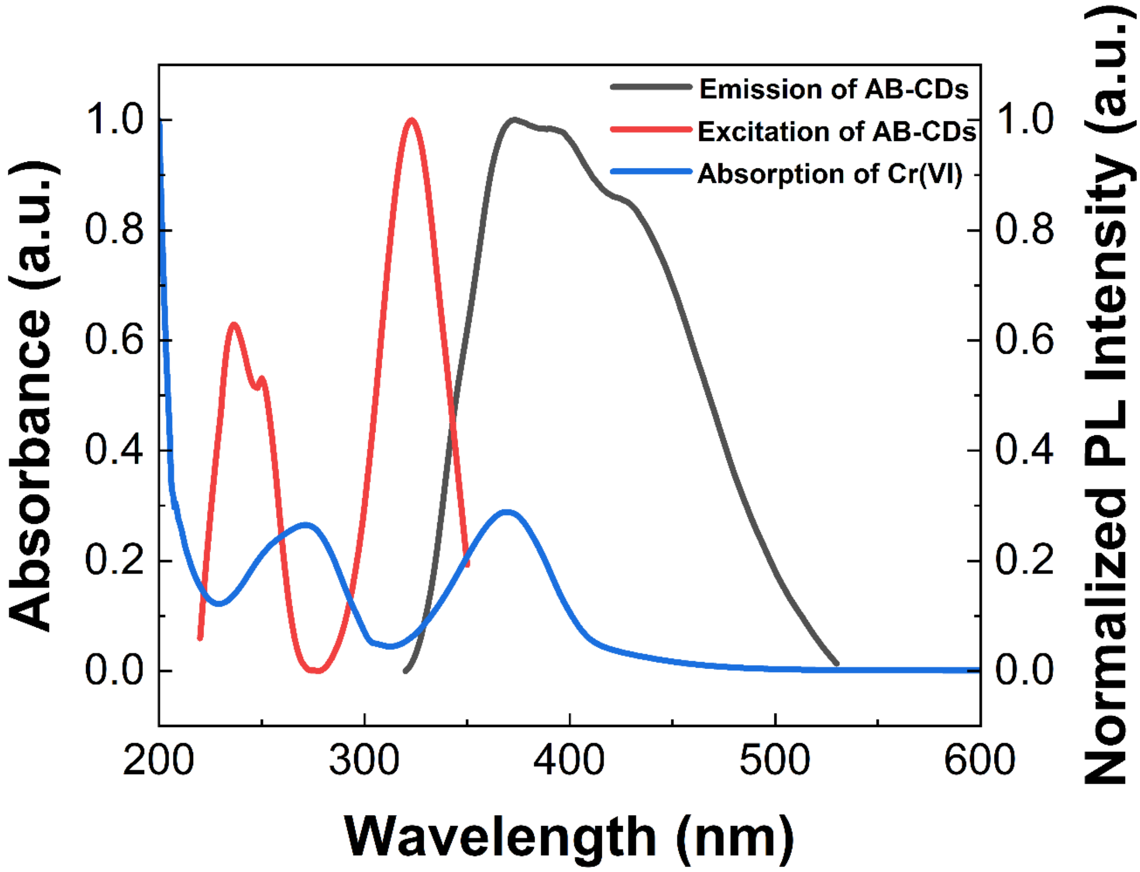

Fig. S7 UV-Visible absorption spectrum of Cr(VI), Excitation spectrum (Emission recorded at 415 nm), and Emission spectrum (λ_{ex} = 320nm) of AB-CDs respectively.

Table S1 Comparison of the current fluorescence-based approach for the detection of Cr(VI) with previously reported works.

Sl. No.	Fluoroprobe	Method of synthesis of CDs	Metal ion detected	Linear range of detection	LOD values	References
1.	Dual emissive carbon dots (DECDs)	Hydrothermal	Cr(VI)	2-300 µM	0.4 µM	[1]
2.	Nitrogen-doped carbon quantum dots (C-dots)	Microwave-induced decomposition	Cr(VI)	0.08-1mM	140 µM	[2]
3.	Blue-emitting carbon dots (M-CDs)	Solvothermal	Cr(VI)	0-300 µM	0.86 µM	[3]

4.	Phosphate functionalized carbon dots (PCDs)	Microwave synthesis	Cr(VI)	1-400 µM	0.24 µM	4
5.	Yellow fluorescent CDs	Hydrothermal	Cr(VI)	1-400 µM	0.13 µM	5
6.	Carbon dots with yellow fluorescence (y-CDs)	Acid carbonization	Cr(VI)	0-200 µM	24.6 µM	6
7.	AB-CDs	Hydrothermal	Cr(VI)	0-50 µM	1.71 µM	**This work**

Table S2 Comparison of the current fluorescence-based approach for the detection of cholesterol with previously reported works.

Sl. No.	**Fluoroprobe**	**Method of synthesis of CDs**	**Biomarker detected**	**Linear range of detection**	**LOD values**	**References**
1.	B, N co-doped carbon dots (B, N-CDs)	Hydrothermal	Cholesterol	0-500 µM	2.31 µM	7
2.	Hemoglobin-capped green-synthesized carbon dots (g-CD)	Microwave synthesis	Cholesterol	0-110.8 µM	9.22 µM	8
3.	Carbon dots-doped CeO_2 (CeO_2-CDs)	Hydrothermal	Cholesterol	1.66 mM -1.65µM	0.49 µM	9
4.	Carbon dot/hemoglobin (CD/Hb) complex	High temperature carbonization	Cholesterol	0-800 µM	56 µM	10
5.	Vesicle-like carbon dots (VCDs)	High temperature carbonization	Cholesterol	5-100 µM	2.8 µM	11
6.	Turn-on fluorescent biosensor based	Microwave synthesis	Cholesterol	2-60 µM	3 µM	12

	on carbon dots hybridized by AgNPs (CD@AgNPs)					
7.	AB-CDs	Hydrothermal	Cholesterol	0-8 μM	0.31 μM	**This work**

References

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