Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

Interfacial Engineering of Carbon Dots with Benzenediboronic Acid for Fluorescent Biosensing

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Supporting Information

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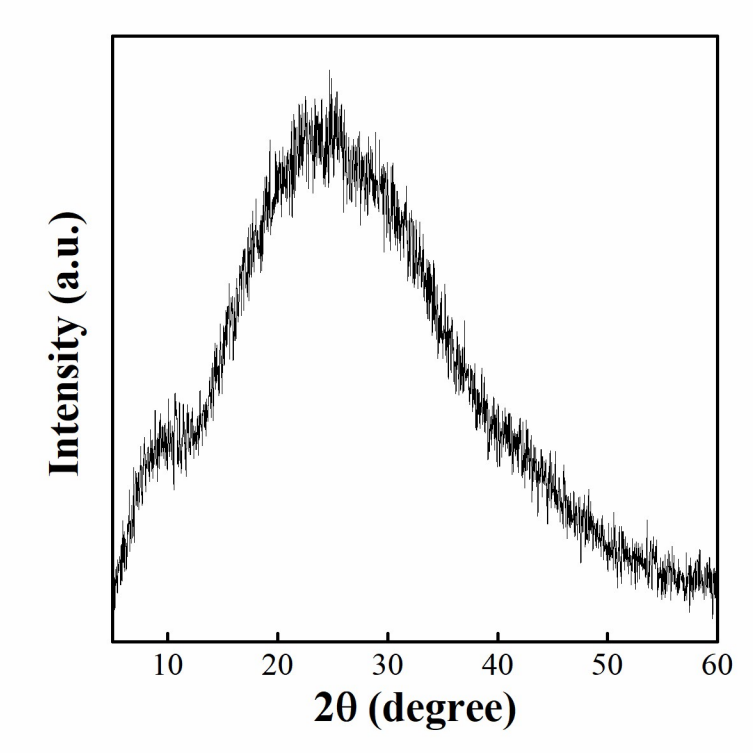

Figure S1. XRD pattern of the CDs

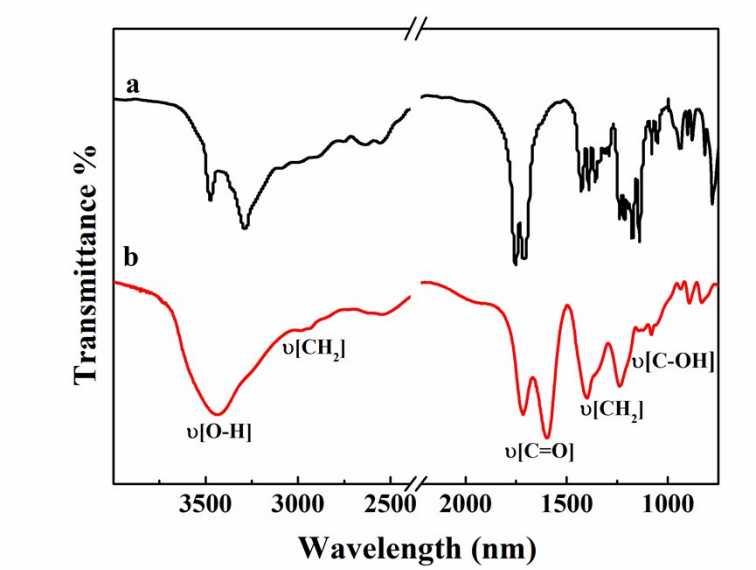

Figure S2. FTIR spectra of critic acid (a) and CDs (b).

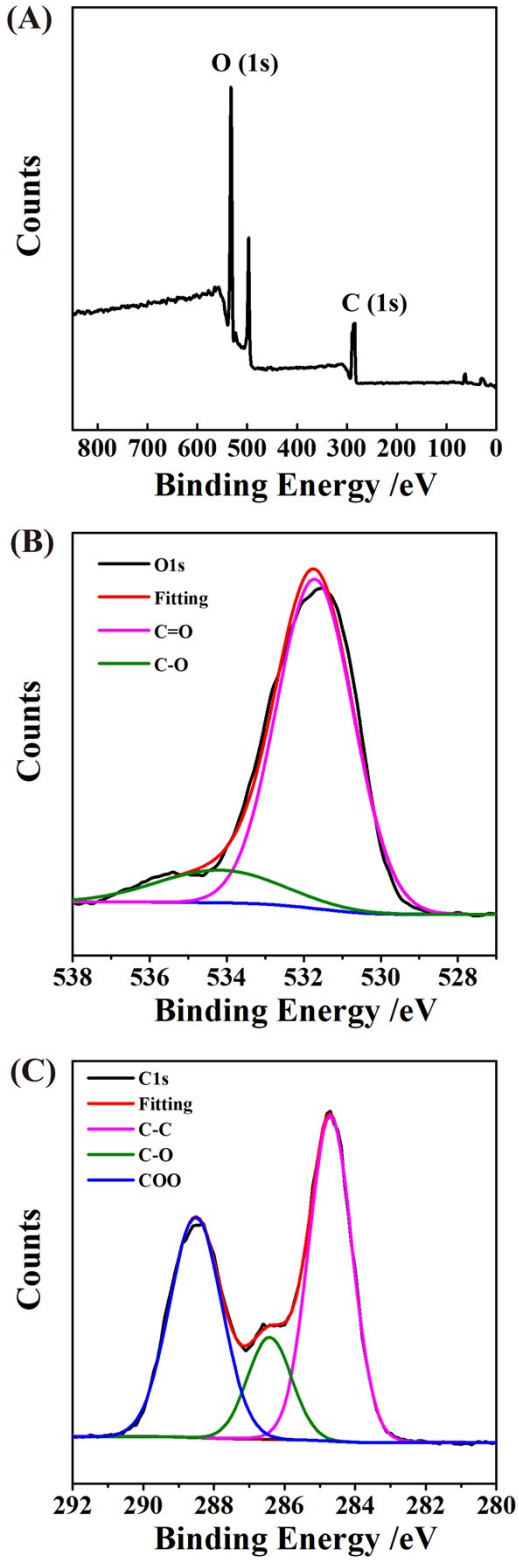

Figure S3. (A) XPS spectrum of CDs. (B) O 1s spectra of the CDs. (C) C 1s spectra of the CDs.

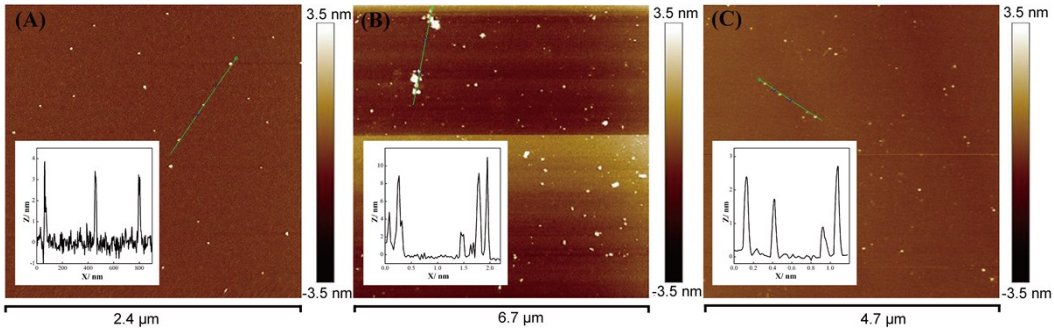

Figure S4. AFM image of CDs (A), and BDBA-associated CDs before (B) and after (C) H_2O_2 incubation. Inset: Cross-section analysis of each sample.

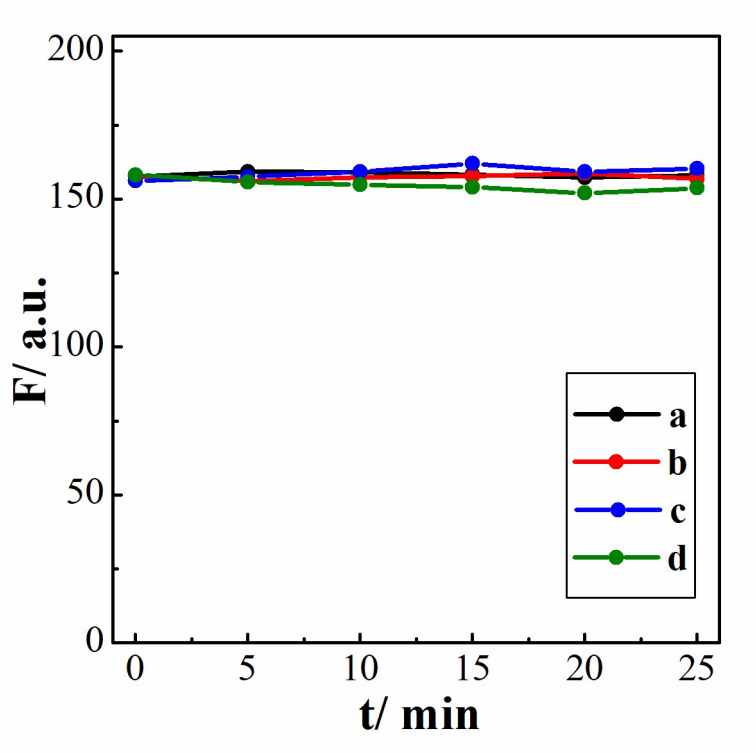

Figure S5. Fluorescence intensity changes of 3-hydroxybutyrate -derived CDs in the absence (a) and presence (b) of BDBA, in the presence of BDBA and in the absence of H_2O_2 (c), and in the absence of both BDBA and H_2O_2 (d).

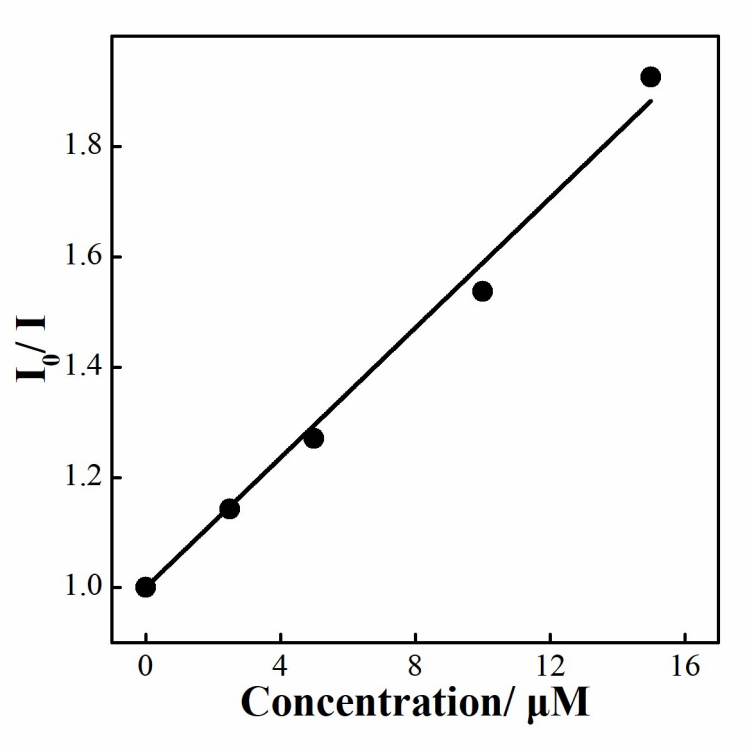

Figure S6. Stern−Volmer plot or the interaction of BDBA-conjugated CDs and H_2O_2.

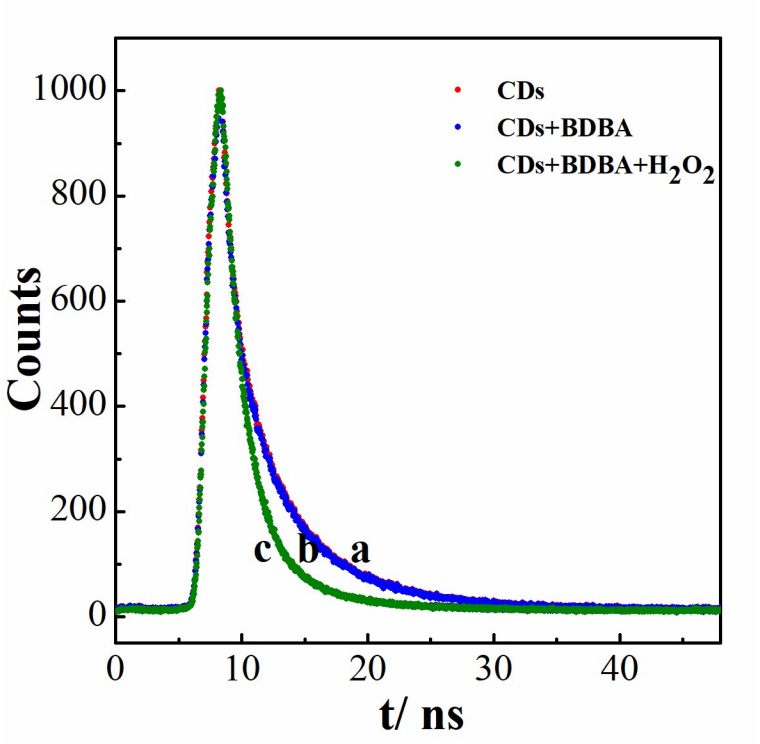

Figure S7. Fluorescence lifetime decay of the CDs (a), BDBA-conjugated CDs in the absence (b) and presence (c) of H_2O_2.

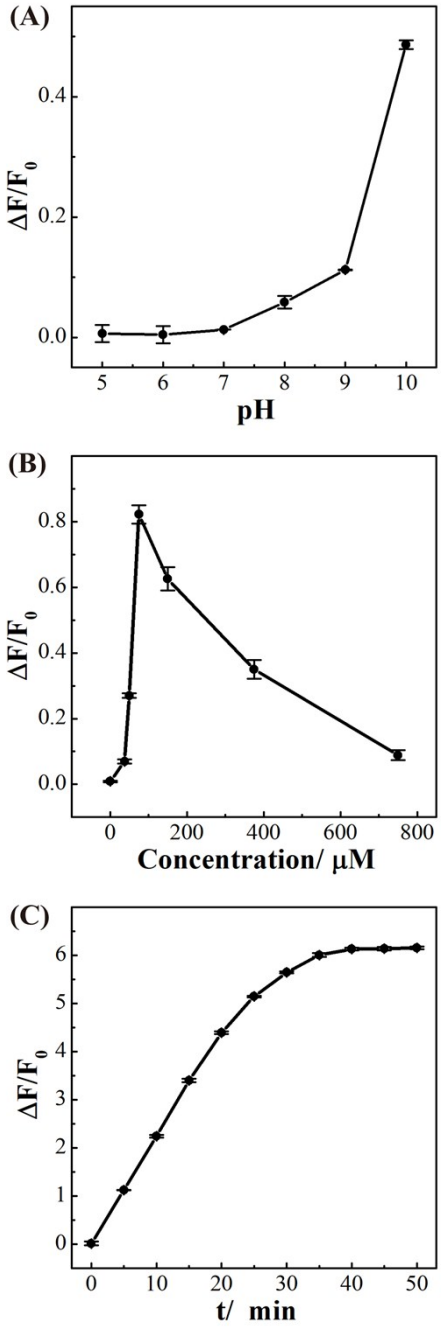

Figure S8. Optimization of reaction conditions for H_2O_2 assay using the sensing platform. Both the concentration of BDBA and H_2O_2 are 75 μM. (A) Dependence of reaction pH on the fluorescence intensity of CDs. (B) Effect of reaction time on the fluorescence intensity of the system. (C) Effect of BDBA concentration on the fluorescence intensity changes of CDs. ΔF= F_0- F, F_0 and F represent the fluorescence intensity in the absence and presence of the H_2O_2, respectively. Error bars were derived from n = 5 experiments.

Table S1. Analysis of glucose by different sensing procedures.

Method	System	Detection limit (μM)	Reference
colorimetric	Pt nanoclusters	0.28	[1]
colorimetric	in situ growth of silver nanoparticles on graphene quantum dots	0.17	[2]
electrochemical	gold nanoparticle/nitrogen-doped graphene	12	[3]
electrochemical	bimetallic Pt–Au nanocatalysts	7.7	[4]
fluorescence	CdS quantum dots assembled on silver nanoparticles	1860	[5]
fluorescence	graphene quantum dots with boronic acid appended bipyridinium salt	1000	[6]
fluorescence	B-doped carbon quantum dots	8	[7]
fluorescence	MnO_2 nanosheet-modified upconversion nano system	3.7	[8]
fluorescence	carbon nanodots supported on silver nanoparticles	1.39	[9]
fluorescence	BDBA-mediated fluorescence changes of CDs	0.4	This work

Reference

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