

# Electronic Supplementary Material

## Carbon dots-based fluorescence sensor for two-photon imaging of pH in diabetic mice

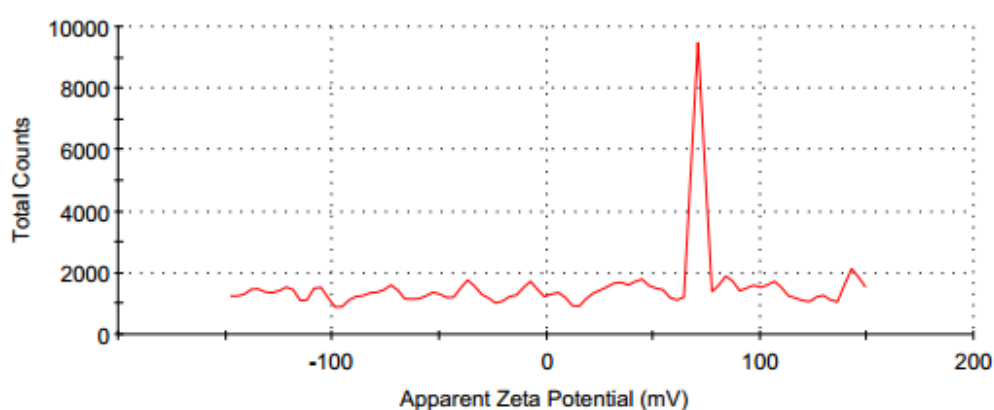
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### SUPPLEMENTAL FIGURES



**Figure S1 Zeta potential measurement of the CA-CDs.** The CA-CDs with a surface potential of 70.2 mV has a positive charge on its surface.

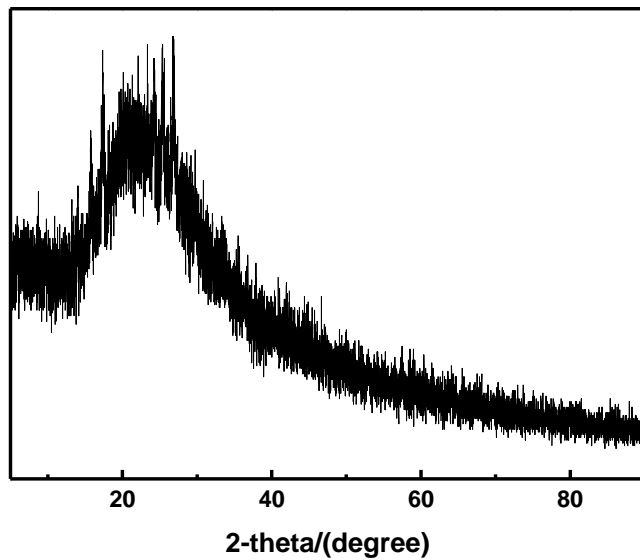


Figure S2 The PXRD pattern of the CA-CDs.

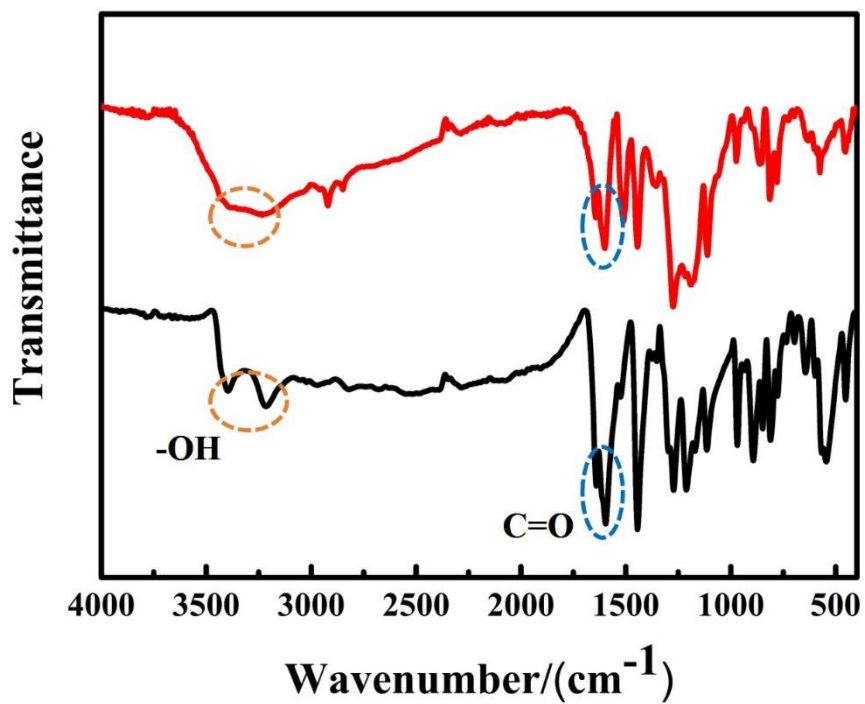
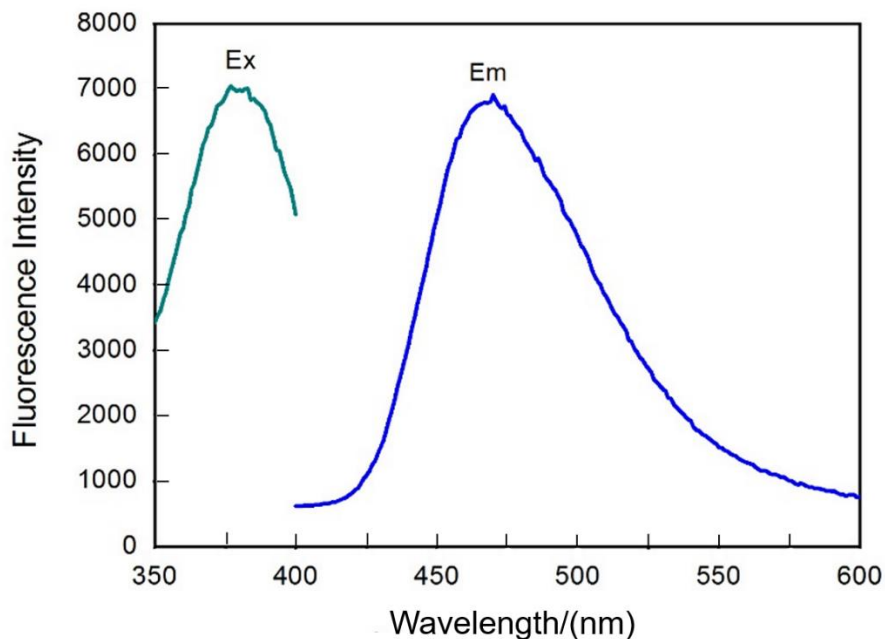
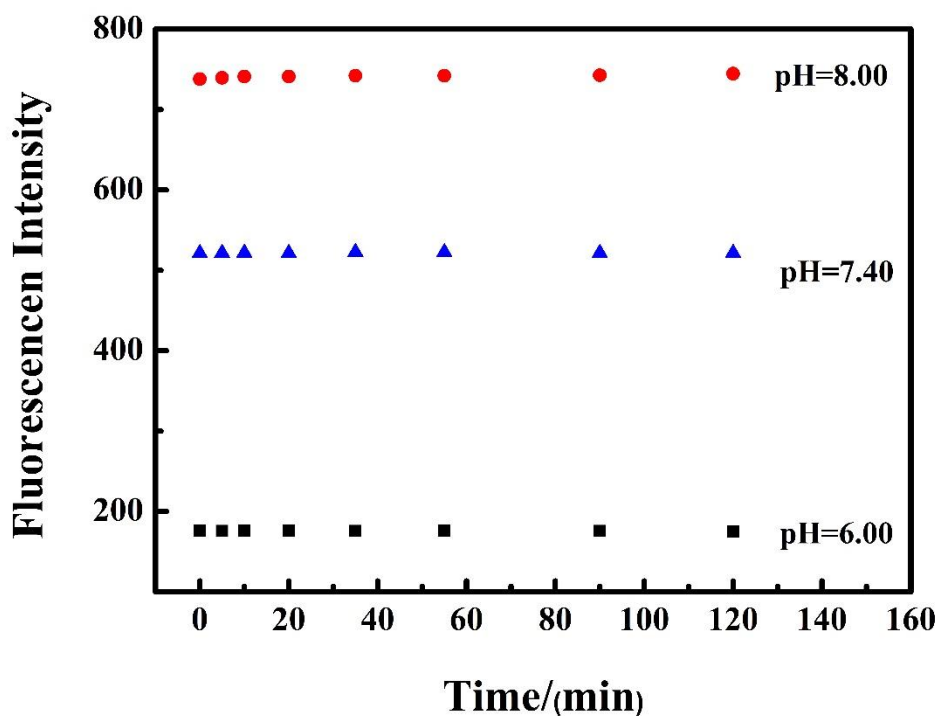


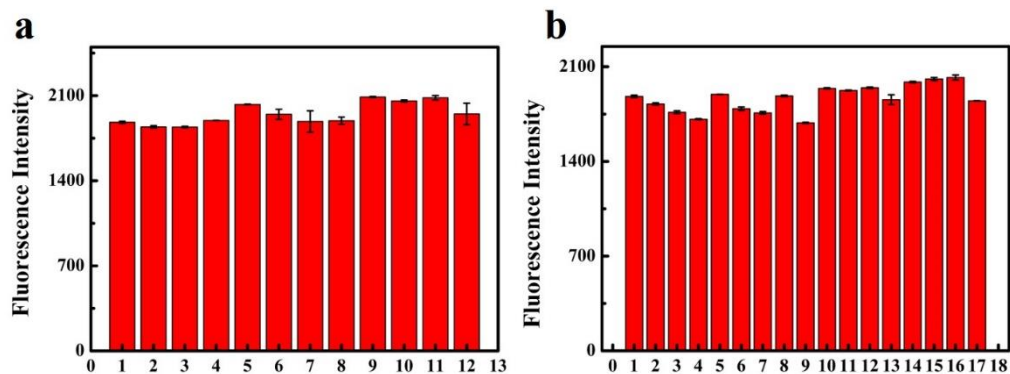
Figure S3 The FTIR spectra of the CA-CDs (red line) and its precursor (black line).



**Figure S4** Fluorescence excitation/emission spectra of the CA-CDs. The maximum excitation and emission wavelengths of the CA-CDs are 380 nm and 470 nm, respectively.



**Figure S5** Time courses of fluorescence intensity at 470 nm of the CA-CDs in PBS buffer solutions at pH 6.00, 7.40, 8.00, respectively.  $\lambda_{\text{ex}} = 380$  nm.



**Figure S6 Experiment to evaluate the effects caused by various interferences.**

Fluorescence responses of CA-CDs (1.0  $\mu\text{g/mL}$ ) to (A) metal ions: 1, blank; 2,  $\text{Na}^+$  (120 mM); 3,  $\text{K}^+$  (120 mM); 4,  $\text{Zn}^{2+}$  (0.3 mM); 5,  $\text{Mg}^{2+}$  (0.5 mM); 6,  $\text{Mn}^{2+}$  (0.3 mM); 7,  $\text{Cu}^{2+}$  (0.3 mM); 8,  $\text{Fe}^{3+}$  (0.03 mM); 9,  $\text{Li}^+$  (0.3 mM); 10,  $\text{Ca}^{2+}$  (0.5 mM); 11,  $\text{Ni}^+$  (0.3 mM); 12,  $\text{Co}^{2+}$  (0.3 mM) and (B) various small biomolecules and reactive oxygen species: 1, blank; 2, L- Ile (100  $\mu\text{M}$ ); 3, L- Pro (100  $\mu\text{M}$ ); 4, L-Val (100  $\mu\text{M}$ ); 5, L-Lys (100  $\mu\text{M}$ ); 6, L-Ser (100  $\mu\text{M}$ ); 7, L-Gly (100  $\mu\text{M}$ ); 8, L-Asp (100  $\mu\text{M}$ ); 9, L-Arg (100  $\mu\text{M}$ ); 10, L-Glu (100  $\mu\text{M}$ ); 11, GSH (100  $\mu\text{M}$ ); 12,  $^1\text{O}_2$  (10  $\mu\text{M}$ ); 13,  $\cdot\text{OH}$  (10  $\mu\text{M}$ ); 14,  $\text{H}_2\text{O}_2$  (10  $\mu\text{M}$ ); 15,  $\text{HClO}$  (10  $\mu\text{M}$ ); 16,  $\text{KO}_2$  (10  $\mu\text{M}$ ); 17,  $\text{ONOO}^-$  (10  $\mu\text{M}$ ). The various interferences were dissolved in PBS buffer solutions (pH 7.40). After the addition of CA-CDs (1.0  $\mu\text{g/mL}$ ), the mixture was heated for 20 minutes. Spectra were collected with an excitation wavelength of 380 nm.

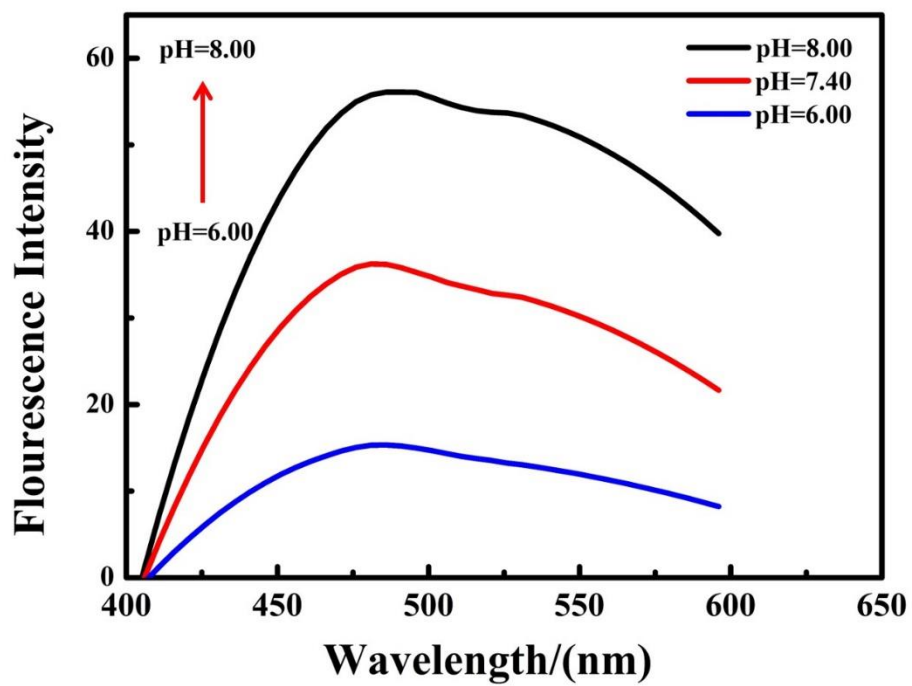


Figure S7 The evaluation of the CA-CDs with TP imaging property.  $\lambda_{\text{ex}} = 760 \text{ nm}$ .