

## A Highly Selective and Sensitive “on-off” Fluorescent Probe for Detecting Cadmium Ions and L-cysteine Based on Nitrogen and Boron co-doped Carbon Quantum Dots

Zhihong Yan<sup>1</sup>, Wei Yao<sup>1</sup>, Kang Mai<sup>3</sup>, Jiaqi Huang<sup>1</sup>, Yating Wan<sup>2</sup>, Huang liu<sup>2\*</sup>, Bo Cai<sup>4\*</sup>,  
Yi Liu<sup>1,2,4\*</sup>

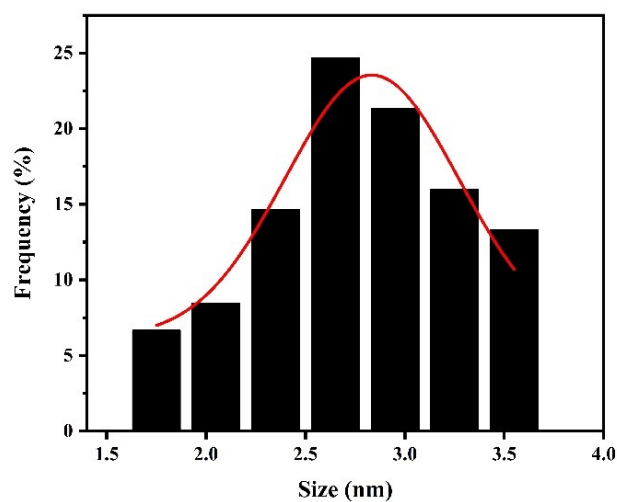
College of Pharmacy, Guangdong Pharmaceutical University, Guangzhou 510000, China

<sup>2</sup> School of pharmaceutical and chemical engineering, Guangdong Pharmaceutical University, Zhongshan 528400, China

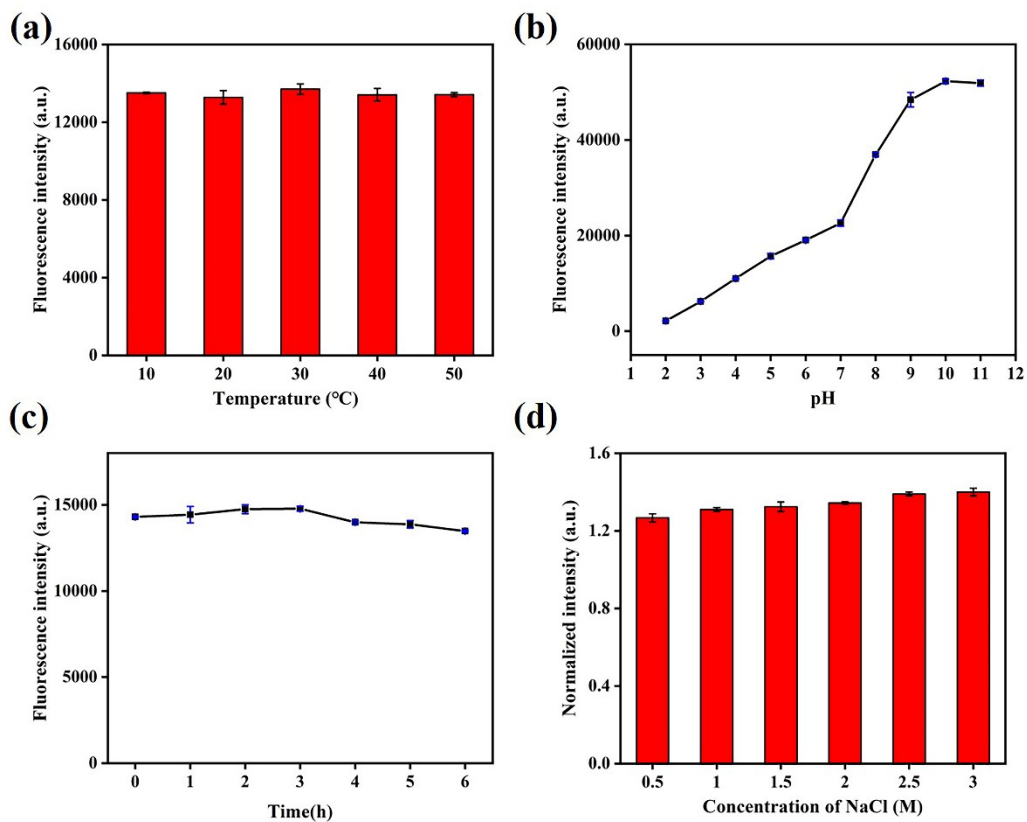
<sup>3</sup> Zhongshan Carefor Daily Necessities Ltd, Zhongshan 528400, China

<sup>4</sup> Guangzhou OPSEVE Cosmetics Co. Ltd, Guangzhou 510000, China

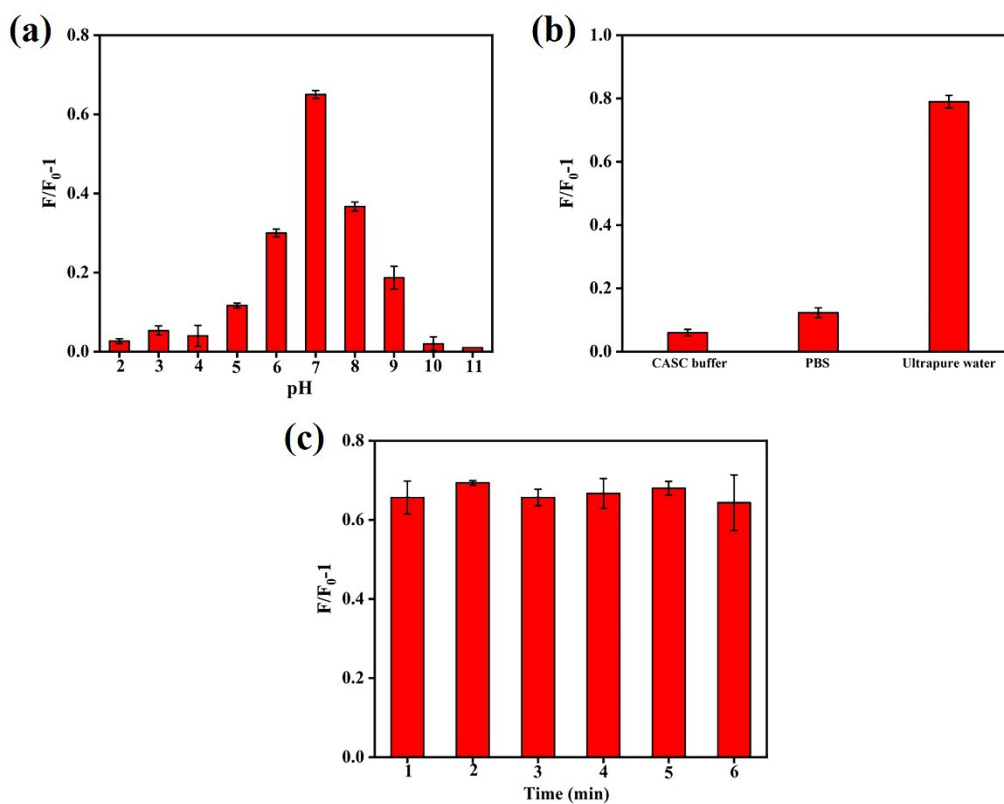
\* Corresponding author: E-mail: [Liuyi915@126.com](mailto:Liuyi915@126.com)



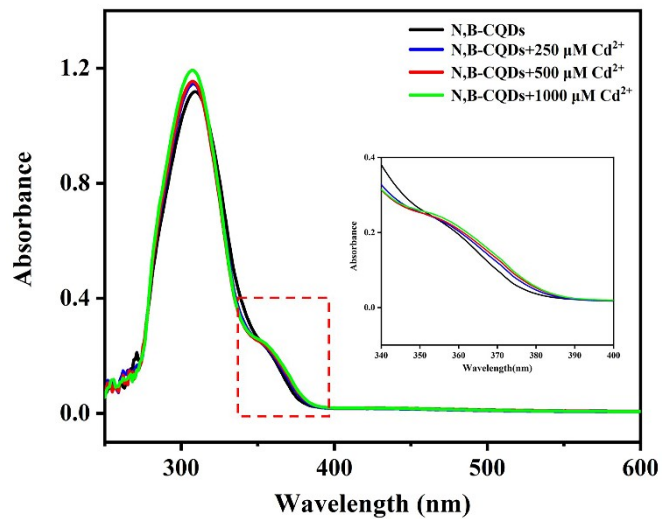
**Fig S1.** The histogram graph of size distribution of N,B-CQD.



**Fig S2.** The effect of temperature (a), pH (b), UV light irradiation time (c) and ionic strength in NaCl aqueous solution (d) on the fluorescence intensity of N<sub>3</sub>B<sub>2</sub>-CQDs. Excitation at 360 nm.



**Fig S3.** Effect of (a) sample pH value,(b) detection medium and (c) reaction time on the detection of  $\text{Cd}^{2+}$  with N,B-CQDs. Excitation at 360 nm.



**Fig S4.** UV-Vis spectra for the N,B-CQDs with different concentrations of  $\text{Cd}^{2+}$  under the optimal experimental conditions.