

## Electronic Supplementary Information

### A ratiometric nanosensor based on fluorescent carbon dots for label-free and highly selective recognition of DNA

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The relative QY of CDs.

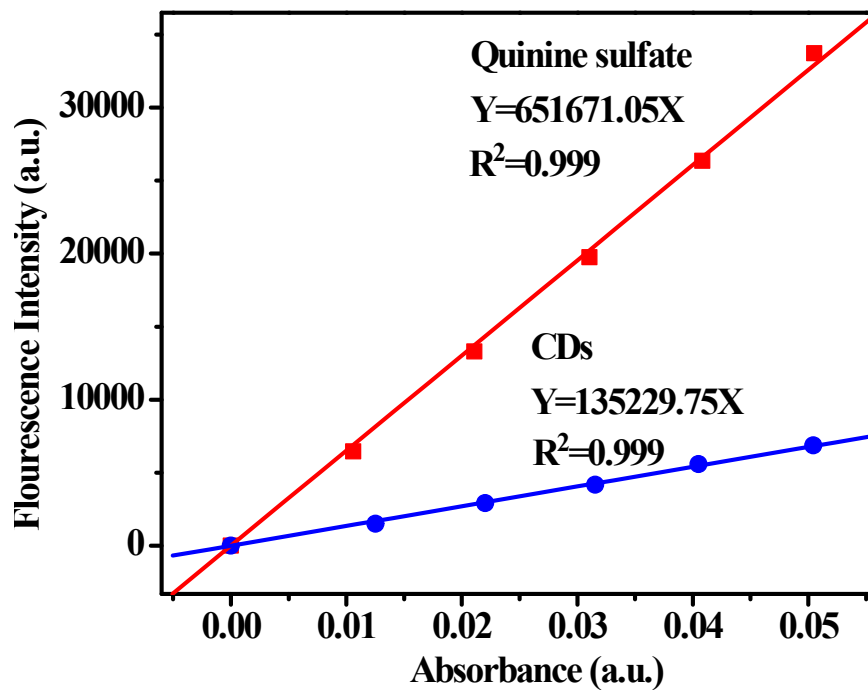
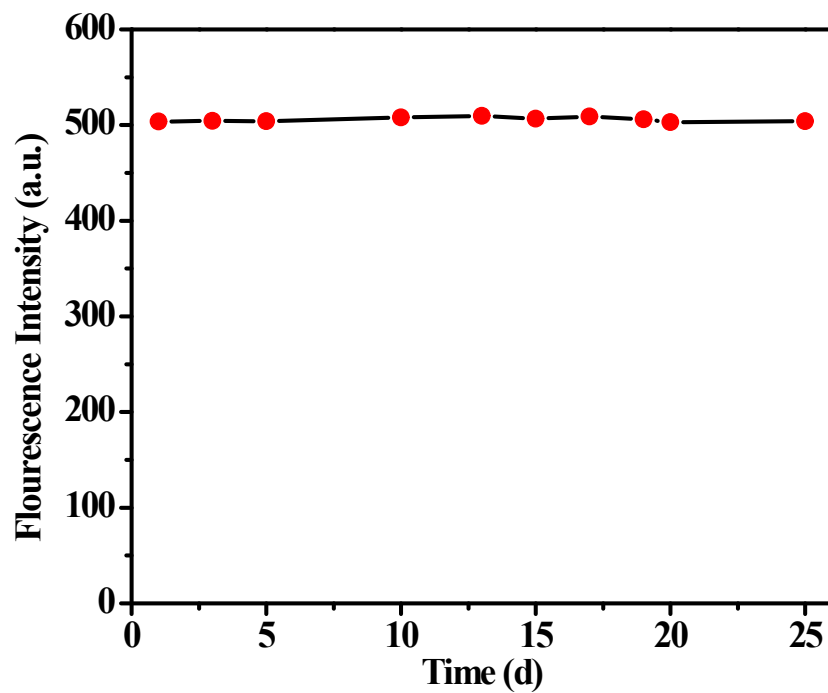


Fig. S1. The relative QY of CDs.

The relative QY of CDs was examined to be about 12.1% in reference to quinine sulfate whose QY was 54% in 0.1 M H<sub>2</sub>SO<sub>4</sub> solution at 375 nm excitation.

### The stability of the fluorescence of CDs.



**Fig. S2.** The stability of the fluorescence of CDs.

The fluorescence stability of CDs were continuously examined by long-time monitoring of the fluorescent emission at room temperature, which indicated that the fluorescent intensity at 447 nm of CDs remained unchanged for nearly 25 days.

### The influence of pH value on CDs.

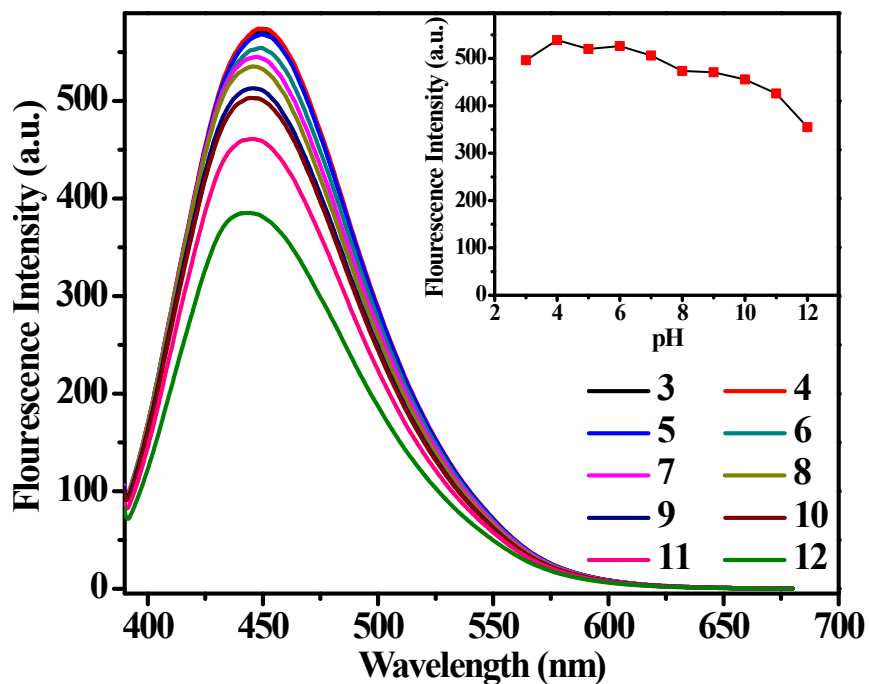
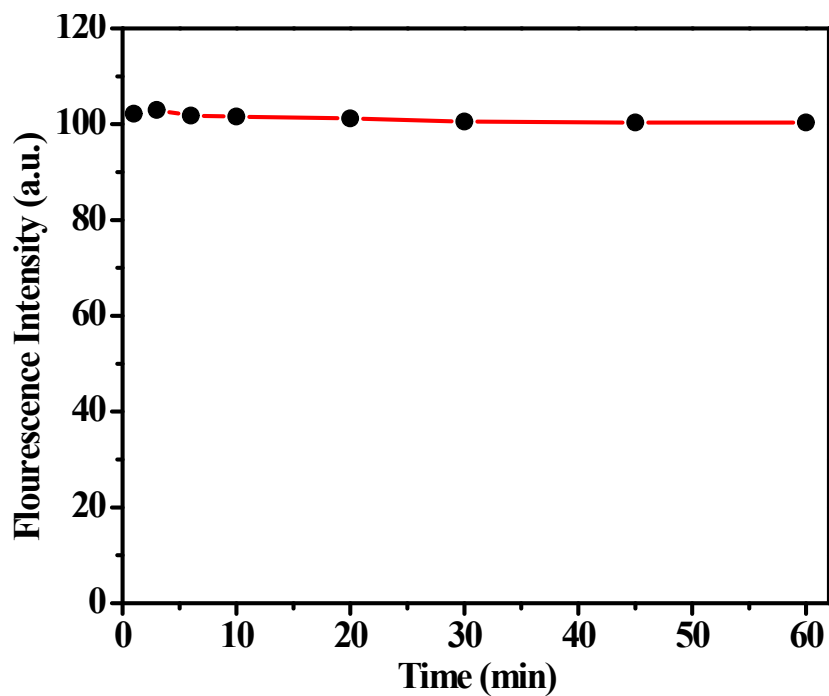


Fig. S3. The influence of pH value on CDs.

The fluorescence intensity of CDs decreased upon regulating pH value from 3 to 12, and the maximum emission wavelength gradually blue-shifted with increasing pH value, which indicated that the fluorescence property of CDs strongly depended on pH value.

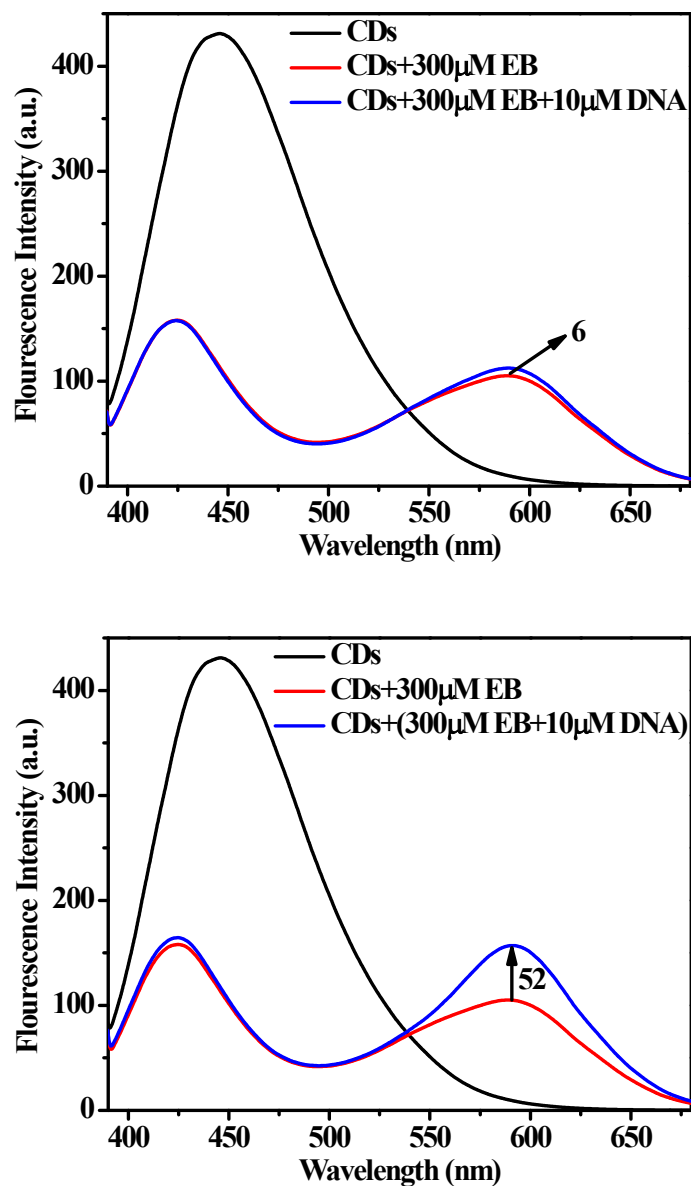
### The stability of CDs–EB system.



**Fig. S4.** The stability of CDs–EB system.

As indicated in Fig. S4, when 300  $\mu\text{M}$  EB was added into CDs solution, the fluorescence of CDs was quenched within 1 min of the contact time, which meant that the response rate was rapid. The fluorescence quenching reached a steady state during 2 min. A further increase in time did not lead to any further detectable quenching of the fluorescence of CDs. Thus, the fluorescence intensity of CDs–EB system was recorded after the addition of EB for 3 min.

### The effect of addition sequence of reagents on CDs–EB–DNA reaction system.



**Fig. S5.** The effect of addition sequence of reagents on CDs–EB–DNA reaction system.  
(Up) Phosphate buffer, CDs, EB and DNA; (Down) Phosphate buffer, EB, DNA and CDs.

As shown in Fig. S5, different addition sequences could affect the fluorescence intensity of EB obviously, and the optimal addition sequence of this system was phosphate buffer, EB, DNA and CDs solution. At room temperature, the time dependent fluorescence of CDs–EB–DNA system was also investigated.

### The stability of CDs–EB–DNA reaction system.

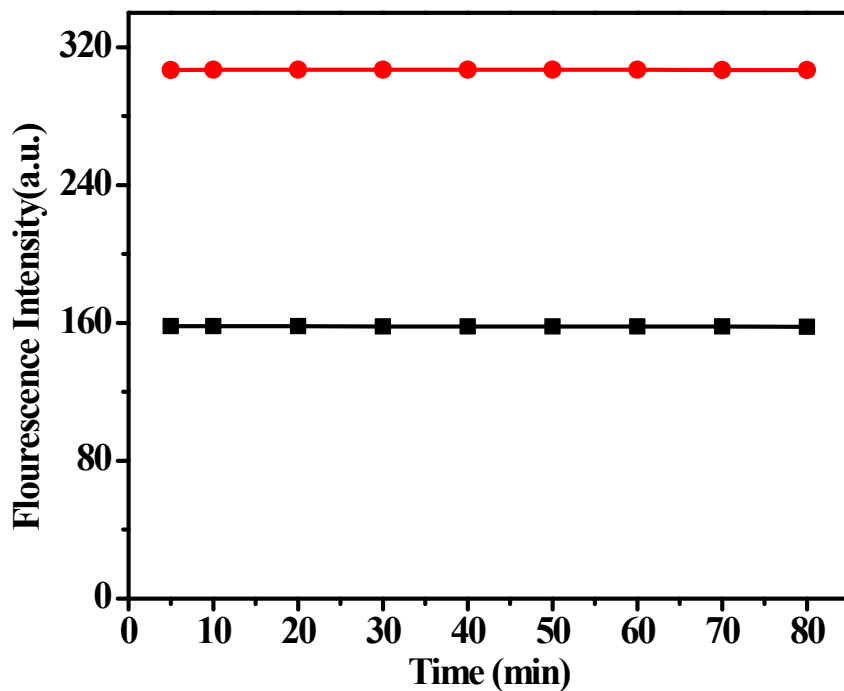


Fig. S6. The stability of CDs–EB–DNA reaction system.

As shown in Fig. S6, the fluorescence of CDs was kept constant, and the fluorescence of EB was obviously increased by DNA within 5 min and almost lasted for more than 80 min. To ensure the consistency throughout the experiment and obtain stable signal, 10 min was chosen as the optimum incubation time for CDs–EB–DNA system.