1 **Supporting Information**

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3 Fluorescent filter paper via pH-responsive carbon dots for on-site detection of

4 biogenic amines in food

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18 **1. Synthesis of N, S-CDs**

19 The CDs was synthesized by one-step hydrothermal treatment with minor

20 modification. Specifically, N-acetyl-L-cysteine (0.08 g, 0.5 mmol) and citric acid

21 (0.13 g, 0.68 mmol) were mixed and dissolved in 8 mL of deionized water. In this

22 segment, sodium hydroxide solution was used to adjust the pH of the solution to 7.

23 Then, the mixed solution was introduced to the Teflon-lined autoclave for reaction at

24 200 °C for 3 h. After cooling to room temperature, a clear, brown solution was

25 obtained. The subsequent purification was achieved through filtration of 0.22 μM

26 filter membrane. Finally, the N, S-CDs solution was diluted to 45 mL and stored at 4

27 °C for further study.

28 **2. Quantum yield measurement**

29 In the experiment, the fluorescence quantum yield (Φ_S) was calculated by using

30 quinine sulfate ($\Phi_R = 0.54$) as the standard according to the literature method. The

31 absorbance and fluorescence spectra of N, S-CDs and Rhodamine B were measured

32 respectively. In general, it is necessary to ensure that the absorbance does not exceed

33 0.1, and the area of fluorescence intensity is calculated by integration. The

34 fluorescence quantum yield is calculated by the following formula:

$$\frac{\Phi_S}{\Phi_R} = \frac{Y_S}{Y_R} \times \frac{(A)_R}{(A)_S} \times \frac{\eta_S^2}{\eta_R^2}$$

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36 Among them, Φ is the fluorescence quantum yield, Y_S and Y_R are the integrated areas

37 of the fluorescence peaks of the N, S-CDs and the Rhodamine B, A_S and A_R are the

38 absorbance at 350 nm, and η_S and η_R are the solvent refractive indexs.
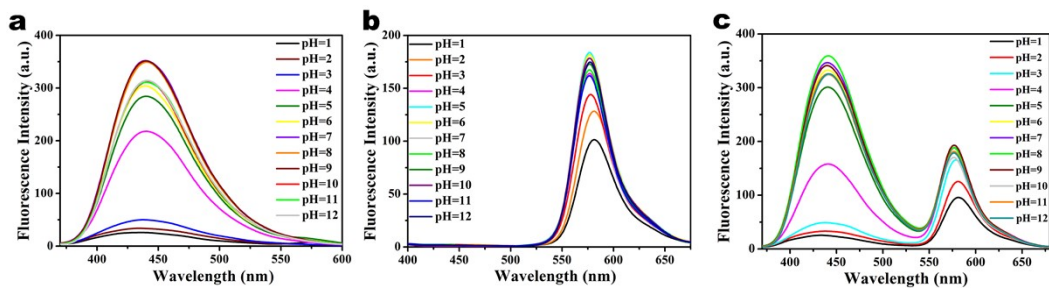
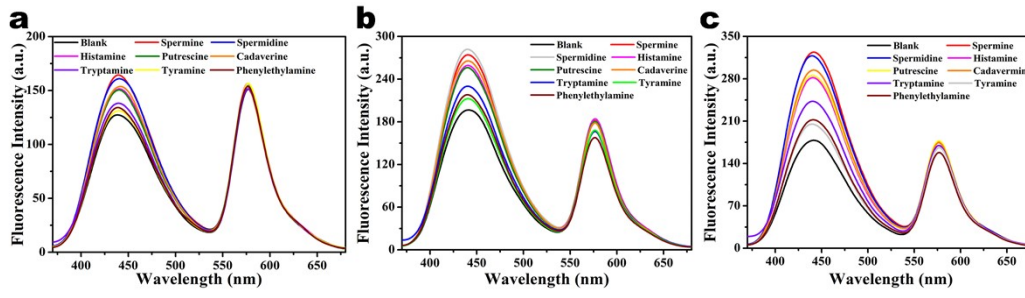**Fig. S1** Fluorescence spectra of (a) Rb, (b) N, S-CDs, and (c) Rb@N, S-CDs at different pH values.

Fig. S2 Fluorescence spectra of Rb@N, S-CDs adding different concentrations of BAs: (a) 12.5 µM, (b) 25 µM, and (c) 50 µM.

111 **Table S1** Analytical data of Rb@N, S-CDs for different BAs.

Analytes	Linear range (μM)	Calibration curve	R^2	LODs (μM)	LOQs (μM)	Repeatability (%)
Spermine	0-50	y=0.0259x+0.8273	0.9967	0.733	2.443	2.5
Spermidine	0-60	y=0.0210x+0.7940	0.9942	0.891	2.971	1.4
Putrescine	0-75	y=0.0145x+0.7134	0.9953	1.407	4.692	3.6
Cadaverine	0-125	y=0.0074x+0.4406	0.9944	2.536	8.453	6.0
Histamine	0-75	y=0.0105x+0.5750	0.9957	1.070	3.567	4.5
Tryptamine	0-112.5	y=0.0086x+0.9678	0.9966	3.673	12.241	2.5
Tyramine	0-150	y=0.0039x+0.9791	0.9988	3.049	10.165	5.7
Phenylethylamine	0-125	y=0.0048x+0.5517	0.9981	3.943	13.143	5.6

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