

Supporting Information

A Novel Fluorescent Probe for Selective Detection of Hydrazine and Its Application in Imaging

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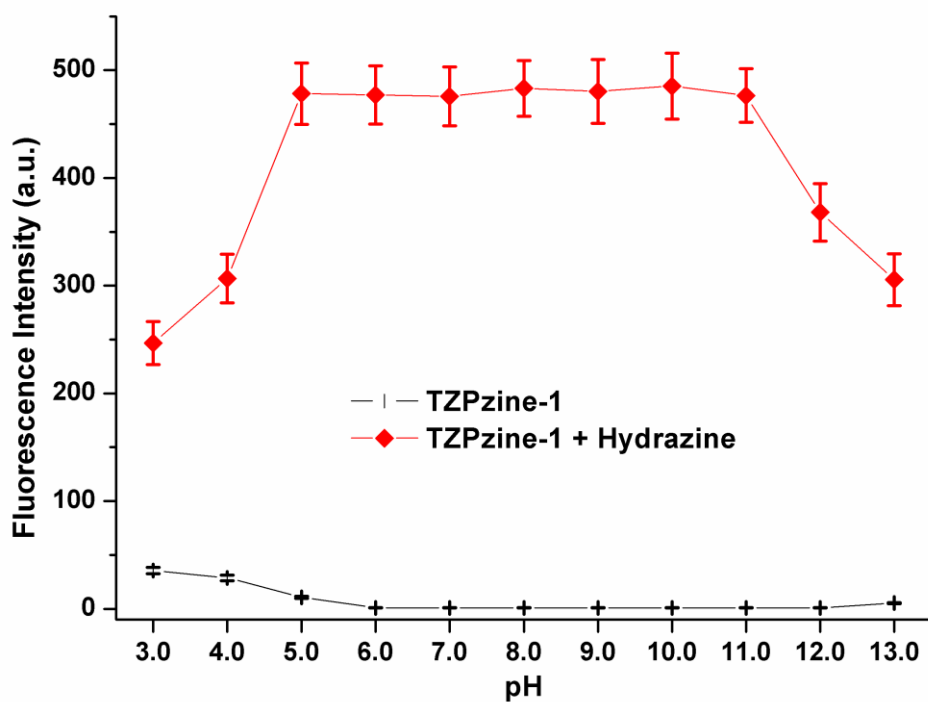


Figure S1. The fluorescence intensity at 460 nm changes in various pH environments. (Black: 10 μ M **TZPzine-1**; Red: **TZPzine-1** with hydrazine). Temperature: 37 $^{\circ}$ C; Incubation time: 20 min; Excitation wavelength: 365 nm.

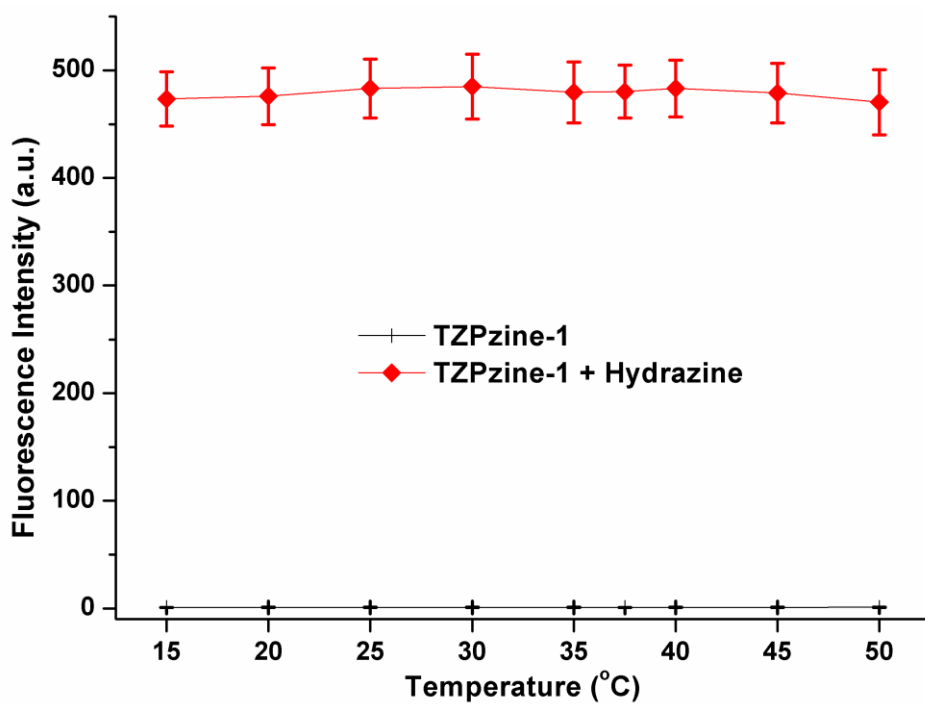


Figure S2. The fluorescence intensity at 460 nm changes in various temperature conditions. (Black: 10 μ M **TZPzine-1**; Red: **TZPzine-1** with hydrazine). pH: 7.4; Incubation time: 20 min; Excitation wavelength: 365 nm.

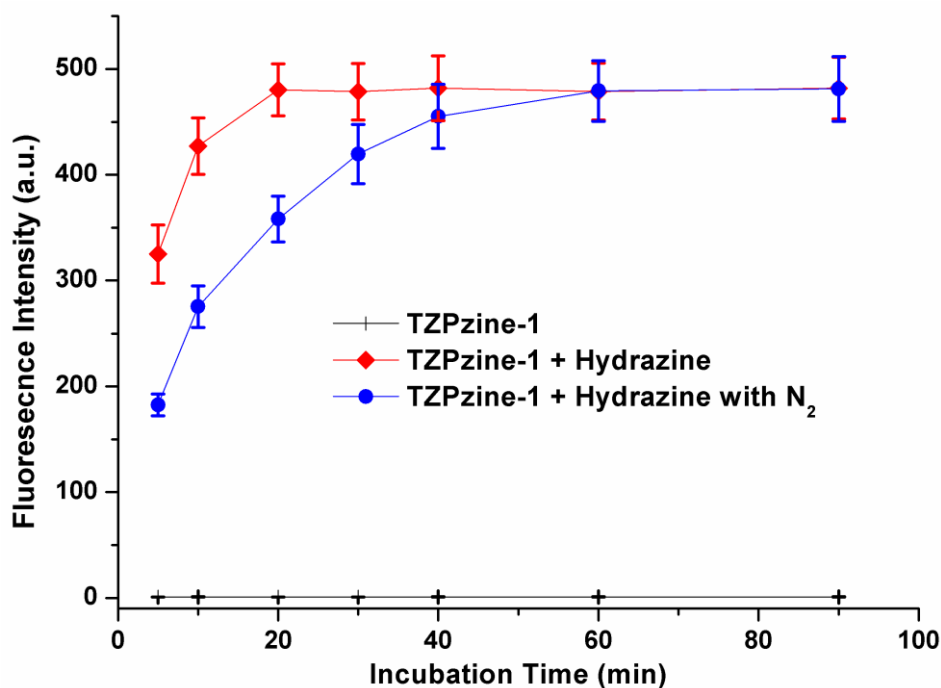


Figure S3. The fluorescence intensity at 460 nm changes in various time conditions. (Black: 10 μ M **TZPzine-1**; Red: **TZPzine-1** with hydrazine; Blue: **TZPzine-1** with hydrazine with nitrogen). pH: 7.4; Temperature: 37 $^{\circ}$ C; Excitation wavelength: 365 nm.

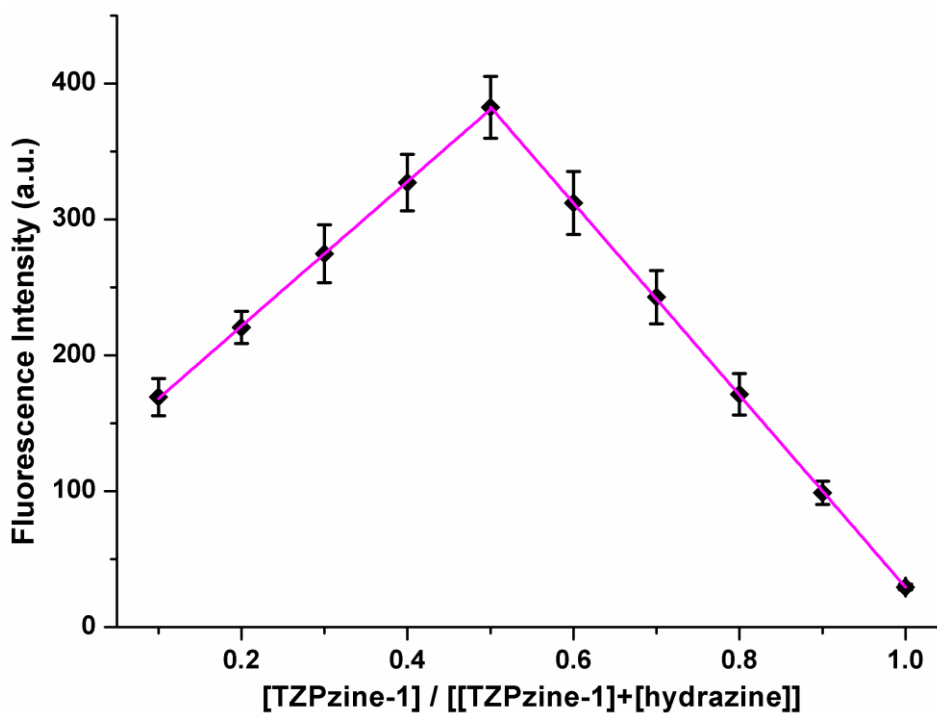


Figure S4. Job's plots analysis for **TZPzine-1** and hydrazine interaction with a total concentration of $[\text{TZPzine-1}] + [\text{hydrazine}]$ at 200 μ M by fluorescence response. The fluorescence emission at 460 nm was used.

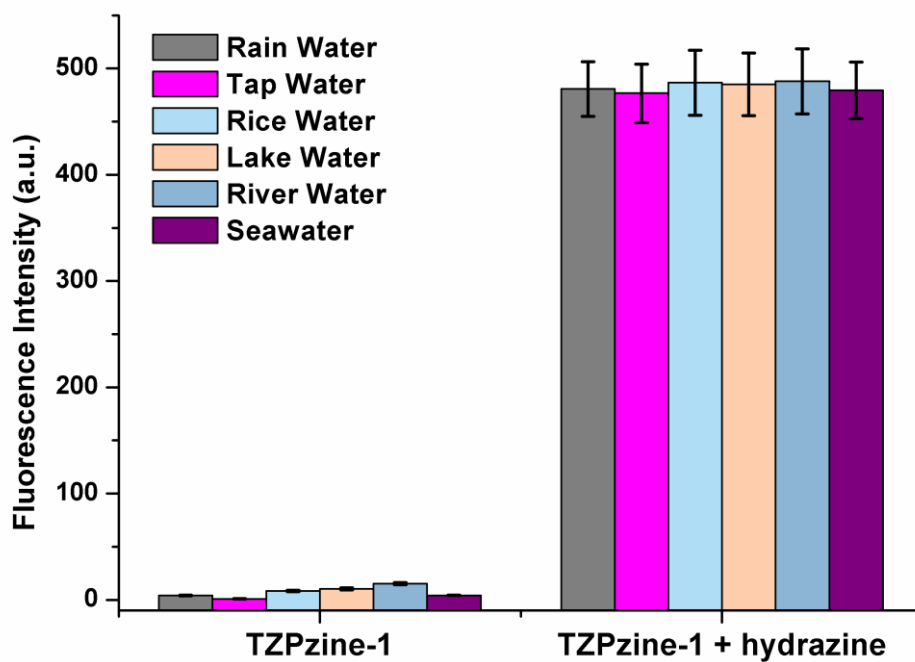


Figure S5. The application of **TZPzine-1** in detecting systems with different water samples from rain, tap, rice, lake, river and sea.

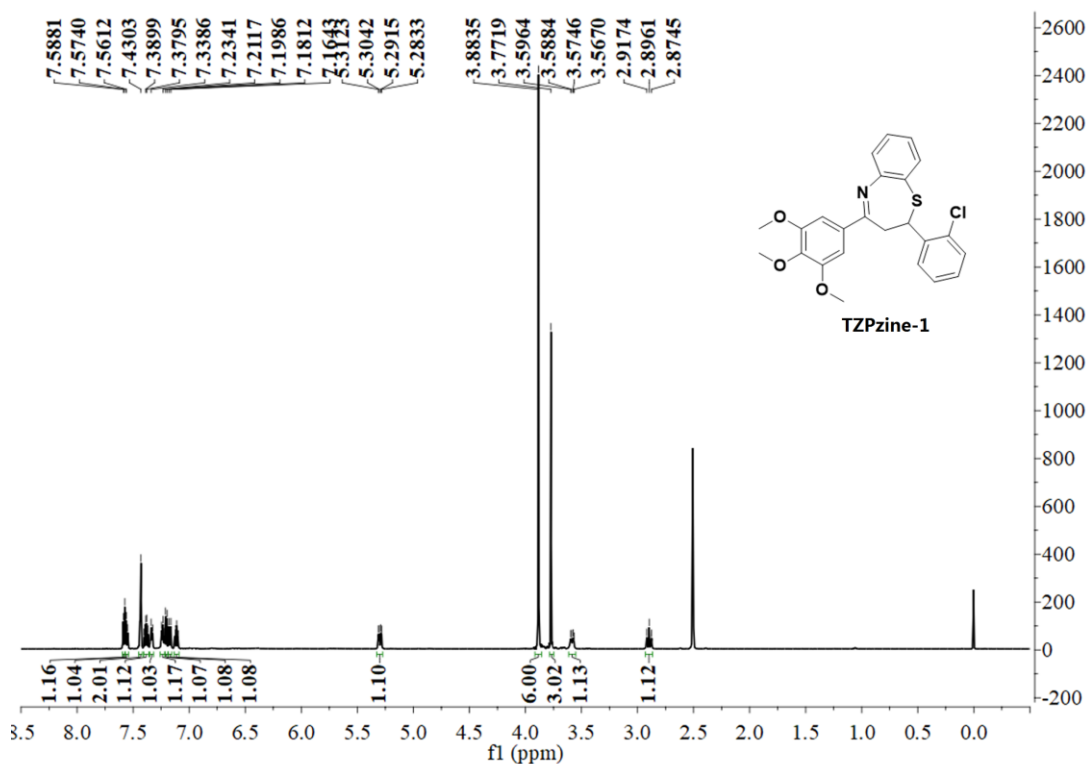


Figure S6. ^1H NMR of the probe **TZPzine-1** (600 MHz, in $\text{DMSO-}d_6$).

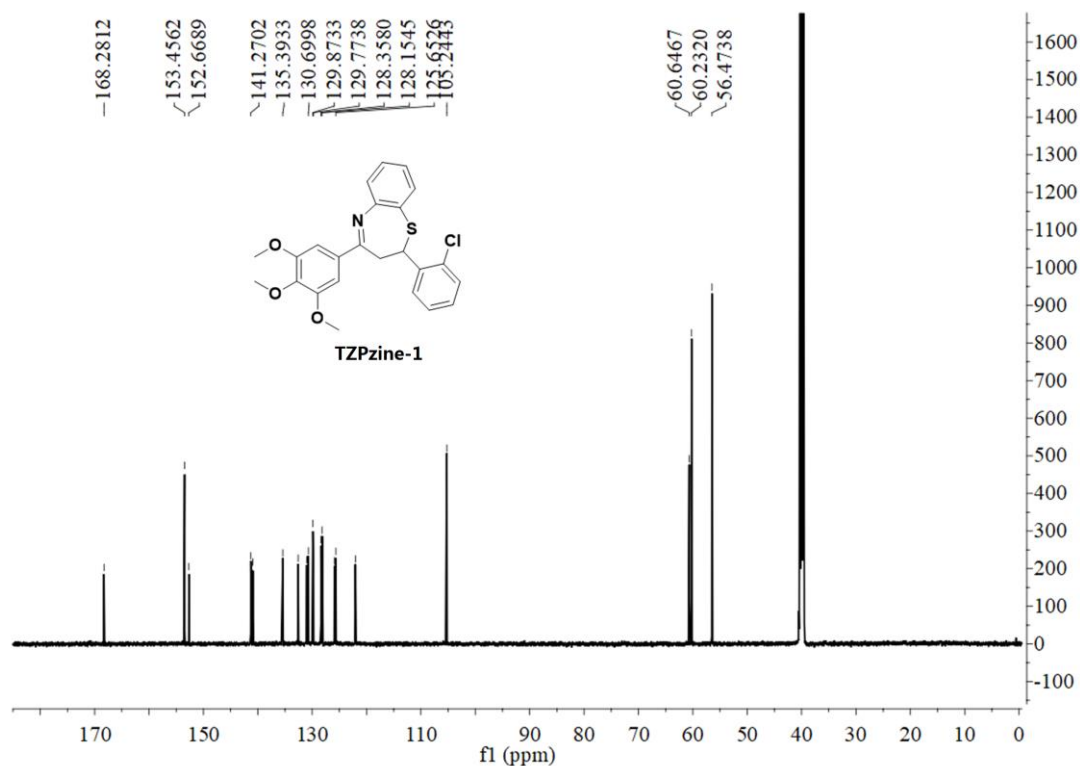


Figure S7. ^{13}C NMR of the probe **TZPzine-1** (151 MHz, in $\text{DMSO-}d_6$).

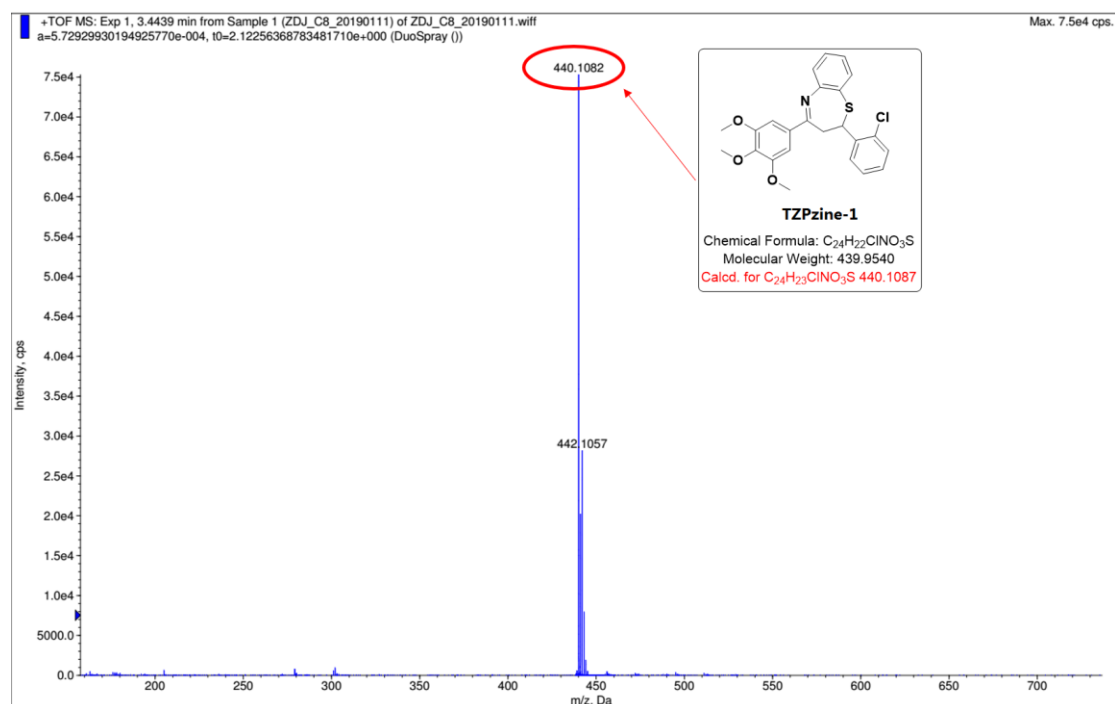


Figure S8. HRMS spectrum of the probe **TZPzine-1** in acetonitrile.

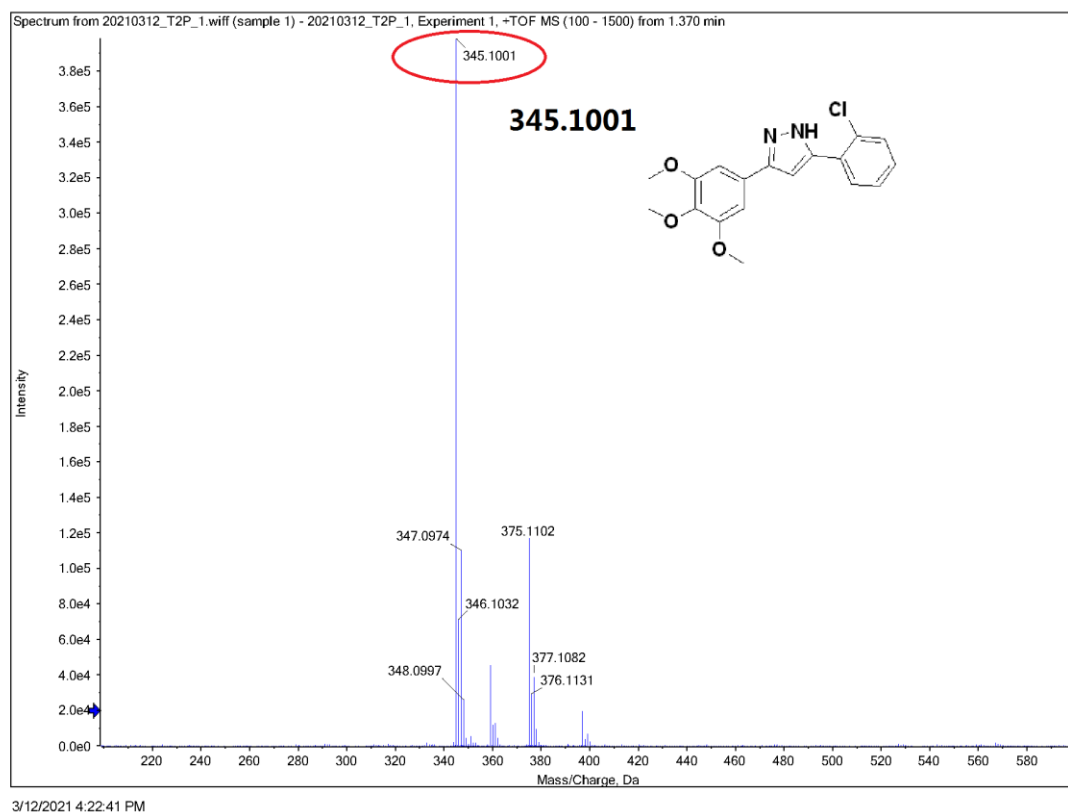


Figure S9. HRMS spectrum of the detecting product in acetonitrile.

Table S1. The comparison with typical probes for hydrazine.

Reference	Recognition Group	$\lambda_{em}/\lambda_{ex}$ (nm)	Response degree (-fold)	Test time (min)	LOD (nM)	Application
Ref 14	4-bromo butyrate	458/343 368/285 ^a	88	1	66	<i>Candida albicans</i>
Ref 15	trifluoroacetyl acetate	501/348 445/295 ^a	33	60	100	TLC plate, HeLa cells
Ref 16	2-(pyridin-4-yl)acetonitrile	510/450 640/560 ^a	3.3	60	380	TLC plate, A549 cells, Zebrafish
Ref 17	benzopyrylium	460/415 694/647 ^a	8	30	87	TLC plate, HeLa cells
Ref 18	dinitrile	490/350	80	30	12.2	HeLa cells, Zebrafish
Ref 19	phthalimide	439/371	350	60	2673	Filter paper
Ref 20	4-bromo butyrate	627/580 814/780 ^a	23	17	12	HeLa cells, Mice
Ref 21	acetyl	400/341 470/382 ^a	10	7	31000	HeLa cells
Ref 22	levulinate	458/360	250	15	2460	None

Ref 23	4-bromo butyrate	521/360 387/360 ^a	3050	30	5.8	Test paper, Water samples, MDA-MB-231 cells
Ref 24	phthalimide	430/360	60	40	48	Hct116 cells, HepG2 cells
Ref 25	aldehyde	556/391	38	60	1.12	Paper strip, Soil samples, Tissue
Ref 26	cyano	516/435 572/525 ^a	> 100	12	163	Water samples, HeLa cells
Ref 27	acetyl	480/371	49	40	120	Water samples, MCF-7 cells, <i>Arabidopsis</i> <i>Thaliana</i>
This work	benzo-thiazepine	460/365	480	20	50	Water samples, HeLa cells

^a The wavelength of the second emission and corresponding excitation (ratiometric analysis).