

Electronic Supplementary Material

A novel flavonol-based colorimetric and turn-on fluorescent probe for rapid determination of hydrazine in real water samples and its bioimaging in vivo and vitro

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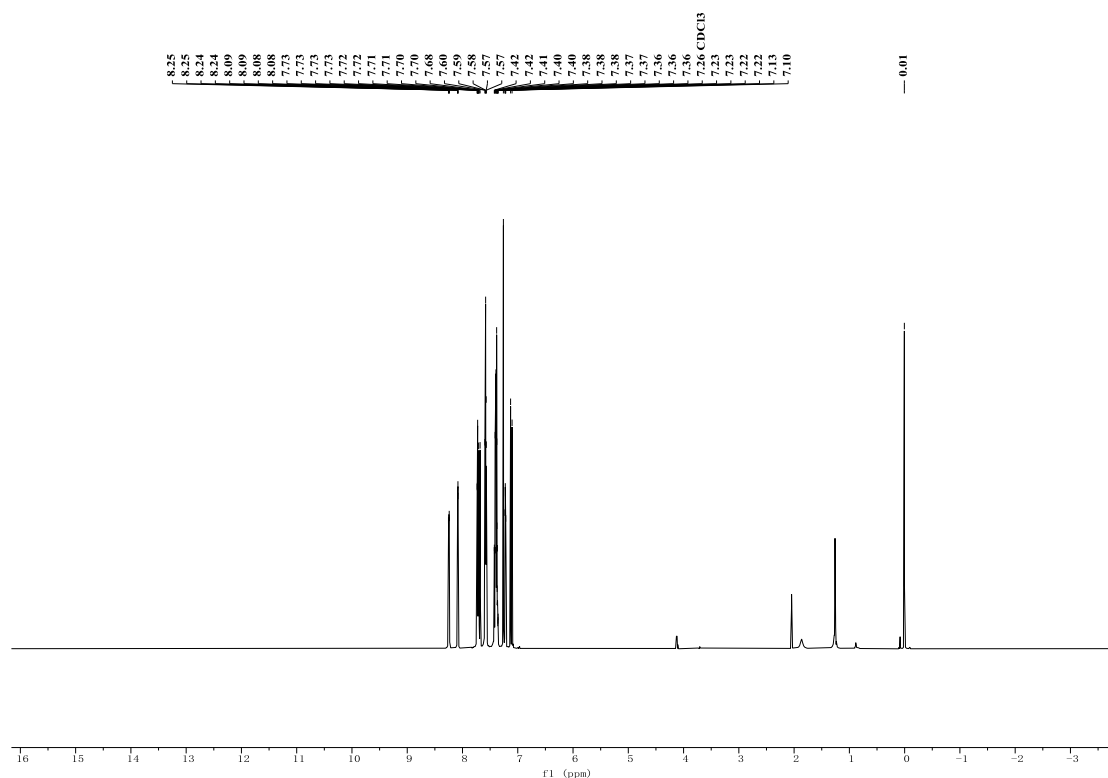


Fig S1. ¹H NMR spectra of compound **FHT** in CDCl₃.

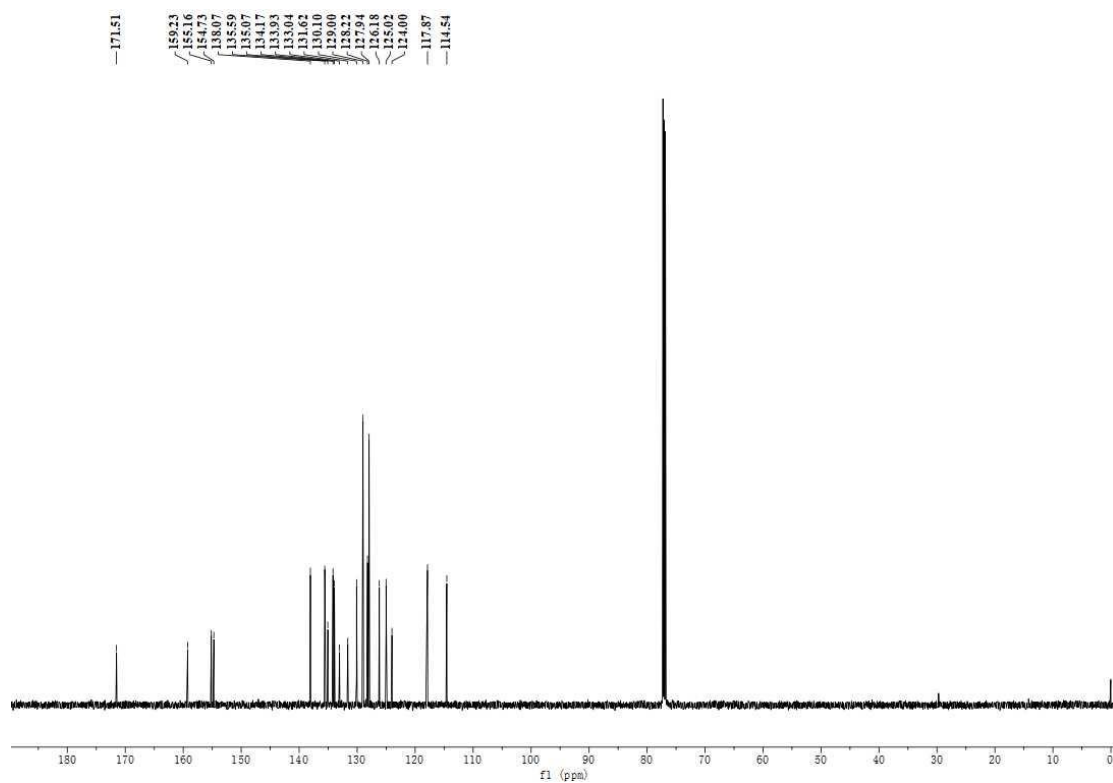


Fig S2. ^{13}C NMR spectra of compound **FHT** in CDCl_3 .

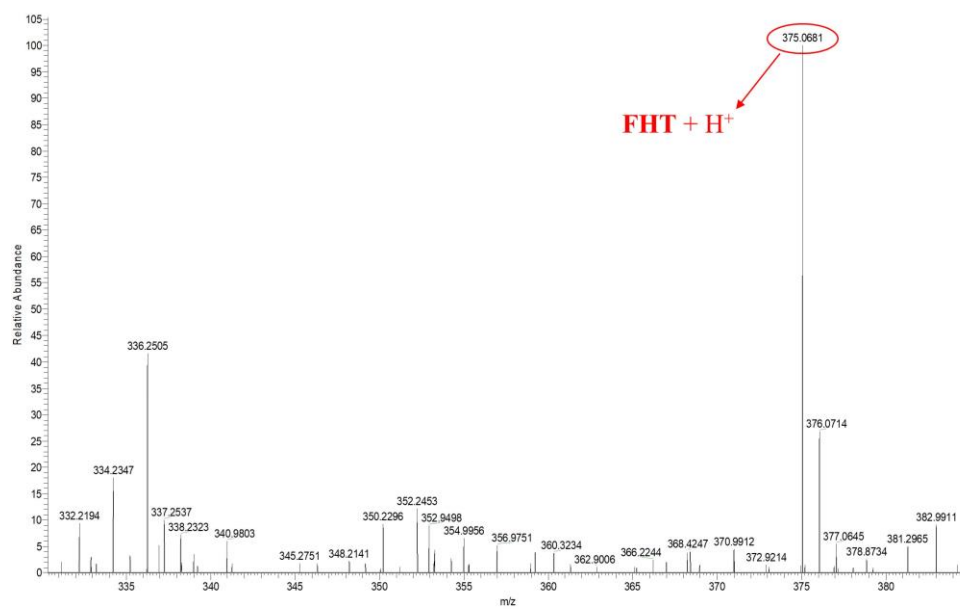


Fig S3. HRMS spectra of probe **FHT**.

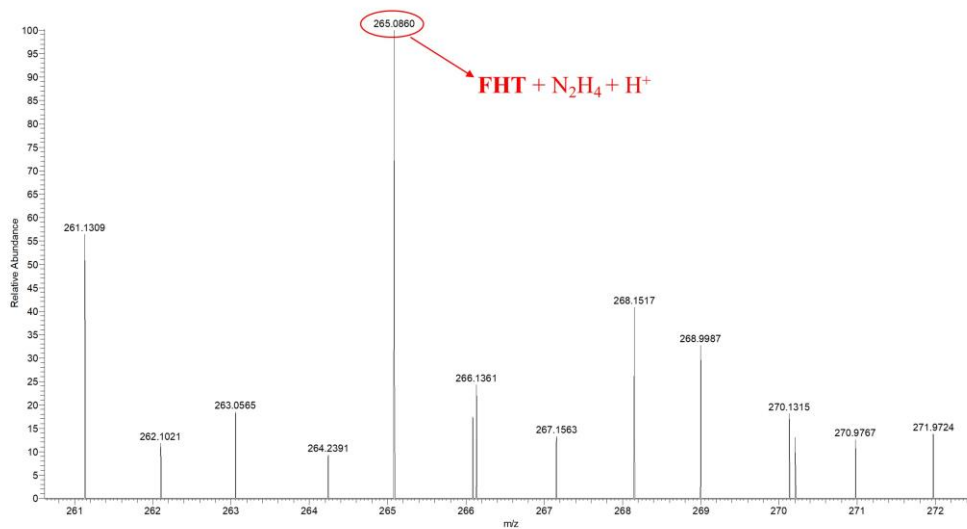


Fig S4. HRMS spectra of the reaction product of probe **FHT** with N_2H_4 .

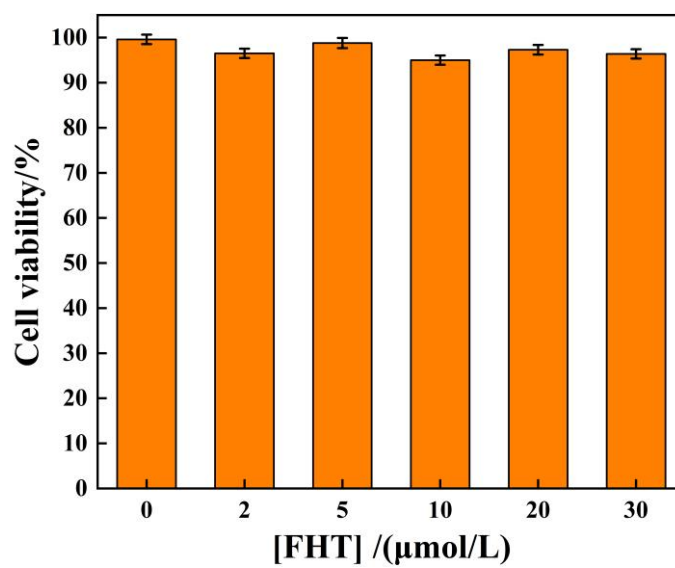


Fig S5. Cell viability of HeLa cells incubated with different concentrations of **FHT**

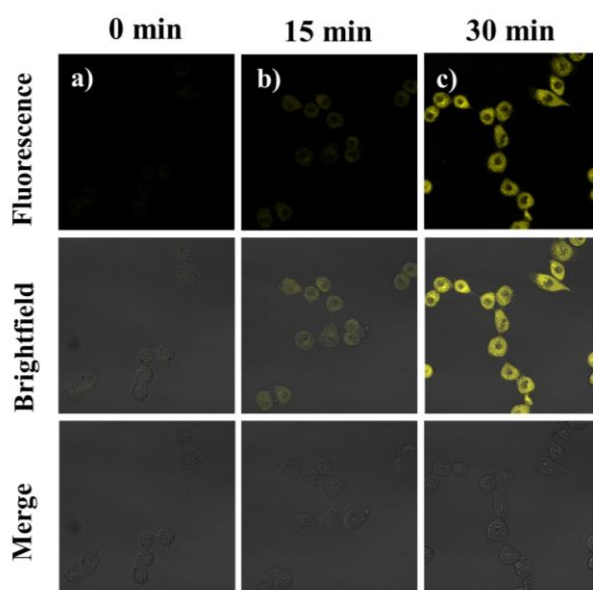


Fig S6. Fluorescence microscope images of HeLa cells: HeLa cells was stimulated with 10 μM **FHT** for 1 h, followed stained with 100 μM N_2H_4 for (a) 0 min, (b) 15 min, (c) 30 min, respectively; (the excitation wavelength: 408 nm; the collected fluorescence wavelength: 450–650 nm)

Fluorescence quantum yield

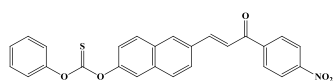
The fluorescence quantum yields (Φ_{fl}) for compounds were calculated by using quinine sulfate (sigma) as the standard ($\Phi_{\text{ref}} = 0.51$, DMSO/ $\text{H}_2\text{O} = 4/6$). The following equation was used for calculation.

$$(\Phi_{\text{fl}})_{\text{sample}} = \Phi_{\text{ref}} \times (\text{Abs}_{\text{ref}}/\text{Abs}_{\text{sample}}) \times (I_{\text{sample}}/I_{\text{ref}}) \times (\eta_{\text{sample}})^2/(\eta_{\text{ref}})^2$$

where Abs is the absorbance of the sample, I is the integrated fluorescence emission intensity and η is the refractive index of the solvent.

Table S1. Comparison of **FHT** with other reported hydrazine probes.

Probe	Detection limit	linearity range	Practical application			Ref.
			Test paper	Water sample	Imaging in vitro and vivo	



1.1×10^{-7} M

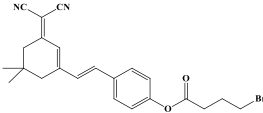
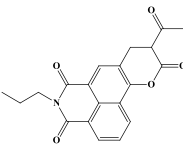
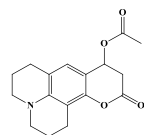
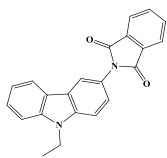
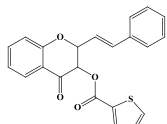
0-120 μM

Yes

Yes

-

[1]

	$8.63 \times 10^{-5} \text{ M}$	0-200 μM	-	Yes	in vitro and vivo	[2]
	$1.5 \times 10^{-7} \text{ M}$	60-160 μM	Yes	-	in vivo	[3]
	$6.32 \times 10^{-5} \text{ M}$	0-25 μM	-	-	in vivo	[4]
	$2.67 \times 10^{-6} \text{ M}$	100-400 μM	Yes	-	-	[5]
	$1.4 \times 10^{-7} \text{ M}$	0-180 μM	Yes	Yes	in vitro and vivo	This work

1. Wu X, Li Y, Yang S, Tian H, Sun B. A multiple-detection-point fluorescent probe for the rapid detection of mercury (II), hydrazine and hydrogen sulphide. *Dyes and Pigments*, 2020, 174: 108056.
2. Zhu M, Xu Y, Sang L, Zhao Z, Wang L, Wu X, Fan F, Wang Y, Li H. An ICT-based fluorescent probe with a large Stokes shift for measuring hydrazine in biological and water samples. *Environ Pollut*, 2020, 256: 113427.
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