Supporting Information

A highly sensitive naked-eye fluorescent probe for trace hydrazine based on 'C-CN' bond cleavage

Hai Xu,[a] Zhen Huang,[a] Yaqian Li,[a] Biao Gu,[b] Zile Zhou,[a] Ruihua Xie,[a] Xiao Pang,[a] Haitao Li,[a,*] and Youyu Zhang[a]

[a]Key Laboratory of Chemical Biology and Traditional Chinese Medicine Research (Ministry of Education), College of Chemistry and Chemical Engineering, Hunan Normal University, Changsha 410081, PR China

[b]Key Laboratory of Functional Organometallic Materials of College of Hunan Province, College of Chemistry and Materials Science, Hengyang Normal University, Hengyang 421008, PR China

*Corresponding author. Tel: +86-751-88865515; Fax: +86-731-88872531.

E-mail address: haitiao-li@hunnu.edu.cn.

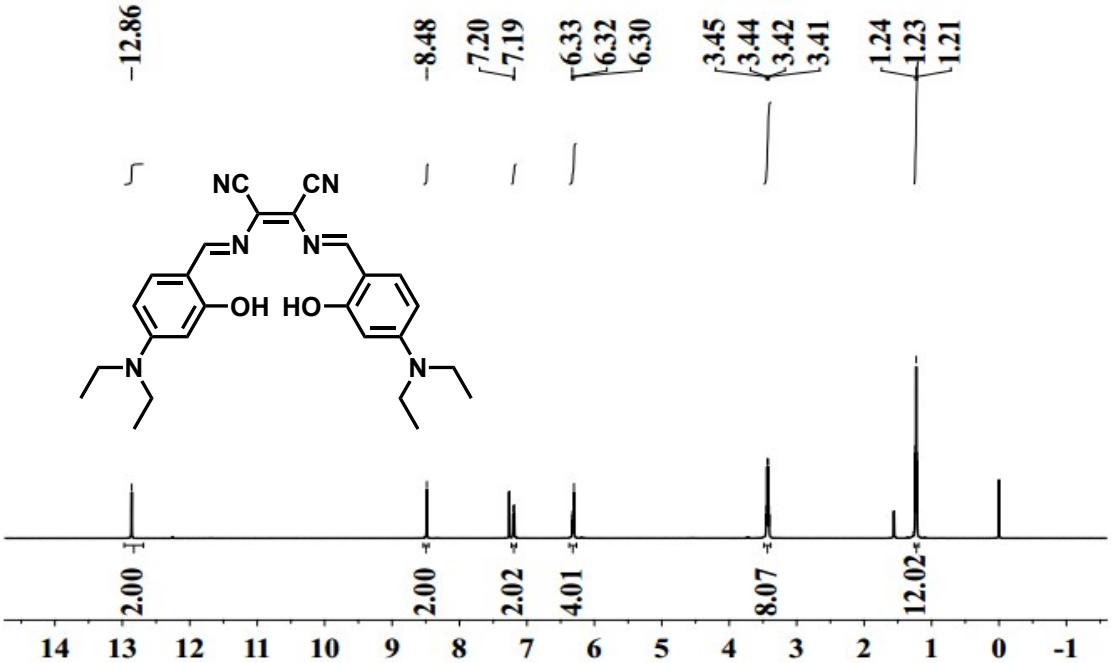

Fig. S1. ^{1}H NMR spectrum of probe **DHM** (500 MHz, $CDCl_3$).

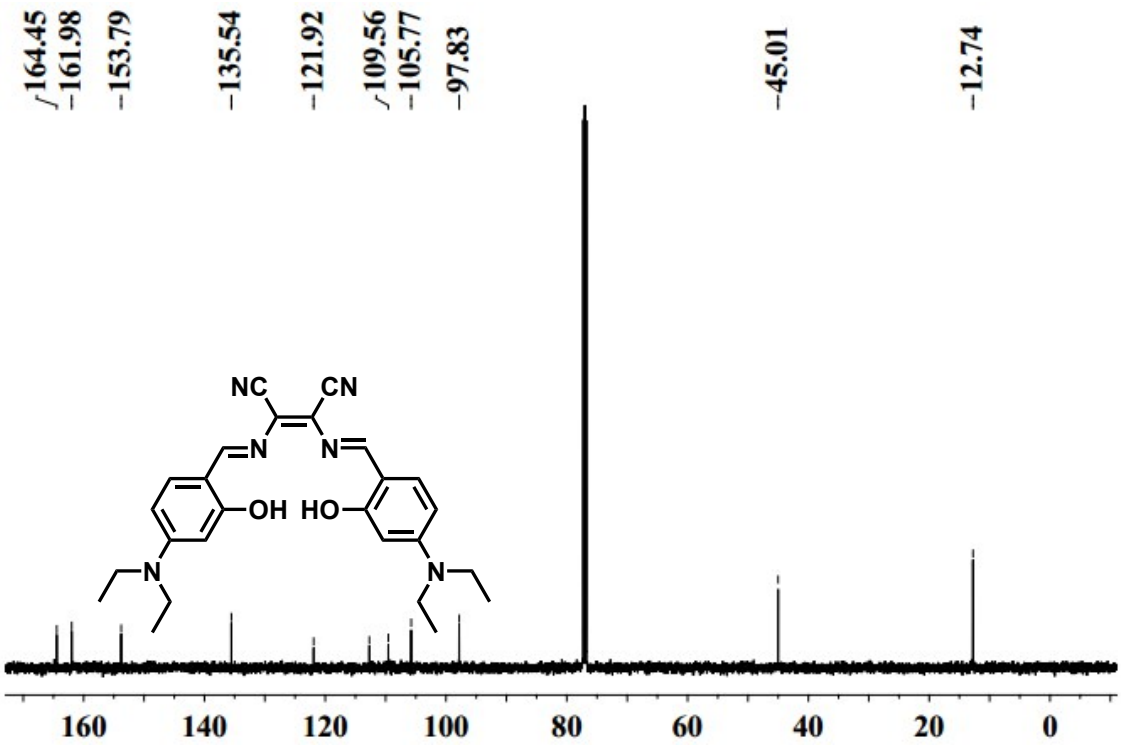

Fig. S2. ^{13}C NMR spectrum of probe **DHM** (126 MHz, $CDCl_3$).

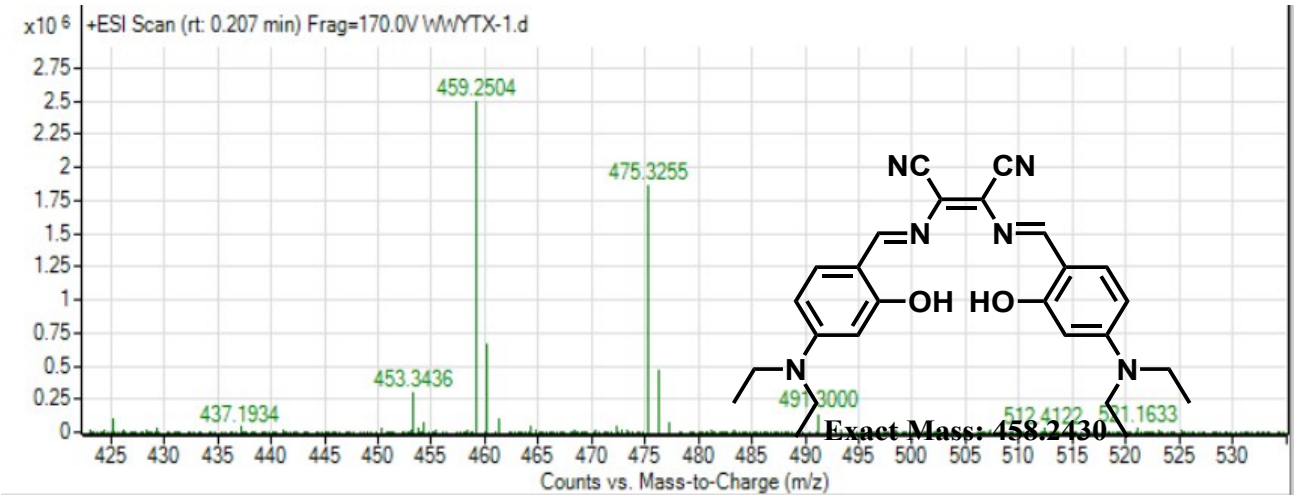

Fig. S3. HRMS spectrum (ESI positive ion mode) of **DHM**.

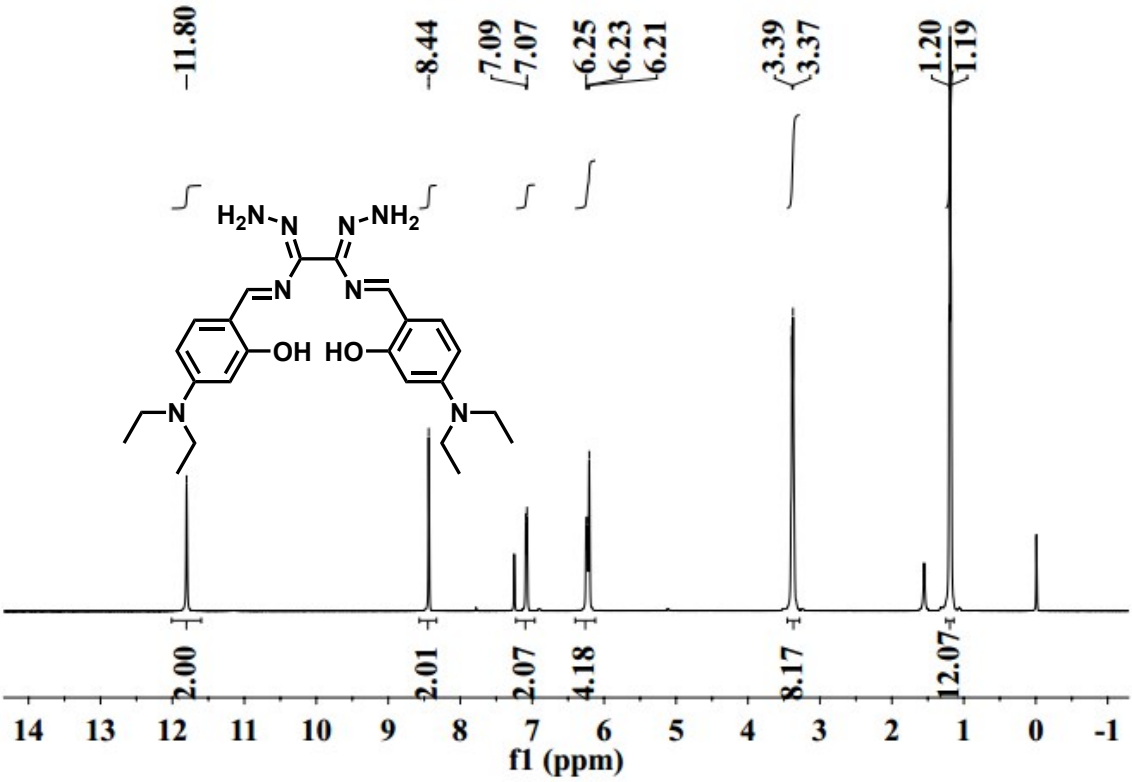

Fig. S4. ^{1}H NMR spectrum of probe **DHM-N_2H_4** (500 MHz, $CDCl_3$).

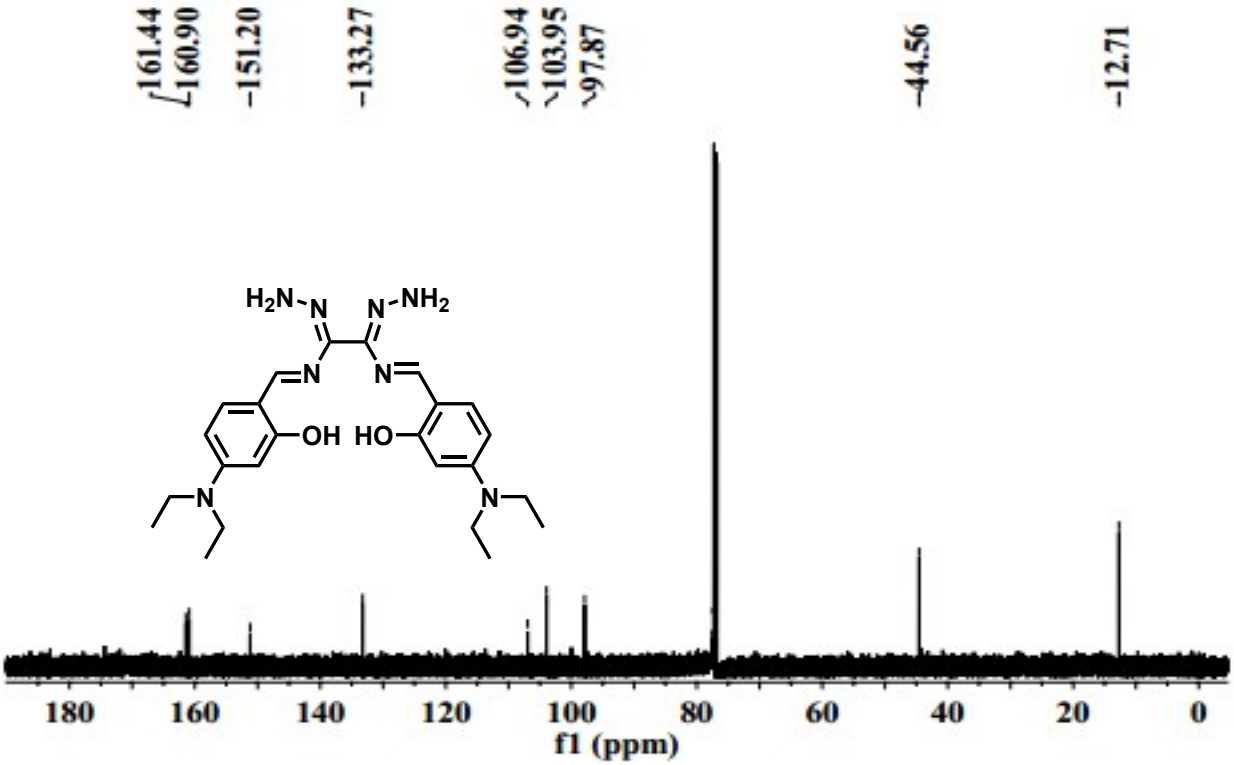

Fig. S5. ^{13}C NMR spectrum of probe **DHM-N_2H_4** (126 MHz, $CDCl_3$).

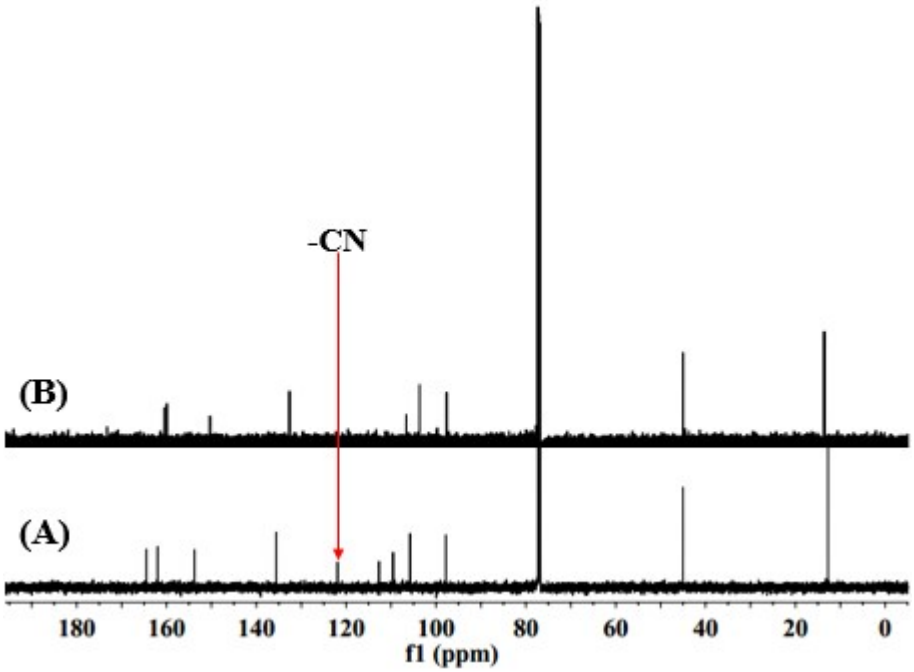

Fig. S6. ^{13}C NMR (500 MHz) spectra of **DHM** (A) and the isolated product of **DHM** + N_2H_4 (B) in $CDCl_3$.

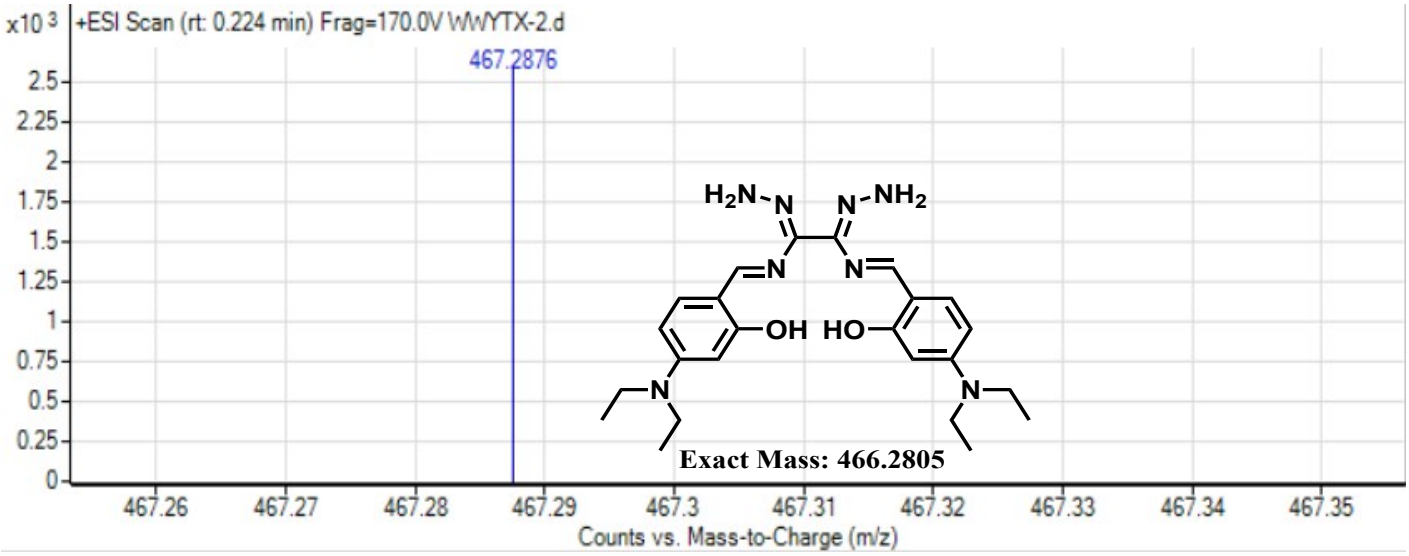

Fig. S7. HRMS spectrum (ESI positive ion mode) of **DHM-N_2H_4**.

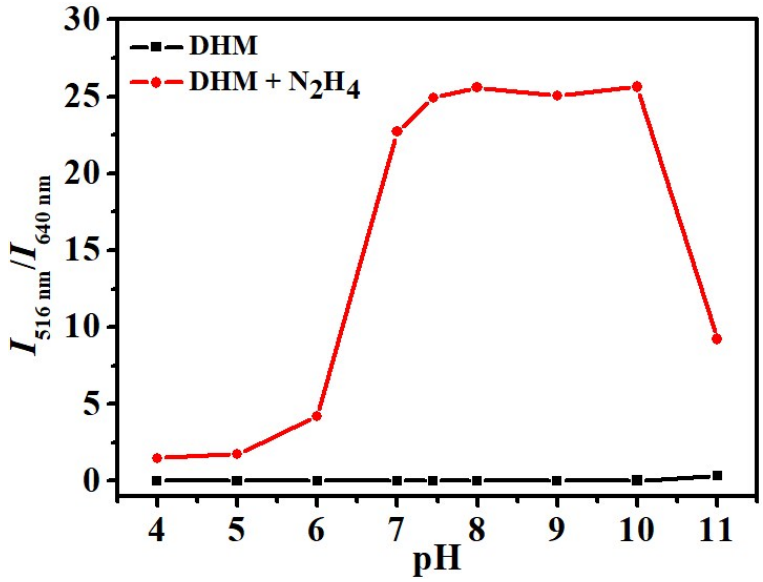

Fig. S8. The effect of pH on the fluorescence intensity at ($I_{516\ nm}/I_{640\ nm}$) of probe **DHM** (10 μM) in the absence (black) or presence (red) of N_2H_4 (300 μM).

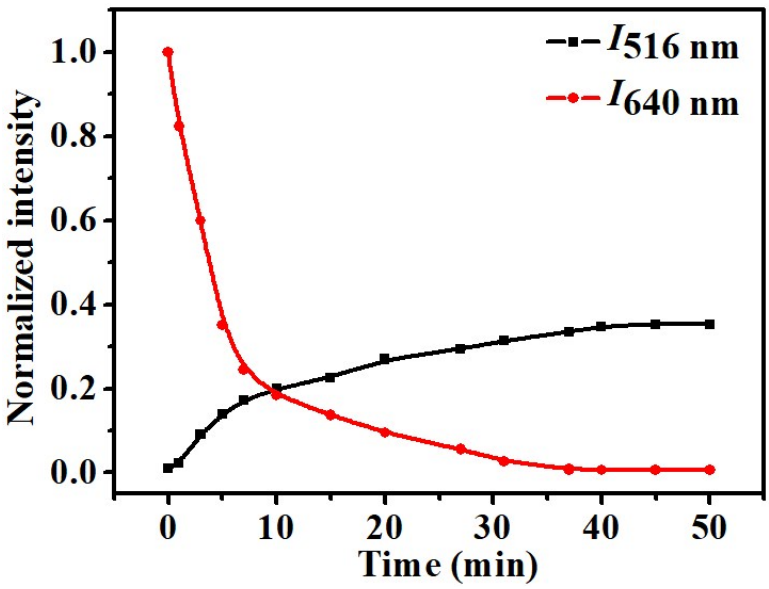

Fig. S9. Time-dependent fluorescence intensity at 516 nm (black) and 640 nm (red) of probe **DHM** in the presence of N_2H_4 (300 μM).

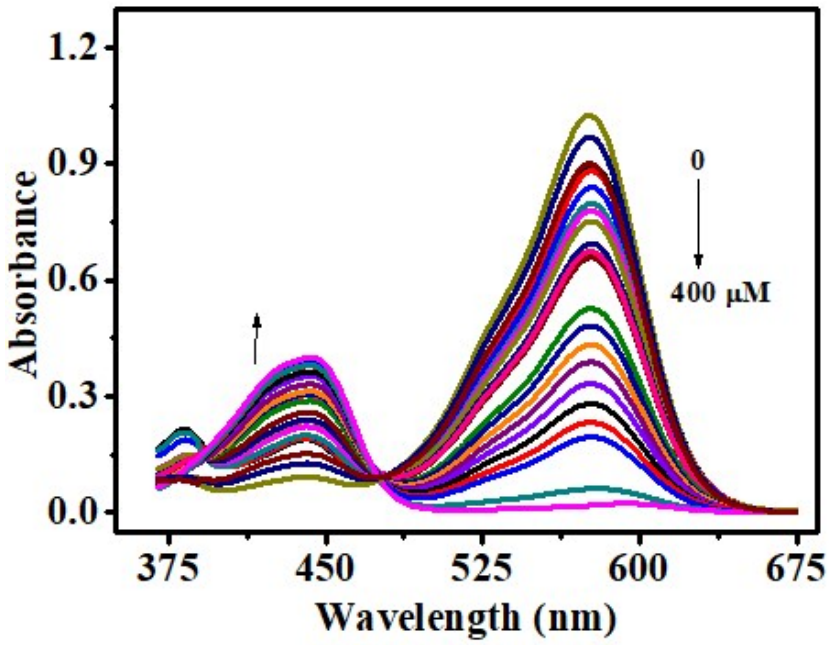

Fig. S10. UV-vis spectra of **DHM** (10 μM) in the presence of different concentrations of N_2H_4 (0-400 μM) in 10 mM PBS buffer (DMSO/H_2O = 9:1, v/v, pH = 7.4).

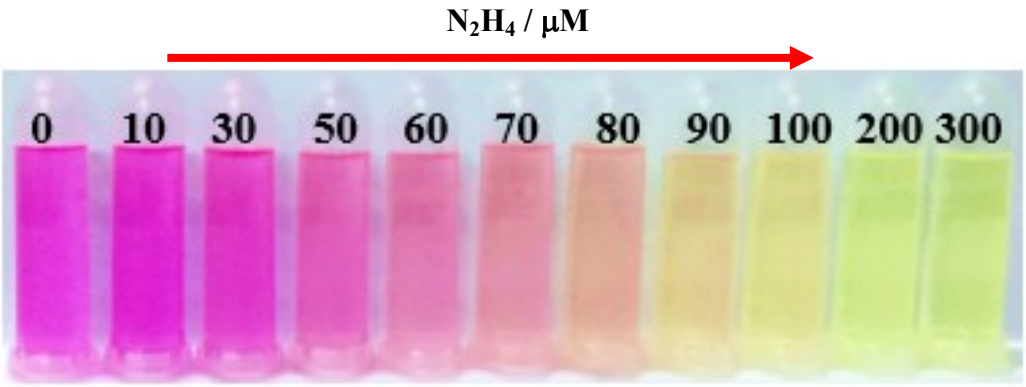

Fig. S11. The color changes of probe **DHM** (10 μM) upon addition of different concentrations of N_2H_4 in DMSO/PBS buffer (9:1, v/v, 10 mM, pH = 7.4).

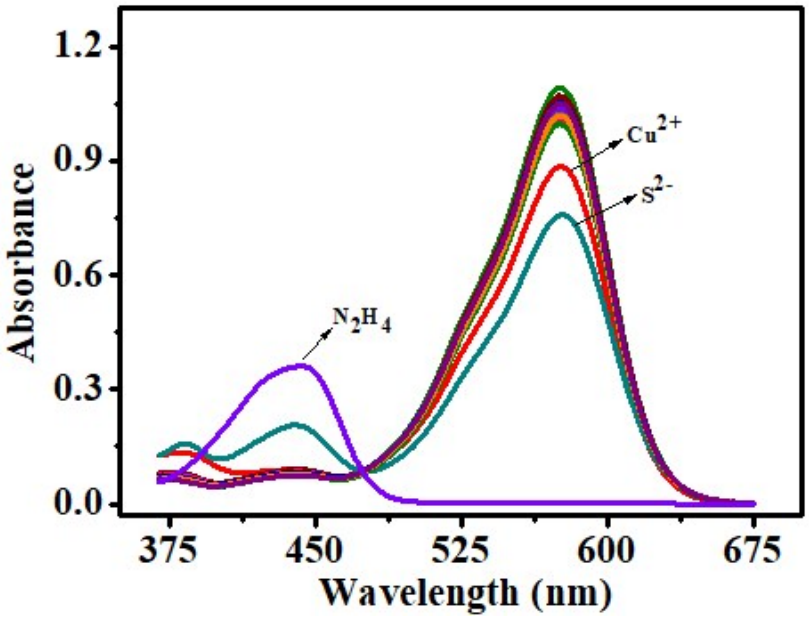

Fig. S12. UV-vis spectra of **DHM** (10 μM) in the presence of various species (300 μM some other amines, metal ions, anions and N_2H_4).

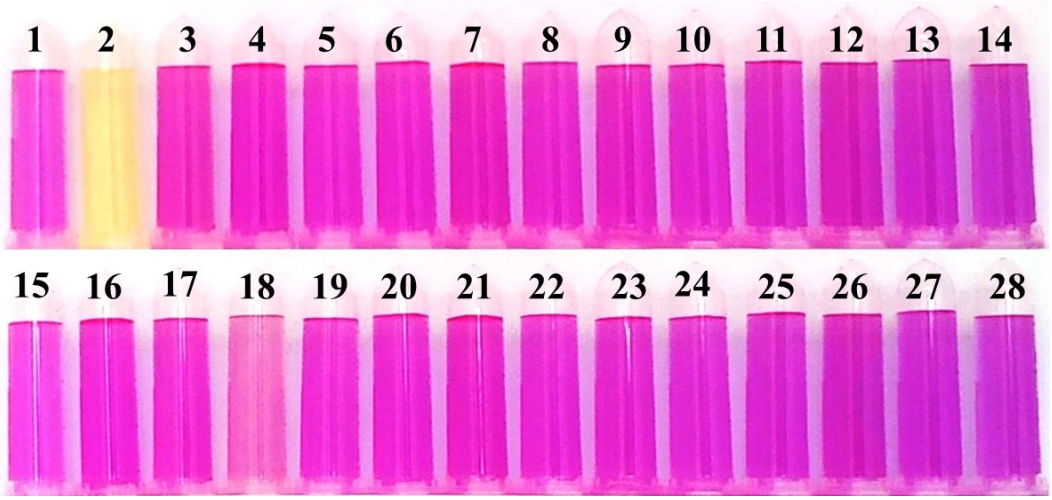

Fig. S13. The color changes of probe **DHM** (10 μM) with various analytes (300 μM). The pictures were recorded at 40 min after addition of the analytes (1. Blank, 2. N_2H_4, 3. NH_4OH, 4. *n*-butylamine, 5. NH_2OH, 6. Et_3N, 7. diaethylamine, 8. aniline, 9. Cys, 10. Hcy, 11. GSH, 12. K^+, 13. Na^+, 14. Mg^{2+}, 15. Pb^{2+}, 16. Hg^+, 17. Cr^{2+}, 18. S^{2-}, 19. Zn^{2+}, 20. N_3^-, 21. ClO^-, 22. HSO_3^-, 23. SO_3^{2-}, 24. HCO_3^-, 25. HPO_4^{2-}, 26. Cl^-, 27. I^-, 28. Cu^{2+}).

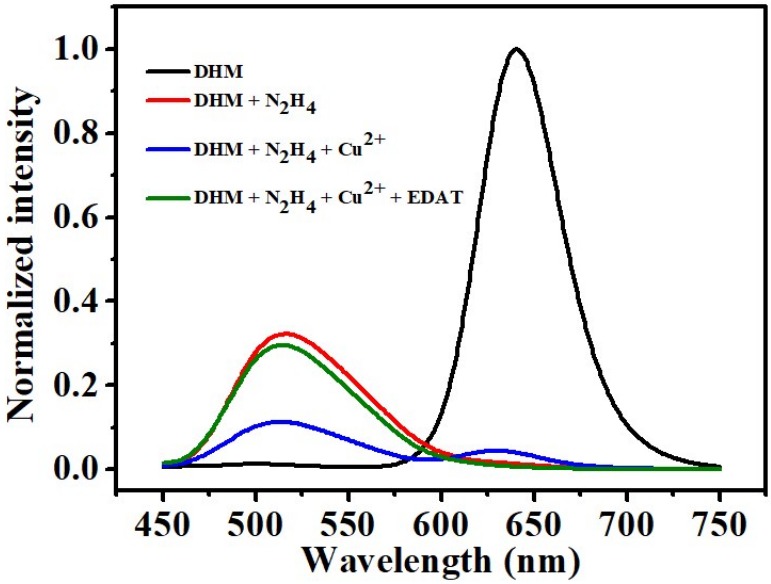

Fig. S14. Fluorescence emission spectra of **DHM** (10 μM) in presence of N_2H_4 (300 μM) and other species in 10 mM PBS buffer (DMSO/H_2O = 9:1, v/v, pH = 7.4). Black line: **DHM**; red line: **DHM** + N_2H_4; blue line: **DHM** + N_2H_4 + Cu^{2+} (300 μM); green line: **DHM** + N_2H_4 + Cu^{2+} (300 μM) + EDTA (400 μM).