A new near-infrared ratiometric fluorescent probe for hydrazine

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**Fig. S1** Absorbance of compound 1 [$1.0 \times 10^{-5}$ M in 5:5 (v/v) 0.01M HEPES/DMSO pH 7.4] (black circle) as a function of addition of hydrazine water solution. $A_{418}$ and $A_{584}$ represent the absorbance at 418 nm and 584 nm. The reaction time is 24 hour.

**Fig. S2** The relationship of ratiometric fluorescence change of probe 1 [$1.0 \times 10^{-5}$ M in 5:5 (v/v) 0.01M HEPES/DMSO, pH 7.4] with the concentration of hydrazine upon excitation at 450 nm. $I_{510}$ and $I_{660}$ represent the emission intensity of probe 1 at 510 nm and 660 nm respectively.
Fig. S3 The relationship of fluorescence change at 660 nm of probe 1 [1.0 × 10⁻⁵ M in 5:5 (v/v) 0.01M HEPES/DMSO pH 7.4] with the concentration of hydrazine upon excitation at 5100 nm. $I_{660}$ represents the emission intensity of probe 1 at 660 nm.

Fig. S4 HRMS spectrum of probe 1.
**Fig. S5** HRMS spectrum of probe 1 reaction with hydrazine.

**Fig. S6** Fluorescence responses of 1 [1.0 × 10^{-5} M in 5:5 (v/v) 0.01M HEPES/DMSO pH 7.4] upon addition of different species (100 equiv of species relative to 1) (green bars) with excitation at 450 nm, and fluorescence changes of the mixture of 1 and hydrazine (1.0 × 10^{-3} M in water) after addition of an excess of the indicated species (100 equiv relative to 1) (red bars) with excitation at 450 nm. I_{510} and I_{660} represent the emission intensity at 510 nm. Intensity means the emission intensity at 660 nm. The species used were thiourea, triethylamine, N,N-diisopropylethylamine, ammonia water, carbamide, aniline.
Fig. S7 Fluorescence responses of 1 \([1.0 \times 10^{-5} \text{ M in 5:5 (v/v) 0.01M HEPES/DMSO pH 7.4}]\) upon addition of different species (100 equiv of species relative to 1) (green bars) with excitation at 580 nm, and fluorescence changes of the mixture of 1 and hydrazine \((1.0 \times 10^{-3} \text{ M in water})\) after addition of an excess of the indicated species (100 equiv relative to 1) (red bars) with excitation at 580 nm. \(I_{660}\) represent the emission intensity at 660 nm. Intensity means the emission intensity at 660 nm. The species used were thiourea, triethylamine, N,N-diisopropylethylamine, ammonia water, carbamide, aniline.

Fig. S8 \(^1\text{H}\) NMR spectrum of compound 4.
Fig. S9 $^{13}$C NMR spectrum of compound 4.

Fig. S10 $^1$H NMR spectrum of compound 3.
Fig. S11 $^{13}$C NMR spectrum of compound 3.

Fig. S12 $^1$H NMR spectrum of compound 2.
Fig. S13 $^{13}$C NMR spectrum of compound 2.

Fig. S14 $^1$H NMR spectrum of compound 1.
Fig. S15 $^{13}$C NMR spectrum of compound 1.