Ratiometric luminescent detection of hydrazine with a carbon dots-hemicyanine nanohybrid system

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Fig. S1 FT-IR spectrum of the CDs.

Fig. S2 Mass spectrum of the product from the reaction of probe 1 and hydrazine.
Fig. S3 Fluorescence response of the CNDs–hemicyanine nanohybrid system ($V_{\text{water}}/V_{\text{DMSO}} = 1/9$) upon addition of different metal ions (100 equiv of metal ions relative to 1) (red bars), and fluorescence change of the mixture of the CNDs–hemicyanine nanohybrid system and hydrazine (1 mM in water) after addition of an excess of the indicated metal ions (100 equiv relative to 1) (green bars). The excitation wavelength was 530 nm and the reaction time was 60 min. $I_{550}$ and $I_{610}$ represent the emission intensity at 550 nm and 610 nm. The metal ions used were Na$^+$, Mg$^{2+}$, Al$^{3+}$, K$^+$, Ca$^{2+}$, Cr$^{3+}$, Mn$^{2+}$, Fe$^{3+}$, Co$^{2+}$, Ni$^{2+}$, Cu$^{2+}$, Zn$^{2+}$, Cd$^{2+}$, Hg$^{2+}$, Pb$^{2+}$.

Fig. S4 Fluorescence responses of the CNDs–hemicyanine nanohybrid system ($V_{\text{water}}/V_{\text{DMSO}} = 1/9$) upon addition of different anions (100 equiv of species relative to 1) (red bars), and fluorescence change of the mixture of the CNDs–hemicyanine nanohybrid system and hydrazine (1 mM in water) after addition of an excess of the indicated species (100 equiv relative to 1) (green bars). The excitation wavelength was 530 nm and the reaction time was 60 min. $I_{550}$ and $I_{610}$ represent the emission intensity at 550 nm and 610 nm. The anions used were blank, CH$_3$COO$^-$, SO$_4^{2-}$, SO$_3^{2-}$, HS$^-$, S$_2$O$_3^{2-}$, S$_2^-$, P$_2$O$_7^{4-}$, NO$_3^-$, N$_3^-$, I$,\Gamma$, HSO$_4^-$, HSO$_3^-$, HPO$_4^{2-}$, HCO$_3^-$, H$_2$PO$_4^-$, F$^-$, ClO$_4^-$, ClO$_3^-$, Cl$^-$, C$_2$O$_4^{2-}$, and Br$^-$. 