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Electronic Supplementary Information

Dual signaling of hydrazine by selective deprotection of dichlorofluorescein and resorufin acetates

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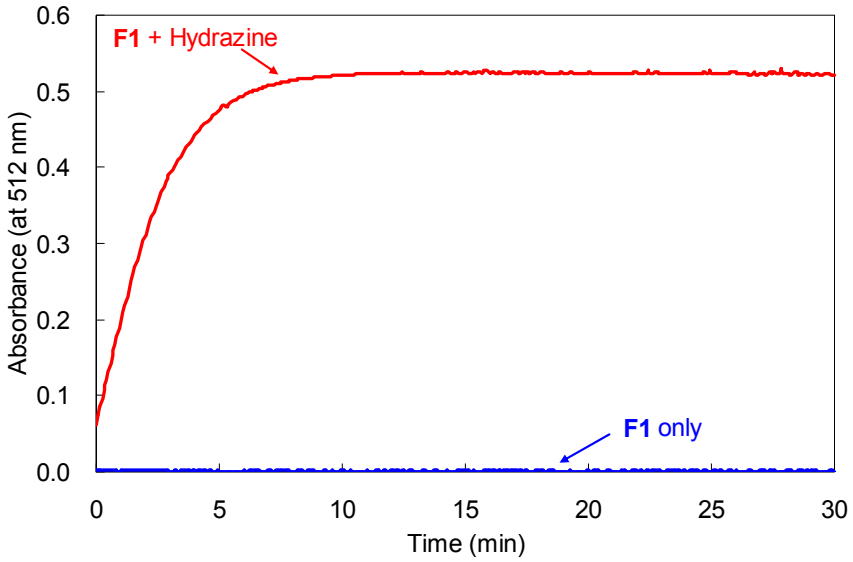
Fig. S1. Time course plot for the changes in absorbance at 512 nm of **F1** and **F2** in the absence and presence of hydrazine. [**F1**] = [**F2**] = 5.0×10^{-6} M, [Hydrazine] = 5.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v).

a) 2′,7′-Dichlorofluorescein acetate derivative **F1**



b) 2′,7′-Dichlorofluorescein chloroacetate derivative **F2**

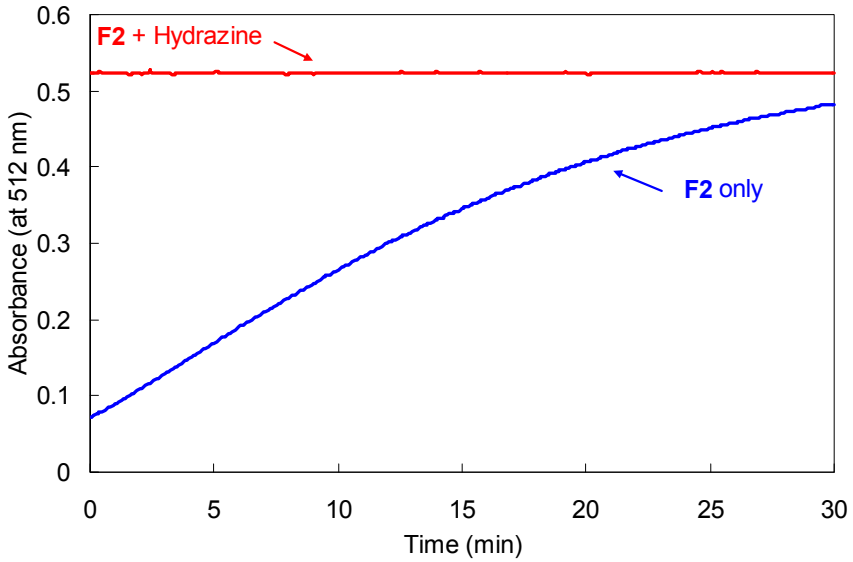


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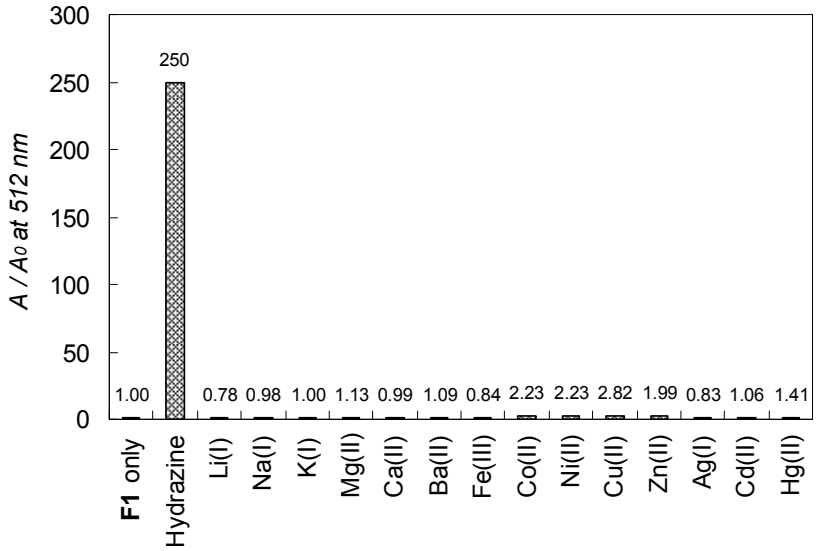
Fig. S2. Absorbance ratio (A/A_0) at 512 nm of **F1** in the presence of hydrazine, representative metal ions, and anions. [**F1**] = 5.0×10^{-6} M, [Hydrazine] = $[M^{n+}]$ = $[A^{n-}]$ = 5.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v).

a) Metal ions



b) Anions

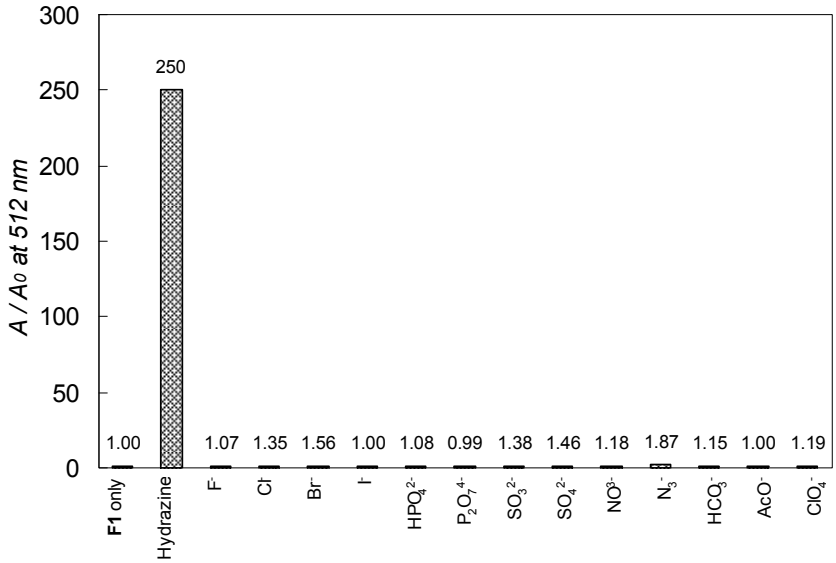


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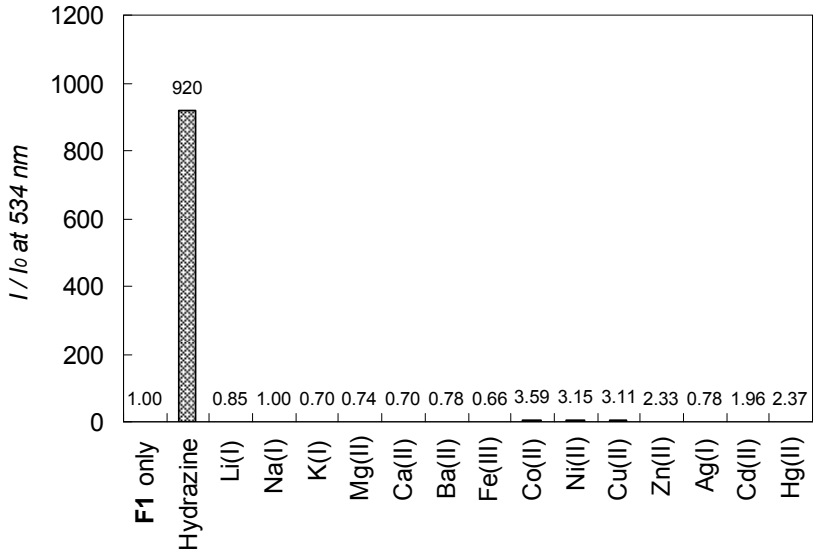
Fig. S3. Changes in fluorescence intensity at 534 nm of **F1** in the presence of hydrazine, representative metal ions, and anions. [**F1**] = 5.0×10^{-6} M, [Hydrazine] = $[M^{n+}]$ = $[A^{n-}]$ = 5.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v). λ_{ex} = 480 nm.

a) Metal ions



b) Anions

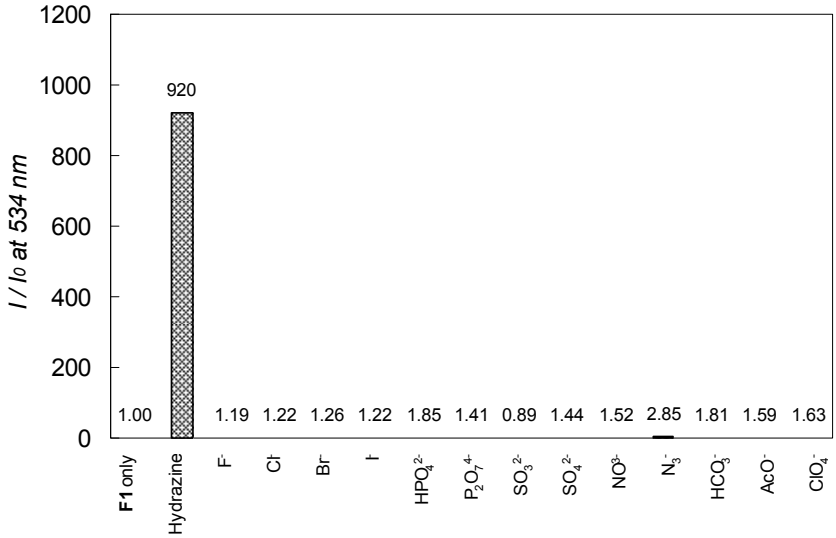


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Fig. S4. Partial ^{1}H NMR spectra of **F1** in the absence and presence of hydrazine. [**F1**] = [DCF] = 1.0×10^{-2} M, [Hydrazine] = 5.0×10^{-2} M in a D_2O/DMSO-d_6 solution (1:1, v/v). DCF: 2′,7′-dichlorofluorescein.

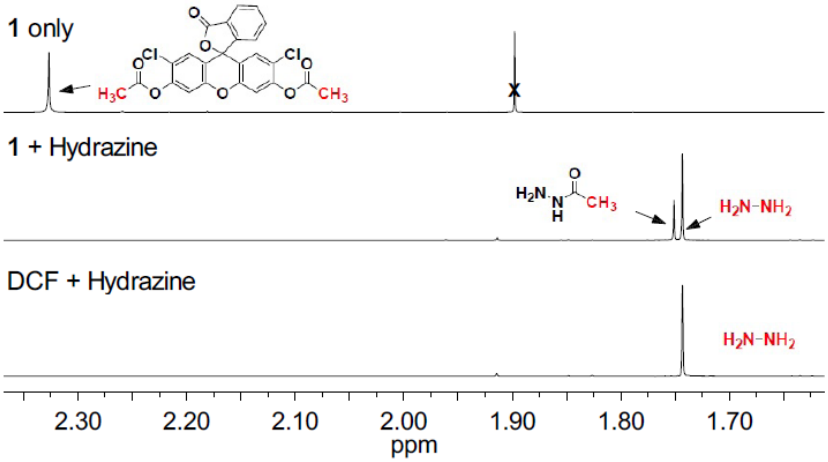

Fig. S5. UV-vis spectra of **F1** and dichlorofluorescein in the absence and presence of hydrazine. [**F1**] = [DCF] = 5.0×10^{-6} M, [Hydrazine] = 1.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v). DCF: 2′,7′-dichlorofluorescein.

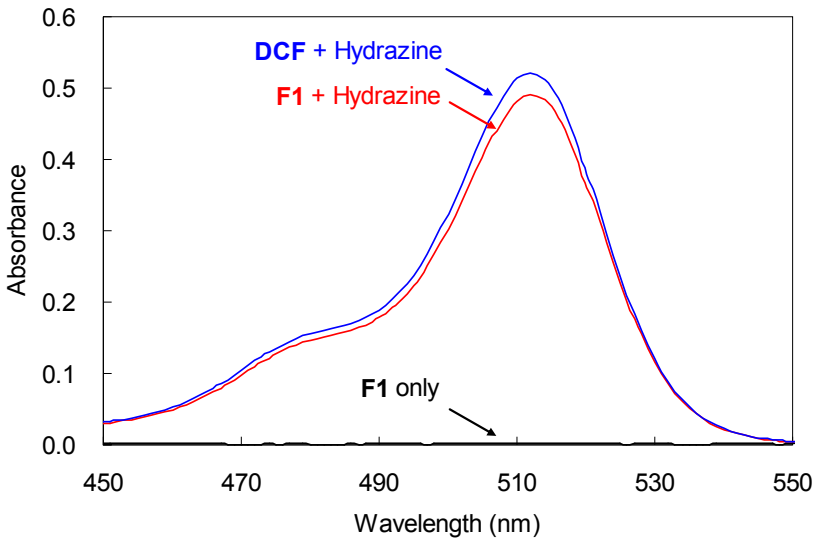

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Fig. S6. Fluorescence spectra of **F1** and dichlorofluorescein in the absence and presence of hydrazine. [**F1**] = [DCF] = 5.0×10^{-6} M, [Hydrazine] = 1.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v). λ_{ex} = 480 nm. DCF: 2′,7′-dichlorofluorescein.

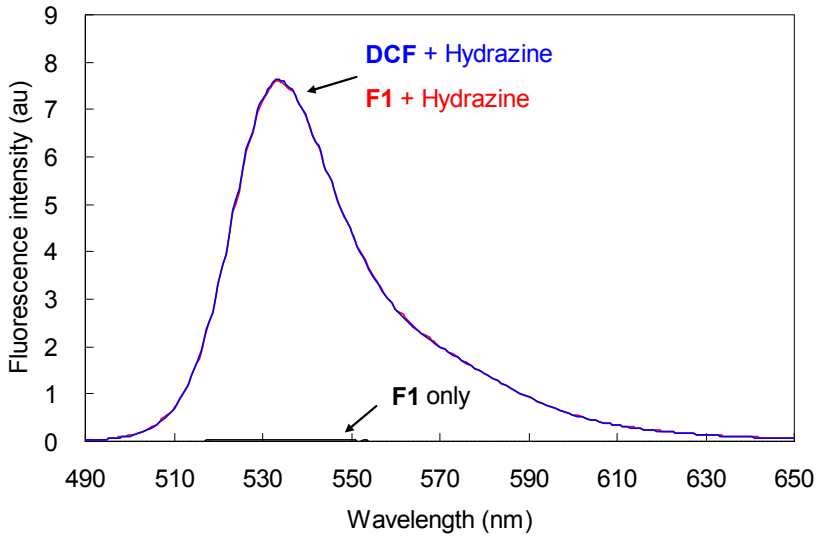

Fig. S7. Fluorescence spectra of **F1** and **F1** in the presence of hydrazine or acetylhydrazine. [**F1**] = 5.0×10^{-6} M, [Hydrazine] = [Acetylhydrazine] = 1.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v). λ_{ex} = 480 nm.

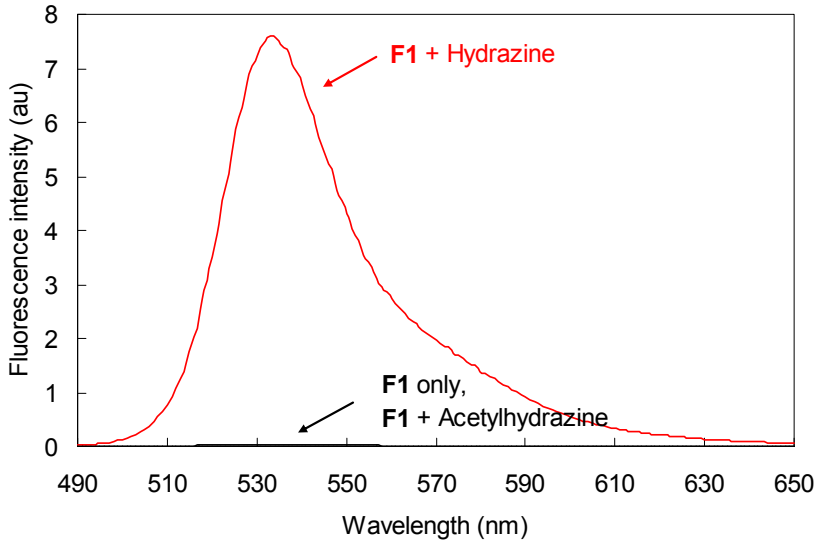

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Fig. S8. Signaling of hydrazine by **F1** in the presence of common metal ions and anions as background. [**F1**] = 5.0×10^{-6} M, [Hydrazine] = 2.5×10^{-4} M, $[M^{n+}] = [A^{n-}] = 5.0 \times 10^{-4}$ M, $[Co^{2+}] = [Cu^{2+}] = [Zn^{2+}] = [Cd^{2+}] = [Hg^{2+}] = 2.5 \times 10^{-4}$ M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v). λ_{ex} = 480 nm.

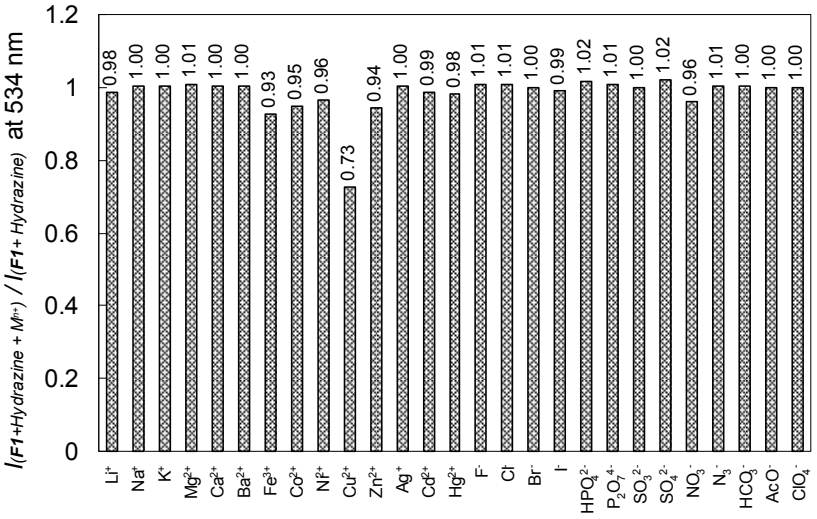

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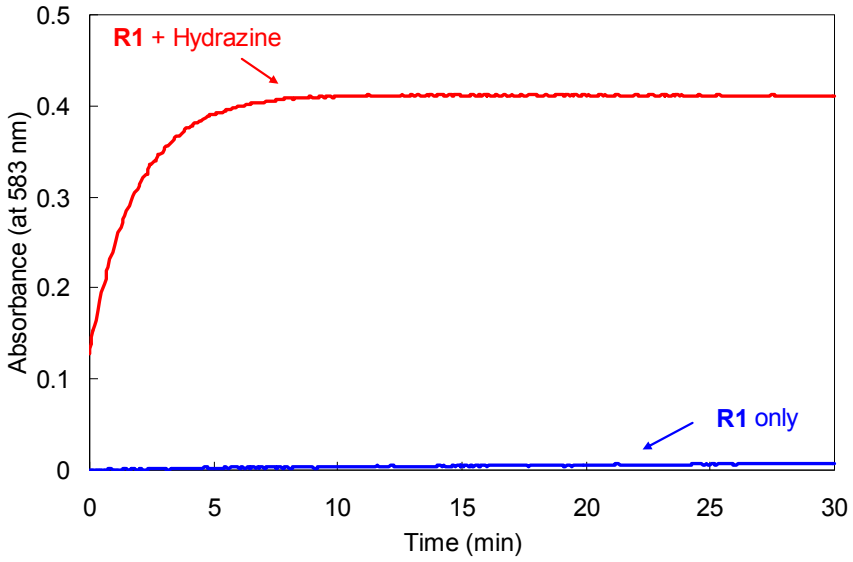
Fig. S9. Time course plot for the changes in absorbance at 583 nm of **R1** and **R2** in the absence and presence of hydrazine. [**R1**] = [**R2**] = 5.0×10^{-6} M, [Hydrazine] = 5.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v).

a) Resorufin acetate derivative **R1**



b) Resorufin chloroacetate derivative **R2**

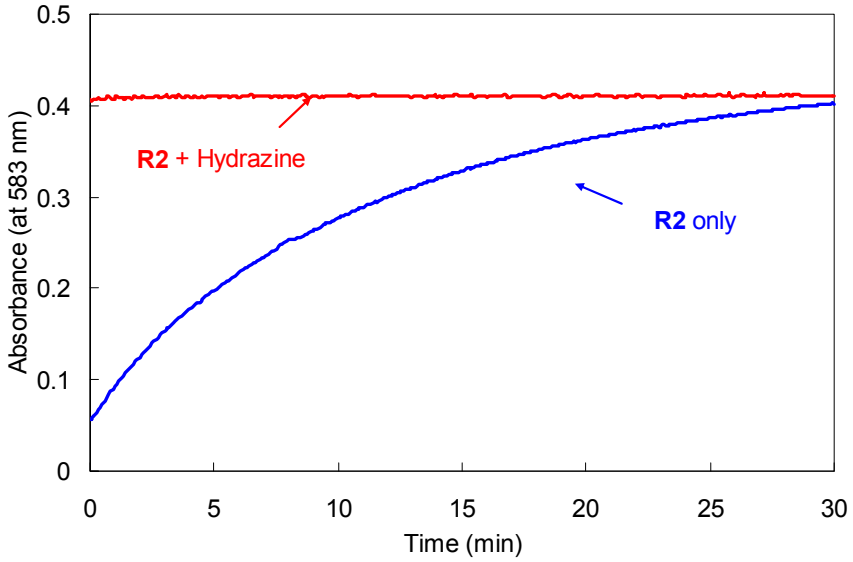


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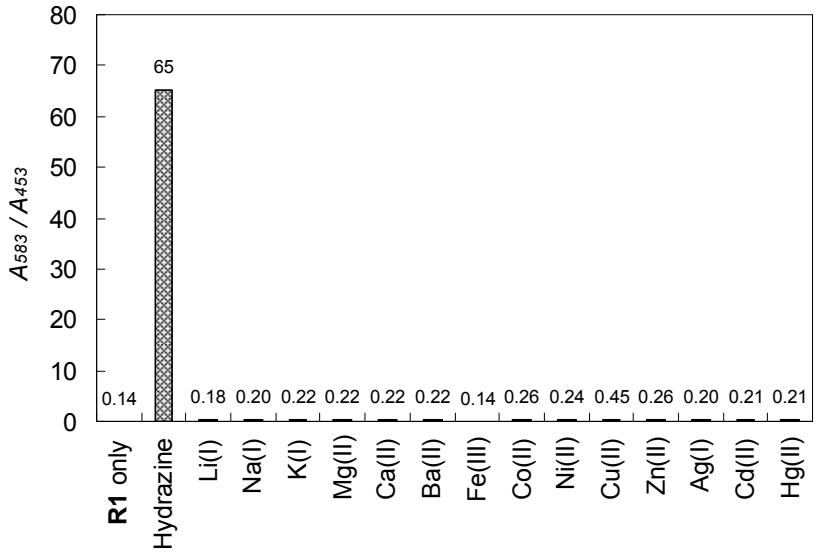
Fig. S10. Absorbance ratio (A_{583}/A_{453}) at 453 nm and 583 nm of **R1** in the presence of hydrazine, representative metal ions, and anions. [**R1**] = 5.0×10^{-6} M, [Hydrazine] = [M^{n+}] = [A^{n-}] = 5.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v).

a) Metal ions



b) Anions

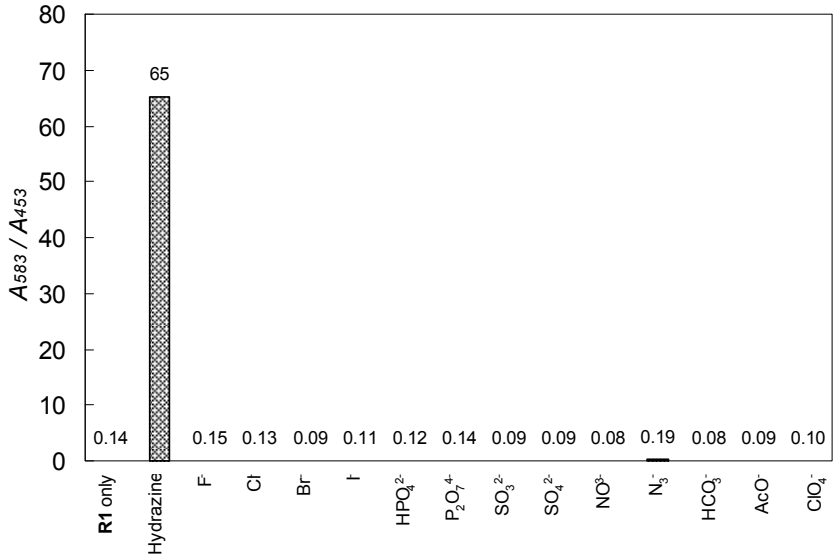


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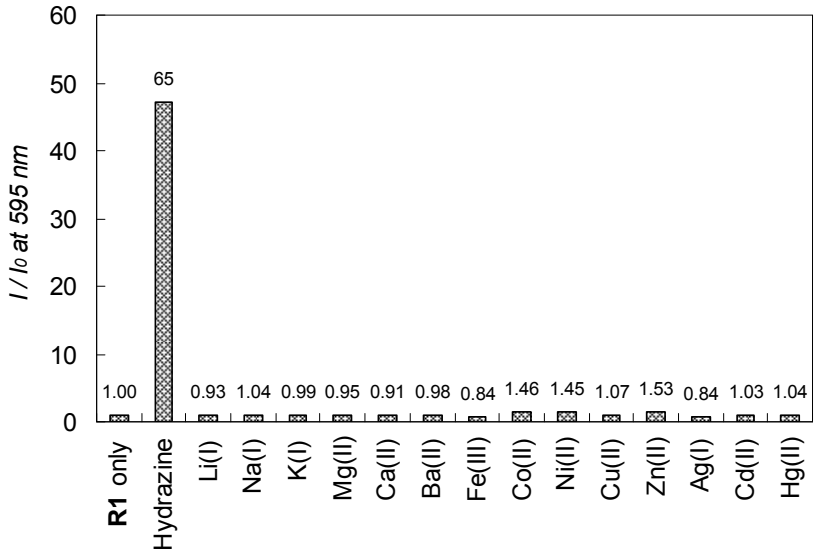
Fig. S11. Changes in fluorescence intensity at 595 nm of **R1** in the presence of hydrazine, representative metal ions, and anions. [**R1**] = 5.0×10^{-6} M, [Hydrazine] = $[M^{n+}]$ = $[A^{n-}]$ = 5.0×10^{-4} M in a mixture of DMSO and tris buffer solution (pH = 8.0, 10 mM), (1:1, v/v). λ_{ex} = 492 nm.

a) Metal ions



b) Anions

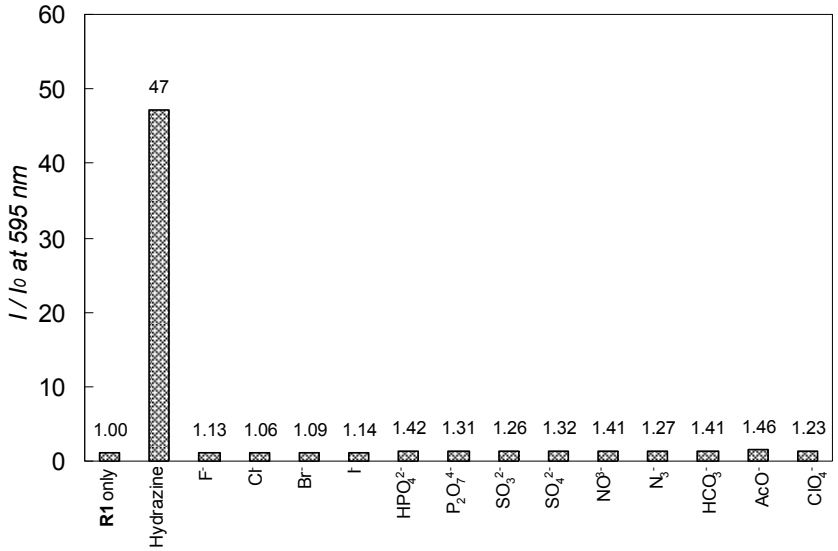


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Fig. S12. Concentration-dependence of hydrazine detection by **R1**. [**R1**] = 5.0×10^{-6} M, [Hydrazine] = from 0 to 3.0×10^{-5} M, in a mixture of DMSO and tris buffer solution (pH 8.0, 10 mM), (1:1, v/v).

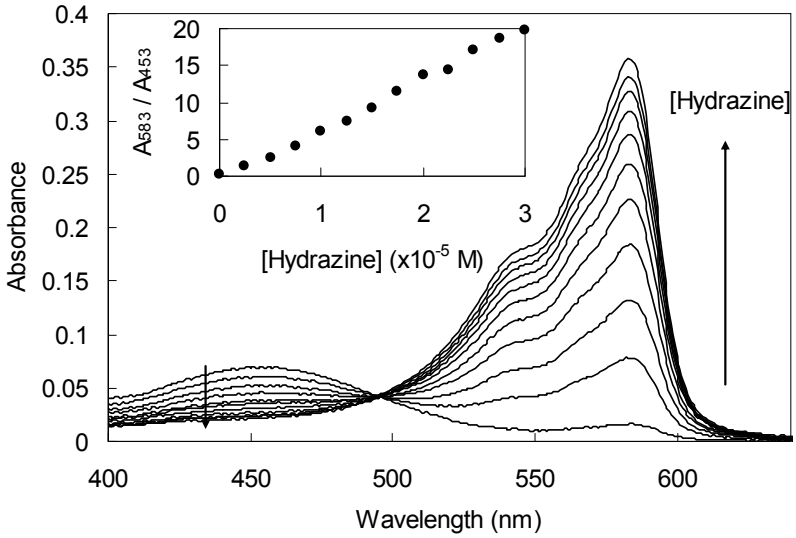

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Fig. S13. ^{1}H NMR spectrum of **F1** in $CDCl_3$.

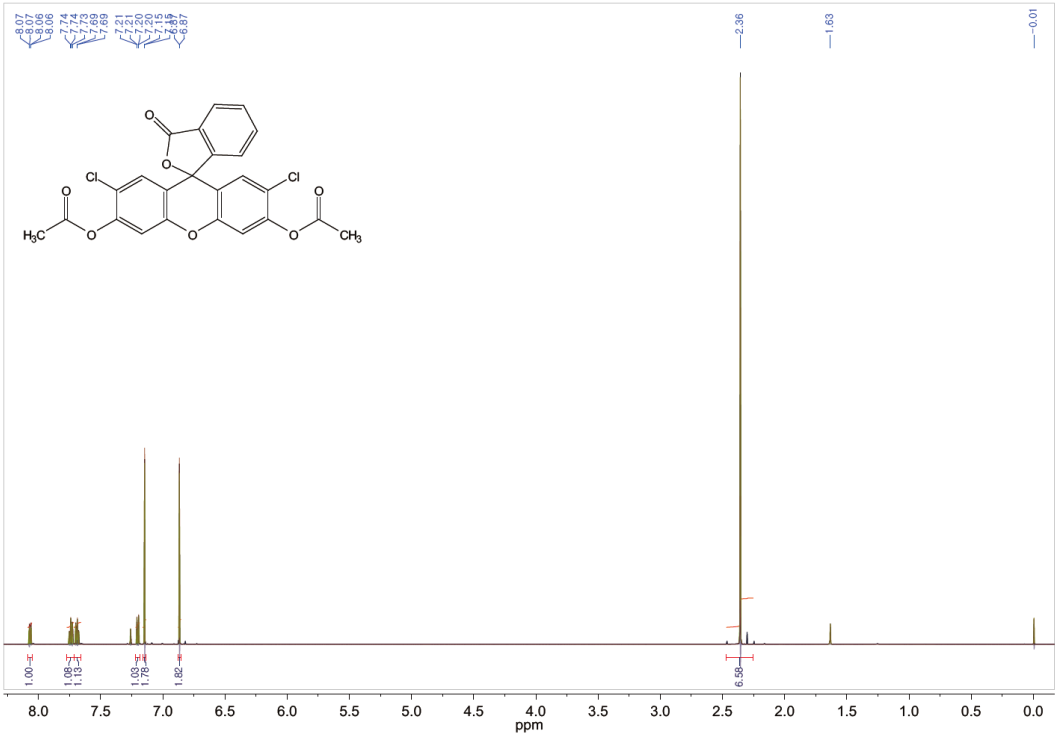

Fig. S14. ^{13}C NMR spectrum of **F1** in $CDCl_3$.

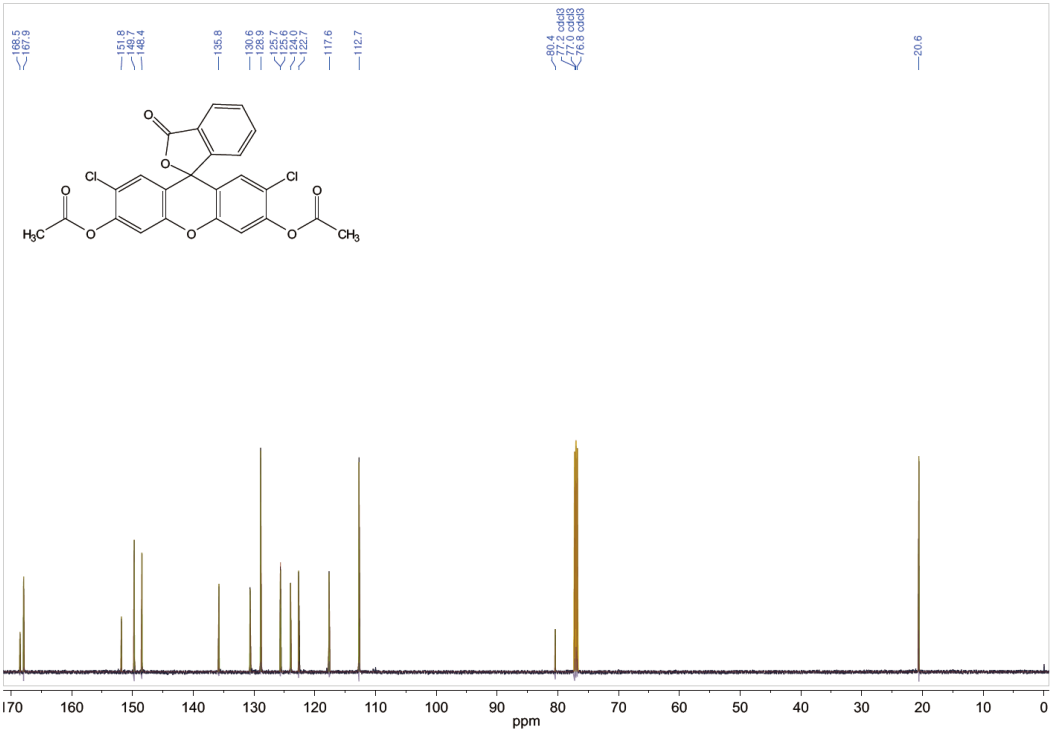

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Fig. S15. ^{1}H NMR spectrum of **F2** in $CDCl_3$.

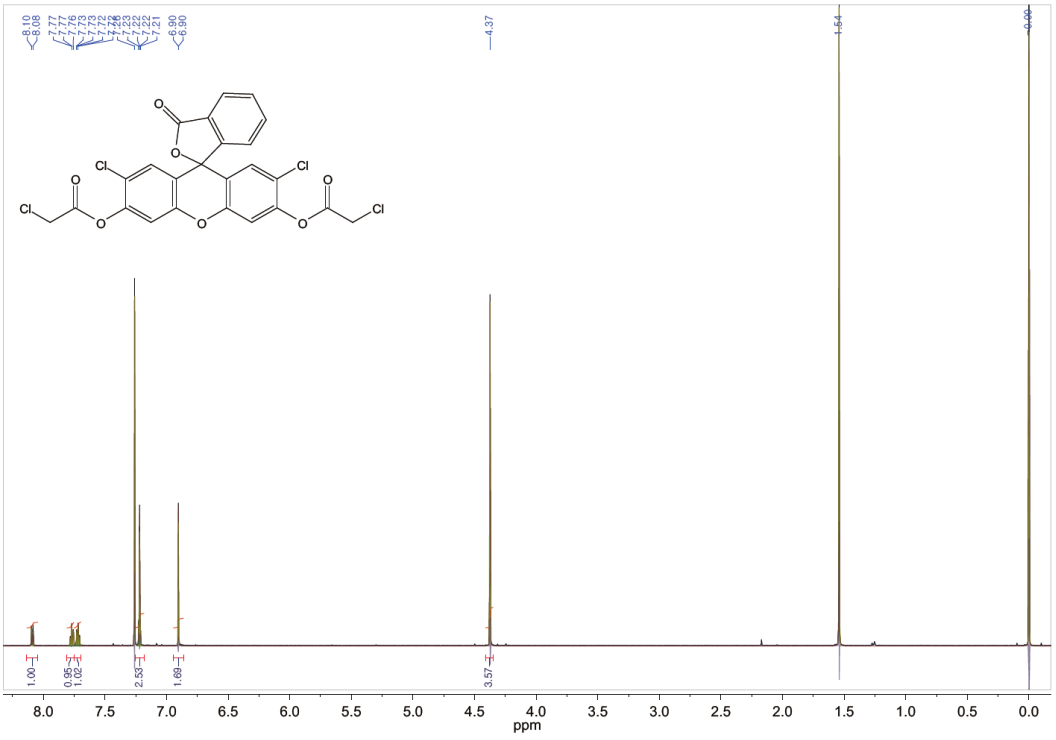

Fig. S16. ^{13}C NMR spectrum of **F2** in $CDCl_3$.

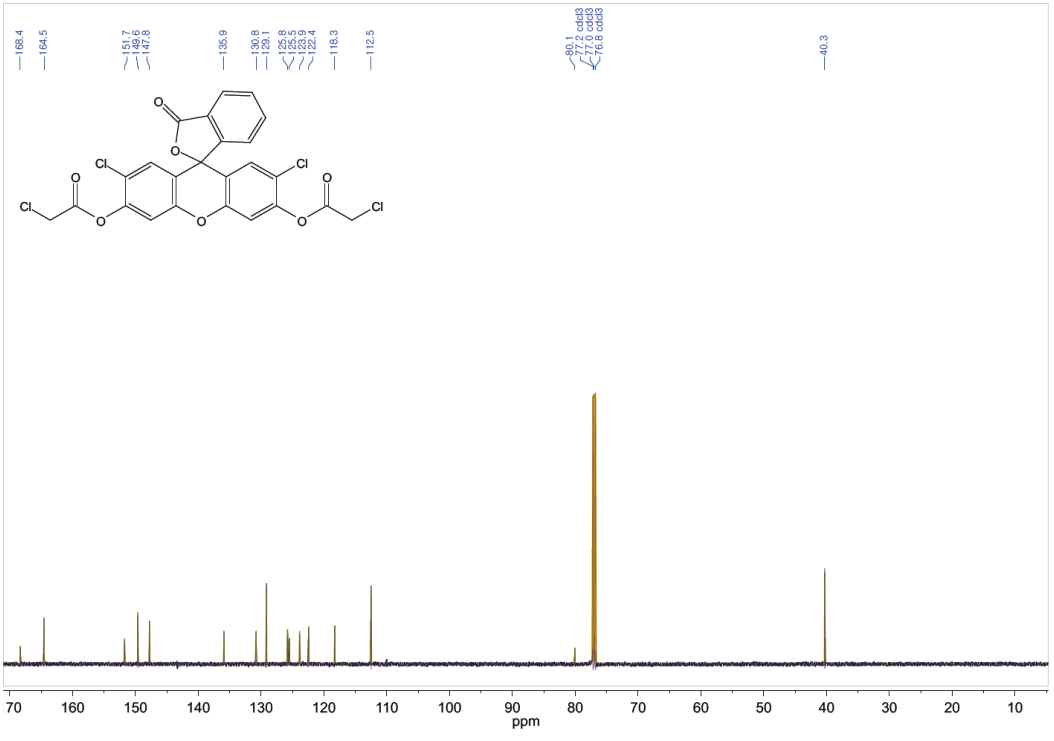

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Fig. S17. ^{1}H NMR spectrum of **R2** in $CDCl_3$.

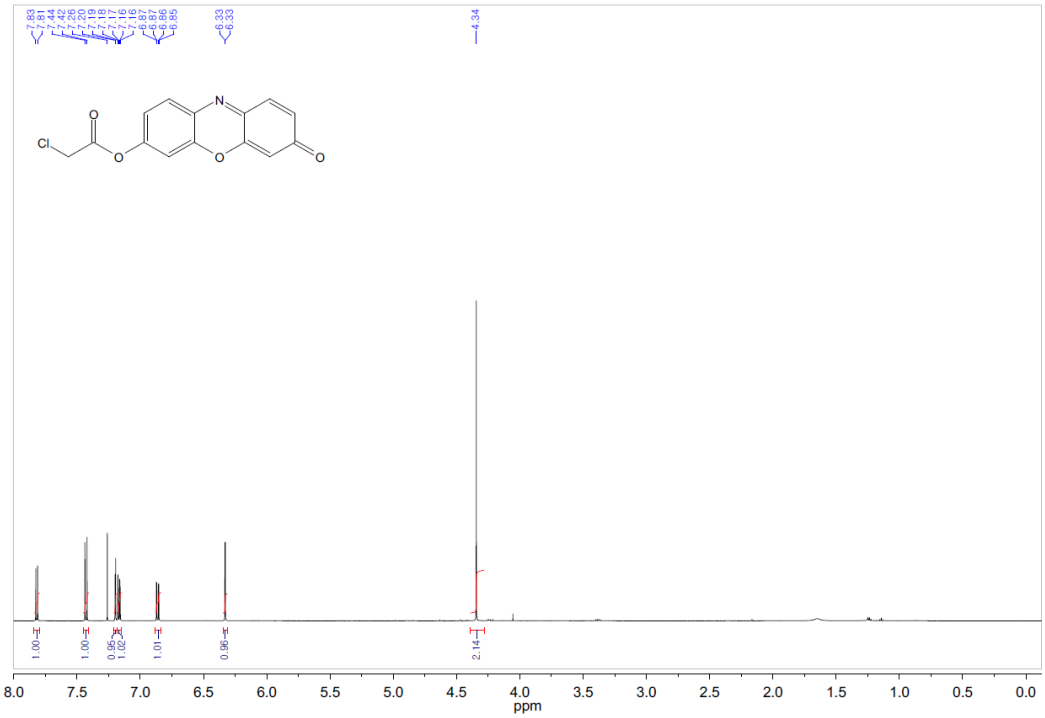

Fig. S18. ^{13}C NMR spectrum of **R2** in $CDCl_3$.