Supporting information

A novel NIR fluorescent probe for fast detection and imaging of methionine sulfoxide reductase A in lysosome of living cells

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Figure S1. ¹H-NMR spectra of 1 in CDCl₃



Figure S2. ¹³C-NMR spectra of 1 in CDCl₃





Figure S4. ¹³C-NMR spectra of 2 in CDCl₃



Figure S5. ¹H-NMR spectra of **RB** in CDCl₃



Figure S6. ¹³C-NMR spectra of **RB** in CDCl₃



Figure S7. ¹H-NMR spectra of RBS in CDCl₃



Figure S8. ¹³C-NMR spectra of RBS in CDCl₃



Figure S9. ¹H-NMR spectra of RBSO in CDCl₃



Figure S10. ¹³C-NMR spectra of RBSO in CDCl₃



Figure S11. HRMS of 1



Figure S12. HRMS of 2



Figure S13. HRMS of RB



Figure S14. HRMS of RBS



Figure S15. HRMS of RBSO



Figure S16. The absorption (solid line) and emission (dotted line) spectra of **RBSO** and **RBSO** + DTT + Msr A in PBS buffer (50 mM, pH = 7.4, 37 °C, $\lambda_{ex} = 600$ nm, slit = 10/10 nm). Black line: **RBSO**; red line: **RBSO** + DTT + Msr A.



Figure S17. HRMS spectra of RBSO upon addition of DTT and Msr A.



Figure S18. a) HPLC of RBSO, b) RBSO in the presence of DTT and Msr A, and c). RBS.

Table S1. Comparison of RBSO with parameters of different probes reported.

Probes	t (min)	$K_m(\mu M)$	$K_{cat}(s^{-1})$	Ref.
Msr-blue	360	120	0.4	Chem. Sci., 2017, 8 , 2966 – 2972
(S)-Sulfox-1	60	913	0.75	Angew. Chem., 2016, 128 , 12919 – 12922
Msr-Ratio	30	-	-	Chem. Commun., 2019, 55 , 1502 – 1505
RBSO	8	72	6.2	This work



Figure S19. Fluorescence intensity of **RBSO** (10 μ M) as a function of pH value in the absence/presence of DTT + Msr A (5 mM + 3 μ g/mL). The conditions: PBS buffer (50 mM, pH 7.4, 37 °C), $\lambda_{ex} = 600$ nm, slit = 10/10 nm.



Figure S20. MTT assay of RBSO.



Figure S21. Intensity profiles of respective tracker-probe with **RBSO** within the linear regions of interest across the cells. a) Costained with Lyso-Tracker Green; b) Costained with Mito-Tracker Green, c) Costained with ER-Tracker Green.