Viscosity probes towards different organelles with red emission based on an identical hemicyanine structure

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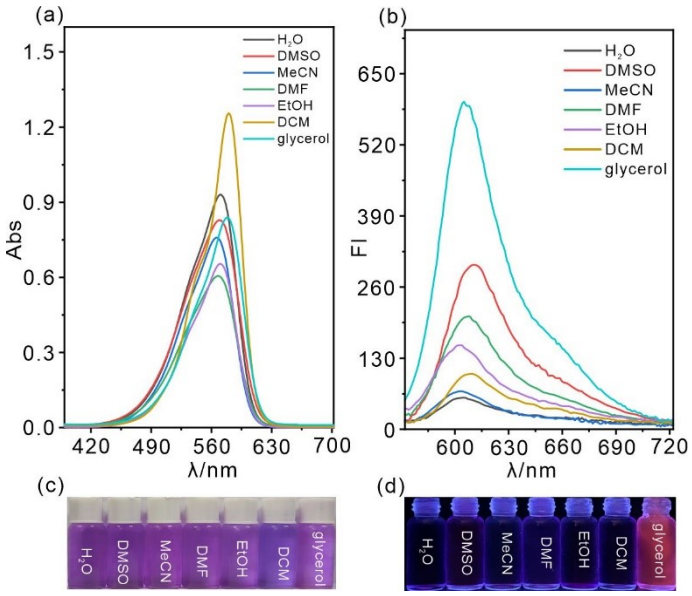

Fig. S1. Optical properties of probe **1b** (10 μM) in solvents of different polarity. (a) UV-vis absorption spectrum. (b) Fluorescence emission spectrum, λ_{ex} = 569 nm, slit widths: 5 nm / 3 nm. (c) Photographs under daylight. (d) Photographs under a lamp at 365 nm in dark conditions.

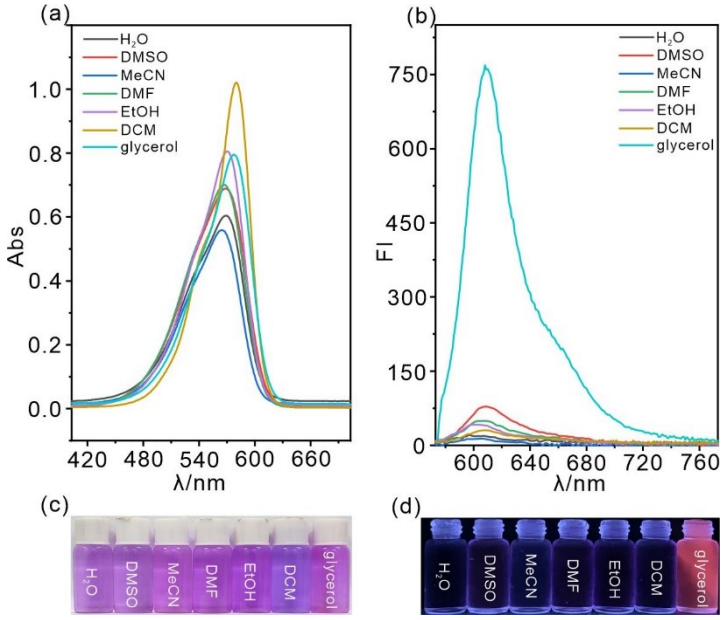

Fig. S2. Optical properties of probe **1c** (10 μM) in solvents of different polarity. (a) UV-vis absorption spectrum. (b) Fluorescence emission spectrum, λ_{ex} = 568 nm, slit widths: 3 nm / 3 nm. (c) Photographs under daylight. (d) Photographs under a lamp at 365 nm in dark conditions.

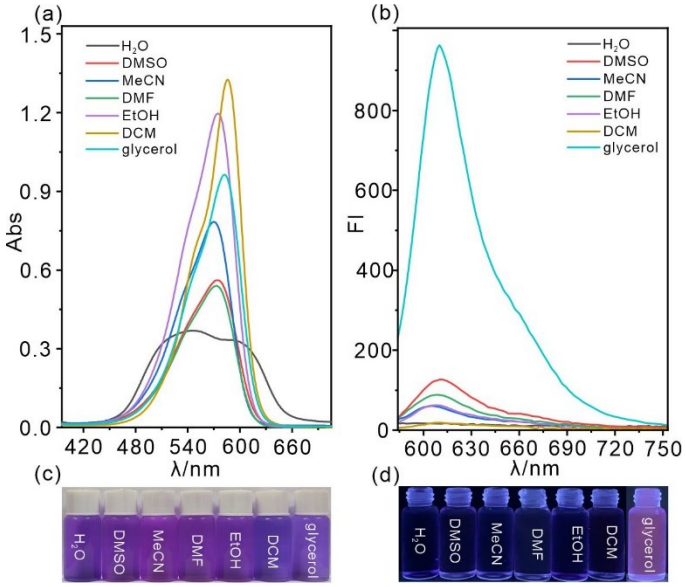

Fig. S3. Optical properties of probe **1d** (10 μM) in solvents of different polarity. (a) UV-vis absorption spectrum. (b) Fluorescence emission spectrum, λ_{ex} = 573 nm, slit widths: 5 nm / 5 nm. (c) Photographs under daylight. (d) Photographs under a lamp at 365 nm in dark conditions.

Table S1. Optical properties of probes **1a-d** in different solvents.

Probe	Solvents	$\lambda_{Abs,max}$[a]	$\lambda_{Em,max}$[a]	ε[b]	Φ[c]
1a	H_2O	576	602	1.95	0.2
1a	DCM	584	611	6.77	0.6
1a	Glycerol	582	613	9.42	36.7
1b	H_2O	570	601	9.29	0.7
1b	DCM	579	610	12.5	1.5
1b	Glycerol	577	606	8.38	24.3
1c	H_2O	569	596	6.04	0.2
1c	DCM	582	609	9.73	5.42
1c	Glycerol	577	610	7.97	27.1
1d	H_2O	574	606	3.35	0.3
1d	DCM	586	608	13.2	0.3
1d	Glycerol	582	609	9.63	42.6

[a] Reported in nm.

[b] Reported in 10^4 M^{-1} cm^{-1}.

[c] Reported in %. Cresyl violet (Φ = 0.578 in ethanol) was used as the reference compound.

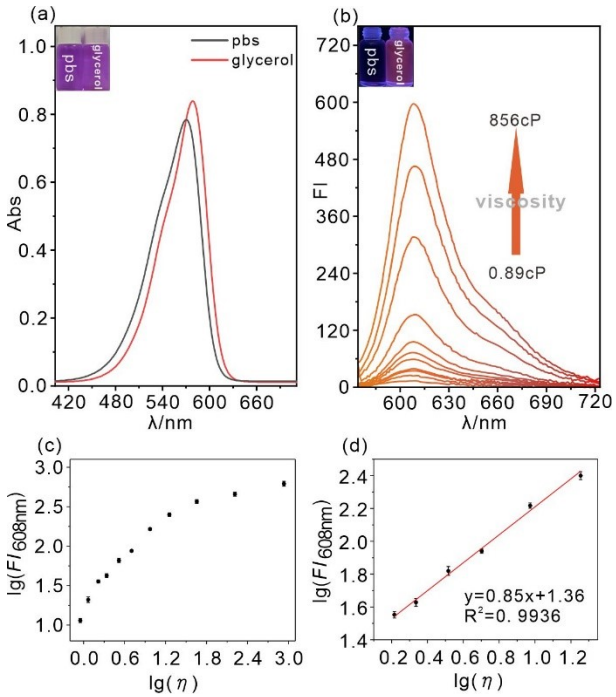

Fig. S4. Viscosity response of probe **1b** (10 μM) in different ratios of PBS-glycerol mixtures (0.89-856 cP). (a) Absorption spectra. (b) Fluorescence spectra. (c) Relationship between lg(FI_{608nm}) and lg(η). (d) Linear relationship between lg(FI_{608nm}) and lg(η). The data were shown as mean ± SD (n = 3).

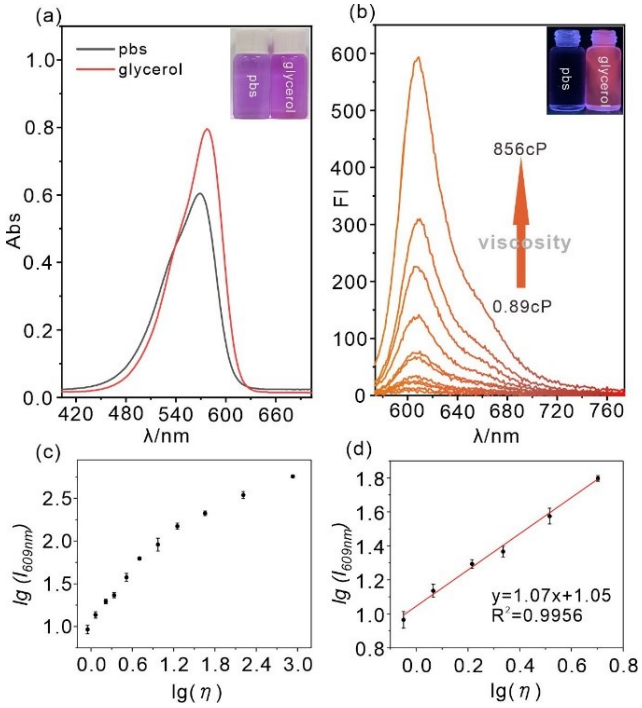

Fig. S5. Viscosity response of probe **1c** (10 μM) in different ratios of PBS-glycerol mixtures (0.89-856 cP). (a) Absorption spectra. (b) Fluorescence spectra. (c) Relationship between lg(FI_{609nm}) and lg(η). (d) Linear relationship between lg(FI_{609nm}) and lg(η). The data were shown as mean ± SD (n = 3).

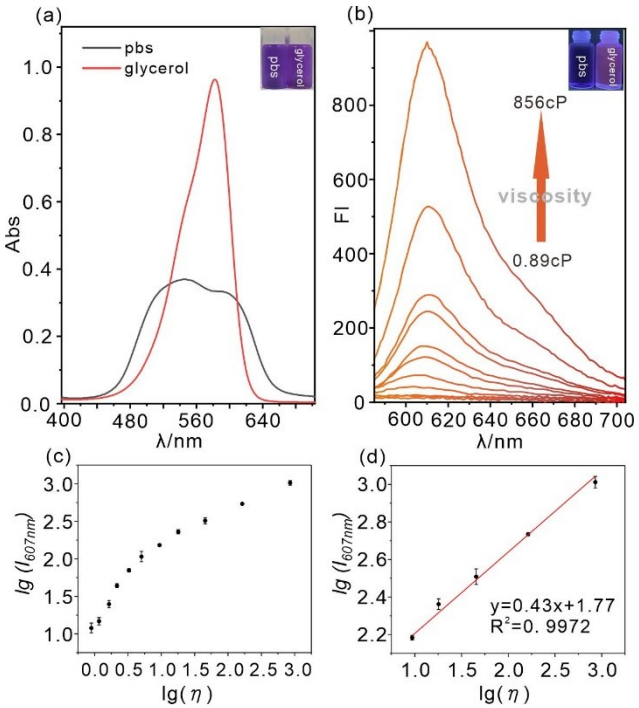

Fig. S6. Viscosity response of probe **1d** (10 μM) in different ratios of PBS-glycerol mixtures (0.89-856 cP). (a) Absorption spectra. (b) Fluorescence spectra. (c) Relationship between lg(FI_{607nm}) and lg(η). (d) Linear relationship between lg(FI_{607nm}) and lg(η). The data were shown as mean ± SD (n = 3).

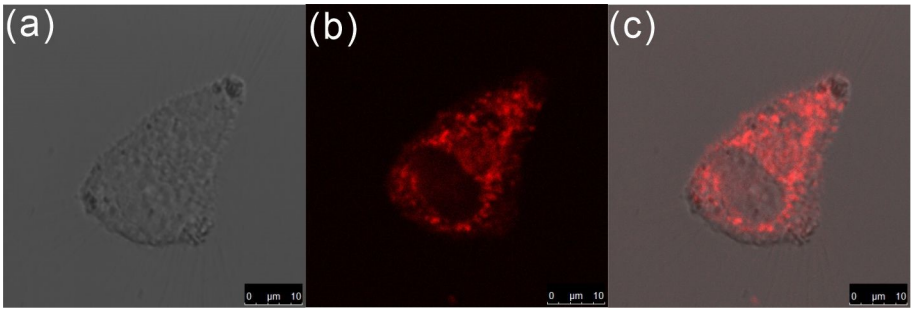

Fig. S7. Fluorescence images of HeLa cells with probes **1d** (10 μM). (a) Brightfields images of HeLa cells. (b) Cells with probe **1d** in red channel. (c) Merged images of (a) and (b).

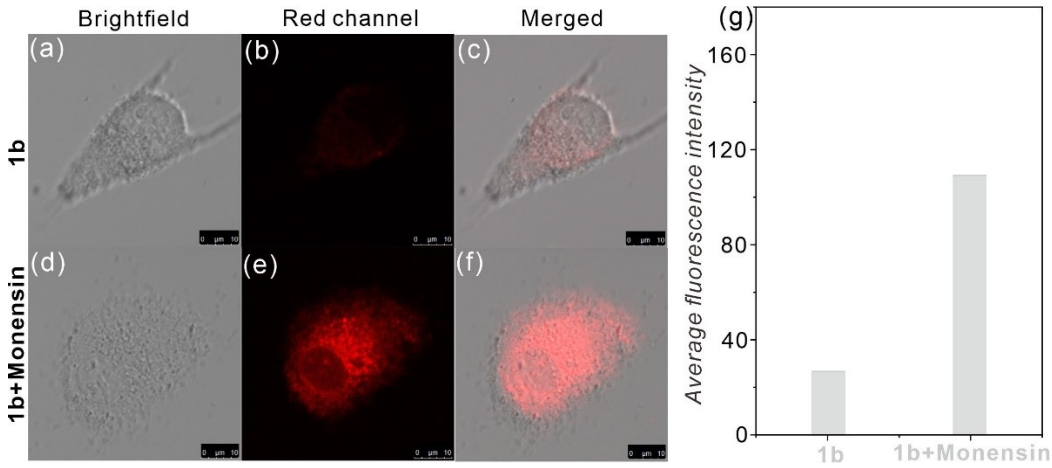

Fig. S8. Fluorescence images for viscosity detection in HeLa cells: (a-c) HeLa cells incubated with only probe **1b** (4 μM) for 20 min; (d-f) HeLa cells treated with monensin (10 μM) for 30 min and probe **1b** (4 μM) for another 20 min; (g) the average fluorescence intensity of probe **1b** in HeLa cells in the presence or absence of monensin.

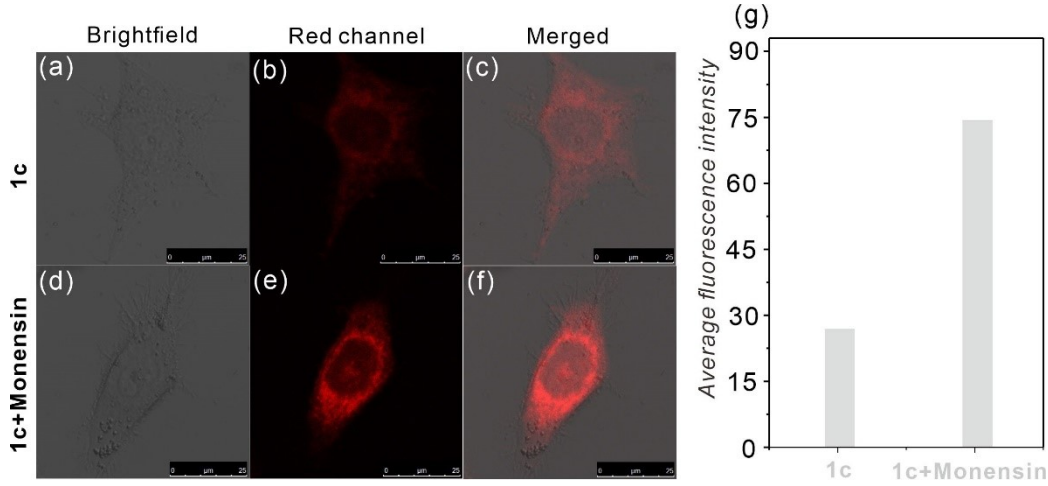

Fig. S9. Fluorescence images for viscosity detection in HeLa cells: (a-c) HeLa cells incubated with only probe **1c** (4 μM) for 20 min; (d-f) HeLa cells treated with monensin (10 μM) for 30 min and probe **1c** (4 μM) for another 20 min; (g) the average fluorescence intensity of probe **1c** in HeLa cells in the presence or absence of monensin.

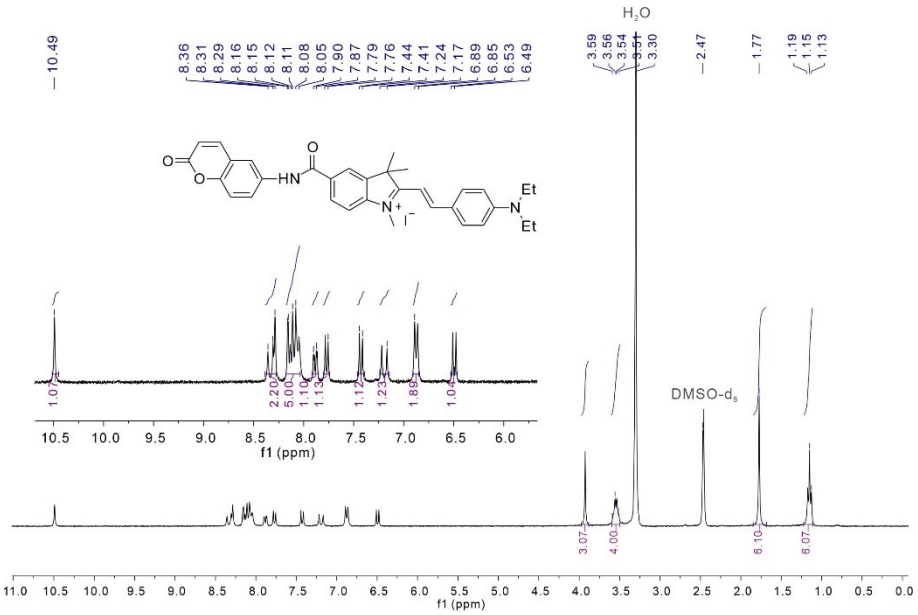

Fig. S10. ^{1}H NMR spectrum of probe **1a**.

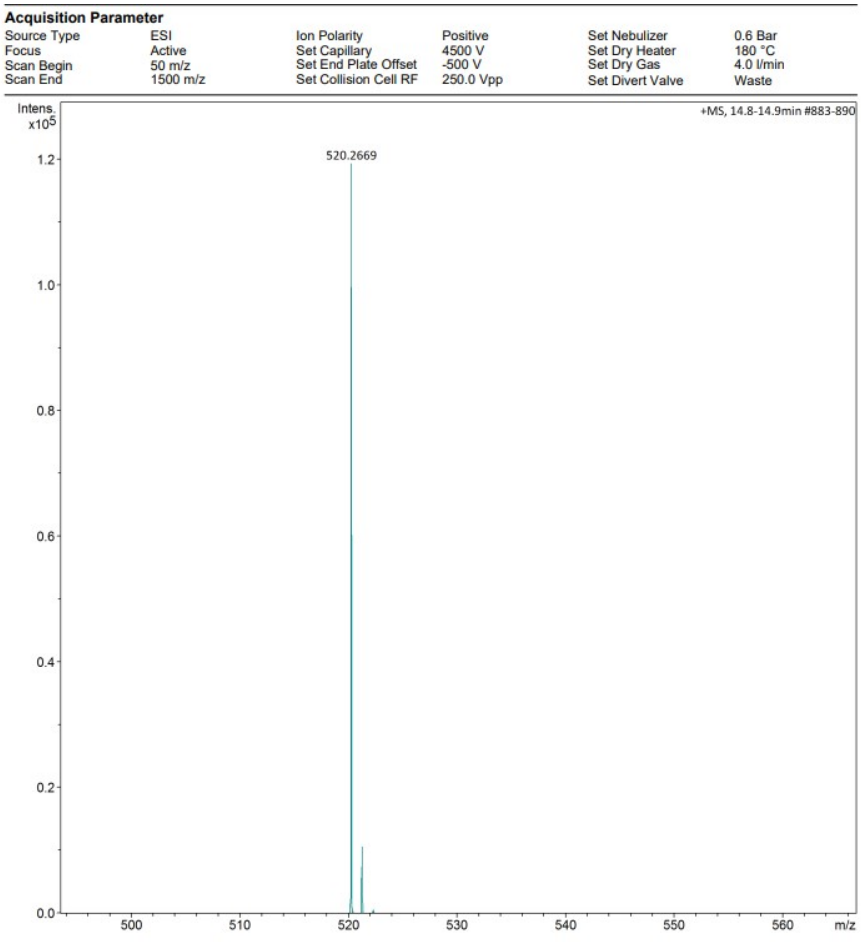

Fig. S11 HRMS(ESI^{+}) spectrum of probe **1a**.

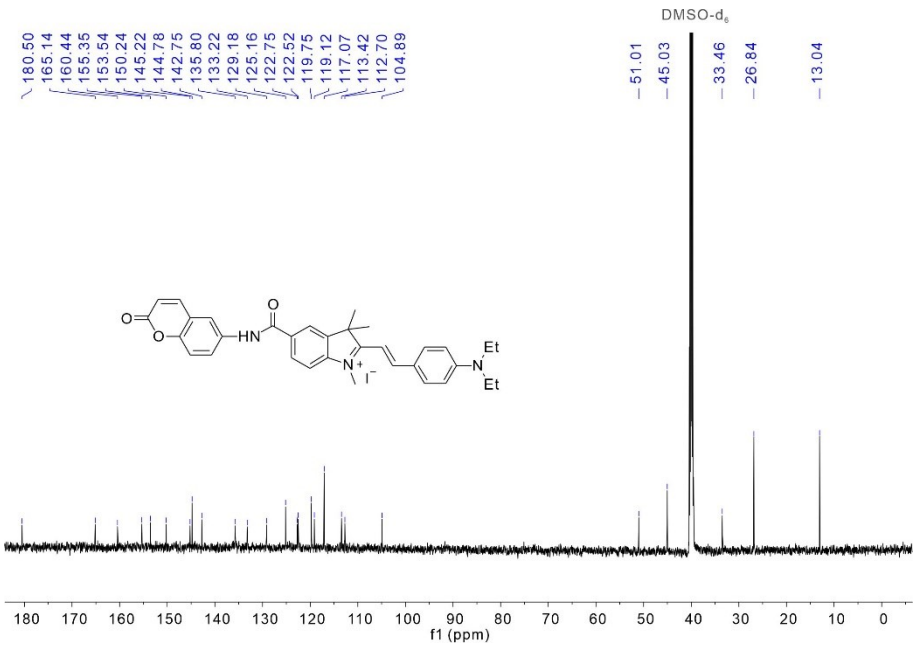

Fig. S12 ^{13}C NMR spectrum of probe **1a**.

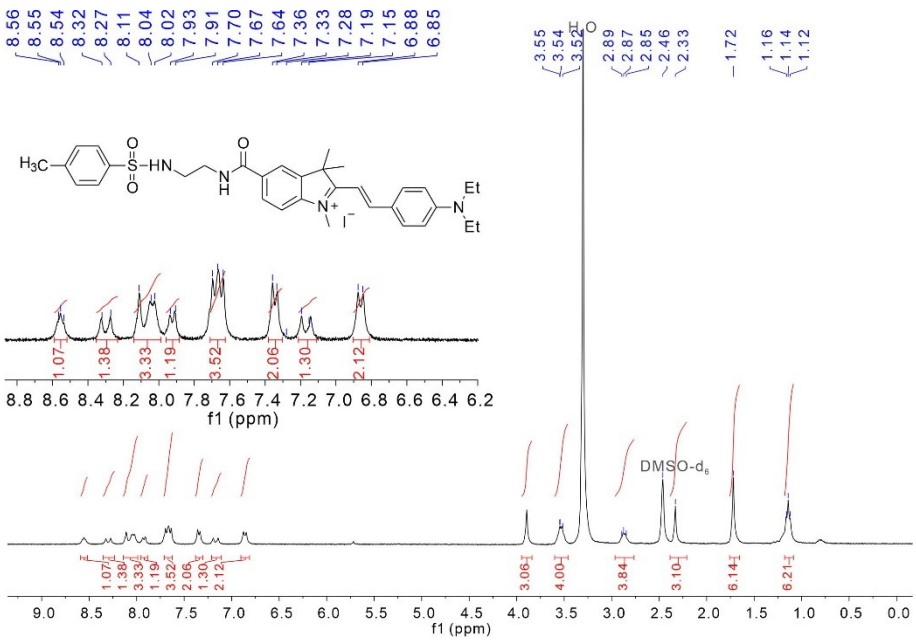

Fig. S13. ^{1}H NMR spectrum of probe **1b**.

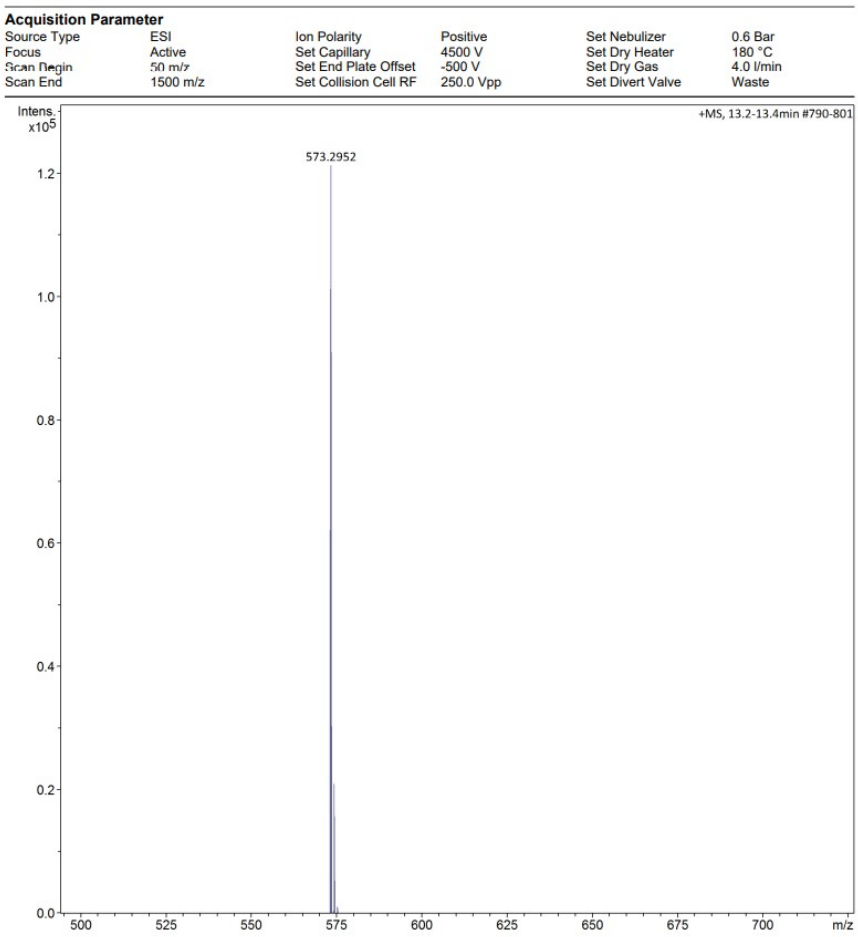

Fig. S14 HRMS(ESI$^+$) spectrum of probe **1b**.

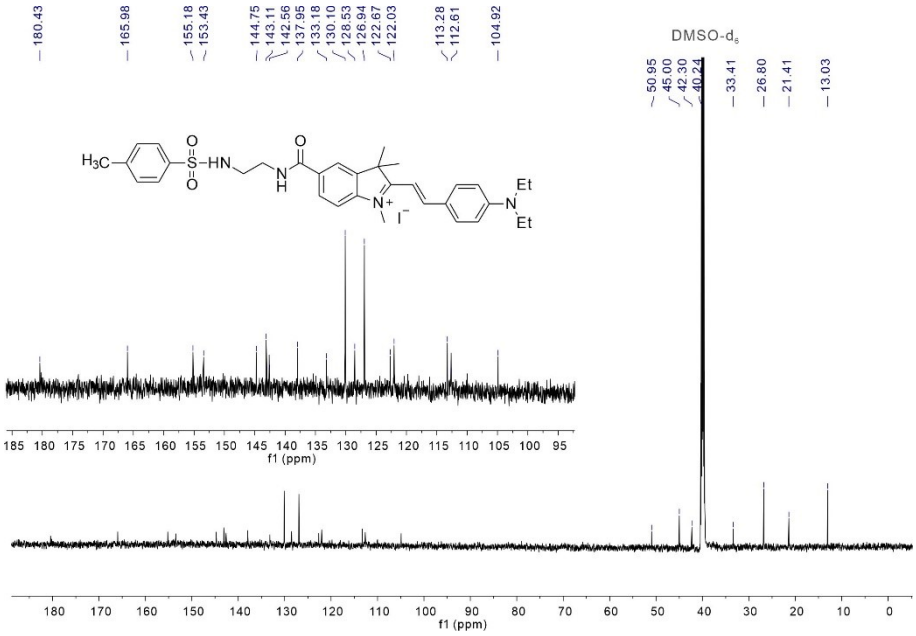

Fig. S15 ^{13}C NMR spectrum of probe **1b**.

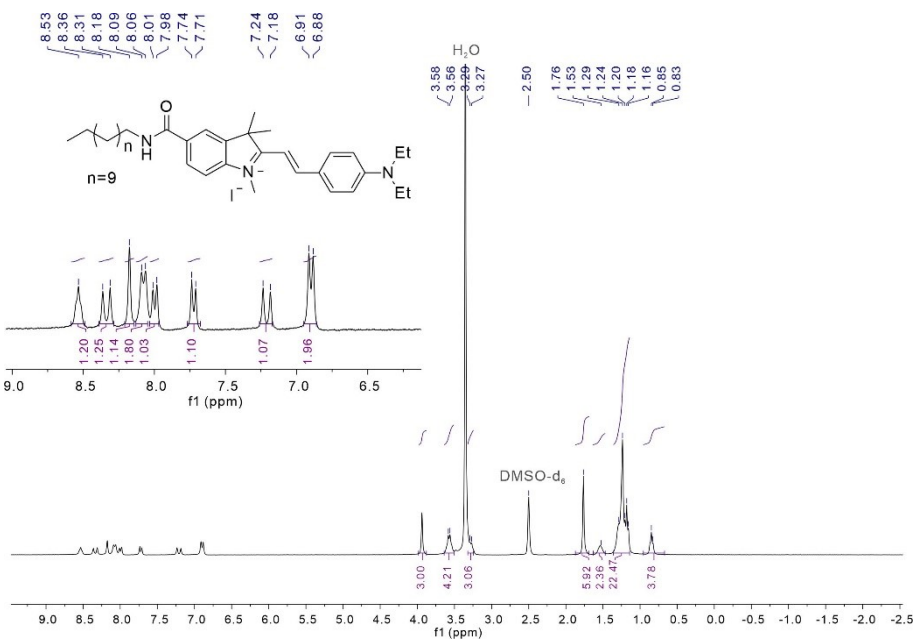

Fig. S16. ^{1}H NMR spectrum of probe **1c**.

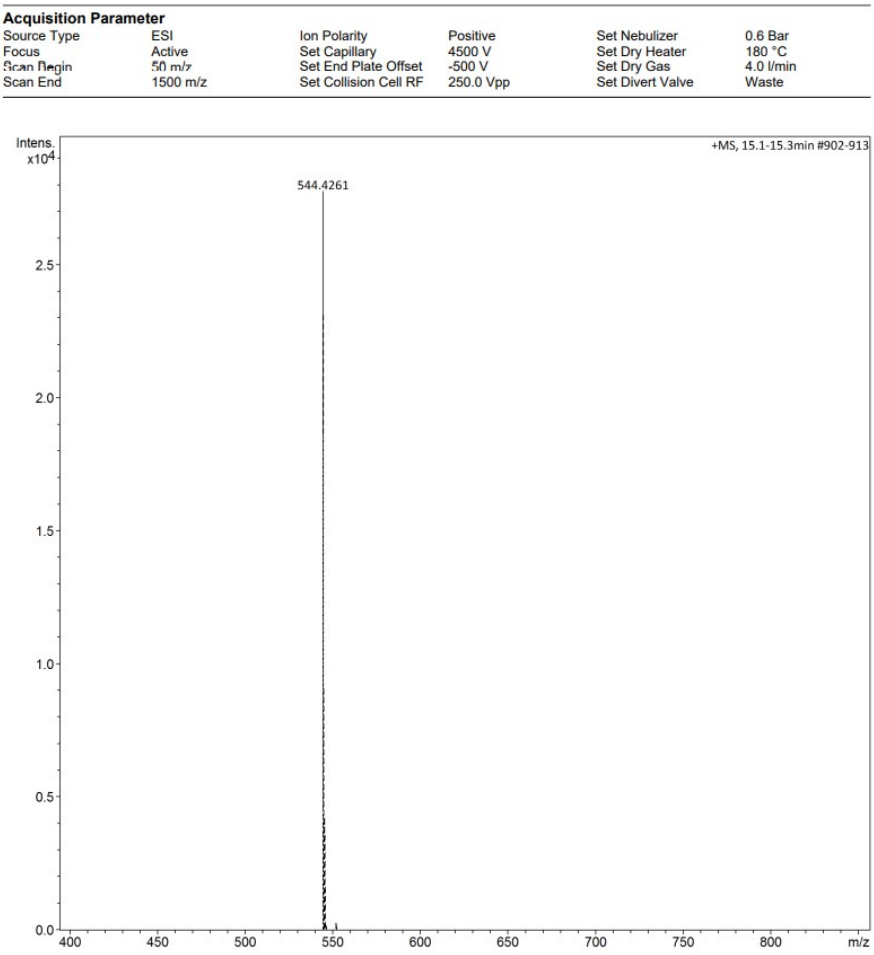

Fig. S17 HRMS(ESI^{+}) spectrum of probe **1c**.

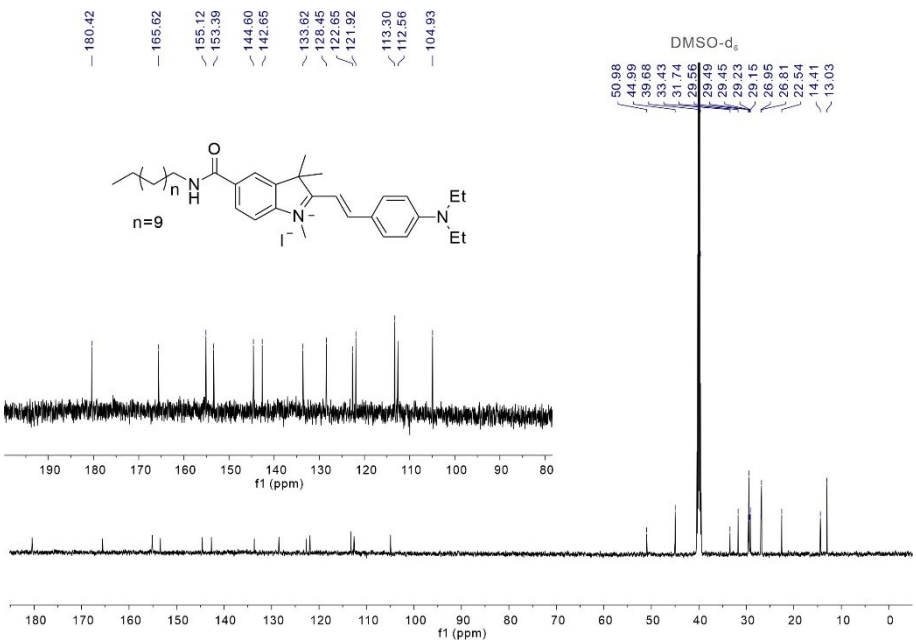

Fig. S18 ^{13}C NMR spectrum of probe **1c**.

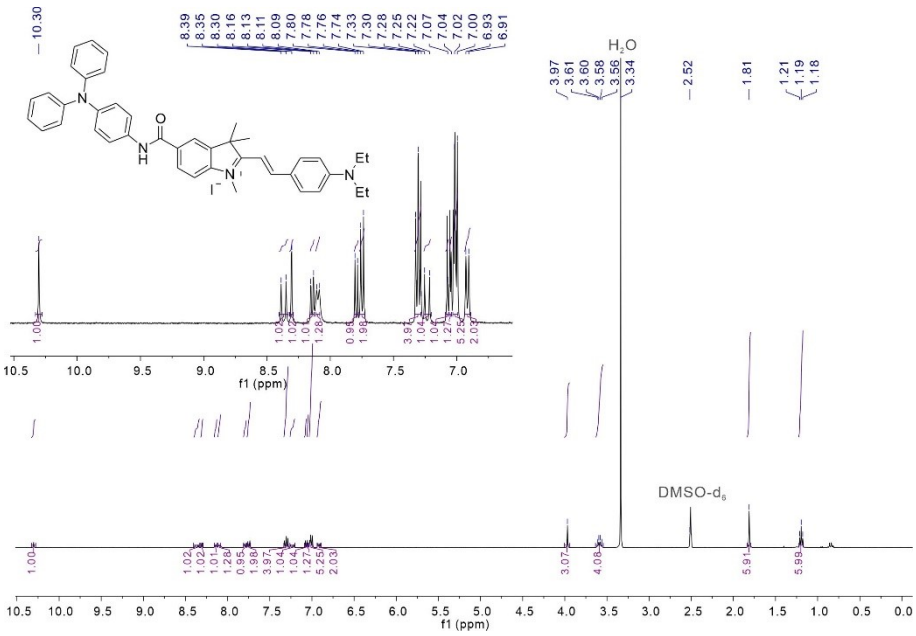

Fig. S19. ^{1}H NMR spectrum of probe **1d**.

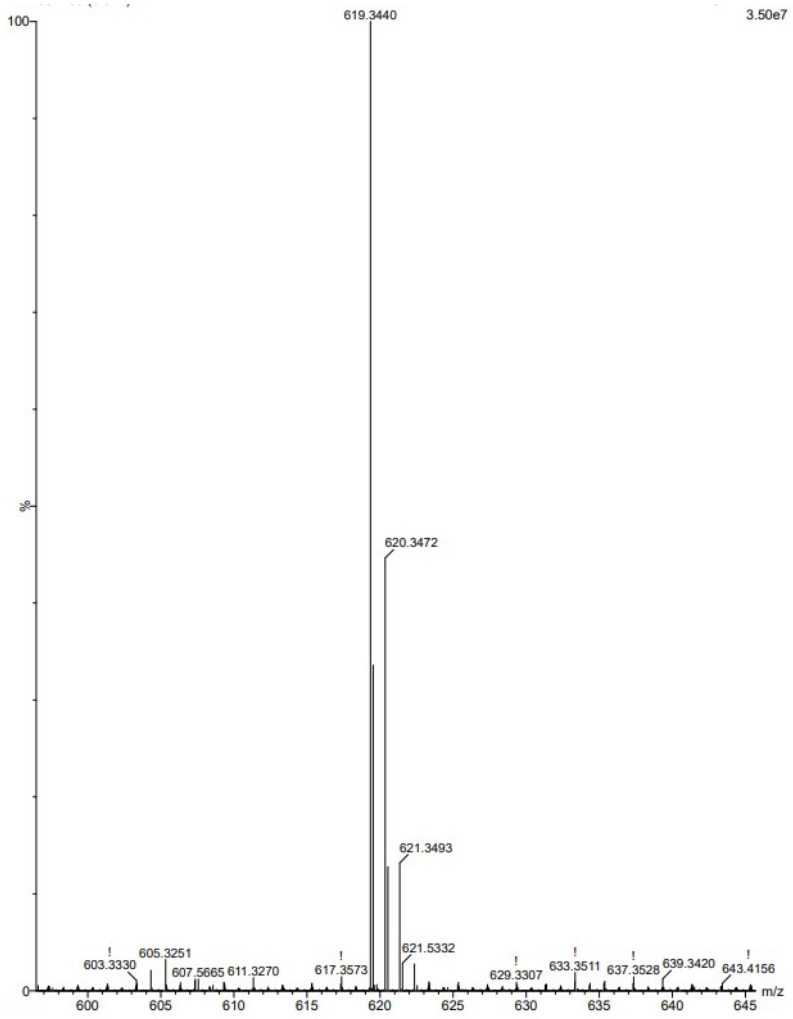

Fig. S20 HRMS(ESI$^+$) spectrum of probe **1d**.

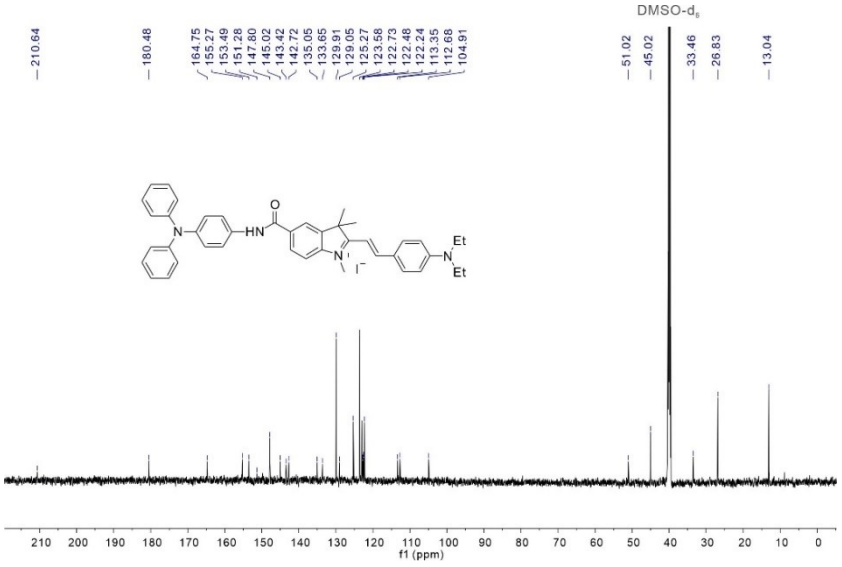

Fig. S21 ^{13}C NMR spectrum of probe **1d**.