A Novel Compact MSAP Reagent for One-Step Dual-Modality Probe Construction via CBT/1,2 Aminothiol Click Reaction

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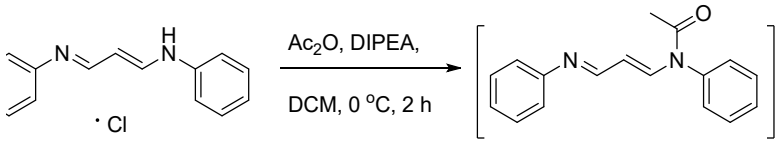
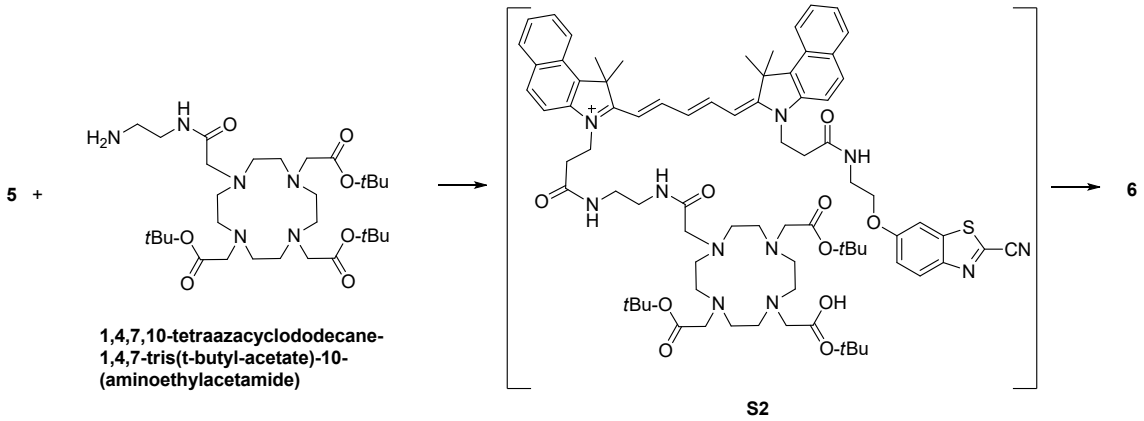


Malonaldehyde bis(phenylimine) monohydrochloride

S1

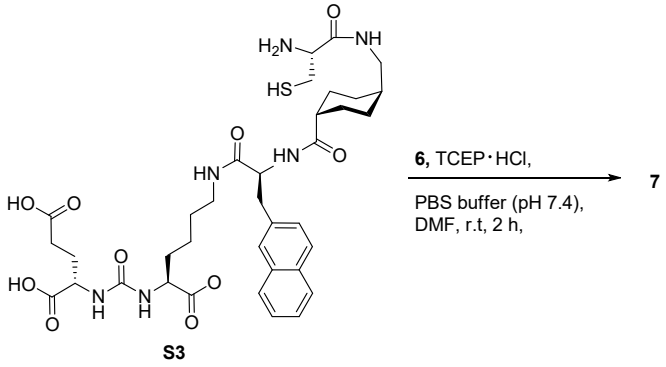
Scheme S1. Synthesis of **S1**.



1,4,7,10-tetraazacyclododecane-1,4,7-tris(t-butyl-acetate)-10-(aminoethylacetamide)

S2

Scheme S2. Synthesis of **6** from **5** through intermediate **S2**.



S3

Scheme S3. Synthesis of **7** using PSMA **S3**.

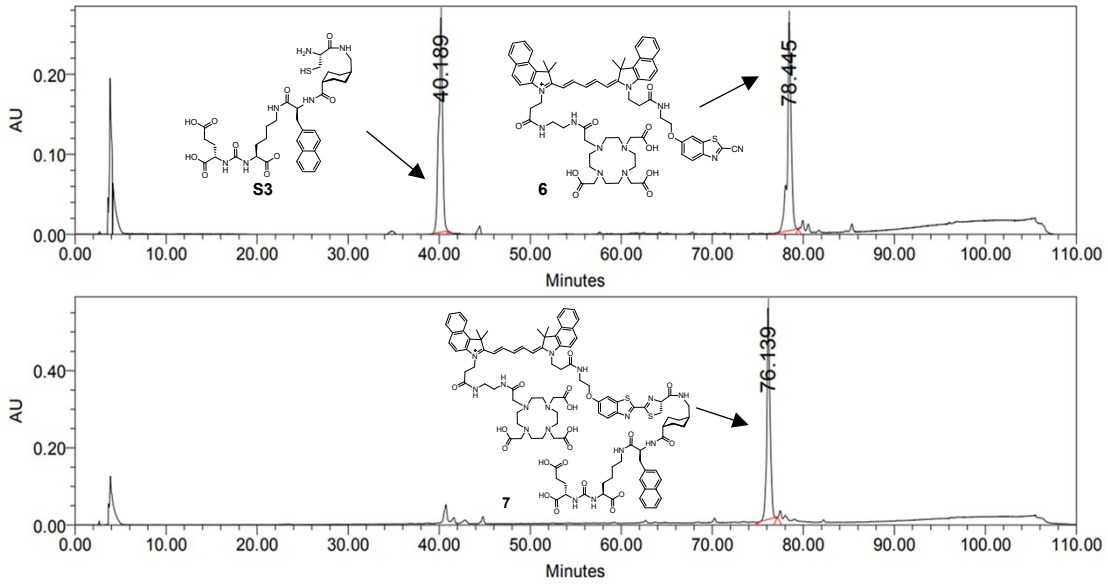


Figure S1. HPLC monitoring of synthesis of **7** from MSAP **6** and PSMA **S3** through a CBT/1,2-aminothiol click reaction. The monitoring tests were performed on by HPLC on a semi-preparative RP-C18 column (Phenomenex, Aqua®, 5 µm, 10.0 × 250 mm) with a gradient elution of acetonitrile (ACN; 10% to 100% in H_2O, containing 0.1 % TFA) at a flow rate of 3 mL·min^{-1} over 110 min. The upper and the lower HPLC spectra were collected at 0 h and 2 h, respectively. The retention time of **S3**, **6** and **7** were 40.18, 78.44, 76.13 min, respectively.

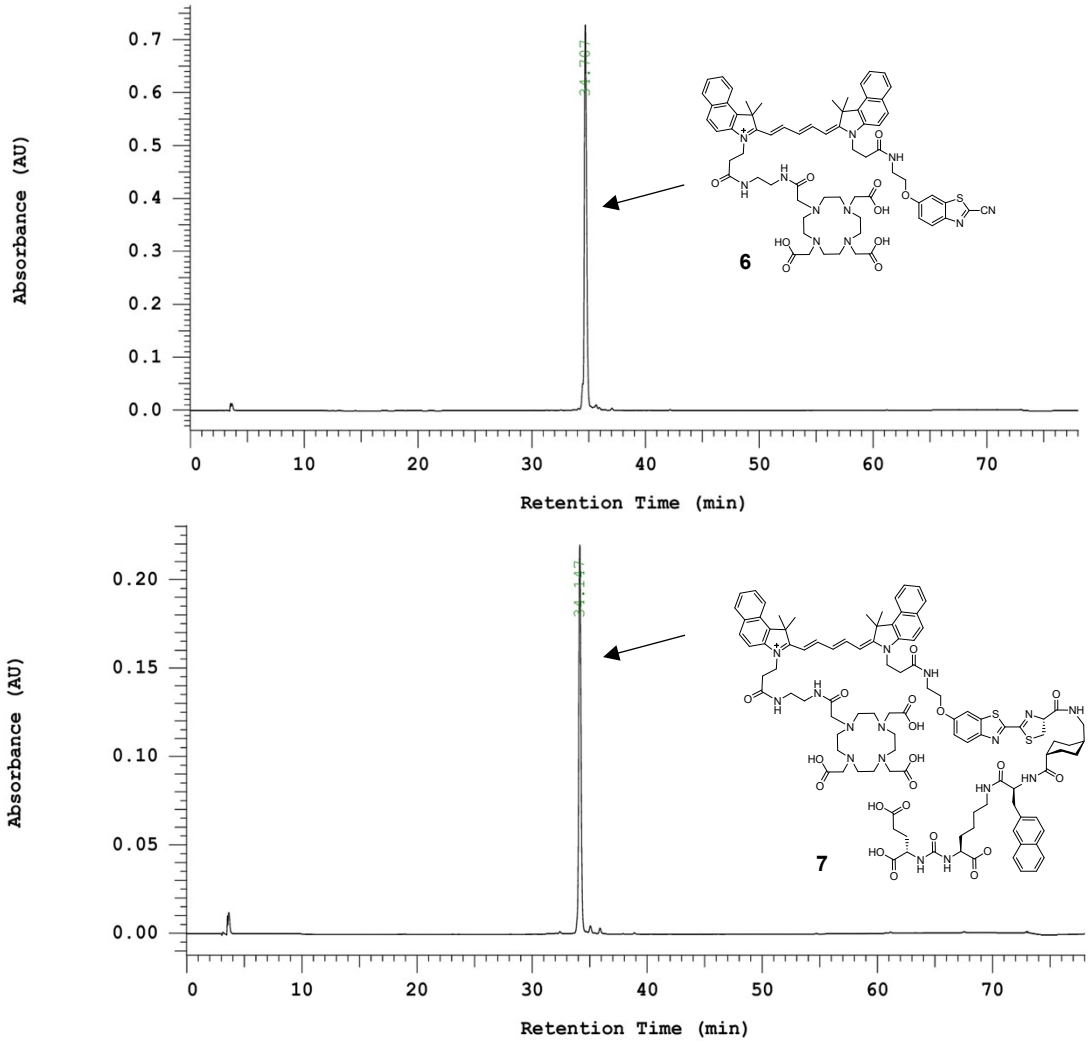


Figure S2. Determination of the purity of compound **6** and **7**. The purity of **6** and **7** were determined on an analytical RP-C18 HPLC (Phenomenex Luna®, 5 µm, 4.6 × 250 mm) using a gradient elution of acetonitrile (ACN; 10% to 100% in H_2O, containing 0.1 % TFA) at a flow rate of 1 mL·min^{-1} over 78 min. The retention time of **6** and **7** was 34.7 and 34.1min, respectively. The purity of both compounds were estimated to be greater than 95% based on absorption at 310 nm.

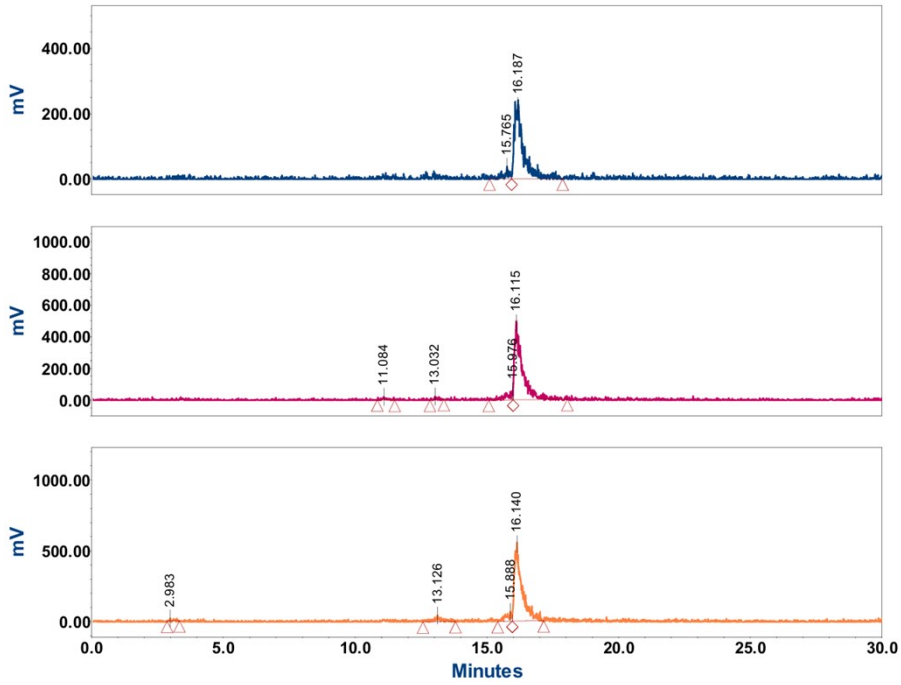


Figure S3. Stability of **[^{111}In]In-7** in PBS. Radio-HPLC chromatograms of [^{111}In]In-**7** following incubation in PBS for 1 h (blue; RCP = 92.1%), 4 h (pink; RCP = 88.1%), and 24 h (orange, RCP = 85.6%).

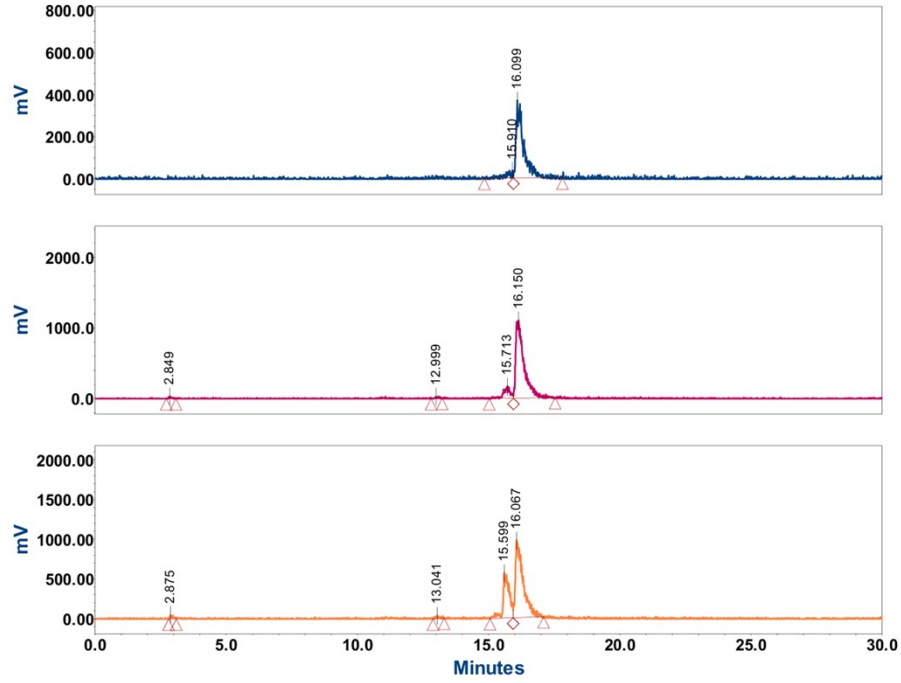


Figure S4. Stability of **[^{111}In]In-7** in mouse serum. Radio-HPLC chromatograms of [^{111}In]In-**7** following incubation in mouse serum for 1 h (blue; RCP = 92.9%), 4 h (pink; RCP = 87.7%), and 24 h (orange; RCP = 66.8%).

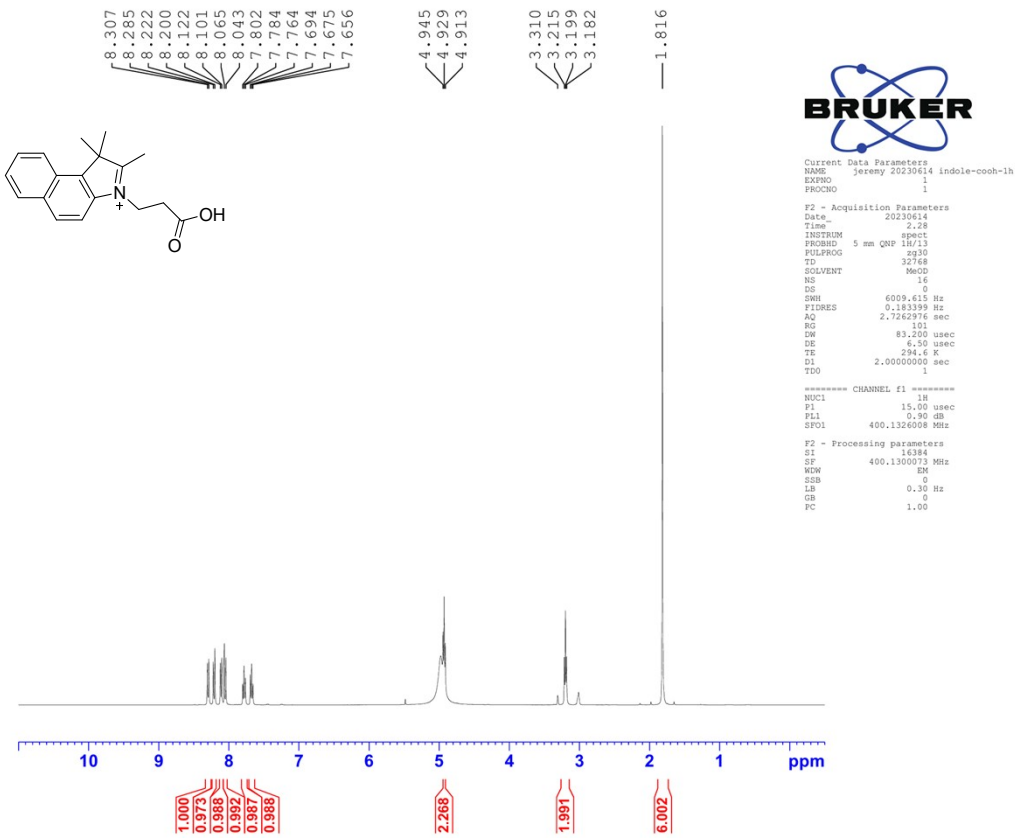


Figure S5. ^{1}H NMR spectrum of compound **2** (400 MHz, CD_3OD)

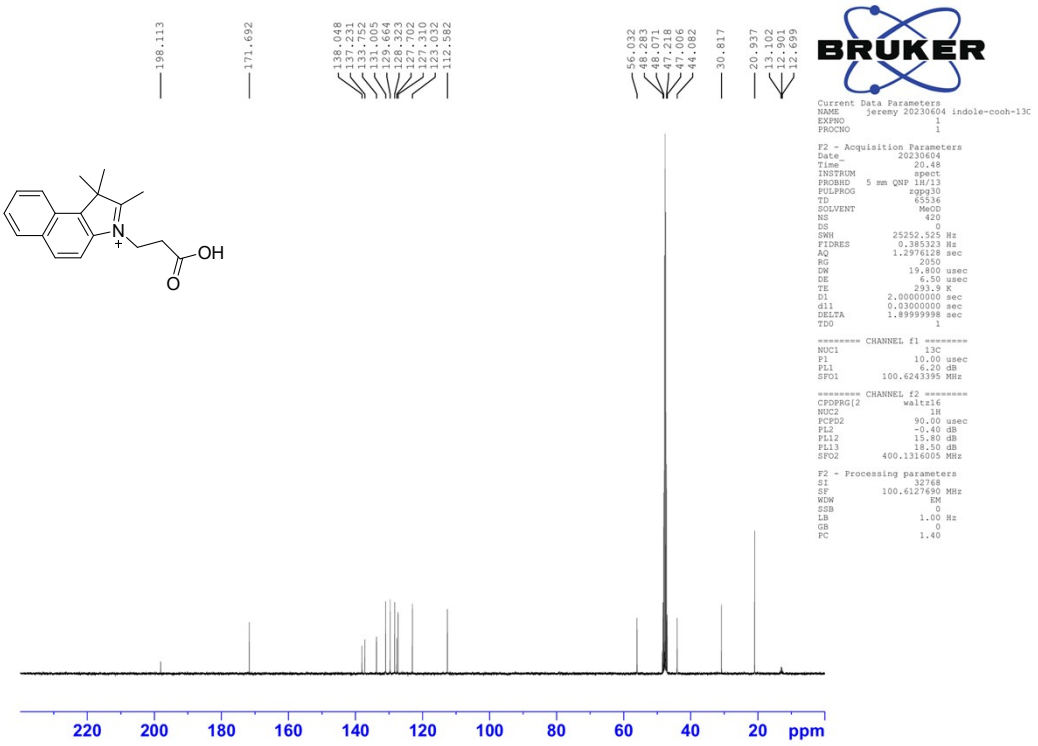


Figure S6. ^{13}C NMR spectrum of compound 2 (100 MHz, CD_3OD)

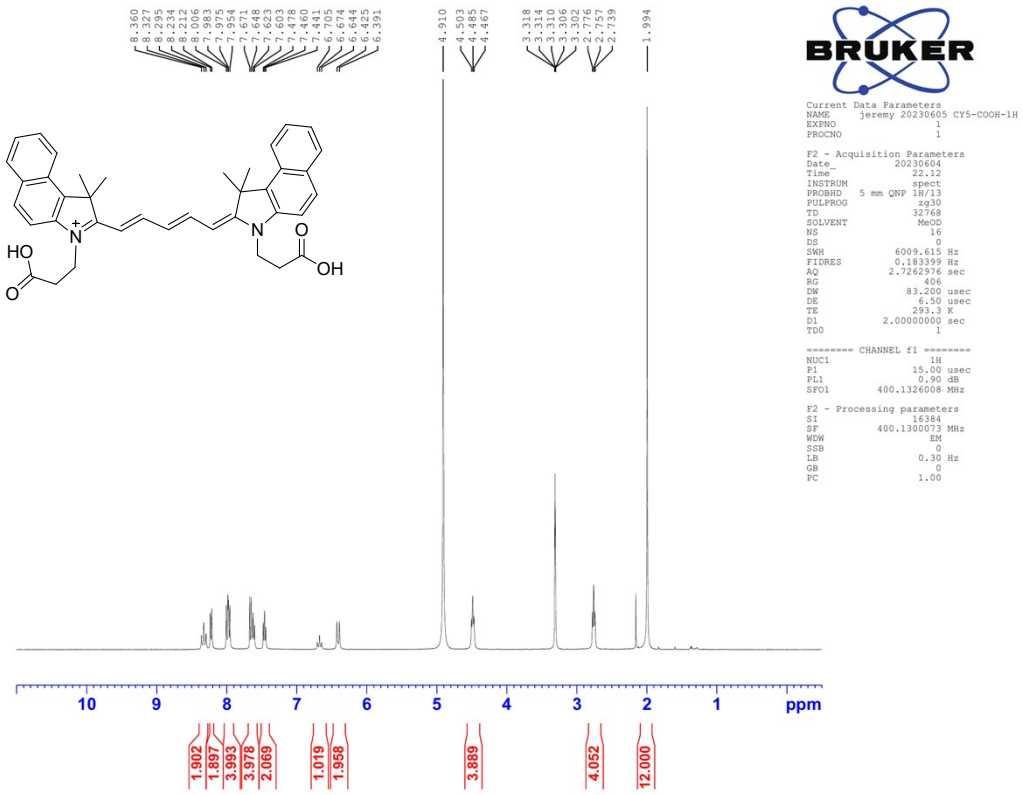


Figure S7. ^{1}H NMR spectrum of compound **3** (400 MHz, CD_3OD)

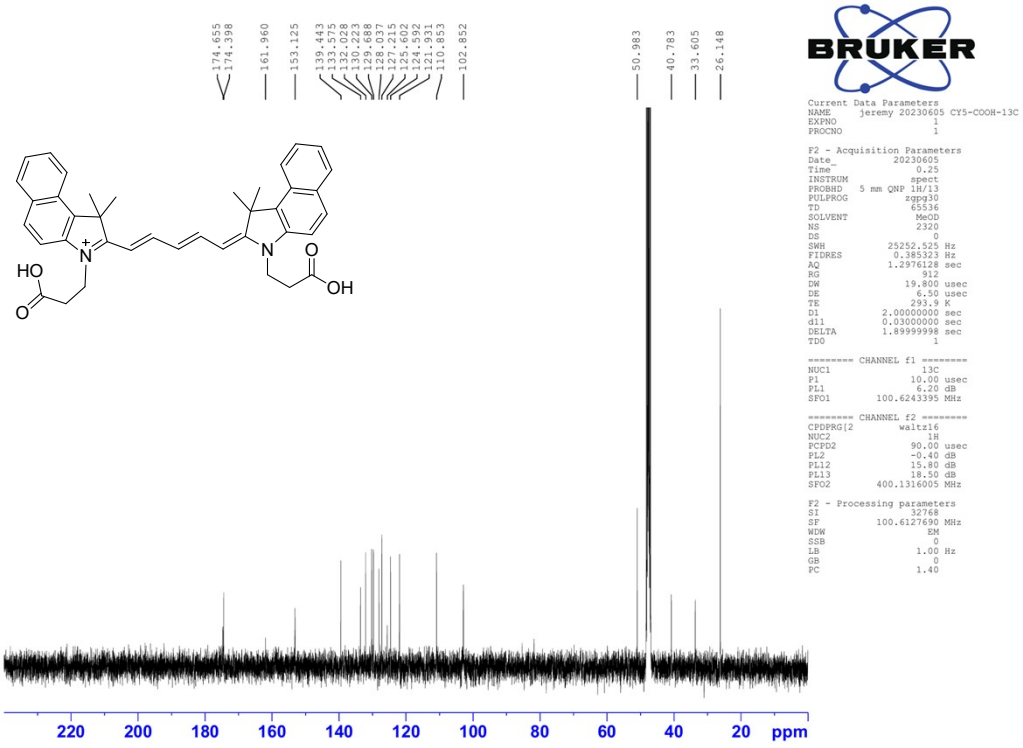


Figure S8.^{13}C NMR spectrum of compound **3** (100 MHz, CD_3OD)

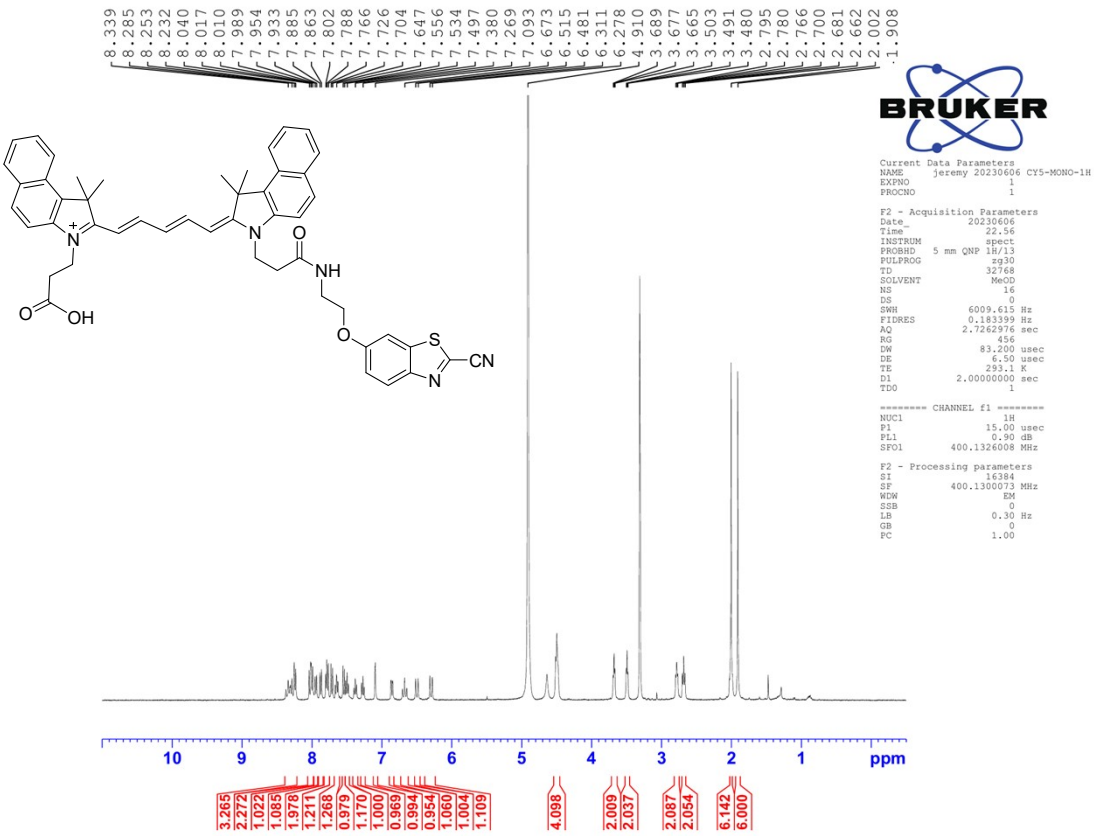


Figure S9. ^{1}H NMR spectrum of compound **5** (400 MHz, CD_3OD)

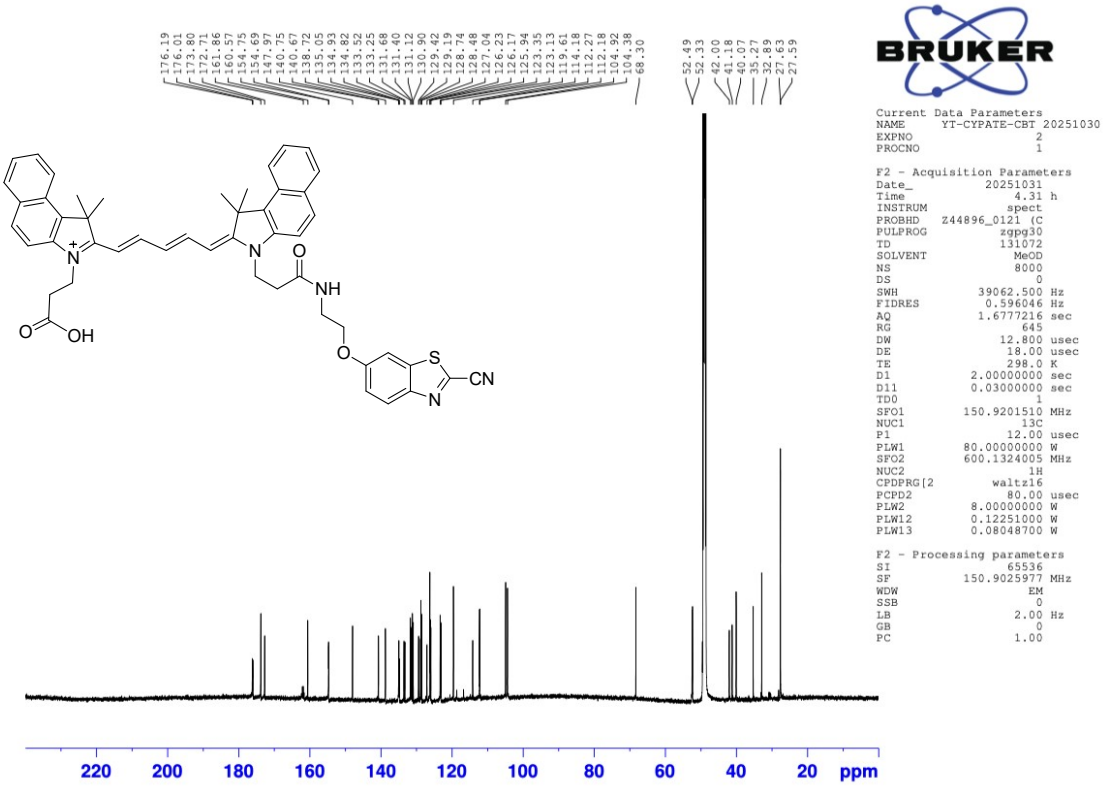


Figure S10. ^{13}C NMR spectrum of compound **5** (150 MHz, CD_3OD)

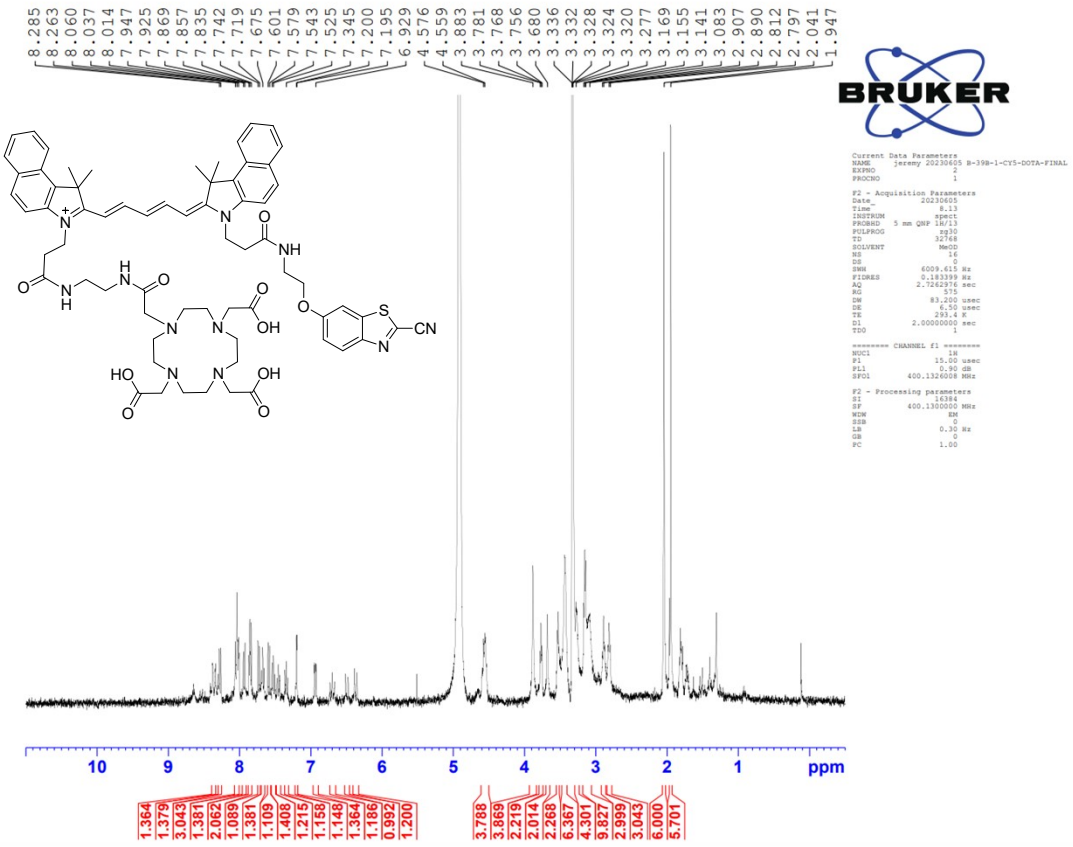


Figure S11. ^{1}H NMR spectrum of compound **6** (400 MHz, CD_3OD)

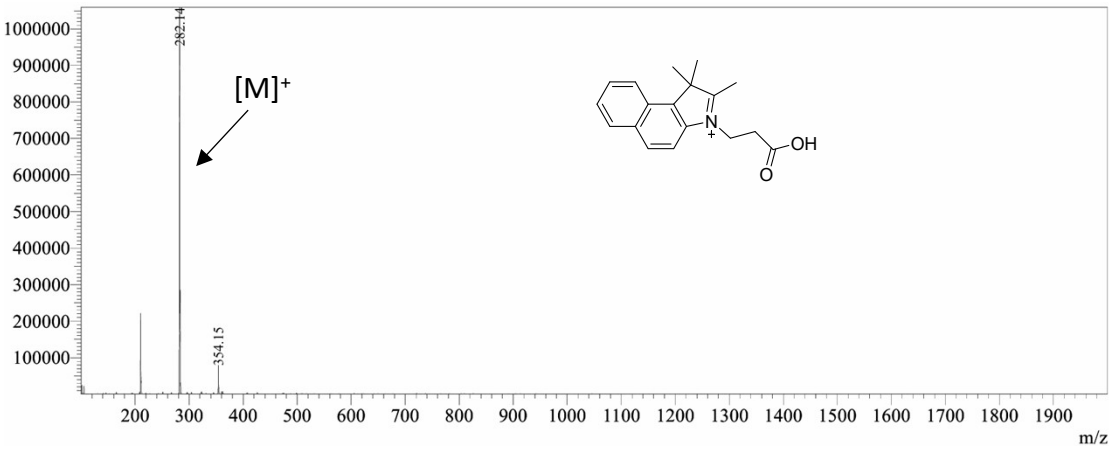


Figure S12. LC-MS spectrum of compound **2**.

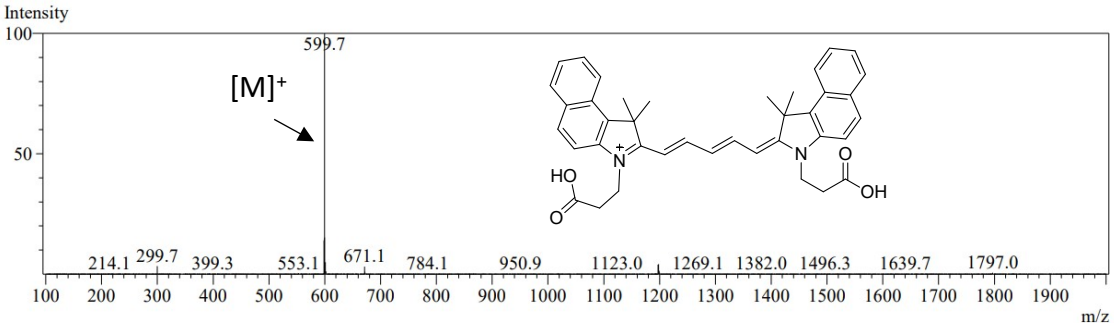


Figure S13. LC-MS spectrum of compound **3**.

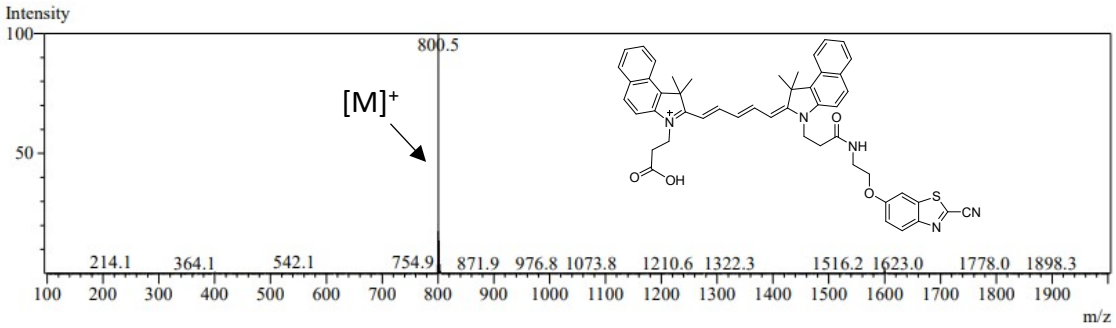


Figure S14. LC-MS spectrum of compound **5**.

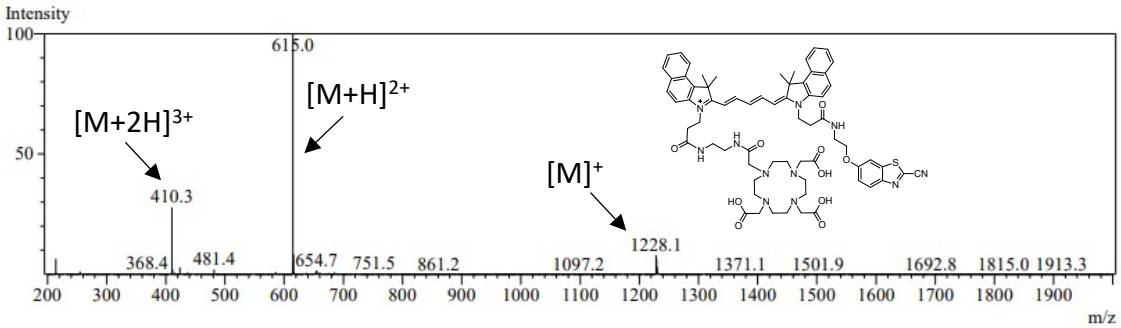


Figure S15. LC-MS spectrum of compound **6**.

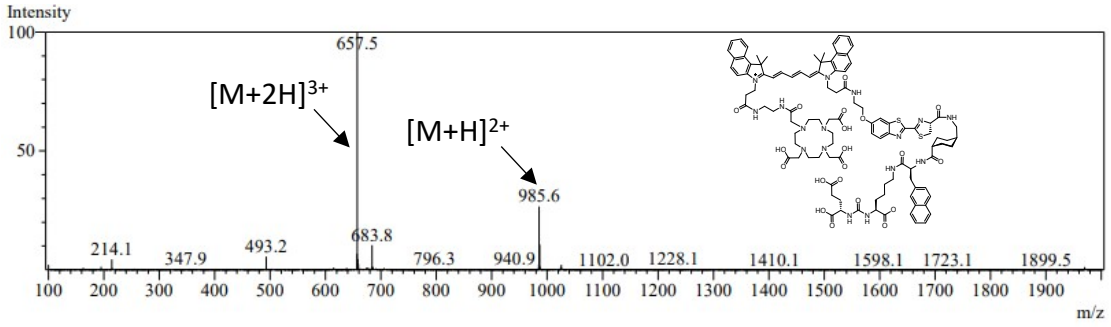


Figure S16. LC-MS spectrum of compound **7**.

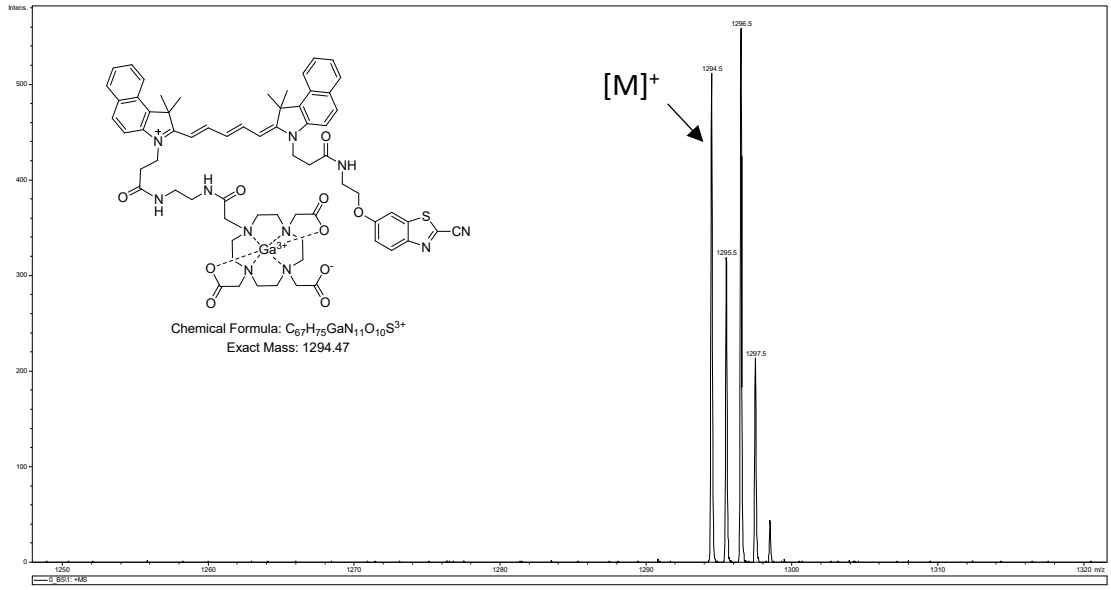


Figure S17. LC-MS spectrum of compound [^{nat}Ga]Ga-**6**.

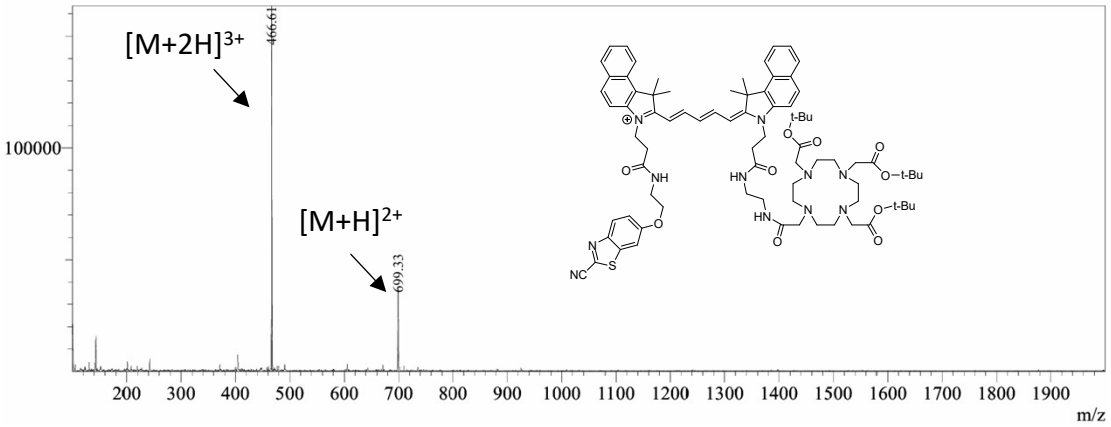


Figure S18. LC-MS spectrum of compound **S2**.