

## Supplementary Materials

### Development of a Highly Selective and Sensitive Fluorescent Probe for Imaging RNA Dynamics in Live Cells

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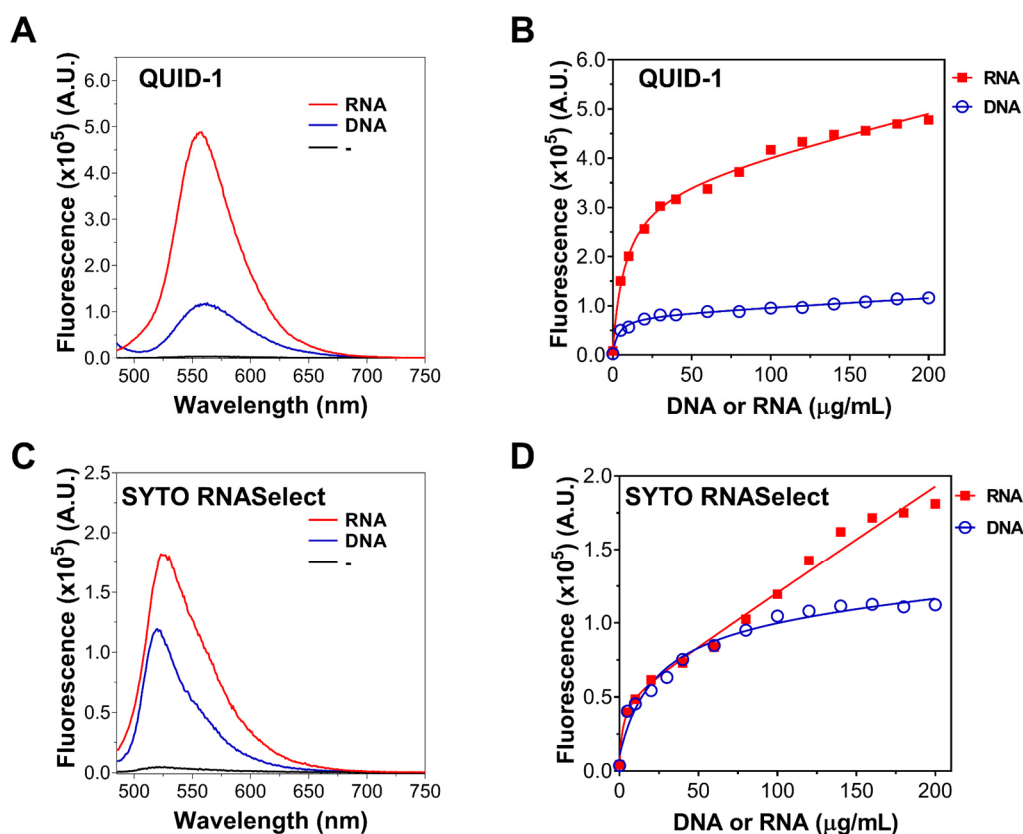
\* E-mail address: chenxc35@mail.sysu.edu.cn (Xiu-Cai Chen).

<sup>†</sup>These authors contributed equally to this work.

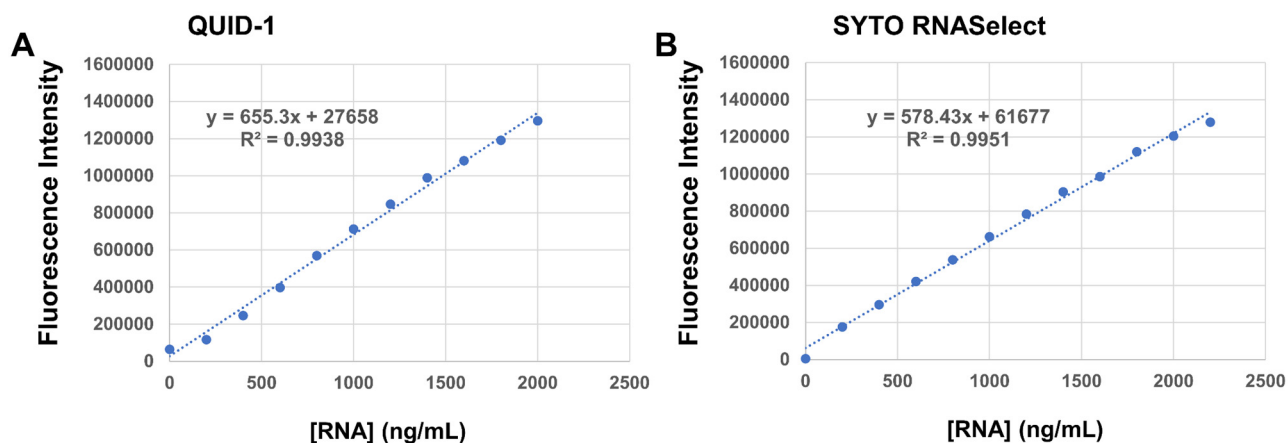
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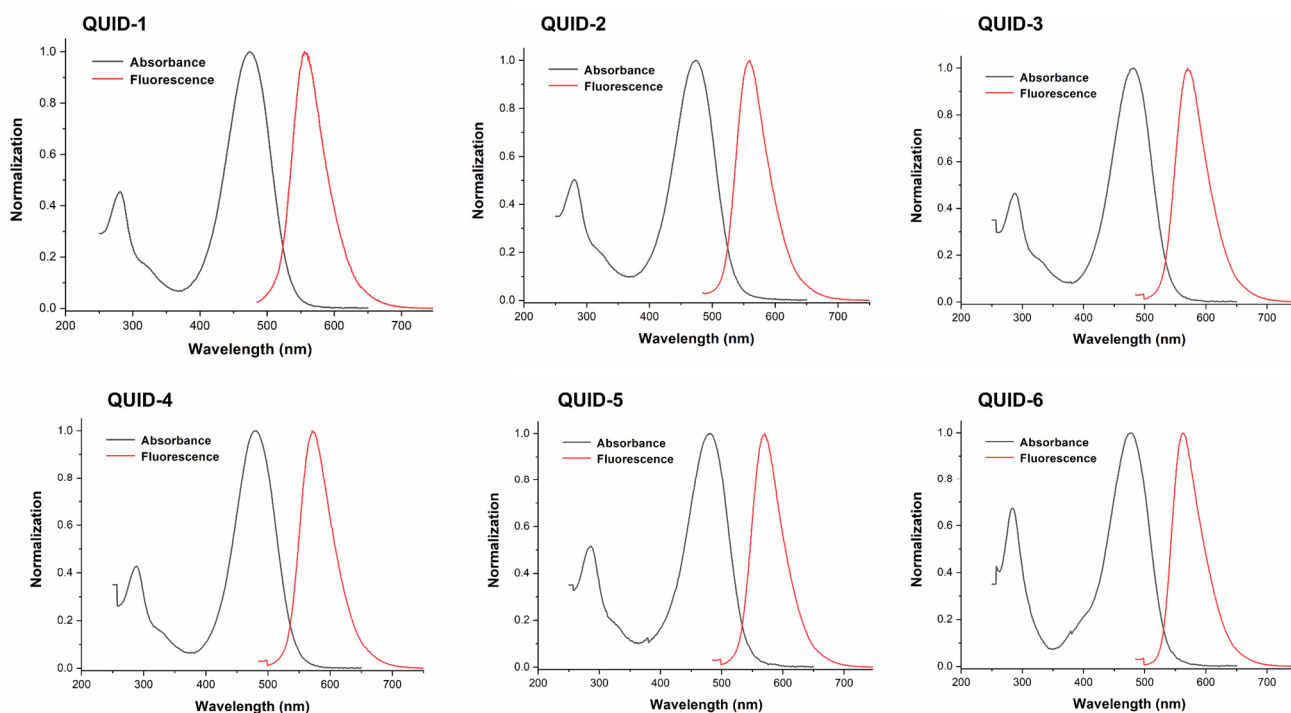
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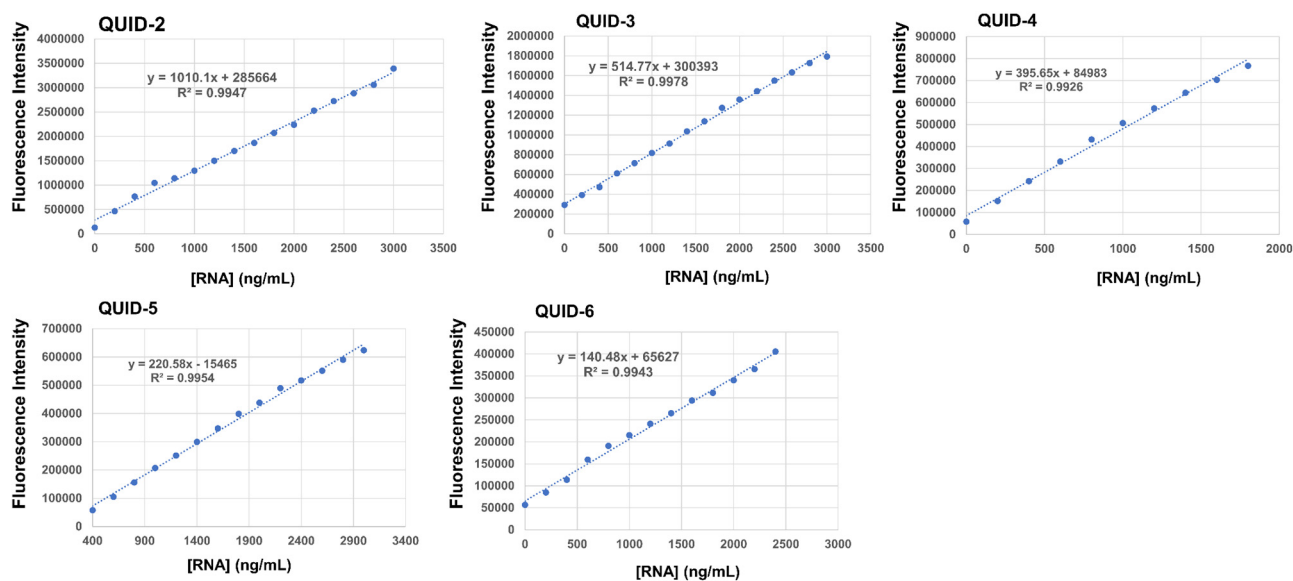
**Figure S1.** Selectivity of **QUID-1** or SYTO RNASelect toward RNA versus DNA. (A) Fluorescence emission spectrum of 1  $\mu\text{M}$  **QUID-1** with or without 200  $\mu\text{g/mL}$  baker's yeast RNA or salmon testes DNA in TE buffer. (B) The fluorescence intensity enhancement of 1  $\mu\text{M}$  **QUID-1** at 560 nm against the sample concentrations,  $\lambda_{\text{ex}} = 470$  nm. (C) Fluorescence emission spectrum of 1  $\mu\text{M}$  SYTO RNASelect with or without 200  $\mu\text{g/mL}$  baker's yeast RNA or salmon testes DNA in TE buffer. (D) The fluorescence intensity enhancement of 1  $\mu\text{M}$  SYTO RNASelect at 525 nm against the sample concentrations,  $\lambda_{\text{ex}} = 470$  nm.



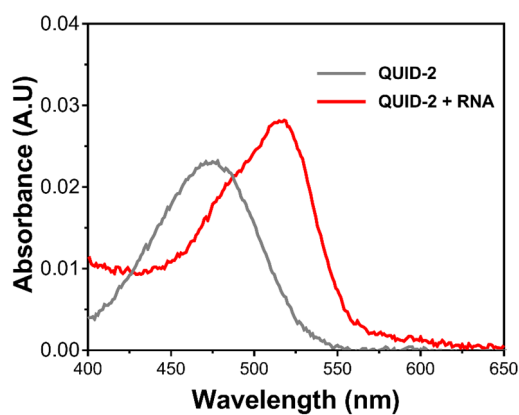
**Figure S2.** (A) Linear fit equations for calculating LOD values of **QUID-1** for baker's yeast RNA. (B) Linear fit equations for calculating LOD values of SYTO RNASelect for baker's yeast RNA.



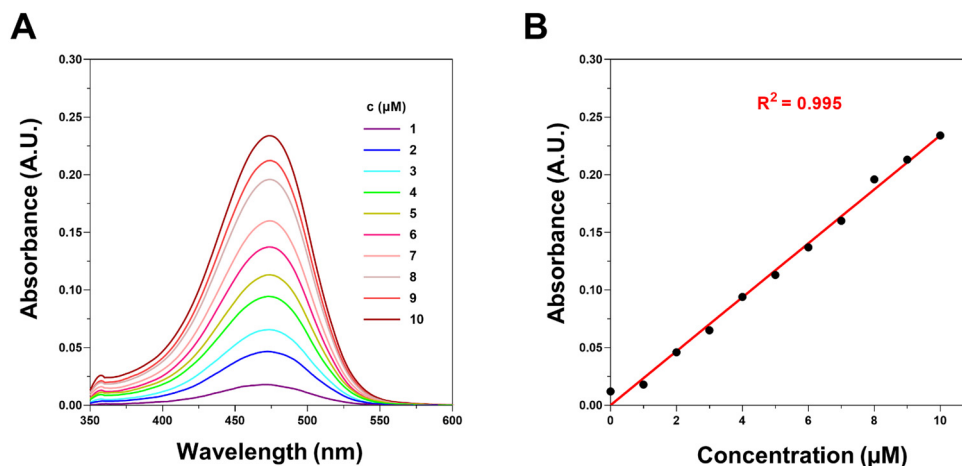
**Figure S3.** Normalized UV spectra of **QUID-1–QUID-6** (5  $\mu$ M) in TE buffer and normalized fluorescence emission spectrum of **QUID-1–QUID-6** (1  $\mu$ M) with 100  $\mu$ g/mL baker's yeast RNA.



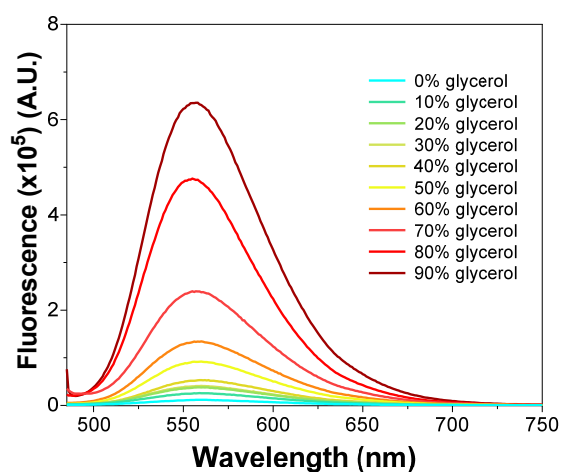
**Figure S4.** Linear fit equations for calculating LOD values of probes (QUID-2–QUID-6) for baker's yeast RNA.



**Figure S5.** The UV spectra of QUID-2 (1  $\mu$ M) with or without 100  $\mu$ g/mL baker's yeast RNA in TE buffer.

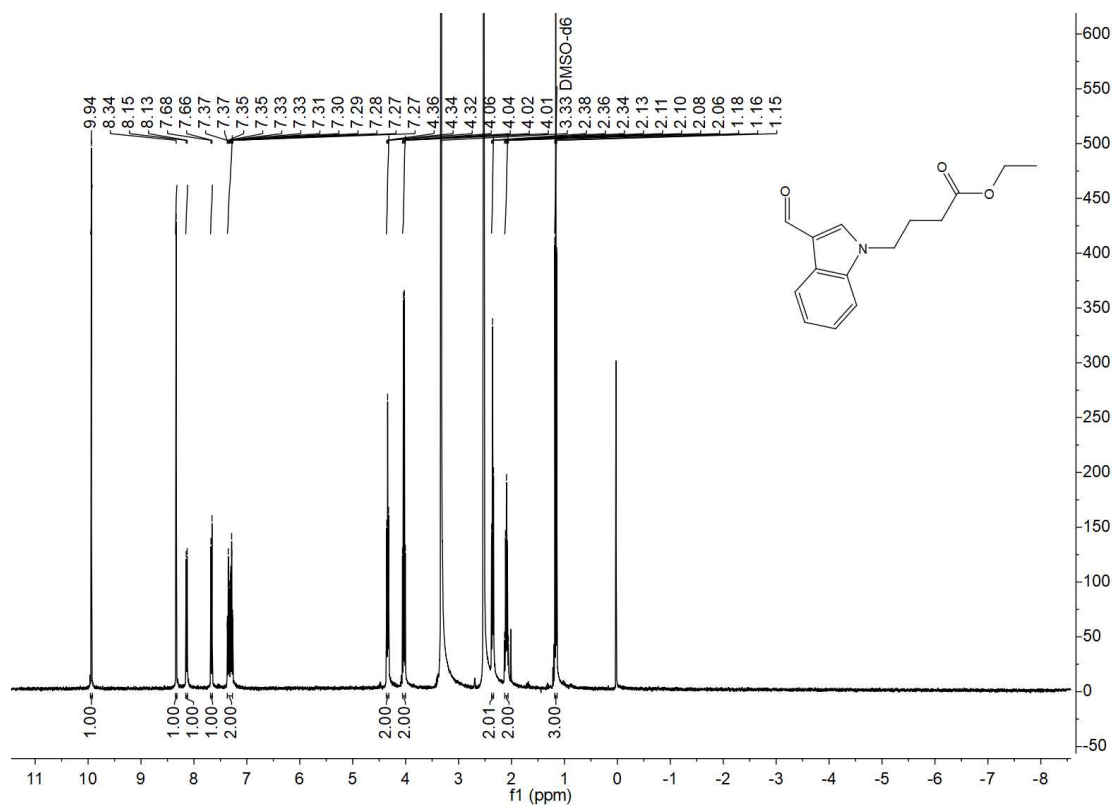


**Figure S6.** Concentration-Dependent UV-Vis absorbance of **QUID-2**. All of the spectra were collected in TE buffer. (A) The spectra of **QUID-2** at different concentrations. (B) The absorbance of **QUID-2** at 475 nm showed that the variations follow the Beer-Lambert law. **QUID-2** had little propensity to aggregate in buffer according to its concentration dependent absorbance spectra.

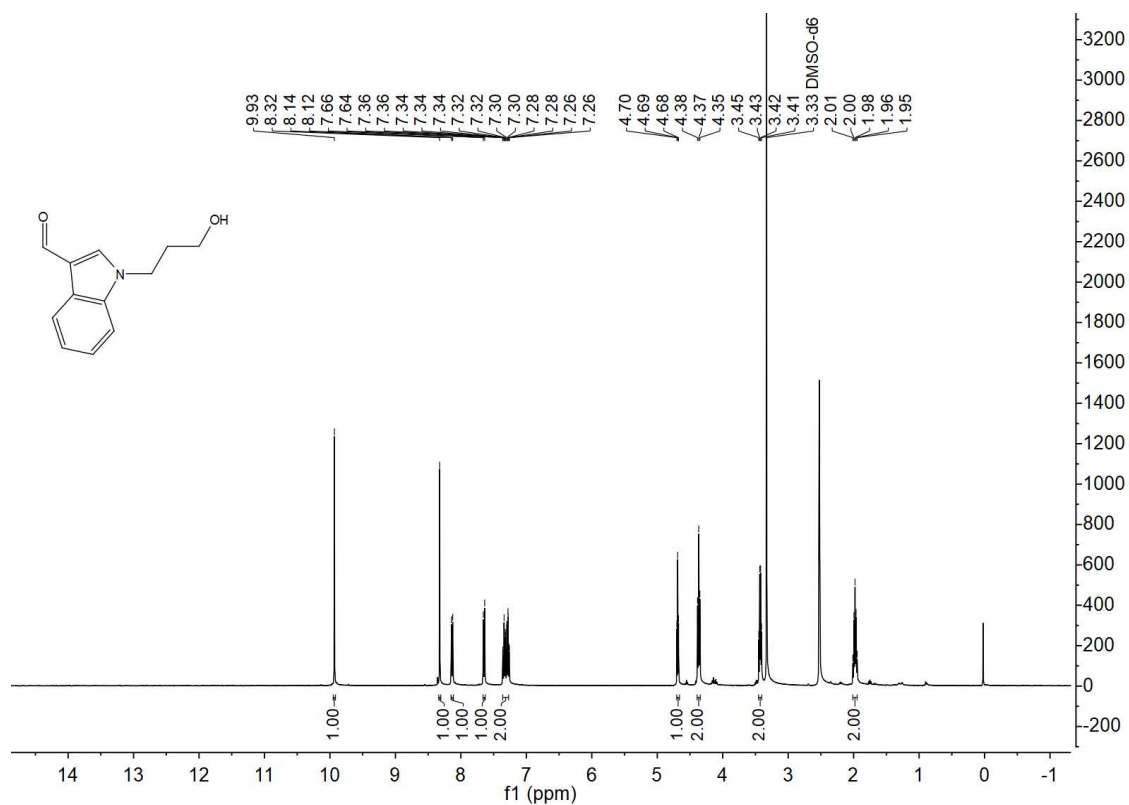


**Figure S7.** The spectra of **QUID-2** (1  $\mu\text{M}$ ) in glycerol-water mixed solution.

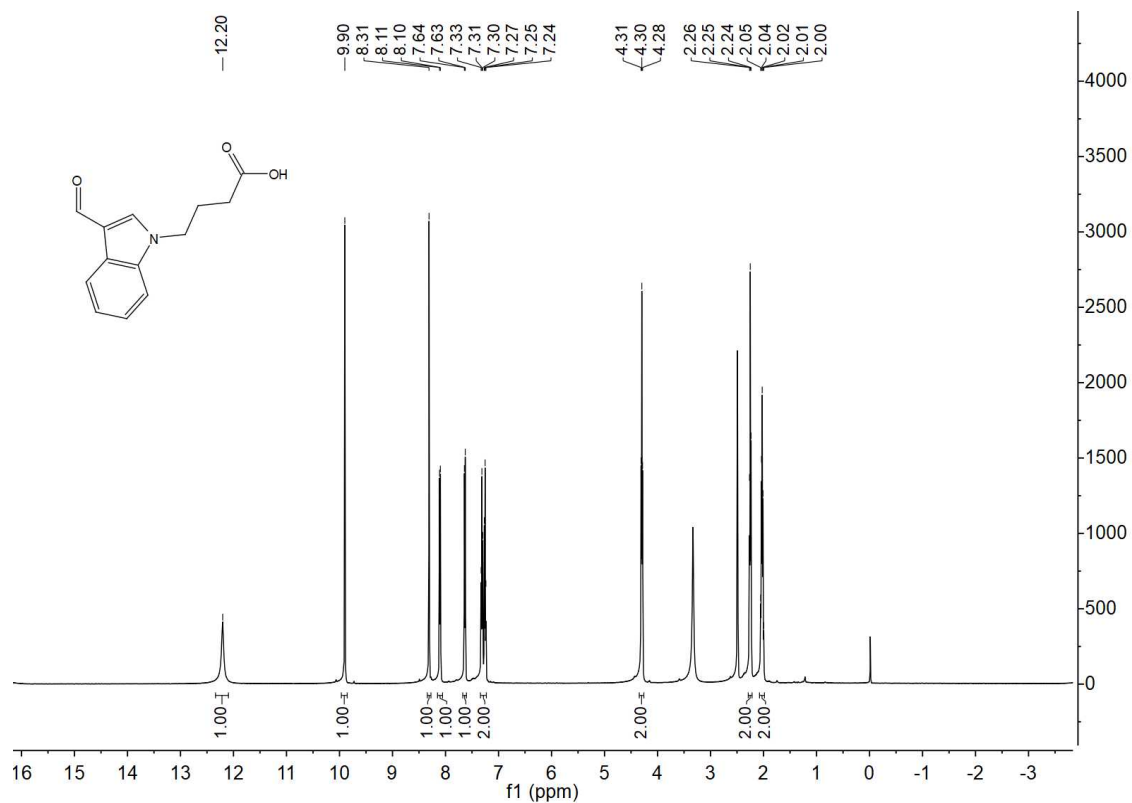




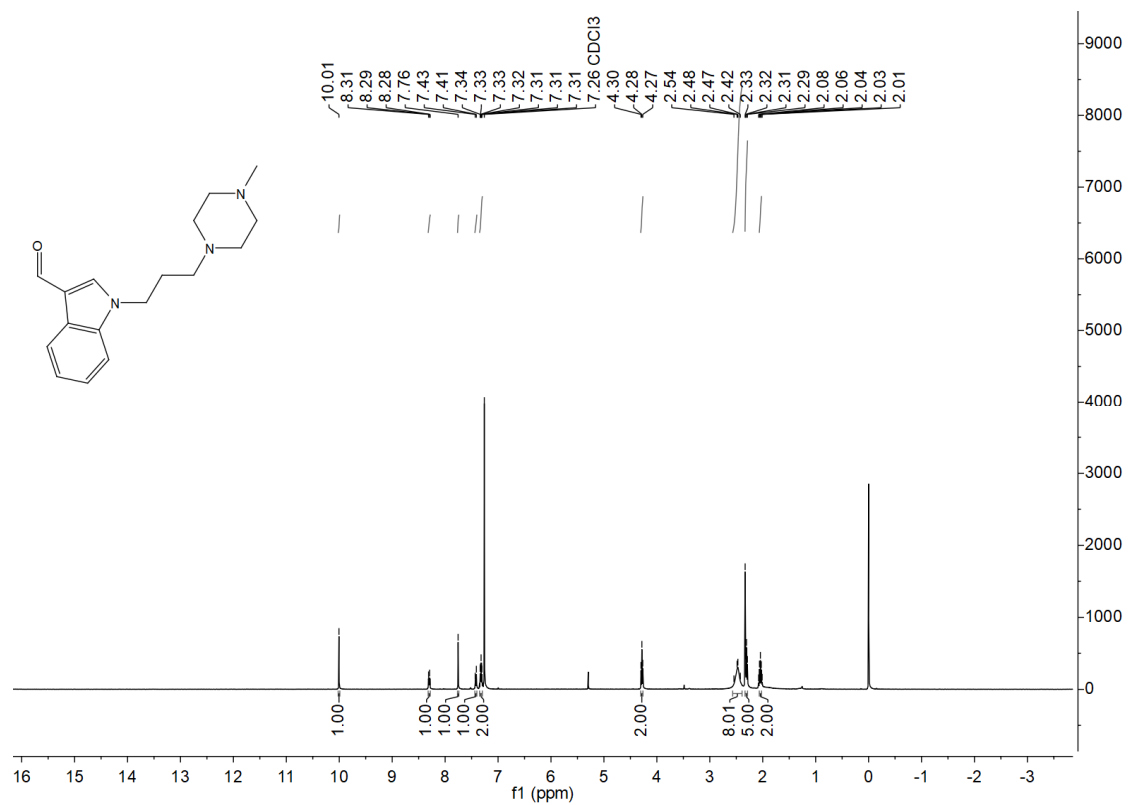
**Figure S10.** <sup>1</sup>H NMR spectrum of intermediate **5**.



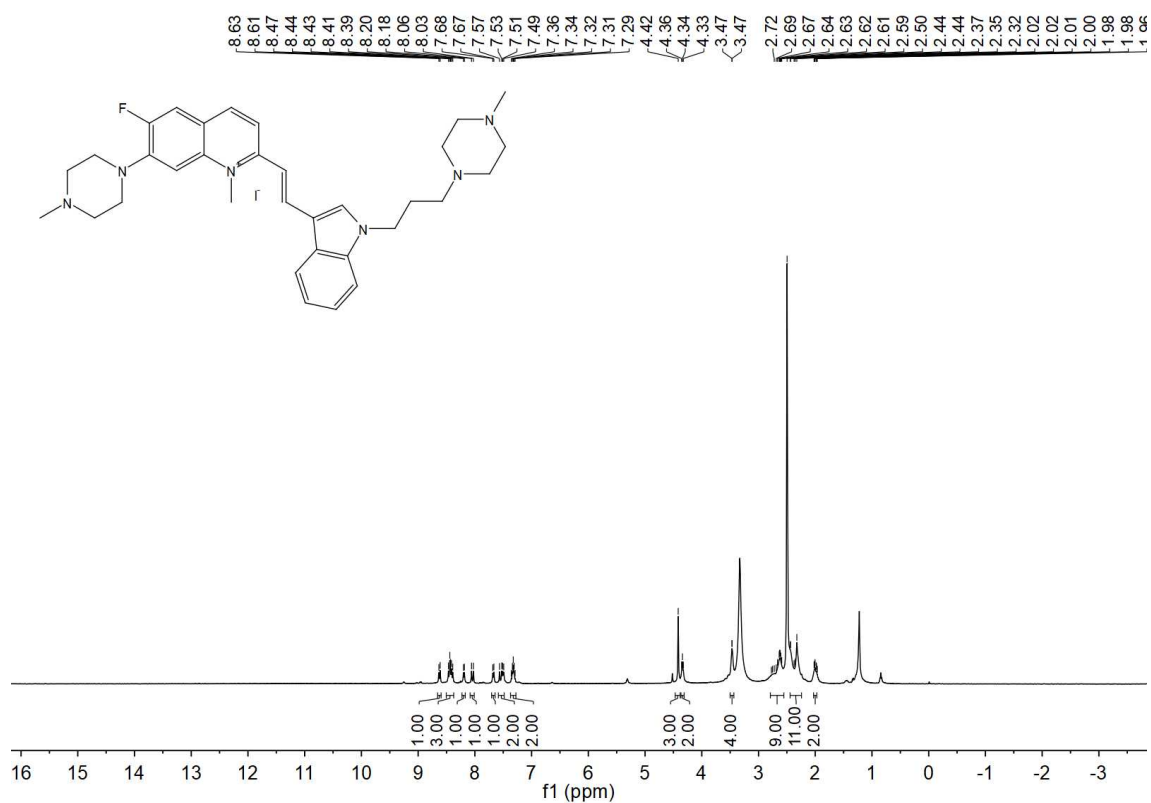
**Figure S11.** <sup>1</sup>H NMR spectrum of intermediate **6**.



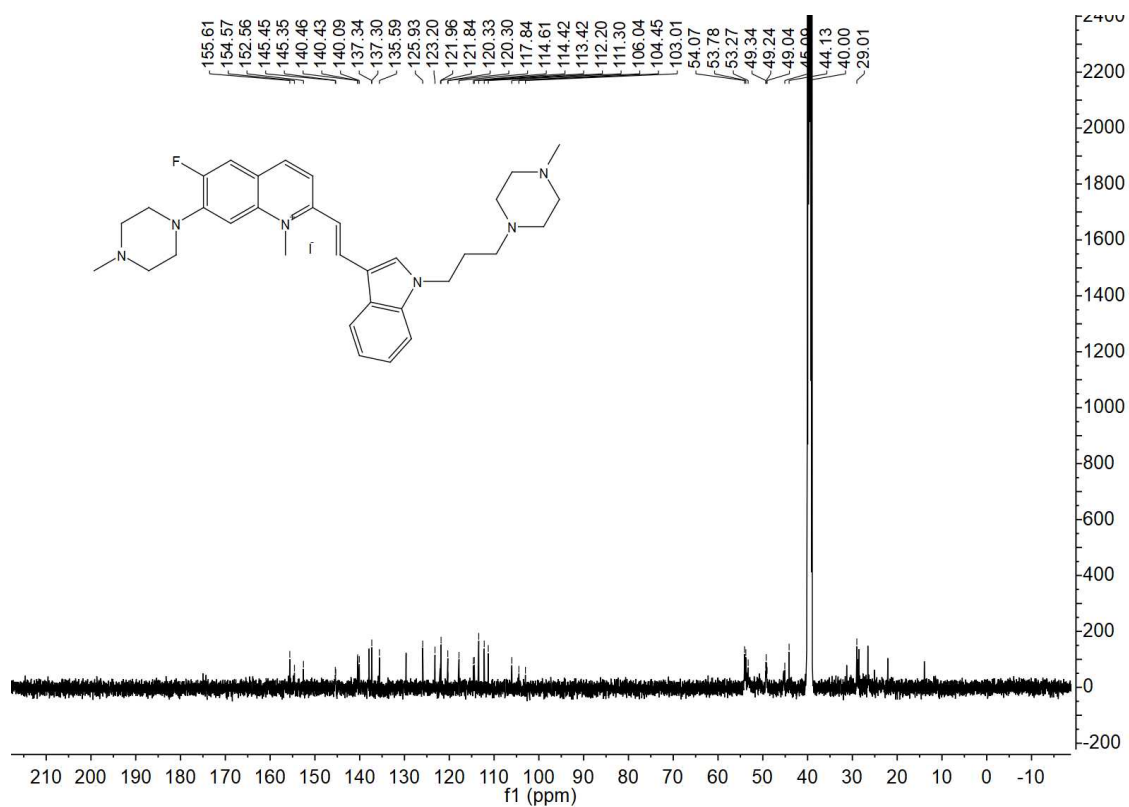
**Figure S12.**  $^1\text{H}$  NMR spectrum of intermediate 7.



**Figure S13.**  $^1\text{H}$  NMR spectrum of intermediate **8**.



**Figure S14.** <sup>1</sup>H NMR spectrum of QUID-2.



**Figure S15.** <sup>13</sup>C NMR spectrum of QUID-2.

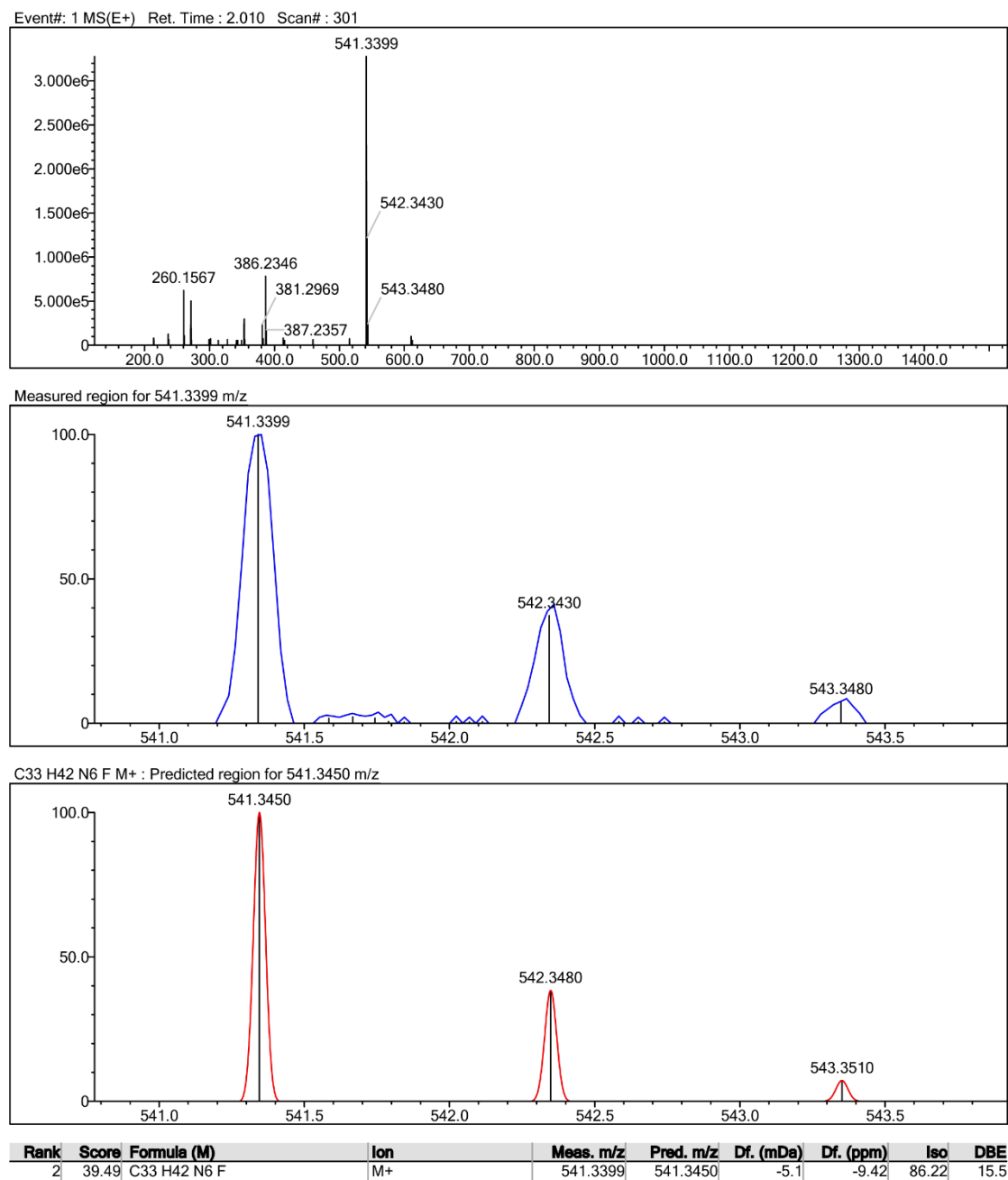
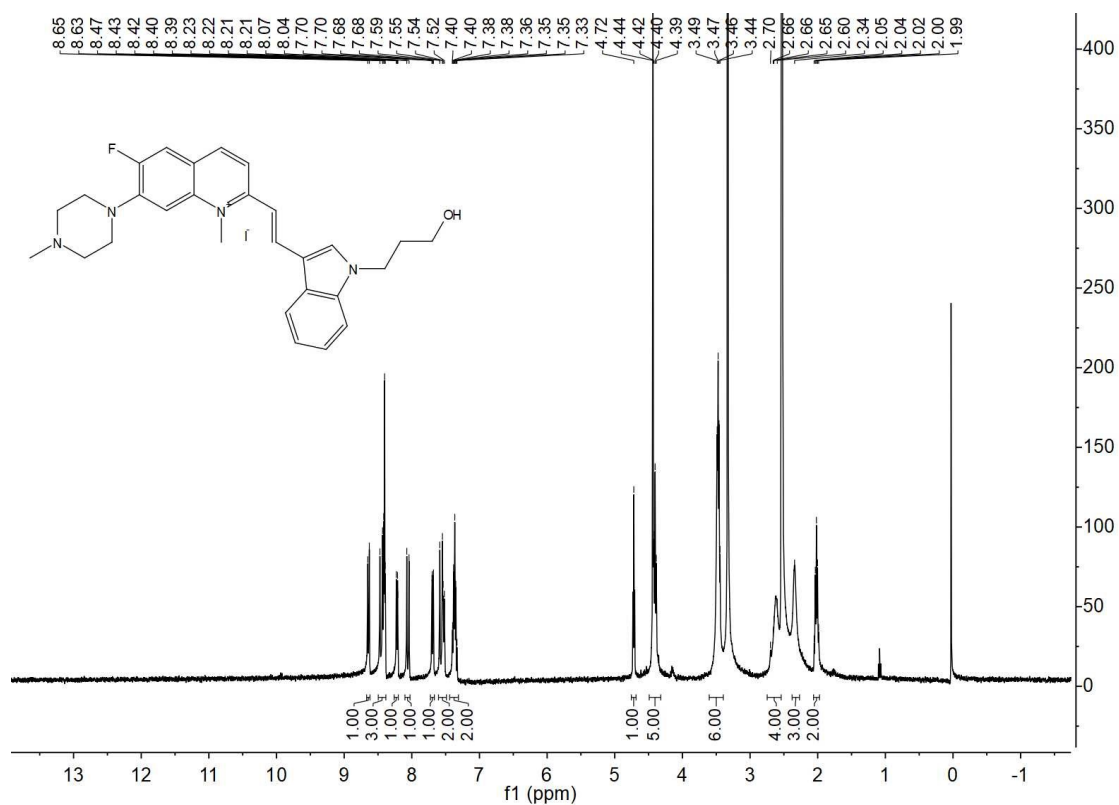
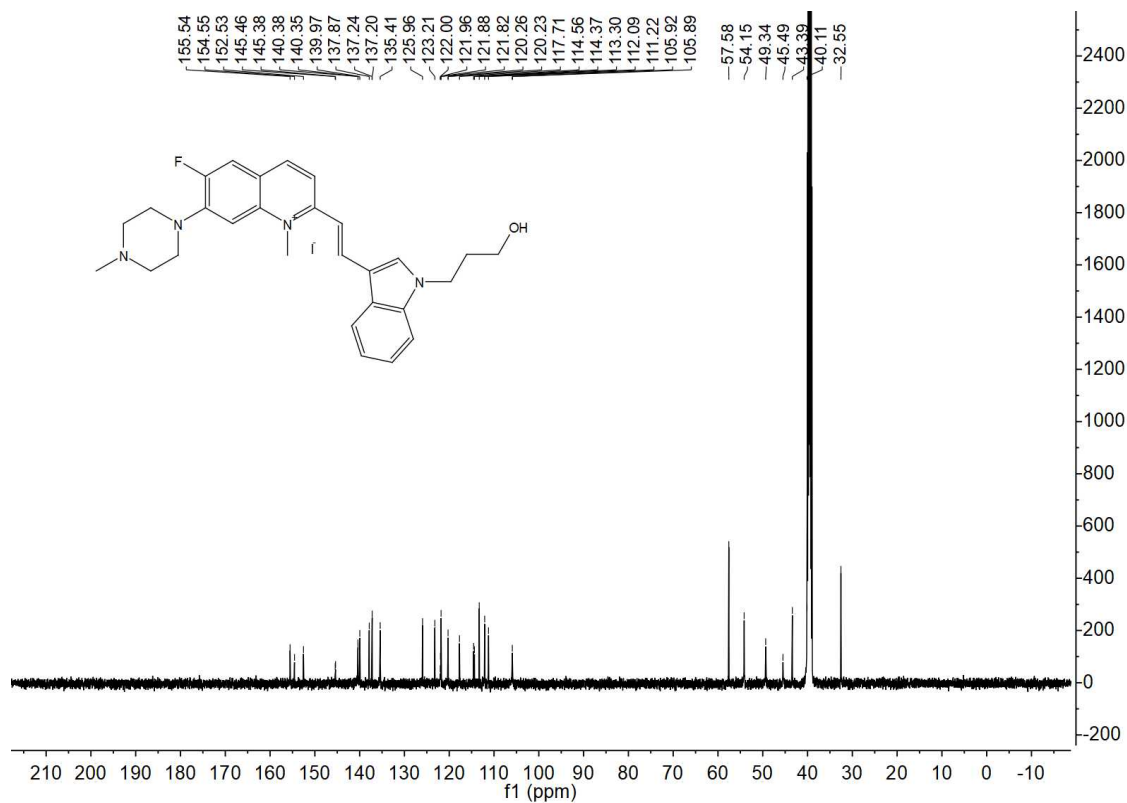


Figure S16. HRMS spectrum of QUID-2.



**Figure S17.** <sup>1</sup>H NMR spectrum of QUID-3.



**Figure S18.** <sup>13</sup>C NMR spectrum of QUID-3.

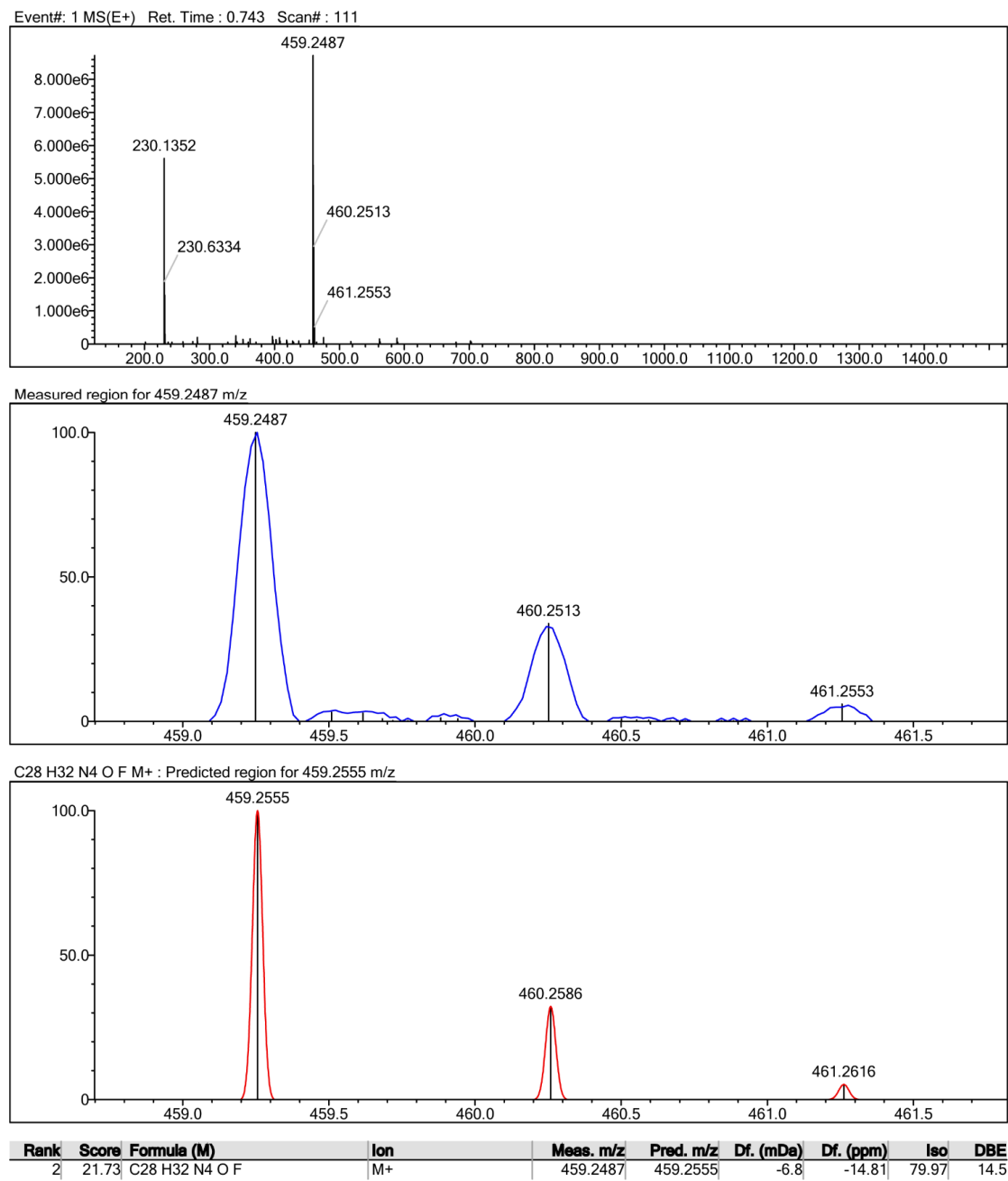


Figure S19. HRMS spectrum of QUID-3.

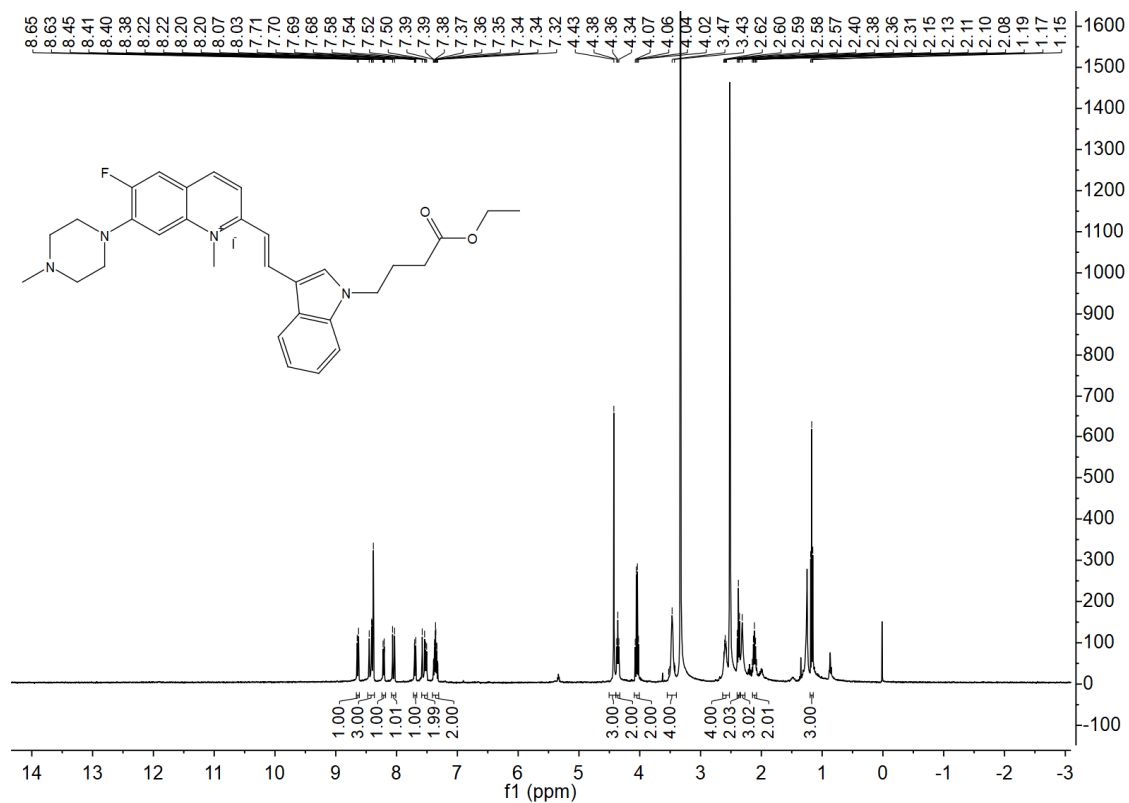


Figure S20. <sup>1</sup>H NMR spectrum of QUID-4.

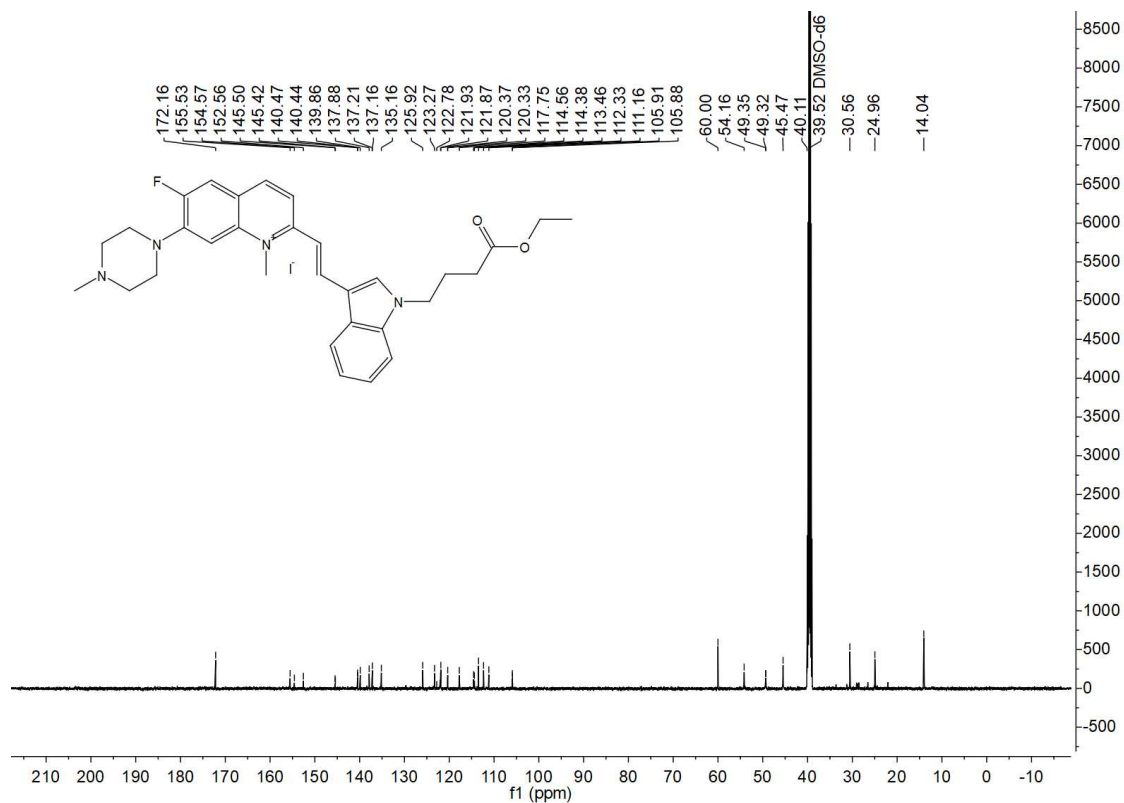
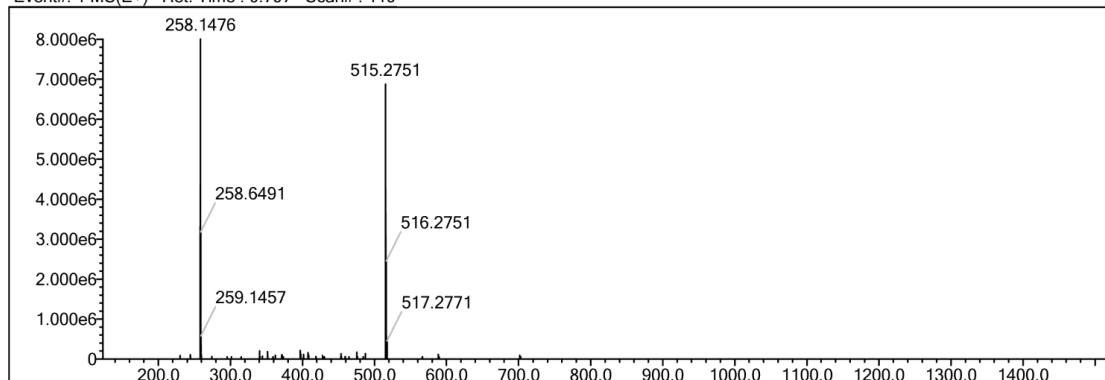
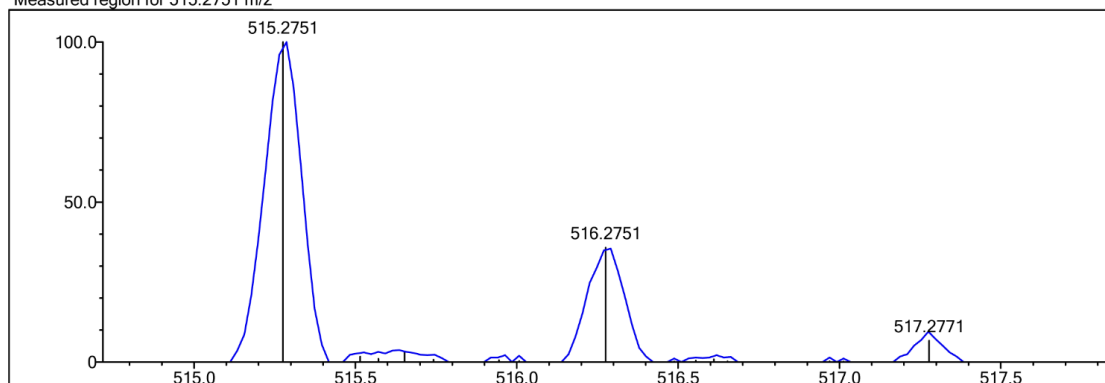


Figure S21. <sup>13</sup>C NMR spectrum of QUID-4.

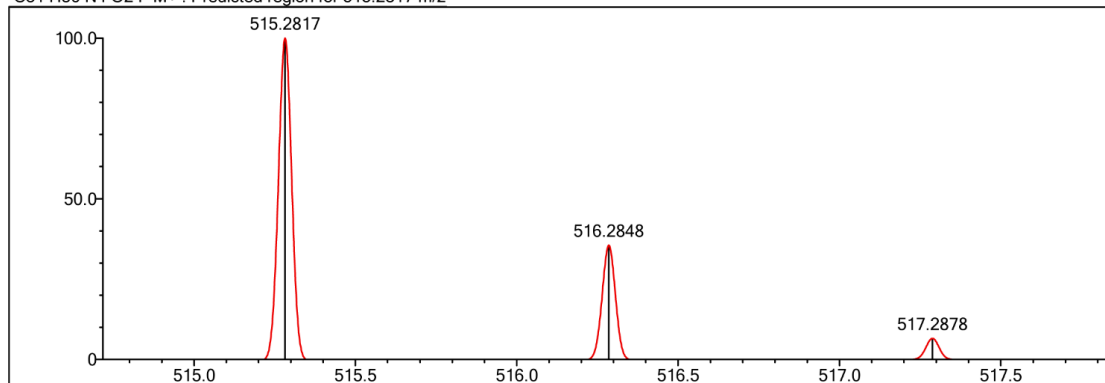
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Measured region for 515.2751  $m/z$



C31 H36 N4 O2 F M+ : Predicted region for 515.2817  $m/z$



Rank	Score	Formula (M)	Ion	Meas. $m/z$	Pred. $m/z$	Df. (mDa)	Df. (ppm)	Iso	DBE
2	24.79	C31 H36 N4 O2 F	M+	515.2751	515.2817	-6.6	-12.81	76.26	15.5

**Figure S22.** HRMS spectrum of QUID-4.

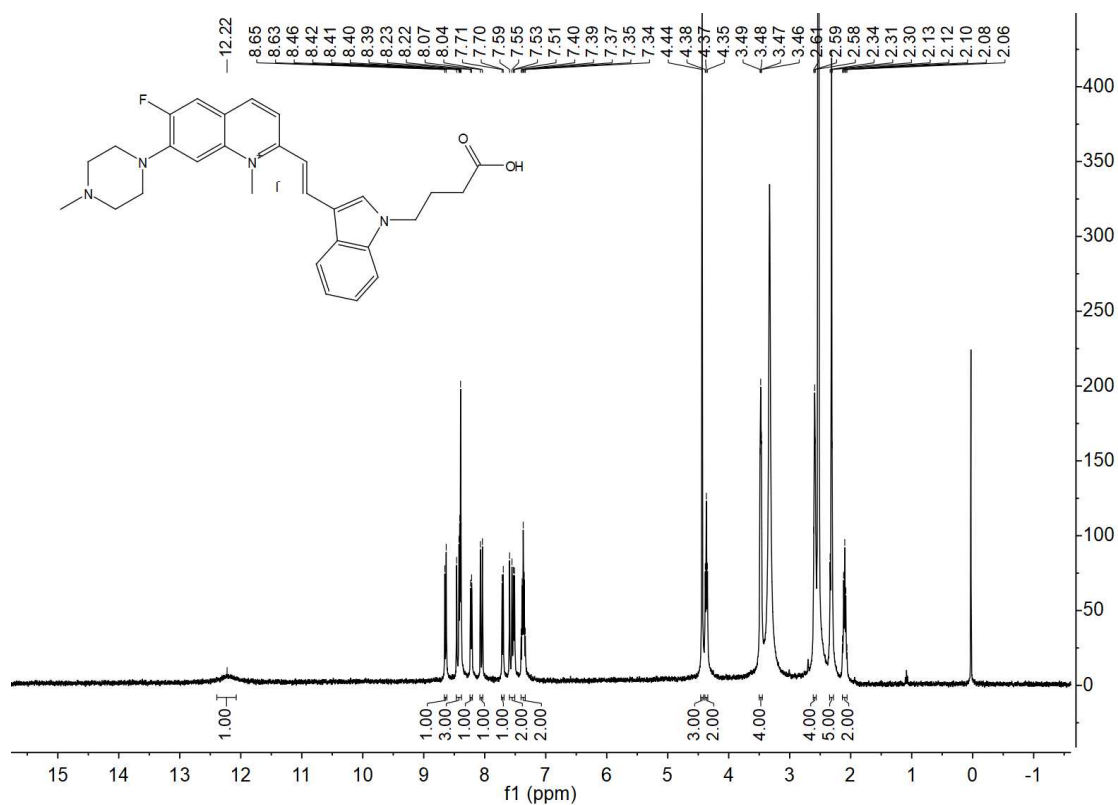


Figure S23. <sup>1</sup>H NMR spectrum of QUID-5.

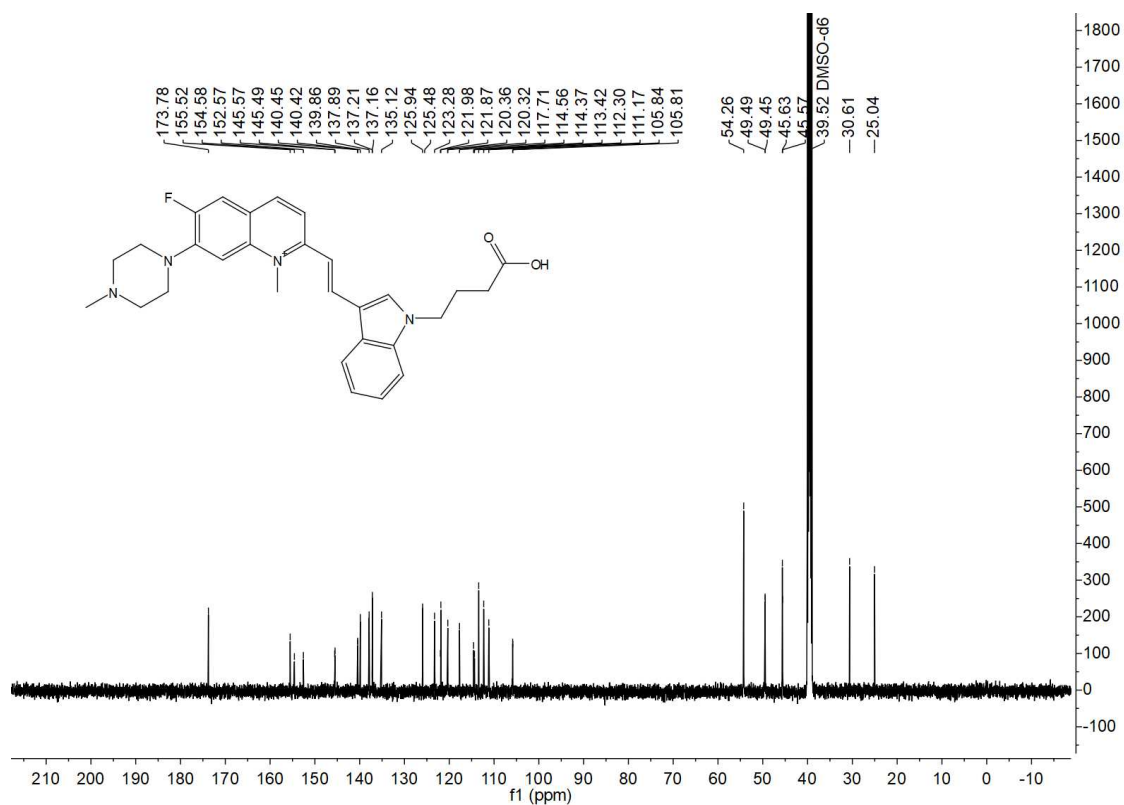


Figure S24. <sup>13</sup>C NMR spectrum of QUID-5.

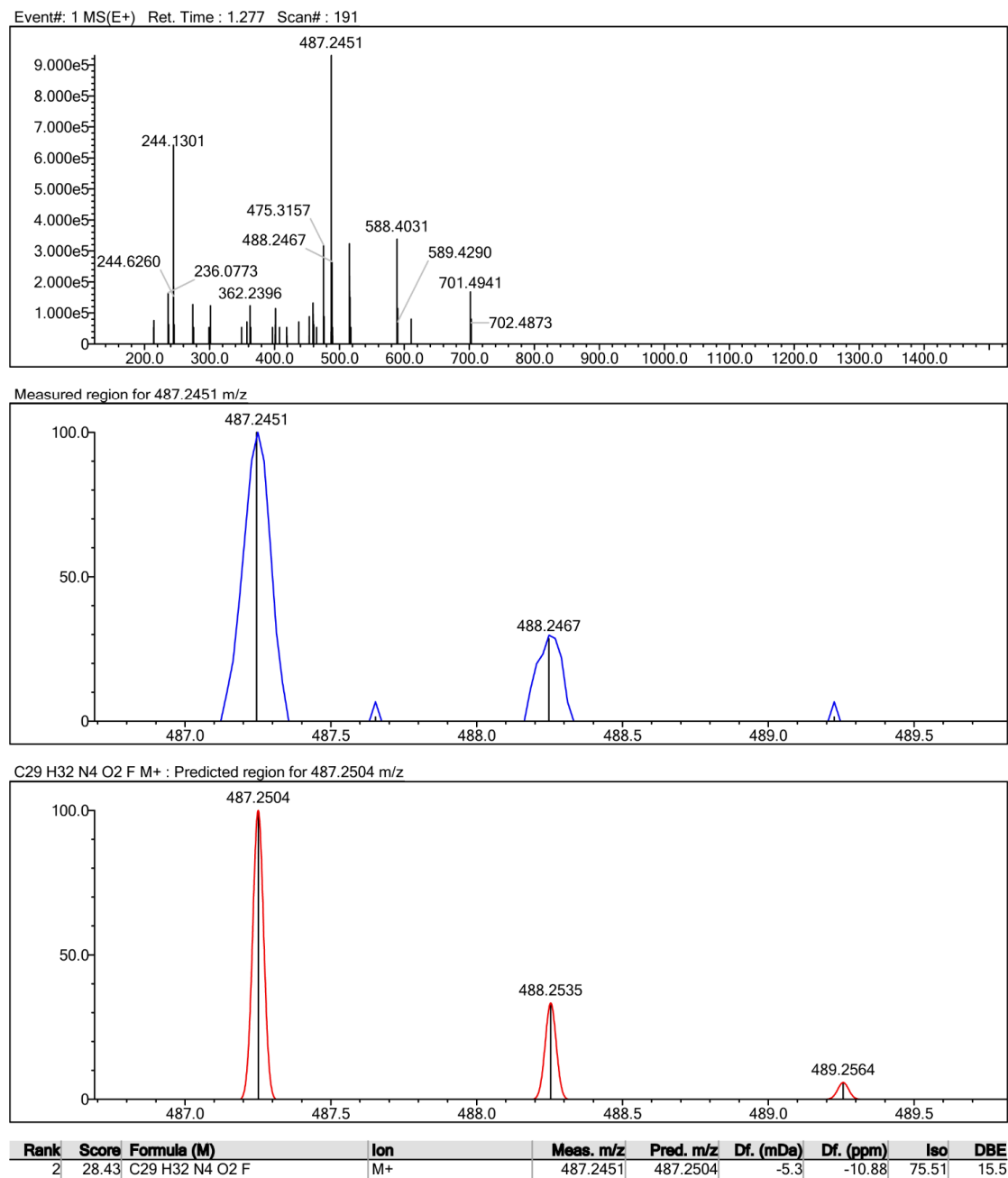
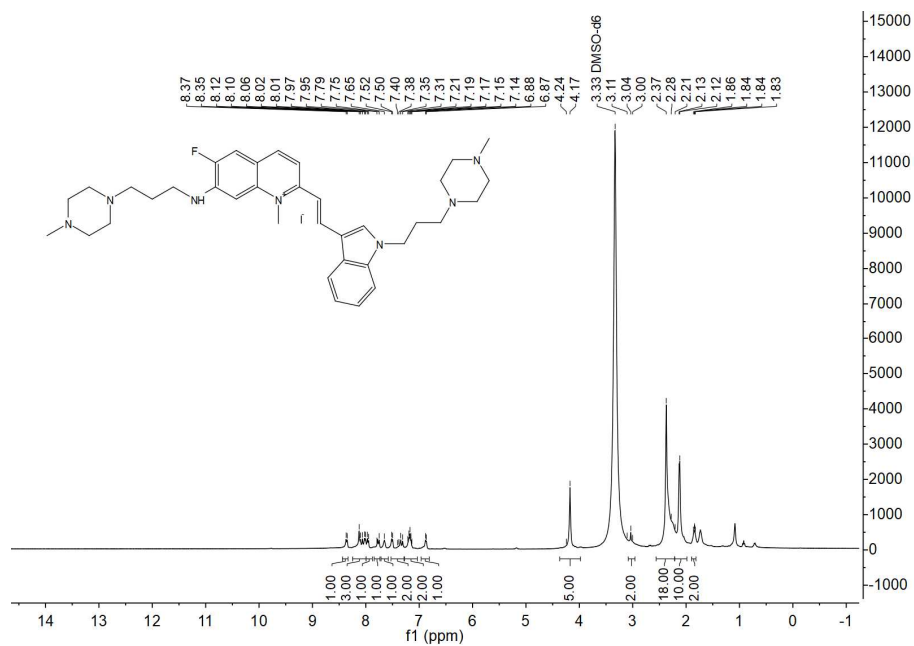
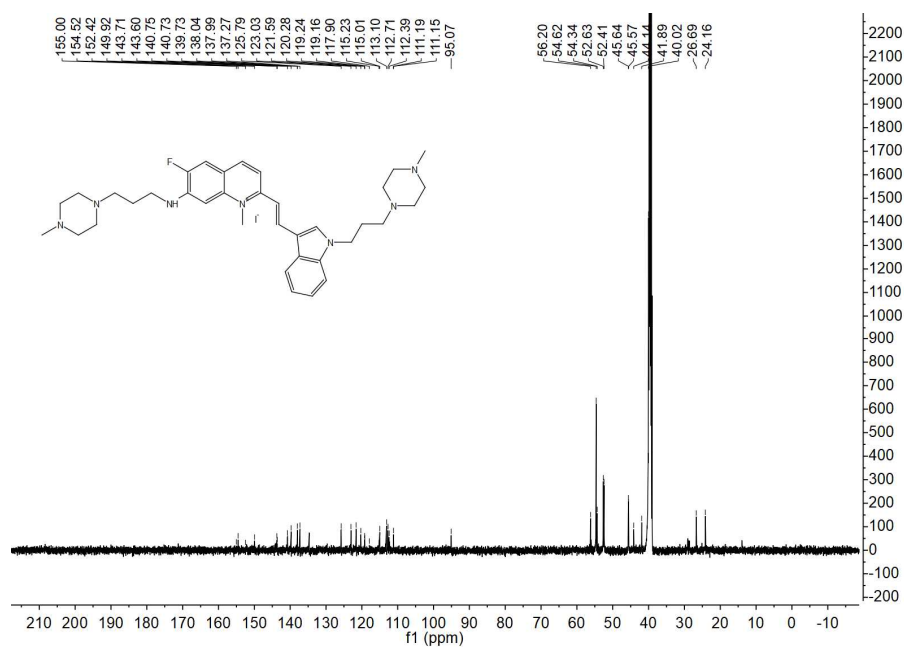


Figure S25. HRMS spectrum of QUID-5.

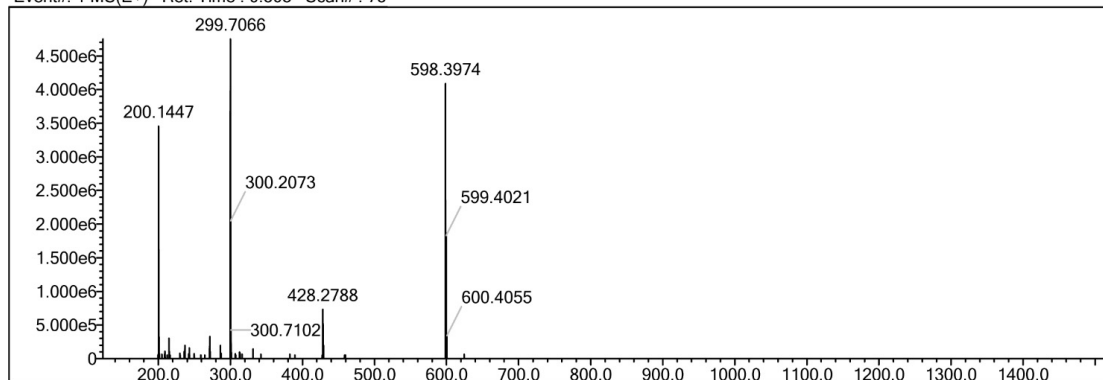


**Figure S26.** <sup>1</sup>H NMR spectrum of QUID-6.

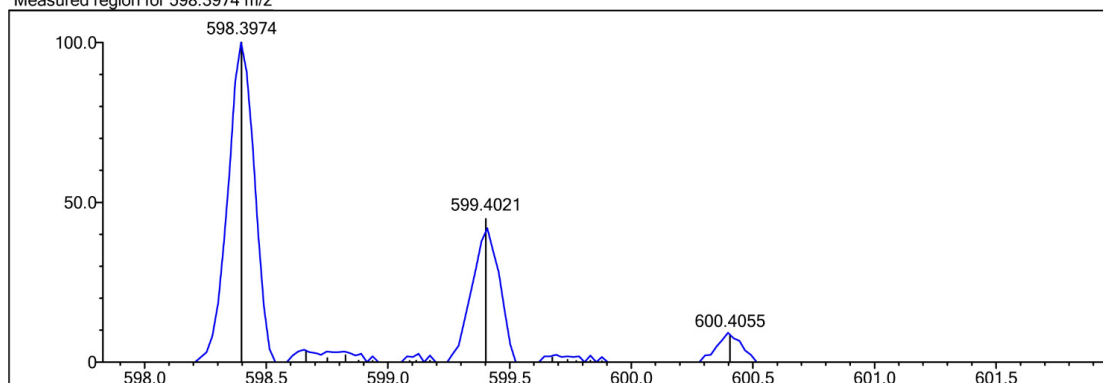


**Figure S27.** <sup>13</sup>C NMR spectrum of QUID-6.

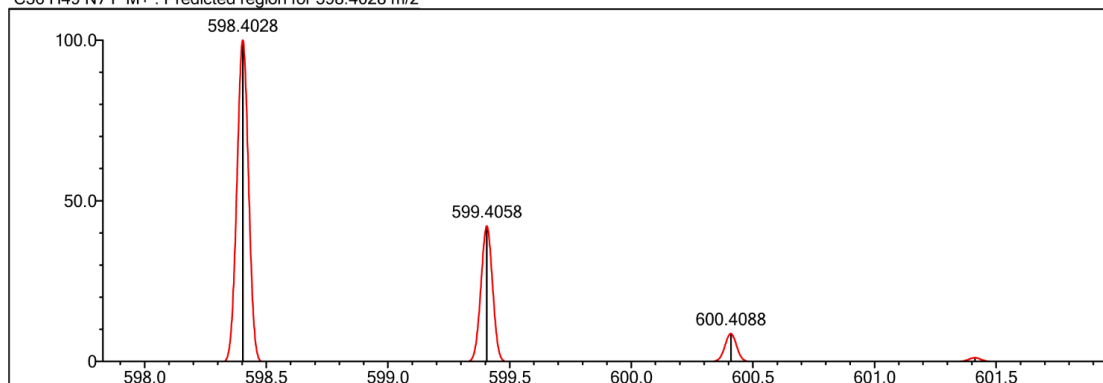
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Measured region for 598.3974 m/z



C36 H49 N7 F M+: Predicted region for 598.4028 m/z



Rank	Score	Formula (M)	Ion	Meas. m/z	Pred. m/z	Df. (mDa)	Df. (ppm)	Iso	DBE
2	44.97	C36 H49 N7 F	M+	598.3974	598.4028	-5.4	-9.02	90.29	15.5

Figure S28. HRMS spectrum of QUID-6.