

Supporting Information

Post-Radiolabeling Thioether Oxidation to Enhance the Bioorthogonal Reactivity of ^{18}F -Tetrazines

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Denk^{1, 2,*}

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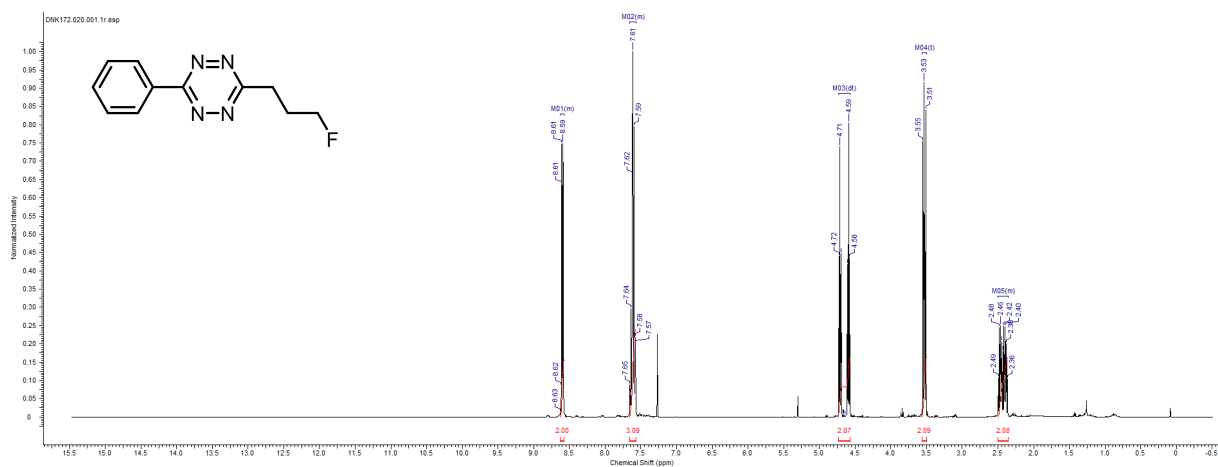
These authors contributed equally

Table of Contents

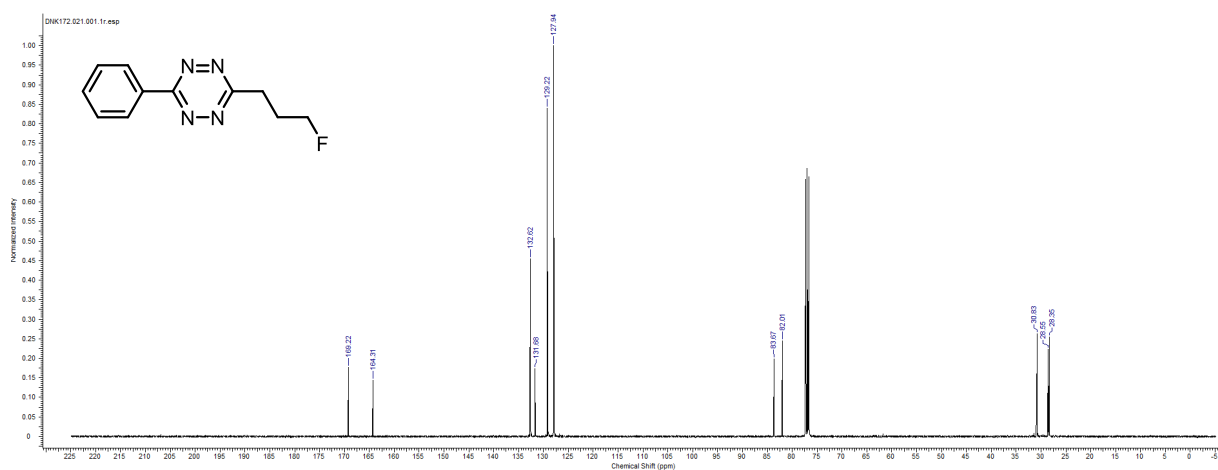
1) NMR Spectra	2
2) Radio-HPLC Chromatograms	29

1) NMR Spectra

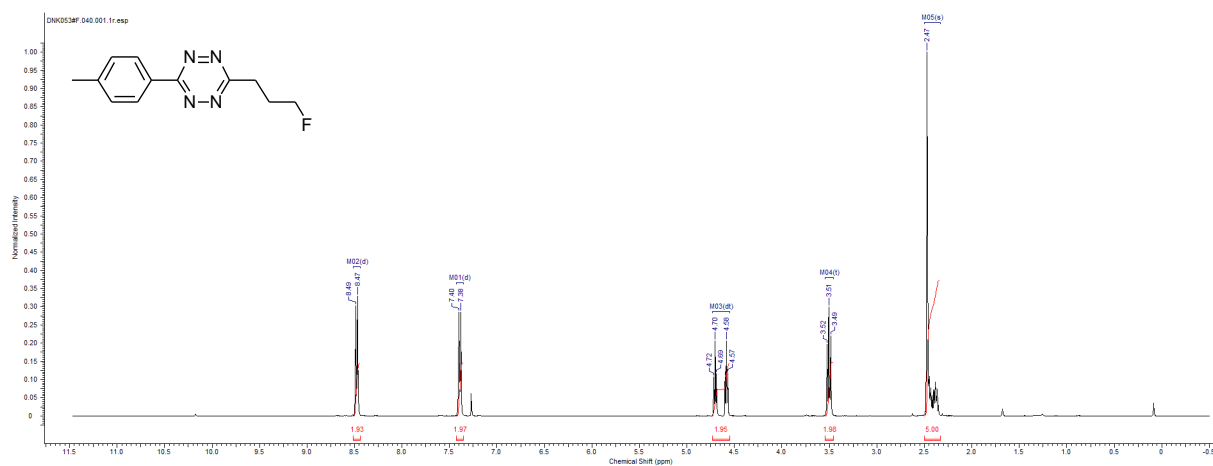
Compound **2**, ^1H NMR



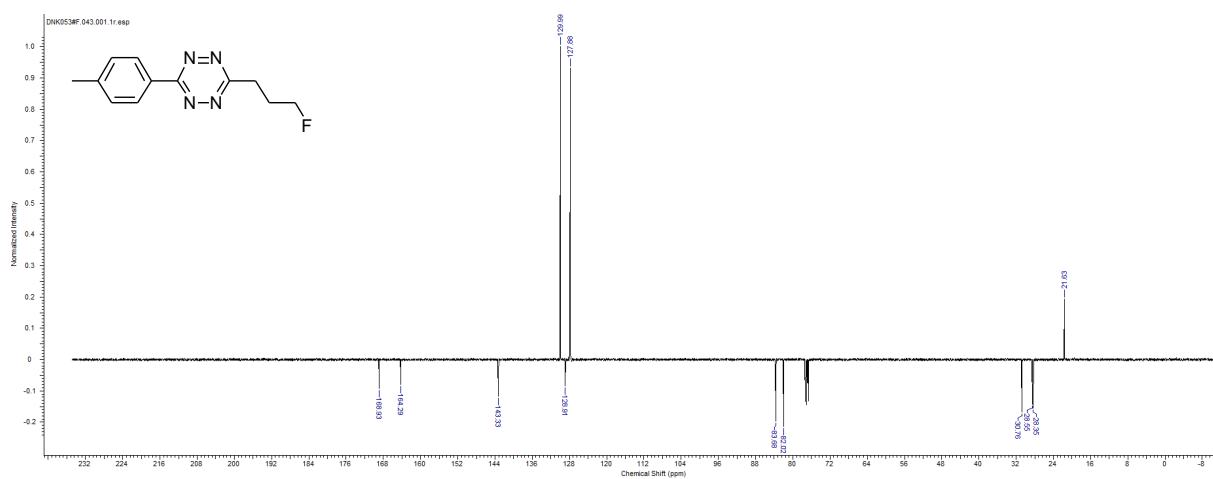
Compound **2**, ^{13}C NMR



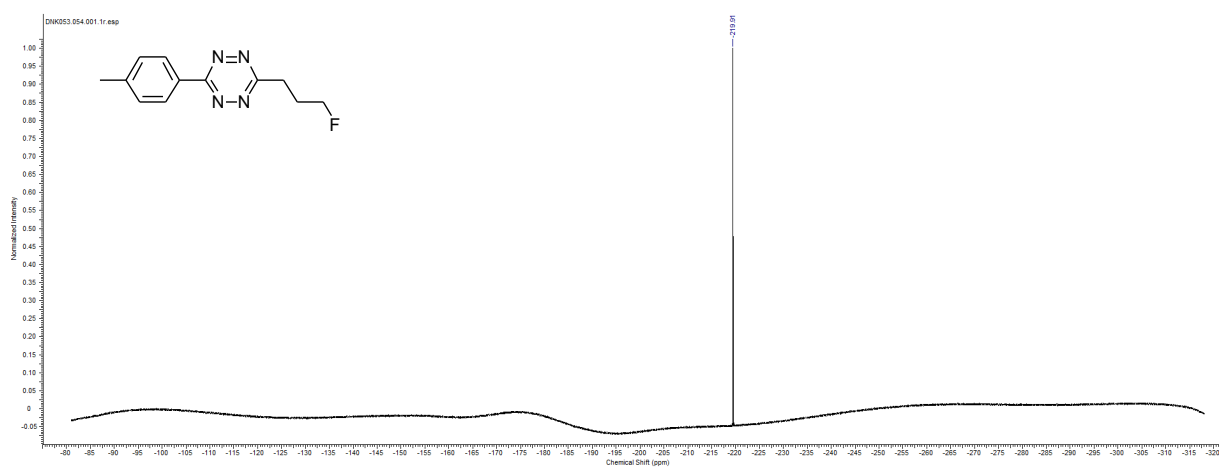
Compound **3**, ^1H NMR



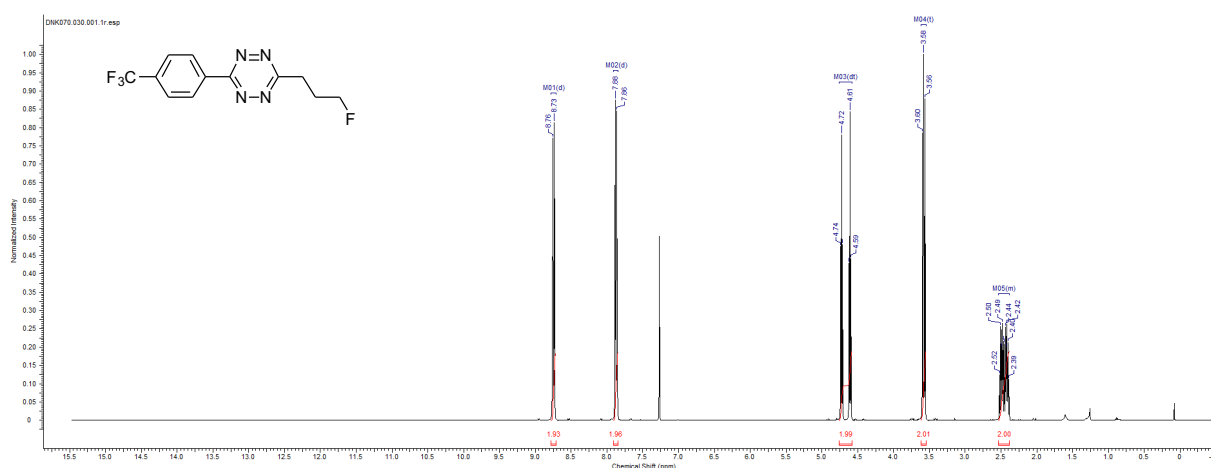
Compound **3**, ^{13}C NMR (APT)



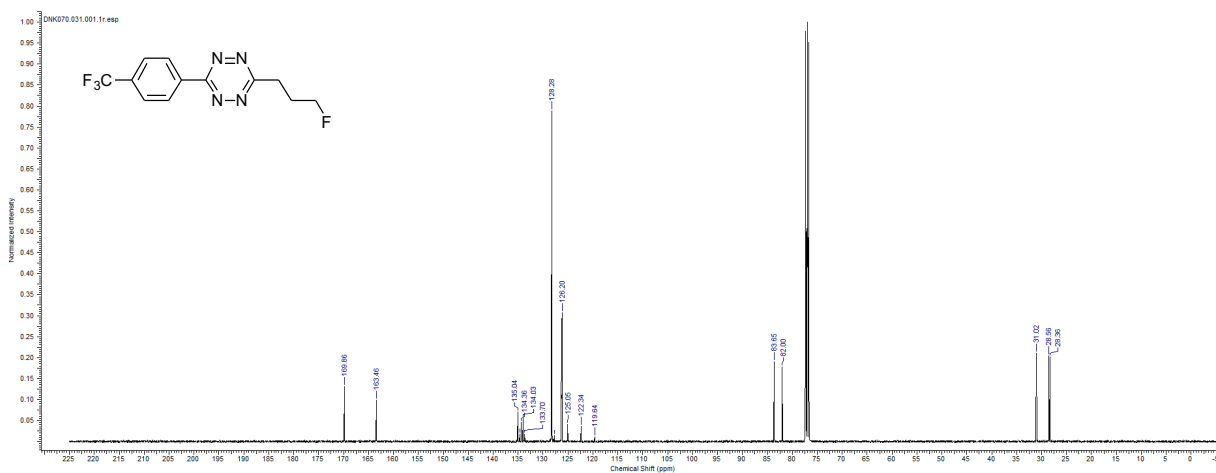
Compound **3**, ^{19}F NMR



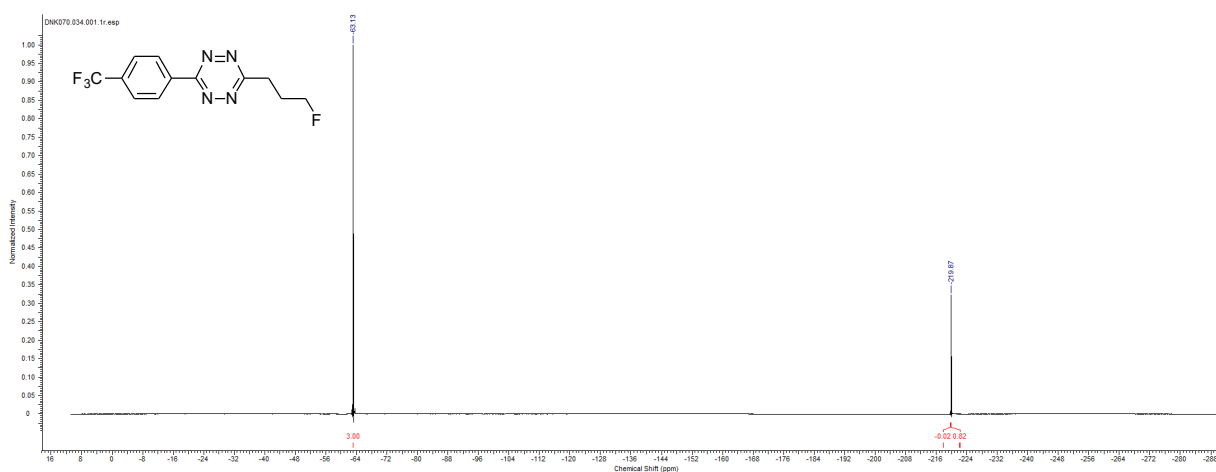
Compound **4**, ¹H NMR



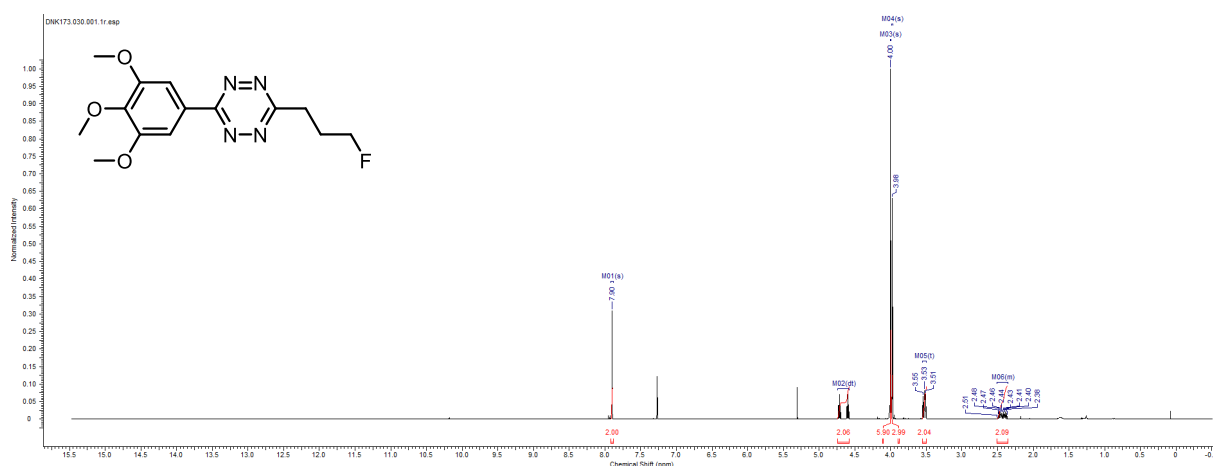
Compound **4**, ¹³C NMR



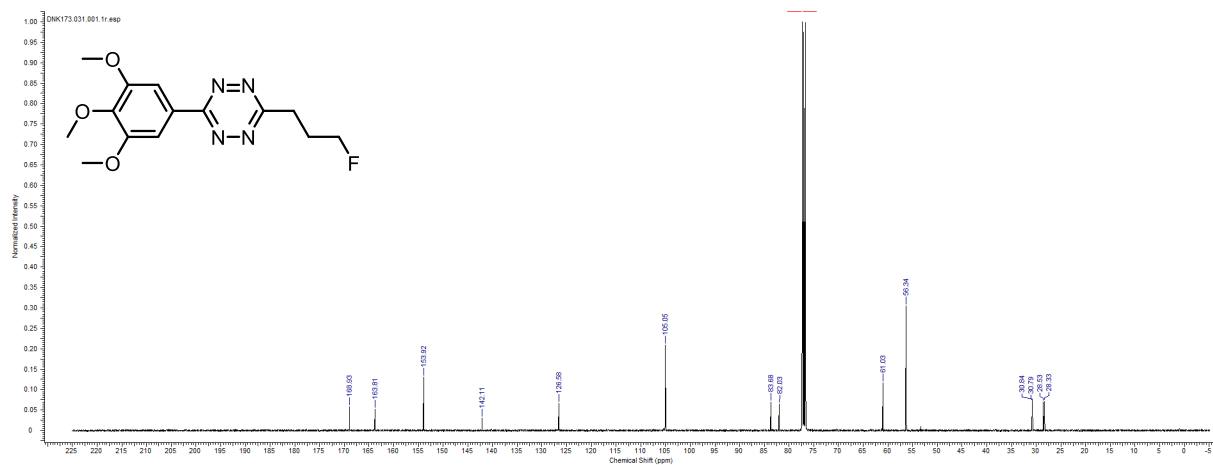
Compound **4**, ¹⁹F NMR



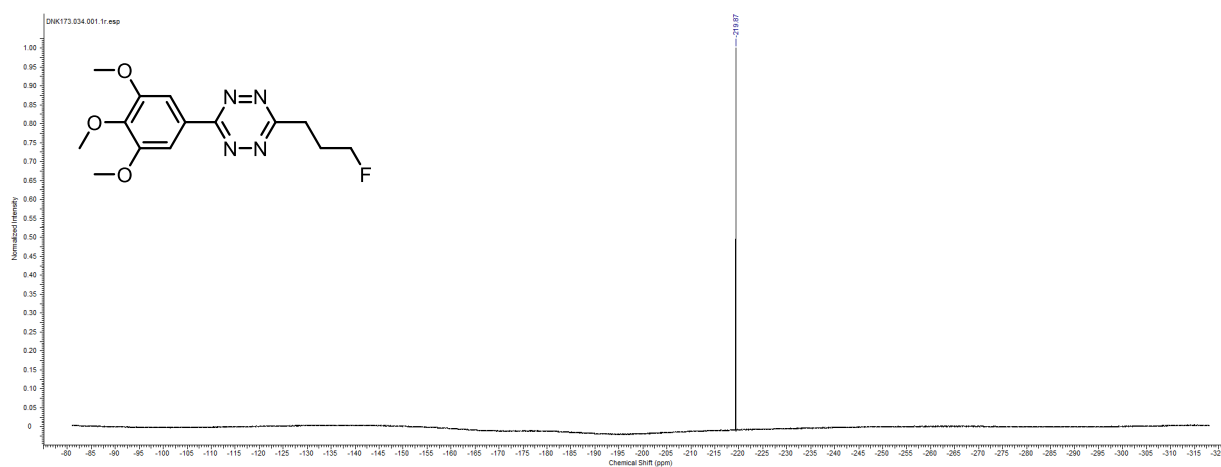
Compound 5, ¹H NMR



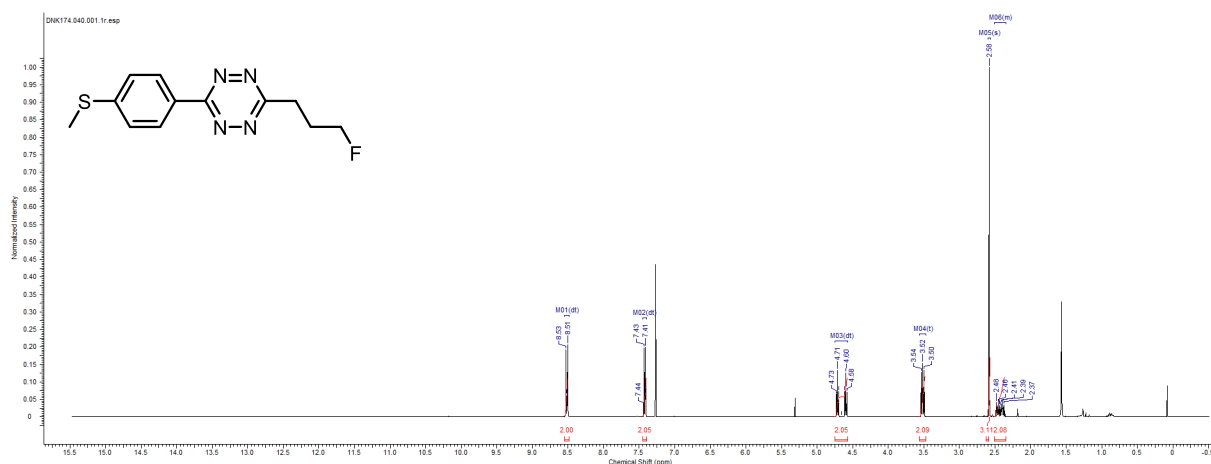
Compound 5, ¹³C NMR



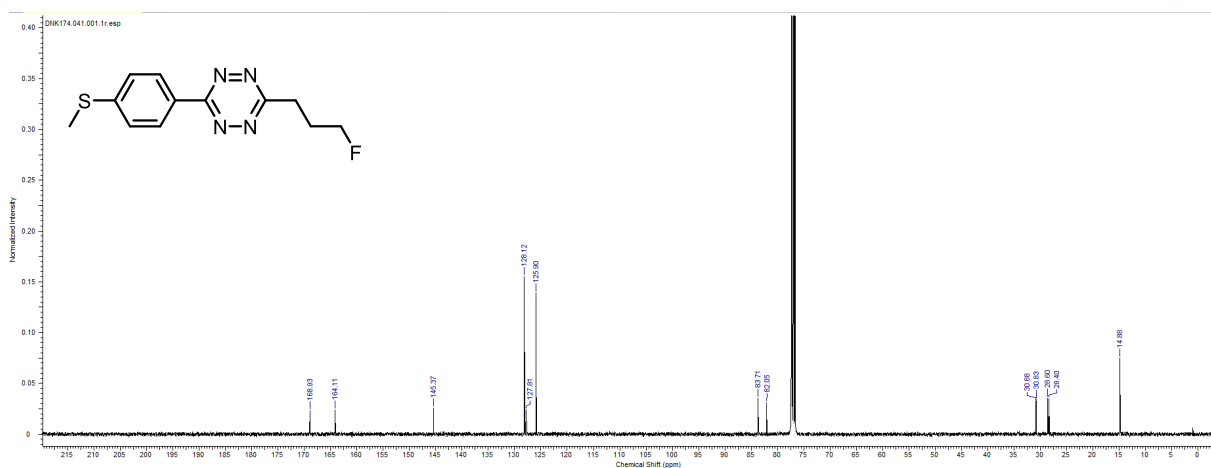
Compound 5, ¹⁹F NMR



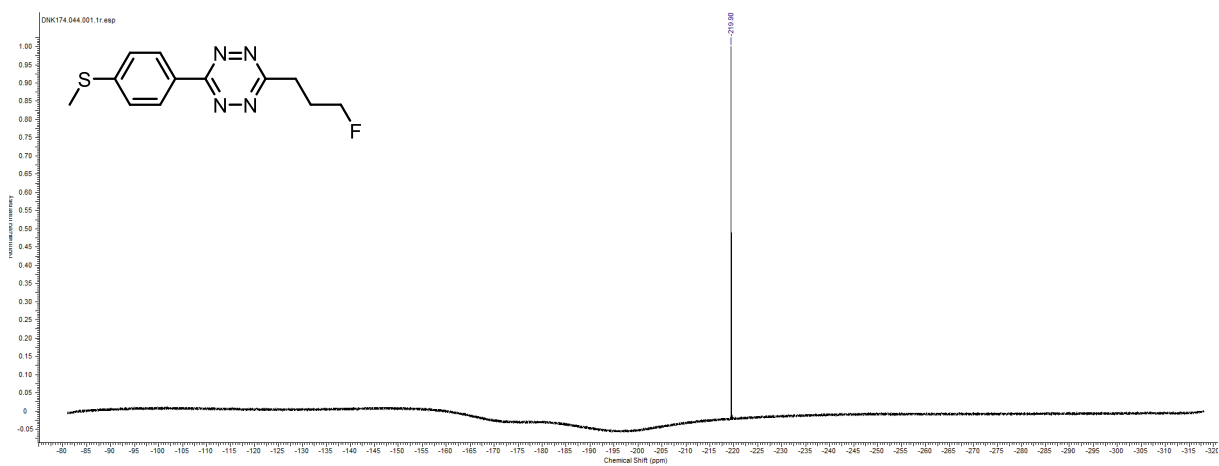
Compound **6**, ¹H NMR



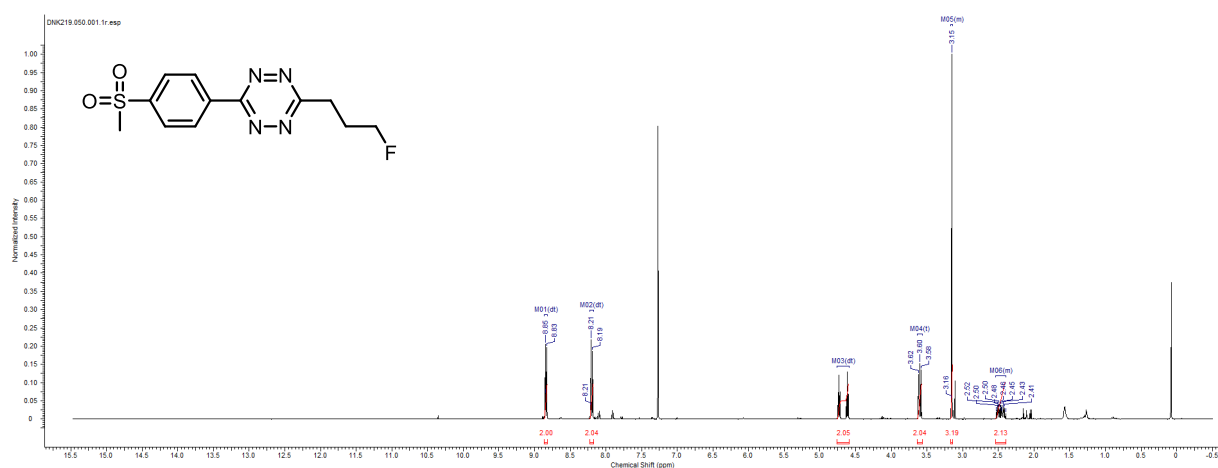
Compound **6**, ^{13}C NMR



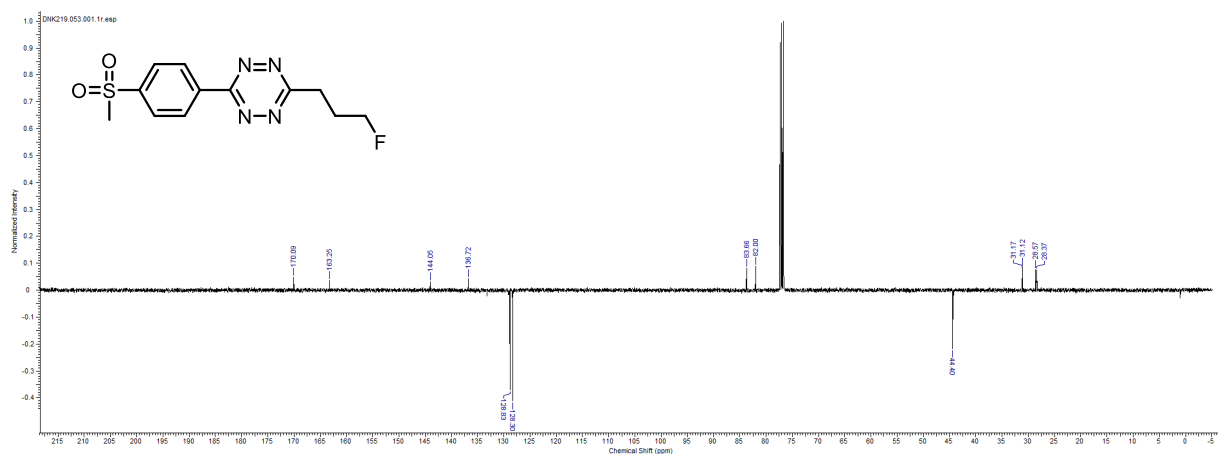
Compound **6**, ^{19}F NMR



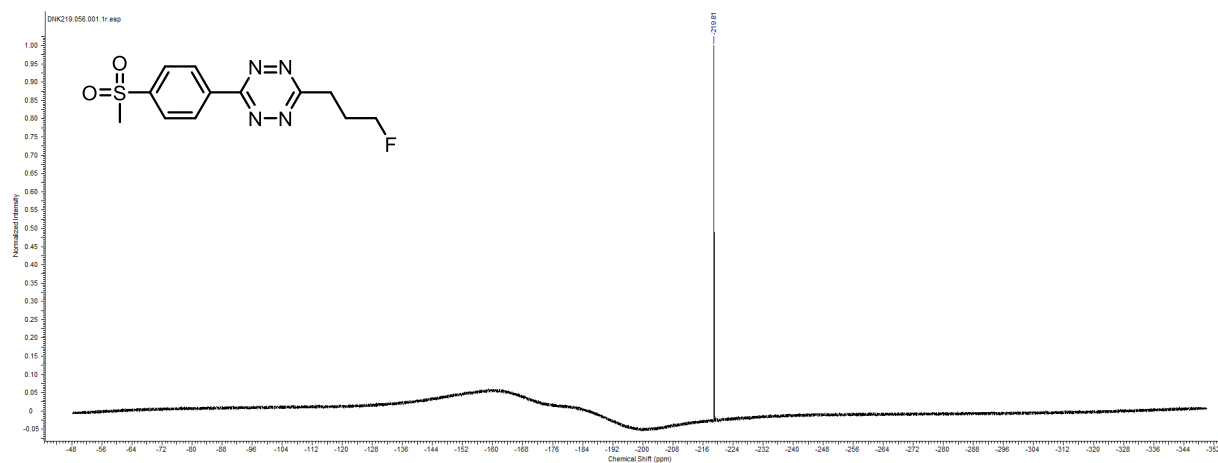
Compound **7**, ^1H NMR



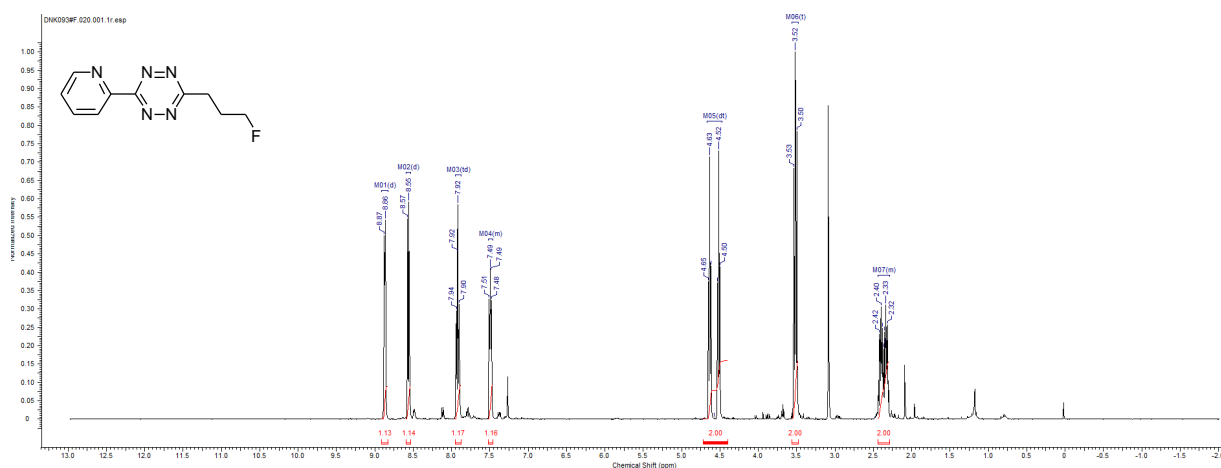
Compound **7**, ^{13}C NMR (APT)



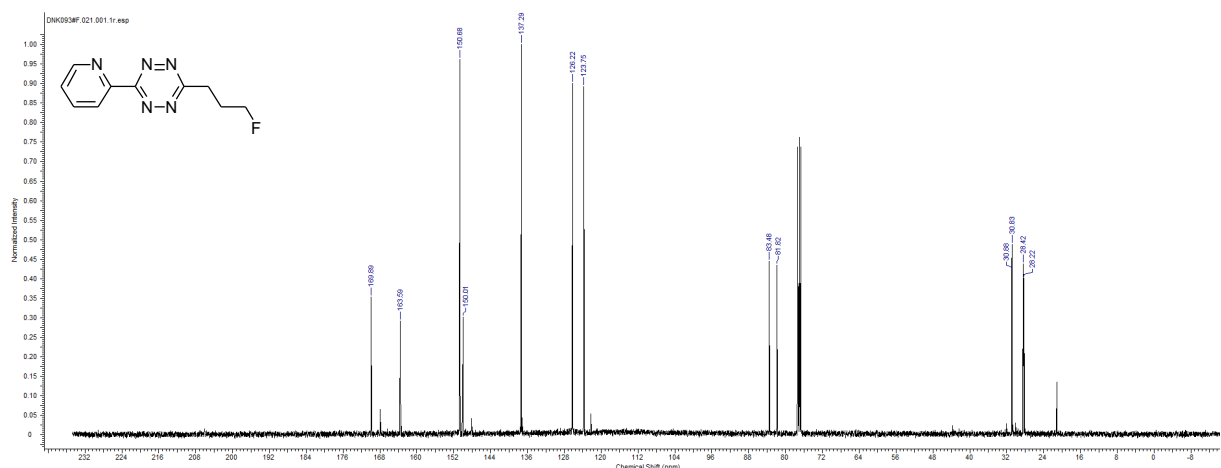
Compound **7**, ^{19}F NMR



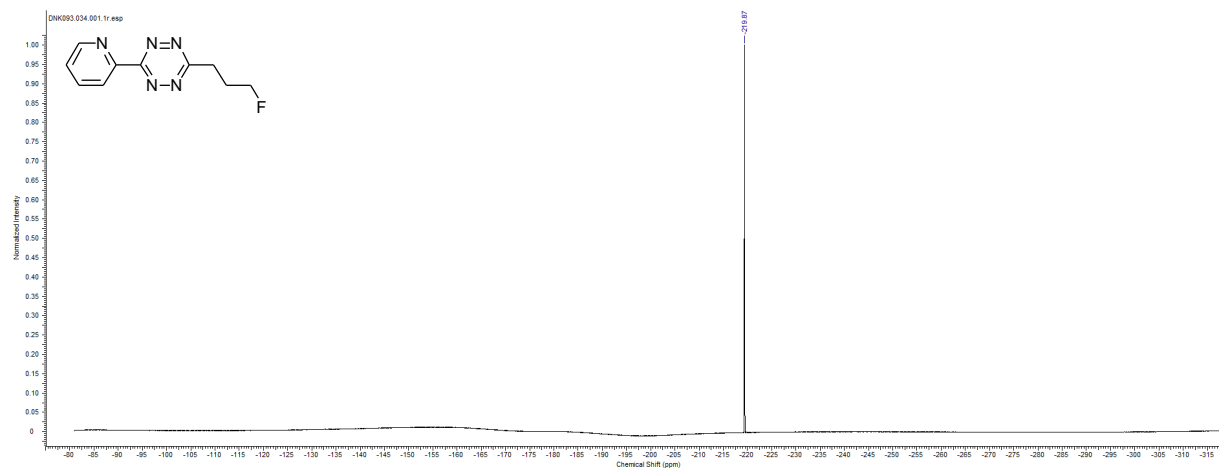
Compound **8**, ^1H NMR



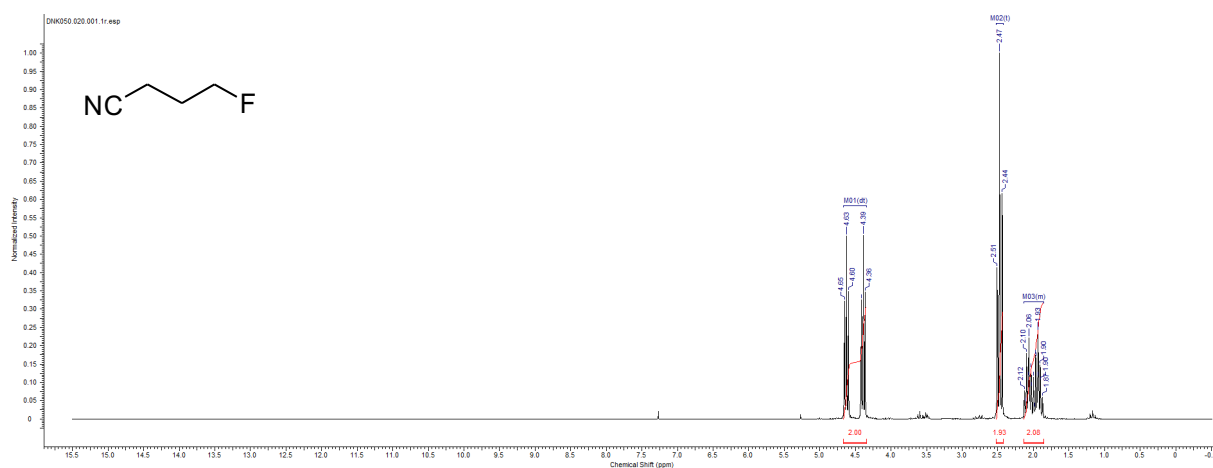
Compound **8**, ^{13}C NMR



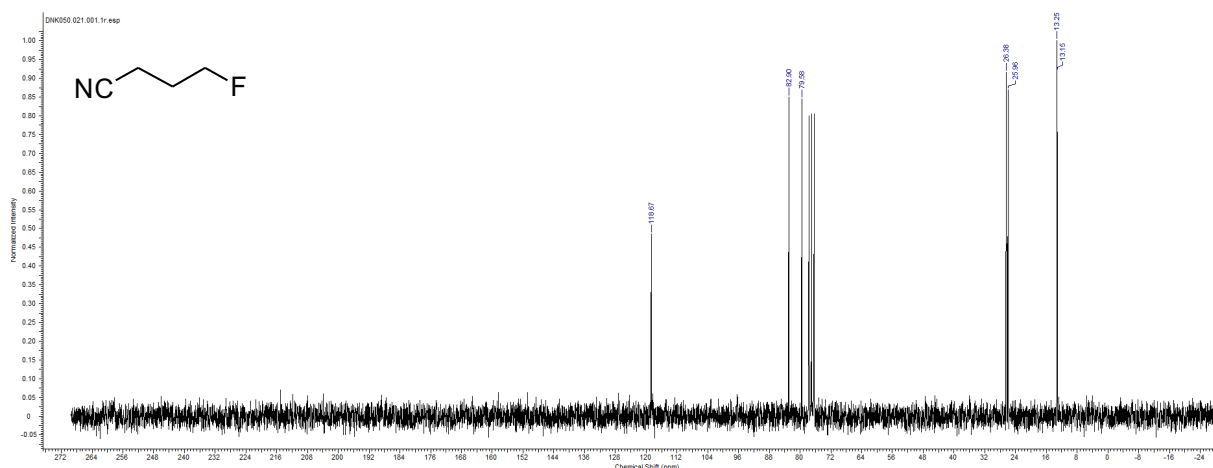
Compound **8**, ^{19}F NMR



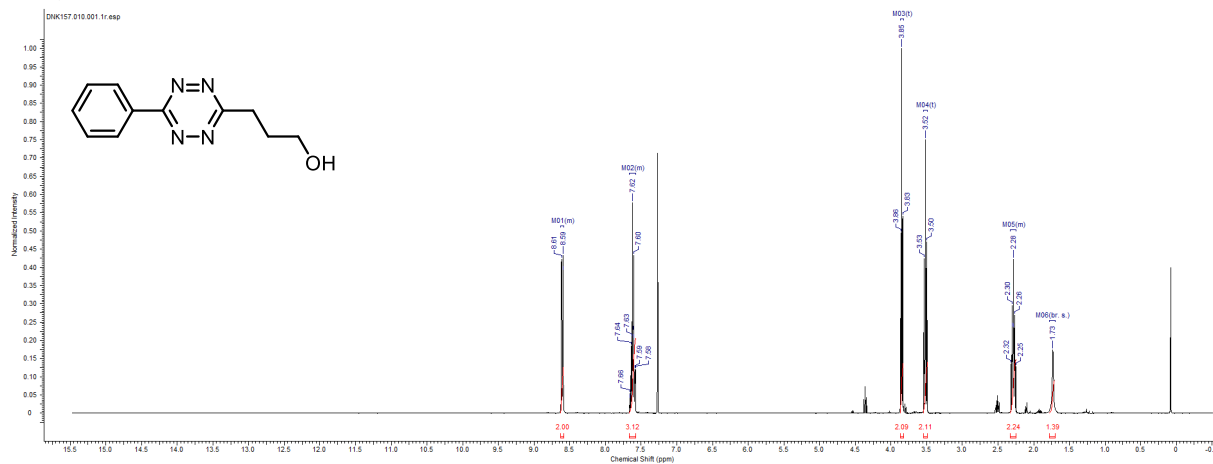
Compound 9, ¹H NMR



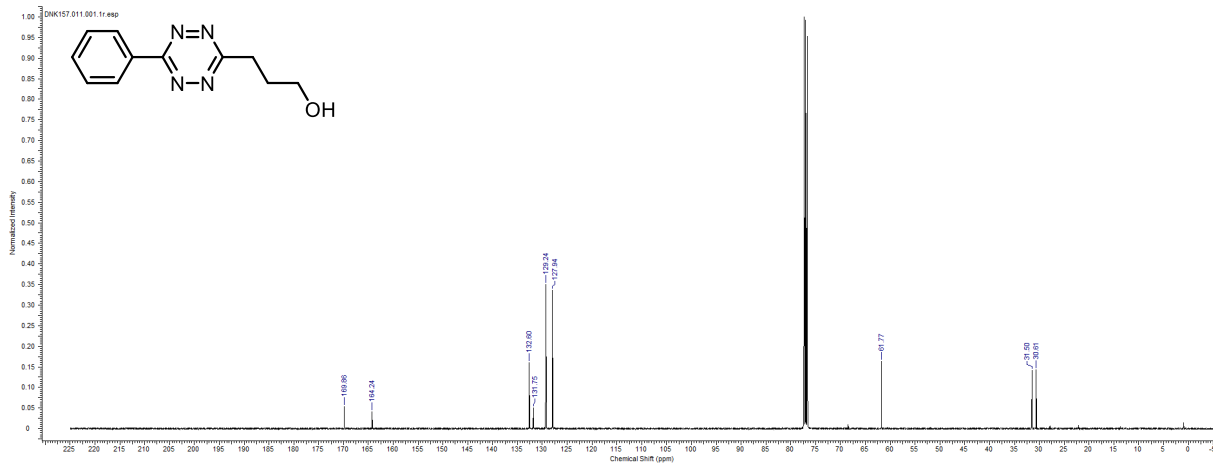
Compound 9, ¹³C NMR



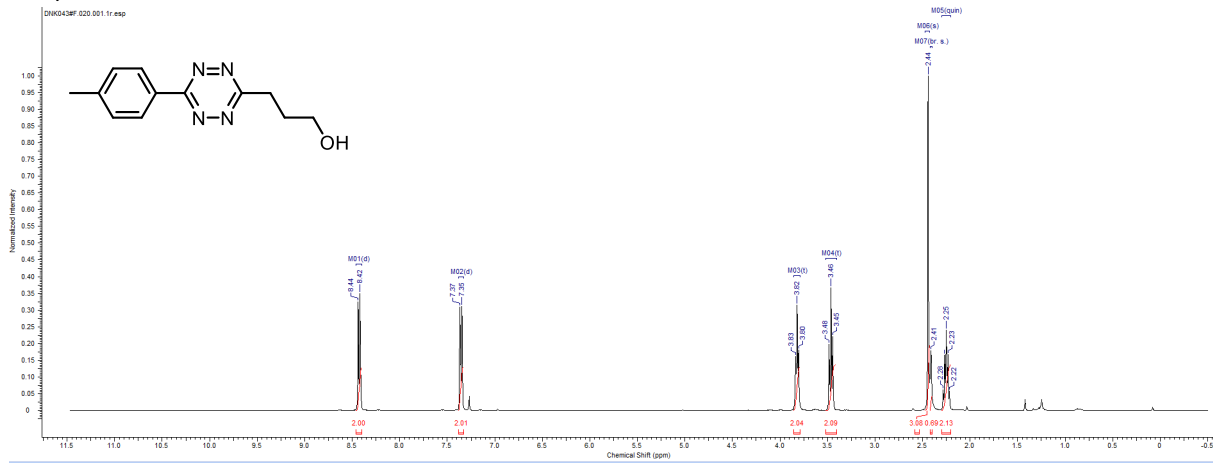
Compound 11, ¹H NMR



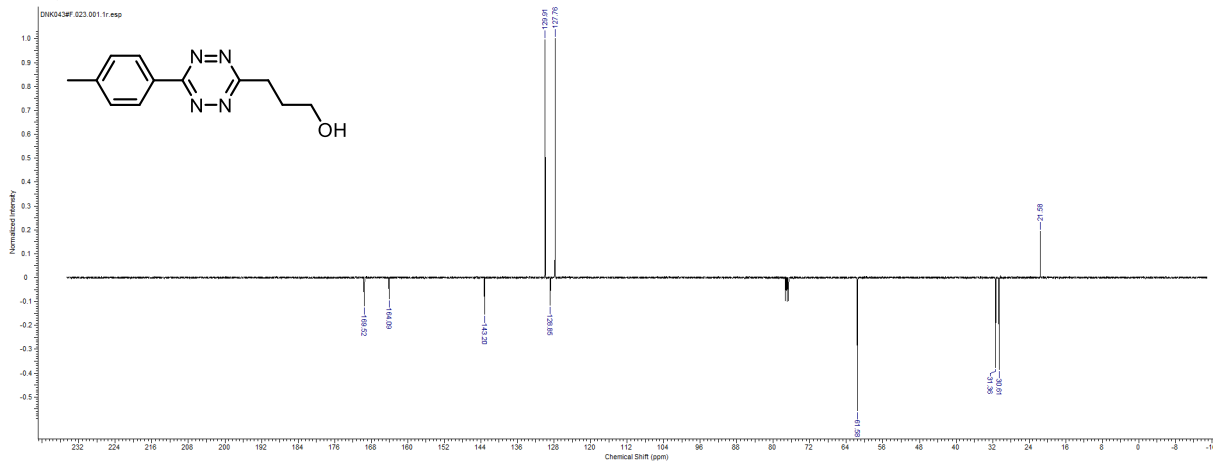
Compound **11**, ¹³C NMR



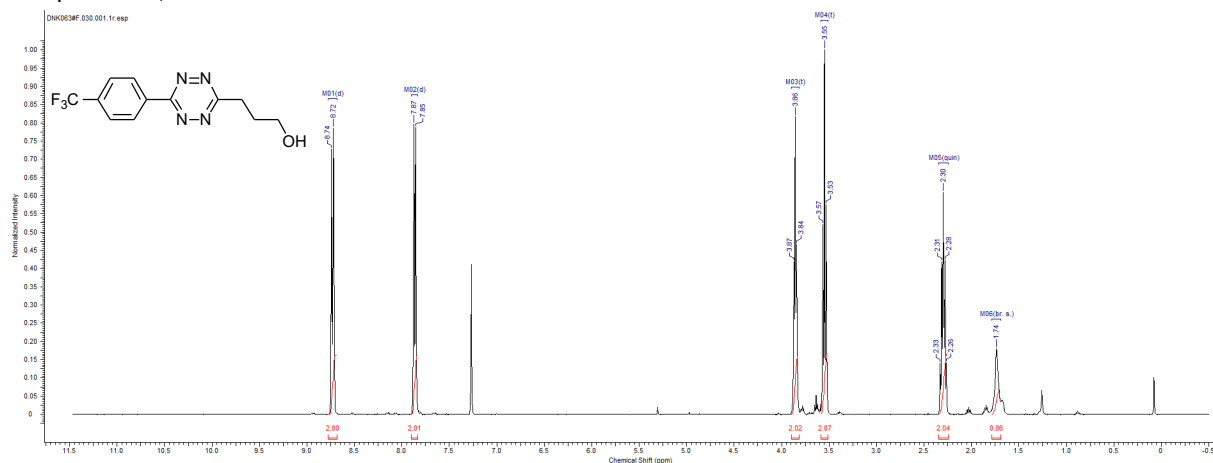
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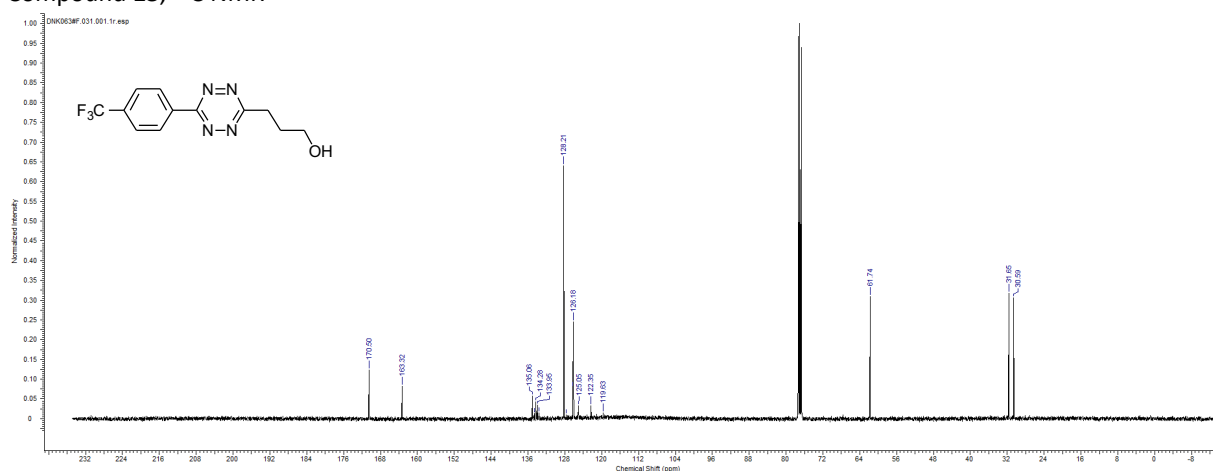
Compound **12**, ¹H NMR



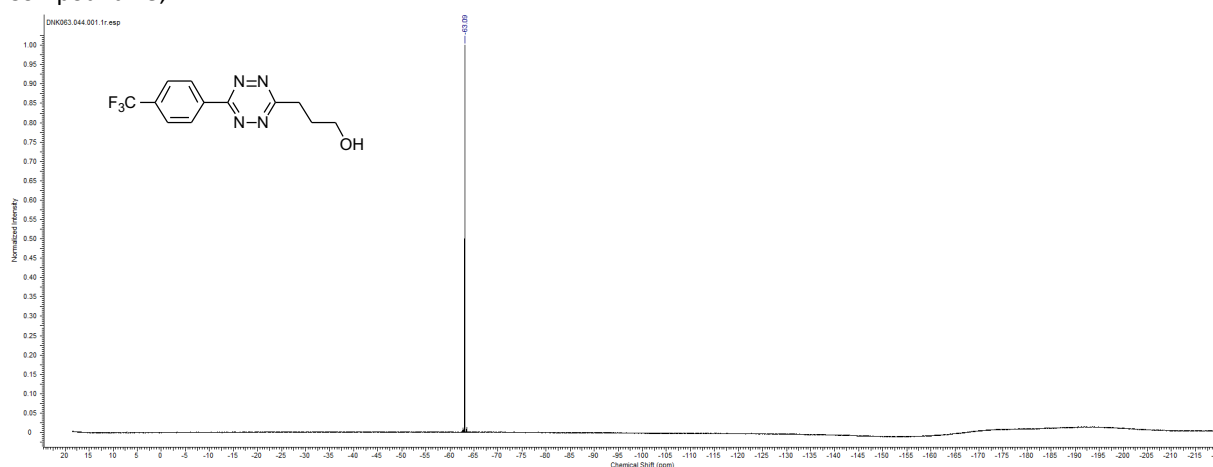
Compound **13**, ^1H NMR



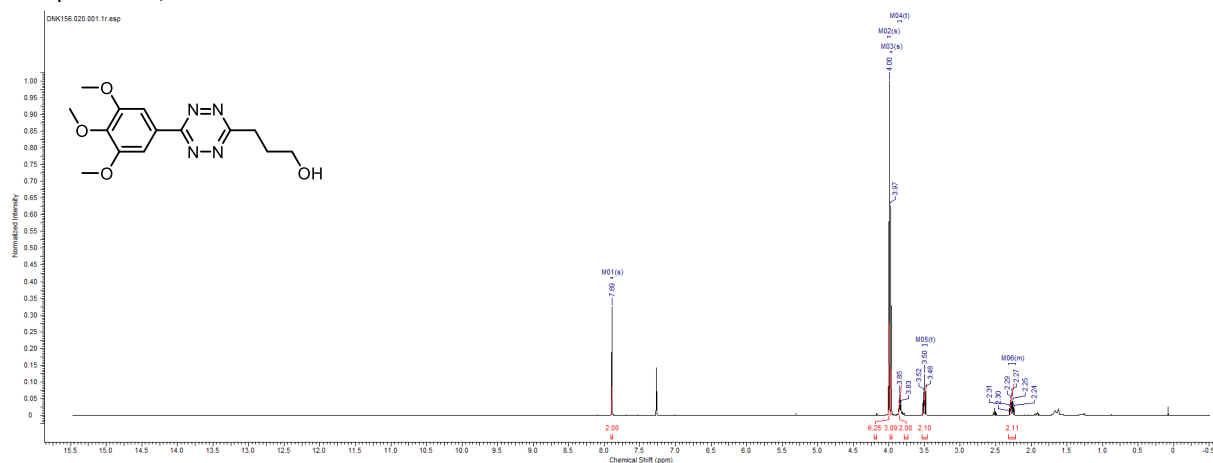
Compound **13**, ^{13}C NMR



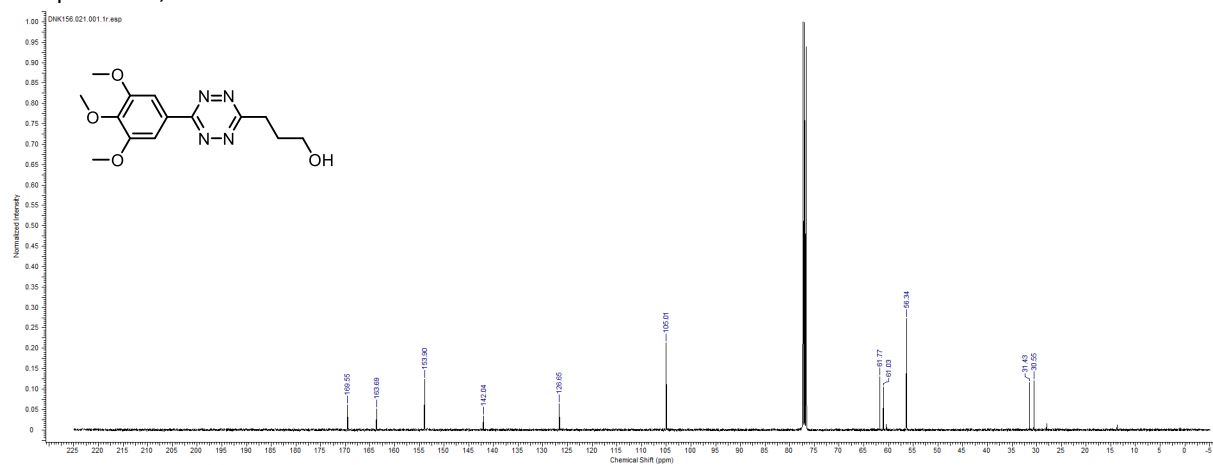
Compound **13**, ^{19}F NMR



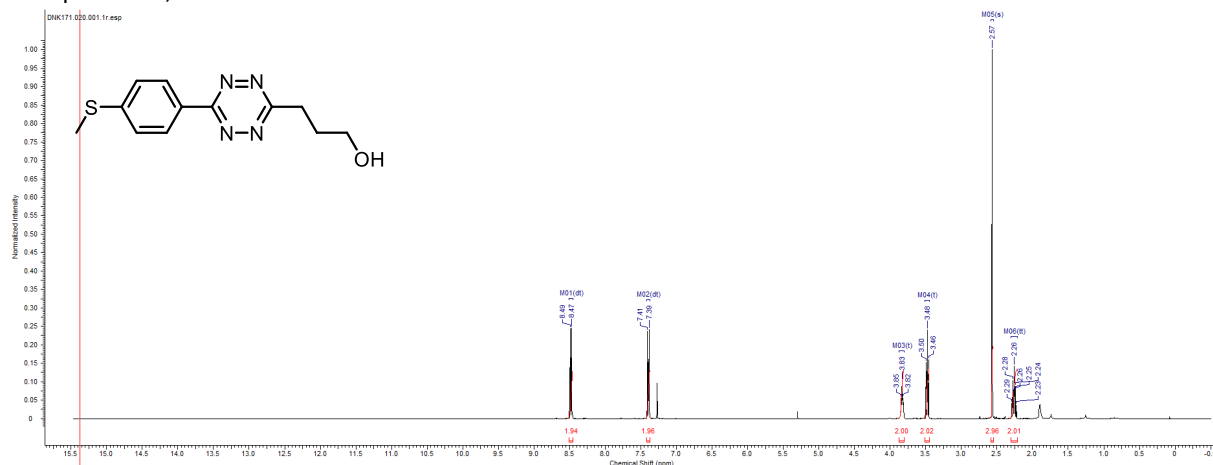
Compound 14, ¹H NMR



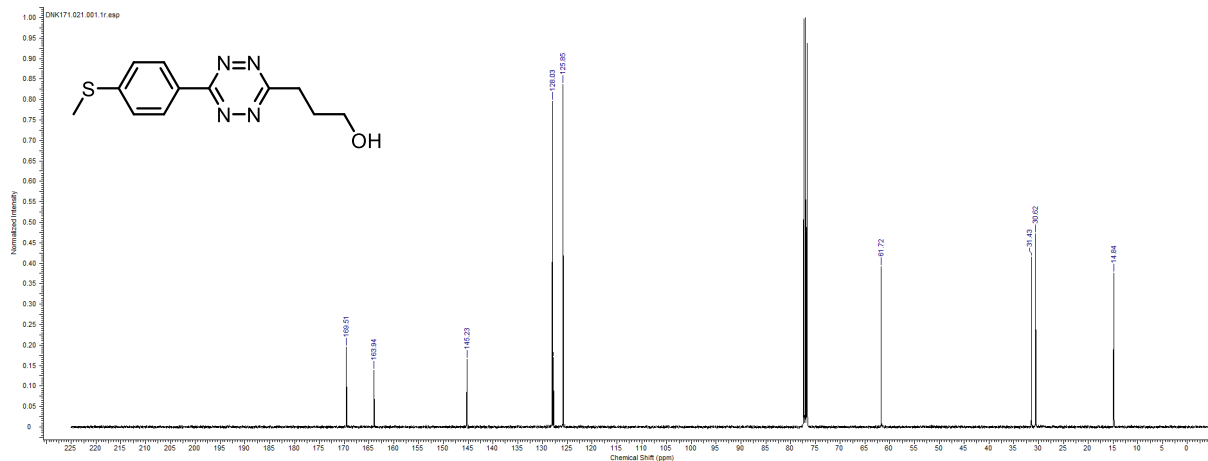
Compound 14, ¹³C NMR



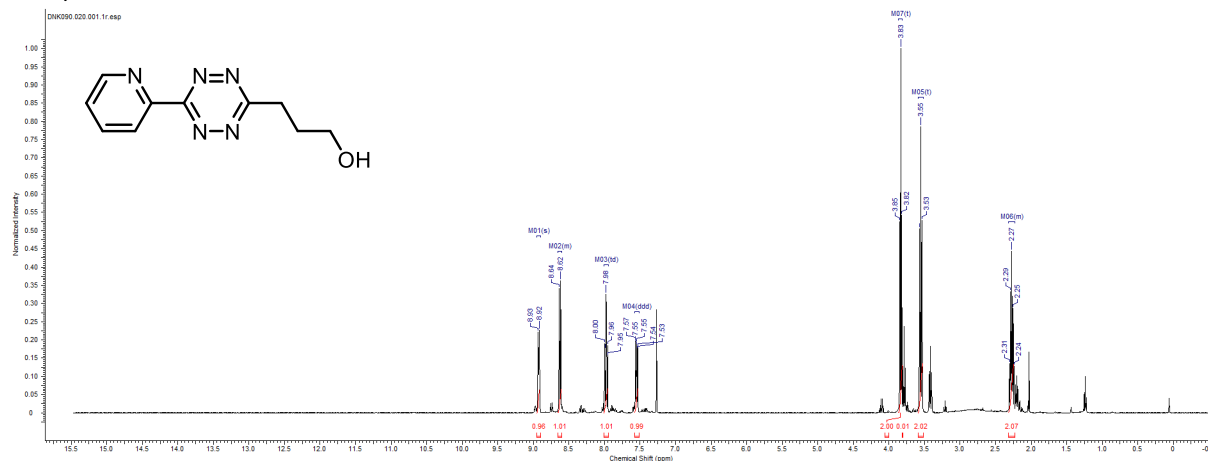
Compound 15, ¹H NMR



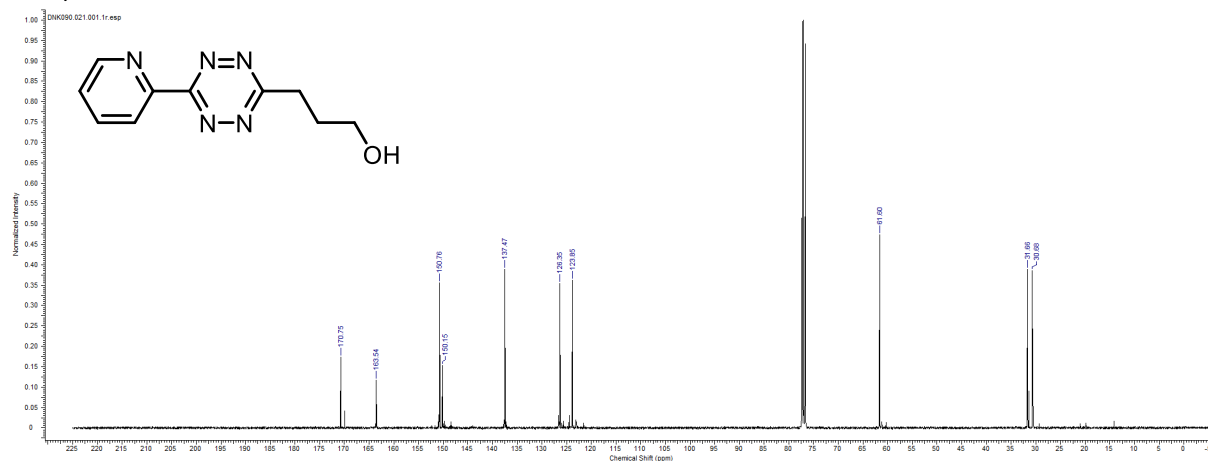
Compound **15**, ^{13}C NMR



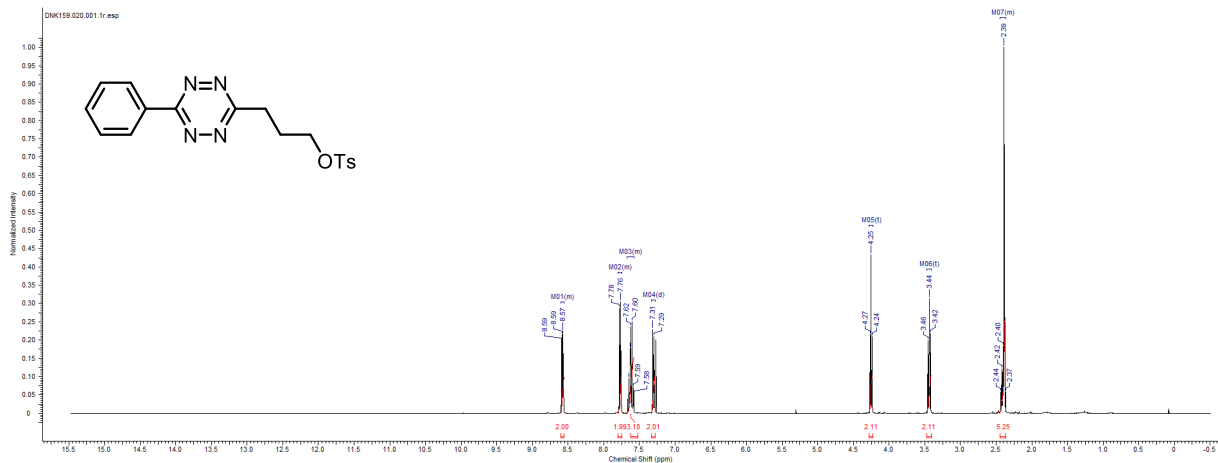
Compound **16**, ^1H NMR



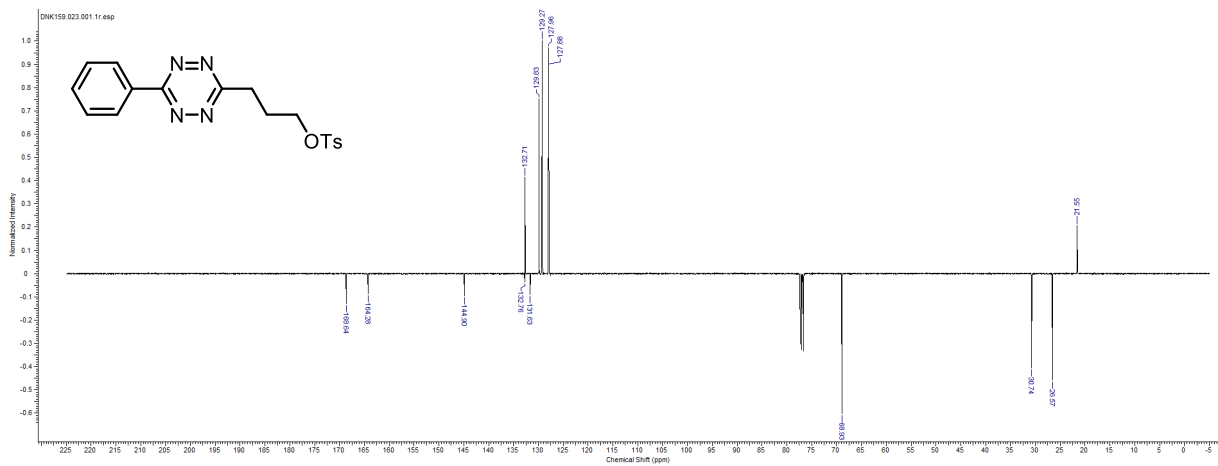
Compound **16**, ^{13}C NMR



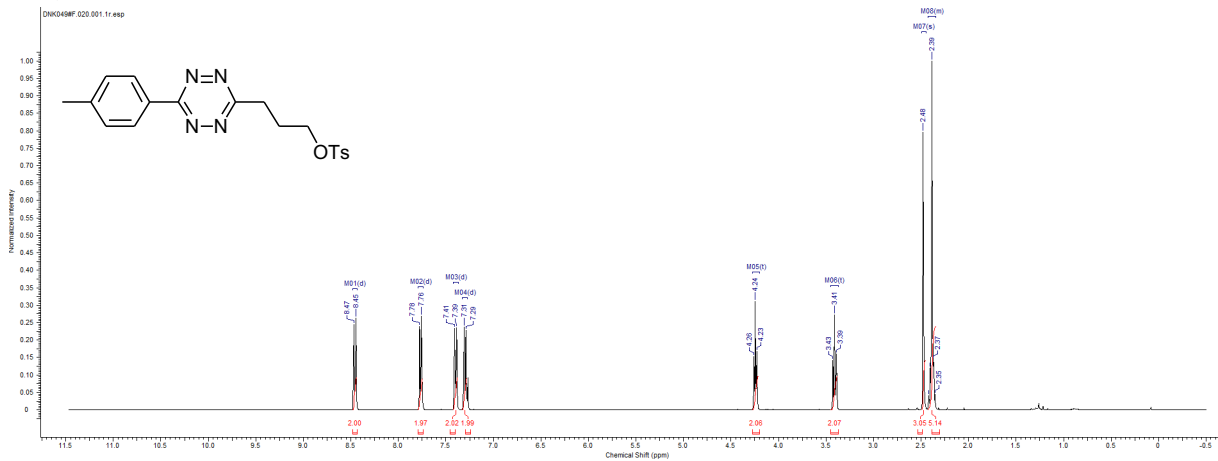
Compound **17**, ¹H NMR



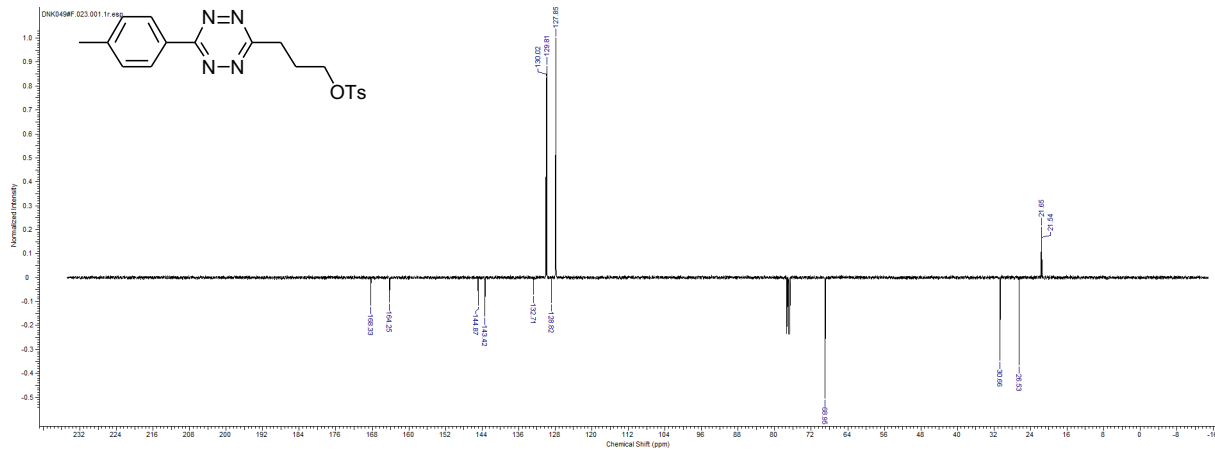
Compound **17**, ¹³C NMR (APT)



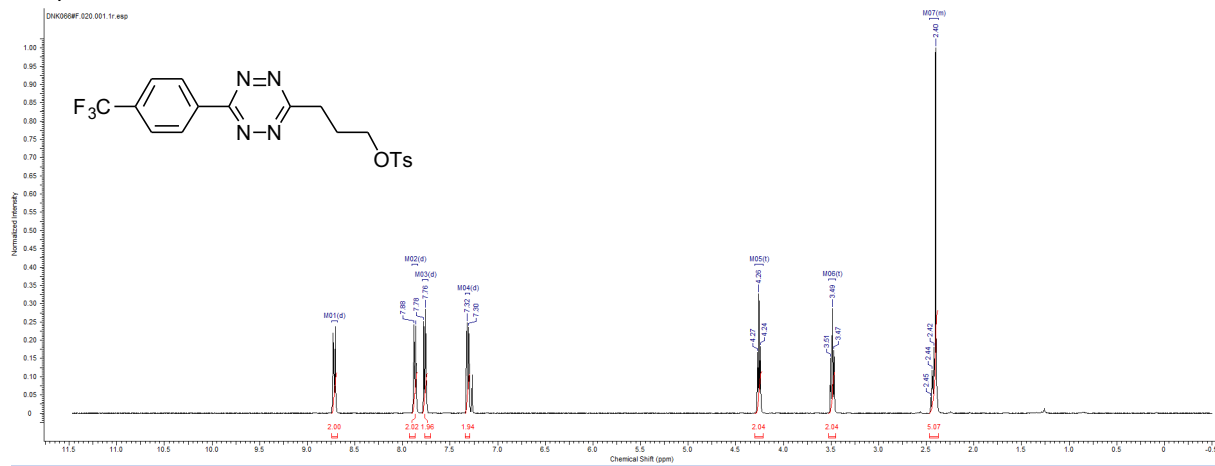
Compound **18**, ¹H NMR



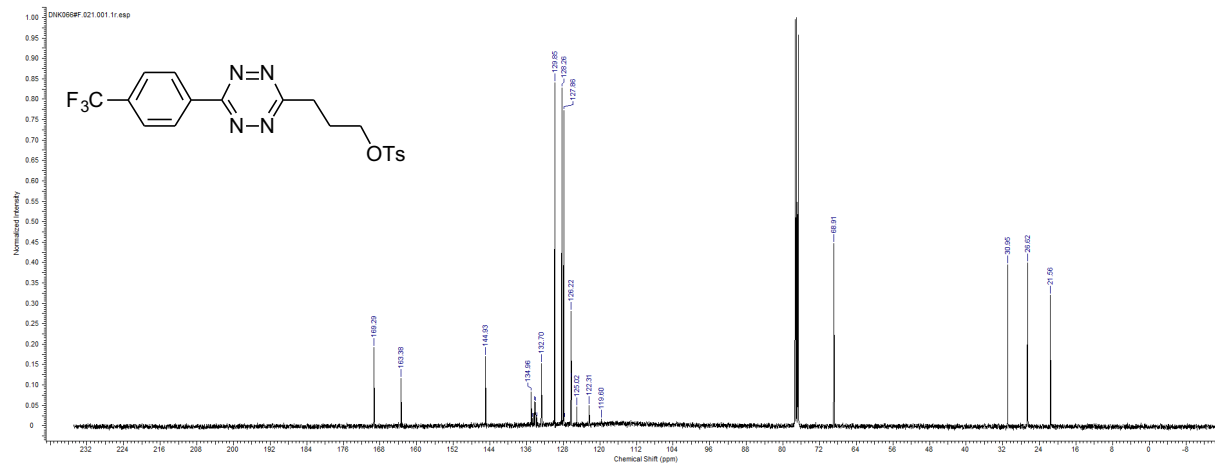
Compound **18**, ¹³C NMR (APT)



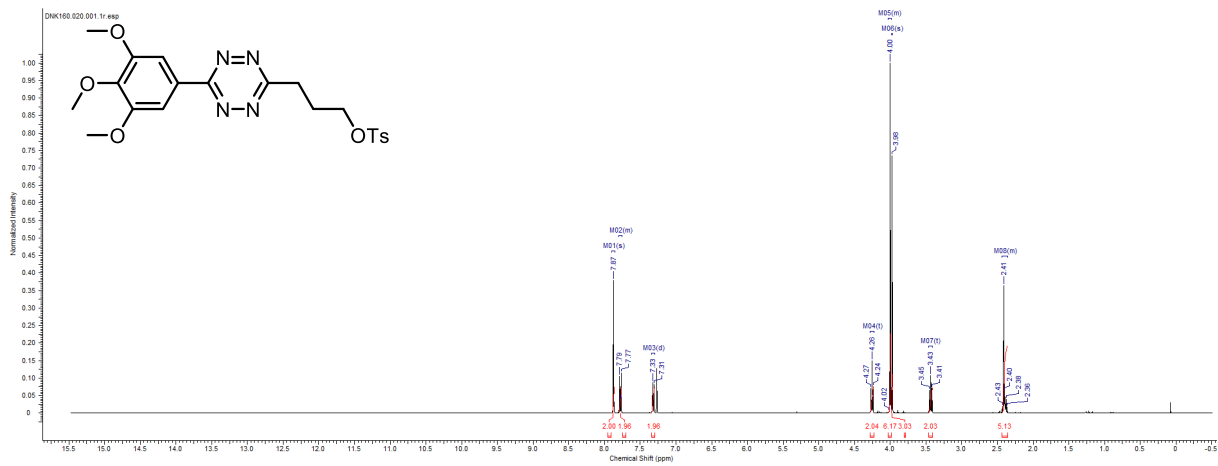
Compound **19**, ¹H NMR



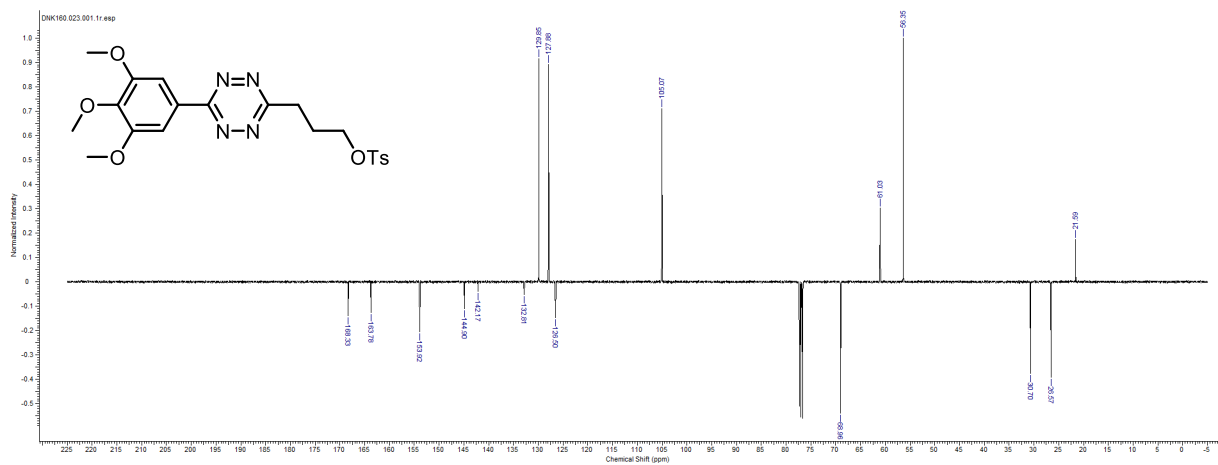
Compound **19**, ¹³C NMR



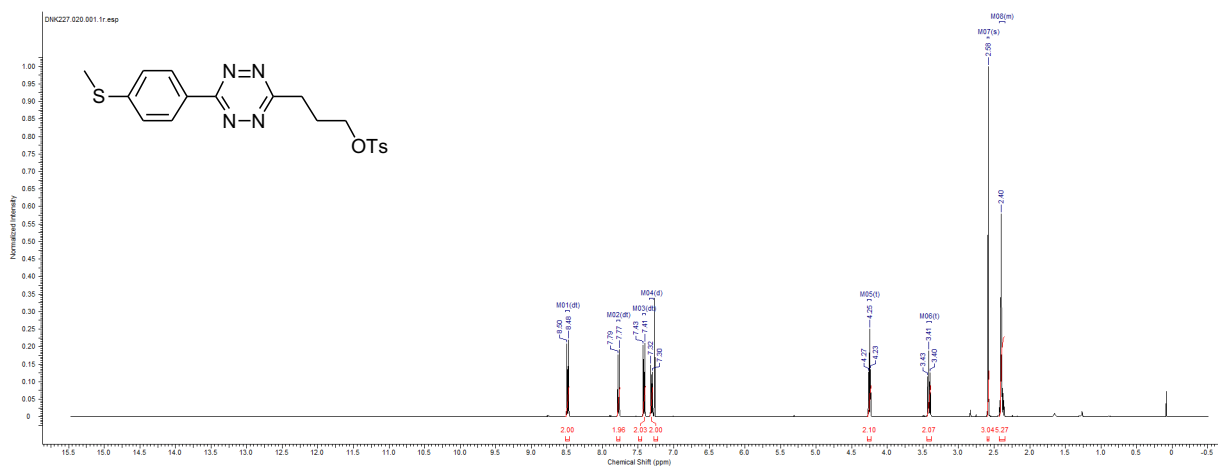
Compound **20**, ¹H NMR



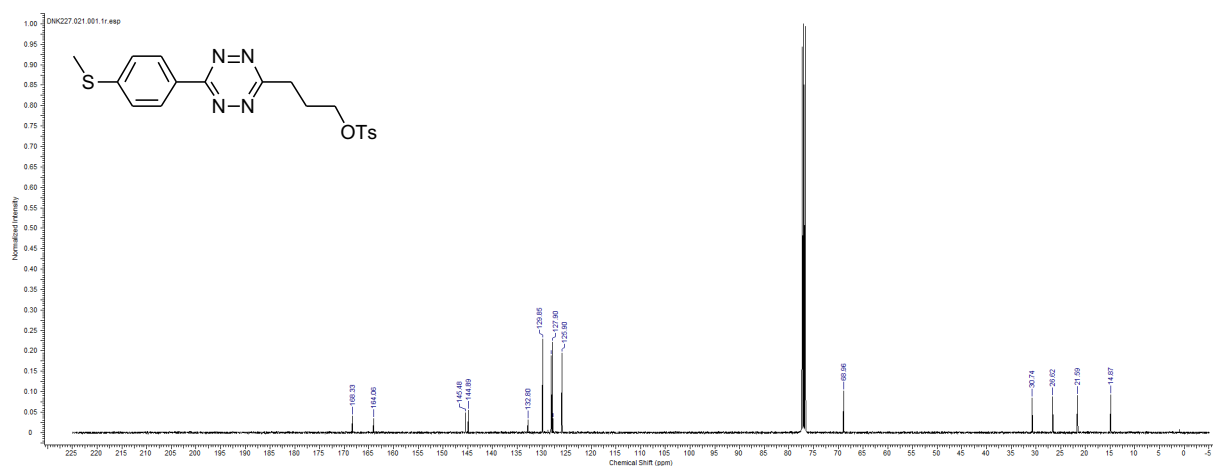
Compound **20**, ¹³C NMR (APT)



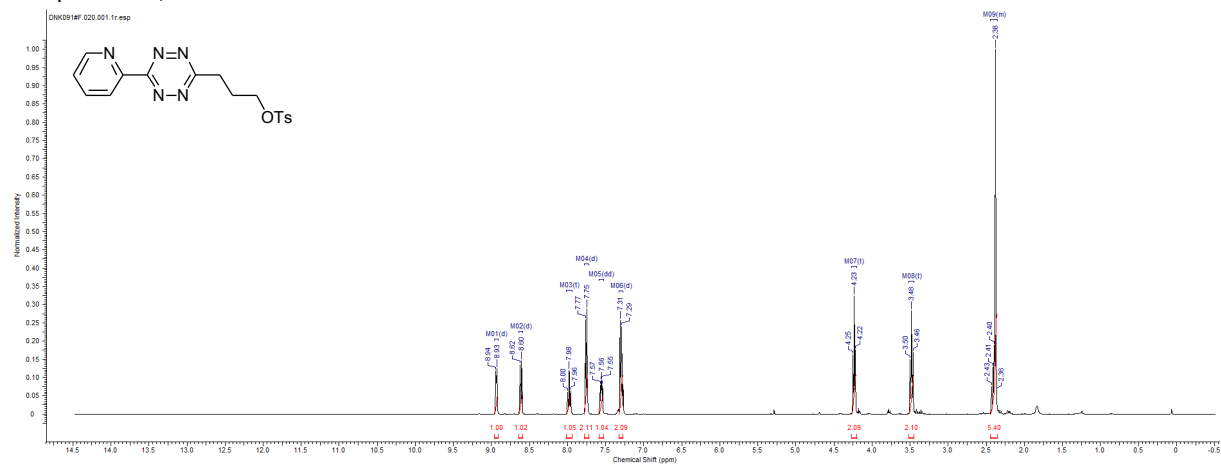
Compound **21**, ¹H NMR



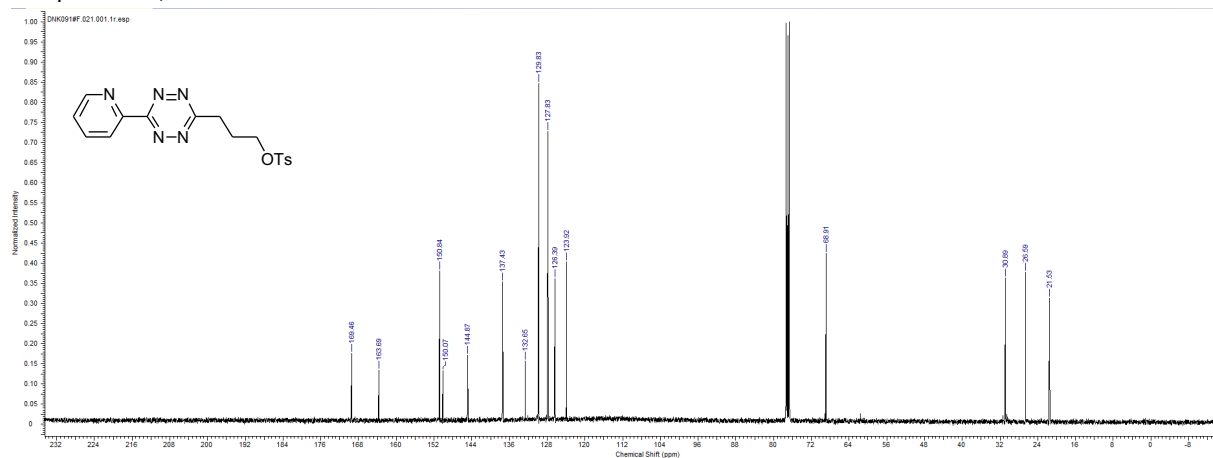
Compound **21**, ^{13}C NMR



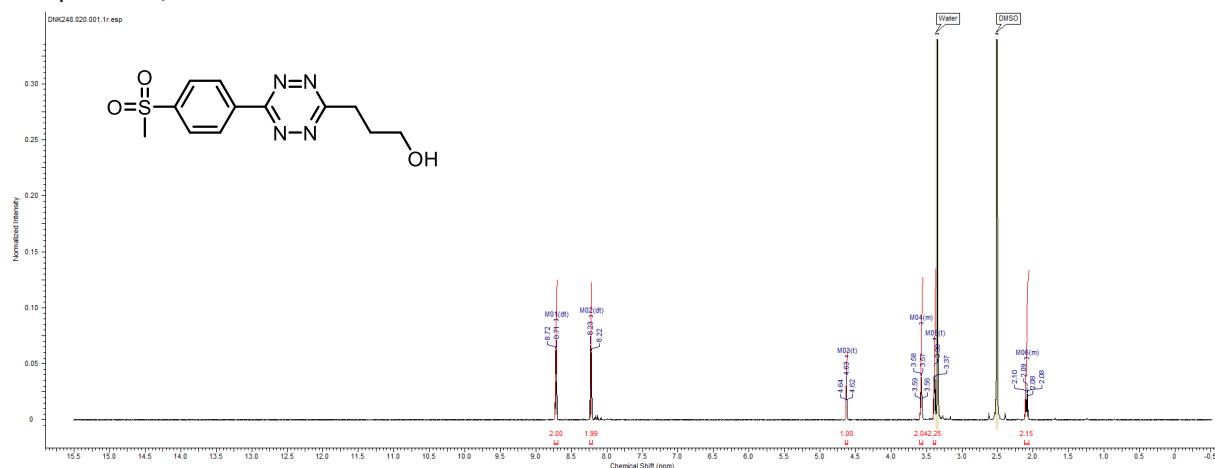
Compound **22**, ^1H NMR



Compound **22**, ^{13}C NMR



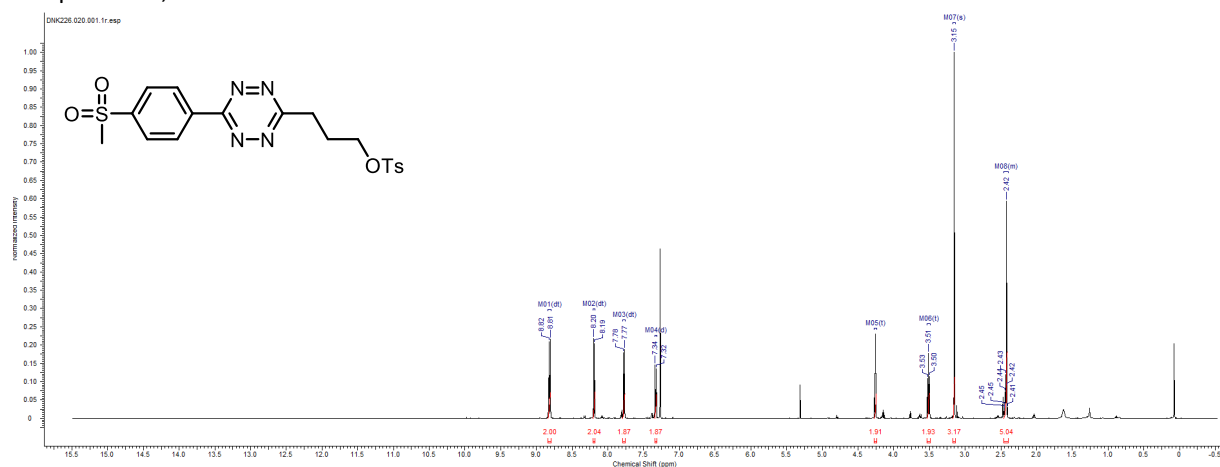
Compound **23**, ^1H NMR



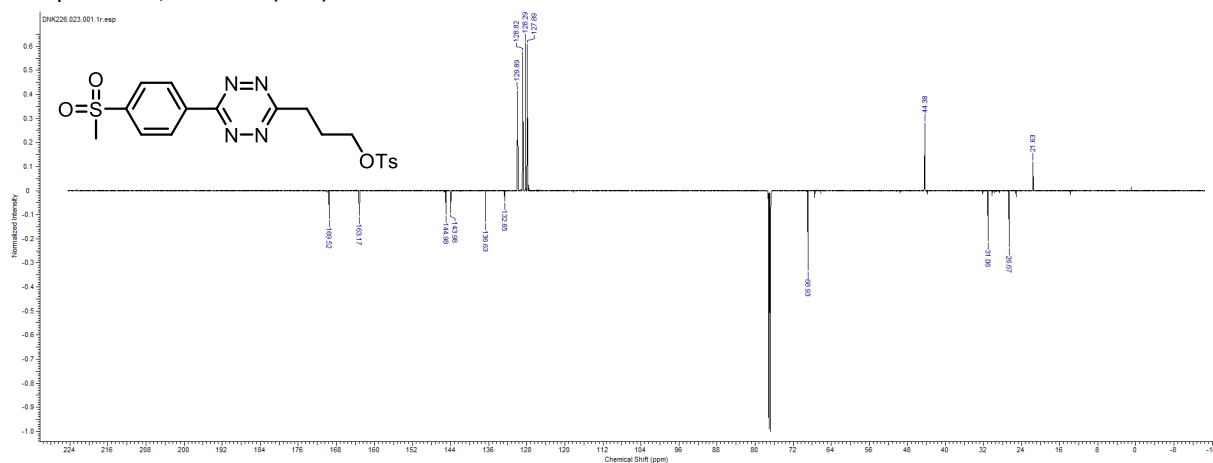
Compound **23**, ^{13}C NMR



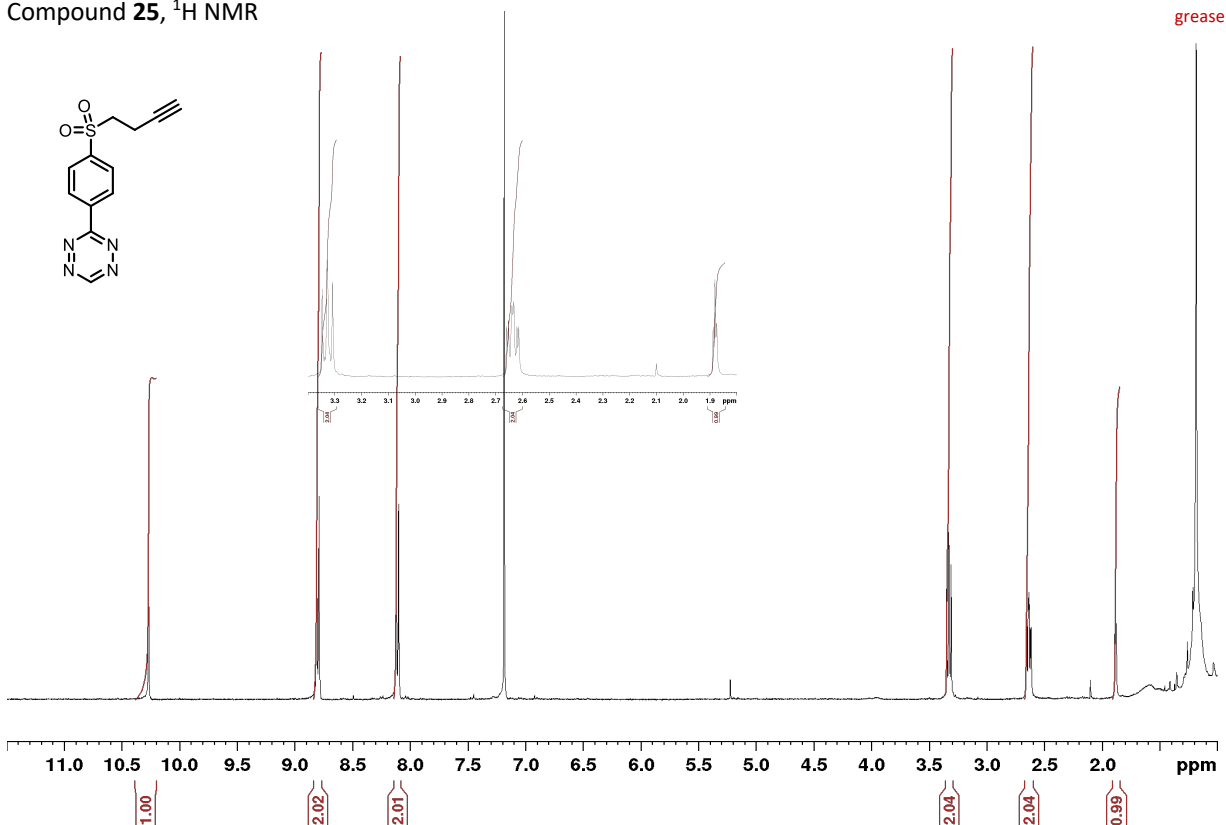
Compound **24**, ^1H NMR



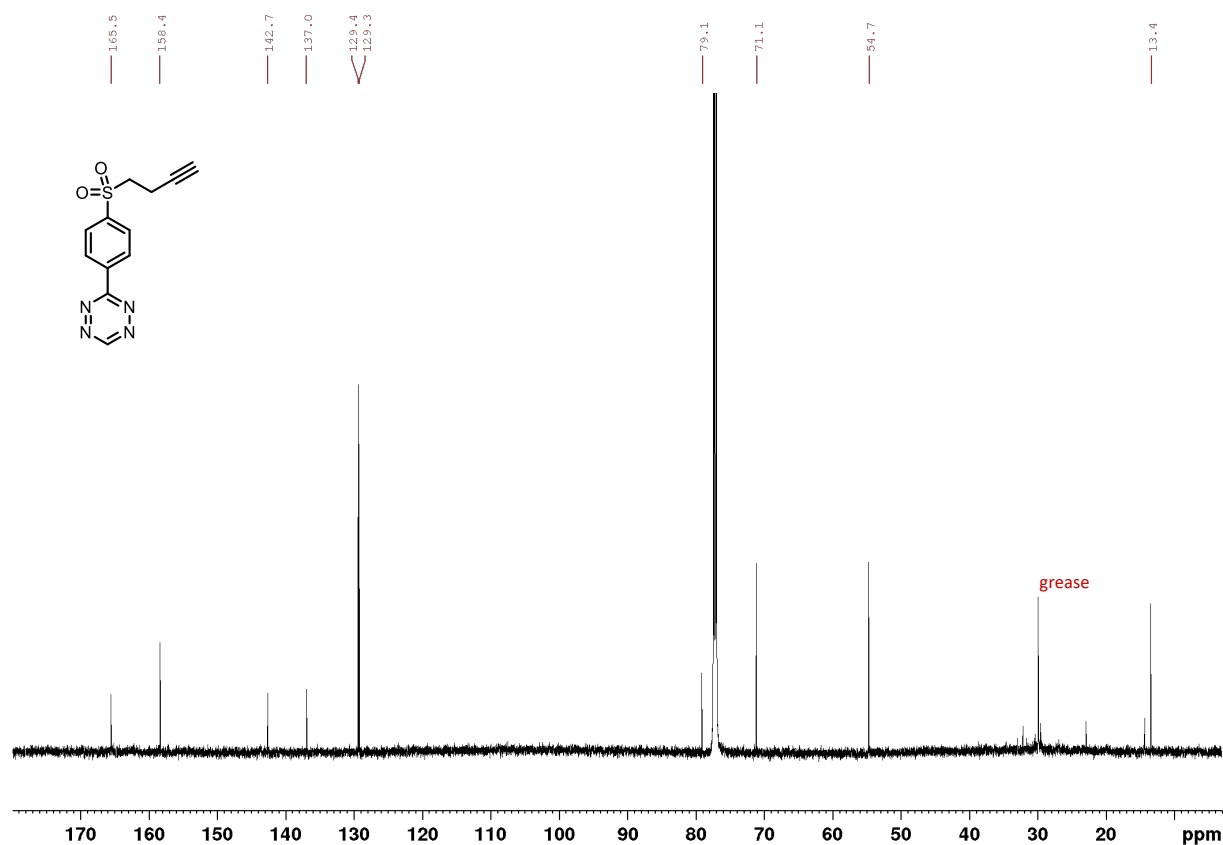
Compound **24**, ^{13}C NMR (APT)



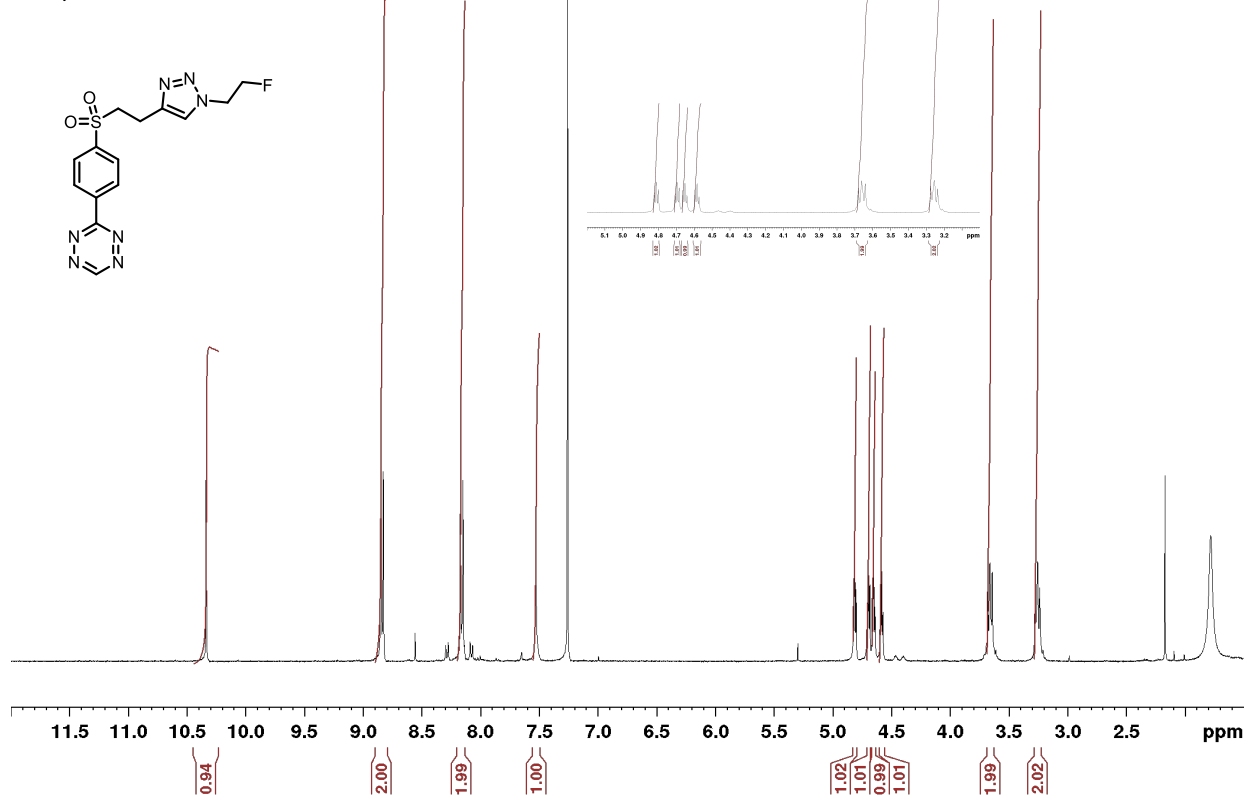
Compound **25**, ^1H NMR



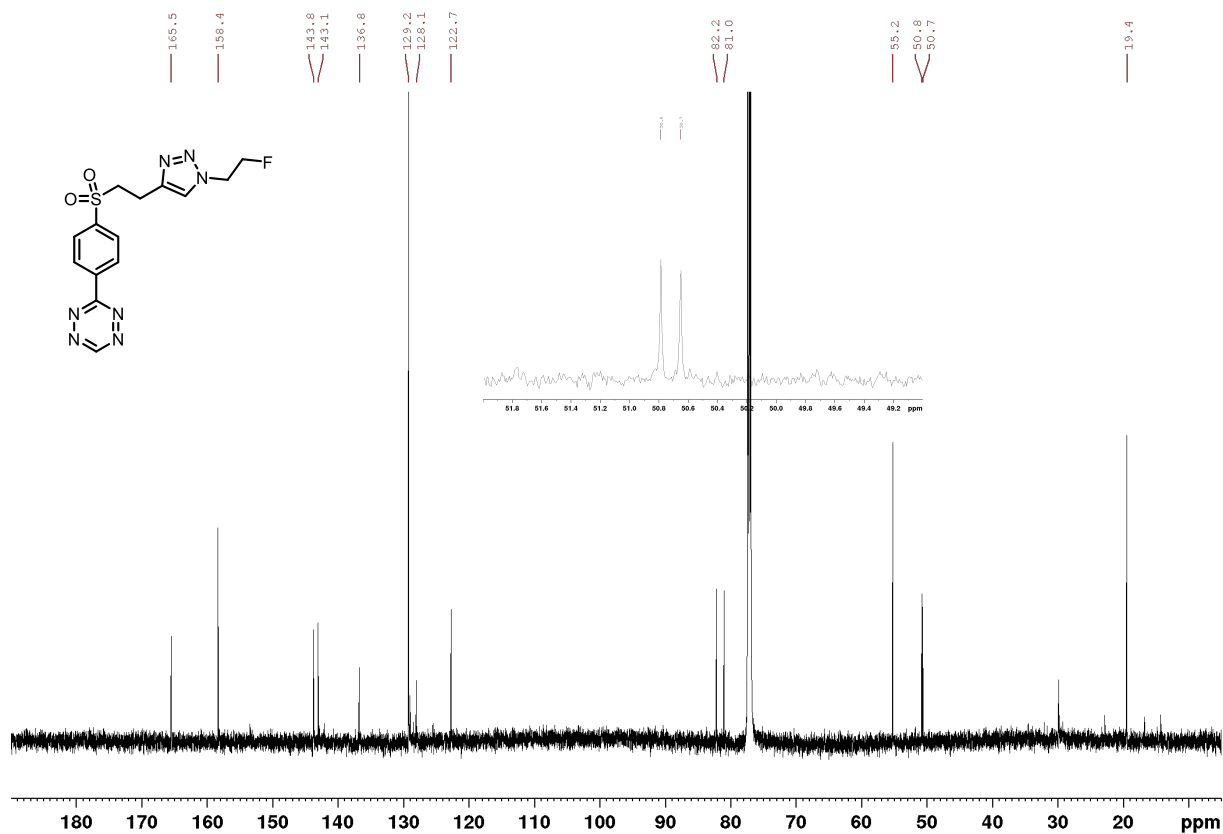
Compound **25**, ^{13}C NMR



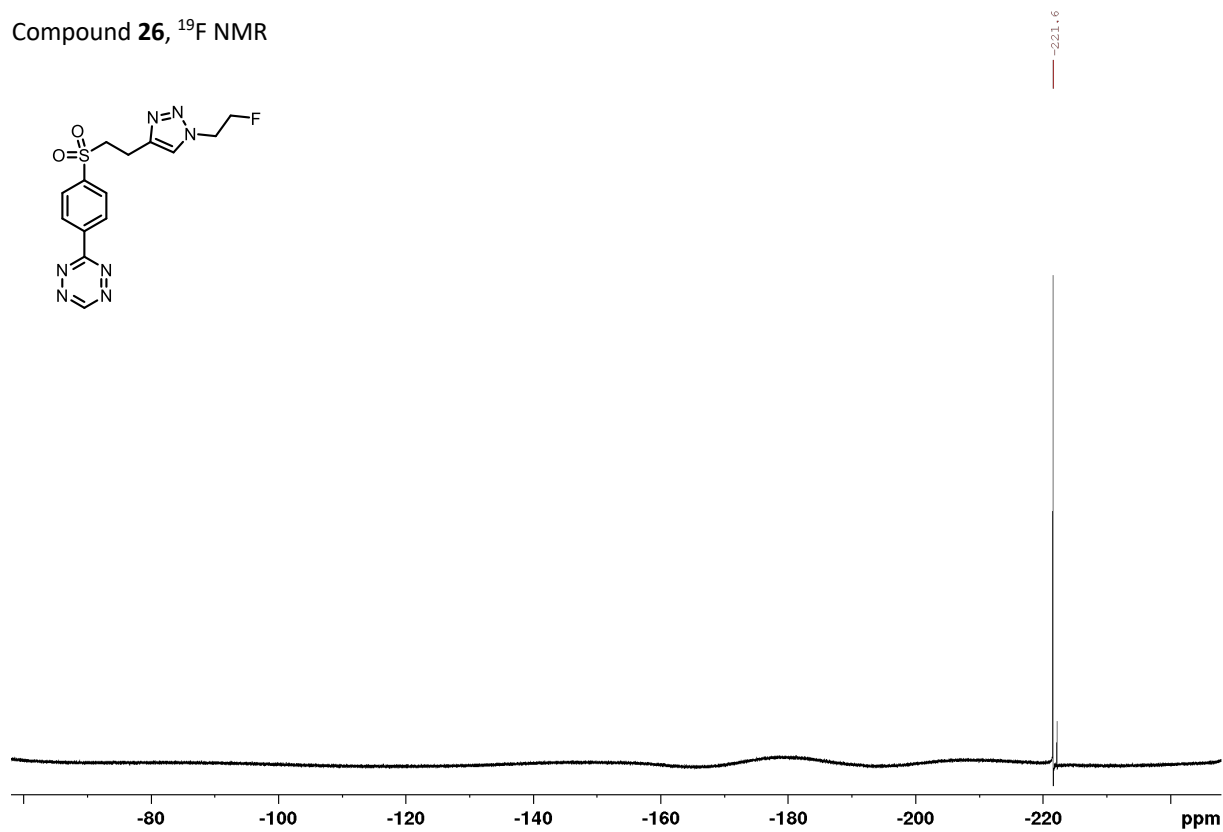
Compound **26**, ^1H NMR



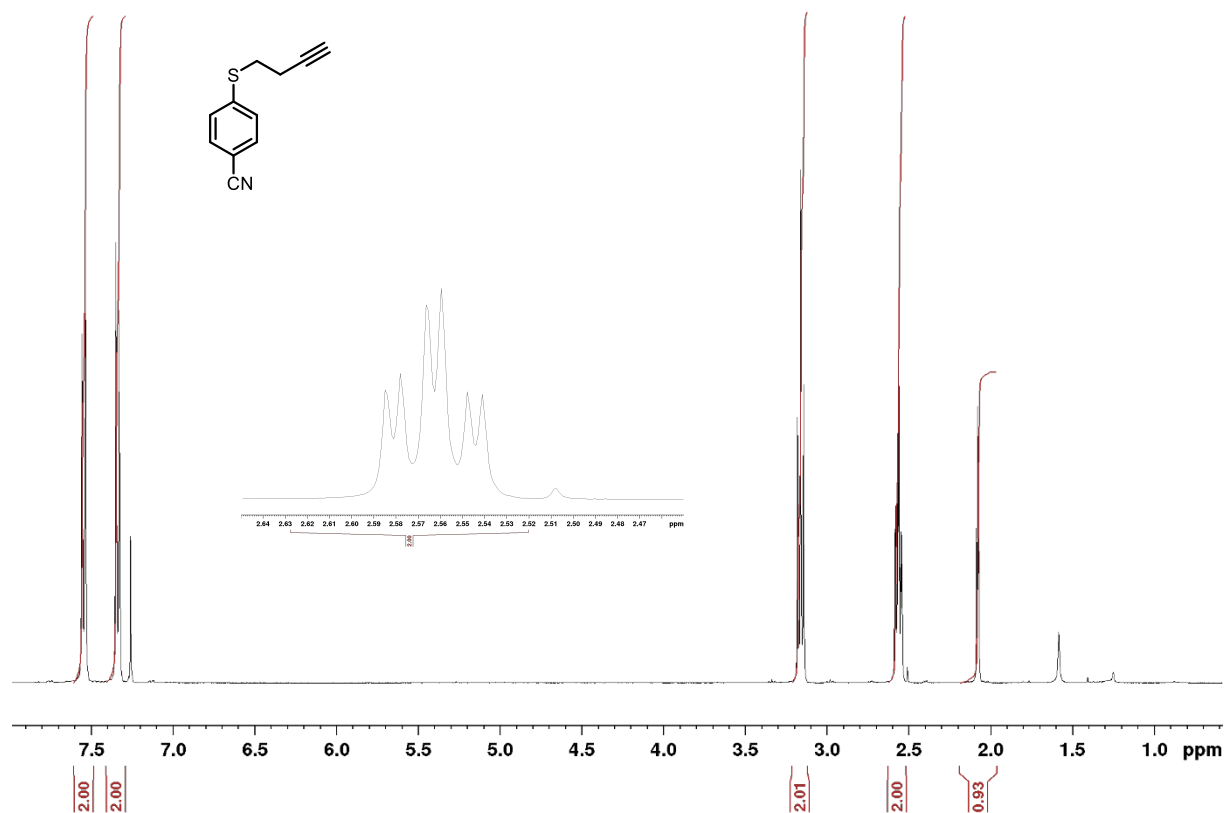
Compound **26**, ^{13}C NMR



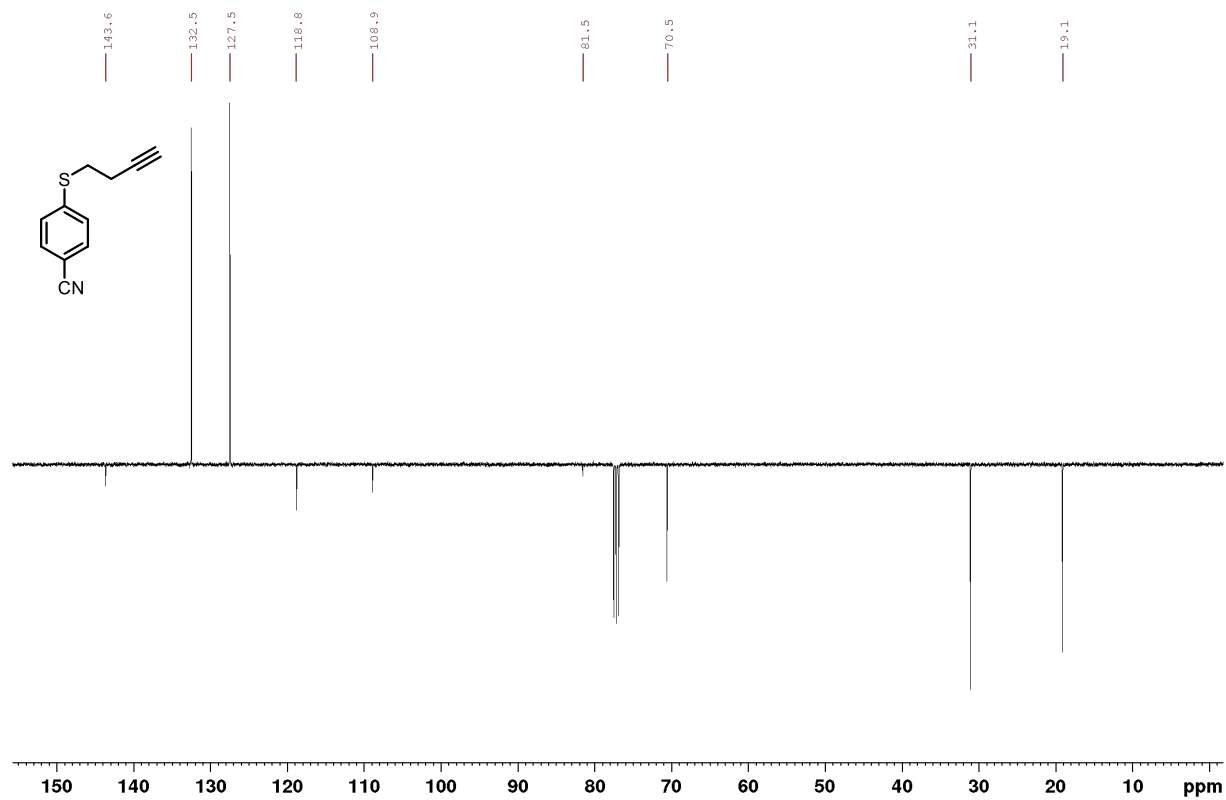
Compound **26**, ^{19}F NMR



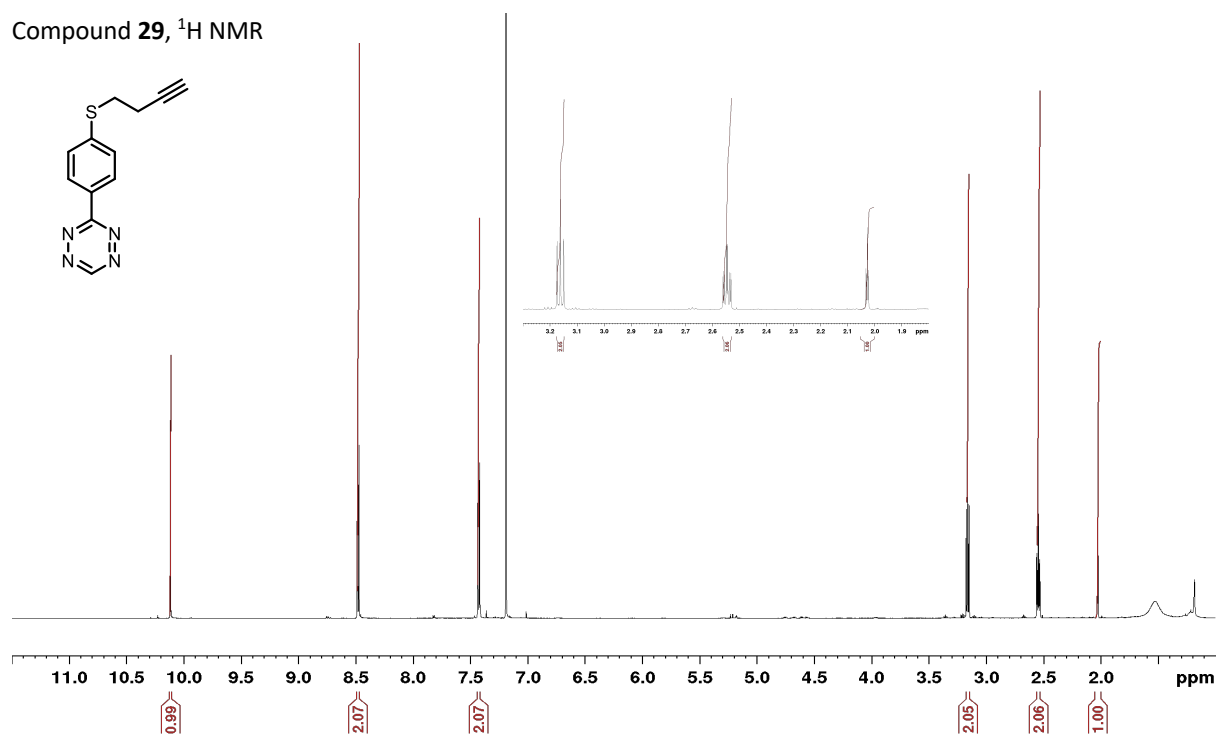
Compound **27**, ^1H NMR



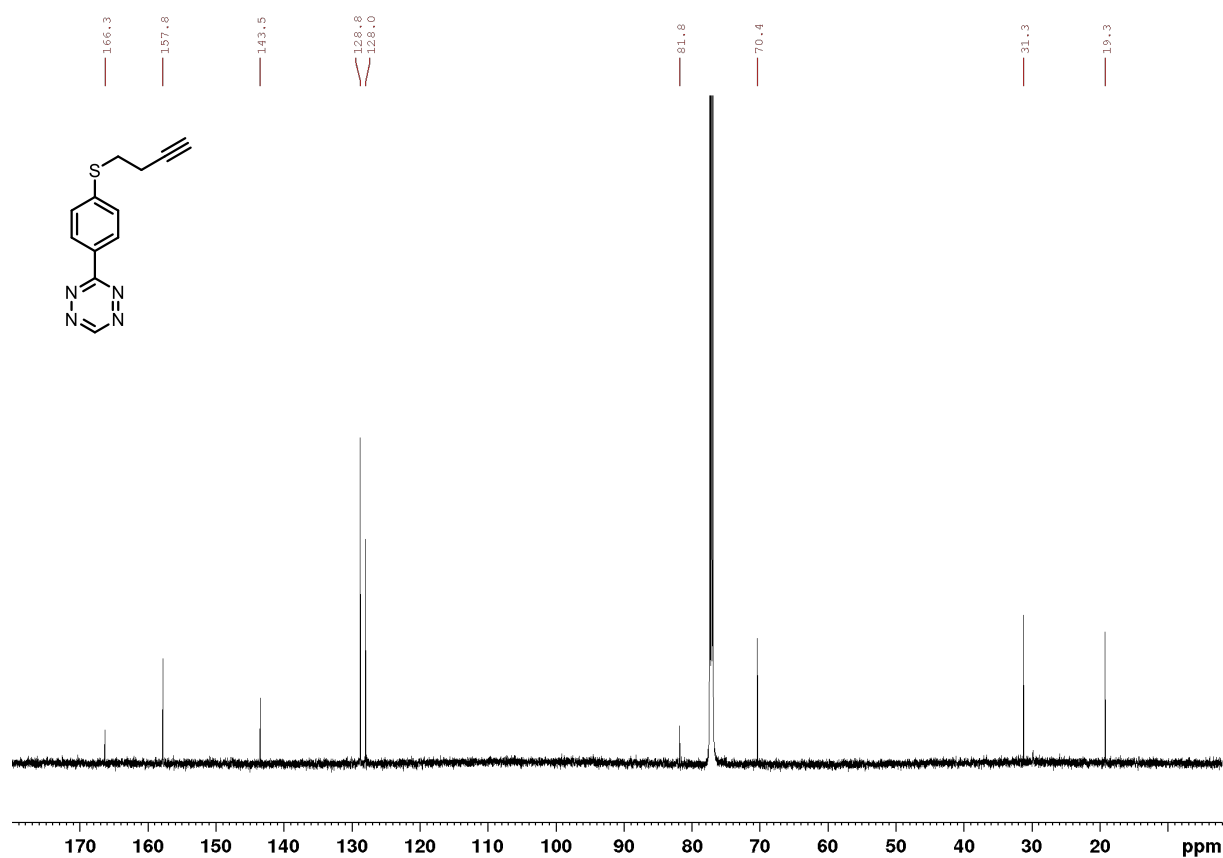
Compound **27**, ^{13}C NMR (APT)



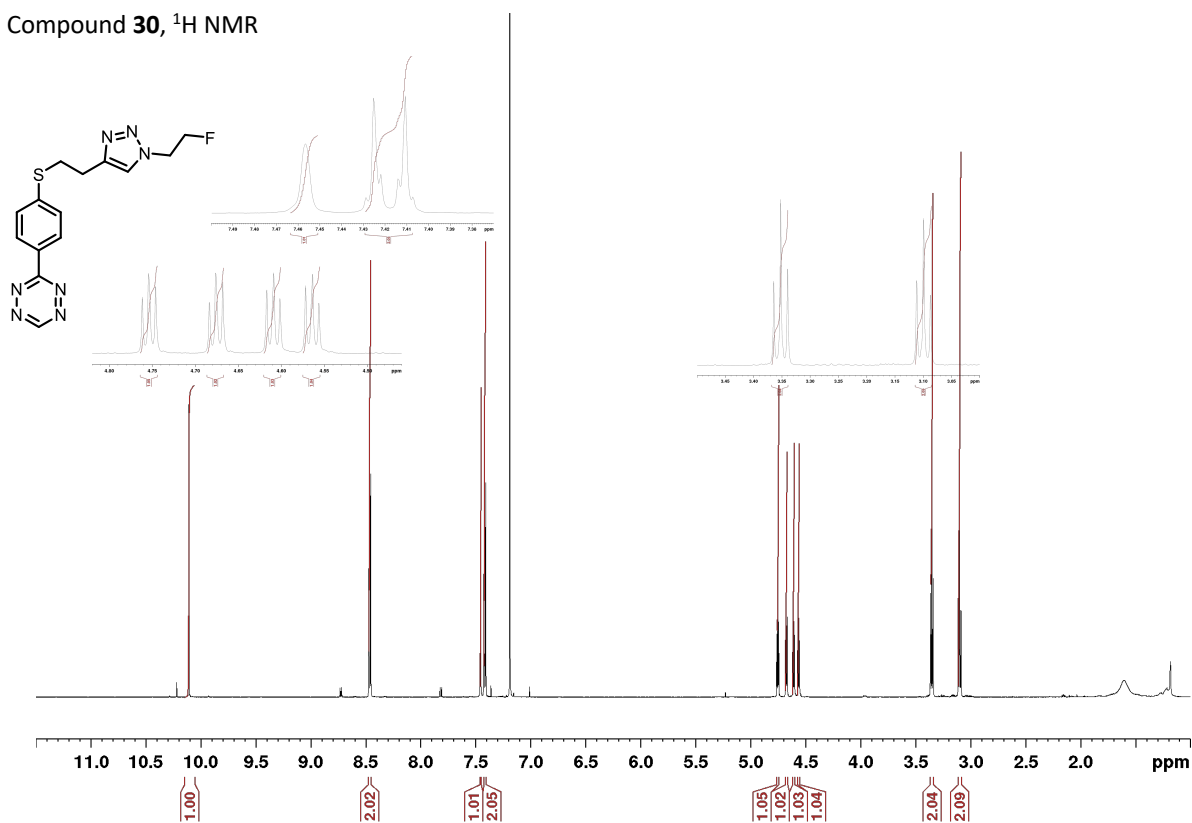
Compound **29**, ^1H NMR



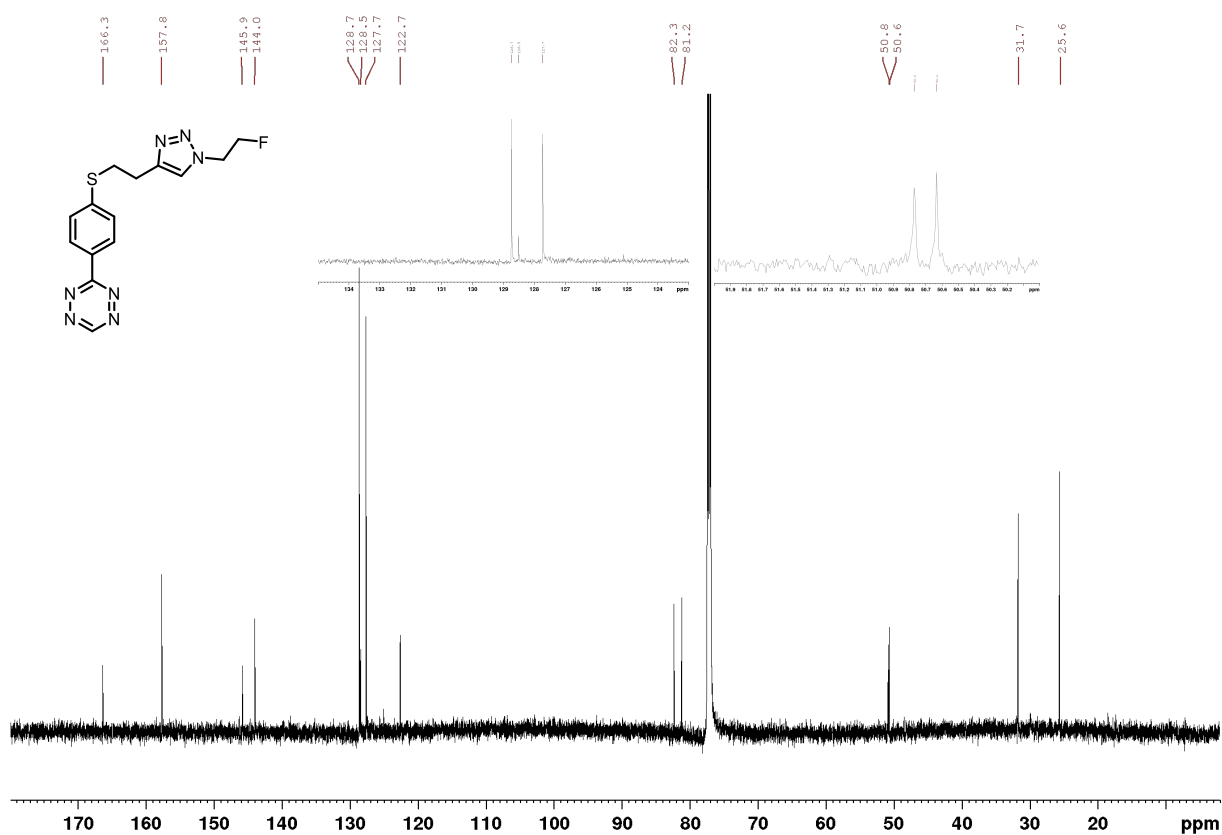
Compound **29**, ^{13}C NMR



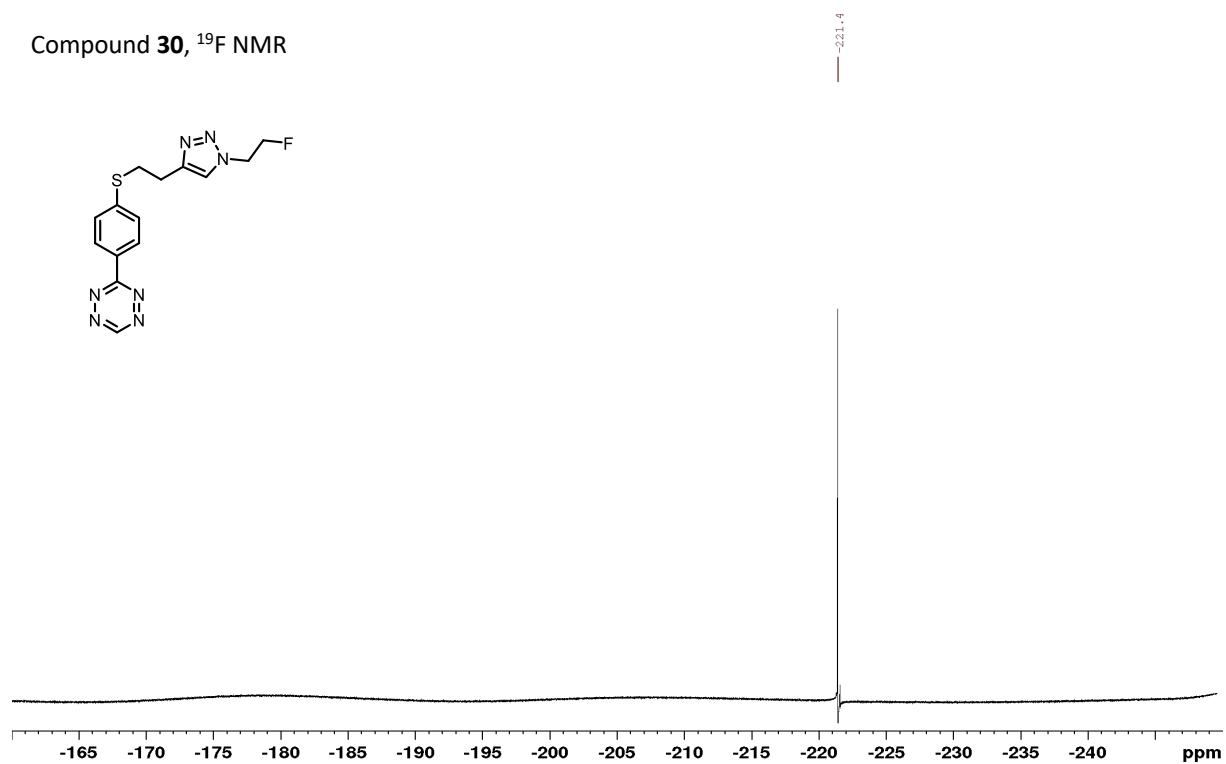
Compound **30**, ^1H NMR



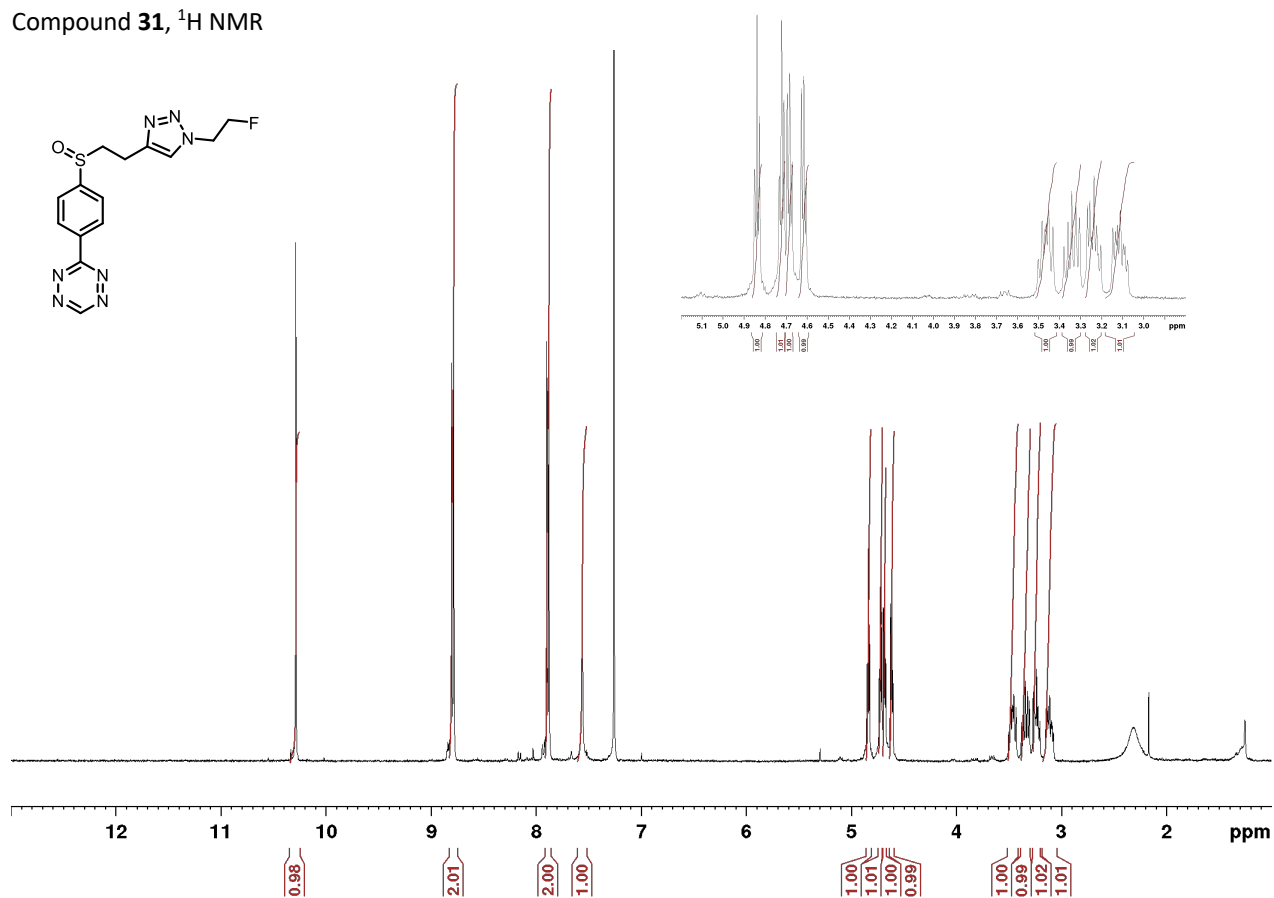
Compound **30**, ^{13}C NMR



Compound **30**, ^{19}F NMR



Compound **31**, ^1H NMR



O=S(=O)(c1ccc(cc1)-c2ncnc3ncnc23)CCc4nnn(CCCF)c4

¹H NMR (DMSO-d₆)

Chemical Shift (ppm)
8.22
8.11
5.57
5.08
5.07
18.5

¹³C NMR (DMSO-d₆)

Chemical Shift (ppm)
166.0
158.2
149.1
144.8
134.2
129.1
125.1
122.8
82.2
81.1
55.7
50.8
50.7
18.5

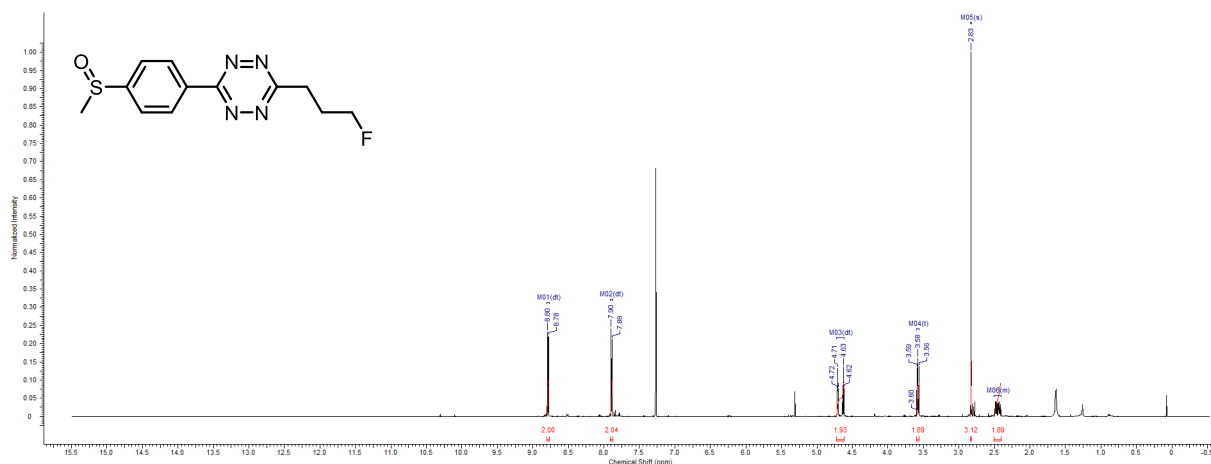
Compound **31**, ^{19}F NMR

Chemical structure of Compound **31**: CC(F)N1C=CC(=N1)CCS(=O)(=O)c2ccc(cc2)c3nn[nH]n3

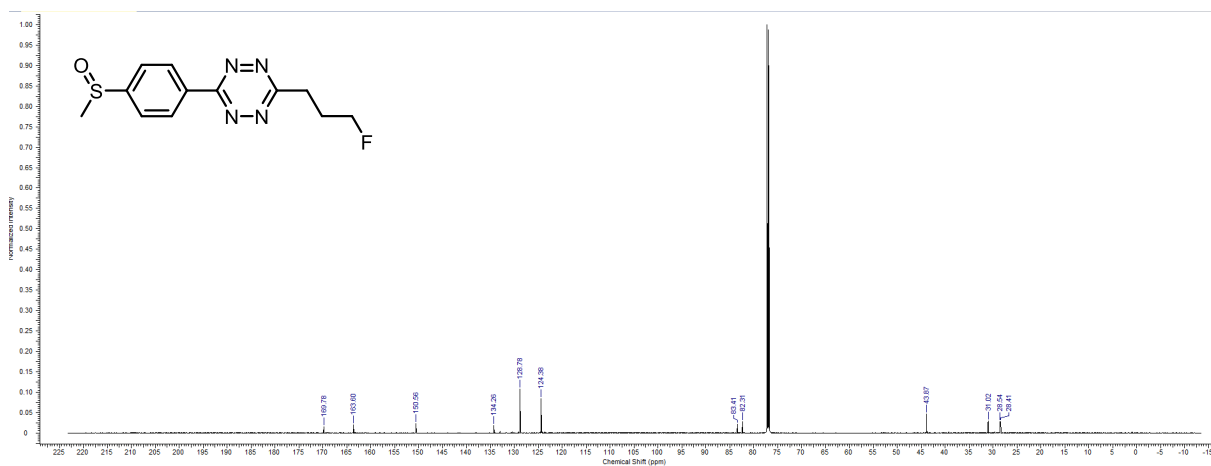
^{19}F NMR spectrum (ppm):

Chemical Shift (ppm)
-221.6

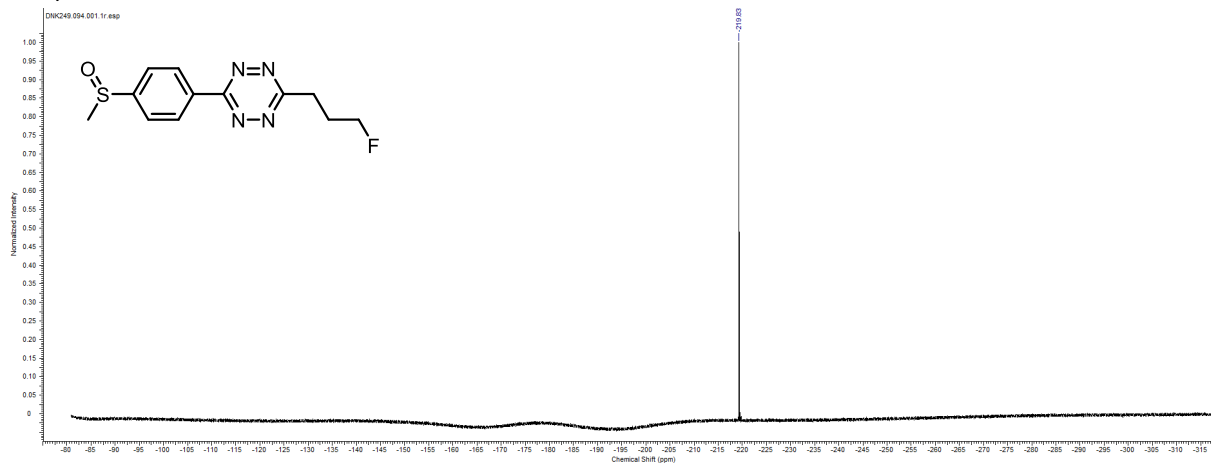
Compound **32**, ¹H NMR



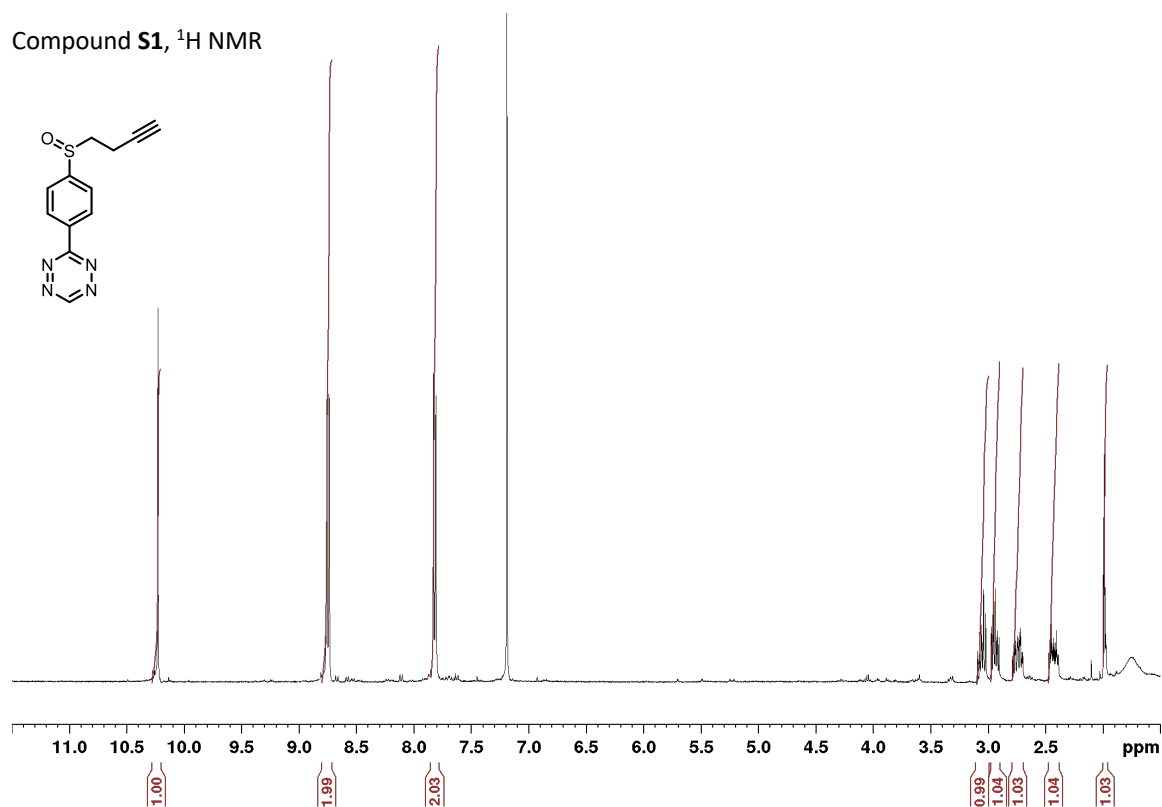
Compound **32**, ¹³C NMR



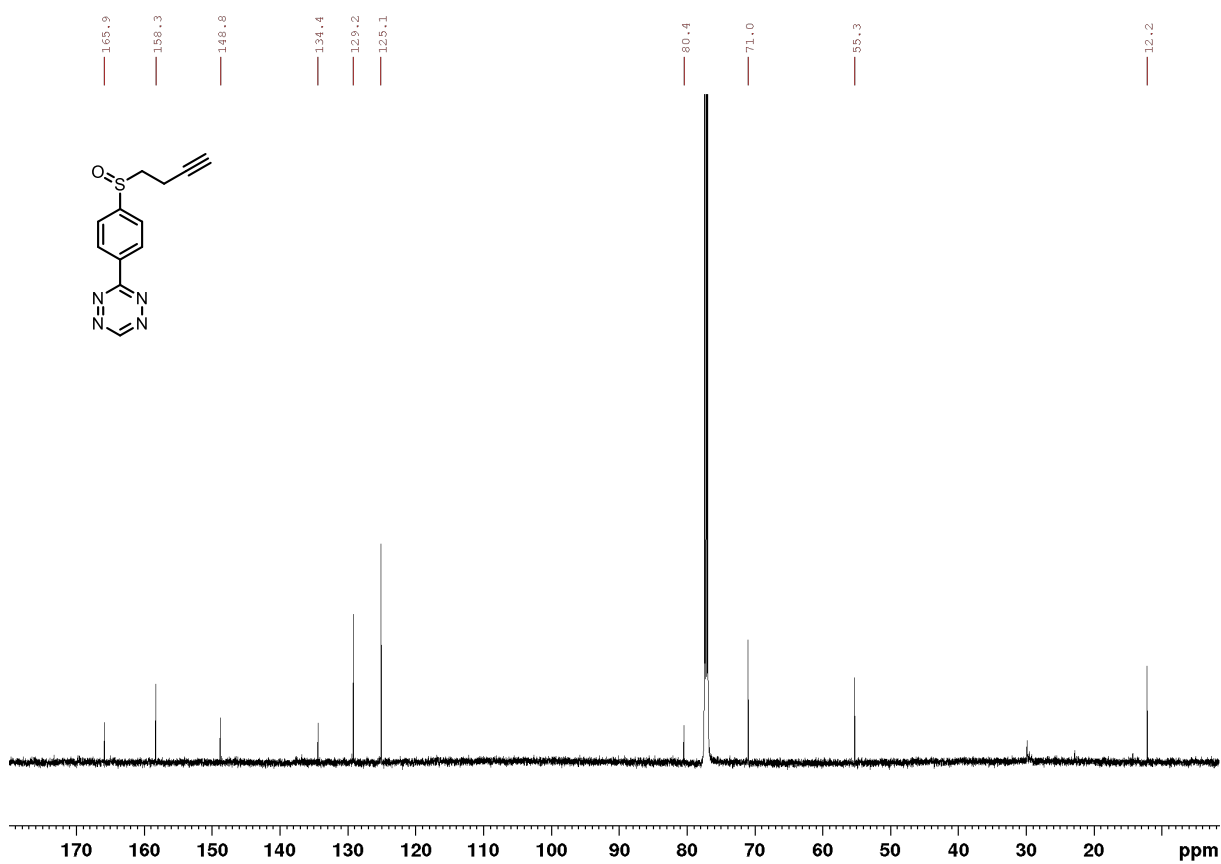
Compound **32**, ¹⁹F NMR



Compound **S1**, ^1H NMR



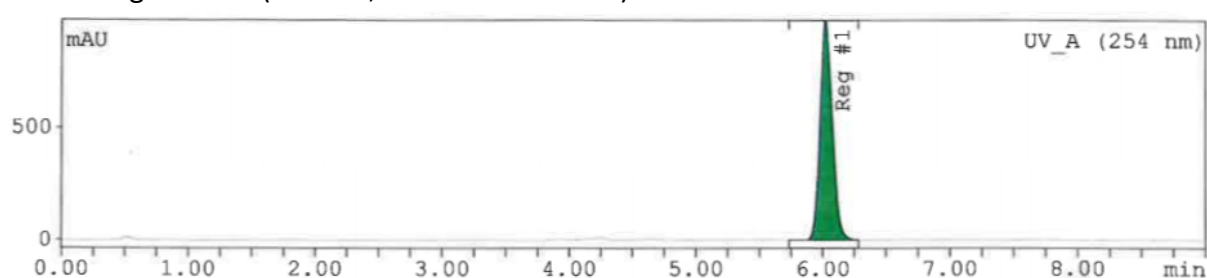
Compound **S1**, ^{13}C NMR



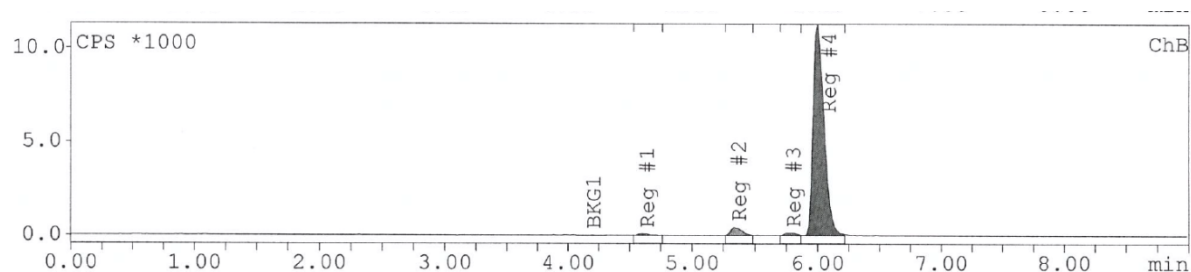
2) Radio-HPLC Chromatograms

HPLC analysis was performed on a 1200 series system (Agilent Technologies) using a reversed phase columns and acetonitrile / water or acetonitrile / phosphate buffer gradients. Analytical conditions: (A): Agilent Extend-C18 3.5 μ m, 3 x 100 mm, gradient 10mM phosphate-buffer pH 6 / acetonitrile, 1.3 mL/min, 0-1 min 15% acetonitrile, 1 $\rightarrow$ 8 min 15% $\rightarrow$ 85% acetonitrile, 8-9 min 85% acetonitrile. (B): Agilent ZORBAX SB-Aq 5 μ m, 4.6 x 250 mm, water / acetonitrile, 1.2 mL/min, 0-2 min 5% acetonitrile, 2 $\rightarrow$ 10 min 5% $\rightarrow$ 20% acetonitrile, 10-16 min 20% $\rightarrow$ 90%, 16-20 min 90% acetonitrile.

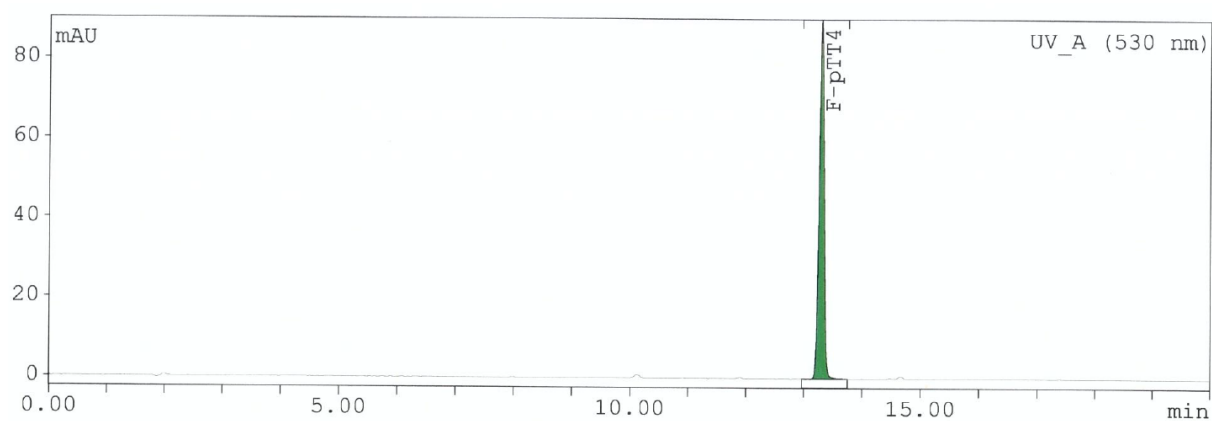
Chromatogram of **2** (254 nm, HPLC conditions A)



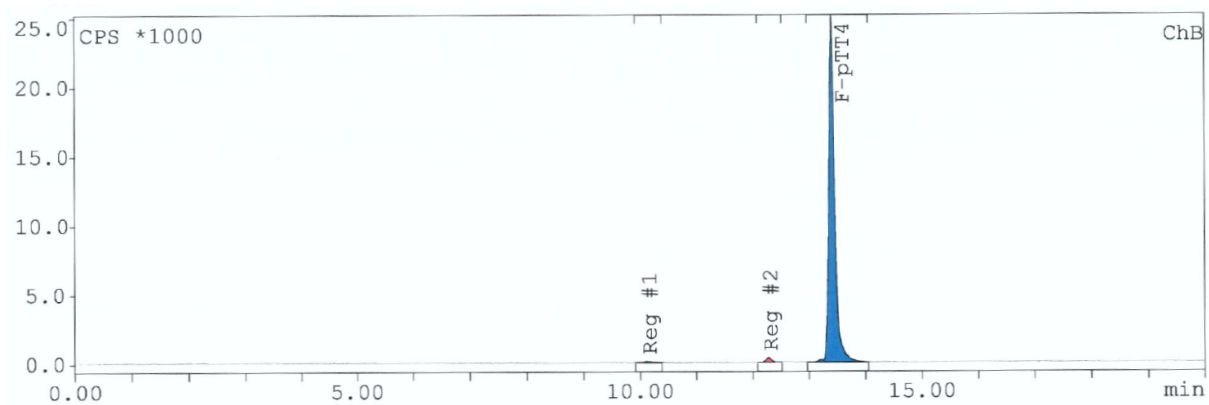
Radio-Chromatogram of [18 F]**2** (HPLC conditions A)



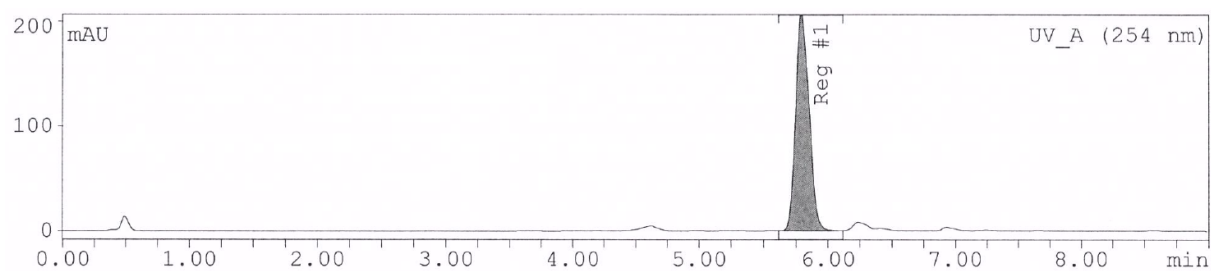
Chromatogram of **3** (540 nm, HPLC conditions B)



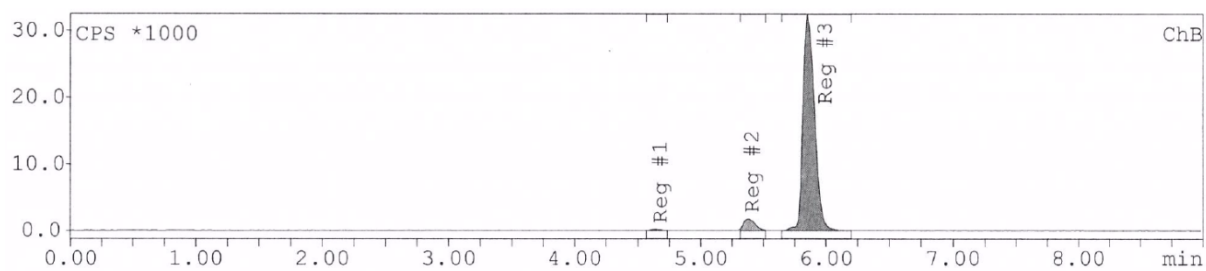
Radio-Chromatogram of [^{18}F]**3** (HPLC conditions B)



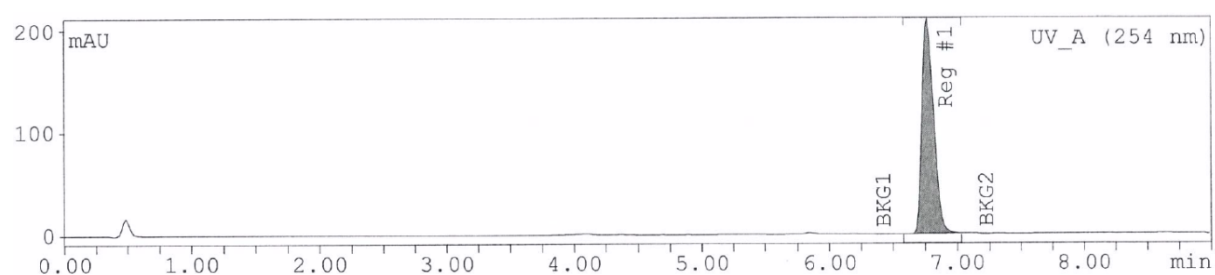
Chromatogram of **5** (254 nm, HPLC conditions A)



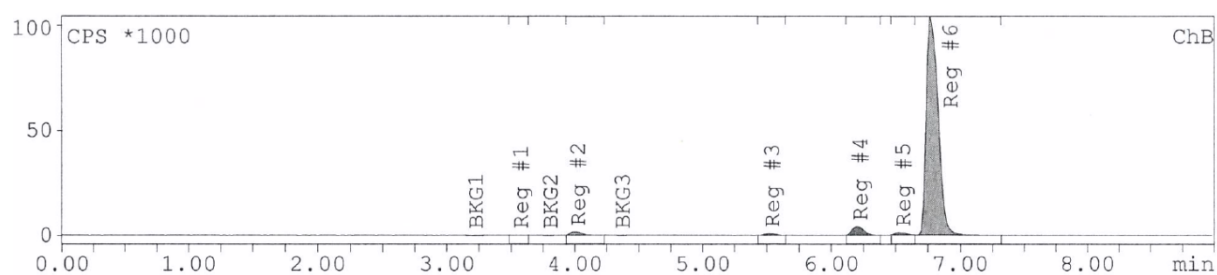
Radio-Chromatogram of [^{18}F]**5** (HPLC conditions A)



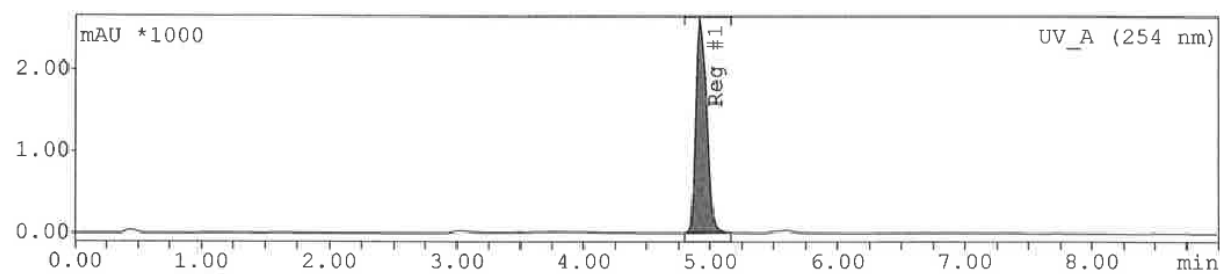
Chromatogram of **6** (254 nm, HPLC conditions A)



Radio-Chromatogram of [^{18}F]**6** (HPLC conditions A)



Chromatogram of **7** (254 nm, HPLC conditions A)



Radio-Chromatogram of [^{18}F]**7** (HPLC conditions A)

