Supplementary Information

Synthesis of Triazole Bridged *N*-glycosides of Pyrazolo[1,5-*a*]pyrimidinones as Anticancer Agent and their *In-Silico* Docking Studies

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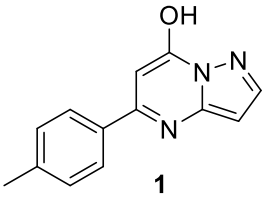
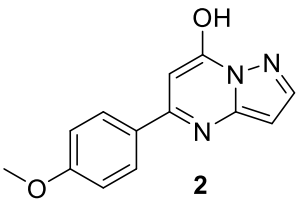
Typical method for synthesis of pyrazolo[1,5-*a*]pyrimidine-7-ol derivatives 1-9:

3-amino pyrazole 0.5 g (6.017 mmol) was taken in an oven dried 100 ml round bottom flask and dissolved in AcOH (20 ml) under N_2 atmosphere. After that, ethyl 3-oxo-3-(*p*-tolyl)propanoate 1.49 g (7.22 mmol) was added to the reaction mixture and then it was heated to reflux at 118 °C for 12-14 h. The solvent was evaporated from the reaction mixture, using toluene as azeotropic solvent, after that it was triturated with diethyl ether. Finally, it was dried under high vacuum to afford solid product with 60% yield, which was used as in further reactions without any purification. The similar protocol followed to synthesize compounds **1-9,** which give moderate to good yields.



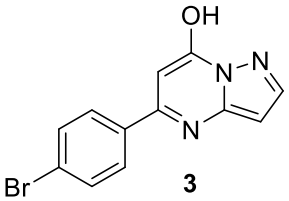
1

5-(p-tolyl)pyrazolo[1,5-a]pyrimidin-7-ol **(1):** light brown colored solid; yield 0.81 g (60%), Rf = 0.26 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.48 (s, 1H), 7.89 (s, 1H), 7.73 (d, J = 7.6 Hz, 2H), 7.39 (d, J = 8.6 Hz, 2H), 6.22 (s, 1H), 6.03 (s, 1H), 2.39 (s, 3H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 156.6, 149.8, 143.2, 141.9, 141.3, 129.7, 129.4, 127.1, 93.1, 89.6, 20.9. HRMS (ESI-TOF), m/z calcd. $C_{13}H_{11}N_3O$ $[M+H]^+$ 226.0975; Found: 226.0993.



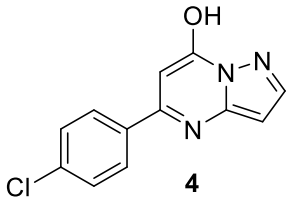
2

5-(4-methoxyphenyl)pyrazolo[1,5-a]pyrimidin-7-ol **(2):** white colored solid; yield 0.81 g (56%), Rf = 0.25 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.37 (s, 1H), 7.88 (s, 1H), 7.81 (d, J = 8.0 Hz, 2H), 7.13 (d, J = 9.3 Hz, 2H), 6.20 (s, 1H), 6.01 (s, 1H), 3.85 (s, 3H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 161.7, 156.6, 149.5, 143.1, 142.0, 128.9, 124.3, 114.6, 92.67, 89.5, 55.6. HRMS (ESI-TOF), m/z calcd. $C_{13}H_{12}N_3O_2$ $[M+H]^+$ 242.0924; Found: 242.0939.



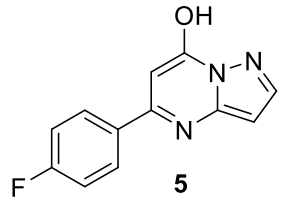
3

5-(4-bromophenyl)pyrazolo[1,5-a]pyrimidin-7-ol **(3):** light brown colored solid; yield 0.87 g (50%), Rf = 0.26 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.57 (s, 1H), 7.91 (s, 1H), 7.80 (s, 4H), 6.23 (s, 1H), 6.09 (s, 1H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 156.4, 148.6, 143.2, 141.8, 132.0, 131.5, 129.3, 124.7, 93.8, 89.6. HRMS (ESI-TOF), m/z calcd. $C_{12}H_9BrN_3O$ $[M+H]^+$ 289.9924; Found: 289.9943.



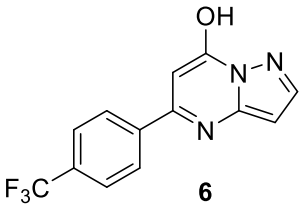
4

5-(4-chlorophenyl)pyrazolo[1,5-a]pyrimidin-7-ol **(4):** light brown colored solid; yield 0.85 g (58%), Rf = 0.27 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.85 (s, 1H), 7.91 (m, 3H), 7.64 (d, J = 8.0 Hz, 2H), 6.27 (d, J = 4.0 Hz, 1H), 6.09 (s, 1H). ^{13}C NMR (126 MHz, DMSO-d_6) δ 156.4, 148.6, 143.1, 141.9, 135.8, 131.0, 129.2, 129.1, 93.7, 89.8. HRMS (ESI-TOF), m/z calcd. $C_{12}H_9ClN_3O$ $[M+H]^+$ 246.0429; Found: 246.0451.



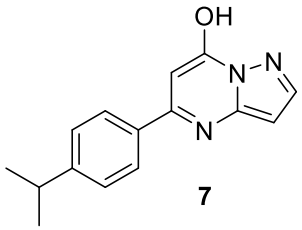
5

5-(4-fluorophenyl)pyrazolo[1,5-a]pyrimidin-7-ol **(5):** brown colored solid; yield: 0.63 (46%), Rf = 0.24 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.53 (s, 1H), 7.91 (m, 3H), 7.43 (dd, J = 8.7 Hz, 2H), 6.22 (s, 1H), 6.05 (s, 1H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 164.7, 162.7, 156.4, 148.7, 143.1, 141.8, 129.8, 129.7, 128.8, 116.2, 116.0, 93.7, 89.5. ^{13}C – ^{19}F Couplings in ^{13}C NMR: (126 MHz, DMSO-d_6) δ 163.7 (d, $J_{C\text{-}F}$ = 249.48 Hz, C_1), 129.8 (d, $J_{C\text{-}F}$ = 8.82 Hz, C_3), 116.1 (d, $J_{C\text{-}F}$ = 21.42 Hz, C_2). HRMS (ESI-TOF), m/z calcd. $C_{12}H_9FN_3O$ $[M+H]^+$ 230.0724; Found: 230.0751.



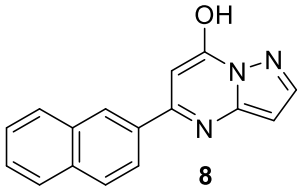
6

5-(4-(trifluoromethyl)phenyl)pyrazolo[1,5-a]pyrimidine-7-ol **(6):** light brown colored solid; 0.67 g (40%), Rf = 0.26 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.69 (s, 1H), 8.07 (d, J = 8.0 Hz, 2H), 7.98 – 7.92 (m, 3H), 6.26 (s, 1H), 6.16 (s, 1H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 156.3, 148.2, 143.2, 141.8, 136.2, 131.3, 131.1, 130.8, 130.6, 128.3, 125.9, 125.8, 124.9, 122.7, 94.6, 89.7. ^{13}C – ^{19}F Couplings in ^{13}C NMR: (126 MHz, DMSO-d_6) δ 130.9 (q, $J_{C\text{-}F}$ = 32.76 Hz, C_2), 125.9 (d, $J_{C\text{-}F}$ = 2.52 Hz, C_3), 123.8 (q, $J_{C\text{-}F}$ = 273.42 Hz, C_1). HRMS (ESI-TOF), m/z calcd. $C_{13}H_9F_3N_3O$ $[M+H]^+$ 280.0692; Found: 280.0704.



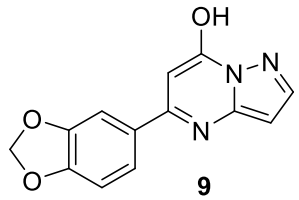
7

5-(4-isopropylphenyl)pyrazolo[1,5-a]pyrimidin-7-ol **(7):** light brown colored solid; yield: 0.73 g (48%), Rf = 0.26 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.44 (s, 1H), 7.89 (s, 1H), 7.77 (d, J = 7.9 Hz, 2H), 7.45 (d, J = 7.9 Hz, 2H), 6.21 (s, 1H), 6.04 (s, 1H), 2.98 (h, J = 6.7 Hz, 1H), 1.24 (d, J = 6.8 Hz, 6H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 156.5, 151.8, 149.7, 143.0, 141.8, 129.8, 127.2, 127.0, 93.1, 89.4, 33.3, 23.6. HRMS (ESI-TOF), m/z calcd. $C_{15}H_{16}N_3O$ $[M+H]^+$ 254.1288; Found: 254.1307.



8

5-(naphthalen-2-yl)pyrazolo[1,5-a]pyrimidin-7-ol **(8):** brown or gray colored solid; yield: 0.92 g (59 %), Rf = 0.26 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.66 (s, 1H), 8.48 (s, 1H), 8.12 (d, *J* = 8.0 Hz, 1H), 8.09 – 8.06 (m, 1H), 8.05 – 8.01 (m, 1H), 7.94 (d, *J* = 5.3 Hz, 2H), 7.67 – 7.63 (m, 2H), 6.27 (s, 1H), 6.23 (s, 1H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 156.8, 150.0, 143.5, 142.4, 134.1, 132.8, 129.9, 129.1, 129.0, 128.2, 128.1, 127.6, 127.5, 124.4, 94.3, 89.9. HRMS (ESI-TOF), m/z calcd. $C_{16}H_{12}N_3O$ $[M+H]^+$ 262.0975; Found: 262.0996.

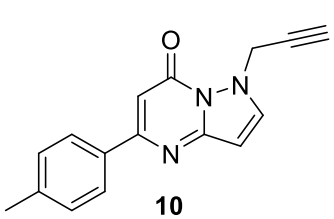


9

5-(benzo[d][1,3]dioxol-5yl)pyrazolo[1,5-a]pyrimidin-7-ol **(9):** white colored solid; yield 0.87 g (57%), Rf = 0.25 (1:9 MeOH/DCM); ^{1}H NMR (500 MHz, DMSO-d_6) δ 12.39 (s, 1H), 7.88 (s, 1H), 7.42 (s, 1H), 7.38 (d, *J* = 8.6 Hz, 1H), 7.11 (d, *J* = 7.6 Hz, 1H), 6.20 (s, 1H), 6.14 (s, 2H), 6.01 (s, 1H); ^{13}C NMR (126 MHz, DMSO-d_6) δ 156.7, 149.9, 149.6, 148.2, 143.3, 142.0, 126.2, 122.1, 108.9, 107.6, 102.2, 93.2, 89.7. HRMS (ESI-TOF), m/z calcd. $C_{13}H_{10}N_3O_3$ $[M+H]^+$ 256.0717; Found: 256.0741.

Typical method for synthesis of *N*-propargylated pyrazolo[1,5-*a*]pyrimidinones 10-18:

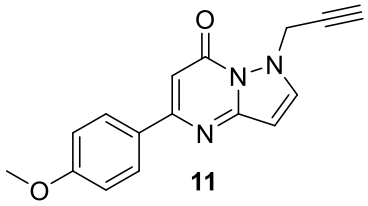
In an oven dried 100 ml two necked round bottom flask taken 0.5 g (2.22 mmol) of 5-(*p*-tolyl)pyrazolo[1,5-*a*]pyrimidin-7-ol **1** in dry 1,4-dioxane, then K_2CO_3 0.36 g (2.65 mmol) was added and stirred for half an hour. After that propargyl bromide 0.22 ml (2.65 mmol) was added dropwise and reaction mixture was heated at 60 °C for 3h. The completion of reaction was monitored by TLC, after completion of reaction the reaction mixture was quenched by aqueous solution of $NaHCO_3$ and extracted with EtOAc. The organic layer dried over Na_2SO_4 and the solvent from the mixture was evaporated under vacuum. After that the crude mixture was subjected for column chromatography to afford purified solid product **10**. The similar protocol followed to synthesize rest of compounds **11-18,** which give moderate to good yields.



10

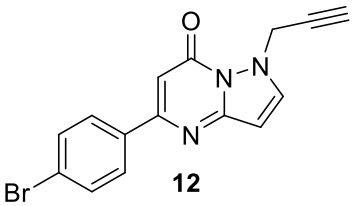
1-*(prop-2-yn-1-yl)-5-(p-tolyl)pyrazolo[1,5-a]pyrimidin-7(1H)-one* **(10):** yellow colored solid; yield 0.38 g (65%), Rf = 0.25 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.41 (d, *J* = 8.0 Hz, 2H), 7.33 (d, *J* = 7.9 Hz, 2H), 6.24 (s, 1H), 5.81 (s, 1H), 4.51 (s, 2H), 2.47 (s, 1H), 2.43 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 156.2,

153.1, 143.5, 143.0, 141.2, 129.9, 129.3, 128.5, 99.9, 90.5, 76.2, 75.1, 40.3, 21.5. HRMS (ESI-TOF), m/z calcd. $C_{16}H_{13}N_3O$ $[M+H]^+$ 264.1131; Found: 264.1163.



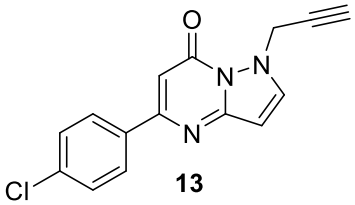
11

5-(4-methoxyphenyl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(11):** yellow colored solid; yield 0.38 g (67%), Rf = 0.24 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.47 (d, *J* = 9.3 Hz, 2H), 7.04 (d, *J* = 8.0 Hz, 2H), 6.24 (s, 1H), 5.81 (s, 1H), 4.53 (s, 2H), 3.88 (s, 3H), 2.48 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 161.5, 156.2, 152.9, 143.6, 143.1, 130.1, 124.3, 114.7, 99.9, 90.5, 76.3, 75.2, 55.6, 40.4. HRMS (ESI-TOF), m/z calcd. $C_{16}H_{13}N_3O_2$ $[M+H]^+$ 280.1081; Found: 280.1107.



12

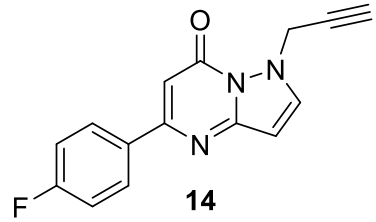
5-(4-bromophenyl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(12):** light brown colored solid; yield 0.37 g (64%), Rf = 0.26 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.69 (d, *J* = 8.0 Hz, 2H), 7.43 (d, *J* = 9.0 Hz, 2H), 6.24 (s, 1H), 5.79 (s, 1H), 4.50 (s, 2H), 2.49 (d, *J* = 3.0 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 155.8, 151.7, 143.7, 142.9, 132.6, 131.0, 130.2, 125.6, 100.2, 90.6, 75.9, 75.5, 40.4. HRMS (ESI-TOF), m/z calcd. $C_{15}H_{10}BrN_3O$ $[M+H]^+$ 328.0080; Found: 328.0097.



13

5-(4-chlorophenyl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(13)** light brown colored solid; yield 0.33 g (60%), Rf = 0.26 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.93 (s, 1H), 7.52 (m, 4H), 6.25 (s, 1H), 5.81 (s, 1H), 4.50 (s, 2H), 2.49 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 155.9, 151.7, 143.7, 142.9, 137.4, 130.6, 130.0, 129.7, 100.2, 90.6, 76.0, 75.5, 40.4. HRMS (ESI-TOF), m/z calcd. $C_{15}H_{10}ClN_3O$ $[M+H]^+$ 284.0585; Found: 284.0612.

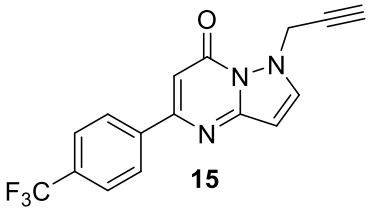
5-(4-fluorophenyl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(14):** light brown colored solid; yield 0.33 g (58%), Rf = 0.25 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.86 (s, 1H), 7.54 (dd, *J* = 6.6 Hz, 2H), 7.21 (d, *J* = 8.4 Hz, 2H), 6.20 (s, 1H), 5.73 (s, 1H), 4.49 (s, 2H), 2.48 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 165.0, 162.9, 155.8, 151.9, 143.5, 142.8, 130.8, 130.7, 128.2, 116.6, 116.4, 100.1, 90.5, 76.0, 75.3, 40.3. ^{13}C – ^{19}F Couplings in ^{13}C NMR: (126 MHz, $CDCl_3$) δ 163.9 (d, J_{C-F} = 253.26 Hz, C_1), 130.8 (d, J_{C-F} = 7.56



14

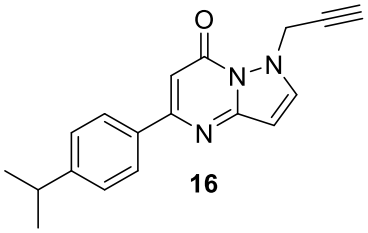
Hz, C_3), 116.5 (d, J_{C-F} = 21.42 Hz, C_2). HRMS (ESI-TOF), m/z calcd. $C_{15}H_{10}FN_3O$ $[M+H]^+$ 268.0881; Found: 268.0898.

5-(4-(trifluoromethyl)phenyl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(15):** light brown colored solid; yield 0.31 g (55%), Rf = 0.27 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 (s, 1H), 7.81 (d, *J* = 7.9 Hz, 2H), 7.70 (d, *J* = 8.0 Hz, 2H), 6.24 (s, 1H), 5.78 (s, 1H), 4.48 (s, 2H), 2.51 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 155.7, 151.3, 143.8, 142.8, 135.6, 133.3, 133.1, 132.8, 132.6, 129.2, 126.8, 126.3, 124.6, 122.4, 120.3, 100.4, 90.7, 75.8, 75.6, 40.5. ^{13}C – ^{19}F Couplings in ^{13}C NMR: (126 MHz, $CDCl_3$) δ 132.9 (q, J_{C-F} = 34.02 Hz, C_2), 126.3 (d, J_{C-F} = 3.78 Hz, C_3), 123.5 (q, J_{C-F} = 273.42 Hz, C_1). HRMS (ESI-TOF), m/z calcd. $C_{16}H_{10}F_3N_3O$ $[M+H]^+$ 318.0849; Found: 318.0868.

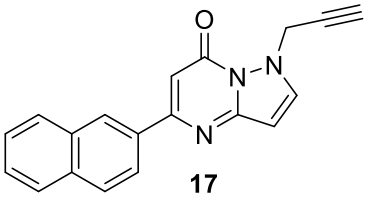


15

5-(4-isopropylphenyl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(16):** light brown colored solid; yield 0.35 g (61%), Rf = 0.25(ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.88 (s, 1H), 7.43 (d, *J* = 7.9 Hz, 2H), 7.36 (d, *J* = 7.9 Hz, 2H), 6.24 (s, 1H), 5.80 (s, 1H), 4.52 (s, 2H), 2.96 (hept, *J* = 6.7 Hz, 1H), 2.48 (s, 1H), 1.27 (d, *J* = 6.7 Hz, 6H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 156.2, 153.2, 152.0, 143.5, 142.9, 129.5, 128.5, 127.3, 99.8, 90.5, 76.2, 75.2, 40.4, 34.1, 23.7. HRMS (ESI-TOF), m/z calcd. $C_{18}H_{17}N_3O$ $[M+H]^+$ 292.1444; Found: 292.1457.

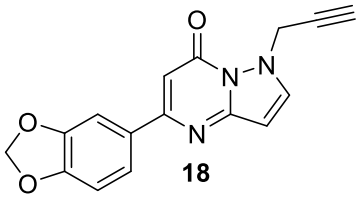


16



17

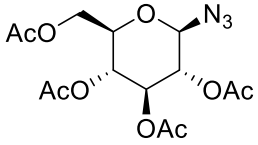
5-(naphthalen-2-yl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(17):** yellow colored solid; yield 0.38 g (68%), Rf = 0.25 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.03 (s, 1H), 7.99 (d, *J* = 8.8 Hz, 1H), 7.96 – 7.89 (m, 3H), 7.60 (m, 3H), 6.28 (s, 1H), 5.93 (s, 1H), 4.55 (s, 2H), 2.52 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 156.2, 153.1, 143.7, 143.0, 133.9, 132.8, 129.3, 129.2, 128.9, 128.6, 128.1, 128.0, 127.5, 124.8, 100.2, 90.6, 76.1, 75.3, 40.5. HRMS (ESI-TOF), m/z calcd. $C_{19}H_{13}N_3O$ $[M+H]^+$ 300.1131; Found: 300.1152.



18

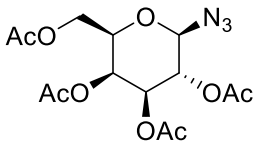
5-(benzo[d][1,3]dioxol-5-yl)-1-(prop-2-yn-1-yl)pyrazolo[1,5-a]pyrimidin-7(1H)-one **(18):** light brown colored solid; yield 0.4 g (70%), Rf = 0.24 (ethyl acetate); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.87 (s, 1H), 6.99 (d, *J* = 8.0 Hz, 1H), 6.96 (s, 1H), 6.91 (d, *J* = 7.6 Hz, 1H), 6.22 (s, 1H), 6.05 (s, 2H), 5.77 (s, 1H), 4.53 (s, 2H), 2.49 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 156.0, 152.6, 149.8, 148.3, 143.5, 142.9, 125.5, 123.1, 108.9, 108.8, 102.0, 99.9, 90.5, 76.2, 75.2, 40.4. HRMS (ESI-TOF), m/z calcd. $C_{16}H_{11}N_3O_3$ $[M+H]^+$ 294.0873; Found: 294.0908.

Experimental method for synthesis of Glucose, Galactose and Mannose derived azido glycosides 19-21: In this experiment, 5 grams (12.82 mmol) of 1,2,3,4,6-penta-*O*-acetyl-β-D-glucopyranose was taken in an oven-dried round-bottom flask. Anhydrous dichloromethane was added to the flask, which was then placed under a nitrogen atmosphere. Next, $SnCl_4$ was added dropwise (1.29 mL, 11.02 mmol) at an ice bath and stirred for 30 minutes. $TMSN_3$ was added next (1.91 mL, 16.66 mmol) at room temperature, and the stirring was continued for 3-4 hours. The reaction was monitored using TLC until completion. After the reaction was complete, the mixture was quenched with ice-cold water and an aqueous solution of $NaHCO_3$ was added. The mixture was extracted with dichloromethane, and the organic layer was washed with a brine solution. The obtained mixture was dried using anhydrous Na_2SO_4 and the solvent was evaporated under vacuum to obtain a crude residue. The crude residue was purified by column chromatography, which resulted in the isolation of a white-colored solid azido glycoside **19** in 95 % yield. The same reaction procedure was used to synthesize glycosides **20** and **21**, starting with 1,2,3,4,6-penta-*O*-acetyl-β-D-galactopyranose and 1,2,3,4,6-penta-*O*-acetyl-β-D-mannopyranose, respectively.



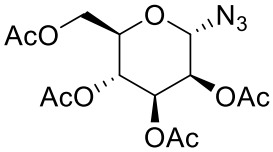
19

(2R,3R,4S,5R,6R)-2-(acetoxymethyl)-6-azidotetrahydro-2H-pyran-3,4,5-triyl triacetate **(19):** white colored solid; yield: 4.54 g (95%), Rf = 0.30 (3:7 EtOAc/hexane); ^{1}H NMR (500 MHz, $CDCl_3$) δ 5.20 (t, *J* = 9.5 Hz, 1H), 5.08 (t, *J* = 9.5 Hz, 1H), 4.93 (t, *J* = 9.1 Hz, 1H), 4.63 (d, *J* = 8.6 Hz, 1H), 4.25 (dd, *J* = 12.4, 4.8 Hz, 1H), 4.15 (d, *J* = 12.4 Hz, 1H), 3.82 – 3.75 (m, 1H), 2.07 (d, *J* = 12.2 Hz, 6H), 2.00 (d, *J* = 11.4 Hz, 6H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 170.7, 170.2, 169.4, 169.3, 87.9, 74.0, 72.6, 70.7, 67.9, 61.7, 20.7, 20.6. HRMS (ESI-TOF), m/z calcd. $C_{14}H_{19}N_3O_9Na$ $[M+Na]^+$ 396.1014; Found: 396.1038.



20

***(2R,3S,4S,5R,6R)-2-(acetoxymethyl)-6-azidotetrahydro-2H-pyran-3,4,5-triyl triacetate* (20):** white colored solid; yield: 4.35 g (91%), Rf = 0.30 (3:7 EtOAc/hexane); ^{1}H NMR (500 MHz, $CDCl_3$) δ 5.40 (d, *J* = 4.0 Hz, 1H), 5.14 (t, *J* = 10.0 Hz, 1H), 5.04 – 4.99 (m, 1H), 4.58 (d, *J* = 9.3 Hz, 1H), 4.13 (dt, *J* = 12.0, 6.7 Hz, 2H), 4.00 (t, *J* = 6.7 Hz, 1H), 2.15 (s, 3H), 2.07 (s, 3H), 2.04 (s, 3H), 1.96 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 170.4, 170.1, 170.0, 169.4, 88.3, 72.9, 70.8, 68.1, 66.9, 61.3, 20.7, 20.6, 20.5. HRMS (ESI-TOF), m/z calcd. $C_{14}H_{19}N_3O_9Na$ $[M+Na]^+$ 396.1014; Found: 396.1041.

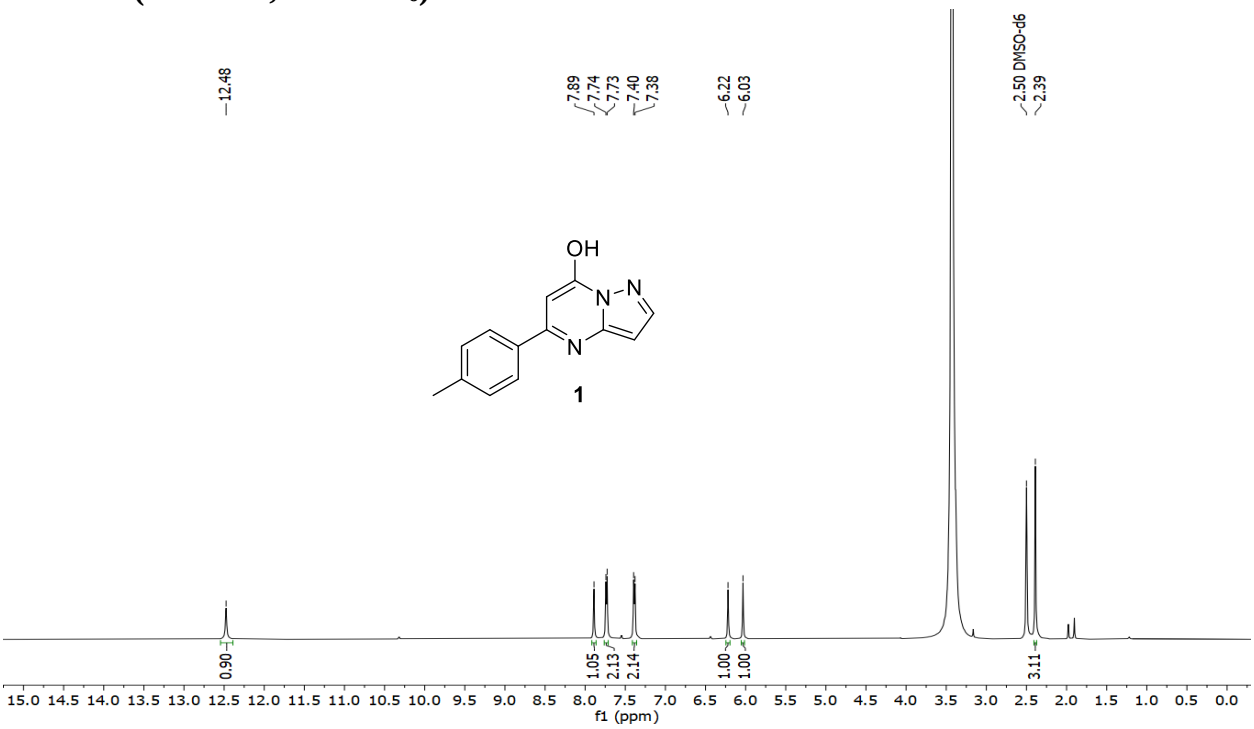


21

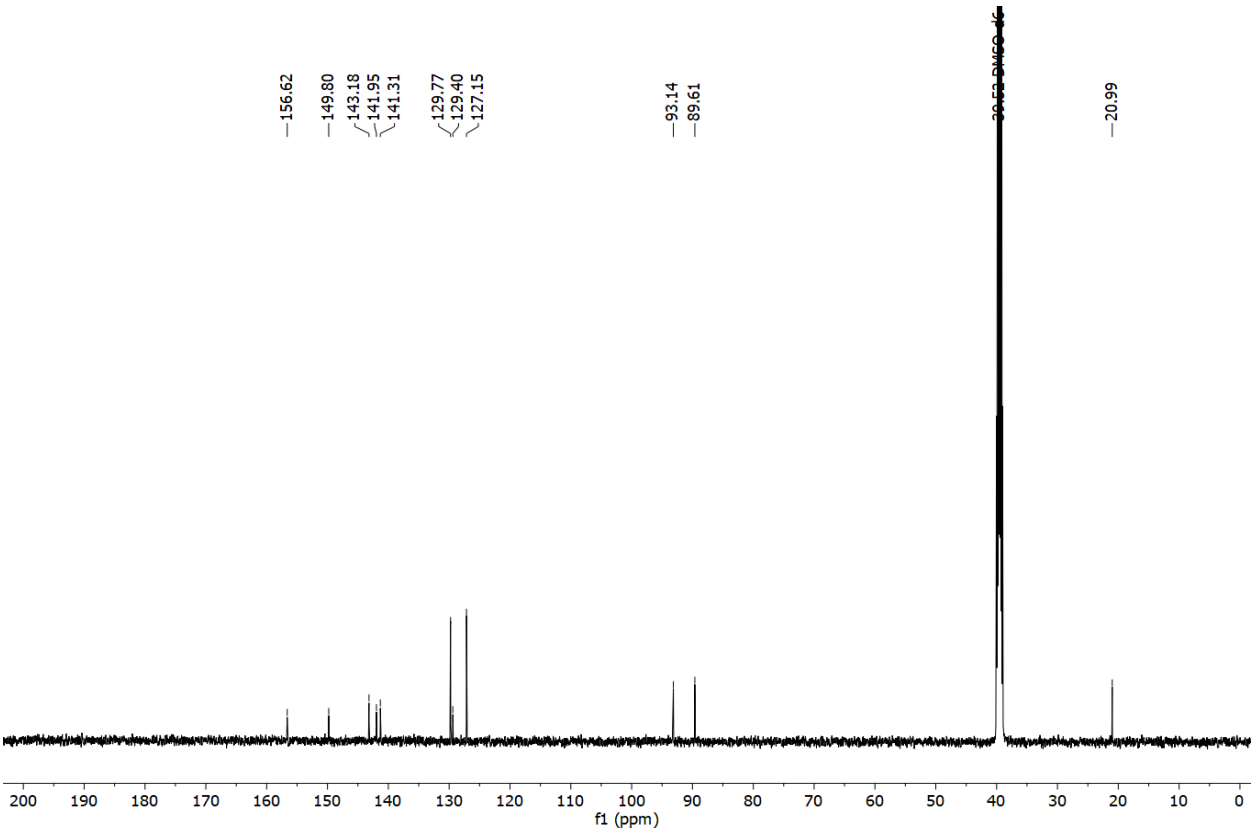
***(2R,3R,4S,5S,6S)-2-(acetoxymethyl)-6-azidotetrahydro-2H-pyran-3,4,5-triyl triacetate* (21):** white colored solid; yield: 4.11 g (86%), Rf = 0.30 (3:7 EtOAc/hexane); ^{1}H NMR (500 MHz, $CDCl_3$) δ 5.34 (s, 1H), 5.26 – 5.16 (m, 2H), 5.11 – 5.08 (m, 1H), 4.25 (dd, *J* = 13.3, 5.3 Hz, 1H), 4.13 – 4.07 (m, 2H), 2.11 (s, 3H), 2.05 (s, 3H), 2.00 (s, 3H), 1.93 (s, 3H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 170.54, 169.8, 169.7, 169.6, 87.4, 70.6, 69.1, 68.2, 65.6, 62.1, 20.7, 20.6, 20.6, 20.5. HRMS (ESI-TOF), m/z calcd. $C_{14}H_{19}N_3O_9Na$ $[M+Na]^+$ 396.1014; Found: 396.1030.

Copies of ^{1}H NMR and ^{13}C NMR of selected pyrazolo[1,5-*a*]pyrimidine-7-ol derivatives 1-9:

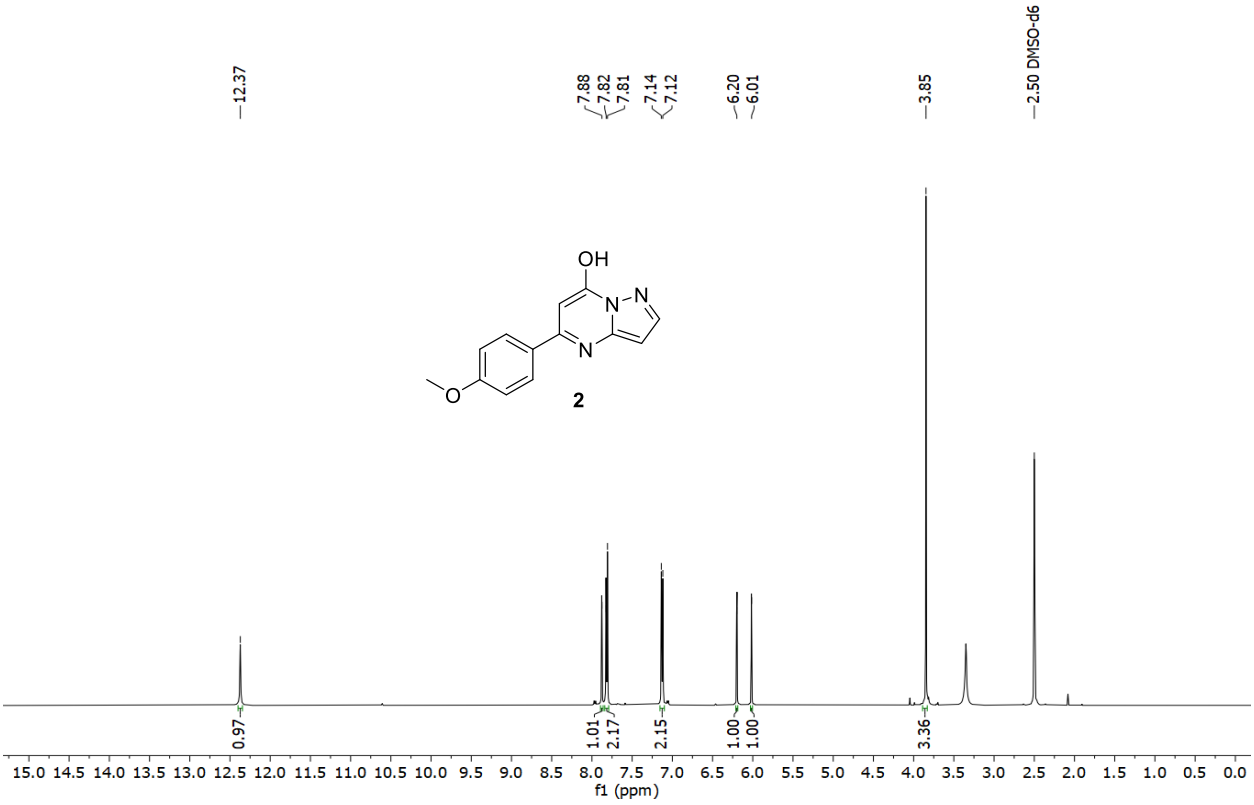
^{1}H-NMR (500 MHz, DMSO-d_6)



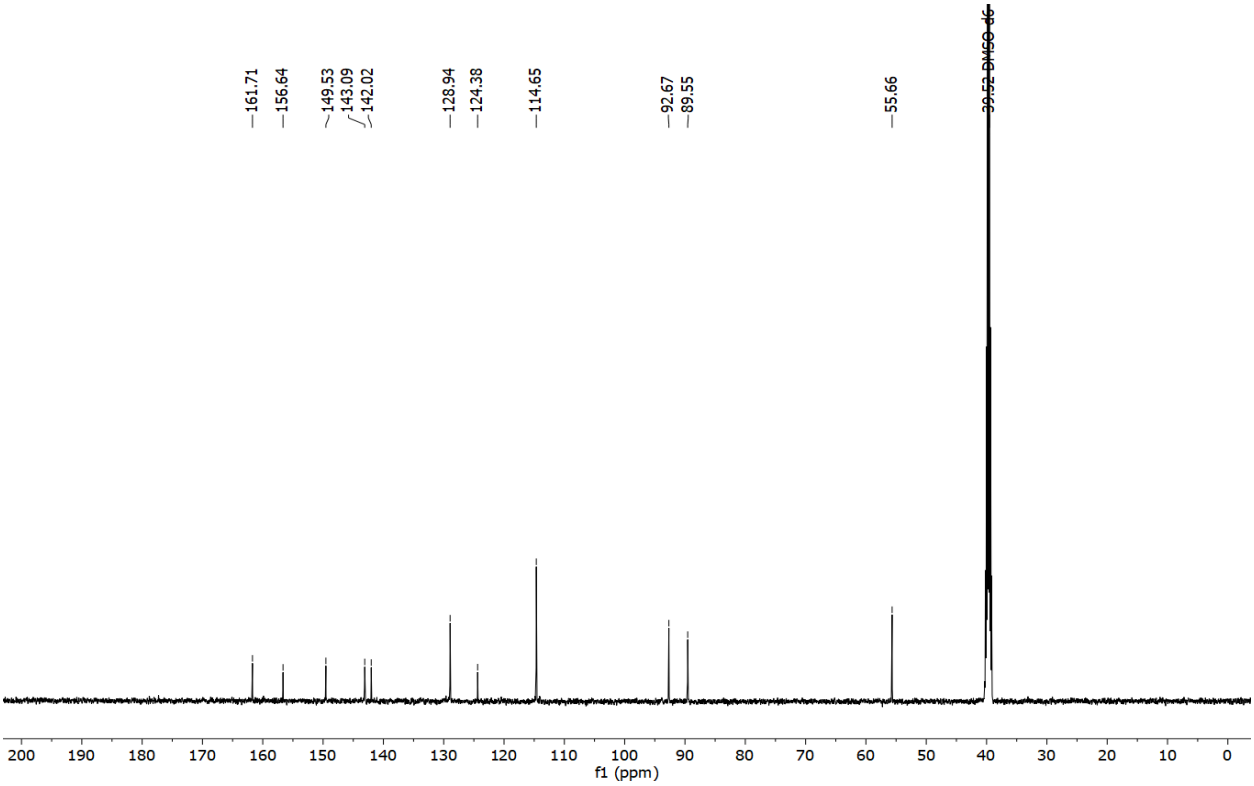
^{13}C NMR (126 MHz, DMSO-d_6)



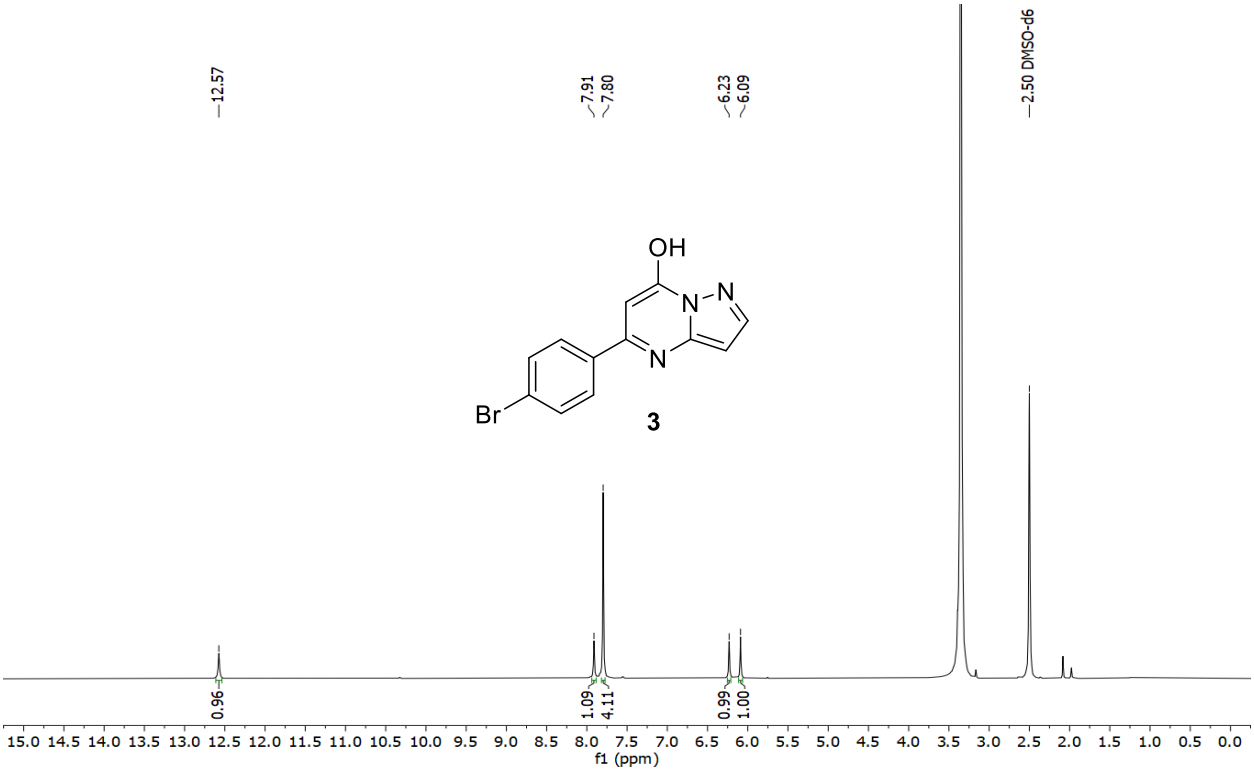
^{1}H-NMR (500 MHz, DMSO-*d*$_6$)



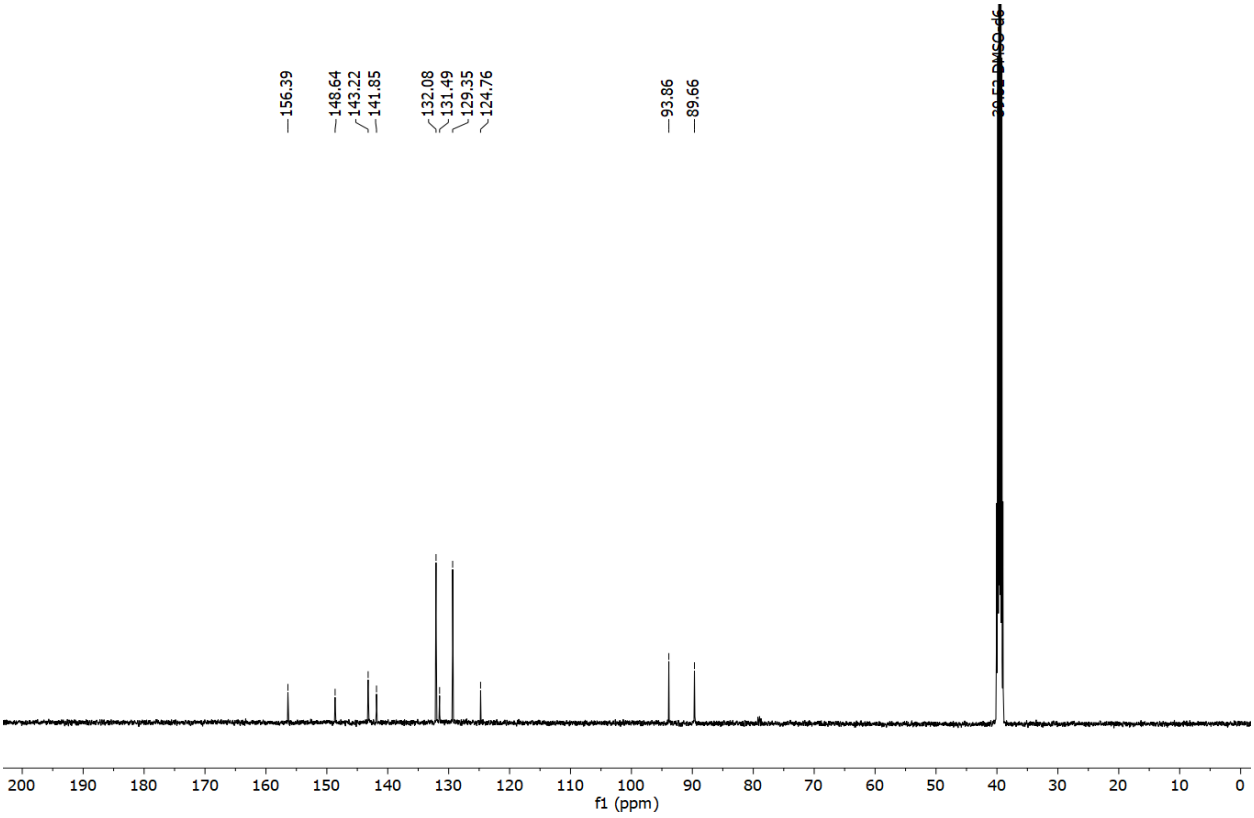
^{13}C NMR (126 MHz, DMSO-*d*$_6$)



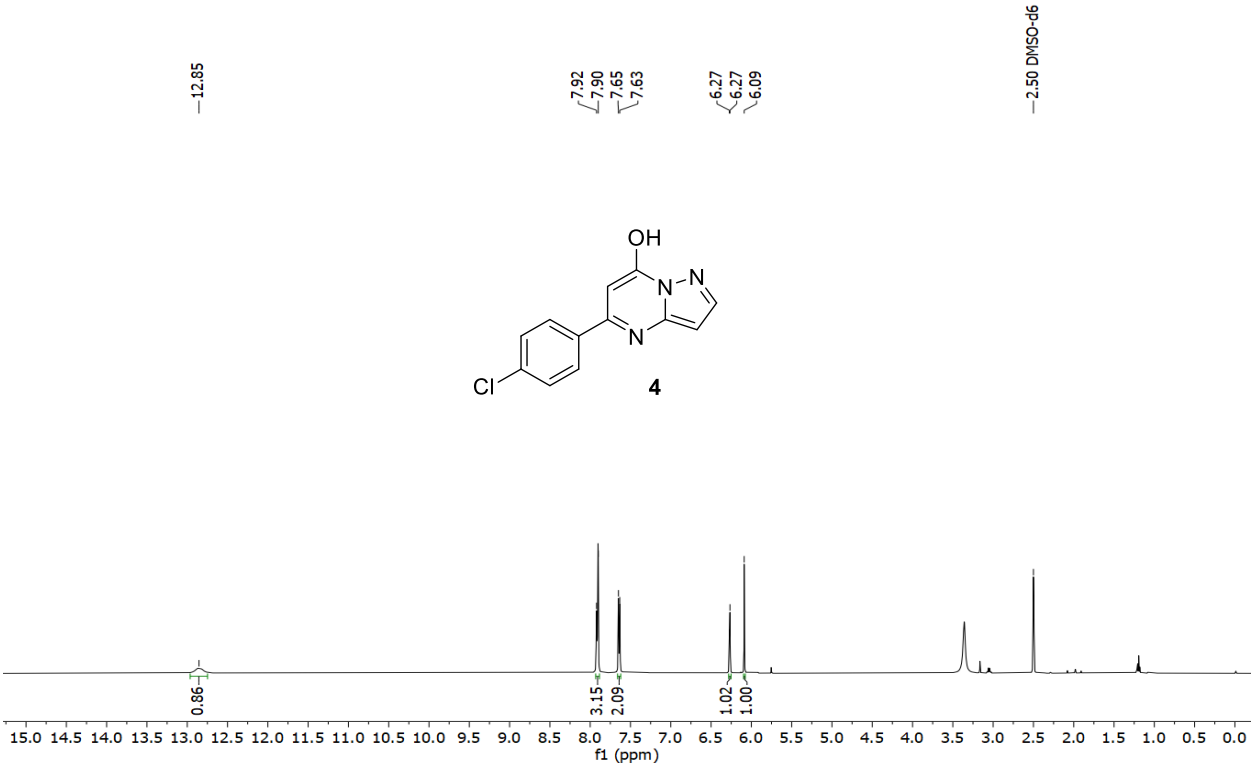
^{1}H-NMR (500 MHz, DMSO-d_6)



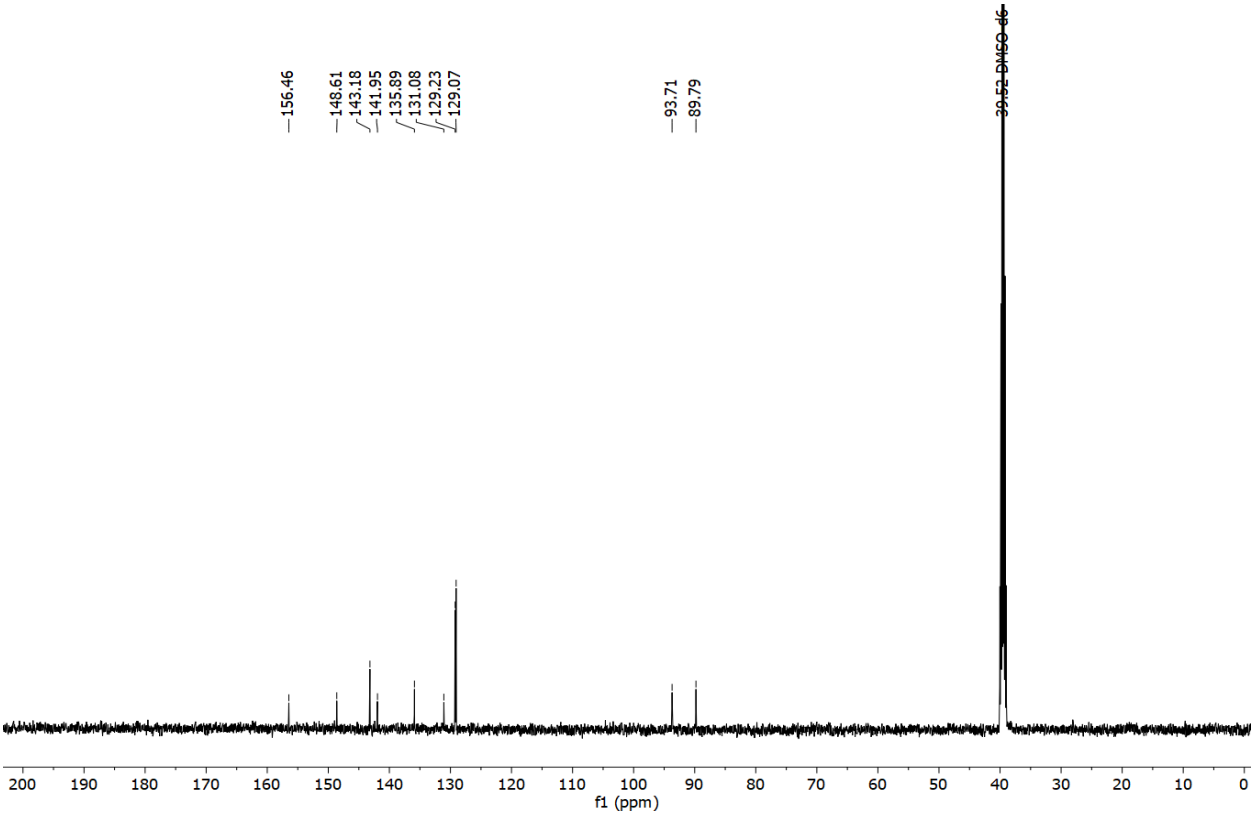
^{13}C NMR (126 MHz, DMSO-d_6)



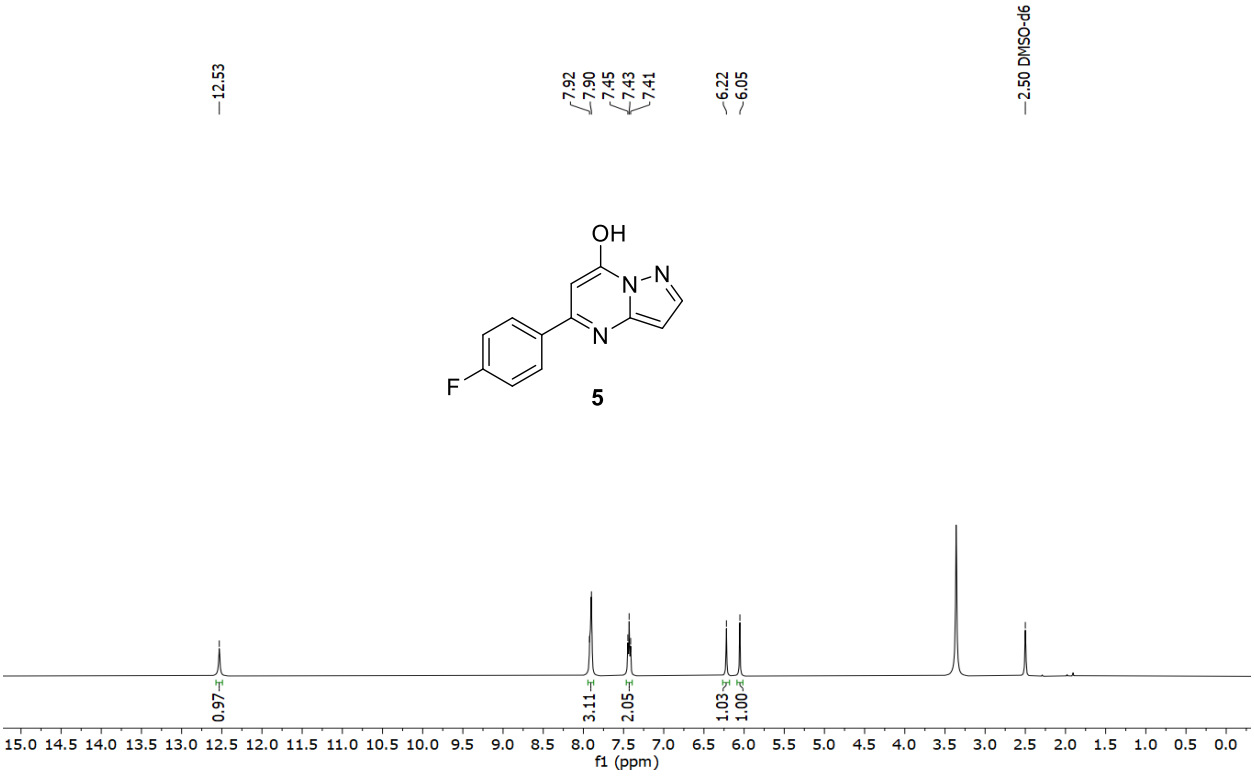
^{1}H-NMR (500 MHz, DMSO-d_6)



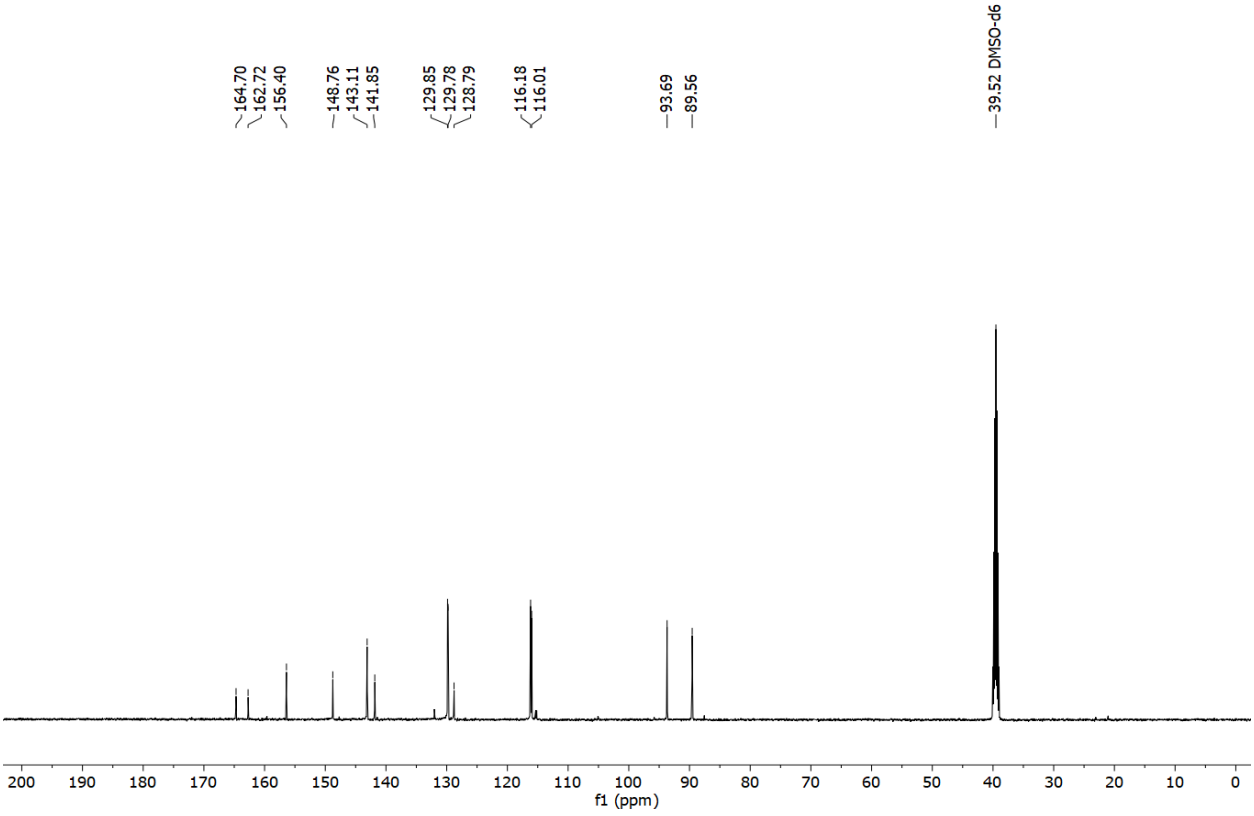
^{13}C NMR (126 MHz, DMSO-d_6)



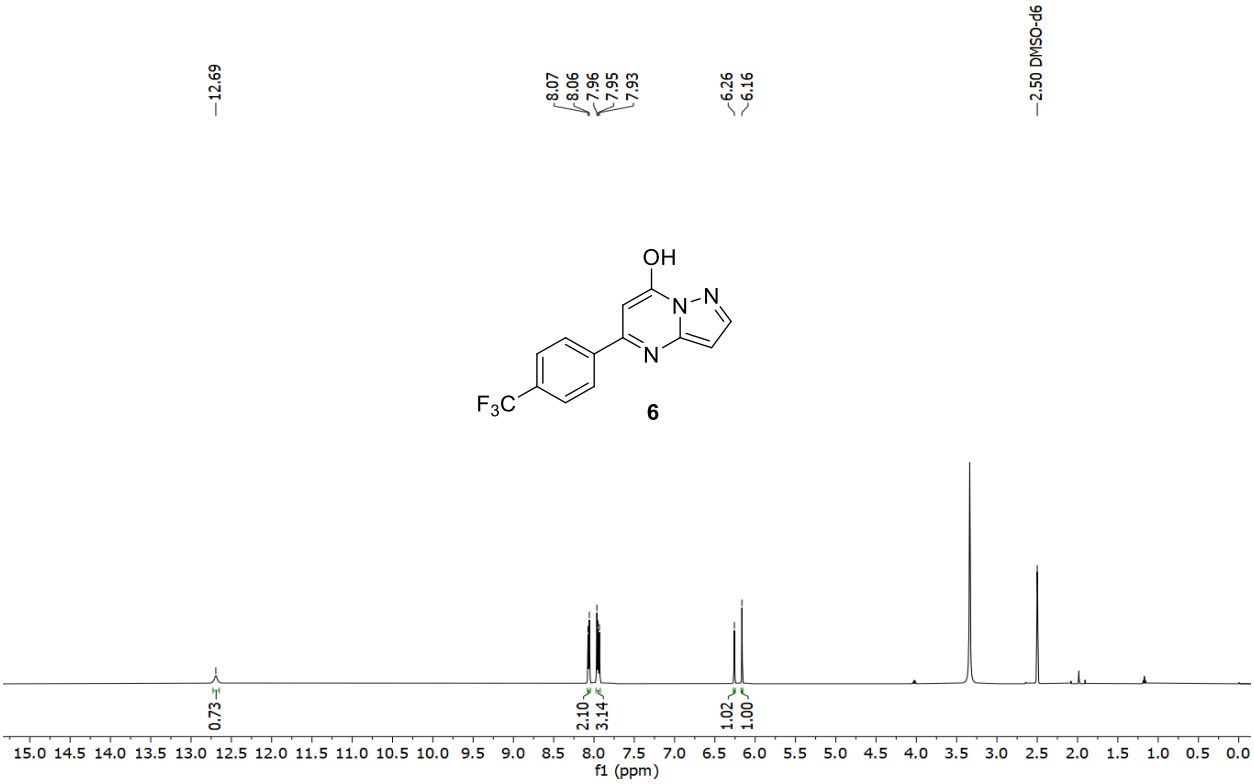
^{1}H-NMR (500 MHz, DMSO-d_6)



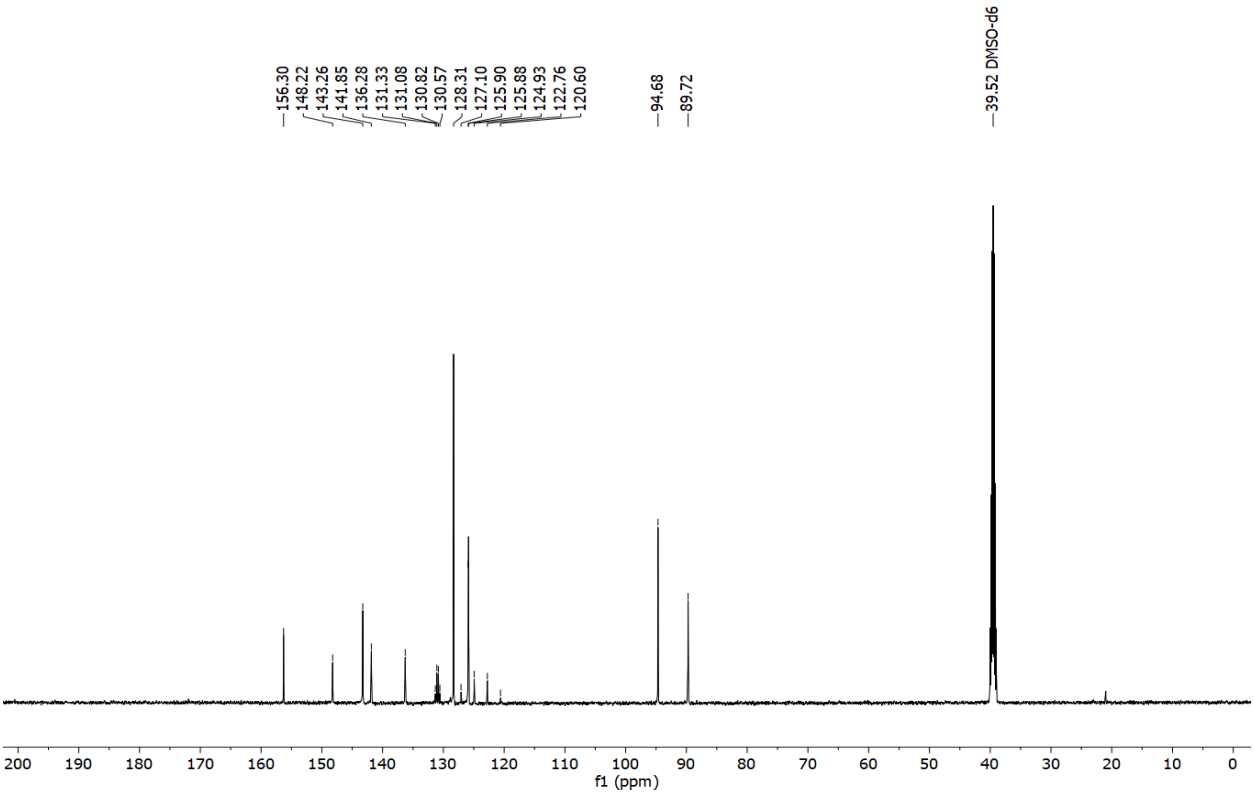
^{13}C NMR (126 MHz, DMSO-d_6)



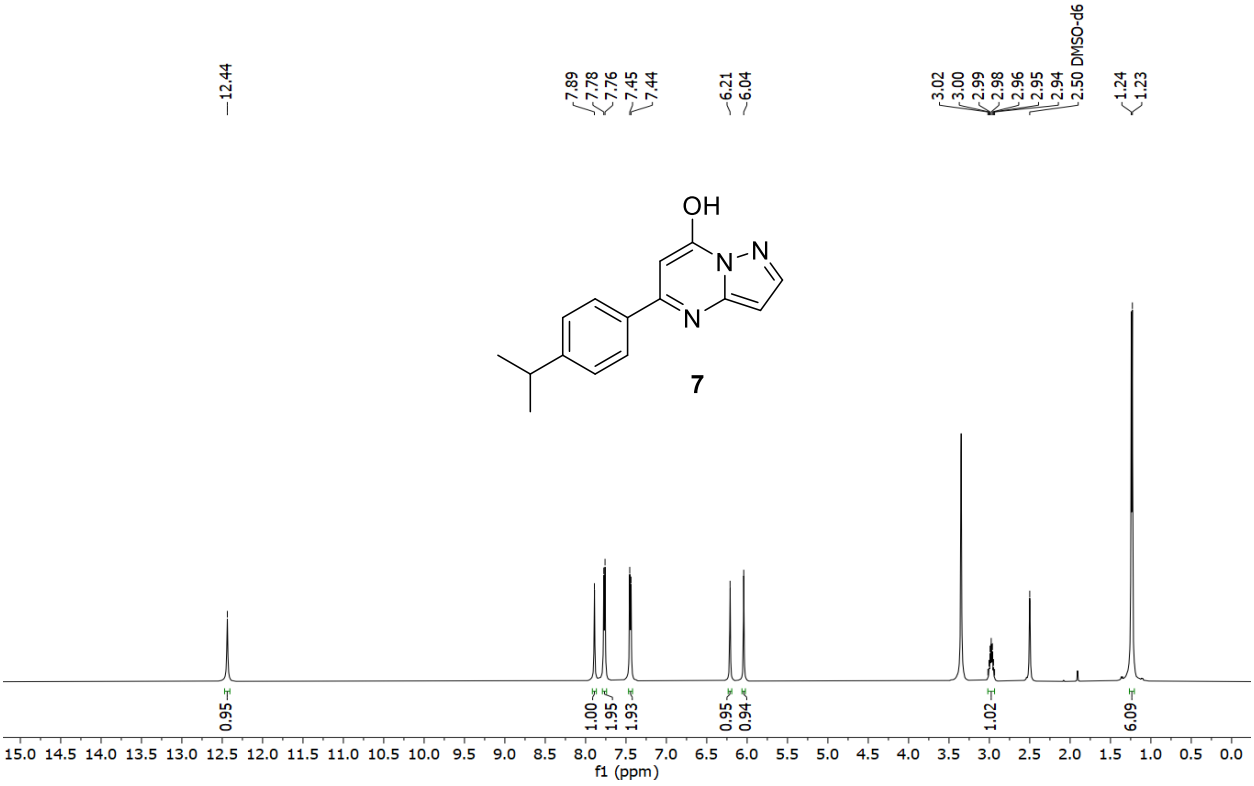
^{1}H-NMR (500 MHz, DMSO-*d*$_6$)



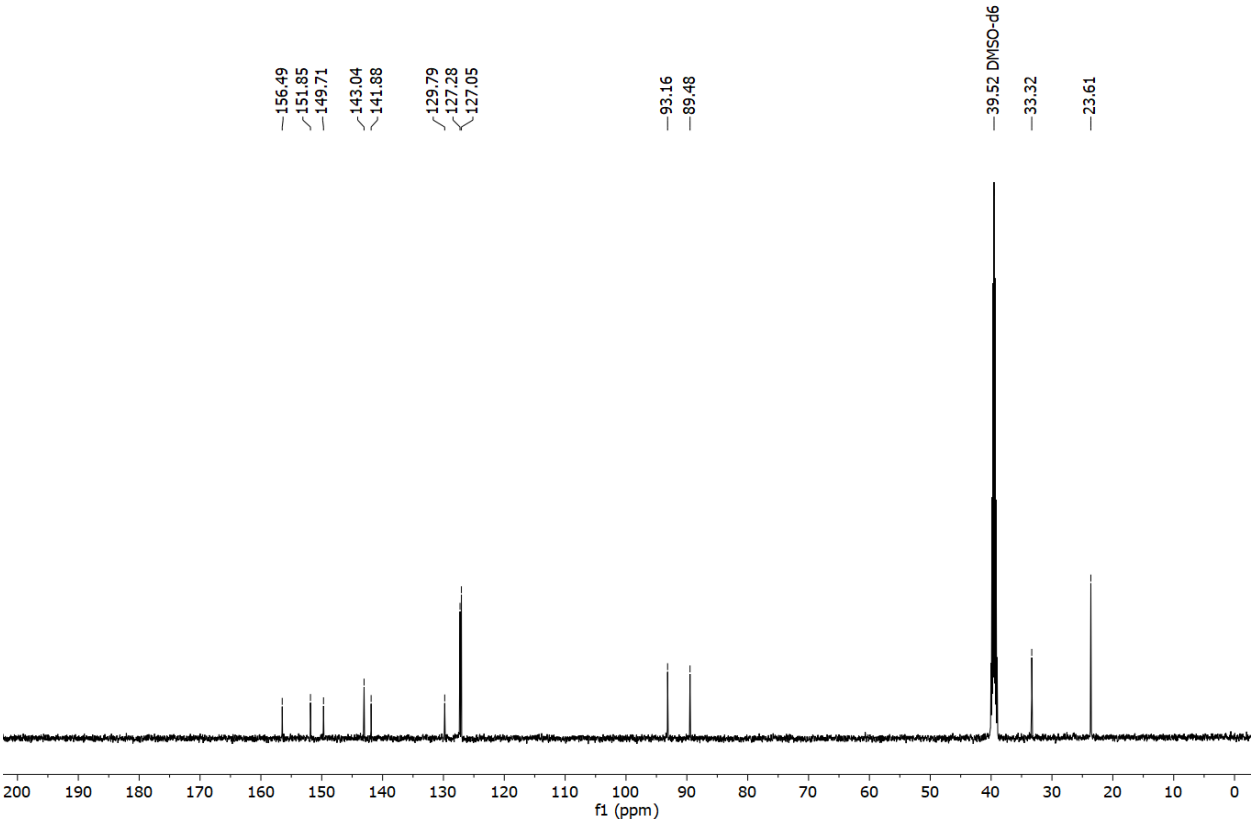
^{13}C NMR (126 MHz, DMSO-*d*$_6$)



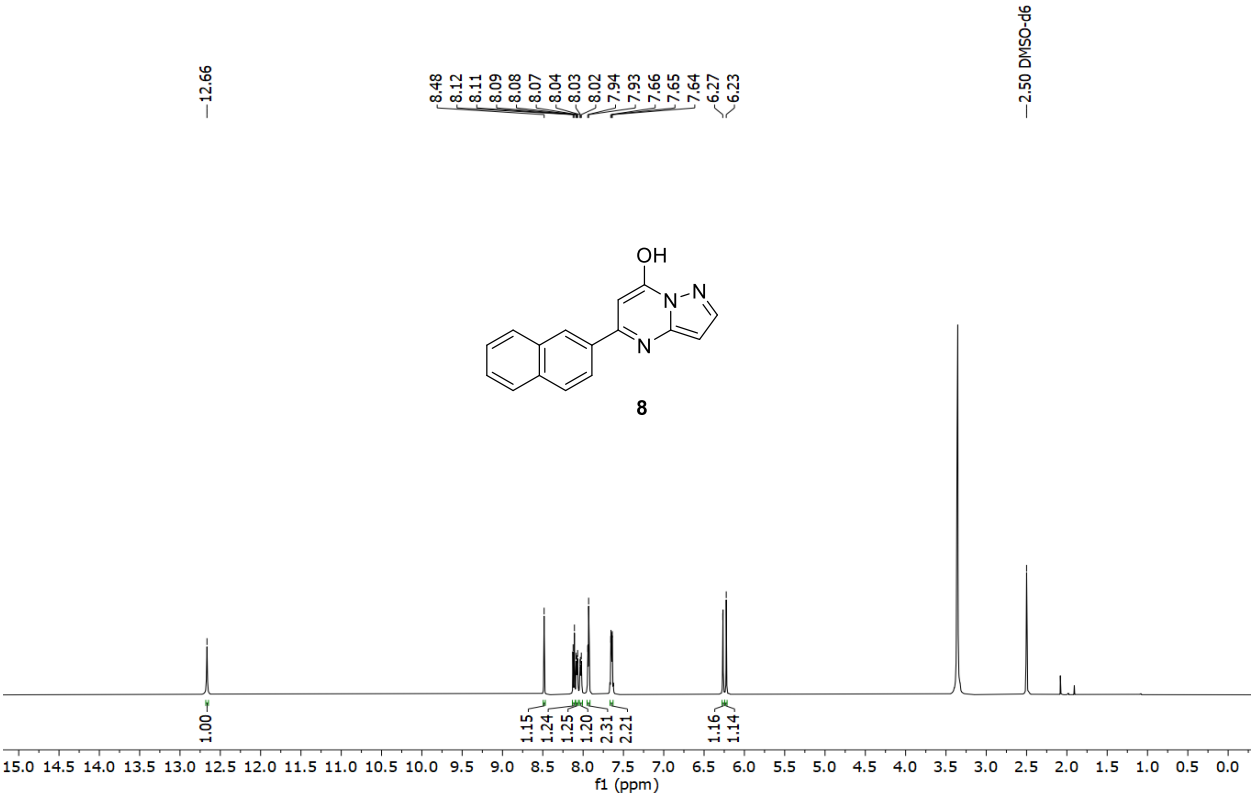
^{1}H-NMR (500 MHz, DMSO-d_6)



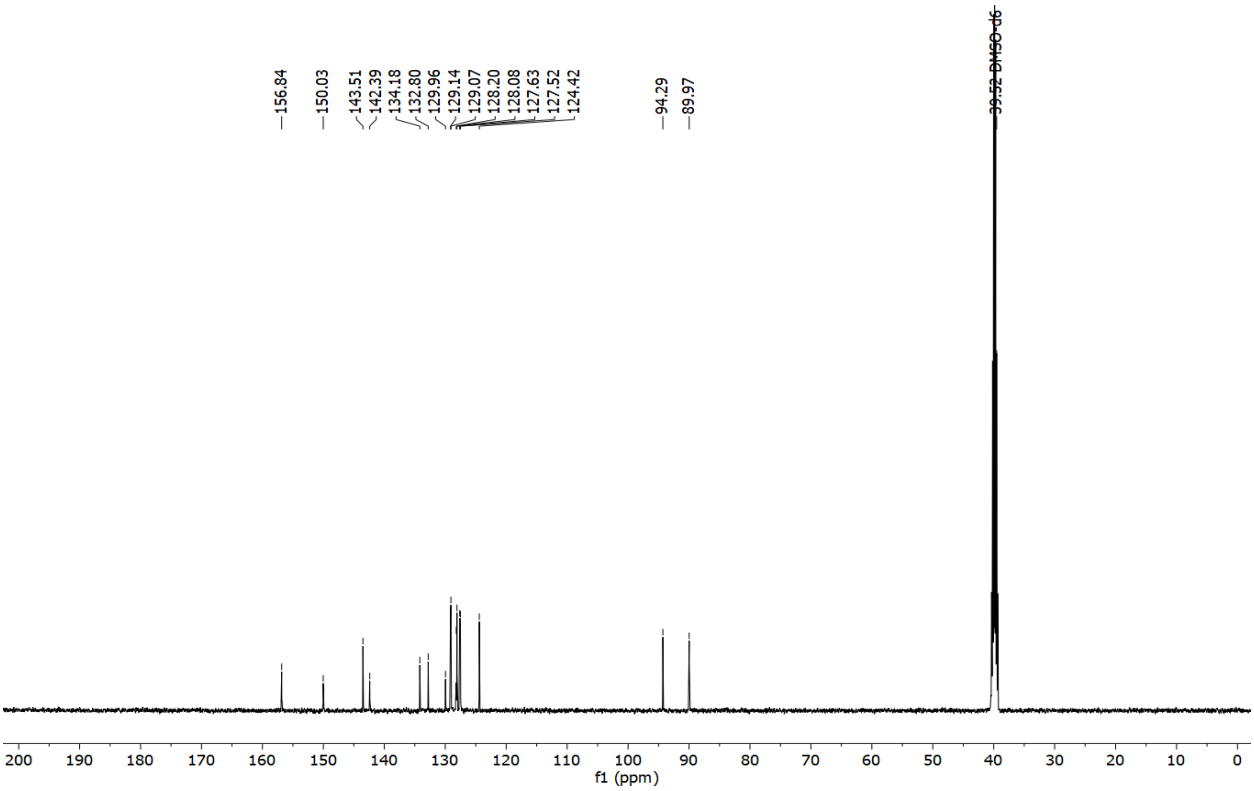
^{13}C NMR (126 MHz, DMSO-d_6)



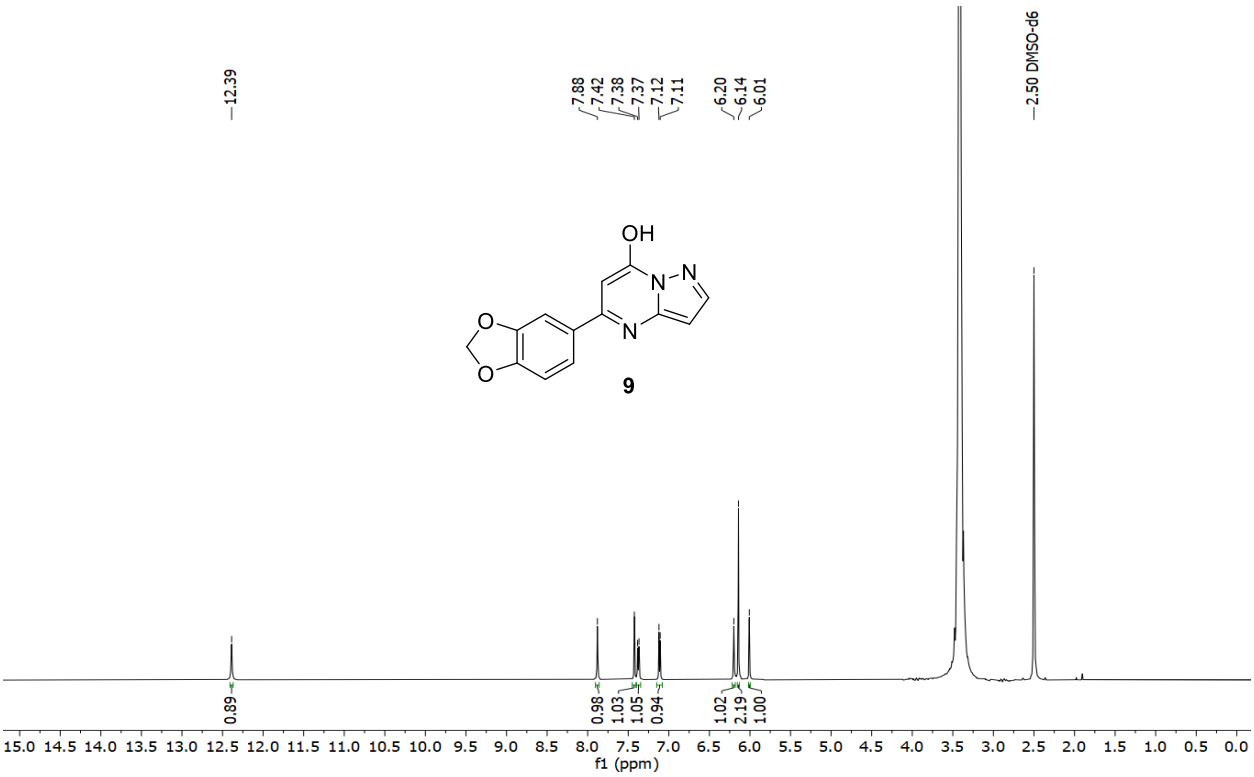
^{1}H-NMR (500 MHz, DMSO-d_6)



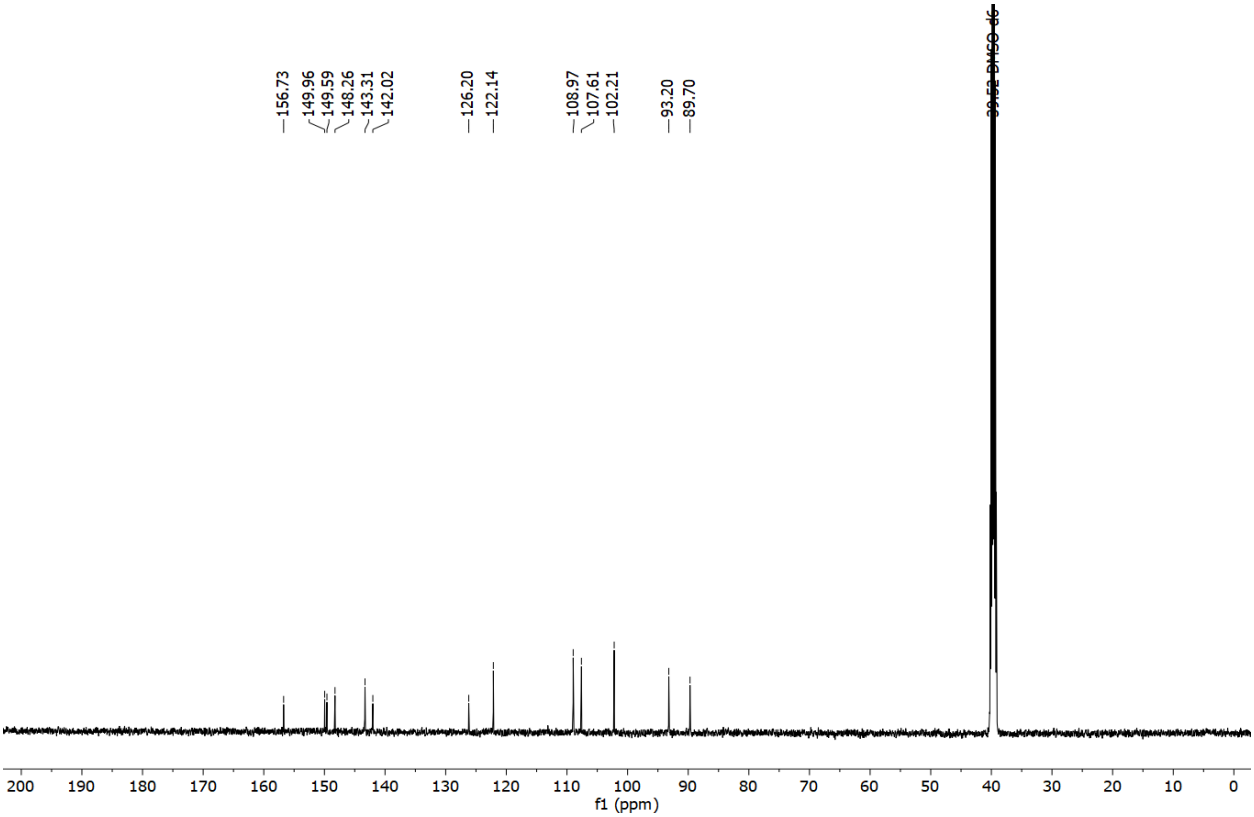
^{13}C NMR (126 MHz, DMSO-d_6)



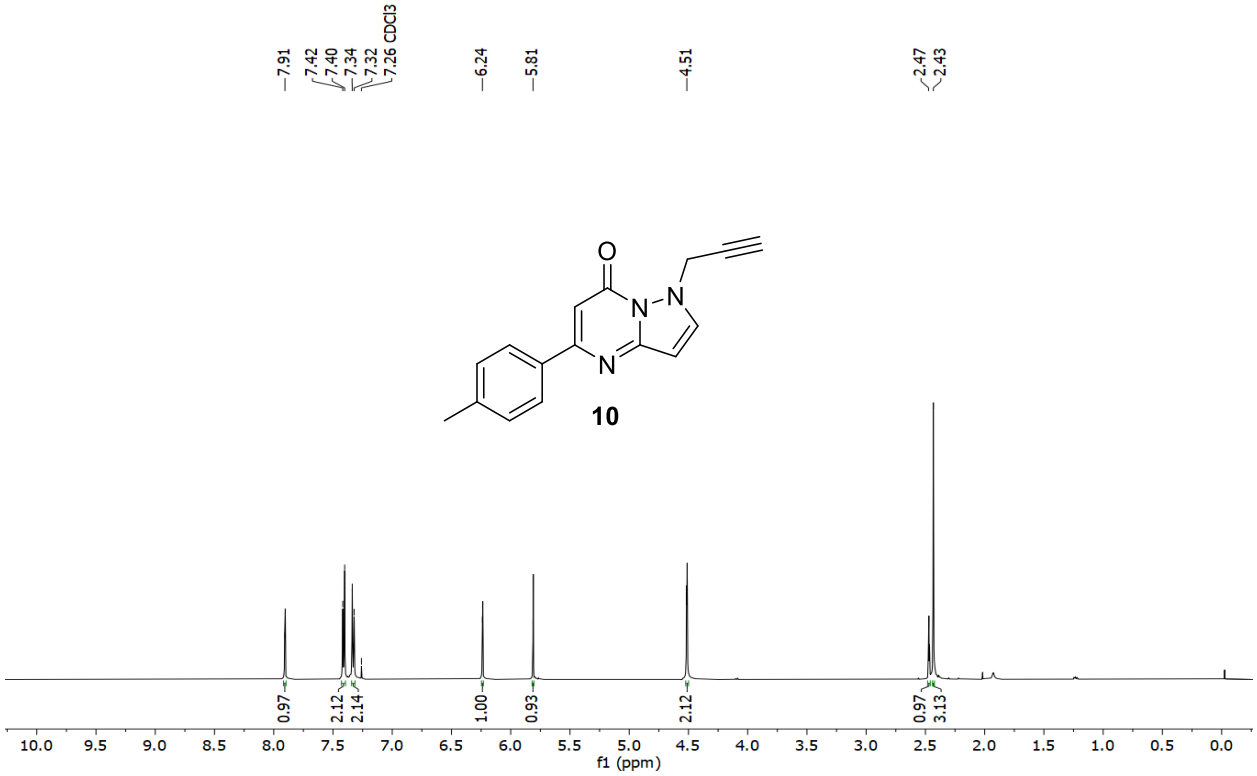
^{1}H-NMR (500 MHz, DMSO-d_6)



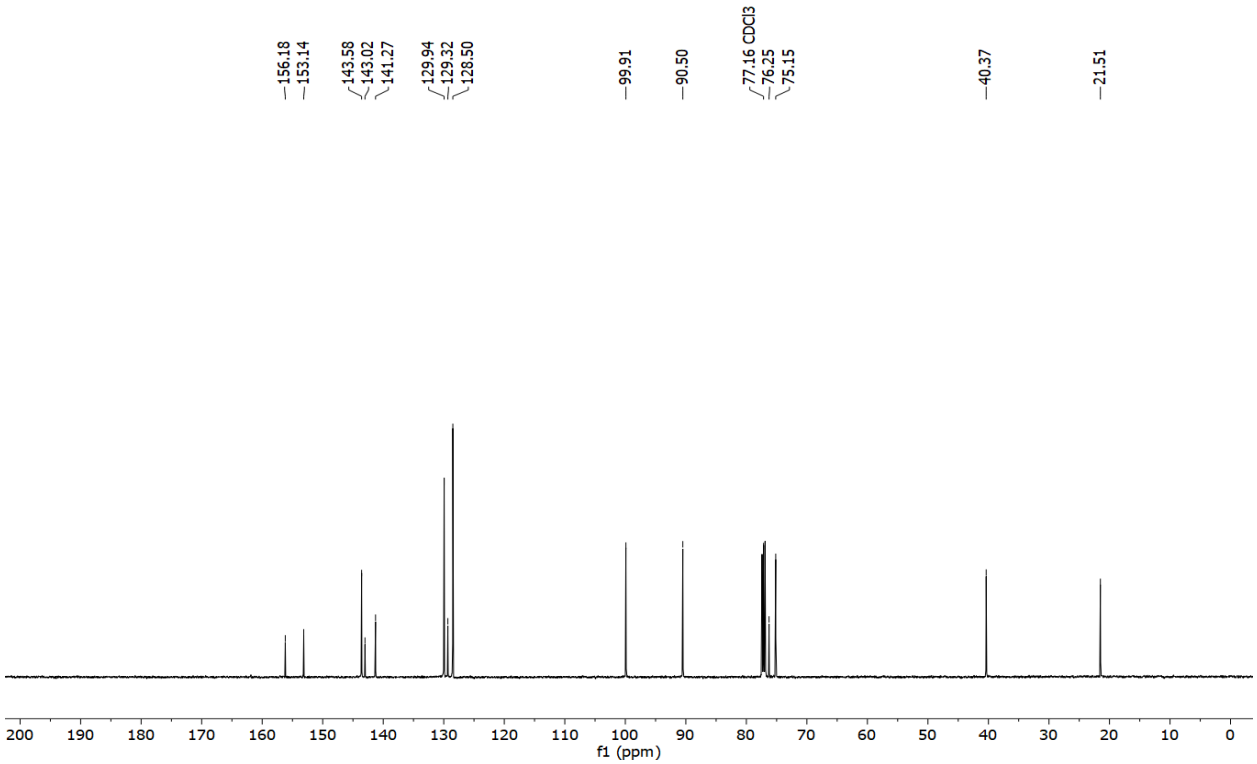
^{13}C NMR (126 MHz, DMSO-d_6)



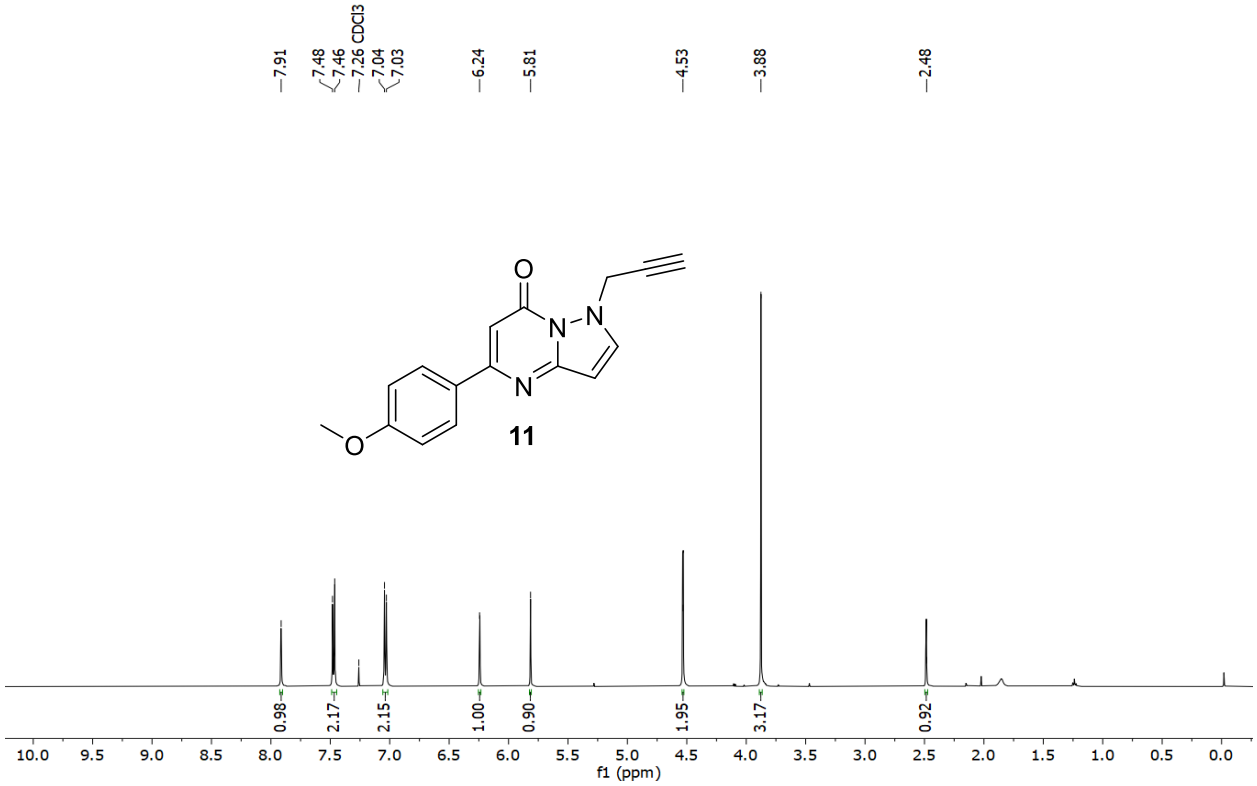
Copies of ^{1}H NMR and ^{13}C NMR of *N*-propargylated pyrazolo[1,5-*a*]pyrimidinone derivatives 10-18: ^{1}H-NMR (500 MHz, $CDCl_3$)



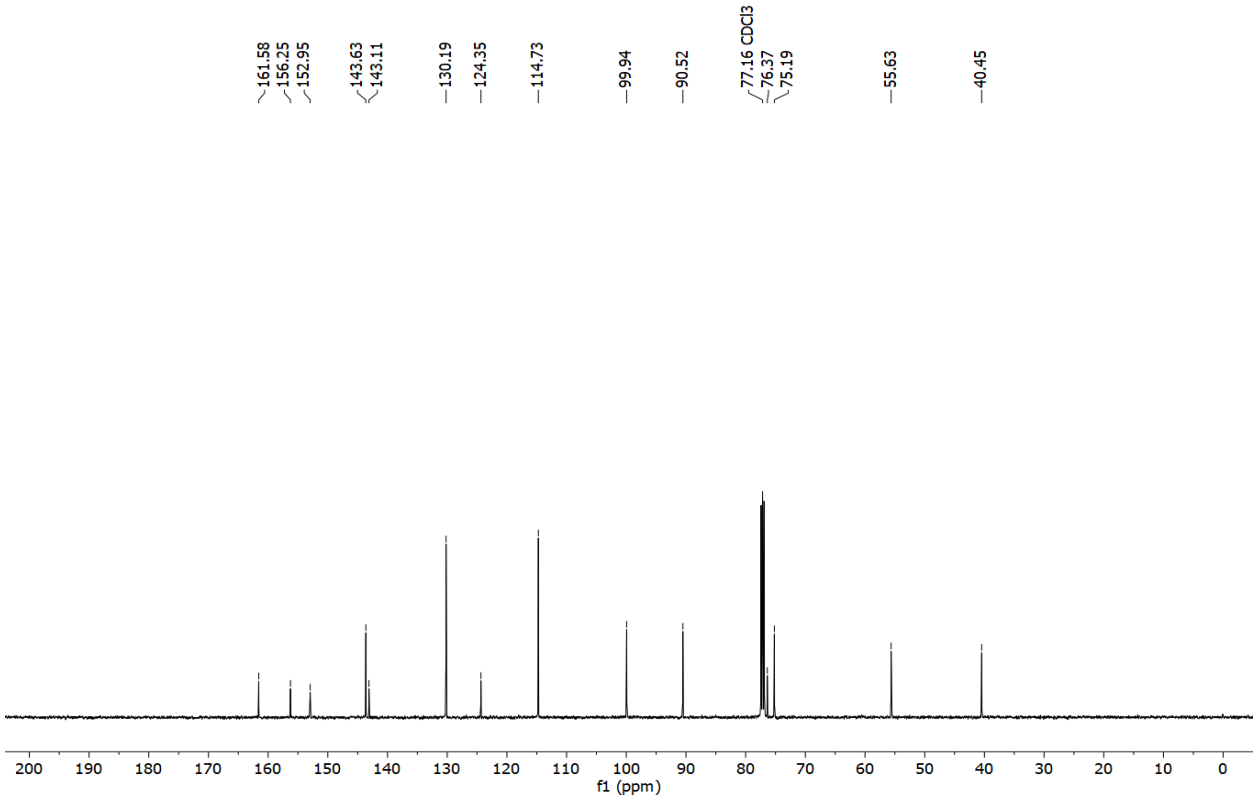
^{13}C-NMR (126 MHz, $CDCl_3$)



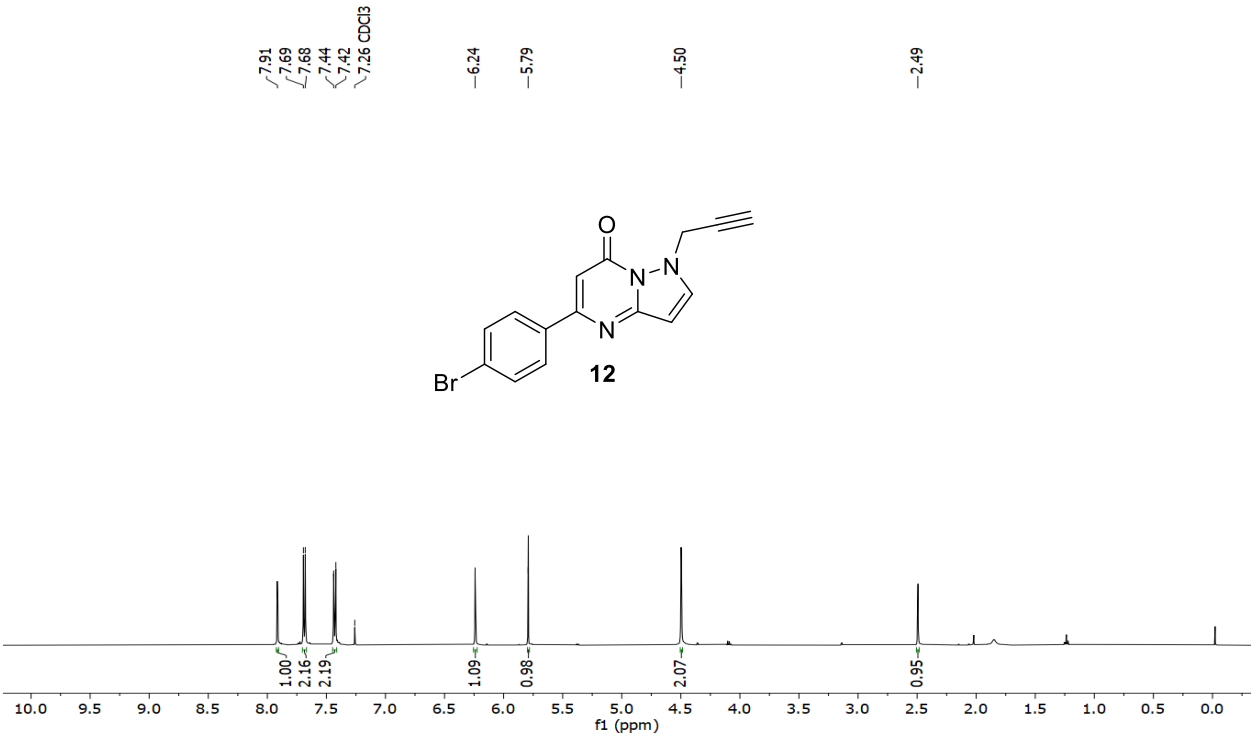
^{1}H-NMR (500 MHz, $CDCl_3$)



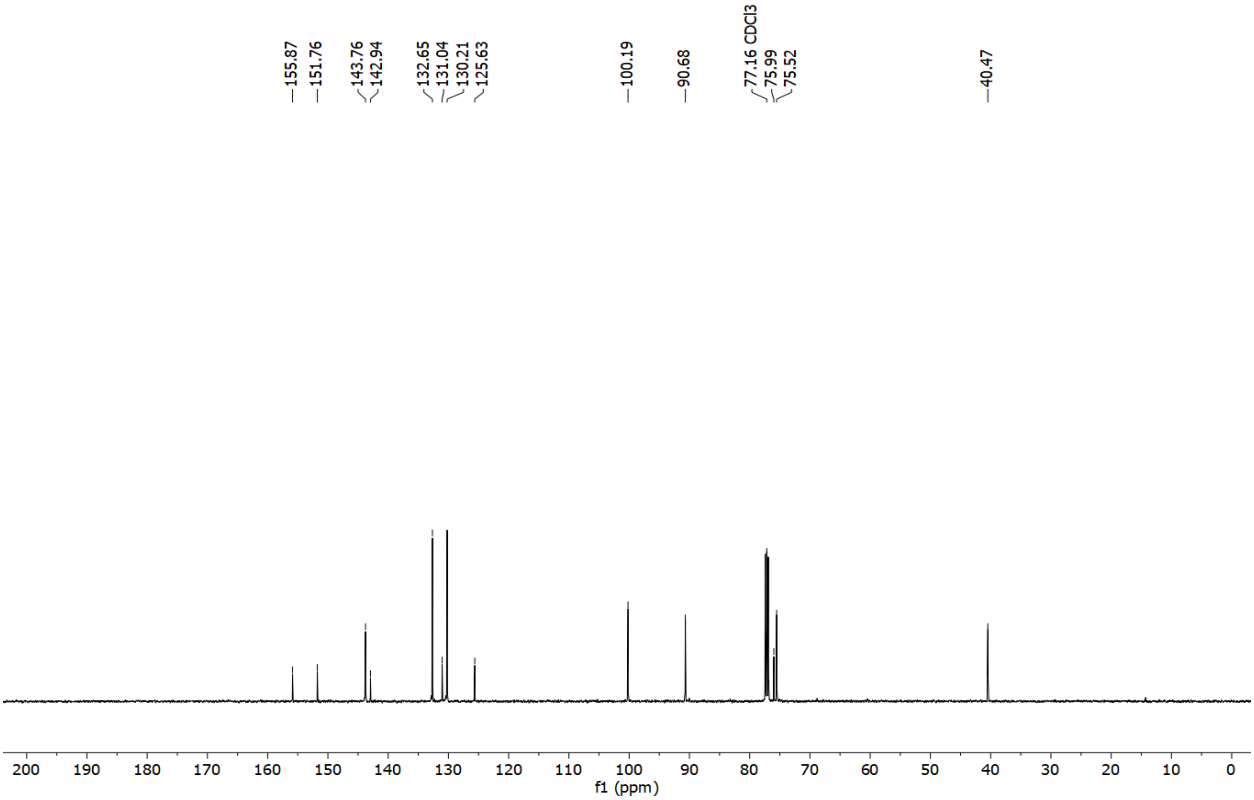
^{13}C-NMR (126 MHz, $CDCl_3$)



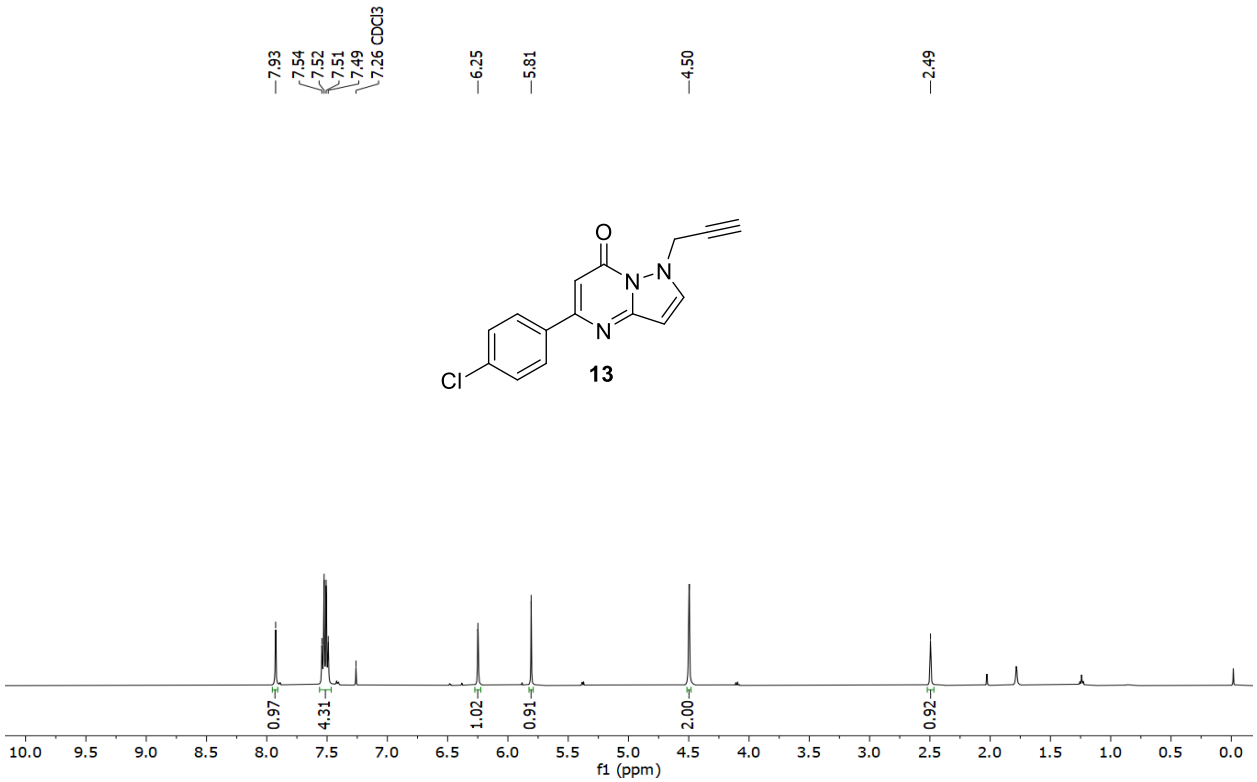
^{1}H-NMR (500 MHz, $CDCl_3$)



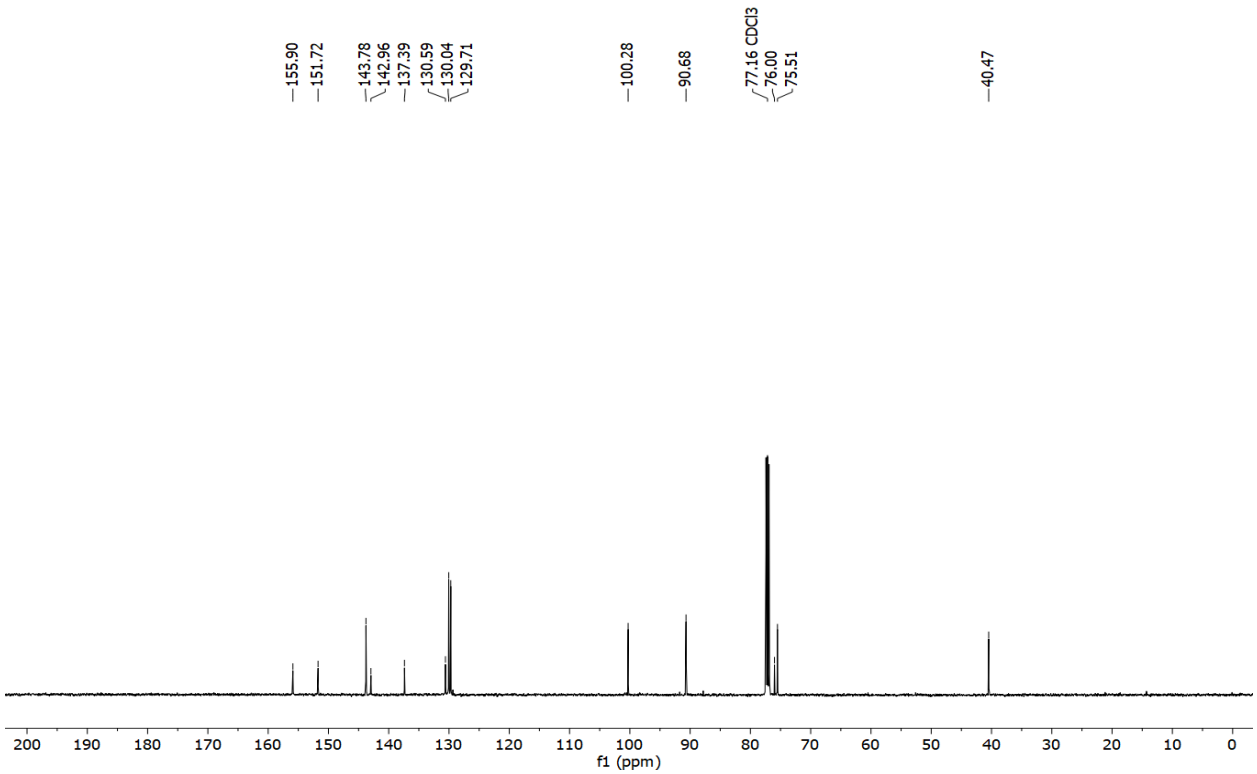
^{13}C-NMR (126 MHz, $CDCl_3$)



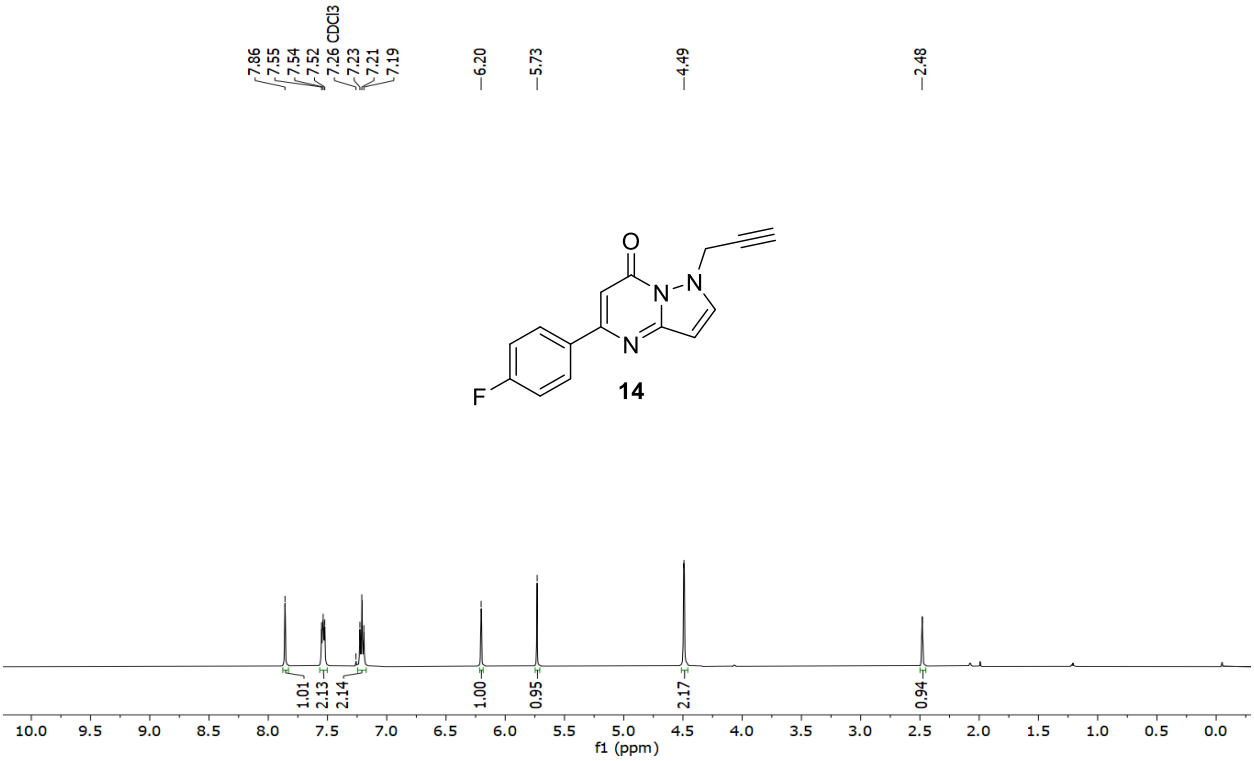
^{1}H-NMR (500 MHz, $CDCl_3$)



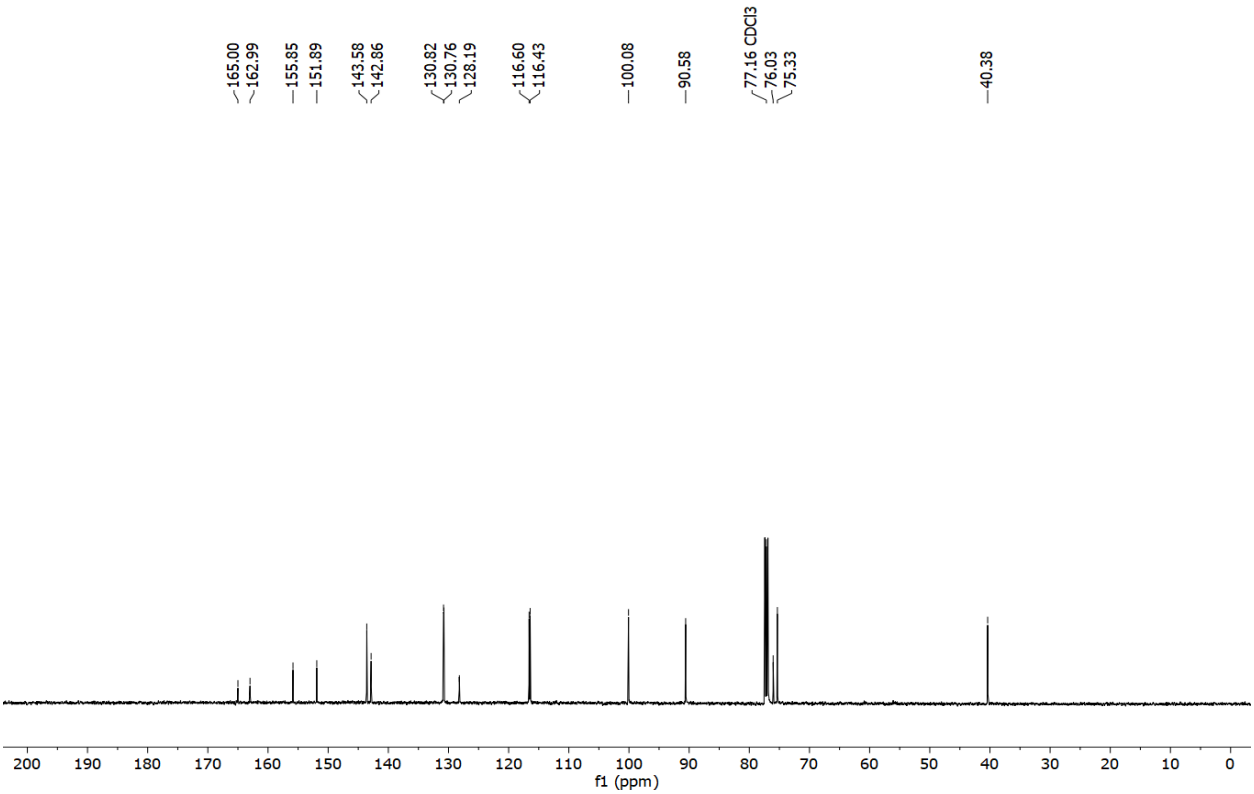
^{13}C-NMR (126 MHz, $CDCl_3$)



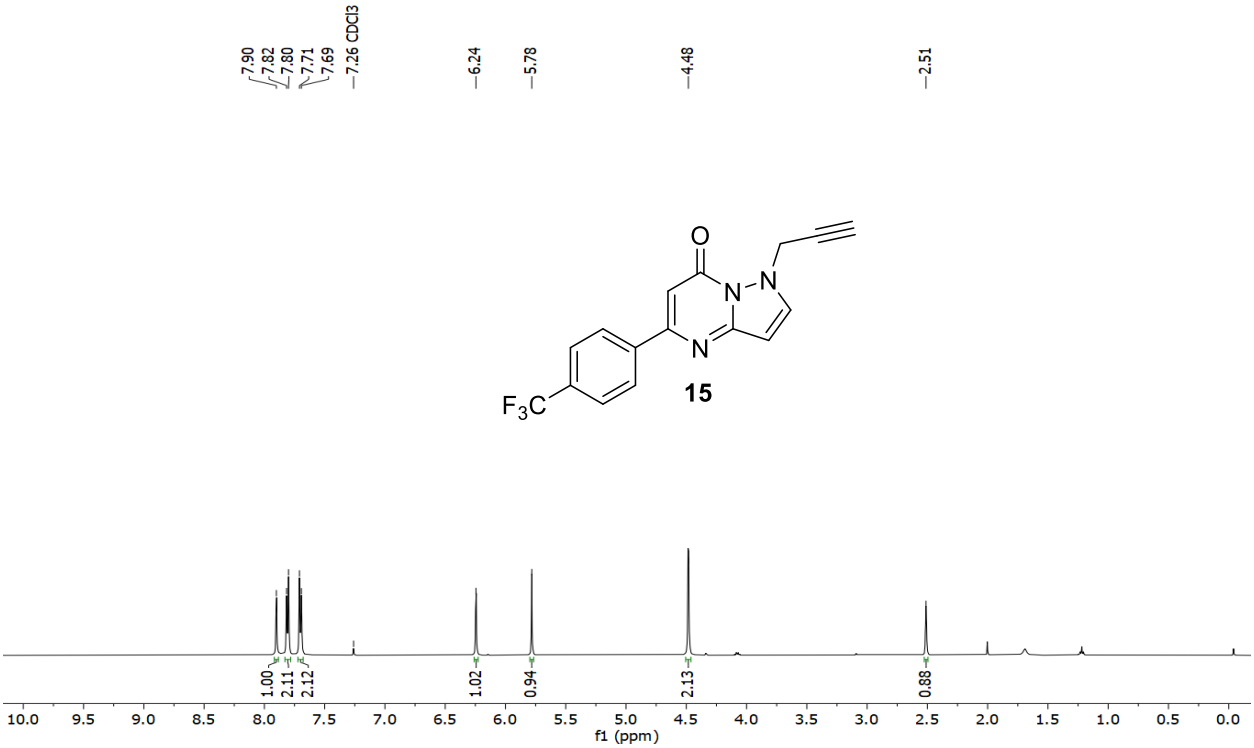
^{1}H-NMR (500 MHz, $CDCl_3$)



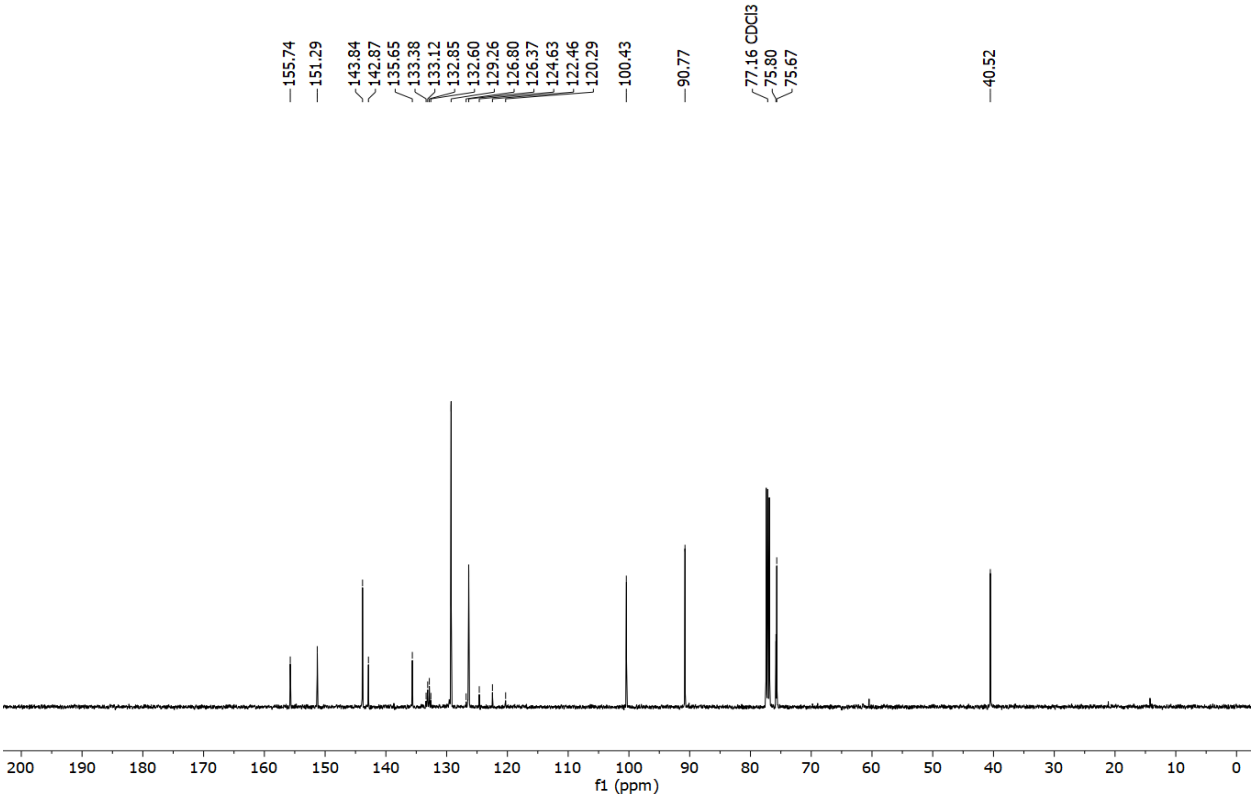
^{13}C-NMR (126 MHz, $CDCl_3$)



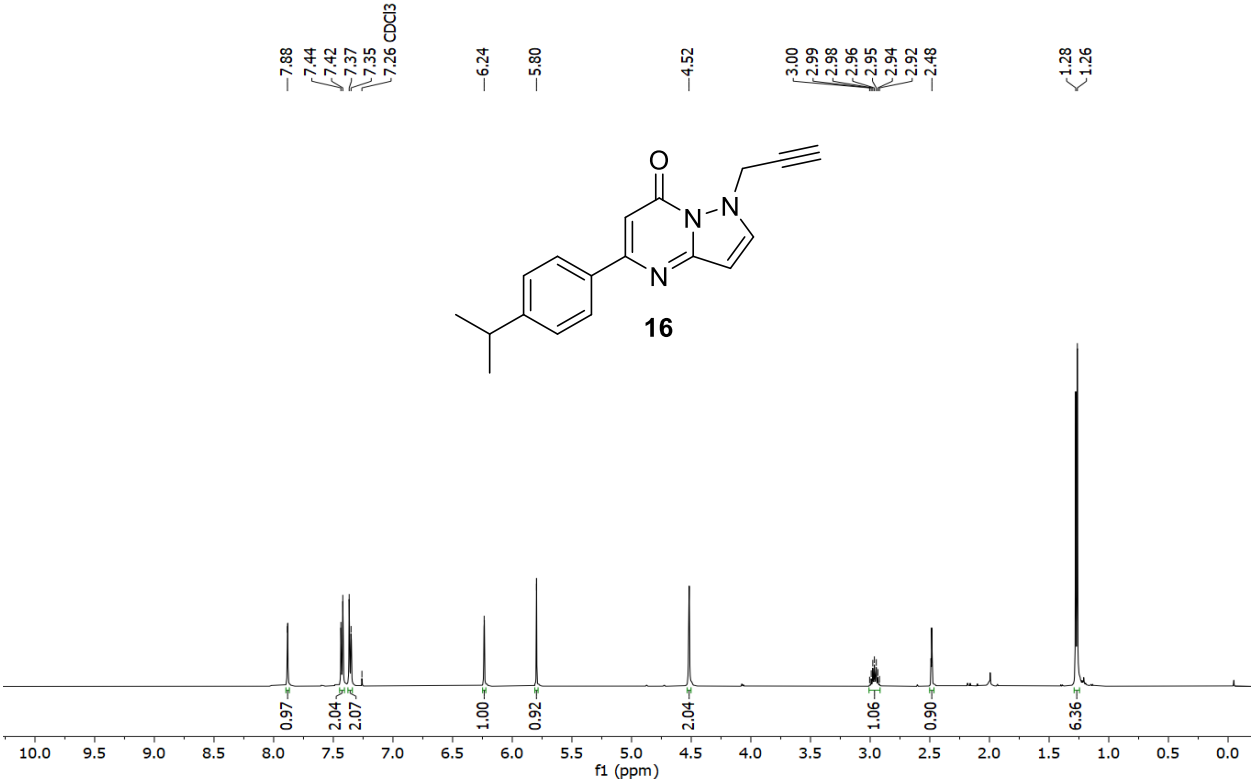
^{1}H-NMR (500 MHz, $CDCl_3$)



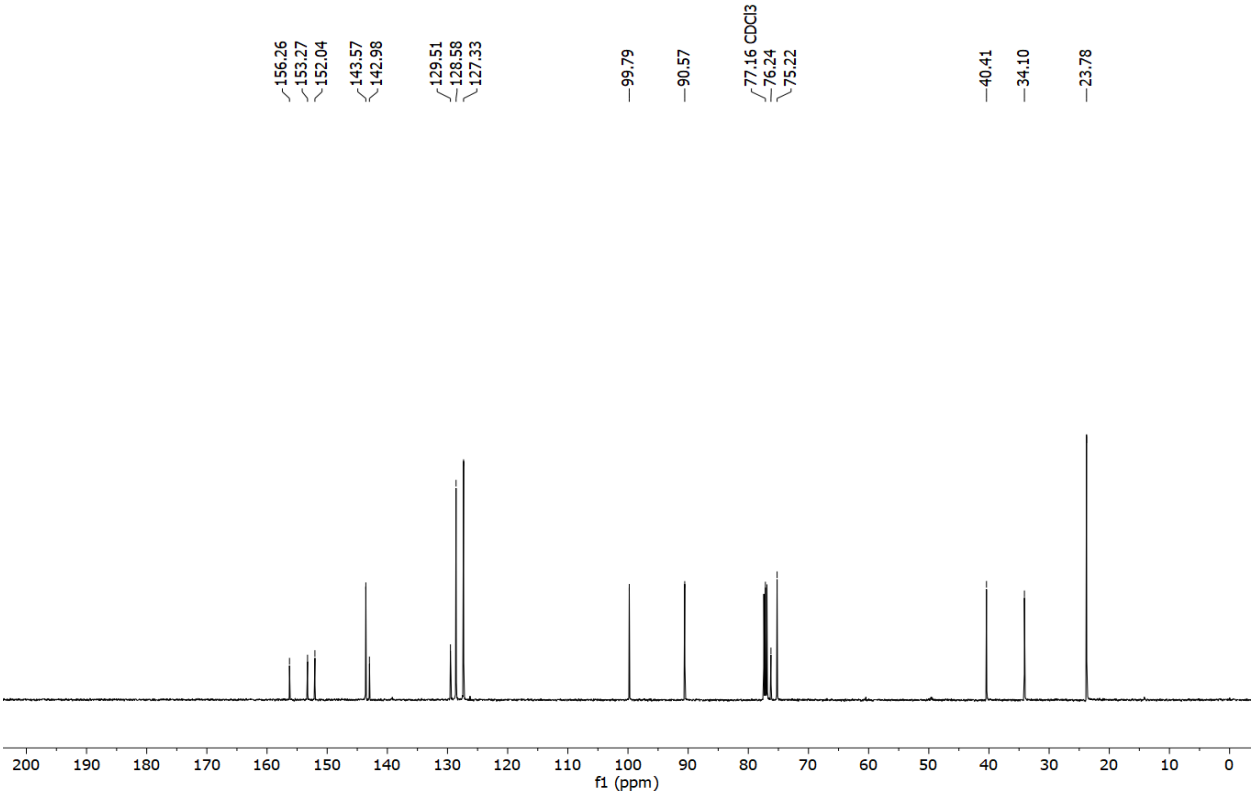
^{13}C-NMR (126 MHz, $CDCl_3$)



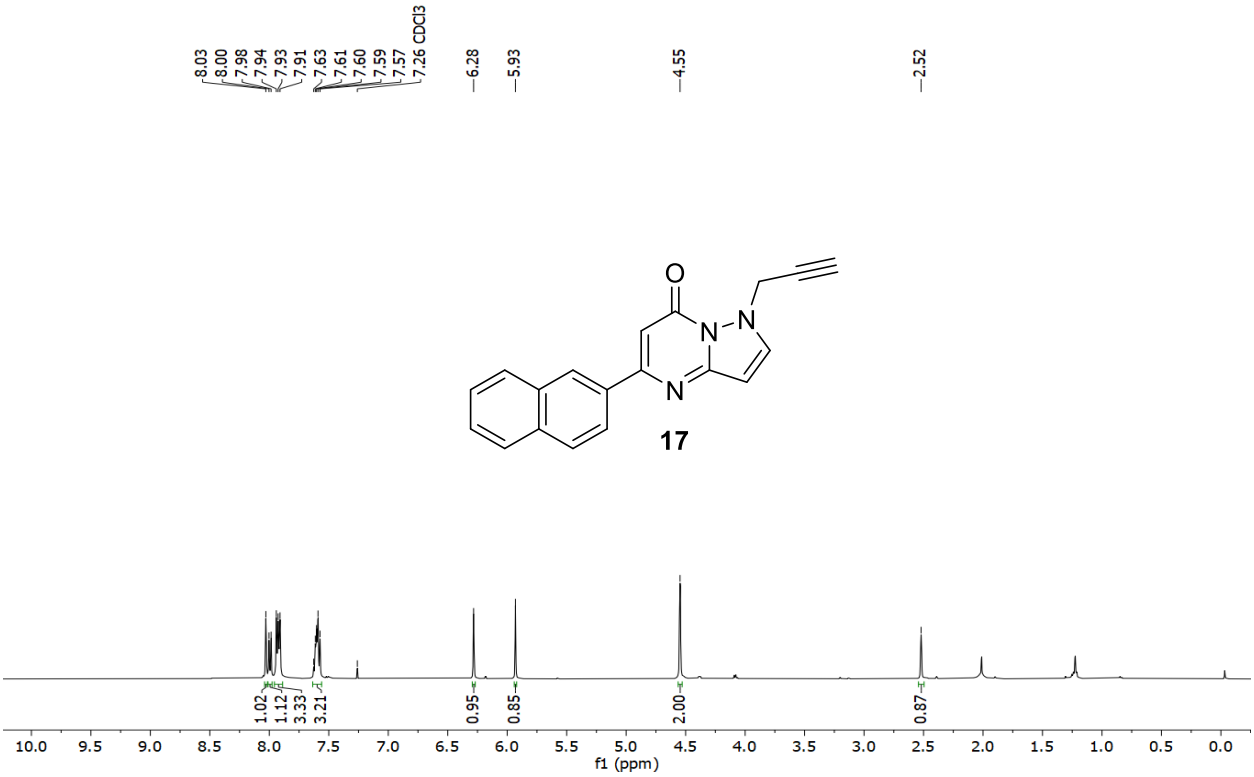
^{1}H-NMR (500 MHz, $CDCl_3$)



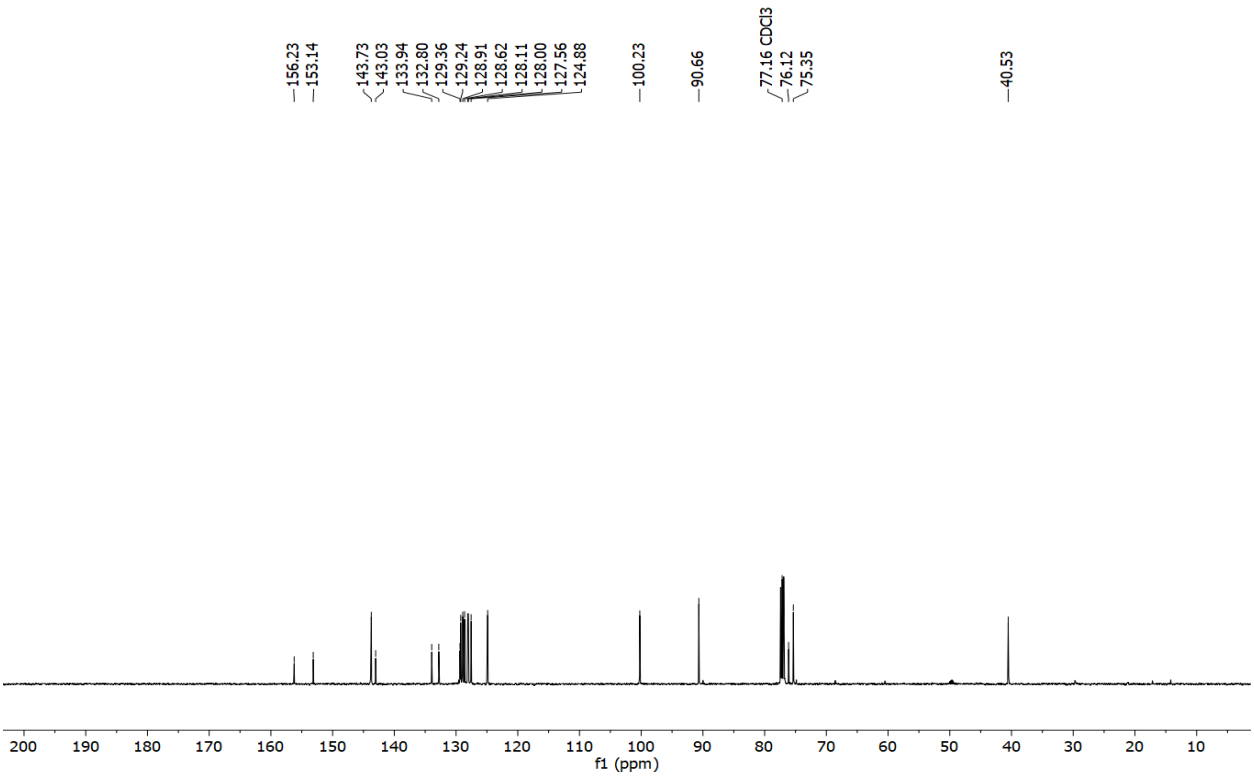
^{13}C-NMR (126 MHz, $CDCl_3$)



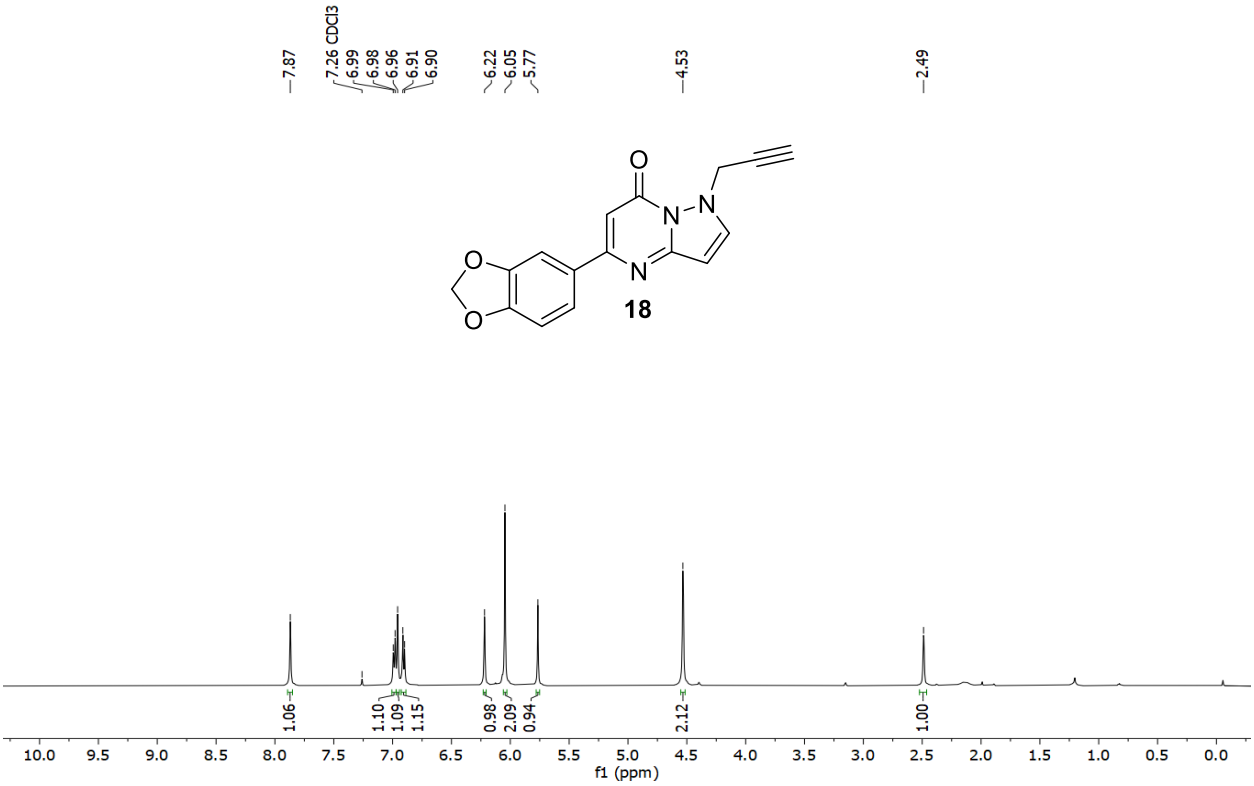
^{1}H-NMR (500 MHz, $CDCl_3$)



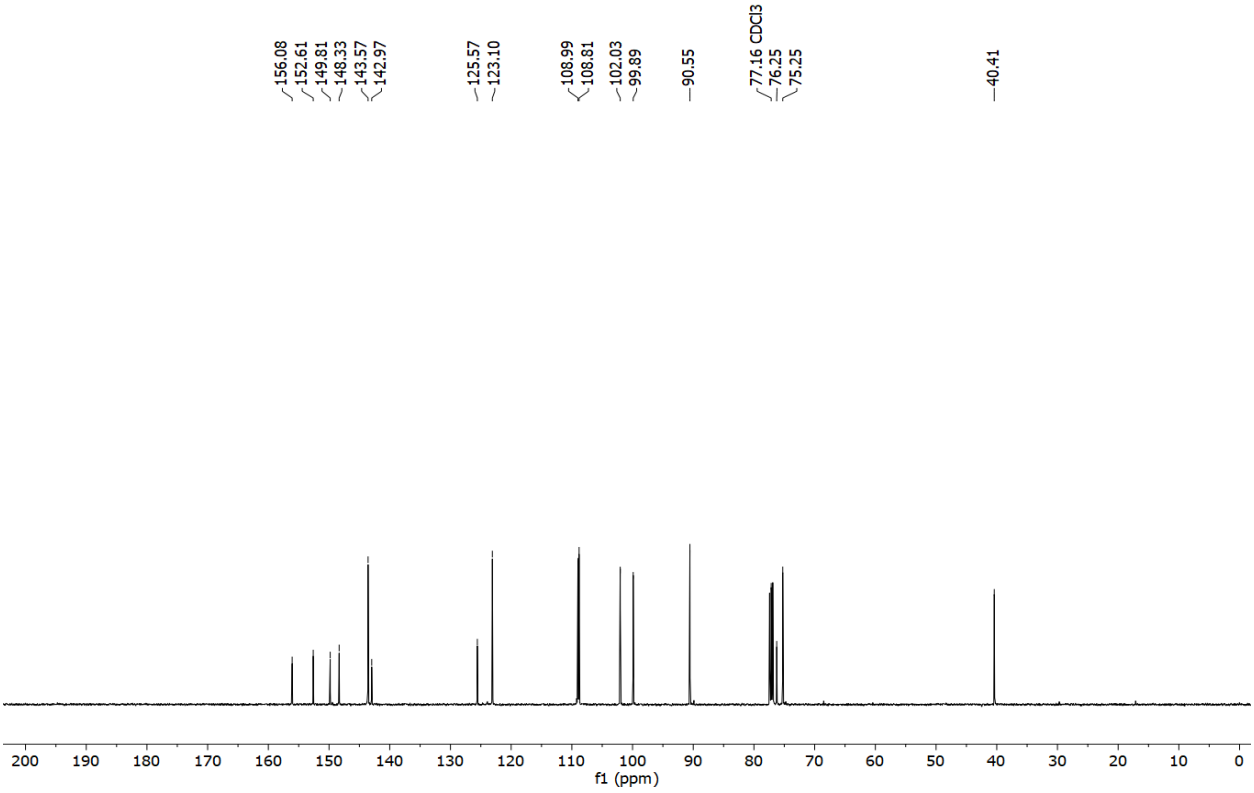
^{13}C-NMR (126 MHz, $CDCl_3$)



^{1}H-NMR (500 MHz, $CDCl_3$)

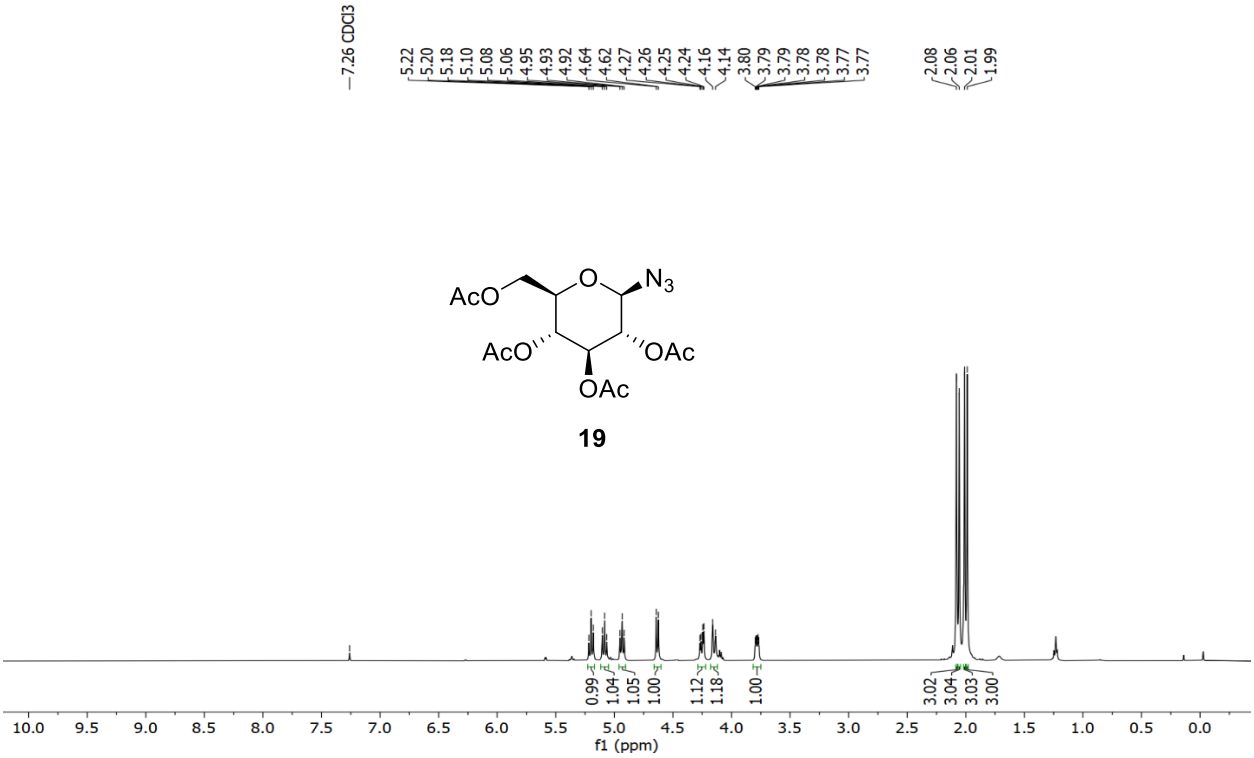


^{13}C-NMR (126 MHz, $CDCl_3$)



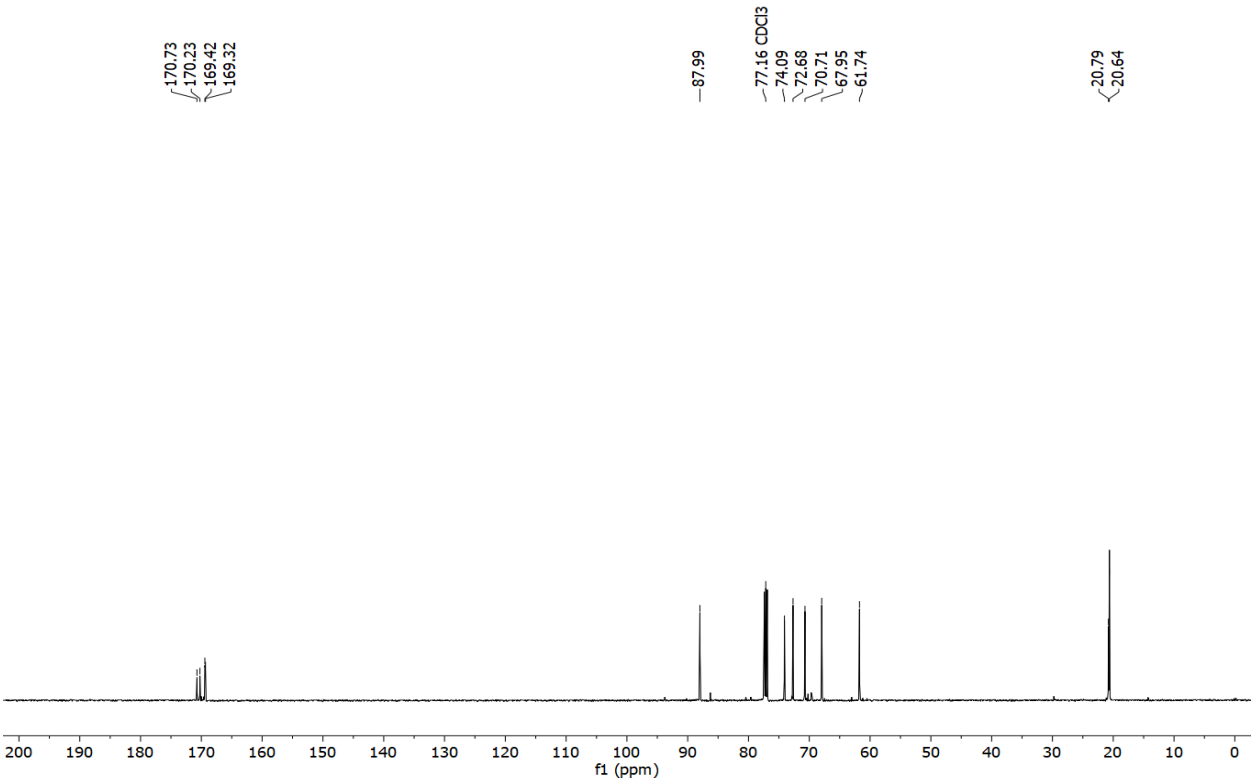
Copies of ^{1}H NMR and ^{13}C NMR of azido glycosides 19-21:

^{1}H-NMR (500 MHz, $CDCl_3$)

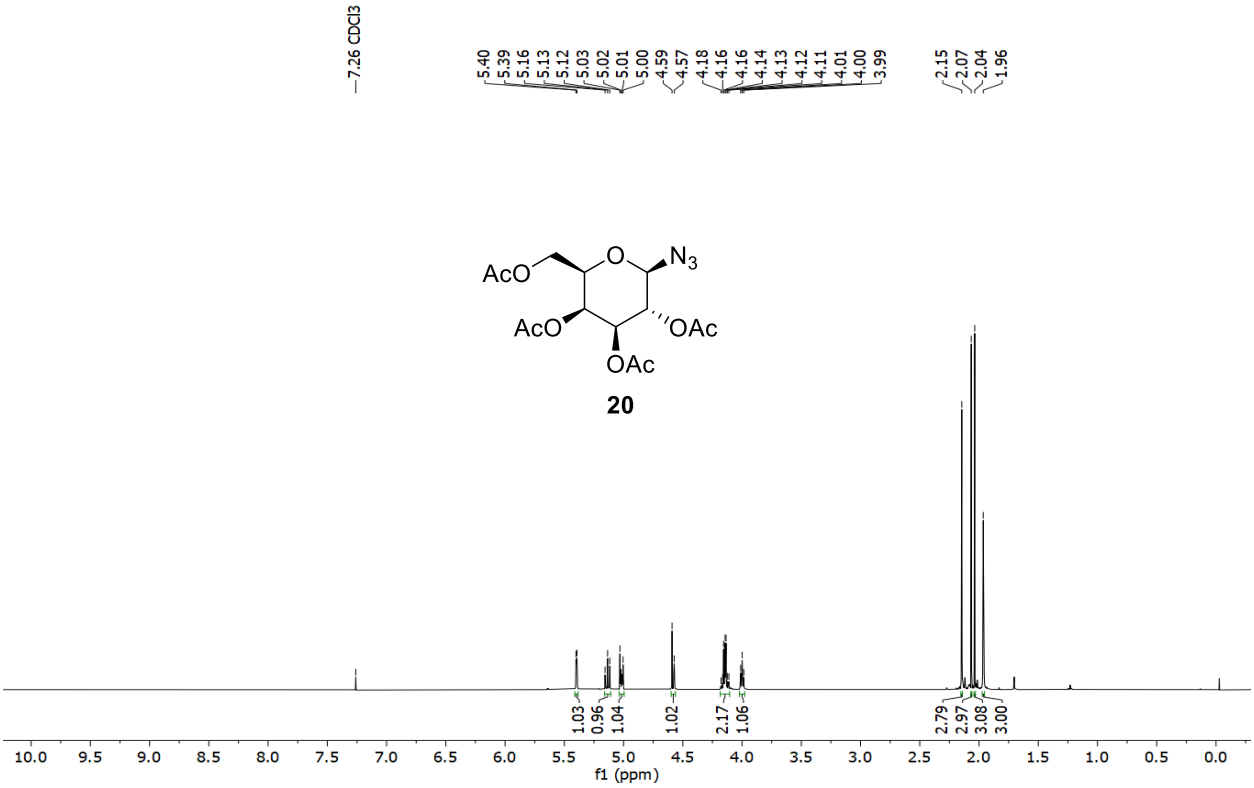


19

^{13}C-NMR (126 MHz, $CDCl_3$)

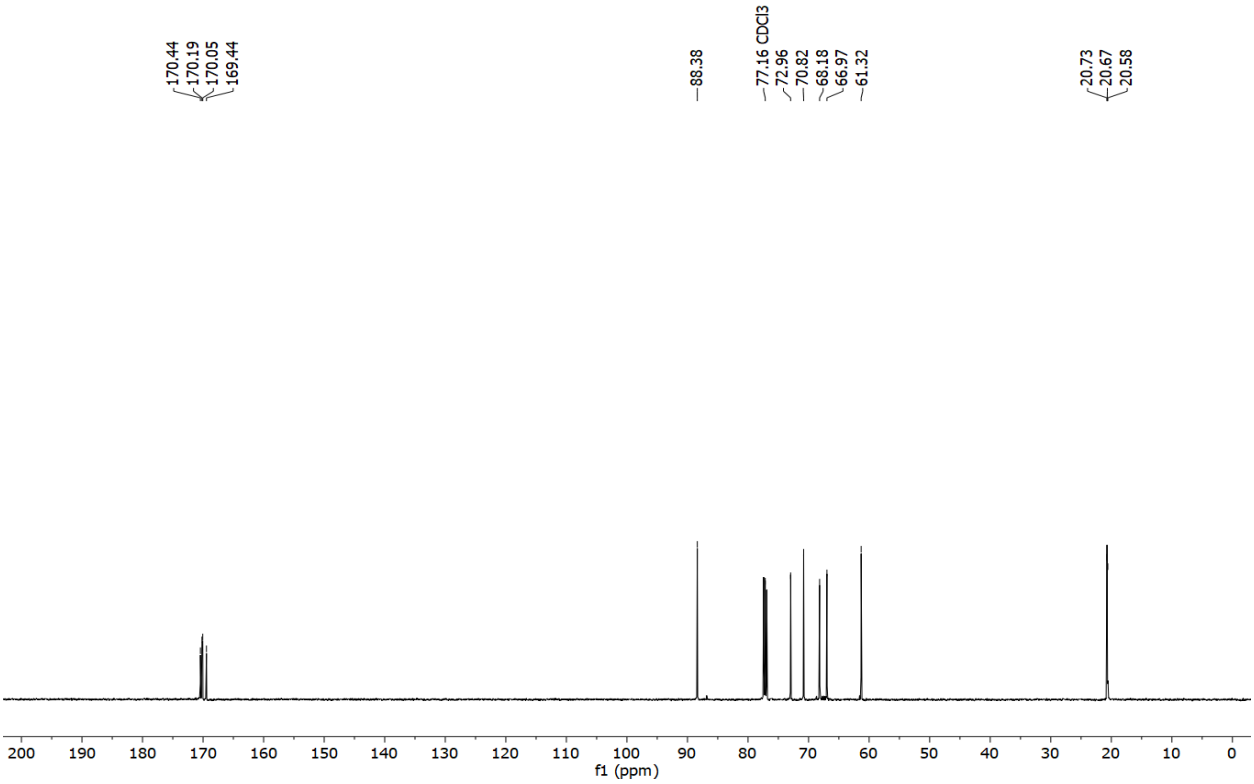


^{1}H-NMR (500 MHz, $CDCl_3$)

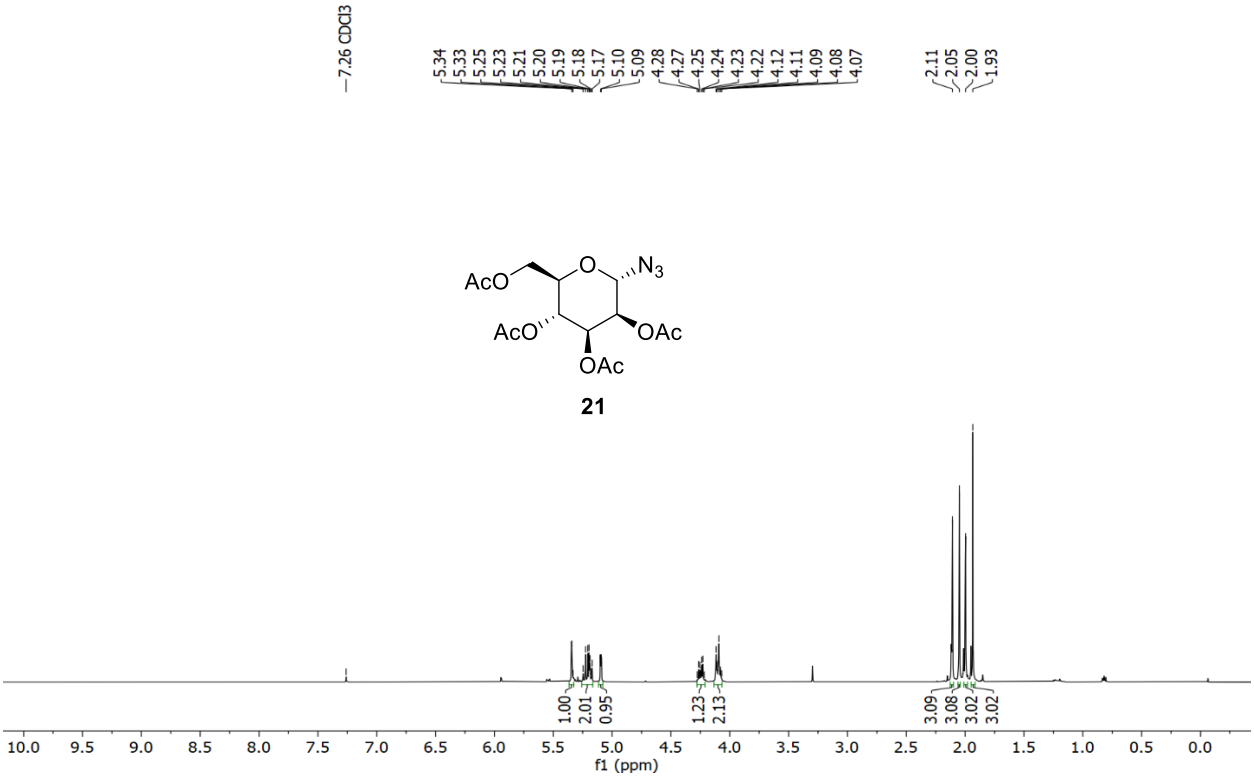


20

^{13}C-NMR (126 MHz, $CDCl_3$)

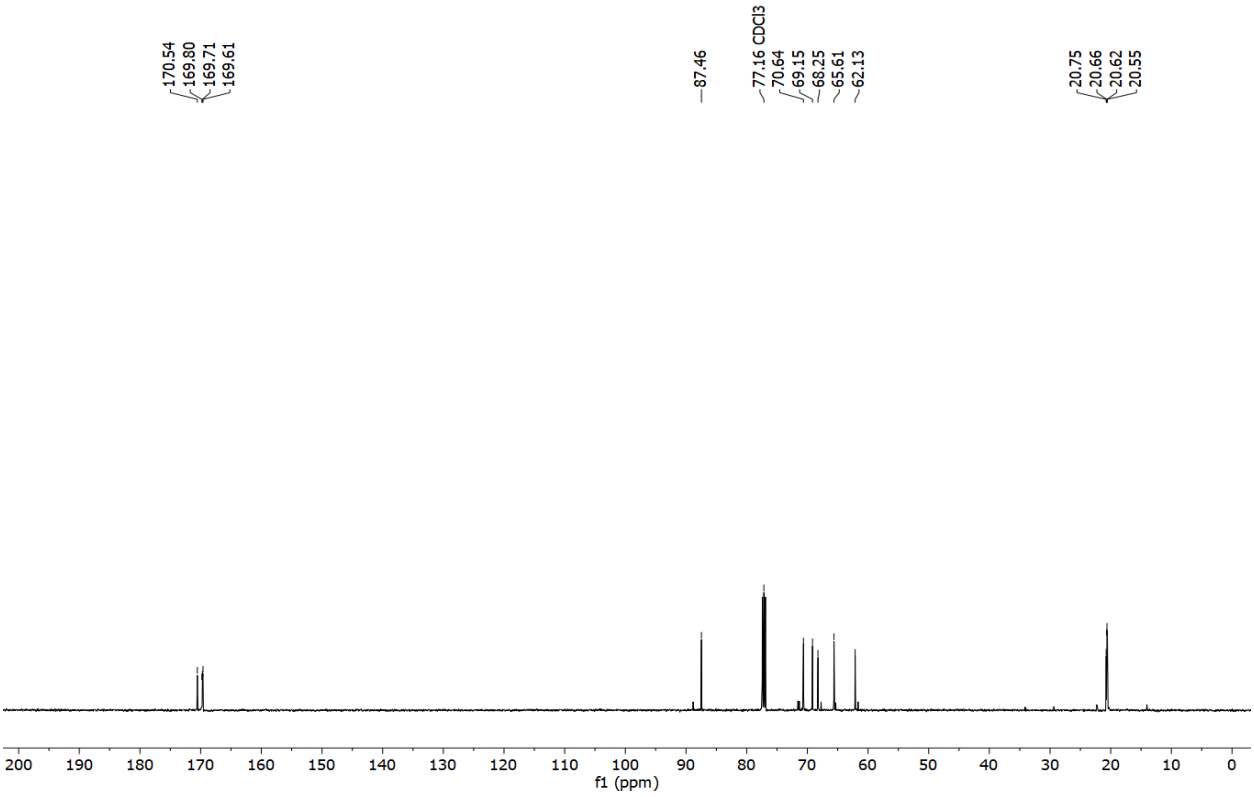


^{1}H-NMR (500 MHz, $CDCl_3$)

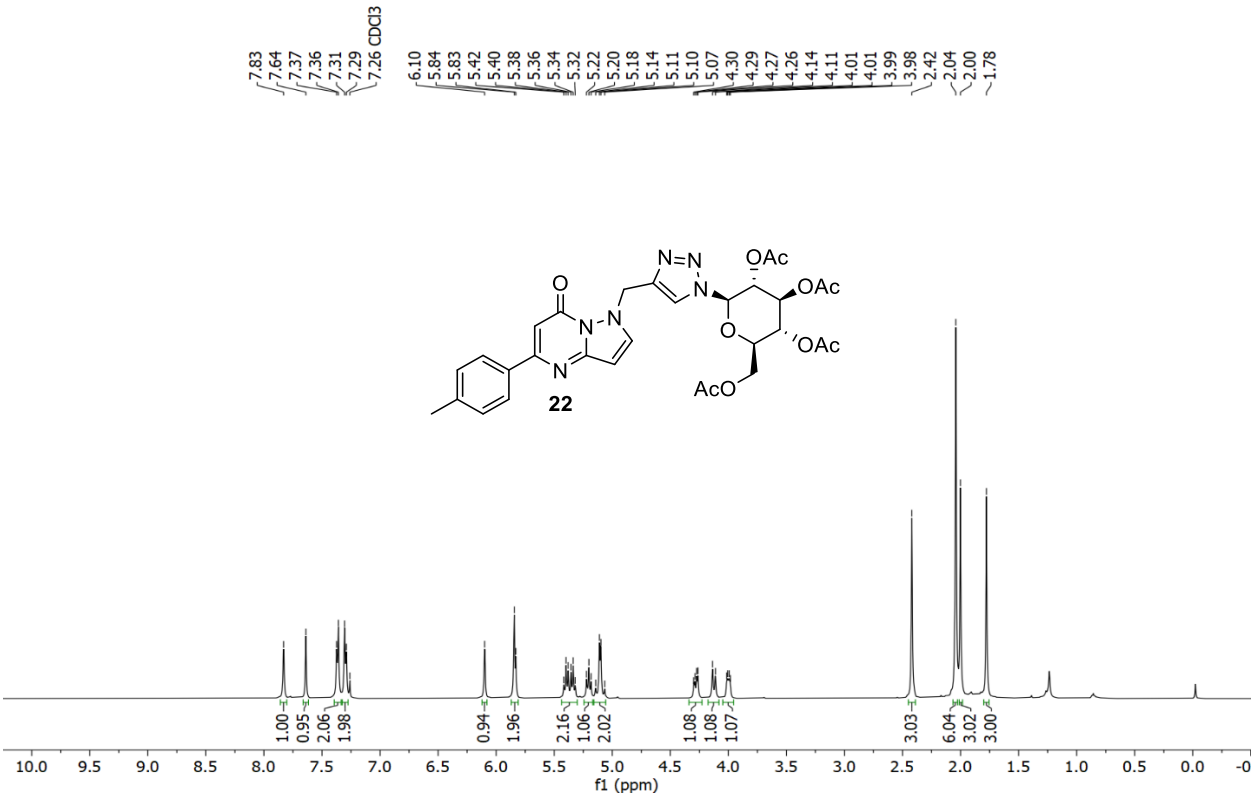


21

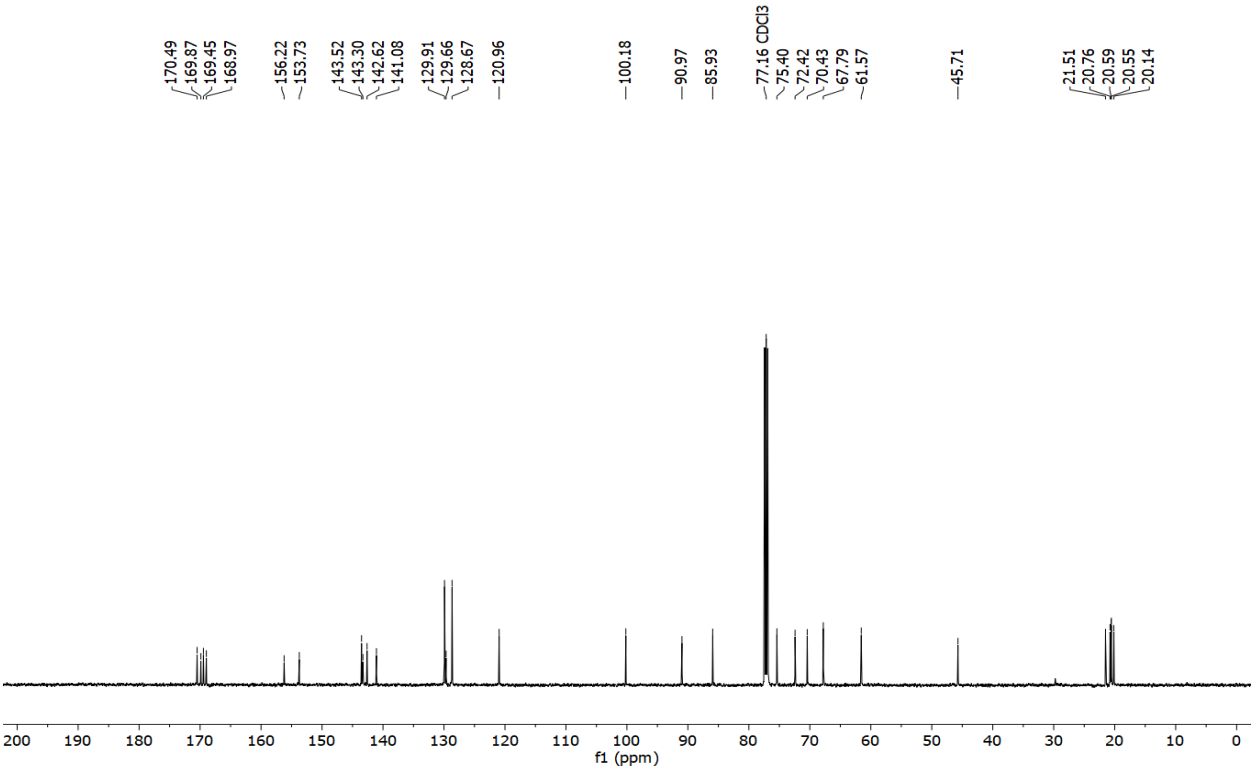
^{13}C-NMR (126 MHz, $CDCl_3$)



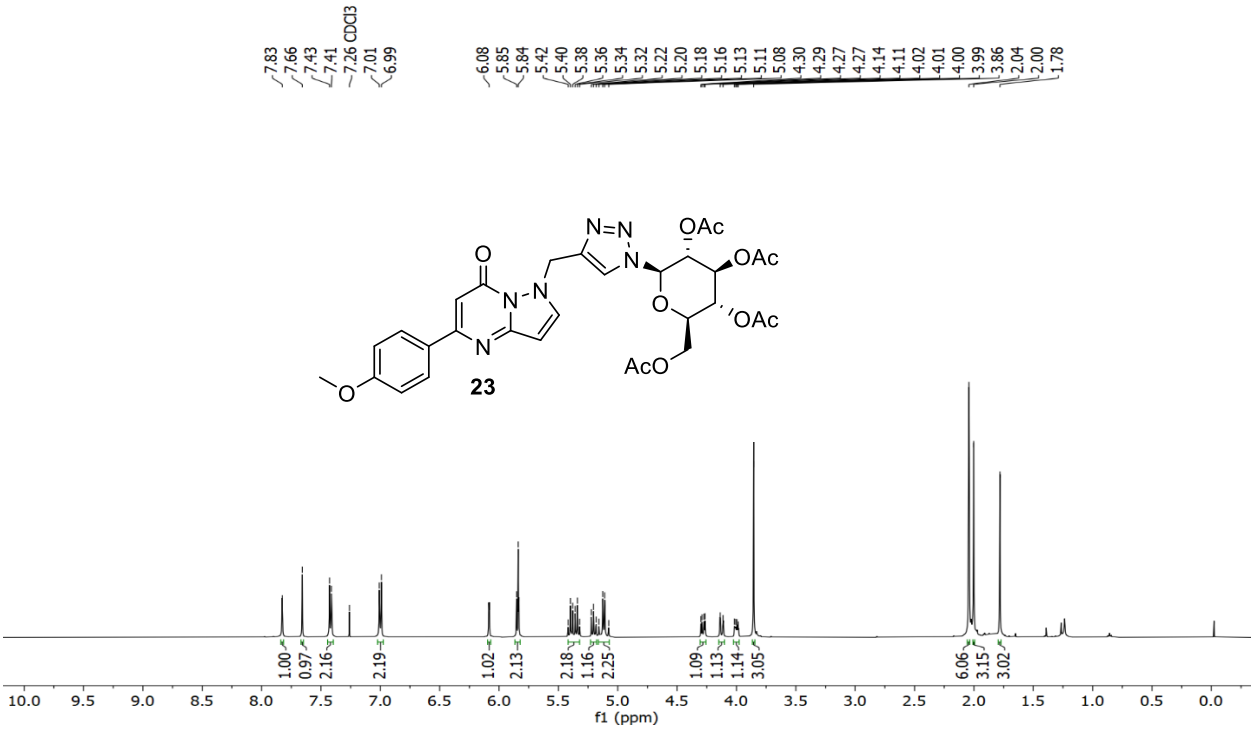
Copies of ^{1}H NMR and ^{13}C NMR of triazole bridged *N*-glycosides of pyrazolo[1,5-*a*]pyrimidinones 22-48: ^{1}H-NMR (500 MHz, $CDCl_3$)



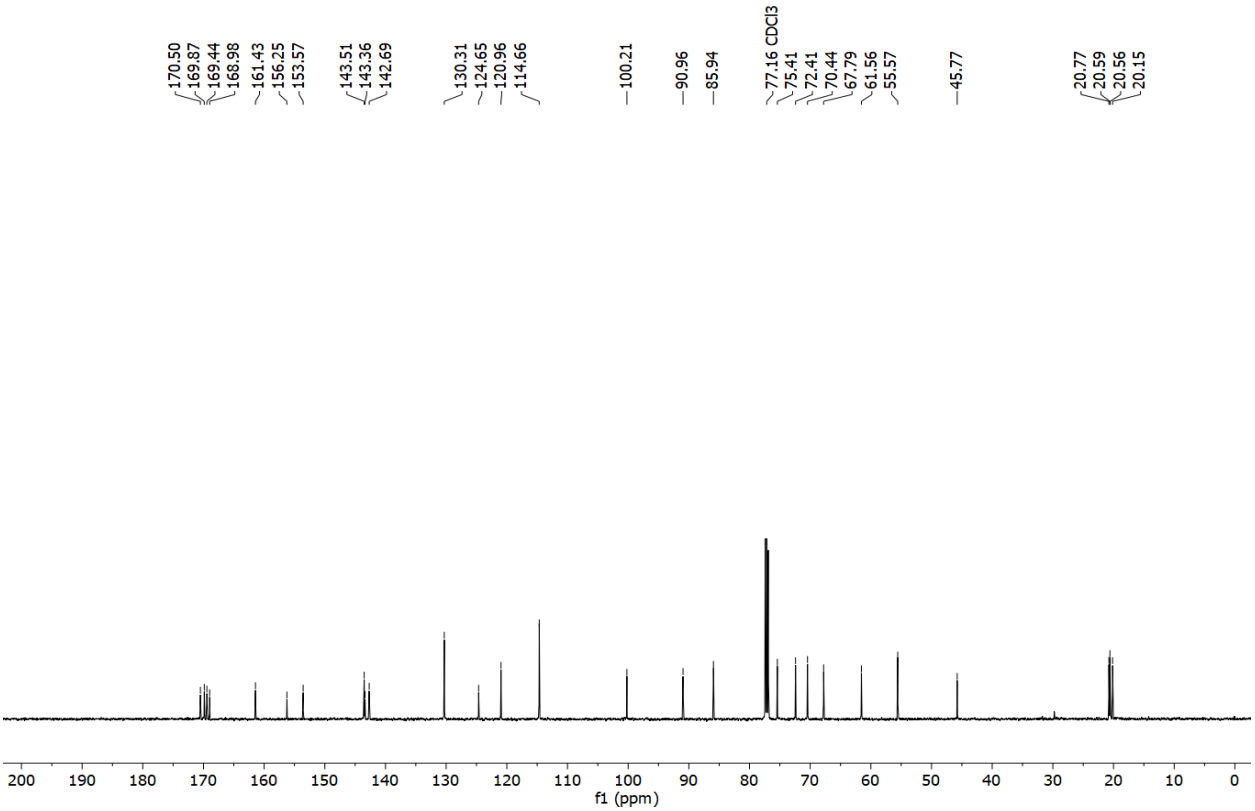
^{13}C-NMR (126 MHz, $CDCl_3$)



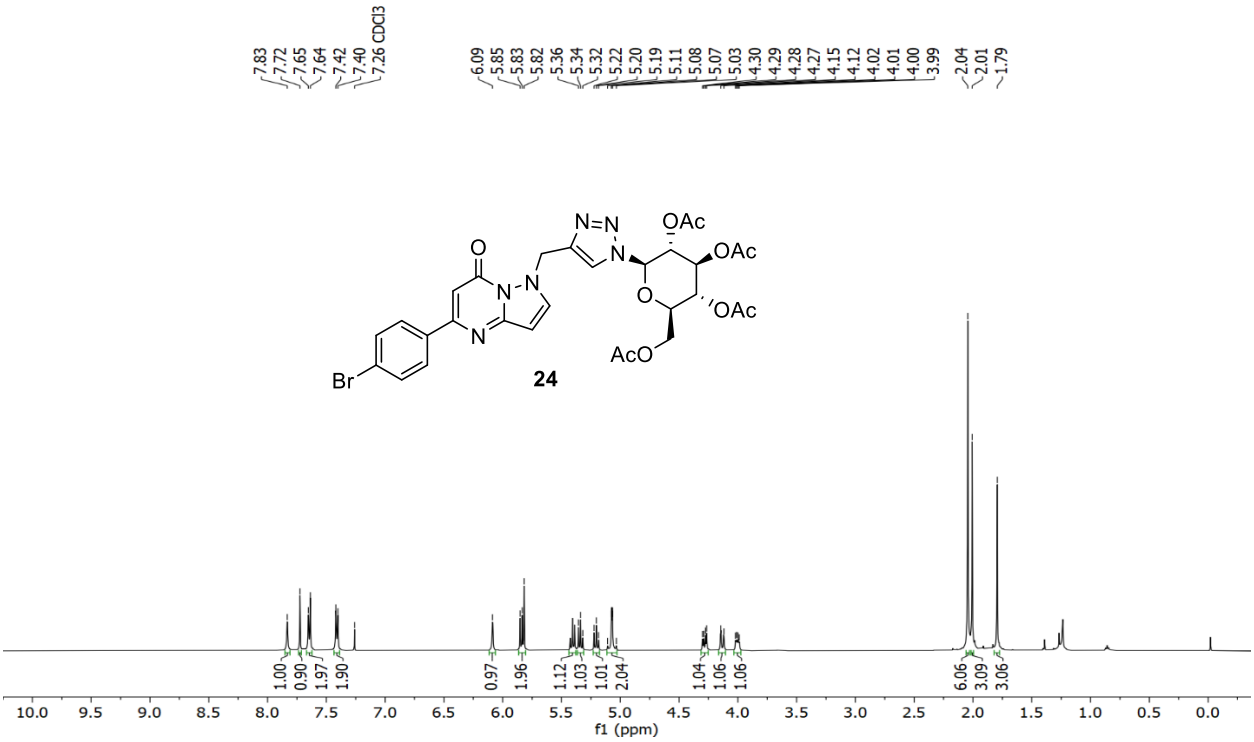
^{1}H-NMR (500 MHz, $CDCl_3$)



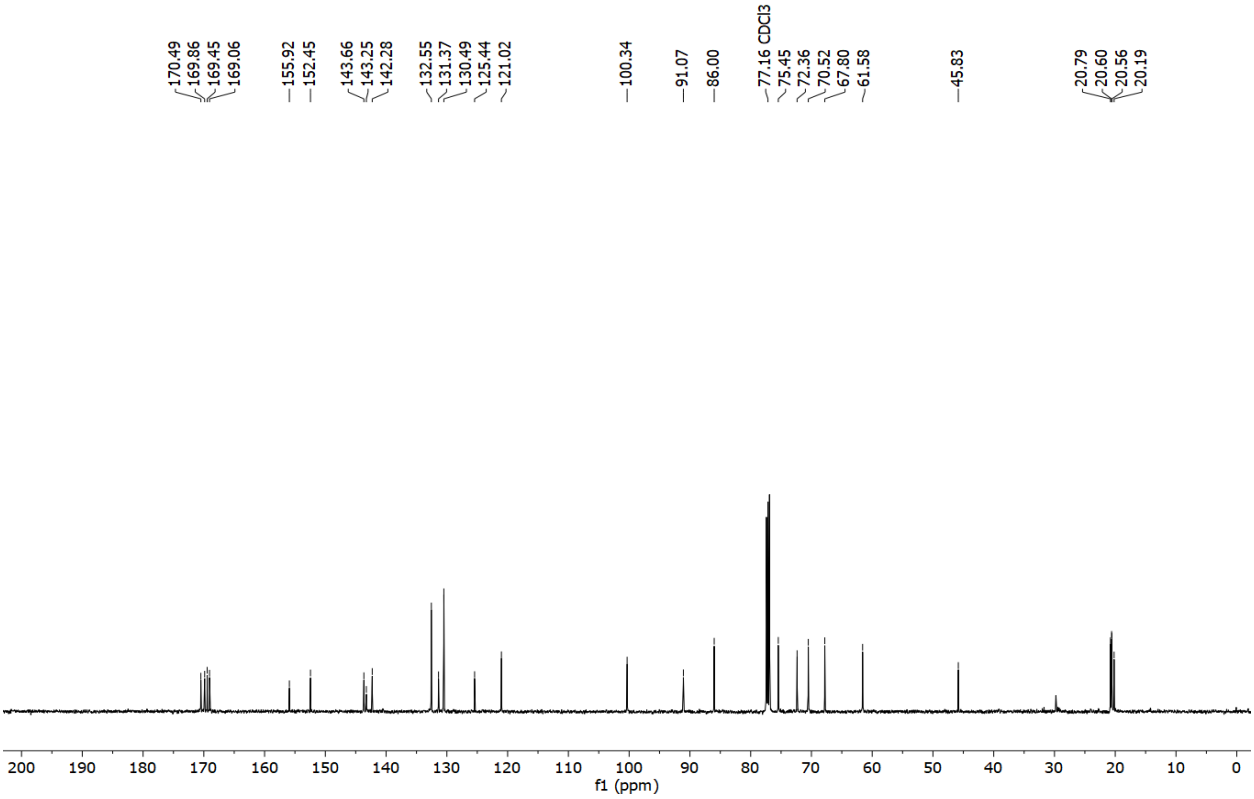
^{13}C-NMR (126 MHz, $CDCl_3$)



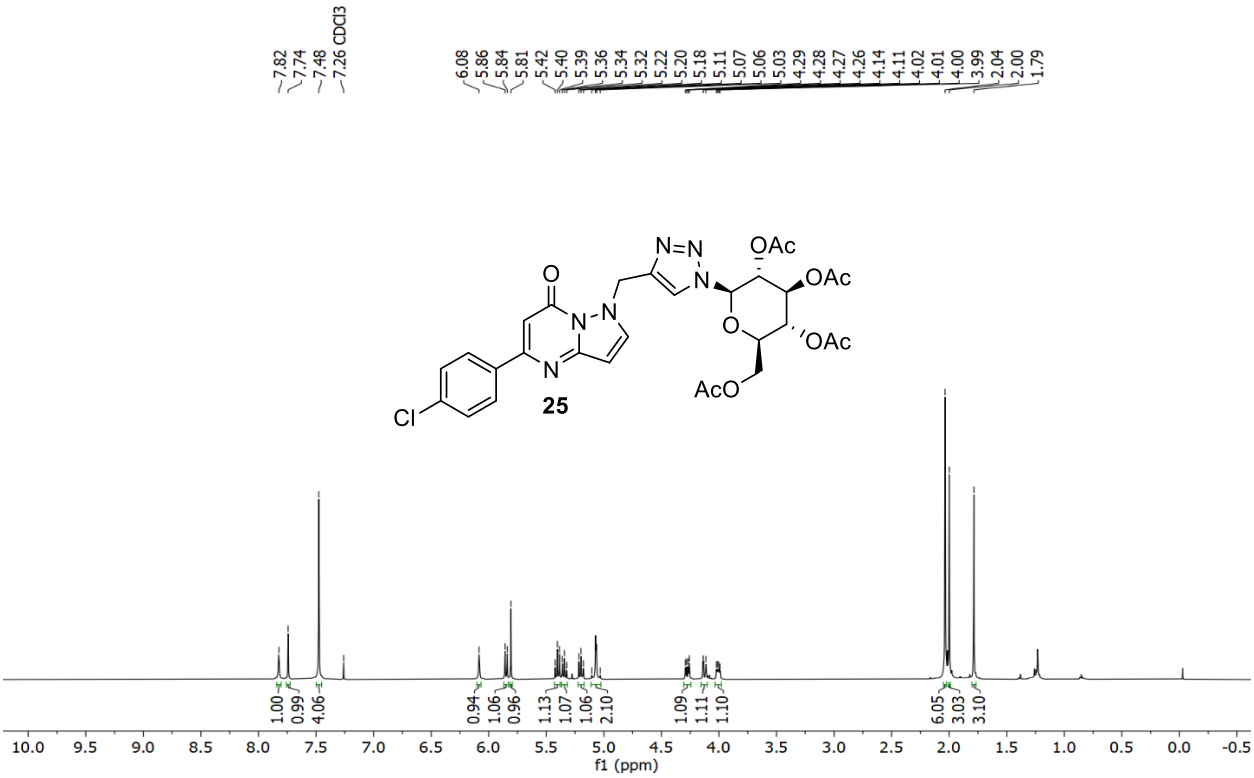
^{1}H-NMR (500 MHz, $CDCl_3$)



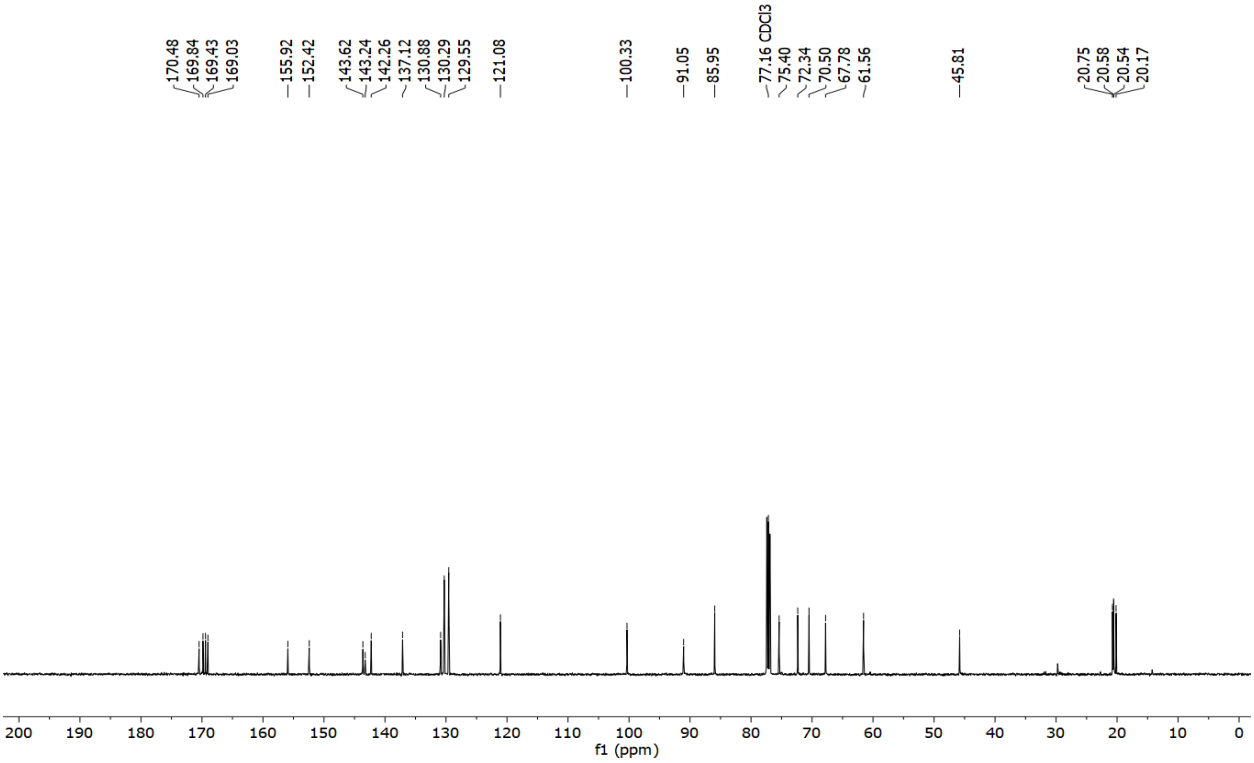
^{13}C-NMR (126 MHz, $CDCl_3$)



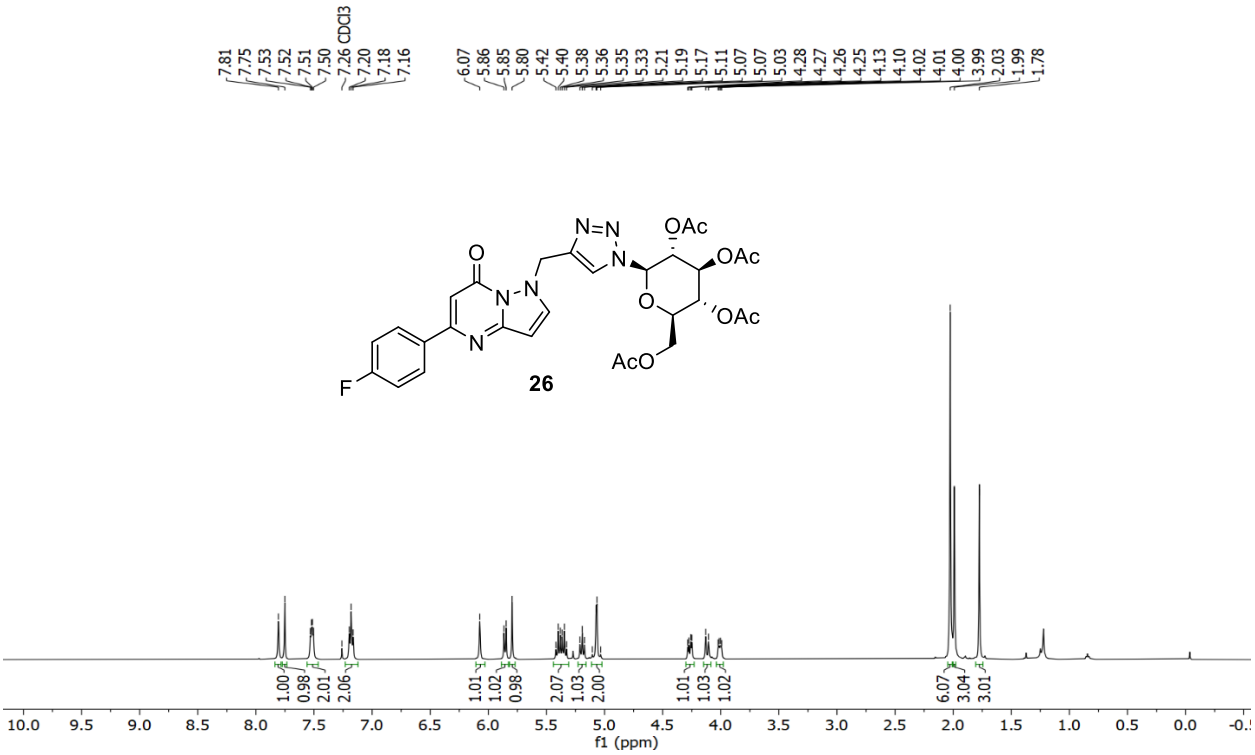
^{1}H-NMR (500 MHz, $CDCl_3$)



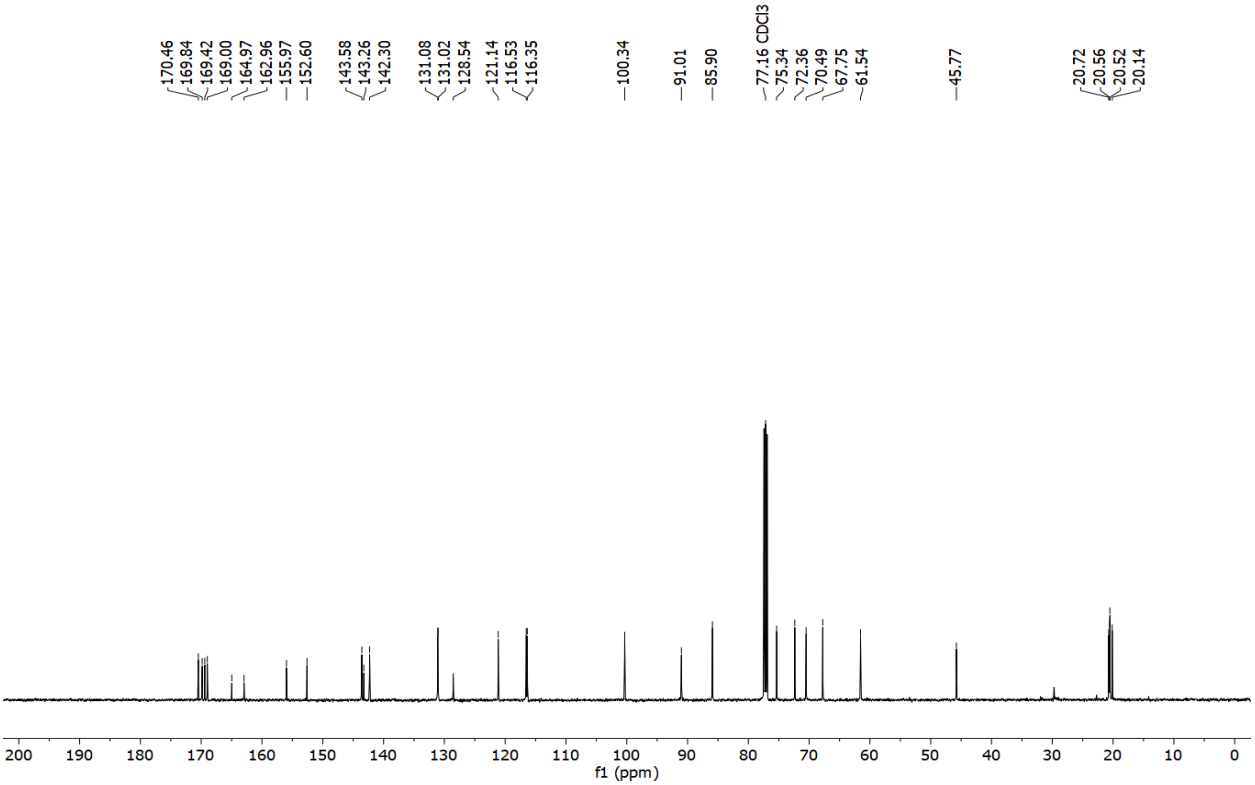
^{13}C-NMR (126 MHz, $CDCl_3$)



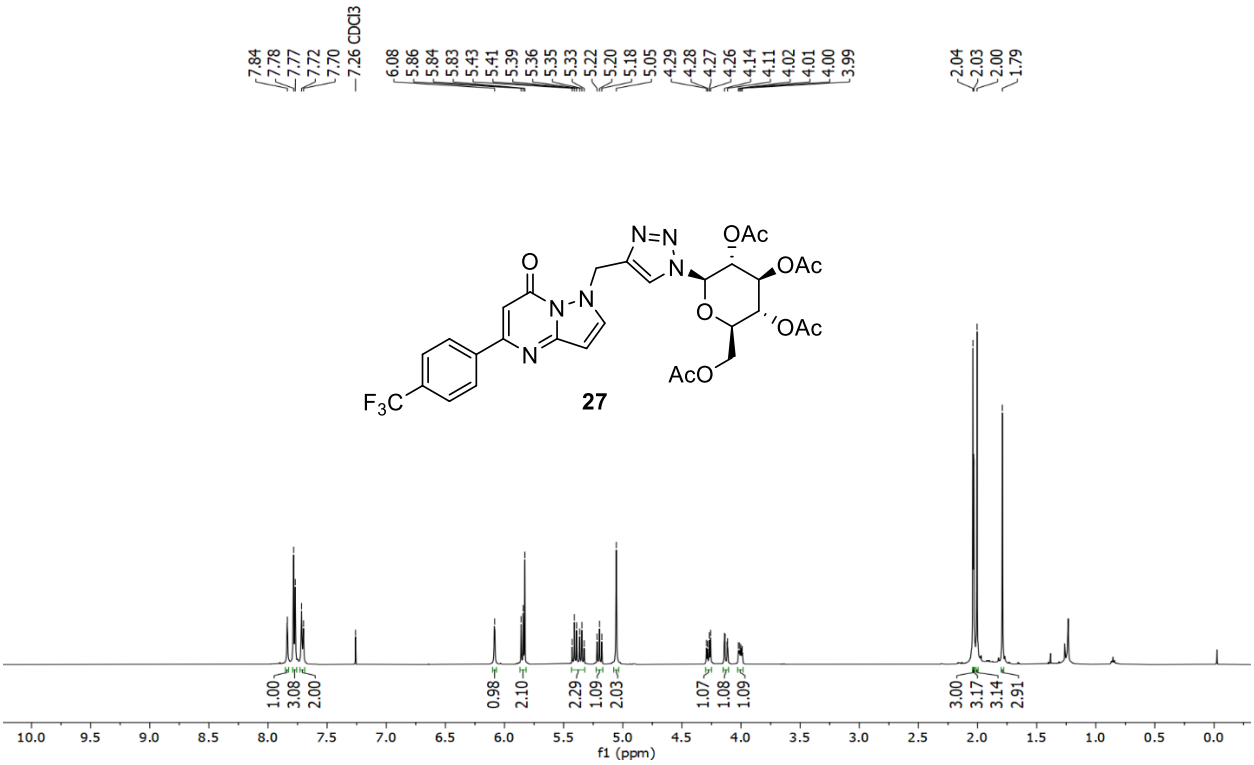
^{1}H-NMR (500 MHz, $CDCl_3$)



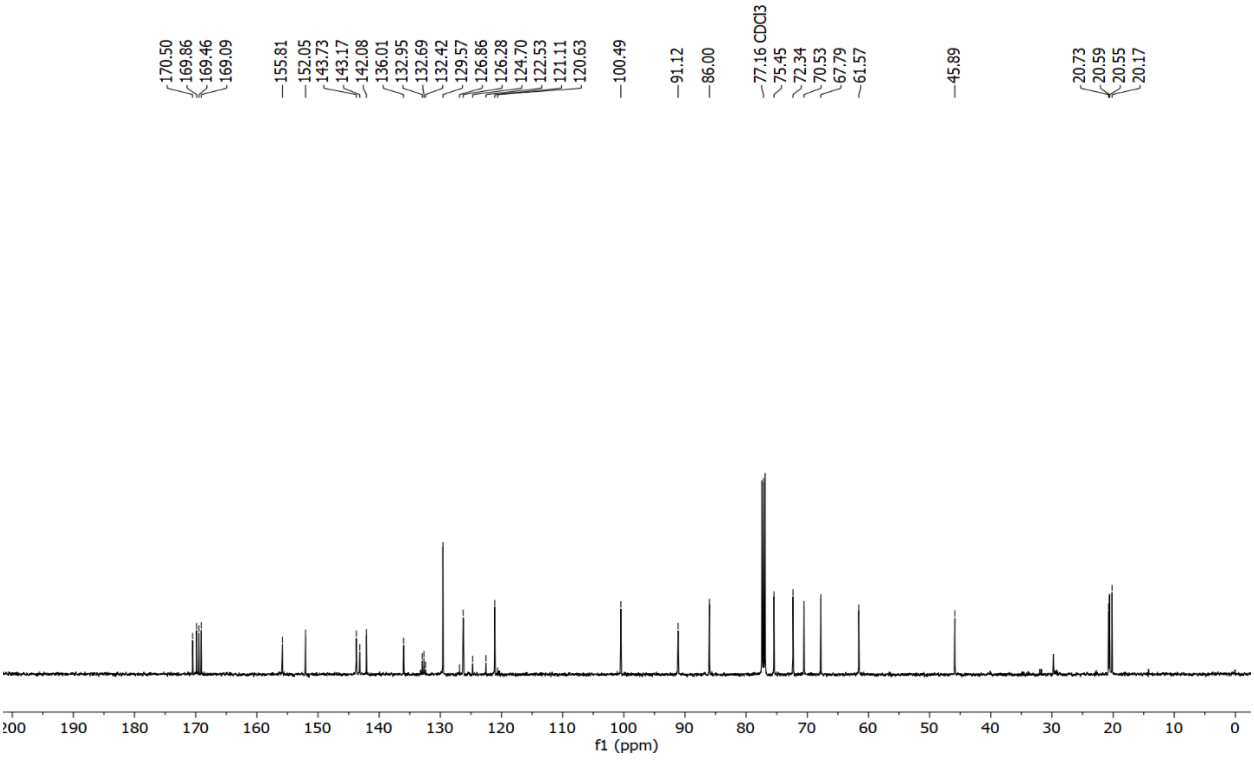
^{13}C-NMR (126 MHz, $CDCl_3$)



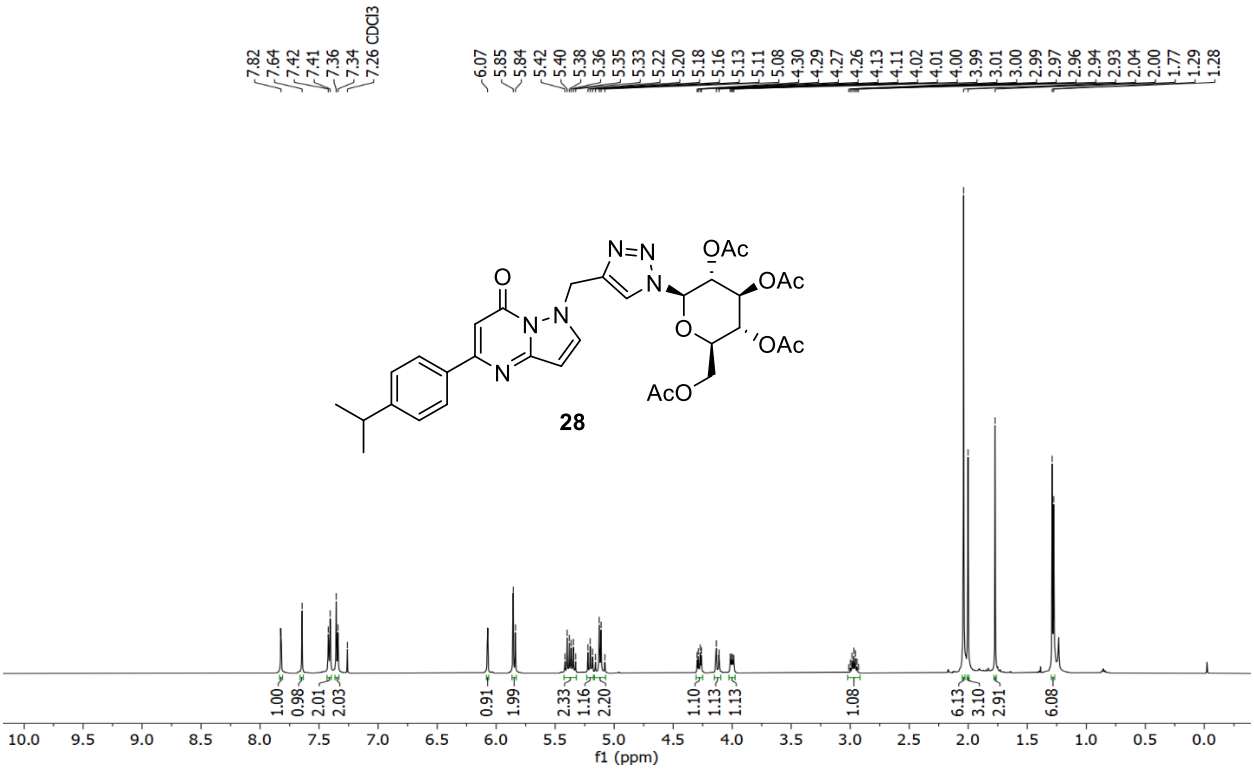
^{1}H-NMR (500 MHz, $CDCl_3$)



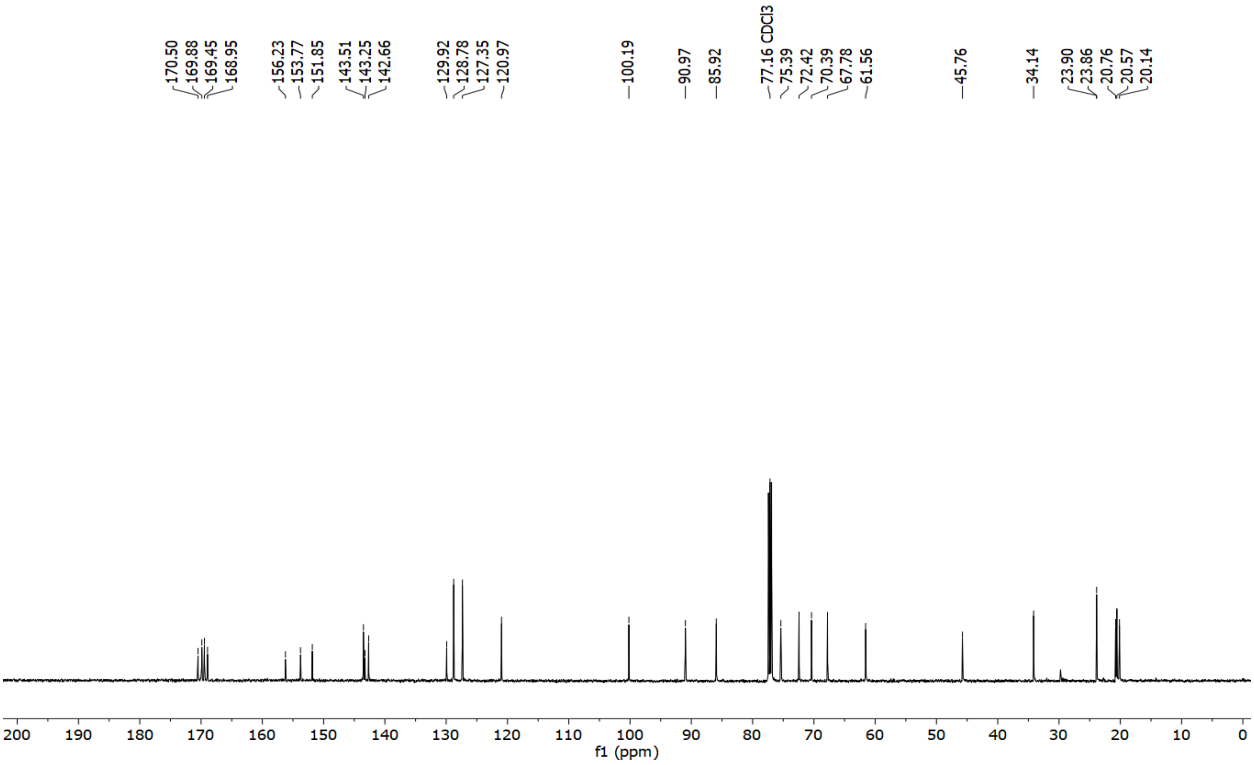
^{13}C-NMR (126 MHz, $CDCl_3$)



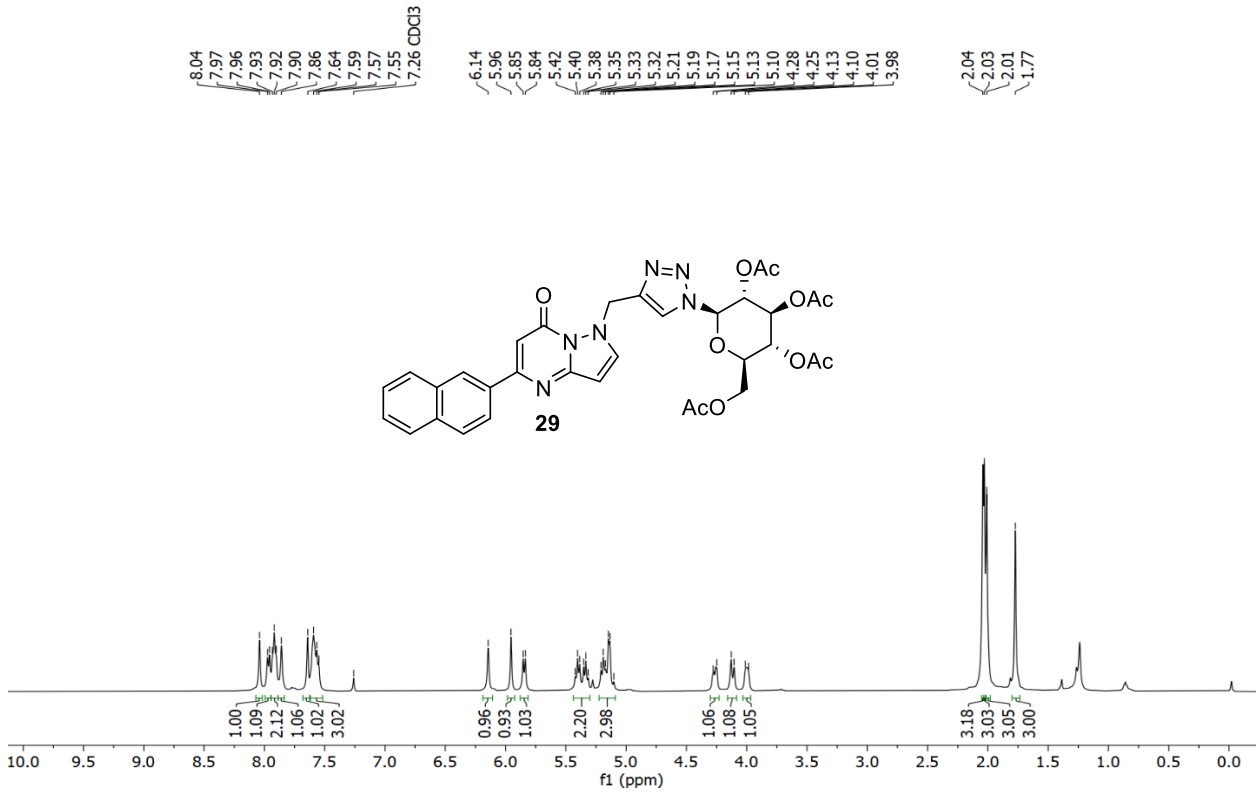
^{1}H-NMR (500 MHz, $CDCl_3$)



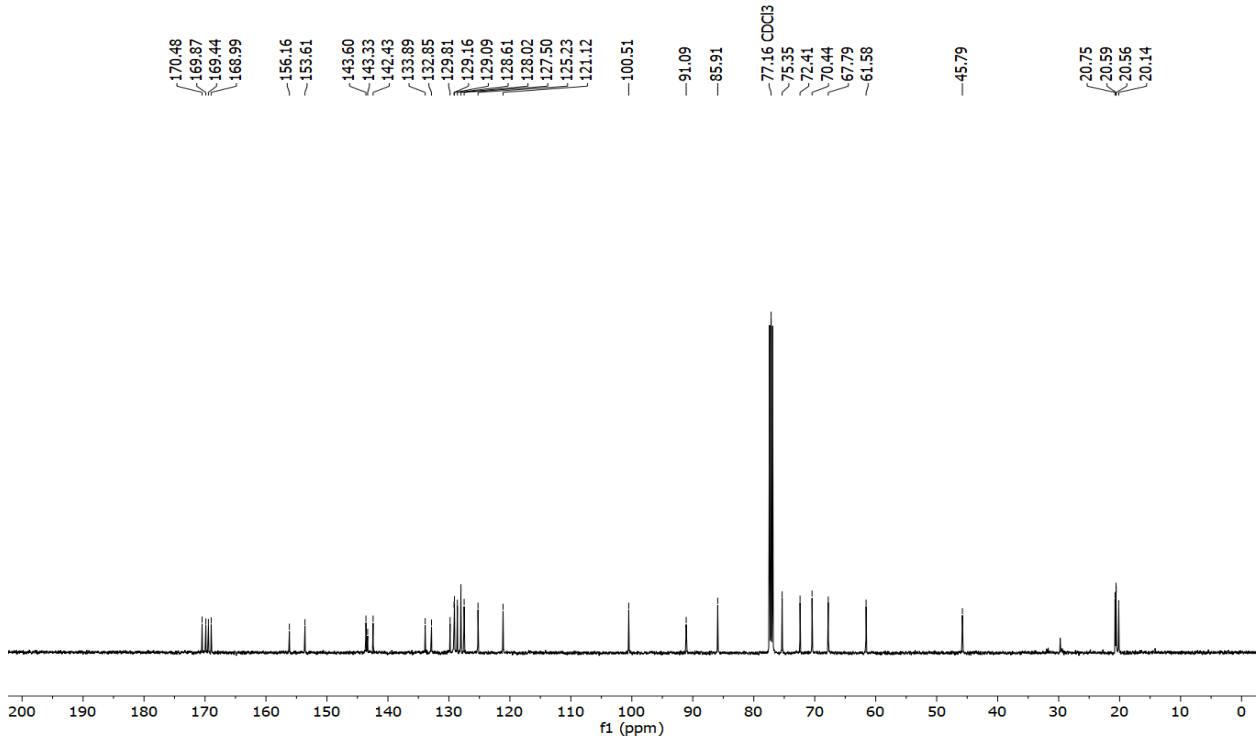
^{13}C-NMR (126 MHz, $CDCl_3$)



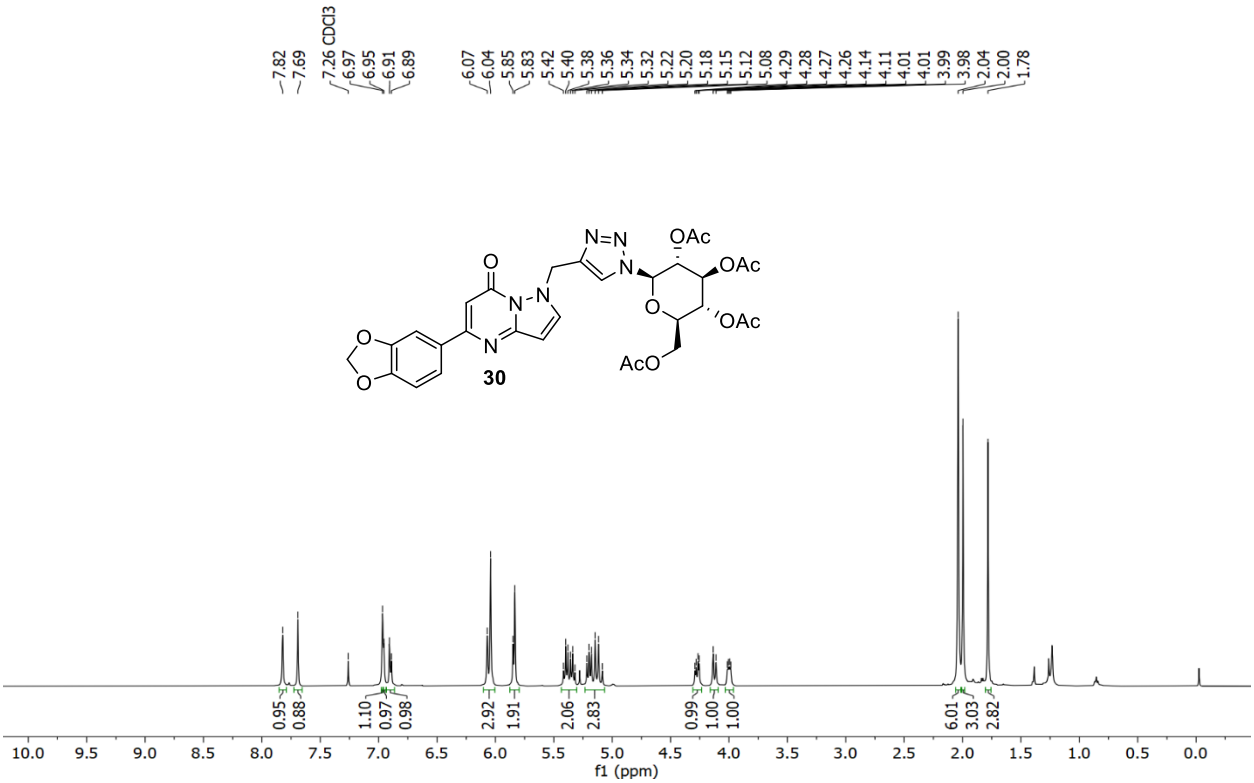
^{1}H-NMR (500 MHz, $CDCl_3$)



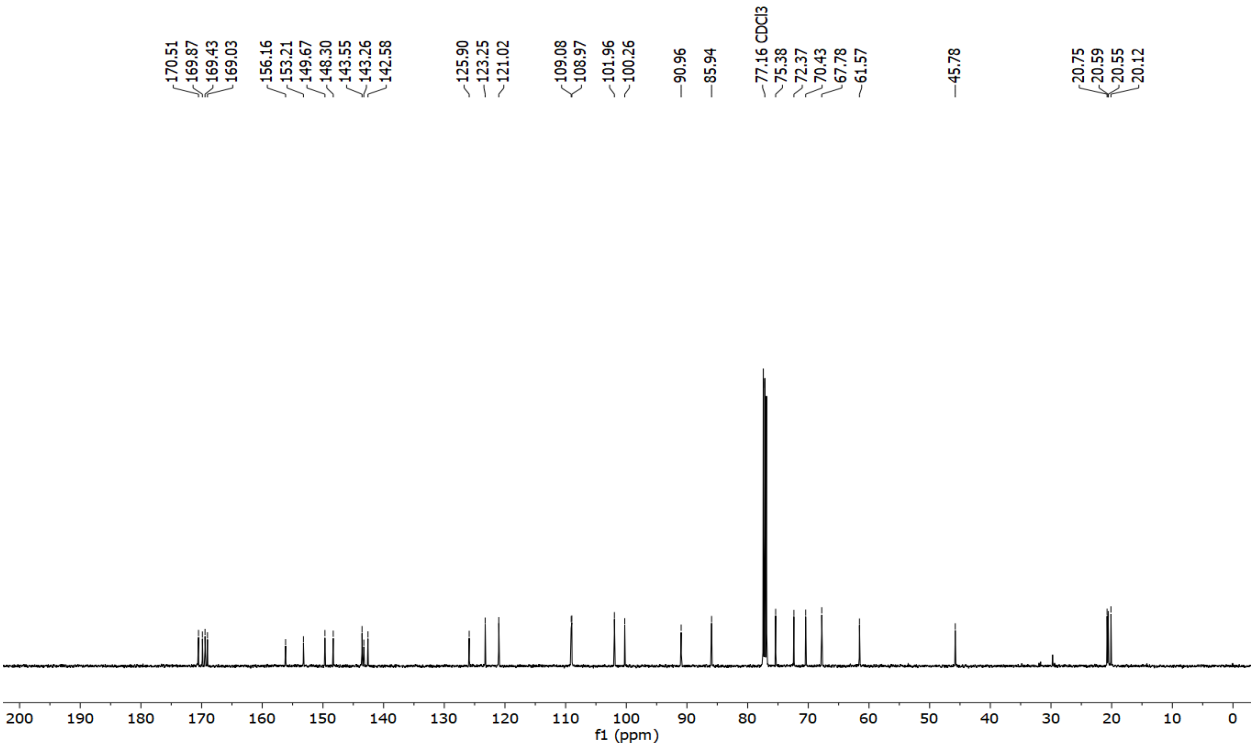
^{13}C-NMR (126 MHz, $CDCl_3$)



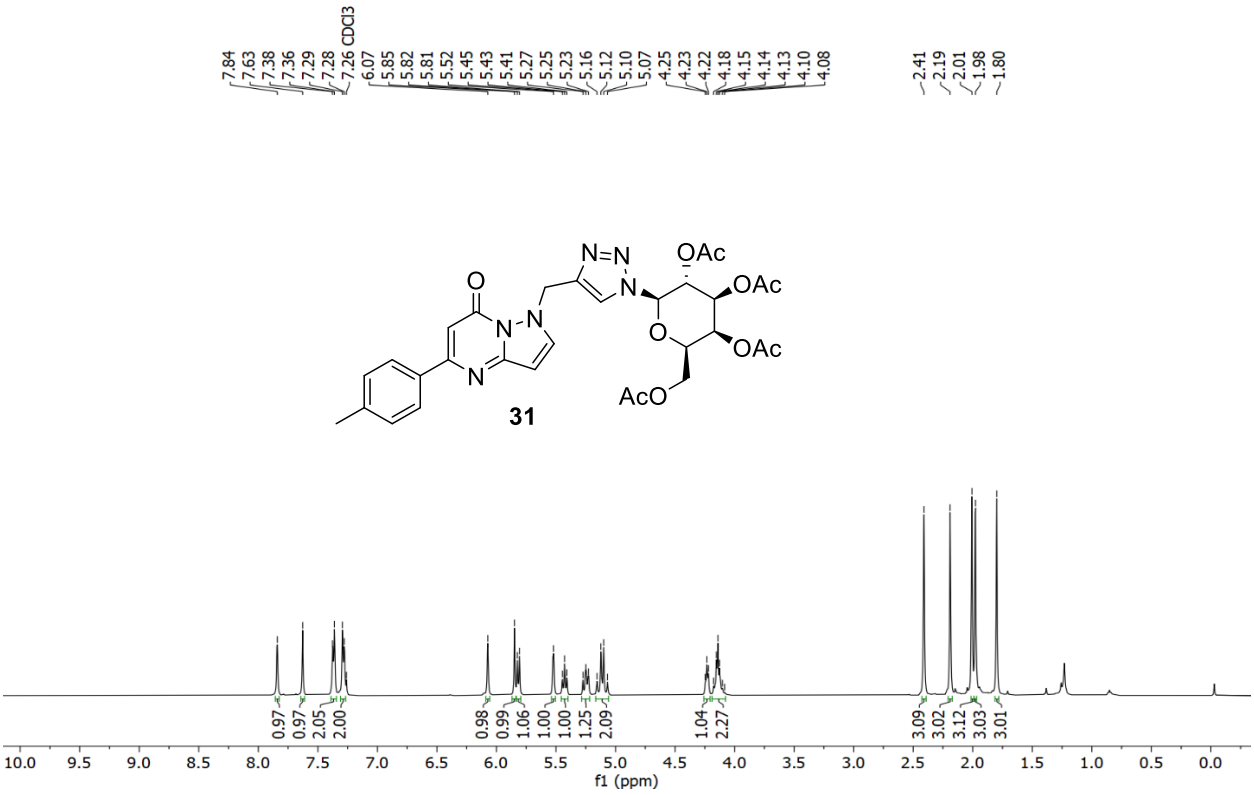
^{1}H-NMR (500 MHz, $CDCl_3$)



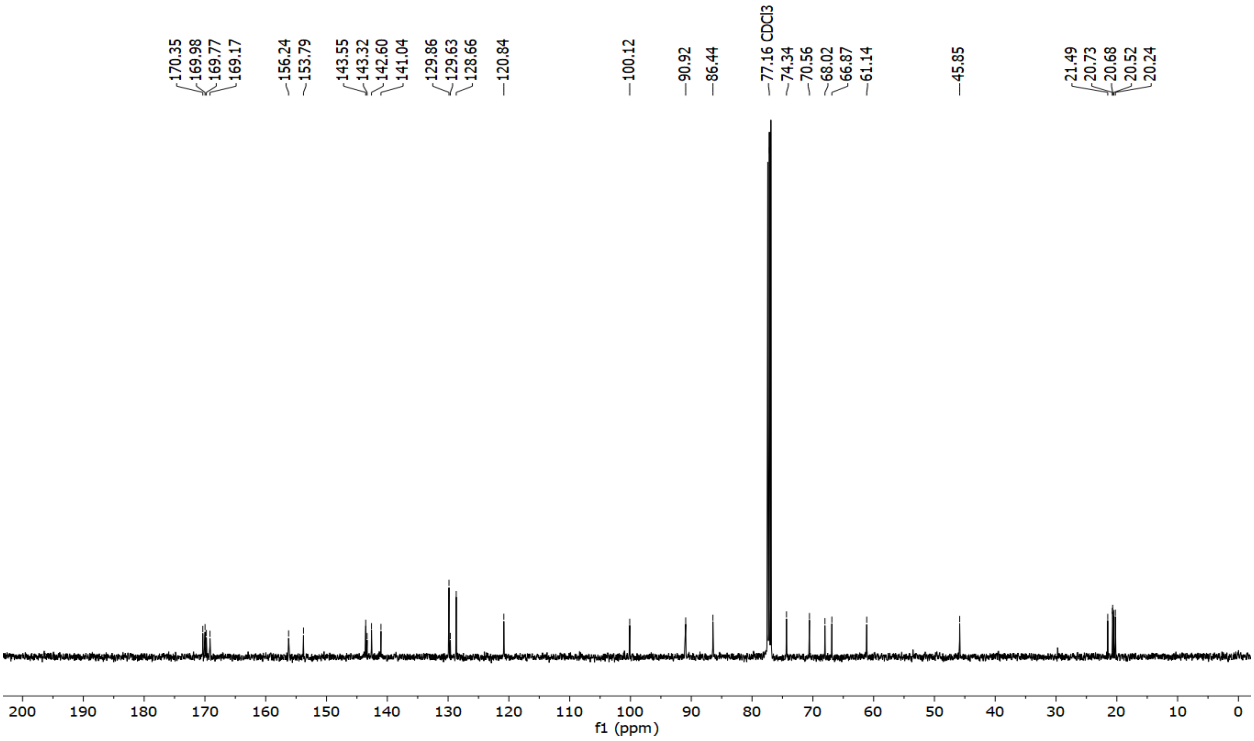
^{13}C-NMR (126 MHz, $CDCl_3$)



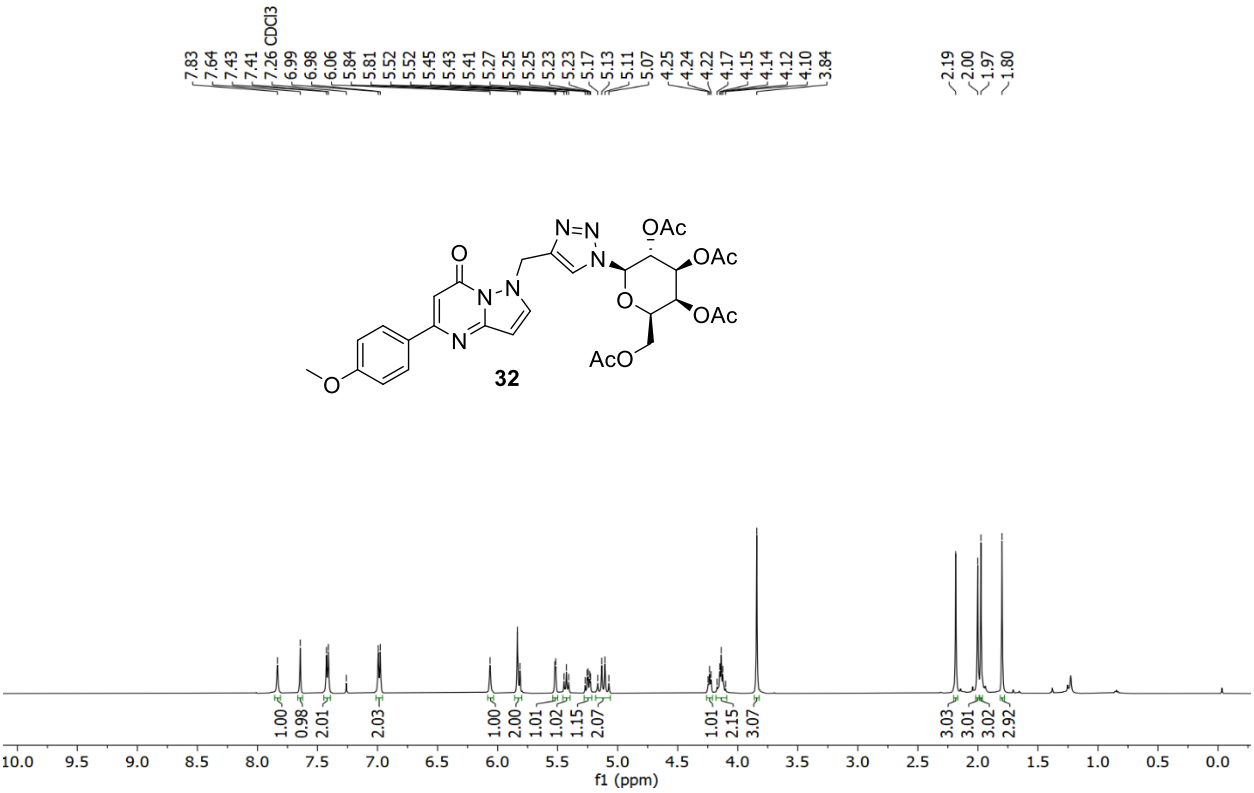
^{1}H-NMR (500 MHz, $CDCl_3$)



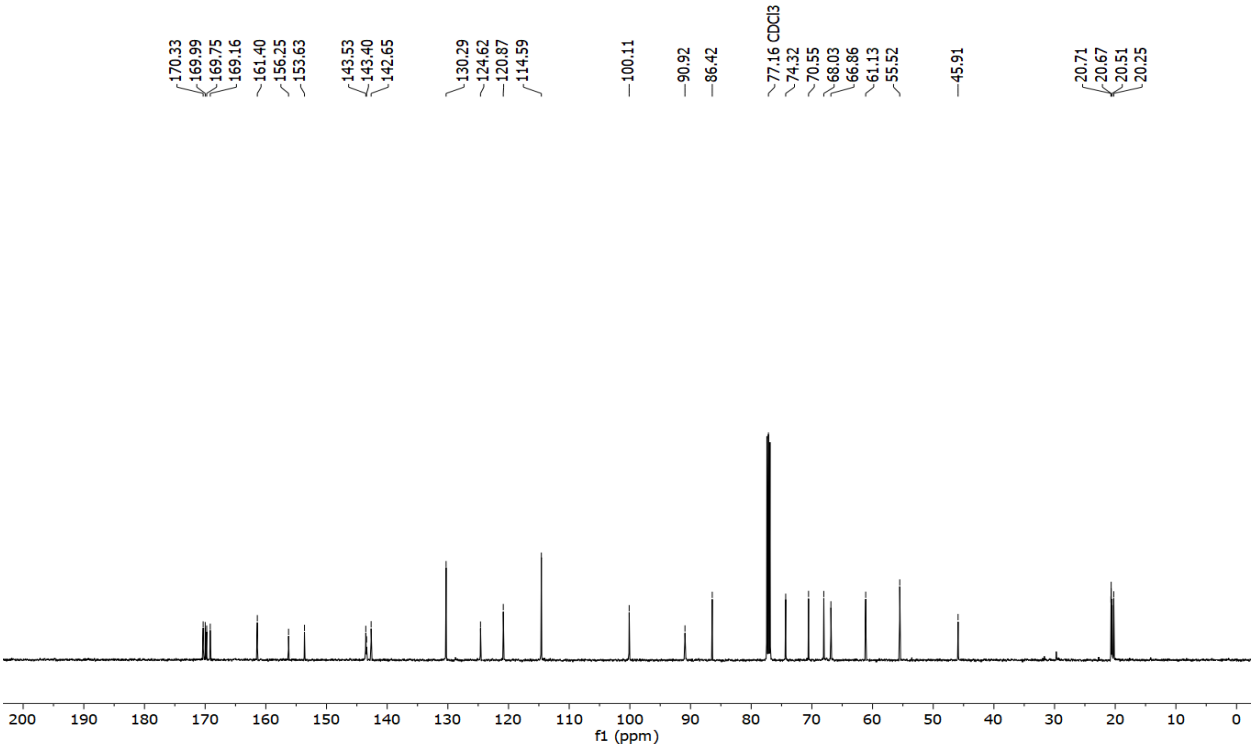
^{13}C-NMR (126 MHz, $CDCl_3$)



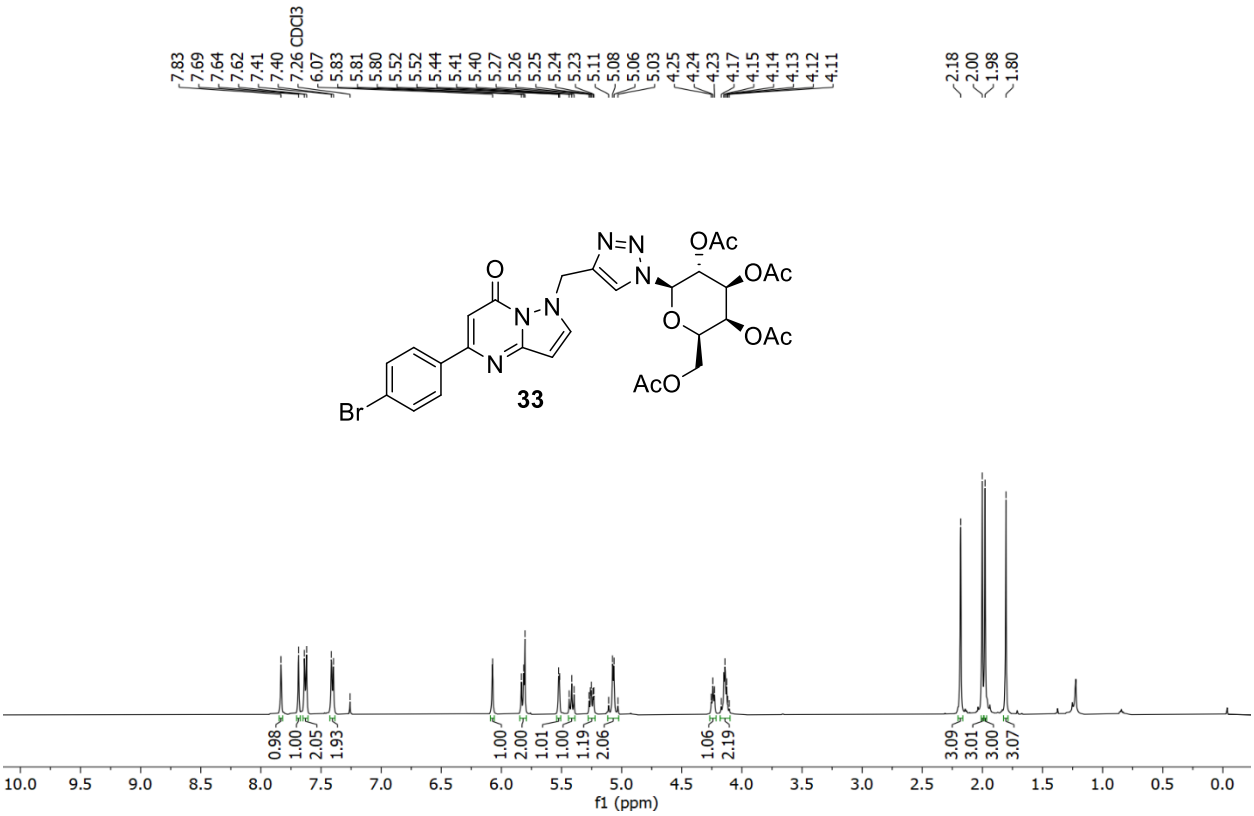
^{1}H-NMR (500 MHz, $CDCl_3$)



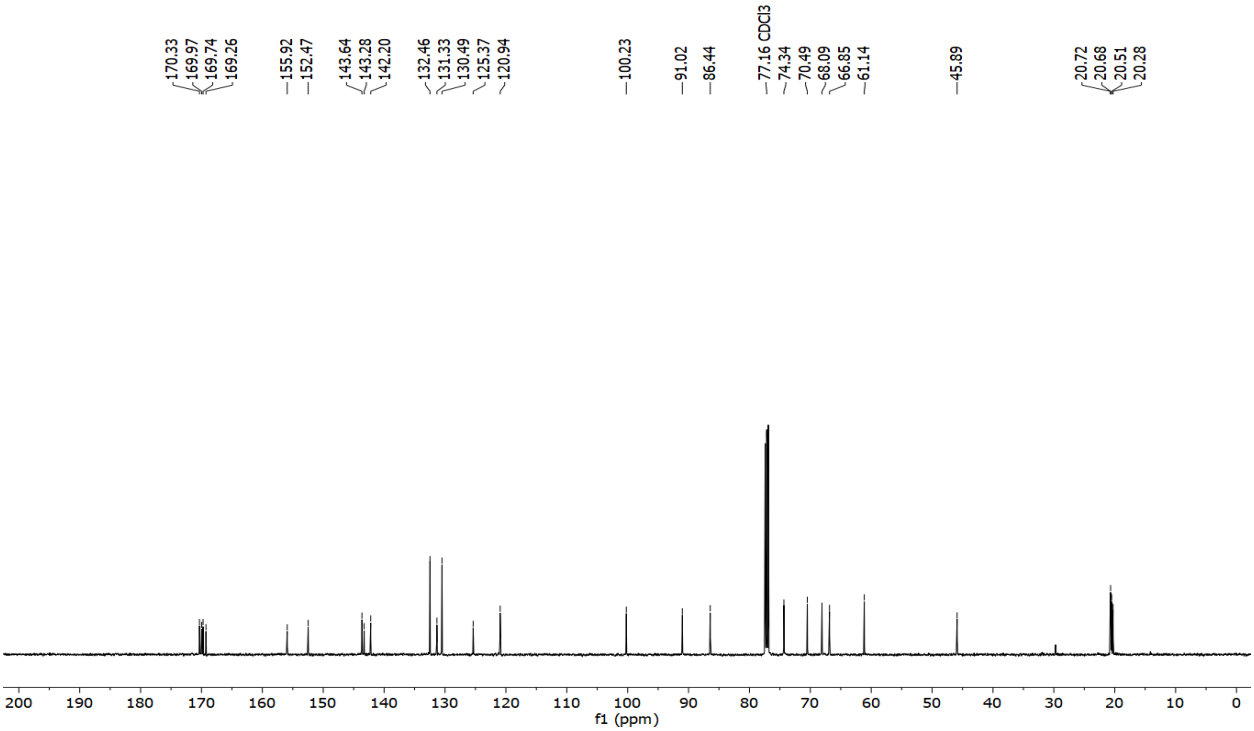
^{13}C-NMR (126 MHz, $CDCl_3$)



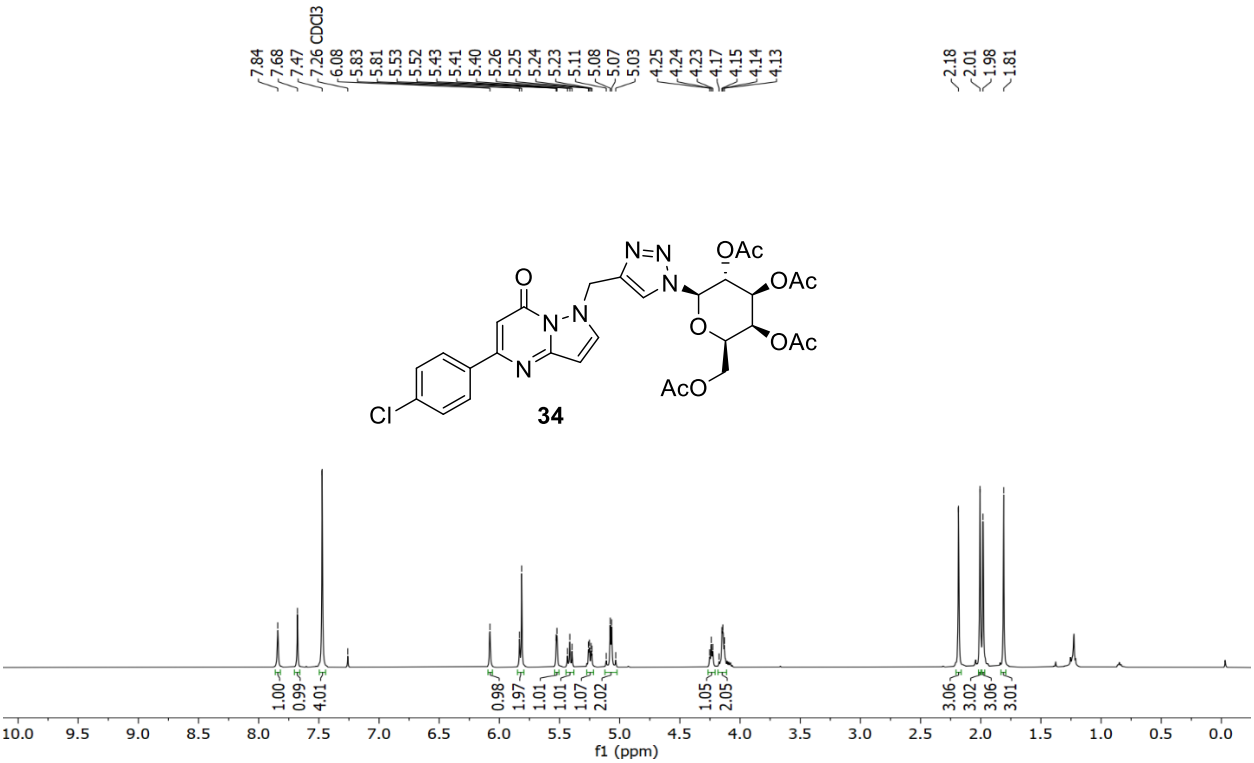
^{1}H-NMR (500 MHz, $CDCl_3$)



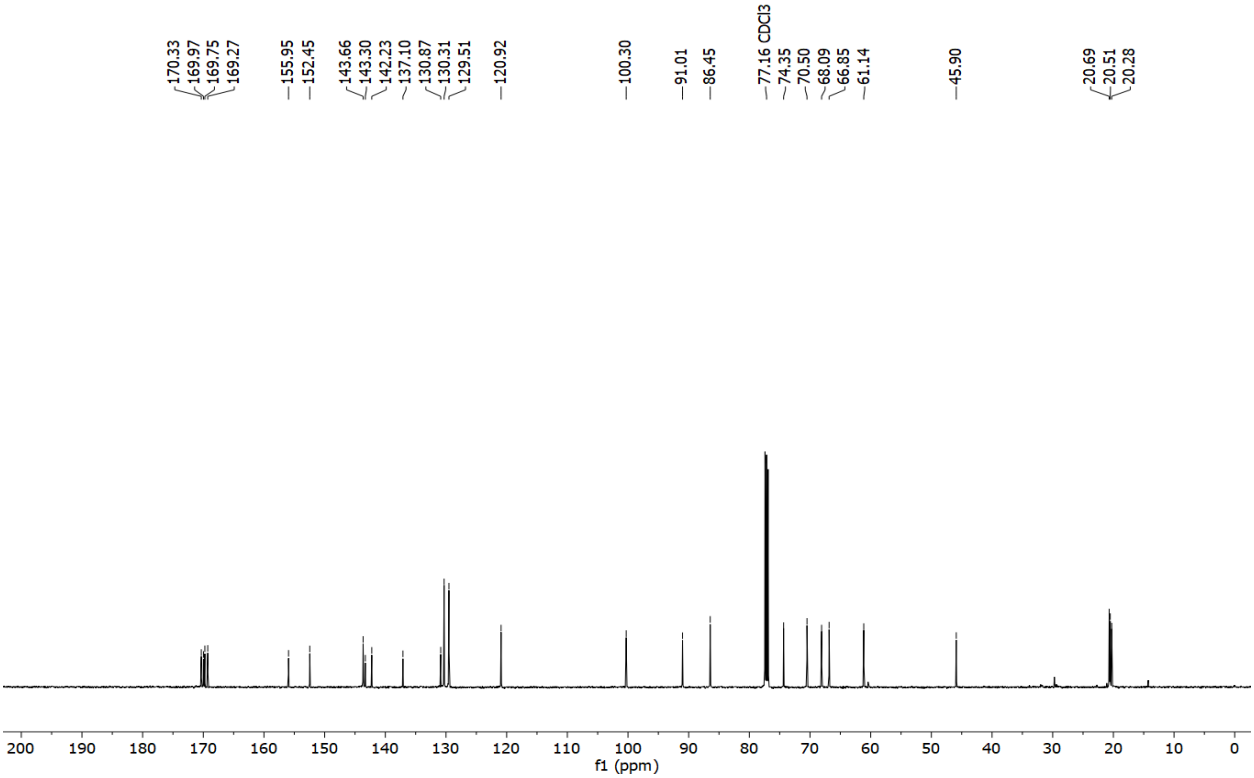
^{13}C-NMR (126 MHz, $CDCl_3$)



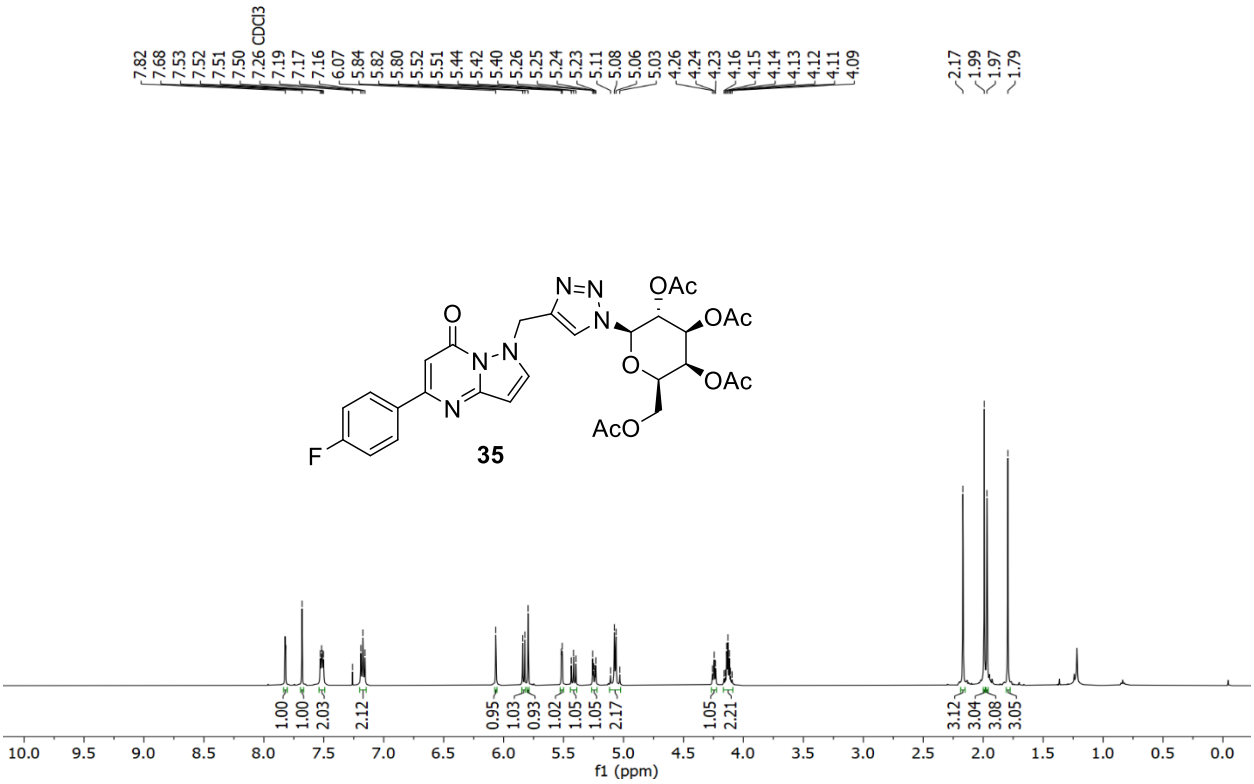
^{1}H-NMR (500 MHz, $CDCl_3$)



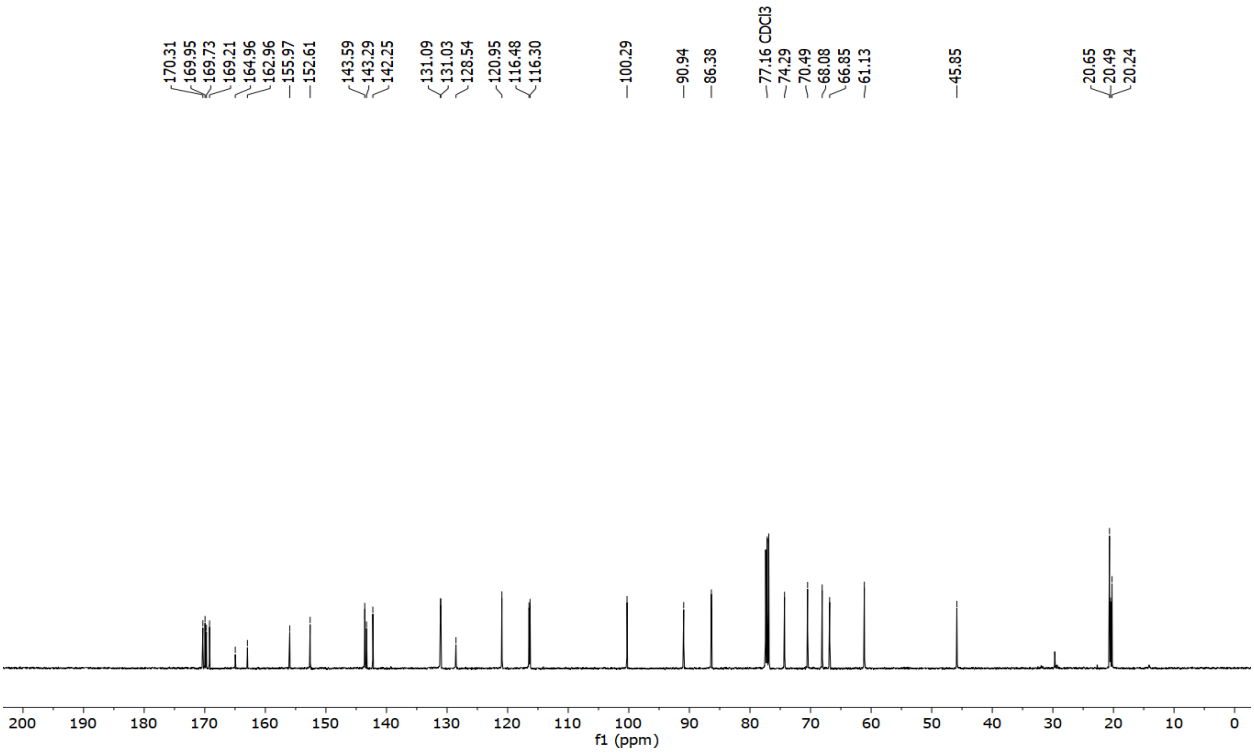
^{13}C-NMR (126 MHz, $CDCl_3$)



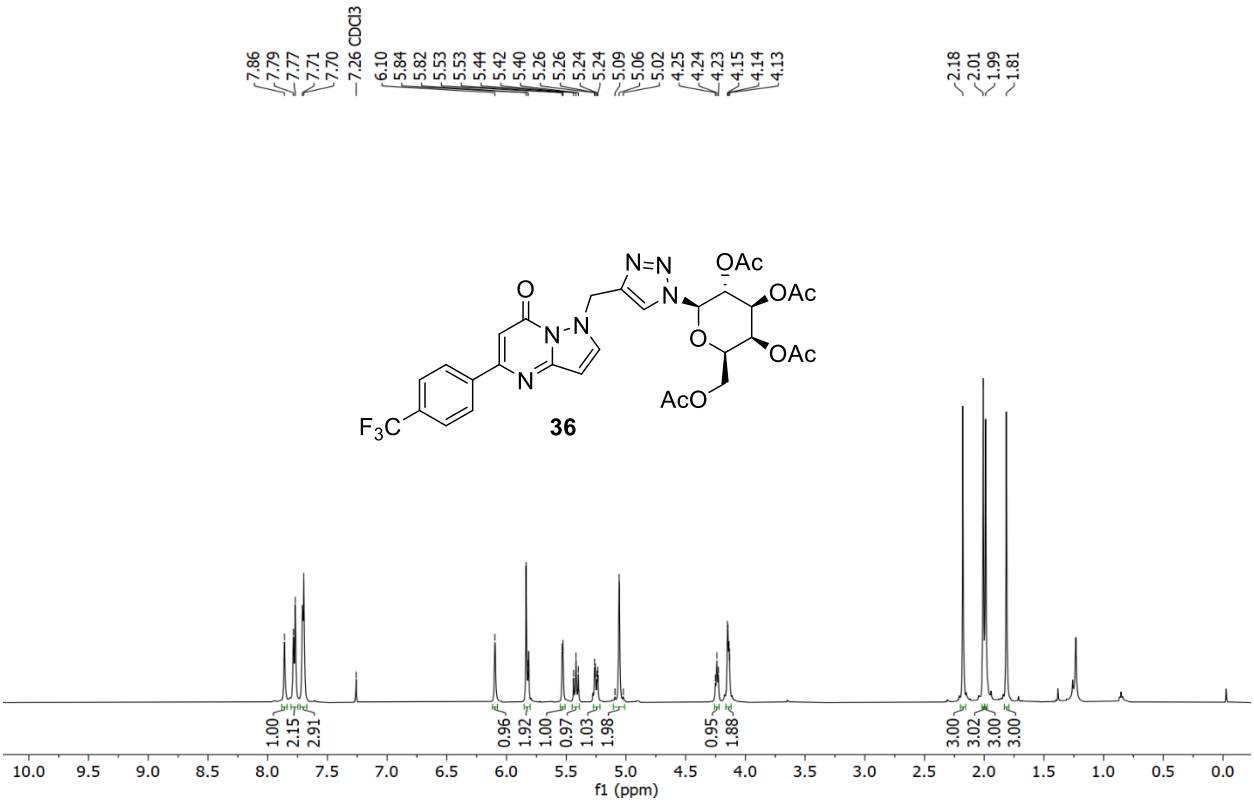
^{1}H-NMR (500 MHz, $CDCl_3$)



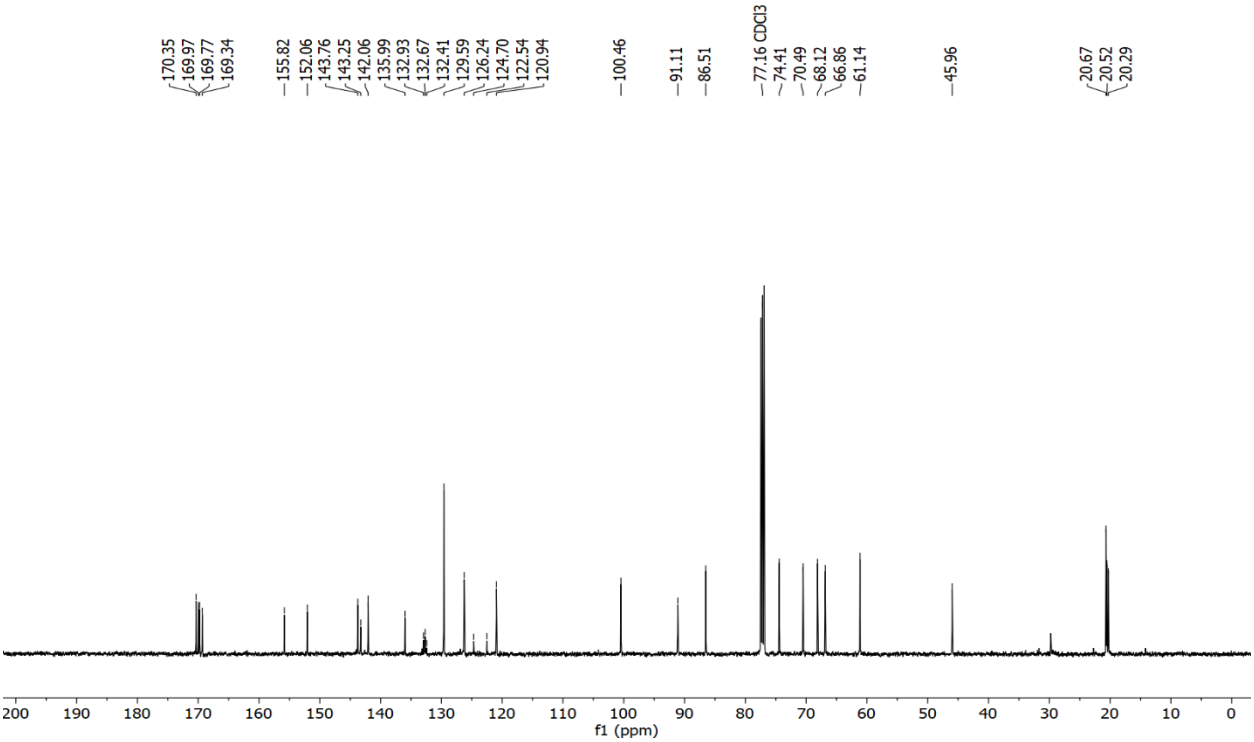
^{13}C-NMR (126 MHz, $CDCl_3$)



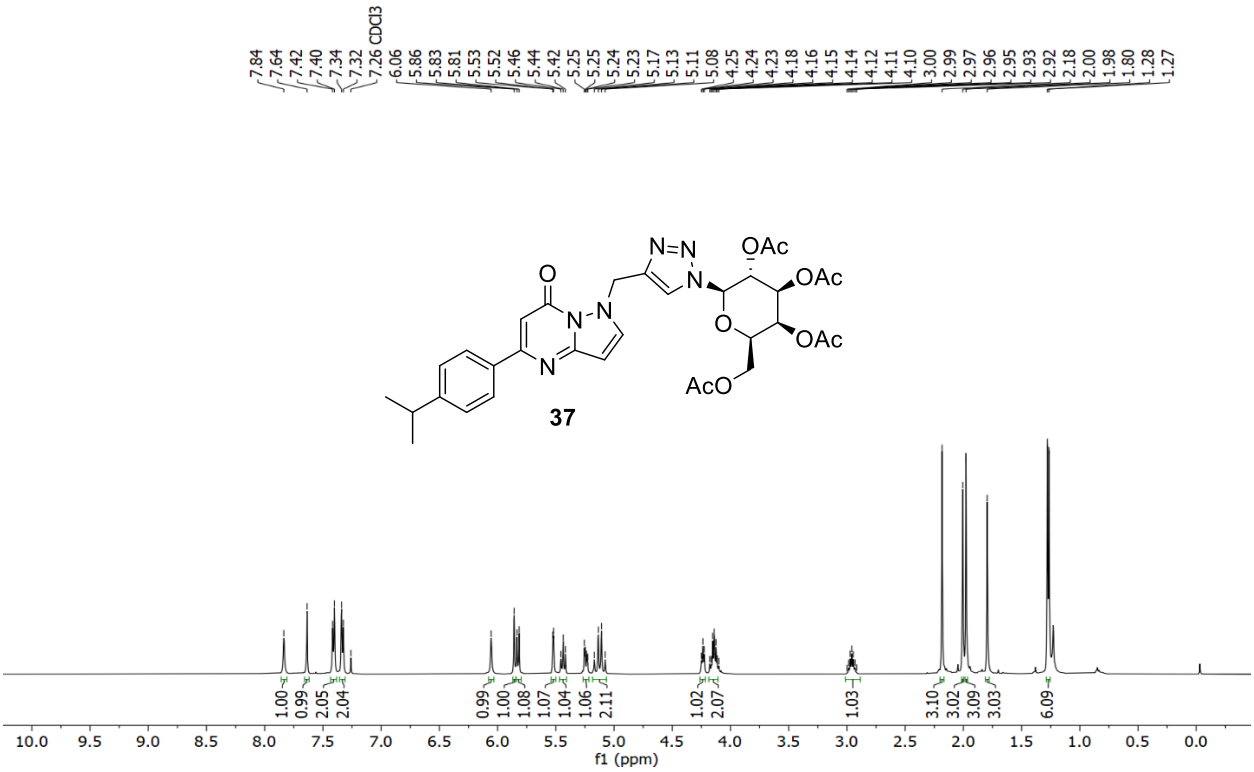
^{1}H-NMR (500 MHz, $CDCl_3$)



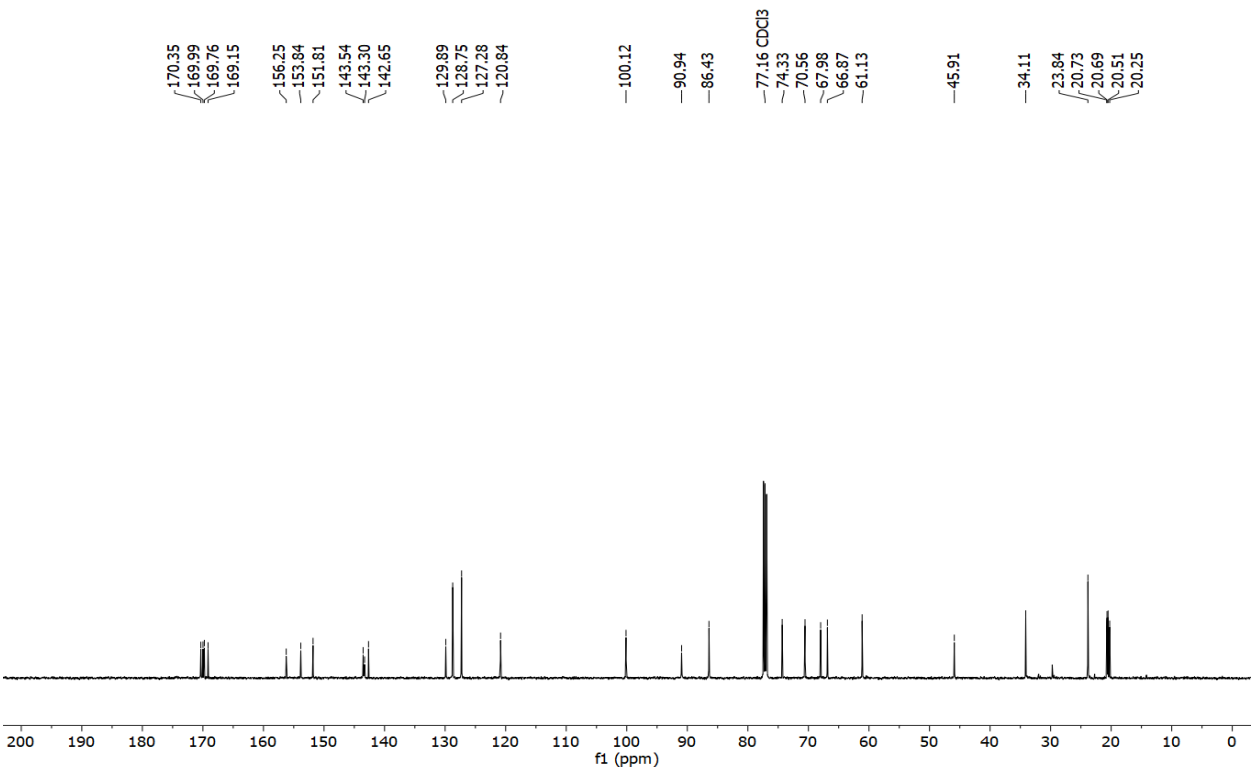
^{13}C-NMR (126 MHz, $CDCl_3$)



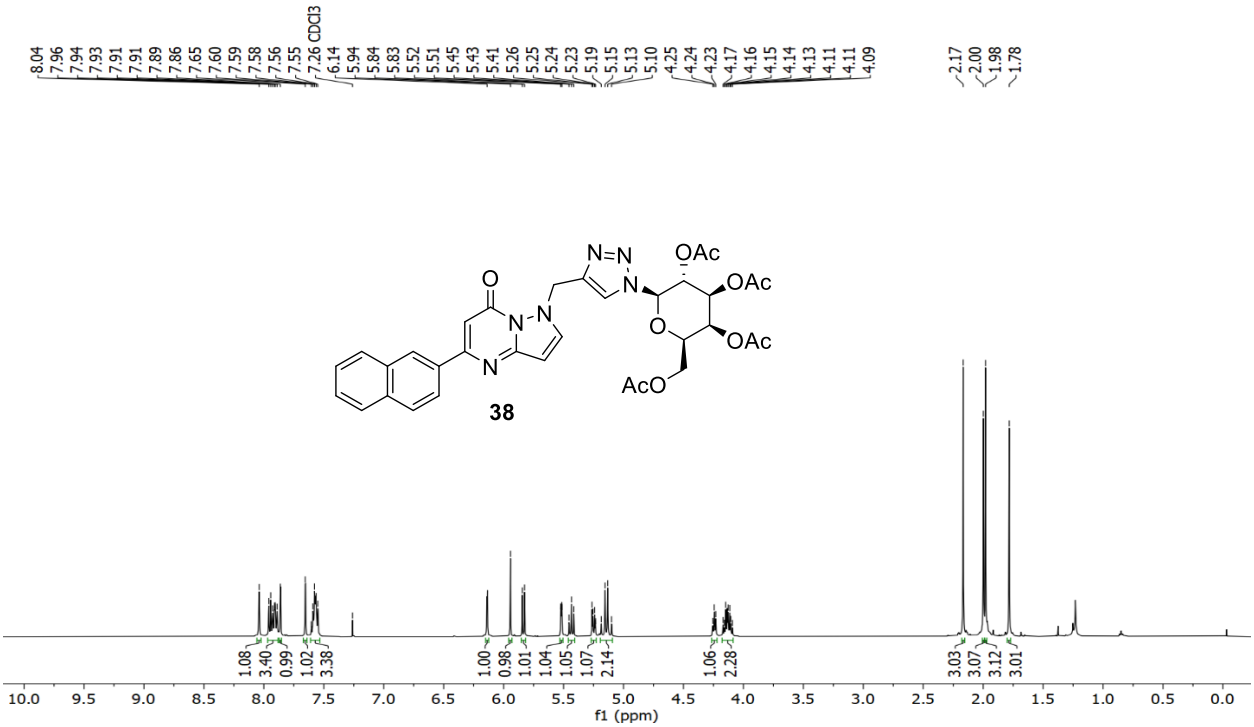
^{1}H-NMR (500 MHz, $CDCl_3$)



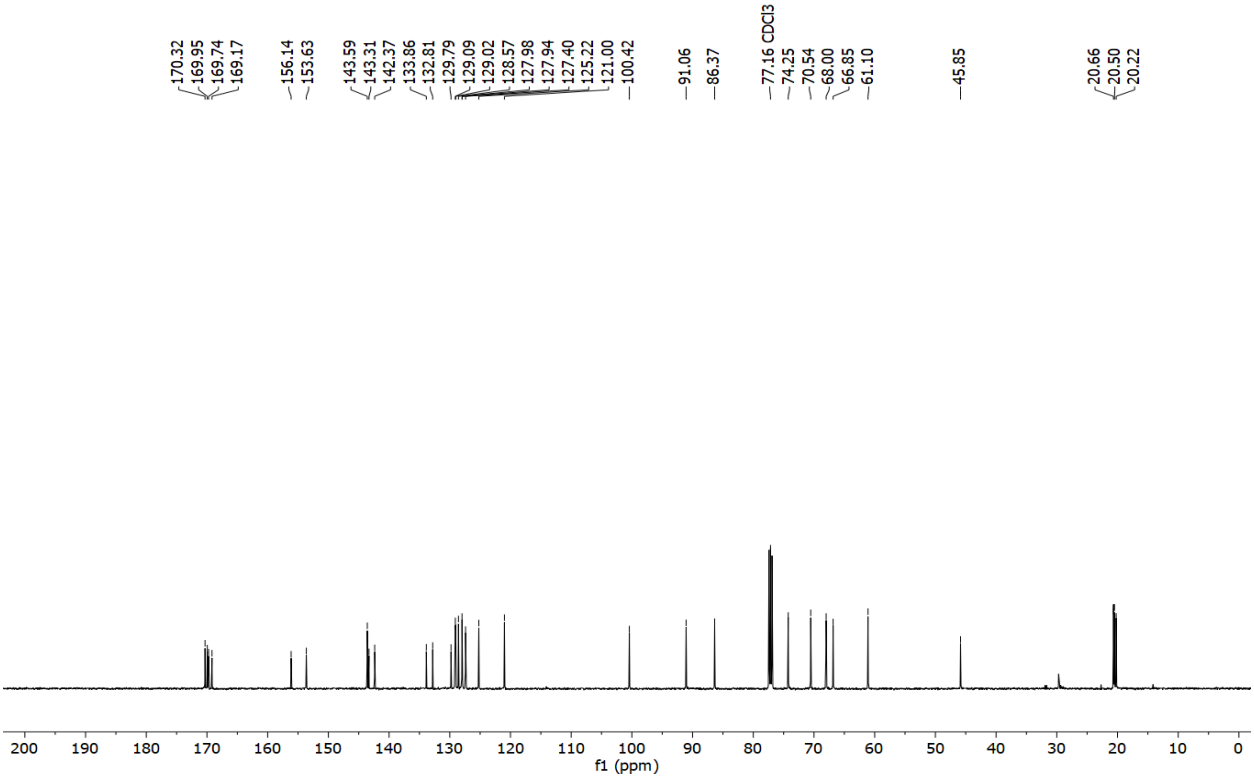
^{13}C-NMR (126 MHz, $CDCl_3$)



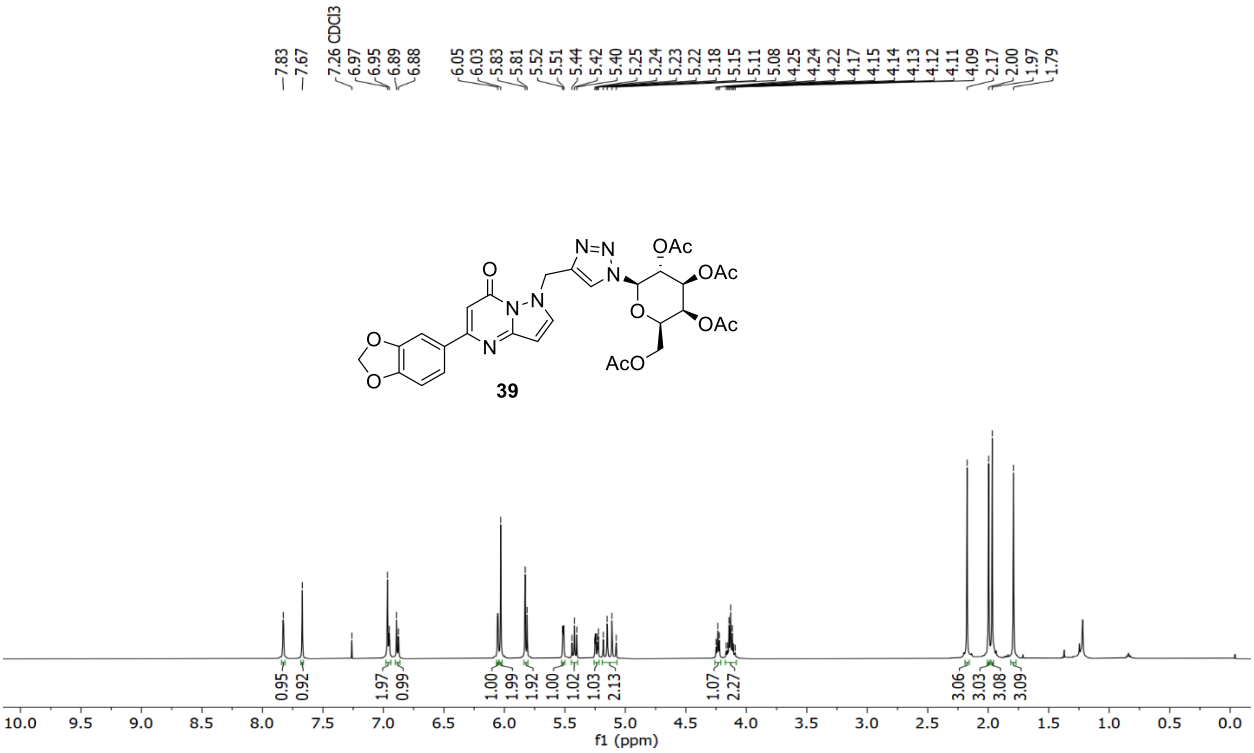
^{1}H-NMR (500 MHz, $CDCl_3$)



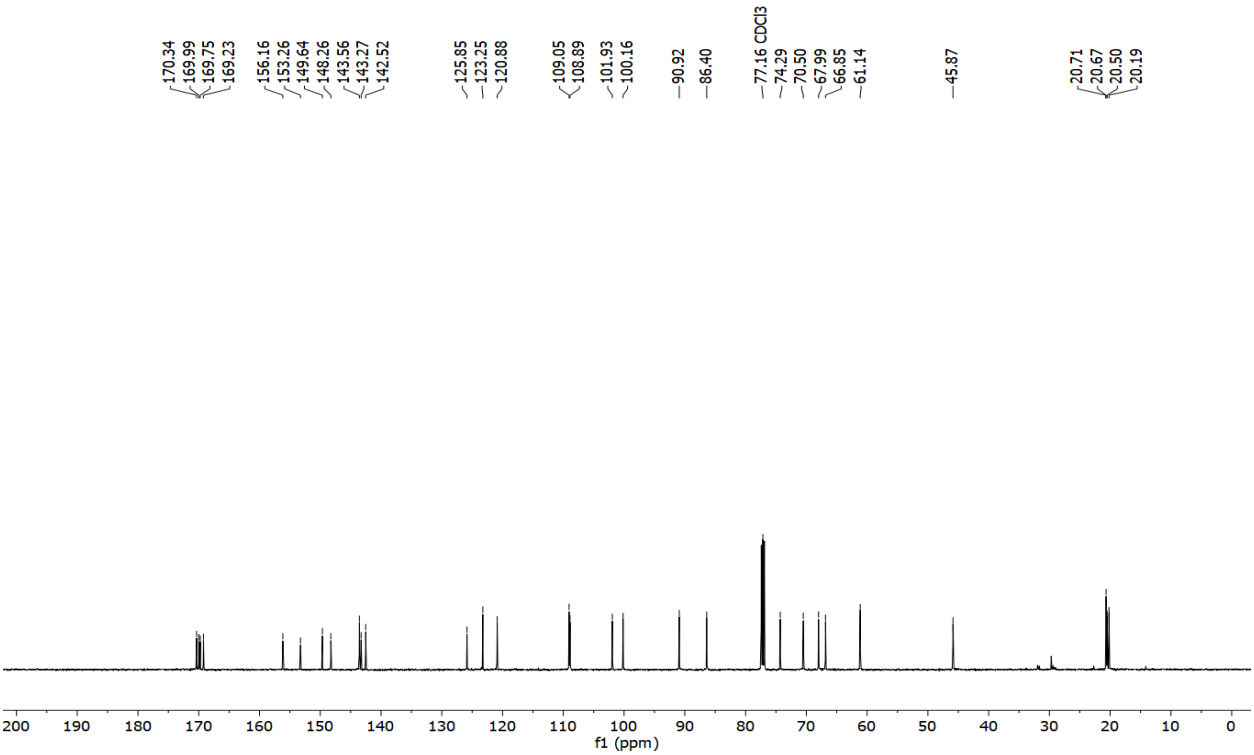
^{13}C-NMR (126 MHz, $CDCl_3$)



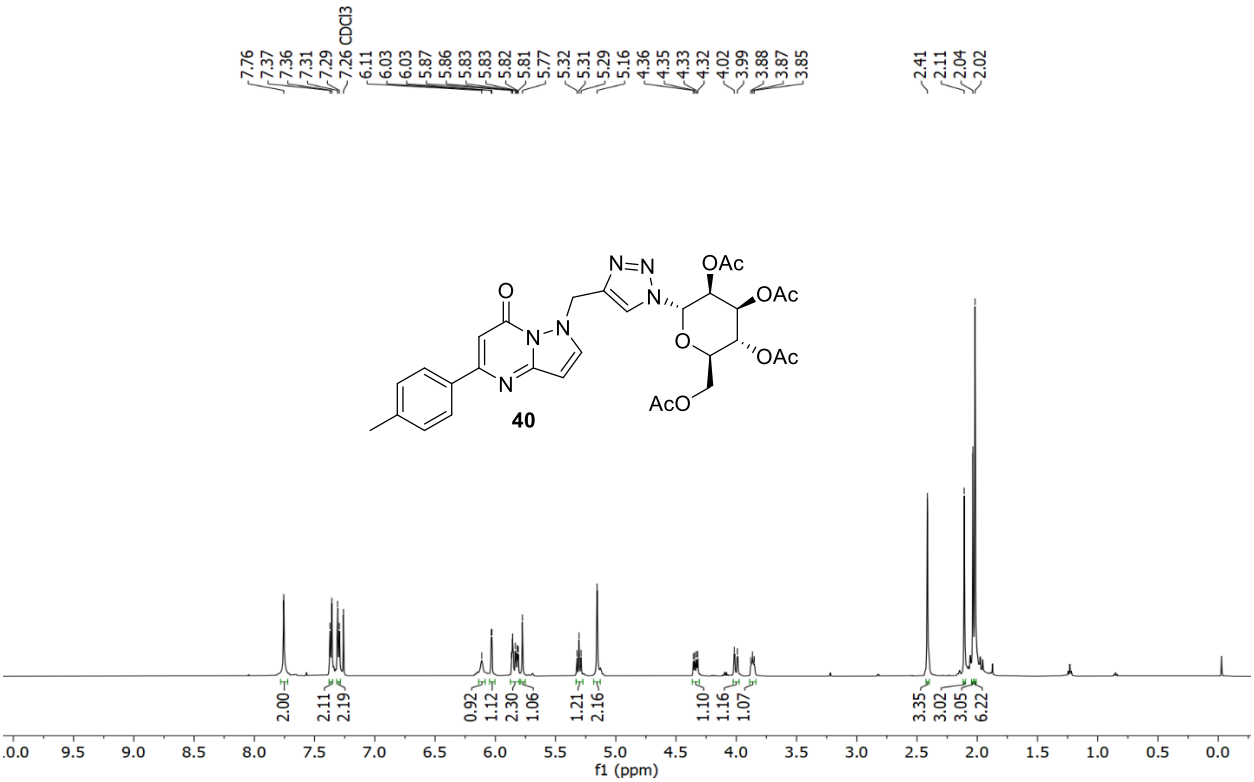
^{1}H-NMR (500 MHz, $CDCl_3$)



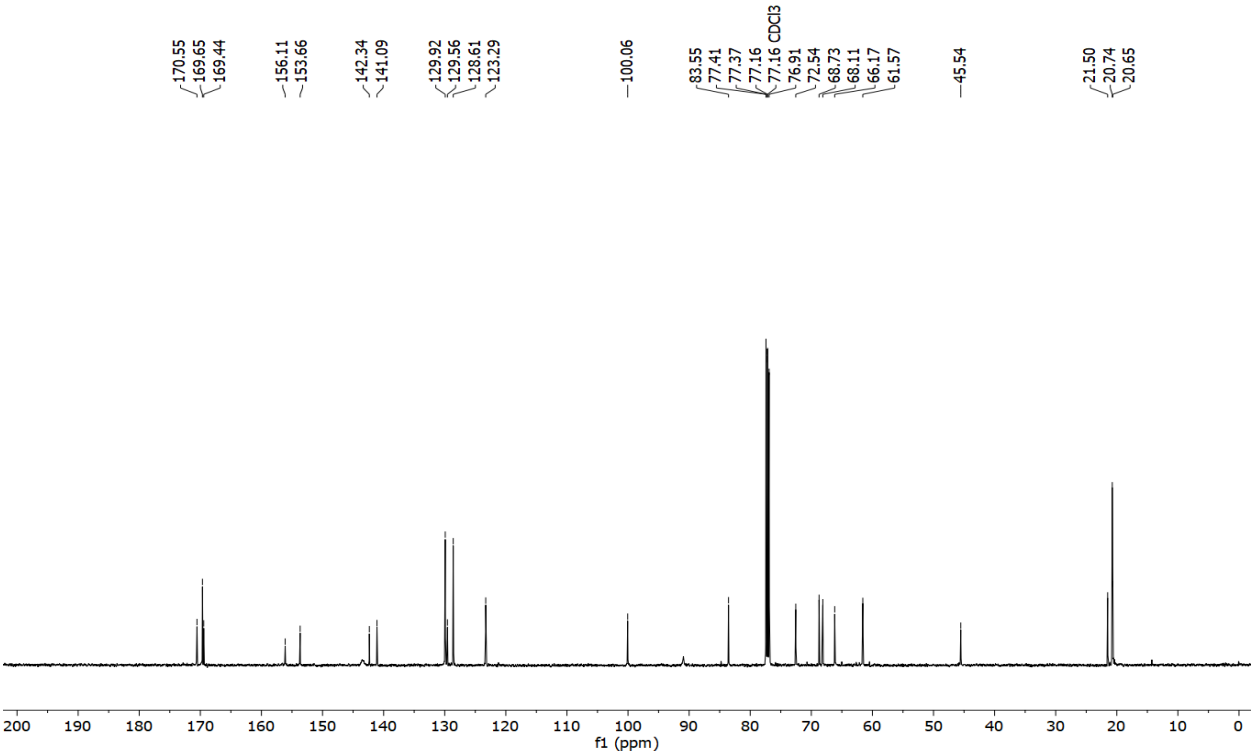
^{13}C-NMR (126 MHz, $CDCl_3$)



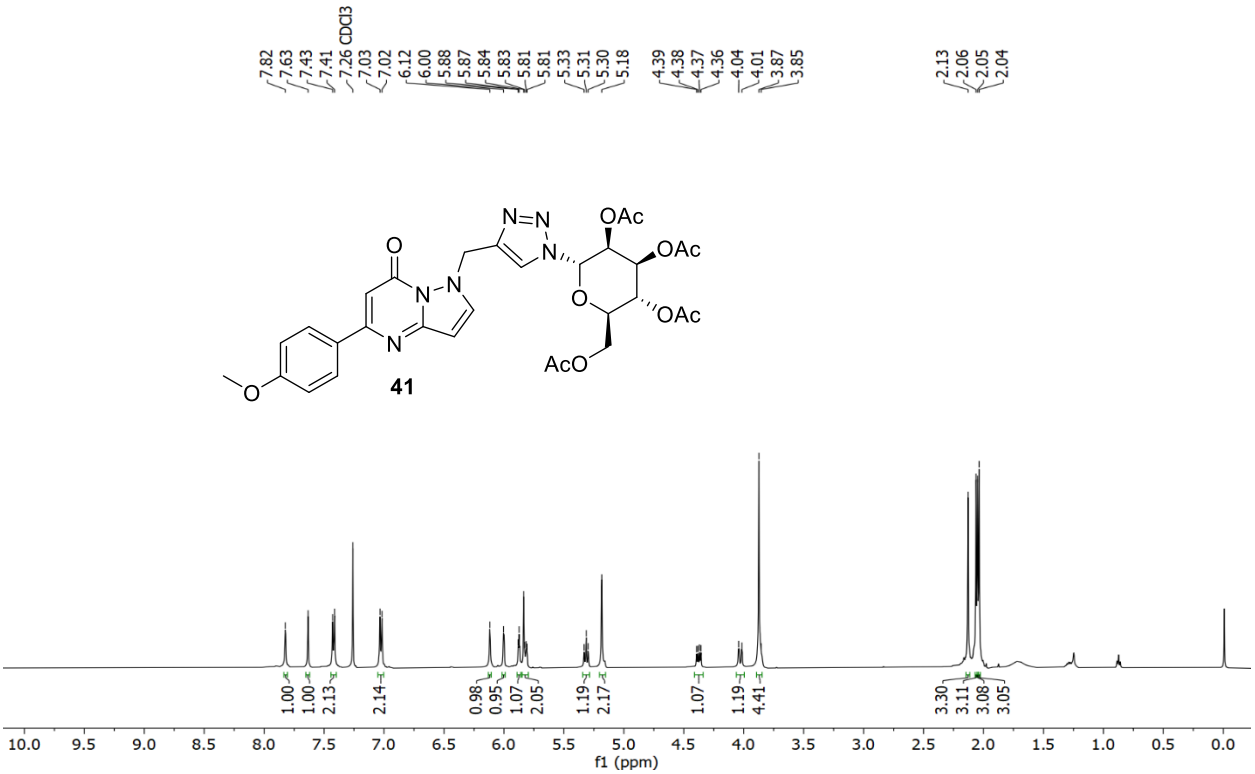
^{1}H-NMR (500 MHz, $CDCl_3$)



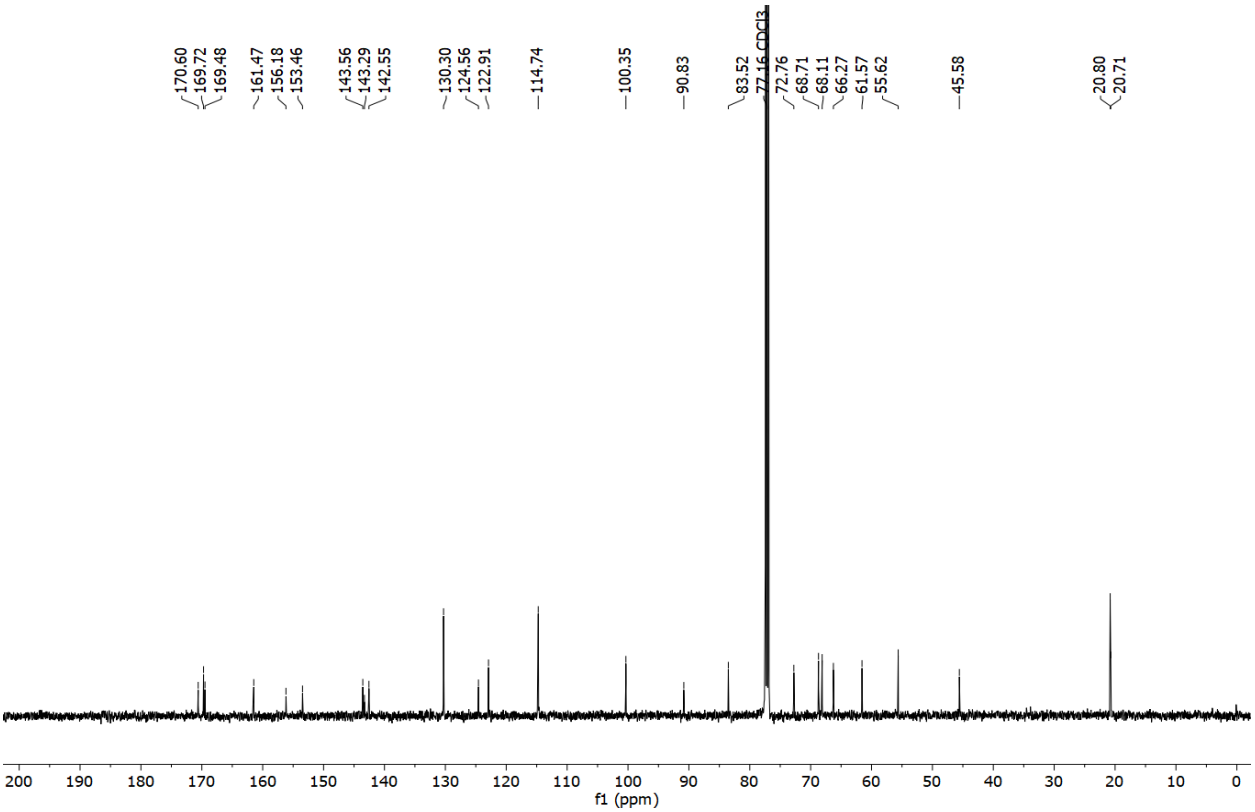
^{13}C-NMR (126 MHz, $CDCl_3$)



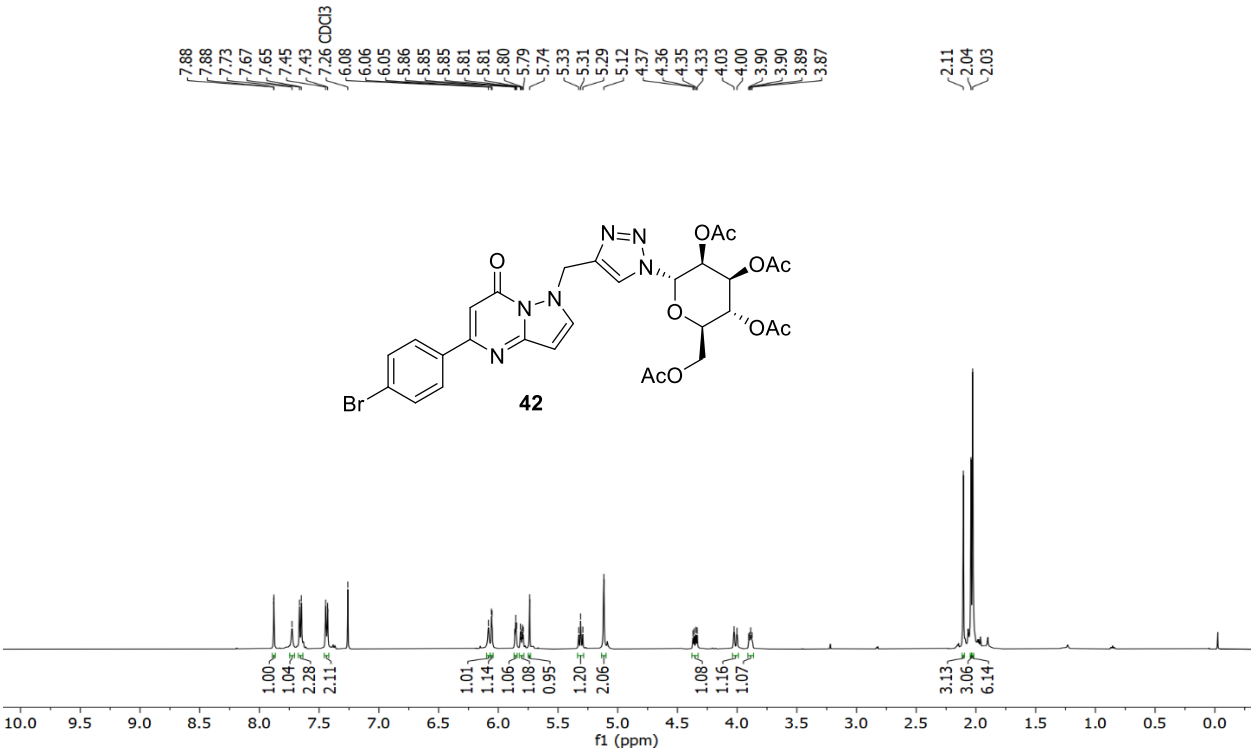
^{1}H-NMR (500 MHz, $CDCl_3$)



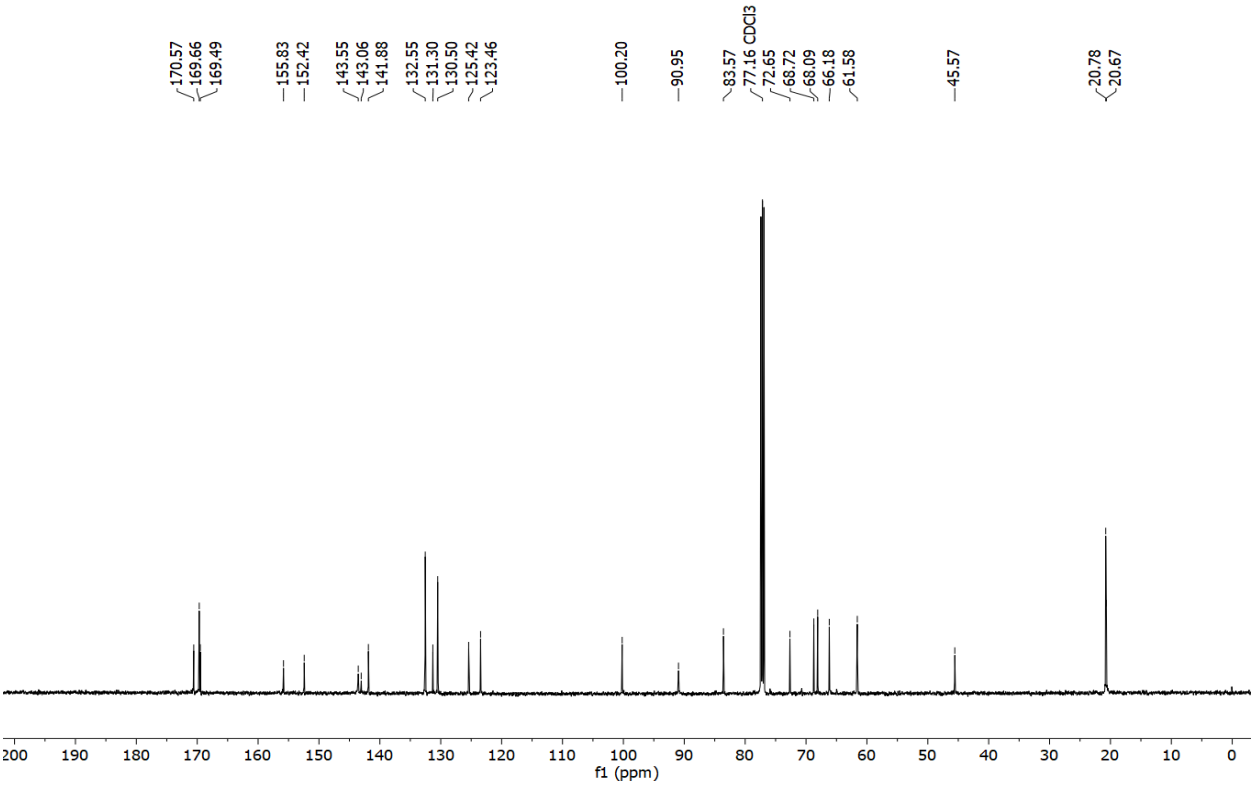
^{13}C-NMR (126 MHz, $CDCl_3$)



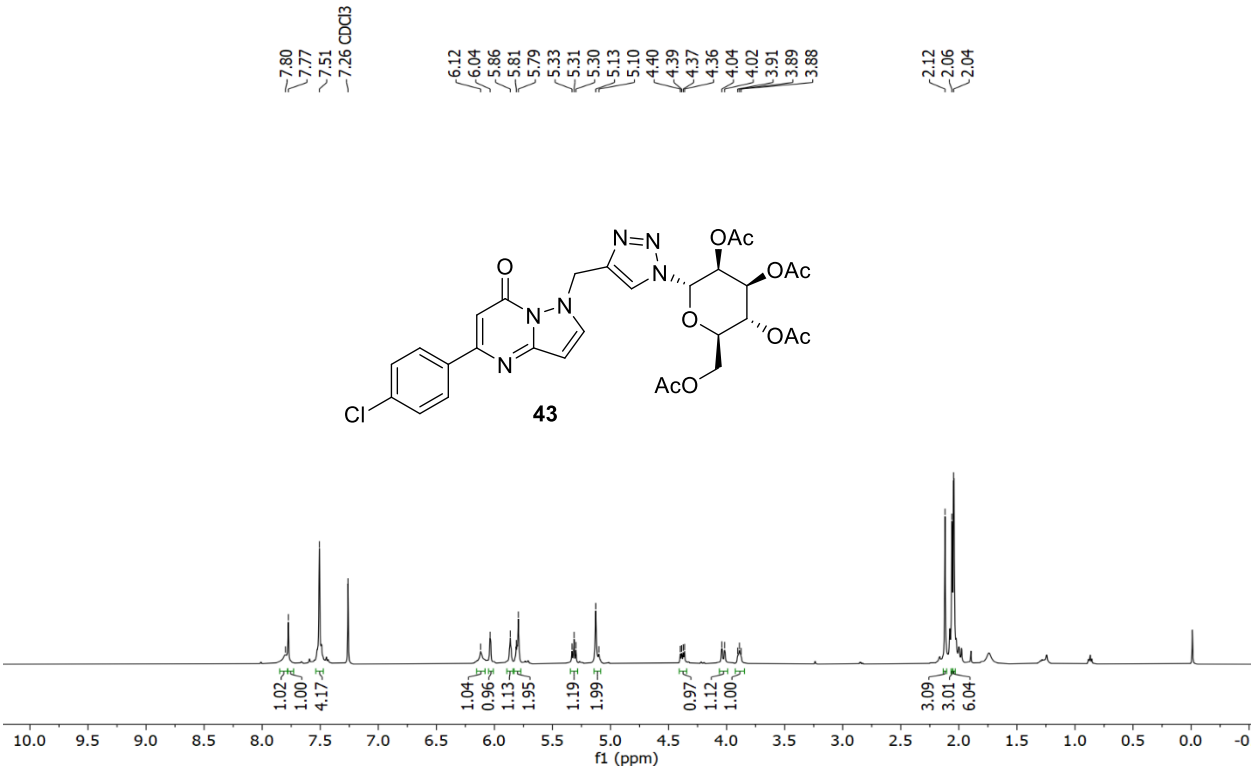
^{1}H-NMR (500 MHz, $CDCl_3$)



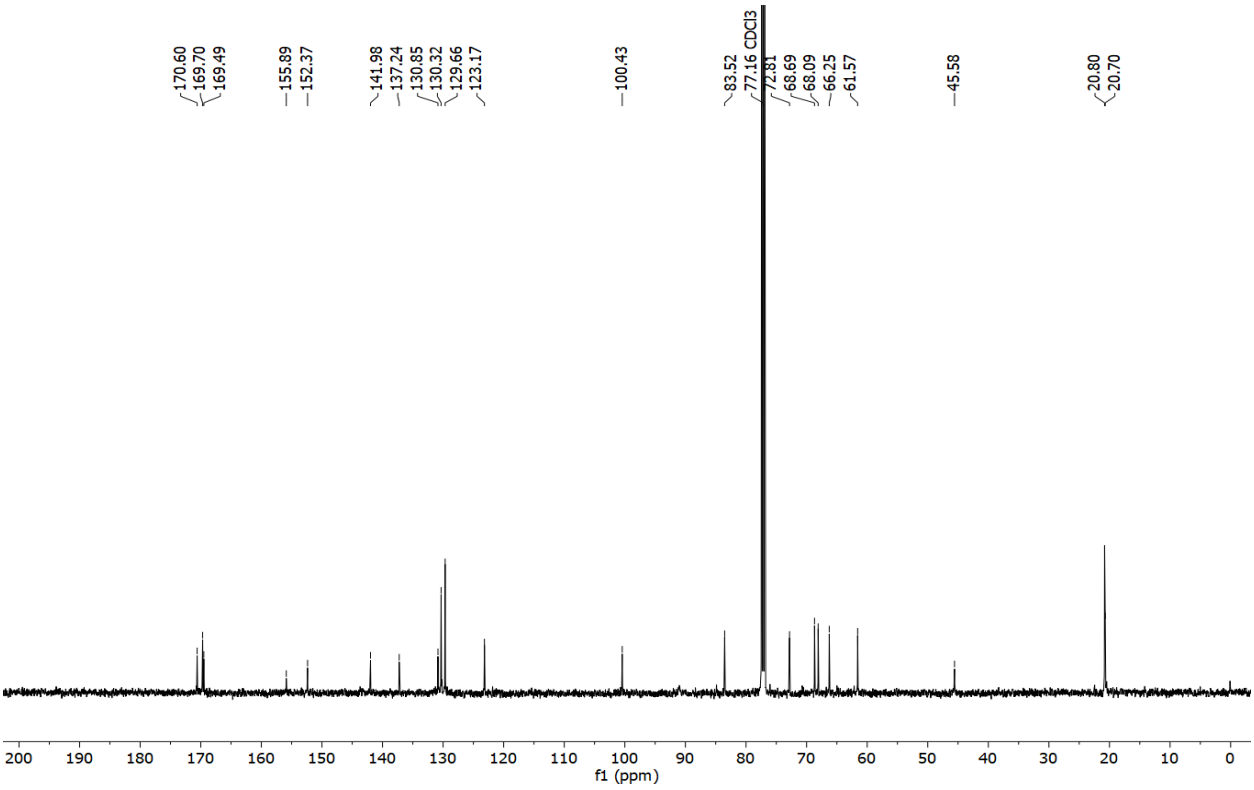
^{13}C-NMR (126 MHz, $CDCl_3$)



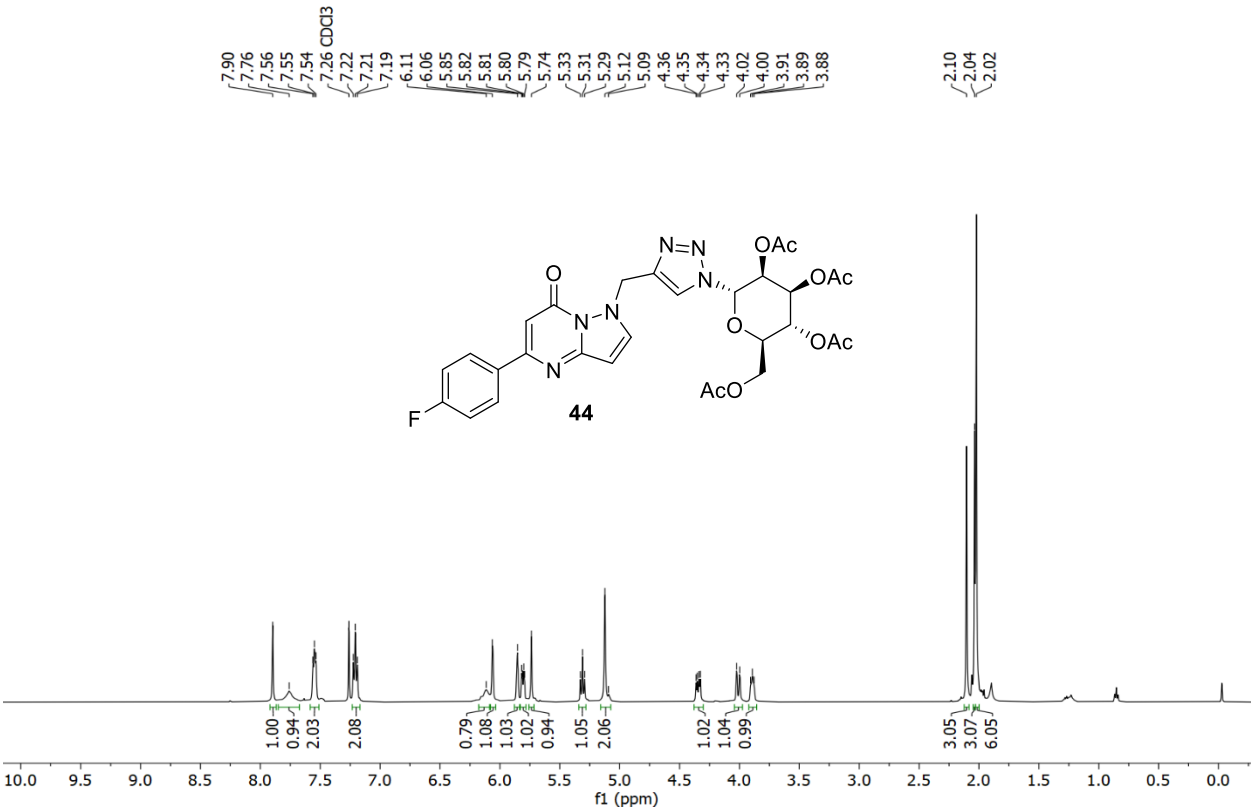
^{1}H-NMR (500 MHz, $CDCl_3$)



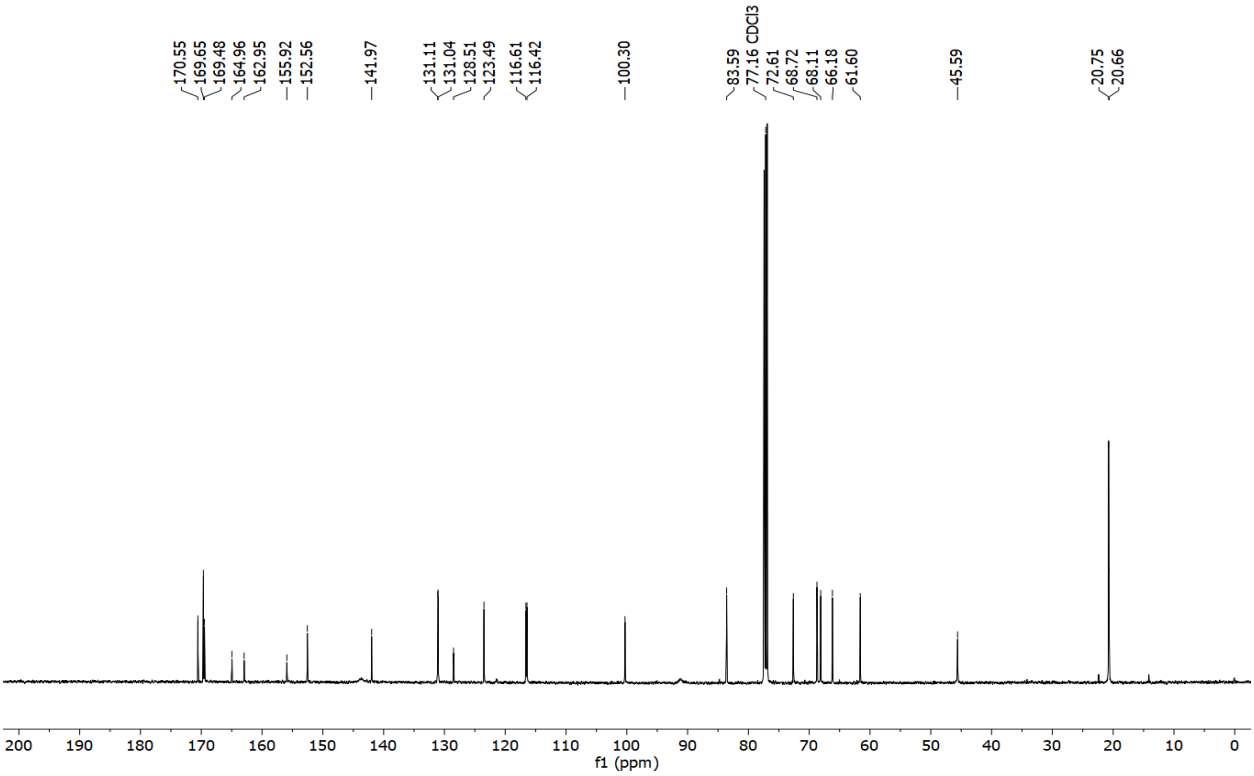
^{13}C-NMR (126 MHz, $CDCl_3$)



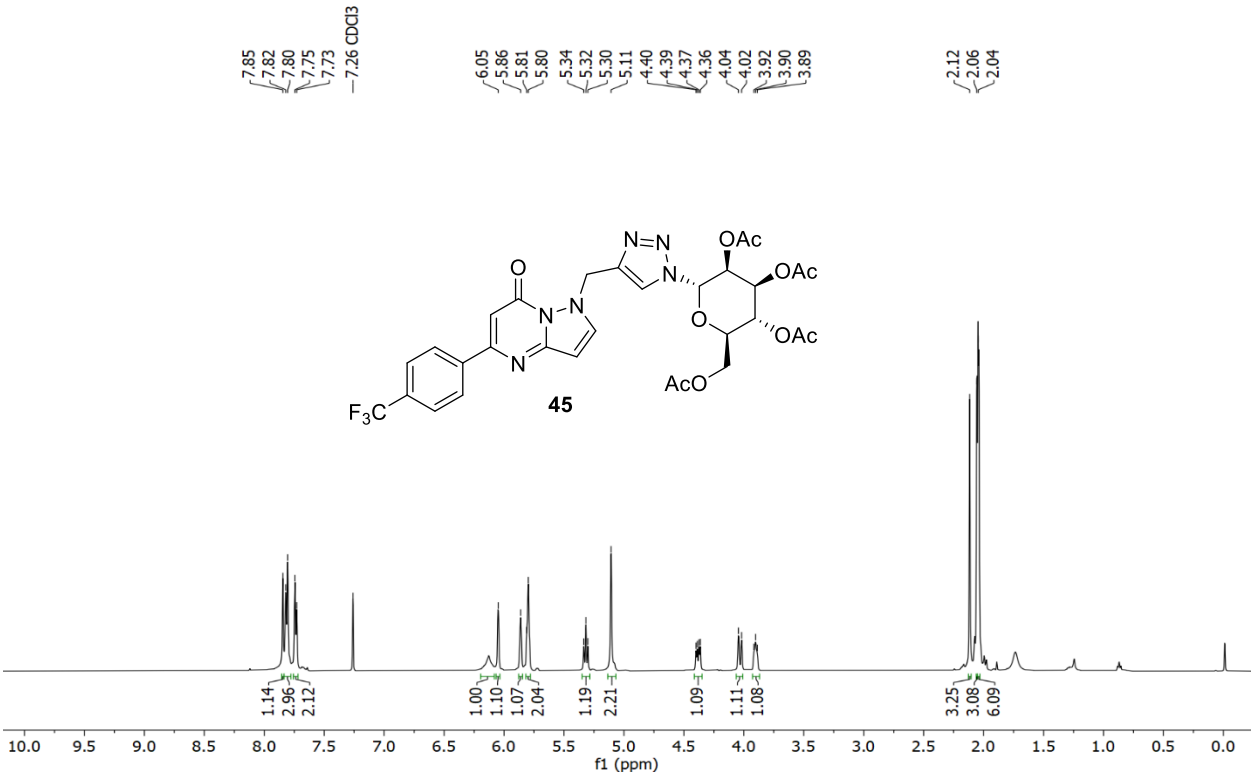
^{1}H-NMR (500 MHz, $CDCl_3$)



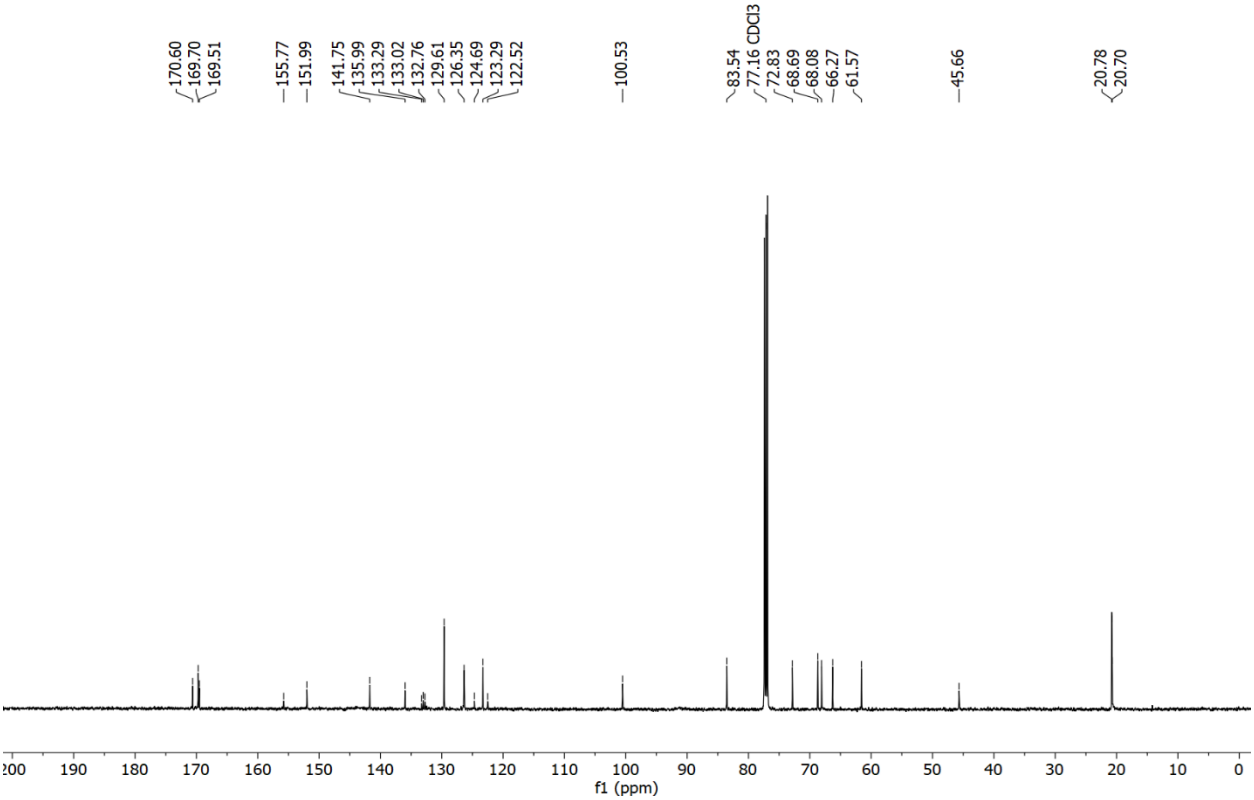
^{13}C-NMR (126 MHz, $CDCl_3$)



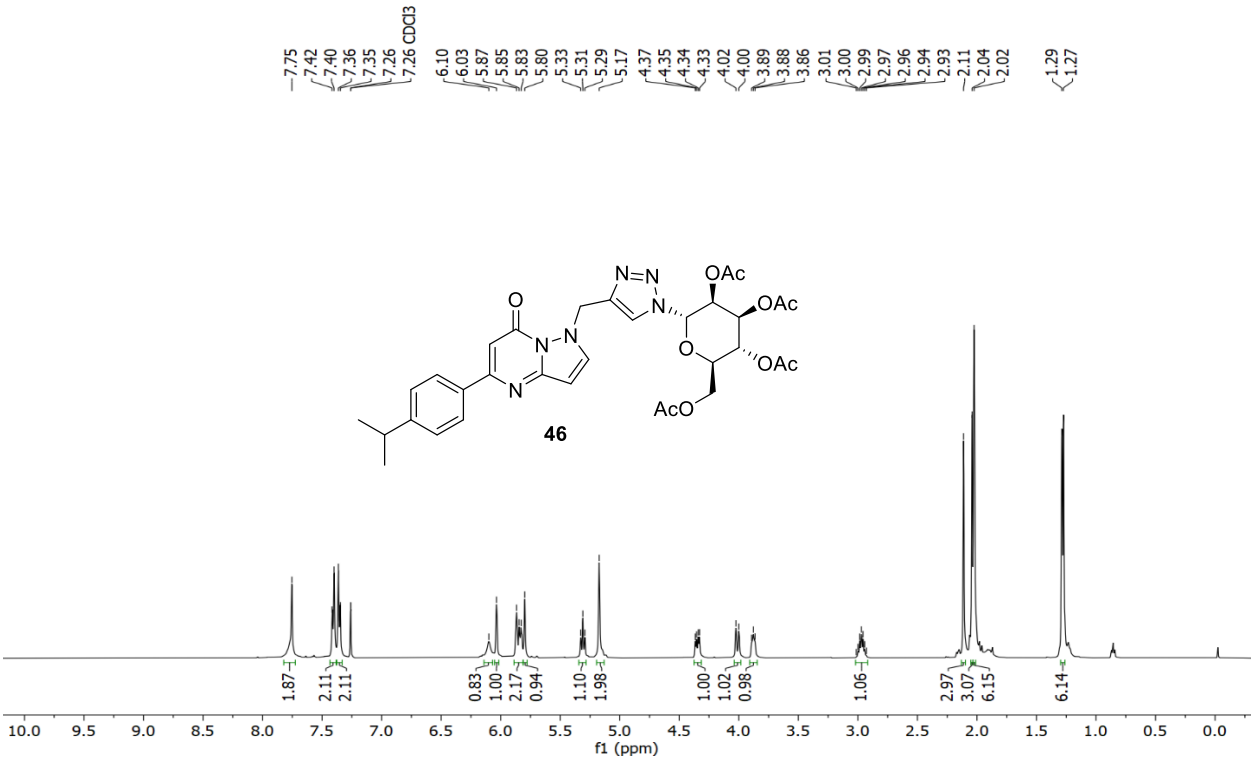
^{1}H-NMR (500 MHz, $CDCl_3$)



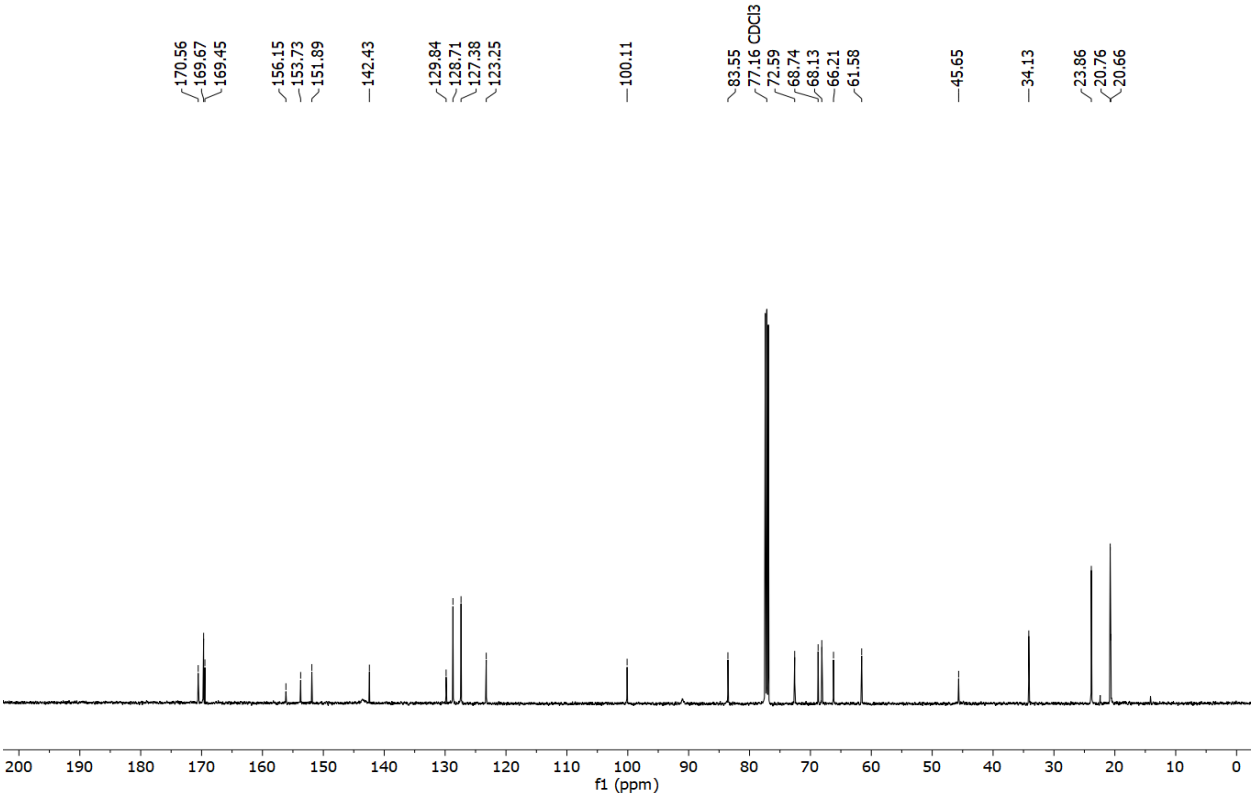
^{13}C-NMR (126 MHz, $CDCl_3$)



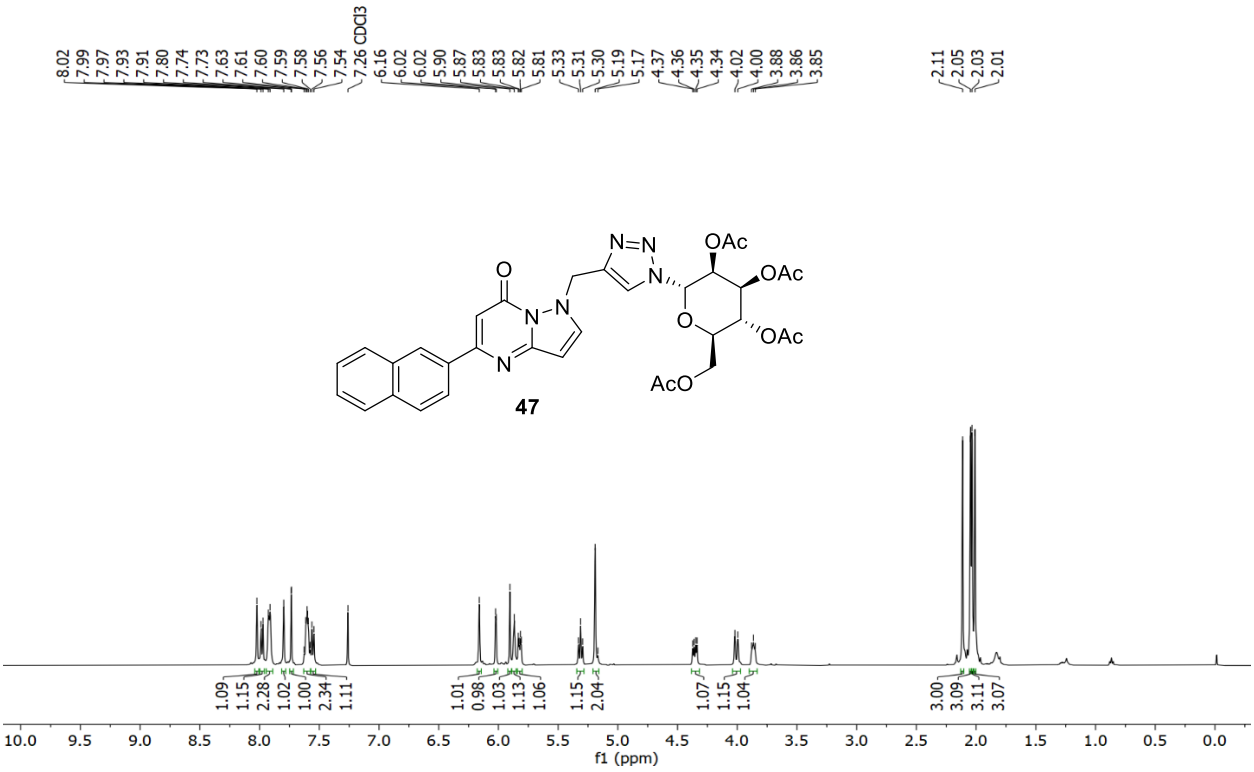
^{1}H-NMR (500 MHz, $CDCl_3$)



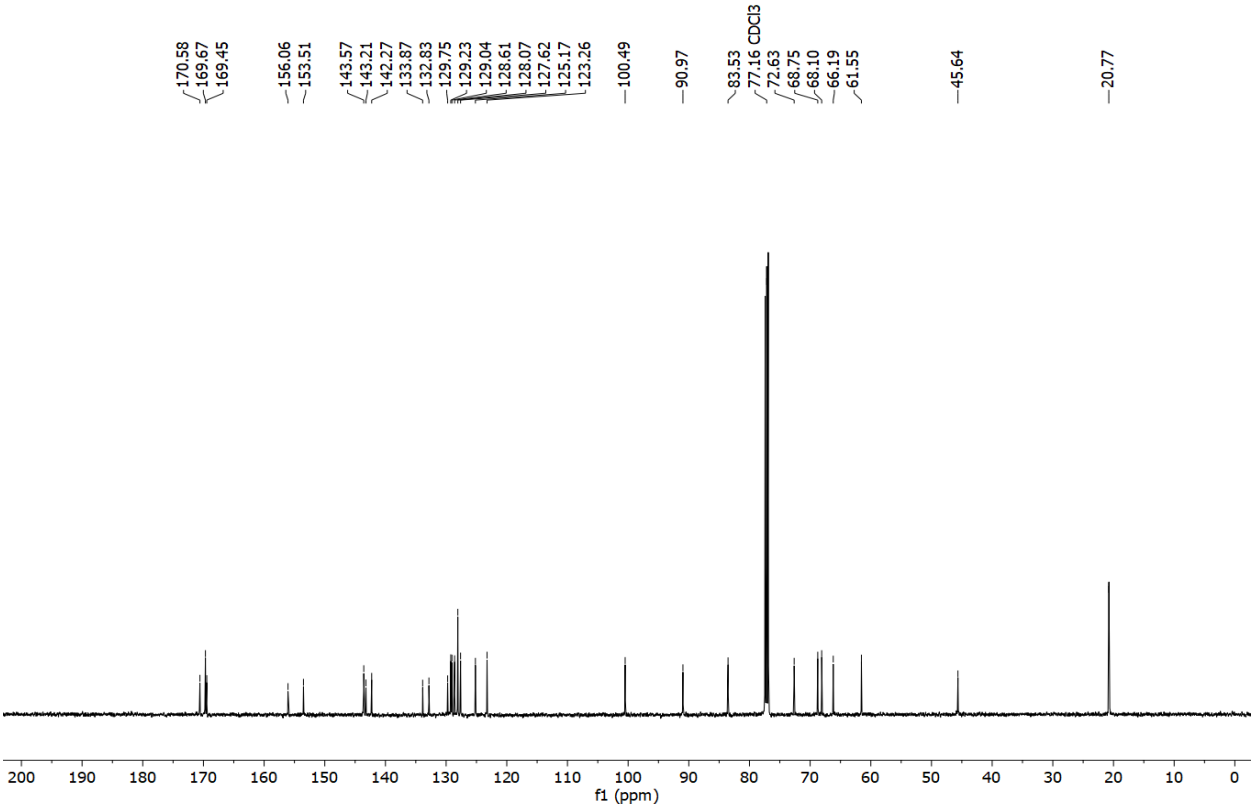
^{13}C-NMR (126 MHz, $CDCl_3$)



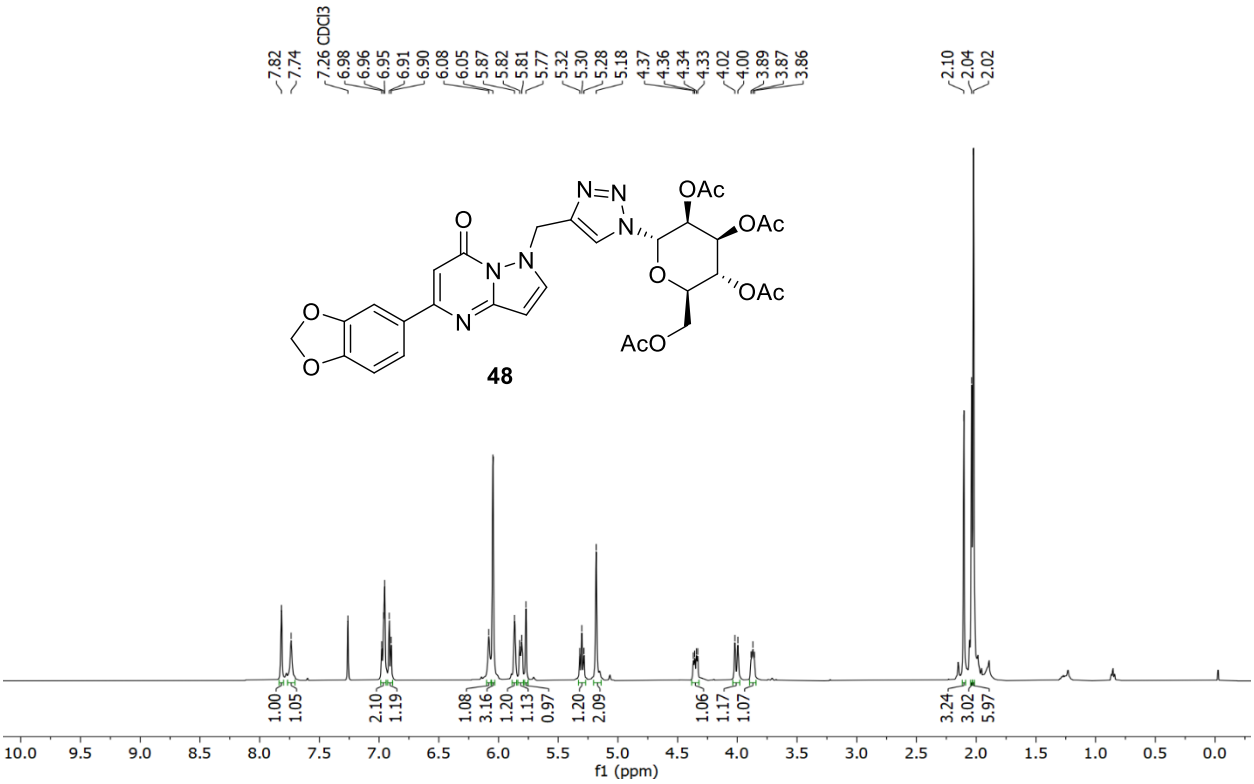
^{1}H-NMR (500 MHz, $CDCl_3$)



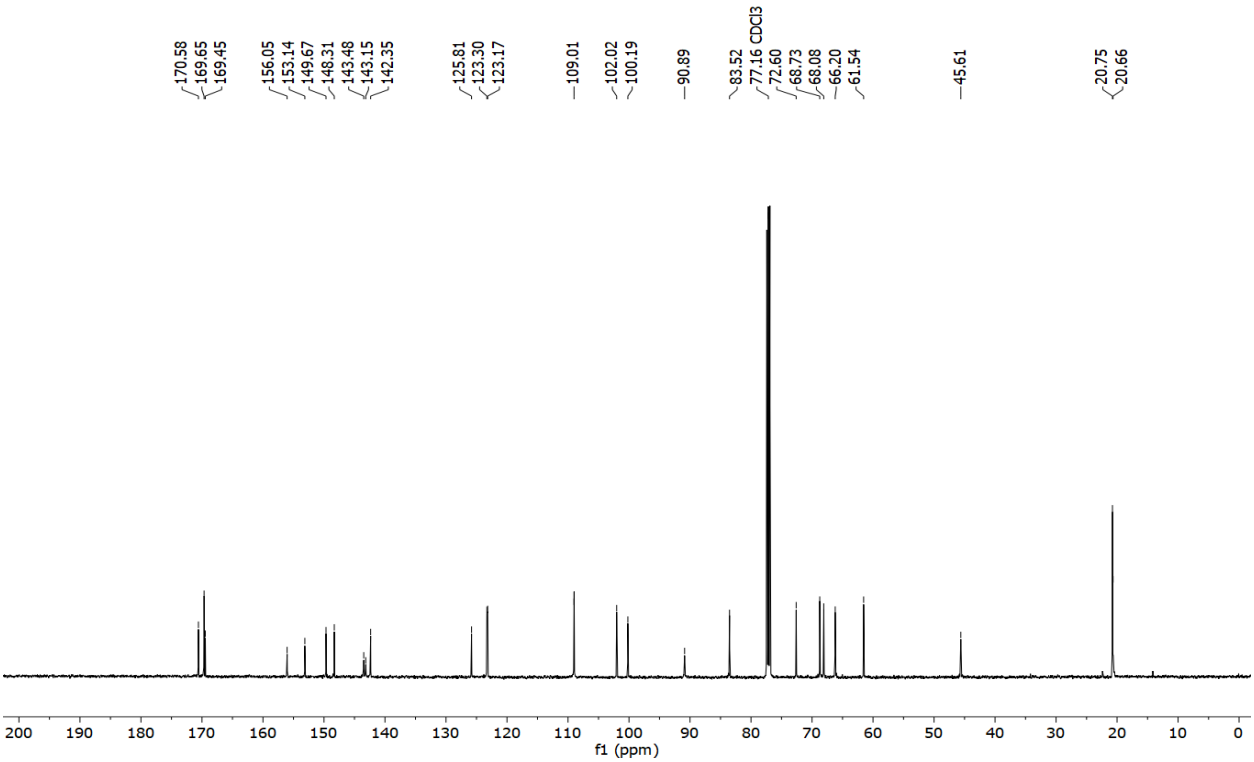
^{13}C-NMR (126 MHz, $CDCl_3$)



^{1}H-NMR (500 MHz, $CDCl_3$)



^{13}C-NMR (126 MHz, $CDCl_3$)



Results of cell viability assays

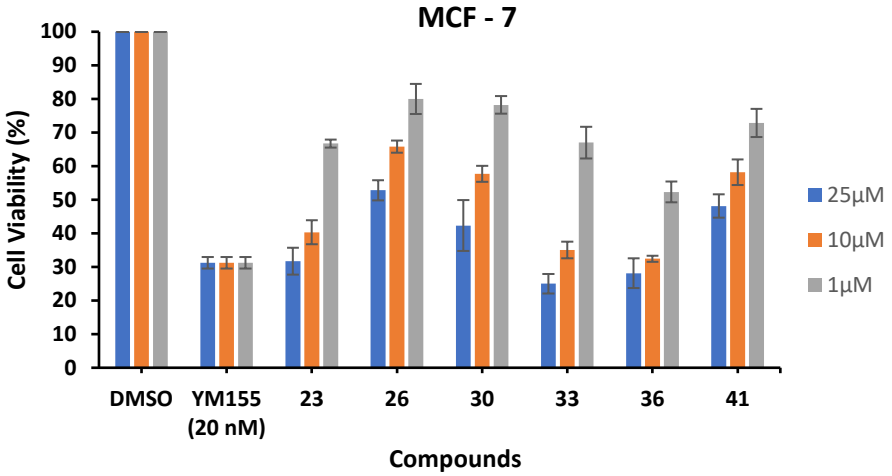


Figure S1. Results of cell viability assays with all the compounds (**22, 26, 30, 33, 36** and **41**) in MCF-7 cancer cell lines (25 µM, 10 µM, 1 µM concentration).

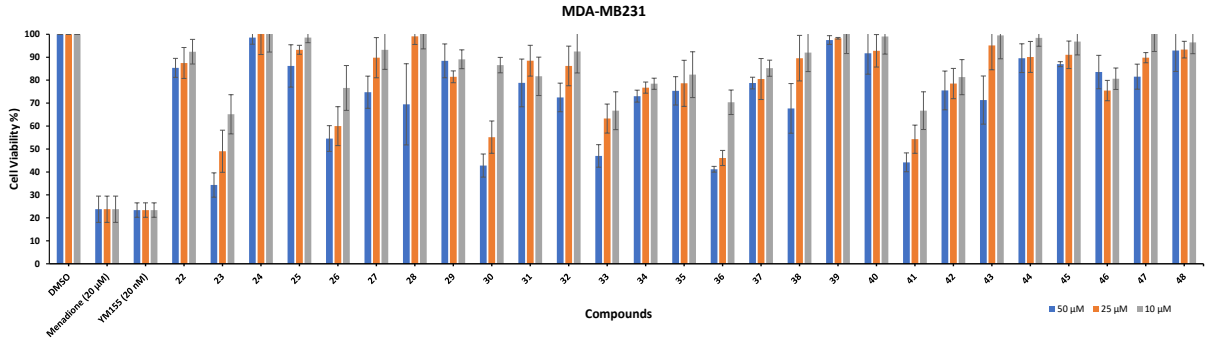


Figure S2. Combined results of cell viability assays with all the compounds (**22-48**) in MDA-MB-231 (50 µM, 25 µM, 10 µM concentration).