

## Supplementary Materials

### X-ray Crystallographic Structure of $\alpha$ -Helical Peptide Stabilized by Hydrocarbon Stapling at *i,i*+1 Positions

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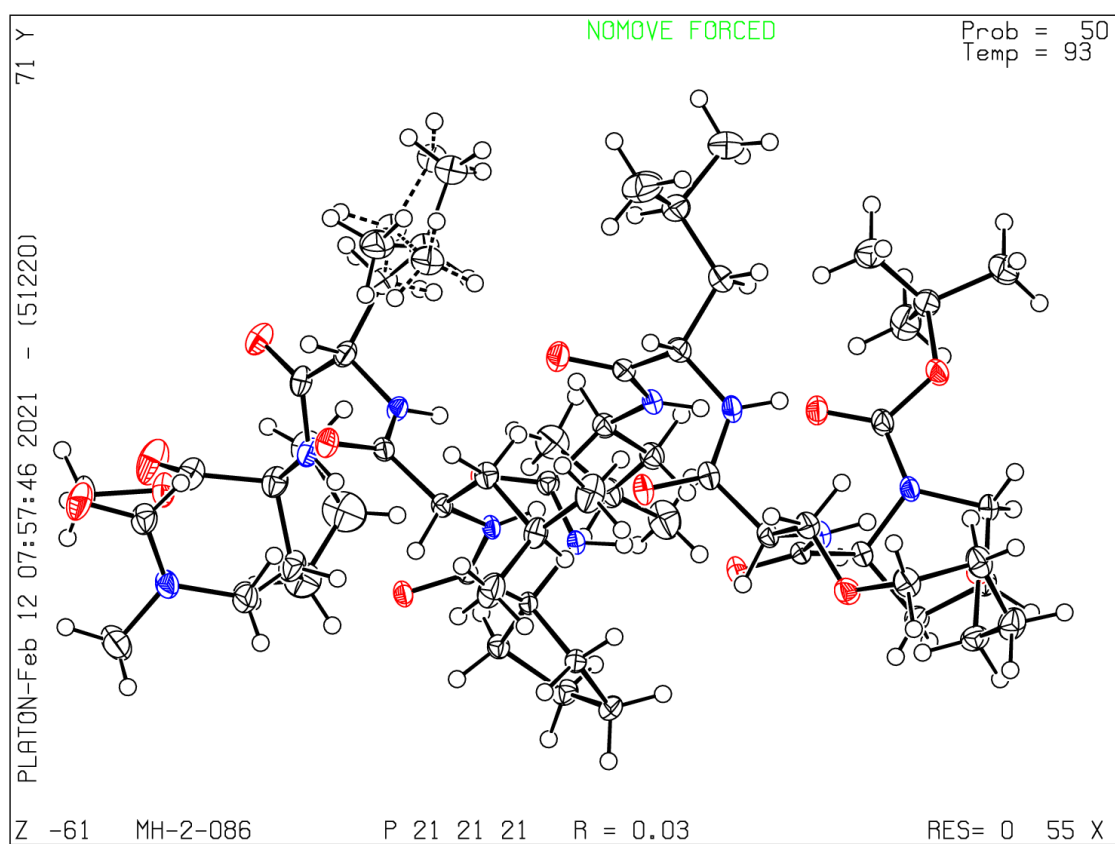
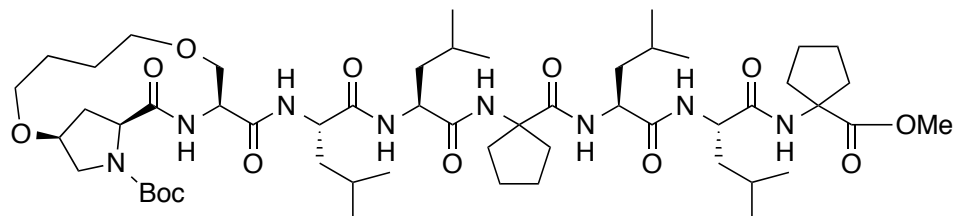
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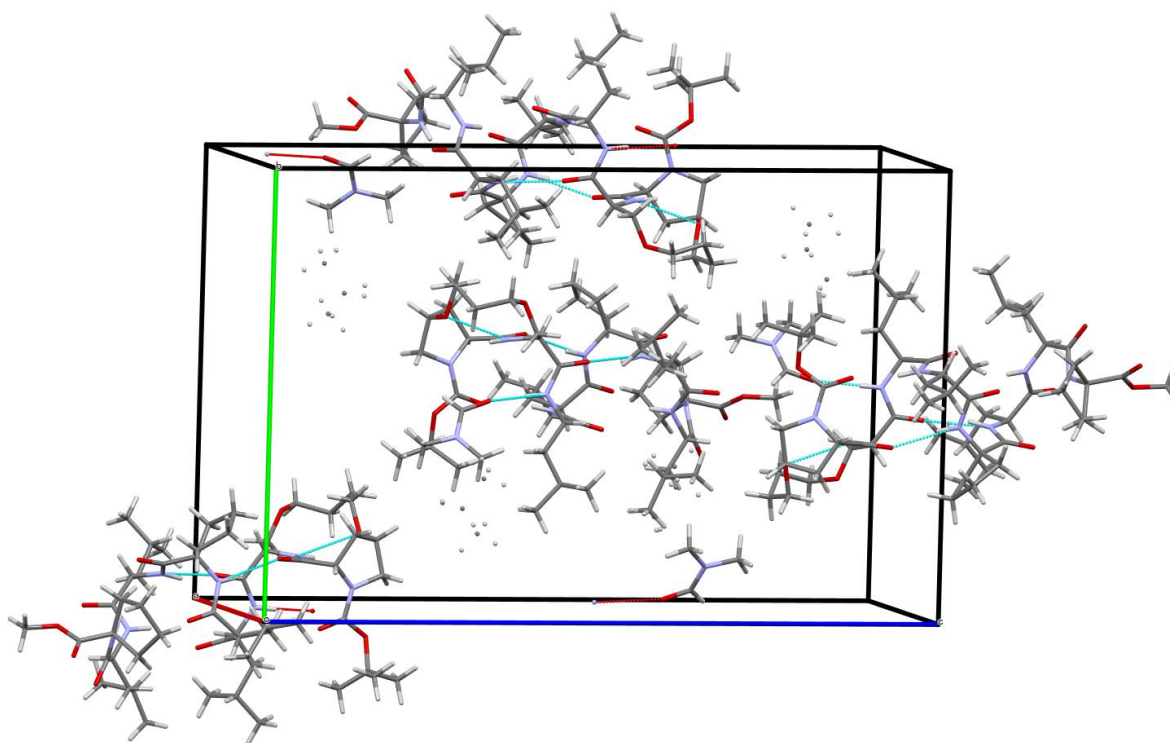
## 1. X-ray crystallographic data of stapled peptide 10



**Figure S1.** ORTEP drawing of stapled peptide **10** (ellipsoids at 50% probability).

**Table S1.** Selected torsion angles  $\omega$ ,  $\phi$ ,  $\psi$ , and  $\chi$  [ $^\circ$ ] for stapled peptide **10**, as determined by an X-ray crystallographic analysis.

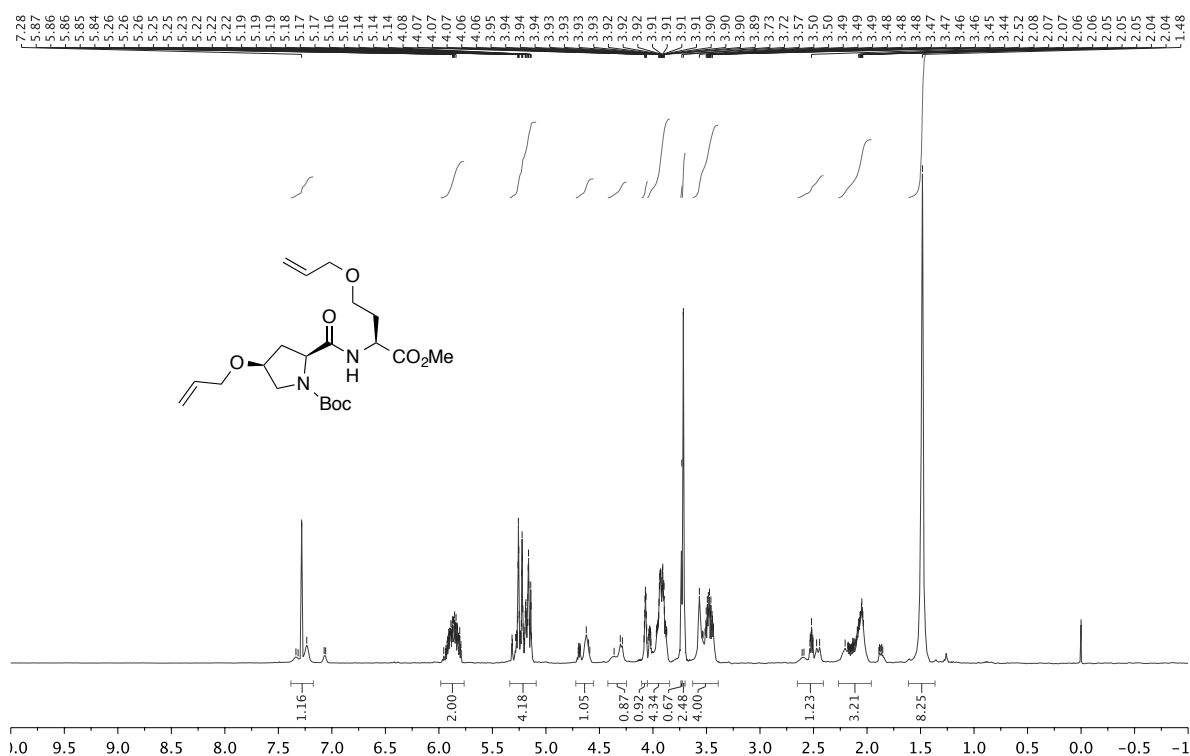
$\omega_0$	−170.4
$\phi_1$	−67.9
$\psi_1$	−45.6
$\omega_1$	−177.3
$\phi_2$	−66.4
$\psi_2$	−44.4
$\omega_2$	179.8
$\phi_3$	−61.2
$\psi_3$	−43.0
$\omega_3$	177.3
$\phi_4$	−59.5
$\psi_4$	−53.3
$\omega_4$	−176.1
$\phi_5$	−57.1
$\psi_5$	−46.2
$\omega_5$	−169.4
$\phi_6$	−75.3
$\psi_6$	−21.7
$\omega_6$	−179.5
$\phi_7$	−102.3
$\psi_7$	7.9
$\omega_7$	−174.4
$\phi_8$	−60.6
$\psi_8$	−41.6
$\omega_8$	−170.4
$\chi_1$	19.1
$\chi_2$	−70.4
$\chi_3$	−172.8
$\chi_4$	172.3
$\chi_5$	−81.9
$\chi_5'$	75.0
$\chi_6$	−65.9
$\chi_7$	−58.2
$\chi_8$	−143.3
$\chi_8'$	115.6



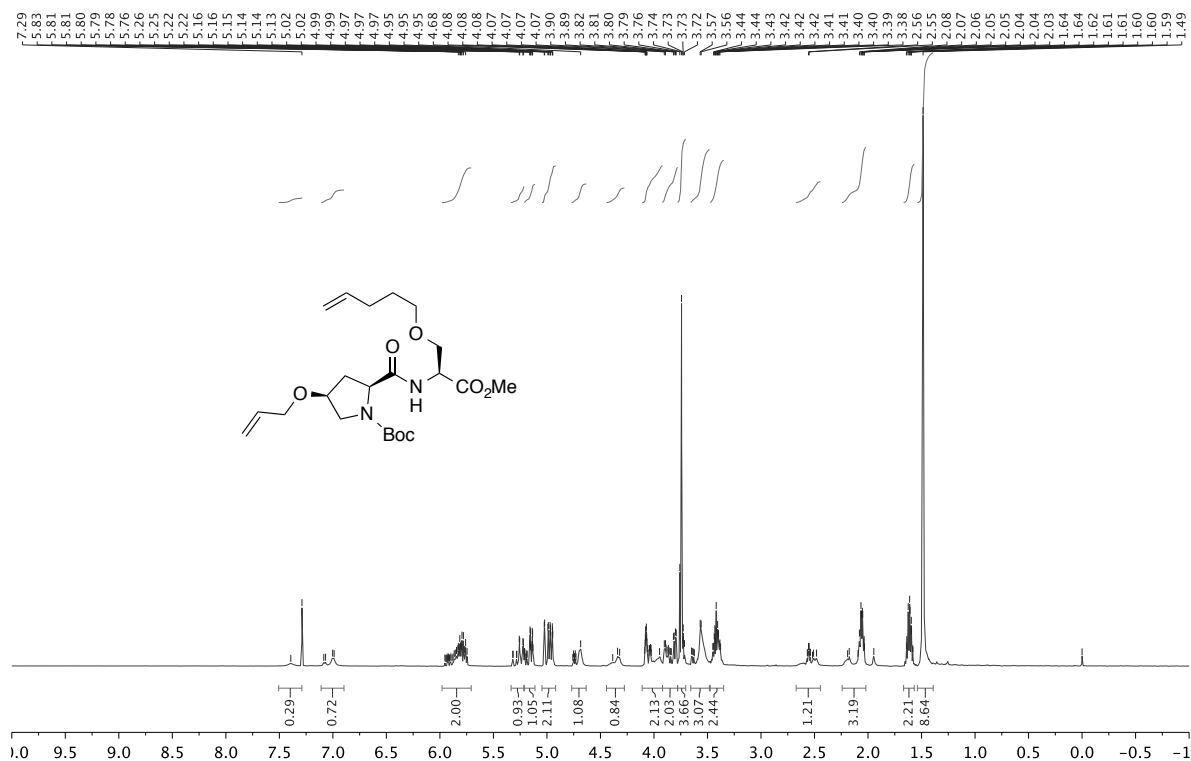
**Figure S2.** Packing structure of stapled peptide **10** in the crystal state.

# 1. NMR spectra.

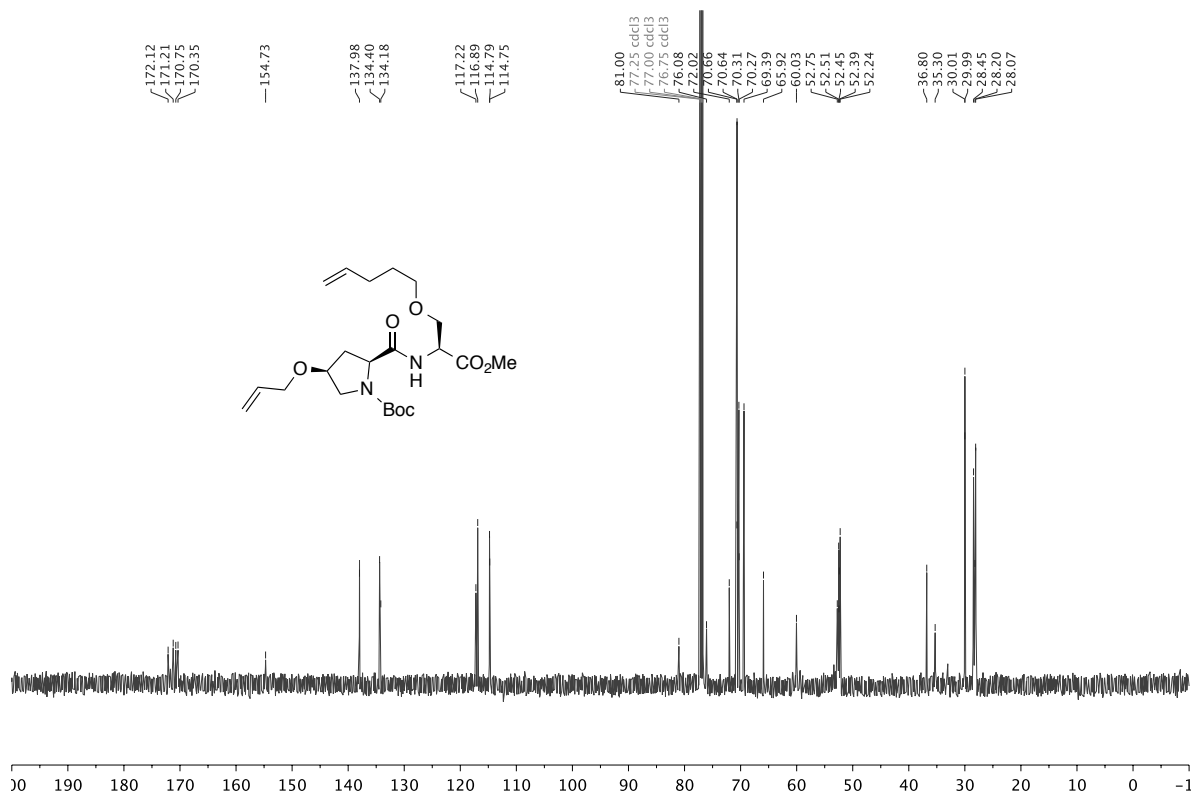
$^1\text{H}$  NMR of **2** (500 MHz,  $\text{CDCl}_3$ )



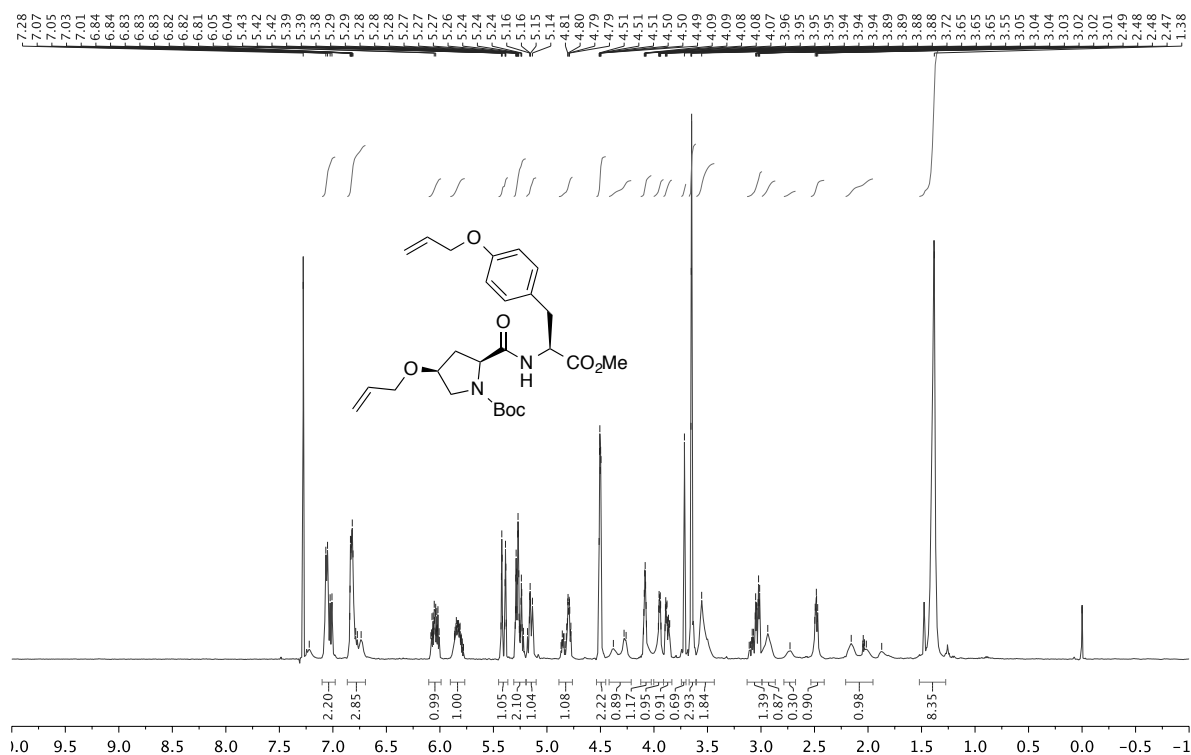
$^1\text{H}$  NMR of **3** (500 MHz,  $\text{CDCl}_3$ )



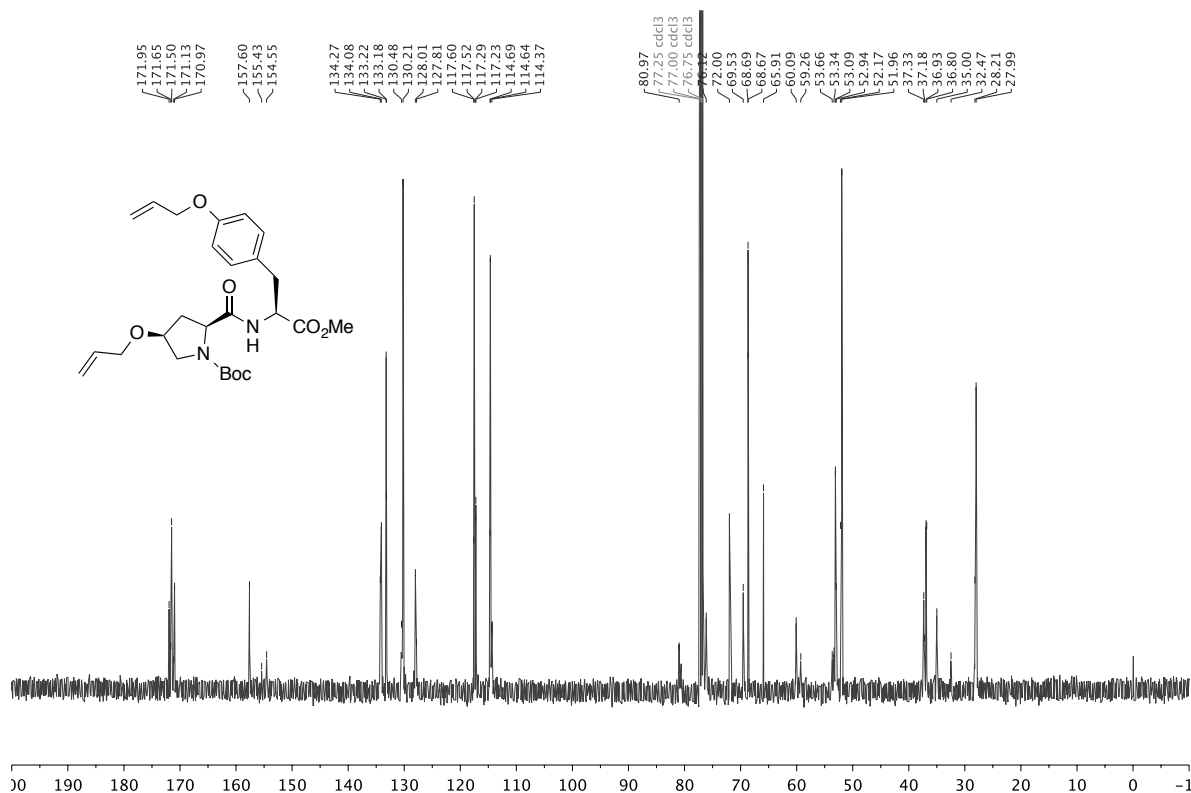
$^{13}\text{C}$  NMR of **3** (125 MHz,  $\text{CDCl}_3$ )



<sup>1</sup>H NMR of **4** (500 MHz, CDCl<sub>3</sub>)



<sup>13</sup>C NMR of **4** (125 MHz, CDCl<sub>3</sub>)



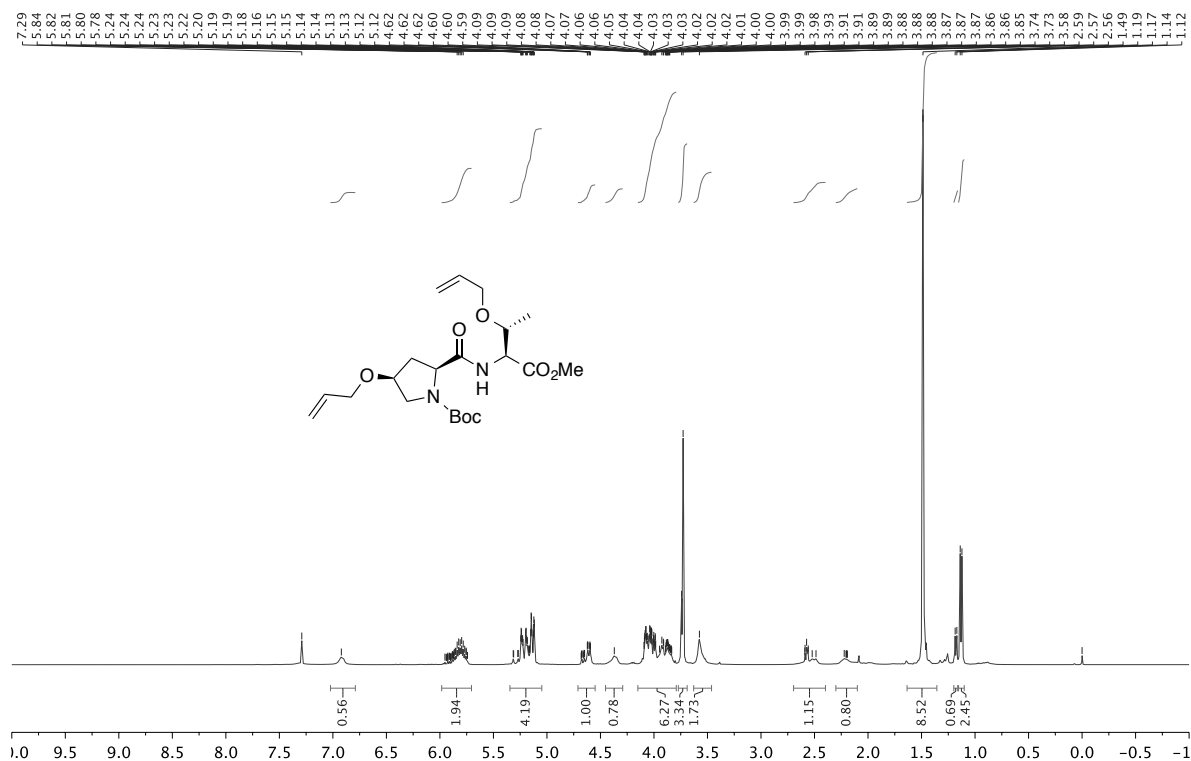
Chemical structure of compound 10 is shown above the spectrum. The structure is a 4-membered ring with an oxygen atom, a nitrogen atom, and a carbonyl group. The nitrogen is substituted with a Boc group and a vinyl group. The carbonyl is substituted with a methyl ester group. The spectrum shows peaks for the vinyl protons (6.0-6.8 ppm), the Boc group (1.4-1.6 ppm), the methyl ester (3.6-3.8 ppm), and the ring protons (3.9-4.1 ppm). Integration values are provided below the peaks.

Chemical structure of compound 10 is shown above the spectrum. The structure is a 4-membered ring with a nitrogen atom, a carbonyl group, and a Boc-protected amine. The Boc group is a tert-butyl ester. The amine is a 2-allyl-2-methoxyethylamine derivative.

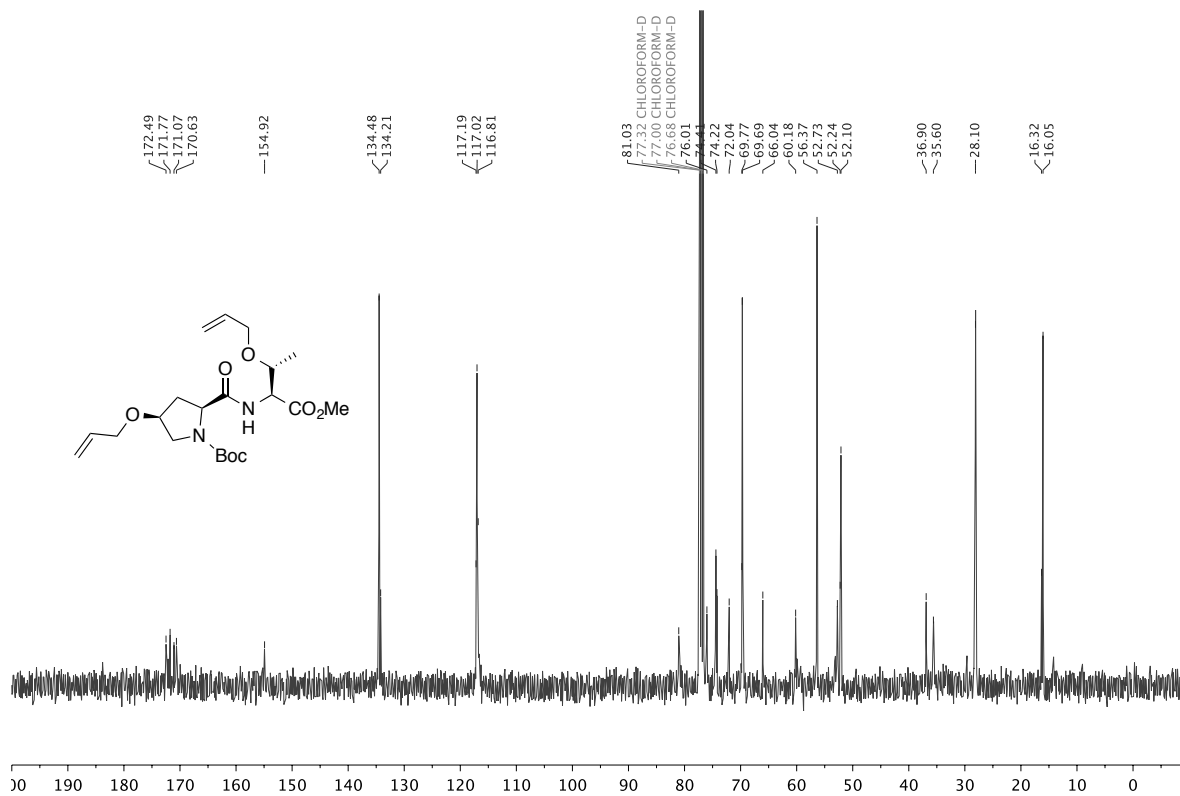
<sup>13</sup>C NMR spectrum (CDCl<sub>3</sub>) of compound 10. The spectrum shows peaks at the following chemical shifts (ppm): 172.57, 170.30, 134.36, 133.56, 133.91, 117.40, 117.24, 116.86, 80.66, 77.25, 77.00, 76.75, 75.76, 72.14, 72.12, 72.03, 69.61, 69.37, 69.00, 68.00, 59.71, 53.24, 52.64, 52.52, 52.46, 52.30, 36.78, 35.20, 33.45, and 28.20.



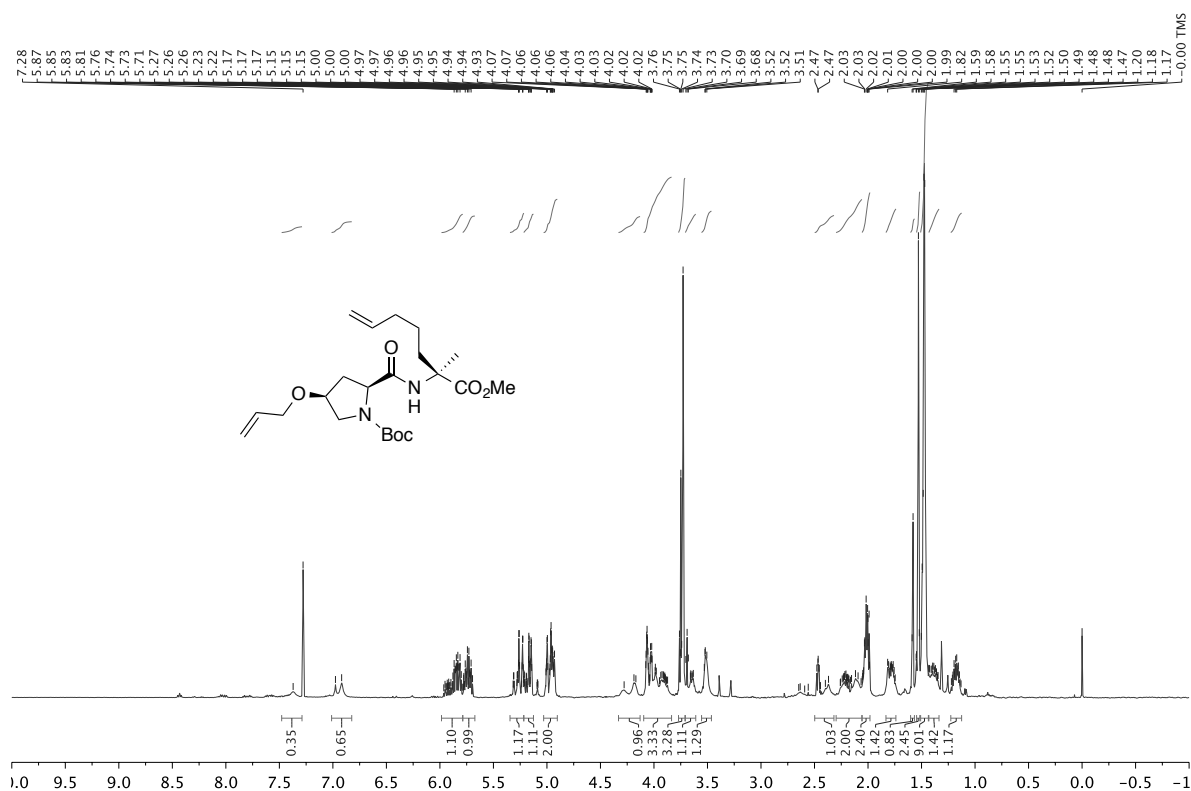
<sup>1</sup>H NMR of **6** (400 MHz, CDCl<sub>3</sub>)



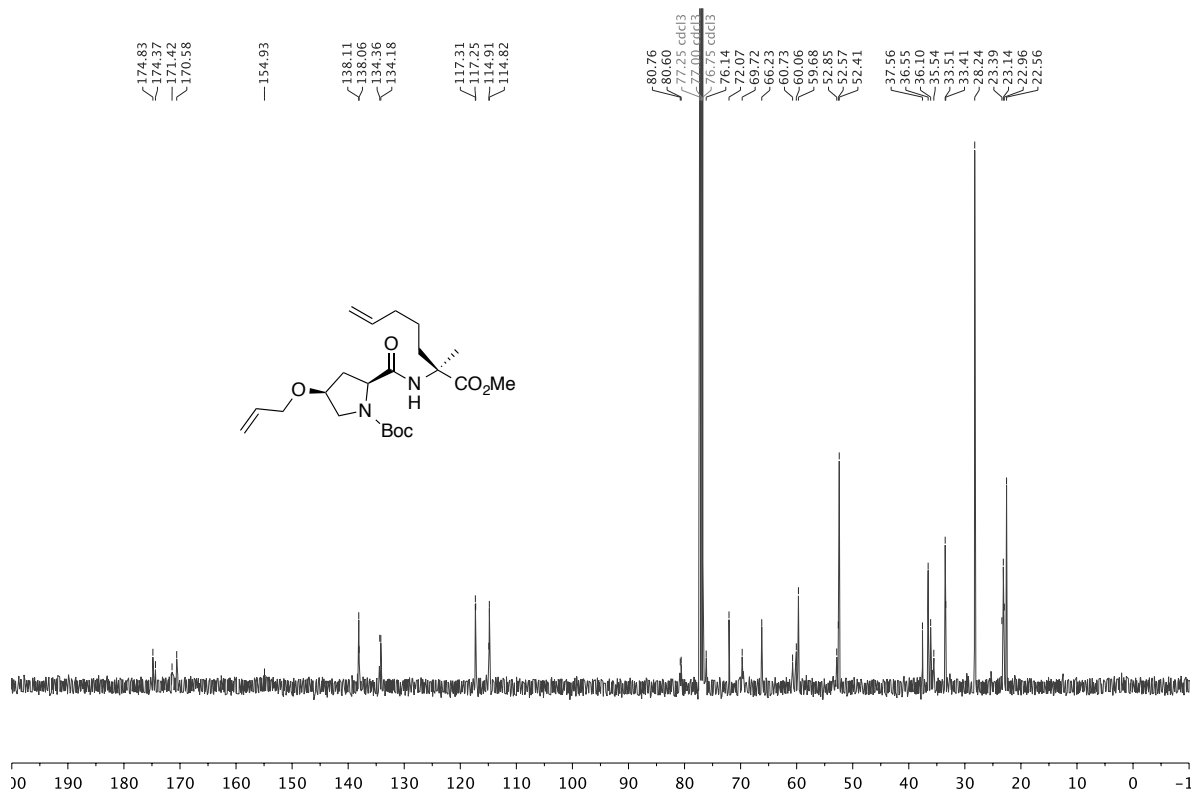
<sup>13</sup>C NMR of **6** (100 MHz, CDCl<sub>3</sub>)



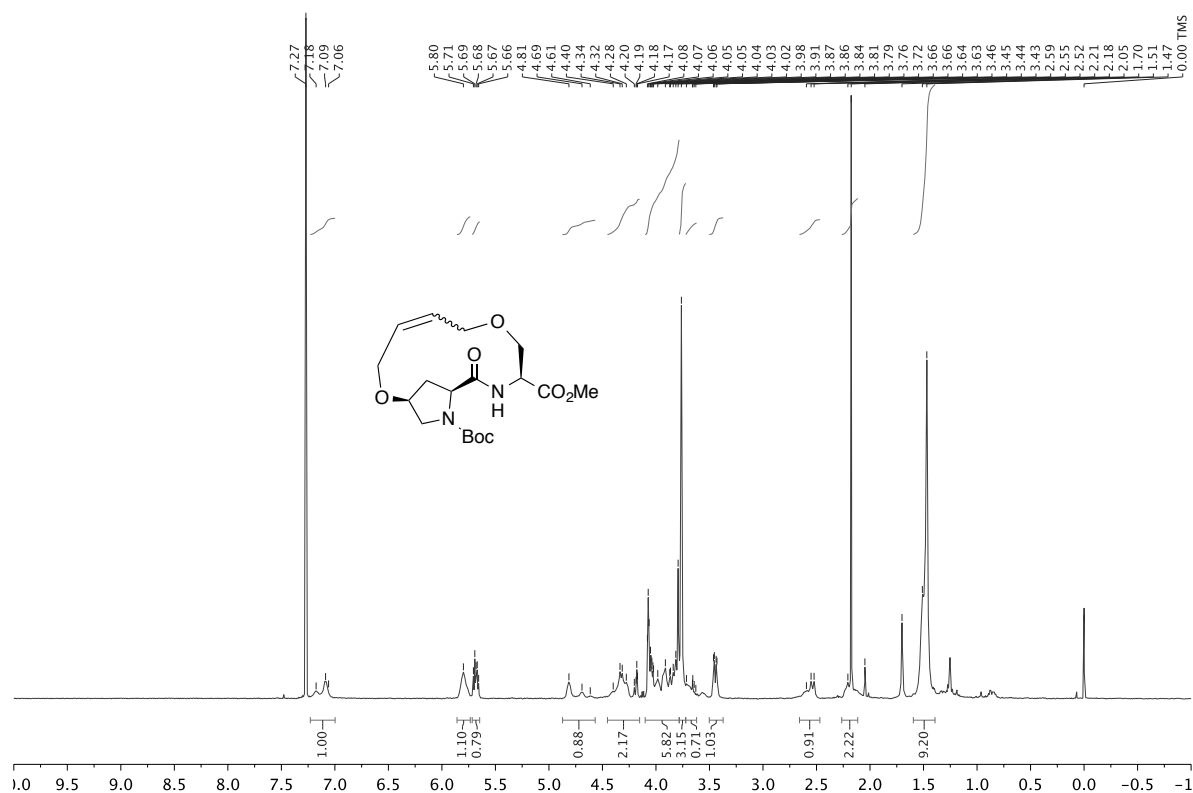
<sup>1</sup>H NMR of 7 (500 MHz, CDCl<sub>3</sub>)



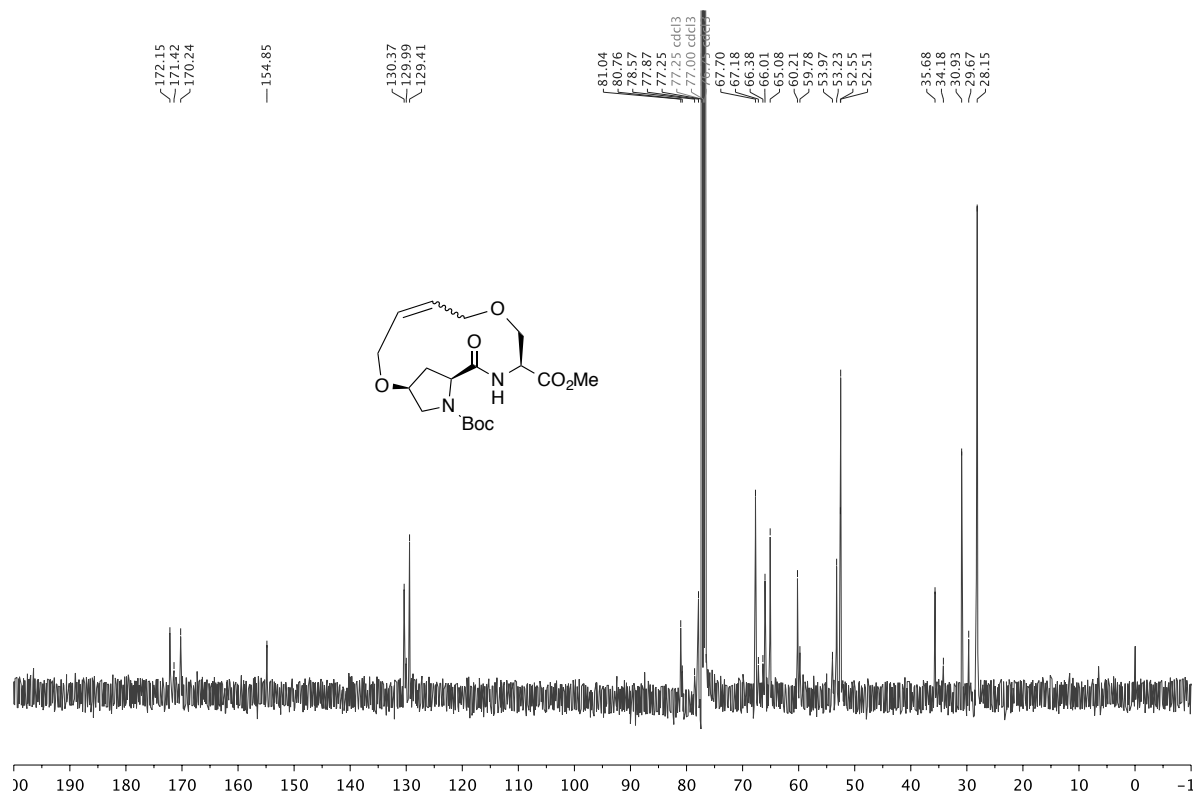
<sup>13</sup>C NMR of 7 (125 MHz, CDCl<sub>3</sub>)



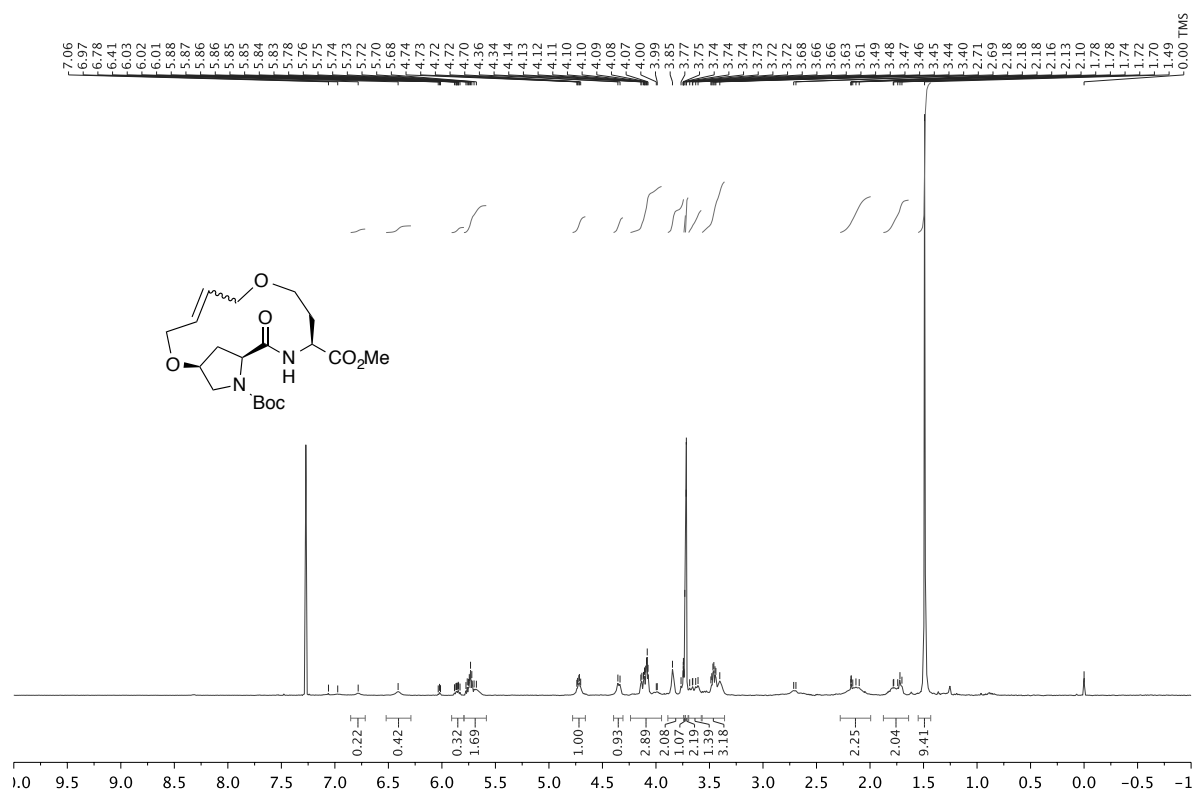
$^1\text{H}$  NMR of **1'** (500 MHz,  $\text{CDCl}_3$ )



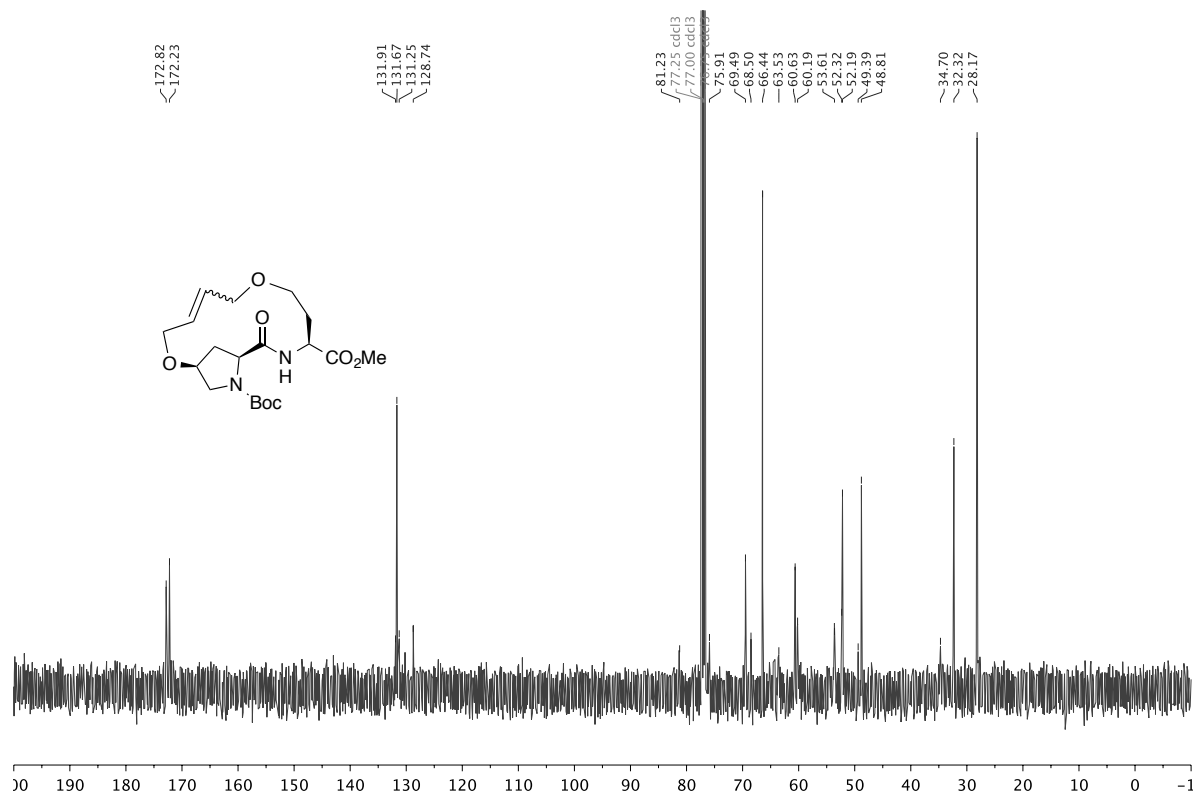
$^{13}\text{C}$  NMR of **1'** (125 MHz,  $\text{CDCl}_3$ )



$^1\text{H}$  NMR of **2'** (500 MHz,  $\text{CDCl}_3$ )



$^{13}\text{C}$  NMR of **2'** (125 MHz,  $\text{CDCl}_3$ )



Chemical structure of compound 10 is shown above the spectrum. The structure is a complex molecule with a Boc-protected amine, a methyl ester, and a cyclohexene ring.

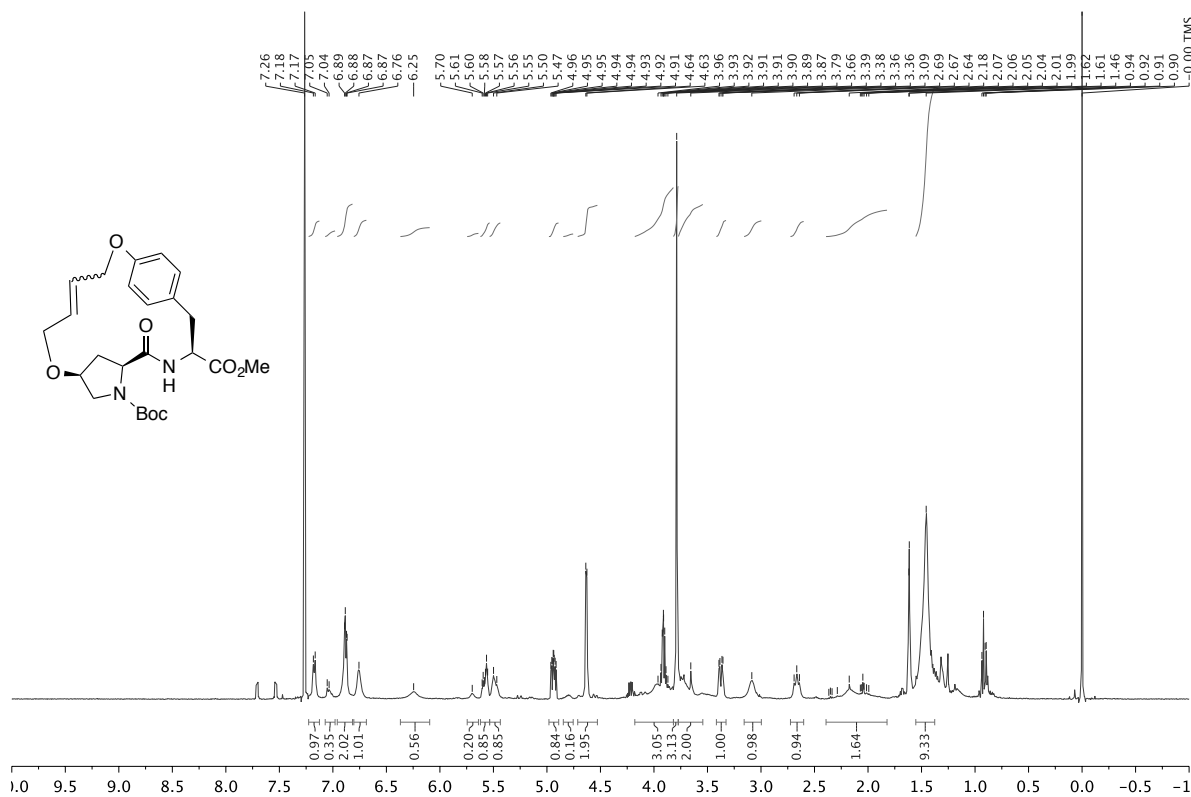
<sup>1</sup>H NMR spectrum (CDCl<sub>3</sub>) of compound 10. The x-axis represents chemical shift in ppm, ranging from 0.00 to 7.27. The spectrum shows several peaks, with integration values provided for some regions:

- Integration values: 0.09, 0.85, 0.80, 0.12, 0.18, 0.74, 0.14, 1.00, 0.89, 0.72, 0.76, 0.60, 0.55, 0.10, 0.23, 0.91, 4.40, 2.46, 3.84.

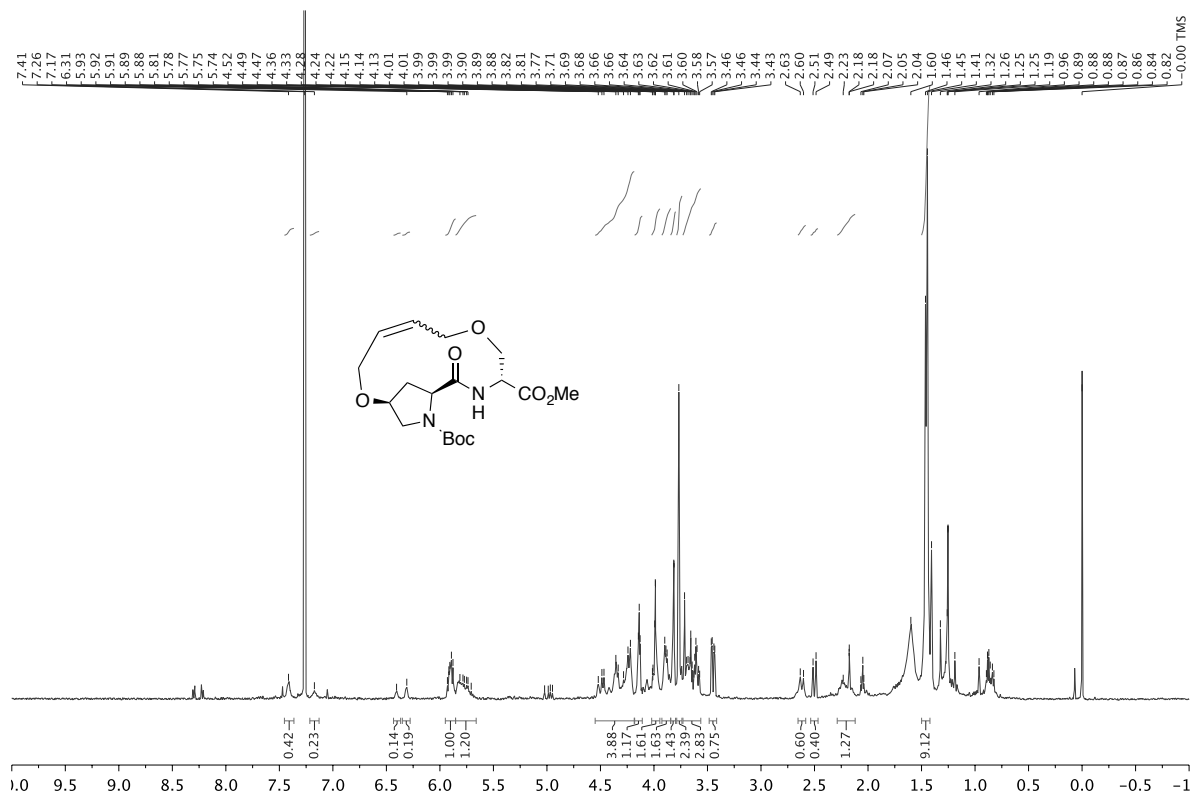
Chemical structure of compound 10b is shown above the spectrum. The structure is a bicyclic compound with a Boc-protected amine, a methyl ester, and a side chain containing an alkene and an acetal.

<sup>13</sup>C NMR spectrum (CDCl<sub>3</sub>) of compound 10b. The spectrum shows peaks at the following chemical shifts (ppm): 172.66, 172.11, 170.81, 170.12, 155.24, 136.42, 135.78, 135.67, 131.90, 125.52, 124.31, 124.06, 80.90, 77.25, 77.05, 77.00, 76.75, 72.72, 72.61, 70.66, 70.38, 70.34, 68.56, 68.11, 65.73, 60.52, 58.55, 52.66, 52.57, 52.40, 52.29, 36.44, 35.85, 32.28, 31.71, 28.60, 28.32, 28.10, 28.03, 27.88, 22.65.

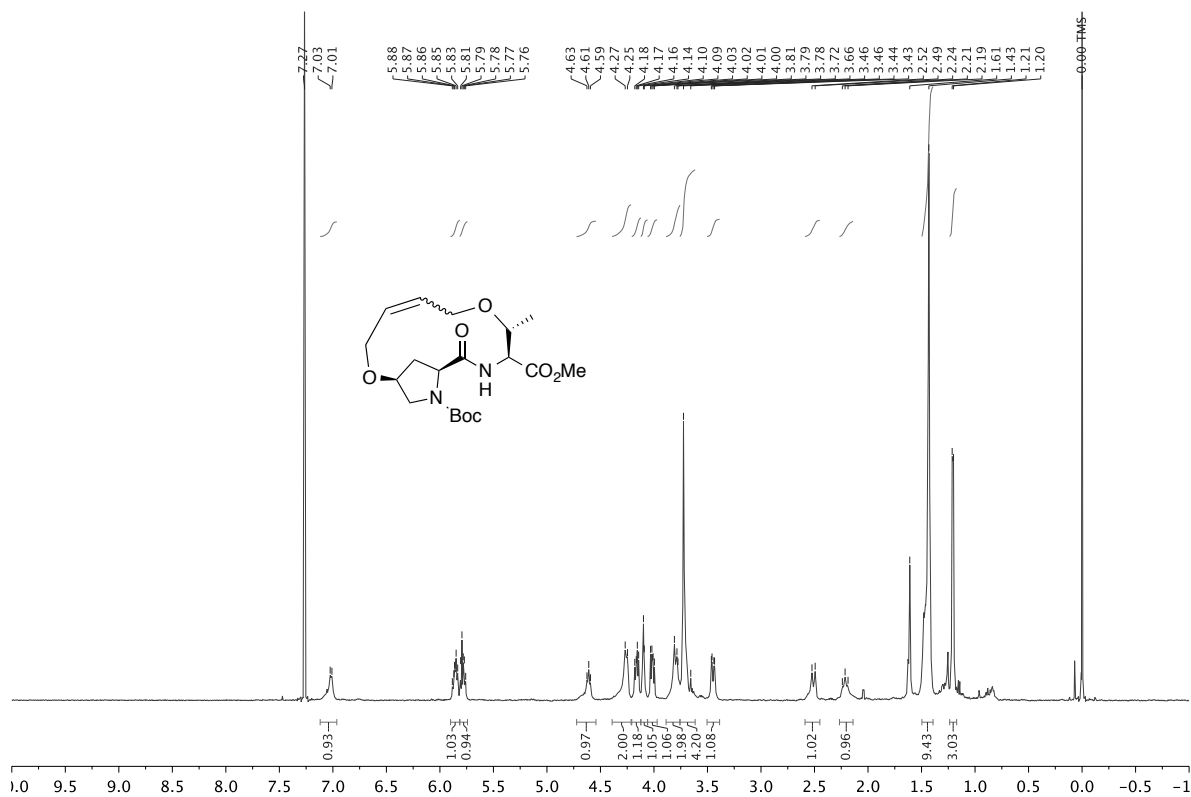
$^1\text{H}$  NMR of **4'** (500 MHz,  $\text{CDCl}_3$ )



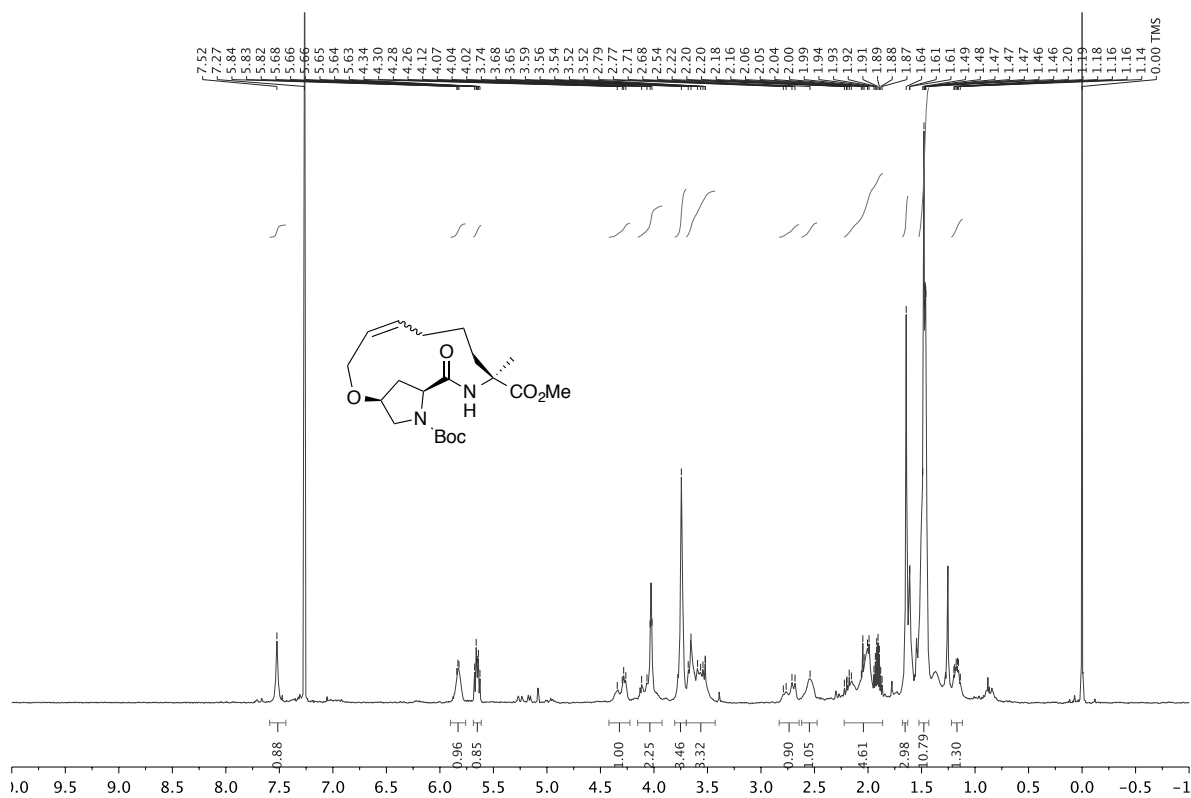
$^1\text{H}$  NMR of **5'** (500 MHz,  $\text{CDCl}_3$ )



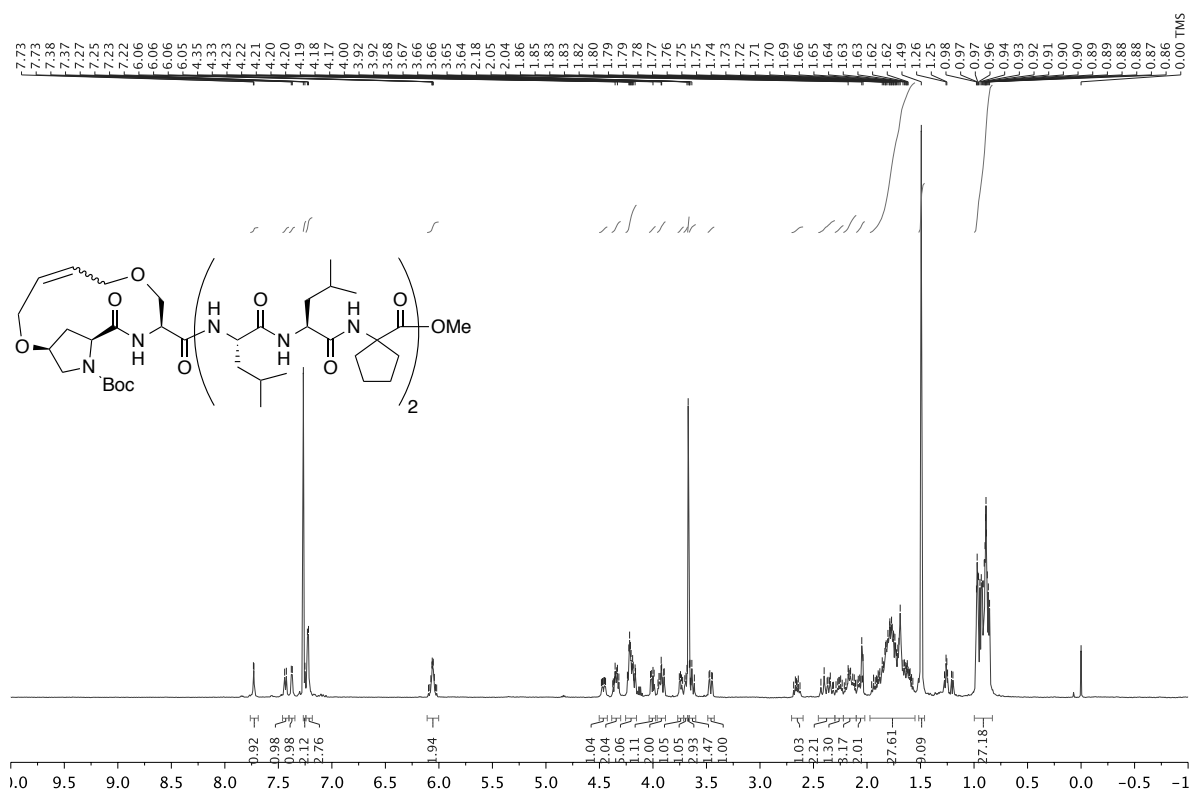
$^1\text{H}$  NMR of **6'** (500 MHz,  $\text{CDCl}_3$ )



$^1\text{H}$  NMR of **7'** (500 MHz,  $\text{CDCl}_3$ )



<sup>1</sup>H NMR of **9** (500 MHz, CDCl<sub>3</sub>)



<sup>1</sup>H NMR of **10** (500 MHz, CDCl<sub>3</sub>)

