

# Supporting Information

for

## A Convergent Synthesis of 6-O-Branched $\beta$ -Glucan Oligosaccharides

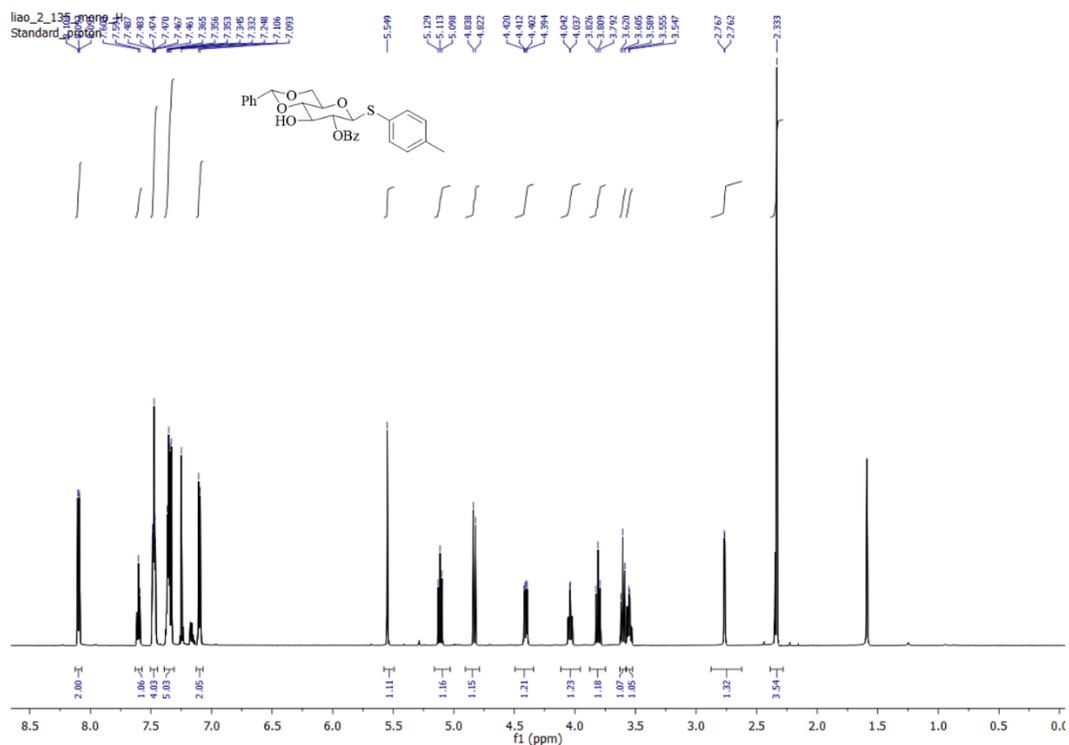
Guochao Liao, Srinivas Burgula, Zhifang Zhou, and Zhongwu Guo\*

Department of Chemistry, Wayne State University, 5101 Cass Avenue, Detroit, MI, 48202, USA

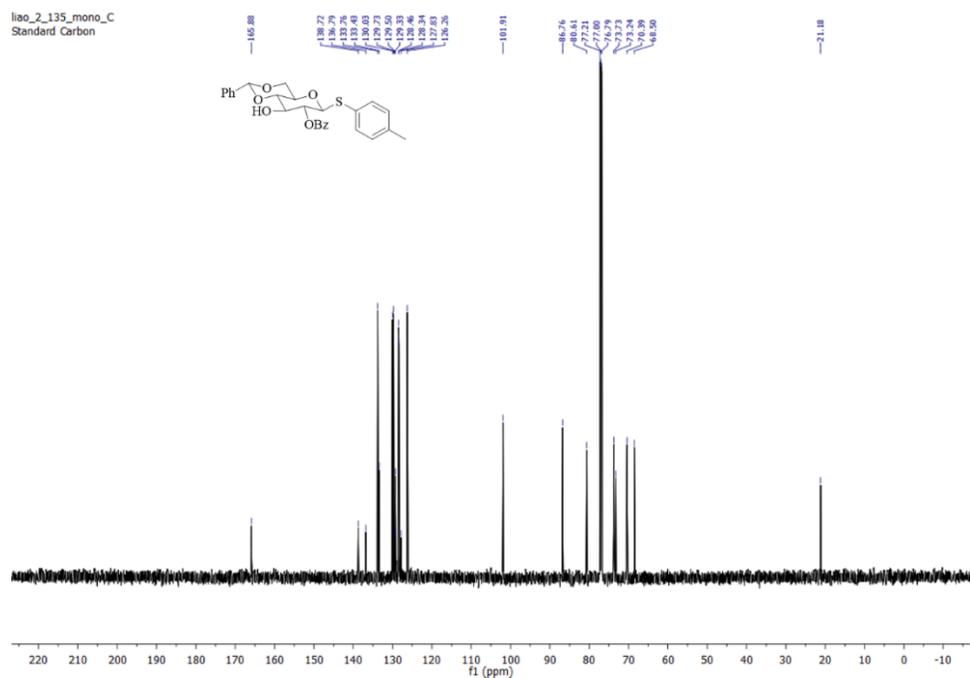
\*Corresponding author: E-mail: [zwguo@chem.wayne.edu](mailto:zwguo@chem.wayne.edu)

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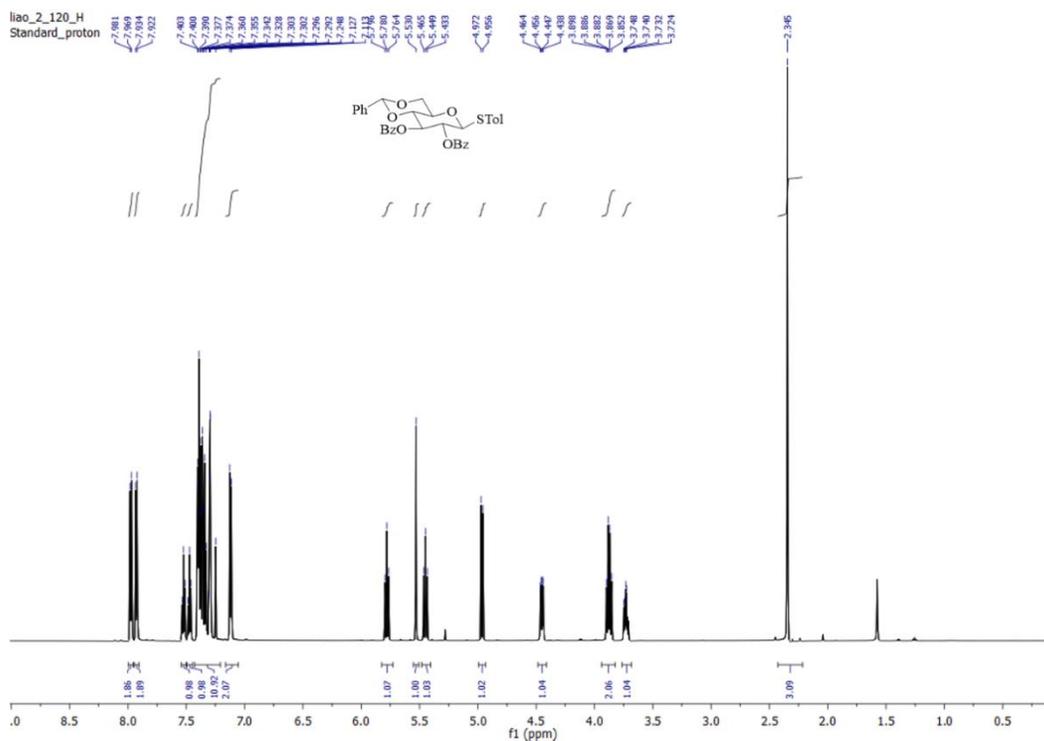
NMR Spectra of Synthesized Compounds ..... S1



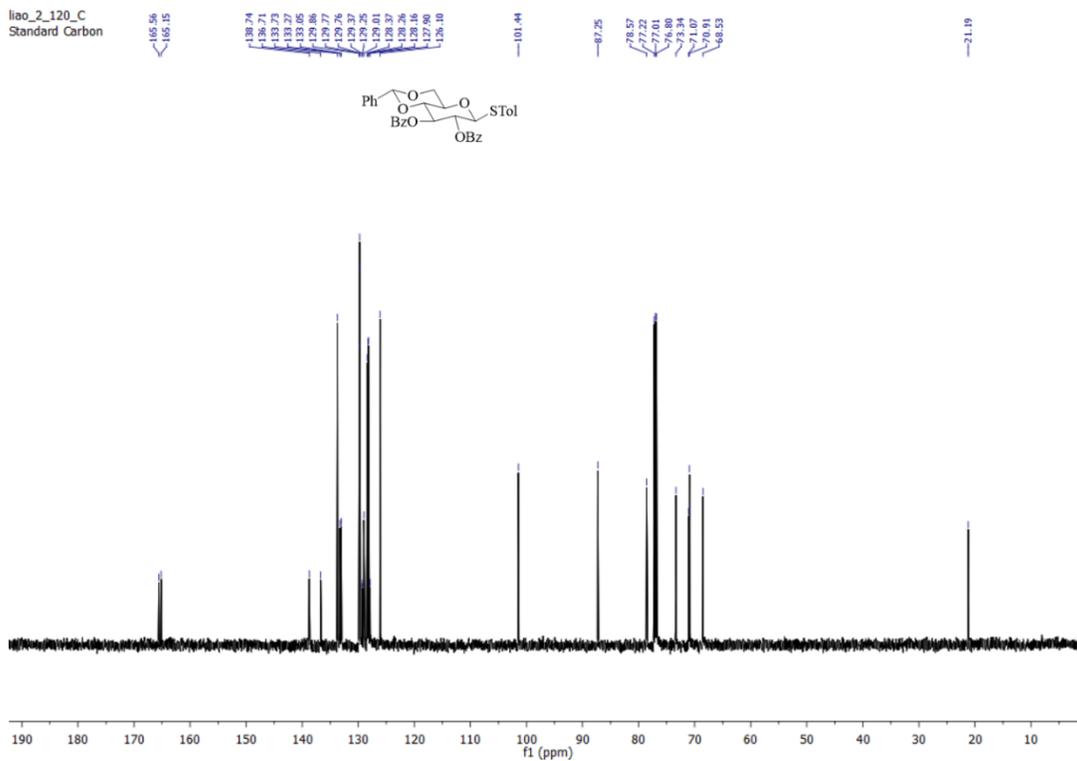
$^1\text{H}$  NMR Spectrum of compound **10** ( $\text{CDCl}_3$ , 600 MHz)



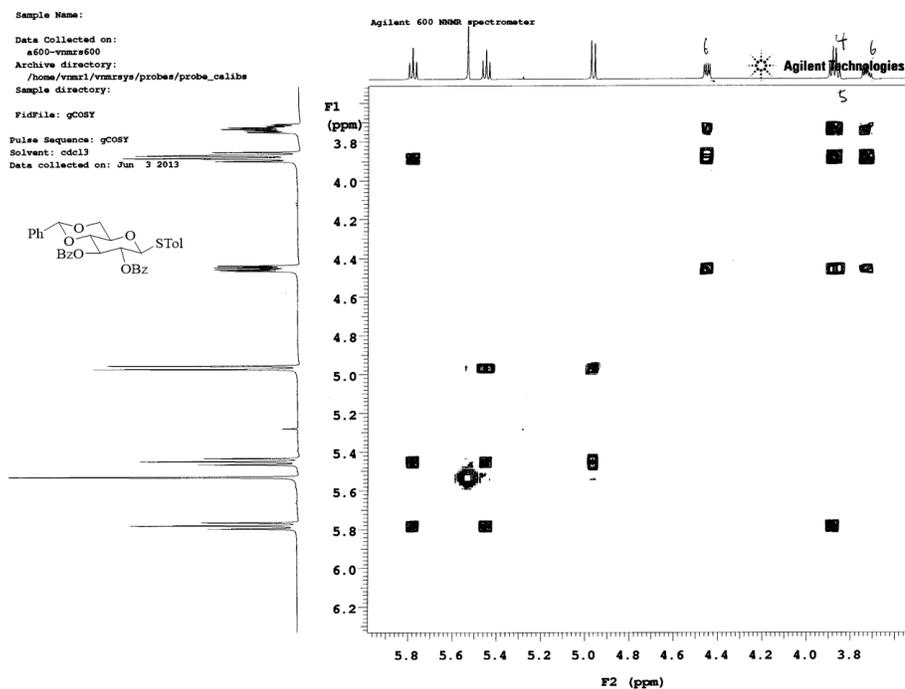
$^{13}\text{C}$  NMR Spectrum of compound **10** ( $\text{CDCl}_3$ , 600 MHz)



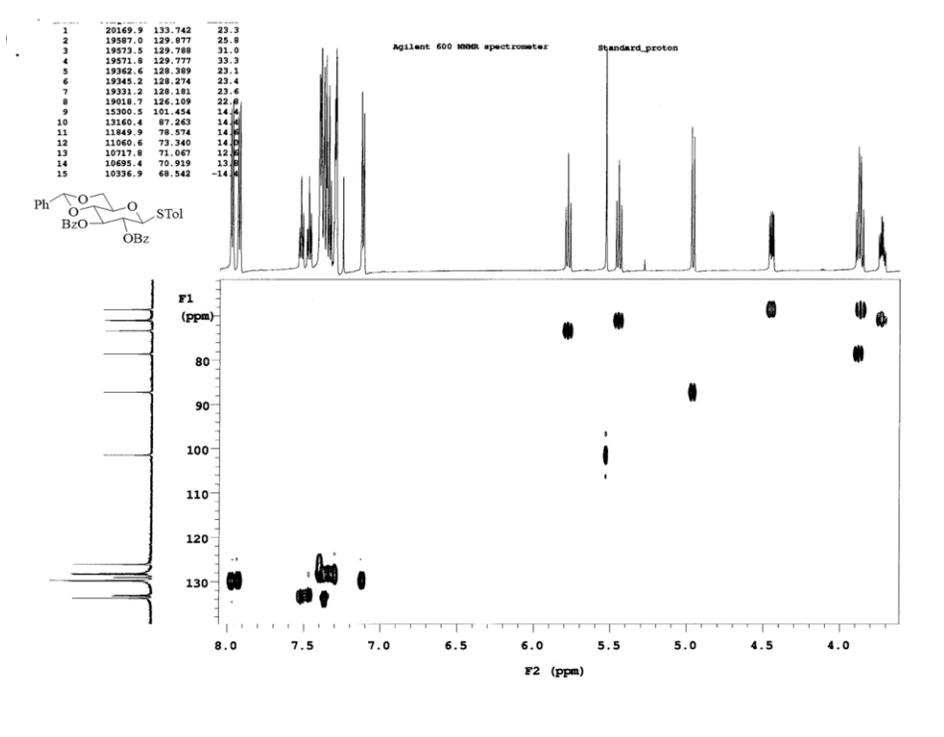
$^1\text{H}$  NMR Spectrum of compound **8** ( $\text{CDCl}_3$ , 600 MHz)



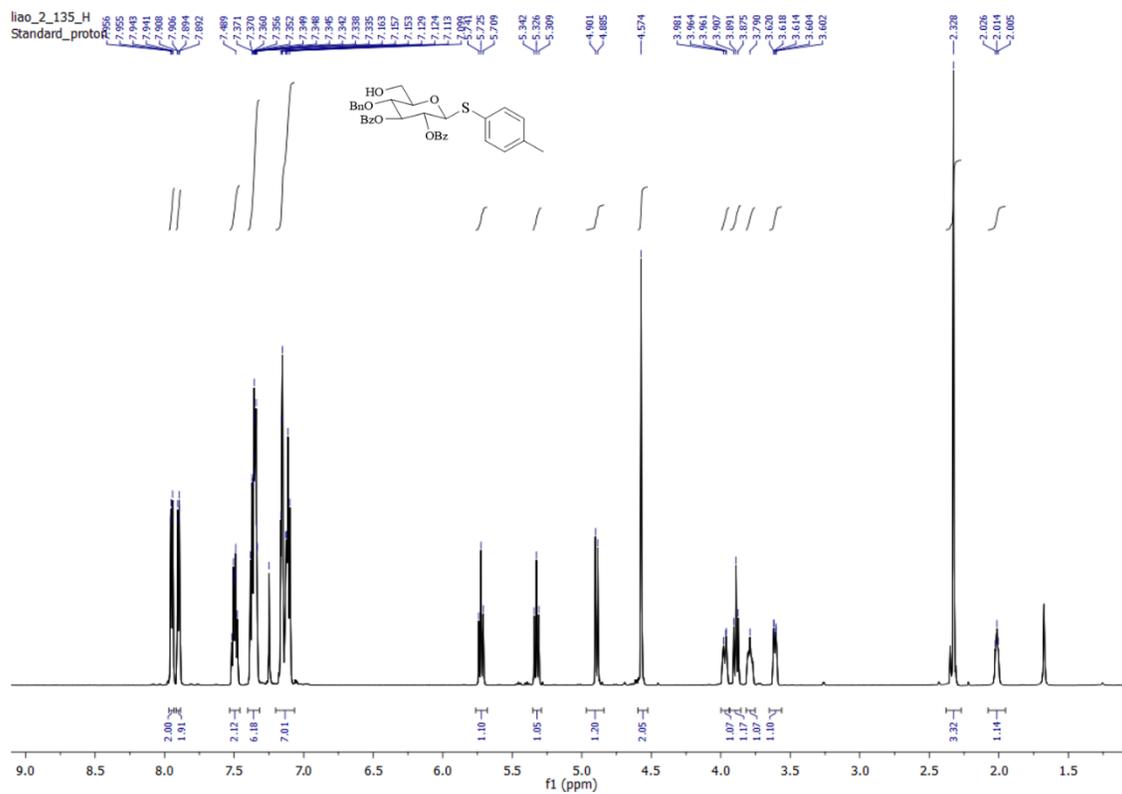
$^{13}\text{C}$  NMR Spectrum of compound **8** ( $\text{CDCl}_3$ , 600 MHz)



$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **8** ( $\text{CDCl}_3$ , 600 MHz)

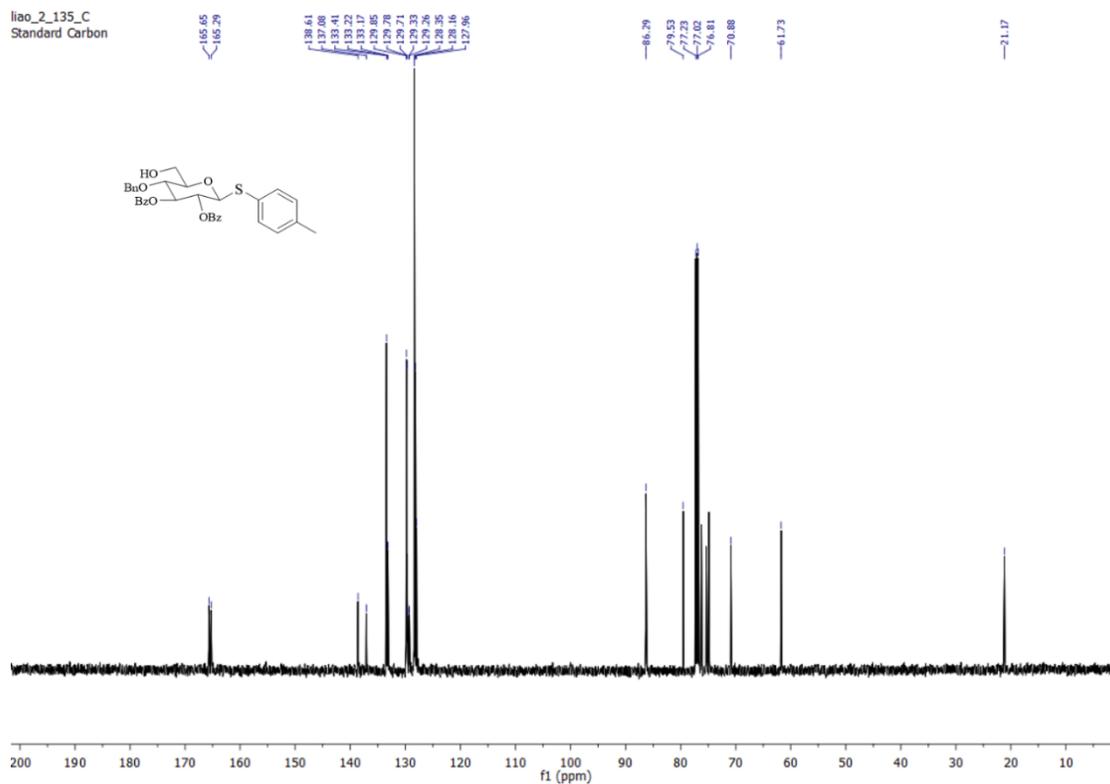


$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **8** ( $\text{CDCl}_3$ , 600 MHz)

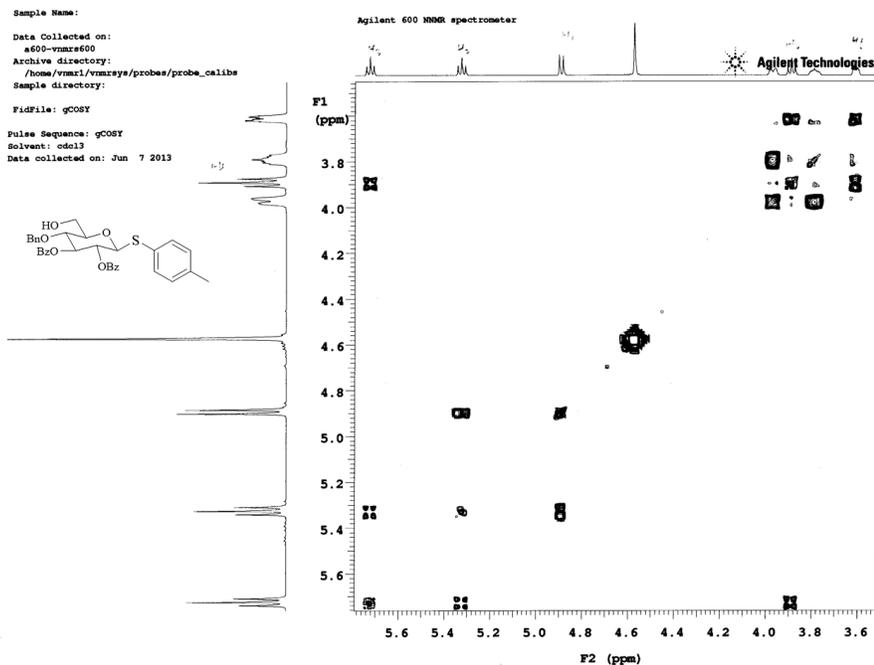


$^1\text{H}$  NMR Spectrum of compound **9** ( $\text{CDCl}_3$ , 600 MHz)

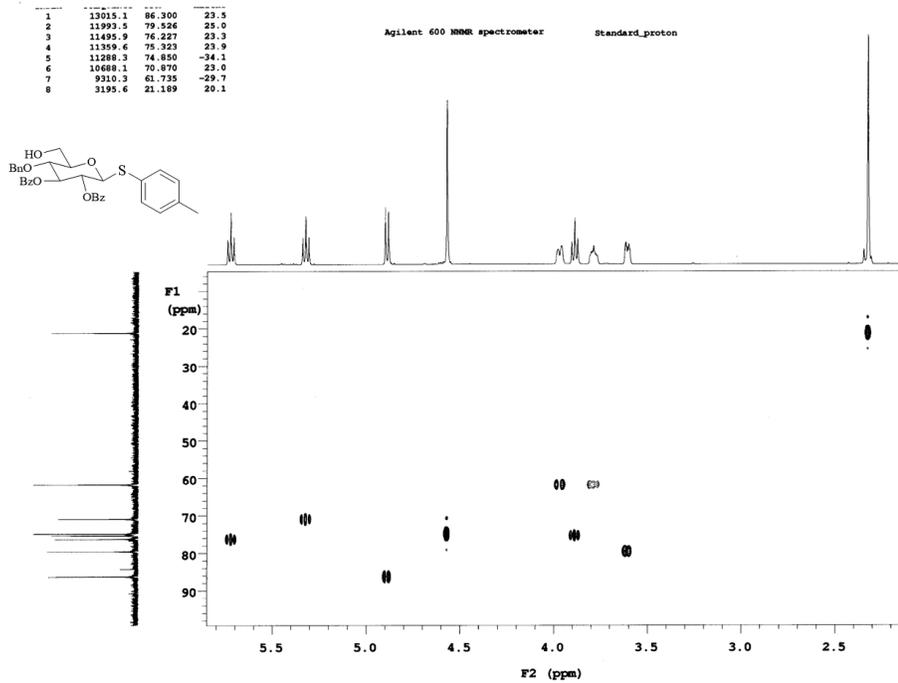
liao\_2\_135\_C  
Standard Carbon



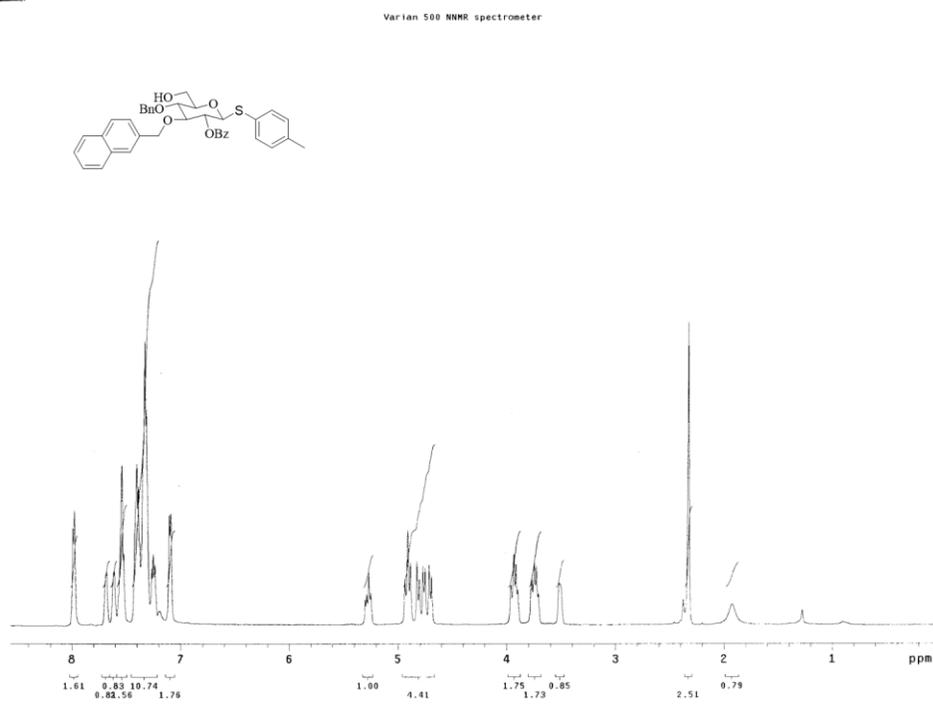
$^{13}\text{C}$  NMR Spectrum of compound **9** ( $\text{CDCl}_3$ , 600 MHz)



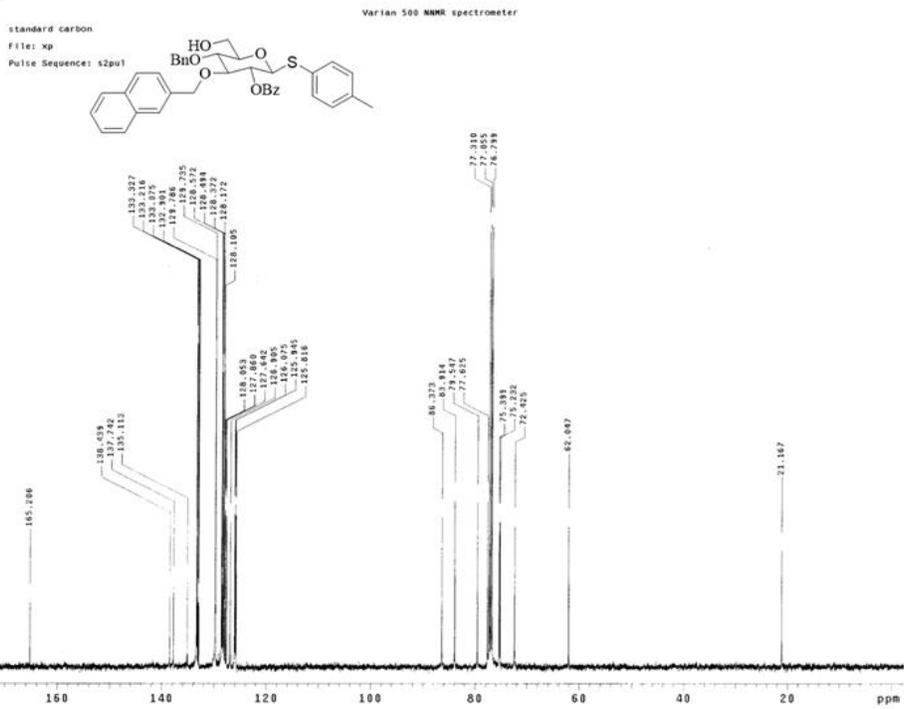
$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **9** ( $\text{CDCl}_3$ , 600 MHz)



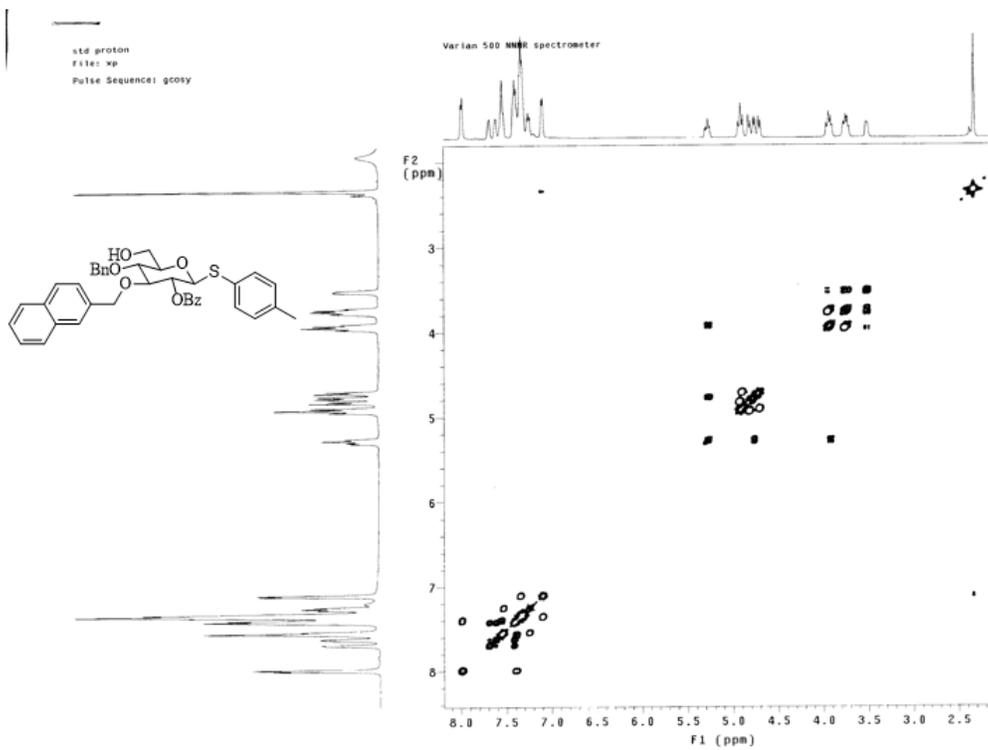
$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **9** ( $\text{CDCl}_3$ , 600 MHz)



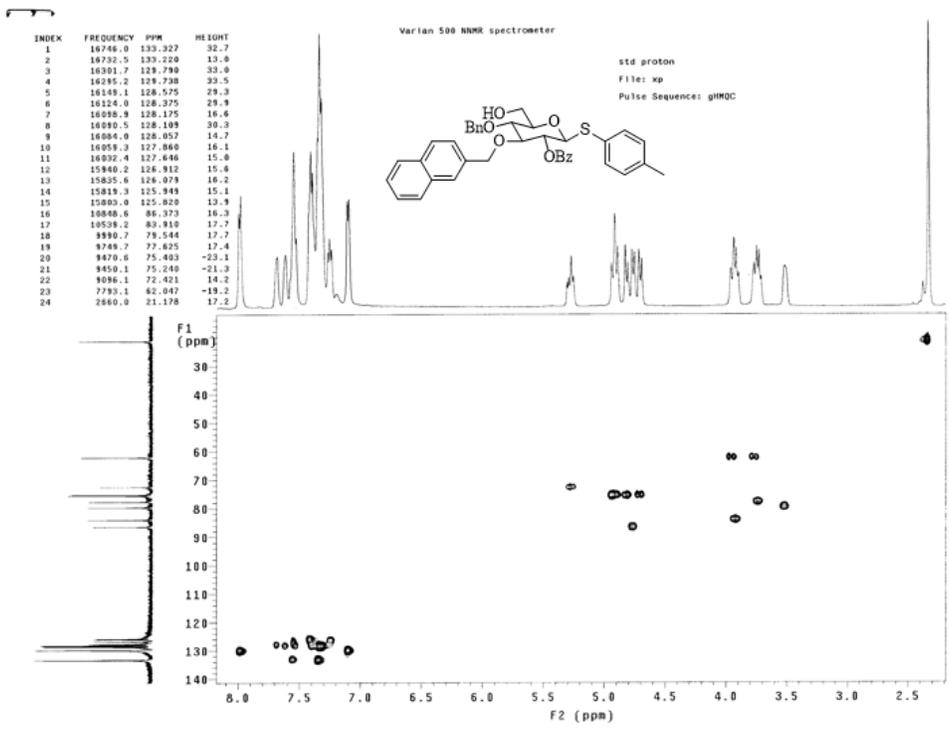
$^1\text{H}$  NMR Spectrum of compound **14** ( $\text{CDCl}_3$ , 500 MHz)



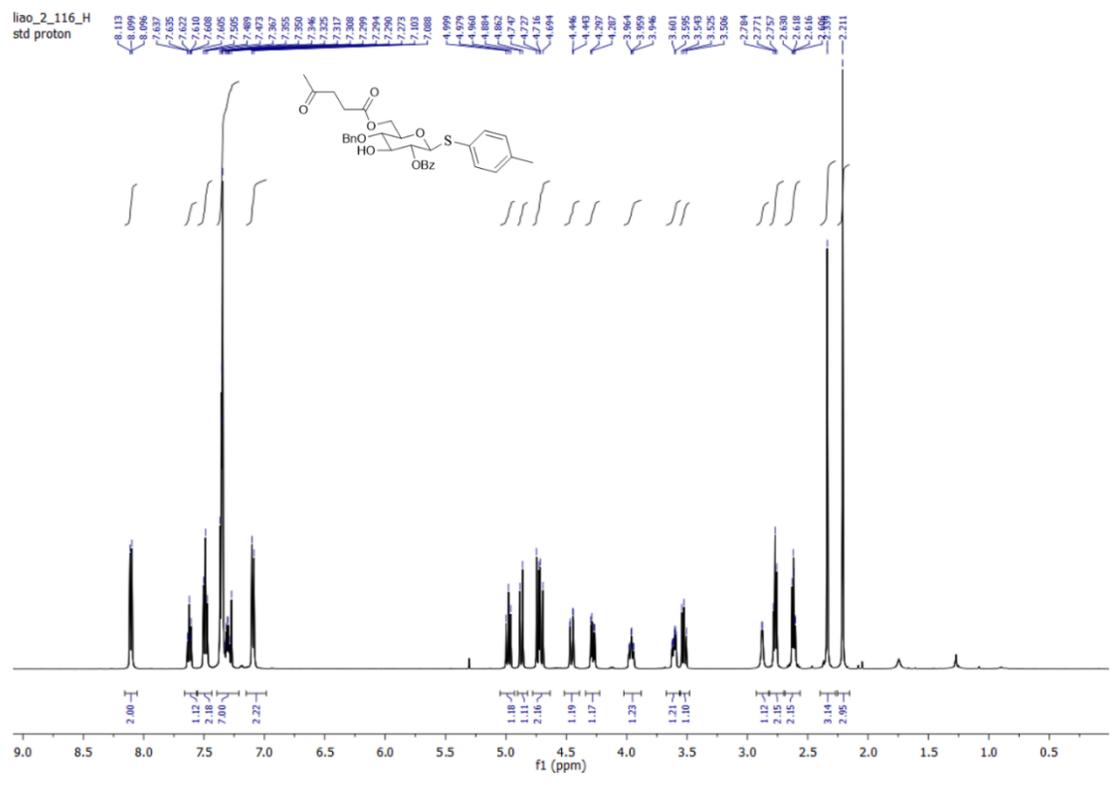
$^{13}\text{C}$  NMR Spectrum of compound **14** ( $\text{CDCl}_3$ , 500 MHz)



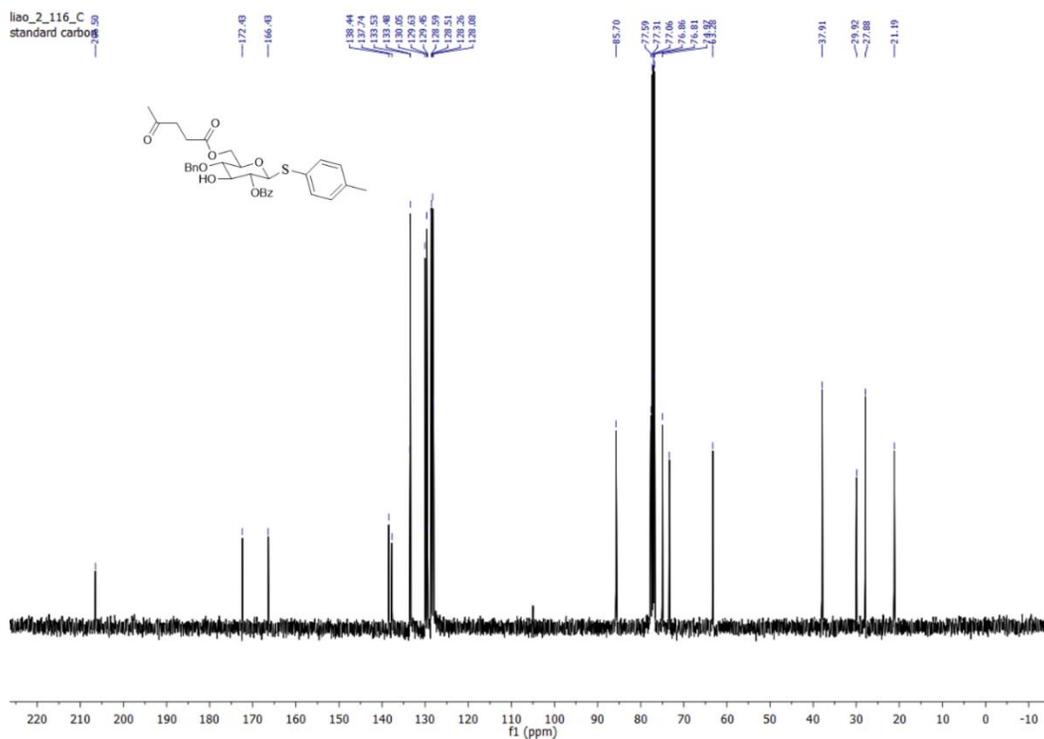
$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **14** ( $\text{CDCl}_3$ , 500 MHz)



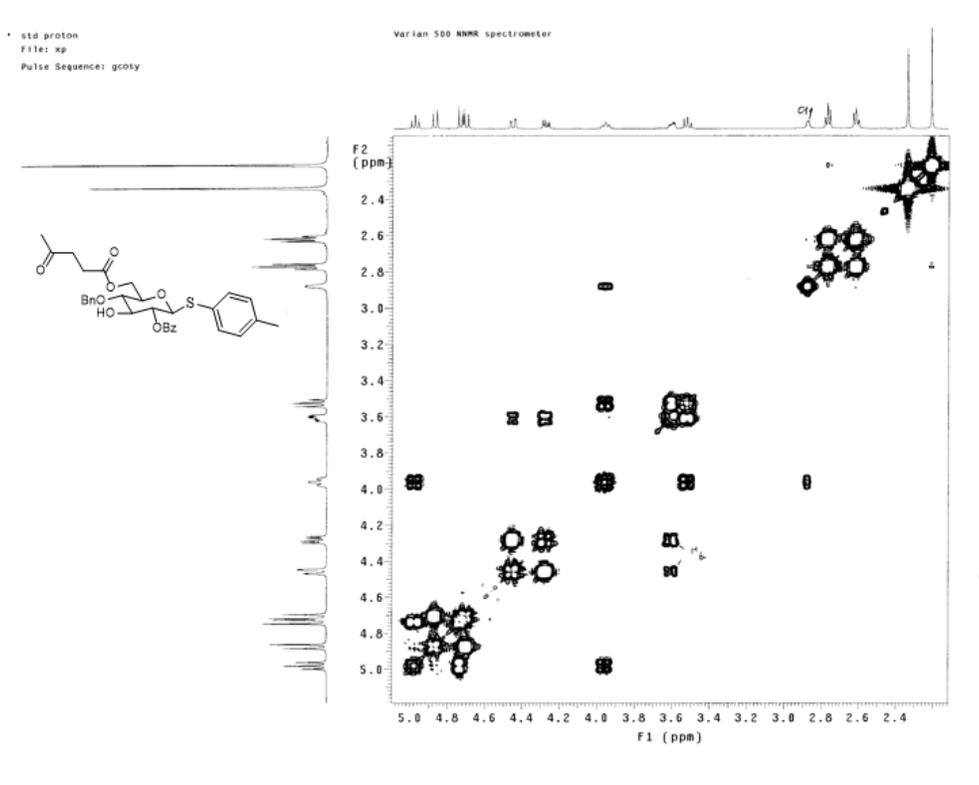
$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **14** ( $\text{CDCl}_3$ , 500 MHz)



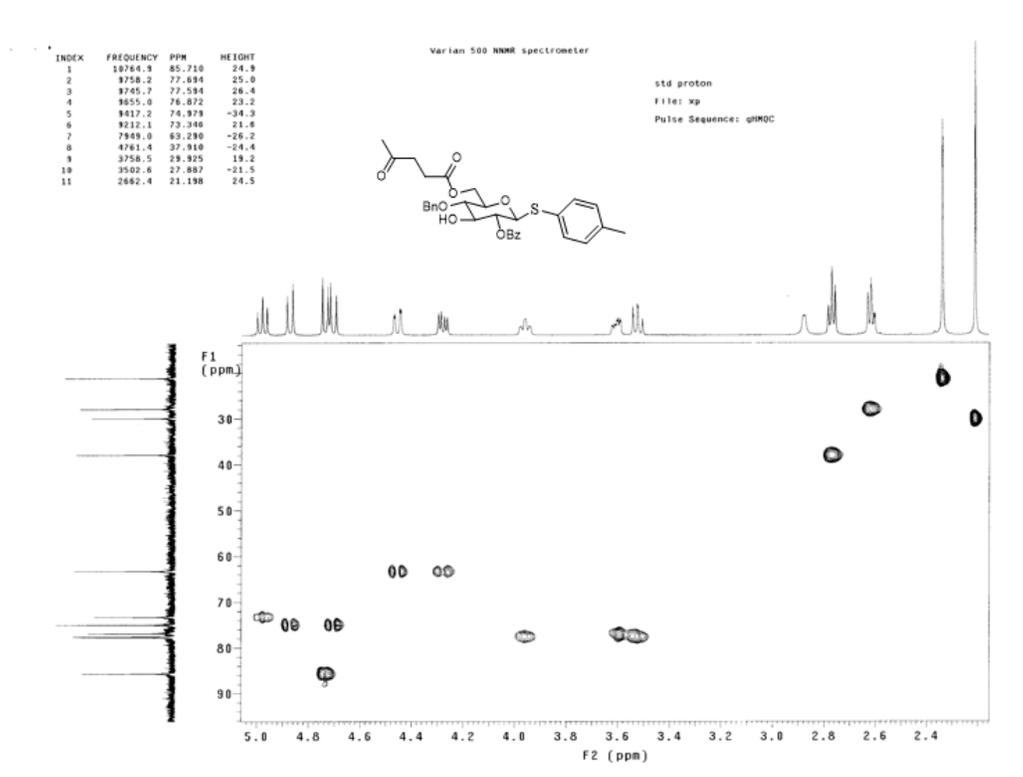
$^1\text{H}$  NMR Spectrum of compound **11** ( $\text{CDCl}_3$ , 500 MHz)



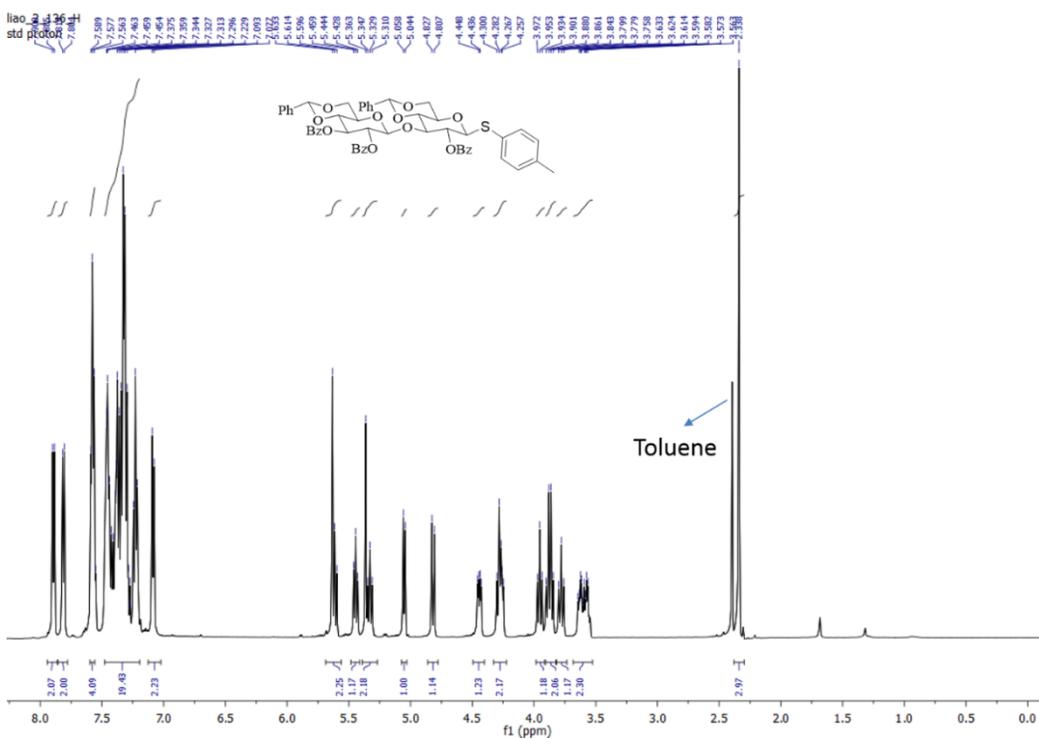
$^{13}\text{C}$  NMR Spectrum of compound **11** ( $\text{CDCl}_3$ , 500 MHz)



$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **11** ( $\text{CDCl}_3$ , 500 MHz)



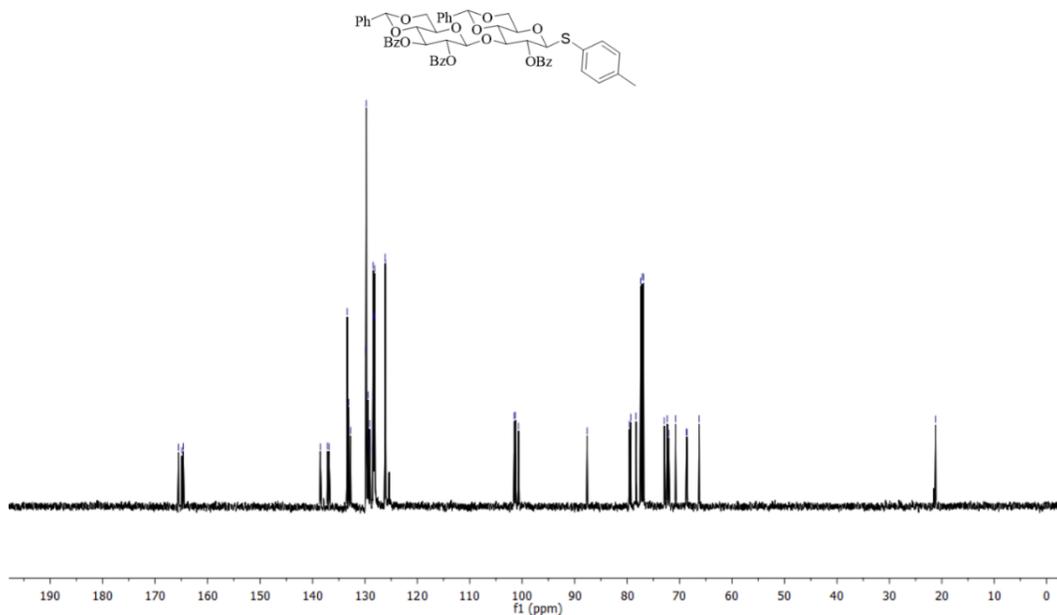
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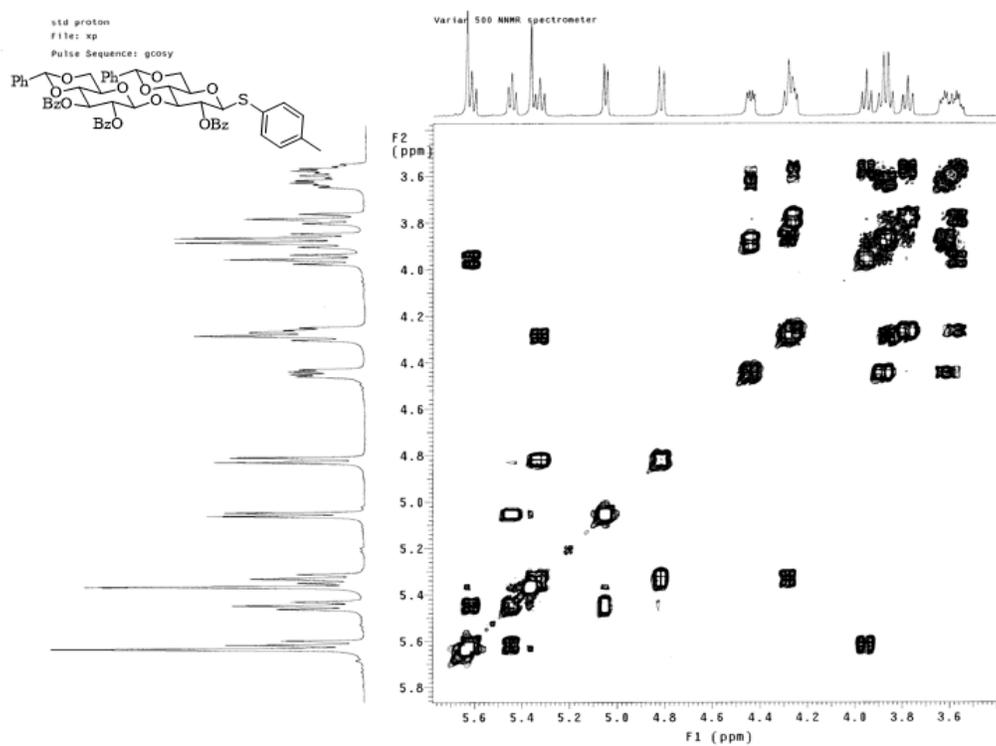
$^1\text{H}$  NMR Spectrum of compound **5** ( $\text{CDCl}_3$ , 500 MHz)

lao\_2\_136\_C  
standard carbon

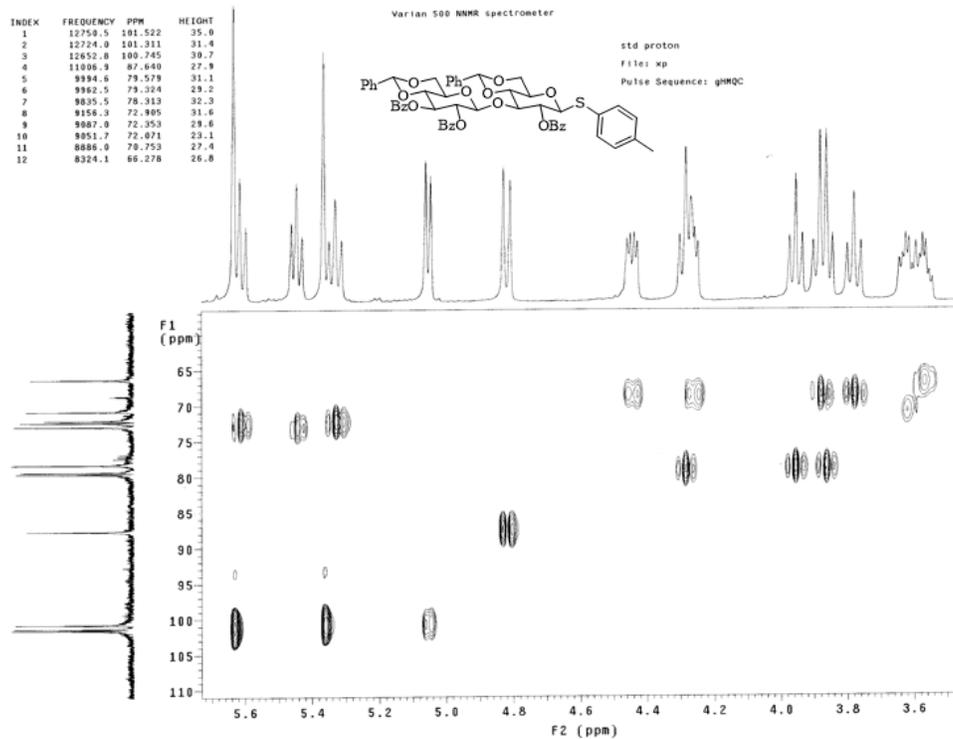
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164.90  
164.64  
138.50  
137.12  
136.84  
133.37  
132.75  
132.75  
129.83  
129.72  
129.41  
129.32  
129.08  
128.99  
128.51  
128.37  
128.27  
128.25  
128.15  
128.11  
128.11  
101.52  
101.36  
100.72  
87.65  
79.96  
79.32  
78.30  
77.39  
77.39  
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72.90  
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70.87  
68.68  
68.60  
46.27  
-21.19



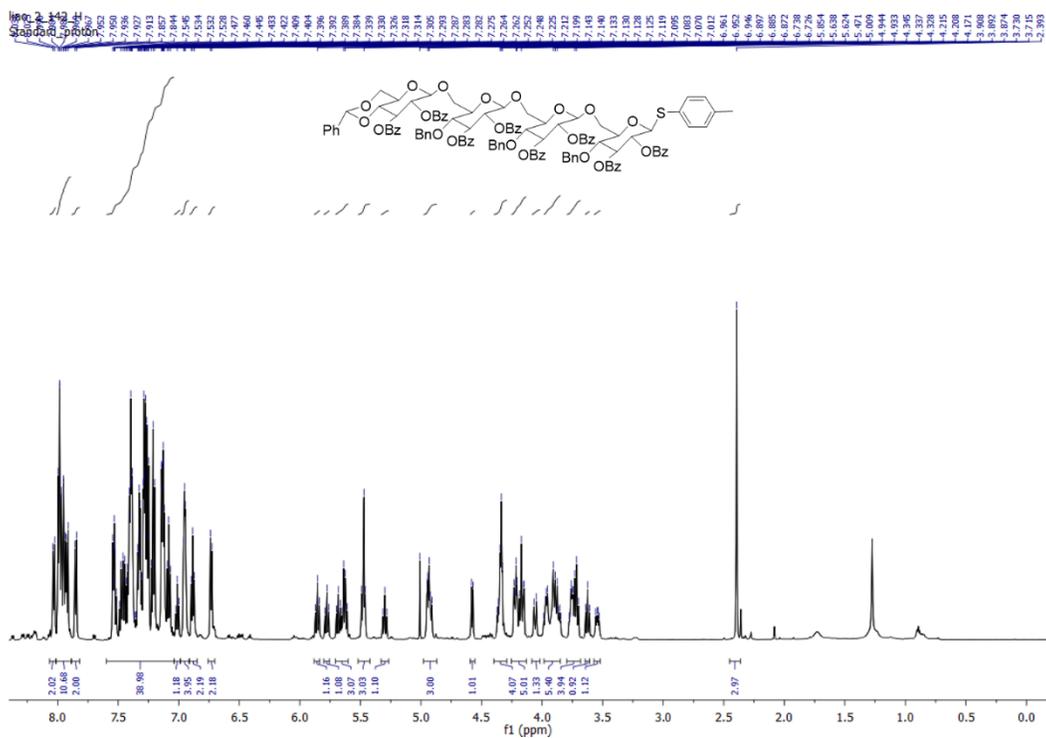
<sup>13</sup>C NMR Spectrum of compound 5 (CDCl<sub>3</sub>, 500 MHz)



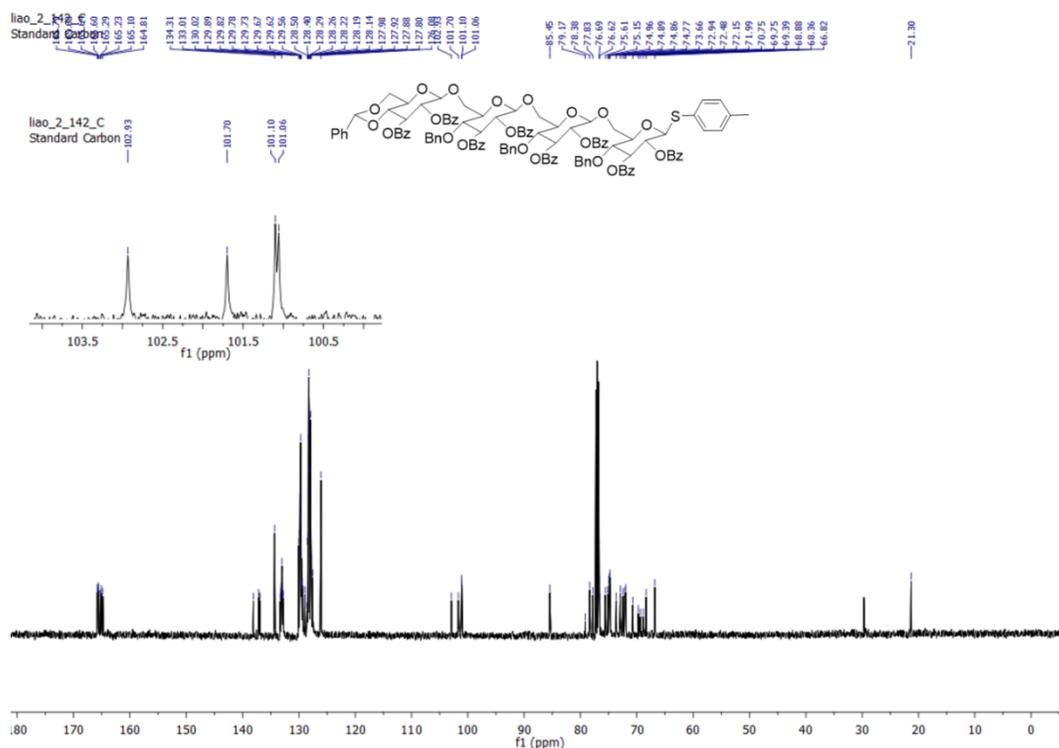
<sup>1</sup>H-<sup>1</sup>H COSY Spectrum of compound 5 (CDCl<sub>3</sub>, 500 MHz)



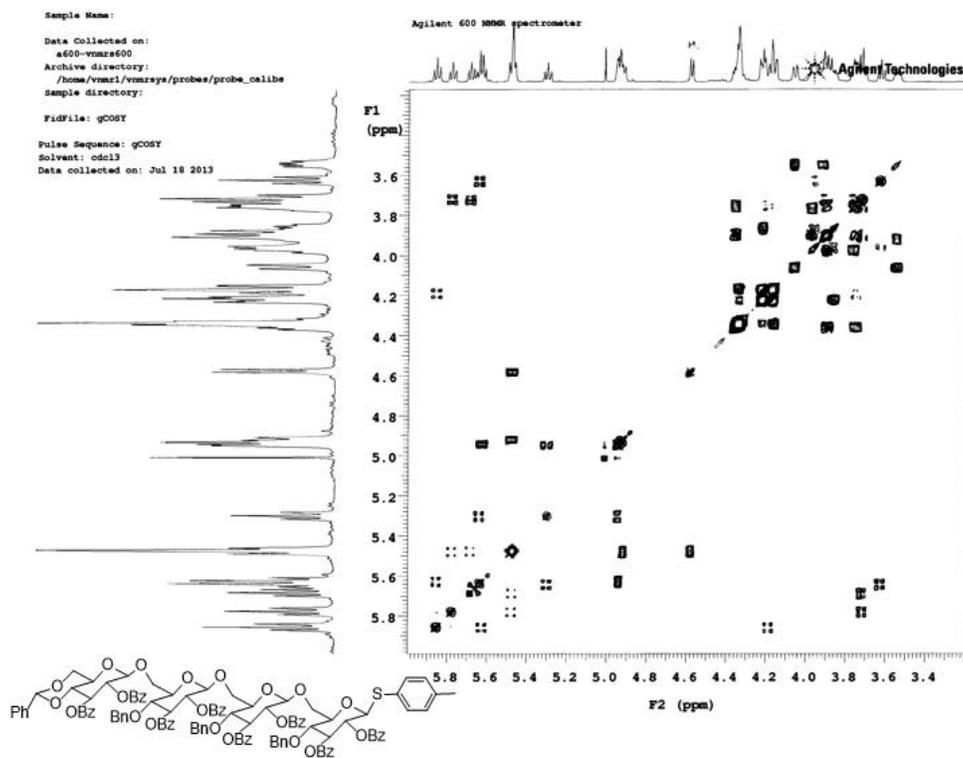
$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **5** ( $\text{CDCl}_3$ , 500 MHz)



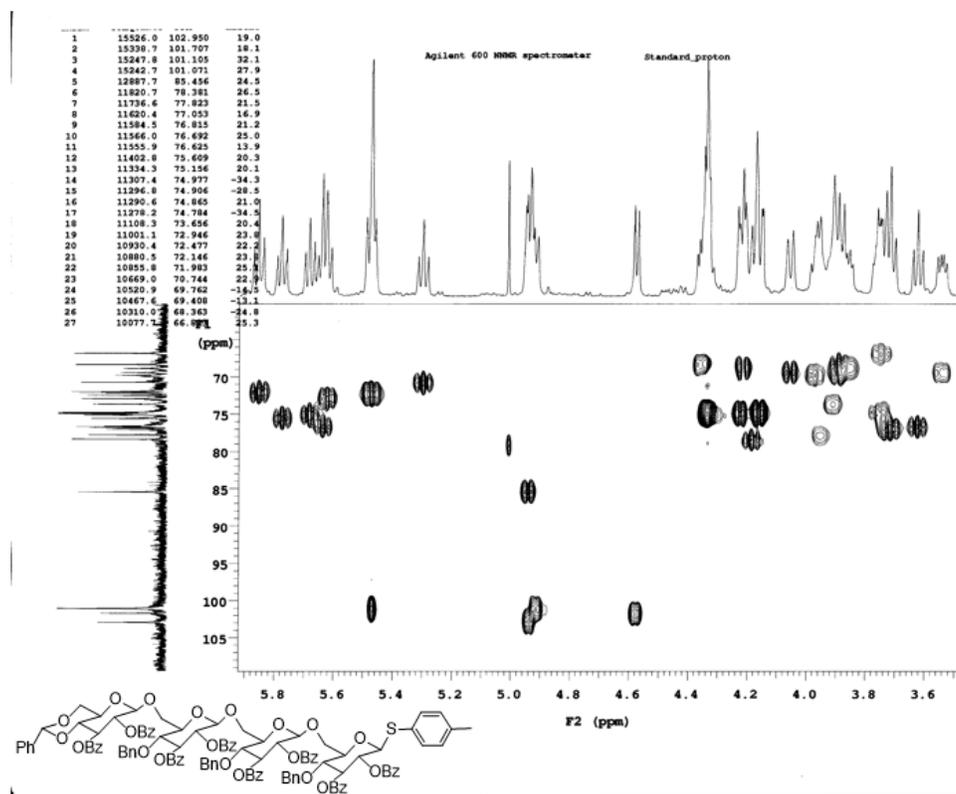
$^1\text{H}$  NMR Spectrum of compound **4** ( $\text{CDCl}_3$ , 600 MHz)



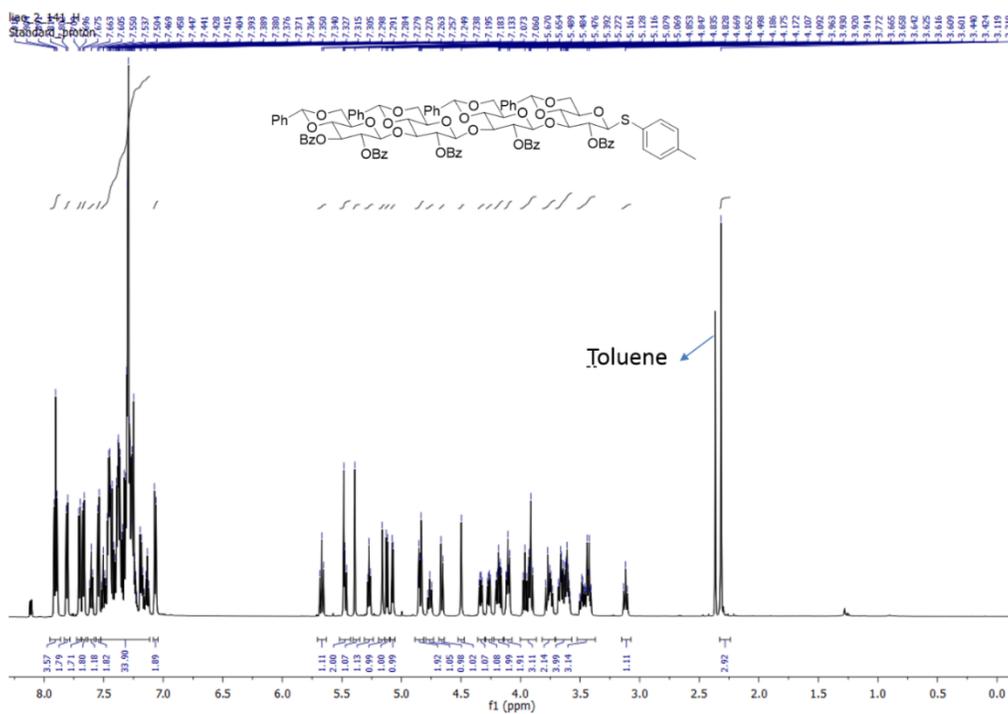
<sup>13</sup>C NMR Spectrum of compound **4** (CDCl<sub>3</sub>, 600 MHz)



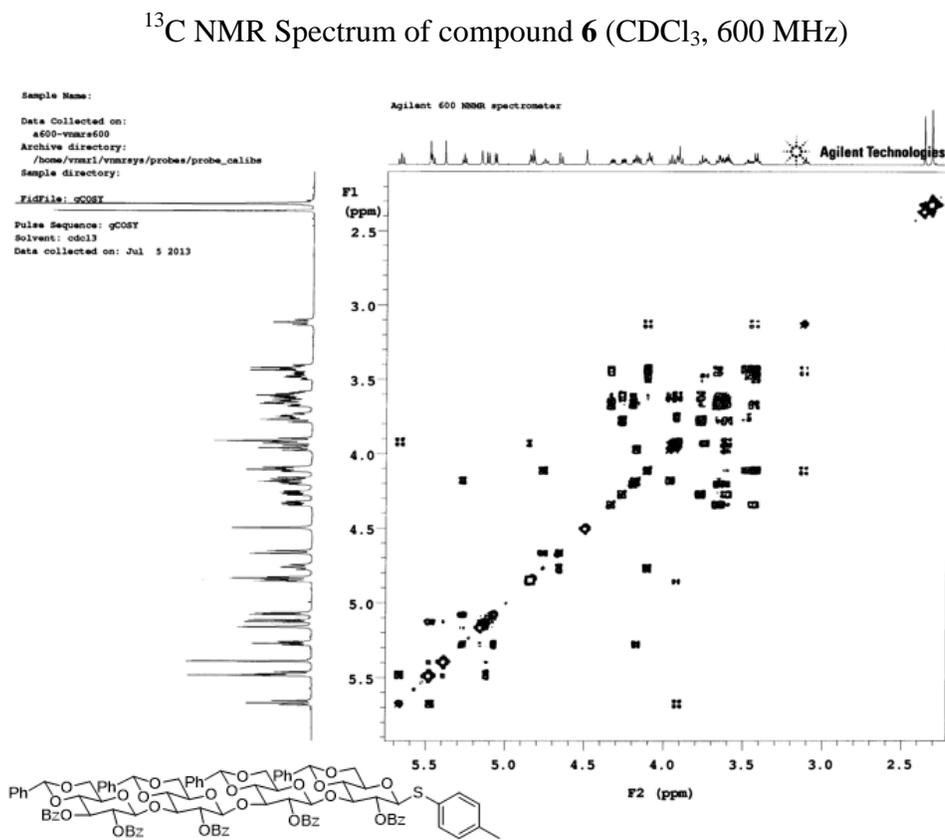
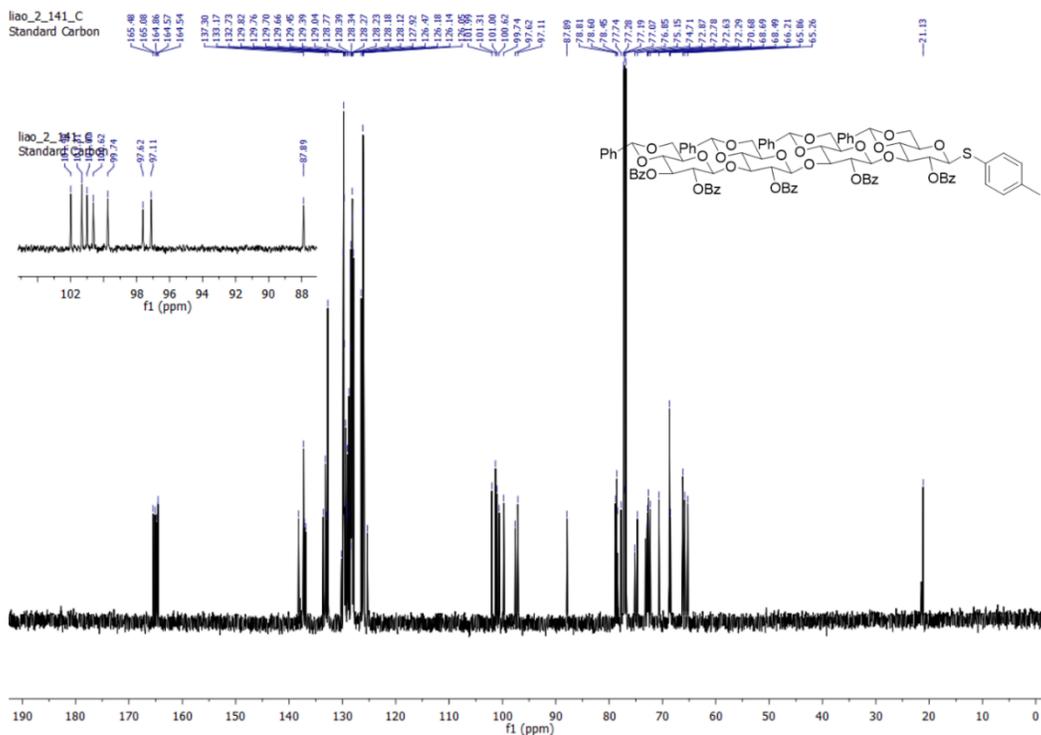
<sup>1</sup>H-<sup>1</sup>H COSY Spectrum of compound **4** (CDCl<sub>3</sub>, 600 MHz)

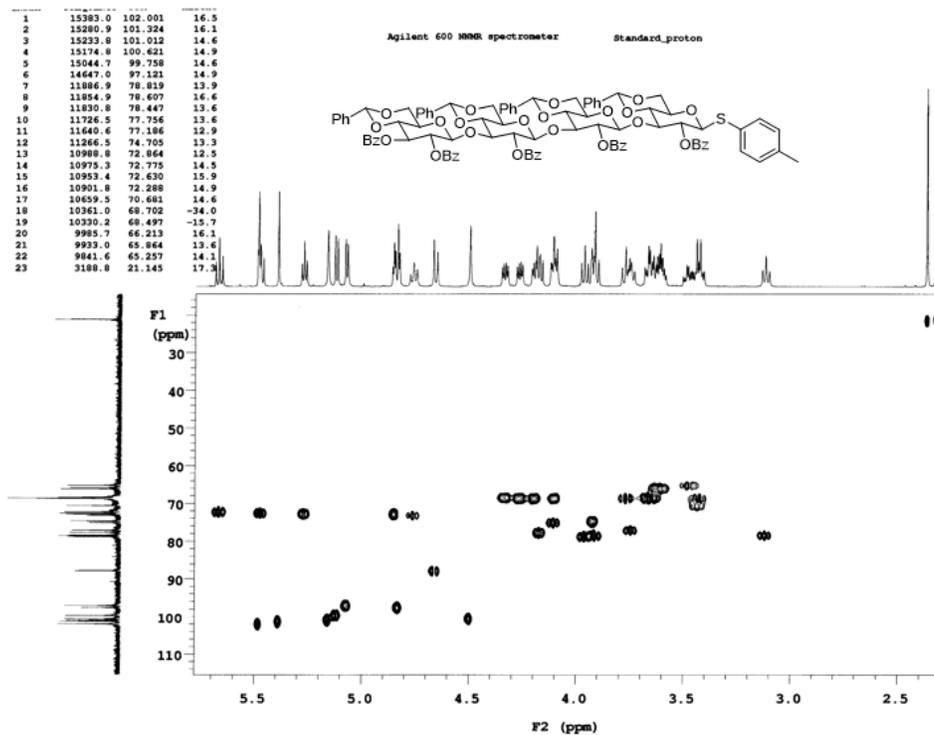


$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **4** ( $\text{CDCl}_3$ , 600 MHz)

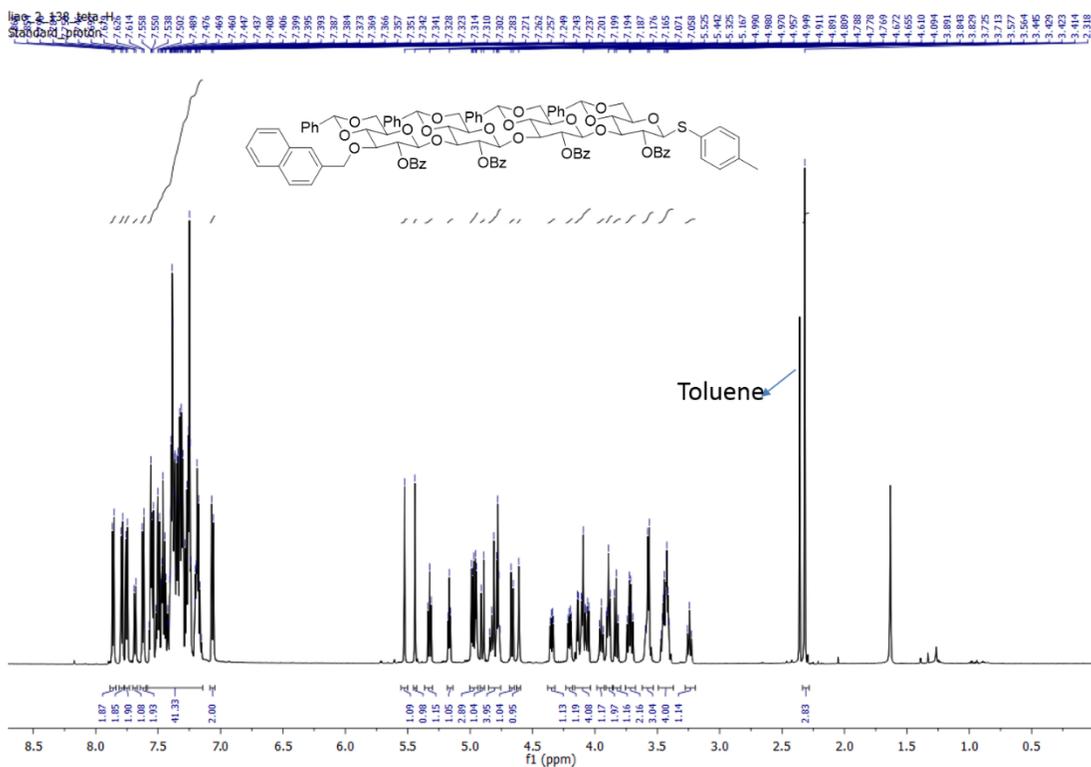


$^1\text{H}$  NMR Spectrum of compound **6** ( $\text{CDCl}_3$ , 600 MHz)

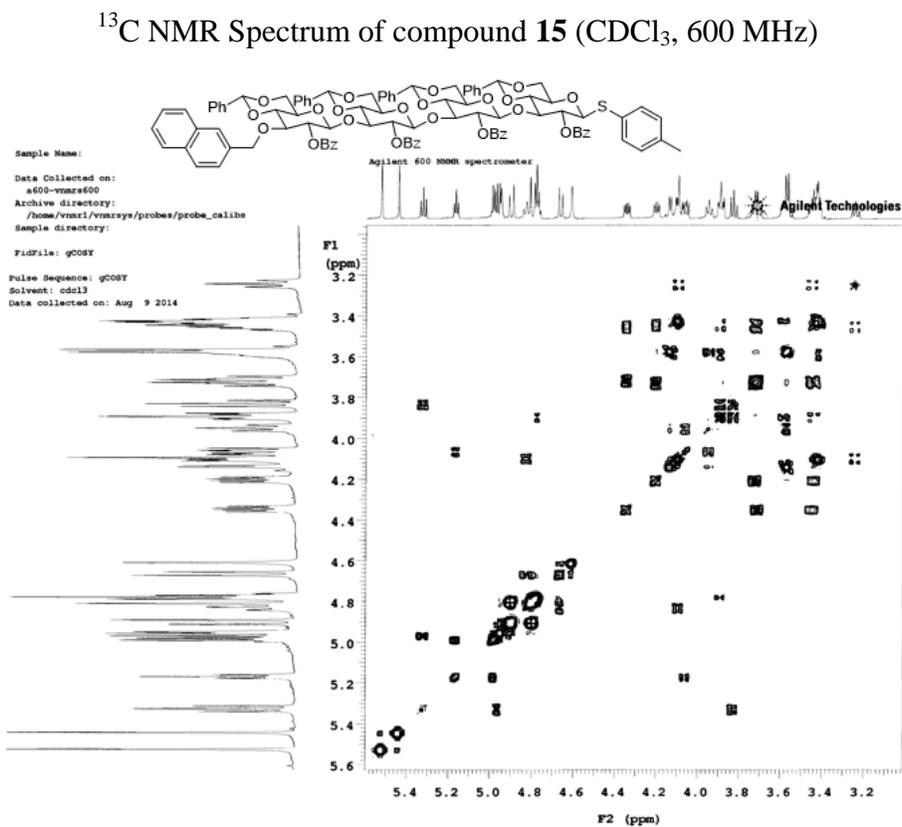
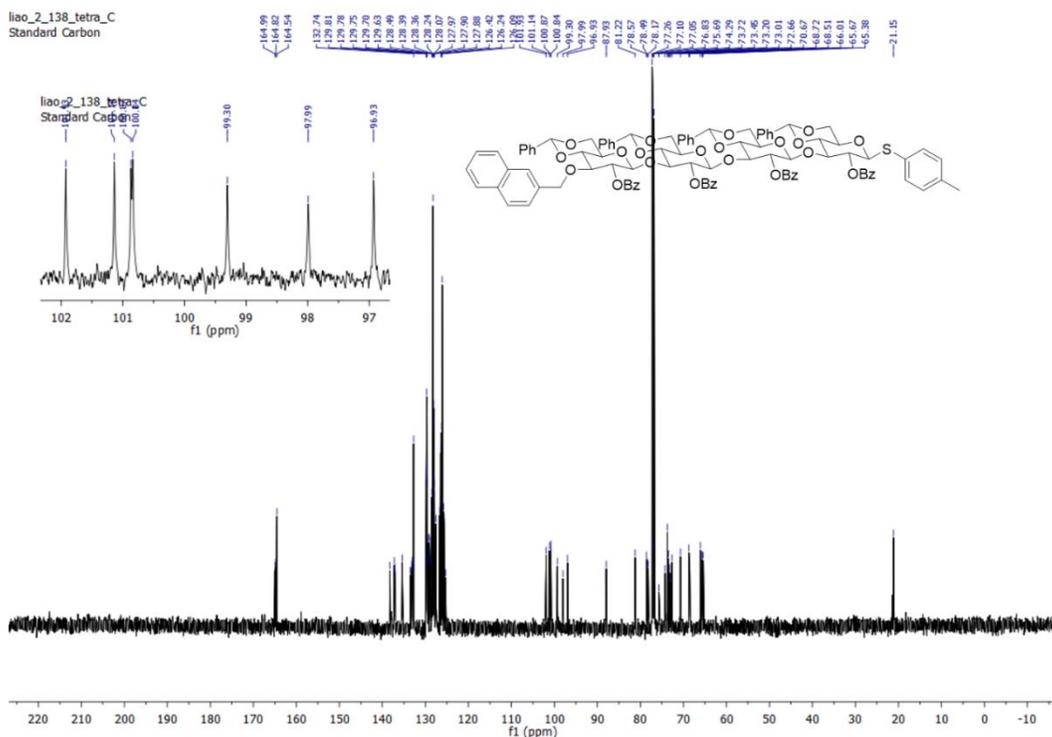


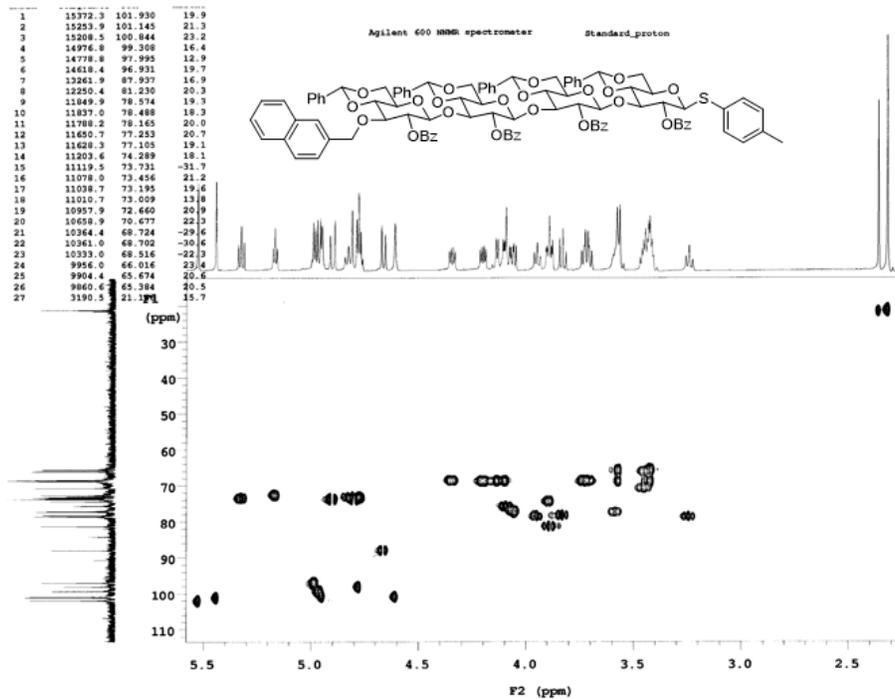


$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **6** ( $\text{CDCl}_3$ , 600 MHz)

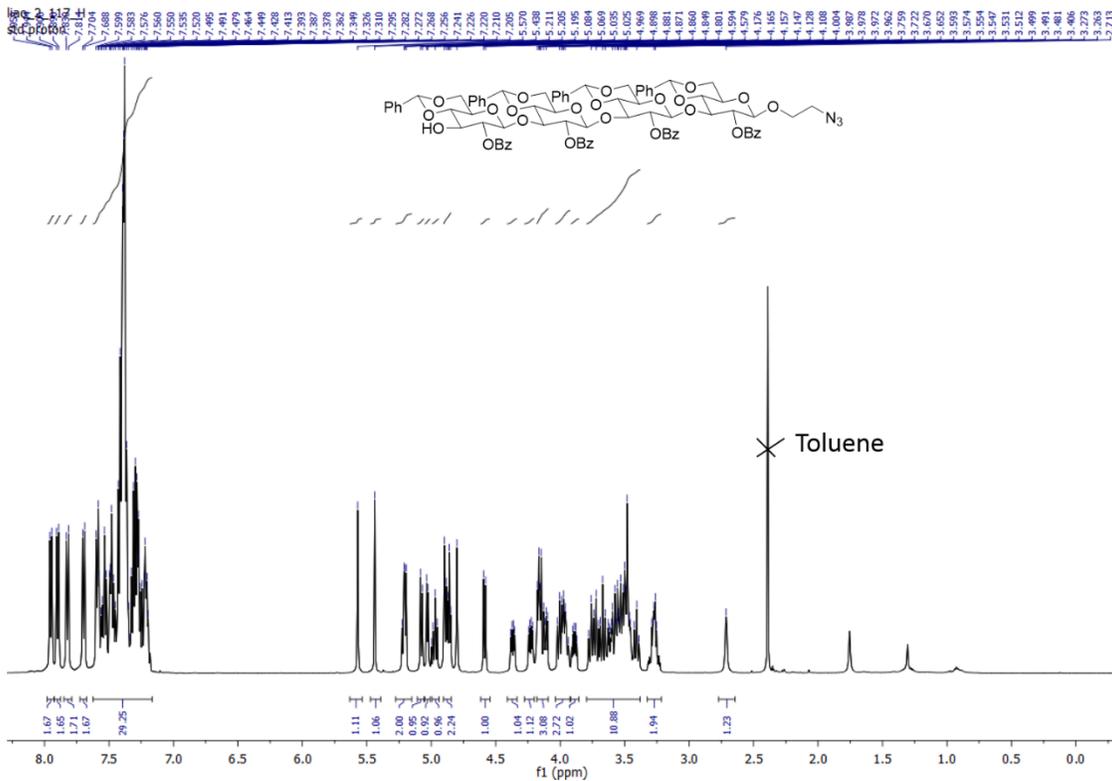


$^1\text{H}$  NMR Spectrum of compound **15** ( $\text{CDCl}_3$ , 600 MHz)

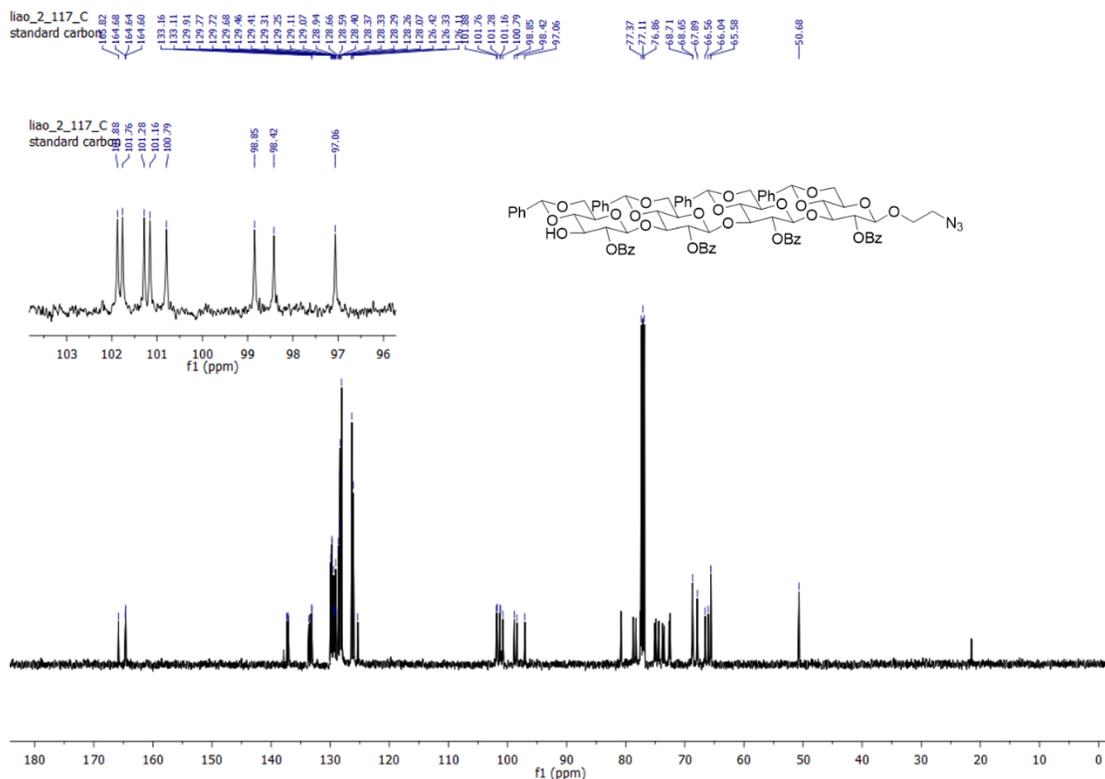




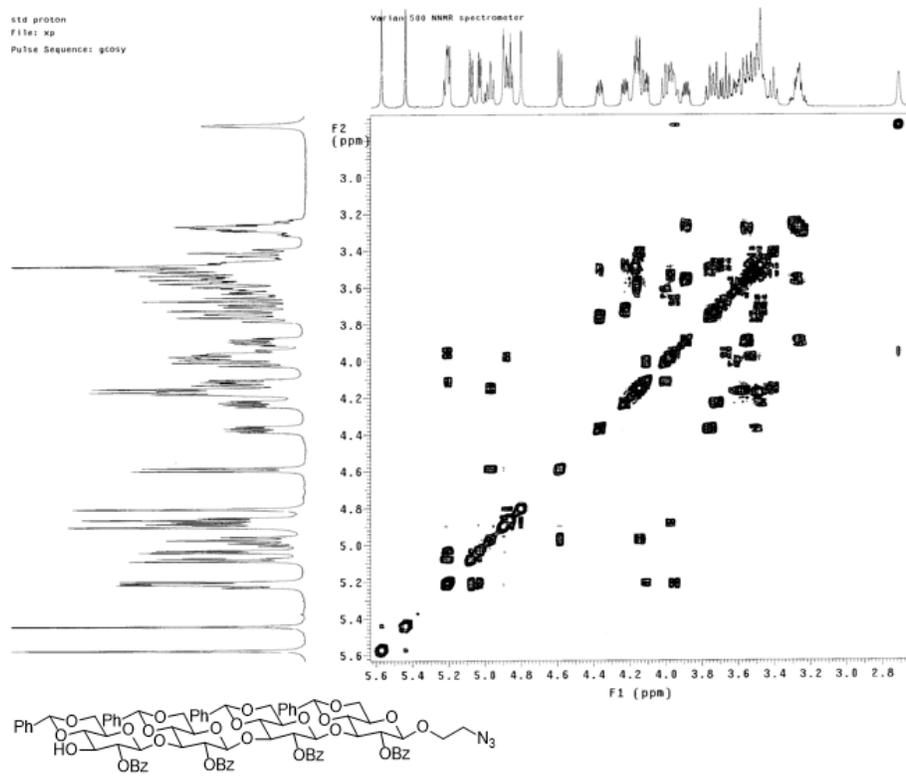
$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **15** ( $\text{CDCl}_3$ , 600 MHz)



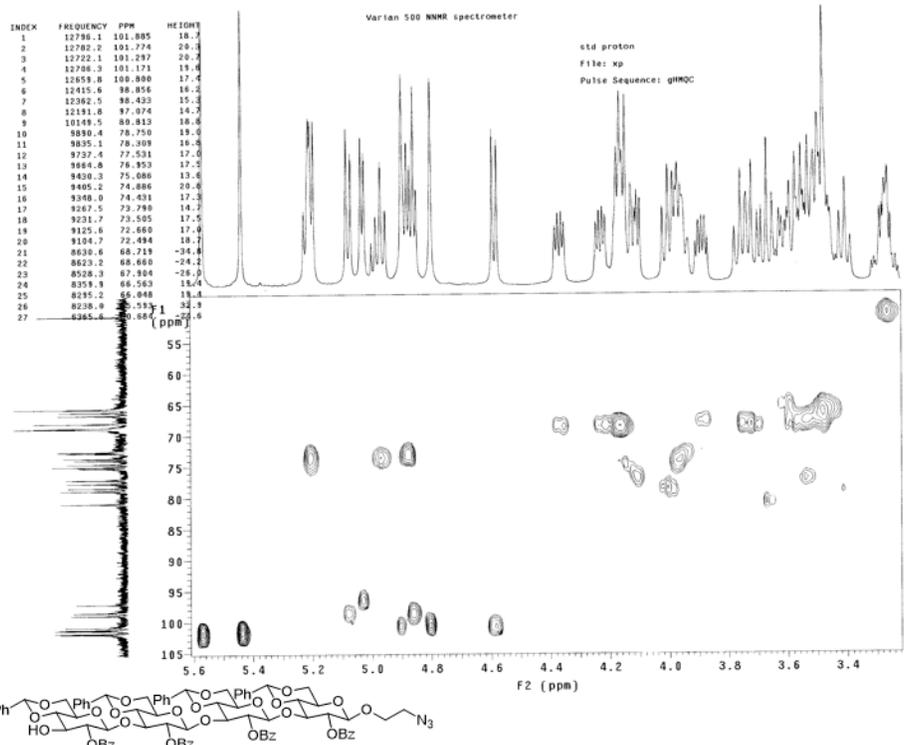
$^1\text{H}$  NMR Spectrum of compound **12** ( $\text{CDCl}_3$ , 600 MHz)



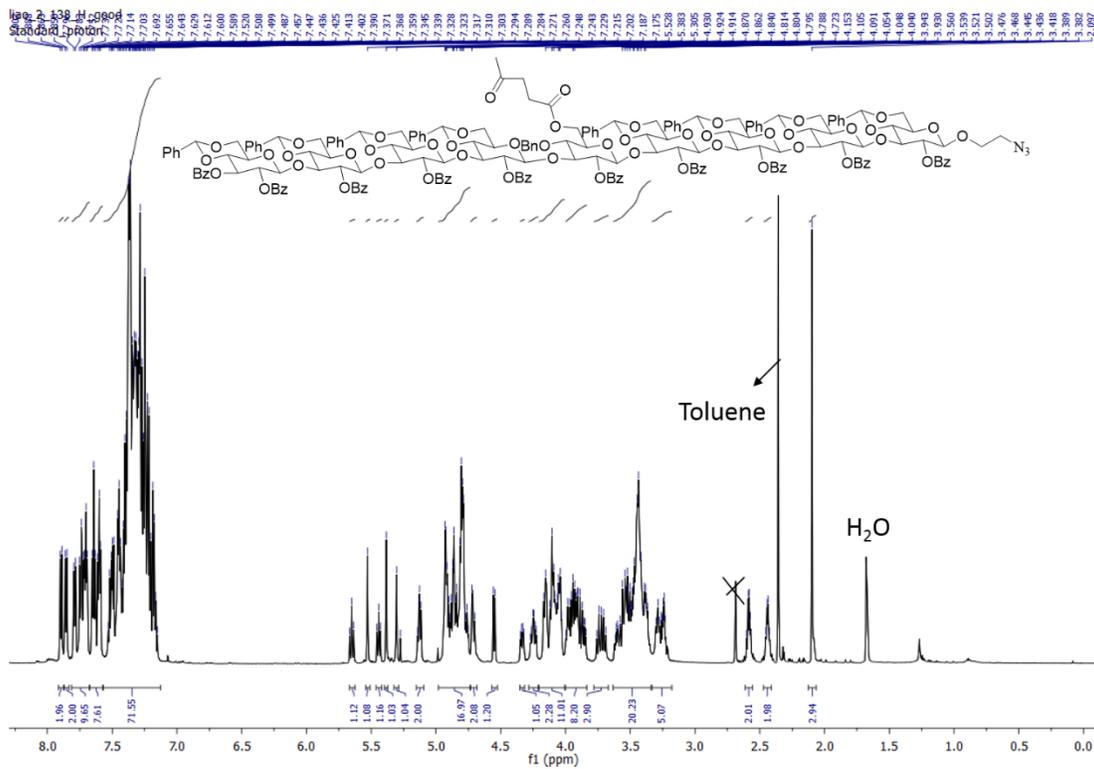
$^{13}\text{C}$  NMR Spectrum of compound **12** ( $\text{CDCl}_3$ , 600 MHz)



$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **12** ( $\text{CDCl}_3$ , 600 MHz)

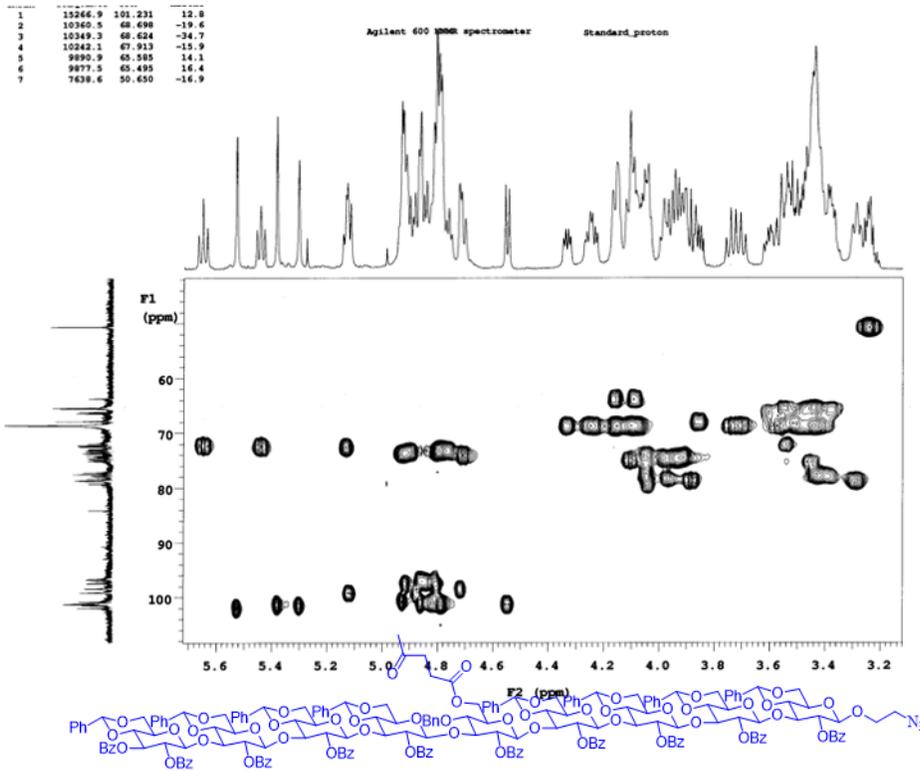


$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **12** ( $\text{CDCl}_3$ , 600 MHz)

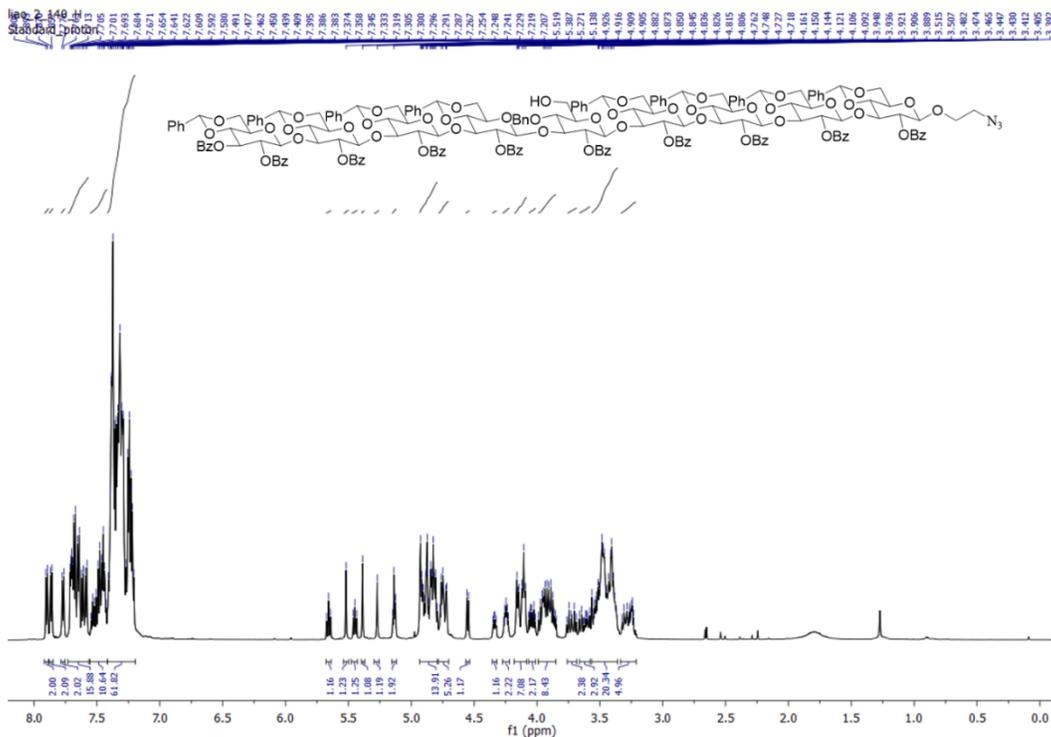


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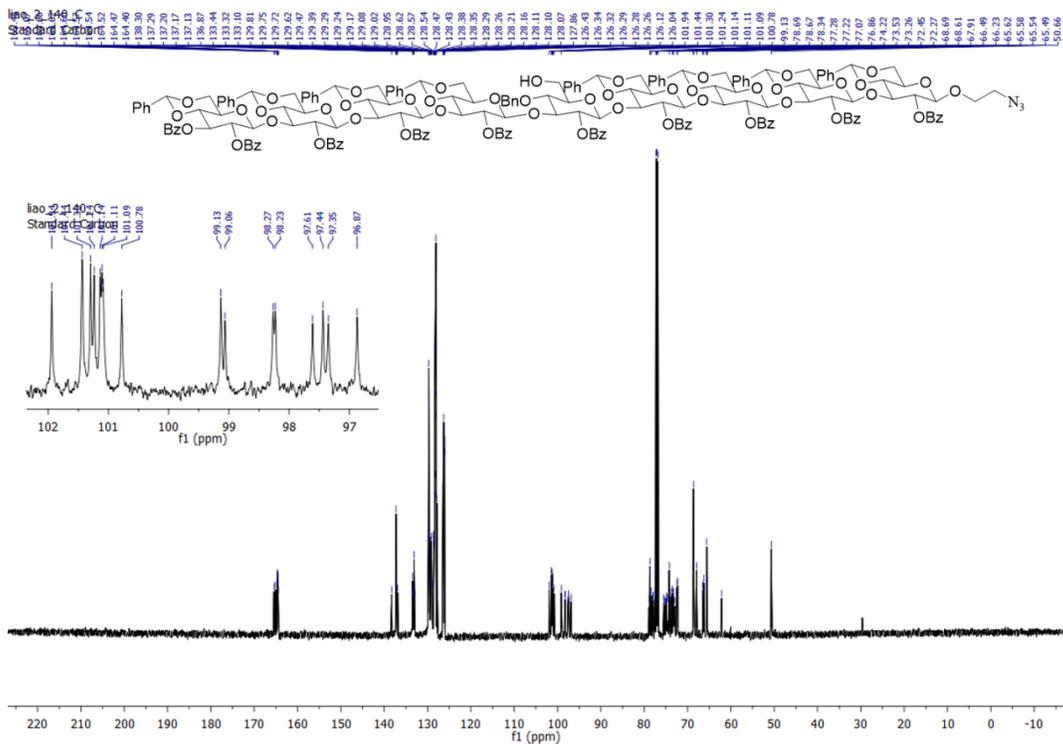




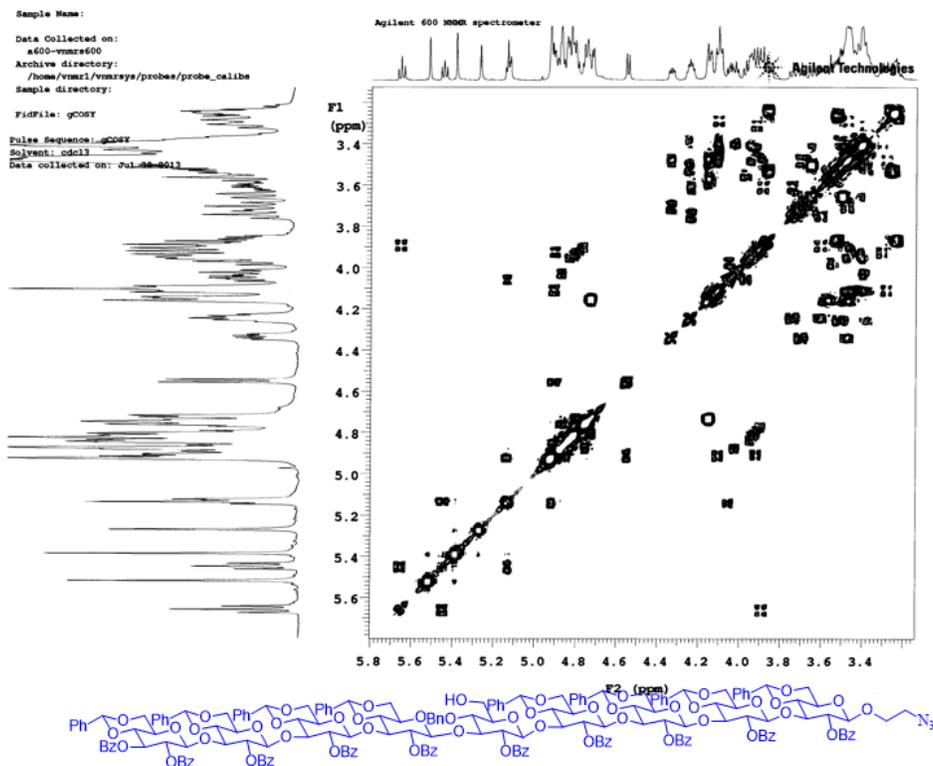
<sup>1</sup>H-<sup>13</sup>C HMQC Spectrum of compound **16** (CDCl<sub>3</sub>, 600 MHz)



<sup>1</sup>H NMR Spectrum of compound **7** (CDCl<sub>3</sub>, 600 MHz)

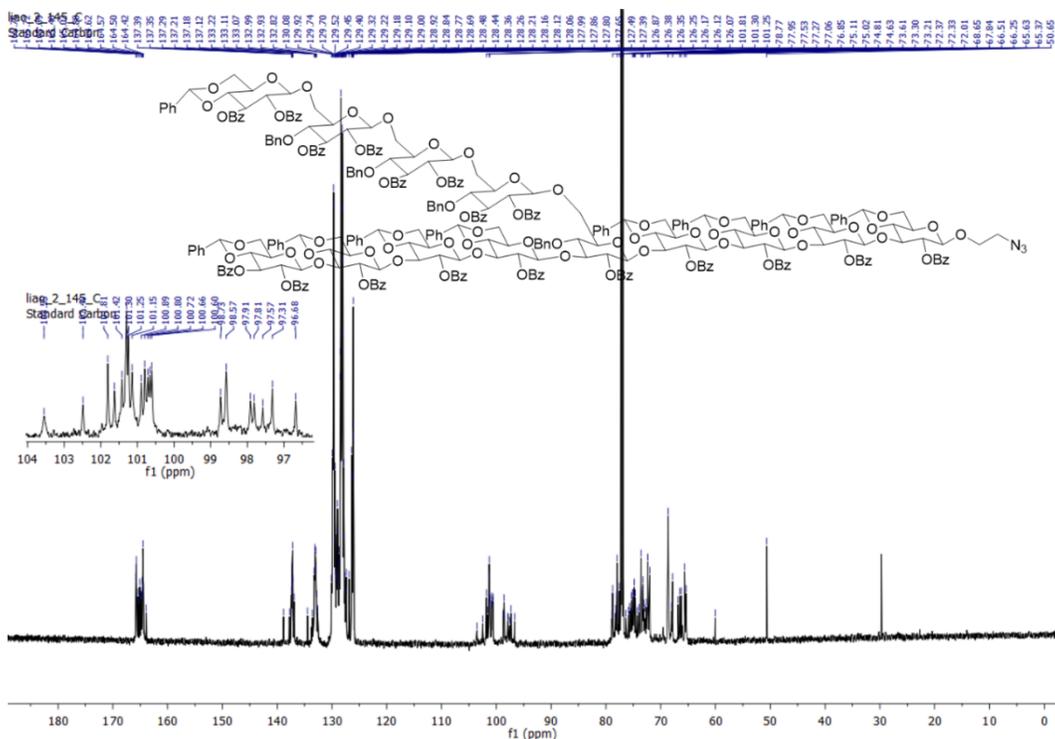


$^{13}\text{C}$  NMR Spectrum of compound **7** ( $\text{CDCl}_3$ , 600 MHz)

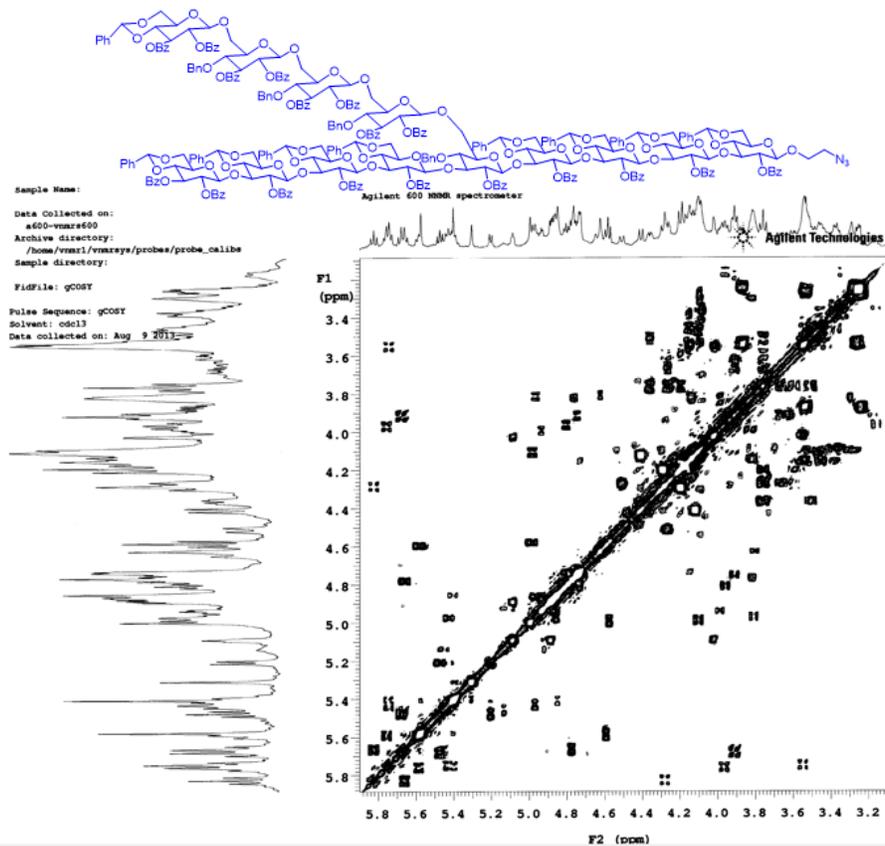


$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **7** ( $\text{CDCl}_3$ , 600 MHz)

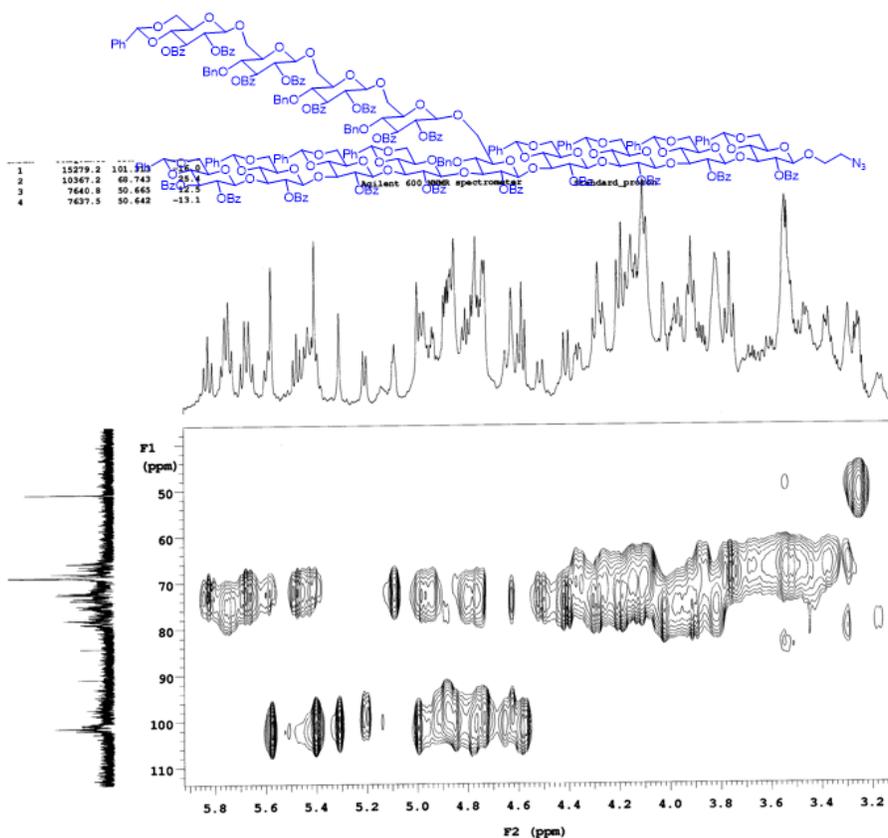




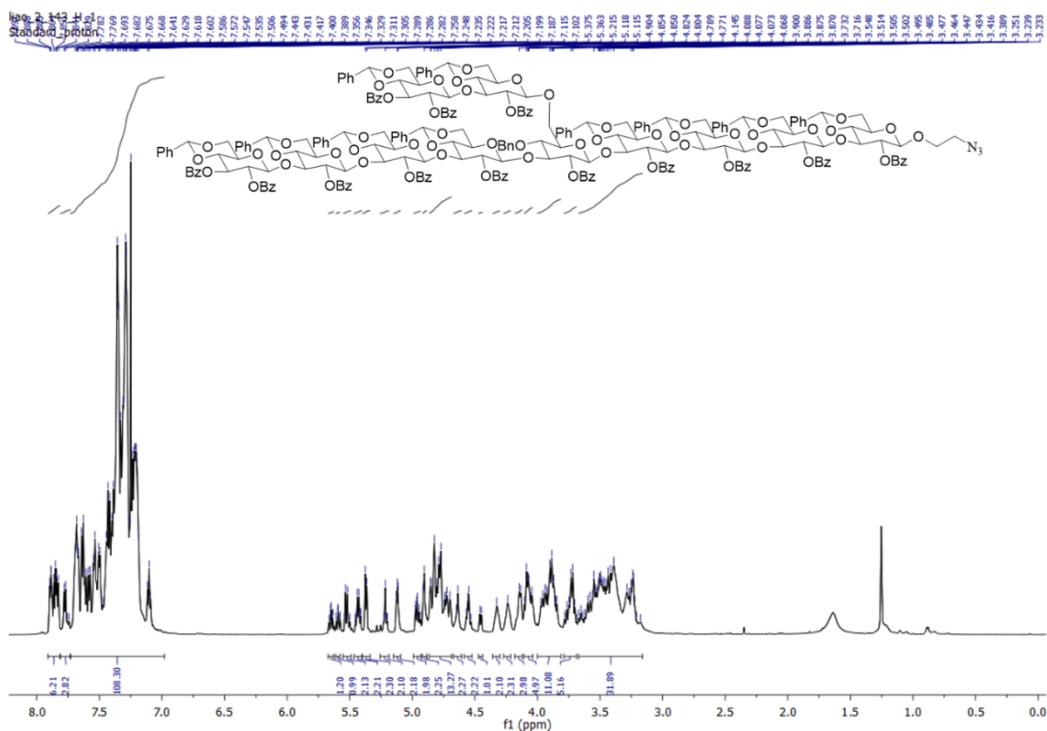
$^{13}\text{C}$  NMR Spectrum of compound **17** ( $\text{CDCl}_3$ , 600 MHz)



$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **17** ( $\text{CDCl}_3$ , 600 MHz)

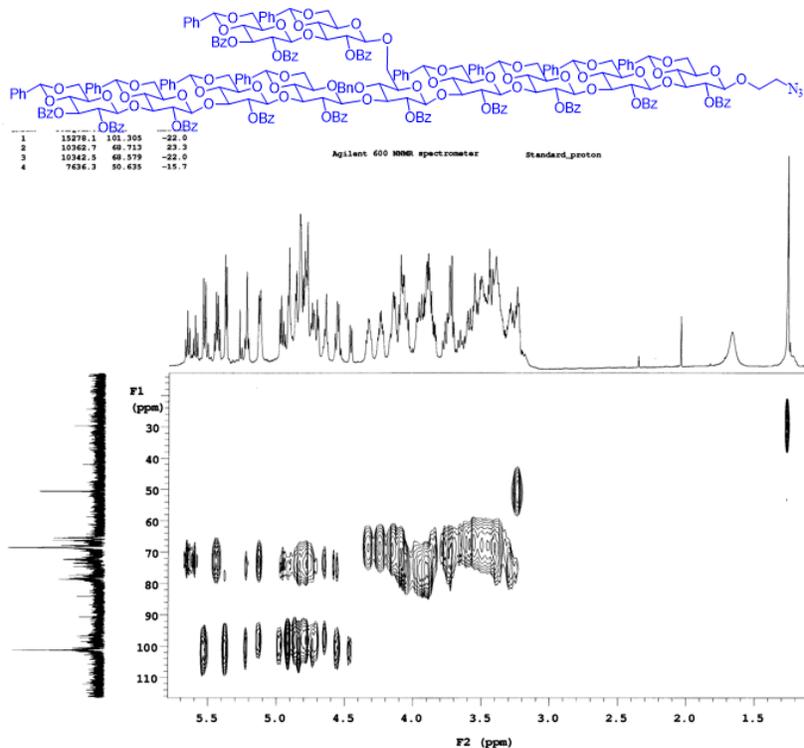


$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **17** ( $\text{CDCl}_3$ , 600 MHz)

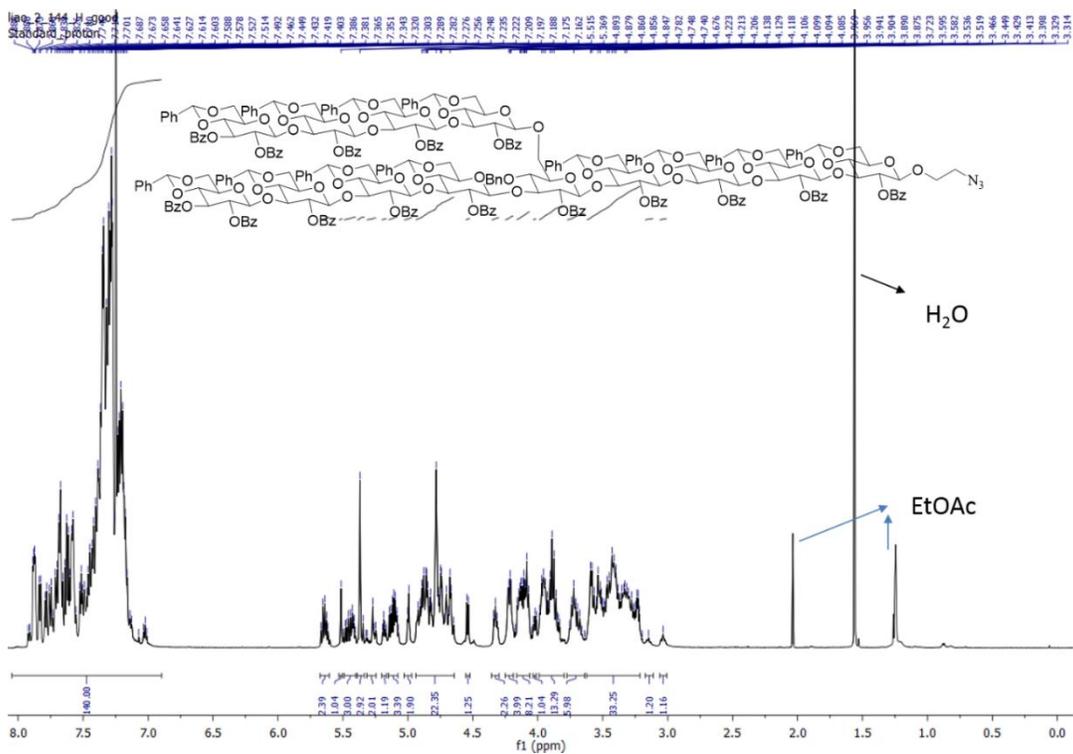


$^1\text{H}$  NMR Spectrum of compound **18** ( $\text{CDCl}_3$ , 600 MHz)

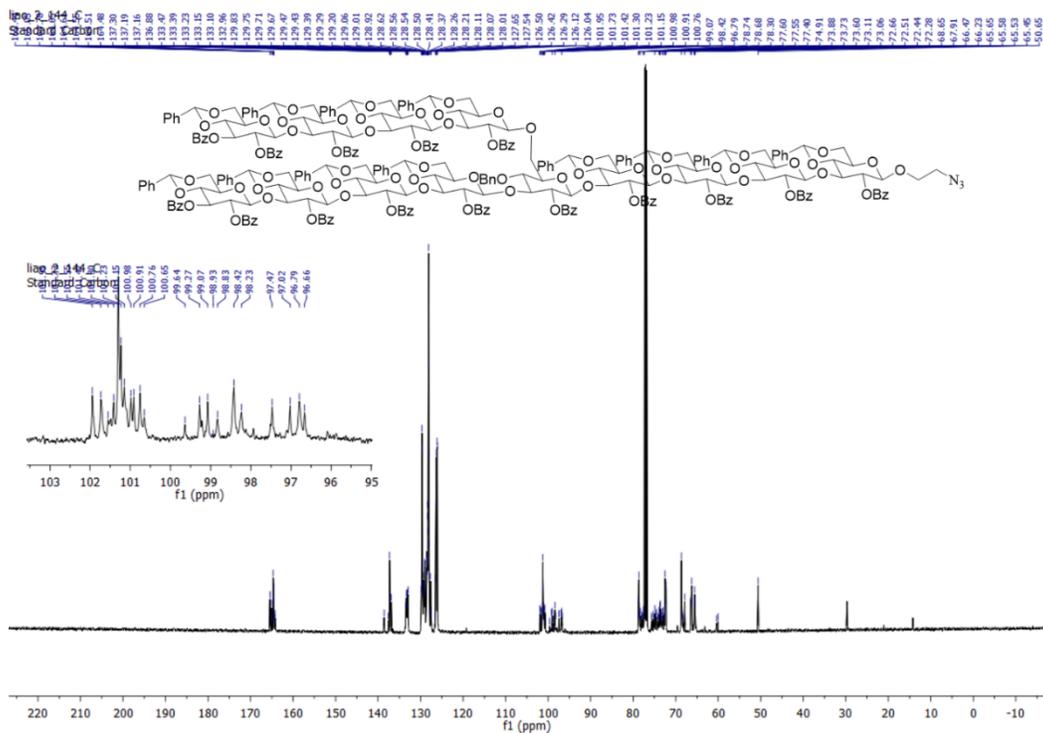




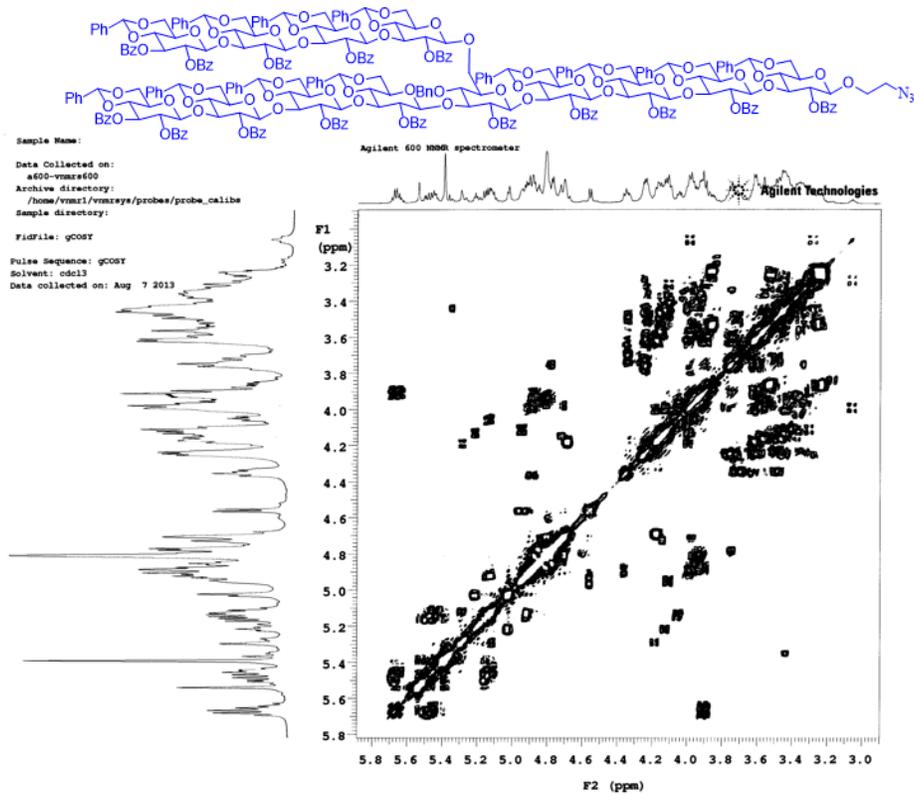
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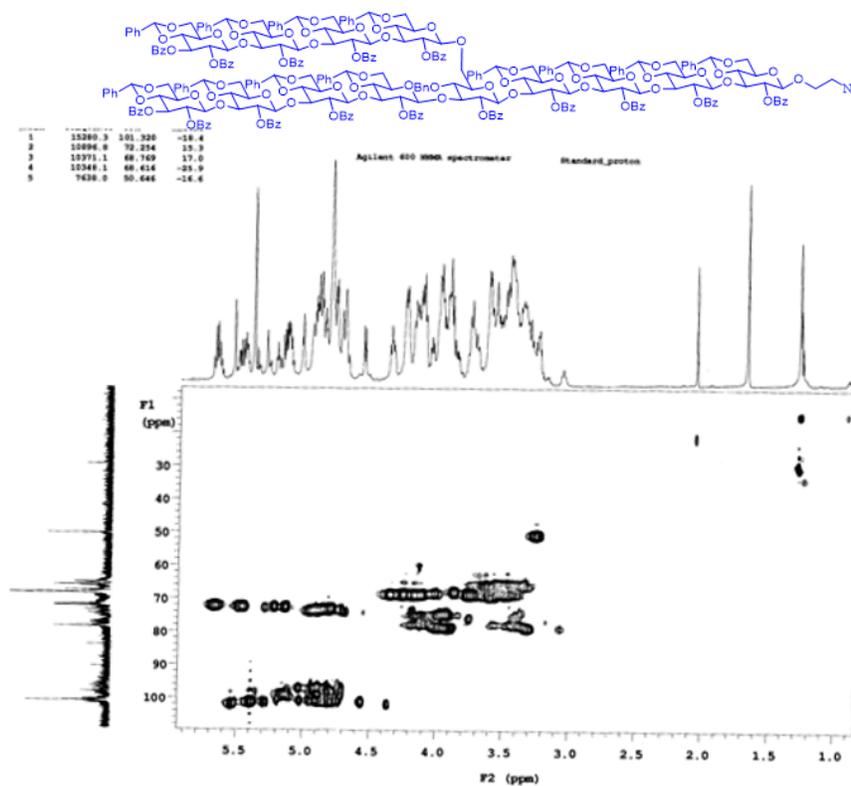
$^1\text{H}$  NMR Spectrum of compound **19** ( $\text{CDCl}_3$ , 600 MHz)



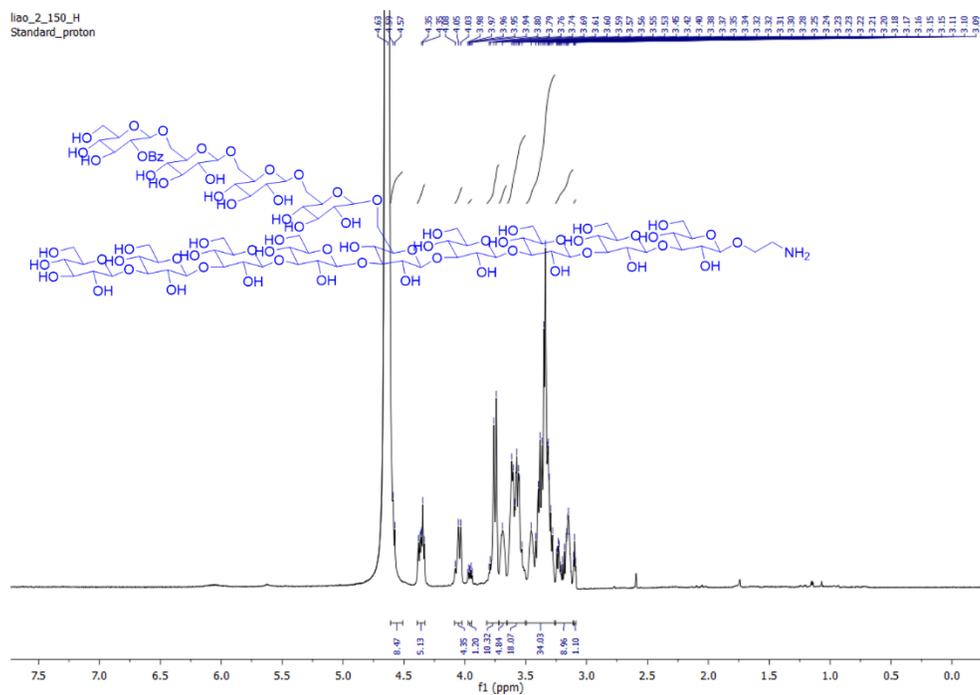
<sup>13</sup>C NMR Spectrum of compound **19** (CDCl<sub>3</sub>, 600 MHz)



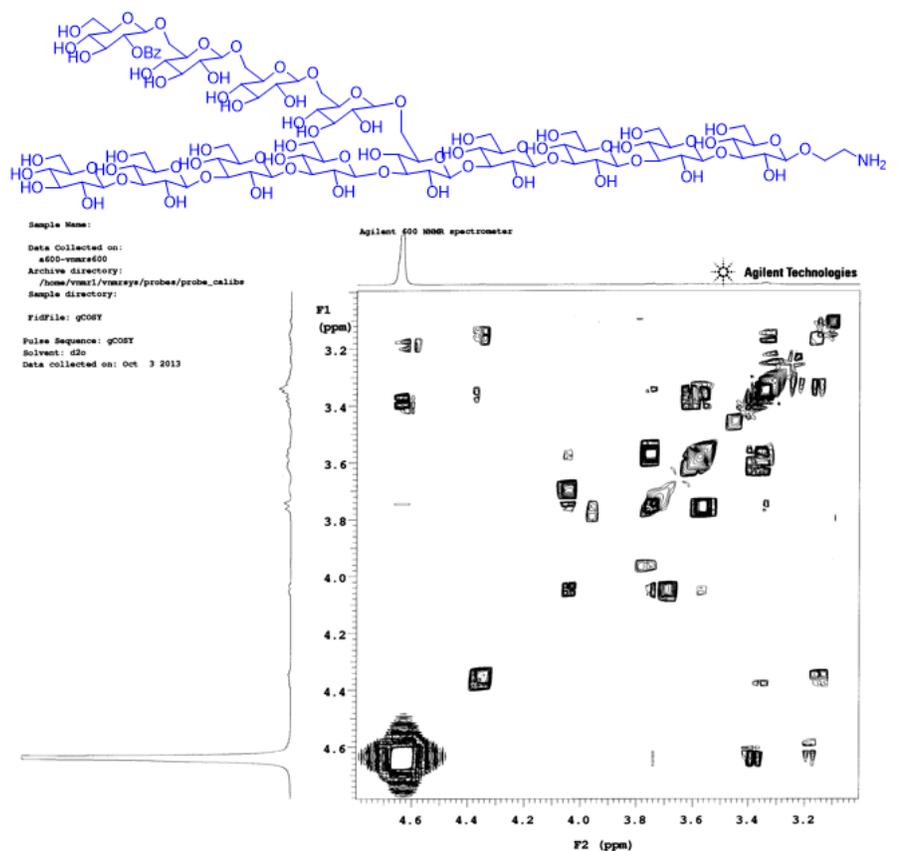
<sup>1</sup>H-<sup>1</sup>H COSY Spectrum of compound **19** (CDCl<sub>3</sub>, 600 MHz)



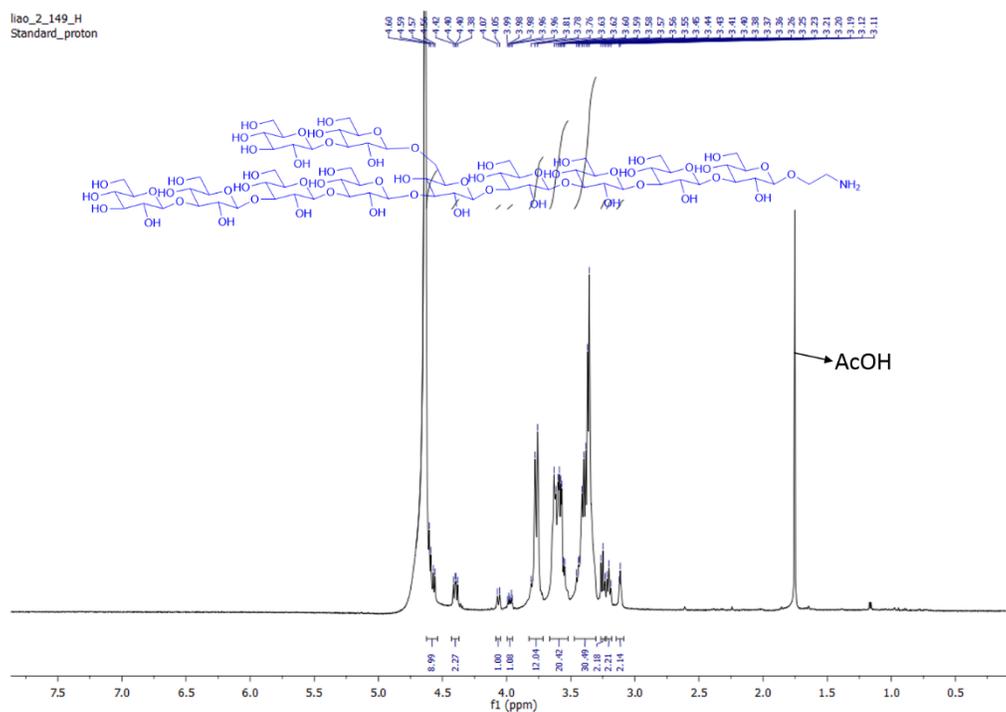
$^1\text{H}$ - $^{13}\text{C}$  HMQC Spectrum of compound **19** ( $\text{CDCl}_3$ , 600 MHz)



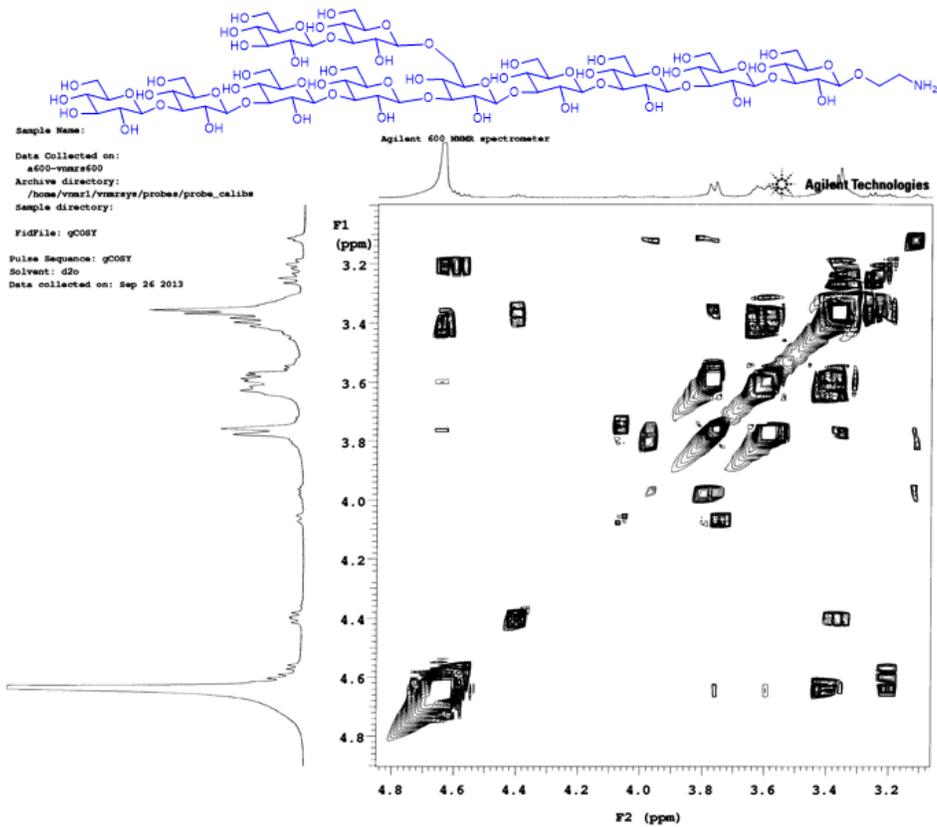
$^1\text{H}$  NMR Spectrum of compound **1** ( $\text{D}_2\text{O}$ , 600 MHz)



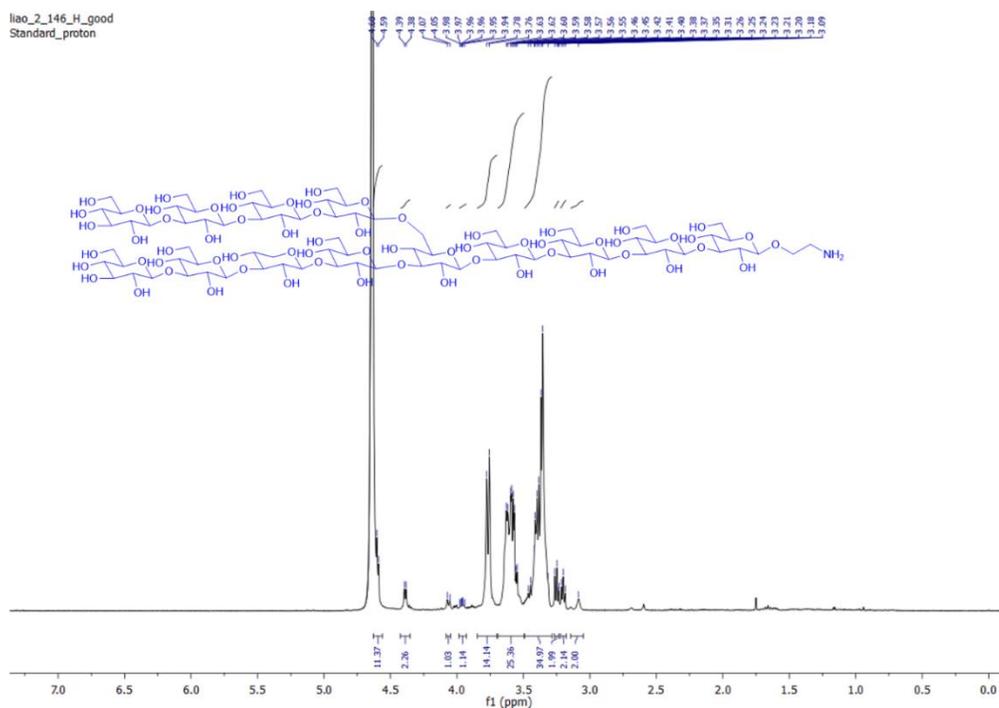
$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound 1 ( $\text{D}_2\text{O}$ , 600 MHz)



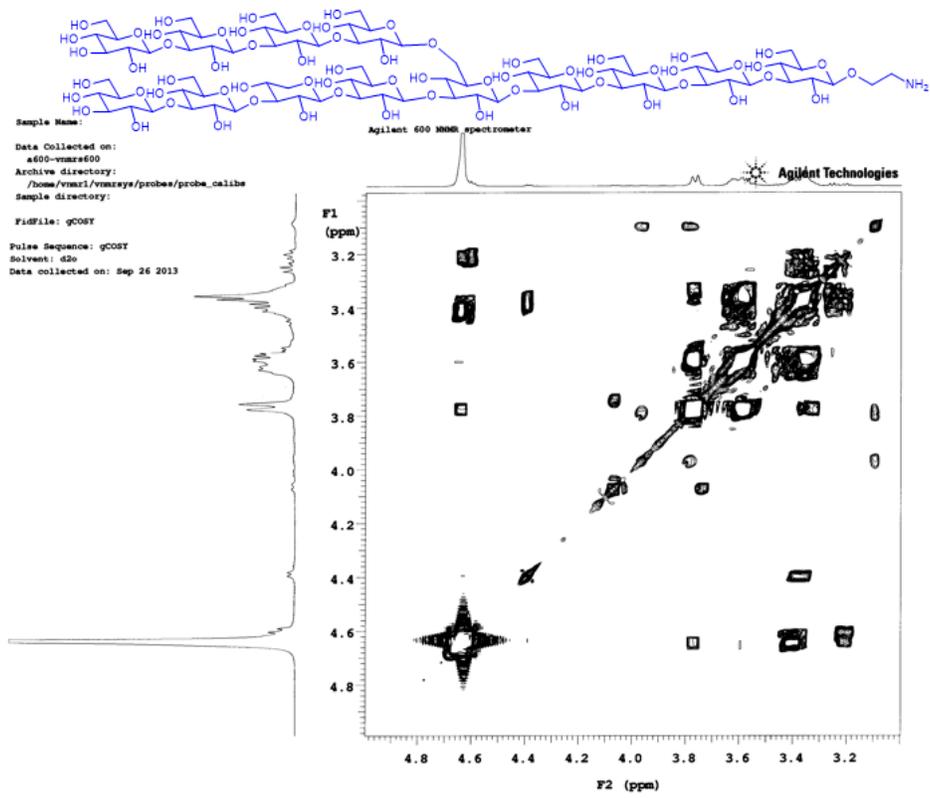
$^1\text{H}$  NMR Spectrum of compound 2 ( $\text{D}_2\text{O}$ , 600 MHz)



$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound 2 ( $\text{D}_2\text{O}$ , 600 MHz)



$^1\text{H}$  NMR Spectrum of compound 3 ( $\text{D}_2\text{O}$ , 600 MHz)



$^1\text{H}$ - $^1\text{H}$  COSY Spectrum of compound **3** ( $\text{D}_2\text{O}$ , 600 MHz)