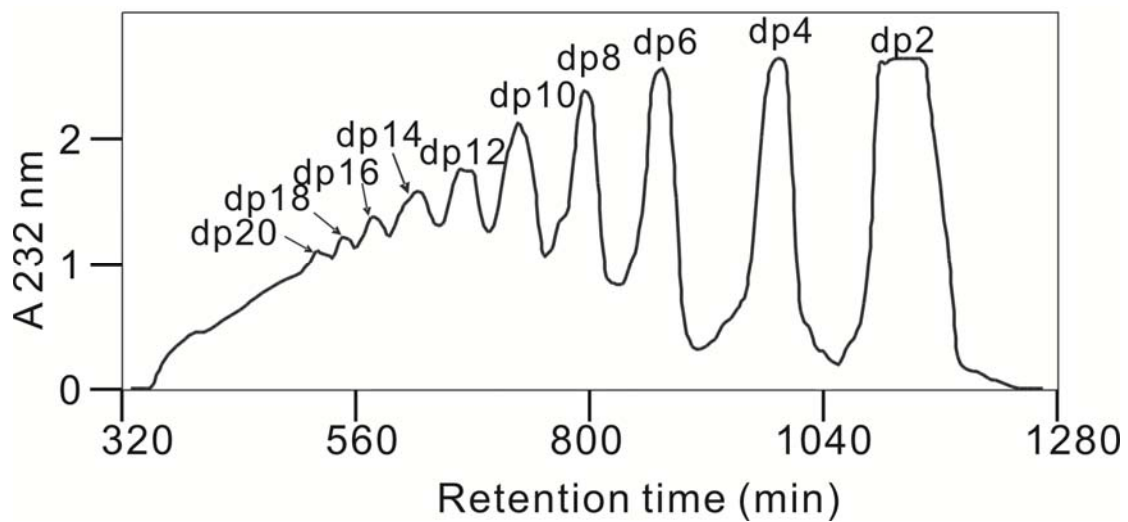
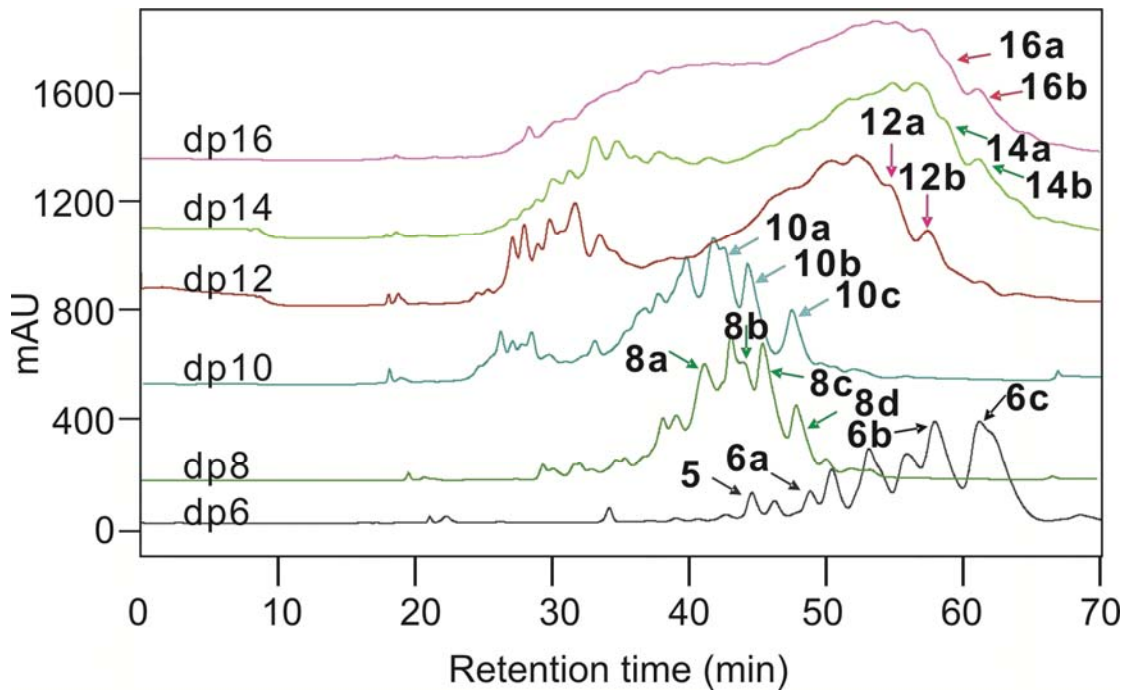


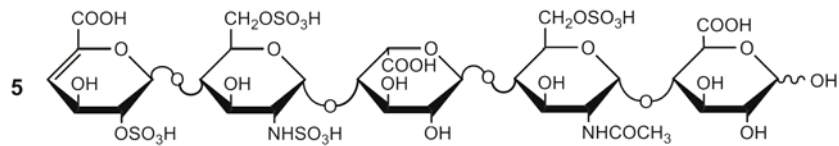
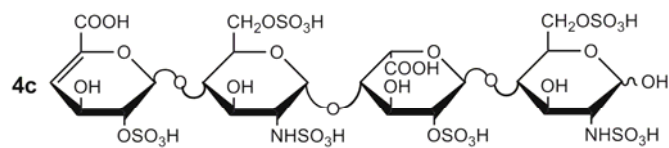
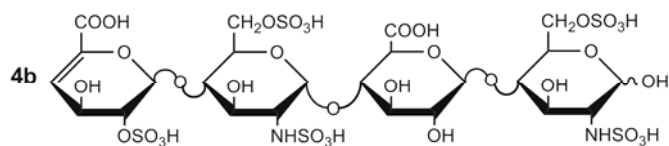
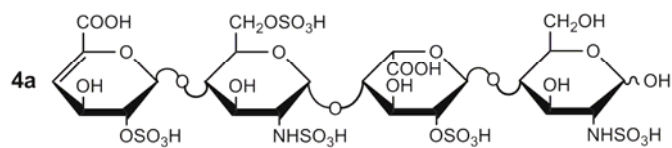
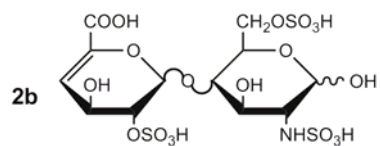
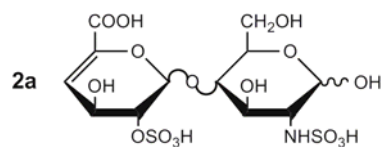
# Chromatography of P10 Column

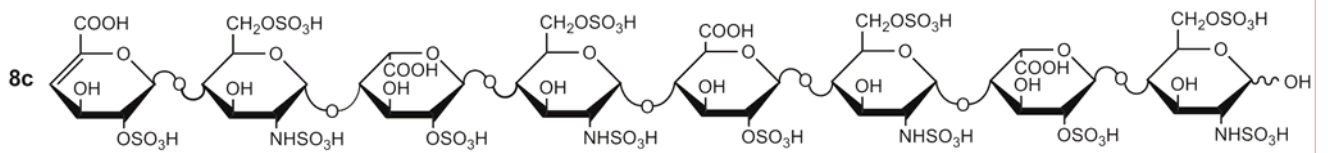
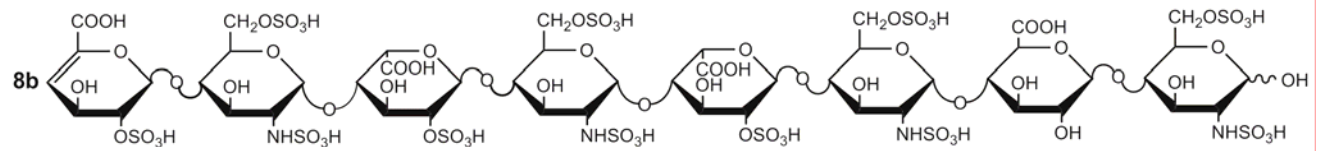
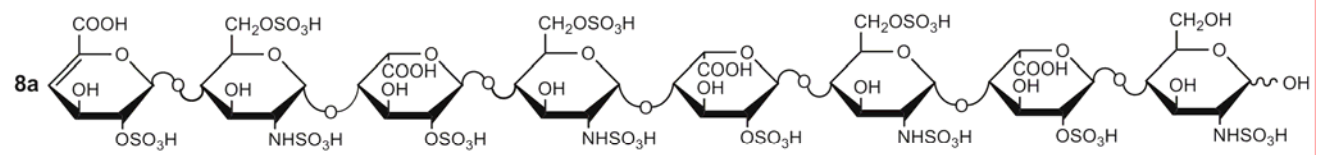
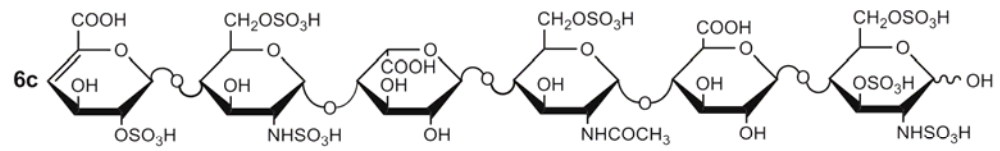
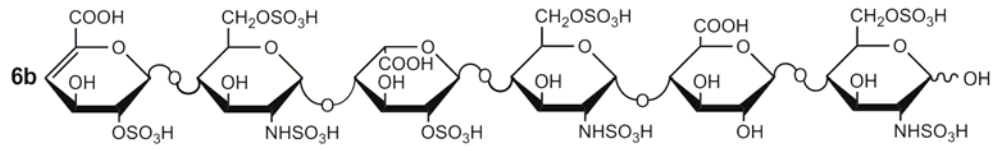
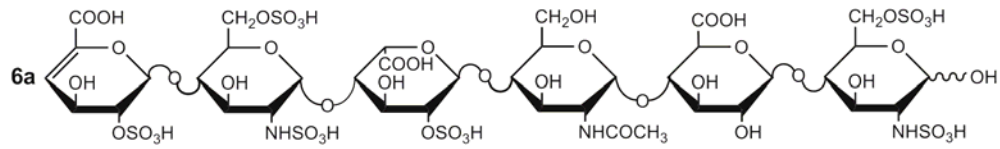


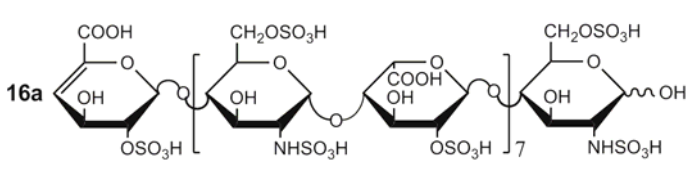
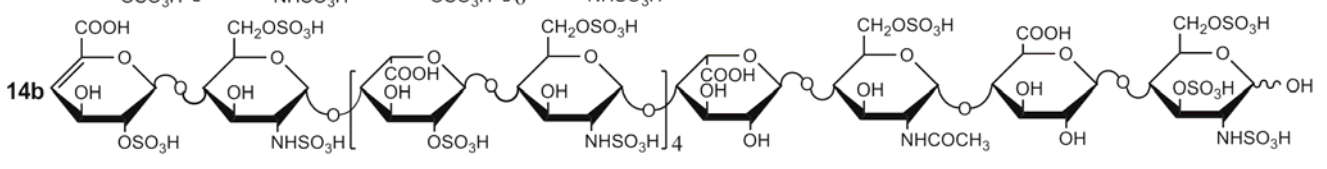
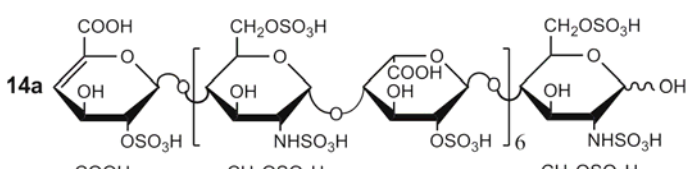
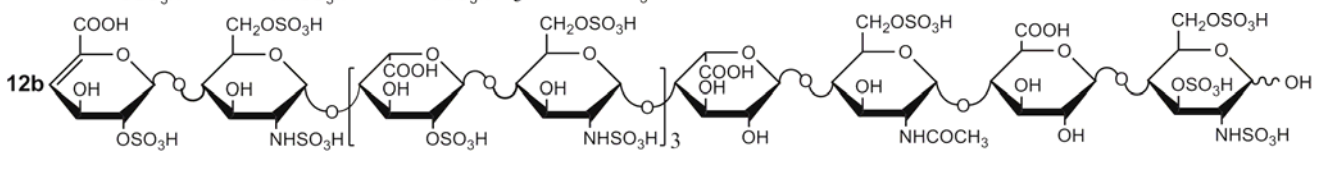
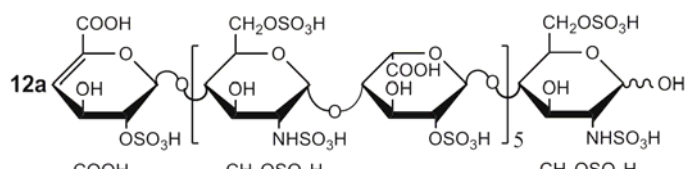
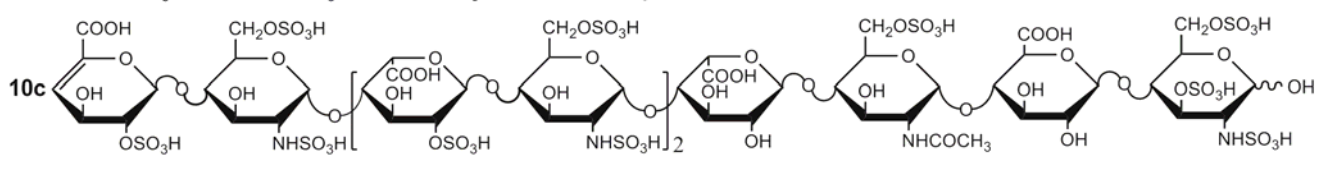
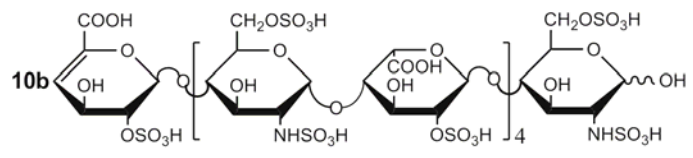
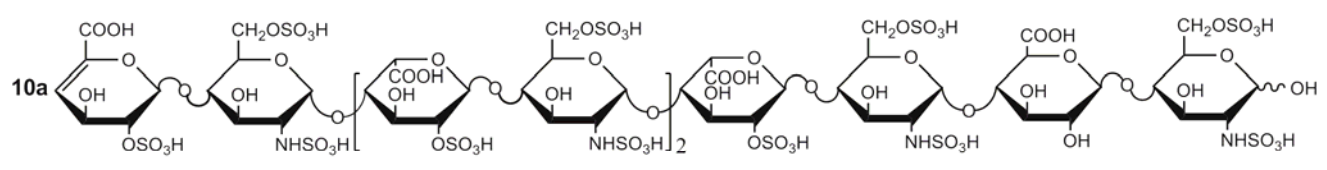
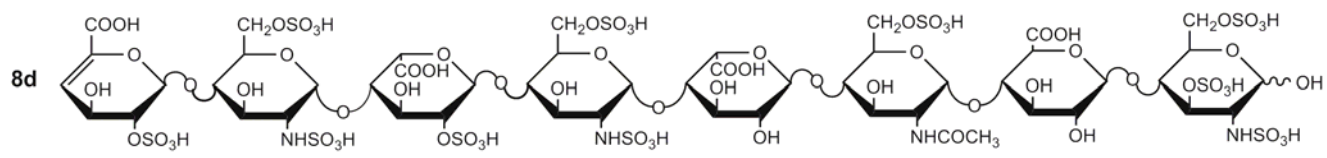
## Purification by Strong-ion-exchange HPLC Chromatography



## Chemical Structures of Heparin-derived Oligosaccharides

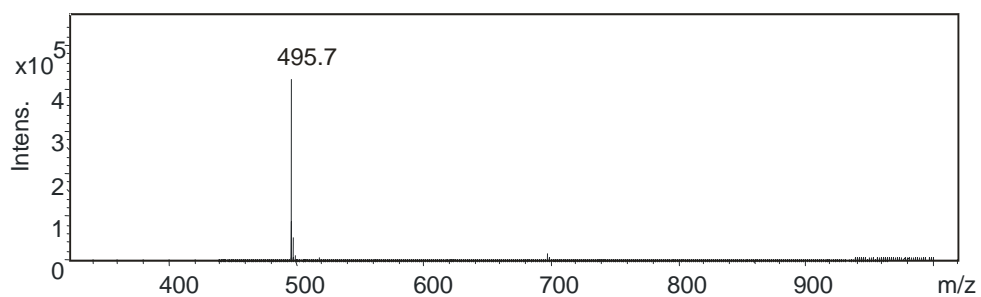




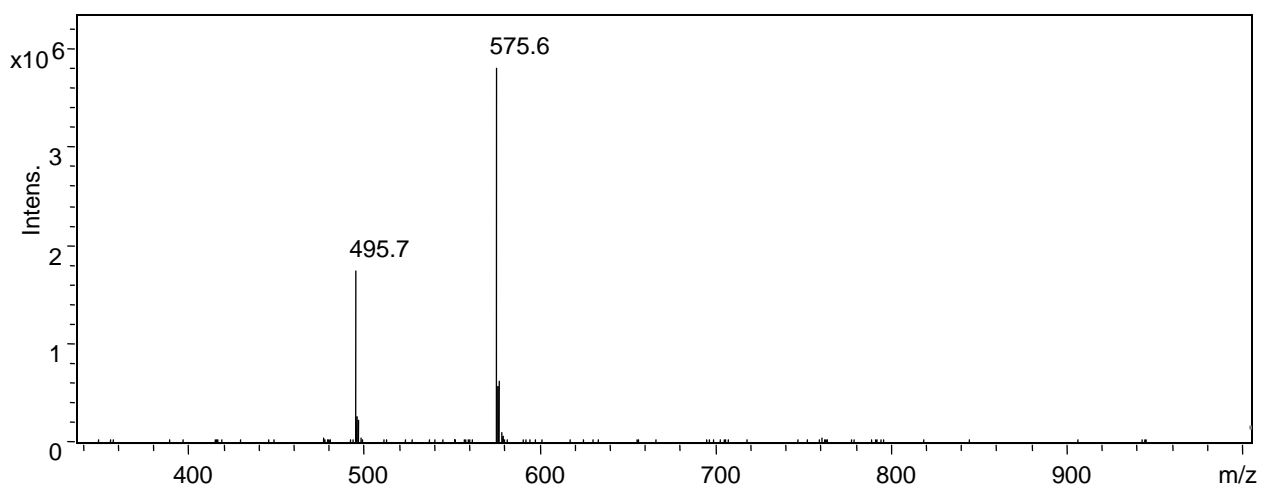


# Mass Spectra

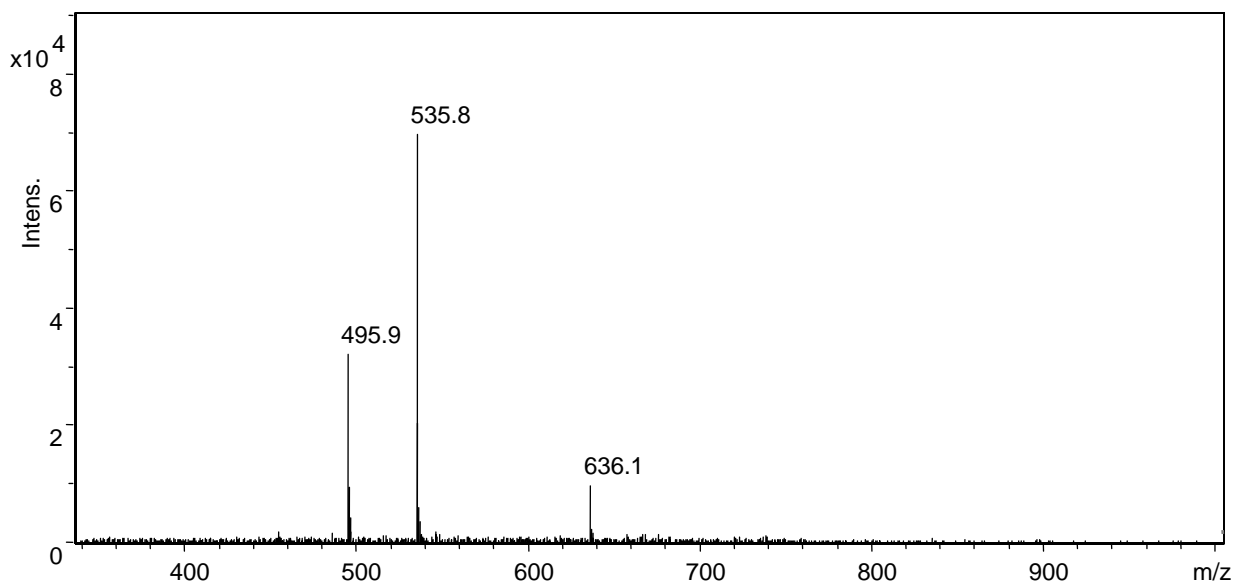
2a



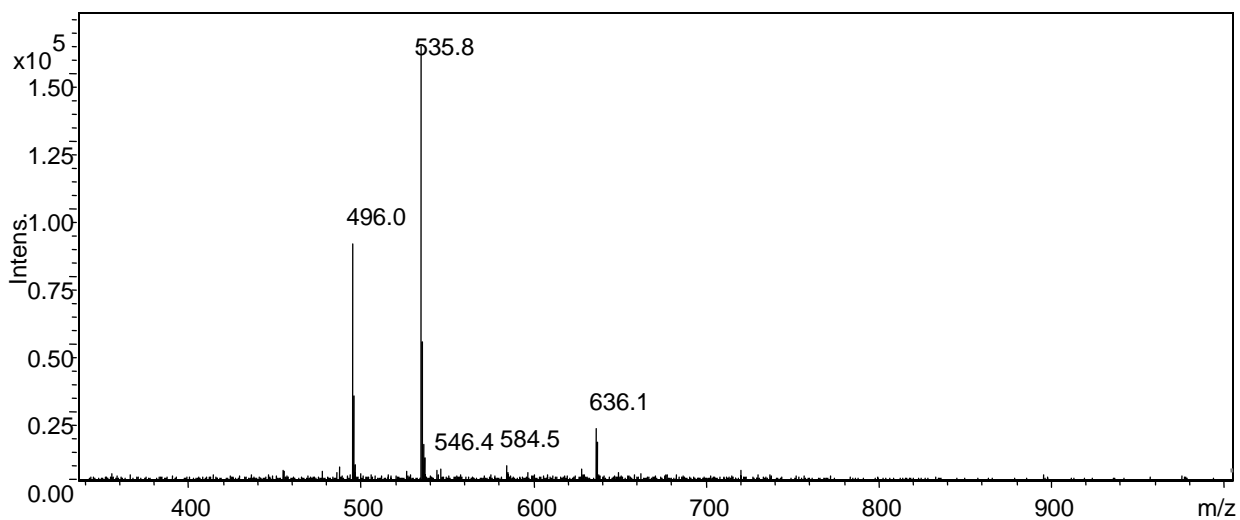
2b



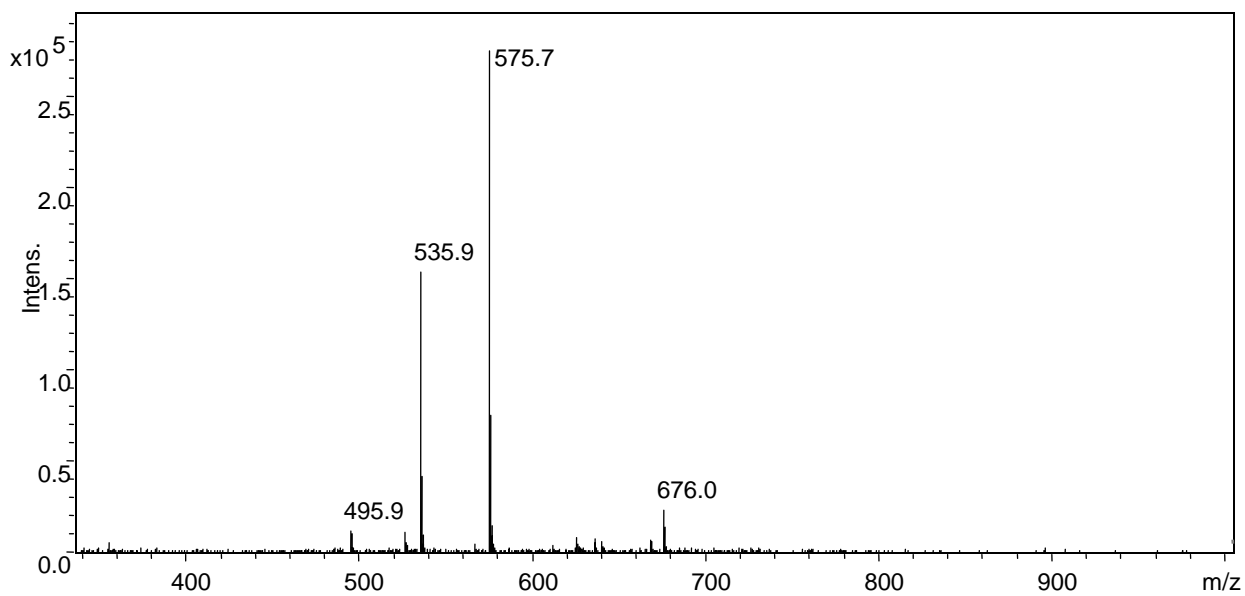
4a



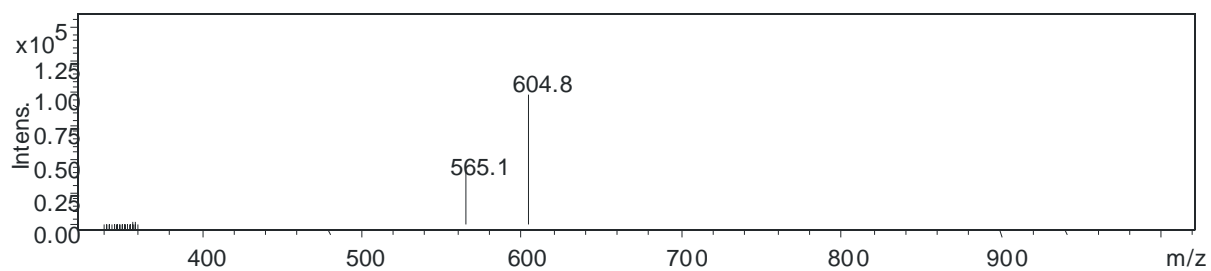
**4b**



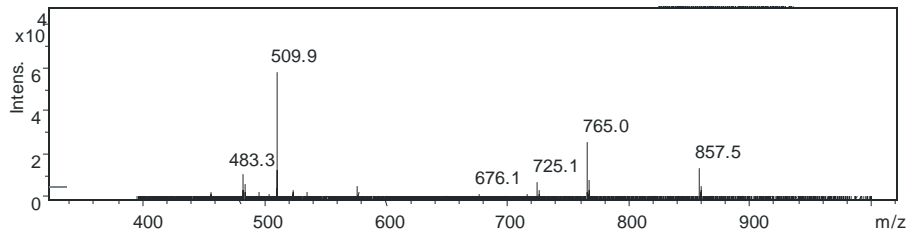
**4c**



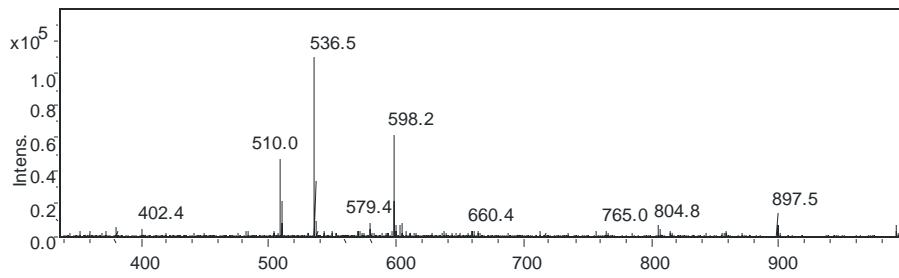
**5**



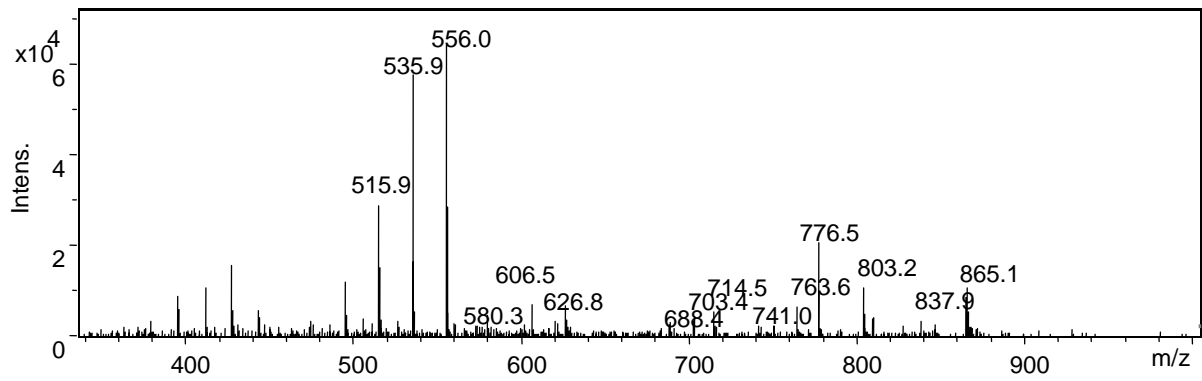
**6a**



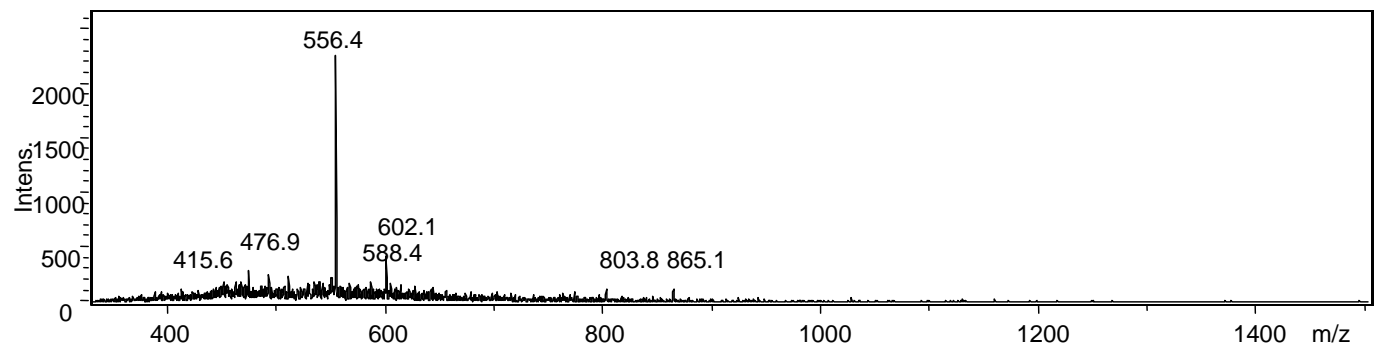
**6c**



**8a**

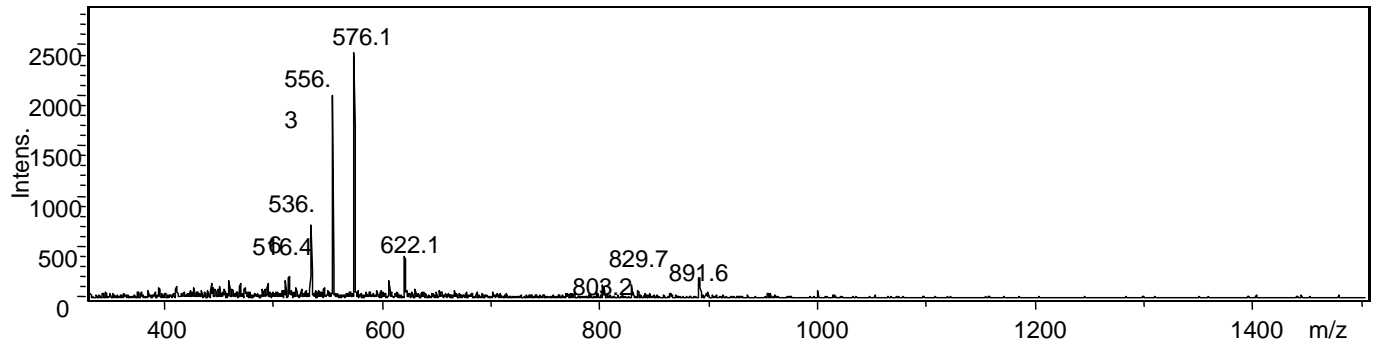


**8b**

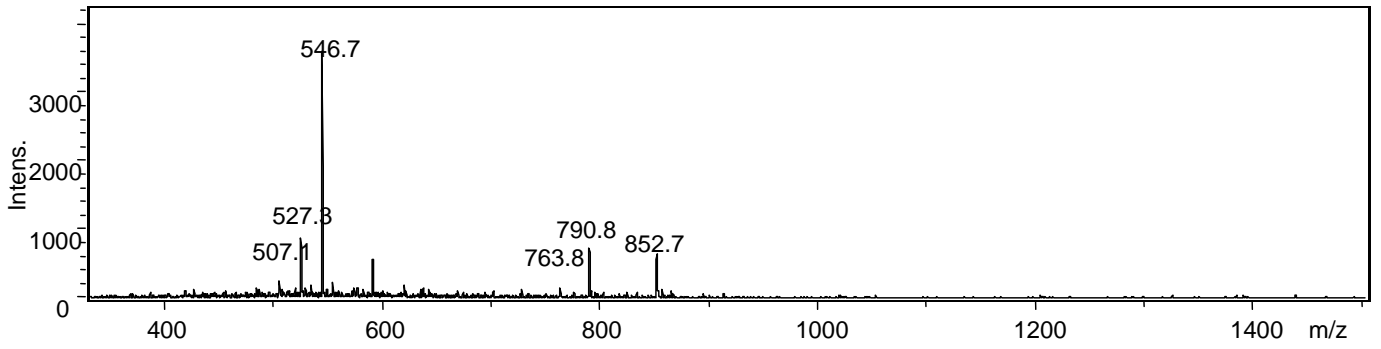




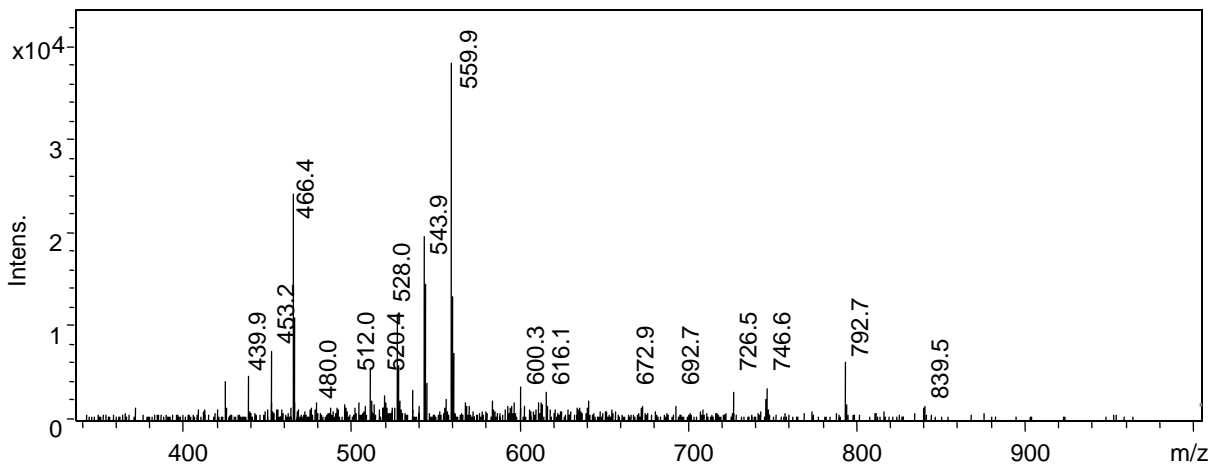
8c



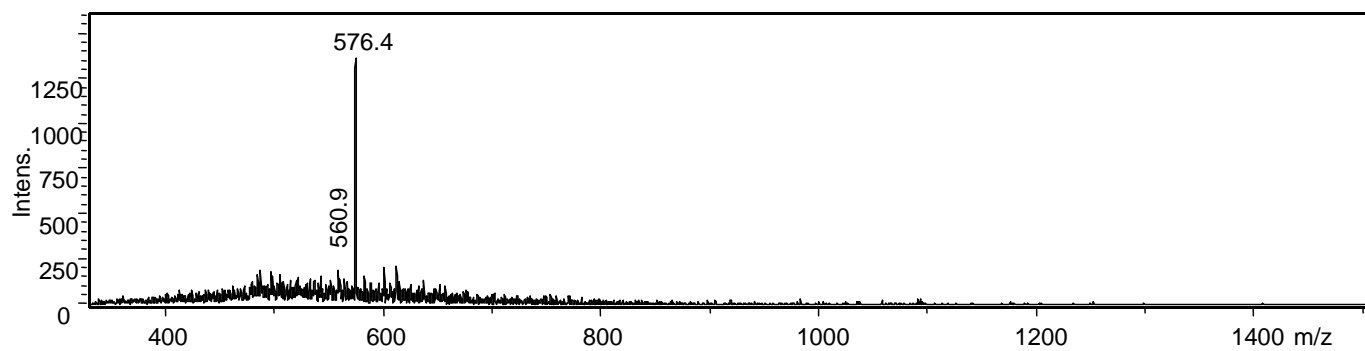
8d



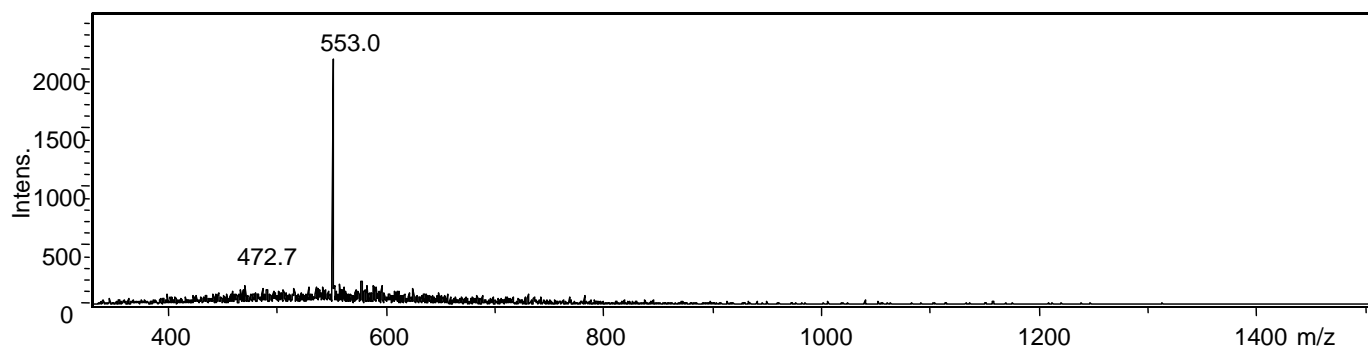
10a



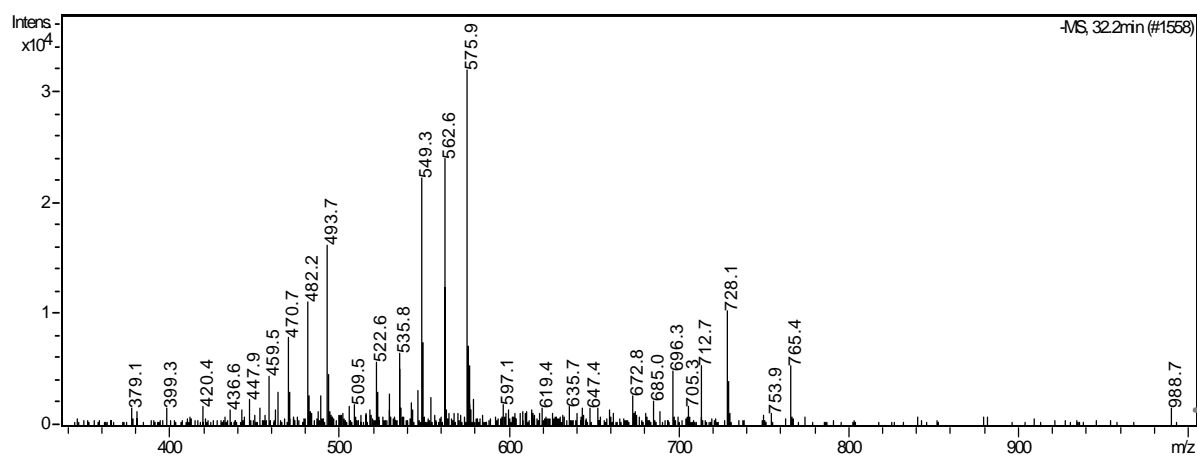
10b



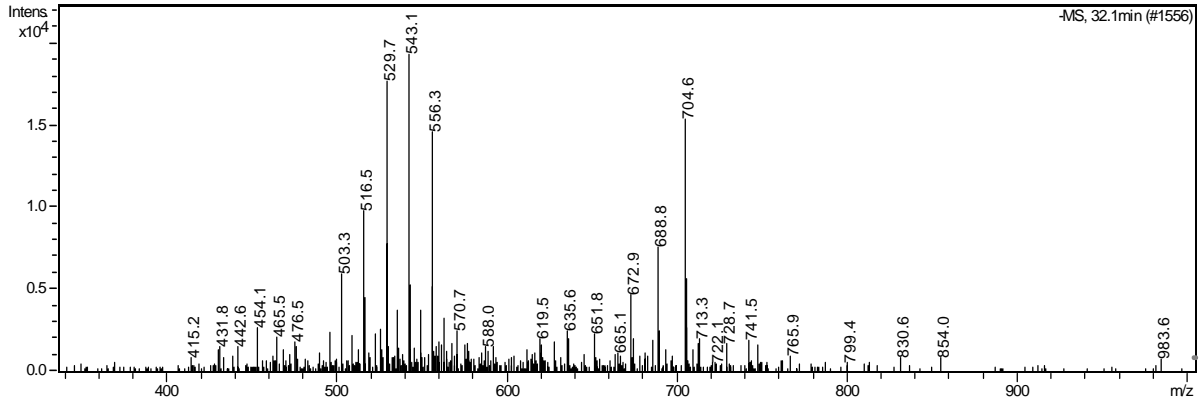
10c



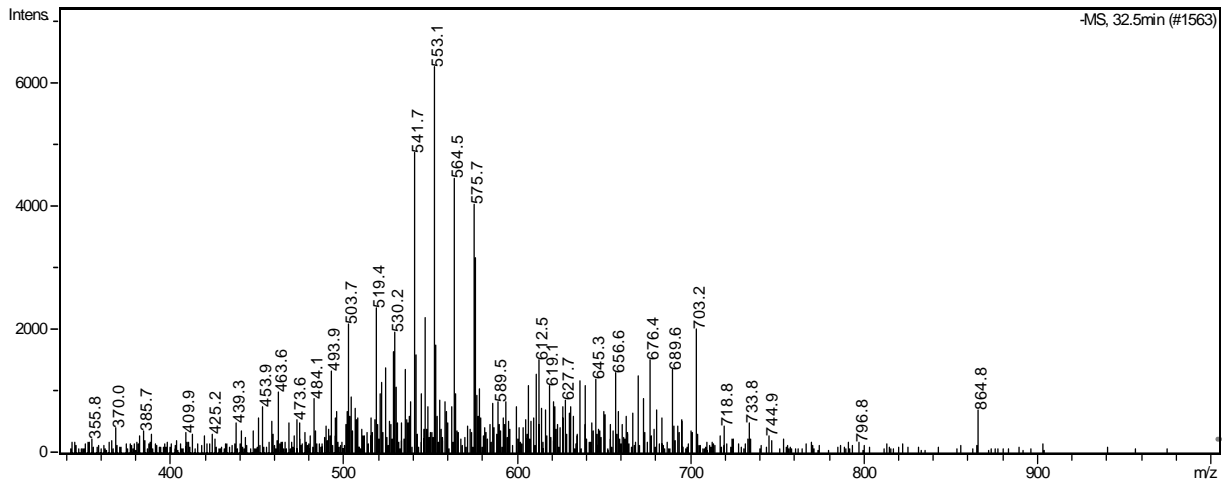
12a



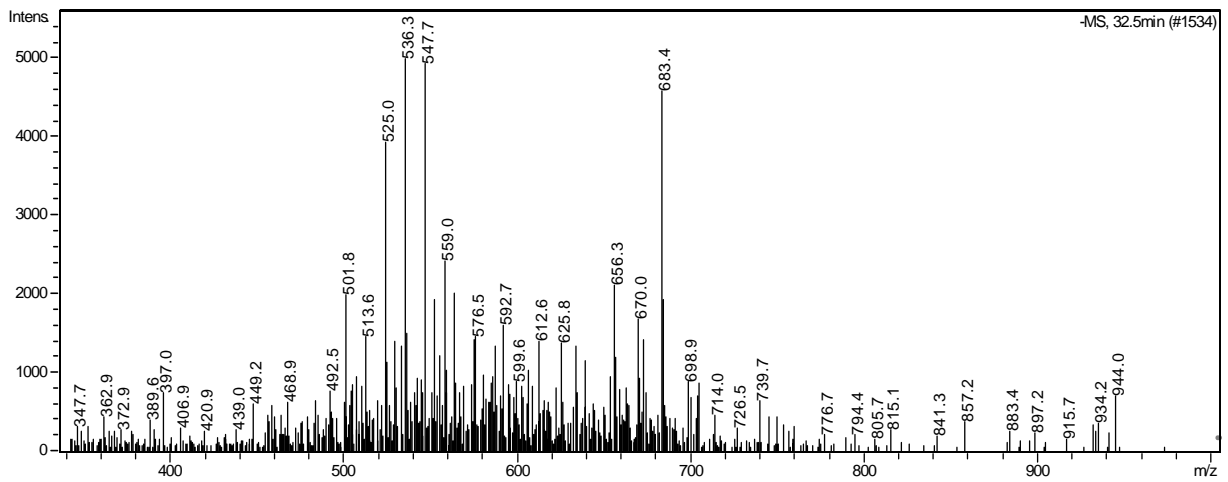
### 12b



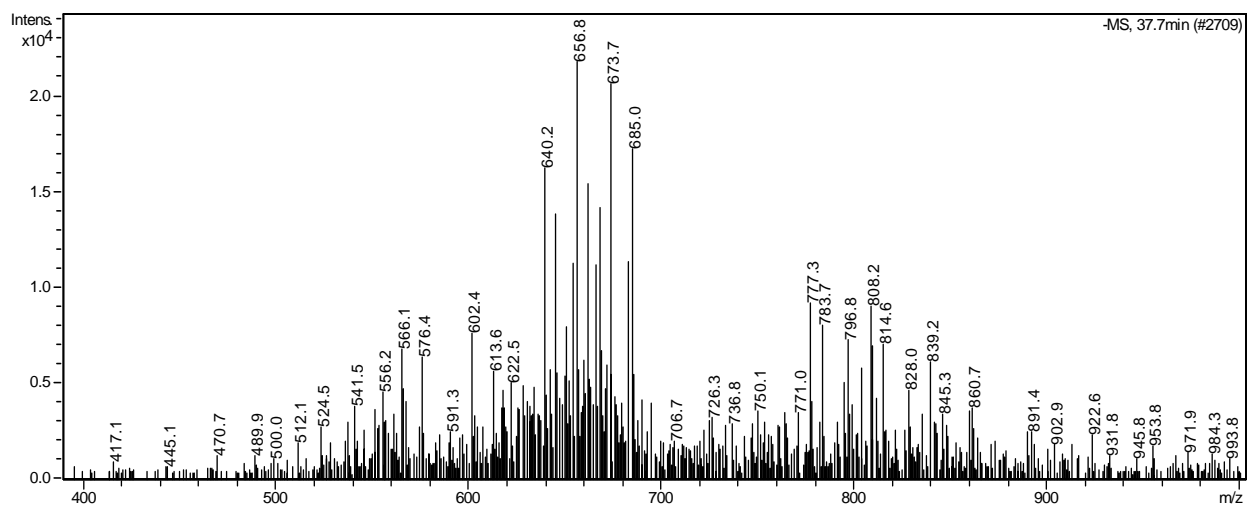
### 14a



### 14b

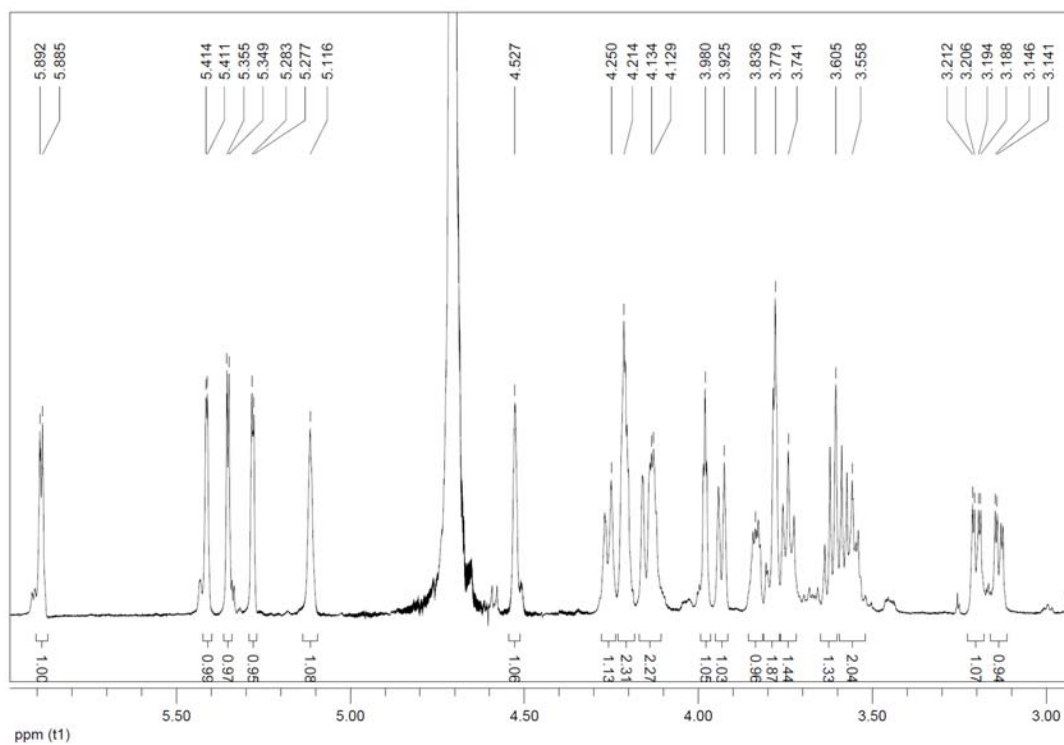


# 16a

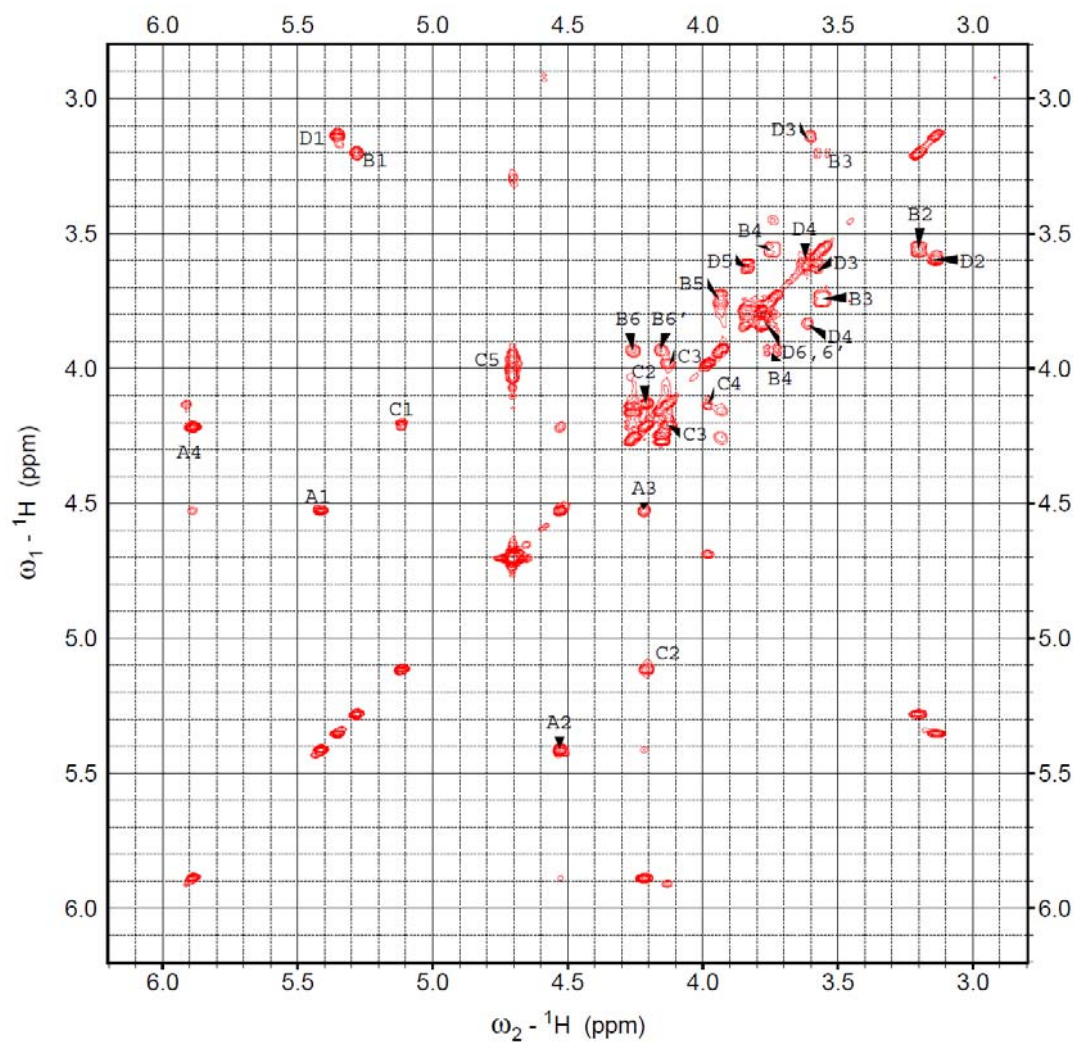


# 1D and 2D NMR Spectra

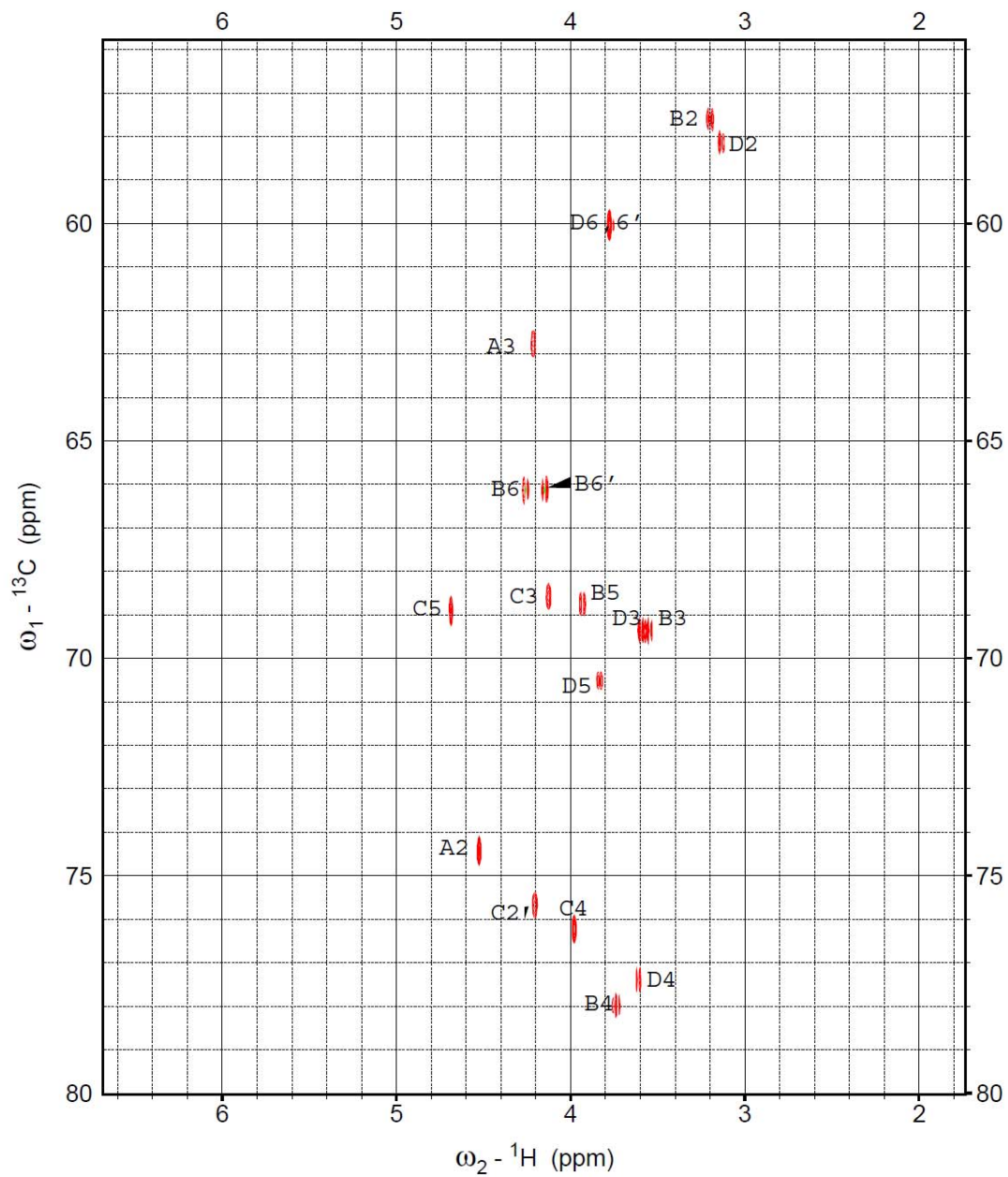
4a



4a <sup>1</sup>H-NMR

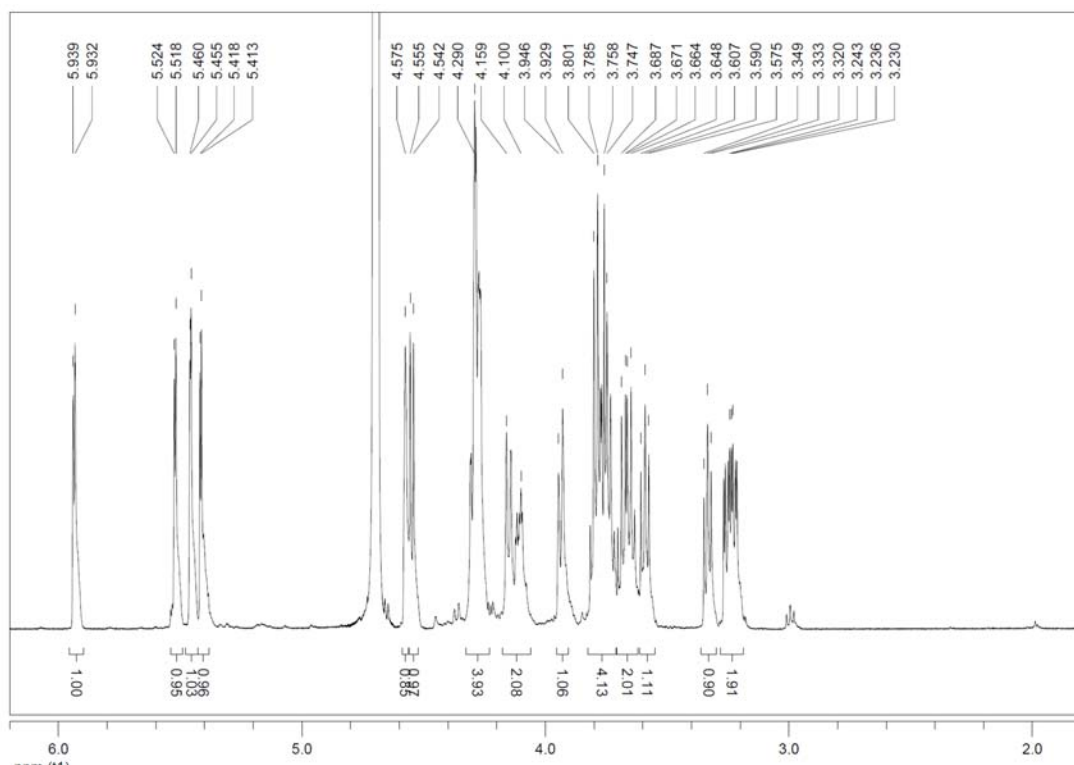


**4a**  ${}^1\text{H}$ - ${}^1\text{H}$  COSY



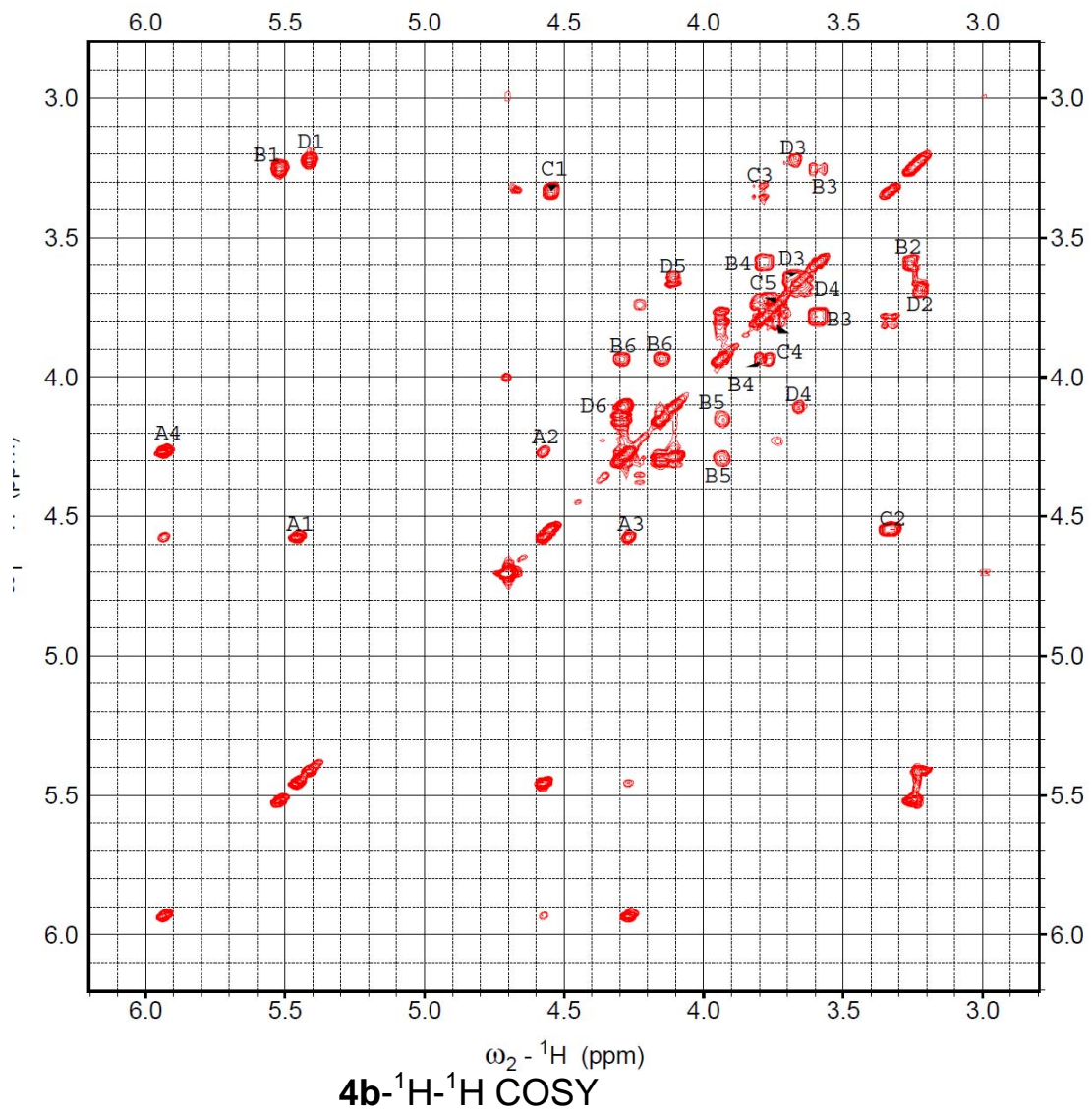
**4a HMQC**

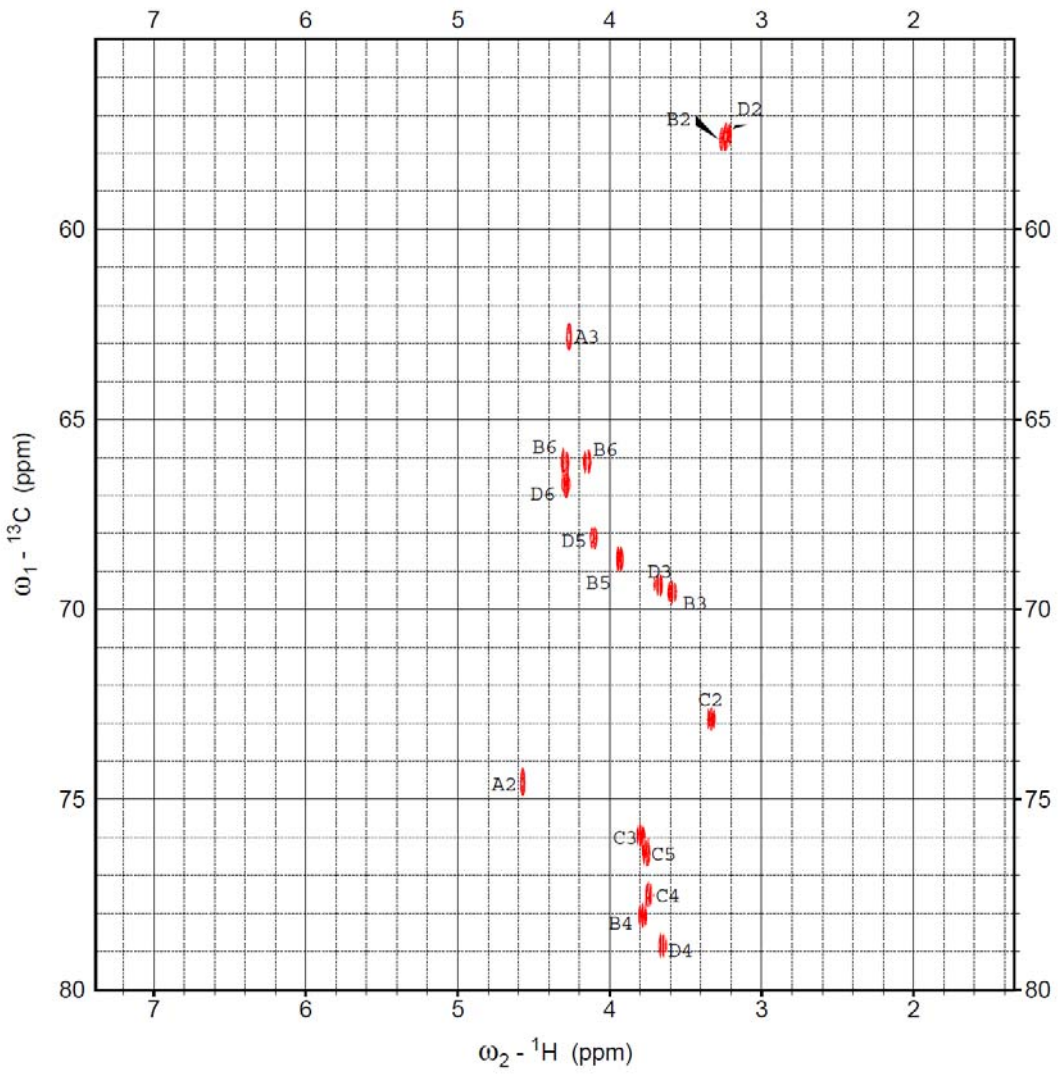
4b



4b  $^1\text{H-NMR}$

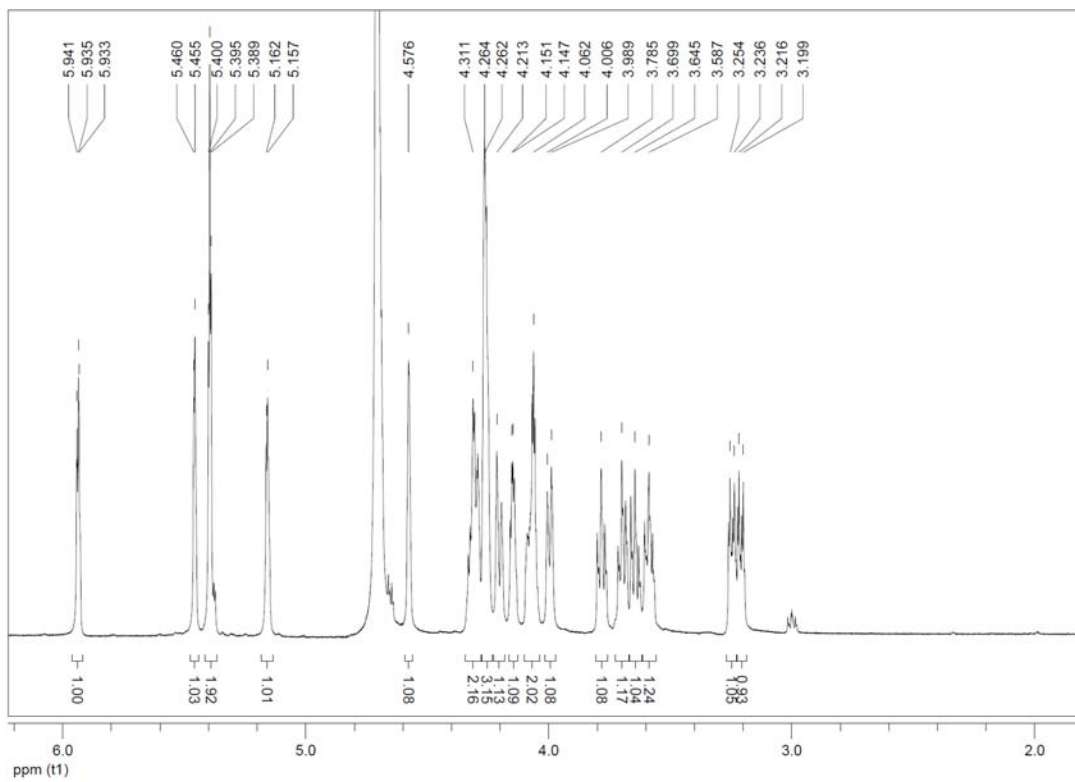




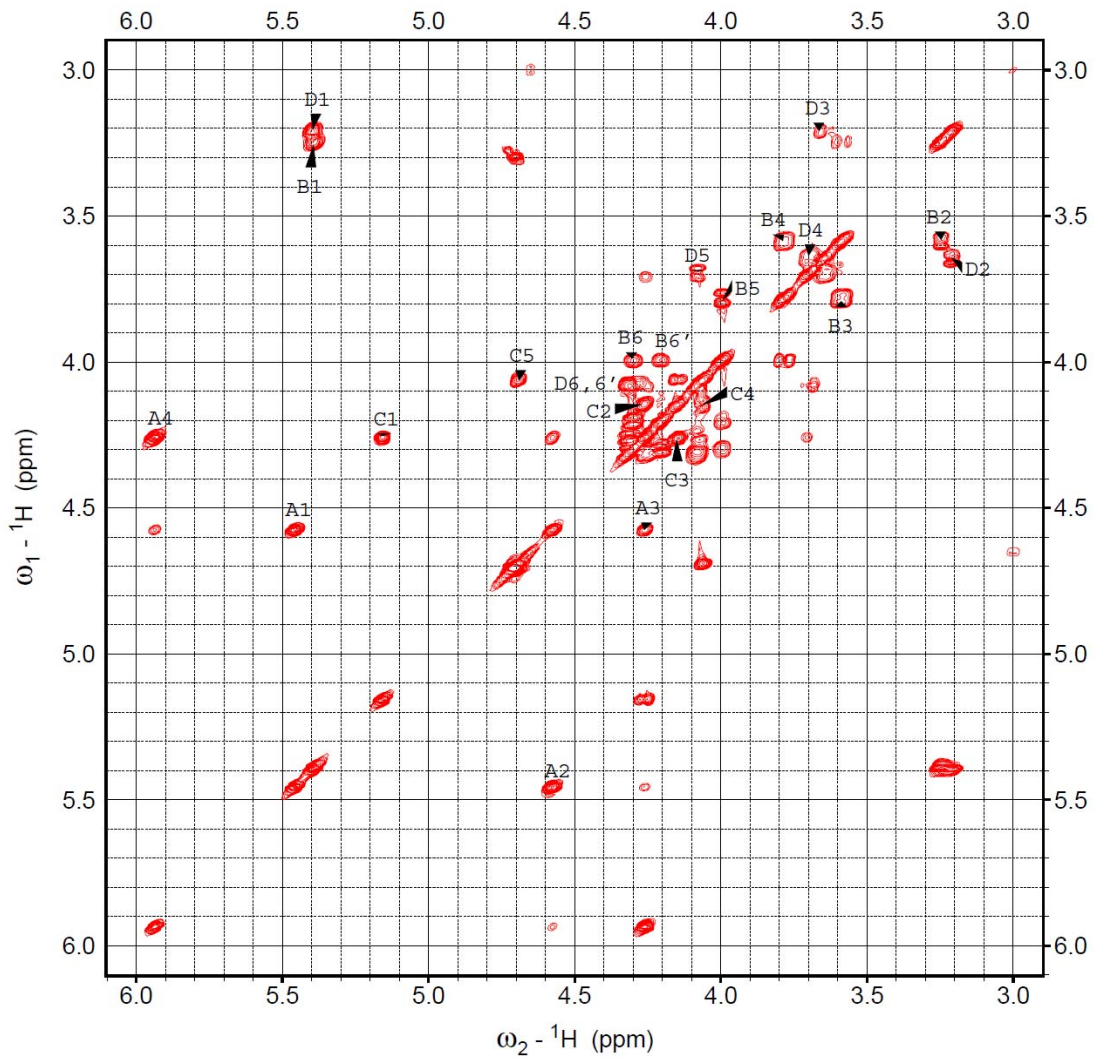


**4b** HMQC

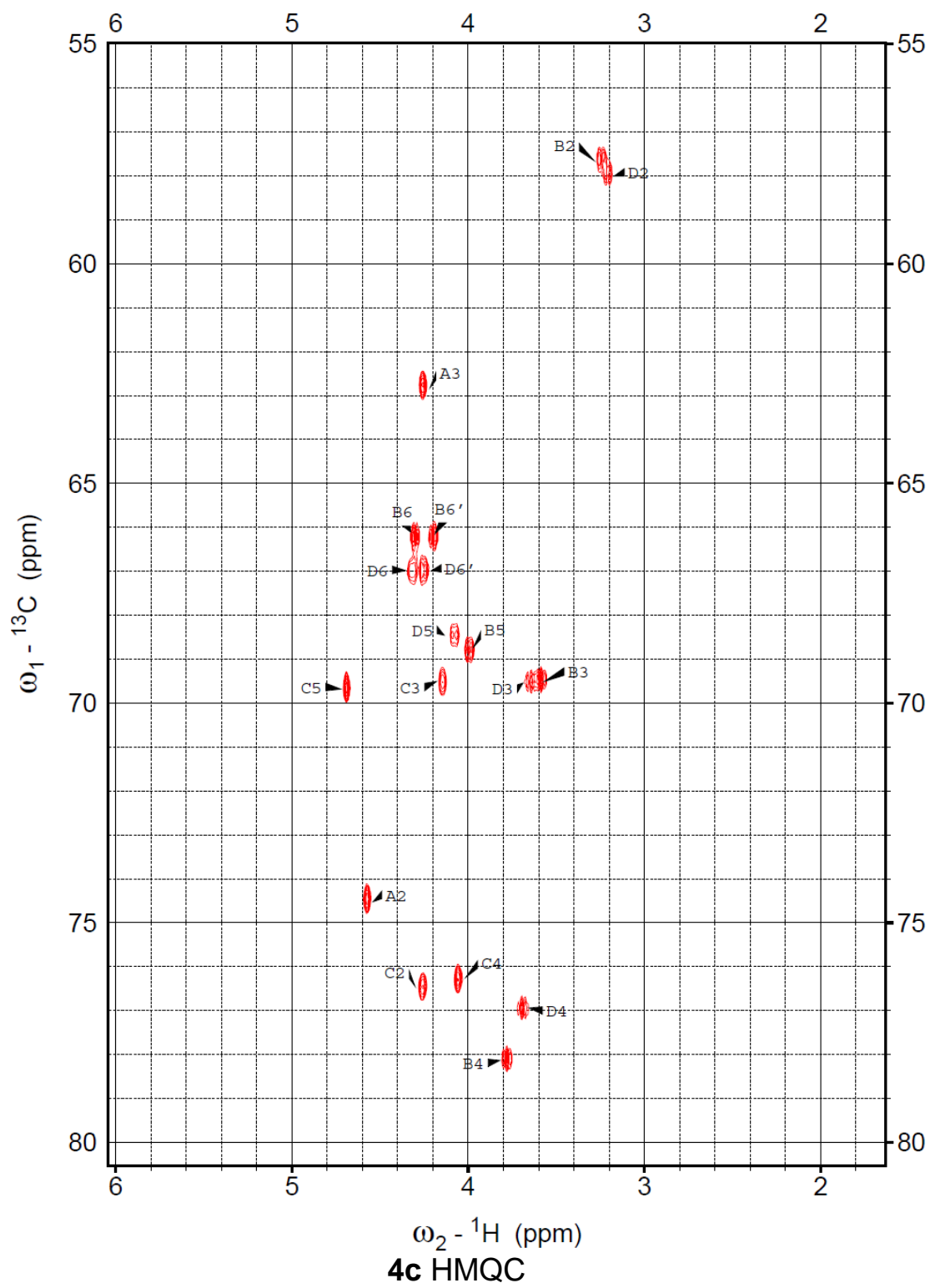
4c



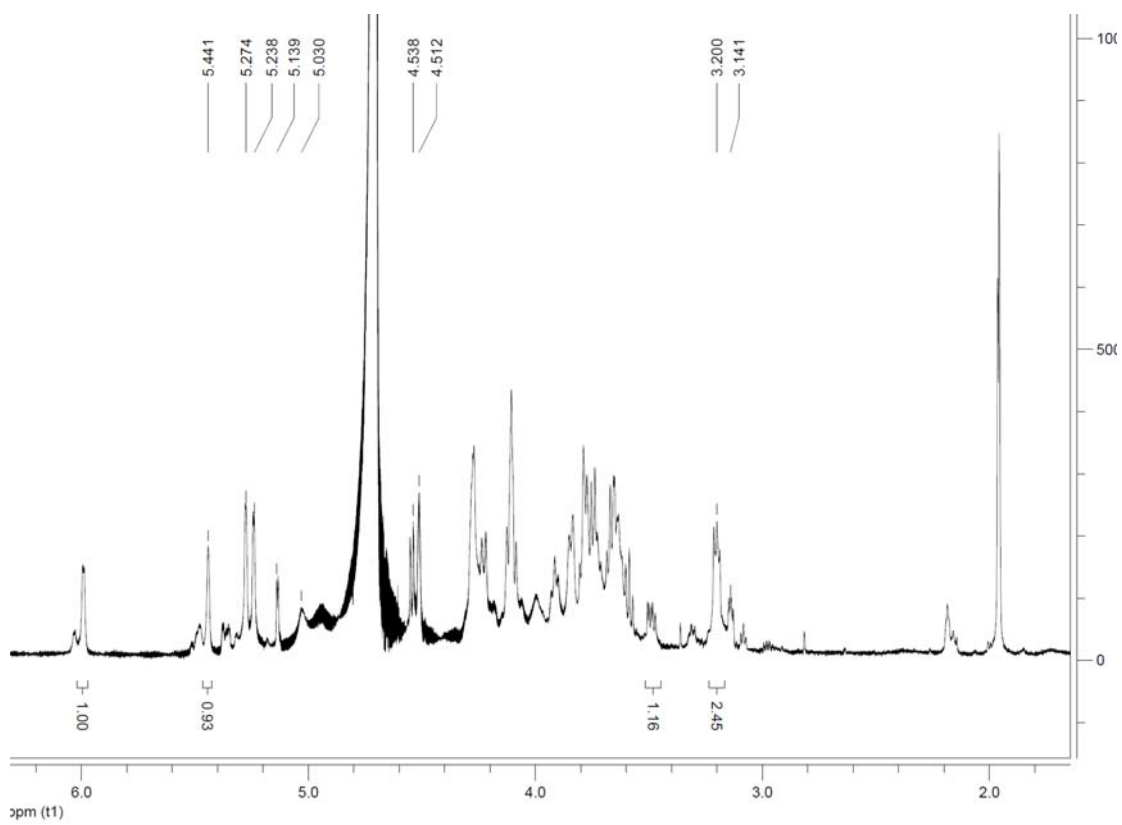
4c <sup>1</sup>H-NMR



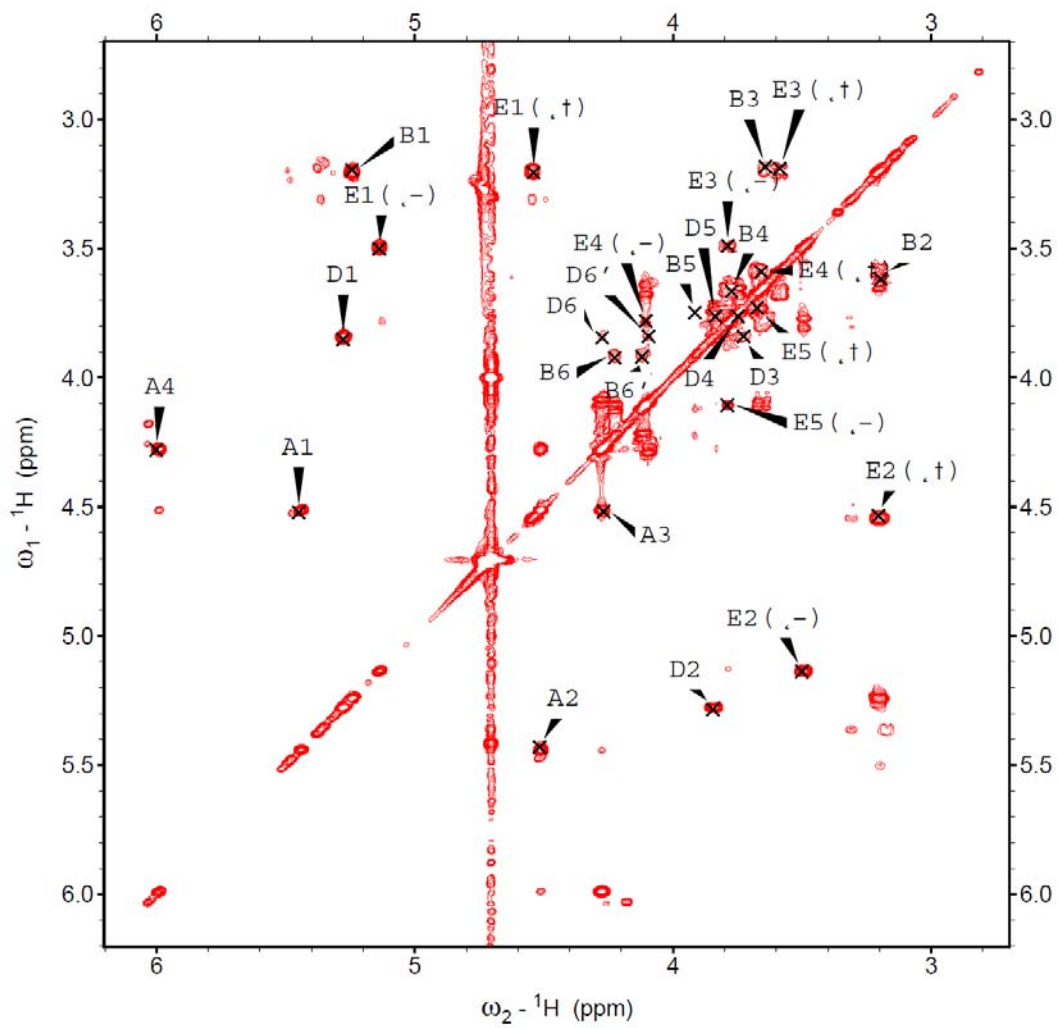
**4c-<sup>1</sup>H-<sup>1</sup>H COSY**



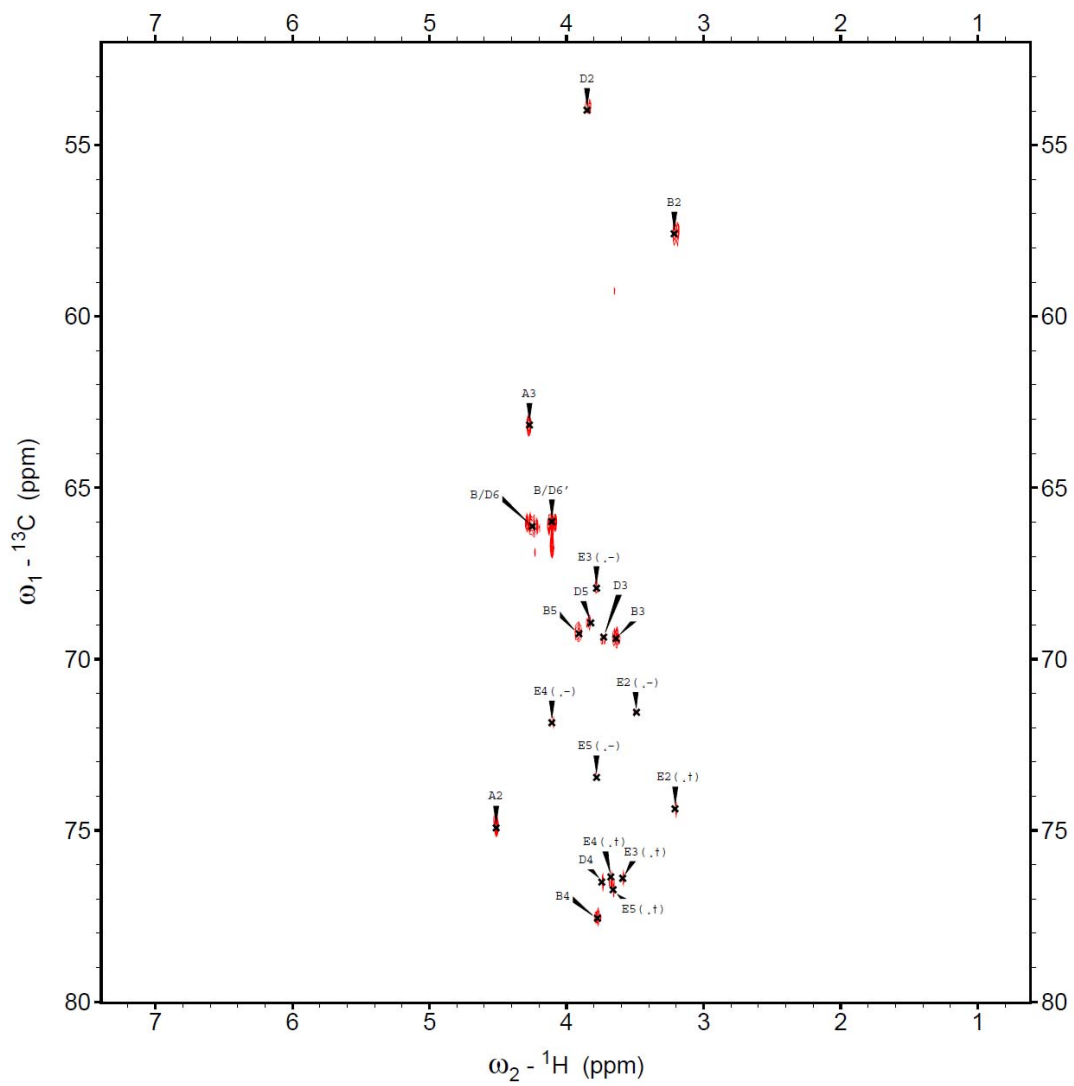
5



5 <sup>1</sup>H-NMR



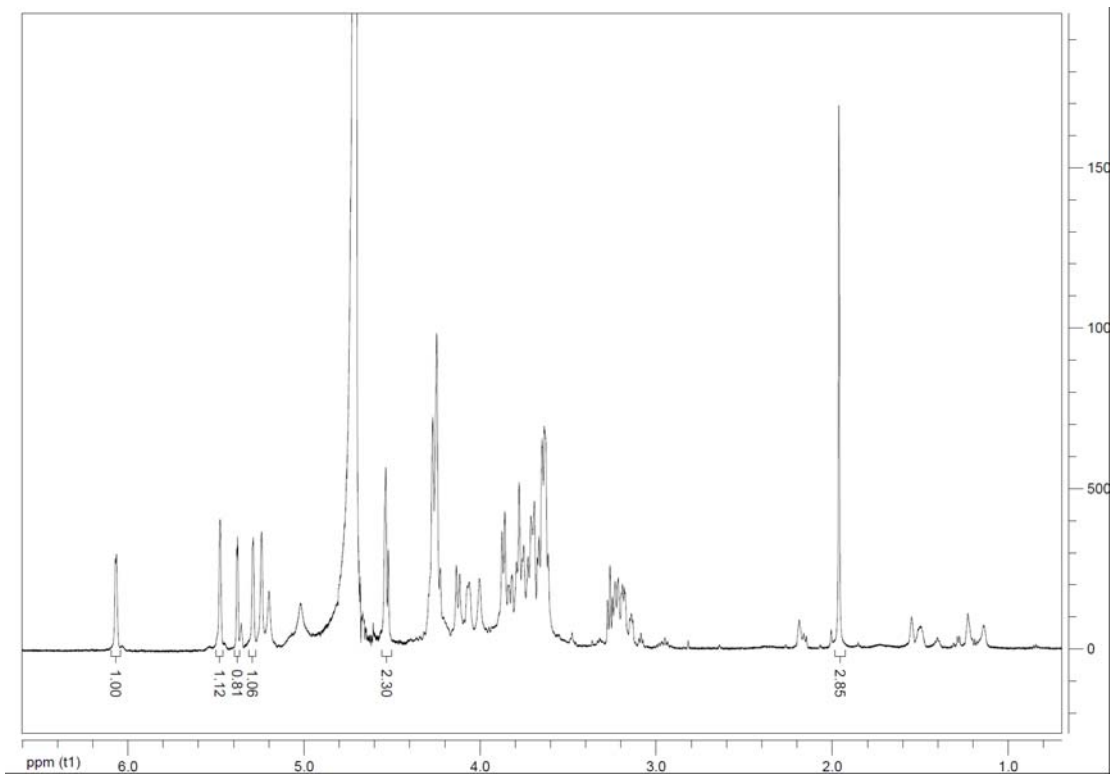
5 <sup>1</sup>H-<sup>1</sup>H COSY



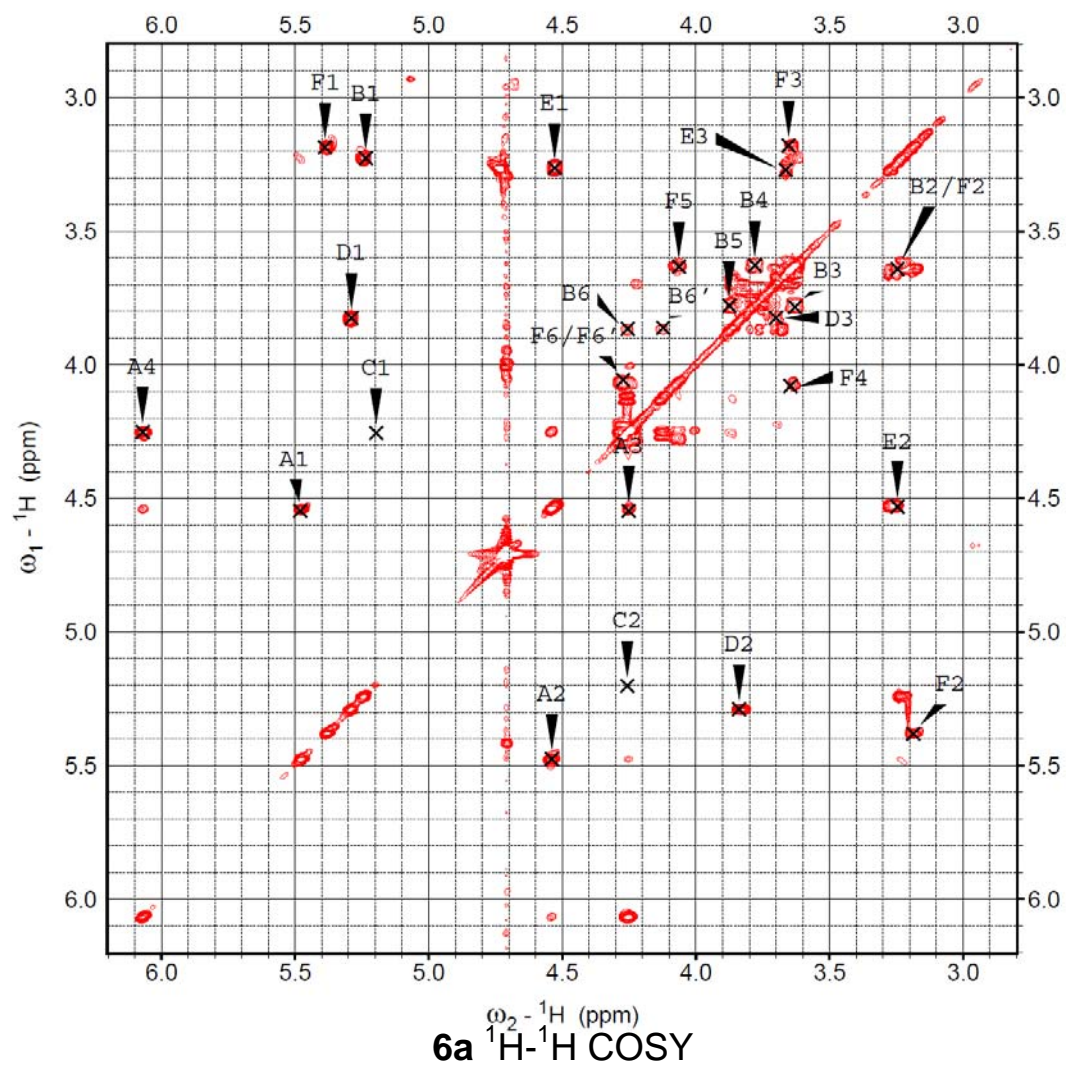
**5 HMQC**

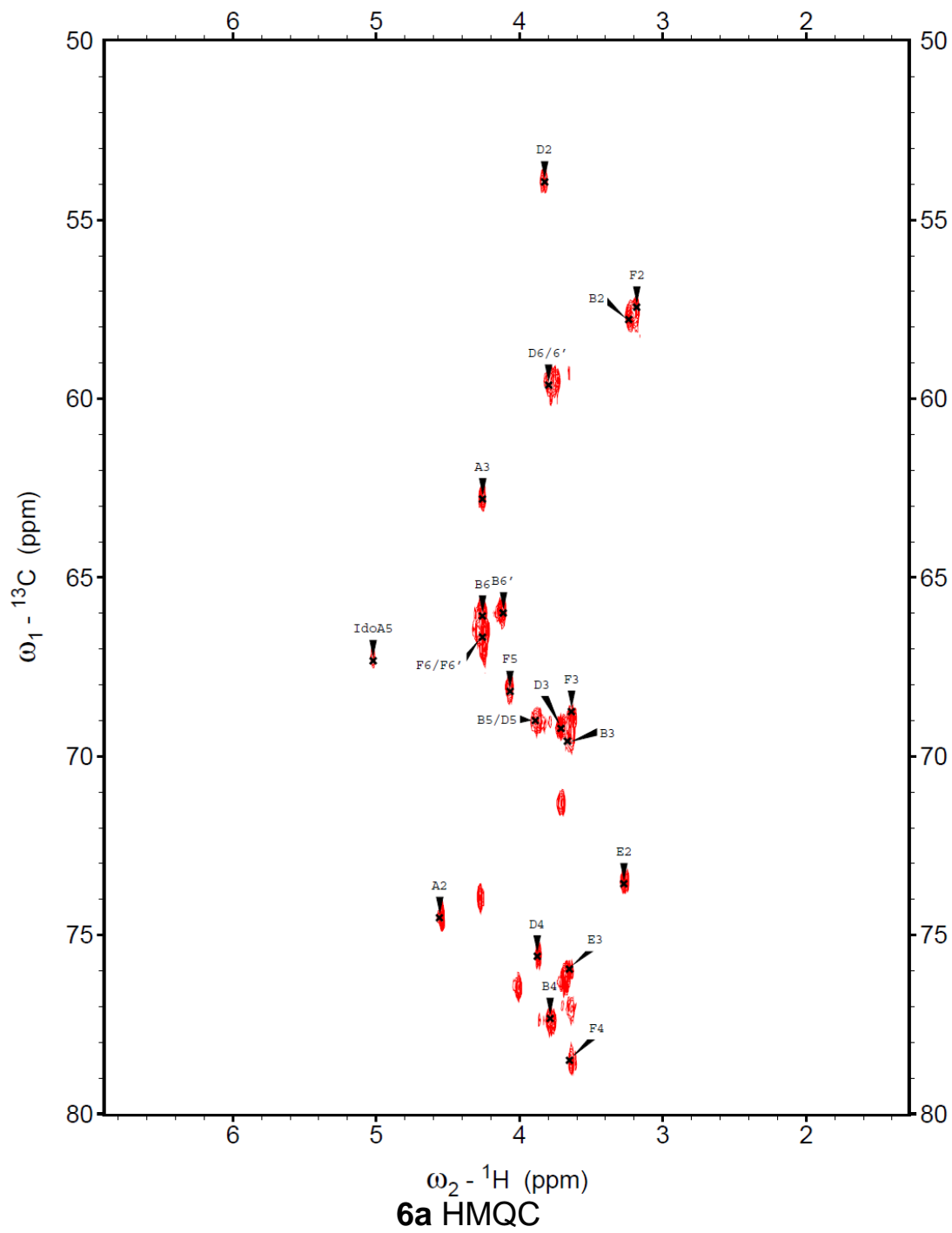


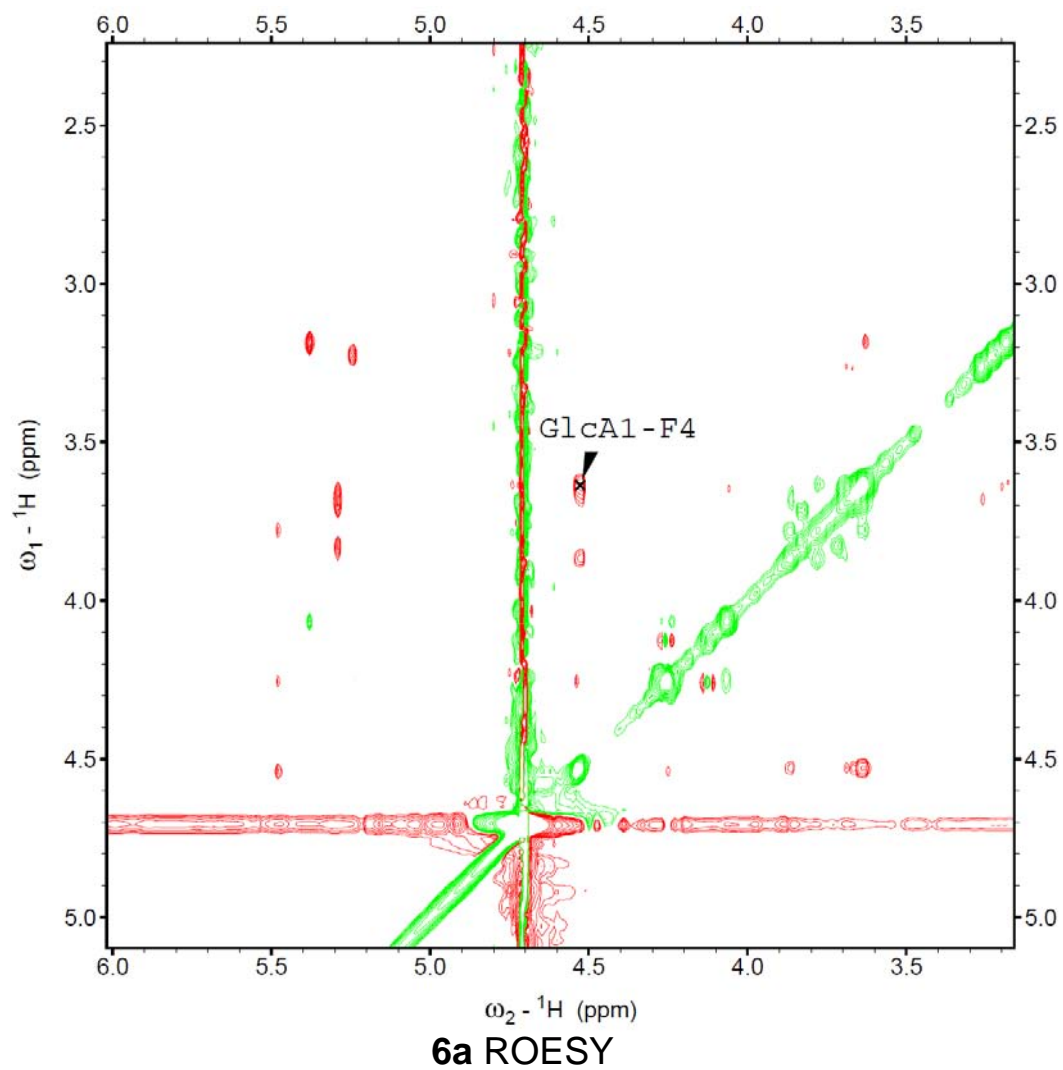
6a

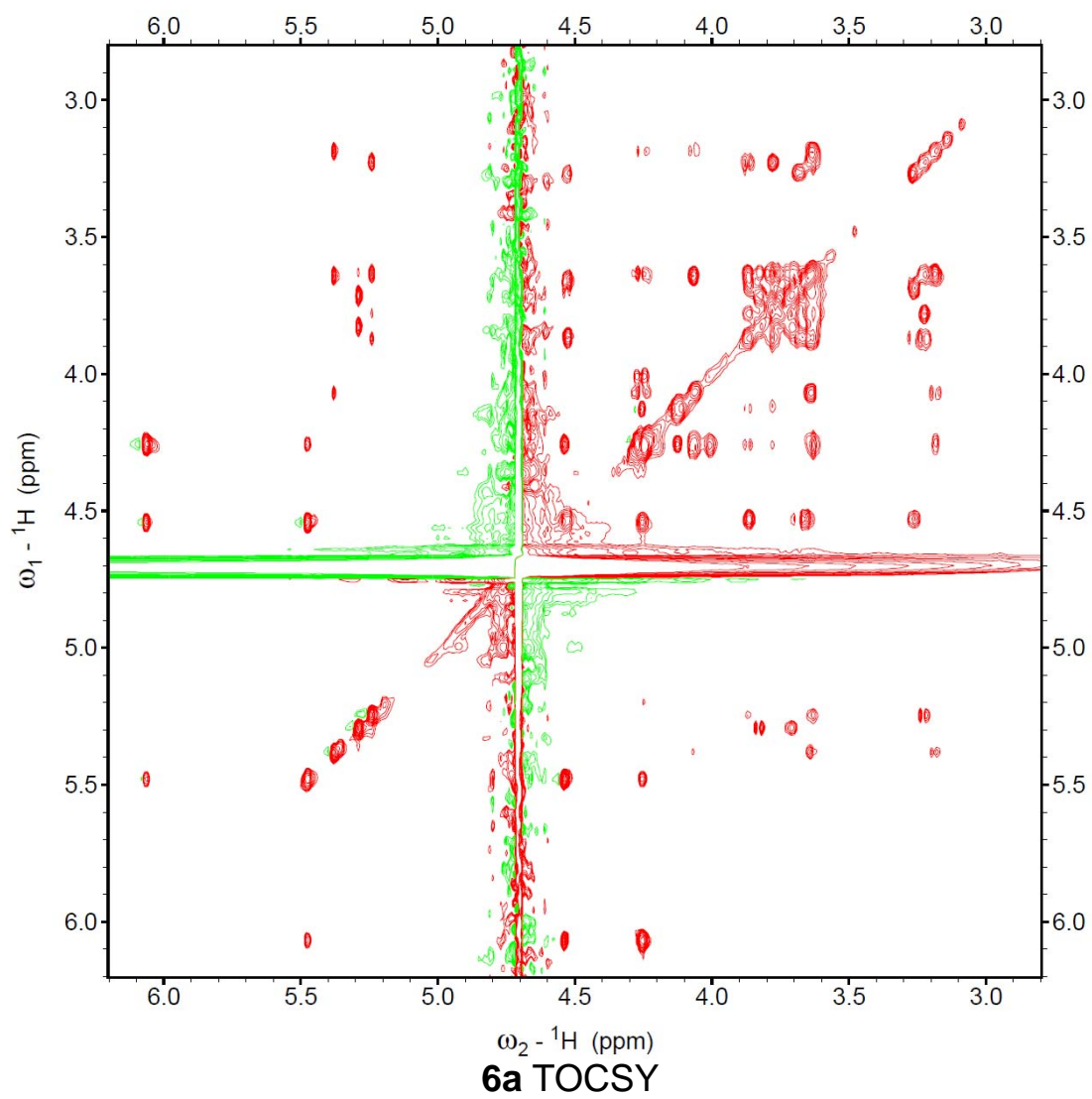


6a  $^1\text{H-NMR}$

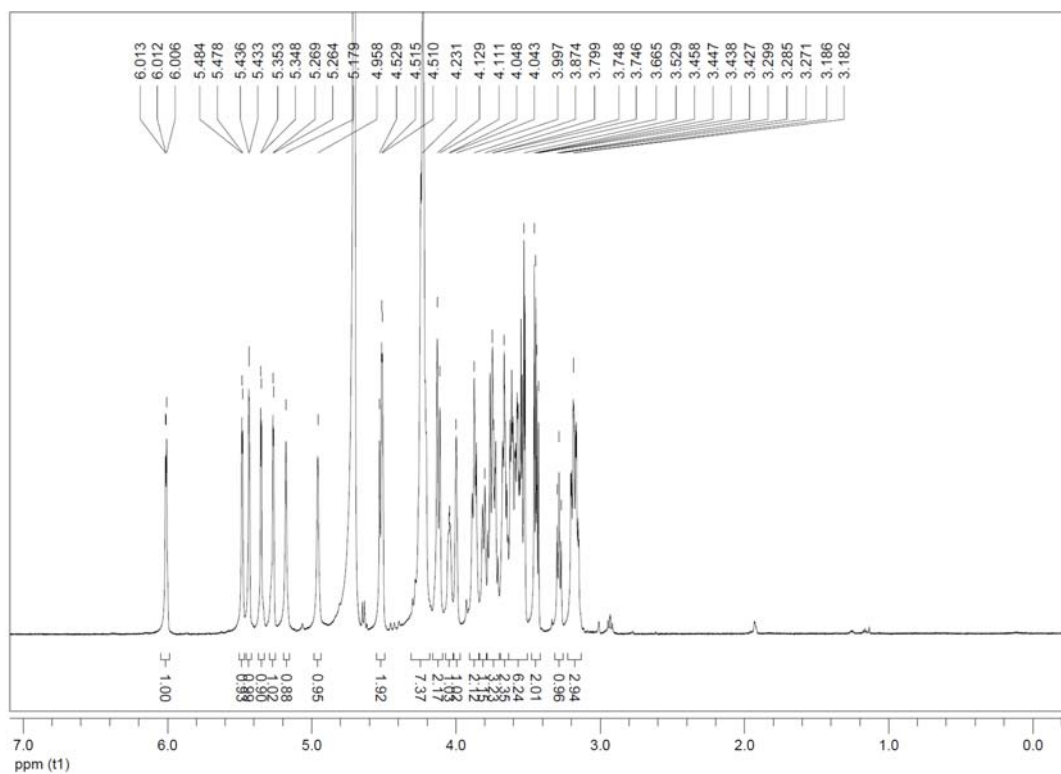




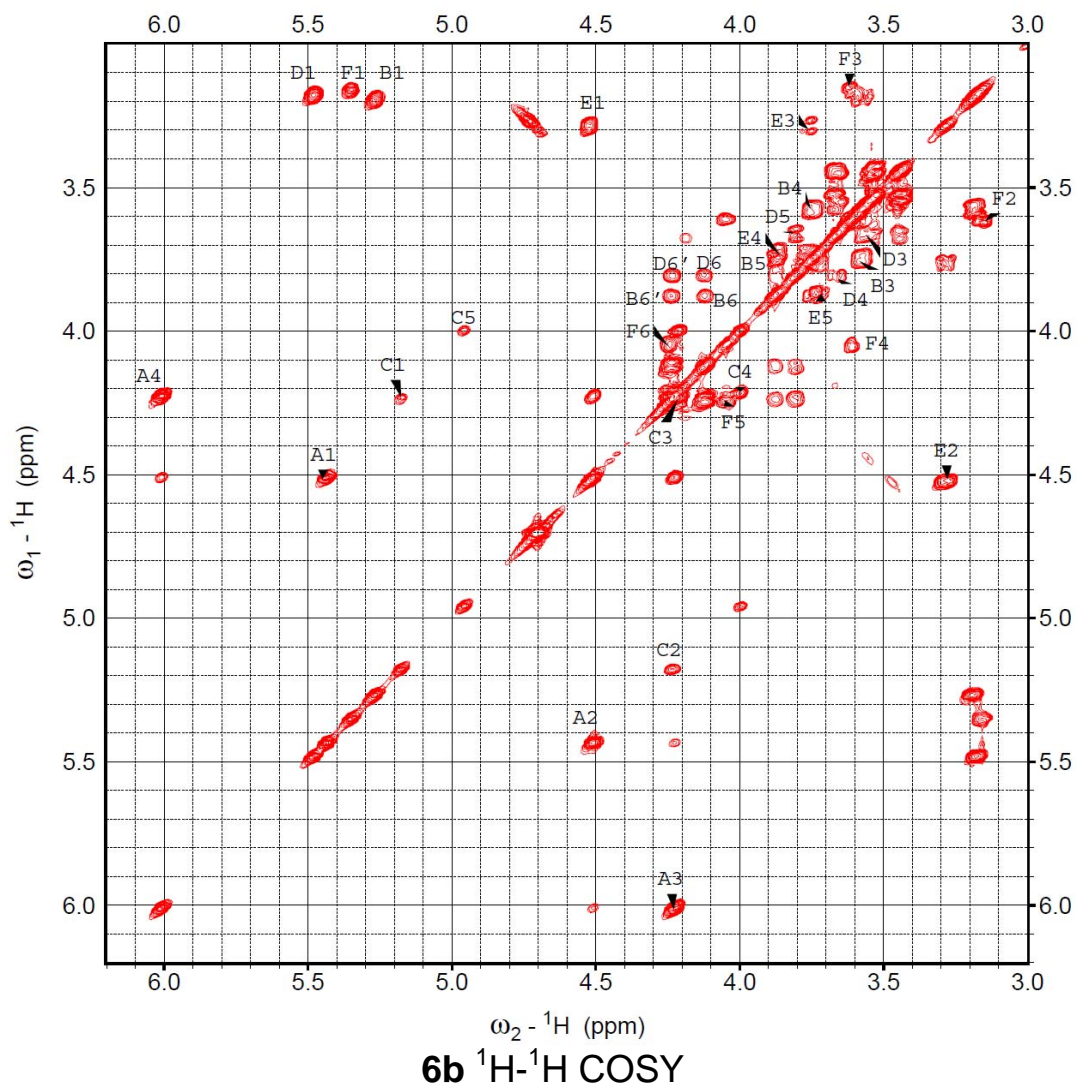


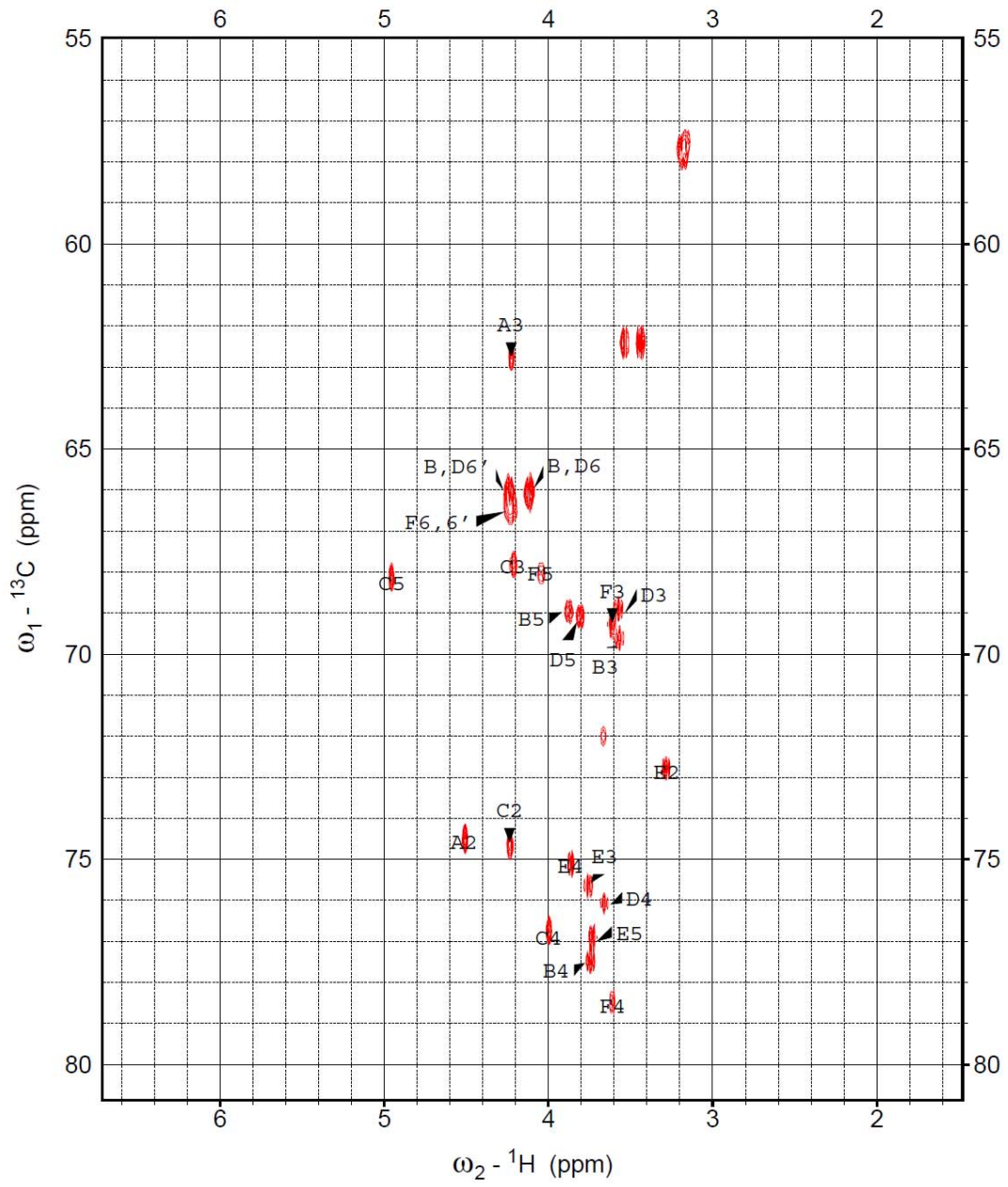


6b



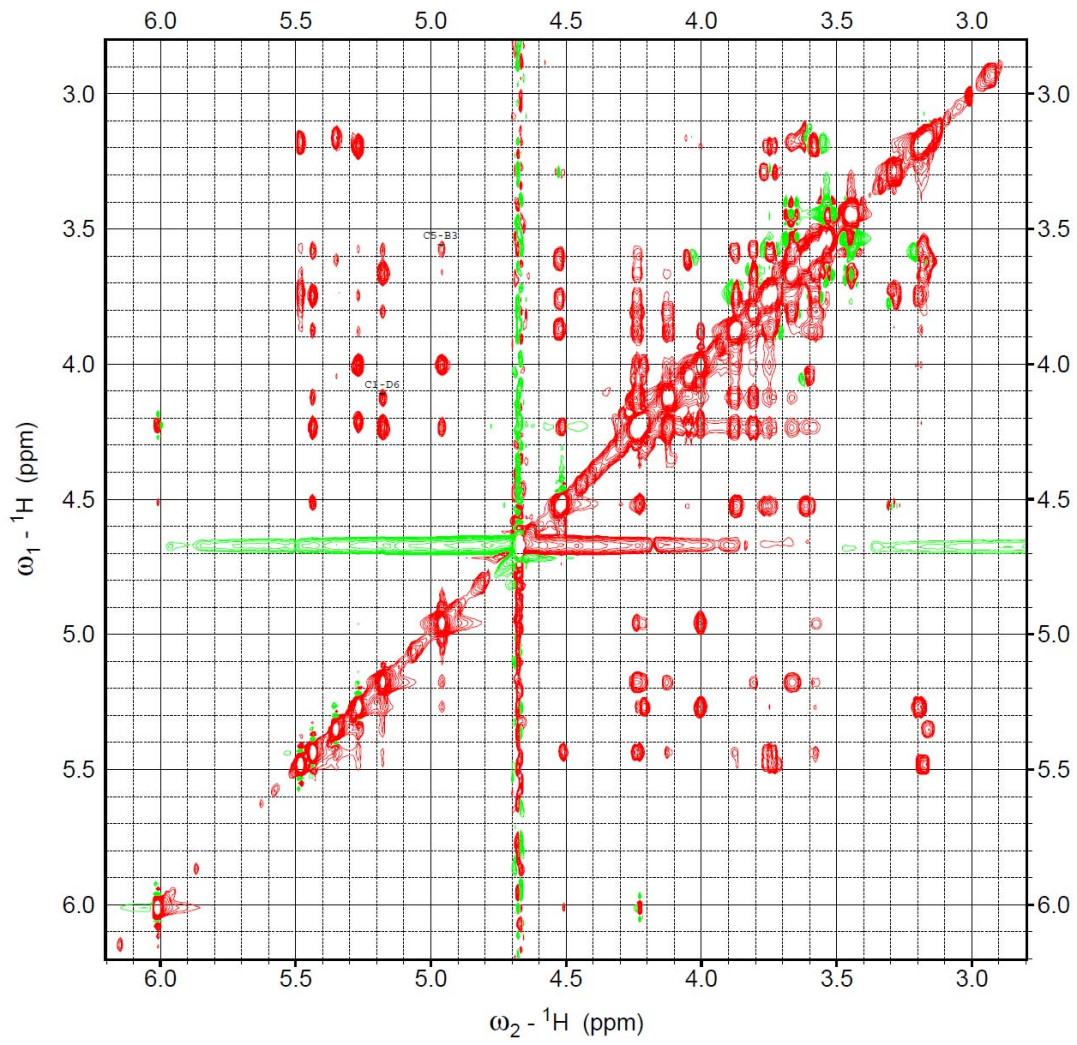
6b <sup>1</sup>H-NMR



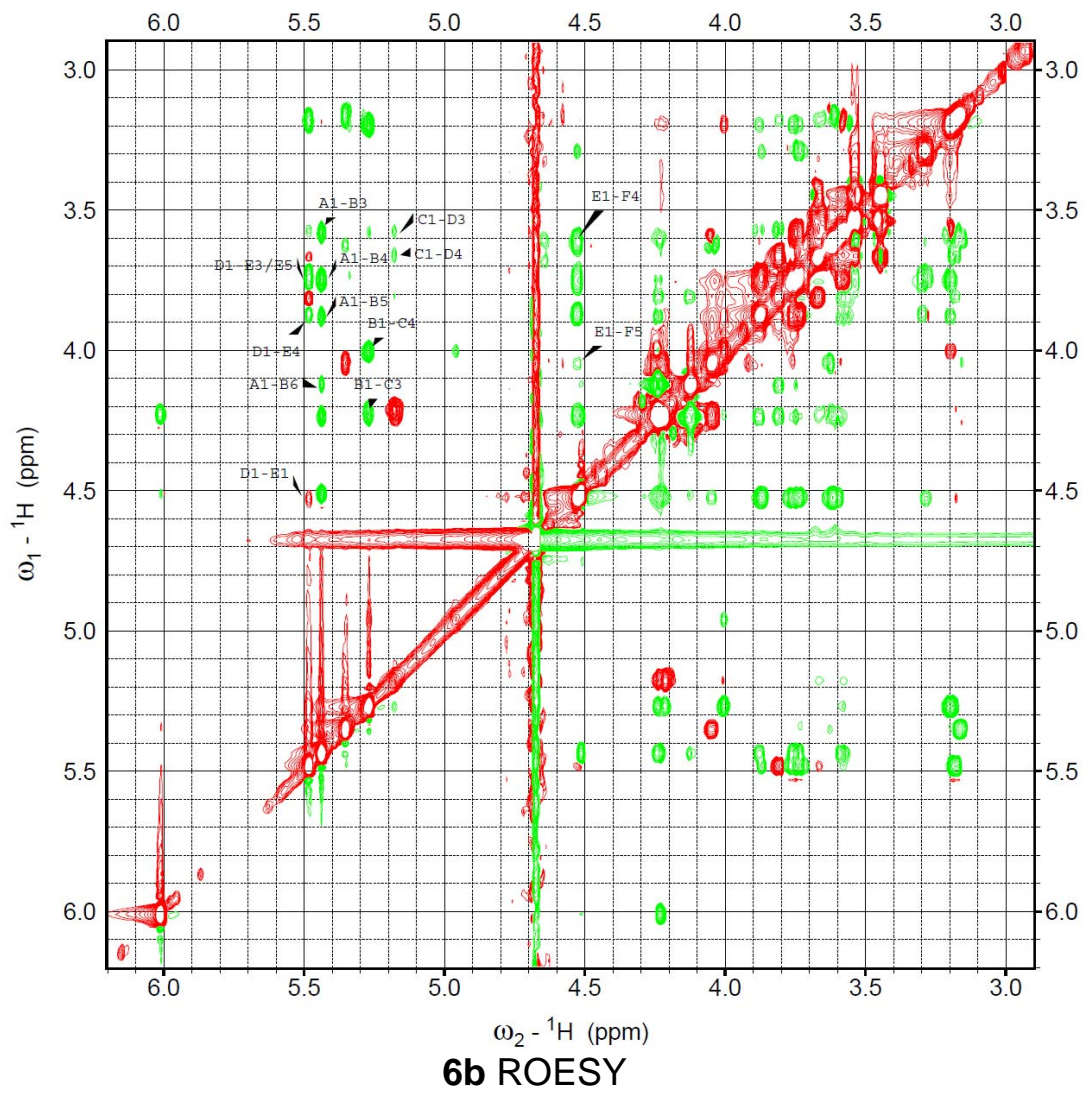


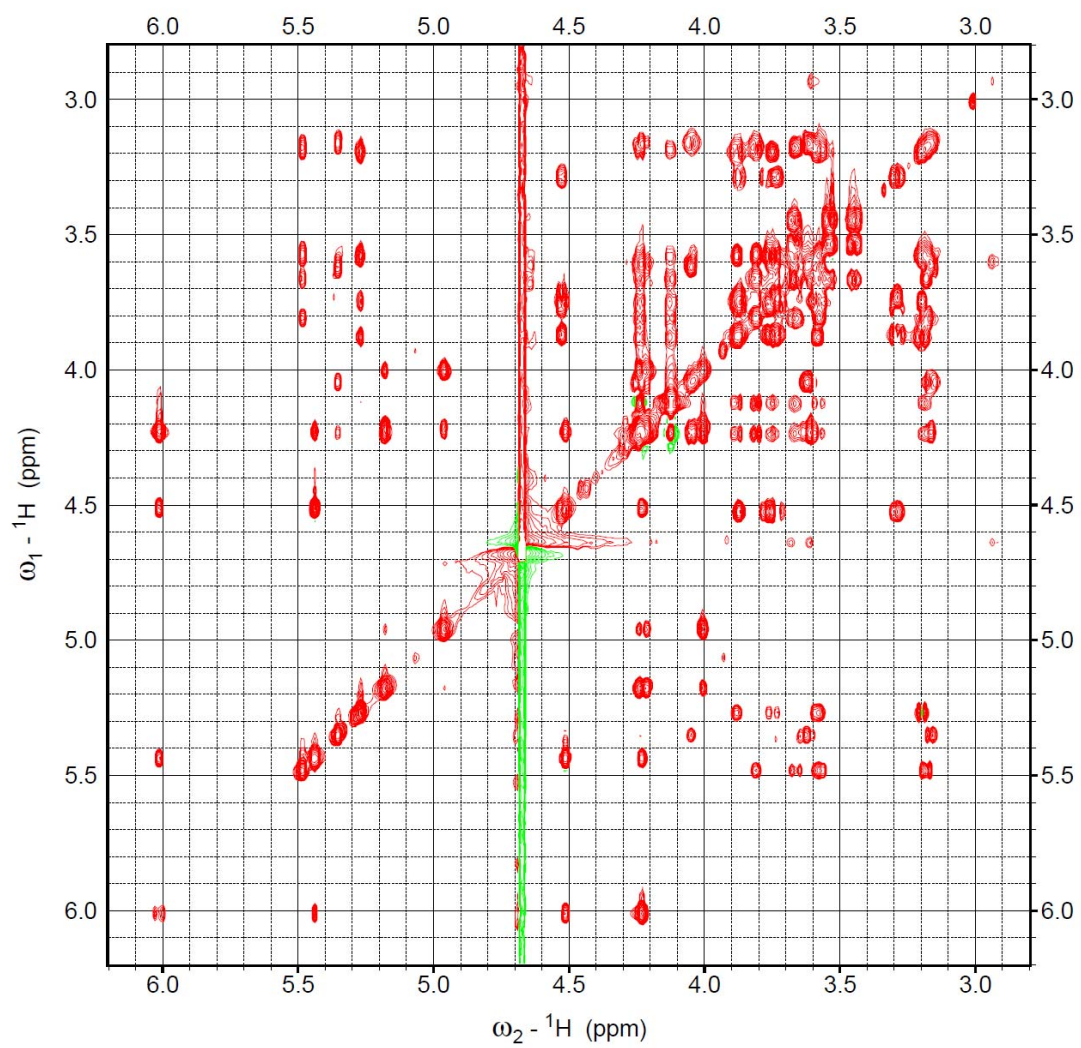
**6b** HMQC





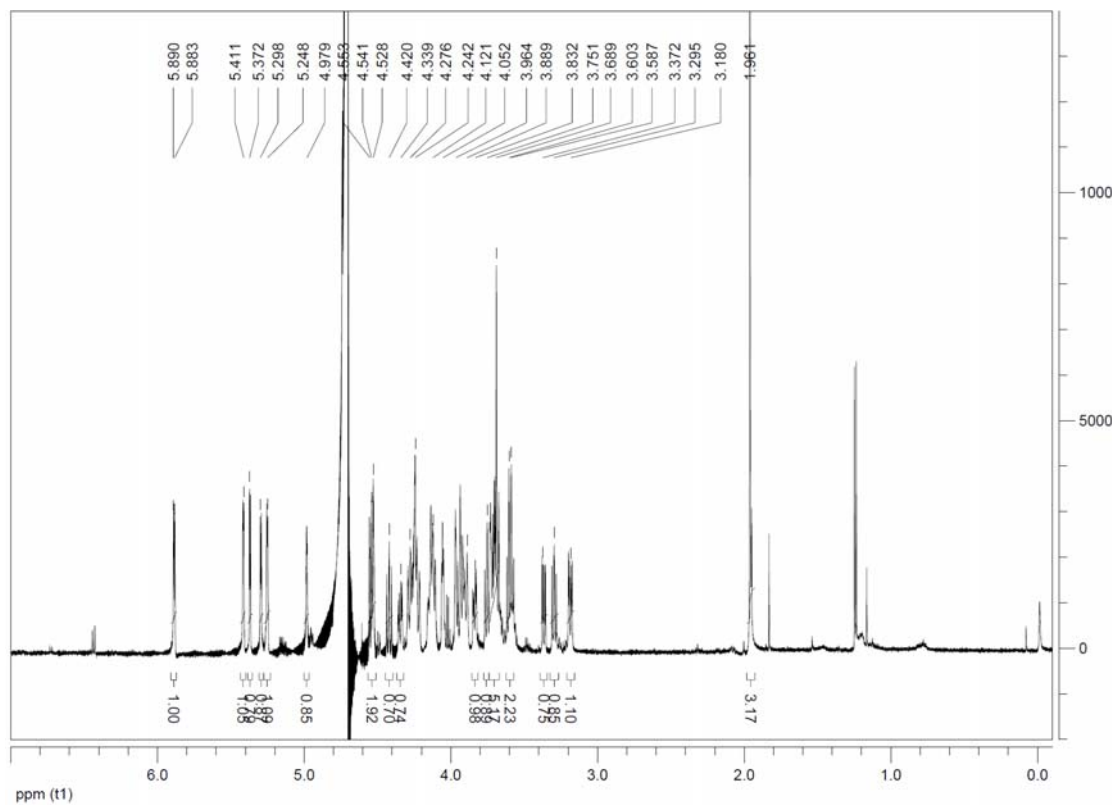
**6b** NOESY



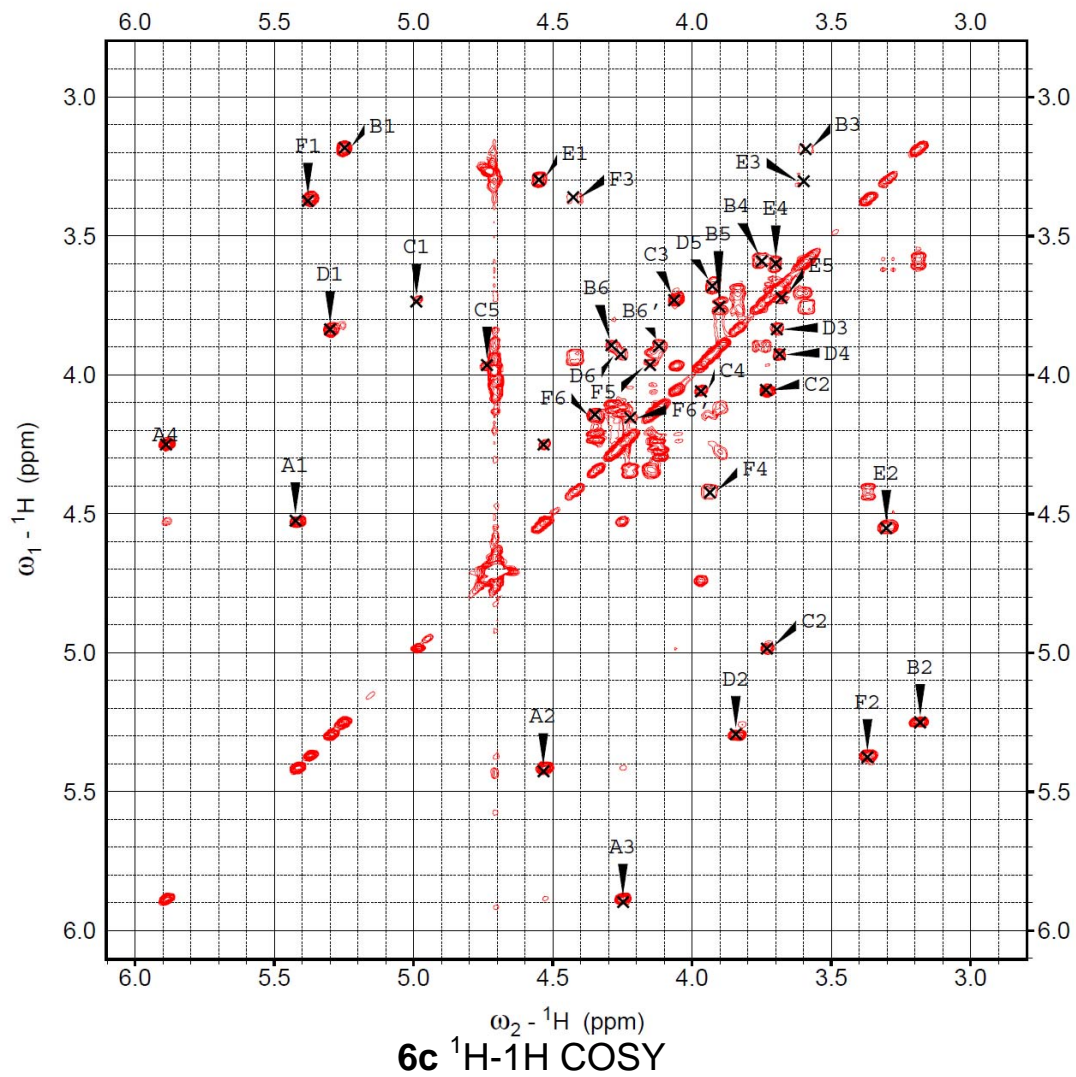


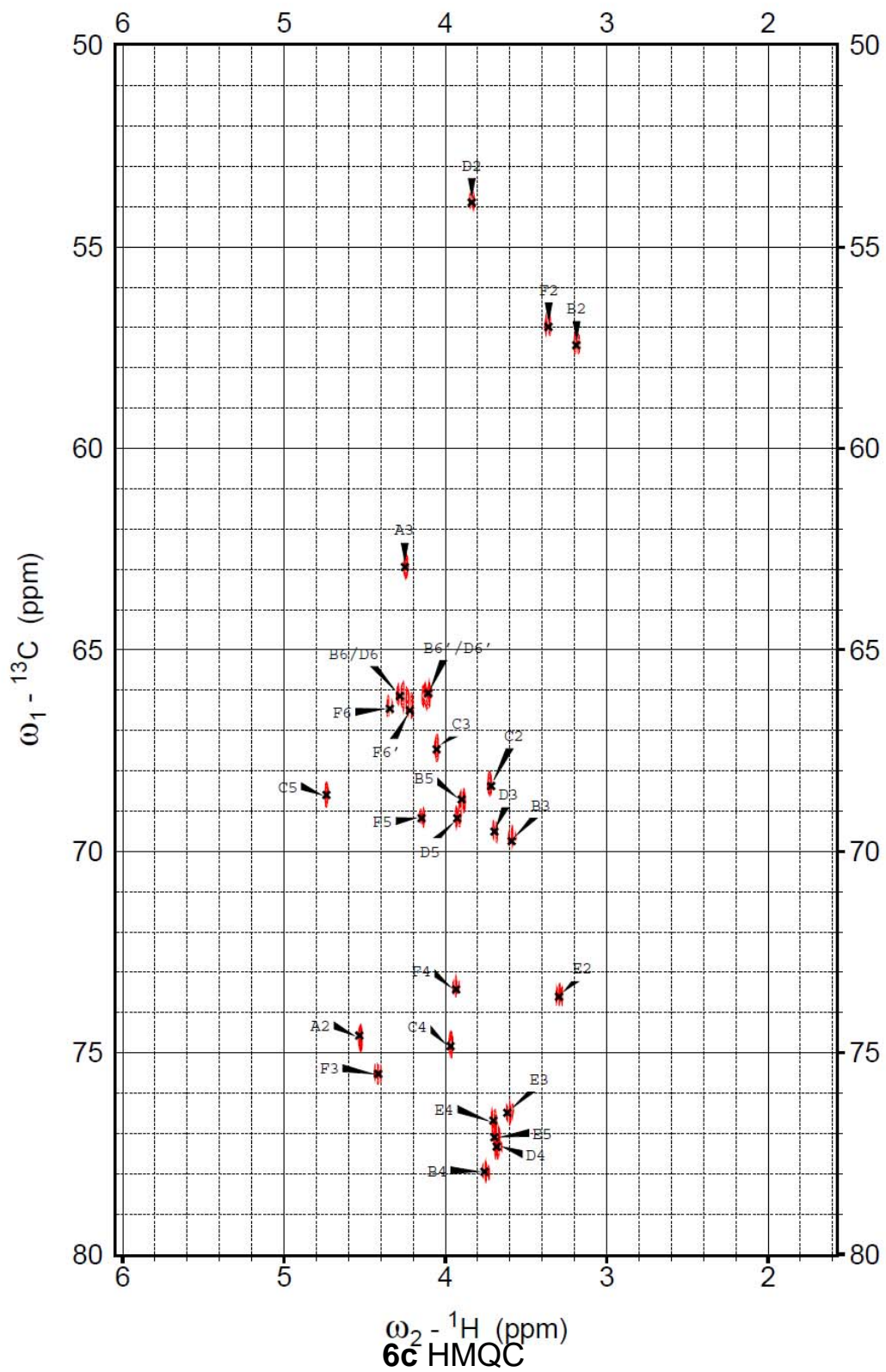
**6b** TOCSY

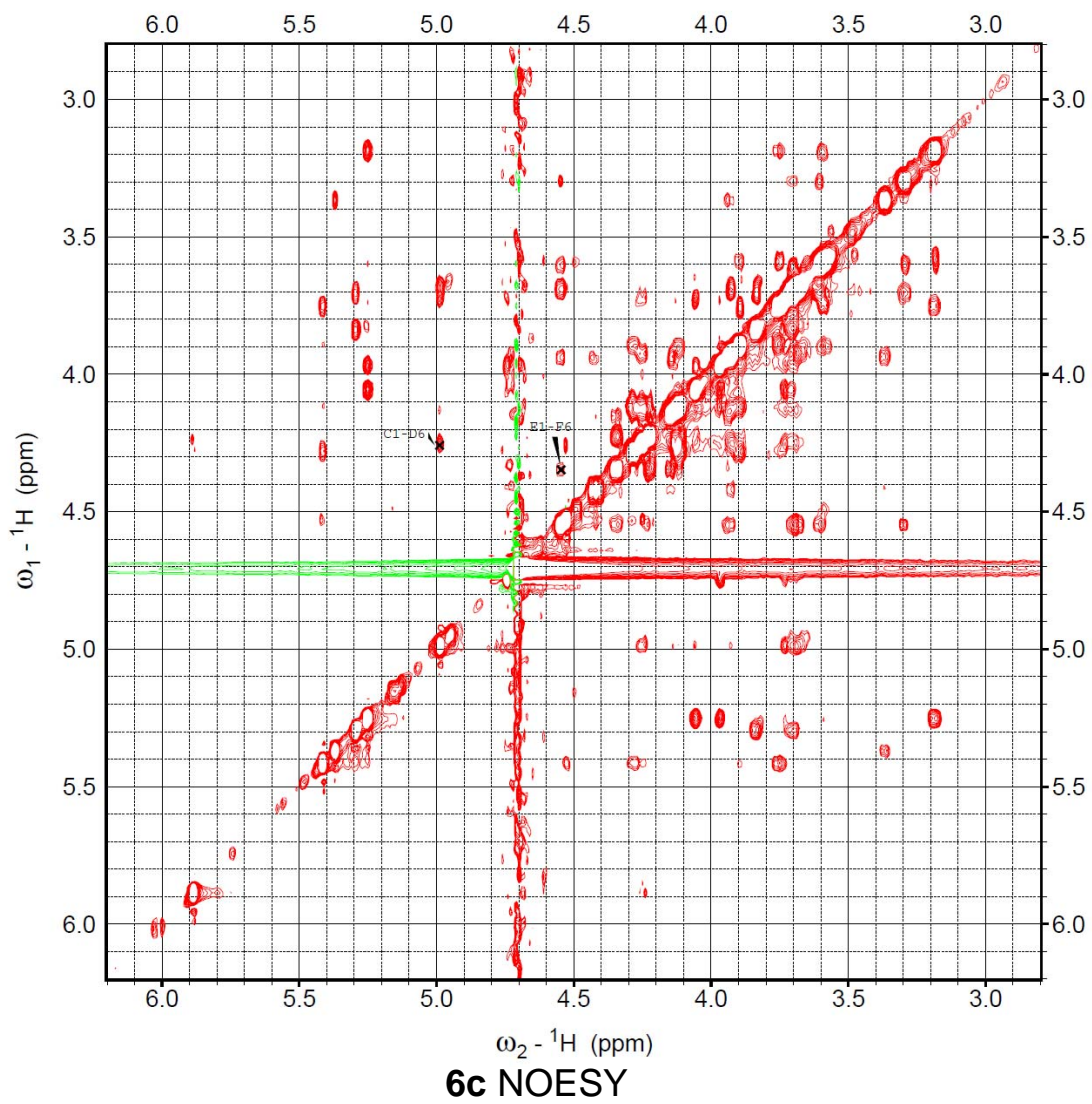
6c

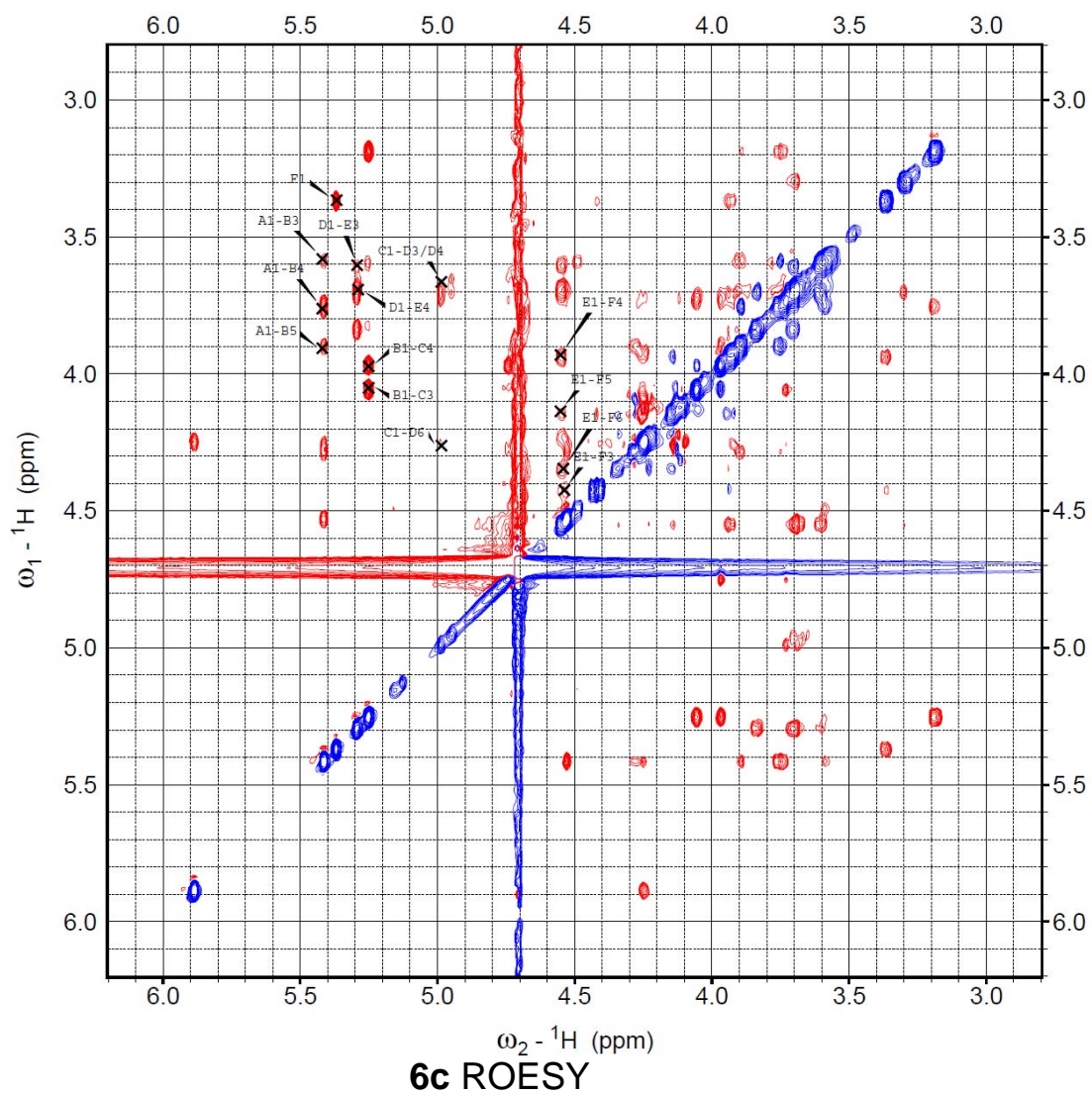


6c <sup>1</sup>H-NMR

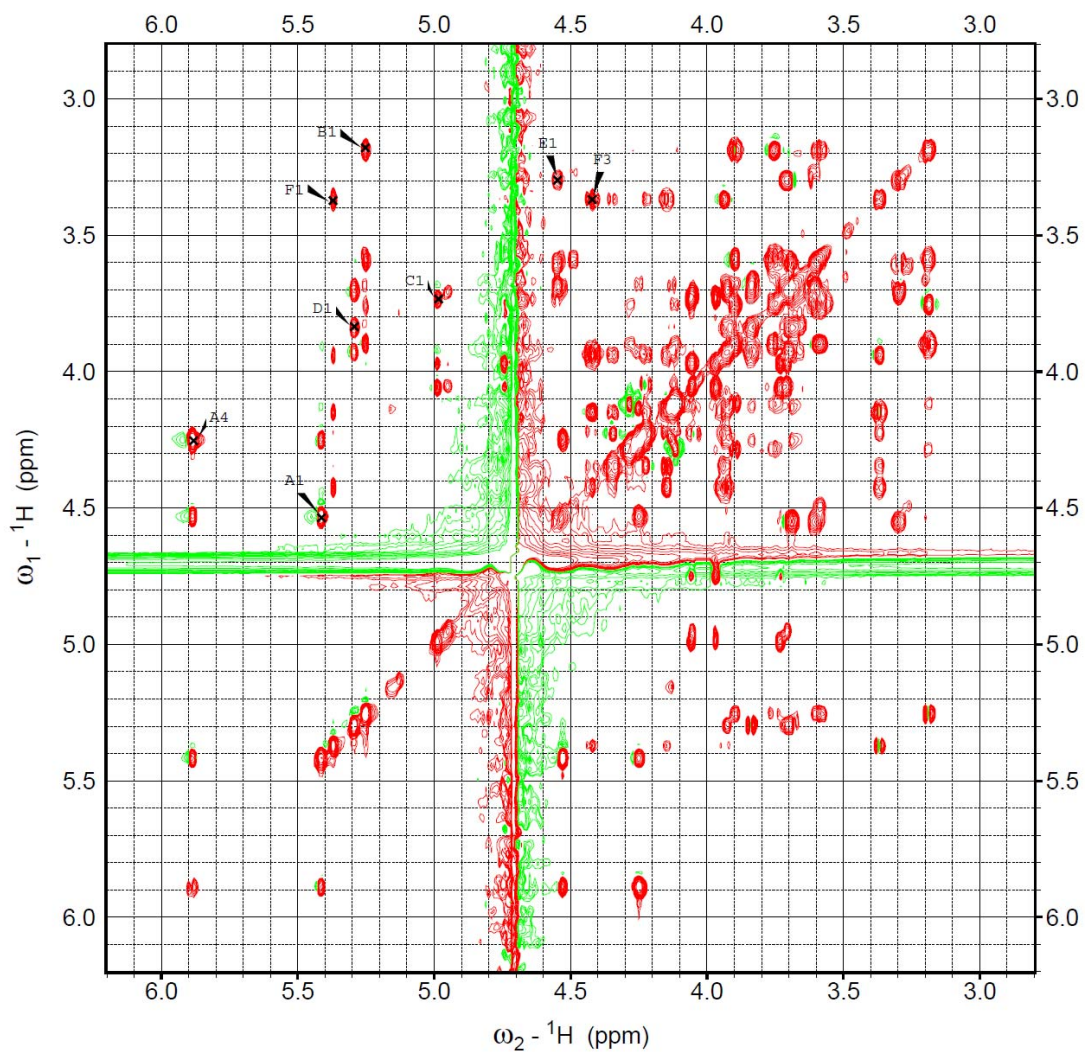






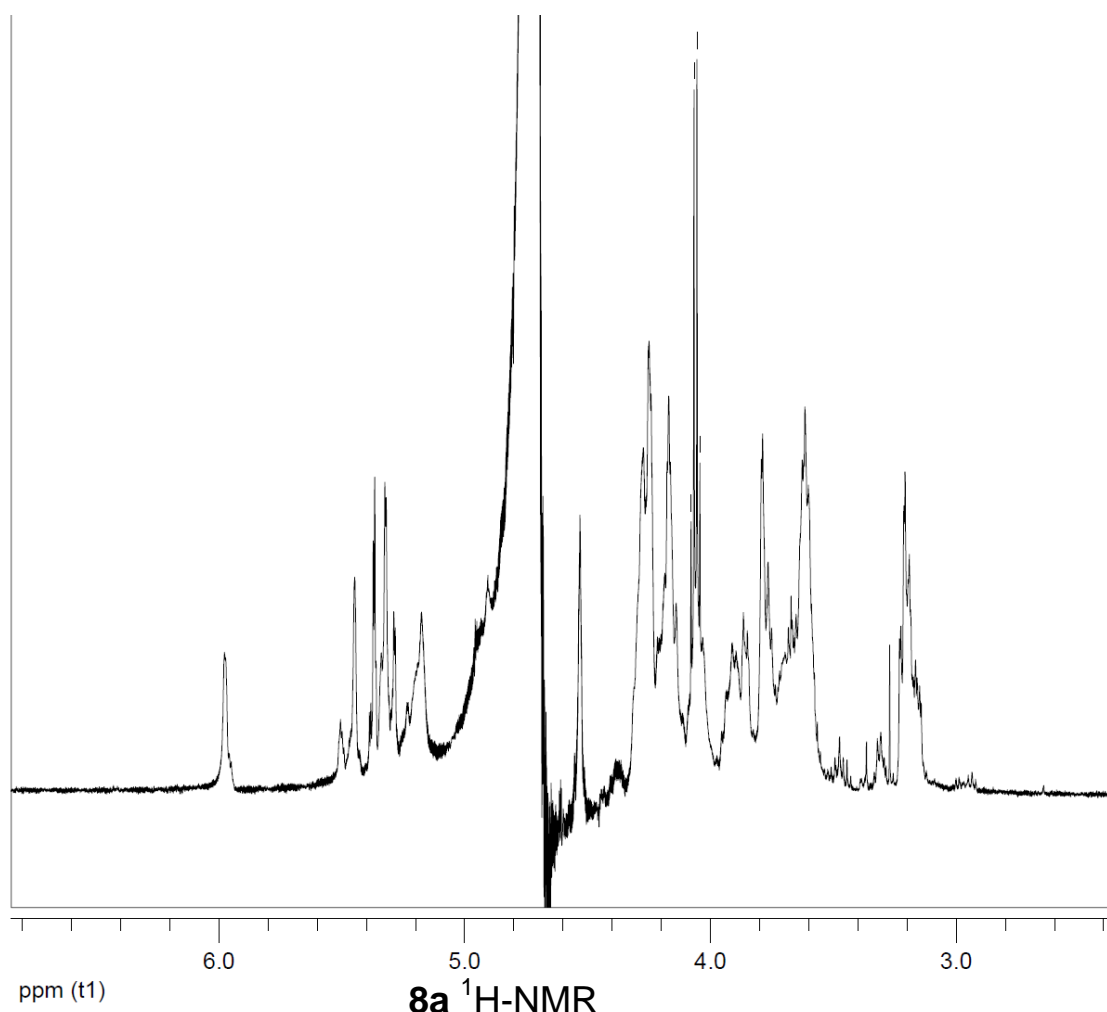


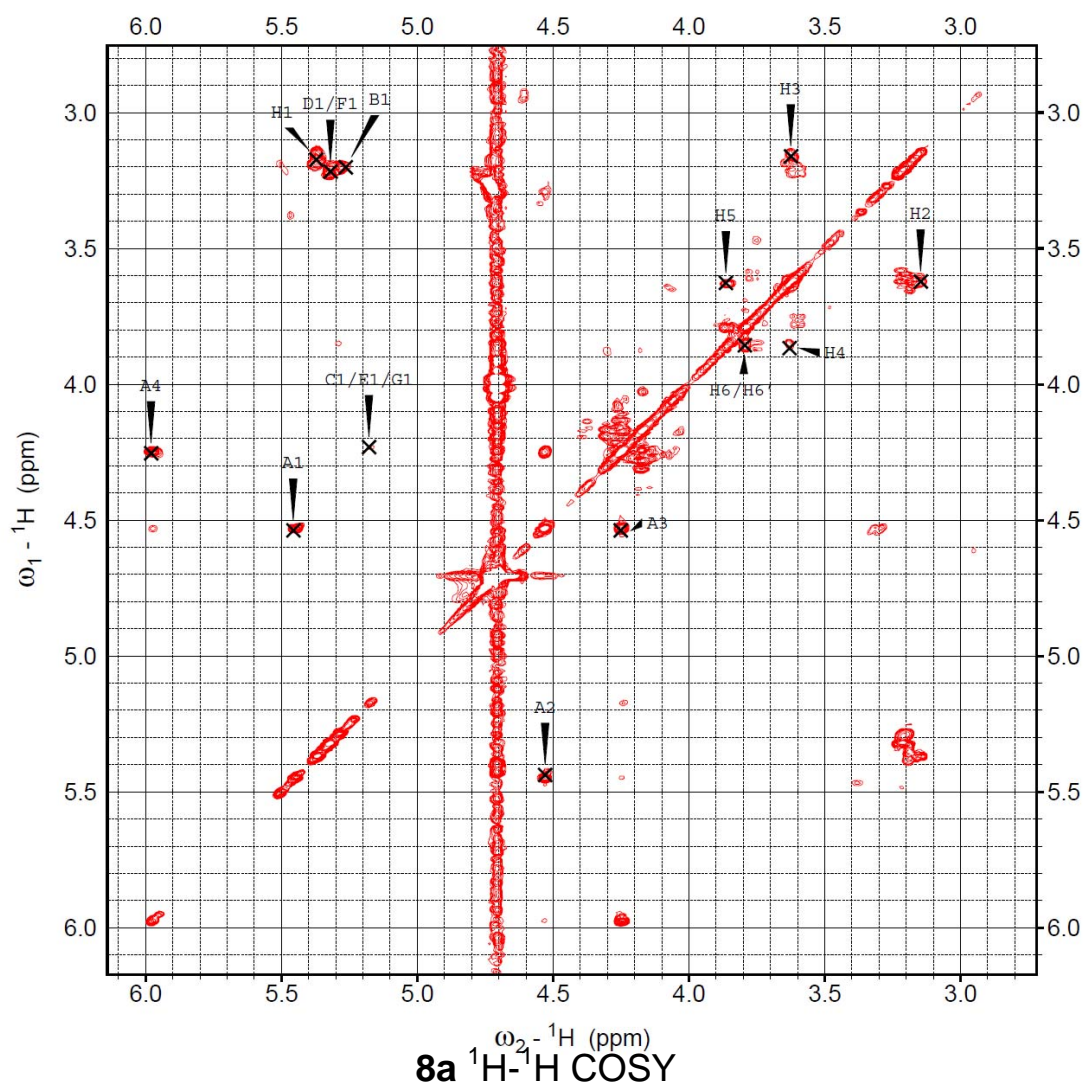


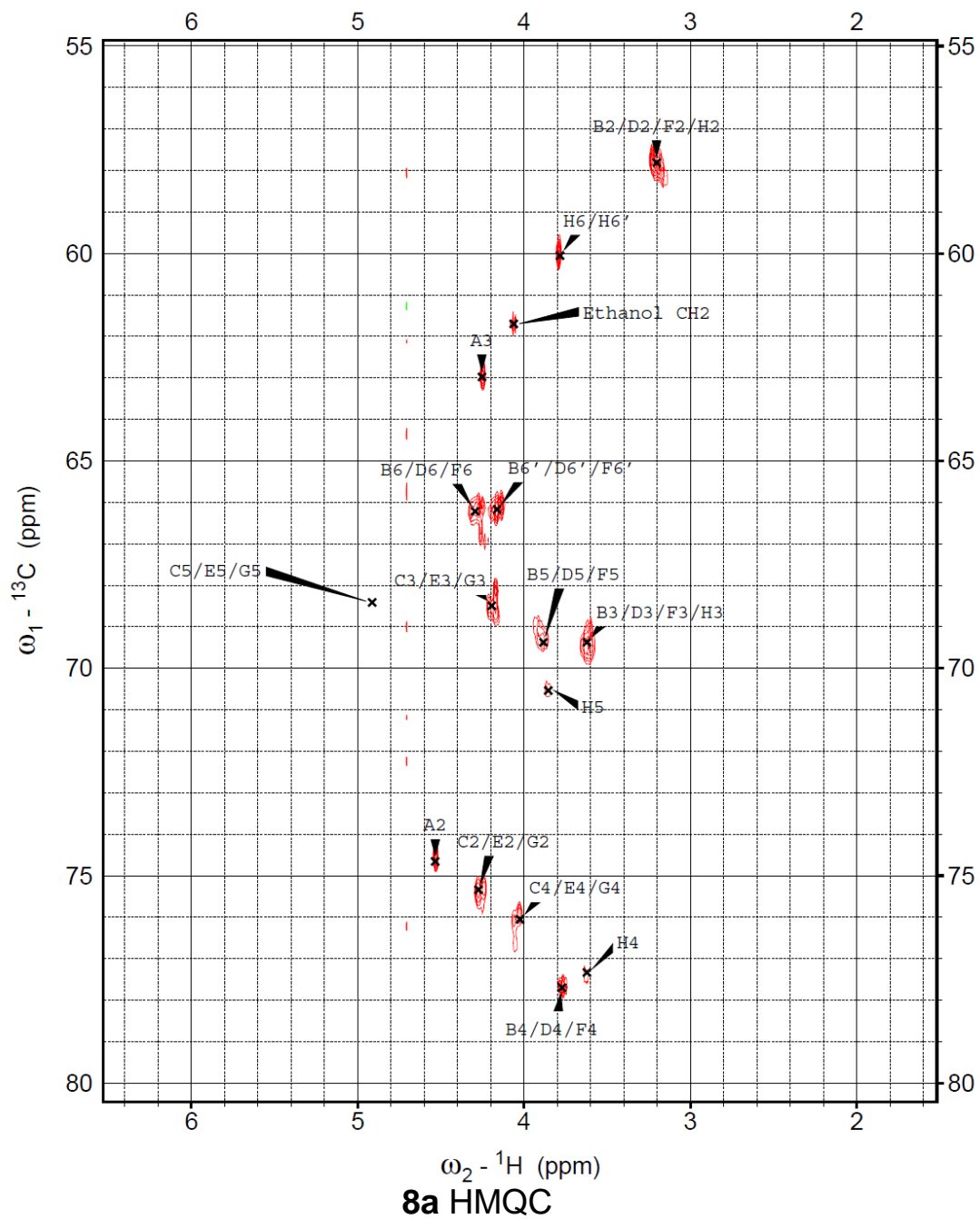


**6c** TOCSY

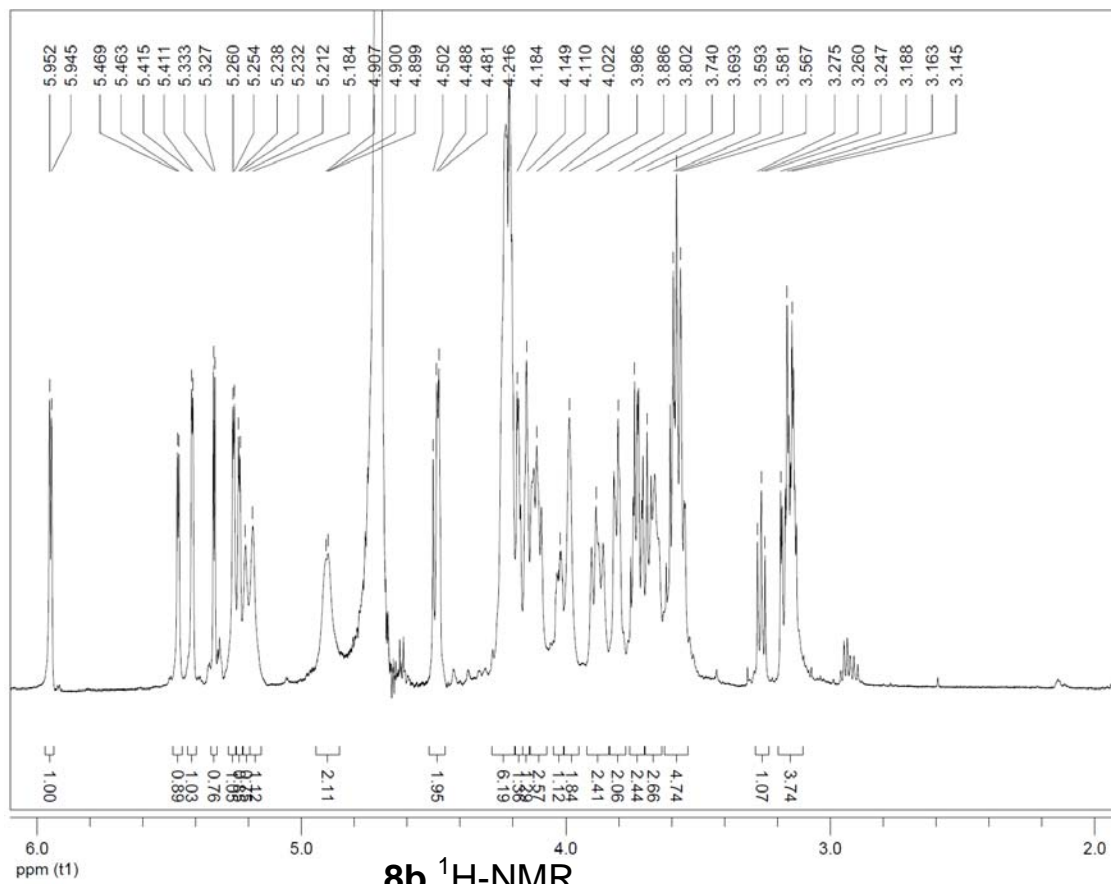
8a

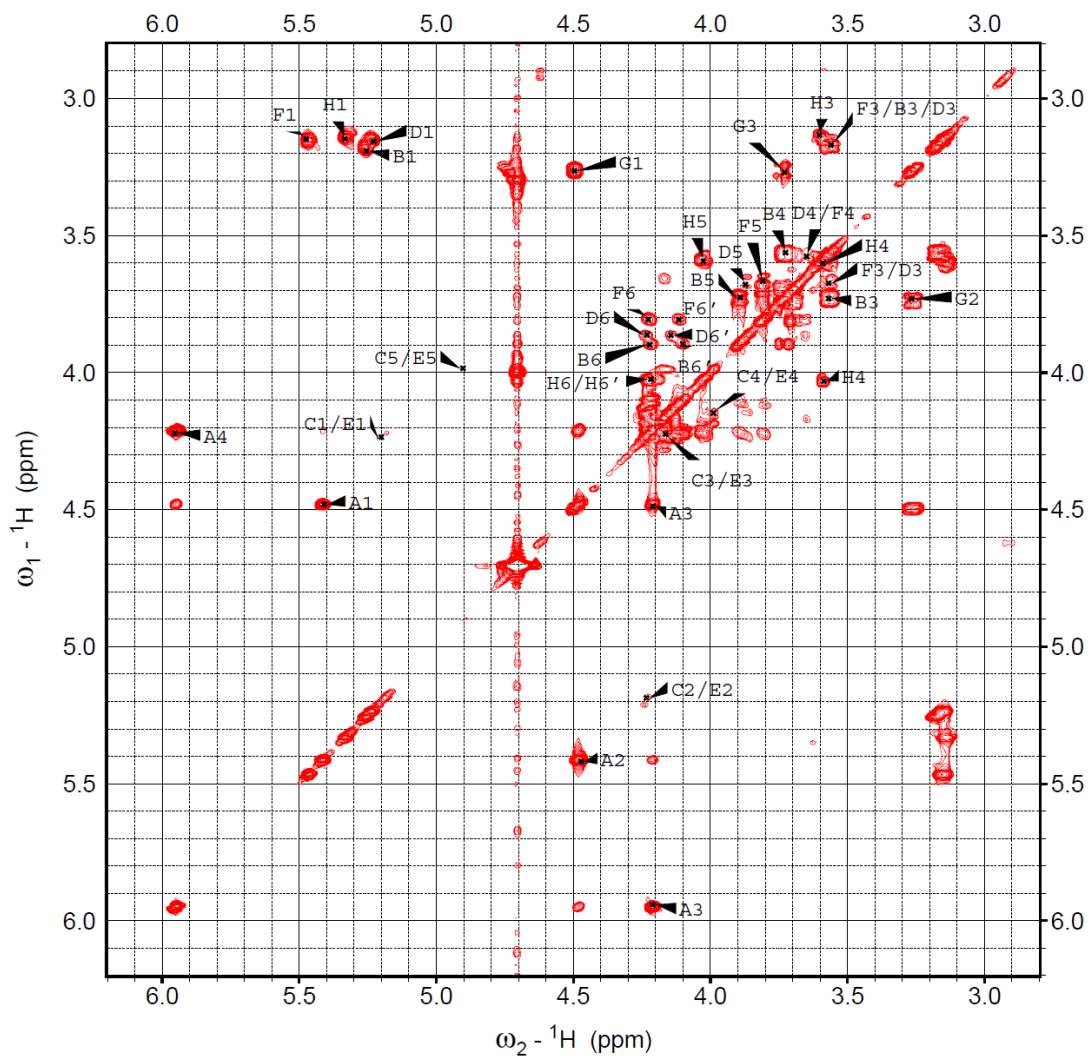


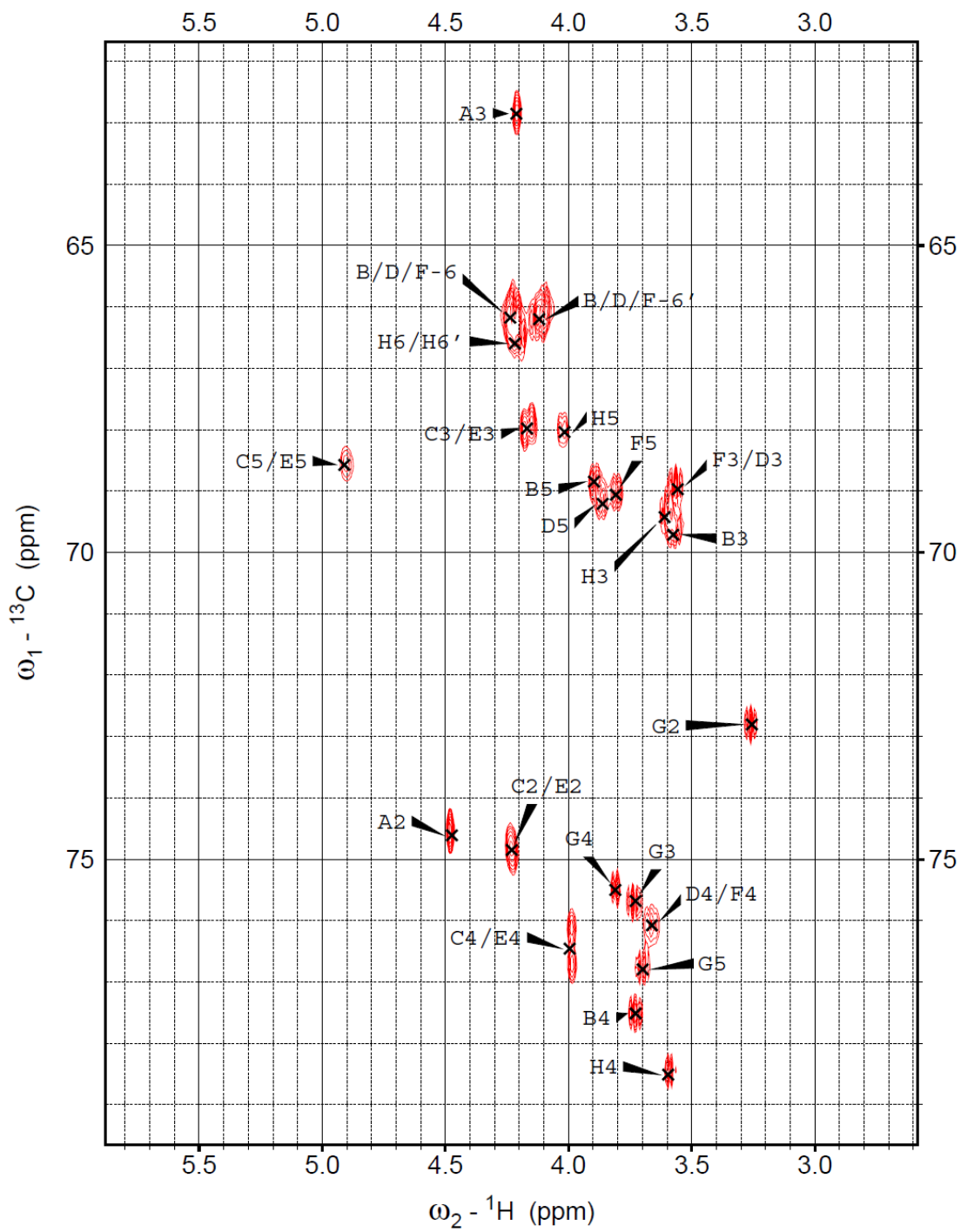




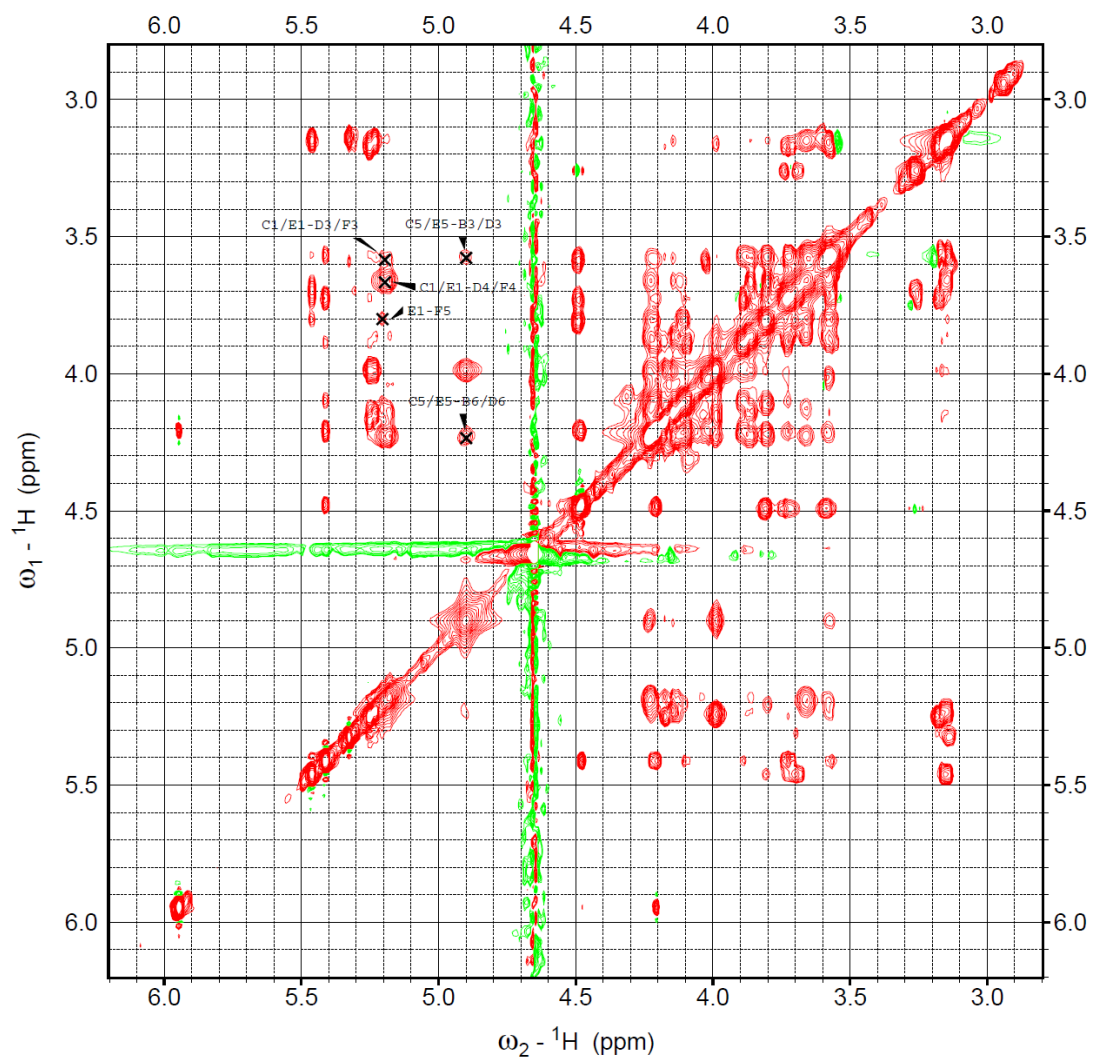
8b





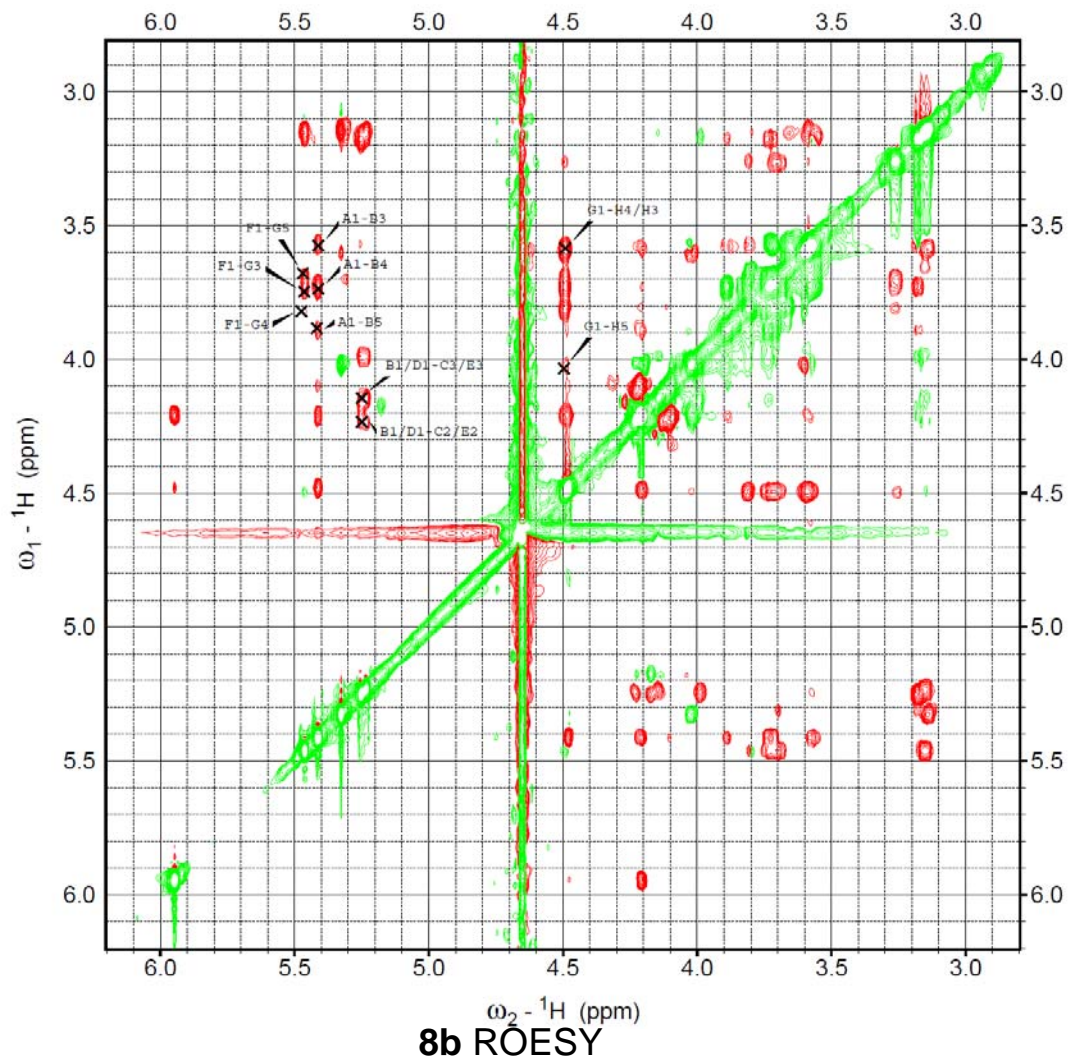


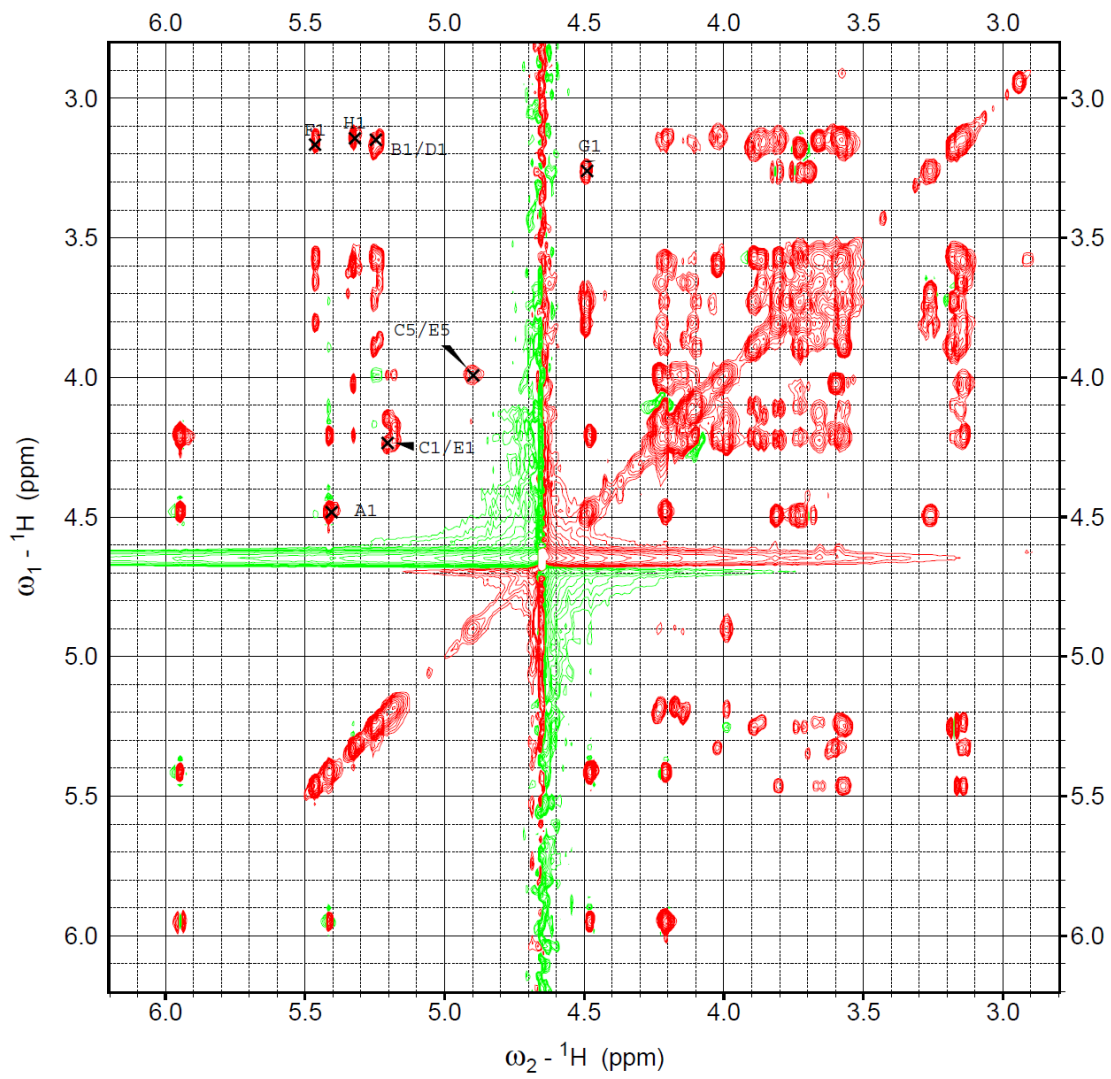
**8b HMQC**



**8b** NOESY

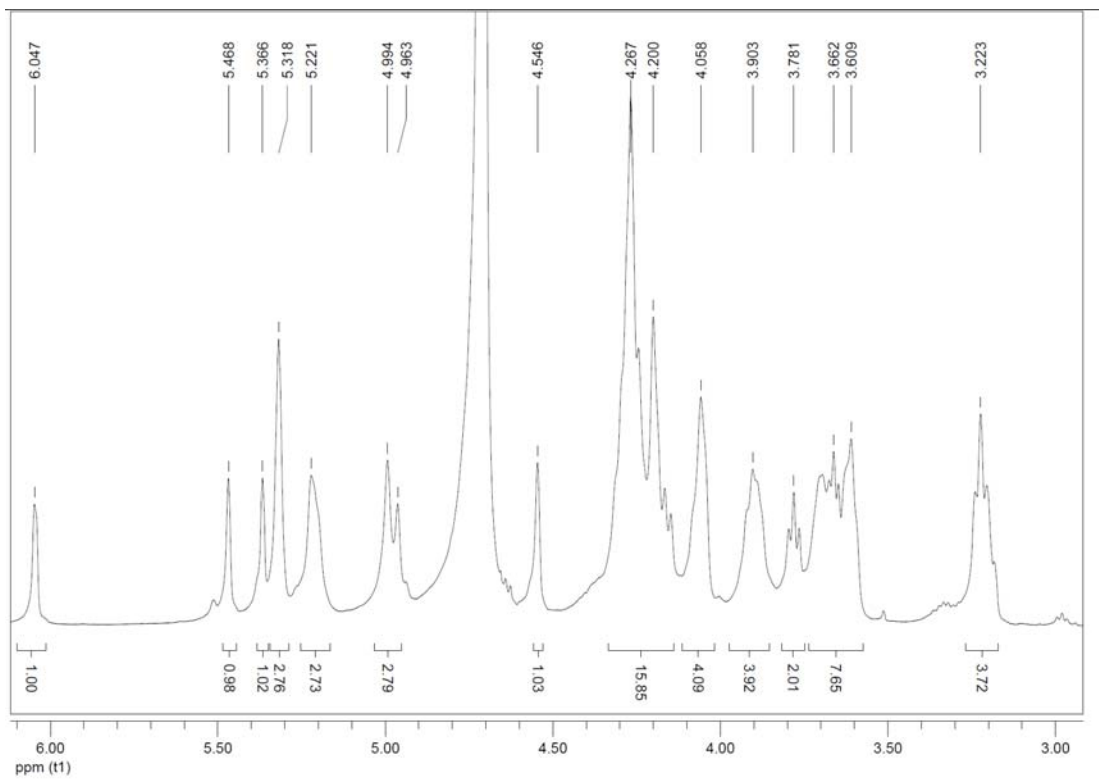




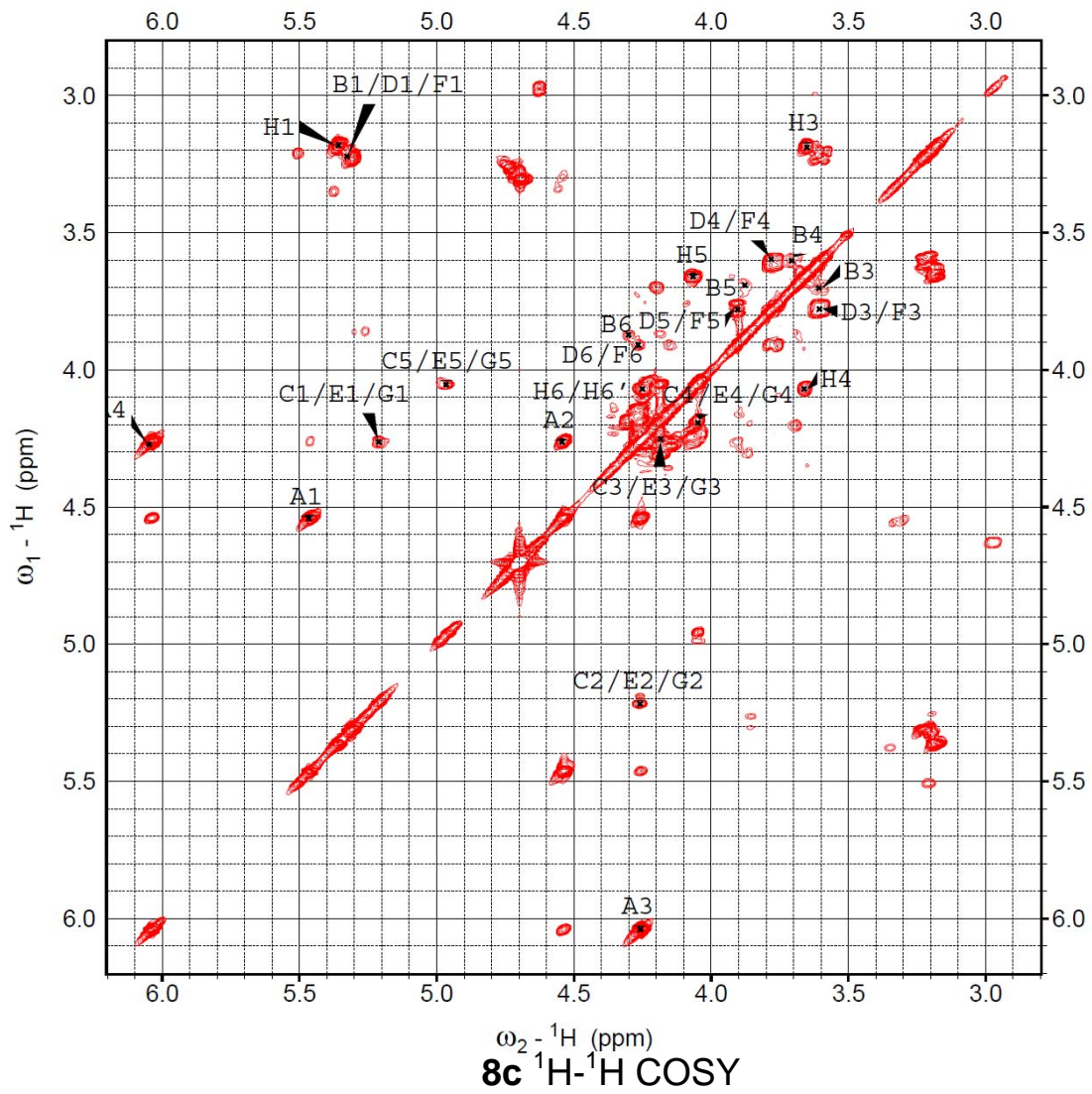


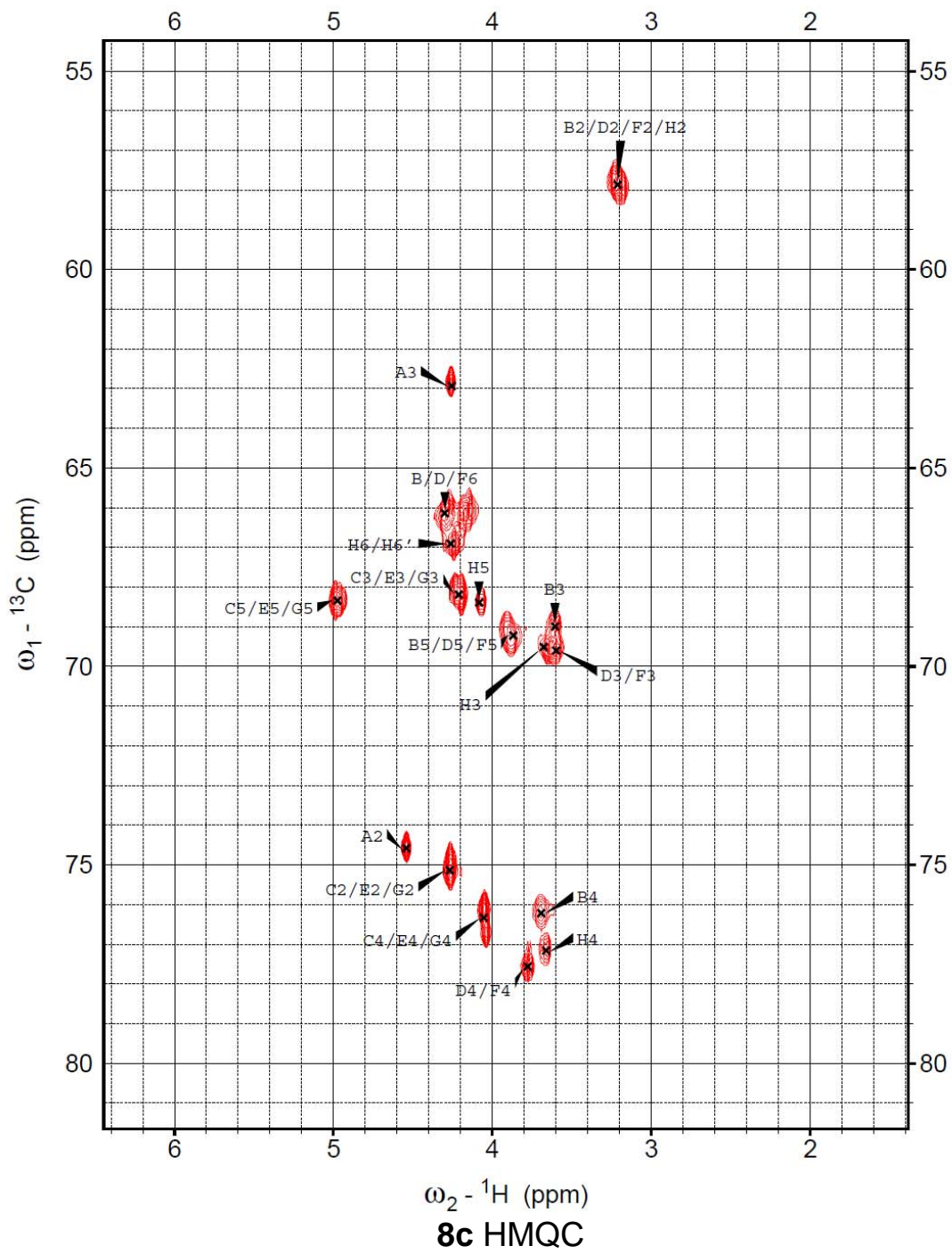
**8b TOCSY**

8c

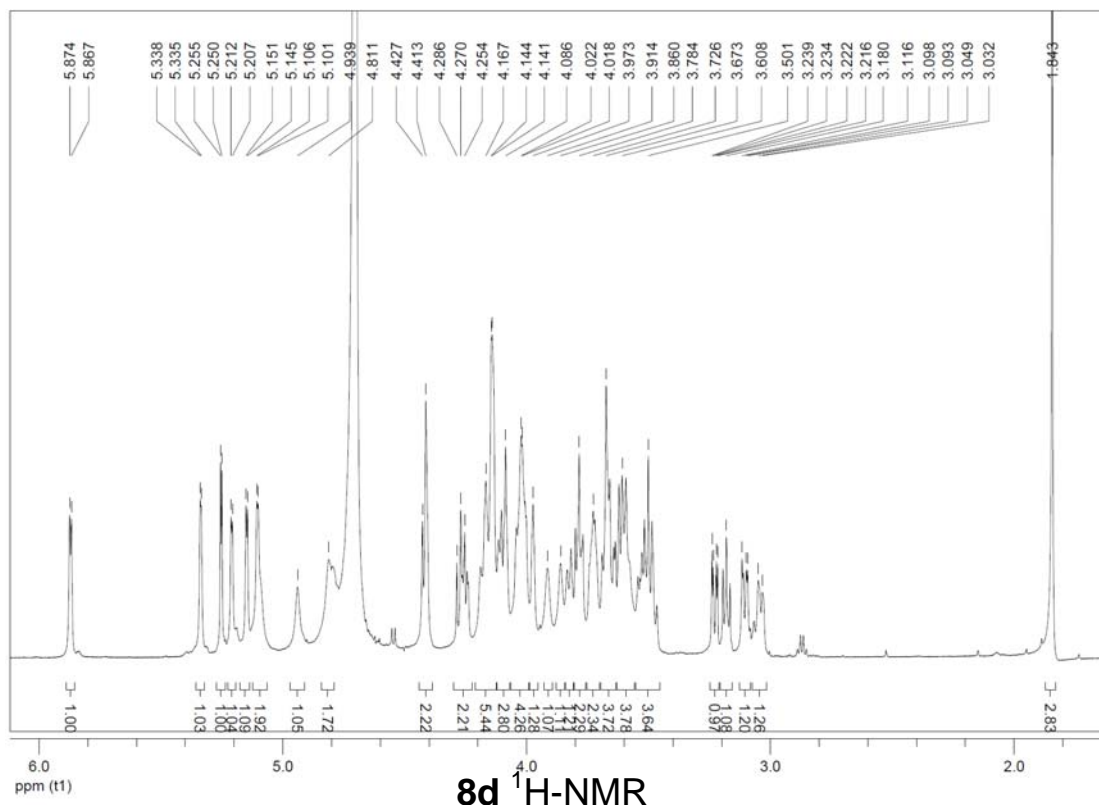


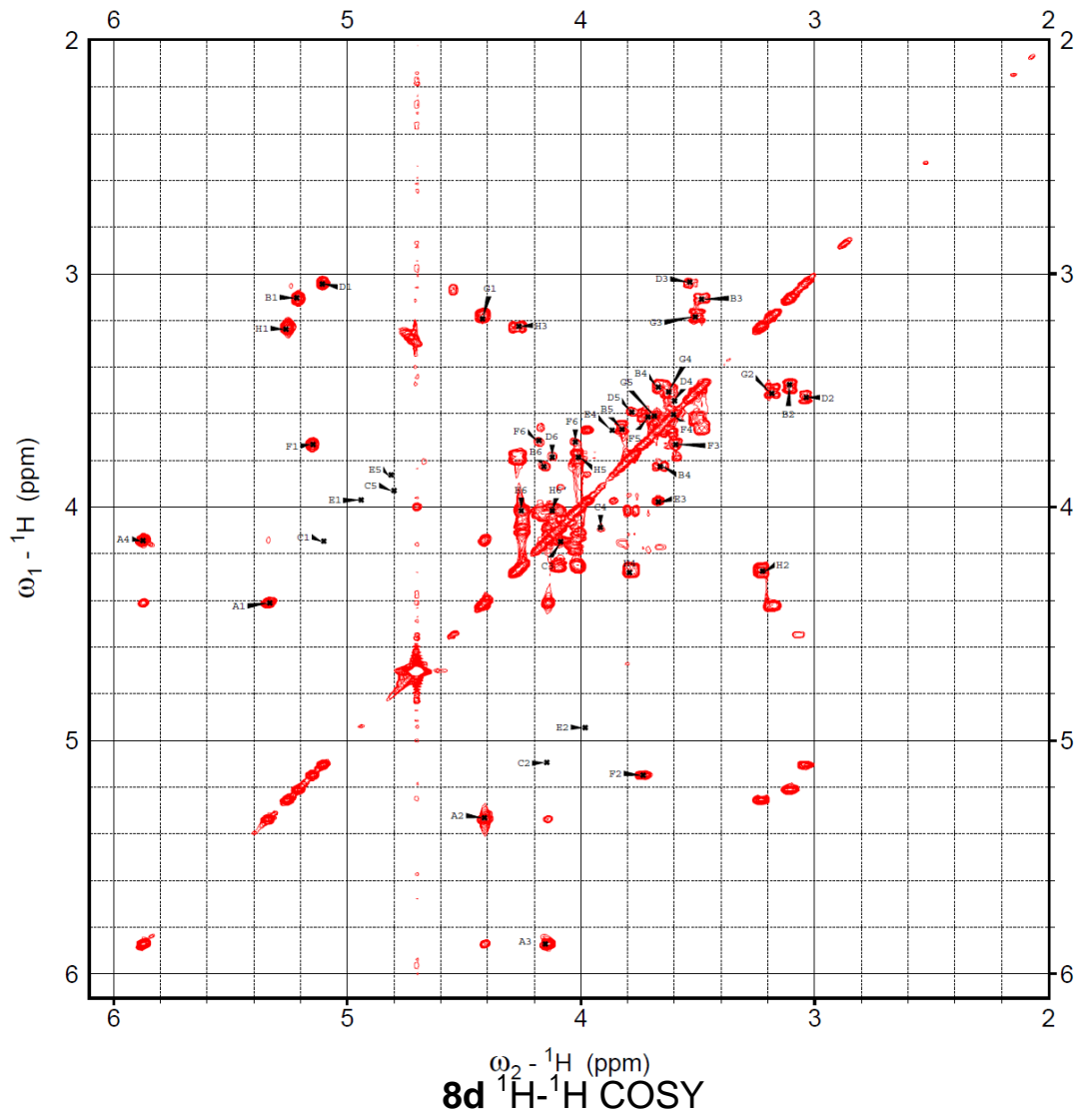
8c <sup>1</sup>H-NMR

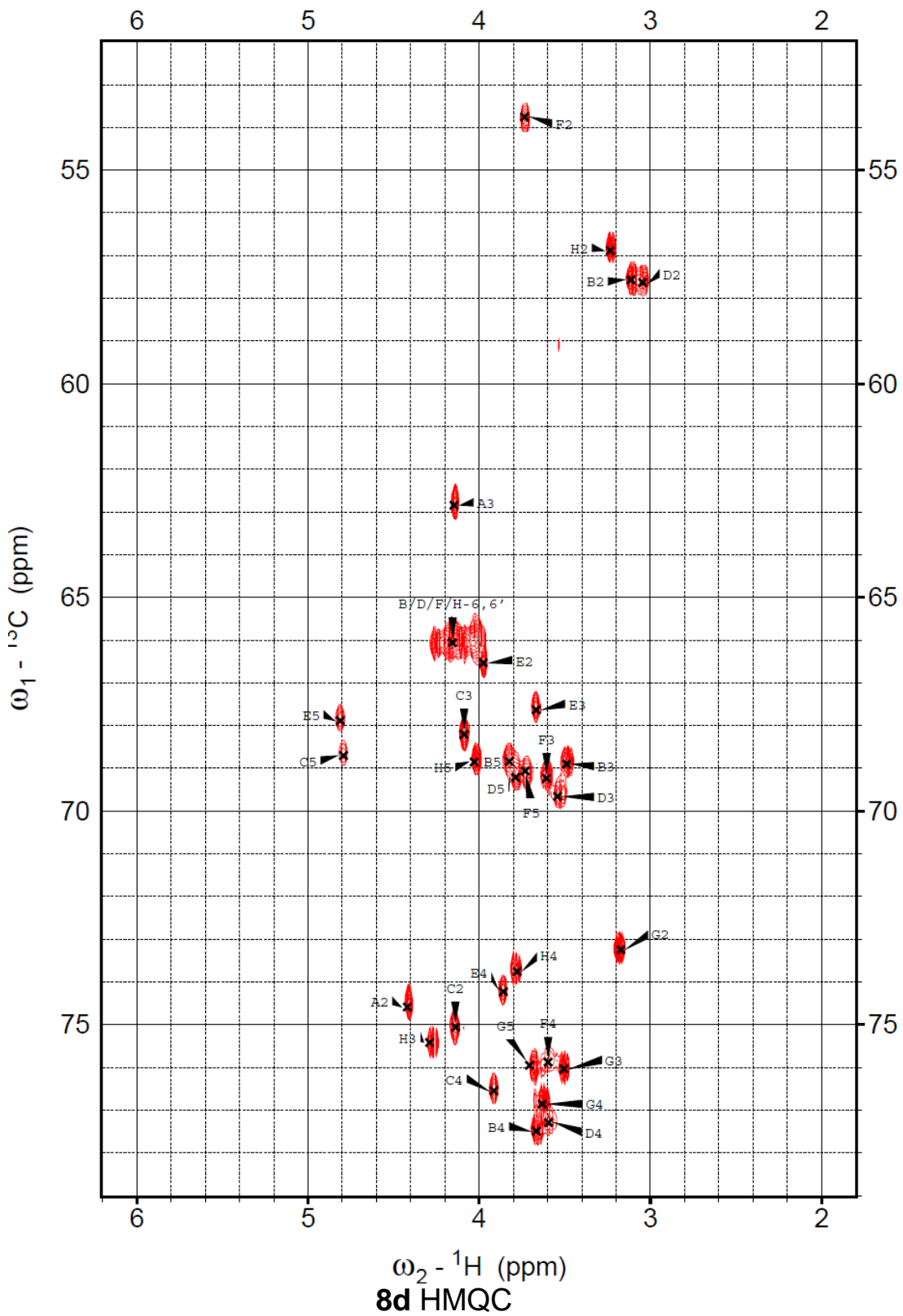




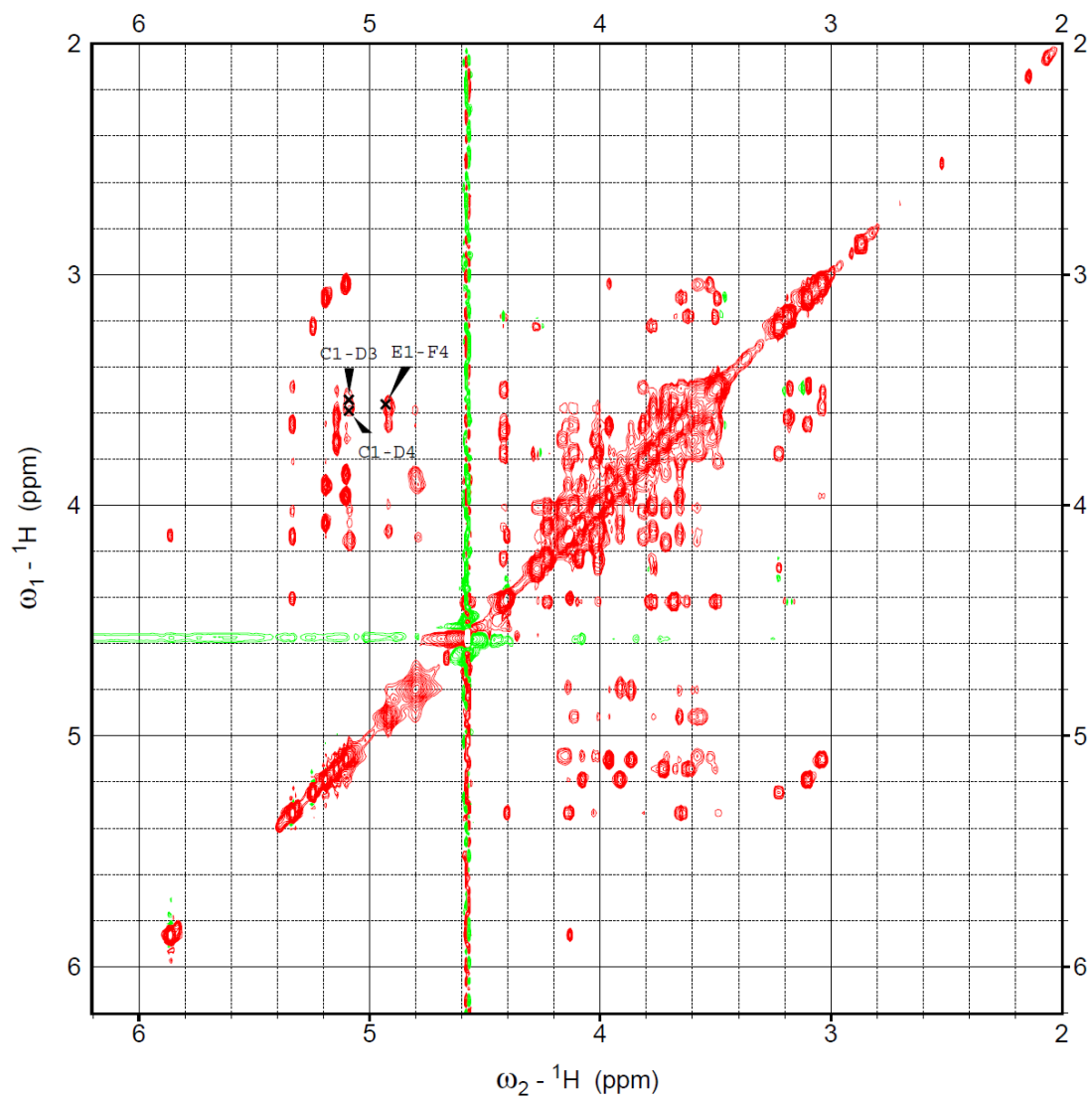
8d



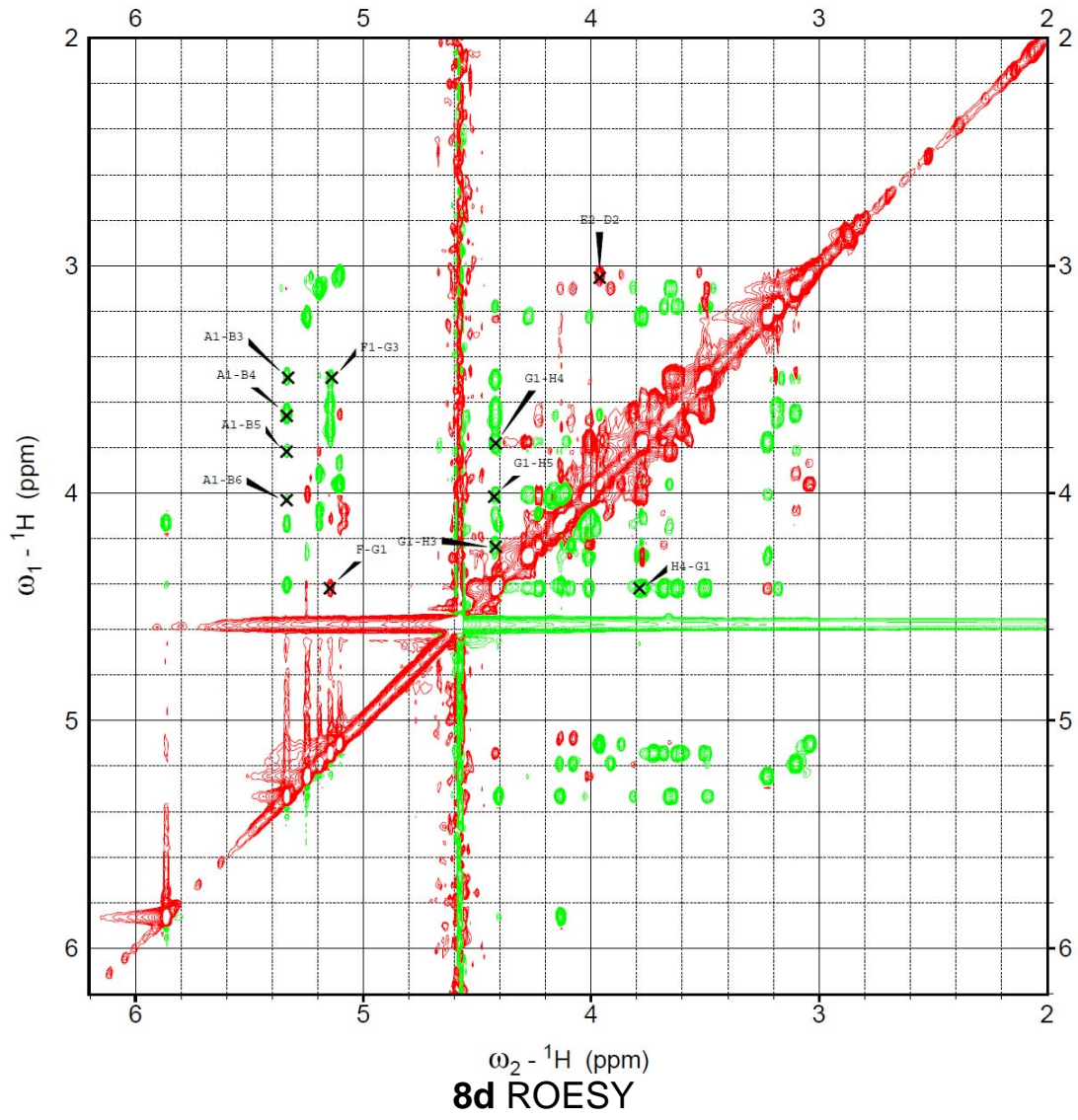


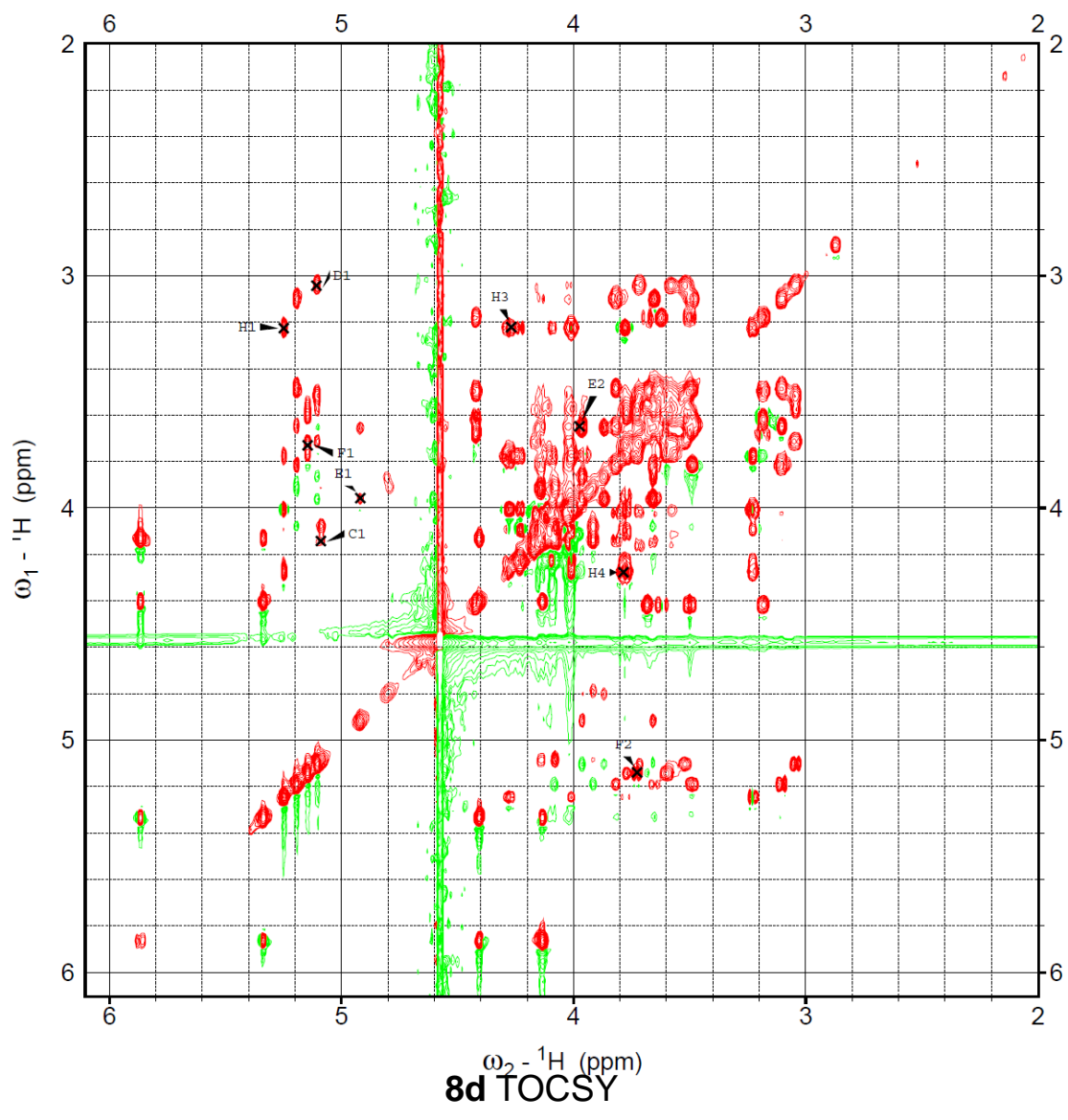




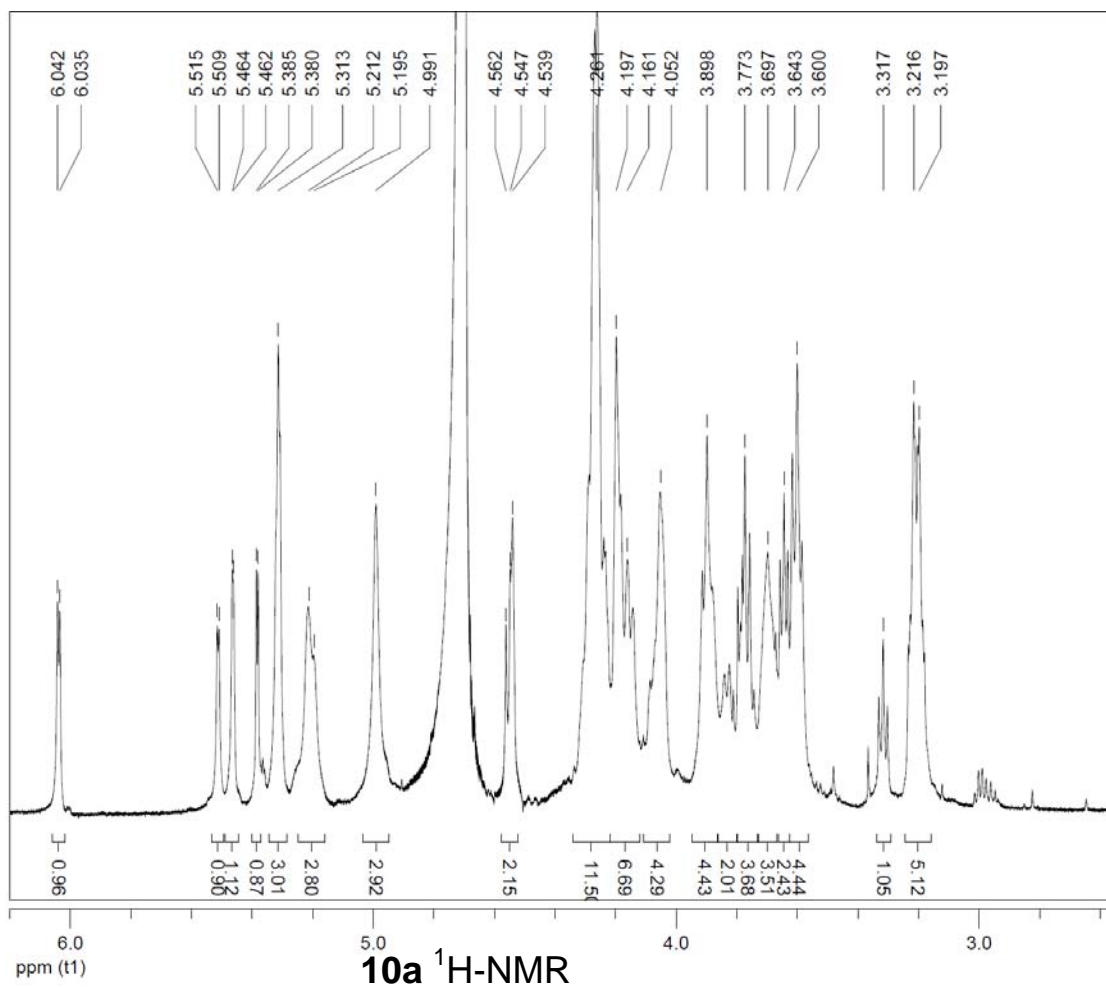


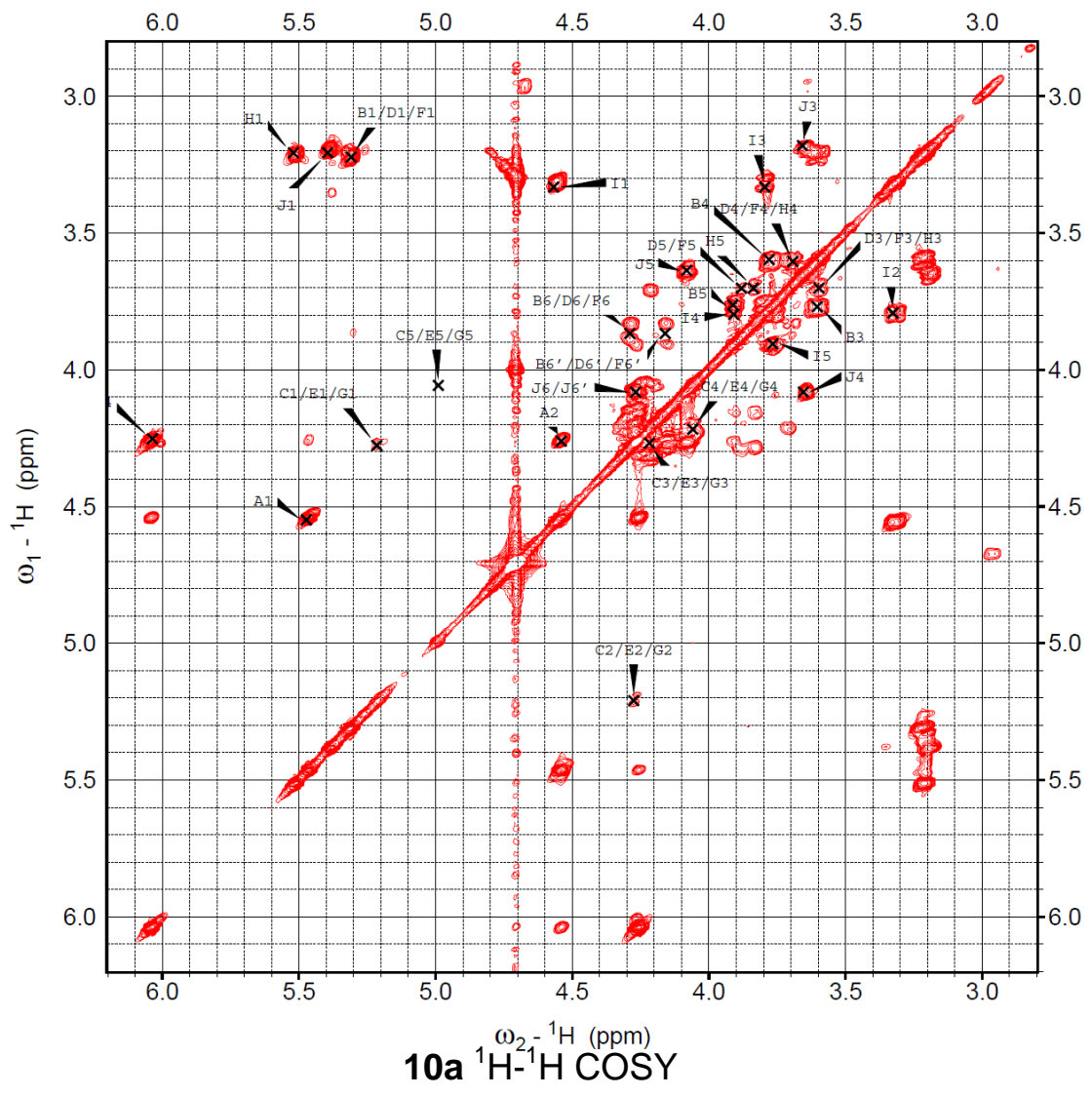
**8d NOESY**

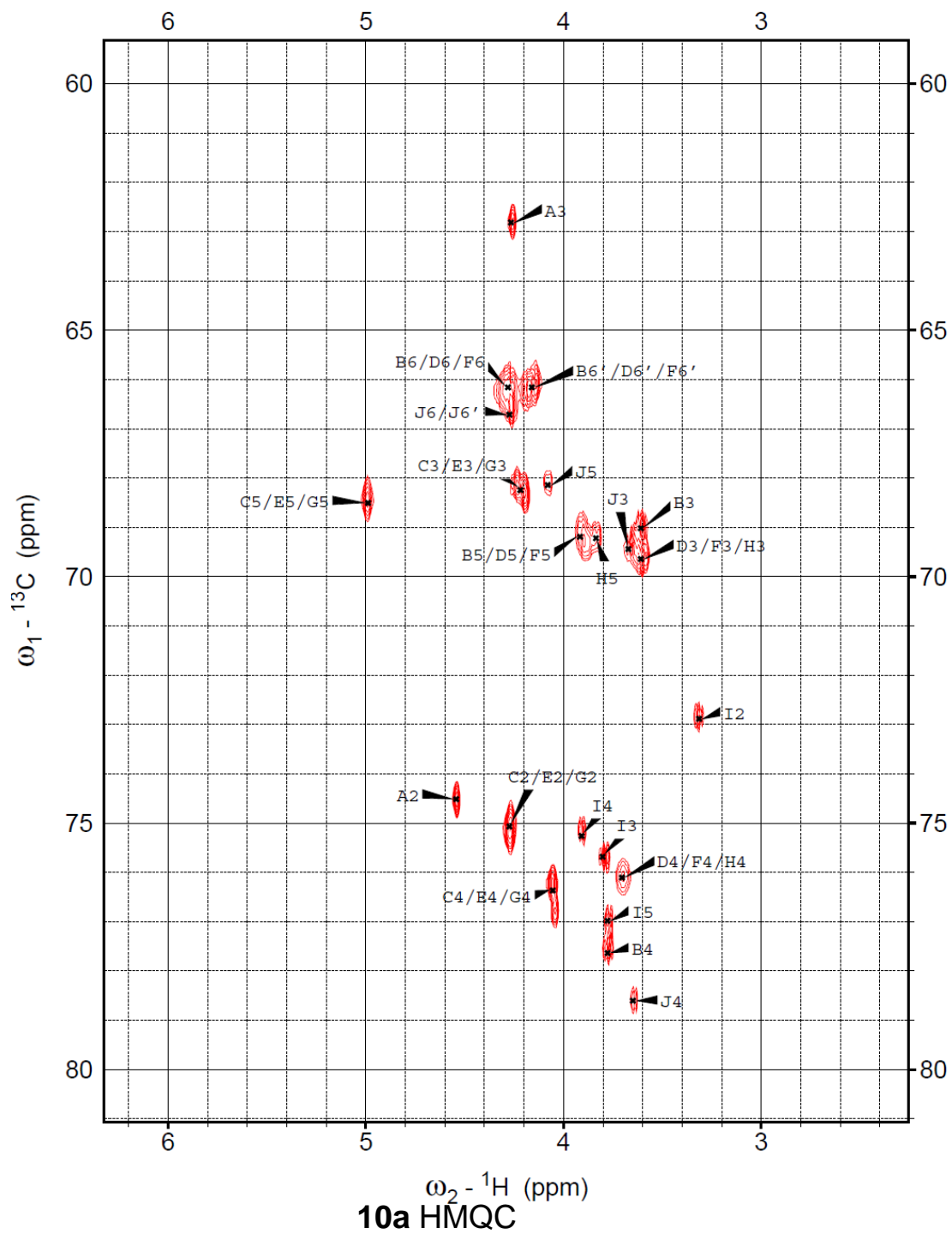


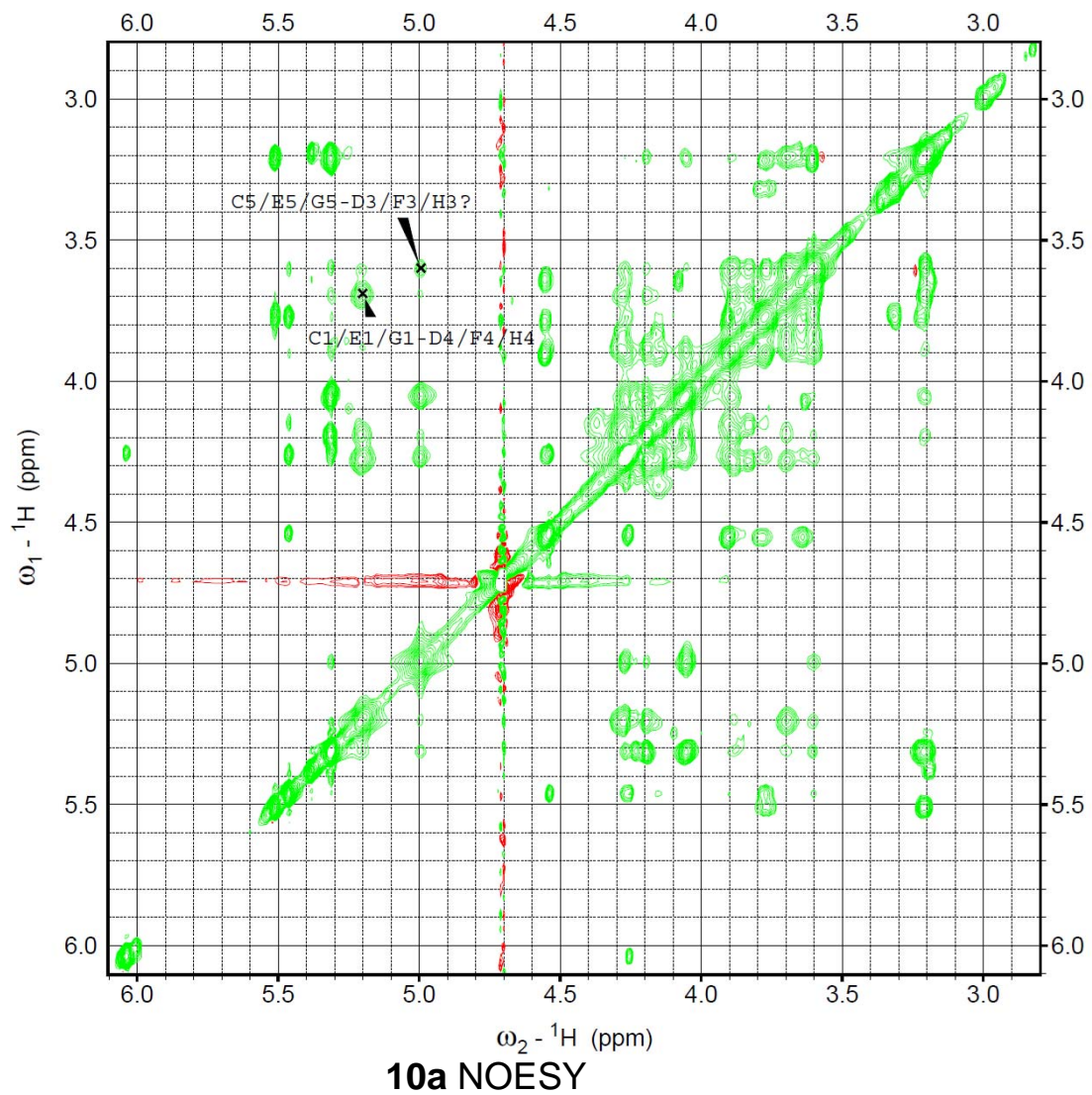


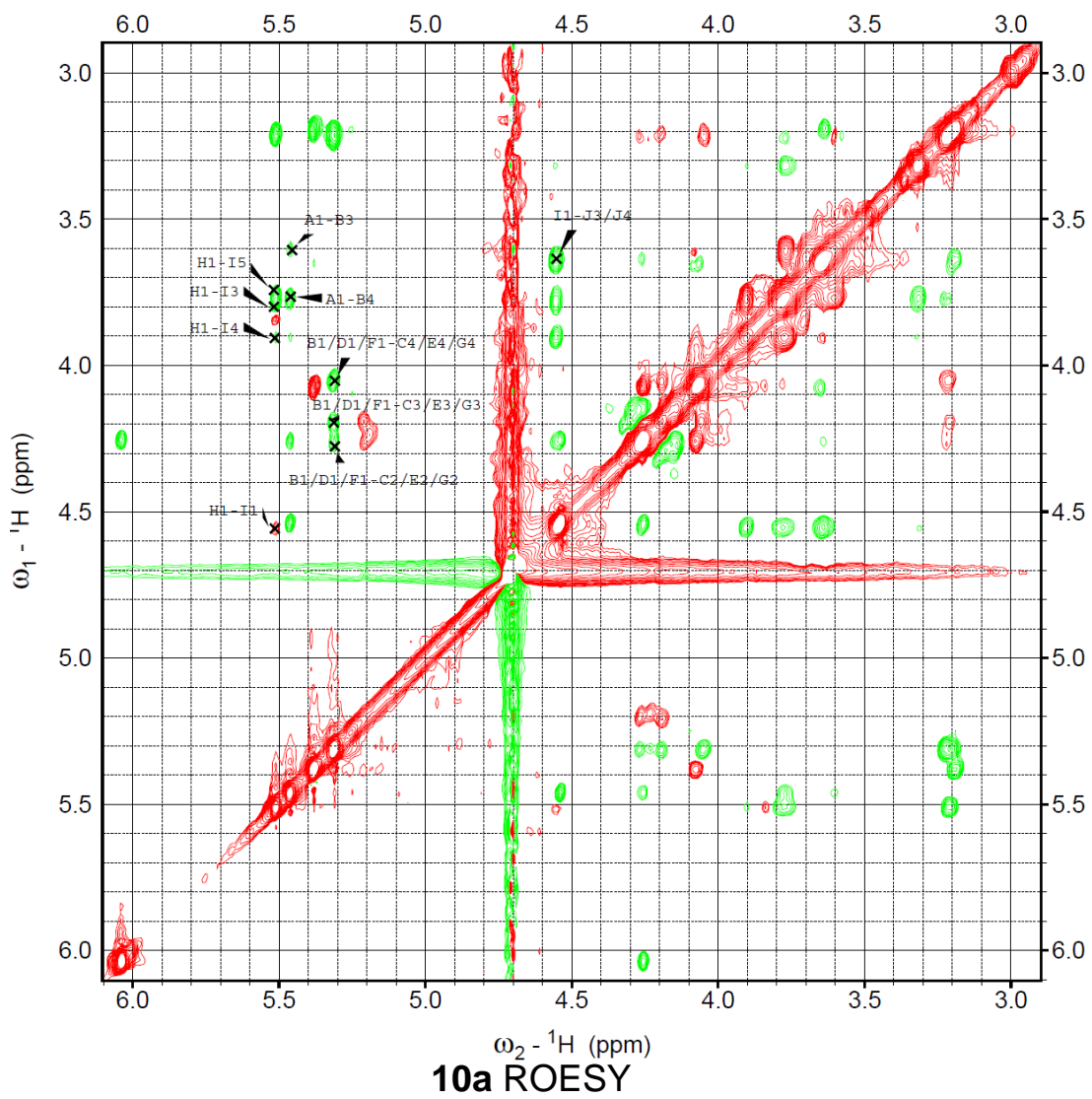
# 10a



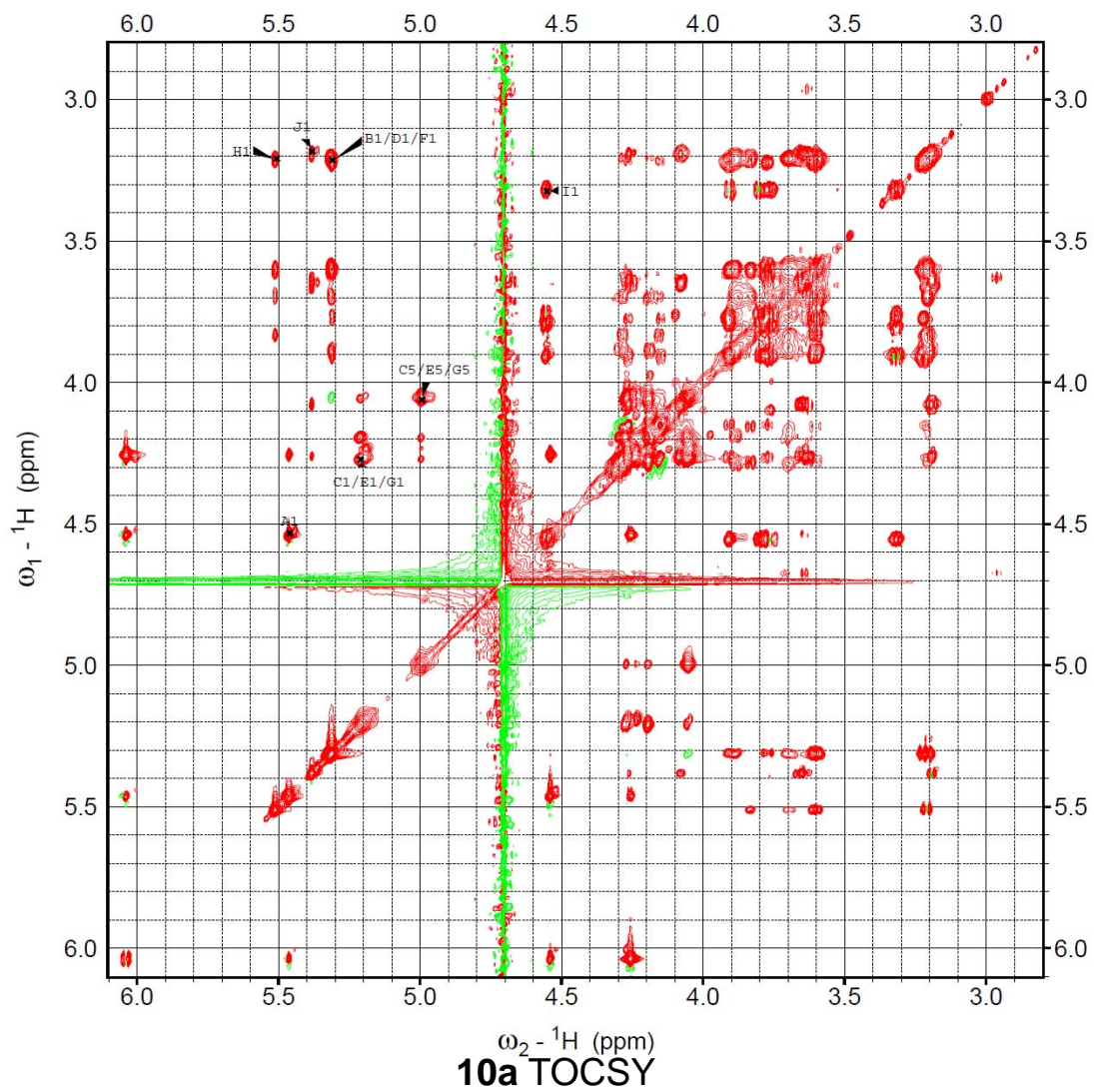




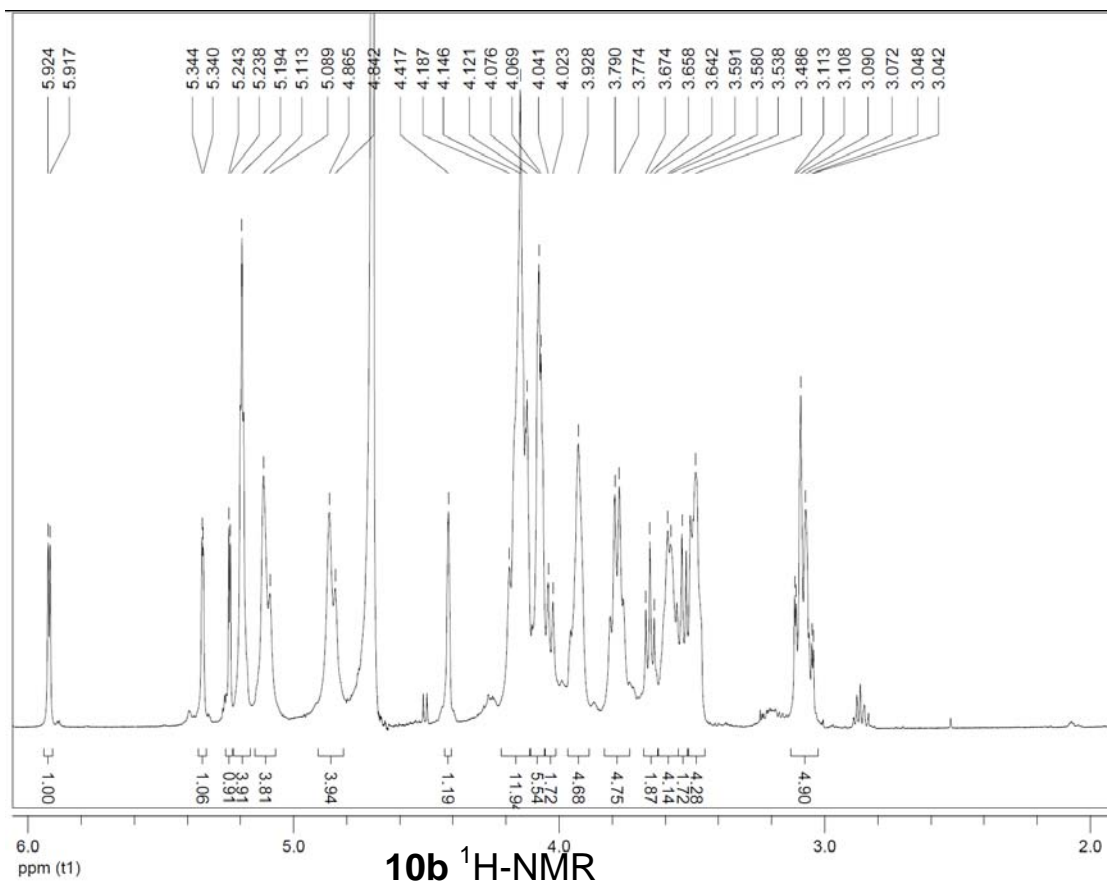




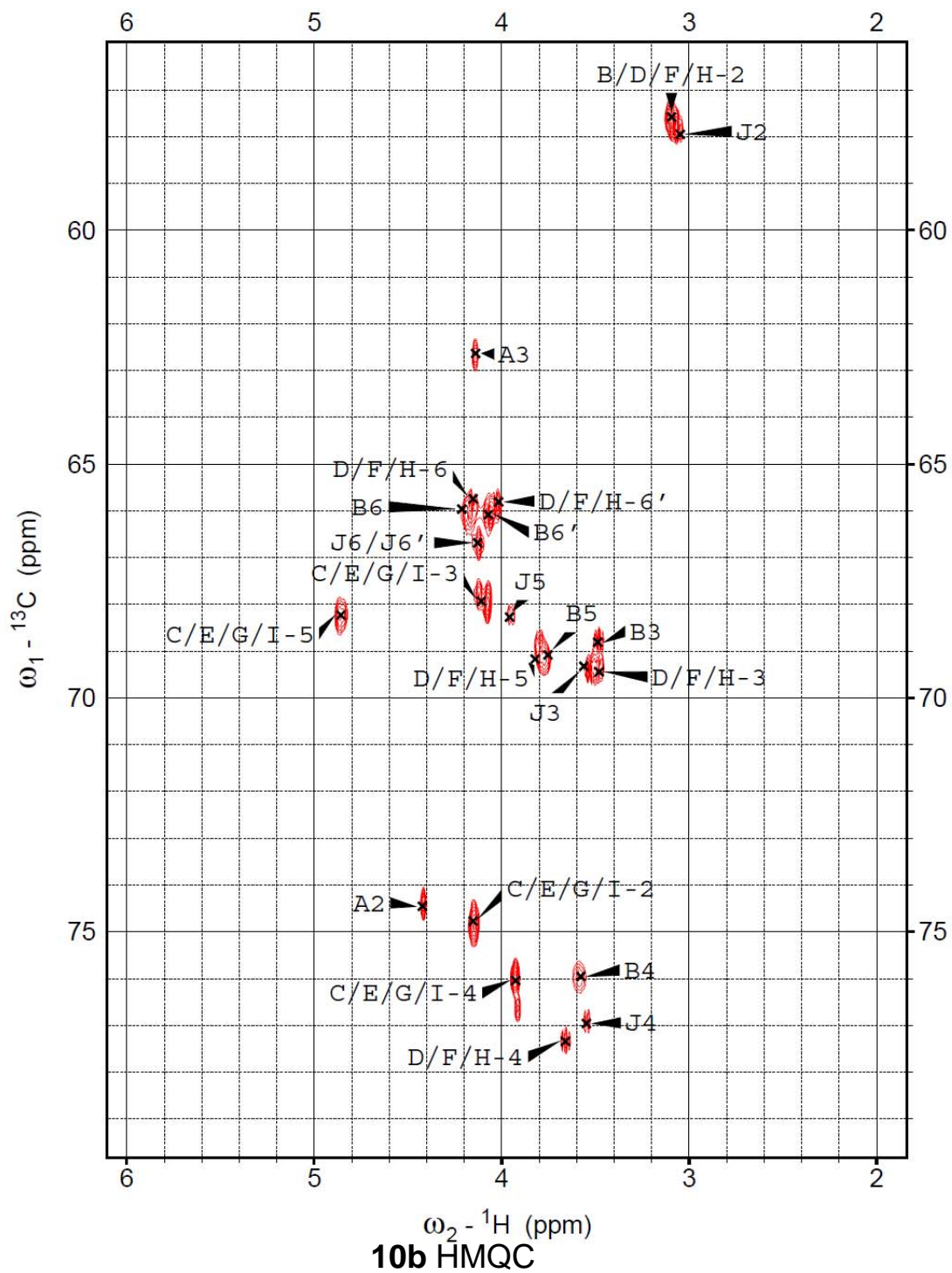




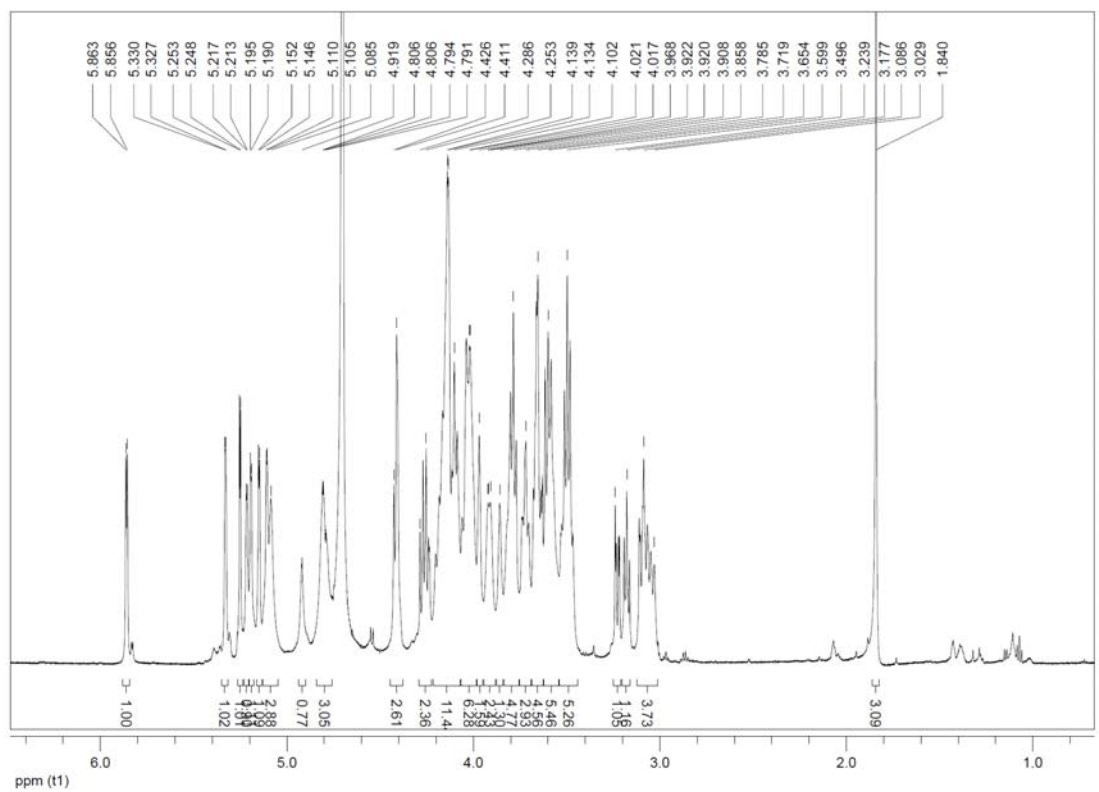
# 10b



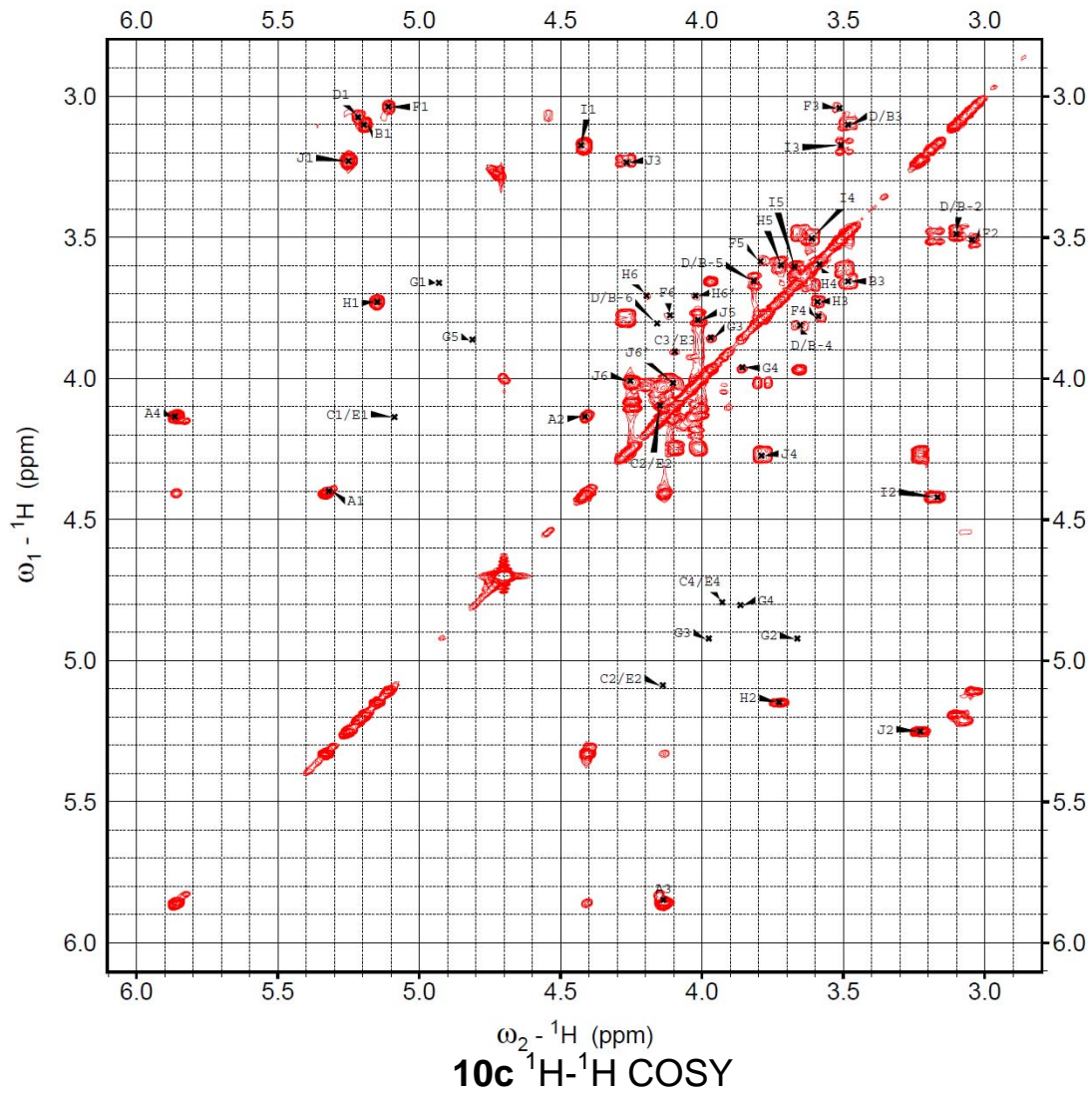


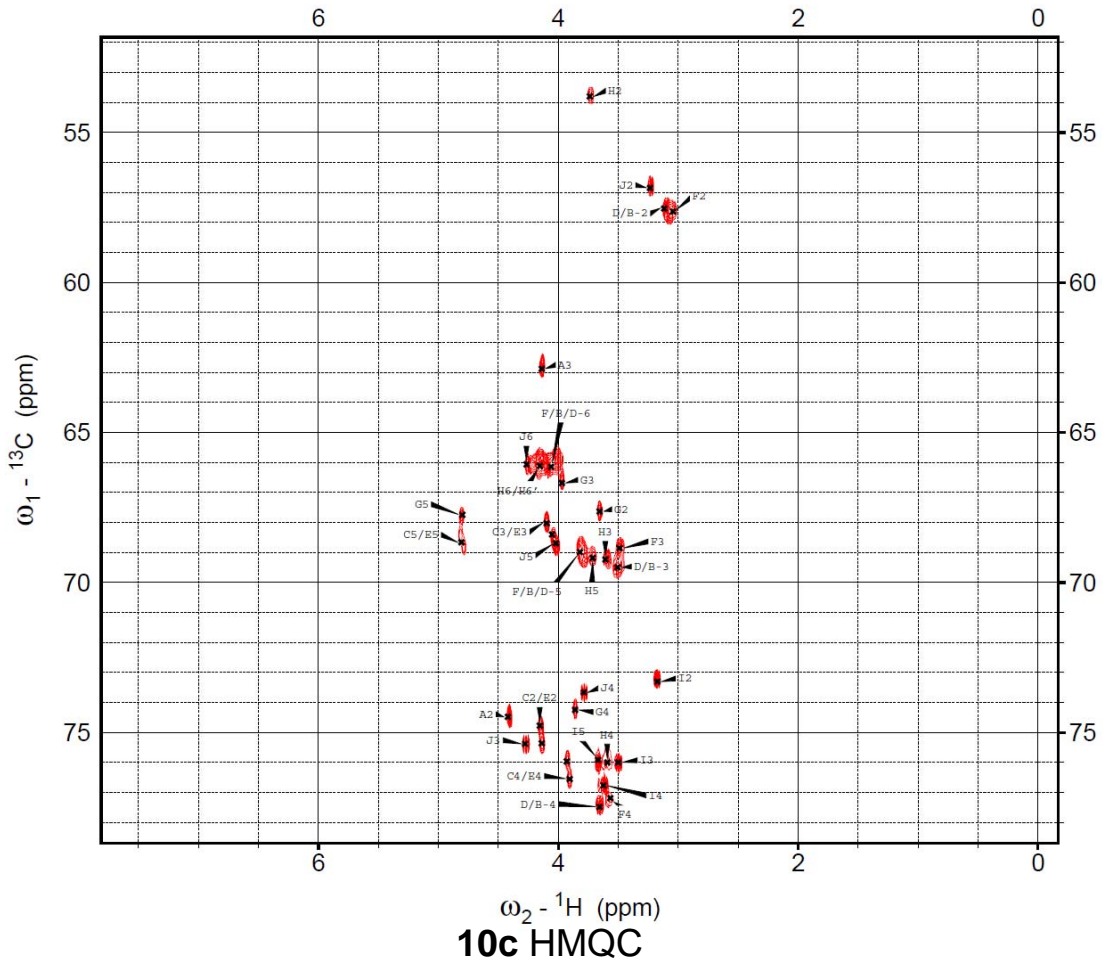


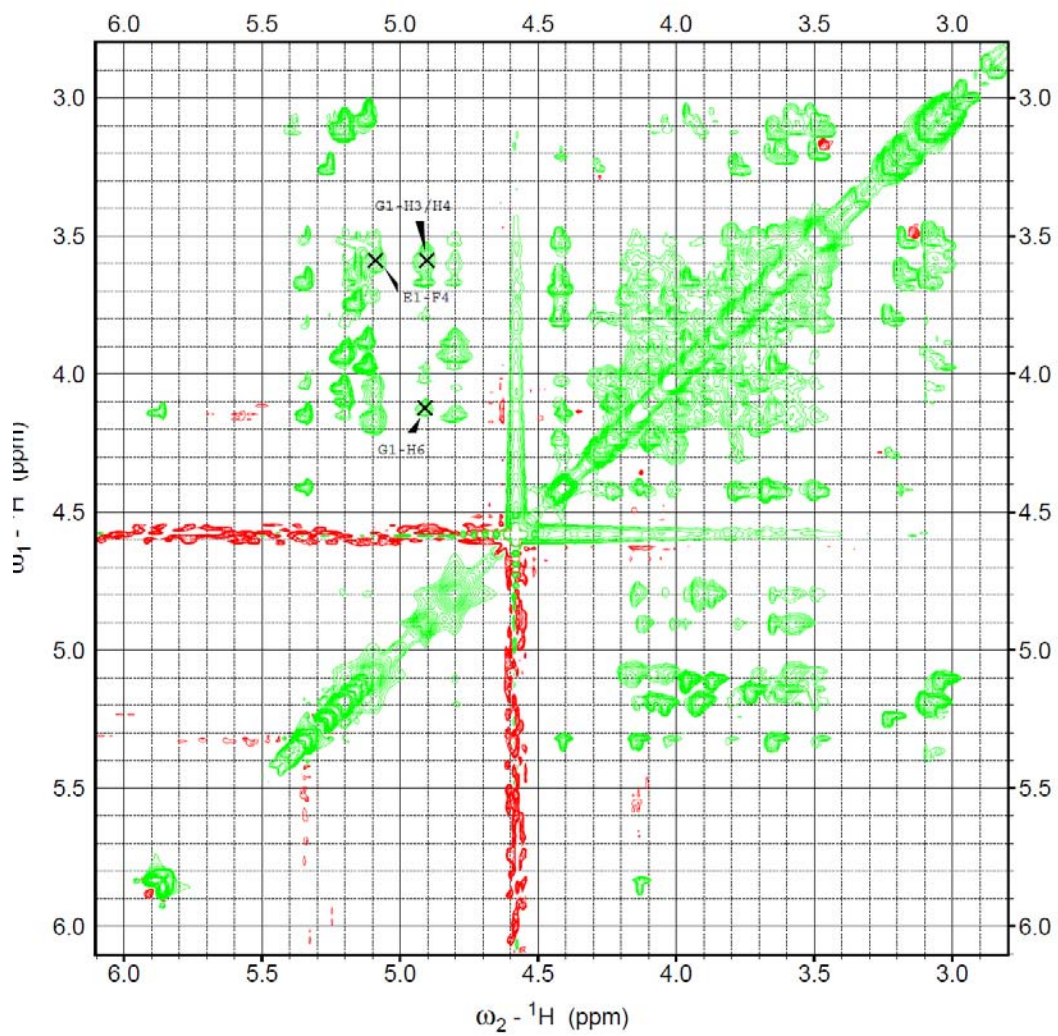
10c



10c <sup>1</sup>H-NMR

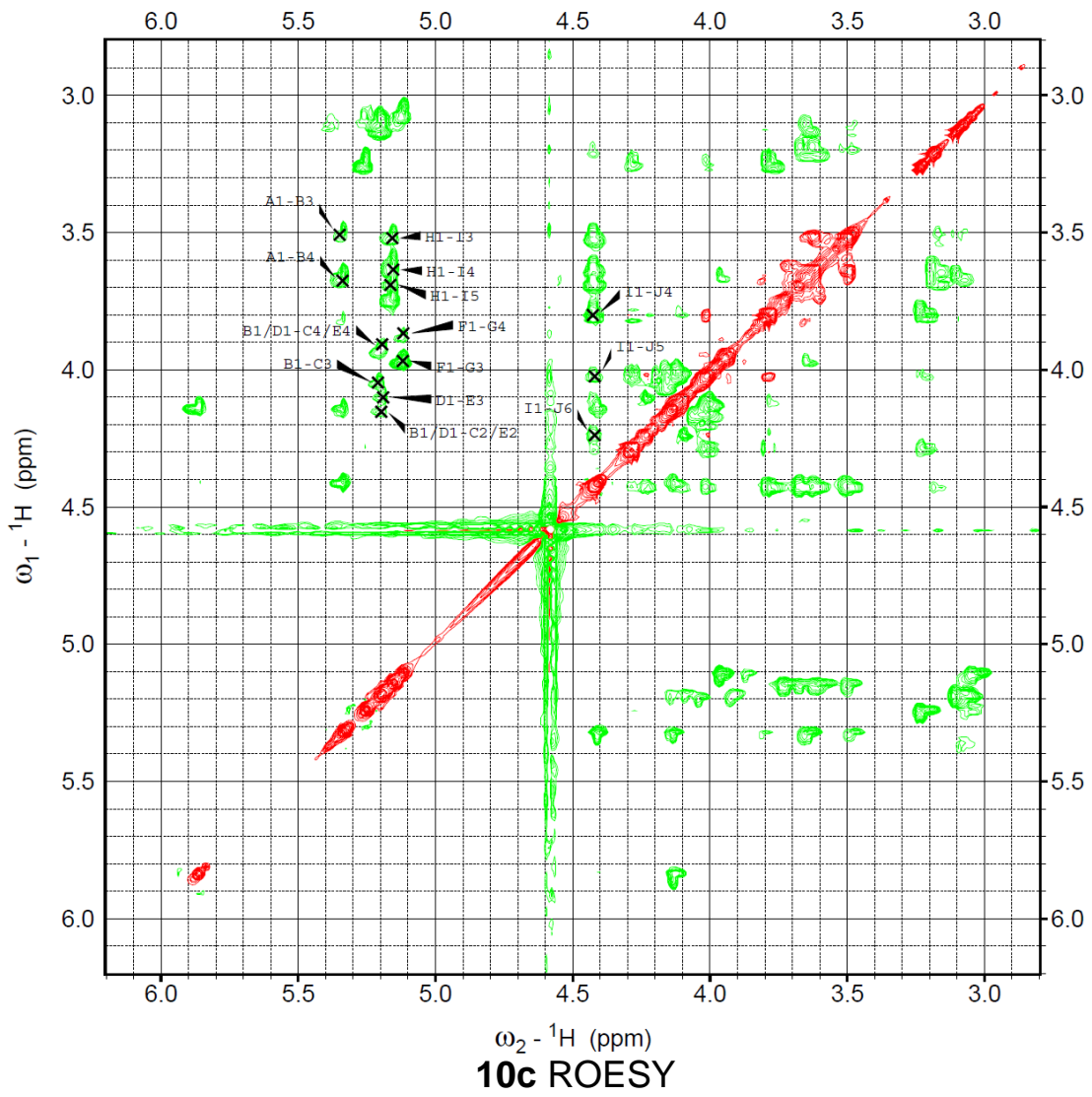


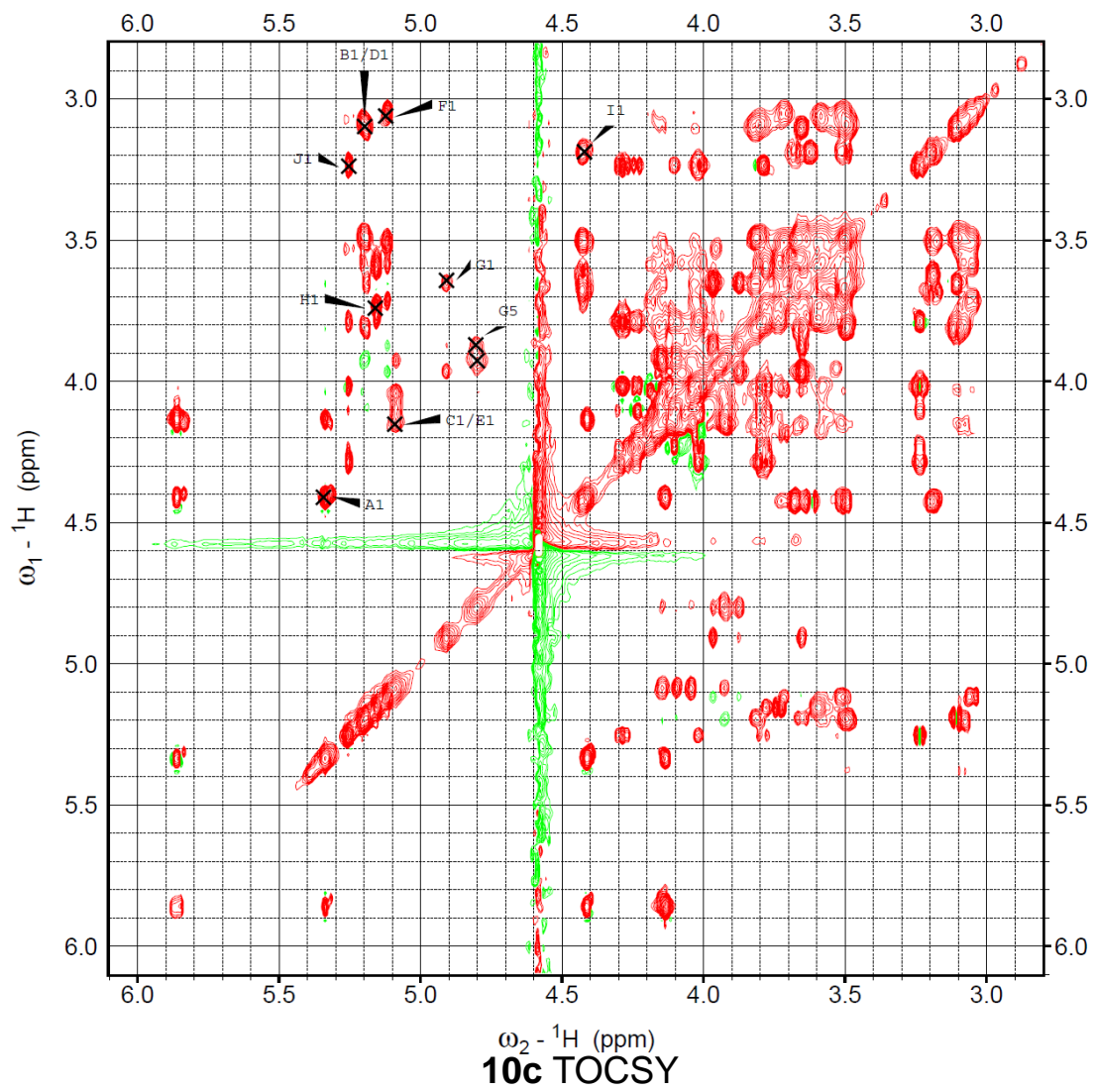




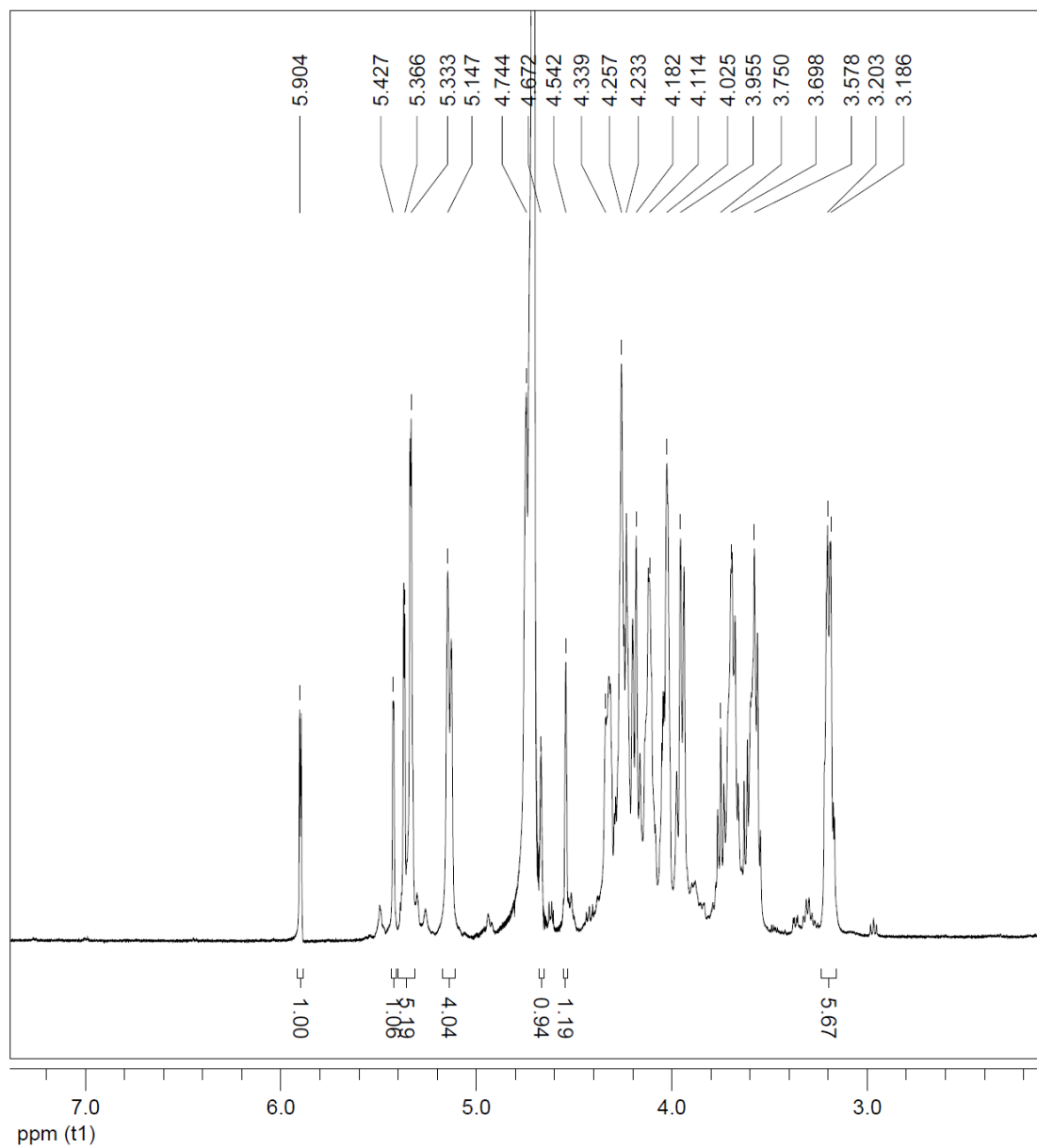
**10c NOESY**



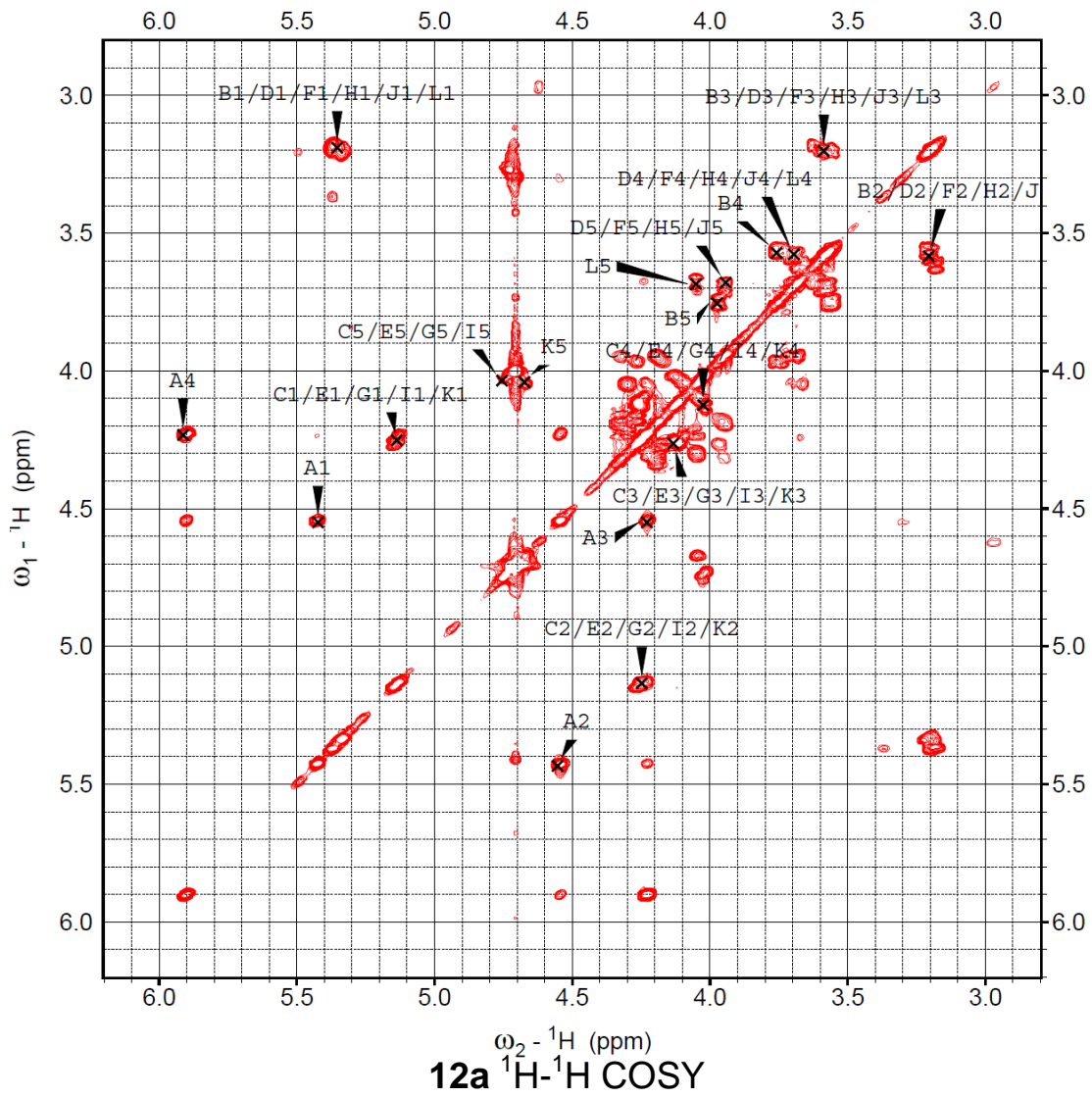


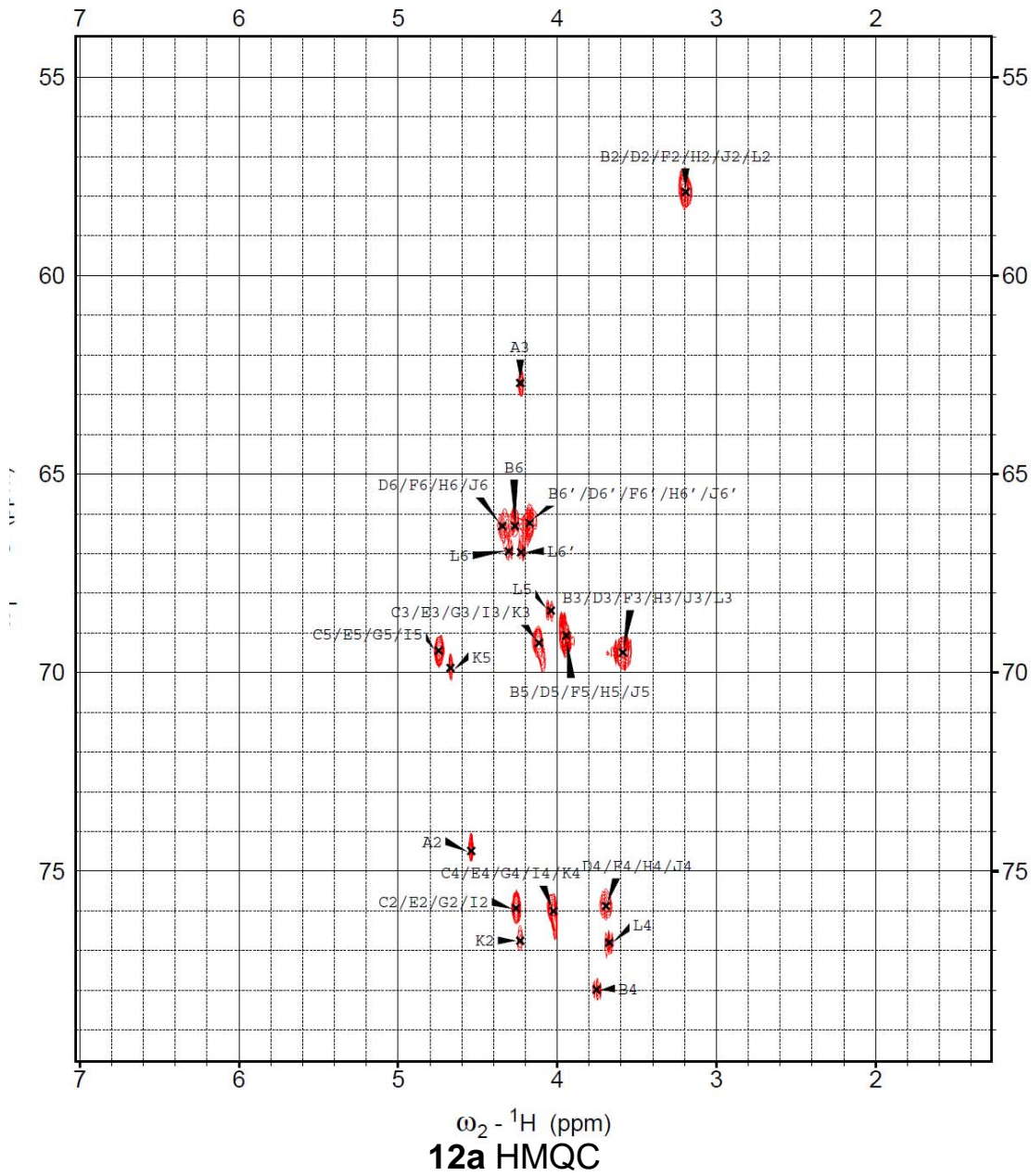


12a

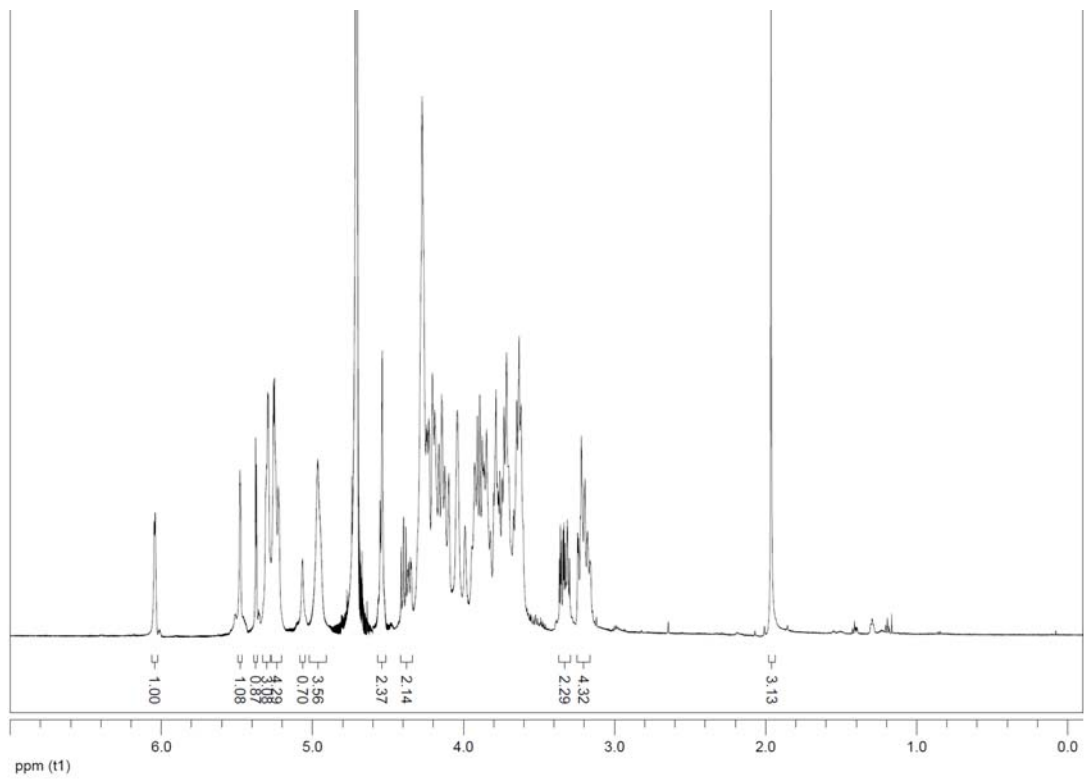


12a <sup>1</sup>H-NMR

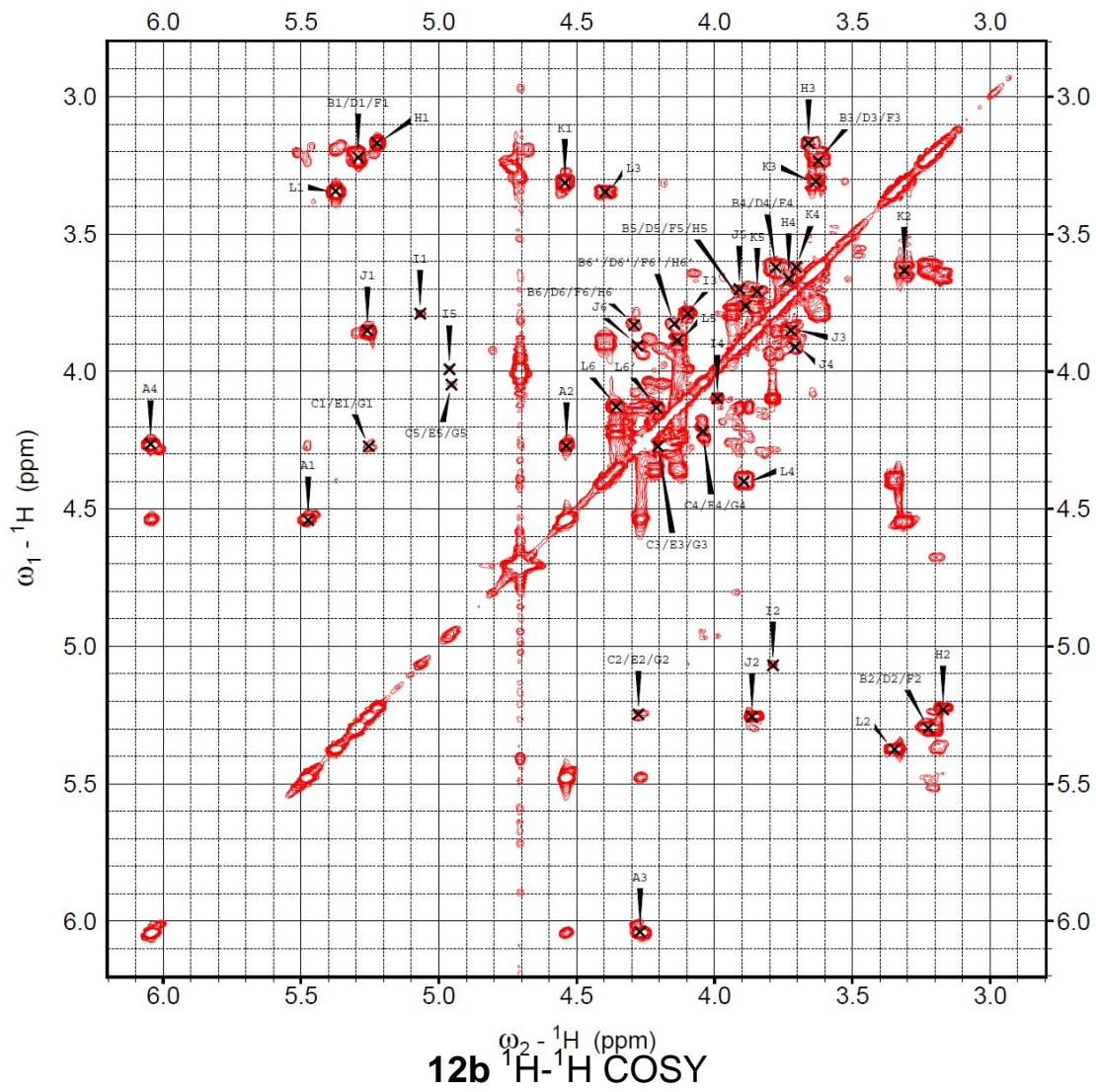


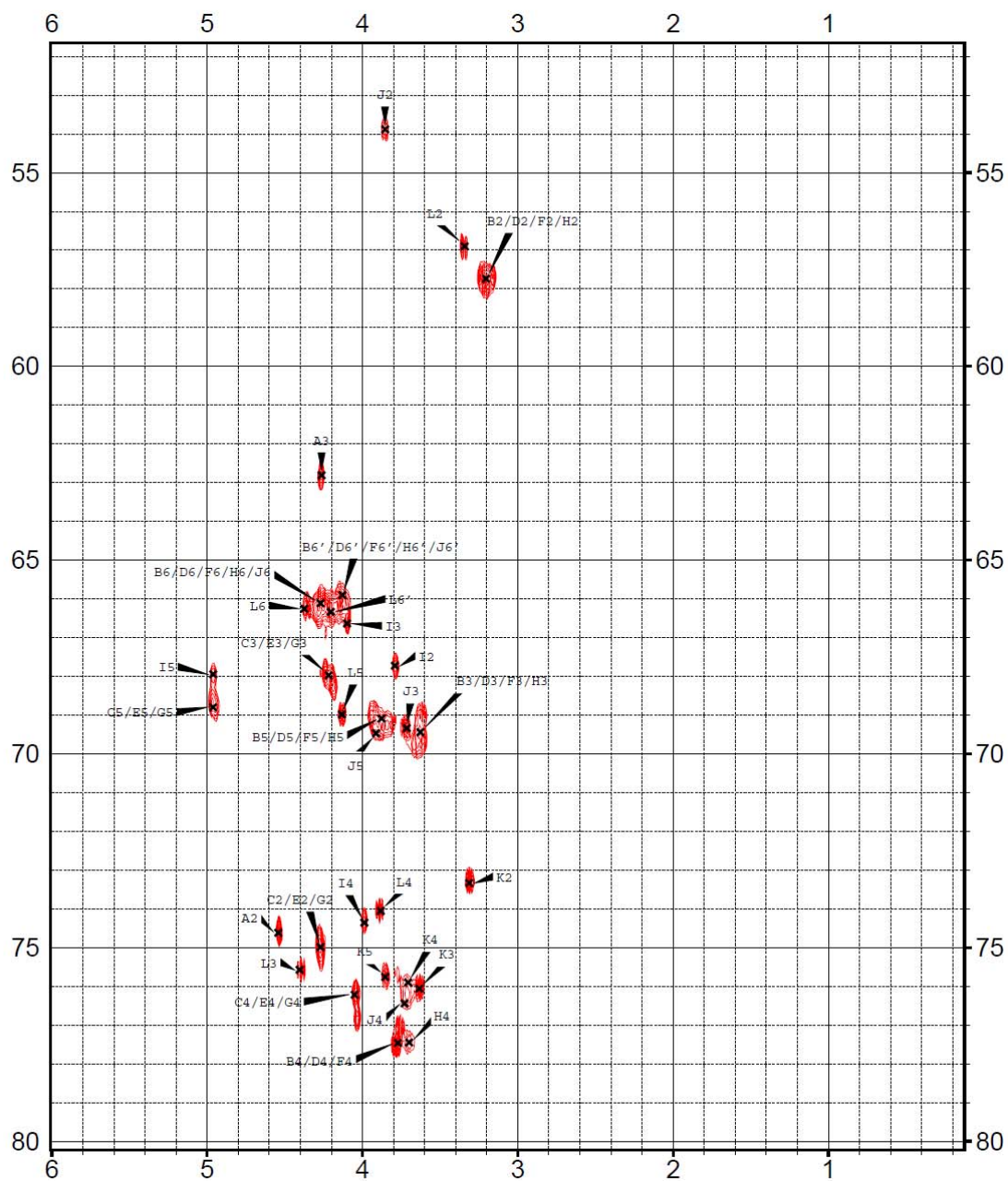


12b

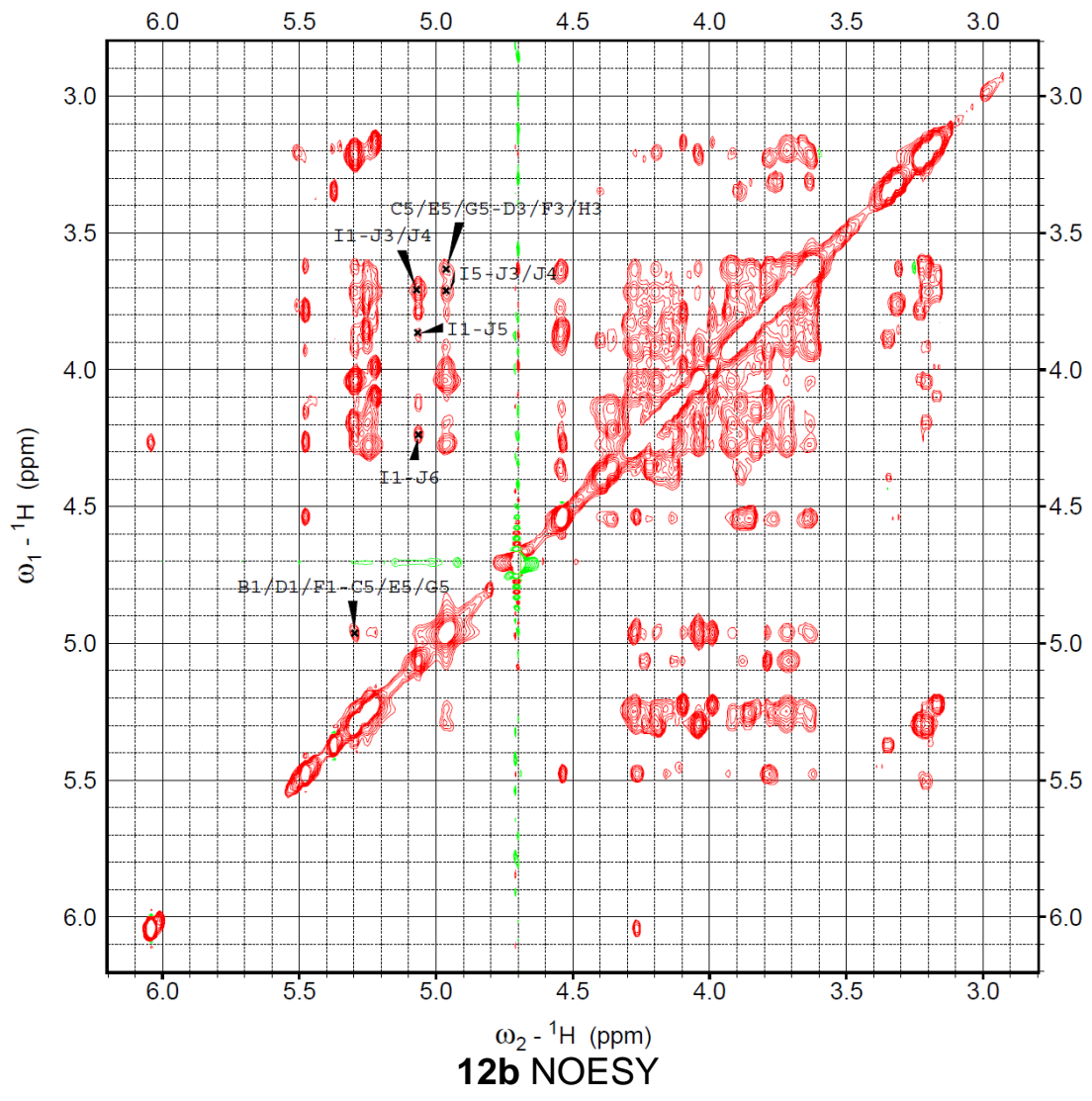


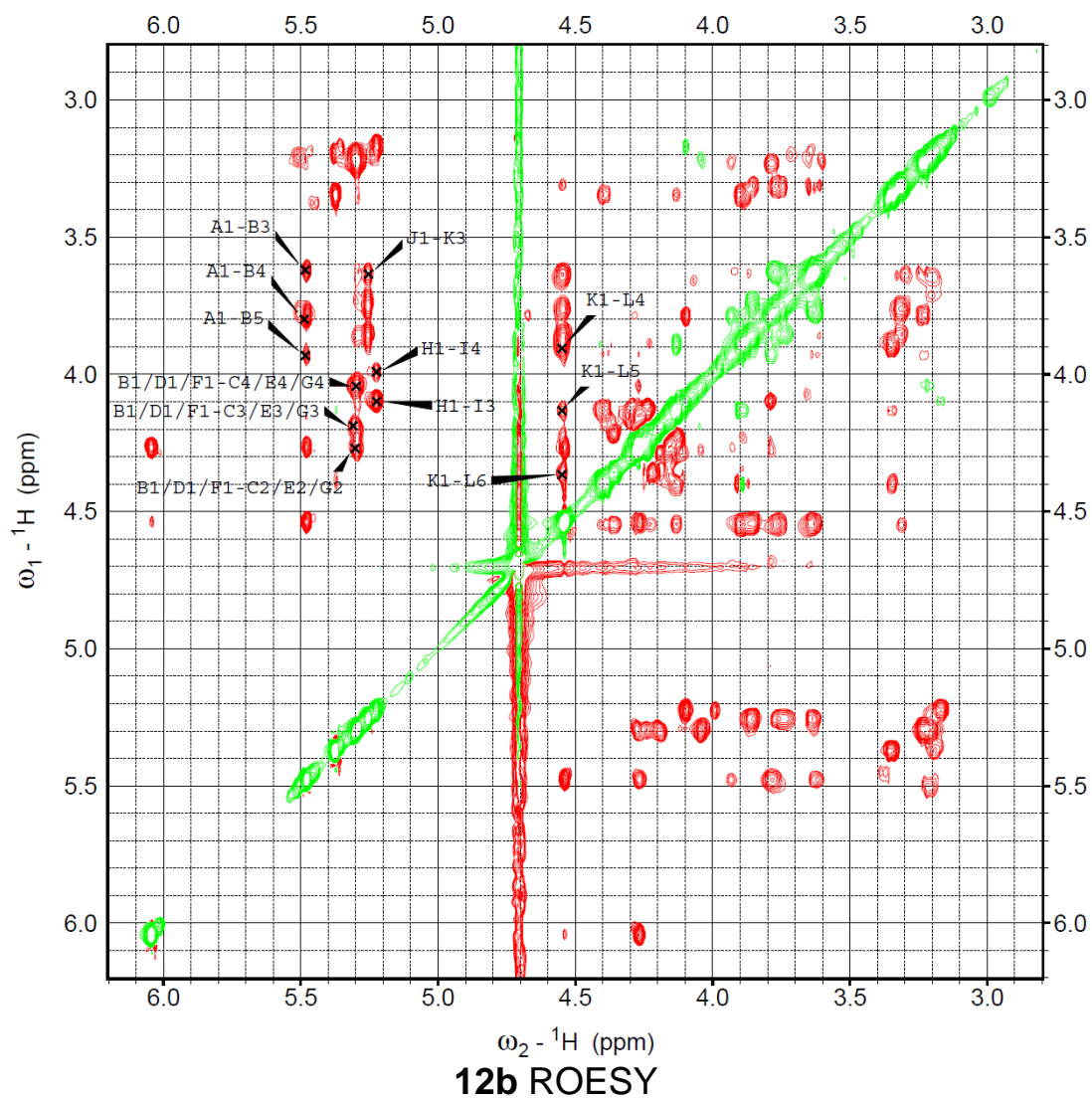
12b  $^1\text{H-NMR}$

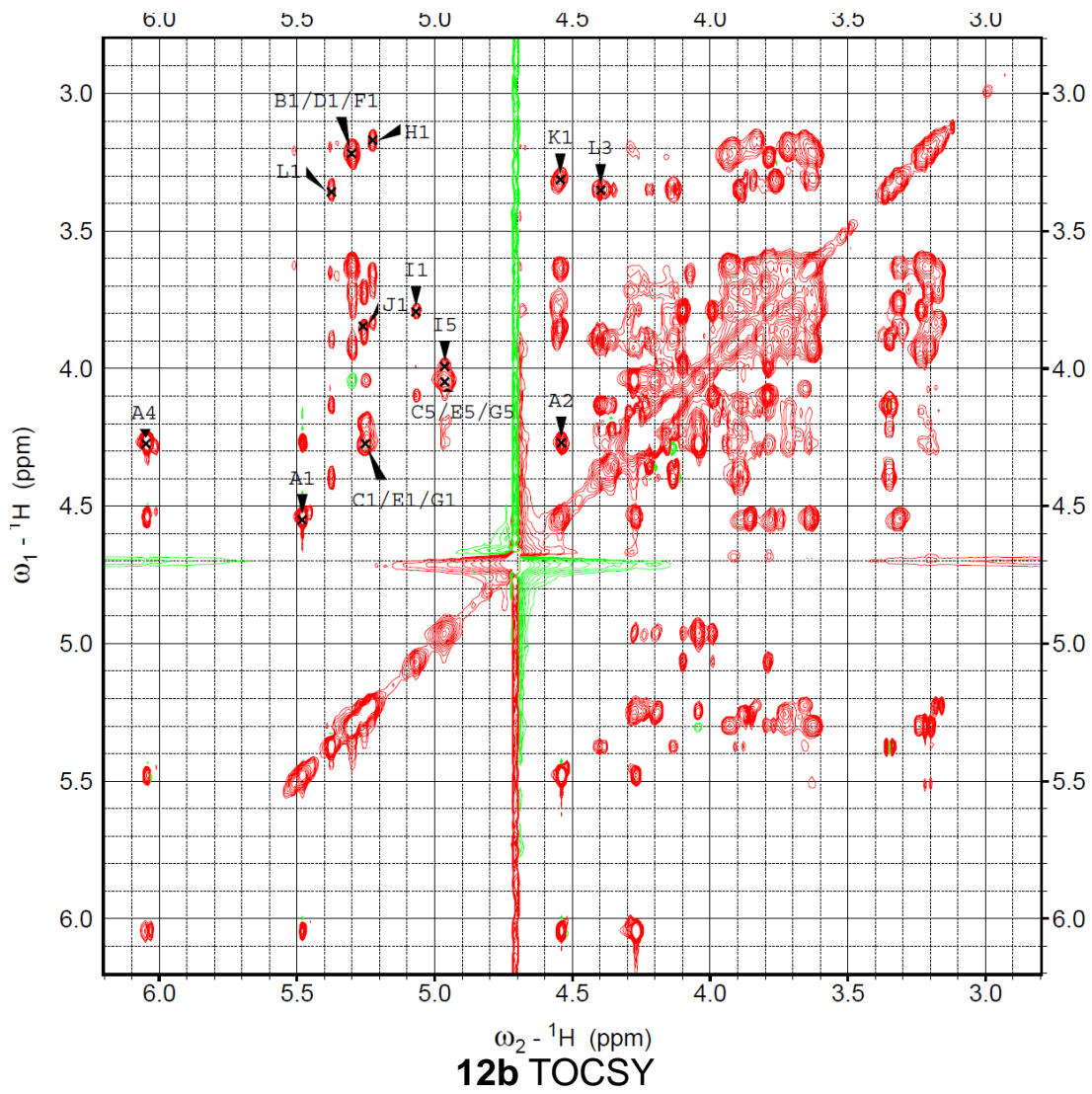




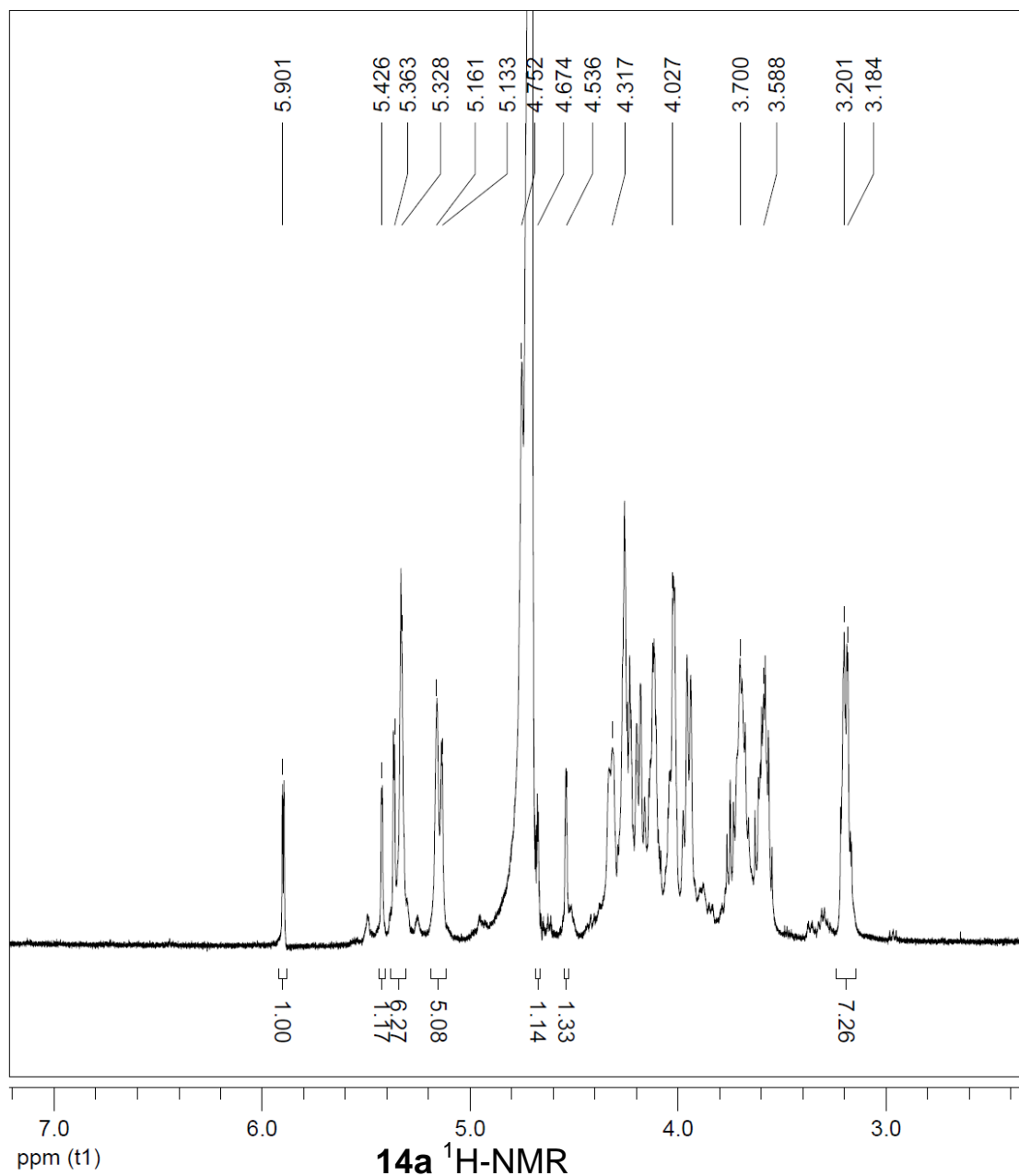


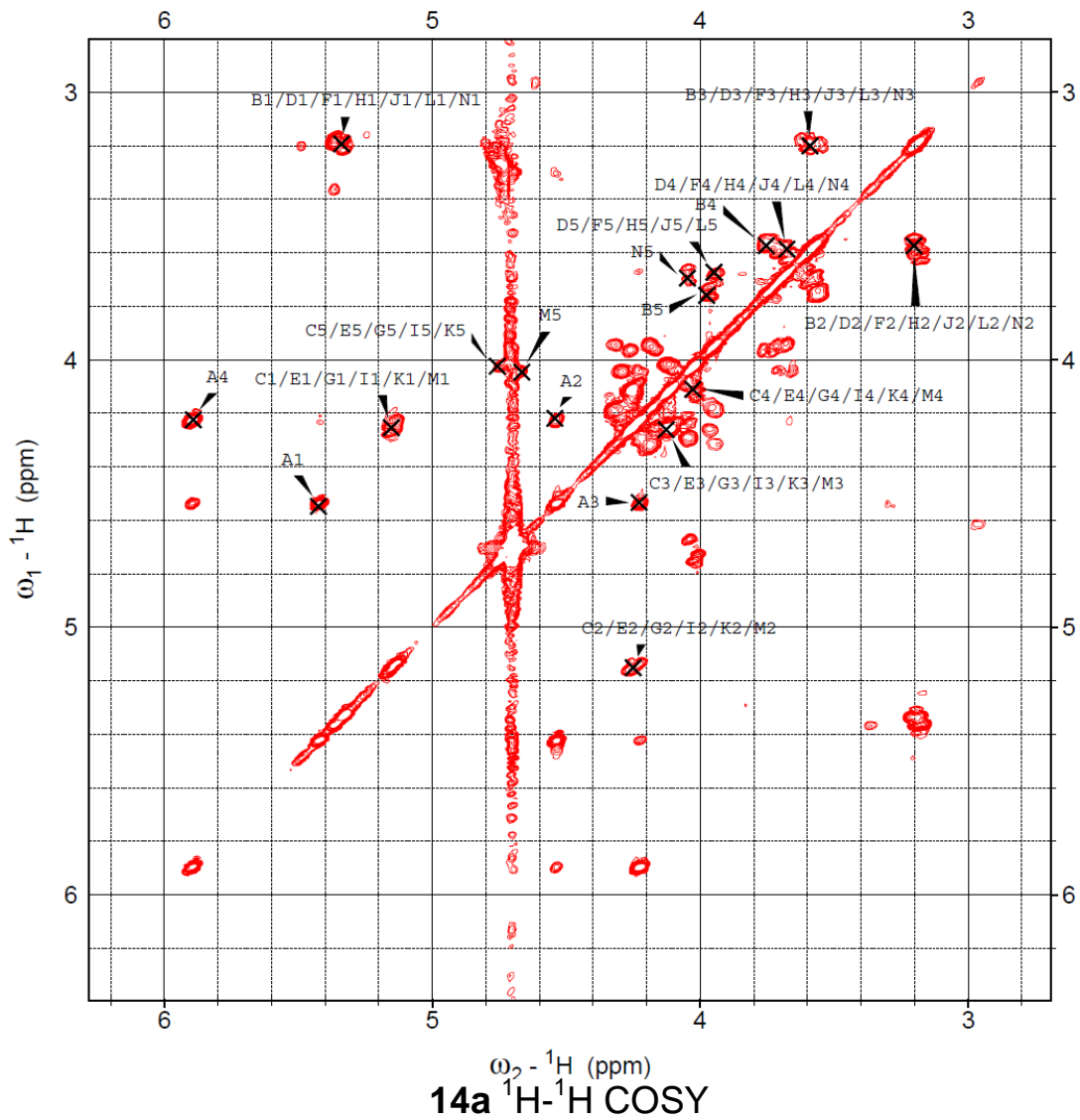


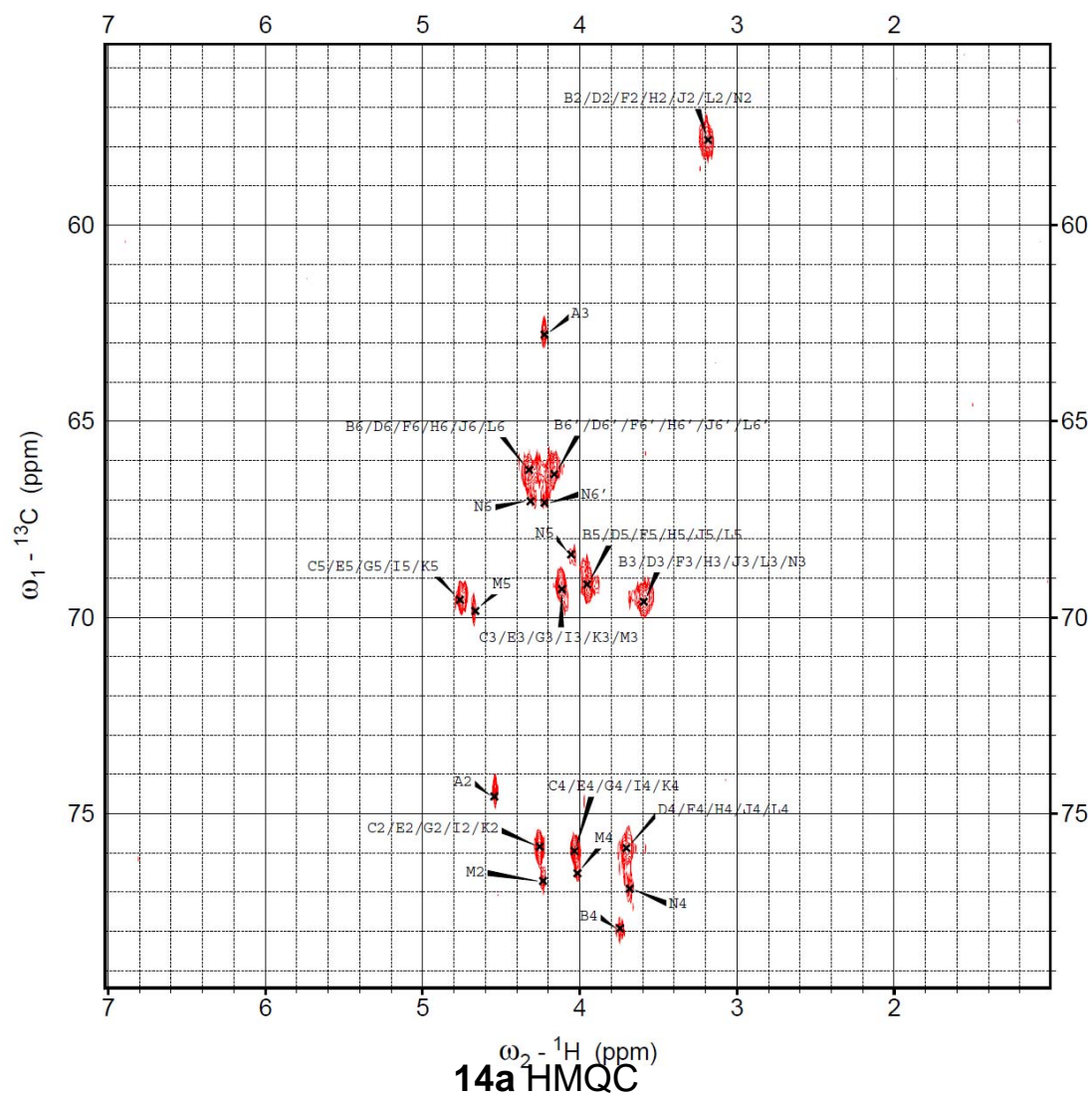




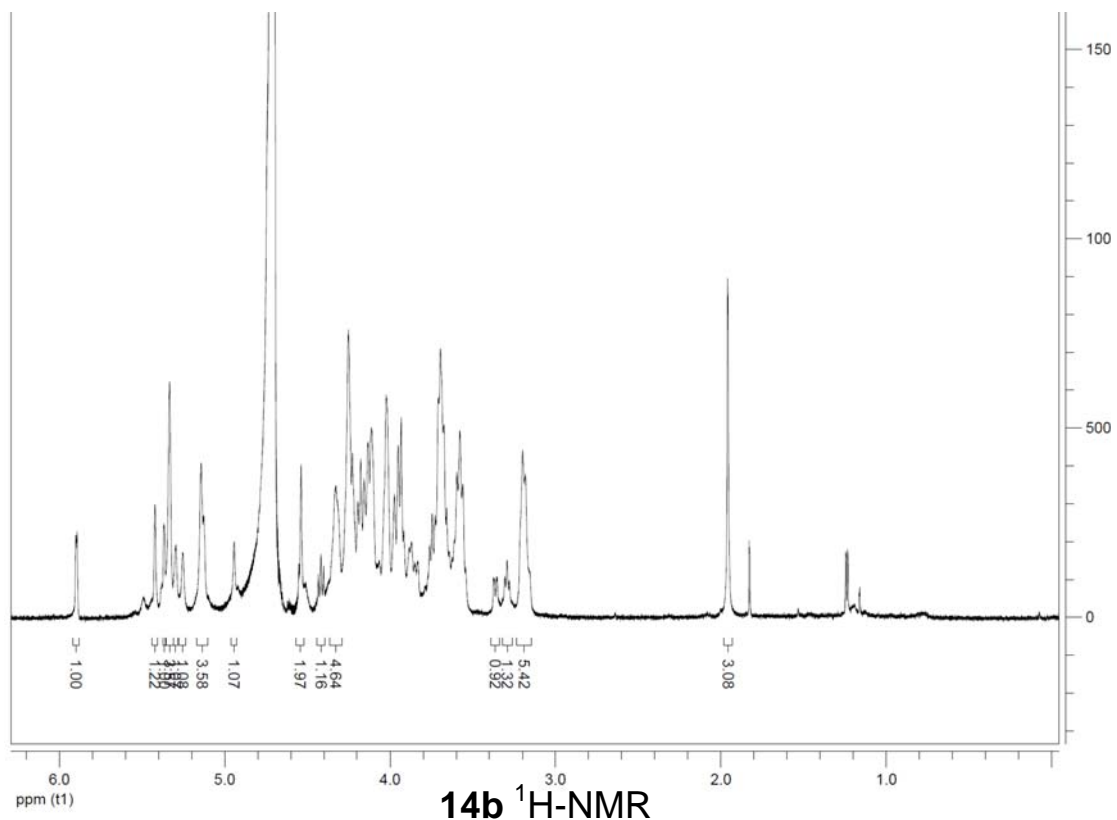
# 14a

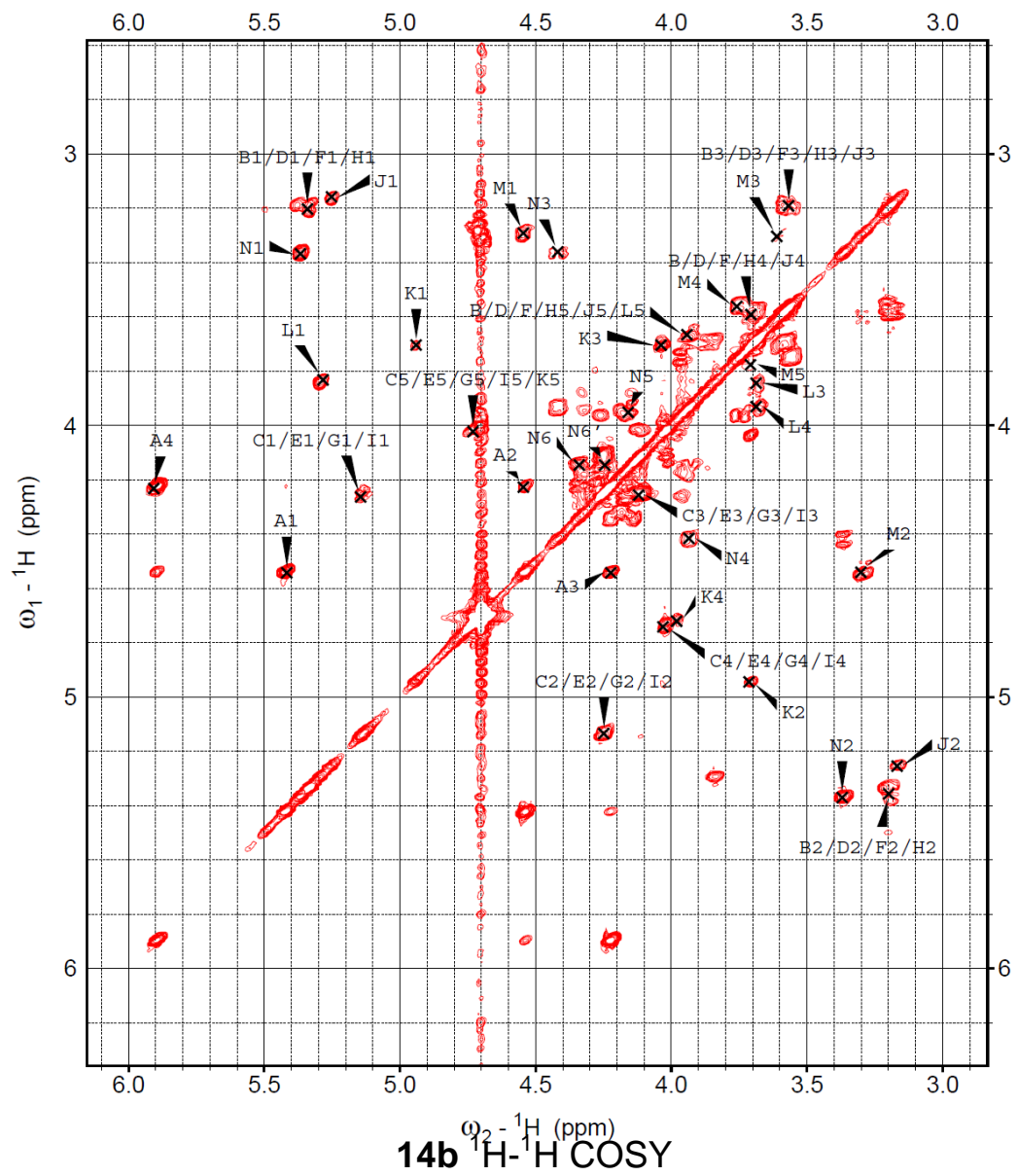




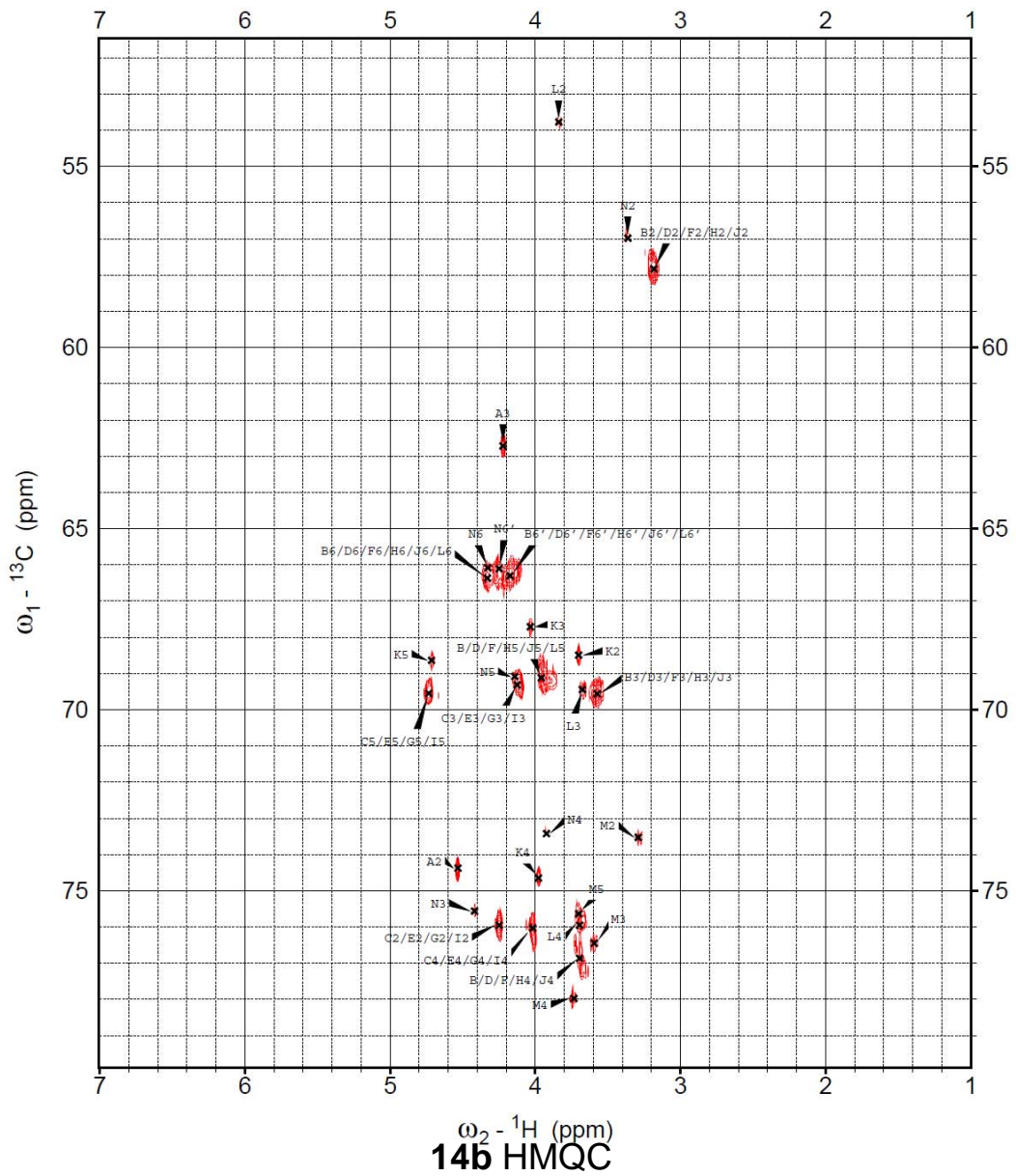


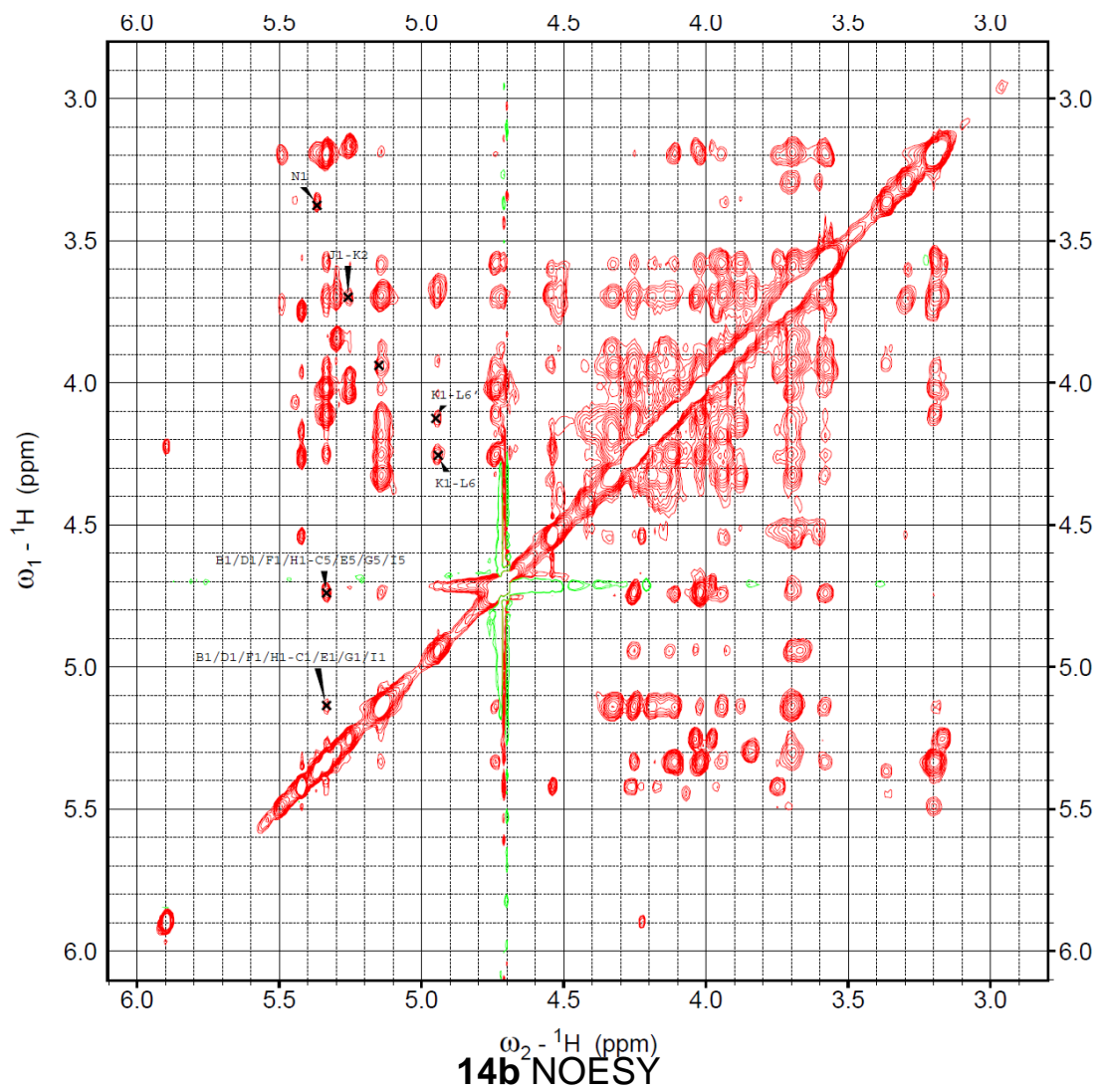
14b

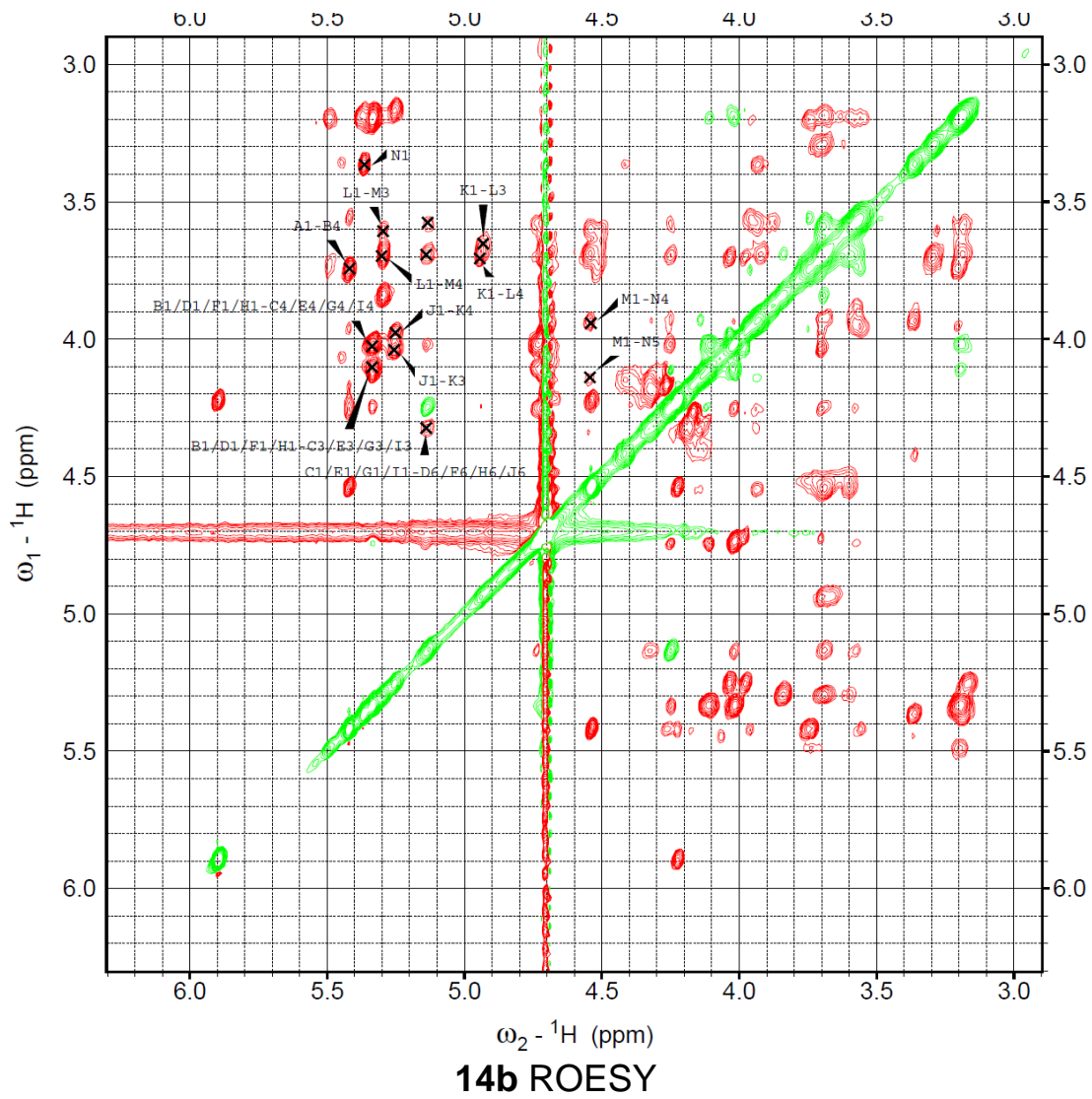


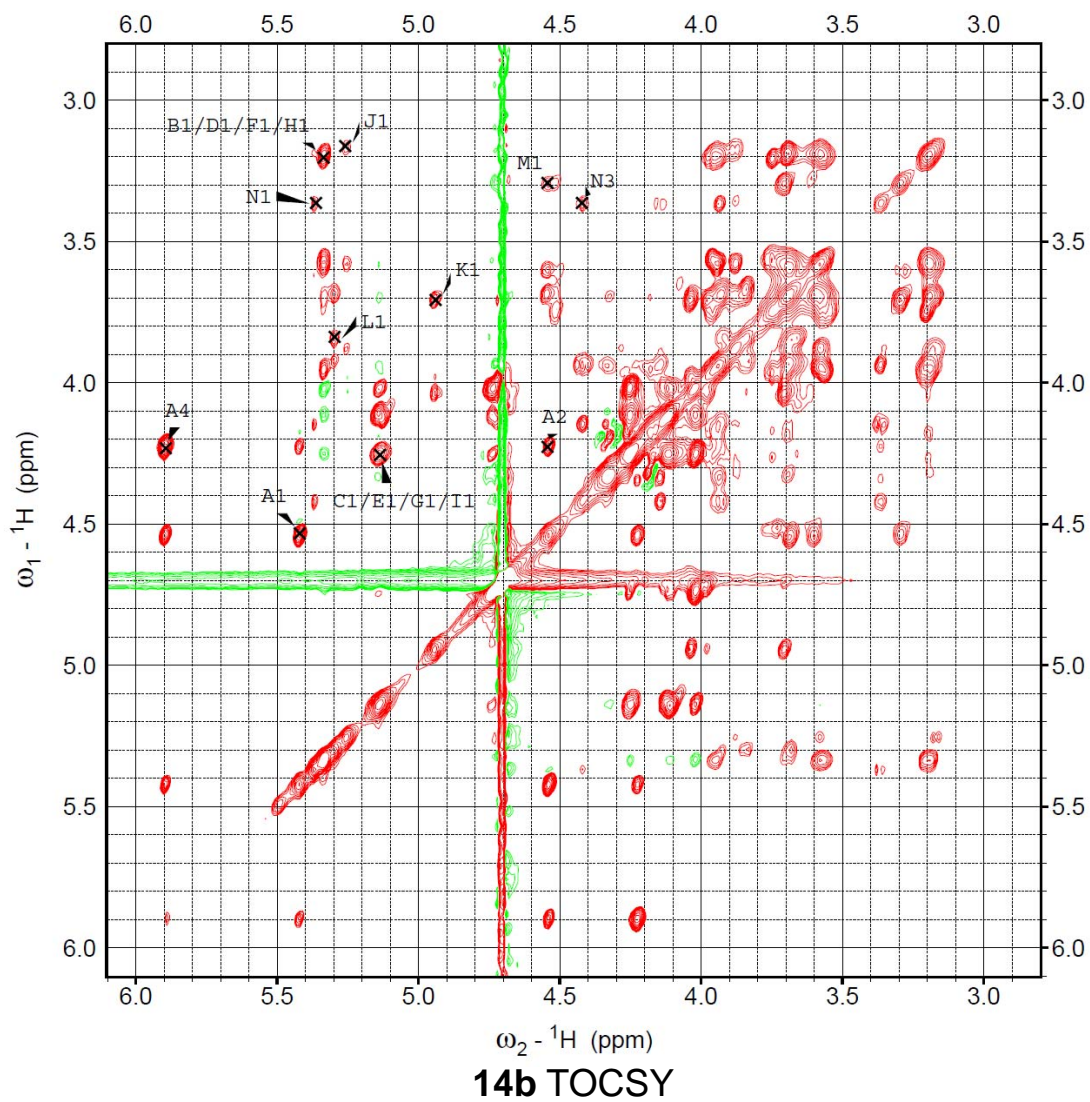




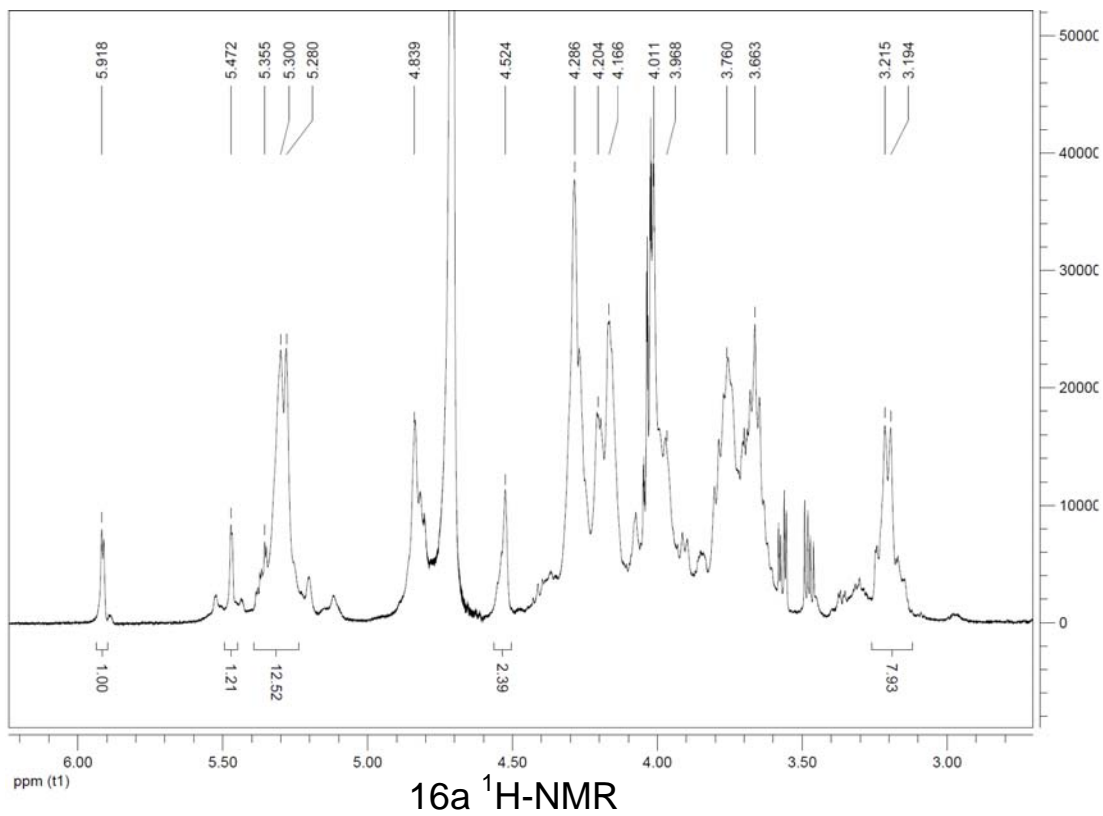


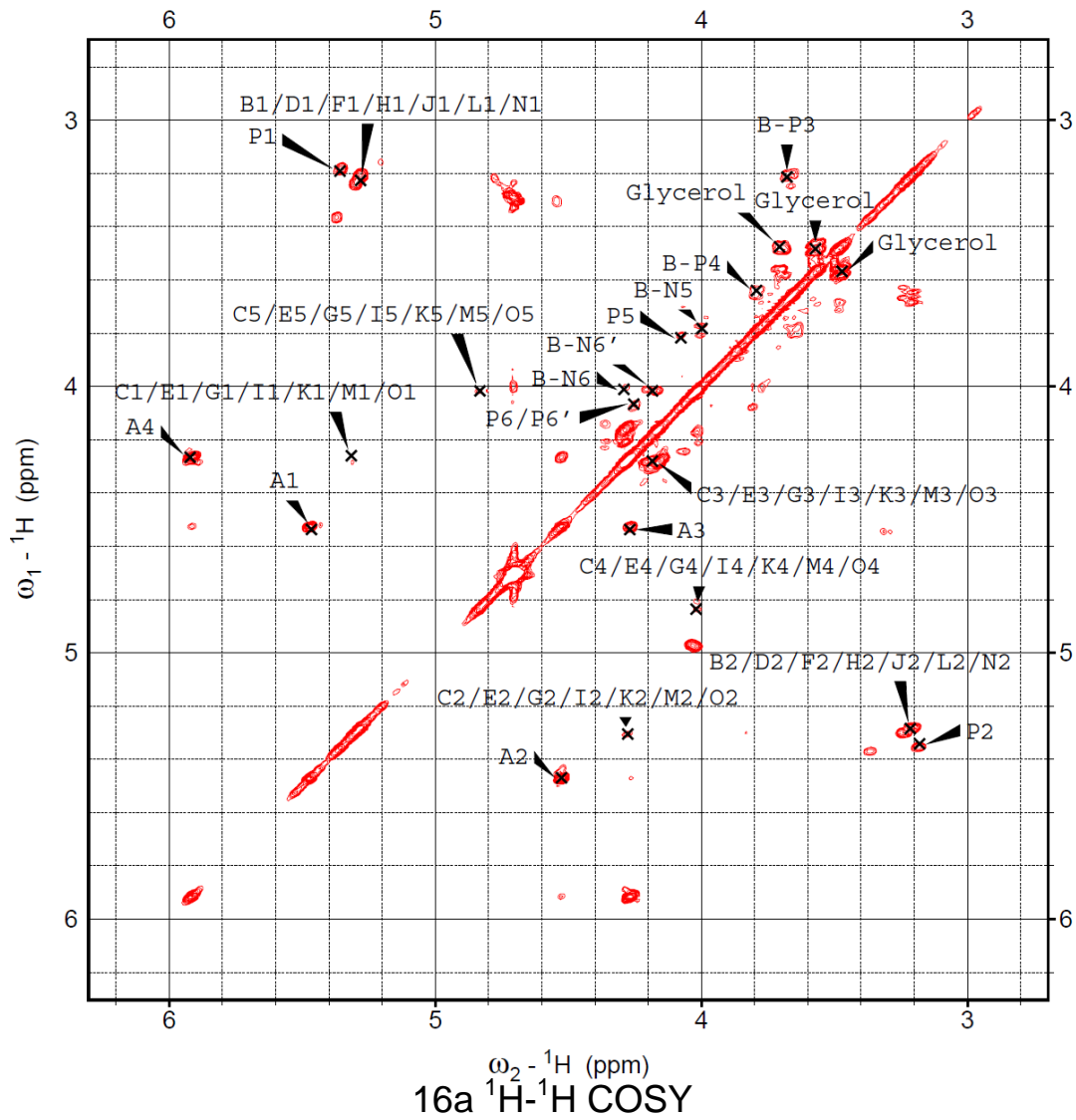


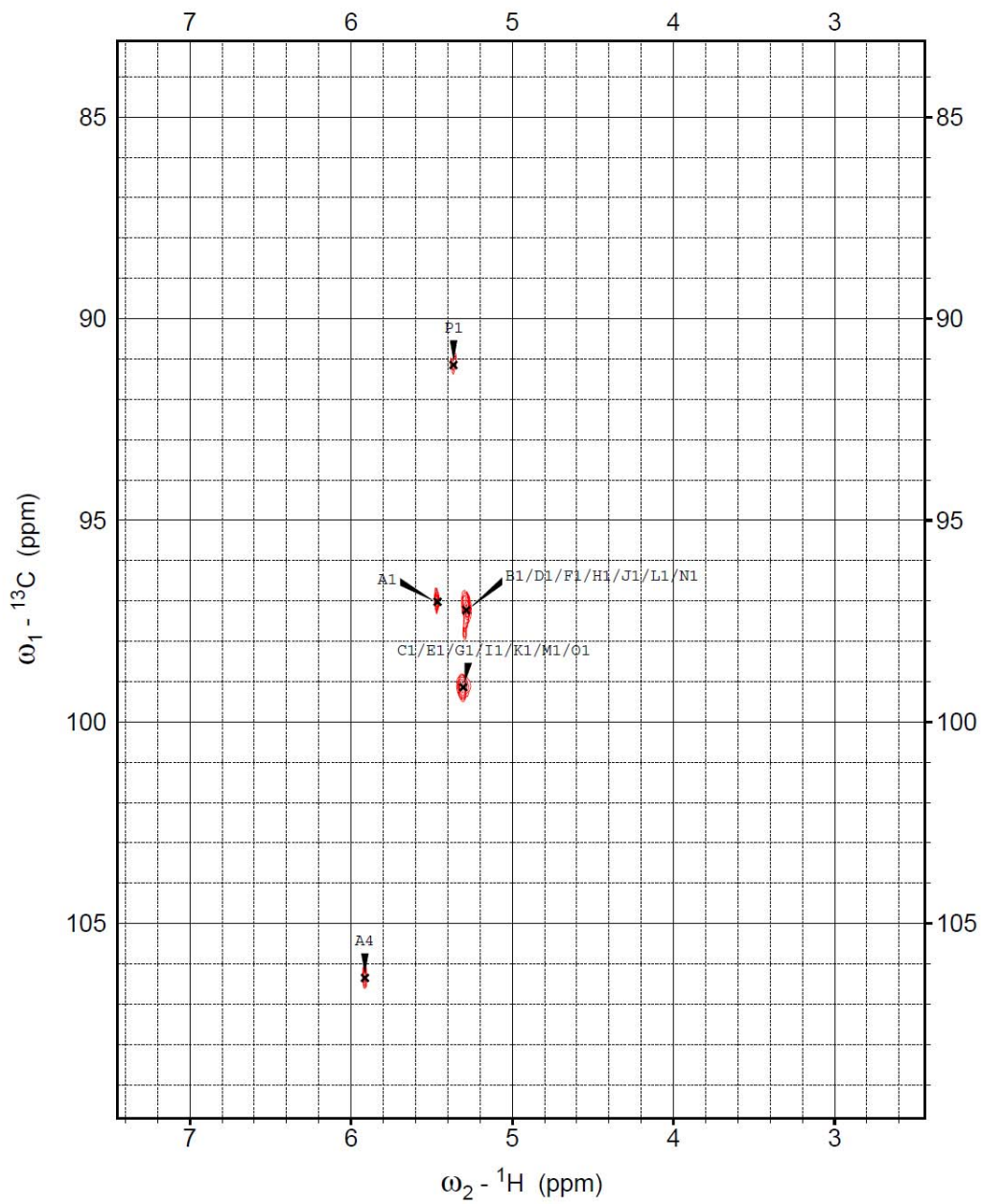




# 16a







16a HMQC (part1)

