Supplementary figures follow:

Figure S1

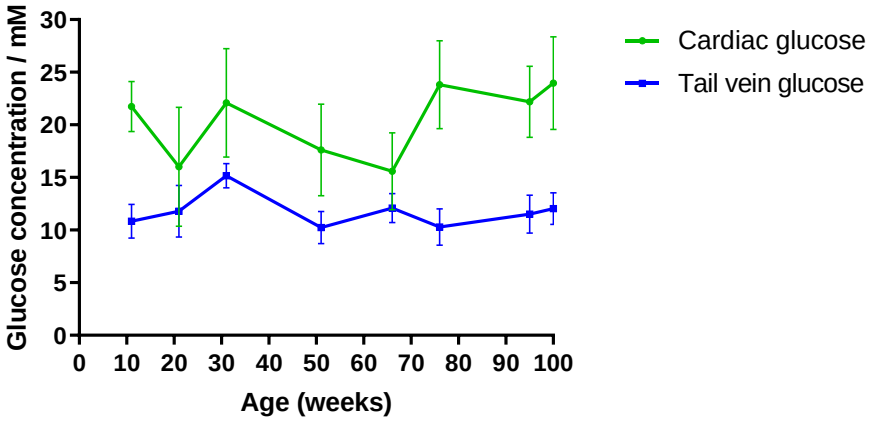


Figure S1a Graphs showing the measured glucose levels in C57Bl/6 mice (mean $\pm SD$) after fasting for 6 hours in different age groups (n=5-12) immediately after culling.

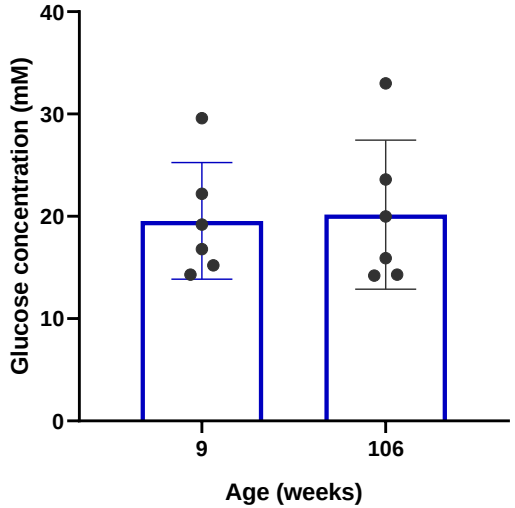


Figure S1b Graphs showing the measured cardiac glucose levels in non-fasting C57Bl/6 mice in different age groups (n=6) immediately after culling (mean $\pm SD$).

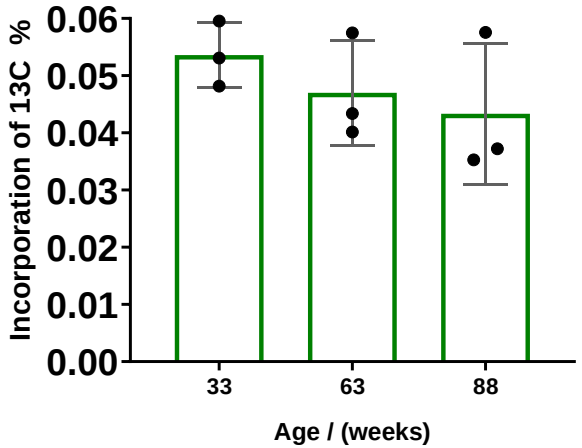


Figure S1c The incorporation of $^{13}C_6$ Lysine into tendon fibres per day (mean $\pm SD$). Mice were fed $^{13}C_6$ Lysine for 28 days (n=3).

Figure S2

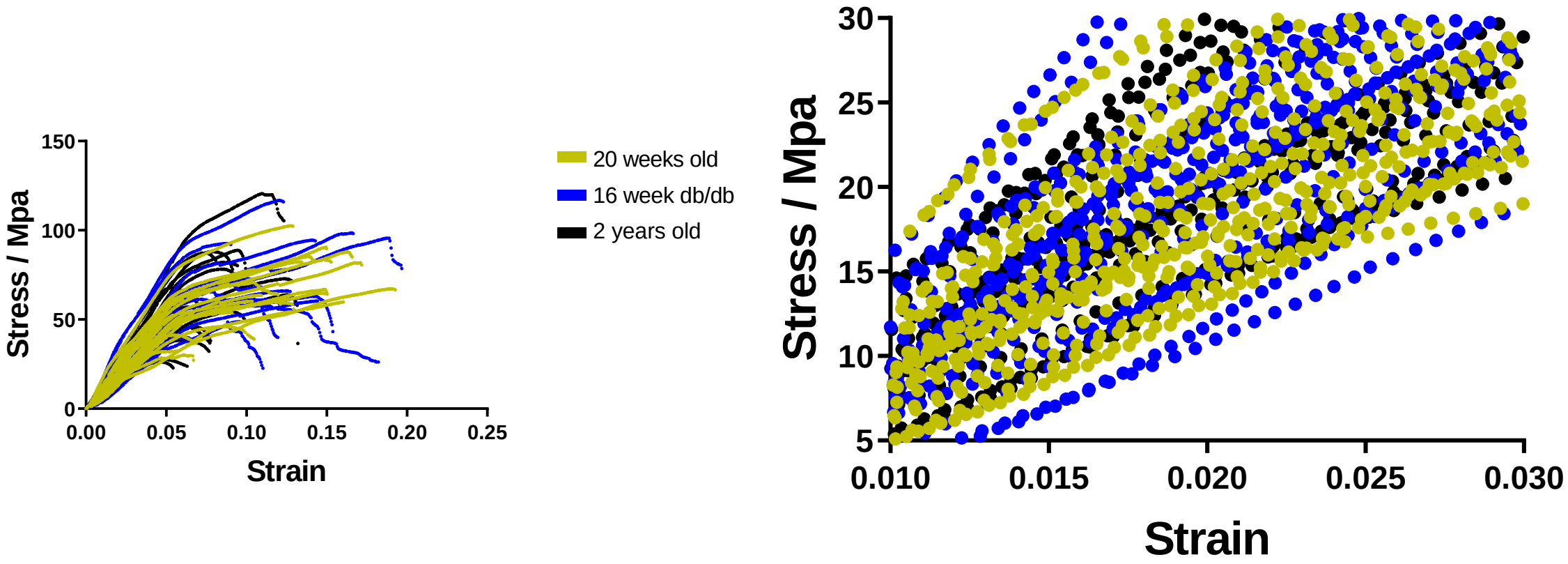


Figure S5 Overlay of traces in figure 2 and 4a (main text) and expansion. The steeper lines to the left show increased stiffness.

Figure S3

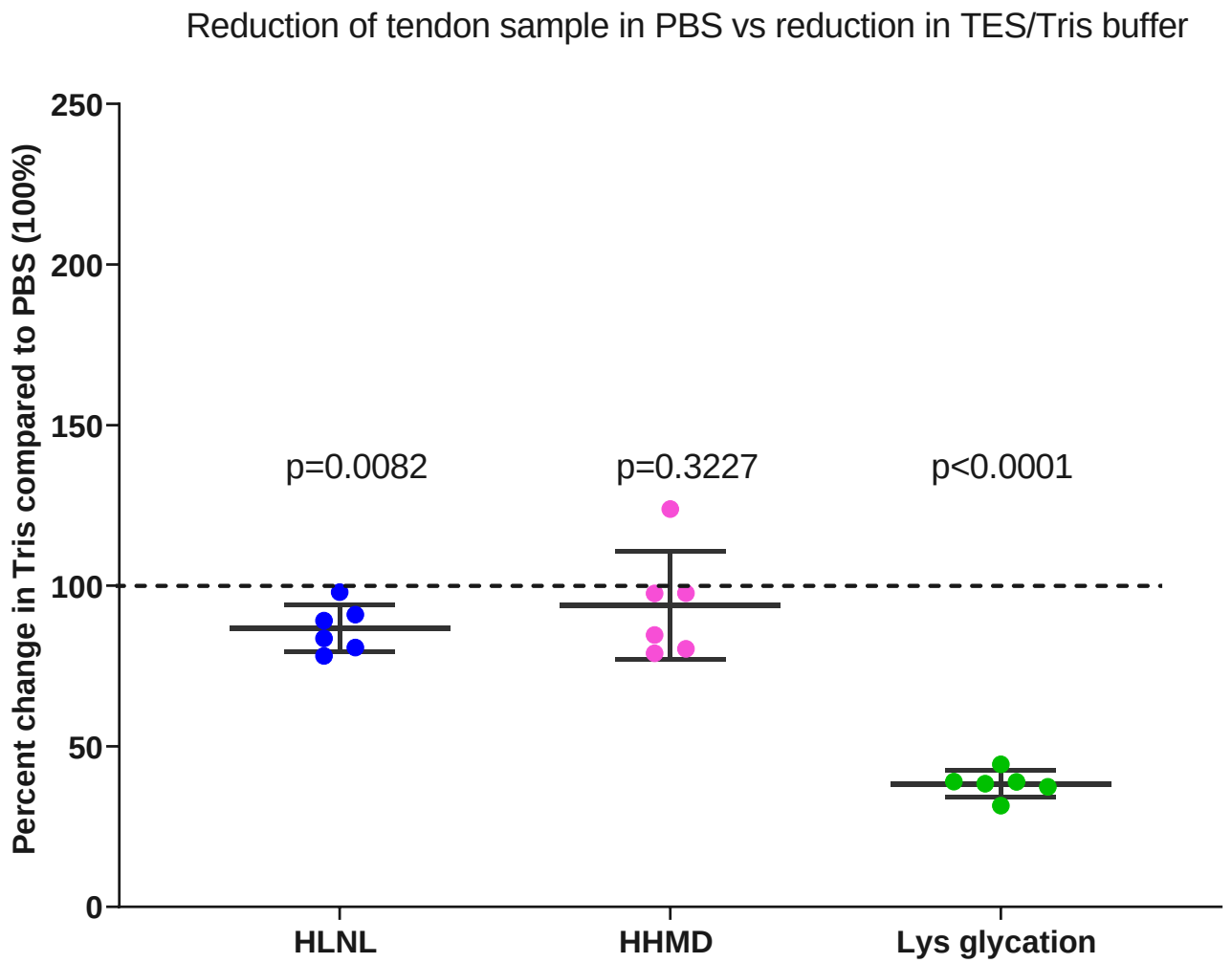

Reduction of tendon sample in PBS vs reduction in TES/Tris buffer
Percent change in Tris compared to PBS (100%)
250
200
150
100
50
0
p=0.0082
p=0.3227
p<0.0001
HLNL
HHMD
Lys glycation

Figure S4

Fragmentation of $NaBH_4$ reduced HHMD signal

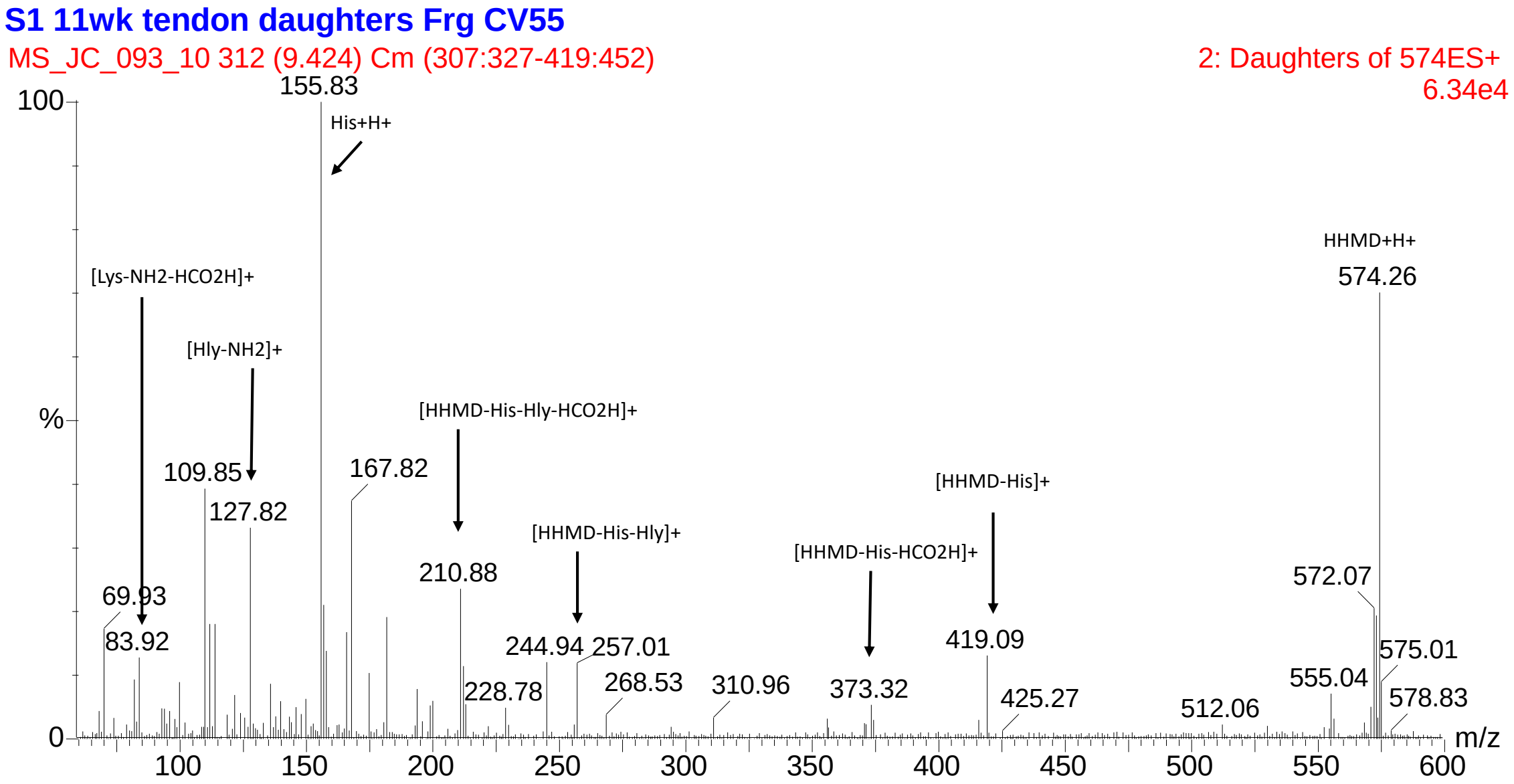
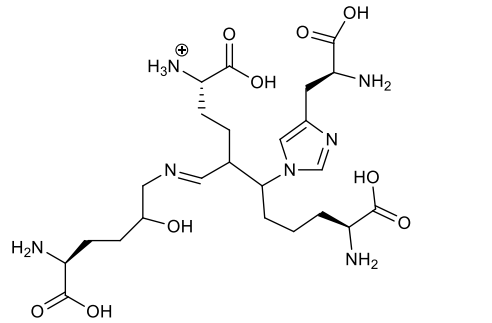
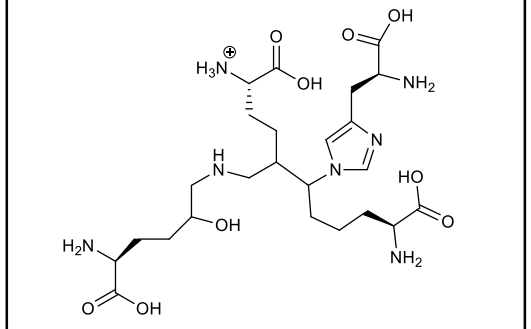


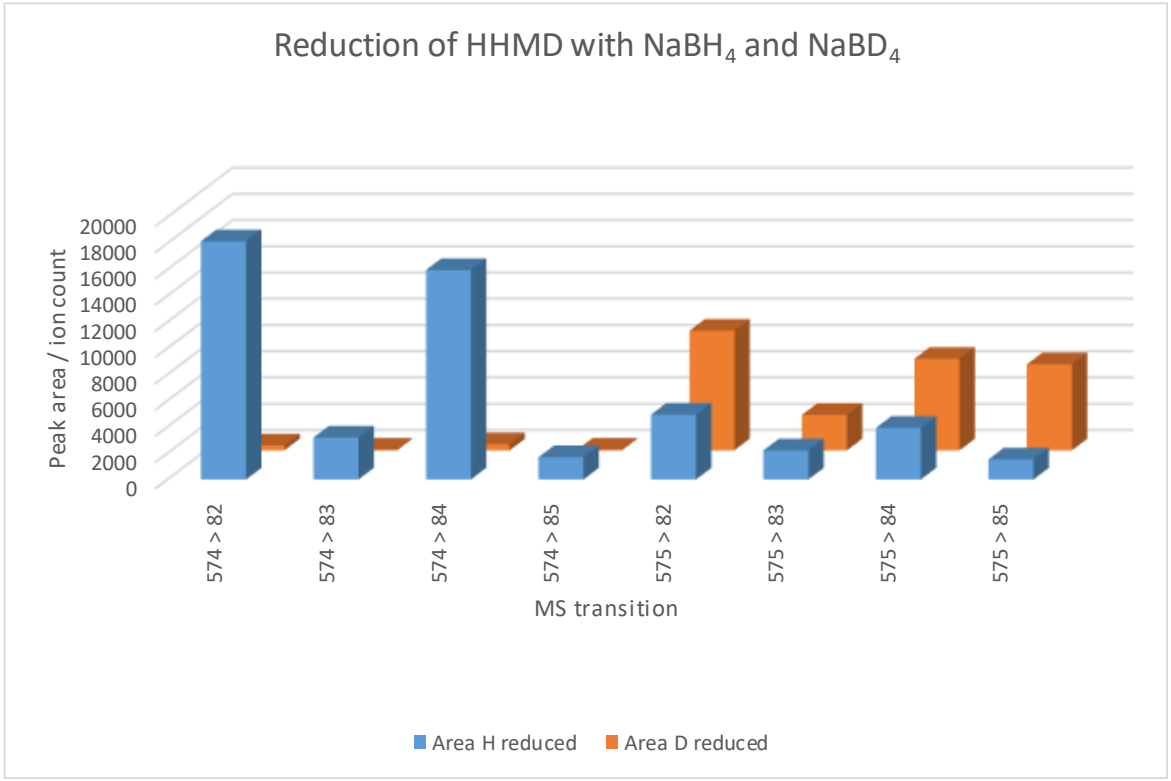
Figure S5 Reduction of HHMD with $NaBH_4$ and $NaBD_4$



Un-reduced HHMD literature structure

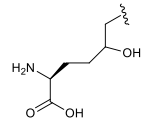


Reduced HHMD literature structure



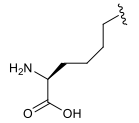
Interpretation of ion transition

Blue 574 > 82 indicates presence of



Blue 574 > 83 shows Lys fragment, protonated fragment or coincidental mass

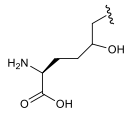
Blue 574 > 84 indicates presence of



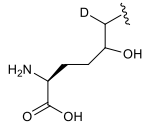
Blue 574 > 85 shows unidentified fragment or coincidental mass

Blue 575 transitions show 13C isotope natural abundance

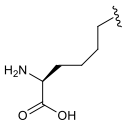
Orange 575 > 82 indicates presence of



Orange 575 > 83 indicates presence of (Higher than the expected background signal)



Orange 575 > 84 indicates presence of



Orange 575 > 85 indicates presence of

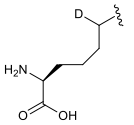


Figure S6

Fragmentation of $NaBD_4$ reduced HHMD signal

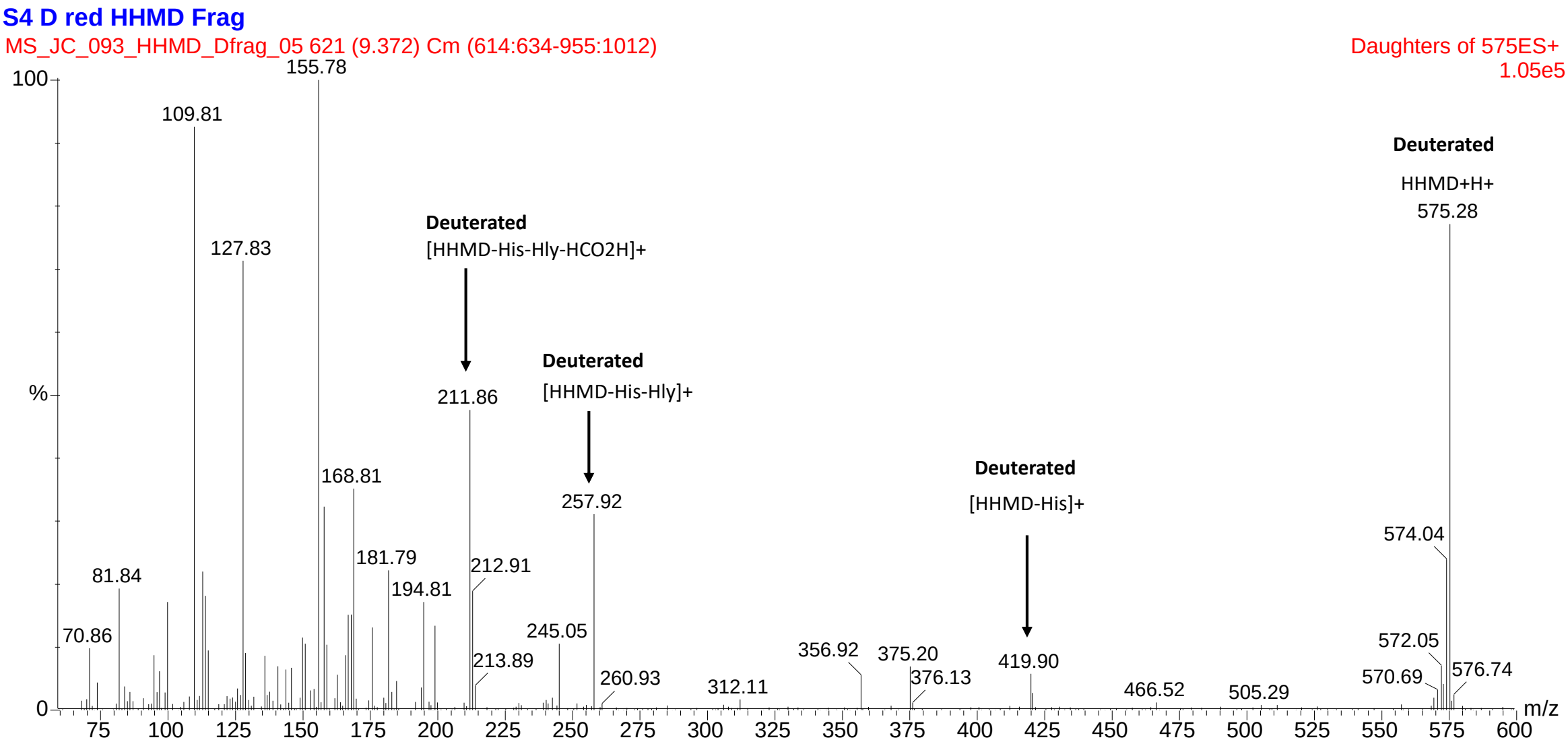
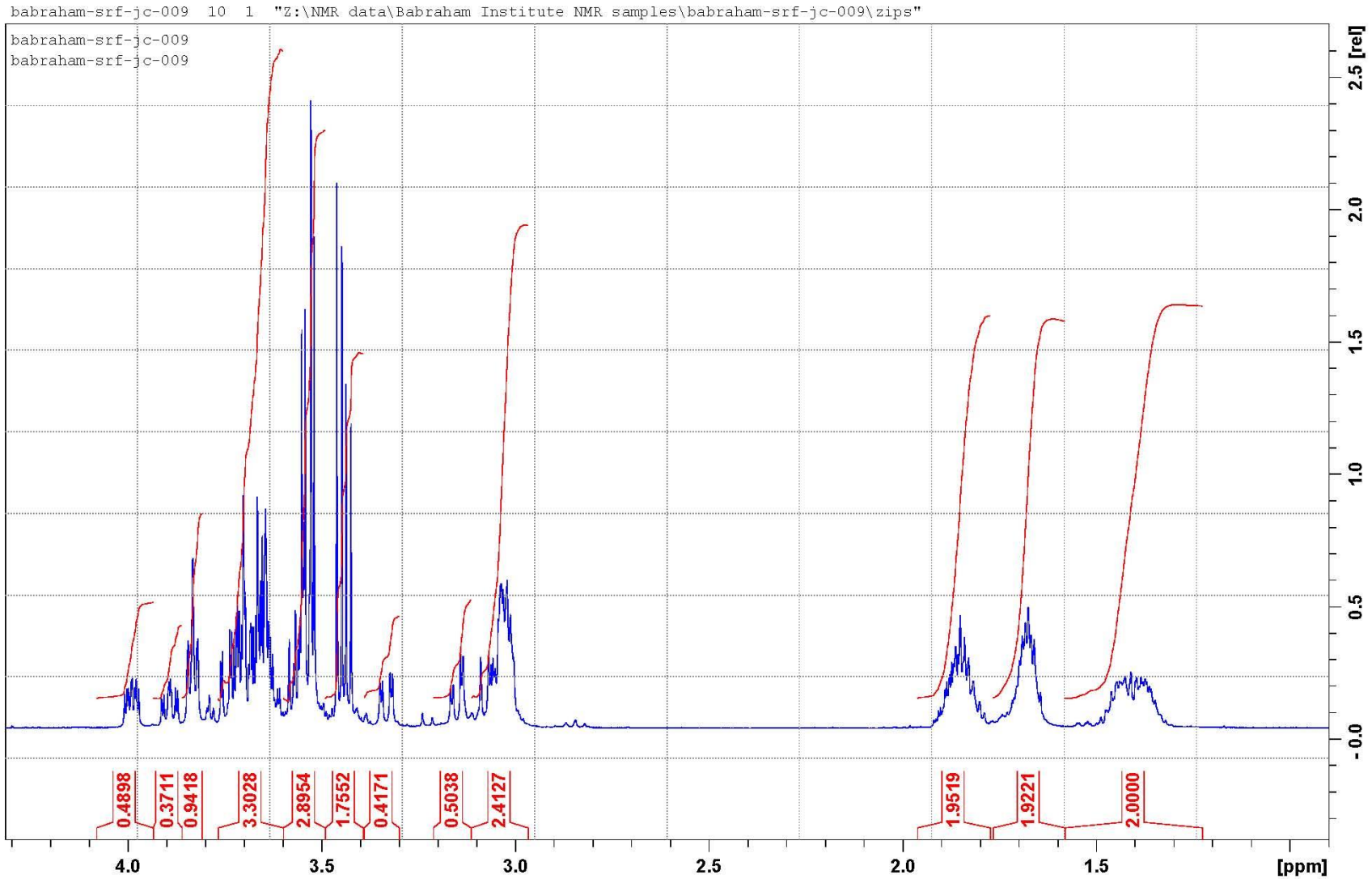
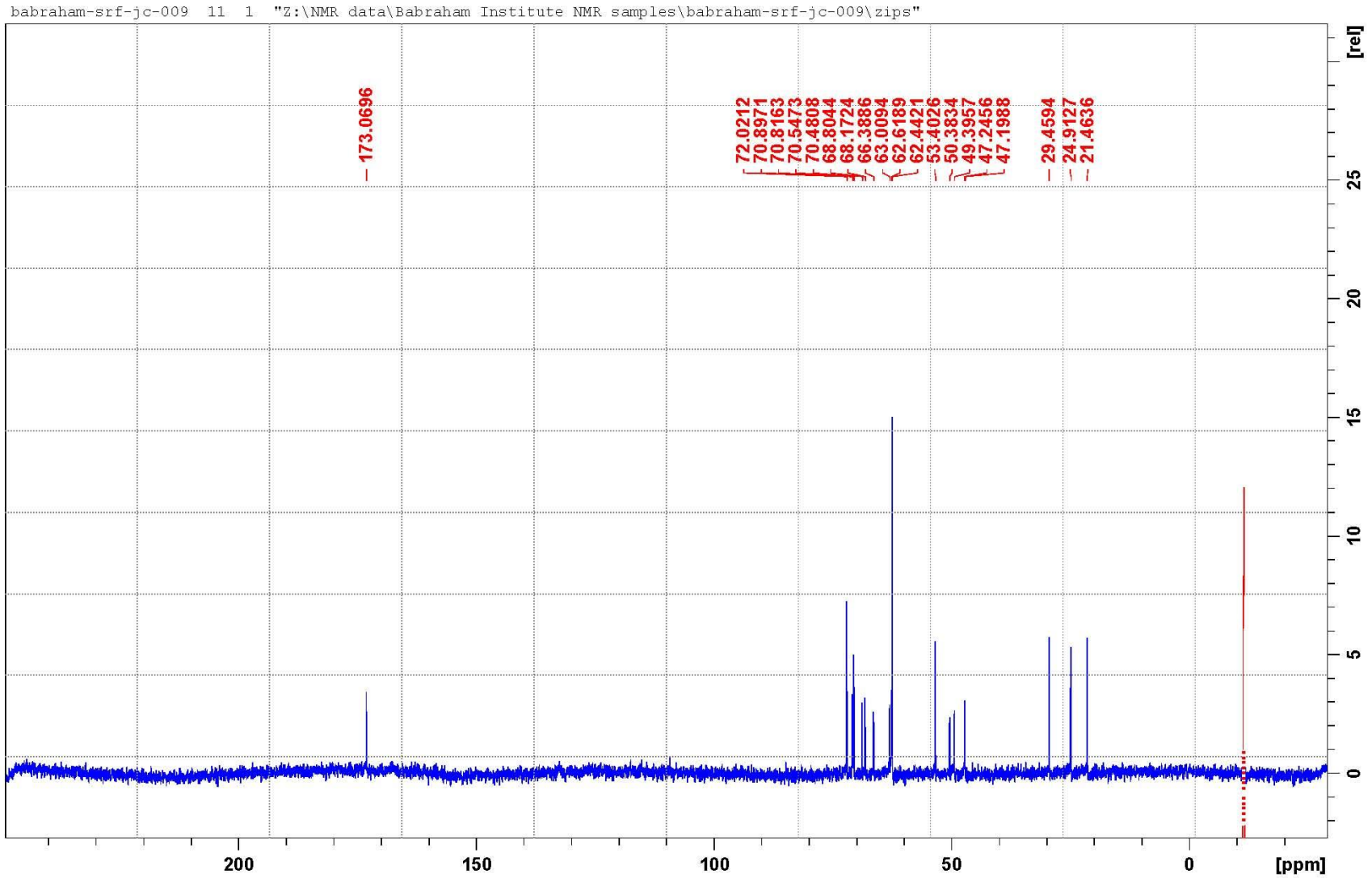


Figure S7a



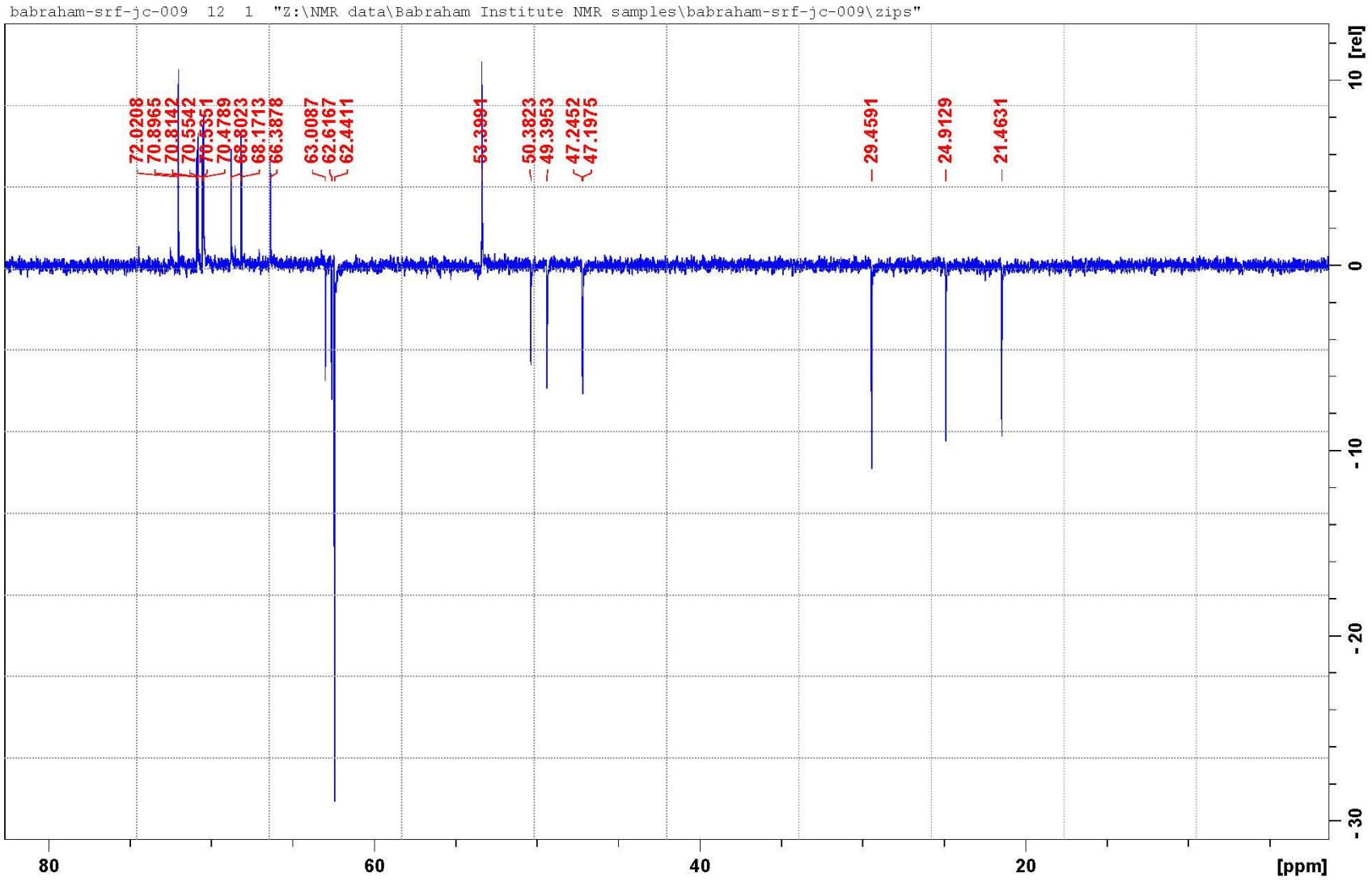
Proton NMR spectrum of Lys-Hx

Figure S7b



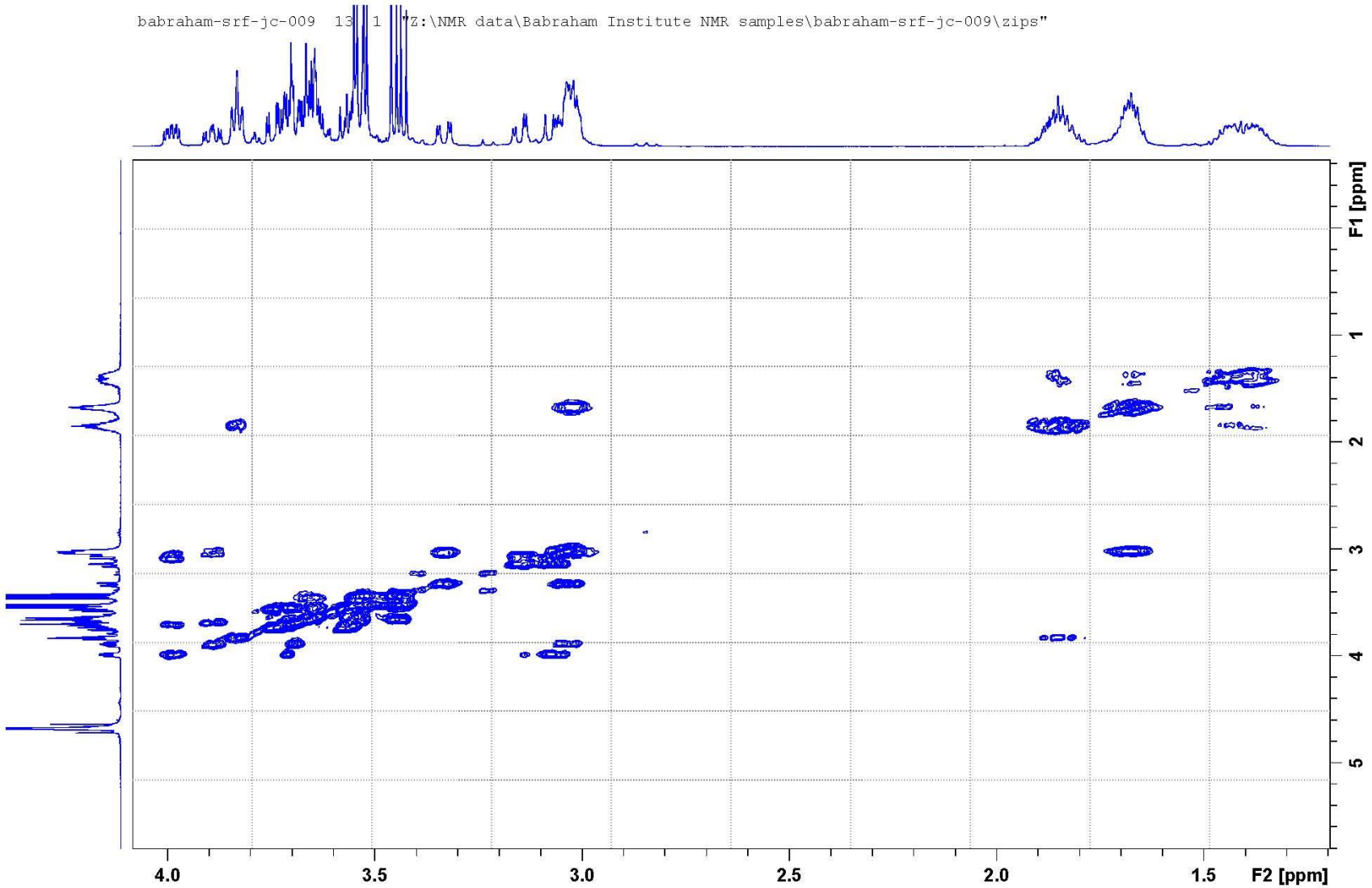
CPD carbon NMR spectrum of Lys-Hx

Figure S7c



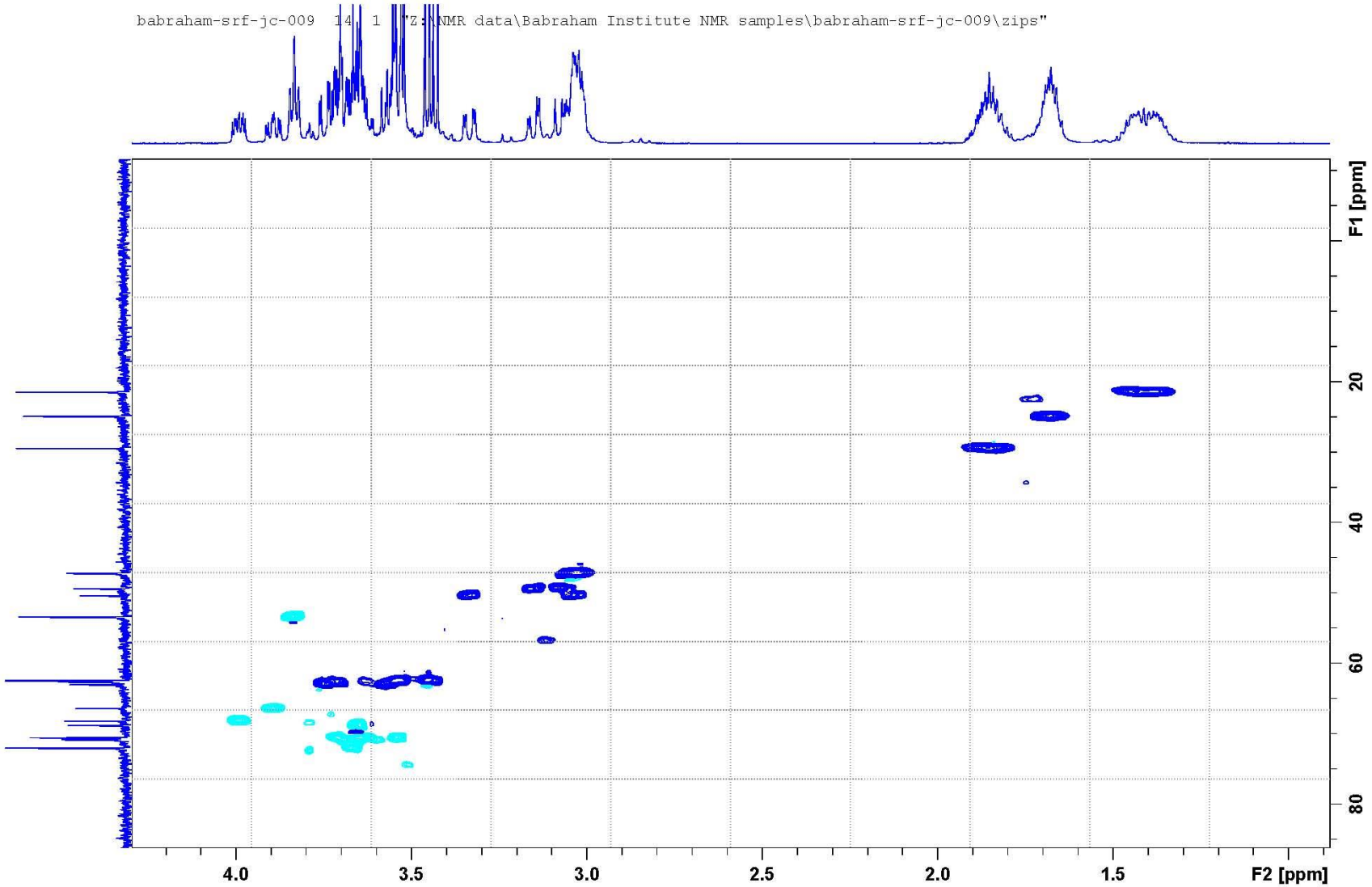
DEPT135 NMR spectrum of Lys-Hx

Figure S7d



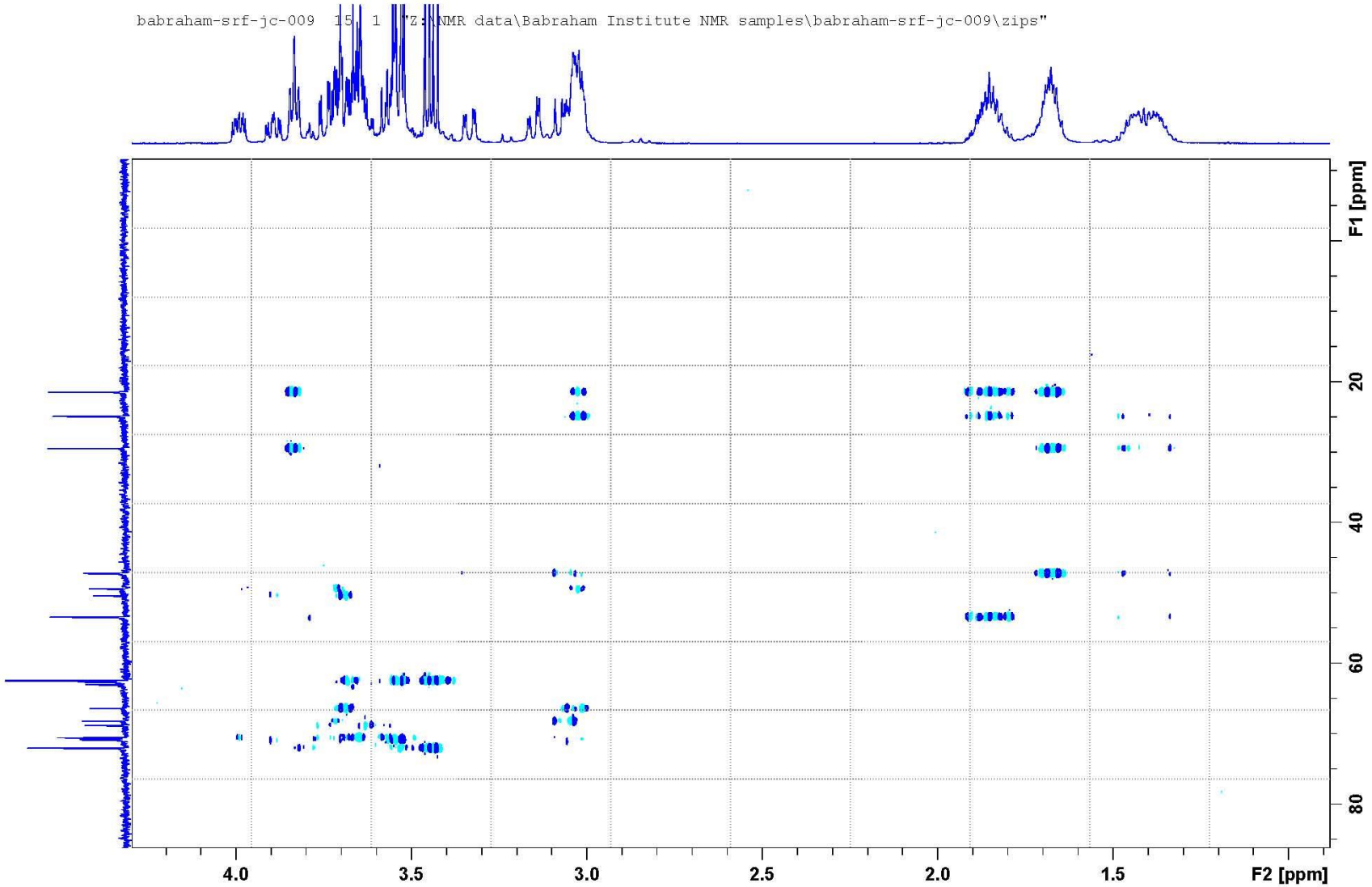
1H COSY NMR spectrum of Lys-Hx

Figure S7e



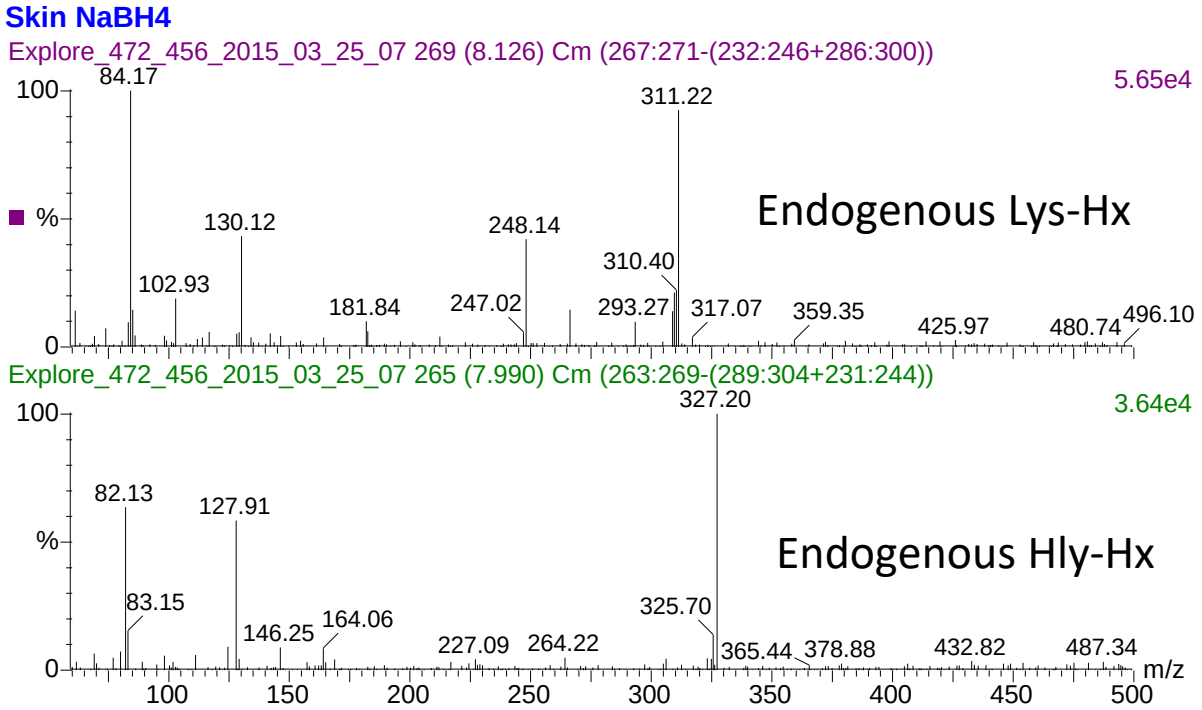
HSQC NMR spectrum of Lys-Hx

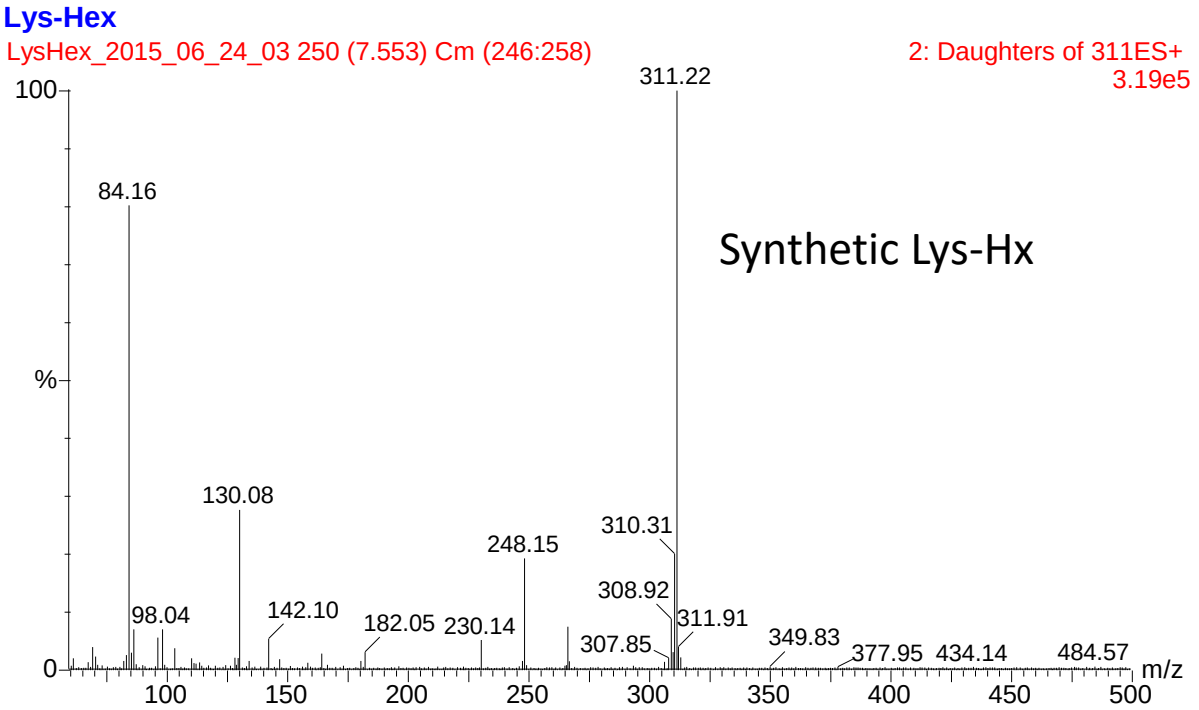
Figure S7f



HMBC NMR spectrum of Lys-Hx

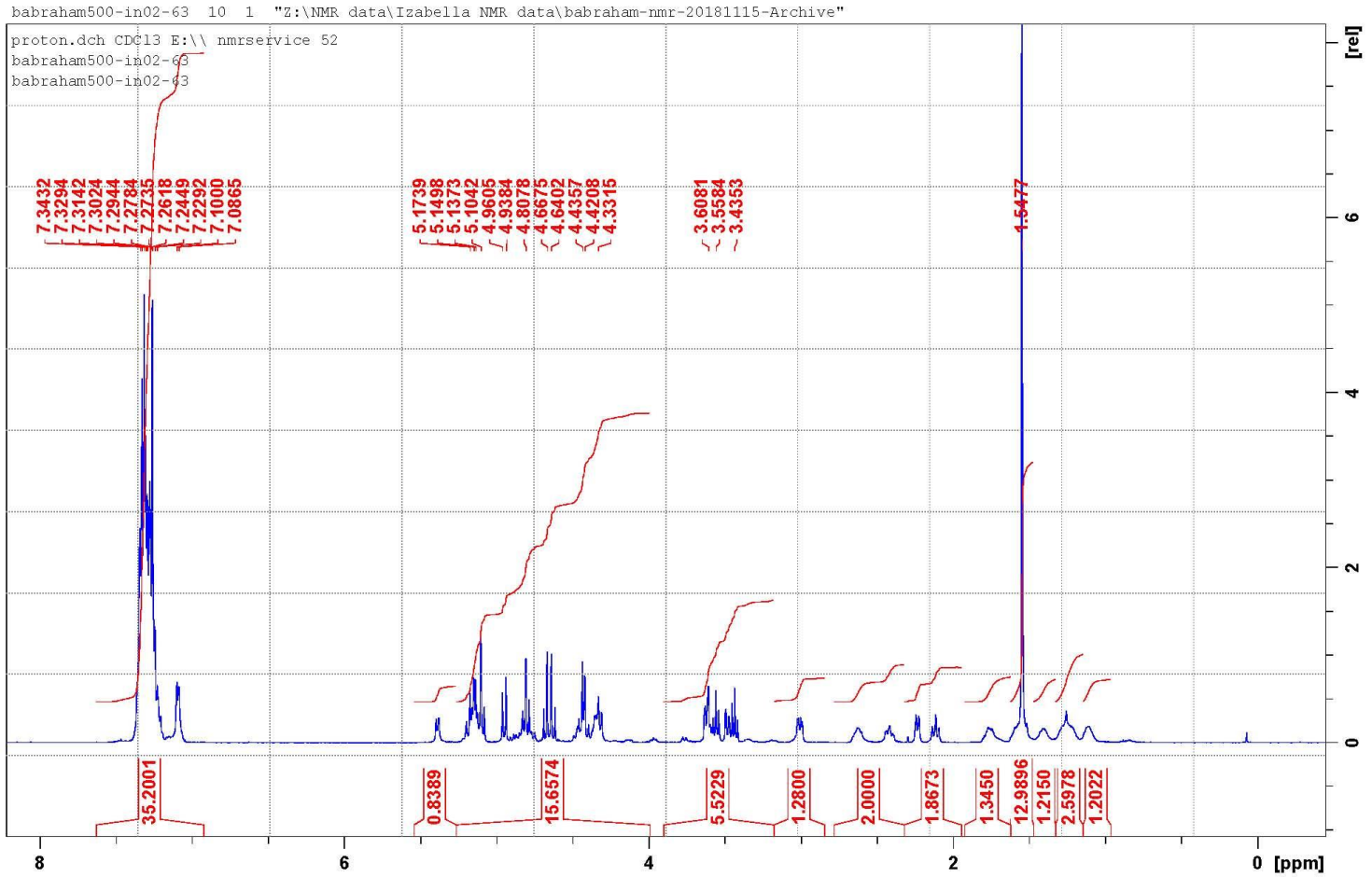
Figure S8





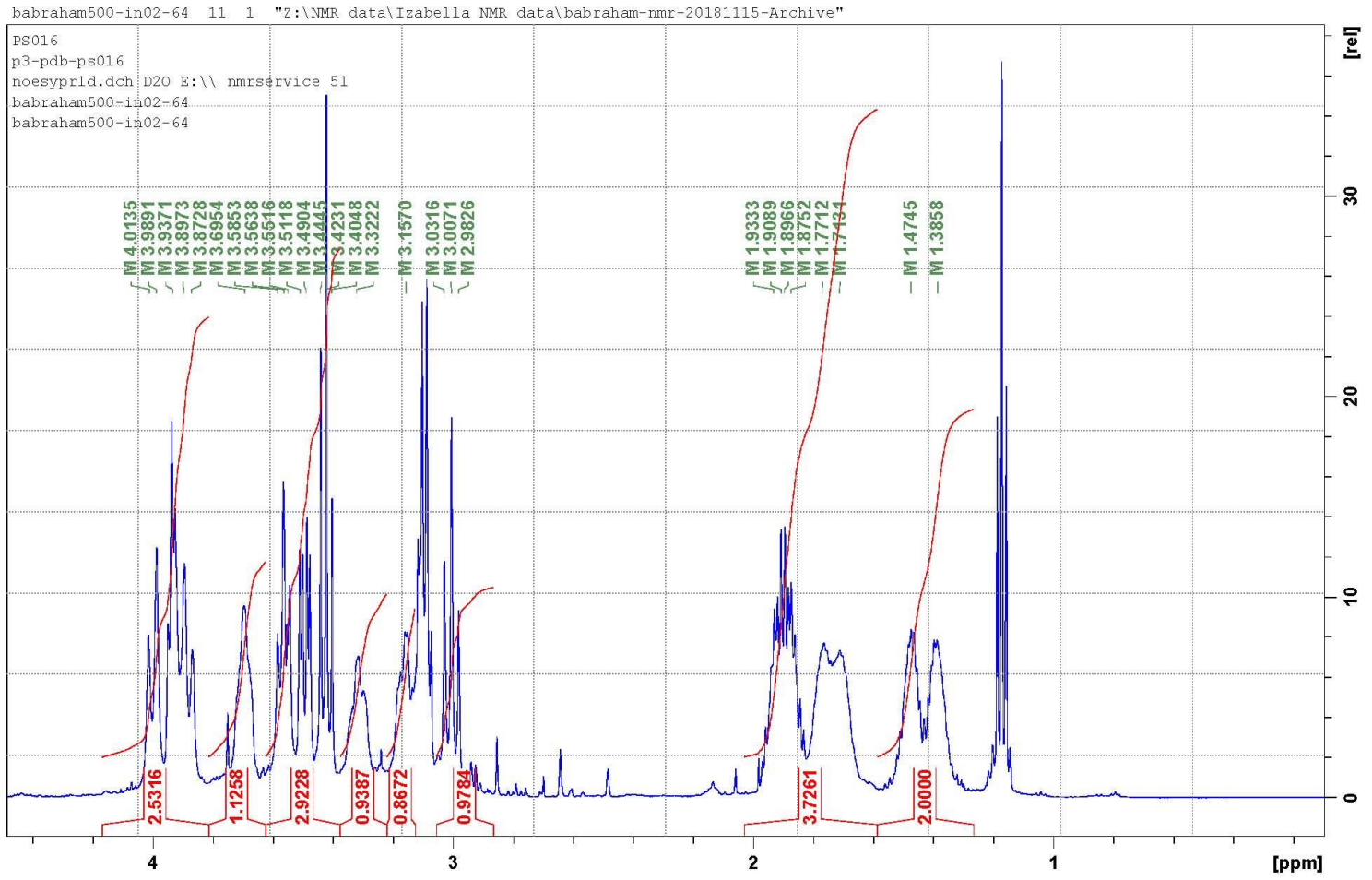
Fragmentation spectra of endogenous Lys-Hx from skin collagen and synthetic Lys-Hx

Figure S9



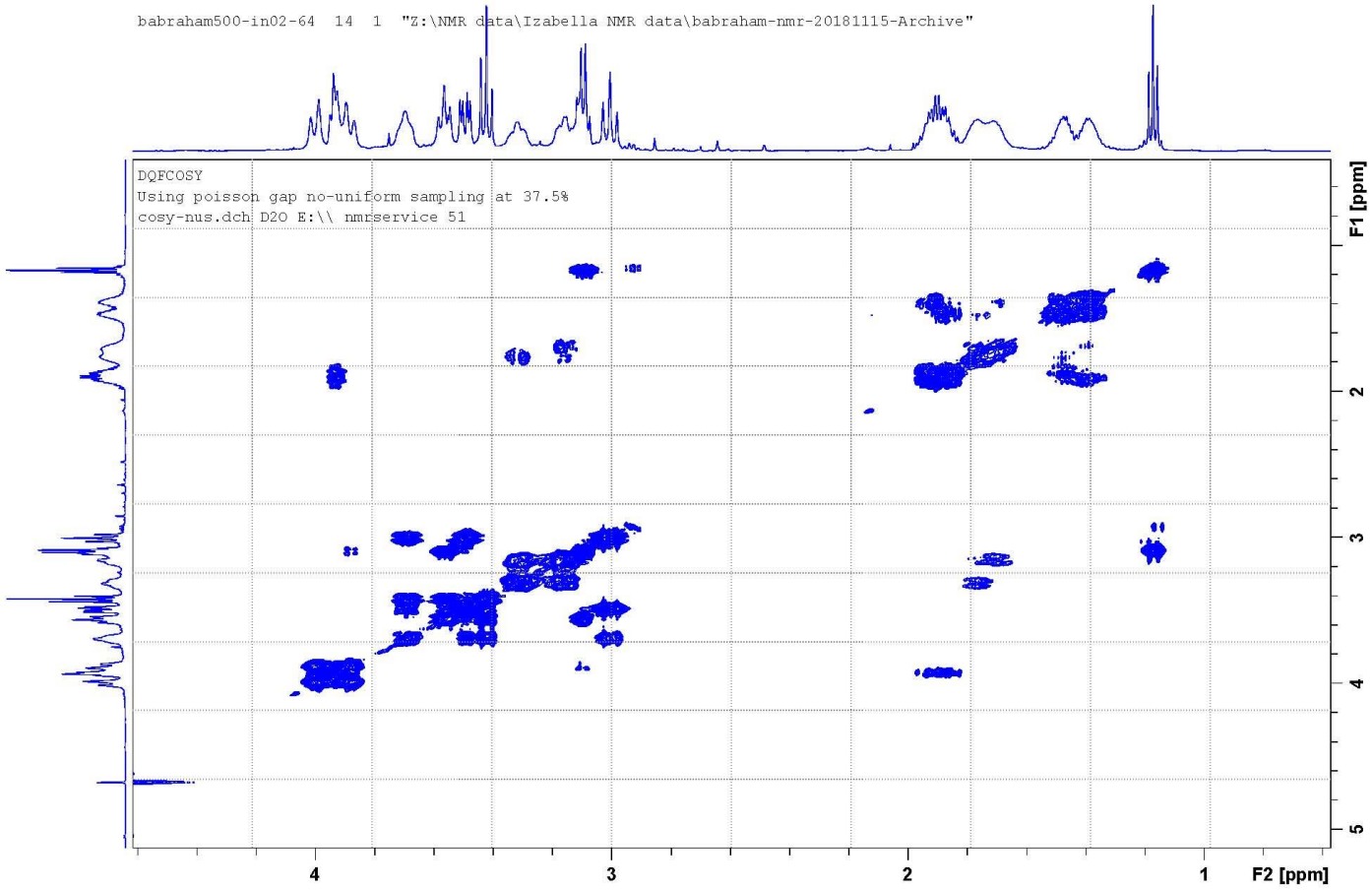
Proton NMR spectrum of benzyl-1-((benzyloxy)carbonyl)-5-(3,4,5-trihydroxy-2-(hydroxymethyl)piperidin-1-yl)pentyl carbamate

Figure S10a



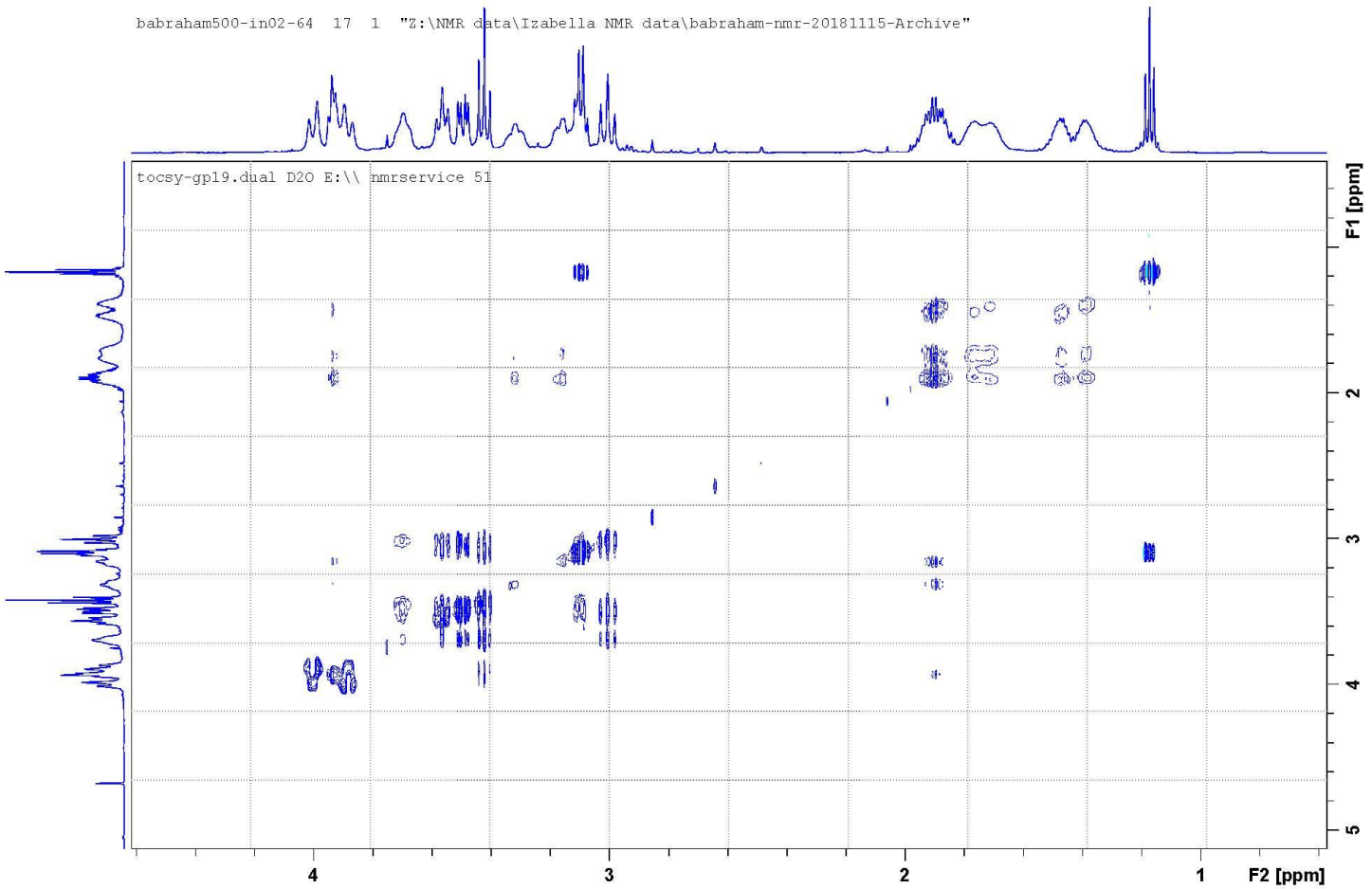
Proton NMR spectrum of 2-amino-6-(3,4,5-trihydroxy-2-(hydroxymethyl)piperidin-1-yl)hexanoic acid triethylamine salt (**Lys-cHx**)

Figure S10b



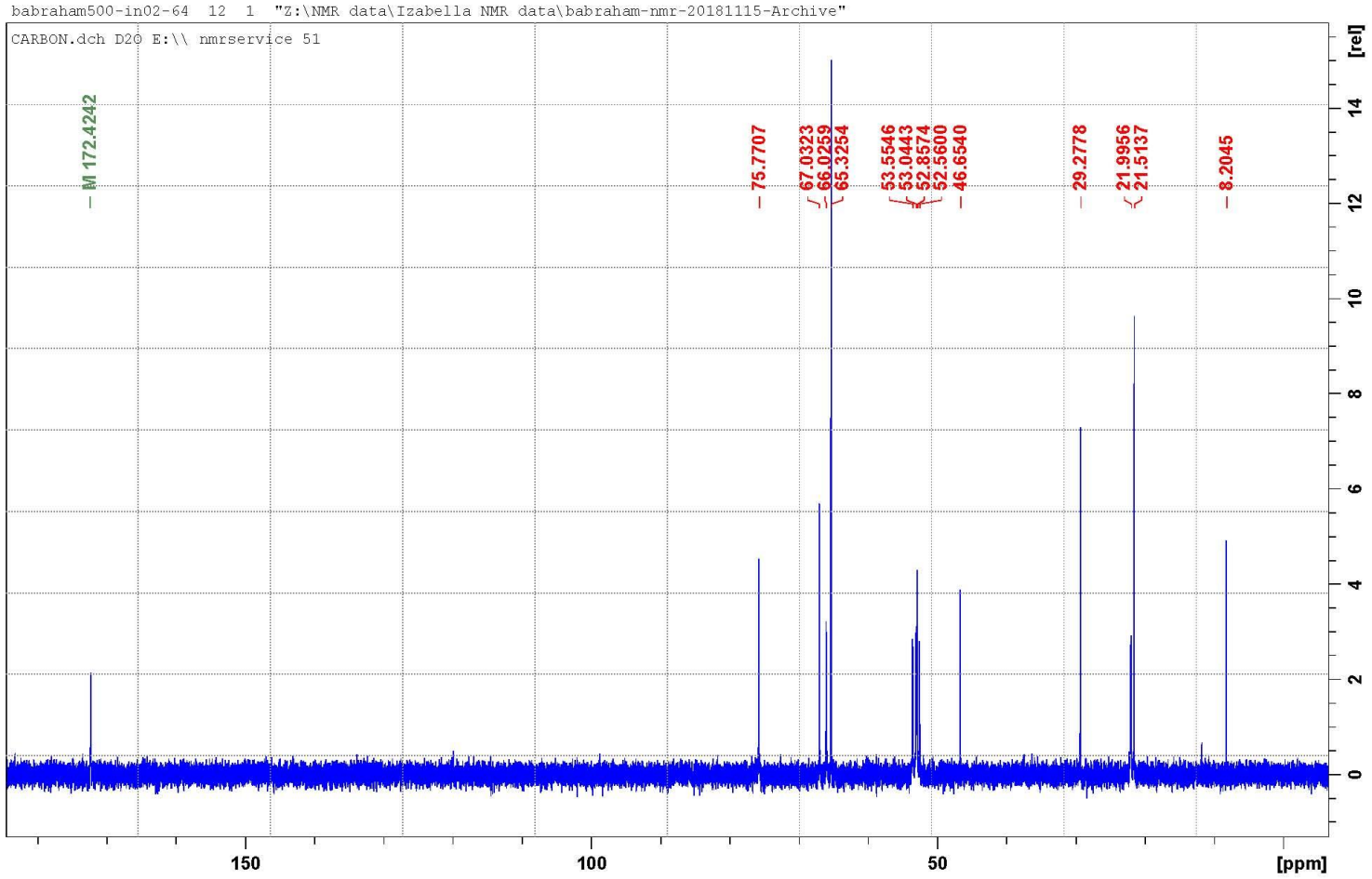
DQF COSY NMR spectrum of 2-amino-6-(3,4,5-trihydroxy-2-(hydroxymethyl)piperidin-1-yl)hexanoic acid triethylamine salt (**Lys-cHx**)

Figure S10c



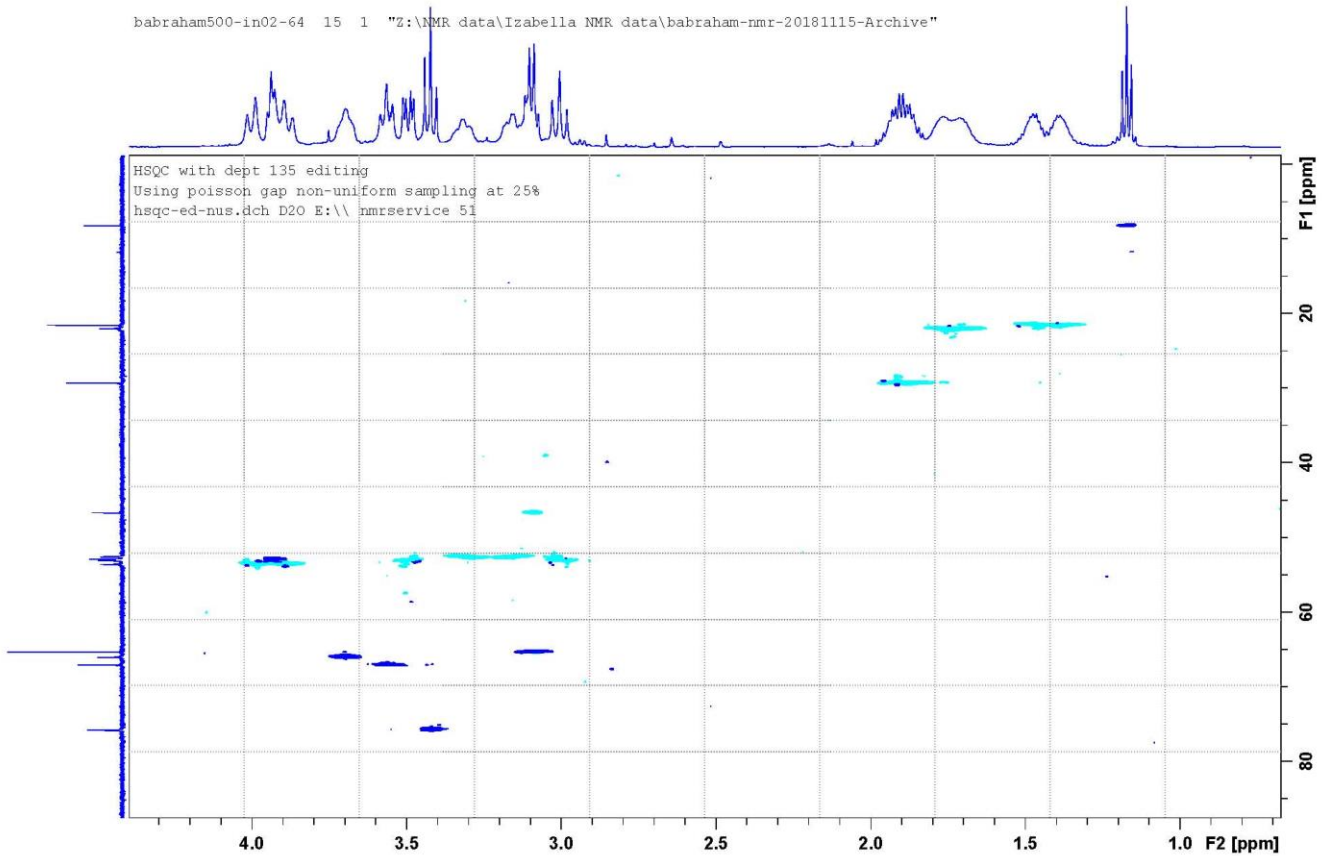
TOCSY NMR spectrum of 2-amino-6-(3,4,5-trihydroxy-2-(hydroxymethyl)piperidin-1-yl)hexanoic acid triethylamine salt (**Lys-cHx**)

Figure S10d



Carbon NMR spectrum of 2-amino-6-(3,4,5-trihydroxy-2-(hydroxymethyl)piperidin-1-yl)hexanoic acid triethylamine salt (**Lys-cHx**)

Figure S10e



HSQC NMR spectrum of 2-amino-6-(3,4,5-trihydroxy-2-(hydroxymethyl)piperidin-1-yl)hexanoic acid triethylamine salt (**Lys-cHx**)