

Supporting Information for

**Multifunctional PEG Retinylamine Conjugate Provides Prolonged Protection against
Retinal Degeneration in Mice**

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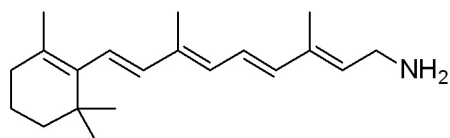
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PROTON
 Retinylamine-080812
 gxy40_08Aug2012

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3 Spectrometer	inova
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5 Temperature	25.0
6 Pulse Sequence	s2pul
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15 Spectrometer Frequency	399.75
16 Spectral Width	6395.9
17 Lowest Frequency	-789.5
18 Nucleus	1H
19 Acquired Size	23946
20 Spectral Size	65536



Retinylamine
 Chemical Formula: C₂₀H₃₁N

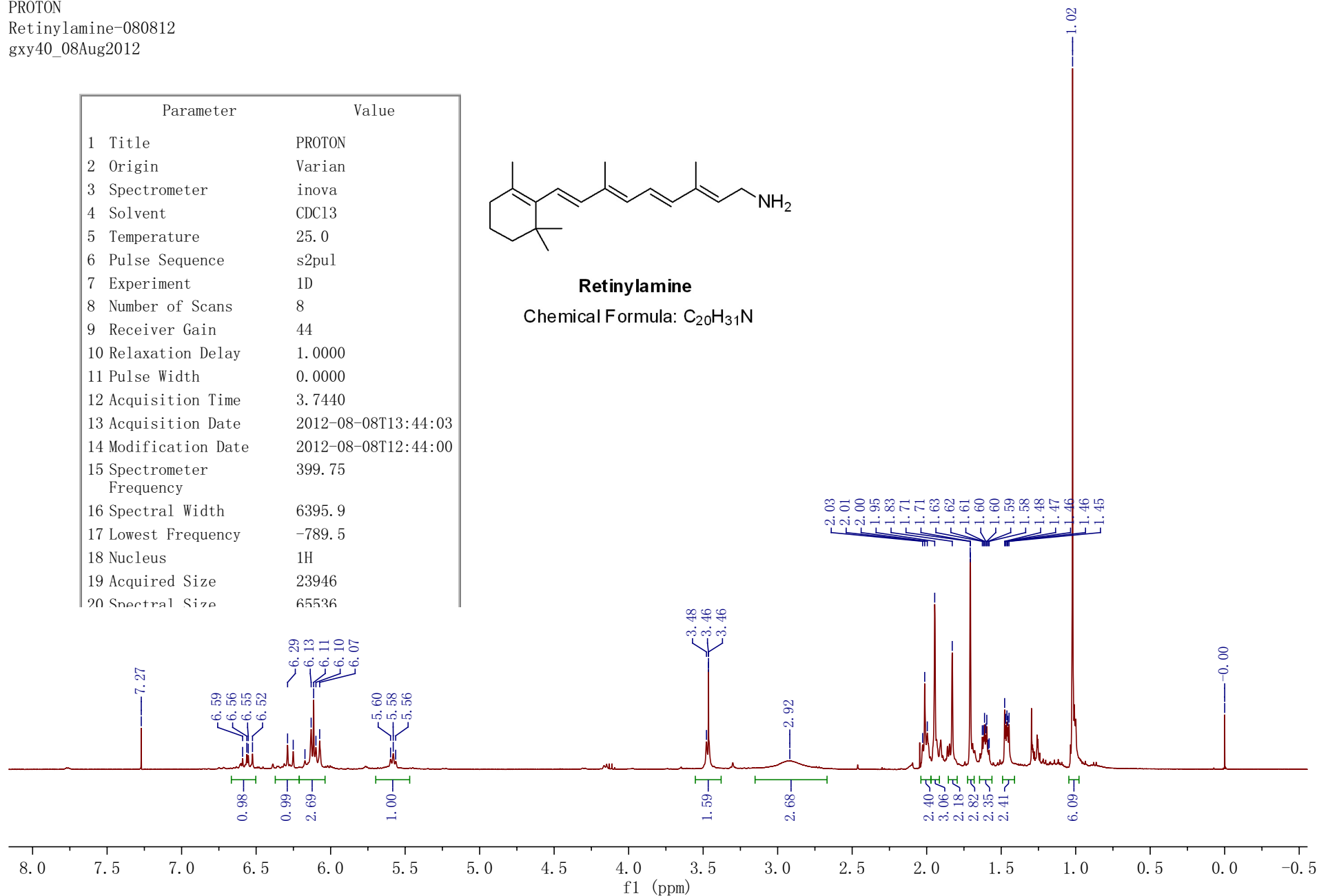
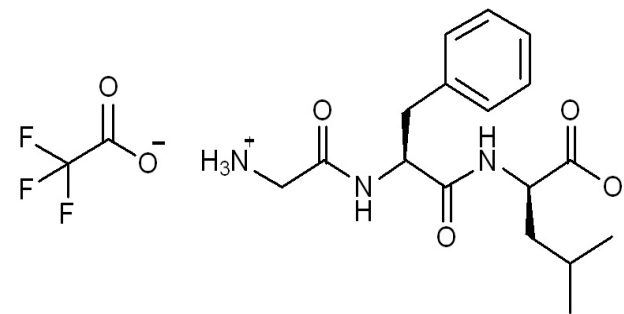


Fig. 1. ¹H NMR spectrum of retinylamine (Ret-NH₂)

PROTON
 NH₂-GFL-OH
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2 Origin	Varian
3 Spectrometer	inova
4 Solvent	D2O
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	48
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
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14 Modification Date	2012-04-20T10:58:00
15 Spectrometer	399.75
Frequency	
16 Spectral Width	6395.9
17 Lowest Frequency	-736.3
18 Nucleus	1H
19 Acquired Size	23946
20 Spectral Size	65536



NH₂-GFL-OH·TFA

Chemical Formula: C₁₉H₂₆F₃N₃O₆

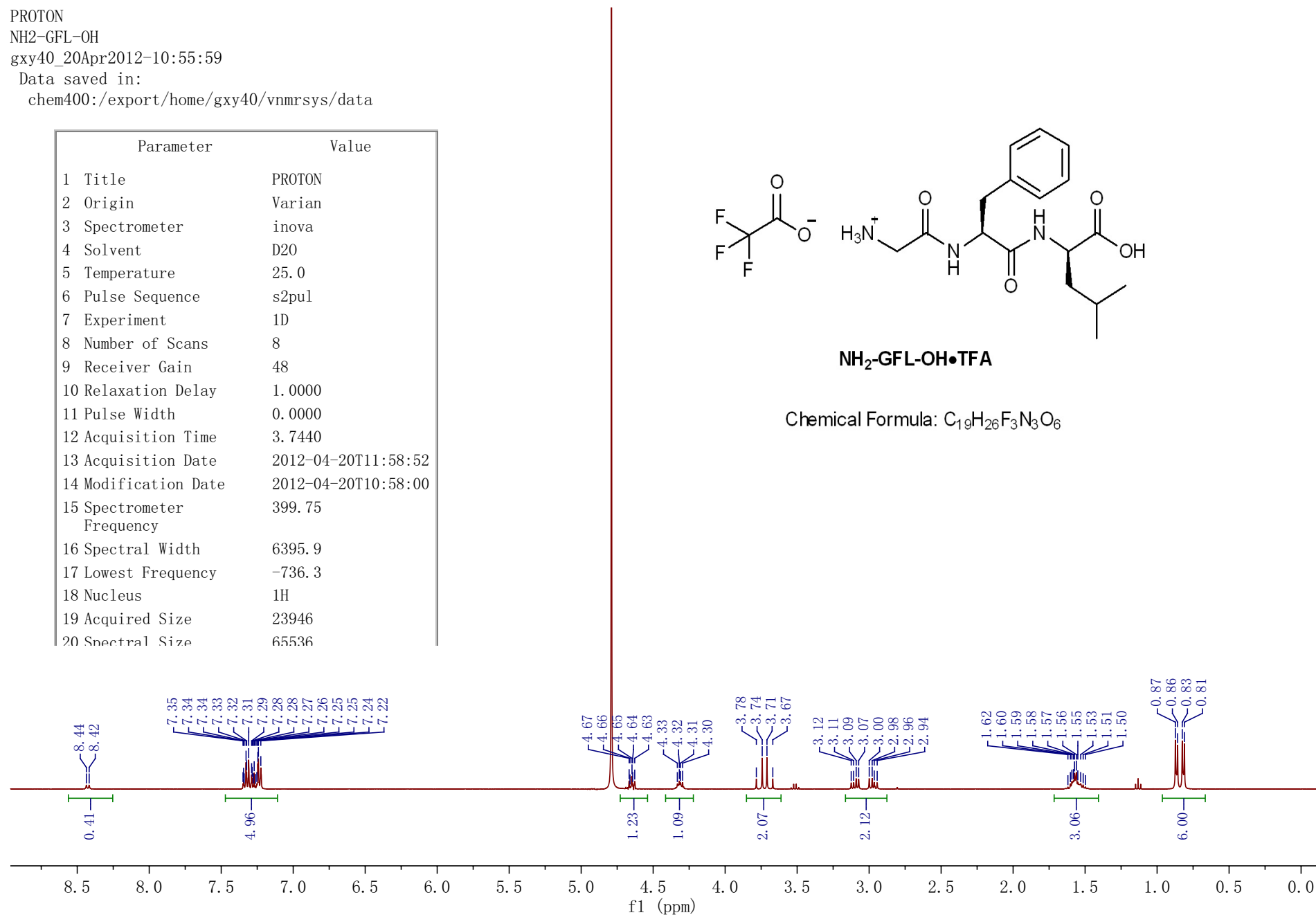
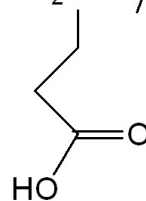
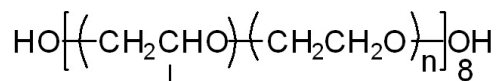


Fig. 2. ¹H NMR spectrum of peptide NH₂-GFL-OH·TFA

PROTON
PEG-PA
Acetone-d6

Parameter	Value
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2 Origin	Varian
3 Spectrometer	inova
4 Solvent	Acetone
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	48
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
12 Acquisition Time	3.7440
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18 Nucleus	1H
19 Acquired Size	23946
20 Spectral Size	65536



PEG-8PA

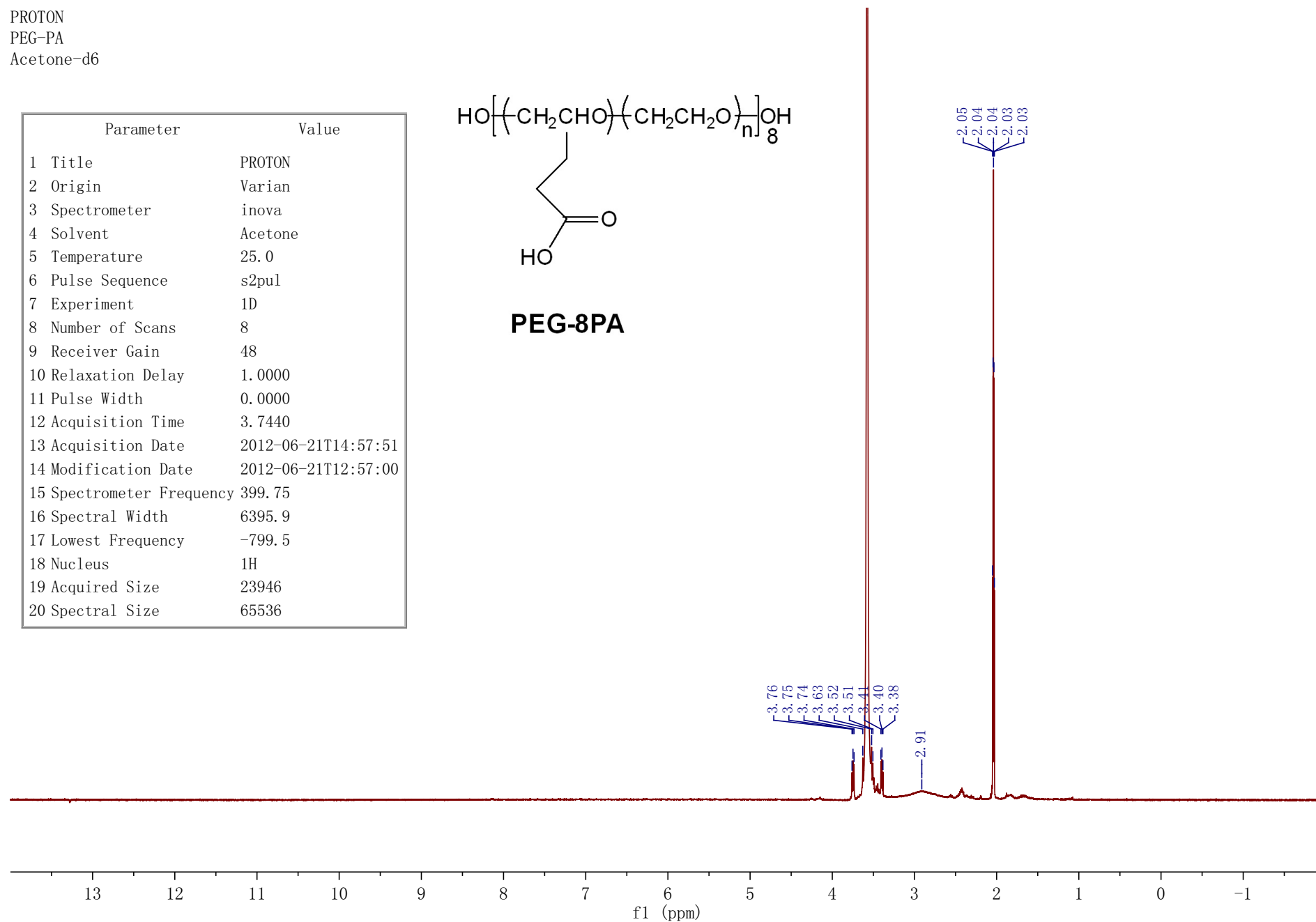


Fig. 3. ^1H NMR spectrum of starting material PEG-8PA

PROTON
 PEG-PA-GFL
 Acetone-d6

Parameter	Value
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3 Spectrometer	inova
4 Solvent	Acetone
5 Temperature	25.0
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7 Experiment	1D
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20 Spectral Size	65536

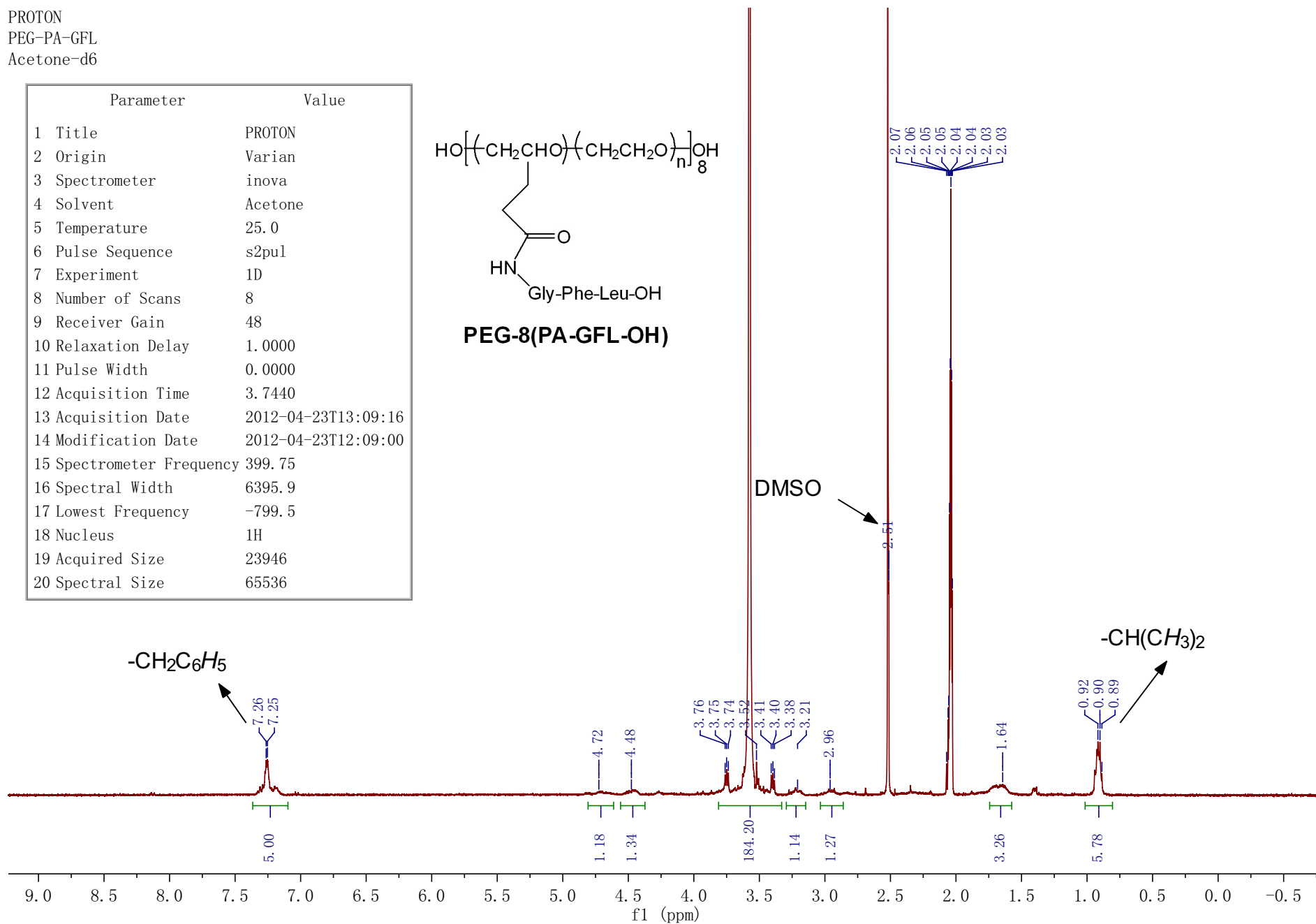
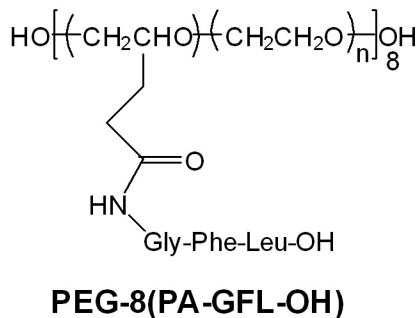


Fig. 4. ^1H NMR spectrum of intermediate PEG-8(PA-GFL-OH)

PROTON
 PEG-PA-GFL-RetNH2
 DMSO-d6

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2 Origin	Varian
3 Spectrometer	inova
4 Solvent	DMSO
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	44
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
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18 Nucleus	1H
19 Acquired Size	23946
20 Spectral Size	65536

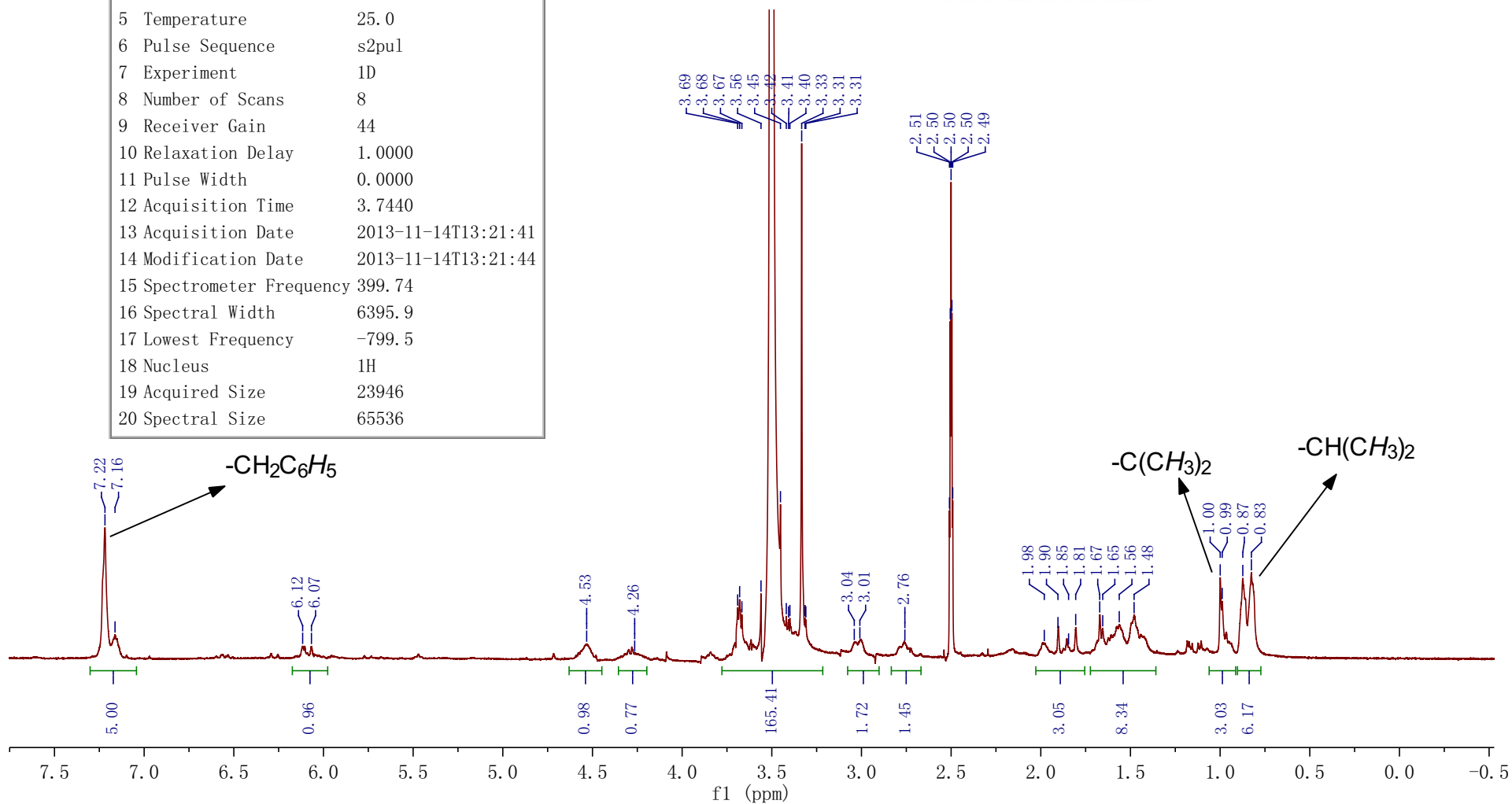
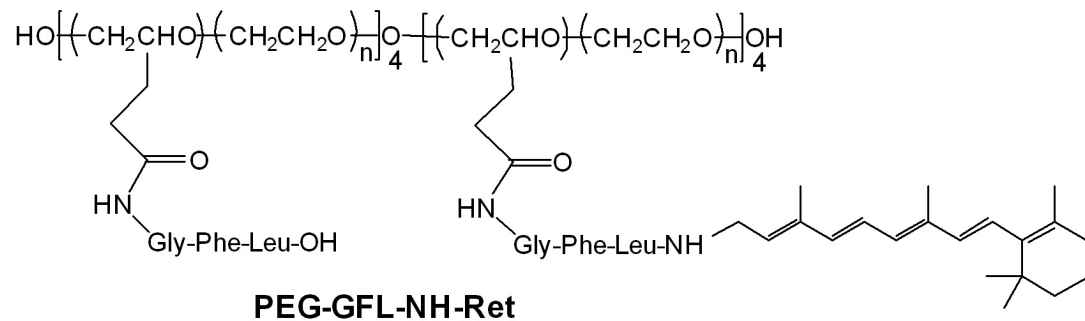


Fig. 5. ¹H NMR spectrum of PEG-GFL-NH-Ret conjugate

PROTON
pNA-110214
gxy40_02Nov2014
Data saved in:
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Parameter	Value
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2 Origin	Varian
3 Spectrometer	inova
4 Solvent	Acetone
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	60
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
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18 Nucleus	^1H
19 Acquired Size	23946
20 Spectral Size	65536

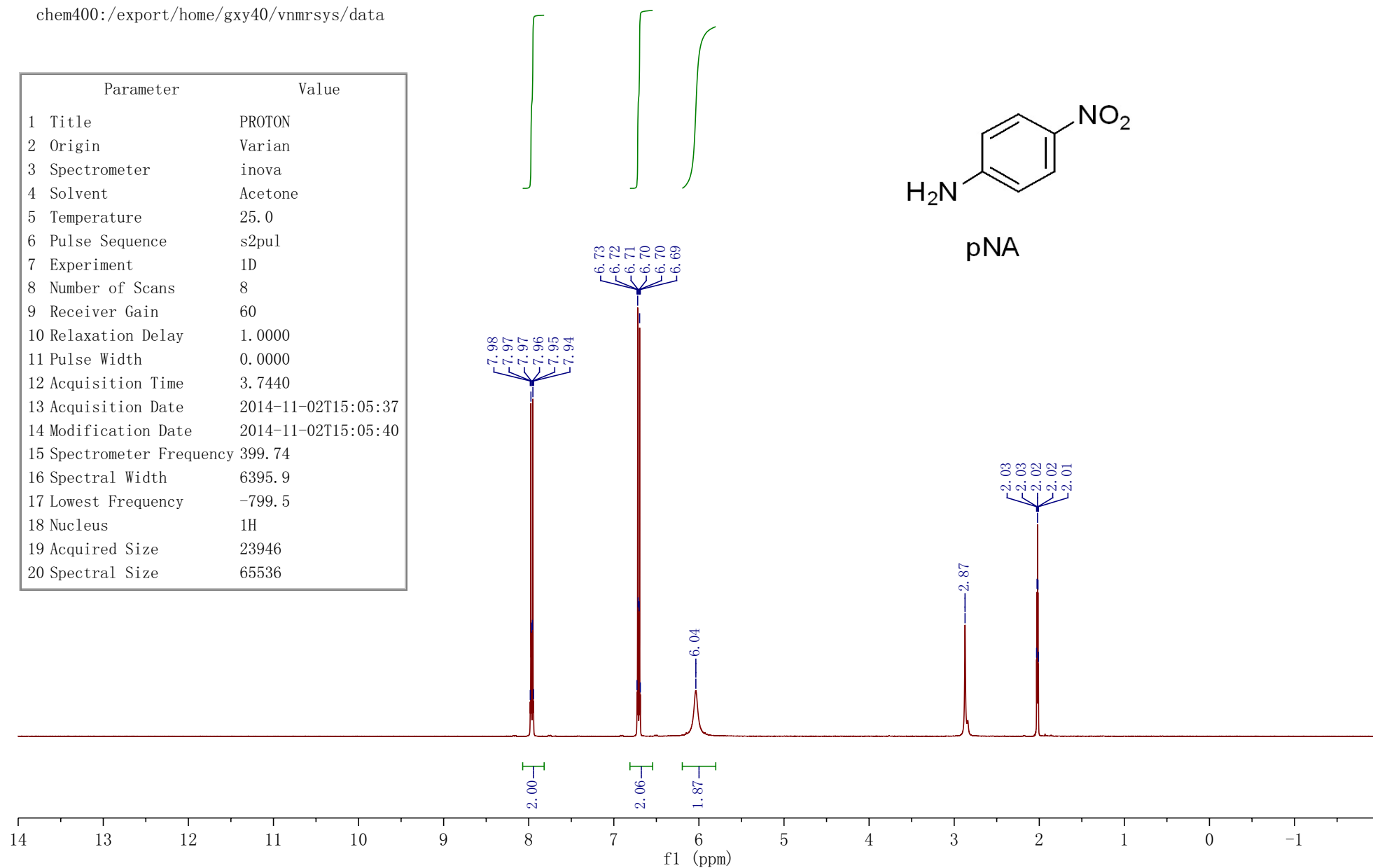
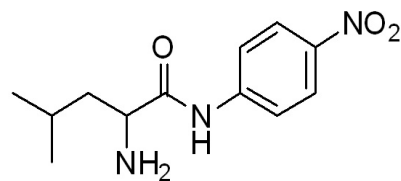


Fig. 6. ^1H NMR spectrum of *p*-nitroaniline (pNA)

PROTON
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 gxy40_02Nov2014-15:06:21
 Data saved in:
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Leu-pNA

Parameter	Value
1 Title	PROTON
2 Origin	Varian
3 Spectrometer	inova
4 Solvent	Acetone
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	58
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
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18 Nucleus	¹ H
19 Acquired Size	23946
20 Spectral Size	65536

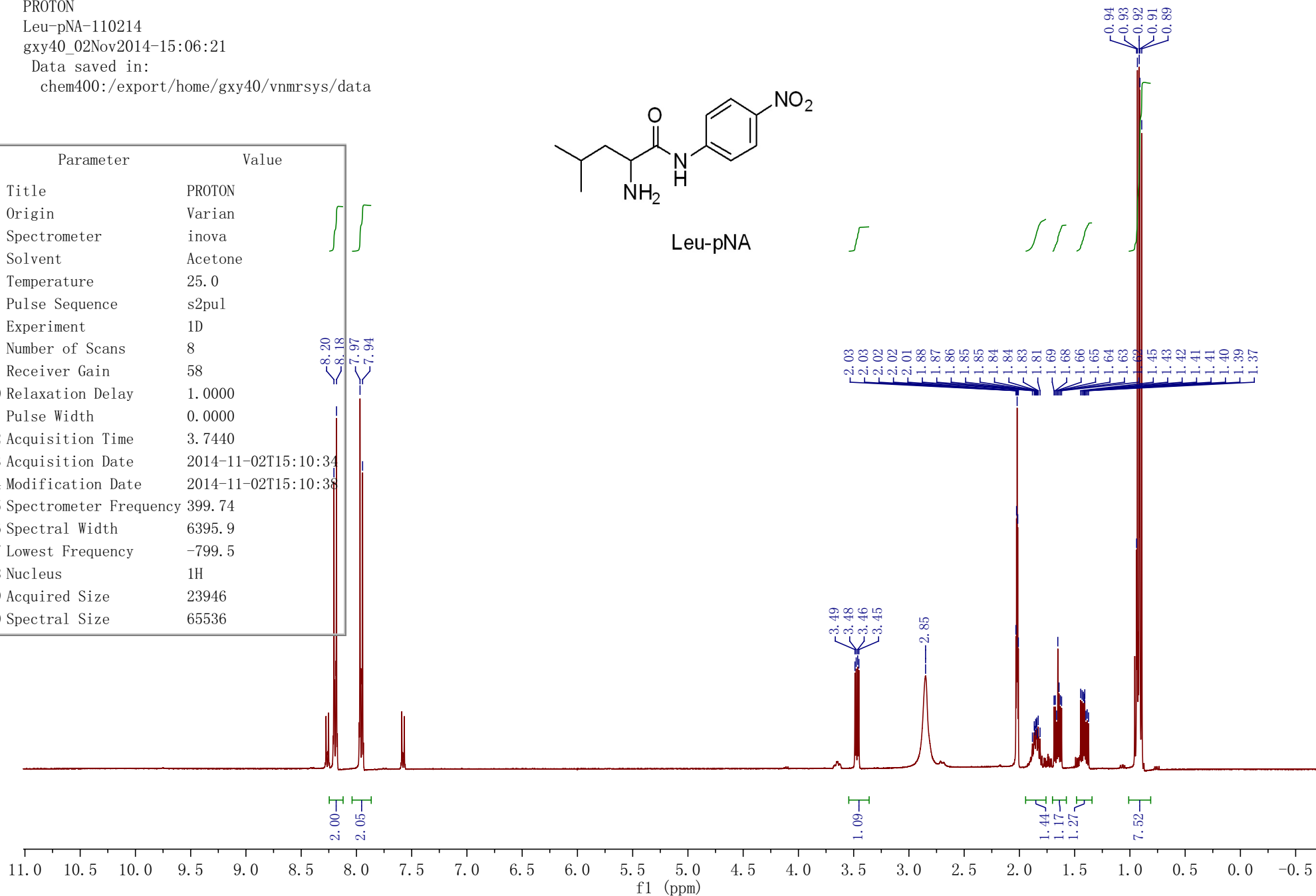


Fig. 7. ¹H NMR spectrum of Leu-pNA

PROTON
GF.TFA-062512
gxy40_25Jun2012
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2 Origin	Varian
3 Spectrometer	inova
4 Solvent	D2O
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	38
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
12 Acquisition Time	3.7440
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18 Nucleus	1H
19 Acquired Size	23946
20 Spectral Size	65536

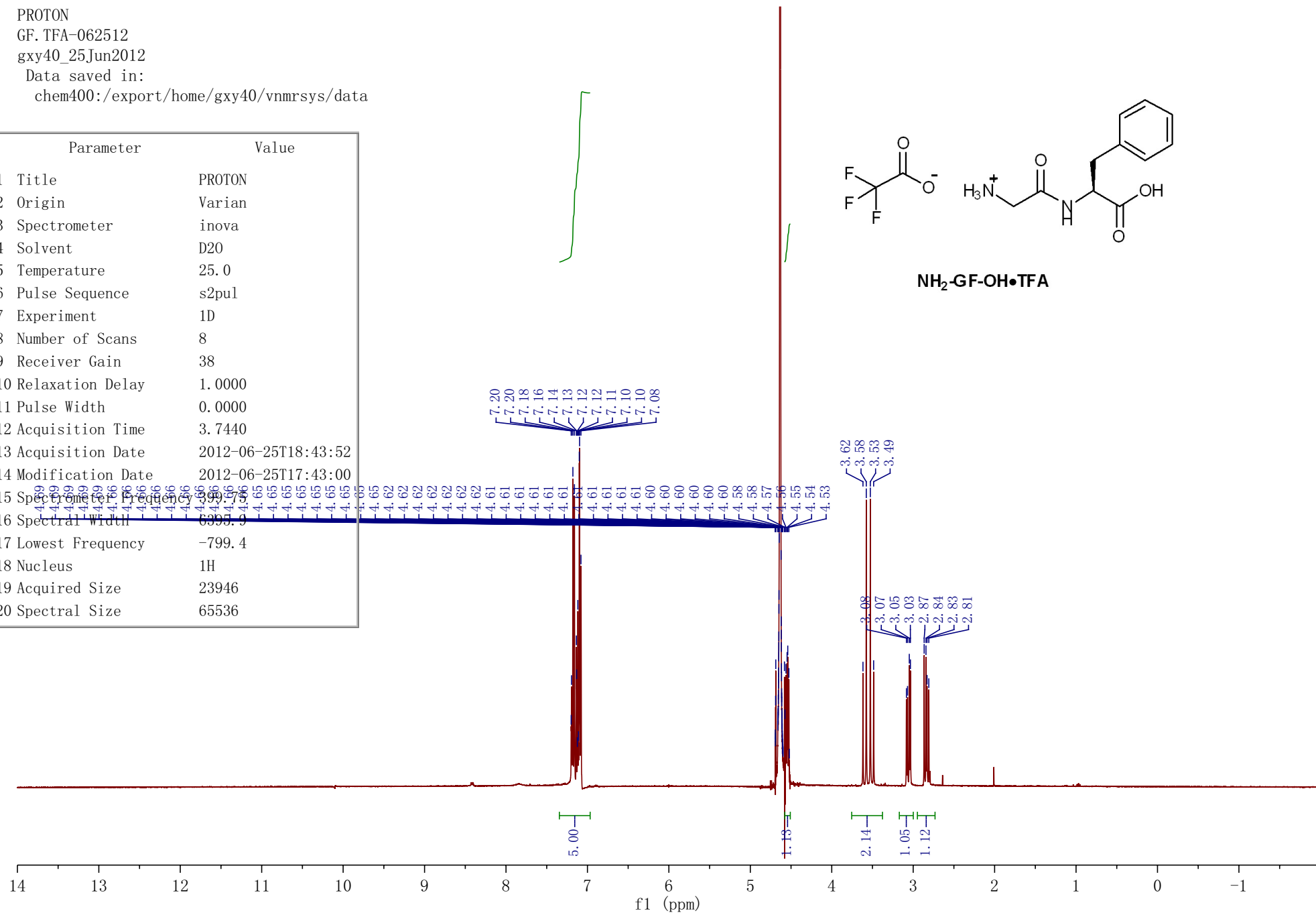
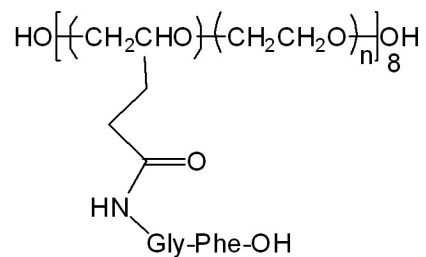


Fig. 8. ¹H NMR spectrum of peptide NH₂-GF-OH·TFA

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2 Origin	Varian
3 Spectrometer	inova
4 Solvent	Acetone
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	44
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
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18 Nucleus	1H
19 Acquired Size	23946
20 Spectral Size	65536



PEG-8(PA-GF-OH)

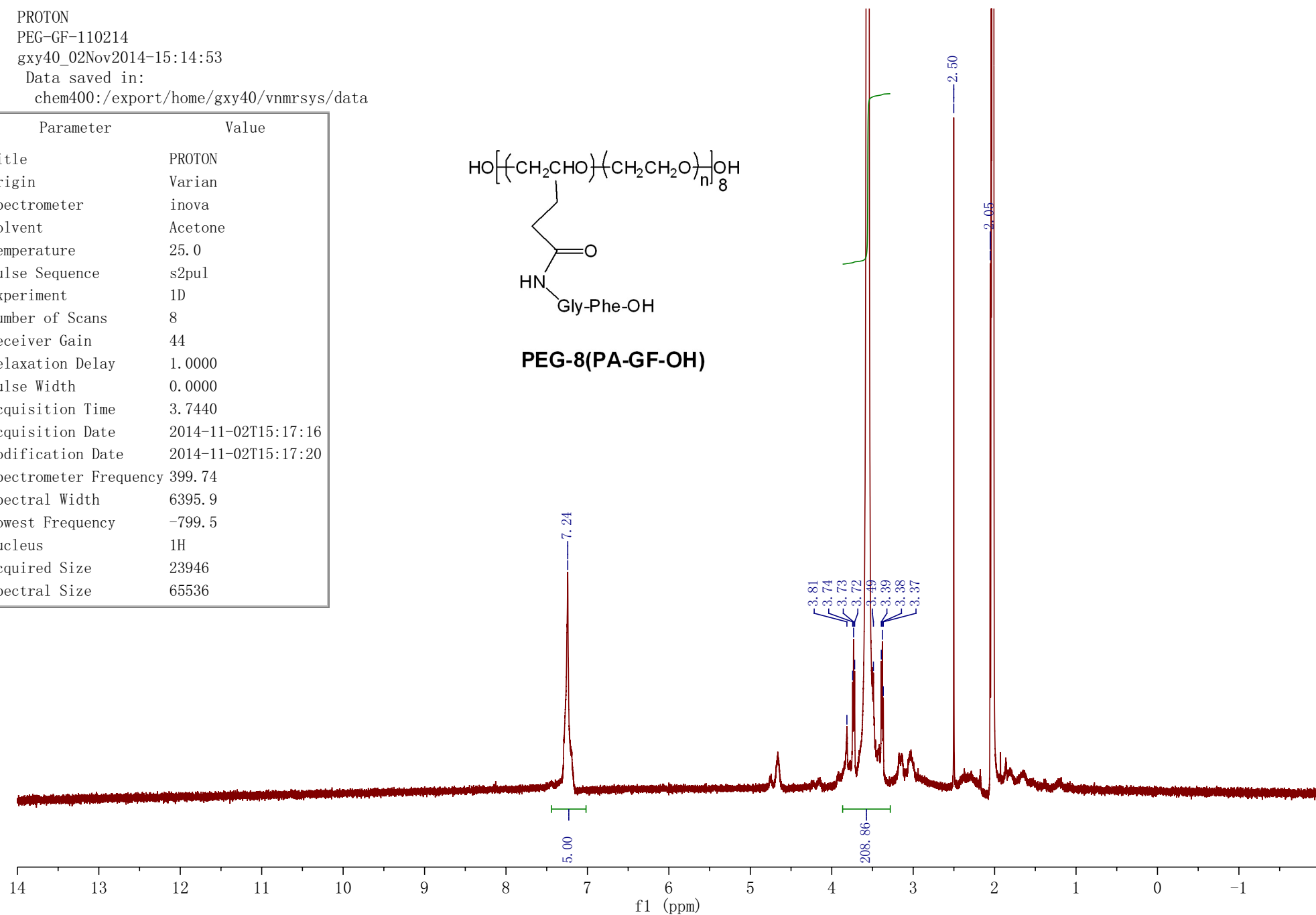


Fig. 9. ^1H NMR spectrum of intermediate PEG-8(PA-GF-OH)

PROTON
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 gxy40_03Nov2014
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Parameter	Value
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2 Origin	Varian
3 Spectrometer	inova
4 Solvent	Acetone
5 Temperature	25.0
6 Pulse Sequence	s2pul
7 Experiment	1D
8 Number of Scans	8
9 Receiver Gain	44
10 Relaxation Delay	1.0000
11 Pulse Width	0.0000
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20 Spectral Size	65536

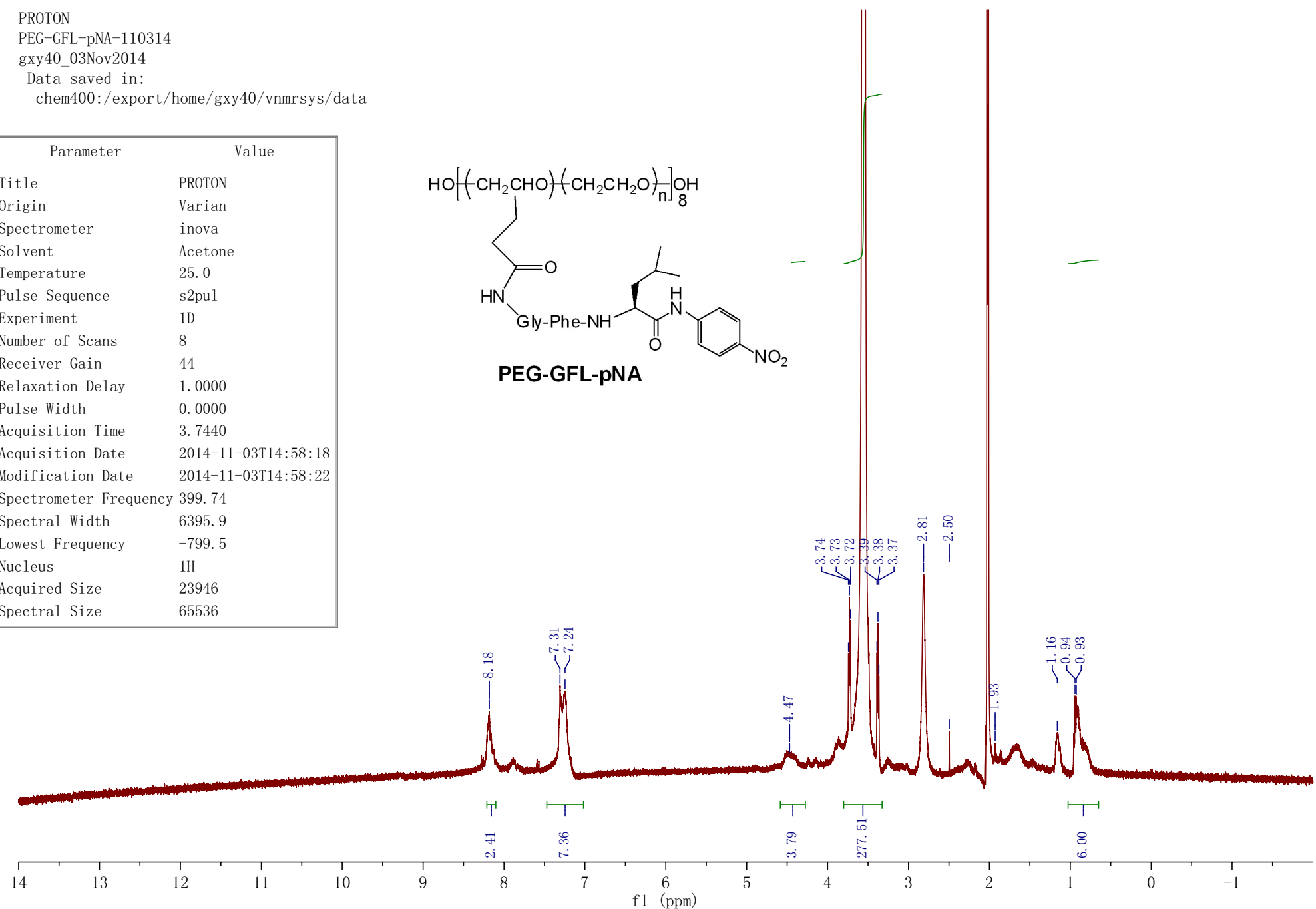
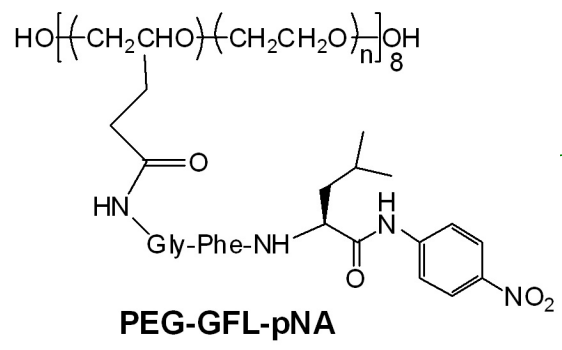


Fig. 10. ¹H NMR spectrum of PEG-GFL-pNA conjugate

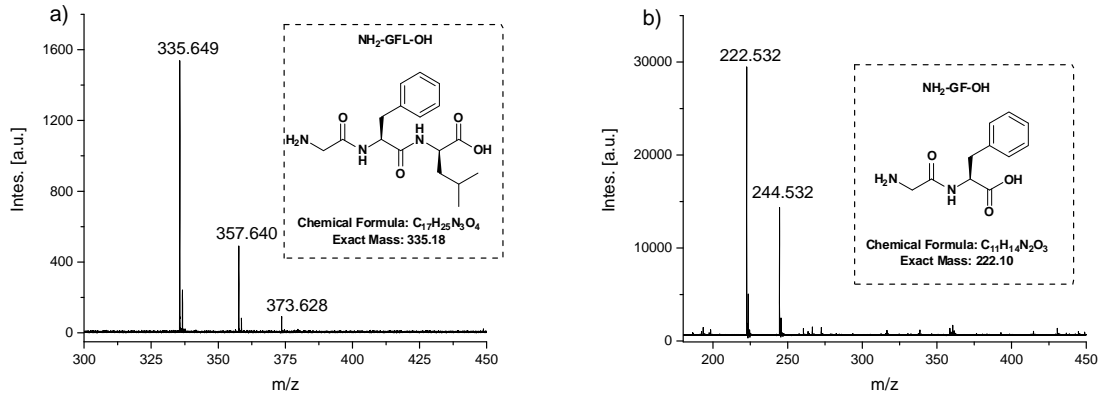


Fig 11. MALDI-TOF spectrum of peptide linker. a) NH₂-GFL-OH, b) NH₂-GF-OH

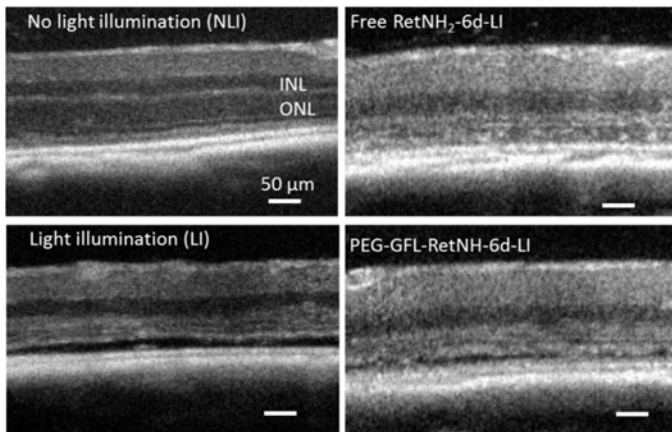


Fig. 12. OCT images indicate representative morphology of *Abca4*^{-/-}*Rdh8*^{-/-} mouse retinas for 6 day pretreatment. Scale bar indicates 50 μm in the OCT image.