

Supporting Information

Structure-Activity Relationships of Cyclic Lactam Analogues of α -Melanocyte Stimulating Hormone (α -MSH) Targeting the Human Melanocortin-3 Receptor.

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Contents:

1. NMR procedures
2. The list of the sequences of peptides **4-15**
3. ¹H NMR spectra of peptide analogues **4-15** in DMSO-d₆ and the list of chemical shifts and coupling constants.

NMR experiments.

NMR samples were prepared in DMSO- d_6 with an approximate peptide concentration of 3.0 mM. The ^1H spectra were recorded on a Varian Inova 600 spectrometer at 599.6995 MHz and 25°C using a Varian 5mm inverse HCN cryogenic probe with single axis gradient, and were processed using the VNMR (Varian) and the Mestre-C (Mestrelab Research, Spain) software packages. Chemical shifts are referenced to the DMSO signal at 2.50 ppm.

- 4** c[CO-*o*-C₆H₄-CO-Pro-*D*-Phe-Arg-Trp-Lys]-NH₂
- 5** c[CO-*o*-C₆H₄-CO-Pro-*D*-Nal(2')-Arg-Trp-Lys]-NH₂
- 6** c[CO-(CH₂)₃-CO-Pro-*D*-Phe-Arg-Trp-Lys]-NH₂
- 7** c[CO-(CH₂)₃-CO-Pro-*D*-Nal(2')-Arg-Trp-Lys]-NH₂
- 8** c[CO-*cis*-CH=CH-CO-Pro-*D*-Phe-Arg-Trp-Lys]-NH₂
- 9** c[CO-*cis*-CH=CH-CO-Pro-*D*-Nal(2')-Arg-Trp-Lys]-NH₂
- 10** c[CO-2,6-pyridine-CO-*D*-Phe-Arg-Trp-Lys]-NH₂
- 11** c[CO-2,6-pyridine-CO-*D*-Nal(2')-Arg-Trp-Lys]-NH₂
- 12** c[CO-2,3-pyrazine-CO-*D*-Phe-Arg-Trp-Lys]-NH₂
- 13** c[CO-2,3-pyrazine-CO-*D*-Nal(2')-Arg-Trp-Lys]-NH₂
- 14** c[CO-(CH₂)₂-CO-Nle-*D*-Phe-Arg-Trp-Lys]-NH₂
- 15** c[CO-(CH₂)₂-CO-Nle-*D*-Nal(2')-Arg-Trp-Lys]-NH₂

Pro⁵-ω *cis/trans* rotamers were observed for the analogues **4** through **8** with the following ratios:

- 4:** 13% (1:0.15)
- 5:** 7% (1:0.07)
- 6:** 50% (1:1)
- 7:** 50% (1:1)
- 8:** 41% (1:0.7)

4 c[CO-*o*-C₆H₄-CO-Pro-*D*-Phe-Arg-Trp-Lys]-NH₂ (56 observable hydrogens)

α-Hydrogens (5):

3.99 (2H, m)

4.36 (1H, dd, $J=7.0, 15.1$ Hz)

4.41 (1H, ddd, $J=4.2, 7.9, 11.8$ Hz)

4.55 (1H, dd, $J=1.4, 5.7$ Hz)

Side chain hydrogens (24):

1.09 (2H, m)

1.30 (1H, m)

1.45 (4H, m)

1.67 (3H, m)

1.74 (2H, m)

1.94 (1H, m)

2.05 (1H, m)

2.83 (3H, m)

3.00 (2H, m)

3.15 (3H, m)

3.24 (1H, dd, $J=2.6, 14.6$ Hz)

3.93 (1H, m)

Amide and aromatic hydrogens (27):

6.26-7.50 (3H, broad singlets)

6.97 (1H, t, $J=7.4$ Hz)

7.06 (2H, t, $J=7.5$ Hz)

7.09 (1H, s)

7.17 (2H, m)

7.23-7.30 (6H, m)

7.32 (1H, d, $J=8.1$ Hz)

7.40 (1H, dd, $J=0.7, 7.5$ Hz)

7.50 (1H, d, $J=7.8$ Hz)

7.57 (3H, m)

7.61 (1H, dt, $J=1.0, 7.5$ Hz)

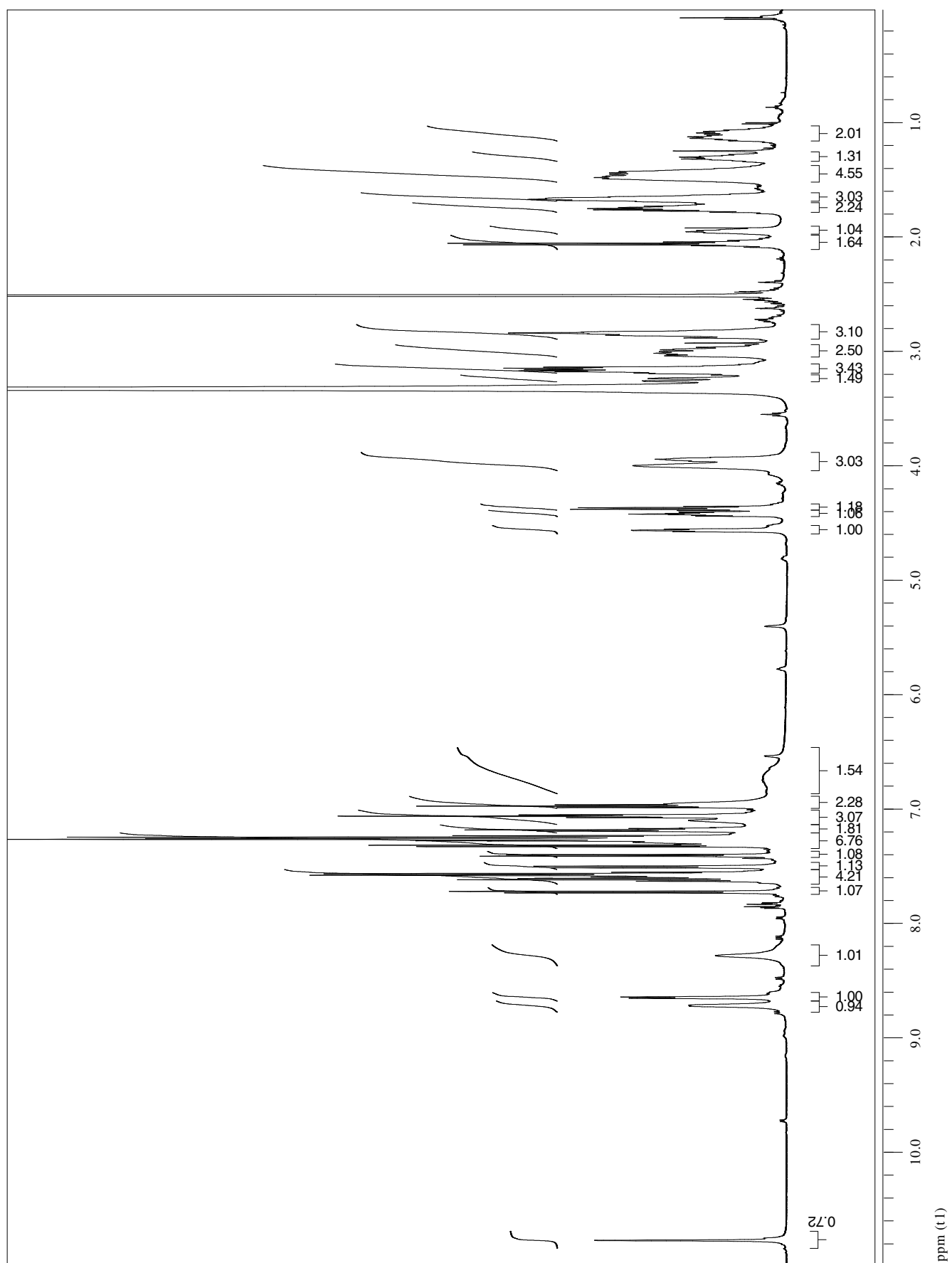
7.72 (1H, d, $J=7.6$ Hz)

8.28 (1H, s)

8.64 (1H, d, $J=6.5$ Hz)

8.71 (1H, d, $J=5.3$ Hz)

10.77 (1H, s)



5 c[CO-*o*-C₆H₄-CO-Pro-*D*-Nal(2')-Arg-Trp-Lys]-NH₂ (58 observable hydrogens)

α-Hydrogens (5):

4.01 (2H, m)

4.41 (1H, m)

4.45 (1H, dd, *J*= 7.2, 15.3 Hz)

4.51 (1H, dd, *J*= 5.0, 7.8 Hz)

Side chain hydrogens (24):

1.00 (1H, m)

1.07 (1H, m)

1.28 (1H, m)

1.45 (4H, m)

1.64 (3H, m)

1.72 (2H, m)

1.91 (1H, m)

2.01 (1H, m)

2.76 (2H, m)

2.84 (1H, dd, *J*=11.1, 14.1 Hz)

3.00 (1H, m)

3.14 (3H, m)

3.21 (1H, dd, *J*=3.3, 14.4 Hz)

3.26 (1H, dd, *J*=6.1, 13.7 Hz)

3.96 (1H, m)

Amide and aromatic hydrogens (29):

6.23-7.88 (4H, broad singlets)

6.95 (2H, t, *J*=7.4 Hz)

7.04 (2H, m)

7.08 (1H, m)

7.30 (1H, br.s)

7.30 (1H, d, *J*=8.1 Hz)

7.39-7.43 (4H, m)

7.50 (1H, d, *J*=7.9 Hz)

7.54 (1H, dt, *J*=1.2, 7.6 Hz)

7.60 (1H, dt, *J*=1.1, 7.5 Hz)

7.62 (2H, t, *J*=7.4 Hz)

7.72 (1H, d, *J*=7.6 Hz)

7.77 (1H, d, *J*=8.6 Hz)

7.78 (1H, s)

7.79 (1H, dd, *J*=2.9, 6.2 Hz)

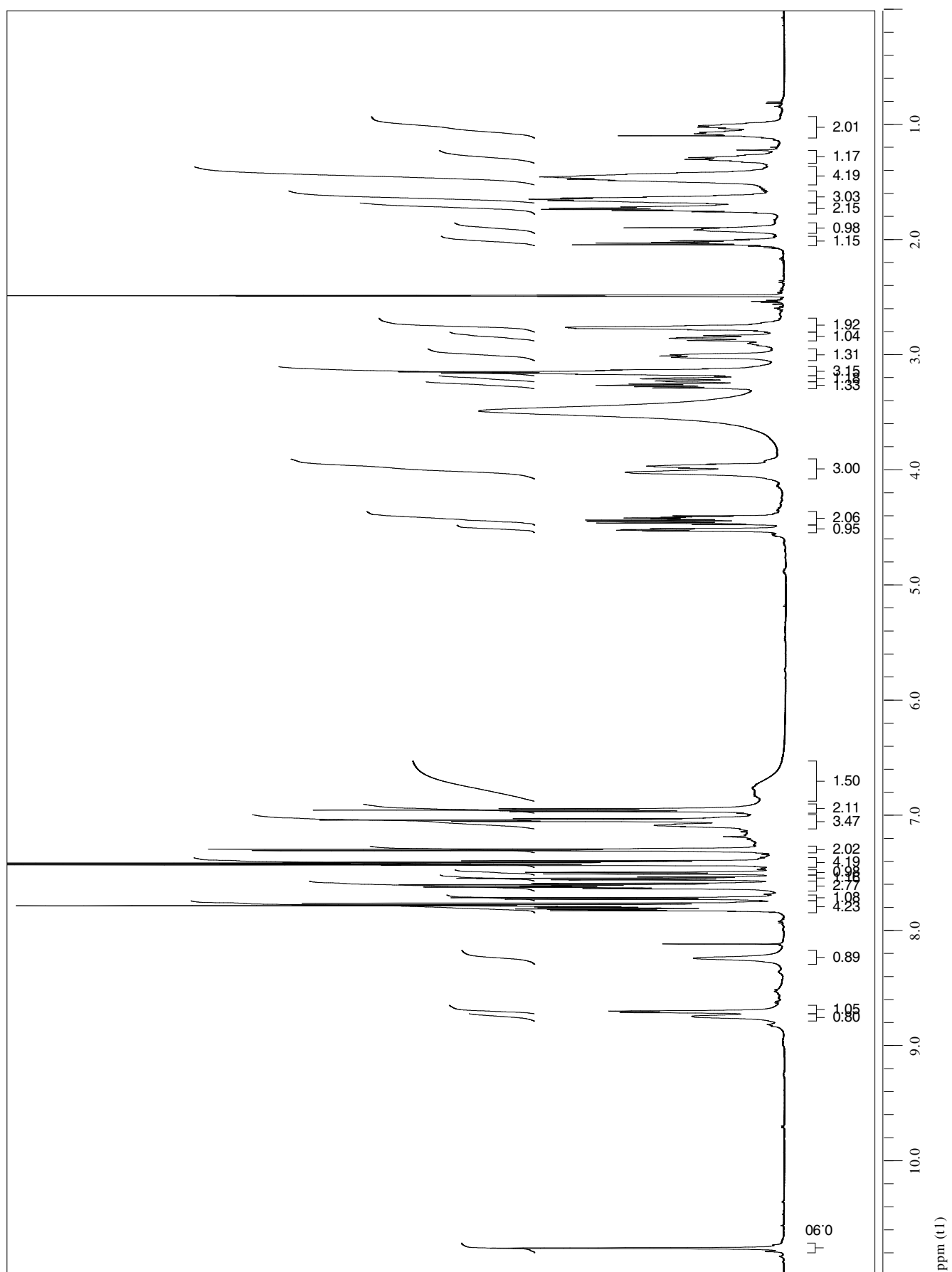
7.82 (1H, dd, *J*=3.5, 6.0 Hz)

8.24 (1H, s)

8.70 (1H, d, *J*=6.7 Hz)

8.74 (1H, m)

10.76 (1H, s)



6 c[CO-(CH₂)₃-CO-Pro-*D*-Phe-Arg-Trp-Lys]-NH₂ (58 observable hydrogens)

α-Hydrogens (5):

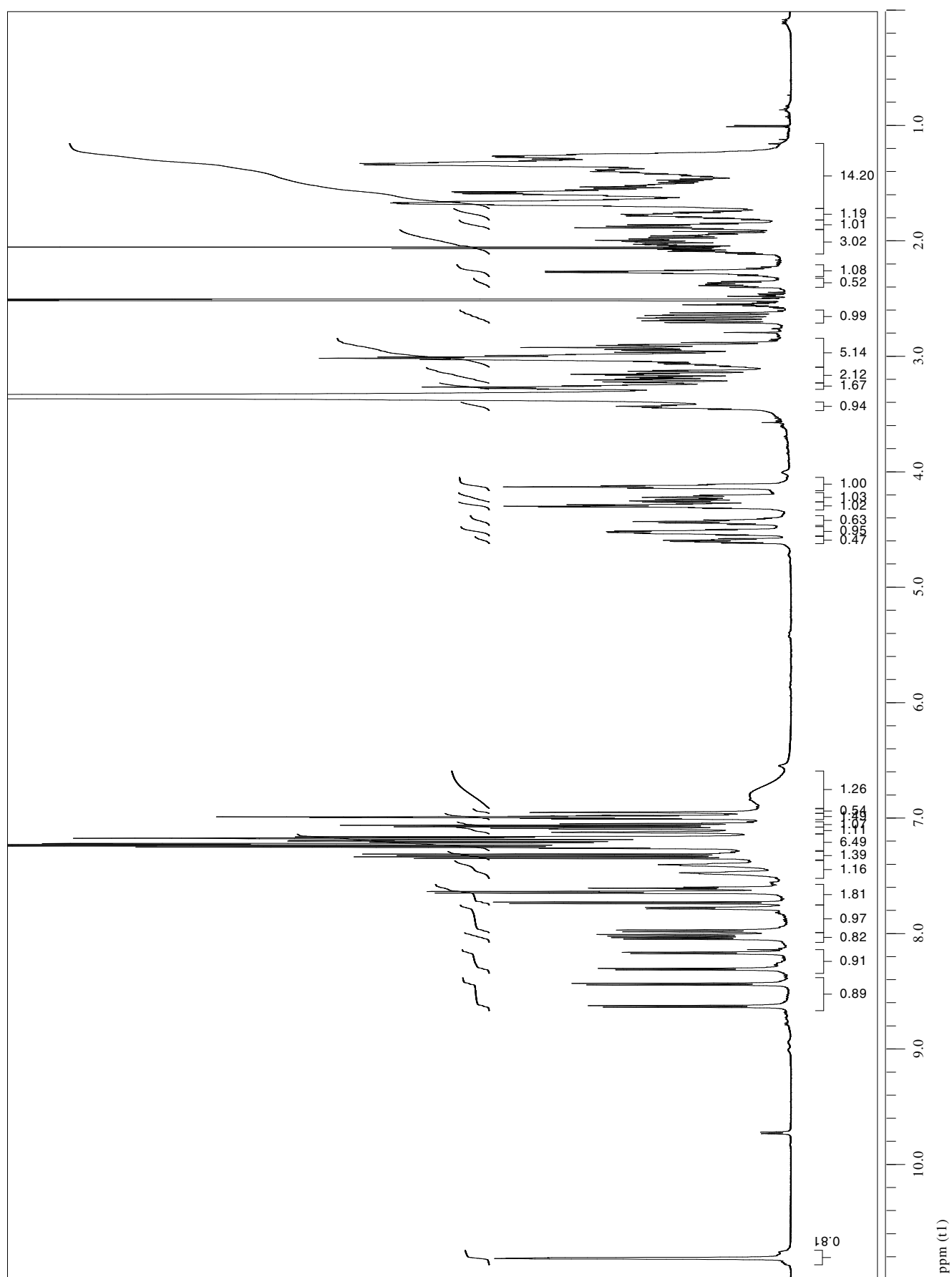
4.12 (1H, m)
4.21 (m) and 4.25 (dd, $J=5.7, 13.2$ Hz) (1H)
4.29 (1H, m)
4.51 (1H, m)
4.43 (dd, $J=8.2, 15.2$ Hz) and 4.59 (dt, $J=5.8, 9.2$ Hz) (1H)

Side chain hydrogens (30):

1.16-1.72 (14H, m)
1.77 (1H, m)
1.86 (1H, m)
1.90-2.11 (m) and 2.36 (m) (3H)
2.26 (1H, m)
2.66 (1H, ddd, $J=10.6, 13.8, 25.7$ Hz)
2.91 (2H, m)
3.01 (3H, m)
3.17 (2H, m)
3.26 (1H, m)
3.43 (1H, m)

Amide and aromatic hydrogens (23):

6.70-7.50 (4H, broad singlets)
6.95 (1H, br. s)
6.99 (1H, m)
7.06 (1H, m)
7.10 (1H, d, $J=17.2$ Hz)
7.14-7.28 (6H, m)
7.33 (1H, dd, $J=8.1, 14.7$ Hz)
7.40 (m) and 7.47 (m) (1H)
7.62 (1H, dt, $J=5.7, 20.0$ Hz)
7.64 (d, $J=7.9$ Hz) and 7.73 (d, $J=7.9$ Hz) (1H)
7.78 (d, $J=7.3$ Hz) and 7.97 (d, $J=8.8$ Hz) (1H)
8.02 (1H, dd, $J=8.2, 16.2$ Hz)
8.16 (d, $J=7.4$ Hz) and 8.30 (d, $J=7.4$ Hz) (1H)
8.43 (d, $J=8.6$ Hz) and 8.63 (d, $J=8.3$ Hz) (1H)
10.81 (1H, dd, $J=2.1, 4.2$ Hz)



7 c[CO-(CH₂)₃-CO-Pro-*D*-Nal(2')-Arg-Trp-Lys]-NH₂ (60 observable hydrogens)

α-Hydrogens (5):

4.12 (1H, m)

4.22 (m) and 4.30 (1H, m) (1H)

4.26 (dd, *J*=7.4, 13.7 Hz) and 4.71 (dd, *J*=8.8, 14.6 Hz) (1H)

4.42 (1H, m)

4.52 (1H, m)

Side chain hydrogens (30):

1.09-2.12 (19H, m)

2.06 (m) and 2.35 (m) (1H)

2.25 (1H, m)

2.76-3.04 (5H, m)

3.07 (m) and 3.26 (m) (1H)

3.10-3.23 (3H, m)

Amide and aromatic hydrogens (25):

6.70-7.50 (4H, broad singlets)

6.95 (1H, br. s)

6.99 (1H, t, *J*=7.3 Hz)

7.07 (2H, dd, *J*=7.0, 14.2 Hz)

7.12 (1H, br. s)

7.22 (1H, m)

7.32 (1H, d, *J*=8.2 Hz)

7.35 (1H, dd, *J*=4.4, 8.2 Hz)

7.40 (1H, d, *J*=8.4 Hz)

7.46 (2H, m)

7.61 (1H, m)

7.65 (1H, d, *J*=8.1 Hz)

7.70 (s) and 7.73 (d, *J*=7.9 Hz) (1H)

7.79 (2H, m)

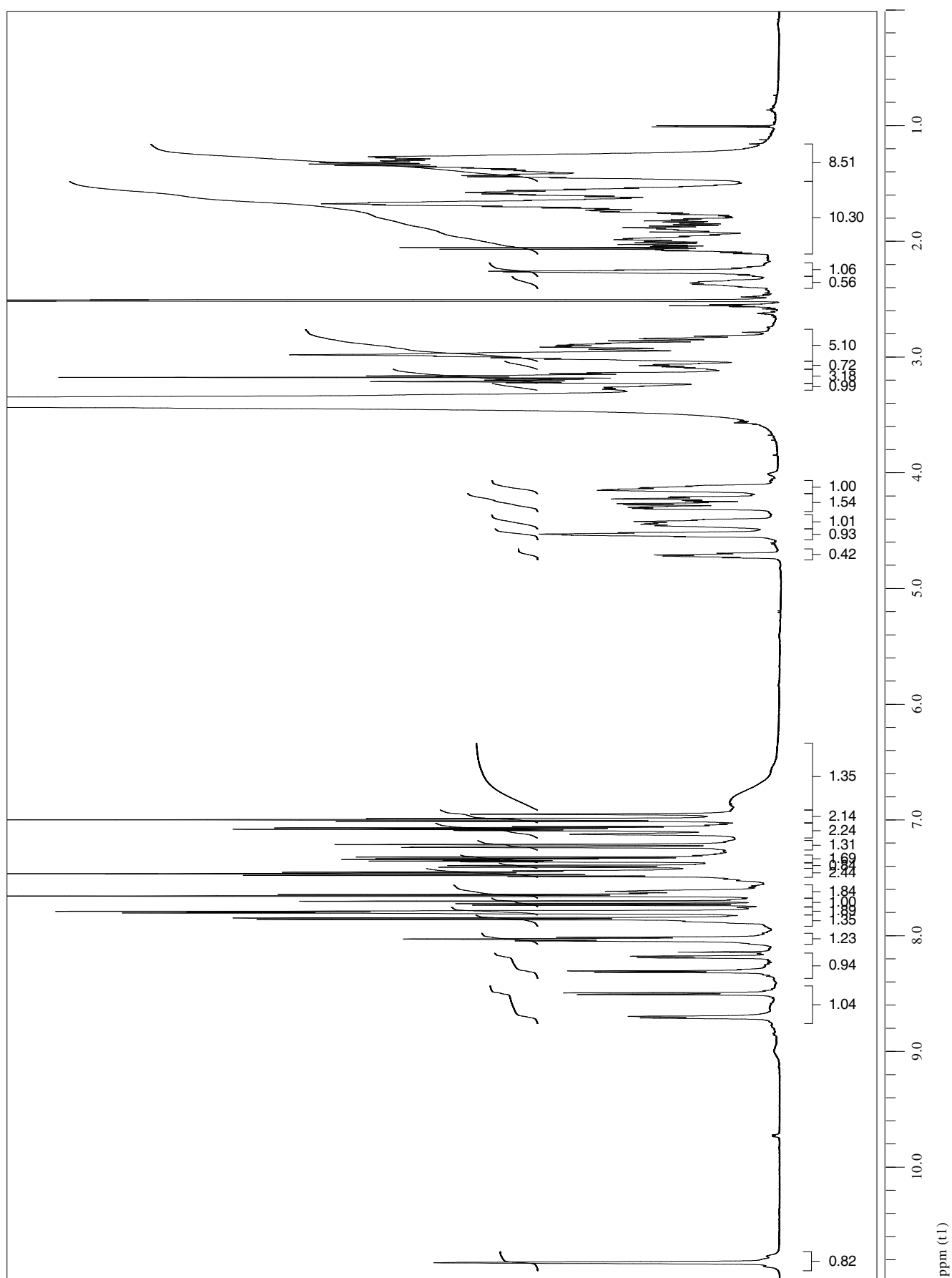
7.85 (1H, d, *J*=7.7 Hz)

8.03 (1H, t, *J*=9.4 Hz)

8.18 (d, *J*=7.2 Hz) and 8.31 (d, *J*=7.4 Hz) (1H)

8.50 (d, *J*=8.5 Hz) and 8.70 (d, *J*=8.0 Hz) (1H)

10.83 (1H, m)



8 c[CO-*cis*-CH=CH-CO-Pro-*D*-Phe-Arg-Trp-Lys]-NH₂ (54 observable hydrogens)

α -Hydrogens (5):

4.10 (dd, $J=7.9, 14.2$ Hz) and 4.17 (m) (2H)
4.42 (dd, $J=5.5, 7.5$ Hz) and 4.60 (dd, $J=6.5, 8.5$ Hz)
4.48 (1H, m)
4.57 (dd, $J=2.4, 8.2$ Hz) and 4.66 (dd, $J=7.4, 14.3$ Hz) (1H)

Side chain hydrogens (24):

1.12-1.75 (12H, m)
1.86 (m) and 1.88 (ddd, $J=6.9, 12.0, 13.7$ Hz) (1H)
2.01 (sxt, $J=6.5$ Hz) and 2.05 (m) (1H)
2.69-3.02 (5H, m)
3.06 (dd, $J=5.5, 13.7$ Hz) and 3.17 (dd, $J=5.0, 14.6$ Hz) (1H)
3.10 (1H, m)
3.38 (1H, m)
3.50 (m) and 3.67 (dt, $J=6.7, 9.6$ Hz) (2H)

Amide and aromatic hydrogens (25):

6.30-7.50 (4H, broad singlets)
6.72 (1H, q, $J=15.0$ Hz)
6.94 (1H, d, $J=15.0$ Hz)
6.96 (1H, s)
6.98 (1H, t, $J=7.9$ Hz)
7.05 (1H, m)
7.11 (1H, s)
7.14 (1H, d, $J=13.3$ Hz)
7.19 (2H, m)
7.25 (4H, m)
7.32 (1H, d, $J=8.0$ Hz)
7.56 (d, $J=7.9$ Hz) and 7.64 (d, $J=7.9$ Hz) (1H)
7.70 (d, $J=7.1$ Hz) and 7.76 (d, $J=9.1$ Hz) (1H)
7.93 (d, $J=8.4$ Hz) and 7.97 (d, $J=8.0$ Hz) (1H)
8.13 (1H, m)
8.21 (d, $J=8.1$ Hz) and 8.25 (dd, $J=4.7, 7.2$ Hz) (1H)
8.53 (d, $J=7.8$ Hz) and 9.03 (d, $J=7.3$ Hz) (1H)
10.74 (d, $J=1.9$ Hz) and 10.78 (d, $J=1.8$ Hz) (1H)

9 c[CO-*cis*-CH=CH-CO-Pro-*D*-Nal(2')-Arg-Trp-Lys]-NH₂ (54 observable hydrogens)

α-Hydrogens (5):

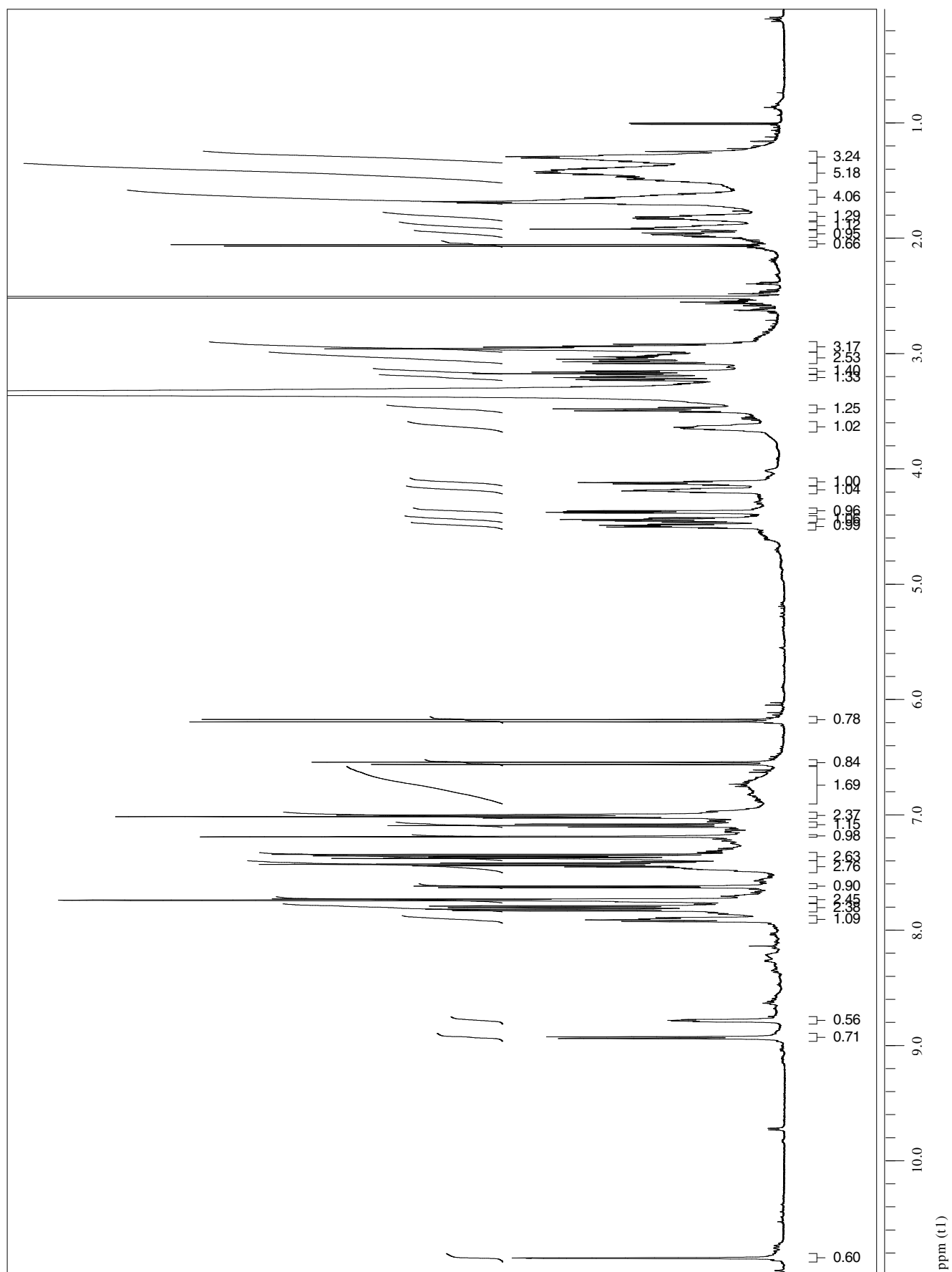
4.11 (1H, dd, $J=6.8, 13.5$ Hz)
4.18 (1H, dt, $J=4.3, 8.8$ Hz)
4.36 (1H, dd, $J=3.7, 8.1$ Hz)
4.43 (1H, dt, $J=6.2, 8.7$ Hz)
4.49 (1H, m)

Side chain hydrogens (24):

1.29 (3H, m)
1.40 (4H, m)
1.46 (1H, m)
1.66 (4H, m)
1.81 (1H, m)
1.89 (1H, m)
1.96 (1H, m)
2.94 (3H, m)
3.02 (1H, m)
3.06 (1H, dd, $J=9.1, 13.6$ Hz)
3.16 (1H, dd, $J=5.6, 13.8$ Hz)
3.21 (1H, dd, $J=5.1, 14.8$ Hz)
3.48 (1H, dt, $J=7.5, 10.0$ Hz)
3.64 (1H, m)

Amide and aromatic hydrogens (25):

6.18 (1H, d, $J=12.2$ Hz)
6.55 (1H, d, $J=12.2$ Hz)
6.44-7.53 (4H, broad singlets)
7.01 (2H, t, $J=7.7$ Hz)
7.09 (1H, t, $J=7.5$ Hz)
7.19 (1H, s)
7.34 (1H, d, $J=8.1$ Hz)
7.36 (1H, dd, $J=1.5, 8.6$ Hz)
7.37 (1H, br.s)
7.42 (2H, m)
7.46 (1H, m)
7.62 (1H, d, $J=7.9$ Hz)
7.74 (2H, m)
7.81 (2H, m)
7.90 (1H, dd, $J=7.2, 12.4$ Hz)
8.78 (1H, dd, $J=3.9, 7.0$ Hz)
8.93 (1H, d, $J=8.3$ Hz)
10.84 (1H, d, $J=1.7$ Hz)



10 c[CO-2,6-pyridine-CO-*D*-Phe-Arg-Trp-Lys]-NH₂ (48 observable hydrogens)

α-Hydrogens (4):

4.10 (2H, m)

4.38 (1H, dt, $J=5.9, 8.6$ Hz)

4.87 (1H, dt, $J=6.7, 8.6$ Hz)

Side chain hydrogens (18):

1.22 (2H, m)

1.38 (3H, m)

1.49 (1H, m)

1.59-1.78 (4H, m)

2.78 (1H, dd, $J=8.6, 14.8$ Hz)

2.94 (2H, dd, $J=6.1, 13.2$ Hz)

3.08 (3H, m)

3.25 (1H, dd, $J=6.4, 13.7$ Hz)

3.70 (1H, m)

Amide and aromatic hydrogens (26):

6.27-7.51 (5H, broad singlets)

6.93 (1H, m)

7.02 (2H, m)

7.15 (2H, m)

7.20 (4H, m)

7.26 (1H, d, $J=8.1$ Hz)

7.44 (2H, dd, $J=6.7, 10.6$ Hz)

7.66 (1H, d, $J=8.1$ Hz)

7.86 (1H, d, $J=8.1$ Hz)

8.08 (1H, dd, $J=1.2, 7.7$ Hz)

8.13 (1H, t, $J=7.7$ Hz)

8.18 (1H, dd, $J=1.2, 7.7$ Hz)

8.31 (1H, d, $J=7.0$ Hz)

9.08 (1H, dd, $J=4.8, 7.1$ Hz)

9.34 (1H, d, $J=8.8$ Hz)

10.78 (1H, d, $J=2.0$ Hz)

11 c[CO-2,6-pyridine-CO-*D*-Nal(2')-Arg-Trp-Lys]-NH₂ (50 observable hydrogens)

α-Hydrogens (4):

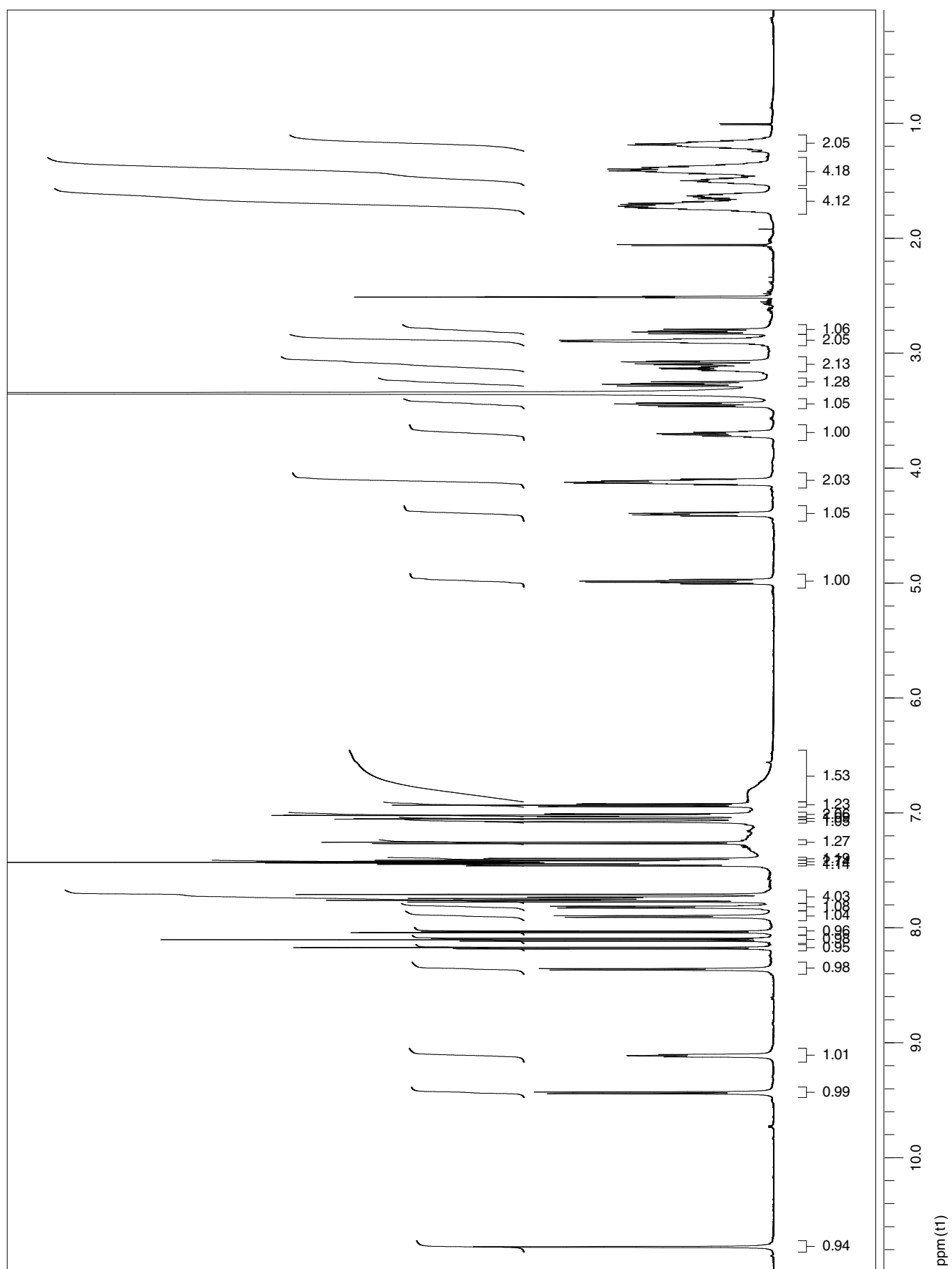
4.11 (2H, m)
4.39 (1H, dt, $J=6.2, 7.5$ Hz)
4.98 (1H, dt, $J=6.4, 8.7$ Hz)

Side chain hydrogens (18):

1.17 (2H, m)
1.39 (3H, m)
1.49 (1H, m)
1.57-1.79 (4H, m)
2.80 (1H, dd, $J=8.6, 14.8$ Hz)
2.88 (2H, dt, $J=7.1, 9.2$ Hz)
3.07 (1H, dd, $J=4.8, 14.8$ Hz)
3.12 (1H, dq, $J=4.8, 9.5$ Hz)
3.26 (1H, dd, $J=8.6, 13.7$ Hz)
3.44 (1H, dd, $J=6.1, 13.8$ Hz)
3.70 (1H, m)

Amide and aromatic hydrogens (28):

6.39-7.52 (5H, broad singlets)
6.93 (1H, m)
7.02 (2H, m)
7.05 (1H, d, $J=2.2$ Hz)
7.07 (1H, m)
7.26 (1H, d, $J=8.1$ Hz)
7.40 (1H, dd, $J=1.6, 8.4$ Hz)
7.43 (3H, m)
7.45 (1H, d, $J=7.5$ Hz)
7.70 (1H, s)
7.74 (2H, m)
7.76 (1H, d, $J=8.6$ Hz)
7.90 (1H, dd, $J=3.2, 6.1$ Hz)
8.03 (1H, dd, $J=1.1, 7.7$ Hz)
8.10 (1H, t, $J=7.7$ Hz)
8.17 (1H, dd, $J=1.2, 7.7$ Hz)
8.36 (1H, d, $J=7.0$ Hz)
9.11 (1H, dd, $J=5.1, 6.7$ Hz)
9.43 (1H, d, $J=8.9$ Hz)
10.78 (1H, d, $J=2.0$ Hz)



12 c[CO-2,3-pyrazine-CO-*D*-Phe-Arg-Trp-Lys]-NH₂ (47 observable hydrogens)

α-Hydrogens (4):

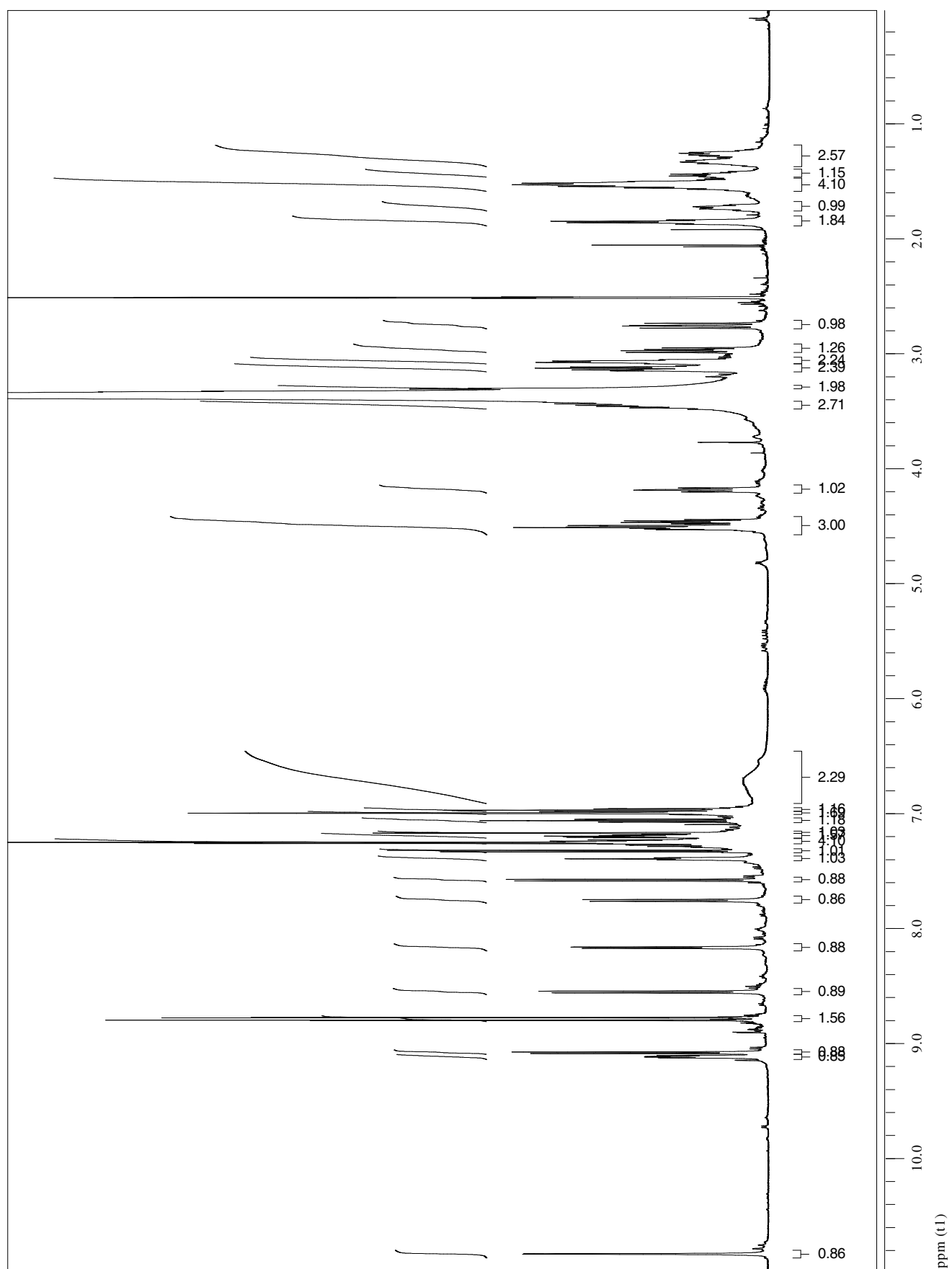
4.18 (1H, m)
4.45 (1H, dt, $J=6.5, 8.8$ Hz)
4.50 (2H, m)

Side chain hydrogens (18):

1.25 (1H, m)
1.32 (1H, m)
1.43 (1H, m)
1.52 (4H, m)
1.72 (1H, m)
1.84 (2H, dd, $J=7.4, 14.7$ Hz)
2.74 (1H, dd, $J=11.1, 14.4$ Hz)
2.96 (1H, dd, $J=8.9, 14.8$ Hz)
3.06 (2H, m)
3.12 (2H, dd, $J=5.8, 14.6$ Hz)
3.32 (1H, m)
3.44 (1H, m)

Amide and aromatic hydrogens (25):

6.30-7.46 (5H, broad singlets)
6.96 (1H, m)
6.99 (1H, s)
7.06 (1H, m)
7.16 (1H, d, $J=2.3$ Hz)
7.19 (1H, m)
7.23 (1H, m)
7.24 (2H, s)
7.25 (1H, d, $J=3.6$ Hz)
7.32 (1H, d, $J=8.1$ Hz)
7.39 (1H, t, $J=5.4$ Hz)
7.57 (1H, d, $J=8.0$ Hz)
7.75 (1H, d, $J=8.8$ Hz)
8.16 (1H, d, $J=6.6$ Hz)
8.55 (1H, d, $J=9.0$ Hz)
8.78 (2H, dd, $J=2.5, 14.2$ Hz)
9.08 (1H, d, $J=7.8$ Hz)
9.11 (1H, dd, $J=4.5, 7.7$ Hz)
10.83 (1H, d, $J=2.0$ Hz)



13 c[CO-2,3-pyrazine-CO-*D*-Nal(2')-Arg-Trp-Lys]-NH₂ (49 observable hydrogens)

α-Hydrogens (4):

4.19 (1H, m)

4.47 (1H, dt, $J=5.8, 8.8$ Hz)

4.52 (1H, m)

4.63 (1H, m)

Side chain hydrogens (18):

1.25 (1H, m)

1.35 (1H, m)

1.44 (1H, m)

1.53 (4H, m)

1.72 (1H, m)

1.85 (2H, dd, $J=7.3, 14.3$ Hz)

2.93 (1H, dd, $J=11.1, 14.5$ Hz)

2.97 (1H, dd, $J=9.0, 14.8$ Hz)

3.06 (2H, m)

3.14 (2H, m)

3.45 (1H, dd, $J=6.9, 14.0$ Hz)

3.48 (1H, dd, $J=3.1, 14.6$ Hz)

Amide and aromatic hydrogens (27):

6.34-7.55 (5H, broad singlets)

6.97 (1H, t, $J=7.7$ Hz)

7.00 (1H, s)

7.06 (1H, t, $J=7.5$ Hz)

7.17 (1H, s)

7.28 (1H, dd, $J=3.9, 8.0$ Hz)

7.33 (1H, d, $J=8.1$ Hz)

7.40 (1H, s)

7.43 (1H, dd, $J=1.6, 8.5$ Hz)

7.47 (2H, m)

7.59 (1H, d, $J=7.9$ Hz)

7.77 (2H, m)

7.80 (1H, dd, $J=3.3, 5.2$ Hz)

7.87 (1H, m)

8.18 (1H, d, $J=6.6$ Hz)

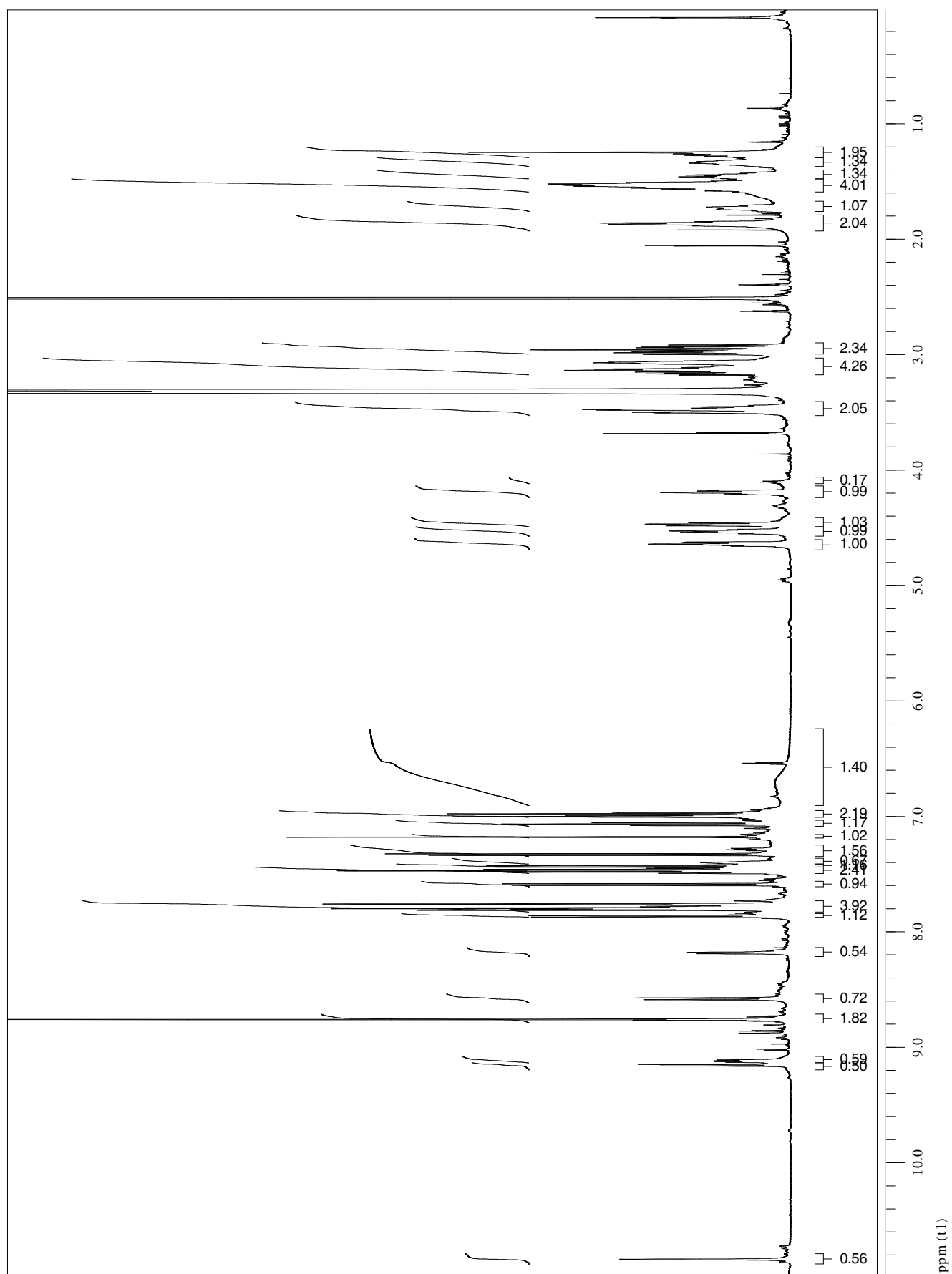
8.58 (1H, d, $J=9.1$ Hz)

8.76 (2H, m)

9.12 (1H, dd, $J=4.3, 7.8$ Hz)

9.15 (1H, d, $J=7.8$ Hz)

10.84 (1H, d, $J=1.9$ Hz)



14 c[CO-(CH₂)₂-CO-Nle-*D*-Phe-Arg-Trp-Lys]-NH₂ (60 observable hydrogens)

α-Hydrogens (5):

3.91 (1H, q, *J*=7.1 Hz)

4.16 (1H, m)

4.32 (2H, m)

4.52 (1H, m)

Side chain hydrogens (31):

0.73 (3H, t, *J*=7.4 Hz)

0.75 (1H, m)

0.92 (1H, m)

1.10 (2H, sxt, *J*=7.4 Hz)

1.19-1.70 (12H, m)

2.36 (4H, m)

2.72 (1H, dd, *J*=11.6, 13.8 Hz)

2.98 (1H, m)

3.02 (3H, m)

3.09 (1H, dd, *J*=4.8, 12.4 Hz)

3.11 (1H, dd, *J*=3.8, 14.0 Hz)

3.19 (1H, dd, *J*=4.6, 14.8 Hz)

Amide and aromatic hydrogens (24):

6.47-7.59 (4H, broad singlets)

6.99 (2H, m)

7.06 (1H, m)

7.10 (1H, br.s)

7.15 (1H, m)

7.19 (1H, d, *J*=2.0 Hz)

7.21 (2H, s)

7.22 (2H, d, *J*=1.6 Hz)

7.33 (1H, d, *J*=8.1 Hz)

7.45 (1H, t, *J*=4.8 Hz)

7.51 (1H, d, *J*=8.4 Hz)

7.68 (1H, d, *J*=7.9 Hz)

7.77 (1H, t, *J*=6.4 Hz)

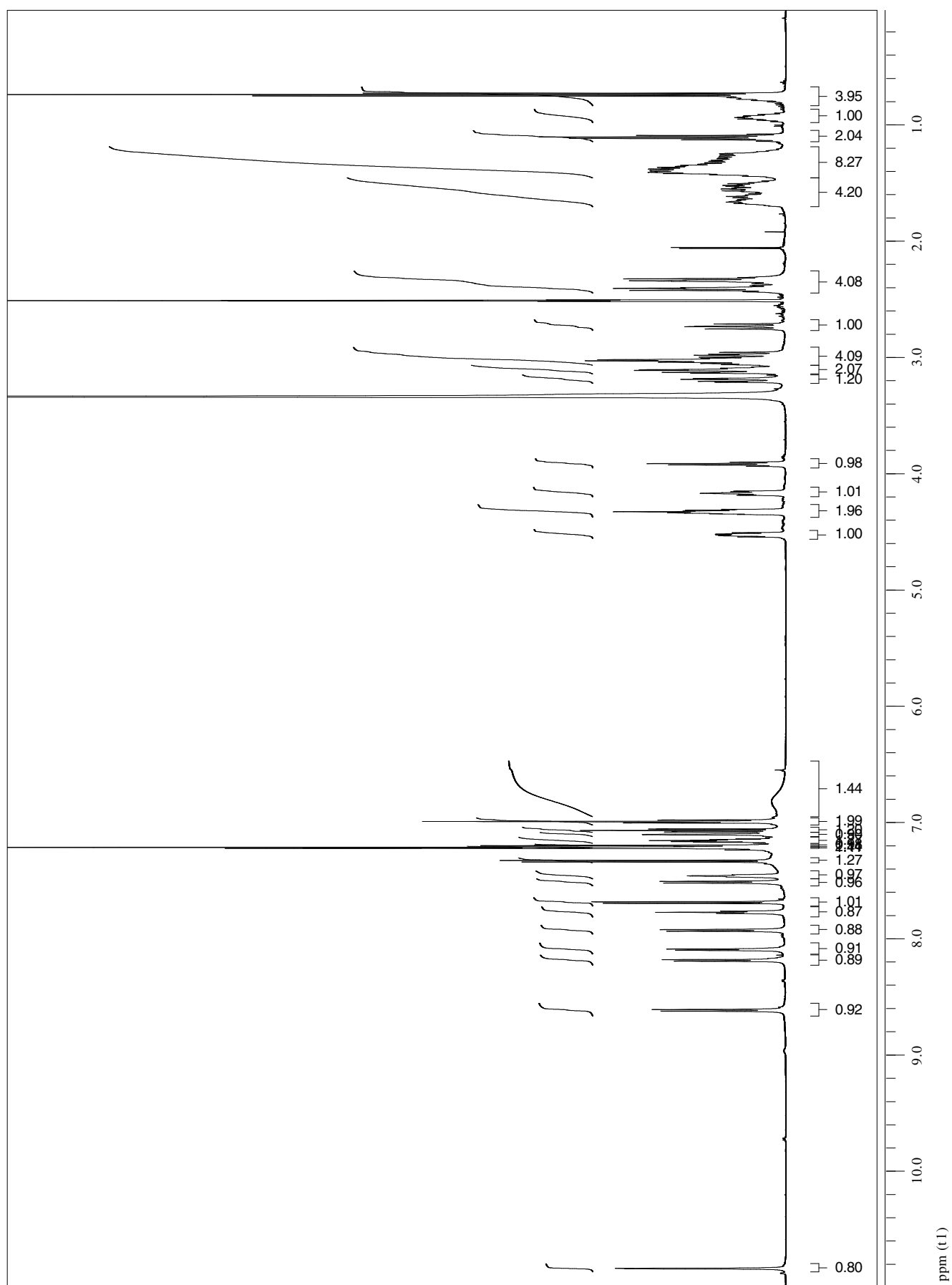
7.92 (1H, d, *J*=8.2 Hz)

8.09 (1H, d, *J*=6.4 Hz)

8.18 (1H, d, *J*=7.3 Hz)

8.61 (1H, d, *J*=8.3 Hz)

10.84 (1H, d, *J*=1.9 Hz)



15 c[CO-(CH₂)₂-CO-Nle-*D*-Nal(2')-Arg-Trp-Lys]-NH₂ (62 observable hydrogens)

α-Hydrogens (5):

3.89 (1H, q, *J*=7.0 Hz)

4.17 (1H, m)

4.36 (1H, m)

4.44 (1H, m)

4.54 (1H, m)

Side chain hydrogens (31):

0.45 (3H, t, *J*=7.3 Hz)

0.53 (1H, m)

0.76 (1H, m)

1.10 (2H, spt, *J*=6.9 Hz)

1.15-1.71 (12H, m)

2.30 (2H, m)

2.40 (2H, m)

2.89 (1H, m)

2.97 (1H, dd, *J*=10.0, 15.0 Hz)

3.01 (2H, m)

3.07 (2H, m)

3.20 (1H, dd, *J*=4.7, 14.8 Hz)

3.28 (1H, m)

Amide and aromatic hydrogens (26):

6.38-7.60 (4H, broad singlets)

7.00 (2H, t, *J*=7.4 Hz)

7.07 (1H, t, *J*=7.6 Hz)

7.09 (1H, br.s)

7.20 (1H, s)

7.34 (1H, d, *J*=8.1 Hz)

7.38 (1H, br.s)

7.38 (1H, dd, *J*=1.4, 8.5 Hz)

7.44 (2H, dqnt, *J*=1.4, 6.8 Hz)

7.55 (1H, d, *J*=8.3 Hz)

7.69 (1H, d, *J*=7.9 Hz)

7.71 (1H, s)

7.77 (3H, m)

7.82 (1H, dd, *J*=1.4, 7.4 Hz)

7.95 (1H, d, *J*=8.2 Hz)

8.04 (1H, d, *J*=6.1 Hz)

8.20 (1H, d, *J*=7.2 Hz)

8.69 (1H, d, *J*=8.3 Hz)

10.83 (1H, d, *J*=2.0 Hz)

