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# Supplementary Information

# Efficient synthesis of glycosylamines in solventless conditions promoted by mechanical milling

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## Contents

# Experimental Section

## General

Chemical reagents were purchased from Sigma-Aldrich or Acros (France) and solvents (analytical grade) such as methanol, diethyl ether, absolute ethanol and dichloromethane were provided by Prolabo. All reagent and solvents were used without any further purification. Reactions were conducted in a high speed vibrational ball-milling (Spex 8000M) into stainless steel jar (volume: 60 mL) with stainless steel balls (diameter: 13.0 mm). Syntheses were monitored by thin-layer chromatography (TLC) on silica gel 60 $F_{254}$ plates (Merck) and detection was conducted by charring with cerium molybdate reagent. FTIR spectra were recorded on a Shimadzu FTIR-8400S spectrometer using ATR technique. $^{1}H$ and $^{13}C$ RMN spectra were recorded on a Bruker 300WB spectrometer at 300 and 75 MHz respectively. Assignments of $^{1}H$ and $^{13}C$ signals were made using correlated spectroscopy (COSY) and heteronuclear single quantum correlation (HSQC). High-resolution electrospray mass spectra (HRMS) in the positive ion mode were obtained on a Q-Tof Ultima Global hybrid quadrupole/ time-of-flight instrument.

## General procedure for the preparation of compounds 1a-1d, 1g, 1n-1p and 1s-1u

Liquid amine (6.0 mmol, 1.1 eq.) and $SiO_2$ (1 g) were mixed in a mortar with a pestle to obtain a powdery mixture. The as-obtained mixture was then introduced with the sugar (5.5 mmol, 1 eq.) into a stainless steel jar and 3 stainless steel balls were added. The jar was placed in a vibrational ball-milling and shaken at 30 Hz. After 1.5h milling, the reaction mixture was scratched off the vessel and dissolved in a minimum of methanol. The solution was filtered through a pad of silica gel and washed with methanol to remove the grinding auxiliary. After evaporation under vacuum, the resulting solid was subsequently triturated with diethyl ether and filtered to afford the corresponding glycosylamine.

## General procedure for the preparation of compounds 1e-1f, 2a, 3a and 4a.

Amine (6.0 mmol, 1.1 eq.) and sugar (5.5 mmol, 1 eq.) were mixed in a mortar with a pestle and introduced with 3 stainless steel balls into a stainless steel jar. The jar was placed in a vibrational ball-milling and shaken at 30 Hz. After 1.5h milling, the reaction mixture was scratched off the vessel and triturated with diethyl ether and filtered to afford the corresponding glycosylamine.

**General procedure for the preparation of compounds 1w**

*p*-Hydroxyaniline (6.0 mmol, 1.1 eq.) and L-rhamnose (5.5 mmol, 1 eq.) were mixed in a mortar with a pestle and introduced with 3 stainless steel balls into a stainless steel jar. The jar was placed in a vibrational ball-milling and shaken at 30 Hz. After 1.5h milling, the reaction mixture was directly purified by column chromatography on silica gel using $CH_2Cl_2$/MeOH to furnish the compound **1w**.

**General procedure for the preparation of compounds 1h-1m, 1v and 1z**

Amine (5.5 mmol, 1 eq.) and sugar (5.5 mmol, 1 eq. for the synthesis of **1h-1j, 1v** or 11 mmol, 2 eq. for the synthesis of **1k-1m, 1z**) were mixed in a mortar with a pestle, then introduced with 3 stainless steel balls into a stainless steel jar. The jar was placed in a vibrational ball-milling and shaken at 30 Hz. After 1.5h to 3h milling, the reaction mixture was scratched off the vessel and dissolved in methanol. Finally, the solution was dried by evaporation under high vacuum to give the corresponding glycosylamine.

**General procedure for the preparation of compounds 1q-1r**

Amino-ester hydrochloride (3.2 mmol, 1 eq.), potassium carbonate (3.2 mmol, 1 eq.) and $SiO_2$ (0.5 g) were mixed in a mortar with a pestle to obtain a powdery mixture. The as-obtained mixture was then introduced with 3 stainless steel balls into a stainless steel jar. The jar was placed in a vibrational ball-milling and shaken at 30 Hz for 2h. The sugar (3.2 mmol, 1.1 eq.) and $SiO_2$ (0.5 g) were then added in the jar and the mixture was continuously milled for 1.5h. The reaction mixture was directly purified by column chromatography on silica gel using $CH_2Cl_2$/MeOH to furnish the corresponding glycosylamine.

# Characterization data

***N*-octyl-L-rhamnosylamine (1a)**

White solid, yield: 94%. Ratio α/β : 93/7. IR (ATR) ν ($cm^{-1}$): 3380-3221, 2932, 2849, 1462-1430, 1112, 1095-1070, 1046, 762-722. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.04 (d, 1H, $J$=1.1 Hz, H-1) ; 3.78 (dd, 1H, $J$=3.3, 1.1 Hz, H-2) ; 3.40 (dd, 1H, $J$=9.2, 3.3 Hz, H-3) ; 3.28 (t, 1H, $J$=9.2Hz, H-4) ; 3.18 (dq, 1H, J=9.2, 6.0 Hz, H-5) ; 2.91 (ddd, 1H, $J$=11.6, 8.4, 6.4 Hz, -HN-***CH₂***-) ; 2.59 (ddd, 1H, $J$= 11.6, 8.4, 5.9 Hz, -HN-***CH₂***-) ; 1.61-1.41 (m, 2H, -$NH_2$-$CH_2$-***CH₂***-) ; 1.40-1.29 (m, 10H, -$CH_2$-$CH_2$-) ; 1.28 (d, 3H, J=5.9 Hz, H-6) ; 0.90 (t, 3H, $J$=6.8 Hz, ***CH₃***-$CH_2$-). $^{13}$C NMR ($CD_3OD$): $\delta$ 88.4 (C-1), 76.0 (C-3), 74.6 (C-5), 74.1 (C-4), 73.1 (C-2), 46.3 (-HN-***CH₂***-), 33.0, 31.0, 30.6, 30.4, 28.4, 23.7 (-$CH_2$-$CH_2$-), 18.1 (C-6), 14.4 (***CH₃***-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{14}H_{29}NO_4$: *m/z* 276.2175, found *m/z* 276.2182.

**_N_-butyl-L-rhamnosylamine (1b)**

White solid, yield: 91%. Ratio α/β: 94/6. IR (ATR) ν ($cm^{-1}$): 3355-3221, 2964, 2858, 1454-1394, 1068, 1003, 897, 769-727. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.04 (d, 1H, $J$=1.1 Hz, H-1) ; 3.78 (dd, 1H, $J$=3.3, 1.1 Hz, H-2) ; 3.40 (dd, 1H, $J$=9.2, 3.3 Hz, H-3) ; 3.28 (t, 1H, J=9.2 Hz, H-4) ; 3.17 (dq, J= 9.1, 6.0 Hz, 1H, H-5) ; 2.93 (ddd, 1H, $J$= 11.6, 8.3, 6.5 Hz, -HN-***CH₂***-) ; 2.59 (ddd, 1H, $J$= 11.6, 8.4, 5.9 Hz, -HN-***CH₂***-) ; 1.58-1.30 (m, 4H, -$CH_2$-$CH_2$-) ; 1.27 (d, 3H, $J$=6.0 Hz, H-6) ; 0.94 (t, 3H, $J$=7.2 Hz, ***CH₃***-$CH_2$). $^{13}$C NMR ($CD_3OD$): $\delta$ 88.4 (C-1), 76.0 (C-3), 74.7 (C-5), 74.1 (C-4), 73.1 (C-2), 46.0 (-HN-***CH₂***-), 33.2 (-HN-$CH_2$-***CH₂***-), 21.5 (-***CH₂***-$CH_3$), 18.1 (C-6), 14.3 (***CH₃***-$CH_2$). HRMS $[M+H]^+$ calcd for $C_{10}H_{21}NO_4$ : *m/z* 220.1549, found *m/z* 220.1546.

**_N_-hexyl-L-rhamnosylamine (1c)**

White solid, yield: 89%. Ratio α/β: 91/9. IR (ATR) ν ($cm^{-1}$): 3306-3185, 2928, 2856, 1458-1419, 1092, 1055, 905, 771. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.04 (d, 1H, $J$=1.1 Hz, H-1) ; 3.78 (dd, 1H, $J$=3.3, 1.1 Hz, H-2) ; 3.40 (dd, 1H, $J$=9.2, 3.3 Hz, H-3) ; 3.28 (t, 1H, J=9.2 Hz, H-4) ; 3.17 (dq, 1H, $J$=9.1, 6.0 Hz, H-5) ; 2.91 (ddd, 1H, $J$=11.6, 8.5, 6.5 Hz, -HN-***CH₂***-) ; 2.59 (ddd, 1H, $J$=11.4, 8.4, 5.9 Hz, -HN-***CH₂***-) ; 1.61-1.41 (m, 2H, -$NH_2$-$CH_2$-***CH₂***-) ; 1.41-1.29 (m, 6H, -$CH_2$-$CH_2$-) ; 1.27 (d, 3H, $J$=5.9 Hz, H-6) ; 0.91 (t, 3H, $J$=6.8 Hz, ***CH₃***-$CH_2$-). $^{13}$C NMR ($CD_3OD$): $\delta$ 88.4 (C-1), 76.0 (C-3), 74.7 (C-5), 74.2 (C-4), 73.1 (C-2), 46.3 (-HN-***CH₂***-), 32.9, 31.0, 28.1, 23.7 (-$CH_2$-$CH_2$-), 18.1 (C-6), 14.4 (***CH₃***-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{12}H_{25}NO_4$: *m/z* 248.1862, found *m/z* 248.1864.

**_N_-decyl-L-rhamnosylamine (1d)**

White solid, yield: 95%. Ratio α/β: 82/18. IR (ATR) ν ($cm^{-1}$): 3443-3102, 2925, 2853, 1442-1416, 1089, 1066, 769, 620. α isomer: $^1$H NMR (DMSO-$d_6$): $\delta$ 4.61 (d, 1H, $J$=4.8 Hz Hz, OH-4) ; 4.52 (m, 2H, OH-2 + OH-3) ; 3.88 (s, 1H, H-1) ; 3.55-3.49 (m, 1H, H-2) ; 3.18 (m, 1H, H-3) ; 3.12-2.91 (m, 2H, H-4 + H-5) ; 2.86-2.71 (m, 1H, -HN-***CH₂***-) ; 2.56-2.35 (m, 1H, -HN-***CH₂***-) ; 2.08 (bs, 1H, -NH-) ; 1.44-1.16 (m, 18H, -$CH_2$-$CH_2$-) ; 1.12 (d, 3H, $J$=5.8 Hz, H-6) ; 0.85 (t, 3H, $J$=6.4 Hz, ***CH₃***-$CH_2$-). $^{13}$C NMR (DMSO-$d_6$): $\delta$ 87.2 (C-1), 74.4 (C-3), 72.5, 72.4 (2s, C-4, C-5), 71.6 (C-2), 44.9 (-HN-***CH₂***-), 31.3, 30.0, 29.0, 28.7, 26.8, 22.1 (-$CH_2$-$CH_2$-), 18.1 (C-6), 13.9 (***CH₃***-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{16}H_{33}NO_4$: *m/z* 304.2488, found *m/z* 304.2496.

**_N_-dodecyl-L-rhamnosylamine (1e)**

White solid, yield: 98%. Ratio α/β: 91/9. IR (ATR) ν ($cm^{-1}$): 3450-3176, 2922, 2854, 1452, 1145, 1064, 873. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.04 (d, 1H, $J$=0.9 Hz, H-1) ; 3.78 (dd, 1H, $J$=3.3, 1.1 Hz, H-2) ; 3.40 (dd, 1H, $J$=9.2, 3.3 Hz, H-3) ; 3.28 (t, 1H, $J$=9.2 Hz, H-4) ; 3.17 (dq, 1H, J=9.1, 6.0 Hz, H-5) ; 2.91 (ddd, 1H, $J$=11.6, 8.4, 6.5 Hz, -HN-***CH₂***-) ; 2.59 (ddd, 1H, $J$=11.6, 8.4, 6.0 Hz, -HN-***CH₂***-) ; 1.60-1.39 (m, 2H, -HN-$CH_2$-***CH₂***-) ; 1.39-1.19 (m, 18H, -

$CH_2$-$CH_2$-); 1.27 (d, 3H, J=6.1 Hz, H-6) ; 0.90 (t, 3H, *J*=6.8 Hz, ***CH₃***-$CH_2$-). $^{13}C$ NMR ($CD_3OD$): $\delta$ 88.4 (C-1), 76.0 (C-3), 74.6 (C-5), 74.2 (C-4), 73.1 (C-2), 46.3 (-HN-***CH₂***-), 33.0, 31.0, 30.7, 30.6, 30.4, 28.4, 23.7 (-$CH_2$-$CH_2$-), 18.1 (C-6), 14.4 (***CH₃***-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{18}H_{37}NO_4$: *m/z* 332.2801, found *m/z* 332.2816.

**_N_-hexadecyl-L-rhamnosylamine (1f)**

White solid, yield: 99%. Ratio α/β: 88/12. IR (ATR) ν ($cm^{-1}$): 3450-3100, 2945, 2827, 1442, 1090, 1062, 650. α isomer: $^1H$ NMR ($CD_3OD$) : $\delta$ 4.04 (d, 1H, *J*=0.9 Hz, H-1), 3.78 (dd, 1H, *J*=3.3, 1.1 Hz, H-2), 3.40 (dd, 1H, *J*=9.2, 3.4 Hz, H-3) ; 3.28 (t, 1H, *J*=9.2 Hz, H-4), 3.17 (dq, 1H, *J*=9.1, 6.0 Hz,, H-5), 2.90 (ddd, 1H, *J*=11.6, 8.1, 6.6 Hz, -HN-***CH₂***-), 2.62 (ddd, 1H, *J*=11.6, 8.0, 6.5 Hz, -HN-***CH₂***-), 1.59-1.41 (m, 2H, -HN-$CH_2$-***CH₂***-), 1.39-1.22 (m, 29H, -$CH_2$-$CH_2$- + H-6), 0.89 (t, 3H, *J*=6.7 Hz, ***CH₃***-$CH_2$-). $^{13}C$ NMR ($CD_3OD$): $\delta$ 88.6(C-1), 76.1 (C-3), 74.6 (C-5), 74.3 (C-4), 73.2 (C-2), 46.4 (-HN-***CH₂***-), 33.0, 31.1, 30.7, 30.5, 30.3 28.3, 23.6 (-$CH_2$-$CH_2$-), 18.1 (C-6), 14.3 (***CH₃***-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{22}H_{45}NO_4$: *m/z* 388.3427, found *m/z* 388.3428.

**_N_-(L-rhamnosyl)-octyl-1,8-diamine (1h)**

White solid, yield: 96%. Ratio α/β: 87/13. IR (ATR) ν ($cm^{-1}$): 3531-3179, 2931, 2859, 1662, 1557, 1454-1416, 1139, 1073, 768, 662. α isomer: $^1H$ NMR (DMSO-$d_6$): $\delta$ 3.88 (s, 1H, H-1) ; 3.70-3.15 (bs, 6H, -OH (3)+-NH-+-$NH_2$) ; 3.54 (d, 1H, *J*=2.9 Hz, H-2) ; 3.20 (dd, 1H, *J*=8.8, 3.3 Hz, H-3) ; 3.16-2.92 (m, 2H, H-4+H-5) ; 2.85-2.71 (m, 1H, -HN-***CH₂***-) ; 2.51-2.41 (m, 3H, -HN-***CH₂***, -***CH₂***-$NH_2$) ; 1.45-1.20 (m, 12H, -$CH_2$-$CH_2$-) ; 1.12 (d, 3H, *J*=5.9 Hz, H-6). $^{13}C$ NMR (DMSO-$d_6$): $\delta$ 87.2 (C-1), 74.5 (C-3), 72.6 (C-5), 72.4 (C-4), 71.6 (C-2), 44.9 (-HN-***CH₂***-), 41.7 (-***CH₂***-$NH_2$), 33.3, 30.0, 29.1, 26.9, 26.5 (-$CH_2$-$CH_2$-), 18.2 (C-6). HRMS $[M+H]^+$ calcd for $C_{14}H_{31}N_2O_4$: *m/z* 291.2239, found *m/z* 291.2270

**_N_-(L-rhamnosyl)-decyl-1,10-diamine (1i)**

White solid, yield: 95%. Ratio α/β: 91/9. IR (ATR) ν ($cm^{-1}$): 3501-3147, 2920, 2845, 1471, 1120, 1018, 784. α isomer: $^1H$ NMR ($CD_3OD$): $\delta$ 4.00 (s, 1H, H-1) ; 3.75 (d, 1H, *J*=2.6 Hz, H-2) ; 3.36 (dd, 1H, *J*=9.2, 3.1 Hz, H-3) ; 3.31-3.20 (m, 1H, H-4) ; 3.20-3.05 (m, 1H, H-5) ; 2.95-2.80 (m, 1H, -HN-***CH₂***-) ; 2.64-2.50 (m, 3H, -HN-***CH₂***- + -***CH₂***-$NH_2$) ; 1.55-1.36 (m, 4H, -***CH₂***-$CH_2$-NH- + -***CH₂***-$CH_2$-$NH_2$) ; 1.36-1.19 (m, 12H, -$CH_2$-$CH_2$-) ; 1.24 (d, 3H, J=6.1 Hz, H-6). $^{13}C$ NMR ($CD_3OD$): $\delta$ 88.4 (C-1), 76.0 (C-3), 74.6 (C-5), 74.1 (C-4), 73.1 (C-2), 46.3 (-HN-***CH₂***-), 42.6 (-***CH₂***-$NH_2$), 33.9, 31.0, 30.6, 28.4, 28.0 (-$CH_2$-$CH_2$-), 18.2 (C-6). HRMS $[M+H]^+$ calcd for $C_{16}H_{34}N_2O_4$: *m/z* 319.2552, found *m/z* 319.2581

**_N_-(L-rhamnosyl)-dodecyl-1,12-diamine (1j)**

Pale yellow solid, yield: 96%. Ratio α/β: 93/7. IR (ATR) ν ($cm^{-1}$): 3389-3196, 2917, 2849, 1652, 1575, 1464, 1088, 1058, 859, 782-684. α isomer: $^1H$ NMR ($CD_3OD$): $\delta$ 4.04 (d, 1H,

*J*=1.1 Hz, H-1) ; 3.78 (dd, 1H, *J*=3.3, 0.9 Hz, H-2) ; 3.40 (dd, 1H, *J*=9.2, 3.3 Hz, H-3) ; 3.28 (t, 1H, *J*=9.2 Hz, H-4) ; 3.18 (dq, 1H, *J* = 9.2, 5.9 Hz, H-5) ; 2.91 (ddd, 1H, *J*= 11.6, 8.4, 6.6 Hz, -HN-***CH₂***-) ; 2.66-2.50 (m, 3H, -HN-***CH₂***- + -***CH₂***-$NH_2$) ; 1.57-1.40 (m, 4H, -***CH₂***-$CH_2$-NH- + -***CH₂***-$CH_2$-$NH_2$) ; 1.40-1.29 (m, 16H, -$CH_2$-$CH_2$-) ; 1.27 (d, 3H, *J*=5.9 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 88.4 (C-1), 76.0 (C-3), 74.7 (C-5), 74.2 (C-4), 73.1 (C-2), 46.3 (-HN-***CH₂***-), 42.5 (-HN-***CH₂***-), 33.7, 31.0, 30.7, 30.6, 28.4, 28.0 (-$CH_2$-$CH_2$-), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_{18}H_{38}N_2O_4$: *m/z* 347.2910, found *m/z* 347.2903.

**_N,N'_-bis-(L-rhamnosyl)-octyl-1,8-diamine (1k)**

White solid, yield: 95%. Ratio α,α /β,β: 82/18. IR (ATR) ν ($cm^{-1}$): 3419-3088, 2928, 2856, 1447, 1101, 1080, 901,769-638. α,α isomer: $^1$H NMR (DMSO-$d_6$): $\delta$ 4.61 (d, 2H, *J*=4.9 Hz, OH-4 ) ; 4.53 (d, 2H, J=5.0 Hz, OH-2), 4.50 (d, 2H, *J*= 5.7 Hz, OH-3), 3.89 (s, 2H, H-1), 3.53 (t, 2H, *J*=3.7 Hz, H-2), 3.23-3.15 (m, 2H, H-3) ; 3.14-2.93 (m, 4H, H-4, H-5), 2.86-2.72 (m, 2H, -HN-***CH₂***-) ; 2.52-2.38 (m, 2H, -HN-***CH₂***-) ; 2.08 (s ; 2H, -NH-) ; 1.45-1.30 (m, 4H, -***CH₂***-$CH_2$-NH-), 1.30-1.20 (m, 8H, -$CH_2$-$CH_2$-) ; 1.12 (d, 6H, *J*=6.0 Hz, H-6). $^{13}$C NMR (DMSO-$d_6$): $\delta$ 87.2 (C-1), 74.4 (C-3), 72.5 (C-5), 72.4 (C-4), 71.6 (C-2), 44.9 (-HN-***CH₂***-), 30.0, 29.0, 26.8 (-$CH_2$-$CH_2$-), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_{20}H_{40}N_2O_8$: *m/z* 437.2866, found *m/z* 437.2872.

**_N,N'_-bis-(L-rhamnosyl)-decyl-1,10-diamine (1l)**

White solid, yield: 98%. Ratio α,α /β,β: 84/16. IR (ATR) ν ($cm^{-1}$): 3477-3203, 2920, 2849, 1462, 1142, 1111-1057, 860,769-638. α,α isomer: $^1$H NMR (DMSO-$d_6$): $\delta$ 4.61 (d, 2H, *J*=4.6 Hz, OH-4) ; 4.54-4.49 (m, 4H, OH-2 + OH-3) ; 3.88 (s, 2H, H-1), 3.60-3.49 (m, 2H, H-2), 3.18-3.14 (m, 2H, H-3) ; 3.10-2.93 (m, 4H, H-4, H-5), 2.84-2.70 (m, 2H, -HN-***CH₂***-) ; 2.51-2.36 (m, 2H, -HN-***CH₂***-) ; 2.08 (s, 2H, -NH-) ; 1.42-1.30 (m, 4H, -***CH₂***-$CH_2$-NH-), 1.29-1.19 (m, 12H, -$CH_2$-$CH_2$-), 1.12 (d, 6H, *J*=5.8 Hz, H-6). $^{13}$C NMR (DMSO-$d_6$): $\delta$ 87.2 (C-1), 74.4 (C-3), 72.5 (C-5), 72.4 (C-4), 71.6 (C-2), 44.9 (-HN-***CH₂***-), 30.0, 29.0, 26.8 (-$CH_2$-$CH_2$-), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_{22}H_{44}N_2O_8$: *m/z* 465.3179, found *m/z* 465.3176.

**_N,N'_-bis-(L-rhamnosyl)-dodecyl-1,12-diamine (1m)**

White solid, yield: 98%. Ratio α,α/β,β: 89/11. IR (ATR) ν ($cm^{-1}$): 3512-3051, 2911, 2842, 1560, 1468, 1101, 1086, 1053, 852, 715. α,α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.04 (d, 2H, *J*=1.1 Hz, H-1) ; 3.78 (dd, 2H, *J*=3.3, 1.1 Hz, H-2) ; 3.40 (dd, 2H, *J*=9.2, 3.5 Hz, H-3) ; 3.28 (t, 2H, *J*=9.0 Hz, H-4) ; 3.17 (dq, 2H, J=9.1, 6.0 Hz, H-5) ; 2.91 (ddd, 2H, J=11.6, 8.4, 6.5 Hz, -HN-***CH₂***-) ; 2.59 (ddd, 2H, J=11.6, 8.3, 5.9 Hz, -HN-***CH₂***-); 1.60-1.42 (m, 4H, -***CH₂***-$CH_2$-NH-) ; 1.41-1.29 (m, 16H, -$CH_2$-$CH_2$-) 1.28 (d, 6H, *J*=5.9 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 88.4 (C-1), 76.0 (C-3), 74.7 (C-5), 74.2 (C-4), 73.1 (C-2), 46.3 (-HN-***CH₂***-), 31.0, 30.7, 30.6, 28.4 (-$CH_2$-$CH_2$-), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_{24}H_{48}N_2O_8$: *m/z* 493.3513, found *m/z* 493.3492.

***N*-propargyl-L-rhamnosylamine (1n)**

Yellow solid, yield: 96%. Ratio α/β: 88/12. IR (ATR) ν ($cm^{-1}$): 3575-3104, 2976, 2833, 2125, 1448, 1141, 1055, 854, 707-628. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.18 (d, 1H, *J*=1.1 Hz, H-1) ; 3.79 (dd, 1H, *J*=3.4, 1.0 Hz, H-2) ; 3.61 (dd, 1H, *J*=16.4, 2.6 Hz, -HN-***CH₂***-) ; 3.52 (dd, 1H, *J*=16.4, 2.6 Hz, -HN-***CH₂***-) ; 3.42 (dd, 1H, *J*=9.2, 3.3 Hz, H-3) ; 3.29 (t, 1H, *J*=9.2 Hz, H-4) ; 3.18 (dq, 1H *J*=9.2, 6.0 Hz, H-5) ; 2.57 (t, 1H, *J*=2.5 Hz, ***HC***≡C-) ; 1.28 (d, 3H, *J*=6.1 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 86.7 (C-1), 82.1 (HC≡***C***-) ; 75.8 (C-3), 74.6 (C-5), 74.0 (C-4), 72.8 (C-2 + ***HC***≡C-), 34.6 (-HN-***CH₂***-), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_9H_{15}NO_4$: *m/z* 202.1035, found *m/z* 202.1070.

***N*-allyl-L-rhamnosylamine (1o)**

Light yellow solid, yield: 91%. Ratio α/β: 90/10. IR (ATR) ν ($cm^{-1}$): 3468-3085, 2971, 2864, 1651, 1453, 1061, 1035, 860, 772. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 6.01-5.80 (m, 1H, -***HC***=$CH_2$) ; 5.24-5.04 (m, 2H, -HC=***CH₂***) ; 4.05 (d, 1H, *J*=1.1 Hz, H-1) ; 3.78 (dd, 1H, *J*=3.4, 1.1 Hz, H-2) ; 3.54-3.45 (m, 1H, -HN-***CH₂***-) ; 3.39 (dd, 1H, *J*=9.2, 3.3 Hz, H-3) ; 3.36-3.24 (m, 2H, H-4 + -HN-***CH₂***-) ; 3.16 (dq, 1H, *J*=9.1, 6.1 Hz, H-5) ; 1.28 (d, 3H, *J*=5.9 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 137.5 (-***HC***=$CH_2$), 116.8 (-HC=***CH₂***), 87.6 (C-1), 76.0 (C-3), 74.6 (C-5), 74.1 (C-4), 73.1 (C-2), 48.7 (-HN-***CH₂***-), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_9H_{17}NO_4$: *m/z* 204.1223, found *m/z* 204.1230

***N*-(3-hydroxypropyl)-L-rhamnosylamine (1p)**

Yellow solid, yield: 92%. Ratio α/β: 92/8. IR (ATR) ν ($cm^{-1}$): 3381-3281, 2955, 2901, 1492, 1145, 1087-1028, 856, 711. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.04 (d, 1H, *J*=0.9 Hz, H-1) ; 3.77 (dd, 1H, *J*=3.3, 1.1 Hz, H-2) ; 3.62 (t, 2H, *J*=6.2 Hz, -***CH₂***-OH) ; 3.40 (dd, 1H, *J*=9.2, 3.3 Hz, H-3) ; 3.27 (t, 1H, *J*=9.0 Hz, H-4) ; 3.17 (dq, 1H, *J*=9.1, 6.0 Hz, H-5) ; 3.02 (dt, 1H, J=12.0; 7.3 Hz, -HN-***CH₂***-) ; 2.70 (dt, 1H, *J*=11.8, 7.1 Hz, -HN-***CH₂***-) ; 1.77-1.62 (m, 2H, -***CH₂***-$CH_2$-OH) ; 1.27 (d, 3H, *J*=5.9 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 88.5 (C-1), 75.9 (C-3), 74.6 (C-5), 74.1 (C-4), 73.1 (C-2), 61.4 (-***CH₂***-OH), 43.6 (-HN-***CH₂***-), 33.7 (-***CH₂***-$CH_2$-OH), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_9H_{19}NO_5$: *m/z* 222.1328, found *m/z* 222.1336.

***N*-(alanine methyl ester)-L-rhamnosylamine (1q)**

Yellow oil, yield: 68%. Ratio α/β: 89/11. IR (ATR) ν ($cm^{-1}$): 3430-3029, 2950, 2753, 1736, 1589, 1452, 1222, 1041, 842, 670. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.10 (d, 1H, *J*=1.1 Hz, H-1) ; 3.78 (dd, 1H, *J*=3.3, 1.1 Hz, H-2) ; 3.69 (s, 3H, -CO-O***CH₃***) ; 3.55 (q, 1H, *J*= 7.0 Hz, -HN-***CH***-) ; 3.39 (dd, 1H, *J*=9.3, 3.4 Hz, H-3) ; 3.25 (t, 1H, *J*=9.2 Hz, H-4) ; 3.13 (dq, 1H, J=9.2; 6.0 Hz, H-5) ; 1.26 (d, 3H, *J*=7.0 Hz, ***CH₃***-CH-) ; 1.21 (d, 3H, *J*=5.9 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 178.0 (-***CO***-$OCH_3$), 87.4 (C-1), 75.9 (C-3), 74.5 (C-5), 74.0 (C-4), 72.9 (C-2), 54.4 (-HN-***CH***-), 52.3 (-CO-O***CH₃***), 18.8 (***CH₃***-CH-), 18.0 (C-6). ). HRMS $[M+Na]^+$ calcd for $C_{10}H_{19}NO_6$: *m/z* 272.1099, found *m/z* 272.1104.

***N*-(leucine methyl ester)-L-rhamnosylamine (1r)**

Pale yellow oil, yield: 70%. Ratio α/β: 90/10. IR (ATR) ν ($cm^{-1}$): 3555-3200, 2924, 2854, 1747, 1525, 1446, 1228, 1080, 744. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 4.05 (s, 1H, H-1) ; 3.79 (dd, 1H, *J*=3.3, 0.9 Hz, H-2) ; 3.66 (s, 3H, -CO-O***CH*$_3$**) ; 3.41-3.33 (m, 2H, H-3, -HN-***CH***-) ; 3.24 (t, 1H, *J*=9.2 Hz, H-4) ; 3.11 (dq, 1H, *J*=9.1, 6.0 Hz, H-5) ; 1.78-1.56 (m, 1H, $(CH_3)_2$***CH***-) ; 1.43 (t, 2H, *J*=7.4 Hz, $(CH_3)_2$CH-***CH*$_2$**-) ; 1.18 (d, 3H, *J*=6.0 Hz, H-6) ; 0.93-0.89 (2d, 6H, *J*=6.6 Hz, ***(CH*$_3$*)*$_2$**CH-).$^{13}$C NMR ($CD_3OD$) : $\delta$ 178.6 (-***CO***-$OCH_3$), 88.9 (C-1), 75.9 (C-3), 74.3 (C-5), 74.0 (C-4), 72.9 (C-2), 58.8 (-HN-***CH***-), 52.1 (-CO-O***CH*$_3$**-), 44.1 (-CH-***CH*$_2$**-), 25.9 ($(CH_3)_2$***CH***-), 23.0, 22.8 (***(CH*$_3$*)*$_2$**CH-), 18.0 (C-6). HRMS $[M+H]^+$ calcd for $C_{13}H_{25}NO_6$: *m/z* 292.17510, found *m/z* 292.17546.

***N*-benzyl-L-rhamnosylamine (1s)**

Yellow solid, yield: 94%. Ratio α/β: 90/10. IR (ATR) ν ($cm^{-1}$): 3356-3090, 2975, 2860, 1606, 1570, 1452, 1101-1022, 754-669. α isomer: $^1$H NMR ($CD_3OD$): $\delta$ 7.39-7.26 (m, 5H, $H_{ar}$), 4.07 (d, 1H, *J*=12.7 Hz, -HN-***CH*$_2$**-), 4.04 (d, 1H, *J*=0.6 Hz H-1), 3.85 (d, 1H, *J*=12.9 Hz, -HN-***CH*$_2$**-), 3.82 (m, 1H, H-2), 3.46-3.35 (m, 2H, H-3 + H-4) ; 3.18 (dq, 1H, J=8.8, 6.1 Hz, H-5), 1.35 (d, 3H, *J*=6.1 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 140.9 (-$CH_2$-***C*$_{ar}$**), 129.6, 129.4, 128.1 ($CH_{ar}$), 87.5 (C-1), 76.0 (C-3), 74.6 (C-5), 74.2 (C-4), 73.1 (C-2), 49.9 (-HN-***CH*$_2$**-), 18.1 (C-6). HRMS $[M+H]^+$ calcd for $C_{13}H_{19}NO_4$: *m/z* 254.1378, found *m/z* 254.1386.

***N*-(2,4-dimethoxybenzyl)-L-rhamnosylamine (1t)**

Yellow solid, yield: 94%. IR (ATR) ν ($cm^{-1}$): 3482-3098, 2925, 2847, 1597, 1513, 1454, 1262, 1141. α isomer (major isomer): $^1$H NMR ($CDCl_3$): $\delta$ 6.87-6.73 (m, 3H, $H_{ar}$), 4.28 (bs, 4H, -OH (3) + -NH-), 3.95 (d, 1H, *J*=12.5 Hz, -HN-***CH*$_2$**-), 3.93 (s, 1H, H-1), ), 3.87-3.83 (m, 1H, H-2), 3.82-3.81 (2s, 6H, -$OCH_3$), 3.71 (d, 1H, *J*=12.7 Hz, -HN-***CH*$_2$**-), 3.36-3.29 (m, 2H, H-3 and H-4) ; 3.15-3.03 (m, 1H, H-5), 1.26 (d, 3H, *J*=6.1 Hz, H-6). $^{13}$C NMR ($CDCl_3$): $\delta$ 149.0, 148.4, ($CO_{ar}$), 131.8 (-$CH_2$-***C*$_{ar}$**), 121.2, 112.3, 111.2 ($CH_{ar}$), 86.2 (C-1), 74.9 (C-3), 73.2 (C-5), 72.8 (C-4), 71.9 (C-2), 56.0 (-$OCH_3$), 49.1 (-HN-***CH*$_2$**-), 17.9 (C-6). HRMS $[M+H]^+$ calcd for $C_{15}H_{23}NO_6$: *m/z* 314.1559, found *m/z* 314.1598

***N*-phenyl-L-rhamnosylamine (1u)**

Brown solid, yield: 99%. IR (ATR) ν ($cm^{-1}$): 3473-3354, 2989, 2850, 1600, 1504, 1112, 1070, 885,746, 692. α isomer (major isomer): $^1$H NMR ($CD_3OD$): $\delta$ 7.16-6.67 (m, 5H, $H_{ar}$), 4.83 (m, 1H, H-1) ; 3.91 (dd, 1H, *J*=3.4, 1.0 Hz, H-2), 3.54-3.49 (m, 1H, H-3) ; 3.37-3.30 (m, 2H, H-4 + H-5), 1.27 (d, 3H, *J*=5.9 Hz, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 147.1 ($CN_{ar}$), 130.0, 119.5, 115.1 ($CH_{ar}$), 83.4 (C-1), 75.9 (C-3), 74.1 (C-5), 74.0 (C-4), 73.0 (C-2), 18.0 (C-6). HRMS $[M+H]^+$ calcd for $C_{12}H_{17}NO_4$: *m/z* 240.1191, found *m/z* 240.1230

***N*-(4-aminophenyl)-L-rhamnosylamine (1v)**

Brown solid, yield: 90%. IR (ATR) ν ($cm^{-1}$): 3600-3034, 2906-2764, 1616, 1506, 1448-1363, 1046, 823, 684. Ratio α/β: 85/15. α isomer : $^1$H NMR ($CD_3OD$): $\delta$ 6.68-6.59 (m, 4H, $H_{ar}$) ; 4.72 (m, 1H, H-1) ; 3.90-3.88 (m, 1H, H-2) ; 3.50-3.47 (m, 1H, H-3) ; 3.33-3.30 (m, 2H, H-4 and H-5) ; 1.26-1.20 (m, 3H, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 140.2 ($CN_{ar}$), 118.5 ($CH_{ar}$), 84.6 (C-1), 76.0 (C-3), 74.2 (C-5), 74.1 (C-4), 73.2 (C-2), 18.0 (C-6). LRMS $[M+H]^+$ calcd for $C_{12}H_{18}N_2O_4$: *m/z* 255.3, found *m/z* 255.2.

***N*-(4-hydroxyphenyl)-L-rhamnosylamine (1w)**

Pale yellow solid, yield: 59%. IR (ATR) ν ($cm^{-1}$): 3506-3288, 2920, 2855, 1595, 1511, 1455, 1260, 1083, 995, 883, 697. α isomer (major isomer): $^1$H NMR ($CD_3OD$): $\delta$ 6.76-6.42 (m, 4H, $H_{ar}$), 4.74 (m, 1H, H-1), ), 3.95 (m, 1H, H-2), 3.56-3.52 (m, 1H, H-3) ; 3.37-3.31 (m, 2H, H-4 and H-5), 1.30 (m, 3H, H-6). $^{13}$C NMR ($CD_3OD$): $\delta$ 151.0 ($CO_{ar}$), 139.9 ($CN_{ar}$), 116.8, 116.7 ($CH_{ar}$), 84.5 (C-1), 75.9 (C-3), 74.1 (C-5), 74.0 (C-4), 73.1 (C-2), 18.0 (C-6). HRMS $[M+H]^+$ calcd for $C_{12}H_{17}NO_5$: *m/z* 256.1172, found *m/z* 256.1179.

***N,N'*-bis-(L-rhamnosyl)-phenyl-1,4-diamine (1z)**

Brown solid, yield: 95%. IR (ATR) ν ($cm^{-1}$): 3600-3035, 2976-2850, 1625, 1518, 1442, 1078, 891, 688. α,α (major isomer) :$^1$H NMR (DMSO-$d_6$): $\delta$ 6.55 (s, 4H, $H_{ar}$) ; 5.01 (d, 2H, *J*=10.7 Hz, -NH-) ; 4.77 (d, 2H, *J*=5.1 Hz, OH-2) ; 4.70 (d, 2H, *J*=4.6 Hz, OH-4) ; 4.65 (s, 2H, H-1) ; 4.62 (d, 2H, *J*=4.6 Hz, OH-3) ; 3.72-3.62 (m, 2H, H-2) ; 3.32-3.17 (m, 2H, H-3) ; 3.23-3.05 (m, 4H, H-4 and H-5), 1.09 (d, 6H, *J*=5.3 Hz, H-6). $^{13}$C NMR (DMSO-$d_6$): $\delta$ 138.1 ($CN_{ar}$), 114.9 ($CH_{ar}$), 82.1 (C-1), 74.3 (C-3), 72.4-72.2 (2s, C-5 and C-4), 71.4 (C-2), 18.1 (C-6). LRMS $[M+Na]^+$ calcd for $C_{18}H_{28}N_2O_8$: *m/z* 423.4, found *m/z* 423.1.

***N*-dodecyl-D-glucosylamine (2a)**

White solid, yield: 97%. IR (ATR) ν ($cm^{-1}$): 3371-3136, 2914, 2847, 1514, 1467, 1078, 1014, 895, 719-607. β (major isomer): $^1$H NMR (DMSO-$d_6$): $\delta$ 4.81 (d, 1H, *J*=4.5 Hz, OH-3); 4.77 (d, 1H, *J*=4.8 Hz, OH-4); 4.42 (d, 1H, *J*=4.2 Hz, OH-2); 4.32 (t, 1H, *J*=5.8 Hz, OH-6); 3.67-3.61 (m, 2H, H-1 + H-6a) ; 3.44-3.36 (m, 1H, H-6b) ; 3.11 (dt, 1H, *J*=8.7, 4.4 Hz, H-3); 3.02-2.98 (m, 2H, H-4 + H-5) ; 2.95 (td, 1H, *J*=8.6; 4.1 Hz, H-2) ; 2.80-2.70 (m, 1H, -HN-***CH*$_2$**-) ; 2.52-2.44 (m, 1H, -HN-***CH*$_2$**-) ; 2.14 (bs, 1H, NH) ; 1.42-1.32 (m, 2H, + -***CH*$_2$**-$CH_2$-NH-) ; 1.29-1.17 (m, 18H, -$CH_2$-$CH_2$-) ; 0.85 (t, 3H, *J*=6.5 Hz, ***CH*$_3$**-$CH_2$-). $^{13}$C NMR (DMSO-$d_6$): $\delta$ 90.8 (C-1), 77.6 (C-3), 77.4 (C-5), 73.5 (C-2), 70.6 (C-4), 61.4 (C-6), 45.5 (-HN-***CH*$_2$**-), 31.3, 30.0, 29.0, 28.7, 26.8, 22.1 (-$CH_2$-$CH_2$-), 13.9 (***CH*$_3$**-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{18}H_{37}NO_5$ : *m/z* 348.2750, found *m/z* 348.2758.

**_N_-dodecyl-D-galactosylamine (3a)**

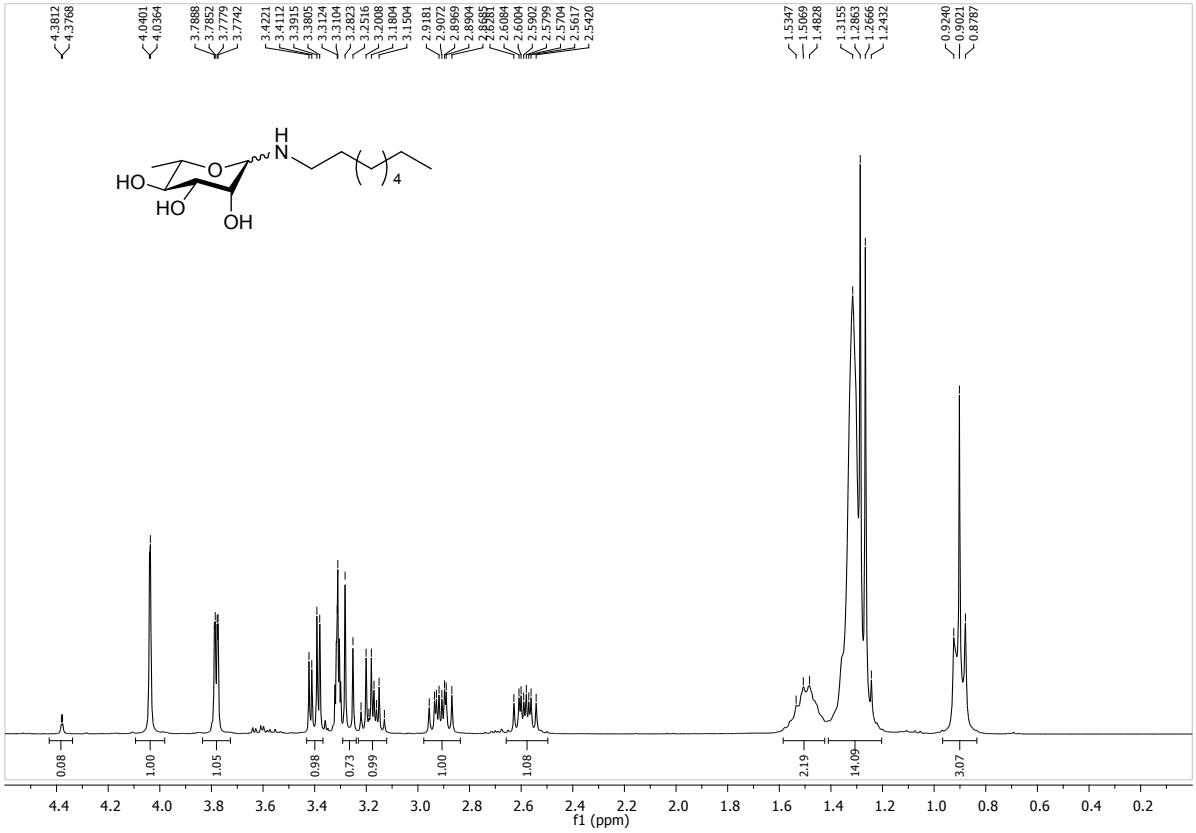
White solid, yield: 94%. IR (ATR) ν ($cm^{-1}$): 3439-3246, 2914, 2847, 1460, 1122, 1050, 866, 673. β (major isomer): $^{1}H$ NMR ($CD_3OD$): $\delta$ 3.85 (dd, 1H, $J$=9.7, 3.6 Hz, H-4), 3.78 (d, 1H, $J$=8.4 Hz, H-1) 3.73-3.65 (m, 2H, H-6a, H-6b), 3.49-3.31 (m, 3H, H-2, H-3, H-5), 2.97-2.79 (m, 1H, -HN-***CH₂***-), 2.68-2.52 (m, 1H, -HN-***CH₂***-), 1.58-1.41 (m, 2H, -***CH₂***-$CH_2$-NH-) ; 1.39-1.17 (m, 18H, -$CH_2$-$CH_2$-), 0.90 (t, 3H, $J$=6.6 Hz, ***CH₃***-$CH_2$-). $^{13}C$ NMR ($CD_3OD$): $\delta$ 92.5 (C-1), 77.5-75.8 (2s, C-3, C-5), 72.5 (C-2), 70.7 (C-4), 62.7 (C-6), 47.2 (-HN-***CH₂***-), 33.1, 31.2, 30.8, 30.5, 28.4, 23.7 (-$CH_2$-$CH_2$-), 14.4 (***CH₃***-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{18}H_{37}NO_5$: $m/z$ 348.2750, found $m/z$ 348.2757.

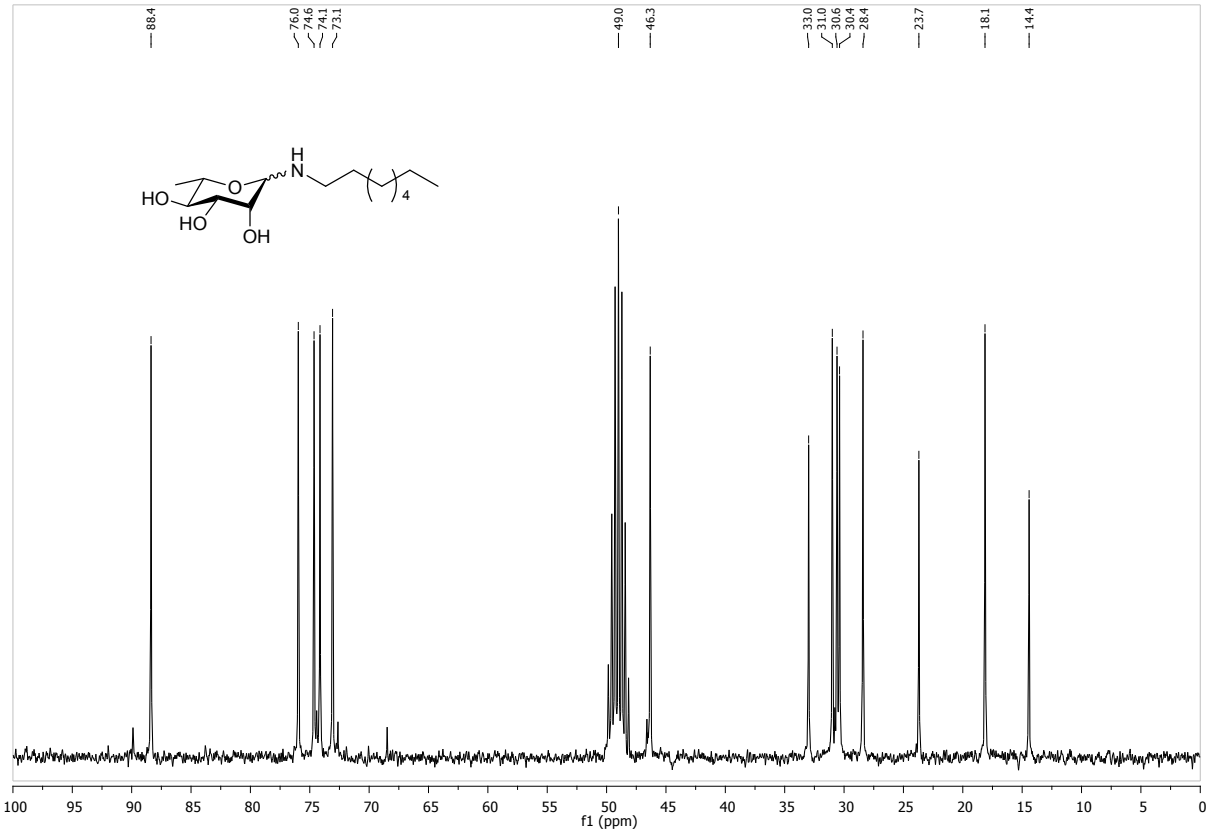
**_N_-dodecyl-D-(4-_O_-α-D-glucopyranosyl)-glucosylamine (4a)**

White solid, yield: 99%. Ratio α/β: 20/80. IR (ATR) ν ($cm^{-1}$): 3573-3084, 2925, 2856, 1558, 1448, 1122-1004, 862, 717. β isomer: $^{1}H$ NMR ($CD_3OD$): $\delta$ 5.15 (d, 1H, $J$= 3.1 Hz, H-1') ; 3.97-3.74 (m, 4H, H-1 + H-6 or H-6' (3)) ; 3.66-3.47 (m, 5H, H-3, H-3', H-4, H-5', H-6 (or H-6')) ; 3.44 (dd, 1H, $J$=9.6, 3.6 Hz, H-2') ; 3.38-3.17 (m, 2H, H-4', H-5) ; 3.12 (t, 1H, $J$=8.8 Hz, H-2) ; 2.96-2.84 (m, 1H, -HN-***CH₂***-) ; 2.72-2.55 (m, 1H, -HN-***CH₂***-) ; 1.59-1.42 (m, 2H, -***CH₂***-$CH_2$-NH-) ; 1.41-1.21 (m, 18H, -$CH_2$-$CH_2$-) ; 0.90 (t, 3H, $J$=6.5 Hz, ***CH₃***-$CH_2$-). $^{13}C$ NMR ($CD_3OD$): $\delta$ 102.9 (C-1'), 91.8 (C-1), 81.6 (C-4), 78.7 (C-3 or C-3'), 77.6 (C-5), 75.1 (C-3 or C-3'), 74.7 (C-5'), 74.6 (C-2), 74.2 (C-2'), 71.5 (C-4'), 62.7-62.4 (2s, C-6, C-6'), 47.2 (-HN-***CH₂***-), 33.1, 31.1, 30.7, 30.4, 28.1, 23.7 (-$CH_2$-$CH_2$-), 14.4 (***CH₃***-$CH_2$-). HRMS $[M+H]^+$ calcd for $C_{24}H_{47}NO_{10}$: $m/z$ 510.3249, found $m/z$ 510.3257

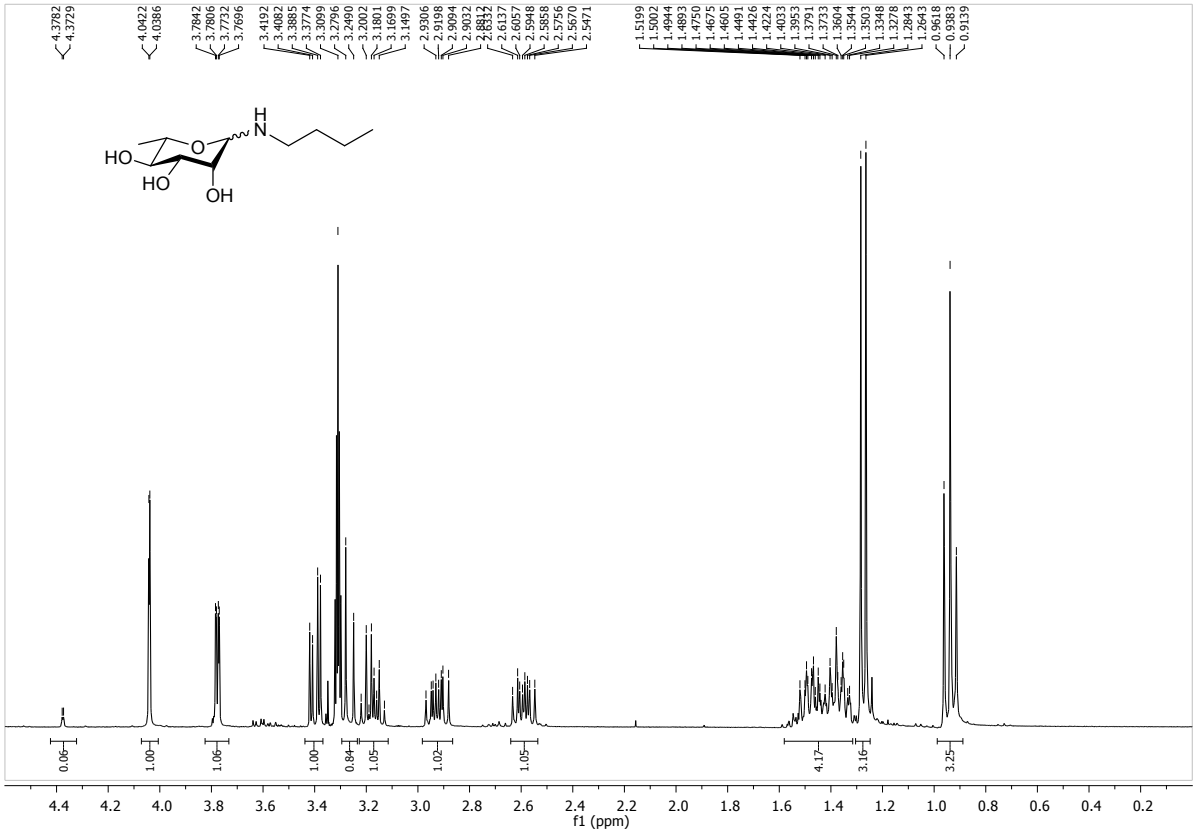
# $^{1}H$ and $^{13}C$ spectra

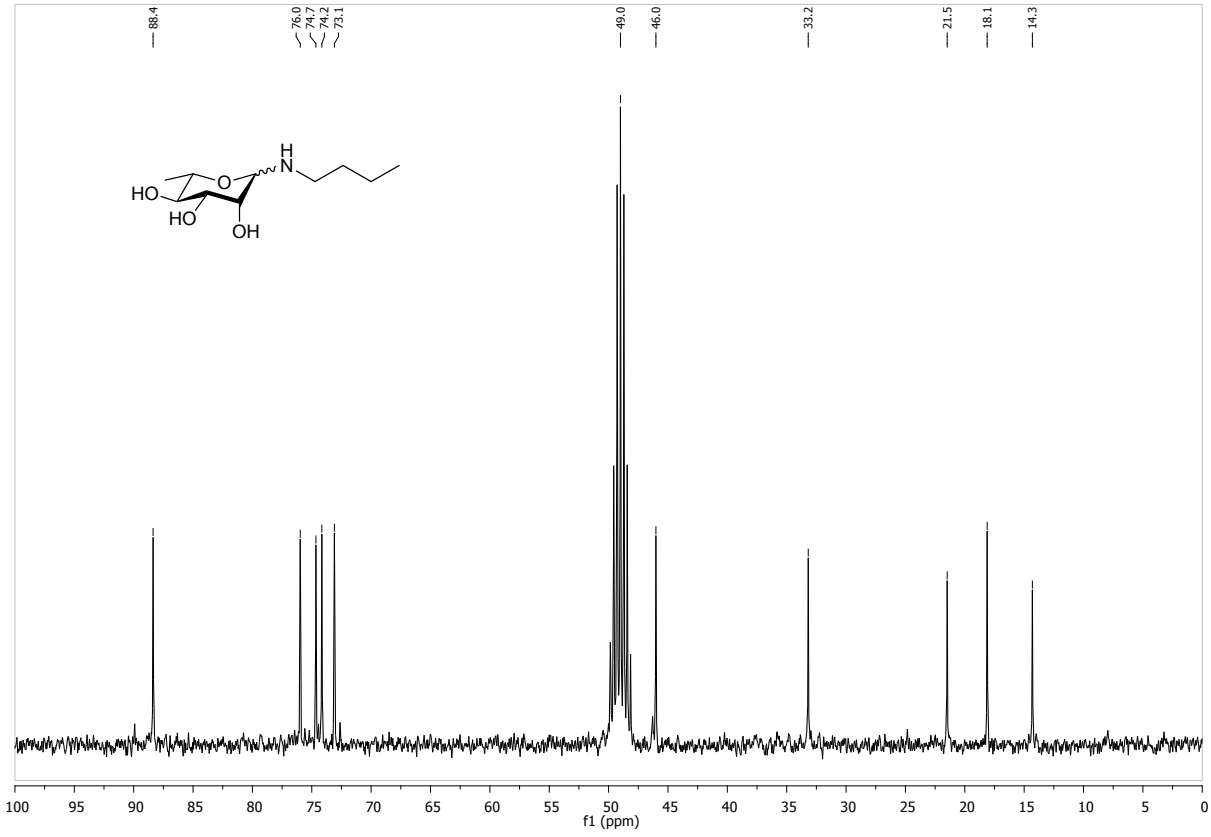
## *N*-octyl-L-rhamnosylamine (1a)



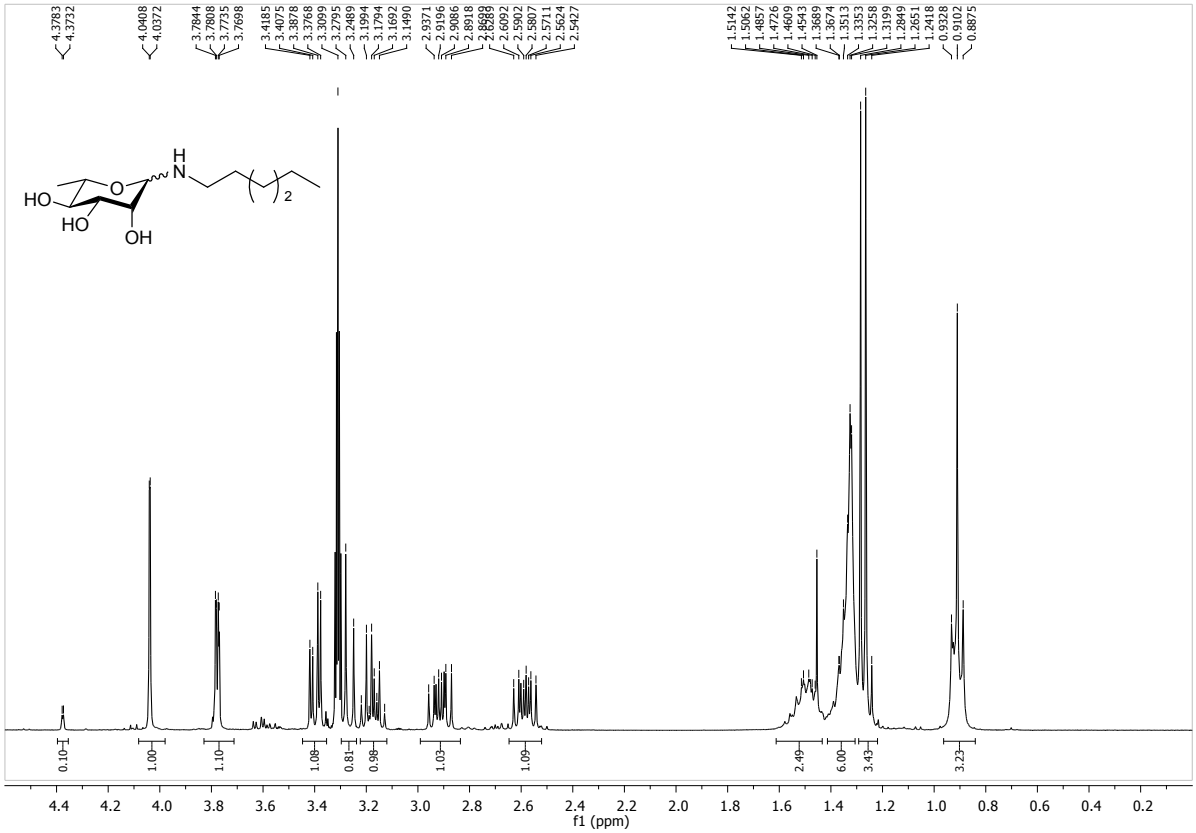



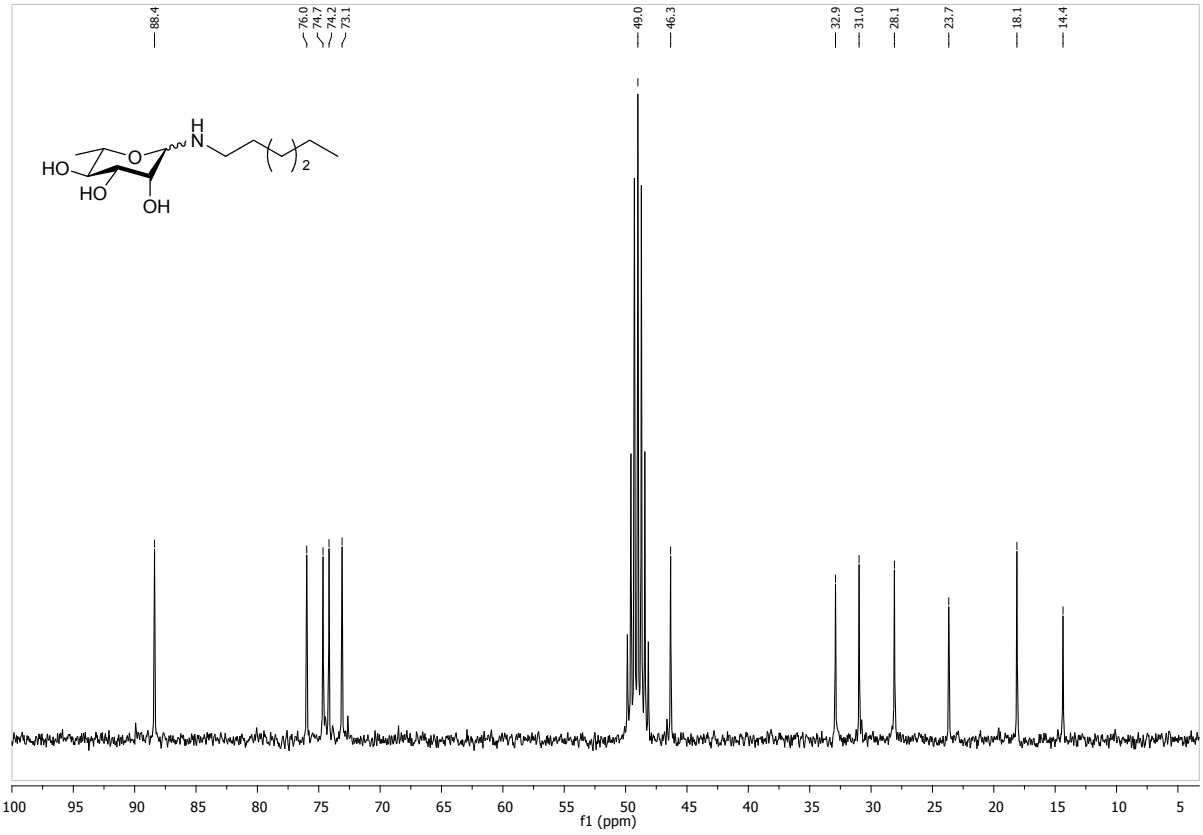
## *N*-butyl-L-rhamnosylamine (1b)



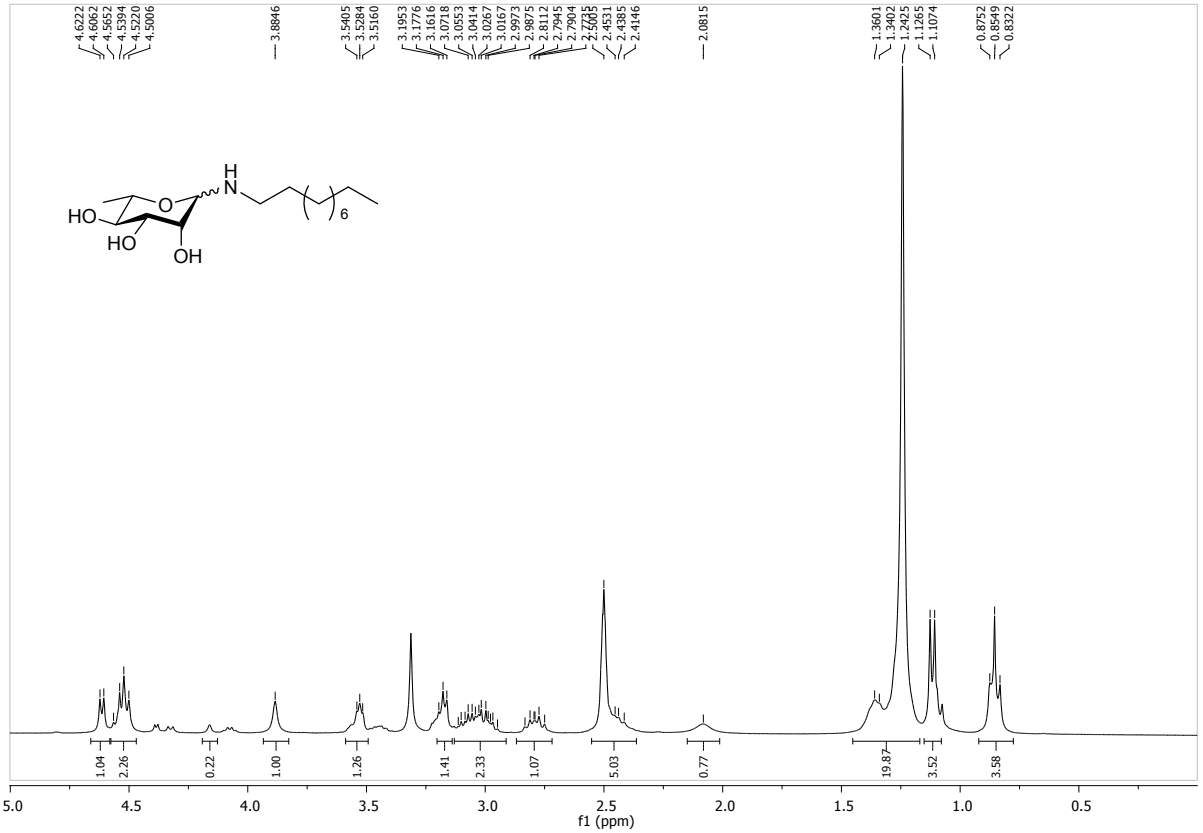



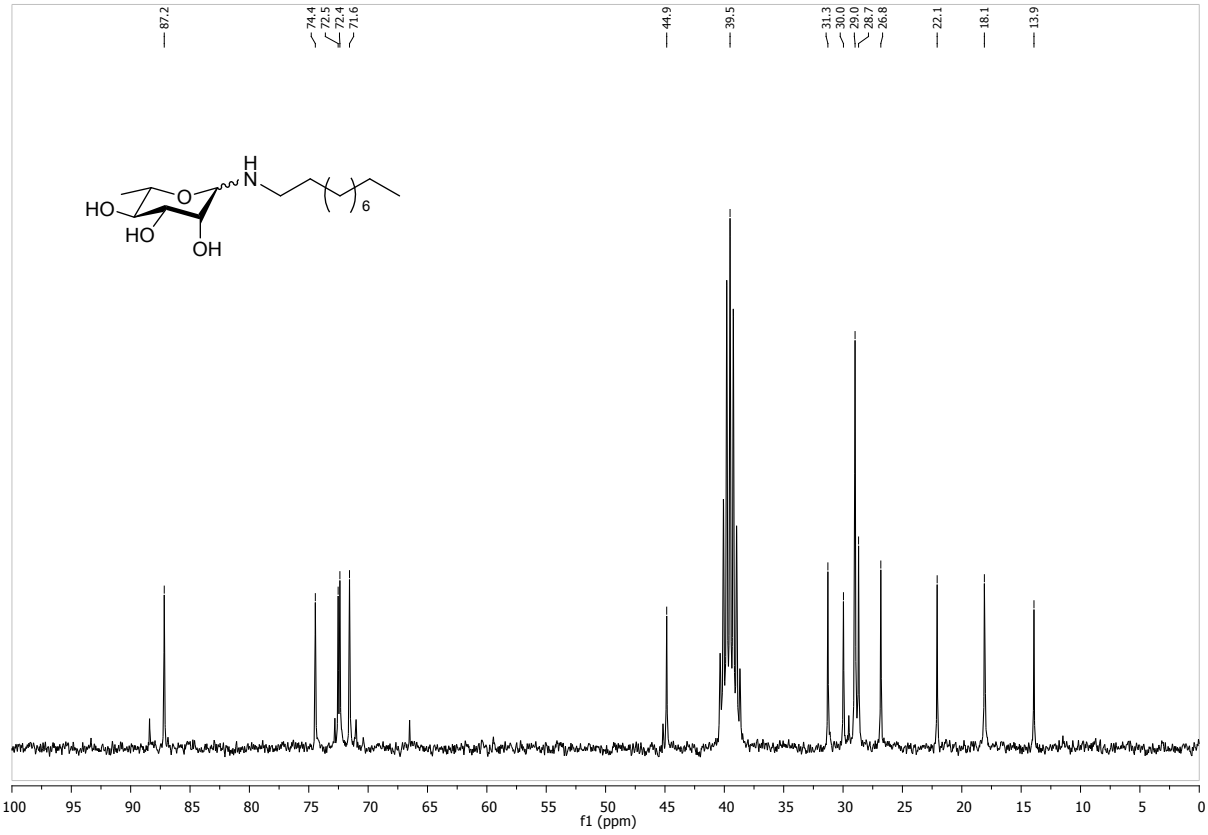
## *N*-hexyl-L-rhamnosylamine (1c)



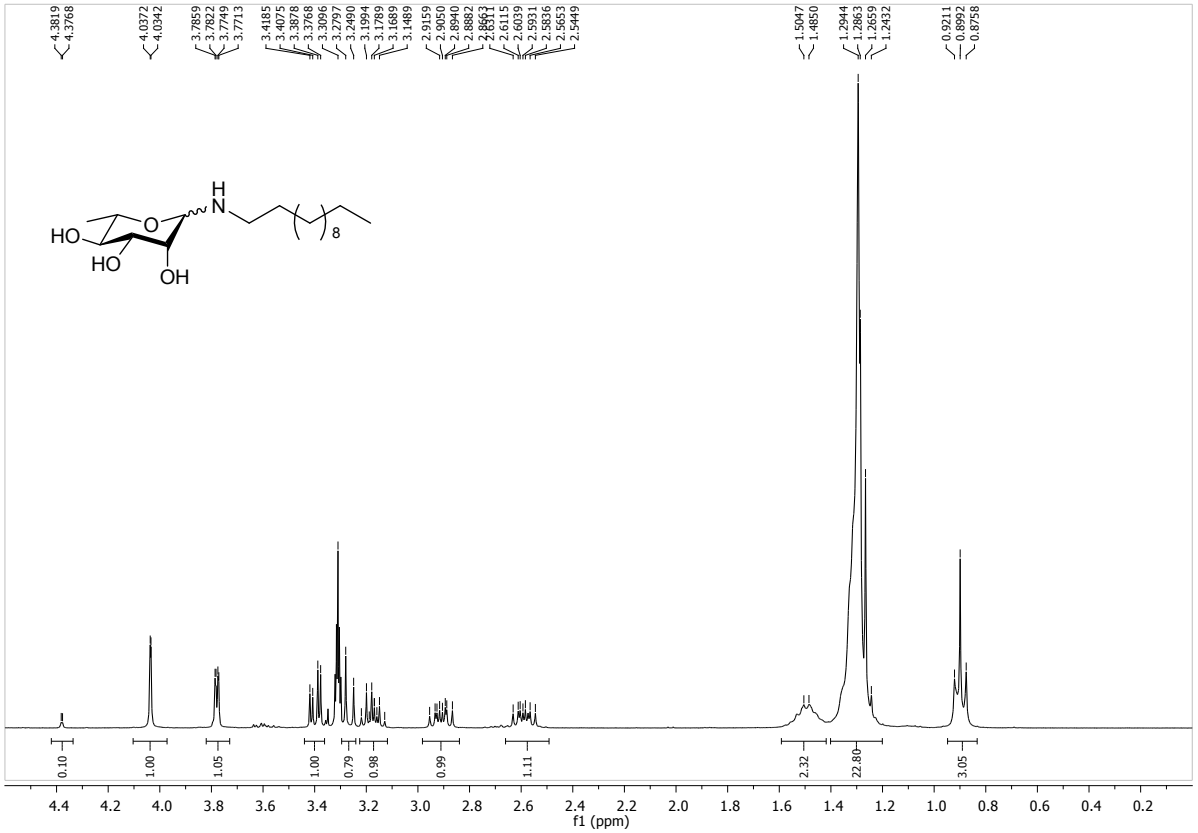



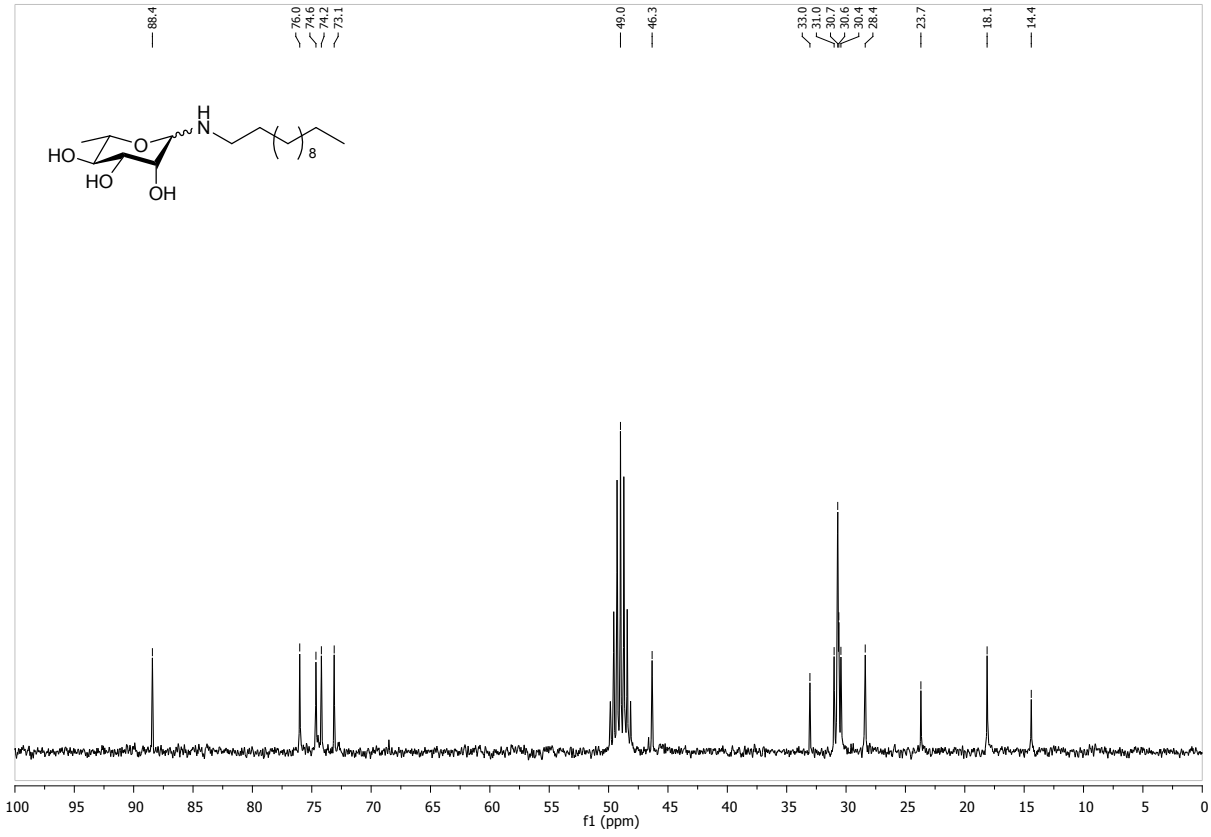
## *N*-decyl-L-rhamnosylamine (1d)



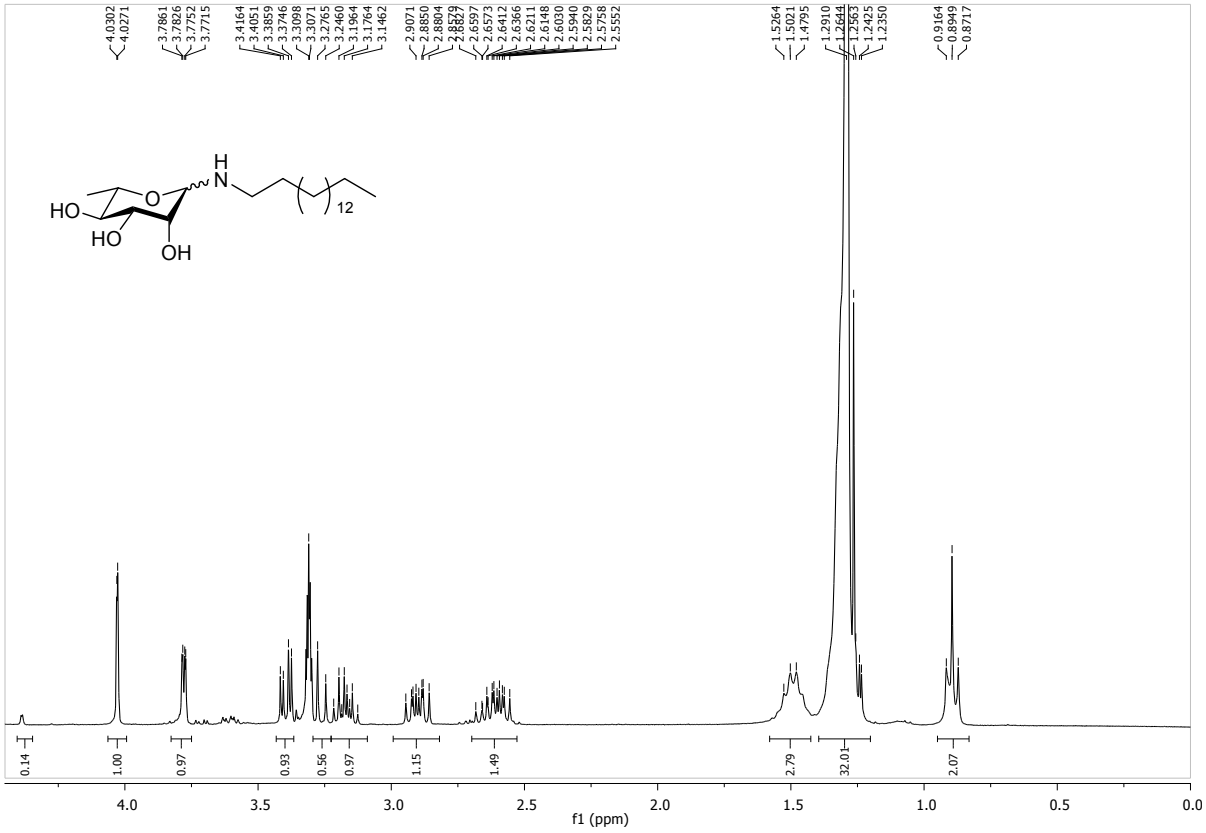



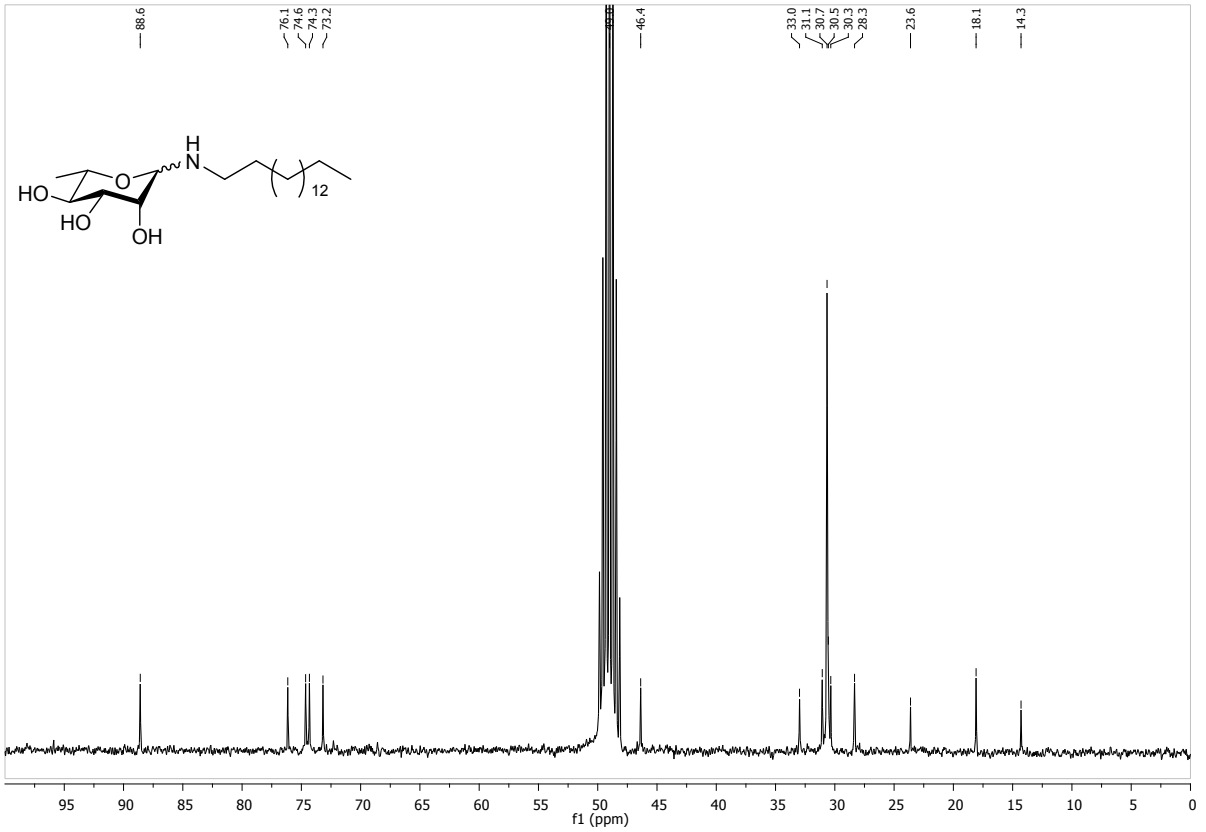
## *N*-dodecyl-L-rhamnosylamine (1e)



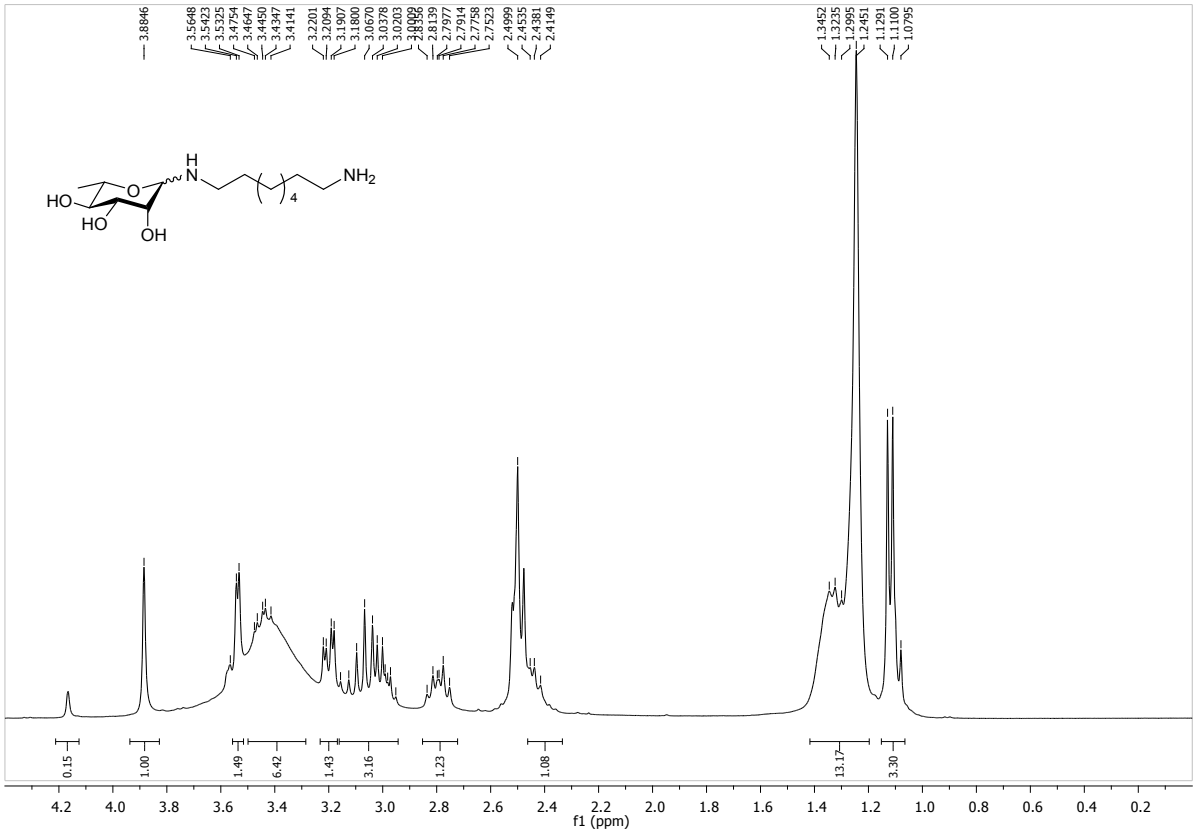



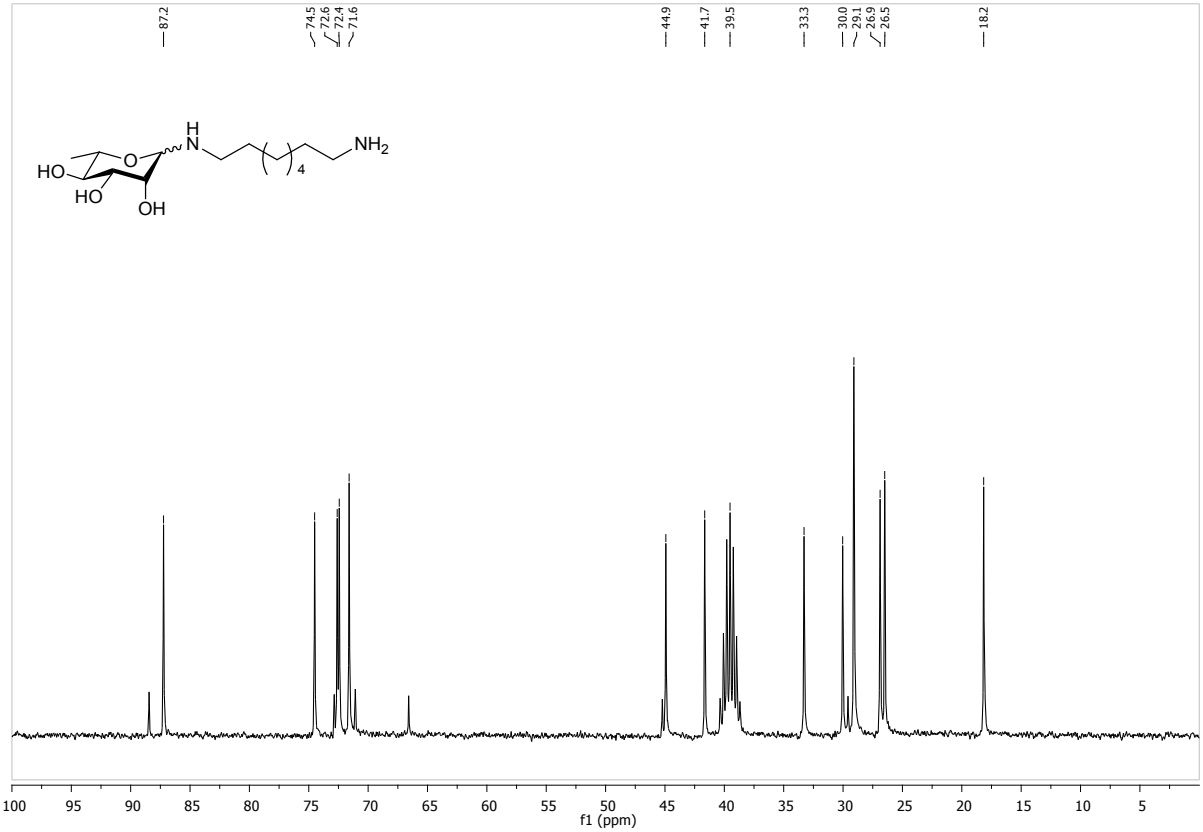
## *N*-hexadecyl-L-rhamnosylamine (1f)



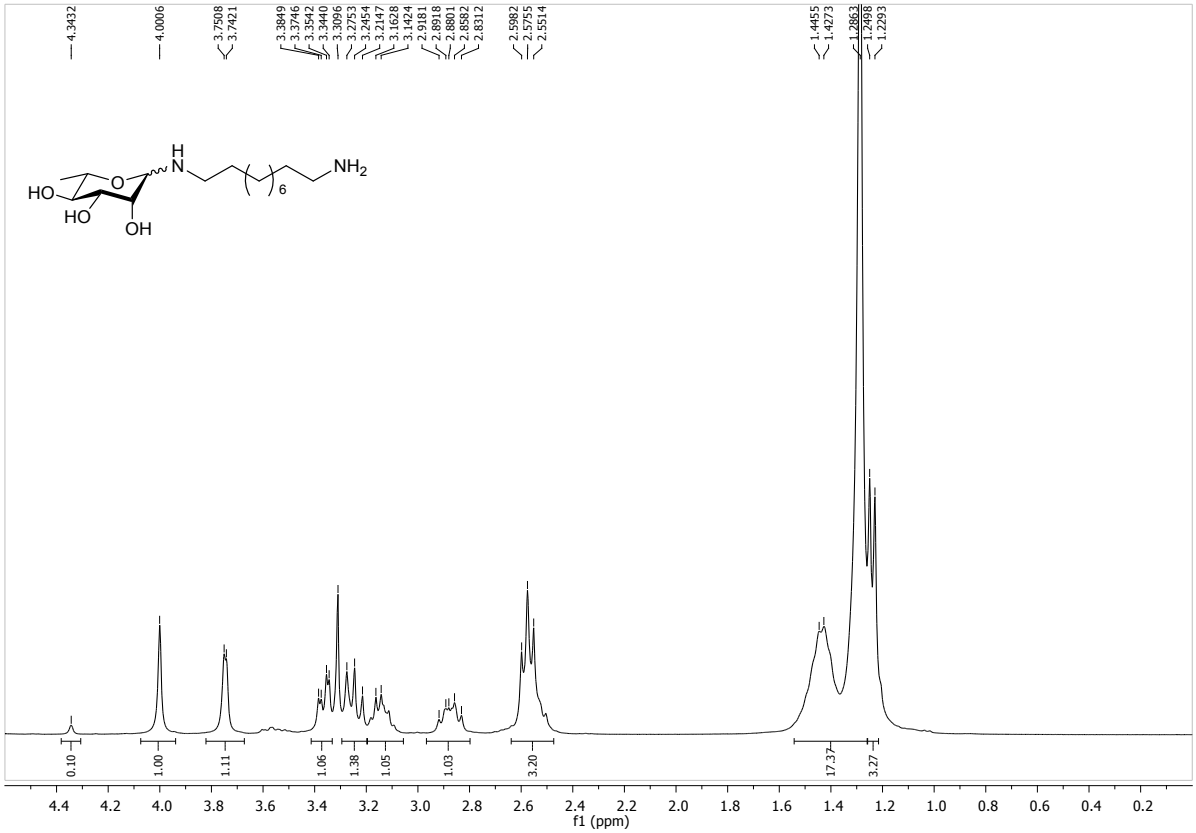



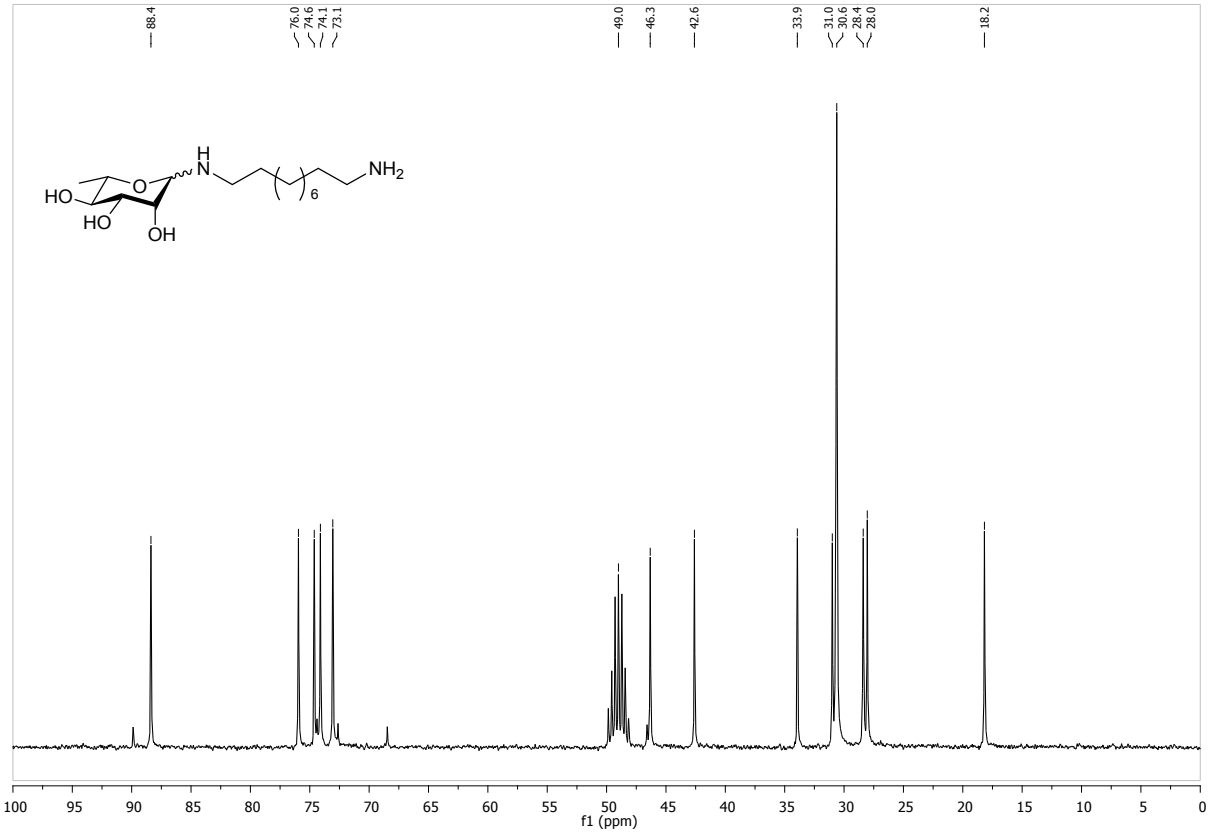
## *N*-(L-rhamnosyl)-octyl-1,8-diamine (1h)



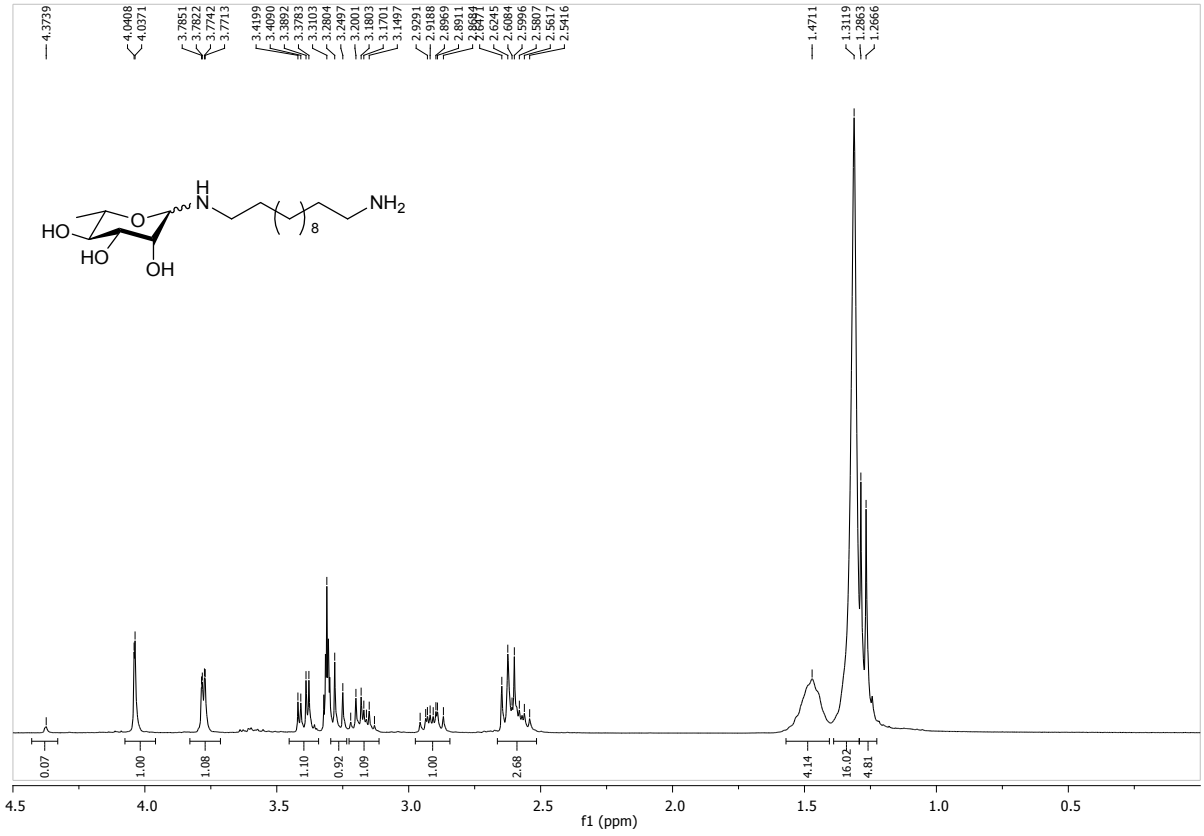



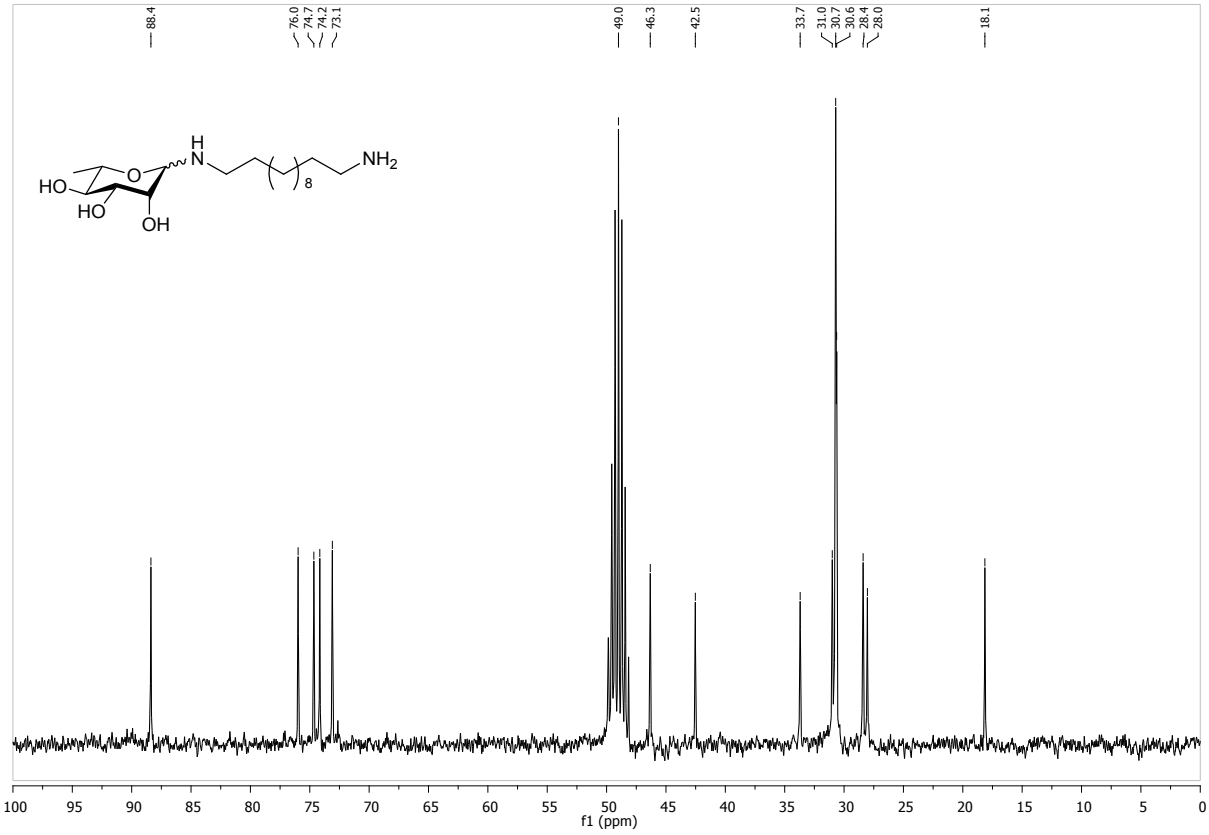
## *N*-(L-rhamnosyl)-decyl-1,10-diamine (1i)



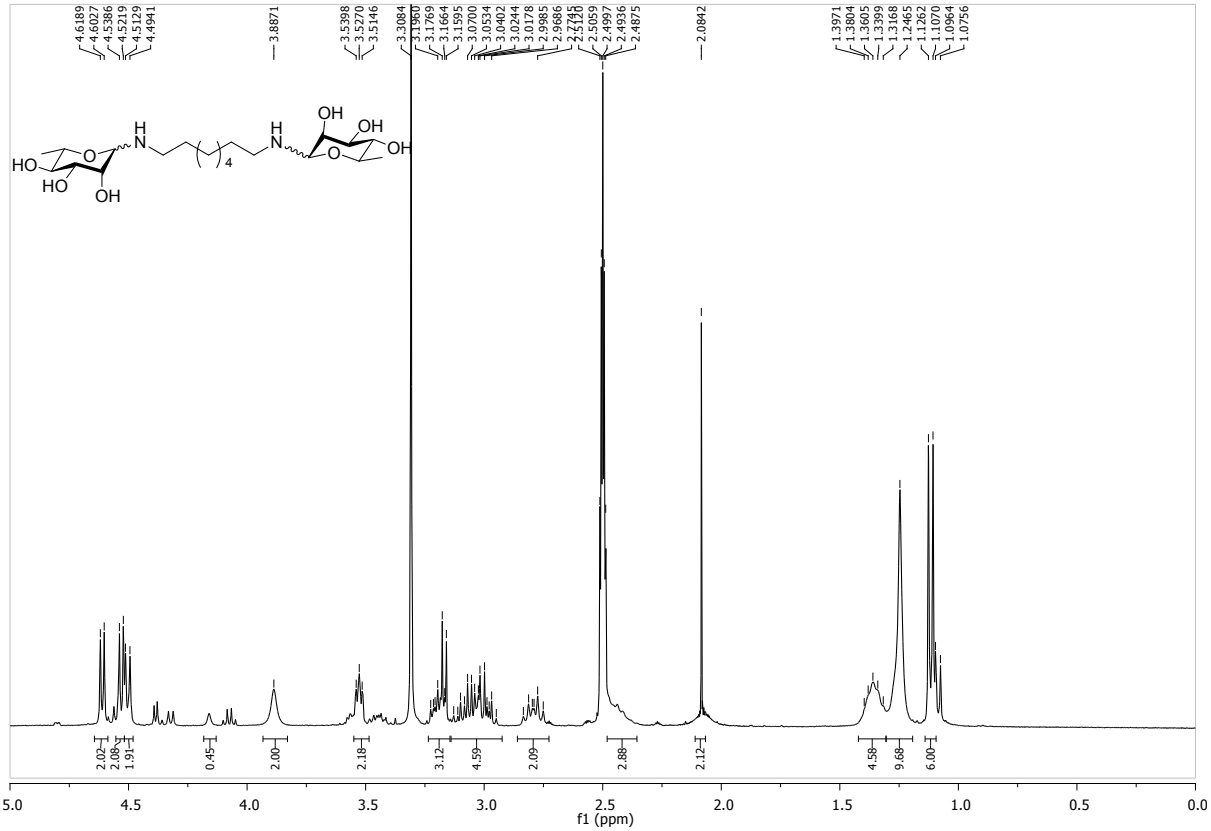



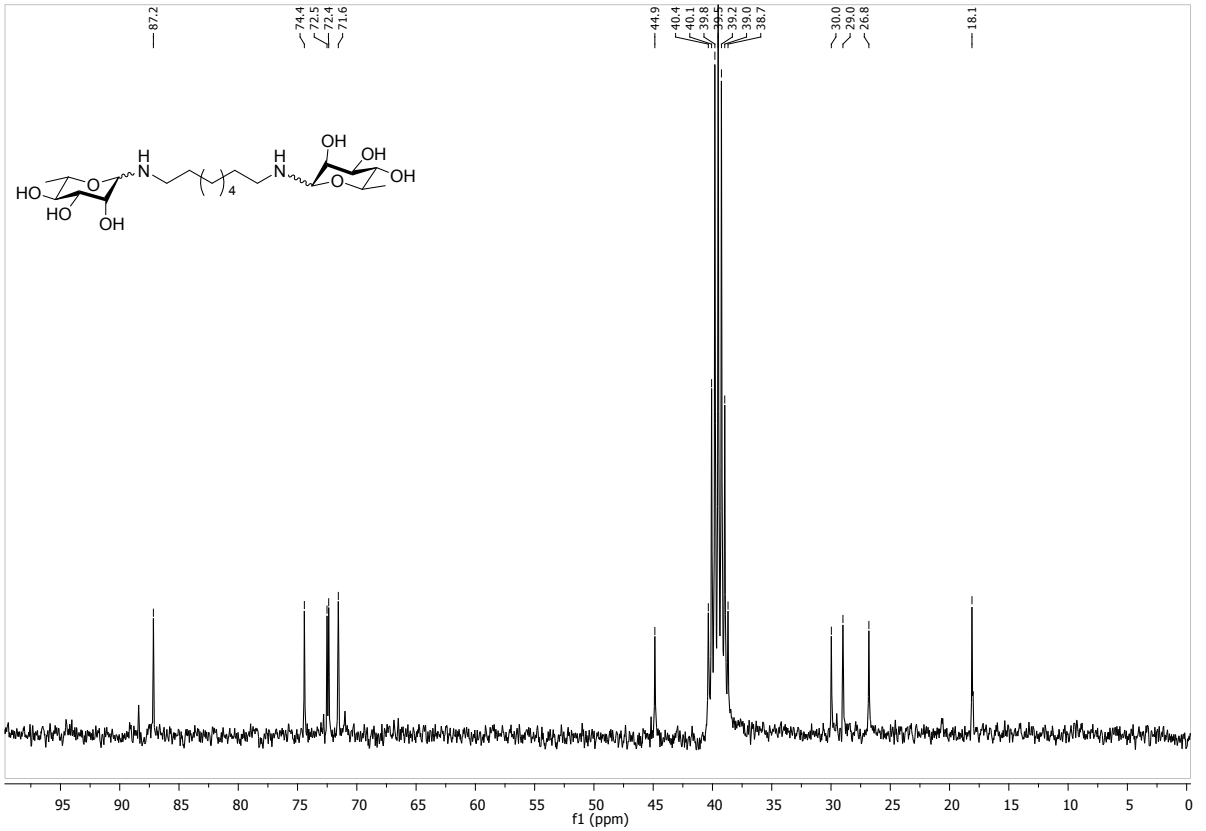
## *N*-(L-rhamnosyl)-dodecyl-1,12-diamine (1j)



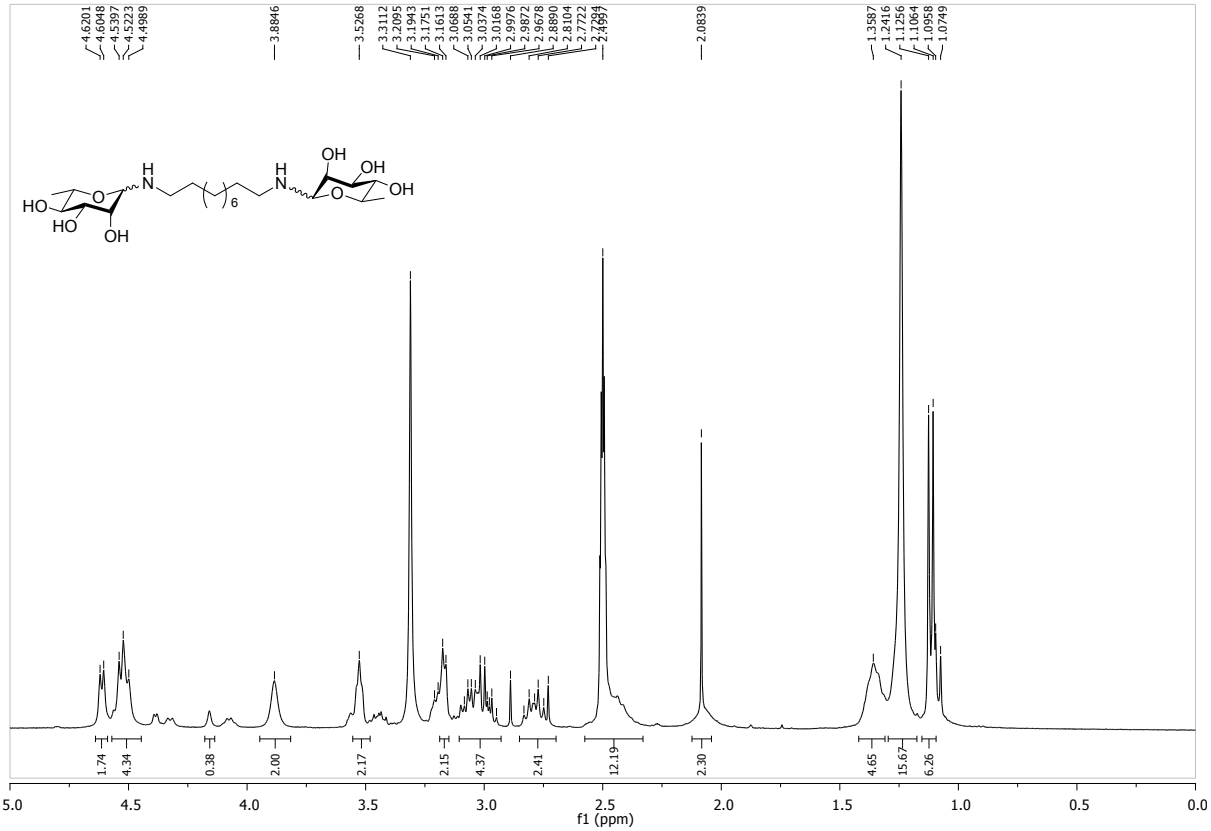



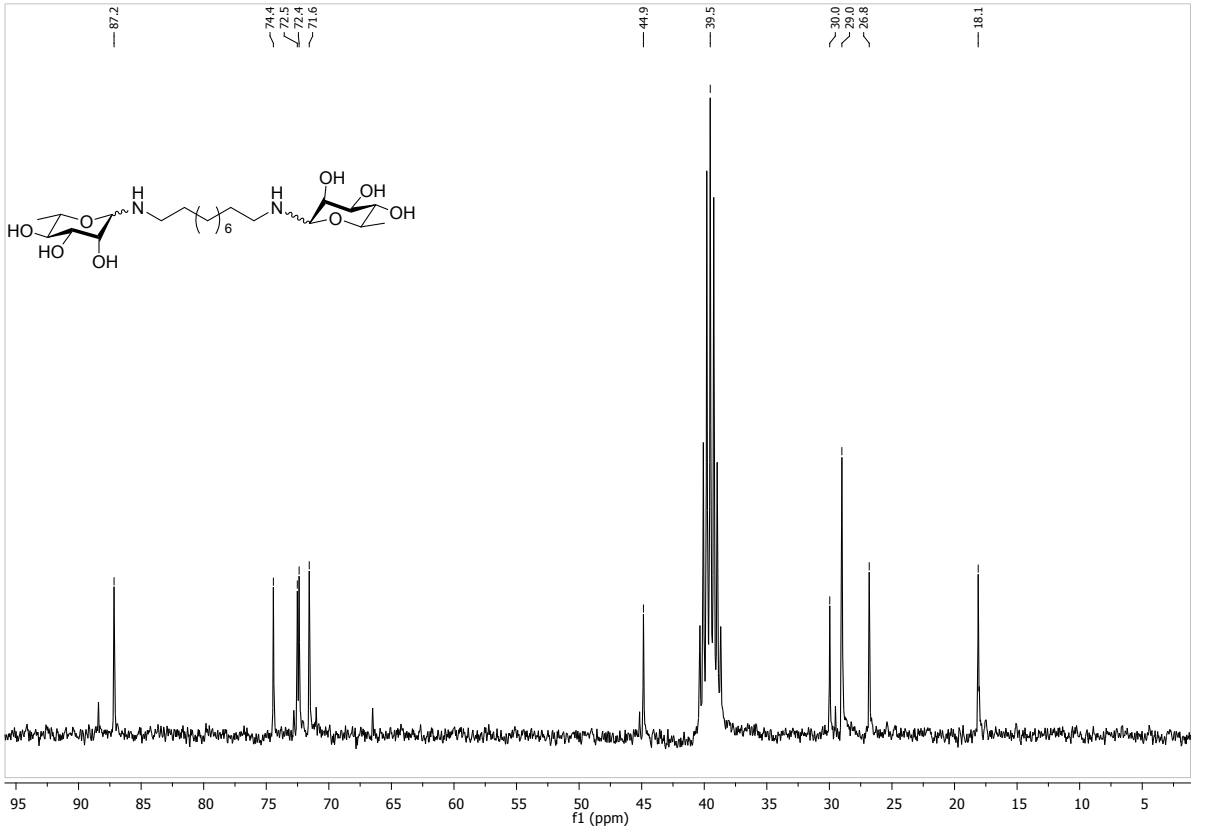
## *N,N'*-bis-(L-rhamnosyl)-octyl-1,8-diamine (1k)



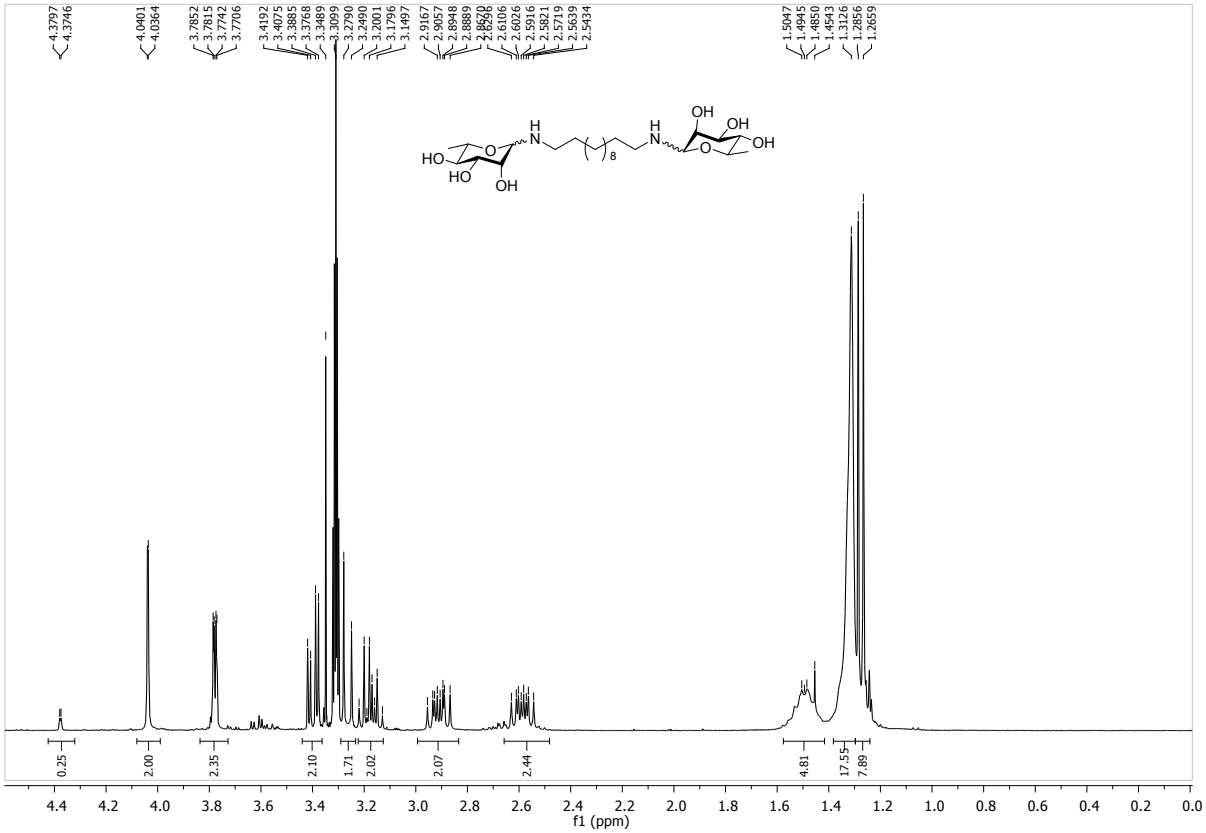



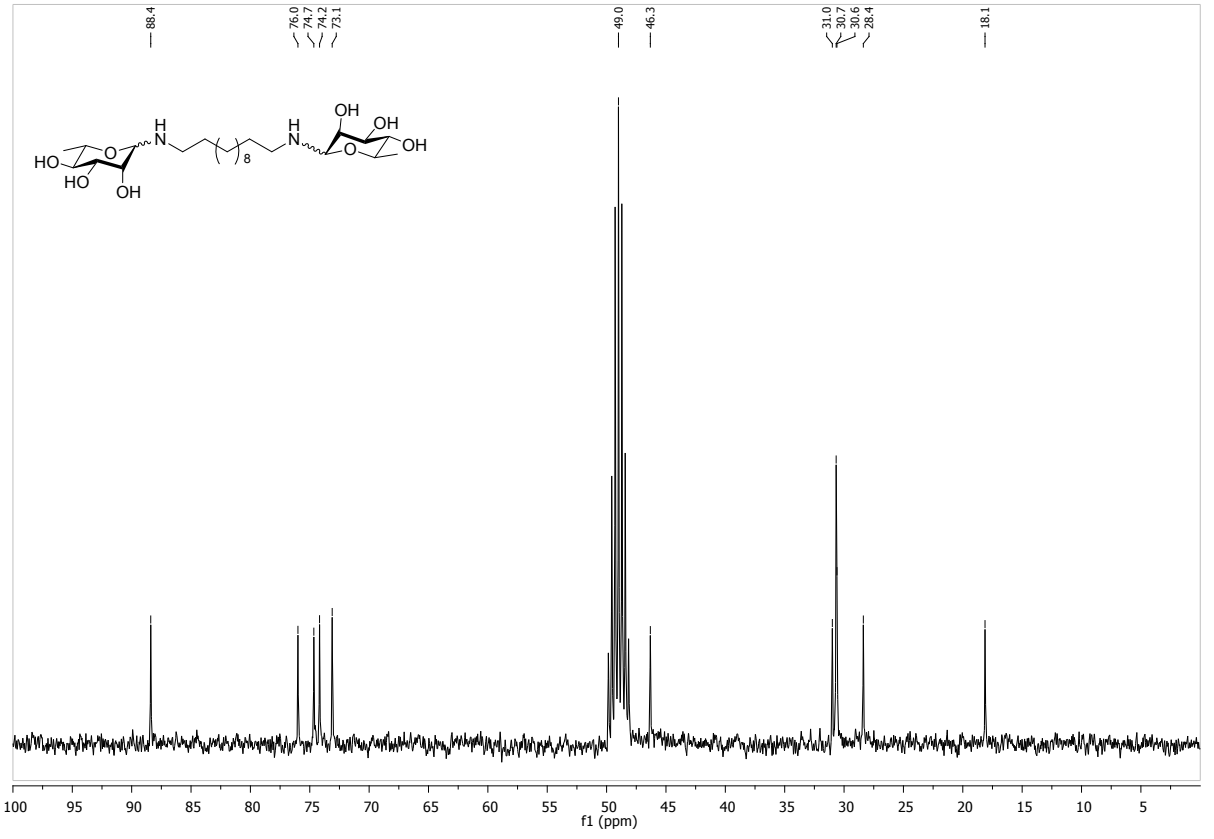
***N,N'*-bis-(L-rhamnosyl)-decyl-1,10-diamine (1l)**



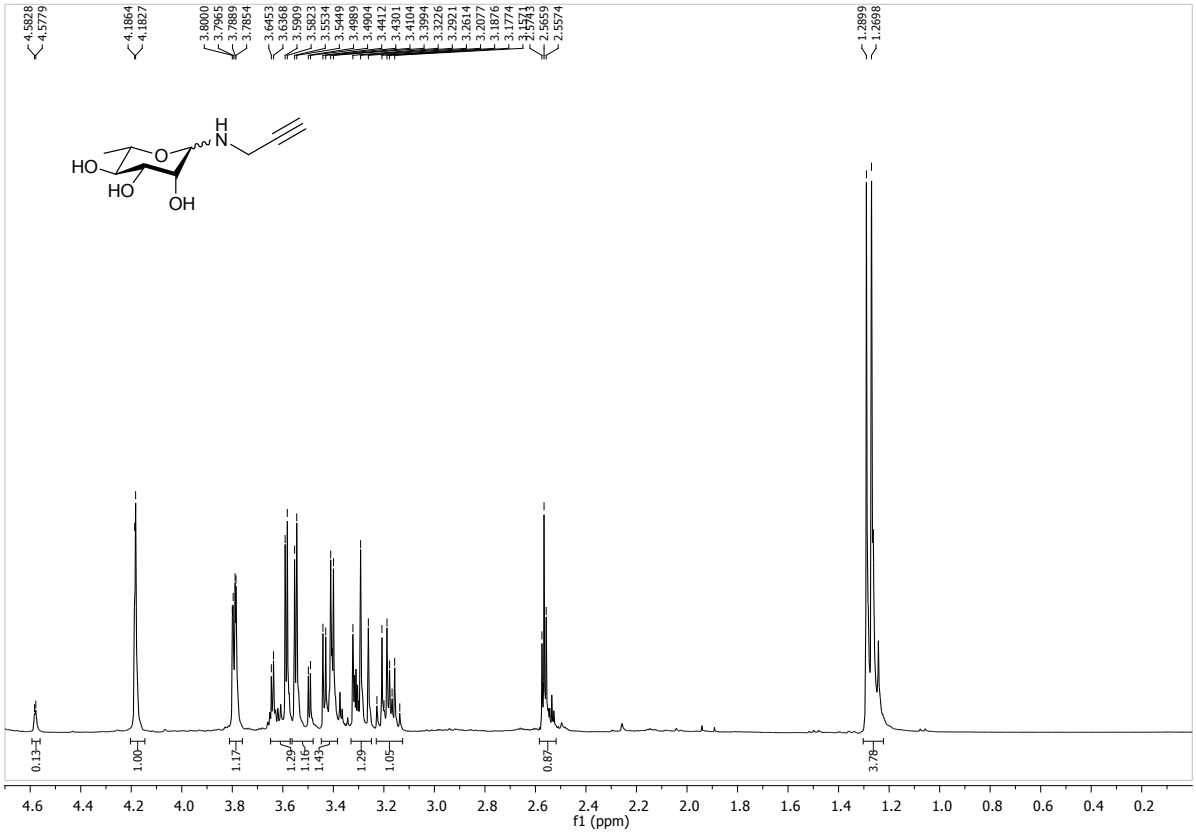



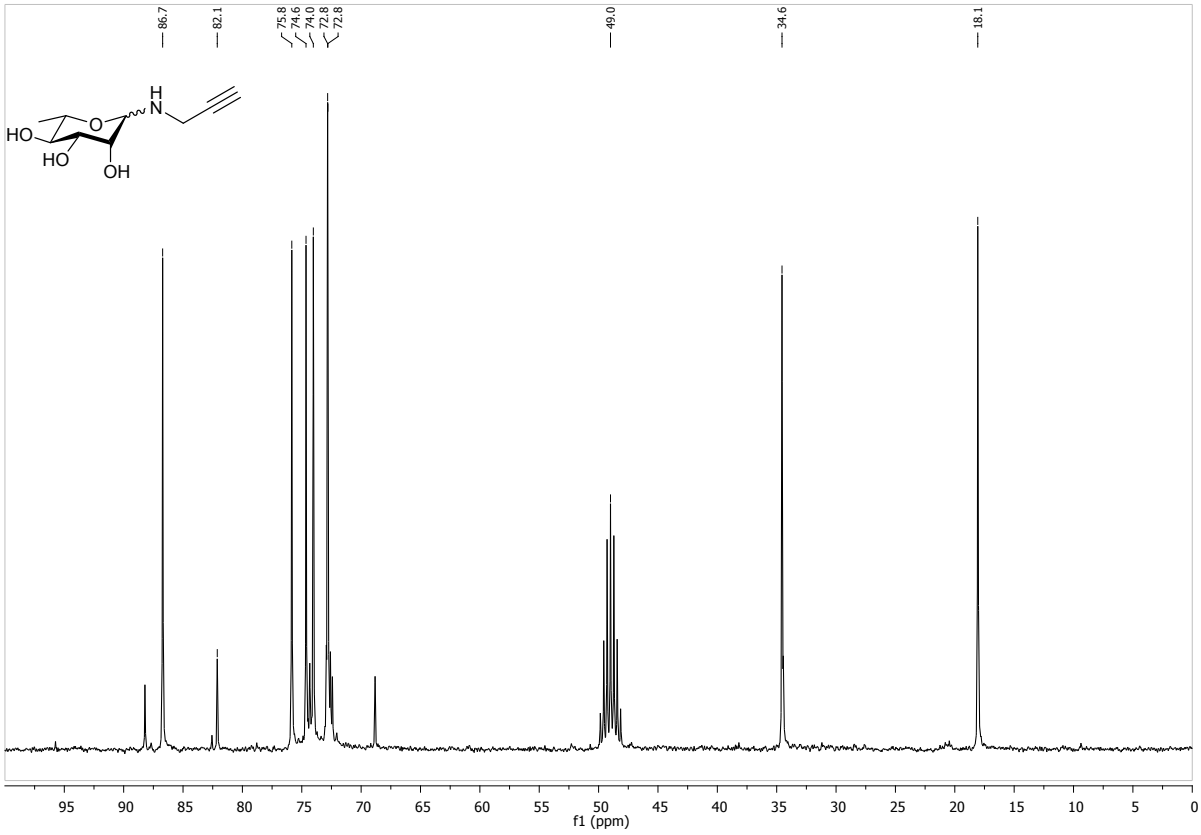
## *N,N'*-bis-(L-rhamnosyl)-dodecyl-1,12-diamine (1m)



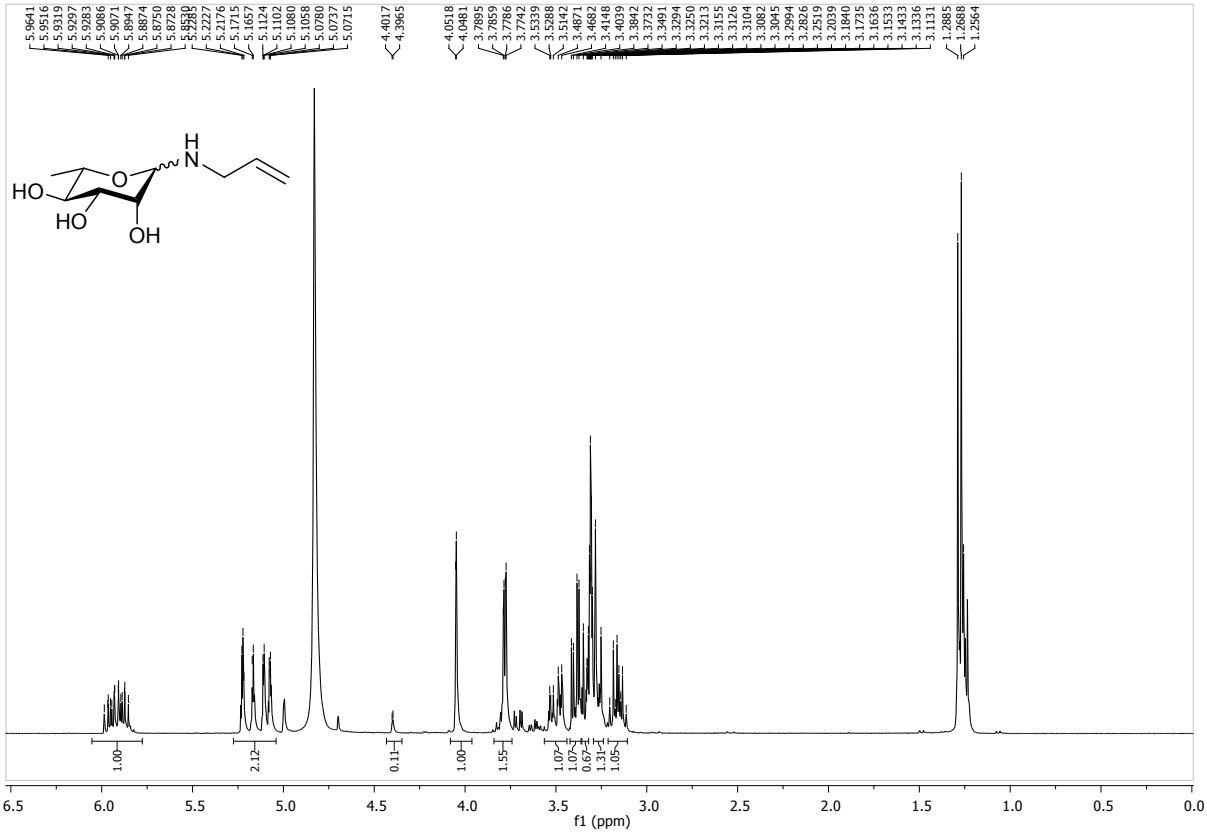



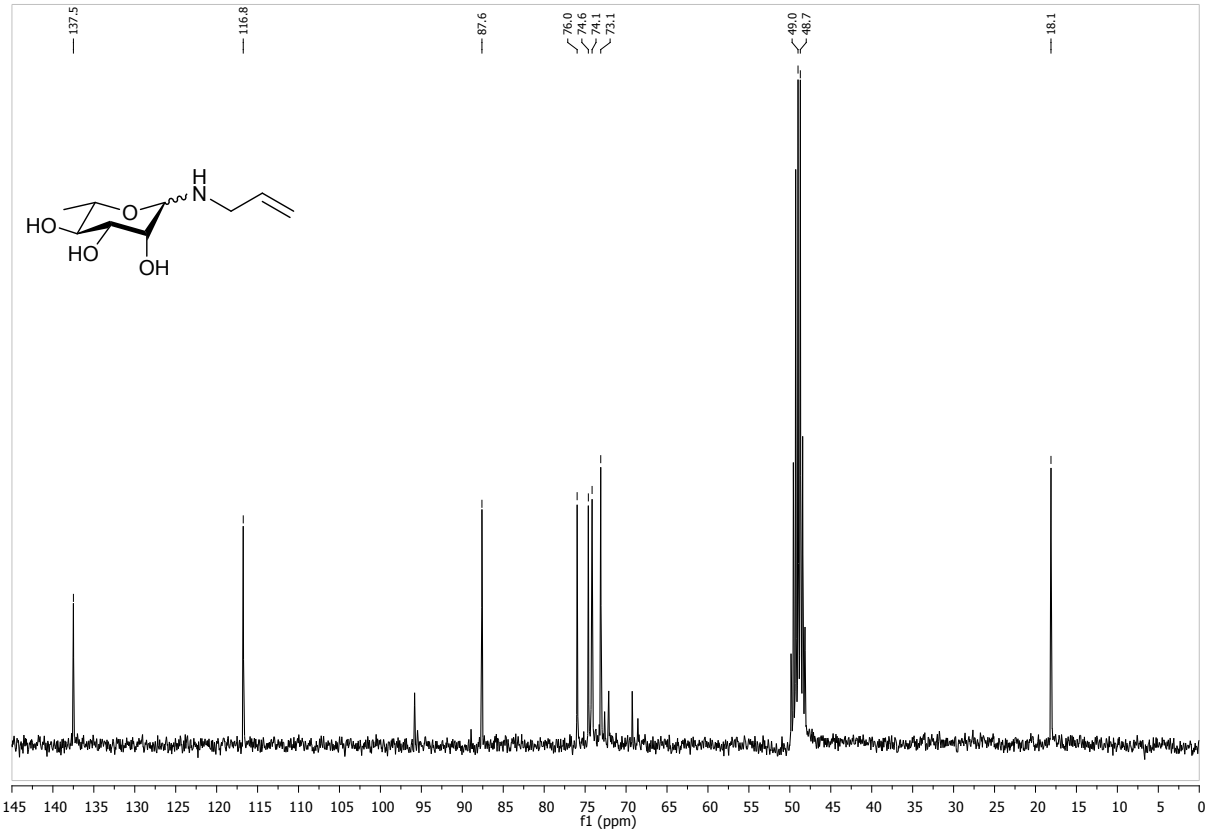
## *N*-propargyl-L-rhamnosylamine (1n)



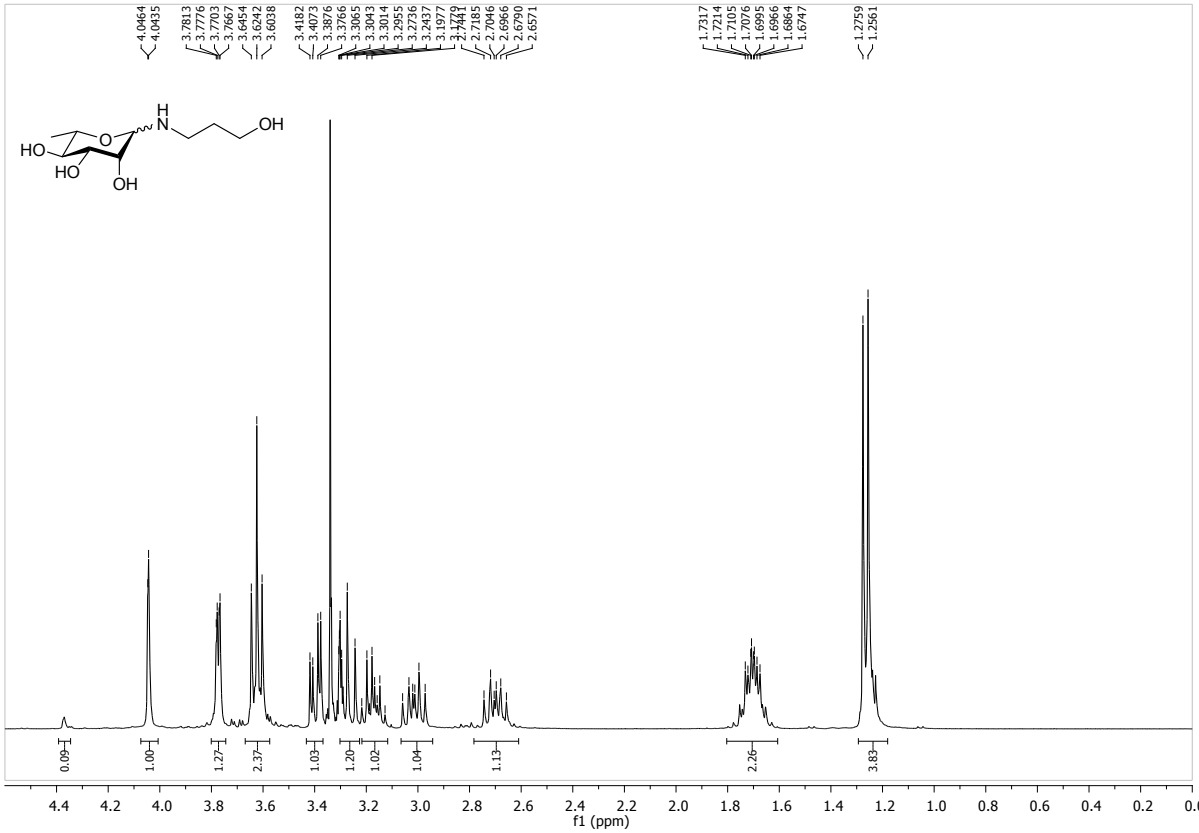



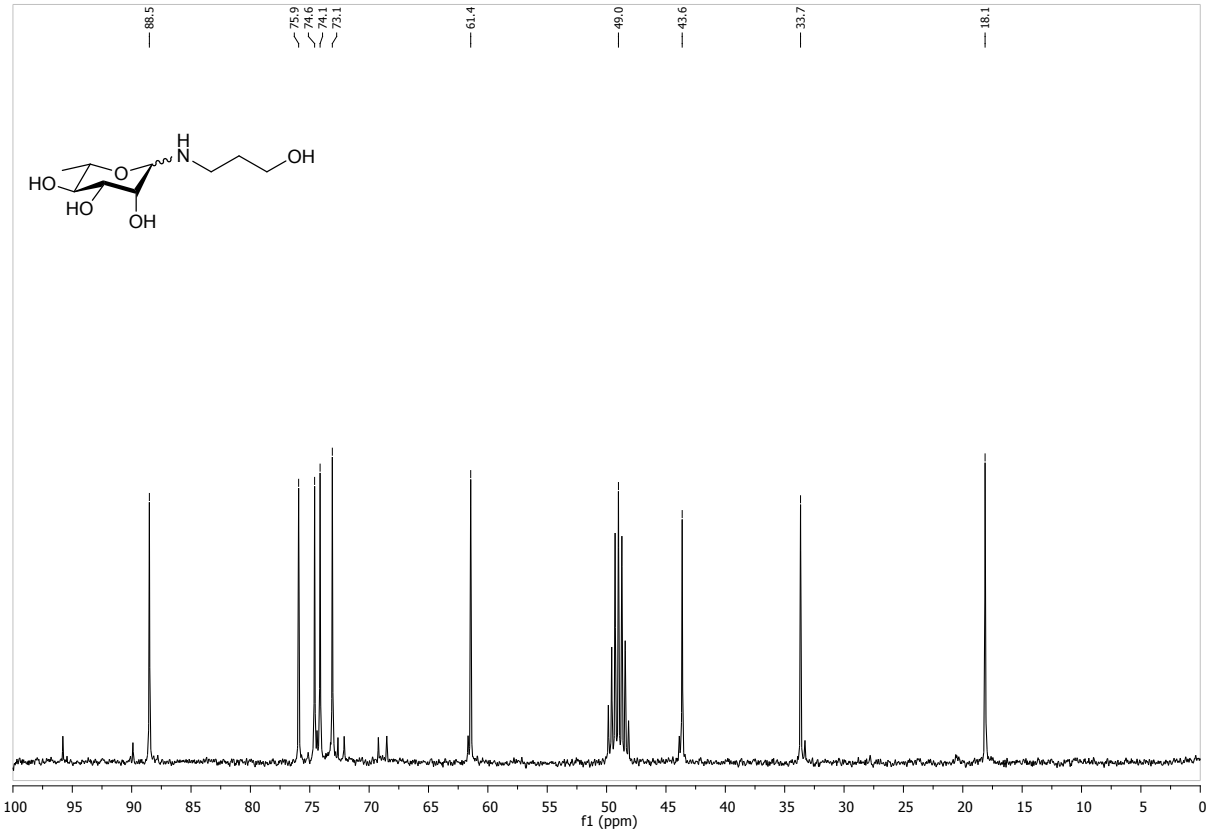
## *N*-allyl-L-rhamnosylamine (1o)



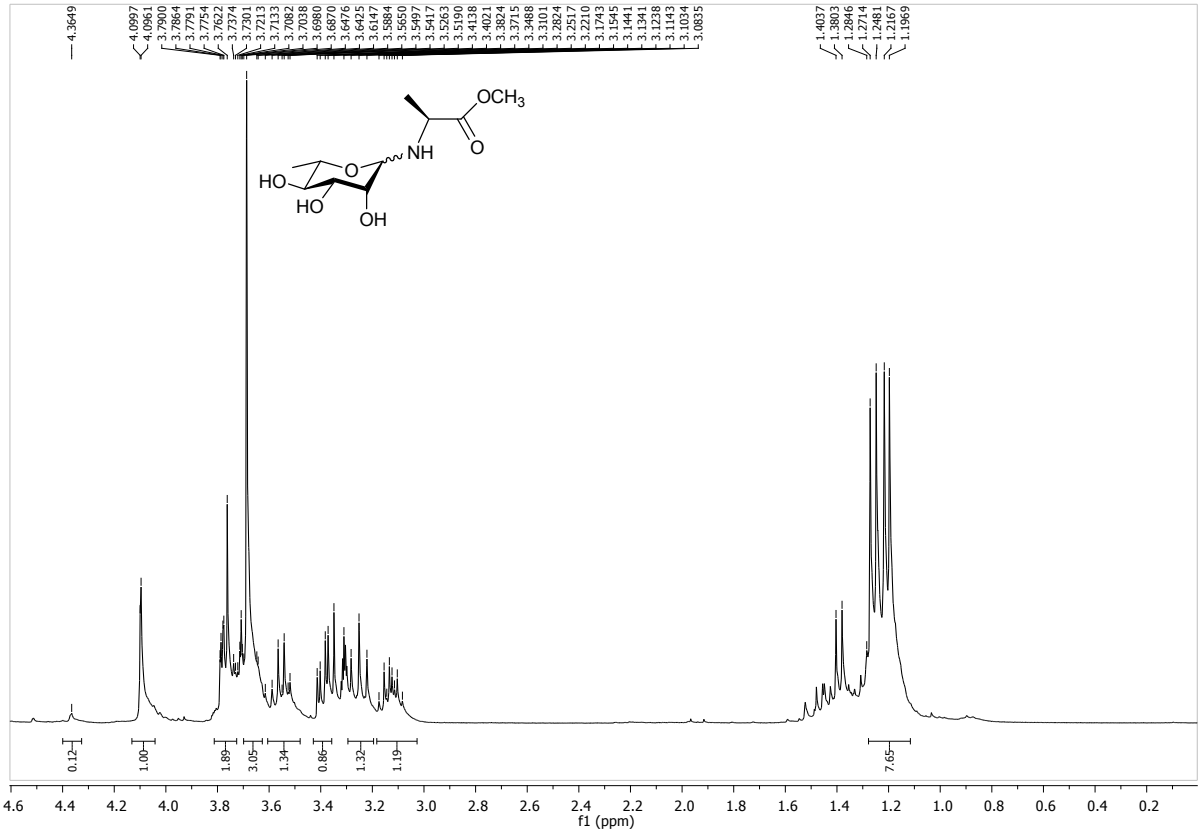



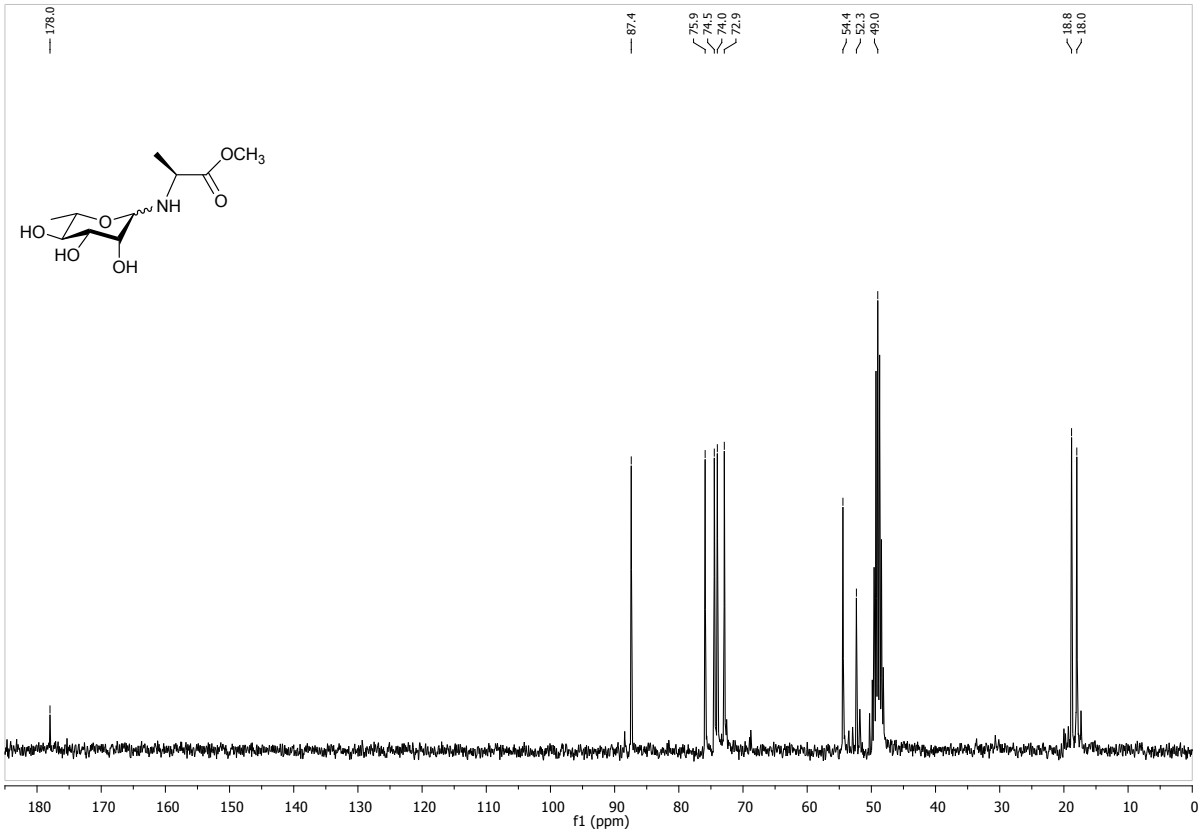
## *N*-(3-hydroxypropyl)-L-rhamnosylamine (1p)



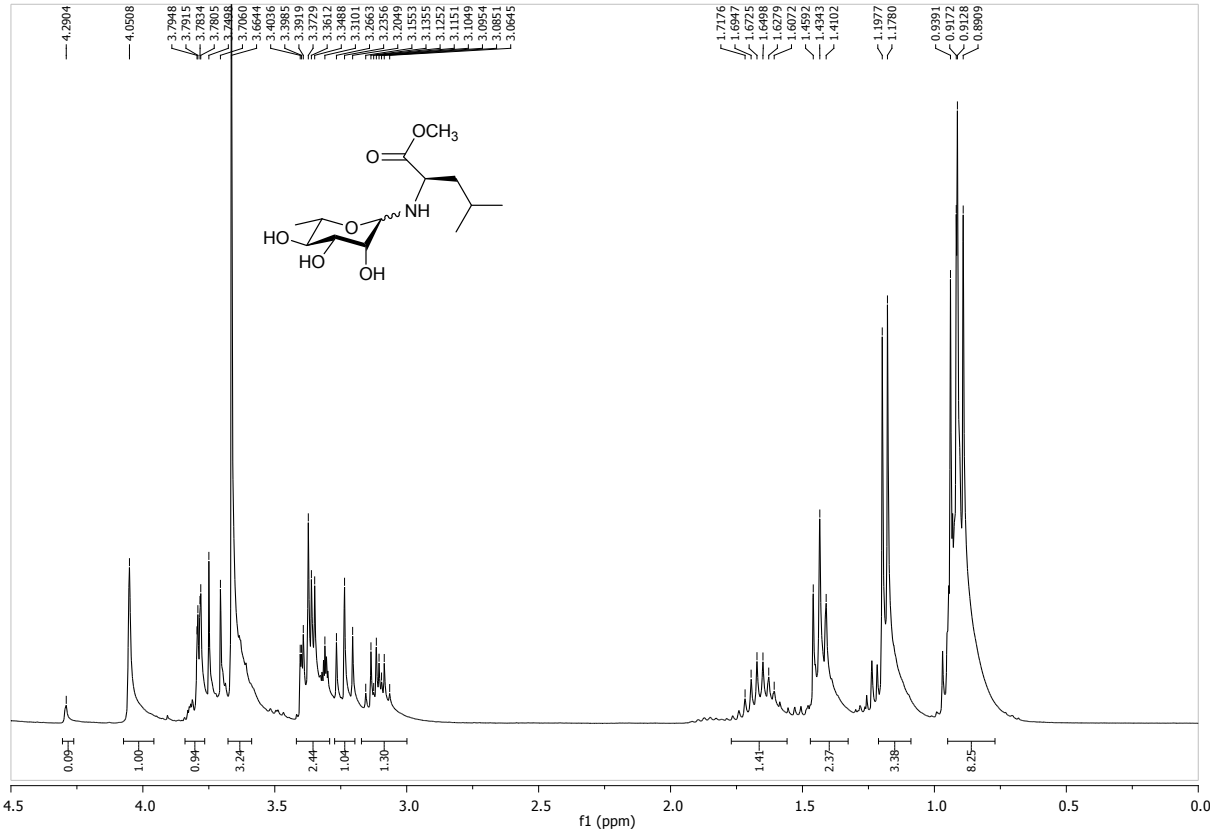



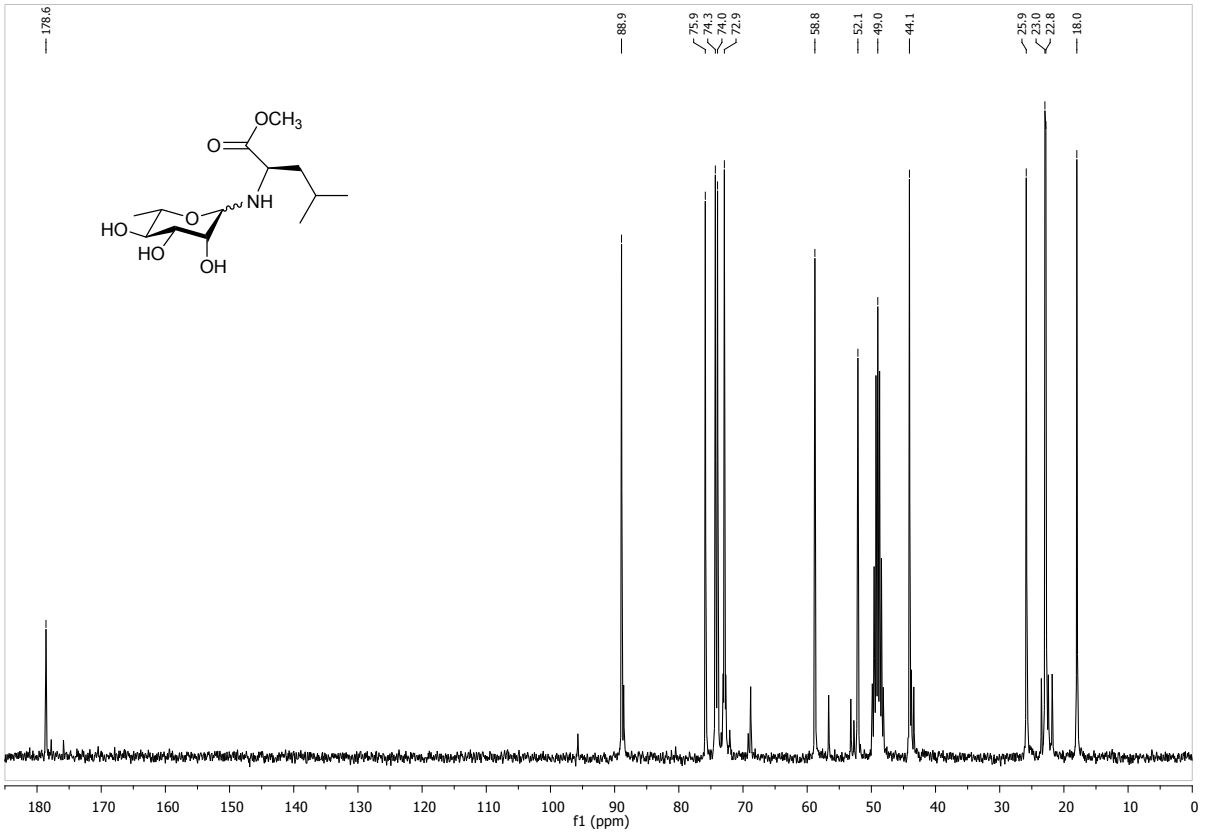
## *N*-(alanine methyl ester)-L-rhamnosylamine (1q)



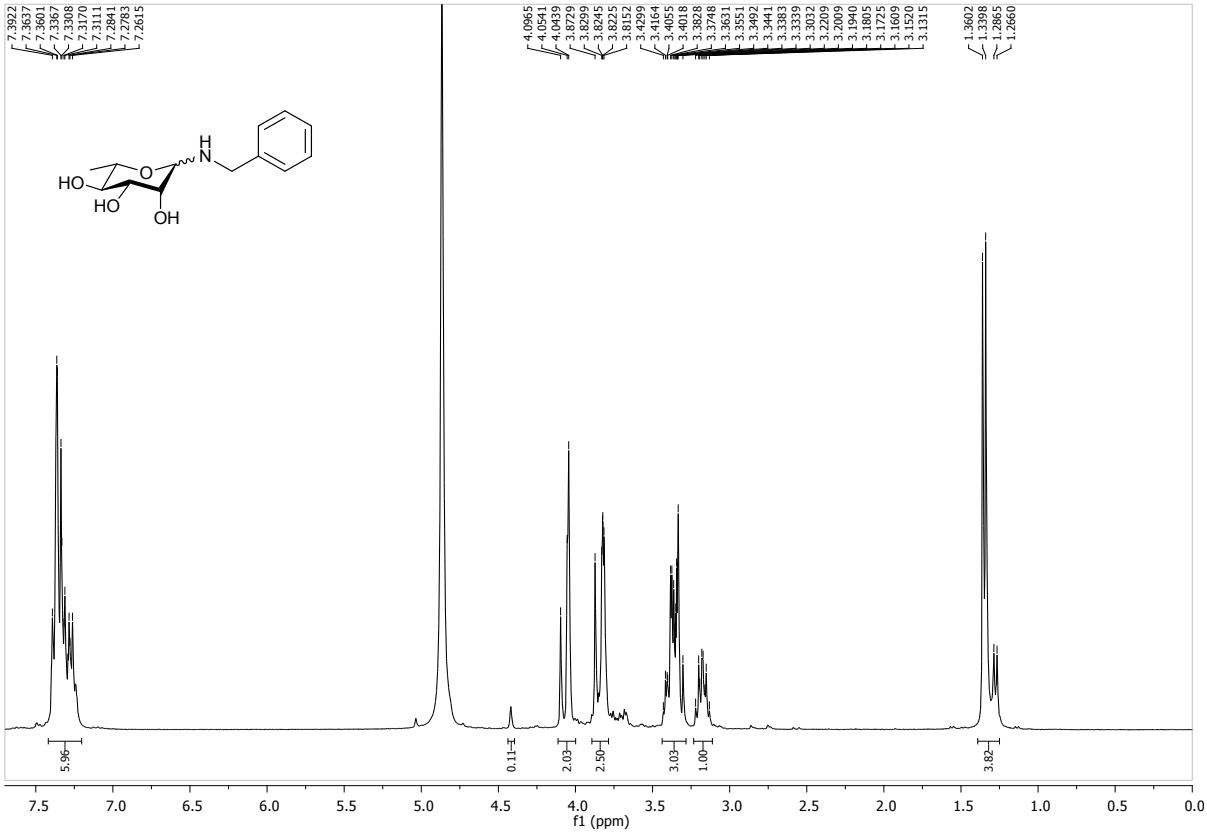



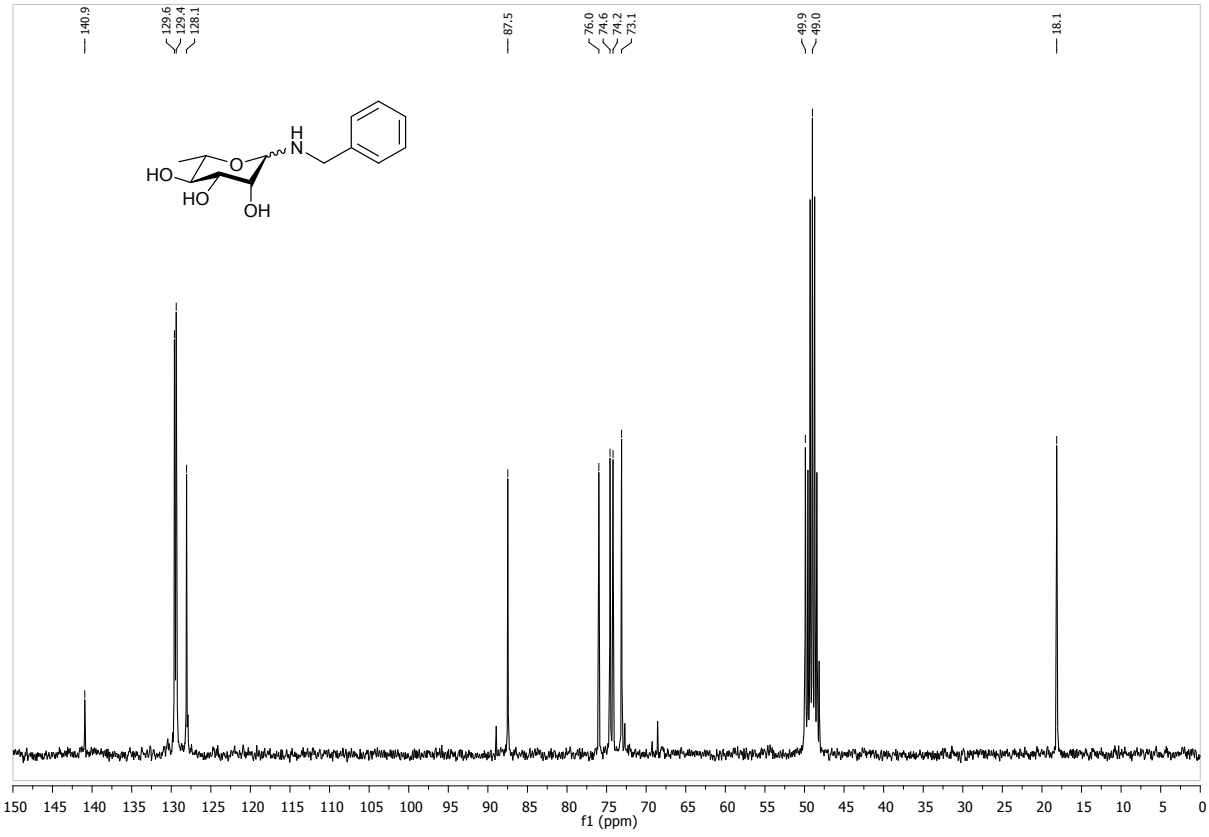
## *N*-(leucine methyl ester)-L-rhamnosylamine (1r)



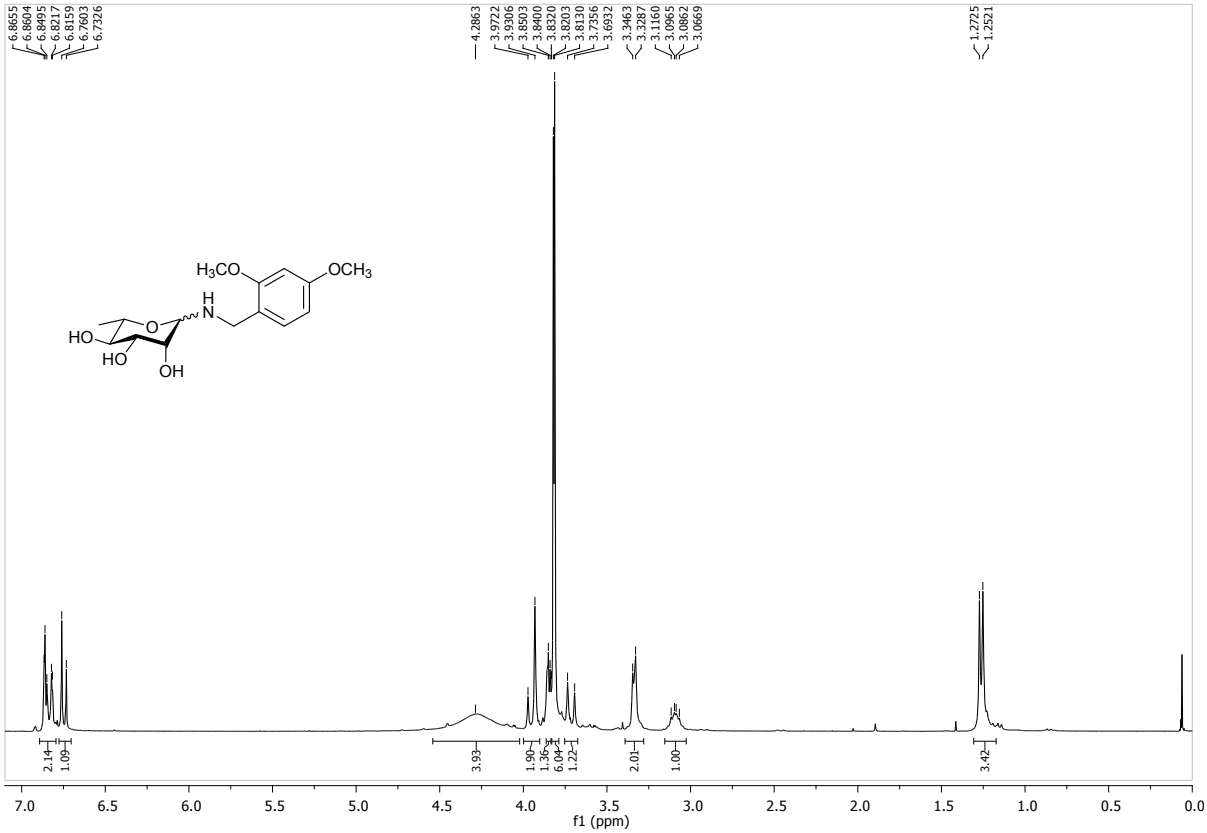



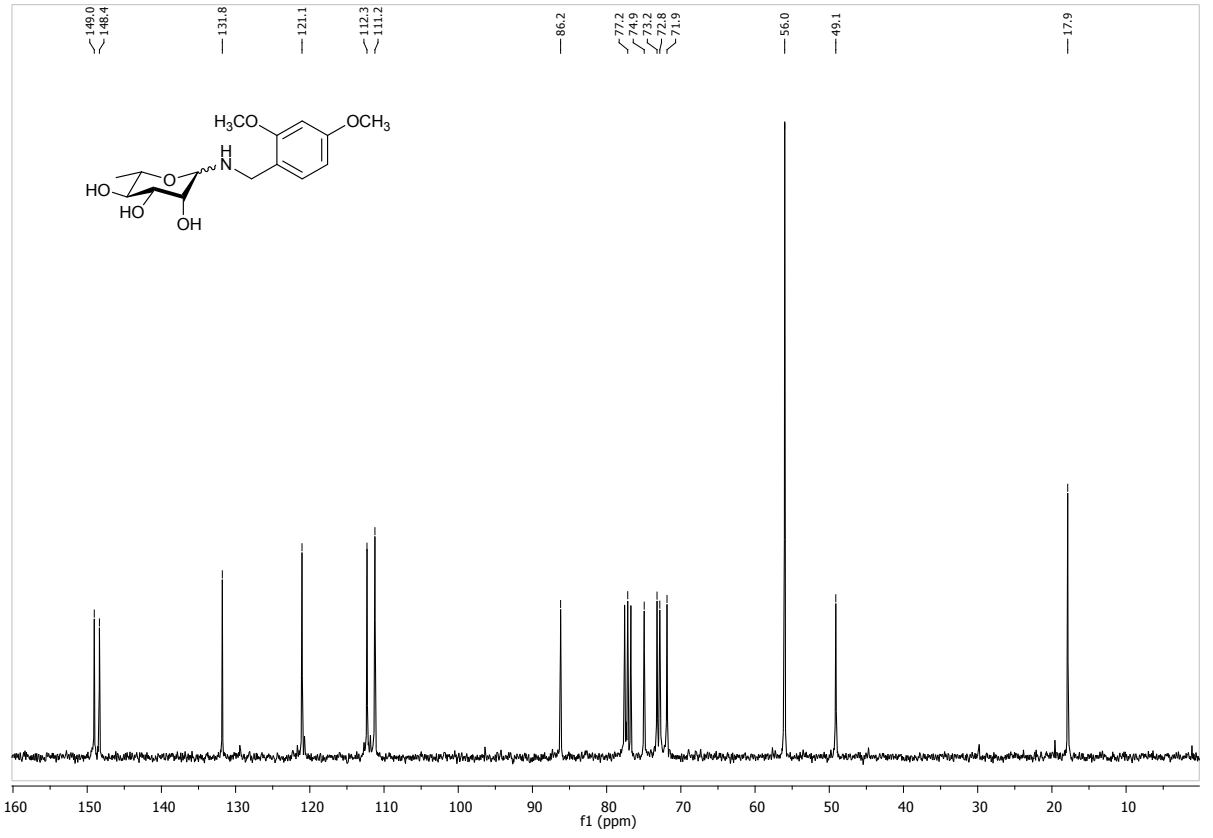
## *N*-benzyl-L-rhamnosylamine (1s)



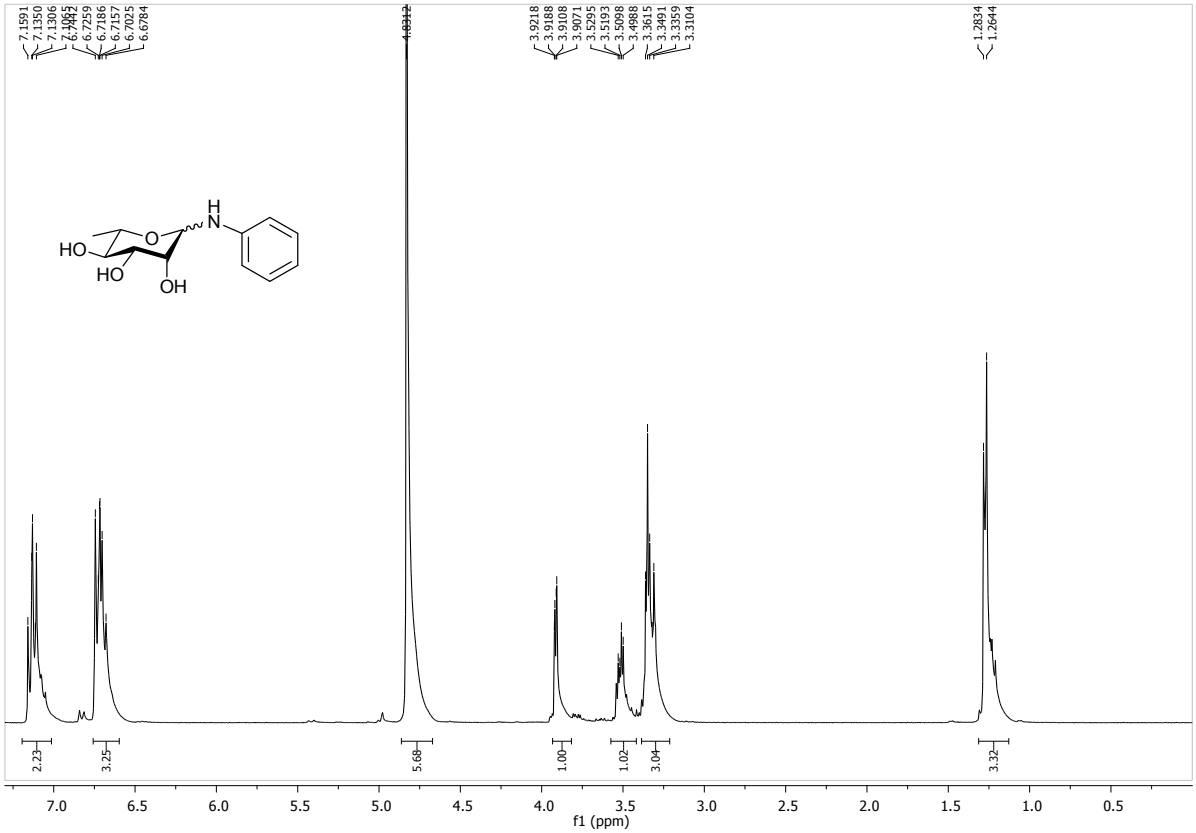



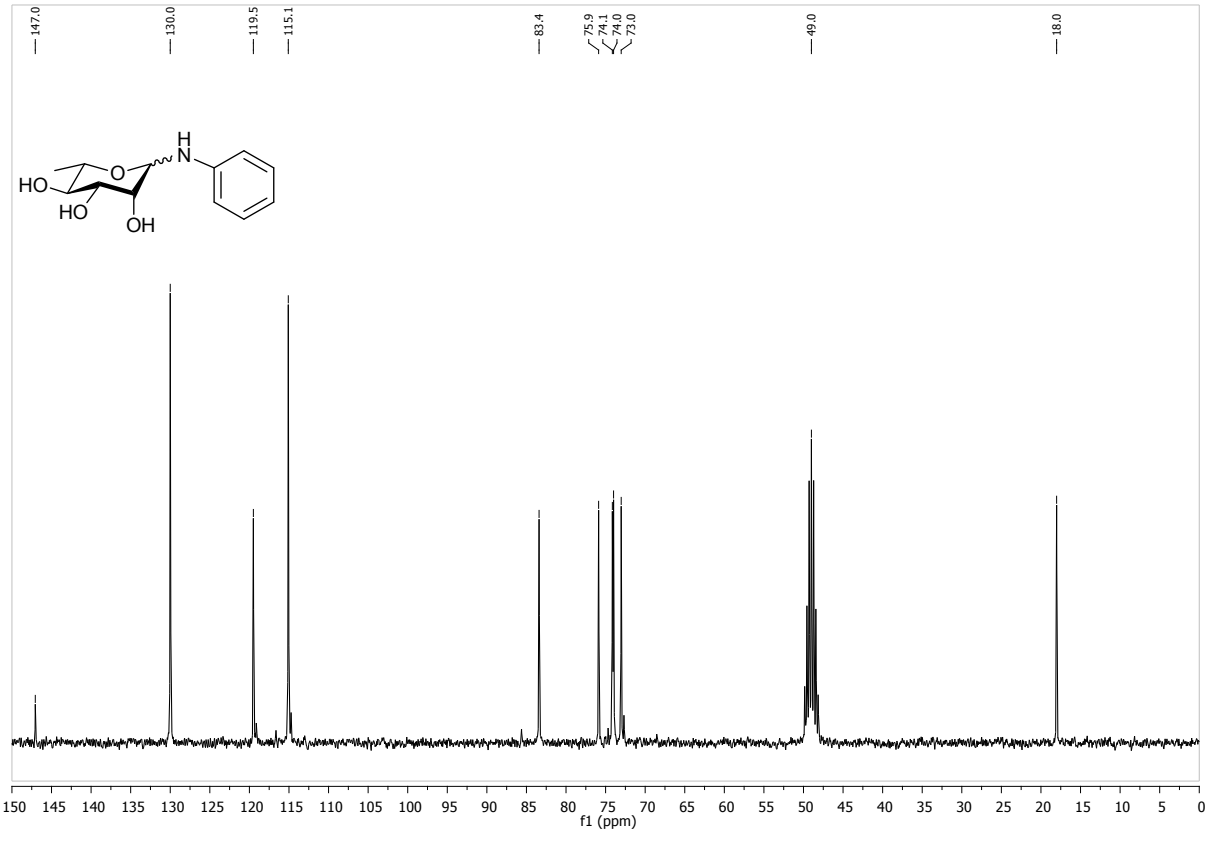
## *N*-(2,4-dimethoxybenzyl)-L-rhamnosylamine (1t)



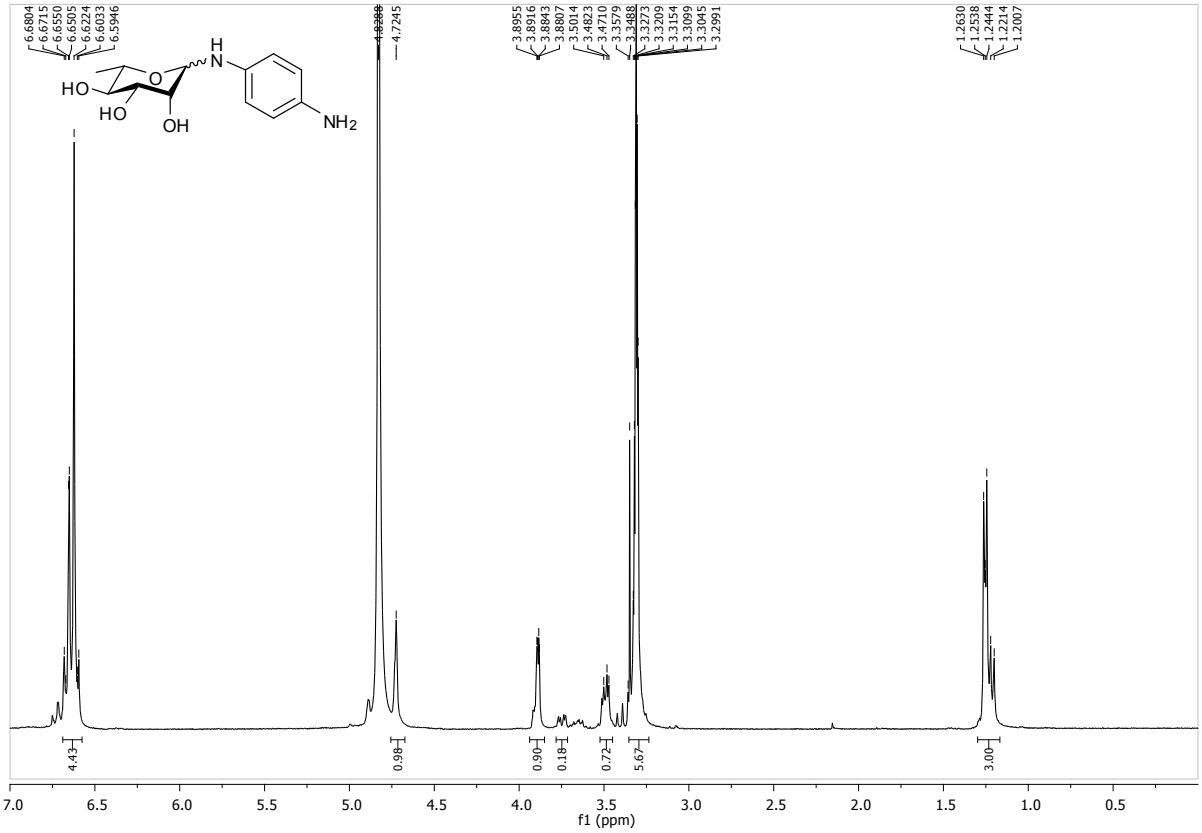



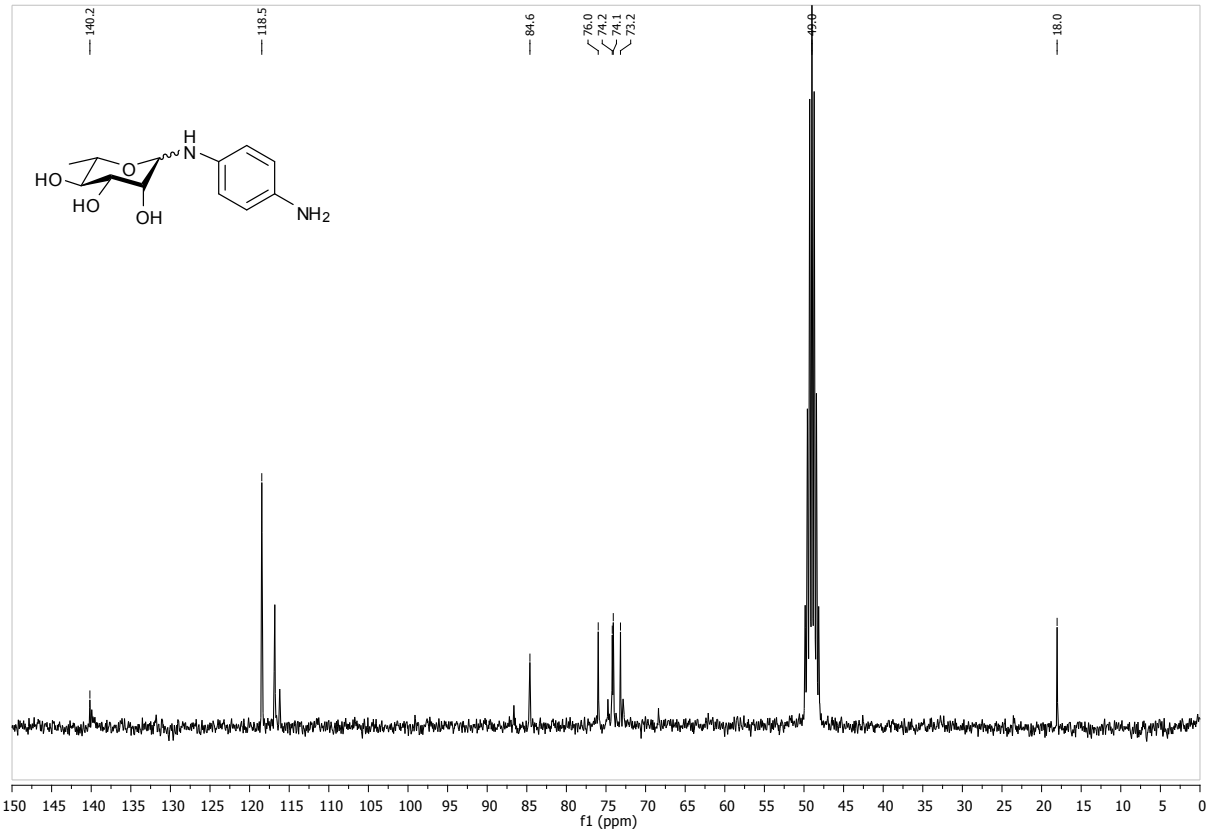
## *N*-phenyl-L-rhamnosylamine (1u)



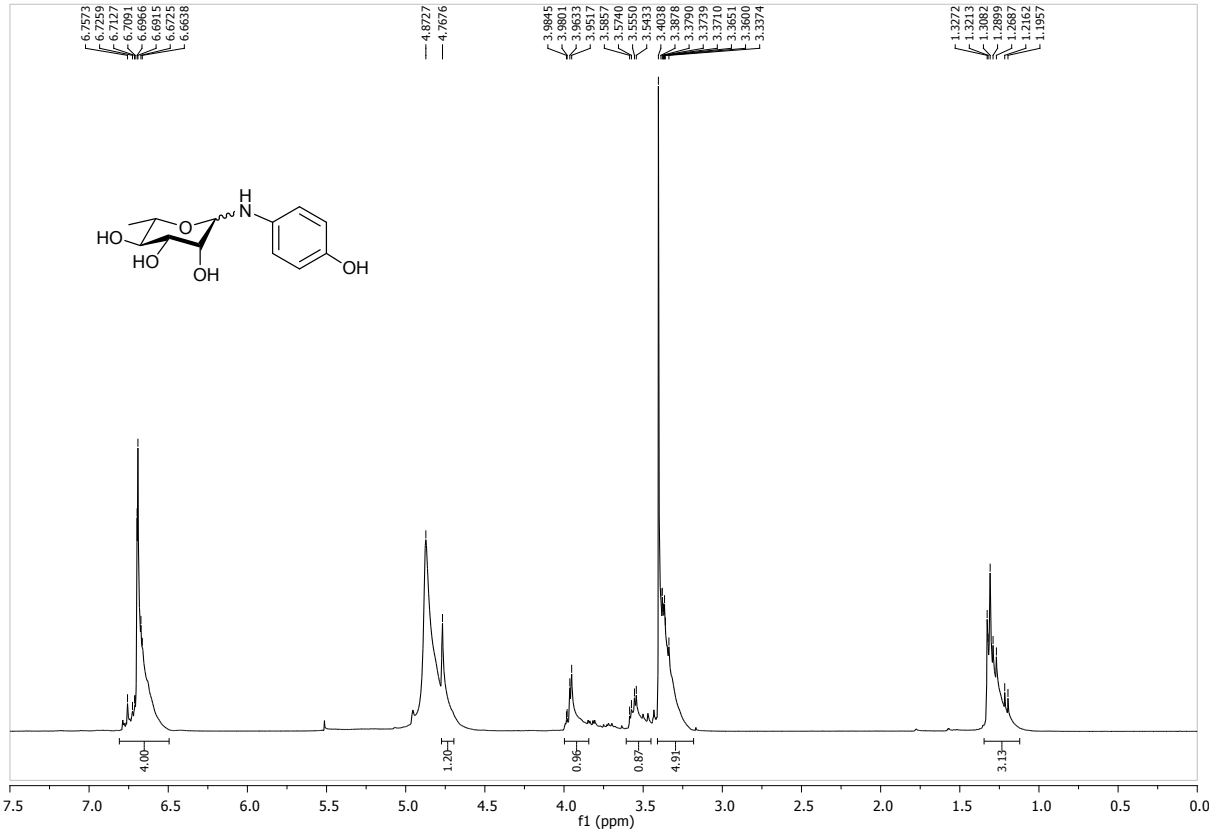



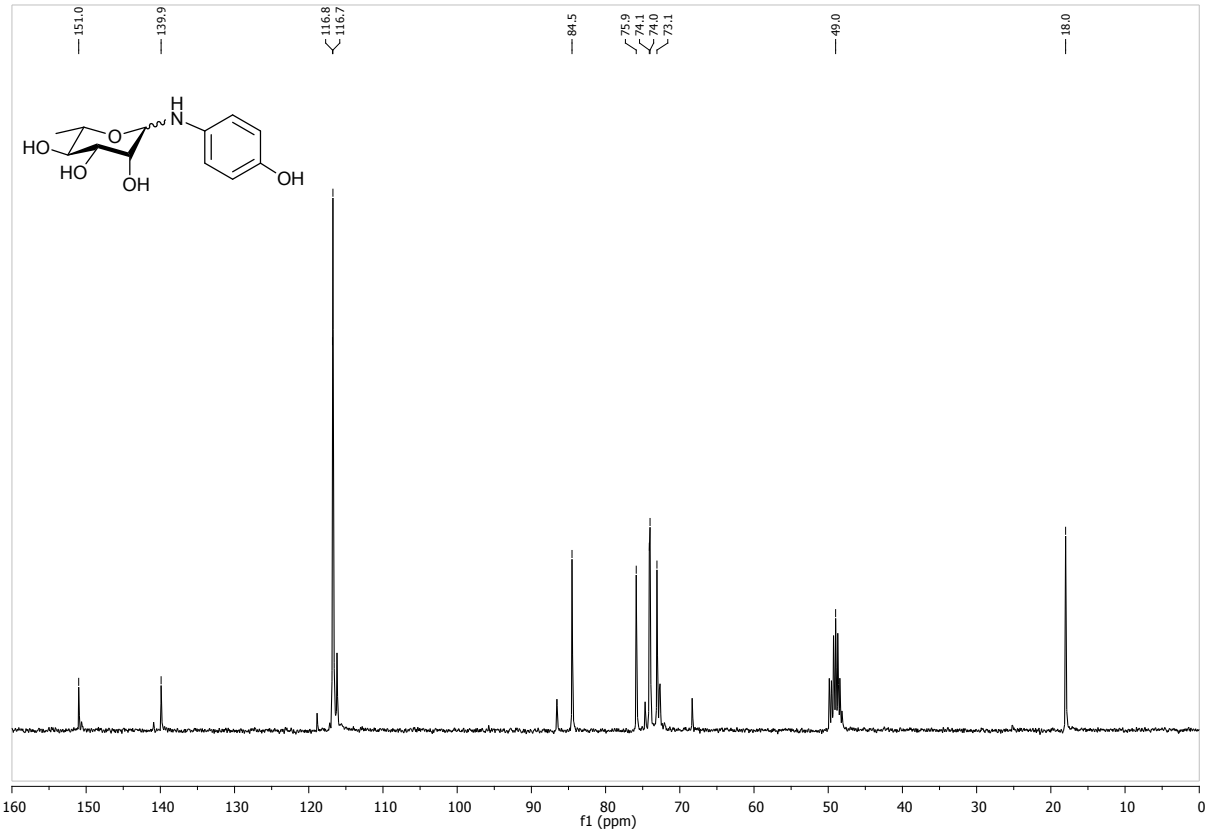
## *N*-(4-aminophenyl)-L-rhamnosylamine (1v)



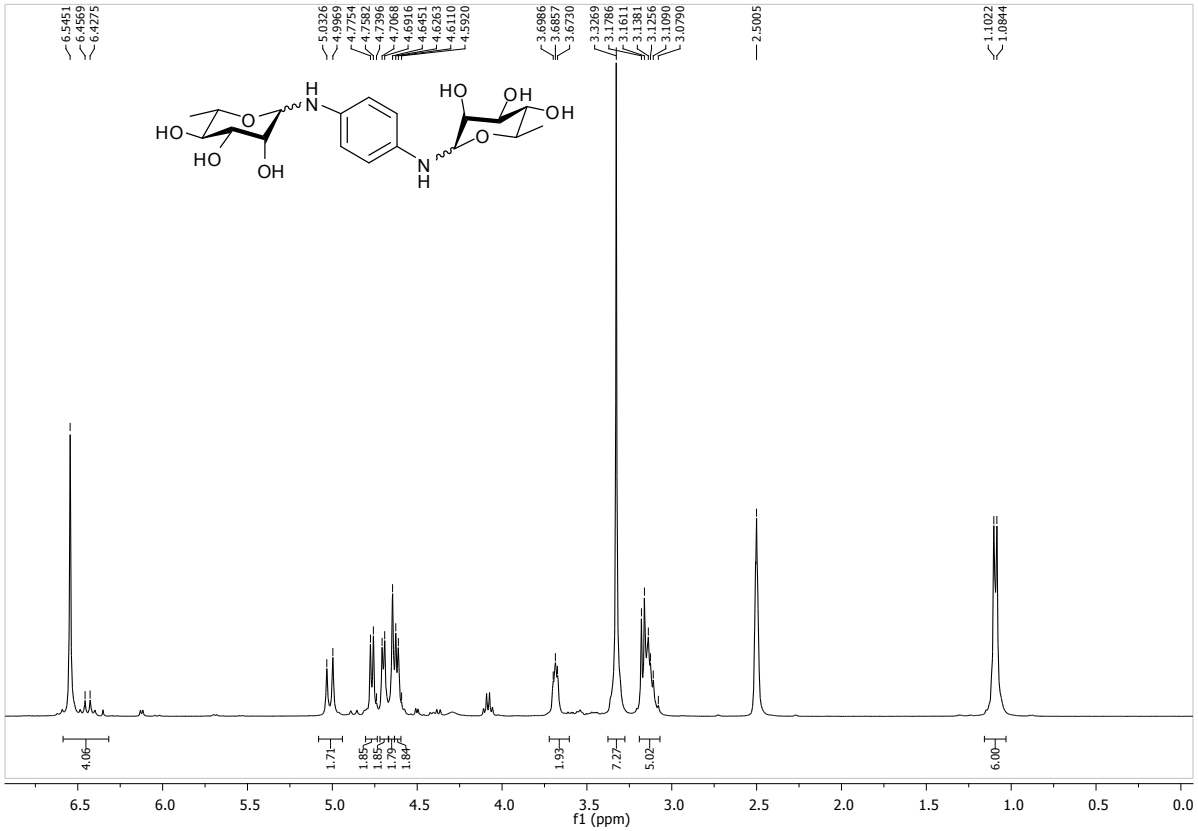



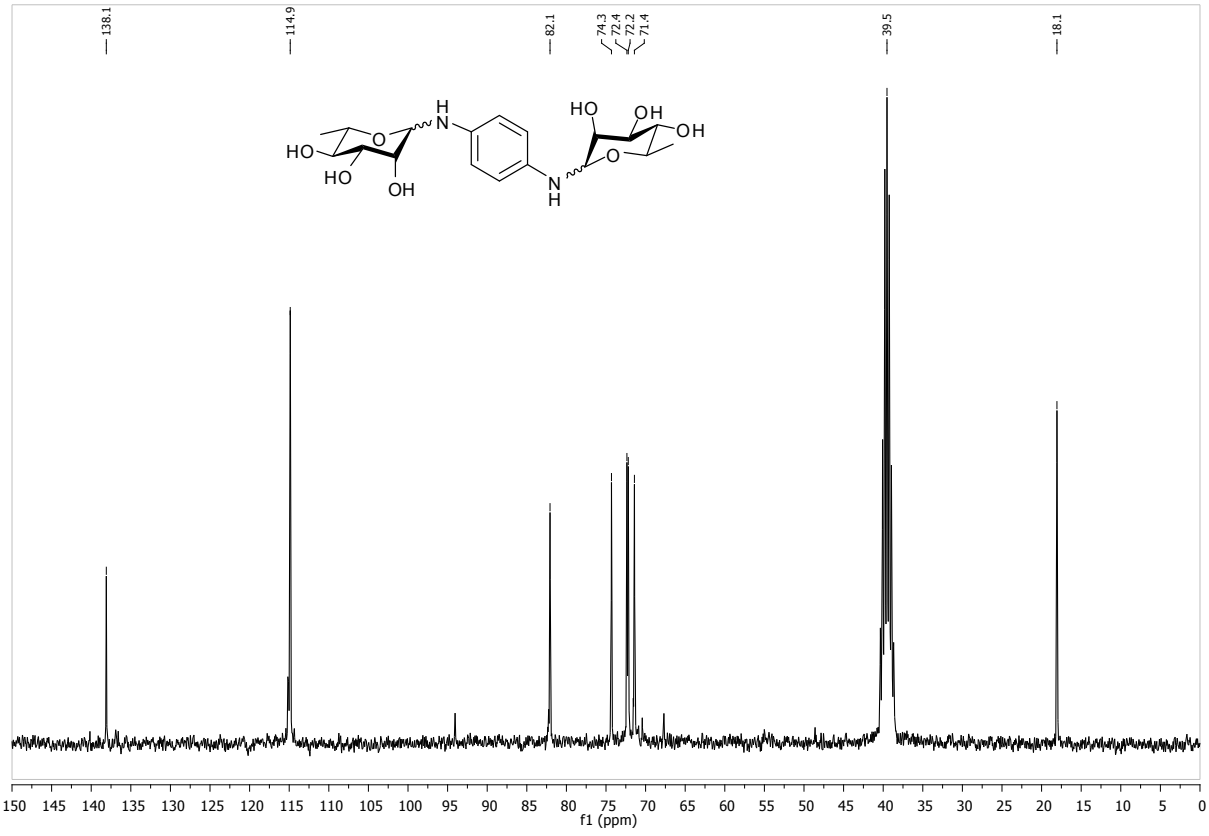
## *N*-(4-hydroxyphenyl)-L-rhamnosylamine (1w)



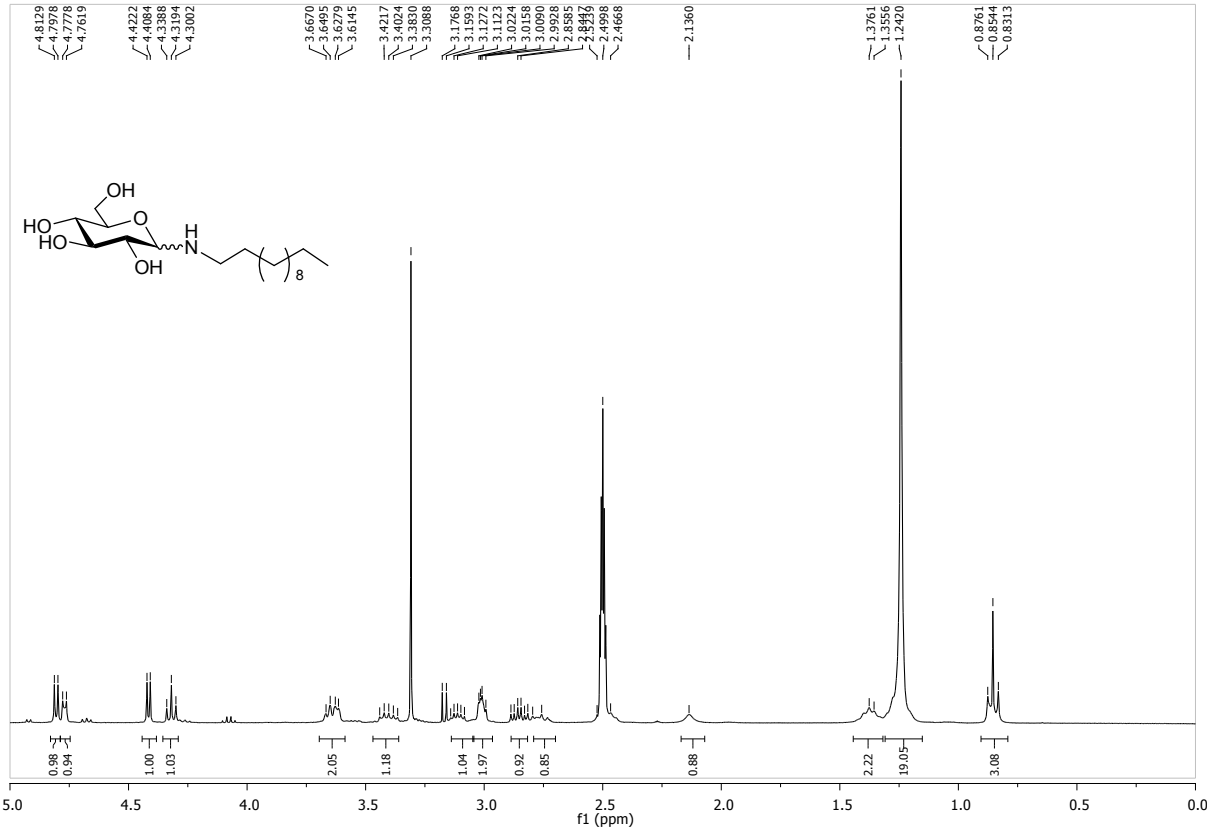



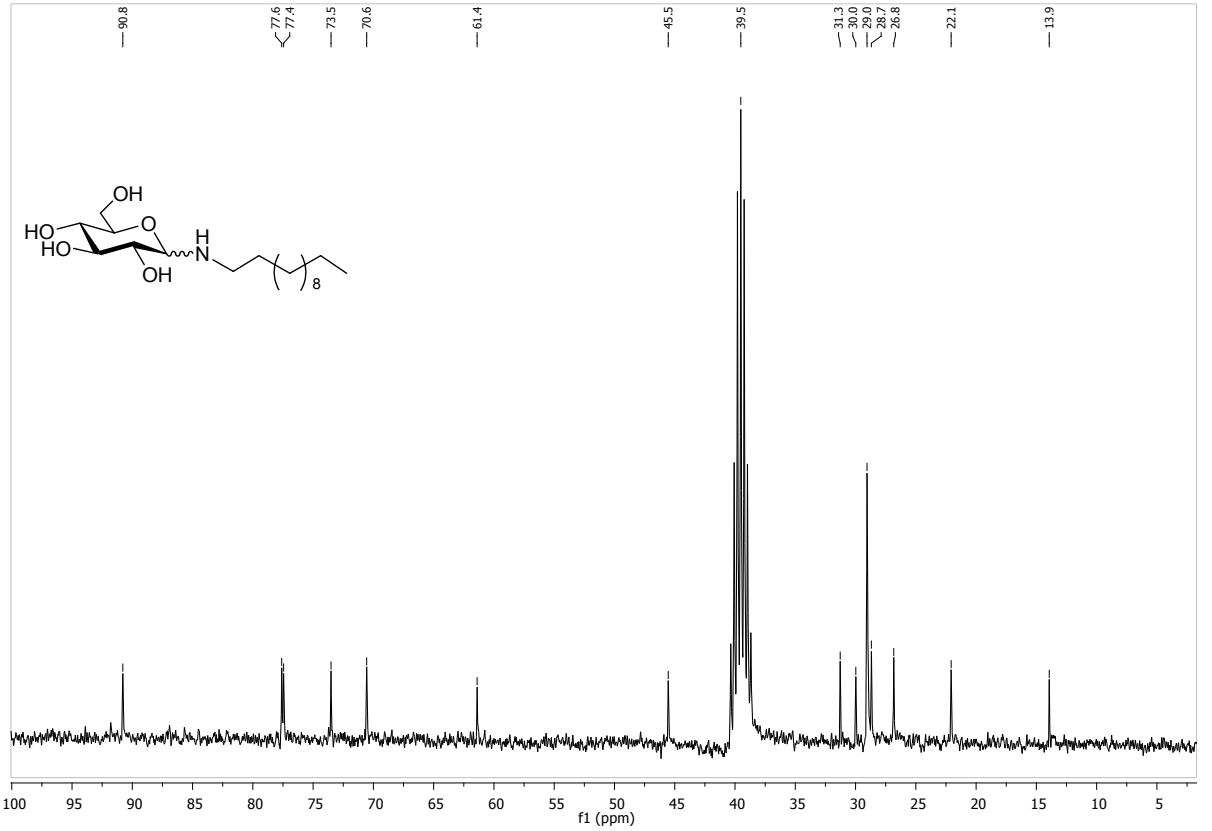
## *N,N′*-bis-(L-rhamnosyl)-phenyl-1,4-diamine (1z)



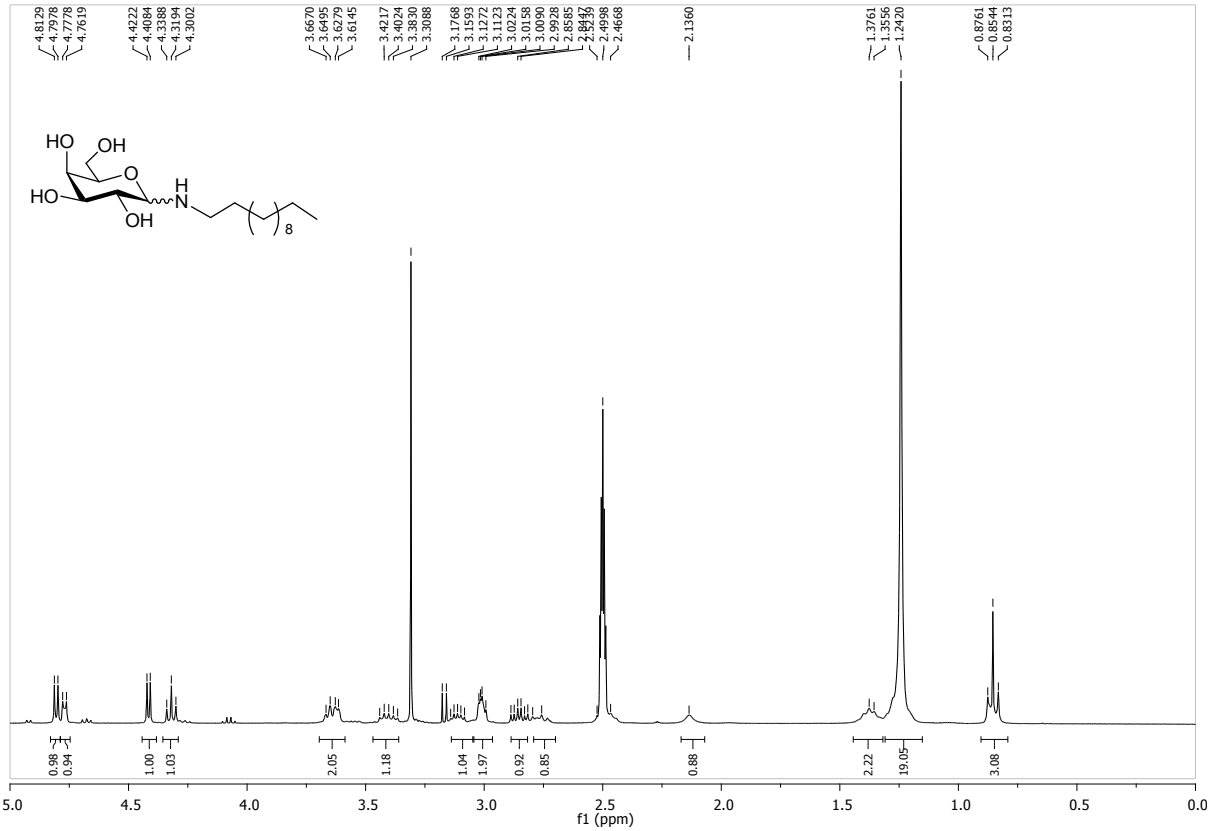



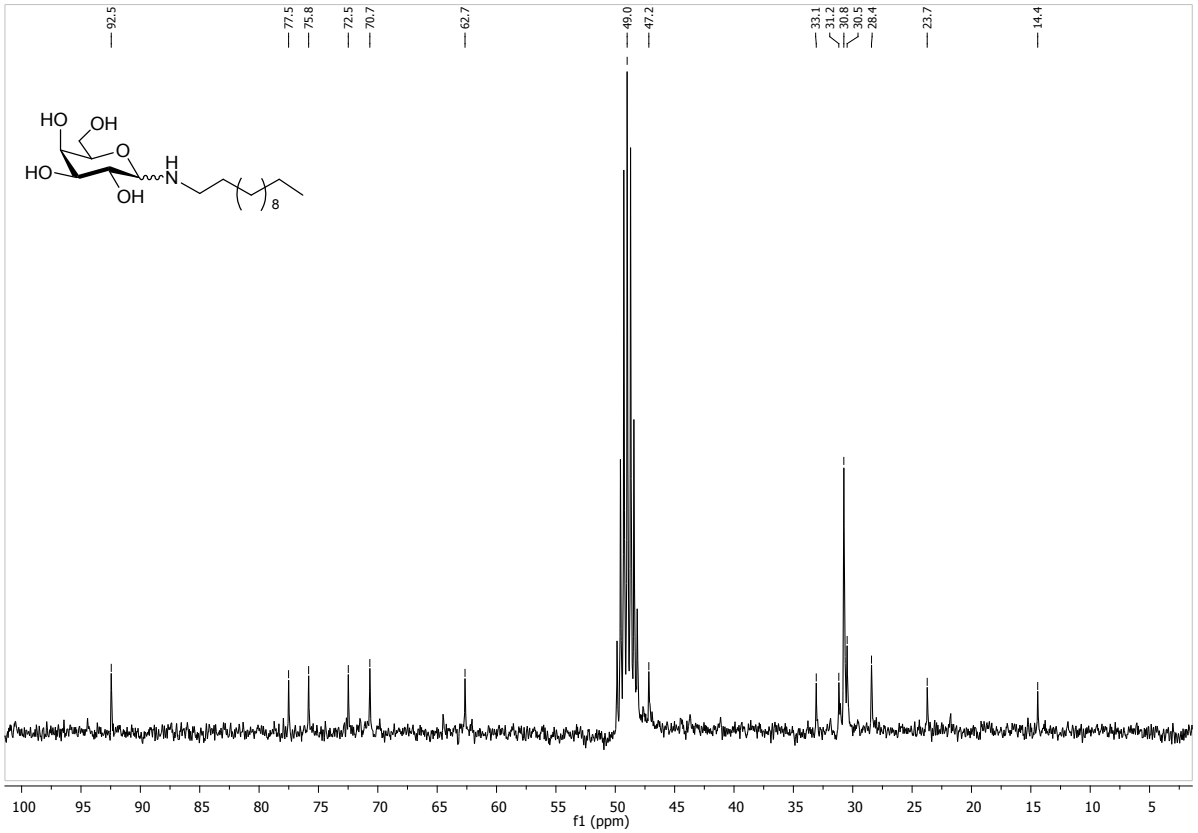
## *N*-dodecyl-D-glucosylamine (2a)



## *N*-dodecyl-D-galactosylamine (3a)



## *N*-dodecyl-D-(4-*O*-α-D-glucopyranosyl)-glucosylamine (4a)