Electronic Supplementary Material (ESI) for RSC Advances

SUPPORTING INFORMATION

Synthesis and Characterization of Thiourea and Urea Linked Glycolipids as Low Molecular-Weight Hydrogelators

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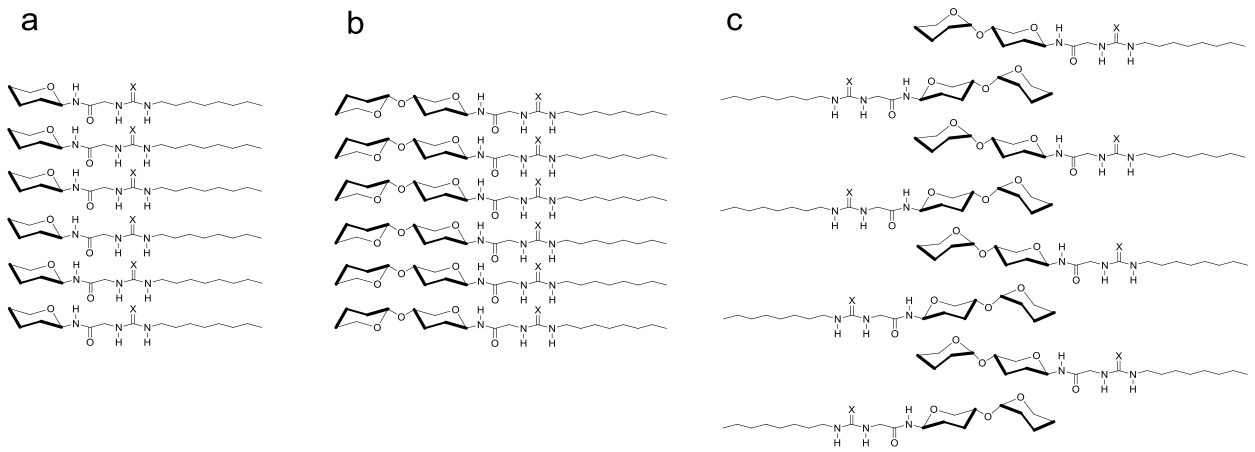

Figure S1 Mode of molecular packing a) monosaccharide b) Lactose (β(1-4) linkage) b) Maltose (α(1-4) linkage).

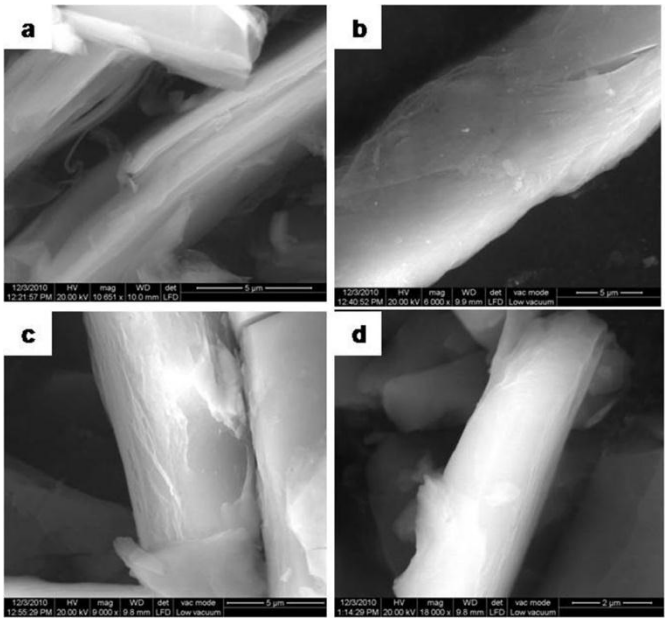

Figure S2 SEM images of the air dried thiourea-linked glycolipids (0.5 wt % water) a) **44** (GlcTUC8) b) **45** (GlcTUC12) c) **52** (LacTUC8) d) **53** (LacTUC12)

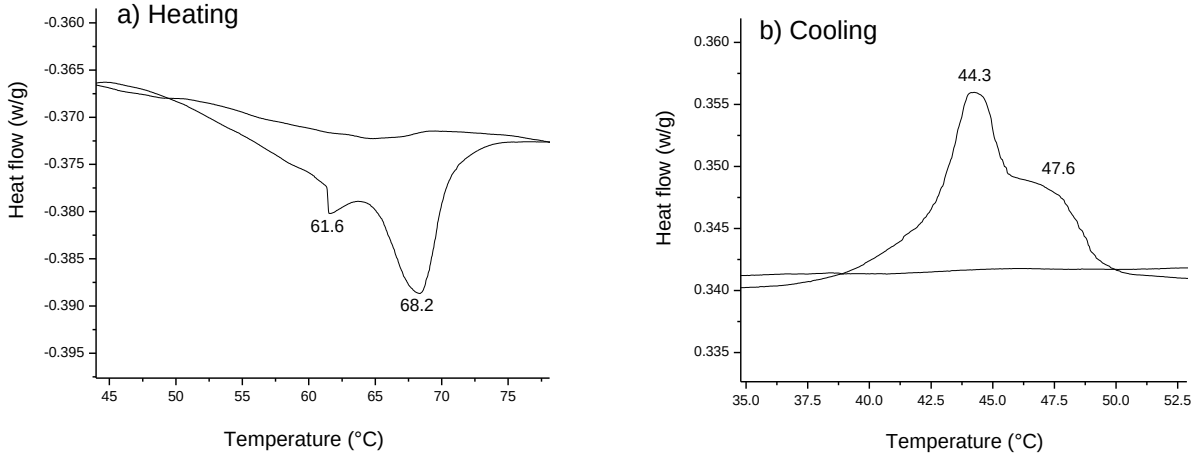

Figure S3 Differential scanning calorimetry cycles of **57** (GalUC8) in nitrogen atmosphere (2 cycles, 5 °C m^{-1}) a) heating, b) cooling

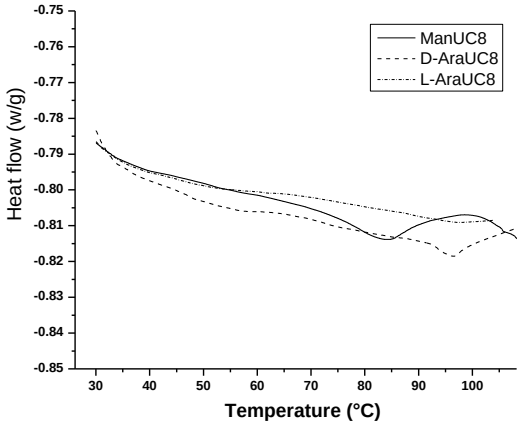

Figure S4 Differential scanning calorimetry of **58** (ManUC8), **62** (D-AraUC8) and **63** (L-AraUC8) in nitrogen atmosphere (10 °C m^{-1})

Table S1 Data collection and refinement statistics for **56** (GlcUC8)

Parameter	**GlcUC8 (56)**
Empirical Formula	$C_{34}H_{73}N_6O_{18.5}$
Formula weight	861.98
Wavelength	0.71073 Å
Crystal system	Monoclinic
Space group	*C*2
Cell Dimensions	a = 30.174(10) Å, b = 4.6629(19) Å , c = 32.708(12) Å, α = 90º, β = 90º, γ = 90º
Volume ($Å^3$)	4543(3)
Z, calculated density (Mg/m^3)	4, 1.260
Absorption coefficient (mm^{-1})	0.102
F(000)	1868
Crystal size (mm)	0.3 x 0.2 x 0.2
Theta range (°)	1.71 to 19.90
Index ranges	-28<=h<=28, -3<=k<=4, -26<=l<=31
Reflections collected /unique	6429 / 3183 [R(int) = 0.0556]
Data / restraints / parameters	3183 / 14 / 547
Goodness-of-fit on F^2	1.048
Final R indices [I > 2sigma (I)]	R1 = 0.0689, wR2 = 0.1749
R indices (all data)	R1 = 0.1059, wR2 = 0.2031

^{1}H and ^{13}C-NMR Spectra of Products

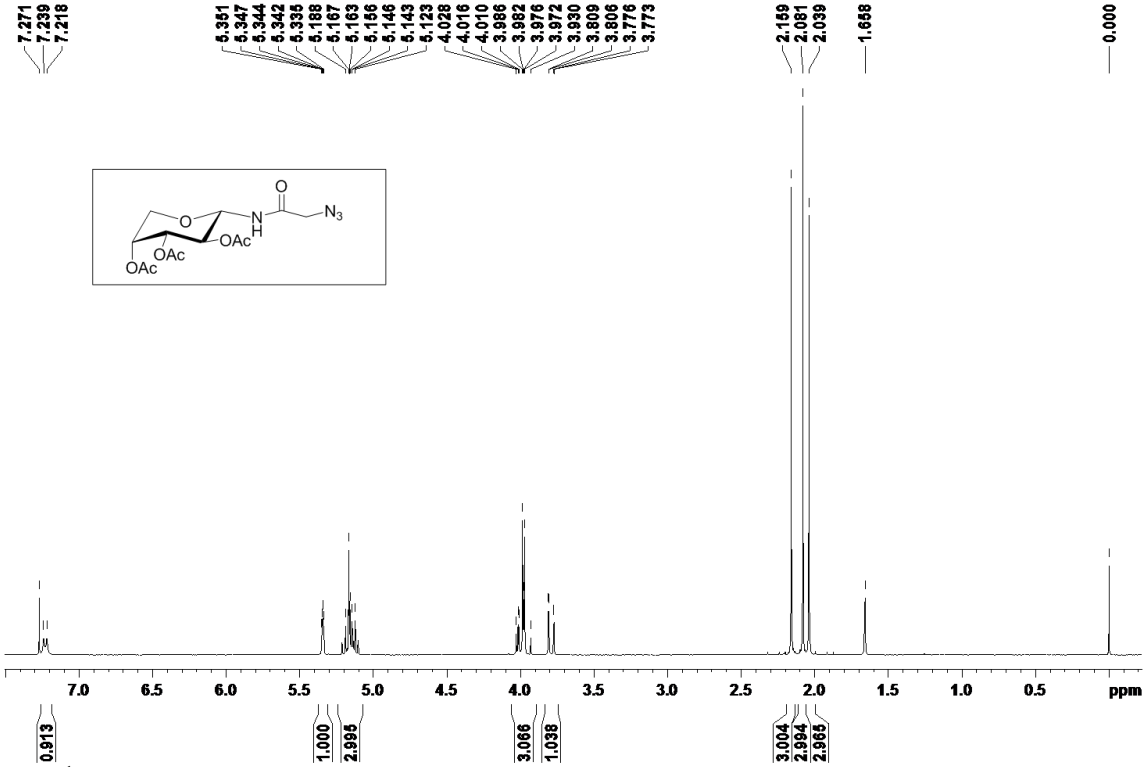

Figure S5 ^{1}H-NMR (400 MHz, $CDCl_3$) of *N*-(2,3,4-tri-*O*-acetyl-α-D-arabinopyranosyl)azidoacetamide (**17**)

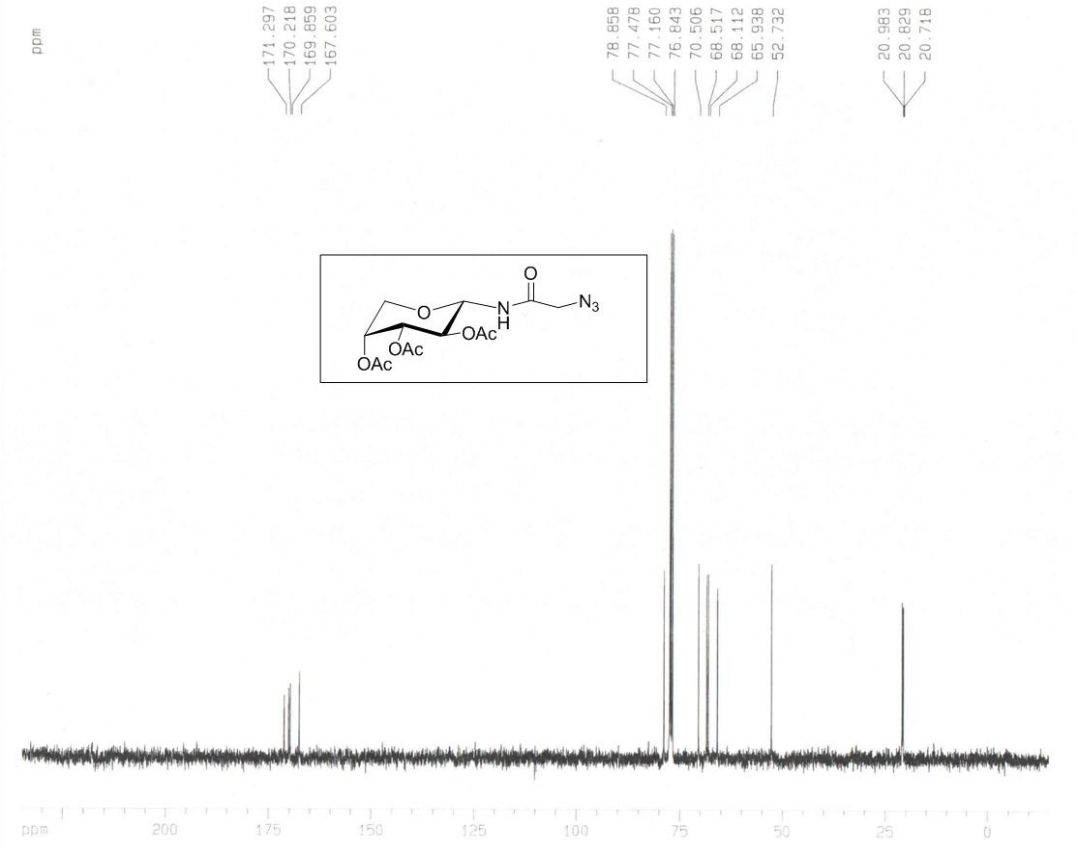

Figure S6 ^{13}C-NMR (100 MHz, $CDCl_3$) of *N*-(2,3,4-tri-*O*-acetyl-α-D-arabinopyranosyl)azidoacetamide (**17**)

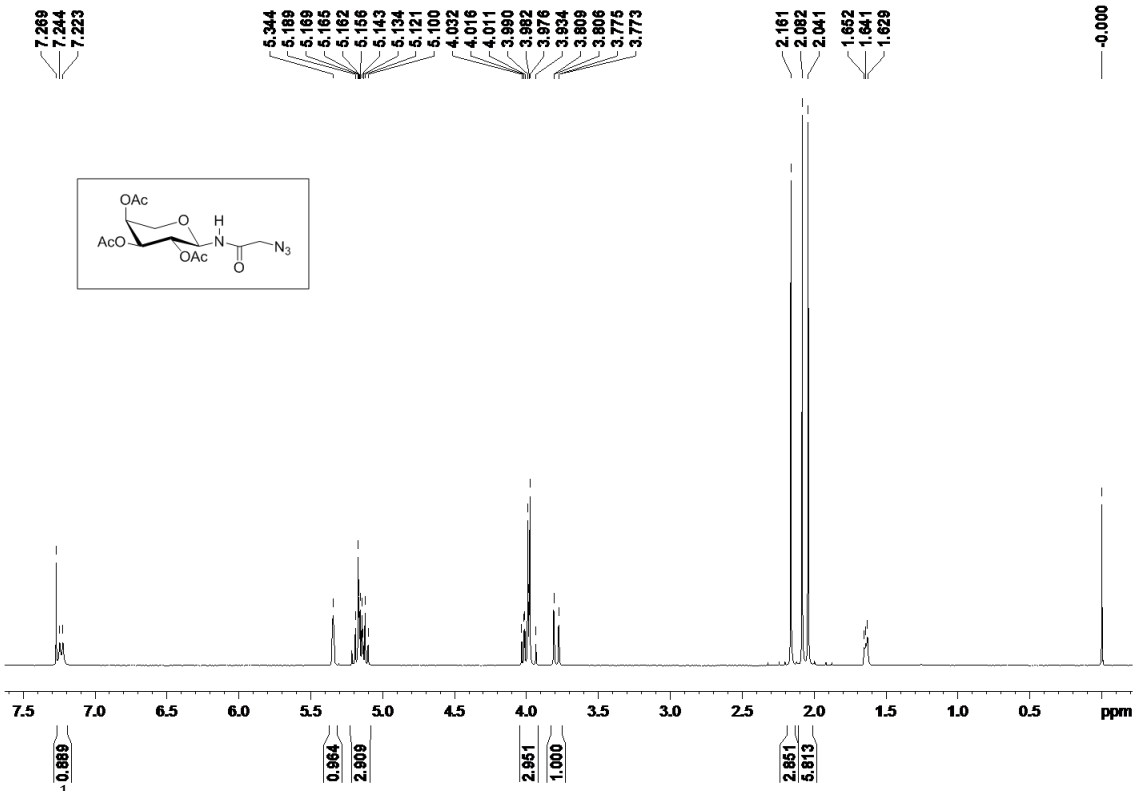

Figure S7 ^{1}H-NMR (400 MHz, $CDCl_3$) of *N*-(2,3,4-tri-*O*-acetyl-α-L-arabinopyranosyl)azidoacetamide (**18**)

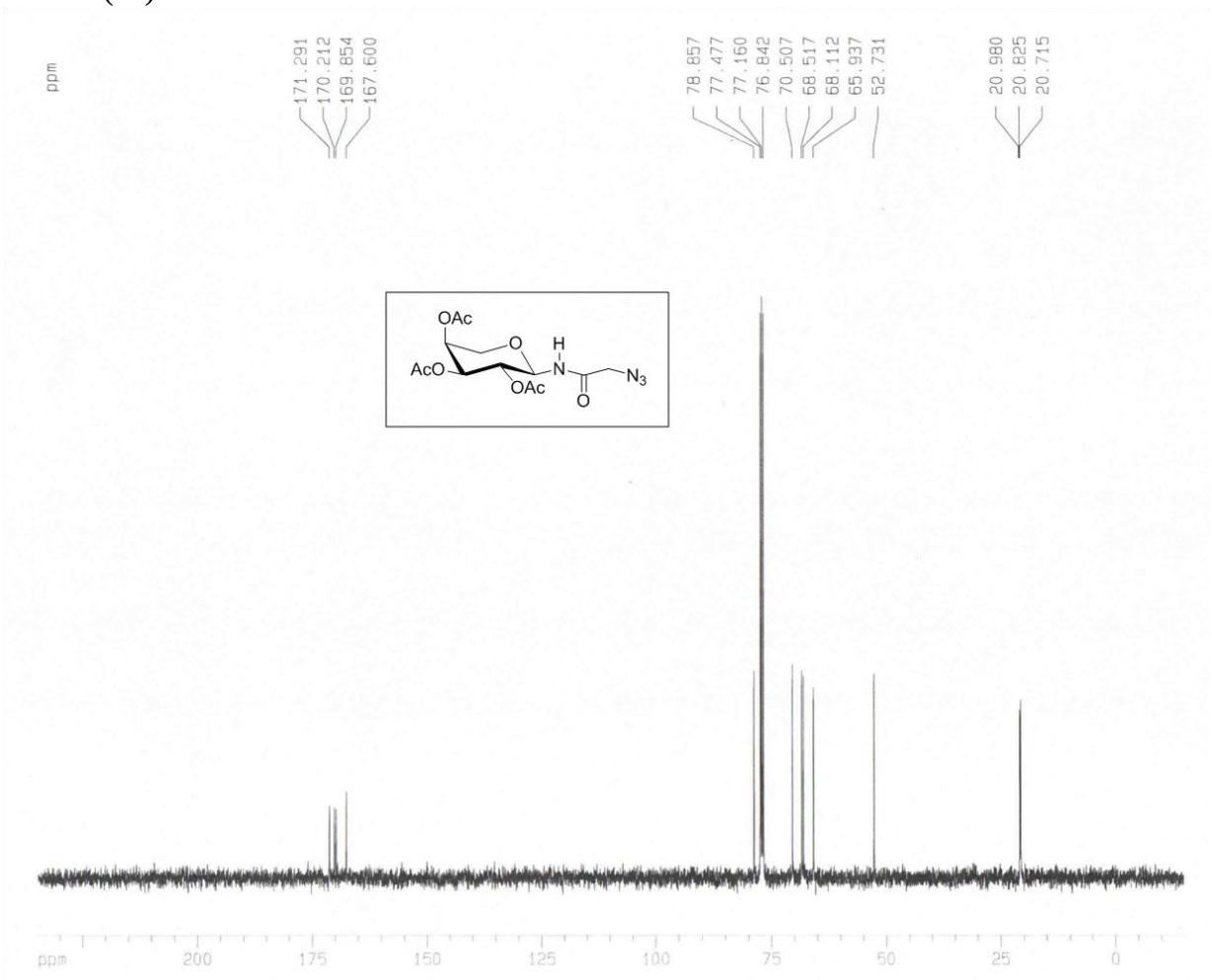

Figure S8 ^{13}C-NMR (100 MHz, $CDCl_3$) of *N*-(2,3,4-tri-*O*-acetyl-α-L-arabinopyranosyl) azidoacetamide (**18**)

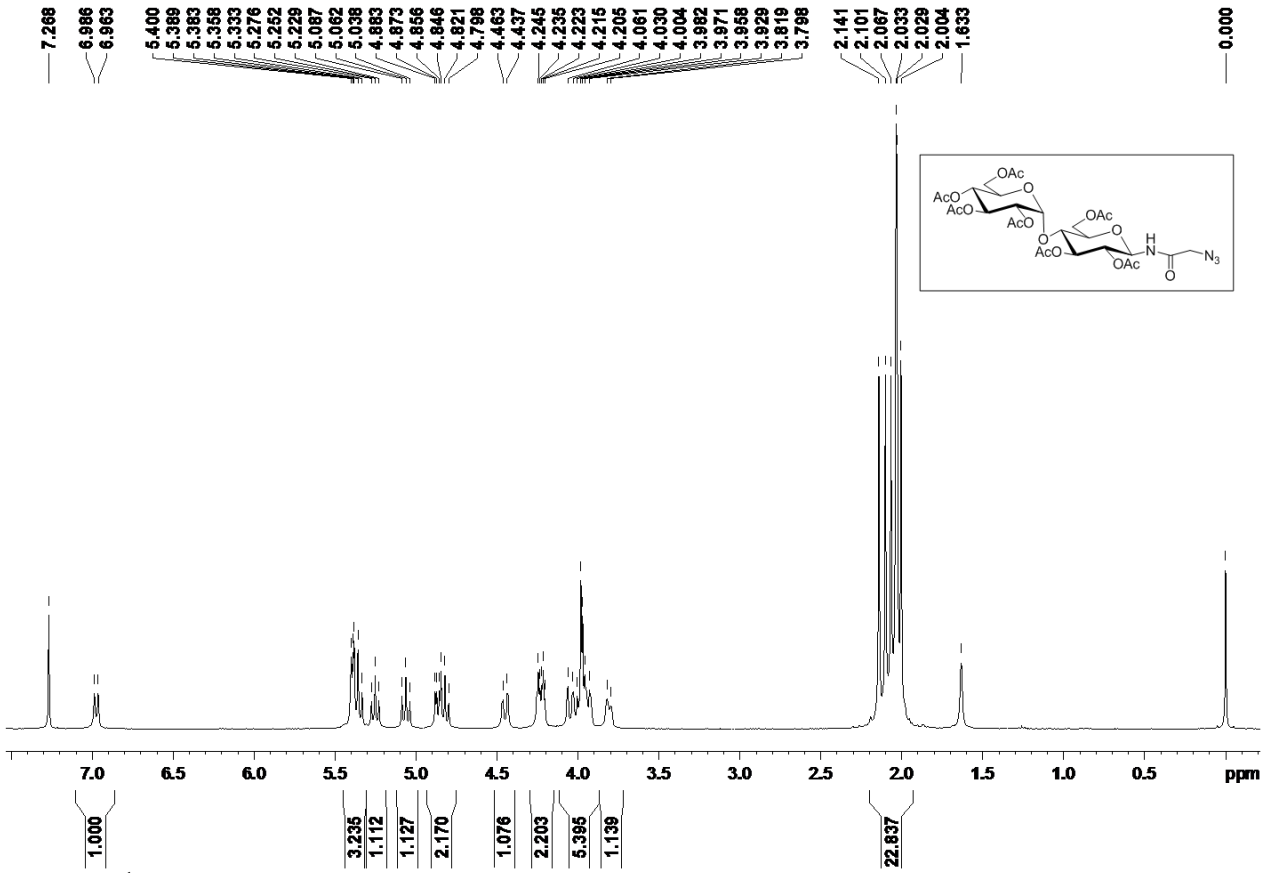

Figure S9 ^{1}H-NMR (400 MHz, $CDCl_3$) of *N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]azidoacetamide **(20)**

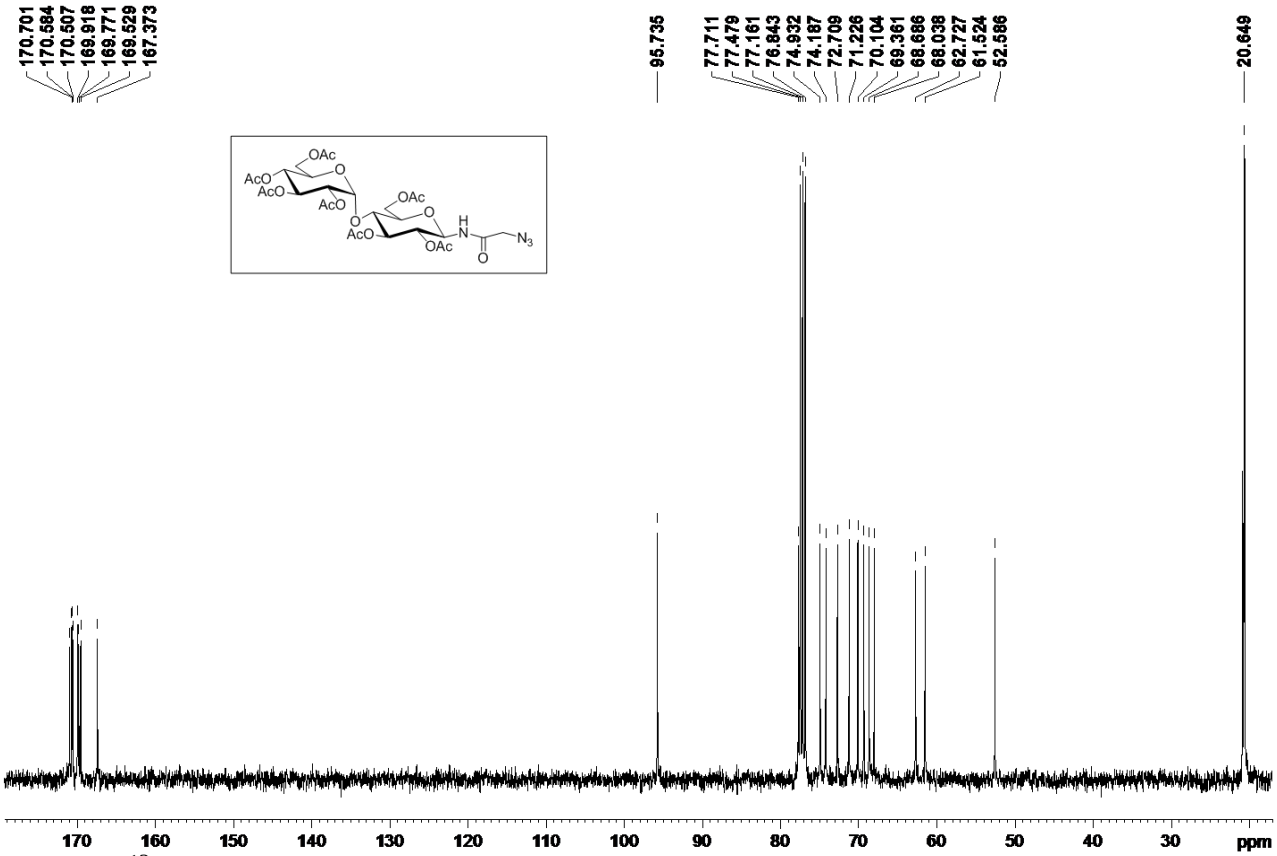

Figure S10 ^{13}C-NMR (100 MHz, $CDCl_3$) of *N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]azidoacetamide **(20)**

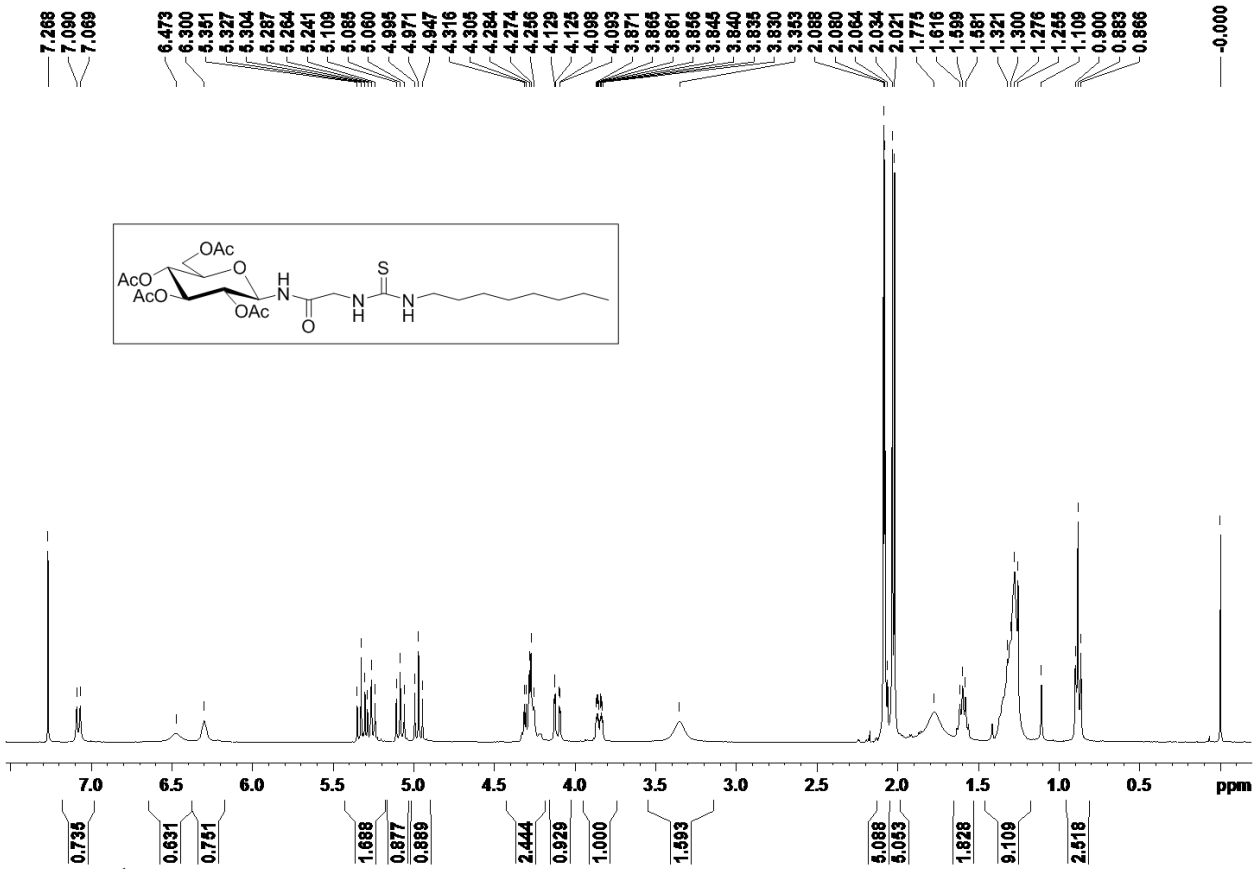

Figure S11 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-glucopyranosyl)-*N''*-(*n*-octyl)-thioureidoacetamide **(21)**

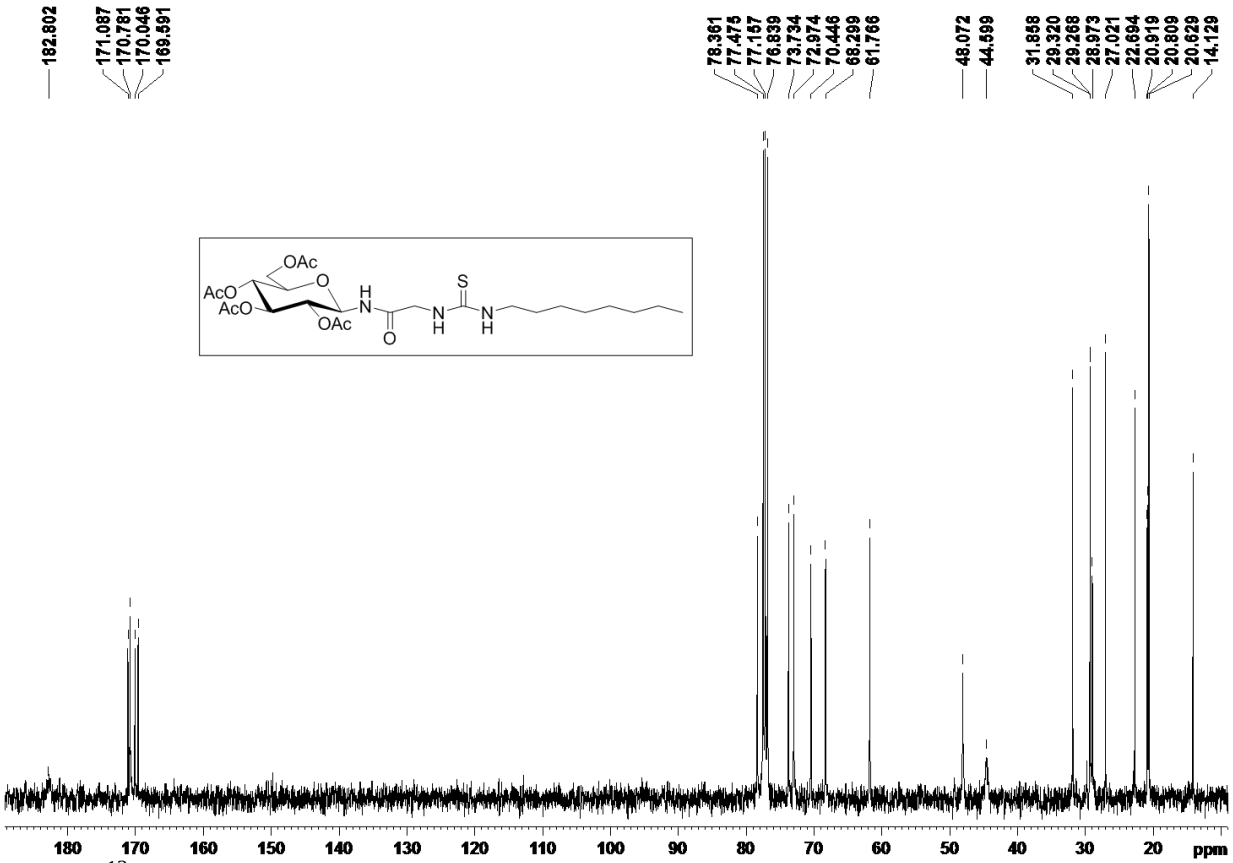

Figure S12 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-glucopyranosyl)-*N''*-(*n*-octyl)-thioureidoacetamide **(21)**

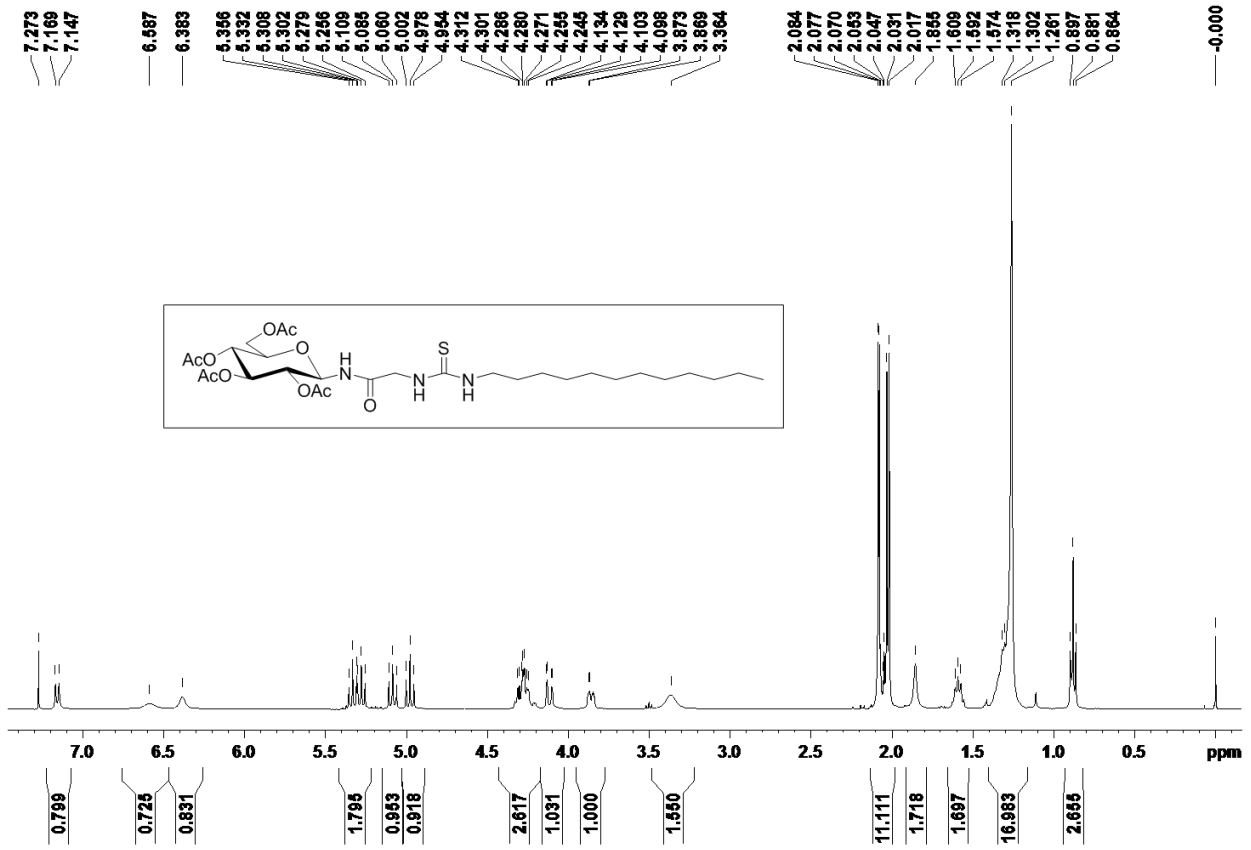

Figure S13 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(22)**

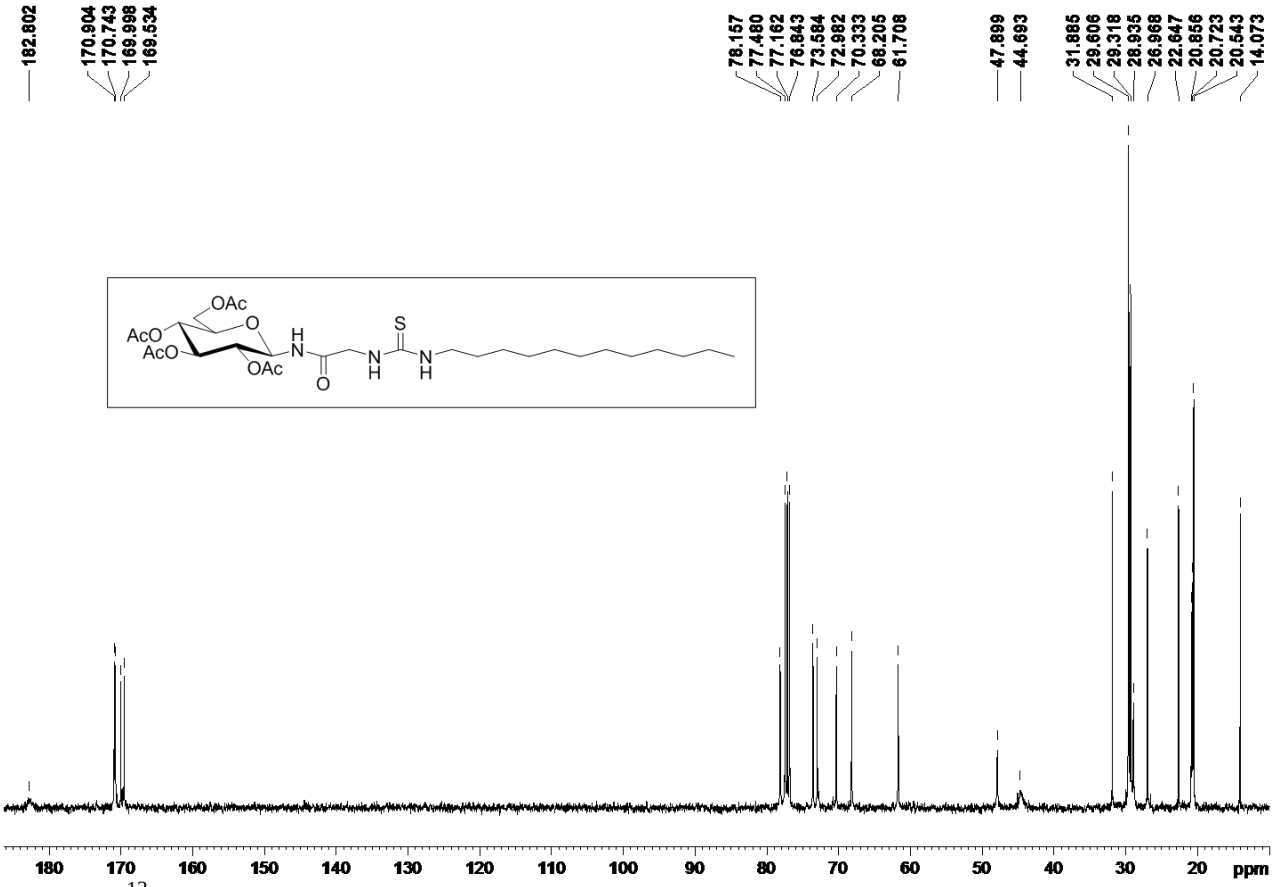

Figure S14 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(22)**

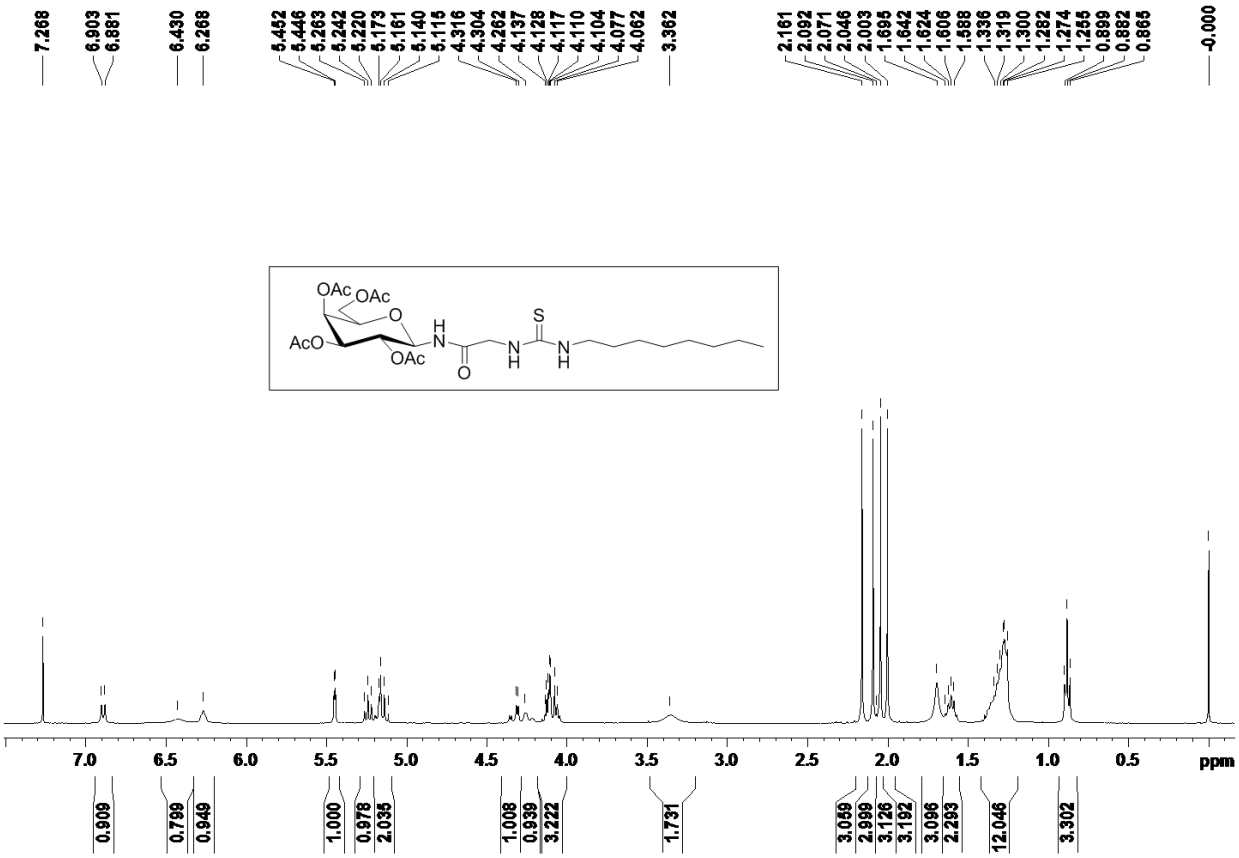

Figure S15 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(23)**

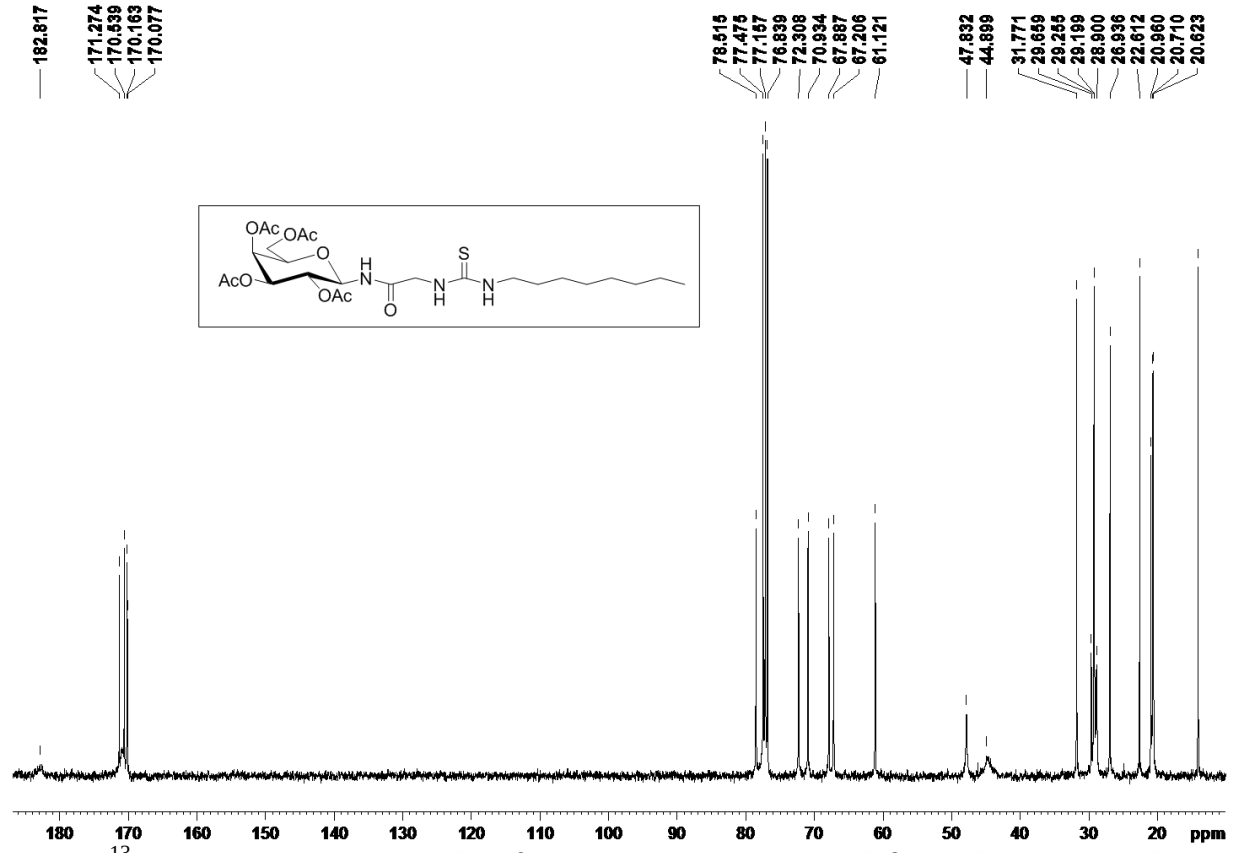

Figure S16 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(23)**

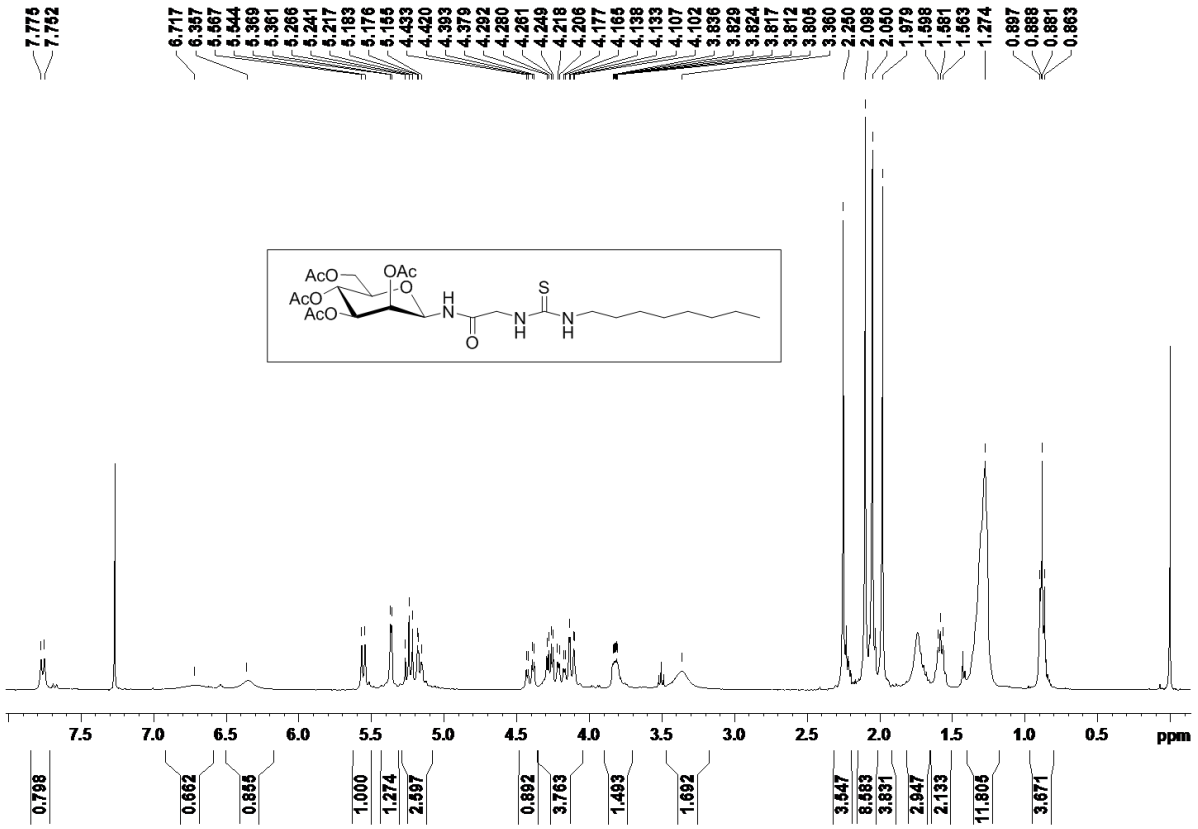

Figure S17 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-mannopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(24)**

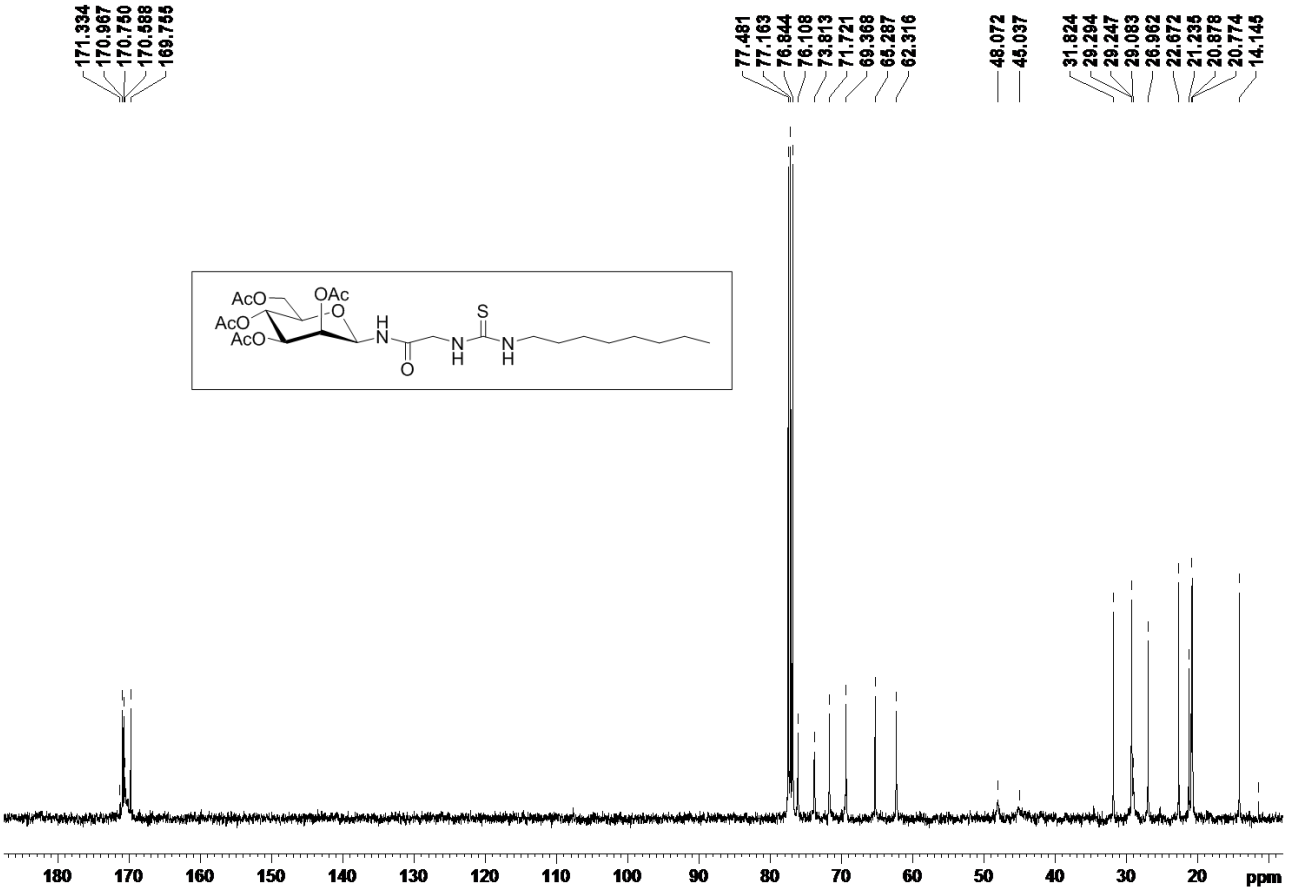

Figure S18 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-mannopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(24)**

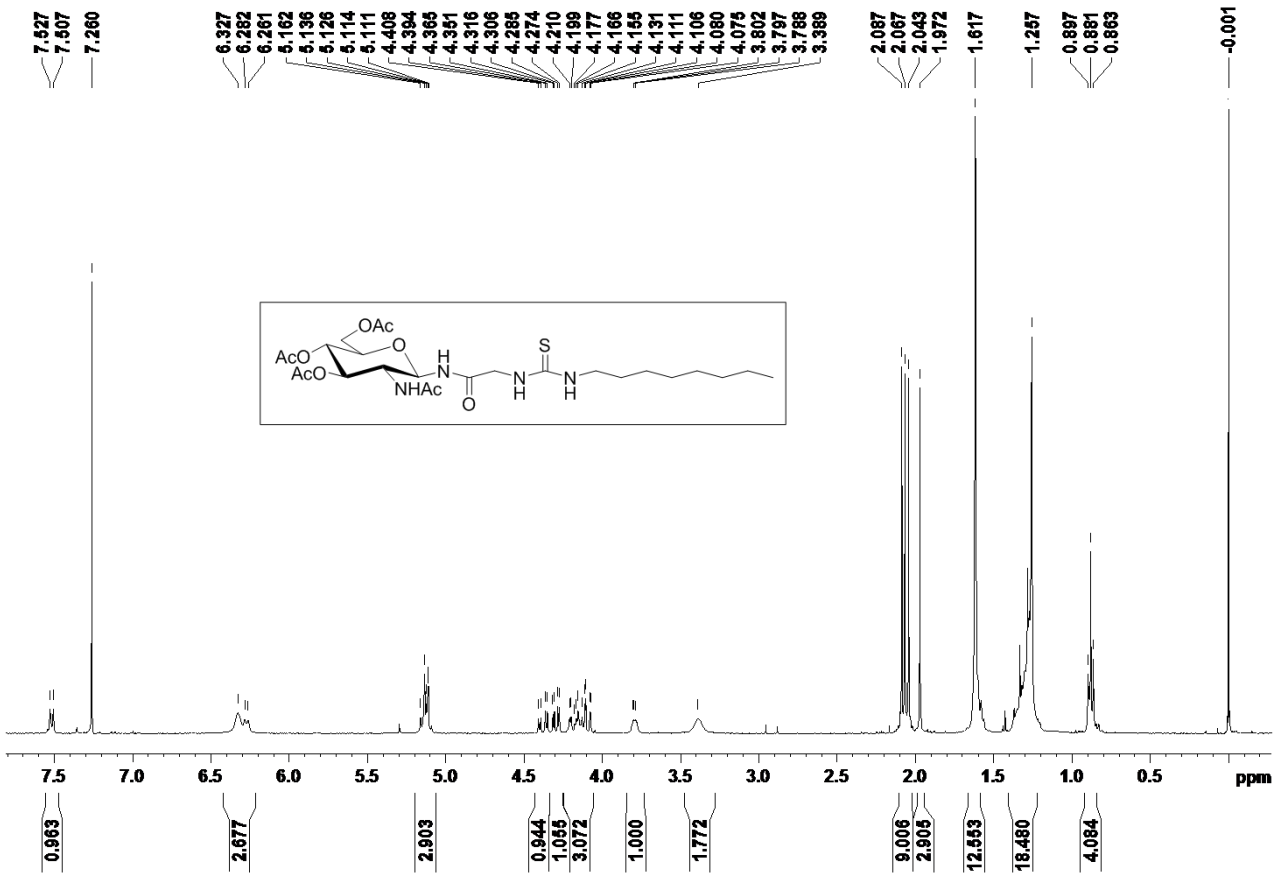

Figure S19 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2-deoxy-2-acetamido-3,4,6-tri-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(25)**

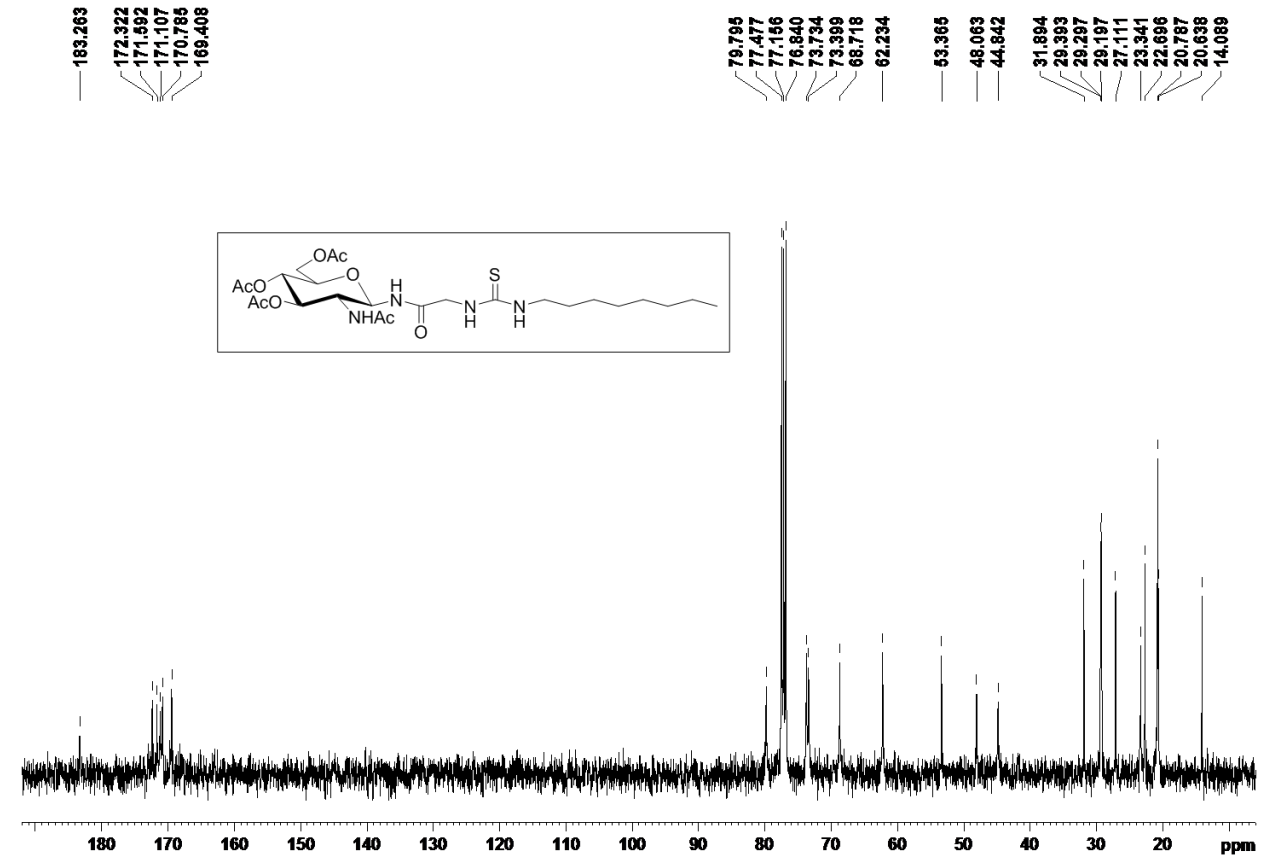

Figure S20 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2-deoxy-2-acetamido-3,4,6-tri-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(25)**

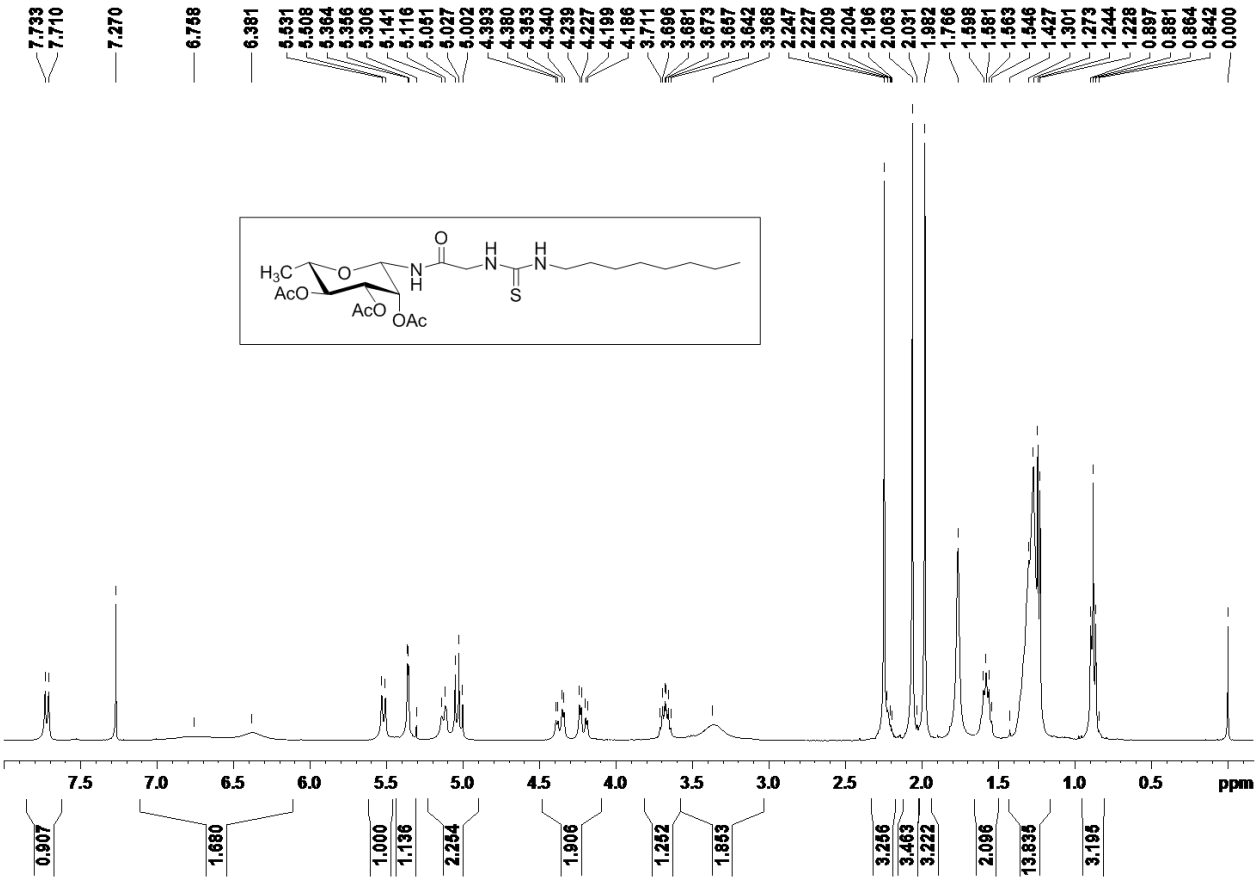

Figure S21 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-L-rhamanopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(26)**

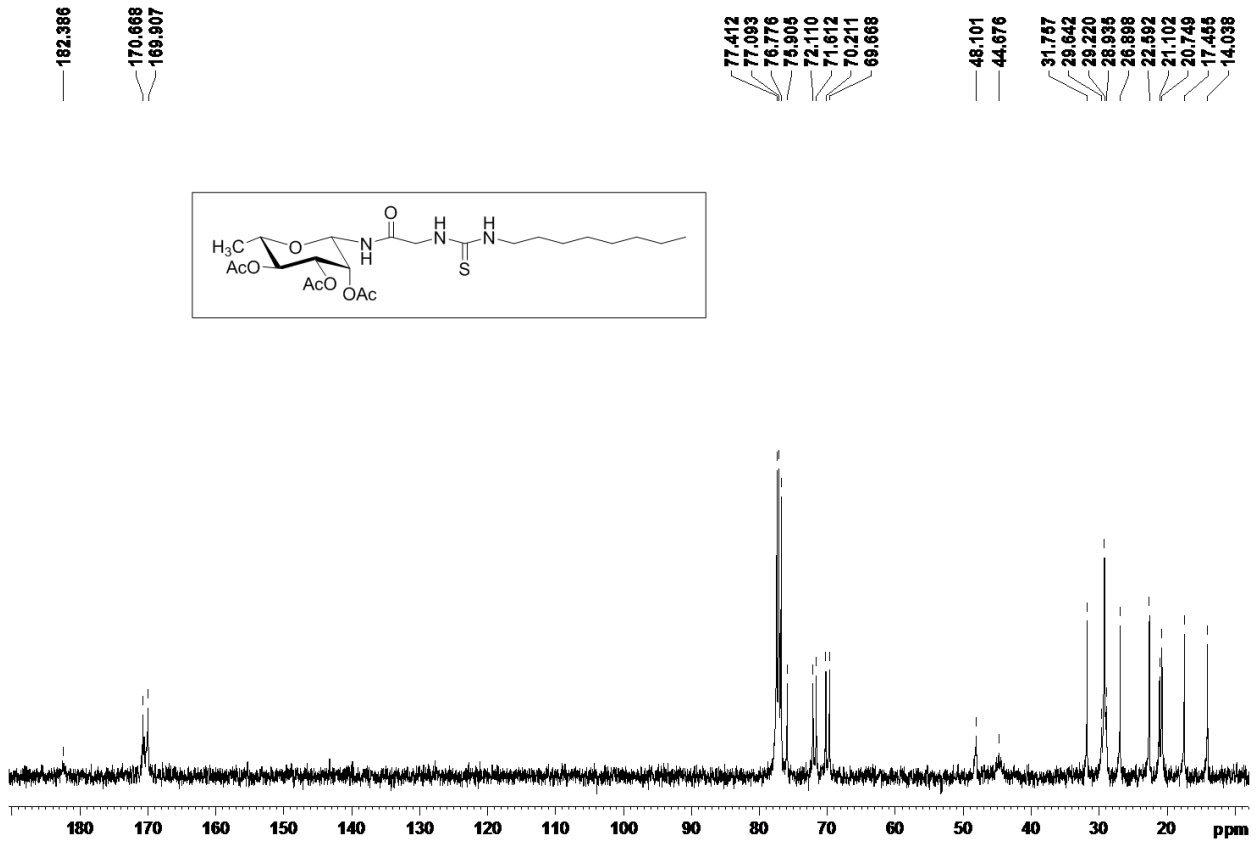

Figure S22 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-L-rhamanopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(26)**

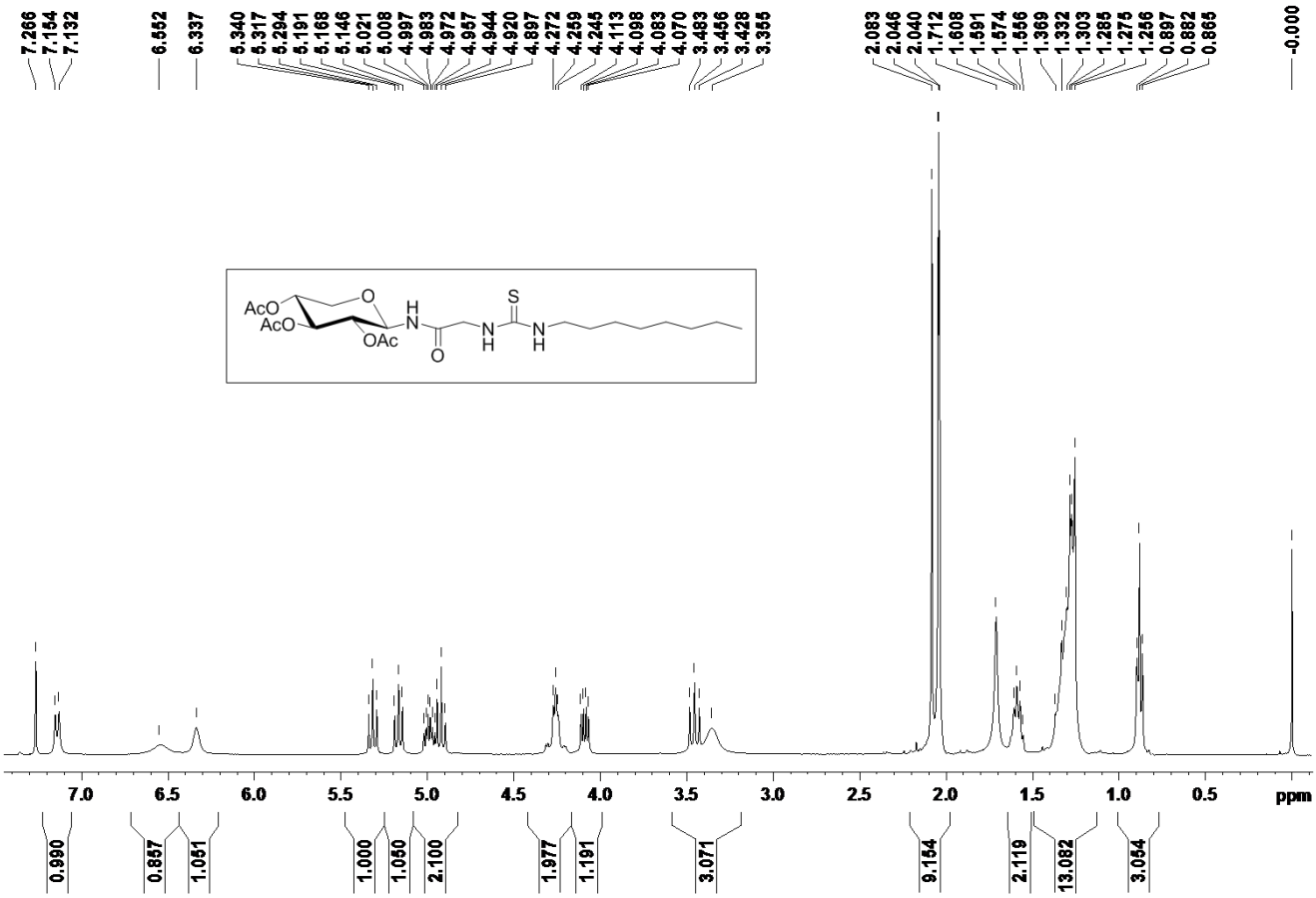

Figure S23 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-β-D-xylopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(27)**

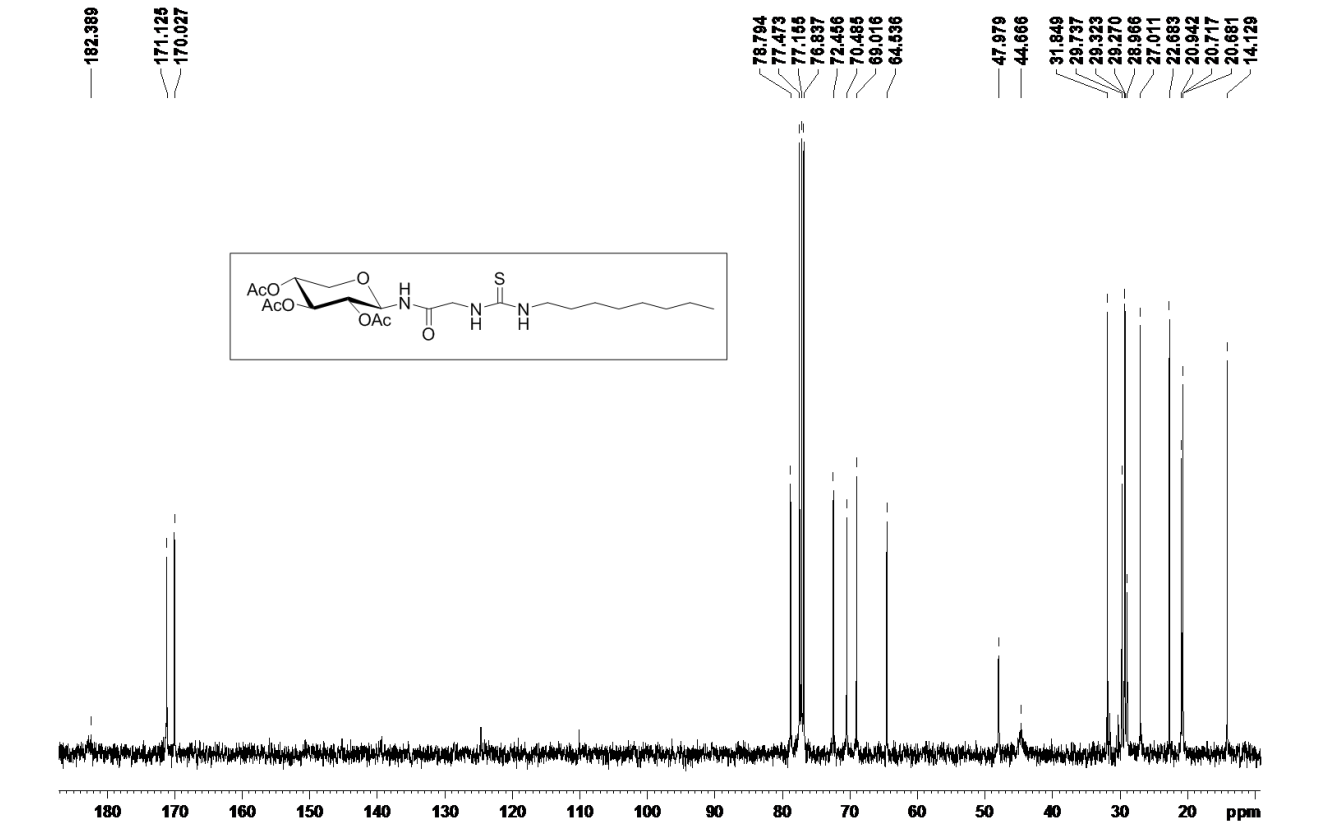

Figure S24 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-β-D-xylopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(27)**

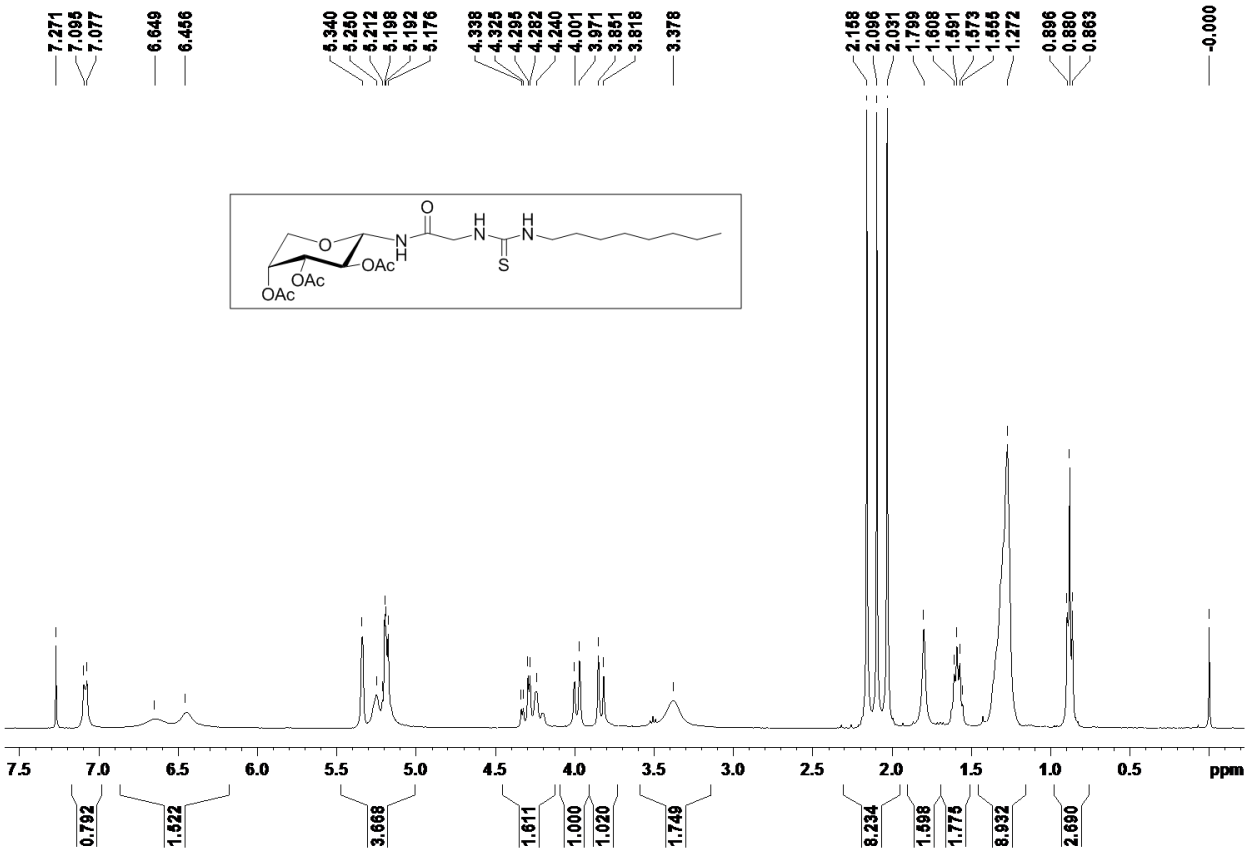

Figure S25 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-D-arabinopyranosyl)-*N''*-(*n*-octyl)-thioureidoacetamide **(28)**

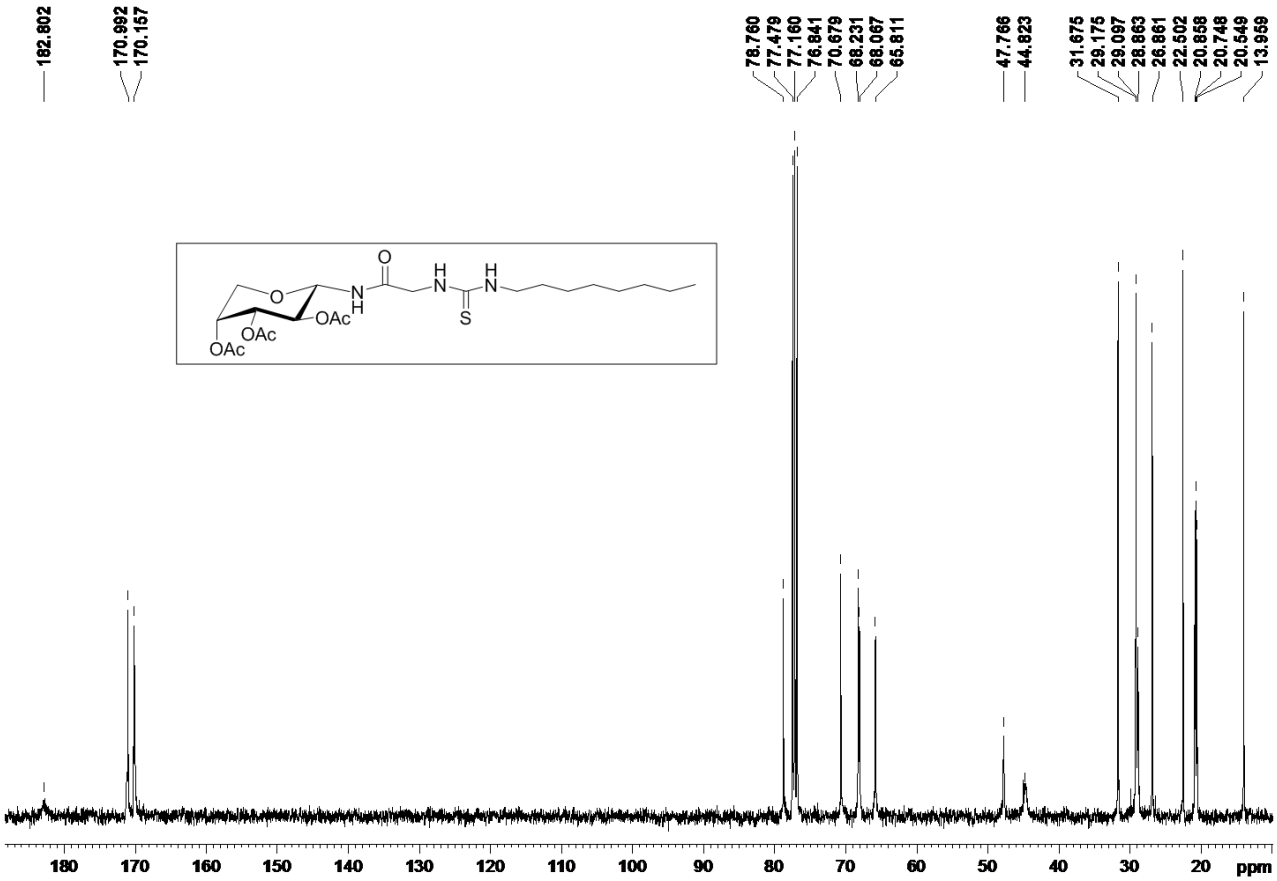

Figure S26 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-D-arabinopyranosyl)-*N''*-(*n*-octyl)-thioureidoacetamide **(28)**

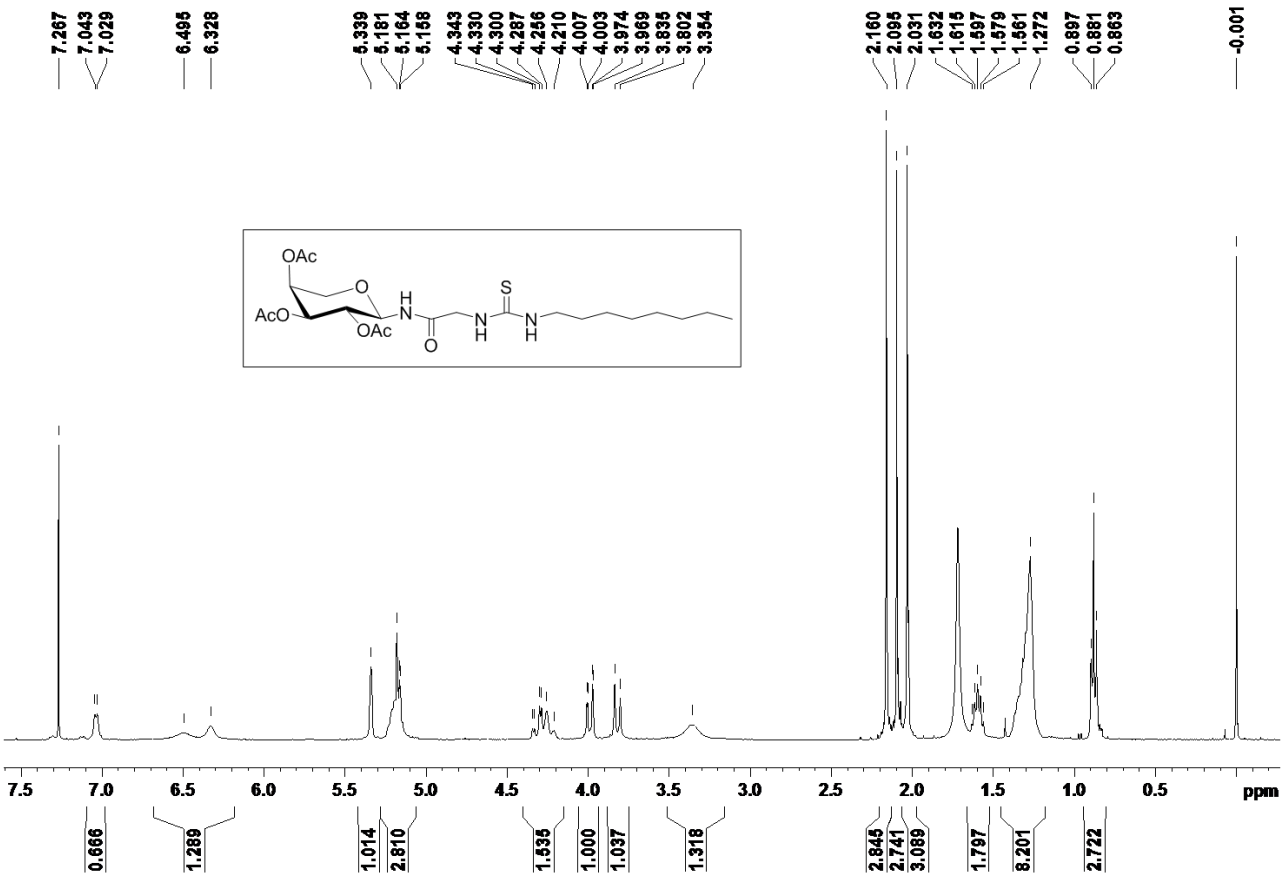

Figure S27 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-L-arabinopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(29)**

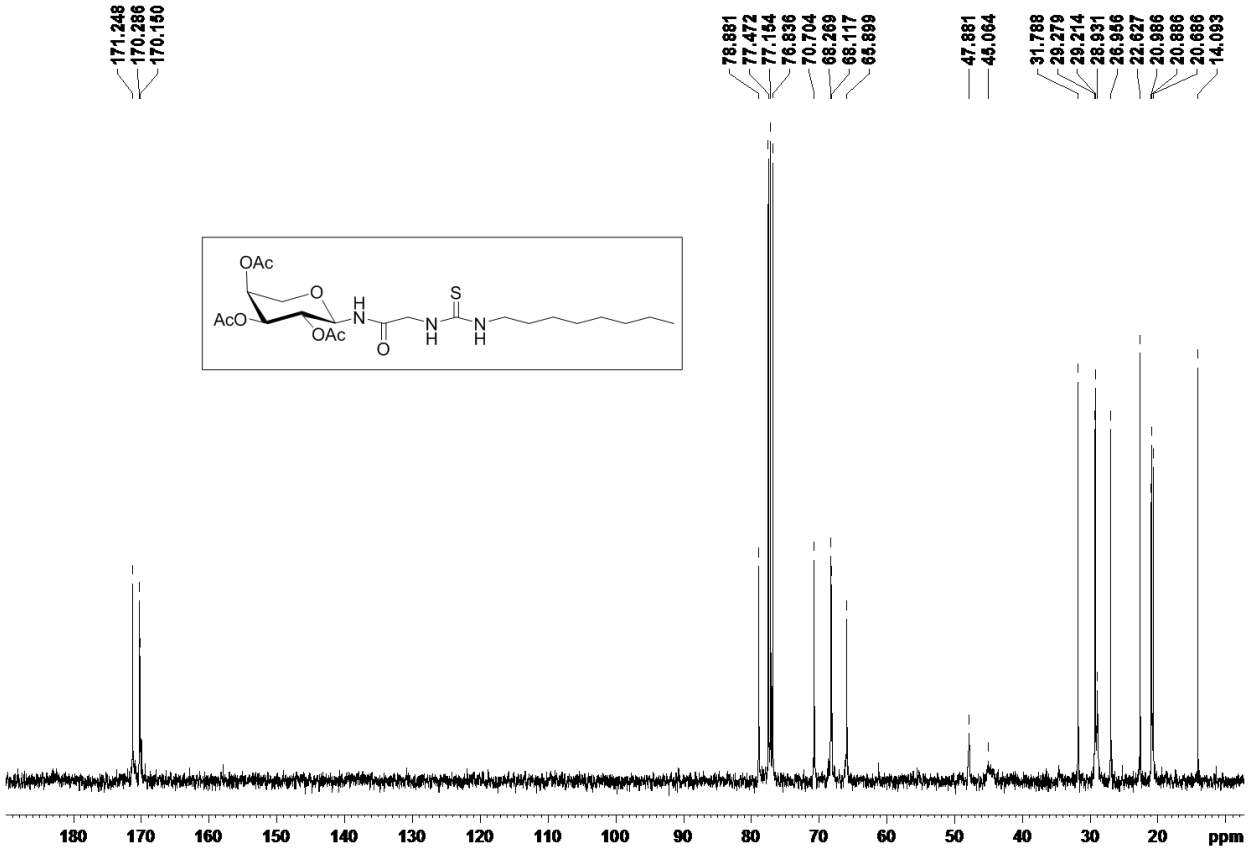

Figure S28 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-L-arabinopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(29)**

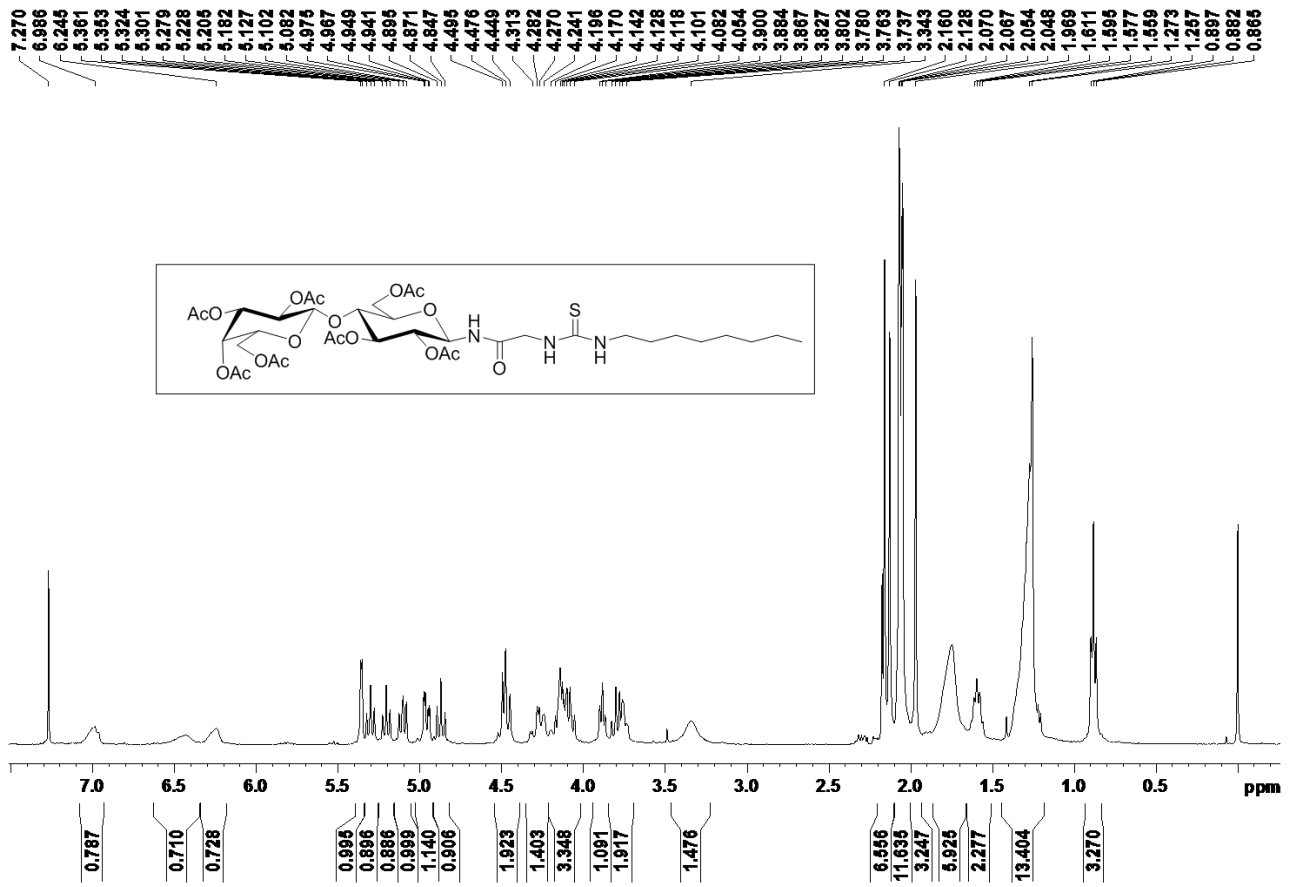

Figure S29 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-β-D-galactopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(30)**

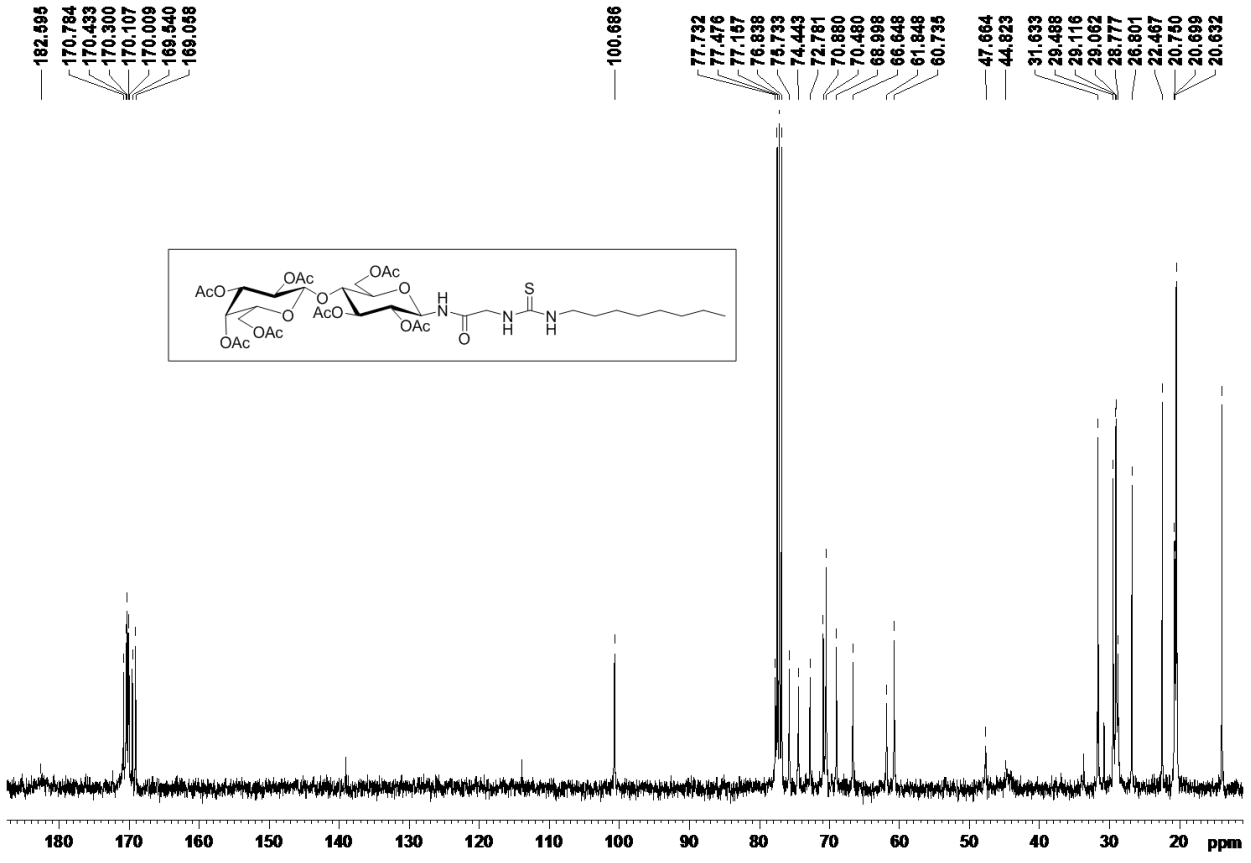

Figure S30 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-β-D-galactopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(30)**

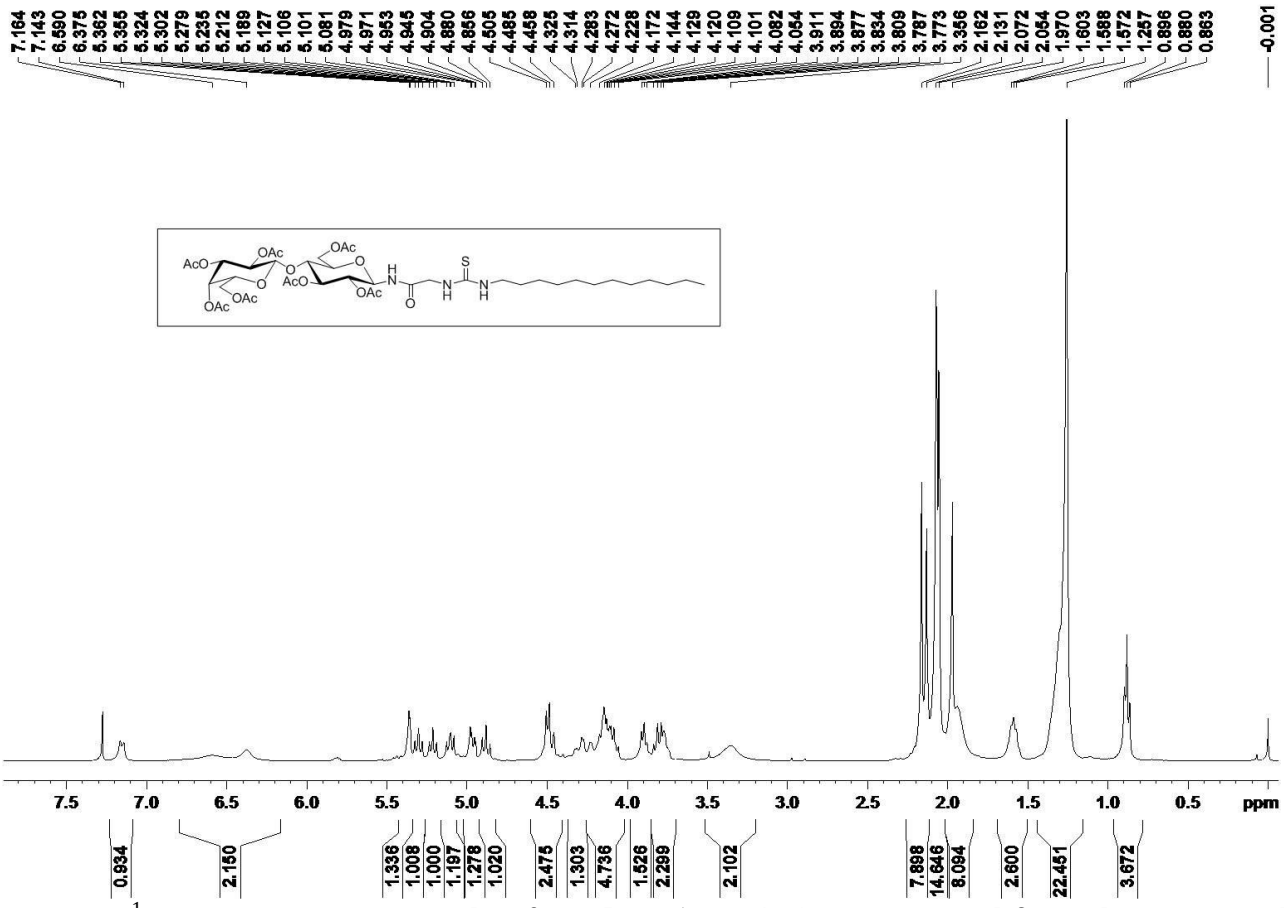

Figure S31 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-β-D-galactopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thioureidoacetamide **(31)**

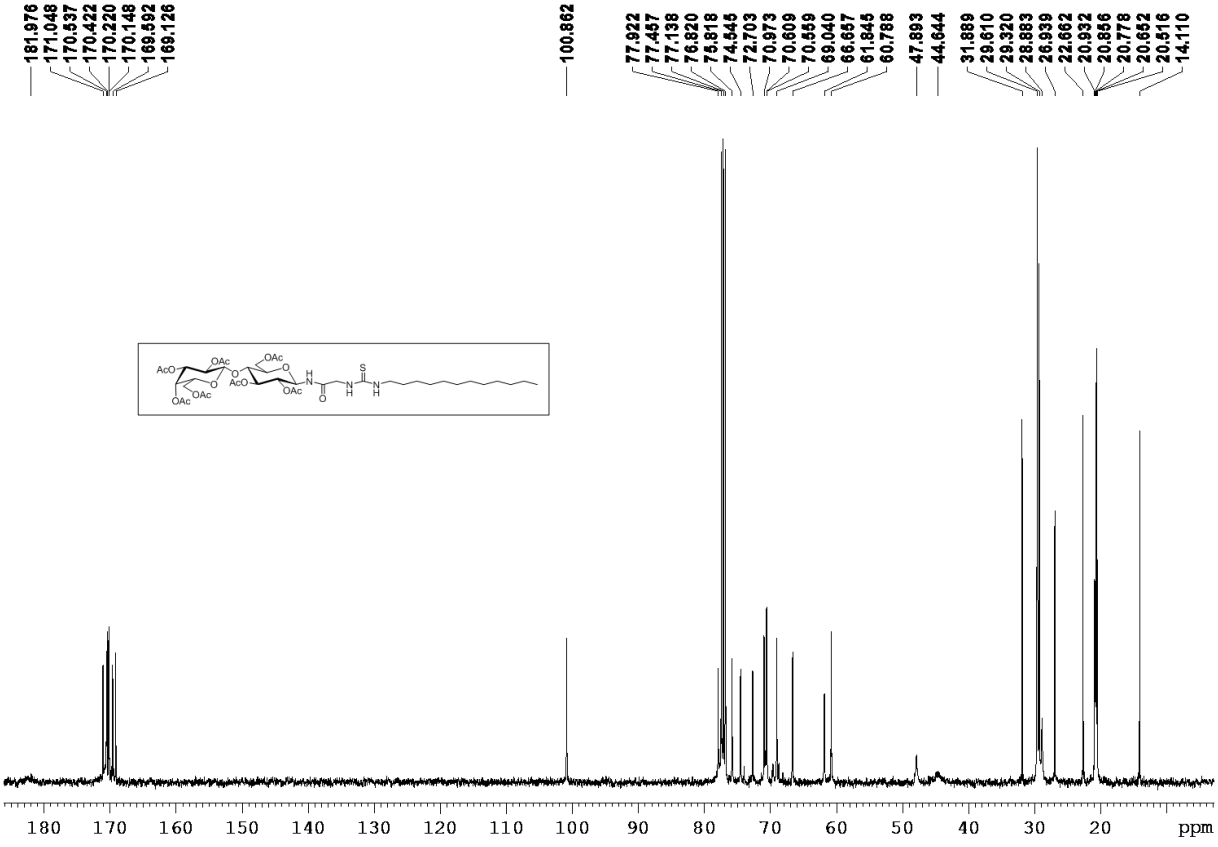

Figure S32 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-β-D-galactopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thioureidoacetamide **(31)**

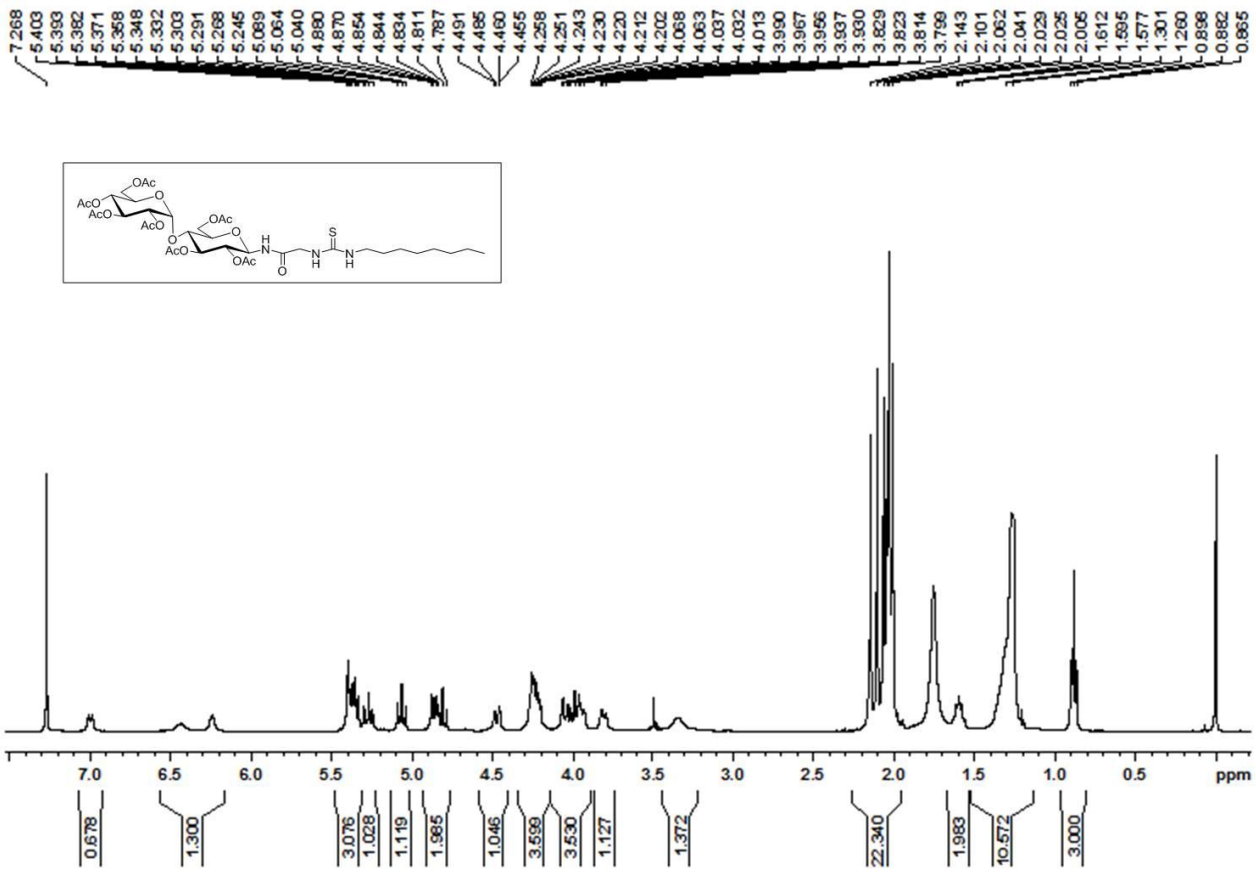

Figure S33 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(32)**

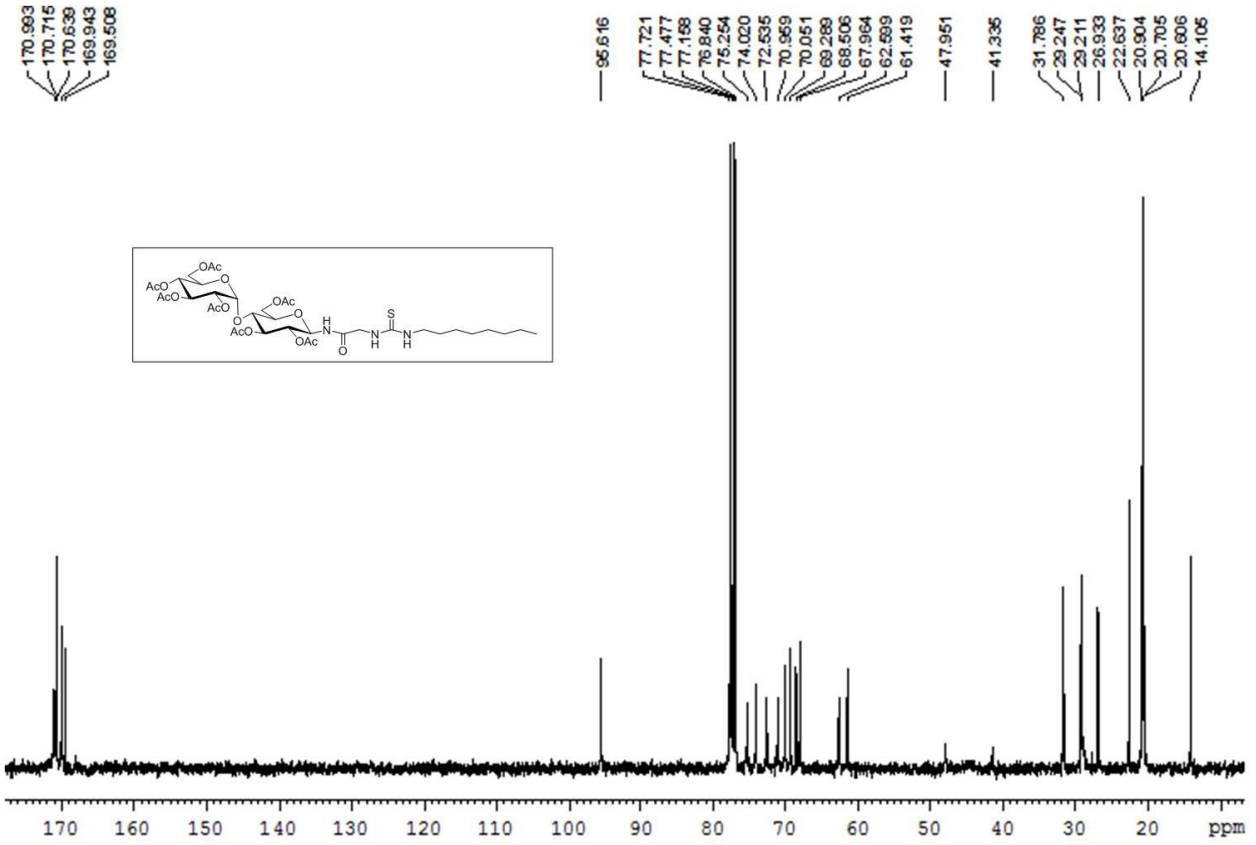

Figure S34 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(32)**

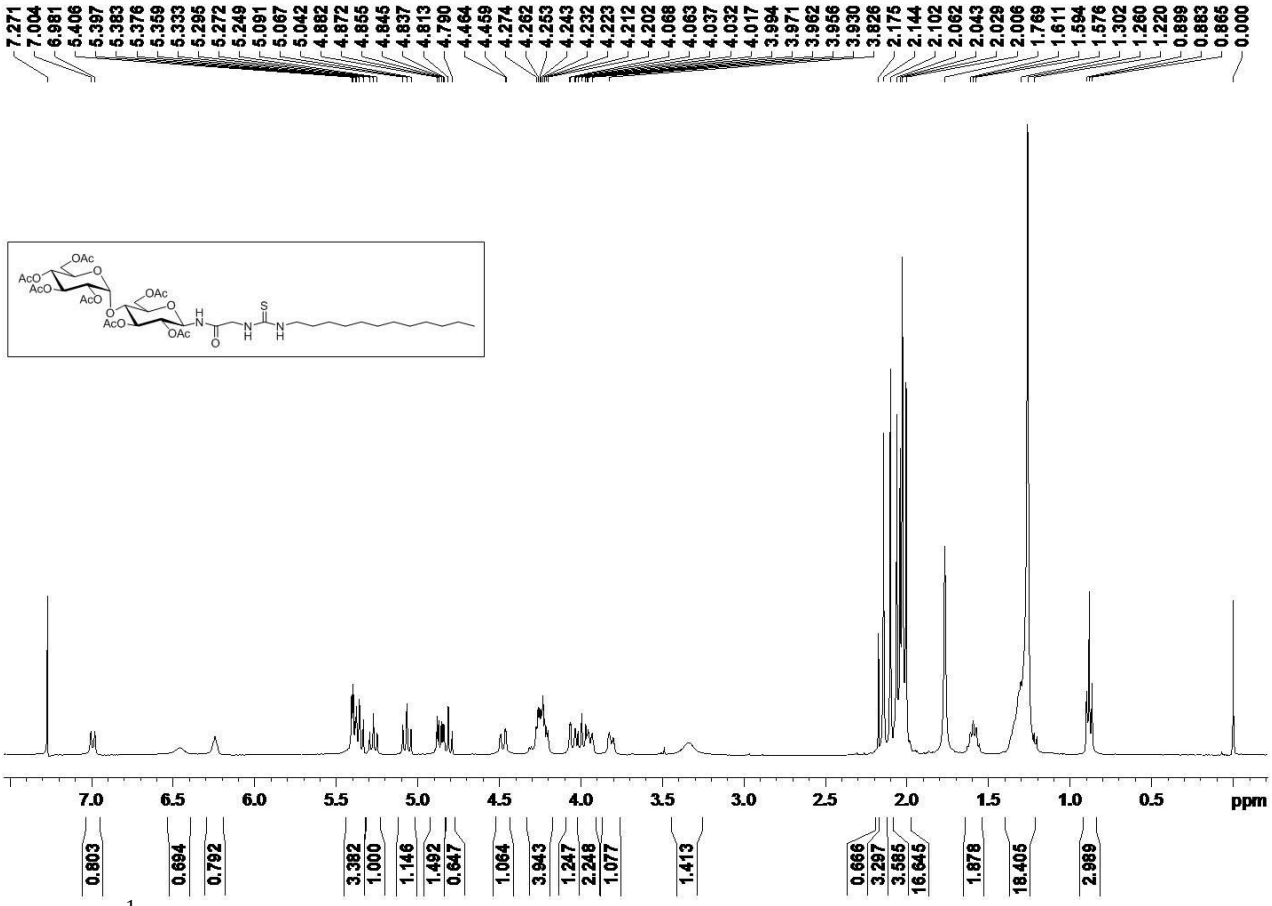

Figure S35 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thiouredoacetamide **(33)**

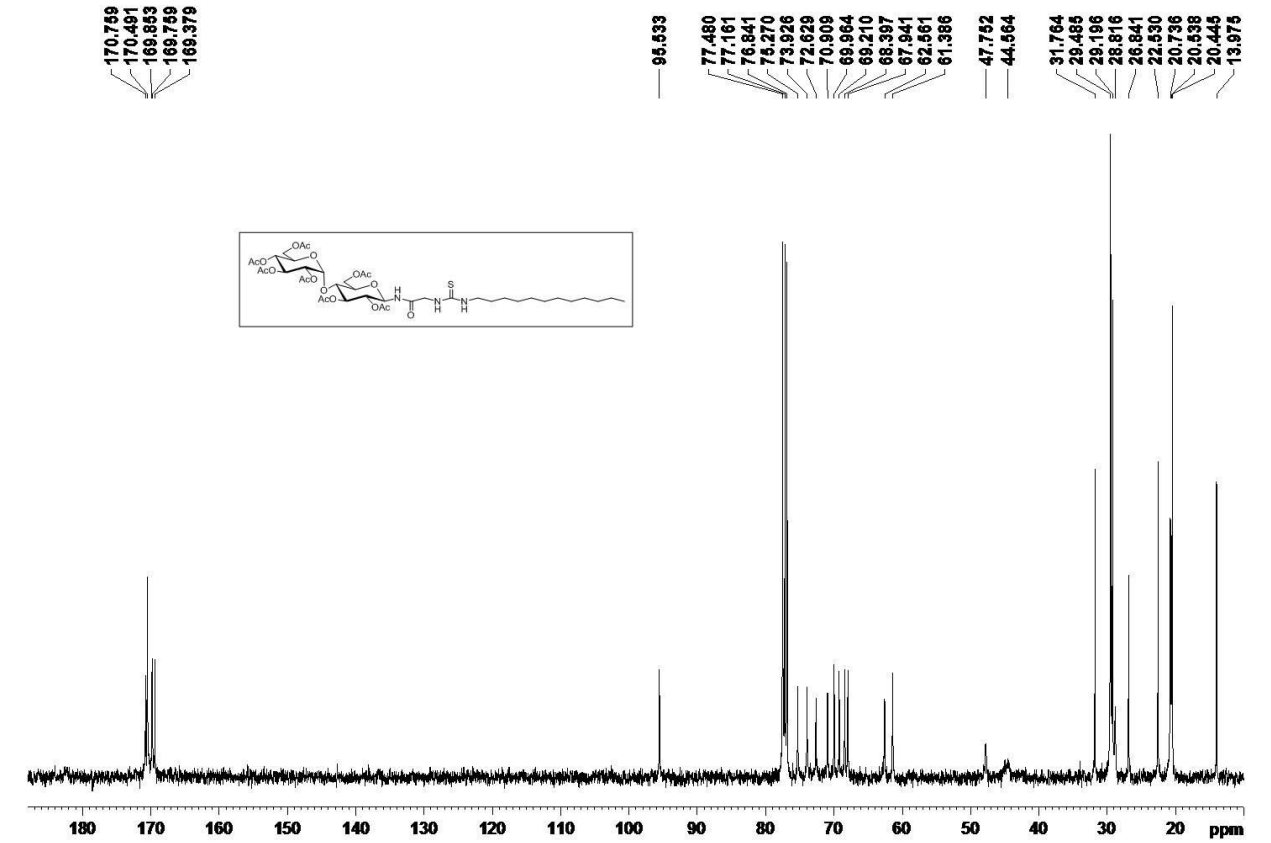

Figure S36 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thiouredoacetamide **(33)**

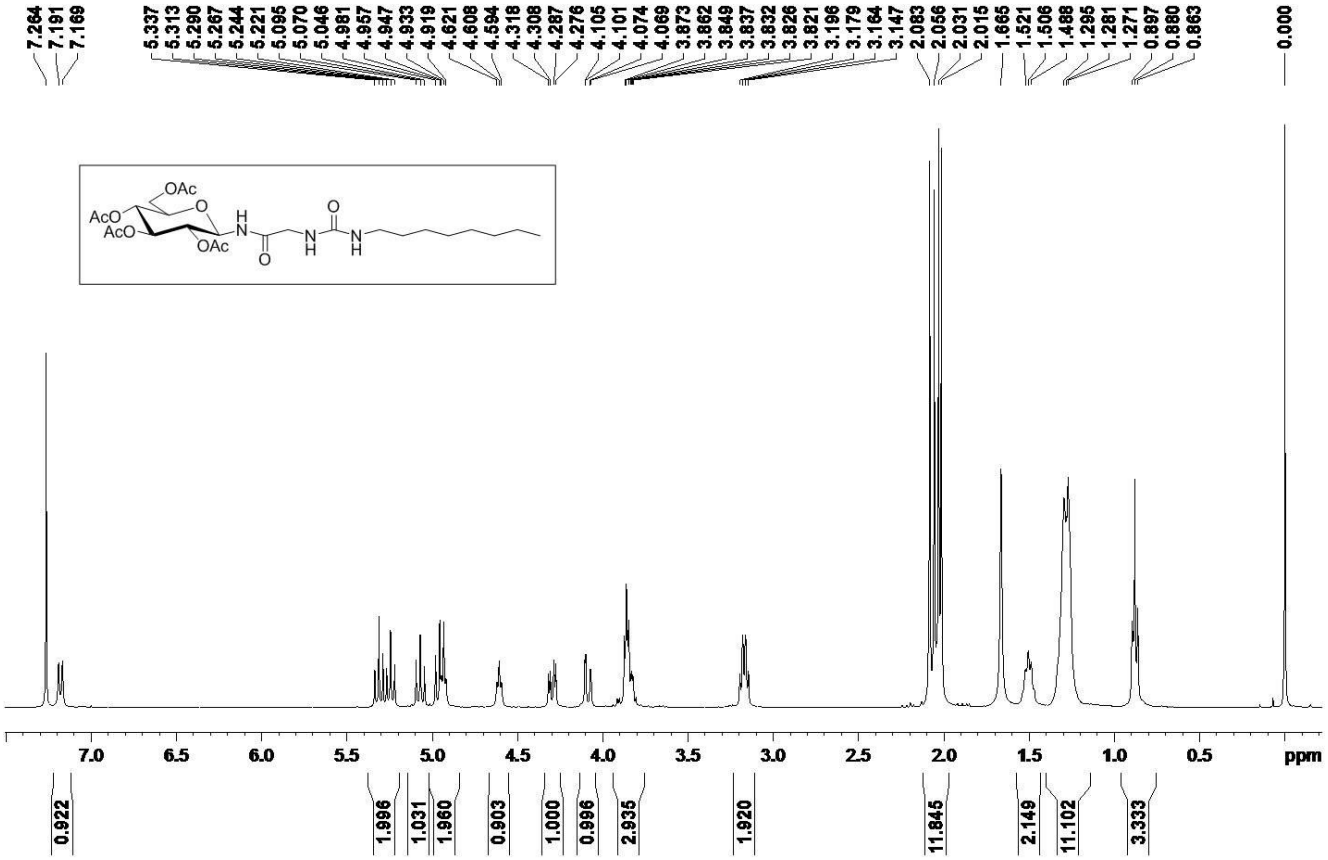

Figure S37 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-Tetra-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(34)**

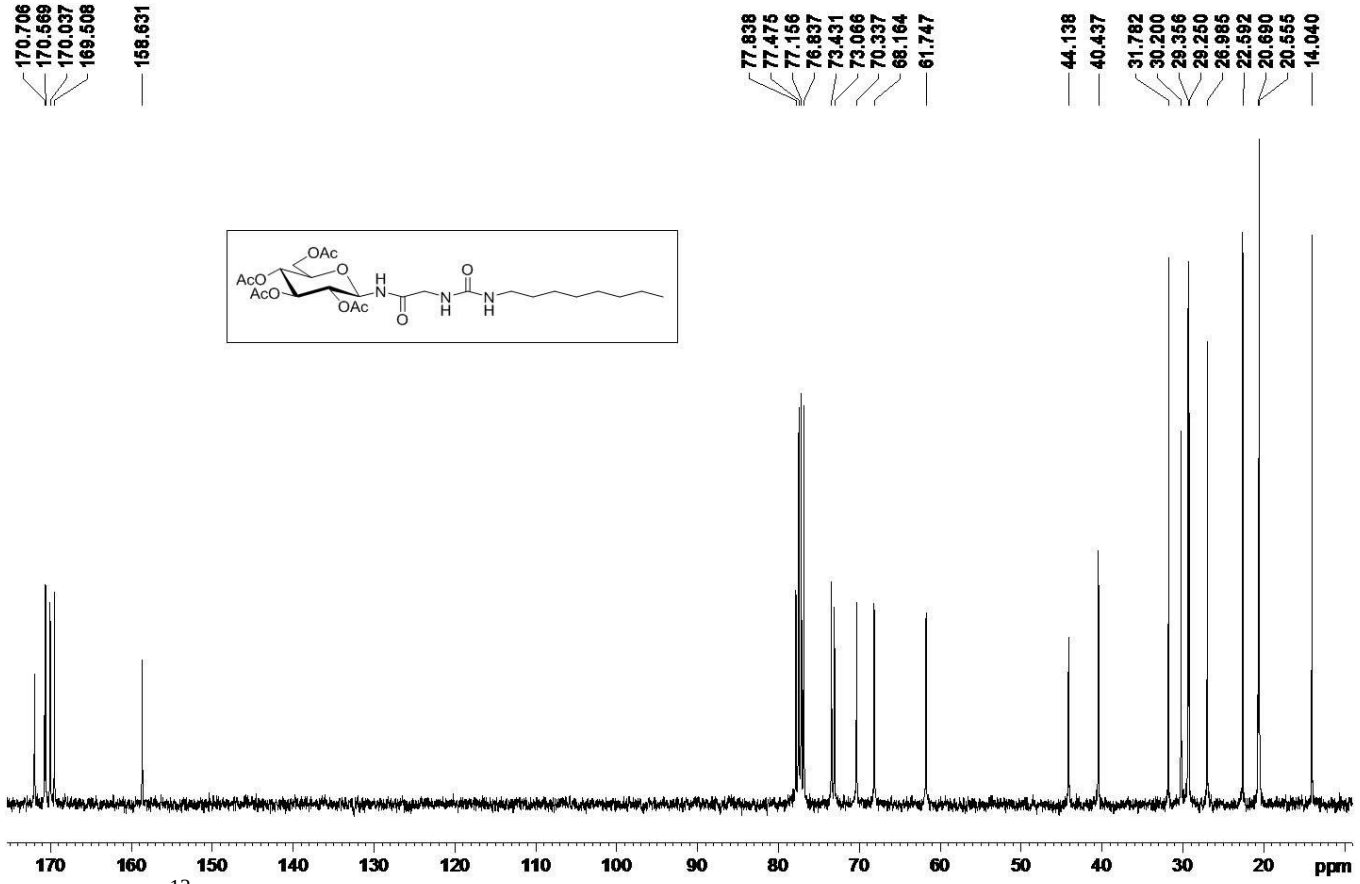

Figure S38 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(34)**

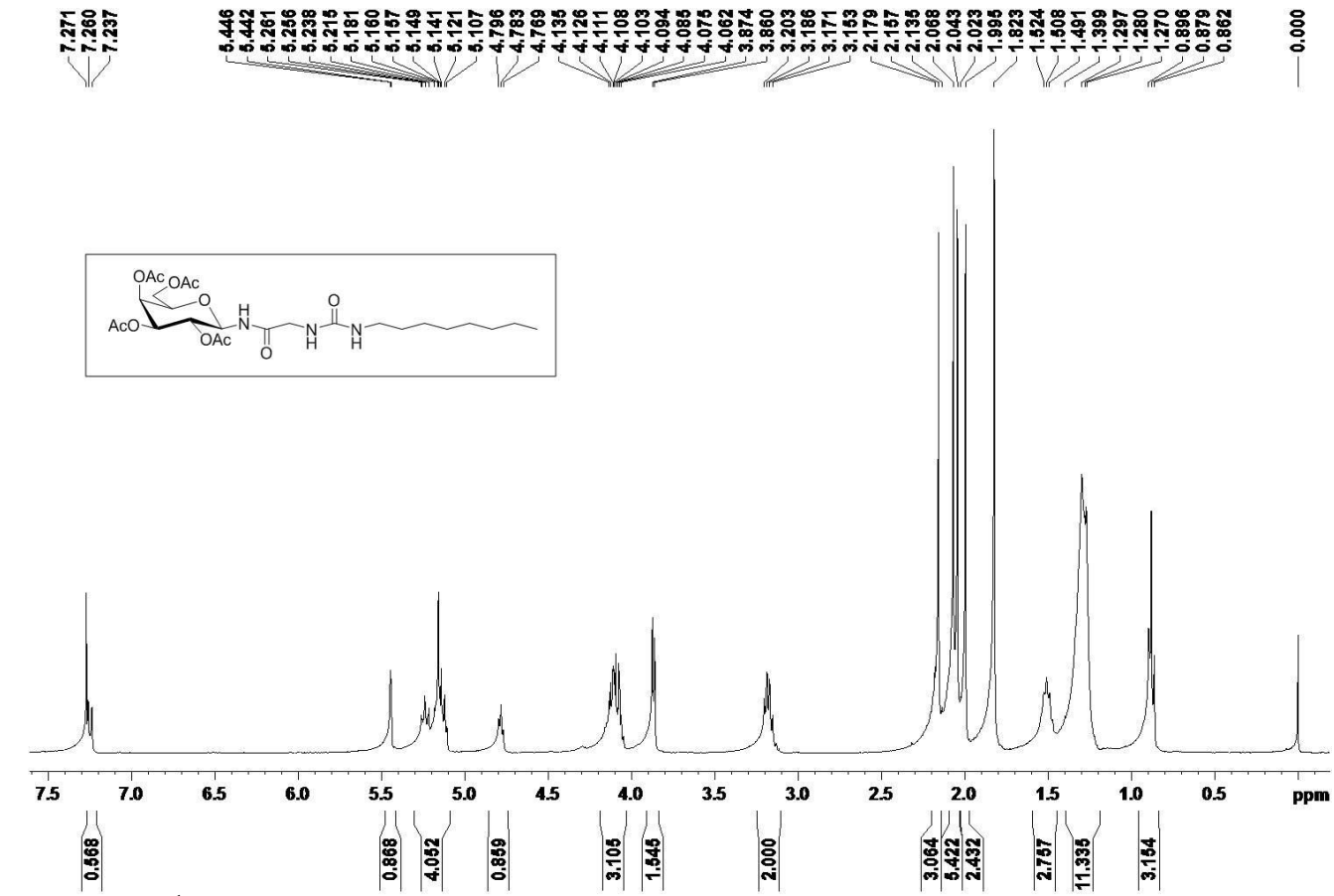

Figure S39 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(35)**

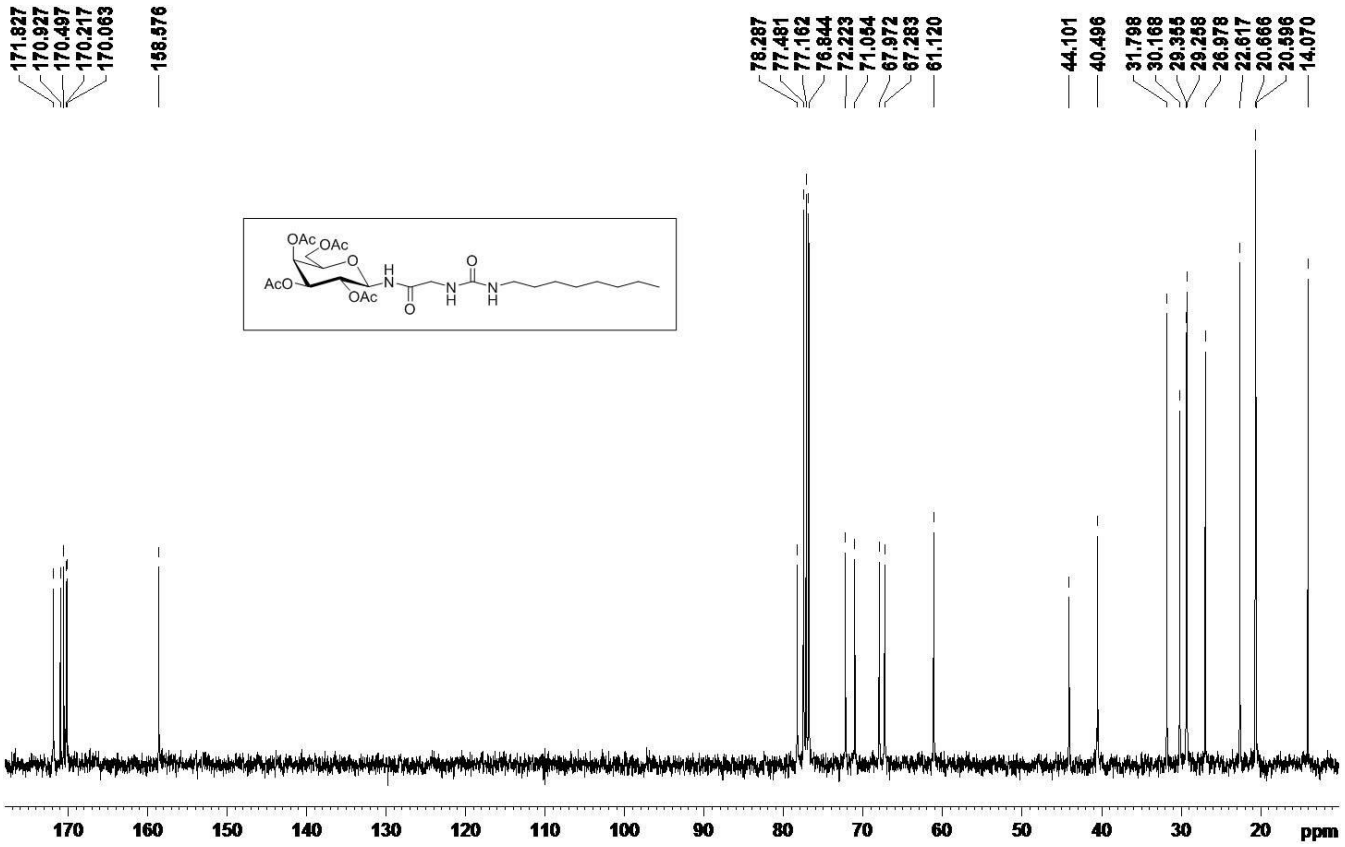

Figure S40 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(35)**

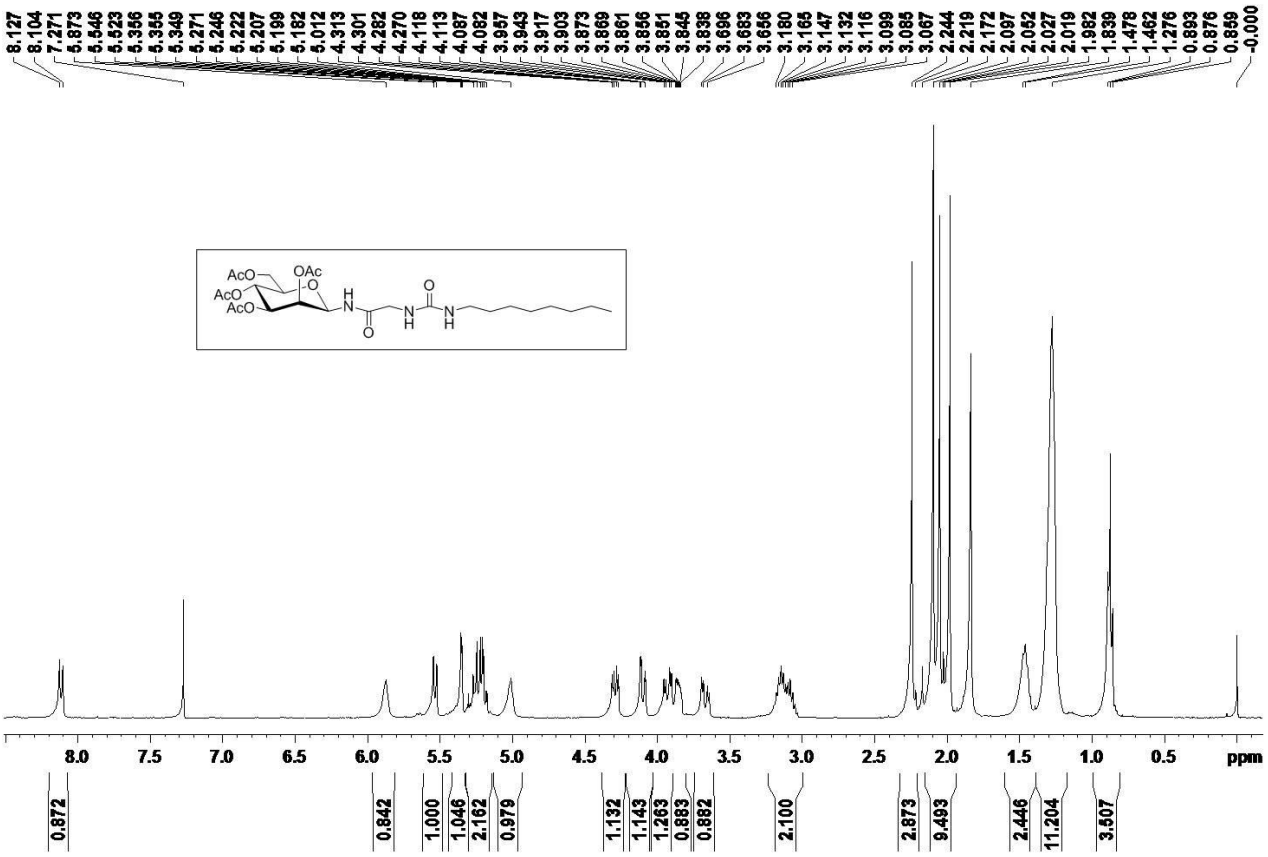

Figure S41 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-mannopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(36)**

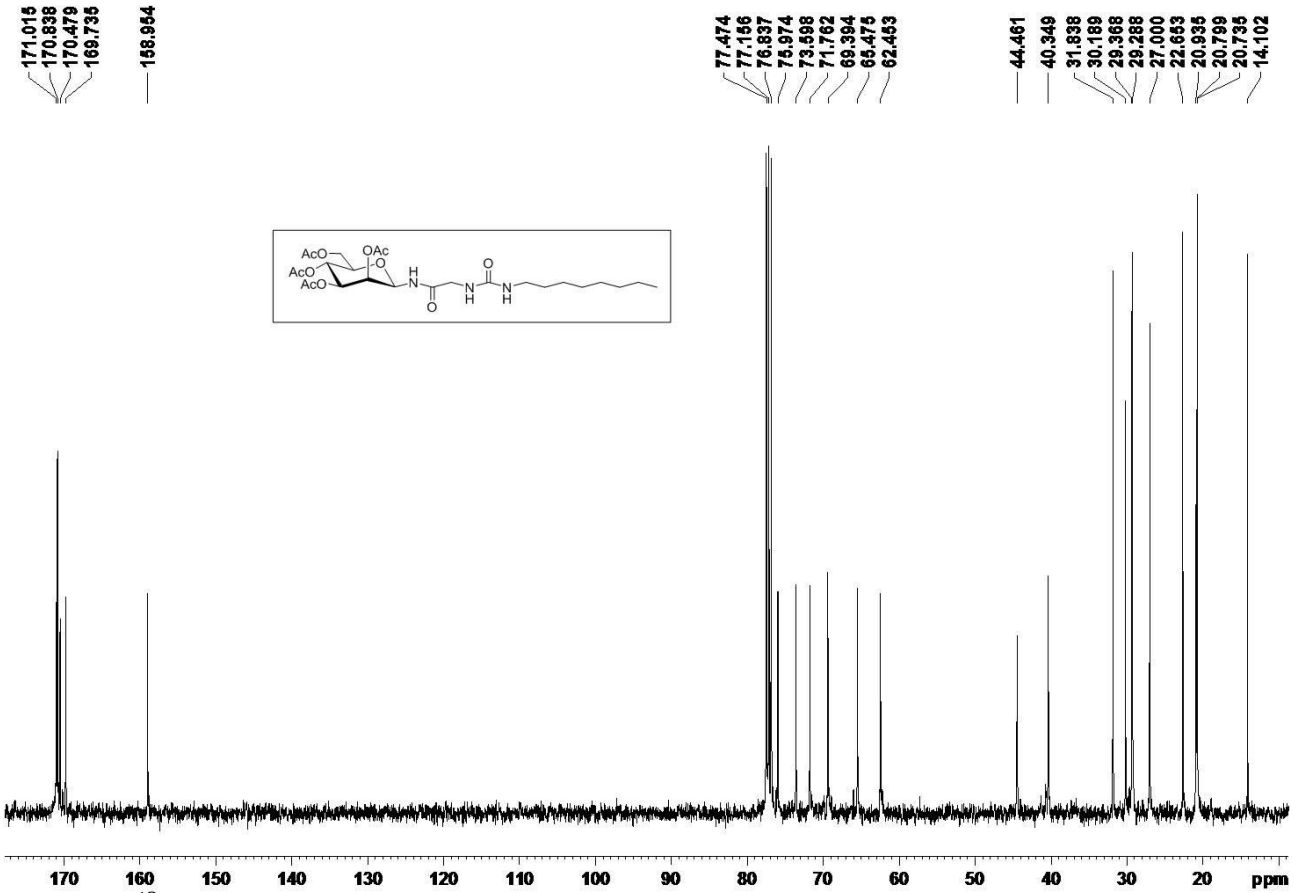

Figure S42 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4,6-tetra-*O*-acetyl-β-D-mannopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(36)**

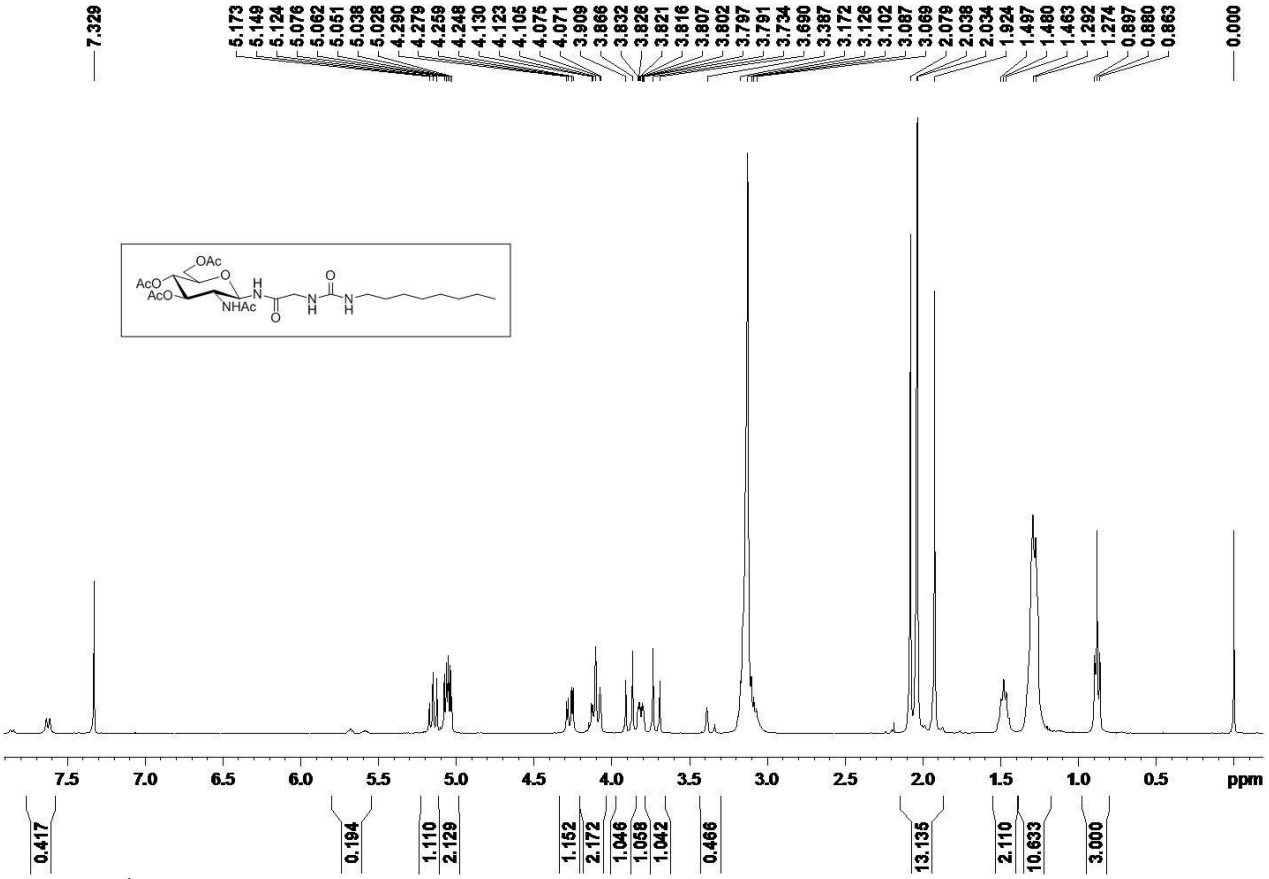

Figure S43 ^{1}H-NMR (400 MHz, CD_3OD + $CDCl_3$) of 1-*N*-(2-deoxy-2-acetamido-3,4,6-tri-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(37)**

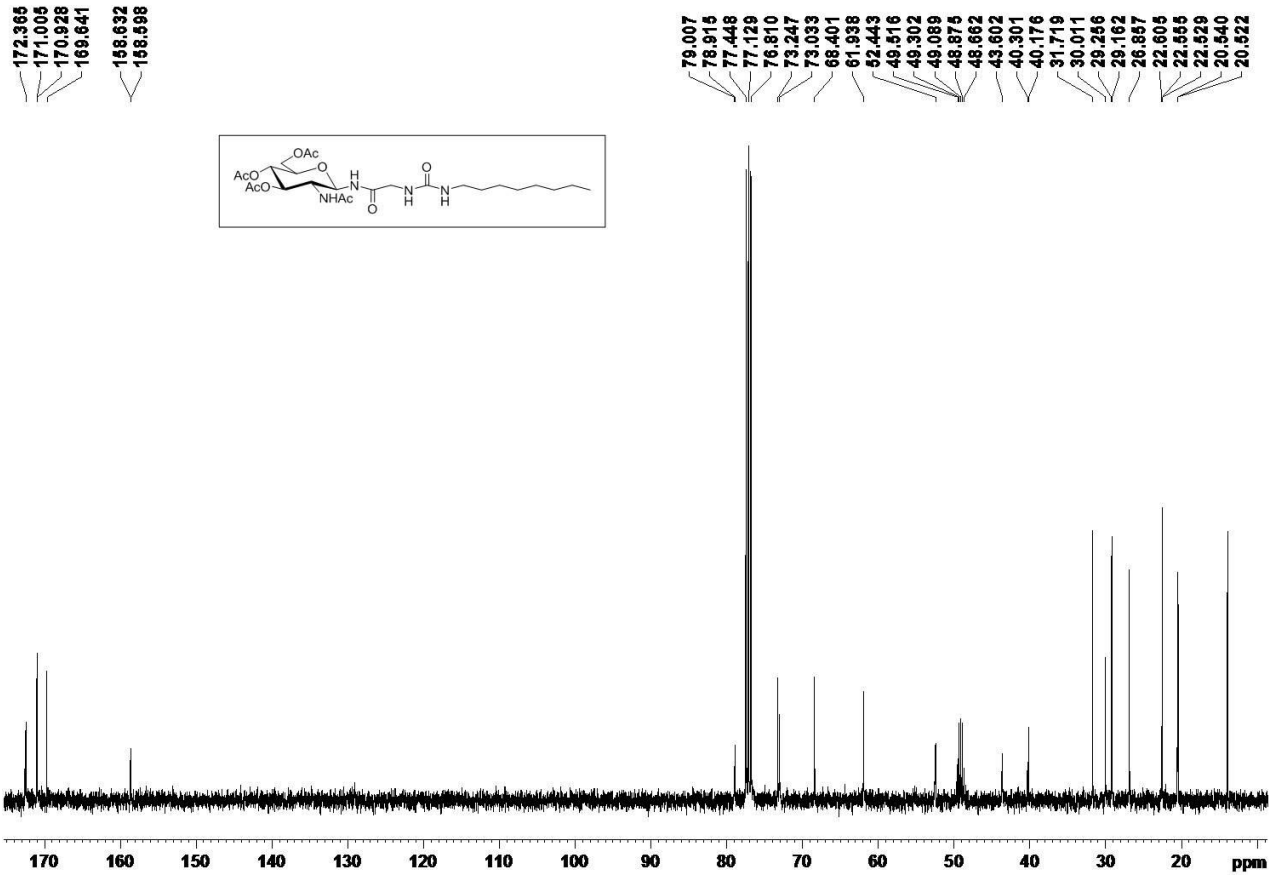

Figure S44 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(2-deoxy-2-acetamido-3,4,6-tri-*O*-acetyl-β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(37)**

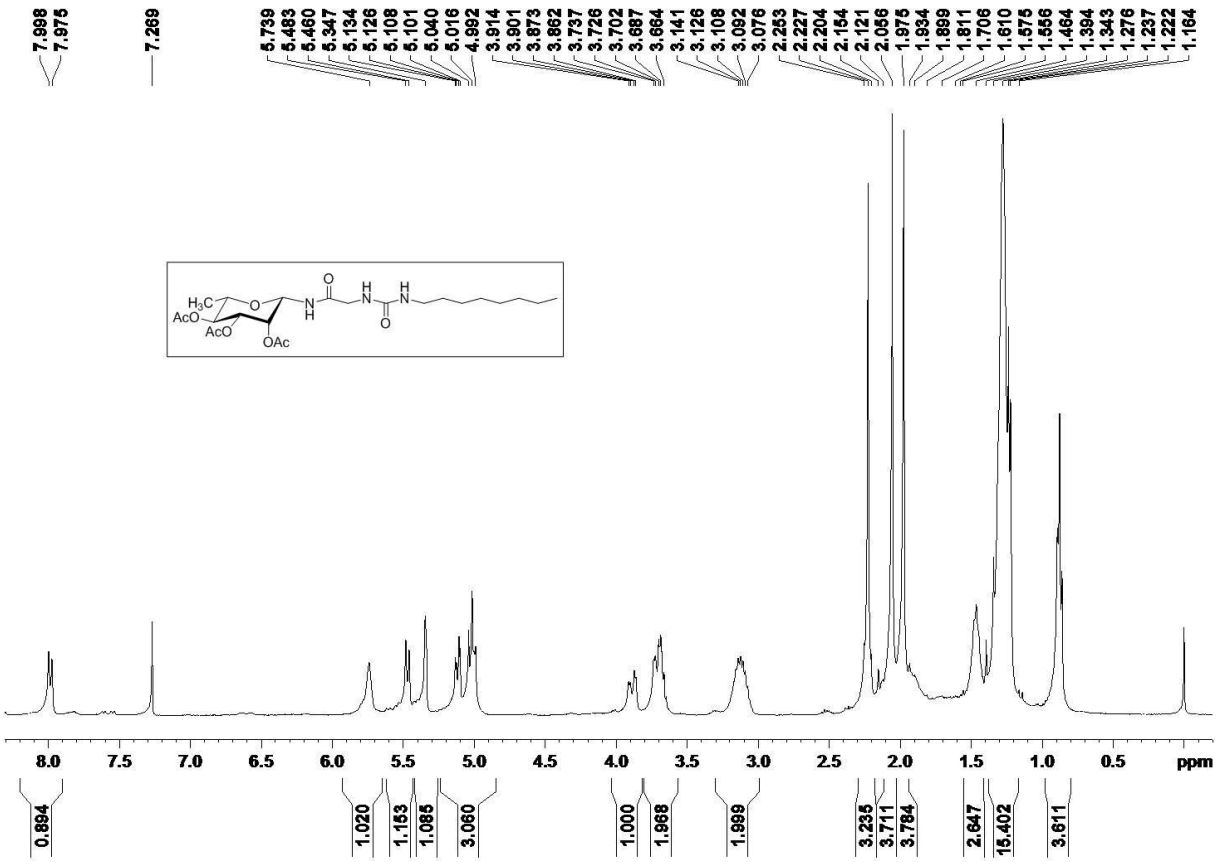

Figure S45 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-β-L-rhamnopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(38)**

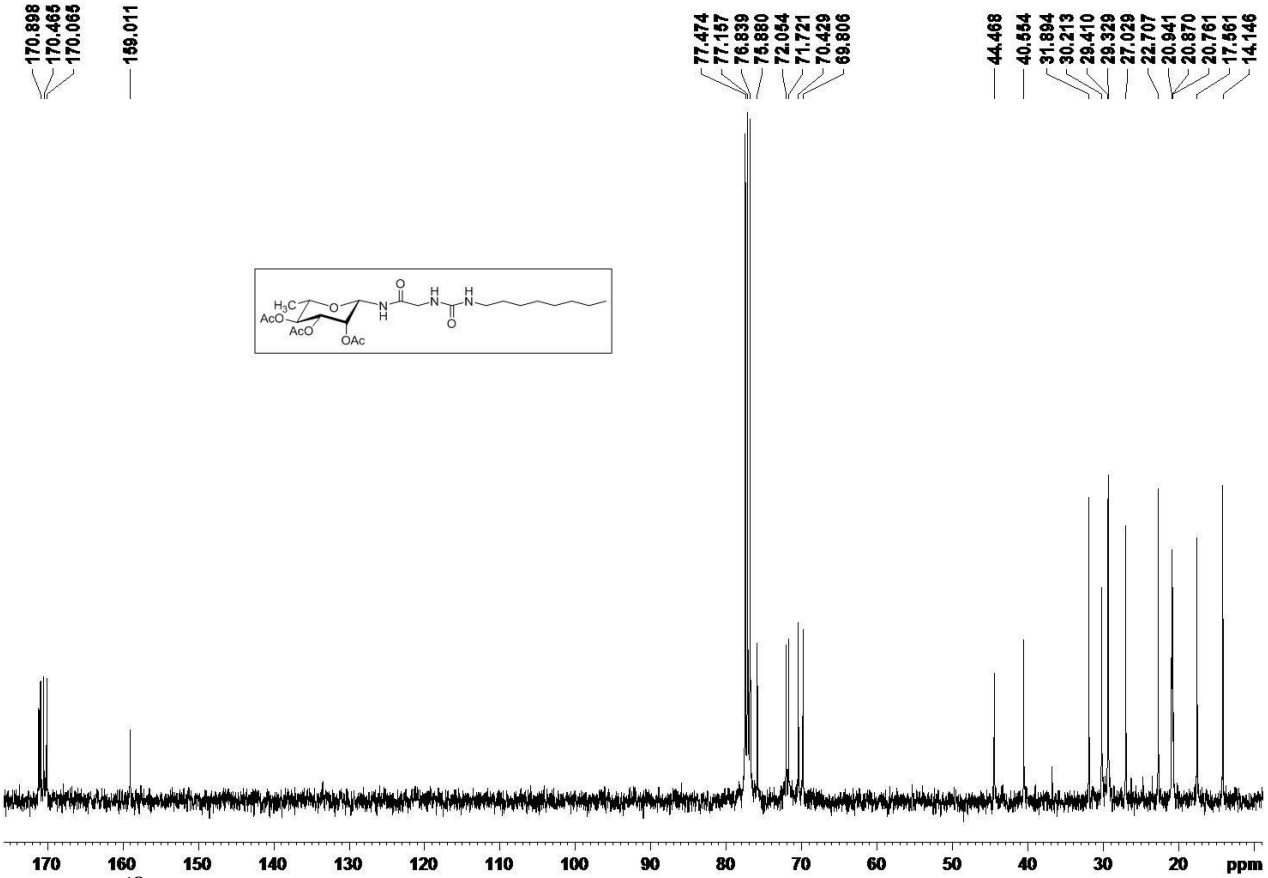

Figure S46 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-β-L-rhamnopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(38)**

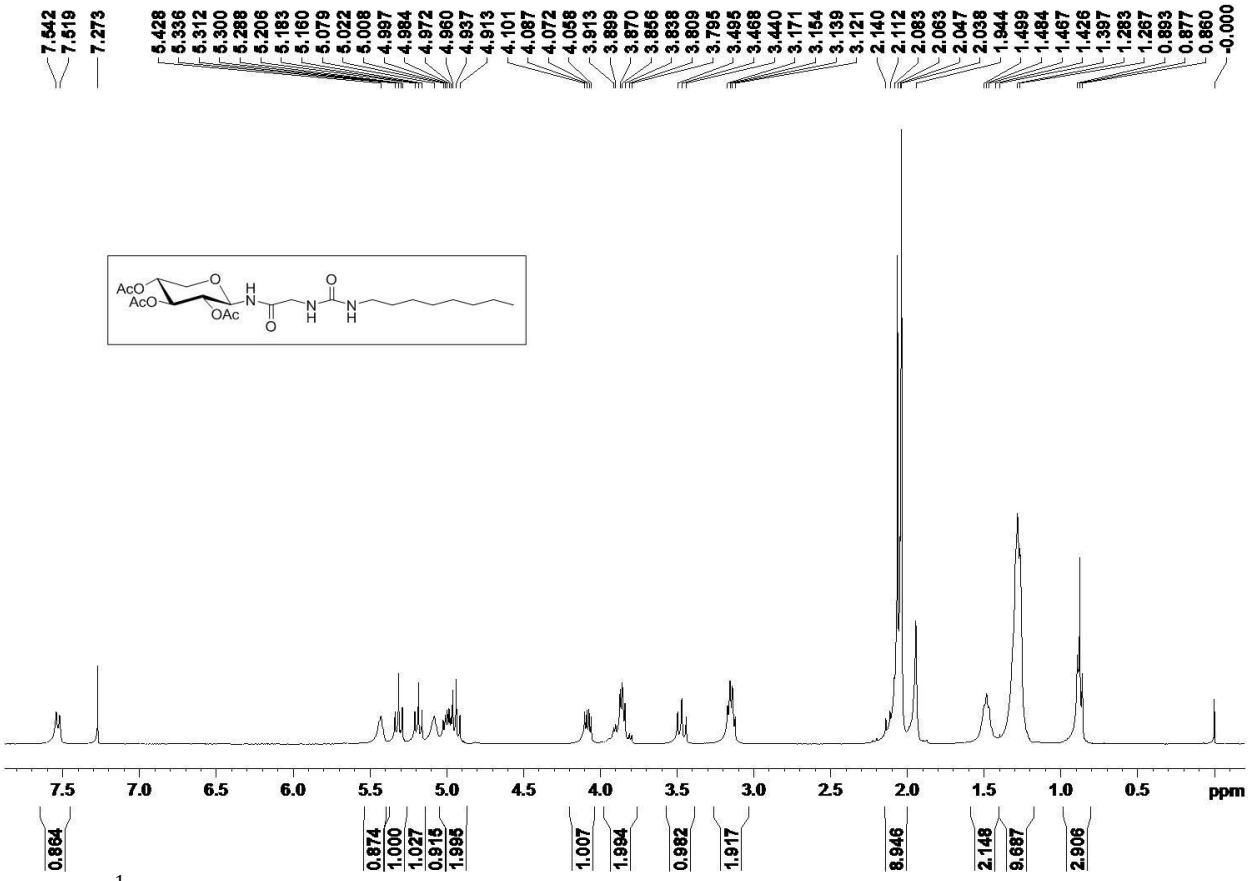

Figure S47 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-β-D-xylopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(39)**

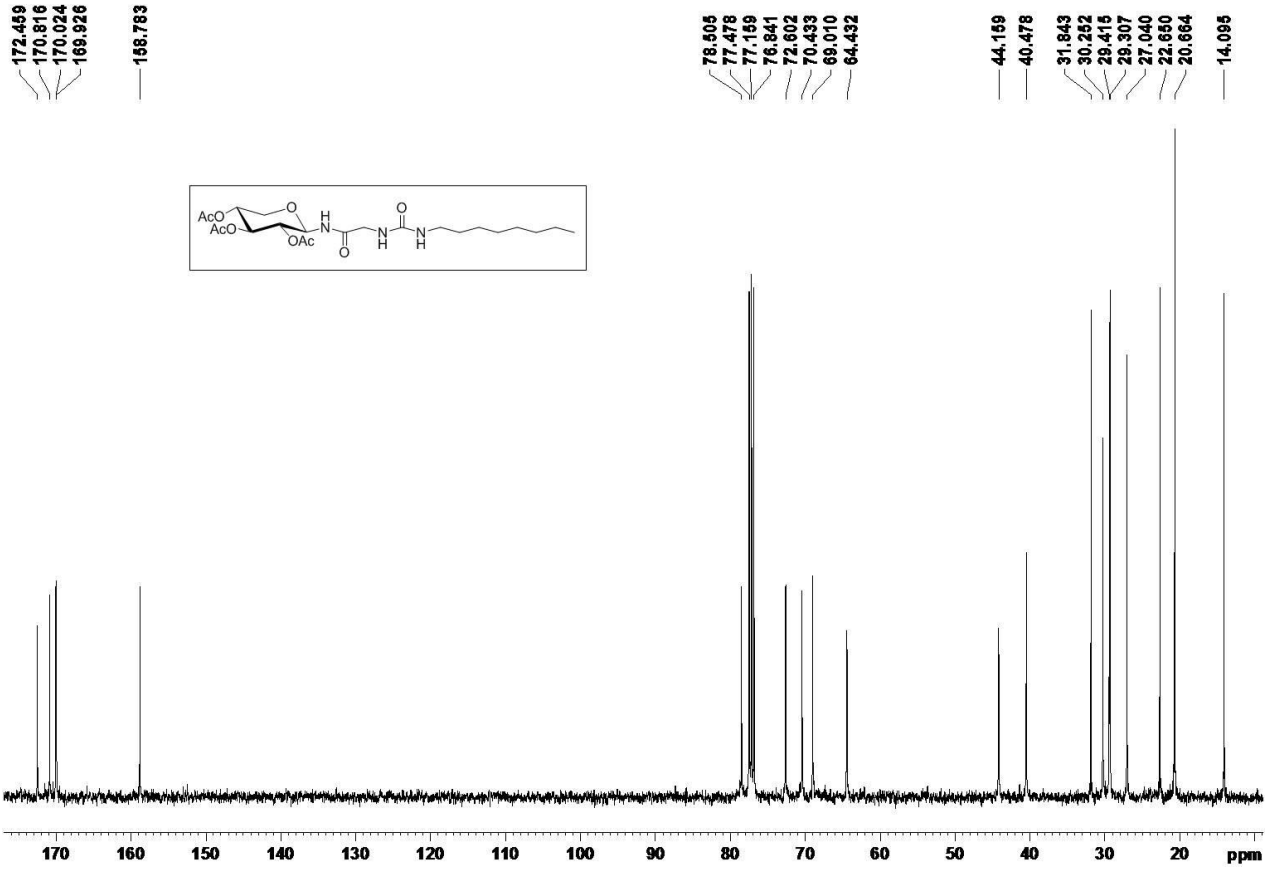

Figure S48 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-β-D-xylopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(39)**

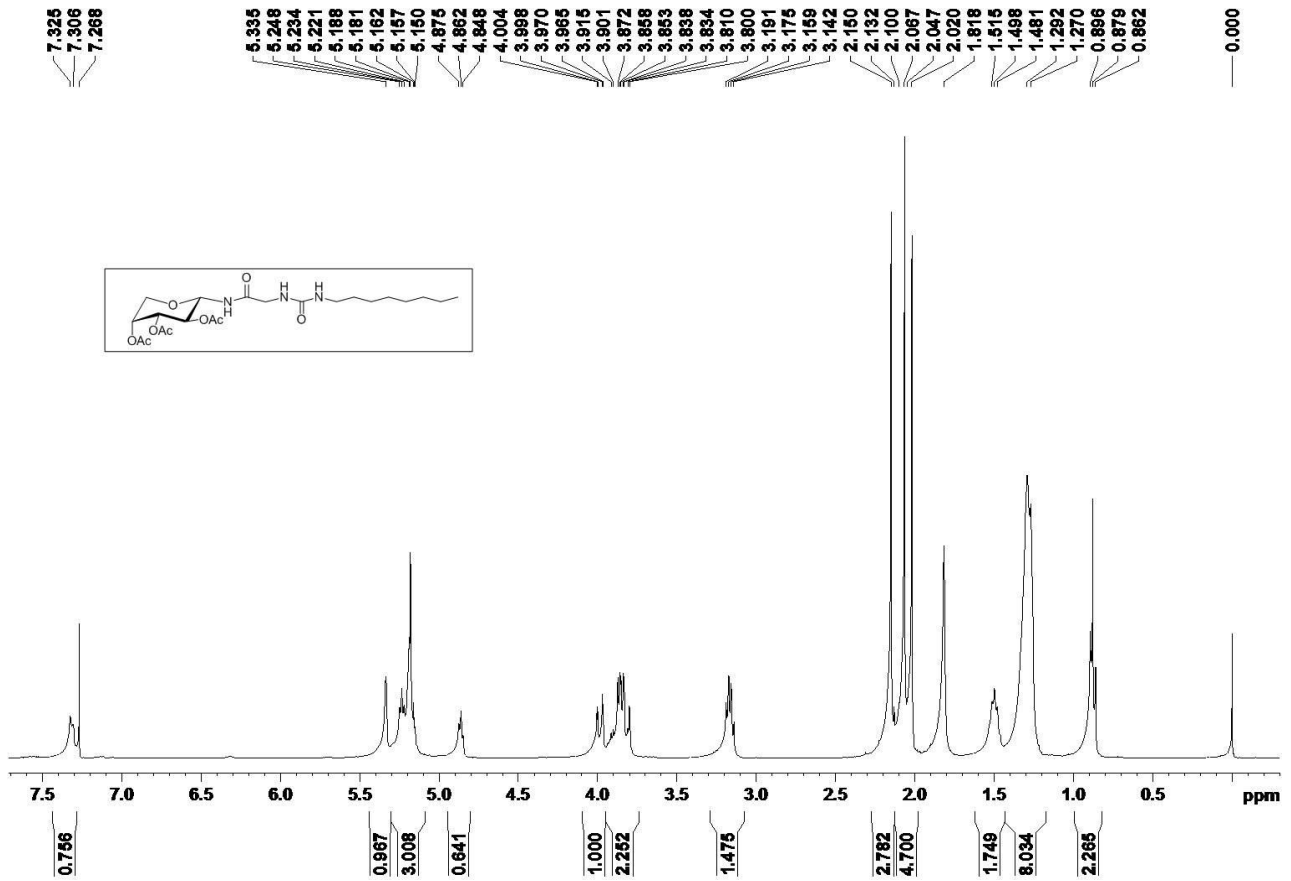

Figure S49 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-D-arabinopyranosyl)-*N''*-(*n*-octyl)-ureidoacetamide **(40)**

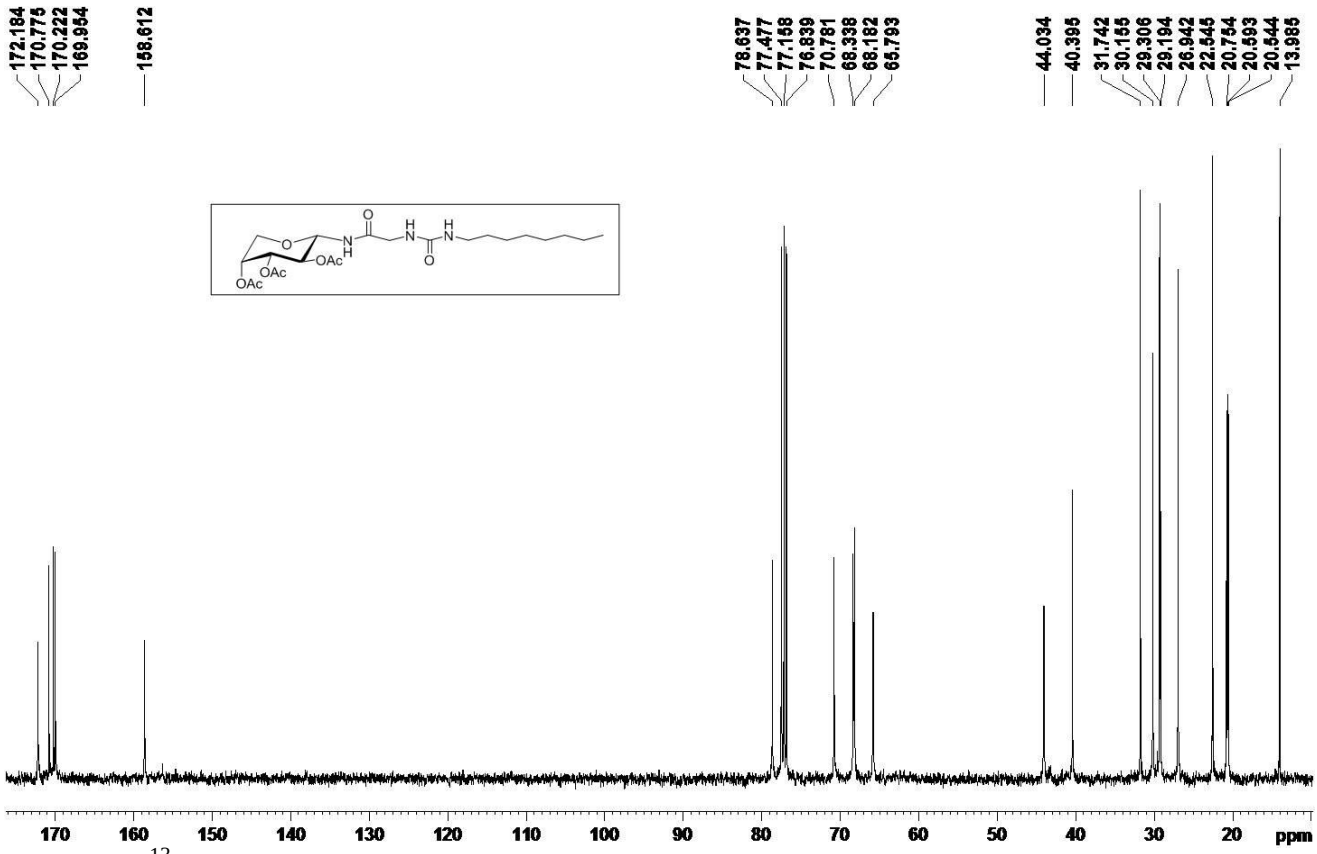

Figure S50 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-D-arabinopyranosyl)-*N''*-(*n*-octyl)-ureidoacetamide **(40)**

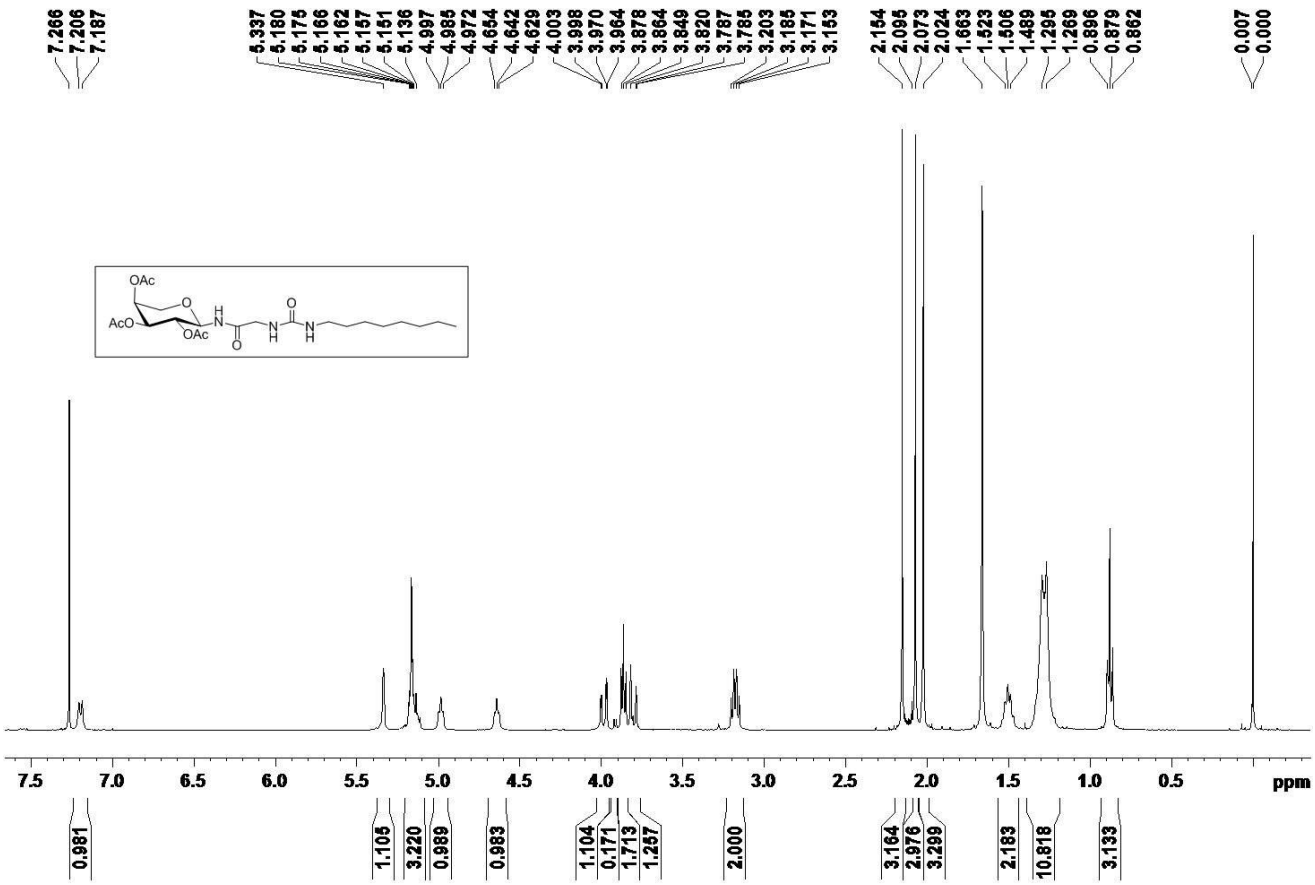

Figure S51 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-L-arabinopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(41)**

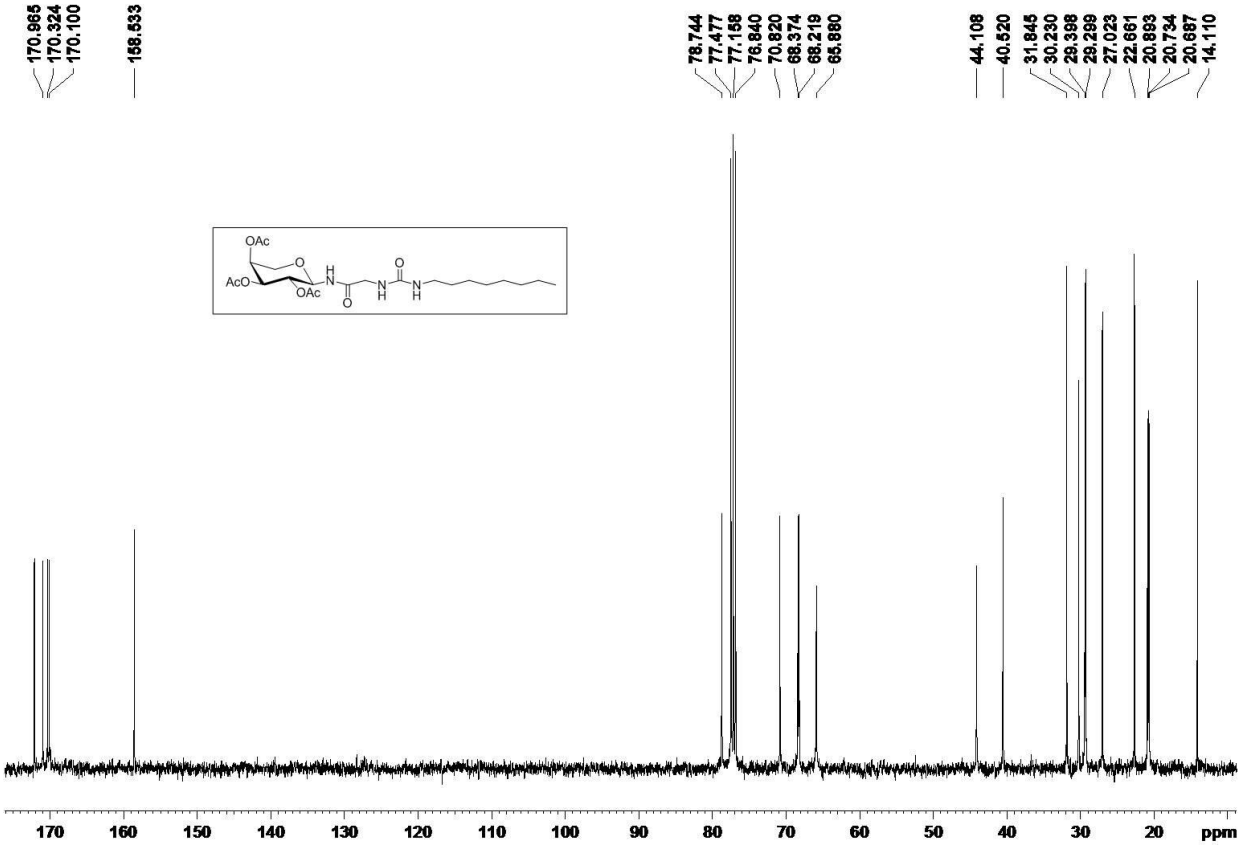

Figure S52 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-(2,3,4-tri-*O*-acetyl-α-L-arabinopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(41)**

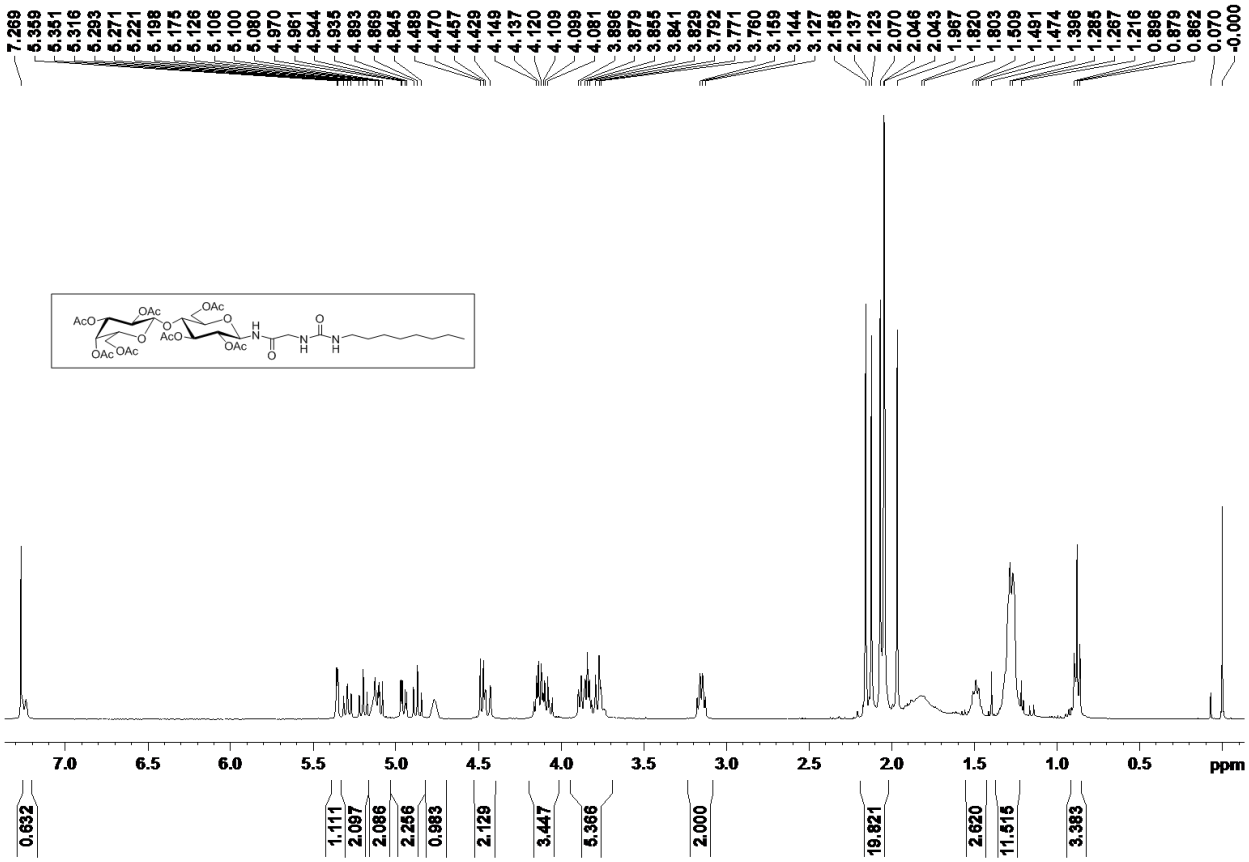

Figure S53 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-β-D-galactopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-ureidoacetamide **(42)**

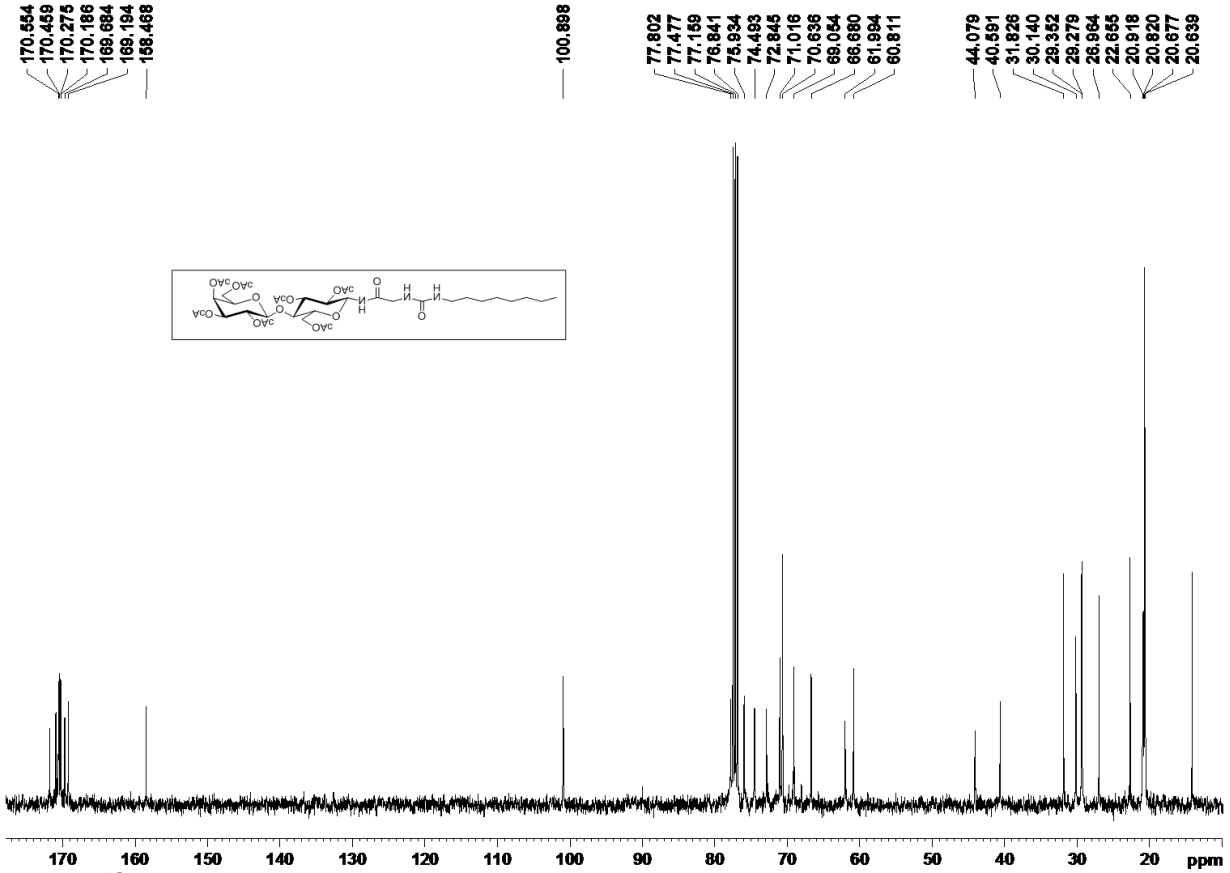

Figure S54 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-β-D-galactopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-ureidoacetamide **(42)**

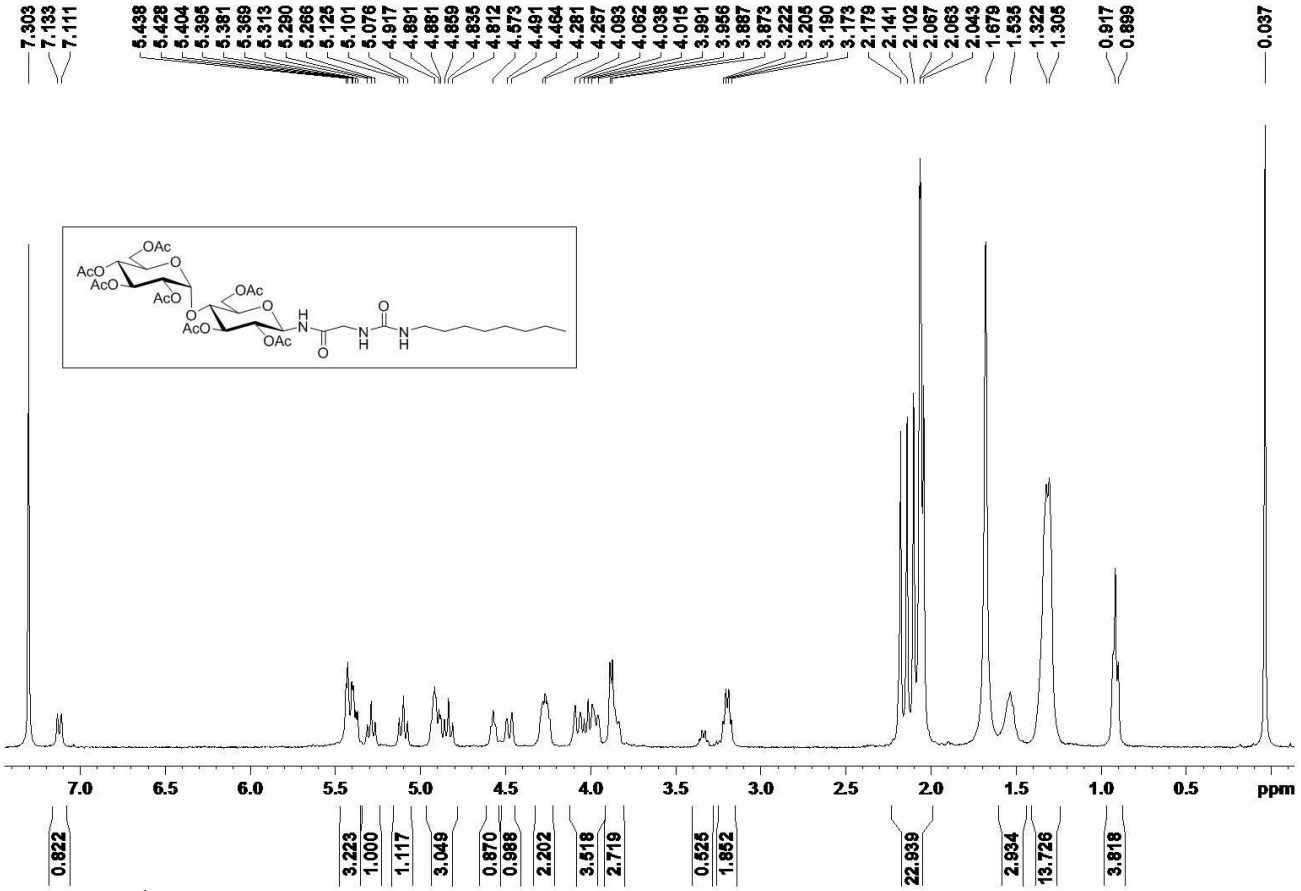

Figure S55 ^{1}H-NMR (400 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)- ureidoacetamide **(43)**

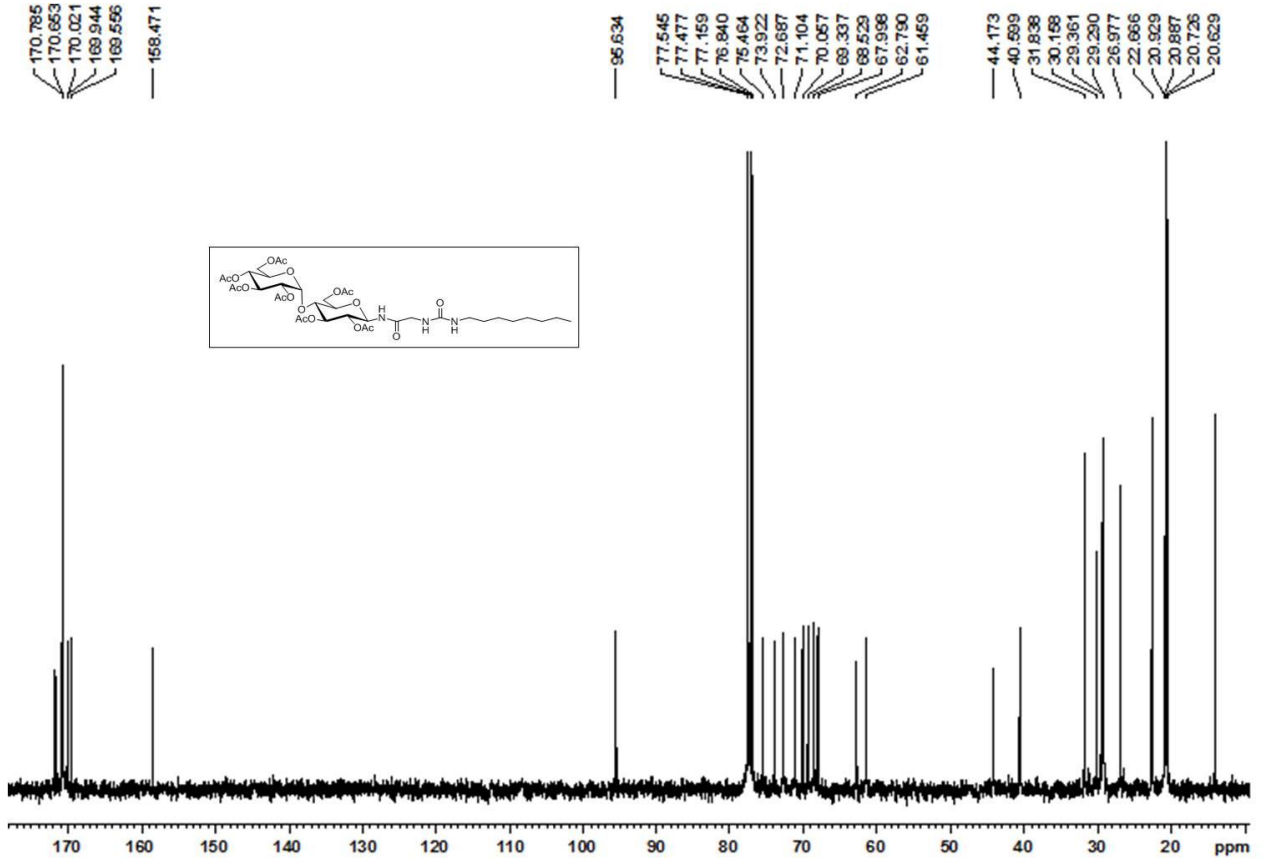

Figure S56 ^{13}C-NMR (100 MHz, $CDCl_3$) of 1-*N*-[4-*O*-(2',3',4',6'-tetra-*O*-acetyl-α-D-glucopyranosyl)-2,3,6-tri-*O*-acetyl-β-D-glucopyranosyl]-*N*''-(*n*-octyl)- ureidoacetamide **(43)**

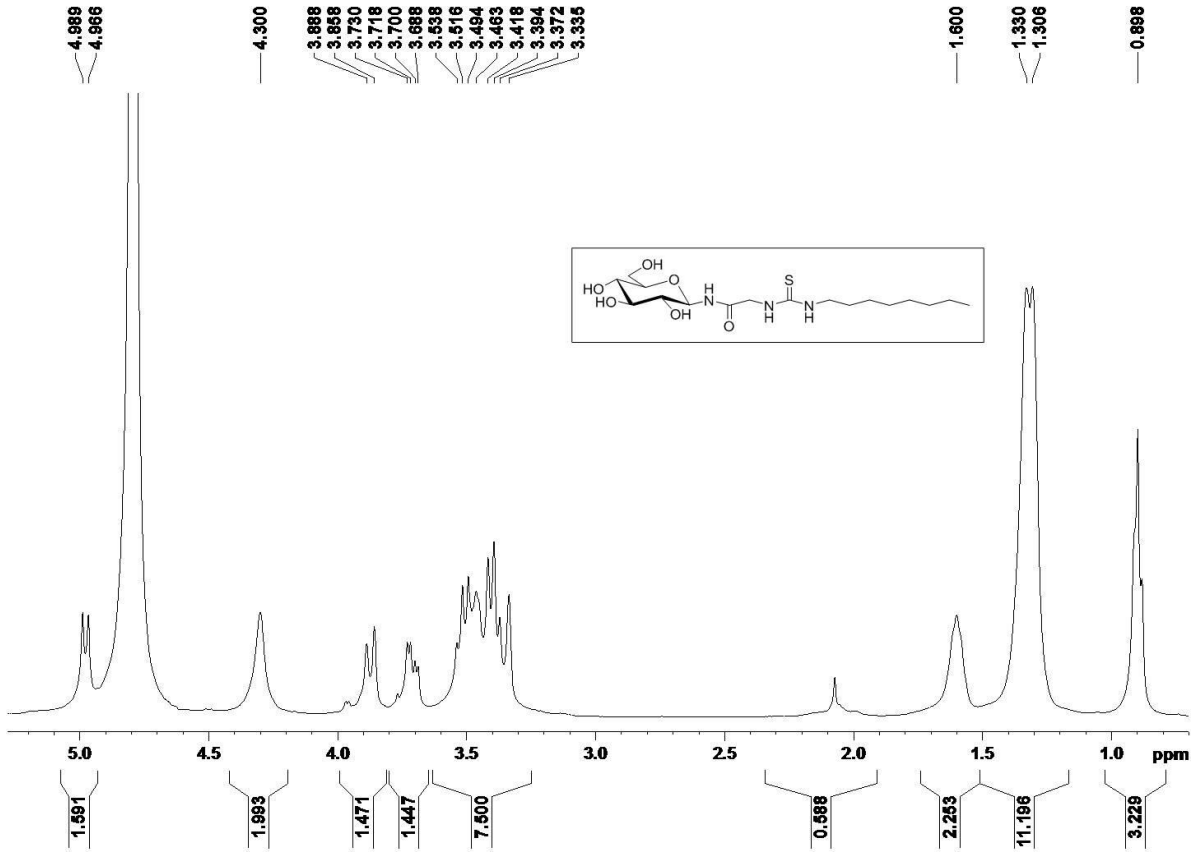

Figure S57 ^{1}H-NMR (400 MHz, D_2O) of 1-*N*-(β-D-glucopyranosyl)-*N''*-(*n*-octyl)-thioureidoacetamide **(44)**

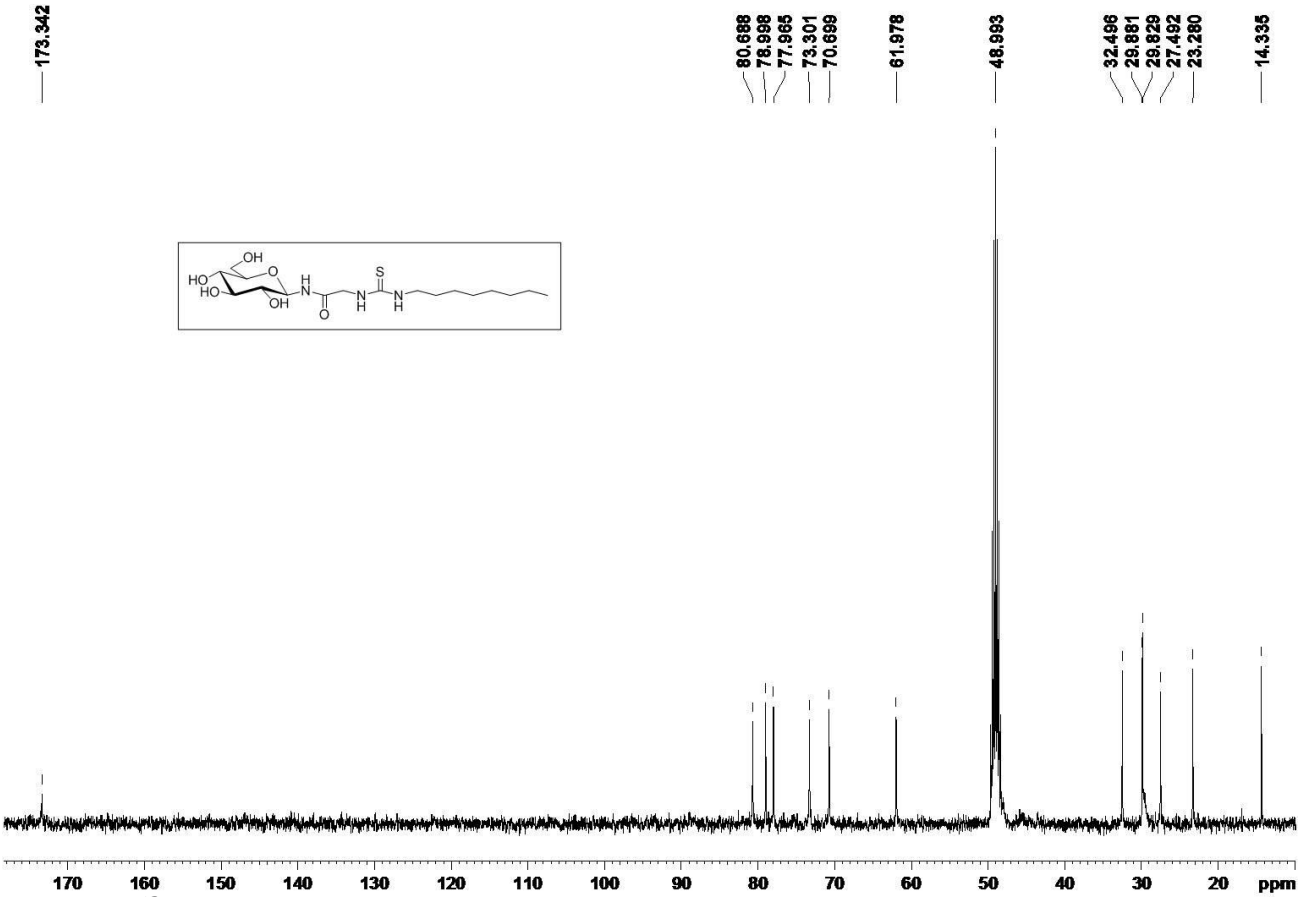

Figure S58 ^{13}C-NMR (100 MHz, D_2O + CD_3OD) of 1-*N*-(β-D-glucopyranosyl)-*N''*-(*n*-octyl)-thioureidoacetamide **(44)**

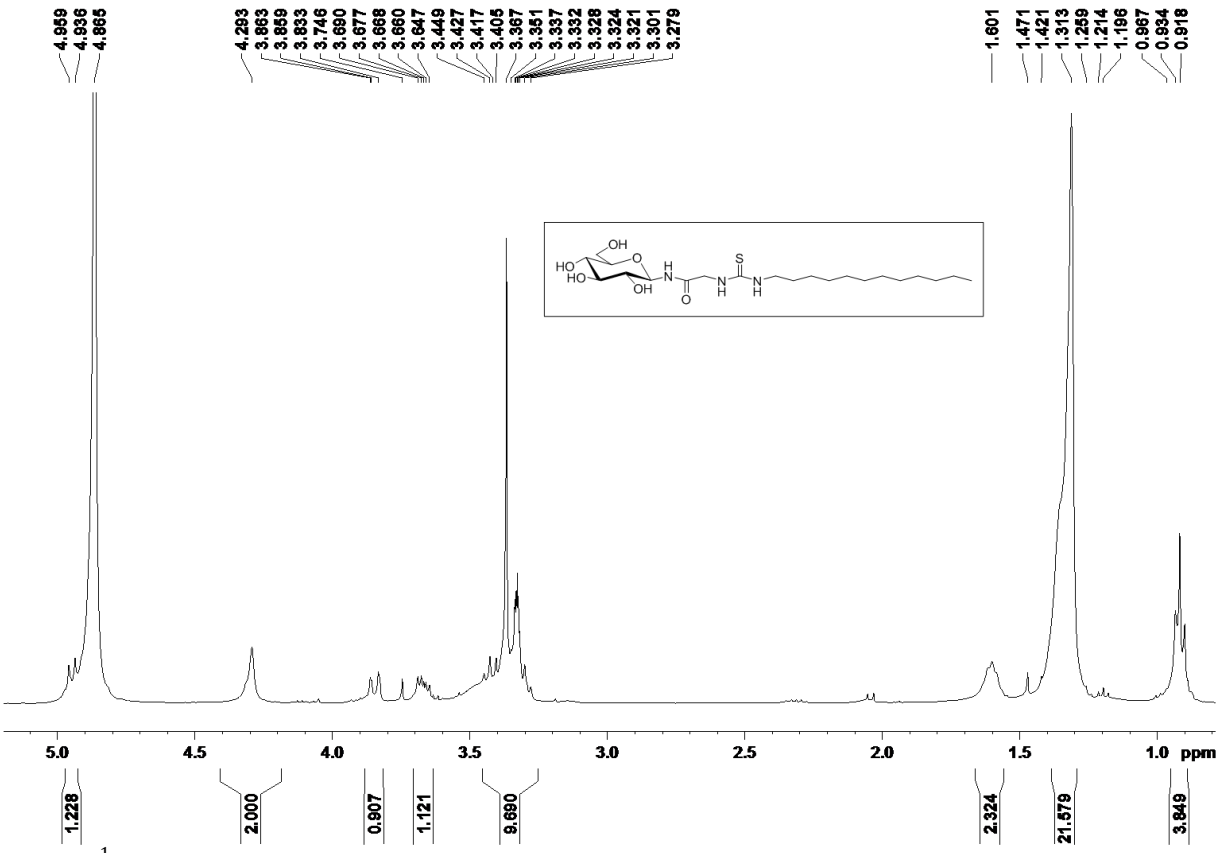

Figure S59 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(45)**

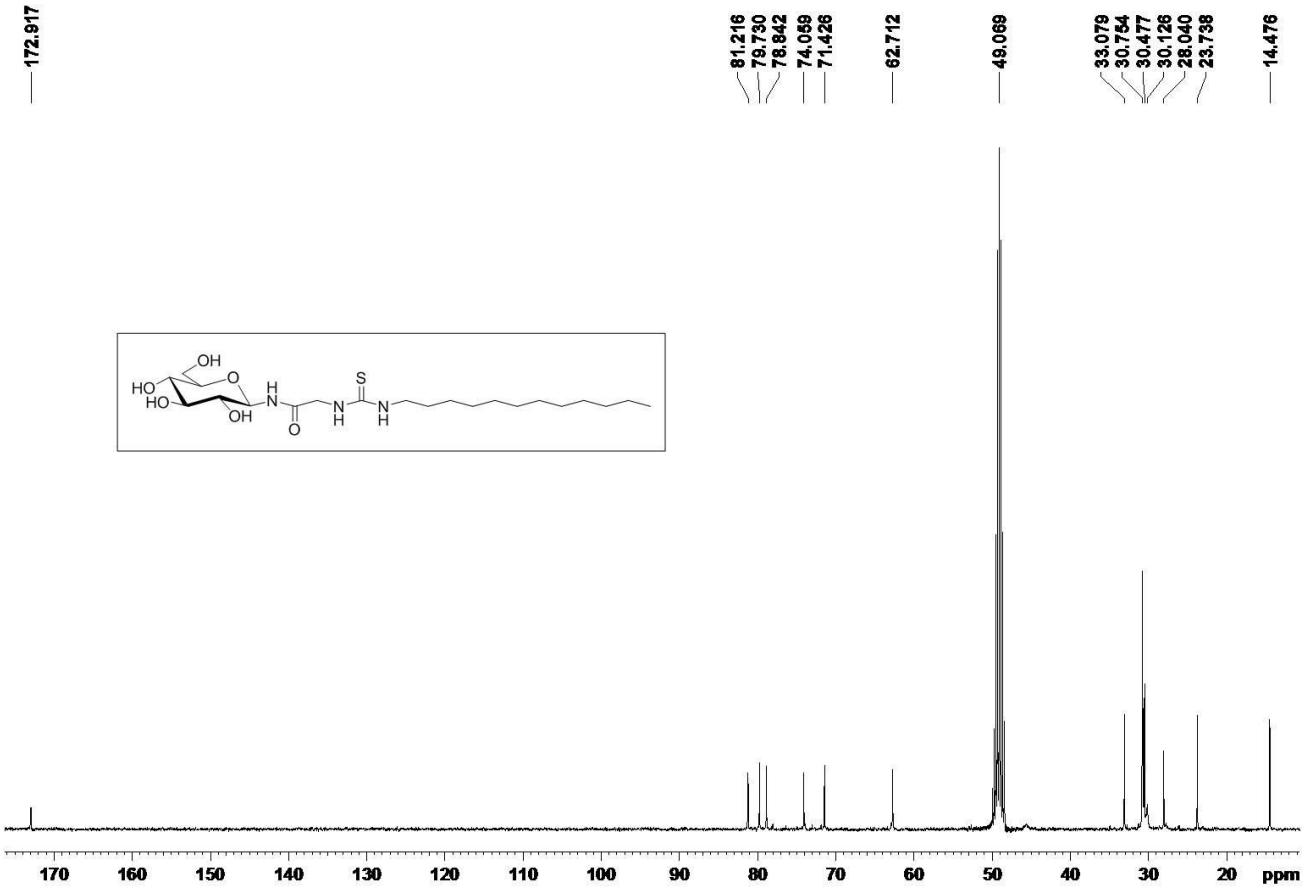

Figure S60 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(45)**

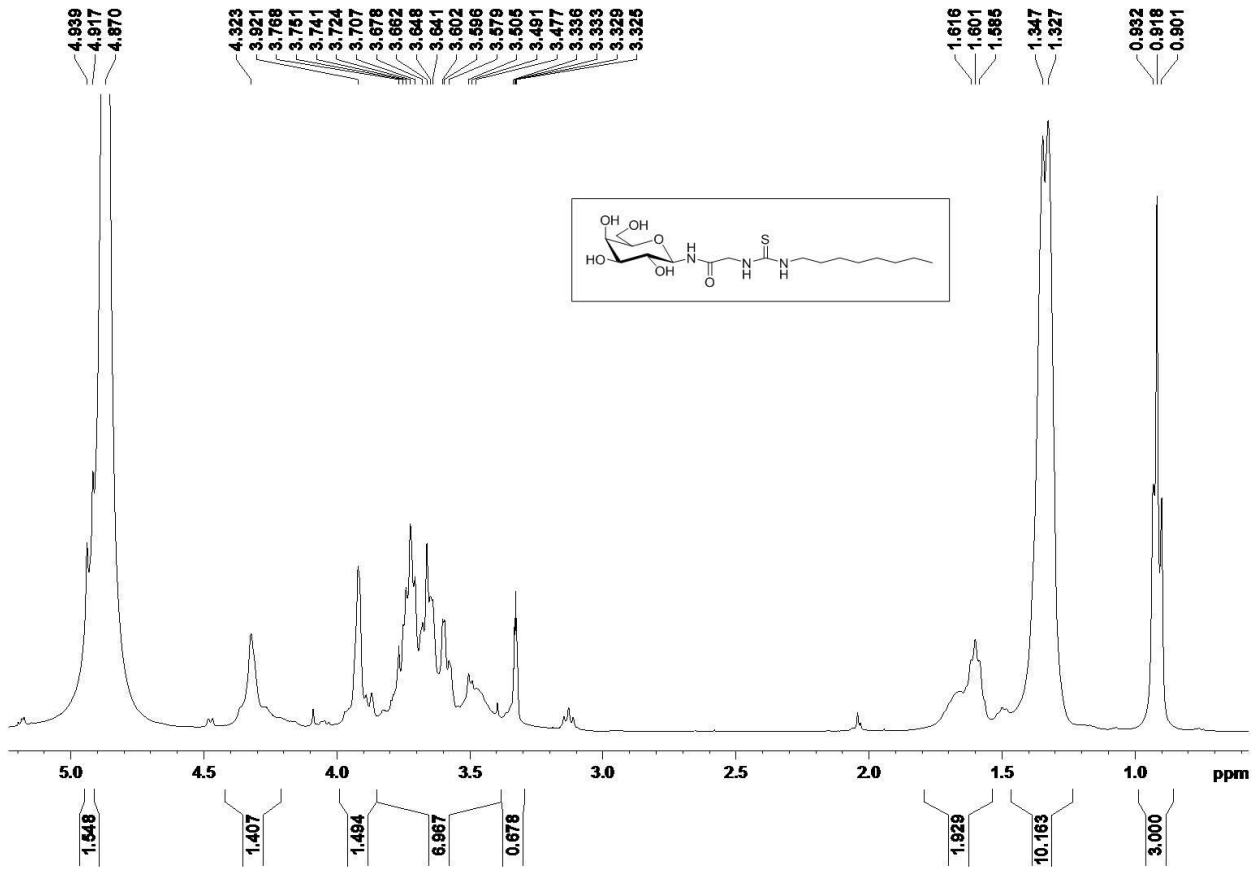

Figure S61 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-D-galactopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(46)**

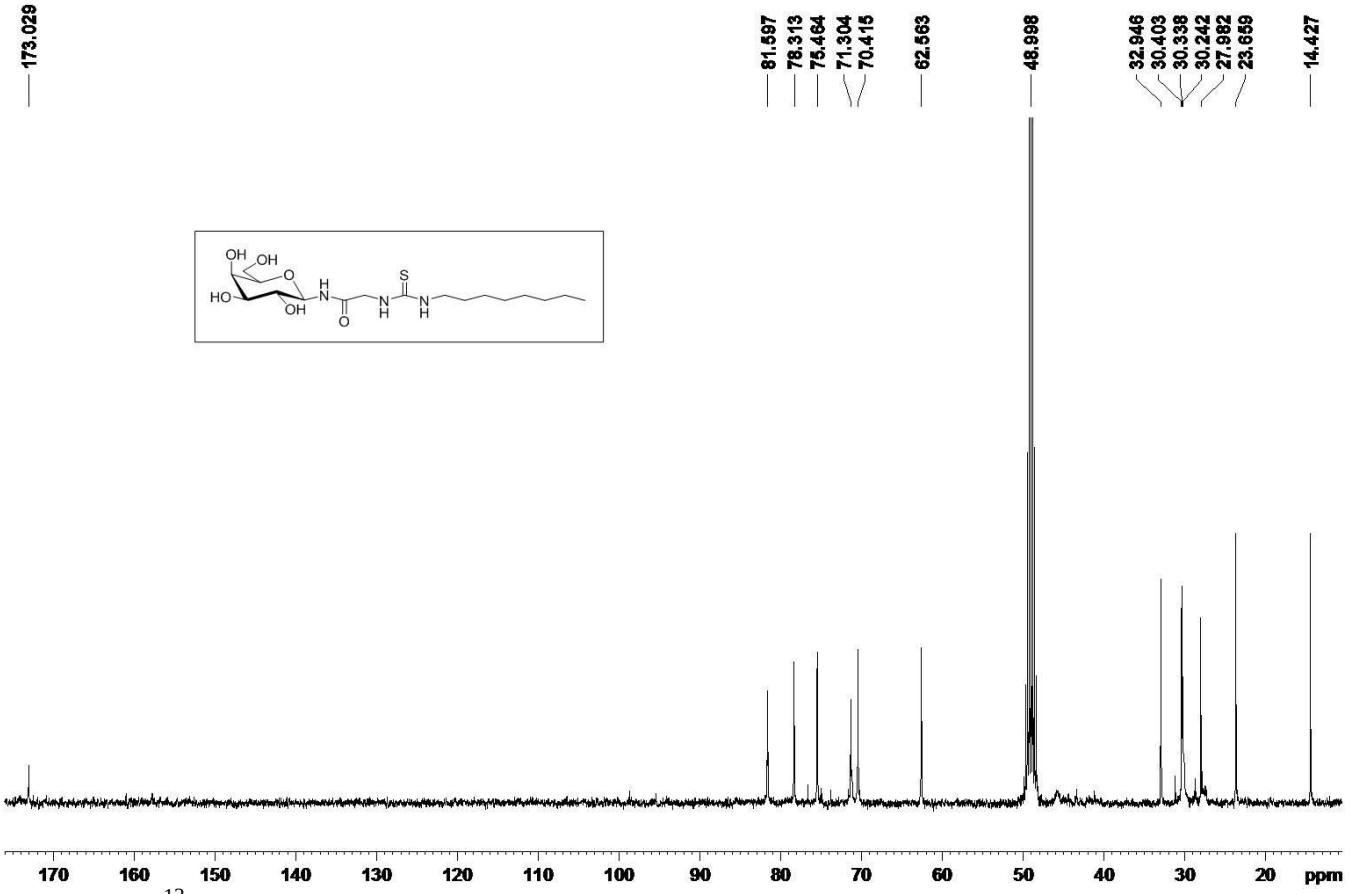

Figure S62 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-D-galactopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(46)**

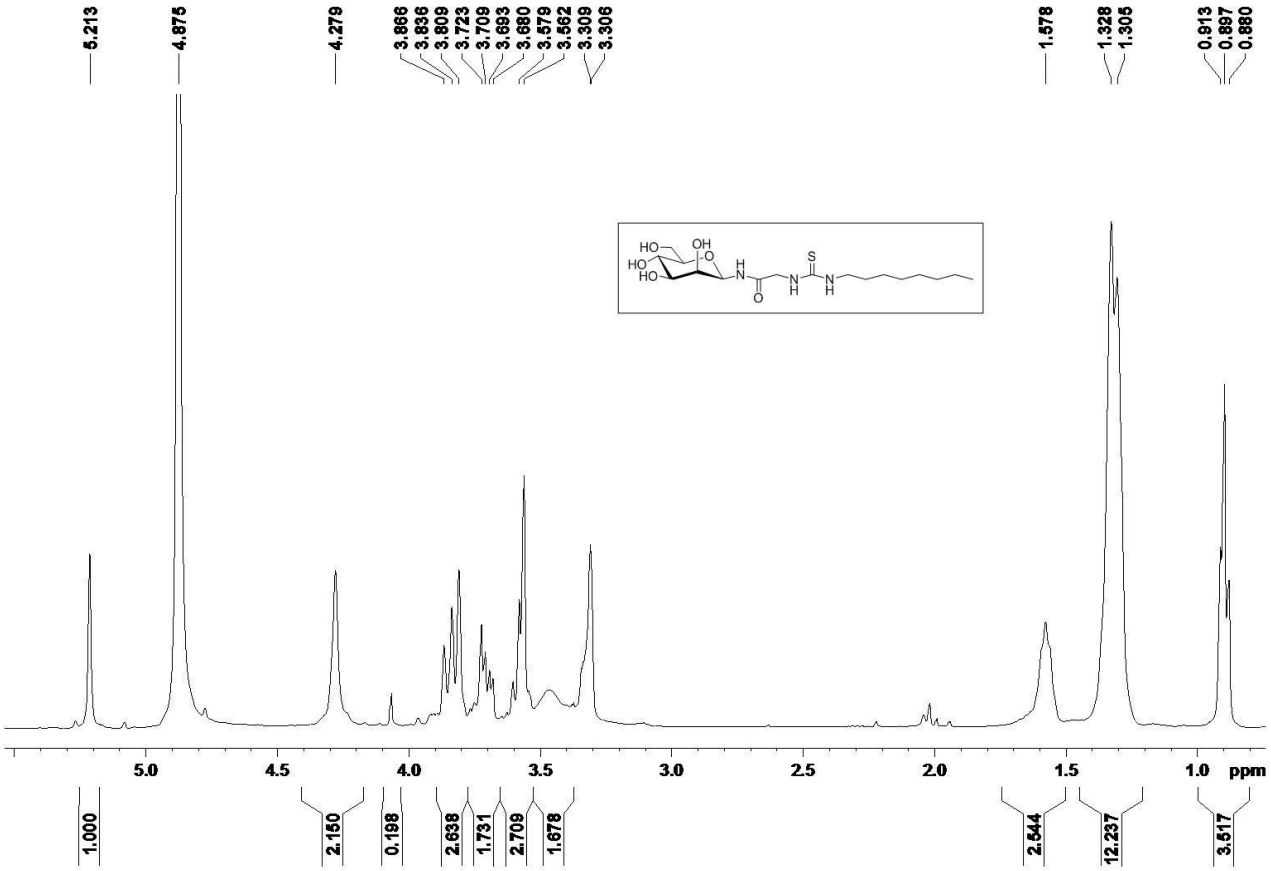

Figure S63 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-D-mannopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(47)**

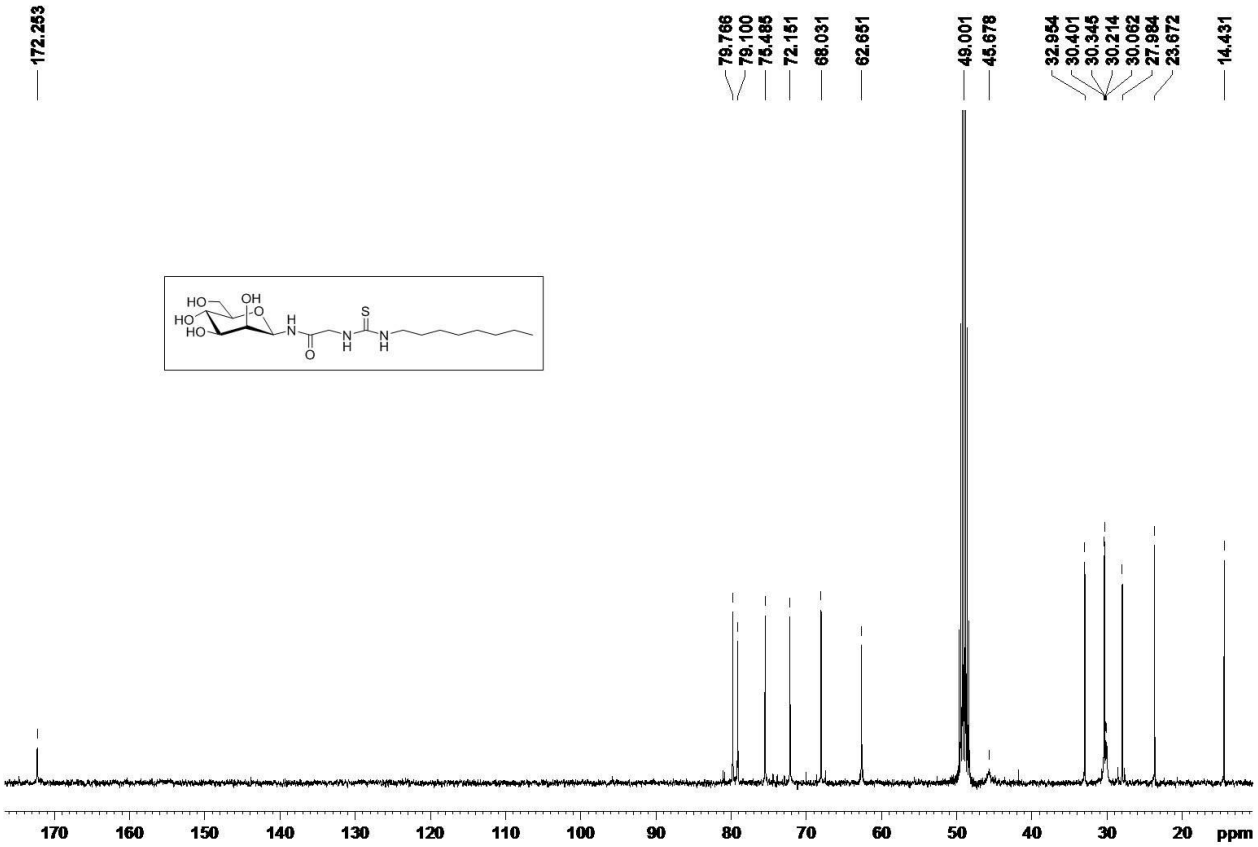

Figure S64 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-D-mannopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(47)**

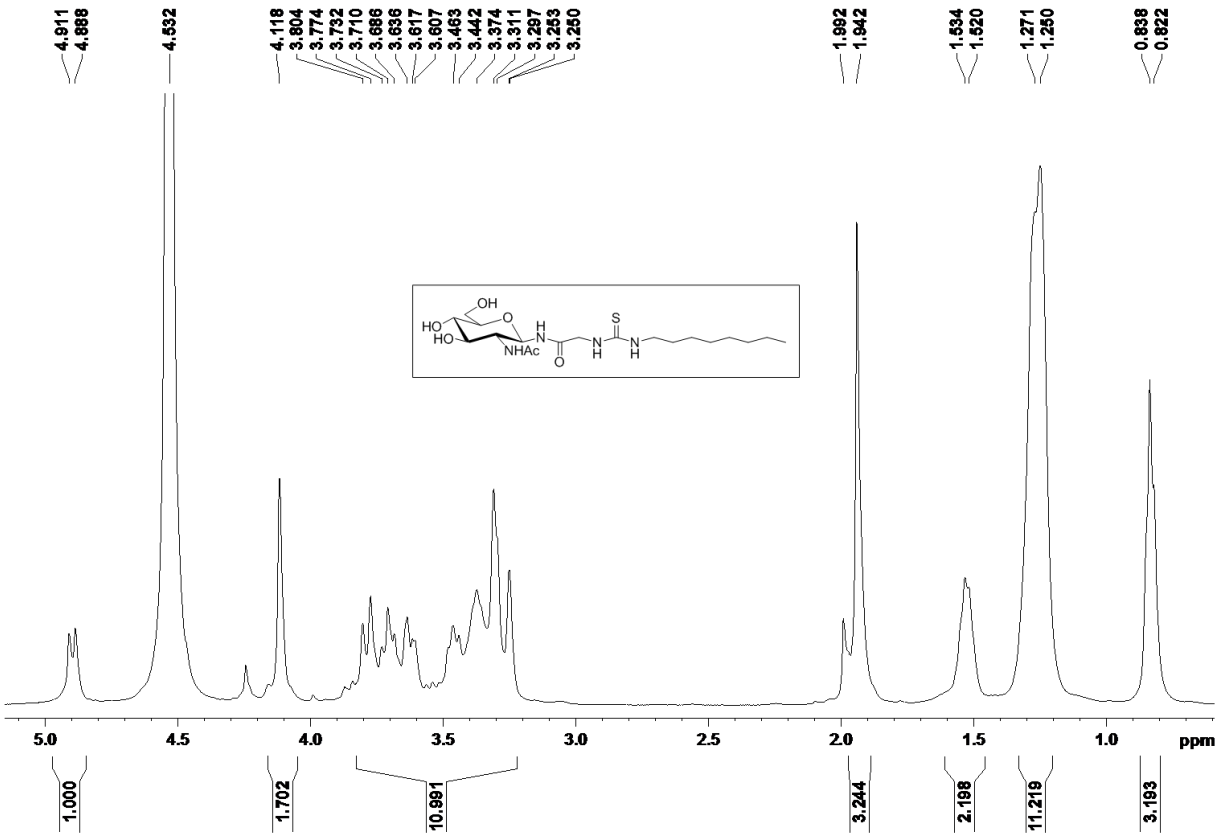

Figure S65 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(2-deoxy-2-acetamido-β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(48)**

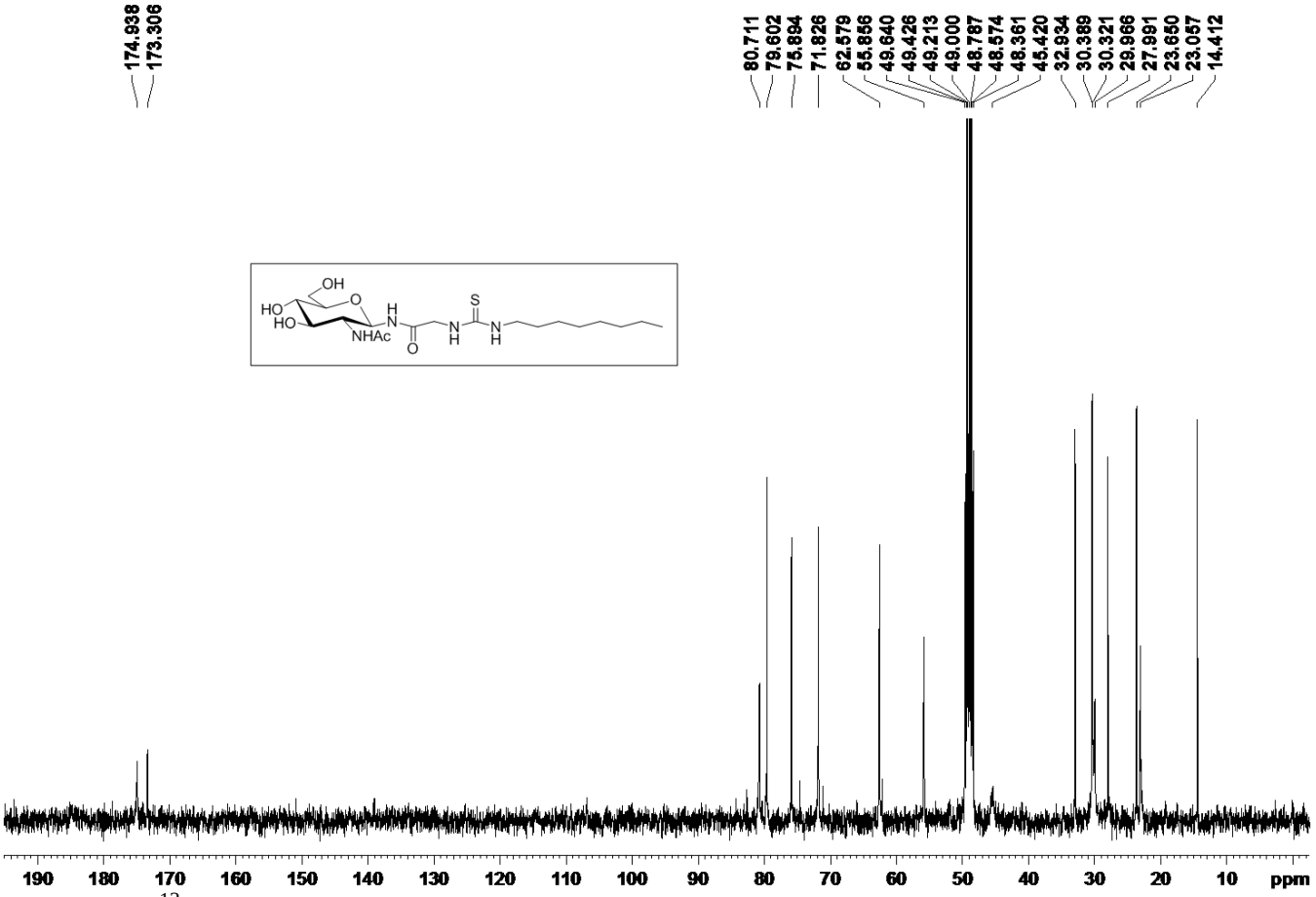

Figure S66 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(2-deoxy-2-acetamido-β-D-glucopyranosyl)-*N*''-(*n*-dodecyl)-thioureidoacetamide **(48)**

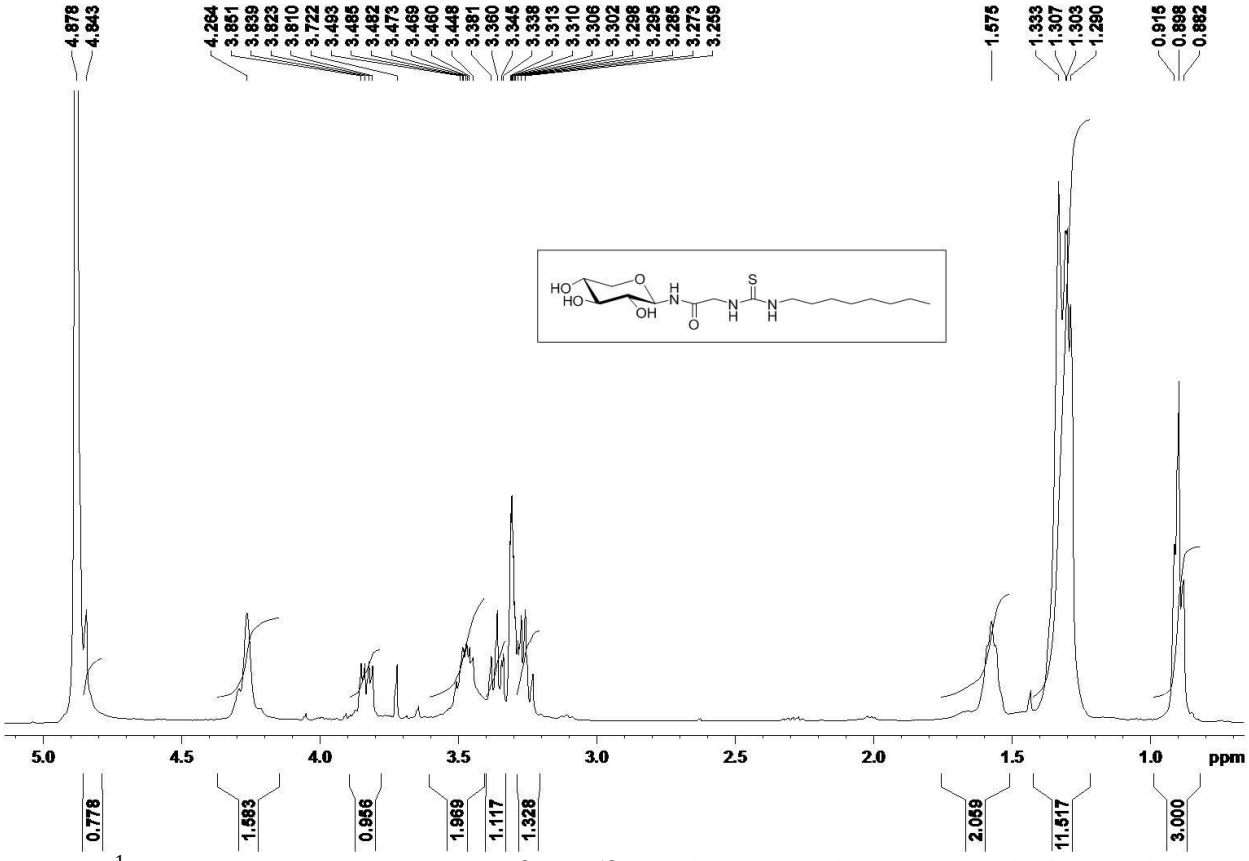

Figure S67 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-D-xylopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(49)**

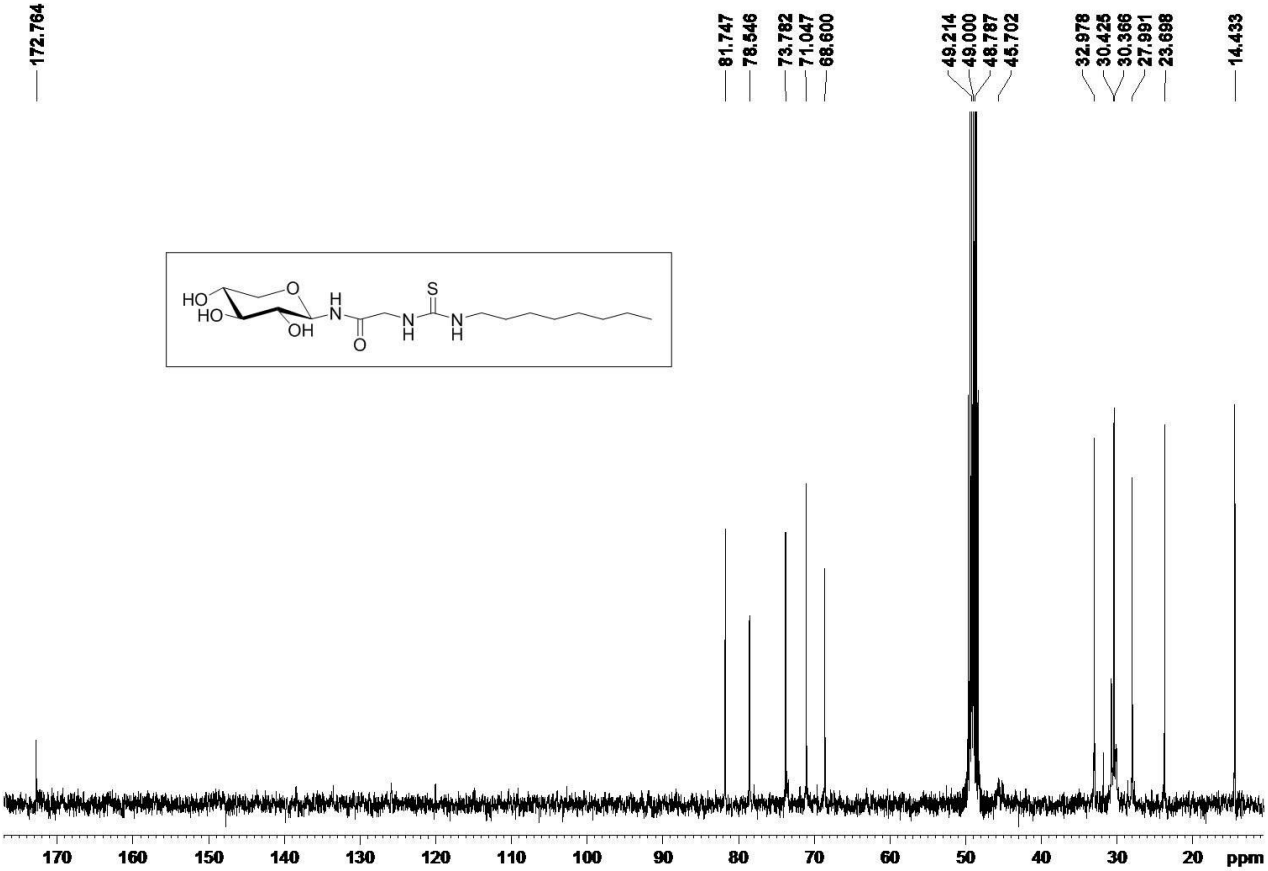

Figure S68 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-D-xylopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(49)**

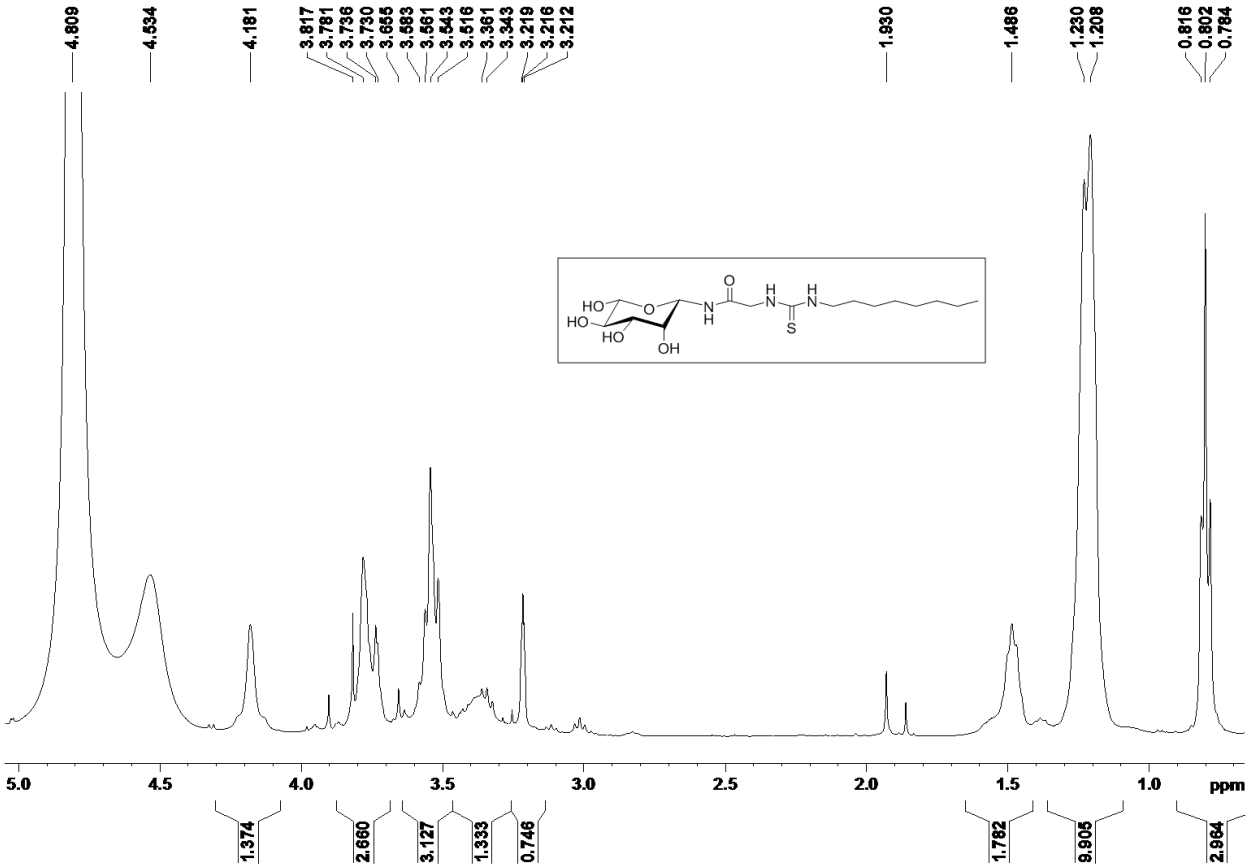

Figure S69 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-D-arabinopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(50)**

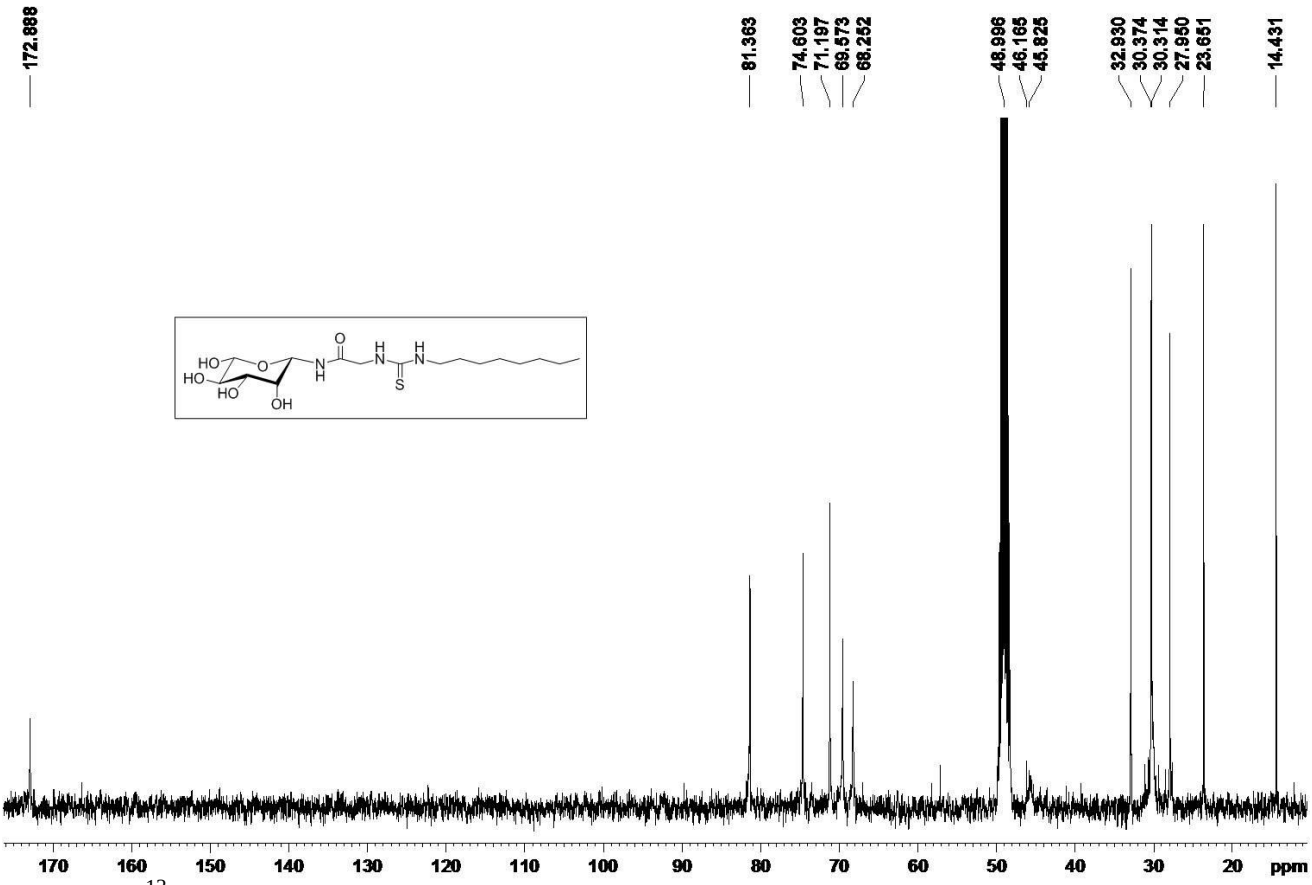

Figure S70 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-D-arabinopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(50)**

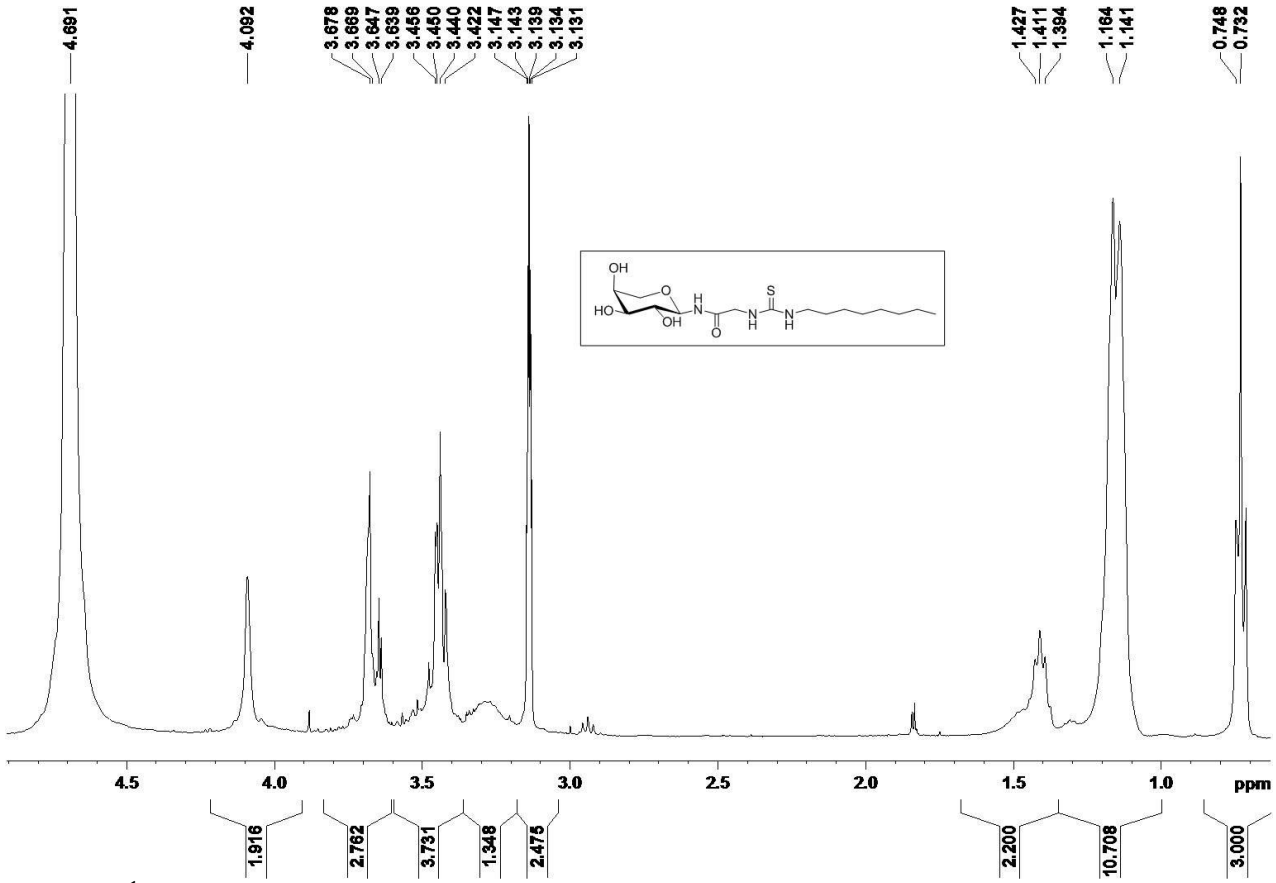

Figure S71 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-L-arabinopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(51)**

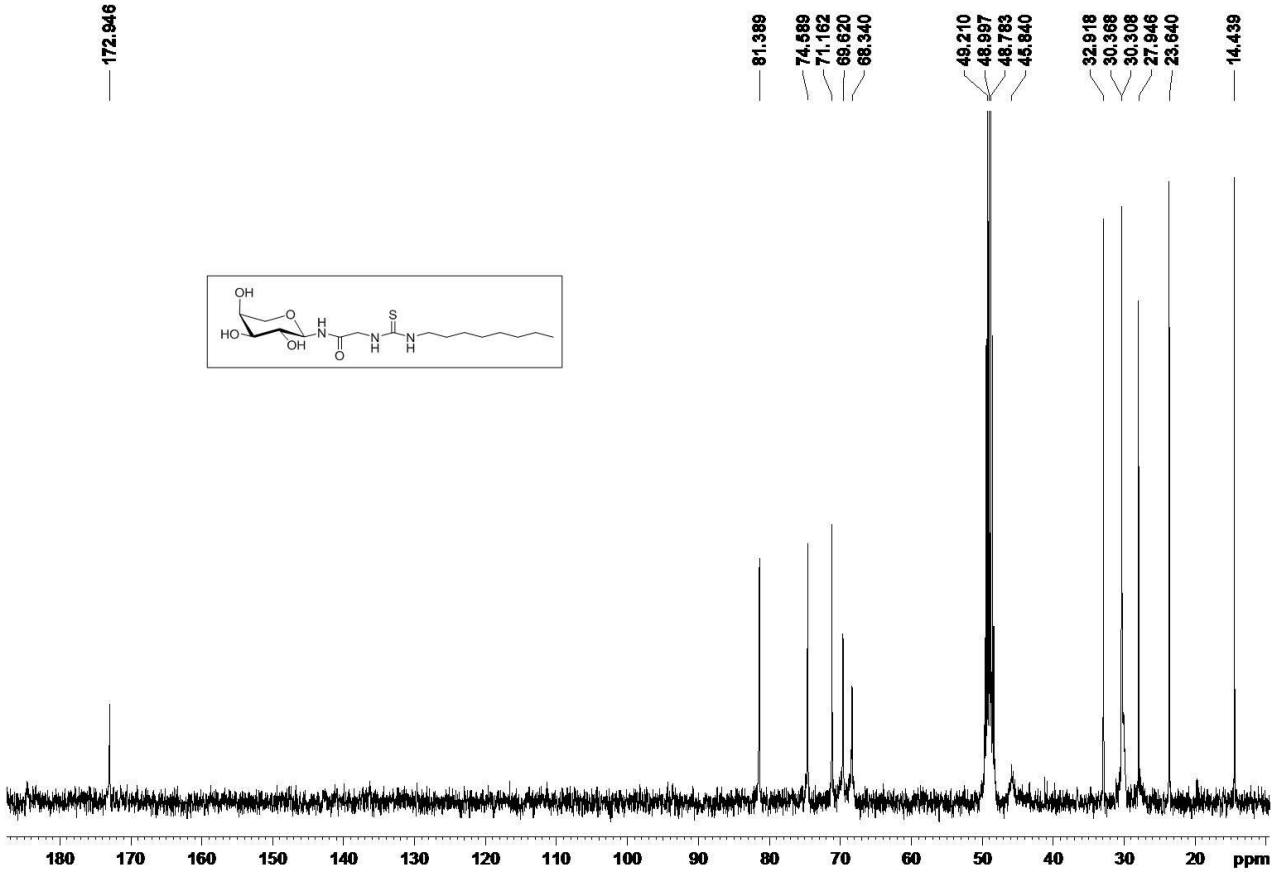

Figure S72 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-L-arabinopyranosyl)-*N*''-(*n*-octyl)-thioureidoacetamide **(51)**

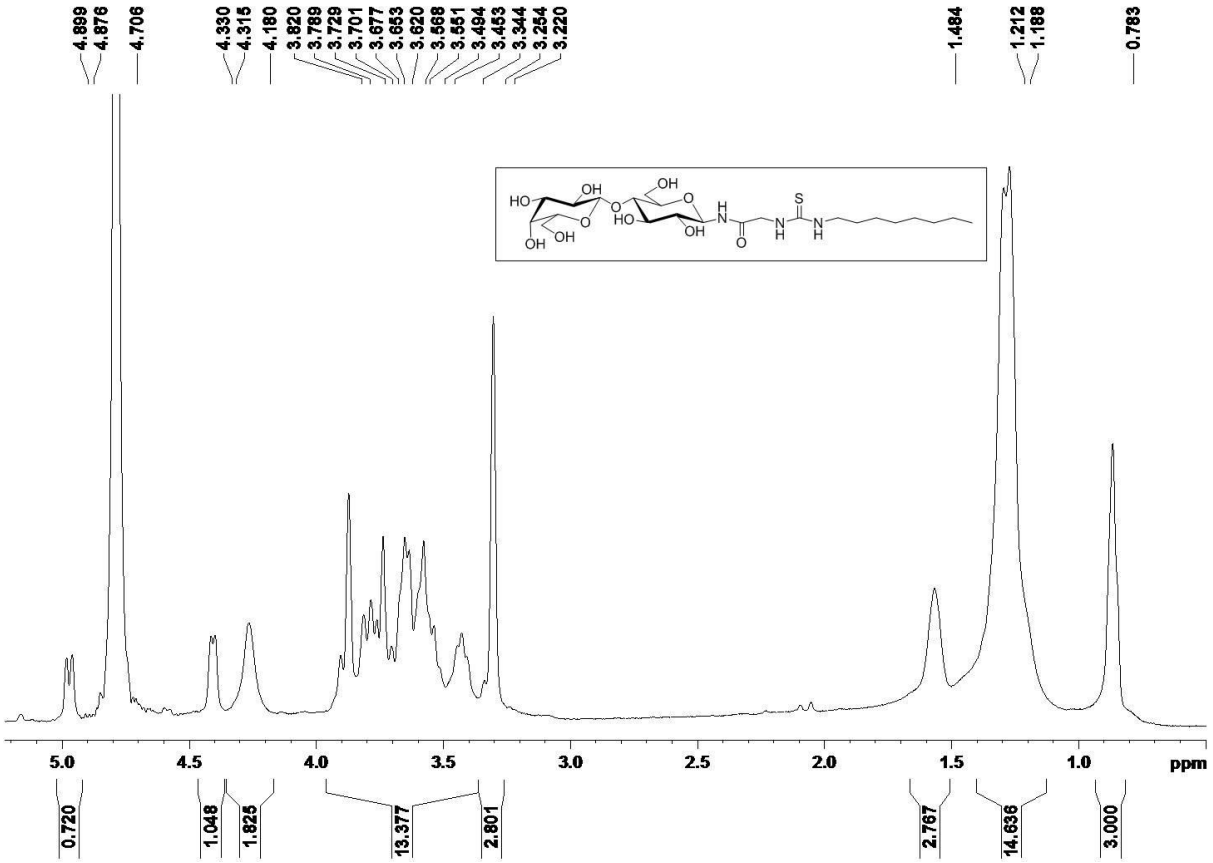

Figure S73 ^{1}H-NMR (400 MHz, D_2O) of 1-*N*-[4-*O*-(β-D-galactopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(52)**

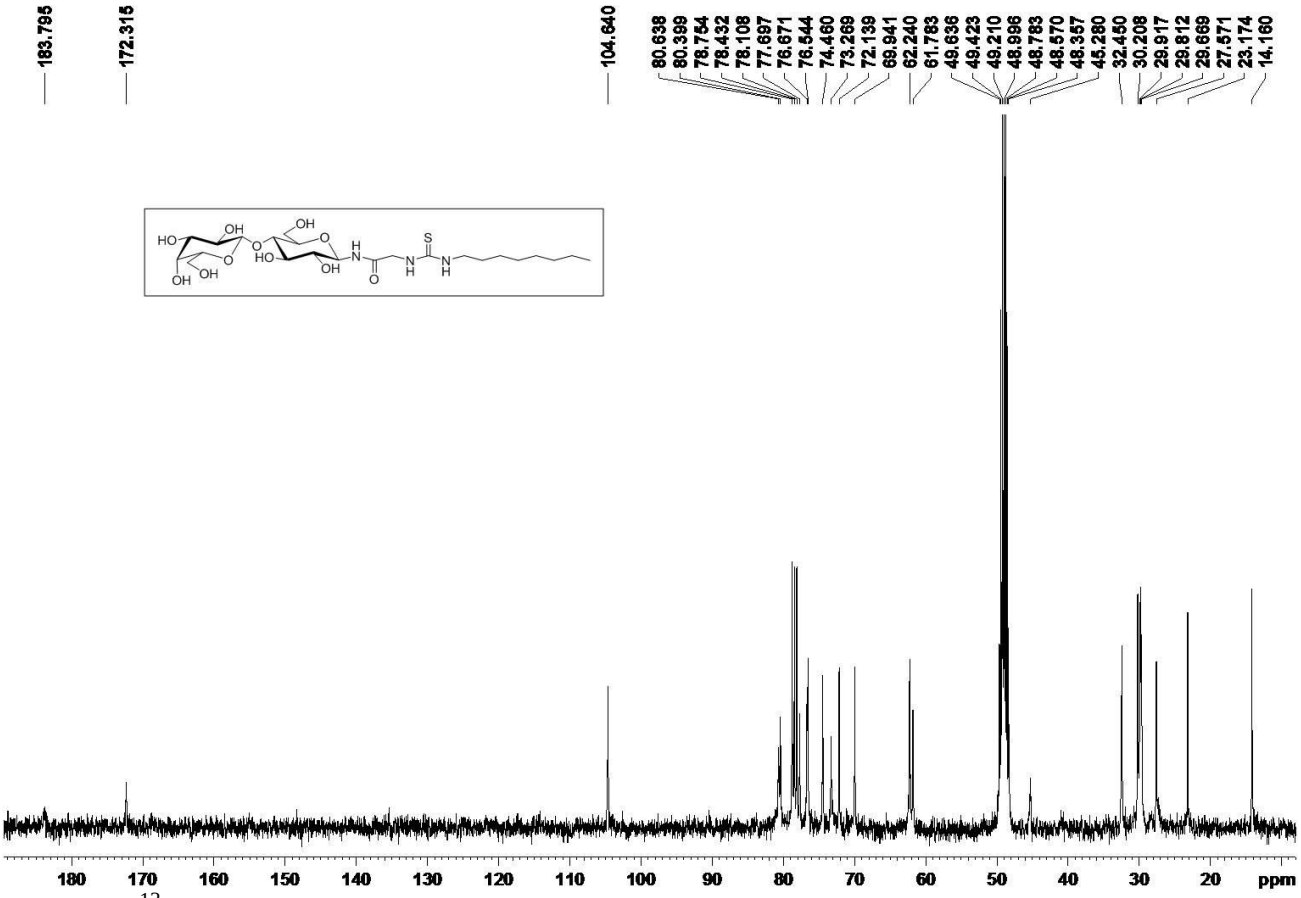

Figure S74 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-[4-*O*-(β-D-galactopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(52)**

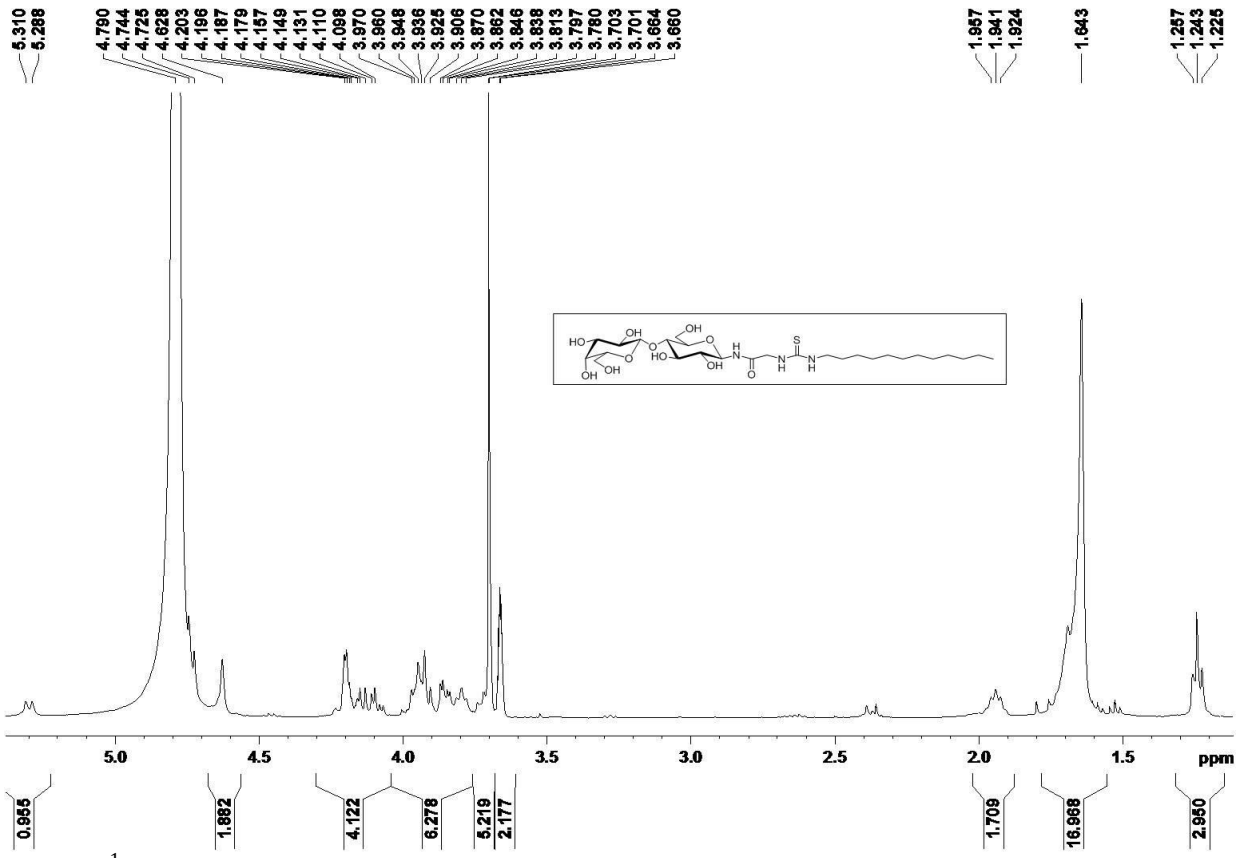

Figure S75 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-[4-*O*-(β-D-galactopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thioureidoacetamide **(53)**

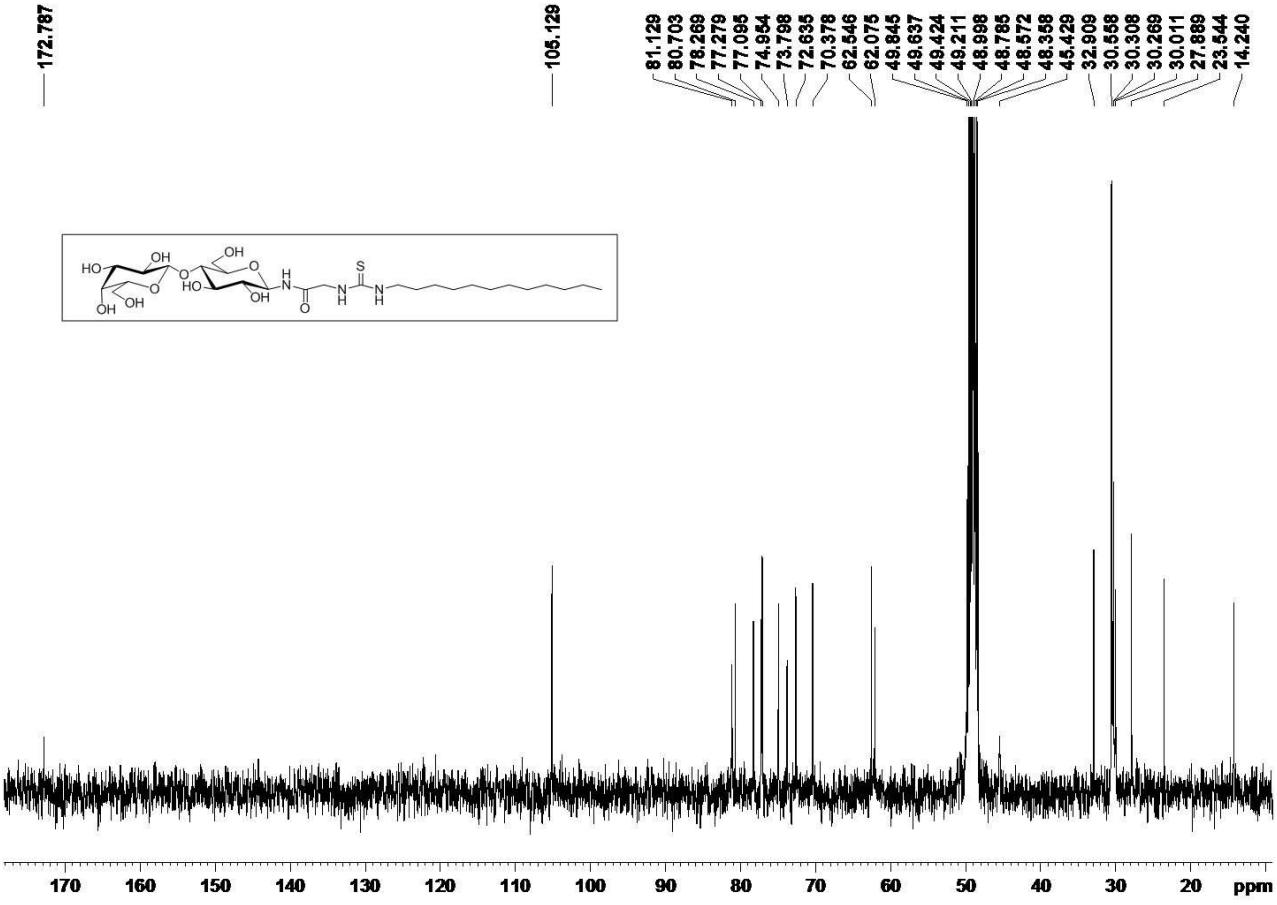

Figure S76 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-[4-*O*-(β-D-galactopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thioureidoacetamide **(53)**

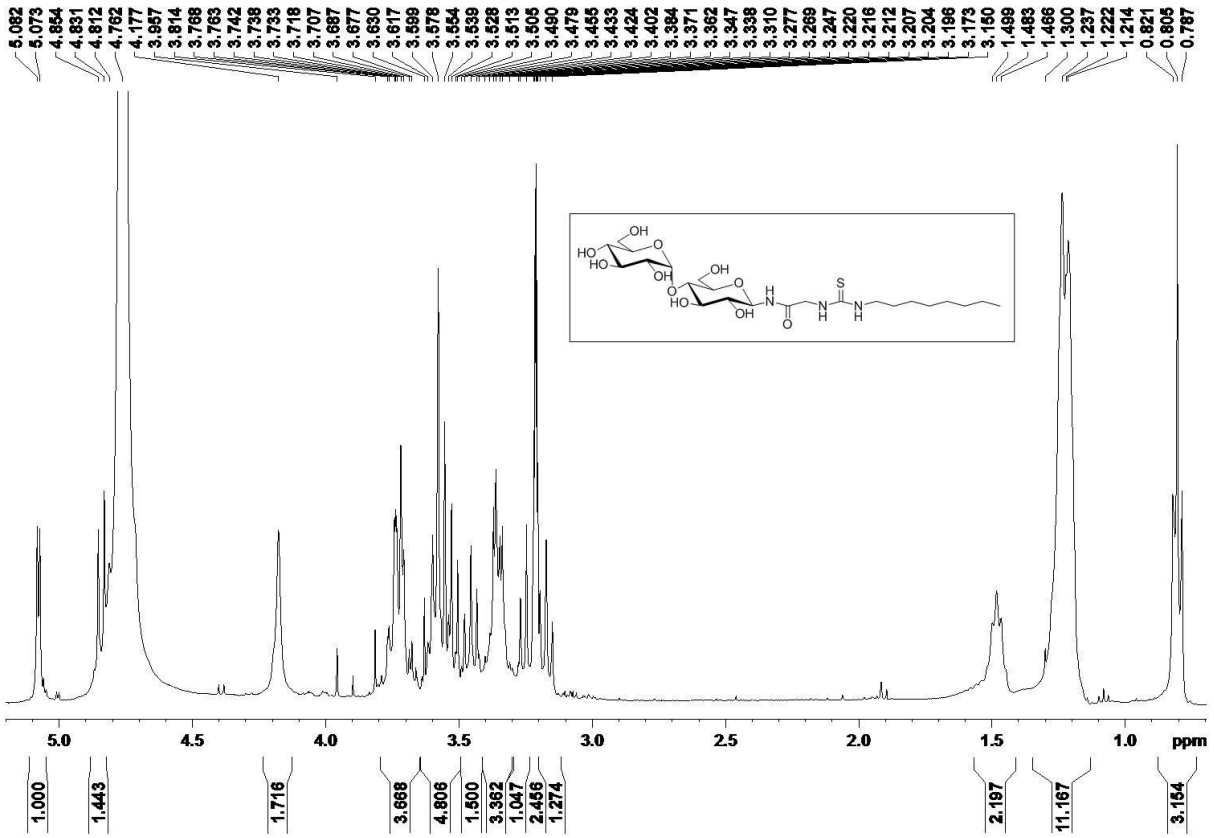

Figure S77 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-[4-*O*-(α-D-glucopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(54)**

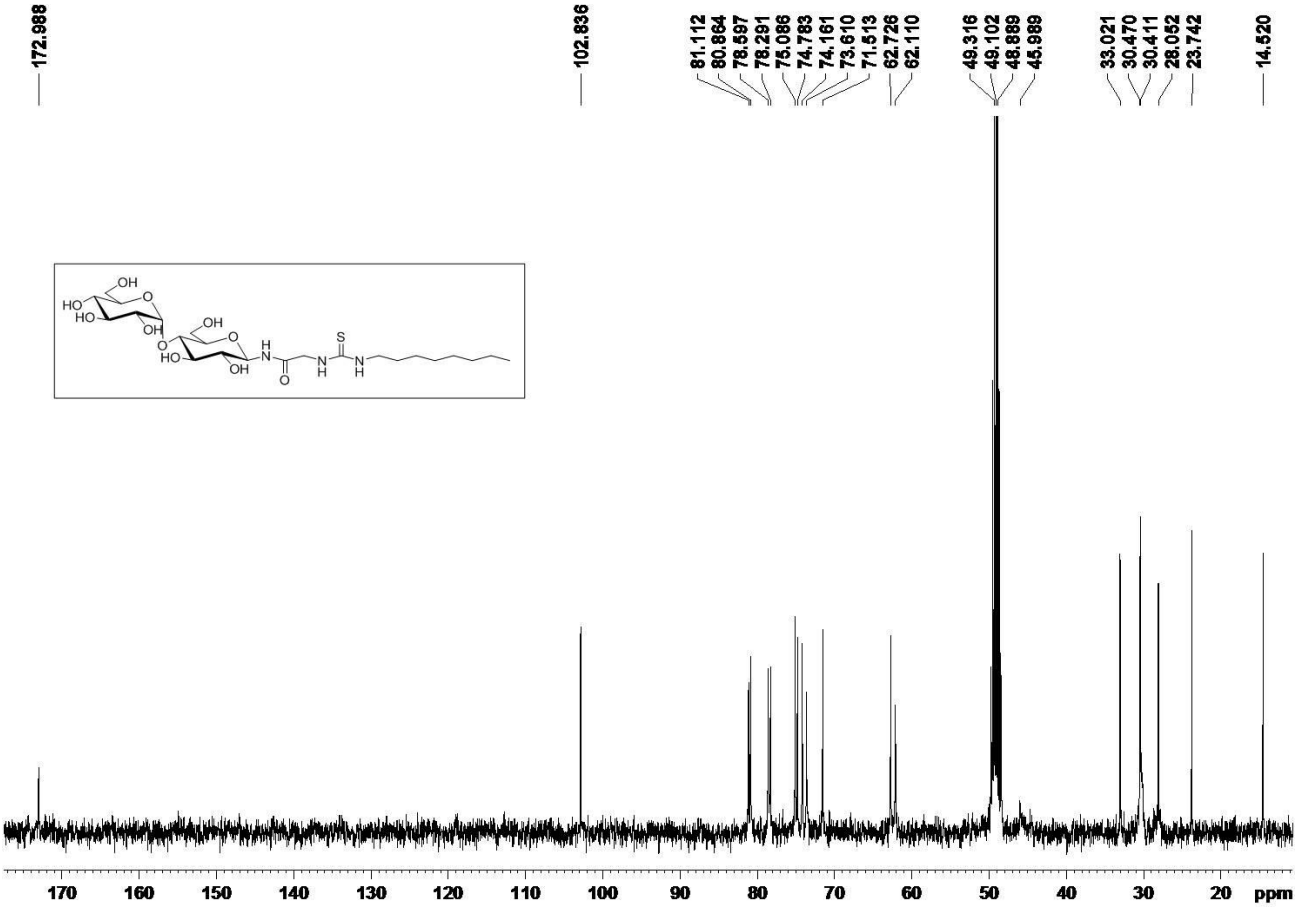

Figure S78 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-[4-*O*-(α-D-glucopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-octyl)-thioureidoacetamide **(54)**

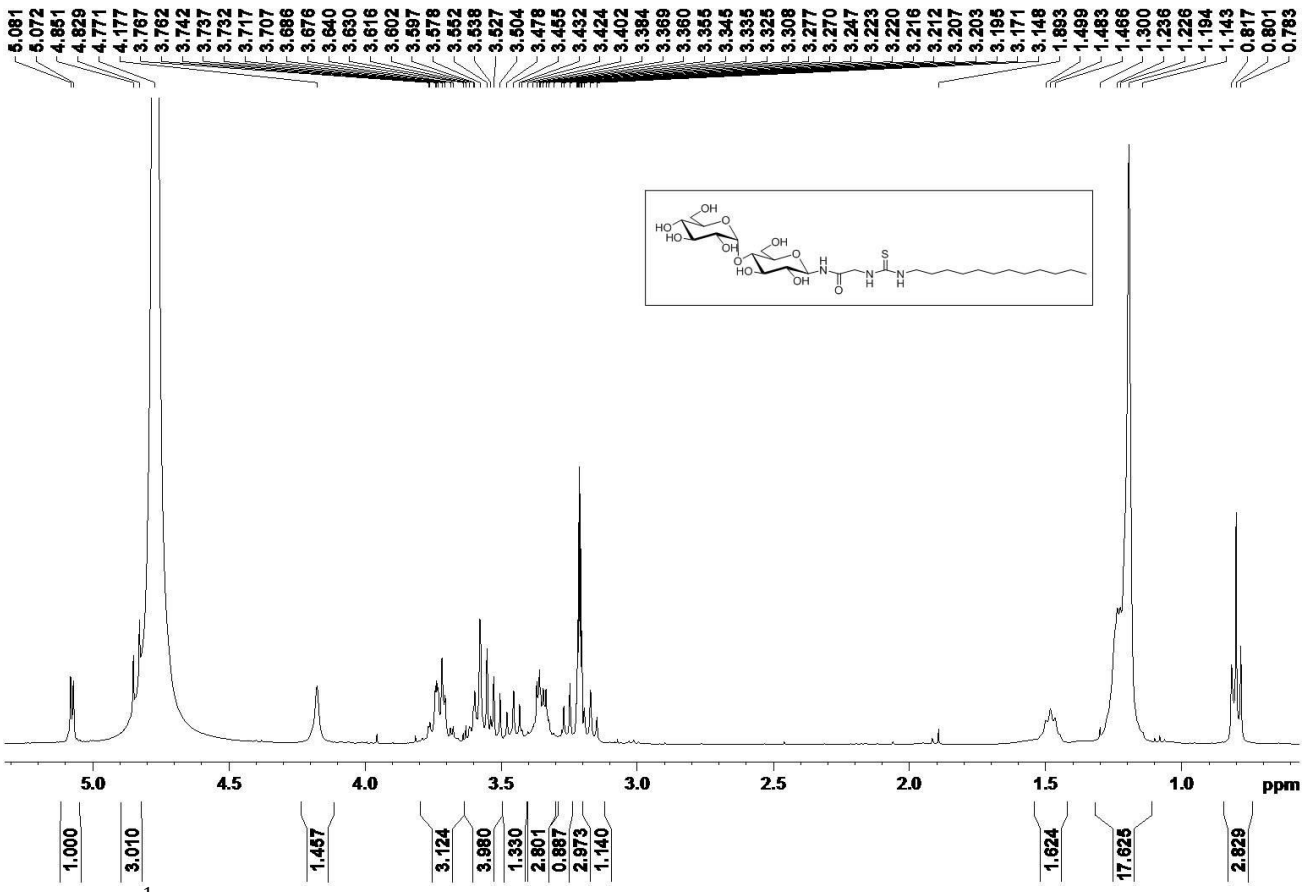

Figure S79 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-[4-*O*-(α-D-glucopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thioureidoacetamide **(55)**

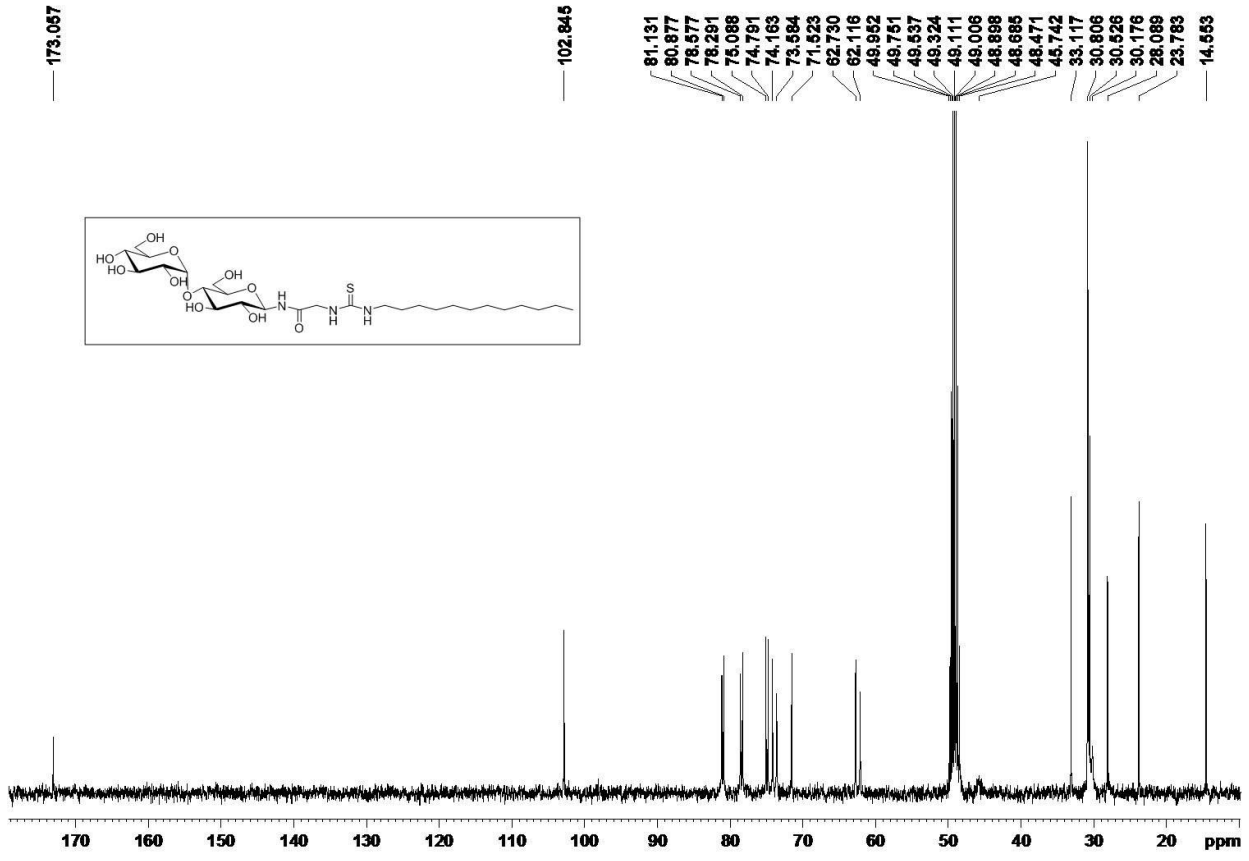

Figure S80 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-[4-*O*-(α-D-glucopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-dodecyl)-thioureidoacetamide **(55)**

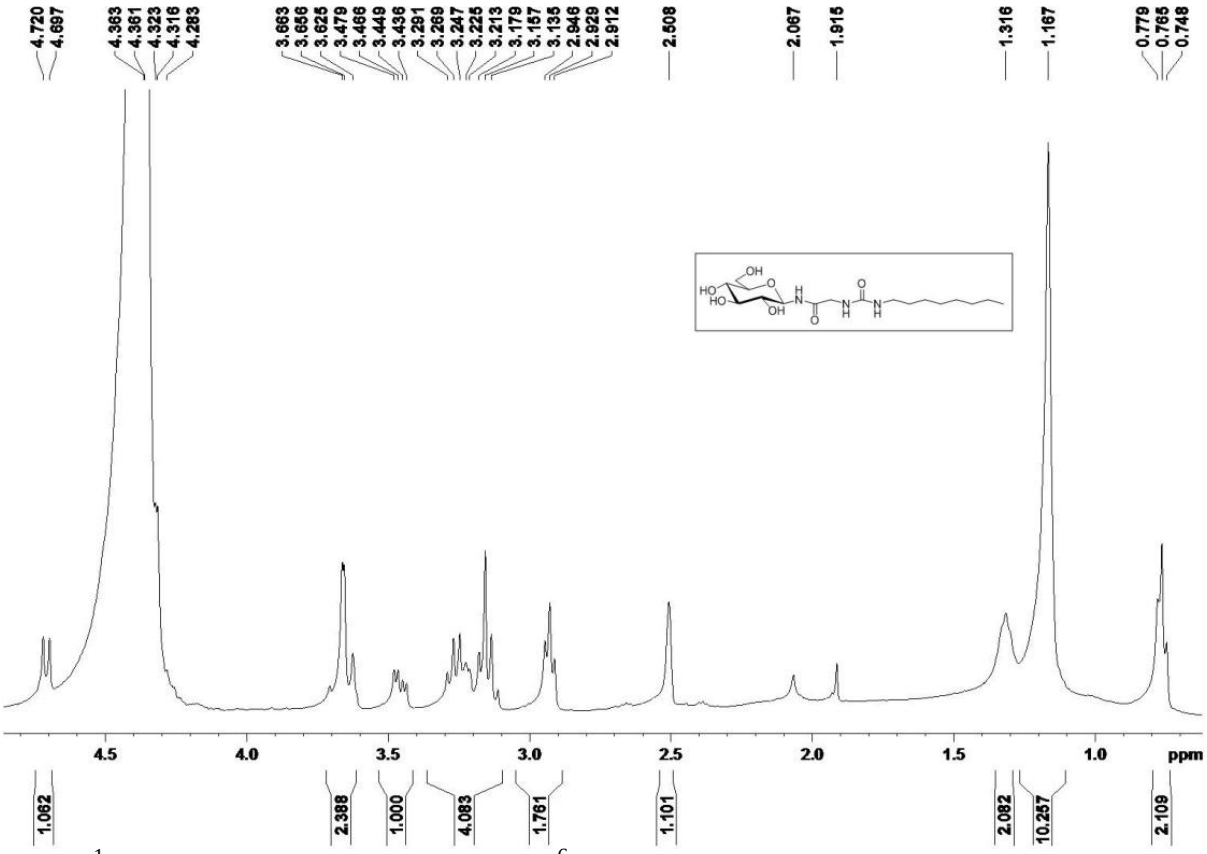

Figure S81 ^{1}H-NMR (400 MHz, D_2O+DMSO-D^6) of 1-*N*-(β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(56)**

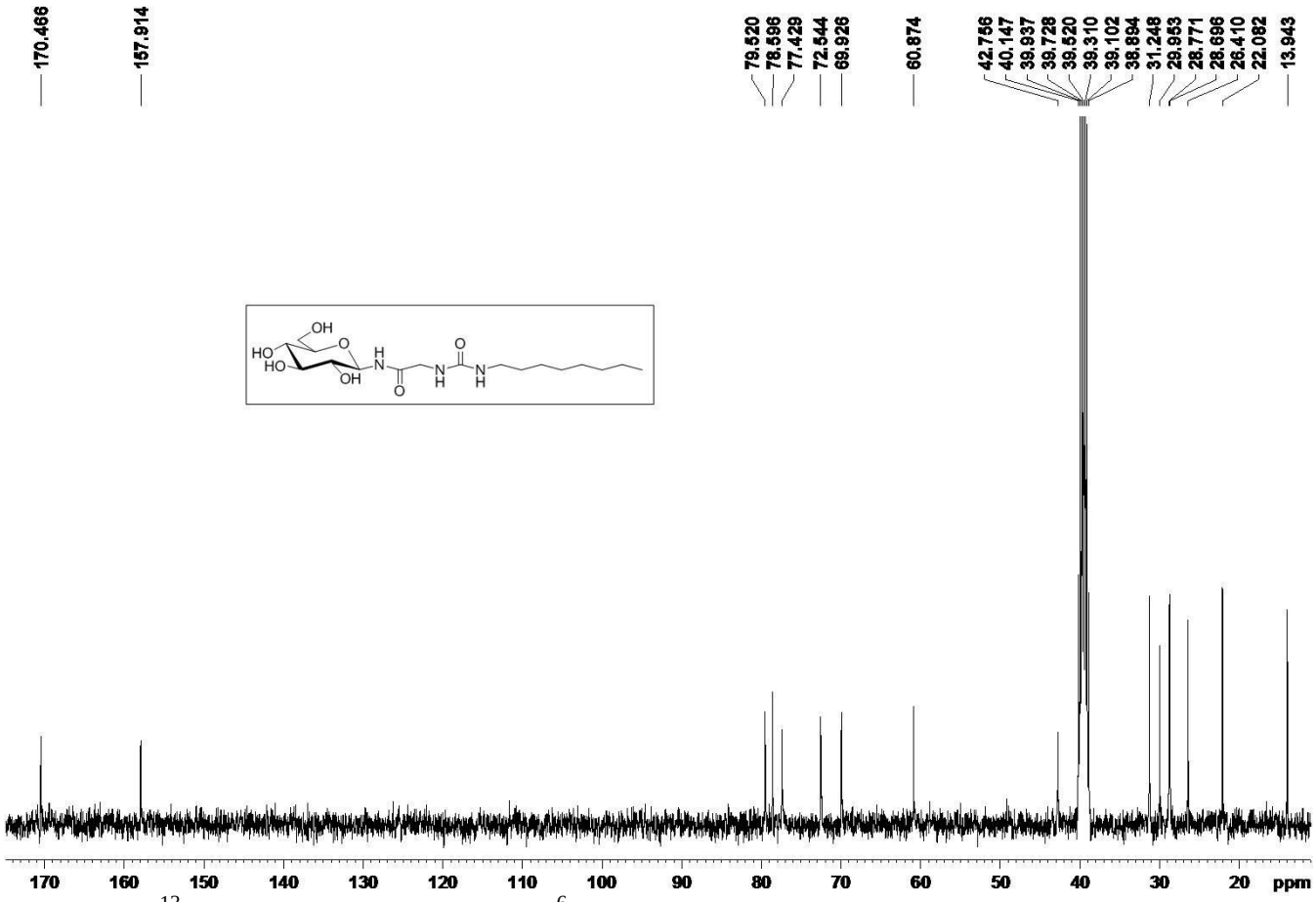

Figure S82 ^{13}C-NMR (100 MHz, DMSO-D^6) of 1-*N*-(β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(56)**

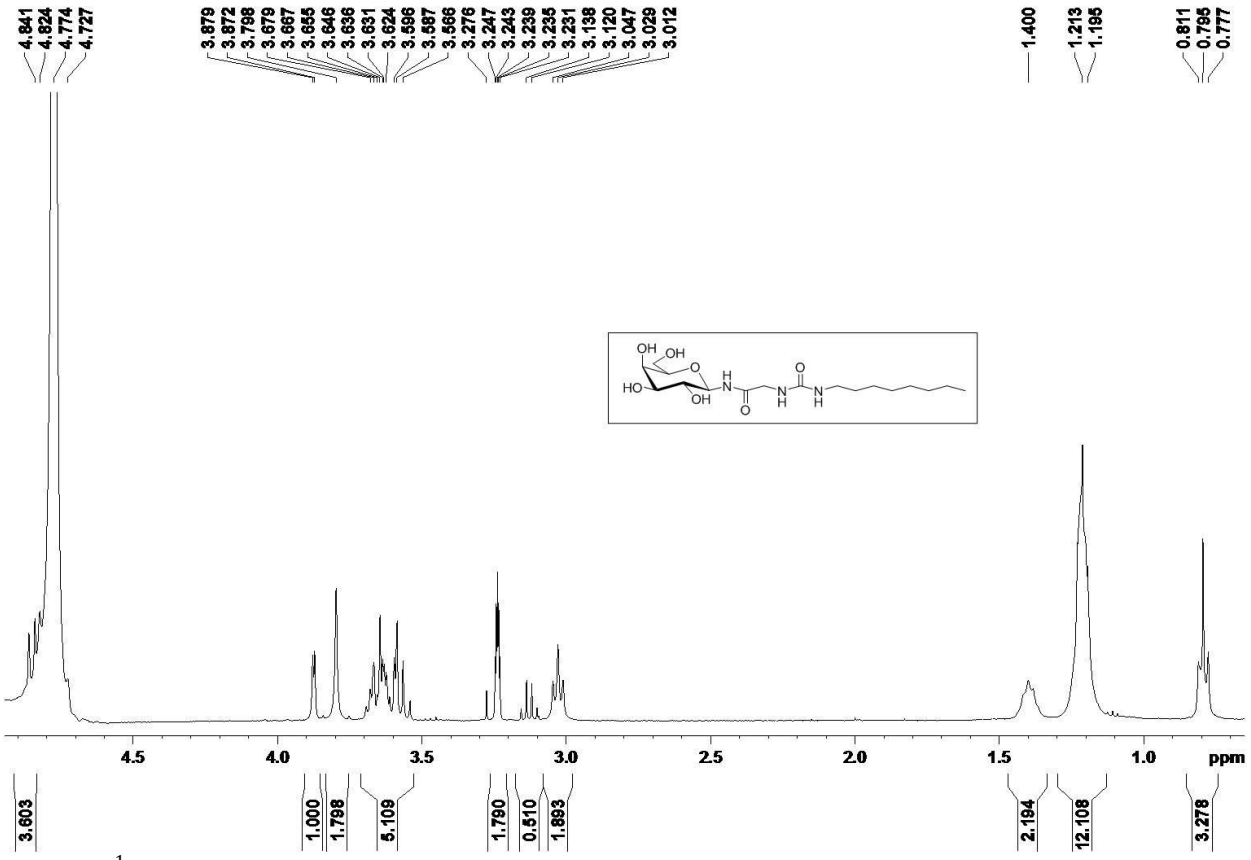

Figure S83 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-Galactopyronosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(57)**

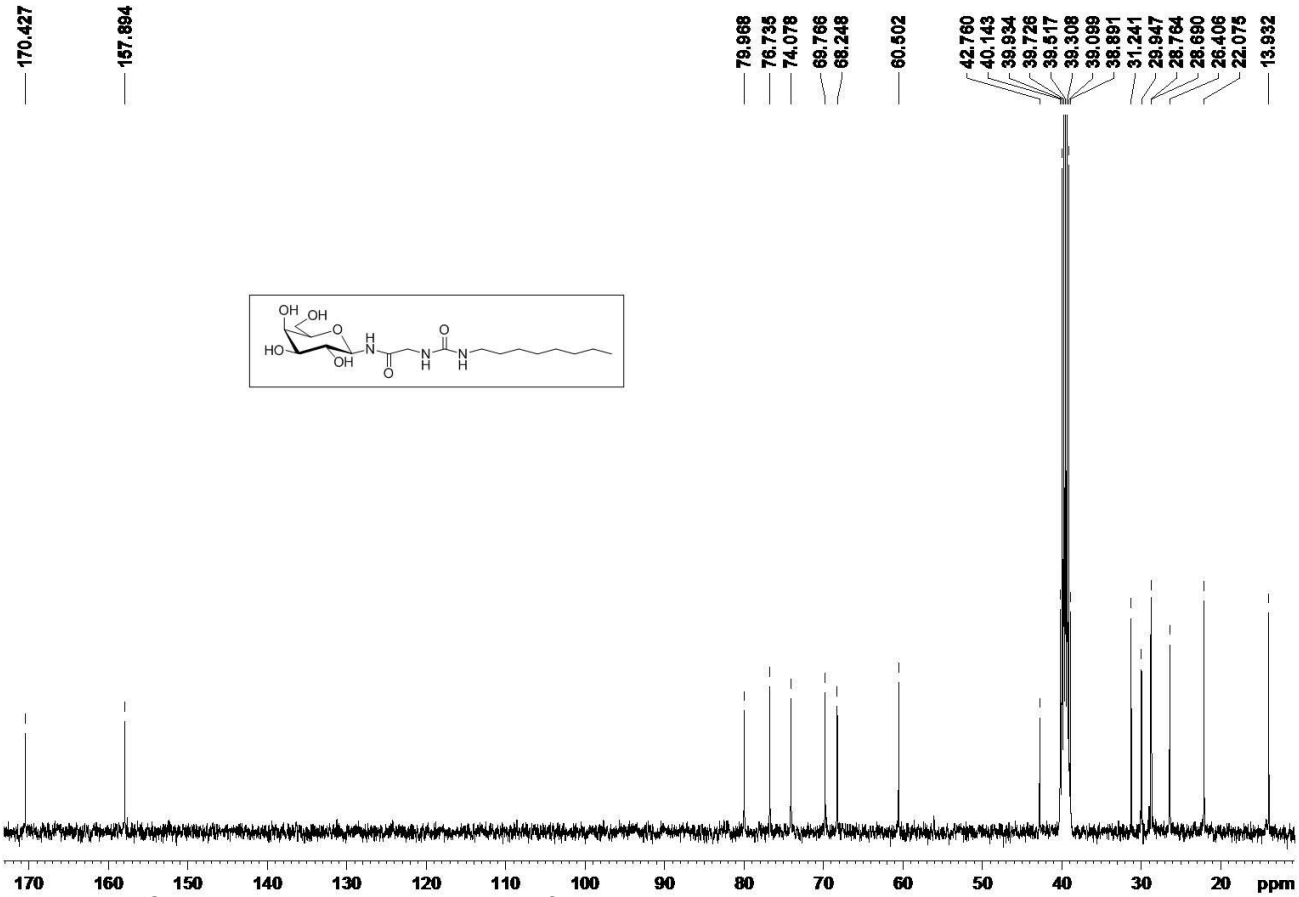

Figure S84 ^{13}C-NMR (100 MHz, DMSO-D^6) of 1-*N*-(β-galactopyronosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(57)**

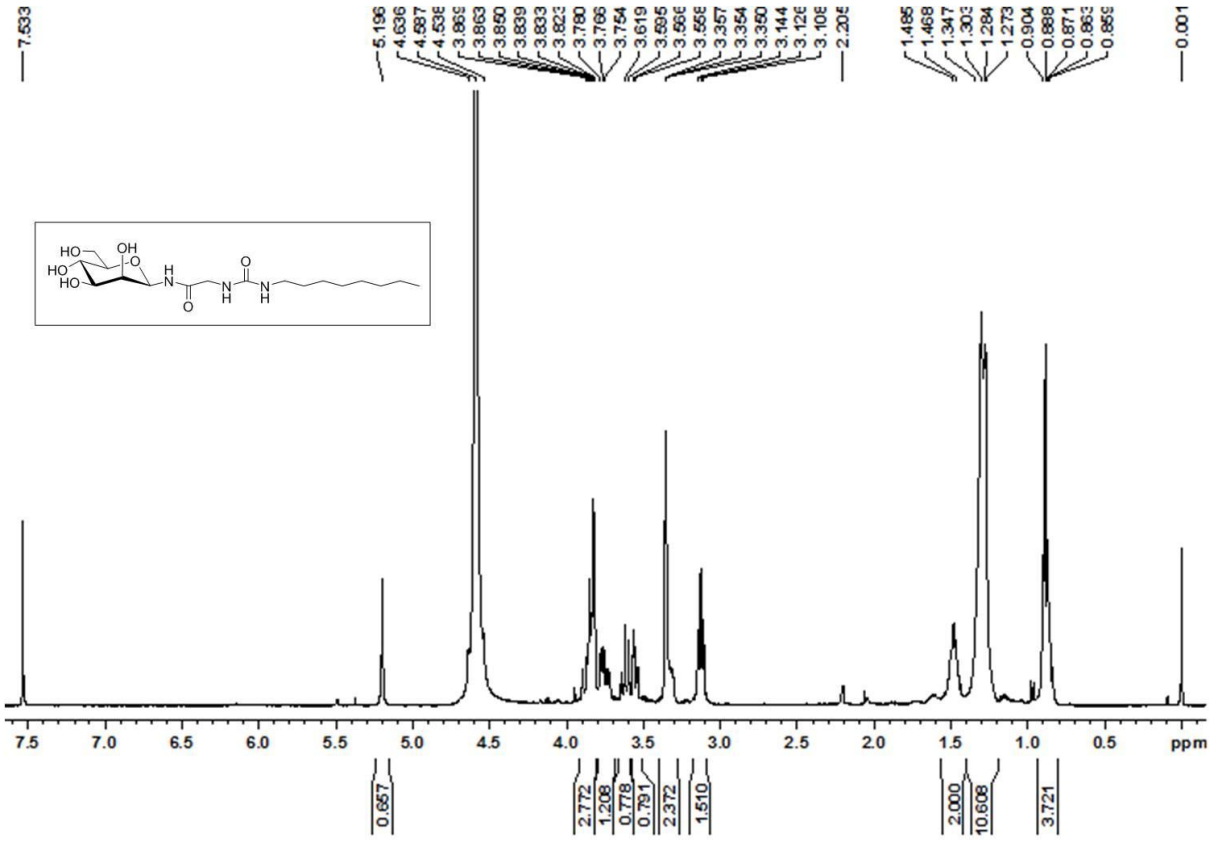

Figure S85 ^{1}H-NMR (400 MHz, $CDCl_3$ + CD_3OD) of 1-*N*-(β-D-mannopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(58)**

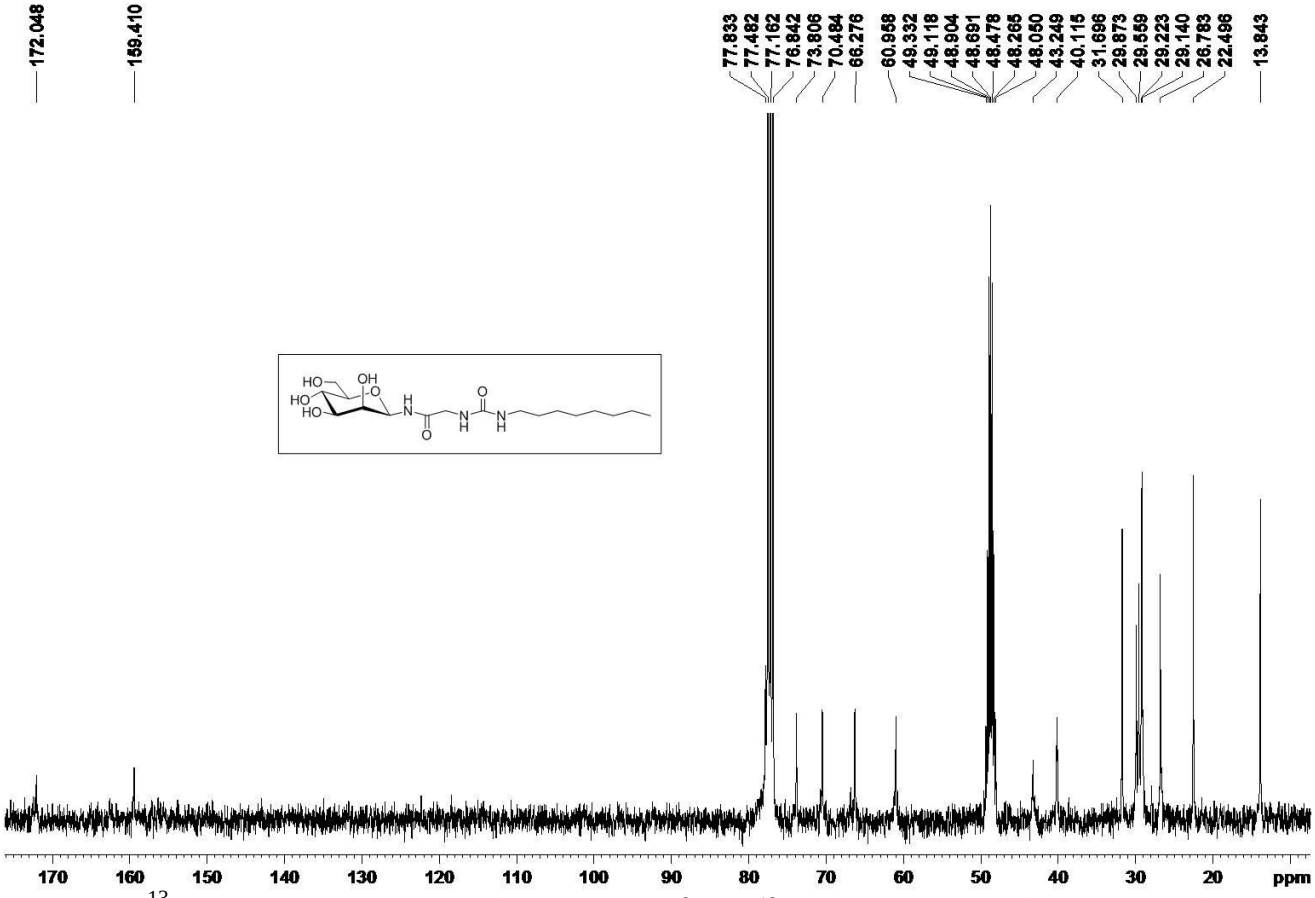

Figure S86 ^{13}C-NMR (100 MHz, $CDCl_3$+ CD_3OD) of 1-*N*-(β-D-mannopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(58)**

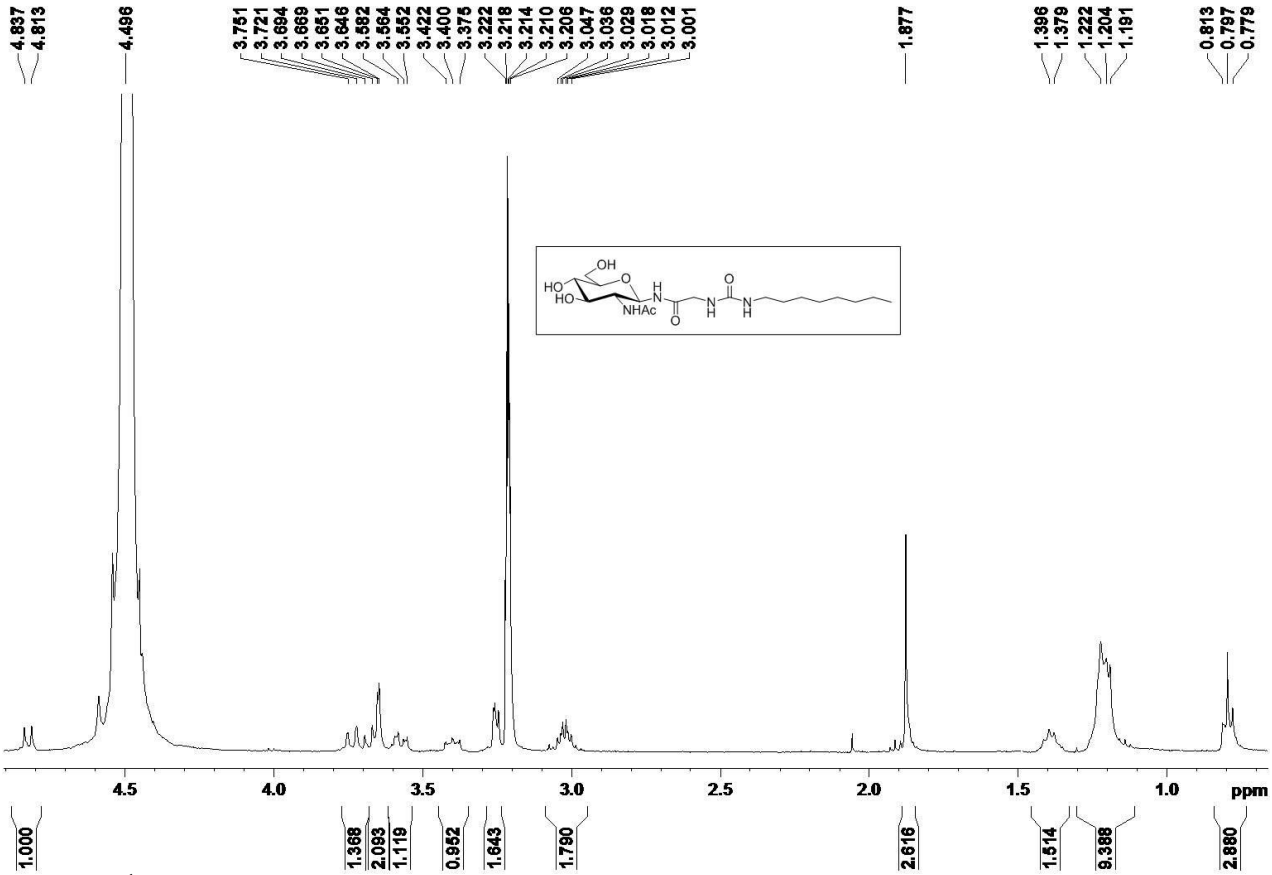

Figure S87 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(2-deoxy-2-acetamido-β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(59)**

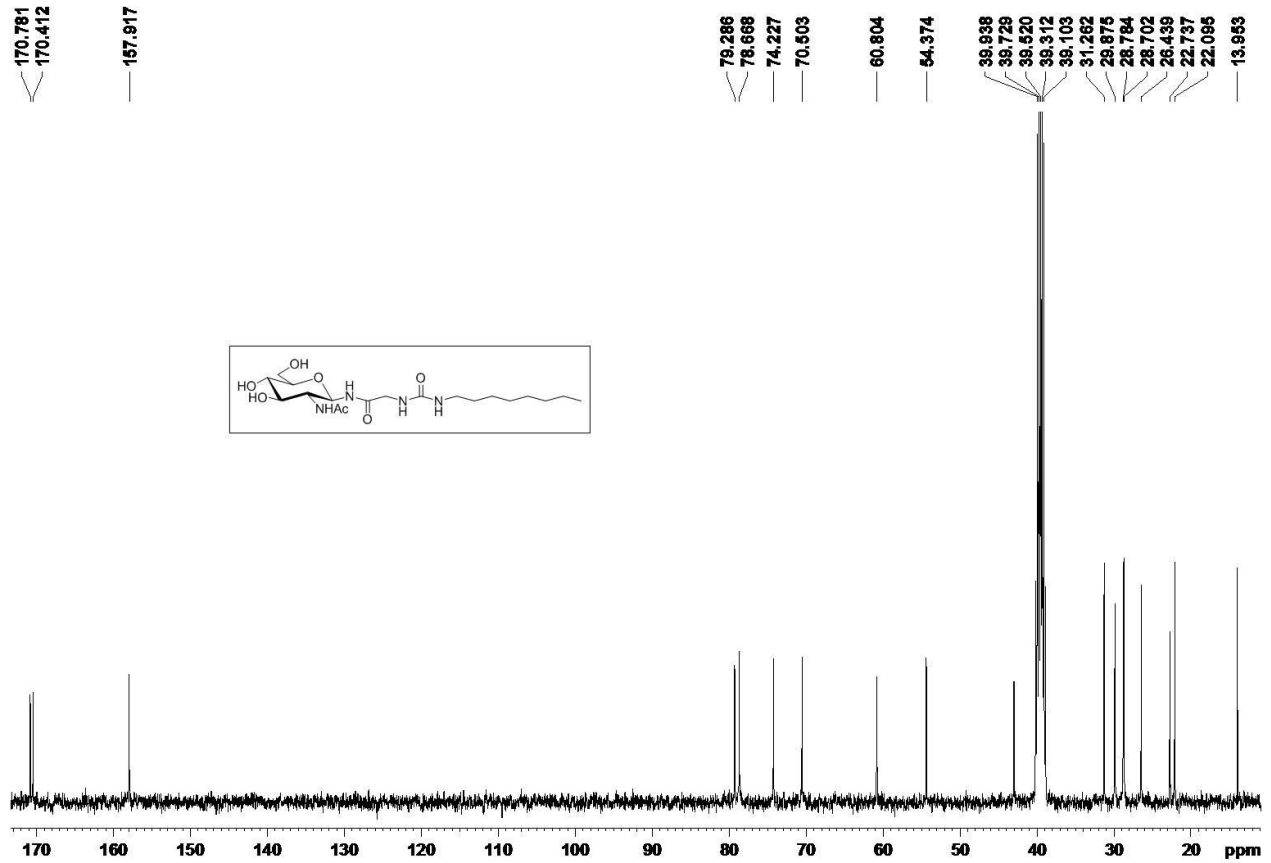

Figure S88 ^{13}C-NMR (100 MHz, DMSO-D^{6}) of 1-*N*-(2-deoxy-2-acetamido-β-D-glucopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(59)**

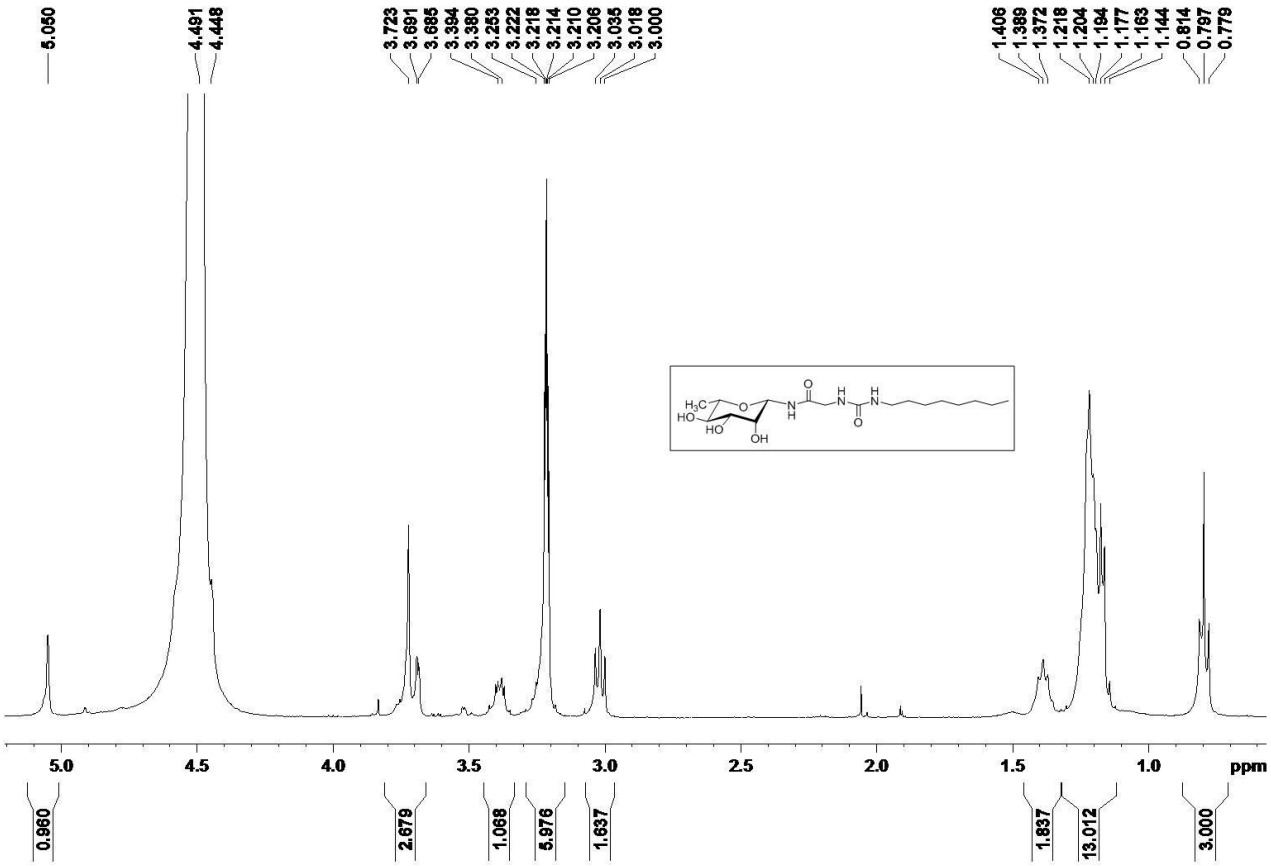

Figure S89 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-D-rhamnopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(60)**

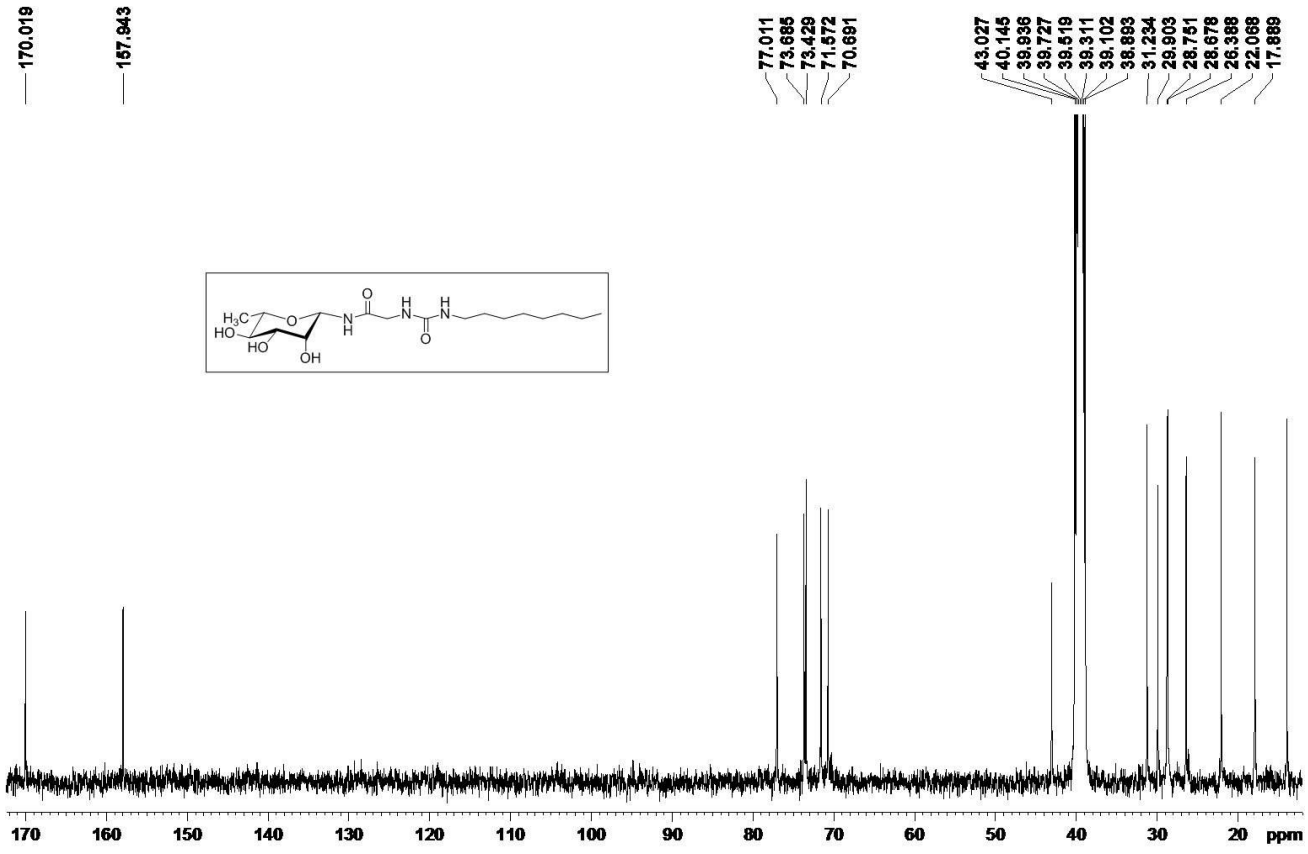

Figure S90 ^{13}C-NMR (100 MHz, DMSO-D^6) of 1-*N*-(β-D-rhamnopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(60)**

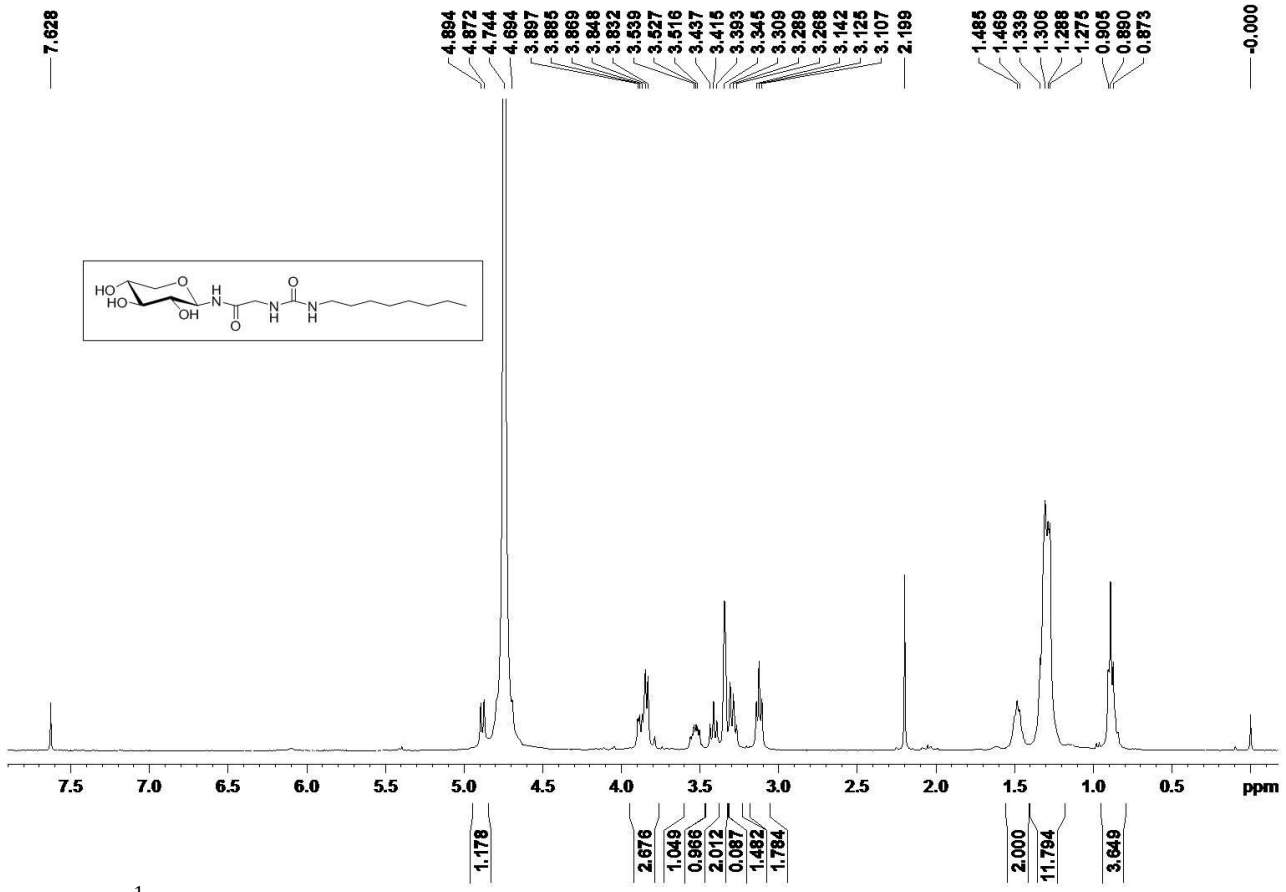

Figure S91 ^{1}H-NMR (400 MHz, $CDCl_3$+ CD_3OD) of 1-*N*-(β-D-xylopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(61)**

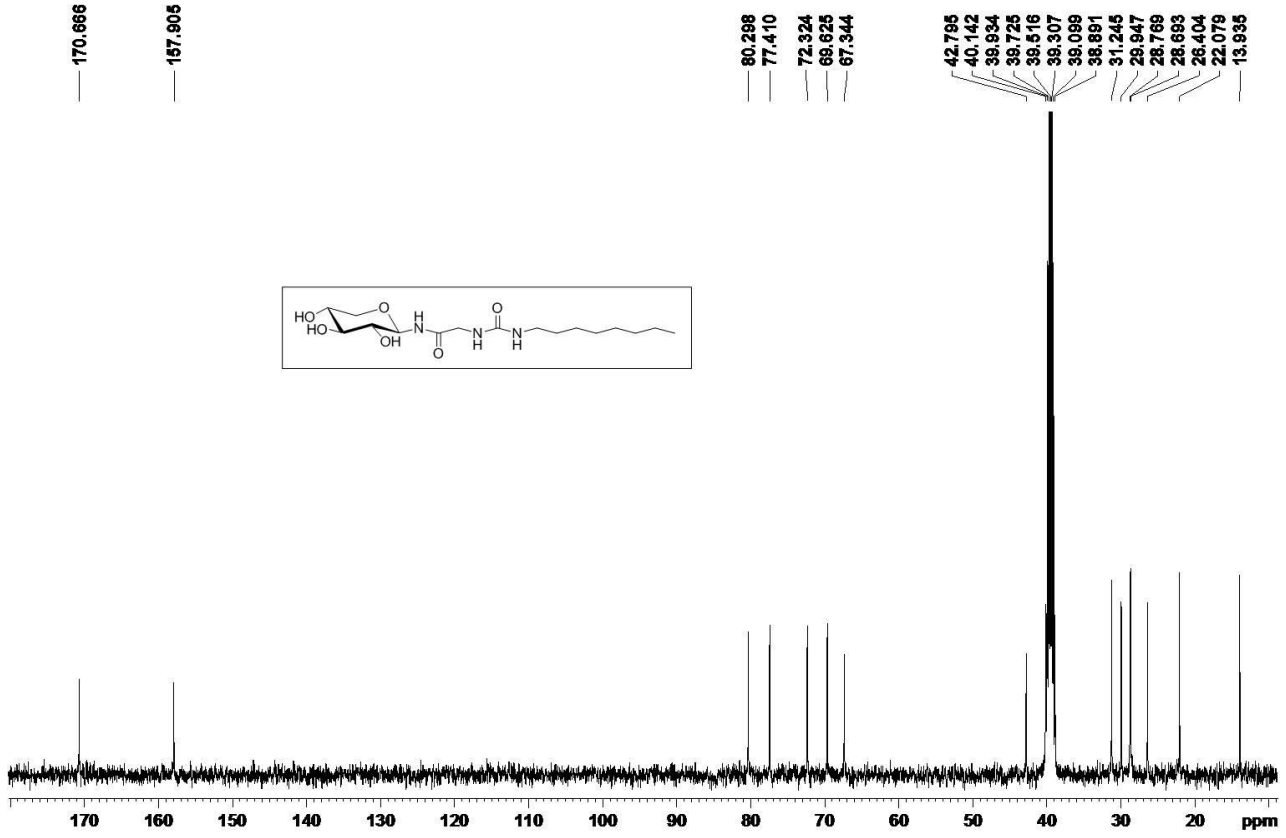

Figure S92 ^{13}C-NMR (100 MHz, DMSO-D^{6}) of 1-*N*-(β-D-xylopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(61)**

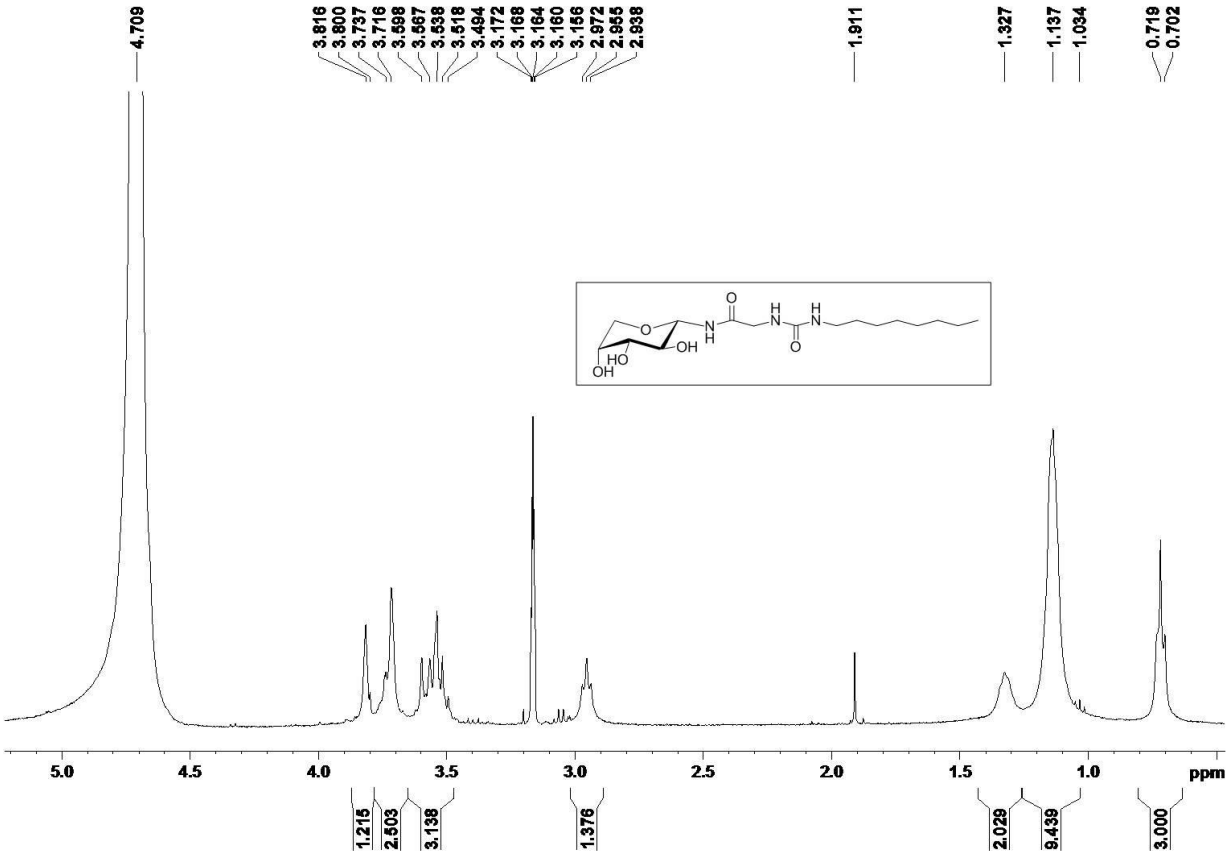

Figure S93 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-D-arbinopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(62)**

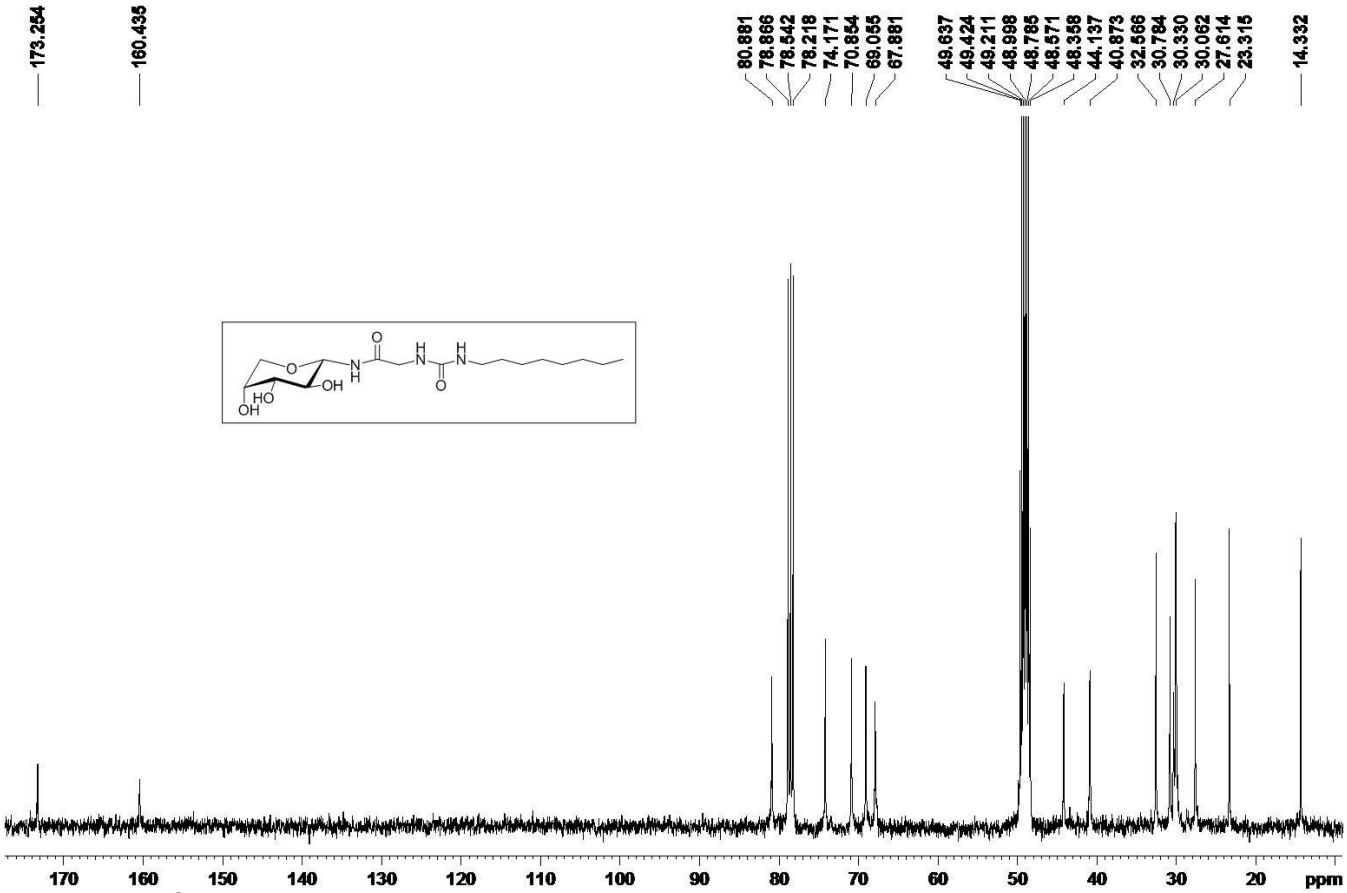

Figure S94 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-D-arbinopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(62)**

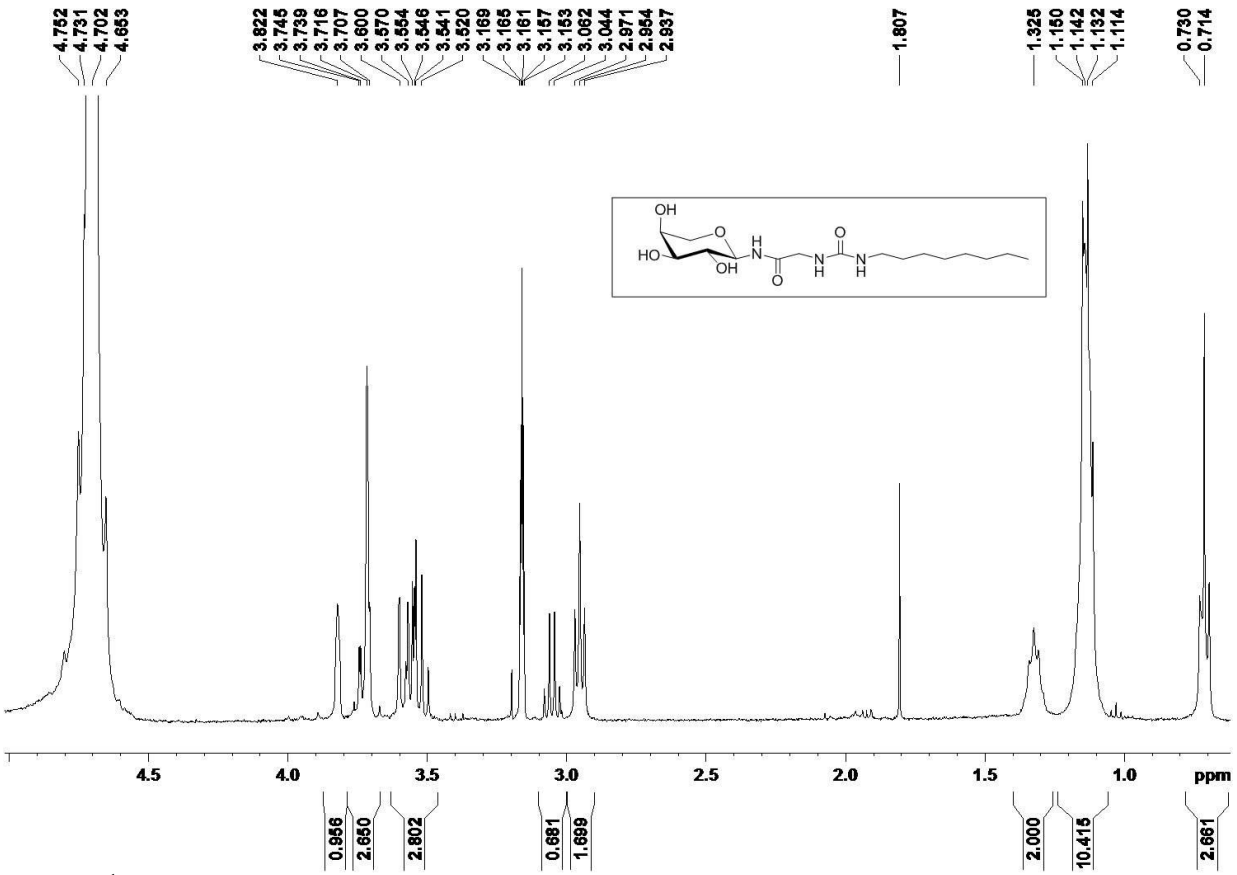

Figure S95 ^{1}H-NMR (400 MHz, CD_3OD) of 1-*N*-(β-L-arbinopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(63)**

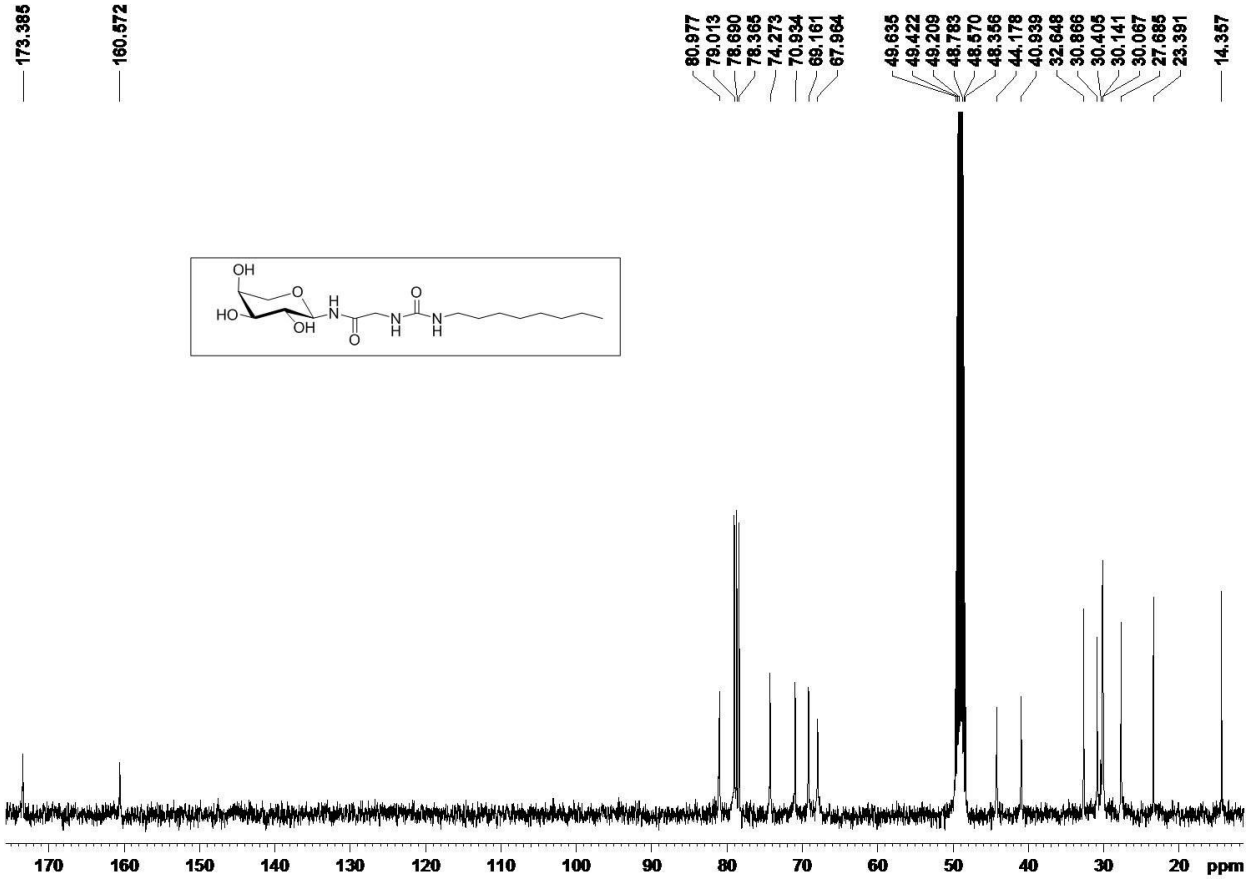

Figure S96 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-(β-L-arbinopyranosyl)-*N*''-(*n*-octyl)-ureidoacetamide **(63)**

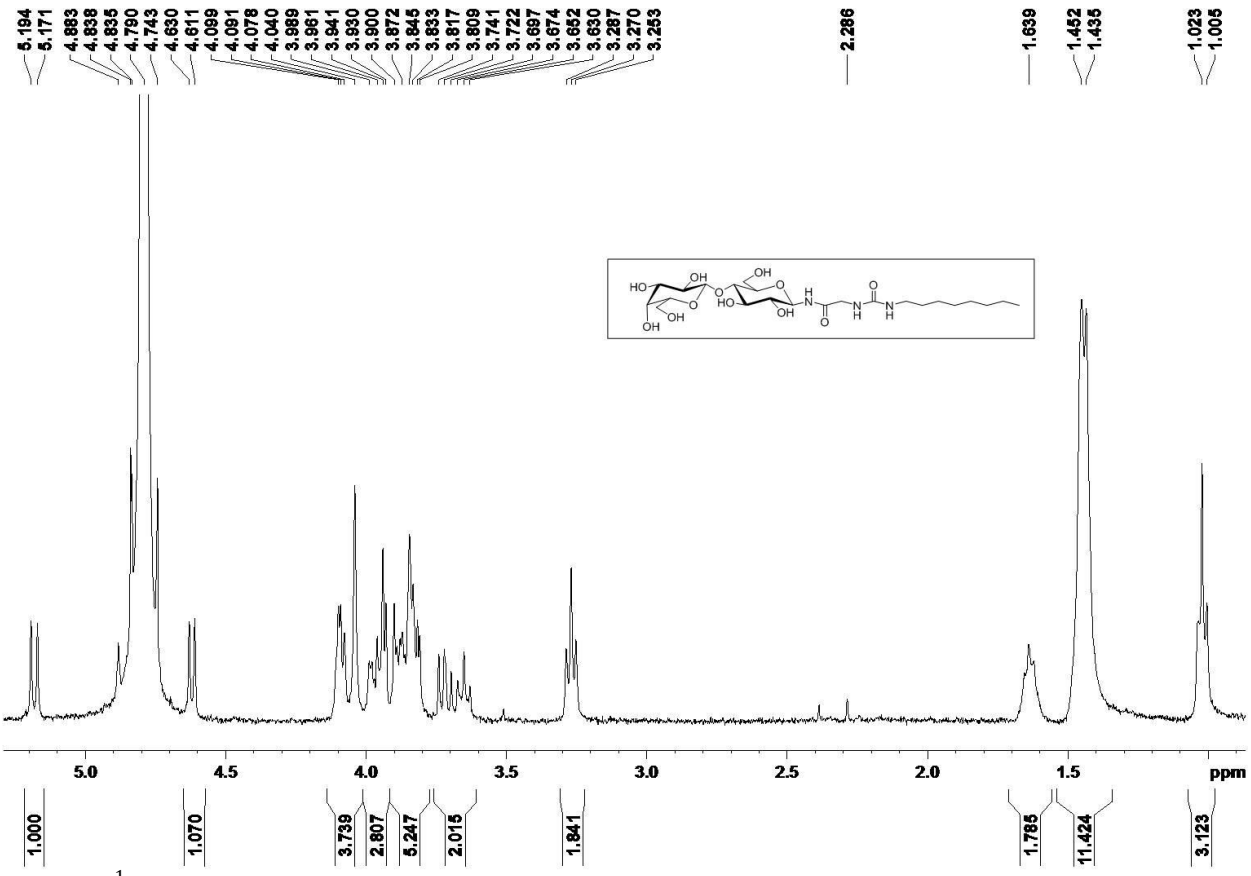

Figure S97 ^{1}H-NMR (400 MHz, D_2O) of 1-*N*-[4-*O*-(β-D-galactopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-octyl)- ureidoacetamide **(64)**

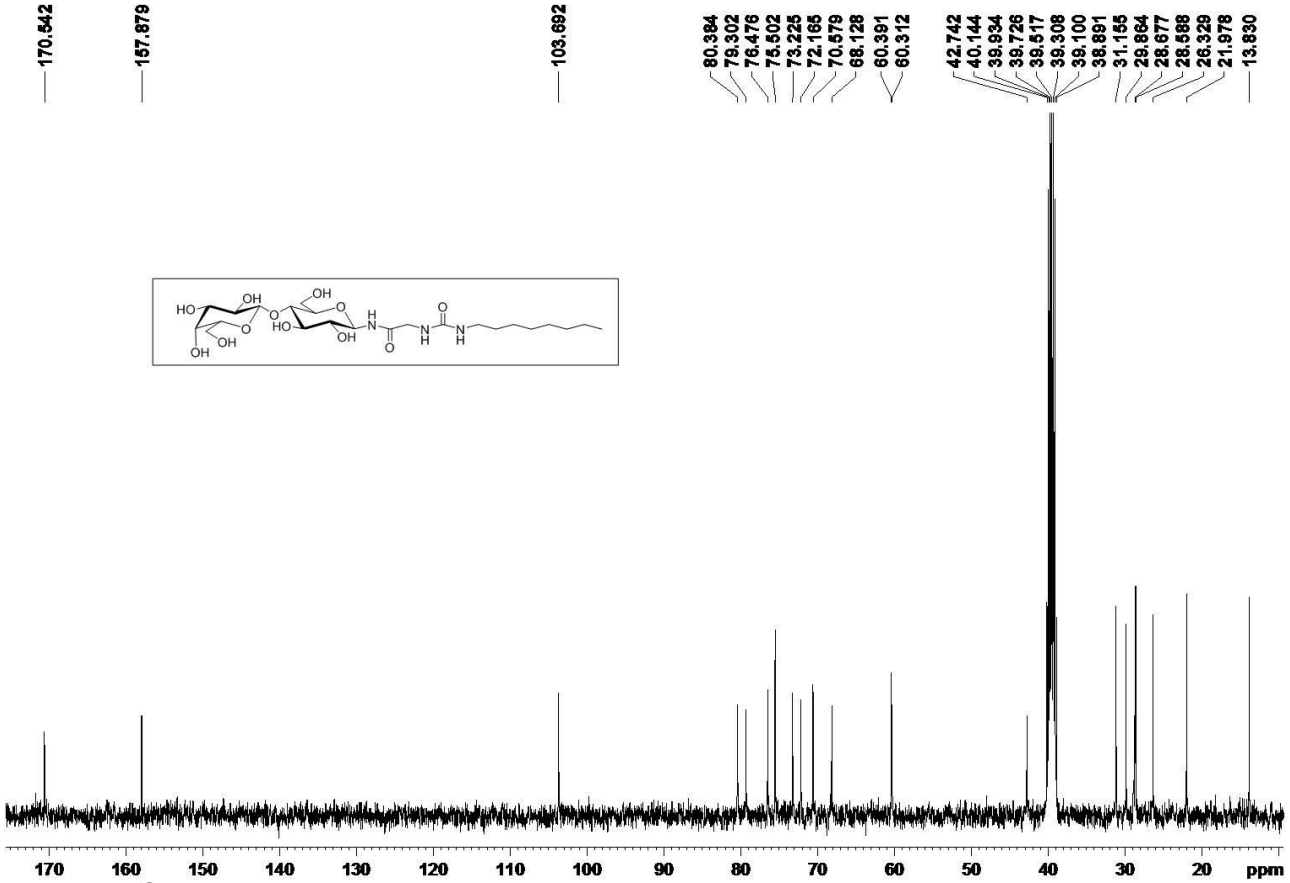

Figure S98 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-[4-*O*-(β-D-galactopyranosyl)-β-D-glucopyranosyl]-*N*''-(*n*-octyl)- ureidoacetamide **(64)**

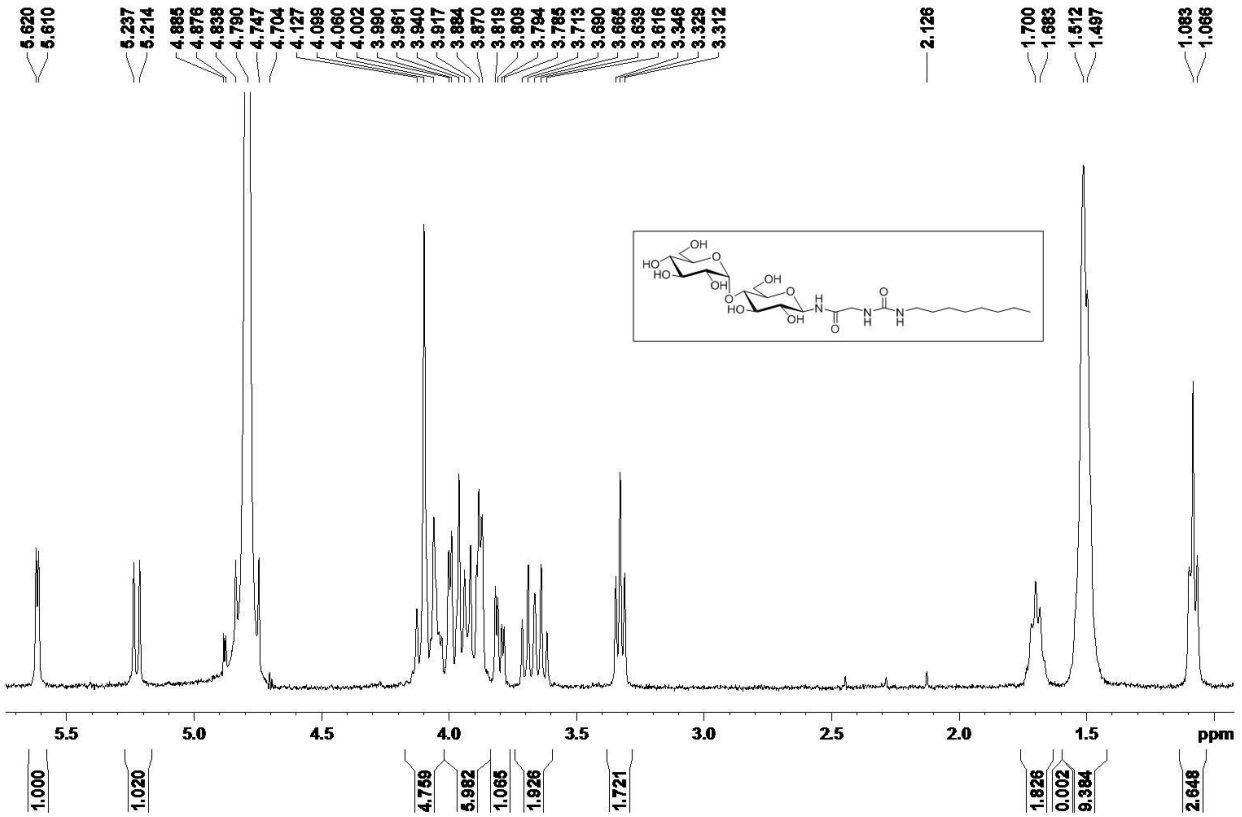

Figure S99 ^{1}H-NMR (400 MHz, D_2O) of 1-*N*-[4-*O*-(α-D-glucopyranosyl)-β-D-glucopyranosyl]-*N*'-(*n*-octyl)- ureidoacetamide **(65)**

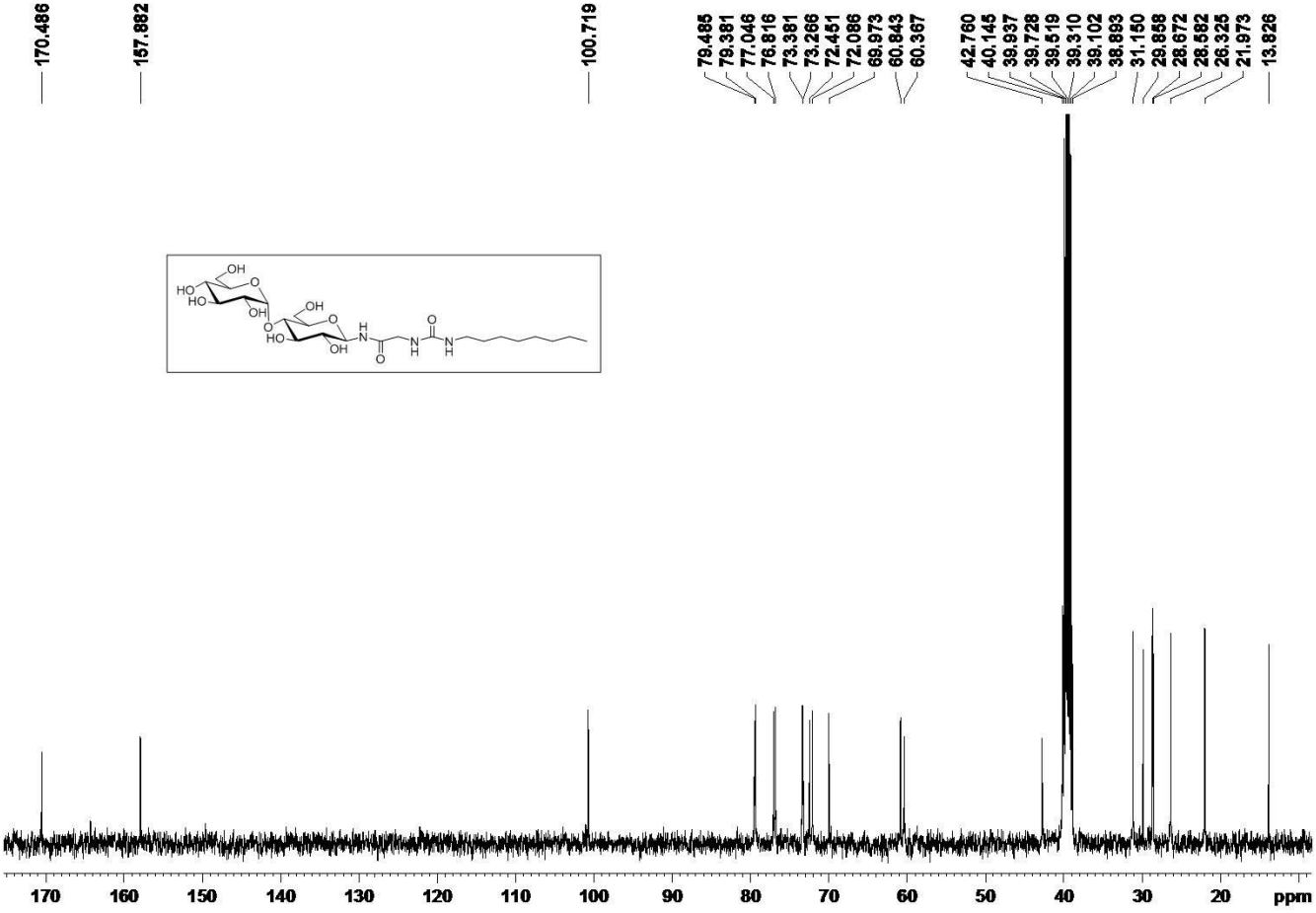

Figure S100 ^{13}C-NMR (100 MHz, CD_3OD) of 1-*N*-[4-*O*-(α-D-glucopyranosyl)-β-D-glucopyranosyl]-*N*'-(*n*-octyl)- ureidoacetamide **(65)**