Supporting Information

Selective synthesis of α -C-(alkynyl)-galactosides by an efficient tandem reaction

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General experimental details:

All the solvents and reagents were used as received. Moisture or air-sensitive reactions were conducted under an argon atmosphere in flame-dried glassware. All anhydrous solvents were either distilled over sodium benzophenone ketyl (Et_2O) or calcium hydride (dichloromethane, pyridine) and stored under an argon atmosphere. Solvents were removed under reduced pressure using standard rotary evaporators. Reactions were monitored by TLC (Merck F 254 silica gel).

^1H NMR and ^{13}C spectra were recorded in deuterated-chloroform unless otherwise stated. ^1H and ^{13}C chemical shifts are expressed as parts per million downfield from the internal standards tetramethylsilane (^1H) and CDCl_3 (^1H and ^{13}C). Multiplicities are indicated by s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet) or br (broadened). FT-IR spectra were recorded using NaCl plates for neat liquids and KBr pellets for solids. Optical rotations were recorded at 25°C . High resolution mass spectra were performed in the positive ESI mode.

5,6-anhydro-2,3,4-tri-*O*-benzyl-L-*altro*-hexose (1).

To a solution of diol **4** (9.05 g, 16.3 mmol) in a mixture of dry CH_2Cl_2 (90 mL) and dry pyridine (55 mL) at 0°C under argon, was added pivaloyl chloride (2.15 g, 17.9 mmol). The solution was allowed to stir at room temperature for 2.5 h before mesyl chloride (2.24 g, 19.5 mmol) and DMAP (0.2 g, 1.63 mmol) were added. The reaction mixture was stirred at rt overnight. An aqueous HCl solution (1N) was then added and organic layer was washed with water and brine, dried (MgSO_4) and evaporated. Purification by silica gel chromatography (petroleum ether/ EtOAc : 9/1) led to the pivalo-mesylate as a colorless oil. This compound (9.98 g, 14.1 mmol) was treated by KOH (1.74 g, 31.0 mmol) in methanol (140 mL). The solution was stirred at rt for 4.5 h and quenched with aqueous HCl solution (1N).

Methanol was then removed under reduced pressure and aqueous layer was extracted with ether. The combined ethereal extracts were washed with brine, dried (MgSO₄) and evaporated. The crude product was purified by silica gel column chromatography (petroleum ether/EtOAc: 9/1) to give compound **5** (6.04 g, 11.2 mmol, 69%) as a colorless oil which was contaminated with a small amount of an unidentified product. The product **5** was used as is in the next step. IR (film, cm⁻¹): 3087, 3062, 3030, 2964, 2925, 1496, 1454, 1091. ¹H NMR (CDCl₃) δ: 7.40-7.26 (m, 15H), 4.90 (d, 1 H, *J*=11.9 Hz), 4.90 (d, 1 H, *J*=11.7 Hz), 4.86-4.75 (m, 3H), 4.66 (d, 1 H, *J*=11.9 Hz), 4.54 (d, 1 H, *J*=12.0 Hz), 4.23 (dd, 1H, *J*=3.2, 6.8 Hz), 4.01 (dd, 1H, *J*=4.0, 6.8 Hz), 3.93 (d, 1H, *J*=4.0 Hz), 3.42 (dd, 1H, *J*=3.2, 5.7 Hz), 3.39-3.34 (m, 1H), 2.78-2.57 (m, 6H), 1.20 (t, 6H). ¹³C NMR (CDCl₃) δ: 138.6, 138.2, 138.1, 128.3, 128.1, 128.0, 127.9, 127.6, 127.5, 127.4, 127.3, 82.9, 82.3, 78.7, 75.6, 75.1, 72.3, 53.6, 50.7, 45.2, 25.4, 24.9, 14.5, 14.3. HRMS (ESI) *m/z* calcd for C₃₁H₃₈O₄NaS₂ (M+Na): 561.2109, found: 561.2111.

To a solution of compound **5** (5.73 g, 10.6 mmol) in THF/H₂O (7/3) (100 mL) was added iodine (5.52 g, 21.7 mmol) and calcium carbonate (2.17 g, 21.7 mmol). The reaction mixture was stirred at rt for 2 h and a saturated aqueous Na₂S₂O₃ solution was added. The solution was extracted with diethyl ether and the combined organic layers were washed with brine, dried (MgSO₄) and evaporated. The crude product was then purified by silica gel column chromatography (petroleum ether/EtOAc: 9/1) to furnish epoxy aldehyde **1** as a colorless oil which slowly crystallized. [α]_D²⁵ + 17.8° (*c* 1.0, CHCl₃). IR (film, cm⁻¹): 3088, 3062, 3031, 2874, 1732, 1497, 1454, 1090. ¹H NMR (CDCl₃) δ: 9.68 (d, 1H, *J*=1.4 Hz), 7.37-7.24 (m, 15H), 4.69 (d, 1 H, *J*=11.8 Hz), 4.65-4.47 (m, 4H), 4.30 (d, 1 H, *J*=11.3 Hz), 4.04 (dd, 1H, *J*=1.4, 4.3 Hz), 3.94 (dd, 1H, *J*=4.3, 5.8 Hz), 3.73 (dd, 1H, *J*=4.3, 5.8 Hz), 3.33-3.25 (m, 1H), 2.71 (dd, 1H, *J*=2.7, 5.3 Hz), 2.64 (dd, 1H, *J*=4.0, 5.3 Hz). ¹³C NMR (CDCl₃) δ: 202.1, 138.3, 137.8, 137.5, 129.0, 128.9, 128.8, 128.7, 128.6, 128.5, 128.4, 128.3, 83.9, 80.9, 76.7, 74.3, 73.9, 73.8, 52.2, 45.0. HRMS (ESI) *m/z* calcd for C₂₇H₂₈O₅Na (M+Na): 455.1834, found: 455.1836.

1-(2,3,4-tri-*O*-benzyl-α-D-galactopyranosyl)-2-phenylacetylene (**3a**).

Following the typical procedure, epoxyaldehyde **1** (63.6 mg, 0.147 mmol) led to compound **3a** (57.2, 0.107 mmol, 73%) as a colorless oil. $[\alpha]_D^{25} + 98.8^\circ$ (*c* 0.5, CHCl₃). IR (film, cm⁻¹): 3571, 3028, 2922, 2235, 1598, 1497, 1489, 1453, 1128. ¹H NMR (CDCl₃) δ : 7.45-7.26 (m, 20H), 5.07 (d, 1H, *J*=5.6 Hz), 4.98 (d, 1H, *J*=11.7 Hz), 4.90 (d, 1H, *J*=11.7 Hz), 4.85-4.72 (m, 3H), 4.66 (d, 1H, *J*=11.5 Hz), 4.19 (dd, 1H, *J*=5.6, 9.5 Hz), 4.05-3.99 (m, 1H), 3.96 (dd, 1H, *J*=2.9, 9.5 Hz), 3.91 (dd, 1H, *J*=1.1, 2.9 Hz), 3.75 (dd, 1H, *J*=6.5, 11.5 Hz), 3.57-3.45 (m, 1H). ¹³C NMR (CDCl₃) δ : 139.0, 138.9, 138.6, 132.4, 129.1, 129.0, 128.9, 128.8, 128.7, 128.5, 128.2, 128.1, 122.8, 88.9, 84.8, 80.2, 76.3, 75.1, 75.0, 74.4, 73.8, 73.3, 68.2, 62.7. HRMS (ESI) *m/z* calcd for C₃₅H₃₄O₅Na (M+Na): 557.2304, found: 557.2295.

1-(2,3,4-tri-*O*-benzyl- α -D-galactopyranosyl)-2-propylacetylene (3b).

Following the typical procedure, epoxyaldehyde **1** (59.2 mg, 0.137 mmol) led to compound **3b** (47.1, 0.094 mmol, 69%) as a colorless oil. $[\alpha]_D^{25} + 66.3^\circ$ (*c* 0.55, CHCl₃). IR (film, cm⁻¹): 3453, 3063, 3030, 2961, 2931, 2872, 1497, 1454, 1087. ¹H NMR (CDCl₃) δ : 7.44-7.26 (m, 15H), 4.97 (d, 1H, *J*=11.7 Hz), 4.91 (d, 1H, *J*=11.7 Hz), 4.87 (d, 1H, *J*=5.5 Hz), 4.82-4.69 (m, 3H), 4.65 (d, 1H, *J*=11.6 Hz), 4.09 (dd, 1H, *J*=5.5, 9.5 Hz), 3.99-3.85 (m, 3H), 3.73 (dd, 1H, *J*=6.6, 11.3 Hz), 3.54-3.40 (m, 1H), 2.24 (dt, 2H, *J*=2.1, 7.1 Hz), 1.60-1.47 (m, 2H), 0.98 (t, 3H, *J*=7.3 Hz). ¹³C NMR (CDCl₃) δ : 137.7, 137.4, 137.2, 127.6, 127.4, 127.3, 127.0, 126.7, 126.6, 88.1, 78.9, 74.7, 73.9, 73.6, 73.4, 72.5, 72.4, 71.8, 66.4, 61.3, 21.1, 19.8, 12.5. HRMS (ESI) *m/z* calcd for C₃₂H₃₆O₅Na (M+Na): 523.2460, found: 523.2474.

1-(2,3,4-tri-*O*-benzyl- α -D-galactopyranosyl)-2-pentylacetylene (3c).

Following the typical procedure, epoxyaldehyde **1** (61.5 mg, 0.142 mmol) led to compound **3c** (47.0, 0.089 mmol, 63%) as a colorless oil. $[\alpha]_D^{25} + 59.5^\circ$ (*c* 0.4, CHCl₃). IR (film, cm⁻¹): 3448, 3063, 3030, 2930, 2230, 1497, 1454, 1087. ¹H NMR (CDCl₃) δ : 7.43-7.26 (m, 15H), 4.95 (d, 1H, *J*=11.7 Hz), 4.92-4.85 (m, 2H), 4.80-4.66 (m, 3H), 4.63 (d, 1H, *J*=11.5

Hz), 4.08 (dd, 1H, $J=5.5, 10.3$ Hz), 3.97-3.84 (m, 3H), 3.72 (dd, 1H, $J=6.6, 11.3$ Hz), 3.53-3.40 (m, 1H), 2.24 (dt, 2H, $J=1.9, 7.1$ Hz), 1.58-1.45 (m, 2H), 1.45-1.25 (m, 4H), 0.87 (t, 3H, $J=7.1$ Hz). ^{13}C NMR (CDCl_3) δ : 138.5, 138.2, 137.9, 128.4, 128.2, 127.3, 128.1, 128.0, 127.7, 127.5, 127.3, 89.1, 79.7, 75.5, 74.4, 74.1, 73.2, 72.5, 67.2, 62.1, 30.8, 28.1, 21.9, 18.6, 13.7. HRMS (ESI) m/z calcd for $\text{C}_{34}\text{H}_{40}\text{O}_5\text{Na}$: 551.2773, found: 551.2775.

1-(2,3,4-tri-*O*-benzyl- α -D-galactopyranosyl)-2-trimethylsilylacetylene (3d).

Following the typical procedure, epoxyaldehyde **1** (61.6 mg, 0.142 mmol) led to compound **3d** (44.0, 0.083 mmol, 62%) as a colorless oil. $[\alpha]_D^{25} + 63.7^\circ$ (c 0.77, CHCl_3). IR (film, cm^{-1}): 3450, 3068, 3030, 2957, 2897, 2170, 1497, 1454, 1089. ^1H NMR (CDCl_3) δ : 7.43-7.27 (m, 15H), 4.95 (d, 1H, $J=11.7$ Hz), 4.87 (d, 1H, $J=5.6$ Hz), 4.86 (d, 1H, $J=11.7$ Hz), 4.80-4.70 (m, 3H), 4.65 (d, 1H, $J=11.5$ Hz), 4.09 (dd, 1H, $J=5.6, 9.5$ Hz), 3.95-3.80 (m, 3H), 3.72 (dd, 1H, $J=6.5, 11.3$ Hz), 3.53-3.40 (m, 1H), 0.18 (s, 9H). ^{13}C NMR (CDCl_3) δ : 138.6, 138.2, 128.8, 128.6, 128.5, 128.4, 128.1, 127.9, 127.8, 127.7, 127.6, 100.5, 93.9, 79.3, 75.7, 74.6, 74.5, 73.9, 73.4, 72.7, 67.5, 62.3, 0.0. HRMS (ESI) m/z calcd for $\text{C}_{32}\text{H}_{38}\text{O}_5\text{SiNa}$ ($\text{M}+\text{Na}$): 553.2386, found: 553.2397.

1-(2,3,4-tri-*O*-benzyl- α -D-galactopyranosyl)-2-((*tert*-butyldimethylsilyloxy)methyl)acetylene (3e).

Following the typical procedure, epoxyaldehyde **1** (60.2 mg, 0.139 mmol) led to compound **3e** (57.9, 0.096 mmol, 69%) as a slightly yellow oil. $[\alpha]_D^{25} + 53.0^\circ$ (c 0.8, CHCl_3). IR (film, cm^{-1}): 3449, 3064, 3030, 2928, 2857, 1497, 1454, 1086. ^1H NMR (CDCl_3) δ : 7.42-7.28 (m, 15H), 4.96 (d, 1H, $J=11.5$ Hz), 4.92-4.86 (m, 2H), 4.81-4.72 (m, 3H), 4.64 (d, 1H, $J=11.5$ Hz), 4.38 (d, 2H, $J=1.9$ Hz), 4.08 (dd, 1H, $J=5.5, 9.5$ Hz), 3.98-3.88 (m, 3H), 3.71 (dd, 1H, $J=6.5, 11.3$ Hz), 3.48 (dd, 1H, $J=5.2, 11.3$ Hz), 0.91 (s, 9H), 0.12 (s, 6H). ^{13}C NMR (CDCl_3) δ : 139.1, 138.7, 138.6, 129.1, 128.9, 128.8, 128.5, 128.3, 128.1, 128.0, 87.5, 80.7,

80.0, 76.0, 75.1, 75.0, 74.2, 74.0, 73.5, 67.8, 62.7, 52.3, 26.2. HRMS (ESI) m/z calcd for $C_{36}H_{46}O_6SiNa$ ($M+Na$): 625.2961, found: 625.2963.

1-(2,3,4-tri-*O*-benzyl- α -D-galactopyranosyl)-2-isoprenylacetylene (3f).

Following the typical procedure, epoxyaldehyde **1** (67.4 mg, 0.156 mmol) led to compound **3f** (56.5, 0.113 mmol, 73%) as a colorless oil. $[\alpha]_D^{25} + 84.6^\circ$ (c 0.7, $CHCl_3$). IR (film, cm^{-1}): 3449, 3088, 3063, 3030, 2921, 2884, 1612, 1497, 1454, 1090. 1H NMR ($CDCl_3$) δ : 7.44-7.24 (m, 15H), 5.34-5.30 (m, 1H), 5.28-5.24 (m, 1H), 4.97 (d, 1H, $J=5.5$ Hz), 4.96 (d, 1H, $J=11.9$ Hz), 4.87 (d, 1H, $J=11.9$ Hz), 4.81-4.64 (m, 3H), 4.65 (d, 1H, $J=11.7$ Hz), 4.12 (dd, 1H, $J=5.5, 9.5$ Hz), 3.96-3.82 (m, 3H), 3.72 (dd, 1H, $J=6.5, 11.3$ Hz), 3.40 (dd, 1H, $J=3.9, 11.3$ Hz), 1.80 (s, 3H). ^{13}C NMR ($CDCl_3$) δ : 138.5, 138.4, 138.1, 128.6, 128.4, 128.3, 128.2, 127.9, 127.7, 127.6, 127.5, 126.1, 122.7, 89.5, 83.0, 79.6, 75.7, 74.5, 74.4, 73.7, 73.3, 72.7, 67.5, 62.1, 23.4. HRMS (ESI) m/z calcd for $C_{32}H_{34}O_5Na$ ($M+Na$): 521.2304, found: 521.2296.

Methyl 2,3,4-tri-*O*-benzyl-6,7-dideoxy-7-*C*-(2,3,4-tri-*O*-benzyl- α -D-galactopyranosyl)- α -D-glucopyranoside (3h).

Following the typical procedure, epoxyaldehyde **1** (40.5 mg, 0.094 mmol) led to compound **3h** (46.1, 0.052 mmol, 55%) as a colorless oil. $[\alpha]_D^{25} + 47.7^\circ$ (c 0.6, $CHCl_3$). IR (film, cm^{-1}): 3458, 3088, 3063, 3030, 2924, 1606, 1497, 1454, 1090. 1H NMR ($CDCl_3$) δ : 7.40-7.19 (m, 30H), 5.00-4.92 (m, 2H), 4.91-4.82 (m, 2H), 4.80-4.65 (m, 6H), 4.64-4.53 (m, 3H), 4.44 (d, 1H, $J=9.5$ Hz), 4.43 (d, 1H, $J=3.1$ Hz), 4.08 (dd, 1H, $J=5.9, 9.3$ Hz), 3.95-3.82 (m, 2H), 3.79-3.60 (m, 3H), 3.56-3.45 (m, 2H), 3.42 (s, 3H), 3.40-3.35 (m, 1H). ^{13}C NMR

(CDCl₃) δ : 138.6, 138.5, 138.4, 138.1, 138.0, 137.9, 128.6, 128.5, 128.4, 128.3, 128.2, 128.1, 128.0, 127.9, 127.7, 127.6, 127.5, 127.3, 127.2, 98.6, 85.6, 82.3, 80.9, 80.5, 80.2, 79.1, 75.9, 75.3, 75.1, 74.4, 74.3, 73.8, 73.5, 73.3, 73.0, 67.4, 62.1, 61.8, 55.8. HRMS (ESI) m/z calcd for C₅₆H₅₈O₁₀Na (M+Na): 913.3928, found: 913.3909.

(4R)-4-[2-(2,3,4-tri-*O*-benzyl-D-galacto- α -C-pyranosyl)-1-ethynyl]-2,2-dimethyloxazolidine-3-carboxylic acid *tert*-butyl ester (3i**).**

Following the typical procedure, epoxyaldehyde **1** (59.6 mg, 0.138 mmol) led to compound **3i** (43.2, 0.066 mmol, 48%) as a slightly yellow oil. $[\alpha]_D^{25} + 76.9^\circ$ (c 0.9, CHCl₃). IR (film, cm⁻¹): 3471, 3064, 3030, 2978, 2929, 1689, 1497, 1445, 1378, 1091. ¹H NMR (CDCl₃) δ : 7.40-7.27 (m, 15H), 4.96 (d, 1H, J =11.8 Hz), 4.91-4.83 (m, 2H), 4.80-4.55 (m, 5H), 4.11 (dd, 1H, J =5.5, 9.5 Hz), 4.01 (dd, 2H, J =2.6, 6.3 Hz), 3.91-3.83 (m, 3H), 3.72 (dd, 1H, J =6.7, 11.6 Hz), 3.55-3.40 (m, 1H), 1.45 (s, 9H), 1.40 (s, 3H), 1.28 (s, 3H). ¹³C NMR (CDCl₃) δ : 139.1, 138.8, 138.6, 129.0, 128.9, 128.8, 128.7, 128.4, 128.1, 127.9, 80.8, 76.1, 75.0, 74.2, 74.1, 73.4, 67.7, 49.1, 30.1, 28.8. HRMS (ESI) m/z calcd for C₃₉H₄₇O₈Na (M+Na): 680.3199, found: 680.3188.

¹H NMR compound 1

¹³C NMR compound 1

¹H NMR compound 3a

¹³C NMR compound 3a

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¹H NMR compound 3b

Current Data Parameters
 NAME sg337
 EXNO 51
 PROCNO 1
 F2 - Acquisition Parameters
 Date_ 20050729
 Time 13.44
 INSTRUM spect
 PROBED 5 mm QNP 1H/13
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SFR 5175.983 Hz
 FIDRES 0.078979 Hz
 AQ 6.3308277 sec
 RG 512
 DM 96.600 usec
 DE 7.00 usec
 TE 300.0 K
 D1 1.0000000 sec
 CHANNEL f1
 NUC1 1H
 P1 9.00 usec
 PL1 -5.00 dB
 SFO1 250.1313447 MHz
 F2 - Processing parameters
 SI 32768
 SF 250.130342 MHz
 WNW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00
 1D NMR plot parameters
 CX 30.00 cm
 CY 19.00 cm
 FIP 11.000 ppm
 F1 2751.43 Hz
 F2F -1.000 ppm
 F2 -250.13 Hz
 PPMCH 0.40000 ppm/cm
 BZCM 100.05202 Hz/cm

¹³C NMR compound 3b

¹H NMR compound 3c

Current Data Parameters
 Date_ 20030704
 Time_ 12.31
 INSTRUM spect
 PULPROG zgpg30
 PROCNO 5
 SOLVENT CDCl3
 NS 64
 DS 4
 SWH 3122.832 Hz
 FIDRES 0.191212 Hz
 AQ 2.155555 sec
 RG 574
 DW 155.600 usec
 DE 3.00 usec
 TE 300.2 usec
 D1 0.3000000 sec
 CHANNEL f1 1H
 NUC1 1H
 P1 9.00 usec
 PL 0.00 dB
 SFO 250.1311802 MHz
 F2 - Processing parameters
 SF 250.1300172 MHz
 DS 8
 SW 30716.65 Hz
 AQ 1.00 sec
 RG 4096
 DW 10.20 Hz
 DE 3.00 usec
 TE 300.2 usec
 D1 1.20 sec
 1D NMR plot parameters
 SI 32768
 SF 250.1300172 MHz
 DS 8
 SW 30716.65 Hz
 AQ 1.00 sec
 RG 4096
 DW 10.20 Hz
 DE 3.00 usec
 TE 300.2 usec
 D1 1.20 sec
 SFO 250.1300172 MHz

¹³C NMR compound 3c

¹H NMR compound 3d

Current Data Parameters
 NAME sg139
 EXPNO 30
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20050729
 Time 14.01
 INSTRUM spect
 PULPROG zgpg30
 FIDRES 0.0013
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SSB 5175.983 Hz
 FIDRES 0.078979 Hz
 AQ 6.3308277 sec
 RG 406.4
 DW 96.600 usec
 DE 7.00 usec
 TE 300.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 9.00 usec
 PL1 -6.00 dB
 SF01 250.1315447 MHz

F2 - Processing parameters
 SI 32768
 SF 250.1300609 MHz
 EX
 WDW 0
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
 CY 30.00 cm
 CX 19.00 cm
 F1 11.355 ppm
 F2 2840.21 Hz
 F3 -0.807 ppm
 F4 -201.98 Hz
 PPMCM 0.40541 ppm/cm
 HZCM 101.40620 Hz/cm

¹³C NMR compound 3d

¹H NMR compound 3e

Current Data Parameters
 NAME 3e35a
 EXPNO 30
 PROCNO 1
 F2 - Acquisition Parameters
 Date_ 20050407
 Time 22.21
 INSTRUM spect
 PROBRD 5 mm QNP 1H/13
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 32
 DS 2
 SWH 5175.983 Hz
 FIDRES 0.078979 Hz
 AQ 6.3308277 sec
 RG 287.4
 DW 96.600 usec
 DE 7.00 usec
 TE 300.0 K
 D1 1.0000000 sec
 ===== CHANNEL f1 =====
 NUC1 1H
 P1 9.00 usec
 PL1 -6.00 dB
 SFO1 250.1315447 MHz
 F2 - Processing parameters
 SI 32768
 SF 250.1300470 MHz
 WHW 64
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00
 1D NMR plot parameters
 CX 30.00 cm
 CY 19.00 cm
 FIP 11.000 ppm
 F1 2751.43 Hz
 F2P -1.000 ppm
 F2 -250.13 Hz
 FPMCM 0.40000 ppm/cm
 HZCM 100.05202 Hz/cm

¹³C NMR compound 3e

Current Data Parameters
 NAME 5925a
 EXPNO 2
 PROCNO 1
 F2 - Acquisition Parameters
 Date_ 20050408
 Time 0.00
 INSTRUM spect
 PULPROG zgpg30
 TO 32768
 SOLVENT CDCl3
 NS 1300
 DS 4
 SWH 14450.867 Hz
 FIDRES 0.145828 Hz
 AQ 1.133228 sec
 RG 2896.3
 DW 34.600 usec
 DE 7.00 usec
 TE 300.0 K
 T1 1.803955 sec
 d11 0.0300000 sec
 d12 0.0002000 sec
 CHANNEL F1
 NUC1 13C
 P1 7.50 usec
 PL1 -1.00 dB
 SFO1 62.901822 MHz
 CHANNEL F2
 CPDPRG2 waltz16
 NUC2 1H
 P2 100.00 usec
 PL2 19.00 dB
 PL12 16.00 dB
 PL13 16.00 dB
 SFO2 250.131005 MHz
 F2 - Processing parameters
 SI 32768
 SF 62.8952140 MHz
 WDW EM
 SSB 0
 LB 2.00 Hz
 GB 0
 SC 1.40
 ID MS plot parameters
 CX 34.00 cm
 CY 16.00 cm
 FID 181.618 ppm
 F2P 11427.90 Hz
 F2 7.133 Hz
 F2 461.60 Hz
 F2 5.12584 ppm/cm
 F2 322.39105 Hz/cm

¹H NMR compound 3f

Current Data Parameters
 NAME sg343
 EXPNO 60
 PROCNO 1
 F2 - Acquisition Parameters
 Date_ 20050720
 Time 11.05
 INSTRUM spect
 PROBHD 5 mm QNP 1H/13
 PULPROG zg30
 TO 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 5175.983 Hz
 FIDRES 0.078979 Hz
 AQ 6.1308277 sec
 RG 287.4
 DW 96.600 usec
 DE 1.00 usec
 TE 300.0 K
 D1 1.00000000 sec
 ===== CHANNEL f1 =====
 NUC1 1H
 P1 9.00 usec
 PL1 -6.00 dB
 SFO1 250.1315447 MHz
 F2 - Processing parameters
 S1 32768
 SF 250.1300390 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00
 1D NMR plot parameters
 CX 30.00 cm
 CY 19.00 cm
 F1 11.000 ppm
 F2 2751.43 Hz
 F2 -1.000 ppm
 F2 -250.13 Hz
 PPMCM 0.40000 ppm/cm
 HZCM 100.05202 Hz/cm

CC(C)=CC#C[C@H]1O[C@@H](CO)[C@H](O)[C@@H](OBn)[C@H]1OBn

Current Data Parameters											
NAME	VALUE	UNIT	NAME	VALUE	UNIT	NAME	VALUE	UNIT	NAME	VALUE	UNIT
EXPNO	30		PROCNO	1		DATE_	20100719		TIME	12:50	
F2	12.50	Hz	INSTRUM	spec		PROBHD	5 QNP 1H/13		PULPROG	zgpg30	
TD	65536		SOLVENT	CDCl3		NS	258		DS	4	
RG	33.200	usec	RG	7.00	usec	RG	33.200	usec	RG	7.00	usec
TE	300.0	K	TE	300.0	K	TE	300.0	K	TE	300.0	K
D1	2.00000000	sec	D1	2.00000000	sec	D1	2.00000000	sec	D1	2.00000000	sec
d12	0.00002000	sec	d12	0.00002000	sec	d12	0.00002000	sec	d12	0.00002000	sec

===== CHANNEL f1 =====											
NAME	VALUE	UNIT	NAME	VALUE	UNIT	NAME	VALUE	UNIT	NAME	VALUE	UNIT
NUC1	13C		NUC2	1H		CPDPRG2	waltz16		CHN1	13C	
F1	75.00	GHz	F2	4.00	GHz	PCPD2	100.00	usec	CHN2	1H	
RF01	62.9015030	MHz	RF02	16.00	MHz	F12	16.00	GHz	RF03	16.00	MHz
						F23	16.00	GHz	RF04	16.00	MHz
						RF02	250.1310000	MHz			

===== CHANNEL f2 =====											
NAME	VALUE	UNIT	NAME	VALUE	UNIT	NAME	VALUE	UNIT	NAME	VALUE	UNIT
NUC1	13C		NUC2	1H		F2	376.68	MHz	F2	376.68	MHz
F1	75.00	GHz	F2	4.00	GHz	RF01	62.8951121	MHz	RF02	62.8951121	MHz
RF01	62.9015030	MHz	RF02	16.00	MHz	RF03	16.00	MHz	RF04	16.00	MHz
						RF05	16.00	MHz	RF06	16.00	MHz
						RF07	16.00	MHz	RF08	16.00	MHz
						RF09	16.00	MHz	RF10	16.00	MHz
						RF11	16.00	MHz	RF12	16.00	MHz
						RF13	16.00	MHz	RF14	16.00	MHz
						RF15	16.00	MHz	RF16	16.00	MHz
						RF17	16.00	MHz	RF18	16.00	MHz
						RF19	16.00	MHz	RF20	16.00	MHz
						RF21	16.00	MHz	RF22	16.00	MHz
						RF23	16.00	MHz	RF24	16.00	MHz
						RF25	16.00	MHz	RF26	16.00	MHz
						RF27	16.00	MHz	RF28	16.00	MHz
						RF29	16.00	MHz	RF30	16.00	MHz
						RF31	16.00	MHz	RF32	16.00	MHz
						RF33	16.00	MHz	RF34	16.00	MHz
						RF35	16.00	MHz	RF36	16.00	MHz
						RF37	16.00	MHz	RF38	16.00	MHz
						RF39	16.00	MHz	RF40	16.00	MHz
						RF41	16.00	MHz	RF42	16.00	MHz
						RF43	16.00	MHz	RF44	16.00	MHz
						RF45	16.00	MHz	RF46	16.00	MHz
						RF47	16.00	MHz	RF48	16.00	MHz
						RF49	16.00	MHz	RF50	16	

¹H NMR compound 3g

Current Data Parameters
 NAME 9342
 EXPNO 18
 PROCNO 1
 F2 - Acquisition Parameters
 Date_ 20050719
 Time 17:21
 INSTRUM spect
 PROBEID 5 mm QNP 1H/13
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWE 5175.983 Hz
 FIDRES 0.078979 Hz
 AQ 6.3308277 sec
 RG 181
 DW 96.600 usec
 DE 7.00 usec
 TE 300.0 K
 D1 1.0000000 sec
 CHANNEL f1
 NUC1 1H
 P1 9.00 usec
 PL1 -5.00 dB
 SFO1 250.1315447 MHz
 F2 - Processing parameters
 SI 32768
 SF 250.130392 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00
 ID NMR plot parameters
 CX 30.00 cm
 CY 19.00 cm
 FIP 11.000 ppm
 F1 2751.43 Hz
 F2 -1.000 ppm
 F2 -250.13 Hz
 PPMCM 0.40000 ppm/cm
 HZCM 100.05202 Hz/cm

¹³C NMR compound 3g

Current Data Parameters
NAME sg42
EXPNO 21
PROCNO 1

F2 - Acquisition Parameters
Date_ 20090717
Time 11:41
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 150
DS 4
SWH 14450.867 Hz
FIDRES 0.441005 Hz
AQ 1.133822 sec
RG 327.6
RG2 34.00 usec
DE 1.00 usec
TE 300.2 K
T2 300.0 X
T2* 1.8999998 sec
D1 0.03000000 sec
d11 0.03000000 sec
d12 0.0002000 sec

===== CHANNEL f1 13C =====
NUC1 13C
P1 7.50 usec
PL1 -4.00 dB
SFO1 62.901622 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
P2 100.00 usec
PL2 -4.00 dB
PL12 18.00 dB
PL13 18.00 dB
SFO2 250.131005 MHz

F2 - Processing parameters
SI 32768
SF 62.8952140 MHz
WDW EM
SS 0
LB 2.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
C1 64.00 cm
C2 64.00 cm
C3 16.00 cm
F1P 181.618 ppm
F1 11422.90 Hz
F2P 7.335 ppm
F2 461.60 Hz
P1P 5.728 ppm/cm
P1 332.33015 Hz/cm

¹H NMR compound 3h

¹³C NMR compound 3h

¹H NMR compound 3i

Current Data Parameters
 NAME 9352
 EXPNO 11
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20090725
 Time 15.11
 INSTRUM spect
 PROBRD 5 mm QNP 1H/13
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 5175.983 Hz
 FIDRES 0.078979 Hz
 AQ 6.3308277 sec
 RG 512
 DM 96.600 usec
 DE 7.00 usec
 TE 300.0 K
 D1 1.0000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 9.00 usec
 PL1 -6.00 dB
 SFO1 250.1319447 MHz

F2 - Processing parameters
 SI 32768
 SF 250.1300150 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
 CX 30.00 cm
 CY 19.00 cm
 FIP 11.000 ppm
 F1 2751.43 Hz
 F2 -1.000 ppm
 F2 250.13 Hz
 PPMCM 0.40000 ppm/cm
 HZCM 100.05201 Hz/cm

¹³C NMR compound 3j

¹H NMR compound 5

¹³C NMR compound 5