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Supporting Information

Preparation, Modification and Evaluation of Cruentaren A and Analogues

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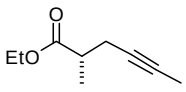
General: All reactions were carried out under Ar in flame-dried glassware. The solvents used were purified by distillation over the drying agents indicated and were transferred under Ar: THF, Et_2O (Mg/anthracene), CH_2Cl_2, Et_3N, CH_3CN, DMSO, (CaH_2), pentane, hexane, toluene (Na/K), DMF (Desmodur 15, dibutyl tin dilaurat), MeOH, EtOH (Mg). Flash chromatography (FC): Merck silica gel 60 (230–400 mesh). NMR: Spectra were recorded on Bruker DPX 300, AMX 300, AV 400, DPX 600 and AVIII 600 spectrometer in the solvents indicated; chemical shifts (δ) are given in ppm relative to TMS, coupling constants (J) in Hz. The solvent signals were used as references and the chemical shifts converted to the TMS scale ($CDCl_3$: $\delta_C \equiv 77.0$ ppm; residual $CHCl_3$ in $CDCl_3$: $\delta_H \equiv 7.26$ ppm; CD_2Cl_2: $\delta_C \equiv 53.8$ ppm; residual ^1H: $\delta_H \equiv 5.32$ ppm; CD_3OD $\delta_C \equiv 49.0$ ppm; residual ^1H: $\delta_H \equiv 3.30$ ppm; $[D]_8$-acetone: $\delta_C \equiv 29.8$ ppm; residual ^1H: $\delta_H \equiv 2.05$ ppm). Where indicated, the signal assignments are unambiguous; the numbering scheme is arbitrary as shown in the inserts. The assignments are based upon 1D and 2D spectra recorded using the following pulse sequences from the Bruker standard pulse program library: DEPT; COSY (*cosygs, cosydqtp*, and *cosygpqf*); HSQC (*invietgssi*, and *hsqcedetgpsisp*^{2}*.2*) optimized for $^1J(C,H) = 145$ Hz; HMBC (*inv4gslplrnd*, and *hmbcetgpl3nd*); for correlations via $^nJ(C,H)$; HSQC-TOCSY (*invietgsml*) using an MLEV17 mixing time of 120 ms; NOESY (*noesygpph*). IR: Magna IR750 (Nicolet) or Spectrum One (Perkin-Elmer) spectrometer, wavenumbers ($\tilde{\nu}$) in cm^{-1}; optical rotations were recorded with a Digital Polarimeter 343 plus (Perkin Elmer) at $\lambda = 589$ nm at 20 °C, unless stated otherwise. MS (EI): Finnigan MAT 8200 (70 eV), ESI-MS: ESQ3000 (Bruker), accurate mass determinations: Bruker APEX III FT-MS (7 T magnet) or Mat 95 (Finnigan). Melting points: Büchi melting point apparatus B-540 (corrected). Elemental analyses: H. Kolbe, Mülheim/Ruhr. All commercially available compounds (Fluka, Lancaster, Aldrich) were used as received.

Building Blocks

(4*R*)-Benzyl-N-((2*S*)-methyl-4-hexynoyl)-oxazolidin-2-one (6): A solution of **5** (4.70 g, 20.1 mmol) in THF (10 mL) was slowly added to a solution of $NaN(SiMe_3)_2$ (NaHMDS, 4.99

g, 27.2 mmol) in THF (70 mL) at −78 °C and the resulting mixture stirred at that temperature for 1 h before 1-iodo-2-butyne (4.74 g, 26.32 mmol) was introduced over the course of 45 min with the aid of a syringe pump. Stirring was continued at −78 °C for 2 h once the addition was complete. The reaction was then quenched with HOAc (2 mL) and the mixture allowed to reach ambient temperature before it was diluted with brine (50 mL). Water was added until two clear phases were formed, the aqueous layer was extracted with Et_2O (3 x 30 mL), the combined extracts were washed with aq. sat. $NaHCO_3$ (30 mL), dried over $MgSO_4$ and evaporated. The residue was purified by flash chromatography (hexanes/EtOAc, 5:1) to give product **6** as a colorless oil (5.11 g, 89 %, dr = 97:3 (HPLC)). $[\alpha]_D^{20}$ = –68.7 (*c* = 1.03, $CHCl_3$); ^{1}H NMR (400 MHz, C_6D_6): δ = 7.08–6.97 (m, 3H), 6.94–6.88 (m, 2H), 4.22–4.14 (m, 1H), 4.08 (sext, *J* = 6.8 Hz, 1H), 3.47 (dd, *J* = 12.8, 3.2 Hz, 1H), 3.23–3.17 (m, 1H), 2.97 (dd, *J* = 13.6, 3.2 Hz, 1H), 2.67–2.57 (m, 1H), 2.54–2.44 (m, 1H), 2.39 (dd, *J* = 13.6, 9.2 Hz, 1H), 1.50 (t, *J* = 2.4 Hz, 3H), 1.27 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, C_6D_6): δ = 175.1 (C), 153.0 (C), 135.9 (C), 129.6 (2 x CH), 129.0 (2 x CH), 127.3 (CH), 77.5 (C), 76.8 (C), 65.6 (CH_2), 55.0 (CH), 38.1 (CH), 37.8 (CH_2), 23.6 (CH_2), 16.6 (CH_3), 3.3 (CH_3); IR (film): $\tilde{\nu}$ = 3029, 2979, 2920, 1771, 1695, 1497, 1454, 1385, 1349, 1240, 1204, 1102, 1053, 1013, 972 cm^{-1}; MS (EI) *m*/*z* (%): 285 (51) [M^+], 270 (15), 194 (12), 168 (14), 167 (16), 117 (42), 109 (94), 91 (30), 81 (100), 79 (27), 53 (21); HRMS (ESI): *m*/*z*: calcd for $C_{17}H_{19}NO_3Na$ [M^+ + Na]: 308.1258, found 308.1257. The analytical and spectroscopic data are in agreement with those reported in the literature.[1]

2-Methyl-4-hexynoic acid ethylester: $Ti(OEt)_4$ (3.68 mL, 17.54 mmol) was added to a solution of oxazolidinone **6** (5 g, 17.54 mmol) in EtOH (42 mL) and the resulting mixture was stirred under reflux for 12 h. For work up, all volatile materials were evaporated at 20 °C bath temperature (50 mbar) and the residue was purified by flash chromatography (pentanes/EtO_2, 19:1) to give the title compound as a colorless oil (2.30 g, 85 %). The *ee* (93 %) was determined by GC (HP 6890 gas chromatograph, 25 m Lipodex-E column; FID detector, temperature gradient: 12 °C/min from 80 °C → 220 °C,



[1] G. J. Kramp, M. Kim, H.-J. Gais, C. Vermeeren, *J. Am. Chem. Soc*. **2005**, *127*, 17910–17920.

then 5 min isothermal; 0.5 bar H_2, t_R = 7.87 min (minor enantiomer), t_R = 8.10 min (major enantiomer)). $[\alpha]_D^{20}$ = +6.7 (*c* = 1.03, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 4.11 (q, *J* = 7.2 Hz, 2H), 2.53 (sext, *J* = 6.8 Hz, 1H), 2.46–2.36 (m, 1H), 2.29–2.21 (m, 1H), 1.72 (t, *J* = 2.8 Hz, 3H), 1.22 (t, *J* = 7.2 Hz, 3H), 1.19 (d, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 175.1 (C), 77.0 (C), 76.1 (C), 60.3 (CH_2), 39.2 (CH), 23.0 (CH_2), 16.3 (CH_3), 14.1 (CH_3), 3.3 (CH_3). IR (film): $\tilde{\nu}$ = 2979, 2922, 1732, 1459, 1375, 1285, 1252, 1228, 1176, 1109, 1050, 1024 cm^{-1}; MS (EI) *m*/*z* (%): 154 (1) [M^+], 139 (100), 126 (13), 111 (83), 109 (28), 83 (15), 81 (52), 79 (64), 69 (20), 53 (48), 41 (32), 29 (33); HRMS (CI): *m*/*z*: calcd for $C_9H_{15}O_2$ [M^+ + H]: 155.1072, found 155.1072. The analytical and spectroscopic data are in agreement with those reported in the literature.[1]

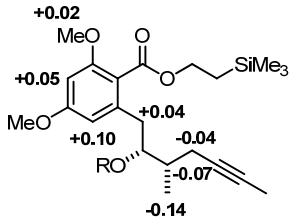
Compound 7: *i*PrMgCl (2.0 M THF, 22.61 mL, 45.23 mmol) was added via syringe pump over the course of 45 min to a solution of 2-methyl-4-hexynoic acid ethylester (2.25 g, 14.59 mmol) and Me(MeO)NH·HCl (2.21 g, 22.61 mmol) in THF (28 mL) at –20 °C and stirring was continued for 30 min at that temperature once the addition was complete. Quenching of the reaction with aq. sat. NH_4Cl followed by a standard extractive work up and flash chromatography of the crude material (EtO_2/pentanes, 4:1) furnished Weinreb amide **7** as a colorless oil (2.27 g, 92 %, *ee* = 93 %). $[\alpha]_D^{20}$ = +14.3 (*c* = 1.16, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.70 (s, 3H), 3.17 (s, 3H), 3.07–2.95 (m, 1H), 2.48–2.38 (m, 1H), 2.25–2.15 (m, 1H), 1.74 (t, *J* = 2 Hz, 3H), 1.16 (d, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 176.0 (C), 77.1 (C), 76.6 (C), 61.5 (CH_3), 35.5 (CH), 32.2 (CH_3), 23.0 (CH_2), 16.9 (CH_3), 3.4 (CH_3); IR (film): $\tilde{\nu}$ = 2969, 2921, 1659, 1461, 1424, 1385, 1329, 1177, 992 cm^{-1}; MS (EI) *m*/*z* (%): 169 (2) [M^+], 154 (19), 138 (23), 109 (40), 82 (10), 81 (100), 79 (49), 61 (12), 53 (41), 41 (25), 27 (12); HRMS (EI): *m*/*z*: calcd for $C_9H_{15}NO_2$: 169.1101, found 169.1103. The analytical and spectroscopic data are in agreement with those reported in the literature.[1]

Compound 10: A freshly prepared solution of LDA (0.64 M in THF, 13.4 mL, 8.62 mmol) was added dropwise to a solution of ester **9** (2.32 g, 7.83 mmol) in THF (40 mL) at –78 °C and stirring was continued for 15 min at that temperature once the addition was complete. The

mixture was then cooled to −100 °C before TMEDA (1.32 mL, 7.83 mmol) was introduced. Next, a pre-cooled (−78 °C) solution of Weinreb amide **7** (2.65 g, 15.7 mmol) in THF (2.5 mL) was added dropwise via canula and the resulting mixture allowed to reach −78 °C. After stirring for 30 min, the reaction was quenched with aq. sat. NH_4Cl (30 mL), the mixture was warmed to ambient temperature, the aqueous phase was extracted with EtOAc (3 x 30 mL), the combined organic layers were dried over Na_2SO_4 and evaporated, and the residue was purified by flash chromatography (hexanes/EtOAc, 9:1 → 4:1) to give ketone **10** as a colorless oil (2.52 g, 79 %). $[\alpha]_D^{20}$ = +17.1 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (400 MHz, C_6D_6): δ = 6.38 (d, *J* = 2.2 Hz, 1H), 6.22 (d, *J* = 2.2 Hz, 1H), 4.51–4.43 (m, 2H), 3.92–3.81 (m, 2H), 3.28 (s, 3H), 3.25 (s, 3H), 2.83 (sext, *J* = 6.8 Hz, 1H), 2.55–2.45 (m, 1H), 2.34–2.24 (m, 1H), 1.51 (t, *J* = 2.8 Hz, 3H), 1.16 (d, *J* = 6.8 Hz, 3H), 1.14–1.07 (m, 2H), –0.06 (s, 9H); ^{13}C NMR (100 MHz, C_6D_6): δ = 207.7 (C), 168.0 (C), 161.8 (C), 159.4 (C), 136.1 (C), 118.1 (C), 107.8 (CH), 98.1 (CH), 77.23 (C), 77.21 (C), 63.2 (CH_2), 55.4 (CH_3), 54.9 (CH_3), 47.0 (CH_2), 45.0 (CH), 22.8 (CH_2), 17.6 (CH_2), 16.3 (CH_3), 3.3 (CH_3), –1.7 (3 x CH_3); IR (film): $\tilde{\nu}$ = 2953, 2841, 1713, 1603, 1586, 1456, 1423, 1374, 1332, 1268, 1204, 1158, 1090, 1045, 931, 835 cm^{-1}; MS (EI) *m*/*z* (%): 404 (10) [M^+], 361 (10), 303 (16), 287 (31), 268 (15), 258 (11), 253 (13), 243 (10), 205 (10), 179 (19), 178 (100), 81 (33), 73 (48); HRMS (ESI): *m*/*z*: calcd for $C_{22}H_{32}O_5SiNa$ [M^+ + Na]: 427.1908, found 427.1911; elemental analysis calcd (%) for $C_{22}H_{32}O_5Si$: C 65.31, H 7.97; found: C 65.27, H 8.01.

Compound 12: A solution of catecholborane (552 μL, 5.22 mmol) in toluene (10.5 mL) was added with the aid of a syringe pump over a period of 6.5 h to a cold (−78 °C) solution of ketone **10** (1.06 g, 2.61 mmol) and oxazaborolidine **11** (7.46 mL, 0.7 M in toluene, 5.22 mmol) in toluene (5.3 mL). Stirring was continued for 12 h at −78 °C before the reaction was quenched with MeOH (11 mL). After stirring at ambient temperature for 1 h, the mixture was washed with NaOH (1 M, 2 x 15 mL), the combined aqueous phases were extracted with EtOAc (3 x 15 mL), the extracts were dried over Na_2SO_4 and evaporated, and the residue was purified by flash chromatography (hexanes/EtOAc, 4:1) to give alcohol **12** as a colorless oil (1.0 g, 95 %). The diastereomeric excess (*de* = 84 %) was determined by HPLC (HP 1090M;

column: 125 mm Purospher RP-18e, 3 mm ∅; eluent: MeCN/water = 3:2, 0.5 mL/min; pressure: 8.8 MPa; T = 308 K; UV detection at 220 nm; t_R = 15.26 min (minor), t_R = 16.09 min (major isomer)). $[\alpha]_D^{20}$ = +50.3 (*c* = 0.3, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.38 (d, *J* = 2.0 Hz, 1H), 6.35 (d, *J* = 2.0 Hz, 1H), 4.42–4.35 (m, 2H), 3.81 (s, 3H), 3.79 (s, 3H), 3.71–3.62 (bs, 1H), 2.93–2.82 (m, 2H), 2.52 (dd, *J* = 13.6, 10.0 Hz, 1H), 2.39–2.29 (m, 1H), 2.28–2.18 (m, 1H), 1.83–1.72 (m, 4H), 1.15–1.08 (m, 2H), 1.06 (d, *J* = 6.8 Hz, 3H), –0.07 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 169.2 (C), 161.6 (C), 158.4 (C), 140.0 (C), 117.2 (C), 106.5 (CH), 97.1 (CH), 77.7 (C), 77.2 (C), 75.6 (CH), 63.8 (CH_2), 55.9 (CH_3), 55.4 (CH_3), 39.0 (CH), 38.3 (CH_2), 22.1 (CH_2), 17.4 (CH_2), 15.8 (CH_3), 3.5 (CH_3), –1.6 (3 x CH_3); IR (film): $\tilde{\nu}$ = 3443, 2955, 1717, 1603, 1586, 1456, 1422, 1377, 1326, 1273, 1250, 1203, 1157, 1090, 1048, 930, 834 cm^{-1}; MS (EI) *m*/*z* (%): 406 (3) [M^+], 305 (16), 289 (25), 288 (10), 279 (18), 269 (13), 268 (56), 253 (40), 207 (21), 179 (54), 178 (100), 75 (19), 73 (71); HRMS (ESI): *m*/*z*: calcd for $C_{22}H_{34}O_5SiNa$ [M^+ + Na]: 429.2065, found 429.2068; elemental analysis calcd (%) for $C_{22}H_{34}O_5Si$: C 64.99, H 8.43; found: C 64.96, H 8.36.



S-1. Analysis (δ_H (ppm) = $\delta_{S\text{-MTPA ester}}$ − $\delta_{R\text{-MTPA ester}}$) of the Mosher esters prepared by reaction of **12** with *S*-MTPA-Cl and *R*-MTPA-Cl, respectively.[2] Note that the use of *S*-MTPA-Cl affords the *R*-MTPA ester, and vice versa; MTPA = α-methoxy-α-trifluoromethyl-phenylacetic acid.

Compound 13a: 2,6-Lutidine (430 μL, 3.69 mmol) and a solution of TBDPSOTf (1.85 mL, 1.2 M, 2.21 mmol) were successively added to a solution of compound **12** (500 mg, 1.23 mmol) in CH_2Cl_2 (8 mL) at −78 °C. The mixture was stirred at this temperature for 10 min and at 0 °C for 1 h before the reaction was quenched with aq. sat. $NaHCO_3$ (10 mL). A

[2] J. M. Seco, E. Quiñoá, R. Riguera, *Chem. Rev.* **2004**, *104*, 17–118.

standard extractive work up followed by purification of the crude product by flash chromatography (hexanes/EtOAc, 9:1) furnished compound **13a** as a colorless syrup (776 mg, 98 %). $[\alpha]_D^{20}$ = +20.1 (*c* = 0.6, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.72–7.64 (m, 2H), 7.63–7.54 (m, 2H), 7.45–7.28 (m, 6H), 6.21 (d, *J* = 2.0 Hz, 1H), 5.91 (d, *J* = 2.0 Hz, 1H), 4.43–4.32 (m, 1H), 4.31–4.21 (m, 1H), 4.06 (td, *J* = 6.8, 2.4 Hz, 1H), 3.74 (s, 3H), 3.57 (s, 3H), 2.79 (dd, *J* = 14.0, 6.9 Hz, 1H), 2.61 (dd, *J* = 14.0, 6.6 Hz, 1H), 2.18–1.97 (m, 2H), 1.74–1.66 (m, 4H), 1.12–1.05 (m, 2H), 1.02–0.93 (m, 12H), 0.07 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 168.3 (C), 160.8 (C), 157.8 (C), 138.7 (C), 136.0 (4 x CH), 134.2 (C), 134.1 (C), 129.5 (CH), 129.4 (CH), 127.5 (2 x CH), 127.4 (2 x CH), 117.9 (C), 105.9 (CH), 97.0 (CH), 78.1 (C), 77.2 (CH), 76.0 (C), 63.3 (CH_2), 55.7 (CH_3), 55.2 (CH_3), 37.1 (CH), 36.8 (CH_2), 27.0 (3 x CH_3), 21.1 (CH_2), 19.5 (C), 17.4 (CH_2), 15.7 (CH_3), 3.5 (CH_3), –1.5 (3 x CH_3); IR (film): $\tilde{\nu}$ = 3068, 3043, 2954, 2857, 1720, 1603, 1588, 1459, 1426, 1375, 1325, 1263, 1250, 1204, 1157, 1103, 1047, 932, 835 cm^{-1}; MS (EI) *m*/*z* (%): 561 (17), 560 (45), 559 (100), 271 (17), 199 (10), 193 (16), 135 (18), 73 (25); HRMS (ESI): *m*/*z*: calcd for $C_{38}H_{52}O_5Si_2Na$ [M^+ + Na]: 667.3242, found 667.3245; elemental analysis calcd (%) for $C_{38}H_{52}O_5Si_2$: C 70.76, H 8.13; found: C 70.58, H 8.05.

Acid 14a: A solution of TASF (0.45 M in DMF, 2.27 mL, 1.02 mmol) was added dropwise to a solution of ester **13a** (600 mg, 0.93 mmol) in DMF (12 mL) at 0 °C and the resulting mixture was stirred at that temperature for 1.5 h. The mixture was diluted with Et_2O (400 mL) and washed with aq. $KHSO_4$ (1 M, 150 mL), the organic phase was dried over $MgSO_4$ and evaporated, and the residue was purified by flash chromatography (hexanes/EtOAc/HOAc, 7:3:0.01) to give acid **14a** as a colorless syrup (430.6 mg, 85 %). $[\alpha]_D^{20}$ = +50.1 (*c* = 0.8, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.59–7.53 (m, 2H), 7.49–7.42 (m, 2H), 7.42–7.36 (m, 2H), 7.36–7.27 (m, 4H), 6.30 (d, *J* = 2.3 Hz, 1H), 6.14 (d, *J* = 2.3 Hz, 1H), 4.24–4.17 (m, 1H), 3.85 (s, 3H), 3.62 (s, 3H), 3.03 (dd, *J* = 13.6, 4.1 Hz, 1H), 2.81 (dd, *J* = 13.6, 9.4 Hz, 1H), 2.08–1.93 (m, 2H), 1.88–1.77 (m, 1H), 1.69 (t, *J* = 2.5 Hz, 3H), 1.04 (d, *J* = 6.8 Hz, 3H), 0.91 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 167.1 (C), 161.8 (C), 159.1 (C), 142.0 (C), 136.1 (2 x CH), 135.9 (2 x CH), 133.6 (C), 133.2 (C), 129.5 (2 x CH), 127.4 (2 x CH), 127.4

(2 x CH), 115.1 (C), 108.0 (CH), 97.5 (CH), 77.8 (CH), 77.2 (C), 76.4 (C), 56.2 (CH_3), 55.2 (CH_3), 37.7 (CH), 36.3 (CH_2), 26.9 (3 x CH_3), 22.3 (CH_2), 19.4 (C), 14.2 (CH_3), 3.5 (CH_3); IR (film): $\tilde{\nu}$ = 2932, 2857, 1694, 1602, 1459, 1426, 1389, 1324, 1288, 1266, 1204, 1161, 1104, 1069, 929, 910, 821 cm^{-1}; MS (EI) *m*/*z* (%): 489 (11), 488 (36), 487 (100), 443 (11), 365 (33), 271 (13), 243 (10), 200 (10), 199 (56), 197 (11), 135 (20); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{40}O_5SiNa$ [M^+ + Na]: 567.2531, found 567.2537; elemental analysis calcd (%) for $C_{33}H_{40}O_5Si$: C 72.76, H 7.40; found: C 72.83, H 7.36.

Acid 14b: A solution containing alcohol **12** (300 mg, 0.74 mmol), DMAP (8.8 mg, 0.07 mmol), *i*Pr_2NEt (387 μL, 2.21 mmol), MOMCl (168 μL, 2.21 mmol) and Bu_4NI (25.8 mg, 0.07 mmol) in CH_2Cl_2 (15.5 mL) was stirred for 48 h before it was diluted with EtOAc (50 mL) and washed with brine (30 mL). The organic layer was dried over Na_2SO_4 and evaporated. The crude product **13b** was dissolved in THF (10 mL) and treated with TBAF (1 M in THF, 1.2 mL, 1.25 mmol) overnight. Quenching of the reaction with aq. sat. NH_4Cl (10 mL) followed by a standard extractive work up and purification of the crude product by flash chromatography (hexanes/EtOAc/HOAc, 1:1:0.01) provided acid **14b** as a colorless solid (218.8 mg, 84 % over both steps). M. p. = 83–85 °C; ^{1}H NMR (400 MHz, CD_2Cl_2): δ = 6.46 (d, *J* = 2.3 Hz, 1H), 6.42 (d, *J* = 2.3 Hz, 1H), 4.46 (d, *J* = 6.8 Hz, 1H), 4.30 (d, *J* = 6.8 Hz, 1H), 3.90–3.85 (m, 4H), 3.83 (s, 3H), 3.01 (s, 3H), 3.00 (dd, *J* = 13.8, 3.1 Hz, 1H), 2.81 (dd, *J* = 13.8, 10.4 Hz, 1H), 2.32–2.23 (m, 1H), 2.21–2.12 (m, 1H), 2.05–1.95 (m, 1H), 1.79 (t, *J* = 2.6 Hz, 3H), 1.05 (d, *J* = 6.9 Hz, 3H); ^{13}C NMR (100 MHz, CD_2Cl_2): δ = 166.8 (C), 162.4 (C), 159.3 (C), 141.7 (C), 116.0 (C), 108.4 (CH), 97.5 (CH), 96.5 (CH_2), 84.4 (CH), 77.5 (C), 77.2 (C), 56.6 (CH_3), 56.0 (CH_3), 55.8 (CH_3), 37.0 (CH), 35.7 (CH_2), 22.7 (CH_2), 14.8 (CH_3), 3.5 (CH_3); IR (film): $\tilde{\nu}$ = 2993, 2955, 2918, 2842, 2822, 2653, 1681, 1599, 1582, 1456, 1421, 1329, 1305, 1273, 1200, 1160, 1094, 1029, 1002, 922, 841, 828 cm^{-1}; MS (EI) *m*/*z* (%): 350 (6) [M^+], 240 (19), 208 (34), 207 (35), 196 (13), 179 (25), 178 (100), 164 (20), 45 (63); HRMS (ESI): *m*/*z*: calcd for $C_{19}H_{26}O_6Na$ [M^+ + Na]: 373.1622, found 373.1623.

Acid 14c: Trichloroacetyl chloride (15.3 μL, 0.14 mmol) was added to a solution of alcohol **12** (28.1 mg, 0.07 mmol) in THF (0.1 mL) and pyridine (17 μL, 0.21 mmol) at 0 °C and the resulting mixture was stirred for 2 h at ambient temperature. The reaction was quenched with aq. sat. $NaHCO_3$ (2 mL), the aqueous layer was extracted with EtOAc (3 x 2 mL), and the extracts were dried over Na_2SO_4 and evaporated.

A solution of TBAF (1 M in THF, 120 μL, 0.12 mmol) was added to a solution of crude **13c** in THF (1 mL) and the resulting mixture stirred overnight. Addition of aq. sat. NH_4Cl (1 mL) followed by a standard extractive work up and purification of the crude product by flash chromatography (hexane/EtOAc/HOAc, 1:1:0.01) gave acid **14c** as a colorless solid. ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.39 (d, J = 2.2 Hz, 1H), 6.32 (d, J = 2.2 Hz, 1H), 4.38–4.31 (m, 1H), 3.90 (s, 3H), 3.85 (s, 3H), 2.91–2.75 (m, 2H), 2.39–2.30 (m, 2H), 1.98–1.87 (m, 1H), 1.74 (t, J = 2.5 Hz, 3H), 1.06 (d, J = 6.9 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 176.8 (C), 164.4 (C), 163.1 (C), 162.8 (C), 143.9 (C), 107.1 (C), 104.0 (CH), 103.9 (C), 97.8 (CH), 79.5 (CH), 77.2 (C), 76.3 (C), 56.1 (CH_3), 55.5 (CH_3), 36.3 (CH), 31.9 (CH_2), 22.0 (CH_2), 15.0 (CH_3), 3.4 (CH_3); IR (film): $\tilde{\nu}$ = 2990, 2958, 2919, 2841, 2822, 2653, 2598, 1723, 1681, 1599, 1582, 1458, 1421, 1305, 1274, 1201, 1160, 1092, 1029, 999, 921, 829 cm^{-1}; HRMS (ESI): *m*/*z*: calcd for $C_{19}H_{21}Cl_3O_6Na$ [M^+ + Na]: 473.0301, found 473.0299.

Iodide 15: A solution of 4-(tetrahydro-2*H*-pyran-2-yloxy)but-2-yn-1-ol (9.6 g, 56.4 mmol)[3, 4] in CH_2Cl_2 (60 mL) was added to a rapidly stirred suspension of PPh_3 (19.2 g, 73.3 mmol), imidazole (5.0 g, 73.3 mmol) and iodine (18.6 g, 73.3 mmol) in CH_2Cl_2 (230 mL). After stirring for 1 h, the solvent was evaporated and the residue purified by flash chromatography (pentanes/Et_2O, 9:1) to give iodide **15** as a pale yellow oil (11.6 g, 73 %). ^{1}H NMR (400 MHz, C_6D_6): δ = 4.75 (t, J = 3.2 Hz, 1H), 4.12 (dt, J = 14.0, 2.0 Hz, 1H), 4.07 (dt, J = 14.0, 2.0 Hz, 1H), 3.67–3.60 (m, 1H), 3.35–3.29 (m, 1H), 3.13 (t, J = 2.4 Hz, 2H), 1.73–1.60 (m, 1H), 1.55–1.49 (m, 2H), 1.38–1.13 (m, 3H); ^{13}C NMR (100 MHz, C_6D_6): δ = 96.7 (CH), 82.9 (C), 82.2 (C), 61.5 (CH_2), 54.3 (CH_2), 30.4 (CH_2), 25.8 (CH_2), 19.2 (CH_2), –18.8

[3] Prepared in analogy to: J.-P. Roduit, H. Wyler, *Helv. Chim. Acta* **1985**, *68*, 403–414.
[4] A. T. Khan, S. Ghosh, L. H. Choudhury, *Eur. J. Org. Chem.* **2005**, 4891–4896.

(CH_2); IR (film): $\tilde{\nu}$ = 2940, 2869, 1440, 1387, 1342, 1200, 1173, 1116, 1019, 963, 901, 867 cm^{-1}; MS (EI) *m*/*z* (%): 179 (60), 153 (30), 127 (4), 101 (17), 97 (67), 85 (100), 67 (23), 52 (61), 41 (24); HRMS (CI) calcd for $C_9H_{14}O_2I$ [M^+ + H]: 281.0038, found 281.0037.

Compound 16: A solution of *ent*-**5** (6.01 g, 25.8 mmol) in THF (12 mL) was slowly added to a solution of NaHMDS (5.91 g, 32.2 mmol) in THF (60 mL) at −78 °C and stirring was continued at that temperature for 1 h before a solution of iodide **15** (8.66 g, 30.9 mmol) in THF (5 mL) was introduced over 45 min via syringe pump. The mixture was stirred for another 2 h at −78 °C before the reaction was quenched with sat. aq. NH_4Cl (50 mL). After reaching ambient temperature, the aqueous layer was extracted with EtOAc (3 x 30 mL), the combined extracts were dried over $MgSO_4$ and evaporated, and the residue was purified by flash chromatography (hexanes/*tert*-butyl methyl ether, 3:2) to give product **16** as a colorless oil (9.23 g, 93 %, dr > 95:5, NMR). $[\alpha]_D^{20}$ = +37.4 (*c* = 0.87, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ = 7.30–7.10 (m, 5H), 4.73–4.69 (m, 1H), 4.66–4.58 (m, 1H), 4.14 (tt, *J* = 15.2, 2.1 Hz, 1H), 4.14–4.06 (m, 3H), 3.92 (dsext, *J* = 6.8, 1.2 Hz, 1H), 3.76–3.67 (m, 1H), 3.46–3.37 (m, 1H), 3.21 (br d, *J* = 13.6 Hz, 1H), 2.72 (dd, *J* = 13.6, 9.6 Hz, 1H), 2.56 (ddt, *J* = 16.6, 6.8, 2.4 Hz, 1H), 2.45 (ddt, *J* = 16.8, 6.8, 2.0 Hz, 1H), 1.76–1.56 (m, 2H), 1.54–1.35 (m, 4H), 1.19 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, $CDCl_3$): δ = 175.1 (C), 152.9 (C), 135.2 (C), 129.3 (2 x CH), 128.8 (2 x CH), 127.2 (CH), 96.5 and 96.4 (CH), 83.2 (C), 77.7 (C), 66.0 (CH_2), 61.8 and 61.7 (CH_2), 55.1 (CH), 54.3 and 54.2 (CH_2), 37.7 (CH_2), 37.3 (CH), 30.1 (CH_2), 25.2 (CH_2), 22.9 (CH_2), 19.0 and 18.9 (CH_2), 16.5 (CH_3); IR (film): $\tilde{\nu}$ = 3020, 2940, 2870, 1774, 1697, 1454, 1385, 1348, 1241, 1200, 1116, 1076, 1053, 1019, 970, 901, 870, 760, 747, 734, 702 cm^{-1}; MS (EI) *m*/*z* (%): 385 (14), 301 (25), 285 (45), 284 (42), 233 (4), 215 (7), 188 (5), 178 (16), 117 (28), 108 (11), 107 (34), 91 (24), 85 (100), 79 (31), 57 (14); HRMS (EI) calcd for $C_{22}H_{27}NO_5Na$ [M^+ + Na]: 408.1781, found 408.1782; elemental analysis calcd (%) for $C_{22}H_{27}NO_5$: C 68.55, H 7.06, N 3.63; found: C 67.58, H 7.42, N 3.52.

Compound 17: $LiBH_4$ (684 mg, 31.4 mmol) was added in portions to a solution of compound **16** (9.2 g, 23.8 mmol) in THF (60 mL) and MeOH (1.25 mL, 31.4 mmol) at 0 °C and the mixture was stirred for 1 h at 0 °C and for 1 h at ambient temperature. The reaction was quenched by addition of sat. aq. Rochelle salt (50 mL) and the mixture stirred overnight until a clear phase separation was reached. The aqueous layer was extracted with EtOAc (3 x 30 mL), the combined organic phases were dried over Na_2SO_4 and evaporated, and the residue purified by flash chromatography (hexanes/*tert*-butyl methyl ether, 3:2) to give (2*R*)-2-methyl-6-(tetrahydro-2*H*-pyran-2-yloxy)hex-4-yn-1-ol as a colorless oil (4.22 g, 83 %), which showed the following analytical and spectral properties: $[\alpha]_D^{20}$ = +3.8 (*c* = 0.92, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, C_6D_6): δ = 4.93 (t, *J* = 3.2 Hz, 1H), 4.32 (dt, *J* = 15.6, 2.0 Hz, 1H), 4.27 (dt, *J* = 15.6, 2.0 Hz, 1H), 3.77–3.70 (m, 1H), 3.40–3.33 (m, 1H), 3.30–3.20 (m, 2H), 2.16 (dds, *J* = 15.6, 5.6, 1.2 Hz, 1H), 2.05 (dds, *J* = 15.6, 5.6, 1.2 Hz, 1H), 1.80–1.68 (m, 1H), 1.67–1.53 (m, 3H), 1.40–1.16 (m, 3H), 0.91 (br s, 1H), 0.86 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, C_6D_6): δ = 96.7 (CH), 85.0 (C), 78.3 (C), 66.8 (CH_2), 61.7 (CH_2), 54.8 (CH_2), 35.8 (CH), 30.9 (CH_2), 25.9 (CH_2), 23.0 (CH_2), 19.4 (CH_2), 16.5 (CH_3); IR (film): $\tilde{\nu}$ = 3410, 2941, 2871, 1454, 1441, 1387, 1345, 1201, 1130, 1115, 1077, 1017, 945, 901, 869, 813 cm^{-1}; MS (EI) *m*/*z* (%): 181 (8), 111 (58), 110 (58), 101 (22), 91 (19), 85 (83), 77 (32), 67 (19), 55 (100); HRMS (ESI): calcd for $C_{12}H_{20}O_3Na$ [M^+ + Na]: 235.1304, found 235.1304; elemental analysis calcd (%) for $C_{12}H_{20}O_3$: C 67.89, H 9.50; found: C 67.27, H 9.97.

A mixture containing this alcohol (4.2 g, 19.8 mmol), pyridine (11.6 mL) and Lindlar catalyst (420 mg, 5 % *w*/*w* Pd on $CaCO_3$, doped with Pb by the supplier) was stirred under an atmosphere of H_2 (1 atm) for 6 h. The catalyst was filtered off over Celite, the filtrate was evaporated and the residue dissolved in Et_2O (50 mL). This organic phase was then washed with aq. sat. $CuSO_4$ (30 mL), dried over $MgSO_4$ and evaporated, and the crude product was purified by flash chromatography (hexanes/*tert*-butyl methyl ether, 3:2) to give product **17** as a colorless oil (4.06 g, 96 %). $[\alpha]_D^{20}$ = –6.1 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 5.70–5.60 (m, 2H), 4.70–4.62 (m, 1H), 4.32–4.20 (m, 1H),

4.13–4.03 (m, 1H), 3.91–3.83 (m, 1H), 3.55–3.40 (m, 3H), 2.35 (br s, 1H), 2.28–2.19 (m, 1H), 2.08–1.97 (m, 1H), 1.77–1.67 (m, 3H), 1.64–1.49 (m, 4H), 0.94 (d, J = 6.8 Hz, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 132.5 and 132.2 (CH), 127.4 and 127.3 (CH), 98.4 and 98.0 (CH), 67.0 (CH_2), 62.9 and 62.7 (CH_2), 62.6 (CH_2), 36.4 and 36.3 (CH), 31.2 and 31.0 (CH_2), 30.9 (CH_2), 25.8 (CH_2), 19.9 and 19.8 (CH_2), 16.6 (CH_3); IR (film): $\tilde{\nu}$ = 3415, 3018, 2941, 2870, 1454, 1441, 1339, 1261, 1200, 1115, 1021, 903, 868, 811 cm^{-1}; MS (EI) *m*/*z* (%): 183 (2), 131 (3), 130 (2), 113 (14), 112 (14), 95 (45), 85 (100), 67 (22), 57 (16); HRMS (CI): calcd for $C_{12}H_{23}O_3$ [M^+ + H]: 215.1647; found 215.1648; elemental analysis calcd (%) for $C_{12}H_{22}O_3$: C 67.26, H 10.35; found: C 66.87, H 10.54.

Aldehyde 18: Dess-Martin periodinane (16.1 g, 37.9 mmol)[5] was added in portions to a solution of compound **17** (4.06 g, 18.9 mmol) in CH_2Cl_2 (135 mL) and pyridine (10.5 mL) at 0 °C and the resulting mixture was stirred at ambient temperature for 3 h before the reaction was quenched with aq. sat. $Na_2S_2O_3$ (50 mL) and aq. sat. $NaHCO_3$ (50 mL) at 0 °C. A standard extractive work up followed by flash chromatography (pentanes/Et_2O, 9:1 → 4:1) furnished aldehyde **18** as a colorless oil (3.71 g, 92 %). $[\alpha]_D^{20}$ = –2.5 (c = 1.0, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 9.63 (s, 1H), 5.70–5.61 (m, 1H), 5.58–5.48 (m, 1H), 4.59 (t, J = 4 Hz, 1H), 4.27–4.20 (m, 1H), 4.08–4.01 (m, 1H), 3.86–3.78 (m, 1H), 3.50–3.43 (m, 1H), 2.51–2.35 (m, 2H), 2.25–2.14 (m, 1H), 1.85–1.73 (m, 1H), 1.72–1.62 (m, 1H), 1.59–1.45 (m, 4H), 1.09 (d, J = 7.2 Hz, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 204.6 (C), 129.6 (CH), 128.9 (CH), 98.3 (CH), 62.9 (CH_2), 62.5 (CH_2), 46.6 (CH), 31.0 (CH_2), 28.7 (CH_2), 25.9 (CH_2), 19.9 (CH_2), 13.2 (CH_3); IR (film): $\tilde{\nu}$ = 3018, 2941, 2872, 1726, 1455, 1441, 1378, 1344, 1201, 1116, 1076, 1021, 972, 902, 869, 813, 752 cm^{-1}; MS (EI) *m*/*z* (%): 111 (34), 93 (13), 85 (100), 81 (12), 67 (26), 57 (15), 55 (28), 43 (48); HRMS (CI): calcd for $C_{12}H_{21}O_3$ [M^+ + H]: 213.1490, found 213.1491.

Compound 19: Freshly distilled Et_2BOTf (6.0 g, 27.5 mmol) was added to a solution of compound *ent*-**5** (6.05 g, 25.9 mmol) in CH_2Cl_2 (62 mL) at 0 °C, causing the formation of a

[5] a) D. B. Dess, J. C. Martin, *J. Org. Chem.* **1983**, *48*, 4155–4156; b) S. D. Meyer, S. L. Schreiber, *J. Org. Chem.* **1994**, *59*, 7549–7552.

white precipitate. After the addition of freshly distilled (iPr)$_2$NEt (11.1 mL, 61.7 mmol) a clear solution was formed which was stirred for 30 min at 0 °C before it was cooled to −78 °C. A solution of aldehyde **18** (3.7 g, 17.4 mmol) in CH_2Cl_2 (5 mL) was then slowly added and stirring was continued at −78 °C for 1h and at 0 °C for 2 h before the reaction was quenched by successive addition of a MeOH/pH 7 phosphate buffer solution (2:1, 24 mL) and a mixture of MeOH/H_2O_2 (30 % *w*/*w*, 21 mL). After stirring for another hour at 0 °C, the layers were separated and the aqueous phase was extracted with EtOAc (3 x 20 mL). The combined extracts were dried over Na_2SO_4 and evaporated, and the residue was purified by flash chromatography (hexanes/*tert*-butyl methyl ether, 1:1) to give aldol **19** as a colorless oil (6.45 g, 83 %). The diastereomeric excess (*de* = 95 %) was determined by HPLC (HP 1090M; column: 125 mm Purospher RP-18e, 3.0 mm ∅; eluent: MeOH/water = 1:1, 0.5 mL/min; T = 308 K; UV detection at 210 nm, t_R = 12.82 min (minor diastereomer), t_R = 18.23 min (minor diastereomer), t_R = 20.37 min (major isomer)). $[\alpha]_D^{20}$ = +24.1 (*c* = 0.95, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 7.38–7.18 (m, 5H), 5.65–5.60 (m, 2H), 4.74–4.66 (m, 1H), 4.62–4.58 (m, 1H), 4.28–4.16 (m, 3H), 4.10-4.02 (m, 1H), 3.90 (dq, *J* = 6.8, 2.4 Hz, 1H), 3.89–3.80 (m, 1H), 3.62 (dd, *J* = 9.2, 1.6 Hz, 1H), 3.51–3.43 (m, 1H), 3.20 (dd, *J* = 13.6, 3.2 Hz, 1H), 3.15 (br s, 1H), 2.85 (dd, *J* = 13.6, 9.2 Hz, 1H), 2.45–2.36 (m, 1H), 2.16–2.05 (m, 1H), 1.88–1.62 (m, 3H), 1.58–1.44 (m, 4H), 1.20 (d, *J* = 7.2 Hz, 3H), 0.87 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 178.0 (C), 153.3 (C), 135.7 (C), 131.8 and 131.7 (CH), 129.9 (2 x CH), 129.2 (2 x CH), 128.0 and 127.9 (CH), 127.7 (CH), 98.4 and 98.3 (CH), 74.8 (CH), 66.6 (CH_2), 63.1 and 63.0 (CH_2), 62.6 and 62.5 (CH_2), 55.5 (CH), 40.0 (CH), 37.9 (CH_2), 36.4 (CH), 31.1 (CH_2), 30.9 (CH_2), 25.9 (CH_2), 20.0 and 19.9 (CH_2), 15.5 and 15.4 (CH_3), 9.7 (CH_3); IR (film): $\tilde{\nu}$ = 3495, 3028, 2942, 2875, 1776, 1694, 1454, 1383, 1352, 1286, 1208, 1114, 1074, 1021, 970, 903, 762, 748, 700 cm^{-1}; MS (EI) *m*/*z* (%): 361 (8), 344 (10), 289 (15), 262 (16), 233 (16), 210 (3), 178 (50), 167 (9), 111 (33), 85 (100), 57 (25); HRMS (ESI): calcd for $C_{25}H_{35}NO_6Na$ [M^+ + Na]: 468.2356, found 468.2359.

Compound 20: 2,6-Lutidine (5.2 mL, 44.4 mmol) and TBSOTf (6.12 mL, 26 mmol) were successively added to a solution of compound **19** (6.44 g, 14.4 mmol) in CH_2Cl_2 (95 mL) at –78 °C. The mixture was allowed to reach 0 °C and stirred at this temperature for 2 h before the reaction was quenched with aq. sat. $NaHCO_3$ (70 mL). A standard extractive work up followed by flash chromatography (hexanes/EtOAc, 4:1) provided product **20** as a colorless syrup (7.55 g, 93 %). $[\alpha]_D^{20}$ = +41.6 (*c* = 1.2, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 7.38–7.19 (m, 5H), 5.62–5.50 (m, 2H), 4.70–4.60 (m, 1H), 4.59–4.55 (m, 1H), 4.27–4.13 (m, 3H), 4.04–3.90 (m, 3H), 3.84–3.76 (m, 1H), 3.48–3.39 (m, 1H), 3.18 (dd, *J* = 13.6, 3.2 Hz, 1H), 2.83 (dd, *J* = 13.6, 9.2 Hz, 1H), 2.23–2.13 (m, 1H), 1.90–1.72 (m, 2H), 1.68–1.42 (m, 6H), 1.23 (d, *J* = 6.8 Hz, 3H), 0.93 (s, 9H), 0.92 (d, *J* = 6.8 Hz, 3H), 0.09 (s, 3H), 0.06 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 176.0 (C), 153.3 (C), 135.9 (C), 132.3 (CH), 129.9, (2 x CH), 129.2 (2 x CH), 127.6 (CH), 127.5 (CH), 98.4 and 98.3 (CH), 76.7 (CH), 66.5 (CH_2), 63.1 (CH_2), 62.5 and 62.4 (CH_2), 55.8 (CH), 41.5 (CH), 39.7 and 39.6 (CH), 37.9 (CH_2), 31.1 (CH_2), 30.4 (CH_2), 27.1 (C), 26.2 (3 x CH_3), 25.9 (CH_2), 20.0 and 19.9 (CH_2), 16.2 (CH_3), 14.2 (CH_3), –3.63 (CH_3), –4.00 (CH_3); IR (film): $\tilde{\nu}$ = 2929, 2856, 1780, 1695, 1455, 1380, 1207, 1115, 1022, 835 cm^{-1}; MS (EI) *m*/*z* (%): 502 (1), 458 (3), 418 (35), 400 (24), 376 (30), 326 (28), 290 (24), 252 (7), 199 (42), 178 (9), 159 (30), 149 (27), 117 (13), 85 (100); HRMS (ESI): calcd for $C_{31}H_{49}NO_6SiNa$ [M^+ + Na]: 582.3221, found 582.3226.

Compound 21: $LiBH_4$ (0.294 g, 13.5 mmol) was added to a solution of compound **20** (7.55 g, 13.5 mmol) in THF (72 mL) and MeOH (2.8 mL, 68.3 mmol) at 0 °C and the resulting mixture was stirred at this temperature for 1h and for another 1.5 h at ambient temperature. The reaction was quenched with aq. sat. Rochelle salt solution (50 mL) and the mixture stirred overnight to give a clean phase separation. Extraction of the aqueous layer with EtOAc (3 x 30 mL), drying (Na_2SO_4) and evaporation of the combined organic phases, and purification of the residue by flash chromatography (hexanes/*tert*-butyl methyl ether, 3:2) gave the corresponding alcohol as a colorless syrup (4.34 g, 81 %), which analyzed as follows: $[\alpha]_D^{20}$ = –1.0 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz,

CD_2Cl_2): δ = 5.63-5.52 (m, 2H), 4.63–4.60 (m, 1H), 4.60–4.26 (m, 1H), 4.22–4.03 (m, 1H), 3.89–3.80 (m, 1H), 3.70 (dd, *J* = 5.2 Hz, 2.4 Hz, 1H), 3.51–3.35 (m, 3H), 2.32–2.22 (m, 1H), 1.94–1.64 (m, 6H), 1.58–1.44 (m, 4H), 0.94–0.88 (m, 12H), 0.85 (d, *J* = 7.2 Hz, 3H), 0.07 (s, 6H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 132.9 and 132.8 (CH), 127.1 and 127.0 (CH), 98.9 and 98.1 (CH), 75.6 and 75.5 (CH), 66.6 (CH_2), 63.3 and 63.0 (CH_2), 62.9 and 62.3 (CH_2), 38.9 and 38.8 (CH), 38.7 and 38.6 (CH), 31.7 and 31.6 (CH_2), 31.1 and 31.0 (CH_2), 26.2 (3 x CH_3), 25.9 (CH_2), 20.2 and 19.8 (CH_2), 18.6 (C), 16.5 (CH_3), 11.9 (CH_3), –3.8 (CH_3), –4.18 (CH_3); IR (film): $\tilde{\nu}$ = 3450, 2929, 2856, 1463, 1252, 1116, 1022, 835, 771 cm^{-1}; MS (EI): *m*/*z* (%): 285 (2), 245 (9), 227 (20), 203 (33), 185 (5), 145 (9), 135 (20), 85 (100). HRMS (ESI) calcd for $C_{21}H_{42}O_4SiNa$ [M^+ + Na]: 409.2744, found 409.2743; elemental analysis calcd (%) for $C_{21}H_{42}O_4Si$: C 65.23, H 10.95; found: C 64.67, H 11.46.

A solution of this alcohol (1.82 g, 4.71 mmol), pyridine (2.27 mL) and Dess-Martin periodinane (4.0 g, 9.41 mmol)[5]**Fehler! Textmarke nicht definiert.** in CH_2Cl_2 (5.2 mL) was stirred for 15 min at 0 °C and then for 3 h at ambient temperature before the reaction was quenched with aq. sat. $Na_2S_2O_3$ and aq. $NaHCO_3$ (5 mL each). A standard extractive work up followed by flash chromatography (hexanes/*tert*-butyl methyl ether, 4:1) provided aldehyde **21** as a colorless oil (1.53 g, 85 %). $[\alpha]_D^{20}$ = +30.6 (*c* = 1.35, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 9.72 (s, 1H), 5.65–5.48 (m, 2H), 4.60–4.57 (m, 1H), 4.24–4.18 (m, 1H), 4.06–3.90 (m, 2H), 3.86–3.79 (m, 1H), 3.52–3.43 (m, 1H), 2.56–2.48 (m, 1H), 2.28–2.18 (m, 1H), 1.96–1.85 (m, 1H), 1.84–1.44 (m, 7H), 1.09 (d, *J* = 7.2 Hz, 3H), 0.93–0.86 (m, 12H), 0.09 (s, 3H), 0.01 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 205.2 (CH), 131.8 (CH), 127.9 (CH), 98.3 (CH), 75.1 (CH), 63.1 (CH_2), 62.4 (CH_2), 50.4 (CH), 38.7 (CH), 31.1 (CH_2), 30.9 (CH_2), 26.1 (3 x CH_3), 25.9 (CH_2), 19.9 (CH_2), 18.5 (C), 16.2 (CH_3), 8.5 (CH_3), –3.9 (CH_3), –4.1 (CH_3); IR (film): $\tilde{\nu}$ = 2930, 2857, 1725, 1463, 1253, 1116, 1023, 834 cm^{-1}; MS (EI): *m*/*z* (%): 283 (1), 243 (4), 225 (12), 201 (6), 185 (3), 173 (3), 159 (13), 133 (3), 115 (8), 85 (100), 73 (16); HRMS (ESI) calcd for $C_{21}H_{40}O_4SiNa$ [M^+ + Na]: 407.2588, found 407.2584.

Compound 22: A solution of aldehyde **21** (1.43 g, 3.73 mmol) in Et_2O (8.5 mL) was slowly added to a solution of borane (*S*)-**27** (1.29 g, 5.22 mmol) in Et_2O (21 mL) at –78 °C and the resulting mixture was stirred at this temperature for 3 h before it was allowed to reach ambient temperature. The solvent was evaporated and the residue dissolved in MeCN (10 mL). Pseudoephedrine (863 mg, 5.22 mmol) was added, and the resulting mixture was stirred under reflux for 4 h before it was slowly cooled to room temperature. The precipitate was filtered off and carefully washed with MeCN, the combined filtrates were evaporated and the residue was purified by flash chromatography (hexanes/*tert*-butyl methyl ether, 2:1) to give product **22** as a colorless oil (1.45 g, 92 %, *de* ≥ 95 %, NMR). $[\alpha]_D^{20} = -7.7$ (c = 0.56, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 5.53–5.50 (m, 2H), 4.63–4.56 (m, 1H), 4.27–4.18 (m, 1H), 4.08–4.00 (m, 1H), 3.89–3.74 (m, 2H), 3.66 (t, J = 4 Hz, 1H), 3.51–3.43 (m, 1H), 2.44–2.23 (m, 2H), 2.29 (dd, J = 6.8 Hz, 4 Hz, 1H), 2.24–2.17 (m, 1H), 2.09–2.05 (m, 1H), 1.97–1.63 (m, 5H), 1.58–1.45 (m, 4H), 0.94 (d, J = 7.2 Hz, 3H), 0.96–0.88 (m, 12H), 0.09 (s, 3H), 0.08 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 132.5 and 132.4 (CH), 127.5 (CH), 98.5 and 98.2 (CH), 81.9 (C), 78.2 (CH), 72.9 and 72.8 (CH), 70.6 (CH), 63.2 and 63.0 (CH_2), 62.6 and 62.3 (CH_2), 39.8 and 39.7 (CH), 39.2 and 39.1 (CH), 31.2 (CH_2), 31.1 (CH_2), 26.3 (3 x CH_3), 25.9 (CH_2), 25.6 (CH_2), 20.0 and 19.8 (CH_2), 18.7 (C), 16.3 (CH_3), 9.3 (CH_3), –3.4 (CH_3), –4.0 (CH_3); IR (film): $\tilde{\nu}$ = 3457, 2929, 2856, 1463, 1253, 1116, 1022, 834 cm^{-1}; MS (EI): *m*/*z* (%): 283 (4), 265 (11), 243 (8), 225 (6), 223 (5), 183 (8), 159 (8), 133 (10), 109 (11), 85 (100), 73 (21); HRMS (ESI) calcd for $C_{24}H_{44}O_4SiNa$ [M^+ + Na]: 447.2901, found 447.2899; elemental analysis calcd (%) for $C_{24}H_{44}O_4Si$: C 67.87, H 10.44; found: C 67.80, H 10.38.

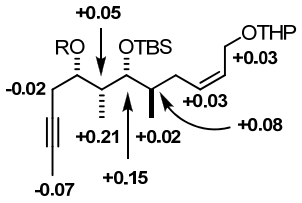
Compound 23: TESCl (1.15 mL, 6.83 mmol) and DMAP (87.5 mg, 0.69 mmol) were added to a solution of compound **22** (1.45 g, 3.41 mmol) in pyridine (60 mL). After stirring for 12 h, the mixture was diluted with EtOAc (100 mL) and washed with aq. sat. $NaHCO_3$ (50 mL), the aqueous phase was extracted with EtOAc (3 x 50 mL), the combined extracts were dried over Na_2SO_4 and evaporated, and the residue was purified by flash chromatography (hexanes/*tert*-butyl methyl ether, 12:1) to give product **23** as a colorless oil (1.77 g, 96 %). $[\alpha]_D^{20} = -1.0$ (c =

1.67, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 5.62–5.52 (m, 2H), 4.62–4.56 (m, 1H), 4.23 (dd, J = 13.2 Hz, 4.4 Hz, 1H), 4.08–4.00 (m, 1H), 3.87–3.78 (m, 2H), 3.56 (t, J = 4.4 Hz, 1H), 3.50–3.42 (m, 1H), 2.49–2.33 (m, 2H), 2.22 (br dt, J = 14 Hz, 4 Hz, 1H), 2.07–2.04 (m, 1H), 2.03–1.87 (m, 2H), 1.86–1.62 (m, 3H), 1.58–1.44 (m, 4H), 0.98 (t, J = 8.0 Hz, 9H), 0.94-0.89 (m, 15H), 0.63 (q, J = 8.0 Hz, 6H), 0.08 (s, 3H), 0.07 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, C_6D_6): δ = 132.0 (CH), 128.2 (CH), 97.8 and 97.6 (CH), 81.5 (C), 77.0 (CH), 72.7 (CH), 71.2 (CH), 63.2 and 63.1 (CH_2), 61.5 and 61.4 (CH_2), 40.9 and 40.8 (CH), 38.7 and 38.6 (CH), 31.0 and 30.9 (CH_2), 30.0 (CH_2), 26.5 (3 x CH_3), 26.0 (CH_2), 25.9 (CH_2), 19.5 and 19.4 (CH_2), 18.7 (C), 17.2 and 17.1 (CH_3), 10.6 (CH_3), 7.2 (3 x CH_3), 5.6 (3 x CH_2), –3.3 (2 x CH_3); IR (film): $\tilde{\nu}$ = 2954, 2878, 1462, 1252, 1116, 1024, 835 cm^{-1}; MS (EI): *m*/*z* (%): 397 (1), 355 (2), 305 (3), 243 (7), 225 (6), 183 (39), 173 (8), 159 (13), 115 (13), 85 (100), 73 (10); HRMS (ESI) calcd for $C_{30}H_{58}O_4Si_2Na$ [M^+ + Na]: 561.3765, found 561.3763; elemental analysis calcd (%) for $C_{30}H_{58}O_4Si_2$: C 68.04, H 10.23; found: C 67.95, H 10.25.

Compound 24: *n*BuLi (1.6 M in hexane, 3.34 mL, 5.34 mmol) was slowly added to a solution of compound **23** (1.77 g, 3.34 mmol) in THF (28 mL) at –78 °C and the resulting mixture was stirred at this temperature for 1 h before MeI (1.1 mL, 16.7 mmol) was introduced. Stirring was continued for 1 h at –78 °C and for 12 h at ambient temperature. The reaction was quenched with aq. sat. NH_4Cl (20 mL), the aqueous phase was extracted with *tert*-butyl methyl ether (3 x 20 mL), the combined organic layers were dried over Na_2SO_4 and evaporated, and the crude product used in the next step without further purification. Characteristic data: ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 5.64–5.52 (m, 2H), 4.62–4.56 (m, 1H), 4.22 (dd, J = 12.0, 3.6 Hz, 1H), 4.05 (dt, J = 12, 5.6 Hz, 1H), 3.89–3.80 (m, 1H), 3.76 (q, J = 5.6 Hz, 1H), 3.57 (t, J = 4.4 Hz, 1H), 3.47 (br dt, $J \approx$ 11.2, 5.2 Hz, 1H), 2.40–2.27 (m, 2H), 2.27 (br d, J = 10.4 Hz, 1H), 2.01–1.88 (m, 2H), 1.86–1.62 (m, 3H), 1.76 (t, J = 2.8 Hz, 3H), 1.60–1.46 (m, 4H), 0.97 (t, J = 7.6 Hz, 9H), 0.94–0.89 (m, 15H), 0.62 (q, J = 7.6 Hz, 6H), 0.07 (s, 3H), 0.06 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 132.8 (CH), 127.5 and 127.4 (CH), 98.4 and 98.3 (CH), 77.7

(C), 76.9 (CH), 76.6 (C), 63.3 and 63.2 (CH_2), 62.5 and 62.4 (CH_2), 40.9 (CH), 38.6 and 38.5 (CH), 31.2 (CH_2), 31.1 (CH_2), 30.1 (CH_2), 26.4 (3 x CH_3), 26.2 (CH_2), 20.1 and 20.0 (CH_2), 18.8 (C), 17.1 and 17.0 (CH_3), 10.7 (CH_3), 7.1 (3 x CH_3), 5.6 (3 x CH_2), 3.6 (CH_3), –3.4 (2 x CH_3).

Compound 25: A Teflon flask was used for this experiment. HF·pyridine adduct (4.17 mL, 33.4 mmol) was added to a solution of crude **24** (1.84 g) in THF (140 mL) and pyridine (7.5 mL) at 0 °C and the resulting mixture was stirred at ambient temperature for 2 h. After cooling to 0 °C, the reaction was quenched with aq. sat. $NaHCO_3$ (80 mL), the aqueous phase was extracted with EtOAc (3 x 50 mL), the combined extracts were dried over Na_2SO_4 and evaporated, and the residue was purified by flash chromatography to give product **25** as a colorless oil (1.4 g, 95 % over both steps). $[\alpha]_D^{20}$ = –8.9 (*c* = 0.75, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, CD_2Cl_2): δ = 5.64–5.53 (m, 2H), 4.61–4.57 (m, 1H), 4.27–4.18 (m, 1H), 4.07–4.01 (m, 1H), 3.88–3.80 (m, 1H), 3.73–3.66 (m, 1H), 3.64 (t, *J* = 4 Hz, 1H), 3.50–3.43 (m, 1H), 2.38–2.24 (m, 2H), 2.22 (br dt, *J* ≈ 14.1, 5.0 Hz, 1H), 2.16 (br t, *J* ≈ 4.8 Hz, 1H), 1.96–1.63 (m, 5H), 1.77 (t, *J* = 2.8 Hz, 3H), 1.59–1.45 (m, 4H), 0.94-0.89 (m, 15H), 0.09 (s, 3H), 0.08 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, CD_2Cl_2): δ = 132.7 and 132.6 (CH), 127.5 and 127.4 (CH), 98.4 and 98.2 (CH), 78.2 (C), 78.1 (CH), 76.0 (C), 72.9 (CH), 63.2 and 63.0 (CH_2), 62.5 and 62.3 (CH_2), 40.0 (CH), 39.1 and 39.0 (CH), 31.2 (CH_2), 31.1 (CH_2), 26.3 (3 x CH_3), 26.0 and 25.9 (CH_2), 20.0 and 19.9 (CH_2), 19.9 (CH_2), 18.7 (C), 16.4 (CH_3), 9.5 (CH_3), 3.5 (CH_3), –3.5 (CH_3), –3.9 (CH_3); IR (film): $\tilde{\nu}$ = 3485, 2928, 2856, 2356, 1463, 1254, 1115, 1077, 1022, 834 cm^{-1}; MS (EI): *m*/*z* (%): 297 (6), 279 (14), 255 (6), 243 (11), 225 (7), 173 (13), 159 (7), 123 (24), 115 (7), 85 (100), 73 (20); HRMS (ESI) calcd for $C_{25}H_{46}O_4SiNa$ [M^+ + Na]: 461.3057, found 461.3057; elemental analysis calcd (%) for $C_{25}H_{46}O_4Si$: C 68.44, H 10.57; found: C 68.35, H 10.50.



S-2. Analysis (δ_H (ppm) = $\delta_{S\text{-MTPA}}$ ester − $\delta_{R\text{-MTPA}}$ ester) of the Mosher esters prepared by reaction of **25** with *S*-MTPA-Cl and *R*-MTPA-Cl, respectively.[2] Note that the use of *S*-MTPA-Cl affords the *R*-MTPA ester, and vice versa; MTPA = α-methoxy-α-trifluoromethyl-phenylacetic acid.

(*S*)-4-Benzyl-*N*-((2*R*,3*R*)-3-hydroxy-2-methylhexanoyl)oxazolidin-2-one (51a): Freshly distilled butanal (370 µL, 4.22 mmol) was added to a suspension of $CrCl_2$ (1.27 g, 10.4 mmol) and LiI (51.4 mg, 0.38 mmol) in THF (12 mL) before a solution of compound **49** (1.2 g, 3.84 mmol)[6] in THF (6 mL) was added, causing an immediate color change to red-brown. After stirring for 1 h, the reaction was quenched with brine (8 mL) and stirring was continued for 15 min to reach a clean phase separation. The aqueous layer was extracted with Et_2O (3 x 10 mL), the combined extracts were dried over $MgSO_4$ and evaporated, and the residue was purified by flash chromatography to give a mixture of products **50a** and **51a** as a colorless solid (0.99 g, 85 %, dr = 2:3). These diastereomers were separated by preparative HPLC to furnish the pure *anti*-configured product **51a** as a colorless solid (Shimadzu LC-8A; column: 125 mm Nucleodur 100-5-C18ec, 2.0 ∅; eluent: MeCN/water = 2:3, 0.2 mL/min; pressure: 6.7 MPa; T = 308 K; UV detection at 220 nm, t_R = 13.25 min (*syn*-aldol **50a**), t_R = 15.03 min (*anti*-aldol **51a**)). m. p. = 72–73 °C; $[\alpha]_D^{20}$ = +38.2 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.34–7.17 (m, 5H), 4.71–4.61 (m, 1H), 4.21–4.10 (m, 2H), 3.87 (quint, *J* = 7.0 Hz, 1H), 3.72 (br s, 1H), 3.30 (dd, *J* = 13.4, 3.4 Hz, 1H), 2.75 (dd, *J* = 13.4, 9.5 Hz, 1H), 2.53 (br s, 1H), 1.61–1.50 (m, 2H), 1.50–1.33 (m, 2H), 1.19 (d, *J* = 7.0 Hz, 3H), 0.93 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 176.9 (C), 153.5 (C), 135.2 (C), 129.4 (2 x CH), 128.9 (2 x CH), 127.3 (CH), 74.4 (CH), 66.0 (CH_2), 55.5 (CH), 43.2 (CH), 37.8 (CH_2), 37.1 (CH_2), 18.7 (CH_2), 14.6 (CH_3), 14.0 (CH_3); IR (film): $\tilde{\nu}$ = 3496, 3027, 2967, 2935, 2871, 1780,

[6] a) L. Wessjohann, T. Gabriel, *J. Org. Chem*. **1997**, *62*, 3772–3774; b) T. Gabriel, L. Wessjohann, *Tetrahedron Lett*. **1997**, *38*, 4387–4388.

1682, 1385, 1353, 1240, 1207, 1196, 1120, 1049, 1019, 962, 762, 727, 710, 696 cm^{-1}; MS (EI) *m*/*z* (%): 305 (31) [M^+], 287 (18), 262 (38), 244 (56), 233 (32), 178 (100), 177 (21), 142 (13), 134 (33), 133 (22), 129 (33), 117 (67), 116 (33), 111 (46), 91 (54), 86 (73), 83 (47), 57 (38), 55 (32), 43 (21); HRMS (ESI): *m*/*z*: calcd for $C_{17}H_{23}NO_4Na$ [M^+ + Na]: 328.1519, found 328.1521.

Compounds 53a and 55a: Prepared analogously from butanal (370 μL, 4.22 mmol) and *ent*-**49** (1.2 g, 3.84 mmol). The product mixture (1.02 g, 87 %, dr = 3:2) was separated by preparative HPLC (Shimadzu LC-8A; column: 125 mm Nucleodur 100-5-C18ec, 2.0 ∅; eluent: MeCN/water = 2:3, 0.2 mL/min; pressure: 6.7 MPa; T = 308 K; UV detection at 220 nm, $t_{R\,=}$ 13.06 min (*syn*-aldol **55a**), t_R = 14.83 min (*anti*-aldol **53a**) to give pure samples of the desired products which analyzed as follows: **Compound 53a**: m. p. = 72–73 °C; $[\alpha]_D^{20}$ = –37.5 (*c* = 1.3, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ= 7.34–7.18 (m, 5H), 4.71–4.61 (m, 1H), 4.20–4.11 (m, 2H), 3.87 (quint, *J* = 7.0 Hz, 1H), 3.71 (br s, 1H), 3.30 (dd, *J* = 13.4, 3.4 Hz, 1H), 2.75 (dd, *J* = 13.4, 9.5 Hz, 1H), 2.52 (br s, 1H), 1.61–1.50 (m, 2H), 1.50–1.33 (m, 2H), 1.19 (d, *J* = 7.0 Hz, 3H), 0.93 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ= 176.9 (C), 153.5 (C), 135.2 (C), 129.4 (2 x CH), 128.9 (2 x CH), 127.3 (CH), 74.4 (CH), 66.0 (CH_2), 55.5 (CH), 43.2 (CH), 37.8 (CH_2), 37.1 (CH_2), 18.7 (CH_2), 14.6 (CH_3), 14.0 (CH_3); IR (film): $\tilde{\nu}$ = 3495, 3027, 2967, 2936, 2879, 1780, 1682, 1386, 1353, 1240, 1207, 1196, 1120, 1049, 1019, 962, 762, 727, 710, 696 cm^{-1}; MS (EI) *m*/*z* (%): 305 (27) [M^+], 287 (20), 262 (38), 244 (58), 233 (32), 178 (100), 177 (22), 142 (14), 134 (33), 133 (22), 129 (29), 117 (59), 116 (32), 111 (44), 91 (40), 86 (65), 83 (36), 57 (37), 55 (29), 43 (12); HRMS (ESI): *m*/*z*: calcd for $C_{17}H_{23}NO_4Na$ [M^+ + Na]: 328.1519, found 328.1519. **Compound 55a**: m. p. = 75–76 °C; $[\alpha]_D^{20}$ = –35.8 (*c* = 1.2, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ= 7.36–7.20 (m, 5H), 4.73–4.66 (m, 1H), 4.24–4.16 (m, 2H), 4.00 (br s, 1H), 3.84 (qd, *J* = 7.0, 2.8 Hz, 1H), 3.31 (dd, *J* = 13.4, 3.4 Hz, 1H), 2.78 (dd, *J* = 13.4, 9.6 Hz, 1H), 2.65 (br s, 1H), 1.62–1.48 (m, 2H), 1.48–1.34 (m, 2H), 1.20 (d, *J* = 7.0 Hz, 3H), 0.96 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ= 177.2 (C), 153.2 (C), 135.2 (C), 129.4 (2 x CH), 129.0 (2 x CH), 127.4 (CH), 71.5 (CH), 66.2 (CH_2), 55.3 (CH), 42.1 (CH), 38.1 (CH_2), 36.1 (CH_2), 19.2 (CH_2), 14.0

(CH_3), 10.2 (CH_3); IR (film): $\tilde{\nu}$ = 3523, 3026, 3004, 2969, 2939, 2877, 1773, 1688, 1383, 1350, 1296, 1235, 1197, 1118, 1096, 1047, 1016, 969, 769, 756, 742, 700 cm^{-1}; MS (EI) *m*/*z* (%): 305 (26) [M^+], 287 (25), 262 (9), 244 (94), 233 (74), 178 (75), 177 (20), 142 (26), 134 (58), 133 (36), 129 (39), 117 (77), 116 (40), 111 (53), 92 (33), 91 (56), 86 (100), 83 (39), 57 (64), 55 (39), 43 (19); HRMS (ESI): *m*/*z*: calcd for $C_{17}H_{23}NO_4Na$ [M^+ + Na]: 328.1519, found 328.1521.

Compound 51b: 2,6-Lutidine (235 μL, 2.07 mmol) and TBSOTf (285 μL, 1.24 mmol) were added to a solution of compound **51a** (210 mg, 0.69 mmol) in CH_2Cl_2 (4.6 mL) at –78 °C. The mixture was then stirred at 0 °C for 1.5 h before the reaction was quenched with aq. sat. $NaHCO_3$ (5 mL). A standard extractive work up followed by flash chromatography of the crude material (hexanes/EtOAc, 9:1) provided silyl ether **51b** as a colorless syrup (254 mg, 88 %). $[\alpha]_D^{20}$ = –3.8 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ= 7.39–7.22 (m, 5H), 4.76–4.67 (m, 1H), 4.25–4.13 (m, 3H), 4.03 (quint, *J* = 6.7 Hz, 1H), 3.36 (dd, *J* = 13.2, 3.3 Hz, 1H), 2.70 (dd, *J* = 13.2, 9.9 Hz, 1H), 1.64–1.31 (m, 4H), 1.16 (d, *J* = 7.0 Hz, 3H), 0.95–0.90 (m, 12H), 0.14 (s, 3H), 0.13 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ= 175.1 (C), 153.0 (C), 135.4 (C), 129.3 (2 x CH), 128.9 (2 x CH), 127.3 (CH), 71.8 (CH), 65.9 (CH_2), 55.3 (CH), 43.8 (CH), 38.3 (CH_2), 34.8 (CH_2), 25.9 (3 x CH_3), 18.1 (C), 17.7 (CH_2), 14.3 (CH_3), 11.4 (CH_3), –4.5 (CH_3), –4.8 (CH_3); IR (film): $\tilde{\nu}$ = 3029, 2956, 2931, 2857, 1779, 1698, 1462, 1385, 1357, 1209, 1119, 1064, 1039, 973, 835, 753 cm^{-1}; MS (EI) *m*/*z* (%): 363 (26), 362 (100), 291 (17), 290 (78), 234 (12), 199 (11), 187 (23), 185 (63), 117 (18), 111 (28), 91 (14), 75 (22), 73 (32); HRMS (ESI): *m*/*z*: calcd for $C_{23}H_{37}NO_4SiNa$ [M^+ + Na]: 442.2384, found 442.2383.

Compound 53b: Prepared analogously as a colorless syrup (427 mg, 86 %). $[\alpha]_D^{20}$ = +4.6 (*c* = 1.2, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ= 7.36–7.20 (m, 5H), 4.74–4.65 (m, 1H), 4.21–4.11 (m, 3H), 4.00 (quint, *J* = 6.7 Hz, 1H), 3.36 (dd, *J* = 13.1, 3.3 Hz, 1H), 2.67 (dd, *J* = 13.1, 9.9 Hz, 1H), 1.58–1.30 (m, 4H), 1.13 (d, *J* = 6.9 Hz, 3H), 0.92–0.88 (m, 12H), 0.11 (s, 3H), 0.10 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ= 175.1 (C), 153.0 (C), 135.4 (C), 129.4 (2 x

CH), 128.9 (2 x CH), 127.3 (CH), 71.8 (CH), 65.9 (CH_2), 55.3 (CH), 43.8 (CH), 38.3 (CH_2), 34.8 (CH_2), 25.9 (3 x CH_3), 18.1 (C), 17.7 (CH_2), 14.3 (CH_3), 11.5 (CH_3), –4.5 (CH_3), –4.8 (CH_3); IR (film): $\tilde{\nu}$ = 3030, 2956, 2930, 2856, 1780, 1698, 1462, 1385, 1358, 1209, 1119, 1064, 1039, 973, 833, 774 cm^{-1}; MS (EI) *m*/*z* (%): 363 (26), 362 (100), 291 (17), 290 (80), 234 (12), 199 (11), 187 (24), 185 (66), 117 (18), 111 (29), 91 (12), 75 (21), 73 (32); HRMS (ESI): *m*/*z*: calcd for $C_{23}H_{37}NO_4SiNa$ [M^+ + Na]: 442.2384, found 442.2387.

Compound 55b: Prepared analogously as a colorless syrup (207 mg, 88 %). $[\alpha]_D^{20}$ = –9.8 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.37–7.20 (m, 5H), 4.72–4.63 (m, 1H), 4.20–4.06 (m, 3H), 3.95–3.87 (m, 1H), 3.39 (dd, *J* = 13.3, 3.3 Hz, 1H), 2.64 (dd, *J* = 13.3, 10.3 Hz, 1H), 1.58–1.34 (m, 4H), 1.19 (d, *J* = 6.8 Hz, 3H), 0.92–0.88 (m, 12H), 0.08 (s, 3H), 0.07 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 175.8 (C), 153.2 (C), 135.5 (C), 129.3 (2 x CH), 129.0 (2 x CH), 127.3 (CH), 73.1 (CH), 66.0 (CH_2), 55.4 (CH), 42.6 (CH), 38.4 (CH_2), 38.1 (CH_2), 25.9 (3 x CH_3), 18.1 (C), 18.0 (CH_2), 14.5 (CH_3), 12.9 (CH_3), –3.9 (CH_3), –4.4 (CH_3); IR (film): $\tilde{\nu}$ = 3030, 2956, 2930, 2857, 1779, 1698, 1462, 1381, 1349, 1208, 1119, 1044, 1017, 986, 833, 772 cm^{-1}; MS (EI) *m*/*z* (%): 363 (25), 362 (94), 291 (21), 290 (100), 199 (14), 187 (20), 185 (41), 117 (18), 111 (25), 91 (14), 75 (25), 73 (39); HRMS (ESI): *m*/*z*: calcd for $C_{23}H_{37}NO_4SiNa$ [M^+ + Na]: 442.2384, found 442.2387.

Acid 52: H_2O_2 (30 % *w*/*w* in water, 337 µL, 3.0 mmol) and a solution of LiOH (29 mg, 1.2 mmol) in water (480 µL) were successively added at 0 °C to a solution of compound **51b** (250 mg, 0.60 mmol) in THF/water (9.7 mL, 3:1) and the resulting mixture was stirred at this temperature for 8 h. To quench excess H_2O_2, a solution of sodium sulfite (394 mg, 3.12 mmol) in water (480 µL) was introduced and stirring continued for 15 min at ambient temperature before most of the THF was evaporated. The remaining organic layer was extracted with CH_2Cl_2 (4 x 3 mL) before it was acidified with HCl (1 M) until a pH of ca. 1 was reached. The acidic phase was extracted with Et_2O and the solvent evaporated to give acid **52** as a colorless oil (150.2 mg, 98 %). $[\alpha]_D^{20}$ = –5.2 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 10.89 (br s, 1H), 3.93 (q, *J* = 5.6 Hz, 1H), 2.65 (dq, *J* = 7.1, 5.6 Hz, 1H),

1.55–1.31 (m, 4H), 1.14 (d, J = 7.2 Hz, 3H), 0.92–0.86 (m, 12H), 0.07 (s, 3H), 0.06 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 180.4 (C), 73.6 (CH), 45.2 (CH), 36.0 (CH_2), 25.7 (3 x CH_3), 18.0 (C), 17.8 (CH_2), 14.2 (CH_3), 12.5 (CH_3), –4.5 (CH_3), –5.0 (CH_3); IR (film): $\tilde{\nu}$ = 2957, 2931, 2858, 1707, 1463, 1416, 1381, 1361, 1252, 1121, 1081, 1038, 1005, 907, 889, 833, 773 cm^{-1}; MS (EI) *m*/*z* (%): 204 (11), 203 (71), 187 (14), 185 (12), 147 (23), 131 (14), 105 (14), 75 (100), 73 (29); HRMS (ESI): *m*/*z*: calcd for $C_{13}H_{28}O_3SiNa$ [M^+ + Na]: 283.1700, found 283.1701.

Acid 54: Prepared analogously as a colorless oil (235 mg, 90 %). $[\alpha]_D^{20}$ = +5.5 (*c* = 1.4, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 10.92 (br s, 1H), 3.92 (q, J = 5.4 Hz, 1H), 2.66 (dq, J = 7.1, 5.4 Hz, 1H), 1.56–1.30 (m, 4H), 1.15 (d, J = 7.1 Hz, 3H), 0.93–0.87 (m, 12H), 0.08 (s, 3H), 0.07 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 180.0 (C), 73.6 (CH), 45.1 (CH), 36.1 (CH_2), 25.7 (3 x CH_3), 18.0 (C), 17.9 (CH_2), 14.2 (CH_3), 12.7 (CH_3), –4.5 (CH_3), –5.0 (CH_3); IR (film): $\tilde{\nu}$ = 2957, 2931, 2858, 1707, 1463, 1417, 1381, 1361, 1252, 1121, 1081, 1038, 1005, 907, 889, 833, 773 cm^{-1}; MS (EI) *m*/*z* (%): 204 (9), 203 (62), 187 (12), 185 (10), 147 (22), 131 (12), 105 (11), 75 (100), 73 (30); HRMS (ESI): *m*/*z*: calcd for $C_{13}H_{28}O_3SiNa$ [M^+ + Na]: 283.1700, found 283.1700.

Acid 56: Prepared analogously as a colorless oil (113 mg, 91 %). $[\alpha]_D^{20}$ = +31.9 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 10.69 (br s, 1H), 4.03–3.97 (m, 1H), 2.62–2.55 (m, 1H), 1.51–1.23 (m, 4H), 1.13 (d, J = 7.1 Hz, 3H), 0.94–0.87 (m, 12H), 0.08 (s, 3H), 0.07 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 179.2 (C), 73.5 (CH), 44.4 (CH), 36.3 (CH_2), 25.7 (3 x CH_3), 18.6 (CH_2), 18.0 (C), 14.2 (CH_3), 11.0 (CH_3), –4.4 (CH_3), –4.8 (CH_3); IR (film) $\tilde{\nu}$ = 2957, 2931, 2858, 1706, 1462, 1414, 1385, 1361, 1252, 1135, 1099, 1042, 1005, 938, 898, 833, 805, 773 cm^{-1}; MS (EI) *m*/*z* (%): 204 (9) 203 (62), 187 (11), 185 (9), 147 (24), 131 (13), 105 (13), 75 (100), 73 (29); HRMS (ESI): *m*/*z*: calcd for $C_{13}H_{28}O_3SiNa$ [M^+ + Na]: 283.1700; found 283.1699.

Compound 74: A solution of freshly prepared LDA (0.64 M in THF, 5.9 mL, 3.81 mmol) was slowly added to a solution of ester **9** (1.0 g, 3.37 mmol) in THF (18 mL) at −78 °C. The resulting red solution was stirred for 15 min at this temperature before a solution of iodide **73** (1.5 g, 6.74 mmol) and TMEDA (568 μL, 3.4 mmol) in THF (4 mL) was added dropwise. After stirring for 1 h at −78 °C, the reaction was quenched with aq. sat. NH_4Cl (15 mL). A standard extractive work up followed by purification of the crude material by flash chromatography (hexanes/EtOAc, 9:1) furnished product **74** as a colorless oil (1.29 g, 98 %). $[\alpha]_D^{20}$ = +1.7 (*c* = 1.9, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.32 (d, *J* = 2.0 Hz, 1H), 6.29 (d, *J* = 2.0 Hz, 1H), 4.40–4.32 (m, 2H), 3.78 (s, 3H), 3.77 (s, 3H), 2.64–2.46 (m, 2H), 2.16–1.98 (m, 2H), 1.77 (t, *J* = 2.5 Hz, 3H), 1.74–1.57 (m, 2H), 1.52–1.41 (m, 1H), 1.14–1.06 (m, 2H), 0.98 (d, *J* = 6.6 Hz, 3H), 0.05 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 168.4 (C), 161.2 (C), 157.3 (C), 142.5 (C), 116.8 (C), 105.6 (CH), 96.0 (CH), 77.5 (C), 76.4 (C), 63.2 (CH_2), 55.7 (CH_3), 55.2 (CH_3), 37.5 (CH_2), 32.7 (CH), 31.4 (CH_2), 26.0 (CH_2), 19.3 (CH), 17.4 (CH_2), 3.4 (CH_3), –1.6 (3 x CH_3); IR (film): $\tilde{\nu}$ = 3000, 2954, 2920, 2839, 1719, 1603, 1586, 1457, 1250, 1202, 1156, 1094, 1043, 931, 835 cm^{-1}; MS (EI) *m*/*z* (%): 390 (15) [M^+], 347 (25), 331 (18), 289 (79), 273 (86), 267 (21), 257 (16), 245 (71), 230 (34), 191 (18), 151 (11), 73 (100); HRMS (ESI): *m*/*z*: calcd for $C_{22}H_{34}O_4SiNa$ [M^+ + Na]: 413.2118, found 413.2114; elemental analysis calcd (%) for $C_{22}H_{34}O_4Si$: C 67.65, H 8.77; found: C 67.03, H 8.84.

Acid 75: A solution of ester **74** (1.29 g, 3.3 mmol) and TBAF (1 M in THF, 6 mL, 5.94 mmol) in THF (10 mL) was stirred for 12 h before the reaction was quenched with aq. sat. NH_4Cl (15 mL). The aqueous layer was extracted with EtOAc (3 x 10 mL), the combined extracts were dried over Na_2SO_4 and evaporated, and the residue purified by flash chromatography (hexanes/EtOAc/HOAc, 1:1:0.01) to give acid **75** as a colorless syrup (0.91 g, 95 %). $[\alpha]_D^{20}$ = +4.7 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 10.24 (br s, 1H), 6.40 (d, *J* = 2.3 Hz, 1H), 6.35 (d, *J* = 2.3 Hz, 1H), 3.87 (s, 3H), 3.83 (s, 3H), 2.90–2.69 (m, 2H), 2.18–2.01 (m, 2H), 1.77 (t, *J* = 2.5 Hz, 3H), 1.76–1.63 (m, 2H), 1.55–1.45 (m, 1H), 1.02 (d, *J* = 6.6 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$): δ = 171.0 (C), 162.0 (C), 158.9 (C), 146.1 (C), 113.6 (C), 107.2

(CH), 96.3 (CH), 77.7 (C), 76.4 (C), 56.2 (CH_3), 55.3 (CH_3), 37.7 (CH_2), 32.8 (CH), 32.2 (CH_2), 26.0 (CH_2), 19.3 (CH), 3.4 (CH_3); IR (film): $\tilde{\nu}$ = 3008, 2960, 2918, 2840, 2658, 2551, 1726, 1693, 1602, 1457, 1422, 1322, 1289, 1266, 1202, 1160, 1074, 1044, 910, 831 cm^{-1}; MS (EI) *m*/*z* (%): 290 (68) [M^+], 275 (67), 273 (48), 261 (24), 245 (44), 243 (20), 231 (16), 207 (17), 196 (100), 195 (35), 191 (45), 181 (15), 178 (14), 165 (15), 152 (30), 151 (26), 137 (21), 120 (18), 109 (15), 91 (20), 77 (24), 53 (29); HRMS (ESI): *m*/*z*: calcd for $C_{17}H_{22}O_4Na$ [M^+ + Na]: 313.1410, found 313.1408; elemental analysis calcd (%) for $C_{17}H_{22}O_4$: C 70.32, H 7.64; found: C 70.68, H 8.13.

Assembly

Compound 28: Pyridine (2.6 μL, 0.032 mmol) and cyanuric fluoride (12.3 μL, 0.14 mmol) were successively added to a solution of acid **14b** (10 mg, 0.028 mmol) in CH_2Cl_2 (0.3 mL) at 0 °C and stirring was continued at this temperature for 1 h, causing the formation of a yellowish-white suspension. The reaction was quenched with aq. sat. $NaHCO_3$ (2 mL) and the aqueous phase extracted with CH_2Cl_2 (3 x 1 mL). The combined organic layers were dried (Na_2SO_4) and evaporated to give analytically pure isochromanone **28** as a colorless oil (7.7 mg, 95 %). $[\alpha]_D^{20}$ = –75.4 (*c* = 0.46, $CHCl_3$); ^{1}H NMR (400 MHz, C_6D_6): δ = 6.19 (d, *J* = 2.2 Hz, 1H), 5.95 (d, *J* = 2.2 Hz, 1H), 4.15 (ddd, *J* = 12.2, 5.1, 2.5 Hz, 1H), 3.35 (s, 3H), 3.25 (s, 3H), 2.47 (dd, *J* = 15.7, 12.2 Hz, 1H), 2.32–2.22 (m, 1H), 2.12 (dd, *J* = 15.7, 2.5 Hz, 1H), 2.10–2.02 (m, 1H), 1.75–1.63 (m, 1H), 1.47 (t, *J* = 2.6 Hz, 3H), 1.04 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, C_6D_6): δ = 166.1 (C), 162.0 (C), 158.3 (C), 141.1 (C), 116.3 (C), 106.4 (CH), 97.8 (CH), 82.4 (CH), 77.3 (C), 77.2 (C), 56.5 (CH_3), 55.9 (CH_3), 37.0 (CH), 35.1 (CH_2), 22.3 (CH_2), 13.8 (CH_3), 3.5 (CH_3); IR (film): $\tilde{\nu}$ = 3057, 2968, 2919, 2843, 1714, 1601, 1581, 1457, 1428, 1341, 1240, 1220, 1198, 1159, 1077, 1040, 833, 731, 700 cm^{-1}; MS (EI): *m*/*z* (%): 288 (59) [M^+], 273 (12), 255 (21), 217 (16), 207 (65), 180 (11), 179 (100), 178 (37), 151 (10), 135 (13), 91 (11), 77 (12); HRMS (ESI) calcd for $C_{17}H_{20}O_4Na$ [M^+ + Na]: 311.1254, found 311.1254.

Representative procedure for esterification reactions via the corresponding acid fluorides. Formation of compound 33: Pyridine (117 μL, 1.41 mmol) was added to a solution of acid **14a** (700 mg, 1.28 mmol) in CH_2Cl_2 (22 mL) at –25 °C before the mixture was treated with cyanuric fluoride (554 μL, 6.43 mmol). After stirring for 10 min at this temperature, the reaction was quenched with aq. sat. $NaHCO_3$ (20 mL) and the mixture allowed to reach ambient temperature. The aqueous phase was extracted with CH_2Cl_2 (3 x 15 mL), the combined extracts were dried over Na_2SO_4 and evaporated, and the resulting crude acid fluoride **32** used in the next step without further characterization.

A solution of alcohol **25** (620 mg, 1.41 mmol) in THF (14.8 mL) was added dropwise to a solution of NaHMDS (259 mg, 1.41 mmol) in THF (3.7 mL) at –78 °C and the resulting mixture was stirred at this temperature for 30 min and at 0 °C for 10 min. A solution of the crude acid fluoride in THF (9.3 mL) was then introduced and the mixture stirred for 1 h at ambient temperature. After evaporation of all volatile materials, the residue was dissolved in EtOAc (30 mL) and the resulting solution successively washed with HCl (1 M), sat. aq. $NaHCO_3$ and brine (10 mL each). Drying over Na_2SO_4 and evaporation of the solvents afforded the crude ester, which was purified by flash chromatography (hexanes/EtOAc, 9:1) to give pure **33** and its 9-epimeric ester **61** as colorless foams each (1.15 g, 93 % overall; major isomer **33**: 1.03 g; minor isomer **61**: 0.12 g). Analytical and spectroscopic data of **33**: $[\alpha]_D^{20}$ = +5.8 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, C_6D_6): δ = 7.95–7.88 (m, 2H), 7.87–7.81 (m, 2H), 7.37–7.22 (m, 6H), 6.33 (d, *J* = 2 Hz, 1H), 6.28 (d, *J* = 2 Hz, 1H), 6.01–5.90 (m, 1H), 5.79–5.67 (m, 1H), 5.64 (q, *J* = 5.6 Hz, 1H), 4.84 (s, 1H), 4.68–4.55 (m, 2H), 4.42–4.31 (m, 1H), 4.02–3.93 (m, 1H), 3.90 (t, *J* = 4.8 Hz, 1H), 3.59–3.51 (m, 1H), 3.39 (s, 3H), 3.38 (s, 3H), 3.25–3.17 (m, 1H), 3.07–2.98 (m, 3H), 2.67–2.57 (m, 2H), 2.51 (dq, *J* = 16.0, 3.2 Hz, 1H), 2.41–2.17 (m, 3H), 2.16–2.05 (m, 1H), 1.97–1.83 (m, 1H), 1.78–1.70 (m, 2H), 1.67 (t, *J* = 2.2 Hz, 3H), 1.64 (t, *J* = 2.3 Hz, 3H), 1.51–1.35 (m, 3H), 1.32 (d, *J* = 6.8 Hz, 3H), 1.30 (d, *J* = 6.8 Hz, 3H), 1.25 (s, 9H), 1.19–1.15 (m, 3H), 1.13 (s, 9H), 0.26–0.20 (m, 6H); ^{13}C NMR (two diastereomers at THP, 75 MHz, C_6D_6): δ = 167.6 (C), 161.4 (C), 158.4 (C), 139.5 (C), 136.5 (4 x CH), 134.7 (C), 134.6 (C), 132.2 (CH), 129.8

(CH), 129.6 (CH), 128.3 (CH), 127.9 (2 x CH), 127.8 (2 x CH), 118.7 (C), 106.6 (CH), 97.7 (CH), 97.4 (CH), 78.4 (C), 78.3 (C), 77.4 (CH), 77.1 and 77.0 (CH), 76.6 (C), 75.3 and 75.3 (CH), 74.6 and 74.5 (C), 63.1 and 63.1 (CH_2), 61.5 and 61.5 (CH_2), 55.2 (CH_3), 54.9 (CH_3), 38.8 and 38.7 (CH), 38.6 (CH), 38.5 and 38.4 (CH), 37.0 (CH_2), 31.1 and 31.0 (CH_2), 30.4 (CH_2), 30.2 (CH_2), 27.4 (3 x CH_3), 26.5 (3 x CH_3), 26.0 (CH_2), 22.5 (CH_2), 19.8 (C), 19.6 (CH_2), 18.8 (C), 17.2 and 17.1 (CH_3), 15.2 (CH_3), 10.9 (CH_3), 3.5 (CH_3), 3.4 (CH_3), –3.3 and –3.3 (CH_3), –3.4 (CH_3); IR (film): $\tilde{\nu}$ = 3070, 3008, 2937, 2857, 1722, 1604, 1462, 1427, 1324, 1259, 1216, 1203, 1159, 1104, 1077, 1042, 936, 834, 751 cm^{-1}; MS (EI) *m*/*z* (%): 908 (16), 907 (23), 603 (14), 602 (37), 601 (75), 528 (14), 527 (34), 489 (11), 488 (36), 487 (98), 289 (13), 243 (14), 237 (15), 225 (14), 135 (14), 85 (100), 73 (20); HRMS (ESI): *m*/*z*: calcd for $C_{58}H_{84}O_8Si_2Na$ [M^+ + Na]: 987.5597, found 987.5595; elemental analysis calcd (%) for $C_{58}H_{84}O_8Si_2$: C 72.15, H 8.77; found: C 72.08, H 8.71.

Ester 61: $[\alpha]_D^{20}$ = +8.0 (*c* = 0.7, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$, two diastereomers at THP): δ = 7.76–7.55 (m, 4H), 7.43–7.28 (m, 6H), 6.18 (d, *J* = 2.1 Hz, 1H), 5.71 (d, *J* = 2.1 Hz, 1H), 5.76–5.54 (m, 2H), 5.15–5.00 (m, 1H), 4.64 (t, *J* = 3.4 Hz, 1H), 4.28–4.09 (m, 3H), 3.92–3.85 (m, 1H), 3.72 (m, 4H), 3.59–3.48 (m, 5H), 2.79–2.71 (m, 1H), 2.67–2.51 (m, 3H), 2.36–2.18 (m, 3H), 2.15–2.05 (m, 1H), 2.00–1.90 (m, 1H), 1.78–1.70 (m, 2H), 1.81–1.70 (m, 4H), 1.64 (t, *J* = 2.2 Hz, 3H), 1.61–1.53 (m, 3H), 1.03–0.90 (m, 28H), 0.12–0.06 (m, 6H); ^{13}C NMR (two diastereomers at THP, 100 MHz, $CDCl_3$): δ = 167.7 and 167.6 (C), 160.8 and 160.7 (C), 157.8 and 157.6 (C), 138.7 and 138.3 (C), 136.1 (CH), 135.9 (CH), 134.3 (C), 133.8 (C), 132.4 and 134.1 (CH), 129.5 (CH), 129.4 and 129.3 (CH), 129.3 (CH), 127.5 (CH), 127.4 (CH), 127.4 (CH), 127.3 (CH), 127.1 (CH), 127.0 (CH), 117.7 (C), 105.6 and 105.2 (CH), 98.0 (CH), 96.9 and 96.8 (CH), 78.4 (C), 78.0 (C), 77.8 and 77.7 (CH), 76.2 and 76.0 (CH), 76.1 (C), 75.8 (C), 74.5 and 74.4 (CH), 63.0 (CH_2), 62.2 and 62.1 (CH_2), 55.6 and 55.5 (CH_3), 55.2 and 55.1 (CH_3), 38.1 and 38.0 (CH), 37.8 and 37.8 (CH), 37.4 (CH_2), 36.6 (CH), 31.1 (CH_2), 36.4 (CH_2), 30.7 and 30.3 (CH_2), 27.0 (3 x CH_3), 26.2 (3 x CH_3), 25.5 (CH_2), 23.1 and 22.3 (CH_2), 19.5 (CH_2), 19.4 (C), 18.5 (C), 16.6 and 16.5 (CH_3), 15.1 (CH_3), 13.5 and 13.3 (CH_3), 10.5 (CH_3), 3.5 and 3.4 (CH_3), –3.5 (CH_3), –4.0 and –4.8 (CH_3); IR (film): $\tilde{\nu}$ =

3074, 3058, 2954, 2930, 2870, 1724, 1604, 1590, 1492, 1427, 1259, 1202, 1159, 1103, 1079, 1024, 834, 773, 702 cm^{-1}; MS (EI) *m*/*z* (%): 602 (18), 601 (36), 528 (11), 527 (27), 488 (36), 487 (100), 365 (16), 289 (19), 237 (17), 225 (17), 199 (13), 135 (19), 75 (12), 73 (33); HRMS (ESI): *m*/*z*: calcd for $C_{58}H_{84}O_8Si_2Na$ [M^+ + Na]: 987.5597, found 987.5587.

Ester 30: Prepared analogously as a colorless foam (21.3 mg, 90 %). ^{1}H NMR (two diastereomers at THP, 400 MHz, C_6D_6): δ = 6.20 (d, *J* = 1.4 Hz, 2H), 5.86–5.79 (m, 1H), 5.64–5.57 (m, 2H), 4.73 (t, *J* = 3.3 Hz, 1H), 4.54–4.45 (m, 1H), 4.30–4.21 (m, 1H), 3.88–3.80 (m, 1H), 3.78 (t, *J* = 4.6 Hz, 1H), 3.48–3.40 (m, 1H), 3.29 (s, 3H), 3.28 (s, 3H), 2.85–2.79 (m, 2H), 2.54–2.45 (m, 2H), 2.39 (s, 3H), 2.19–2.08 (m, 1H), 2.05–1.96 (m, 1H), 1.83–1.75 (m, 1H), 1.65–1.59 (m, 2H), 1.54 (t, *J* = 2.5 Hz, 3H), 1.40–1.26 (m, 3H), 1.23 (d, *J* = 6.9 Hz, 3H), 1.06–0.99 (m, 12H), 0.14 (s, 3H), 0.11 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, C_6D_6): δ = 167.6 (C), 161.7 (C), 158.7 (C), 138.3 (C), 132.2 (CH), 128.3 (CH), 118.1 (C), 106.9 (CH), 97.7 (CH), 96.8 (CH), 78.2 (C), 77.1 (CH), 75.3 (C), 74.3 (CH), 63.1 (CH_2), 61.5 (CH_2), 55.3 (CH_3), 54.8 (CH_3), 38.9 and 38.8 (CH), 38.6 (CH), 31.0 and 31.0 (CH_2), 30.5 (CH_2), 26.4 (3 x CH_3), 26.0 (CH_2), 23.1 (CH_2), 20.1 (CH_3), 19.5 (CH_2), 18.7 (C), 17.1 and 17.0 (CH_3), 10.9 (CH_3), 3.3 (CH_3), –3.4 (CH_3), –3.5 (CH_3); IR (film): $\tilde{\nu}$ = 2958, 2934, 2857, 1720, 1601, 1463, 1427, 1324, 1259, 1216, 1200, 1161, 1102, 1078, 1041, 936, 834 cm^{-1}; MS (EI): *m*/*z* (%): 252 (22), 237 (14), 179 (100), 85 (21), 73 (9); HRMS (ESI) calcd for $C_{35}H_{56}O_7SiNa$ [M^+ + Na]: 639.3687, found 639.3690.

Ester 77: Prepared analogously as a white foam (408 mg, 92 %). $[\alpha]_D^{20}$ = +18.0 (*c* = 0.6, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ = 6.33 (d, *J* = 2.2 Hz, 1H), 6.29 (d, *J* = 2.2 Hz, 1H), 5.67–5.54 (m, 2H), 5.13–5.04 (m, 1H), 4.64 (br t, *J* = 3.1 Hz, 1H), 4.27 (dd, *J* = 12.0, 4.7 Hz, 1H), 4.08 (ddd, *J* = 12.0, 5.8, 2.5 Hz, 1H), 3.92–3.83 (m, 1H), 3.81 (s, 3H), 3.77 (s, 3H), 3.57 (t, *J* = 4.4 Hz, 1H), 3.54–3.47 (m, 1H), 2.69–2.47 (m, 4H), 2.33–2.21 (m, 2H), 2.19–2.09 (m, 1H), 2.08–1.99 (m, 1H), 1.99–1.89 (m, 1H), 1.86–1.44 (m, 16H), 1.00 (d, *J* = 5.2 Hz, 3H), 0.99 (d, *J* = 5.5 Hz, 3H), 0.93–0.89 (m, 12H), 0.08 (s, 3H), 0.07 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, $CDCl_3$): δ = 167.9 (C), 161.3

(C), 157.9 (C), 142.6 (C), 132.5 (CH), 127.0 (CH), 116.9 (C), 105.5 (CH), 98.0 (CH), 96.0 (CH), 78.1 (C), 77.7 (C), 76.4 (C), 76.3 (CH), 74.6 (CH), 74.5 (C), 63.0 (CH_2), 62.2 (CH_2), 55.6 (CH_3), 55.3 (CH_3), 38.0 (CH), 37.9 (CH), 37.5 (CH_2), 32.8 (CH), 31.2 (CH_2), 30.7 (CH_2), 30.2 (CH_2), 26.2 (3 x CH_3), 26.1 (CH_2), 25.5 (CH_2), 22.3 (CH_2), 19.5 (CH_2), 19.3 (CH_3), 18.5 (C), 16.6 (CH_3), 10.4 (CH_3), 3.6 (CH_3), 3.5 (CH_3), –3.6 (2 x CH_3); IR (film): $\tilde{\nu}$ = 2954, 2927, 2856, 1721, 1604, 1587, 1461, 1258, 1202, 1158, 1095, 1078, 1039, 1024, 834, 772, 736 cm^{-1}; MS (EI) *m*/*z* (%): 405 (3), 347 (19), 274 (18), 273 (100), 237 (17), 159 (5), 85 (14), 73 (9); HRMS (ESI): *m*/*z*: calcd for $C_{42}H_{66}O_7SiNa$ [M^+ + Na]: 733.4470, found 733.4474; elemental analysis calcd (%) for $C_{42}H_{66}O_7Si$: C 70.94, H 9.36; found: C 71.49, H 9.38.

Representive procedure for ring closing alkyne metathesis: preparation of cycloalkyne 34: Freshly distilled CH_2Cl_2 (535 μL) was added to a solution of complex **43** (12.4 mg, 0.02 mmol) in toluene (17.5 mL) and the resulting mixture was stirred for 5 min before a solution of compound **33** (191 mg, 0.20 mmol) in toluene (5.5 mL) was introduced. The resulting mixture was stirred at 80 °C for 1 h before it was cooled to ambient temperature. For work up, the solvent was evaporated and the residue purified by flash chromatography (hexanes/EtOAc, 9:1), furnishing product **34** as a colorless solid (157 mg, 87 %). $[\alpha]_D^{20}$ = –27.6 (*c* = 0.9, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ = 7.75–7.67 (m, 2H), 7.62–7.54 (m, 2H), 7.42–7.27 (m, 6H), 6.39 (d, *J* = 2.8 Hz, 1H), 6.28 (d, *J* = 2.8 Hz, 1H), 5.67–5.52 (m, 2H), 5.52–5.41 (m, 1H), 4.66–4.59 (m, 1H), 4.28–4.18 (m, 1H), 4.09–3.94 (m, 2H), 3.93–3.81 (m, 2H), 3.75 (s, 3H), 3.60 (s, 3H), 3.54–3.45 (m, 2H), 2.55–2.41 (m, 3H), 2.25–2.14 (m, 1H), 1.91–1.65 (m, 8H), 1.65–1.44 (m, 5H), 1.00–0.84 (m, 26H), 0.05 (s, 6H); ^{13}C NMR (two diastereomers at THP, 75 MHz, $CDCl_3$): δ = 167.1 (C), 160.5 (C), 157.5 (C), 139.0 (C), 136.0 (2 x CH), 135.8 (2 x CH), 134.5 (C), 134.0 (C), 132.4 (CH), 129.5 (CH), 129.4 (CH), 127.5 (2 x CH), 127.4 (2 x CH), 127.0 and 126.9 (CH), 118.1 (C), 107.5 (CH), 97.9 and 97.8 (CH), 97.0 (CH), 79.0 (C), 77.2 (CH), 76.4 (CH), 76.3 (CH), 74.5 (C), 62.8 (CH_2), 62.2 and 62.1 (CH_2), 55.7 (CH_3), 55.3 (CH_3), 40.7 and 40.7 (CH), 38.9 (CH_2), 37.9 (CH), 36.0 (CH), 30.7 and 30.6 (CH_2), 30.1 and 30.1 (CH_2), 26.8 (3 x CH_3), 26.2 (3 x

CH_3), 25.5 and 25.5 (CH_2), 23.7 (CH_2), 22.2 (CH_2), 19.5 (CH_2), 19.4 (C), 18.4 (C), 16.9 (CH_3), 16.9 (CH_3), 11.3 (CH_3), –3.8 (CH_3), –3.7 (CH_3); IR (film): $\tilde{\nu}$ = 3052, 2961, 2928, 2857, 1729, 1604, 1588, 1463, 1427, 1342, 1264, 1202, 1158, 1104, 1079, 1050, 1025, 908, 835 cm^{-1}; MS (EI) *m*/*z* (%): 855 (14), 854 (30), 853 (46), 769 (11), 642 (14), 641 (28), 528 (11), 527 (26), 243 (11), 225 (19), 199 (13), 135 (13), 85 (100), 73 (24); HRMS (ESI): *m*/*z*: calcd for $C_{54}H_{78}O_8Si_2Na$ [M^+ + Na]: 933.5132, found 933.5127; elemental analysis calcd (%) for $C_{54}H_{78}O_8Si_2$: C 71.17, H 8.63; found: C 71.06, H 8.62.

Compound 62: Prepared analogously as an amorphous solid (176 mg, 85 %). $[\alpha]_D^{20}$ = –26.3 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ = 7.71–7.67 (m, 2H), 7.50–7.46 (m, 2H), 7.39–7.23 (m, 6H), 6.06 (d, *J* = 2.2 Hz, 1H), 5.77 (d, *J* = 2.2 Hz, 1H), 5.64–5.58 (m, 2H), 5.40 (q, *J* = 6.3 Hz, 1H), 4.64 (t, *J* = 3.6 Hz, 1H), 4.55–4.50 (m, 1H), 4.29–4.23 (m, 1H), 4.11–4.05 (m, 1H), 3.91–3.85 (m, 1H), 3.67 (s, 3H), 3.53–3.49 (m, 2H), 3.39 (dd, J = 14.7, 3.8 Hz, 1H), 3.28 (s, 3H), 2.80 (dd, J = 15.1, 6.7 Hz, 1H), 2.49–2.44 (m, 2H), 2.38–2.30 (m, 1H), 2.22–2.08 (m, 1H), 1.96–1.78 (m, 6H), 1.63–1.50 (m, 5H), 1.07 (d, J = 6.9 Hz, 3H), 0.95–0.91 (m, 24H), 0.15 (s, 3H), 0.08 (s, 3H); 13C NMR (two diastereomers at THP, 100 MHz, CDCl3): δ = 167.9 (C), 160.5 (C), 158.3 (C), 138.4 (C), 136.0 (2 x CH), 135.7 (2 x CH), 135.0 (C), 133.0 (C), 132.6 (CH), 129.2 (CH), 128.9 (CH), 127.4 (2 x CH), 127.3 (2 x CH), 126.9 and 126.8 (CH), 115.8 (C), 106.8 (CH), 97.9 (CH), 97.1 (CH), 81.8 (C), 79.6 (C), 77.3 (CH), 76.4 (CH), 74.5 (CH), 62.9 (CH2), 62.1 (CH2), 55.3 (CH3), 54.8 (CH_3), 41.7 (CH), 41.1 (CH), 40.6 (CH2), 37.1 and 37.0 (CH), 30.7 (CH2), 29.5 and 29.4 (CH2), 27.0 (3 x CH3), 26.2 (3 x CH3), 25.5 (CH2), 24.1 (CH2), 22.1 (CH2), 19.7 (C), 19.5 (CH2), 18.6 (C), 17.5 and 17.4 (CH3), 14.0 (CH3), 11.4 (CH3), –3.3 (CH3), –3.6 (CH3); IR (film): $\tilde{\nu}$ = 3074, 3049, 2956, 2930, 2856, 1707, 1602, 1584, 1462, 1427, 1323, 1260, 1227, 1200, 1160, 1104, 1079, 1057, 1035, 908, 832, 772, 732, 700 cm^{-1}; HRMS (ESI): *m*/*z*: calcd for $C_{54}H_{78}O_8Si_2Na$ [M^+ + Na]: 933.5127, found 933.5135; elemental analysis calcd (%) for $C_{54}H_{78}O_8Si_2$: C 71.17, H 8.63; found: C 71.15, H 8.60.

Compound 78: Prepared analogously as an amorphous solid (302 mg, 86 %). $[\alpha]_D^{20}$ = –18.8 (*c* = 1.4, $CHCl_3$); ^1H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ = 6.33 (d, *J* = 2.2 Hz, 1H), 6.29 (d, *J* = 2.2 Hz, 1H), 5.66–5.54 (m, 2H), 5.47–5.38 (m, 1H), 4.62 (br t, *J* = 3.5 Hz, 1H), 4.29–4.21 (m, 1H), 4.06 (ddd, *J* = 12.3, 6.0, 3.8 Hz, 1H), 3.89–3.83 (m, 1H), 3.80 (s, 3H), 3.75 (s, 3H), 3.59–3.54 (m, 1H), 3.52–3.47 (m, 1H), 2.85 (td, *J* = 12.9, 3.2 Hz, 1H), 2.55–2.47 (m, 2H), 2.38–2.30 (m, 2H), 2.28–2.20 (m, 1H), 1.94–1.47 (m, 13H), 1.08 (d, *J* = 6.9 Hz, 3H), 0.94–0.88 (m, 15H), 0.14 (s, 3H), 0.08 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, $CDCl_3$): δ = 168.3 (C), 161.1 (C), 157.5 (C), 143.3 (C), 132.3 (CH), 127.1 (CH), 117.0 (C), 105.9 (CH), 98.0 (CH), 95.9 (CH), 78.8 (C), 78.7 (C), 76.4 (CH), 75.2 (CH), 62.9 (CH_2), 62.2 (CH_2), 55.4 (CH_3), 55.3 (CH_3), 41.1 (CH), 38.8 (CH_2), 38.0 (CH), 31.5 (CH_2), 30.9 (CH), 30.7 (CH_2), 30.4 (CH_2), 26.2 (3 x CH_3), 25.5 (CH_2), 24.0 (CH_2), 23.5 (CH_2), 21.3 (CH_3), 19.5 (CH_2), 18.4 (C), 16.7 (CH_3), 11.3 (CH_3), –3.58 (CH_3), –3.63 (CH_3); IR (film): $\tilde{\nu}$ = 2953, 2929, 2856, 1721, 1604, 1587, 1461, 1254, 1202, 1158, 1093, 1058, 1024, 908, 834, 810, 772, 730 cm^{-1}; MS (EI) *m*/*z* (%): 599 (13), 515 (46), 497 (23), 473 (14), 423 (48), 405 (17), 387 (28), 341 (60), 331 (18), 313 (53), 301 (17), 273 (26), 257 (13), 243 (14), 235 (14), 229 (16), 225 (19), 219 (27), 205 (32), 191 (43), 185 (19), 177 (19), 159 (30), 151 (23), 133 (20), 85 (100), 75 (43), 73 (56); HRMS (ESI): *m*/*z*: calcd for $C_{38}H_{60}O_7SiNa$ [M^+ + Na]: 679.4000, found 679.3995; elemental analysis calcd (%) for $C_{38}H_{60}O_7Si$: C 69.47, H 9.21; found: C 68.87, H 9.89.

Compound 35: A suspension containing cycloalkyne **34** (50 mg, 0.055 mmol), quinoline (9 μL, 0.13 mmol) and Lindlar catalyst (50 mg, 5 % *w*/*w* Pd on $CaCO_3$, doped with Pb by the supplier) in EtOAc (7 mL) was stirred under H_2 (1 atm) for 5 h. The catalyst was then filtered off over a pad of Celite, the filtrate was evaporated and the residue purified by flash chromatography (hexanes/*tert*-butyl methyl ether, 9:1) to give cycloalkene **35** as a colorless solid (48.1 mg, 96 %). $[\alpha]_D^{20}$ = +4.4 (*c* = 0.98, $CHCl_3$); ^1H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ = 7.66–7.62 (m, 2H), 7.38–7.29 (m, 6H), 7.27–7.22 (m, 2H), 6.46 (d, *J* = 2.2 Hz, 1H), 6.33 (d, *J* = 2.2 Hz, 1H), 5.81–5.62 (m, 2H), 5.31–5.15 (m, 2H), 4.62 (br t, *J* = 3.3 Hz, 1H), 4.32–4.20 (m, 2H), 4.09–4.00 (m, 2H), 3.91–3.83 (m, 1H), 3.77 (s, 3H), 3.76 (s,

3H), 3.53–3.43 (m, 1H), 3.15 (d, J = 13.0 Hz, 1H), 2.61–2.48 (m, 1H), 2.40 (dd, J = 14.2, 11.6 Hz, 1H), 2.22–2.12 (m, 1H), 2.02–1.64 (m, 8H), 1.63–1.41 (m, 6H), 0.98–0.86 (m, 18H), 0.80 (s, 9H), 0.01 (s, 3H), –0.02 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, $CDCl_3$): δ= 165.9 (C), 160.6 (C), 158.9 (C), 140.4 (C), 136.1 (2 x CH), 135.9 (2 x CH), 135.0 (C), 133.5 (C), 132.7 (CH), 129.3 (CH), 129.2 (CH), 129.1 (CH), 127.4 (2 x CH), 127.3 (2 x CH), 126.8 (CH), 126.7 (CH), 116.6 (C), 109.4 (CH), 97.9 and 97.8 (CH), 97.3 (CH), 77.2 (CH), 76.6 (CH), 74.3 (CH), 62.9 (CH_2), 62.2 and 62.1 (CH_2), 56.1 (CH_3), 55.2 (CH_3), 41.4 (CH), 38.7 and 38.8 (CH), 37.9 (CH), 34.4 (CH_2), 32.1 (CH_2), 31.9 (CH_2), 30.7 (CH_2), 29.3 (CH_2), 26.7 (3 x CH_3), 26.2 (3 x CH_3), 25.5 (CH_2), 19.5 and 19.5 (CH_2), 19.4 (C), 18.5 (C), 17.3 (CH_3), 13.9 (CH_3), 11.1 (CH_3), –3.7 (CH_3), –3.8 (CH_3); IR (film): $\tilde{\nu}$ = 3072, 3047, 3010, 2993, 2952, 2891, 2856, 1727, 1603, 1587, 1461, 1427, 1376, 1323, 1258, 1200, 1158, 1103, 1052, 1024, 973, 934, 860, 832 cm^{-1}; MS (EI) m/z (%): 857 (9), 856 (17), 855 (26), 644 (16), 643 (30), 639 (11), 530 (11), 529 (26), 423 (14), 243 (11), 225 (16), 199 (13), 135 (10), 85 (100), 73 (21); HRMS (ESI): m/z: calcd for $C_{54}H_{84}NO_8Si_2$ [M^+ + NH_4]: 930.5735, found 930.5730.

Compound 63: Prepared analogously as an amorphous solid (93.2 mg, 93 %). $[\alpha]_D^{20}$ = –11.0 (c = 1.12, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ= 7.68–7.64 (m, 2H), 7.50–7.46 (m, 2H), 7.39–7.27 (m, 6H), 6.22 (d, J = 2.2 Hz, 1H), 5.93 (br s, 1H), 5.68–5.56 (m, 3H), 5.52–5.43 (m, 1H), 5.26 (br t, J = 6.5 Hz, 1H), 4.64 (t, J = 3.6 Hz, 1H), 4.27 (dd, J = 12.1, 5.2 Hz, 1H), 4.11–4.03 (m, 2H), 3.91–3.85 (m, 1H), 3.73 (s, 3H), 3.61–3.58 (m, 4H), 3.53–3.48 (m, 1H), 3.02 (dd, J = 14.2, 8.1 Hz, 1H), 2.80 (dd, J = 14.1, 6.1 Hz, 1H), 2.53–2.45 (m, 1H), 2.34–2.27 (m, 1H), 2.17–2.10 (m, 2H), 2.00–1.73 (m, 6H), 1.62–1.50 (m, 5H), 0.99 (d, J = 6.8 Hz, 3H), 0.93 (s, 18H), 0.91 (d, J = 7.2 Hz, 3H), 0.56 (d, J = 7.3 Hz, 3H), 0.12 (s, 3H), 0.09 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, $CDCl_3$): δ= 167.1 (C), 160.7 (C), 158.1 (C), 139.5 (C), 136.2 (2 x CH), 136.1 (2 x CH), 134.6 (C), 134.2 (C), 132.5 (CH), 132.2 (CH), 129.3 (2 x CH), 127.3 (2 x CH), 127.2 (2 x CH), 127.1 and 127.0 (CH), 124.2 (CH), 118.6 (C), 106.0 (CH), 97.9 (CH), 96.7 (CH), 78.1 (CH), 76.7 (CH), 76.3 (CH), 62.9 (CH_2), 62.2 (CH_2), 55.6 (CH_3), 55.2 (CH_3), 39.4 (CH), 39.0 (CH), 38.4 and

38.3 (CH), 36.4 (CH_2), 30.7 (CH_2), 30.7 and 30.6 (CH_2), 30.3 (CH_2), 29.9 and 29.8 (CH_2), 26.9 (3 x CH_3), 26.2 (3 x CH_3), 25.5 (CH_2), 19.5 (CH_2), 19.3 (C), 18.5 (C), 17.8 (CH_3), 16.5 (CH_3), 10.6 (CH_3), –3.5 (CH_3), –3.7 (CH_3); IR (film): $\tilde{\nu}$ = 3011, 2954, 2931, 2890, 2856, 1724, 1604, 1588, 1462, 1427, 1378, 1346, 1325, 1257, 1202, 1158, 1102, 1041, 1025, 907, 832, 772, 730, 701 cm^{-1}; MS (EI) *m*/*z* (%): 857 (19), 856 (31), 855 (48), 772 (15), 771 (24), 753 (17), 644 (23), 643 (45), 639 (18), 530 (15), 529 (38), 423 (25), 225 (20), 199 (27), 135 (21), 85 (100), 75 (14), 73 (34); HRMS (ESI): *m*/*z*: calcd for $C_{54}H_{80}O_8Si_2Na$ [M^+ + Na]: 935.5284, found 935.5281.

Compound 79: Prepared analogously as an amorphous solid (280 mg, 93 %). $[\alpha]_D^{20}$ = +18.2 (*c* = 1.0, $CHCl_3$); ^{1}H NMR (two diastereomers at THP, 400 MHz, $CDCl_3$): δ= 6.27 (s, 2H), 5.63–5.50 (m, 4H), 5.32 (m, 1H), 4.62 (t, *J* = 3.2 Hz, 1H), 4.27–4.20 (m, 1H), 4.05 (ddd, *J* = 11.8, 5.9, 4.2 Hz, 1H), 3.90–3.83 (m, 1H), 3.79 (s, 3H), 3.74 (s, 3H), 3.63 (t, *J* = 4.0 Hz, 1H), 3.52–3.46 (m, 1H), 2.72 (td, *J* = 13.0, 3.9 Hz, 1H), 2.66–2.54 (m, 1H), 2.46 (td, *J* = 12.7, 5.1 Hz, 1H), 2.40–2.29 (m, 1H), 2.26–2.17 (m, 1H), 2.16–2.03 (m, 1H), 2.00–1.65 (m, 7H), 1.63–1.40 (m, 6H), 1.00 (d, *J* = 6.9 Hz, 6H), 0.93–0.88 (m, 12H), 0.09 (s, 3H), 0.07 (s, 3H); ^{13}C NMR (two diastereomers at THP, 100 MHz, $CDCl_3$): δ= 167.5 (C), 161.1 (C), 157.7 (C), 142.8 (C), 132.3 (CH), 131.1 (CH), 127.0 (CH), 126.2 (CH), 117.0 (C), 105.5 (CH), 97.7 (CH), 96.0 (CH), 76.3 (CH), 75.9 (CH), 62.9 (CH_2), 62.1 (CH_2), 55.6 (CH_3), 55.3 (CH_3), 39.6 (CH), 38.6 (CH), 38.5 (CH_2), 32.5 (CH), 31.9 (CH_2), 30.6 (CH_2), 30.4 (CH_2), 26.2 (3 x CH_3), 25.5 (2 x CH_2), 22.3 (CH_3), 19.5 (CH_2), 19.4 (CH_2), 18.5 (C), 16.4 (CH_3), 10.9 (CH_3), –3.6 (CH_3), –3.8 (CH_3); IR (film): $\tilde{\nu}$ = 2953, 2933, 2855, 1726, 1604, 1587, 1461, 1421, 1319, 1252, 1201, 1157, 1091, 1058, 1024, 833, 811, 771 cm^{-1}; MS (EI) *m*/*z* (%): 601 (18), 517 (30), 499 (17), 475 (23), 426 (29), 425 (100), 407 (37), 389 (26), 344 (18), 343 (77), 333 (15), 315 (40), 303 (39), 283 (15), 225 (16), 219 (23), 205 (29), 191 (38), 178 (24), 177 (23), 175 (13), 159 (27), 151 (16), 85 (99), 81 (19), 75 (24), 73 (35). HRMS (ESI): *m*/*z*: calcd for $C_{38}H_{62}O_7SiNa$ [M^+ + Na]: 681.4157, found 681.4150; elemental analysis calcd (%) for $C_{38}H_{62}O_7Si$: C 69.26, H 9.48; found: C 70.13, H 9.52.

Compound 36: $MgBr_2 \cdot Et_2O$ (63.7 mg, 0.25 mmol)[7] was added to a solution of compound **35** (45 mg, 0.049 mmol) in Et_2O (5.8 mL) and the resulting mixture stirred for 6 h before the reaction was quenched with aq. sat. NH_4Cl. A standard extractive work up followed by flash chromatography (hexanes/EtOAc, 7:3) of the crude material furnished alcohol **36** as an amorphous solid (38 mg, 93 %). $[\alpha]_D^{20}$ = +1.9 (*c* = 1.4, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.67–7.61 (m, 2H), 7.41–7.31 (m, 6H), 7.27–7.21 (m, 2H), 6.46 (d, *J* = 2.4 Hz, 1H), 6.33 (d, *J* = 2.4 Hz, 1H), 5.70–5.61 (m, 1H), 5.60–5.50 (m, 1H), 5.34–5.10 (m, 2H), 4.36–4.25 (m, 1H), 4.24–4.06 (m, 2H), 4.04–3.97 (m, 1H), 3.77 (s, 3H), 3.76 (s, 3H), 3.48–3.42 (m, 1H), 3.13 (d, *J* = 12.8 Hz, 1H), 2.58 (q, *J* = 12.4 Hz, 1H), 2.40 (dd, *J* = 12.9, 11.3 Hz, 1H), 2.23–2.12 (m, 1H), 2.02–1.72 (m, 5H), 1.69–1.53 (m, 2H), 1.53–1.42 (m, 1H), 0.98–0.86 (m, 18H), 0.80 (s, 9H), 0.01 (s, 3H), –0.04 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 166.0 (C), 160.7 (C), 158.8 (C), 140.5 (C), 136.1 (2 x CH), 135.9 (2 x CH), 134.9 (C), 133.4 (C), 131.9 (CH), 129.4 (2 x CH), 129.2 (CH), 129.1 (CH), 127.4 (2 x CH), 127.3 (2 x CH), 126.6 (CH), 116.5 (C), 109.4 (CH), 97.3 (CH), 77.2 (CH), 76.6 (CH), 74.3 (CH), 58.6 (CH_2), 56.1 (CH_3), 55.2 (CH_3), 41.3 (CH), 38.7 (CH), 38.0 (CH), 34.3 (CH_2), 32.1 (CH_2), 31.9 (CH_2), 29.2 (CH_2), 26.7 (3 x CH_3), 26.1 (3 x CH_3), 19.4 (C), 18.4 (C), 17.1 (CH_3), 13.9 (CH_3), 11.2 (CH_3), –3.8 (CH_3), –3.9 (CH_3); IR (film): $\tilde{\nu}$ = 3448, 3010, 2955, 2929, 2892, 2855, 1723, 1603, 1586, 1461, 1427, 1377, 1323, 1258, 1200, 1159, 1103, 1078, 1051, 1005, 933, 832, 754, 701, 686 cm^{-1}; MS (EI) *m*/*z* (%): 772 (30), 771 (52), 644 (26), 643 (51), 639 (22), 603 (27), 530 (32), 529 (81), 490 (22), 489 (59), 423 (18), 243 (21), 225 (30), 199 (51), 135 (40), 81 (28), 75 (28), 73 (100); HRMS (ESI): *m*/*z*: calcd for $C_{49}H_{72}O_7Si_2Na$ [M^+ + Na]: 851.4711, found 851.4709.

Compound 64: Prepared analogously as an amorphous solid (41.3 mg, 91 %). $[\alpha]_D^{20}$ = –16.2 (*c* = 1.1, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.70–7.63 (m, 2H), 7.50–7.42 (m, 2H), 7.41–7.26 (m, 6H), 6.24 (d, *J* = 2.1 Hz, 1H), 5.95 (d, *J* = 2.0 Hz, 1H), 5.73–5.38 (m, 4H), 5.34–5.22 (m, 1H), 4.27–4.15 (m, 2H), 4.06–4.00 (m, 1H), 3.77–3.72 (m, 3H), 3.64–3.58 (m, 4H), 3.05 (dd, *J* = 14.2, 8.4 Hz, 1H), 2.79 (dd, *J* = 14.2, 5.8 Hz, 1H), 2.53 (br s, 1H), 2.36–

[7] a) J. D. White, R. G. Carter, K. F. Sundermann, *J. Org. Chem.* **1999**, *64*, 684–685; b) S. Kim, J. H. Park, *Tetrahedron Lett.* **1987**, *28*, 439–440.

2.27 (m, 1H), 2.18–1.80 (m, 6H), 1.61–1.50 (m, 1H), 1.38–1.24 (m, 1H), 1.00 (d, J = 6.8 Hz, 3H), 0.94–0.89 (m, 21H), 0.57 (d, J = 7.3 Hz, 3H), 0.11 (s, 3H), 0.08 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 167.0 (C), 160.8 (C), 158.1 (C), 139.6 (C), 136.2 (2 x CH), 136.1 (2 x CH), 134.7 (C), 134.2 (C), 132.3 (CH), 131.9 (CH), 129.5 (CH), 129.3 (2 x CH), 127.3 (2 x CH), 127.2 (2 x CH), 124.2 (CH), 118.6 (C), 106.0 (CH), 96.7 (CH), 78.0 (CH), 76.5 (CH), 76.4 (CH), 58.7 (CH_2), 55.6 (CH_3), 55.2 (CH_3), 39.6 (CH), 39.0 (CH), 38.3 (CH), 36.1 (CH_2), 30.6 (CH_2), 30.3 (CH_2), 30.1 (CH_2), 26.9 (3 x CH_3), 26.2 (3 x CH_3), 19.2 (C), 18.5 (C), 17.9 (CH_3), 16.7 (CH_3), 10.8 (CH_3), –3.6 (CH_3), –3.7 (CH_3); IR (film): $\tilde{\nu}$ = 3437, 3072, 3009, 2956, 2929, 2890, 2856, 1717, 1603, 1588, 1462, 1427, 1326, 1252, 1203, 1158, 1101, 1045, 1005, 908, 832, 772, 732, 700 cm^{-1}; MS (EI) *m*/*z* (%): 774 (13), 773 (34), 772 (59), 771 (100), 644 (14), 643 (28), 639 (24), 555 (11), 531 (11), 530 (35), 529 (87), 423 (34), 225 (43), 219 (13), 199 (55), 197 (17), 191 (21), 178 (18), 135 (37), 115 (13), 111 (13), 95 (13), 93 (23), 81 (21), 75 (27), 73 (91); HRMS (ESI): *m*/*z*: calcd for $C_{49}H_{72}O_7Si_2Na$ [M^+ + Na]: 851.4709, found 851.4713; elemental analysis calcd (%) for $C_{49}H_{72}O_7Si_2$: C 70.97, H 8.75; found: C 71.03, H 8.79.

Compound 79b: Prepared analogously as an amorphous solid (79.6 mg, 91 %). $[\alpha]_D^{20}$ = +21.3 (c = 1.0, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.28 (s, 2H), 5.68–5.58 (m, 1H), 5.57–5.47 (m, 3H), 5.37–5.28 (m, 1H), 4.23–4.11 (m, 2H), 3.79 (s, 3H), 3.75 (s, 3H), 3.62 (t, J = 4.3 Hz, 1H), 2.77–2.58 (m, 2H), 2.48 (td, J = 12.9, 5.0 Hz, 1H), 2.40–2.27 (m, 1H), 2.25–2.18 (m, 1H), 2.17–2.02 (m, 2H), 2.00–1.93 (m, 1H), 1.92–1.82 (m, 1H), 1.81–1.67 (m, 2H), 1.60–1.49 (m, 2H), 1.47–1.37 (m, 1H), 1.01 (d, J = 6.9 Hz, 6H), 0.94–0.88 (m, 12H), 0.08 (s, 3H), 0.06 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 167.5 (C), 161.1 (C), 157.7 (C), 143.0 (C), 131.8 (CH), 131.3 (CH), 129.5 (CH), 126.2 (CH), 116.8 (C), 105.6 (CH), 96.1 (CH), 76.2 (CH), 76.0 (CH), 58.6 (CH_2), 55.6 (CH_3), 55.3 (CH_3), 39.9 (CH), 39.2 (CH_2), 38.5 (CH), 32.5 (CH), 31.6 (CH_2), 30.9 (CH_2), 30.8 (CH_2), 30.2 (CH_2), 26.2 (3 x CH_3), 22.3 (CH_3), 18.5 (C), 16.5 (CH_3), 11.1 (CH_3), –3.6 (CH_3), –3.8 (CH_3); IR (film): $\tilde{\nu}$ = 3465, 2955, 2928, 2855, 1724, 1603, 1587, 1461, 1422, 1374, 1318, 1252, 1201, 1157, 1091, 1041, 940, 833, 771 cm^{-1}; MS (EI) *m*/*z* (%): 518 (14), 517 (38), 475 (22), 426 (29), 425 (99), 407 (43), 389 (39), 344

(23), 343 (100), 333 (21), 316 (17), 315 (77), 303 (40), 283 (21), 245 (17), 225 (28), 219 (45), 205 (56), 203 (20), 196 (19), 191 (70), 178 (45), 177 (45), 175 (23), 151 (35), 121 (19), 111 (23), 93 (31), 81 (46), 75 (57), 73 (85); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{54}O_6SiNa$ [M^+ + Na]: 597.3582, found 597.3583; elemental analysis calcd (%) for $C_{33}H_{54}O_6Si$: C 68.95, H 9.47; found: C 68.52, H 9.11.

Azide 37: PPh_3 (19.2 mg, 0.072 mmol) and [$Zn(N_3)_2$·(pyridine)$_2$] (22.2 mg, 0.072 mmol) were added to a solution of alcohol **36** (30 mg, 0.036 mmol) in toluene (0.6 mL) and the resulting mixture was cooled to 0 °C prior to the introduction of DIAD (14.1 μL, 0.072 mmol). Stirring was continued at this temperature for 3 h before the mixture was filtered through a plug of Celite. The filtrate was evaporated and the residue purified by flash chromatography (hexanes/EtOAc, 10:1), providing azide **37** as an amorphous solid (20 mg, 65 %). $[\alpha]_D^{20}$ = +1.5 (*c* = 0.97, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.67–7.61 (m, 2H), 7.41–7.30 (m, 6H), 7.27–7.21 (m, 2H), 6.47 (d, *J* = 2.4 Hz, 1H), 6.34 (d, *J* = 2.4 Hz, 1H), 5.80–5.63 (m, 1H), 5.62–5.41 (m, 1H), 5.32–5.12 (m, 2H), 4.36–4.23 (m, 1H), 4.05–3.98 (m, 1H), 3.83–3.71 (m, 8H), 3.52–3.43 (m, 1H), 3.15 (d, *J* = 13.2 Hz, 1H), 2.63–2.48 (m, 1H), 2.41 (dd, *J* = 13.2, 11.6 Hz, 1H), 2.28–2.12 (m, 1H), 2.04–1.87 (m, 2H), 1.87–1.72 (m, 2H), 1.64–1.53 (m, 1H), 1.52–1.41 (m, 1H), 1.33–1.23 (m, 1H), 0.98–0.86 (m, 18H), 0.80 (s, 9H), 0.01 (s, 3H), –0.02 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 165.9 (C), 160.7 (C), 158.9 (C), 140.5 (C), 136.1 (2 x CH), 135.9 (2 x CH), 135.3 (CH), 134.9 (C), 133.5 (C), 129.4 (CH), 129.2 (CH), 129.1 (CH), 127.4 (2 x CH), 127.3 (2 x CH), 126.6 (CH), 122.8 (CH), 116.5 (C), 109.4 (CH), 97.3 (CH), 76.6 (CH), 76.1 (CH), 74.3 (CH), 56.1 (CH_3), 55.2 (CH_3), 52.9 (CH_2), 47.2 (CH_2), 41.4 (CH), 38.7 (CH), 37.7 (CH), 34.4 (CH_2), 31.9 (CH_2), 29.2 (CH_2), 26.7 (3 x CH_3), 26.2 (3 x CH_3), 19.4 (C), 18.4 (C), 17.1 (CH_3), 13.9 (CH_3), 11.2 (CH_3), –3.7 (CH_3), –3.9 (CH_3); IR (film): $\tilde{\nu}$ = 2958, 2931, 2894, 2856, 2096, 1776, 1730, 1603, 1587, 1461, 1427, 1375, 1323, 1240, 1200, 1158, 1049, 1005, 934, 832, 773, 739, 728, 701, 686 cm^{-1}; MS (EI) *m*/*z* (%): 797 (28), 796 (46), 769 (23), 768 (39), 644 (25), 643 (48), 636 (21), 603 (20), 529 (29), 489 (31), 240 (34), 199 (41), 135 (34), 96 (21), 75 (22), 73 (100); HRMS (ESI): *m*/*z*: calcd for $C_{49}H_{71}N_3O_6Si_2Na$ [M^+ + Na]: 876.4777, found 876.4774.

Azide 65: Prepared analogously as a colorless solid, which was used in the next step without further characterization (10.0 mg, 65 %).

Amide 40: A mixture of azide **37** (120 mg, 0.14 mmol) and PPh_3 (367 mg, 1.4 mmol) in THF (7.5 mL) and water (50 μL) was stirred for 2.5 h at 50 °C until TLC showed complete consumption of the starting material. At this point, the solvent was evaporated and the residue purified by flash chromatography (CH_2Cl_2/MeOH/NH_4OH, 9:1:0.01) to give the rather unstable amine **38** (105.5 mg, 91 %) as an amorphous solid which was immediately used in the next step without further characterization.

Acid **39** (50.2 mg, 0.20 mmol),[8] HBTU (91mg, 0.24 mmol), HOAt (33.6 mg, 0.24 mmol) and $(i\text{Pr})_2\text{NEt}$ (210 μL, 1.2 mmol) were added to a solution of this amine (100 mg, 0.12 mmol) in DMF (4 mL) and the resulting mixture was stirred for 12 h before the reaction was quenched with water (10 mL). The aqueous layer was extracted with Et_2O (3 x 10 mL), the combined organic phases were dried over $MgSO_4$ and evaporated, and the residue was purified by flash chromatography (hexanes/EtOAc, 10:1 → 9:1) to give amide **40** as a colorless solid (82 mg, 64 %). $[\alpha]_D^{20}$ = –1.0 (*c* = 0.36, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.67–7.61 (m, 2H), 7.41–7.30 (m, 6H), 7.27–7.21 (m, 2H), 6.46 (d, *J* = 2.0 Hz, 1H), 6.37 (br t, *J* = 5.2 Hz, 1H), 6.44 (d, *J* = 2.0 Hz, 1H), 5.57–5.47 (m, 1H), 5.46–5.37 (m, 1H), 5.31–5.12 (m, 2H), 4.29 (br t, *J* = 11.0 Hz, 1H), 4.05–3.98 (m, 1H), 3.93–3.82 (m, 2H), 3.79–3.71 (m, 7H), 3.48–3.42 (m, 1H), 3.15 (d, *J* = 13.0 Hz, 1H), 2.62–2.49 (m, 1H), 2.48–2.35 (m, 2H), 2.20–2.10 (m, 1H), 2.03–1.86 (m, 3H), 1.85–1.69 (m, 2H), 1.62–1.53 (m, 1H), 1.51–1.34 (m, 3H), 1.32–1.20 (m, 2H), 1.08 (d, *J* = 7.2 Hz, 3H), 0.98–0.85 (m, 30H), 0.80 (s, 9H), 0.08 (s, 6H), 0.00 (s, 3H), –0.03 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 173.8 (C), 165.9 (C), 160.6 (C), 158.8 (C), 140.4 (C), 136.1 (2 x CH), 135.9 (2 x CH), 135.0 (C), 133.5 (C), 132.3 (CH), 129.4 (CH), 129.2 (CH), 129.1 (CH), 127.3 (2 x CH), 127.2 (2 x CH), 126.7 (CH), 123.3 (CH), 116.6 (C), 109.4 (CH), 97.3 (CH), 77.2 (CH), 76.5 (CH), 74.8 (CH), 74.3 (CH), 56.1 (CH_3), 55.2 (CH_3), 45.7 (CH), 41.5 (CH), 38.6 (CH), 37.9 (CH), 36.4 (CH_2), 35.0 (CH_2),

[8] a) V. V. Vintonyak, M. E. Maier, *Angew. Chem.* **2007**, *119*, 5301–5303; *Angew. Chem. Int. Ed.* **2007**, *46*, 5209–5211; b) V. V. Vintonyak, M. E. Maier, *Org. Lett.* **2007**, *9*, 655–658.

34.4 (CH_2), 32.1 (CH_2), 31.9 (CH_2), 29.2 (CH_2), 26.7 (3 x CH_3), 26.2 (3 x CH_3), 25.9 (3 x CH_3), 19.4 (C), 19.2 (CH_2), 18.4 (C), 18.0 (C), 17.2 (CH_3), 14.2 (CH_3), 13.9 (CH_3), 12.8 (CH_3), 11.1 (CH_3), –3.7 (CH_3), –3.9 (CH_3), –4.5 (2 x CH_3); IR (film): $\tilde{\nu}$ = 3356, 2956, 2931, 2857, 1727, 1654, 1603, 1523, 1462, 1427, 1377, 1324, 1255, 1201, 1159, 1103, 1058, 1004, 936, 834 cm^{-1}; MS (EI) *m*/*z* (%): 1015 (17), 1014 (42), 1013 (79), 1012 (100), 980 (9), 881 (12), 880 (18), 485 (17), 484 (45), 187 (11), 115 (12), 73 (41); HRMS (ESI): *m*/*z*: calcd for $C_{62}H_{99}NO_8Si_3Na$ [M^+ + Na]: 1092.6563, found 1092.6571.

Amide 58a: A solution of *n*Bu_3P (0.5 M in THF, 54 μL, 0.027 mmol) was added to a solution of azide **37** (9.8 mg 0.011 mmol) in THF (0.24 mL) and the resulting mixture stirred at 50 °C for 2 h. After reaching ambient temperature, acid **52** (4.2 mg, 0.02 mmol), HOAt (2.2 mg, 0.02 mmol), HBTU (6.2 mg, 0.02 mmol) and (*i*Pr)$_2$NEt (14 μL, 0.1 mmol) were introduced and stirring continued overnight. The reaction was quenched with water (2 mL), the aqueous layer was extracted with EtOAc (3 x 2 mL), the combined extracts were dried over $MgSO_4$ and evaporated, and the residue was purified by flash chromatography (hexanes/EtOAc, 10:1→9:1) to give amide **58a** as a colorless oil (9.3 mg, 77 %). $[\alpha]_D^{20}$ = +6.3 (*c* = 0.7, $CHCl_3$); ^{1}H NMR (600 MHz, $CDCl_3$): δ = 7.70–7.67 (m, 2H), 7.65–7.62 (m, 2H), 7.40–7.29 (m, 6H), 6.59 (br t, *J* = 4.9 Hz, 1H), 6.45 (d, *J* = 2.2 Hz, 1H), 6.33 (d, *J* = 2.2 Hz, 1H), 5.54–5.51 (m, 1H), 5.43–5.38 (m, 1H), 5.27–5.16 (m, 2H), 4.25–4.17 (m, 1H), 4.00 (d, *J* = 11.5 Hz, 1H), 3.93–3.85 (m, 5H), 3.74 (s, 3H), 3.71–3.67 (m, 1H), 3.13 (d, *J* = 12.8 Hz, 1H), 2.84 (d, *J* = 13.0 Hz, 1H), 2.55–2.48 (m, 1H), 2.44–2.39 (m, 2H), 2.14 (d, *J* = 11.8 Hz, 1H), 1.97–1.87 (m, 3H), 1.78–1.70 (m, 1H), 1.60–1.55 (m, 1H), 1.39–1.20 (m, 6H), 1.00 (d, *J* = 6.8 Hz, 3H), 0.95 (d, *J* = 6.8 Hz, 3H), 0.92–0.85 (m, 36H), 0.08 (s, 6H), –0.01 (s, 3H), –0.03 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$): δ = 175.0 (C), 165.5 (C), 160.6 (C), 156.4 (C), 140.4 (C), 136.1 (2 x CH), 135.9 (2 x CH), 134.9 (C), 133.3 (C), 132.4 (CH), 129.2 (CH), 129.1 (CH), 128.8 (CH), 127.3 (2 x CH), 127.2 (2 x CH), 126.4 (CH), 126.1 (CH), 116.4 (C), 109.2 (CH), 97.1 (CH), 77.2 (CH), 76.5 (CH), 74.4 (CH), 73.6 (CH), 56.3 (CH_3), 55.2 (CH_3), 45.7 (CH), 41.4 (CH), 38.6 (CH), 37.9 (CH_2), 37.7 (CH), 36.3 (CH_2), 34.3 (CH_2), 31.8 (CH_2), 29.7 (2 x CH_2), 26.6 (3 x CH_3), 26.2 (3 x CH_3), 25.9 (3 x CH_3), 19.4 (C), 18.5 (CH_2), 18.4 (C), 18.0 (C), 17.2 (CH_3),

16.6 (CH_3), 14.2 (CH_3), 13.9 (CH_3), 11.0 (CH_3), –3.7 (CH_3), –3.8 (CH_3), –4.3 (CH_3), –4.8 (CH_3); IR (film): $\tilde{\nu}$ = 3367, 2956, 2928, 2856, 1726, 1654, 1603, 1589, 1461, 1377, 1331, 1254, 1208, 1159, 1077, 1060, 1005, 835, 774, 736, 701 cm^{-1}; MS (EI) *m*/*z* (%): 1015 (23), 1014 (50), 1013 (85), 1012 (93), 880 (19), 484 (71), 478 (16), 352 (11), 199 (15), 187 (13), 115 (16), 75 (21), 73 (100); HRMS (ESI): *m*/*z*: calcd for $C_{62}H_{99}NO_8Si_3Na$ [M^+ + Na]: 1092.6571, found 1092.6561.

Compound 59a: Prepared analogously as a colorless oil (10.1 mg, 76 %). $[\alpha]_D^{20}$ = +5.9 (*c* = 0.8, $CHCl_3$); ^{1}H NMR (600 MHz, $CDCl_3$): δ = 7.68–7.66 (m, 2H), 7.64–7.61 (m, 2H), 7.40–7.30 (m, 6H), 6.58 (br t, *J* = 5.4 Hz, 1H), 6.44 (d, *J* = 2.2 Hz, 1H), 6.31 (d, *J* = 2.2 Hz, 1H), 5.54–5.48 (m, 1H), 5.42–5.36 (m, 1H), 5.26–5.13 (m, 2H), 4.23–4.16 (m, 1H), 3.98 (d, *J* = 11.6 Hz, 1H), 3.90–3.80 (m, 5H), 3.75 (s, 3H), 3.70–3.66 (m, 1H), 3.39 (dd, *J* = 8.8, 4.8 Hz, 1H), 2.83 (d, *J* = 13.0 Hz, 1H), 2.55–2.47 (m, 1H), 2.44–2.35 (m, 2H), 2.12 (d, *J* = 12.4 Hz, 1H), 1.96–1.85 (m, 3H), 1.78–1.70 (m, 1H), 1.60–1.55 (m, 1H), 1.39–1.20 (m, 6H), 0.98 (d, *J* = 6.8 Hz, 3H), 0.93 (d, *J* = 6.8 Hz, 3H), 0.92–0.85 (m, 36H), 0.06 (s, 6H), –0.02 (s, 3H), –0.04 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$): δ = 175.0 (C), 165.5 (C), 160.6 (C), 156.4 (C), 140.4 (C), 136.1 (2 x CH), 135.9 (2 x CH), 134.9 (C), 133.3 (C), 132.4 (CH), 129.2 (CH), 129.1 (CH), 128.8 (CH), 127.3 (2 x CH), 127.2 (2 x CH), 126.4 (CH), 126.1 (CH), 116.4 (C), 109.2 (CH), 97.1 (CH), 77.2 (CH), 76.5 (CH), 74.4 (CH), 73.6 (CH), 56.3 (CH_3), 55.2 (CH_3), 45.7 (CH), 41.4 (CH), 38.6 (CH), 37.9 (CH_2), 37.7 (CH), 36.3 (CH_2), 34.3 (CH_2), 31.8 (CH_2), 29.7 (2 x CH_2), 26.6 (3 x CH_3), 26.2 (3 x CH_3), 25.9 (3 x CH_3), 19.4 (C), 18.5 (CH_2), 18.4 (C), 18.0 (C), 17.2 (CH_3), 16.6 (CH_3), 14.2 (CH_3), 13.9 (CH_3), 11.0 (CH_3), –3.7 (CH_3), –3.8 (CH_3), –4.3 (CH_3), –4.8 (CH_3); IR (film): $\tilde{\nu}$ = 3364, 2956, 2928, 2856, 1726, 1654, 1589, 1462, 1378, 1331, 1255, 1209, 1159, 1104, 1076, 1060, 1005, 936, 835, 810, 774, 736, 701 cm^{-1}; MS (EI) *m*/*z* (%): 1015 (33), 1014 (61), 1013 (92), 1012 (93), 880 (29), 484 (82), 352 (20), 199 (32), 187 (19), 115 (26), 75 (39), 73 (100); HRMS (ESI): *m*/*z*: calcd for $C_{62}H_{99}NO_8Si_3Na$ [M^+ + Na]: 1092.6571, found 1092.6572.

Compound 60a: Prepared analogously as a colorless oil (10.5 mg, 71 %). $[\alpha]_D^{20}$ = +11.2 (*c* = 0.5, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.66–7.61 (m, 2H), 7.40–7.29 (m, 6H), 7.27–7.21 (m, 2H), 6.46 (d, *J* = 2.2 Hz, 1H), 6.37 (br t, *J* = 5.1 Hz, 1H), 6.33 (d, *J* = 2.2 Hz, 1H), 5.58–5.48 (m, 1H), 5.46–5.37 (m, 1H), 5.31–5.14 (m, 2H), 4.35–4.22 (m, 1H), 4.02 (d, *J* = 10.9 Hz, 1H), 3.96–3.79 (m, 2H), 3.78–3.73 (m, 7H), 3.44 (dd, *J* = 5.5, 3.7 Hz, 1H), 3.18–3.11 (m, 1H), 2.55 (q, *J* = 12.4 Hz, 1H), 2.48–2.36 (m, 2H), 2.16 (d, *J* = 14.6 Hz, 1H), 2.02–1.86 (m, 3H), 1.76–1.62 (m, 1H), 1.62–1.54 (m, 1H), 1.51–1.35 (m, 4H), 1.30–1.21 (m, 2H), 1.08 (d, *J* = 7.2 Hz, 3H), 0.95–0.87 (m, 30H), 0.80 (s, 9H), 0.08 (s, 6H), 0.00 (s, 3H), –0.03 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 173.7 (C), 165.9 (C), 160.7 (C), 151.6 (C), 140.5 (C), 136.1 (2 x CH), 135.9 (2 x CH), 135.0 (C), 133.5 (C), 132.3 (CH), 129.3 (CH), 129.2 (CH), 129.1 (CH), 127.3 (2 x CH), 127.2 (2 x CH), 126.7 (CH), 126.3 (CH), 116.6 (C), 109.4 (CH), 97.3 (CH), 77.2 (CH), 76.6 (CH), 74.8 (CH), 72.7 (CH), 56.1 (CH_3), 55.2 (CH_3), 45.7 (CH), 42.7 (CH), 38.7 (CH), 37.9 (CH), 37.2 (CH_2), 36.5 (CH_2), 35.0 (CH_2), 34.3 (CH_2), 31.9 (CH_2), 29.2 (CH_2), 26.7 (3 x CH_3), 26.2 (3 x CH_3), 25.9 (3 x CH_3), 19.4 (C), 19.2 (CH_2), 18.4 (C), 18.0 (C), 17.2 (CH_3), 14.2 (CH_3), 13.9 (CH_3), 12.8 (CH_3), 11.1 (CH_3), –3.7 (CH_3), –3.9 (CH_3), –4.5 (2 x CH_3); IR (film): $\tilde{\nu}$ = 3345, 2957, 2930, 2856, 1728, 1664, 1603, 1522, 1461, 1427, 1377, 1324, 1253, 1201, 1159, 1059, 1004, 936, 896, 834, 773, 737 cm^{-1}; MS (EI) *m*/*z* (%): 1015 (17), 1014 (42), 1013 (79), 1012 (100), 880 (17), 484 (37), 478 (14), 187 (10), 115 (11), 75 (10), 73 (41); HRMS (ESI): *m*/*z*: calcd for $C_{62}H_{99}NO_8Si_3Na$ [M^+ + Na]: 1092.6571, found 1092.6560.

Amide 66: Prepared analogously as a colorless oil (9.7 mg, 76 %). $[\alpha]_D^{20}$ = –21.2 (*c* = 0.7, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.70–7.63 (m, 2H), 7.50–7.41 (m, 2H), 7.41–7.26 (m, 6H), 6.32 (br t, *J* = 5.0 Hz, 1H), 6.22 (d, *J* = 2.0 Hz, 1H), 6.15 (d, *J* = 2.0 Hz, 1H), 5.73–5.65 (m, 2H), 5.45–5.36 (m, 2H), 5.34–5.22 (m, 1H), 4.09–4.03 (m, 1H), 3.96–3.85 (m, 2H), 3.79–3.74 (m, 4H), 3.63–3.56 (m, 4H), 3.10 (dd, *J* = 14.1, 8.1 Hz, 1H), 2.80 (dd, *J* = 14.1, 5.9 Hz, 1H), 2.62–2.53 (m, 2H), 2.36–2.27 (m, 1H), 2.18–1.80 (m, 6H), 1.61–1.50 (m, 1H), 1.48–1.24 (m, 4H) 1.09 (d, *J* = 7.2 Hz, 3H), 0.98 (d, *J* = 6.8 Hz, 3H), 0.92–0.81 (m, 33H), 0.57 (d, *J* = 7.3 Hz, 3H), 0.10 (s, 3H), 0.09 (s, 3H), 0.01 (s, 3H), –0.04 (s, 3H); ^{13}C NMR (100 MHz,

$CDCl_3$): δ = 173.4 (C), 167.1 (C), 160.8 (C), 158.1 (C), 139.7 (C), 136.1 (2 x CH), 136.0 (2 x CH), 134.6 (C), 134.2 (C), 132.3 (CH), 131.9 (CH), 129.4 (CH), 129.3 (2 x CH), 127.3 (2 x CH), 127.2 (2 x CH), 124.2 (CH), 118.5 (C), 106.2 (CH), 96.7 (CH), 78.0 (CH), 76.5 (CH), 76.4 (CH), 74.8 (CH), 55.6 (CH_3), 55.2 (CH_3), 45.6 (CH), 39.6 (CH), 39.0 (CH), 38.3 (CH), 36.4 (CH_2), 36.1 (CH_2), 35.0 (CH_2), 30.5 (CH_2), 30.3 (CH_2), 30.0 (CH_2), 26.9 (3 x CH_3), 26.2 (3 x CH_3), 25.8 (3 x CH_3), 19.3 (CH_2), 19.2 (C), 18.5 (C), 18.2 (C), 17.7 (CH_3), 16.9 (CH_3), 14.1 (CH_3), 11.1 (CH_3), 10.8 (CH_3), –3.5 (CH_3), –3.6 (CH_3), –4.6 (2 x CH_3); IR (film): $\tilde{\nu}$ = 3350, 2952, 2931, 2857, 1727, 1658, 1603, 1524, 1462, 1428, 1377, 1325, 1256, 1160, 1102, 1058, 1002, 834, 773, 735, 701 cm^{-1}; MS (EI) *m*/*z* (%): 1015 (12), 1014 (34), 1013 (65), 1012 (100), 880 (25), 485 (11), 484 (42), 115 (12), 73 (41); HRMS (ESI): *m*/*z*: calcd for $C_{62}H_{99}NO_8Si_3Na$ [M^+ + Na]: 1092.6571, found 1092.6564.

Allylester 69: HBTU (9.1 mg, 0.024 mmol), HOAt (2.5 mg, 0.018 mmol), (*i*Pr)$_2$NEt (20.1 µL, 0.12 mmol) and DMAP (1.5 mg, 0.012 mmol) were added to a solution of alcohol **36** (10.0 mg, 0.012 mmol) in CH_2Cl_2 (0.3 mL) and DMF (0.1 mL). After stirring for 14 h, the reaction was quenched with water (1 mL), the aqueous phase was extracted with EtOAc (3 x 1 mL), the combined organic layers were dried over Na_2SO_4 and evaporated, and the residue was purified by flash chromatography (hexanes/EtOAc, 13:1) to give ester **69** as a colorless oil (11.7 mg, 91 %). $[\alpha]_D^{20}$ = +3.6 (*c* = 1.4, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.67–7.61 (m, 2H), 7.38–7.29 (m, 6H), 7.26–7.20 (m, 2H), 6.46 (d, *J* = 2.2 Hz, 1H), 6.33 (d, *J* = 2.2 Hz, 1H), 5.65–5.53 (m, 2H), 5.31–5.14 (m, 2H), 4.64–4.53 (m, 2H), 4.28 (br t, *J* = 11.1 Hz, 1H), 4.04–3.98 (m, 2H), 3.77 (s, 3H), 3.76 (s, 3H), 3.48–3.42 (m, 1H), 3.14 (d, *J* = 12.9 Hz, 1H), 2.59–2.48 (m, 2H), 2.40 (dd, *J* = 13.1, 11.5 Hz, 1H), 2.23–2.14 (m, 1H), 2.00–1.88 (m, 3H), 1.84–1.74 (m, 2H), 1.61–1.54 (m, 1H), 1.48–1.42 (m, 3H), 1.38–1.21 (m, 2H), 1.12 (d, *J* = 7.0 Hz, 3H), 0.97–0.84 (m, 30H), 0.80 (s, 9H), 0.04 (s, 3H), 0.01 (s, 3H), 0.01 (s, 3H), –0.02 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 174.9 (C), 165.9 (C), 160.7 (C), 158.9 (C), 140.4 (C), 136.1 (2 x CH), 135.9 (2 x CH), 135.0 (C), 134.1 (CH), 133.5 (C), 129.4 (CH), 129.2 (CH), 129.1 (CH), 127.4 (2 x CH), 127.3 (2 x CH), 126.7 (CH), 124.4 (CH), 116.7 (C), 109.5 (CH), 97.3 (CH), 77.2 (CH), 76.7 (CH), 74.3 (CH), 73.1 (CH), 60.3 (CH_2), 56.1 (CH_3),

55.2 (CH_3), 44.6 (CH), 41.5 (CH), 38.7 (CH), 37.8 (CH), 37.5 (CH_2), 32.1 (CH_2), 31.9 (CH_2), 29.7 (CH_2), 29.5 (CH_2), 26.7 (3 x CH_3), 26.2 (3 x CH_3), 25.8 (3 x CH_3), 19.4 (C), 18.5 (C), 18.3 (CH_2), 18.1 (C), 17.2 (CH_3), 14.3 (CH_3), 13.9 (CH_3), 11.3 (CH_3), 11.1 (CH_3), –3.7 (CH_3), –3.9 (CH_3), –4.2 (CH_3), –4.7 (CH_3); IR (film): $\tilde{\nu}$ = 2956, 2930, 2889, 2856, 1729, 1603, 1586, 1461, 1427, 1376, 1376, 1323, 1254, 1200, 1158, 1102, 1090, 1078, 1057, 1005, 936, 909, 860, 834, 773, 730 cm^{-1}; MS (EI) *m*/*z* (%): 1015 (38), 1014 (64), 1013 (83), 812 (27), 811 (42), 754 (19), 753 (32), 645 (21), 644 (50), 643 (96), 639 (31), 621 (30), 555 (15), 529 (34), 423 (31), 226 (18), 225 (100), 199 (32), 187 (33), 135 (21), 115 (20), 75 (23), 73 (70); HRMS (ESI): *m*/*z*: calcd for $C_{62}H_{98}O_9Si_3Na$ [M^+ + Na]: 1093.6411, found 1093.6417.

Compound 81: Prepared analogously as a colorless oil (18.7 mg, 76 %). $[\alpha]_D^{20}$ = +6.4 (*c* = 0.5, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ= 6.37 (br s, 1H), 6.27 (s, 2H), 5.57–5.46 (m, 2H), 5.45–5.38 (m, 1H), 5.37–5.29 (m, 2H), 3.89–3.86 (m, 1H), 3.79 (s, 3H), 3.77–3.73 (m, 4H), 3.65–3.60 (m, 2H), 2.77–2.66 (m, 1H), 2.66–2.54 (m, 1H), 2.50–2.42 (m, 2H), 2.22 (br d, *J* = 13.6 Hz, 1H), 2.1 (br s, 1H), 2.01–1.84 (m, 4H), 1.78–1.68 (m, 2H), 1.57–1.54 (m, 2H), 1.47–1.38 (m, 4H), 1.36–1.29 (m, 3H), 1.08 (d, *J* = 7.1 Hz, 3H), 1.00 (d, *J* = 6.9 Hz, 3H), 1.00 (d, *J* = 6.7 Hz, 3H), 0.93–0.88 (m, 21H), 0.11–0.05 (m, 12H); ^{13}C NMR (125 MHz, $CDCl_3$): δ= 173.4 (C), 167.5 (C), 161.1 (C), 157.7 (C), 142.9 (C), 132.1 (CH), 130.0 (CH), 129.8 (CH), 126.6 (CH), 117.0 (C), 105.6 (CH), 96.1 (CH), 76.2 (CH), 76.0 (CH), 74.8 (CH), 63.1 (CH_2), 55.7 (CH_3), 55.3 (CH_3), 45.7 (CH), 38.5 (CH), 36.5 (CH_2), 35.1 (CH_2), 32.8 (CH_2), 32.6 (CH_2), 31.9 (CH), 31.8 (CH), 29.7 (CH_2), 26.2 (3 x CH_3), 25.9 (3 x CH_3), 22.7 (CH_2), 19.2 (CH_2), 18.5 (C), 18.0 (C), 16.5 (CH_3), 14.2 (CH_3), 14.1 (CH_3), 12.8 (CH_3), 10.9 (CH_3), –3.6 (CH_3), –3.7 (CH_3), –4.5 (2 x CH_3); IR (film): $\tilde{\nu}$ = 3352, 3004, 2954, 2927, 2855, 1724, 1648, 1605, 1588, 1462, 1254, 1202, 1158, 1093, 1043, 1005, 834, 772 cm^{-1}; MS (EI) *m*/*z* (%): 815 (8) [M^+], 760 (23), 759 (56), 758 (100), 666 (17), 426 (13), 343 (18), 205 (10), 191 (11), 121 (17), 115 (11), 75 (16), 73 (49); HRMS (ESI): *m*/*z*: calcd for $C_{46}H_{81}NO_7Si_2Na$ [M^+ + Na]: 838.5444, found 838.5443.

Compound 41: BCl_3 (1 M in CH_2Cl_2, 180 µL, 0.18 mmol) was added dropwise to a solution of compound **40** (50 mg, 0.045 mmol) in CH_2Cl_2 (2 mL) at −78 °C and stirring continued at this temperature for 2 h before the reaction was quenched with aq. sat. NaOAc (2 mL). After reaching ambient temperature, the aqueous phase was extracted with CH_2Cl_2 (3 x 1 mL), the combined organic layers were washed with water and brine (1 mL each), dried over $MgSO_4$ and evaporated. Purification of the residue by flash chromatography (CH_2Cl_2/EtOAc, 9:1) gave product **41** as a colorless amorphous solid (34.8 mg, 83 %). $[\alpha]_D^{20}$ = +11.9 (*c* = 1.01, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ= 11.61 (s, 1H), 7.59–7.53 (m, 2H), 7.43–7.29 (m, 4H), 7.25–7.13 (m, 4H), 6.44 (d, *J* = 2.8 Hz, 1H), 6.31 (d, *J* = 2.8 Hz, 1H), 5.75 (br t, *J* = 5.6 Hz, 1H), 5.37–5.22 (m, 2H), 5.09–4.98 (m, 1H), 4.93 (dd, *J* = 11.0 Hz, *J* = 4.8 Hz, 1H), 4.64 (br t, *J* = 10.8 Hz, 1H), 3.91–3.79 (m, 2H), 3.76 (s, 3H), 3.69 (br s, 1H), 3.65–3.55 (m, 2H), 3.54–3.44 (m, 2H), 2.61–2.49 (m, 1H), 2.44 (dd, *J* = 12.6 Hz, *J* = 7.2 Hz, 1H), 2.28 (dq, *J* = 7.0 Hz, *J* = 2.4 Hz, 1H), 2.08–1.94 (m, 3H), 1.70–1.58 (m, 5H), 1.55–1.45 (m, 2H), 1.40–1.28 (m, 2H), 1.17 (d, *J* = 7.2 Hz, 3H), 1.01 (d, *J* = 6.8 Hz, 3H), 0.98–0.85 (m, 15H), 0.83–0.76 (m, 12H), 0.06 (s, 3H), 0.04 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ= 176.4 (C), 171.3 (C), 165.1 (C), 163.4 (C), 144.3 (C), 135.9 (4 x CH), 134.8 (C), 133.1 (C), 131.7 (CH), 131.4 (CH), 129.3 (CH), 129.2 (CH), 127.4 (2 x CH), 127.3 (2 x CH), 126.2 (CH), 125.0 (CH), 114.2 (CH), 104.4 (C), 99.7 (CH), 78.2 (CH), 74.7 (CH), 73.7 (CH), 71.7 (CH), 55.2 (CH_3), 44.5 (CH), 39.8 (CH), 38.7 (CH), 37.8 (CH), 36.9 (CH_2), 36.1 (CH_2), 35.8 (CH_2), 31.7 (CH_2), 30.2 (CH_2), 27.9 (CH_2), 26.8 (3 x CH_3), 26.0 (3 x CH_3), 19.2 (CH_2), 19.1 (C), 18.3 (C), 14.6 (CH_3), 14.3 (CH_3), 14.0 (CH_3), 12.0 (CH_3), 11.1 (CH_3), –3.4 (CH_3), –4.5 (CH_3); IR (film): $\tilde{\nu}$ = 3350, 1641, 1615, 1574, 1531, 1427, 1390, 1202, 1158, 1088, 1057, 996, 960, 936, 834 cm^{-1}; MS (EI) *m*/*z* (%): 886 (30), 885 (65), 884 (100), 806 (10), 734 (13), 610 (8), 550 (6), 490 (8), 370 (18), 238 (25), 225 (11), 199 (20), 135 (22), 111 (12), 110 (24), 95 (11), 93 (17), 83 (15), 81 (23), 75 (18), 73 (55), 55 (17); HRMS (ESI): *m*/*z*: calcd for $C_{55}H_{83}NO_8Si_2Na$ [M^+ + Na]: 964.5550, found 964.5549.

Cruentaren A (1): A Teflon flask was used for this experiment. Aqueous HF (48 % *w*/*w*, 200 µL) was added to a solution of compound **41** (8 mg, 0.0084 mmol) in MeCN (200 µL) at 0 °C

and the resulting mixture was stirred at this temperature for 1 h and for 2 h at ambient temperature. The mixture was then cooled again to 0 °C before the reaction was diluted with EtOAc (5 mL) and quenched with aq. sat. $NaHCO_3$ (5 mL). The aqueous layer was extracted with EtOAc (4 x 5 mL), the combined organic phases were dried over $MgSO_4$ and evaporated, and the residue purified by preparative thin layer chromatography (hexanes/EtOAc, 1:4) to give the title compound as a colorless syrup (4.1 mg, 84 %). $[\alpha]_D^{20}$ = –2.9 (*c* = 0.5, CH_2Cl_2) (ref. [8] $[\alpha]_D^{20}$ = –3.3 (*c* = 0.6, CH_2Cl_2)); ^{1}H NMR (600 MHz, $CDCl_3$): δ = 11.48 (br s, 1H, 3–O*H*), 6.36 (d, *J* = 2.6 Hz, 1H, H4), 6.30 (d, *J* = 2.6 Hz, 1H, H6), 6.09 (t, *J* = 5.4 Hz, 1H, N*H*), 5.55 (dddt, *J* = 10.8, 8.6, 7.1, 1.4 Hz, 1H, H20), 5.46–5.52 (m, 1H, H12), 5.44 (ddd, *J* = 11.1, 4.5, 1.6 Hz, 1H, H13), 5.40 (dddd, *J* = 11.0, 11.0, 4.5, 2.0 Hz, 1H, H21), 5.29 (ddd, *J* = 11.6, 5.6, 1.9 Hz, 1H, H15), 3.91 (dddd, *J* = 14.9, 7.5, 5.8, 1.3, 1H, H22a), 3.80–3.87 (m, 2H, H22b, H25), 3.80 (s, 3H, 5–O*CH*$_3$), 3.75 (dd, *J* = 12.8, 1.6 Hz, 1H, H8a), 3.64 (ddd, *J* = 10.8, 2.9, 1.7 Hz, 1H, H9), 3.45 (dd, *J* = 9.1, 2.1 Hz, 1H, H17), 3.10 (br s, 1H, 25–O*H*), 2.82 (dt, *J* = 14.1, 11.5 Hz, 1H, H14a), 2.71 (br s, 1H, 17–O*H*), 2.32 (dt, *J* = 14.3, 11.6 Hz, 1H, H11a), 2.27 (dq, *J* = 7.2, 2.9 Hz, 1H, H24) 2.20–2.28 (m, 4H, H8b, H14b, H19a, H19b), 1.95–2.05 (m, 3H, H10, H11b, H16), 1.70 (dddq, *J* = 9.1, 6.8, 6.8, 4.7 Hz, 1H, H18), 1.42–1.51 (m, 2H, H26a, H27a), 1.35 (br s, 1H, 9–O*H*), 1.27–1.35 (m, 2H, H26b, H27b), 1.14 (d, *J* = 7.2 Hz, 3H, H33), 1.01 (d, *J* = 6.9 Hz, 3H, H30), 0.92 (t, *J* = 7.0 Hz, 3H, H28), 0.89 (d, *J* = 7.0 Hz, 3H, H31), 0.79 (d, *J* = 6.9 Hz, 3H, H32); ^{13}C NMR (150 MHz, $CDCl_3$): δ = 176.4 (C23), 171.5 (C1), 165.7 (C3), 163.5 (C5), 143.7 (C7), 132.2 (C12), 130.9 (C20), 126.7 (C21), 125.8 (C13), 112.3 (C6), 104.9 (C2), 99.7 (C4), 78.0 (C15), 74.7 (C17), 73.1 (C9), 71.8 (C25), 55.4 (C29), 44.8 (C24), 39.2 (C16), 38.3 (C10), 36.8 (C18), 36.7 (C8), 36.6 (C22), 35.8 (C26), 31.6 (C11), 30.7 (C19), 29.8 (C14), 19.2 (C27), 16.1 (C32), 14.2 (C30), 14.0 (C28), 11.2 (C33), 8.6 (C31); IR ($CHCl_3$): $\tilde{\nu}$ = 3360, 3009, 2960, 2934, 2875, 2848, 1643, 1613, 1576, 1535, 1459, 1442, 1421, 1380, 1316, 1250, 1220, 1202, 1159, 1111, 1057, 1037, 1016, 987, 951 cm^{-1}; MS (EI) *m*/*z* (%): 589 (17) [M^+], 426 (14), 408 (28), 257 (16), 256 (100), 238 (21), 227 (20), 200 (13),

165 (15), 164 (21), 128 (18), 111 (21), 83 (13), 81 (13), 55 (18), 43 (15); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{51}NO_8Na$ [M^+ + Na]: 612.3506, found 612.3507. The analytical and spectroscopic data are in full agreement with those reported in the literature.[8, 9]

Compound 58b: Prepared analogously as a colorless oil (3.1 mg, 69 % over two steps). $[\alpha]_D^{20}$ = +2.9 (*c* = 0.32, CH_2Cl_2); ^{1}H NMR (600 MHz, $CDCl_3$): δ = 11.48 (s, 1H, 3–O*H*), 6.35 (d, *J* = 2.6 Hz, 1H, H4), 6.29 (d, *J* = 2.6 Hz, 1H, H6), 6.14 (t, *J* = 5.6 Hz, 1H, N*H*), 5.55 (ddd, *J* = 10.9, 8.6, 7.1 Hz, 1H, H20), 5.50–5.46 (m, 1H, H12), 5.43 (tdd, *J* = 11.1, 4.6, 1.7 Hz, 1H, H13), 5.41–5.36 (m, 1H, H21), 5.29 (ddd, *J* = 11.3, 5.6, 1.5 Hz, 1H, H15), 3.74 (ddd, *J* = 14.9, 7.3, 5.5 Hz, 1H, H22a), 3.83 (dd, *J* = 8.8, 3.7 Hz, 1H, H25), 3.82–3.75 (m, 4H, H22b, H29), 3.75–3.72 (m, 1H, H8a), 3.62 (ddd, *J* = 10.6, 2.7, 1.3 Hz, 1H, H9), 3.43 (dd, *J* = 8.8, 2.1 Hz, 1H, H17), 3.15 (br s, 1H, 25–O*H*), 2.87 (br s, 1H, 17–O*H*), 2.80 (dt, *J* = 14.1, 11.5 Hz, 1H, H14a), 2.32 (dt, *J* = 14.2, 11.6 Hz, 1H, H11a), 2.26 (dq, *J* = 7.2, 2.8 Hz, 1H, H24), 2.25–2.21 (m, 3H, H14b, H19a, H19b), 2.20 (dd, *J* = 12.6, 10.7 Hz, 1H, H8b), 2.01–1.97 (m, 1H, H10), 1.95 (ddq, *J* = 7.0, 5.6, 2.0 Hz, 1H, H16), 1.93 (d, *J* = 13.9 Hz, 1H, H11b), 1.70–1.65 (m, 1H, H18), 1.47–1.31 (m, 5H, 9–O*H*, H26, H27), 1.13 (d, *J* = 7.2 Hz, 3H, H33), 1.02 (d, *J* = 6.8 Hz, 3H, H30), 0.90 (t, *J* = 7.1 Hz, 3H, H28), 0.87 (d, *J* = 7.0 Hz, 3H, H31), 0.79 (d, *J* = 6.9 Hz, 3H, H32); ^{13}C NMR (125 MHz, $CDCl_3$): δ = 176.4 (C23), 171.5 (C1), 165.6 (C3), 163.5 (C5), 143.6 (C7), 132.2 (C12), 130.8 (C20), 126.6 (C21), 125.8 (C13), 112.3 (C6), 104.9 (C2), 99.7 (C4), 78.1 (C15), 74.5 (C17), 73.0 (C9), 71.5 (C25), 55.4 (C29), 44.5 (C24), 39.2 (C16), 38.3 (C10), 36.7 (C18), 36.6 (C8), 36.5 (C22), 35.7 (C26), 31.5 (C11), 30.7 (C19), 29.8 (C14), 19.2 (C27), 16.0 (C32), 14.2 (C30), 14.0 (C28), 11.1 (C33), 8.5 (C31); IR (film): $\tilde{\nu}$ = 3360, 2959, 2928, 2851, 1641, 1613, 1575, 1536, 1468, 1380, 1317, 1298, 1253, 1222, 1203, 1161, 1104, 1053, 1042, 951, 801 cm^{-1}; MS (EI) *m*/*z* (%): 589 (10), 408 (22), 314 (25), 256 (100), 227 (25), 193 (38), 164 (35), 128 (24), 43 (30); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{51}NO_8Na$ [M^+ + Na]: 612.3507, found 612.3508.

[9] a) L. Jundt, H. Steinmetz, P. Luger, M. Weber, B. Kunze, H. Reichenbach, G. Höfle, *Eur. J. Org. Chem.* **2006**, 5036–5044; b) L.-P. Molleyres, G. Höfle, H. Reichenbach, H. Steinmetz (Syngenta Participations AG), PCT Int. Appl. WO 2003044005 A1 20030530 (2003).

Compound 59b: Prepared analogously as a colorless oil (3.8 mg, 72 % over two steps). $[\alpha]_D^{20}$ = +2.3 (*c* = 0.41, CH_2Cl_2); ^{1}H NMR (600 MHz, $CDCl_3$): δ = 11.47 (s, 1H, 3–O*H*), 6.36 (d, *J* = 2.5 Hz, 1H, H4), 6.29 (d, *J* = 2.5 Hz, 1H, H6), 6.10 (t, *J* = 5.5 Hz, 1H, N*H*), 5.57–5.51 (m, 1H, H20), 5.50–5.46 (m, 1H, H12), 5.43 (tdd, *J* = 11.1, 4.6, 1.7 Hz, 1H, H13), 5.41–5.36 (m, 1H, H21), 5.29 (ddd, *J* = 11.3, 5.6, 1.5 Hz, 1H, H15), 3.74 (ddd, *J* = 14.9, 7.3, 5.5 Hz, 1H, H22a), 3.83 (dd, *J* = 8.8, 3.7 Hz, 1H, H25), 3.82–3.75 (m, 4H, H22b, H29), 3.75–3.72 (m, 1H, H8a), 3.62 (ddd, *J* = 10.8, 2.9, 1.5 Hz, 1H, H9), 3.43 (dd, *J* = 8.8, 2.1 Hz, 1H, H17), 3.10 (br s, 1H, 25–O*H*), 2.85 (br s, 1H, 17–O*H*), 2.80 (dt, *J* = 14.1, 11.5 Hz, 1H, H14a), 2.32 (dt, *J* = 14.2, 11.6 Hz, 1H, H11a), 2.26 (dq, *J* = 7.2, 2.8 Hz, 1H, H24), 2.25–2.21 (m, 3H, H14b, H19), 2.20 (dd, *J* = 12.8, 10.8 Hz, 1H, H8b), 2.03–1.98 (m, 1H, H10), 1.95 (ddq, *J* = 5.7, 2.1, 7.0 Hz, 1H, H16), 1.94 (d, *J* = 13.9 Hz, 1H, H11b), 1.71–1.66 (m, 1H, H18), 1.48–1.30 (m, 5H, 9–O*H*, H26, H27), 1.14 (d, *J* = 7.2 Hz, 3H, H33), 1.01 (d, *J* = 6.8 Hz, 3H, H30), 0.91 (t, *J* = 7.1 Hz, 3H, H28), 0.88 (d, *J* = 7.0 Hz, 3H, H31), 0.78 (d, *J* = 6.9 Hz, 3H, H32); ^{13}C NMR (125 MHz, $CDCl_3$): δ = 176.4 (C23), 171.5 (C1), 165.7 (C3), 163.5 (C5), 143.7 (C7), 132.2 (C12), 130.8 (C20), 126.6 (C21), 125.8 (C13), 112.3 (C6), 104.9 (C2), 99.7 (C4), 78.1 (C15), 74.5 (C17), 73.0 (C9), 71.7 (C25), 55.4 (C29), 44.8 (C24), 39.2 (C16), 38.3 (C10), 36.7 (C18), 36.6 (C8), 36.5 (C22), 35.8 (C26), 31.5 (C11), 30.7 (C19), 29.8 (C14), 19.2 (C27), 16.0 (C32), 14.2 (C30), 14.0 (C28), 11.1 (C33), 8.6 (C31); IR (film): $\tilde{\nu}$ = 3345, 2958, 2929, 2853, 1644, 1614, 1575, 1536, 1468, 1380, 1317, 1298, 1251, 1222, 1201, 1160, 1105, 1053, 1042, 951, 799 cm^{-1}; MS (EI) *m*/*z* (%): 589 (15), 408 (21), 314 (21), 256 (100), 227 (30), 193 (34), 164 (46), 128 (27), 73 (23), 43 (35); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{51}NO_8Na$ [M^+ + Na]: 612.3507, found 612.3510.

Compound 60b: Prepared analogously as a colorless oil (5.5 mg, 72 % over two steps). $[\alpha]_D^{20}$ = +8.2 (*c* = 0.5, CH_2Cl_2); ^{1}H NMR (600 MHz, $CDCl_3$): δ = 11.48 (s, 1H, 3–O*H*), 6.35 (d, *J* = 2.6 Hz, 1H, H4), 6.29 (d, *J* = 2.6 Hz, 1H, H6), 6.16 (t, *J* = 5.6 Hz, 1H, N*H*), 5.58–5.52 (m, 1H, H20), 5.48 (br t, *J* = 11.2 Hz, 1H, H12), 5.43 (tdd, *J* = 11.0, 4.5, 1.9 Hz, 1H, H13), 5.41–5.37 (m, 1H, H21), 5.28 (ddd, *J* = 11.5, 5.7, 1.5 Hz, 1H, H15), 3.74 (ddd, *J* = 14.9, 7.2, 5.6 Hz, 1H, H22a), 3.83 (ddd, *J* = 8.7, 3.7, 3.0 Hz, 1H, H25), 3.82–3.76 (m, 4H, H22b, H29),

3.75–3.72 (m, 1H, H8a), 3.62 (ddd, *J* = 10.7, 2.7, 1.5 Hz, 1H, H9), 3.43 (br d, *J* = 8.8 Hz, 1H, H17), 3.19 (br s, 1H, 25–O*H*), 2.87 (br s, 1H, 17–O*H*), 2.80 (dt, *J* = 14.2, 11.5 Hz, 1H, H14a), 2.32 (dt, *J* = 13.9, 11.7 Hz, 1H, H11a), 2.26 (dq, *J* = 7.1, 2.7 Hz, 1H, H24), 2.25–2.21 (m, 3H, H14b, H19), 2.20 (dd, *J* = 12.8, 10.8 Hz, 1H, H8b), 2.03–1.98 (m, 1H, H10), 1.95 (ddq, *J* = 7.0, 5.7, 2.1 Hz, 1H, H16), 1.94 (d, *J* = 13.9 Hz, 1H, H11b), 1.71–1.66 (m, 1H, H18), 1.48–1.42 (m, 2H, H27a, H26a), 1.36 (br s, 1H, 9–O*H*), 1.31–1.26 (m, 2H, H26b, H27b), 1.13 (d, *J* = 7.2 Hz, 3H, H33), 1.00 (d, *J* = 6.8 Hz, 3H, H30), 0.90 (t, *J* = 7.1 Hz, 3H, H28), 0.87 (d, *J* = 7.0 Hz, 3H, H31), 0.78 (d, *J* = 6.8 Hz, 3H, H32); ^{13}C NMR (125 MHz, $CDCl_3$): δ = 176.5 (C23), 171.5 (C1), 165.7 (C3), 163.5 (C5), 143.6 (C7), 132.1 (C12), 130.8 (C20), 126.6 (C21), 125.7 (C13), 112.3 (C6), 104.9 (C2), 99.6 (C4), 78.0 (C15), 75.5 (C17), 73.0 (C9), 71.7 (C25), 55.4 (C29), 44.7 (C24), 39.2 (C16), 38.2 (C10), 36.7 (C18), 36.6 (C8), 36.5 (C22), 35.6 (C26), 31.5 (C11), 30.6 (C19), 29.8 (C14), 19.2 (C27), 16.0 (C32), 14.2 (C30), 14.0 (C28), 11.1 (C33), 8.5 (C31); IR (film): $\tilde{\nu}$ = 3351, 2960, 2928, 2874, 2853, 1645, 1615, 1576, 1537, 1466, 1380, 1317, 1299, 1251, 1222, 1204, 1159, 1109, 1053, 1040, 989, 952, 800 cm^{-1}; MS (EI) *m*/*z* (%): 589 (11), 408 (16), 314 (26), 256 (100), 227 (37), 193 (14), 164 (27), 128 (31), 43 (38); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{51}NO_8Na$ [M^+ + Na]: 612.3507, found 612.3509.

9-*epi*-Cruentaren A (68): Prepared analogously as a colorless oil (3.5 mg, 72 %). $[\alpha]_D^{20}$ = –13.2 (*c* = 0.4, CH_2Cl_2); ^{1}H NMR (600 MHz, C_6D_6): δ = 12.25 (s, 1H, 3–O*H*), 6.49 (d, *J* = 2.6 Hz, 1H, H4), 6.47 (d, *J* = 2.6 Hz, 1H, H6), 5.59 (ddd, *J* = 11.7, 6.0, 1.6 Hz, 1H, H15), 5.51–5.44 (m, 2H, H13, H20), 5.38 (br t, *J* = 11.3 Hz, 1H, H12), 5.23 (t, *J* = 5.8 Hz, 1H, N*H*), 5.17–5.11 (m, 1H, H21), 3.88 (dd, *J* = 14.5, 7.8 Hz, 1H, H22a), 3.76 (quin, *J* = 7.1 Hz, 1H, H22b), 3.69 (dt, *J* = 9.1, 3.4 Hz, 1H, H25), 3.64 (ddd, *J* = 10.7, 2.8, 1.6 Hz, 1H, H9), 3.53 (d, *J* = 9.2 Hz, 1H, H17), 3.43–3.37 (m, 1H, H8a), 3.10 (s, 3H, H29), 2.94 (br s, 1H, 25–O*H*), 2.88 (dt, *J* = 14.1, 11.7 Hz, 1H, H14a), 2.39–2.26 (m, 4H, H11a, H14b, H18, H19a), 2.15–2.11 (m, 2H, H19b, H8b) 2.00 (quint, *J* = 6.8, 1.7 Hz, 1H, H10), 1.96–1.90 (m, 1H, 17–O*H*), 1.82 (br d, *J* = 4.8 Hz, 1H, H11b), 1.79 (dq, *J* = 7.1, 3.2 Hz, 1H, H24), 1.68–1.62 (m, 1H, H16), 1.53–1.47 (m, 1H, H27a), 1.45–1.39 (m, 1H, H26a), 1.31 (br s, 1H, 9–O*H*), 1.30–1.23

(m, 1H, H27b), 1.18–1.12 (m, 1H, H26b), 1.05 (d, *J* = 7.1 Hz, 3H, H33), 1.03 (d, *J* = 6.9 Hz, 3H, H30), 0.98 (d, *J* = 7.0 Hz, 3H, H31), 0.89 (t, *J* = 7.3 Hz, 3H, H28), 0.67 (d, *J* = 6.9 Hz, 3H, H32); ^{13}C NMR (150 MHz, C_6D_6): δ = 176.4 (C23), 172.0 (C1), 166.6 (C3), 163.9 (C5), 144.5 (C7), 132.3 (C12), 130.1 (C20), 127.2 (C21), 126.3 (C13), 113.0 (C6), 105.6 (C2), 99.9 (C4), 78.5 (C15), 73.6 (C17), 73.1 (C9), 71.7 (C25), 54.6 (C29), 45.3 (C24), 39.5 (C16), 39.0 (C10), 37.0 (C18), 36.9 (C8), 36.7 (C22), 36.2 (C26), 31.9 (C11), 30.8 (C19), 29.7 (C14), 19.6 (C27), 16.0 (C32), 14.4 (C30), 14.2 (C28), 11.6 (C33), 9.1 (C31); IR (film): $\tilde{\nu}$ = 3345, 3007, 2959, 2933, 2870, 1642, 1612, 1576, 1535, 1460, 1441, 1421, 1380, 1316, 1220, 1201, 1159, 1110, 1057, 1037, 1017, 987, 951 cm^{-1}; MS (EI) *m*/*z* (%): 589 (15) [M^+], 426 (10), 408 (27), 257 (17), 256 (100), 238 (20), 227 (19), 200 (12), 165 (12), 164 (24), 128 (17), 111 (21), 83 (13), 81 (15), 55 (17), 43 (19); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{51}NO_8Na$ [M^+ + Na]: 612.3506, found 612.3509.

Ester 71: Prepared analogously as a colorless oil (4.7 mg, 80 %). $[\alpha]_D^{20}$ = +2.8 (*c* = 0.49, CH_2Cl_2); ^{1}H NMR (600 MHz, $CDCl_3$): δ = 11.50 (s, 1H, 3–O*H*), 6.35 (d, *J* = 2.6 Hz, 1H, H4), 6.29 (d, *J* = 2.6 Hz, 1H, H6), 5.64 (ddd, *J* = 10.8, 8.8, 6.6 Hz, 1H, H20), 5.55 (dt, *J* = 10.9, 6.9 Hz, 1H, H21), 5.49 (br t, *J* = 10.8 Hz, 1H, H12), 5.42 (tdd, *J* = 11.1, 4.5, 1.9 Hz, 1H, H13), 5.27 (ddd, *J* = 11.5, 5.3, 1.7 Hz, 1H, H15), 4.64 (d, *J* = 6.9 Hz, 2H, H22), 3.90 (m, 1H, H25), 3.79 (s, 3H, H29), 3.73 (dd, *J* = 12.8, 1.4 Hz, 1H, H8a), 3.62 (d, *J* = 10.8 Hz, 1H, H9), 3.43 (d, *J* = 8.0 Hz, 1H, H17), 2.82 (dt, *J* = 14.1, 11.6 Hz, 1H, H14a), 2.50 (dq, *J* = 3.4, 7.2 Hz, 1H, H24), 2.43 (br s, 1H, 25–O*H*), 2.35–2.27 (m, 2H, H19a, H11a), 2.23–2.17 (m, 2H, H14b, H8b), 2.10 (dt, *J* = 14.8, 8.0 Hz, 1H, H19b), 2.06 (br s, 1H, 17–O*H*), 2.04–1.94 (m, 3H, H10, H16, H11b), 1.69–1.64 (m, 1H, H18), 1.50–1.42 (m, 2H, H27a, H26a), 1.36–1.28 (m, 3H, H27b, H26b, 9–O*H*), 1.15 (d, *J* = 7.2 Hz, 3H, H33), 1.00 (d, *J* = 6.8 Hz, 3H, H30), 0.91 (t, *J* = 7.0 Hz, 3H, H28), 0.89 (d, *J* = 7.1 Hz, 3H, H31), 0.76 (d, *J* = 6.8 Hz, 3H, H32); ^{13}C NMR (125 MHz, $CDCl_3$): δ = 176.0 (C23), 171.5 (C1), 165.8 (C3), 163.5 (C5), 143.6 (C7), 133.5 (C20), 132.2 (C12), 125.6 (C13), 124.6 (C21), 112.4 (C6), 104.7 (C2), 99.6 (C4), 77.7 (C15), 75.2 (C17), 73.0 (C9), 71.4 (C25), 60.5 (C22), 55.4 (C29), 44.3 (C24), 39.2 (C16), 38.2 (C10), 36.9 (C18), 36.6 (C8), 36.0 (C26), 31.6 (C11), 30.8 (C19), 29.9 (C14), 19.2 (C27),

16.0 (C32), 14.1 (C30), 14.0 (C28), 10.5 (C33), 8.5 (C31); IR (film): $\tilde{\nu}$ = 3442, 2958, 2927, 2874, 2855, 1716, 1646, 1613, 1577, 1459, 1378, 1317, 1251, 1221, 1202, 1159, 1089, 1039, 1017, 988, 951, 800, 722 cm^{-1}; MS (EI) *m*/z (%): 444 (11), 363 (10), 305 (23), 275 (36), 263 (22), 193 (38), 164 (100), 151 (35), 111 (69), 93 (23), 81 (33), 67 (22), 55 (34); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{50}O_9Na$ [M^+ + Na]: 613.3346, found 613.3347.

9-Deoxy-cruentaren A (82): Prepared analogously as a colorless oil (5.7 mg, 81 %). $[\alpha]_D^{20}$ = +1.2 (*c* = 0.87, CH_2Cl_2); ^{1}H NMR (600 MHz, $CDCl_3$): δ= 11.45 (s, 1H, 3–O*H*), 6.28 (d, *J* = 2.6 Hz, 1H, H4), 6.24 (d, *J* = 2.6 Hz, 1H, H6), 6.13 (t, *J* = 5.2 Hz, 1H, N*H*), 5.58–5.53 (m, 1H, H20), 5.44–5.38 (m, 3H, H21, H13, H12), 5.22 (ddd, *J* = 11.4, 5.4, 1.7 Hz, 1H, H15), 3.90 (ddd, *J* = 15.2, 7.2, 5.2 Hz, 1H, H22a), 3.84 (ddd, *J* = 8.6, 3.9, 2.9 Hz, 1H, H25), 3.81 (ddd, *J* = 15.2, 7.2, 5.2 Hz, 1H, H22b), 3.77 (s, 3H, H29), 3.46 (dd, *J* = 9.1, 2.2 Hz, 1H, H17), 3.37 (br t, *J* = 12.0 Hz, 1H, H8a), 2.82 (dt, *J* = 14.0, 11.0 Hz, 1H, H14a), 2.34 (dt, *J* = 13.6, 11.2 Hz, 1H, H11a), 2.28–2.20 (m, 5H, H8b, H24, H14b, H19), 2.02 (ddq, *J* = 5.5, 2.2, 7.1 Hz, 1H, H16), 1.90 (br s, 2H, 17–O*H*, 25–O*H*), 1.81–1.76 (m, 2H, H11b, H10), 1.73–1.66 (m, 1H, H18), 1.57 (tt, *J* = 13.2, 2.9 Hz, 1H, H9a), 1.49–1.41 (m, 2H, H27a, H26a), 1.33–1.26 (m, 3H, H27b, H26b, H9b), 1.13 (d, *J* = 7.2 Hz, 3H, H33), 1.01 (d, *J* = 6.9 Hz, 3H, H30), 0.90 (t, *J* = 7.1 Hz, 3H, H28), 0.89 (d, *J* = 7.1 Hz, 3H, H31), 0.79 (d, *J* = 6.8 Hz, 3H, H32); ^{13}C NMR (125 MHz, $CDCl_3$): δ= 176.5 (C23), 171.7 (C1), 165.0 (C3), 163.7 (C5), 148.8 (C7), 133.1 (C12), 131.1 (C20), 126.6 (C21), 125.5 (C13), 110.7 (C6), 105.0 (C2), 98.7 (C4), 77.9 (C15), 74.8 (C17), 71.7 (C25), 55.3 (C29), 44.7 (C24), 39.1 (C16), 36.8 (C9), 36.7 (C18), 36.4 (C22), 35.7 (C26), 32.1 (C10), 32.0 (C11), 30.6 (C19), 30.0 (C14), 29.2 (C8), 19.7 (C30), 19.2 (C27), 16.1 (C32), 14.1 (C28), 11.1 (C33), 8.6 (C31); IR (film): $\tilde{\nu}$ = 3311, 2956, 2926, 2872, 1643, 1614, 1574, 1458, 1438, 1378, 1317, 1249, 1219, 1202, 1158, 1112, 1041, 986, 950, 846, 801, 719 cm^{-1}; MS (EI) *m*/z (%): 573 (42) [M^+], 296 (11), 289 (23), 257 (16), 256 (100), 238 (21), 228 (11), 227 (54), 200 (15), 198 (15), 197 (15), 191 (20), 184 (14), 182 (26), 177 (21), 164 (26), 146 (17), 138 (11), 137 (11), 128 (23), 111 (37), 98 (11), 93 (15), 83 (20), 81 (29), 69 (22), 67 (18), 57 (18), 55 (38), 43 (30); HRMS (ESI): *m*/*z*: calcd for $C_{33}H_{51}NO_7Na$ [M^+ + Na]: 596.3558, found 596.3556.

Bioassays

Cell culture: The L-929 cell line was obtained from the German Collection of Microorganisms and Cell Cultures (DSMZ) and was cultured under conditions recommended by the depositor. Cell culture reagents were purchased from Sigma-Aldrich and plastic ware was obtained from Sarstedt AG & Co.

Cytotoxicity assays: Cells were seeded at $6 \cdot 10^3$ cells per well of 96-well plates in 180 μL complete medium and directly treated with varying concentrations of the cruentarenes diluted in methanol. Each compound as well as the internal methanol control was tested in duplicate. After 5 d of incubation, 20 μL of 5 mg mL^{-1} MTT (thiazolyl blue tetrazolium bromide) in PBS was added per well and the mixture was further incubated for 2 h at 37 °C. The medium was then discarded and cells were washed with 100 μL PBS before adding 100 μL 2-propanol/10 M HCl (250:1) in order to dissolve formazan granules. The absorbance at 570 nm was measured using a microplate reader (EL808, Bio-Tek Instruments Inc.), and cell viability was expressed as percentage relative to the respective methanol control.

Cell cycle analysis: 10^5 cells were harvested by centrifugation, washed with ice-cooled PBS, and fixed overnight with cold (–20 °C) ethanol (80 % *v*/*v*). After fixation, the ethanol was removed completely and the cell pellet was resuspended in a PBS solution containing 5 μg mL^{-1} propidium iodide and 0.1 mg mL^{-1} RNase A. The suspension was incubated for 30 min at 37 °C and the samples were analyzed by a flowcytometric system (EasyCyte Plus, Guava Technologies). In total, 5000 viable cells were acquired per sample and cell cycle histograms were generated after exclusion of small cell debris using a Watson algorithm of FlowJo 7.2.5 software (TreeStar Inc.).