Supporting information for manuscript:

"**Synthesis of the Integrastatin Nucleus using the Ramberg-Bäcklund Reaction**" (*Org. Lett*.)

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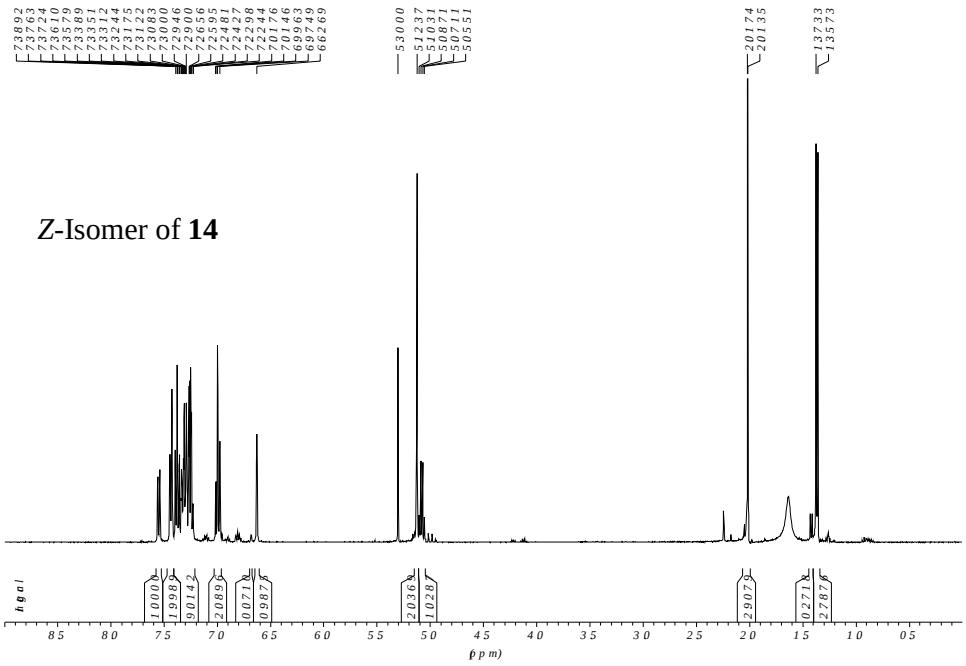
Procedure for the synthesis of compound 14.

To a stirred solution of **12** (0.57 g, 1.4 mmol) in carbon tetrachloride (10 mL), *tert*-butanol (10 mL) and water (1.5 mL) was added powdered potassium hydroxide (3.30 g, 59 mmol). The reaction mixture was then heated at 80 ºC for 16 hours. Solvent was removed *in vacuo*, and the residue extracted with ethyl acetate (50 mL), washing with water (10 mL) and saturated sodium chloride solution (15 mL), and drying over magnesium sulfate. Filtration and removal of the solvent *in vacuo* gave a brown oil (0.62 g). Purification by flash chromatography, eluting in 9:1 petroleum ether : ethyl acetate, afforded almost exclusively the Z isomer of **14** (0.43 g, 89%) as a yellow oil; R_F [Petroleum ether-ethyl acetate (4:1)] 0.25; ν_{max} (NaCl)/cm^{-1} 3400 (OH), 2857, 1447; δ_H ($CDCl_3$, 400 MHz) 1.36 (3 H, d, *J* 5.6 Hz, CH_3), 1.83 (1 H, brs, OH), 2.01 (3 H, s, CH_3), 5.08 (1 H, q, *J* 5.6 Hz, CH), 512 (2 H, s, CH_2), 6.63 (1 H, brs, vinyl CH), 7.02 (2 H, m, 2 ArH), 7.26-7.45 (10 H, m, 10 ArH), 7.55 (1 H, d, *J* 7.2 Hz, ArH); δ_C ($CDCl_3$, 100 MHz) 18.9 (CH_3), 29.8 (CH_3), 67.4 (CH), 70.4 (CH_2), 112.4 (ArH), 121.1 (ArH), 124.6 (ArH), 126.9 (ArH), 127.4 (ArH), 127.5 (2 ArH), 127.7 (ArH), 128.0 (ArH), 128.4 (ArH), 128.6 (2 ArH), 129.6 (C), 129.8 (ArH), 134.6 (C), 135.6 (C), 137.3 (C), 138.4 (vinyl CH), 144.3 (C), 155.9 (ArO); *m/z* (CI) 344 ([M-H_2O]NH_4^+, 20%), 327 ([M-H_2O]$^+$, 100%); [Found [M-H_2O]NH_4^+, 344.2004 (error = 3.2 ppm). $C_{24}H_{24}O_2$ requires: *[M-H_2O]NH_4^+, 344.2014*].

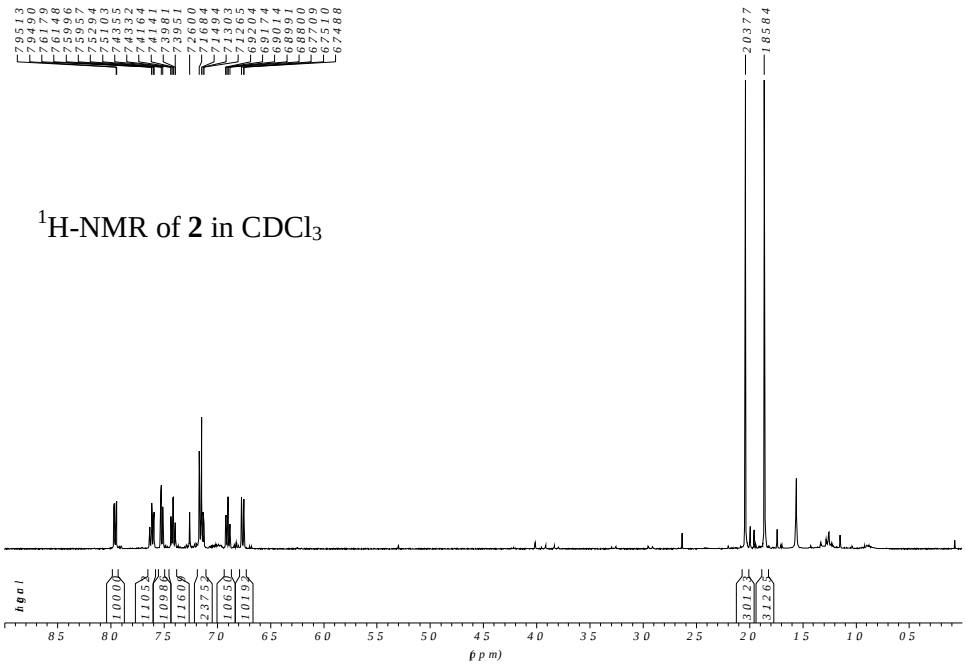


Procedure for the synthesis of compound 17.

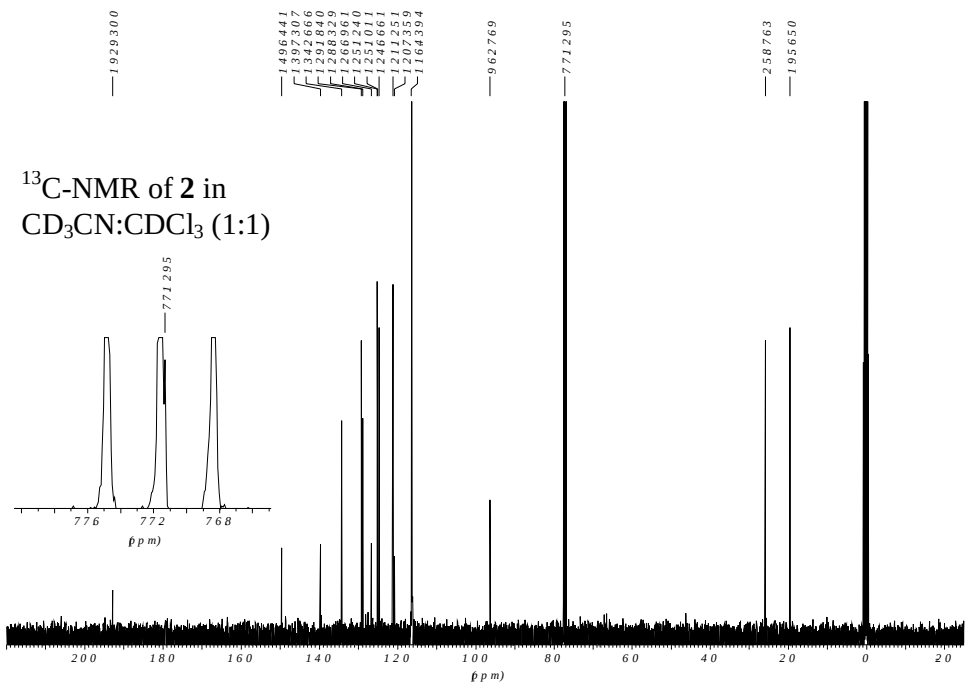
To a stirred solution of **13** (15:1 *Z:E,* 0.55 g, 1.61 mmol) in dichloromethane (40 mL) was added tin(II) chloride dihydrate (3.63 g, 16.1 mmol). The reaction mixture was allowed to stir at room temperature for 2 days, filtered through Celite®, and the solvent removed *in vacuo* to give an orange oil (0.52 g). Purification by flash chromatography, eluting in 9:1 petroleum ether : ethyl acetate, afforded **17** (0.38 g, 94%) as colourless crystals; CDDS no. **219622** ; R_F [Petroleum ether-ethyl acetate (4:1)] 0.42; m.p. 112-114 ^oC; ν_{max} (NaCl)/cm^{-1} 1115, 901; δ_H ($CDCl_3$, 400 MHz) 1.74 (3 H, s, CH_3), 1.96 (3 H, s, CH_3), 2.92 (1 H, d, *J* 16.0 Hz, CH), 3.27 (1 H, d, *J* 16.0 Hz, CH), 6.68 (1 H, d, *J* 8.0 Hz, ArH), 6.82 (1 H, t, *J* 7.6 Hz, ArH), 6.99-7.07 (3 H, m, 3 ArH), 7.14-7.26 (2 H, m, 2 ArH), 7.43 (1 H, d, *J* 8.0 Hz, ArH); δ_C ($CDCl_3$, 100 MHz) 26.6 (CH_3), 27.6 (CH_3), 43.0 (CH_2), 73.1 (C), 97.6 (C), 116.8 (ArH), 120.7 (ArH), 124.6 (ArH), 125.7 (ArH), 126.7 (ArH), 128.1 (ArH), 128.2 (2 ArH), 133.2 (C), 135.8 (C), 140.8 (C), 151.0 (ArO); *m/z* (CI) 253 (MH^+, 100%); [Found MH^+, 253.1234 (error = 2.1 ppm). $C_{17}H_{16}O_2$ requires: *MH^+, 253.1228*].

Procedure for the synthesis of Integrastatin Nucleus, 2.

To a stirred solution of **17** (0.03 g, 0.12 mmol), PDC (0.26 g, 0.7 mmol) and Celite® (0.2 g) in benzene (3.5 mL) at 6-10 °C under nitrogen, was added TBHP (5.5 M in decane, 0.13 mL, 0.7 mmol). The reaction mixture was stirred below 10 °C for 4 days, with further addition of TBHP (2 x 0.13 mL) after 36 h and 72 h. Filtration of the reaction through a pad of Celite®, washing with EtOAc, and removal of solvent *in vacuo*, followed by purification (flash chromatography, eluting in 15:1 petroleum ether : EtOAc) afforded the integrastatin nucleus, **2** (0.013 g, 41%) and unreacted **17** (0.014 g, 47% recovered); R_F [Petroleum ether-ethyl acetate (4:1)] 0.40; ν_{max} (NaCl)/cm^{-1} 1704, 916; δ_H ($CDCl_3$, 400 MHz) 1.86 (3 H, s, CH_3), 2.04 (3 H, s, CH_3), 6.76 (1 H, d, *J* 8.0 Hz, ArH), 6.90 (1 H, t, *J* 7.6 Hz, ArH), 7.12-7.17 (2 H, m, 2 ArH), 7.41 (1 H, t, *J* 7.6 Hz, ArH), 7.52 (1 H, d, *J* 7.7 Hz, ArH), 7.63 (1 H, t, *J* 7.7 Hz, ArH), 7.97 (1 H, d, *J* 8.0 Hz, ArH); δ_C (CD_3CN:$CDCl_3$ 1:1, 100 MHz) 19.6 (CH_3), 25.9 (CH_3), 77.1 (C), 96.3 (C), 116.3 (ArH), 120.7 (C), 121.1 (ArH), 124.7 (ArH), 125.1 (2 ArH), 126.7 (C), 128.8 (ArH), 129.2 (ArH), 134.3 (ArH), 139.7 (C), 149.6 (ArO), 192.9 (CO); *m/z* (CI) 267 (MH^+, 100%); [Found MH^+, 267.1022 (error = 0.2 ppm). $C_{17}H_{14}O_3$ requires: *MH^+, 267.1021*].



^{1}H-NMR of **2** in $CDCl_3$


^{13}C-NMR of **2** in
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1291440
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1251240
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1207359
1164394
962769
771295
258763
195650
200
180
160
140
120
100
80
60
40
20
0
20
(ppm)
771295
776
772
768
(ppm)