

Antimicrobial Potential of Natural and Semi-Synthetic *ent*-Kaurane and *ent*-Pimarane Diterpenes against Clinically Isolated Gram-Positive Multidrug-Resistant Bacteria

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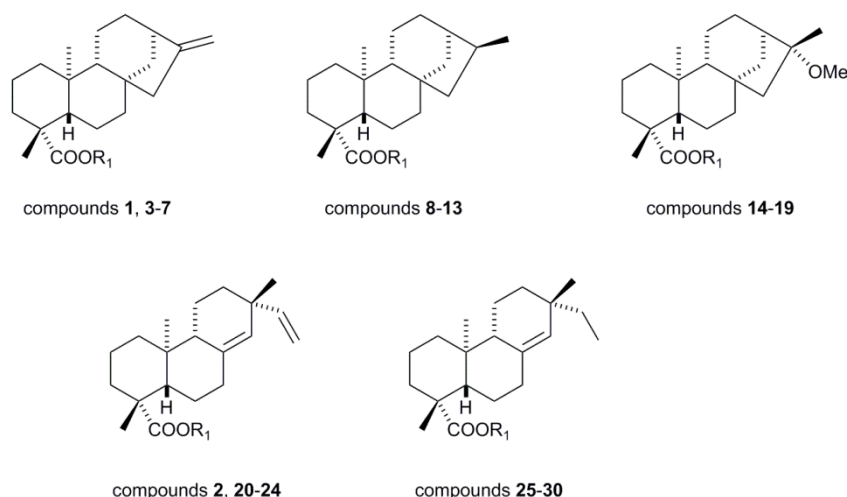


Figure S1. Generic structures for all compounds in this work.

Spectroscopic data for all compounds

Compound **1** (*ent*-16-kahren-19-oic acid)/(*ent*-kaur-16-en-18-oic acid)/(*ent*-kaur-16-en-oic acid)

¹H NMR (500 MHz, CDCl₃) δ 4.80 (dddd, 1H, *J* 0.9, 1.5, 2.2, 2.6 Hz), 4.74 (dddd, 1H, *J* 0.9, 1.5, 2.2, 2.6 Hz), 2.64 (dddt, 1H, *J* 0.9, 0.9, 1.9, 4.4, 5.0 Hz), 2.16 (m, 1H), 2.08 (dq, 1H, *J* 1.7, 2.2, 2.2, 16.8 Hz), 2.03 (dt, 1H, *J* 2.6, 2.6, 16.8 Hz), 1.99 (dd, 1H, *J* 1.9, 11.4 Hz), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.16 (s, 3H), 1.13 (ddt, 1H, *J* 5.0, 11.4 Hz), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.82 (s, 3H), 0.78 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 184.6, 155.9, 103.0, 57.0, 55.1, 48.9, 44.2, 43.8, 43.7, 41.2, 40.7, 39.7, 39.6, 37.8, 33.1, 28.9, 21.8, 19.1, 18.4, 15.6.

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Compound 2 (*ent*-pimara-8(14),15-dien-19-oic acid)

^1H NMR (300 MHz, CDCl_3) δ 5.72 (dd, 1H, J 10.6, 17.1 Hz), 5.15 (m, 1H), 4.95 (dd, 1H, J 2.0, 10.6 Hz), 4.92 (dd, 1H, J 2.0, 17.1 Hz), 2.35 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 1.99 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.95 (m, 1H), 1.91 (m, 1H), 1.89 (m, 1H), 1.71 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.69 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.27 (s, 3H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.01 (s, 3H), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.66 (s, 3H); ^{13}C NMR (75 MHz, CDCl_3) δ 184.6, 147.1, 137.9, 128.0, 112.9, 56.1, 50.5, 44.0, 39.2, 38.5, 38.47, 37.9, 36.4, 35.8, 29.3, 29.2, 24.1, 19.6, 19.2, 13.8.

Compound 3 (*ent*-16-kauren-19-oic acid butyl ester)

^1H NMR (500 MHz, CDCl_3) δ 4.79 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 4.73 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 4.07 (dt, 1H, J 6.6, 10.8 Hz), 4.00 (dt, 1H, J 6.6, 10.8 Hz), 2.63 (dddt, 1H, J 0.9, 0.9, 1.9, 4.4, 5.0 Hz), 2.17 (m, 1H), 2.06 (dq, 1H, J 1.7, 2.2, 2.2, 16.8 Hz), 2.01 (dt, 1H, J 2.6, 2.6, 16.8 Hz), 1.96 (dd, 1H, J 1.9, 11.4 Hz), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.65 (m, 2H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (sext, 2H, J 7.4, 7.4 Hz), 1.40 (m, 1H), 1.17 (s, 3H), 1.10 (ddt, 1H, J 5.0, 11.4 Hz), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.95 (t, 3H, J 7.4 Hz), 0.85 (s, 3H), 0.78 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.7, 156.0, 102.9, 63.9, 57.1, 55.1, 49.0, 44.2, 43.8, 41.4, 40.8, 39.6, 39.5, 38.1, 33.1, 30.6, 29.7, 28.9, 21.9, 19.4, 19.2, 18.4, 15.6, 13.7.

Compound 4 (*ent*-16-kauren-19-oic acid benzyl ester)

^1H NMR (500 MHz, CDCl_3) δ 7.40-7.28 (m, 5H), 5.14 (d, 1H, J 12.4 Hz), 5.04 (d, 1H, J 12.4 Hz), 4.79 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 4.73 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 2.61 (dddt, 1H, J 0.9, 0.9, 2.0, 4.4, 5.0 Hz), 2.17 (m, 1H), 2.06 (dq, 1H, J 2.2, 2.2, 2.2, 16.8 Hz), 2.00 (dt, 1H, J 2.6, 2.6, 16.8 Hz), 1.92 (dd, 1H, J 2.0, 11.4 Hz), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.19 (s, 3H), 1.09 (ddt, 1H, J 5.0, 11.4 Hz), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.78 (s, 3H), 0.74 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.3, 155.9, 136.2, 128.4, 128.2, 128.0, 102.9, 65.9, 57.2, 55.0, 48.9, 44.2, 43.9, 43.8, 41.3, 40.7, 39.6, 39.5, 38.1, 33.1, 28.9, 21.9, 19.2, 18.4, 15.6.

Compound 5 (*ent*-16-kauren-19-oic acid *p*-chlorobenzyl ester)

^1H NMR (500 MHz, CDCl_3) δ 7.34 (m, 2H), 7.30 (m, 2H), 5.11 (d, 1H, J 12.4 Hz), 5.00 (d, 1H, J 12.4 Hz), 4.79 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 4.73 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 2.63 (dddt, 1H, J 0.9, 0.9, 1.9, 4.4, 5.0 Hz), 2.17 (m, 1H), 2.06 (dq, 1H, J 1.7, 2.2, 2.2, 16.8 Hz), 2.01 (dt, 1H, J 2.6, 2.6, 16.8 Hz), 1.88 (dd, 1H, J 1.9, 11.4 Hz), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.18 (s, 3H), 1.10 (ddt, 1H, J 5.0, 11.4 Hz), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.77 (s, 3H), 0.74 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.2, 155.9, 134.7, 129.6, 128.7, 103.0, 65.1, 57.1, 55.0, 48.9, 44.2, 43.9, 43.8, 41.3, 40.7, 39.6, 39.5, 38.1, 33.0, 29.7, 28.8, 21.9, 19.1, 18.4, 15.6.

Compound 6 (*ent*-16-kauren-19-oic acid *p*-bromobenzyl ester)

^1H NMR (400 MHz, CDCl_3) δ 7.49 (m, 2H), 7.24 (m, 2H), 5.09 (d, 1H, J 12.6 Hz), 4.98 (d, 1H, J 12.6 Hz), 4.79 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 4.73 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 2.63 (dddt, 1H, J 0.9, 0.9, 1.9, 4.4,

5.0 Hz), 2.18 (m, 1H), 2.07 (dq, 1H, J 1.7, 2.2, 2.2, 16.8 Hz), 2.01 (dt, 1H, J 2.6, 2.6, 16.8 Hz), 1.88 (dd, 1H, J 1.9, 11.4 Hz), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.18 (s, 3H), 1.10 (ddt, 1H, J 5.0, 11.4 Hz), 1.05 (m, 1H), 1.03 (m, 1H), 0.99 (m, 1H), 0.78 (m, 1H), 0.77 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 177.5, 156.1, 135.5, 131.9, 130.2, 122.3, 103.2, 65.4, 57.4, 55.3, 49.2, 44.2, 44.0, 41.5, 40.9, 39.8, 39.7, 38.3, 33.3, 29.9, 29.1, 22.2, 19.4, 18.6, 15.9.

Compound 7 (*ent*-16-kauren-19-oic acid methyl ester)

^1H NMR (500 MHz, CDCl_3) δ 4.79 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 4.73 (dddd, 1H, J 0.9, 1.5, 2.2, 2.6 Hz), 3.64 (s, 3H), 2.63 (dddt, 1H, J 0.9, 0.9, 1.9, 4.4, 5.0 Hz), 2.17 (m, 1H), 2.08 (dq, 1H, J 1.7, 2.2, 2.2, 16.8 Hz), 2.05 (dt, 1H, J 2.6, 2.6, 16.8 Hz), 1.96 (dd, 1H, J 1.9, 11.4 Hz), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.16 (s, 3H), 1.13 (ddt, 1H, J 5.0, 11.4 Hz), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.82 (s, 3H), 0.78 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 178.0, 155.8, 102.9, 56.9, 55.0, 51.0, 48.8, 44.1, 43.8, 43.7, 41.2, 40.6, 39.5, 39.3, 38.0, 33.0, 28.6, 21.8, 19.0, 18.3, 15.3.

Compound 8 (*ent*-kauran-19-oic acid)

^1H NMR (500 MHz, CDCl_3) δ 2.14 (m, 1H), 2.02 (m, 1H), 1.96 (m, 1H), 1.90 (m, 1H), 1.88 (m, 1H), 1.84 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.62 (m, 1H), 1.60 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.23 (s, 3H), 1.05 (m, 1H), 1.03 (m, 1H), 1.00 (d, 3H, J 7.1 Hz), 0.96 (m, 1H), 0.93 (m, 1H), 0.91 (m, 1H), 0.94 (s, 3H), 0.80 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 178.2, 57.1, 56.6, 48.7, 44.8, 43.8, 42.2, 40.8, 40.7, 40.0, 39.4, 38.2, 34.4, 28.7, 25.9, 22.2, 19.2, 19.0, 15.8, 15.4.

Compound 9 (*ent*-kauran-19-oic acid butyl ester)

^1H NMR (500 MHz, CDCl_3) δ 4.07 (dt, 1H, J 6.6, 10.8 Hz), 4.00 (dt, 1H, J 6.6, 10.8 Hz), 2.14 (m, 1H), 2.06 (dq, 1H, J 1.7, 2.2, 2.2, 16.8 Hz), 2.01 (dt, 1H, J 2.6, 2.6, 16.8 Hz), 2.02 (m, 1H), 1.96 (m, 1H), 1.90 (m, 1H), 1.88 (m, 1H), 1.84 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.62 (m, 1H), 1.60 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (sext, 2H, J 7.4, 7.4 Hz), 1.42 (m, 1H), 1.23 (s, 3H), 1.05 (m, 1H), 1.03 (m, 1H), 1.00 (d, 3H, J 7.1 Hz), 0.96 (m, 1H), 0.95 (t, 3H, J 7.4 Hz), 0.93 (m, 1H), 0.91 (m, 1H), 0.94 (s, 3H), 0.80 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.9, 63.9, 57.2, 56.6, 48.8, 44.9, 43.9, 42.3, 40.9, 40.7, 40.1, 39.5, 38.2, 34.4, 30.6, 28.9, 25.9, 22.2, 19.5, 19.2, 19.0, 15.8, 15.6, 13.7.

Compound 10 (*ent*-kauran-19-oic acid benzyl ester)

^1H NMR (500 MHz, CDCl_3) δ 7.40-7.27 (m, 5H), 5.14 (d, 1H, J 12.5 Hz), 5.04 (d, 1H, J 12.5 Hz), 2.17 (m, 1H), 2.02 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.80 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.60 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.18 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.99 (d, 3H, J 7.1 Hz), 0.96 (m, 1H), 0.91 (m, 1H), 0.77 (s, 3H), 0.74 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.4, 136.3, 128.4, 128.2, 128.0, 65.9, 57.3, 56.5, 48.7, 44.8, 44.0, 42.2, 40.8, 40.7, 40.0, 39.5, 38.2, 34.4, 28.9, 25.9, 22.2, 19.2, 19.0, 15.6, 15.5.

Compound 11 (*ent*-kauran-19-oic acid *p*-chlorobenzyl ester)

^1H NMR (400 MHz, CDCl_3) δ 7.36-7.28 (m, 4H), 5.10 (d, 1H, J 12.4 Hz), 4.99 (d, 1H, J 12.4 Hz), 2.17 (m, 1H), 2.00 (m, 1H), 1.96 (m, 1H), 1.90 (m, 1H), 1.88 (m, 1H), 1.84 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.62 (m, 1H), 1.60 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.17 (s, 3H), 1.05 (m, 1H), 1.03 (m, 1H), 0.99 (d, 3H, J 7.1 Hz), 0.96 (m, 1H), 0.93 (m, 1H), 0.91 (m, 1H), 0.80 (m, 1H), 0.77 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 177.3, 134.8, 133.9, 129.7, 128.7, 65.1, 57.3, 56.5, 48.7, 44.8, 44.0, 42.2, 40.8, 40.7, 40.0, 39.5, 38.2, 34.4, 28.9, 25.9, 22.3, 19.2, 19.0, 15.8, 15.6.

Compound 12 (*ent*-kauran-19-oic acid *p*-bromobenzyl ester)

^1H NMR (500 MHz, CDCl_3) δ 7.40-7.27 (m, 4H), 5.14 (d, 1H, J 12.5 Hz), 5.04 (d, 1H, J 12.5 Hz), 2.17 (m, 1H), 2.02 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.80 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.60 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.18 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.99 (d, 3H, J 7.1 Hz), 0.96 (m, 1H), 0.91 (m, 1H), 0.77 (s, 3H), 0.74 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.3, 135.3, 131.6, 129.9, 122.0, 65.1, 57.2, 56.5, 48.7, 44.8, 44.0, 42.2, 40.8, 40.7, 40.0, 39.5, 38.1, 34.4, 28.9, 25.9, 22.3, 19.1, 18.9, 15.8, 15.6.

Compound 13 (*ent*-kauran-19-oic acid methyl ester)

^1H NMR (500 MHz, CDCl_3) δ 3.64 (s, 3H), 2.17 (m, 1H), 2.02 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.60 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.18 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.99 (d, 3H, J 7.1 Hz), 0.96 (m, 1H), 0.91 (m, 1H), 0.77 (s, 3H), 0.74 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 178.2, 57.1, 56.6, 51.1, 48.7, 44.8, 43.8, 42.2, 40.8, 40.7, 40.0, 39.4, 38.2, 34.4, 28.7, 25.9, 22.2, 19.2, 19.0, 15.8, 15.4.

Compound 14 (*ent*-16-methoxykauran-19-oic acid)

^1H NMR (500 MHz, CDCl_3) δ 3.12 (s, 3H), 2.17 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.27 (s, 3H), 1.16 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.82 (s, 3H), 0.78 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 178.3, 84.1, 57.2, 56.2, 54.8, 49.4, 44.9, 44.0, 43.5, 42.3, 40.9, 39.7, 38.3, 37.3, 28.9, 26.9, 22.3, 19.3, 18.7, 18.5, 15.5.

Compound 15 (*ent*-16-methoxykauran-19-oic acid butyl ester)

^1H NMR (500 MHz, CDCl_3) δ 4.06 (dt, 1H, J 6.6, 10.8 Hz), 4.00 (dt, 1H, J 6.6, 10.8 Hz), 3.12 (s, 3H), 2.17 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 2H), 1.60 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (sext, 2H, J 7.4, 7.4 Hz), 1.40 (m, 1H), 1.27 (s, 3H), 1.17 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.95 (t, 3H, J 7.4 Hz), 0.85 (s, 3H), 0.78 (m, 1H); ^{13}C NMR (125 MHz, CDCl_3) δ 177.7, 83.9, 63.9, 57.0, 56.0, 54.5, 49.1, 44.7, 43.8, 43.3, 42.1, 40.8, 39.5, 38.1, 37.1, 30.6, 28.9, 26.6, 22.1, 19.5, 19.1, 18.4, 18.2, 15.5, 13.7.

Compound 16 (*ent*-16-methoxykauran-19-oic acid benzyl ester)

^1H NMR (500 MHz, CDCl_3) δ 7.40-7.27 (m, 5H), 5.14 (d, 1H, J 12.5 Hz), 5.04 (d, 1H, J 12.5 Hz), 3.12 (s, 3H), 2.17 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.27 (s, 3H), 1.16 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.82 (s, 3H), 0.78 (m,

1H); ¹³C NMR (125 MHz, CDCl₃) δ 177.3, 136.2, 128.4, 128.2, 128.0, 83.9, 65.9, 57.1, 56.0, 54.5, 49.1, 44.7, 43.9, 43.3, 42.1, 40.7, 39.5, 38.1, 37.0, 28.8, 26.6, 22.1, 19.1, 18.4, 18.2, 15.5.

Compound 17 (*ent*-16-methoxykauran-19-oic acid *p*-chlorobenzyl ester)

¹H NMR (500 MHz, CDCl₃) δ 7.49 (m, 2H), 7.24 (m, 2H), 5.07 (d, 1H, *J* 12.5 Hz), 4.99 (d, 1H, *J* 12.5 Hz), 3.12 (s, 3H), 2.17 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.27 (s, 3H), 1.18 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.77 (s, 3H), 0.74 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 177.1, 131.7, 130.0, 129.7, 128.7, 83.9, 65.1, 57.1, 55.9, 54.6, 49.1, 44.7, 43.9, 43.3, 42.1, 40.7, 39.5, 38.1, 37.0, 28.8, 26.6, 22.1, 19.1, 18.4, 18.2, 15.5.

Compound 18 (*ent*-16-methoxykauran-19-oic acid *p*-bromobenzyl ester)

¹H NMR (500 MHz, CDCl₃) δ 7.49 (m, 2H), 7.24 (m, 2H), 5.07 (d, 1H, *J* 12.5 Hz), 4.99 (d, 1H, *J* 12.5 Hz), 3.12 (s, 3H), 2.17 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.27 (s, 3H), 1.18 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.77 (s, 3H), 0.74 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 177.1, 135.1, 131.6, 130.0, 122.1, 83.9, 65.2, 57.0, 55.9, 54.5, 49.1, 44.7, 43.9, 43.3, 42.1, 40.6, 39.5, 38.1, 37.0, 28.8, 26.6, 22.2, 19.1, 18.4, 18.2, 15.5.

Compound 19 (*ent*-16-methoxykauran-19-oic acid methyl ester)

¹H NMR (500 MHz, CDCl₃) δ 3.64 (s, 3H), 3.12 (s, 3H), 2.17 (m, 1H), 1.87 (m, 1H), 1.85 (m, 1H), 1.82 (m, 1H), 1.76 (m, 1H), 1.63 (m, 1H), 1.58 (m, 2H), 1.52 (m, 2H), 1.50 (m, 1H), 1.42 (m, 1H), 1.27 (s, 3H), 1.16 (s, 3H), 1.06 (m, 1H), 1.03 (m, 1H), 0.98 (m, 1H), 0.82 (s, 3H), 0.78 (m, 1H); ¹³C NMR (125 MHz, CDCl₃) δ 178.1, 83.9, 57.0, 56.0, 54.6, 51.1, 49.1, 44.7, 43.8, 43.3, 42.1, 40.7, 39.5, 38.1, 37.1, 28.7, 26.6, 22.1, 19.1, 18.4, 18.2, 15.3.

Compound 20 (*ent*-pimara-8(14),15-dien-19-oic acid butyl ester)

¹H NMR (400 MHz, CDCl₃) δ 5.71 (dd, 1H, *J* 10.5, 17.2 Hz), 5.14 (m, 1H), 4.94 (dd, 1H, *J* 2.0, 10.5 Hz), 4.91 (dd, 1H, *J* 2.0, 17.2 Hz), 4.06 (dt, 1H, *J* 6.6, 10.8 Hz), 4.00 (dt, 1H, *J* 6.6, 10.8 Hz), 2.33 (ddd, 1H, *J* 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, *J* 1.7, 2.9, 3.0, 13.1 Hz), 1.99 (dddd, 1H, *J* 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.95 (m, 1H), 1.91 (m, 1H), 1.89 (m, 1H), 1.71 (dddd, 1H, *J* 1.7, 3.1, 3.3, 12.9 Hz), 1.69 (ddd, 1H, *J* 2.0, 5.8, 10.4 Hz), 1.63 (m, 2H), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.40 (sext, 2H, *J* 7.4, 7.4 Hz), 1.36 (m, 1H), 1.33 (m, 1H), 1.27 (s, 3H), 1.06 (ddd, 1H, *J* 4.0, 12.9, 13.5 Hz), 1.00 (s, 3H), 1.00 (ddd, 1H, *J* 3.8, 13.1, 13.6 Hz), 0.93 (t, 3H, *J* 7.4 Hz), 0.58 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 177.5, 147.3, 138.1, 127.9, 112.7, 64.0, 56.2, 50.5, 44.2, 39.3, 39.1, 38.5, 38.3, 36.5, 35.8, 30.6, 29.3, 29.1, 24.3, 19.7, 19.4, 19.2, 13.72, 13.68.

Compound 21 (*ent*-pimara-8(14),15-dien-19-oic acid benzyl ester)

¹H NMR (400 MHz, CDCl₃) δ 7.42-7.26 (m, 5H), 5.70 (dd, 1H, *J* 10.4, 17.0 Hz), 5.14 (d, 1H, *J* 12.5 Hz), 5.13 (m, 1H), 5.04 (d, 1H, *J* 12.5 Hz), 4.93 (dd, 1H, *J* 2.1, 10.4 Hz), 4.89 (dd, 1H, *J* 2.1, 17.0 Hz), 2.31 (ddd, 1H, *J* 2.2, 4.5, 13.1 Hz), 2.21 (dddd, 1H, *J* 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, *J* 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, *J* 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, *J* 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.22 (s, 3H), 1.06 (ddd, 1H, *J* 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, *J* 3.8, 13.1, 13.6 Hz), 0.99 (s, 3H), 0.52 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 177.2, 147.2, 138.0, 136.2,

128.4, 128.1, 128.0, 127.9, 112.8, 66.0, 56.2, 50.5, 44.2, 39.3, 38.5, 38.2, 37.9, 36.5, 35.8, 29.3, 29.1, 24.3, 19.7, 19.2, 13.7.

Compound 22 (*ent*-pimara-8(14),15-dien-19-oic acid *p*-chlorobenzyl ester)

^1H NMR (400 MHz, CDCl_3) δ 7.35–7.26 (m, 4H), 5.70 (dd, 1H, J 10.4, 17.3 Hz), 5.13 (m, 1H), 5.09 (d, 1H, J 12.5 Hz), 4.99 (d, 1H, J 12.5 Hz), 4.94 (dd, 1H, J 2.0, 10.4 Hz), 4.88 (dd, 1H, J 2.0, 17.3 Hz), 2.31 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.21 (s, 3H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.99 (s, 3H), 0.49 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 177.3, 147.2, 138.0, 134.7, 131.5, 129.7, 129.6, 128.0, 112.9, 65.2, 56.1, 50.5, 44.1, 39.3, 38.5, 38.47, 37.8, 36.5, 35.7, 29.4, 29.1, 24.2, 19.6, 19.2, 13.7.

Compound 23 (*ent*-pimara-8(14),15-dien-19-oic acid *p*-bromobenzyl ester)

^1H NMR (400 MHz, CDCl_3) δ 7.48 (m, 2H), 7.22 (m, 2H), 5.70 (dd, 1H, J 10.4, 17.0 Hz), 5.14 (m, 1H), 5.07 (d, 1H, J 12.5 Hz), 4.97 (d, 1H, J 12.5 Hz), 4.94 (dd, 1H, J 2.1, 10.4 Hz), 4.90 (dd, 1H, J 2.1, 17.0 Hz), 2.31 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.21 (s, 3H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.99 (s, 3H), 0.49 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 173.0, 147.2, 138.0, 133.4, 131.8, 131.6, 129.9, 128.0, 112.8, 65.2, 56.2, 50.4, 44.2, 39.2, 38.5, 38.47, 37.9, 36.4, 35.8, 29.3, 29.0, 24.3, 19.6, 19.2, 13.7.

Compound 24 (*ent*-pimara-8(14),15-dien-19-oic acid methyl ester)

^1H NMR (300 MHz, CDCl_3) δ 5.72 (dd, 1H, J 10.6, 17.1 Hz), 5.15 (m, 1H), 4.95 (dd, 1H, J 2.0, 10.6 Hz), 4.92 (dd, 1H, J 2.0, 17.1 Hz), 3.63 (s, 3H), 2.35 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 1.99 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.95 (m, 1H), 1.91 (m, 1H), 1.89 (m, 1H), 1.71 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.69 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.20 (s, 3H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.04 (ddd, 1H, J 3.8, 13.1, 13.5 Hz), 1.00 (s, 3H), 0.55 (s, 3H); ^{13}C NMR (75 MHz, CDCl_3) δ 184.6, 147.1, 137.9, 128.0, 112.9, 56.1, 51.5, 50.5, 44.0, 39.2, 38.5, 38.47, 37.9, 36.4, 35.8, 29.3, 29.2, 24.1, 19.6, 19.2, 13.8.

Compound 25 (*ent*-8(14)-pimaren-19-oic acid)

^1H NMR (400 MHz, CDCl_3) δ 5.21 (m, 1H), 2.25 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.17 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.25 (s, 3H), 1.24 (m, 2H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.85 (s, 3H), 0.81 (t, 3H, J 7.5 Hz), 0.68 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 183.5, 135.5, 131.5, 56.3, 49.9, 44.0, 39.3, 39.1, 38.1, 36.7, 34.0, 33.6, 33.3, 29.1, 27.2, 24.4, 19.7, 18.9, 13.8, 8.5.

Compound 26 (*ent*-8(14)-pimaren-19-oic acid butyl ester)

^1H NMR (400 MHz, CDCl_3) δ 5.21 (m, 1H), 4.06 (dt, 1H, J 6.6, 10.8 Hz), 4.00 (dt, 1H, J 6.6, 10.8 Hz), 2.25 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.17 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.63 (m, 2H), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.40 (sext, 2H, J 7.4, 7.4 Hz), 1.36 (m, 1H), 1.33 (m, 1H), 1.19 (s, 3H), 1.24 (m, 2H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.93 (t, 3H, J 7.5 Hz), 0.85 (s, 3H), 0.60 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 183.5, 135.5, 131.5, 56.3, 49.9, 44.0, 39.3, 39.1, 38.1, 36.7, 34.0, 33.6, 33.3, 29.1, 27.2, 24.4, 19.7, 18.9, 13.8, 8.5.

Compound 27 (*ent*-8(14)-pimaren-19-oic acid benzyl ester)

^1H NMR (400 MHz, CDCl_3) δ 7.39-7.28 (m, 5H), 5.19 (m, 1H), 5.15 (d, 1H, J 12.5 Hz), 5.01 (d, 1H, J 12.5 Hz), 2.24 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.20 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 1.97 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.94 (m, 1H), 1.89 (m, 1H), 1.87 (m, 1H), 1.70 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.65 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.52 (m, 1H), 1.50 (m, 1H), 1.42 (m, 1H), 1.40 (m, 1H), 1.33 (m, 1H), 1.30 (m, 1H), 1.22 (s, 3H), 1.21 (m, 2H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.84 (s, 3H), 0.80 (t, 3H, J 7.5 Hz), 0.55 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 177.3, 136.3, 135.5, 131.3, 128.4, 128.1, 127.9, 66.0, 56.4, 49.9, 44.3, 39.4, 39.0, 38.3, 36.8, 33.9, 33.6, 33.3, 29.1, 27.2, 24.6, 19.8, 18.9, 13.8, 8.5.

Compound 28 (*ent*-8(14)-pimaren-19-oic acid *p*-chlorobenzyl ester)

^1H NMR (400 MHz, CDCl_3) δ 7.35-7.26 (m, 4H), 5.19 (m, 1H), 5.10 (d, 1H, J 12.5 Hz), 4.99 (d, 1H, J 12.5 Hz), 2.24 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.24 (m, 2H), 1.20 (s, 3H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.84 (s, 3H), 0.80 (t, 3H, J 7.5 Hz), 0.53 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 177.2, 135.4, 134.7, 131.4, 129.7, 129.6, 128.7, 65.2, 56.4, 49.8, 44.3, 39.3, 39.0, 38.3, 36.7, 33.9, 33.6, 33.3, 29.0, 27.2, 24.6, 19.7, 18.9, 13.8, 8.5.

Compound 29 (*ent*-8(14)-pimaren-19-oic acid *p*-bromobenzyl ester)

^1H NMR (400 MHz, CDCl_3) δ 7.48 (m, 2H), 7.23 (m, 2H), 5.19 (m, 1H), 5.08 (d, 1H, J 12.5 Hz), 4.97 (d, 1H, J 12.5 Hz), 2.24 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43 (m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.24 (m, 2H), 1.20 (s, 3H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.84 (s, 3H), 0.80 (t, 3H, J 7.5 Hz), 0.53 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 177.3, 135.5, 131.6, 131.5, 130.0, 129.9, 65.2, 56.4, 49.8, 44.3, 39.3, 39.0, 38.3, 36.7, 33.9, 33.6, 33.3, 29.7, 29.0, 27.2, 24.6, 19.7, 18.9, 13.8, 8.5.

Compound 30 (*ent*-8(14)-pimaren-19-oic acid methyl ester)

^1H NMR (400 MHz, CDCl_3) δ 5.21 (m, 1H), 3.62 (s, 3H), 2.24 (ddd, 1H, J 2.2, 4.5, 13.1 Hz), 2.18 (dddd, 1H, J 1.7, 2.9, 3.0, 13.1 Hz), 2.02 (dddd, 1H, J 1.5, 2.3, 6.4, 13.1, 14.5 Hz), 1.96 (m, 1H), 1.92 (m, 1H), 1.91 (m, 1H), 1.73 (dddd, 1H, J 1.7, 3.1, 3.3, 12.9 Hz), 1.70 (ddd, 1H, J 2.0, 5.8, 10.4 Hz), 1.55 (m, 1H), 1.54 (m, 1H), 1.45 (m, 1H), 1.43

(m, 1H), 1.36 (m, 1H), 1.33 (m, 1H), 1.19 (s, 3H), 1.24 (m, 2H), 1.06 (ddd, 1H, J 4.0, 12.9, 13.5 Hz), 1.00 (ddd, 1H, J 3.8, 13.1, 13.6 Hz), 0.85 (s, 3H), 0.80 (t, 3H, J 7.5 Hz), 0.58 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 178.0, 135.7, 131.4, 56.3, 51.1, 49.9, 44.2, 39.4, 39.0, 38.3, 36.7, 34.0, 33.3, 28.9, 27.1, 24.6, 19.7, 19.6, 18.9, 13.6, 8.4.

^1H NMR spectra for all compounds

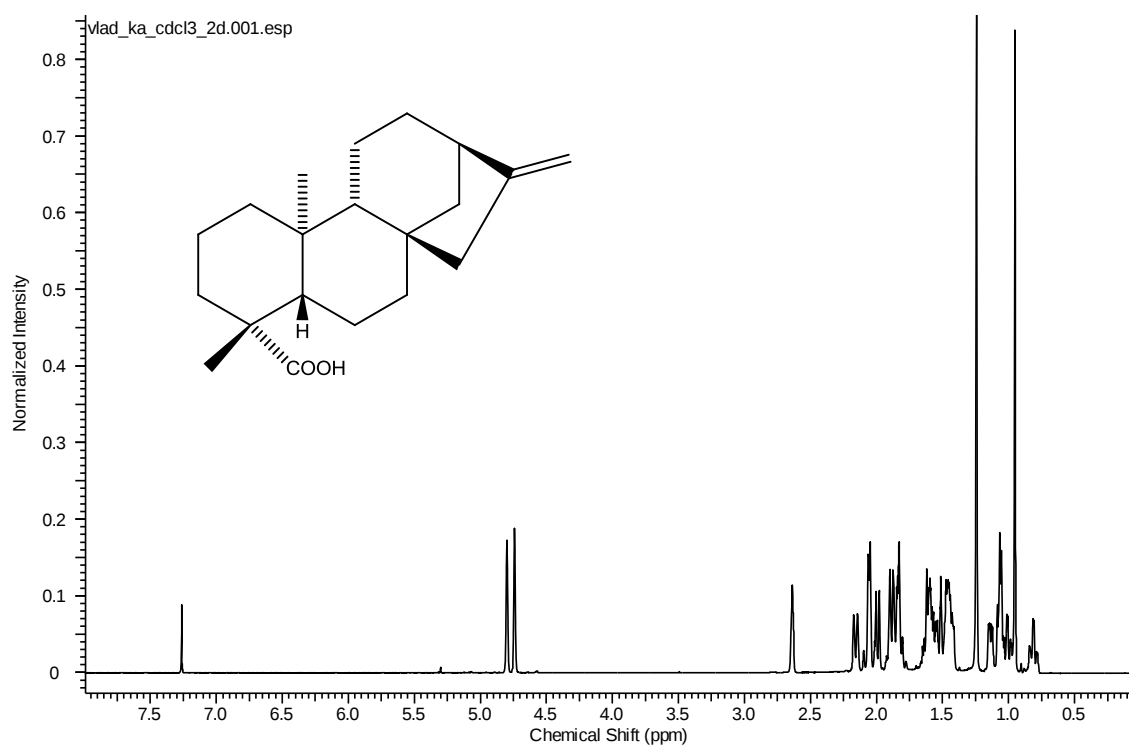


Figure S2. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-kauren-19-oic acid (compound 1).

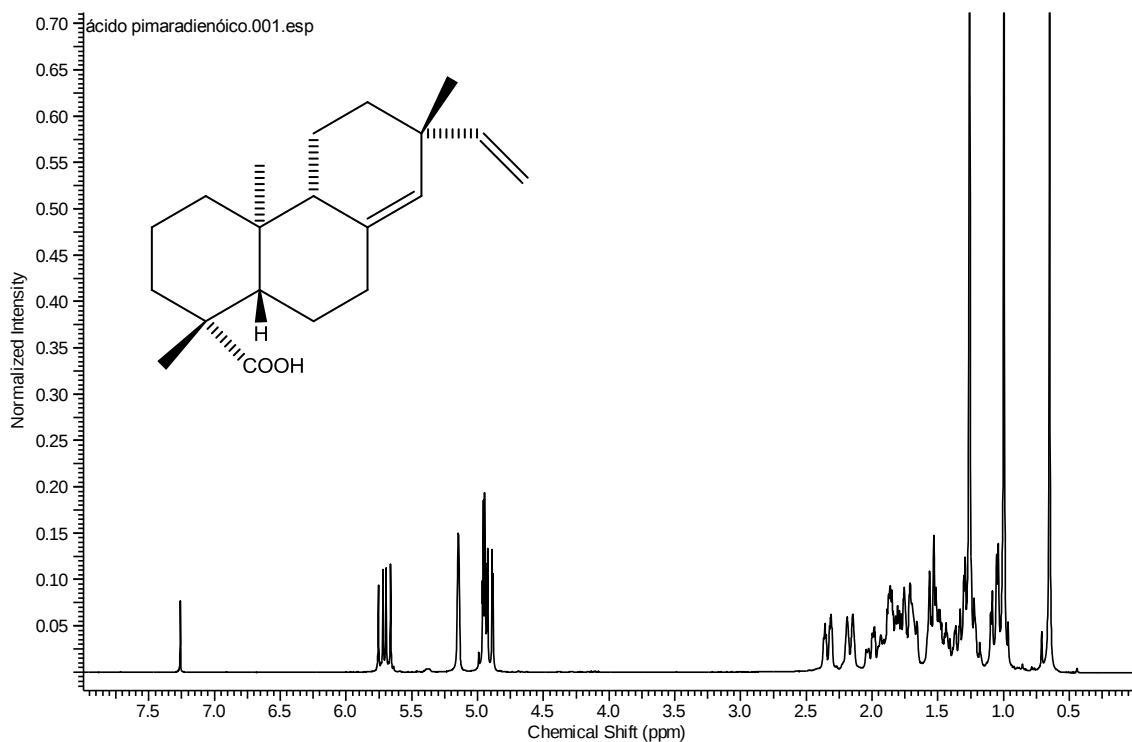


Figure S3. ^1H NMR spectrum (300 MHz, CDCl_3) of *ent*-pimara-8(14),15-dien-19-oic acid (compound **2**).

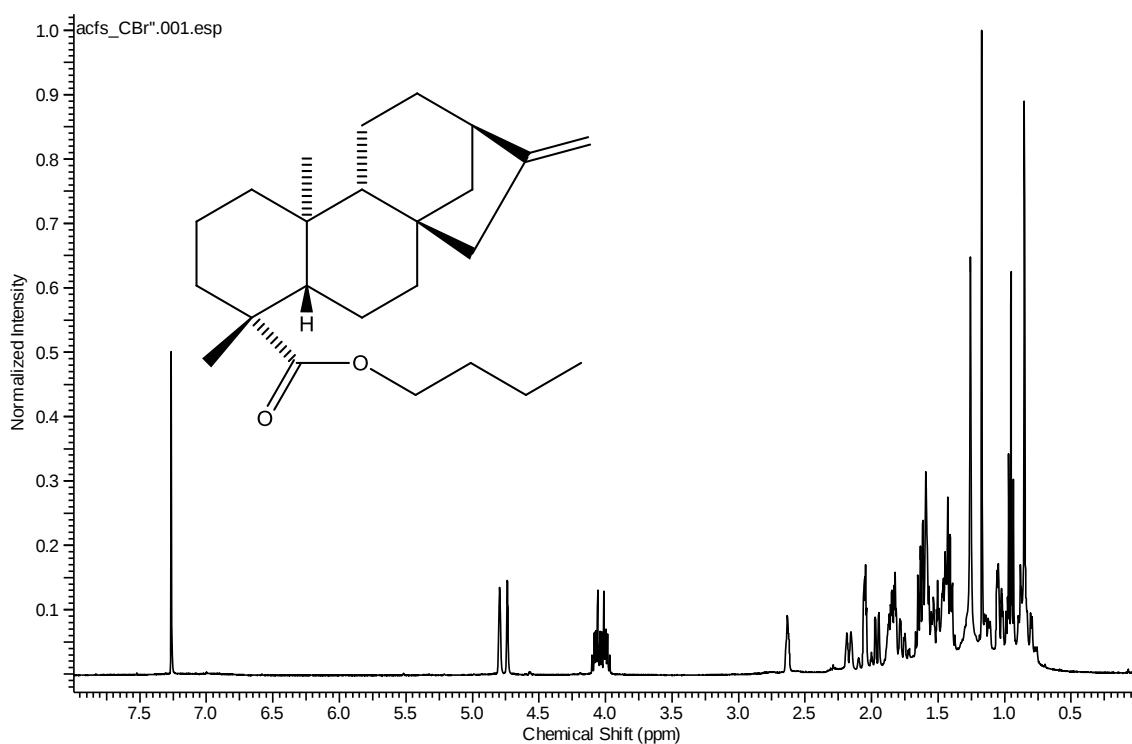


Figure S4. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-kauren-19-oic acid butyl ester (compound **3**).

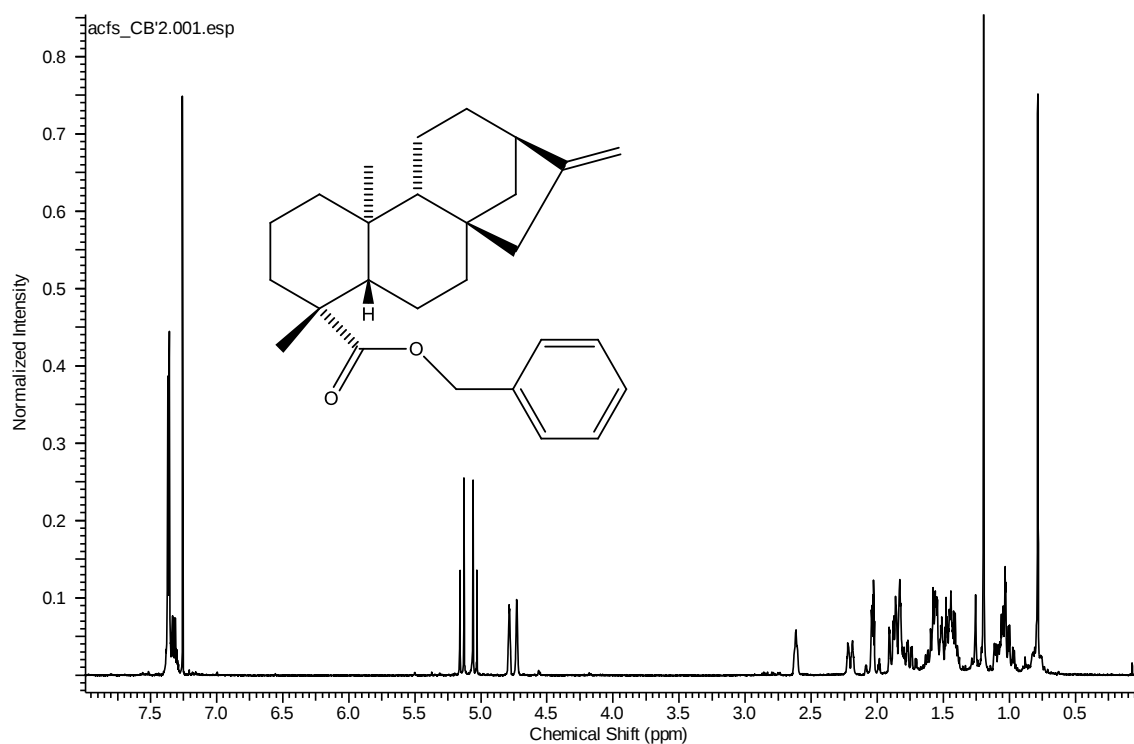


Figure S5. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-kauren-19-oic acid benzyl ester (compound 4).

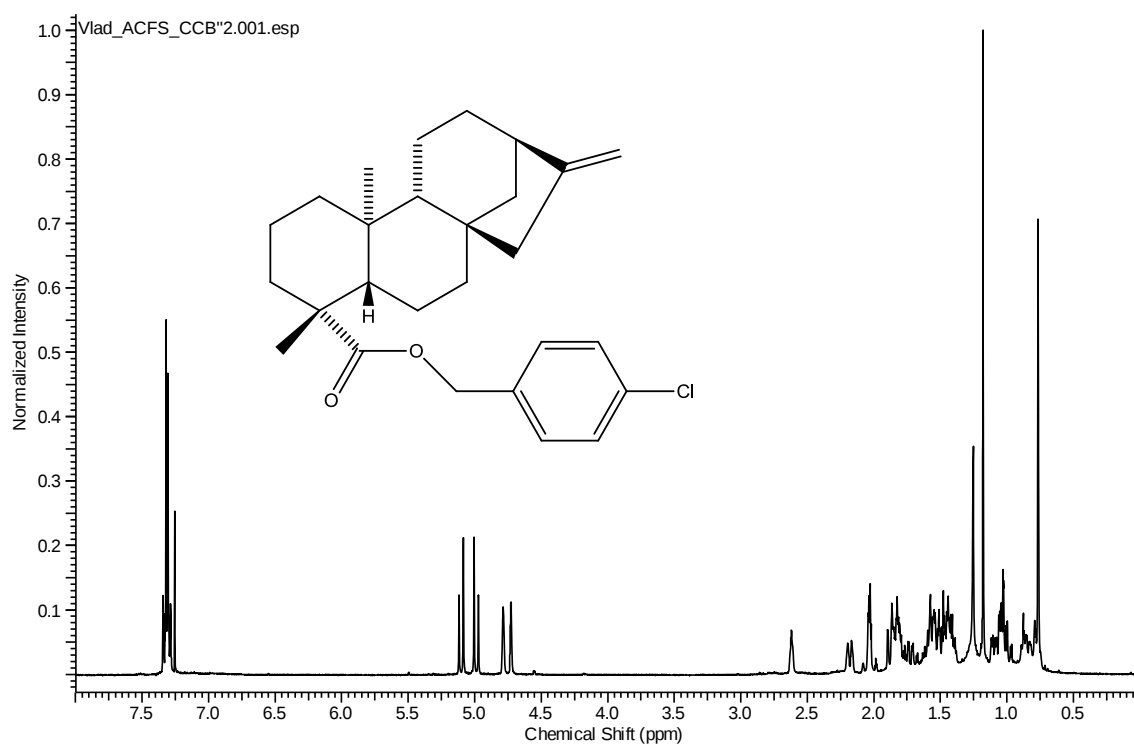


Figure S6. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-kauren-19-oic acid *p*-chlorobenzyl ester (compound 5).

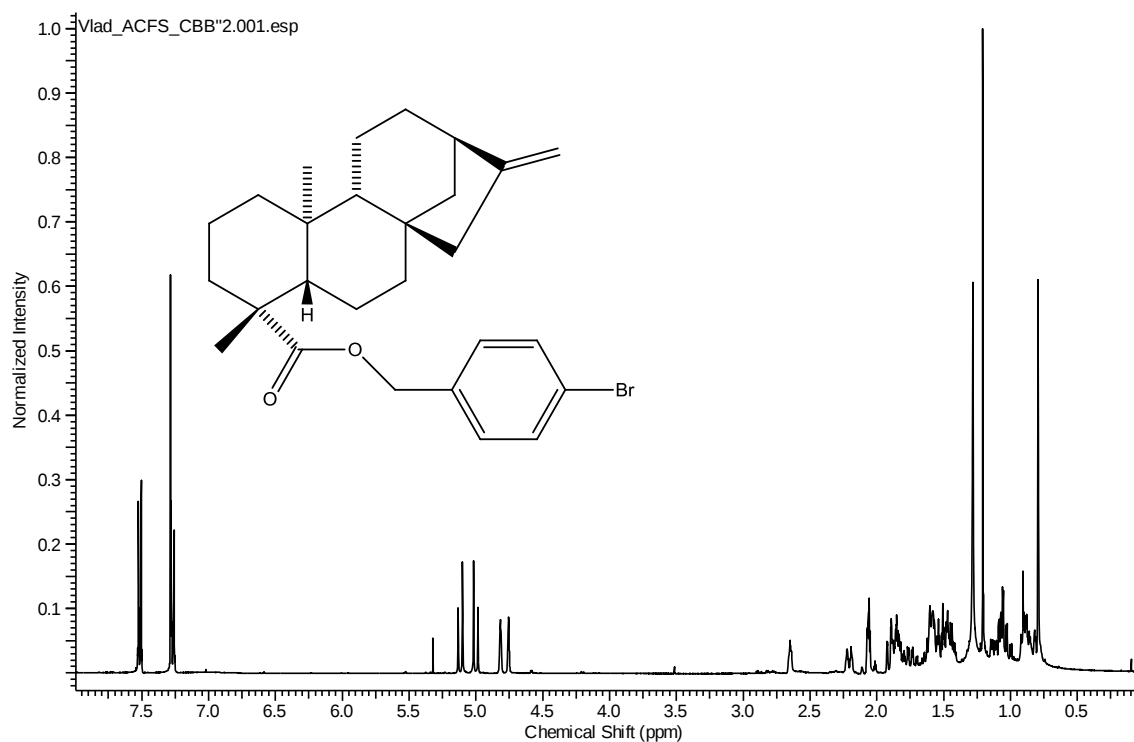


Figure S7. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-16-kauren-19-oic acid *p*-bromobenzyl ester (compound 6).

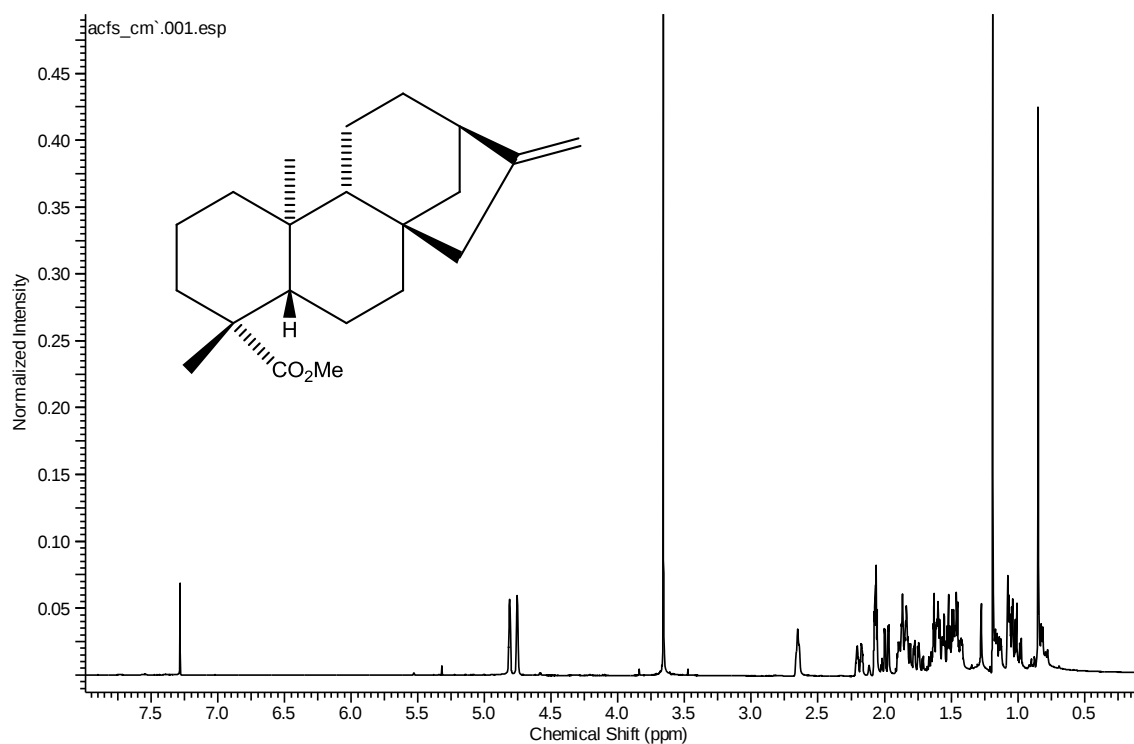


Figure S8. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-kauren-19-oic acid methyl ester (compound 7).

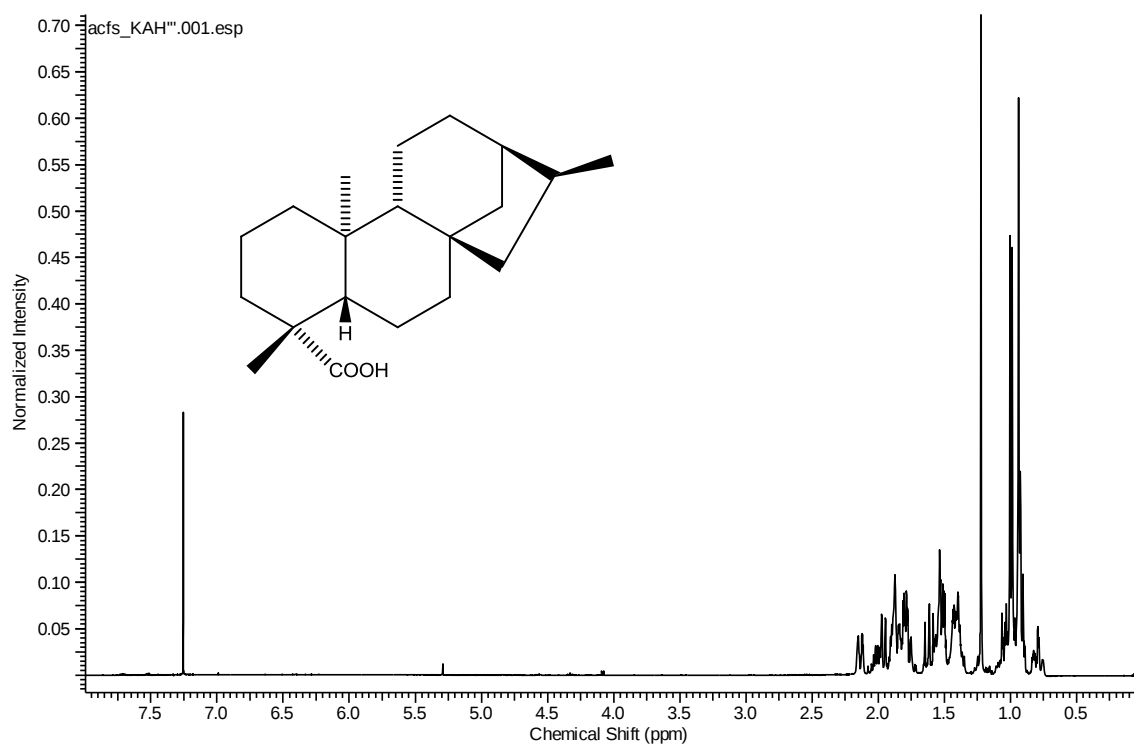


Figure S9. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-kauran-19-oic acid (compound 8).

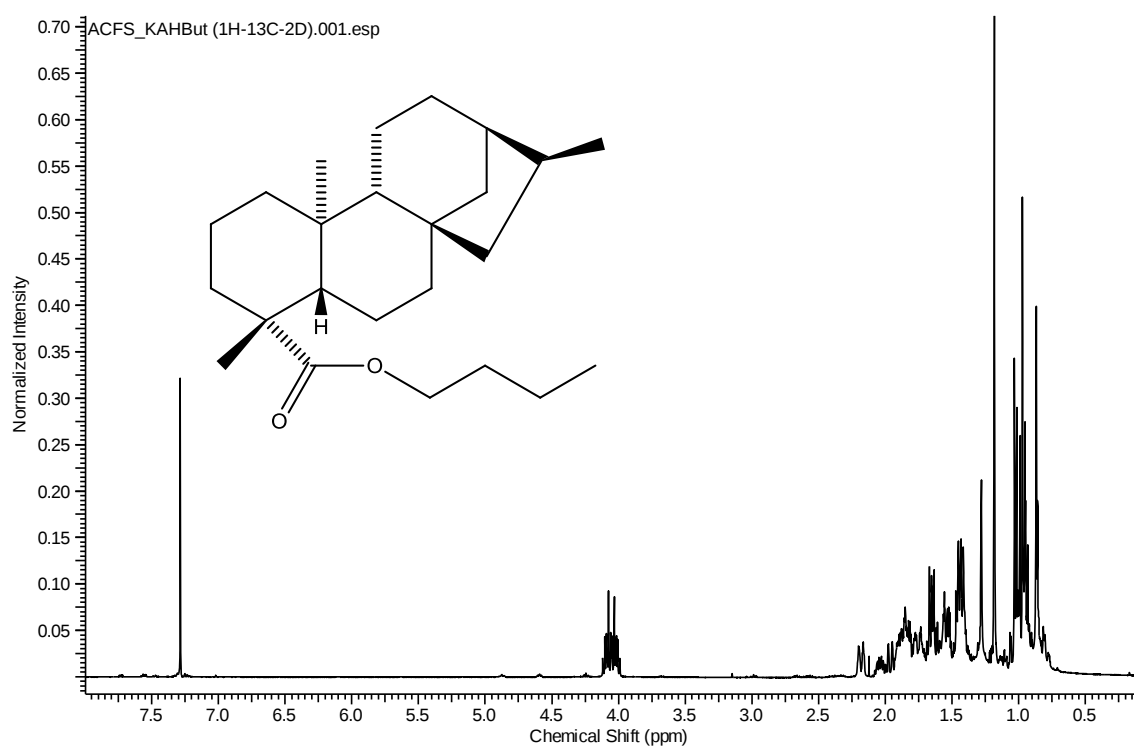


Figure S10. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-kauran-19-oic acid butyl ester (compound 9).

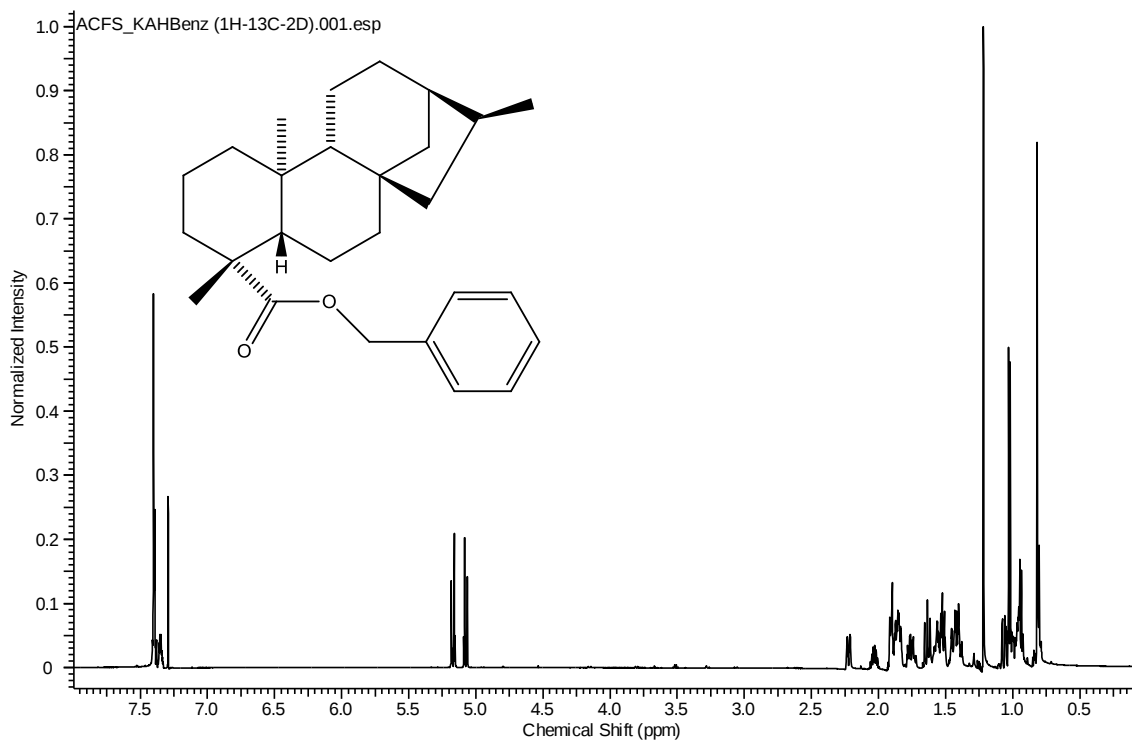


Figure S11. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-kauran-19-oic acid benzyl ester (compound 10).

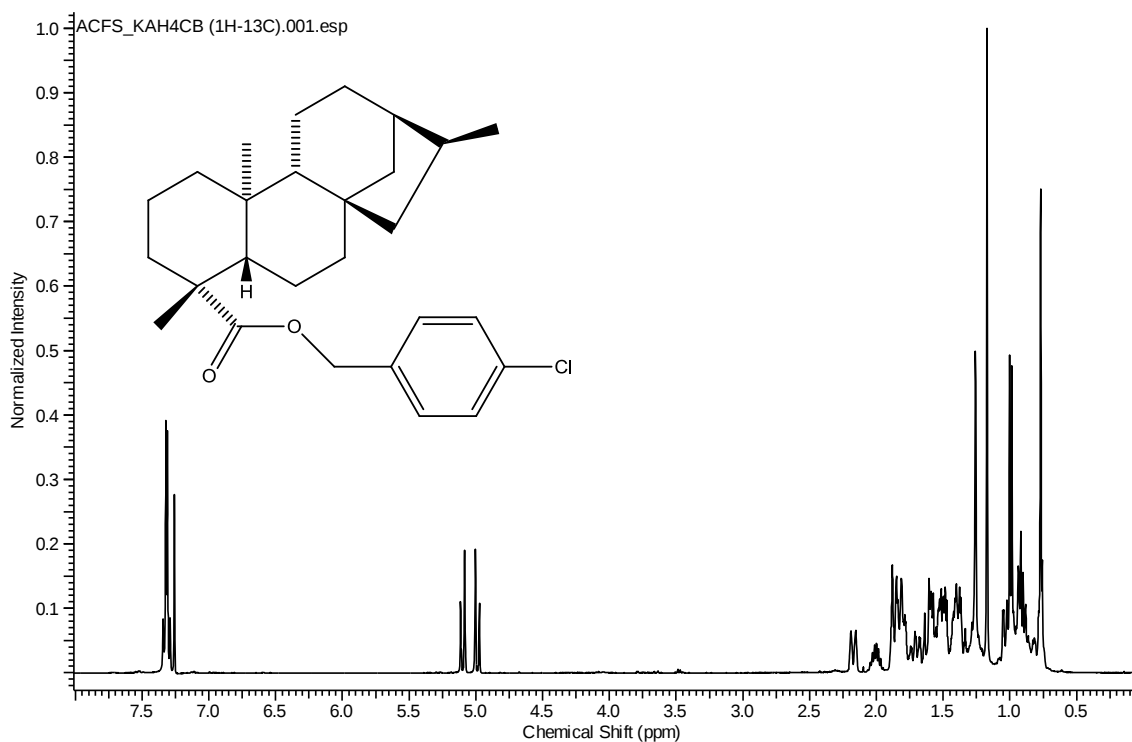


Figure S12. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-kauran-19-oic acid *p*-chlorobenzyl ester (compound 11).

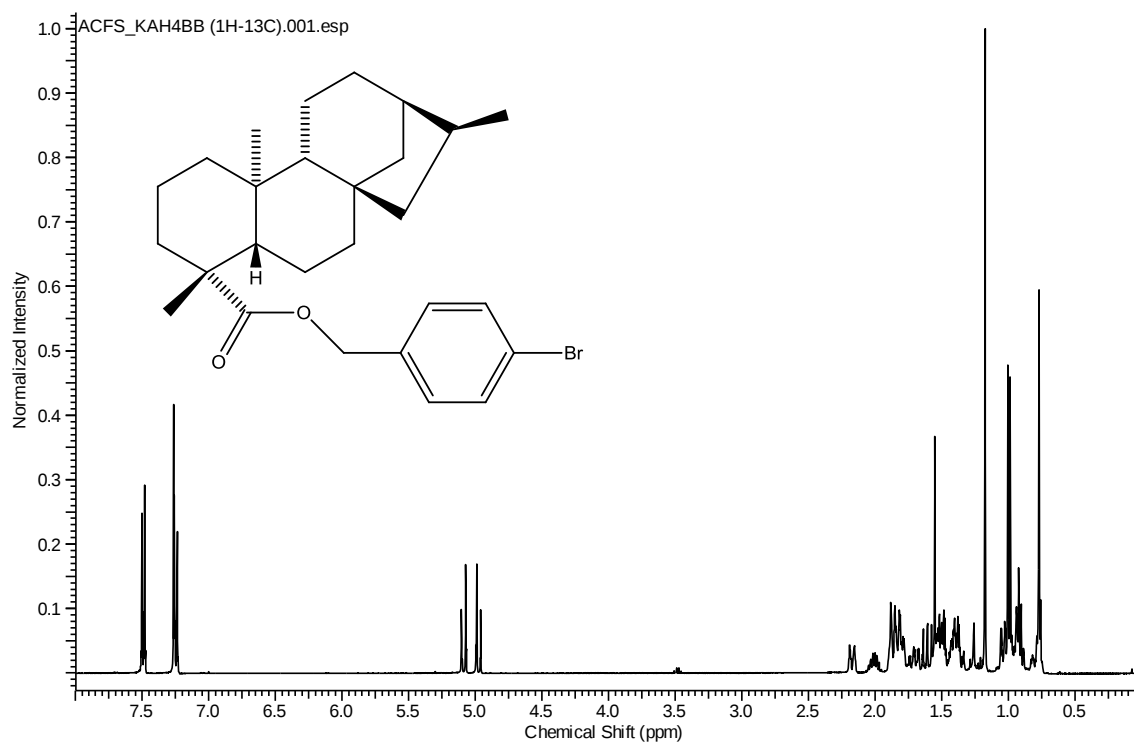


Figure S13. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-kauran-19-oic acid *p*-bromobenzyl ester (compound 12).

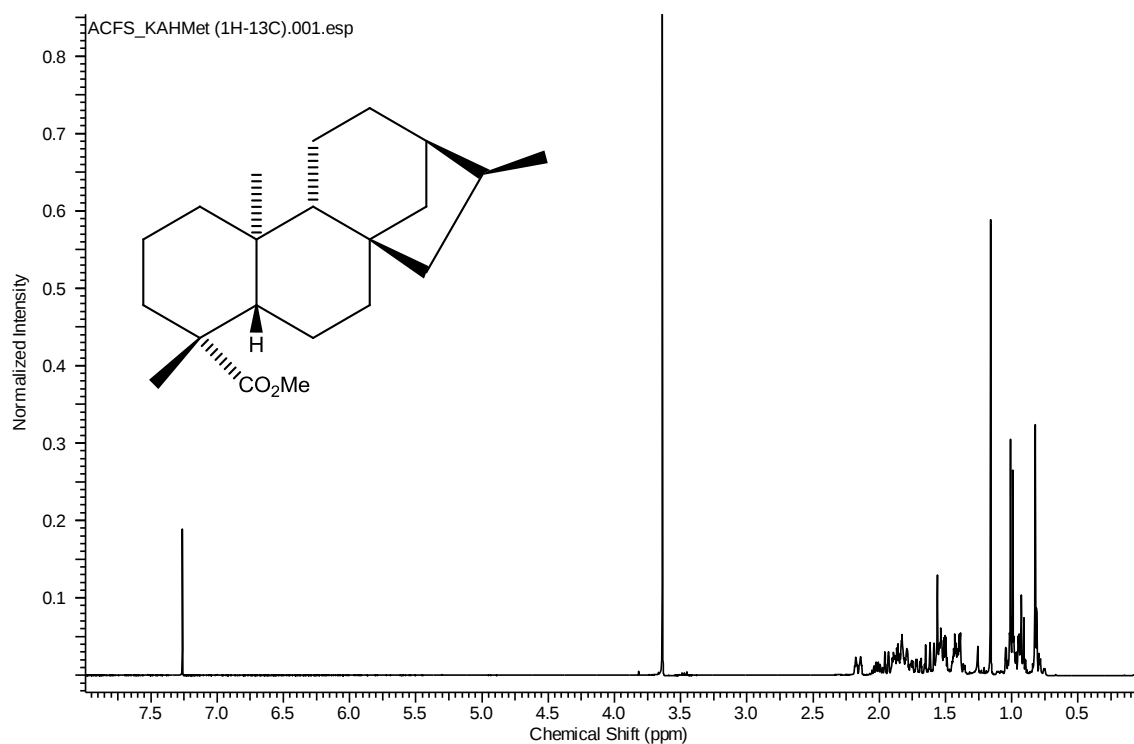


Figure S14. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-kauran-19-oic acid methyl ester (compound 13).

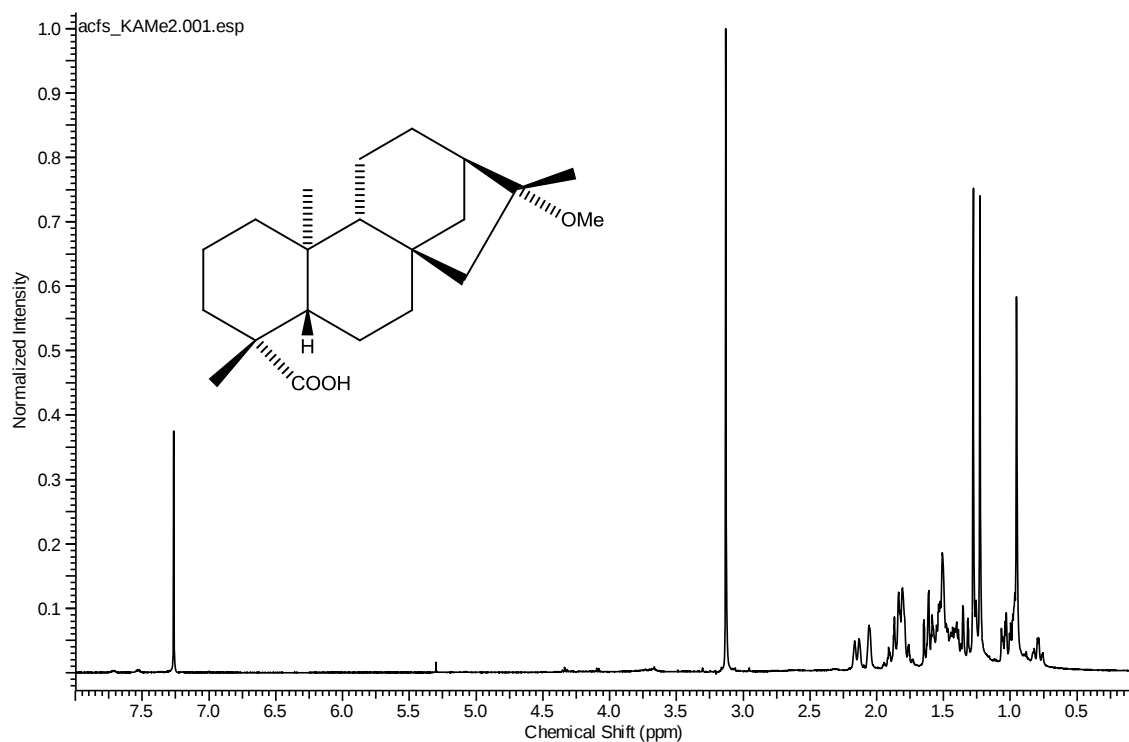


Figure S15. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-methoxykauran-19-oic acid (compound 14).

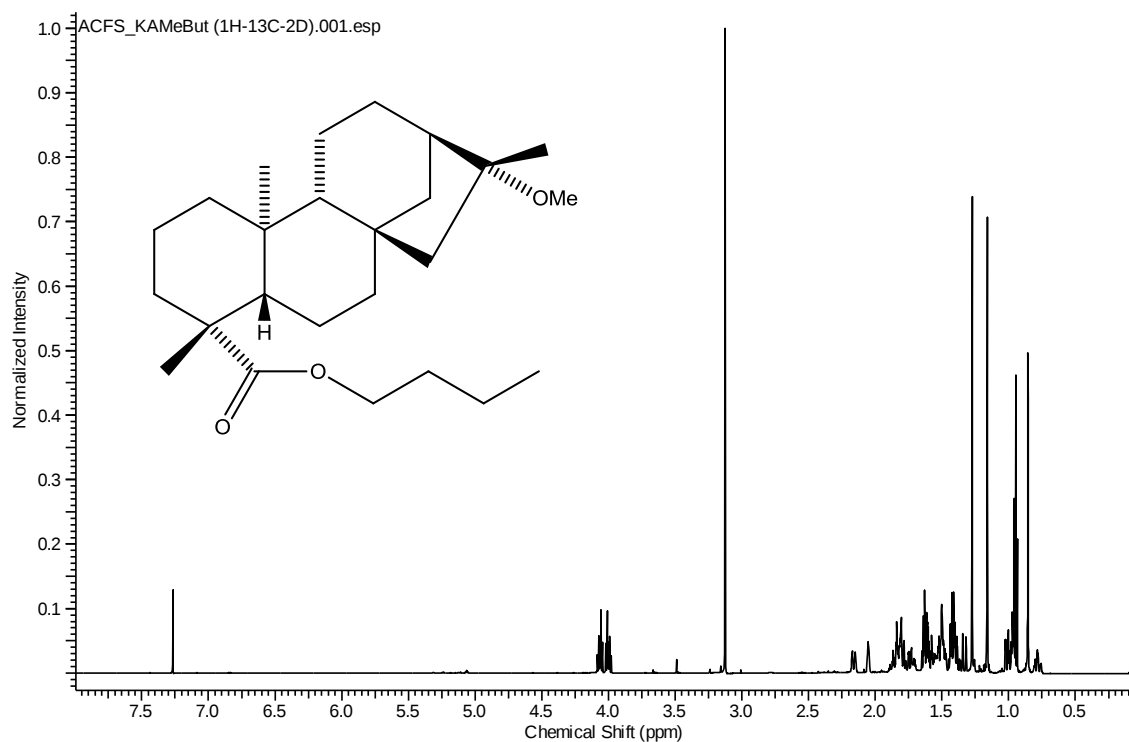


Figure S16. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-methoxykauran-19-oic acid butyl ester (compound 15).

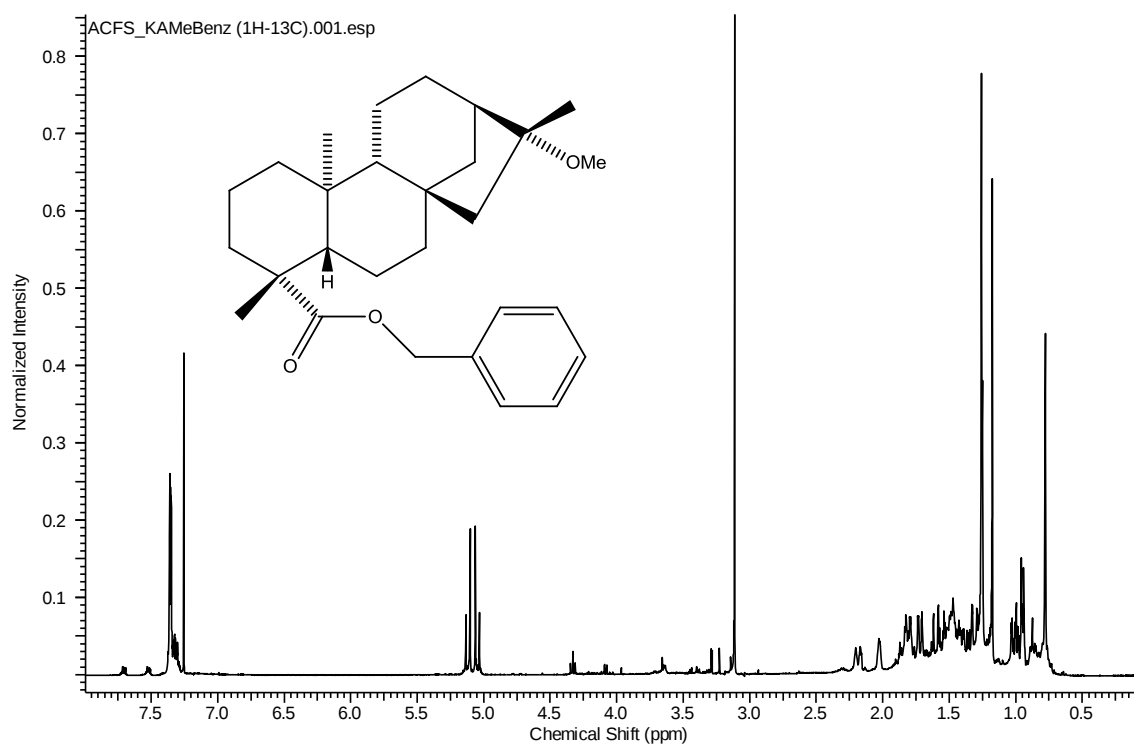


Figure S17. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-methoxykauran-19-oic acid benzyl ester (compound 16).

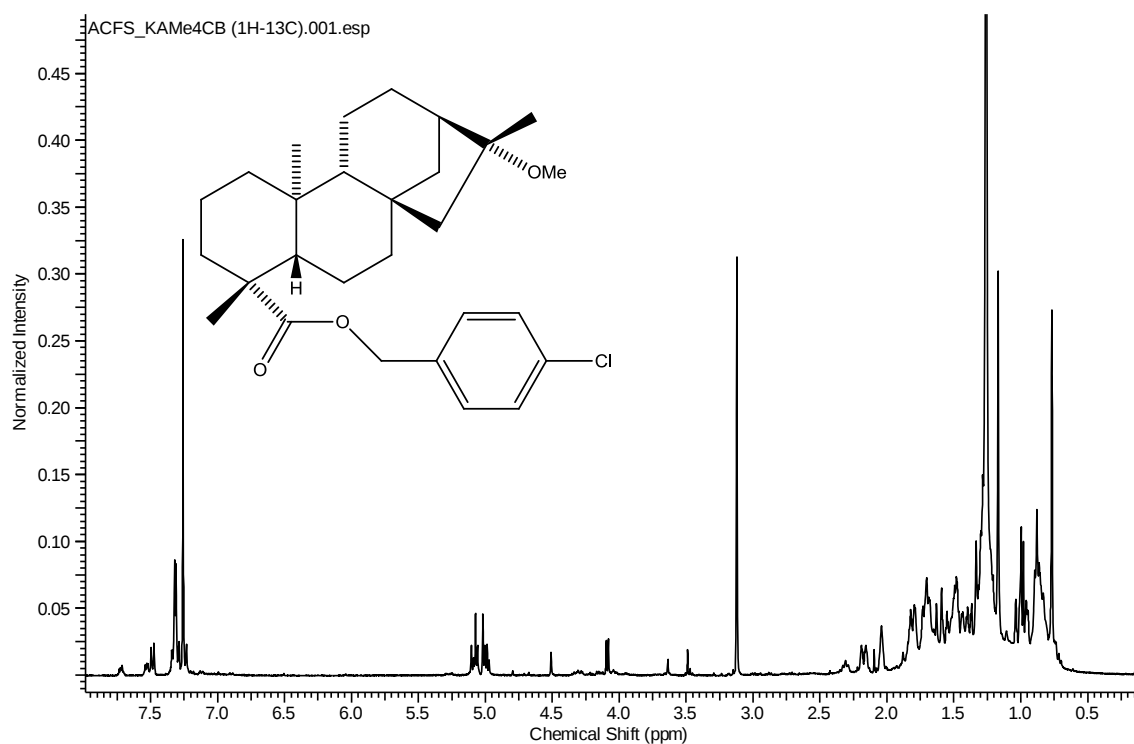


Figure S18. ^1H NMR spectrum (500 MHz, CDCl_3) of *ent*-16-methoxykauran-19-oic acid *p*-chlorobenzyl ester (compound 17).

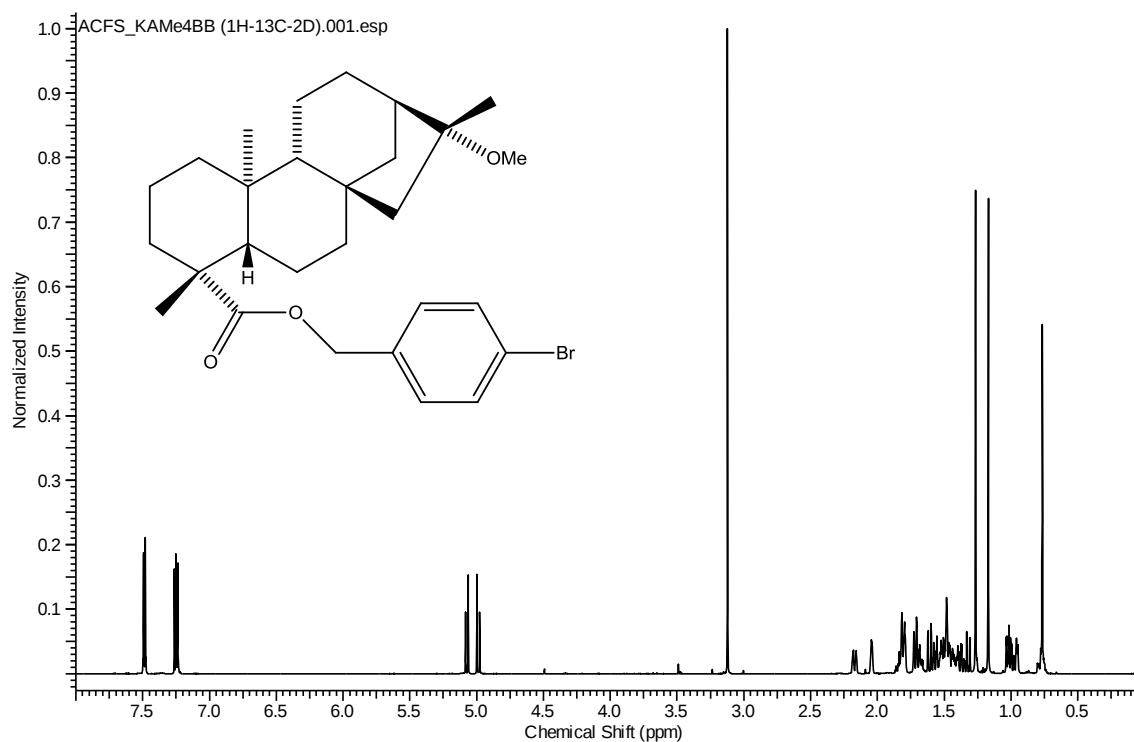


Figure S19. ¹H NMR spectrum (500 MHz, CDCl₃) of *ent*-16-methoxykauran-19-oic acid *p*-bromobenzyl ester (compound 18).

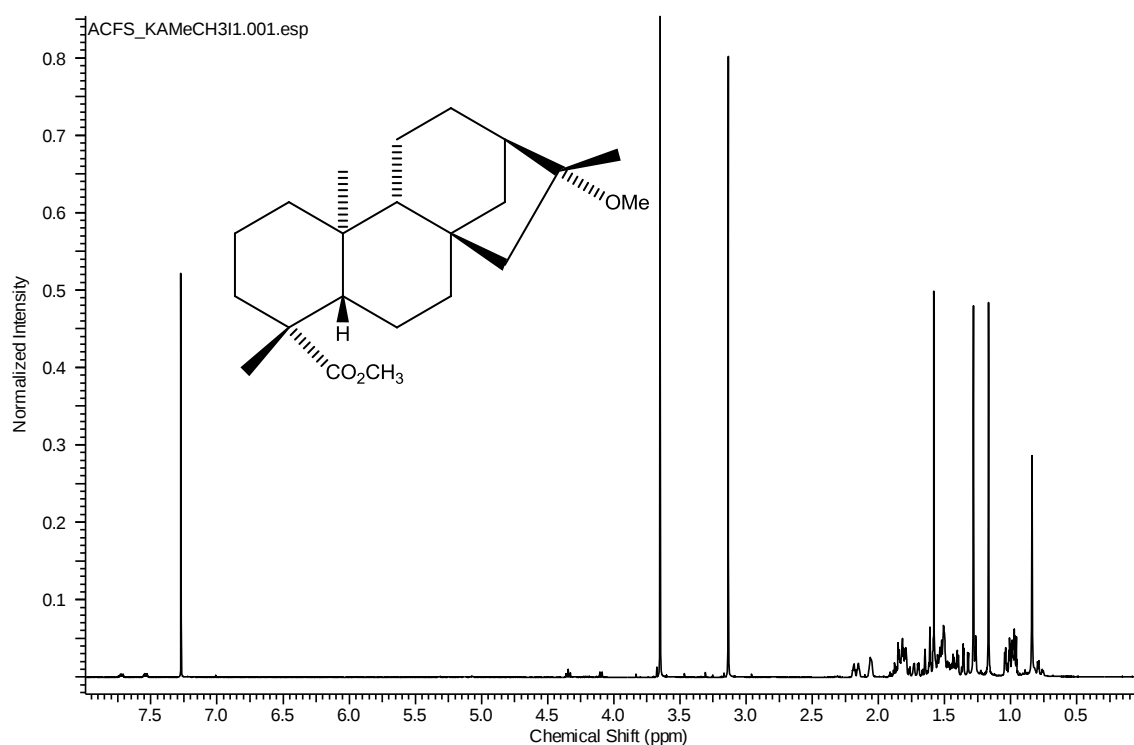


Figure S20. ¹H NMR spectrum (500 MHz, CDCl₃) of *ent*-16-methoxykauran-19-oic acid methyl ester (compound 19).

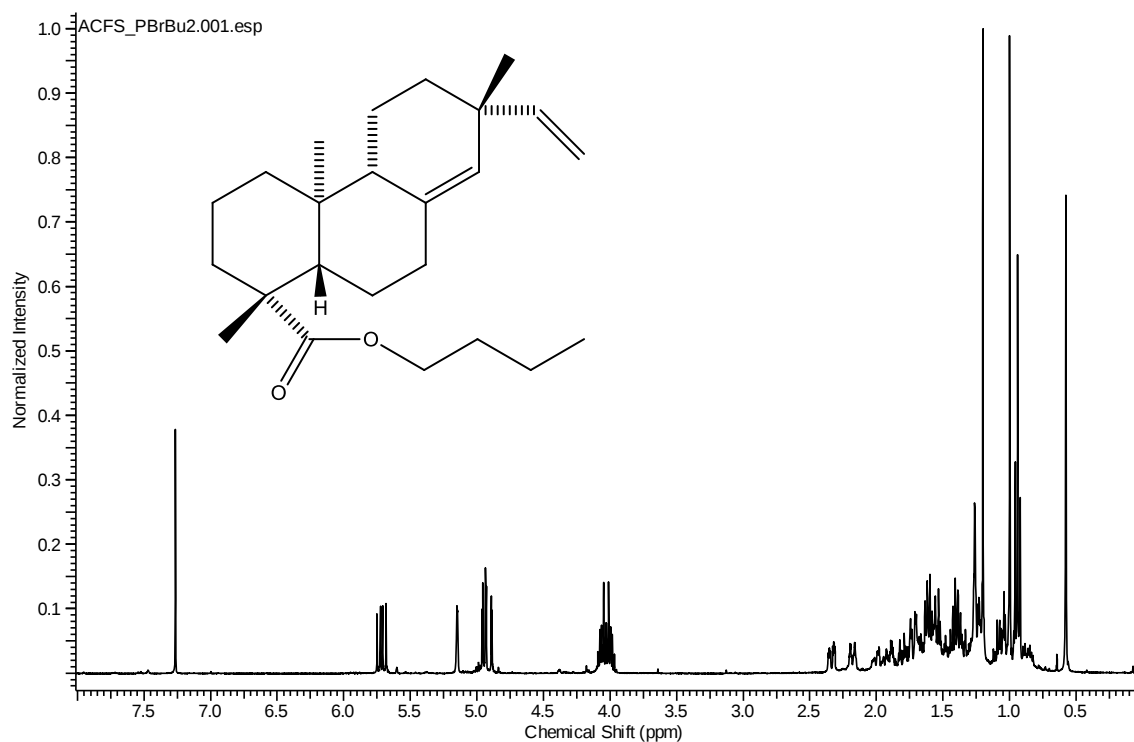


Figure S21. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-pimara-8(14),15-dien-19-oic acid butyl ester (compound 20).

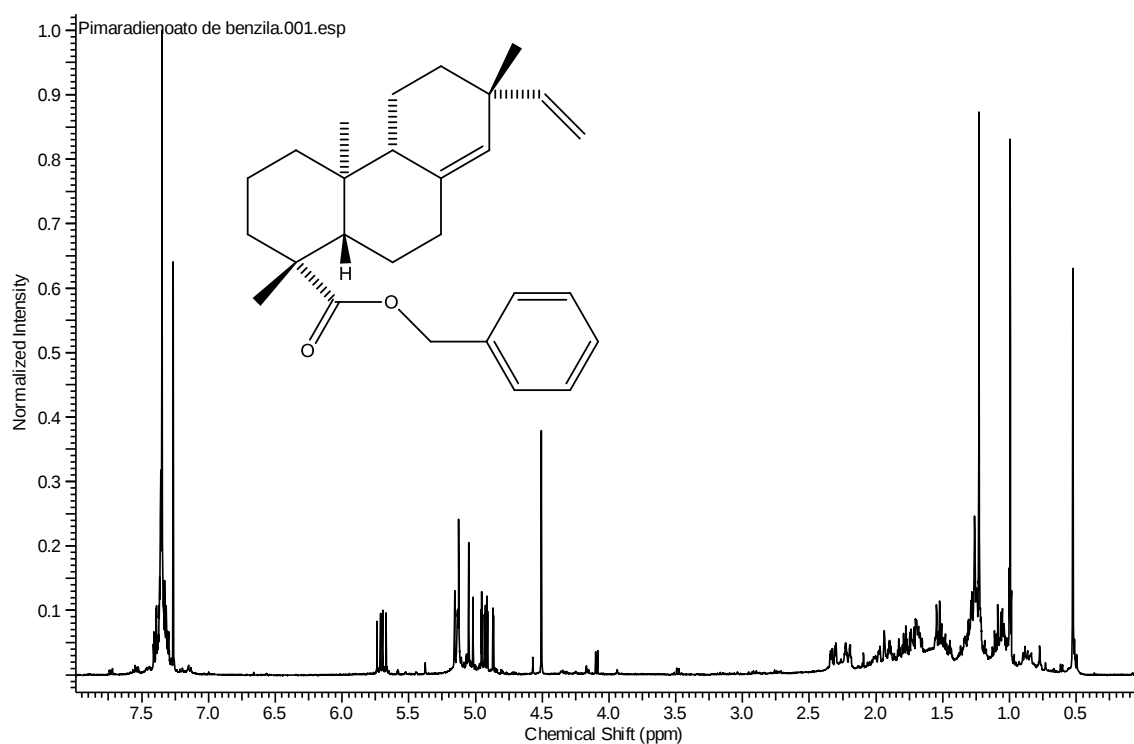


Figure S22. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-pimara-8(14),15-dien-19-oic acid benzyl ester (compound 21).

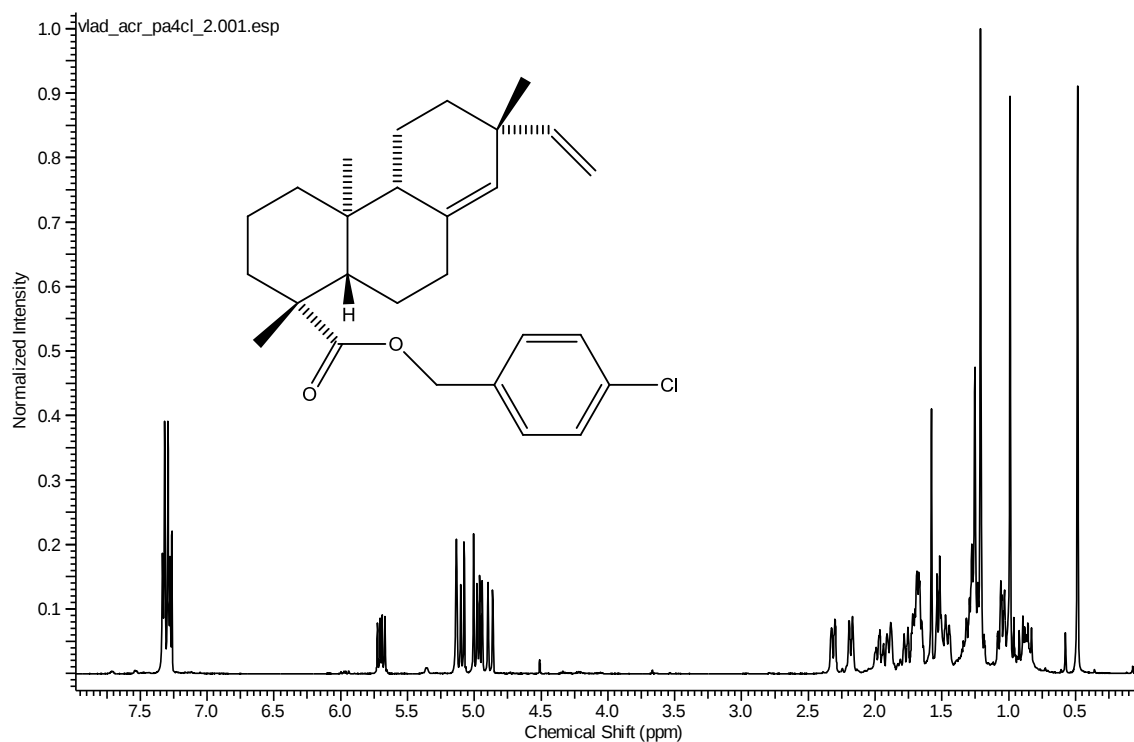


Figure S23. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-pimara-8(14),15-dien-19-oic acid *p*-chlorobenzyl ester (compound 22).

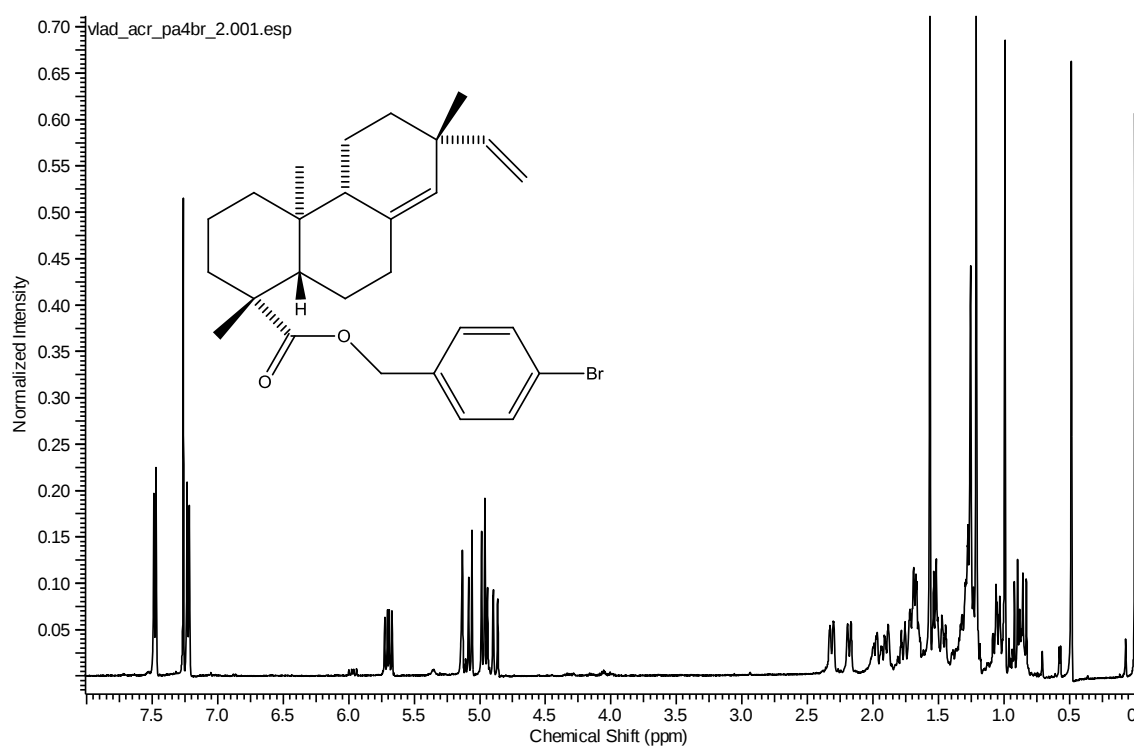


Figure S24. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-pimara-8(14),15-dien-19-oic acid *p*-bromobenzyl ester (compound 23).

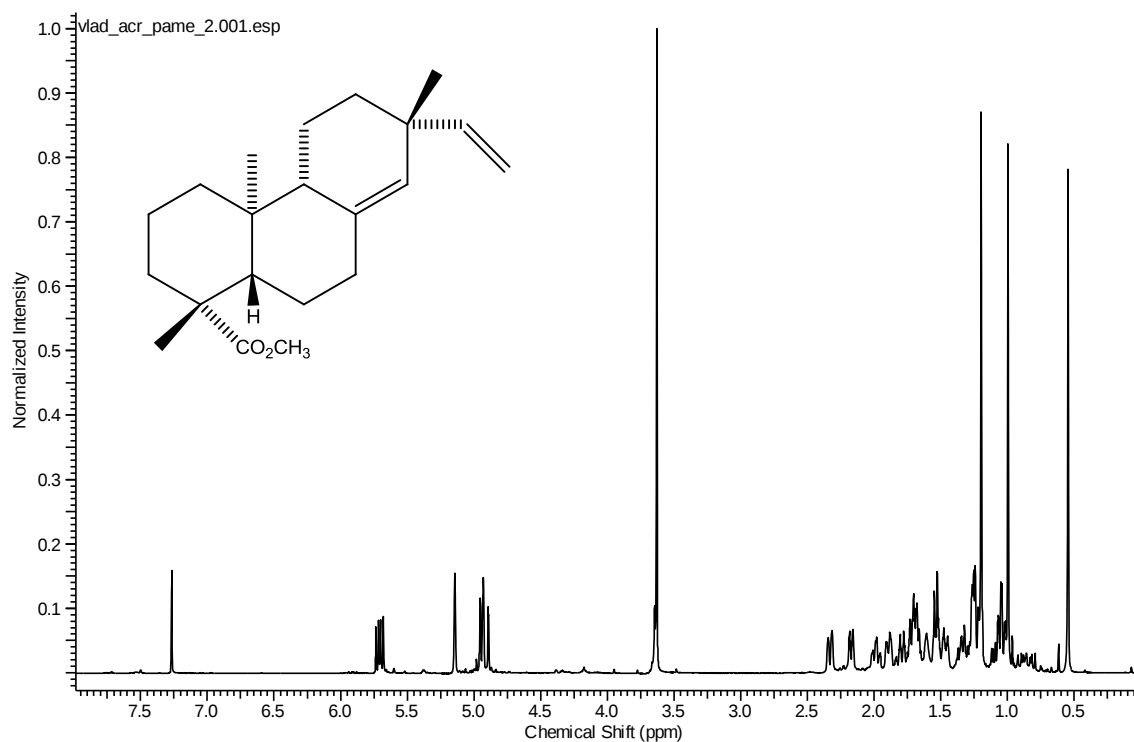


Figure S25. ^1H NMR spectrum (300 MHz, CDCl_3) of *ent*-pimara-8(14),15-dien-19-oic acid methyl ester (compound 24).

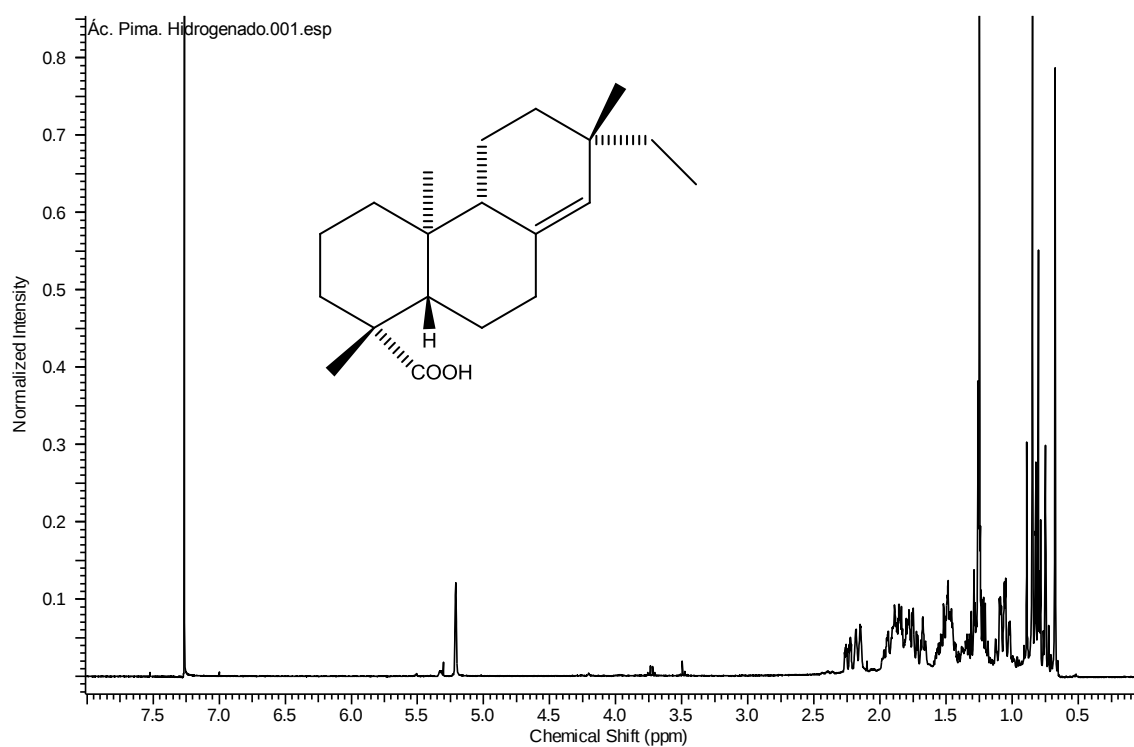


Figure S26. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-8(14)-pimaren-19-oic acid (compound 25).

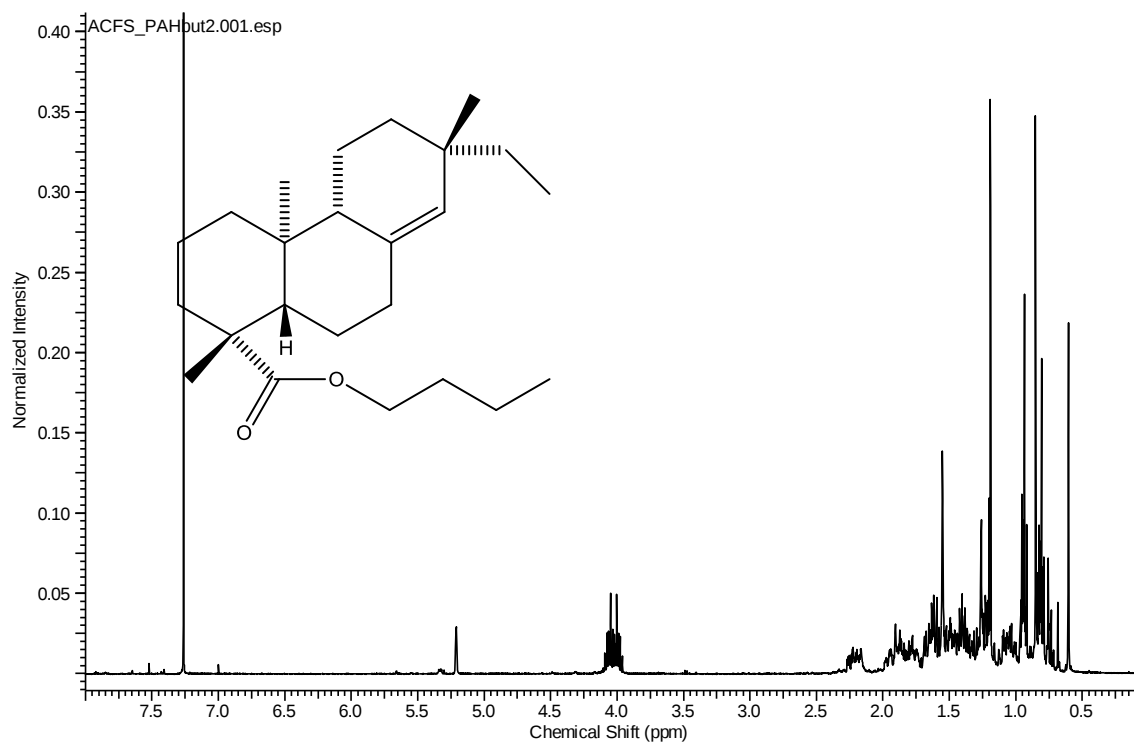


Figure S27. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-8(14)-pimaren-19-oic acid butyl ester (compound 26).

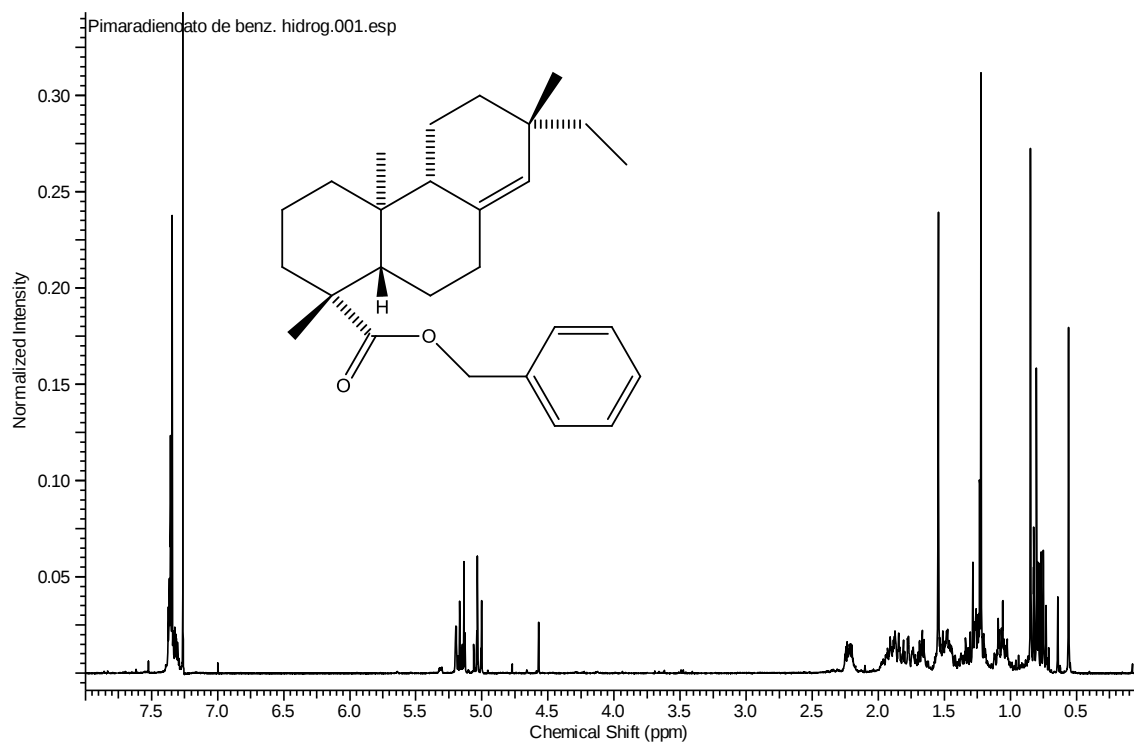


Figure S28. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-8(14)-pimaren-19-oic acid benzyl ester (compound 27).

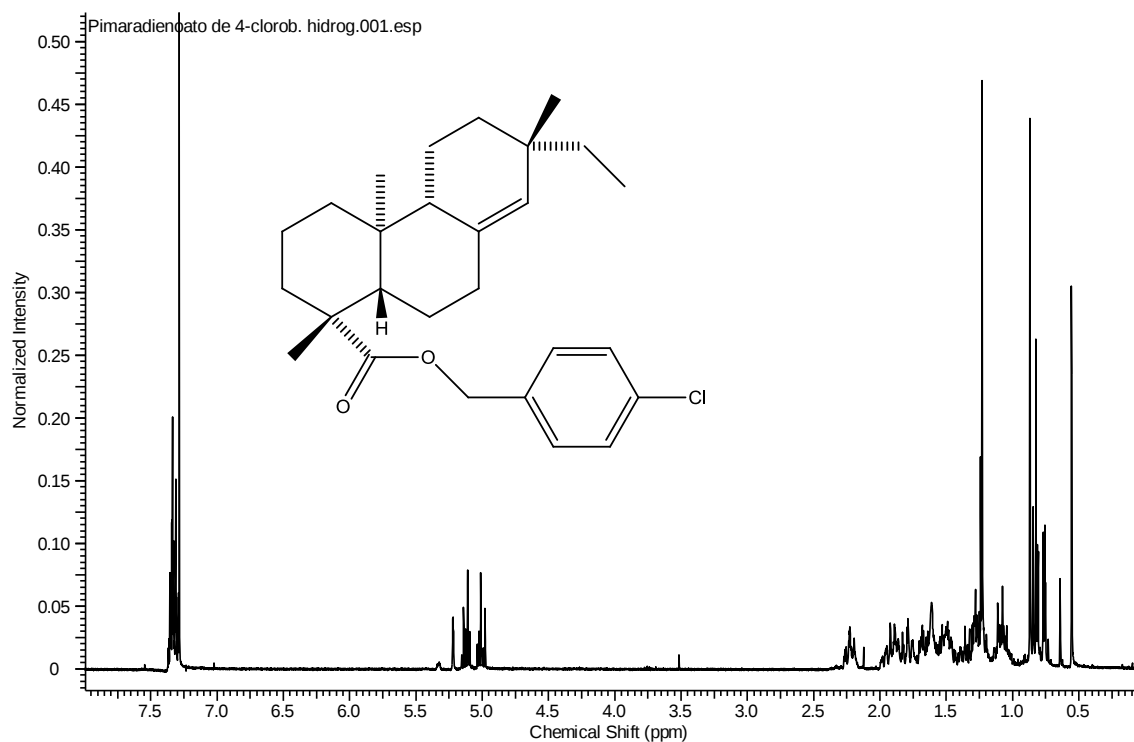


Figure S29. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-8(14)-pimaren-19-oic acid *p*-chlorobenzyl ester (compound 28).

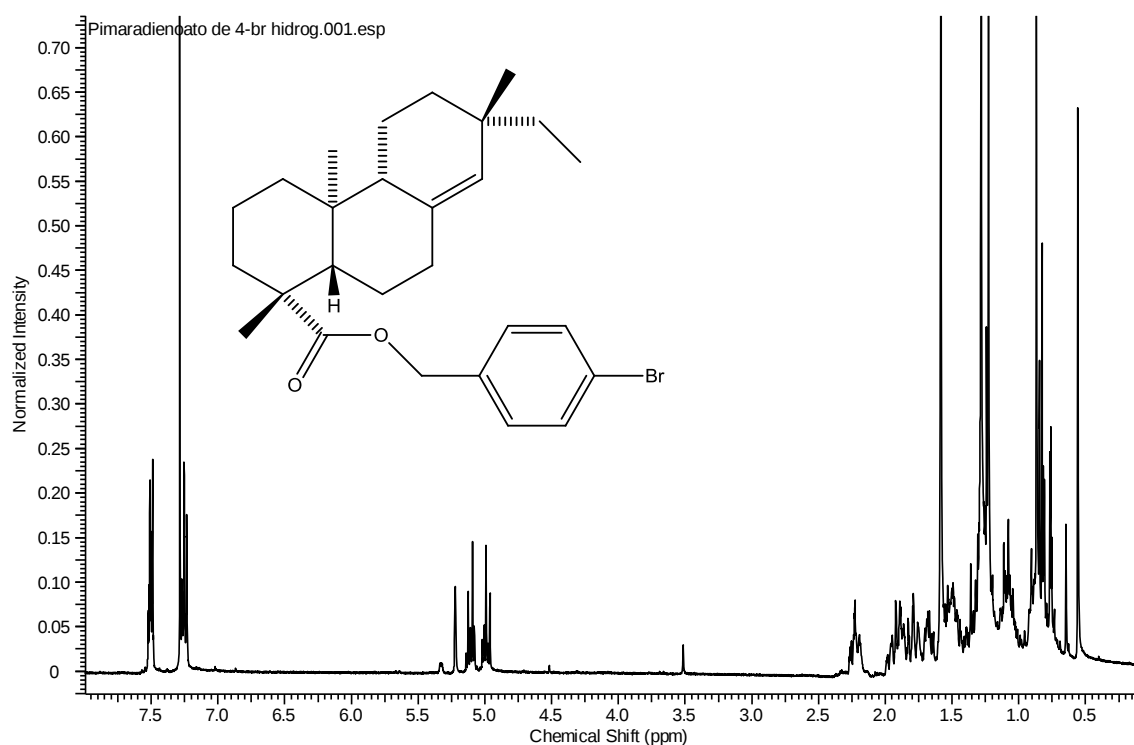


Figure S30. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-8(14)-pimaren-19-oic acid *p*-bromobenzyl ester (compound 29).

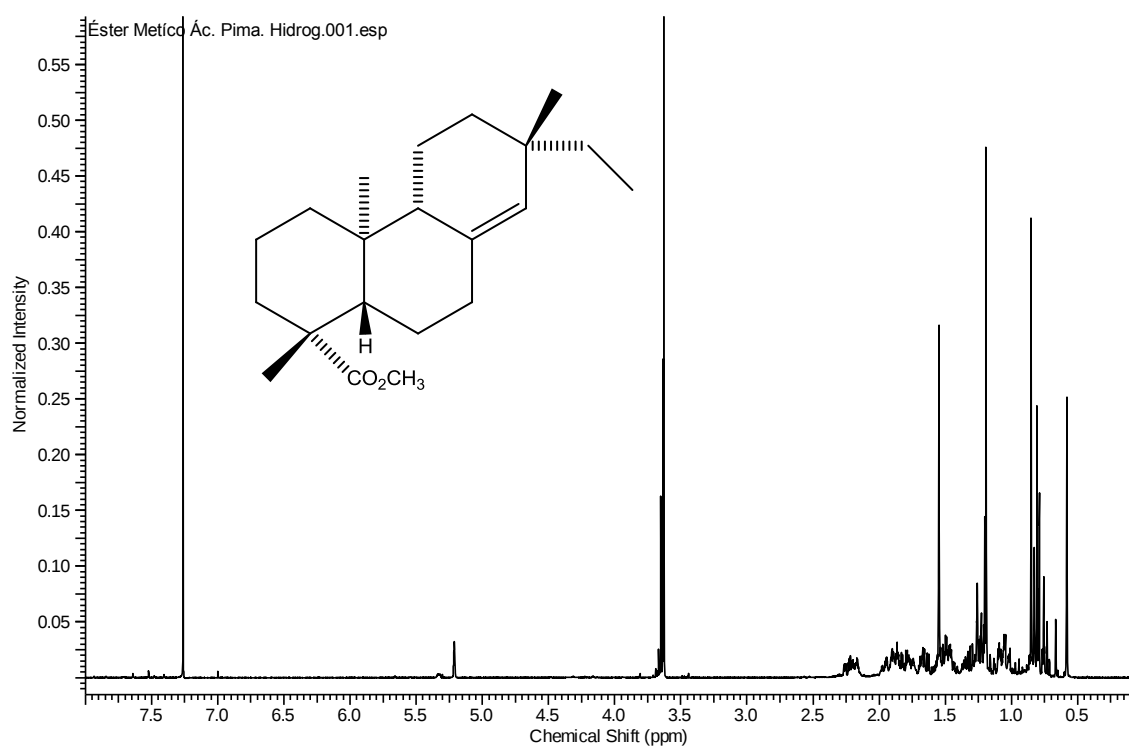


Figure S31. ^1H NMR spectrum (400 MHz, CDCl_3) of *ent*-8(14)-pimaren-19-oic acid methyl ester (compound **30**).