

NMR spectra for compounds

3-Oxo-olean-12-en-28-oic acid (**15**): ^1H NMR (400 MHz, CDCl_3) δ 5.30 (s, 1H), 2.84 (dd, J = 13.7, 4.1 Hz, 1H), 2.59-2.50 (m, 1H), 2.42-2.31 (m, 1H), 2.04-1.82 (m, 5H), 1.77-1.55 (m, 7H), 1.54-1.17 (m, 12H), 1.15 (s, 3H), 1.08 (s, 3H), 1.05 (s, 3H), 1.03 (s, 3H), 0.93 (s, 3H), 0.91 (s, 3H), 0.87-0.83 (m, 3H), 0.81 (s, 3H). ^{13}C NMR (101 MHz, CDCl_3) δ 217.7, 183.6, 143.7, 122.4, 55.3, 47.4, 46.9, 46.6, 45.8, 41.7, 41.1, 39.3, 39.1, 36.8, 34.1, 33.8, 33.1, 32.4, 32.2, 30.7, 27.7, 26.5, 25.8, 23.6, 23.8, 22.9, 21.4, 19.6, 17.0, 15.0.

3 β -Olean-12-ene-3,28-diol (**16**): ^1H NMR (400 MHz, DMSO) δ 5.11 (s, 1H), 4.30 (s, 2H), 3.39 (s, 1H), 3.31 (d, J = 10.5 Hz, 1H), 3.02-2.98 (m, 1H), 2.94 (d, J = 10.5 Hz, 1H), 1.93 (dd, J = 13.7, 3.9 Hz, 1H), 1.85-1.61 (m, 5H), 1.54 -1.33 (m, 8H), 1.32-1.18 (m, 4H), 1.09 (d, J = 18.5 Hz, 5H), 0.97 (d, J = 16.5 Hz, 1H), 0.90 (s, 3H), 0.89 (s, 3H), 0.87 (s, 3H), 0.85 (s, 3H), 0.83 (s, 3H), 0.69-0.61 (m, 4H). ^{13}C NMR (101 MHz, DMSO) δ 144.8, 121.9, 77.3, 67.9, 55.2, 47.5, 46.8, 42.3, 41.7, 38.9, 37.0, 36.9, 34.3, 33.5, 32.6, 31.4, 31.2, 28.7, 26.1, 25.6, 24.0, 23.5, 18.5, 16.9, 16.5, 15.8.

3 β -Hydroxy-olean-12-en-28-oic acidmethyl ester (**17**): ^1H NMR (400 MHz, CDCl_3) δ 5.28 (s, 1H), 3.62 (s, 3H), 3.21 (dd, J = 11.1, 4.4 Hz, 1H), 2.86 (dd, J = 13.7, 3.9 Hz, 1H), 2.03-1.82 (m, 3H), 1.73-1.50 (m, 12H), 1.46-1.37 (m, 2H), 1.35-1.25 (m, 4H), 1.20-1.16 (m, 2H), 1.13 (s, 3H), 1.07-1.04(m, 1H), 0.99 (s, 3H), 0.93 (s, 3H), 0.91 (s, 3H), 0.90 (s, 3H), 0.78 (s, 3H), 0.72 (s, 3H). ^{13}C NMR (101 MHz, CDCl_3) δ 178.3, 143.8, 122.4, 79.0, 55.3, 51.5, 47.7, 46.7, 45.9, 41.7, 41.3, 39.3, 38.8, 38.5, 37.1, 33.9, 33.1, 32.7, 32.4, 30.7, 28.1, 27.7, 27.2, 25.9, 23.6, 23.4, 23.1, 18.3, 16.8, 15.6, 15.3.

3 β -Hydroxy-olean-12-en-28-amide (**18**): ^1H NMR (400 MHz, DMSO) δ 6.76 (d, J = 5.2 Hz, 2H), 5.21 (s, 1H), 4.27 (s, 1H), 3.05-2.91 (m, 1H), 2.73 (dd, J = 13.2, 3.7 Hz, 1H), 1.92-1.84 (m, 1H), 1.82-1.79 (m, 2H), 1.67-1.61 (m, 2H), 1.55-1.37(m, 9H), 1.37-1.18 (m, 4H), 1.09 (s, 5H), 0.89 (s, 5H), 0.88 (s, 3H), 0.86 (s, 3H), 0.85 (s, 3H), 0.72 (s, 3H), 0.68 (s, 3H). ^{13}C NMR (101 MHz, DMSO) δ 179.27, 144.69, 121.76, 77.30, 55.30, 47.59, 46.62, 45.66, 41.75, 40.98, 39.33, 38.85, 38.54, 37.07, 34.15, 33.42, 33.09, 32.93, 30.90, 28.71, 27.43, 26.11, 23.99, 23.38, 22.86, 18.50, 17.40, 16.48, 15.57.

3 β -O-Acetyl-olean-12-en-28-oic acid (**19**): ^1H NMR (400 MHz, DMSO) δ 5.16 (s, 1H), 4.45-4.34 (m, 1H), 2.76-2.73 (m, 1H), 2.00 (s, 3H), 1.97-1.87 (m, 1H), 1.91-1.80 m, 2H), 1.68-1.41 (m,

10H), 1.33-1.16 (m, 6H), 1.11 (s, 3H), 1.07-0.98 (m, 4H), 0.89 (s, 3H), 0.87 (s, 6H), 0.82 (s, 6H), 0.72 (s, 3H).

3 β -O-(β -Carboxypropionyl)-olean-12-en-28-oic acid (**20**): ^1H NMR (400 MHz, DMSO) δ 12.04 (brs, 2H), 5.13 (s, 1H), 4.41 (dd, J = 11.4, 4.7 Hz, 1H), 2.51-2.47 (m, 4H), 2.11 (d, J = 11.3 Hz, 1H), 1.98-1.76 (m, 4H), 1.63-1.39 (m, 11H), 1.34-1.26 (m, 4H), 1.06 (s, 3H), 1.03-0.95 (m, 2H), 0.91 (s, 6H), 0.87-0.83 (m, 1H), 0.81 (s, 9H), 0.76 (s, 3H). ^{13}C NMR (101 MHz, DMSO) δ 179.0, 173.9, 172.1, 144.3, 121.9, 80.5, 55.0, 47.3, 46.1, 45.9, 41.8, 41.3, 38.0, 37.8, 37.0, 33.3, 32.6, 30.9, 29.7, 29.2, 28.2, 27.7, 26.0, 23.8, 23.6, 23.4, 23.1, 18.3, 17.3, 17.1, 15.5.

3-Oxo-urs-12-en-28-oic acid (**21**): ^1H NMR (400 MHz, CDCl_3) δ 5.26 (s, 1H), 2.64-2.46 (m, 1H), 2.39-2.35 (m, 1H), 2.20 (d, J = 11.2 Hz, 1H), 2.07-1.82 (m, 5H), 1.75-1.58 (m, 4H), 1.58-1.19 (m, 11H), 1.13 (s, 1H), 1.09 (s, 6H), 1.06 (s, 3H), 1.03 (s, 3H), 0.96 (s, 3H), 0.86 (d, J = 6.4 Hz, 3H), 0.83 (s, 3H). ^{13}C NMR (101 MHz, CDCl_3) δ 217.8, 183.4, 138.1, 125.6, 55.3, 52.6, 48.0, 47.4, 46.8, 42.1, 39.5, 39.3, 39.1, 38.8, 36.7, 36.7, 34.2, 32.5, 30.6, 28.0, 26.6, 24.1, 23.5, 23.4, 21.5, 21.2, 19.6, 17.0, 17.0, 15.2.

3 β -O-(β -Carboxypropionyl)-urs-12-en-28-oic acid (**22**): ^1H NMR (400 MHz, DMSO) δ 12.04 (brs, 2H), 5.13 (s, 1H), 4.41 (dd, J = 11.4, 4.7 Hz, 1H), 2.50-2.45 (m, 4H), 2.11 (d, J = 11.3 Hz, 1H), 1.99-1.75 (m, 4H), 1.64-1.40 (m, 11H), 1.34-1.26 (m, 4H), 1.06 (s, 3H), 1.02-0.98 (m, 2H), 0.91 (s, 6H), 0.87-0.85 (m, 1H), 0.81 (s, 9H), 0.76 (s, 3H). ^{13}C NMR (101 MHz, DMSO) δ 178.8, 173.9, 172.1, 138.7, 124.9, 80.5, 55.0, 52.8, 47.3, 42.5, 42.1, 39.0, 38.9, 38.1, 37.8, 36.9, 36.8, 33.0, 30.6, 29.7, 29.3, 28.2, 28.0, 24.3, 23.7, 23.3, 21.5, 18.2, 17.5, 17.4, 17.1, 15.6, 12.5, 11.9.

3 β -Hydroxy-urs-12-en-28-oic acid methyl ester (**23**): ^1H NMR (400 MHz, CDCl_3) δ 5.25 (s, 1H), 3.60 (s, 3H), 3.33-3.12 (m, 1H), 2.23 (d, J = 11.4 Hz, 1H), 2.04-1.96 (m, 1H), 1.92-1.89 (m, 2H), 1.82-1.73 (m, 1H), 1.69-1.57 (m, 7H), 1.55-1.45 (m, 5H), 1.40-1.21 (m, 7H), 1.08 (s, 3H), 0.99 (s, 3H), 0.95-0.93 (m, 6H), 0.87-0.84 (m, 5H), 0.78 (s, 3H), 0.75 (s, 3H). ^{13}C NMR (101 MHz, CDCl_3) δ 178.1, 138.2, 125.6, 79.1, 55.2, 52.9, 51.5, 48.1, 47.6, 42.0, 39.5, 39.1, 38.9, 38.8, 38.6, 37.0, 36.7, 33.0, 30.7, 29.7, 28.1, 28.0, 27.3, 24.2, 23.6, 23.3, 21.2, 18.3, 17.0, 16.9, 15.6, 15.4.

3-Oxo-urs-12-en-28-oic acid methyl ester (**24**): ^1H NMR (400 MHz, DMSO) δ 5.17 (s, 1H), 3.52 (s, 3H), 2.34-2.27 (m, 1H), 2.19-2.15 (m, 1H), 2.06-1.95 (m, 1H), 1.92-1.88 (m, 2H), 1.85-1.64 (m, 2H), 1.64-1.15 (m, 16H), 1.06 (s, 3H), 1.00 (s, 3H), 0.98 (s, 3H), 0.95 (s, 3H), 0.92 (s, 3H), 0.82 (d, J = 6.5 Hz, 3H), 0.72 (s, 3H).

3,11-Dioxo-urs-12-en-28-oic acid methyl ester (**25**): ^1H NMR (400 MHz, CDCl_3) δ 5.64 (s, 1H), 3.62 (s, 3H), 3.09-2.88 (m, 1H), 2.67-2.59 (m, 1H), 2.54-2.26 (m, 3H), 2.13-2.06 (m, 1H), 1.90-1.73 (m, 3H), 1.70-1.35 (m, 9H), 1.31 (s, 3H), 1.26 (s, 6H), 1.09 (s, 3H), 1.06 (s, 3H), 0.98 (s, 3H), 0.95 (s, 3H), 0.87 (d, 3H). ^{13}C NMR (101 MHz, CDCl_3) δ 217.1, 199.1, 177.2, 163.3, 130.6, 60.7, 55.4, 52.8, 51.9, 47.7, 47.7, 44.5, 43.9, 39.8, 38.6, 36.8, 36.0, 34.2, 32.4, 30.3, 28.5, 26.5, 23.9, 21.4, 21.1, 21.0, 18.8, 17.1, 15.5.

3 β -O-(β -Carboxypropionyl)-olean-12-en-30-oic acid (**27**): ^1H NMR (400 MHz, DMSO) δ 12.13 (s, 2H), 5.17 (s, 1H), 4.42 (dd, J = 11.4, 4.6 Hz, 1H), 2.50-2.45 (m, 4H), 2.06-1.94 (m, 1H), 1.92-1.82 (m, 3H), 1.78-1.66 (m, 3H), 1.63-1.49 (m, 7H), 1.44-1.23 (m, 5H), 1.13 (s, 3H), 1.07 (s, 3H), 1.03-0.96 (m, 2H), 0.92 (s, 6H), 0.87-0.85 (m, 1H), 0.82 (s, 6H), 0.74 (s, 3H). ^{13}C NMR (101 MHz, DMSO) δ 178.5, 174.6, 172.1, 144.9, 122.2, 80.4, 54.9, 48.3, 47.3, 43.6, 42.9, 41.6, 38.5, 38.1, 37.8, 36.8, 32.5, 32.1, 31.1, 29.6, 28.7, 28.6, 28.1, 26.8, 26.2, 26.1, 23.6, 23.6, 18.2, 17.1, 17.0, 15.7.





















