Supporting Information

A one pot three-component tandem metathesis/Diels-Alder reaction

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General consideration:

Unless otherwise noted, materials were obtained from commercial supplier and used without further purification. Grubbs 2nd generation catalyst was purchased from Strem. Silica gel column chromatography was performed using Baxter brand silica gel (230-400 mesh ASTM). CH₂Cl₂ was distilled from CaH₂. Proton nuclear magnetic resonance spectroscopy (¹H NMR) was recorded on Bruker Fourier Transform AM 400 (400MHz) spectrometers. Chemical shifts were reported in units, parts per million (ppm) relative to the singlet as 7.24 ppm for chloroform-*d* or in ppm relative to the singlet as 7.15 ppm for benzene-*d*₆. The following abbreviations were used to describe peak patterns when appropriate: b = broad, s = singlet, d = doublet, t = triplet, q = quadraplet, m = multiplet. Coupling constant, J, was reported in Hertz unit (Hz). Carbon-13 nuclear magnetic resonance spectroscopy (¹³C NMR) was recorded on Bruker Fourier Transform AM 400 (100MHz) and was fully decoupled by broad-band decoupling. Chemical shifts were reported in ppm with the centerline of the triplet for chloroform-*d* set at 77.00 ppm or that for benzene-*d*₆ set at 128.00 ppm.

Infrared (IR) spectra were recorded in 0.1 mm path length sodium chloride cells on a BOMEM MB-100 Fourier Transform spectrometer and frequencies are given in reciprocal centimeters (cm⁻¹).

Mass spectra were obtained on a VG AUTOSPEC Ultima GC/MS system using direct insertion probe (DIP) and electron impact (EI) (70eV) method.

Spectral data

^1H NMR (400MHz, C_6D_6) 7.78 (d, J = 8.2 Hz, 2H), 6.77 (d, J = 8.0 Hz, 2H), 5.76 (d, J = 16.1 Hz, 1H), 5.15 (dt, J = 16.0 Hz, 6.7 Hz, 1H), 4.86 (br.s, 1H), 4.24 (br.s, 2H), 4.02 (br.s, 2H), 1.86 (s, 3H), 1.82 (m, 2H), 1.15 (m, 4H), 0.81 (t, J = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, C_6D_6) 142.92, 137.41, 135.41, 133.90, 129.77, 127.88, 123.76, 120.82, 55.21, 54.24, 32.69, 31.33, 22.43, 21.06, 14.03; IR (neat, cm^{-1}) 1346, 1164

^1H NMR (400MHz, C_6D_6) 7.85 (d, J = 8.2 Hz, 2H), 6.86 (d, J = 8.2 Hz, 2H), 5.81 (d, J = 15.9 Hz, 1H), 5.17 (dt, J = 15.9 Hz, 6.9 Hz, 1H), 4.94 (br.s, 1H), 4.28 (br.s, 2H), 4.08 (br.s, 2H), 2.15 (m, 2H), 1.94 (m, 5H), 1.68 (s, 3H); ^{13}C NMR (100 MHz, C_6D_6) 205.18, 143.02, 137.14, 135.29, 132.24, 129.81, 127.88, 124.33, 121.45, 55.22, 54.15, 42.17, 29.32, 26.93, 21.06; IR (neat, cm^{-1}) 1716, 1344, 1164

^1H NMR (400MHz, C_6D_6) 7.80 (d, J = 8.2, 2H), 7.14-7.02 (m, 5H), 6.80 (d, J = 8.0, 2H), 6.41 (d, J = 16.3 Hz, 1H), 6.07 (d, J = 16.3 Hz, 1H), 5.01 (br.s, 1H), 4.31 (br.s, 2H), 4.06 (d, J = 2.7 Hz, 2H), 1.86 (s, 3H); ^{13}C NMR (100 MHz, C_6D_6) 143.07, 137.40, 136.94, 135.34, 131.31, 129.82, 128.84, 128.19, 127.80, 126.83, 123.88, 121.93, 55.39, 54.01, 21.06; IR (neat, cm^{-1}) 1345, 1165

^1H NMR (400MHz, C_6D_6) 7.74 (d, J = 8.2 Hz, 2H), 7.12 (m, 2H), 7.05 (m, 1H), 6.95 (m, 2H), 6.75 (d, J = 8.4 Hz, 2H), 5.71 (d, J = 15.9 Hz, 1H), 5.24 (dt, J = 15.9 Hz, 6.9 Hz, 1H), 4.81 (br.s, 1H), 4.14 (br.s, 2H), 3.98 (br.s, 2H), 3.05 (d, J = 6.7 Hz, 2H), 1.85 (s, 3H); ^{13}C NMR (100 MHz, C_6D_6) 142.9, 139.7, 137.1, 135.4, 132.3, 129.8, 128.9, 128.8, 127.8, 126.6, 124.7, 121.8, 55.2, 54.1, 39.2, 21.1; IR (neat, cm^{-1}) 1334, 1166

^1H NMR (400MHz, C_6D_6) 8.10 (m, 2H), 7.76 (d, J = 8.2 Hz, 2H), 7.12-7.02 (m, 3H), 6.77 (d, J =

8.0 Hz, 2H), 5.71 (d, $J = 16.0$ Hz, 1H), 5.01 (dt, $J = 15.9$ Hz, 6.9 Hz, 1H), 4.82 (br.s, 1H), 4.17 (br.s, 2H), 4.08 (t, $J = 6.8$ Hz, 2H), 3.98 (br.s, 2H), 2.11 (m, 2H), 1.86 (s, 3H); ^{13}C NMR (100 MHz, C_6D_6) 166.17, 143.00, 136.98, 135.35, 132.94, 130.87, 129.80, 129.79, 128.57, 128.30, 127.89, 125.99, 122.08, 63.70, 55.18, 54.08, 32.38, 21.07; IR (KBr, cm^{-1}) 1171, 1348, 1165

^1H NMR (400MHz, C_6D_6) 7.77 (d, $J = 8.2$ Hz, 2H), 6.78 (d, $J = 7.9$ Hz, 2H) 5.60 (d, $J = 16.1$ Hz, 1H), 4.85 (m, 2H), 4.15 (br.s, 2H), 3.99 (br.s, 2H), 2.80 (t, $J = 7.0$ Hz, 2H), 2.08 (m, 2H), 1.86 (s, 3H); ^{13}C NMR (100 MHz, C_6D_6) 143.1, 136.8, 135.4, 129.8, 129.5, 127.9, 126.1, 122.5, 55.2, 54.0, 36.0, 31.4, 21.1; IR (neat, cm^{-1}) 1344, 1164

^1H NMR (400MHz, C_6D_6) 7.77 (d, $J = 8.2$ Hz, 2H), 6.76 (d, $J = 8.0$ Hz, 2H), 5.69 (d, $J = 15.8$ Hz, 1H), 5.29 (dt, $J = 15.8$ Hz, 8.3 Hz, 1H), 4.84 (br.s, 1H), 4.28 (br.s, 2H), 4.04 (d, $J = 2.3$ Hz, 2H), 1.86 (s, 3H), 1.30 (d, $J = 8.3$ Hz, 2H), -0.12 (s, 9H); ^{13}C NMR (100 MHz, C_6D_6) 142.9, 137.5, 135.5, 130.8, 129.7, 127.9, 122.5, 119.2, 55.2, 54.2, 23.9, 21.1, -2.0; IR (neat, cm^{-1}) 1348, 1166

^1H NMR (400MHz, C_6D_6) 7.71 (d, $J = 8.2$ Hz, 2H), 6.79 (d, $J = 8.0$ Hz, 2H), 5.84 (d, $J = 16.0$ Hz, 1H), 5.37 (dt, $J = 16.0$ Hz, 6.9 Hz, 1H), 5.31 (br.s, 1H), 3.86 (d, $J = 1.8$ Hz, 2H), 2.95 (t, $J = 5.8$, 2H), 1.90 (s, 3H), 1.86 (m, 4H), 1.19 (m, 4H), 0.83 (t, $J = 7.0$, 3H); ^{13}C NMR (100 MHz, C_6D_6) 142.95, 134.75, 132.37, 130.27, 129.65, 128.12, 127.88, 123.98, 45.04, 42.95, 32.87, 31.71, 25.62, 22.54, 21.10, 14.08; IR (KBr, cm^{-1}) 1344, 1166

^1H NMR (400MHz, C_6D_6) 7.71 (d, $J = 8.2$ Hz, 2H), 6.77 (d, $J = 8.1$ Hz, 2H), 5.79 (d, $J = 16.0$, 1H), 5.28 (br.s, 1H), 5.23 (dt, $J = 16.0$ Hz, 7.3 Hz, 1H), 3.82 (d, $J = 2.0$ Hz, 2H), 2.93 (t, $J = 5.8$ Hz, 2H), 2.12 (m, 2H), 1.88 (s, 3H), 1.84 (m, 4H), 1.58 (s, 3H); ^{13}C NMR (100 MHz, C_6D_6) 205.22, 142.93, 134.79, 132.15, 130.86, 129.63, 127.89, 126.40, 124.59, 44.92, 42.88, 42.56, 29.30, 27.07, 25.61, 21.07; IR (neat, cm^{-1}) 1716, 1342, 1166

^1H NMR (400MHz, C_6D_6) 7.72 (d, $J = 8.2$ Hz, 2H), 7.17-7.01 (m, 5H), 6.78 (d, $J = 7.9$ Hz, 2H), 6.50 (d, $J = 16.5$ Hz, 1H), 6.31 (d, $J = 16.5$ Hz, 1H), 5.43 (m, 1H), 3.96 (d, $J = 1.9$ Hz, 2H), 2.97 (t, $J = 5.8$ Hz, 2H), 1.89 (s, 3H), 1.86 (m, 2H); ^{13}C NMR (100 MHz, C_6D_6) 142.98, 137.45, 134.91, 132.49, 129.67, 128.83, 128.80, 128.13, 127.89, 127.19, 126.72, 126.25, 44.87, 42.79, 25.88, 21.09; IR (neat, cm^{-1}) 1345, 1165

^1H NMR (400MHz, C_6D_6) 7.65 (d, $J = 8.3$ Hz, 2H), 7.13 (m, 2H), 7.03 (m, 3H), 6.76 (d, $J = 7.9$ Hz, 2H), 5.80 (d, $J = 16.0$ Hz, 1H), 5.47 (dt, $J = 15.9$ Hz, 6.6 Hz, 1H), 5.27 (br.s, 1H), 3.78 (d, $J = 2.0$ Hz, 2H), 3.14 (d, $J = 6.8$ Hz, 2H), 2.92 (t, $J = 5.8$ Hz, 2H), 1.89 (s, 3H), 1.83 (br.s, 2H); ^{13}C NMR (100 MHz, C_6D_6) 142.9, 140.2, 134.7, 132.2, 131.4, 129.6, 128.9, 128.7, 128.0, 126.5, 126.4, 125.0, 44.9, 42.9, 39.4, 25.7, 21.1; IR (neat, cm^{-1}) 1343, 1165

^1H NMR (400MHz, C_6D_6) 8.13 (m, 2H), 7.71 (d, $J = 8.3$ Hz, 2H), 7.10-7.02 (m, 3H), 6.80 (d, $J = 8.2$ Hz, 2H), 5.79 (d, $J = 16.1$ Hz, 1H), 5.25 (m, 1H), 5.22 (dt, $J = 16.5$ Hz, 6.8 Hz, 1H), 4.11 (t, $J = 6.9$ Hz, 2H), 3.78 (m, $J = 2.0$ Hz, 2H), 2.91 (t, $J = 5.8$ Hz, 2H), 2.18 (m, 2H), 1.90 (s, 3H), 1.80 (br.s, 2H); ^{13}C NMR (100 MHz, C_6D_6) 166.17, 143.01, 134.73, 132.86, 132.57, 132.07, 130.99, 129.82, 129.66, 128.54, 127.89, 125.18, 122.83, 64.01, 44.86, 42.81, 32.49, 25.57, 21.09; IR (neat, cm^{-1}) 1717, 1343, 1166

^1H NMR (400MHz, C_6D_6) 7.72 (d, $J = 8.3$ Hz, 2H), 6.81 (d, $J = 8.3$ Hz, 2H), 5.67 (d, $J = 16.1$ Hz, 1H), 5.28 (br.s, 1H), 5.04 (dt, $J = 16.0$ Hz, 7.0 Hz, 1H), 3.76 (d, $J = 2.1$ Hz, 2H), 2.91 (t, $J = 5.8$ Hz, 2H), 2.83 (t, $J = 7.2$ Hz, 2H), 2.15 (m, 2H), 1.91 (s, 3H), 1.65 (br.s, 2H); ^{13}C NMR (100 MHz, C_6D_6) 143.1, 134.7, 132.7, 132.0, 129.7, 127.9, 125.6, 123.9, 44.8, 42.8, 36.3, 31.9, 25.6, 21.1; IR (neat, cm^{-1}) 1342, 1165

^1H NMR (400MHz, C_6D_6) 7.71 (d, $J = 8.2$ Hz, 2H), 6.78 (d, $J = 8.0$ Hz, 2H), 5.76 (d, $J = 15.8$ Hz,

1H), 5.48 (dt, $J = 15.8$ Hz, 7.9 Hz, 1H), 5.28 (br.s, 1H), 3.90 (d, $J = 2.0$ Hz, 2H), 2.96 (t, $J = 5.8$ Hz, 2H), 1.89 (s, 3H), 1.86 (br.s, 2H), 1.37 (d, $J = 8.2$ Hz, 2H), -0.08 (s, 9H); ^{13}C NMR (100 MHz, C_6D_6) 142.9, 135.0, 132.5, 129.6, 129.0, 127.9, 124.7, 122.4, 45.0, 43.0, 25.5, 23.5, 21.1, -2.0; IR (neat, cm^{-1}) 1345, 1167

^1H NMR (400MHz, C_6D_6) 6.14 (d, $J = 15.7$ Hz, 1H), 5.50 (dt, $J = 15.7$ Hz, 1H), 5.29 (br.s, 1H), 3.94 (q, $J = 7.1$ Hz, 4H), 3.40 (br.s, 2H), 3.27 (br.s, 2H), 1.95 (m, 2H), 1.21 (m, 4H), 0.89 (t, $J = 7.1$ Hz, 6H), 0.82 (t, $J = 7.0$ Hz, 3H); ^{13}C NMR (100 MHz, C_6D_6) 171.9, 140.1, 132.4, 126.5, 124.4, 61.4, 59.3, 41.1, 40.3, 32.8, 31.7, 22.5, 14.1, 14.0; IR (neat, cm^{-1}) 1735

^1H NMR (400MHz, C_6D_6) 6.08 (d, $J = 15.5$ Hz, 1H), 5.40 (dt, $J = 15.8$ Hz, 6.6 Hz, 1H), 5.28 (br.s, 1H), 3.94 (q, $J = 7.0$ Hz, 4H), 3.37 (br.s, 2H), 3.26 (br.s, 2H), 2.17 (m, 2H), 1.88 (t, $J = 7.5$ Hz, 2H), 1.58 (s, 3H), 0.89 (t, $J = 7.0$ Hz, 6H); ^{13}C NMR (100 MHz, C_6D_6) 205.3, 171.9, 139.9, 130.8, 127.0, 125.1, 61.4, 59.2, 42.6, 41.2, 40.3, 29.3, 27.1, 14.0; IR (neat, cm^{-1}) 1732

^1H NMR (400MHz, C_6D_6) 7.20 (m, 2H), 7.11 (m, 2H), 7.04 (m, 1H), 6.80 (d, $J = 16.3$ Hz, 1H), 6.39 (d, $J = 16.1$ Hz, 1H), 5.45 (br.s, 1H), 3.97 (q, $J = 7.0$ Hz, 4H), 3.46 (br.s, 2H), 3.30 (br.s, 2H), 0.91 (t, $J = 7.1$ Hz, 6H); ^{13}C NMR (100 MHz, C_6D_6) 171.8, 140.2, 137.7, 130.4, 128.8, 127.9, 127.7, 126.8, 124.8, 61.5, 59.3, 41.4, 40.1, 14.0; IR (neat, cm^{-1}) 1718

^1H NMR (400MHz, C_6D_6) 7.12 (m, 2H), 7.05 (m, 3H), 6.10 (d, $J = 15.5$ Hz, 1H), 5.59 (dt, $J = 15.5$ Hz, 7.0 Hz, 1H), 5.26 (br.s, 1H), 3.93 (m, 4H), 3.33 (br.s, 2H), 3.25 (br.s, 2H), 3.18 (d, $J = 6.8$ Hz, 2H), 0.88 (t, $J = 7.2$ Hz, 6H); ^{13}C NMR (100 MHz, C_6D_6) 171.9, 140.4, 139.9, 130.9, 129.0, 128.7, 127.4, 126.4, 125.4, 61.4, 59.2, 41.2, 40.3, 39.4, 13.9; IR (neat, cm^{-1}) 1733

^1H NMR (400MHz, C_6D_6) 8.13 (m, 2H), 7.09-7.01 (m, 3H), 6.09 (d, $J = 15.8$ Hz, 1H), 5.35 (dt, J

= 15.8 Hz, 7.0 Hz, 1H), 5.25 (br.s, 1H), 4.13 (t, J = 6.9 Hz, 2H), 3.94 (q, J = 7.0 Hz, 4H), 3.33 (br.s, 2H), 3.23 (br.s, 2H), 2.22 (m, 2H), 0.89 (t, J = 7.1 Hz, 6H); ^{13}C NMR (100 MHz, C_6D_6) 171.8, 166.2, 139.7, 132.8, 131.1, 129.8, 128.8, 128.5, 127.0, 125.7, 64.1, 61.4, 59.2, 41.1, 40.2, 32.5, 13.9; IR (neat, cm^{-1}) 1731

^1H NMR (400MHz, C_6D_6) 5.95 (d, J = 15.8 Hz, 1H), 5.27 (br.s, 1H), 5.20 (dt, J = 15.5 Hz, 7.0 Hz, 1H), 3.94 (q, J = 7.0 Hz, 4H), 3.30 (br.s, 2H), 3.22 (br.s, 2H), 2.84 (t, J = 7.2 Hz, 2H), 2.20 (m, 2H), 0.89 (t, J = 7.1 Hz, 6H); ^{13}C NMR (100 MHz, C_6D_6) 171.8, 139.6, 128.8, 128.1, 126.2, 61.4, 59.2, 41.2, 40.1, 36.3, 31.7, 14.0; IR (neat, cm^{-1}) 1732

^1H NMR (400MHz, C_6D_6) 6.08 (d, J = 15.6 Hz, 1H), 5.61 (dt, J = 15.6 Hz, 8.3 Hz, 1H), 5.27 (br.s, 1H), 3.94 (q, J = 7.1 Hz, 4H), 3.45 (br.s, 2H), 3.30 (br.s, 2H), 1.41 (d, J = 8.2 Hz, 2H), 0.89 (t, J = 7.0 Hz, 6H), -0.07 (s, 9H); ^{13}C NMR (100 MHz, C_6D_6) 172.0, 140.3, 129.0, 125.4, 122.8, 61.3, 41.1, 40.4, 23.7, 23.0, 13.9, -2.0; IR (neat, cm^{-1}) 1735

^1H NMR (400MHz, CDCl_3) 7.58 (d, J = 8.2 Hz, 2H), 7.34 (m, 3H), 7.27 (d, J = 8.0 Hz, 2H), 6.96 (m, 2H), 5.63 (br.s, 1H), 3.86 (m, 2H), 3.61 (m, 2H), 3.29 (dd, J = 8.4 Hz, 8.4 Hz, 1H), 3.21 (dd, J = 8.4 Hz, 5.2 Hz, 1H), 2.81 (m, 1H), 2.39 (s, 3H), 2.17 (m, 1H), 1.89 (m, 2H), 1.36 (m, 4H), 0.89 (t, J = 7.0 Hz, 3H); ^{13}C NMR (100 MHz, CDCl_3) 176.0, 175.3, 143.7, 138.9, 132.0, 131.5, 129.5, 128.9, 128.4, 128.1, 126.3, 124.2, 50.6, 49.0, 44.2, 41.7, 38.1, 37.7, 30.9, 30.3, 22.5, 21.5, 14.0; IR (neat, cm^{-1}) 1708, 1346, 1162; EI-HRMS calcd for $\text{C}_{27}\text{H}_{30}\text{N}_2\text{O}_4\text{S}$ 478.1926, found 478.1927

The stereochemistry of this compound was determined by NOE experiment.

^1H NMR (400MHz, CDCl_3) 7.62 (d, $J = 8.2$ Hz, 2H), 7.39 (m, 2H), 7.32 (m, 1H), 7.25 (d, $J = 8.2$ Hz, 2H), 7.07 (m, 2H), 5.60 (br.s, 1H), 3.96 (d, $J = 14.3$ Hz, 1H), 3.62 (br.d, $J = 14.3$ Hz, 1H), 3.56 (dt, $J = 11.6$ Hz, 4.0 Hz, 1H), 3.18 (m, 2H), 3.09 (td, $J = 11.7$ Hz, 4.1 Hz, 1H), 2.38 (s, 3H), 2.34-2.24 (m, 1H), 2.21 (m, 1H), 2.13 (m, 1H), 2.00 (m, 1H), 1.90 (m, 1H), 1.71 (m, 1H), 1.37 (m, 4H), 0.92 (t, $J = 7.2$ Hz, 3H); ^{13}C NMR (100 MHz, CDCl_3) 176.1, 175.9, 143.4, 135.3, 134.3, 131.5, 129.6, 129.0, 128.5, 127.5, 127.4, 126.3, 46.6, 44.5, 43.6, 43.6, 36.4, 34.3, 30.8, 30.3, 23.7, 22.6, 21.4, 14.0; IR (neat, cm^{-1}) 1709, 1342, 1161; EI-HRMS calcd for $\text{C}_{28}\text{H}_{32}\text{N}_2\text{O}_4\text{S}$ 492.2083, found 492.2096

^1H NMR (400MHz, CDCl_3) 7.41 (m, 2H), 7.33 (m, 1H), 7.15 (m, 2H), 5.60 (br.s, 1H), 4.15 (m, 4H), 3.31 (dd, $J = 8.4$ Hz, 8.4 Hz, 1H), 3.24 (dd, $J = 8.5$ Hz, 5.6 Hz, 1H), 2.89 (m, 2H), 2.84 (m, 1H), 2.74 (m, 2H), 2.24 (m, 1H), 1.97 (m, 1H), 1.81 (m, 1H), 1.40 (m, 4H), 1.21 (m, 6H), 0.90 (t, $J = 7.1$ Hz, 3H); ^{13}C NMR (100 MHz, CDCl_3) 176.5, 176.5, 171.6, 170.7, 142.64, 131.8, 129.0, 128.49, 126.6, 123.7, 61.6, 60.5, 45.2, 42.7, 39.3, 38.3, 37.8, 34.5, 31.1, 30.5, 22.7, 14.1, 14.0; IR (neat, cm^{-1}) 1708, 1383, 1191; EI-HRMS calcd for $\text{C}_{27}\text{H}_{33}\text{NO}_6$ 467.2308, found 467.2301

^1H NMR (400MHz, CDCl_3) 7.67 (m, 2H), 7.41-7.34 (m, 3H), 7.30-7.19 (m, 7H), 6.98 (m, 2H), 5.73 (br.s, 1H), 3.81 (br.d, $J = 13.8$ Hz, 1H), 3.78 (dd, $J = 10.3$ Hz, 6.3 Hz, 1H), 3.63 (br.d, $J = 13.8$ Hz, 1H), 3.57 (dd, $J = 10.3$ Hz, 8.7 Hz, 1H), 3.42 (dd, $J = 13.8$ Hz, 8.9 Hz, 1H), 3.23 (dd, $J = 8.7$ Hz, 8.7 Hz, 1H), 3.18-3.11 (m, 2H), 2.80 (m, 1H), 2.52 (m, 1H), 2.40 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) 176.3, 175.0, 143.8, 139.7, 139.1, 131.8, 131.4, 129.5, 129.1, 129.0, 128.5, 128.5, 128.1, 126.4, 126.3, 123.5, 50.5, 49.0, 43.3, 41.7, 39.5, 38.0, 36.5, 21.5; IR (neat, cm^{-1}) 1708, 1347, 1164; EI-HRMS calcd for $\text{C}_{30}\text{H}_{28}\text{N}_2\text{O}_4\text{S}$ 512.1770, found 512.1774

^1H NMR (400MHz, CDCl_3) 7.57 (d, $J = 8.2$ Hz, 2H), 7.44-7.22 (m, 8H), 7.15 (d, $J = 8.0$ Hz, 2H), 7.10 (m, 2H), 5.73 (br.s, 1H), 3.99 (d, $J = 14.5$ Hz, 1H), 3.63 (br.d, $J = 14.7$ Hz, 1H), 3.54 (m, 1H), 3.39 (dd, $J = 13.7$ Hz, 8.4 Hz, 1H), 3.13 (m, 2H), 3.08-3.01 (m, 2H), 2.43 (m, 1H), 2.38 (s, 3H), 2.25-2.11 (m, 2H), 1.97 (m, 1H); ^{13}C NMR (100 MHz, CDCl_3) 176.2, 175.9, 143.4, 139.8, 135.5, 134.1, 131.5, 129.5, 129.1, 129.1, 128.6, 128.5, 127.4, 127.0, 126.4, 126.4, 46.5, 44.4, 43.6, 42.8, 38.5, 36.6, 34.2, 23.6, 21.4; IR (neat, cm^{-1}) 1708, 1342, 1160; EI-HRMS calcd for $\text{C}_{31}\text{H}_{30}\text{N}_2\text{O}_4\text{S}$ 526.1926, found 526.1928

^1H NMR (400MHz, CDCl_3) 7.44 (m, 2H), 7.36 (m, 3H), 7.29 (m, 2H), 7.23-7.16 (m, 3H), 5.72 (br.s, 1H), 4.15 (m, 4H), 3.45 (dd, $J = 13.9$ Hz, 9.8 Hz, 1H), 3.25 (dd, $J = 8.6$ Hz, 8.6 Hz, 1H), 3.11 (m, 2H), 2.90 (br.s, 2H), 2.85 (m, 1H), 2.76 (m, 1H), 2.58 (m, 2H), 1.21 (m, 6H); ^{13}C NMR (100 MHz, CDCl_3) 176.8, 176.2, 171.5, 170.6, 142.9, 140.2, 131.7, 129.3, 129.1, 128.6, 128.4, 126.7, 126.3, 123.1, 61.6, 60.4, 44.1, 42.6, 39.7, 39.3, 38.3, 36.7, 34.7, 14.0; IR (KBr, cm^{-1}) 1707, 1385, 1194; EI-HRMS calcd for $\text{C}_{30}\text{H}_{31}\text{NO}_6$ 501.2151, found 501.2160

^1H NMR (400MHz, CDCl_3) 7.68 (d, $J = 8.2$ Hz, 2H), 7.35 (m, 3H), 7.28 (d, $J = 7.9$ Hz, 2H), 6.97 (m, 2H), 5.59 (br.s, 1H), 3.91 (dd, $J = 10.4$ Hz, 6.2 Hz, 1H), 3.85 (br.d, $J = 14.0$ Hz, 1H), 3.70-3.53 (m, 4H), 3.35 (dd, $J = 8.5$ Hz, 8.5 Hz, 1H), 3.25 (dd, $J = 8.5$ Hz, 5.1 Hz, 1H), 2.84 (m, 1H), 2.57 (m, 1H), 2.54-2.35 (m, 2H), 2.40 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) 175.9, 175.0, 143.9, 140.1, 132.0, 131.3, 129.6, 129.0, 128.6, 128.1, 126.3, 122.3, 50.6, 48.8, 43.1, 41.5, 38.2, 35.4, 33.4, 32.2, 21.6; IR (KBr, cm^{-1}) 1708, 1345, 1162; EI-HRMS calcd for $\text{C}_{25}\text{H}_{25}\text{BrN}_2\text{O}_4\text{S}$ 528.0718, found 528.0704

^1H NMR (400MHz, CDCl_3) 7.62 (d, $J = 8.2$ Hz, 2H), 7.41-7.32 (m, 3H), 7.26 (d, $J = 8.1$ Hz, 2H), 7.06 (m, 2H), 5.53 (br.s, 1H), 3.99 (d, $J = 14.6$ Hz, 1H), 3.69 (m, 1H), 3.64 (d, $J = 14.6$ Hz, 1H), 3.57 (m, 2H), 3.23 (m, 2H), 3.09 (td, $J = 11.8$ Hz, 4.1 Hz, 1H), 2.50 (m, 1H), 2.46 (m, 1H), 2.39 (s, 3H), 2.25 (m, 3H), 1.98 (m, 1H); ^{13}C NMR (100 MHz, CDCl_3) 175.8, 143.5, 136.4, 134.2, 131.3, 129.6, 129.0, 128.7, 127.3, 126.3, 125.7, 46.3, 44.4, 43.5, 42.1, 34.2, 34.0, 33.3, 32.2, 23.5, 21.5; IR (KBr, cm^{-1}) 1704, 1344, 1165; EI-HRMS calcd for $\text{C}_{26}\text{H}_{27}\text{BrN}_2\text{O}_4\text{S}$ 542.0875, found 542.0870

^1H NMR (400MHz, CDCl_3) 7.41 (m, 2H), 7.34 (m, 1H), 7.14 (m, 2H), 5.54 (br.s, 1H), 4.15 (m, 4H), 3.71 (m, 1H), 3.60 (dt, $J = 10.4$ Hz, 5.8 Hz, 1H), 3.36 (dd, $J = 8.3$ Hz, 8.3 Hz, 1H), 3.28 (dd, $J = 8.6$ Hz, 5.6 Hz, 1H), 2.91 (m, 3H), 2.77 (m, 2H), 2.63 (m, 1H), 2.52 (m, 1H), 2.35 (m, 1H), 1.22 (m, 6H); ^{13}C NMR (100 MHz, CDCl_3) 176.4, 176.1, 171.4, 170.6, 143.9, 131.6, 129.0, 128.6, 126.5, 121.7, 61.6, 61.6, 60.4, 43.8, 42.4, 39.4, 38.3, 35.4, 34.4, 33.7, 32.3, 14.0, 13.9; IR (KBr, cm^{-1}) 1695, 1392, 1197; EI-HRMS calcd for $\text{C}_{25}\text{H}_{28}\text{BrNO}_6$ 517.1100, found 517.1123