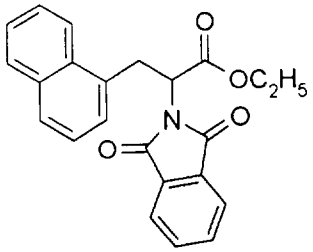
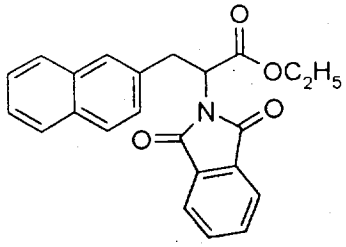
Experimental Details and Compound Characterization

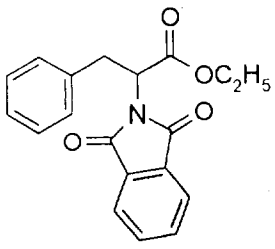
General procedures for the conjugated addition of aryltin reagents to α-amino acrylates: A suspension of α-phthalimidoacrylates (0.25 mmol), trialkylaryltin (0.5 mmol), chloro(1,5-cyclooctadiene)rhodium (I) dimer (6.2 mr, 0.0125 mmol) in 3 mL water was sonicated for several 1-4hrs in a commercial ultrasonic cleaning bath at room temperature. After the reaction was complete (monitored by TLC), 15 mL of ethyl acetate was added. The organic phase was separated and the aqueous phase was extracted with ethyl acetate (3 × 10 mL). The combined organic layer was washed with brine (15 mL), dried over $MgSO_4$, filtered and concentrated in vacuo. The crude material was purified by a flash chromatography on silica gel (eluent: hexane/ethyl acetate).



^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 8.10 (d, J = 8.8 Hz, 1 H), 7.81 (d, J = 8.0 Hz, 1 H), 7.76–7.64 (m, 5 H), 7.55-7.44 (m, 2 H), 7.26-7.21 (m, 2 H), 5.32 (dd, J_1 = 11.6 Hz, J_2 = 4.4 Hz, 1 H), 4.32-4.26 (m, 2 H), 4.17 (dd, J_1 = 14.8 Hz, J_2 = 4.4 Hz, 1 H), 3.91 (dd, J_1 = 14.4 Hz, J_2 = 11.2 Hz, 1 H), 1.28 (t, J = 7.2 Hz, 3 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.15, 167.63, 134.27, 134.00, 133.15, 131.90, 131.77, 129.18, 128.00, 127.44, 126.60, 125.92, 125.44, 123.63, 62.36, 53.00, 32.03, 14.37. IR: 3477.7, 3061.9, 2982.9, 2937.9, 1777.4, 1714.2, 1613.4, 1596.1, 1511.5, 1386.0, 1247.3, 1105.8, 1026.1, 951.1, 877.3, 778.4, 720.6. MS, m/z (rel intensity), 373 (M^+, 12). Anal. Calcd for $C_{23}H_{19}NO_4$: C, 73.98; H, 5.13; N, 3.75. Found: C, 74.29; H, 5.58; N, 3.87.

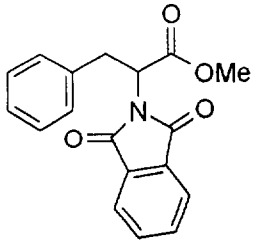


^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.76-7.60 (m, 8H), 7.40-7.33 (m, 3H), 5.30 (dd, J_1 = 11.4 Hz, J_2 = 5.2 Hz, 1 H), 4.32-4.24 (m, 2 H), 3.81-3.70 (m, 2 H), 1.27 (t, J = 7.0 Hz, 3 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.11, 167.82, 134.55, 134.30, 133.63, 132.55, 131.78, 128.53, 127.91, 127.82, 127.79, 127.02, 126.19, 125.79, 123.69, 62.36, 53.52, 35.04, 14.38. IR: 2983.2, 1776.5, 1742.0, 1715.9, 1601.1, 1508.8, 1467.9, 1445.9, 1388.3, 1244.1, 1214.3, 1102.1, 1026.8, 949.5, 901.5, 874.5, 812.7, 747.2, 719.3. MS, m/z (rel intensity), 373 (M^+, 9). Anal. Calcd for $C_{23}H_{19}NO_4$: C, 73.98; H, 5.13; N, 3.75. Found: C, 74.17; H, 5.77; N, 3.81.

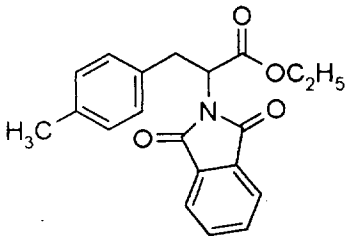


^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.78 (dd, J_1 = 5.2 Hz, J_2 = 3.1 Hz, 2 H), 7.68 (dd, J_1 = 5.6 Hz, J_2 = 3.2 Hz, 2 H), 7.22-7.10 (m, 5 H), 5.14 (dd, J_1 = 11.3 Hz, J_2 = 5.1 Hz, 1 H), 4.32-4.20 (m, 2 H), 3.64-3.48 (m, 2 H), 1.25 (t, J = 6.8 Hz, 3 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.07, 167.73, 137.04, 134.32,

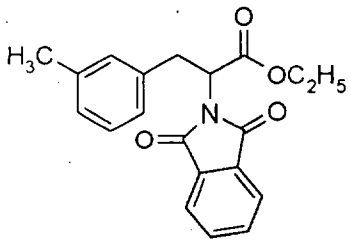
131.80, 129.08, 128.78, 127.05, 123.67, 62.29, 53.65, 34.87, 14.36. IR: 3478.0, 3063.8, 3029.7, 2982.5, 2937.8, 1777.0, 1713.0, 1606.5, 1497.6, 1468.1, 1455.5, 1387.0, 1243.4, 1196.9, 1104.8, 1027.2, 952.4, 915.8, 794.3, 751.1, 719.7. MS, m/z (rel intensity), 323 (M^+, 9).



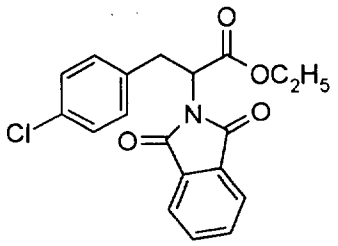
^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.76 (dd, J1 = 5.2 Hz, J2 = 3.2 Hz, 2 H), 7.66 (dd, J1 = 5.6 Hz, J2 = 3.2 Hz, 2 H), 7.19-7.09 (m, 5 H), 5.14 (dd, J1 = 11.2 Hz, J2 = 5.2 Hz, 1 H), 3.76 (s, 3 H), 3.61-3.48 (m, 2 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.58, 167.67, 136.90, 134.33, 131.78, 129.05, 128.79, 127.08, 123.70, 53.46, 53.13, 34.85. IR: 3380.7, 3029.7, 2361.9, 1708.1, 1668.3, 1527.8, 1446.5, 1420.8, 1290.5, 1265.4, 1238.7, 1191.0, 1156.4, 1102.5, 922.2, 802.0, 779.9, 750.1. MS, m/z, (rel intensity), 309 (M^+, 4).



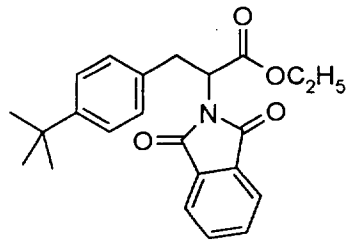
^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.80 (dd, J_1 = 5.6 Hz, J_2 = 3.2 Hz, 2 H), 7.68 (dd, J_1 = 5.6 Hz, J_2 = 3.1 Hz, 2 Hz), 7.04 (d, J = 8.4 Hz, 2 H), 6.98 (d, J = 8.4 Hz, 2 H), 5.12 (dd, J_1 = 11.2 Hz, J_2 = 4.2 Hz, 1 H), 4.28-4.20 (m, 2 H), 3.59-3.45 (m, 2 H), 2.22 (s, 3 H), 1.25 (t, J = 7.2 Hz, 3 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.14, 167.77, 136.51, 134.27, 133.88, 131.86, 129.46, 128.91, 123.67, 62.23, 53.77, 34.41, 21.24, 14.36. IR: 3628.4, 3479.8, 2982.1, 2924.6, 2360.1, 2341.2, 1777.7, 1715.0, 1614.5, 1516.9, 1468.0, 1446.2, 1386.8, 1196.5, 1115.0, 1099.1, 1026.6, 952.9, 881.0, 802.1, 719.9. MS, m/z, (rel intensity), 337 (M^+, 11).



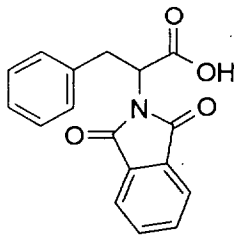
^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.80 (dd, J_1 = 5.6 Hz, J_2 = 3.1 Hz, 2 H), 7.68 (dd, J_1 = 5.5 Hz, J_2 = 3.2 Hz, 2 H), 7.06 (dd, J_1 = 8.0 Hz, J_2 = 8.0 Hz, 1 H), 6.98-6.90 (m, 3 H), 5.13 (dd, J_1 = 11.2 Hz, J_2 = 4.1 Hz, 1 H), 4.28-4.20 (m, 2 H), 3.58-3.44 (m, 2 H), 2.19 (s, 3 H), 1.25 (t, J = 7.2 Hz, 3 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.13, 167.76, 138.32, 136.96, 134.29, 131.86, 129.89, 128.62, 127.76, 126.02, 123.65, 62,25, 53.72, 34,77, 21.48, 14.36. IR: 2981.7, 2360.7, 2341.1, 1776.8, 1743.1, 1716.9, 1610.3, 1467.9, 1446.7, 1388.5, 1277.3, 1244.0, 1197.0, 1107.5, 1027.5, 955.1, 908.1, 874.9, 773.6, 719.8. MS, m/z, (rel intensity), 337 (M^+, 7).



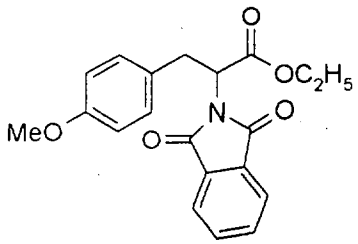
^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.78 (dd, J_1 = 5.6 Hz, J_2 = 3.2 Hz, 2 H), 7.68 (dd, J_1 = 5.6 Hz, J_2 = 3.2 Hz, 2 H), 7.20 (d, J = 8.4 Hz, 2 H), 7.09 (d, J = 8.4 Hz, 2 H), 5.14 (dd, J_1 = 11.2 Hz, J_2 = 4.2 Hz, 1 H), 4.28-4.20 (m, 2 H), 3.60-3.48 (m, 2 H), 1.25 (t, J = 7.2 Hz, 3 H), 1.21 (s, 9 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.22, 167.82, 149.77, 134.27, 133.93, 131.92, 128.69, 125.64, 123.63, 62.24, 53.64, 34.57, 34.31, 31.48, 14.35. IR: 3480.6, 3058.9, 2963.4, 2869.9, 1913.1, 1778.2, 1714.8, 1613.7, 1517.6, 1467.9, 1445.4, 1386.4, 1243.9, 1194.1, 1124.0, 1100.4, 1027.1, 992.4, 953.9, 882.8, 837.5, 817.8, 794.1, 772.2, 720.3. MS, m/z, (rel intensity), 379 (M^+, 2).



^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.79 (dd, J1 = 5.6 Hz, J2 = 2.8 Hz, 2 H), 7.70 (dd, J1 = 5.6 Hz, J2 = 2.8 Hz, 2 H), 7.15 (d, J = 8.4 Hz, 2 H), 7.09 (d, J = 8.4 Hz, 2 H), 5.10 (dd, J1 = 11.2 Hz, J2 = 4.1 Hz, 1 H), 4.30-4.18 (m, 2 H), 3.60-3.48 (m, 2 H), 1.24 (t J = 7.2 Hz, 3 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 168.82, 167.71, 135.51, 134.45, 132.89, 131.71, 130.48, 128.95, 123.79, 62.39, 53.97, 34.26, 14.34. IR: 3479.0, 2982.4, 1777.8, 1714.5, 1613.6, 1493.3, 1468.1, 1445.4, 1386.9, 1241.5, 1197.2, 1112.4, 1093.9, 1026.5, 954.8, 883.0, 811.0, 771.8, 719.4. MS, m/z, (rel intensity), 357 (M^+, 5).



^{1}H NMR (400 MHz, CD_3OD, 20°C, TMS) δ 7.92 (d, J = 8.0 Hz, 1 H), 7.57-7.48 (m, 2 H), 7.32-7.19 (m, 6 H), 4.88 (dd, J1 = 6.4 Hz, J2 = 6.4 Hz, 1 H), 3.25 (dd, J1 = 14.0 Hz, J2 = 6.0 Hz, 1 H), 3.11 (dd, J1 = 14.0 Hz, J2 = 8.0 Hz, 1 H).). ^{13}C NMR (CD_3OD, 100 MHz) δ 202.37, 168.11, 162.63, 137.24, 135.16, 131.76, 130.06, 129.48, 129.30, 128.21, 127.71, 126.60, 116.95, 110.00, 54.28, 37.27. IR: 3470.9, 2983.1, 2939.6, 2361.5, 1779.4, 1741.9, 1708.4, 1604.4, 1497.1, 1455.2, 1392.8, 1249.1, 1198.9, 1165.2, 1098.8, 1032.3, 934.7, 863.2, 820.2, 753.1.



^{1}H NMR (400 MHz, $CDCl_3$, 20°C, TMS) δ 7.82 (dd, J_1 = 5.6 Hz, J_2 = 3.2 Hz, 2 H), 7.69 (dd, J_1 = 5.6 Hz, J_2 = 3.1 Hz, 2 Hz), 7.14 (d, J = 8.4 Hz, 2 H), 6.98 (d, J = 8.4 Hz, 2 H), 5.12 (dd, J_1 = 11.2 Hz, J_2 = 4.2 Hz, 1 H), 4.28-4.20 (m, 2 H), 3.59-3.45 (m, 5 H), 1.27 (t, J = 7.2 Hz, 3 H). ^{13}C NMR ($CDCl_3$, 100 MHz) δ 169.14, 167.77, 136.51, 134.27, 133.88, 131.86, 129.46, 128.91, 123.67, 62.23, 53.77, 34.41, 21.24, 14.36. IR: 3481.4, 3219.9, 3064.3, 2958.3, 2933.1, 2872.0, 2360.5, 1789.7, 1775.7, 1723.8, 1639.7, 1514.1, 1388.5, 1290.5, 1249.7, 1198.8, 1143.9, 1115.3, 1087.5, 1025.6, 954.6, 887.0, 793.9, 718.1. MS, m/z, (rel intensity), 353 (M^+, 9).