SUPPORTING INFORMATION

Synthesis of 3,4-Disubstituted Isoquinolines via Palladium-Catalyzed Cross-Coupling of 2-(1-Alkynyl)benzaldehyde Imines and Organic Halides

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For the procedure for preparation of the *N*-*tert*-butyl-2-(1-alkynyl)aryldimines, see the Experimental Section and previous reports.^{1,3}

3,4-Disubstituted Isoquinolines Prepared.

For characterization of 3,4-diphenylisoquinoline (**2a**), see references 1 and 2. For characterization of 4-(4-nitrophenyl)-3-phenylisoquinoline (**3**), 4-(3-nitrophenyl)-3-phenylisoquinoline (**4**), ethyl 4-(3-phenylisoquinolin-4-yl)benzoate (**6**), ethyl 3-(3-phenylisoquinolin-4-yl)benzoate (**7**), 4-(4-methoxyphenyl)-3-phenylisoquinoline (**14**), 3-*n*-butyl-4-(4-nitrophenyl)isoquinoline (**16**), 3-(1-cyclohexenyl)-4-(4-nitrophenyl)isoquinoline (**18**), 3-(4-methoxyphenyl)-4-(4-nitrophenyl)isoquinoline (**21**), 4-(4-nitrophenyl)-3-phenyl[1,6]naphthyridine (**26**), 4-allyl-3-phenylisoquinoline (**27**), 4-methallyl-3-phenylisoquinoline (**28**), 3-*n*-butyl-4-methallylisoquinoline (**35**), 3-(1-cyclohexenyl)-4-methallylisoquinoline (**37**), 4-benzyl-3-phenylisoquinoline (**41**), 4-(1-decynyl)-3-phenylisoquinoline (**44**), see reference 3.

3-Phenyl-4-(4-trifluoromethylphenyl)isoquinoline (9). The reaction mixture was chromatographed using 5:1 hexanes/ethyl acetate to afford 52 mg (65 %) of the indicated compound as a yellow solid: mp 128-129 °C; ¹H NMR (CDCl₃) δ 7.22-7.23 (m, 3H), 7.32-7.34 (m, 2H), 7.39-7.40 (d, *J* = 5.7 Hz, 2H), 7.57-7.65 (m, 5H), 8.07-8.09 (d, *J* = 5.7 Hz, 1H), 9.41 (s, 1H); ¹³C NMR (CDCl₃) δ 125.24, 125.50 (q, *J* = 3.8 Hz, 1C, including 125.43, 125.48, 125.53, 125.58), 127.37, 127.51, 127.64, 128.00, 128.07, 129.38, 130.00, 130.44, 131.14, 131.87, 135.69, 140.43, 141.52, 151.03, 152.58 (one sp² carbon is missing due to overlap); IR (CHCl₃) 3060, 3019, 2929, 1619 cm⁻¹; HRMS *m/z* 349.1083 (calcd for C₂₂H₁₄F₃N, 349.1078).

3-Phenyl-4-(3-trifluoromethylphenyl)isoquinoline (10). The reaction mixture was chromatographed using 7:1 hexanes/ethyl acetate to afford 45 mg (51 %) of the indicated compound as a yellow oil: ¹H NMR (CDCl₃) δ 7.21-7.25 (m, 3H), 7.28-7.32 (m, 2H), 7.43 (d, *J* = 7.6 Hz, 1H), 7.49 (t, *J* = 7.6 Hz, 1H), 7.55 (s, 1H), 7.59-7.69 (m, 4H), 8.08-8.10 (m, 1H), 9.41 (s, 1H); ¹³C NMR (CDCl₃) δ 126.59 (q, *J* = 272.6 Hz, 1C, including 122.37, 125.98), 124.41 (q, *J* = 3.8 Hz, 1C, including 124.33, 124.38, 124.43, 124.48), 125.16, 127.38, 127.57, 127.60, 128.28 (q, *J* = 3.8 Hz, 1C, including 128.04, 128.26, 128.31, 128.41), 129.07, 129.30, 130.39, 130.75, 131.18, 131.23, 134.83 (d, *J* = 1.2 Hz, 1C, including 134.82, 134.84), 135.71, 138.38, 140.38, 151.33, 152.55 (one sp² carbon is missing due to overlap); IR (CHCl₃) 3061, 3018, 2972, 1619 cm⁻¹; HRMS *m/z* 349.1083 (calcd for C₂₂H₁₄F₃N, 349.1078).

3-Phenyl-4-(3-pyridyl)isoquinoline (11). The reaction mixture was chromatographed using 3:1 hexanes/ethyl acetate to afford 34 mg (48 %) of the indicated

compound as a yellow solid: mp 149-150 °C; ^1H NMR (CDCl_3) δ 7.22-7.24 (m, 3H), 7.29-7.34 (m, 3H), 7.55-7.62 (m, 2H), 7.63-7.69 (m, 2H), 8.08-8.12 (m, 1H), 7.54-7.55 (d, $J = 1.5$, 1H), 8.59-8.61 (dd, $J = 4.8$, 1.5 Hz, 1H), 9.42 (s, 1H); ^{13}C NMR (CDCl_3) δ 123.39, 125.00, 127.06, 127.42, 127.50, 127.66, 128.05, 128.12, 130.54, 131.26, 135.89, 138.81, 140.26, 148.71, 151.76, 151.81, 152.69 (one sp^2 C is missing due to overlap); IR (CHCl_3) 3020, 1672 cm^{-1} ; HRMS m/z 282.1158 (calcd for $\text{C}_{20}\text{H}_{14}\text{N}_2$, 282.1157).

4-(4-Methylphenyl)-3-phenylisoquinoline (12). The reaction mixture was chromatographed using 10:1 hexanes/EtOAc to yield a yellow solid: mp 120-121 °C (hexanes); ^1H NMR (CDCl_3) δ 2.30 (s, 3H), 7.07 (d, $J = 8.0$ Hz, 2H), 7.21-7.29 (m, 3H), 7.58 (d, $J = 8.0$ Hz, 2H), 7.63-7.68 (m, 4H), 7.72 (d, $J = 7.2$ Hz, 1H), 8.07-8.09 (m, 1H), 9.45 (s, 1H); ^{13}C NMR (CDCl_3) δ 21.86, 124.76, 127.09, 127.72, 128.09, 128.43, 128.55, 129.08, 129.45, 129.67, 129.92, 131.57, 134.33, 135.17, 139.82, 144.87, 149.82, 153.43; IR (CHCl_3) 3018, 2956, 1610 cm^{-1} ; HRMS 323.1315 (calcd for $\text{C}_{22}\text{H}_{17}\text{N}$ 323.1310).

4-(2-Methylphenyl)-3-phenylisoquinoline (13). The reaction mixture was chromatographed using 10:1 hexanes/EtOAc to yield a yellow solid: mp 99-100 °C (hexanes); ^1H NMR (CDCl_3) δ 2.58 (s, 3H), 6.90 (t, $J = 5.7$ Hz, 1H), 7.06 (d, $J = 5.7$ Hz, 1H), 7.10 (d, $J = 5.7$ Hz, 1H), 7.18-7.28 (m, 4H), 7.51-7.53 (m, 2H), 7.67 (td, $J = 6.0$, 0.9 Hz, 1H), 7.73 (td, $J = 6.0$, 0.9 Hz, 1H), 7.92 (d, $J = 6.0$ Hz, 1H), 8.10 (d, $J = 8.0$ Hz, 1H), 9.44 (s, 1H); ^{13}C NMR (CDCl_3) δ 21.84, 124.77, 125.58, 127.26, 127.81, 128.19, 128.31, 128.53, 129.55, 130.59, 131.84, 131.87, 132.08, 132.52, 134.51, 137.47, 140.15, 140.37, 150.67, 153.54; IR (CHCl_3) 3058, 3012, 1612 cm^{-1} ; HRMS 323.1315 (calcd for $\text{C}_{22}\text{H}_{17}\text{N}$ 323.1310).

Ethyl 4-[3-(1-cyclohexenyl)isoquinolin-4-yl]benzoate (19). The reaction mixture was chromatographed using 5:1 hexanes/ethyl acetate to afford 54.4 mg (61 %) of the indicated compound as a yellow solid: mp 128-129 °C; ¹H NMR (CDCl₃) δ 1.45 (t, *J* = 7.2 Hz, 3H), 1.48-1.52 (m, 2H), 1.56-1.61 (m, 2H), 1.95-1.97 (m, 2H), 2.16-2.18 (m, 2H), 4.44 (q, *J* = 7.2 Hz, 2H), 5.63-5.66 (m, 1H), 7.41 (dd, *J* = 7.2, 1.6 Hz, 2H), 7.49-7.51 (m, 1H), 7.54-7.58 (m, 2H), 7.99-8.01 (m, 1H), 8.15 (dd, *J* = 7.2, 1.6 Hz, 2H), 9.27 (s, 1H); ¹³C NMR (CDCl₃) δ 14.61, 22.03, 23.00, 25.71, 29.20, 61.32, 125.26, 126.76, 127.28, 127.85, 128.89, 129.51, 129.56, 130.71, 130.98, 131.22, 135.66, 137.93, 143.09, 151.95, 154.02, 166.79; IR (CHCl₃) 3019, 1725 cm⁻¹; HRMS *m/z* 357.1734 (calcd for C₂₄H₂₃NO₂, 357.1729).

3,4-Di(4-methoxyphenyl)isoquinoline (22). The reaction mixture was chromatographed using 2:1 hexanes/ethyl acetate to afford 27 mg (30 %) of the indicated compound as a white solid: mp 164-165 °C; ¹H NMR (CDCl₃) δ 3.77 (s, 3H), 3.85 (s, 3H), 6.74-6.78 (dt, *J* = 6.9, 1.8 Hz, 2H), 6.91-6.95 (dt, *J* = 6.6, 1.8 Hz, 2H), 7.15-7.18 (dt, *J* = 6.9, 1.8 Hz, 2H), 7.32-7.35 (dt, *J* = 6.6, 1.8 Hz, 2H), 7.55-7.61 (m, 2H), 7.68-7.70 (d, *J* = 6.0 Hz, 1H), 8.00-8.03 (m, 1H), 9.33 (s, 1H); ¹³C NMR (CDCl₃) δ 55.37, 55.45, 113.36, 114.11, 125.73, 126.75, 127.44, 127.73, 129.82, 129.92, 130.53, 131.73, 132.48, 133.63, 136.57, 150.59, 151.68, 158.83, 158.99; IR (CHCl₃) 3019, 1514 cm⁻¹; HRMS *m/z* 341.1422 (calcd for C₂₃H₁₉NO₂, 341.1416).

8-(4-Nitrophenyl)-7-phenyl-[1,3]dioxolo[4,5-g]isoquinoline (24). The reaction mixture was chromatographed using 3.5:1 hexanes/ethyl acetate to afford 56 mg (60 %) of the indicated compound as a yellow solid: mp 169-170 °C; ¹H NMR (CDCl₃) δ 6.11

(s, 2H), 6.78 (s, 1H), 7.18-7.24 (m, 3H), 7.25-7.29 (m, 2H), 7.31 (s, 1H), 7.39-7.43 (dt, $J = 8.7, 2.1$ Hz, 2H), 8.20-8.25 (dt, $J = 8.7, 2.1$ Hz, 2H), 9.14 (s, 1H); ^{13}C NMR (CDCl_3) δ 101.26, 102.17, 103.55, 123.86, 124.99, 127.73, 128.15, 128.47, 130.27, 132.40, 133.79, 140.22, 145.33, 147.28, 148.61, 150.46, 150.56, 152.07; IR (CHCl_3) 3019, 2926, 1642 cm^{-1} ; HRMS m/z 370.0959 (calcd for $\text{C}_{22}\text{H}_{14}\text{N}_2\text{O}_4$, 370.0954).

4-(3-Phenylallyl)-3-phenylisoquinoline (29). The reaction mixture was chromatographed using 7:1 hexanes/ethyl acetate to afford 39 mg (48 %) of the indicated compound as a yellow oil: ^1H NMR (CDCl_3) δ 3.96-3.97 (d, $J = 4.4$ Hz, 2H), 6.20-6.23 (d, $J = 16.0$ Hz, 1H), 6.49-6.54 (dt, $J = 16.0, 5.6$ Hz, 1H), 7.18-7.27 (m, 5H), 7.41-7.48 (m, 3H), 7.59-7.64 (m, 3H), 7.71-7.74 (t, $J = 5.7$ Hz, 1H), 8.02-8.04 (d, $J = 8.0$ Hz, 1H), 8.07-8.09 (d, $J = 8.8$ Hz, 1H), 9.28 (s, 1H); ^{13}C NMR (CDCl_3) δ 32.41, 124.23, 125.60, 126.04, 126.72, 127.22, 127.69, 127.81, 128.13, 128.20, 128.48, 128.88, 129.32, 130.61, 131.63, 135.82, 137.25, 141.04, 151.05, 152.67; IR (CHCl_3) 3019, 1673 cm^{-1} ; HRMS m/z 321.1521 (calcd for $\text{C}_{24}\text{H}_{19}\text{N}$, 321.1518).

Ethyl 2-[(3-phenylisoquinolin-4-yl)methyl]propenoate (33). The reaction mixture was chromatographed using 3:1 hexanes/ethyl acetate to afford 47 mg (59 %) of the indicated compound as an orange oil: ^1H NMR (CDCl_3) δ 1.34 (t, $J = 9.6$ Hz, 3H), 4.06 (t, $J = 2.8$ Hz, 2H), 4.28 (q, $J = 9.6$ Hz, 2H), 6.30 (d, $J = 0.8$ Hz, 1H), 7.40-7.47 (m, 3H), 7.54-7.57 (m, 2H), 7.61 (td, $J = 9.2, 1.6$ Hz, 1H), 7.72 (td, $J = 9.2, 1.6$ Hz, 2H), 7.83 (d, $J = 11.2$ Hz, 1H), 8.03 (d, $J = 10.8$ Hz, 1H), 9.29 (s, 1H); ^{13}C NMR (CDCl_3) δ 29.89, 31.43, 61.28, 124.44, 124.58, 126.70, 127.04, 127.84, 128.17, 128.42, 129.04, 130.94, 135.82, 140.02, 140.96, 151.64, 153.38, 166.99 (one sp^2 carbon is missing due to

overlap); IR (CHCl₃) 2982, 1710 cm⁻¹; HRMS *m/z* 317.1420 (calcd for C₂₁H₁₉NO₂, 317.1416).

4-Allyl-3-*n*-butylisoquinoline (36). The reaction mixture was chromatographed using 10:1 hexanes/ethyl acetate to afford 34 mg (55 %) of the indicated compound as a pale yellow oil: ¹H NMR (CDCl₃) δ 0.97 (t, *J* = 7.2 Hz, 3H), 1.47 (sextet, *J* = 7.5 Hz, 2H), 1.70-1.81 (m, 2H), 2.96 (t, *J* = 8.1 Hz, 2H), 3.82 (dt, *J* = 5.4, 1.2 Hz, 2H), 4.93 (dq, *J* = 22.8, 2.4 Hz, 1H), 5.06 (dq, *J* = 13.2, 2.4 Hz, 1H), 5.98-6.11 (m, 1H), 7.49-7.69 (m, 1H), 7.64-7.69 (m, 1H), 7.91-7.95 (m, 2H), 9.12 (s, 1H); ¹³C NMR (CDCl₃) δ 14.27, 23.22, 31.91, 32.63, 35.47, 116.29, 123.41, 124.92, 125.97, 127.39, 128.32, 130.32, 135.78, 136.10, 150.93, 154.13; IR (CHCl₃) 3011, 1628 cm⁻¹; HRMS *m/z* 225.1521 (calcd for C₁₆H₁₉N, 225.1518).

4-Methallyl-3-(4-methoxyphenyl)isoquinoline (38). The reaction mixture was chromatographed using 5:1 hexanes/ethyl acetate to afford 67 mg (88 %) of the indicated compound as a yellow solid: mp 81-82 °C; ¹H NMR (CDCl₃) δ 1.90 (s, 3H), 3.67 (s, 2H), 3.86 (s, 3H), 4.33 (d, *J* = 0.8 Hz, 1H), 4.90-4.91 (t, *J* = 1.2 Hz, 1H), 6.97-7.01 (dt, *J* = 9.2, 2.4 Hz, 2H), 7.54-7.58 (td, *J* = 8.4, 0.8 Hz, 1H), 7.59-7.64 (dt, *J* = 9.2, 2.4 Hz, 2H), 7.67-7.71 (td, *J* = 8.4, 0.8 Hz, 1H), 7.88-7.90 (dd, *J* = 8.4, 0.8 Hz, 1H), 7.96-7.98 (d, *J* = 8.0 Hz, 1H), 9.23 (s, 1H); ¹³C NMR (CDCl₃) δ 23.88, 37.65, 55.48, 112.80, 113.64, 124.68, 125.52, 126.58, 127.52, 128.12, 130.46, 130.51, 133.80, 136.46, 145.07, 151.10, 152.37, 159.50; IR (CHCl₃) 3019, 2970, 1609 cm⁻¹; HRMS *m/z* 289.1471 (calcd for C₂₀H₁₉NO, 289.1467).

8-Methallyl-7-phenyl-[1,3]dioxolo[4,5-g]isoquinoline (39). The reaction mixture was chromatographed using 4:1 hexanes/ethyl acetate to afford 48 mg (59 %) of the indicated compound as a yellow solid: mp 145-147 °C; ¹H NMR (CDCl₃) δ 1.84 (s, 3H), 3.55 (s, 2H), 4.36-4.37 (d, *J* = 0.6 Hz, 1H), 4.90-4.91 (t, *J* = 1.5 Hz, 1H), 6.10 (s, 2H), 7.16 (s, 1H), 7.21 (s, 1H), 7.38-7.46 (m, 3H), 7.59-7.62 (m, 2H), 8.98 (s, 1H); ¹³C NMR (CDCl₃) δ 23.74, 38.00, 101.30, 101.80, 103.51, 112.74, 125.13, 125.54, 127.82, 128.20, 129.16, 134.85, 141.45, 144.61, 148.01, 148.95, 151.39, 152.30; IR (CHCl₃) 3018, 2970, 1616, 1583 cm⁻¹; HRMS *m/z* 303.1264 (calcd for C₂₀H₁₇NO₂, 303.1259).

8-Methallyl-7-phenyl[1,6]naphthyridine (40). The reaction mixture was chromatographed using 3:1 hexanes/ethyl acetate to afford 27 mg (42 %) of the indicated compound as a yellow solid: mp 66-67 °C; ¹H NMR (CDCl₃) δ 1.88 (d, *J* = 0.4 Hz, 3H), 3.90 (s, 2H), 4.11-4.12 (dd, *J* = 1.6, 0.8 Hz, 1H), 4.81-4.83 (dt, *J* = 3.2, 1.2 Hz, 1H), 7.41-7.50 (m, 3H), 7.50-7.54 (dd, *J* = 8.0, 4.0 Hz, 1H), 7.67-7.70 (dt, *J* = 6.8, 1.6 Hz, 2H), 8.29-8.32 (dd, *J* = 6.8, 1.6 Hz, 1H), 9.15-9.17 (dd, *J* = 4.0, 1.6 Hz, 1H), 9.28 (s, 1H); ¹³C NMR (CDCl₃) δ 24.11, 35.48, 111.62, 122.19, 122.29, 128.24, 128.28, 129.15, 129.24, 135.90, 140.83, 146.11, 150.51, 151.02, 154.53, 156.35; IR (CHCl₃) 3019, 1606 cm⁻¹; HRMS *m/z* 260.1318 (calcd for C₁₈H₁₆N₂, 260.1314).

4-(4-Methoxybenzyl)-3-phenylisoquinoline (42). The reaction mixture was chromatographed using 3:1 hexanes/ethyl acetate to afford 41 mg (51 %) of the indicated compound as a white solid: mp 136-137 °C; ¹H NMR (CDCl₃) δ 3.76 (s, 3H), 4.43 (s, 2H), 6.77-6.80 (d, *J* = 8.4 Hz, 2H), 6.95-6.97 (d, *J* = 8.4 Hz, 2H), 7.36-7.42 (m, 3H), 7.52-7.56 (m, 2H), 7.57-7.64 (m, 2H), 7.85-7.87 (d, *J* = 8.4 Hz, 1H), 8.01-8.03 (d, *J* = 5.7

Hz, 1H), 9.30 (s, 1H); ^{13}C NMR (CDCl_3) δ 34.20, 55.39, 114.16, 124.82, 126.24, 126.89, 127.97, 128.02, 128.34, 128.35, 129.22, 129.48, 130.77, 133.06, 136.27, 141.24, 151.42, 153.19, 158.02; IR (CHCl_3) 3019, 1510 cm^{-1} ; HRMS m/z 325.1473 (calcd for $\text{C}_{23}\text{H}_{19}\text{NO}$, 325.1467).

Ethyl 3-(3-phenylisoquinolin-4-yl)prop-2-ynoate (43). The reaction mixture was chromatographed using 5:1 hexanes/ethyl acetate to afford 29 mg (38 %) of the indicated compound as a yellow solid: mp 92-93 $^{\circ}\text{C}$; ^1H NMR (CDCl_3) δ 1.34-1.38 (t, J = 7.2 Hz, 3H), 4.27-4.34 (q, J = 7.2 Hz, 2H), 7.45-7.56 (m, 3H), 7.66-7.72 (td, J = 7.5, 0.9 Hz, 1H), 7.84-7.89 (td, J = 7.2, 1.2 Hz, 1H), 8.04-8.08 (m, 3H), 8.37-8.40 (d, J = 8.7 Hz, 1H), 9.34 (s, 1H); ^{13}C NMR (CDCl_3) δ 14.34, 62.43, 82.66, 90.04, 109.27, 125.52, 126.54, 128.28, 128.33, 128.44, 129.43, 130.05, 132.37, 137.40, 139.21, 153.75, 154.04, 157.31; IR (CHCl_3) 2208, 1701 cm^{-1} ; HRMS m/z 301.1104 (calcd for $\text{C}_{20}\text{H}_{15}\text{NO}_2$, 301.1103).

4-(3-Methoxy-1-propynyl)-3-phenylisoquinoline (45). The mixture was chromatographed using 6:1 hexanes/ethyl acetate to afford 36 mg of the indicated compound as a yellow oil: ^1H NMR (CDCl_3) δ 3.42 (s, 3H), 4.41 (s, 2H), 7.41-7.44 (m, 1H), 7.47-7.51 (t, J = 7.2 Hz, 2H), 7.65 (td, J = 8.0, 0.8 Hz, 1H), 7.80 (td, J = 7.6, 1.2 Hz, 1H), 8.00-8.05 (m, 3H), 8.38 (d, J = 8.4 Hz, 1H), 9.28 (s, 1H); ^{13}C NMR (CDCl_3) δ 58.01, 60.82, 82.59, 95.39, 112.17, 125.81, 126.75, 127.79, 128.05, 128.16, 128.70, 129.96, 131.57, 137.14, 140.12, 151.86, 155.03; IR (CHCl_3) 3019, 2219, 1619 cm^{-1} ; HRMS m/z 273.1158 (calcd for $\text{C}_{19}\text{H}_{15}\text{NO}$, 273.1154).

4-(1-Decynyl)-3-(4-methoxyphenyl)isoquinoline (46). The reaction mixture was chromatographed using 10:1 hexanes/ethyl acetate to afford 52 mg (56 %) of the

indicated compound as a brown oil: ^1H NMR (CDCl_3) δ 0.87-0.90 (t, $J = 6.8$ Hz, 3H), 1.29-1.31 (m, 8H), 1.42-1.49 (m, 2H), 1.62-1.70 (sextet, $J = 3.2$ Hz, 2H), 2.52-2.55 (t, $J = 6.8$ Hz, 2H), 3.88 (s, 3H), 7.00-7.02 (d, $J = 8.8$ Hz, 2H), 7.57-7.61 (td, $J = 7.6, 0.8$ Hz, 1H), 7.73-7.77 (td, $J = 6.8, 1.2$ Hz, 1H), 7.95-7.97 (d, $J = 8.0$ Hz, 1H), 8.06-8.08 (d, $J = 8.8$ Hz, 2H), 8.35-8.37 (d, $J = 8.4$ Hz, 1H), 9.20 (s, 1H); ^{13}C NMR (CDCl_3) δ 14.32, 20.21, 22.88, 28.76, 29.27, 29.41, 29.46, 32.07, 55.49, 76.94, 101.08, 112.70, 113.39, 125.93, 126.60, 127.23, 127.89, 131.08, 131.34, 132.96, 137.50, 150.81, 153.81, 159.92; IR (CHCl_3) 3009, 2928, 2218, 1607 cm^{-1} ; HRMS m/z 371.2253 (calcd for $\text{C}_{26}\text{H}_{29}\text{NO}$, 371.2249).

Ethyl (Z)-3-(3-phenylisoquinolin-4-yl)propenoate (49). The mixture was chromatographed using 7:1 hexanes/ethyl acetate to afford 42 mg (55 %) of the indicated compound as a red oil: ^1H NMR (CDCl_3) δ 0.78 (t, $J = 7.2$ Hz, 3H), 3.83 (t, $J = 7.2$ Hz, 2H), 6.30 (d, $J = 12.0$ Hz, 1H), 7.25 (d, $J = 12.0$ Hz, 1H), 7.38-7.47 (m, 3H), 7.58-7.72 (m, 4H), 7.91 (d, $J = 8.4$ Hz, 1H), 8.02 (d, $J = 8.4$ Hz, 1H), 9.30 (s, 1H); ^{13}C NMR (CDCl_3) δ 13.78, 60.39, 124.56, 125.63, 125.90, 127.70, 127.13, 128.18, 128.19, 128.23, 160.26, 130.84, 134.42, 140.08, 140.75, 149.93, 152.09, 165.54; IR (CHCl_3) 3020, 2980, 1720, 1620 cm^{-1} ; HRMS m/z 303.1265 (calcd for $\text{C}_{20}\text{H}_{17}\text{NO}_2$, 303.1259).

References

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Table 2, compound 9

153.536
150.674
140.369
140.152
137.473
134.510
132.524
132.075
131.886
131.840
130.591
129.549
128.530
128.308
128.190
127.806
127.265
125.580
124.774

77.660
77.236
76.812

21.838

Table 2, compound **13**

Table 2, compound 39

Table 2, compound 45

Table 2, compound 46