Supporting Information

Synthesis of Substituted Benzoxacycles *via* Domino *ortho*-Alkylation/Heck Coupling

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General Information

The following includes general experimental procedures, specific details for representative reactions, isolation, and spectroscopic data for new compounds. Melting points were recorded using a Fisher-Johns melting point apparatus and are uncorrected. ^1H and ^{13}C NMR spectra were obtained using either Varian Gemini 300 MHz, Varian Mercury 300 MHz or Varian Unity 400 MHz spectrometers. ^1H spectra were referenced to tetramethylsilane (TMS, 0 ppm) or solvent carbons (DMSO, 2.53 ppm), ^{13}C spectra were referenced to solvent carbons (77.23 ppm for CDCl_3), and ^{31}P spectra were unreferenced. IR spectra were obtained using a Perkin Elmer Spectrum 1000 FT-IR spectrometer on NaCl plates. High-resolution mass spectra were obtained using a VG 70-250S (double focusing) mass spectrometer at 70 eV for electron impact ionization or a Sciex QStar operating at a spray voltage of 5500 V for electrospray ionization. Dry dichloromethane and diethyl ether were obtained from an MBraun solvent purification system, and used without further treatment. Dry acetone was obtained from solvent bottles stored over 4 Å molecular sieves. Acetonitrile was distilled under $\text{N}_{2(g)}$ over CaH_2 , and stored under $\text{N}_{2(g)}$ in a sealed Wheaton bottle over 4 Å molecular sieves. Neutral silica (Silicycle, Quebec, Canada) for flash chromatography was used as received. All reagents, metal catalysts and ligands were purchased from Sigma-Aldrich, VWR International, or Strem Chemical Company and used as received unless otherwise noted.

Abbreviations:

Grubbs' 2nd Generation:

br: broad

w: weak

Et_2O : Diethyl Ether

RT: Room Temperature

EtOAc: Ethyl Acetate

Ms: Methanesulfonyl,

h: hours

s: strong

m: moderate

Experimental Data

1-But-3-enyloxy-2-iodo-benzene (2-iodophenol-but-3-enyl ether) (**8**)

In a 100 mL RBF, 2-iodophenol (1.59 g, 7.23 mmol), 4-bromo-1-butene (1.46 g, 10.8 mmol), K_2CO_3 (2.00 g, 14.5 mmol), and 50 mL acetone were combined and flushed with $N_{2(g)}$. The mixture was stirred under reflux for 3 days. The mixture was diluted with 100 mL Et_2O , and washed with 30 mL H_2O . The organic phase was then dried with $MgSO_4$, filtered, and concentrated. The crude product was then purified by flash chromatography on silica gel ($R_f = 0.9$ on with 10 % Et_2O /hexane) using 0 %, and 5 % Et_2O /hexane to yield **8** as a clear oil. Isolated yield: 1.28 g (65 % yield, quantitative based upon recovered starting material). 1H NMR (400 MHz, $CDCl_3$) δ 2.65 (qd, $J=6.7$, 1.1 Hz, 2H), 4.10 (t, $J=6.6$ Hz, 2H), 5.18 (d, $J=10.3$ Hz, 1H), 5.25 (d, $J=17.2$ Hz, 1H), 6.02 (m, 1H), 6.74 (t, $J=7.7$ Hz, 1H), 6.84 (d, $J=8.4$ Hz, 1H), 7.32 (m, 1H), 7.81 (dd, $J=7.9$, 1.7 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 33.6, 68.6, 86.7, 112.2, 117.3, 122.5, 129.4, 134.3, 139.4, 157.4; IR neat, ν (cm^{-1}) 748 (s), 1018 (s), 1248 (s), 1277 (s), 1439 (s), 1464 (s), 1581 (s), 2875 (m), 2928 (m), 3075 (m), 3854 (m); HRMS (EI) calc'd for $C_{10}H_{11}IO$: 273.9849 (M^+), found 273.9855.

tert-Butyl (2*E*)-5-(2-iodophenoxy)pent-2-enoate (**1a**)

8 (3.00 g, 10.9 mmol) and *tert*-butyl acrylate (24.0 mL, 164 mmol) were combined and 25 mL CH_2Cl_2 added. The mixture was flushed with $N_{2(g)}$, and Grubbs' 2nd generation catalyst (140 mg, 0.320 mmol) added. A water-cooled condenser was attached, and flushed with $N_{2(g)}$, and the mixture stirred at 40 °C for 4 days. Solvent and acrylate were then removed via short-path distillation (RT to 60 °C at ~40-60 mm Hg). The crude mixture was then purified by flash chromatography on silica gel ($R_f = 0.28$ in 10 % Et_2O /hexane) using 0-10 % Et_2O /hexane to afford **1a** as a pale yellow oil, slowly solidifying to a waxy, white solid (mp = 38-39 °C). Isolated yield: 3.62 g (88 %). 1H NMR (300 MHz, $CDCl_3$) δ 1.49 (s, 9H), 2.71 (qd, $J=6.6$, 1.4 Hz, 2H), 4.10 (t, $J=6.6$ Hz, 2H), 5.92 (dt, $J=15.5$, 1.5 Hz, 1H), 6.71 (td, $J=7.6$, 1.2 Hz, 1H), 6.79 (dd, $J=8.2$, 1.2 Hz, 1H), 6.99 (dt, $J=15.6$, 7.1 Hz, 1H), 7.25-7.31 (m, 1H), 7.77 (dd, $J=7.8$, 1.6 Hz, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 28.2, 31.9, 67.4, 80.3, 86.8, 112.2, 122.8, 125.6, 129.4, 139.6, 142.9, 157.2, 165.7; IR, neat, ν (cm^{-1}) 848 (s), 978 (s), 1018 (s), 1050 (s), 1155 (s), 1248 (s), 1277 (s), 1367 (s), 1465 (s), 1716 (s), 2931 (m), 2976 (s); HRMS (EI) calc'd for $C_{15}H_{19}IO_3$: 374.0379 (M^+); found: 374.0385.

Methyl (2*E*)-5-(2-iodophenoxy)pent-2-enoate (**1b**)

In a 10 mL RBF, **8** (500 mg, 1.82 mmol) was dissolved in methyl acrylate (2.46 mL, 27.3 mmol) and flushed with dry $N_{2(g)}$. Grubbs' 2nd generation catalyst (46.0 mg, 0.0550 mmol) was added and stirred for 2 days. The reaction mixture was concentrated *in vacuo* and the crude mixture purified by flash

chromatography on silica gel ($R_f = 0.2$ in 10 % Et₂O/ hexane) using 0 to 20 % Et₂O/hexane to yield **1b** as a clear oil. Isolated yield: 168 mg (28 %). ¹H NMR (300 MHz, CDCl₃) δ 2.74 (q, $J=13.2$ Hz, 2H), 3.74 (s, 3H), 4.11 (t, $J=6.6$ Hz, 2H), 6.02 (dd, $J=15.8, 1.5$ Hz, 1H), 6.72 (t, $J=7.5$ Hz, 1H), 6.78 (d, $J=8.2$ Hz, 1H), 7.10 (td, $J=15.7, 7.0$ Hz, 1H), 7.24-7.31 (m, 1H), 7.76 (d, $J=7.9$ Hz, 1H); ¹³C NMR (75 MHz, CDCl₃) δ 32.0, 51.6, 67.3, 86.8, 112.2, 122.9, 123.5, 129.5, 139.6, 144.6, 157.1, 166.7; IR, neat, ν (cm⁻¹) 750 (s), 977 (m), 1247 (s), 1732 (s); HRMS (EI) calc'd for C₁₂H₁₃IO₃: 331.9909 (M⁺); found: 331.9909.

Ethyl-(5-(2-Iodo-phenoxy))-pent-2-enoate (**1c**)

In a 100 mL RBF, **8** (1.28 g, 4.67 mmol) was dissolved in 50 mL dry CH₂Cl₂, and flushed with dry N_{2(g)}. Ethyl acrylate (10.5 mL, 117 mmol) was added, followed by Grubbs' 2nd generation catalyst (59.0 mg, 0.0700 mmol, 1.5 mol %), and stirring for 1.5 days. An additional portion of catalyst was added, followed by stirring for an additional 1.5 days. The reaction mixture was concentrated *in vacuo* and the crude mixture purified by flash chromatography on silica gel ($R_f = 0.20$ in 10 % Et₂O/ hexane) using 0 to 20 % Et₂O/hexane to yield **1c** as a pale yellow oil. Isolated yield: 1.40 g (87 %). ¹H NMR (400 MHz, CDCl₃) δ 1.29 (t, $J=7.1$ Hz, 3H), 2.75 (qd, $J=6.5, 1.5$ Hz, 2H), 4.12 (t, $J=6.2$ Hz, 2H), 4.20 (q, $J=7.2$ Hz, 2H), 6.01 (dt, $J=15.7, 1.5$ Hz, 1H), 6.72 (td, $J=7.6, 1.3$ Hz, 1H), 6.79 (dd, $J=8.1, 1.5$ Hz, 1H), 7.09 (dt, $J=15.7, 7.0$ Hz, 1H), 7.26-7.31 (m, 1H), 7.77 (dd, $J=7.9, 1.7$ Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 14.4, 32.0, 60.3, 67.3, 86.8, 112.2, 122.9, 123.9, 129.5, 139.5, 144.3, 157.1, 166.2; IR, neat, ν (cm⁻¹) 1277 (s), 1465 (s), 1717 (s), 2979 (m), 3649 (s). HRMS (EI) calc'd for C₁₃H₁₅IO₃: 346.0067 (M⁺); found: 346.0066.

(2E)-5-(2-Iodophenoxy)pent-2-enoic acid (**12**)

Compound **1c** (592 mg, 1.71 mmol) was dissolved in 7.5 mL dioxane, and 7.5 mL H₂O was added. The mixture was cooled to 0 °C, and NaOH (1.71 mL, 5.00 M, 8.55 mmol) was added, and stirred while allowing to warm to RT for 4 h. The reaction was then diluted with 70 mL toluene, 30 mL H₂O, and separated. The organic phase was washed with H₂O, and the combined aqueous extracts acidified with 10 % HCl to ~pH 2 and extracted with 2 x 50 mL Et₂O. The organic phase was dried with MgSO₄, filtered, and concentrated. This yielded a waxy, impure solid, which was recrystallized from Et₂O by addition of hexane. The mother liquor was then concentrated and a second recrystallization performed, yielding **12** as a white flaky crystalline solid (mp = 110-112 °C). Isolated yield: 339 mg (62 %). ¹H NMR (300 MHz, CDCl₃) δ 2.78 (qd, $J=6.5, 1.5$ Hz, 2H), 4.13 (t, $J=6.1$ Hz, 1H), 6.03 (dt, $J=15.8, 1.5$ Hz, 1H), 6.72 (td, $J=7.6, 1.2$ Hz, 1H), 6.79 (dd, $J=8.2, 1.2$ Hz, 1H), 7.16-7.25 (m, 1H), 7.26-7.32 (m, 1H), 7.77 (dd, $J=7.8, 1.6$ Hz, 1H); ¹³C NMR (75 MHz, CDCl₃) δ 32.1, 67.1, 86.8, 112.2, 122.9, 123.2, 129.4, 139.6, 147.3, 157.1, 171.4; IR, neat, ν (cm⁻¹) 735 (s), 908 (s), 1019 (m), 1050 (m), 1700 (s), 2254 (m), 2926 (w); Elemental Anal. calc'd for C₁₁H₁₁IO₃: C (41.53 %) H (3.49 %); found C (41.69 %) H (3.55 %).

1-[(2*E*)-5-(2-Iodophenoxy)pent-2-enoyl]pyrrolidine (**1d**)

Compound **12** (100 mg, 0.310 mmol) and SOCl₂ (10.0 mL, 13.7 mmol) were combined and heated to 80 °C for 2 h. SOCl₂ was then removed *in vacuo*. The crude acid chloride was then dissolved in 2 mL dry CH₂Cl₂ and transferred to a flask containing dry pyrrolidine (39.0 μL, 0.465 mmol) and dry pyridine (38.0 μL, 0.465 mmol) in 3 mL dry CH₂Cl₂ at 0 °C. The mixture was then allowed to stir and warm to RT for 12 h. The mixture was then acidified with 3 mL 10 % HCl, and extracted with 2 x 10 mL Et₂O. The combined organic extracts were then washed with 10 % HCl, saturated NaHCO₃, then dried with MgSO₄, filtered, and concentrated *in vacuo*. The crude product was purified by flash chromatography on silica gel (*R_f* = 0.31 in 25 % EtOAc/hexane) using 5 to 80 % EtOAc/hexane to yield **1d** as a pale yellow oil. Isolated yield: 55 mg (48 %). ¹H NMR (300 MHz, CDCl₃) δ 1.81-2.01 (m, 4H), 2.75 (qd, *J*=13.2, 1.5 Hz, 2H), 3.50-3.58 (m, 4H), 4.12 (t, *J*=6.3 Hz, 2H), 6.33 (dt, *J*=15.1, 1.5 Hz, 1H), 6.71 (td, *J*=7.5, 1.3 Hz, 1H), 6.79 (dd, *J*=8.2, 1.5 Hz, 1H), 6.98 (dt, *J*=15.1, 7.1 Hz, 1H), 7.25-7.32 (m, 1H), 7.76 (dd, *J*=7.9, 1.5 Hz, 1H); ¹³C NMR (75 MHz, CDCl₃) δ 24.3, 26.1, 32.1, 45.8, 46.7, 67.5, 86.7, 112.1, 122.7, 124.5, 129.4, 139.5, 140.3, 157.2, 164.5. IR, neat, ν (cm⁻¹) 975 (s), 1017 (s), 1050 (s), 1247 (s), 1277 (s), 1457 (s, br), 1615 (s, br), 1662 (s), 2874 (s), 2949 (s), 2969 (s), 3502 (m, br); HRMS (EI) calc'd for C₁₅H₁₈INO₂: 371.0382 (M⁺); found: 371.0379.

(2*E*)-5-(2-Iodophenoxy)-*N*-methoxy-*N*-methylpent-2-enamide (**1e**)

(Based upon Grubbs, *et al. Angew. Chem., Int. Ed.* **2001**, *40*, 1277.)

N-methoxy-*N*-methylacrylamide (200 mg, 1.74 mmol), compound **8** (537 mg, 2.17 mmol), and Grubbs' 2nd Generation catalyst (74.0 mg, 0.0870 mmol) were dissolved in 9 mL CH₂Cl₂ and stirred under reflux for 2 days. The mixture was concentrated *in vacuo* and purified by flash chromatography on silica gel (*R_f* = 0.34 in 20 % EtOAc/hexane) using 10 to 35 % EtOAc/hexane to afford **1e** as a dark brown oil. Isolated yield: 361 mg (57 %). ¹H NMR (300 MHz, CDCl₃) δ 2.78 (qd, *J*=6.4, 1.2 Hz, 2H) 3.24 (s, 3H) 3.70 (s, 3H) 4.12 (t, *J*=6.4 Hz, 2H) 6.59 (d, *J*=15.5 Hz, 1H) 6.70 (td, *J*=7.6, 1.2 Hz, 1H) 6.79 (dd, *J*=8.2, 1.2 Hz, 1H) 7.07 (dt, *J*=15.5, 7.1 Hz, 1H) 7.28 (td, *J*=7.8, 1.6 Hz, 1H) 7.75 (dd, *J*=7.8, 1.6 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 32.2, 32.4, 61.8, 67.5, 86.7, 112.2, 121.3, 122.7, 129.4, 139.5, 142.6, 157.2, 166.5; IR neat, ν (cm⁻¹) 751 (s), 813 (w), 834 (w), 978 (s), 1017 (s), 1050 (s), 1122 (m), 1178 (m), 1247 (s), 1277 (s), 1381 (s), 1465 (s), 1581 (s), 1633 (s), 1665 (s), 1936 (w), 2934 (m), 3482 (br, w); HRMS (EI) calc'd for C₁₃H₁₆INO₃: 361.0175 (M⁺), found 361.0185.

1-(3-Bromopropoxy)-2-iodobenzene (**13**)

2-Iodophenol (6.69 g, 30.4 mmol), 1,3-dibromopropane (46.0 mL, 456 mmol), and K_2CO_3 (21.0 g, 152 mmol) were combined and dissolved/suspended in 300 mL acetone. The mixture was stirred under reflux for 2 days, then concentrated *in vacuo*. The crude mixture was then worked up with Et_2O/H_2O , and the combined organic extracts dried with $MgSO_4$, filtered, and concentrated. Excess 1,3-dibromopropane was removed via short path distillation (bp = 167 at 760 mm Hg), and the crude product purified by flash chromatography on silica gel (R_f = 0.61 in 10 % Et_2O /hexane) using 0 to 10 % Et_2O /hexane to afford **13** as a clear oil. Isolated yield: 9.01 g (87 %). 1H NMR (300 MHz, $CDCl_3$) δ 2.37 (tt, J =6.3, 5.9 Hz, 2H), 3.72 (t, J =6.4 Hz, 2H), 4.16 (t, J =5.7 Hz, 2H), 6.72 (td, J =7.5, 1.3 Hz, 1H), 6.84 (dd, J =8.2, 1.5 Hz, 1H), 7.27-7.33 (m, 1H), 7.77 (dd, J =7.8, 1.6 Hz, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 30.7, 32.6, 66.7, 87.0, 112.5, 123.1, 129.8, 139.7, 157.3; IR neat, ν (cm^{-1}) 1018 (s), 1050 (s), 1246 (s), 1277 (s), 1438 (s), 1464 (s), 2880 (w), 2932 (m), 3059 (w); HRMS (EI) calc'd for $C_9H_{10}OBrI$: 339.8960(M^+), found 339.8962.

[3-(2-Iodophenoxy)propyl](triphenyl)phosphonium iodide (**14**)

Compound **13** (2.56 g, 7.50 mmol) was combined with NaI (16.9 g, 113 mmol), dissolved in 100 mL acetone, and stirred overnight. Et_2O was added dropwise until precipitation ceased, and the resulting precipitate filtered off. The liquid phase was concentrated *in vacuo*, and taken up in 100 mL EtOAc. PPh_3 (2.16 g, 8.25 mmol) was added, and the mixture stirred under reflux for 2 days. The mixture was then cooled, and the precipitate filtered off and washed with EtOAc. This afforded **14** as a white, powdery solid (mp = 232 °C (dec.)). Isolated yield: 1.16 g (24 %). 1H NMR (400 MHz, $DMSO-d_6$) δ 1.96-2.06 (m, 2H), 3.70-3.79 (m, 2H), 4.17 (t, J =5.5 Hz, 2H), 6.76 (td, J =7.5, 1.1 Hz, 1H), 6.98 (dd, J =8.1, 0.9 Hz, 1H), 7.31-7.36 (m, 1H), 7.75-7.82 (m, 7H), 7.83-7.94 (m, 8H); ^{13}C NMR (100 MHz, $DMSO-d_6$) δ 18.4 (d, J =56.0 Hz), 22.7 (d, J =3.1 Hz), 68.1 (d, J =17.6 Hz), 87.6, 113.3, 118.6 (d, J =85.9 Hz), 123.5, 130.3, 130.8 (d, J =13.0 Hz), 134.0 (d, J =10.0 Hz), 135.5, 139.4, 156.9; ^{31}P NMR (121.5 MHz, $DMSO-d_6$) δ 23.9; IR neat, ν (cm^{-1}) 737 (s), 747 (s), 917 (m), 1112 (s), 1465 (s), 1558 (s), 1575 (s), 1651 (m), 1683 (m), 1699 (m), 3626 (s), 3645 (s), 3733 (s); HRMS (ESI) calc'd for $C_{27}H_{25}POI$: 523.0682 ($M-I^+$), found 523.0693.

2-[(1E)-4-(2-Iodophenoxy)but-1-enyl]pyridine (**1f**)

Compound **14** (455 mg, 0.700 mmol) was dissolved in 70 mL THF, and cooled to -78 °C. NaH (31.0 mg, 60 % in paraffin oil, 0.770 mmol) was added, and the mixture stirred for 10 minutes, then allowed to warm to 0 °C. Pyridine-2-carboxaldehyde (69.0 μ L, 0.700 mmol) was then added, and the mixture

stirred at 0 °C for 2 hours, and allowed to stir while warming to RT overnight. The mixture was diluted with Et₂O (100 mL) and quenched with 50 mL H₂O. The layers were separated, and the aqueous phase washed with 2 x 50 mL Et₂O. The organic phases were then dried with Na₂SO₄, filtered, and concentrated *in vacuo*. The crude product was then purified by flash chromatography on silica gel (*R_f* = 0.60 in hexane) using 0 to 2.5 % Et₂O/hexane to yield **1f** as a clear orange oil. Isolated yield: 150 mg (61 %). ¹H NMR (400 MHz, CDCl₃) δ 3.22 (dq, *J*=13.8, 1.5 Hz, 2H), 4.17 (t, *J*=6.4 Hz, 2H), 6.10 (dt, *J*=11.7, 7.3 Hz, 1H), 6.58 (dt, *J*=11.7, 1.5 Hz, 1H), 6.69 (td, *J*=7.6, 1.3 Hz, 1H), 6.88 (dd, *J*=8.2, 1.3 Hz, 1H), 7.11 (ddd, *J*=7.5, 4.9, 1.1 Hz, 1H), 7.26-7.30 (m, 2H), 7.64 (td, *J*=7.7, 1.8 Hz, 1H), 7.76 (dd, *J*=7.7, 1.5 Hz, 1H), 8.60-8.62 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 28.8, 68.7, 86.7, 112.4, 121.4, 122.4, 124.2, 129.4, 130.3, 132.3, 136.1, 139.4, 149.2, 156.5, 157.5; IR neat, ν (cm⁻¹) 746 (s), 810 (m), 928 (m), 1017 (s), 1049 (s), 1121 (m), 1247 (s), 1277 (s), 1438 (s), 1463 (s), 1584 (s), 1646 (w), 2875 (w), 2925 (m), 1015 (w), 3058 (w); HRMS (EI) calc'd for C₁₅H₁₄INO: 351.0120 (M⁺), found 351.0123.

(1E)-4-(2-Iodophenoxy)but-1-enyl phenyl sulfone (1g)

(Based upon Grela, K.; Bieniek, M. *Tetrahedron Lett.* **2001**, 42, 6425-6428.)

Compound **8** (274 mg, 1.00 mmol) and phenyl vinyl sulfone (336 mg, 2.00 mmol) were combined in a flask and flushed with N_{2(g)}. The mixture was dissolved in 80 mL CH₂Cl₂ and Grubbs' 2nd generation catalyst (42.0 mg, 0.0500 mmol) was added. The mixture was stirred for 3 days at 45 °C, then concentrated *in vacuo*. The crude mixture was purified by silica gel chromatography (*R_f* = 0.43 in 30 % EtOAc/hexane) using 15 to 35 % EtOAc/hexane, affording product **1g** as a brown-yellow viscous oil which slowly crystallized to a gray-white solid (mp = 71-72 °C). Isolated yield: 281 mg (68 %). ¹H NMR (300 MHz, CDCl₃) δ 2.76 (ddd, *J*=12.6, 6.0, 1.6 Hz, 2H), 4.12 (t, *J*=5.9 Hz, 2H), 6.57 (dt, *J*=15.2, 1.5 Hz, 1H), 6.70 (td, *J*=7.6, 1.2 Hz, 1H), 6.75, (dd, *J*=8.3, 1.3 Hz, 1H), 7.10 (dt, *J*=15.1, 6.6 Hz, 1H), 7.23-7.30 (m, 1H), 7.48-7.54 (m, 2H), 7.56-7.62 (m, 1H), 7.71 (dd, *J*=7.8, 1.6 Hz, 1H), 7.87-7.92 (m, 2H); ¹³C NMR (75 MHz, CDCl₃) δ 31.3, 66.4, 86.6, 112.1, 123.1, 127.9, 129.4, 129.6, 132.8, 133.5, 139.6, 140.3, 142.6, 156.8; IR neat, ν (cm⁻¹) 1034 (m), 1145 (m), 1281 (m), 3105 (w), 3852 (s); HRMS (EI) calc'd for C₁₆H₁₅IO₃S: 413.9787 (M⁺), found 413.9790.

1-(But-3-enyloxy)-2-iodo-4-methoxybenzene (9)

2-Iodo-4-methoxyphenol (500 mg, 2.00 mmol), 4-bromo-1-butene (305 μL, 3.00 mmol), and K₂CO₃ (829 mg, 6.00 mmol) were combined and 30 mL acetone added. The mixture was stirred under reflux for 4 days. The mixture was cooled, concentrated, and suspended in 25 mL 1 M NaOH. The aqueous phase was extracted with Et₂O (3 x 25 mL), and the combined organic extracts dried with MgSO₄, filtered, and concentrated *in vacuo*. The crude product was then purified by flash chromatography on silica gel (*R_f* = 0.8 in 10 % Et₂O/hexane) using 2 to 5 % Et₂O/hexane to afford **9** as a pale yellow oil. Isolated yield: 322 mg (53 %). ¹H NMR (300 MHz, CDCl₃) δ 2.57 (qt, *J*=6.7, 1.2 Hz, 2H), 3.75 (s, 3H), 3.99 (t, *J*=6.7 Hz, 2H), 5.09-5.15 (m, 1H), 5.19 (dq, *J*=17.1, 1.6 Hz, 1H), 5.89-6.04 (m, 1H), 6.75 (d, *J*=9.1 Hz, 1H), 6.84 (dd, *J*=8.9, 2.9 Hz, 1H), 7.32 (d, *J*=3.0 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 33.8, 55.9, 69.6, 87.1, 113.4, 114.8, 117.1, 124.6, 134.5, 152.0, 154.4; IR neat, ν (cm⁻¹) 749 (m), 796

(m), 844 (m), 918 (m), 1044 (s), 1215 (s), 1272 (s), 1384 (m), 1437 (m), 1488 (s), 1570 (m), 1600 (m), 1844 (w), 2058 (w), 2936 (m), 3074 (m); HRMS (EI) calc'd for C₁₁H₁₃IO₂: 303.9960 (M⁺), found 303.9962.

5-(2-Iodo-4-methoxy-phenoxy)-pent-2-enoic acid tert-butyl ester (**1h**)

In a 10 mL RBF, **9** (152 mg, 0.500 mmol), *t*-butyl acrylate (1.10 mL, 7.50 mmol), and CH₂Cl₂ (5 mL) were combined, and flushed with N_{2(g)}. Grubbs' 2nd generation catalyst (6.40 mg, 0.00750 mmol) was added, a condenser attached, and the system flushed again with N_{2(g)}. The mixture was stirred at 45 °C for 1.5 days, a second portion of catalyst added, and stirred an additional 1.5 days. The mixture was then heated to 60 °C, and solvent and acrylate were removed by short path distillation at ~30 torr. The crude product was then purified by flash chromatography on silica gel (*R_f* = 0.19 in 10 % Et₂O/hexane) using 0 % to 15 % Et₂O/hexane to yield **1h** as a viscous yellow oil. Isolated yield: 188 mg (93 %). ¹H NMR (400 MHz, CDCl₃) δ 1.49 (s, 9H), 2.69 (qd, *J*=6.7, 1.3 Hz, 2H), 3.75 (s, 3H), 4.04 (t, *J*=6.4 Hz, 2H), 5.90 (dt, *J*=15.5, 1.4 Hz, 1H), 6.74 (d, *J*=8.8 Hz, 1H), 6.82–6.85 (m, 1H), 6.98 (dt, *J*=15.7, 7.0 Hz, 1H), 7.32 (d, *J*=2.9 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 28.4, 32.2, 56.1, 68.7, 80.4, 87.4, 113.7, 115.0, 124.9, 125.6, 143.4, 152.0, 154.8, 165.9; IR neat, ν (cm⁻¹) 848 (m), 978 (s), 1045 (s), 1155 (s), 1215 (s), 1273 (s), 1367 (s), 1391 (m), 1439 (m), 1490 (s), 1570 (m), 1599 (m), 1654 (s), 1711 (s), 2065 (w), 2833 (m), 2933 (s), 2975 (s); HRMS (EI) calc'd for C₁₆H₂₁IO₄: 404.0485 (M⁺), found 404.0489.

2-(But-3-enyloxy)-1-iodo-4-nitrobenzene (**11**)

3-buten-1-ol (830 μL, 9.69 mmol) was dissolved in 20 mL dry CH₂Cl₂ and cooled to 0 °C. Et₃N (2.70 mL, 19.4 mmol) was added, followed by MsCl (750 μL, 9.69 mmol). The mixture was stirred at 0 °C for 30 minutes, then allowed to warm to RT, and stirred for an additional 30 minutes. The mixture was concentrated *in vacuo* and suspended in 25 mL dry acetone. This suspension was then transferred to a flask containing 2-iodo-5-nitrophenol (857 mg, 3.23 mmol) and K₂CO₃ (1.34 g, 9.69 mmol) in 25 mL dry acetone. The mixture was stirred under reflux for 24 h, and was then concentrated *in vacuo*. The mixture was then worked up using 30 mL 1 M NaOH, which was extracted using 3 x 50 mL Et₂O. The combined organic phases were dried with MgSO₄, filtered, and concentrated *in vacuo*. The crude mixture was then purified by flash chromatography on silica gel (*R_f* = 0.61 in 10 % Et₂O/hexane) using 5 to 7.5 % Et₂O/hexane to afford **11** as a white/pale yellow solid (mp = 48–49 °C). Isolated yield: 980 mg (95 %). ¹H NMR (300 MHz, CDCl₃) δ 2.65 (q, *J*=6.4 Hz, 2H) 4.16 (t, *J*=6.4 Hz, 2H) 5.17 (d, *J*=10.2 Hz, 1H) 5.24 (dq, *J*=17.2, 3.1 Hz, 1H) 5.97 (m, 1H) 7.58 (m, 2H) 7.95 (m, 1H); ¹³C NMR (75 MHz, CDCl₃) δ 33.3, 69.3, 95.6, 105.9, 116.9, 117.9, 133.7, 139.8, 149.2, 158.1; IR, neat, ν (cm⁻¹) 815 (s), 871 (s), 916 (s), 1027 (s), 1095 (m), 1507 (s), 1522 (s), 1559 (s), 2954 (m), 3103 (m); HRMS (EI) calc'd for C₁₀H₁₀INO₃: 318.9705 (M⁺); found: 318.9714.

***tert*-Butyl (2*E*)-5-(2-iodo-5-nitrophenoxy)pent-2-enoate (**1i**)**

In a flask, **11** (300 mg, 0.940 mmol), *tert*-butyl acrylate (2.06 mL, 14.1 mmol) and 5 mL CH₂Cl₂ were combined and flushed with N_{2(g)}. Grubbs' 2nd generation catalyst (12.0 mg, 0.0140 mmol) was then added, a water cooled condenser attached, and flushed with N_{2(g)}. The mixture was stirred under reflux for 2 days, and concentrated *in vacuo*. Excess acrylate was removed via short path distillation (~30 mm Hg, 60 °C), and the crude product purified by flash chromatography on silica gel (*R_f* = 0.25 in 10 % Et₂O/hexane) using 5 to 20 % Et₂O/hexane to yield **1i** as a yellow oil, slowly crystallizing to a yellow solid (mp = 77-78 °C). Isolated yield: 386 mg (98 %). ¹H NMR (400 MHz, CDCl₃) δ 1.49 (s, 9H), 2.77 (qd, *J*=13.3, 1.4 Hz, 2H), 4.22 (t, *J*=6.3 Hz, 2H), 5.95 (dt, *J*=15.6, 1.5 Hz, 1H), 6.97 (dt, *J*=15.6, 7.0 Hz, 1H), 7.58-7.62 (m, 2H), 7.96 (d, *J*=8.6 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 28.1, 31.5, 68.0, 80.4, 95.5, 106.0, 117.1, 126.1, 139.8, 142.0, 149.1, 157.8, 165.4; IR thin film, ν (cm⁻¹) 737 (m), 1021 (m), 1153 (s), 1255 (m), 1344 (s), 1461 (m), 1522 (s), 1569 (m), 1653 (m), 1709 (s), 2976 (m); HRMS (EI) calc'd for C₁₅H₁₈NO₃I: 419.0230 (M⁺), found 419.0227.

1-(But-3-enyloxy)-4-chloro-2-iodobenzene (10**)**

3-buten-1-ol (385 μL, 4.50 mmol) was dissolved in 20 mL dry CH₂Cl₂ and cooled to 0 °C. Et₃N (616 μL, 4.50 mmol) was added, followed by MsCl (348 μL, 4.50 mmol). The mixture was stirred at 0 °C for 30 minutes, then allowed to warm to RT, and stirred for overnight under N_{2(g)}. The mixture was concentrated *in vacuo* and suspended in 25 mL dry acetone. This suspension was then transferred to a flask containing 4-chloro-2-iodophenol (382 mg, 1.50 mmol) and K₂CO₃ (622 mg, 4.50 mmol). The mixture was stirred under reflux for 2.5 days, and was then concentrated *in vacuo*. The mixture was diluted with 25 mL H₂O, and extracted with 2 x 25 mL Et₂O. The combined organic extracts were dried with MgSO₄, filtered and concentrated *in vacuo*. The crude product was then passed through a 1 cm silica gel plug (*R_f* = 0.85 in 10 % Et₂O/hexane) with 10 % Et₂O/hexane. This afforded **10** as a clear, pale yellow oil. Isolated yield: 452 mg (98 %). ¹H NMR (300 MHz, CDCl₃) δ 2.59 (qt, *J*=6.7, 1.3 Hz, 2H), 4.03 (t, *J*=6.6 Hz, 2H), 5.11-5.16 (m, 1H), 5.20 (dq, *J*=17.2, 3.3 Hz, 1H), 5.88-6.02 (m, 1H), 6.70 (d, *J*=8.5 Hz, 1H), 7.25 (dd, *J*=8.5, 2.6 Hz, 1H), 7.74 (d, *J*=2.6 Hz, 1H); ¹³C NMR (75 MHz, CDCl₃) δ 33.8, 69.2, 87.1, 112.7, 117.8, 126.5, 129.4, 134.3, 138.8, 156.6; IR neat, ν (cm⁻¹) 705 (s), 1039 (s), 1247 (s), 1262 (s), 1283 (s), 1461 (s), 1475 (s), 1636 (m), 2875 (m), 2928 (m), 2979 (m), 3078 (m); HRMS (EI) calc'd for C₁₀H₁₀IOCl: 307.9465 (M⁺), found 307.9465.

***tert*-Butyl (2*E*)-5-(4-chloro-2-iodophenoxy)pent-2-enoate (**1j**)**

Compound **10** (445 mg, 1.44 mmol) and *tert*-butyl acrylate (3.17 mL, 21.6 mmol) were combined and 5 mL CH₂Cl₂ added. The mixture was flushed with N_{2(g)}, and Grubbs' 2nd generation catalyst (37.0 mg, 0.0400 mmol) added. A water-cooled condenser was attached, and flushed with N_{2(g)}, and the mixture stirred at 40 °C for 2 days. Solvent and acrylate were then removed via short-path distillation (rt to 60 °C at ~40-60 mm Hg). The crude mixture was then purified by flash chromatography on silica gel (R_f = 0.45 in 10 % Et₂O/hexane) using 0-10 % Et₂O/hexane to afford **1j** as a clear, colourless oil. Isolated yield: 502 mg (85 %). ¹H NMR (300 MHz, CDCl₃) δ 1.49 (s, 9H), 2.71 (qd, *J*=13.5, 1.5 Hz, 2H), 4.07 (t, *J*=6.5 Hz, 2H), 5.91 (dt, *J*=15.7, 1.6 Hz, 1H), 6.69 (d, *J*=8.79 Hz, 1H), 6.96 (dt, *J*=15.7, 7.0 Hz, 1H), 7.26 (dd, *J*=8.8, 2.5 Hz, 1H), 7.74 (d, *J*=2.5 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 28.2, 31.8, 67.8, 80.4, 86.9, 112.6, 125.7, 126.7, 129.2, 138.7, 142.5, 156.1, 165.6; IR neat, ν (cm⁻¹) 801 (m), 978 (m), 1040 (s), 1106 (m), 1155 (s), 1247 (s), 1283 (s), 1367 (s), 1463 (s), 1560 (m), 1577 (m), 1654 (m), 1711 (s), 2931 (m), 2976 (m); HRMS (EI) calc'd for C₁₅H₁₈IO₃Cl: 407.9989 (M⁺), found 407.9997.

Ethyl (2*E*)-6-(2-iodophenoxy)hex-2-enoate (**1k**)

2-Iodophenol (2.00 g, 9.09 mmol) was dissolved in 50 mL acetone, and K₂CO₃ (3.77 g, 27.3 mmol), and ethyl (2*E*)-6-bromohex-2-enoate (6.03 g, 27.3 mmol) were added. The mixture was stirred under reflux for 48 hours, then concentrated *in vacuo*. The mixture was taken up in 50 mL Et₂O, and washed with 50 mL H₂O. The aqueous phase was then washed with 2 x 50 mL Et₂O, and the combined organic extracts dried with MgSO₄, filtered, and concentrated *in vacuo*. The crude product was purified by flash chromatography on silica gel (R_f = 0.20 in 10 % Et₂O/hexane) using 0 to 15 % Et₂O/hexane to afford **1k** as a clear, pale yellow oil. Isolated yield: 2.78 g (85 %). ¹H NMR (300 MHz, CDCl₃) δ 1.29 (t, *J*=7.2 Hz, 3H), 1.96-2.06 (m, 2H), 2.51 (qd, *J*=7.0, 1.5 Hz, 2H), 4.03 (t, *J*=6.0 Hz, 2H), 4.19 (q, *J*=7.1 Hz, 2H), 5.90 (dt, *J*=15.7, 1.6 Hz, 1H), 6.71 (td, *J*=7.5, 1.3 Hz, 1H), 6.79 (dd, *J*=8.2, 1.2 Hz, 1H), 7.03 (dt, *J*=15.6, 7.0 Hz, 1H), 7.28 (ddd, *J*=8.1, 7.2, 1.8 Hz, 1H), 7.77 (dd, *J*=7.8, 1.6 Hz, 1H); IR neat, ν (cm⁻¹) 748 (m), 1049 (m), 1162 (m), 1247 (m), 1275 (m), 1439 (m), 1464 (s), 1582 (m), 1653 (m), 1716 (s), 2923 (s); ¹³C NMR (75 MHz, CDCl₃) δ 14.3, 27.6, 28.8, 60.2, 67.8, 86.7, 112.1, 122.1, 122.6, 129.4, 139.5, 147.9, 157.3, 166.6; HRMS (EI) calc'd for C₁₄H₁₇IO₃: 360.0222 (M⁺), found 360.0217.

Representative Spectra (in numerical order)

Compound 1a

Compound **1b**

Compound **1c**

Compound **1d**

Compound **1e**

Compound **1f**

Compound **1g**

Compound **1h**

Compound **1i**

Compound **1j**

Compound **1k**

Compound 2a

Compound 2b

Compound **2c**

Compound **2d**

Compound **2e**

Compound **2f**

Compound **2g**

Compound **2h**

Compound **2i**

Compound **2j**

Compound **2k**

Compound **2m**

Compound 2n

Compound 2o

Compound **2p**

Compound 2q

Compound 8

Compound 9

Compound **10**

Compound **11**

Compound **12**

Compound 13

Compound 14