Supporting Information

Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

Arun Ghosh,* Janice Sieser, Maxime Riou, and Luis Rivera-Ruiz

Process Research and Development, Pfizer Global Research and Development, Eastern Point Road, P.O. Box 8013, Groton, CT 06340-8013.

Experimental procedures and characterization data for N-aryloxazolidinones (**Table 2**, etries **1-19**, **22-27**).

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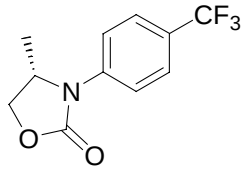
General Considerations:

All reactions were carried out in tubes that were oven-dried and cooled under nitrogen. Pd_2dba_3 was purchased from Strem Chemicals. Cesium carbonate was purchased from Aldrich. All aryl halides and amines were used as received. Anhydrous toluene was purchased from Aldrich (Sure-seal bottle) and was purged with nitrogen prior to use. All other reagents were commercially available and used without further purification. All materials were weighed in the air. Silica gel (230-400 mesh) was purchased from Merck. Preparative thin layer chromatography was performed with Whatman PK 6F Silica Gel. Elemental analysis were performed by Schwarzkopf Microanalytical Laboratory, Inc., Woodside, NY 11377. ^{1}H NMR and ^{13}C NMR were recorded on a Varian 400 MHz instrument with chemical shifts reported relative to residual deuterated solvent peaks. HPLC analyses were performed on a Hewlett Packard Series 1100 system with a Diode Array Detector. Chiral HPLC analyses were performed using a Chiracel® OD-H column [cellulose tris(3,5-dimethylphenyl carbamate) on 5 μm silica-gel] obtained from Chiral Technologiess Inc., Exton, PA. Samples prepared identically from both antipodes were compared to determine the stereochemical purity. All yields reported in the publication represent an average of at least two runs. Compounds previously reported in the literature were charecterized by comparing their ^{1}H, ^{13}C NMR or MS to the previously reported data.

General Procedure: ***Palladium-Catalyzed N-Arylation of oxazolidinones using Aryl Chlorides.***

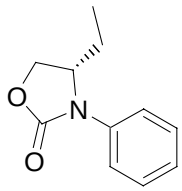
An oven-dried tube was charged with $Pd_2(dba)_3$ (45.6 mg, 0.05 mmol), ligand **2** (29.8 mg, 0.05 mmol), aryl chloride (1.3 mmol), oxazolidinone (1.3 mmol), Cs_2CO_3 (590 mg, 1.82 mmol), and degassed toluene (1.5 mL). The tube was evacuated and back-filled with nitrogen three times, and then heated at 100-115 ^oC with stirring for 14-18 h. The reaction mixture was allowed to cool to room temperature, diluted with MTBE (~1.5 mL), and filtered. The organic layer was washed with saturated NH_4Cl, dried with Na_2SO_4, filtered through a pad of Celite, and concentrated in vacuo. The crude residue was purified by flash column chromatography or preparative thin layer chromatography on silica gel using mixtures of ethyl acetate/hexanes as the eluent to afford the desired product.

Table 2. Palladium-Catalyzed N-Arylation of oxazolidinones.



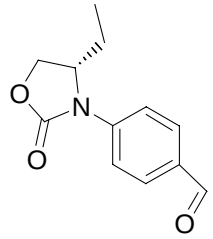
4-Methyl-3-phenyl-oxazolidin-2-one[1] (Table 2, entry 1).

Followed the general procedure, using chlorobenzene (132 μL, 1.3 mmol), 4-ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 110°C for 14 h. Purification of the residue by flash column chromatography (hexane/ethyl acetate 1:1.5) provided the desired product (88% yield) as an oil. ^1H NMR (400 MHz, $CDCl_3$): δ 7.55-7.65 (m, 4 H), 4.55-4.65 (m, 2H), 4.05-4.15 (m, 1 H), 1.35 (d, 3 H, J = 6.0 Hz). ^{13}C NMR ($CDCl_3$): δ 155.3, 140.1, 126.6, 126.6, 126.5, 120.7, 68.8, 52.0, 18.5. MS m/z 246 (MH^+).



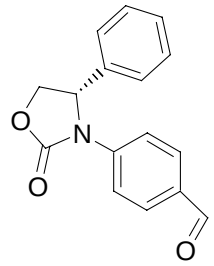
4-Ethyl-3-phenyl-oxazolidin-2-one[2] (Table 2, entry 2).

Followed the general procedure, using chlorobenzene (132 μL, 1.3 mmol), 4-ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 110°C for 18 h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1.5) provided the desired product (81% yield) as an oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.44-7.35 (m, 4 H), 7.19-7.15 (m, 1 H), 4.52 (t, 1H, J = 8.5 Hz), 4.44-4.37 (m, 1 H), 4.13 (dd, 1 H, J_1 = 5.4 Hz, J_2 = 8.3 Hz), 1.78-1.56 (m, 1 H), 0.87 (t, 3 H, J = 7.5 Hz). ^{13}C NMR ($CDCl_3$): δ 156.2, 137.2, 129.5, 129.4, 125.4, 122.2, 122.1, 66.6, 57.2, 24.7, 8.1. MS m/z 192 (MH^+).



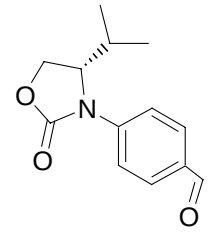
4-(4-Ethyl-2-oxo-oxazolidin-3-yl)-benzaldehyde (Table 2, entry 3).

Followed the general procedure, using 4-chlorobenzaldehyde (183 mg, 1.3 mmol), 4-ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 100°C for 15h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; heptane/ethyl acetate 1:1) provided the product (97% yield) as an orange semisolid. ^{1}H NMR (400 MHz, $CDCl_3$): 9.87 (s, 1 H), 7.83 (d, 2 H, J = 8.7 Hz), 7.64 (d, 2 H, J = 8.7 Hz), 4.52-4.44 (m, 2 H), 4.14 (quartet, 1 H, J_1 = 2.9 Hz, J_2 = 4.2 Hz), 1.80-1.62 (m, 2 H), 0.87 (t, 3 H, J = 7.5 Hz).^{13}C NMR ($CDCl_3$): δ 191.2, 143.0, 132.5, 131.2, 120.2, 66.5, 56.7, 24.6, 8.1. Anal. Calcd for $C_{12}H_{13}NO_3$: C, 65.74; H, 5.98; N, 6.39. Found: C, 66.58; H, 5.95; N, 5.47.



4-(2-Oxo-4-phenyl-oxazolidin-3-yl)-benzaldehyde (Table 2, entry 4).

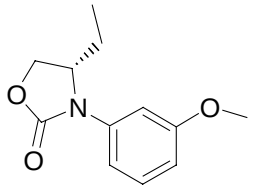
Followed the general procedure, using 4-chlorobenzaldehyde (183 mg, 1.3 mmol), (R)-(+)-4-phenyl-oxazolidin-2-one (147 mg, 0.9 mmol) at 115°C for 15h. The resulting suspension was cooled to room temperature and filtered through a pad of celite eluting with methyl tert-butyl ether. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1) provided (88% yield) the product as an orange oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.87 (s, 1 H), 7.77 (d, 2 H, J = 8.7 Hz), 7.62 (d, 2 H, J = 8.7 Hz), 7.40-7.28 (m, 5 H), 5.46 (dd, 1 H, J_1 = 5.4 Hz, J_2 = 8.7 Hz), 4.82 (t, 1 H, J = 8.7 Hz), 4.23 (dd, 1 H, J_1 = 5.4 Hz, J_2 = 8.7 Hz). ^{13}C NMR ($CDCl_3$): δ 191.2, 154.9, 142.5, 134.8, 132.6, 131.4, 129.4, 129.3, 127.8, 120.0, 66.1, 56.8, 37.7. MS m/z 268 (MH^+).



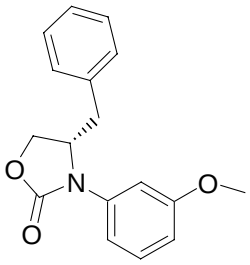
4-(4-Isopropyl-2-oxo-oxazolidin-3-yl)-benzaldehyde (Table 2, entry 5).

Followed the general procedure, using 4-chlorobenzaldehyde (183 mg, 1.3 mmol), (S)-(-)-4-isopropyl-oxazolidin-2-one (169 mg, 1.3 mmol) at 115°C for 17 h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1) provided (86% yield) the product as a red-brown oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.93 (s, 1 H), 7.88 (d, 2 H, J = 8.7 Hz), 7.68 (d, 2 H, J = 8.7 Hz), 4.54-4.49 (m, 1 H), 4.42 (t, 1 H, J = 8.7 Hz), 4.27 (dd, 1 H, J_1 = 4.2 Hz, J_2 = 8.7 Hz), 2.18-2.25 (m, 1 H), 0.93 (d, 3 H, J = 7.1 Hz), 0.82 (d, 3 H, J = 6.6 Hz). ^{13}C NMR ($CDCl_3$): δ 191.2, 155.5, 142.6, 132.7, 132.6, 131.1, 120.8, 62.6, 60.1, 27.7, 18.0, 14.3.

Anal. Calcd for $C_{13}H_{15}NO_3$: C, 66.94; H, 6.48; N, 6.00. Found: C, 66.62; H, 6.49 ; N, 5.71.

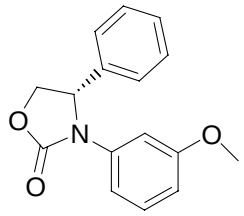


4-Ethyl-3-(3-methoxy-phenyl)-oxazolidin-2-one (Table 2, entry 6). Followed the general procedure, using 3-chloroanisole (185 mg, 1.3 mmol) 4-Ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 100°C for 17h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (98% yield) the product as a brown oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.28 (t, 1 H, J = 8.1 Hz), 7.10 (t, 1 H, J = 2.3 Hz), 6.97 (dd, 1 H, J_1 = 1.7 Hz, J_2 = 7.9 Hz), 6.72 (dd, 1 H, J_1 = 2.1 Hz, J_2 = 8.3 Hz), 4.51 (t, 1 H, J = 8.5 Hz), 4.41-4.34 (m, 1H), 4.14 (dd, 1H, J_1 = 5.2 Hz, J_2 = 8.5 Hz), 3.81 (s, 3 H), 1.81-1.60 (m, 2 H), 0.89 (t, 3 H, J = 7.5 Hz). ^{13}C NMR ($CDCl_3$): δ 160.5, 155.9, 138.2, 130.1, 114.0, 110.8, 108.2, 66.5, 57.4, 55.6, 24.8, 8.1. Anal. Calcd for $C_{12}H_{15}NO_3$: C, 65.14; H, 6.83; N, 6.33. Found: C, 64.72; H, 6.95 ; N, 6.02.



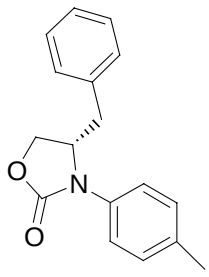
4-Benzyl-3-(3-methoxy-phenyl)-oxazolidin-2-one (Table 2, entry 7). Followed the general procedure, using 3-chloroanisole (185 mg, 1.3 mmol), 4-benzyl-oxazolidin-2-one (233 mg, 1.3 mmol) at 115°C for 17h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (82% yield) the product as a brown oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.36-7.22 (m, 5 H), 7.15-7.09 (m, 3 H), 6.77 (dd, 1 H, J_1 = 2.5 Hz, J_2 = 8.3 Hz), 4.59-4.66 (m, 1 H), 4.34 (t, 1 H, J = 8.5 Hz), 4.20 (dd, 1 H, J_1 = 4.6 Hz, J_2 = 8.7 Hz), 3.85 (s, 3 H), 3.17 (dd, 1 H, J_1 =

3.3 Hz, J_2 = 13.7 Hz), 2.78 (dd, 1 H, J_1 = 9.5 Hz, J_2 = 13.7 Hz).^{13}C NMR ($CDCl_3$): δ 160.6, 138.1, 135.4, 130.3, 129.4, 129.2, 127.5, 113.6, 110.9, 107.9, 66.1, 57.6, 55.7, 37.9. Anal. Calcd for $C_{17}H_{17}NO_3$: C, 72.07; H, 6.05; N, 4.94. Found: C, 71.79; H, 6.04; N, 4.76.



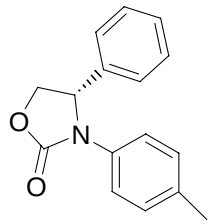
3-(3-Methoxy-phenyl)-4-phenyl-oxazolidin-2-one (Table 2, entry 8).

Followed the general procedure, using 3-chloroanisole (185 mg, 1.3 mmol), (R)-(+)-4-phenyl-oxazolidin-2-one (147 mg, 0.9 mmol) at 115°C for 17h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1.5:1) provided (52% yield) of the product as an orange oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.38-7.29 (m, 5 H), 7.16-7.08 (m, 2 H), 6.90 (dd, 1 H, J_1 = 2.1 Hz, J_2 = 8.3 Hz), 6.61 (dd, 1 H, J_1 = 2.3 Hz, J_2 = 8.1 Hz), 5.37 (dd, 1 H, J_1 = 5.8 Hz, J_2 = 8.7 Hz), 4.77 (t, 1 H, J = 8.7 Hz), 4.19 (dd, 1 H, J_1 = 5.8 Hz, J_2 = 8.7 Hz), 3.72 (s, 3 H). ^{13}C NMR ($CDCl_3$): δ 160.2, 138.5, 130.0, 129.8, 129.6, 129.5, 129.4, 129.3, 129.1, 126.4, 113.1, 110.5, 107.1, 70.0, 61.0, 55.1. MS m/z 270 (MH^+).

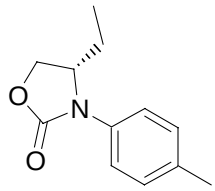


4-Benzyl-3-*p*-tolyl-oxazolidin-2-one (Table 2, entry 9). Followed the general procedure, using 4-chlorotoluene (164 mg, 1.3 mmol), 4-benzyl-oxazolidin-2-one (233 mg, 1.3 mmol) at 115°C for 14h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1.5) provided (75% yield) the product as an orange oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.42 (d, 2 H, J = 8.7 Hz), 7.34-

7.23 (m, 5 H), 7.12 (d, 2 H, J = 7.1 Hz), 4.64-4.58 (m, 1 H), 4.34 (t, 1 H, J = 8.5 Hz), 4.19 (dd, 1 H, J_1 = 5.0 Hz, J_2 = 8.7 Hz), 3.12 (dd, 1 H, J_1 = 3.3 Hz, J_2 = 13.7 Hz), 2.75 (dd, 1 H, J_1 = 9.5 Hz, J_2 = 13.7 Hz), 2.37 (s, 3 H).^{13}C NMR ($CDCl_3$): δ 156.2, 135.5, 134.2, 130..2, 129.4, 129.2, 129.1, 129.0, 127.5, 122.3, 66.3, 57.8, 38.0, 21.2. Anal. Calcd for $C_{17}H_{17}NO_2$: C, 76.38; H, 6.41; N, 5.24. Found: C, 75.73; H, 6.25; N, 4.65.

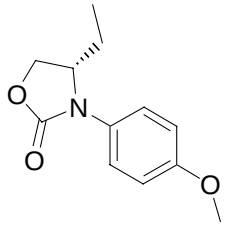


4-Phenyl-3-p-tolyl-oxazolidin-2-one[3] (Table 2, entry 10). Followed the general procedure, using 4-chlorotoluene (164 mg, 1.3 mmol), (R)-(+)-4-phenyl-oxazolidin-2-one (212 mg, 1.3 mmol) at 115°C for 17h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1) provided (50% yield) the product as a yellowish solid. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.36-7.24 (m, 7 H), 7.04 (d, 2 H, J = 8.3 Hz), 5.36 (dd, 1 H, J_1 = 6.2 Hz, J_2 = 8.7 Hz), 4.76 (t, 1 H, J = 8.7 Hz), 4.18 (dd, 1 H, J_1 = 6.2 Hz, J_2 = 8.7 Hz), 2.24 (s, 3 H).^{13}C NMR ($CDCl_3$): δ 156.5, 138.6, 134.7, 129.7, 129.6, 129.5, 129.0, 126.7, 126.6, 121.3, 70.0, 61.1, 21.0. Anal. Calcd for $C_{16}H_{15}NO_2$: C, 75.87; H, 5.97; N, 5.53. Found: C, 75.74; H, 5.90; N, 5.24.

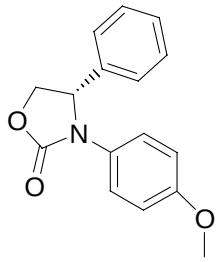


4-Ethyl-3-p-tolyl-oxazolidin-2-one (Table 2, entry 11). Followed the general procedure, using 4-chlorotoluene (164 mg, 1.3 mmol), 4-ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 115°C for 15h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (95% yield) the product as an yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.30 (d, 2 H, J = 8.3 Hz), 7.18 (d, 2 H, J = 7.9 Hz), 4.52 (t, 1 H, J = 8.5 Hz), 4.40-4.33 (m, 1 H), 4.13 (dd, 1 H, J_1 = 5.6 Hz, J_2 = 8.5 Hz), 2.33 (s, 3 H), 1.78-1.56 (m, 2 H), 0.88 (t, 3 H, J = 7.5 Hz).^{13}C NMR ($CDCl_3$): δ

156.5, 135.4, 134.2, 130.2, 130.0, 122.5, 66.6, 57.5, 24.8, 21.1, 8.1. Anal. Calcd for $C_{12}H_{15}NO_2$: C, 70.22; H, 7.37; N, 6.82. Found: C, 70.17; H, 7.85; N, 6.73.

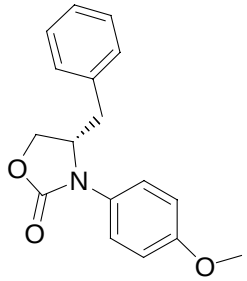


4-Ethyl-3-(4-methoxy-phenyl)-oxazolidin-2-one (Table 2, entry 12). Followed the general procedure, using 4-bromoanisole (185 mg, 1.3 mmol), 4-Ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 100°C for 17h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1.5) provided (32% yield) the product as a brown oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.29 (d, 2 H, *J* = 8.7 Hz), 6.90 (d, 2 H, *J* = 8.7 Hz), 4.51 (t, 1 H, *J* = 8.5 Hz), 4.32-4.25 (m, 1 H), 4.15 (dd, 1 H, J_1 = 5.8 Hz, J_2 = 8.7 Hz), 3.79 (s, 3 H), 1.74-1.64 (m, 1 H), 1.64-1.52 (m, 1 H), 0.86 (t, 3 H, *J* = 7.5 Hz).^{13}C NMR ($CDCl_3$): δ 157.7, 131.0, 129.5, 129.0, 124.9, 114.7, 66.7, 58.1, 55.7, 25.0, 8.1. Anal. Calcd for $C_{12}H_{15}NO_3$: C, 65.14; H, 6.83; N, 6.33. Found: C, 65.57; H, 6.87 ; N, 5.51.

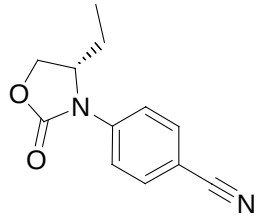


3-(4-Methoxy-phenyl)-4-phenyl-oxazolidin-2-one (Table 2, entry 13). Followed the general procedure, using 4-bromoanisole (185 mg, 1.3 mmol), (R)-(+)-4-phenyl-oxazolidin-2-one (212 mg, 1.3 mmol) at 115°C for 17h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1) provided (15% yield) the product as an orange solid. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.37-7.22 (m, 7 H), 6.78 (d, 2 H, *J* = 9.1 Hz), 5.31 (dd, 1 H, J_1 = 6.6 Hz, J_2 = 8.7 Hz), 4.77 (t, 1 H, *J* = 8.7 Hz), 4.21 (dd, 1 H, J_1 = 6.6 Hz, J_2 = 8.7 Hz), 3.72 (s, 3 H). ^{13}C NMR

($CDCl_3$): δ 157.1, 138.5, 130.1, 129.5, 129.1, 126.8, 123.6, 114.5, 114.4, 70.0, 61.6, 55.6. MS m/z 270 (MH^+).

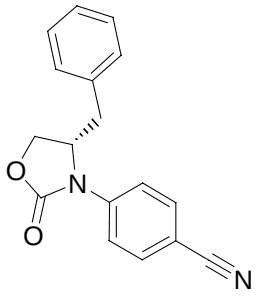


4-Benzyl-3-(4-methoxy-phenyl)-oxazolidin-2-one (Table 2, entry 14). Followed the general procedure, using 4-bromoanisole (185 mg, 1.3 mmol), 4-benzyl-oxazolidin-2-one (231 mg, 1.3 mmol) at 115°C for 17h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1.5) provided (11% yield) the product as a brown solid. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.40 (d, 2 H, *J* = 9.1 Hz), 7.34-7.24 (m, 3 H), 7.11 (d, 2 H, *J* = 6.6 Hz), 6.97 (d, 2 H, *J* = 9.1 Hz), 4.58-4.51 (m, 1 H), 4.34 (t, 1 H, *J* = 8.5 Hz), 4.18 (dd, 1 H, J_1 = 5.4 Hz, J_2 = 9.1 Hz), 3.83 (s, 3 H), 3.09 (dd, 1 H, J_1 = 3.3 Hz, J_2 = 13.7 Hz), 2.73 (dd, 1 H, J_1 = 9.5 Hz, J_2 = 13.7 Hz). ^{13}C NMR ($CDCl_3$): δ 157.7, 156.4, 135.5, 129.5, 129.3, 129.2, 127.5, 124.7, 114.9, 66.5, 58.3, 55.8, 38.3. Anal. Calcd for $C_{17}H_{17}NO_3$: C, 72.07; H, 6.05; N, 4.94. Found: C, 71.79; H, 5.92; N, 4.80.

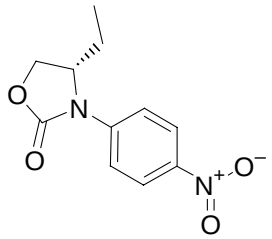


4-(4-Ethyl-2-oxo-oxazolidin-3-yl)-benzonitrile (Table 2, entry 15). Followed the general procedure, using 4-chlorobenzonitrile (179 mg, 1.3 mmol), 4-Ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 100°C for 16h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (97% yield) the product as light brown oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.67 (quart, 4 H, J_1 = 9.1 Hz, J_2 = 14.1 Hz), 4.56 (t, 1 H, *J* = 8.5 Hz), 4.50-4.42 (m, 1 H), 4.22 (dd, 1 H, J_1 = 4.1 Hz, J_2 = 8.3 Hz), 1.96-1.66 (m, 2 H), 0.93 (t, 3 H, *J* = 7.5 Hz).^{13}C NMR

($CDCl_3$): δ 165.0, 141.5, 133.5, 120.3, 118.8, 107.8, 66.5, 56.5, 24.5, 8.1. Anal. Calcd for $C_{12}H_{12}N_2O_2$: C, 66.65; H, 5.59; N, 12.96. Found: C, 66.95; H, 5.31; N, 11.09.

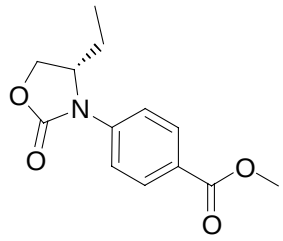


4-(4-Benzyl-2-oxo-oxazolidin-3-yl)-benzonitrile (Table 2, entry 16). Followed the general procedure, using 4-chlorobenzonitrile (179 mg, 1.3 mmol), (R)-(+)-4-benzyl-oxazolidin-2-one (231 mg, 1.3 mmol) at 115°C for 15h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1) provided (99% yield) the product as an orange foam. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.56-7.69 (m, 4 H), 7.36-7.29 (m, 3 H), 7.12 (d, 2 H, J = 7.1 Hz), 4.75-4.69 (m, 1 H), 4.39 (t, 1 H, J = 8.2 Hz), 4.27 (dd, 1 H, J_1 = 3.7 Hz, J_2 = 9.1 Hz), 3.15 (dd, 1 H, J_1 = 3.7 Hz, J_2 = 14.1 Hz), 2.84 (dd, 1 H).^{13}C NMR ($CDCl_3$): δ 154.8, 141.2, 134.7, 133.7, 133.6, 129.4, 127.9, 120.2, 118.8, 107.8, 66.1, 56.7, 37.7. MS m/z 279 (MH^+).

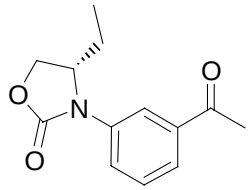


4-Ethyl-3-(4-nitro-phenyl)-oxazolidin-2-one (Table 2, entry 17). Followed the general procedure, using 4-chloro-4-nitrobenzene (205 mg, 1.3 mmol) evacuated and backfilled with nitrogen. Toluene (2.0 mL), 4-Ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 100°C for 17h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (87% yield) the product as a light brown foam. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.26 (d, 2 H, J = 9.1 Hz), 7.71 (d, 2 H, J = 9.5 Hz), 4.58 (t, 1 H, J = 8.3 Hz), 4.54-4.47 (m, 1 H), 4.24 (dd, 1 H, J_1 = 3.7 Hz, J_2 = 8.3 Hz), 1.90-1.69 (m, 2 H), 0.95 (t, 3 H, J = 7.5 Hz). ^{13}C NMR ($CDCl_3$): δ 155.0, 143.0,

125.3, 125.2, 119.8, 66.5, 56.7, 24.5, 8.1. Anal. Calcd for $C_{11}H_{12}N_2O_4$: C, 55.93; H, 5.12; N, 11.86. Found: C, 55.61; H, 5.12; N, 11.73.

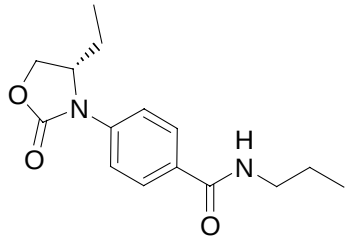


4-(4-Ethyl-2-oxo-oxazolidin-3-yl)-benzoic acid methyl ester (Table 2, entry 18). Followed the general procedure, using methyl 4-chlorobenzoate (222 mg, 1.3 mmol), 4-Ethyl-oxazolidin-2-one (149 mg, 1.3 mmol) at 100°C for 17h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1.5) provided (99% yield) the product an orange oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.05 (d, 2 H, *J* = 8.7 Hz), 7.58 (d, 2 H, *J* = 9.1 Hz), 4.54 (t, 1 H, *J* = 8.3), 4.51-4.44 (m, 1 H), 4.19 (dd, 1 H, J_1 = 7.3 Hz, J_2 = 14.3 Hz), 3.91 (s, 3 H), 1.85-1.64 (m, 2 H), 0.91 (t, 3 H, *J* = 7.5 Hz).^{13}C NMR ($CDCl_3$): δ 166.7, 155.4, 141.2, 131.0, 126.2, 120.0, 119.9, 66.5, 56.7, 52.4, 24.6, 8.1. Anal. Calcd for $C_{13}H_{15}NO_4$: C, 62.64; H, 6.07; N, 5.62. Found: C, 62.69; H, 6.08; N, 5.40.

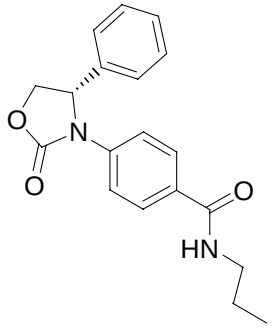


3-(3-Acetyl-phenyl)-4-ethyl-oxazolidin-2-one (Table 2, entry 19). Followed the general procedure, using 3-chloroacetophenone (169 μL, 1.3 mmol), 4-Ethyl-oxazolidin-2-one (151 mg, 1.3 mmol) at 100 °C for 17h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (94% yield) of the product as a brown oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.93 (t, 1 H, *J* = 1.9 Hz), 7.72 (m, 2 H), 7.44 (t, 1 H, *J* = 8.1 Hz), 4.55-4.44 (m, 2H), 4.14 (quart, 1 H, J_1 = 4.4 Hz, J_2 = 7.7 Hz), 2.57 (s, 3 H), 1.77-1.56 (m, 2 H), 0.85 (t, 3H, *J* = 7.5 Hz). ^{13}C NMR ($CDCl_3$): δ 197.8, 156.0, 138.1, 137.6, 129.7, 126.5, 126.4, 125.2, 120.8, 66.6, 56.9, 26.9,

24.6, 8.0. Anal. Calcd for $C_{13}H_{15}NO_3$: C, 66.94; H, 6.48; N, 6.00. Found: C, 67.36; H, 6.48; N, 5.40.

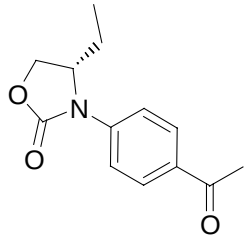


4-(4-Ethyl-2-oxo-oxazolidin-3-yl)-N-propyl-benzamide (Table 2, entry 22). Followed the general procedure, using 4-Chloro-N-propyl-benzamide (257 mg, 1.3 mmol), 4-ethyl-oxazolidin-2-one (150 mg, 1.3 mmol) at 115°C for 18h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:3) provided (97% yield) of the product as yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.77 (d, 2H, *J* = 8.7 Hz), 7.43 (d, 2 H, *J* = 8.7 Hz), 6.91 (br s, 1 H), 4.48 (t, 1 H, *J* = 8.3 Hz), 4.45-4.39 (m, 1 H), 4.10 (dd, 1 H, J_1 = 4.2 Hz, J_2 = 7.9 Hz), 3.32 (quart, 2 H, J_1 = 6.4 Hz, J_2 = 13.9 Hz), 1.74-1.52 (m, 4 H), 0.90 (t, 3 H, *J* = 7.3 Hz), 0.82 (t, 3 H, *J* = 7.5 Hz).^{13}C NMR ($CDCl_3$): δ 167.0, 155.6, 139.7, 131.1, 128.2, 120.6, 66.5, 56.8, 42.0, 24.6, 23.1, 11.7, 8.0. MS m/z 277 (MH^+).

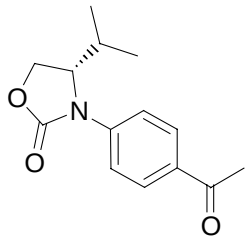


4-(4-Phenyl-2-oxo-oxazolidin-3-yl)-N-propyl-benzamide(Table 2, entry 23). Followed the general procedure, 4-Chloro-N-propyl-benzamide (257 mg, 1.3 mmol), 4-phenyl-oxazolidin-2-one (215 mg, 1.3 mmol) at 115°C for 18h. Purification of the residue by flash chromatography on silica gel (1.5x15 cm; heptane/ethyl acetate 1:1.5) provided (98% yield) of the product as a brown solid. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.65 (d, 2H, *J* = 8.7 Hz), 7.48 (d, 2 H, *J* = 8.7 Hz), 7.38-7.26 (m, 5 H,), 5.43 (dd, 1 H, J_1 = 5.81, J_2 = 8.7 Hz), 4.80 (t, 1 H, *J* = 8.7 Hz), 4.22 (dd, 1 H, J_1 = 5.8 Hz, J_2 = 8.7 Hz),

3.37 (quart, 2 H, J_1 = 7.3 Hz, J_2 = 13.1 Hz), 1.59 (sextet, 4 H, J = 7.5 Hz), 0.95 (t, 3 H, J = 7.5 Hz).^{13}C NMR ($CDCl_3$): δ 166.5, 156.0, 140.0. 137.9, 131.0, 129.8, 129.3, 127.9, 126.3, 120.1, 70.1, 60.6, 41.9, 23.1, 11.7. MS m/z 325 (MH^+).



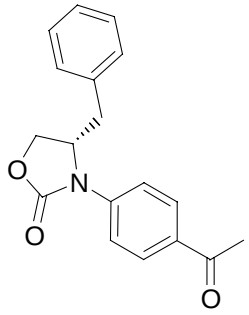
3-(4-Acetyl-phenyl)-4-ethyl-oxazolidin-2-one (Table 2, entry 24). Followed the general procedure, using 4'-chloroacetophenone (201 mg, 1.3 mmol), 4-Ethyl-oxazolidin-2-one (151 mg, 1.3 mmol) at 100°C for 17h. Purification of the residue by flash column chromatography on silica gel (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (91% yield) the product as a pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.92 (d, 2 H, J = 9.1 Hz), 7.56 (d, 2 H, J = 8.7 Hz), 4.53-4.44 (m, 2 H), 4.14 (quart, 1 H, J_1 = 3.3 Hz, J_2 = 7.7 Hz), 2.53 (s, 3 H), 1.80-1.60 (m, 2 H), 0.86 (t, 3 H, J = 7.5 Hz).^{13}C NMR ($CDCl_3$): δ 197.2, 155.4, 141.3, 133.1, 129.8, 120.0, 66.5, 56.6, 26.7, 24.5, 8.0. Anal. Calcd for $C_{13}H_{15}NO_3$: C, 66.94; H, 6.48; N, 6.00. Found: C, 67.42; H, 6.36; N, 5.37.



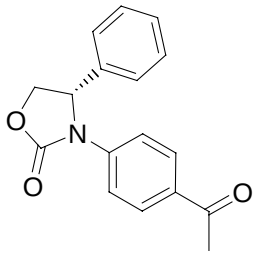
3-(4-Acetyl-phenyl)-4-isopropyl-oxazolidin-2-one (Table 2, entry 25).

Followed the general procedure, using 4-chloroacetophenone (201 mg, 1.3 mmol), (S)-(-)-4-isopropyl-oxazolidin-2-one (169 mg, 1.3 mmol) at 115°C for 17h. Purification of the residue by preparative thin layer chromatography (20x20x0.05 cm; hexane/ethyl acetate 1:1) provided (61% yield) the product as an yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.97 (d, 2 H, J = 8.7 Hz), 7.60 (d, 2 H, J = 8.7 Hz), 4.52-4.47 (m, 1 H), 4.42 (t, 1 H, J = 8.7 Hz), 4.26 (dd, 1 H, J_1 = 4.2 Hz, J_2 = 8.7 Hz), 2.57 (s, 3 H), 2.23-2.15 (m, 1 H), 0.92 (d, 3 H, J = 7.1 Hz), 0.81 (d, 2 H, 6.6 Hz). ^{13}C NMR (400 MHz,

$CDCl_3$): δ 197.0, 155.8, 141.5, 133.4, 129.9, 120.6, 62.6, 60.1, 27.7, 26.8, 18.0, 14.3. MS m/z 248 (MH^+).



3-(4-Acetyl-phenyl)-4-benzyl-oxazolidin-2-one (Table 2, entry 26). Followed the general procedure, using 4-chloroacetophenone (201 mg, 1.3 mmol), 4-benzyl-oxazolidin-2-one (232 mg, 1.3 mmol) at 115°C for 17h. Purification of the residue by flash column chromatography (1.5x15 cm; hexane/ethyl acetate 1:1.5) provided (94% yield) of the product as a light brown foam. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.04 (d, 2 H, *J* = 9.1 Hz), 7.72 (d, 2 H, *J* = 8.7 Hz), 7.36-7.29 (m, 3 H), 7.13 (d, 2 H, *J* = 7.1 Hz), 4.70-4.77 (m, 1 H), 4.38 (t, 1 H, *J* = 8.5 Hz), 4.26 (dd, 1 H, J_1 = 3.9 Hz, J_2 = 8.9 Hz), 3.16 (dd, 1 H, J_1 = 3.3 Hz, J_2 = 13.7 Hz), 2.84 (dd, 1 H, J_1 = 9.1 Hz, J_2 = 14.1 Hz), 2.61 (s, 3 H). ^{13}C NMR (400 MHz, $CDCl_3$): δ 197.1, 157.0, 141.2, 134.9, 133.5, 130.0, 129.8, 129.4, 129.3, 129.2, 128.1, 127.8, 127.6, 119.8, 66.1, 56.8, 37.7, 26.8. Anal. Calcd for $C_{18}H_{17}NO_3$: C, 73.20; H, 5.80; N, 4.74. Found: C, 72.57; H, 5.67; N, 4.30.



3-(4-Acetyl-phenyl)-4-phenyl-oxazolidin-2-one (Table 2, entry 27). Followed the general procedure, using 4-chloroacetophenone (201 mg, 1.3 mmol), (R)-(+)-4-phenyl-oxazolidin-2-one (212 mg, 1.3 mmol) at 115°C for 17h. Purification of the residue by flash column chromatography (1.5x15 cm; hexane/ethyl acetate 1:1.5)

provided (97% yield) the product as a pale yellow solid. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.85 (d, 2 H, *J* = 8.7 Hz), 7.53 (d, 2 H, J = 8.7 Hz), 7.39-7.28 (m, 5 H), 5.45 (dd, 1 H, J_1 = 5.8 Hz, J_2 = 8.7 Hz), 4.81 (t, 1 H, *J* = 8.7 Hz), 4.22 (dd, 1 H, J_1 = 5.6 Hz, J_2 = 8.5 Hz), 2.51 (s, 3 H).^{13}C NMR (400 MHz, $CDCl_3$): δ 197.2, 155.6, 141.5, 138.0, 133.0, 129.8, 129.6, 129.3, 126.2 126.1, 119.7, 119.6, 70.1, 60.5, 26.7. Anal. Calcd for $C_{17}H_{15}NO_3$: C, 72.58; H, 5.37; N, 4.98. Found: C, 71.20; H, 5.14; N, 4.39.

References.

[1] Nicolaou, K. C.; Baran, P. S.; Zhong, Y.-L.; Barluenga, S.; Hunt, K. W.; Kranich, R.; Vega, J. A. *J. Am Chem Soc.* **2002**, *124*, 2233.

[2] Fujiwara, M.; Baba, A.; Matsuda, H. *Bull Chem. Soc Jpn.* **1990**, *63*, 1069.

[3] Herweh, J. E.; Foglia, T. A.; Swern, D. *J. Org. Chem.* **1968**, *33*, 4029.