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Addition/Correction

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Correction to Direct Bis-Arylation of Cyclobutanecarboxamide via Double C−H Activation: An Auxiliary-Aided Diastereoselective Pd-Catalyzed Access to Trisubstituted Cyclobutane Scaffolds Having Three Contiguous Stereocenters and an All-*cis* Stereochemistry

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Supporting Information

Upon further analysis in the data presented on the proton NMR spectra of various compounds, changes in the coupling constants and assignment of multiplicity of signals are warranted. The proton NMR processing software was set to use inadvertently fewer numbers of significant digits, which we did not realize at the time of processing.

In the current revisions, the NMR spectra were reprocessed and given the proton NMR spectra expanded in relevant regions to obtain the coupling constants clearly. In the case of compounds **15c**, **16n−p**, **16y**, **16ae**, **16aj**, **19b,c**, **21i,l,m**, **23**, and **27**, a few inadvertent typographical errors in the ^{13}C chemical shift values have been corrected, and the corrected ^{13}C chemical shift values are given below.

Adventitious water and/or minor impurity peaks such as grease had been excluded from the NMR spectra of most of the reported molecules. The revised Supporting Information now contains the full spectra for all of the compounds, and the NMR spectra of compounds **15h**, **16a**, **16ab**, **16ac**, **16af**, **16ai**, **16k**, and **21e** have been rerecorded.

The revised values of the coupling constants and spectral data do not alter any of the structural characterizations of the molecules, nor do these changes alter any of the original contents or data and conclusions of the paper.

15a. ^1H NMR (400 MHz, $CDCl_3$): δ 9.70 (br s, 1H), 8.79 (d, 1H, J = 8.0 Hz), 8.70 (d, 1H, J = 4.0 Hz), 8.01 (d, 1H, J = 8.0 Hz), 7.45 (t, 1H, J = 8.0 Hz), 7.37 (d, 1H, J = 8.0 Hz), 7.32 (dd, 1H, J_1 = 8.0 Hz, J_2 = 4.0 Hz), 3.37−3.29 (m, 1H), 2.50−2.41 (m, 2H), 2.30−2.22 (m, 2H), 2.02−1.87 (m, 2H).

15b. ^1H NMR (400 MHz, $CDCl_3$): δ 7.95−7.92 (m, 2H), 7.67−7.64 (m, 1H), 7.58−7.57 (m, 3H), 7.28 (dd, 1H, J_1 = 7.2 Hz, J_2 = 0.9 Hz), 3.56−3.48 (m, 2H), 2.44−2.32 (m, 2H), 2.11−2.02 (m, 1H), 1.91−1.78 (m, 3H).

15c. ^1H NMR (400 MHz, $CDCl_3$): δ 8.86 (br s, 1H), 8.27−8.23 (m, 2H), 7.71−7.67 (m, 1H), 7.03−7.0 (m, 1H), 3.23−3.14 (m, 1H), 2.42−2.33 (m, 2H), 2.20−2.13 (m 2H), 2.0−1.87 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 173.9, 151.9, 147.1, 138.5, 119.5, 114.3, 40.7, 25.1, 18.0.

15d. ^1H NMR (400 MHz, $CDCl_3$): δ 8.54 (d, 1H, J = 4.5 Hz), 8.21 (br s, 1H), 8.19 (d, 1H, J = 7.8 Hz), 7.84 (t, 1H, J = 7.8 Hz), 7.44−7.41 (m, 1H), 4.63−4.55 (m, 1H), 2.46−2.39 (m, 2H), 2.10−2.01 (m, 2H), 1.82−1.75 (m, 2H).

15e. ^1H NMR (400 MHz, $CDCl_3$): δ 8.37 (dd, 1H, J_1 = 7.9 Hz, J_2 = 1.3 Hz), 7.74 (br s, 1H), 6.93 (dt, 1H, J_1 = 7.8 Hz, J_2 = 1.5 Hz), 6.85 (dt, 1H, J_1 = 7.8 Hz, J_2 = 1.2 Hz), 6.76 (dd, 1H, J_1 = 8.0 Hz, J_2 = 1.2 Hz), 3.74 (s, 3H), 3.15−3.10 (m, 1H), 2.37−2.27 (m, 2H), 2.18−2.10 (m, 2H), 1.95−1.80 (m, 2H).

15f. ^1H NMR (400 MHz, $CDCl_3$): δ 8.53 (d, 1H, J = 8.0 Hz), 8.18 (br s, 1H), 7.61 (dd, 1H, J_1 = 8.0 Hz, J_2 = 1.5 Hz), 7.49−7.45 (m, 1H), 7.28−7.23 (m, 2H), 7.19−7.07 (m, 4H), 3.10−3.01 (m, 1H), 2.20−2.08 (m, 4H), 1.97−1.86 (m, 1H), 1.85−1.77 (m, 1H).

15g. ^1H NMR (400 MHz, $CDCl_3$): δ 8.35 (d, 1H, J = 7.2 Hz), 8.27 (br s, 1H), 7.45 (d, 1H, J = 7.2 Hz), 7.28 (dt, 1H, J_1 = 8.0 Hz, J_2 = 2.1 Hz), 7.04 (t, 1H, J = 8.0 Hz), 3.27−3.23 (m, 1H), 2.45−2.38 (m, 2H), 2.35 (s, 3H), 2.28−2.26 (m, 2H), 2.06−1.91 (m, 2H).

15h. ^1H NMR (400 MHz, $CDCl_3$): δ 6.22 (br s, 1H), 3.37−3.34 (m, 2H), 3.04−2.98 (m, 1H), 2.49 (t, 2H, J = 5.8 Hz), 2.34 (s, 6H), 2.30−2.23 (m, 2H), 2.16−2.09 (m, 2H), 1.98−1.84 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 175.2, 57.9, 44.9, 39.9, 36.4, 25.4, 18.2.

16a. ^1H NMR (400 MHz, $CDCl_3$): δ 9.51 (br s, 1H), 8.73 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.7 Hz), 8.38 (dd, 1H, J_1 = 6.8 Hz, J_2 = 2.1 Hz), 8.04 (d, 1H, J = 8.2 Hz), 7.37 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.2 Hz), 7.35−7.28 (m, 6H), 6.78 (d, 4H, J = 8.6 Hz), 4.10−3.99 (m, 3H), 3.69 (s, 6H), 3.50 (dd, 1H, J_1 = 21.5 Hz, J_2 = 11.0 Hz) 2.76−2.69 (m, 1H).

16b. ^1H NMR (400 MHz, $CDCl_3$): δ 9.47 (br s, 1H), 8.67 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.25 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 7.97 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.32−7.15 (m, 11H), 7.04 (t, 2H, J = 7.4 Hz), 4.14−4.10 (m, 1H), 4.06−3.99 (m, 2H), 3.52 (dd, 1H, J_1 = 21.7 Hz, J_2 = 10.8 Hz), 2.73−2.67 (m, 1H).

16c. ^1H NMR (400 MHz, $CDCl_3$): δ 9.45 (br s, 1H), 8.65 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.7 Hz), 8.31 (dd, 1H, J_1 = 6.2 Hz, J_2 = 2.7 Hz), 7.93 (dd, 1H, J_1 = 8.0 Hz, J_2 = 1.7 Hz), 7.27 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.2 Hz), 7.24−7.20 (m, 6H), 6.97 (d, 4H, J = 8.0 Hz), 4.09−4.04 (m, 1H), 4.0−3.93 (m, 2H), 3.47 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.69−2.62 (m, 1H), 2.15 (s, 6H).

16d. ^1H NMR (400 MHz, $CDCl_3$): δ 9.43 (br s, 1H), 8.68 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.7 Hz), 8.30 (dd, 1H, J_1 = 6.8 Hz, J_2 = 2.2 Hz), 7.97 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.7 Hz), 7.31 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.2 Hz), 7.27−7.22 (m, 6H), 7.02 (d, 4H, J = 8.0 Hz), 4.11−4.08 (m, 1H), 4.04−3.97 (m, 2H), 3.50 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.70−2.66 (m, 1H), 2.48 (q, 4H, J = 7.6 Hz), 1.06 (t, 6H, J = 7.6 Hz).

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16e. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.65 (br s, 1H), 8.73 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.18 (dd, 1H, J_1 = 7.7 Hz, J_2 = 1.1 Hz), 8.08−8.03 (m, 5H), 7.45 (d, 4H, J = 8.6 Hz), 7.41−7.36 (m, 2H), 7.27 (t, 1H, J = 8.0 Hz), 4.35−4.30 (m, 1H), 4.20−4.13 (m, 2H), 3.56 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.89−2.82 (m, 1H).

16f. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.47 (br s, 1H), 8.70 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.26 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.6 Hz), 8.06 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.39−7.27 (m, 3H), 7.22 (d, 4H, J = 8.5 Hz), 7.13 (td, 4H, J_1 = 8.5 Hz, J_2 = 1.9 Hz), 4.11−4.06 (m, 1H), 4.0−3.94 (m, 2H), 3.42 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.72−2.65 (m, 1H).

16g. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.49 (br s, 1H), 8.69 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.26 (dd, 1H, J_1 = 7.5 Hz, J_2 = 1.2 Hz), 8.03 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.37−7.22 (m, 7H), 7.15 (d, 4H, J = 8.3 Hz), 4.10−4.06 (m, 1H), 3.97−3.90 (m, 2H), 3.40 (dd, 1H, J_1 = 21.7 Hz, J_2 = 11.0 Hz), 2.70−2.63 (m, 1H).

16h. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.48 (br s, 1H), 8.69 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.27 (dd, 1H, J_1 = 7.5 Hz, J_2 = 1.4 Hz), 8.02 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.36−7.23 (m, 7H), 6.87 (tt, 4H, J_1 = 8.4 Hz, J_2 = 3.0 Hz), 4.10−4.05 (m, 1H), 4.01−3.94 (m, 2H), 3.44 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.72−2.65 (m, 1H).

16i. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.49 (br s, 1H), 8.70 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.27 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.3 Hz), 8.05 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.48 (dd, 4H, J_1 = 8.3 Hz, J_2 = 2.2 Hz), 7.39−7.28 (m, 3H), 7.03 (d, 4H, J = 8.0 Hz), 4.11−4.06 (m, 1H), 3.96−3.90 (m, 2H), 3.38 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.69−2.65 (m, 1H).

16j. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.03 (br s, 1H), 8.42 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.23 (d, 2H, J = 8.4 Hz), 7.84 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.3 Hz), 7.76 (dd, 1H, J_1 = 8.4 Hz, J_2 = 1.5 Hz), 7.69 (d, 2H, J = 7.0 Hz), 7.65 (d, 2H, J = 8.0 Hz), 7.58−7.51 (m, 4H), 7.42 (t, 2H, J = 8.0 Hz), 7.33 (t, 2H, J = 7.0 Hz), 7.16 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.2 Hz), 7.03−6.94 (m, 2H), 4.78−4.72 (m, 3H), 4.07 (dd, 1H, J_1 = 21.3 Hz, J_2 = 10.0 Hz), 2.91−2.84 (m, 1H).

16k. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.52 (br s, 1H), 8.76 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.7 Hz), 8.35 (dd, 1H, J_1 = 7.2 Hz, J_2 = 1.7 Hz), 8.06 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.5 Hz), 7.45−7.28 (m, 4H), 7.20−7.10 (m, 5H), 6.91 (d, 2H, J = 7.3 Hz), 4.20-4.03 (m, 3H), 3.55 (dd, 1H, J_1 = 21.7 Hz, J_2 = 11.3 Hz), 2.79−2.73 (m, 1H), 2.23 (s, 6H).

16l. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.46 (br s, 1H), 8.65 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.14 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.3 Hz), 7.97 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.50 (s, 2H), 7.43 (d, 2H, J = 6.7 Hz), 7.32−7.18 (m, 7H), 4.17−4.12 (m, 1H), 4.06−3.99 (m, 2H), 3.48 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.77−2.69 (m, 1H).

16m. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.57 (br s, 1H), 8.67 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.16 (s, 2H), 8.12 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.0 Hz), 8.01 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.88 (dd, 2H, J_1 = 8.0 Hz, J_2 = 1.6 Hz), 7.63 (d, 2H, J = 8.0 Hz), 7.36−7.28 (m, 4H), 7.21 (t, 1H, J = 8.0 Hz), 4.29−4.24 (m, 1H), 4.17−4.10 (m, 2H), 3.57 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.86−2.79 (m, 1H).

16n. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.49 (br s, 1H), 8.68 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.24 (dd, 1H, J_1 = 7.5 Hz, J_2 = 1.3 Hz), 7.98 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.5 Hz), 7.33−7.20 (m, 3H), 7.12−6.98 (m, 6H), 6.73−6.69 (m, 2H), 4.12−4.07 (m, 1H), 4.01−3.94 (m, 2H), 3.42 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.71−2.63 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 168.4, 164.0 (d, J_{C-F} = 244 Hz), 147.9, 143.1 (d, J_{C-F} = 8.0 Hz), 138.1, 136.2, 133.9, 129.5 (d, J_{C-F} = 9.0 Hz), 127.7, 127.2, 122.5 (d, J_{C-F} = 3 Hz), 121.4, 121.3, 116.4, 114.0 (d, J_{C-F} = 21.5 Hz), 113.1 (d, J_{C-F} = 20.9 Hz), 54.3, 38.6, 38.6, 29.9.

16o. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.52 (br s, 1H), 8.78 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.30 (dd, 1H, J_1 = 7.5 Hz, J_2 = 1.4 Hz), 8.09 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.44−7.31 (m, 5H), 7.21 (d, 2H, J = 7.6 Hz), 7.13 (t, 2H, J = 7.8 Hz), 7.07−7.04 (m, 2H), 4.19−4.14 (m, 1H), 4.06−4.0 (m, 2H), 3.48 (dd, 1H, J_1 = 21.5 Hz, J_2 = 11.0 Hz), 2.77−2.70 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 168.3, 148.0, 142.5, 138.2, 136.2, 134.0, 133.8, 129.3, 127.7, 127.2, 126.4, 125.1, 121.4, 121.3, 116.5, 54.3, 38.6, 29.8.

16p. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.55 (br s, 1H), 8.78 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.32 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 8.05 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.50 (s, 2H), 7.40−7.21 (m, 7H), 7.07 (t, 2H, J = 7.8 Hz), 4.17−4.12 (m, 1H), 4.05−3.98 (m, 2H), 3.47 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.76−2.69 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 168.3, 148.0, 142.8, 138.2, 136.2, 133.8, 130.1, 129.7, 129.3, 127.7, 127.2, 125.6, 122.4, 121.4, 121.3, 116.5, 54.3, 38.6, 29.9.

16q. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.42 (br s, 1H), 8.64 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.32−8.30 (m, 1H), 7.92 (d, 1H, J = 8.0 Hz), 7.26 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.2 Hz), 7.23−7.17 (m, 2H), 7.08−7.03 (m, 4H), 6.91 (d, 2H, J = 8.0 Hz), 4.07−4.03 (m, 1H), 3.97−3.90 (m, 2H), 3.44 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.68−2.61 (m, 1H), 2.05 (s, 6H), 2.03 (s, 6H).

16r. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.40 (br s, 1H), 8.68 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.28 (dd, 1H, J_1 = 7.0 Hz, J_2 = 2.0 Hz), 7.96 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.31 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.2 Hz), 7.28−7.19 (m, 2H), 6.90 (s, 4H), 6.62 (s, 2H), 4.09−4.04 (m, 1H), 3.96−3.90 (m, 2H), 3.41 (dd, 1H, J_1 = 21.8 Hz, J_2 = 11.0 Hz), 2.65−2.62 (m, 1H), 2.09 (s, 12H).

16s. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.64 (br s, 1H), 8.80 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.18 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.3 Hz), 8.07 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.44−7.36 (m, 4H), 7.30−7.18 (m, 5H), 4.58−4.53 (m, 1H), 4.19−4.12 (m, 2H), 3.57 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.66−2.59 (m, 1H).

16t. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.60 (br s, 1H), 8.74 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.24 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.2 Hz), 8.06 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.80 (d, 4H, J = 8.3 Hz), 7.42−7.34 (m, 6H), 7.26 (t, 1H, J = 8.0 Hz), 4.30−4.25 (m, 1H), 4.16−4.09 (m, 2H), 3.57 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.84−2.78 (m, 1H), 2.47 (s, 6H).

16u. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.53 (br s, 1H), 8.74 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.12 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.2 Hz), 8.01 (dd, 1H, J_1 = 8.0 Hz, J_2 = 1.6 Hz), 7.57 (d, 2H, J = 8.7 Hz), 7.36 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.2 Hz), 7.31 (d, 2H, J = 2.6 Hz), 7.32−7.29 (m, 1H), 7.22 (t, 1H, J = 7.6 Hz), 7.08 (dd, 2H, J_1 = 8.7 Hz, J_2 = 2.6 Hz), 4.68−4.63 (m, 1H), 4.34−4.27 (m, 2H), 3.70 (s, 6H), 3.53 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.62−2.57 (m, 1H).

16v. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.53 (br s, 1H), 8.95 (br s, 2H), 8.44 (d, 1H, J = 4.0 Hz), 8.12 (d, 1H, J = 7.6 Hz), 7.86 (d, 1H, J = 8.2 Hz), 7.59 (s, 2H), 7.23−6.98 (m, 9H), 6.32 (s, 2H), 4.15 (t, 3H, J = 6.5 Hz), 3.59−3.54 (m, 1H), 2.80−2.74 (m, 1H).

16w. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.61 (br s, 1H), 8.74 (dd, 1H, J_1 = 4.3 Hz, J_2 = 1.8 Hz), 8.58−8.53 (m, 1H), 8.06 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.42−7.37 (m, 3H), 7.10−7.06 (m, 4H), 6.90 (dd, 2H, J_1 = 5.0 Hz, J_2 = 3.5 Hz), 4.22−

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4.16 (m, 2H), 4.06−4.01 (m, 1H), 3.56 (dd, 1H, J_1 = 21.8 Hz, J_2 = 11.2 Hz), 2.95−2.88 (m, 1H).

16x. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.70 (br s, 1H), 8.75 (dd, 1H, J_1 = 4.4 Hz, J_2 = 1.6 Hz), 8.23−8.17 (m, 4H), 7.83 (dt, 2H, J_1 = 8.1 Hz, J_2 = 2.5 Hz), 7.48−7.45 (m, 2H), 7.38 (t, 1H, J = 8.1 Hz), 6.80 (dd, 2H, J_1 = 8.5 Hz, J_2 = 2.8 Hz), 4.22−4.05 (m, 3H), 3.52 (dd, 1H, J_1 = 21.8 Hz, J_2 = 11.0 Hz), 2.80−2.77 (m, 1H).

16y. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.66 (br s, 1H), 8.75 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.21 (dd, 1H, J_1 = 7.7 Hz, J_2 = 1.2 Hz), 8.16 (d, 2H, J = 5.1 Hz), 8.09 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.42−7.39 (m, 2H), 7.32 (t, 1H, J = 7.8 Hz), 7.26 (s, 2H), 7.12 (d, 2H, J = 5.1 Hz), 4.28−4.23 (m, 1H), 4.03−3.96 (m, 2H), 3.42 (dd, 1H, J_1 = 21.7 Hz, J_2 = 11.0 Hz), 2.78−2.75 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 167.3, 152.7, 151.5, 149.3, 148.2, 138.1, 136.5, 133.2, 127.8, 127.1, 122.7, 122.1, 121.7, 120.9, 116.7, 53.6, 37.7, 28.9.

16z. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.55 (br s, 1H), 8.74 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.45 (dd, 1H, J_1 = 6.9 Hz, J_2 = 2.1 Hz), 8.08 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.41−7.36 (m, 3H), 7.28 (dd, 2H, J_1 = 8.4 Hz, J_2 = 2.7 Hz), 7.07−7.03 (m, 2H), 6.87 (dd, 1H, J_1 = 5.0 Hz, J_2 = 3.6 Hz), 6.79 (td, 1H, J_1 = 8.7 Hz, J_2 = 3.0 Hz), 4.23−4.17 (m, 1H), 4.09−4.0 (m, 2H), 3.72 (s, 3H), 3.51 (dd, 1H, J_1 = 21.4 Hz, J_2 = 11.0 Hz), 2.83−2.77 (m, 1H).

16aa. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.57 (br s, 1H), 8.60 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.31 (dd, 1H, J_1 = 7.5 Hz, J_2 = 1.4 Hz), 8.21 (br s, 1H), 7.95 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.67 (s, 1H), 7.32−7.13 (m, 6H), 7.06 (d, 1H, J = 8.4 Hz) 6.98 (t, 1H, J = 2.5 Hz), 6.77 (td, 2H, J_1 = 8.7 Hz, J_2 = 3.0 Hz), 6.41 (t, 1H, J = 2.1 Hz), 4.20−4.13 (m, 2H), 4.08−4.04 (m, 1H), 3.68 (s, 3H), 3.58 (dd, 1H, J_1 = 21.1 Hz, J_2 = 11.0 Hz), 2.80−2.75 (m, 1H).

16ab. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.51 (br s, 1H), 8.76 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.29 (dd, 1H, J_1 = 7.6 Hz, J_2 = 1.4 Hz), 8.21 (d, 1H, J = 5.3 Hz), 8.11 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.44−7.40 (m, 2H), 7.35 (t, 1H, J = 7.7 Hz), 7.28-7.24 (m, 3H), 7.16−7.14 (m, 1H), 6.71 (d, 2H, J = 8.7 Hz), 4.19−3.89 (m, 3H), 3.64 (s, 3H), 3.45 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.1 Hz), 2.76−2.69 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 168.2, 158.2, 154.1, 151.5, 149.1, 147.9, 138.2, 136.3, 133.8, 131.3, 128.2, 127.7, 127.2, 122.6, 121.4, 120.9, 116.5, 113.6, 55.1, 54.3, 39.1, 37.4, 29.7.

16ac. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.59 (br s, 1H), 8.77 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.39 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.4 Hz), 8.23 (d, 1H, J = 5.1 Hz), 8.11 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.44−7.35 (m, 3H), 7.27 (s, 1H), 7.13 (d, 1H, J = 5.1 Hz), 7.03−7.02 (m, 2H), 6.82 (dd, 1H, J_1 = 4.8 Hz, J_2 = 3.7 Hz), 4.30−4.24 (m, 1H), 4.18−4.13 (m, 1H), 3.92−3.88 (m, 1H), 3.45 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.88−2.82 (m, 1H).

16ad. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.61 (br s, 1H), 8.60 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.40 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 8.16 (br s, 1H), 8.0 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.65 (s, 1H), 7.34−7.22 (m, 3H), 7.13 (s, 2H), 7.07−7.04 (m, 3H), 6.87 (dd, 1H, J_1 = 5.0 Hz, J_2 = 3.5 Hz), 6.44 (t, 1H, J = 2.5 Hz), 4.29−4.10 (m, 3H), 3.59 (dd, 1H, J_1 = 21.7 Hz, J_2 = 11.0 Hz), 2.93−2.86 (m, 1H).

16ae. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.52 (br s, 1H), 8.79 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.35 (dd, 1H, J_1 = 7.3 Hz, J_2 = 1.6 Hz), 8.06 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.39 (dd, 1H, J_1 = 8.2 Hz, J_2 = 4.0 Hz), 7.31−7.24 (m, 4H), 6.47 (dd, 2H, J_1 = 8.4 Hz, J_2 = 2.4 Hz), 6.25 (d, 2H, J = 2.4 Hz), 4.29−4.24 (m, 1H), 4.09−4.02 (m, 2H), 3.75 (s, 6H), 3.71 (s, 6H), 3.38 (dd, 1H, J_1 = 21.4 Hz, J_2 = 11.2 Hz), 2.65−2.62 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 170.3, 159.1, 158.0, 147.6, 138.2, 136.2, 134.8, 128.1, 127.7, 127.4, 122.1, 121.2, 120.2, 115.9, 103.5, 97.9, 55.2, 55.2, 53.8, 35.4, 28.1.

16af. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.56 (br s, 1H), 8.72 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.42 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 8.09 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.42−7.32 (m, 3H), 6.90−6.87 (m, 4H), 6.75 (d, 2H, J = 8.7 Hz), 4.13−4.09 (m, 1H), 4.04−3.95 (m, 2H), 3.77 (s, 6H), 3.73 (s, 6H), 3.44 (dd, 1H, J_1 = 21.3 Hz, J_2 = 11.0 Hz), 2.76−2.73 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 169.3, 148.5, 147.7, 147.2, 138.2, 136.3, 134.2, 133.3, 127.7, 127.3, 121.3, 121.1, 119.2, 116.4, 110.8, 110.1, 55.7, 55.6, 54.6, 38.8, 31.1.

16ag. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.51 (br s, 1H), 8.75 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.40 (dd, 1H, J_1 = 7.1 Hz, J_2 = 1.8 Hz), 8.09 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.42−7.33 (m, 3H), 6.85−6.79 (m, 4H), 6.66 (d, 2H, J = 8.0 Hz), 5.81 (dd, 4H, J_1 = 8.9 Hz, J_2 = 1.6 Hz), 4.07−4.04 (m, 1H), 3.98−3.91 (m, 2H), 3.38 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.68−2.63 (m, 1H).

16ah. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.58 (br s, 1H), 8.72 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.44 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 8.11 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.44−7.34 (m, 3H), 6.53 (s, 4H), 4.18−4.13 (m, 1H), 4.03−3.96 (m, 2H), 3.73 (s, 12H), 3.67 (s, 6H), 3.39 (dd, 1H, J_1 = 21.4 Hz, J_2 = 11.0 Hz), 2.82−2.77 (m, 1H).

16ai. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.52 (br s, 1H), 8.72 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.41 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 8.09 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.42−7.32 (m, 3H), 7.26 (d, 2H, J = 8.1 Hz), 6.81 (td, 2H, J_1 = 8.7 Hz, J_2 = 3.0 Hz), 6.56 (s, 2H), 4.17−4.10 (m, 1H), 4.03−3.95 (m, 2H), 3.73 (s, 3H), 3.71 (s, 6H), 3.61 (s, 3H), 3.43 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.77−2.73 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 169.2, 157.8, 152.8, 147.8, 138.1, 136.4, 136.3, 136.2, 134.2, 132.7, 127.8, 127.7, 127.3, 121.4, 121.1, 116.4, 113.5, 104.0, 60.6, 55.9, 55.2, 54.6, 39.7, 38.1, 30.8.

16aj. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.57 (br s, 1H), 8.72 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.43 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 8.09 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.41−7.32 (m, 3H), 6.90−6.88 (m, 2H), 6.76 (d, 1H, J = 8.7 Hz), 6.55 (s, 2H), 4.14−4.11 (m, 1H), 4.03−3.96 (m, 2H), 3.78 (s, 3H), 3.74 (s, 3H), 3.72 (s, 6H), 3.65 (s, 3H), 3.41 (dd, 1H, J_1 = 21.4 Hz, J_2 = 11.1 Hz), 2.78−2.75 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 169.2, 152.9, 148.6, 147.8, 147.3, 138.1, 136.6, 136.3, 136.1, 134.2, 133.3, 127.8, 127.3, 121.4, 121.2, 119.0, 116.4, 110.8, 110.0, 103.8, 60.7, 55.9, 55.7, 55.6, 54.5, 39.4, 38.6, 31.1.

17a. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.36 (br s, 1H), 8.72 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.7 Hz), 8.56 (dd, 1H, J_1 = 7.1 Hz, J_2 = 1.7 Hz), 8.10 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.7 Hz), 7.47−7.39 (m, 3H), 7.24 (td, 2H, 1H, J_1 = 8.7 Hz, J_2 = 3.0 Hz), 6.64 (td, 2H, 1H, J_1 = 8.7 Hz, J_2 = 3.0 Hz), 4.07 (dd, 1H, J_1 = 17.8 Hz, J_2 = 9.1 Hz), 3.79−3.71 (m, 1H), 3.57 (s, 3H), 2.70−2.63 (m, 2H), 2.43−2.35 (m, 2H).

17b. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.40 (br s, 1H), 8.73 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.54 (dd, 1H, J_1 = 6.6 Hz, J_2 = 2.3 Hz), 8.10 (dd, 1H, J_1 = 8.3 Hz, J_2 = 1.6 Hz), 7.42−7.32 (m, 4H), 7.22 (t, 1H, J = 7.5 Hz), 7.13−7.09 (m, 2H), 6.98−6.93 (m, 1H), 4.16−4.07 (m, 1H), 3.82−3.76 (m, 1H), 2.77−2.61 (m, 2H), 2.45−2.37 (m, 2H).

17c. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.51 (br s, 1H), 8.76 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.64 (dd, 1H, J_1 = 7.3 Hz, J_2 = 1.7 Hz), 8.11 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.6 Hz), 7.49−7.38

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(m, 3H), 6.98−6.93 (m, 2H), 6.75 (dd, 1H, J_1 = 5.1 Hz, J_2 = 3.5 Hz), 4.32 (dd, 1H, J_1 = 16.2 Hz, J_2 = 7.6 Hz), 3.79−3.73 (m, 1H), 2.73−2.51 (m, 3H), 2.36−2.28 (m, 1H).

17d. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.26 (br s, 1H), 8.66 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.7 Hz), 8.63 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 8.07 (dd, 1H, J_1 = 8.2 Hz, J_2 = 1.7 Hz), 7.46−7.36 (m, 3H), 6.50 (s, 2H), 4.09−4.03 (m, 1H), 3.76−3.71 (m, 1H), 3.67 (s, 6H), 3.30 (s, 3H), 2.72−2.58 (m, 2H), 2.40−2.34 (m, 2H).

19a. ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.98 (s, 2H), 7.95 (br s, 1H), 7.84 (s, 2H), 7.69 (d, 2H, J = 8.0 Hz), 7.61 (d, 2H, J = 8.0 Hz), 7.50−7.44 (m, 3H), 7.30−7.28 (m, 1H), 7.02−6.90 (m, 2H), 4.17−4.04 (m, 3H), 3.61 (dd, 1H, J_1 = 21.6 Hz, J_2 = 11.0 Hz), 2.82−2.78 (m, 1H), 2.18 (s, 3H).

19b. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.94 (br s, 1H), 7.74 (d, 1H, J = 8.0 Hz), 7.34 (dd, 1H, J_1 = 8.0 Hz, J_2 = 1.6 Hz), 7.22 (d, 4H, J = 8.0 Hz), 7.08 (d, 4H, J = 8.0 Hz), 7.06-7.05 (m, 1H), 6.92 (t, 1H, J = 7.8 Hz), 4.03−3.91 (m, 3H), 3.44 (dd, 1H, J_1= 21.3 Hz, J_2= 10.4 Hz), 2.72−2.65 (m, 1H), 2.28 (s, 6H), 2.13 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 168.8, 138.2, 137.3, 135.6, 132.8, 129.0, 128.9, 128.6, 126.8, 124.8, 123.8, 121.0, 54.5, 38.7, 30.0, 21.1, 18.8.

19c. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.99 (br s, 1H), 7.88 (d, 4H, J = 8.2 Hz), 7.60 (dd, 1H J = 8.5 Hz), 7.39 (d, 4H, J = 8.2 Hz), 7.32 (dd, 1H, J_1 = 7.8 Hz, J_2 = 1.4 Hz), 7.05−7.0 (m, 1H), 6.93 (t, 1H, J = 7.6 Hz), 4.13−4.06 (m, 3H), 3.55 (dd, 1H, J_1 = 21.4 Hz, J_2 = 10.8 Hz), 2.80−2.78 (m, 1H), 2.56 (s, 6H), 2.19 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 197.9, 168.0, 146.0, 137.3, 135.3, 132.3, 128.5, 128.4, 127.0, 125.3, 124.4, 120.9, 54.3, 38.9, 29.7, 26.6, 18.6.

21a. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.08 (s, 2H), 8.03 (dd, 2H, J_1 = 8.2 Hz, J_2 = 1.5 Hz), 7.60 (d, 2H, J = 8.0 Hz), 7.45 (t, 2H, J = 8.0 Hz), 6.34 (br s, 1H), 4.03−3.96 (m, 2H), 3.89−3.84 (m, 1H), 3.46 (dd, 1H, J_1 = 21.4 Hz, J_2 = 11.0 Hz), 2.83−2.74 (m, 3H), 2.01 (s, 6H), 1.95 (t, 2H, J = 6.0 Hz).

21b. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.33−7.27 (m, 8H), 7.22−7.17 (m, 2H), 5.78 (br s, 1H), 3.96−3.89 (m, 2H), 3.78−3.74 (m, 1H), 3.37 (dd, 1H, J_1 = 21.8 Hz, J_2 = 11.0 Hz), 2.81 (dd, 2H, J_1 = 11.0 Hz, J_2 = 6.0 Hz), 2.65−2.61 (m, 1H), 2.0 (s, 6H), 1.84 (t, 2H, J = 6.0 Hz).

21c. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.18 (d, 4H, J = 8.5 Hz), 6.82 (d, 4H, J = 8.5 Hz), 5.67 (br s, 1H), 3.84−3.79 (m, 2H), 3.76 (s, 6H), 3.66−3.61 (m, 1H), 3.25 (dd, 1H, J_1 = 21.8 Hz, J_2 = 11.2 Hz), 2.81 (dd, 2H, J_1 = 11.2 Hz, J_2 = 6.0 Hz), 2.56−2.52 (m, 1H), 1.98 (s, 6H), 1.85 (t, 2H, J = 6.0 Hz).

21d. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.19 (d, 4H, J = 8.4 Hz), 7.12 (d, 4H, J = 8.4 Hz), 5.70 (br s, 1H), 3.91−3.84 (m, 2H), 3.73−3.68 (m, 1H), 3.31 (dd, 1H, J_1 = 22.6 Hz, J_2 = 11.2 Hz), 2.84 (dd, 2H, J_1 = 11.2 Hz, J_2 = 6.2 Hz), 2.61−2.57 (m, 1H), 2.33 (s, 6H), 2.01 (s, 6H), 1.84 (t, 2H, J = 6.2 Hz).

21e. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.21 (d, 4H, J = 8.0 Hz), 7.14 (d, 4H, J = 8.0 Hz), 5.63 (br s, 1H), 3.92−3.85 (m, 2H), 3.74−3.72 (m, 1H), 3.30 (dd, 1H, J_1 = 21.8 Hz, J_2 = 11.2 Hz), 2.84−2.80 (m, 2H), 2.61 (q, 4H, J = 7.6 Hz), 2.60−2.58 (m, 1H), 1.98 (s, 6H), 1.81 (t, 2H, J = 6.0 Hz), 1.23 (t, 6H, J = 7.6 Hz). ^{13}C NMR (100 MHz, $CDCl_3$): δ 170.1, 141.9, 138.0, 127.5, 127.1, 57.5, 53.4, 44.8, 38.4, 36.0, 29.8, 28.5, 15.7.

21f. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.28−7.18 (m, 8H), 5.71 (br s, 1H), 3.88−3.81 (m, 2H), 3.67 (dt, 1H, J_1 = 8.2 Hz, J_2 = 3.5 Hz), 3.32 (dd, 1H, J_1 = 21.7 Hz, J_2 = 11.2 Hz), 2.84 (dd, 2H, J_1 = 11.2 Hz, J_2 = 6.0 Hz), 2.61−2.57 (m, 1H), 2.01 (s, 6H), 1.89 (t, 2H, J = 6.0 Hz).

21g. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.39 (d, 4H, J = 8.4 Hz), 7.13 (d, 4H, J = 8.4 Hz), 6.48 (br s, 1H), 3.84−3.77 (m, 2H), 3.70−3.65 (m, 1H), 3.31 (dd, 1H, J_1 = 21.5 Hz, J_2 = 11.0 Hz), 2.89 (dd, 2H, J_1 = 11.0 Hz, J_2 = 5.4 Hz), 2.59−2.52 (m, 1H), 2.09 (s, 6H), 1.99 (t, 2H, J = 5.4 Hz).

21h. ^{1}H NMR (400 MHz, $CDCl_3$ and DMSO-d_6): δ 8.08 (d, 4H, J = 8.0 Hz), 7.35 (d, 4H, J = 8.0 Hz), 6.56 (br s, 1H), 3.98−3.91 (m, 2H), 3.87−3.75 (m, 1H), 3.42 (dd, 1H, J_1 = 21.4 Hz, J_2 = 11.0 Hz), 2.79 (dd, 2H, J_1 = 11.0 Hz, J_2 = 5.6 Hz), 2.69−2.66 (m, 1H), 2.0 (s, 6H), 1.90 (t, 2H, J = 5.6 Hz).

21i. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.56 (d, 4H, J = 8.2 Hz), 7.34 (d, 4H, J = 8.2 Hz), 6.13 (br s, 1H), 3.97−3.90 (m, 2H), 3.81−3.77 (m, 1H), 3.41 (dd, 1H, J_1 = 21.5 Hz, J_2 = 11.0 Hz), 2.81 (dd, 2H, J_1 = 11.0 Hz, J_2 = 6.0 Hz), 2.68−2.61 (m, 1H), 2.03 (s, 6H), 1.93 (t, 2H, J = 6.0 Hz). ^{13}C NMR (100 MHz, CDCl3): δ 168.9, 146.4, 131.8, 127.8, 119.1, 109.8, 57.6, 53.0, 44.8, 38.4, 36.0, 29.2.

21j. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.44 (t, 2H, J = 7.5 Hz), 7.01 (dd, 2H, J_1 = 9.8 Hz, J_2 = 1.8 Hz), 6.92 (dd, 2H, J_1 = 8.2 Hz, J_2 = 1.8 Hz), 6.27 (br s, 1H), 3.81−3.77 (m, 2H), 3.71−3.66 (m, 1H), 3.28 (dd, 1H, J_1 = 21.3 Hz, J_2 = 11.0 Hz), 2.91 (dd, 2H, J_1 = 11.0 Hz, J_2 = 5.4 Hz), 2.64−2.56 (m, 1H), 2.10 (s, 6H), 2.03 (t, 2H, J = 5.4 Hz).

21k. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.08−7.01 (m, 6H), 6.08 (br s, 1H), 3.87−3.81 (m, 2H), 3.72−3.68 (m, 1H), 3.30 (dd, 1H, J_1 = 22.0 Hz, J_2 = 11.0 Hz), 2.90 (dd, 2H, J_1 = 11.0 Hz, J_2 = 6.0 Hz), 2.60−2.53 (m, 1H), 2.27 (s, 6H), 2.24 (s, 6H), 2.04 (s, 6H), 1.91 (t, 2H, J = 6.0 Hz).

21l. ^{1}H NMR (400 MHz, $CDCl_3$): δ 6.79−6.72 (m, 6H), 5.79 (br s, 1H), 4.22 (s, 8H), 3.79−3.72 (m, 2H), 3.65−3.60 (m, 1H), 3.15 (dd, 1H, J_1 = 21.7 Hz, J_2 = 11.2 Hz), 2.91 (dd, 2H, J_1 = 11.2 Hz, J_2 = 5.8 Hz), 2.55−2.49 (m, 1H), 2.06 (s, 6H), 1.96 (t, 2H, J = 6.1 Hz). ^{13}C NMR (100 MHz, $CDCl_3$): δ 170.0, 143.1, 141.8, 134.3, 120.0, 116.7, 115.9, 64.3, 57.6, 53.1, 44.9, 37.9, 36.1, 30.1.

21m. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.16 (dd, 2H, J_1 = 5.0 Hz, J_2 = 1.2 Hz), 6.99−6.94 (m, 4H), 6.03 (br s, 1H), 4.04−3.98 (m, 2H), 3.63−3.58 (m, 1H), 3.36 (dd, 1H, J_1 = 21.8 Hz, J_2 = 11.0 Hz), 3.0 (dd, 2H, J_1 = 11.0 Hz, J_2 = 5.4 Hz), 2.82−2.75 (m, 1H), 2.07 (s, 6H), 2.04 (t, 2H, J = 5.4 Hz). ^{13}C NMR (100 MHz, $CDCl_3$): δ 169.3, 143.7, 126.7, 125.1, 123.8, 57.6, 54.7, 44.8, 36.1, 35.3, 35.0.

23. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.63 (dd, 1H, J_1 = 4.2 Hz, J_2 = 1.6 Hz), 8.07−8.04 (m, 1H), 7.57−7.14 (m, 11H), 7.07−7.04 (m, 1H), 6.60 (t, 1H, J = 6.5 Hz), 3.59 (d, 2H, J = 5.6 Hz), 3.38−3.26 (m, 2H), 2.91−2.72 (m, 2H), 2.22−2.10 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 146.8, 144.7, 142.6, 138.1, 135.9, 131.5, 128.8, 127.6, 127.0, 121.4, 120.1, 114.0, 104.7, 51.0, 46.8, 40.3, 34.1.

24. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.24 (d, 4H, J = 8.0 Hz), 7.17 (d, 4H, J = 8.0 Hz), 3.76 (dd, 2H, J_1 = 18.6 Hz, J_2 = 10.0 Hz), 3.28 (t, 1H, J = 10.0 Hz), 2.79−2.76 (m, 1H), 2.38 (s, 6H), 2.31 (dd, 1H, J_1 = 20.1 Hz, J_2 = 10.0 Hz).

25. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.33 (d, 4H, J = 8.5 Hz), 7.26 (d, 4H, J = 8.5 Hz), 3.78 (dd, 2H, J_1 = 18.3 Hz, J_2 = 10.0 Hz), 3.24 (t, 1H, J = 10.0 Hz), 2.84−2.78 (m, 1H), 2.27 (dd, 1H, J_1 = 21.0 Hz, J_2 = 10.0 Hz).

26. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.48 (d, 4H, J = 8.4 Hz), 7.20 (d, 4H, J = 8.4 Hz), 3.76 (dd, 2H, J_1 = 18.5 Hz, J_2 = 10.0 Hz), 3.24 (t, 1H, J = 10.6 Hz), 2.84−2.77 (m, 1H), 2.26 (dd, 1H, J_1 = 21.0 Hz, J_2 = 10.0 Hz).

27. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.97 (dd, 1H, J_1 = 4.3 Hz, J_2 = 1.9 Hz), 8.24 (dd, 1H, J_1 = 8.4 Hz, J_2 = 1.9 Hz), 7.84

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(dd, 1H, J_1 = 8.4 Hz, J_2 = 1.6 Hz), 7.54−7.46 (m, 6H), 7.26−7.23 (m, 4H), 6.72 (dd, 1H, J_1 = 7.4 Hz, J_2 = 1.6 Hz), 3.56−3.33 (m, 4H), 2.98 (s, 3H), 2.49−2.43 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 170.2, 151.0, 144.2, 141.4, 141.3, 139.2, 136.3, 131.0, 130.8, 130.4, 129.4, 128.7, 128.1, 126.4, 122.1, 120.8, 119.2, 50.0, 39.7, 37.7, 37.1.

For compound **16f**, in addition to the original FT-IR data, irrelevant FT-IR data corresponding to compound **15a** was inadvertently typed. The line FT-IR (KBr): 2988, 1698, 1598, 1351, 778 cm^{-1} should be ignored.

■ ASSOCIATED CONTENT

Supporting Information

Corrected version of Supporting Information containing the X-ray structures and revised ^{1}H and ^{13}C NMR spectra. This material is available free of charge via the Internet at http://pubs.acs.org.

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