**Series 2 Experimental**

**General Chemistry.** Reagents purchased were used as received, unless otherwise noted. Purification of intermediates and final compounds was performed using silica gel or reverse phase chromatography using the Biotage® Selekt flash purification system. LCMS analysis was performed using an Agilent reverse phase HPLC with InfinityLab Poroshell 120 columns (EC-C18, 2.7 μm, ID 4.6 mm, length 50 mm), using a multi-wavelength photodiode array detector from 210 nm to 600 nm and Waters Micromass ZQ detector (electrospray ionization). All compounds tested had a purity of > 95% as measured by LCMS, unless otherwise noted. 1H NMR spectra were obtained with Bruker NMR systems, operating at either 400 or 500 MHz at room temperature. Chemical shifts (δ, ppm) are reported relative to the solvent peak (CDCl3: 7.26 [1H]; DMSO-*d*6: 2.50 [1H]; or CD3OD: 3.31 [1H]). Data for 1H NMR spectra are reported as follows: chemical shift (ppm), multiplicity (s for singlet, d for doublet, t for triplet, dd for doublet of doublet, m for multiplet), coupling constant (Hz), and integration.

**General procedure A for the synthesis of 2-(pyridyl)imidazoles.** The corresponding 2-bromo-1-(pyridyl)ethan-1-one hydrobromide (1 equiv.), heterocycloalkenyl or heteroaryl amine (1 – 2 equiv.), and Na2CO3 (2 – 4 equiv.) were stirred in DMF (15 – 20 mL) at 85 °C for 18 h. After cooling to room temperature, the reaction mixture was partitioned between dichloromethane and water. The organic layer was separated, dried over Na2SO4, filtered and concentrated under reduced pressure to give a residue that was purified by flash chromatography on silica.

**General procedure B for the synthesis of 3-bromo-2-(pyridyl)imidazoles.** To a solution of the corresponding 2-(pyridyl)imidazole (1 equiv.) in dichloromethane (3 – 10 mL) was added N-bromosuccinimide (1 equiv.) and the mixture stirred at 25 °C for 1 h. On completion, the volatiles were evaporated. The residue was diluted with ethyl acetate and washed with saturated solution of NaHCO3 and brine. The organic phase was dried over Na2SO4, filtered and concentrated under reduced pressure to afford the desired product, which was used without further purification.

**General procedure C for the synthesis of 3-Aryl-2-(pyridyl)imidazoles.** A reaction vial was charged with the corresponding 3-bromo-2-(pyridyl)imidazole (1 equiv.), the appropriate aryl boronic acid or pinacol boronic ester (1.3 equiv.) and Pd(PPh3)4 (0.12 equiv.). The vial was sealed with a Teflon septum, evacuated and backfilled with nitrogen (this sequence was carried out three times). Under an inert atmosphere, a mixture of toluene and methanol (3:1, v/v, 0.2 M) was added via syringe, followed by the addition of 2 M aqueous Na2CO3 (4 equiv.). The mixture was heated at 120 °C for 18 h or in the microwave at 120 °C for 30 minutes. After cooling to room temperature, the mixture was either diluted with dichloromethane and the organic layer was washed with brine, dried over Na2SO4, filtered and concentrated under reduced pressure; or alternatively, the reaction mixture was diluted with MeOH, filtered through celite, and concentrated. The crude residue was purified by flash chromatography on silica and the product triturated to afford a fine powder.



**5-(2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazol-3-yl)benzo[d]thiazole (OSA\_000835).** The title compound was prepared according to General Procedure C using 3-bromo-2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazole (70 mg) and 5-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)benzo[d]thiazole. The crude material was purified by flash chromatography (1-20% MeOH:DCM), then triturated with 1:10 EtOAc:Hex to afford the title compound as an orange solid (10 mg, 12%).

HRMS [M+H]+

1H NMR (500 MHz, CHLOROFORM-d) δ ppm 9.04 (s, 1 H) 8.43 (d, J=5.0 Hz, 1 H) 8.22 (d, J=1.3 Hz, 1 H) 7.95 (d, J=8.2 Hz, 1 H) 7.71 (d, J=7.9 Hz, 1 H) 7.53 - 7.62 (m, 2 H) 7.06 (ddd, J=7.4, 4.9, 0.9 Hz, 1 H) 4.04 (t, J=7.1 Hz, 2 H) 3.05 (t, J=7.6 Hz, 2 H) 2.67 (quin, J=7.3 Hz, 2 H)

13C NMR (500 MHz, CHLOROFORM-d) δ ppm 23.6, 26.2, 44.7, 121.3, 121.4, 121.7, 123.5, 127.1, 127.5, 129.5, 133.1, 136.1, 141.7, 149.1, 153.5, 154.1, 154.3, 154.6

ELN Link: https://au-mynotebook.labarchives.com/share/Dana%2520Klug/MzE3LjJ8Njk2ODYvMjQ0L1RyZWVOb2RlLzI3NjE2MjY4MzJ8ODA1LjE5OTk5OTk5OTk5OTk=



**2-methyl-5-(2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazol-3-yl)benzo[d]thiazole (OSA\_000836).**

The title compound was prepared according to General Procedure C using 3-bromo-2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazole (65 mg) and 2-methyl-5-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)benzo[d]thiazole. The crude material was purified by flash chromatography (1-20% MeOH:DCM), then triturated with 1:10 EtOAc:Hex to afford the title compound as a tan solid (24 mg, 29%).

HRMS [M+H]+ 333.1167 m/z

1H NMR (500 MHz, CHLOROFORM-d) δ ppm 8.45 (d, J=4.1 Hz, 1 H) 8.02 (d, J=0.9 Hz, 1 H) 7.80 (d, J=8.5 Hz, 1 H) 7.65 (d, J=7.9 Hz, 1 H) 7.56 (td, J=7.7, 1.9 Hz, 1 H) 7.44 (dd, J=8.4, 1.4 Hz, 1 H) 7.05 (ddd, J=7.4, 4.9, 0.9 Hz, 1 H) 4.01 (t, J=7.1 Hz, 2 H) 3.03 (t, J=7.6 Hz, 2 H) 2.86 (s, 3 H) 2.65 (quin, J=7.3 Hz, 2 H)

13C NMR (500 MHz, CHLOROFORM-d) δ ppm 20.2, 23.6, 26.2, 44.7, 121.2, 121.3, 121.4, 122.4, 126.4, 127.3, 129.0, 135.1, 136.0 141.5, 149.2, 153.6, 154.1, 154.2167.7

ELN Link: https://au-mynotebook.labarchives.com/share/Dana%2520Klug/MzE4LjV8Njk2ODYvMjQ1L1RyZWVOb2RlLzI5MTExMzY4M3w4MDguNQ==



**3-phenyl-2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazole (OSA\_000870).**

DMK136-1-A

The title compound was prepared according to General Procedure C using 3-bromo-2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazole (75 mg) and phenylboronic acid. The crude material was purified by flash chromatography (1-10% MeOH:DCM), then repurified by reverse phase chromatography (5-100% MeOH:H2O) to afford the title compound as a tan solid (18 mg, 24%).

HRMS [M+H]+ 262.1354 m/z

1H NMR (500 MHz, CHLOROFORM-d) δ ppm 8.49 (d, J=4.7 Hz, 1 H) 7.51 - 7.61 (m, 2 H) 7.42 - 7.46 (m, 2 H) 7.39 (t, J=7.4 Hz, 2 H) 7.32 - 7.37 (m, 1 H) 7.02 - 7.08 (m, 1 H) 3.97 (t, J=7.1 Hz, 2 H) 3.01 (t, J=7.6 Hz, 2 H) 2.63 (quin, J=7.3 Hz, 2 H).

13C NMR (500 MHz, CHLOROFORM-d) δ ppm 23.6, 26.2, 44.6, 121.1, 121.4, 127.8, 128.4, 129.2, 131.1, 135.8, 141.4, 149.3, 154.0, 154.2.

ELN Link: https://au-mynotebook.labarchives.com/share/Dana%2520Klug/MzQ0LjV8Njk2ODYvMjY1L1RyZWVOb2RlLzEyMTIyMzQ2OTh8ODc0LjU=



**3-(benzo[b]thiophen-5-yl)-2-(pyridin-2-yl)imidazo[1,2-a]pyridine (OSA\_000871).**

The title compound was prepared according to General Procedure C using 3-bromo-2-(pyridin-2-yl)imidazo[1,2-a]pyridine (100 mg) and 2-(benzo[b]thiophen-5-yl)-4,4,5,5-tetramethyl-1,3,2-dioxaborolane. The crude material was purified by flash chromatography (1-15% MeOH:DCM), then repurified by flash chromatography (20-100% EtOAc:Hex - 0-15% MeOH:DCM). The resulting dark yellow semisolid was purified by reverse phase chromatography (5-100% MeOH:H2O), concentrated, and triturated with 1:10 EtOAc:Hex to afford the title compound as a dull yellow solid (39 mg, 33%).

HRMS [M+H]+ 328.0909 m/z

1H NMR (500 MHz, CHLOROFORM-d) δ ppm 8.57 (d, J=5.0 Hz, 1 H) 8.04 (d, J=8.2 Hz, 1 H) 8.02 (d, J=6.9 Hz, 1 H) 7.99 (s, 1 H) 7.84 (d, J=8.8 Hz, 1 H) 7.72 (d, J=7.9 Hz, 1 H) 7.54 - 7.62 (m, 2 H) 7.45 (dd, J=8.2, 1.3 Hz, 1 H) 7.40 (d, J=5.4 Hz, 1 H) 7.30 (t, J=7.6 Hz, 1 H) 7.14 (dd, J=7.4, 4.9 Hz, 1 H) 6.81 (t, J=6.8 Hz, 1 H)

13C NMR

ELN Link: https://au-mynotebook.labarchives.com/share/Dana%2520Klug/MzU0LjkwMDAwMDAwMDAwMDAzfDY5Njg2LzI3My9UcmVlTm9kZS82MTYxNDQyMjd8OTAwLjk=



**3-(3-fluorophenyl)-2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazole (OSA\_000872).**

The title compound was prepared according to General Procedure C using 3-bromo-2-(pyridin-2-yl)-6,7-dihydro-5H-pyrrolo[1,2-a]imidazole (75 mg) and (3-fluorophenyl)boronic acid. The crude material was purified by flash chromatography (1-10% MeOH:DCM, step gradient). The resulting orange solid was triturated with 1:10 EtOH:Hex, then with a minimal amount of MeOH to afford a cream solid, which was then purified by reverse phase chromatography (5-100% ACN:H2O) to afford the title compound as a tan solid (13 mg, 16%).

HRMS [M+H]+ 280.1251 m/z

1H NMR (500 MHz, CHLOROFORM-d) δ ppm 8.47 (dd, J=4.7, 0.6 Hz, 1 H) 7.69 (d, J=7.9 Hz, 1 H) 7.61 (td, J=7.7, 1.9 Hz, 1 H) 7.35 (td, J=8.0, 6.1 Hz, 1 H) 7.21 (d, J=7.6 Hz, 1 H) 7.16 - 7.20 (m, 1 H) 7.09 (ddd, J=7.4, 4.9, 0.9 Hz, 1 H) 7.04 (td, J=6.6, 1.9 Hz, 1 H) 3.99 (t, J=7.1 Hz, 2 H) 3.04 (t, J=7.6 Hz, 2 H) 2.65 (quin, J=7.3 Hz, 2 H)

13C NMR (500 MHz, CHLOROFORM-d) δ ppm 23.6, 26.4, 44.9, 114.8 (d, J=21.1 Hz), 116.2 (d, J=22.0 Hz), 121.5 (d, J=1.8 Hz), 124.9 (d, J=2.7 Hz), 126.6 (d, J=1.8 Hz), 129.9 (d, J=8.2 Hz), 132.78 (d, J=8.2 Hz), 136.2, 141.2, 149.1, 153.4, 154.1, 161.6, 163.6

ELN Link: https://au-mynotebook.labarchives.com/share/Dana%2520Klug/MzczLjF8Njk2ODYvMjg3L1RyZWVOb2RlLzM2NTE1NDYxMjN8OTQ3LjA5OTk5OTk5OTk5OTk=



**7-chloro-2-(pyridin-2-yl)-3-(p-tolyl)imidazo[1,2-a]pyridine (OSA\_000978).**

DMK159-1-A



**3-(benzofuran-5-yl)-7-chloro-2-(pyridin-2-yl)imidazo[1,2-a]pyridine (OSA\_000985).**

DMK164-1-A

**(OSA\_000986).**

DMK165-1-A

**(OSA\_000987).**

DMK166-1-A

**(OSA\_000988).**

DMK169-1-A

**(OSA\_000989).**

DMK170-2-B

**(OSA\_000990).**

DMK170-2-C

**(OSA\_001008).**

DMK195-1-A

**(OSA\_001009).**

DMK196-2-A

**(OSA\_001010).**

DMK197-1-A

**(OSA\_001018).**

DMK204-1-A