

SUPPORTING INFORMATION

Discovery of Novel Small Molecules that Activate Satellite Cell Proliferation and Enhance Repair of Damaged Muscle

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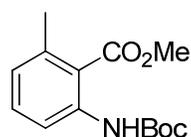
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General Methods and Chemistry Experimentals.....	2
Supplemental Figure S1.....	29
Supplemental Table S1.....	31
Supplemental Table S2.....	44
Supplemental Table S3.....	47
Supplemental Table S4.....	60
Supplemental Table S5.....	71

General methods

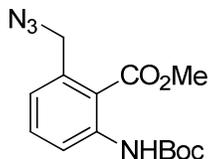
All chemicals and solvents were purchased from commercial sources and were used as received unless otherwise specified. The following solvents and reagents have been abbreviated: tetrahydrofuran (THF), ethyl ether (Et₂O), dimethyl sulfoxide (DMSO), trifluoroacetic acid (TFA), dimethylformamide (DMF), methanol (MeOH), acetonitrile (MeCN), N-methylpyrrolidine (NMP). The ¹H NMR spectra were obtained on a Varian 500 MHz spectrometer. Chemical shifts are reported in δ ppm values downfield from tetramethylsilane. Coupling constants (*J*) are reported in hertz (Hz). Splitting patterns are designated as s, singlet; d, doublet; t, triplet; q, quartet; m, multiplet; br, broad. Low-resolution mass spectra (MS) were acquired in either positive or negative ion mode under electrospray ionization (ESI). Silica gel chromatography was performed on an Isco CombiFlash system using RediSep pre-packed silica gel cartridges. Analytical purity was determined by reverse-phase high performance liquid chromatography (RP-HPLC) using an Agilent 1100 system equipped with a diode array spectrometer (λ range= 190–400 nm). The stationary phase was a Keystone Scientific BDS Hypersil C-18 column (5 μm, 4.6 mm x 200 mm). The mobile phase employed 0.1% aqueous TFA with MeCN as the organic modifier and a flow rate of 1.0 mL/min. Typical elution conditions were a 5–100% MeCN gradient over 15 minutes.

Methyl 2-((tert-butoxycarbonyl)amino)-6-methylbenzoate



2-((Tert-butoxycarbonyl)amino)-6-methylbenzoic acid¹ (5.0468 g, 20.1 mmol) was dissolved in 10/1 THF/methanol (44 mL). Trimethylsilyldiazomethane (2M solution in hexanes, 11.0 ml, 22.0 mmol) was added dropwise and the solution was stirred at RT overnight. The solution was concentrated and the residue was purified by silica gel chromatography eluting with 5-15% ethyl acetate/heptane gradient to provide the desired product (3.7222 g, 70%) as a white solid. ¹H NMR (CDCl₃): δ 8.70 (s, br, 1H), 8.04 (d, *J*=8.5 Hz, 1H), 7.30 (t, *J*=7.9 Hz, 1H), 6.88 (d, *J*=7.5 Hz, 1H), 3.94 (s, 3H), 2.43 (s, 3H), 1.51 (s, 9H).

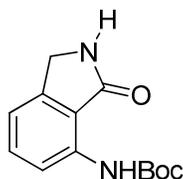
Methyl 2-(azidomethyl)-6-((tert-butoxycarbonyl)amino)benzoate



Methyl 2-((tert-butoxycarbonyl)amino)-6-methylbenzoate (3.7222 g, 14.0 mmol) was dissolved in carbon tetrachloride (30 mL) and NBS (recrystallized from water, 2.7759 g, 15.6 mmol) was added. Benzoyl peroxide (0.1754 g, 0.72 mmol) was added and the mixture was heated to 75 °C for 4 hours, then at 85 °C for 2 hours. The mixture was cooled to RT and filtered. The filtrate was concentrated and the residue was dissolved in DMF (30 mL). Sodium azide (1.4600 g, 22.5 mmol) was added and the resulting mixture was stirred at RT for 2 days. Water (150 mL) was added and the mixture was extracted with diethyl ether (3 x 35 mL). The combined organics were dried over magnesium sulfate and concentrated. The residue was purified by silica gel chromatography eluting with 5-10% ethyl

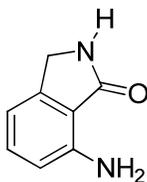
acetate/heptane gradient to provide the desired product (4.1034 g, 95%) as a colorless oil. $^1\text{H NMR}$ (CDCl_3): δ 8.84 (s, br, 1H), 8.25 (d, $J=8.5$ Hz, 1H), 7.44 (t, $J=8.0$ Hz, 1H), 7.04 (d, $J=7.5$ Hz, 1H), 4.55 (s, 2H), 3.98 (s, 3H), 1.52 (s, 9H).

Tert-butyl (3-oxoisindolin-4-yl)carbamate



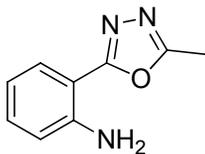
Methyl 2-(azidomethyl)-6-((tert-butoxycarbonyl)amino)benzoate (4.1034 g, 13.4 mmol) was dissolved in THF (26 mL). Water (0.800 mL, 44.0 mmol) was added followed by triphenylphosphine (3.8607 g, 14.7 mmol) and the solution was stirred at RT overnight. The solution was concentrated and the residue was purified by silica gel chromatography eluting with 5–40% ethyl acetate/heptane gradient to provide the desired product (2.4556 g, 74%) as a white solid. $^1\text{H NMR}$ (CDCl_3): δ 9.43 (s, br, 1H), 8.20 (d, $J=8.5$ Hz, 1H), 7.49 (t, $J=7.9$ Hz, 1H), 7.03 (d, $J=7.5$ Hz, 1H), 6.51 (s, br, 1H), 4.41 (s, 2H), 1.54 (s, 9H).

7-Aminoisindolin-1-one



Tert-butyl (3-oxoisindolin-4-yl)carbamate (2.4556 g, 9.89 mmol) was dissolved in DCM (20 mL) and methanol (10 mL). HCl (4M solution in 1,4-dioxane, 10 mL, 40 mmol) was added and the mixture was stirred at RT for overnight. The mixture was concentrated and the residue was dissolved in water (50 mL). Saturated aqueous sodium bicarbonate (50 mL) was carefully added and the resulting mixture was extracted with methylene chloride (3 x 20 mL). The combined organics were dried over sodium sulfate and concentrated to provide the desired product (1.2558 g, 86%) as a yellow solid. $^1\text{H NMR}$ (CDCl_3): δ 7.31–7.22 (m, 1H), 6.74–6.66 (m, 1H), 6.57 (d, $J=8.0$ Hz, 1H), 6.52 (s, br, 1H), 5.21 (s, br, 2H), 4.36 (s, 2H).

2-(5-methyl-1,3,4-oxadiazol-2-yl)aniline



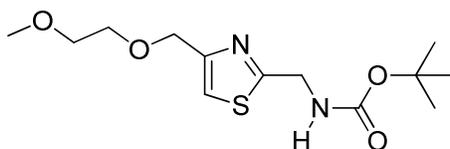
Step 1: Acetylhydrazide (0.8802 g, 11.9 mmol) and N,N-diisopropylethylamine (2.40 mL, 13.7 mmol) were dissolved in DCM (20 mL) and cooled to 0 °C. 2-Nitrobenzoyl chloride (1.45 mL, 11.0 mmol) was added dropwise and the resulting mixture was stirred at 0 °C for 2 hours. Water (75 mL) was added and the resulting slurry was filtered. The solid was dried to provide N'-acetyl-2-nitrobenzohydrazide (0.5038 g, 21%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.55–10.47 (m, 1H), 10.14 (d, $J=1.4$ Hz, 1H), 8.08 (dd,

$J=8.2$, 1.0 Hz, 1H), 7.84 (td, $J=7.5$, 1.2 Hz, 1H), 7.75 (td, $J=7.8$, 1.4 Hz, 1H), 7.67 (dd, $J=7.6$, 1.4 Hz, 1H), 1.91 (s, 3H).

Step 2: *N*-Acetyl-2-nitrobenzohydrazide (0.5038, 2.26 mmol) was suspended in phosphorus oxychloride (5 mL). The mixture was heated to 90 °C for 45 minutes and was cooled to RT. The mixture was added portionwise to crushed ice and extracted with methylene chloride (3 x 15 mL). The combined organics were dried over sodium sulfate and concentrated. The residue was purified by silica gel chromatography eluting with 25–50% ethyl acetate/hexane gradient to provide 2-methyl-5-(2-nitrophenyl)-1,3,4-oxadiazole (0.4050 g, 87%) as a white solid. $^1\text{H NMR}$ (CDCl_3): δ 8.07–8.00 (m, 1H), 8.00–7.94 (m, 1H), 7.81–7.70 (m, 2H), 2.61 (s, 3H).

Step 3: A clean, dry flask was charged with 10% palladium/carbon (Degussa, 0.2180 g, 0.205 mmol). Methanol was added dropwise under a nitrogen atmosphere until the entire catalyst was wet. A solution of 2-methyl-5-(2-nitrophenyl)-1,3,4-oxadiazole (0.4050 g, 1.97 mmol) in methanol (10 mL) was added. The atmosphere was changed to hydrogen (balloon) and the resulting mixture was vigorously stirred at RT for 4 hours. The mixture was filtered through a pad of Celite and the filtrate was concentrated to provide the desired product (0.3297 g, 95%) as a white solid. $^1\text{H NMR}$ (CDCl_3): δ 7.71 (dd, $J=8.0$, 1.4 Hz, 1H), 7.26 (ddd, $J=8.9$, 6.5, 1.6 Hz, 1H), 6.81–6.71 (m, 2H), 5.82 (s, br, 2H), 2.61 (s, 3H).

Tert-butyl ((4-((2-methoxyethoxy)methyl)thiazol-2-yl)methyl)carbamate



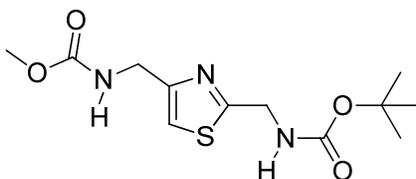
Step 1: Ethyl 2-(((tert-butoxycarbonyl)amino)methyl)thiazole-4-carboxylate (3.1475 g, 11.0 mmol) was dissolved in THF (90 mL). Lithium borohydride (2M solution in THF, 21.0 mL, 42.0 mmol) was added and the mixture was heated to 65 °C for 2 hours. The solution was cooled to RT and concentrated. Water (100 mL) was carefully added (gas evolution!) and the resulting mixture was extracted with methylene chloride (3 x 25 mL). The combined organics were dried over sodium sulfate and concentrated to provide tert-butyl ((4-(hydroxymethyl)thiazol-2-yl)methyl)carbamate (2.1323 g, 79%) as a yellow solid. $^1\text{H NMR}$ (CDCl_3): δ 7.13 (s, 1H), 5.42 (s, br, 1H), 4.73 (s, 2H), 4.59 (d, $J=6.0$ Hz, 2H), 1.47 (s, 9H).

Step 2: Tert-butyl ((4-(hydroxymethyl)thiazol-2-yl)methyl)carbamate (2.1323 g, 8.73 mmol) was dissolved in DCM (17 mL). Triethylamine (1.85 mL, 13.3 mmol) was added followed by *p*-toluenesulfonyl chloride (1.8431 g, 9.67 mmol). The reaction was stirred at RT overnight. Water (100 mL) was added and the two layers were separated. The aqueous layer was extracted with methylene chloride (3 x 20 mL). The combined organics were dried over sodium sulfate and concentrated. The residue was purified by silica gel chromatography eluting with a 15-30% ethyl acetate/hexane gradient to provide tert-butyl ((4-(chloromethyl)thiazol-2-yl)methyl)carbamate (0.7105 g, 31%) as a white solid. $^1\text{H NMR}$ (CDCl_3): δ 7.24 (s, 1H), 5.26 (s, br, 1H), 4.69–4.63 (m, 2H), 4.61 (d, $J=6.0$ Hz, 2H), 1.47 (s, 9H).

Step 3: Sodium hydride (60% dispersion in mineral oil, 0.2676 g, 6.69 mmol) was washed with hexane (25 mL) and suspended in DMF (6 mL). 2-Methoxyethanol (0.530 mL, 6.72 mmol) was added dropwise (gas evolution!) and the resulting solution was stirred at RT for 45 minutes. A solution of tert-butyl ((4-(chloromethyl)thiazol-2-yl)methyl)carbamate (0.2507 g, 0.954 mmol) in DMF (2 mL) was added and the resulting mixture was stirred at RT for 2 hours. Water (50 mL) and brine (15 mL) were added and the

mixture was extracted with methylene chloride (3 x 15 mL). The combined organics were dried over sodium sulfate and concentrated. The residue was chromatographed (Isco Combiflash Rf 4X, 12 g RediSep cartridge, 30–70% ethyl acetate/hexane gradient). The isolated material still contained a large amount of DMF, so it was dissolved in ethyl acetate (15 mL) and washed with water (3 x 25 mL). The organics were dried over magnesium sulfate and concentrated. The crude residue was purified by silica gel chromatography eluting with a 50–90% ethyl acetate/hexane gradient to provide the desired product (0.0671 g, 23%) as a colorless oil. $^1\text{H NMR}$ (CDCl_3): δ 7.20 (s, 1H), 5.25 (s, br, 1H), 4.65 (d, $J=0.8$ Hz, 2H), 4.60 (d, $J=6.0$ Hz, 2H), 3.76–3.68 (m, 2H), 3.63–3.57 (m, 2H), 3.40 (s, 3H), 1.47 (s, 9H).

Tert-butyl methyl (thiazole-2,4-diylbis(methylene))dicarbamate

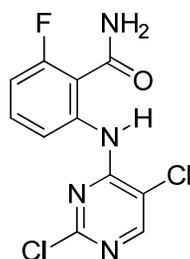


Step 1: Tert-butyl ((4-(chloromethyl)thiazol-2-yl)methyl)carbamate (0.2129 g, 0.810 mmol) was dissolved in DMF (1.6 mL). Potassium phthalimide (0.1828 g, 0.987 mmol) was added and the mixture was stirred at RT for 3 days. Water (50 mL) was added and the precipitated solid was collected by filtration to provide tert-butyl ((4-((1,3-dioxisoindolin-2-yl)methyl)thiazol-2-yl)methyl)carbamate (0.2434 g, 80%) as a white solid. $^1\text{H NMR}$ (CDCl_3): δ 7.88 (dd, $J=5.4$, 3.1 Hz, 2H), 7.73 (dd, $J=5.4$, 3.1 Hz, 2H), 7.14 (s, 1H), 5.20 (s, br, 1H), 4.96 (s, 2H), 4.55 (d, $J=5.9$ Hz, 2H), 1.45 (s, 9H).

Step 2: Tert-butyl ((4-((1,3-dioxisoindolin-2-yl)methyl)thiazol-2-yl)methyl)carbamate (0.2434 g, 0.652 mmol) was dissolved in ethanol (5 mL). Hydrazine (0.200 mL, 6.37 mmol) was added and the mixture was heated to 85 °C for 2 hours. The mixture was cooled to RT and filtered. The filter cake was washed with ethanol and the combined filtrates were concentrated to provide tert-butyl ((4-(aminomethyl)thiazol-2-yl)methyl)carbamate (0.1759 g, 98%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 7.73 (t, $J=6.0$ Hz, 1H), 7.23 (s, 1H), 4.33 (d, $J=6.2$ Hz, 2H), 3.77–3.69 (m, 2H), 1.40 (s, 9H).

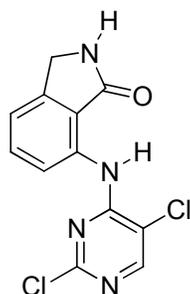
Step 3: Tert-butyl ((4-(aminomethyl)thiazol-2-yl)methyl)carbamate (0.1759 g, 0.723 mole) was suspended in DCM (3 mL) and cooled to 0 °C. N,N-Diisopropylethylamine (0.250 mL, 1.43 mmol) was added followed by methyl chloroformate (0.110 mL, 1.42 mmol). The mixture was stirred at 0 °C for 2 hours. Water (50 mL) was added and the mixture was extracted with methylene chloride (3 x 15 mL). The combined organics were dried over sodium sulfate and concentrated. The crude product was purified by silica gel chromatography eluting with a 40-70% ethyl acetate/hexane gradient to provide the desired product (0.1630 g, 75%) as a white solid. $^1\text{H NMR}$ (CDCl_3): δ 7.09 (s, 1H), 5.28 (s, br, 2H), 4.58 (d, $J=5.9$ Hz, 2H), 4.43 (d, $J=5.9$ Hz, 2H), 3.69 (s, 3H), 1.47 (s, 9H).

General Procedure A: Displacement at the 4-position: 2-((2,5-Dichloropyrimidin-4-yl)amino)-6-fluorobenzamide



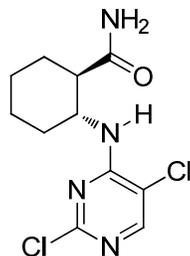
2,4,5-Trichloropyrimidine (5.0371 g, 27.5 mmol) was dissolved in isopropanol (54 mL) in a 150 mL pressure tube. 2-Amino-6-fluorobenzamide (4.3285 g, 28.1 mmol) and N,N-diisopropylethylamine (24.0 mL, 137 mmol) were added, the tube was sealed and the mixture was heated to 90 °C for 21 hours. The mixture was cooled to RT and the precipitated solid was collected by filtration. The solid was washed with isopropanol and dried under vacuum to provide the product (3.7130 g, 45%) as a tan solid. ¹H NMR (*d*₆-DMSO): δ 10.86 (s, 1H), 8.51 (s, 1H), 8.22 (s, 1H), 8.18–8.07 (m, 2H), 7.59 (td, *J*=8.4, 6.4 Hz, 1H), 7.13 (ddd, *J*=10.4, 8.4, 1.0 Hz, 1H).

7-((2,5-Dichloropyrimidin-4-yl)amino)isoindolin-1-one



Following General Procedure A using 2,4,5-trichloropyrimidine (1.5591 g, 8.50 mmol) and 7-aminoisoindolin-1-one (1.2558 g, 8.48 mmol) in isopropanol (17 mL) the desired product (1.2210 g, 49%) was isolated as a yellow solid. ¹H NMR (*d*₆-DMSO): δ 11.15 (s, 1H), 8.93 (s, 1H), 8.54 (s, 1H), 8.49 (d, *J*=8.0 Hz, 1H), 7.65 (t, *J*=8.0 Hz, 1H), 7.29 (d, *J*=7.5 Hz, 1H), 4.43 (s, 2H).

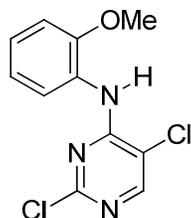
Trans-2-((2,5-dichloropyrimidin-4-yl)amino)cyclohexanecarboxamide



Following General Procedure A using 2,4,5-trichloropyrimidine (0.5060 g, 2.76 mmol), trans-2-aminocyclohexanecarboxamide hydrochloride (0.4849 g, 2.71 mmol) and N,N-diisopropylethylamine (2.40 mL, 13.4 mmol) in isopropanol (5.5 mL) the desired product (0.3937 g, 49%) was isolated as a white solid. ¹H NMR (*d*₆-DMSO): δ 8.14 (s, 1H), 7.42 (d, *J*=8.6 Hz, 1H), 7.05 (s, br, 1H), 6.76 (s, br, 1H),

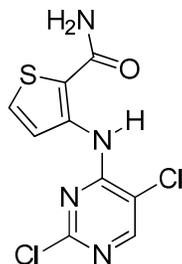
4.18–4.02 (m, 1H), 2.54–2.44 (m, 1H), 1.85 (dd, $J=9.0$, 4.1 Hz, 2H), 1.76–1.60 (m, 2H), 1.43 (qd, $J=12.7$, 2.9 Hz, 1H), 1.36–1.22 (m, 2H), 1.22–1.08 (m, 1H).

2,5-Dichloro-N-(2-methoxyphenyl)pyrimidin-4-amine



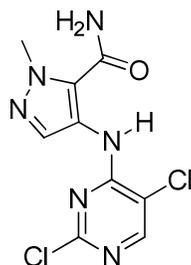
Following General Procedure A using 2,4,5-trichloropyrimidine (1.0077 g, 5.49 mmol), 2-methoxyaniline (1.25 mL, 11.1 mmol) and N,N-diisopropylethylamine (1.90 mL, 10.9 mmol) in isopropanol (11 mL) the desired product (1.3658 g, 92%) was isolated as a white solid. ^1H NMR (d_6 -DMSO): δ 8.98 (s, 1H), 8.36 (s, 1H), 7.58 (dd, $J=7.8$, 1.6 Hz, 1H), 7.31–7.21 (m, 1H), 7.14 (dd, $J=8.3$, 1.3 Hz, 1H), 7.01 (td, $J=7.6$, 1.4 Hz, 1H), 3.81 (s, 3H).

3-((2,5-Dichloropyrimidin-4-yl)amino)thiophene-2-carboxamide



Following General Procedure A using 2,4,5-trichloropyrimidine (1.007 g, 5.49 mmol), 3-aminothiophene-2-carboxamide (1.077 g, 7.57 mmol) and N,N-diisopropylethylamine (1.90 mL, 10.9 mmol) in isopropanol (11 mL). The solid was dried to provide the desired product (1.001 g, 63%) as a tan solid. ^1H NMR (d_6 -DMSO): δ 12.17 (s, 1H), 8.49 (s, 1H), 8.16 (d, $J=5.5$ Hz, 1H), 7.92 (s, br, 1H), 7.85 (d, $J=5.5$ Hz, 1H), 7.69 (s, br, 1H).

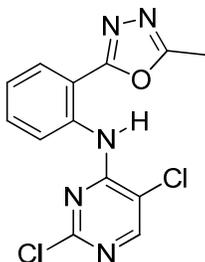
4-((2,5-Dichloropyrimidin-4-yl)amino)-1-methyl-1H-pyrazole-5-carboxamide



Following General Procedure A using 4-amino-1-methyl-1H-pyrazole-5-carboxamide (0.5021 g, 3.58 mmol), 2,4,5-trichloropyrimidine (0.6581 g, 3.59 mmol) and N,N-diisopropylethylamine (1.25 mL, 7.16

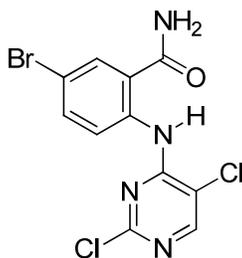
mmol) in isopropanol (7 mL) the desired product (0.7324 g, 71%) was isolated as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 9.54 (s, 1H), 8.38 (s, 1H), 7.79 (s, 3H), 4.01 (s, 3H).

2,5-Dichloro-N-(2-(5-methyl-1,3,4-oxadiazol-2-yl)phenyl)pyrimidin-4-amine



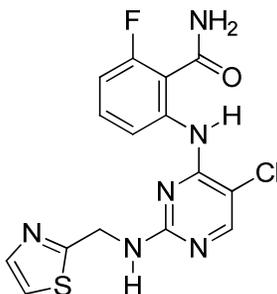
Following General Procedure A using 2,4,5-trichloropyrimidine (0.6904 g, 3.76 mmol), 2-(5-methyl-1,3,4-oxadiazol-2-yl)aniline (0.3297 g, 1.88 mmol) and N,N-diisopropylethylamine (0.660 mL, 3.78 mmol) in isopropanol (4.8 mL) the desired product (0.0875 g, 14%) was isolated as a yellow solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.85 (s, 1H), 8.53 (s, 1H), 8.46 (d, $J=8.4$ Hz, 1H), 7.97 (dd, $J=8.0, 1.6$ Hz, 1H), 7.69 (ddd, $J=8.5, 7.3, 1.6$ Hz, 1H), 7.43–7.34 (m, 1H), 2.59 (s, 3H).

5-Bromo-2-((2,5-dichloropyrimidin-4-yl)amino)benzamide



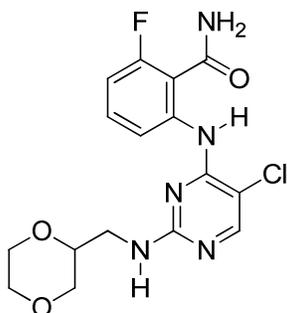
Following General Procedure A using 2,4,5-trichloropyrimidine (0.600 g, 3.27 mmol), 2-amino-5-bromobenzamide (0.739 g, 3.43 mmol) and N,N-diisopropylethylamine (2.85 mL, 16.4 mmol) in isopropanol (2 mL) the desired product (0.971 g, 82%) was isolated. $^1\text{H NMR}$ (d_6 -DMSO): δ 12.36 (s, 1H), 8.50 (m, 3H), 8.05 (s, 1H), 7.92 (s, 1H), 7.79 (d, 1H).

General Procedure B: Displacement of the 2-chloropyrimidine: 2-((5-chloro-2-((thiazol-2-ylmethyl)amino)pyrimidin-4-yl)amino)-6-fluorobenzamide (GSK2226649A)



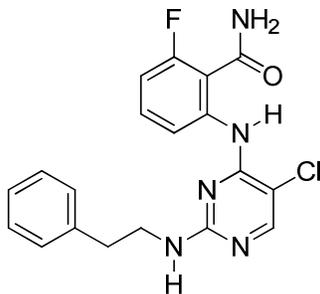
2-[(2,5-Dichloro-4-pyrimidinyl)amino]-6-fluorobenzamide (3.0559 g, 10.2 mmol) and 2-aminomethylthiazole dihydrochloride (2.2395 g, 12.0 mmol) were suspended in acetonitrile (35 mL) in a 150 mL pressure tube. N,N-Diisopropylethylamine (5.20 mL, 29.8 mmol) was added, the tube was sealed and the mixture was heated to 100 °C for 4 days. The mixture was cooled to RT and the solid was collected by filtration, washed with acetonitrile and dried to provide the desired product (2.2658 g, 59%) as a tan solid. ¹H NMR (*d*₆-DMSO): δ 10.33 (s, br, 1H), 8.25–7.98 (m, 4H), 7.88 (s, br, 1H), 7.75 (s, br, 1H), 7.56 (d, *J*=3.2 Hz, 1H), 7.22 (s, br, 1H), 6.95 (s, br, 1H), 4.83–4.54 (m, 2H). LCMS calculated for C₁₅H₁₂ClFN₆O₃: *m/z*= 378; found: *m/z*= 379 (M+H⁺). HPLC purity= 99%.

2-((2-(((1,4-Dioxan-2-yl)methyl)amino)-5-chloropyrimidin-4-yl)amino)-6-fluorobenzamide



Following General Procedure B using 2-((2,5-dichloropyrimidin-4-yl)amino)-6-fluorobenzamide (0.0990 g, 0.329 mmol), (1,4-dioxan-2-yl)methylamine (0.0846 g, 0.722 mmol) and N,N-diisopropylethylamine (0.120 mL, 0.687 mmol) in NMP (1 mL). The crude material was purified by silica gel chromatography eluting with a 40-80% ethyl acetate/hexane gradient. The isolated material was treated with diethyl ether and the solid was collected by filtration to provide the desired product (0.0835 g, 67%) as a white solid. ¹H NMR (*d*₆-DMSO): δ 10.26 (s, br, 1H), 8.41 (s, br, 1H), 8.16 (s, br, 1H), 8.11 (s, 1H), 8.06 (s, 1H), 7.45 (td, *J*=8.4, 6.6 Hz, 1H), 7.26 (s, br, 1H), 7.05–6.92 (m, 1H), 3.80–3.58 (m, 4H), 3.58–3.38 (m, 2H), 3.30–3.13 (m, 3H). LCMS calculated for C₁₆H₁₇ClFN₅O₃: *m/z*= 381; found: *m/z*= 382 (M+H⁺). HPLC purity= 99%.

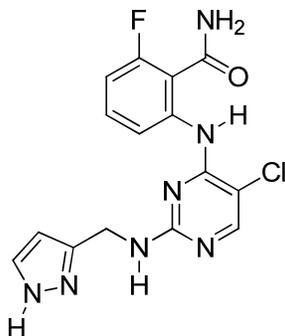
2-(5-Chloro-2-(phenethylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), 2-phenethylamine (0.0970 g, 0.797 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in acetonitrile (3 mL) provided the desired product (0.0750 g, 49%) as a tan solid. ¹H NMR (*d*₆-DMSO): δ 10.23 (s, br, 1H), 8.16 (s, br, 1H), 8.10 (s, br, 1H), 8.06 (s, br, 1H), 7.40 (s, br, 1H), 7.36–7.24

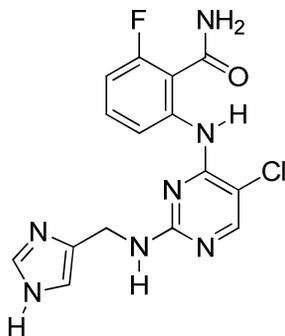
(m, 3H), 7.24–7.14 (m, 2H), 6.99 (t, $J=9.2$ Hz, 1H), 3.46 (q, $J=6.5$ Hz, 2H), 2.82 (t, $J=7.3$ Hz, 2H). LCMS calculated for $C_{19}H_{17}ClFN_5O$: $m/z=385$; found: $m/z=386$ ($M+H^+$). HPLC purity= 99%.

2-(2-((1H-Pyrazol-3-yl)methylamino)-5-chloropyrimidin-4-ylamino)-6-fluorobenzamide



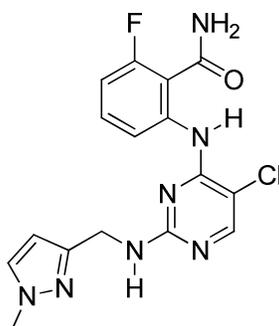
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1H-pyrazol-3-yl)methylamine (0.387 g, 3.99 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in acetonitrile (3 mL) provided the desired product (0.0750 g, 49%) as a tan solid. 1H NMR (d_6 -DMSO): δ 8.19 (s, br, 2H), 8.11 (s, br, 1H), 7.60 (s, br, 1H), 7.49–7.37 (m, 1H), 7.04 (t, $J=9.2$ Hz, 1H), 6.17 (s, br, 1H), 4.46 (s, br, 2H). LCMS calculated for $C_{15}H_{13}ClFN_7O$: $m/z=361$; found: $m/z=362$ ($M+H^+$). HPLC purity= 95%.

2-(2-((1H-Imidazol-4-yl)methylamino)-5-chloropyrimidin-4-ylamino)-6-fluorobenzamide



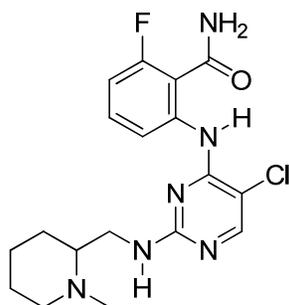
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1H-imidazol-4-yl)methylamine (0.0387 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in acetonitrile (3 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0800 g, 56%) as a white solid. 1H NMR (d_6 -DMSO): δ 11.81 (s, br, 1H), 10.27 (s, br, 1H), 8.14 (s, br, 1H), 8.12–8.00 (m, 2H), 7.60–7.49 (m, 1H), 7.41 (s, br, 2H), 6.95 (t, $J=9.2$ Hz, 1H), 6.89 (s, br, 1H), 4.41–4.29 (m, 2H). LCMS calculated for $C_{15}H_{13}ClFN_7O$: $m/z=361$; found: $m/z=362$ ($M+H^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methyl-1H-pyrazol-3-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



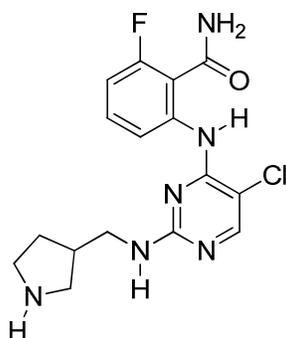
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1H-imidazol-4-yl)methylamine (0.0443 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in acetonitrile (3 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5-90% methanol/water gradient to provide the desired product (0.0800 g, 56%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.28 (s, 1H), 8.15 (s, br, 1H), 8.09 (s, 1H), 8.06 (s, 1H), 7.61–7.46 (s, br, 1H), 7.54 (d, $J=2.0$ Hz, 2H), 7.40 (q, $J=7.8$ Hz, 1H), 6.96 (t, $J=9.2$ Hz, 1H), 6.09 (s, 1H), 4.37 (d, $J=5.7$ Hz, 2H), 3.32 (s, 3H). LCMS calculated for $\text{C}_{16}\text{H}_{15}\text{ClF}_2\text{N}_7\text{O}$: $m/z=375$; found: $m/z=376$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methylpiperidin-2-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



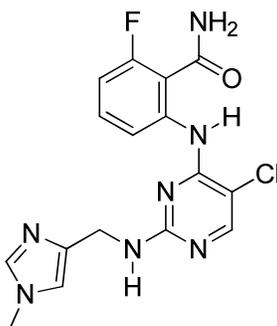
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1H-imidazol-4-yl)methylamine (0.0511 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in acetonitrile (3 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0550 g, 35%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.24 (s, br, 1H), 8.44 (s, br, 1H), 8.15 (s, br, 1H), 8.10 (s, br, 1H), 8.05 (s, br, 1H), 7.44 (q, $J=7.4$ Hz, 1H), 7.03–6.94 (m, 1H), 6.83 (s, br, 1H), 3.57 (s, br, 1H), 3.08 (s, br, 1H), 2.73 (d, $J=11.2$ Hz, 1H), 2.22 (s, 3H), 2.09–1.93 (m, 2H), 1.64 (d, $J=10.1$ Hz, 2H), 1.55–1.34 (m, 2H), 1.33–1.07 (m, 2H). LCMS calculated for $\text{C}_{18}\text{H}_{22}\text{ClF}_2\text{N}_6\text{O}$: $m/z=392$; found: $m/z=393$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-(pyrrolidin-3-ylmethylamino)pyrimidin-4-ylamino)-6-fluorobenzamide tris(trifluoroacetate) salt



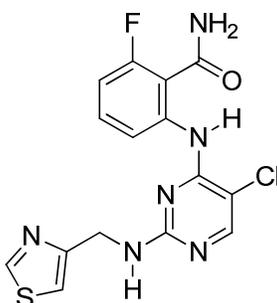
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol), tert-butyl 3-(aminomethyl)pyrrolidine-1-carboxylate (0.100 g, 0.498 mmol) and N,N-diisopropylethylamine (0.175 mL, 0.996 mmol) in acetonitrile (3 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide tert-butyl 3-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)pyrrolidine-1-carboxylate (0.120 g, 52%) as a white solid. LCMS calculated for $C_{20}H_{24}ClFN_7O_3$: $m/z=464$; found: $m/z=465$ ($M+H^+$). Tert-butyl 3-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)pyrrolidine-1-carboxylate (120 mg, 0.258 mmol) and TFA (0.010 mL, 0.130 mmol) were oscillated by Ultrasonic wave for 5 min, then concentrated to provide the desired product (0.095 g, 52%) as a white solid. 1H NMR (d_6 -DMSO): δ 8.67 (s, br, 1H), 8.18 (s, br, 1H), 8.14 (s, br, 1H), 8.09 (s, br, 1H), 7.04 (s, br, 1H), 3.38–3.17 (m, 4H), 3.13 (dd, $J=11.6, 6.0$ Hz, 1H), 2.88 (dd, $J=12.0, 6.5$ Hz, 1H), 2.54–2.63 (m, 1H), 2.00 (dd, $J=12.8, 5.5$ Hz, 1H), 1.64 (dd, $J=12.8, 8.1$ Hz, 1H). LCMS calculated for $C_{16}H_{18}ClFN_6O$: $m/z=364$; found: $m/z=365$ ($M+H^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methyl-1H-imidazol-4-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



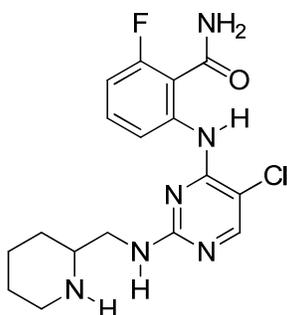
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1-methyl-1H-imidazol-4-yl)methylamine (0.0443 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.087 g, 58%) as a white solid. 1H NMR (d_6 -DMSO): δ 10.26 (s, br, 1H), 8.14 (s, br, 1H), 8.09 (s, br, 1H), 8.06 (s, 1H), 7.47 (s, 1H), 7.44–7.30 (m, 2H), 6.96 (t, $J=9.3$ Hz, 1H), 6.87 (s, br, 1H), 4.29 (d, $J=5.7$ Hz, 2H), 3.57 (s, 3H). LCMS calculated for $C_{16}H_{15}ClFN_7O$: $m/z=375$; found: $m/z=376$ ($M+H^+$). HPLC purity= 99%.

2-(5-Chloro-2-(thiazol-4-ylmethylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



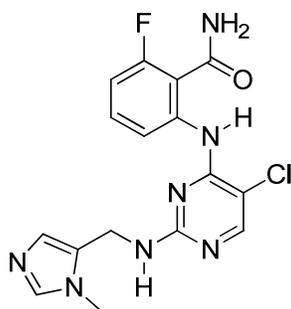
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol), thiazol-4-ylmethylamine (0.0569 g, 0.498 mmol) and N,N-diisopropylethylamine (0.175 mL, 0.996 mmol) in N,N-dimethylformamide (5 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0500 g, 25%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.27 (s, br, 1H), 9.07 (s, br, 1H), 8.14 (s, br, 1H), 8.09 (s, 2H), 7.96 (s, br, 1H), 7.77 (s, br, 1H), 7.36 (s, br, 1H), 7.25 (s, br, 1H), 6.94 (s, br, 1H), 4.70–4.45 (m, 2H). LCMS calculated for $\text{C}_{15}\text{H}_{12}\text{ClFN}_6\text{OS}$: $m/z=378$; found: $m/z=379$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-(piperidin-2-ylmethylamino)pyrimidin-4-ylamino)-6-fluorobenzamide trifluoroacetate



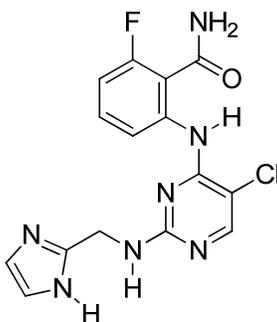
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol), tert-butyl 2-(aminomethyl)piperidine-1-carboxylate (0.107 g, 0.498 mmol) and N,N-diisopropylethylamine (0.175 mL, 0.996 mmol) in N,N-dimethylformamide (5 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0800 g, 34%) that was used without further purification. Tert-butyl 2-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)piperidine-1-carboxylate (0.075 g, 0.157 mmol) and TFA (0.024 mL, 0.313 mmol) was stirred for 5 minutes, then concentrated to provide the desired product (0.068 g, 88%). $^1\text{H NMR}$ (d_6 -DMSO): δ 10.37 (s, 1H), 8.53 (s, br, 1H), 8.16 (s, br, 1H), 8.14 (s, br, 1H), 8.09 (s, br, 1H), 7.55–7.42 (m, 1H), 7.10–6.98 (m, 1H), 3.43 (s, br, 1H), 3.22 (d, $J=12.1$ Hz, 2H), 2.82 (d, $J=10.1$ Hz, 1H), 1.88–1.65 (m, 3H), 1.56 (d, $J=11.4$ Hz, 1H), 1.40 (s, br, 2H). LCMS calculated for $\text{C}_{17}\text{H}_{20}\text{ClFN}_6\text{O}$: $m/z=378$; found: $m/z=379$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methyl-1H-imidazol-5-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



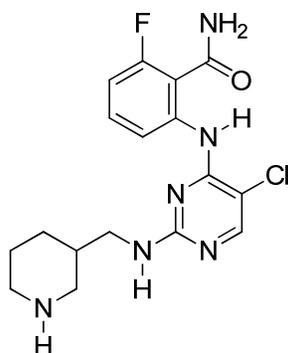
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol), (1-methyl-1H-imidazol-5-yl)methylamine (0.0554 g, 0.498 mmol) and N,N-diisopropylethylamine (0.175 mL, 0.996 mmol) in N,N-dimethylformamide (5 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0600 g, 32%). $^1\text{H NMR}$ (d_6 -DMSO): δ 10.27 (s, 1H), 8.15 (s, br, 1H), 8.08 (d, $J=6.8$ Hz, 2H), 7.53 (s, br, 1H), 7.48–7.38 (m, 2H), 7.31 (s, 1H), 7.02–6.92 (m, 1H), 4.26 (d, $J=5.9$ Hz, 2H), 3.75 (s, 3H). LCMS calculated for $\text{C}_{16}\text{H}_{15}\text{ClFN}_7\text{O}$: $m/z=375$; found: $m/z=376$ ($\text{M}+\text{H}^+$). HPLC purity= 94%.

2-(2-((1H-imidazol-2-yl)methylamino)-5-chloropyrimidin-4-ylamino)-6-fluorobenzamide



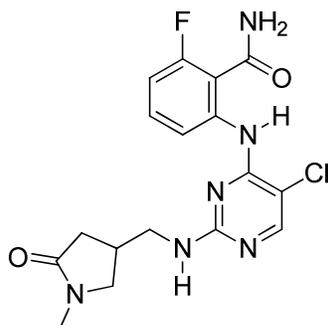
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1H-imidazol-2-yl)methylamine (0.0387 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0450 g, 31%). $^1\text{H NMR}$ (d_6 -DMSO): δ 11.70 (s, br, 1H), 10.29 (s, br, 1H), 8.14 (s, br, 1H), 8.09 (s, 2H), 7.53 (s, br, 1H), 7.36 (s, br, 1H), 7.05–6.89 (m, 2H), 6.81 (s, br, 1H), 4.44 (d, $J=5.3$ Hz, 3H). LCMS calculated for $\text{C}_{15}\text{H}_{13}\text{ClFN}_7\text{O}$: $m/z=361$; found: $m/z=360$ ($\text{M}-\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-(piperidin-3-ylmethylamino)pyrimidin-4-ylamino)-6-fluorobenzamide tris(trifluoroacetate)



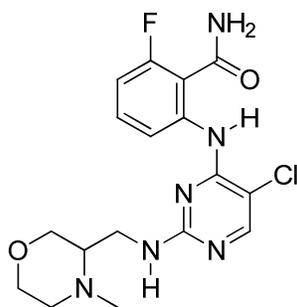
Following the general procedure from 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol), tert-butyl 3-(aminomethyl)piperidine-1-carboxylate (0.107 g, 0.498 mmol) and N,N-diisopropylethylamine (0.175 mL, 0.996 mmol) in N,N-dimethylformamide (5 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide tert-butyl 3-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)piperidine-1-carboxylate (0.0900 g, 38%). LCMS calculated for $C_{22}H_{28}ClFN_6O_3$: $m/z=478$; found: $m/z=479$ ($M+H^+$). Tert-butyl 3-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)piperidine-1-carboxylate (0.085 g, 0.177 mmol) and TFA (0.068 mL, 0.887 mmol) was sonicated for 5 min and concentrated to provide the desired product (0.060 g, 47%). 1H NMR (d_6 -DMSO): δ 10.71 (s, br, 1H), 8.69 (s, br, 1H), 8.48 (s, br, 1H), 8.35 (s, 1H), 8.22 (s, 1H), 8.09 (s, 1H), 7.52 (s, br, 1H), 7.05 (m, 1H), 3.27 (m, 3H), 3.09 (s, br, 1H), 2.75 (m, 1H), 2.52 (m, 1H), 2.01 (m, 1H), 1.79 (m, 2H), 1.51 (m, 1H), 1.18 (m, 1H). LCMS calculated for $C_{17}H_{20}ClFN_6O$: $m/z=378$; found: $m/z=379$ ($M+H^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methyl-5-oxopyrrolidin-3-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



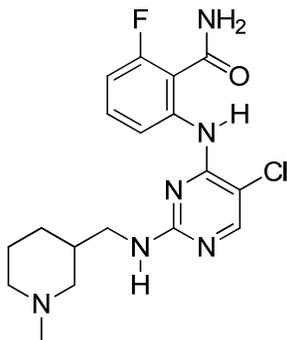
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), 4-(aminomethyl)-1-methylpyrrolidin-2-one (0.0511 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0700 g, 45%). 1H NMR (d_6 -DMSO): δ 10.25 (s, br, 1H), 8.15 (s, br, 1H), 8.09 (s, br, 1H), 8.06 (s, 1H), 7.53–7.39 (m, 2H), 6.99 (t, $J=9.2$ Hz, 1H), 3.40 (t, $J=8.8$ Hz, 1H), 3.29–3.18 (m, 2H), 3.10 (dd, $J=9.7, 4.6$ Hz, 1H), 2.68 (s, 3H), 2.59 (s, br, 1H), 2.35 (dd, $J=16.7, 9.0$ Hz, 1H), 2.04 (dd, $J=16.7, 5.3$ Hz, 1H). LCMS calculated for $C_{17}H_{18}ClFN_6O_2$: $m/z=392$; found: $m/z=391$ ($M-H^+$). HPLC purity= 99%.

2-(5-Chloro-2-((4-methylmorpholin-3-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



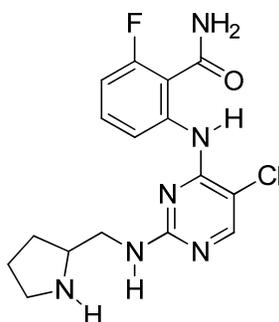
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (4-methylmorpholin-3-yl)methylamine (0.0511 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.045 g, 29%). ^1H NMR (d_6 -DMSO): δ 10.23 (s, br, 1H), 8.39 (s, br, 1H), 8.15 (s, br, 1H), 8.10 (s, br, 1H), 8.06 (s, br, 1H), 7.50–7.36 (m, 1H), 7.10 (s, br, 1H), 7.04–6.93 (m, 1H), 3.71 (d, $J=9.3$ Hz, 1H), 3.64 (d, $J=11.2$ Hz, 1H), 3.61–3.52 (m, 1H), 3.51–3.39 (m, 1H), 3.20 (t, $J=9.9$ Hz, 1H), 3.08 (s, br, 1H), 2.62 (d, $J=11.7$ Hz, 1H), 2.25 (s, 3H), 2.23–2.07 (m, 2H). LCMS calculated for $\text{C}_{17}\text{H}_{20}\text{ClFN}_6\text{O}_2$: $m/z=394$; found: $m/z=393$ (M-H $^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methylpiperidin-3-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



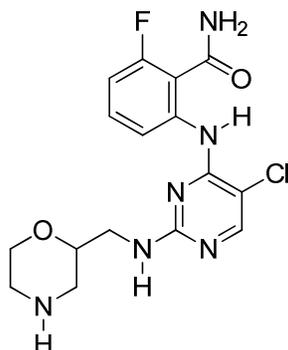
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1-methylpiperidin-3-yl)methylamine (0.0519 g, 0.399 mmol) and N,N-diisopropylethylamine (0.140 mL, 0.797 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.0700 g, 45%). ^1H NMR (d_6 -DMSO): δ 10.24 (s, br, 1H), 8.16 (s, br, 1H), 8.13–8.07 (m, 1H), 8.04 (s, br, 1H), 7.51–7.39 (m, 1H), 6.98 (t, $J=9.2$ Hz, 1H), 3.20–3.00 (m, 2H), 2.80–2.67 (m, 1H), 2.67–2.56 (m, 1H), 2.15 (s, br, 3H), 1.85 (s, br, 2H), 1.72–1.56 (m, 3H), 1.41 (d, $J=11.2$ Hz, 1H), 0.99–0.82 (m, 1H) ppm. LCMS calculated for $\text{C}_{18}\text{H}_{22}\text{ClFN}_6\text{O}$: $m/z=392$; found: $m/z=393$ (M+H $^+$). HPLC purity= 98%.

2-(5-Chloro-2-(pyrrolidin-2-ylmethylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol), tert-butyl 2-(aminomethyl)pyrrolidine-1-carboxylate (0.100 g, 0.498 mmol) and N,N-diisopropylethylamine (0.175 mL, 0.996 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide tert-butyl 2-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)pyrrolidine-1-carboxylate (0.075 g, 35%). LCMS calculated for $C_{21}H_{26}ClFN_6O_3$: $m/z=464$; found: $m/z=465$ ($M+H^+$). Tert-butyl 2-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)pyrrolidine-1-carboxylate (0.075 g, 0.161 mmol) and TFA (0.062 mL, 0.807 mmol) was sonicated for 5 min and concentrated. The crude product was purified by silica gel chromatography eluting with a methanol/ammonia (5%–95%) gradient to provide the desired product (0.058 g, 99%). 1H NMR (d_6 -DMSO): δ 10.26 (s, br, 1H), 8.15 (s, br, 1H), 8.09 (s, br, 1H), 8.06–8.00 (m, 1H), 7.47 (q, $J=7.8$ Hz, 1H), 7.17 (s, br, 1H), 7.03–6.91 (m, 1H), 3.42–3.12 (m, 3H), 2.92–2.73 (m, 1H), 1.86–1.56 (m, 4H), 1.40 (dd, $J=11.8, 8.1$ Hz, 1H) ppm. LCMS calculated for $C_{16}H_{18}ClFN_6O$: $m/z=364$; found: $m/z=365$ ($M+H^+$). HPLC purity= 98%.

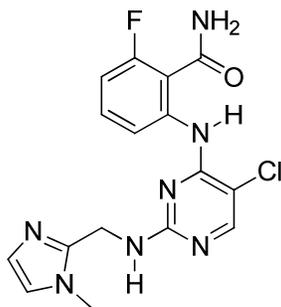
2-(5-Chloro-2-(morpholin-2-ylmethylamino)pyrimidin-4-ylamino)-6-fluorobenzamide tetrahydrochloride



Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.200 g, 0.664 mmol), tert-butyl 2-(aminomethyl)morpholine-4-carboxylate (0.144 g, 0.664 mmol) and N,N-diisopropylethylamine (0.115 mL, 0.664 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide tert-butyl 2-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)morpholine-4-carboxylate (0.130 g, 41%). LCMS calculated for $C_{21}H_{26}ClFN_6O_4$: $m/z=480$; found: $m/z=481$ ($M+H^+$). Tert-butyl 2-((4-(2-carbamoyl-3-fluorophenylamino)-5-chloropyrimidin-2-ylamino)methyl)morpholine-4-carboxylate (0.125 g, 0.260 mmol) and TFA (0.100 mL, 1.300 mmol) was sonicated for 5 min and concentrated. This material was treated with hydrochloric acid (0.024 mL, 0.777

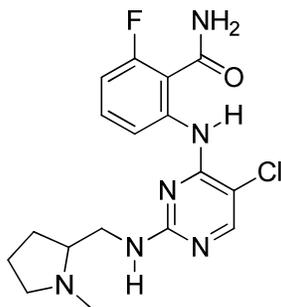
mmol) in water (5ml) and was stirred 2 hr then concentrated to provide the desired product (0.077 g, 94%). $^1\text{H NMR}$ (d_6 -DMSO): δ 8.29 (s, br, 1H), 8.20 (s, br, 1H), 8.15 (s, br, 2 H), 3.85 – 4.02 (m, 2 H), 3.75 (t, $J=11.7$ Hz, 1 H), 3.39 (s, br, 2 H), 3.15 (d, $J=12.1$ Hz, 2 H), 2.94 (d, $J=8.6$ Hz, 1 H), 2.68 – 2.84 (m, 1 H). LCMS calculated for $\text{C}_{16}\text{H}_{18}\text{ClFN}_6\text{O}_2$: $m/z=380$; found: $m/z=381$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methyl-1H-imidazol-2-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



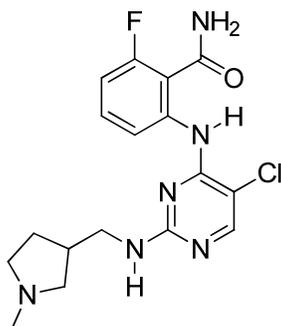
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1-methyl-1H-imidazol-2-yl)methylamine (0.0443 g, 0.399 mmol) and N,N-diisopropylethylamine (0.105 mL, 0.598 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.065 g, 43%). $^1\text{H NMR}$ (d_6 -DMSO): δ 10.28 (s, br, 1H), 8.14 (s, br, 1H), 8.12–8.04 (m, 2H), 7.53 (s, br, 1H), 7.48–7.36 (m, 1H), 7.07 (s, 1H), 7.02–6.91 (m, 1H), 6.77 (s, 1H), 4.48 (d, $J=5.5$ Hz, 2H), 3.60 (s, 3H). LCMS calculated for $\text{C}_{16}\text{H}_{15}\text{ClFN}_7\text{O}$: $m/z=375$; found: $m/z=376$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methylpyrrolidin-2-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



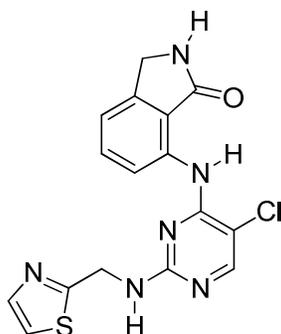
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1-methylpyrrolidin-2-yl)methylamine (0.0501 g, 0.438 mmol) and N,N-diisopropylethylamine (0.105 mL, 0.598 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.020 g, 13%). $^1\text{H NMR}$ (d_6 -DMSO): δ 10.32 (s, 1H), 8.51 (d, $J=8.4$ Hz, 1H), 8.17 (s, br, 1H), 8.14–8.06 (m, 2H), 7.54–7.39 (m, 1H), 6.97 (t, $J=9.2$ Hz, 1H), 4.11 (s, br, 1H), 3.49 (s, br, 1H), 3.41 (s, br, 1H), 2.76 (s, br, 1H), 2.47–2.36 (m, 1H), 2.28 (s, br, 3H), 2.06–1.81 (m, 4H). LCMS calculated for $\text{C}_{17}\text{H}_{20}\text{ClFN}_6\text{O}$: $m/z=378$; found: $m/z=379$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-(5-Chloro-2-((1-methylpyrrolidin-3-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide hydrochloride



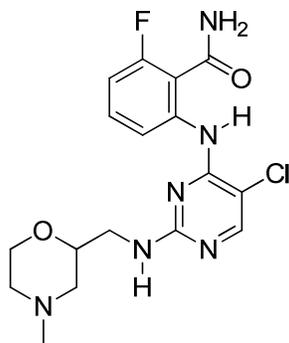
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.120 g, 0.399 mmol), (1-methylpyrrolidin-3-yl)methylamine (0.116 g, 1.02 mmol) and N,N-diisopropylethylamine (0.180 mL, 1.02 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient. The isolated material was treated with 1N aqueous HCl and dried under vacuum to provide the desired product (0.050 g, 30%). ¹H NMR (*d*₆-DMSO): δ 8.39 (s, br, 1H), 8.29 (s, br, 1H), 8.14 (s, 2H), 8.19 (s, 2H), 7.17 (s, br, 1H), 3.58–3.43 (m, 1H), 3.42–3.33 (m, 2H), 3.14–3.03 (m, 1H), 3.03–2.92 (m, 1H), 2.75 (m, 4H), 2.68–2.56 (m, 1H), 1.81 (d, *J*=6.6 Hz, 1H), 1.67 (dd, *J*=12.7, 10.0 Hz, 1H). LCMS calculated for C₁₇H₂₀ClFN₆O: *m/z*= 378; found: *m/z*= 379 (M+H⁺). HPLC purity= 99%.

7-(5-Chloro-2-(thiazol-2-ylmethylamino)pyrimidin-4-ylamino)isoindolin-1-one



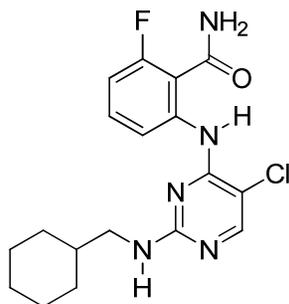
Following General Procedure B using 7-(2,5-dichloropyrimidin-4-ylamino)isoindolin-1-one (0.200 g, 0.678 mmol), thiazol-2-ylmethylamine (0.0546 g, 0.478 mmol) and N,N-diisopropylethylamine (0.084 mL, 0.478 mmol) in N,N-dimethylformamide (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.050 g, 20%). ¹H NMR (*d*₆-DMSO): δ 8.78 (s, br, 1H), 8.22–8.11 (m, 3H), 7.75 (s, br, 1H), 7.56 (d, *J*=2.9 Hz, 1H), 7.39 (s, br, 1H), 7.16 (s, br, 1H), 4.77 (d, *J*=6.0 Hz, 2H), 4.38 (s, br, 2H). LCMS calculated for C₁₆H₁₃ClFN₆OS: *m/z*= 372; found: *m/z*=373 (M+H⁺). HPLC purity= 99%.

2-(5-Chloro-2-((4-methylmorpholin-2-yl)methylamino)pyrimidin-4-ylamino)-6-fluorobenzamide



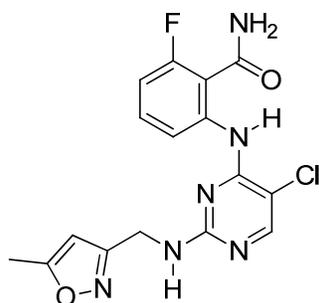
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.231 g, 0.768 mmol), (4-methylmorpholin-2-yl)methylamine (0.141 g, 1.25 mmol) and N,N-diisopropylethylamine (0.135 mL, 0.768 mmol) in DMF (2 mL). The crude product was purified by reverse phase silica gel chromatography eluting with a 5–90% methanol/water gradient to provide the desired product (0.027 g, 9%). ¹H NMR (CD₃OD): δ 8.18 (s, 2H), 8.10 (s, br, 1H), 7.62 (m, 1H), 7.23 (t, *J*=8.0 Hz, 1H), 4.14 (dd, *J*= 7.8, 2.8 Hz, 1H), 4.02 (s, br, 1H), 3.86 (t, *J*= 12 Hz, 1H), 3.58 (m, 2H), 3.41 (m, 1H), 3.93 (m, 1H), 3.12 (m, 1H), 2.91 (s, 3H), 2.87 (m, 1H). LCMS calculated for C₁₇H₂₀ClFN₆O₂: *m/z*= 394; found: *m/z*= 395 (M+H⁺). HPLC purity= 99%.

2-({5-Chloro-2-[(cyclohexylmethyl)amino]-4-pyrimidinyl}amino)-6-fluorobenzamide



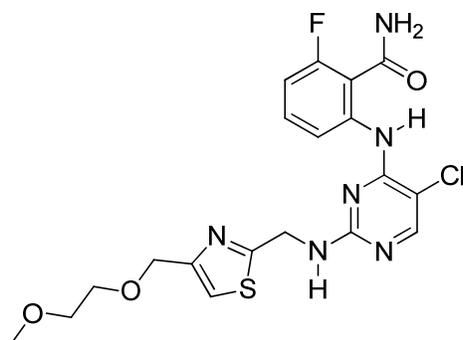
Following General Procedure B using 2-(2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol) and cyclohexylmethyl amine (0.141 g, 1.25 mmol) in 1,4-dioxane (1.7 mL). The crude product was purified by HPLC eluting with a 5–95% acetonitrile/water gradient to provide the desired product (0.128 g, 68%). ¹H NMR (*d*₆-DMSO): δ 10.51 (s, br, 1H), 8.32 (s, br, 1H), 8.17 (s, br, 1H), 8.09 (s, 2H), 7.59 (s, br, 1H), 7.46 (m, 1H), 7.04 (m, 1H), 3.15 (m, 2H), 1.66 (m, 3H), 1.57 (m, 1H), 1.13 (m, 2H), 0.88 (m, 2H). LCMS calculated for C₁₈H₂₁ClFN₅O: *m/z*= 377; found: *m/z*= 378 (M+H⁺). HPLC purity= 99%.

2-[(5-Chloro-2-[(5-methyl-3-isoxazolyl)methyl]amino)-4-pyrimidinyl]amino]-6-fluorobenzamide



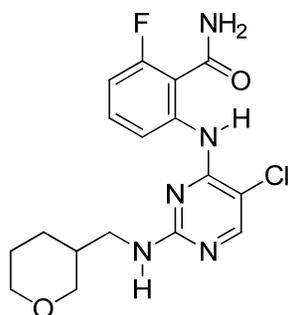
Following General Procedure B using 2-((2,5-dichloropyrimidin-4-ylamino)-6-fluorobenzamide (0.150 g, 0.498 mmol) and [(5-methyl-3-isoxazolyl)methyl]amine (0.112 g, 0.996 mmol) in 1,4-dioxane (1.7 mL). The crude product was purified by HPLC eluting with a 5–95% acetonitrile/water gradient to provide the desired product (0.069 g, 37%). $^1\text{H NMR}$ (d_6 -DMSO): δ 10.54 (s, br, 1H), 8.16 (d, $J=4.8$ Hz, 2H), 8.10 (s, br, 1H), 7.41 (s, br, 1H), 7.02 (t, $J=9.3$ Hz, 1H), 6.13 (s, 1H), 4.44 (d, $J=4.2$ Hz, 2H), 2.34 (s, 3H). LCMS calculated for $\text{C}_{16}\text{H}_{14}\text{ClFN}_6\text{O}_2$: $m/z=376$; found: $m/z=377$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-((5-Chloro-2-(((4-((2-methoxyethoxy)methyl)thiazol-2-yl)methyl)amino)pyrimidin-4-yl)amino)-6-fluorobenzamide



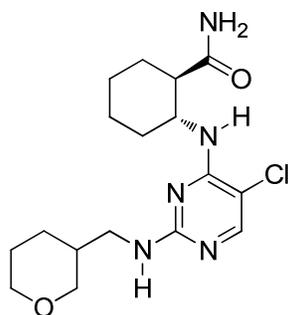
Tert-butyl ((4-((2-methoxyethoxy)methyl)thiazol-2-yl)methyl)carbamate (0.0671 g, 0.222 mmol) was dissolved in DCM (2 mL). HCl (4M solution in 1,4-dioxane, 0.560 mL, 2.24 mmol) was added and the mixture was stirred at RT for 90 minutes. The mixture was concentrated and the residue was added to a 15 mL pressure tube containing 2-((2,5-dichloropyrimidin-4-yl)amino)-6-fluorobenzamide (0.0655 g, 0.218 mmol). Isopropanol (1 mL) and N,N-diisopropylethylamine (0.120 mL, 0.687 mmol) were added, the tube was sealed and the mixture was heated to 100 °C for 3 days. The mixture was cooled to RT and the precipitated solid was collected by filtration. The crude residue was purified by silica gel chromatography eluting with a 60–100% ethyl acetate/hexane gradient to provide the desired product (0.0110 g, 10%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.34 (s, br, 1H), 8.22–7.99 (m, 4H), 7.94 (s, br, 1H), 7.31 (s, br, 1H), 7.38 (s, 1H), 6.96 (s, br, 1H), 4.66 (s, br, 2H), 4.52 (s, 2H), 3.59 (dd, $J=5.7, 3.8$ Hz, 2H), 3.46 (dd, $J=5.6, 3.8$ Hz, 2H), 3.24 (s, 3H). LCMS calculated for $\text{C}_{19}\text{H}_{20}\text{ClFN}_6\text{O}_3\text{S}$: $m/z=466$; found: $m/z=467$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

2-((5-Chloro-2-(((tetrahydro-2H-pyran-3-yl)methyl)amino)pyrimidin-4-yl)amino)-6-fluorobenzamide



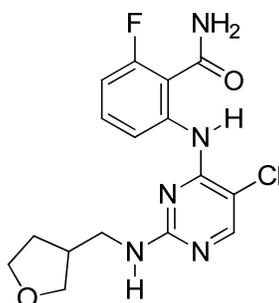
Following General Procedure B using 2-((2,5-dichloropyrimidin-4-yl)amino)-6-fluorobenzamide (0.1523 g, 0.506 mmol), (tetrahydro-2H-pyran-3-yl)methylamine (0.1234 g, 1.07 mmol) and N,N-diisopropylethylamine (0.175 mL, 1.00 mmol) in NMP (1 mL). The crude product was purified by silica gel chromatography eluting with 35–70% ethyl acetate/hexane gradient. The isolated material was triturated with diethyl ether, collected by filtration and dried to provide the desired product (0.1213 g, 63%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.24 (s, br, 1H), 8.44 (s, br, 1H), 8.16 (s, br, 1H), 8.11 (s, br, 1H), 8.04 (s, br, 1H), 7.45 (td, $J=8.4, 6.7$ Hz, 1H), 7.35–7.21 (s, br, 1H), 7.05–6.93 (m, 1H), 3.78–3.73 (m, 1H), 3.70–3.67 (s, br, 1H), 3.31–3.22 (m, 1H), 3.18–3.02 (m, 3H), 1.86–1.71 (m, 2H), 1.63–1.51 (m, 1H), 1.47–1.35 (m, 1H), 1.31–1.14 (m, 1H). LCMS calculated for $\text{C}_{17}\text{H}_{19}\text{ClFN}_5\text{O}_2$: $m/z= 379$; found: $m/z= 380$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

Trans-2-((5-chloro-2-(((tetrahydro-2H-pyran-3-yl)methyl)amino)pyrimidin-4-yl)amino)cyclohexanecarboxamide



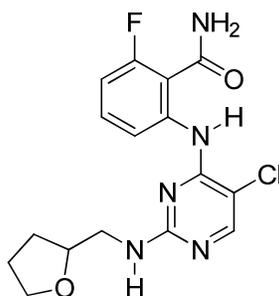
Following General Procedure B using trans-2-((2,5-dichloropyrimidin-4-yl)amino)cyclohexanecarboxamide (0.1015 g, 0.351 mmol), (tetrahydro-2H-pyran-3-yl)methylamine (0.0854 g, 0.741 mmol) and N,N-diisopropylethylamine (0.125 mL, 0.716 mmol) in NMP (1 mL). The residue was purified by silica gel chromatography eluting with a 50% ethyl acetate/hexane to 20% isopropanol/ethyl acetate gradient to provide the desired product (0.0248 g, 19%) as a white solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 7.71 (s, br, 1H), 7.05 (s, br, 1H), 6.76 (s, br, 2H), 6.20 (s, br, 1H), 4.00 (s, br, 1H), 3.80–3.62 (m, 2H), 3.31–3.21 (m, 1H), 3.14–3.02 (m, 2H), 2.00 (d, $J=9.0$ Hz, 1H), 1.76 (s, br, 6H), 1.62–1.49 (m, 1H), 1.43 (s, br, 2H), 1.17 (d, $J=8.0$ Hz, 5H). LCMS calculated for $\text{C}_{17}\text{H}_{26}\text{ClN}_5\text{O}_2$: $m/z= 367$; found: $m/z= 368$ ($\text{M}+\text{H}^+$). HPLC purity= 97%.

2-((5-Chloro-2-(((tetrahydrofuran-3-yl)methyl)amino)pyrimidin-4-yl)amino)-6-fluorobenzamide



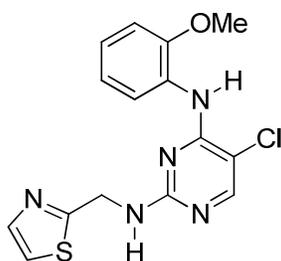
Following General Procedure B using, 2-((2,5-dichloropyrimidin-4-yl)amino)-6-fluorobenzamide (0.1021 g, 0.339 mmol), (tetrahydrofuran-3-yl)methylamine (0.0739 g, 0.731 mmol) and N,N-diisopropylethylamine (0.120 mL, 0.687 mmol) in NMP (1 mL). The crude product was purified by silica gel chromatography eluting with 40–80% ethyl acetate/hexane. The isolated material was treated with diethyl ether and the solid was collected by filtration to provide the desired product (0.0872 g, 70%) as a white solid. ^1H NMR (d_6 -DMSO): δ 10.25 (s, 1H), 8.44 (s, br, 1H), 8.16 (s, br, 1H), 8.10 (s, br, 1H), 8.05 (s, 1H), 7.53–7.24 (m, 2H), 6.98 (dd, $J=9.7, 8.7$ Hz, 1H), 3.80–3.53 (m, 3H), 3.47 (dd, $J=8.1, 5.2$ Hz, 1H), 3.26–3.12 (m, 2H), 2.50 (s, br, 1H), 2.02–1.84 (m, 1H), 1.66–1.49 (m, 1H). LCMS calculated for $\text{C}_{16}\text{H}_{17}\text{ClFN}_5\text{O}_2$: $m/z=365$; found: $m/z=366$ ($\text{M}+\text{H}^+$). HPLC purity= 98%.

2-((5-Chloro-2-(((tetrahydrofuran-2-yl)methyl)amino)pyrimidin-4-yl)amino)-6-fluorobenzamide



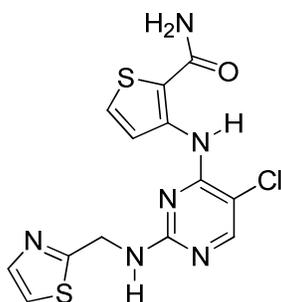
Following General Procedure B using 2-((2,5-dichloropyrimidin-4-yl)amino)-6-fluorobenzamide (0.150 g, 0.498 mmol), (tetrahydrofuran-2-yl)methylamine (0.126 g, 1.25 mmol) and N,N-diisopropylethylamine (0.120 mL, 0.687 mmol) in 1,4-dioxane (1.7 mL). The crude material was purified by preparative HPLC eluting with 5–95% acetonitrile/water to provide the desired product (0.012 g, 6%) as a white solid. ^1H NMR (d_6 -DMSO): δ 10.65 (s, br, 1H), 8.16 (s, br, 2H), 8.11 (s, br, 1H), 7.50 (d, $J=7.0$ Hz, 1H), 7.07 (s, br, 1H), 4.04–3.92 (m, 1H), 3.80–3.70 (m, 1H), 3.62 (q, $J=7.4$ Hz, 1H), 3.31 (s, br, 2H), 1.95–1.85 (m, 1H), 1.85–1.74 (m, 2H), 1.61–1.50 (m, 1H). LCMS calculated for $\text{C}_{16}\text{H}_{17}\text{ClFN}_5\text{O}_2$: $m/z=365$; found: $m/z=366$ ($\text{M}+\text{H}^+$). HPLC Purity= 99%.

5-Chloro-N4-(2-methoxyphenyl)-N2-(thiazol-2-ylmethyl)pyrimidine-2,4-diamine



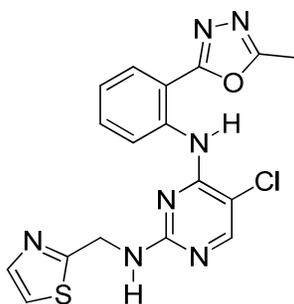
Following General Procedure B using 2,5-dichloro-N-(2-methoxyphenyl)pyrimidin-4-amine (0.1501 g, 0.556 mmol), thiazol-2-ylmethanamine dihydrochloride (0.2017 g, 1.08 mmol) and N,N-diisopropylethylamine (0.485 mL, 2.78 mmol) in NMP (1.1 mL). The crude product was purified by silica gel chromatography eluting with 20–50% ethyl acetate/hexane gradient. The isolated solid was triturated with diethyl ether and dried to provide the desired product (0.0932 g, 48%) as a pale yellow solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 8.06 (s, 1H), 7.95–7.84 (m, 3H), 7.72 (d, $J=3.1$ Hz, 1H), 7.54 (d, $J=3.3$ Hz, 1H), 7.06 (s, br, 2H), 6.85 (s, br, 1H), 4.68 (d, $J=6.1$ Hz, 2H), 3.87 (s, 3H). LCMS calculated for $\text{C}_{15}\text{H}_{14}\text{ClN}_5\text{OS}$: $m/z=347$; found: $m/z=348$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

3-((5-Chloro-2-((thiazol-2-ylmethyl)amino)pyrimidin-4-yl)amino)thiophene-2-carboxamide



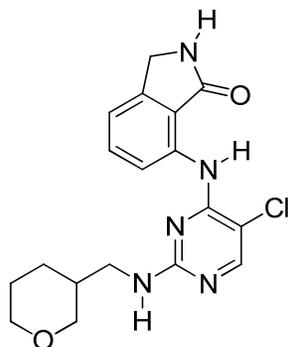
Following General Procedure B using 3-((2,5-dichloropyrimidin-4-yl)amino)thiophene-2-carboxamide (0.1492 g, 0.516 mmol), thiazol-2-ylmethylamine dihydrochloride (0.1434 g, 0.766 mmol) and N,N-diisopropylethylamine (0.270 mL, 1.55 mmol) in NMP (1 mL). The crude product was purified by silica gel chromatography eluting with 30–80% ethyl acetate/hexane gradient to provide the desired product (0.0402 g, 21%) as a tan solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 11.59 (s, br, 1H), 8.11 (s, 2H), 7.89 (s, br, 1H), 7.73 (d, $J=2.9$ Hz, 2H), 7.62 (s, br, 1H), 7.56 (d, $J=3.3$ Hz, 2H), 4.74 (d, $J=6.1$ Hz, 2H). LCMS calculated for $\text{C}_{13}\text{H}_{11}\text{ClN}_6\text{OS}_2$: $m/z=366$; found: $m/z=367$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

5-Chloro-N4-(2-(5-methyl-1,3,4-oxadiazol-2-yl)phenyl)-N2-(thiazol-2-ylmethyl)pyrimidine-2,4-diamine



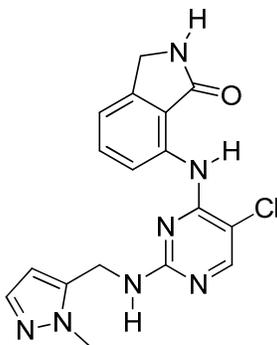
Following General Procedure B using 2,5-dichloro-N-(2-(5-methyl-1,3,4-oxadiazol-2-yl)phenyl)pyrimidin-4-amine (0.0875 g, 0.272 mmol), thiazol-2-ylmethylamine dihydrochloride (0.0759 g, 0.406 mmol) and N,N-diisopropylethylamine 0.145 mL, 0.830 mmol) in NMP (1 mL). The crude product was purified by silica gel chromatography eluting with 50–80% ethyl acetate/hexane gradient to provide the desired product (0.0334 g, 31%) as a pale yellow solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.68 (s, br, 1H), 8.44 (s, br, 1H), 8.23–8.11 (m, 2H), 7.90 (s, br, 1H), 7.76 (s, br, 1H), 7.57 (d, $J=3.3$ Hz, 1H), 7.39 (s, br, 1H), 7.22 (s, br, 1H), 4.73 (d, $J=5.9$ Hz, 2H), 2.61 (s, 3H). LCMS calculated for $\text{C}_{17}\text{H}_{14}\text{ClN}_7\text{O}$: $m/z=399$; found: $m/z=400$ ($\text{M}+\text{H}^+$). HPLC purity= 99%.

7-((5-chloro-2-(((tetrahydro-2H-pyran-3-yl)methyl)amino)pyrimidin-4-yl)amino)isoindolin-1-one



Following General Procedure B using 7-((2,5-dichloropyrimidin-4-yl)amino)isoindolin-1-one (0.1020 g, 0.346 mmol), (tetrahydro-2H-pyran-3-yl)methylamine (0.0512 g, 0.445 mmol) and N,N-diisopropylethylamine (0.090 mL, 0.515 mmol) heated in NMP (1 mL). The mixture was cooled to RT and water (50 mL) was added. The precipitated solid was collected by filtration. The solid was triturated with methylene chloride followed by trituration with isopropanol. The remaining solid was treated with hot isopropanol, cooled to RT, collected by filtration and dried to provide the desired product (0.0630 g, 42%) as a tan solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 10.59 (s, 1H), 8.79 (s, 1H), 8.67 (s, br, 1H), 8.06 (s, 1H), 7.53 (t, $J=7.9$ Hz, 1H), 7.38 (s, br, 1H), 7.18 (d, $J=7.2$ Hz, 1H), 4.40 (s, 2H), 3.79 (s, br, 1H), 3.69 (s, br, 1H), 3.31 (m, 1H), 3.17 (s, br, 3H), 1.83 (s, br, 2H), 1.58 (s, br, 1H), 1.46 (s, br, 1H), 1.23 (s, br, 1H). LCMS calculated for $\text{C}_{18}\text{H}_{20}\text{ClN}_5\text{O}_2$: $m/z=373$; found: $m/z=374$ ($\text{M}+\text{H}^+$). HPLC purity= 86%.

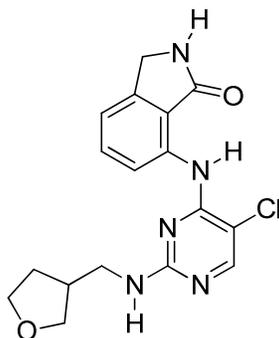
7-((5-Chloro-2-(((1-methyl-1H-pyrazol-5-yl)methyl)amino)pyrimidin-4-yl)amino)isoindolin-1-one



Following General Procedure B using 7-((2,5-dichloropyrimidin-4-yl)amino)isoindolin-1-one (0.1018 g, 0.345 mmol), (1-methyl-1H-pyrazol-5-yl)methylamine (0.0566 g, 0.509 mmol) and N,N-

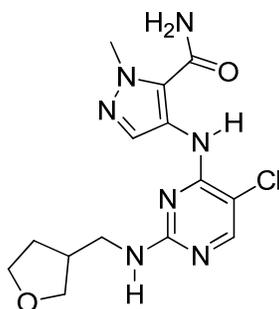
diisopropylethylamine (0.120 mL, 0.690 mmol) in NMP (1.5 mL) the desired product was obtained as a tan solid (0.016 g, 13%) after purification by silica gel chromatography eluting with 10% methanol/methylene chloride. ¹H NMR (*d*₆-DMSO): δ 10.62 (s, 1H), 8.79 (s, 2H), 8.12 (s, 1H), 7.67 (s, br, 1H), 7.53 (s, 2H), 7.17 (d, *J*=7.2 Hz, 1H), 6.80 (s, 1H), 4.48 (d, *J*=5.5 Hz, 2H), 4.39 (s, 2H), 3.63 (s, 3H). LCMS calculated for C₁₇H₁₆ClN₇O: *m/z*= 369; found: *m/z*= 370 (M+H⁺). HPLC purity = 99%.

7-((5-Chloro-2-(((tetrahydrofuran-3-yl)methyl)amino)pyrimidin-4-yl)amino)isoindolin-1-one



7-((2,5-Dichloropyrimidin-4-yl)amino)isoindolin-1-one (0.0989 g, 0.335 mmol) was dissolved in NMP (1 mL). (Tetrahydrofuran-3-yl)methanamine (0.0493 g, 0.487 mmol) and N,N-diisopropylethylamine (0.120 mL, 0.687 mmol) were added and the solution was heated to 120 °C overnight. The solution was cooled to RT and water (75 mL) was added. The mixture was extracted with methylene chloride (3 x 15 mL). The combined organics were dried over sodium sulfate and concentrated. The residue was purified by silica gel chromatography, eluting with 50–100% ethyl acetate/heptane gradient to provide the desired product (0.0251 g, 21%) as a tan solid. ¹H NMR (*d*₆-DMSO): δ 10.60 (s, 1H), 8.92–8.73 (m, 2H), 8.07 (s, 1H), 7.54 (t, *J*=7.9 Hz, 1H), 7.47 (s, br, 1H), 7.18 (d, *J*=7.5 Hz, 1H), 4.40 (s, 2H), 3.81–3.73 (m, 1H), 3.73–3.66 (m, 1H), 3.66–3.57 (m, 1H), 3.51 (s, br, 1H), 3.30–3.16 (m, 2H), 2.64–2.53 (m, 1H), 2.03–1.87 (m, 1H), 1.63 (s, br, 1H). LCMS calculated for C₁₇H₁₈ClN₅O₂: *m/z*= 359; found: *m/z*= 360 (M+H⁺). HPLC Purity = 96%.

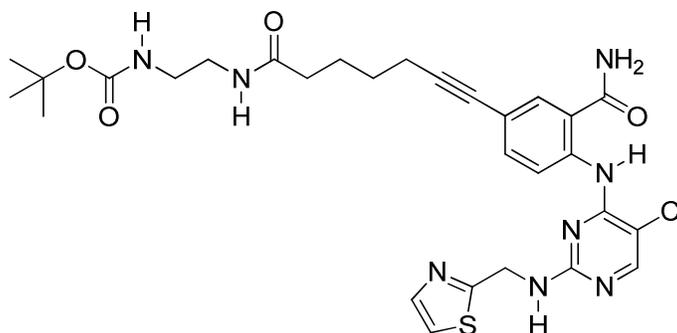
4-((5-Chloro-2-(((tetrahydrofuran-3-yl)methyl)amino)pyrimidin-4-yl)amino)-1-methyl-1H-pyrazole-5-carboxamide



(Tetrahydrofuran-3-yl)methanamine (0.0783 g, 0.774 mmol) and 4-((2,5-dichloropyrimidin-4-yl)amino)-1-methyl-1H-pyrazole-5-carboxamide (0.1020 g, 0.355 mmol) were dissolved in NMP (1 mL). N,N-Diisopropylethylamine (0.125 mL, 0.716 mmol) was added and the solution was heated to 120 °C for 90 minutes. The solution was cooled to RT and water (50 mL) was added. The mixture was extracted with methylene chloride (3 x 15 mL). The combined organics were dried over sodium sulfate and

concentrated. The residue was purified by silica gel chromatography eluting with ethyl acetate to provide the desired product (0.0512 g, 41%) as a yellow solid. $^1\text{H NMR}$ (d_6 -DMSO): δ 9.09 (s, 1H), 8.24 (s, br, 1H), 7.96 (s, 1H), 7.76 (s, br, 2H), 7.28 (s, br, 1H), 4.01 (s, 3H), 3.78–3.53 (m, 3H), 3.44 (dd, $J=8.4$, 5.1 Hz, 1H), 3.26–3.12 (m, 2H), 2.46 (s, br, 1H), 1.98–1.84 (m, 1H), 1.63–1.49 (m, 1H). LCMS calculated for $\text{C}_{14}\text{H}_{18}\text{ClN}_7\text{O}_2$: $m/z=351$; found: $m/z=352$ ($\text{M}+\text{H}^+$). HPLC purity = 96%.

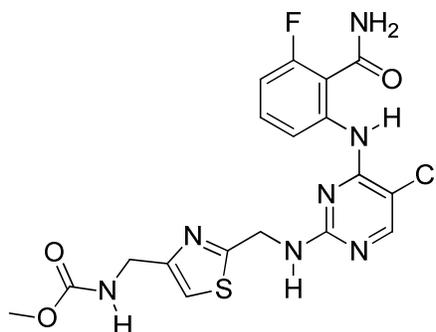
Tert-butyl (2-(7-(3-carbamoyl-4-((5-chloro-2-((thiazol-2-ylmethyl)amino)pyrimidin-4-yl)amino)phenyl)hept-6-ynamido)ethyl)carbamate



Following general procedure B using 5-bromo-((2,5-dichloropyrimidin-4-yl)amino)benzamide (0.516 g, 1.43 mmol), thiazol-2-ylmethylamine dihydrochloride (0.507 g, 2.71 mmol) and triethylamine (0.995 mL, 7.13 mmol) in NMP (2 mL). Upon addition of water (50 mL), the precipitated solid was collected by filtration, washed with water and dried to provide 5-bromo-2-((5-chloro-2-((thiazol-2-ylmethyl)amino)pyrimidin-4-yl)amino)benzamide (0.069 g, 37%) that was carried on without further purification. LCMS calculated for $\text{C}_{15}\text{H}_{12}\text{BrClN}_6\text{O}_2$: $m/z=438$; found: $m/z=439$ ($\text{M}+\text{H}^+$). HPLC purity= 96%.

5-Bromo-2-((5-chloro-2-((thiazol-2-ylmethyl)amino)pyrimidin-4-yl)amino)benzamide (0.050 g, 0.114 mmol), copper(I) iodide (4.33 mg, 0.023 mmol), diethylamine (0.178 mL, 1.706 mmol), tert-butyl (2-(hept-6-ynamido)ethyl)carbamate (0.0336 g, 0.125 mmol) and bis(triphenylphosphine)palladium(II) chloride (7.98 mg, 0.011 mmol) were put into a vial. To the reactants was added N,N-Dimethylformamide (DMF) (0.5 mL) and was heated at 50 °C. The reaction was cooled to RT and purified directly by HPLC eluting with 10%–100% acetonitrile/water (+ 0.05% TFA) to provide the desired product (0.025 g, 35%). LCMS calculated for $\text{C}_{29}\text{H}_{35}\text{ClN}_8\text{O}_4\text{S}$: $m/z=626$; found: $m/z=627$ ($\text{M}+\text{H}^+$). HPLC purity= 87%.

Methyl ((2-(((4-((2-carbamoyl-3-fluorophenyl)amino)-5-chloropyrimidin-2-yl)amino)methyl)thiazol-4-yl)methyl)carbamate

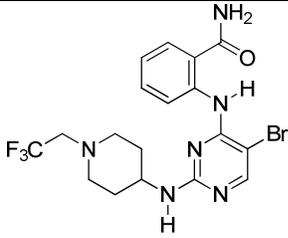
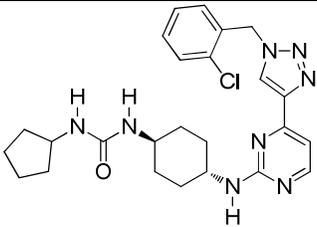
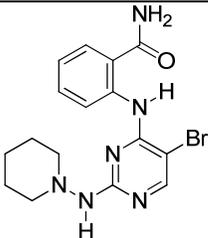
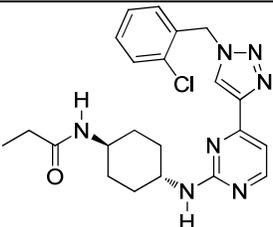
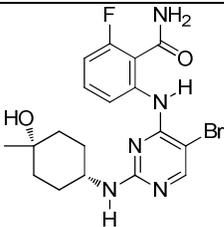
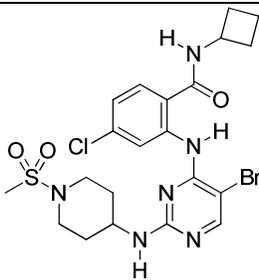
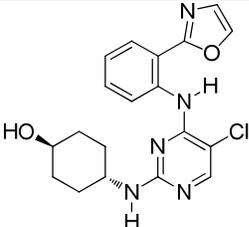
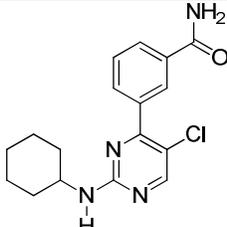
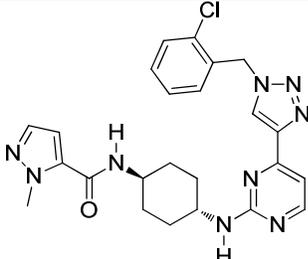
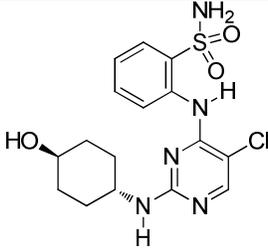


Tert-butyl methyl (thiazole-2,4-diylbis(methylene))dicarbamate (0.1630 g, 0.541 mmol) was dissolved in methylene chloride (2 mL). HCl (4M solution in 1,4-dioxane, 1.35 mL, 5.40 mmol) was added and the mixture was stirred at RT for 2 hours and was concentrated. A 15 mL pressure tube was charged with 2-((2,5-dichloropyrimidin-4-yl)amino)-6-fluorobenzamide (0.1667 g, 0.554 mmol). The HCl salt generated above was added followed by isopropanol (4 mL) and N,N-diisopropylethylamine (0.190 mL, 1.09 mmol). The tube was sealed and the mixture was heated to 100 °C for 48 hours. The mixture was cooled to RT and the precipitated solid was collected by filtration. The crude residue was purified by silica gel chromatography eluting with a 40–100% ethyl acetate/hexane gradient to provide the desired product (0.0721 g, 28%) as a white solid. ¹H NMR (*d*₆-DMSO): δ 10.33 (s, br, 1H), 8.27–7.99 (m, 5H), 7.68 (s, br, 1H), 7.30 (s, br, 1H), 7.16 (s, 1H), 6.95 (s, br, 1H), 4.65 (s, br, 2H), 4.24 (d, *J*=5.6 Hz, 2H), 3.54 (s, 3H). LCMS calculated for C₁₈H₁₇ClF₂N₇O₃S: *m/z*= 465; found: *m/z*= 466 (M+H⁺). HPLC purity= 98%.

Supplementary materials references

1. Comess, K. M.; Erickson, S. A.; Henkin, J.; Kalvin, D. M.; Kawai, M.; Kim, K. H.; Bamaung, N. Y.; Park, C. H.; Sheppard, G. S.; Vasudevan, A.; Wang, J.; Barnes, D. M.; Fidanze, S. D.; Kolaczowski, L.; Mantei, R. A.; Park, D. C.; Sanders, W. J.; Tedrow, J. S.; Wang, G. T. "Sulfonamides Having Antiangiogenic and Anticancer Activity" from Abbott Laboratories, Abbott Park, IL, 22 April, 2004.

Figure S1: Structures of JNK-1 inhibitor compounds found in Table 2 that are not displayed in Table 3.

Compound		Compound	
41		47	
42		48	
43		49	
44		50	
45		51	

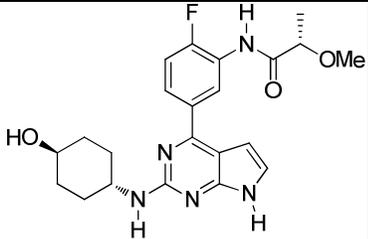
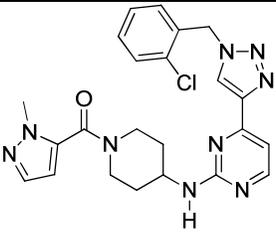
46		52	
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Table S1. Enzyme activity of Compounds **1**, **2**, and **45** across a broad set of kinases.

KINASE	Compound 1 % enzyme activity ¹	Compound 2 % enzyme activity ¹	Compound 45 % enzyme activity ¹
ABL1	95	96	99
ABL2/ARG	93	91	97
ACK1	105	102	99
AKT1	97	102	99
AKT2	91	86	97
AKT3	92	103	98
ALK	78	85	96
ALK1/ACVRL1	102	97	101
ALK2/ACVR1	90	90	95
ALK4/ACVR1B	100	105	103
ALK5/TGFBR1	90	93	89
ARAF	96	105	110
ARK5/NUAK1	39	83	90
ASK1/MAP3K5	11	95	103
Aurora A	10	53	84
Aurora B	77	95	97
Aurora C	54	82	78
AXL	72	97	97
BLK	97	97	96
BMX/ETK	96	99	100
BRAF	95	98	103

BRK	59	55	94
BRSK1	60	83	95
BRSK2	45	82	95
BTK	93	97	95
c-Kit	80	90	86
c-MER	48	90	2
c-MET	80	89	89
c-Src	97	94	97
CAMK1a	71	115	110
CAMK1b	86	98	108
CAMK1d	75	104	105
CAMK1g	88	95	92
CAMK2a	84	106	90
CAMK2b	64	85	99
CAMK2d	62	84	94
CAMK2g	84	105	97
CAMK4	93	8	97
CAMKK1	87	102	116
CAMKK2	93	96	95
CDK1/cyclin A	5	90	101
CDK1/cyclin B	-1	58	74
CKD2/cyclin A	2	73	79
CDK2/cyclin E	19	59	84
CDK3/cyclin E	10	94	101

CDK4/cyclin D1	7	89	78
CDK4/cyclin D3	25	93	92
CDK5/p25	2	79	90
CDK5/p35	15	67	90
CDK6/cyclin D1	8	92	88
CDK6/cyclin D3	31	88	84
CDK7/cyclin H	42	80	77
CDK9/cyclin K	14	85	55
CDK9/cyclin T1	24	89	55
CHK1	93	100	99
CHK2	28	88	95
CK1a1	37	73	97
CK1d	26	72	80
CK1epsilon	51	76	88
CK1g1	17	44	49
CK1g2	10	29	21
CK1g3	19	47	31
CK2a	33	35	93
CK2a2	33	63	100
CLK1	50	62	105
CLK2	11	30	97
CLK3	88	89	97
CLK4	19	23	80
COT1/MAP3K8	103	94	96

CSK	96	103	99
CTK MATK	98	95	92
DAPK1	55	52	65
DAPK2	97	104	95
DCAMKL2	85	89	92
DDR2	97	94	94
DMPK	102	99	99
DRAK1/STK17A	43	85	94
DYRK1/DYRK1A	13	43	92
DYRK1B	5	39	89
DYRK2	1	11	86
DYRK3	8	69	90
DYRK4	40	63	104
EGFR	91	91	90
EPHA1	97	95	91
EPHA2	94	98	99
EPHA3	93	98	96
EPHA4	96	92	93
EPHA5	93	93	90
EPHA7	73	83	88
EPHA8	99	94	96
EPHB1	91	91	93
EPHB2	103	103	99
EPHB3	97	97	98

EPHB4	96	88	94
ERBB2/HER2	100	99	101
ERBB4/HER4	98	102	102
ERK1	3	100	63
ERK2/MAPK1	47	94	84
FAK/PTK2	63	77	100
FER	74	92	103
FES/FPS	36	72	96
FGFR1	55	79	93
FGFR2	78	97	102
FGFR3	72	99	106
FGFR4	86	92	89
FGR	98	97	96
FLT1/VEGFR1	69	90	85
FLT3	14	31	82
FLT4 VEGFR3	45	104	112
FMS	70	95	90
FRK PTK5	99	99	100
FYN	95	62	100
GCK/MAP4K2	29	74	100
GRK2	103	104	102
GRK3	91	98	99
GRK4	90	100	103
GRK5	80	102	103

GRK6	84	90	101
GRK7	67	97	96
GSK3a	4	54	26
GSK3b	7	68	40
Haspin	28	63	108
HCK	103	101	102
HGK/MAP4K4	57	39	92
HIPK1	56	104	103
HIPK2	13	99	98
HIPK3	33	98	102
HIPK4	7	23	59
IGF1R	74	83	93
IKKa/CHUK	83	91	94
IKKb/IKBKB	54	96	99
IKKe/IKBKE	81	87	73
IR	53	95	99
IRAK1	65	74	116
IRAK4	78	83	109
IRR/INSRR	74	81	97
ITK	96	99	96
JAK1	88	86	82
JAK2	102	104	103
JAK3	85	102	103
JNK1	-1	72	3

JNK2	2	54	21
JNK3	16	108	28
KDR/VEGFR2	80	106	104
KHS/MAP4K5	69	88	103
LCK	93	102	100
LIMK1	18	86	71
LKB1	49	80	81
LOK/STK10	51	90	96
LRRK2	4	18	95
LYN	98	99	99
LYN B	96	96	97
MAPKAPK2	101	103	100
MAPKAPK3	106	105	102
MAPKAPK5/PRAK	94	95	101
MARK1	80	103	97
MARK2/PAR-1Ba	66	98	91
MARK3	77	100	98
MARK4	83	104	103
MEK1	93	90	105
MEK2	101	102	91
MEKK2	111	95	98
MEKK3	101	100	106
MELK	26	56	80
MINK/MINK1	77	66	98

MKK6	59	90	90
MLCK/MYLK	13	44	96
MLCK2/MYLK2	45	66	91
MLK1/MAP3K9	34	93	100
MLK2/MAP3K10	21	78	93
MLK3/MAP3K11	28	92	95
MNK1	97	61	103
MNK2	61	44	89
MRCKa/CDC42BPA	104	102	101
MRCKb/CDC42BPB	84	98	93
MSK1/RPS6KA5	33	85	89
MSK2/RPS6KA4	36	82	77
MSSK1/STK23	84	93	101
MST1/STK4	66	92	98
MST2/STK3	81	92	94
MST3/STK24	57	66	93
MST4	90	82	101
MUSK	18	28	81
NEK1	9	47	36
NEK11	100	97	94
NEK2	100	106	102
NEK3	58	70	94
NEK4	41	62	87
NEK6	99	84	109

NEK7	87	85	99
NEK9	55	58	93
NIK/MAP3K14	121	81	91
NLK	30	105	28
OSR1/OXSR1	63	75	100
P38a/MAPK14	47	103	98
P38b/MAPK11	18	101	81
P38d/MAPK13	70	99	97
P38g	94	104	100
p70S6K/RPS6KB1	65	98	97
p70S6Kb/RPS6KB2	125	104	98
PAK1	90	88	92
PAK2	95	96	96
PAK3	94	97	98
PAK4	93	101	95
PAK5	100	102	109
PAK6	78	98	103
PASK	38	24	84
PBK/TOPK	89	37	96
PDGFRa	90	98	98
PDGFRb	95	99	103
PDK1/PDPK1	92	101	95
PHKg1	36	73	88
PHKg2	88	98	94

PIM1	83	89	99
PIM2	108	110	110
PIM3	60	93	104
PKA	61	96	102
PKCa	39	61	86
PKCb1	82	89	96
PKCb2	78	92	83
PKCd	46	96	102
PKCepsilon	55	89	91
PKCeta	101	94	85
PKCg	100	89	92
PKCiota	98	98	94
PKCmu/PRKD1	10	62	90
PKCnu/PRKD3	9	56	91
PKCtheta	46	71	98
PKCzeta	98	97	98
PKD2/PRKD2	15	74	90
PKG1a	65	81	97
PKG1b	94	103	108
PKG2/PRKG2	84	81	91
PKN1/PRK1	65	95	98
PKN2/PRK2	93	98	94
PLK1	77	35	91
PLK2	88	94	92

PLK3	84	44	94
PRKX	96	110	106
PYK2	74	91	96
RAF1	97	92	105
RET	80	97	100
RIPK2	65	70	53
RIPK5	28	99	97
ROCK1	60	101	51
ROCK2	52	95	52
RON/MST1R	95	97	95
ROS/ROS1	78	65	103
RSK1	5	22	96
RSK2	-1	6	81
RSK3	5	27	82
RSK4	5	22	101
SGK1	7	62	91
SGK2	62	96	99
SGK3/SGKL	99	98	96
SIK2	96	112	107
SLK/STK2	65	88	98
SNARK/NUAK2	63	97	102
SRMS	96	86	85
SRPK1	74	89	98
SRPK2	71	97	101

STK16	65	80	100
STK22D/TSSK1	60	90	83
STK25/YSK1	81	88	97
STK33	18	59	91
STK39/STLK3	56	86	107
SYK	82	95	96
TAK1	34	92	92
TAOK1	28	64	85
TAOK2/TAO1	56	89	100
TAOK3/JIK	70	65	102
TBK1	71	90	91
TEC	114	103	113
TGFBR2	100	105	99
TIE2/TEK	96	99	97
TRKA	90	93	92
TRKB	85	93	94
TRKC	83	70	95
TSSK2	97	102	99
TTK	40	82	89
TXK	97	100	96
TYK1/LTK	68	84	93
TYK2	79	100	100
TYRO3 SKY	84	103	100
ULK1	66	71	97

ULK2	103	96	98
VRK1	87	98	97
WEE1	89	98	100
WNK2	92	91	94
WNK3	77	93	99
YES/YES1	87	96	99
ZAK/MLTK	96	98	102
ZAP70	102	105	101
ZIPK/DAPK3	87	93	104

¹Compound were tested in duplicate at a single concentration of 1 μ M. Reported values are an average of n=2 experiments and are expressed as % enzyme activity relative to DMSO controls. All experiments were carried out in the presence of 10 μ M ATP.

Table S2. Results of chemoproteomics pulldown experiments in HeLa cells with Probes N, E, and W.

Probe	Protein Name	Synonym	Quant. Unique Peptides	Compound 2 relative binding vs. DMSO	Compound 2 relative binding vs. Compound 43
E	CALML5		6	0.56	0.01
N	TP53RK	PRPK	7	0.11	0.20
N	MAP3K6/ASK2	MAP3K6	16	0.18	0.23
N	MAP3K15/ASK3	MAP3K7	20	0.20	0.26
N	LOC654188		6	0.49	0.26
E	PARP1	PARP1	8	0.12	0.29
N	HSPD1		9	0.37	0.29
E	HSPD1		5	0.74	0.32
N	DYNC1H1		8	0.46	0.32
W	HSP90AB1		6	0.38	0.33
N	HINT1		5	0.40	0.33
N	PDXK		28	0.26	0.33
W	TP53RK	PRPK	9	0.09	0.35
E	SUB1		6	0.19	0.36
N	CLTC		18	0.57	0.38
N	MAP3K5	MAP3K5	20	0.33	0.40
N	PRKDC	DNAPK	28	0.43	0.40
E	PRDX1		5	0.78	0.41
E	HSP90AB1		6	1.97	0.41
N	ENO1		6	1.47	0.41
N	PKM2		8	0.69	0.41
W	GAPDH		6	0.26	0.42
W	TPRKB		8	0.15	0.43
N	ACTB		11	0.82	0.45
N	PTK6	BRK	6	0.24	0.45
N	GAPDH		13	1.13	0.45
N	DCD		6	0.46	0.45
E	HSP90AA1		5	1.30	0.46
N	TNK1	TNK1	34	0.12	0.46
N	TPRKB		6	0.13	0.47
W	XTP3TPA		8	0.60	0.50
E	NQO2		9	0.24	0.50
W	SFPQ		9	0.67	0.51
W	TNK1	TNK1	18	0.13	0.52
N	UGCG1		5	0.55	0.52
E	CSTA		5	1.04	0.53
N	FASN	SDR27X1	29	0.66	0.53
N	CPS1		9	1.45	0.53
N	NONO		8	0.67	0.54
N	LDHB		5	1.11	0.54
N	FN3K		5	0.64	0.54
N	PI4KA	PIK4Ca	7	0.48	0.56
W	APRT		7	0.75	0.57
N	NME1-NME2		17	0.71	0.57
N	PDE1A		17	0.50	0.57
N	PRDX4		5	0.53	0.57
N	FLAD1		9	0.53	0.57
E	HSPA9		7	0.58	0.57
N	PRDX1		6	0.58	0.58
N	DCK		9	0.67	0.58
E	SFPQ		17	0.35	0.58
N	CSNK1E	CK1e	5	0.58	0.58
E	EEF1A1		16	0.95	0.59
N	FECH		32	0.50	0.59
W	NEK9	NEK9	52	0.27	0.60
E	SERBP1		5	0.67	0.62

W	DYNLL1		6	0.48	0.62
E	SDHA		5	0.81	0.62
N	ATP5A1		5	0.83	0.62
N	ATP5B		6	0.98	0.63
W	SPR	SDR38C1	15	0.57	0.63
N	LRRC59		5	0.77	0.63
N	PRDX6		6	0.58	0.63
E	TUBB		5	0.72	0.64
N	AHCY		6	0.78	0.64
E	LRRC59		8	1.42	0.64
N	AURKB	AurB	5	0.77	0.64
N	TUBB		7	0.61	0.65
W	PDXK		6	0.27	0.65
N	EEF2		6	1.04	0.65
W	HDAC10	HDAC10	11	0.73	0.66
N	EPDR1		5	0.56	0.66
W	HSP90AA1		5	1.07	0.66
W	ACLY		5	0.72	0.67
W	CLTC		102	0.78	0.67
N	TUBA1A		6	0.70	0.67
W	FUS		7	0.61	0.68
W	RPS6KA1	RSK3	21	0.08	0.68
N	FN3KRP		20	0.71	0.69
E	DNAJC10		8	0.86	0.69
W	CLTA		10	0.39	0.69
N	NEK9	NEK9	55	0.33	0.70
N	GCDH		9	0.88	0.70
W	HSPA1A		23	0.78	0.70
W	FECH		8	0.65	0.70
E	TUBA1A		5	0.64	0.71
E	LGALS3BP		12	0.67	0.71
W	IPI00070448.1		5	0.65	0.72
W	KIAA0664		89	0.72	0.72
N	LGALS3BP		12	0.63	0.73
W	NME1-NME2		19	0.91	0.73
W	GCDH		8	0.66	0.73
W	HSPA8		26	0.68	0.73
N	XPO1		5	0.77	0.73
N	EEF1A1		15	0.89	0.73
W	ZADH2		5	0.56	0.74
N	KIAA0664		38	0.64	0.74
E	DCD		6	1.16	0.74
N	AURKA	AurA	36	0.55	0.74
W	HSPA9		33	0.66	0.75
E	GAPDH		9	1.05	0.75
N	ALDH1B1		7	0.71	0.75
N	MAPK1	Erk2	6	0.42	0.76
N	CBR1	SDR21C1	11	0.75	0.77
E	NONO		14	0.80	0.77
N	PDE12		5	0.59	0.78
W	LRRC59		7	0.73	0.78
E	KIAA0664		64	0.78	0.79
W	HSPA5		23	0.59	0.79
N	IPO7		7	1.31	0.80
N	PDE10A		45	0.62	0.80
W	C10ORF88		7	0.83	0.81
E	FASN	SDR27X1	43	0.81	0.82
E	PCBP1		9	0.73	0.82
E	CSNK2A1	CK2a1	5	0.15	0.83
W	RPS6KA3	RSK2	15	0.09	0.83
E	HSPA1A		8	0.74	0.84
W	ALDH2		26	0.83	0.85
N	ACLY		31	0.79	0.85

E	HSPA8		14	0.97	0.86
W	CSNK2A1	CK2a1	23	0.12	0.86
W	FASN	SDR27X1	12	0.91	0.87
N	HSP90AB1		5	1.85	0.87
E	GSR		5	0.64	0.87
N	HDAC10	HDAC10	10	0.70	0.87
W	EEF1A1		9	0.83	0.87
N	HSPA8		25	0.58	0.89
N	HSPA5		10	0.53	0.90
E	STRAP		6	0.83	0.92
E	HDAC10	HDAC10	11	0.88	0.92
W	CLTB		10	1.22	0.94
N	HSPA1A		16	0.50	0.94
W	ALDH1B1		17	0.85	0.95
E	EWSR1		5	1.21	0.98
W	C15ORF23		19	0.88	0.98
W	SPAG5		33	0.72	0.99
N	HSPA9		20	0.48	1.00
W	MAPK1	Erk2	5	0.35	1.01
W	AURKA	AurA	27	0.47	1.01
E	SERPINB1		5	1.03	1.01
N	SFPQ		13	0.97	1.02
N	PARP1	PARP1	5	0.35	1.04
W	CSNK2B		10	0.15	1.08
W	TUBA1A		11	1.19	1.10
N	IPO5		5	0.86	1.11
N	ACADVL		6	0.71	1.16
E	FUS		11	0.78	1.21
W	EIF3J		31	0.16	1.23
W	DCD		7	2.67	1.27
N	RPS6KA1	RSK3	44	0.02	1.29
N	GSK3B	GSK3B	5	0.37	1.34
E	EIF3J		8	0.23	1.40
N	PRKAG1		7	0.18	1.65
W	CSNK2A2	CK2a2	24	0.15	2.03
N	MAPK9	JNK2	10	0.14	2.55
N	RPS6KA3	RSK2	34	0.07	2.68
W	MAPK8	JNK1	10	0.24	5.05
W	MAPK9	JNK2	16	0.37	17.08

Table S3. Results of chemoproteomics pulldown experiments in A204 cells with Probe N.

Protein Name	Synonym	Quant. Unique Peptides	Compound 43 relative binding vs. DMSO	Compound 2 relative binding vs. Compound 43	Compound 2 relative binding vs. DMSO
TAOK3	TAO3	2	0.6	0.1	0.1
MMS19		2	0.7	0.2	0.2
CPNE3		2	7.7	0.4	3.1
PTBP1		2	0.8	0.4	0.3
BMP2K	BIKE	2	1.6	0.4	0.7
SRR		2	0.8	0.4	0.4
C7ORF27		3	0.8	0.4	0.3
SND1	SND1	2	1.0	0.4	1.0
WARS		2	5.1	0.4	2.3
TPRKB		9	0.4	0.5	0.2
POFUT2		2	0.9	0.5	0.5
TP53RK	PRPK	7	0.4	0.6	0.2
CAP1		2	1.0	0.6	1.0
ACTN1		3	3.4	0.6	1.9
PLOD3	PLOD3	3	1.3	0.6	0.7
TBK1	TBK1	2	0.8	0.6	0.5
ACOT9		2	0.6	0.6	0.3
CSNK1E	CK1e	7	0.7	0.6	0.4
RTN4		2	1.1	0.6	0.7
ALDH16A1		2	0.7	0.6	0.4
KPNA6		2	1.9	0.6	1.2
CSNK1A1L	CK1a2	2	0.4	0.6	0.3
CCT6A		2	1.7	0.6	1.1
S100A6		2	0.8	0.6	0.5
TIA1		2	1.3	0.7	0.8
PI4K2A	PIK4C2A	2	0.8	0.7	0.5
PI4K2B	PIK4C2B	9	0.9	0.7	0.6
NMRAL1	SDR48A1	2	1.0	0.7	0.7
HSD17B10	SDR5C1	2	0.9	0.7	0.6
OSGEP		10	0.4	0.7	0.3
ANXA5		2	3.9	0.7	2.6
HDAC6	HDAC6	4	0.9	0.7	0.6
ZW10		2	1.5	0.7	1.0
YWHAZ		3	2.5	0.7	1.7
GAPDH		14	5.2	0.7	3.6
VPS35		2	1.2	0.7	0.8
CFL1		6	0.7	0.7	0.5
PDIA3		2	0.9	0.7	0.6
UBA1		5	0.8	0.7	0.5
COPB1		2	1.6	0.7	1.1
HSD17B10	SDR5C1	2	1.3	0.7	0.9
CAMK2G	CaMK2g	2	1.6	0.7	1.1
PGAM1		3	4.7	0.7	3.3
ADK		3	1.3	0.7	0.9
MGP		2	0.9	0.7	0.7
TBCD		3	1.3	0.7	1.0
CFL1		3	3.4	0.7	2.4
PSMD13		3	1.8	0.7	1.3
SEPT9		2	1.1	0.7	0.8
TBK1	TBK1	2	0.9	0.7	0.6
INF2		2	0.9	0.7	0.7
PSMA4		4	1.6	0.7	1.2
ALDOA		6	4.7	0.7	3.4
PRDX3		2	0.9	0.7	0.7

RPS19		2	1.2	0.7	0.9
LGALS1		4	2.3	0.7	1.7
TPRKB		10	0.8	0.7	0.6
YWHAH		2	0.8	0.7	0.6
PRDX4		5	1.2	0.7	0.9
HNRNPD		2	1.3	0.7	1.0
HSP90AB1		15	2.4	0.7	1.7
DDX3X		8	1.0	0.7	0.7
RRM1		3	1.2	0.7	0.9
HEATR2		2	2.1	0.7	1.6
HDAC10	HDAC10	2	1.2	0.7	0.9
Q9UDG2_HUMAN		2	0.7	0.7	0.5
CAND1		3	0.9	0.7	0.7
PDIA3		5	4.4	0.7	3.3
GSTP1		2	3.3	0.7	2.4
ENO1		13	5.0	0.7	3.7
CDC42		2	4.9	0.7	3.6
ATP5O		2	0.6	0.7	0.5
OSGEP		11	0.7	0.7	0.6
NCL		3	2.1	0.7	1.5
ECHS1		3	2.3	0.8	1.7
FKBP10		3	1.8	0.8	1.4
GLT25D1		2	2.0	0.8	1.5
ENO1		12	0.7	0.8	0.5
CALR		2	0.6	0.8	0.5
MDH2		3	4.0	0.8	3.0
PPIB		6	3.4	0.8	2.6
HSP90AA1		8	2.8	0.8	2.1
TPI1		3	0.9	0.8	0.7
TKT		8	4.2	0.8	3.2
HSP90B1		11	4.2	0.8	3.2
CALR		3	7.9	0.8	6.1
ANXA2		4	2.4	0.8	1.8
CKAP4		6	1.4	0.8	1.1
PTBP1		2	0.8	0.8	0.6
P4HB		15	2.5	0.8	1.9
GNB2L1		3	1.3	0.8	1.0
XPO5		5	1.0	0.8	0.7
PI4KA	PIK4Ca	4	0.9	0.8	0.7
CLIC1		2	0.7	0.8	0.5
DPYSL2		5	1.4	0.8	1.1
CCT2		3	2.2	0.8	1.7
GANAB		3	0.7	0.8	0.6
KTN1		5	1.0	0.8	0.8
CNP		2	1.1	0.8	0.9
OAT		5	1.5	0.8	1.2
HDAC10	HDAC10	2	1.0	0.8	0.8
VIM		4	2.1	0.8	1.6
PFN2		2	0.8	0.8	0.6
TKT		7	0.7	0.8	0.6
TPI1		4	3.1	0.8	2.5
PGK1		5	4.3	0.8	3.2
CANX		2	3.6	0.8	2.8
RAN		2	0.8	0.8	0.6
PCBP2		2	1.1	0.8	0.8
S100A11		2	0.6	0.8	0.5
MARS		2	0.8	0.8	0.6
EEF1G		7	1.8	0.8	1.4
MCM7		2	2.7	0.8	2.1
GMPS		2	1.5	0.8	1.2
HMGCL		2	1.7	0.8	1.3
PPP1CB		4	2.1	0.8	1.7
RPN1		7	1.3	0.8	1.1

ECHS1		2	0.8	0.8	0.6
PSMA7		2	1.9	0.8	1.5
RSU1		2	1.7	0.8	1.3
TP53RK	PRPK	5	0.7	0.8	0.5
PFN1		4	4.4	0.8	3.5
PKM2		20	2.2	0.8	1.7
UCHL1		2	2.3	0.8	1.8
RAN		4	3.1	0.8	2.5
CTPS		4	0.7	0.8	0.5
TPR		3	0.8	0.8	0.7
HNRNPK		3	1.8	0.8	1.4
HINT1		3	1.1	0.8	0.8
CCT5		3	1.9	0.8	1.5
YWHAZ		2	0.8	0.8	0.6
HSPD1		13	2.2	0.8	1.8
C1QBP		2	1.5	0.8	1.2
EEF1A1		19	1.3	0.8	1.0
ALDH7A1		7	1.6	0.8	1.3
PGK1		5	0.7	0.8	0.6
YWHAE		4	0.9	0.8	0.8
PDIA6		10	2.6	0.8	2.1
PSAP		2	0.8	0.8	0.7
PIR		2	3.3	0.8	2.7
ALDH9A1		2	1.1	0.8	0.9
SERPINH1		14	1.7	0.8	1.4
ECH1		4	0.9	0.8	0.7
G6PD		4	1.8	0.8	1.4
LDHA		9	2.5	0.8	2.0
ZC3H14		2	2.6	0.8	2.1
DSTN		8	0.8	0.8	0.6
PHB		4	0.9	0.8	0.7
PRDX6		7	1.4	0.8	1.1
PSMC4		4	1.5	0.8	1.2
GALC		4	1.1	0.8	0.9
PDXK		26	0.7	0.8	0.6
PPP2R1A		7	1.4	0.8	1.1
GAPDH		14	0.7	0.8	0.6
LOC654188		5	0.8	0.8	0.6
ATP5A1		6	1.4	0.8	1.1
GLT25D1		2	1.1	0.8	0.9
CSNK1A1	CK1a	2	1.0	0.8	0.9
TRIM25		2	1.0	0.8	0.9
PSME2		12	1.2	0.8	1.0
AHNAK		3	1.0	0.8	0.8
PRDX1		6	1.3	0.8	1.1
CNN3		3	1.4	0.8	1.1
LEPRE1	LEPRE1	2	1.4	0.8	1.1
EML4		4	0.6	0.8	0.5
LAGE3		3	0.8	0.8	0.7
NEK9	NEK9	45	0.7	0.8	0.5
FN3K		2	1.1	0.8	0.9
DSTN		10	1.7	0.8	1.4
YWHAE		2	2.6	0.8	2.2
BZW1		2	0.7	0.8	0.6
MCM3		4	1.2	0.8	1.0
IQGAP1		2	0.9	0.8	0.8
PGAM1		3	0.7	0.8	0.6
ALDOA		7	0.7	0.8	0.6
NEK6	NEK6	2	0.7	0.8	0.6
FKBP10		2	0.9	0.8	0.8
ACSL3		2	1.6	0.8	1.4
KPNB1		4	2.1	0.8	1.7
CLIC1		5	3.2	0.8	2.7

CDA		2	0.8	0.8	0.6
LEPREL2	LEPREL2	2	1.4	0.8	1.2
HSPA8		19	1.4	0.8	1.2
SLC25A3		5	0.9	0.8	0.7
HSP90B1		13	0.7	0.8	0.6
P4HB		15	0.8	0.8	0.7
TAOK1	TAO1	5	0.8	0.8	0.7
HNRNPH1		3	0.9	0.8	0.8
LEPREL2	LEPREL2	2	0.9	0.8	0.7
KARS		4	1.4	0.8	1.2
TARBP1	TARBP1	5	1.0	0.8	0.9
TFRC		4	2.1	0.8	1.8
LAGE3		2	0.3	0.8	0.3
PDIA6		6	0.7	0.8	0.6
PSMC4		3	0.9	0.8	0.8
IPO7		5	1.0	0.8	0.8
NAP1L1		2	1.7	0.8	1.5
HADHB		3	0.9	0.8	0.7
ACTR3		2	2.6	0.8	2.2
RAB1A		4	0.9	0.8	0.7
FECH		32	1.0	0.8	0.8
SURF4		4	1.0	0.8	0.8
LOC654188		4	2.8	0.8	2.4
ATP5O		2	2.1	0.8	1.7
PRKDC	DNAPK	36	1.1	0.8	1.0
EPDR1		7	0.8	0.8	0.7
AHCY		9	0.9	0.8	0.8
TIA1		2	1.2	0.9	1.0
PPP2CA		2	1.0	0.9	0.8
UBE2L6		5	0.8	0.9	0.7
SSBP1		2	1.1	0.9	0.9
TCP1		2	1.4	0.9	1.2
MCCC1		2	1.0	0.9	0.9
VCL		5	2.4	0.9	2.0
GBE1		8	0.9	0.9	0.8
FN3K		2	1.0	0.9	0.8
STAT3		3	1.0	0.9	0.9
TXN		5	0.9	0.9	0.8
HNRNPK		7	0.9	0.9	0.8
GARS		2	0.6	0.9	0.5
SFN		4	3.6	0.9	3.1
PAICS		4	2.1	0.9	1.7
HSPA5		25	1.4	0.9	1.2
ACTB		8	0.8	0.9	0.7
RIOK2	RIOK2	8	0.8	0.9	0.7
EIF2AK2	PKR	2	0.8	0.9	0.7
SFN		2	0.6	0.9	0.5
EEF1G		7	0.8	0.9	0.7
LDHB		5	0.8	0.9	0.7
ACAT1		2	0.6	0.9	0.5
KIAA0664		2	1.2	0.9	1.1
HADHA		11	1.3	0.9	1.1
PFKL		5	0.8	0.9	0.7
RARS		3	1.3	0.9	1.1
CSE1L		4	0.8	0.9	0.7
PEF1		3	1.1	0.9	1.0
PRDX4		6	1.0	0.9	0.9
HNRNPF		5	1.0	0.9	0.8
STOML2		4	1.4	0.9	1.2
HERC4		2	1.2	0.9	1.1
LDHB		8	3.6	0.9	3.1
RPL12		2	0.8	0.9	0.7
ARL1		3	1.1	0.9	1.0

PSMA4		2	0.9	0.9	0.7
GSN		3	1.2	0.9	1.0
PHB2		3	1.2	0.9	1.0
HSPA1A		10	1.3	0.9	1.1
ADSS		7	1.5	0.9	1.3
IQGAP1		3	1.4	0.9	1.3
PDE12		3	1.0	0.9	0.9
DCTN1		2	1.9	0.9	1.6
GSN		5	0.7	0.9	0.6
CAPZA1		4	1.3	0.9	1.1
IAH1		4	0.8	0.9	0.7
PHB		5	1.1	0.9	0.9
RIPK2	RIPK2	6	1.1	0.9	1.0
GSTP1		2	0.8	0.9	0.7
PSME1		6	1.2	0.9	1.0
ASAH1		2	0.9	0.9	0.8
HSPB1		7	1.8	0.9	1.6
PFN1		2	0.7	0.9	0.6
SFPQ		2	1.1	0.9	0.9
CAD		14	1.0	0.9	0.9
GDI2		4	3.4	0.9	2.9
MAP2K2	MAP2K2	3	0.9	0.9	0.8
GMDS	SDR3E1	2	1.3	0.9	1.1
PYGB		8	0.9	0.9	0.8
SSB		2	0.9	0.9	0.8
HSPE1		2	4.3	0.9	3.8
HADHA		9	0.8	0.9	0.7
CAPNS1		2	3.4	0.9	3.0
IPO7		3	1.3	0.9	1.1
PSMC3		8	1.3	0.9	1.1
EEF2		17	2.4	0.9	2.1
PYGB		8	1.4	0.9	1.2
MGMT		3	0.8	0.9	0.7
ERP29		2	1.5	0.9	1.3
UBA6		2	0.8	0.9	0.7
ADH5		8	0.9	0.9	0.8
P4HA1	P4HA1	4	1.3	0.9	1.1
RPL12		2	1.2	0.9	1.1
PPP2R2A		3	1.0	0.9	0.9
LOXL3		4	0.9	0.9	0.8
NQO2		3	0.6	0.9	0.5
G6PD		2	0.7	0.9	0.6
MAP2K1	MAP2K1	2	0.8	0.9	0.7
AGL		49	1.1	0.9	1.0
BCAP31		2	0.8	0.9	0.7
SEC13		3	1.1	0.9	1.0
FECH		27	1.0	0.9	0.9
ACTN4		2	0.7	0.9	0.6
PPIB		4	0.7	0.9	0.6
CCT8		4	0.8	0.9	0.7
SEC61A1		5	0.9	0.9	0.8
HSPA9		14	1.2	0.9	1.1
PRDX2		3	1.8	0.9	1.6
PRMT1	PRMT1	5	1.4	0.9	1.3
ITGB1		3	1.5	0.9	1.4
NQO1		8	0.9	0.9	0.8
LDHA		11	0.9	0.9	0.8
GBE1		8	1.3	0.9	1.2
PDIA4		4	2.9	0.9	2.6
ATP5B		8	0.9	0.9	0.8
PLD3		5	1.2	0.9	1.1
PRDX1		7	0.9	0.9	0.8
MAP2K2	MAP2K2	3	1.1	0.9	0.9

ACTB		7	1.8	0.9	1.6
DYNLL1		3	0.7	0.9	0.6
OPA1		5	0.9	0.9	0.8
ZC3H11A		3	1.2	0.9	1.1
SEC23A		6	1.0	0.9	0.9
ARF4		4	1.9	0.9	1.7
SEH1L		3	1.1	0.9	1.0
PLOD1	PLOD1	4	1.0	0.9	0.9
BLVRB		2	1.0	0.9	0.9
KDEL2		4	1.2	0.9	1.1
PPP1CB		3	0.8	0.9	0.8
NUP155		4	1.2	0.9	1.1
CCT7		4	2.0	0.9	1.8
MCCC2		10	1.0	0.9	0.9
SERPINB6		4	0.9	0.9	0.8
ZC3H8		3	1.3	0.9	1.2
RPS27A		4	0.8	0.9	0.7
CAPN1		2	0.8	0.9	0.7
ATP5B		9	1.4	0.9	1.3
QARS		2	1.3	0.9	1.2
HSPD1		16	0.8	0.9	0.7
KTN1		3	1.2	0.9	1.1
CAP1		3	0.7	0.9	0.6
AHCY		7	1.1	0.9	1.0
VCP		6	1.9	0.9	1.7
DYNC1H1		21	1.2	0.9	1.1
PDE10A		7	1.0	0.9	0.9
PRDX6		7	0.9	0.9	0.8
RPSA		3	1.3	0.9	1.2
ISOC2		6	0.9	0.9	0.8
ALDH7A1		7	1.0	0.9	0.9
ACADVL		8	1.3	0.9	1.2
ERGIC1		4	1.0	0.9	0.9
NQO1		8	1.2	0.9	1.1
DYNC112		2	0.9	0.9	0.8
PCCA		28	1.2	0.9	1.1
DLD		2	0.4	0.9	0.4
TNPO3		2	1.0	0.9	0.9
HSPA1A		8	0.9	0.9	0.8
EEF2		16	0.8	0.9	0.7
SERPINH1		17	0.8	0.9	0.8
UBA1		9	2.4	0.9	2.2
DJ-1		3	1.6	0.9	1.5
C3ORF21		9	1.0	0.9	1.0
SRP14		2	2.4	0.9	2.2
APOBEC3C		2	0.8	0.9	0.8
MYH9		23	1.0	0.9	0.9
AURKB	AurB	2	0.5	0.9	0.5
TUBA1A		27	1.0	0.9	1.0
ADH5		6	1.1	0.9	1.0
CAPZB		2	0.9	0.9	0.8
RPL11		2	1.2	0.9	1.1
CTNND1		2	0.8	0.9	0.8
FASN	SDR27X1	19	0.9	0.9	0.9
VCP		5	0.7	0.9	0.6
ACLY		3	1.1	0.9	1.0
NQO2		4	1.1	0.9	1.0
ACOX1		7	1.0	0.9	0.9
TCP1		3	0.8	0.9	0.7
PCBP1		6	0.8	0.9	0.8
HEXB		9	1.1	0.9	1.0
KIAA0368		2	1.0	0.9	1.0
MUTED		3	0.8	0.9	0.7

ADK		2	0.8	0.9	0.7
HSP90AB1		11	0.8	0.9	0.7
SIRT3	SIR3	5	1.1	0.9	1.0
MAP2K1	MAP2K1	2	0.9	0.9	0.9
PFN2		7	1.0	0.9	0.9
NME1-NME2		13	0.9	0.9	0.9
FN3KRP		15	1.0	0.9	1.0
C21ORF33		2	1.1	0.9	1.0
PSME2		11	0.9	0.9	0.8
GCDH		14	1.0	0.9	0.9
CAND1		2	2.0	0.9	1.9
TIMM50		2	0.8	0.9	0.8
FLAD1		14	1.1	0.9	1.0
IPO5		14	0.8	0.9	0.8
SPTBN1		4	1.1	0.9	1.1
EPRS		7	1.3	0.9	1.2
CLTC		30	1.0	0.9	1.0
MYH9		21	1.3	0.9	1.3
CDC42		2	0.9	0.9	0.9
NME4		12	1.0	0.9	0.9
HSPB1		7	0.9	0.9	0.8
PKM2		17	0.8	0.9	0.7
KIAA1618		4	1.1	0.9	1.0
SDHA		3	1.1	0.9	1.0
LGALS3BP		10	1.0	0.9	1.0
PFKP		8	1.3	0.9	1.3
DCK		17	1.0	0.9	1.0
FN3KRP		18	1.0	0.9	1.0
ALDH1B1		19	1.0	0.9	0.9
RRBP1		3	1.3	0.9	1.3
ERP29		3	0.8	0.9	0.7
RAB1A		2	1.6	0.9	1.6
KHSRP		8	0.9	0.9	0.9
SSBP1		5	1.1	0.9	1.0
CLTC		22	1.1	1.0	1.1
AIP		2	0.6	1.0	0.5
C7ORF27		2	0.7	1.0	0.6
RPSA		2	1.0	1.0	1.0
DYNLL1		4	0.9	1.0	0.9
TUBB2B		4	0.8	1.0	0.8
CNN3		3	0.9	1.0	0.8
MYD88		2	1.0	1.0	1.0
SPR	SDR38C1	4	0.9	1.0	0.8
ZAK	ZAK	6	0.9	1.0	0.9
RPS27A		2	1.8	1.0	1.7
NME1-NME2		14	1.1	1.0	1.0
CMBL		7	0.9	1.0	0.8
KARS		2	0.9	1.0	0.8
CSNK1E	CK1e	11	0.8	1.0	0.8
KPNB1		5	0.8	1.0	0.8
COL11A1		12	1.3	1.0	1.2
RPLP0-LIKE		2	0.8	1.0	0.7
ERGIC1		3	1.0	1.0	1.0
PDXK		28	0.9	1.0	0.9
TMED10		2	1.3	1.0	1.3
DNAJC10		24	0.8	1.0	0.8
PLOD1	PLOD1	4	1.3	1.0	1.2
ARAF	ARAF	2	0.6	1.0	0.5
PSMD2		3	1.3	1.0	1.3
SEC61A1		7	1.2	1.0	1.1
TPM3		2	2.0	1.0	1.9
CSE1L		5	1.2	1.0	1.2
EML4		10	0.7	1.0	0.7

CSNK2A2	CK2a2	2	0.5	1.0	0.5
ARL1		2	0.8	1.0	0.8
ALDH1B1		15	1.0	1.0	0.9
KHSRP		6	1.2	1.0	1.2
DHFR		18	1.0	1.0	1.0
FLNA		23	1.3	1.0	1.3
MTHFD1		2	0.8	1.0	0.7
DHFR		16	1.0	1.0	0.9
CSNK2A1	CK2a1	2	0.5	1.0	0.5
XPO1		5	1.1	1.0	1.1
GCDH		14	1.0	1.0	1.0
HPD		2	2.1	1.0	2.1
AIP		2	1.0	1.0	1.0
HNRNPF		3	0.9	1.0	0.9
FBXO22		5	0.9	1.0	0.9
NME3		3	1.0	1.0	1.0
AIFM2		3	1.0	1.0	1.0
PDE10A		6	0.9	1.0	0.9
PC		43	1.0	1.0	1.0
FLNA		23	0.9	1.0	0.9
PLAA		2	1.4	1.0	1.3
RIOK2	RIOK2	5	0.6	1.0	0.6
ECH1		4	1.5	1.0	1.4
STOML2		2	0.6	1.0	0.6
ATP2A2		2	1.3	1.0	1.2
TXN		4	1.1	1.0	1.1
VIM		3	0.8	1.0	0.7
GAK	GAK	2	0.4	1.0	0.4
SPR	SDR38C1	2	0.9	1.0	0.8
CMBL		8	1.1	1.0	1.1
COL11A1		13	1.0	1.0	0.9
PLD3		4	1.1	1.0	1.0
DDX1		2	0.6	1.0	0.6
MKRN2		5	0.9	1.0	0.9
C3ORF21		9	0.8	1.0	0.8
DNAJC10		17	0.8	1.0	0.8
FER	FER	2	0.7	1.0	0.6
TUBA1A		27	0.8	1.0	0.8
LOC284889		2	1.0	1.0	1.0
XPO5		5	1.1	1.0	1.1
RUVBL1		2	0.9	1.0	0.9
C21ORF33		2	1.0	1.0	1.0
ALDH2		19	0.9	1.0	0.9
CTSB		3	0.9	1.0	0.9
NME3		4	1.0	1.0	1.0
HSDL2	SDR13C1	2	1.0	1.0	1.0
ALDH2		26	0.9	1.0	0.9
RPS19		3	1.8	1.0	1.7
ADSS		6	0.7	1.0	0.7
S100A11		3	3.3	1.0	3.3
PCBP2		3	1.3	1.0	1.3
DBN1		2	0.9	1.0	0.9
SLC25A3		5	1.0	1.0	1.0
TFRC		4	0.8	1.0	0.8
RUVBL2		3	0.7	1.0	0.6
PSMA2		2	0.8	1.0	0.8
HEXB		5	0.8	1.0	0.8
HSDL2	SDR13C1	2	1.1	1.0	1.1
DJ-1		3	0.8	1.0	0.8
MTHFD1		3	1.4	1.0	1.4
CTSD		3	1.3	1.0	1.3
ACLY		4	1.0	1.0	1.0
TARBP1	TARBP1	5	1.1	1.0	1.1

ACADVL		10	0.9	1.0	0.9
NEK9	NEK9	44	0.8	1.0	0.8
EEF1A1		10	0.8	1.0	0.8
CCT4		3	0.7	1.0	0.7
DYNC1H1		23	1.0	1.0	1.0
IPO5		8	1.1	1.0	1.1
EZR		2	0.5	1.0	0.5
HNRNPA2B1		2	1.1	1.0	1.1
MUTED		4	1.8	1.0	1.8
CBR1	SDR21C1	5	0.8	1.0	0.8
PSMA6		3	2.0	1.0	2.1
AURKA	AurA	11	0.8	1.0	0.8
RPN1		11	0.9	1.0	0.9
ATP5H		2	0.6	1.0	0.6
EPDR1		8	0.9	1.0	0.9
AHNAK		3	1.2	1.0	1.2
USP5		2	1.5	1.0	1.5
TAOK1	TAO1	3	0.6	1.0	0.6
EPRS		6	0.9	1.0	0.9
SEC13		4	0.7	1.0	0.8
AAK1	AAK1	3	1.1	1.0	1.1
PRKG1	PKG1	2	1.1	1.0	1.1
FBXO22		5	1.1	1.0	1.1
PSME1		8	0.9	1.0	1.0
TXNRD1		5	0.8	1.0	0.9
GART		28	1.0	1.0	1.0
GANAB		2	2.0	1.0	2.0
ATP5A1		10	0.9	1.0	0.9
HNRNPH1		3	0.9	1.0	0.9
DCK		19	1.0	1.0	1.0
HSPA5		20	0.7	1.0	0.7
UGCG1		11	1.0	1.0	1.1
ACOX1		7	1.3	1.0	1.3
HADHB		3	1.2	1.0	1.3
HSPA9		11	0.7	1.0	0.7
SKP1		3	0.8	1.0	0.8
DCTN1		2	1.1	1.0	1.1
FAM62A		3	0.5	1.0	0.5
HSPA8		20	0.8	1.0	0.8
CBR1	SDR21C1	4	1.2	1.0	1.2
MON2		3	1.7	1.0	1.8
PCBP1		5	1.1	1.0	1.1
SPTAN1		10	1.1	1.0	1.1
SLC25A6		2	0.9	1.0	0.9
GCN1L1		9	1.3	1.0	1.3
ISOC2		4	1.1	1.0	1.2
LOXL3		5	1.2	1.0	1.2
FSCN1		4	1.8	1.0	1.9
GMPS		2	0.7	1.0	0.7
PFKP		15	0.9	1.0	0.9
PPP2R1A		5	0.9	1.0	0.9
AURKA	AurA	15	0.8	1.0	0.9
HEBP1		4	0.8	1.0	0.8
TUBB2C		2	0.7	1.0	0.8
DYNC1LI1		2	0.9	1.0	0.9
FLAD1		14	0.8	1.0	0.8
LGALS3BP		7	1.0	1.0	1.0
PHB2		4	0.9	1.0	0.9
PCBD1		3	0.9	1.0	1.0
NME4		12	1.0	1.0	1.0
GEMIN4		3	1.0	1.0	1.0
EIF4A1		2	0.6	1.0	0.6
PC		42	1.1	1.0	1.2

FSCN1		2	0.7	1.0	0.7
SPG20		2	0.8	1.0	0.8
GALC		4	0.9	1.0	1.0
AGL		44	1.0	1.0	1.0
MCCC2		10	0.9	1.0	0.9
PCCA		22	0.9	1.0	1.0
TXNDC4		4	0.8	1.0	0.9
CAPN1		2	1.3	1.0	1.4
KDEL2		4	0.9	1.0	0.9
S100A4		2	1.2	1.0	1.3
HERC4		3	0.9	1.1	0.9
RPL11		2	0.7	1.1	0.8
CARM1	PRMT4	3	1.0	1.1	1.1
AURKB	AurB	2	0.6	1.1	0.6
MEMO1		2	0.8	1.1	0.9
PEF1		4	0.8	1.1	0.9
PRKDC	DNAPK	39	1.0	1.1	1.0
GCS1		2	1.5	1.1	1.6
CRKL		2	0.8	1.1	0.8
MAT2A		2	0.8	1.1	0.9
MAPK14	p38a	2	0.6	1.1	0.7
RAB10		2	0.9	1.1	1.0
PFN2		3	0.7	1.1	0.8
PCCB		12	1.1	1.1	1.2
RIPK2	RIPK2	3	0.8	1.1	0.9
PI4K2A	PIK4C2A	5	1.0	1.1	1.1
ZC3H11A		5	1.0	1.1	1.0
XPOT		2	1.0	1.1	1.1
PARS2		2	0.8	1.1	0.8
TUBB		4	0.8	1.1	0.8
UGCG1		13	1.0	1.1	1.0
NUMA1		5	0.9	1.1	0.9
MSRB3		2	1.0	1.1	1.1
HSP90AA1		7	0.8	1.1	0.8
PYGL		2	0.5	1.1	0.5
LIMK1	LIMK1	3	0.8	1.1	0.9
FASN	SDR27X1	22	1.2	1.1	1.3
NUP155		6	0.9	1.1	1.0
TIMM50		2	0.9	1.1	1.0
CCT5		4	0.8	1.1	0.8
SPTBN1		8	1.1	1.1	1.2
KIAA1618		3	0.9	1.1	1.0
GART		39	1.0	1.1	1.1
COPB1		4	1.0	1.1	1.1
PI4K2B	PIK4C2B	11	0.8	1.1	0.9
MAPK3	Erk1	2	1.1	1.1	1.2
SKP1		3	1.0	1.1	1.1
PCCB		16	1.0	1.1	1.0
CCT2		3	0.7	1.1	0.7
UBE2L6		6	0.9	1.1	1.0
MKRN2		7	1.0	1.1	1.1
PSMC5		2	1.6	1.1	1.8
APRT		3	1.0	1.1	1.1
TUBB		4	1.2	1.1	1.3
ZC3H8		2	0.8	1.1	0.9
CPNE3		2	0.8	1.1	0.9
CTPS		3	1.3	1.1	1.4
HNRNPA2B1		3	0.9	1.1	1.0
ARF3		3	0.7	1.1	0.8
XPO1		2	0.8	1.1	0.9
HSD17B4	SDR8C1	3	0.8	1.1	0.9
CSNK2A1	CK2a1	2	0.2	1.1	0.2
OAT		3	0.7	1.1	0.8

GCN1L1		14	0.8	1.1	0.9
CAD		11	1.0	1.1	1.2
TK1		2	0.8	1.1	0.9
CCT6A		3	0.8	1.1	0.9
DDX3X		6	0.8	1.1	0.9
LIMK1	LIMK1	2	0.8	1.1	0.9
KCTD7		3	1.1	1.1	1.2
OPA1		7	0.9	1.1	1.0
ALDH18A1		2	0.7	1.1	0.8
CARM1	PRMT4	2	0.9	1.1	1.0
SIRT2	SIR2	3	0.8	1.1	0.9
PLAA		3	0.7	1.1	0.8
SURF4		4	0.9	1.1	1.0
PAICS		4	0.6	1.1	0.7
HINT1		3	1.1	1.1	1.2
NONO		2	0.7	1.1	0.8
PYGL		3	1.4	1.1	1.6
P4HA1	P4HA1	4	0.6	1.1	0.7
MCM3		3	0.6	1.1	0.7
IPO4		3	0.7	1.1	0.8
MAPK3	Erk1	2	0.8	1.1	0.9
PI4KA	PIK4Ca	2	0.7	1.1	0.8
INF2		2	0.7	1.2	0.8
TRIM5		2	0.8	1.2	0.9
NT5DC2		3	0.9	1.2	1.1
TUBB2B		5	1.1	1.2	1.3
HMGCL		2	0.9	1.2	1.1
S100A6		2	1.2	1.2	1.4
PFKL		8	1.0	1.2	1.2
PDE12		6	1.0	1.2	1.1
PMPCB		2	1.1	1.2	1.3
ANXA2		5	0.7	1.2	0.9
PSMA1		2	0.7	1.2	0.9
TXNRD1		3	1.0	1.2	1.2
MYD88		3	0.7	1.2	0.9
PRKACA	PKACa	2	1.3	1.2	1.6
LOC284889		3	1.2	1.2	1.4
SPTAN1		10	0.9	1.2	1.0
MAPK1	Erk2	11	0.7	1.2	0.8
RPS6KA4	MSK2	3	0.5	1.2	0.6
PSMD1		2	0.5	1.2	0.6
CAPZA1		2	0.8	1.2	1.0
NT5DC2		4	0.6	1.2	0.8
LPCAT1		3	0.9	1.2	1.1
LATS1	LATS1	2	0.7	1.2	0.9
LPCAT1		2	0.9	1.2	1.0
CTSD		3	0.9	1.2	1.0
DYNLT1		2	1.6	1.2	2.0
RAB18		3	0.9	1.2	1.1
SEC24C		2	1.2	1.2	1.4
SLC25A5		4	1.2	1.2	1.4
PTK7	CCK4	2	1.7	1.2	2.0
DNPEP		5	0.9	1.2	1.0
ZC3HAV1L		2	0.7	1.2	0.8
ATAD3A		2	0.9	1.3	1.1
ATP2A2		2	1.2	1.3	1.5
GBA		2	0.8	1.3	1.0
DNPEP		6	1.0	1.3	1.3
NCKAP1		2	1.2	1.3	1.5
ZW10		2	0.7	1.3	0.9
MAPK1	Erk2	9	0.6	1.3	0.7
PSMD2		5	0.7	1.3	0.8
QARS		3	1.2	1.3	1.6

ACAD10		6	0.6	1.3	0.8
IAH1		2	1.0	1.3	1.2
TRIM25		2	0.8	1.3	1.0
CNN2		2	0.7	1.3	0.9
PRKAG1		15	0.6	1.3	0.7
ACAD10		7	0.8	1.3	1.1
NUFIP2		2	1.7	1.3	2.2
FBXO21		2	0.8	1.3	1.1
GAK	GAK	2	0.4	1.3	0.5
DPYSL2		4	0.5	1.3	0.7
AAK1	AAK1	14	0.4	1.3	0.6
HIPK2	HIPK2	2	0.6	1.3	0.8
ULK3	ULK3	8	0.6	1.3	0.8
PRKG1	PKG1	2	0.7	1.3	0.9
STAT3		4	0.5	1.3	0.6
EML2		2	0.8	1.3	1.1
CCT7		3	0.9	1.3	1.2
RAB5C		2	1.0	1.4	1.4
PSMB1		2	0.8	1.4	1.0
HEBP1		2	1.0	1.4	1.4
ATP6V1H		2	0.3	1.4	0.5
IPO4		4	1.0	1.4	1.4
GPI		2	0.9	1.4	1.2
ADRM1		2	1.1	1.4	1.6
TIAL1		2	0.7	1.4	1.0
SF3B1		3	1.3	1.4	1.8
CAMK1	CaMK1a	2	0.4	1.4	0.6
RPN2		2	0.6	1.4	0.9
PRKAA1	AMPKa1	6	0.7	1.4	1.0
CSNK2A2	CK2a2	2	0.6	1.4	0.8
PCBD1		5	1.1	1.4	1.6
CDK5	CDK5	2	0.3	1.4	0.4
CKAP4		2	1.0	1.5	1.4
C12ORF10		2	0.7	1.5	1.0
KIAA1524		2	1.9	1.5	2.7
RPS6KA4	MSK2	2	0.6	1.5	0.9
KIAA0664		2	0.7	1.5	1.1
FER	FER	2	0.6	1.5	1.0
LRRC59		2	0.7	1.5	1.0
DARS		2	1.0	1.6	1.5
USP5		2	0.8	1.6	1.3
PRKAB1		2	0.5	1.6	0.7
FGFR1	FGFR1	2	0.3	1.6	0.4
MSH2		3	1.1	1.6	1.8
PRKAG1		13	0.3	1.6	0.5
RPA2		2	1.0	1.6	1.7
RPS6KA1	RSK3	20	0.1	1.6	0.1
GSK3B	GSK3B	12	0.5	1.7	0.8
NAGLU		3	1.0	1.7	1.0
RPS6KA1	RSK3	22	0.2	1.7	0.3
PRKAA1	AMPKa1	5	0.3	1.8	0.5
PSMC3		3	1.3	1.9	2.4
NUMA1		3	1.0	2.0	1.9
ACAD11		7	0.4	2.0	0.9
GSK3A	GSK3A	10	0.4	2.1	0.9
ACAD11		3	0.2	2.3	0.5
DSG1		2	1.1	2.3	2.4
HIPK2	HIPK2	2	0.2	2.6	0.6
GSK3A	GSK3A	10	0.1	2.8	0.4
ULK3	ULK3	9	0.3	2.9	0.9
RPS6KA3	RSK2	34	0.2	3.0	0.5
GSK3B	GSK3B	12	0.2	3.0	0.6
RPS6KA3	RSK2	30	0.1	3.1	0.2

MAPK9	JNK2	14	0.1	4.2	0.4
MAPK9	JNK2	13	0.1	4.5	0.6
MAPK8	JNK1	6	0.1	4.9	0.4
MAPK8	JNK1	4	0.1	5.0	0.7

Table S4. Dose-response profiling data with compounds 2 and 43 in A204 cells using probe N.

Compound	Protein	Synonym	IC ₅₀	Hill Slope
43	MAPK8	JNK1	0.02	0.74
43	MAPK9	JNK2	0.04	0.84
43	RPS6KA3	RSK2	0.04	0.87
43	FKBP10		0.05	0.71
43	RPS6KA1	RSK3	0.08	0.96
2	RPS6KA1	RSK3	0.11	0.71
43	CSNK2B		0.21	0.54
43	PRKAA1	AMPKa1	0.25	0.83
2	RPS6KA3	RSK2	0.28	0.81
43	PRKAB1		0.37	0.78
2	TAOK3	TAO3	0.39	0.69
2	EIF3J		0.40	1.02
43	EIF3J		0.42	0.69
2	LAGE3		0.45	1
43	TP53RK	PRPK	0.48	0.55
43	CSNK2A2	CK2a2	0.48	1.14
43	ACAD11		0.54	1.19
43	EML2		0.55	0.8
43	GSK3B	GSK3B	0.61	1.04
43	PRKAG1		0.63	0.95
2	OSGEP		0.72	0.91
43	ULK3	ULK3	0.73	0.95
43	LAGE3		0.75	0.66
43	CSNK2A1	CK2a1	0.76	0.86
2	TP53RK	PRPK	0.78	1.15
2	CSNK2A1	CK2a1	0.82	0.73
43	GSK3A	GSK3A	0.84	0.93
2	MAPK8	JNK1	0.84	0.96
2	TPRKB		0.84	1.13
2	CSNK2B		0.85	0.85
2	EML2		1.00	0.59
43	AAK1	AAK1	1.03	0.54
43	MAPK1	Erk2	1.06	1
2	RPS6KA4	MSK2	1.32	0.52
2	EML4		1.57	0.81
2	PRKAG1		1.62	0.66
2	PRKAA1	AMPKa1	1.88	0.95
2	MAPK9	JNK2	1.88	0.72
2	AAK1	AAK1	1.90	0.73
43	HIPK2	HIPK2	1.93	1.11
43	CAMK2G	CaMK2g	2.03	1
2	NEK9	NEK9	2.14	0.84
2	MAPK1	Erk2	2.22	0.58
2	ACAD11		2.36	1.07
2	CSNK1E	CK1e	2.37	0.68
2	CSNK1A1	CK1a	2.57	1
2	PI4K2B	PIK4C2B	2.60	0.77
43	TPRKB		2.77	0.81
2	PRKAB1		2.79	0.68
2	GSK3A	GSK3A	2.98	0.92
2	RIOK2	RIOK2	2.98	0.8
43	OSGEP		3.09	0.78
43	EML4		3.15	1.04
43	PTK2	FAK	3.16	1.06
43	EML2		3.31	1.33
2	HIPK2	HIPK2	3.38	1
43	RIOK2	RIOK2	3.43	1
2	CAMK2G	CaMK2g	3.50	1

2	PDXK		4.23	0.83
43	NEK9	NEK9	4.28	0.93
2	GSK3B	GSK3B	4.85	1
2	ULK3	ULK3	5.07	0.64
2	PI4KA	PIK4Ca	5.29	1
43	TAOK3	TAO3	6.57	1.4
43	MAPK3	Erk1	6.81	1.04
2	CAMK2D	CaMK2d	7.49	1
2	ARF4		8.05	0.56
43	PDXK		8.74	2.48
2	TBK1	TBK1	10	0
2	DDX1		10	1
2	VDAC3		10	1
2	ENTPD4		10	1
2	CBR1	SDR21C1	10	1
2	CTSB		10	0
2	COPB1		10	1
2	PRKDC	DNAPK	10	0
2	GBE1		10	1
2	ACOX1		10	1
2	DDOST		10	1
2	STT3A		10	1
2	CCT2		10	0
2	PTK7	CCK4	10	0
2	TARBP1	TARBP1	10	0
2	DJ-1		10	1
2	AURKA	AurA	10	0.9
2	XPO1		10	1
2	TMEM33		10	1
2	PDIA6		10	0
2	FARSB		10	0.65
2	SSR1		10	1
2	CAD		10	1
2	SKP1		10	1
2	BOLA2		10	0.59
2	CCT4		10	1
2	ATP5B		10	0
2	NONO		10	1
2	HSPA1A		10	1
2	SDHA		10	1
2	XPOT		10	1
2	PRDX1		10	1
2	EEF1G		10	1
2	GCN1L1		10	0
2	KPNB1		10	1
2	HSPA5		10	1
2	MAP2K2	MAP2K2	10	1
2	HSPA8		10	0.65
2	HNRNPF		10	1
2	PYGB		10	1
2	CRKL		10	2.17
2	KARS		10	0.81
2	AGL		10	1
2	KTN1		10	0
2	UBE2L6		10	0
2	ZAK	ZAK	10	1
2	FLNA		10	1
2	STOML2		10	1
2	HSP90AA1		10	1
2	CMBL		10	0
2	Q9UDG2_HUMAN		10	0
2	PSME2		10	1
2	ACLY		10	1

2	EEF1A1		10	1
2	RARS		10	1
2	U2AF1		10	0
2	HDAC6	HDAC6	10	1
2	SURF4		10	0.86
2	LATS1	LATS1	10	1
2	CAPZA1		10	1
2	ALDH2		10	2.46
2	SLC25A5		10	0.67
2	IPO7		10	1
2	TUBB2C		10	1
2	HSPA9		10	0.63
2	MARS		10	1
2	RPS5		10	0
2	UNC93B1		10	1
2	PABPC1		10	1
2	IPO4		10	1
2	RPSA		10	1
2	HSP90AB1		10	0
2	VIM		10	0
2	TIMM50		10	0
2	IAH1		10	1
2	ATP5A1		10	1
2	TTC7B		10	1
2	DYNC1H1		10	0
2	TPI1		10	0
2	RPLP2		10	1
2	GALC		10	1
2	RAB1B		10	1.43
2	PTPLAD1		10	0.65
2	RUVBL2		10	1
2	SSR3		10	1
2	PFKP		10	1
2	IMMT		10	1
2	MAT2A		10	1
2	DECR2	SDR17C1	10	1
2	ACOT7		10	1
2	CCT5		10	1
2	P4HB		10	2.22
2	CSNK1D	CK1d	10	0.9
2	CTSD		10	0
2	DSTN		10	1
2	RAB18		10	1
2	HNRNPH1		10	1
2	KHSRP		10	1
2	MSRB3		10	0
2	FECH		10	1
2	PPP2R1A		10	1
2	NME1-NME2		10	1
2	SIRT3	SIR3	10	1
2	XPO5		10	0
2	YES1	YES	10	2.36
2	RPS3		10	1
2	HNRPDL		10	1
2	LOXL3		10	1
2	TUBB		10	1.89
2	PRDX4		10	1
2	AHCY		10	1.79
2	CFL1		10	1
2	NQO1		10	1
2	NME3		10	1
2	HEXB		10	1
2	MCM3		10	1

2	EPRS		10	1
2	S100A11		10	0
2	GNB2L1		10	1
2	EEF1D		10	1
2	TKT		10	1
2	IARS		10	0.74
2	PPIB		10	1
2	NUDT21		10	1
2	EPDR1		10	1
2	TPR		10	0
2	MYO1C		10	0
2	DYNC112		10	0
2	PLEC1		10	0
2	RAB5C		10	1
2	PCBP1		10	1
2	SEC23A		10	1
2	SPR	SDR38C1	10	1
2	GPD2		10	1
2	MAPK3	Erk1	10	1
2	PEF1		10	1
2	MCM5		10	0
2	PSMC3		10	1
2	CCT7		10	0
2	ADH5		10	1
2	ACAD8		10	0
2	PSME1		10	1
2	CRTAP		10	1
2	DUT		10	1
2	NT5DC2		10	1
2	MCCC2		10	0
2	CCT8		10	1
2	HSPD1		10	1
2	PFKL		10	0.93
2	STAT3		10	1.73
2	MYL6		10	0
2	TK1		10	0
2	PHB		10	1
2	RAN		10	0.89
2	IPO5		10	1
2	PRMT1	PRMT1	10	1
2	DYNLL1		10	1.35
2	SSR4		10	1
2	DYNLT1		10	0
2	MYH9		10	0
2	RAB11B		10	1
2	DCK		10	1
2	RUVBL1		10	1
2	LMNA		10	1
2	RTN4		10	1
2	AHNAK		10	0
2	CSTB		10	1
2	RIPK2	RIPK2	10	1
2	SLC25A3		10	0.95
2	MTHFD1		10	1
2	ALDOA		10	1
2	PCBP2		10	1
2	DPM1		10	0.54
2	AURKB	AurB	10	1
2	RPS12		10	1
2	SEC13		10	0
2	NME4		10	1
2	SPTAN1		10	0
2	RPLP0-LIKE		10	1

2	SPTBN1		10	0
2	RPL7		10	0
2	OAT		10	1
2	TFRC		10	1
2	CSE1L		10	1
2	CDK5	CDK5	10	0
2	LGALS3BP		10	1
2	NAP1L1		10	0
2	CLTC		10	0
2	GCDH		10	1
2	UGCGL1		10	1
2	ERP29		10	0
2	PRDX3		10	1
2	RPL12		10	1
2	ECHS1		10	0
2	CNN3		10	1
2	HNRNPA2B1		10	1
2	ERGIC1		10	1
2	YWHAZ		10	0
2	TXNRD1		10	1
2	PI4KA	PIK4Ca	10	1
2	LOC654188		10	1
2	ACTB		10	1
2	CYFIP1		10	0
2	GART		10	1
2	PDCD6		10	1
2	HSPB1		10	0
2	RPN1		10	1
2	SF3B1		10	1
2	GSN		10	0
2	NUP155		10	1
2	QARS		10	1
2	FASN	SDR27X1	10	0
2	ADSS		10	1
2	ERLIN2		10	1
2	SRI		10	1
2	HSP90B1		10	2.47
2	PHB2		10	1
2	CCT6A		10	0.9
2	HEXA		10	1
2	VDAC2		10	1
2	ACADVL		10	1.39
2	CAMK1	CaMK1a	10	1
2	RPN2		10	0
2	MGP		10	0
2	ATP5F1		10	1
2	TRIM25		10	0
2	AKR1C1		10	1
2	SSBP1		10	0
2	GMDS	SDR3E1	10	1
2	PLOD3	PLOD3	10	1
2	CPSF6		10	1
2	TM9SF3		10	1.37
2	TUBB2B		10	1
2	HADHA		10	1
2	FARSA		10	2.43
2	CPT1A		10	1
2	SERPINH1		10	1
2	FN3KRP		10	1.58
2	ALDH1B1		10	1.96
2	PFN2		10	0
2	OPA1		10	1
2	CKAP4		10	1

2	KDELC2		10	1
2	HEBP1		10	0
2	GLT25D1		10	1
2	C3ORF21		10	1.85
2	MUTED		10	1
2	LPCAT1		10	1
2	HNRNPM		10	1
2	PDE12		10	1
2	RPS27A		10	0
2	TUBA1A		10	1.97
2	PEG3		10	1
2	FBXO22		10	1
2	PTBP1		10	1
2	EEF2		10	1
2	DDX3X		10	1
2	RPS19		10	1
2	PDE10A		10	1
2	TXN		10	1
2	HNRNPK		10	0
2	GFPT1		10	0
2	LDHA		10	1
2	LMNB1		10	0.54
2	SEC61A1		10	1
2	COL11A1		10	0
2	P4HA1	P4HA1	10	1
2	CAPZB		10	1
2	ATP2A2		10	1
2	RPL30		10	1
2	LGALS1		10	0
2	MAP2K1	MAP2K1	10	1
2	PSMA2		10	1
2	FLAD1		10	1
2	PRDX6		10	1.67
2	HINT1		10	0
2	TCP1		10	1
2	SLC25A6		10	1
2	IMPDH2		10	0.54
2	RAB14		10	1
2	NUMA1		10	0
2	DNAJC10		10	1
2	LOC284889		10	0
2	DDB1		10	1
2	HMGCL		10	1
43	MAP2K5	MAP2K5	10	0
43	EIF2AK4	GCN2	10	1
43	CSNK1A1	CK1a	10	1
43	YWHAE		10	1
43	SPTLC1		10	0
43	TUBB2C		10	1
43	UNC93B1		10	1
43	RUVBL2		10	0
43	IMMT		10	1
43	CCT5		10	1
43	SFPQ		10	0.69
43	PHGDH		10	0
43	CLTA		10	1
43	CHCHD3		10	1
43	GBAS		10	0
43	RAB5C		10	0
43	HSD17B10	SDR5C1	10	0
43	MCM5		10	1
43	SSR4		10	0
43	GBA		10	1

43	AHNAK		10	0.52
43	CSTB		10	1
43	OAT		10	0
43	PML		10	0
43	LPGAT1		10	0
43	ACADSB		10	1
43	PDCD6		10	0
43	GSN		10	0
43	QARS		10	2.28
43	ADSS		10	0
43	HEXA		10	0
43	ATP5F1		10	1.77
43	PLOD3	PLOD3	10	1
43	ACAT1		10	1
43	U2AF2		10	0
43	FARSA		10	0
43	CPT1A		10	1
43	SET		10	1
43	CPOX		10	1
43	KCTD6		10	0
43	LPCAT1		10	1
43	EEF1B2		10	1
43	RPS19		10	1
43	ARF4		10	1
43	GFPT1		10	0
43	LMNB1		10	0
43	CAPZB		10	0
43	LDHB		10	0
43	LGALS1		10	0
43	ARL1		10	0
43	PSMA2		10	1
43	ATP5H		10	1
43	DPYSL2		10	1
43	TCP1		10	0
43	RAB14		10	1
43	HMGCL		10	1
43	SDHB		10	1
43	CTSB		10	0
43	DDOST		10	1
43	PTK7	CCK4	10	0
43	DJ-1		10	0
43	FARSB		10	0
43	CCT4		10	0
43	RPL11		10	0
43	IPO4		10	0
43	ALDH9A1		10	0
43	NCL		10	0.57
43	FUBP1		10	1
43	GPSN2		10	1
43	ACOT9		10	0
43	HIST2H2BA		10	1
43	C7ORF27		10	0.54
43	DYNC1I2		10	1
43	ACAD8		10	0
43	CRTAP		10	0
43	MYL6		10	1
43	TK1		10	1
43	C14ORF166		10	0
43	MTHFD1		10	0
43	RPL10A		10	1
43	RRBP1		10	0
43	CNN3		10	0
43	YWHAZ		10	0

43	LOC650788		10	0
43	SLC25A22		10	0
43	MAP2K2	MAP2K2	10	1
43	HDAC6	HDAC6	10	0
43	SLC25A5		10	1
43	PPP2CA		10	1
43	RPS5		10	1
43	RPLP2		10	0
43	IQGAP1		10	1
43	MAT2A		10	0
43	CFL1		10	0
43	PSMD2		10	0
43	RPS7		10	0
43	ACTN4		10	0
43	DNPEP		10	1
43	DLD		10	1
43	LATS2	LATS2	10	1
43	SPR	SDR38C1	10	2.19
43	PSMC3		10	0
43	CCT7		10	0
43	DYNLL1		10	0.51
43	RAB11B		10	0
43	DLAT		10	2.41
43	FN3K		10	1
43	NAP1L1		10	0
43	ERP29		10	0
43	GART		10	1
43	HSPB1		10	0
43	ERLIN2		10	0
43	SRI		10	1
43	RPN2		10	1.78
43	MGP		10	1
43	HNRNPD		10	1
43	GMDS	SDR3E1	10	1
43	TM9SF3		10	1
43	KDELC2		10	0
43	HEBP1		10	1
43	MUTED		10	0
43	TXN		10	1
43	VDAC1		10	0
43	ITGB1		10	0
43	RPL22		10	1
43	ALDH7A1		10	1
43	IMPDH2		10	0
43	LOC284889		10	0
43	GBE1		10	0
43	STT3A		10	1
43	SKP1		10	1.89
43	NONO		10	0
43	XPOT		10	1
43	PDHA1		10	1
43	KTN1		10	0
43	ZAK	ZAK	10	0
43	FLNA		10	1
43	GANAB		10	0
43	TIMM50		10	1
43	MSRB3		10	1
43	SIRT3	SIR3	10	1
43	XPO5		10	1
43	EEF1D		10	0
43	IARS		10	1
43	MYO1C		10	1
43	RAN		10	1

43	AURKB	AurB	10	1
43	SEC13		10	0
43	RPL7		10	0
43	TXNRD1		10	1
43	VDAC2		10	0
43	CRKL		10	0
43	SURF4		10	2.04
43	PABPC1		10	1
43	RAB1B		10	0
43	TUBB		10	1
43	PRDX4		10	0
43	MCM3		10	0
43	PI4K2A	PIK4C2A	10	0
43	LMNA		10	0
43	CSE1L		10	0
43	SF3B1		10	0
43	NUP155		10	1
43	CCT6A		10	1
43	CPSF6		10	2.32
43	TUBB2B		10	1
43	RPS27A		10	0
43	FBXO22		10	0
43	HNRNPK		10	1
43	RPL30		10	1
43	MAP2K1	MAP2K1	10	0
43	SLC25A6		10	0
43	SDHA		10	0
43	CARM1	PRMT4	10	0
43	PPIB		10	0
43	PCBP2		10	0
43	SPTBN1		10	0
43	KPNB1		10	0
43	CAPZA1		10	0
43	IPO7		10	1
43	CTSD		10	0
43	NME3		10	1.33
43	PEF1		10	1
43	PRMT1	PRMT1	10	0
43	RUVBL1		10	1
43	UGCGL1		10	0
43	CSNK1E	CK1e	10	0.61
43	DDX3X		10	1
43	ATP2A2		10	1
43	HINT1		10	1
43	ENTPD4		10	1
43	PDIA6		10	0
43	IAH1		10	0
43	DSTN		10	0
43	PHB		10	1
43	HNRNPA2B1		10	0
43	LOC654188		10	0
43	HNRNPF		10	1.29
43	DECR2	SDR17C1	10	1
43	PLEC1		10	0
43	PCBP1		10	0
43	PTBP1		10	0
43	P4HA1	P4HA1	10	0
43	COPB1		10	0
43	UBE2L6		10	1
43	CMBL		10	1.59
43	HNRNPH1		10	0
43	PPP2R1A		10	1
43	GNB2L1		10	1

43	NUDT21		10	0
43	MCCC2		10	0
43	PRDX1		10	0
43	LOXL3		10	1
43	NQO1		10	1
43	EPRS		10	0
43	LGALS3BP		10	0
43	RPL12		10	1
43	SSBP1		10	0
43	LDHA		10	0
43	SEC61A1		10	1
43	PRDX6		10	0
43	CAD		10	0
43	KARS		10	0
43	RPSA		10	1
43	HSP90AB1		10	0
43	EPDR1		10	1
43	ADH5		10	0.94
43	NT5DC2		10	1
43	PFKL		10	1
43	IPO5		10	0
43	ACTB		10	0
43	PYGB		10	0.63
43	FASN	SDR27X1	10	1
43	PEG3		10	1
43	XPO1		10	1
43	PSME1		10	1.56
43	SPTAN1		10	0
43	ERGIC1		10	1.9
43	GCN1L1		10	0
43	AHCY		10	0.82
43	HEXB		10	1
43	MYH9		10	0
43	ACADVL		10	0
43	AKR1C1		10	0
43	SERPINH1		10	0
43	CKAP4		10	0
43	PI4K2B	PIK4C2B	10	1
43	RPLP0-LIKE		10	0
43	EEF1G		10	0
43	PHB2		10	0
43	ACOX1		10	0
43	ATP5B		10	1
43	HSPA1A		10	1
43	ATP5A1		10	1
43	HSPA9		10	1
43	RIPK2	RIPK2	10	1
43	SLC25A3		10	0
43	GCDH		10	0.79
43	RPN1		10	0
43	HADHA		10	1
43	PI4KA	PIK4Ca	10	1.64
43	OPA1		10	0
43	PDE12		10	1
43	HSPD1		10	0
43	DCK		10	1
43	EEF2		10	0
43	PSME2		10	0
43	P4HB		10	0
43	PFKP		10	0
43	ACLY		10	1
43	KHSRP		10	0
43	NME4		10	0.86

43	NME1-NME2		10	1
43	C3ORF21		10	1
43	PDE10A		10	0
43	ALDH2		10	1
43	FN3KRP		10	0.66
43	EEF1A1		10	1
43	ALDH1B1		10	2.5
43	COL11A1		10	0
43	FLAD1		10	0.54
43	DNAJC10		10	1
43	AURKA	AurA	10	1
43	HSPA8		10	1
43	DYNC1H1		10	1
43	TUBA1A		10	2.04
43	HSPA5		10	1
43	FECH		10	0
43	AGL		10	0
43	VIM		10	0
43	CLTC		10	0
43	PRKDC	DNAPK	10	1

Table S5. Dose-response profiling data with compounds 2 and 43 in A204 cells using kinobead protocol¹⁹.

Compound	Protein	Synonym	Quant. Unique Peptides	IC ₅₀	Hill Slope
43	RPS6KA3	RSK2	11	0.027	0.79
43	RPS6KA1	RSK3	8	0.028	0.85
43	MAPK8	JNK1	8	0.042	0.77
2	RPS6KA1	RSK3	7	0.052	0.78
43	MAPK9	JNK2	7	0.059	0.74
2	RPS6KA3	RSK2	11	0.149	0.79
43	CSNK2A2	CK2a2	8	0.228	1.03
43	RPS6KA4	MSK2	9	0.233	0.99
43	CDK5	CDK5	10	0.319	0.85
43	CSNK2B	CSNK2B	5	0.344	1.17
43	CDK2	CDK2	7	0.398	1.02
2	CSNK2B	Csnk2b	5	0.429	0.73
43	CSNK2A1	CK2a1	5	0.671	0.7
43	CDK9	CDK9	5	0.723	1.15
43	CDK7	CDK7	7	0.734	1.09
2	CSNK2A2	CK2a2	7	0.761	1.03
43	PRKAA1	AMPKa1	9	1.142	0.84
2	CSNK1G1	CK1g1	2	1.258	1.24
2	CSNK2A1	CK2a1	4	1.26	0.8
43	TTK	TTK	1	1.655	0.99
43	ULK3	ULK3	10	1.959	0.81
2	PRKCD	PKCd	5	2.213	1
43	JAK1	JAK1	9	2.253	1.17
2	TAOK3	TAO3	5	2.309	0.89
43	AAK1	AAK1	8	2.309	0.93
2	RPS6KA4	MSK2	8	2.314	1.34
43	GAK	GAK	11	2.38	0.77
2	CDK7	CDK7	9	2.917	1.12
43	PTK2	FAK	10	3.489	0.97
43	TAOK1	TAO1	2	3.955	1.36
43	SLK	SLK	5	4.289	0.95
43	CABC1	ADCK3	2	4.33	0.67
43	ICK	ICK	2	4.693	1
43	CDK10	CDK10	5	4.832	0.64
2	CSNK1A1	CK1a	9	4.856	1
2	CSNK1D	CK1d	5	5.536	1
43	GSK3A	GSK3A	9	5.697	0.61
2	CSNK1G3	CK1g3	4	5.878	1.24
2	GAK	GAK	10	5.919	0.64
43	PRKD1	PKD1	1	6.004	1.19
2	HIPK2	HIPK2	2	6.04	1
2	NEK7	NEK7	2	6.157	1
43	CSNK1G1	CK1g1	2	7.183	1.09
2	AAK1	AAK1	8	7.209	1.09
2	NEK9	NEK9	10	7.285	0.75
2	CDK2	CDK2	7	7.715	1.28
2	MAPK8	JNK1	10	8.144	1.06
2	TTK	TTK	1	8.558	1.57
43	MELK	MELK	9	8.655	1
43	MAPK3	Erk1	7	8.661	0.7
2	PIP4K2C	PIP5K2C	3	8.917	1.19
43	FGFR1	FGFR1	7	9.63	0.68
43	MERTK	MER	4	9.943	0.92

2	PDGFRA	PDGFRA	10	10	0
2	CSNK1E	CK1e	5	10	1
2	IKBKE	IKKe	2	10	0
2	ACVR1	ALK2	7	10	1
2	FER	FER	9	10	1
2	PTK2B	PYK2	1	10	1
2	MERTK	MER	6	10	1
2	TYRO3	TYRO3	4	10	1
2	JAK2	JAK2	3	10	0.75
2	MARK4	MARK4	5	10	1
2	MAP4K2	GCK	7	10	1
2	MAP2K5	MAP2K5	7	10	0.65
2	EIF2AK4	GCN2	7	10	0
2	CABC1	ADCK3	2	10	1
2	MARK3	MARK3	9	10	1
2	MARK1	MARK1	1	10	1
2	RPS6KB1	p70S6K	1	10	1
2	GSK3B	GSK3B	9	10	0
2	PIP4K2B	PIP5K2B	1	10	0
2	MAP4K3	KHS2	7	10	1
2	NQO2		8	10	1
2	MAP2K1	MAP2K1	5	10	1
2	FGFR3	FGFR3	4	10	1
2	MAPK14	p38a	7	10	0
2	ABL1	ABL	7	10	0
2	EPHB3	EphB3	2	10	1
2	EPHB4	EphB4	10	10	0
2	CAMKK2	CaMKK2	9	10	1
2	LIMK1	LIMK1	6	10	1.52
2	GSK3A	GSK3A	9	10	1
2	TBK1	TBK1	12	10	0
2	IRAK1	IRAK1	4	10	1
2	MAP4K5	KHS1	7	10	0
2	LYN	LYN	2	10	2.43
2	AURKA	AurA	8	10	1.24
2	XPO1		3	10	1.01
2	TANK		8	10	1
2	CAD		4	10	1
2	MAPK9	JNK2	9	10	1.43
2	BRAF	BRAF	4	10	1.32
2	EIF2AK1	HRI	3	10	1.55
2	SRC	SRC	8	10	0
2	VRK2	VRK2	1	10	1
2	ABL2	ARG	4	10	0.74
2	ZAK	ZAK	8	10	1
2	BMP2K	BIKE	3	10	1
2	PRKCA	PKCa	9	10	0.83
2	MAP3K4	MAP3K4	7	10	1
2	PRKAA1	AMPKa1	10	10	1
2	PLK4	PLK4	4	10	0
2	STK3	MST2	4	10	1
2	PKN1	PKN1	6	10	1.92
2	PKN3	PKN3	1	10	0
2	PTK2	FAK	11	10	1.51
2	ICK	ICK	4	10	1
2	CAMK4	CaMK4	6	10	0
2	PRKG1	PKG1	14	10	2.46
2	TAOK2	TAO2	4	10	1.86
2	SIK2	QIK	6	10	0
2	MAP3K2	MAP3K2	7	10	0
2	CDK9	CDK9	9	10	1
2	TNK2	ACK	6	10	0
2	FECH		8	10	2.11

2	MARK2	MARK2	9	10	1
2	XPO5		1	10	1
2	KIAA0999	QSK	6	10	1
2	DDR1	DDR1	3	10	2.25
2	BMPR2	BMPR2	6	10	1
2	JAK1	JAK1	9	10	1.48
2	CAMKK1	CaMKK1	5	10	1
2	MAP3K12	DLK	1	10	1
2	AURKB	AurB	7	10	0.8
2	CAMK2D	CaMK2d	13	10	1
2	MAP3K1	MAP3K1	1	10	1
2	ACTB		10	10	1
2	ACVR2A	ACTR2	4	10	1
2	CAMK2G	CaMK2g	13	10	1
2	PKMYT1	MYT1	5	10	0
2	CALCOCO2		4	10	1
2	MAPK7	Erk5	1	10	0
2	ULK3	ULK3	7	10	1
2	STK16	MPSK1	3	10	1
2	TEC	TEC	4	10	1
2	MAP3K11	MLK3	9	10	1
2	TAOK1	TAO1	3	10	0.76
2	PDPK1	PDK1	8	10	1
2	PKN2	PKN2	10	10	1
2	MAPK1	Erk2	9	10	1
2	MAP2K2	MAP2K2	7	10	2.17
2	DDR2	DDR2	10	10	1.62
2	FGFR1	FGFR1	7	10	0.81
2	EPHB6	EphB6	1	10	1
2	BMPR1A	BMPR1A	7	10	0
2	ACVR1B	ALK4	2	10	0
2	TGFBR1	TGFbR1	3	10	1
2	TBKBP1		4	10	1
2	MELK	MELK	7	10	1
2	AZI2		10	10	2.49
2	EPHA5	EphA5	5	10	1
2	STK4	MST1	4	10	1
2	PHKG2	PHKg2	2	10	1
2	CSK	CSK	12	10	0
2	ILK	ILK	7	10	0
2	YES1	YES	9	10	0
2	PAK4	PAK4	9	10	1
2	CDK10	CDK10	6	10	1
2	EPHA7	EphA7	6	10	1.94
2	TESK1	TESK1	8	10	0
2	MAPK3	Erk1	7	10	1
2	MAPK11	p38b	6	10	1.15
2	DCK		7	10	0
2	ARAF	ARAF	1	10	1
2	CRKRS	CRK7	1	10	0
2	EPHA2	EphA2	13	10	0
2	EPHB2	EphB2	6	10	0
2	NEK2	NEK2	3	10	0
2	RIPK2	RIPK2	11	10	1
2	TYK2	TYK2	8	10	0
2	SLK	SLK	4	10	1
2	CDK5	CDK5	9	10	1.3
2	LIMK2	LIMK2	2	10	1
2	WEE1	Wee1, Wee1B	5	10	0
2	CDC2	CDC2	6	10	1
43	TEC	TEC	4	10	0.59
43	MAP3K11	MLK3	8	10	1
43	PDPK1	PDK1	10	10	1

43	PKN2	PKN2	9	10	0
43	MAPK1	Erk2	9	10	0.57
43	MAP2K2	MAP2K2	10	10	1
43	DDR2	DDR2	10	10	0
43	BMPR1A	BMPR1A	4	10	1
43	ACVR1B	ALK4	2	10	1
43	TGFBR1	TGFBR1	6	10	1
43	TBKBP1		3	10	0
43	NLK	NLK	3	10	1
43	AZI2		8	10	1
43	EPHA5	Epha5	5	10	0
43	CSNK1D	CK1d	5	10	0.84
43	STK4	MST1	5	10	1
43	PHKG2	PHKg2	1	10	0
43	CSK	CSK	12	10	1
43	ILK	ILK	7	10	0
43	YES1	YES	9	10	0
43	PAK4	PAK4	9	10	1
43	EPHA7	Epha7	6	10	0
43	TESK1	TESK1	8	10	1
43	MAPK11	p38b	4	10	0
43	DCK		7	10	0
43	EPHA2	Epha2	13	10	0
43	EPHB2	EphB2	5	10	0
43	NEK2	NEK2	2	10	1
43	RIPK2	RIPK2	10	10	1
43	TYK2	TYK2	8	10	0
43	LIMK2	LIMK2	3	10	1
43	WEE1	Wee1, Wee1B	6	10	1
43	CDC2	CDC2	4	10	2.15
43	PDGFRA	PDGFRa	11	10	0
43	CSNK1E	CK1e	4	10	0.64
43	IKBKE	IKKe	1	10	1
43	ACVR1	ALK2	7	10	1
43	FER	FER	12	10	0
43	TYRO3	TYRO3	3	10	0
43	JAK2	JAK2	3	10	1
43	MARK4	MARK4	4	10	0.51
43	MAP4K2	GCK	5	10	0.87
43	PIP4K2C	PIP5K2C	4	10	1
43	MAP2K5	MAP2K5	8	10	1
43	EIF2AK4	GCN2	5	10	1
43	MARK3	MARK3	9	10	1
43	MARK1	MARK1	2	10	1
43	GSK3B	GSK3B	9	10	0.57
43	PIP4K2B	PIP5K2B	1	10	1
43	MAP4K3	KHS2	8	10	1
43	CSNK1G3	CK1g3	4	10	1
43	NQO2		7	10	1
43	MAP2K1	MAP2K1	6	10	1.74
43	FGFR3	FGFR3	3	10	1.91
43	MAPK14	p38a	8	10	1
43	ABL1	ABL	9	10	0
43	EPHB3	EphB3	2	10	1
43	EPHB4	EphB4	10	10	0
43	CAMKK2	CaMKK2	9	10	0
43	LIMK1	LIMK1	6	10	1
43	TBK1	TBK1	15	10	0
43	IRAK1	IRAK1	4	10	1
43	MAP4K5	KHS1	6	10	1
43	AURKA	AurA	7	10	1
43	XPO1		3	10	1
43	TANK		6	10	1

43	CAD		3	10	0
43	NEK9	NEK9	10	10	1
43	BRAF	BRAF	5	10	1
43	SRC		8	10	0
43	PRKCD	PKCd	6	10	1
43	VRK2	VRK2	2	10	0
43	ABL2	ARG	7	10	0
43	ZAK	ZAK	8	10	0
43	BMP2K	BIKE	2	10	1
43	BRSK2	BRSK2	1	10	0
43	PRKCA	PKCa	9	10	1
43	MAP3K4	MAP3K4	5	10	1
43	PLK4	PLK4	4	10	1
43	TAOK3	TAO3	3	10	1
43	STK3	MST2	4	10	1
43	PKN1	PKN1	5	10	2.1
43	CAMK4	CaMK4	4	10	1
43	PRKG1	PKG1	12	10	1
43	CSNK1A1	CK1a	9	10	1
43	TAOK2	TAO2	5	10	1
43	SIK2	QIK	7	10	1
43	MAP3K2	MAP3K2	6	10	1
43	TNK2	ACK	7	10	0
43	FECH		8	10	1
43	MARK2	MARK2	8	10	0.61
43	XPO5		1	10	0
43	KIAA0999	QSK	7	10	1
43	DDR1	DDR1	5	10	1
43	BMPR2	BMPR2	5	10	0
43	CAMKK1	CaMKK1	6	10	1
43	AURKB	AurB	6	10	0.73
43	CAMK2D	CaMK2d	14	10	1
43	MAP3K1	MAP3K1	1	10	1
43	ACTB		2	10	1
43	ACVR2A	ACTR2	3	10	0
43	CAMK2G	CaMK2g	12	10	1
43	PKMYT1	MYT1	5	10	0
43	CALCOCO2		3	10	0
43	MAPK7	Erk5	2	10	1
43	STK16	MPSK1	2	10	0.69
