ELECTRONIC SUPPORTING INFORMATION

Bioactive Cyclometalated Phthalimides: Design, Synthesis and

Kinase Inhibition

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1. Synthesis of the Phthalimides 1b and 1b



Scheme S1. Synthesis of *N*-(benzyl)-4-bromophthalimide (1a) and *N*-(*tert*-butyldimethylsilyl)-4-bromophthalimide (1b).

N-(**Benzyl**)-4-bromophthalimide (1a). 4-Bromo phthalic anhydride¹ (5.00 g, 22.0 mmol) was dissolved in 50 mL glacial acetic acid. Benzylamine (2.40 mL, 22.0 mmol) was added and the solution was heated to 130 °C for 4 h. The hot solution was carefully poured into 200 mL ice-cold water, the resulting solid filtered off, and washed with 100 mL water. *N*-Benzyl-4-bromophthalimide (1a) was obtained as beige solid (6.22 g, 89%). ¹H-NMR (300 MHz, CDCl₃): δ (ppm) 7.97 (dd, J = 1.6, 0.3 Hz, 1H), 7.84 (dd, J = 7.9, 1.7 Hz, 1H), 7.69-7.72 (m, 1H), 7.40-7.43 (m, 2H), 7.27-7.35 (m, 3H), 4.83 (s, 2H). ¹³C-NMR (75 MHz, CDCl₃): δ (ppm) 167.2, 166.7, 137.0, 136.0, 133.7, 130.6, 128.9, 128.7, 128.6, 128.0, 126.7, 124.7, 41.8. IR (film): v (cm⁻¹) 3065, 3033, 1772, 1710, 1607, 1430, 1418, 1387, 1345, 1186, 1170, 1102, 1068, 942, 739, 714, 398. HRMS calcd for C₁₅H₁₁BrNO₂ (M+H)⁺ 317.9949, found 317.9950.

N-(*tert*-Butyldimethylsilyl)-4-bromophthalimide (1b). 4-Bromophthalimide (1c)¹ (4.00 g, 17.7 mmol) was suspended in 100 mL MeCN, (*tert*-butyldimethylsilyl)-methoxyethene² (6.16 mL, 28.3 mmol) was added, and the suspension heated to reflux for 5 h. The solvent was removed and the crude product subjected to silica gel chromatography with CH₂Cl₂. The combined product eluents were dried *in vacuo* and *N*-(*tert*-butyldimethylsilyl)-4-bromophthalimide (1b) was obtained as white solid (5.59 g, 93%) ¹H-NMR (300 MHz, CDCl₃): δ (ppm) 7.93 (d, *J* = 0.9 Hz, 1H), 7.83 (dd, *J* = 8.1, 0.9 Hz, 1H), 7.67 (d, *J* = 8.1 Hz, 1Hz)

1H) 0.97 (s, 9H), 0.51 (s, 6H). ¹³C-NMR (75 MHz, CDCl₃): δ (ppm) 172.8, 172.3, 136.9, 135.7, 132.6, 128.8, 126.4, 124.4, 26.3, 19.0, -4.3. IR (film): v (cm⁻¹) 2955, 2932, 2857, 1757, 1700, 1599, 1464, 1414, 1331, 1293, 1255, 1167, 1068, 885, 834, 792, 746, 705, 672. HRMS calcd for C₁₄H₁₉BrNO₂Si (M+H)⁺ 340.0363, found 340.0365.

2. Crystal Structure of *N*-(*tert*-Butyldimethylsilyl)-4-bromophthalimide (1b)

Single crystals of *N*-(*tert*-butyldimethylsilyl)-4-bromophthalimide (**1b**) were obtained by slow evaporation of CH_2Cl_2 at 23 °C. The intensity data set was collected at 100 K using a STOE IPDS2 system. The data was corrected for absorption effects using multi scanned reflections.³ The structure was solved using direct (SIR2008)⁴ and refined using the full matrix least squares procedure implemented in SHELX-97.⁵ One of the two independent molecules in the asymmetric unit showed positional disorder of the Br atom. Hydrogen atoms were included at calculated positions.



Figure S1. Crystal structure of *N*-(*tert*-butyldimethylsilyl)-4-bromophthalimide (**1b**). ORTEP drawing with 50% probability thermal ellipsoids.

| formula | C ₁₄ H ₁₈ BrNO ₂ Si |
|--|--|
| fw | 340.29 |
| a(Å) | 16.9037(7) |
| b(Å) | 13.2574(3) |
| c(Å) | 14.3409(6) |
| α(°) | 90 |
| β(°) | 108.001(3) |
| γ(°) | 90 |
| V(Å ³) | 3056.5(2) |
| Z | 8 |
| space group | $P2_1/c$ |
| $d_{calcd}(Mg/m^3)$ | 1.479 |
| $\mu(mm^{-1})$ | 2.766 |
| θ range(°) | 1.27 – 26.74 |
| no. of indep. | 6471 |
| reflections | |
| no. of parameters | 362 |
| wR2 (all data) ^{b} | 0.0752 |
| R1 ($I > 2\sigma(I)$) ^b | 0.0364 |
| CCDC no. ^c | 861338 |
| | |

 Table S1. Crystallographic data for 1b.^a

^{*a*} MoK α radiation ($\lambda = 0.71073$ Å). ^{*b*} R1 = $\Sigma ||F_o| - |F_c|| / \Sigma |F_o|$; wR2=[w(F_o² - F_c²)² / $\Sigma w(F_o^2)^2$]^{1/2}. ^{*c*} Crystallographic data (excluding structure factors) have been deposited in the Cambridge Crystallographic Data Center. A CIF file can be obtained from the CCDC free of charge via http://www.ccdc.cam.ac.uk/data_request/cif.

3. Supplementary Kinase Inhibition Data

The protein kinase selectivity profile of racemic complexes **8b** and **9b** at an assay concentration of 10 μ M was derived from an active-site-directed affinity screening against 442 human protein kinases (KINOMEscan, DiscoveRx).^{6,7}

| Ambit Gene Symbol | Entrez Gene Symbol | Percent Control |
|-------------------------------|--------------------|-----------------|
| AAK1 | AAK1 | 91 |
| ABL1(E255K)-phosphorylated | ABL1 | 16 |
| ABL1(F317I)-nonphosphorylated | ABL1 | 100 |
| ABL1(F317I)-phosphorylated | ABL1 | 71 |
| ABL1(F317L)-nonphosphorylated | ABL1 | 48 |
| ABL1(F317L)-phosphorylated | ABL1 | 23 |
| ABL1(H396P)-nonphosphorylated | ABL1 | 3.3 |
| ABL1(H396P)-phosphorylated | ABL1 | 27 |
| ABL1(M351T)-phosphorylated | ABL1 | 28 |
| ABL1(Q252H)-nonphosphorylated | ABL1 | 13 |
| ABL1(Q252H)-phosphorylated | ABL1 | 54 |
| ABL1(T315I)-nonphosphorylated | ABL1 | 3.1 |
| ABL1(T315I)-phosphorylated | ABL1 | 1.6 |
| ABL1(Y253F)-phosphorylated | ABL1 | 40 |
| ABL1-nonphosphorylated | ABL1 | 27 |
| ABL1-phosphorylated | ABL1 | 35 |
| ABL2 | ABL2 | 67 |
| ACVR1 | ACVR1 | 100 |
| ACVR1B | ACVR1B | 95 |
| ACVR2A | ACVR2A | 100 |
| ACVR2B | ACVR2B | 93 |
| ACVRL1 | ACVRL1 | 100 |
| ADCK3 | CABC1 | 88 |
| ADCK4 | ADCK4 | 90 |
| AKT1 | AKT1 | 0.7 |
| AKT2 | AKT2 | 35 |
| AKT3 | AKT3 | 8.7 |
| ALK | ALK | 30 |
| AMPK-alpha1 | PRKAA1 | 1.4 |
| AMPK-alpha2 | PRKAA2 | 7.4 |
| ANKK1 | ANKK1 | 100 |
| ARK5 | NUAK1 | 16 |
| ASK1 | MAP3K5 | 100 |
| ASK2 | MAP3K6 | 63 |
| AURKA | AURKA | 23 |
| AURKB | AURKB | 16 |
| AURKC | AURKC | 31 |

Table S2. KINOMEscan Screening Data for Complex 8b (DiscoveRx).

| AXL | AXL | 8.3 |
|---------------|------------|-----------|
| BIKE | BMP2K | 62 |
| BLK | BLK | 1.2 |
| BMPR1A | BMPR1A | 98 |
| BMPR1B | BMPR1B | 100 |
| BMPR2 | BMPR2 | 15 |
| BMX | BMX | 76 |
| BRAF | BRAF | 100 |
| BRAF(V600E) | BRAF | 100 |
| BRK | PTK6 | 100 |
| BRSK1 | BRSK1 | 100 |
| BRSK2 | BRSK2 | 100 |
| BTK | ВТК | 0.1 |
| CAMK1 | CAMK1 | 41 |
| CAMK1D | CAMK1D | 2.3 |
| CAMK1G | CAMK1G | 45 |
| CAMK2A | CAMK2A | 30 |
| CAMK2B | CAMK2B | 35 |
| CAMK2D | CAMK2D | 65 |
| CAMK2G | CAMK2G | 43 |
| CAMK4 | CAMK4 | 1.3 |
| CAMKK1 | CAMKK1 | 0.9 |
| CAMKK2 | CAMKK2 | 0.95 |
| CASK | CASK | 100 |
| CDC2L1 | CDC2L1 | 100 |
| CDC2L2 | CDC2L2 | 100 |
| CDC2L5 | CDC2L5 | 100 |
| CDK11 | CDC2L6 | 98 |
| CDK2 | CDK2 | 32 |
| CDK3 | CDK3 | 32 72 |
| CDK4-cyclinD1 | CDK4 | 100 |
| CDK4-cyclinD3 | CDK4 | 00 |
| CDK5 | CDK5 | 100 |
| CDK7 | CDK7 | 7 |
| CDK8 | CDK8 | 100 |
| CDK9 | CDK9 | 100 |
| CDKL1 | CDKL1 | 100 |
| CDKL2 | CDKL 2 | 100 |
| CDKL2 | CDKL3 | 100 |
| CDKL5 | CDKL5 | 100 |
| CHFK1 | CHEK1 | 41 |
| CHEK2 | CHEK? | 2 |
| CIT | CIT | 100 |
| CLK1 | CL K1 | 38 |
| CLK2 | CLK2 | 14 |
| CLK3 | CLK2 | 5.2 |
| CLK4 | CLK4 | 3.2 84 |
| CSF1R | CSF1R | 71 |
| CSK | CSK | 71 77 |
| CSNK1A1 | CSNK1A1 | 100 |
| CSNK1A1I | CSNK1A1I | 100 |
| COMMITTE | USIMIXIAIL | 100 |

| CSNK1D | CSNK1D | 100 |
|---------------------------|----------|-----------|
| CSNK1E | CSNK1E | 92 |
| CSNK1G1 | CSNK1G1 | 100 |
| CSNK1G2 | CSNK1G2 | 100 |
| CSNK1G3 | CSNK1G3 | 100 |
| CSNK2A1 | CSNK2A1 | 98 |
| CSNK2A2 | CSNK2A2 | 80 |
| СТК | МАТК | 93 |
| DAPK1 | DAPK1 | 61 |
| DAPK2 | DAPK2 | 76 |
| DAPK3 | DAPK3 | 68 |
| DCAMKL1 | DCLK1 | 7.8 |
| DCAMKI 2 | DCL K2 | 7.8 4 |
| DCAMKI 3 | DCLK3 | 25 |
| DDR1 | DDR1 | 53 |
| | | 53 |
| | MAD2V12 | 54 |
| | MAF5K12 | J4 72 |
| DMPK | | /3 |
| DMPK2 | CDC42BPG | 60 100 |
| DRAKI | SIKI/A | 100 |
| DRAK2 | SIKI/B | 100 |
| DYRKIA | DYRKIA | 82 |
| DYRKIB | DYRKIB | 82 |
| DYRK2 | DYRK2 | 100 |
| EGFR | EGFR | 100 |
| EGFR(E746-A750del) | EGFR | 100 |
| EGFR(G719C) | EGFR | 100 |
| EGFR(G719S) | EGFR | 100 |
| EGFR(L747-E749del, A750P) | EGFR | 92 |
| EGFR(L747-S752del, P753S) | EGFR | 100 |
| EGFR(L747-T751del,Sins) | EGFR | 100 |
| EGFR(L858R) | EGFR | 100 |
| EGFR(L858R,T790M) | EGFR | 65 |
| EGFR(L861Q) | EGFR | 84 |
| EGFR(\$752-I759del) | EGFR | 100 |
| EGFR(T790M) | EGFR | 24 |
| EIF2AK1 | EIF2AK1 | 100 |
| EPHA1 | EPHA1 | 100 |
| EPHA2 | EPHA2 | 93 |
| EPHA3 | EPHA3 | 29 |
| EPHA4 | EPHA4 | 79 |
| FPHA5 | EPHA5 | 94 |
| FPHA6 | EPHA6 | 74 |
| FPHA7 | FPHA7 | 89 |
| EPHA8 | EPHA8 | 65 |
| EDHR1 | EDHR1 | 100 |
| | | 100 |
| | | 100 |
| | | 04 100 |
| | | 100 |
| | | /6 |
| EKBB2 | EKBB2 | 84 |

| ERBB3 | ERBB3 | 100 |
|-----------------------|---------|------------|
| ERBB4 | ERBB4 | 95 |
| ERK1 | MAPK3 | 15 |
| ERK2 | MAPK1 | 19 |
| ERK3 | MAPK6 | 95 |
| ERK4 | MAPK4 | 100 |
| ERK5 | MAPK7 | 2.5 |
| ERK8 | MAPK15 | 49 |
| ERN1 | ERN1 | 64 |
| FAK | PTK2 | 8.5 |
| FER | FER | 2.9 |
| FES | FES | 54 |
| FGFR1 | FGFR1 | 12 |
| FGFR2 | FGFR2 | 30 |
| FGFR3 | FGFR3 | 47 |
| FGFR3(G697C) | FGFR3 | 54 |
| FGFR4 | FGFR4 | 29 |
| FGR | FGR | 24 |
| FLT1 | FLT1 | 86 |
| FLT3 | FLT3 | 29 |
| FL T3(D835H) | FLT3 | 12 |
| FI T3(D835Y) | FLT3 | 50 |
| FI T3(ITD) | FLT3 | 50 44 |
| FLT3(K6630) | FLT3 | 12 |
| FI T3(N8411) | FLT3 | 27 |
| $FI T3(R83/\Omega)$ | FLT3 | 2.7 |
| FI TA | FLT4 | 10 66 |
| FRK | FRK | 36 |
| FVN | FYN | 23 |
| GAK | GAK | 56 |
| GCN2(Kin Dom 2 S808G) | FIF2AKA | 98 |
| GRK1 | GRK1 | 16 |
| GRKA | GRKA | 1.0 |
| GRK7 | GRK7 | 100 |
| GSK3A | GSK3A | 36 |
| GSK3A GSK3B | GSK3R | 5.0 1 2 |
| HCK | HCK | 1.2 |
| HIDK1 | HIPK1 | 88 |
| | HIPK2 | 45 |
| HIPK3 | HIPK3 | |
| | | 100 |
| HDK1 | MAP/K1 | 38 |
| HUNK | HUNK | 100 |
| ICK | ICK | 100 / 9 |
| ICEIP | IGE1R | 16 |
| IKK-alpha | CHUK | 10 |
| IKK-beta | IKRKR | 100 |
| IKK-ensilon | IKBKF | 100 |
| INSP | INDR | 100 |
| INSPR | INSR | 11 |
| | | 20 70 |
| INANI | INANI | /8 |

| IRAK3 | IRAK3 | 51 |
|------------------------------|----------|------|
| IRAK4 | IRAK4 | 1.3 |
| ITK | ITK | 14 |
| JAK1(JH1domain-catalytic) | JAK1 | 95 |
| JAK1(JH2domain-pseudokinase) | JAK1 | 73 |
| JAK2(JH1domain-catalytic) | JAK2 | 31 |
| JAK3(JH1domain-catalytic) | JAK3 | 4.8 |
| JNK1 | MAPK8 | 100 |
| JNK2 | MAPK9 | 100 |
| JNK3 | MAPK10 | 75 |
| KIT | KIT | 64 |
| KIT(A829P) | KIT | 63 |
| KIT(D816H) | KIT | 92 |
| KIT(D816V) | KIT | 73 |
| KIT(L576P) | KIT | 42 |
| KIT(V559D) | KIT | 62 |
| KIT(V559D,T670I) | KIT | 87 |
| KIT(V559D,V654A) | KIT | 87 |
| LATS1 | LATS1 | 74 |
| LATS2 | LATS2 | 7.4 |
| LCK | LCK | 3.8 |
| LIMK1 | LIMK1 | 92 |
| LIMK2 | LIMK2 | 100 |
| LKB1 | STK11 | 81 |
| LOK | STK10 | 65 |
| LRRK2 | LRRK2 | 100 |
| LRRK2(G2019S) | LRRK2 | 78 |
| LTK | LTK | 5.8 |
| LYN | LYN | 49 |
| LZK | MAP3K13 | 46 |
| MAK | MAK | 100 |
| MAP3K1 | MAP3K1 | 71 |
| MAP3K15 | MAP3K15 | 100 |
| MAP3K2 | MAP3K2 | 28 |
| MAP3K3 | MAP3K3 | 17 |
| MAP3K4 | MAP3K4 | 100 |
| MAP4K2 | MAP4K2 | 100 |
| MAP4K3 | MAP4K3 | 0.85 |
| MAP4K4 | MAP4K4 | 76 |
| MAP4K5 | MAP4K5 | 9 |
| MAPKAPK2 | MAPKAPK2 | 100 |
| MAPKAPK5 | MAPKAPK5 | 100 |
| MARK1 | MARK1 | 42 |
| MARK2 | MARK2 | 4.8 |
| MARK3 | MARK3 | 24 |
| MARK4 | MARK4 | 47 |
| MAST1 | MAST1 | 81 |
| MEK1 | MAP2K1 | 5.2 |
| MEK2 | MAP2K2 | 10 |
| MEK3 | MAP2K3 | 0 |
| MEK4 | MAP2K4 | 5.8 |
| | | 2.0 |

| MEK5 | MAP2K5 | 5.8 |
|----------------|----------------------------|-----------|
| MEK6 | MAP2K6 | 85 |
| MELK | MELK | 100 |
| MERTK | MERTK | 5.4 |
| MET | MET | 33 |
| MET(M1250T) | MET | 16 |
| MET(Y1235D) | MET | 31 |
| MINK | MINK1 | 12 |
| MKK7 | MAP2K7 | 14 |
| MKNK1 | MKNK1 | 100 |
| MKNK2 | MKNK2 | 0.6 |
| MLCK | MYLK3 | 99 |
| ML K1 | MAP3K9 | 29 |
| MLK2 | MAP3K10 | 2) 66 |
| MLK2 | MAP3K11 | 26 |
| MRCKA | CDC/2BPA | 20 78 |
| MPCKB | CDC42BPB | 70 /6 |
| MST1 | STKA | 40 / 0 |
| MST1D | 51 К 4 Мст1D | 4.9 64 |
| MST1K MST2 | | 04 50 |
| MST2 | SINJ STV24 | 30 |
| | |))) |
| MIS14 MITOD | | 0.2 |
| MICR | | 100 |
| MUSK | MUSK | 100 |
| | MYLK | 15 |
| MYLK2 | MYLK2 | 100 |
| MYLK4 | MYLK4 | 85 |
| MYO3A | MY03A | 2.1 |
| MYO3B | MYO3B | 23 |
| NDR1 | STK38 | 7.8 |
| NDR2 | STK38L | 14 |
| NEK1 | NEK1 | 74 |
| NEK11 | NEK11 | 100 |
| NEK2 | NEK2 | 63 |
| NEK3 | NEK3 | 56 |
| NEK4 | NEK4 | 100 |
| NEK5 | NEK5 | 95 |
| NEK6 | NEK6 | 100 |
| NEK7 | NEK7 | 100 |
| NEK9 | NEK9 | 100 |
| NIM1 | MGC42105 | 100 |
| NLK | NLK | 77 |
| OSR1 | OXSR1 | 30 |
| p38-alpha | MAPK14 | 99 |
| p38-beta | MAPK11 | 72 |
| p38-delta | MAPK13 | 54 |
| p38-gamma | MAPK12 | 70 |
| PAK1 | PAK1 | 0.8 |
| PAK2 | PAK2 | 12 |
| PAK3 | PAK3 | 25 |
| PAK4 | PAK4 | 14 |
| | | |

| PAK7 PAK7 0.55 PCTK1 PCTK1 17 PCTK2 PCTK2 52 PCTK3 PCTK3 100 PDGFRA PDGFRB 39 PDGFRB PDGFRB 39 PDFK1 PDPK1 62 PFCDFK1(P.falciparum) MAL13P1.279 37 PFTAIRE2 PFTK2 4.4 PFTK1 PFTK1 39 PHKG2 PHKG2 7.8 PHKG2 PHKG2 7.8 PHK3C2B PIK3C2B 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E545K) | PAK6 | PAK6 | 13 |
|---|--|------------------|-----------|
| PCTK1 PCTK1 17 PCTK2 PCTK3 PCTK3 100 PDGFRA PDGFRA 79 PDGFRB PDGFRB 39 PDPK1 PDFK1 62 PFCDPK1(P.falciparum) PFB0815w 100 PFFK2 PFK3 44 PFTK1 PFTK1 39 PHKG1 PHKG1 75 PHKG2 PHKG2 7.8 PHK3C2B PIK3C2B 100 PIK3CACB PIK3CA 100 PIK3CACB PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047V) PIK3CA 100 PIK3CA(H1047V) PIK3CA 100 PIK3CA(H1047V) PIK3CA 100 PIK3CA(H047V) PIK3CA 100 PIK3CA(H047V) PIK3CA 100 PIK3CA(H047V) PIK3CA 100 < | PAK7 | PAK7 | 0.55 |
| PCTK2 PCTK2 52 PCTK3 PCTK3 100 PDGFRA PDGFRA 79 PDGFRB PDGFRB 39 PPK1 PDFN1 62 PFCDPK1(P.falciparum) PFB0815w 100 PFR5(P.falciparum) MAL13P1.279 37 PFTAIRE2 PFTK2 4.4 PFK1 PFTK1 39 PHKG1 PHKG1 75 PHKG2 PHKG2 7.8 PIK3C2G PIK3C2G 100 PIK3CA(F420R) PIK3CA 100 PIK3CA(E545A) PIK3CA 30 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H047L) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CA PIK3CB 91 PIK4CB </td <td>PCTK1</td> <td>PCTK1</td> <td>17</td> | PCTK1 | PCTK1 | 17 |
| PCTK3 PCTK3 100 PDGFRA PDGFRA 79 PDGFRB PDGFRB 39 PDPKI PDPKI 62 PCDFK1(P.falciparum) MAL13P1.279 37 PFTAIRE2 PFTK1 39 PHKG1 PFTK1 39 PHKG2 PHK2 44 PFTK1 PFTK1 39 PHKG1 PHK2 44 PFTK1 PFTK1 39 PHK3C2 PHK3C2 7.8 PIK3C2B PIK3C2B 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(C454SK) PIK3CA 100 PIK3CA(M1043I) | PCTK2 | PCTK2 | 52 |
| PDGFRA PDGFRA 79 PDGFRB PDGFRB 39 PDPK1 PDFK1 62 PFCDPK1(P.falciparum) PFB0515w 100 PFFK2 PFK2 4.4 PFTK1 PFTK1 39 PHKG1 PFK1 39 PHKG1 PHKG1 75 PHKG2 PHKG2 7.8 PHK3C2B PIK3C2B 100 PIK3CA PIK3CA 100 PIK3CA(E542K) PIK3CA 100 PIK3CA(E545K) PIK3CA 40 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA PIM3 39 97 < | PCTK3 | PCTK3 | 100 |
| PDGFRB PDGFRB 39 PDPK1 PDPK1 62 PFCDPK1(P.falciparum) PFB0815w 100 PFPK5(P.falciparum) MAL13P1.279 37 PFTAIRE2 PFTK2 4.4 PFTK1 PFTK1 39 PHKG1 PHKG1 75 PHKG2 PHKG2 7.8 PIK3C2B PIK3C2B 100 PIK3CAG PIK3CA 100 PIK3CA PIK3CA 100 PIK3CA PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA 100 | PDGFRA | PDGFRA | 79 |
| PDPKI PDPKI 62 PFCDPK1(P.falciparum) PDPK1 62 PFPK5(P.falciparum) MAL13P1.279 37 PFTAIRE2 PFTK1 39 PHKG1 PFTK1 39 PHKG2 PHKG2 7.8 PHKG2 PHKG2 7.8 PHK3C2B PIK3C2B 100 PIK3C2G PIK3CC2G 100 PIK3CA(E542K) PIK3CA 100 PIK3CA(E545K) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H047L) PIK3CA 100 PIK3CA(MI043I) PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CG PIK3CB 84 PIK3CD PIS 93 PIK3CG PIK3CB 94 PIK3CD PIS 94 | PDGFRB | PDGFRB | 39 |
| PFCDFX1(P.falciparum) PFB0815w 100 PFPK5(P.falciparum) MAL13P1.279 37 PFTAIRE2 PFTK2 4.4 PFTK1 PFTK1 39 PHKG1 PHKG1 75 PHKG2 7.8 PIK3C2B PIK3C2B 100 PIK3C2G PIK3CA 100 PIK3CA(542K) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545K) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA PIK3CB 84 PIK3CB PIK3CB 93 PIK3CB PIK3CB 93 PIK3CG PIK3CB 77 <t< td=""><td>PDPK1</td><td>PDPK1</td><td>62</td></t<> | PDPK1 | PDPK1 | 62 |
| PFPKS(P.falciparum) MAL13P1.279 37 PFTAIRE2 PFTK2 4.4 PFTK1 PFTK1 39 PHKG1 PHKG1 75 PHKG2 PHKG2 7.8 PHKG2 PHKG2 7.8 PHK3C2B PIK3C2B 100 PIK3C2G PIK3CA 100 PIK3CA(E542K) PIK3CA 100 PIK3CA(E542K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047Y) PIK3CA 100 PIK3CA(Q546K) PIK3CA 100 PIK3CG PIK3CB 84 PIK3CG PIK3CB 84 PIK3CG PIK3CG 77 PIK3CG PIK3CG 77 PIK3CG PIM3 39 PIESK1A PIM3 39 PIPSK1A PI | PFCDPK1(P.falciparum) | PFB0815w | 100 |
| PFTARE2 PFTK2 4.4 PFTK1 PFTK1 39 PHKG1 PFTK1 39 PHKG2 PHK3C2 7.8 PHK3C2B PIK3C2B 100 PIK3C2G PIK3C2G 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545K) PIK3CA 97 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(R00L) PIK3CA 100 PIK3CA(R00L) PIK3CA 100 PIK3CB PIK3CB 84 PIK3CD 93 93 PIK3CG PIM3 39 PIK4CB PI4KB 4.7 PIM1 PIM3 39 PISK1C PIPSK1A 100 PIPSK1A PIPSK1A <td>PFPK5(P falciparum)</td> <td>MAL13P1 279</td> <td>37</td> | PFPK5(P falciparum) | MAL13P1 279 | 37 |
| PFTK1 PFTK1 39 PHKG1 PHKG1 75 PHKG2 PHK3C2B 100 PIK3C2B PIK3C2G 100 PIK3C2G PIK3C2G 100 PIK3C2G PIK3CA 100 PIK3CA(E542K) PIK3CA 100 PIK3CA(E545K) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CB PIK3CB 84 PIK3CB PIK3CB 93 PIK3CG PIK3CG 77 PIK4CB PIK3CB 93 PIK3CG PIM3 39 PIK3C PIM3 39 PIM2 PIP 91 PIM3 PIP 91 PIM3 92 91 | PFTAIRE2 | PFTK2 | 44 |
| PHKG1 PHKG1 75 PHKG2 PHKG2 7.8 PIK3C2B PIK3C2B 100 PIK3C2G PIK3C2G 100 PIK3CA PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545K) PIK3CA 97 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047I) PIK3CA 100 PIK3CA(R00L) PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CA 100 PIK3CB PIK3CB 84 PIK3CB 84 PIK3CB PIK3CB 93 PIK3CG 77 PIM1 PIM1 22 PIM1 22 PIM2 P19 P19 100 PIP5K1A 100 PIP5K1A | PFTK1 | PFTK1 | 39 |
| PHKG2 PHKG2 7.8 PHKG2 7.8 PIK3C2B PIK3C2B 100 PIK3C2G PIK3CA 100 PIK3CA PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545K) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1043I) PIK3CA 100 PIK3CB PIK3CB 84 PIK3CD PIS3CA 100 PIK3CB PIK3CB 77 PIK4CB PIK3CB 77 PIK4CB PIK3CB 77 PIM1 PIM1 22 PIM2 P1P 79 PIM3 PIPSK1A 100 PIPSK1C PIPSK1C 49 PIPSK2B <td>PHKG1</td> <td>PHKG1</td> <td>75</td> | PHKG1 | PHKG1 | 75 |
| FIRED 111102 111102 111102 PIK3C2B PIK3C2B 100 PIK3C2G PIK3CA 100 PIK3CA PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545A) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CD PIK3CG 77 PIK3CG PIK3CG 77 PIK4CB PI4KB 4.7 PIM1 PIM2 79 PIM3 PIM3 39 PIPSK1C PIPSK1C 49 PIPSK2C PIP4K2B 100 PIP5K2C PIP4K2B 100 PIP5K2C PIP4K2B 2 PKM1 PKACB <td< td=""><td>PHKG2</td><td>PHKG2</td><td>78</td></td<> | PHKG2 | PHKG2 | 78 |
| FIRSC2D FIRSC2D 100 PIK3CA PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545A) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047S) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CCB PIK3CB 84 PIK3CD P3 PIK3CB 84 PIK3CD P1K3CB 77 PIK4CB PIK3CG 77 PIK4CB 4.7 PIM1 PIM1 22 PIM2 79 PIM2 PIM3 39 PIPSK1C 49 PIPSK1C PIPSK1C 49 PIPSK2B 100 PISK2C PIM4K2B <td>PIK3C2B</td> <td>PIK3C2B</td> <td>100</td> | PIK3C2B | PIK3C2B | 100 |
| FIRSCA FIRSCA 100 PIK3CA PIK3CA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545A) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(I1047Y) PIK3CA 100 PIK3CA(I1047Y) PIK3CA 100 PIK3CA(I1043I) PIK3CA 100 PIK3CB PIK3CB 84 PIK3CD PIS3CA 100 PIK3CG PIK3CB 84 PIK3CG PIK3CB 84 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIM3 39 PIM3 PIM3 39 PIM1 PIM3 39 PIPSK1A PIPSK1A 100 PIPSK2B PIP4K2B 100 | PIK3C2G | PIK3C2G | 100 |
| FIRSCA 100 PIK3CA(C420R) PIK3CA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E542K) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047Y) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CB PIK3CB 84 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIM3 PIM3 39 PIPSK1A PID9 100 PIFSK2C PIP4K2B 100 PIPSK2C PIP4K2B 100 PKAC-alpha PRKACB 2 PKM | PIK3CA | PIK3CA | 100 |
| FIRSCA(C420R) FIRSCA 100 PIK3CA(E542K) PIK3CA 97 PIK3CA(E545K) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(I800L) PIK3CA 73 PIK3CA(U1043I) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CD PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIM3 PIM1 22 PIM3 PIM3 39 PIP5K1A PIP5K1C 49 PIP5K2C PIP4K2B 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKN1 4.3 97 PLK1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 | $\mathbf{D}\mathbf{K}\mathbf{C}\mathbf{A}(\mathbf{C}\mathbf{A}20\mathbf{P})$ | DIKICA | 100 |
| FIKSCA(E342K) FIKSCA 97 PIK3CA(E545A) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047Y) PIK3CA 100 PIK3CA(M1043I) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CD PIK3CB 84 PIK3CD PIK3CB 84 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIA3 39 PIK3CG PIM1 22 PIM2 P9 91 PIM3 PIM3 39 PIP5K1C PIP5K1A 100 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2B 100 PIP5K2C PIP4K2B 100 PKAC-alpha PRKACB 2 PKN1 PKN1 4.3 PKN2 35 PKN1 PKN | $\mathbf{D}\mathbf{W}^{2}\mathbf{C}\Lambda(\mathbf{C}^{4}20\mathbf{K})$ | DIV2CA | 100 |
| PIK3CA(E545K) PIK3CA 88 PIK3CA(E545K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047Y) PIK3CA 100 PIK3CA(I800L) PIK3CA 100 PIK3CA(I800L) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CB PIK3CG 77 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIM3 PIM2 79 PIM3 PIP5K1A 100 PIP5K1C PIP5K1C 49 PIP5K2B PIP4K2C 100 PIFSK2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKN1 PKM3 35 PKN1 PKM3 72 PKN1 PLK1 97 PLK2 PLK1 97 PLK3 PLK1 97 PLK1 | PIK3CA(E542K) | PIKJCA DIV2CA | 97 |
| PIK3CA(E33K) PIK3CA 100 PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047Y) PIK3CA 73 PIK3CA(I800L) PIK3CA 100 PIK3CA(I800L) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CB PIK3CB 84 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIM3 PIM1 22 PIM3 PIM3 39 PIP5K1A PIO0 95K1C PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2B 100 PIP5K2C PIP4K2B 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKN1 PK3 35 PKN1 PK3 72 PKN1 PK3 72 <td>PIK3CA(E545A)$DIV2CA(E545V)$</td> <td>PIK3CA DIV2CA</td> <td>00 100</td> | PIK3CA(E545A) $DIV2CA(E545V)$ | PIK3CA DIV2CA | 00 100 |
| PIK3CA(H1047L) PIK3CA 100 PIK3CA(H1047Y) PIK3CA 100 PIK3CA(I800L) PIK3CA 100 PIK3CA(I800L) PIK3CA 100 PIK3CA(I800L) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CD PIK3CB 84 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIAB 4.7 PIM1 PIM1 22 PIM2 79 79 PIM3 91 39 PIPSK1A PIPSK1A 100 PIP5K1A PIP5K1C 49 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKA1 4.3 PKN2 35 76 PKN1 PKA2 35 PKN1 PKA2 35 PKN1 PKA3 72 PLK3 PLK3 72 <td>PIK3CA(E343K)</td> <td>PIKJCA</td> <td>100</td> | PIK3CA(E343K) | PIKJCA | 100 |
| PIK3CA(H1047Y) PIK3CA 100 PIK3CA(1800L) PIK3CA 73 PIK3CA(M1043I) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CD PIK3CD 93 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PIP5K2C PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKA2 35 PKN8(M.tuberculosis) pknB 38 PLK1 PIC 100 PLK3 PLK3 72 PKN2 PS 35 PKNB(M.tuberculosis) pknB 38 PLK1 PIC 100 PLK3 PLK3 <td>PIK3CA(H1047L)</td> <td>PIK3CA</td> <td>100</td> | PIK3CA(H1047L) | PIK3CA | 100 |
| PIK3CA(1800L) PIK3CA 73 PIK3CA(M1043I) PIK3CA 100 PIK3CA(Q546K) PIK3CB 84 PIK3CB PIK3CB 84 PIK3CB PIK3CB 84 PIK3CB PIK3CB 93 PIK3CG PIK3CG 77 PIK4CB PIM3 4.7 PIM1 PIM1 22 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKN1 PKN1 4.3 PKN2 PKN2 35 PKN1 PLK1 97 < | PIK3CA(H104/Y) | PIK3CA | 100 |
| PIK3CA(M10431) PIK3CA 100 PIK3CA(Q546K) PIK3CB 100 PIK3CB PIK3CB 84 PIK3CD PIK3CB 84 PIK3CD PIK3CB 93 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIM1 PIM1 22 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKN1 4.3 PKN2 PKN2 35 PKN8(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK3 72 PLK4 PLK4 0.9 | PIK3CA(1800L) | PIK3CA | /3 |
| PIK3CA(Q546K) PIK3CA 100 PIK3CB PIK3CB 84 PIK3CD PIK3CD 93 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PIM3 4.7 PIM1 PIM2 79 PIM3 PIM3 39 PIP5K1A PID5K1A 100 PIP5K1C PIP5K1C 49 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKN1 4.3 PKN2 PKN2 35 PKN1 PKN2 35 PKN8[M.tuberculosis) pknB 38 PLK1 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PS 85 PRKCE PRKCH 40 <t< td=""><td>PIK3CA(M10431)</td><td>PIK3CA</td><td>100</td></t<> | PIK3CA(M10431) | PIK3CA | 100 |
| PIK3CB PIK3CB 84 PIK3CD PIK3CD 93 PIK3CG PIK3CG 77 PIK4CB PIK3CG 77 PIK4CB PI4KB 4.7 PIM1 PIM1 22 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K2B PIP5K1C 49 PIP5K2C PIP4K2B 100 PKAC-alpha PRKACA 1.4 PKAC-alpha PRKACB 2 PKMYT1 PKN1 4.3 PKN2 PKN2 35 PKN1 PKN2 35 PKN2 PKN2 35 PKN2 PLK1 97 PLK2 PLK3 72 PLK4 PLK4 0.95 PRKCD PS 85 PRKCE PRKCH 40 PRKCI PRKCI 31 | PIK3CA(Q546K) | PIK3CA | 100 |
| PIK3CD PIK3CD 93 PIK3CG PIK3CG 77 PIK4CB PI4KB 4.7 PIM1 PIM1 22 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK2 100 PLK2 PLK3 72 PLK4 PLK4 0.95 PKKCD PKCD 85 PRKCD PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIK3CB | PIK3CB | 84 |
| PIK3CG PIK3CG 77 PIK4CB PI4KB 4.7 PIM1 PIM1 22 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK2 100 PLK2 PLK2 100 PLK3 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 <td>PIK3CD</td> <td>PIK3CD</td> <td>93</td> | PIK3CD | PIK3CD | 93 |
| PIK4CB PI4KB 4.7 PIM1 PIM1 22 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K1C PIP5K1C 49 PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKN8(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIK3CG | PIK3CG | 77 |
| PIM1 PIM1 22 PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K1C PIP5K1C 49 PIP5K2B PIP4K2B 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIK4CB | PI4KB | 4.7 |
| PIM2 PIM2 79 PIM3 PIM3 39 PIP5K1A PIP5K1A 100 PIP5K1C PIP5K1C 49 PIP5K2B PIP4K2B 100 PIF5K2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKN8(M.tuberculosis) pknB 38 PLK1 P1K2 100 PLK2 PLK1 97 PLK2 PLK1 97 PLK2 PLK3 72 PLK4 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIM1 | PIM1 | 22 |
| PIM3PIM339PIP5K1APIP5K1A100PIP5K1CPIP5K1C49PIP5K2BPIP4K2B100PIP5K2CPIP4K2C100PKAC-alphaPRKACA1.4PKAC-betaPRKACB2PKMYT1PKMYT158PKN1PKN14.3PKN2PKN235PKN8(M.tuberculosis)pknB38PLK1PLK197PLK2PLK2100PLK3PLK372PLK4PLK40.95PRKCDPRKCD85PRKCEPRKCE4.4PRKCHPRKCH40PRKCIPRKCI31 | PIM2 | PIM2 | 79 |
| PIP5K1A PIP5K1A 100 PIP5K1C PIP5K1C 49 PIP5K2B PIP4K2B 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIM3 | PIM3 | 39 |
| PIP5K1C PIP5K1C 49 PIP5K2B PIP4K2B 100 PIF5K2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIP5K1A | PIP5K1A | 100 |
| PIP5K2B PIP4K2B 100 PIP5K2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKN8(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIP5K1C | PIP5K1C | 49 |
| PIP5K2C PIP4K2C 100 PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PIP5K2B | PIP4K2B | 100 |
| PKAC-alpha PRKACA 1.4 PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 4.4 PRKCH PRKCH 31 | PIP5K2C | PIP4K2C | 100 |
| PKAC-beta PRKACB 2 PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PKAC-alpha | PRKACA | 1.4 |
| PKMYT1 PKMYT1 58 PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PKAC-beta | PRKACB | 2 |
| PKN1 PKN1 4.3 PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PKMYT1 | PKMYT1 | 58 |
| PKN2 PKN2 35 PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PKN1 | PKN1 | 4.3 |
| PKNB(M.tuberculosis) pknB 38 PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PKN2 | PKN2 | 35 |
| PLK1 PLK1 97 PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PKNB(M.tuberculosis) | pknB | 38 |
| PLK2 PLK2 100 PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCI 40 PRKCI PRKCI 31 | PLK1 | PLK1 | 97 |
| PLK3 PLK3 72 PLK4 PLK4 0.95 PRKCD PRKCD 85 PRKCE PRKCE 4.4 PRKCH PRKCH 40 PRKCI PRKCI 31 | PLK2 | PLK2 | 100 |
| PLK4PLK40.95PRKCDPRKCD85PRKCEPRKCE4.4PRKCHPRKCH40PRKCIPRKCI31 | PLK3 | PLK3 | 72 |
| PRKCDPRKCD85PRKCEPRKCE4.4PRKCHPRKCH40PRKCIPRKCI31 | PLK4 | PLK4 | 0.95 |
| PRKCEPRKCE4.4PRKCHPRKCH40PRKCIPRKCI31 | PRKCD | PRKCD | 85 |
| PRKCHPRKCH40PRKCIPRKCI31 | PRKCE | PRKCE | 4.4 |
| PRKCI PRKCI 31 | PRKCH | PRKCH | 40 |
| | PRKCI | PRKCI | 31 |

| PRKCQ | PRKCQ | 1 |
|--|--------------|-----------------|
| PRKD1 | PRKD1 | 58 |
| PRKD2 | PRKD2 | 67 |
| PRKD3 | PRKD3 | 25 |
| PRKG1 | PRKG1 | 53 |
| PRKG2 | PRKG2 | 100 |
| PRKR | EIF2AK2 | 58 |
| PRKX | PRKX | 21 |
| PRP4 | PRPF4B | 100 |
| PYK2 | PTK2B | 32 |
| OSK | KIA A0999 | 100 |
| RAF1 | RAF1 | 77 |
| RFT | RFT | 24 |
| RET(M918T) | RET | 2.4 |
| $\mathbf{RET}(\mathbf{V80}\mathbf{I})$ | RET | 18 |
| $\mathbf{PET}(\mathbf{V}\mathbf{S}04\mathbf{M})$ | DET | 4 .0 |
| | REI DIOVI | 65 |
| NIOKI | | 100 |
| RIOK2 | RIUK2 | 100 |
| RIUK3 | RIUK3 | 98 |
| RIPKI | RIPKI | 100 |
| RIPK2 | RIPK2 | 100 |
| RIPK4 | RIPK4 | 100 |
| RIPK5 | DSTKY | 5.4 |
| ROCK1 | ROCK1 | 1.4 |
| ROCK2 | ROCK2 | 3.6 |
| ROS1 | ROS1 | 90 |
| RPS6KA4(Kin.Dom.1-N-terminal) | RPS6KA4 | 2.8 |
| RPS6KA4(Kin.Dom.2-C-terminal) | RPS6KA4 | 100 |
| RPS6KA5(Kin.Dom.1-N-terminal) | RPS6KA5 | 17 |
| RPS6KA5(Kin.Dom.2-C-terminal) | RPS6KA5 | 100 |
| RSK1(Kin.Dom.1-N-terminal) | RPS6KA1 | 7.2 |
| RSK1(Kin.Dom.2-C-terminal) | RPS6KA1 | 3.9 |
| RSK2(Kin.Dom.1-N-terminal) | RPS6KA3 | 0.3 |
| RSK3(Kin.Dom.1-N-terminal) | RPS6KA2 | 4.4 |
| RSK3(Kin.Dom.2-C-terminal) | RPS6KA2 | 51 |
| RSK4(Kin Dom 1-N-terminal) | RPS6KA6 | 3 |
| RSK4(Kin Dom 2-C-terminal) | RPS6KA6 | 14 |
| S6K1 | RPS6KB1 | 11 |
| SBK1 | SBK1 | 100 |
| SgK110 | SDIM | 100 |
| SGK3 | SCK3 | 100 |
| SUKS | SUK5 SIK1 | 20 |
| SIK SIK2 | SIKI SIKI | 29 66 |
| | | 24 |
| | | 54 12 |
| SINAKA | | 13 |
| SINKA | SINKK | 100 |
| SKU | SKU | 2 |
| SKMS | SKMS | 60 |
| SKPKI | SKPKI | 100 |
| SRPK2 | SRPK2 | 100 |
| SRPK3 | SRPK3 | 100 |

| STK16 | STK16 | 60 |
|------------------------------|--------|------|
| STK33 | STK33 | 9 |
| STK35 | STK35 | 36 |
| STK36 | STK36 | 84 |
| STK39 | STK39 | 98 |
| SYK | SYK | 100 |
| TAK1 | MAP3K7 | 69 |
| TAOK1 | TAOK1 | 11 |
| TAOK2 | TAOK2 | 76 |
| TAOK3 | TAOK3 | 60 |
| TBK1 | TBK1 | 45 |
| TEC | TEC | 19 |
| TESK1 | TESK1 | 100 |
| TGFBR1 | TGFBR1 | 100 |
| TGFBR2 | TGFBR2 | 100 |
| TIE1 | TIE1 | 46 |
| TIE2 | TEK | 51 |
| TLK1 | TLK1 | 31 |
| TLK2 | TLK2 | 81 |
| TNIK | TNIK | 12 |
| TNK1 | TNK1 | 56 |
| TNK2 | TNK2 | 50 |
| TNNI3K | TNNI3K | 86 |
| TRKA | NTRK1 | 0.25 |
| TRKB | NTRK2 | 1.4 |
| TRKC | NTRK3 | 2.3 |
| TRPM6 | TRPM6 | 75 |
| TSSK1B | TSSK1B | 100 |
| TTK | ТТК | 64 |
| ТХК | ТХК | 90 |
| TYK2(JH1domain-catalytic) | TYK2 | 9.4 |
| TYK2(JH2domain-pseudokinase) | TYK2 | 100 |
| TYRO3 | TYRO3 | 84 |
| ULK1 | ULK1 | 11 |
| ULK2 | ULK2 | 4.3 |
| ULK3 | ULK3 | 0.3 |
| VEGFR2 | KDR | 69 |
| VRK2 | VRK2 | 0.75 |
| WEE1 | WEE1 | 100 |
| WEE2 | WEE2 | 67 |
| YANK1 | STK32A | 21 |
| YANK2 | STK32B | 44 |
| YANK3 | STK32C | 65 |
| YES | YES1 | 13 |
| YSK1 | STK25 | 28 |
| YSK4 | YSK4 | 52 |
| ZAK | ZAK | 100 |
| ZAP70 | ZAP70 | 85 |

| Ambit Gene Symbol | Entrez Gene Symbol | Percent Control |
|-------------------------------|--------------------|-----------------|
| AAK1 | AAK1 | 79 |
| ABL1(E255K)-phosphorylated | ABL1 | 100 |
| ABL1(F317I)-nonphosphorylated | ABL1 | 100 |
| ABL1(F317I)-phosphorylated | ABL1 | 100 |
| ABL1(F317L)-nonphosphorylated | ABL1 | 100 |
| ABL1(F317L)-phosphorylated | ABL1 | 100 |
| ABL1(H396P)-nonphosphorylated | ABL1 | 100 |
| ABL1(H396P)-phosphorylated | ABL1 | 100 |
| ABL1(M351T)-phosphorylated | ABL1 | 100 |
| ABL1(Q252H)-nonphosphorylated | ABL1 | 100 |
| ABL1(Q252H)-phosphorylated | ABL1 | 100 |
| ABL1(T315I)-nonphosphorylated | ABL1 | 100 |
| ABL1(T315I)-phosphorylated | ABL1 | 71 |
| ABL1(Y253F)-phosphorylated | ABL1 | 90 |
| ABL1-nonphosphorylated | ABL1 | 100 |
| ABL1-phosphorylated | ABL1 | 100 |
| ABL2 | ABL2 | 100 |
| ACVR1 | ACVR1 | 100 |
| ACVR1B | ACVR1B | 91 |
| ACVR2A | ACVR2A | 100 |
| ACVR2B | ACVR2B | 100 |
| ACVRL1 | ACVRL1 | 100 |
| ADCK3 | CABC1 | 56 |
| ADCK4 | ADCK4 | 95 |
| AKT1 | AKT1 | 3.9 |
| AKT2 | AKT2 | 65 |
| AKT3 | AKT3 | 11 |
| ALK | ALK | 21 |
| AMPK-alphal | PRKAAI | 26 |
| AMPK-alpha2 | PRKAA2 | 55 |
| ANKKI | ANKK1 | 100 |
| ARK5 | NUAKI MADAKE | 27 |
| ASKI | MAP3K5 | 100 |
| ASK2 | MAP3K6 | 100 |
| AURKA | AURKA | 100 |
| AURKB | AURKB | 57 |
| AURKC | AURKC | 56 |
| AXL | AXL | |
| BIKE | BMP2K | 60 |
| BLK | BLK | 43 |
| BMP 1P | BMPKIA | 100 |
| | DMDD2 | 100 |
| | DMPK2 | 63 |
| BMA | BMX | 92 |
| вкаг | вкаг | 63 |

 Table S3. KINOMEscan Screening Data for Complex 9b (DiscoveRx).

| BRAF(V600E) | BRAF | 50 |
|----------------------|----------------------|-----------|
| BRK | PTK6 | 66 |
| BRSK1 | BRSK1 | 70 |
| BRSK2 | BRSK2 | 90 |
| BTK | BTK | 76 |
| CAMK1 | CAMK1 | 62 |
| CAMK1D | CAMK1D | 11 |
| CAMK1G | CAMK1G | 66 |
| CAMK2A | CAMK2A | 59 |
| CAMK2B | CAMK2B | 67 |
| CAMK2D | CAMK2D | 76 |
| CAMK2G | CAMK2G | 86 |
| CAMK4 | CAMK4 | 1 |
| CAMKK1 | CAMKK1 | 39 |
| CAMKK2 | CAMKK2 | 48 |
| CASK | CASK | 100 |
| CDC2L1 | CDC2L1 | 100 |
| CDC2L2 | CDC2L2 | 100 |
| CDC2L5 | CDC2L5 | 100 |
| CDK11 | CDC2L6 | 100 |
| CDK2 | CDK2 | 48 |
| CDK3 | CDK3 | 42 |
| CDK4-cyclinD1 | CDK4 | 84 |
| CDK4-cyclinD3 | CDK4 | 90 |
| CDK5 | CDK5 | 76 |
| CDK7 | CDK7 | 18 |
| CDK8 | CDK8 | 10 |
| CDK0 | CDK0 | 02 |
| CDKI 1 | CDKI 1 | 100 |
| CDKL1 | CDKL2 | 74 |
| CDKL2 CDKL3 | CDKL2 CDKL3 | 100 |
| CDKL5 | CDKL5 | 100 |
| CDRLJ CHEV1 | CDKL5 CHEV1 | 90 |
| CHEK1 CHEV2 | CHEK2 | 15 76 |
| | CIT | /0 |
| | | 95 |
| | | 4.5 |
| CLK2 | CLK2 | 1.4 |
| | CLK5 | 5.4 11 |
| CLK4 | CLK4 CSE1D | 11 |
| CSFIR | CSFIK | 5/ |
| CSK CSNR1 A 1 | | 89 |
| CSINKIAI CSINKIAI | CSINKIAI | 19 |
| CSINKIAIL | CSNKIAIL | 31 |
| CSNKID | CSNKID CONKIE | 9.3 |
| CSNKIE | CSNKIE | 5.4 |
| USINKIGI GINIKIG2 | USINKIGI GINWI GO | 74 |
| CSNKIG2 | CSNKIG2 | 56 |
| CSNKIG3 | USNKIG3 | 84 |
| CSNK2A1 | CSNK2A1 | 83 |
| CSNK2A2 | CSNK2A2 | 44 |
| СТК | MATK | 86 |

| DAPK1 | DAPK1 | 20 |
|---------------------------|----------|------|
| DAPK2 | DAPK2 | 50 |
| DAPK3 | DAPK3 | 18 |
| DCAMKL1 | DCLK1 | 14 |
| DCAMKL2 | DCLK2 | 19 |
| DCAMKL3 | DCLK3 | 1.4 |
| DDR1 | DDR1 | 94 |
| DDR2 | DDR2 | 75 |
| DLK | MAP3K12 | 52 |
| DMPK | DMPK | 47 |
| DMPK2 | CDC42BPG | 66 |
| DRAK1 | STK17A | 100 |
| DRAK2 | STK17B | 100 |
| DYRK1A | DYRK1A | 7 |
| DYRK1B | DYRK1B | 12 |
| DYRK2 | DYRK2 | 61 |
| EGFR | EGFR | 100 |
| EGFR(E746-A750del) | EGFR | 100 |
| EGFR(G719C) | EGFR | 97 |
| EGFR(G719S) | EGFR | 100 |
| EGFR(L747-E749del, A750P) | EGFR | 72 |
| EGFR(L747-S752del, P753S) | EGFR | 90 |
| EGFR(L747-T751del,Sins) | EGFR | 88 |
| EGFR(L858R) | EGFR | 100 |
| EGFR(L858R,T790M) | EGFR | 94 |
| EGFR(L861Q) | EGFR | 92 |
| EGFR(S752-I759del) | EGFR | 100 |
| EGFR(T790M) | EGFR | 41 |
| EIF2AK1 | EIF2AK1 | 100 |
| EPHA1 | EPHA1 | 63 |
| EPHA2 | EPHA2 | 100 |
| EPHA3 | EPHA3 | 63 |
| EPHA4 | EPHA4 | 88 |
| EPHA5 | EPHA5 | 90 |
| EPHA6 | EPHA6 | 85 |
| EPHA7 | EPHA7 | 96 |
| EPHA8 | EPHA8 | 96 |
| EPHB1 | EPHB1 | 84 |
| EPHB2 | EPHB2 | 100 |
| EPHB3 | EPHB3 | 89 |
| EPHB4 | EPHB4 | 97 |
| EPHB6 | EPHB6 | 100 |
| ERBB2 | ERBB2 | 53 |
| ERBB3 | ERBB3 | 100 |
| ERBB4 | ERBB4 | 82 |
| ERK1 | MAPK3 | 98 |
| ERK2 | MAPK1 | 100 |
| ERK3 | MAPK6 | 69 |
| ERK4 | MAPK4 | 100 |
| ERK5 | MAPK7 | 4.6 |
| ERK8 | MAPK15 | 0.85 |

| ERN1 | ERN1 | 99 |
|------------------------------|---------|------|
| FAK | PTK2 | 67 |
| FER | FER | 46 |
| FES | FES | 88 |
| FGFR1 | FGFR1 | 32 |
| FGFR2 | FGFR2 | 56 |
| FGFR3 | FGFR3 | 69 |
| FGFR3(G697C) | FGFR3 | 69 |
| FGFR4 | FGFR4 | 79 |
| FGR | FGR | 61 |
| FLT1 | FLT1 | 100 |
| FLT3 | FLT3 | 16 |
| FLT3(D835H) | FLT3 | 3.7 |
| FLT3(D835Y) | FLT3 | 11 |
| FLT3(ITD) | FLT3 | 25 |
| FLT3(K663Q) | FLT3 | 6 |
| FLT3(N841I) | FLT3 | 0.45 |
| FLT3(R834Q) | FLT3 | 16 |
| FLT4 | FLT4 | 54 |
| FRK | FRK | 74 |
| FYN | FYN | 71 |
| GAK | GAK | 64 |
| GCN2(Kin.Dom.2,S808G) | EIF2AK4 | 78 |
| GRK1 | GRK1 | 6.1 |
| GRK4 | GRK4 | 100 |
| GRK7 | GRK7 | 1.7 |
| GSK3A | GSK3A | 0.2 |
| GSK3B | GSK3B | 0.35 |
| НСК | НСК | 60 |
| HIPK1 | HIPK1 | 49 |
| HIPK2 | HIPK2 | 14 |
| HIPK3 | HIPK3 | 9.6 |
| HIPK4 | HIPK4 | 90 |
| HPK1 | MAP4K1 | 61 |
| HUNK | HUNK | 100 |
| ICK | ICK | 21 |
| IGF1R | IGF1R | 60 |
| IKK-alpha | CHUK | 100 |
| IKK-beta | IKBKB | 100 |
| IKK-epsilon | IKBKE | 100 |
| INSR | INSR | 59 |
| INSRR | INSRR | 65 |
| IRAK1 | IRAK1 | 65 |
| IRAK3 | IRAK3 | 44 |
| IRAK4 | IRAK4 | 25 |
| ITK | ITK | 56 |
| JAK1(JH1domain-catalytic) | JAK1 | 76 |
| JAK1(JH2domain-pseudokinase) | JAK1 | 86 |
| JAK2(JH1domain-catalytic) | JAK2 | 52 |
| JAK3(JH1domain-catalytic) | JAK3 | 17 |
| JNK1 | MAPK8 | 100 |

| JNK2 | MAPK9 | 91 |
|-----------------------|----------------------|----------------|
| JNK3 | MAPK10 | 67 |
| KIT | KIT | 69 |
| KIT(A829P) | KIT | 62 |
| KIT(D816H) | KIT | 57 |
| KIT(D816V) | KIT | 33 |
| KIT(L576P) | KIT | 56 |
| KIT(V559D) | KIT | 65 |
| KIT(V559D,T670I) | KIT | 63 |
| KIT(V559D,V654A) | КІТ | 88 |
| LATS1 | LATS1 | 79 |
| LATS2 | LATS2 | 20 |
| LCK | LCK | <u>2</u> 82 |
| LIMK1 | LIMK1 | 100 |
| LIMK2 | LIMK2 | 100 |
| I KB1 | STK11 | 75 |
| LINDI | STK10 | 59 |
| I RRK2 | IRRK2 | 100 |
| I PP K2(G2010S) | | 100 |
| LKKK2(020195) I TV | LKKK2 I TV | 100 |
| | | 44 |
| | L_{11N} MAD2V12 | 92 |
| | MARSKIS | 100 |
| | MAR MAD2V1 | 100 |
| | MAP3NI MAD2K15 | 80 100 |
| MAP3KI3 | MAP3K13 | 100 |
| MAP3K2 | MAP3K2 | 42 |
| | MAP3K3 | 20 |
| MAP3K4 | MAP3K4 | 100 |
| MAP4K2 | MAP4K2 | 100 |
| MAP4K3 | MAP4K3 | 7.6 |
| MAP4K4 | MAP4K4 | 78 |
| MAP4K5 | MAP4K5 | 56 |
| MAPKAPK2 | МАРКАРК2 | 100 |
| МАРКАРК5 | МАРКАРК5 | 100 |
| MARK1 | MARK1 | 98 |
| MARK2 | MARK2 | 36 |
| MARK3 | MARK3 | 56 |
| MARK4 | MARK4 | 90 |
| MAST1 | MAST1 | 100 |
| MEK1 | MAP2K1 | 85 |
| MEK2 | MAP2K2 | 81 |
| MEK3 | MAP2K3 | 1.7 |
| MEK4 | MAP2K4 | 100 |
| MEK5 | MAP2K5 | 91 |
| MEK6 | MAP2K6 | 82 |
| MELK | MELK | 78 |
| MERTK | MERTK | 5.4 |
| MET | MET | 56 |
| MET(M1250T) | MET | 27 |
| MET(Y1235D) | MET | 54 |
| MINK | MINK1 | 72 |
| | | |

| MKK7 | MAP2K7 | 83 |
|------------------|----------------|----------|
| MKNK1 | MKNK1 | 97 |
| MKNK2 | MKNK2 | 85 |
| MLCK | MYLK3 | 100 |
| MLK1 | MAP3K9 | 62 |
| MLK2 | MAP3K10 | 84 |
| MLK3 | MAP3K11 | 58 |
| MRCKA | CDC42BPA | 96 |
| MRCKB | CDC42BPB | 61 |
| MST1 | STK4 | 14 |
| MST1R | MST1R | 80 |
| MST2 | STK3 | 22 |
| MST3 | STK24 | 79 |
| MST/ | MST/ | 3 4 |
| MTOR | FR A P1 | 100 |
| MISK | MUSK | 100 |
| MVI K | MUSK MVI K | 3 1 |
| MULKA MVLKA | MILK MVL V2 | 00 |
| MIILKZ MVI KA | MILKZ MVLKA | 90 |
| MILK4 | MILK4 | 90 70 |
| MYO2D | MYO2D | /0 |
| | MIU3B CTK29 | 93 |
| NDR1 | 51K38 | 14 |
| NDR2 | STK38L | 18 |
| NEKI | NEKI | /1 |
| NEKII | NEKII | 100 |
| NEK2 | NEK2 | 68 70 |
| NEK3 | NEK3 | 79 |
| NEK4 | NEK4 | 100 |
| NEK5 | NEK5 | 100 |
| NEK6 | NEK6 | 100 |
| NEK7 | NEK7 | 100 |
| NEK9 | NEK9 | 99 |
| NIM1 | MGC42105 | 100 |
| NLK | NLK | 61 |
| OSR1 | OXSR1 | 76 |
| p38-alpha | MAPK14 | 100 |
| p38-beta | MAPK11 | 76 |
| p38-delta | MAPK13 | 81 |
| p38-gamma | MAPK12 | 100 |
| PAK1 | PAK1 | 34 |
| PAK2 | PAK2 | 18 |
| PAK3 | PAK3 | 34 |
| PAK4 | PAK4 | 48 |
| PAK6 | PAK6 | 54 |
| PAK7 | PAK7 | 29 |
| PCTK1 | PCTK1 | 94 |
| PCTK2 | PCTK2 | 98 |
| PCTK3 | РСТКЗ | 100 |
| PDGFRA | PDGFRA | 80 |
| PDGFRB | PDGFRB | 17 |
| PDPK1 | PDPK1 | 84 |
| | • • • • | |

| PFCDPK1(P.falciparum) | PFB0815w | 100 |
|-----------------------|--------------------------|-----------------------|
| PFPK5(P.falciparum) | MAL13P1.279 | 73 |
| PFTAIRE2 | PFTK2 | 43 |
| PFTK1 | PFTK1 | 100 |
| PHKG1 | PHKG1 | 79 |
| PHKG2 | PHKG2 | 33 |
| PIK3C2B | PIK3C2B | 100 |
| PIK3C2G | PIK3C2G | 100 |
| PIK3CA | PIK3CA | 100 |
| PIK3CA(C420R) | РІКЗСА | 100 |
| PIK3CA(E542K) | PIK3CA | 100 |
| PIK3CA(E545A) | PIK3CA | 98 |
| PIK3CA(E545K) | PIK3CA | 100 |
| PIK3CA(H1047L) | PIK3CA | 100 |
| PIK3CA(H1047Y) | PIK3CA | 100 |
| PIK3CA(I800L) | PIK3CA | 91 |
| PIK3CA(M1043I) | PIK3CA | 100 |
| PIK3CA(0546K) | PIK3CA | 100 |
| PIK3CB | PIK3CB | 58 |
| PIK3CD | PIK3CD | 80 |
| PIK3CG | PIK3CG | 96 |
| PIK4CB | PI4KB | 100 |
| PIM1 | PIM1 | 16 |
| PIM2 | PIM2 | 1.0 |
| PIM3 | PIM3 | ч.0 2 |
| ΡΙΡ5Κ1Δ | $PIP5K1\Delta$ | 73 |
| PIP5K1C | PIP5K1C | 16 |
| PIP5K2B | PIP/K/PR | 10 |
| PIP5K2C | PIP/K2C | 100 |
| PKAC alpha | DPKACA | 100 |
| PKAC-beta | PRKACR | 12 |
| DKMVT1 | DVMVT1 | 66 |
| PKN1 | PKN1 | 3 |
| PKN2 | PKN2 | 11 |
| PKNB(M tuberculosis) | nknB | 11 |
| DI K1 | | 05 |
| DI K2 | $PI K^{2}$ | 100 |
| DI K3 | DI K2 | 100 |
| PI KA | PI KA | 100 47 |
| | | |
| DDKCE | DPKCE | 2.2 17 |
| DRACH | DPKCH | 6 |
| PRKCI | PRKCI | 0 57 |
| PRKCO | PRKCO | 24 |
| DDKD1 | DDKD1 | 2. 4 54 |
| | | 5 5 |
| | | 20 |
| PRKG1 | PRKG1 | 29 60 |
| DDKC2 | DDKCJ | 02 16 |
| | $\frac{1}{1} \times 102$ | 10 |
| | DH'ZANZ DDVV | 20 51 |
| ΓΙΛΑΛ | Γιλλ | 54 |

| PRP4 | PRPF4B | 100 |
|--|---------------|-----------|
| PYK2 | PTK2B | 74 |
| QSK | KIAA0999 | 100 |
| RAF1 | RAF1 | 94 |
| RET | RET | 5.4 |
| RET(M918T) | RET | 1.9 |
| RET(V804L) | RET | 10 |
| RET(V804M) | RET | 12 |
| RIOK1 | RIOK1 | 100 |
| RIOK2 | RIOK2 | 87 |
| RIOK3 | RIOK3 | 100 |
| RIPK1 | RIPK1 | 100 |
| RIPK? | RIPK? | 100 |
| RIPKA | RIPKA | 100 |
| RIDK5 | DSTKV | 77 |
| RIKJ POCK1 | POCK1 | 11 |
| POCK1 | POCK2 | 1.1 |
| ROCK2 | ROCK2 DOS1 | 0.4 40 |
| RUSI DDS (V A 4 (Vin Dome 1 N terminal) | | 40 |
| RPS0KA4(Kin.Dom.1-N-terminal) | RPSOKA4 | 12 |
| RPS6KA4(Kin.Dom.2-C-terminal) | RPS0KA4 | 100 |
| RPS6KA5(Kin.Dom.1-N-terminal) | RPS6KA5 | 36 |
| RPS6KA5(Kin.Dom.2-C-terminal) | RPS6KA5 | 100 |
| RSK1(Kin.Dom.1-N-terminal) | RPS6KA1 | 29 |
| RSK1(Kin.Dom.2-C-terminal) | RPS6KA1 | 62 |
| RSK2(Kin.Dom.1-N-terminal) | RPS6KA3 | 2.6 |
| RSK3(Kin.Dom.1-N-terminal) | RPS6KA2 | 18 |
| RSK3(Kin.Dom.2-C-terminal) | RPS6KA2 | 89 |
| RSK4(Kin.Dom.1-N-terminal) | RPS6KA6 | 4.4 |
| RSK4(Kin.Dom.2-C-terminal) | RPS6KA6 | 34 |
| S6K1 | RPS6KB1 | 25 |
| SBK1 | SBK1 | 84 |
| SgK110 | | 100 |
| SGK3 | SGK3 | 58 |
| SIK | SIK1 | 93 |
| SIK2 | SIK2 | 70 |
| SLK | SLK | 42 |
| SNARK | NUAK2 | 16 |
| SNRK | SNRK | 100 |
| SRC | SRC | 70 |
| SRMS | SRMS | 85 |
| SRPK1 | SRPK1 | 100 |
| SRPK2 | SRPK2 | 93 |
| SRPK3 | SRPK3 | 100 |
| STK16 | STK16 | 57 |
| STK33 | STK33 | 11 |
| STK35 | STK35 | 62 |
| STK36 | STK36 | 89 |
| STK39 | STK39 | 100 |
| SYK | SYK | 97 |
| TAK1 | MAP3K7 | 35 |
| TAOK1 | TAOK1 | 55 |
| | | 5.8 |

| TAOK2 | TAOK2 | 40 |
|------------------------------|--------|-----|
| TAOK3 | TAOK3 | 10 |
| TBK1 | TBK1 | 100 |
| TEC | TEC | 100 |
| TESK1 | TESK1 | 100 |
| TGFBR1 | TGFBR1 | 100 |
| TGFBR2 | TGFBR2 | 100 |
| TIE1 | TIE1 | 63 |
| TIE2 | TEK | 92 |
| TLK1 | TLK1 | 41 |
| TLK2 | TLK2 | 91 |
| TNIK | TNIK | 65 |
| TNK1 | TNK1 | 52 |
| TNK2 | TNK2 | 100 |
| TNNI3K | TNNI3K | 79 |
| TRKA | NTRK1 | 26 |
| TRKB | NTRK2 | 18 |
| TRKC | NTRK3 | 36 |
| TRPM6 | TRPM6 | 82 |
| TSSK1B | TSSK1B | 100 |
| ТТК | TTK | 72 |
| TXK | ТХК | 100 |
| TYK2(JH1domain-catalytic) | TYK2 | 93 |
| TYK2(JH2domain-pseudokinase) | TYK2 | 100 |
| TYRO3 | TYRO3 | 92 |
| ULK1 | ULK1 | 0.2 |
| ULK2 | ULK2 | 7 |
| ULK3 | ULK3 | 100 |
| VEGFR2 | KDR | 75 |
| VRK2 | VRK2 | 9.5 |
| WEE1 | WEE1 | 100 |
| WEE2 | WEE2 | 85 |
| YANK1 | STK32A | 43 |
| YANK2 | STK32B | 68 |
| YANK3 | STK32C | 92 |
| YES | YES1 | 52 |
| YSK1 | STK25 | 43 |
| YSK4 | YSK4 | 0.2 |
| ZAK | ZAK | 100 |
| ZAP70 | ZAP70 | 100 |

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