

Supplementary Table 2- All drugs used in screen

| Name | Synonyms | Targets | Target pathway | PubCHEM |
|--------------------|---|---|-------------------------------|----------------|
| (5Z)-7-Oxozeaenol | | TAK1 (MAP3K7) | other | |
| 17-AAG | tanespimycin | HSP90 | other | 6505803 |
| 5-Fluorouracil | 5-FU | DNA antimetabolite | DNA replication | |
| 681640 | 681640 | WEE1, CHEK1 | cell cycle | 10384072 |
| A-443654 | KIN001-139 | AKT1, AKT2, AKT3 | PI3K signaling | 10172943 |
| A-770041 | KIN001-111 | SRC family | other | 9549184 |
| AC220 | Quizartinib | FLT3 | RTK signaling | 24889392 |
| AG-014699 | PF-01367338 | PARP1, PARP2 | Genome integrity | 9931953 |
| AICAR | N1-(b-D-Ribofuranosyl)-5-aminoimidazole-4-carboxamide | AMPK agonist | metabolism | 65110 |
| AKT inhibitor VIII | | AKT1, AKT2, AKT3 | PI3K signaling | 16218954 |
| AMG-706 | AMG-706 | VEGFR, RET, c-KIT, PDGFR | RTK signaling | 11667893 |
| AP-24534 | KIN001-192 | ABL | ABL signaling | 24826799 |
| AR-42 | HDAC-42 | HDAC | chromatin histone acetylation | 6918848 |
| AS601245 | AS601245 | JNK | JNK and p38 signaling | 11422035 |
| AS605240 | KIN001-173 | PI3K gamma | PI3K signaling | |
| AT-7519 | | CDK9 | cell cycle | |
| ATRA | Tretinoin | Retinoic acid and retinoid X receptor agonist | other | 444795 |
| AUY922 | VER-52296,NVP-AUY922 | HSP90 | other | 10096043 |
| AZ628 | | BRAF | ERK MAPK signaling | 11676786 |
| AZD6482 | KIN001-193 | PI3K beta (P3C2B) | PI3K signaling | 44137675 |
| AZD6482 | WO2009093972 | PI3K beta (P3C2B) | PI3K signaling | |
| AZD7762 | AZD 7762 | CHEK1, CHEK2 | Genome integrity | |
| AZD8055 | AZD8055 | mTORC1/2 | TOR signaling | |
| Afatinib | BIBW2992, Tovok | ERBB2, EGFR | EGFR signaling | 10184653 |
| Afatinib | | ERBB2, EGFR | EGFR signaling | |
| Axitinib | AG-013736 | PDGFR, KIT, VEGFR | RTK signaling | 6450551 |
| BAY 61-3606 | | SYK | other | 16760671 |
| BEZ235 | NVP-BEZ235 | PI3K (class 1), mTORC1/2 | PI3K signaling | |
| BHG712 | NVP-BHG712 | EPHB4 | RTK signaling | 16747388 |
| BI-2536 | KIN001-124 | PLK1, PLK2, PLK3 | mitosis | 11364421 |
| BIRB 0796 | | Androgen receptor (ANDR) | JNK and p38 signaling | 156422 |
| BIX02189 | | MEK5 | other | 46931012 |
| BMS-509744 | KIN001-127 | ITK | other | 20635522 |
| BMS-536924 | KIN001-126 | IGF1R | IGFR signaling | 10390396 |
| BMS-536924 | BMS-536924 | IGF1R | IGFR signaling | |
| BMS-708163 | Avagacestat | gamma-secretase | other | |
| BMS-708163 | Avagacestat | gamma-secretase | other | 46883536 |
| BMS-754807 | | IGF1R | IGFR signaling | 24785538 |
| BMS345541 | BMS345541 | IKBKB | other | |
| BX-795 | BX 795 | TBK1, PDPK1, IKK, AURKB, AURKC | other | 10077147 |
| BX-912 | KIN001-175 | PDK1 (PDPK1) | PI3K signaling | |

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|-------------------|--|--------------------------|---------------------------------|----------|
| Belinostat | PXD101 | HDAC | chromain histone acetylation | 6918638 |
| Bexarotene | LG-100069,LGD-1069 | Retinoic acid X family | other | 82146 |
| Bicalutamide | ICI-176334 | Androgen receptor (ANDR) | other | 2375 |
| Bicalutamide | ICI-176334 | Androgen receptor (ANDR) | other | |
| Bleomycin | | DNA damage | DNA replication | 5460769 |
| Bleomycin (50 uM) | | DNA damage | DNA replication | |
| Bortezomib | LDP-341,PS-341 | Proteasome | other | 387447 |
| Bosutinib | SKI-606 | SRC, ABL, TEC | ABL signaling | 5328940 |
| Bryostatin 1 | Bryostatin 1 | PRKC | other | 5280757 |
| CAL-101 | | PI3K delta | PI3K signaling chromain histone | |
| CAY10603 | | HDAC6 | acetylation | 24951314 |
| CCT007093 | | PPM1D | other | |
| CCT018159 | | HSP90 | other | |
| CEP-701 | CEP-701 | FLT3, JAK2, NTRK1, RET | RTK signaling | 126565 |
| CGP-082996 | CINK4,KIN001-021 | CDK4 | cell cycle | 24825971 |
| CGP-60474 | KIN001-019 | CDK1,CDK2,CDK5,CDK7,CDK9 | cell cycle | 644215 |
| CH5424802 | | ALK | RTK signaling | 49806720 |
| CHIR-99021 | CT 99021 | GSK3B | WNT signaling | 9956119 |
| CHIR-99021 | CT 99021 | GSK3B | WNT signaling | 9956119 |
| CI-1040 | PD-18435,PD-184352 | MEK1, MEK2 | ERK MAPK signaling | 6918454 |
| CMK | KIN001-128 [2-(6,7-dimethoxyquinazolin-4-yl)-5-(pyridin-2-yl)-2H-1,2,4-triazol-3-amine] | RSK | ERK MAPK signaling | NO MATCH |
| CP466722 | | ATM | Genome integrity | 44551660 |
| CP724714 | | ERBB2 | EGFR signaling chromain histone | 9874913 |
| CUDC-101 | | HDAC, EGFR | acetylation | 24756910 |
| CX-5461 | | RNA Pol I | other | 25257557 |
| Camptothecin | 7-Ethyl-10-Hydroxy-Camptothecin,SN-38 | TOP1 | DNA replication | 104842 |
| Cetuximab | Erbitux cis-Diammineplatinum(II) dichloride | EGFR | EGFR signaling | |
| Cisplatin | dichloride | DNA crosslinker | DNA replication | 84691 |
| Crizotinib | Xalkori,PF2341066 | MET, ALK | RTK signaling | 11496366 |
| Cyclophamide | 11-deoxojervine Ara-Cytidine,Arabinosyl | SMO | other | 442972 |
| Cytarabine | Cytosine,U-19920 | DNA synthesis | DNA replication | 6253 |
| DMOG | Dimethyloxalylglycine | Prolyl-4-Hydroxylase | other | 560326 |
| Dabrafenib | GSK2118436 | BRAF | ERK MAPK signaling | |
| Dasatinib | KIN001-005 | ABL, SRC, KIT, PDGFR | ABL signaling | 3062316 |
| Docetaxel | RP-56976 | Microtubules | cytoskeleton | 148124 |
| Doxorubicin | Doxil,Rubex | DNA intercalating | DNA replication | 31703 |
| EHT 1864 | | Rac GTPases | cytoskeleton | |
| EKB-569 | Pelitinib | EGFR | EGFR signaling | 6445562 |
| EX-527 | | SIRT1 | other | 5113032 |
| Elesclomol | | HSP70 | other | |
| Embelin | | XIAP | apoptosis regulation | 3218 |

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| Epothilone B | GNF-PF-193 | Microtubules | cytoskeleton | 448013 |
| Erlotinib | | EGFR | EGFR signaling | 176870 |
| Etoposide | | TOP2 | DNA replication | 36462 |
| FH535 | FH535 | unknown | other | 3463933 |
| FK866 | APO866 | NAMPT inhibitor | metabolism | |
| FMK | KIN001-242 | RSK | ERK MAPK signaling | |
| FR-180204 | | ERK | ERK MAPK signaling | 11493598 |
| FTI-277 | | Farnesyl-transferase (FNTA) | other | 3005532 |
| Foretinib | GSK1363089, XL-880 | MET | RTK signaling | 42642645 |
| GDC0449 | GDC0449 | SMO | other | 24776445 |
| GDC0941 | | PI3K (class 1) | PI3K signaling | 17755052 |
| GDC0941 | | PI3K | PI3K signaling | |
| | KIN001-013 (GNF-2 / 3-(6-(4-(trifluoromethoxy)phenylamino)pyrimidin-4-yl)benzamide) | | | |
| GNF-2 | | ABL (T315I) | ABL signaling | 5311510 |
| GSK-650394 | | SGK3 | other | 25022668 |
| GSK1070916 | | AURKB | mitosis | 46885626 |
| GSK1904529A | GSK1904529A | IGF1R | IGFR signaling | 25124816 |
| GSK2126458 | EX-8678 | PI3K, mTOR | PI3K signaling | 52914946 |
| GSK269962A | KIN001-155 | ROCK1,ROCK2 | cytoskeleton | 16095342 |
| GSK269962A | KIN001-155 | ROCK1,ROCK2 | cytoskeleton | 1609532 |
| GSK429286A | | ROCK2 | cytoskeleton | |
| GSK690693 | | AKT | PI3K signaling | 16725726 |
| GW 441756 | | NTRK1 | RTK signaling | |
| GW-2580 | GW-2580 | cFMS | RTK signaling | |
| GW843682X | KIN001-134 | PLK1 | mitosis | 15983966 |
| Gefitinib | ZD-1839 | EGFR | EGFR signaling | 123631 |
| Gemcitabine | Gemzar, LY-188011 | DNA replication | DNA replication | 60750 |
| Genentech Cpd 10 | | AURKA, AURKB | mitosis | |
| HG-5-113-01 | | LOK, LTK, TRCB, ABL(T315I) | ABL signaling | |
| HG-5-88-01 | | EGFR, ADCK4 | EGFR signaling | |
| HG-6-64-1 | KIN001-206 | BRAFV600E, TAK, MAP4K5 | ERK MAPK signaling | |
| I-BET-762 | GSK525762A | BRD2, BRD3, BRD4 | chromatin other | 46943432 |
| IOX2 | | EGLN1 | other | |
| IPA-3 | IPA-3 | PAK | cytoskeleton | 521106 |
| Imatinib | Gleevec,STI-571 | ABL, KIT, PDGFR | ABL signaling | 5291 |
| Ispinesib Mesylate | SB-715992 | KIF11 | mitosis | 6851740 |
| JNJ-26854165 | | MDM2 | p53 pathway | 11609586 |
| JNK Inhibitor VIII | JNK Inhibitor VIII | JNK | JNK and p38 signaling | 11624601 |
| JNK-9L | KIN001-204 | JNK, CDK9 | JNK and p38 signaling | NO MATCH |
| JQ1 | JQ1 | BRD2, BRD3, BRD4 | chromatin other | |
| JQ1 | | BRD2, BRD3, BRD4 | chromatin other | 46907787 |
| | | | chromain histone | |
| JQ12 | JQ12 | HDAC | acetylation | |
| JW-7-24-1 | | LCK | other | |
| JW-7-52-1 | | mTOR | TOR signaling | 49836027 |
| KIN001-055 | WHI-P97, AC1L1GQE | JAK3, MNK1 | other | 3796 |
| KIN001-102 | | AKT1 | PI3K signaling | |
| KIN001-135 | KIN001-135 | IKKE | other | 11626927 |

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| KIN001-236 | | TIE2 | other | |
| KIN001-244 | | PDK1 (PDPK1) | PI3K signaling | 56965967 |
| KIN001-260 | Bayer IKKb inhibitor | IKK | other | |
| KIN001-266 | | TPL2,COT(M3K8) | other | 44143370 |
| KIN001-270 | | CDK9 | cell cycle | |
| KU-55933 | | ATM | Genome integrity | 5278396 |
| | | | chromain histone | |
| LAQ824 | Dacinostat, NVP-LAQ824 | HDAC | acetylation | 6445533 |
| LFM-A13 | DDE-28 | BTK | other | 9549280 |
| LY317615 | Enzastaurin | PKCbeta | other | 176167 |
| Lapatinib | Tykerb, Tyverb | EGFR, ERBB2 | EGFR signaling | 208908 |
| Lenalidomide | | TNF alpha | other | 216326 |
| Linifanib | ABT-869 | RTK | RTK signaling | 11485656 |
| Lisitinib | OSI-906 | IGF1R | IGFR signaling | 11640390 |
| MG-132 | zLLL | Proteasome | other | 462382 |
| MK-2206 | | AKT1, AKT2 | PI3K signaling | |
| | | NEDD8-activating enzyme | | |
| MLN4924 | | (NAE) | other | |
| MP470 | | PDGFR | RTK signaling | 11282283 |
| MPS-1-IN-1 | | MPS1 | mitosis | 25195352 |
| | | | chromain histone | |
| MS-275 | MS275 | HDAC | acetylation | 4261 |
| Masitinib | AB1010 | KIT | RTK signaling | 10074640 |
| Methotrexate | | Dihydrofolate reductase | DNA replication | 126941 |
| Midostaurin | PKC 412 | KIT | RTK signaling | 24202429 |
| Mitomycin C | Mytozytrex,NSC-26980 | DNA crosslinker | DNA replication | 5746 |
| NG-25 | | TAK | other | |
| NPK76-II-72-1 | | PLK3 | mitosis | 46843648 |
| NSC-207895 | XI-006 | MDMX | p53 pathway | 3246561 |
| NSC-87877 | | SHP-1 (PTPN6), SHP-2 | other | 5459322 |
| NU-7441 | KU-57788 | DNAPK | Genome integrity | 11327430 |
| Navitoclax | ABT-263 | BCL-2, BCL-XL, BCL-W | apoptosis regulation | 24978538 |
| Nilotinib | | ABL | ABL signaling | 644241 |
| Nutlin-3a (-) | Nutlin-3a (-) | MDM2 | p53 pathway | 11433190 |
| OSI-027 | A-1065 | mTORC1/2 | TOR signaling | 44224160 |
| OSI-930 | | KIT, VEGFR, PDGFR | RTK signaling | 9868037 |
| OSU-03012 | AR-12 | PDK1 (PDPK1) | PI3K signaling | 10027278 |
| Obatoclax Mesylate | | BCL-2, BCL-XL, MCL-1 | apoptosis regulation | 16727411 |
| Olaparib | KU0059436, AZD-2281 | PARP1, PARP2 | Genome integrity | 23725625 |
| Olaparib | KU0059436, AZD2281 | PARP1, PARP2 | Genome integrity | |
| PAC-1 | PAC-1 | CASP3 agonist | apoptosis regulation | 6851947 |
| PD-0325901 | PD-0325901 | MEK1, MEK2 | ERK MAPK signaling | 9826528 |
| PD-0332991 | Palbociclib lsethionate | CDK4, CDK6 | cell cycle | 5330286 |
| PD-173074 | PD-173074 | FGFR1, FGFR3 | RTK signaling | 1401 |
| PF-4708671 | | p70 S6KA | TOR signaling | |
| PF-562271 | KIN001-205 | FAK | cytoskeleton | 11713159 |
| PFI-1 | | BRD2, BRD3, BRD4 | chromatin other | |
| PHA-665752 | | MET | RTK signaling | 10461815 |
| PHA-793887 | | CDK-pan | cell cycle | 46191454 |

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| PI-103 | | PI3K alpha,DNAPK | PI3K signaling | 9884685 |
| PIK-93 | | PI4K,PI3K | PI3K signaling | 6852167 |
| PLX4720 | | BRAF | ERK MAPK signaling | 24180719 |
| PLX4720 | | BRAF | ERK MAPK signaling | |
| Paclitaxel | BMS-181339-01 | Beta subunit of Tubulin | cytoskeleton | 36314 |
| Parthenolide | | NFKB1 | other | 5420805 |
| Pazopanib | GW786034 | VEGFR, PDGFRA, PDGFRB, KIT | RTK signaling | 10113978 |
| Phenformin | Phenformin | | metabolism | |
| Piperlongumine | | Increases ROS levels | other | 637858 |
| Pyrimethamine | | Dihydrofolate reductase | DNA replication | 4993 |
| QL-VIII-58 | | mTOR, ATR | TOR signaling | |
| QL-X-138 | | MNK2, DNAPK, MTOR, BTK, | other | |
| QL-XI-92 | | DDR1 | RTK signaling | |
| QL-XII-47 | | BTK, BMX | other | |
| QL-XII-61 | | BMX, BTK | other | |
| QS11 | QS11 | ARFGAP | other | No Match |
| RDEA119 | RDEA119 | MEK1, MEK2 | ERK MAPK signaling | 44182295 |
| RDEA119 | | MEK1, MEK2 | ERK MAPK signaling | |
| RO-3306 | | CDK1 | cell cycle | 44450571 |
| Rapamycin | AY-22989,Sirolimus,WY-090217 | mTOR | TOR signaling | 5284616 |
| Roscovitine | Seliciclib | CDK family | cell cycle | 160355 |
| Ruxolitinib | INCB-18424 | JAK1, JAK2, TYK2 | other | 25127112 |
| S-Trityl-L-cysteine | NSC 83265 | KIF11 | mitosis | 76044 |
| SB 216763 | SB 216763 | GSK3A, GSK3B | WNT signaling | |
| | 2-(5-Benzo[1,3]dioxol-5-yl-2-tert-butyl-3H-imidazol-4-yl)-6-methylpyridine hydrochloride | | | |
| SB 505124 | hydrate | TGFbetaR-I (ALK5) | other | 24724611 |
| SB52334 | | ALK5 | RTK signaling | 9967941 |
| SB590885 | | BRAF | ERK MAPK signaling | 11316960 |
| | | | chromatin histone | |
| SGC0946 | | DOT1L (Q8TEK3) | methylation | |
| SL 0101-1 | | RSK, AURKB, PIM3 | ERK MAPK signaling | |
| | 7-ethyl-10-hydroxy- | | | |
| SN-38 | camptothecin | TOP1 | DNA replication | |
| SNX-2112 | | HSP90 | other | 24772860 |
| STF-62247 | | Autophagy | other | 704473 |
| | 3-Phenyl-N-[2,2,2-trichloro-1-[[[(8-quinolinylamino)thioxomethyl]amino]ethyl]-2-propenamide | | | |
| Salubrinal | AZD-0530,KIN001-045 | GADD34-PP1C phosphatase | other | 5717801 |
| Saracatinib | | SRC, ABL1 | ABL signaling | 10302451 |
| Selumetinib | | MEK1, MEK2 | ERK MAPK signaling | 10127622 |
| Selumetinib | | MEK1, MEK2 | ERK MAPK signaling | |
| Shikonin | Shikonin | unknown | other | 5208 |
| | | PDGFRA, PDGFRB, KDR, KIT, | | |
| Sorafenib | BAY-439006, Nexavar | FLT3 | RTK signaling | 216239 |
| | | PDGFRA, PDGFRB, KDR, KIT, | | |
| Sunitinib | Sutent | FLT3 | RTK signaling | 5329102 |

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| T0901317 | | LXR | other | 447912 |
| TAE684 | NVP-TAE684 | ALK | RTK signaling | 16038120 |
| TAK-715 | KIN001-201 | p38a | JNK and p38 signaling | |
| TG101348 | | JAK2 | other | 16722836 |
| TGX221 | | PI3K beta | PI3K signaling | 9907093 |
| THZ-2-102-1 | | CDK7 | cell cycle | |
| THZ-2-49 | | CDK9 | cell cycle | |
| TL-1-85 | | TAK | other | |
| TL-2-105 | | CRAF | ERK MAPK signaling | |
| TPCA-1 | | IKK | other | 9903786 |
| TW 37 | | BCL-2, BCL-XL | apoptosis regulation | 11455910 |
| Talazoparib | BMN-673 | PARP1, PARP2 | Genome integrity | |
| Tamoxifen | | ER | other | |
| Temozolomide | Temodar | DNA alkylating agent | DNA replication | |
| Temsirolimus | CCI-779 | mTOR | TOR signaling | 6918289 |
| Thapsigargin | | ATPase, Ca ⁺⁺ transporting, cardiac muscle, slow twitch 2 | other | 446378 |
| Tipifarnib | | Farnesyl-transferase (FNTA) | other | 159324 |
| Tivozanib | AV-951 | VEGFR | RTK signaling | 9911830 |
| Trametinib | GSK1120212 | MEK1, MEK2 | ERK MAPK signaling | |
| Tubastatin A | | HDAC6 | chromatin histone acetylation | 53394750 |
| UNC0638 | | G9a(EHMT2), GLP(EHMT1) | methylation chromatin histone | 46224516 |
| UNC0638 | | G9a(EHMT2), GLP(EHMT1) | methylation | |
| UNC1215 | | L3MBTL3 | other | |
| VNLG/124 | 4-(Butanoyloxymethyl)phenyl- (2E,4E,6E,8E)-3,7-dimethyl-9- (2,6,6-trimethylcyclohex-1- enyl)nona-2,4,6,8-tetraenoate | HDAC,RAR | chromatin histone acetylation | 24894414 |
| VX-11e | | ERK | ERK MAPK signaling | 11634725 |
| VX-680 | MK-045,MK-0457,VX-68 | AURKA, AURKB, AURKC, FLT3, ABL1, JAK2 | mitosis | 5494449 |
| VX-702 | | p38 | JNK and p38 signaling | 10341154 |
| Veliparib | ABT-888 | PARP1, PARP2 | Genome integrity | 11960529 |
| Vinblastine | Vinblastine sulphate | Microtubules | cytoskeleton | 6710780 |
| Vinorelbine | | Microtubules | cytoskeleton | 60780 |
| Vorinostat | SAHA | HDAC inhibitor Class I, IIa, IIb, IV | chromatin histone acetylation | 5311 |
| WH-4-023 | KIN001-112 | SRC family, ABL | ABL signaling | 11844351 |
| WZ-1-84 | KIN001-123 | BMX | other | 49821040 |
| WZ3105 | | CLK2, CNSK1E, FLT3, ULK1 | other | |
| XAV939 | NVP-XAV939 | TNKS1, TNKS2 | WNT signaling | |
| XL-184 | Cabozantinib | VEGFR, MET, RET, KIT, FLT1, FLT3, FLT4, TIE2,AXL | RTK signaling | 25102847 |
| XMD11-85h | | BRSK2, FLT4, MARK4, PRKCD, RET, SPRK1 | other | |
| XMD13-2 | | RIPK | other | |

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| XMD14-99 | | EPHB3, CAMK1 | RTK signaling | |
| XMD15-27 | | CAMK2B, CLK2, DYRK1A, | | |
| XMD8-85 | XMD8-85 | MAST1, STK39 | other | |
| XMD8-92 | | ERK5 (MK07) | other | 46844147 |
| Y-39983 | | ERK5 | other | |
| YK 4-279 | | ROCK | cytoskeleton | 9810884 |
| YM155 | Sepantronium bromide | RNA helicase A | other | |
| YM201636 | | BIRC5 (Survivin) | apoptosis regulation | 11178236 |
| Z-LLNle-CHO | Z-L-Norleucine-CHO | PYKfyve(FYV1) | other | 9956222 |
| ZG-10 | | gamma-secretase | other | 16760646 |
| ZM-447439 | ZM447439 | IRAK1 | other | |
| ZSTK474 | KIN001-167 | AURKB | mitosis | 9914412 |
| Zibotentan | Zibotentan | PI3K | PI3K signaling | |
| rTRAIL | | Endothelin A Receptor | other | 9910224 |
| | | DR4, DR5 | apoptosis regulation | |