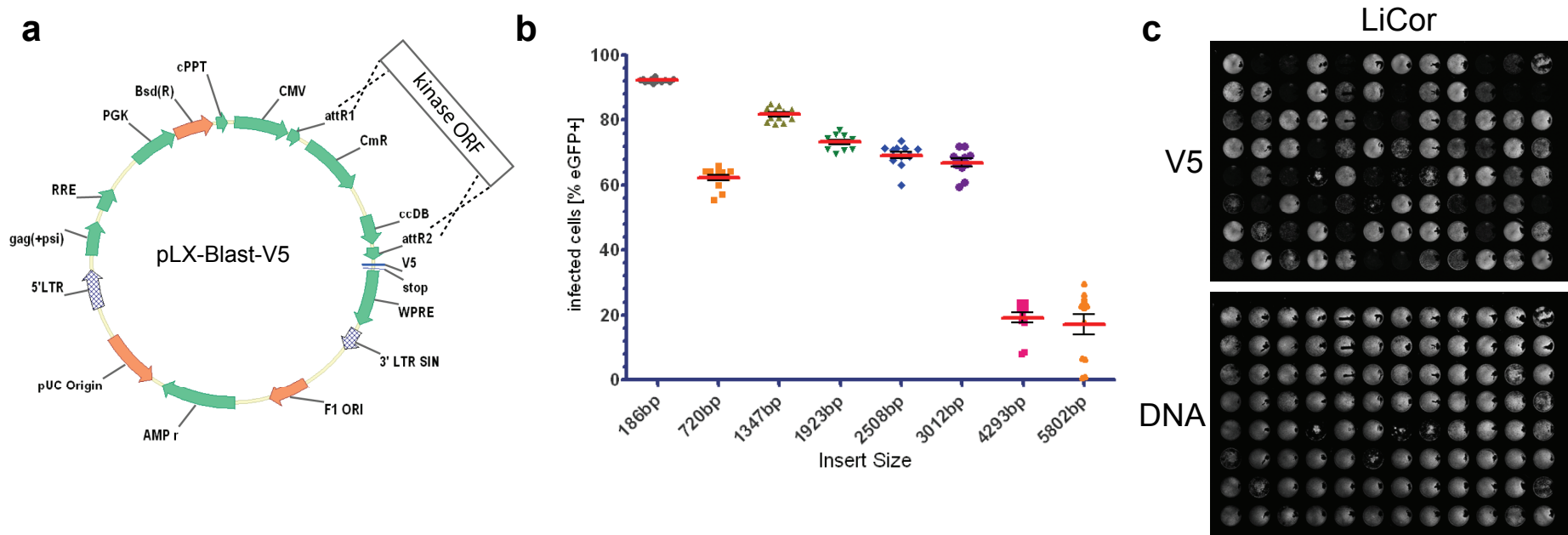
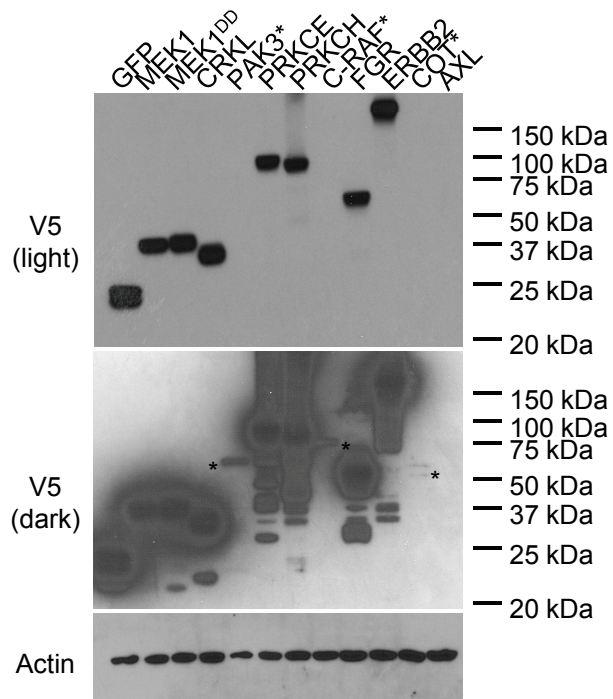


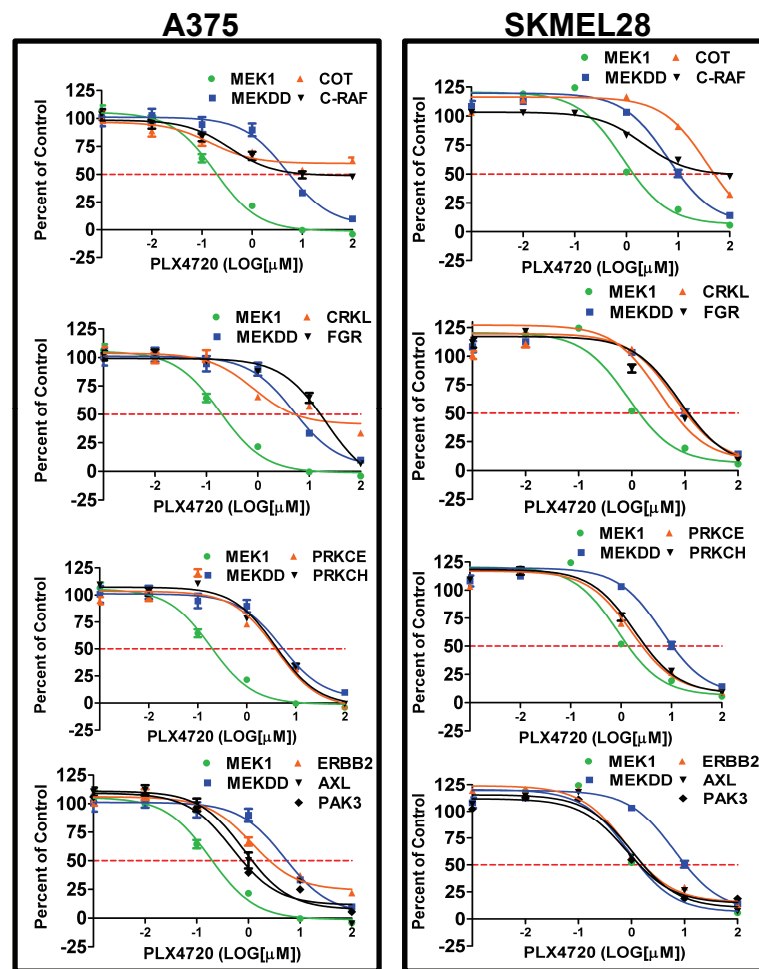
Supplemental Fig.1: Schematic outlining an ORF-based functional screen for kinases that drive resistance to B-RAF inhibition. The B-RAF^{V600E} cell line A375 was lentivirally transduced with the 597 kinases in the CCSB/Broad Institute Kinase ORF Collection. ORFs having a positive or negative effect on proliferation in control-treated A375 were identified and removed from final analysis. Resistance-promoting ORFs were identified by generating a differential viability ratio between B-RAF inhibited (PLX4720-treated) and control-treated cells. Differential viability was normalized to a constitutively active MEK1 allele, MEK1^{DD}; an assay specific positive control.



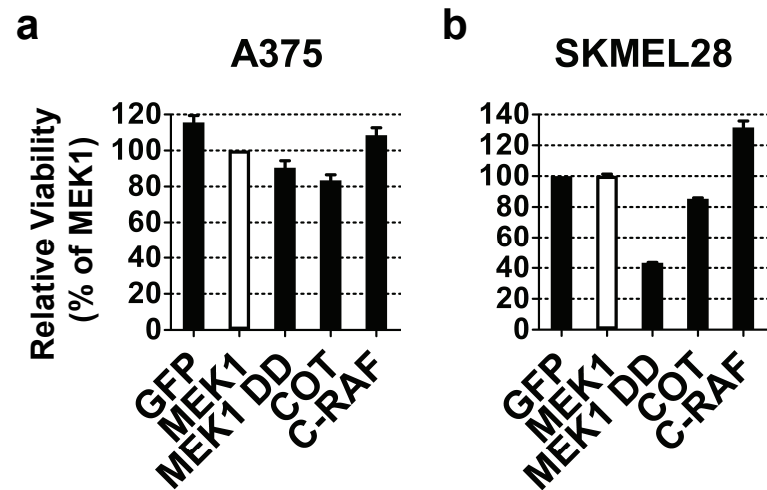
Supplementary Fig. 2: The CCSB/Broad Institute Kinase ORF Collection is well expressed via high titer lentivirus. (a), schematic of the pLX-BLAST-V5 lentiviral expression vector used for all ORF-screens and subsequent validation. (b) GFP-tagged ORFs representing a broad size range were lentivirally expressed in Jurkat cells and the percentage of GFP-expressing cells/ORF (e.g., infected cells) quantified, demonstrating high viral titer across a range of ORF sizes. (c), expression of 96 random ORFs detected via LiCor with antibodies against the V5-epitope tag, relative to cellular DNA. Expression was detectable in 83% of the wells.



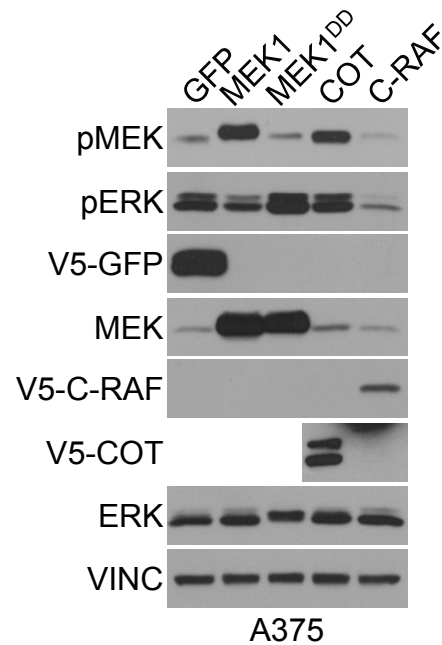
Supplementary Fig. 3: Expression of candidate resistance ORFs. 293T were transiently transfected with pLX-BLAST-V5-ORF (indicated) and expression detected using an anti-V5-HRP antibody. The AXL clone is 'closed' and has a stop codon preceding the V5 tag. See Supplementary Fig. 8 for verification of expression; (*) on dark-exposure indicate the expression of three ORFs not visible in the lighter exposure.



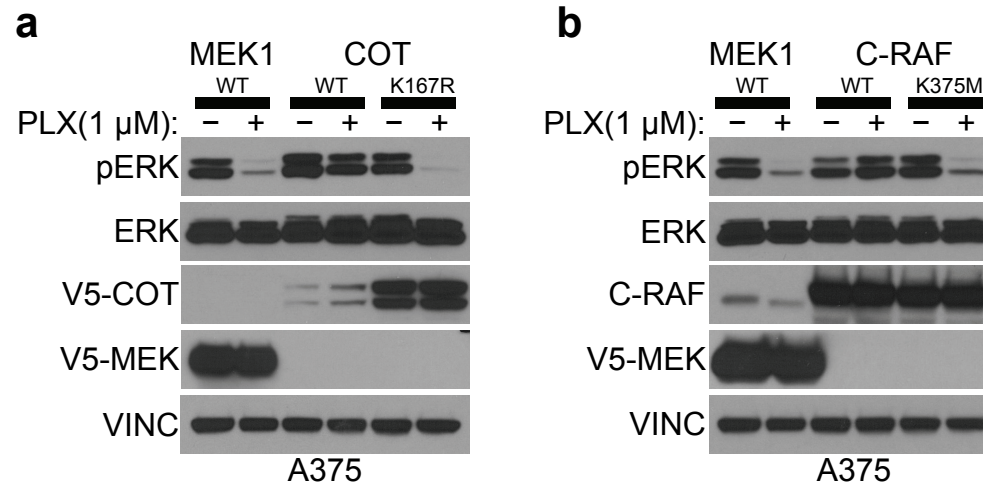
Supplementary Fig. 4: A secondary screen prioritizes the top 9 candidate B-RAF inhibitor resistance ORFs. The top nine ORFs scoring in the primary screen were expressed in A375 or SKMEL28 and a GI_{50} generated from an 8-point PLX4720 concentration range.



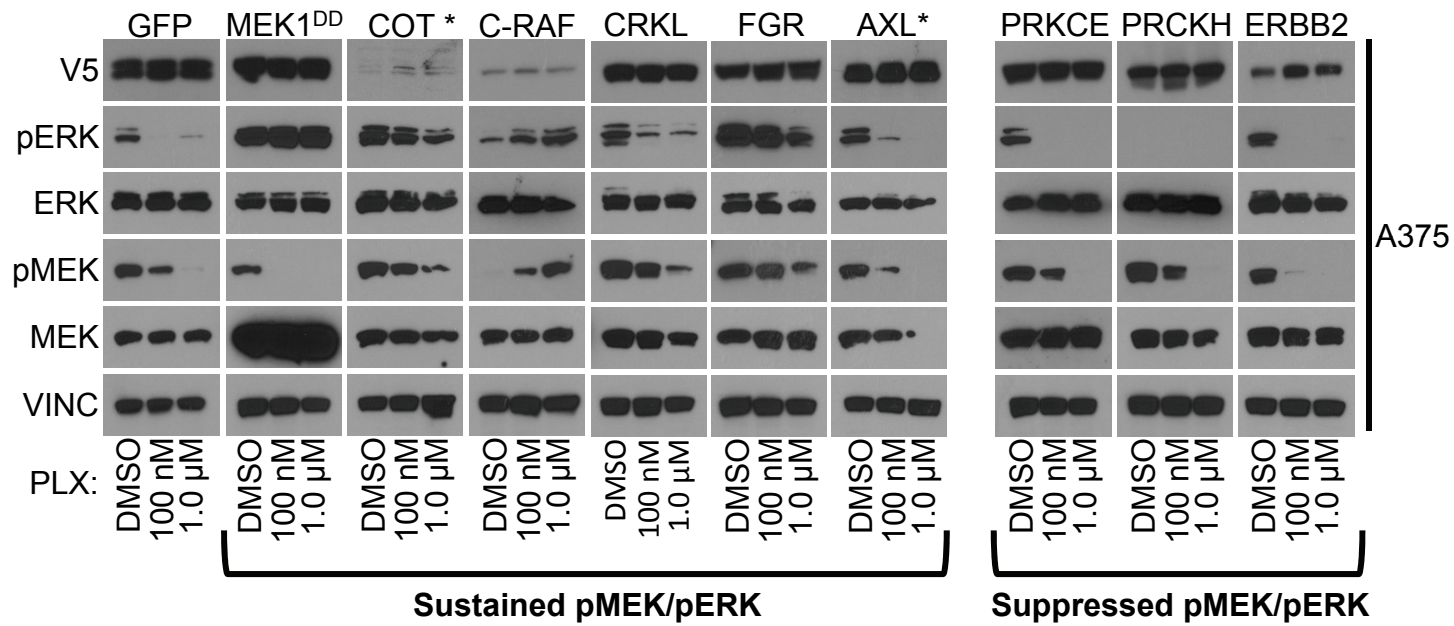
Supplementary Fig. 5: Effects of ORF expression on proliferation in B-RAF^{V600E} cell lines. Proliferation, relative to MEK1, in (a) A375 or (b) SKMEL28 expressing indicated ORFs after 7 days of growth.



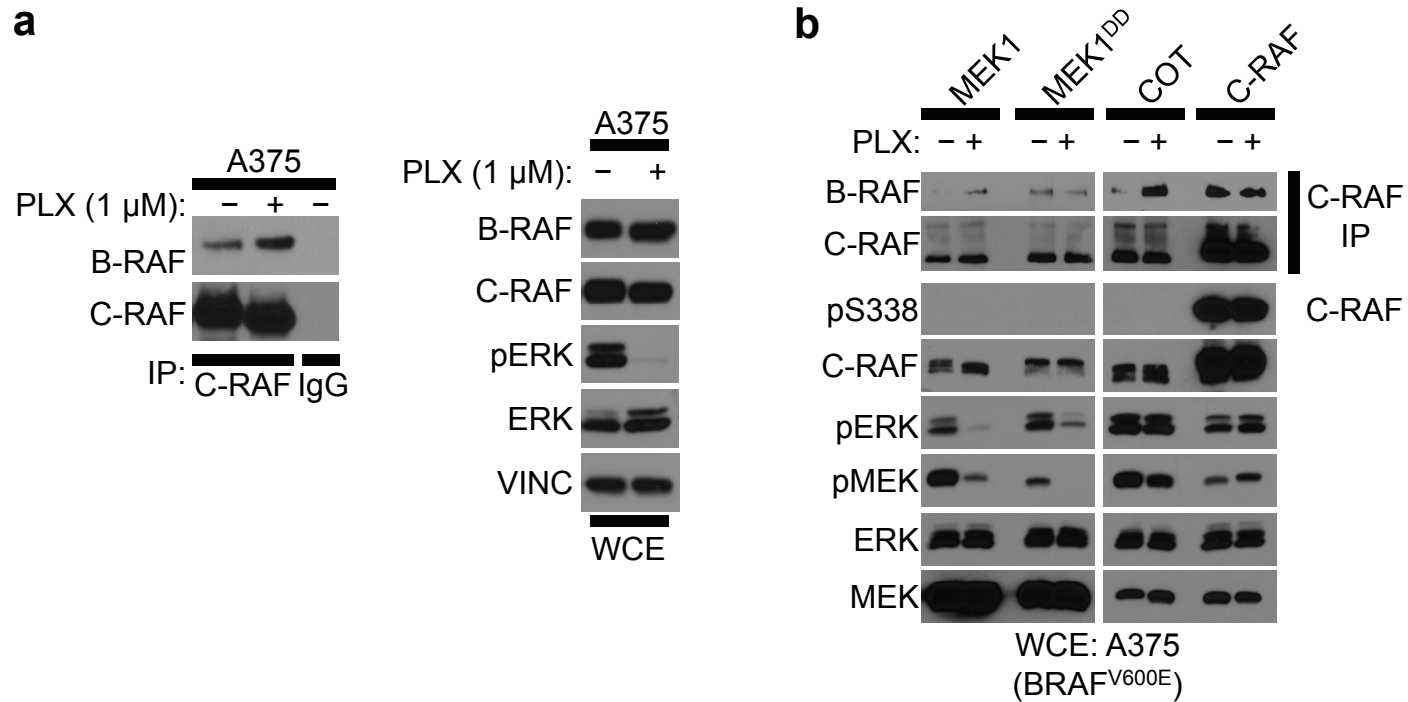
Supplementary Fig. 6: Ectopic expression of constitutively active MEK1 (MEK1^{DD}) and COT lead to increased pMEK/pERK in A375, whereas C-RAF reduces pMEK/pERK levels. Lysates from A375 ectopically expressing GFP, MEK1, MEK^{DD}, COT or C-RAF were analyzed via immunoblot for levels of pERK and pMEK. GFP and MEK1 (lanes 1-3) were separated from COT/C-RAF (lanes 4-5) to prevent residual V5-MEK1 signal from overwhelming that of COT and C-RAF, which are expressed at much lower levels.



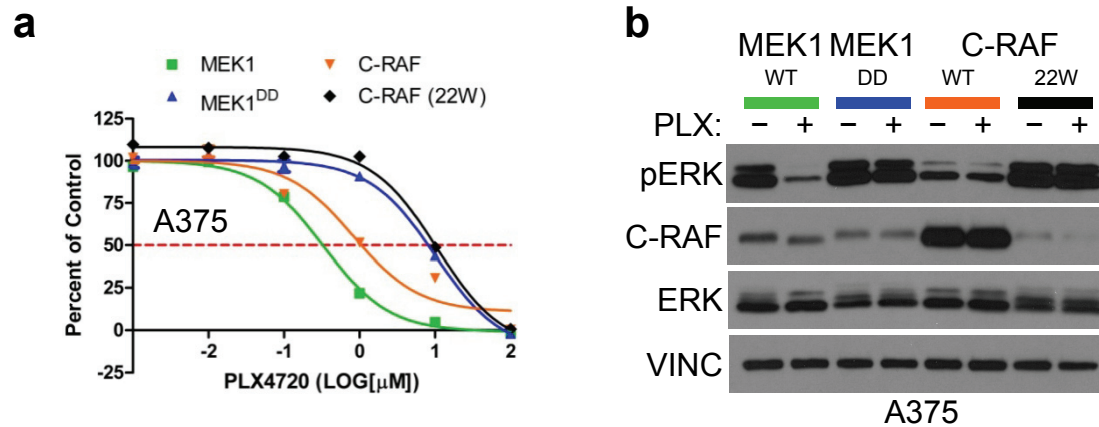
Supplementary Fig. 7: The kinase activity of COT and C-RAF is required for sustained ERK phosphorylation in the context of PLX4720 treatment. Immunoblot analysis of A375 expressing ectopic (a) MEK1, wild type COT or kinase inactive COT (COT^{K167R}) or (b) MEK1, wild type C-RAF or kinase inactive C-RAF (C-RAF^{K375M}) treated with 1 μ M PLX4720 for 18 h.



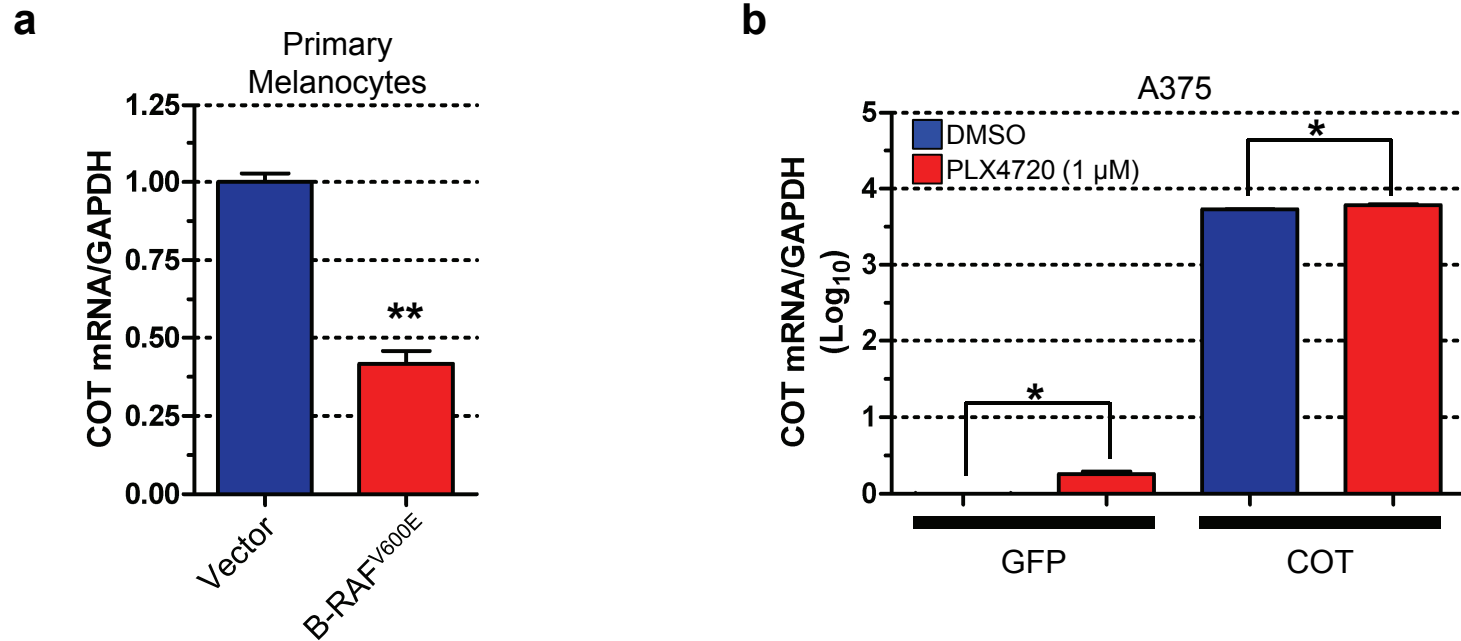
Supplementary Fig. 8: Effects of ORF expression on MAPK signaling in the context of the B-RAF inhibitor PLX4720. MAPK pathway activation was assessed by immunoblot analysis of pERK and pMEK in A375 expressing the indicated ORFs in the presence of PLX4720 (18 h., concentration indicated). (*) indicates the use of an antibody directed against the expressed ORF, not the V5 epitope. AXL was cloned without the V5 tag.



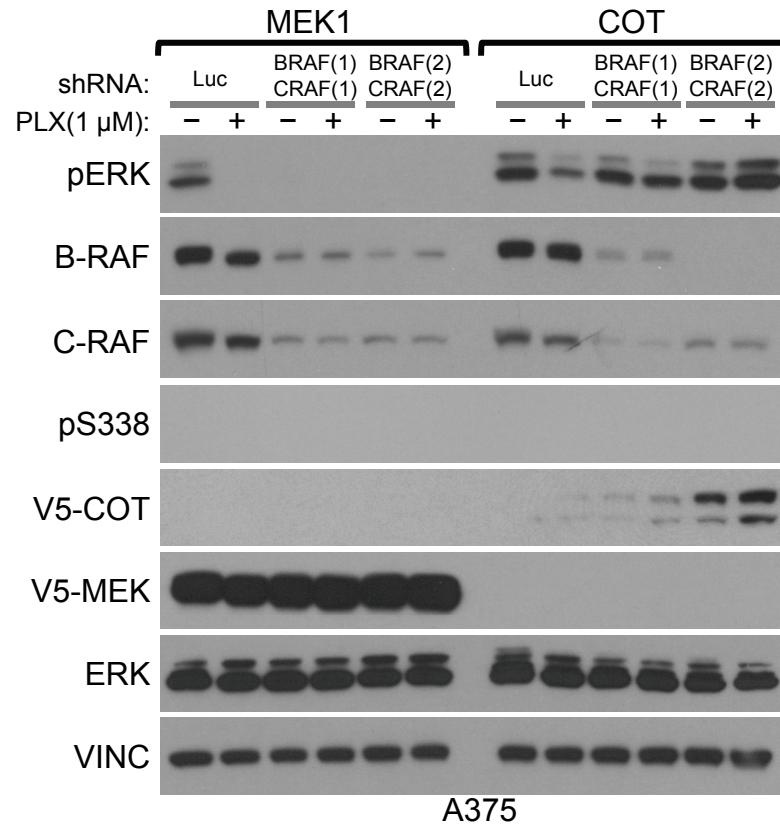
Supplementary Fig. 9: B-RAF associates with immunoprecipitated C-RAF in A375 following 18 hr. treatment with 1 μ M PLX4720 (+) or DMSO (-)(a). WCE; whole cell extract controls. Ectopically expressed C-RAF constitutively associates with B-RAF and is phosphorylated at S338, consistent with membrane localization and activation. MEK1, MEK^{DD} and COT-expressing A375 show no evidence of C-RAF activation, (b).



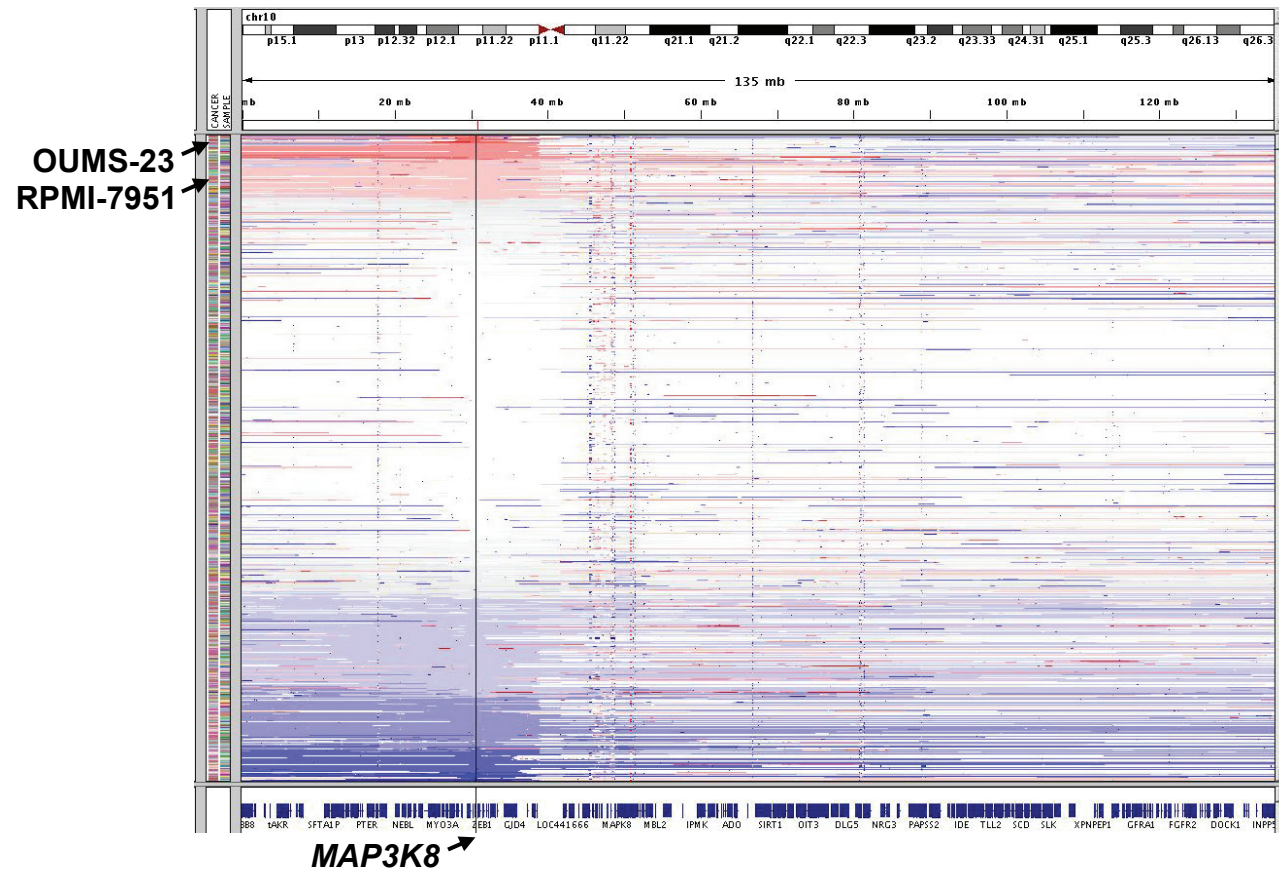
Supplementary Fig. 10: Retroviral expression of a wild-type C-RAF or a high-activity truncation mutant of C-RAF (C-RAF(22W)) renders A375 resistant to the B-RAF inhibitor PLX4720 (a) and leads to sustained pERK levels in the context of PLX4720 treatment (1 μ M, 18 h.), (b). C-RAF expression levels achieved with retroviruses are significantly lower than with lentiviral-based systems, resulting in a lower GI_{50} than that achieved with lentiviral C-RAF.



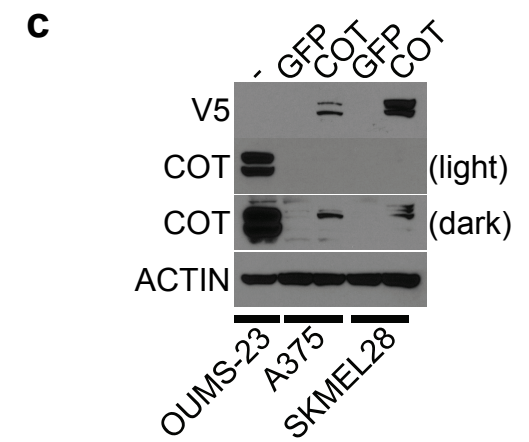
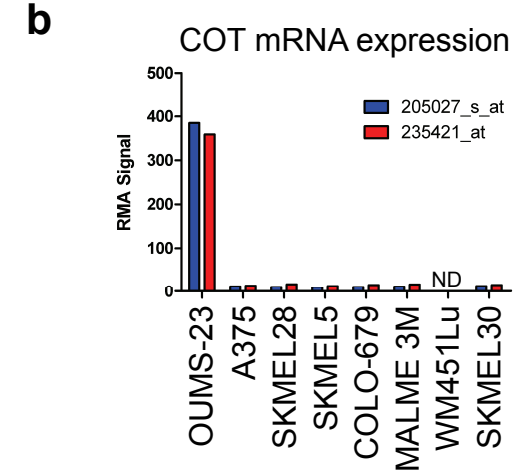
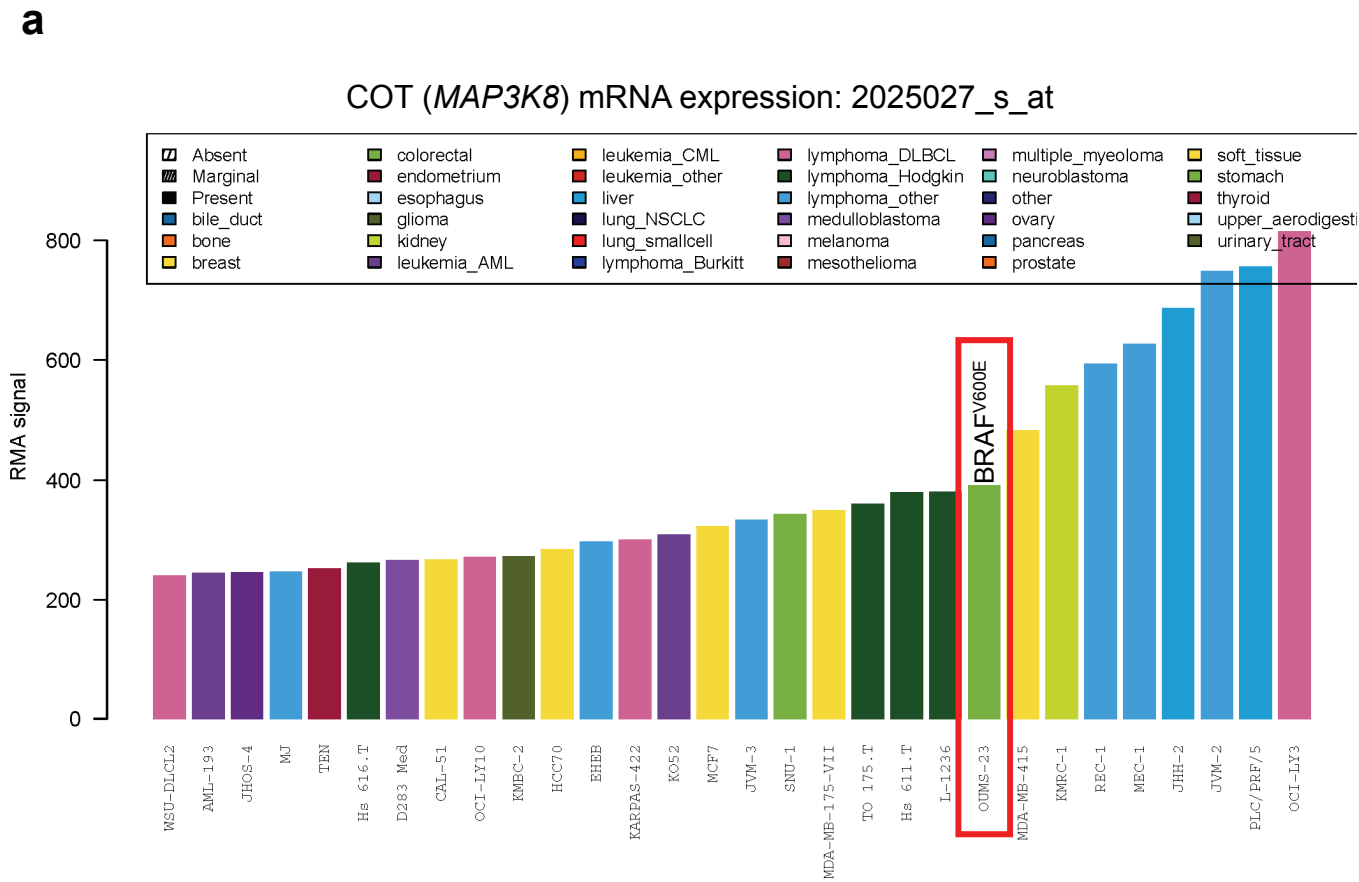
Supplementary Fig. 11: Effects of B-RAF^{V600E} on COT mRNA (a) Quantitative RT/PCR of COT mRNA expression relative to GAPDH mRNA expression in transformed primary melanocytes expressing wild-type B-RAF (vector) or B-RAF^{V600E}. COT expression was normalized to that of vector-expressing primary melanocytes. (**) Significant, $p < 0.05$ (Student's two-tailed, paired T-Test). (b) Endogenous COT mRNA is undetectable in PLX4720-sensitive A375 and ectopically expressed COT mRNA levels are unaffected by 1 μM PLX4720 treatment. A375 expressing GFP or COT were treated for 18 h. with 1 μM PLX4720. Reverse-transcribed mRNA was analyzed for GAPDH-normalized COT expression, relative to GFP-expressing, DMSO treated, A375. (*) Not significant, $p > 0.05$ (Student's two-tailed, paired T-Test). Error bars represent SEM.



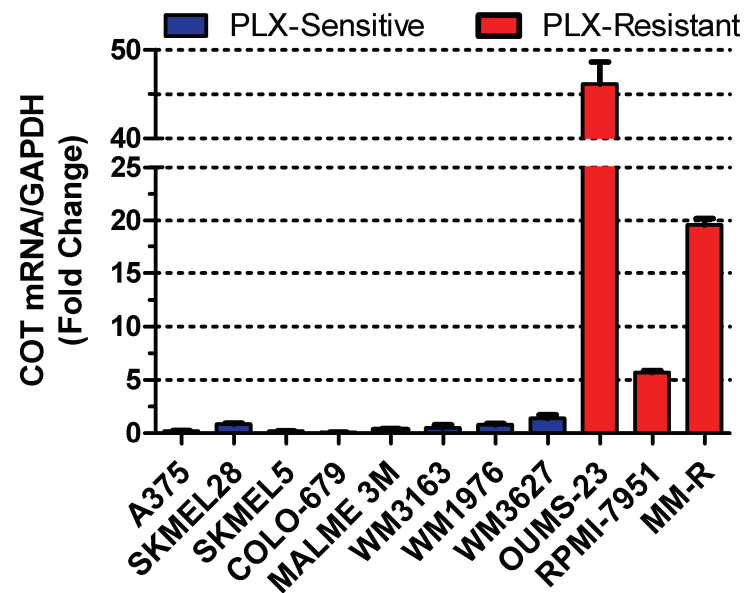
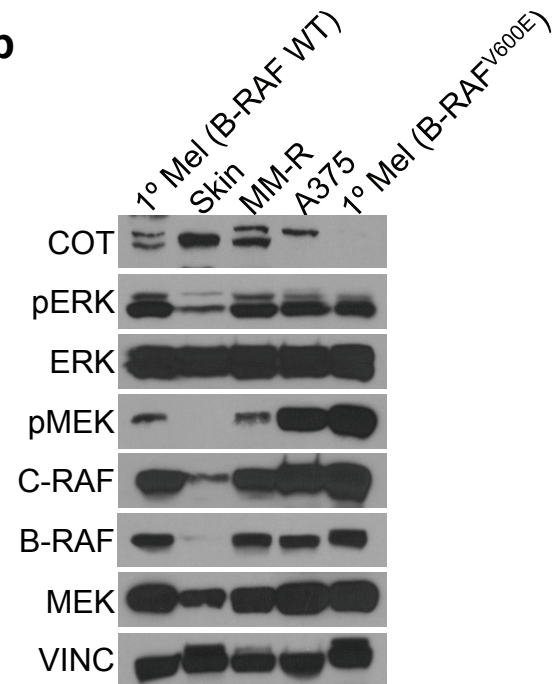
Supplementary Fig. 12: B- and C-RAF protein levels are not required for COT-mediated ERK phosphorylation. A375 expressing ectopic MEK1 (control) or COT were sequentially infected with lentivirus expressing shRNAs targeting B-RAF, C-RAF or control shRNA (shLuc) and assayed for expression of the indicated proteins in the presence (+) or absence (-) of 1 μ M PLX4720, 18 h.



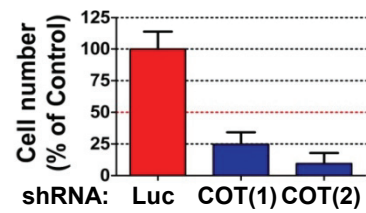
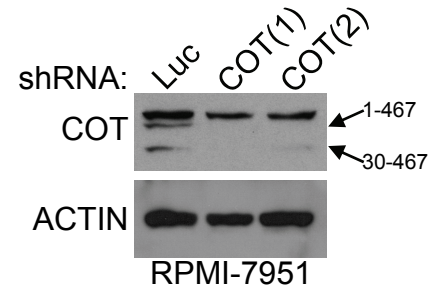
Supplementary Fig. 13: SNP analysis of 752 cell lines reveals copy number alterations in *MAP3K8/COT*. Of the 752 cell lines that had undergone copy number analysis, 534 had also undergone mutation profiling. Thirty-eight (7.1%) of mutation-profiled cells harbor the B-RAF^{V600E} mutation. Two cell lines (OUMS-23, RPMI-7951, indicated) harbor the B-RAF^{V600E} mutation along with copy number gain in *MAP3K8/COT*.



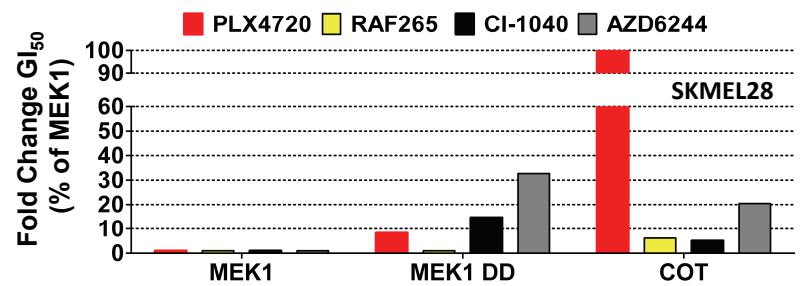
Supplementary Fig. 14: MAP3K8/COT alterations in the cancer cell line OUMS-23. (a) RMA signal of a *MAP3K8* /COT probe (noted) from mRNA microarray analysis. OUMS-23 is one of the top 2% (of 765 cell lines) expressing COT mRNA. (b) COT mRNA expression in a panel of B-RAF^{V600E}-mutant cell lines. (c) Endogenous COT protein expression in OUMS-23 relative to ectopically expressed COT in A375 and SKMEL28 cell lines, as determined via immunoblot analysis of the indicated cells.

a**b**

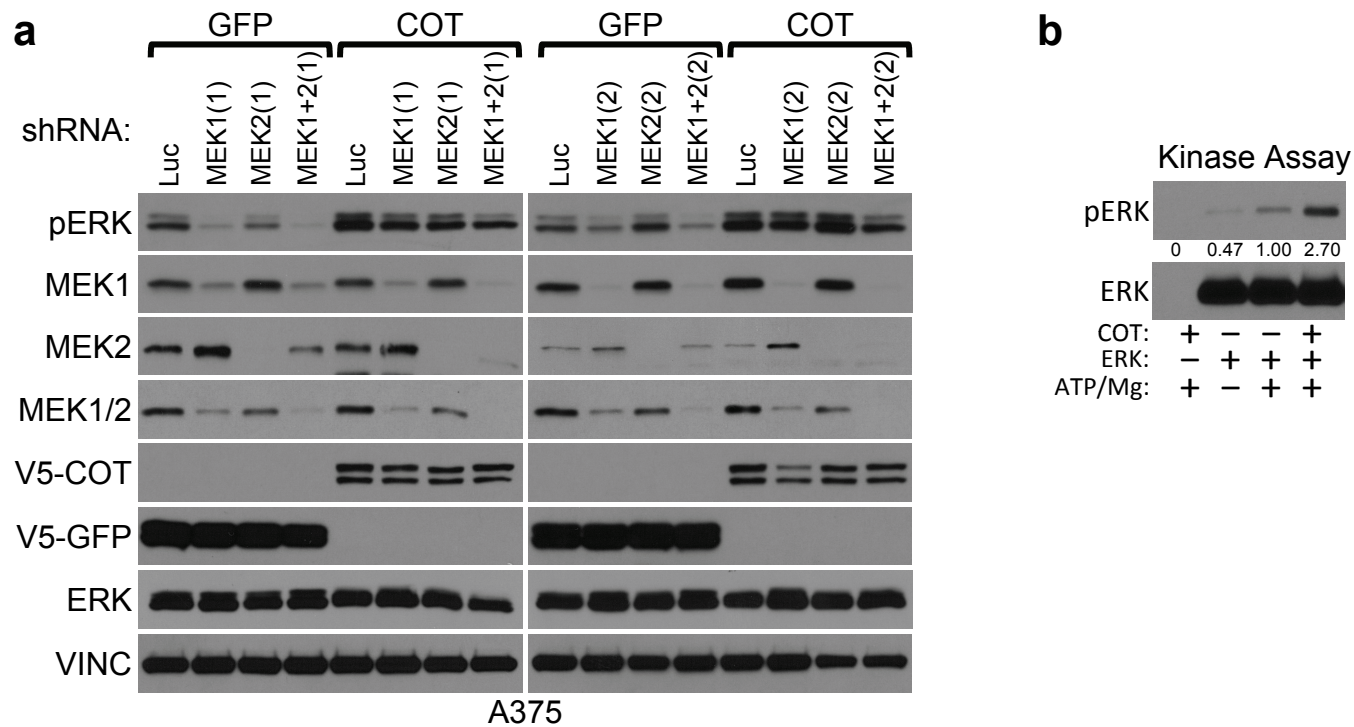
Supplementary Fig. 15: COT mRNA and protein are expressed in B-RAF-inhibitor resistant cell lines and tissue. (a) RT/PCR analysis of GAPDH-normalized COT mRNA expression in a panel of cell lines, short term cultures and tissue from relapsed, PLX4032-treated, malignant melanoma (MM-R). Corresponding protein expression for cell lines and short term cultures are shown in main Figure 3b and 3c, respectively. (b) Western blot analysis of lysates from primary melanocytes (1° Mel(B-RAF WT)), patient matched normal skin (Skin) and metastatic malignant melanoma (MM-R; COT mRNA shown in panel a), A375 cells and primary melanocytes expressing B-RAF^{V600E}(1° Mel (B-RAF^{V600E})).

a**b**

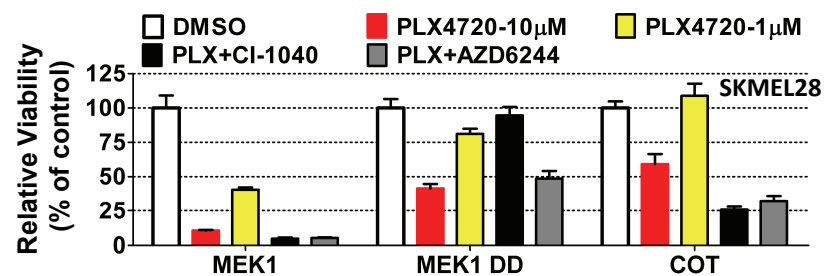
Supplementary Fig. 16: Depletion of COT affects viability in the COT amplified cell line RPMI-7951. (a) Quantification of RPMI-7951 viability following lentiviral shRNA-mediated COT depletion (shCOT), relative to control shRNA (shLuc). Error bars represent standard deviation between replicates. (b) Immunoblot analysis showing relative COT protein expression in shLuc and shCOT-expressing RPMI-7951.



Supplementary Fig. 17: Effects of ORF expression on the GI_{50} of a panel of MAPK pathway inhibitors in SKMEL28. The half-maximal growth-inhibitory concentration (GI_{50}) of SKMEL28 ectopically expressing MEK1, MEK1^{DD} or COT was determined for the RAF inhibitors PLX4720 and RAF265 and the MEK1/2 inhibitors CI-1040 and AZD6244. The change in GI_{50} for MEK1^{DD} and COT (relative to MEK1) was determined for each compound.



Supplementary Fig. 18: COT can activate ERK via MEK-independent and MEK-dependent mechanisms. (a) Immunoblot analysis of ERK phosphorylation in lysates from A375 following expression of GFP or COT and subsequent lentiviral shRNA-mediated MEK1, MEK2 or MEK1 and MEK2 (MEK1+2) depletion, relative to control shRNA (shLuc). Left and right panels represent two different pairs of MEK1 and MEK2 shRNA constructs. (b) Immunoblot blot analysis of recombinant, inactive ERK phosphorylation (Thr202/Tyr204) by recombinant COT in an *in vitro* kinase assay.



Supplementary Fig. 19: Combinatorial MAPK pathway inhibition effectively suppresses proliferation in SKMEL28. Viability (relative to DMSO) of SKMEL28 ectopically expressing MEK1, MEK1^{DD} or COT and treated with DMSO, PLX4720 (concentration indicated), PLX4720 (1 μ M) and CI-1040 (1 μ M) or PLX4720 (1 μ M) and AZD6244 (1 μ M). Error bars represent the standard deviation between replicates.

Supplementary Table 1: CCSB/Broad Institute Kinase ORF Library description and ORF classification

Abbreviations: RS/TK(Receptor Serine/Threonine Kinase); RTK (Receptor Tyrosine Kinase); NRS/TK(Non-Receptor Serine/Threonine Kinase); NRTK (Non-Receptor Tyrosine Kinase)

GENE	GENE ID	DESCRIPTION	KINASE CLASS
AAK1	22848	AP2 associated kinase 1	protein kinase (NRS/TK)
ABL1	25	v-abl Abelson murine leukemia viral oncogene homolog 1	protein kinase (NRTK)
ABL2	27	v-abl Abelson murine leukemia viral oncogene homolog 2 (arg, Abelson-related gene)	protein kinase (NRTK)
ACVR1	90	activin A receptor, type I	protein kinase (RS/TK)
ACVR1B	91	activin A receptor, type IB	protein kinase (RS/TK)
ACVR1C	130399	activin A receptor, type IC	protein kinase (RS/TK)
ACVR2A	92	activin A receptor, type II	protein kinase (RS/TK)
ACVR2B	93	activin A receptor, type IIB	protein kinase (RS/TK)
ACVRL1	94	activin A receptor type II-like 1	protein kinase (RS/TK)
ADCK1	57143	aarF domain containing kinase 1	protein kinase
ADCK2	90956	aarF domain containing kinase 2	protein kinase
ADCK4	79934	aarF domain containing kinase 4	protein kinase
ADPGK	83440	ADP-dependent glucokinase	kinase related
ADRBK1	156	adrenergic, beta, receptor kinase 1	protein kinase (NRS/TK)
ADRBK2	157	adrenergic, beta, receptor kinase 2	protein kinase (NRS/TK)
AGK	55750	multiple substrate lipid kinase;MULK	kinase related
AK1	203	adenylate kinase 1	nucleotide kinase
AK2	204	adenylate kinase 2	nucleotide kinase
AK3	205	adenylate kinase 3	nucleotide kinase
AK3L1	50808	adenylate kinase 3 like 1	nucleotide kinase
AK7	122481	adenylate kinase 7	nucleotide kinase
AKT1	207	v-akt murine thymoma viral oncogene homolog 1	protein kinase (NRS/TK)
AKT3	10000	v-akt murine thymoma viral oncogene homolog 3 (protein kinase B, gamma)	protein kinase (NRS/TK)
ALDH18A1	5832	aldehyde dehydrogenase 18 family, member A1;ALDH18A1	kinase related
ALK	238	anaplastic lymphoma kinase (Ki-1)	protein kinase (RTK)
ALPK1	80216	alpha-kinase 1	protein kinase (NRS/TK)
ALPK2	115701	alpha-kinase 2	protein kinase (NRS/TK)
ALS2CR7	65061	amyotrophic lateral sclerosis 2 (juvenile) chromosome region, candidate 7	protein kinase (NRS/TK)
AMHR2	269	anti-Mullerian hormone receptor, type II	protein kinase (RS/TK)
ARAF	369	v-raf murine sarcoma 3611 viral oncogene homolog 1	protein kinase (NRS/TK)
ARSG	22901	arylsulfatase G;ARSG	kinase related
ASCIZ	23300	ATM/ATR-Substrate Chk2-Interacting Zn2+-finger protein;ASCIZ	protein kinase (NRS/TK)
AURKA	6790	serine/threonine kinase 6	protein kinase (NRS/TK)
AURKB	9212	aurora kinase B	protein kinase (NRS/TK)
AURKC	6795	aurora kinase C	protein kinase (NRS/TK)
AXL	558	AXL receptor tyrosine kinase	protein kinase (RTK)
BCKDK	10295	branched chain alpha-ketoacid dehydrogenase kinase	protein kinase
BLK	640	B lymphoid tyrosine kinase	protein kinase (NRTK)
BMP2K	55589	BMP2 inducible kinase	protein kinase (NRS/TK)
BMP2KL	347359	BMP2 inducible kinase-like	protein kinase (NRS/TK)
BMPRI1A	657	bone morphogenetic protein receptor, type IA	protein kinase (RS/TK)
BMPRI1B	658	bone morphogenetic protein receptor, type IB	protein kinase (RS/TK)
BMPRI2	659	bone morphogenetic protein receptor, type II (serine/threonine kinase)	protein kinase (RS/TK)
BMX	660	BMX non-receptor tyrosine kinase	protein kinase (NRTK)
BRAF	673	v-raf murine sarcoma viral oncogene homolog B1	protein kinase (NRS/TK)
BRD3	8019	bromodomain containing 3	protein kinase (NRS/TK)
BRD4	23476	bromodomain containing 4	protein kinase (NRS/TK)
BRSK1	84446	KIAA1811 protein	protein kinase (NRS/TK)
BRSK2	9024	serine/threonine kinase 29	protein kinase (NRS/TK)
BTK	695	Bruton agammaglobulinemia tyrosine kinase	protein kinase (NRTK)
BUB1	699	BUB1 budding uninhibited by benzimidazoles 1 homolog (yeast)	protein kinase (NRS/TK)
BUB1B	701	BUB1 budding uninhibited by benzimidazoles 1 homolog beta (yeast)	protein kinase (NRS/TK)
C1orf57	84284	chromosome 1 open reading frame 57;C1orf57	kinase related
C9orf95	54981	chromosome 9 open reading frame 95;C9orf95	kinase related
C9orf98	158067	chromosome 9 open reading frame 98;C9orf98	nucleotide kinase
CABC1	56997	chaperone, ABC1 activity of bc1 complex like (S. pombe)	protein kinase
CALM1	801	calmodulin 1 (phosphorylase kinase, delta)	kinase related
CALM2	805	calmodulin 2 (phosphorylase kinase, delta)	kinase related
CALM3	808	calmodulin 3 (phosphorylase kinase, delta)	kinase related
CAMK1	8536	calcium/calmodulin-dependent protein kinase I	protein kinase (NRS/TK)
CAMK1D	57118	calcium/calmodulin-dependent protein kinase ID	protein kinase (NRS/TK)
CAMK1G	57172	calcium/calmodulin-dependent protein kinase IG	protein kinase (NRS/TK)
CAMK2A	815	calcium/calmodulin-dependent protein kinase (CaM kinase) II alpha	protein kinase (NRS/TK)
CAMK2B	816	calcium/calmodulin-dependent protein kinase (CaM kinase) II beta	protein kinase (NRS/TK)
CAMK2D	817	calcium/calmodulin-dependent protein kinase (CaM kinase) II delta	protein kinase (NRS/TK)
CAMK2G	818	calcium/calmodulin-dependent protein kinase (CaM kinase) II gamma	protein kinase (NRS/TK)
CAMK4	814	calcium/calmodulin-dependent protein kinase IV	protein kinase (NRS/TK)
CAMKK1	84254	calcium/calmodulin-dependent protein kinase kinase 1, alpha	protein kinase (NRS/TK)
CAMKK2	10645	calcium/calmodulin-dependent protein kinase kinase 2, beta	protein kinase (NRS/TK)
CAMKV	79012	hypothetical protein MGC8407	protein kinase (NRS/TK)
CARD11	84433	caspase recruitment domain family, member 11;CARD11	nucleotide kinase
CARKL	23729	carbohydrate kinase-like	carbohydrate kinase
CASK	8573	calcium/calmodulin-dependent serine protein kinase (MAGUK family)	nucleotide kinase
CCL2	6347	chemokine (C-C motif) ligand 2;CCL2	protein kinase
CCL4	6351	chemokine (C-C motif) ligand 4;CCL4	protein kinase (RTK)
CCRK	23552	cell cycle related kinase	protein kinase (NRS/TK)
CD2	914	CD2 antigen (p50), sheep red blood cell receptor;CD2	protein kinase
CDC2	983	cell division cycle 2, G1 to S and G2 to M	protein kinase (NRS/TK)
CDC2L1	984	cell division cycle 2-like 1 (PITSLRE proteins)	protein kinase (NRS/TK)
CDC2L2	985	cell division cycle 2-like 2 (PITSLRE proteins)	protein kinase (NRS/TK)
CDC2L6	23097	cell division cycle 2-like 6 (CDK8-like)	protein kinase (NRS/TK)
CDC42BPG	55561	CDC42 binding protein kinase gamma (DMPK-like)	protein kinase (NRS/TK)
CDC7	8317	CDC7 cell division cycle 7 (S. cerevisiae)	protein kinase (NRS/TK)
CDK10	8558	cyclin-dependent kinase (CDC2-like) 10	protein kinase (NRS/TK)
CDK2	1017	cyclin-dependent kinase 2	protein kinase (NRS/TK)
CDK3	1018	cyclin-dependent kinase 3	protein kinase (NRS/TK)
CDK4	1019	cyclin-dependent kinase 4	protein kinase (NRS/TK)
CDK5	1020	cyclin-dependent kinase 5	protein kinase (NRS/TK)
CDK5R1	8851	cyclin-dependent kinase 5, regulatory subunit 1 (p35)	protein kinase (NRS/TK)

CDK6	1021	cyclin-dependent kinase 6	protein kinase (NRS/TK)
CDK7	1022	cyclin-dependent kinase 7 (MO15 homolog, Xenopus laevis, cdk-activating kinase)	protein kinase (NRS/TK)
CDK8	1024	cyclin-dependent kinase 8	protein kinase (NRS/TK)
CDK9	1025	cyclin-dependent kinase 9 (CDC2-related kinase)	protein kinase (NRS/TK)
CDKL1	8814	cyclin-dependent kinase-like 1 (CDC2-related kinase)	protein kinase (NRS/TK)
CDKL2	8999	cyclin-dependent kinase-like 2 (CDC2-related kinase)	protein kinase (NRS/TK)
CDKL3	51265	cyclin-dependent kinase-like 3	protein kinase (NRS/TK)
CDKL4	344387	cyclin-dependent kinase-like 4	protein kinase (NRS/TK)
CDKL5	6792	cyclin-dependent kinase-like 5	protein kinase (NRS/TK)
CHEK1	1111	CHK1 checkpoint homolog (S. pombe)	protein kinase (NRS/TK)
CHEK2	11200	CHK2 checkpoint homolog (S. pombe)	protein kinase (NRS/TK)
CHKA	1119	choline kinase alpha	kinase related
CIB1	10519	calcium and integrin binding 1 (calmyrin):CIB1	kinase related
CIB4	130106	calcium and integrin binding family member 4:CIB4	kinase related
CKB	1152	creatine kinase, brain	kinase related
CKM	1158	creatine kinase, muscle	kinase related
CKMT1A	548596	creatine kinase, mitochondrial 1A;CKMT1A	kinase related
CKMT2	1160	creatine kinase, mitochondrial 2 (sarcomeric)	kinase related
CKS1B	1163	CDC28 protein kinase regulatory subunit 1B	protein kinase
CKS2	1164	CDC28 protein kinase regulatory subunit 2	protein kinase
CLK1	1195	CDC-like kinase 1	protein kinase (NRS/TK)
CLK2	1196	CDC-like kinase 2	protein kinase (NRS/TK)
CLK3	1198	CDC-like kinase 3	protein kinase (NRS/TK)
COASY	80347	Coenzyme A synthase;COASY	kinase related
COL4A3BP	10087	collagen, type IV, alpha 3 (Goodpasture antigen) binding protein;COL4A3BP	protein kinase
CRKL	1399	v-crk sarcoma virus CT10 oncogene homolog (avian)-like;CRKL	kinase related
CSF1R	1436	colony stimulating factor 1 receptor, formerly McDonough feline sarcoma viral (v-fms) oncogene homolog	protein kinase (RTK)
CSK	1445	c-src tyrosine kinase	protein kinase (NRTK)
CSNK1A1	1452	casein kinase 1, alpha 1	protein kinase (NRS/TK)
CSNK1A1L	122011	casein kinase 1, alpha 1-like	protein kinase (NRS/TK)
CSNK1D	1453	casein kinase 1, delta	protein kinase (NRS/TK)
CSNK1E	1454	casein kinase 1, epsilon	protein kinase (NRS/TK)
CSNK1G1	53944	casein kinase 1, gamma 1	protein kinase (NRS/TK)
CSNK1G2	1455	casein kinase 1, gamma 2	protein kinase (NRS/TK)
CSNK1G3	1456	casein kinase 1, gamma 3	protein kinase (NRS/TK)
CSNK2A1	1457	casein kinase 2, alpha 1 polypeptide	protein kinase (NRS/TK)
CSNK2B	1460	casein kinase 2, beta polypeptide	protein kinase (NRS/TK)
DAK	26007	dihydroxyacetone kinase 2 homolog (S. cerevisiae);DAK	kinase related
DAPK1	1612	death-associated protein kinase 1	protein kinase (NRS/TK)
DAPK2	23604	death-associated protein kinase 2	protein kinase (NRS/TK)
DAPK3	1613	death-associated protein kinase 3	protein kinase (NRS/TK)
DCAKD	79877	dephospho-CoA kinase domain containing;DCAKD	kinase related
DCAMKL2	166614	hypothetical protein MGC45428	protein kinase (NRS/TK)
DCK	1633	deoxycytidine kinase	nucleotide kinase
DDR1	780	discoidin domain receptor family, member 1	protein kinase (RTK)
DDR2	4921	discoidin domain receptor family, member 2	protein kinase (RTK)
DGKA	1606	diacylglycerol kinase, alpha 80kDa	kinase related
DGKB	1607	diacylglycerol kinase, beta 90kDa	kinase related
DGKG	1608	diacylglycerol kinase, gamma 90kDa	kinase related
DGKK	139189	diacylglycerol kinase, kappa;DGKK	kinase related
DGKZ	8525	diacylglycerol kinase, zeta 104kDa	kinase related
DGUOK	1716	deoxyguanosine kinase	nucleotide kinase
DKFZp434B1231	91156	eEF1A2 binding protein;DKFZp434B1231	protein kinase (NRS/TK)
DKFZp761P0423	157285	hypothetical protein DKFZp761P0423	protein kinase (RS/TK)
DLG1	1739	discs, large homolog 1 (Drosophila);DLG1	nucleotide kinase
DLG3	1741	discs, large homolog 3 (neuroendocrine-dlg, Drosophila);DLG3	nucleotide kinase
DTYMK	1841	deoxythymidylate kinase (thymidylate kinase)	nucleotide kinase
DYRK1A	1859	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1A	protein kinase (NRS/TK)
DYRK1B	9149	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1B	protein kinase (NRS/TK)
DYRK2	8445	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2	protein kinase (NRS/TK)
DYRK3	8444	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 3	protein kinase (NRS/TK)
DYRK4	8798	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 4	protein kinase (NRS/TK)
EEF2K	29904	eukaryotic elongation factor-2 kinase	protein kinase (NRS/TK)
EGFR	1956	epidermal growth factor receptor (erythroblastic leukemia viral (v-erb-b) oncogene homolog, avian)	protein kinase (RTK)
EIF2AK1	27102	heme-regulated initiation factor 2-alpha kinase	protein kinase (NRS/TK)
EIF2AK4	415116	serine/threonine-protein kinase pim-3	protein kinase (RS/TK)
EPHA1	2041	EPH receptor A1	protein kinase (RTK)
EPHA2	1969	EPH receptor A2	protein kinase (RTK)
EPHA3	2042	EPH receptor A3	protein kinase (RTK)
EPHA4	2043	EPH receptor A4	protein kinase (RTK)
EPHA6	285220	EPH receptor A6	protein kinase (RTK)
EPHB1	2047	EPH receptor B1	protein kinase (RTK)
EPHB4	2050	EPH receptor B4	protein kinase (RTK)
EPHB6	2051	EPH receptor B6	protein kinase (RTK)
ERBB2	2064	v-erb-b2 erythroblastic leukemia viral oncogene homolog 2, neuro/glioblastoma derived oncogene homolog (avian)	protein kinase (RTK)
ERBB3	2065	v-erb-b2 erythroblastic leukemia viral oncogene homolog 3 (avian)	protein kinase (RTK)
ERBB4	2066	v-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian)	protein kinase (RTK)
ERN1	2081	endoplasmic reticulum to nucleus signalling 1	protein kinase
ETNK1	55500	ethanolamine kinase 1	kinase related
ETNK2	55224	ethanolamine kinase 2	kinase related
EXOSC10	5394	exosome component 10;EXOSC10	protein kinase (NRS/TK)
FASTK	10922	FAST kinase	protein kinase (NRS/TK)
FASTKD1	79675	FAST kinase domains 1;FASTKD1	protein kinase
FASTKD2	22868	FAST kinase domains 2;FASTKD2	protein kinase
FASTKD3	79072	FAST kinase domains 3;FASTKD3	protein kinase
FASTKD5	60493	FAST kinase domains 5;FASTKD5	protein kinase
FER	2241	fer (fps/fes related) tyrosine kinase (phosphoprotein NCP94)	protein kinase (NRTK)
FES	2242	feline sarcoma oncogene	protein kinase (NRTK)
FGFR1	2260	fibroblast growth factor receptor 1 (fms-related tyrosine kinase 2, Pfeiffer syndrome)	protein kinase (RTK)
FGFR2	2263	fibroblast growth factor receptor 2 (craniofacial dysostosis 1, Crouzon, Pfeiffer and Jackson-Weiss syndrome)	protein kinase (RTK)
FGFR3	2261	fibroblast growth factor receptor 3 (achondroplasia, thanatophoric dwarfism)	protein kinase (RTK)
FGFRL1	53834	fibroblast growth factor receptor-like 1;FGFRL1	protein kinase (RTK)
FGFR	2268	Gardner-Rasheed feline sarcoma viral (v-igr) oncogene homolog	protein kinase (NRTK)
FLJ10986	55277	hypothetical protein FLJ10986;FLJ10986	carbohydrate kinase
FLJ23356	84197	hypothetical protein FLJ23356	protein kinase
FLJ25006	124923	hypothetical protein FLJ25006	protein kinase (NRS/TK)

FLJ40852	285962	hypothetical protein FLJ40852	protein kinase
FLT1	2321	fms-related tyrosine kinase 1 (vascular endothelial growth factor/vascular permeability factor receptor)	protein kinase (RTK)
FLT3	2322	fms-related tyrosine kinase 3	protein kinase (RTK)
FLT4	2324	fms-related tyrosine kinase 4	protein kinase (RTK)
FN3K	64122	fructosamine 3 kinase	kinase related
FN3KRP	79672	fructosamine-3-kinase-related protein	kinase related
FRK	2444	fyn-related kinase	protein kinase (NRTK)
FUK	197258	fucokinase	kinase related
FXN	2395	frataxin;FXN	kinase related
FYN	2534	FYN oncogene related to SRC, FGR, YES	protein kinase (NRTK)
GALK1	2584	galactokinase 1	carbohydrate kinase
GALK2	2585	galactokinase 2	carbohydrate kinase
GCK	2645	glucokinase (hexokinase 4, maturity onset diabetes of the young 2)	carbohydrate kinase
GK	2710	glycerol kinase	carbohydrate kinase
GK2	2712	glycerol kinase 2	carbohydrate kinase
GK5	256356	hypothetical protein MGC40579;MGC40579	carbohydrate kinase
GLYCTK	132158	glycerate kinase	carbohydrate kinase
GNE	10020	glucosamine (UDP-N-acetyl)-2-epimerase/N-acetylmannosamine kinase	carbohydrate kinase
GRK6	2870	G protein-coupled receptor kinase 6	protein kinase (NRS/TK)
GRK7	131890	G protein-coupled receptor kinase 7	protein kinase (NRS/TK)
GSG2	83903	haspin	protein kinase (RS/TK)
GSK3A	2931	glycogen synthase kinase 3 alpha	protein kinase (NRS/TK)
GTF2H1	2965	general transcription factor IIH, polypeptide 1, 62kDa;GTF2H1	protein kinase (NRS/TK)
GUK1	2987	guanylate kinase 1	nucleotide kinase
HCK	3055	hemopoietic cell kinase	protein kinase (NRTK)
HIPK1	204851	homeodomain interacting protein kinase 1	protein kinase (NRS/TK)
HIPK2	28996	homeodomain interacting protein kinase 2	protein kinase (NRS/TK)
HIPK3	10114	homeodomain interacting protein kinase 3	protein kinase (NRS/TK)
HIPK4	147746	homeodomain interacting protein kinase 4	protein kinase (NRS/TK)
HK1	3098	hexokinase 1	carbohydrate kinase
HK2	3099	hexokinase 2	carbohydrate kinase
HK3	3101	hexokinase 3 (white cell)	carbohydrate kinase
HKDC1	80201	hexokinase domain containing 1;HKDC1	carbohydrate kinase
HSPB8	26353	heat shock 22kDa protein 8	protein kinase (NRS/TK)
IGF1R	3480	insulin-like growth factor 1 receptor	protein kinase (RTK)
IHPK1	9807	inositol hexaphosphate kinase 1	kinase related
IHPK2	51447	inositol hexaphosphate kinase 2	Lipid Kinase
IHPK3	117283	inositol hexaphosphate kinase 3	Lipid Kinase
IKBKE	9641	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase epsilon	protein kinase (NRS/TK)
ILK	3611	integrin-linked kinase	protein kinase (NRS/TK)
INSRR	3645	insulin receptor-related receptor	protein kinase (RTK)
IPMK	253430	inositol polyphosphate multikinase	Lipid Kinase
IPPK	64768	inositol 1,3,4,5,6-pentakisphosphate 2-kinase;IPPK	Lipid Kinase
IRAK2	3656	interleukin-1 receptor-associated kinase 2	protein kinase (RS/TK)
IRAK3	11213	interleukin-1 receptor-associated kinase 3	protein kinase (RS/TK)
IRAK4	51135	interleukin-1 receptor-associated kinase 4	protein kinase (RS/TK)
ITGB1BP3	27231	integrin beta 1 binding protein 3;ITGB1BP3	kinase related
ITK	3702	IL2-inducible T-cell kinase	protein kinase (NRTK)
ITPKB	3707	inositol 1,4,5-trisphosphate 3-kinase B	kinase related
JAK1	3716	Janus kinase 1 (a protein tyrosine kinase)	protein kinase (NRTK)
JAK2	3717	Janus kinase 2 (a protein tyrosine kinase)	protein kinase (NRTK)
JAK3	3718	Janus kinase 3 (a protein tyrosine kinase, leukocyte)	protein kinase (NRTK)
KDR	3791	kinase insert domain receptor (a type III receptor tyrosine kinase)	protein kinase (RTK)
KHK	3795	ketoheokinase (fructokinase)	carbohydrate kinase
KIAA0999	23387	KIAA0999 protein	protein kinase (RS/TK)
KIAA2002	79834	KIAA2002 protein	protein kinase (RS/TK)
KSR	8844	kinase suppressor of ras	protein kinase (NRS/TK)
KSR2	283455	kinase suppressor of Ras-2	protein kinase (NRS/TK)
LATS1	9113	LATS, large tumor suppressor, homolog 1 (Drosophila)	protein kinase (NRS/TK)
LATS2	26524	LATS, large tumor suppressor, homolog 2 (Drosophila)	protein kinase (NRS/TK)
LCK	3932	lymphocyte-specific protein tyrosine kinase	protein kinase (NRTK)
LIMK1	3984	LIM domain kinase 1	protein kinase (NRS/TK)
LIMK2	3985	LIM domain kinase 2	protein kinase (NRS/TK)
LMTK2	22853	lemur tyrosine kinase 2	protein kinase (RTK)
LOC220686	220686	hypothetical protein LOC220686;LOC220686	kinase related
LOC340156	340156	hypothetical protein LOC340156	protein kinase (NRS/TK)
LOC340371	340371	hypothetical protein LOC340371	protein kinase (NRS/TK)
LOC375133	375133	similar to phosphatidylinositol 4-kinase alpha	Lipid Kinase
LOC388957	388957	similar to BMP2 inducible kinase	protein kinase (NRS/TK)
LOC389599	389599	similar to amyotrophic lateral sclerosis 2 (juvenile) chr. region, candidate 2; ILP-interacting protein ILPIPA	protein kinase
LOC390877	390877	similar to adenylate kinase (EC 2.7.4.3), cytosolic - common carp	nucleotide kinase
LOC42075	442075	similar to serine/threonine kinase, establishes embryonic polarity	protein kinase (NRS/TK)
LOC54103	54103	hypothetical protein LOC54103;LOC54103	protein kinase (RTK)
LOC646505	646505	similar to Dual specificity protein kinase CLK3 (CDC-like kinase 3);unassigned	protein kinase (NRS/TK)
LOC647279	647279	similar to MAP/microtubule affinity-regulating kinase 3;unassigned	protein kinase (NRS/TK)
LOC648152	648152	similar to ataxia telangiectasia and Rad3 related protein;unassigned	protein kinase (NRS/TK)
LOC649288	649288	similar to Adenylate kinase isoenzyme 4, mitochondrial (Adenylate kinase 3-like 1)	nucleotide kinase
LOC650122	650122	similar to choline kinase alpha isoform a;unassigned	kinase related
LOC652722	652722	similar to PTK2 protein tyrosine kinase 2 isoform a;unassigned	protein kinase (NRTK)
LOC652799	652799	similar to Mast/stem cell growth factor receptor precursor (SCFR) (c-kit) (CD117 antigen);unassigned	protein kinase (RTK)
LOC653052	653052	similar to Homeodomain-interacting protein kinase 2 (hHIPK2);unassigned	protein kinase (NRS/TK)
LOC653155	653155	similar to PRP4 pre-mRNA processing factor 4 homolog B;unassigned	protein kinase (NRS/TK)
LOC727761	727761	similar to deoxythymidylate kinase (thymidylate kinase);unassigned	nucleotide kinase
LOC730000	730000	similar to testis-specific serine kinase 6;unassigned	protein kinase (NRS/TK)
LOC732306	732306	similar to vaccinia related kinase 2;unassigned	protein kinase (NRS/TK)
LOC91461	91461	hypothetical protein BC007901	protein kinase (NRTK)
LOC91807	91807	myosin light chain kinase (MLCK)	protein kinase (NRS/TK)
LRGUK	136332	leucine-rich repeats and guanylate kinase domain containing;LRGUK	nucleotide kinase
LRPPRC	10128	leucine-rich PPR-motif containing;LRPPRC	protein kinase (RS/TK)
LRRK2	120892	leucine-rich repeat kinase 2	protein kinase (NRS/TK)
LYK5	92335	protein kinase LYK5	protein kinase
LYN	4067	v-yes-1 Yamaguchi sarcoma viral related oncogene homolog	protein kinase (NRTK)
MAGI1	9223	membrane associated guanylate kinase, WW and PDZ domain containing 1;MAGI1	nucleotide kinase
MAK	4117	male germ cell-associated kinase	protein kinase (NRS/TK)
MAP2K1	5604	mitogen-activated protein kinase kinase 1	protein kinase
MAP2K1IP1	8649	mitogen-activated protein kinase kinase 1 interacting protein 1	protein kinase

MAP2K2	5605	mitogen-activated protein kinase kinase 2	protein kinase
MAP2K5	5607	mitogen-activated protein kinase kinase 5	protein kinase
MAP2K6	5608	mitogen-activated protein kinase kinase 6	protein kinase
MAP2K7	5609	mitogen-activated protein kinase kinase 7	protein kinase
MAP3K11	4296	mitogen-activated protein kinase kinase kinase 11	protein kinase (NRS/TK)
MAP3K12	7786	mitogen-activated protein kinase kinase kinase 12	protein kinase (NRS/TK)
MAP3K14	9020	mitogen-activated protein kinase kinase kinase 14	protein kinase
MAP3K15	389840	FLJ16518 protein	protein kinase
MAP3K2	10746	mitogen-activated protein kinase kinase kinase 2	protein kinase
MAP3K5	4217	mitogen-activated protein kinase kinase kinase 5	protein kinase
MAP3K6	9064	mitogen-activated protein kinase kinase kinase 6	protein kinase
MAP3K7	6885	mitogen-activated protein kinase kinase kinase 7	protein kinase (NRS/TK)
MAP3K8	1326	mitogen-activated protein kinase kinase kinase 8	protein kinase
MAP4K1	11184	mitogen-activated protein kinase kinase kinase kinase 1	protein kinase
MAP4K2	5871	mitogen-activated protein kinase kinase kinase kinase 2	protein kinase
MAP4K3	8491	mitogen-activated protein kinase kinase kinase kinase 3	protein kinase
MAP4K4	9448	mitogen-activated protein kinase kinase kinase kinase 4	protein kinase
MAP4K5	11183	mitogen-activated protein kinase kinase kinase kinase 5	protein kinase
MAPK1	5594	mitogen-activated protein kinase 1	protein kinase (NRS/TK)
MAPK10	5602	mitogen-activated protein kinase 10	protein kinase (NRS/TK)
MAPK12	6300	mitogen-activated protein kinase 12	protein kinase (NRS/TK)
MAPK13	5603	mitogen-activated protein kinase 13	protein kinase (NRS/TK)
MAPK14	1432	mitogen-activated protein kinase 14	protein kinase (NRS/TK)
MAPK15	225689	extracellular signal-regulated kinase 8	protein kinase (NRS/TK)
MAPK3	5595	mitogen-activated protein kinase 3	protein kinase (NRS/TK)
MAPK4	5596	mitogen-activated protein kinase 4	protein kinase (NRS/TK)
MAPK6	5597	mitogen-activated protein kinase 6	protein kinase (NRS/TK)
MAPK8	5599	mitogen-activated protein kinase 8	protein kinase (NRS/TK)
MAPK9	5601	mitogen-activated protein kinase 9	protein kinase (NRS/TK)
MAPKAPK2	9261	mitogen-activated protein kinase-activated protein kinase 2	protein kinase (NRS/TK)
MAPKAPK3	7867	mitogen-activated protein kinase-activated protein kinase 3	protein kinase (NRS/TK)
MAPKAPK5	8550	mitogen-activated protein kinase-activated protein kinase 5	protein kinase (NRS/TK)
MARK2	2011	MAP/microtubule affinity-regulating kinase 2	protein kinase (NRS/TK)
MARK3	4140	MAP/microtubule affinity-regulating kinase 3	protein kinase (NRS/TK)
MAST1	22983	microtubule associated serine/threonine kinase 1	protein kinase (NRS/TK)
MAST2	23139	microtubule associated serine/threonine kinase 2	protein kinase (NRS/TK)
MASTL	84930	microtubule associated serine/threonine kinase-like	protein kinase (NRS/TK)
MATK	4145	megakaryocyte-associated tyrosine kinase	protein kinase (NRTK)
MERTK	10461	c-mer proto-oncogene tyrosine kinase	protein kinase (RTK)
MET	4233	met proto-oncogene (hepatocyte growth factor receptor)	protein kinase (RTK)
MGC16169	93627	hypothetical protein MGC16169	protein kinase
MGC42105	167359	hypothetical protein MGC42105	protein kinase (NRS/TK)
MINK1	50488	misshapen/NIK-related kinase	protein kinase
MKNK1	8569	MAP kinase interacting serine/threonine kinase 1	protein kinase (NRS/TK)
MKNK2	2872	MAP kinase interacting serine/threonine kinase 2	protein kinase (NRS/TK)
MORN2	378464	MORN repeat containing 2;MORN2	kinase related
MOS	4342	v-mos Moloney murine sarcoma viral oncogene homolog	protein kinase (NRS/TK)
MPP1	4354	membrane protein, palmitoylated 1, 55kDa;MPP1	protein kinase
MPP2	4355	membrane protein, palmitoylated 2 (MAGUK p55 subfamily member 2);MPP2	nucleotide kinase
MPP3	4356	membrane protein, palmitoylated 3 (MAGUK p55 subfamily member 3);MPP3	nucleotide kinase
MPP4	58538	membrane protein, palmitoylated 4 (MAGUK p55 subfamily member 4);MPP4	nucleotide kinase
MPP5	64398	membrane protein, palmitoylated 5 (MAGUK p55 subfamily member 5);MPP5	nucleotide kinase
MPP6	51678	membrane protein, palmitoylated 6 (MAGUK p55 subfamily member 6);MPP6	nucleotide kinase
MPP7	143098	membrane protein, palmitoylated 7 (MAGUK p55 subfamily member 7);MPP7	nucleotide kinase
MST1R	4486	macrophage stimulating 1 receptor (c-met-related tyrosine kinase)	protein kinase (RTK)
MUSK	4593	muscle, skeletal, receptor tyrosine kinase	protein kinase (RTK)
MVK	4598	mevalonate kinase (mevalonic aciduria)	kinase related
MYLK2	85366	myosin light chain kinase 2, skeletal muscle	protein kinase (NRS/TK)
MYO3B	140469	myosin IIIB	protein kinase (NRS/TK)
NADK	65220	NAD kinase	kinase related
NAGK	55577	N-acetylglucosamine kinase	kinase related
NEK10	152110	NIMA (never in mitosis gene a)- related kinase 10	protein kinase
NEK11	79858	NIMA (never in mitosis gene a)- related kinase 11	protein kinase
NEK2	4751	NIMA (never in mitosis gene a)-related kinase 2	protein kinase
NEK3	4752	NIMA (never in mitosis gene a)-related kinase 3	protein kinase
NEK4	6787	NIMA (never in mitosis gene a)-related kinase 4	protein kinase
NEK5	341676	NIMA (never in mitosis gene a)-related kinase 5	protein kinase
NEK6	10783	NIMA (never in mitosis gene a)-related kinase 6	protein kinase
NEK7	140609	NIMA (never in mitosis gene a)-related kinase 7	protein kinase
NEK8	284086	NIMA (never in mitosis gene a)- related kinase 8	protein kinase
NEK9	91754	NIMA (never in mitosis gene a)- related kinase 9	protein kinase
NJMU-R1	64149	protein kinase Njmu-R1	protein kinase
NLK	51701	nemo like kinase	protein kinase (NRS/TK)
NME1	4830	nucleoside-diphosphate kinase 1	nucleotide kinase
NME1-NME2	654364	NME1-NME2 protein;NME1-NME2	nucleotide kinase
NME2	4831	nucleoside-diphosphate kinase 2	nucleotide kinase
NME3	4832	nucleoside-diphosphate kinase 3	nucleotide kinase
NME4	4833	nucleoside-diphosphate kinase 4	nucleotide kinase
NME5	8382	non-metastatic cells 5, protein expressed in (nucleoside-diphosphate kinase)	nucleotide kinase
NME6	10201	non-metastatic cells 6, protein expressed in (nucleoside-diphosphate kinase)	nucleotide kinase
NME7	29922	non-metastatic cells 7, protein expressed in (nucleoside-diphosphate kinase)	nucleotide kinase
NPR2	4882	natriuretic peptide receptor B/guanylate cyclase B (atrionatriuretic peptide receptor B)	protein kinase
NRPB	29959	nuclear receptor binding protein	protein kinase (NRS/TK)
NTRK1	4914	neurotrophic tyrosine kinase, receptor, type 1	protein kinase (RTK)
NTRK2	4915	neurotrophic tyrosine kinase, receptor, type 2	protein kinase (RTK)
NTRK3	4916	neurotrophic tyrosine kinase, receptor, type 3	protein kinase (RTK)
NUAK2	81788	likely ortholog of rat SNF1/AMP-activated protein kinase	protein kinase (NRS/TK)
NUP62	23636	nucleoporin 62kDa;NUP62	protein kinase (NRS/TK)
NYD-SP25	89882	protein kinase NYD-SP25	protein kinase
OXSRI	9943	oxidative-stress responsive 1	protein kinase
PAK1	5058	p21/Cdc42/Rac1-activated kinase 1 (STE20 homolog, yeast)	protein kinase
PAK2	5062	p21 (CDKN1A)-activated kinase 2	protein kinase
PAK3	5063	p21 (CDKN1A)-activated kinase 3	protein kinase
PAK4	10298	p21(CDKN1A)-activated kinase 4	protein kinase
PAK6	56924	p21(CDKN1A)-activated kinase 6	protein kinase
PAK7	57144	p21(CDKN1A)-activated kinase 7	protein kinase

PANK2	80025	pantothenate kinase 2 (Hallervorden-Spatz syndrome)	kinase related
PANK3	79646	pantothenate kinase 3	kinase related
PANK4	55229	pantothenate kinase 4	kinase related
PAPSS1	9061	3-phosphoadenosine 5'-phosphosulfate synthase 1:PAPSS1	kinase related
PAPSS2	9060	3-phosphoadenosine 5'-phosphosulfate synthase 2:PAPSS2	kinase related
PBK	55872	T-LAK cell-originated protein kinase	protein kinase
PCK2	5106	phosphoenolpyruvate carboxykinase 2 (mitochondrial)	kinase related
PCTK1	5127	PCTAIRE protein kinase 1	protein kinase (NRS/TK)
PCTK2	5128	PCTAIRE protein kinase 2	protein kinase (NRS/TK)
PCTK3	5129	PCTAIRE protein kinase 3	protein kinase (NRS/TK)
PDGFRA	5156	platelet-derived growth factor receptor, alpha polypeptide	protein kinase (RTK)
PDGFRB	5159	platelet-derived growth factor receptor, beta polypeptide	protein kinase (RTK)
PDGFRL	5157	platelet-derived growth factor receptor-like;PDGFRL	protein kinase (RTK)
PDIK1L	149420	PDLIM1 interacting kinase 1 like	protein kinase (NRS/TK)
PDK1	5163	pyruvate dehydrogenase kinase, isoenzyme 1	protein kinase
PDK2	5164	pyruvate dehydrogenase kinase, isoenzyme 2	protein kinase
PDK3	5165	pyruvate dehydrogenase kinase, isoenzyme 3	protein kinase
PDK4	5166	pyruvate dehydrogenase kinase, isoenzyme 4	protein kinase
PDPK1	5170	3-phosphoinositide dependent protein kinase-1	protein kinase
PDXK	8566	pyridoxal (pyridoxine, vitamin B6) kinase	kinase related
PFKFB1	5207	6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase 1	carbohydrate kinase
PFKFB2	5208	6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase 2	carbohydrate kinase
PFKFB3	5209	6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase 3	carbohydrate kinase
PFKL	5211	phosphofructokinase, liver	carbohydrate kinase
PFKM	5213	phosphofructokinase, muscle	carbohydrate kinase
PFKP	5214	phosphofructokinase, platelet	carbohydrate kinase
PFTK1	5218	PFTAIRE protein kinase 1	protein kinase (NRS/TK)
PGK1	5230	phosphoglycerate kinase 1	carbohydrate kinase
PGK2	5232	phosphoglycerate kinase 2	carbohydrate kinase
PHKA1	5255	phosphorylase kinase, alpha 1 (muscle)	protein kinase (NRS/TK)
PHKA2	5256	phosphorylase kinase, alpha 2 (liver)	protein kinase (NRS/TK)
PHKB	5257	phosphorylase kinase, beta	protein kinase (NRS/TK)
PHKG1	5260	phosphorylase kinase, gamma 1 (muscle)	protein kinase (NRS/TK)
PHKG2	5261	phosphorylase kinase, gamma 2 (testis)	protein kinase (NRS/TK)
PI4K2B	55300	phosphatidylinositol 4-kinase type-II beta	Lipid Kinase
PI4KII	55361	phosphatidylinositol 4-kinase type II	Lipid Kinase
PIK3C2G	5288	phosphoinositide-3-kinase, class 2, gamma polypeptide	Lipid Kinase
PIK3C3	5289	phosphoinositide-3-kinase, class 3	Lipid Kinase
PIK3CA	5290	phosphoinositide-3-kinase, catalytic, alpha polypeptide	Lipid Kinase
PIK3CB	5291	phosphoinositide-3-kinase, catalytic, beta polypeptide	Lipid Kinase
PIK3CG	5294	phosphoinositide-3-kinase, catalytic, gamma polypeptide	Lipid Kinase
PIK3R1	5295	phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha)	Lipid Kinase
PIK3R3	8503	phosphoinositide-3-kinase, regulatory subunit 3 (p55, gamma)	Lipid Kinase
PIK3R4	30849	phosphoinositide-3-kinase, regulatory subunit 4, p150	Lipid Kinase
PIK3R5	23533	phosphoinositide-3-kinase, regulatory subunit 5, p101	Lipid Kinase
PIK4CA	5297	phosphatidylinositol 4-kinase, catalytic, alpha polypeptide	Lipid Kinase
PIK4CB	5298	phosphatidylinositol 4-kinase, catalytic, beta polypeptide	Lipid Kinase
PIM1	5292	pim-1 oncogene	protein kinase (RS/TK)
PIM2	11040	pim-2 oncogene	protein kinase (RS/TK)
PINK1	65018	PTEN induced putative kinase 1	protein kinase (RS/TK)
PIP5K1A	8394	phosphatidylinositol-4-phosphate 5-kinase, type I, alpha	Lipid Kinase
PIP5K1B	8395	phosphatidylinositol-4-phosphate 5-kinase, type I, beta	Lipid Kinase
PIP5K2A	5305	phosphatidylinositol-4-phosphate 5-kinase, type II, alpha	Lipid Kinase
PIP5K2C	79837	phosphatidylinositol-4-phosphate 5-kinase, type II, gamma	kinase related
PIP5K3	200576	phosphatidylinositol-3-phosphate/phosphatidylinositol 5-kinase, type III	Lipid Kinase
PIP5KL1	138429	phosphatidylinositol-4-phosphate 5-kinase-like 1	Lipid Kinase
PKLR	5313	pyruvate kinase, liver and RBC	carbohydrate kinase
PKM2	5315	pyruvate kinase, muscle	carbohydrate kinase
PKMYT1	9088	membrane-associated tyrosine- and threonine-specific cdc2-inhibitory kinase	protein kinase (NRS/TK)
PLAU	5328	plasminogen activator, urokinase	kinase related
PLK1	5347	polo-like kinase 1 (Drosophila)	protein kinase (NRS/TK)
PLK2	10769	polo-like kinase 2 (Drosophila)	protein kinase (NRS/TK)
PLK4	10733	polo-like kinase 4 (Drosophila)	protein kinase (NRS/TK)
PLXNA3	55558	plexin A3;PLXNA3	protein kinase (RTK)
PLXNA4B	91584	plexin A4, B;PLXNA4B	protein kinase (RTK)
PLXNB2	23654	plexin B2;PLXNB2	protein kinase (RTK)
PMVK	10654	phosphomevalonate kinase	kinase related
PNCK	139728	pregnancy upregulated non-ubiquitously expressed CaM kinase	protein kinase (NRS/TK)
PNKP	11284	polynucleotide kinase 3'-phosphatase	nucleotide kinase
PRKAA1	5562	protein kinase, AMP-activated, alpha 1 catalytic subunit	protein kinase (NRS/TK)
PRKAA2	5563	protein kinase, AMP-activated, alpha 2 catalytic subunit	protein kinase (NRS/TK)
PRKAB1	5564	protein kinase, AMP-activated, beta 1 non-catalytic subunit	protein kinase (NRS/TK)
PRKAB2	5565	protein kinase, AMP-activated, beta 2 non-catalytic subunit	protein kinase (NRS/TK)
PRKACA	5566	protein kinase, cAMP-dependent, catalytic, alpha	protein kinase (NRS/TK)
PRKACB	5567	protein kinase, cAMP-dependent, catalytic, beta	protein kinase (NRS/TK)
PRKACG	5568	protein kinase, cAMP-dependent, catalytic, gamma	protein kinase (NRS/TK)
PRKAG1	5571	protein kinase, AMP-activated, gamma 1 non-catalytic subunit	protein kinase (NRS/TK)
PRKAG2	51422	protein kinase, AMP-activated, gamma 2 non-catalytic subunit	protein kinase (NRS/TK)
PRKAG3	53632	protein kinase, AMP-activated, gamma 3 non-catalytic subunit	protein kinase (NRS/TK)
PRKAR1A	5573	protein kinase, cAMP-dependent, regulatory, type I, alpha (tissue specific extinguisher 1)	protein kinase (NRS/TK)
PRKAR1B	5575	protein kinase, cAMP-dependent, regulatory, type I, beta	protein kinase (NRS/TK)
PRKAR2A	5576	protein kinase, cAMP-dependent, regulatory, type II, alpha	protein kinase (NRS/TK)
PRKAR2B	5577	protein kinase, cAMP-dependent, regulatory, type II, beta	protein kinase (NRS/TK)
PRKCA	5578	protein kinase C, alpha	protein kinase (NRS/TK)
PRKCB1	5579	protein kinase C, beta 1	protein kinase (NRS/TK)
PRKCE	5581	protein kinase C, epsilon	protein kinase (NRS/TK)
PRKCG	5582	protein kinase C, gamma	protein kinase (NRS/TK)
PRKCH	5583	protein kinase C, eta	protein kinase (NRS/TK)
PRKCI	5584	protein kinase C, iota	protein kinase (NRS/TK)
PRKCQ	5588	protein kinase C, theta	protein kinase (NRS/TK)
PRKCZ	5590	protein kinase C, zeta	protein kinase (NRS/TK)
PRKD1	5587	protein kinase D1	protein kinase (NRS/TK)
PRKD2	25865	protein kinase D2	protein kinase (NRS/TK)
PRKD3	23683	protein kinase D3	protein kinase (NRS/TK)
PRKG1	5592	protein kinase, cGMP-dependent, type I	protein kinase (NRS/TK)
PRKG2	5593	protein kinase, cGMP-dependent, type II	protein kinase (NRS/TK)

PRKR	5610	protein kinase, interferon-inducible double stranded RNA dependent	protein kinase (NRS/TK)
PRKX	5613	protein kinase, X-linked	protein kinase (NRS/TK)
PRKY	5616	protein kinase, Y-linked	protein kinase (NRS/TK)
PRPF4B	8899	PRP4 pre-mRNA processing factor 4 homolog B (yeast)	protein kinase (NRS/TK)
PRPS1	5631	phosphoribosyl pyrophosphate synthetase 1;PRPS1	kinase related
PRPS1L1	221823	phosphoribosyl pyrophosphate synthetase 1-like 1;PRPS1L1	kinase related
PRPS2	5634	phosphoribosyl pyrophosphate synthetase 2;PRPS2	kinase related
PSKH1	5681	protein serine kinase H1	protein kinase (NRS/TK)
PTK2	5747	PTK2 protein tyrosine kinase 2	protein kinase (NRTK)
PTK2B	2185	PTK2B protein tyrosine kinase 2 beta	protein kinase (NRTK)
PTK6	5753	PTK6 protein tyrosine kinase 6	protein kinase (NRTK)
PTK7	5754	PTK7 protein tyrosine kinase 7	protein kinase (RTK)
PTK9	5756	PTK9 protein tyrosine kinase 9	protein kinase (NRTK)
PXK	54899	PX domain containing serine/threonine kinase	kinase related
RAF1	5894	v-raf-1 murine leukemia viral oncogene homolog 1	protein kinase (NRS/TK)
RAGE	5891	renal tumor antigen	protein kinase (NRS/TK)
RBKS	64080	ribokinase	nucleotide kinase
RET	5979	ret proto-oncogene (multiple endocrine neoplasia and medullary thyroid carcinoma 1, Hirschsprung disease)	protein kinase (RTK)
RFK	55312	riboflavin kinase	kinase related
RIOK1	83732	RIO kinase 1 (yeast)	protein kinase (NRS/TK)
RIOK2	55781	RIO kinase 2 (yeast)	protein kinase (NRS/TK)
RIOK3	8780	RIO kinase 3 (yeast)	protein kinase (NRS/TK)
RIPK1	8737	receptor (TNFRSF)-interacting serine-threonine kinase 1	protein kinase (NRS/TK)
RIPK2	8767	receptor-interacting serine-threonine kinase 2	protein kinase (NRS/TK)
RIPK5	25778	receptor-interacting protein kinase 5	protein kinase (NRS/TK)
RKHD3	84206	ring finger and KH domain containing 3;RKHD3	protein kinase
ROR2	4920	receptor tyrosine kinase-like orphan receptor 2	protein kinase (RTK)
RP2	6102	retinitis pigmentosa 2 (X-linked recessive);RP2	nucleotide kinase
RP6-213H19.1	51765	Mst3 and SOK1-related kinase	protein kinase
RPS6KA1	6195	ribosomal protein S6 kinase, 90kDa, polypeptide 1	protein kinase (NRS/TK)
RPS6KA2	6196	ribosomal protein S6 kinase, 90kDa, polypeptide 2	protein kinase (NRS/TK)
RPS6KA3	6197	ribosomal protein S6 kinase, 90kDa, polypeptide 3	protein kinase (NRS/TK)
RPS6KA4	8986	ribosomal protein S6 kinase, 90kDa, polypeptide 4	protein kinase (NRS/TK)
RPS6KA5	9252	ribosomal protein S6 kinase, 90kDa, polypeptide 5	protein kinase (NRS/TK)
RPS6KA6	27330	ribosomal protein S6 kinase, 90kDa, polypeptide 6	protein kinase (NRS/TK)
RPS6KB1	6198	ribosomal protein S6 kinase, 70kDa, polypeptide 1	protein kinase (NRS/TK)
RPS6KB2	6199	ribosomal protein S6 kinase, 70kDa, polypeptide 2	protein kinase (NRS/TK)
RPS6KC1	26750	ribosomal protein S6 kinase, 52kDa, polypeptide 1	protein kinase (NRS/TK)
RPS6KL1	83694	ribosomal protein S6 kinase-like 1	protein kinase (NRS/TK)
SCYL1	57410	SCY1-like 1 (S. cerevisiae)	protein kinase (NRTK)
SCYL2	55681	hypothetical protein FLJ10074	protein kinase (NRTK)
SCYL3	57147	ezrin-binding partner PACE-1	protein kinase (NRTK)
SEPHS2	22928	selenophosphate synthetase 2;SEPHS2	kinase related
SGK	6446	serum/glucocorticoid regulated kinase	protein kinase (NRS/TK)
SGK2	10110	serum/glucocorticoid regulated kinase 2	protein kinase (NRS/TK)
SGK3	23678	serum/glucocorticoid regulated kinase-like	protein kinase (NRS/TK)
SH3BP4	23677	SH3-domain binding protein 4;SH3BP4	protein kinase (NRTK)
SH3BP5	9467	SH3-domain binding protein 5 (BTK-associated);SH3BP5	kinase related
SH3BP5L	80851	SH3-binding domain protein 5-like;SH3BP5L	kinase related
SLAMF6	114836	SLAM family member 6;SLAMF6	protein kinase (RTK)
SNF1LK	150094	SNF1-like kinase	protein kinase (NRS/TK)
SNRK	54861	SNF-1 related kinase	protein kinase (NRS/TK)
SNX16	64089	sorting nexin 16;SNX16	kinase related
SPHK1	8877	sphingosine kinase 1	carbohydrate kinase
SPHK2	56848	sphingosine kinase 2	carbohydrate kinase
SRC	6714	v-src sarcoma (Schmidt-Ruppin A-2) viral oncogene homolog (avian)	protein kinase (NRTK)
SRPK1	6732	SFRS protein kinase 1	protein kinase (NRS/TK)
SRPK2	6733	SFRS protein kinase 2	protein kinase (NRS/TK)
SRPK3	26576	serine/threonine kinase 23	protein kinase (NRS/TK)
STK11	6794	serine/threonine kinase 11 (Peutz-Jeghers syndrome)	protein kinase (NRS/TK)
STK16	8576	serine/threonine kinase 16	protein kinase (NRS/TK)
STK17B	9262	serine/threonine kinase 17b (apoptosis-inducing)	protein kinase (NRS/TK)
STK19	8859	serine/threonine kinase 19	protein kinase (NRS/TK)
STK24	8428	serine/threonine kinase 24 (STE20 homolog, yeast)	protein kinase
STK25	10494	serine/threonine kinase 25 (STE20 homolog, yeast)	protein kinase
STK3	6788	serine/threonine kinase 3 (STE20 homolog, yeast)	protein kinase
STK32A	202374	serine/threonine kinase 32A	protein kinase (NRS/TK)
STK32B	55351	serine/threonine kinase 32B	protein kinase (NRS/TK)
STK32C	282974	serine/threonine kinase 32C	protein kinase (NRS/TK)
STK33	65975	serine/threonine kinase 33	protein kinase (NRS/TK)
STK36	27148	serine/threonine kinase 36 (fused homolog, Drosophila)	protein kinase (RS/TK)
STK38	11329	serine/threonine kinase 38	protein kinase (NRS/TK)
STK38L	23012	serine/threonine kinase 38 like	protein kinase (NRS/TK)
STK40	83931	Ser/Thr-like kinase	protein kinase
STYK1	55359	protein kinase STYK1	protein kinase (RTK)
SYK	6850	spleen tyrosine kinase	protein kinase (NRTK)
TAOK3	51347	TAO kinase 3	protein kinase
TBK1	29110	TANK-binding kinase 1	protein kinase (NRS/TK)
TEC	7006	tec protein tyrosine kinase	protein kinase (NRTK)
TESK1	7016	testis-specific kinase 1	protein kinase (NRS/TK)
TESK2	10420	testis-specific kinase 2	protein kinase (NRS/TK)
TGFBR1	7046	transforming growth factor, beta receptor I (activin A receptor type II-like kinase, 53kDa)	protein kinase (NRS/TK)
TGFBR2	7048	transforming growth factor, beta receptor II (70/80kDa)	protein kinase (RS/TK)
TGFBR3	7049	transforming growth factor, beta receptor III (betaglycan, 300kDa);TGFBR3	protein kinase (RS/TK)
TIE1	7075	tyrosine kinase with immunoglobulin-like and EGF-like domains 1	protein kinase (RTK)
TK1	7083	thymidine kinase 1, soluble	nucleotide kinase
TLK1	9874	tousled-like kinase 1	protein kinase (NRS/TK)
TLK2	11011	tousled-like kinase 2	protein kinase (NRS/TK)
TNK1	8711	tyrosine kinase, non-receptor, 1	protein kinase (NRTK)
TNNI3K	51086	TNNI3 interacting kinase	protein kinase
TP53RK	112858	TP53 regulating kinase	protein kinase (NRS/TK)
TPK1	27010	thiamin pyrophosphokinase 1	kinase related
TPR	7175	translocated promoter region (to activated MET oncogene);TPR	protein kinase (RTK)
TRIB1	10221	tribbles homolog 1 (Drosophila)	protein kinase
TRIB2	28951	tribbles homolog 2 (Drosophila)	protein kinase
TRIB3	57761	tribbles homolog 3 (Drosophila)	protein kinase

<i>TRIM27</i>	5987	tripartite motif-containing 27;TRIM27	protein kinase (RTK)
<i>TRPM7</i>	54822	transient receptor potential cation channel, subfamily M, member 7	protein kinase (NRS/TK)
<i>TSSK1</i>	83942	serine/threonine kinase 22D (spermiogenesis associated)	protein kinase (NRS/TK)
<i>TSSK2</i>	23617	serine/threonine kinase 22B (spermiogenesis associated)	protein kinase (NRS/TK)
<i>TSSK3</i>	81629	serine/threonine kinase 22C (spermiogenesis associated)	protein kinase (NRS/TK)
<i>TSSK6</i>	83983	serine/threonine protein kinase SSTK	protein kinase (NRS/TK)
<i>TTK</i>	7272	TTK protein kinase	protein kinase
<i>TWf2</i>	11344	PTK9L protein tyrosine kinase 9-like (A6-related protein)	protein kinase (NRTK)
<i>TXK</i>	7294	TXK tyrosine kinase	protein kinase (NRTK)
<i>TXNDC3</i>	51314	thioredoxin domain containing 3 (spermatozoa);TXNDC3	nucleotide kinase
<i>TYK2</i>	7297	tyrosine kinase 2	protein kinase (NRTK)
<i>TYRO3</i>	7301	TYRO3 protein tyrosine kinase	protein kinase (RTK)
<i>UCK2</i>	7371	uridine-cytidine kinase 2	nucleotide kinase
<i>UHMK1</i>	127933	U2AF homology motif (UHM) kinase 1	protein kinase (NRS/TK)
<i>ULK2</i>	9706	unc-51-like kinase 2 (C. elegans)	protein kinase (NRS/TK)
<i>ULK3</i>	25989	DKFZP434C131 protein	protein kinase (NRS/TK)
<i>ULK4</i>	54986	hypothetical protein FLJ20574	protein kinase
<i>VRK1</i>	7443	vaccinia related kinase 1	protein kinase (NRS/TK)
<i>VRK2</i>	7444	vaccinia related kinase 2	protein kinase (NRS/TK)
<i>VRK3</i>	51231	vaccinia related kinase 3	protein kinase (NRS/TK)
<i>WNK1</i>	65125	protein kinase, lysine deficient 1	protein kinase (NRS/TK)
<i>WNK4</i>	65266	protein kinase, lysine deficient 4	protein kinase (NRS/TK)
<i>XRCC6BP1</i>	91419	XRCC6 binding protein 1;XRCC6BP1	protein kinase
<i>XYLB</i>	9942	xylulokinase homolog (H. influenzae)	carbohydrate kinase
<i>YES1</i>	7525	v-yes-1 Yamaguchi sarcoma viral oncogene homolog 1	protein kinase (NRTK)
<i>YSK4</i>	80122	hypothetical protein FLJ23074	protein kinase
<i>ZAK</i>	51776	sterile alpha motif and leucine zipper containing kinase AZK	protein kinase (NRS/TK)
<i>ZAP70</i>	7535	zeta-chain (TCR) associated protein kinase 70kDa	protein kinase (NRTK)

Supplementary Table 2: Ranking of average differential proliferation (1 μ M PLX4720/control) for 597 kinase-related ORFs, relative to MEK DD

RANK	GENE	AVERAGE	STDEV.	Z-SCORE	NOTES
-	ALL ORFS	44.26%	7.19%	-	
1	MEK DD	100.00%	6.54%	7.75	(+) Control
2	RAF1	86.80%	18.00%	5.92	
3	PRKCE	74.76%	8.78%	4.24	
4	MAP3K8	67.51%	10.03%	3.23	
5	PRKCH	67.37%	17.56%	3.21	
6	FGR	65.03%	20.76%	2.89	
7	CRKL	64.74%	19.66%	2.85	
8	PAK3	60.33%	13.59%	2.23	
9	AXL	59.75%	10.23%	2.15	
10	LCK	59.47%	15.66%	2.11	Lethal
11	ERBB2	59.32%	9.39%	2.09	2 SD = 58.64%
12	PRKCQ	55.40%	11.97%	1.55	
13	NME3	55.10%	15.46%	1.51	
14	MOS	55.04%	11.84%	1.50	
15	KHK	55.03%	14.75%	1.50	
16	TIE1	54.65%	15.26%	1.44	Proliferative
17	PRKAG2	54.23%	7.15%	1.39	
18	LOC91461	53.75%	12.45%	1.32	
19	TYRO3	53.64%	10.57%	1.30	
20	CDK3	53.55%	13.92%	1.29	
21	PIM2	53.36%	10.78%	1.27	
22	CIB4	53.31%	12.21%	1.26	
23	PRPS2	53.24%	14.53%	1.25	
24	PRKCB1	53.12%	7.74%	1.23	
25	ACVR1B	53.08%	9.53%	1.23	
26	ETNK2	52.85%	12.63%	1.19	
27	STK36	52.85%	15.28%	1.19	
28	DDR1	52.78%	15.54%	1.19	
29	PRKCA	52.47%	13.38%	1.14	
30	AURKB	52.22%	11.80%	1.11	
31	CAMK4	52.14%	9.09%	1.10	
32	DAPK1	51.94%	11.43%	1.07	
33	AURKC	51.89%	11.23%	1.06	Proliferative
34	IGF1R	51.35%	10.70%	0.99	
35	FN3K	51.27%	12.65%	0.97	
36	LOC646505	50.97%	16.89%	0.93	
37	PIK3CB	50.90%	12.87%	0.92	
38	YES1	50.68%	9.51%	0.89	
39	LOC340156	50.59%	14.63%	0.88	
40	MAP4K5	50.57%	35.45%	0.88	
41	ABL1	50.55%	19.09%	0.87	
42	MAP2K1IP1	50.47%	11.54%	0.86	
43	PRKAR1B	50.34%	8.31%	0.84	
44	RPS6KA1	50.12%	12.28%	0.81	
45	TSSK6	50.10%	11.70%	0.81	
46	NEK9	50.04%	14.37%	0.80	
47	DLG1	49.98%	12.07%	0.80	
48	PTK6	49.93%	10.93%	0.79	
49	SCYL2	49.85%	12.51%	0.78	
50	STK11	49.82%	12.10%	0.77	
51	C9orf98	49.82%	10.38%	0.77	
52	PCK2	49.77%	12.93%	0.77	
53	NTRK2	49.77%	10.02%	0.77	

54	<i>TRIM27</i>	49.69%	10.38%	0.75	
55	<i>FN3KRP</i>	49.69%	11.83%	0.75	
56	<i>CAMK2D</i>	49.61%	11.93%	0.74	
57	<i>ALPK2</i>	49.56%	10.41%	0.74	
58	<i>LOC652722</i>	49.52%	13.10%	0.73	
59	<i>LATS2</i>	49.49%	12.45%	0.73	
60	<i>STK3</i>	49.48%	10.15%	0.73	
61	<i>CDC42BPG</i>	49.44%	10.19%	0.72	
62	<i>HKDC1</i>	49.44%	11.53%	0.72	
63	<i>CDK7</i>	49.42%	14.45%	0.72	Proliferative
64	<i>WNK4</i>	49.37%	14.07%	0.71	
65	<i>PRPF4B</i>	49.36%	12.18%	0.71	
66	<i>MAPKAPK2</i>	49.30%	12.83%	0.70	
67	<i>MEK WT</i>	49.29%	14.33%	0.70	(-) Control
68	<i>PRPS1</i>	49.28%	12.09%	0.70	
69	<i>BTK</i>	49.22%	14.59%	0.69	
70	<i>MYO3B</i>	49.19%	11.05%	0.69	
71	<i>TESK1</i>	49.18%	12.19%	0.68	
72	<i>PLXNA3</i>	49.11%	9.04%	0.67	
73	<i>CLK2</i>	49.09%	8.01%	0.67	
74	<i>PFKFB1</i>	49.02%	14.04%	0.66	
75	<i>DAK</i>	49.00%	12.68%	0.66	
76	<i>ITPKB</i>	48.99%	16.62%	0.66	
77	<i>CHEK1</i>	48.98%	14.41%	0.66	
78	<i>MERTK</i>	48.94%	12.88%	0.65	
79	<i>IKBKE</i>	48.83%	12.46%	0.63	
80	<i>CARD11</i>	48.83%	15.02%	0.63	
81	<i>PANK3</i>	48.78%	9.70%	0.63	
82	<i>TRIB2</i>	48.76%	10.71%	0.63	
83	<i>CDC7</i>	48.74%	9.83%	0.62	
84	<i>PIK3C3</i>	48.69%	12.05%	0.62	
85	<i>LRGUK</i>	48.60%	11.29%	0.60	
86	<i>SCYL3</i>	48.58%	10.86%	0.60	
87	<i>MAP3K14</i>	48.57%	8.10%	0.60	
88	<i>LOC730000</i>	48.57%	13.36%	0.60	
89	<i>LOC442075</i>	48.55%	10.75%	0.60	
90	<i>LOC54103</i>	48.50%	10.77%	0.59	
91	<i>NPR2</i>	48.49%	13.29%	0.59	
92	<i>COL4A3BP</i>	48.49%	11.10%	0.59	
93	<i>MYLK2</i>	48.49%	11.83%	0.59	
94	<i>CSNK2B</i>	48.48%	11.52%	0.59	
95	<i>CARKL</i>	48.47%	9.19%	0.58	
96	<i>TP53RK</i>	48.44%	14.25%	0.58	Proliferative
97	<i>PRKCG</i>	48.42%	8.31%	0.58	
98	<i>ALK</i>	48.39%	14.07%	0.57	
99	<i>ETNK1</i>	48.37%	11.25%	0.57	
100	<i>DYRK2</i>	48.36%	11.80%	0.57	
101	<i>DGKA</i>	48.31%	10.71%	0.56	
102	<i>ADPGK</i>	48.30%	13.36%	0.56	
103	<i>PRKAB2</i>	48.29%	10.75%	0.56	
104	<i>ULK3</i>	48.28%	11.18%	0.56	
105	<i>KIAA2002</i>	48.28%	12.39%	0.56	
106	<i>IRAK3</i>	48.26%	10.96%	0.56	
107	<i>TYK2</i>	48.24%	10.88%	0.55	
108	<i>MAP2K7</i>	48.23%	12.06%	0.55	
109	<i>NRBP</i>	48.18%	13.40%	0.54	
110	<i>CDK2</i>	48.14%	14.65%	0.54	
111	<i>MORN2</i>	47.98%	11.36%	0.52	
112	<i>EPHB4</i>	47.92%	12.52%	0.51	

113	<i>PRKCZ</i>	47.88%	12.68%	0.50	
114	<i>RFK</i>	47.85%	10.44%	0.50	
115	<i>RAGE</i>	47.83%	10.46%	0.50	
116	<i>LOC91807</i>	47.80%	11.25%	0.49	
117	<i>PIK3CG</i>	47.76%	11.25%	0.49	
118	<i>PIK3C2G</i>	47.74%	10.75%	0.48	
119	<i>ARSG</i>	47.71%	10.26%	0.48	
120	<i>CSNK1A1L</i>	47.66%	10.26%	0.47	
121	<i>ALS2CR7</i>	47.65%	11.56%	0.47	
122	<i>FLJ40852</i>	47.62%	12.34%	0.47	
123	<i>LOC390877</i>	47.61%	11.43%	0.46	
124	<i>TRIB1</i>	47.59%	12.91%	0.46	
125	<i>TPR</i>	47.58%	13.00%	0.46	
126	<i>RPS6KL1</i>	47.57%	12.33%	0.46	
127	<i>CCRK</i>	47.56%	10.28%	0.46	
128	<i>PDPK1</i>	47.53%	10.42%	0.45	
129	<i>FASTKD5</i>	47.52%	10.70%	0.45	
130	<i>CDKL3</i>	47.49%	13.14%	0.45	
131	<i>DTYMK</i>	47.49%	10.60%	0.45	
132	<i>MPP3</i>	47.47%	10.65%	0.45	
133	<i>HSPB8</i>	47.46%	11.73%	0.44	
134	<i>NME6</i>	47.44%	14.48%	0.44	
135	<i>NEK3</i>	47.42%	15.46%	0.44	
136	<i>PIK3R4</i>	47.41%	11.14%	0.44	
137	<i>MGC16169</i>	47.41%	13.90%	0.44	
138	<i>OXSRI</i>	47.40%	11.68%	0.44	
139	<i>MASTL</i>	47.35%	10.28%	0.43	
140	<i>PNCK</i>	47.35%	10.15%	0.43	
141	<i>ADCK2</i>	47.32%	15.57%	0.43	
142	<i>SNX16</i>	47.26%	12.76%	0.42	
143	<i>HCK</i>	47.24%	23.41%	0.41	
144	<i>CDKL2</i>	47.21%	10.60%	0.41	
145	<i>NEK11</i>	47.20%	14.68%	0.41	
146	<i>BMP2K</i>	47.15%	11.18%	0.40	
147	<i>BUB1</i>	47.15%	11.76%	0.40	
148	<i>PINK1</i>	47.13%	11.38%	0.40	
149	<i>RBKS</i>	47.08%	8.73%	0.39	
150	<i>LOC732306</i>	47.03%	8.82%	0.39	
151	<i>PKLR</i>	47.03%	12.10%	0.38	
152	<i>DYRK1A</i>	47.01%	12.69%	0.38	
153	<i>RPS6KA4</i>	47.01%	11.70%	0.38	
154	<i>DGKG</i>	46.94%	12.71%	0.37	
155	<i>CDK5R1</i>	46.93%	9.40%	0.37	
156	<i>FLJ25006</i>	46.87%	11.64%	0.36	
157	<i>PBK</i>	46.86%	14.05%	0.36	
158	<i>ACVR1C</i>	46.82%	9.98%	0.35	
159	<i>FLT1</i>	46.78%	10.42%	0.35	
160	<i>PLXNA4B</i>	46.76%	9.39%	0.35	
161	<i>MVK</i>	46.71%	9.26%	0.34	
162	<i>LIMK2</i>	46.70%	11.29%	0.34	
163	<i>DYRK1B</i>	46.68%	20.75%	0.34	
164	<i>MARK3</i>	46.67%	11.71%	0.34	Proliferative
165	<i>BMPRI1B</i>	46.66%	12.24%	0.33	
166	<i>NUP62</i>	46.63%	9.92%	0.33	
167	<i>JAK2</i>	46.62%	12.50%	0.33	
168	<i>MAPK12</i>	46.55%	9.98%	0.32	
169	<i>DDR2</i>	46.54%	7.99%	0.32	
170	<i>MAK</i>	46.52%	15.42%	0.31	
171	<i>GLYCTK</i>	46.50%	13.19%	0.31	

172	AK1	46.47%	9.68%	0.31	
173	MAPK15	46.47%	11.14%	0.31	
174	MAST1	46.45%	10.77%	0.30	
175	PAPSS2	46.39%	11.53%	0.30	
176	CSF1R	46.34%	12.86%	0.29	
177	TPK1	46.29%	9.52%	0.28	
178	PAK4	46.24%	9.98%	0.28	
179	NAGK	46.21%	12.34%	0.27	
180	CDK8	46.20%	7.68%	0.27	
181	STK40	46.19%	12.92%	0.27	
182	CIB1	46.10%	10.92%	0.26	
183	PLK1	46.08%	9.99%	0.25	
184	FLJ23356	46.04%	10.45%	0.25	
185	LOC220686	46.04%	9.31%	0.25	
186	PRKAB1	46.03%	12.00%	0.25	
187	JAK3	46.02%	10.17%	0.24	
188	NME1	46.02%	13.01%	0.24	
189	NME5	46.00%	11.53%	0.24	
190	FER	45.97%	9.92%	0.24	
191	AK3L1	45.97%	10.39%	0.24	
192	PRKG2	45.90%	13.24%	0.23	
193	RP6-213H19.1	45.88%	12.83%	0.22	
194	AKT3	45.87%	11.32%	0.22	
195	PSKH1	45.86%	10.16%	0.22	
196	PRKAR2B	45.84%	13.05%	0.22	
197	FUK	45.81%	10.94%	0.22	
198	ADCK4	45.79%	11.25%	0.21	
199	TEC	45.78%	11.46%	0.21	
200	PRKAG1	45.77%	11.08%	0.21	
201	FXN	45.77%	12.03%	0.21	
202	AAK1	45.68%	11.49%	0.20	
203	CAMK2B	45.67%	19.84%	0.20	
204	COASY	45.64%	11.07%	0.19	
205	PRKAG3	45.63%	10.21%	0.19	
206	NME7	45.58%	10.18%	0.18	
207	LMTK2	45.58%	12.15%	0.18	
208	PANK2	45.57%	11.72%	0.18	
209	PRKD3	45.47%	13.14%	0.17	
210	PHKA2	45.47%	10.92%	0.17	
211	SLAMF6	45.46%	9.67%	0.17	
212	SRPK1	45.46%	12.54%	0.17	
213	HIPK1	45.42%	12.59%	0.16	
214	EPHA1	45.39%	10.59%	0.16	
215	WNK1	45.38%	13.79%	0.15	
216	PDIK1L	45.33%	12.31%	0.15	
217	BMP2KL	45.33%	10.08%	0.15	
218	MAP3K5	45.32%	14.13%	0.15	
219	EPHA2	45.30%	12.87%	0.14	
220	CCL2	45.29%	9.71%	0.14	
221	CDKL1	45.25%	10.13%	0.14	
222	NJMU-R1	45.23%	8.13%	0.13	
223	LOC652799	45.18%	10.30%	0.13	
224	GUK1	45.15%	12.23%	0.12	
225	NME4	45.12%	13.03%	0.12	
226	YSK4	45.11%	13.47%	0.12	
227	NEK2	45.11%	9.38%	0.12	
228	C9orf95	45.10%	9.38%	0.12	
229	CDC2	45.05%	11.95%	0.11	
230	FGFR2	45.01%	11.23%	0.10	

231	<i>IPMK</i>	44.98%	10.67%	0.10	
232	<i>STK32C</i>	44.98%	12.10%	0.10	
233	<i>PIP5K2A</i>	44.92%	14.55%	0.09	
234	<i>PRKX</i>	44.90%	10.44%	0.09	
235	<i>TRPM7</i>	44.80%	10.36%	0.07	
236	<i>FLJ10986</i>	44.74%	10.95%	0.07	
237	<i>SNF1LK</i>	44.74%	12.70%	0.07	
238	<i>MAP3K6</i>	44.71%	9.75%	0.06	
239	<i>LOC653052</i>	44.70%	14.56%	0.06	
240	<i>IRAK2</i>	44.69%	11.61%	0.06	
241	<i>XYLB</i>	44.68%	11.47%	0.06	
242	<i>PTK7</i>	44.67%	14.55%	0.06	
243	<i>PKMYT1</i>	44.66%	13.74%	0.05	
244	<i>SPHK2</i>	44.63%	10.35%	0.05	
245	<i>NME2</i>	44.63%	11.57%	0.05	
246	<i>PRKAA1</i>	44.62%	15.03%	0.05	
247	<i>MAPK14</i>	44.60%	10.77%	0.05	
248	<i>NTRK3</i>	44.58%	13.43%	0.04	
249	<i>PRKACB</i>	44.58%	9.30%	0.04	
250	<i>LOC650122</i>	44.56%	11.24%	0.04	
251	<i>CDK6</i>	44.51%	10.74%	0.03	
252	<i>AMHR2</i>	44.48%	11.11%	0.03	
253	<i>IPPK</i>	44.42%	10.63%	0.02	
254	<i>AK7</i>	44.41%	10.36%	0.02	
255	<i>PIP5KL1</i>	44.36%	11.74%	0.01	
256	<i>LOC340371</i>	44.30%	16.04%	0.01	
257	<i>DKFZp434B1231</i>	44.29%	12.21%	0.00	
258	<i>PRKAA2</i>	44.28%	11.42%	0.00	
259	<i>FASTKD1</i>	44.28%	10.73%	0.00	
260	<i>ARAF</i>	44.27%	14.40%	0.00	RAF Family
261	<i>HK3</i>	44.26%	14.83%	0.00	
262	<i>KSR2</i>	44.25%	10.28%	0.00	
263	<i>PAK7</i>	44.24%	18.45%	0.00	
264	<i>GTF2H1</i>	44.23%	10.90%	0.00	
265	<i>RPS6KB2</i>	44.23%	9.32%	-0.01	
266	<i>PAK6</i>	44.21%	13.83%	-0.01	
267	<i>IRAK4</i>	44.18%	10.27%	-0.01	
268	<i>NLK</i>	44.18%	12.92%	-0.01	
269	<i>FYN</i>	44.14%	12.43%	-0.02	
270	<i>BMPR2</i>	44.14%	12.20%	-0.02	
271	<i>CDK4</i>	44.13%	10.47%	-0.02	
272	<i>STK32A</i>	44.07%	13.93%	-0.03	
273	<i>TNK1</i>	44.06%	10.80%	-0.03	
274	<i>STK24</i>	43.99%	10.79%	-0.04	
275	<i>CSNK2A1</i>	43.99%	11.97%	-0.04	
276	<i>AK3</i>	43.98%	11.16%	-0.04	
277	<i>TTK</i>	43.93%	10.47%	-0.05	
278	<i>PGK2</i>	43.91%	13.31%	-0.05	
279	<i>GALK1</i>	43.89%	10.14%	-0.05	
280	<i>DYRK3</i>	43.89%	9.32%	-0.05	
281	<i>EIF2AK4</i>	43.83%	11.00%	-0.06	
282	<i>PDK1</i>	43.79%	13.31%	-0.07	
283	<i>EIF2AK1</i>	43.79%	12.02%	-0.07	
284	<i>PRKACG</i>	43.79%	11.37%	-0.07	
285	<i>BUB1B</i>	43.74%	10.69%	-0.07	
286	<i>PKM2</i>	43.74%	14.46%	-0.07	
287	<i>LRPPRC</i>	43.64%	10.87%	-0.09	
288	<i>EPHA6</i>	43.63%	12.60%	-0.09	
289	<i>HK2</i>	43.58%	12.55%	-0.10	

290	<i>MET</i>	43.55%	10.99%	-0.10	
291	<i>CKS2</i>	43.53%	7.83%	-0.10	
292	<i>LOC375133</i>	43.53%	10.05%	-0.10	
293	<i>LIMK1</i>	43.52%	12.43%	-0.10	
294	<i>TWF2</i>	43.50%	11.71%	-0.11	
295	<i>PCTK2</i>	43.47%	12.02%	-0.11	
296	<i>DCAKD</i>	43.43%	11.61%	-0.12	
297	<i>PLXNB2</i>	43.41%	11.85%	-0.12	
298	<i>MST1R</i>	43.35%	11.99%	-0.13	
299	<i>PRKAR1A</i>	43.35%	9.03%	-0.13	
300	<i>SEPHS2</i>	43.32%	9.68%	-0.13	
301	<i>SPHK1</i>	43.31%	9.87%	-0.13	
302	<i>CCL4</i>	43.30%	11.83%	-0.13	
303	<i>KIAA0999</i>	43.28%	9.68%	-0.14	
304	<i>PDGFRL</i>	43.23%	11.93%	-0.14	
305	<i>BRSK1</i>	43.21%	14.17%	-0.15	
306	<i>BRAF</i>	43.21%	12.56%	-0.15	RAF Family
307	<i>MUSK</i>	43.20%	11.03%	-0.15	
308	<i>TNNI3K</i>	43.20%	10.46%	-0.15	
309	<i>GK2</i>	43.18%	15.15%	-0.15	
310	<i>CKB</i>	43.14%	9.45%	-0.16	
311	<i>DGKB</i>	43.12%	11.62%	-0.16	
312	<i>LOC648152</i>	42.99%	11.15%	-0.18	
313	<i>RPS6KA5</i>	42.87%	11.23%	-0.19	
314	<i>CASK</i>	42.87%	12.05%	-0.19	
315	<i>PHKA1</i>	42.86%	10.10%	-0.20	
316	<i>AK2</i>	42.84%	9.83%	-0.20	
317	<i>PIM1</i>	42.81%	14.09%	-0.20	
318	<i>ZAP70</i>	42.81%	12.10%	-0.20	
319	<i>PNKP</i>	42.79%	12.95%	-0.20	
320	<i>CDK10</i>	42.78%	9.77%	-0.21	
321	<i>CHEK2</i>	42.77%	12.86%	-0.21	
322	<i>CAMK2A</i>	42.72%	11.68%	-0.21	
323	<i>CAMK2G</i>	42.70%	9.66%	-0.22	
324	<i>ADRBK2</i>	42.70%	12.56%	-0.22	
325	<i>NEK8</i>	42.69%	9.88%	-0.22	
326	<i>PRKR</i>	42.69%	10.65%	-0.22	
327	<i>CHKA</i>	42.66%	12.84%	-0.22	
328	<i>ACVRL1</i>	42.65%	10.85%	-0.22	
329	<i>PRKY</i>	42.63%	11.80%	-0.23	
330	<i>TRIB3</i>	42.62%	11.45%	-0.23	
331	<i>PRKD2</i>	42.59%	10.48%	-0.23	
332	<i>PIP5K3</i>	42.57%	9.78%	-0.24	
333	<i>LOC727761</i>	42.56%	14.17%	-0.24	
334	<i>PTK2B</i>	42.50%	15.72%	-0.25	
335	<i>MPP2</i>	42.48%	10.73%	-0.25	
336	<i>CSNK1A1</i>	42.47%	13.54%	-0.25	
337	<i>PTK9</i>	42.42%	11.31%	-0.26	
338	<i>STK25</i>	42.41%	12.54%	-0.26	
339	<i>PFKL</i>	42.39%	12.01%	-0.26	
340	<i>STK19</i>	42.35%	11.20%	-0.27	
341	<i>PI4KII</i>	42.30%	14.04%	-0.27	
342	<i>HK1</i>	42.26%	12.73%	-0.28	
343	<i>AURKA</i>	42.21%	14.80%	-0.29	
344	<i>GK5</i>	42.21%	10.98%	-0.29	
345	<i>MAP3K7</i>	42.20%	13.13%	-0.29	
346	<i>PFTK1</i>	42.18%	12.49%	-0.29	
347	<i>ERN1</i>	42.17%	13.74%	-0.29	
348	<i>STK33</i>	42.17%	13.22%	-0.29	

349	SYK	42.13%	12.42%	-0.30	
350	GALK2	42.13%	11.34%	-0.30	
351	TSSK1	42.12%	11.98%	-0.30	
352	MAPK6	42.11%	10.58%	-0.30	
353	ASCIZ	42.07%	10.61%	-0.30	
354	PFKP	42.07%	14.99%	-0.31	
355	PXK	42.05%	14.69%	-0.31	
356	PI4K2B	42.05%	11.84%	-0.31	
357	PIP5K2C	42.02%	9.50%	-0.31	
358	PFKFB3	42.00%	12.79%	-0.31	
359	TSSK3	41.97%	14.82%	-0.32	
360	MPP6	41.97%	12.68%	-0.32	
361	MPP4	41.87%	12.27%	-0.33	
362	LOC653155	41.85%	11.50%	-0.34	
363	ALPK1	41.82%	12.37%	-0.34	
364	CDK9	41.76%	10.32%	-0.35	
365	PDK3	41.66%	10.87%	-0.36	
366	CKMT2	41.66%	12.57%	-0.36	
367	CAMK1G	41.63%	12.06%	-0.37	
368	MAPKAPK3	41.61%	13.19%	-0.37	
369	PIK4CB	41.55%	14.29%	-0.38	
370	PRPS1L1	41.54%	11.08%	-0.38	
371	FASTK	41.49%	12.56%	-0.39	
372	CAMK1D	41.49%	11.54%	-0.39	
373	MARK2	41.48%	14.28%	-0.39	
374	PDK4	41.43%	13.43%	-0.39	
375	NEK7	41.36%	9.57%	-0.40	
376	MAPK4	41.34%	10.83%	-0.41	
377	PIK4CA	41.32%	11.99%	-0.41	
378	JAK1	41.31%	11.56%	-0.41	
379	PDXK	41.30%	11.93%	-0.41	
380	TGFBR2	41.25%	15.85%	-0.42	
381	PHKB	41.25%	10.81%	-0.42	
382	ULK2	41.24%	15.35%	-0.42	
383	MKMK1	41.21%	13.08%	-0.42	
384	CDC2L6	41.17%	10.91%	-0.43	
385	CSNK1G3	41.13%	10.53%	-0.44	
386	CAMK1	41.08%	11.68%	-0.44	
387	DGKZ	41.07%	12.69%	-0.44	
388	SGK	40.91%	11.92%	-0.47	
389	TBK1	40.83%	14.81%	-0.48	
390	ILK	40.81%	12.62%	-0.48	
391	STK32B	40.80%	11.79%	-0.48	
392	TXNDC3	40.78%	12.24%	-0.48	
393	RPS6KB1	40.72%	10.13%	-0.49	
394	ZAK	40.71%	10.32%	-0.49	
395	DYRK4	40.66%	12.59%	-0.50	
396	ITGB1BP3	40.57%	11.99%	-0.51	
397	MPP1	40.53%	10.94%	-0.52	
398	HIPK2	40.49%	11.06%	-0.52	
399	MAPK13	40.46%	12.06%	-0.53	
400	TK1	40.39%	11.04%	-0.54	
401	SH3BP4	40.36%	12.11%	-0.54	
402	CKM	40.29%	12.70%	-0.55	
403	FGFRL1	40.23%	16.94%	-0.56	
404	MAPK10	40.23%	12.29%	-0.56	
405	CALM2	40.16%	8.64%	-0.57	
406	CALM3	40.12%	11.85%	-0.58	
407	STYK1	40.09%	11.47%	-0.58	

408	<i>CDKL4</i>	40.08%	11.01%	-0.58	
409	<i>NADK</i>	40.08%	11.89%	-0.58	
410	<i>MPP7</i>	40.06%	11.72%	-0.59	
411	<i>CAMKV</i>	40.03%	12.16%	-0.59	
412	<i>EXOSC10</i>	40.02%	12.78%	-0.59	
413	<i>CDKL5</i>	39.98%	10.10%	-0.60	
414	<i>STK38</i>	39.90%	9.61%	-0.61	
415	<i>INSRR</i>	39.90%	15.08%	-0.61	
416	<i>DCK</i>	39.86%	10.23%	-0.61	
417	<i>TLK2</i>	39.80%	14.66%	-0.62	
418	<i>PCTK3</i>	39.66%	10.48%	-0.64	
419	<i>LOC388957</i>	39.65%	10.97%	-0.64	
420	<i>PAPSS1</i>	39.59%	13.48%	-0.65	
421	<i>ACVR2B</i>	39.56%	14.70%	-0.65	
422	<i>NME1-NME2</i>	39.53%	12.01%	-0.66	
423	<i>NEK10</i>	39.50%	13.78%	-0.66	
424	<i>MAP3K11</i>	39.47%	9.33%	-0.67	
425	<i>PMVK</i>	39.46%	10.19%	-0.67	
426	<i>MAPK9</i>	39.45%	12.74%	-0.67	
427	<i>MKNK2</i>	39.39%	13.54%	-0.68	
428	<i>GRK7</i>	39.34%	14.98%	-0.68	
429	<i>RIOK2</i>	39.27%	11.79%	-0.69	
430	<i>DGKK</i>	39.27%	9.02%	-0.69	
431	<i>ACVR1</i>	39.15%	13.96%	-0.71	
432	<i>TLK1</i>	39.11%	15.46%	-0.72	
433	<i>LATS1</i>	39.05%	10.46%	-0.73	
434	<i>SCYL1</i>	39.01%	11.41%	-0.73	
435	<i>TESK2</i>	38.93%	13.30%	-0.74	
436	<i>DGUOK</i>	38.90%	14.54%	-0.75	
437	<i>PGK1</i>	38.87%	12.26%	-0.75	
438	<i>MAGI1</i>	38.87%	12.66%	-0.75	
439	<i>SNRK</i>	38.79%	11.61%	-0.76	
440	<i>CALM1</i>	38.65%	10.26%	-0.78	
441	<i>RIOK1</i>	38.58%	12.39%	-0.79	
442	<i>EEF2K</i>	38.56%	11.96%	-0.79	
443	<i>MAPK8</i>	38.45%	10.51%	-0.81	
444	<i>CSNK1D</i>	38.44%	15.60%	-0.81	
445	<i>ULK4</i>	38.42%	12.02%	-0.81	
446	<i>STK38L</i>	38.33%	12.63%	-0.83	
447	<i>RIOK3</i>	38.21%	12.80%	-0.84	
448	<i>MINK1</i>	38.00%	14.94%	-0.87	
449	<i>ROR2</i>	37.95%	15.32%	-0.88	
450	<i>PTK2</i>	37.93%	10.59%	-0.88	
451	<i>PIK3R5</i>	37.84%	13.17%	-0.89	
452	<i>ALDH18A1</i>	37.81%	15.66%	-0.90	
453	<i>NYD-SP25</i>	37.79%	13.52%	-0.90	
454	<i>MAP4K3</i>	37.76%	9.58%	-0.90	
455	<i>AGK</i>	37.61%	13.89%	-0.92	
456	<i>GSK3A</i>	37.56%	14.44%	-0.93	
457	<i>BMPR1A</i>	37.56%	16.10%	-0.93	
458	<i>STK16</i>	37.53%	11.09%	-0.94	
459	<i>FASTKD2</i>	37.50%	8.53%	-0.94	
460	<i>MAP4K4</i>	37.39%	15.68%	-0.96	
461	<i>LRRK2</i>	37.38%	10.11%	-0.96	
462	<i>TGFBR3</i>	37.33%	11.04%	-0.96	
463	<i>PDGFRB</i>	37.29%	16.90%	-0.97	
464	<i>DLG3</i>	37.09%	12.08%	-1.00	
465	<i>PFKFB2</i>	36.99%	10.37%	-1.01	
466	<i>AKT1</i>	36.66%	13.43%	-1.06	

467	<i>PRKCI</i>	36.54%	11.44%	-1.07	
468	<i>NEK4</i>	36.50%	13.19%	-1.08	
469	<i>PRKD1</i>	36.45%	14.57%	-1.09	
470	<i>SRPK2</i>	36.37%	12.38%	-1.10	
471	<i>SH3BP5</i>	36.37%	17.17%	-1.10	
472	<i>CLK1</i>	36.06%	11.13%	-1.14	
473	<i>GK</i>	35.86%	17.33%	-1.17	
474	<i>IHPK1</i>	35.53%	12.15%	-1.21	
475	<i>IHPK3</i>	35.48%	9.30%	-1.22	
476	<i>PLAU</i>	35.36%	13.10%	-1.24	
477	<i>TAOK3</i>	35.29%	14.78%	-1.25	
478	<i>PAK2</i>	35.20%	12.51%	-1.26	
479	<i>BMX</i>	35.12%	12.94%	-1.27	
480	<i>DAPK2</i>	35.01%	13.92%	-1.29	
481	<i>CSNK1E</i>	34.83%	15.21%	-1.31	
482	<i>MAPK3</i>	34.75%	19.93%	-1.32	Lethal
483	<i>MAP3K15</i>	34.40%	16.76%	-1.37	Lethal
484	<i>MPP5</i>	34.35%	11.80%	-1.38	
485	<i>MAST2</i>	34.08%	16.10%	-1.42	
486	<i>GRK6</i>	34.04%	15.82%	-1.42	
487	<i>DKFZp761P0423</i>	33.93%	13.58%	-1.44	
488	<i>VRK1</i>	33.87%	9.28%	-1.45	
489	<i>DCAMKL2</i>	33.77%	11.96%	-1.46	
490	<i>IHPK2</i>	33.75%	9.56%	-1.46	
491	<i>MATK</i>	33.44%	10.25%	-1.51	
492	<i>RP2</i>	33.20%	13.41%	-1.54	
493	<i>MAP2K2</i>	32.98%	15.34%	-1.57	
494	<i>UCK2</i>	32.82%	13.75%	-1.59	
495	<i>NEK6</i>	32.74%	15.85%	-1.60	
496	<i>PRKG1</i>	32.52%	14.60%	-1.63	
497	<i>MAP3K12</i>	32.49%	15.33%	-1.64	
498	<i>PCTK1</i>	32.48%	13.21%	-1.64	
499	<i>MGC42105</i>	32.36%	13.85%	-1.66	
500	<i>MAP2K6</i>	32.32%	11.92%	-1.66	
501	<i>SH3BP5L</i>	32.11%	15.55%	-1.69	
502	<i>FES</i>	32.07%	11.04%	-1.70	
503	<i>RKHD3</i>	31.89%	12.45%	-1.72	
504	<i>PRKACA</i>	31.76%	18.45%	-1.74	Lethal
505	<i>MAP4K1</i>	31.51%	13.69%	-1.77	
506	<i>CSNK1G1</i>	30.32%	14.90%	-1.94	
507	<i>MAPKAPK5</i>	30.15%	13.47%	-1.96	
508	<i>CSK</i>	29.83%	14.11%	-2.01	Lethal
509	<i>BRD3</i>	29.16%	8.83%	-2.10	
510	<i>ADRBK1</i>	29.00%	16.93%	-2.12	
511	<i>BRSK2</i>	28.64%	13.09%	-2.17	
512	<i>ADCK1</i>	28.30%	13.52%	-2.22	
513	<i>CSNK1G2</i>	26.81%	14.42%	-2.43	
514	<i>CKMT1A</i>	26.80%	12.42%	-2.43	
515	<i>TSSK2</i>	25.66%	13.30%	-2.59	Lethal
516	<i>CD2</i>	25.01%	14.99%	-2.68	
517	<i>PIP5K1A</i>	24.76%	15.49%	-2.71	
518	<i>PHKG1</i>	23.31%	14.24%	-2.91	
519	<i>ABL2</i>	Low pLX DNA yield			
520	<i>ACVR2A</i>	Low pLX DNA yield			
521	<i>BLK</i>	Low pLX DNA yield			
522	<i>CDC2L1</i>	Low pLX DNA yield			
523	<i>EGFR</i>	Low pLX DNA yield			
524	<i>EPHA3</i>	Low pLX DNA yield			
525	<i>EPHB1</i>	Low pLX DNA yield			

526	<i>ERBB4</i>	Low pLX DNA yield	
527	<i>FASTKD3</i>	Low pLX DNA yield	
528	<i>FGFR1</i>	Low pLX DNA yield	
529	<i>FLT3</i>	Low pLX DNA yield	
530	<i>FLT4</i>	Low pLX DNA yield	
531	<i>HIPK3</i>	Low pLX DNA yield	
532	<i>KSR</i>	Low pLX DNA yield	
533	<i>LYN</i>	Low pLX DNA yield	
534	<i>PANK4</i>	Low pLX DNA yield	
535	<i>PDGFRA</i>	Low pLX DNA yield	
536	<i>PLK4</i>	Low pLX DNA yield	
537	<i>RET</i>	Low pLX DNA yield	
538	<i>SGK3</i>	Low pLX DNA yield	
539	<i>SRC</i>	Low pLX DNA yield	
540	<i>TXK</i>	Low pLX DNA yield	
541	<i>BRD4</i>	Inf. Effic. < 70%	
542	<i>CAMKK2</i>	Inf. Effic. < 70%	
543	<i>CKS1B</i>	Inf. Effic. < 70%	
544	<i>CLK3</i>	Inf. Effic. < 70%	
545	<i>DAPK3</i>	Inf. Effic. < 70%	
546	<i>EPHA4</i>	Inf. Effic. < 70%	
547	<i>EPHB6</i>	Inf. Effic. < 70%	
548	<i>FGFR3</i>	Inf. Effic. < 70%	
549	<i>FRK</i>	Inf. Effic. < 70%	
550	<i>GCK</i>	Inf. Effic. < 70%	
551	<i>GNE</i>	Inf. Effic. < 70%	
552	<i>HIPK4</i>	Inf. Effic. < 70%	
553	<i>ITK</i>	Inf. Effic. < 70%	
554	<i>KDR</i>	Inf. Effic. < 70%	
555	<i>LOC389599</i>	Inf. Effic. < 70%	
556	<i>LOC649288</i>	Inf. Effic. < 70%	
557	<i>MAP3K2</i>	Inf. Effic. < 70%	
558	<i>NEK5</i>	Inf. Effic. < 70%	
559	<i>NTRK1</i>	Inf. Effic. < 70%	
560	<i>PAK1</i>	Inf. Effic. < 70%	
561	<i>PHKG2</i>	Inf. Effic. < 70%	
562	<i>PIK3CA</i>	Inf. Effic. < 70%	
563	<i>PIK3R3</i>	Inf. Effic. < 70%	
564	<i>PIP5K1B</i>	Inf. Effic. < 70%	
565	<i>RIPK1</i>	Inf. Effic. < 70%	
566	<i>RIPK2</i>	Inf. Effic. < 70%	
567	<i>RPS6KA2</i>	Inf. Effic. < 70%	
568	<i>RPS6KC1</i>	Inf. Effic. < 70%	
569	<i>STK17B</i>	Inf. Effic. < 70%	
570	<i>TGFBR1</i>	Inf. Effic. < 70%	
571	<i>UHMK1</i>	Inf. Effic. < 70%	
572	<i>XRCC6BP1</i>	Inf. Effic. < 70%	
573	<i>BCKDK</i>	Replicate STDEV	
574	<i>C1orf57</i>	Replicate STDEV	
575	<i>CAMKK1</i>	Replicate STDEV	
576	<i>CDC2L2</i>	Replicate STDEV	
577	<i>CDK5</i>	Replicate STDEV	
578	<i>ERBB3</i>	Replicate STDEV	
579	<i>GSG2</i>	Replicate STDEV	
580	<i>LOC647279</i>	Replicate STDEV	
581	<i>LYK5</i>	Replicate STDEV	
582	<i>MAPK1</i>	Replicate STDEV	Lethal
583	<i>MAP2K5</i>	Replicate STDEV	
584	<i>MAP4K2</i>	Replicate STDEV	

585	<i>NUAK2</i>	Replicate STDEV	
586	<i>PDK2</i>	Replicate STDEV	Lethal
587	<i>PFKM</i>	Replicate STDEV	
588	<i>PIK3R1</i>	Replicate STDEV	
589	<i>PLK2</i>	Replicate STDEV	
590	<i>PRKAR2A</i>	Replicate STDEV	
591	<i>RPS6KA3</i>	Replicate STDEV	
592	<i>RPS6KA6</i>	Replicate STDEV	
593	<i>SGK2</i>	Replicate STDEV	
594	<i>SRPK3</i>	Replicate STDEV	
595	<i>VRK1</i>	Replicate STDEV	
596	<i>VRK2</i>	Replicate STDEV	
597	<i>VRK3</i>	Replicate STDEV	

Supplementary Table 3: Results of a secondary screen quantifying the change in PLX4720 GI₅₀ induced by the top 9 candidate resistance ORFs

Secondary Screen							
A375				SKMEL28			
Gene	GI ₅₀ (μ M)	Fold Change GI ₅₀	Rank	Gene	GI ₅₀ (μ M)	Fold Change GI ₅₀	Rank
<i>MAP3K8</i>	>100.0	598	1	<i>MAP3K8</i>	>100.0	~100	1
<i>RAF1</i>	\geq 100.0	598	2	<i>RAF1</i>	\geq 10.0	\geq 10	2
<i>CRKL</i>	>10.0	59.8	3	<i>CRKL</i>	9.7	9.7	3
<i>FGR</i>	>10.0	59.8	4	<i>FGR</i>	5	5	4
<i>PRKCE</i>	4.41	26.4	5	<i>PRKCH</i>	2.26	2.26	5
<i>PRKCH</i>	4.14	24.7	6	<i>PRKCE</i>	1.91	1.91	6
<i>ERBB2</i>	1.33	7.95	7	<i>AXL</i>	1.18	1.18	7
<i>AXL</i>	1	5.98	8	<i>ERBB2</i>	1	1	8
<i>PAK3</i>	0.4934	2.95	9	<i>PAK3</i>	0.9041	0.9041	9
Controls				Controls			
<i>Mock</i>	0.1528	0.91		<i>Mock</i>	0.5287	1.89	
<i>MEK1</i>	0.1671	1	(-)	<i>MEK1</i>	1	1	(-)
<i>MEK DD</i>	4.8	28	(+)	<i>MEK DD</i>	8.29	8.29	(+)

Supplementary Table 4: Patient characteristics

Patient	Tissue	Age (years)	Gender	Biopsy Location	Time from primary diagnosis (years)	Time from metastatic disease diagnosis (years)	Response	<i>BRAF</i> status (pre-treatment)	<i>BRAF</i> status (on-treatment/post-relapse)	<i>NRAS</i> status	<i>KRAS</i> status	pMEK status	pERK status
Pt 1	Tissue Biopsy	49	F	Back	5	3	Partial Response	V600E	N/A	N/A	N/A	N/A	N/A
Pt 2	Tissue Biopsy	67	M	Back	2	0	Partial Response	V600E	N/A	N/A	N/A	N/A	N/A
Pt 3	Tissue Biopsy	68	M	Leg	11	0	Partial Response	V600E	N/A	N/A	N/A	N/A	N/A
MM-R	Tissue Biopsy	38	M	Axilla	0	0	Partial Response	V600E	V600E	WT	WT	*	*
M307	Short-term Culture	59	M	Axillary Lymph node	4	4	Stable Disease	V600E	V600E	N/A	N/A	Ref. (14)	**

* See Supplementary Figure 16

** See Main Figure 3f