

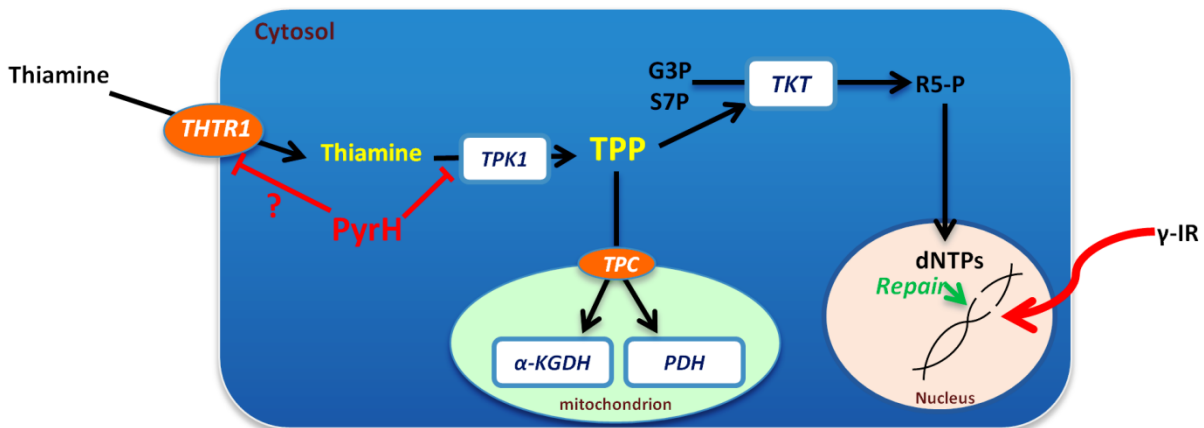
Identification of Vitamin B1 metabolism as a tumor-specific radiosensitizing pathway using a high-throughput colony formation screen

Supplementary Material

Supplementary Figures S1, S3 and Tables S1-S3

	1	2	3	4	5	6	7	8	9	10	11	12
A	PLK	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	DNA-PKcs
B	NT	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	UN
C	NT	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	UN
D	NT	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	NT
E	NT	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	NT
F	UN	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	NT
G	UN	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	NT
H	DNA-PKcs	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	LIBRARY	DNA-PKcs

Supplementary Figure S1. siRNA library plate layout. Controls are located on the edge columns 1 and 12. A total of eight non-targeting (NT), one PLK1 siRNA (transfection control), three DNA-PKcs siRNA (DNA-PKcs; positive radiosensitisation control), and four untransfected (UN) wells are found in columns 1 and 12. Library siRNA are located on columns 2 through 11.



Supplementary Figure S3. Possible model of radiosensitization by thiamine metabolism

inhibition.

Under normal physiological conditions, thiamine first enters the cell via the THTR1 transporter where it is readily converted into its active form, thiamine pyrophosphate (TPP) by TPK1. TPP is a co-factor for transketolase (TKT), an enzyme in the non-oxidative pentose phosphate pathway (PPP), which catalyzes from glyceraldehyde 3-phosphate (G3P) and sedoheptulose 7-phosphate (S7P) the production of ribose-5 phosphate (R5-P), the sugar phosphate backbone of deoxynucleotide triphosphates (dNTPs). TPP can also be transported into the mitochondria by thiamine pyrophosphate carrier (TPC) and used as a prosthetic group for pyruvate dehydrogenase (PDH) and α -ketoglutarate dehydrogenase (α -KGDH).

Thiamine metabolism can be perturbed by THTR1 and TPK1 knockdown, reducing thiamine uptake and production of TPP, respectively. In addition, disruption of thiamine metabolism can be achieved by the thiamine analogue pyrithiamine hydrobromide (PyrH), reducing TPP levels and possibly also thiamine uptake directly. As less TPP is available as a co-factor for TKT, the production of R5-P is decreased. This results in an inhibition of nucleotide production, reducing the cell's capability to repair DNA after irradiation and increasing cell death. The mitochondrial

functions of TPP do not appear to be linked with radiosensitivity as knockdown of the mitochondrial transporter, TPC, did not affect radiosurvival.

Table S1 Primary high-throughput colony formation assay screen List of radiosensitivity scores (R-score) for the two primary screen runs of the 709 Dharmacon Kinome ON-TARGET_{plus} siRNA library. Genes ordered by rank product analysis using R-score values. Radiosensitizing siRNAs shown by R-scores <0. Abbreviations: Percentage of false prediction (PFP).

Gene	Rank Product	PFP	R-score Run1	R-score Run2
PRKDC	17.54992877	0.112	-2.77248913	-2.87254
CLK3	25.78759392	0.195	-2.04204307	-2.91376
CHEK1	28.4956137	0.2375	-2.486693582	-2.74961
ATM	28.56571371	0.230862	-2.635472343	-2.43795
CSNK2B	30.85449724	0.252097	-2.058988782	-2.78619
ATR	34.05877273	0.304688	-2.372951047	-2.09122
CKS2	34.871119155	0.312121	-1.904632817	-2.59912
PKMYT1	35.4964787	0.313971	-2.012726169	-2.41409
TAF1	36.33180425	0.317429	-1.755511813	-2.65153
TAF1L	41.82104733	0.399861	-1.541934118	-2.52179
HAK	41.98809355	0.391351	-1.799665558	-2.07109
SMG1	42.14261501	0.383421	-1.690170264	-2.3331
GAK	44.72135955	0.408974	-1.869937535	-1.70943
EPHB2	45.57411546	0.4105	-2.266227599	-1.36282
ACVR2	49.74937186	0.464268	-1.738005255	-1.484
PIK3C2A	49.95998399	0.457381	-1.54611734	-1.75791
SRP72	51.75905718	0.477907	-1.702904033	-1.46401
GCK	52.47856705	0.478636	-1.573846592	-1.49582
TPK1	53.24471805	0.479222	-1.391169382	-1.88296
PCK2	54.08326913	0.483152	-1.879877227	-1.31326
PRKCL2	57.91372894	0.540106	-1.170481113	-2.12681
STK32A	58.49786321	0.537708	-1.460019936	-1.42668
MAP4K3	59.14389233	0.535714	-1.389058206	-1.49693
PFKL	59.24525297	0.5266	-1.518674315	-1.38102
CDC2	60.21627687	0.532451	-1.246492279	-1.74517
MARK3	64.93073232	0.598077	-1.361577689	-1.40574
XYLB	66.09084657	0.604717	-1.21539149	-1.48272
TGFB3	66.1135387	0.594259	-1.125924174	-1.78053
IPMK	67.15653356	0.599	-1.827956225	-0.90456
ACVR2B	69.97856815	0.628214	-1.436206058	-1.18402
PRKCH	70.74602462	0.629035	-1.506981303	-1.07179
MARK2	80.42387705	0.763017	-1.092206653	-1.37926
WNK4	83.9761871	0.809492	-0.682898127	-1.952
DYRK1A	84.90583019	0.809917	-1.14002598	-1.2
TLK1	85.97674104	0.812049	-1.172556148	-1.11406
TRPM7	88.65664104	0.842339	-1.399208051	-0.73944
BRD4	91.86402996	0.878254	-1.145784169	-1.01432
PSKH2	92.0597632	0.86625	-1.239067752	-0.81041
DGKD	94.13819629	0.887846	-1.824127273	-0.39851
PRKCZ	95.36770942	0.893864	-0.98857154	-1.15397
BRAF	95.43584232	0.881418	-1.130059723	-0.99371
CLK4	95.66608594	0.871985	-1.144889798	-0.9501
EFNA3	95.74445154	0.86058	-1.036987123	-1.08134
HUS1	96.95875412	0.865286	-1.210794527	-0.8012
KCNH8	97.11848434	0.854718	-0.293824597	-2.34667
ROCK2	98.01785552	0.855	-0.708600341	-1.41367
PAK7	100	0.872945	-1.590901876	-0.44772
DTYMK	101.1978261	0.875068	-1.653210154	-0.40321
EFNA5	103.4891299	0.891333	-0.653920709	-1.40496
CAMK4	103.9230485	0.885855	-1.073825832	-0.9208
COL4A3BP	104.1633333	0.877013	-0.714603325	-1.33615
TOPK	104.2688832	0.867244	-1.327319257	-0.65417
DGKA	104.297651	0.856582	-0.747358426	-1.31684
CHKA	104.4126429	0.84775	-0.801698825	-1.21771
BRDT	105.2330746	0.851173	-0.960186323	-1.00414
LOC390226	106.5833008	0.858537	-0.705824826	-1.32977
GUCY2C	109.5810203	0.886566	-1.224332153	-0.61018
PACE-1	111.0315271	0.894167	-0.840759291	-1.06674
PRKCQ	112.4055159	0.900412	-0.861523967	-1.06466
PLK3	113.8419958	0.905988	-1.197441442	-0.59751
CDK9	115.0217371	0.910632	-0.885447191	-0.94758
IHPK3	116.3829884	0.91733	-0.708600341	-1.14811

SNARK	117.5755077	0.920449	-0.984683702	-0.74443
PLK4	119.9208072	0.940444	-0.547684887	-1.32128
VRK3	120.218551	0.935055	-1.396835552	-0.30031
CSNK2A1	121.8605761	0.946141	-2.084296665	0.201201
CDKN2B	122.6784415	0.945376	-1.349782721	-0.38488
PTK6	122.7191917	0.935745	-0.319437898	-1.4214
ILK	126.1427762	0.967842	-0.932968194	-0.72912
AK3L1	127.0826503	0.967865	0.125261707	-2.26812
PKM2	130.4607221	0.994536	-1.715856746	0.00629
SRMS	132.7026752	1.007653	-2.349398602	0.526766
SPHK2	134.3130671	1.017071	-0.469500307	-1.19564
MAPK7	135.7865973	1.0237	0.148765661	-1.97574
NTRK1	137.5027272	1.032079	-2.012573074	0.332392
INSRR	141.2515487	1.055631	-0.949894927	-0.54299
STK35	142.1126314	1.055673	-0.719360871	-0.73735
MAP3K13	142.1829807	1.046048	-0.275760788	-1.26284
DMPK	142.821567	1.043726	-0.47745247	-1.06514
CSF1R	142.8845688	1.034953	-0.138974863	-1.40276
SCAP1	144.0138882	1.038102	-0.907636903	-0.55626
PIK3R3	144.1873781	1.029495	-0.255744323	-1.21907
BRD3	146.355731	1.043455	0.115806812	-1.57715
AMHR2	146.4308711	1.03509	-1.337414807	-0.13891
PDK3	148.7749979	1.050357	-0.396224124	-1.06627
BTK	153.205744	1.086681	-0.765557734	-0.58534
NEK1	154.0649214	1.087325	-1.351887436	-0.04714
MAPK10	156.2561999	1.103217	-0.978450855	-0.33717
CKM	160.3995012	1.137284	-1.390450096	0.063312
FRAP1	160.9316625	1.134017	-1.102599508	-0.21066
C9ORF96	161.0434724	1.125636	-1.389772306	0.051945
PAK6	161.4249051	1.120756	-0.524540043	-0.74295
EFNB3	164.1219059	1.140542	-1.026915985	-0.23919
MAPK13	164.2071862	1.131901	-0.1252858	-1.17978
TNK2	164.5357104	1.126557	-1.104596482	-0.17853
CDKN2D	164.6815108	1.119024	-0.447990009	-0.79834
CDKL2	165.3360215	1.11621	-1.042545661	-0.20594
MAP3K14	165.8432995	1.11236	0.030113805	-1.32863
PIK3CD	166.4992492	1.110913	-0.667775578	-0.57257
ERBB3	167.4096771	1.110157	-0.688714966	-0.53847
MGC45428	168.1963139	1.108164	-1.191000543	-0.0462
BUB1	168.6416319	1.104729	-0.145316259	-1.07612
CAMK2A	168.9260193	1.099192	0.286083815	-1.46068
ANKRD3	171.0263138	1.109542	-0.868798857	-0.33348
MARK4	171.119841	1.102197	-0.908668716	-0.28399
MAPKAPK3	172.8930305	1.112203	-0.603247459	-0.60889
ULK2	175.0542773	1.125373	-0.685162295	-0.47613
BMX	175.3225599	1.118889	-1.114010212	-0.09175
CALM2	175.7668911	1.107883	-0.254526555	-0.8069
PRKCSH	175.7839583	1.099964	-0.159517077	-0.99213
NTRK2	177.5161964	1.11018	-0.150906432	-0.99213
VRK1	178.2806776	1.109071	-0.802249368	-0.30853
C9ORF12	178.8658715	1.107376	-0.196464401	-0.93059
MAP2K1	179.1926338	1.102324	-1.109845207	-0.06601
PIK3C2B	179.5550055	1.097832	-1.20821034	0.066547
RPS6KC1	179.6580084	1.090903	-0.001329759	-1.12204
PIK3R4	182.0631758	1.103897	-0.643848791	-0.46718
CRK7	183.3112108	1.108014	0.270007694	-1.33762
MAP3K1	183.6518445	1.104082	0.295159052	-1.34726
SYK	184.7593029	1.107128	-0.810873384	-0.25136
ACVR1B	185.1512895	1.104094	-0.204175611	-0.80186
FLJ10761	185.2565788	1.097367	-0.679677628	-0.40791
COASY	187.6166304	1.111093	1.660130434	-1.95061
MAP2K7	187.6459432	1.104145	-0.207184863	-0.79469
GALK2	189.9894734	1.114967	-0.782114466	-0.24729
MYO3B	191.2328424	1.119968	1.57698245	-1.86769
IGF1R	192.4993506	1.12329	-0.582491861	-0.45379
CCRK	193.4476673	1.117325	-0.199615139	-0.75056
GRK4	195.9642825	1.131329	-0.493011035	-0.50785
KSR	196.2956953	1.126289	1.195676873	-1.53662
AKT1	197.4841766	1.129156	-0.325630547	-0.62261
PRKCD	197.90907	1.125342	0.084512274	-1.01965
LATS1	197.9898987	1.119105	-0.961209364	-0.03812
CDC42BPA	198.1035083	1.113067	-0.410852516	-0.56813
URKL1	198.3607824	1.102667	-1.32710416	0.37625
EPHA4	198.8089535	1.099608	-1.171162572	0.235716
PANK4	199.7498436	1.100958	-1.463715696	0.916178
LMTK3	201.1019642	1.105387	-0.238598444	-0.68035
TNIK	201.6184515	1.103136	-0.729688559	-0.20368
PRKCG	201.9108714	1.099618	-0.008047999	-0.83002
RIPK3	202.2325394	1.096637	-0.373606214	-0.55866
NRBP	203.2043307	1.097616	-0.901160059	-0.07821

IKBKG	203.5951866	1.093873	-1.396835552	0.786809
MLCK	204.2302622	1.092443	-0.484224355	-0.45281
CHEK2	207.9975961	1.110938	-0.317958361	-0.55428
FRK	208.0552811	1.104915	-0.166183383	-0.70213
NME3	209.3800373	1.107669	0.424068988	-1.21156
SAST	209.8928298	1.105531	-1.091637231	0.185048
PDK1	210.8648856	1.100276	-1.475055661	1.626886
ANKK1	211.4142852	1.098462	-0.722494313	-0.14741
PRX	212.3864402	1.099672	-0.318869437	-0.52496
ICK	213.6164788	1.103071	-0.004022341	-0.75233
MAPKAPK5	213.8223562	1.097892	-0.881214078	-0.01563
CDK11	213.850415	1.092204	0.166444669	-0.97128
CSNK1G1	214.368841	1.090856	-0.511527508	-0.35728
ULK4	215.9629598	1.096888	0.150466152	-0.93752
FLJ34389	216.062491	1.091852	-0.340708309	-0.4757
STK32B	217.3464976	1.096211	0.085393337	-0.80448
MUSK	219.0091322	1.096198	-0.617496433	-0.2114
MGC8407	219.0616352	1.090933	-0.298855851	-0.48521
MELK	220.027271	1.093144	-0.550006684	-0.27006
AK2	220.0499943	1.084987	-0.081040972	-0.70052
DLG1	220.0499943	1.084987	-0.779144814	-0.05121
EEF2K	221.5581188	1.081843	-0.919948212	0.092661
SGK	222.6207537	1.083794	-0.916290369	0.084422
MAPK9	223.6515146	1.080647	-0.167723932	-0.58096
CDKN1A	225.3397435	1.087574	0.762353282	-1.21796
RIPK1	227.3279569	1.094236	-0.547322314	-0.22868
RAF1	227.4335068	1.089583	0.21814808	-0.88349
NLK	228.195092	1.088927	-0.64561731	-0.14227
MYO3A	229.3948561	1.091748	-0.674839129	-0.10637
NME6	229.8347232	1.089034	-0.488882394	-0.26133
PIK3CA	230.2976335	1.087091	-1.180734658	0.67413
EPHB4	232.1637353	1.094306	-0.793677546	0.028914
KIAA1811	232.383304	1.090786	-1.366473056	1.878123
MAPK3	232.4930106	1.086114	-0.586402757	-0.17833
AATK	232.6606972	1.081745	0.082087499	-0.73257
EIF2AK3	232.7337535	1.077324	-0.952178732	0.252387
FLJ23356dup	232.7659769	1.0725	-0.182211652	-0.52074
ARAF1	232.8733561	1.068256	-0.209265408	-0.4791
NME2	234.0512764	1.071644	-0.864356052	0.091246
NME5	234.499467	1.070184	-1.136433677	0.593834
ACVR1C	234.9957446	1.06789	-0.076169535	-0.59678
MARK1	235.8134856	1.068356	-0.662665822	-0.08032
DYRK2	237.3646983	1.072773	-0.216945809	-0.44929
PHKG2	237.802439	1.070792	0.136780625	-0.74062
HK3	237.9957983	1.067005	0.167854486	-0.74616
PRKG2	238.1554114	1.063318	0.090202521	-0.72467
PI4K2B	238.6461816	1.061518	-0.082983621	-0.56337
DGKH	238.8660713	1.058244	0.288416804	-0.80448
TRIO	239.2488244	1.054084	-0.989132914	0.377946
RPS6KA3	239.2488244	1.054084	-0.624956371	-0.10521
RIOK1	239.7394419	1.050241	-0.500702707	-0.19077
PRKAB2	241.1223756	1.055328	0.025684768	-0.64312
MGC4796	241.6195356	1.053696	0.099016654	-0.71691
CDK10	242.1363252	1.048384	0.089816964	-0.69082
STK4	247.2286391	1.076502	0.300071958	-0.79318
CSNK1A1	247.4712104	1.073355	-0.06691045	-0.52737
IHPK2	249.3431371	1.075339	0.057543079	-0.61264
PRKWINK2	251.6525382	1.085169	0.5143837	-0.90638
UCK1	251.6783662	1.080777	0.671048675	-0.97386
GRK1	251.7081643	1.076444	0.132500255	-0.66972
MYLK2	254.0964384	1.086479	-0.608789153	-0.04109
BLK	254.1653005	1.08222	-0.72171976	0.118386
CHUK	254.3580154	1.078967	0.355825936	-0.77181
MGC42105	255.4407955	1.081543	-0.45093431	-0.15933
STK17B	256.7761671	1.085369	-0.464645996	-0.14663
CKS1B	256.9163288	1.082041	-0.954217818	0.515986
PDK4	257.2236381	1.079167	-0.237113905	-0.29604
MAPK12	259.1524648	1.085891	-0.754483208	0.224583
BAIAP1	259.4937379	1.079116	-0.209680338	-0.30408
CDKL5	260.5225518	1.081	-1.044405147	0.783589
MAP3K6	261.2470096	1.081315	-0.494997929	-0.09407
RPS6KB2	262.4404694	1.083651	-0.760159802	0.258286
PFKM	262.9429596	1.078287	-0.918726149	0.518836
MAP3K7	264.9433902	1.08166	0.30816664	-0.72092
LMTK2	265.7856279	1.077946	-0.660158478	0.093678
ERN1	265.879672	1.074266	-0.242476839	-0.24311
KDR	266.9269563	1.076288	0.232040686	-0.65558
PRKY	267.787229	1.077816	-0.040954552	-0.43935
MAGI-3	269.2805229	1.078289	-0.516703773	-0.03577
PIM3	269.8777501	1.078087	-0.539392186	-0.00513

KHK	270.5549852	1.073891	0.06284939	-0.49712
IRAK1	270.6159641	1.070187	-0.396504263	-0.12553
MAP2K2	271.064568	1.06461	-0.41106615	-0.11766
NEK9	273.3623968	1.068155	-0.020897713	-0.41147
YES1	273.7736291	1.066397	-0.061900587	-0.38345
STK17A	273.9653263	1.063223	0.054610171	-0.46718
EPHB3	274.226184	1.06073	-0.528943859	0.01004
FGFR2	274.4193871	1.057673	0.276135029	-0.62972
CRKL	276.1485108	1.054317	-0.614513921	0.100651
SLK	276.2607464	1.051004	-0.139730914	-0.2918
MAP3K3	279.7731224	1.065536	-0.046923249	-0.34138
PRKWINK3	280.1017672	1.063594	0.533296412	-0.73219
ITPKC	280.2748651	1.06078	-0.013491718	-0.37953
INSR	280.3408639	1.057367	-0.527184957	0.03494
UMP-CMPK	281.6806703	1.060845	-0.411575754	-0.04917
DGKI	284.1302518	1.061899	-0.071731394	-0.30343
CAMKK1	284.7279403	1.061493	-0.970081333	1.098992
MAP2K3	284.9385899	1.058997	-0.41574513	-0.03453
PTK2	286.3354676	1.063362	0.062565594	-0.41498
MAP3K11	286.9146214	1.062715	-0.202532973	-0.18364
RIOK2	288.1527373	1.065548	-0.486245855	0.030285
COMMD3	288.3747562	1.062952	-0.993069542	1.601991
TESK1	289.0415195	1.063112	0.396184566	-0.6292
FUK	289.6515148	1.06239	-0.635441198	0.255856
BMPR1A	289.843061	1.059561	-0.905353974	0.834096
CDK5R2	290.9347006	1.060976	0.030132024	-0.36374
BRD2	292.5064102	1.065302	-0.157001153	-0.18913
CDKL3	292.6174978	1.062191	0.920944409	-0.75114
RPS6KA6	294.0833215	1.0652	-0.044061829	-0.27636
ZAK	294.3976902	1.062807	-0.823877834	0.677243
LOC91461	294.4995756	1.059967	1.170854774	-0.80153
ETNK1	294.7269923	1.057442	-0.629389737	0.281479
PDGFRA	295.4285023	1.057105	-0.176990087	-0.15941
IKBKAP	295.7566567	1.055016	0.296252589	-0.52874
NEK3	295.7752525	1.051667	-0.008129919	-0.2876
ERBB4	297.7263845	1.054221	0.155942888	-0.44009
TTBK2	298.1140721	1.052994	-0.693639117	0.402388
MAP2K6	299.8132752	1.058032	0.123274641	-0.39695
ROCK1	299.9733321	1.055482	0.557746737	-0.64902
CKMT2	301.4249492	1.055431	-0.375224255	0.01268
PSKH1	302.2267361	1.055064	0.203173896	-0.44837
PIM2	302.4070105	1.052603	-0.201179765	-0.12409
TK2	308.0178566	1.073044	-0.886831814	1.2165
AK1	308.6357076	1.072642	0.04459173	-0.28308
DAPK1	309.2183694	1.071755	0.030646386	-0.25613
RIPK2	309.6320397	1.070016	-0.457854749	0.138174
DLG3	310.0104837	1.06866	-0.596867916	0.330621
PIK3R1	310.3191905	1.066553	0.399445171	-0.52671
TNK1	310.4979871	1.06418	-0.420502359	0.109484
CDKN2C	311.2699793	1.064367	0.022624665	-0.24526
TRIB1	311.3165591	1.061262	0.449204616	-0.53504
DUSTYK	311.6191586	1.059356	0.381876301	-0.51171
KUB3	311.9038313	1.05737	-0.270942802	-0.01088
SIK2	312.7618903	1.057896	-0.205243601	-0.07337
PAK1	313.3560275	1.05734	-0.168306275	-0.10158
PRKACA	314.6426545	1.060258	0.299323184	-0.44857
CDC2L5	314.6982682	1.057281	0.912719996	-0.68251
GSG2	314.8174074	1.054819	-0.286063174	0.008552
MAPK11	315.1713819	1.053213	-0.219630741	-0.03724
CPNE3	315.3252289	1.050928	-0.109738774	-0.13346
CAMK2D	317.1435006	1.056448	0.22792206	-0.3935
MST1R	317.348389	1.054033	0.010996497	-0.20375
PMVK	317.9308101	1.053338	-0.227149782	-0.01438
EPHB1	318.0172951	1.050651	-0.6281807	0.442682
AURKB	318.405402	1.048997	-0.005609272	-0.18795
DCK	319.1238004	1.049191	-0.092890473	-0.1359
LCK	319.1394679	1.046232	0.51784538	-0.53096
FGFR4	319.4119597	1.044415	-0.474500036	0.242205
RPS6KB1	319.9812495	1.043878	-0.031942636	-0.17127
PGK1	320.1749522	1.041599	-0.649964973	0.559006
PRKAR2B	320.3185914	1.03913	0.191892286	-0.32279
PRKAB1	321.6208948	1.041416	-0.379447188	0.145563
ITK	323.2460363	1.044784	0.995526225	-0.66682
NEK6	323.4176866	1.042557	-0.304652116	0.071711
RPS6KA2	323.8981321	1.041433	0.396174684	-0.45274
PHKA1	323.9614175	1.038786	0.339087032	-0.41999
PAK4	324.9615362	1.039915	0.429807847	-0.46294
PFKFB1	325.5272646	1.039205	-0.200093221	-0.02002
RET	326.9418909	1.03904	-0.799721689	1.322739
SBK1	327.1926038	1.037042	1.569248809	-0.73127

BCR	327.2842801	1.034607	0.508572061	-0.49303
MAST3	327.7834651	1.030656	-0.31653954	0.113417
GTF2H1	328.1950639	1.029485	-0.604398063	0.509252
STK33	328.686781	1.02608	0.355935569	-0.41498
PNKP	328.9832823	1.024489	0.054973019	-0.1923
PRKCA	329.1443452	1.022383	-0.360124489	0.184229
STK38L	329.8029715	1.021676	1.131107166	-0.65939
NEK4	331.0755201	1.022158	-0.652985019	0.675444
IGF2R	331.5056561	1.021076	-0.427920475	0.26658
CHKB	332.2920402	1.02106	-0.415332201	0.264622
HIPK2	332.9864862	1.020989	-0.641447492	0.645261
STK3	333.9221466	1.019245	-0.239799226	0.070151
RPS6KL1	335.2670577	1.021841	0.28797295	-0.3175
KIT	335.5845646	1.020134	0.034869519	-0.15926
IRAK2	336.1428268	1.018797	-0.046160438	-0.10269
CAMKK1dup	338.0606454	1.0236	-0.218522047	0.061394
EPHA6	342.9110672	1.04008	-0.387690667	0.297023
PRKAA1	346.6641026	1.049061	-0.523115203	0.550669
PRPS1L1	347.9784476	1.051372	-0.459750354	0.382674
TRPM6	348.3819743	1.050526	0.36011853	-0.31597
PRPS2	350.0114284	1.051296	0.296307793	-0.27532
PRKR	351.1125176	1.052611	0.850600688	-0.49541
ROS1	352.2570084	1.054271	0.093694133	-0.14444
LIMK2	354.5504195	1.053669	0.490690578	-0.37606
MAP3K8	355.2801711	1.053814	-0.117859222	0.039191
ADCK2	355.4166569	1.051799	0.374960275	-0.29676
C10ORF89	356.2583332	1.05209	-0.093658238	0.019878
NPR2	357.7708764	1.055166	-0.137023732	0.060486
BMPR1B	358.6474592	1.055944	1.570704574	-0.59448
RFK	358.6767347	1.053333	-0.613554134	0.923247
PRKCB1	359.3744565	1.053198	-0.353268048	0.360775
ITPKA	359.7999444	1.05219	-0.235426161	0.23156
RFP	361.0900165	1.054621	-0.604748623	0.916345
CDK3	361.6490011	1.054156	-0.51857062	0.67204
STK31	361.7098285	1.051809	0.102772204	-0.11934
RELA	362.3009798	1.051391	0.045671659	-0.07426
PASK	364.7437457	1.054638	-0.080388536	0.031036
FGR	365.4805056	1.054851	0.474910501	-0.2987
HUNK	365.7512816	1.053226	-0.140926659	0.110292
DDR1	366.9822884	1.054777	-0.295467696	0.341684
MAPK1	367.1157856	1.052617	0.125626882	-0.10944
PKIB	367.4152964	1.050998	-0.198685868	0.203939
STK10	367.559519	1.049066	-0.05044239	0.029675
TBK1	367.7662301	1.047279	0.814317354	-0.41869
CLK1	367.9211872	1.045183	0.208056508	-0.15462
SSTKdup	369.1747554	1.047524	0.543415775	-0.31417
ERK8	369.5186058	1.046399	-0.253185702	0.31658
AKT3	369.6484817	1.044126	0.452753799	-0.27788
DGKB	370.867901	1.045811	0.070845055	-0.04799
MAST2	370.9339564	1.043527	0.980689719	-0.44956
ERBB2	373.1353642	1.04853	-0.167414034	0.206599
NAGK	374.0427783	1.046223	-0.033642345	0.041334
FN3KRP	376.4518562	1.049308	-0.219605632	0.311214
CAMKK2	377.3963434	1.049679	-0.09811781	0.138922
FLT4	378.153408	1.049893	0.761539962	-0.36922
PACSIN1	378.4441835	1.048294	0.031564897	0.007446
MAP3K4	379.0659573	1.047955	0.717088411	-0.31939
EFNA4	380.462876	1.050425	0.820380555	-0.37725
JAK2	382.6238362	1.055576	0.343364827	-0.18217
STYK1	383.1866386	1.054859	0.062602898	0.003653
MPP1	384.4450546	1.054019	-0.032635734	0.08937
CDC42BPB	384.8129416	1.052634	0.060521198	0.008527
BCKDK	384.9363584	1.050581	-0.089973169	0.181265
AURKC	385.9987047	1.051462	-0.146088339	0.25502
CERK	386.3159329	1.050174	0.195198526	-0.09168
CDK7	386.3871116	1.047921	0.446013558	-0.20584
PFKFB3	387.5732189	1.049044	-0.153193729	0.267709
KIAA1765	390.1486896	1.054966	-0.492471742	1.00208
FLJ23356	390.3844259	1.053383	0.322389828	-0.14396
GUCY2D	391.1725962	1.053638	-0.335721837	0.608818
ALS2CR7	395.4023268	1.059477	-0.411479643	0.779536
DYRK1B	396.8626967	1.061882	0.709890816	-0.2553
PIP5K1B	397.2404813	1.060656	0.590713077	-0.22164
SPEG	397.3310962	1.058352	0.310251322	-0.11996
PFKFB2	397.3650714	1.056081	-0.471288469	1.018657
LYK5	397.67449	1.054472	-0.558693594	2.013898
NYD-SP25	399.1240409	1.057063	-0.194620417	0.365509
SGK2	401.1882351	1.061063	-0.404501951	0.831766
PINK1	402.8721882	1.061915	0.027488807	0.125138
CIB2	404.6924758	1.062816	0.125626882	0.026559

ITPK1	405.5514764	1.063418	0.67865244	-0.21187
PRKCN	406.5599587	1.06404	0.209190217	-0.02426
IKBKE	407.8565924	1.063736	0.425670768	-0.13602
ADRBK1	408.8520515	1.064452	1.597859846	-0.4024
TEC	409.3910111	1.063895	0.252501712	-0.0457
DGKQ	409.4874845	1.061878	0.740173178	-0.22523
TRIB2	409.756025	1.060359	0.492179949	-0.15853
DLG2	411.8154927	1.064326	-0.074309493	0.298094
ALS2CR2	414.5370912	1.070933	1.077419655	-0.2929
CAMK2B	418.4973118	1.078359	0.956257461	-0.2499
PIK3CB	419.2994157	1.078825	0.586380069	-0.15248
CDKL1	419.4412951	1.076753	0.64491793	-0.16647
DGUOK	419.5414163	1.074742	0.380264517	-0.08751
EPHA5	421.0605657	1.073974	0.971100315	-0.24913
KIAA2002	421.2837524	1.072505	-0.313966368	0.90448
PRPS1	421.3241033	1.070404	0.044086723	0.204396
PRKG1	421.594592	1.068811	0.278713841	-0.012
STK36	422.5695209	1.069576	0.302017749	-0.0303
DCAMKL1	424.1650622	1.067747	-0.057335805	0.342599
TSKS	424.2640687	1.065809	-0.213369814	0.632425
HIPK3	424.5291509	1.064539	-0.2714747	0.792008
JAK3	425.0058823	1.064111	0.078840659	0.191967
FYN	427.9158796	1.063091	0.021036774	0.280537
PAK2	428.1354926	1.061553	-0.295806204	0.936891
DUSP21	429.3436852	1.060412	-0.226875158	0.713566
FLT1	431.4510401	1.064588	-0.005844401	0.331644
PRKCM	433.0958324	1.066561	0.08059073	0.229689
TGFBR2	433.5666039	1.065738	1.084769588	-0.23386
RIOK3	436.8523778	1.070878	-0.004519031	0.350004
STK16	437.1978957	1.06943	-0.095307977	0.484035
PFTK1	439.6817031	1.074583	-0.023644905	0.374007
PRKAR1B	442.6962841	1.080588	0.236881515	0.07751
PRKACG	445.2527372	1.083343	-0.110178928	0.592859
STK11	447.2940867	1.087026	0.456317473	-0.02871
IRAK3	447.3969155	1.085131	0.647609068	-0.09303
CDK4	447.7175449	1.083936	-0.109391797	0.60026
GSK3A	449.5564481	1.086613	-0.168580349	0.766018
STK22Ddup	453.4754679	1.092824	0.035429713	0.364023
MOS	453.667279	1.091155	0.252099998	0.128404
SRC	456.335403	1.093492	0.093383944	0.320043
MAP3K15	456.683698	1.092228	-0.105876356	0.656985
PKLR	457.8908167	1.092875	0.09565242	0.324175
CALM3	460.5659562	1.097761	-0.296281157	2.701992
HSMDPKIN	461.0249451	1.0969	-0.109117005	0.69049
MAP4K2	462.4283728	1.098124	-0.286689684	1.991781
MAP2K4	462.8174586	1.09701	0.97481092	-0.12876
PTK9	463.2407581	1.095714	0.238794403	0.195775
GRK6	463.6830814	1.094609	0.03388053	0.415141
LTK	468.2392551	1.101284	1.387923971	-0.17626
PIP5K2C	469.7446115	1.10266	0.015191032	0.538954
PDPK1	470.6399898	1.102946	0.071744883	0.402228
PRKAR1A	471.06369	1.101586	-0.116919359	0.84559
DYRK3	471.2769886	1.100039	0.201413081	0.27295
PTK7	474.5576888	1.105925	0.662693414	-0.00575
NEK5	475.2567727	1.105538	-0.214811642	1.500588
PTK2B	475.4702935	1.103896	0.660901718	-0.00407
GOLGA5	475.6469279	1.102232	0.996393647	-0.10276
ROR1	477.080706	1.103652	0.719110344	-0.01637
PRKCE	477.3730198	1.102137	0.568727282	0.022874
HSPB8	478.2760709	1.102143	0.94678738	-0.08003
DDR2	478.3513353	1.100323	0.87502795	-0.05551
EPHA2	481.1901911	1.103011	0.091898817	0.434098
MAP3K2	481.2691555	1.101115	-0.149269337	1.125591
GUCY2F	481.3408356	1.099189	0.159083587	0.353598
THNSL1	483.0900537	1.101318	0.15697001	0.361871
PRKCL1	484.3862095	1.102688	0.559361829	0.045921
MAPK6	486.1944056	1.104296	0.337222423	0.223903
MAK	489.1012165	1.109223	0.39922925	0.184103
PNCK	490.1897592	1.109953	0.025108354	0.66463
FER	490.2570754	1.108032	0.209546915	0.345197
EPHA3	490.6444741	1.106946	1.203248131	-0.09898
ADCK1	491.4600696	1.106877	0.11856601	0.466737
NRBP2	491.8536368	1.105603	0.132765601	0.42971
AXL	493.0314392	1.10414	0.228227531	0.341056
JAK1	493.5098783	1.10322	0.337879752	0.252673
CASK	497.0553289	1.107592	1.021627801	-0.0457
CDKL4	499.5738184	1.111358	-0.099457084	1.193164
LRRK2	500.665557	1.11196	1.724797894	-0.12024
FASTK	501.4578746	1.111755	0.798551965	0.019947
LOC340156	502.0906293	1.111186	0.724572483	0.047665

FGFR1	502.5186564	1.110419	0.354698921	0.266045
TYRO3	503.4580419	1.110709	0.3253729	0.306261
RNASEL	504.3193433	1.11049	0.340761751	0.29366
CRIM1	506.415837	1.112935	1.319206737	-0.07046
NEK8	507.9192849	1.114159	0.147863402	0.529043
PAPSS1	509.0432202	1.114422	0.952248952	0.009699
GALK1	510.4762482	1.115486	0.218697691	0.415875
MAPK14	510.4870224	1.113525	1.254724226	-0.0457
SPHK1	511.6277944	1.114013	0.590423315	0.168542
CAMK1G	512.3475383	1.11388	0.691626608	0.108074
AAK1	512.5553629	1.112317	0.115376905	0.638161
DKFZP761P0423	514.8300691	1.115241	0.215314178	0.466285
MAPK4	515.7324888	1.113221	0.003628487	0.977701
CSNK1D	517.1537489	1.11389	0.075931966	0.737428
KCNH2	518.4322521	1.114415	0.810865207	0.071215
MGC4796dup	518.8188509	1.113221	0.543024407	0.213831
KIAA1811dup	519.4997594	1.112862	0.342959281	0.348739
CALM1	521.7470652	1.115212	0.03765592	0.908112
LATS2	522.4538257	1.112636	0.223976163	0.519656
MAP4K1	523.5647047	1.113325	0.166628354	0.605095
MAP3K5	523.8625774	1.111909	0.331997511	0.371855
PDGFRL	524.22705	1.110769	0.695011128	0.177264
MVK	525.0904684	1.110541	0.63767482	0.2038
RPS6KA4	525.1161776	1.108641	0.141371964	0.649214
PIM1	526.3078947	1.108974	0.442629685	0.313178
TP53RK	526.3952887	1.107205	1.064331806	0.029722
NME4	530.6241608	1.113839	0.116502084	0.770001
PRKAR2A	530.9237233	1.112561	0.757984319	0.164071
MERTK	531.2626469	1.111235	0.540727767	0.264856
LRRK1	531.3275826	1.109466	0.900555601	0.093444
CAMK2G	535.1448402	1.114079	0.834973008	0.139313
LYN	536.1865347	1.114167	0.25378283	0.554431
ABL1	539.5164502	1.118559	0.228126847	0.609921
MAP3K9	540.2295808	1.117877	1.327506357	0.020904
PFKFB4	540.8992512	1.117453	0.260711234	0.573426
PANK2	541.6142539	1.116945	1.405165026	0.01574
HIPK4	541.8440735	1.115434	0.357961349	0.409165
PAK3	542.566125	1.114651	0.180735855	0.707488
BMP2K	542.9079112	1.113396	0.435209217	0.366703
MPP3	544.9770637	1.113037	0.292412556	0.56919
TYK2	545.4310222	1.112061	0.59147349	0.301352
MAP3K10	545.5712602	1.110481	0.690722638	0.262544
C14ORF20	545.8058263	1.109074	0.133516031	0.85832
ACVR1	547.64861	1.110538	0.03758588	1.333458
NRK	548.4806286	1.110327	0.1684207	0.785195
ADRBK2	550.3580653	1.1099	0.458359218	0.376201
FLJ32685	551.1288416	1.109282	0.520850666	0.35187
CDK2	551.3710185	1.10785	0.130565699	0.93788
SCYL1	551.5541678	1.106356	0.301825151	0.578809
PDIK1L	551.8876697	1.105033	0.256149456	0.64472
STK38	551.9112247	1.103234	0.505951507	0.361405
CSNK1E	554.5151035	1.106175	0.835124558	0.228413
ABL2	555.1162041	1.105298	0.630646763	0.330416
HRI	555.3458382	1.103903	0.207791177	0.777042
AK7	555.5069757	1.102471	1.246220769	0.083857
CSK	559.2566495	1.107064	1.086523607	0.149242
EPHA1	559.7713819	1.106034	0.494891963	0.383964
PI4KII	560.9367166	1.106336	1.102065791	0.154138
BMPR2	560.983957	1.104583	0.786491634	0.264626
CARKL	561.0632763	1.102884	1.079720957	0.168009
SRPK2	561.4730626	1.101892	0.475364666	0.410257
CDADC1	566.2225711	1.105626	0.945147585	0.236664
SNF1LK	566.5897987	1.104318	0.357051352	0.586248
MINK	567.3473363	1.102055	1.522437487	0.074149
DGKK	567.5737837	1.100654	0.09319235	1.388293
MAP4K5	567.7534676	1.099032	1.899387601	0.047247
MAPKAPK2	567.9084433	1.097424	1.163050265	0.17969
CKB	568.928818	1.097235	0.408705262	0.558128
STK24	569.8420834	1.096798	1.07758212	0.20351
HIPK1	570.3051815	1.095761	0.17062678	1.032468
EPHA7	570.9308189	1.095088	0.421533949	0.559577
RAGE	570.9570912	1.093371	1.659081271	0.072697
PHKB	571.6712342	1.090764	0.379591341	0.597827
NME7	574.202055	1.091111	0.44852695	0.551326
FGFRL1	574.4893385	1.088054	0.485948644	0.515592
VRK2	575.0165215	1.087125	0.709909879	0.356621
AK3	575.7343137	1.08642	0.343982277	0.6672
PIK4CB	578.7521058	1.089465	0.172551744	1.149757
PIP5K3	581.3449922	1.092264	0.229306404	0.96571
STK25	581.7516652	1.091287	0.472131857	0.565919

GK	584.6451915	1.094459	0.829774444	0.340807
GRK7	584.9418775	1.093177	1.185777585	0.230586
EGFR	585.9249099	1.092961	1.141921442	0.249902
AK5	586.4588647	1.092122	1.359455972	0.201067
PANK3	588.2686461	1.093217	1.056086474	0.270409
KIAA1361	592.748682	1.096724	0.956079371	0.330604
FLJ25006	594.4072678	1.097395	0.530370818	0.578442
TJP2	596.0939523	1.098166	0.956249073	0.339109
RPS6KA5	598.980801	1.100456	0.348065024	0.844467
CAMK1	599.2119825	1.099151	1.009687377	0.326726
TEX14	599.764954	1.098428	1.065501681	0.315568
SGKL	599.7666213	1.096738	0.206777444	1.413267
GNE	601.5280542	1.097481	0.914465681	0.363806
NEK11	601.9792355	1.096457	0.583559953	0.581455
MAST4	602.3603573	1.095314	1.197690777	0.292331
PIK3C3	602.4997925	1.09393	0.180735855	1.806385
TESK2	604.4071475	1.095038	0.88928409	0.382329
UHMK1	606.301905	1.094247	0.672563819	0.541275
PDXK	606.9332748	1.093495	0.487966824	0.679701
RP6-213H19.1	607.7499486	1.09283	0.335492671	1.011667
PGK2	608.3568032	1.091917	1.003822018	0.35305
PRKACB	609.5244048	1.092073	0.244505478	1.343509
HCK	610.0311467	1.091073	0.321510356	1.084048
PAPSS2	611.959966	1.091765	0.619263582	0.613459
PRKD2	614.0114005	1.092831	0.363330173	0.958906
PRKAG3	615.6362562	1.09214	0.859982929	0.440115
DAPK3	616.5387255	1.091754	0.908811293	0.425708
SNRK	617.9344625	1.091467	0.701438601	0.590023
EPHB6	619.7580173	1.092332	0.845244611	0.485926
ACVRL1	621.0104669	1.09073	0.73771257	0.573574
CSNK1A1L	622.1286041	1.090379	0.750494753	0.572541
DAPK2	624.3268375	1.091813	0.581817908	0.711355
MAP3K12	624.6471004	1.089044	0.619204676	0.68905
KIAA1804	624.9559985	1.08787	0.995152257	0.405022
STK29	625.7075994	1.087031	0.277299039	1.729993
NTRK3	625.7411605	1.08545	0.363573509	1.09267
PANK1	625.9257144	1.08405	0.906819188	0.513474
ITPKB	626.348146	1.082926	0.433660866	0.964926
ADK	627.3802675	1.081144	0.550043444	0.764797
DGKG	629.4886814	1.082108	0.271420232	2.029034
MET	631.5623485	1.081431	0.453440632	0.962302
MKNK1	631.9018911	1.080168	1.107195415	0.400899
NME1	632.2032901	1.078981	1.513899777	0.330621
PDK2	633.5897726	1.076217	0.997770155	0.454139
FLT3	634.4982269	1.075615	0.730201451	0.664077
ROR2	635.3109475	1.075029	0.665386296	0.693962
SSTK	636.7456321	1.07518	0.663440893	0.711173
JIK	638.0556402	1.074957	0.412627919	1.16323
ALK	639.7030561	1.075173	1.195432243	0.403345
MAP4K4	640.4998048	1.07444	0.740986869	0.674553
LAK	641.6774891	1.074175	1.249136157	0.39934
DLG4	642.2810911	1.073338	0.482523784	1.032154
P101-PI3K	643.4656168	1.071414	0.630272007	0.818826
CSNK2A2	644.2903072	1.069259	0.624267249	0.843856
RPS6KA1	646.3497505	1.069836	0.663253117	0.802441
PFKP	646.9969088	1.069162	0.751554194	0.69057
PCTK2	648.2900585	1.069078	0.710170251	0.753931
FRDA	648.3795185	1.067741	0.802698058	0.667843
NEK2	651.4982732	1.067839	0.771905635	0.693252
KIAA0999	653.4125802	1.068406	0.460662624	1.200273
TGFBR1	654.266001	1.064747	1.120244471	0.527348
CDK6	656.2895702	1.065231	1.274314582	0.474307
MATK	659.1213849	1.066232	0.533296412	1.130824
CAMKIIALPHA	659.1813104	1.064811	1.336068664	0.454384
TNNI3K	660.9515867	1.065056	0.846988714	0.709687
N4BP2	660.9969743	1.063584	0.797806134	0.741527
MAPK8	664.6690906	1.064395	0.559070048	1.145797
MAP3K7IP1	664.800722	1.062986	1.320214188	0.51628
STK23	665.1856884	1.061893	0.475882387	1.385692
ADCK5	665.8468292	1.061011	1.853202121	0.390947
PRKCI	668.2963415	1.060338	2.026965652	0.398482
IHPK1	669.3429614	1.060055	0.780112705	0.843785
MKNK2	671.3240648	1.058941	1.167123638	0.600908
EPHA8	672.2945783	1.058338	1.125216835	0.615311
TTBK1	675.1066582	1.056717	1.672156438	0.455933
PIP5K1A	676.2603049	1.0564	1.752664977	0.452865
ADCK4	677.5455704	1.056153	0.70479201	1.062502
AKT2	678.1799171	1.055191	0.592591606	1.264119
CSNK1G2	678.1887643	1.053755	0.511313	1.613837
HK1	678.6434999	1.052717	0.975272182	0.717002

PCK1	679.0655344	1.05156	0.485107139	1.984336
MGC16169	680.4983468	1.051233	0.910428842	0.816272
IRAK4	682.4031067	1.051475	0.852298302	0.901518
FGFR3	682.5423064	1.050149	0.788145214	0.953495
PCTK1	683.3681292	1.04915	1.263271169	0.61897
PIP5K2A	683.9736837	1.048086	0.949806094	0.814616
PIK3C2G	685.9271098	1.048499	1.276833443	0.62847
OSR1	691.4998192	1.045842	0.955825008	0.870394
HK2	692.3763428	1.04502	0.610189547	1.676041
SRPK1	694.7387998	1.044115	1.232663596	0.689858
CDK8	695.2021289	1.042952	0.776703271	1.107697
GRK5	696.5881136	1.039828	0.648641537	1.540502
CAMK1D	696.9648485	1.038598	1.172001795	0.718934
CDKN1C	697.3922856	1.037556	0.639026677	1.679109
CDK5	698.5470636	1.037124	2.102085568	0.564987
PIP5KL1	700.5883242	1.037181	0.644090077	1.752233
TAO1	710.1711061	1.039678	1.322100685	0.726653
PCTK3	713.4619822	1.040223	0.90046128	1.189024
PIP5K2B	714.0420156	1.039202	0.905030593	1.185893
ADP-GK	716.8612139	1.038238	1.362544739	0.779177
NUCKS	719.6394931	1.038644	0.731494548	2.048695
DYRK4	721.0055478	1.038151	0.760322549	1.741993
LIMK1	722.2565334	1.03736	0.73771257	2.25354
ERN2	725.2406497	1.038234	2.196426696	0.678647
MAP2K5	726.7165885	1.036658	1.676329306	0.717252
PDGFRB	728.381768	1.036391	0.757704504	3.060716
PRKAG2	731.108747	1.032439	1.717923602	0.749949
STK39	731.1908096	1.031144	0.782058023	2.134393
PLK2	731.9603814	1.030257	0.927840186	1.392219
RBK5	735.2744386	1.027903	2.281916268	0.717252
STK32C	737.1254981	1.026135	1.036132523	1.244021
RYK	739.2685574	1.024644	1.079113091	1.211031
MPP2	741.5787214	1.024485	1.064956569	1.281195
CSNK1G3	742.8694367	1.023718	0.986681014	1.459818
DKFZP434C131	743.0679646	1.022497	0.890669628	2.365611
TLK2	743.7129823	1.021506	2.166787659	0.805973
IKBKB	749.2736483	1.019956	1.480275865	0.991849
PKIA	750.29994	1.019144	1.834046919	0.903786
PHKA2	751.1923855	1.018239	1.401201922	1.055739
CDC7	755.3224477	1.018555	1.531166952	1.023233
PHKG1	756.4522457	1.01793	1.237575376	1.274557
TEK	757.0046235	1.015594	0.9940632	2.13164
PIK3CG	757.4707915	1.014413	1.637323374	1.005111
C7ORF2	760.0171051	1.014095	1.777014856	0.976668
UMPK	761.9291306	1.013248	1.567216865	1.080691
ASK	767.9583322	1.012799	1.316304191	1.353234
FLJ23074	768.3814157	1.011727	1.476266829	1.196717
PIP5K1C	769.9350622	1.010868	1.452395717	1.229444
PKN3	771.499838	1.010062	1.381790576	1.333983
ARK5	772.8984409	1.009121	1.682485408	1.139877
KSR2	775.7157985	1.008677	1.278749266	1.682164
ZAP70	778.8632743	1.007004	1.835840963	1.168529
NEK7	780.4921524	1.006182	1.48371359	1.35524
PXK	783.4960115	1.004533	1.457817471	1.478215
STK22C	786.326904	1.003798	1.677679072	1.328342
FN3K	790.838163	1.002105	1.418911155	1.935526
FLJ13052	792.3673391	1.001247	1.749874964	1.381724
MULK	792.4645102	1.000049	1.500078469	1.737182
CLK2	811.969827	1.000927	2.222881931	1.812384
CDK5R1	820.4998477	1	2.249091726	3.204973

Table S2 Intra-assay variability. Mean un-normalized surviving fraction (SF) for non-targeting siRNA (siNT) following 7 Gy irradiation and corresponding coefficients of variation (CV) across the primary and secondary screen library plates are shown. CV calculated by dividing the standard deviation of siNT SF_{7Gy} by the mean siNT SF_{7Gy}.

Screen	Screen Run	Library Plate	Mean siNT SF after 7 Gy	% CV
Primary Screen	1	1	0.065	19.81%
		2	0.074	16.62%
		3	0.070	33.54%
		4	0.078	15.78%
		5	0.073	19.29%
		6	0.070	22.70%
		7	0.083	30.87%
		8	0.100	33.77%
		9	0.084	15.07%
	2	1	0.079	13.65%
		2	0.079	8.98%
		3	0.098	14.33%
		4	0.089	20.64%
		5	0.092	15.73%
		6	0.092	18.35%
		7	0.101	14.59%
		8	0.093	15.51%
		9	0.092	16.16%
Secondary Screen	1	1	0.092	12.29%
	2	1	0.080	8.02%

Table S3 Secondary colony formation assay screen Top 76 genes chosen based on rank product from primary screen were re-run twice in 96-well plate colony formation assay using Dharmacon siGENOME siRNA. Rank product scores were calculated based on R-score. Radiosensitizing siRNAs shown by R-scores <0. Abbreviations: Percentage of false prediction (PFP).

Gene	Rank Product	PFP	R-score Run1	R-score Run2
ATM	3.301927	0.015	-7.43373	-7.3684
PRKDC	5.313293	0.04	-6.13342	-5.77834
CDC2	7.113787	0.110833	-5.17802	-6.64324
TAF1	7.883735	0.124286	-5.75644	-4.45539
MARK2	7.958114	0.109375	-5.61649	-5.62891
CLK3	10.39117	0.25	-5.78792	-4.06633
GAK	11.47759	0.2985	-5.5476	-4.22583
MULK	11.88784	0.310909	-5.07646	-4.30879
MAP4K3	12.14636	0.299167	-4.97033	-4.95304
PIK3C2A	13.27614	0.353846	-5.37506	-4.29703
XYLB	15.13217	0.476786	-4.58231	-4.32119
PRKCL2	15.62678	0.483	-4.13955	-3.99355
DGKD	16.6803	0.53	-4.86016	-3.76176
TLK1	17.83177	0.582941	-4.78866	-4.11414
FLJ13052	18.29155	0.587778	-2.70328	-4.62765
GCK	19.42134	0.655789	-5.10971	-3.66074
TAF1L	20.65811	0.70975	-4.66111	-4.09631
EPHB2	22.64743	0.828095	-4.30628	-3.62874
BRAF	24.9353	0.956364	-4.19997	-2.04878
PKM2	27.15593	1.086957	-3.41142	-3.91335
SRMS	27.30518	1.052708	-3.68874	-2.96704
TPK1	28.09492	1.0724	-5.2426	-1.68947
DTYMK	28.67371	1.074615	-2.66619	-3.32043
SRP72	28.95991	1.054444	-4.27162	-2.22763
GUCY2C	30.80769	1.124643	-3.00206	-1.62136
ROCK2	30.9684	1.096897	-3.22927	-3.80346
GSK3B	31.33932	1.088333	-4.60453	-2.94799
CSNK2B	31.96807	1.089355	-2.41152	-3.73965
SMG1	33.65805	1.15625	-3.50315	-2.48566
IHPK3	33.68451	1.12303	-2.75491	-2.04861
DYRK1A	33.70917	1.091176	-3.74989	-1.80467
TOPK	34.48834	1.100571	-4.13955	-1.87718
CSF1R	35.84605	1.1375	-2.08907	-2.81433
ACVR2B	38.05831	1.221081	-5.01352	-0.10764
IPMK	38.21302	1.1975	-1.54822	-2.49463
CLK4	38.27865	1.168718	-2.94173	-1.72851
CSNK2A1	39.83473	1.204875	-2.53106	-1.26796
CAMK4	40.62195	1.214146	-1.60862	-1.28517
PLK4	42.19224	1.25	-2.96735	-0.85416
NTRK1	43.52801	1.271628	-1.50445	-1.17824
COL4A3BP	44.42832	1.249222	-1.68497	-2.73072
AK3L1	44.74756	1.232174	-4.15339	-0.94117
PRKCH	46.01638	1.255851	-2.57579	-1.74323
PTK6	47.62203	1.28875	-1.96441	-1.31368
PSKH2	48.14798	1.28102	-1.77198	-1.74998
EXOSC10	48.72342	1.2763	-1.80249	-1.11097
PFKL	49.10459	1.261275	-0.95252	-1.34857
VRK3	49.52075	1.248654	-2.52551	-1.29567
HUS1	49.6103	1.227736	-2.82138	-1.25323
PLK3	50.53088	1.23	-1.22563	-2.31428
TRPM7	51.13051	1.224818	-1.90366	-0.56925
BRD3	51.16937	1.204286	-0.78051	-1.8718
BRDT	52.44029	1.214912	-1.66772	-0.86293
BRD4	52.50688	1.195776	-0.4954	-1.28761
MYLK	57.29609	1.282373	-2.2162	0.840643
PRKAA2	58.93971	1.298333	-1.83883	-0.46761
PKMYT1	59.2856	1.281475	-1.65985	-0.64197
ACVR2	60.70863	1.283468	-3.31506	-0.06882
HAK	61.15218	1.270794	-1.59182	-1.23295
TGFBR3	62.18329	1.27	-0.95823	-0.34569
CHKA	62.69797	1.258923	-2.81349	2.867491
EFNA3	63.46891	1.233731	-0.71686	-0.34815

CDKN2B	64.96361	1.235294	-1.03714	-0.40168
STK22C	66.21418	1.232246	-1.40855	-0.46255
CLK2	67.29343	1.229286	-1.59182	-0.27177
FES	68.07072	1.220141	-1.1039	0.055213
CDK5R1	69.6939	1.205	-1.44101	-0.02328
CKS2	70.0136	1.192568	-0.48181	-1.01794
KCNH8	72.88617	1.185395	1.107199	0.04329
PRKCQ	76.75958	1.164051	-0.87558	2.649254
EFNA5	77.95263	1.141728	0.061556	0.788593
WNK4	78.38697	1.130488	-1.19197	4.447382
MARK3	79.89016	1.110476	0.772705	-0.05686
PCK2	81.74664	1.103647	1.042937	-0.30339
PRKCZ	85.16917	1.072955	1.324428	-0.16389
PAK7	85.32425	1.061124	0.289948	0.535149
MAPK7	88.66168	1.030652	1.200119	1.046589
DGKA	91.97439	1.021075	3.00651	1.515868
STK32A	92.31759	1.010213	3.272219	2.846899
PACE-1	93.30321	0.999737	3.320649	2.339296