

Table S2. Details of KEGG-PIC genes (328) from KEGG PATHWAY Database.

HGNC Gene ID	Gene Symbol	Full Name of the Gene
1630	DCC	deleted in colorectal carcinoma
836	CASP3	caspase 3, apoptosis-related cysteine peptidase (EC:3.4.22.56)
842	CASP9	caspase 9, apoptosis-related cysteine peptidase (EC:3.4.22.62)
26060	APPL1	adaptor protein, phosphotyrosine interaction, PH domain and leucine zipper containing 1
999	CDH1	cadherin 1, type 1, E-cadherin (epithelial)
1499	CTNNB1	catenin (cadherin-associated protein), beta 1, 88kDa
1496	CTNNA2	catenin (cadherin-associated protein), alpha 2
1495	CTNNA1	catenin (cadherin-associated protein), alpha 1, 102kDa
29119	CTNNA3	catenin (cadherin-associated protein), alpha 3
8312	AXIN1	axin 1
8313	AXIN2	axin 2
10297	APC2	adenomatosis polyposis coli 2
324	APC	adenomatous polyposis coli
2932	GSK3B	glycogen synthase kinase 3 beta (EC:2.7.11.1 2.7.11.26)
6932	TCF7	transcription factor 7 (T-cell specific, HMG-box)
83439	TCF7L1	transcription factor 7-like 1 (T-cell specific, HMG-box)
6934	TCF7L2	transcription factor 7-like 2 (T-cell specific, HMG-box)
51176	LEF1	lymphoid enhancer-binding factor 1
332	BIRC5	baculoviral IAP repeat containing 5
4609	MYC	v-myc myelocytomatosis viral oncogene homolog (avian)
595	CCND1	cyclin D1
7471	WNT1	wingless-type MMTV integration site family, member 1
7482	WNT2B	wingless-type MMTV integration site family, member 2B
7472	WNT2	wingless-type MMTV integration site family member 2
7473	WNT3	wingless-type MMTV integration site family, member 3
89780	WNT3A	wingless-type MMTV integration site family, member 3A
54361	WNT4	wingless-type MMTV integration site family, member 4
7474	WNT5A	wingless-type MMTV integration site family, member 5A
81029	WNT5B	wingless-type MMTV integration site family, member 5B
7475	WNT6	wingless-type MMTV integration site family, member 6
7477	WNT7B	wingless-type MMTV integration site family, member 7B
7476	WNT7A	wingless-type MMTV integration site family, member 7A
7479	WNT8B	wingless-type MMTV integration site family, member 8B
7478	WNT8A	wingless-type MMTV integration site family, member 8A
7483	WNT9A	wingless-type MMTV integration site family, member 9A

7484	WNT9B	wingless-type MMTV integration site family, member 9B
7480	WNT10B	wingless-type MMTV integration site family, member 10B
80326	WNT10A	wingless-type MMTV integration site family, member 10A
7481	WNT11	wingless-type MMTV integration site family, member 11
51384	WNT16	wingless-type MMTV integration site family, member 16
8321	FZD1	frizzled family receptor 1
8324	FZD7	frizzled family receptor 7
2535	FZD2	frizzled family receptor 2
7976	FZD3	frizzled family receptor 3
8322	FZD4	frizzled family receptor 4
8325	FZD8	frizzled family receptor 8
7855	FZD5	frizzled family receptor 5
8323	FZD6	frizzled family receptor 6
8326	FZD9	frizzled family receptor 9
11211	FZD10	frizzled family receptor 10
1856	DVL2	dishevelled, dsh homolog 2 (Drosophila)
1857	DVL3	dishevelled, dsh homolog 3 (Drosophila)
1855	DVL1	dishevelled, dsh homolog 1 (Drosophila)
1284	COL4A2	collagen, type IV, alpha 2
1286	COL4A4	collagen, type IV, alpha 4
1288	COL4A6	collagen, type IV, alpha 6
1287	COL4A5	collagen, type IV, alpha 5
1282	COL4A1	collagen, type IV, alpha 1
284217	LAMA1	laminin, alpha 1
3908	LAMA2	laminin, alpha 2
3911	LAMA5	laminin, alpha 5
3909	LAMA3	laminin, alpha 3
3910	LAMA4	laminin, alpha 4
3912	LAMB1	laminin, beta 1
3913	LAMB2	laminin, beta 2 (laminin S)
3914	LAMB3	laminin, beta 3
22798	LAMB4	laminin, beta 4
3915	LAMC1	laminin, gamma 1 (formerly LAMB2)
3918	LAMC2	laminin, gamma 2
10319	LAMC3	laminin, gamma 3
2335	FN1	fibronectin 1
3673	ITGA2	integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor)
3674	ITGA2B	integrin, alpha 2b (platelet glycoprotein IIb of IIb/IIIa complex, antigen CD41)
3675	ITGA3	integrin, alpha 3 (antigen CD49C, alpha 3 subunit of VLA-3 receptor)

3655	ITGA6	integrin, alpha 6
3685	ITGAV	integrin, alpha V (vitronectin receptor, alpha polypeptide, antigen CD51)
3688	ITGB1	integrin, beta 1 (fibronectin receptor, beta polypeptide, antigen CD29 includes MDF2, MSK12)
5747	PTK2	PTK2 protein tyrosine kinase 2 (EC:2.7.10.2)
5293	PIK3CD	phosphoinositide-3-kinase, catalytic, delta polypeptide (EC:2.7.1.153)
5291	PIK3CB	phosphoinositide-3-kinase, catalytic, beta polypeptide (EC:2.7.1.153)
5294	PIK3CG	phosphoinositide-3-kinase, catalytic, gamma polypeptide (EC:2.7.11.1 2.7.1.153)
5290	PIK3CA	phosphoinositide-3-kinase, catalytic, alpha polypeptide (EC:2.7.11.1 2.7.1.153)
8503	PIK3R3	phosphoinositide-3-kinase, regulatory subunit 3 (gamma)
23533	PIK3R5	phosphoinositide-3-kinase, regulatory subunit 5
5296	PIK3R2	phosphoinositide-3-kinase, regulatory subunit 2 (beta)
5295	PIK3R1	phosphoinositide-3-kinase, regulatory subunit 1 (alpha)
5728	PTEN	phosphatase and tensin homolog (EC:3.1.3.67 3.1.3.16 3.1.3.48)
4824	NKX3-1	NK3 homeobox 1
207	AKT1	v-akt murine thymoma viral oncogene homolog 1 (EC:2.7.11.1)
208	AKT2	v-akt murine thymoma viral oncogene homolog 2 (EC:2.7.11.1)
10000	AKT3	v-akt murine thymoma viral oncogene homolog 3 (protein kinase B, gamma) (EC:2.7.11.1)
1147	CHUK	conserved helix-loop-helix ubiquitous kinase (EC:2.7.11.10)
3551	IKBKB	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta (EC:2.7.11.10)
8517	IKBKG	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase gamma
4792	NFKBIA	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha
4790	NFKB1	nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
4791	NFKB2	nuclear factor of kappa light polypeptide gene enhancer in B-cells 2 (p49/p100)
5970	RELA	v-rel reticuloendotheliosis viral oncogene homolog A (avian)
5743	PTGS2	prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase) (EC:1.14.99.1)
4843	NOS2	nitric oxide synthase 2, inducible (EC:1.14.13.39)

596	BCL2	B-cell CLL/lymphoma 2
330	BIRC3	baculoviral IAP repeat containing 3
331	XIAP	X-linked inhibitor of apoptosis
329	BIRC2	baculoviral IAP repeat containing 2
598	BCL2L1	BCL2-like 1
7185	TRAF1	TNF receptor-associated factor 1
7186	TRAF2	TNF receptor-associated factor 2
7187	TRAF3	TNF receptor-associated factor 3
9618	TRAF4	TNF receptor-associated factor 4
7188	TRAF5	TNF receptor-associated factor 5
7189	TRAF6	TNF receptor-associated factor 6, E3 ubiquitin protein ligase
2475	MTOR	mechanistic target of rapamycin (serine/threonine kinase) (EC:2.7.11.1)
572	BAD	BCL2-associated agonist of cell death
2308	FOXO1	forkhead box O1
4193	MDM2	Mdm2, p53 E3 ubiquitin protein ligase homolog (mouse) (EC:6.3.2.19)
7157	TP53	tumor protein p53
1027	CDKN1B	cyclin-dependent kinase inhibitor 1B (p27, Kip1)
1026	CDKN1A	cyclin-dependent kinase inhibitor 1A (p21, Cip1)
613	BCR	breakpoint cluster region (EC:2.7.11.1)
25	ABL1	c-abl oncogene 1, non-receptor tyrosine kinase (EC:2.7.10.2)
1399	CRKL	v-crk sarcoma virus CT10 oncogene homolog (avian)-like
1398	CRK	v-crk sarcoma virus CT10 oncogene homolog (avian)
23624	CBLC	Cbl proto-oncogene, E3 ubiquitin protein ligase C (EC:6.3.2.19)
868	CBLB	Cbl proto-oncogene, E3 ubiquitin protein ligase B (EC:6.3.2.19)
867	CBL	Cbl proto-oncogene, E3 ubiquitin protein ligase (EC:6.3.2.19)
6776	STAT5A	signal transducer and activator of transcription 5A
6777	STAT5B	signal transducer and activator of transcription 5B
3716	JAK1	Janus kinase 1 (EC:2.7.10.2)
6774	STAT3	signal transducer and activator of transcription 3 (acute-phase response factor)
6772	STAT1	signal transducer and activator of transcription 1, 91kDa
7423	VEGFB	vascular endothelial growth factor B
5228	PGF	placental growth factor
7422	VEGFA	vascular endothelial growth factor A
7424	VEGFC	vascular endothelial growth factor C
2277	FIGF	c-fos induced growth factor (vascular endothelial growth factor D)

7039	TGFA	transforming growth factor, alpha
1950	EGF	epidermal growth factor
1956	EGFR	epidermal growth factor receptor (EC:2.7.10.1)
2064	ERBB2	v-erb-b2 erythroblastic leukemia viral oncogene homolog 2, neuro/glioblastoma derived oncogene homolog (avian) (EC:2.7.10.1)
5154	PDGFA	platelet-derived growth factor alpha polypeptide
5155	PDGFB	platelet-derived growth factor beta polypeptide
5156	PDGFRA	platelet-derived growth factor receptor, alpha polypeptide (EC:2.7.10.1)
5159	PDGFRB	platelet-derived growth factor receptor, beta polypeptide (EC:2.7.10.1)
3479	IGF1	insulin-like growth factor 1 (somatomedin C)
3480	IGF1R	insulin-like growth factor 1 receptor (EC:2.7.10.1)
4254	KITLG	KIT ligand
3815	KIT	v-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog (EC:2.7.10.1)
2323	FLT3LG	fms-related tyrosine kinase 3 ligand
2322	FLT3	fms-related tyrosine kinase 3 (EC:2.7.10.1)
3082	HGF	hepatocyte growth factor (hepapoietin A)
4233	MET	met proto-oncogene (hepatocyte growth factor receptor) (EC:2.7.10.1)
2258	FGF13	fibroblast growth factor 13
2253	FGF8	fibroblast growth factor 8 (androgen-induced)
8817	FGF18	fibroblast growth factor 18
2257	FGF12	fibroblast growth factor 12
2248	FGF3	fibroblast growth factor 3
2251	FGF6	fibroblast growth factor 6
2256	FGF11	fibroblast growth factor 11
8823	FGF16	fibroblast growth factor 16
2252	FGF7	fibroblast growth factor 7
2259	FGF14	fibroblast growth factor 14
8822	FGF17	fibroblast growth factor 17
9965	FGF19	fibroblast growth factor 19
2254	FGF9	fibroblast growth factor 9 (glia-activating factor)
2250	FGF5	fibroblast growth factor 5
2249	FGF4	fibroblast growth factor 4
8074	FGF23	fibroblast growth factor 23
27006	FGF22	fibroblast growth factor 22
26281	FGF20	fibroblast growth factor 20
2255	FGF10	fibroblast growth factor 10
2247	FGF2	fibroblast growth factor 2 (basic)

26291	FGF21	fibroblast growth factor 21
2246	FGF1	fibroblast growth factor 1 (acidic)
2260	FGFR1	fibroblast growth factor receptor 1 (EC:2.7.10.1)
2263	FGFR2	fibroblast growth factor receptor 2 (EC:2.7.10.1)
2261	FGFR3	fibroblast growth factor receptor 3 (EC:2.7.10.1)
2885	GRB2	growth factor receptor-bound protein 2
6654	SOS1	son of sevenless homolog 1 (Drosophila)
6655	SOS2	son of sevenless homolog 2 (Drosophila)
3265	HRAS	v-Ha-ras Harvey rat sarcoma viral oncogene homolog
3845	KRAS	v-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog
4893	NRAS	neuroblastoma RAS viral (v-ras) oncogene homolog
369	ARAF	v-raf murine sarcoma 3611 viral oncogene homolog (EC:2.7.11.1)
673	BRAF	v-raf murine sarcoma viral oncogene homolog B1 (EC:2.7.11.1)
5894	RAF1	v-raf-1 murine leukemia viral oncogene homolog 1 (EC:2.7.11.1)
5604	MAP2K1	mitogen-activated protein kinase kinase 1 (EC:2.7.12.2)
5605	MAP2K2	mitogen-activated protein kinase kinase 2 (EC:2.7.12.2)
5594	MAPK1	mitogen-activated protein kinase 1 (EC:2.7.11.24)
5595	MAPK3	mitogen-activated protein kinase 3 (EC:2.7.11.24)
3725	JUN	jun proto-oncogene
2353	FOS	FBJ murine osteosarcoma viral oncogene homolog
4312	MMP1	matrix metalloproteinase 1 (interstitial collagenase) (EC:3.4.24.7)
4313	MMP2	matrix metalloproteinase 2 (gelatinase A, 72kDa gelatinase, 72kDa type IV collagenase) (EC:3.4.24.24)
4318	MMP9	matrix metalloproteinase 9 (gelatinase B, 92kDa gelatinase, 92kDa type IV collagenase) (EC:3.4.24.35)
3576	IL8	interleukin 8
1019	CDK4	cyclin-dependent kinase 4 (EC:2.7.11.22)
5979	RET	ret proto-oncogene (EC:2.7.10.1)
8030	CCDC6	coiled-coil domain containing 6
8031	NCOA4	nuclear receptor coactivator 4
4914	NTRK1	neurotrophic tyrosine kinase, receptor, type 1 (EC:2.7.10.1)
7170	TPM3	tropomyosin 3
7175	TPR	translocated promoter region (to activated MET oncogene)
10342	TFG	TRK-fused gene
11186	RASSF1	Ras association (RalGDS/AF-6) domain family member 1
83593	RASSF5	Ras association (RalGDS/AF-6) domain family member 5
6789	STK4	serine/threonine kinase 4 (EC:2.7.11.1)
1613	DAPK3	death-associated protein kinase 3 (EC:2.7.11.1)

23604	DAPK2	death-associated protein kinase 2 (EC:2.7.11.1)
1612	DAPK1	death-associated protein kinase 1 (EC:2.7.11.1)
5335	PLCG1	phospholipase C, gamma 1 (EC:3.1.4.11)
5336	PLCG2	phospholipase C, gamma 2 (phosphatidylinositol-specific) (EC:3.1.4.11)
5579	PRKCB	protein kinase C, beta (EC:2.7.11.13)
5578	PRKCA	protein kinase C, alpha (EC:2.7.11.13)
5582	PRKCG	protein kinase C, gamma (EC:2.7.11.13)
5900	RALGDS	ral guanine nucleotide dissociation stimulator
5898	RALA	v-ral simian leukemia viral oncogene homolog A (ras related)
5899	RALB	v-ral simian leukemia viral oncogene homolog B (ras related)
10928	RALBP1	ralA binding protein 1
998	CDC42	cell division cycle 42 (GTP binding protein, 25kDa)
5879	RAC1	ras-related C3 botulinum toxin substrate 1 (rho family, small GTP binding protein Rac1)
5880	RAC2	ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)
5881	RAC3	ras-related C3 botulinum toxin substrate 3 (rho family, small GTP binding protein Rac3)
387	RHOA	ras homolog family member A
5602	MAPK10	mitogen-activated protein kinase 10 (EC:2.7.11.24)
5601	MAPK9	mitogen-activated protein kinase 9 (EC:2.7.11.24)
5599	MAPK8	mitogen-activated protein kinase 8 (EC:2.7.11.24)
7849	PAX8	paired box 8
5468	PPARG	peroxisome proliferator-activated receptor gamma
6256	RXRA	retinoid X receptor, alpha
6257	RXRB	retinoid X receptor, beta
6258	RXRG	retinoid X receptor, gamma
5915	RARB	retinoic acid receptor, beta
5467	PPARD	peroxisome proliferator-activated receptor delta
3728	JUP	junction plakoglobin
7704	ZBTB16	zinc finger and BTB domain containing 16
5371	PML	promyelocytic leukemia
5914	RARA	retinoic acid receptor, alpha
861	RUNX1	runt-related transcription factor 1
862	RUNX1T1	runt-related transcription factor 1
6688	SPI1	spleen focus forming virus (SFFV) proviral integration oncogene spi1
1050	CEBPA	CCAAT/enhancer binding protein (C/EBP), alpha
1438	CSF2RA	colony stimulating factor 2 receptor, alpha, low-affinity (granulocyte-macrophage)
1441	CSF3R	colony stimulating factor 3 receptor (granulocyte)

1436	CSF1R	colony stimulating factor 1 receptor (EC:2.7.10.1)
3569	IL6	interleukin 6 (interferon, beta 2)
1029	CDKN2A	cyclin-dependent kinase inhibitor 2A (melanoma, p16, inhibits CDK4)
1871	E2F3	E2F transcription factor 3
1869	E2F1	E2F transcription factor 1
1870	E2F2	E2F transcription factor 2
4149	MAX	MYC associated factor X
8554	PIAS1	protein inhibitor of activated STAT, 1
51588	PIAS4	protein inhibitor of activated STAT, 4
10401	PIAS3	protein inhibitor of activated STAT, 3
9063	PIAS2	protein inhibitor of activated STAT, 2
1030	CDKN2B	cyclin-dependent kinase inhibitor 2B (p15, inhibits CDK4)
1021	CDK6	cyclin-dependent kinase 6 (EC:2.7.11.22)
1163	CKS1B	CDC28 protein kinase regulatory subunit 1B
6502	SKP2	S-phase kinase-associated protein 2, E3 ubiquitin protein ligase
1017	CDK2	cyclin-dependent kinase 2 (EC:2.7.11.22)
9134	CCNE2	cyclin E2
898	CCNE1	cyclin E1
5925	RB1	retinoblastoma 1
4286	MITF	microphthalmia-associated transcription factor
7040	TGFB1	transforming growth factor, beta 1
7042	TGFB2	transforming growth factor, beta 2
7043	TGFB3	transforming growth factor, beta 3
7046	TGFBR1	transforming growth factor, beta receptor 1 (EC:2.7.11.30)
7048	TGFBR2	transforming growth factor, beta receptor II (70/80kDa) (EC:2.7.11.30)
4087	SMAD2	SMAD family member 2
4088	SMAD3	SMAD family member 3
4089	SMAD4	SMAD family member 4
2122	MECOM	MDS1 and EVI1 complex locus
1488	CTBP2	C-terminal binding protein 2
1487	CTBP1	C-terminal binding protein 1
3066	HDAC2	histone deacetylase 2 (EC:3.5.1.98)
3065	HDAC1	histone deacetylase 1 (EC:3.5.1.98)
4292	MLH1	mutL homolog 1, colon cancer, nonpolyposis type 2 (E. coli)
4436	MSH2	mutS homolog 2, colon cancer, nonpolyposis type 1 (E. coli)
4437	MSH3	mutS homolog 3 (E. coli)
2956	MSH6	mutS homolog 6 (E. coli)
581	BAX	BCL2-associated X protein
675	BRCA2	breast cancer 2, early onset

5888	RAD51	RAD51 homolog (<i>S. cerevisiae</i>)
356	FASLG	Fas ligand (TNF superfamily, member 6)
355	FAS	Fas (TNF receptor superfamily, member 6)
8772	FADD	Fas (TNFRSF6)-associated via death domain
841	CASP8	caspase 8, apoptosis-related cysteine peptidase (EC:3.4.22.61)
637	BID	BH3 interacting domain death agonist
54205	CYCS	cytochrome c, somatic
7428	VHL	von Hippel-Lindau tumor suppressor, E3 ubiquitin protein ligase
6921	TCEB1	transcription elongation factor B (SIII), polypeptide 1 (15kDa, elongin C)
6923	TCEB2	transcription elongation factor B (SIII), polypeptide 2 (18kDa, elongin B)
9978	RBX1	ring-box 1, E3 ubiquitin protein ligase
8453	CUL2	cullin 2
112399	EGLN3	egl nine homolog 3 (<i>C. elegans</i>) (EC:1.14.11.29)
112398	EGLN2	egl nine homolog 2 (<i>C. elegans</i>) (EC:1.14.11.29)
54583	EGLN1	egl nine homolog 1 (<i>C. elegans</i>) (EC:1.14.11.29)
2271	FH	fumarate hydratase (EC:4.2.1.2)
3091	HIF1A	hypoxia inducible factor 1, alpha subunit (basic helix-loop-helix transcription factor)
2034	EPAS1	endothelial PAS domain protein 1
405	ARNT	aryl hydrocarbon receptor nuclear translocator
9915	ARNT2	aryl-hydrocarbon receptor nuclear translocator 2
1387	CREBBP	CREB binding protein (EC:2.3.1.48)
2033	EP300	E1A binding protein p300 (EC:2.3.1.48)
6513	SLC2A1	solute carrier family 2 (facilitated glucose transporter), member 1
6469	SHH	sonic hedgehog
5727	PTCH1	patched 1
6608	SMO	smoothened, frizzled family receptor
27148	STK36	serine/threonine kinase 36 (EC:2.7.11.1)
51684	SUFU	suppressor of fused homolog (<i>Drosophila</i>)
2737	GLI3	GLI family zinc finger 3
2736	GLI2	GLI family zinc finger 2
2735	GLI1	GLI family zinc finger 1
650	BMP2	bone morphogenetic protein 2
652	BMP4	bone morphogenetic protein 4
64399	HHIP	hedgehog interacting protein
8643	PTCH2	patched 2
367	AR	androgen receptor

3320	HSP90AA1	heat shock protein 90kDa alpha (cytosolic), class A member 1
3326	HSP90AB1	heat shock protein 90kDa alpha (cytosolic), class B member 1
7184	HSP90B1	heat shock protein 90kDa beta (Grp94), member 1
354	KLK3	kallikrein-related peptidase 3 (EC:3.4.21.77)
112401	BIRC8	baculoviral IAP repeat containing 8
2113	ETS1	v-ets erythroblastosis virus E26 oncogene homolog 1 (avian)
2950	GSTP1	glutathione S-transferase pi 1 (EC:2.5.1.18)
5337	PLD1	phospholipase D1, phosphatidylcholine-specific (EC:3.1.4.4)
79444	BIRC7	baculoviral IAP repeat containing 7
8900	CCNA1	cyclin A1