

## FIGURE LEGENDS

Fig. S1 Kinases and kinase-associated factors assayed in screen

All genes (sorted by CG number) encoding either kinases or associated factors for which UAS-controlled inverted repeat strains were tested. Kinase group and family is indicated, as well as human orthologs.

Fig. S2 Phosphatases and Phosphatase-associated factors assayed in screen

All genes (sorted by CG number) encoding either phosphatase or associated factors for which UAS-controlled inverted repeat strains were tested. Phosphatase group and family is indicated, as well as human orthologs.

Fig. S3 Wnt pathway pilot screen in the *Drosophila* wing disc.

Graphical summary of the Wnt pathway pilot screen in the wing disc that displays whether knock-down of pathway components decreased (green), increased (red), or had no effect (black) on the levels of the ligand and downstream targets. A subset of known components of the Wnt pathway were knocked-down using *dpp-Gal4* and *hh-Gal4* in the wing disc to evaluate their effects on the levels of Sens, Dll, and Wg. Knock-down of *lacZ* (negative control) did not affect the levels of Sens, Dll, or Wg. Knock-down of the positive regulator *porcupine* (*por*) resulted in a decrease of Sens and Dll levels (arrowheads) in the ligand-receiving cells due to the impaired secretion of Wg (arrow) (detected as an increase in levels) from the ligand-producing cells. Knock-down of the negative regulator *Axn* resulted in increased levels of Sens and Dll (arrowheads) in the ligand-receiving cells, but had no effect on Wg levels. Knock-down of the ligand *wg* resulted in the loss of Wg (arrow) in the ligand-producing cells and a corresponding loss of Sens and Dll (arrowheads) in the ligand-receiving cells.

Fig. S4 Results of primary and secondary screening of kinome

Results obtained with indicated RNAi lines in crosses indicated in top line of table, under primary screen and secondary screen headings. Blank infill indicates that there was no change in targets in primary screen. Black infill means there was no change observed in in that particular assay although there was an effect either with another readout or another RNAi line corresponding to the same gene. Coloured infill represents changes to readouts as indicated in legend. Genes that were tested in secondary screen are highlighted by lines above and below the gene. Adult phenotypes (if observed) are indicated. Any indicated lethality occurred after third instar, thus allowing larval discs to be examined. Transgenic RNAi Project strains are in blue font, while National Institute of Genetics (NIG) strains have the letter R in the stock number. All other strains are from Vienna Drosophila RNAi Center (VDRC).

Fig. S5 Results of primary and secondary screening of phosphatome

Results obtained with indicated RNAi lines in crosses indicated in top line of table, under primary screen and secondary screen headings. Blank infill indicates that there was no change in targets in primary screen. Black infill means there was no change observed in in that particular assay although there was an effect either with another readout or another RNAi line corresponding to the same gene. Coloured infill represents changes to readouts as indicated in legend. Genes that were tested in secondary screen are highlighted by lines above and below the gene. Adult phenotypes (if observed) are indicated. Any indicated lethality occurred after third instar, thus allowing larval discs to be examined. Transgenic RNAi Project strains are in blue font, while National Institute of Genetics (NIG) strains have the letter R in the stock number. All other strains are from Vienna Drosophila RNAi Center (VDRC).

Fig. S6 Signaling at the dorsal/ventral compartment boundary of the *Drosophila* wing disc. The Notch pathway signals from non-boundary cells to induce expression of the target genes *wg* (red) and *ct* (orange) in cells at the dorsal/ventral compartment boundary of the wing disc. Wg that is subsequently produced from cells at the dorsal/ventral compartment boundary induces the nested expression of the target genes *sens* (blue) and *Dll* (grey) in non-boundary cells that receive the ligand. The expression domains of *dpp-Gal4*, *hh-Gal4*, and *C5-Gal4* in the wing disc relative to boundary and non-boundary cells are shown in green.

Fig. S7 Identification of phospho-regulators of the Notch pathway.

(A) 36 kinases (and associated factors) [left column] and 32 phosphatases (and associated factors) [right column] of the 590 phospho-regulators screened in the wing disc were shown to regulate the Notch pathway and the levels of Wg and Ct. (B) All 68 phospho-regulators identified positively (blue) regulate the Notch pathway. (C) The kinase and phosphatase groups are displayed in a graphical summary, and family names are as defined in Figs. S1 and S2.

Fig.S8 Identification of phospho-regulators of the Hh pathway.

(A) *MS1096-Gal4* is expressed throughout the central region of the wing disc, but displays stronger expression in the dorsal half. Knock-down of *lacZ* (negative control) using *MS109-Gal4* did not affect Ci or Ptc levels. (B) 66 of the 90 candidates of the Wnt pathway also regulated the Hh pathway to either promote (21; blue) or inhibit (45; yellow) signaling in the

wing disc. 24 candidates of the Wnt pathway did not affect (black) the Hh pathway in the wing disc.

Fig.S9 Effects of *cdc37* and *gish* in the wing disc

(A) Relative to the knock-down of *lacZ* (negative control), knock-down of *Cdc37* with *MS1096-Gal4* in the wing disc resulted in increased levels of expression of the Hh pathway target *dpp-lacZ* (arrowheads) as detected by anti- $\beta$ -gal. (B) The *dpp-Gal4* driver is expressed along the anterior/posterior compartment boundary of the wing disc (green). Knock-down of *cdc37* with *dpp-Gal4* increases the levels of PH3 (white). (C) The *hh-Gal4* driver is expressed in the posterior compartment of the wing disc (green). Knock-down of *gish* with *hh-Gal4* did not affect DI (red) or Casp 3 levels (white).

Fig S1

**Classifications of kinases and associated factors**

AGC	Named after Protein Kinase A, G, and C families
Tyrosine Kinase-Like	
STE	Homologs of the yeast STE7, STE11 and STE20 genes
Casein Kinase 1	
Protein Kinase-Like	
CMGC	Named after a set of families (CDK, MAPK, GSK3 and CLK)
Tyrosine Kinase	
Receptor Guanylate Cyclase	
Calcium & Calmodulin-regulated Kinase	
Atypical	
Other	
Unclassified	Diverse group of kinases and candidate kinases
Kinase-associated	Co-factors such as cyclins
Non-protein Kinase	Such as lipid and sugar kinases

Kinase Gene			Gene Group	Gene Family	Human ortholog(s)
Annotation Symbol	Gene Symbol	Gene Name			
CG10023	Fak56D	Focal adhesion kinase	TK	FAK	PTK2, PTK2B
CG10033	for	foraging	AGC	PKG	PRKG1, PRKG2
CG10079	Egfr	Epidermal growth factor receptor	TK	EGFR	ERBB2, ERBB4, EGFR, ERBB3
CG10082			Non-Protein Kinase	Lipid Kinase	
CG10155	Spred	Sprouty-related protein with EVH-1 domain	Kinase-associated		SPRED3, SPRED2, SPRED1
CG10177			CAMK	DCAMKL	
CG10244	Cad96Ca	Cadherin 96Ca	TK		
CG10260			PKL		PI4KA
CG10268			Unclassified		PMVK
CG10295	Pak	PAK-kinase	STE	STE20	PAK3, PAK2, PAK1
CG10308	CycJ	Cyclin J	CMGC	CDK	
CG10498	cdc2c	cdc2c	CMGC	CDK	CDK1, CDK2, CDK3
CG10504	Ilk	Integrin linked kinase	TKL	MLK	ILK
CG10522	sticky		AGC	DMPK	CIT
CG10539	S6k	RPS6-p70-protein kinase	AGC	RSK	RPS6KB1
CG10572	Cdk8	Cyclin-dependent kinase 8	CMGC	CDK	CDK8, CDK19
CG10579	Eip63E	Ecdysone-induced protein 63E	CMGC	CDK	CDK16, CDK14, CDK18
CG10637	Nak	Numb-associated kinase	Other	NAK	BMP2KL, BMP2K, AAK1
CG10673			Other	Bud32	TP53RK
CG10702			Kinase-associated		
CG10738			RGC	RGC	NPR2, NPR1
CG10776	wit	wishful thinking	TKL	STKR	BMPR2, ACVR2A, TGFB2, ACVR2B
CG10895	lok	loki	CAMK	RAD53	CHEK2
CG10933			Kinase-associated		
CG10951	niki	nimA-like kinase	Other	NEK	
CG10967	Atg1	Autophagy-specific gene 1	Other	ULK	

CG1098	Madm	MLF1-adaptor molecule	Other	NRBP	NRBP1, NRBP2
CG1107	aux	auxillin	Other	NAK	DNAJC6, GAK
CG11221			Other	NKF1	
CG11228	hpo	hippo	STE	STE20	STK3, STK4
CG11249			Non-Protein Kinase	Carbohydrate Kinase	Pyruvate Kinase
CG11255			Non-Protein Kinase	Carbohydrate Kinase	ADK
CG11420	png	pan gu	Other		
CG11486			Kinase-associated		PAN3
CG11489	srpk79D	serine-arginine protein kinase at 79D	CMGC	SRPK	SRPK1, SRPK3, SRPK2
CG11525	CycG	Cyclin G	CMGC	CDK	
CG11533	Asator	Asator	CK1	TTBK	TTBK1, TTBK2
CG11594			Non-Protein Kinase	Carbohydrate Kinase	FGGY
CG11621	Pi3K68D	Phosphatidylinositol 3 kinase 68D	Non-Protein Kinase	Lipid Kinase	PIK3C2G, PIK3C2A, PIK3C2B
CG11660			Atypical	RIO	RIOK3, RIOK1
CG11811			Non-Protein Kinase	Nucleic Acid Kinase	GUK1
CG11859			Atypical	RIO	RIOK2
CG12019	Cdc37	Cdc37	Kinase-associated		CDC37
CG12066	Pka-C2	cAMP-dependent protein kinase 2	AGC	PKA	PRKACB
CG12069			AGC	PKA	
CG12072	warts	warts	AGC	NDR	LATS2, LATS1
CG1210	Pdk1	Phosphoinositide-dependent kinase 1	AGC	PDK1	PDPK1, PDPK2
CG12147			CK1	CK1	
CG1216	mri	mrityu	Kinase-associated		KCTD20, BTBD10
CG12229			Non-Protein Kinase	Carbohydrate Kinase	Pyruvate Kinase
CG12244	lic	licorne	STE	STE7	MAP2K4, MAP2K6, MAP2K3
CG1227			Other	NAK	STK16
CG12289			Non-Protein Kinase	Carbohydrate Kinase	KHK
CG12306	polo	polo	Other	PLK	PLK3, PLK2, PLK1
CG12559	rl	rolled	CMGC	MAPK	MAPK3, MAPK1
CG1271			Non-Protein Kinase	Lipid Kinase	GK5
CG13369			Non-Protein Kinase	Carbohydrate Kinase	RBKS
CG13388	Akap200	A kinase anchor protein 200	Kinase-associated		UNC79
CG1344			Other	SCY1	SCYL3
CG13591	Ssl	Suppressor of Stellate-like	CMGC		CSNK2B
CG1362	cdc2rk	cdc2-related-kinase	CMGC	CDK	CDC2L2
CG13688	lpk2	lpk2	PKL	IPK	IPMK
CG1389	tor	torso	Atypical	PIKK	
CG14026	tkv	thickveins	TKL	STKR	ACVR1, BMPR1A, ACVR1C, BMPR1B, ACVR1.1, ACVR1B
CG14030	Bub1	Bub1 homologue	Other	BUB	BUB1
CG14217	Tao	Tao	STE	STE20	TAOK1, TAOK2, TAOK3
CG14305			CAMK	TSSK	TSSK6, TSSK2, TSSK4, TSSK3, TSSK1

## Kinases and Associated factors

CG14396	Ret	Ret oncogene	TK	Ret	FGFR4, FGFR1, FGFR3, RET, FGFR2
CG14895	Pak3	Pak3	STE	STE20	PAK3, PAK1, PAK2
CG14939	CycY	Cyclin Y	CMGC	CDK	CCNYL2, CCNY, CCNYL1, CCNYL3
CG1495	CaMK1	Calcium/calmodulin-dependent protein kinase I	CAMK	CAMK1	PSKH2, CAMK4, CAMK1D, CAMK1D, PSKH1, PNCK, CAMK1
CG14992	Ack	Activated Cdc42 kinase	TK	Ack	TNK2, TNK1
CG1511	Eph	Eph receptor tyrosine kinase	TK	Eph	EPHB6, EPHB3, EPHA1, EPHA10, EPHA4, EPHB2, EPHA8, EPHA2
CG15218	CycK	Cyclin K	CMGC	CDK	CCNK
CG15224	CklI $\beta$	Casein kinase II $\beta$ subunit	CMGC	CK2	CSNK2B
CG15547			Non-Protein Kinase	Nucleic Acid Kinase	
CG15793	Dsor1	Downstream of raf1	STE	STE7	MAP2K1, MAP2K2
CG15862	Pka-R2	cAMP-dependent protein kinase R2	AGC	PKA	PRKAR2A, PRKAR2B
CG1594	hop	hopscotch	TK	Jak	
CG1609	Gcn2	Gcn2	Other	PEK	EIFA2K4
CG16708	Cerk	Ceramide kinase	Non-Protein Kinase	Lipid Kinase	CERK
CG16903			Kinase-associated		CCNL1, CCNL2
CG16910	key	kenny	Kinase-associated		
CG16973	msn	misshapen	STE	STE20	MINK1, MAP4K4, TNIK
CG17010			Non-Protein Kinase	Carbohydrate Kinase	RBKS
CG17090	hipk	homeodomain interacting protein kinase	CMGC	DYRK	HIPK1, HIPK2, HIPK3
CG17146	Adk1	Adenylate kinase-1	Non-Protein Kinase	Nucleic Acid Kinase	AK1, AK5
CG17161	grp	grapes	CAMK	CAMKL	CHEK1
CG17216	KP78b	KP78b	CAMK	CAMKL	MARK2, MARK4, MARK3, MARK1
CG17245	plexB	plexin B	Kinase-associated		PLXNA3, PLXNB1, PLXNA1, PLXND1, PLXNA4, PLXNB3, PLXNB2, PLXNA2
CG1725	dlg1	discs large 1	Kinase-associated		DLG3, DLG2, DLG4, DLG1
CG17256	Nek2	Nek2	Other	NEK	NEK7, NEK2, NEK6
CG17299	SNF4Ay	SNF4/AMP-activated protein kinase gamma subunit	PKL	PIPK	PRKAG1, PRKAG2, PRKAG3
CG17342	Lk6	Lk6	CAMK	MAPKAPK	MKNK2
CG17348	drl	derailed	TK	Ryk	RYK, TYRO, AXL, MERTK
CG1747	Sk1	Sphingosine kinase 1	Non-Protein Kinase	Lipid Kinase	SPHK1, SPHK2
CG17471			PKL	PIPK	PIP4K2B, PIP4K2C, PIP4K2A
CG17520	CklI $\alpha$	casein kinase II $\alpha$	CMGC	CK2	CSNK2A1, CSNK2A2
CG17528			CAMK	DCAMKL	DCX, DCLK3, DCLK1, DCLK2
CG17559	dnt	doughnut on 2	TK	Ryk	RYK, TYRO3, AXL, MERTK
CG17596	S6kII	Ribosomal protein S6 kinase II	AGC	RSK	RPS6KA6, RPS6KA5, RPS6KA4, RPS6KA3, RPS6KA2, RPS6KA1
CG17603	Taf1	TBP-associated factor 1	Atypical	TAF1	TAF1L, TAF1
CG17698			Other	CAMKK	CAMKK1, CAMKK2
CG1772	dap	dacapo	Kinase-associated		CDKN1B
CG17998	Gprk2	G protein-coupled receptor kinase 2	AGC	GRK	GRK4, GRK5, GRK6
CG18069	CaMKII	Calcium/calmodulin-dependent protein kinase II	CAMK	CAMK2	CAMK2A, CAMK2D, CAMK2B, CAMK2G
CG18085	sev	sevenless	TK	Sev	ROS1

## Kinases and Associated factors

CG18247	shark	SH2 ankyrin repeat kinase	TK	Syk	
CG18255	Strn-Mlck	Stretchin-Mlck	CAMK	MLCK	MYLK4, MYLK2, MYLK, MYLK3
CG1830	PhKy	Phosphorylase kinase $\gamma$	CAMK	PHK	PHKG2
CG18374	Gyk	Glycerol kinase	Non-Protein Kinase	Lipid Kinase	GK, GK2
CG18402	InR	Insulin-like receptor	TK	InsR	IGF1R
CG1848	LIMK1	LIM-kinase1	TKL	LISK	LIMK1, LIMK2
CG18492	Tak1	TGF- $\beta$ activated kinase 1	TKL	MLK	MAP3K7
CG1851	Ady43A	Ady43A	Non-Protein Kinase	Nucleic Acid Kinase	
CG18582	mbt	mushroom bodies tiny	STE	STE20	PAK6, PAK4, PAK7
CG18854			Non-Protein Kinase	Lipid Kinase	
CG1891	sax	saxophone	TKL	STKR	ACVR1, BMPR1A, ACVR1C, BMPR1B, ACVRL1
CG1915	sls	sallimus	Kinase-associated		TTN
CG1939	Dpck	Dephospho-CoA kinase	Unclassified		DCAKD
CG1951			Other	SCY1	SCYL2
CG1954	Pkc98E	Protein C kinase 98E	AGC	PKC	PRKCG, PRKCB, PRKCE, PRKCQ, PRKCA, PRKCH,
CG1973	yata	yata	Other	SCY1	SCYL1
CG2028	Ckl $\alpha$	Casein kinase I $\alpha$	CK1	CK1	CSNK1A1, CSNK1D, CSNK1A1L, CSNK1E
CG2048	dco	discs overgrown	CK1	CK1	CSNK1A1, CSNK1D, CSNK1A1L, CSNK1E
CG2049	Pkn	Protein kinase related to protein kinase N	AGC	PKN	PKN2, PKN3, PKN1
CG2087	PEK	pancreatic eIF-2 $\alpha$ kinase	Other	PEK	EIF2AK3
CG2201			Non-Protein Kinase	Lipid Kinase	CHKB-CPT1B, CHKB
CG2210	awd	abnormal wing discs	Atypical	NDK	NME4, NME2, NME1, NME1-NME2, NME3
CG2246			Non-Protein Kinase	Carbohydrate Kinase	PRPSAP2, PRPSAP1
CG2252	fs(1)h	female sterile (1) homeotic	Atypical		BRD2, BRD3, BRDT, BRD4
CG2272	slpr	slipper	TKL	MLK	RP5-862P8.2, MLTK, MAP3K9, MAP3K10, MAP3K11
CG2577			CK1	CK1	CSNK1E, CSNK1A1, CSNK1A1L, CSNK1D
CG2615	ik2	I $\kappa$ B kinase-like 2	Other	IKK	IKBKE, TBK1
CG2621	sgg	shaggy	CMGC	GSK	GSK3B, GSK3A
CG2699	Pi3K21B	Pi3K21B	PKL	PIK	PIK3R3, PIK3R2, PIK3R1
CG2794			Non-Protein Kinase	Carbohydrate Kinase	
CG2845	phl	pole hole	TKL	RAF	ARAF, BRAF, RAF1
CG2846			Non-Protein Kinase	Carbohydrate Kinase	RFK
CG2899	ksr	kinase suppressor of ras	TKL	RAF	KSR2, KSR1
CG2929	Pi4KII $\alpha$	Pi4KII $\alpha$	PKL	PIK	PI4K2A, PI4K2B
CG2964			Non-Protein Kinase	Carbohydrate Kinase	PKLR, PKM
CG3001	Hex-A	Hexokinase A	Non-Protein Kinase	Carbohydrate Kinase	HK3, HK2, HKDC1, HK1
CG30021	metro	menage a trois	Non-Protein Kinase	Nucleic Acid Kinase	MPP4, MPP5, MPP7, MPP2, MPP1, MPP3
CG3008			Atypical	RIO	RIOK3, RIOK1
CG30184			Kinase-associated		
CG30295	lpk1	lpk1	PKL		IPPK
CG3051	SNF1A	SNF1A/AMP-activated protein kinase	CAMK	CAMKL	PRKAA1, PRKAA2
CG3068	aur	aurora	Other	Aur	AURKA, AURKB, AURKA



## Kinases and Associated factors

CG3006	aur	aurora	Other	Aur	AURKA, AURKB, AURKC
CG3086	MAPK-Ak2	MAP kinase activated protein-kinase-2	CAMK	MAPKAPK	MAPKAPK2, MAPKAPK5, MAPKAPK3
CG31003	gskt	gasket	CMGC	GSK	GSK3B, GSK3A
CG3105	Pask	PAS kinase	CAMK	CAMKL	PASK
CG31097			Unclassified		
CG31127	Wsck	Wsck	TK		
CG31140			Non-Protein Kinase	Lipid Kinase	DGKQ
CG31183			Kinase-associated		NPR2, NPR1
CG3127	Pgk	Phosphoglycerate kinase	Non-Protein Kinase	Lipid Kinase	PGK1, PGK2
CG31349	pyd	polychaetoid	Kinase-associated		TJP2, TJP1, TJP3
CG3140	Adk2	Adenylate kinase-2	Non-Protein Kinase	Nucleic Acid Kinase	AK4, AK2, AK3
CG31421	Tak1	Tak1-like 1	TKL		MAP3K7
CG31643			Atypical		FASTKD1, TBRG4, FASTKD3, FASTK, FASTKD3
CG3172	twf	twinfilin	TK		TWF2, TWF1
CG31751			Unclassified		AGPHD1
CG31873			Non-Protein Kinase	Lipid Kinase	FLJ10842
CG32019	bt	bent	CAMK		MYLK4, MYLK2, MYLK3, MYLK
CG32031	Argk	Arginine kinase	Unclassified		CKMT2, CKMT1A, CKMT1B, CKM, CKB
CG32134	btl	breathless	TK		FGFR4, FGFR1, FGFR3, RET, FGFR2
CG3216			RGC	RGC	NPR2, NPR1
CG32417	Myt1	Myt1	AGC		PKMYT1
CG32484	Sk2	Sphingosine kinase 2	Non-Protein Kinase	Lipid Kinase	
CG32649			Atypical		ADCK4, ADCK3
CG32666	Drak	Death-associated protein kinase related	CAMK	MLCK	
CG32703			CMGC		MAPK15
CG32717	sdt	stardust	CAMK		CASK, MPP4, MPP5, MPP7, MPP2, MPP1, MPP3
CG32742	l(1)G0148	lethal (1) G0148	Other		CDC7
CG32743	nonC	no-on-and-no-off transient C	PKL		SMG1
CG3277			TK	VEGFR	
CG32849	Hex-t2	Hex-t2	Non-Protein Kinase	Carbohydrate Kinase	HK3, HK2, HKDC1, HK1
CG32944			CAMK		STK32C, STK32B, STK32A
CG33102	Hex-t1	Hex-t1	Non-Protein Kinase	Carbohydrate Kinase	
CG33114	Gyc32E	Guanyl cyclase at 32E	RGC		NPR2, NPR1
CG3319	Cdk7	Cyclin-dependent kinase 7	CMGC	CDK	CDK7, CDK20
CG3324	Pkg21D	cGMP-dependent protein kinase 21D	AGC	PKG	PRKG2, PRKG1
CG33338	p38c	p38c	CMGC	MAPK	MAPK12, MAPK13, MAPK14, MAPK11
CG33519	Unc-89	Unc-89	Unclassified		
CG33531	Ddr	Discoidin domain receptor	TK		DDR1, DDR2
CG33554	Nipped-A	Nipped-A	Atypical	PIKK	TRRAP
CG33671			Non-Protein Kinase	Carbohydrate Kinase	MVK
CG33981			Kinase-associated		ANAPC13
CG3400	Pfrx	6-phosphofructo-2-kinase	Non-Protein Kinase	Carbohydrate Kinase	PFKFB1, PFKFB2, PFKFB4, PFKFB3
CG34344	rdgA	retinal degeneration A	Non-Protein Kinase	Lipid Kinase	DGKZ, DGKI
CG34356			Unclassified		
CG34357			RGC		NPR2, NPR1
CG34359	IP3K2	Inositol 1,4,5-triphosphate kinase 2	Non-Protein Kinase	Lipid Kinase	ITPK1
CG34361	Dgk	Diacyl glycerol kinase	Non-Protein Kinase	Lipid Kinase	DGKA, DGKG, DGKB

CG34380			TK		DDR1, DDR2
CG34384			Non-Protein Kinase	Lipid Kinase	DGKH, DGKD
CG34392	Epac	Exchange protein directly activated by cAMP ortholog	Kinase-associated		RAPGEF5, RAPGEF3, RAPGEF4, RAPGEFL1
CG34412	tlk	Tousled-like kinase	Other	TLK	TLK1, TLK2
CG3510	CycB	Cyclin B	CMGC	CDK	CCNB2, CCNB1
CG3525	eas	easily shocked	Non-Protein Kinase	Lipid Kinase	ETNK2, ETNK1
CG3534			Non-Protein Kinase	Carbohydrate Kinase	XYLB
CG3544			Non-Protein Kinase	Carbohydrate Kinase	XYLB
CG3608			Atypical	ABC1	ADCK1
CG3682	PIP5K59B	PIP5K59B	PKL		PIP5K1A, PIP5K1B, PSMD4, PIP5K1C
CG3738	Cks30A	Cyclin-dependent kinase subunit 30A	Kinase-associated		CKS2, CKS1B
CG3809			Non-Protein Kinase	Nucleic Acid Kinase	ADK
CG3837			Kinase-associated		
CG3915	Drl-2	Derailed 2	TK	Ryk	RYK, TYRO3, AXL, MERTK
CG3938	CycE	Cyclin E	CMGC	CDK	CCNE2, CCNE1
CG4006	Akt1	Akt1	AGC	Akt	SGK3, AKT1, SGK1, AKT2, SGK2, AKT3
CG4007	Nrk	Neurospecific receptor kinase	TK	Musk	MUSK, ROR1, ROR2
CG4012	gek	genghis khan	AGC	DMPK	CDC42BPA, CDC42BPG, CDC42BPB
CG40129	Gprk1	G protein-coupled receptor kinase 1	AGC	GRK	ADRBK2, ADRBK1
CG4026	IP3K1	Inositol 1,4,5-triphosphate kinase 1	PKL		ITPKB, ITPKC, ITPKA
CG40293	Stlk	Ste20-like kinase	STE		STRADA, STRADB
CG4032	Abl	Abl tyrosine kinase	TK	Abl	ABL1, ABL2
CG4041			Other	TBCK	TBCK
CG40478	Dyrk3	Dyrk3	CMGC	DYRK	DYRK4, DYRK1B, DYRK1A, DYRK3, DYRK2
CG4132	pkaap	pkaap	Kinase-associated		AKAP10
CG4141	Pi3K92E	PI3K92E	PKL		PIK3CB, PIK3CD, PIK3CA, PIK3CG
CG4201	ird5	immune response deficient 5	Other	IKK	IKKBK, CHUK
CG42273	mnb	minibrain	CMGC	DYRK	DYRK4, DYRK1B, DYRK1A, DYRK3, DYRK2
CG42317	Csk	C-terminal Src kinase	TK	Csk	MATK, CSK
CG42320	Doa	Darkener of apricot	CMGC	CLK	CLK4, CLK2, CLK3, CLK1
CG42341	Pka-R1	cAMP-dependent protein kinase R1	AGC	PKA	PRKAR1B, PRKAR1A
CG42347			CAMK		MYLK4, MYLK2, MYLK3
CG42349	Pkcδ	Protein kinase C δ	AGC	PKC	PRKCG, PRKCB, PRKCE, PRKCQ, PRKCA, PRKCH
CG42366			CMGC	CDC2	ICK, MAK
CG42403	Ca-β	Ca <sup>2+</sup> -channel-protein-β-subunit	Non-Protein Kinase	Nucleic Acid Kinase	CACNB3, CACNB1, CACNB4, CACNB2
CG4252	mei-41	meiotic 41	Atypical	PIKK	ATR
CG42636	Gyc76c	Guanylyl cyclase at 76C	RGC	RGC	NPR2, NPR1
CG4268	Pitslre	Pitslre	CMGC	CDK	CDC2L2
CG42783	aPKC	atypical protein kinase C	AGC	PKC	PRKCZ, PRKCI
CG42856	Sik3	Salt-inducible kinase 3	CAMK	CAMKL	SIK2, SIK3, SIK1
CG4290	Sik2	Salt-inducible kinase 2	CAMK	CAMKL	SIK2, SIK3, SIK1
CG43143			Unclassified		
CG4353	hep	hemipterous	STE	STE7	MAP2K7
CG43729			Kinase-associated		STAC, STAC3, STAC2
CG43741	Ack-like	Activated Cdc42 kinase-like	TK	Ack	

CG4379	Pka-C1	cAMP-dependent protein kinase 1	AGC	PKA	PRKACA, PRKACB, PRKACG, PRKX
CG4488	wee	wee	Other	WEE	WEE2, WEE1
CG4523	Pink1	PTEN-induced putative kinase 1	Other	NKF2	PINK1
CG4527	slik	Sterile20-like kinase	STE	STE20	STK10
CG4546			Unclassified		MYCBP
CG4551	smi35A	smell impaired 35A	CMGC	DYRK	DYRK4, DYRK1B, DYRK1A, DYRK3, DYRK2
CG4583	Ire1	Inositol-requiring enzyme-1	Other	IRE	ERN2, ERN1
CG4629			CAMK	CAMKL	NIM1
CG4720	Pk92B	Protein kinase at 92B	STE	STE11	MAP3K6, MAP3K5, MAP3K15
CG4798	l(2)k01209	lethal (2) k01209	Non-Protein Kinase	Nucleic Acid Kinase	UCKL1
CG4803	Tak12	Tak1-like 2	TKL	MLK	MAP3K7
CG4839			AGC	PKG	PRKG1, PRKG2
CG4926	Ror	Ror	TK	Ror	MUSK, ROR1, ROR2
CG4945			Other	NKF1	
CG5072	Cdk4	Cyclin-dependent kinase 4	CMGC	CDK	CDK4, CDK6
CG5092	Tor	Target of rapamycin	Atypical	PIKK	MTOR
CG5125	ninaC	neither inactivation nor afterpotential C	STE	STE20	
CG5144			Non-Protein Kinase	Nucleic Acid Kinase	CKM, CKB, CKMT2, CKMT1B, CKMT1A
CG5169	GckIII	Germinal centre kinase III	STE	STE20	STK25, STK24, MST4
CG5179	Cdk9	Cyclin-dependent kinase 9	CMGC	CDK	CDK13, CDK9, CDK12
CG5182	Pk34A	Pk34A	CMGC	GSK	
CG5288			Non-Protein Kinase	Carbohydrate Kinase	GALK2
CG5310	nmdyn-D6	nmdyn-D6	Atypical		NME6
CG5363	cdc2	cdc2	CMGC	CDK	CDK1, CDK2, CDK3
CG5373	Pi3K59F	Phosphatidylinositol 3 kinase 59F	CMGC	CDK	PIK3C3
CG5387	Cdk5α	Cdk5 activator-like protein	Kinase-associated		CDK5R1
CG5408	trbl	tribbles	CAMK	Trbl	TRIB2, TRIB3, TRIB1
CG5452	dnk	deoxyribonucleoside kinase	Non-Protein Kinase	Nucleic Acid Kinase	TK2
CG5475	Mpk2	Mpk2	CMGC	MAPK	MAPK12, MAPK13, MAPK14, MAPK11
CG5483	Lrrk	Leucine-rich repeat kinase	TKL	LRRK	LRRK2, LRRK1
CG5626			Non-Protein Kinase	Nucleic Acid Kinase	
CG5680	bsk	basket	CMGC	MAPK	MAPK10, MAPK9
CG5725	fbl	fumble	Non-Protein Kinase	Lipid Kinase	PANK2, PANK1, PANK3
CG5757			Non-Protein Kinase	Nucleic Acid Kinase	DTYMK
CG5790			Other	CDC7	CDC7
CG5940	CycA	Cyclin A	CMGC	CDK	CCNA1, CCNA2
CG5974	pil	pelle	TKL	IRAK	IRAK2
CG6027	cdi	center divider	TKL	LISK	TESK1
CG6092	Dak1	Dak1	Non-Protein Kinase	Nucleic Acid Kinase	CMPK
CG6114	sff	sugar-free frosting	CAMK	CAMKL	BRSK1, BRSK2
CG6117	Pka-C3	cAMP-dependent protein kinase 3	AGC	PKA	PRKACG, PRKACA, PRKACB, PRKX
CG6214	MRP	Multidrug-Resistance like Protein 1	Kinase-associated		ABCC1, ABCC2, ABCC4, ABCC3
CG6292	CycT	Cyclin T	CMGC	CDK	CCNT1, CCNT2
CG6297	JIL-1	JIL-1	AGC	RSK	RPS6KA6, RPS6KA5, RPS6KA4, RPS6KA3, RPS6KA2, RPS6KA1
CG6343	ND42	NADH:ubiquinone reductase 42kD subunit precursor	Kinase-associated		NDUFA10

CG6355	fab1	fab2	PKL		PIKFYVE
CG6364			Other	UK	UCK2, UCK1
CG6386	ball	ballchen	CK1	VRK	VRK3, VRK1, VRK2
CG6498			AGC	MASR	MAST1, MAST3, MAST4, MAST2
CG6509			Kinase-associated		DLG5
CG6518	inaC	inactivation no afterpotential C	AGC	PKC	PRKCG, PRKCB, PRKCE, PRKCQ, PRKCA, PRKCH, STAM2, STAM
CG6521	Stam	Signal transducing adaptor molecule	Kinase-associated		
CG6535	tefu	telomere fusion	Atypical	PIKK	ATM
CG6551	fu	fused	Other	ULK	STK36
CG6612	Adk3	Adenylate kinase-3	Non-Protein Kinase	Nucleic Acid Kinase	AK4, AK2, AK3
CG6620	ial	lplI-aurora-like kinase	Other	AUR	AURKC, AURKB, AURKA
CG6622	Pkc53E	Protein C kinase 53E	AGC	PKC	PRKCG, PRKCB, PRKCE, PRKCQ, PRKCA, PRKCH, CASK, MPP4, MPP5, MPP7, MPP2, MPP1, MPP3
CG6703	CASK	CASK ortholog	CAMK	CAMKL	
CG6715	KP78a	KP78a	CAMK	CAMKL	MARK2, MARK4, MARK3, MARK1
CG6767			Non-Protein Kinase	Carbohydrate Kinase	PRPS1L1, PRPS1
CG6772	Slob	Slowpoke binding protein	Other	Slob	
CG6775	rg	rugose	Kinase-associated		NBEA, LRBA
CG6800			CMGC	CDK	CDK7, CDK20
CG6875	asp	abnormal spindle	Kinase-associated		ASPM
CG6963	gish	gilgamesh	CK1	CK1	CSNK1G1, CSNK1G3, CSNK1G2
CG7001	Pk17E	Protein kinase-like 17E	AGC	RSKR	
CG7004	fwd	four wheel drive	PKL		PIK4B
CG7028	PRP4	PRP4	CMGC	DYRK	PRPF4B
CG7069			Non-Protein Kinase	Carbohydrate Kinase	PKM2, PKLR
CG7070	PyK	Pyruvate kinase	Non-Protein Kinase	Carbohydrate Kinase	PKM2, PKLR
CG7094			CK1	CK1	CSNK1E, CSNK1A1, CSNK1A1L, CSNK1D
CG7097	hppy	happyhour	STE	STE20	MAP4K2, MAP4K3, MAP4K1, MAP4K5
CG7103	Pvf1	PDGF- and VEGF-related factor 1	Kinase-associated		VEGFA, VEGFB, VEGFD
CG7125	PKD	Protein Kinase D	CAMK	PKD	PRKD1, PRKD2, PRKD3
CG7156			AGC	RSKL	
CG7177	Wnk	WNK homolog	Other	WNK	WNK1, WNK4, WNK2, WNK3
CG7186	SAK	Sak kinase	Other	PLK	PLK4
CG7207	cert	ceramide transfer protein	Kinase-associated		COL4A3BP
CG7223	htl	heartless	TK	FGFR	FGFR4, FGFR1, FGFR3, RET, FGFR2
CG7236			CMGC	CDKL	CDKL3, CDKL5, CDKL1, CDKL2
CG7281	CycC	Cyclin C	CMGC	CDK	CCNC
CG7328			Non-Protein Kinase	Carbohydrate Kinase	KHK
CG7335			Non-Protein Kinase	Carbohydrate Kinase	KHK
CG7362			Non-Protein Kinase	Carbohydrate Kinase	PKLR, PKM2
CG7393	p38b	p38b	CMGC	MAPK	MAPK12, MAPK13, MAPK14, MAPK11
CG7405	CycH	Cyclin H	CMGC	CDK	CCNH
CG7470			Unclassified		ALDH18A1
CG7524	Src64B	Src oncogene at 64B	TK	Src	HCK, LCK, FRK, SRC, BLK, YES1, FGR, FYN, LYN
CG7525	Tie	Tie-like receptor tyrosine kinase	TK		TIE1
CG7551			Non-Protein Kinase	Carbohydrate Kinase	KHK

## Kinases and Associated factors

CG7597	Cdk12	Cdk12	CMGC	CDK	CDK13, CDK9, CDK12
CG7616			Atypical	ABC1	ADCK5
CG7643	ald	altered disjunction	Other	TTK	TTK
CG7693	fray	frayed	STE	STE20	OXSRI
CG7717	Mekk1	Mekk1	STE	STE11	MAP3K4
CG7719	gwl	greatwall	AGC	MAST	MASTL
CG7766			Kinase-associated		PHKA1, PHKA2
CG7838	BubR1	Bub1-related kinase	Other	BUB	BUB1B
CG7873	Src42A	Src oncogene at 42A	TK	Src	HCK, LCK, FRK, SRC, BLK, YES1, FGR, FYN, LYN
CG7892	nmo	nemo	CMGC	MAPK	NLK
CG7904	put	punt	TKL	STKR	BMPR2, ACVR2A, TGFB2, ACVR2B
CG7995			Non-Protein Kinase	Lipid Kinase	GK, GK2
CG8049	Btk29A	Btk family kinase at 29A	TK	Tec	TEC, ITK, TXK, BMX, BTK
CG8057	alc	alicorn	Non-Protein Kinase	Nucleic Acid Kinase	PRKAB2, PRKAB1
CG8094	Hex-C	Hexokinase C	Non-Protein Kinase	Carbohydrate Kinase	HK3, HK2, HKDC1, HK1
CG8173			Other	TOPK	PBK
CG8174	SRPK	SRPK	CMGC	SRPK	SRPK1, SRPK3, SRPK2
CG8201	par-1	par-1	CAMK	CAMKL	MARK2, MARK4, MARK3, MARK1
CG8203	Cdk5	Cyclin-dependent kinase 5	CMGC	CDK	CDK5
CG8222	Pvr	PDGF- and VEGF-receptor related	TK	VEGFR	VEGFR3, VEGFR2, VEGFR1
CG8224	babo	baboon	TKL	STKR	ACVR1, BMPR1A, ACVR1C, ACVR1B, BMPR1B, ACVRL1
CG8239			Non-Protein Kinase	Carbohydrate Kinase	MVD
CG8250	Alk	Alk	TK	ALK	ALK, LTK, ROS1
CG8286	P58IPK	P58IPK	Kinase-associated		DNAJC3, DNAJC7
CG8298			Non-Protein Kinase	Lipid Kinase	GK, GK2
CG8351	Tcp-1 $\eta$	Tcp-1 $\eta$	Kinase-associated		CCT7
CG8362	nmdyn-D7	nmdyn-D7	Atypical		NME7
CG8363	Papss	PAPS synthetase	Non-Protein Kinase	Nucleic Acid Kinase	PAPSS1, PAPSS2
CG8475			CAMK		PHKB
CG8485			CAMK	CAMKL	SNRK
CG8565			CMGC	SRPK	SRPK1, SRPK3, SRPK2
CG8637	trc	tricornered	AGC	NDR	STK38
CG8657	Dgke	Diacyl glycerol kinase $\epsilon$	Non-Protein Kinase	Lipid Kinase	DGKE
CG8726			Other	Slob	PXK
CG8767	mos	mos	Other	MOS	MOS
CG8789	wnd	wallenda	TKL	MLK	MAP3K12, MAP3K13
CG8808	Pdk	Pyruvate dehydrogenase kinase	Atypical	PDHK	PDK4, PDK3, PDK1, PDK2
CG8866			Other	ULK	ULK3
CG8874	Fps85D	Fps oncogene analog	TK	Fer	FER
CG8878			CK1	VRK	
CG8914	CK11 $\beta$ 2	Casein kinase II $\beta$ 2 subunit	CMGC		CSNK2B
CG8948	Graf	GTPase regulator associated with focal adhesion kinase ortholog	Kinase-associated		OPHN1, ARHGAP42, ARHGAP10, ARHGAP26
CG8967	otk	off-track	TK	CCK4	PTK7
CG9096	CycD	Cyclin D	CMGC	CDK	CCND1, CCND2, CCND3
CG9222			CAMK	TSSK	TSSK6, TSSK2, TSSK4, TSSK3,

Kinases and Associated factors

CG9222			CAMK	ISSR	TSSK1
CG9326	vari	varicose	Non-Protein Kinase	Nucleic Acid Kinase	MPP4, MPP5, MPP7, MPP2, MPP1, MPP3
CG9358	Phk-3	Pherokine 3	Non-Protein Kinase	Lipid Kinase	
CG9374	lkb1	lkb1	CAMK	CAMKL	STK11
CG9541			Non-Protein Kinase	Nucleic Acid Kinase	
CG9738	Mkk4	MAP kinase kinase 4	STE	STE7	MAP2K4, MAP2K6, MAP2K3
CG9746	ird1	immune response deficient 1	Other	VPS15	PIK3R4
CG9774	rok	Rho-kinase	AGC	DMPK	ROCK1, ROCK2
CG9961			Non-Protein Kinase	Lipid Kinase	PGK1, PGK2
CG9962			CK1	CK1	
CG9985	sktl	skittles	PKL		PIP5K1A, PIP5K1B, PSMD4, PIP5K1C

Fig S2

## Classifications of phosphatases and associated factors

Phosphoprotein Phosphatase
Protein Phosphatase
Mg <sup>+</sup> /Mn <sup>+</sup> -dependent
Classical Protein Tyrosine Phosphatase
Class I/Dual Specificity Phosphatase
Class III Protein Tyrosine Phosphatase
Factor IIF-interacting CTD Phosphatase/Small CTD Phosphatase
Haloacid Dehalogenase-like Hydrolase
Unclassified
Phosphatase-associated
Non-protein Phosphatase

Co-factors such as subunits of multi-component PPTases  
Such as lipid and sugar phosphatases

Drosophila Phosphatase			Gene Group	Gene Family	Human ortholog(s)
Annotation Symbol	Gene Symbol	Gene Name			
CG10089			PTP	Class I/DSP	DUSP22, DUSP15
CG10138	PpD5	Protein phosphatase D5	STP	PPP	PPP1CC, PPP1CA
CG10371	Plip	PTEN-like phosphatase	PTP	Classical	PTPMT1
CG10376			STP	PPM	PPM1F, PPM1E
CG10417			STP	PPM	PPM1G
CG10426			Non-Protein Phosphatase	Lipid Phosphatase	INPP5E
CG10443	Lar	Leukocyte-antigen-related-like	PTP	Classical	PTPRS, PTPRD, PTPRF
CG10493	Phlpp	PH domain leucine-rich repeat protein phosphatase	STP	PPM	PHLPP1, PHLPP2
CG10574	I-2	Inhibitor-2		Phosphatase-associated	PPP1R2
CG10592				Unclassified	ALPL, ALPPL2, ALPP
CG10827				Unclassified	ALPL, ALPPL2, ALPP
CG10930	PpY-55A	Protein phosphatase Y at 55A	STP	PPP	
CG10975	Ptp69D	Protein tyrosine phosphatase 69D	PTP	Classical	PTPRG, PTPRZ1
CG11217	CanB2	Calcineurin B2	STP	PPP	PPP3R1, WDR92, PPP3R2
CG11425			Non-Protein Phosphatase	Lipid Phosphatase	PPAP2C, PPAP2B, PPAP2A
CG11426			Non-Protein Phosphatase	Lipid Phosphatase	PPAP2C, PPAP2B, PPAP2A
CG11437			Non-Protein Phosphatase	Lipid Phosphatase	PPAP2C, PPAP2B, PPAP2A
CG11438			Non-Protein Phosphatase	Lipid Phosphatase	PPAP2C, PPAP2B, PPAP2A
CG11440	laza	lazarro	Non-Protein Phosphatase	Lipid Phosphatase	PPAP2C, PPAP2B, PPAP2A
CG11516	Ptp99A	Protein tyrosine phosphatase 99A	PTP	Classical	PTPRG, PTPRZ1
CG11597			STP	PPP	
CG11883				Phosphatase-associated	
CG12034				Phosphatase-associated	SMPD2
CG12078			Asp-based catalysis	HAD	
CG12091			STP	PPM	PPTC7
CG12151	Pdp	Pyruvate dehydrogenase phosphatase	STP	PPM	PDP1, PDP2
CG12169	Ppm1	Ppm1	STP	PPM	
CG12173			Asp-based catalysis	HAD	ENOPH1
CG12217	PpV	Protein phosphatase V	STP	PPP	PPP4C, PPP6C, PPP2CA, PPP2CB
CG12252	Fcp1		Asp-based catalysis	FCP/SCP	CTDP1
CG1228	Ptpmeg	Ptpmeg	PTP	Classical	PTPN3, PTPN4

CG12538			Non-Protein Phosphatase	Nucleic Acid Phosphatase	
CG12746			Non-Protein Phosphatase	Lipid Phosphatase	PPAPDC1A, PPAPDC1B
CG13125	TbCMF46	TbCMF47		Phosphatase-associated	LRRC48
CG13197			PTP	Class I/DSP	DUSP11
CG13311				Phosphatase-associated	
CG13570	spag	spaghetti		Phosphatase-associated	
CG1395	stg	string	PTP	Class I/DSP	CDC25A, CDC25B
CG14022			Non-Protein Phosphatase	Lipid Phosphatase	ACYP1, ACYP2
CG14080	Mkp3	Mitogen-activated protein kinase phosphatase 3	PTP	Class I/DSP	DUSP7, DUSP6, DUSP9
CG14211	MKP-4	MAPK Phosphatase 4	PTP	Class I/DSP	DUSP12
CG14297			PTP	Class III	ACP1
CG14411			PTP	Class I/DSP	MTMR11, MTMR10, MTMR12
CG1455	CanA1	Calcineurin A1	STP	PPP	PPP3CB, PPP3CC
CG14616	I(1)G0196	lethal (1) G0196	Non-Protein Phosphatase	Lipid Phosphatase	PPIP5K2, PPIP5K1
CG1462	Aph-4	Alkaline phosphatase 4		Unclassified	ALPL, ALPPL2, ALPP
CG14719	I-t	inhibitor-t		Phosphatase-associated	
CG14903			PTP	Class III	PTRHD1
CG15035			STP	PPM	PPTC7
CG15385			Non-Protein Phosphatase	Nucleic Acid Phosphatase	ACPL2
CG15400			Non-Protein Phosphatase	Carbohydrate Phosphatase	G6PC
CG15528			PTP	Class I/DSP	DUSP14, DUSP21
CG15533				Phosphatase-associated	SMPD1
CG15534				Phosphatase-associated	SMPD1
CG15743			Non-Protein Phosphatase	Lipid Phosphatase	IMPAD1
CG1637			Non-Protein Phosphatase	Nucleic Acid Phosphatase	PAPL
CG16717				Phosphatase-associated	MPPED2, MPPED1
CG16757	Spn	Spinophilin		Phosphatase-associated	
CG16771				Unclassified	ALPL, ALPPL2, ALPP
CG16870	Acyp	Acylphosphatase	Non-Protein Phosphatase	Lipid Phosphatase	ACYP1, ACYP2
CG16928	mre11	meiotic recombination 11		Phosphatase-associated	MRE11A
CG1696	Dd	Dullard	Asp-based catalysis	FCP/SCP	CTDNEP1
CG17026			Non-Protein Phosphatase	Lipid Phosphatase	IMPA1, IMPA2
CG17027			Non-Protein Phosphatase	Lipid Phosphatase	IMPA1, IMPA2
CG17028			Non-Protein Phosphatase	Lipid Phosphatase	IMPA1, IMPA2
CG17029			Non-Protein Phosphatase	Lipid Phosphatase	IMPA1, IMPA2
CG17124				Phosphatase-associated	PPP1R14C, PPP1R14B, PPP1R14D, PPP1R14A
CG17291	Pp2A-29B	Protein phosphatase 2A at 29B	STP	PPP	PPP2R1B, PPP2R1A
CG17598			STP	PPM	PPM1M, PPM1J, PPM1H
CG17746			STP	PPM	
CG1809				Unclassified	ALPL, ALPPL2, ALPP
CG1810	mRNA-cap	mRNA-capping enzyme	PTP	Class I/DSP	RNGTT
CG1817	Ptp10D	Protein tyrosine phosphatase 10D	PTP	Classical	PTPRB, PTPRJ, PTPRO
CG18243	Ptp52F	Ptp52F	PTP	Classical	
CG1906	alph	alphabet	STP	PPM	PPM1A, PPM1B



CG2096	flw	flapwing	STP	PPP	PPP1CB, PPP1CA, PPP1CC
CG2104			PTP	Unclassified	PPP2R4
CG2890	PPP4R2r	Protein phosphatase 4 regulatory subunit 2-related	STP	PPP	PPP4R2
CG2984	Pp2C1	Protein phosphatase 2C	STP	PPM	PP2CM
CG30103				Phosphatase-associated	NT5E
CG30104				Phosphatase-associated	NT5E
CG3028	lpp	Inositol polyphosphate 1-phosphatase	Non-Protein Phosphatase	Lipid Phosphatase	INPP1
CG3059	NTPase	NTPase	Non-Protein Phosphatase	Nucleic Acid Phosphatase	ENTPD6, ENTPD5
CG31137	twin	twin		Phosphatase-associated	CNOT6L, CNOT6
CG31299	cu	curled		Phosphatase-associated	CCRN4L
CG31469			PTP	Class III	ACP1
CG31692	fbp	fructose-1,6-bisphosphatase	Non-Protein Phosphatase	Carbohydrate Phosphatase	FBP2, FBP1
CG31717			Non-Protein Phosphatase	Lipid Phosphatase	PPAPDC3, PPAPDC2
CG31759				Phosphatase-associated	PDE12
CG3178	Rrp1	Recombination repair protein 1		Phosphatase-associated	APEX1
CG31795	IA-2	IA-2 ortholog	PTP	Classical	PTPRN2, PTPRN
CG32156	Mbs	Myosin binding subunit	STP	PPP	PPP1R12A, PPP1R12B
CG3245	PpN-58A	Protein phosphatase N at 58A	STP	PPP	
CG32487			Asp-based catalysis	HAD	PDXP, PGP
CG32488			Asp-based catalysis	HAD	PDXP, PGP
CG32505	Pp4-19C	Protein phosphatase 19C	STP	PPP	PPP4C, PPP6C, PPP2CA, PPP2CB
CG32568			STP	PPP	
CG3264				Unclassified	ALPL, ALPPL2, ALPP
CG32697	I(1)G0232	lethal (1) G0232	PTP	Classical	PTPN9
CG32812			STP	PPP	
CG3289	Ptpa	Phosphotyrosyl phosphatase activator	PTP	Unclassified	PPP2R4
CG3290				Unclassified	ALPL, ALPPL2, ALPP
CG3292				Unclassified	ALPL, ALPPL2, ALPP
CG33747	primo-2	primo-2	PTP	Class III	ACP2
CG33748	primo-1	primo-1	PTP	Class III	ACP1
CG3376				Phosphatase-associated	SMPD1
CG34099	Mkp	MAP kinase-specific phosphatase	PTP	Class I/DSP	DUSP19
CG34140				Phosphatase-associated	PUSL1
CG3530			PTP	Class I/DSP	MTMR6, MTMR7, MTMR8
CG3573	Ocrl	Oculocerebrorenal syndrome of Lowe ortholog	Non-Protein Phosphatase	Lipid Phosphatase	INPP5B, OCRL
CG3632			PTP	Class I/DSP	MTMR3, MTMR4
CG3705	aay	astray	Asp-based catalysis	HAD	PSPH
CG3954	csw	corkscrew	PTP	Classical	PTPN11, PTPN6
CG3980	Cep97			Phosphatase-associated	CEP97
CG40448	Pp1-Y2	Pp1-Y2	STP	PPP	PPP1CB, PPP1CA, PPP1CC
CG4123	Mipp1	Multiple inositol polyphosphate phosphatase 1	Non-Protein Phosphatase	Lipid Phosphatase	
CG41534	Pp1-Y1	Pp1-Y1	STP	PPP	PPP1CB, PPP1CA, PPP1CC

CG4209	CanB	Calcineurin B	STP	PPP	PPP3R1, WDR92, PPP3R2
CG42249				Phosphatase-associated	NT5E
CG42271			Non-Protein Phosphatase	Lipid Phosphatase	INPP4A, INPP4B
CG42283	5Ptasel	5Ptasel	Non-Protein Phosphatase	Lipid Phosphatase	INPP5A
CG42327			PTP	Classical	
CG4317	Mipp2	Multiple inositol polyphosphate phosphatase 2	Non-Protein Phosphatase	Lipid Phosphatase	
CG4733	PR72	PR72	STP	PPP	PPP2R3A, PPP2R3B
CG4827	veil	veil		Phosphatase-associated	NT5E
CG4965	twe	twine	PTP	Class I/DSP	
CG4993	PRL-1	PRL-2	PTP	Class I/DSP	PTP4A1, PTP4A2, PTP4A3
CG5026			PTP	Class I/DSP	MTMR9
CG5150				Unclassified	ALPL, ALPPL2, ALPP
CG5171			Non-Protein Phosphatase	Carbohydrate Phosphatase	
CG5177			Non-Protein Phosphatase	Carbohydrate Phosphatase	
CG5276			Non-Protein Phosphatase	Nucleic Acid Phosphatase	CANT1
CG5361				Unclassified	
CG5567			Asp-based catalysis	HAD	PDXP, PGP
CG5577			Asp-based catalysis	HAD	PDXP, PGP
CG5643	wdb	widerborst	STP	PPP	PPP2R5D, PPP2R5E, PPP2R5C, PPP2R5A
CG5650	Pp1-87B	Protein phosphatase 1 at 87B	STP	PPP	PPP1CB, PPP1CA, PPP1CC
CG5656				Unclassified	ALPL, ALPPL2, ALPP
CG5671	Pten	Pten	PTP	Class I/DSP	PTEN, TPTE, TPTE2
CG5784	Mapmodulin	Mapmodulin		Phosphatase-associated	ANP32E, ANP32D, ANP32A, ANP32B
CG5820	Gp150			Phosphatase-associated	
CG5830			Asp-based catalysis	FCP/SCP	CTDSPL, CTDSP2, CTDSP1
CG5851	sds22	sds22	STP	PPP	PPP1R7
CG6036			STP	PPM	PPM1A, PPM1B
CG6235	tws	twins	STP	PPP	PPP2R2C, PPP2R2B, PPP2R2D, PPP2R2A
CG6238	ssh	slingshot	PTP	Class I/DSP	SSH2, SSH3, SSH1
CG6380			STP	PPP	PPP1R2
CG6542	EDTP	Egg-derived tyrosine phosphatase	PTP	Class I/DSP	MTMR14
CG6562	synj	synaptojanin	Non-Protein Phosphatase	Lipid Phosphatase	SYNJ2, SYNJ1
CG6571	rdgC	retinal degeneration C	STP	PPP	PPEF1, PPEF2
CG6593	Pp1 $\alpha$ -96A	Protein phosphatase 1 $\alpha$ at 96A	STP	PPP	PPP1CB, PPP1CA, PPP1CC
CG6656			Non-Protein Phosphatase	Nucleic Acid Phosphatase	ACPP, ACP2, ACPT
CG6746			PTP	Unclassified	PTPLA, PTPLB
CG6805			Non-Protein Phosphatase	Lipid Phosphatase	INPP5J, INPP5K
CG6896	MYPT-75D	MYPT-75D	STP	PPP	PPP1R16B, PPP1R16A
CG6899	Ptp4E	Protein tyrosine phosphatase 4E	PTP	Classical	PTPRB, PTPRJ, PTPRO
CG6939	Sbf	SET domain binding factor	PTP	Class I/DSP	SBF2, SBF1

CG7067	NitFhit	Nitrilase and fragile histidine triad fusion protein	Non-Protein Phosphatase	Nucleic Acid Phosphatase	NIT1, NIT2, FHIT
CG7109	mts	microtubule star	STP	PPP	PPP4C, PPP6C, PPP2CA, PPP2CB
CG7115			STP	PPM	PPM1L
CG7134	cdc14	cdc14	PTP	Class I/DSP	CDC14B, CDC14A
CG7180			PTP	Classical	PTPRK
CG7378			PTP	Class I/DSP	DUSP3, DUSP26, DUSP13, DUSP1, DUSP27
CG7615	fig	fos intronic gene	STP	PPM	PPTC7
CG7789			PTP	Class I/DSP	BPNT1
CG7850	puc	puckered	PTP	Class I/DSP	DUSP10
CG7899	Acph-1	Acid phosphatase 1	Non-Protein Phosphatase	Nucleic Acid Phosphatase	ACPP, ACP2, ACPT
CG7913	Pp2A-B'	Pp2A-B'	STP	PPP	PPP2R5D, PPP2R5E, PPP2R5C, PPP2R5A
CG7942	ldbr	ariat debranching enzyme		Phosphatase-associated	DBR1
CG8105				Unclassified	ALPL, ALPLL2, ALPP
CG8147				Unclassified	ALPL, ALPLL2, ALPP
CG8402	PpD3	Protein phosphatase D3	STP	PPP	PPP5C
CG8455			Non-Protein Phosphatase	Lipid Phosphatase	MPPE1
CG8509			PTP	Unclassified	PPP2R4
CG8584			Asp-based catalysis	FCP/SCP	
CG8804	wun	wunen	Non-Protein Phosphatase	Lipid Phosphatase	PPAP2C, PPAP2B, PPAP2A
CG8805	wun2	wunen-2	Non-Protein Phosphatase	Lipid Phosphatase	PPAP2C, PPAP2B, PPAP2A
CG8822	PpD6	Protein phosphatase D6	STP	PPP	PPP1CC, PPP1CA
CG8889	Mppe	Metallophosphoesterase	Non-Protein Phosphatase	Lipid Phosphatase	MPPE1
CG8980	NiPp1	Nuclear inhibitor of Protein phosphatase 1		Phosphatase-associated	PPP1R8
CG9115	mtm	myotubularin	PTP	Class I/DSP	MTMR1, MTM1, MTMR2
CG9128	Sac1	Sac1	Non-Protein Phosphatase	Lipid Phosphatase	SACM1L
CG9151	acj6	abnormal chemosensory jump 6		Phosphatase-associated	POU4F2, POU4F3
CG9156	Pp1-13C	Protein phosphatase 1 at 13C	STP	PPP	PPP1CB, PPP1CA, PPP1CC
CG9181	Ptp61F	Protein tyrosine phosphatase 61F	PTP	Classical	PTN2, PTPN1
CG9236	Cib2	CIB2 ortholog		Phosphatase-associated	CIB1, CIB4, CIB2
CG9238			STP	PPP	PPP1R3C
CG9267			PTP	Classical	PTPLAD1, PTPLAD2
CG9311	mop	myopic	PTP	Classical	PTPN23
CG9351	fifi	falafel	STP	PPP	SMEK2, SMEK1
CG9389			Non-Protein Phosphatase	Lipid Phosphatase	IMPA1, IMPA1
CG9391			Non-Protein Phosphatase	Lipid Phosphatase	IMPA1, IMPA2
CG9449			Non-Protein Phosphatase	Nucleic Acid Phosphatase	ACPP, ACP2, ACPT
CG9451			Non-Protein Phosphatase	Nucleic Acid Phosphatase	ACPP, ACP2, ACPT
CG9452			Non-Protein Phosphatase	Nucleic Acid Phosphatase	ACPP, ACP2, ACPT
CG9493	Pez	Pez	PTP	Classical	PTPN14

CG9554	eya	eyes absent	Asp-based catalysis	HAD	EYA1, EYA4, EYA3, EYA2
CG9601			Non-Protein Phosphatase	Nucleic Acid Phosphatase	PNKP
CG9619	Gbs-76A	Glycogen binding subunit 76A	STP	PPP	PPP1R3A, PPP1R3C, PPP1R3B
CG9764	yrt	yurt		Phosphatase-associated	EPB41L4B, EPB41L5
CG9784			Non-Protein Phosphatase	Lipid Phosphatase	
CG9801			STP	PPM	
CG9819	CanA-14F	Calcineurin A at 14F	STP	PPP	
CG9842	Pp2B-14D	Protein phosphatase 2B at 14D	STP	PPP	PPP3CB, PPP3CC
CG9856	PTP-ER	Protein tyrosine phosphatase-ERK/Enhancer of Ras1	PTP	Class I/DSP	

Fig. S3

Drosophila Gene			PILOT SCREEN							
Annotation Symbol	Gene Symbol	Gene Name	RNAi Stock	UAS-dcr2::dpp-Gal4			RNAi Stock	UAS-dcr2;hh-Gal4		
				Wing disc				Wing disc		
				Wg	Sens	Dll		Wg	Sens	Dll
CG4889	wg	wingless	13352				104579			
CG6205	por	porcupine	47864				100780			
CG6210	wls	wntless	103812				5215			
CG5912	arr	arrow	36286				6708			
CG11579	arm	armadillo	107344				7767			
CG7926	Axn	Axin	7748							
CG6193	Apc2	Adenomatous polyposis coli tumor suppressor homolog 2	22290				100104			
CG34403	pan	pangolin	108679				25940			

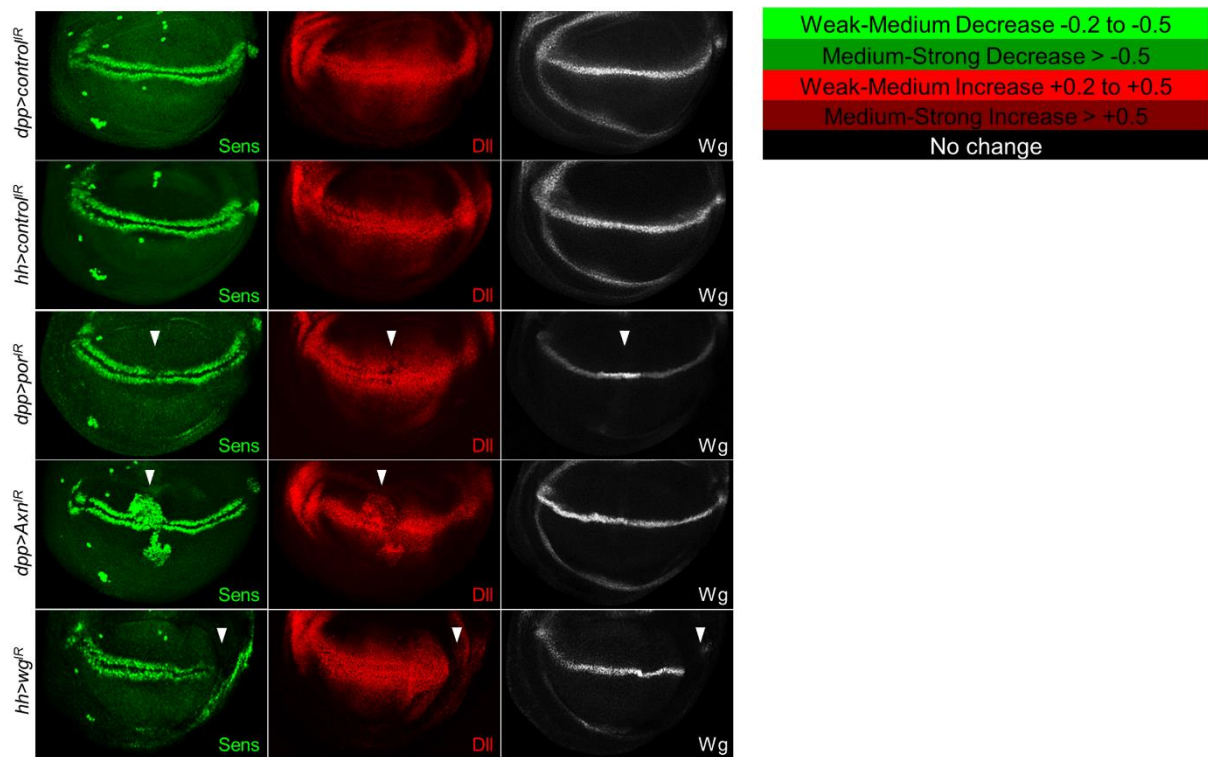
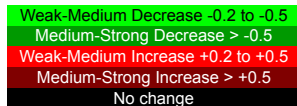


Fig. S4

**Kinase Data**



Wing phenotype any visible wing phenotype including notches, blisters, vein spacing, altered size  
 Lethal No adults recovered

Kinase Gene		PRIMARY SCREEN						SECONDARY SCREEN						HEDGEHOG SCREEN				
Annotation Symbol	Gene Symbol	RNAi Stock	UAS-dcr2;;dpp-Gal4			RNAi Stock	UAS-dcr2;hh-Gal4			RNAi Stock	UAS-dcr2;C5-Gal4			UAS-dcr2; dpp-Gal4 or UAS-dcr2; hh-Gal4	RNAi Stock	MS1096-Gal4;UAS-dcr2		
			Wing disc		Adult		Wing disc		Adult		Wing disc		Adult	Wing disc		Wing disc		Adult
			Wg	Sens	Dll		Wg	Sens	Dll		Wg	Sens	Dll	Cut		Ci	Ptc	
CG10023	Fak56D	17957 108608																
CG10033	for	38320	Wing phenotype							38320	Wing phenotype				38320	Wing phenotype		
		108293													108293	Wing phenotype		
		10033R-2	Wing phenotype			10033R-1	Lethal								10033R-1	Lethal		
															10033R-2	Wing phenotype/Lethal		
CG10079	Egfr	43268	Lethal							43268	Wing phenotype				43268	Wing phenotype		
		43267	Wing phenotype															
		107130	Wing phenotype			107130	Lethal								107130	Lethal		
		10079R-2																
CG10082		38327																
CG10155	Spred		103749															
			18024															
CG10177			18025															
			38349															
			107848															
CG10244	Cad96Ca		1091	Wing phenotype														
			8402	Wing phenotype														
CG10260			15993	Wing phenotype														
			105614	Wing phenotype														
CG10268			110640															
			10268R-2															
CG10295	Pak		12553	Wing phenotype														
			108937	Wing phenotype														
CG10308	CycJ		31217															
			110222															
			104959	Lethal														
CG10498	cdc2c		10498R-2	Wing phenotype														
			34856															
CG10504	Ilk		16062	Wing phenotype														
CG10522	sticky		47280															
			100265															
CG10539	S6k		18126	Wing phenotype														
			104369	Wing phenotype														
CG10572	Cdk8		45370	Wing phenotype														
			107187	Wing phenotype														
CG10579	Eip63E	47860	Wing phenotype			47860	Lethal			47860	Wing phenotype				47860	Wing phenotype		
		106824	Wing phenotype															
		50599	Wing phenotype			50599	Wing phenotype								50599	Wing phenotype		
			10579R-3	Wing phenotype														
CG10637	Nak		35482															
			109507															
CG10673			27301															
CG10702		27052	Wing phenotype												27052	Wing phenotype		
		3691	Wing phenotype			3691	Lethal			3691	Wing phenotype				3691	Wing phenotype		
		100842				100842												
CG10738			28580															
			10738R-1															

CG10776	wit	42244 865 103808 10776R-2							
CG10895	lok	44980 110342							
CG10933		46726 46727 104282	Wing phenotype Wing phenotype Wing phenotype						
CG10951	niki	16120 100823							
CG10967	Atg1	16133 10967R-1							
CG1098	Madm	27347 101758	Wing phenotype						
CG1107	aux	16182 103426	Wing phenotype Wing phenotype		16182			16182 103426	Lethal Lethal
CG11221		100163 42947 29603	Wing phenotype Wing phenotype						
CG11228	hpo	7823 104169 27661	Wing phenotype Wing phenotype Wing phenotype						
CG11249		18196 108319							
CG11255		17533 17534							
CG11420	png	31500 11420R-3							
CG11486		106497 51711 11486R-3 11486R-4	Wing phenotype Wing phenotype	11486R-3 11486R-4	106497	Wing phenotype		106497 11486R-3	Wing phenotype Wing phenotype
CG11489	srpk79D	47544 102632							
CG11525	CycG	13655 106846							
CG11533	Asator	45120 45121							
CG11594		28311 105487							
CG11621	Pi3K68D	16240 109582							
CG11660		18526 105395	Wing phenotype Wing phenotype						
CG11811		30915 110740							
CG11859		47401 109296	Wing phenotype Wing phenotype	11859R-2 11859R-3 31580	109296			47401 109296	Wing phenotype Wing phenotype
CG12019	Cdc37	47776 110727	Lethal Lethal		110727	Wing phenotype		47776 110727	Wing phenotype Wing phenotype
CG12066	Pka-C2	30658 108424 23719							
CG12069		100886 9928	Wing phenotype						
CG12072	warts	106174 12072R-1	Lethal Wing phenotype						
CG1210	Pdk1	18736 109812	Wing phenotype Wing phenotype						

CG12147		31659 101875						
CG1216	mri	17043 101345						
CG12229		31704 101097	Wing phenotype					
CG12244	lic	106822 20166						
CG1227		38648 105610	Wing phenotype					
CG12289		31725 105685						
CG12306	polo	20177 12306R-2 12306R-3	Wing phenotype Wing phenotype	12306R-2	20177 12306R-3	Wing phenotype Wing phenotype	20177 12306R-3	Wing phenotype Wing phenotype
CG12559	rl	43123 109108 13044	Wing phenotype					
CG1271		110178						
CG13369		17161 17158 100747 13369R-1	Wing phenotype Wing phenotype Wing phenotype	17161 13369R-1	100747	Lethal Wing phenotype	17161 100747 13369R-1	Wing phenotype Wing phenotype Wing phenotype
CG13388	Akap200	5647 102374	Wing phenotype Wing phenotype					
CG1344		108838						
CG13591	Ssl	17282 108692						
CG1362	cdc2rk	32249 100299						
CG13688	lpk2	43824 43825						
CG1389	tor	36280 101154						
CG14026	tkv	3059 105834	Lethal Lethal		105834	Wing phenotype	3059 105834	Wing phenotype Wing phenotype
CG14030	Bub1	101096 24833 14030R-1 14030R-2	Wing phenotype Wing phenotype	101096 24833 14030R-1 14030R-2	101096	Wing phenotype Lethal Lethal	101096 24833 14030R-2	Lethal Lethal
CG14217	Tao	17432 107645	Wing phenotype Wing phenotype					
CG14305		17477 17478 14305R-3						
CG14396	Ret	30832 107648						
CG14895	Pak3	44607 107260						
CG14939	CycY	107010 32335 34009	Wing phenotype Wing phenotype	107010 32335 32334	107010	Wing phenotype Wing phenotype	107010 32334	
CG1495	CaMK1	101380 1495R-2 39857	Wing phenotype					
CG14992	Ack	14992R-1 33899	Wing phenotype Wing phenotype/Lethal					
CG1511	Eph	4771 110448						
CG15218	Cyck	36216 110774	Wing phenotype Wing phenotype		36216	Wing phenotype	36216 110774	Wing phenotype Wing phenotype



CG15224	Ckll $\beta$	32378 106845	Wing phenotype/Lethal Wing phenotype		106845  Wing phenotype	32378  Wing phenotype 106845  Wing phenotype
CG15547		32621 104520				
CG15793	Dsor1	40026 40025	Wing phenotype Wing phenotype	32920  Lethal	40026  Wing phenotype	40026  Wing phenotype 32920  Wing phenotype
CG15862	Pka-R2	39437 101763				
CG1594	hop	102830 40037 32966	Wing phenotype Wing phenotype			
CG1609	Gcn2	32664 103976	Wing phenotype	32664	103976	32664  Wing phenotype 103976  Wing phenotype 1609R-4 1609R-2
CG16708	Cerk	43412 101550	Wing phenotype			
CG16903		37570 37572	Wing phenotype Lethal			
CG16910	key	7723 100257				
CG16973	msn	101517 16973R-2	Lethal			
CG17010		28791 17010R-2 17010R-3	Wing phenotype			
CG17090	hipk	108254 32855 17090R-1	Wing phenotype Wing phenotype Lethal	108254  Wing phenotype 32855  Wing phenotype	32855  Wing phenotype	108254  Wing phenotype 32855  Wing phenotype
CG17146	Adk1	25214 104475				
CG17161	grp	12680 110076				
CG17216	KP78b	51996 105265				
CG17245	plexB	27220 12167 46687 17245R-2				
CG1725	dlg1	41134 109274	Lethal	109274 41136  Lethal	41136  Wing phenotype	41134  Wing phenotype 109274
CG17256	Nek2	1725R-2 1725R-1	Lethal			
CG17299	SNF4Ay	40052 103408 17299R-1 17299R-3				
CG17342	Lk6	34726 32885	Wing phenotype			
CG17348	drl	109663 27053 100039				
CG1747	Sk1	32932 32930				
CG17471		1747R-3				
CG17520	Ckll $\alpha$	17520R-2 31645	Wing phenotype Wing phenotype	17520R-2  Lethal 31645  Lethal	31645	17520R-2  Wing phenotype 31645  Wing phenotype
CG17528		26292 27057				
CG17550	dent					

CG17599	unt	106056					
CG17596	S6klI	5702					
		101451					
CG17603	Taf1	41099	Lethal				
		106119	Wing phenotype				
CG17698		35634	Wing phenotype				
		105884					
CG1772	dap	36720					
CG17998	Gprk2	1835		1835		1835	
		101463		101463	Wing phenotype	101463	Wing phenotype
		34843	Wing phenotype			34843	Wing phenotype/Lethal
CG18069	CaMKII	47280					
		100265					
CG18085	sev	49925					
		107048					
CG18247	shark	105706					
		25304					
		18255R-1	Wing phenotype				
CG18255	Strn-Mlck	18255R-3					
		26736					
		31891					
		110638					
CG1830	PhKy	33054	Wing phenotype/Lethal				
		52478					
CG18374	Gyk	110806					
		18374R-3					
CG18402	InR	991	Wing phenotype				
		992	Wing phenotype				
CG1848	LIMK1	25343					
		25344					
CG18492	Tak1	101357					
		1388R-2					
CG1851	Ady43A	33133					
		1851R-2					
		109880					
CG18582	mbt	46044					
		29379					
CG18854		31732					
CG1891	sax	42457	Wing phenotype				
		46358	Wing phenotype				
CG1915	sls	47298					
		47301	Wing phenotype				
CG1939	Dpck	44765					
		100276	Wing phenotype				
CG1951		33430					
		33431					
CG1954	Pkc98E	33434					
		108151	Wing phenotype				
		19275					
CG1973	yata	110214					
CG2028	CkIa	13664	Lethal			13664	Lethal
		110768	Wing phenotype/Lethal			110768	Lethal
		25786	Lethal				
CG2048	dco	9241	Wing phenotype	9241	Lethal	9241	Wing phenotype
		2048R-1		2048R-1		2048R-1	
		2048R-3		2048R-3		2048R-3	
		27719					
CG2049	Pkn	108870	Lethal				
		2055R-2					
		28335					
CG2087	PEK	16427	Wing phenotype				
		110278					

CG2201		33502 108958				
CG2210	awd	110782 2210R-2	Wing phenotype	110782 2210R-1 33712	Wing phenotype Lethal	2210R-2 Wing phenotype 110782 2210R-2 Wing phenotype 2210R-1 Wing phenotype 33712 Wing phenotype
CG2246		48878 110389	Wing phenotype			
CG2252	fs(1)h	51227 51305 108662 2252R-2	Wing phenotype/Lethal Lethal Lethal Lethal			51305 Wing phenotype 51305 Wing phenotype/Lethal 108662 Wing phenotype
CG2272	slpr	33518 106449 2272R-1	Wing phenotype	106449 2272R-1	Wing phenotype	33518 Wing phenotype 33518 Wing phenotype 2272R-1
CG2577		41694 105471 49366 103748	Wing phenotype			
CG2615	ik2					
CG2621	sgg	101538 2621R-3  31308	Wing phenotype Wing phenotype	101538 2621R-3 2621R-1	Lethal Wing phenotype Wing phenotype	101538 Wing phenotype 101538 Wing phenotype 2621R-3 Wing phenotype
CG2699	Pi3K21B	104179 33556 13369 109682	Wing phenotype			
CG2794		20909 107766 100266	Wing phenotype Wing phenotype			
CG2845	phl	45041 110621	Wing phenotype Wing phenotype			
CG2846						
CG2899	ksr					
CG2929	Pi4KIIa	40995 110687	Wing phenotype	40995 110687	Wing phenotype	40995 Wing phenotype 110687 Wing phenotype
CG2964		42293 109509	Wing phenotype			
CG3001	Hex-A	21054 104680				
CG30021	metro	29965 110814				
CG3008		52634 103828				
CG30184		3539 104976				
CG30295	lpk1	47790 109497				
CG3051	SNF1A	1827 106200				
CG3068	aur	108446 35763				
CG3086	MAPk-Ak2	3170 110317				
CG31003	gskt	25640 107429	Wing phenotype			
CG3105	Pask	25661 107025				
CG31097		107652 33761				
CG31127	Wsck					
CG31140		38936 101347				
CG31183		859 4773				

CG3127	Pgk	33798 110081				
CG31349	pyd	38863 104159				
CG3140	Adk2	25046 107326	Wing phenotype Wing phenotype			
CG31421	Tak1	25760 110765				
CG31643		31643R-1 31643R-2				
CG3172	twf	25817 21415				
CG31751		110319 105621				
CG31873		36375 46252				
CG32019	bt	46253 34036				
CG32031	Argk	34037 27106				
CG32134	btl	110277 29915				
CG3216		107985 34547				
CG32417	Myt1	105157 101018				
CG32484	Sk2	41905 26534				
CG32649		26536				
CG32666	Drak	107263 32961 44374 <a href="#">29449</a>	Lethal	44374 <a href="#">29449</a>	107263 Wing phenotype	107263 Lethal 44374 <a href="#">29449</a> Wing phenotype
CG32703		13444 109661				
CG32717	sdt	29844 100685				
CG32742	I(1)G0148	40716 104902				
CG32743	nonC	41990 108450				
CG3277		7271 108052				
CG32849	Hex-t2	47331 100218				
CG32944		29286 103642				
CG33102	Hex-t1	46573 46574				
CG33114	Gyc32E	108142 10442				
CG3319	Cdk7	103413	Wing phenotype Wing phenotype			
CG3324	Pkg21D	34594 103513				
CG33338	p38c	105173 29412				
CG33519	Unc-89	106267	Wing phenotype			
CG33531	Ddr	52126 101831				
CG33554	Nipped-A	44781 52487 52486 2905R-3 49772	Wing phenotype Lethal Lethal Wing phenotype	44781 Lethal	52487 Wing phenotype	44781 Wing phenotype 52487 Wing phenotype
CG33671		49772				



CG33981		49773				
CG3400	Pfrx	25958 25959				
CG34344	rdgA	102909 3024				
CG34356		5201	Wing phenotype			
CG34357		28745 109790	Wing phenotype			
		105185 31983				
CG34359	IP3K2	19159		1630R-2	102772	19159 Wing phenotype 1630R-2 Wing phenotype 102772 Wing phenotype
		102772	Wing phenotype			
CG34361	Dgk	38239	Wing phenotype/Lethal			
		105753				
CG34380		29459				
		39447				
CG34384		39446				
		102481				
CG34392	Epac	43739	Wing phenotype			
		110077				
		50373				
CG34412	tlk	105732	Wing phenotype/Lethal	105732	105732	105732 Wing phenotype 20905 Lethal
		20905				
		2829R-1	Lethal			
		33983	Lethal			
CG3510	CycB	43772				
		109611				
CG3525	eas	103784	Wing phenotype			
		34286				
CG3534		109666				
		41276				
CG3544		21685				
		105459				
CG3608		106695				
		3608R-2				
CG3682	PIP5K59B	47027				
		108104				
CG3738	Cks30A	108401				
		108975				
CG3809		43780				
		44576	Wing phenotype			
CG3837		105549				
		40484				
CG3915	Drl-2	102192				
		52662				
CG3938	CycE	110204	Wing phenotype			
		2902	Wing phenotype			
CG4006	Akt1	103703				
		103804				
CG4007	Nrk	42442				
		107207				
CG4012	gek	28367				
CG40129	Gprk1	28354				
CG4026	IP3K1	31733				
		27305				
CG40293	Stlk	34620				
		2897				
CG4032	Abl	110186				
		108887				
CG4041		34780				

CG40478	Dyrk3							
CG4132	pkaap	21792 106808	Wing phenotype					
CG4141	PI3K92E	38985 107390	Wing phenotype					
CG4201	ird5	26427						
CG42273	mnb	28628 107066	Wing phenotype					
CG42317	Csk	109813 32877	Lethal					
CG42320	Doa	20120 102520	Wing phenotype					
CG42341	Pka-R1	103720 26329						
CG42347		101640 44737						
CG42349	Pkcδ	33838 101421						
CG42366		108102 39904	Wing phenotype Lethal					
CG42403	Ca-β	36112 27581						
CG4252	mei-41	105748 103624						
CG42636	Gyc76c	11251 106525 27094						
CG4268	PitsIre	107303 45127	Wing phenotype	107303		Lethal	107303	Wing phenotype
CG42783	aPKC	2907 105624 34332	Wing phenotype Wing phenotype	2907		Lethal	105624	Wing phenotype
CG42856	Sik3	39866 107458						
CG4290	Sik2	103739 26497	Wing phenotype					
CG43143		16334 106088						
CG4353	hep	109277 47509						
CG43729		35848 35850 26065						
CG43741	Ack-like	100169 3969R-2						
CG4379	Pka-C1	31599 101524	Wing phenotype Wing phenotype					
CG4488	wee	106329 26543						
CG4523	Pink1	109614 21860						
CG4527	slik	43783 43784	Wing phenotype Wing phenotype					
CG4546		34869 34868						
CG4551	smi35A	40535 101376 4551R-1 4551R-3		40535			101376	
CG4583	Ire1	39561 39562						
CG4629		26574 26573						
CG4720	Pka2R	110228						

CG4798	FRS2D l(2)k01209	34892 106934 26628 104701 34898 100999 26642							
CG4803	Tak12	932 935 24683 40577 40576							
CG4839		5092R-1 5092R-2 34639	Wing phenotype						
CG4926	Ror	110702 27360 30946							
CG4945		104240	Wing phenotype						
CG5072	Cdk4	22024 107158	Wing phenotype/Lethal						
CG5092	Tor								
CG5125	ninaC								
CG5144									
CG5169	GckIII								
CG5179	Cdk9	30449 103561	Lethal Wing phenotype		30449	Wing phenotype		30449 103561	lethal lethal
CG5182	Pk34A	101146 27368 24440 103656							
CG5288		39402 110565	Wing phenotype						
CG5310	nmdyn-D6								
CG5363	cdc2	106130 41839	Lethal Wing phenotype		106130	Wing phenotype		106130 41839	Wing phenotype Lethal
CG5373	Pi3K59F	100296 5373R-2 33384	Wing phenotype Wing phenotype						
CG5387	Cdk5a	34990 108656	Wing phenotype Wing phenotype						
CG5408	trbl	22113 106774							
CG5452	dnk	39137 103385 102484	Wing phenotype						
CG5475	Mpk2	52277							
CG5483	Lrrk	105630 22140 27469							
CG5626		5626R-1	Wing phenotype						
CG5680	bsk	104569 34138 44157	Wing phenotype Wing phenotype						
CG5725	fbl	101437 110460 27504 110683 45045							
CG5757									
CG5790									
CG5940	CycA	32421 103595	Wing phenotype Wing phenotype/Lethal		32421	Wing phenotype		32421 5940R-4 103595	Wing phenotype Wing phenotype Wing phenotype
CG5974	pll	103774 2889							
CG6027	cdi	109409 43634 44165							
CG6092	Dak1	104861							

CG6114	sff	22224 100717 6117R-1						
CG6117	Pka-C3	6117R-2 27569						
CG6214	MRP	105419 6214R-3						
CG6292	CycT	37562 103387 6292R-3	 Lethal Wing phenotype		103387  Wing phenotype 		37562   Wing phenotype/Lethal 103387  Wing phenotype	
CG6297	JIL-1	107001 6297R-4						
CG6343	ND42	14444 110787	Wing phenotype Wing phenotype					
CG6355	fab1	27591 27592	Wing phenotype					
CG6364		11693 108949	 Wing phenotype  Wing phenotype		108494  Wing phenotype 		11693   Wing phenotype 108949  Wing phenotype	
CG6386	ball	48980 108630	Wing phenotype					
CG6498		109282 35101						
CG6509		101596 46234	Wing phenotype Wing phenotype					
CG6518	inaC	101719 2895						
CG6521	Stam	22497 35016	Wing phenotype Wing phenotype					
CG6535	tefu	22502 108074						
CG6551	fu	27662 27663	Wing phenotype Wing phenotype					
CG6612	Adk3	110382 42064						
CG6620	ial	104051 35107 6620R-3	  Wing phenotype Lethal Wing phenotype/Lethal		35107   Wing phenotype 		104051  Wing phenotype 35107  Wing phenotype	
CG6622	Pkc53E	27696 27699						
CG6703	CASK	104793 34184						
CG6715	KP78a	26722 47657	Wing phenotype					
CG6767		35111 35112 109894 6767R-1	  Wing phenotype Wing phenotype	35112	109894   Wing phenotype 		35112  Lethal 109894  Wing phenotype	
CG6772	Slob	100987 30674						
CG6775	rg	107056 36404						
CG6800		40394 104255						
CG6875	asp	2911 110177	Wing phenotype					
CG6963	gish	106826 26003 28066	 Wing phenotype Wing phenotype Wing phenotype	106826  Wing phenotype 26003  Wing phenotype	106826   		106826  Wing phenotype 26003  Wing phenotype	
CG7001	Pk17E	101951 102179	Wing phenotype					
CG7004	fwd	27786 110159						
		27808	 Wing phenotype		27808   Wing phenotype 		27808  Lethal	



CG7028	PRP4	107042	 Wing phenotype			107042	 Wing phenotype/Lethal
CG7069		101116					
CG7070	PyK	27834					
CG7094		49533					
CG7097	hppy	35165	Wing phenotype				
CG7103	Pvf1	27843					
CG7125	PKD	108273					
CG7156		103580					
		35166					
		6175					
		102699					
		22344	Wing phenotype				
		106255	Wing phenotype				
		26035					
		26036					
CG7177	Wnk	35193		35193	 Wing phenotype	35193	
		35194		35194	 Wing phenotype	35194	Wing phenotype
		106928	 Wing phenotype	106928	 Wing phenotype	106928	Wing phenotype
CG7186	SAK	27904					
CG7207	cert	105102					
CG7223	htl	103563					
CG7236		27914					
CG7281	CycC	27180					
CG7328		6692					
CG7335		27505					
CG7362		27937	Wing phenotype				
CG7393	p38b	48834	Wing phenotype				
CG7405	CycH	110610					
CG7470		27952					
CG7524	Src64B	7328R-1					
CG7525	Tie	29035					
CG7551		100062					
		104218					
		7557					
		108099					
		7393R-3					
		10398					
		104312	Wing phenotype				
		101476					
		38955					
		35252					
		7524R-3					
		27087					
		26879					
		7551R-1					
		7551R-3					
CG7597	Cdk12	25508	 Lethal	34838	 Lethal	25508	 Wing phenotype/Lethal
		25510	 Wing phenotype			34838	 Wing phenotype
						25510	 Lethal
CG7616		41408					
CG7643	ald	104663					
CG7693	fray	110572					
CG7717	Mekk1	7643R-3	Wing phenotype				
CG7719	gwl	106919					
CG7766		41719					
CG7838	BubR1	110339					
		25529					
		21046					
		7719R-1	Wing phenotype				
		52572					
		110184	Wing phenotype				
		26109					
		7838R-1	Wing phenotype				

CG7873	Src42A	26019 100708 3002	Wing phenotype Wing phenotype				
CG7892	nmo	101545 25793					
CG7904	put	37279 107071 7904R-2 7904R-3	Lethal Lethal Lethal		37279	Wing phenotype	37279 7904R-2 7904R-3
CG7995		101869 22652					
CG8049	Btk29A	106962 22675					
CG8057	alc	104489 8057R-4					
CG8094	Hex-C	35338 35337					
CG8173		35846	Wing phenotype				
CG8174	SRPK	105661 26933 103416	Wing phenotype				
CG8201	par-1	52553 52556 32410	Wing phenotype	52553 52556 32410	Lethal	52556	Wing phenotype
CG8203	Cdk5	104491 35856					
CG8222	Pvr	43459 105353					
CG8224	babo	3825 106092	Wing phenotype				
CG8239		24254 107034					
CG8250	Alk	107083 11446					
CG8286	P58IPK	109649 14154 43541					
CG8298		43539 8298R-3					
CG8351	Tcp-1η	108585 28895	Wing phenotype				
CG8362	nmdyn-D7	35903 105161					
CG8363	Papss	35904 110544					
CG8475		2801 110591	Wing phenotype				
CG8485		35939 35940	Wing phenotype	35940		35939	Wing phenotype
CG8565		100449 8565R-2					
CG8637	trc	35988 107923	Wing phenotype Wing phenotype				
CG8657	Dgkε	4659 8657R-2	Wing phenotype				
CG8726		109451 40719					
CG8767	mos	110435 43526					
CG8789	wnd	103410 26910					
CG8808	Pdk	106641 37968					
CG8866		103725					

CG8874	Fps85D	44859 36053 107266				
CG8878		28971 100985	Wing phenotype Wing phenotype		100985	28971 100985 Wing phenotype Wing phenotype
CG8914	CK11β2	102633 26915				
CG8948	Graf	42165 42166				
CG8967	otk	42566 30834 104688 8967R-2		42566 30834 104688 8967R-2 Wing phenotype	104688	30834 104688 Wing phenotype
CG9096	CycD	29024 105361				
CG9222		104259 27010				
CG9326	vari	104548 24157	Wing phenotype			
CG9358	Phk-3	106938 49008				
CG9374	lkb1	34362 108356	Wing phenotype			
CG9541		49212 102912				
CG9738	Mkk4	108561 26929				
CG9746	ird1	9746R-1 110706	Wing phenotype Wing phenotype			
CG9774	rok	3793 104675	Wing phenotype Wing phenotype			
CG9961		101702 36176				
CG9962		108721 36473				
CG9985	sktl	6229 101624	Wing phenotype Wing phenotype			

Weak-Medium Decrease -0.2 to -0.5  
 Medium-Strong Decrease > -0.5  
 Weak-Medium Increase +0.2 to +0.5  
 Medium-Strong Increase > +0.5  
 No change

Transgenic RNAi Project strains are in blue font  
 National Institute of Genetics strains have the letter R in the stock number  
 All other strains are from Vienna Drosophila RNAi Center

Fig. S5

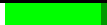
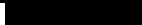


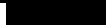

**Phosphatase Data**

Weak-Medium Decrease -0.2 to -0.5  
 Medium-Strong Decrease > -0.5  
 Weak-Medium Increase +0.2 to +0.5  
 Medium-Strong Increase > +0.5  
 No change

Wing phenotype any visible wing phenotype including notches, blisters, vein spacing, altered size  
 Lethal No adults recovered

Drosophila Phosphatase			PRIMARY SCREEN						SECONDARY SCREEN						HEDGEHOG SCREEN				
Annotation Symbol	Gene Symbol	Gene Name	RNAi Stock	UAS-dcr2;;dpp-Gal4			RNAi Stock	UAS-dcr2;hh-Gal4			RNAi Stock	UAS-dcr2;C5-Gal4			UAS-dcr2; dpp-Gal4 or UAS-dcr2; hh-Gal4	RNAi Stock	MS1096-Gal4;UAS-dcr2		
				Wing disc		Adult		Wing disc		Adult		Wing disc		Adult			Wing disc		Adult
				Wg	Sens	Dll		Wg	Sens	Dll		Wg	Sens	Dll			Cut	Ci	Ptc
CG10089			17991																
			108744																
CG10138	PpD5	Protein phosphatase D5	18016			Wing phenotype													
			104452			Wing phenotype													
CG10371	Plip	PTEN-like phosphatase	47624			Wing phenotype													
			104774			Wing phenotype													
CG10376			101335			Wing phenotype													
			35475			Wing phenotype													
CG10417			27259																
			106180																
CG10426			16048																
			34037																
CG10443	Lar	Leukocyte-antigen-related-like	107996																
			36270																
			36269																
CG10493	Phlpp	PH domain leucine-rich repeat protein phosphatase	110360																
			45365																
CG10574	I-2	Inhibitor-2	101547			Wing phenotype				101547					101547		Wing phenotype		
			39054			Wing phenotype									39054		Wing phenotype		
CG10592			104767																
			38171																
CG10827			30822																
			100073																
CG10930	PpY-55A	Protein phosphatase Y at 55A Protein	102021																
			16096																
CG10975	Ptp69D	tyrosine phosphatase 69D	104761																
			40631																
CG11217	CanB2	Calcineurin B2	104370																
			28762																
CG11425			103037																
			8458																
CG11426			42599																
			42600																
CG11437			9452			Wing phenotype													

CG11437			31721						
CG11438			11438R-3 11438R-2						
CG11440	laza	lazaro	42594 109898						
CG11516	Ptp99A	Protein tyrosine phosphatase 99A	103457 27208						
CG11597			38540 104729						
CG11883			106744 38590	Wing phenotype	106744 38590	Wing phenotype	38590	106744 38590	Wing phenotype Wing phenotype
CG12034			107062 12034R-1						
CG12078			101274 15288						
CG12091			100800 13987						
CG12151	Pdp	Pyruvate dehydrogenase phosphatase	31661						
CG12169	Ppm1	Ppm1	107271 38631						
CG12173			101257 31676 31674						
CG12217	PpV	Protein phosphatase V	101997 31690	Wing phenotype Wing phenotype			101997 31690	Wing phenotype Wing phenotype	
CG12252	Fcp1		38640 106253	Wing phenotype Wing phenotype			38640 106253	Lethal Wing phenotype	
CG1228	Ptpmeg	Ptpmeg	38652						
CG12538			103740 102895						
CG12746			31957 104989						
CG13125	TbCMF46	TbCMF47	33314 17123						
CG13197			36423 105122	Wing phenotype					
CG13311			51574 101655	Wing phenotype					
CG13570	spag	spaghetti	103353 23895						
CG1395	stg	string	17760 1395R-1 1395R-2 34831	Wing phenotype	17760 34831	Wing phenotype Lethal	17760 34831	Wing phenotype Wing phenotype	
CG14022		Mitogen-activated	110777 31795 45415						

CG14080	Mkp3	acuvateo protein kinase phosphatase	23911				
			104884		Wing phenotype	104884	
CG14211	MKP-4	MAPK Phosphatase 4	3146		Lethal		
			3147		Wing phenotype		
			14211R-4			104884	
						3147	
CG14297			102071				
			14297R-4				
CG14411			17579				
			109622		Wing phenotype		
CG1455	CanA1	Calcineurin A1	32283				
			32284				
CG14616	I(1)G0196	lethal (1) G0196	106973				
		Alkaline					
CG1462	Aph-4	phosphatase 4	6862				
			110043				
CG14719	It	inhibitor-t	105565				
			32314				
CG14903			49108				
			105752				
CG15035			100241				
			32353				
CG15385			51859				
			110458				
CG15400			7261				
			15400R-2				
CG15528			14865				
			105484				
CG15533			42520				
			102842				
CG15534			108181				
			30187				
CG15743			42686		Wing phenotype		
			42685				
CG1637			101368		Wing phenotype		
			<a href="#">33733</a>				
CG16717			29199				
			105831				
CG16757	Spn	Spinophilin	19658				
			105888				
CG16771			6386				
			16771R-2				
CG16870	Acyp	Acylphosphatase meiotic	16870R-2				
			16870R-1				
CG16928	mre11	recombination 11	30474				
			30476				
CG1696	Dd	Dullard	104785				
			12941				
CG17026			32813				
			49199				
CG17027			103270				

CG17027			50075										
CG17028			100100										
			32819										
CG17029			32823										
			49565										
CG17124			19078										
			17124R-3										
CG17291	Pp2A-29B	Protein phosphatase 2A at 29B	49672		Lethal		49672	 	Wing phenotype 	49672		Lethal	
			23886		Wing phenotype					23886		Wing phenotype	
CG17598			32956		Wing phenotype								
			32955										
CG17746			100178										
			40102										
CG1809			43231										
			1809R-1										
CG1810	mRNA-cap	mRNA-capping enzyme	108809		Wing phenotype		108809	 	Wing phenotype 	108809		Wing phenotype/ Lethal	
			32847		Wing phenotype	32847		Lethal		32847		Wing phenotype	
CG1817	Ptp10D	Protein tyrosine phosphatase 10D	1102										
			8010										
CG18243	Ptp52F	Ptp52F	39175										
			3116										
CG1906	alph	alphabet	105483										
			32476										
CG2096	flw	flapwing	29622		Wing phenotype	29622				29622			
			104677		Wing phenotype	104677	 	Wing phenotype 		104677		Wing phenotype	
			15305R-1			15305R-1							
CG2104			30018										
			100216										
CG2890	PPP4R2r	Protein phosphatase 4 regulatory subunit 2-related protein	105399		Wing phenotype					105399		Wing phenotype	
			25445		Wing phenotype		25445	 		25445		Wing phenotype/ Lethal	
CG2984	Pp2C1	Protein phosphatase 2C	105249			105249		Wing phenotype	105249	 	105249		Wing phenotype
			2984R-4				2984R-3	Wing phenotype		2984R-4		Wing phenotype	
CG30103			105458										
			4950										
CG30104			10051										
			106640										
CG3028	lpp	Inositol polyphosphate 1-phosphatase	110775										
			25615										
CG3059	NTPase	NTPase	110510										
			7265										
CG31137	twin	twin	13365										

CG31137	twiii	twiii	104442					
CG31299	cu	curled	45442					
CG31469			109759					
CG31692	fbp	fructose-1,6-bisphosphatase	102474					
			23397					
			108554					
			21396					
CG31717			7663		Lethal	7663		Wing phenotype
			7662		Wing phenotype/Lethal			7662
			105379					105379
			31717R-1			31717R-1		31717R-1
								31717R-3
CG31759			106772					
CG3178	Rrp1	Recombination repair protein 1	47321					
CG31795	IA-2	IA-2 ortholog	108661					
			19819					
			7560					
			110595					
CG32156	Mbs	Myosin binding subunit Protein	105762		Wing phenotype	105762		Wing phenotype
			32516		Wing phenotype			32516
CG3245	PpN-58A	Protein phosphatase N at 58A	41901					
CG32487			102060					
CG32488			26154					
			2077R-1					
			46570					
			100129					
CG32505	Pp4-19C	Protein phosphatase 19C	25317		Wing phenotype	25317		Lethal
			27726		Lethal			27726
								Wing phenotype
CG32568			103317					
CG3264			46651					
			43250					
			108783					
CG32697	I(1)G0232	lethal (1) G0232	104427			21276		104427
			21276			3101R-1		21276
						33744		
								Wing phenotype
								Wing phenotype
CG32812			45397					
CG3289	Ptpa	Phosphotyrosyl phosphatase activator	104081					
CG3290			41913					
CG3292			41912					
			104586					
			52378					
			19989					
			3292R-2					
CG33747	primo-2	primo-2	23081		Wing phenotype	23079		23081
			23079		Wing phenotype	39004		23079
			39004			50642		39004
								Wing phenotype/Lethal
								Lethal




CG33748	primo-1	primo-1						
CG3376			12226					
			12227					
CG34099	Mkp	MAP kinase-specific phosphatase	104374					
CG34140			23452	Wing phenotype				
			23454					
CG3530			110786		110786	Wing phenotype		110786
			26217					
			26216	Wing phenotype	26216	Wing phenotype	26216	Wing phenotype
CG3573	Ocrl	Oculocerebror enal syndrome of Lowe ortholog	34649					
			110796					
CG3632			110167					
			26254					
CG3705	aay	astray	23179					
			110661					
CG3954	csw	corkscrew	108352	Wing phenotype				108352
			21757	Wing phenotype		21757	Wing phenotype	21757
CG3980	Cep97		34774					
CG40448	Pp1-Y2	Pp1-Y2	103357					
		Multiple inositol polyphosphate phosphatase 1	109147					
CG4123	Mipp1	polyphosphate phosphatase 1	101634					
			8493					
CG41534	Pp1-Y1	Pp1-Y1	110123					
			21607					
CG4209	CanB	Calcineurin B	21611					
			52390					
CG42249			101200					
			47397					
			41672					
CG42271			100176	Wing phenotype				
			33768	Wing phenotype	33768	Lethal		33768
			33769		33769	Lethal		
CG42283	5Ptasel	5Ptasel	25030					
			100802	Wing phenotype	100802	Wing phenotype/Lethal		100802
CG42327			106630					
			47455					
CG4317	Mipp2	Multiple inositol polyphosphate phosphatase 2	14163					
			108018					
CG4733	PR72	PR72	107621		107621			107621
			34894	Wing phenotype	34894	Wing phenotype		34894
CG4827	veil	veil	49359					
			100050					
			46064					
CG4965	twe	twine	104147					

CG4993	PRL-1	PRL-2	107836 45518 105674							
CG5026			34916							
CG5150			102646 15298							
CG5171			108686 5171R-3							
CG5177			27367 103024 5177R-1 5177R-2	Wing phenotype						
CG5276			47995							
CG5361			106691 51984 51985	Wing phenotype						
CG5567			44319							
CG5577			106981 22163 5577R-1							
CG5643	wdb	widerborst	27470 101406 5643R-3		27470 101406 5643R-3	Wing phenotype Wing phenotype/ Lethal	101406		27470 101406 5643R-3	Wing phenotype Wing phenotype
CG5650	Pp1-87B	Protein phosphatase 1 at 87B	35024 35025 32414	Wing phenotype/ Lethal Wing phenotype			32414	35024 35025 32414	Lethal Lethal	
CG5656			110733 18119							
CG5671	Pten	Pten	101475 35731	Wing phenotype						
CG5784	Mapmodulin	Mapmodulin	100283 49385							
CG5820	Gp150		36301 100134	Wing phenotype Wing phenotype			36301	36301 100134	Wing phenotype Wing phenotype	
CG5830			101539 5830R-2							
CG5851	sds22	sds22	42051 5851R-1	Lethal Wing phenotype/Lethal			42051	42051 5851R-1	Wing phenotype Wing phenotype	
CG6036			21023 105568							
CG6235	tws	twins	104167 34340	Wing phenotype Wing phenotype			104167	104167 6235R-2 34340	Wing phenotype Wing phenotype Wing phenotype	
CG6238	ssh	slingshot	107998 30136 29950 100121	Wing phenotype						
CG6380			6542R-1 6542R-2	Wing phenotype						
CG6542	EDTP	Egg-derived tyrosine phosphatase								
			46070 34378		46070 34378			34378	Wing phenotype	

CG6562	synj	synaptotjanin	6562R-1  Wing phenotype/ Lethal	27489	6562R-1  Wing phenotype 	6562R-1  Wing phenotype
			6562R-2  Wing phenotype/ Lethal			
CG6571	rdgC	retinal degeneration C	35105			
			6571R-2			
CG6593	Pp1α-96A	Protein phosphatase 1α at 96A	27673  Lethal		27673   Wing phenotype 	27673  Lethal
			105525  Lethal			105525  Lethal
CG6656			104175			
			1633			
CG6746			46513	Wing phenotype		
			103625			
CG6805			107728			
			<a href="#">34615</a>			
CG6896	MYPT-75D	MYPT-75D	109909   Wing phenotype		109909   	109909   Wing phenotype
			6896R-1  Wing phenotype			6896R-1   Wing phenotype
			<a href="#">34688</a>			
CG6899	Ptp4E	Protein tyrosine phosphatase 4E	1012			
			27232			
CG6939	Sbf	SET domain binding factor	22317			
			<a href="#">32419</a>			
CG7067	NitFhit	Nitrilase and fragile histidine triad fusion protein	27831			
			108545			
CG7109	mts	microtubule star	41924  Wing phenotype/ Lethal	41924  Wing phenotype	41924   Lethal 	41924  Lethal
			35171  Wing phenotype	35171  Wing phenotype		35171  Wing phenotype
			35172			
CG7115			9404  Wing phenotype	9404  Wing phenotype	9404  	9404  Wing phenotype
			103354  Wing phenotype	103354  Wing phenotype		103354  Wing phenotype
			<a href="#">39065</a>	<a href="#">39065</a>		<a href="#">39065</a>
CG7134	cdc14	cdc14	103627	Wing phenotype		
			7134R-6	Wing phenotype		
CG7180			102397			
			34369			
CG7378			106098			
			35226			
CG7615	fig	fos intronic gene	47314			
			47312			
CG7789						
CG7850	puc	puckered	3019			
			3018	Wing phenotype		
CG7899	Acph-1	Acid phosphatase 1	110470			
			3579	Wing phenotype		
CG7913	Pp2A-B'	Pp2A-B'	22614			
			107057			
CG7942	ldhr	lariat debranching	110582	Wing phenotype		

CG8105		ectonucleotidase enzyme	7942R-4 104510 8037 2892 100052	Wing phenotype  Wing phenotype				
CG8402	PpD3	Protein phosphatase D3	107386 24308 8402R-1	Wing phenotype Wing phenotype		24308	24308 8402R-1	Wing phenotype Wing phenotype
CG8455			47953 8455R-2 108802 28915 8509R-2	Wing phenotype				
CG8509				Wing phenotype				
CG8584			107849 26987 26988	Wing phenotype	107849 26988	26988	26988	Wing phenotype Wing phenotype
CG8804	wun	wunen	6447 51090					
CG8805	wun2	wunen-2	103452 4176 4177 8805R-1 32423	Wing phenotype Wing phenotype Wing phenotype	103452 4176 8805R-1 32423	4176	103452 4177 8805R-1	Wing phenotype Lethal Wing phenotype Wing phenotype
CG8822	PpD6	Protein phosphatase D6	104211 36047					
CG8889	Mppe	Metallophosphoesterase	108190 8889R-2	Wing phenotype				
CG8980	NiPp1	Nuclear inhibitor of Protein phosphatase 1	108859 42175					
CG9115	mtm	myotubularin	29032 31552 9115R-1 9115R-2		29032 9115R-1	9115R-1	29032 9115R-1	Wing phenotype Wing phenotype
CG9128	Sac1	Sac1	37216 44376					
CG9151	acj6	abnormal chemosensory jump 6	9827 105292					
CG9156	Pp1-13C	Protein phosphatase 1 at 13C	29057 107770	Lethal	9156R-1	29057	29057 9156R-1 107770	Wing phenotype Lethal Wing phenotype Wing phenotype
CG9181	Ptp61F	tyrosine phosphatase 61F	37436 108888 101474 39162 100593 24150 101546 2879					
CG9236	Cib2	CIB2 ortholog						
CG9238								
CG9267								
CG9311	mop	myopic	104860 14174	Wing phenotype Wing phenotype/ Lethal		14174	104860 14174 9311R-3	Wing phenotype Wing phenotype Wing phenotype

			9311R-4	 	Lethal										
CG9351	fifi	falafel	24143		Wing phenotype			24143		Wing phenotype		24143		Wing phenotype	
			103793		Wing phenotype	103793		Wing phenotype				103793		Wing phenotype	
CG9389			44663												
CG9391			23723												
CG9449			23725												
			12895												
			102991												
CG9451			109721												
			14344												
CG9452			100887												
			51202												
CG9493	Pez	Pez	108301		Wing phenotype	108301						108301		Wing phenotype	
			9493R-3		Wing phenotype							9493R-3		Wing phenotype	
			40743		Wing phenotype	9493R-2						9493R-2		Wing phenotype	
						40743		Lethal	40743		Wing phenotype		40743		Wing phenotype
CG9554	eya	eyes absent	43911		Wing phenotype				43911			43911		Wing phenotype	
			108071			108071		Wing phenotype				108071		Wing phenotype	
			28733			28733						28733		Wing phenotype	
CG9601			24070												
			108251												
CG9619	Gbs-76A	Glycogen binding subunit 76A	103044												
			36121												
CG9764	yrt	yurt	28674												
			107016												
CG9784			108075												
			30098		Wing phenotype										
CG9801			104525												
CG9819	CanA-14F	Calcineurin A at 14F	109858		Wing phenotype										
			30105												
CG9842	Pp2B-14D	phosphatase 2B at 14D	46873												
			103144												
CG9856	PTP-ER	phosphatase-tyrosine ERK/Enhancer of Ras1	9856R-1												
			9856R-2												
			32359												

Weak-Medium Decrease -0.2 to -0.5  
 Medium-Strong Decrease > -0.5  
 Weak-Medium Increase +0.2 to +0.5  
 Medium-Strong Increase > +0.5  
 No change

Transgenic RNAi Project strains are in blue font  
 National Institute of Genetics strains have the letter R in the stock number  
 All other strains are from Vienna Drosophila RNAi Center

Fig. S6

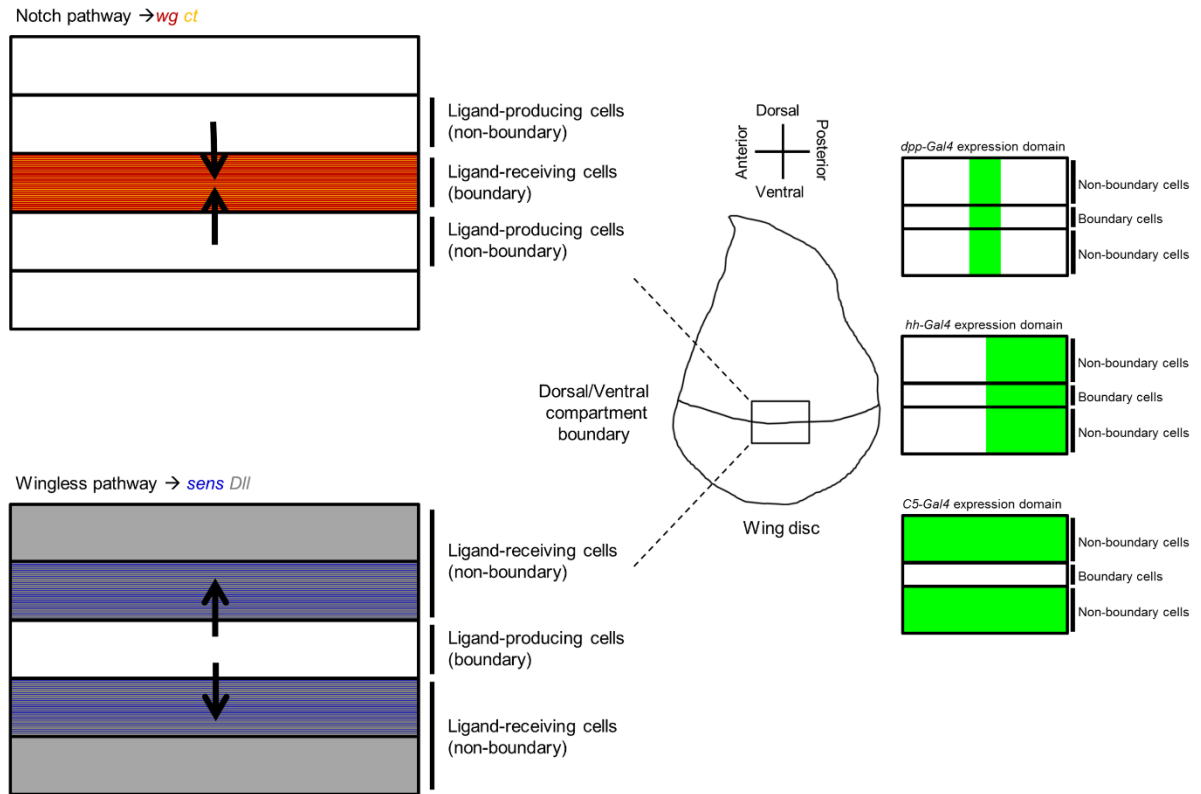


Fig. S7

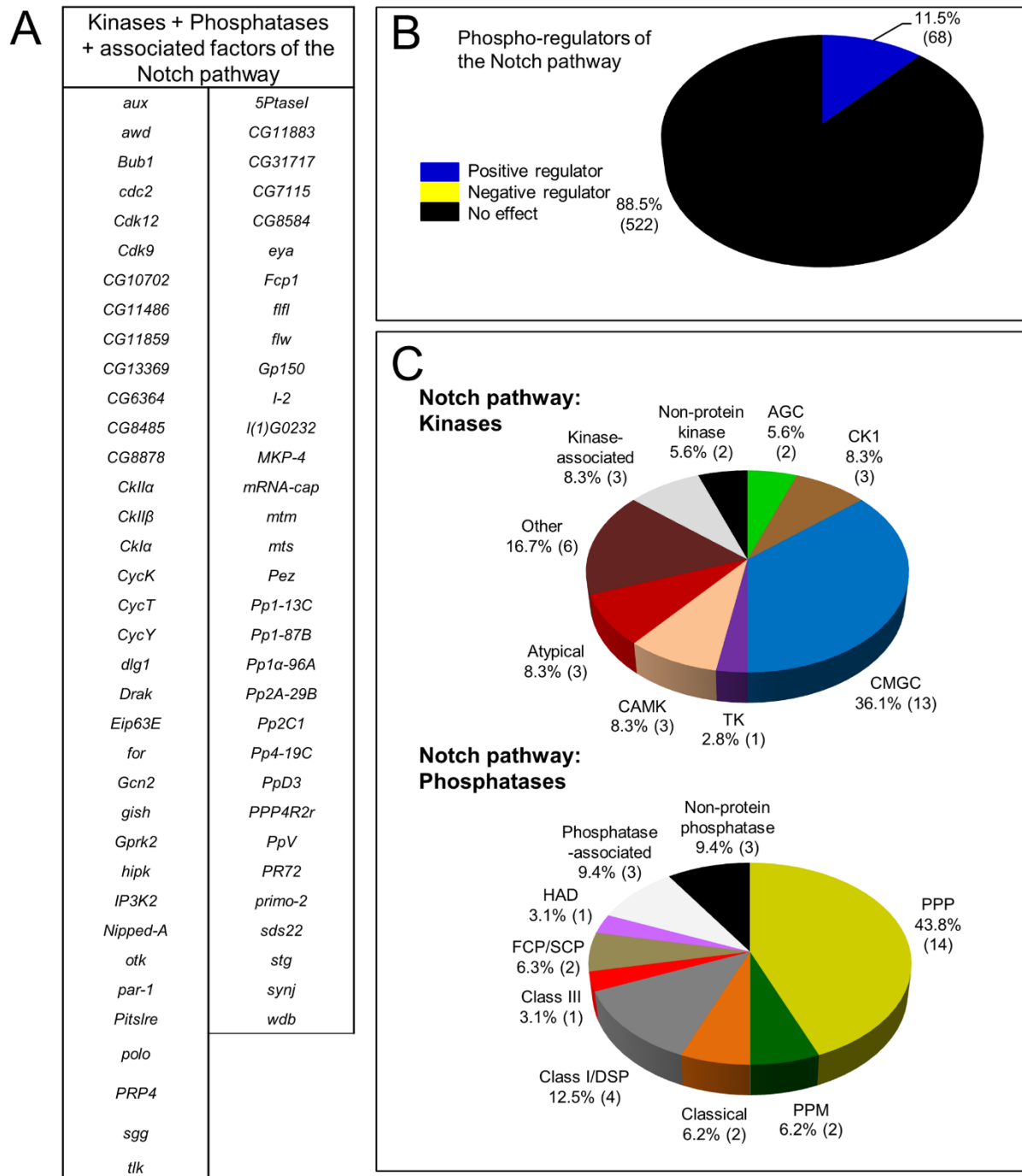
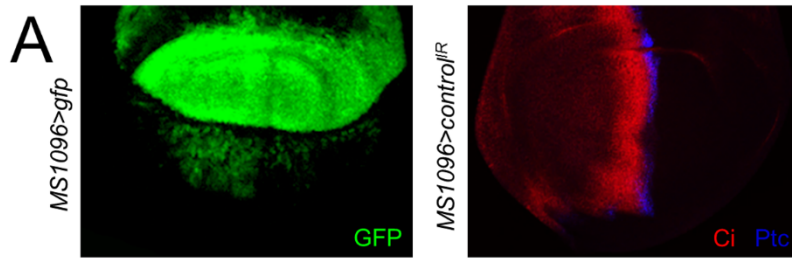


Fig. S8



**B**

Kinase (+ associated factor)	Hedgehog pathway	Phosphatase (+ associated factor)	Hedgehog pathway
<i>aPKC</i>	Yellow	<i>5Ptasel</i>	Black
<i>aux</i>	Yellow	<i>CG11883</i>	Yellow
<i>awd</i>	Yellow	<i>CG31717</i>	Black
<i>Bub1</i>	Yellow	<i>CG3530</i>	Black
<i>cdc2</i>	Yellow	<i>CG7115</i>	Yellow
<i>Cdc37</i>	Yellow	<i>CG8584</i>	Black
<i>Cdk12</i>	Yellow	<i>csw</i>	Black
<i>Cdk9</i>	Blue	<i>eya</i>	Black
<i>CG10702</i>	Black	<i>Fcp1</i>	Yellow
<i>CG11486</i>	Black	<i>ffl</i>	Yellow
<i>CG11859</i>	Yellow	<i>flw</i>	Blue
<i>CG13369</i>	Yellow	<i>Gp150</i>	Yellow
<i>CG6364</i>	Yellow	<i>I-2</i>	Yellow
<i>CG676</i>	Black	<i>I(1)G0232</i>	Black
<i>CG8485</i>	Black	<i>Mbs</i>	Yellow
<i>CG8878</i>	Black	<i>MKP-4</i>	Black
<i>CkIIa</i>	Blue	<i>mop</i>	Black
<i>CkIIβ</i>	Blue	<i>mRNA-cap</i>	Blue
<i>Ckla</i>	Yellow	<i>mtm</i>	Blue
<i>CycA</i>	Yellow	<i>mts</i>	Blue
<i>CycK</i>	Yellow	<i>MYPT-75D</i>	Yellow
<i>CycT</i>	Blue	<i>Pez</i>	Black
<i>CycY</i>	Blue	<i>Pp1-13C</i>	Yellow
<i>dco</i>	Yellow	<i>Pp1-87B</i>	Yellow
<i>dlg1</i>	Yellow	<i>Pp1α-96A</i>	Yellow
<i>Drak</i>	Blue	<i>Pp2A-29B</i>	Yellow
<i>Dsor1</i>	Blue	<i>Pp2C1</i>	Black
<i>Egfr</i>	Blue	<i>Pp4-19C</i>	Yellow
<i>Eip63E</i>	Blue	<i>PpD3</i>	Yellow
<i>for</i>	Yellow	<i>PPP4R2r</i>	Yellow
<i>fs(1)h</i>	Blue	<i>PpV</i>	Yellow
<i>Gcn2</i>	Yellow	<i>PR72</i>	Blue
<i>gish</i>	Blue	<i>primo-2</i>	Black
<i>Gprk2</i>	Blue	<i>sds22</i>	Black
<i>hipk</i>	Blue	<i>stg</i>	Yellow
<i>ial</i>	Yellow	<i>synj</i>	Yellow
<i>IP3K2</i>	Yellow	<i>tw</i>	Blue
<i>Nipped-A</i>	Yellow	<i>wdb</i>	Blue
<i>otk</i>	Black	<i>wun2</i>	Black
<i>par-1</i>	Black		
<i>Pi4KIIa</i>	Blue		
<i>Pitslre</i>	Yellow		
<i>polo</i>	Yellow		
<i>PRP4</i>	Yellow		
<i>put</i>	Yellow		
<i>sgg</i>	Yellow		
<i>slpr</i>	Black		
<i>smi35A</i>	Black		
<i>tkv</i>	Yellow		
<i>tlk</i>	Black		
<i>Wnk</i>	Black		

■ Positive regulator  
■ Negative regulator  
■ No effect



Fig. S9

