in PKN	Node 1	Action	Node 2	Node1 type	Node2 type	UniProtID	UniProtID	*PMID (;)*	Class	Evidence Tag	Comments
yes-altered	byr4&cdc16	->	byr4-cdc16	protein	complex	Q10951;P36618	Q10951-P36618		S		in PKN, functions were assigned independently to byr4 and cdc16. During the optimization we transfered these functions to the complex, and we built in the complex creation mechanism
yes	byr4-cdc16	-|	spg1	complex	protein	Q10951-P36618	P87027	*10381387;17340144;19305416;9742395;20876564;16691419;18252797;19736319*	S	Cdc16 and Byr4 form a two component GTPase-activating protein (GAP) for Spg1 that inhibits its activity	
yes-altered	spg1&cdc11	->	cdc7	protein	protein	P87027	P41892	*19736319;17340144;9742395;9203579;11514436;18252797;16691419;10381387;9420333;*	S	GTP-bound Spg1 recruits its downstream effector, the Cdc7 kinase	interaction changed from spg1 activating cdc7 to spg1&cdc11->cdc7
yes	nak1	->	orb6	protein	protein	O75011	O13310	*20805322;16096637*	S	Orb6 kinase is activated by the GC kinase Nak1;The exact mechanism by which Nak1 activates Orb6 remains unclear.	
yes	pmo25	->	nak1	protein	protein	Q9P7Q8	O75011	*20805322;16096637;*	S	the known dependence of Nak1 activity on Pmo25	
yes	etd1	->	spg1	protein	protein	Q9UTR4	P87027	*19736319*	S	Our results suggest that the key function of Etd1 is to cause the hyperactivation of Spg1 that occurs in late anaphase.	
yes-altered	cdc11&cdc7&^SIP	->	sid2	protein	protein	O74473	Q09898	*10459013;15062098;19736319;10459013;10775265*	S	A)Cdc11p(488–660) was the smallest tested Cdc11p region that showed a positive interaction with Sid2p. Using a similar strategy, we found that the N terminus but not the kinase domain of Sid2p directed its interaction with Cdc11p. B) SPB-localized Cdc7 then promotes activation of the Sid2 protein kinase	concatenated cdc7->sid2 and cdc11->sid2, added SIP regulation
yes	cdc7	->	sid2	protein	protein	P41892	Q09898	*19736319;10459013;10775265*	S	SPB-localized Cdc7 then promotes activation of the Sid2 protein kinase	
yes	ras1	->	scd1	protein	protein	P08647	P40995	*8682866;11063680*	U	ras1 binds and presumably activates the scd1 protein	
yes	cdc7	->	cdc11	protein	protein	P41892	O74473	*8039497;1527180;12546793*	S	We demonstrate that mitotic hyperphosphorylation of cdc11p requires the activity of cdc7p	
yes	cdc7	->	pmo25	protein	protein	P41892	Q9P7Q8	*20876564*	I	The localization of Pmo25 at the SPBs and the kinase activities of Nak1-Orb6 during interphase are under the control of the Cdc7 and Sid1 SIN kinases, suggesting a functional linkage between SIN and the network for cell morphogenesis	
yes	cdc14-sid1	->	pmo25	protein	protein	O14305	Q9P7Q8	*20876564*	I	The localization of Pmo25 at the SPBs and the kinase activities of Nak1-Orb6 during interphase are under the control of the Cdc7 and Sid1 SIN kinases, suggesting a functional linkage between SIN and the network for cell morphogenesis	sid1 of the PKN became cdc14- sid1 and the cdc14 and sid1 independant functionalities were transfered to the complex
yes	sid4	->	cdc11	protein	protein	O60187	O74473	*15062098;11676915*	I	Cdc11p is a phosphoprotein, which becomes hyperphosphorylated during anaphase. It localizes to the spindle pole body at all stages of the cell cycle, in a sid4p-dependent manner, and cdc11p is required for the localization of all the known SIN components, except sid4p, to the SPB. Cdc11p and sid4p can be coimmunoprecipitated from cell extracts.	
yes-altered	cdc16	->	cdc11	protein	protein	P36618	O74473	*15062098*	I	Cdc16p interacted with the N-terminal 660 amino acids of Cdc11p but not the Cdc11p C-terminal half	inversed
yes	cdc11	->	spg1	protein	protein	O74473	P87027	*15062098*	I	In a two-hybrid assay, Spg1p interacted with full-length Cdc11p as well as the Cdc11p N terminus (amino acids 1–551). ...indicating that Cdc11p and Spg1p interact directly.	
yes	sid2-mob1	->	flp1	complex	protein	Q09898-O94360	Q9P7H1	*12957817;19305416*	S	Figure 4	
yes	scd1	->	cdc42	protein	protein	P40995	Q01112	*20175747;12972551;16931912*	S	Fission yeast Cdc42p is activated by a GEF called Scd1p or Ral1p	
yes	gef1	->	cdc42	protein	protein	Q09763	Q01112	*20175747;12972551*	S	This study and a parallel study by others establish that Gef1p is another GEF for Cdc42p	
yes	ppc89	->	sid4	protein	protein	O60187	Q10218	*16775007*	I	this observation not only suggests a SIN tethering role for Ppc89 but indicates that the N-terminal 300 amino acids of Sid4 is solely responsible for its essential function in the SIN. This conclusion is consistent with the evidence that Sid4 residues 1–300 contain the docking sites for the checkpoint protein Dma1p, the mitotic kinase Plo1, and also Cdc11, which in turn links to all other SIN components and Cdk1-cyclin B	
yes	cdc42	-|	byr4	protein	protein			*8682866*		scd1-null is more sensitive to very mild byr4OP, suggesting that cdc42 stimulates SIN signalling, or inhibits byr4p. The latter is taken for the model, applying Occam's razor.	
yes	cdc42	->	pak1	protein	protein			*9858584*		Cdc42 interaction disrupts the intramolecular interactions of Pak1, thereby releasing the kinase from autoinhibition.	
yes	pak1	->	orb6	protein	protein			*9636183*		Pak1/Shk1 is required for proper Orb6 intracellular localization (Orb6 kinase acts downstream of a morphogenetic control pathway involving Cdc42 and Pak1/Shk1)	
yes	orb6	->	gef1	protein	protein			*19646873*		Orb6 Kinase spatially controls Cdc42 GEF Gef1 localization to the cell tips	
yes	pak1	->	pom1	protein	protein			*12764130*		Tea1 (regulator of Pom1), is a potential substrate target of the p21-activated kinase, Shk1; it is directly phosphorylated	
yes	pom1	-|	Rga4	protein	protein			*18328707*		Pom1 interacts with Rga4 to exclude it from the cell tips (might not be a direct interaction)	
yes	Rga4	-|	cdc42	protein	protein			*18328707; 21849474*		Rga4 is a GAP for cdc42	
yes	sid4	->	plo1	protein	protein	O60187	P50528	*15062098;16775007*	I	We find that Sid4p interacts with the SIN activator, Plo1p, in addition to Cdc11p and Dma1p.	
yes	sid4&CK1	->	dma1	protein	protein	O60187	Q10322	*15062098;20980623*	I	Dma1 localizes to the SPB during meiosis and the maintenance of this localization at meiosis II depends on septation initiation network (SIN) scaffold proteins Sid4 and Cdc11	
yes-altered	dma1&sid4	-|	plo1	protein	protein	Q10322	P50528	*12479804*	S	overexpressing Dma1p reduces SIN signaling. Dma1p seems to function by inhibiting the SIN activator, Plo1p kinase,	added dependance on sid4
yes	cdk-H&ppc89	->	SIP	complex	complex			*22119525*		Ppc89 is required for SIP localisation; in cdc25-22 G2 arrested cells, csc1 is not on the SPBs, in prometaphase arrested cells it is on SPBs	
no	cdk-0	-|	SIP	complex	complex			*22119525*		SIP complex dislocation from SPB is linked to Cdc13 degradation (in non-degradable Cdc13 - csc1 on SPBs)	Adjusted SIP regulation for multi-node CDK
yes-altered	cdk-0	->	flp1	protein	protein	Q9P7H1	P04551	*16950131*	S	Cdk1 phosphorylates and inhibits the catalytic activity of the Cdc14 family member, Clp1/Flp1. As Cdk1 activity declines during anaphase progression, Clp1/Flp1 autocatalytically reverses these phosphorylation events to stimulate its own activity.	adjusted cdc2-|flp1 regulation for multi-node CDK
yes-altered	cdk-H	-|	flp1	protein	protein	Q9P7H1	P04551	*16950131*	S	Cdk1 phosphorylates and inhibits the catalytic activity of the Cdc14 family member, Clp1/Flp1. As Cdk1 activity declines during anaphase progression, Clp1/Flp1 autocatalytically reverses these phosphorylation events to stimulate its own activity.	adjusted cdc2-|flp1 regulation for multi-node CDK
yes-altered	cdk-L	-|	plo1	complex	protein	P04551-P10815	P50528	*17340144;18793196;11250892*	S	Plo1 kinase is activated downstream of MPF	adjusted cdk regulation to plo1 for multi-node CDK
yes-altered	cdk-H	->	plo1	complex	protein	P04551-P10815	P50528	*17340144;18793196;11250892*	S	Plo1 kinase is activated downstream of MPF	adjusted cdk regulation to plo1 for multi-node CDK
yes-altered	sid2-mob1&^cdk-H	->	nak1					*23394829; 24972934*		Sid2 phosphorylation of Nak1 causes removal of Nak1 from the spindle pole bodies	
yes	cdk-H	->	fin1					*17804403*		S. Cerevisiae, The N-terminal half of Fin1 is phosphorylated at multiple sites by the cyclin-dependent kinase Clb5-Cdk1	
no	**fin1**	**-|**	**cdc16**					**PREDICTION**			predictive link
yes	flp1&sid4	->	cdc11					*23297348*		cdc11 is a flp1 substrate, mutation of clp1 sites to Asp decreases restrictive temp of SIN mutants	
yes	cdc7	->	cdc14-sid1	protein	complex	P41892	P36589-O14305	*10775265;12957817;11715048*	S	Our localization studies suggest that Sid1p–Cdc14p functions at an intermediate step in the pathway, downstream of Cdc7p and upstream of Sid2p	
yes	cdk-H	-|	cdc14-sid1	protein	complex	P04551	P36589-O14305	*10775265;12957817*	S	loss of Cdc2-cyclin activity promotes Sid1p-Cdc14p association with the SPB	adjusted for multi-node CDK
no	cdk-L	->	byr4					*10381387*		co-regulation of SIN by CDK-L and GAP	
yes	cdk-H&plo1	-|	byr4	protein	protein	P50528	Q10951	*24920823*	S	Our analyses show that Cdk1-mediated phosphoregulation of Byr4 facilitates complete removal of Byr4 from metaphase SPBs in concert with Plo1	