

SUPPLEMENTARY MATERIAL

corresponding to:

**A screen of kinase inhibitors reveals a potential role of Chk1
in regulating *Hydra* head regeneration and maintenance**

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Chk1 (HYDRA)	1	VEFPFVEGWDFVETLGE ^{GAY} GEVRLAINRKTQE ^{AVAVKIVNADKLAGNKD}	50
Chk1 (HUMAN)	1	MAVPFVEDWDLVQ ^{TLGE} GAYGEVQLAVNRVTEEA ^{VAVKIVDMKRAVDCPE}	50
Chk1 (HYDRA)	51	CLKKEVC ^{IHKMLQ} SHI ^{IKFY} GQRTEKDRV ^{LFLE} YAAGGELFDRIE ^{PDV}	100
Chk1 (HUMAN)	51	NIKKEICINKMLNHENVK ^{FYGH} RREGNIQY ^{LFLE} YC ^{SGGEL} FDRIE ^{PDI}	100
Chk1 (HYDRA)	101	GM ^{PI} PQACRYFK ^{QL} INGLEYI ^{HSK} GVTHRDIK ^{PEN} ILLD ^{VDGNLKITDFG}	150
Chk1 (HUMAN)	101	GM ^{PE} PDAQRF ^{FHQL} MAGVVYLHGIGITH ^{RDIK} PENLL ^{DLDERDN} LKISDFG	150
Chk1 (HYDRA)	151	LS ^{TVFR} YK ^{DVER} LLERCC ^{GTPPY} VAVEV ^{LQK} KEYKA ^{EPA} IW ^{SCGIVLTA}	200
Chk1 (HUMAN)	151	L ^{ATVFR} YNNRERLL ^{NKMC} GTLPYVAPELL ^{KR} REFHAE ^{PVDV} W ^{SCGIVLTA}	200
Chk1 (HYDRA)	201	MLAGELP ^{WD} EPIESC ^{KEYLD} W ^{SHSKLI} HTPW ^{NKLN} TTSIG ^F LK ^{LLHPVP}	250
Chk1 (HUMAN)	201	MLAGELP ^{WD} QPS ^{SDSC} Q ^{EYSD} WKEK ^{TYL} NPW ^{KKID} SAP ^{LALLH} KILVEN ^P	250
Chk1 (HYDRA)	251	SKRYTIAE ^{IKKDK} W ^{FNG} --NYGSLK ^{TKSPL} NGLT ^{NFET} S ^{SLK} KH ^{CS} --D	296
Chk1 (HUMAN)	251	SARIT ^{IPDI} K ^{KDR} WY ^{NKPL} KK ^{GAKR} PRVT ^{SGG} VSE-- ^{SP} SG ^F SK ^{HIQ} S ^{NLD}	299
Chk1 (HYDRA)	297	RSV ST SV ^{NSKLV} SNFSS ^{QPIP} SC----- ^{TSSD} YELQ ^{EIRE} EQQ ^{IWI} YS	340
Chk1 (HUMAN)	300	FSP ^{VNSAS} SEEN ^{VKYSS} Q ^{PEPR} TGL ^{SLWD} TSPSY---- ^{IDKL} VQ ^{GIS} SFS	345
Chk1 (HYDRA)	341	QPVNIEDMLL-S ^{QISL} TP ^{GSSQN} PM ^{AHLAK} RM ^{TRFNL} SL ^{TLD} EAV ^{KKLSS}	389
Chk1 (HUMAN)	346	QPT ^{CPD} H ^{MLNS} QL ^{LGP} SS ^{QNP} W ^{QRLV} K ^{RMTR} FF ^{TKL} D ^{ADK} SYQ ^{CLKE}	395
Chk1 (HYDRA)	390	TLKEL ^{SFQY} KIV ^{SLNQ} IRIT ^{SHDR} R ^{KHTL} TYLT ^{NLIE} IN ^{QR} PL ^{LVD} F ^{RLS}	439
Chk1 (HUMAN)	396	TCEK ^{LG} YQ ^{WKK} SC ^{MNQV} TIST ^{TDR} R ^{NKLI} FK ^{VNL} LEM ^{DDK} - ^{ILVD} F ^{RLS}	444
Chk1 (HYDRA)	440	KGDG ^{LE} FK ^{RQ} FK ^{TIK} GL ^{LCQ} YV ^V *----- 463	
Chk1 (HUMAN)	445	KGDG ^{LE} FK ^{RH} FL ^{KIK} GL ^{LID} IV ^{SSQ} K ^{VW} L ^{PAT} 476	

Fig. S1. Global pairwise alignment of Chk1 (Hydra) and Chk1 (Human) amino acid sequences. A global pairwise alignment of Chk1 (H. vulgaris) and Chk1 (Human) amino acid sequences was performed using EMBOSS Needle. The catalytic domain and critical residues of the ATP binding pocket are represented by orange and yellow, respectively.

TABLE S1

ORGANIZATION OF THE 80 KINASE INHIBITORS BY THEIR TARGET SIGNAL TRANSDUCTION PATHWAY

Signal Transduction Pathway	Target Kinase	Cat. No.	Product Name	Signal Transduction Pathway	Target Kinase	Cat. No.	Product Name
Cell Cycle Regulation	CDK	1937	NSC 693868	DDR	Chk1	2560	SB 218078
	CDK	2072	Aminopurvalanol A		Chk1	2694	PD 407824
	CDK	2457	Arcyriaflavin A		ATR/ATM	2639	CGK 733
	CDK	1284	Olomoucine		ATM	3544	KU 55933
	CDK	1580	Purvalanol A		DNA-PK	2828	NU 7026
	CDK	1581	Purvalanol B		DNA-PK	3271	Compound 401
	CDK	2609	Ryuvudine	EGFR	EGFR	0414	AG 490
	Aurora	2458	ZM 447439		EGFR	1110	Genistein
PLK	2977	GW 843682X	EGFR		2239	GW 583340 dihydrochloride	
MAPK/ERK	P38 MAPK	1962	SB 239063	EGFR	2416	BIBX 1382 dihydrochloride	
	P38 MAPK	1264	SB 202190	EGFR	3000	Iressa	
	P38 MAPK	1402	SB 203580 hydrochloride	PI3K-AKT/PKB	PKB	2926	FPA 124
	P38 MAPK	2908	EO 1428		PKB	2151	API-2
	MEK	1213	PD 98059		PKB	2558	10-DEBC hydrochloride
	MEK	1969	SL 327		FLT3	2591	TCS 359
	MEK	1144	UO126		PI3K	2814	PI 828
	MEK	2605	PD 198306		PI3K	1130	LY 294002 hydrochloride
	MEK	1777	Arctigenin	SGK	3572	GSK 650394	
	Mnk1	2731	CGP 57380	VEGF	VEGFR	1459	SU 4312
	Raf	1321	ZM 336372		VEGFR	2475	ZM 323881 hydrochloride
Raf	1381	GW 5074	VEGFR		2499	ZM 306416 hydrochloride	
			VEGFR		2542	KI 8751	
DAG-PKC	PKC	0741	GF 109203X	VEGFR	3037	SU 5416	
	PKC	2002	Ro 31-8220 mesylate	Wnt	GSK-3	1616	SB 216763
	PKC	2442	CGP 53353		GSK-3	1617	SB 415286
			GSK-3		3194	BIO	
JAK/STAT	JAK3	1366	ZM 449829	CK1	2902	D 4476	
	JAK3	1367	ZM 39923 hydrochloride	CK2	3194	TBB	
NF-κB	JAK2	2291	1,2,3,4,5,6-Hexabromocyclohexane	BCR	BKT	1300	LFM-A13
	IKK	2539	IKK 16		BKT	1405	(-)-Terreic acid
	IKK	2559	TPCA-1	cAMP	PKA	2910	H 89 dihydrochloride
	IKK	2611	IMD 0354		CaM Kinase III	3439	NH 125
	IKK	3318	SC 514	FceRI	Syk	2417	ER 27319 maleate
ROCK/MLCK	MLCK	0431	ML 9 hydrochloride		HGF/cMET	cMET	2693
	ROCK	0541	Fasudil hydrochloride	IGF-1R	IGF-1R	2768	PQ 401
	ROCK	1254	Fasudil hydrochloride	JNK/SAPK	JNK	1496	SP 600125
	ROCK	2415	HA 1100 hydrochloride		JNK	3314	BI 78D3
TGF-β	TGFβR1	1614	SB 431542	NGF	TrkA	2238	GW 441756
	TGFβR1	2718	LY 364947		TrkA	2272	Ro 08-2750
	TGFβR1	3269	SD 208				
SRF	Src	1397	PP 1				
	Src	1407	PP 2				
	Src	3063	1-Naphthyl PP1				

Column 1 is the signal transduction pathways targeted by the kinase inhibitors; column 2 is the main target kinase within the signaling pathway; column 3 is the catalogue number (Cat. No.); column 4 is the product name of the kinase inhibitor. Abbreviations for signal transduction pathways: MAPK/ERK = mitogen-activated protein kinase/extracellular signal-regulated kinase, DAG-PKC = diacylglycerol-protein kinase C, JAK/STAT = Janus kinase/signal transducers and activators of transcription, NF-κB = nuclear factor kappa-light-chain-enhancer of activated B cells, ROCK/MLCK = Rho-associated kinase/myosin light chain kinase, TGF-β = transforming growth factor-β, SRF = serum response factor, DDR = DNA damage response, EGFR = epidermal growth factor receptor, PI3K-PKB = phosphoinositide-3-kinase-protein kinase B, VEGF = vascular endothelial growth factor, BCR = B cell antigen receptor, FceRI = high affinity IgE receptor, HGF/cMET = hepatocyte growth factor, IGF-1R = insulin-like growth factor 1, JNK/SAPK = c-Jun NH2-terminal kinase/stress-activated protein kinase, NGF = nerve growth factor. Abbreviations for target kinases: Cdk = cyclin-dependent kinase, PLK = polo-like kinase, P38 MAPK = P38 mitogen-activated protein kinase, MEK = mitogen-activated protein kinase kinase, Mnk1 = MAP kinase-interacting serine/threonine-protein kinase 1, JAK3 = Janus kinase 3, JAK2 = Janus kinase 2, IKK = IκB kinase, TGFβR1 = transforming growth factor-beta receptor type 1, ATM = ataxia-telangiectasia, mutated, ATR = ATM and Rad3-related, DNA-PK = DNA-dependent protein kinase, FLT3 = fms like tyrosine kinase 3, SGK = serum- and glucocorticoid-inducible protein kinase, VEGFR = vascular endothelial growth factor receptor, GSK-3 = glycogen synthase kinase 3, CK1 = casein kinase 1, CK2 = casein kinase 2, BKT = Bruton's tyrosine kinase, PKA = protein kinase A, Syk = spleen tyrosine kinase, TrkA = tropomyosin receptor kinase A.