

Dataset S2. Alignments of C-terminal DnaJ domains (A) and NDK domains (B) underlying phylogentic inferences in Fig. S1.

A

	1					64
Hs-DnajA1	TYVDVLGVKP	NATQEELKKA	YRKLALKYHP	DKNPNEG---	-EKFKQISQA	YEVLSDAKKR
Bt-DnajA1	TYVDVLGVKP	NATQEELKKA	YRKLALKYHP	DKNPNEG---	-EKFKQISQA	YEVLSDAKKR
Mm-DnajA1	TYVDVLGVKP	NATQEELKKA	YRKLALKYHP	DKNPNEG---	-EKFKQISQA	YEVLSDAKKR
Gg-DnajA1	TYVDVLGVSP	NASAEELKKA	YRKLALKYHP	DKNHNEG---	-EKFKQISQA	YEVLSDPKKR
Dr-DnajA1	GFYDMLGVKP	SASPEELKKA	YRKLALKYHP	DKNPTEG---	-EKFKQISQA	YEVLSDAKKR
Hs-DnajA2	KLYDILGVPP	GASENELKKA	YRKLAKYHP	DKNPNAG---	-DKFKEISFA	YEVLSNPEKR
Bt-DnajA2	KLYDILGVPP	GASENELKKA	YRKLAKYHP	DKNPNAG---	-DKFKEISFA	YEVLSNPEKR
Mm-DnajA2	KLYDILGVPP	GASENELKKA	YRKLAKYHP	DKNPNAG---	-DKFKEISFA	YEVLSNPEKR
Gg-DnajA2	KLYDILGVPP	GASDNELKKA	YRKLAKYHP	DKNPNAG---	-DKFKEISFA	YEVLSNPEKR
Dr-DnajA2	KLYDILGVSP	SASENELKKA	YRKLAKYHP	DKNPNAG---	-DKFKEISFA	YEVLTNPEKR
Hs-DnaJB1	DYYOTLGLAR	GASDEEIKKA	YRROALRYHP	DKNKEPG--A	EEKFKEIAEA	YDVLSDPKKR
Bt-DnaJB1	DYYOTLGLAR	GASDEEIKKA	YRROALRYHP	DKNKEPG--A	EEKFKEIAEA	YDVLSDPKKR
Mm-DnaJB1	DYYOTLGLAR	GASDEEIKKA	YRROALRYHP	DKNKEPG--A	EEKFKEIAEA	YDVLSDPKKR
Dr-DnaJB1	DYYSVLGIQK	GASDDEIKKA	YRKOALKYHP	DKNKSAG--A	EEKFKEIAEA	YDVLSDPKKK
Hs-DnaJB4	DYYCILGIEK	GASDEDIKKA	YRKOALKFHP	DKNKSPO--A	EEKFKEVAEA	YEVLSDPKKR
Bt-DnaJB4	DYYCILGIPS	GASDEDIKKA	YRKOALKFHP	DKNKSPO--A	EEKFKEVAEA	YEVLSDPKKR
Mm-DnaJB4	DYYHILGIDK	GATDEDVKKK	YRKOALKFHP	DKNKSPO--A	EEKFKEVAEA	YEVLSDPKKR
Gg-DnaJB4	DYYSILGIEK	GASEEDIKKA	YRKOALKWHP	DKNKSAH--A	EEKFKEIAEA	YEVLSDPKKR
Dr-DnaJB4	DYYKILGITK	GASDDD IKKA	YRKOALKWHP	DKNKAAN--A	EEKFKEVAEA	YEVLSDPKKR
Hs-DnaJB5	DYYKILGIPS	GANEDEIKKA	YRKMALKYHP	DKNKEPN--A	EEKFKEIAEA	YDVLSDPKKR
Bt-DnaJB5	DYYKILGIPS	GANEDEIKKA	YRKMALKYHP	DKNKEPN--A	EEKFKEIAEA	YDVLSDPKKR
Mm-DnaJB5	DYYKILGIPS	GANEDEIKKA	YRKMALKYHP	DKNKEPN--A	EEKFKEIAEA	YDVLSDPKKR
Gg-DnaJB5	DYYKILGIQS	GANEDEIKKA	YRKMALKYHP	DKNKDPN--A	EEKFKEIAEA	YDVLSDPKKR
Dr-DnaJB5	DYYKILGIPS	GSNEDEIKKA	YRKMALKFHP	DKNKDPN--A	EEKFKEIAEA	YEVLSDPKKR
Hs-DnaJB11	DFYKILGVPR	SASIKDIKKA	YRKLALQLHP	DRNPDDP--QA	QEKFODLGAA	YEVLSDEKKR
Bt-DnaJB11	DFYKILGVPR	SASIKDIKKA	YRKLALQLHP	DRNPDDP--RA	QEKFODLGAA	YEVLSDEKKR
Mm-DnaJB11	DFYKILGVPR	SASIKDIKKA	YRKLALQLHP	DRNPDDP--QA	QEKFODLGAA	YEVLSDEKKR
Gg-DnaJB11	DFYKILGVSR	GASVKDIKKA	YRKLALQLHP	DRNPDDP--RA	QEKFODLGAA	YEVLSDEKKR
Dr-DnaJB11	DFYKILGVSR	SASVKDIKKA	YRKLALQLHP	DRNQDDP--NA	QDKFADLGAA	YEVLSDEKKR
Hs-DnaJB13	DYYSVLGITR	NSEDAQIKQA	YRRLALKHHP	LKSNEPS--S	AEIFRQIAEA	YDVLSDPKKR
Bt-DnaJB13	DYYSVLQITR	NSEDAQIKKA	YRKLALKNHP	LRSIEPG--A	VEIFRQIAEA	YDVLSDPVKR
Mm-DnaJB13	DYYAVLQVTR	NSEDAQIKKA	YRKLALKNHP	LKSSEPG--A	PEIFRQIAEA	YDVLSDPVKR
Gg-DnaJB13	DYYAVLELGR	NATDADIKKA	YRLLALENHP	QKCKEPL--A	QERFRLLAEA	YDVLSDPVRR
Dr-DnaJB13	DYYAILEINR	NAIDADIKKA	YRRLALKHHP	RSNSHAR--A	AERFNLLAEA	FDVLSDPKKK
Ta-DnaJB1/4/5	DYYOILGVOH	NATDDEIKKA	YRKMALKYHP	DKNKDKN--A	EEIFKDVAEA	YEVLSDEKKR
Ta-DnaJB11	DFYKILGVDR	DATLKQVKKK	YRKLAIKYHP	DKNKDDP--KA	QDKFODINAA	YEVLSDEKKR
Ta-DnaJB13	DYYKILOITO	NVKSODIKKA	YRKFALKYHP	DRNTAID--A	VDKFKEVSEA	YDVLSNGIRR
Nv-DnaJB1/4/5-a	NYAYILGVPR	NASDDDIKKA	YRROALIFHP	DKNKNSG--A	EEKFKEISEA	YKVLTDPRQR
Nv-DnaJB1/4/5-b	DYYAVLNVDK	AASADDIKKA	YRKOALKYHP	DKNKSPG--A	EEKFKEISEA	YEVLSDPKKK
Nv-DnaJB1/4/5-c	NYDYILGVKK	DASDOELKKA	YKQAFKYHP	DKNKDPG--A	EEKFKEIAEA	YEVLSDPQKR
Nv-DnaJB1/4/5-d	NYEVLGVER	NATTDIIRRA	YRRLALKYHP	DKNAGTE---	-ENFKEVSEA	YEVLCDPQOR
Nv-DnaJB11	DFYAILGVPR	DASKNOIKKA	YRKLAMKLHP	DKNKDDP--KA	QEKFHDIGAA	YEVLADDDQR
Nv-DnaJB13	DYYDILGLTR	SATDADIKKE	YRKLALKYHP	DKNQEPS--A	EVKFRQAAEA	YDVLSDPKKR

B

[illegible]

Csp-NDK	PVVAMVWEG	---	KGVVASA	RKIIGATNPL	NS---	EPGTI	RGDYGVDIG	RNIHGS	DAV	ETAOREIALW	FQPAE
Ssp-NDK	PVVAMVWQG	---	KGVIAAA	RKLIGKTNP	DA---	EPGTI	RGDFGIDIG	RNLVHGS	DGP	ETAOREIALW	FOESE
Am-NDK	PVVAMVWEG	---	KGVVAAA	RKIIGATNPL	GS---	EPGTI	RGDFGIDIG	RNIHGS	DAV	ETAOREISLW	FKSEE
Te-NDK	PVVAMVWEG	---	RGVIANA	RKLIGATNPL	NA---	EPGTL	RGDFAVDVG	RNVHGS	DSP	ENAEREINLW	FOTQE
Hs-Nme1	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEIGLW	FHPPE
Mm-Nme1	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEISLW	FHPPE
Bt-Nme1	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEIALW	FHPPE
Md-Nme1	PVVAMVWEG	---	LNvvKTG	RMMVGETNPA	DS---	KPGTV	RGDFCQVVG	RNIHGS	DSV	ESAEKEIGLW	FHPNE
Hs-Nme2	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEISLW	FKPPE
Mm-Nme2	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEISLW	FKPPE
Bt-Nme2	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEINLW	FKPPE
Md-Nme2	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEISLW	FKPPE
Gg-Nme2	PVVAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESAEKEISLW	FKPAE
Xt-Nme2	PVLAMVWEG	---	LNvvKTG	RVMLGETNPA	DS---	KPGTI	RGDFCQVVG	RNIHGS	DSV	ESANKEIALW	FEDKE
Hs-Nme3	PVVAMVWQG	---	LDVVRTS	RALIGATNPA	DA---	PPGTI	RGDFCIEVG	KNLIHGS	DSV	ESARREIALW	FRADE
Mm-Nme3	PVVAMVWQG	---	LDVVHAS	RALIGATDPG	DA---	MPGTI	RGDFCMEVG	KNVIHGS	DSV	ESAHREIALW	FREAE
Xt-Nme3	PVVAMVWQG	---	LDVVKTA	RLMIGETNPA	HS---	LPGTI	RGDFCVDVG	RNVHGS	DSR	ESAOEIALW	FQDPE
Dr-Nme3	PIVAMVWQG	---	LDVVKTA	RKMLGETNPA	DS---	LPGTI	RGDSCVEVG	RNVHGS	DSV	ESAEKEISLW	FEDHE
Tn-Nme3	PVVAMVWQG	---	QDVVKTG	RKMLGETNPA	DS---	LPGTI	RGDSCVDVG	RNVHGS	DSV	ESAEKEIYLW	FHPHE
Hs-Nme4	PVVAMVWEG	---	YNVVRAS	RAMIGHTDSA	EA---	APGTI	RGDFSVMHS	RNVHAS	DSV	EGAOREIQLW	FOSSE
Mm-Nme4	PVVAMVWEG	---	PNVVHIS	RAMIGHTDST	EA---	APGTI	RGDFSVMHS	RNVHAS	DSV	DGAOREIELW	FOSSE
Gg-Nme4	PLVAMVWEG	---	YNVVRST	RAMVGDTPSA	QA---	AGGTI	RGDFSVMHS	RNVHAS	DSV	ETALREIWF	FORDE
Xt-Nme4	PVVAMVWEG	---	HNvVRTS	RAMVGDTPSS	QA---	KPGTI	RGDFSVMHS	RNVHAS	DSV	EVAEREISLW	FHSGE
Dr-Nme4	PIVAMVWEG	---	HNvVKTG	RMMVGDTPA	AA---	APGTI	RGDFSVMHS	RNVHAS	DSV	EGAOREISLW	FHRSE
Tn-Nme4	PVVMAWEG	---	HOVIQSS	RNMVGOTNPA	EA---	OAGTV	RGDFSVMHS	RNVHAS	DSV	EGALRELQLW	FRGOE
Hs-Nme5	PLVAMILAR	---	HKAISYW	LELLGPNNSL	VAKE	THPDSL	RAIYGTDDL	RNALHGS	NDP	AAAREIRFM	F-PE-
Mm-Nme5	PLVAMILAR	---	HKAISYW	KELMGPSNSL	VAKE	THPDSL	RAIYGTDEL	RNALHGS	NDP	AAAREIRFM	F-PA-
Gg-Nme5	PSVAMILAR	---	HRAVSYW	KELMGPSNSI	KARMT	HPHSL	RAIYGTDDL	RNALHGS	SLT	SSAREIRFM	F-PE-
Xt-Nme5	PIIAMTLAR	---	YNAISYW	KELIGPTNSL	KAKE	THPESL	RAIYGTDDL	RNALHGS	SYCF	TSAAREIRFM	F-PEA
Dr-Nme5	PVVALALAR	---	DOAIATW	KAIMGPTSSI	KARE	THPDSL	RAIYGTDDL	RNALHGS	SETF	SAAREIRFM	F-PHS
Tn-Nme5	PIIAMVLSR	---	DDAISYW	KDLIGPSNSV	IAKK	THPDSL	RAKYGTSEI	ONALHGS	ESL	PASVREIKFM	F-PNT
Hs-Nme6	PIRAYILAH	---	KDAIQLW	RTLMGPTRVF	RARH	VAPDSI	RGSFGLTDT	RNTTHGS	DSV	VSASREIAAF	F-PD-
Mm-Nme6	PIRAYILAH	---	KDAIQLW	RTLMGPTRVF	RARY	IAPDSI	RGSFGLTDT	RNTTHGS	DSV	VSASREIAAF	F-PD-
Gg-Nme6	PMWAYILAH	---	ENAIISLW	RSLMGPTKVF	RARN	CHPDSL	RGAYGLTDT	RNTTHGS	DSV	ASASREIAAF	F-PGL
Xt-Nme6	PMQAYILAH	---	EDAVQLW	RNLMGPTKVF	RARI	VAPGTV	RGDLGLTDT	RNTTHGS	DSV	ESACREITFF	F-PEF
Dr-Nme6	QMRAYILAR	---	EDAITHW	RTMMGPTKVF	RARF	SSPETL	RGKYGLTDT	RNTTHGS	DSI	ESAKREISFF	F-PE-
Tn-Nme6	PMRAYILAR	---	EDAIRHW	RELMGPTKVF	RARH	TVPASI	RAQFGLTDT	RNTTHGS	DSV	ESAOREICFF	F-PE-
Hs-Nme7A	PIIAMILIR	---	DDAICEW	KRLIGPANSV	VART	DASEI	RALFGTDGI	RNAHGS	PDF	ASAAREMELF	F-PS-
Mm-Nme7A	PVIAMEILR	---	DDAICEW	KRLIGPANSV	LSRT	DAPGSI	RALFGTDGV	RNAHGS	PDF	ASAAREMELF	F-PS-
Xt-Nme7A	PIVAMEVVG	---	DEAVSSW	RKLLGPTNSS	IARSEL	POSI	RARFGTDGT	KNAHGS	DSI	ASAARELEFF	F-PS-
Dr-Nme7A	PVIAMELMG	---	DEAVSTW	RKVLGPTDSG	VAQEA	AHSL	RGQFGTDGT	KNAGHS	DSL	ASAARELEYF	F-PS-
Hs-Nme8B	PSLALVLLR	---	DNGLOYW	KQLLGPTVE	EAIE	YFPESL	CAQFAMDSL	VNQLYGS	DSL	ETAEREIOHF	F-P--
Mm-Nme8B	HSYVLALRR	---	ENGVEYW	KTLLGPKTIE	EAYASH	POSL	CVQFASGNFP	TNQFYGSSSK		AAAKEKIAHF	F-PPQ
Gg-Nme8B	PTLVLALTR	---	QNAIQHW	RDLLGPKTIE	EAK-	KVPNSL	RAKYAIDNIA	INQLHGS	SSSV	NDACKELEFF	F-PQE
Xt-Nme8B	PVLALALVK	---	DHAVDHW	RNMLGPASLR	QALSE	APDSL	RAQFAPNDS	INQLHGS	SSTP	EEAKKEINFF	F-P--
Dr-Nme8B	LVLALALVK	---	EGAVEHW	RNMLGPKDPI	KAKNE	OPDSL	RAQFSVENSS	INQLHGS	SSSS	EEAEKEISFF	F-PPE
Tn-Nme8B	PVLALALAR	---	KEAVCHW	RNMLGPSDVN	KAKEED	PESL	RAQFVGSAS	INQLHGS	SASH	EEAEEREIFF	F-PPQ
Hs-Nme9	PSHLLILTRT	EGFED	VVTW	RTVMGPRDPN	VARRE	OPESL	RAQYGTTEMP	FNAVHGS	SRDR	EDADRELALL	F-PS-
Mm-Nme9	PSHLLILTKT	EGTED	VVTAW	RTFLGPCDPN	VARRE	HPESL	RAQYGTTEMP	FNAVHGS	SRDR	EDANRELALL	F-PSF
Bt-Nme9	PSHLLILART	EGTED	VVTAW	RTLMGPCDPH	VARRE	OPDSL	RAQYGTTEMP	FNAVHGS	SWDS	EDARRELALL	F-PG-
Ta-Nme1	PVACMVWEG	---	KDvvKTG	RRMLGETDPL	KS---	LPGSI	RGDYAIDLG	RNVCHGS	DSV	ESANKEIKLW	FNEDE
Ta-Nme5	PIVAYILAK	---	NNAIEDW	RNSMGPTNSM	NARIA	APESL	RAKYGIDEM	RNGFHGS	DGP	LTAEREIRFF	F----
Ta-Nme6	PATIAILVG	---	NNAITHW	RDLLGPTSRSH	RARSSH	PSTI	RAIYGLTDT	RNAVHGS	DSV	ESAAREIOFF	F-PE-
Ta-Nme7A	PVLGMELMR	---	SNAIKRW	RELLGPTNSS	KAROE	APNSI	RARYGTDGT	QNACHGS	DST	DSAAKEIEFI	F-PT-
Ta-Nme8B	PLVALALAK	---	QDSVDAW	RDMIGPPDVN	LAKEL	APSSL	RARYSSDD--	VNVVHGS	SENH	ESAEKELEFF	F-PER
Nv-Nme2-a	PVVAMVWEG	---	AGVVKTG	RVMLGETNPA	DS---	KPGTI	RGDFCVHIG	RNIHGS	DST	DSANKEIALW	FSPKE
Nv-Nme2-b	PVCAMVWEG	---	LGvvKTA	RVMLGETDPA	KS---	LPGTI	RGDFSIIHG	RNIHGS	DAV	ETAKEEIALW	FKDDE
Nv-Nme5	PIMALVLAR	---	ENAIISYW	ROLIGPTNTQ	KARDO	APESL	RAIYGTDST	RNALHGS	DGT	VSADKEIHFF	F-PDS
Nv-Nme6	PMTAMILGR	---	ENAITHW	RKLMGPTHAY	KARS	IAPKSI	RALYGTSDT	RNATHGS	DSD	ESARKEIEFF	F-PEF
Nv-Nme7A	PVVAFELKG	---	PGAVDSW	RKVLGPTDSA	TARNO	APLSV	RAKFGTDNT	KNAHGS	DST	ESAEREVSFF	F-DKR
Nv-Nme8B	PMMAICLAR	---	EDAIEGW	RGMLGPKEVE	KAKDE	APESL	RAQFOVEDSP	INPLHGS	DTA	ENAEKEIOKF	F-PM-