

Thap9-Pr.

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α5										α6										α7										α8										α9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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KLKD	CLLS	MKDK	HL							IEGA	AHE	MLEN	AF	G	M	SLN	L	F	K	H	M	V	R	R	S	T	E	K							KN	R	P	P	S	Y	S	Q	A	L	K	T	F	S	V	T	L	N	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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RNase H

	β7	β8	β9	α15	β10																		
<i>Che-2506</i>	310	320	330	340	350	360 370 380																	
<i>Che-2506</i>	EHHI	FTGHVDFGAGPV	...TNT	VATNVLVF	MLVSLK	SWKTPIAYFLT	NHIDSE	TL	SRNITDAL	LMQTADKGLHVK	TVVADG	LKA											
<i>Che-310</i>	NTHSY	QGHVDFGAGGAI	...SDT	VASSALVF	MLVSMRK	HWKTP	PIAYFLT	NHVDSE	EAL	SNSIK	EAVL	LAADYGLNVK	TVVADG	LQA									
<i>Che-5060</i>	TRHVS	YSGCHVDVDFG	GPV	...SGTE	ASNALVF	MLVSLK	ASWKT	PIAYFLT	NHVDSE	TL	SRNIT	EAL	LMKTSEAGLVK	TVVADG	LKA								
<i>Bus-52</i>	KA...	LSGFAE	...	NK	VNEE	EATITQ	AFMISSL	FSKYKE	IIGLV	PVNLMTAE	DL	FHLTKQAL	QLLNDAGFN	VCL	LIADN	NRI							
<i>Bus-559</i>	NQ...	LSGIAE	...	NK	NSST	ETATII	QAFMISSL	FSKYKE	IVIGLV	PVNLMTAE	DL	FHLTKQAL	QLLNDAGFN	VCL	LIADN	NRI							
<i>Bus-5470</i>	KQ...	LSGIAE	...	NK	DLSTE	EASTMQ	AFMISSL	FSKYKE	IIGLV	PCSNLTAK	DL	FHLYELSK	QALAILNEAD	FQVLC	VISDN	NRI							
<i>Thap9-Actinopterygii</i>	DQ...	IHG YVDIG	GGEEI	...	ENVVAT	QALVLM	VVAING	SGWIK	PIAYFLIN	SMTGPER	ANITRES	LV	RLHAVGV	RVISLT	CTCD	PSQ							
<i>Thap9-Afrotheria</i>	ISHHL	QGFMDFGL	GKLD	ADETP	LASE	TVLLMAVGI	FGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Agnatha</i>	RR...	YHGRVDL	GTG	LD	ADSLP	AARAA	LTFMLVA	INASWKL	PVGYFL	LIDG	LSG	SERANL	VRCL	LS	AVHDAGA	QVVS	LTFD	GAA					
<i>Thap9-Anura</i>	DRNEL	VGFVNF	KGAG	SGSQD	VANEV	LMFV	LVGAT	GHWKV	PIAYFH	VKNS	LTPQA	QKQLV	HV	LH	ELYE	KRF	EVFA	VTMDR	HLR				
<i>Thap9-Aves</i>	RSKOL	SGFADL	GAGILD	ADAP	LASE	IVLMAVGI	SSPWT	APLGYF	LVNST	SGPF	FLAQLLR	QA	IH	KLNS	VGVV	VLAV	TS	SGA	SAR				
<i>Thap9-Carnivora</i>	SSHHL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	SGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Cetartiodactyla</i>	SSHHL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	SGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Chiroptera</i>	SSQHL	QGFMDFGL	GKLD	ADEMP	LASE	TILMAVGI	CGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVVA	VTSDV	TAQ								
<i>Thap9-Crocodylia</i>	RIQHL	TQGFMDL	GVGL	DAEAP	QASE	IVLMAVGI	LGRTA	PLGYF	VNNGAT	GHMLA	QQLLR	QA	IN	KLNS	IGITV	LA	VTSDA	TAH					
<i>Thap9-Dermoptera</i>	SSHHL	QGFMDFGL	GKLD	ADEMP	LASE	TILMAVGI	FGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Insectivora</i>	SSHHL	QGFMDFGL	GKLD	ADEMP	LASE	TILMAVGI	SGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Lagomorpha</i>	SSQSL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	SGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Perissodactyla</i>	SSHHL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	SGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDV	TAH								
<i>Thap9-Pholidota</i>	SSHHL	QGFMDFGL	GKLD	ADEMP	LASE	TILMAVGI	SGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Rodentia</i>	SSNSL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	FGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Sarcopterygii</i>	CQKKV	VGLIDY	NGPE	E...	AYSQNV	VATQTL	FMVGI	NGHWA	PIAYFLT	LTNS	LTPQA	QME	LV	HAL	EL	MD	NG	FD	IK	ST	LD	G	CET
<i>Thap9-Scandentia</i>	SSNTL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	FGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Squamata</i>	STRRL	QGLVDFG	GAGSY	DADE	LA	AGAE	LVAVG	QHVWV	PLGYF	LLAT	PGDI	QAQLLR	HCL	IL	KLHN	VGV	QVVS	TS	SDA	TAP			
<i>Thap9-Testudines</i>	VTQRV	QGFID	L	GAGAL	DADE	LA	SEAV	LVMAVGI	LVGWR	APLGYF	VN	GTSGH	LLAQLLR	QT	IS	KL	TS	IGITV	LA	VTSDA	TAH		
<i>Thap9-Xenarthra</i>	SSHRL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	FGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Primates</i>	SSHSL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	FGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								
<i>Thap9-Primates</i>	SSHSL	QGFMDFGL	GKLD	ADETP	LASE	TILMAVGI	FGHWRT	PLGYF	VNRASGYL	QAQLRL	LT	IGKLS	DIGITVLA	VTSDA	TAH								

<i>Che-2506</i>	α16	α15	η4	β11	η5	β12	α17	GBD	β13	β14	β15	α18
	390	400	410	420	430	440	450	460				
<i>Che-2506</i>	NLKAAAEKLGCKLNISDLRCYFLNPHQSFQQERVWFVCDPPHMLKLFERNILGDITTYVPTRDGK...KPISSWSYIEELSH											
<i>Che-310</i>	NMKAAKILGCEIRAR.NPKPYFLNPHPSFSSERIYIFCDAPHMLKLFERNLLAEYGCIYRHSDDGK...KCISSWKFIQNLH											
<i>Che-5060</i>	NLKAAAKLLGCSLS.PV.NLRCRSFOHHP...FAGECQVWIFCDPPHMLKLFERNLLGDITKYASREDGTFF...RTISSYIYRELH											
<i>Bus-52</i>	NRNMFSKLSFSQSLNSNFCMANPA...DESKKLFVFMDSVHIKLCIRNNWNLQNSNLEKTFLFPPKFENLQEVSKADFCLLLRKVF											
<i>Bus-559</i>	NRNMFQLHFGNNSS...NOICVQVNP...DETNNKLFMLDSVHLVKSIRNNWNLQNLNVEKTFICPRFDNFDETMNVFSFNNLRKVF											
<i>Bus-5470</i>	NRNMFHLFPYSYNS...SOTCVRNPI...DETNNKLFMLDSVHLKISIRNNWNLQNLNVEKTFICPRFDNYDETMNVSVFSNNLRKVF											
<i>Thap9-Actinopterygii</i>	NLAMIRELGAASLDIM.NMRPYPFHHP...DNTQKVVHLLDPC.HMLKLLRNVFSTHQVVLFFRED...GTEIRWCYIEELH											
<i>Thap9-Afrotheria</i>	SVQMAKALGIHIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPSTHQVSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Agnatha</i>	NLSMARALGCCLEPSEQLKTHFEHP...VTGEPVFLFLDPC.HMLTLVRDALREKRSVADGSG...DGLVLDWHVVERLG											
<i>Thap9-Anura</i>	NEEMCTLLGCDFTYPEWLETRHFSLP...SRDYRHYVVDVSVHELOTISDMIIEELGSILSPE...GVITWOXYITDLM											
<i>Thap9-Aves</i>	GAETARALGIRIDPK.RIQCTFOHPP...GSAHSIAYFFDVPHALLIRLNALQCFQKVEWLG...DTMWQOHLVDLA											
<i>Thap9-Carnivora</i>	SVQMAKALGIHIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Cetartiodactyla</i>	SVQMAKALGIHIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSVHFLN...GTAEHWOHLVDLV											
<i>Thap9-Chiroptera</i>	SVQMAKALGIHIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFSN...GTAEHWOHLVDLV											
<i>Thap9-Crocodylia</i>	GME TAKALGV RMDVD.NMQCTFOHPS...STHQIAYFFDTC.HLLQLIRNAPQCFHRIEHTC...ETAEHWOHLVDLA											
<i>Thap9-Dermoptera</i>	SVQMAKVLGIRIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Insectivora</i>	SVQMAKALGIHIDGD.NMKYTFQHP...SSGQQIAYFFDSC.HLLRLIRNAPQDFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Lagomorpha</i>	SVQMAKALGICIDEG.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQTIQFMN...GTAQWOHLVDLA											
<i>Thap9-Perissodactyla</i>	SVQMAKALGILIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Pholidota</i>	SVQMAKALGIHIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Rodentia</i>	SVQMAKALGIHIDGD.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Sarcopterygii</i>	NIQMCTMLGCDPFAHLLQTHFTIP...GTTKSCYVVDVYKEAGLLCNLIETYESVKSNNK...GTIRWOHKLKNLK											
<i>Thap9-Scandentia</i>	SIQMAKALGIRIDED.NMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQIIRFTN...GTAEHWOHLVDLV											
<i>Thap9-Squamata</i>	NIDTARRLGVVVDGL.TVKSTFFHPA...TPMLEIAYFFDSC.HLLSLIHNFLQTNGSLQVSS...KAVCWWDYLLRLG											
<i>Thap9-Testudines</i>	GVEMAKALGIRIDAN.NIQCTFOHPS...TTHQITTYFFDAC.HMLQLIKNVFCQSHSIQSVN...ETAEHWOHLVDLV											
<i>Thap9-Xenarthra</i>	SVQMAKALGIRIDGD.NVKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Primates</i>	SVQMAKALGIHIDGD.DMKCTFOHPS...SSGQQIAYFFDSC.HLLRLIRNAPQNFQSIQFIN...GTAEHWOHLVDLV											
<i>Thap9-Primates</i>	α15	β13	β14	α16	β15	β16	α17					

GBD

	η8	β16	η9	α23	η10	α24	β17
<i>Che-2506</i>	550	560	570	580	590	600	610
<i>Che-2506</i>	K.GLAPLNSNREEWLPFFNEATLYLNL	DCH.GMPLHSSSR	GTAAVGFI	VSAT	SASGLTQEL	LDH..Y	GFKY
<i>Che-310</i>	K.GTKAPLSNENRDTWETILODSVAYLLSLH	DAA.GKPLHQTPR	GQAVIGFIV	TAT	STLGLAREL	LD..G	ALQY
<i>Che-5060</i>	V.GFKAPLANYNKPVWTSFRRKAFDYLLTLH	DRT.KTPLYLSTR	GTAVIGFIV	AMT	SASGLAEEL	MHS..G	RFOY
<i>Bus-52</i>	..GIF..IANPDKCYVLKSVDERFNFLENFIL	WLEA.WONLKLKPRCGCLSE	ETFFALHT	TTK	CMKSVSKHL	LSN..G	TOY
<i>Bus-559</i>	..GKR..LRNVNTYPTFTSMDERLTFLERFTN	WLKA.WONLQKQKRCGYLSE	ETFFALHT	TTT	CMKSVIEFL	LSN..G	AEY
<i>Bus-5470</i>	..GKR..LRNVNTYPTFTSLDERLTFLERFTN	WLKA.WONLQKQKRCGYLSE	ETFFALHT	TTT	CMKSVIEFL	LSN..G	AEY
<i>Thap9-Actinopterygii</i>	K.GHKAPIKPPTTKHRAIVLEETESLLRGLRIK	GKNT.LVHVYSTQK	KTPIYGFI	ACGR	SVMGCIYED	LVEQPAAS	SCRY
<i>Thap9-Afrotheria</i>	K.ELKGPLLPETYSKINHVLIEAKTIFVTL	DTN.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQSYVFTKVMFPFY
<i>Thap9-Agnatha</i>	KEGWKKPVSFENLGEVREFADVDYIIRTLK	DSEGRDR	LVLSRR	KTGGF	IGFLVCCR	SVVALYDHA	FSK..HKLRC
<i>Thap9-Anura</i>	Q.GDKRGINQNNLEQKQILOETREYLLTL	TCN.NNFI	FQTSR	TWCTV	GLLVTTIA	SLSELLPRL	IMTH..DC
<i>Thap9-Aves</i>	..KEPFLLAGNYTKISNLFDEARSCFVNLT	DSV.GRY	IIKSKR	KLGLFL	LLNAE	SLKWLSSNH	CLKGT
<i>Thap9-Carnivora</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DAS.SNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Cetartiodactyla</i>	K.GFRGPLLPETFNKINHVLIEAKTIFVTLA	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKIMFPFY
<i>Thap9-Chiroptera</i>	K.GFRGPLMLATFNKINQVLTAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVRFPFY
<i>Thap9-Crocodylia</i>	K.GLKGPLSPKNYAKINCLTEAKSIFVTL	DAT.GRC	VLKSKR	KLGLGFL	LLNAE	SLKWL	YVNYLPESTAF
<i>Thap9-Dermoptera</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Insectivora</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Lagomorpha</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Perissodactyla</i>	K.GLKGPLWPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLQWL	YQNYVFPKVMFPFY
<i>Thap9-Pholidota</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Rodentia</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Sarcopterygii</i>	K.GYKGAVDNSNLQHILGLSEVKAYLLSL	TVE.GTM	LYDYPR	KT	CIICFLIS	IOFC	EMLPRLTHQ..KY
<i>Thap9-Scandentia</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Squamata</i>	K.GSKAPLSSASVDILSNLNEYENLLRLR	TAS.GEF	LELSKH	RWGLF	GLFVLNLR	SLQWL	VQAHLLVEESPMTY
<i>Thap9-Testudines</i>	T.GLKGPSVSSNAYKINHLLIEAKNVFIALT	DTL.GRH	FLKSKH	KLGLF	GLFLLNAE	SLKWL	LYTNYVFPKSMFPYC
<i>Thap9-Xenarthra</i>	K.GLKGPLLPETYNKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY
<i>Thap9-Primates</i>	K.GLKGPLLPETYSKINHVLIEAKTIFVTL	DTS.NNQI	IKGKR	KLGLGFL	LLNAE	SLKWL	YQNYVFPKVMFPFY

	η11	α25	RNase H	α26	CTD								
<i>Che-2506</i>	620	630	640	650	660	670	680	690					
<i>Che-2506</i>	VLPLYKFCQDHL	EFFGKIRQR	GGW...	NNNPTADHFR	QSIKALL	KNEVRAPSHGNS	IQLDNA.ET	DLSSI	DVQTTRRP				
<i>Che-310</i>	LLTYKFSQDHIET	YFYSKVSQI	STYFYD	KHNDSGEN	LHFHPSMI	QNDVKASEYANC	LQDGTTEEL	QLDC	FLFKAPAKPQN				
<i>Che-5060</i>	LLPLYKFSQDHL	EMFFGKVRQR	GGW...	NNNPTAEQIR	NSVTRL	LLKNEVSAPSQNGS	IQQEDAPES	DISV	SFSLTRQP				
<i>Bus-52</i>	VLTGKFPQTDCL	SRFGSYRQ	PGS...	TFHVTAQD	LESERKLRVKS	SVLI	.....	LHSDM	.....				
<i>Bus-559</i>	VLTGKFPQTDAL	SRFGLYRQ	SGS...	NYHVTQVE	LESERKLRVKS	SILS	.....	LDSKY	.....				
<i>Bus-5470</i>	VLTGKFPQTDAL	SRFGLYRQ	SGS...	NYHVSQVE	LESERKLRVKS	SILS	.....	LDSKO	.....				
<i>Thap9-Actinopterygii</i>	LLTYKLSQDHL	ELFFSAVRAR	GGY...	NNPNVVRQ	FMESYKRL	LRVHQVKRGT	GNC	LLRDNTTIL	DSTT	ASVNIARR			
<i>Thap9-Afrotheria</i>	LLTYKFSQDHL	ELFLRVLKQV	LVT...	SSSPTCMAR	FQKAYHHL	ETRYRF	.....	QDEVFQNEVSIL	DISI	ARRTDLALWTVQHQ			
<i>Thap9-Agnatha</i>	LCTYRVSWDHL	EMFFDAVRSQ	SGGG	GDKDP	TARQFAS	AYKRALAA	HGGT	GE	GAS	AGTGAAAPD	SASA	LRASSCGGLRAVQL	
<i>Thap9-Anura</i>	ITTYRFGTHHLKE	FISVSRRT	GGA...	DTRPSALD	VTRTVGN	VLSQCGFLYN	.....	.....	.....	.....	VKNDRCA	STWIGHG	
<i>Thap9-Aves</i>	LHTHAFSLDPL	EQFLRALQQA	CGS...	SGSPTCAVF	QAAAYHKL	LASCSLAPGS	PPSS	.....	GNASPW	DVSL	SQRRPLT	LGSIRAQ	
<i>Thap9-Carnivora</i>	LLTYKFSQDHL	ELFLKMLRQV	LVT...	SGSPTCMAR	FQKAYHNL	ETRYRS	.....	QDEVFLSEVSIF	DISI	ARRTDLALWTVQRO	.....	.....	
<i>Thap9-Cetartiodactyla</i>	LLTYKFSQDHL	ELFLKMLRQV	SVT...	VSNLTCMAR	FQKAYHNL	ETRYRL	.....	QDEVFLSEVSIF	DISI	ARRTDLALWTVQRO	.....	.....	
<i>Thap9-Chiroptera</i>	LLTYKFSQDHL	ELFLKMLRQV	LAT...	SSNPTCMAR	FQKAYHNL	ETRYRL	.....	QDEVFLSDLSIL	DISI	ARRTDLNLWTVQRO	.....	.....	
<i>Thap9-Crocodylia</i>	LHTHAFSLDHL	EQFLGTLKQA	CAG...	SSNPTCTMF	QAAAYCQL	LTSDSLMRGS	QENN	VLVGD	TSTL	DASL	LRRKNLT	LHKTFSQ	
<i>Thap9-Dermoptera</i>	LLTYKFSQDHL	ELFLRMLRV	LGT...	SSSPTCMAR	FQKAYHNL	ETRYRF	.....	QDQVFLSEVSIF	DISI	ARRKDLALWTVQRO	.....	.....	
<i>Thap9-Insectivora</i>	LLTYKLSQDHL	ELFLKM	..LVT	SSNPTCMAR	FQKAYHNL	ETRYRL	.....	QDEVFLHEVSIL	DISI	ARRTDLALWTVQSQ	.....	.....	
<i>Thap9-Lagomorpha</i>	LLTYKFSQDHL	ELFLKMLRQV	LVN...	SSASPTCLAF	FQKAYHNL	ESRYRF	.....	QDEVFLSEVSTF	DISI	ARRKDLALWTVQRO	.....	.....	
<i>Thap9-Perissodactyla</i>	LLTYKFSQDHL	ELFLKMLRQV	LVT...	SSHPTCMAR	FQKAYHNL	ETRYRP	.....	QDEVFLREVSIL	DISI	AQRTDLALWTVIQHQ	.....	.....	
<i>Thap9-Pholidota</i>	LLTYKFSQDHL	ELFLRMLRQV	LVN...	SSNPTCLAF	FQKAYHNL	ETRYKL	.....	QDETFLSEVSIL	DISI	ARRKDLALWTVQRO	.....	.....	
<i>Thap9-Rodentia</i>	LLTYKFSQDHL	ELFLKMLRQV	LVP...	SSSFTCMAR	FQKAYHNL	ETRYRF	.....	QDEVFLSEVSIF	DISV	ARRKDLALWTVQRO	.....	.....	
<i>Thap9-Sarcopterygii</i>	VLTYSQDHL	EFVKNFFNDVHAP	GEL	GYELTASQV	KHAMRKL	LRGGIN	.....	.....	.....	IDQDNET	AKNSMEF	.....	
<i>Thap9-Scandentia</i>	LLTYKFSQDHL	ELFLKMLRQV	LVT...	SSSPTCIAF	FQKAYHNL	ETRYRF	.....	QDEVFLSEVSIF	DISV	ARRKDLALWTVQRO	.....	.....	
<i>Thap9-Squamata</i>	LLPCWWSLDAL	EWGCAIRKE	CGT...	KNIA	TAGNF	KDAYKL	VLNKA		VSG	LGLDTPNLL	DISL	CRRASLQ	LQASWP
<i>Thap9-Testudines</i>	LLTYTFSLDHL	ELFLSTLRQA	CAC...	SSNPTCRMFT	QAYK	KLTRYK	MIKPIGL	LQN	AVL	IGDMNTL	DVSI	VRRTDLAL	LHTIHSQ
<i>Thap9-Xenarthra</i>	LLTYKFSQDHL	ELFLKMLRQV	LVS...	SSSPTCMAR	FQKAYHNL	ETRYRF	.....	QDKAFLSEVSIL	DISI	ARRTDLALWTVIQHE	.....	.....	
<i>Thap9-Primates</i>	LLTYKFSQDHL	ELFLKMLRQV	LVT...	SSSPTCMAR	FQAYY	NL	ETRYKF		QDEVFLSKVSIF	DISI	ARRKDLALWTVQRO		

	α27	α28	α29	α30	α31				
<i>Che-2506</i>	700	710	720	730	740				
<i>Che-2506</i>	SSSFC.....PEFDY...AAE	..LLE...TGLK..	FSDSDWR...	TSCLYTT	AGFVGRRLKKT	VKG	GGCRL	AL	
<i>Che-310</i>	LPDF.....SQDDMFAAAVD	..RLE...STFT..	LPDNEWR...	YSCLYTT	AGFVGRRLIPK	IKSD	CRAL	AL	
<i>Che-5060</i>	VMDF.....HEMDM...AAE	..RLE...QSLK..	FDDKDW...	TSCLYTT	AGFVGRRLKK	IKVKE	CSIAL	AL	
<i>Bus-52</i>	LG.....NVPIKCLFDEMSS..VAN	..PVTCDLSVFDD	IQSDV	ELNVSMNEQ	QALTYI	AGYCVHSL..	KLG	CVI	CKEKT
<i>Bus-559</i>	LR.....KLSIRHLFMKFVQ..PST	..P.DIDFTKFENI	LLDL	GVKVTSD	DEIQI	TYI	GGYCVHIL..	KLG	CKE
<i>Bus-5470</i>	LG.....KLSIRQLFMKFVQ..PST	..S.DIDITKFENI	LLDL	LDVQVTS	DEIQI	TYI	GGYCVYAL..	KLG	CAE
<i>Thap9-Actinopterygii</i>	VD.....VEPVEVLVPEEDS..LSD	..LPD...V	VDNLSEY	..KEAAT	SYI	TGYIVK	MMKEK	VTCMP	CLQAL
<i>Thap9-Afrotheria</i>	YG.....GSVINALFQKEDI..SQD	..WSS...CSL	SEALLD	SDH	..RRNL	TYC	AGYIANK	LSALL	TEDCIAAL
<i>Thap9-Agnatha</i>	INTSAERAR.AVGQDSLGFDPSP	..RSE..SANGC	FSR	LPVPADDP	PEWS...	DRAVACV	ARFVTR	RLRAAL	TCER
<i>Thap9-Anura</i>	LT.....SFQQLIPSPFEET..NIE	..LSC...HVV	QSRLLD	VDVTLH	..NSEMYM	TGWVVR	EAQKLS	CKN	CRWAL
<i>Thap9-Aves</i>	YH.....PAPGRPLAPEYPY..SAG	..LLPS...SALS	NALTD	SLY	..AQSL	TC	AGVVAE	QLALD	LCQEC
<i>Thap9-Carnivora</i>	YG.....VSGIKTLFHKEDI..CRD	..WSN...CSL	SEALLD	SDH	..RQKL	TCC	ASYVANK	LSALL	TCECISAL
<i>Thap9-Cetartiodactyla</i>	YG.....VSIVKTLFQKEDI..CCD	..WSD...CLL	SEALLD	SDH	..RRNL	TCC	ASYIADK	LSALL	TCECISAL
<i>Thap9-Chiroptera</i>	YG.....VNTIKTLHKNKI..COD	..WSN...CSL	SEALLD	SDY	..RRNL	TCC	AGYIADK	LSALL	TCECISAL
<i>Thap9-Crocodylia</i>	LN.....LGGTESTSMDYMY..SAG	..LVSLY...SPL	SNVLDL	SDY	..EES	ITGT	AGFVAE	KLALD	LCQEC
<i>Thap9-Dermoptera</i>	YG.....VSVIKTLFYKEDI..COD	..WSN...CSL	SEALLD	SDH	..RRNL	TCC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Insectivora</i>	YG.....INVKTLFHKEDI..CLD	..WSN...GLL	SEALLD	SDH	..RRNL	TCC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Lagomorpha</i>	YG.....TRAVRTLFPKEDV..YQD	..WSS...CSL	SEALLD	SDH	..RRNL	TCC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Perissodactyla</i>	YG.....VSVTKTPFHKEDI..COD	..WSD...CSL	SEALLD	SDH	..RRNL	TCC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Pholidota</i>	YD.....VTIIKTLFHKEDI..COD	..WSN...CSL	SEALLD	SDH	..RRNL	TCC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Rodentia</i>	YG.....VRVMKSLFHKEDI..COD	..WSN...CSL	SEALLD	SDH	..RRNL	TCC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Sarcopterygii</i>	LTLYEERSLP	IFQQHLSP	FPEDN..	STIE..LPD	..HNL	ISETLN	FLN	..NPL	VYF
<i>Thap9-Scandentia</i>	YG.....VSSMRTRFLKEDI..COD	..RSN...CSL	GEALLD	SDH	..RRNL	TCC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Squamata</i>	LG.....QGIWQLQWGSFGF..POK	..MNN...VSV	DPAL	AEK	..EDT	VTYI	SCAILG	KLPL	SLSCAK
<i>Thap9-Testudines</i>	YR.....RGYVESPTDYLF..CMG	..HILFN...SAL	GYSTDL	SLY	..AEG	MTYA	AGCVAE	KLAAV	ICEACVT
<i>Thap9-Xenarthra</i>	YG.....GSIKALFHKEVI..COD	..WSN...CSL	SEALLD	SDH	..RRNL	TYC	AGYIANK	LSALL	TCECISAL
<i>Thap9-Primates</i>	YG.....VSVTKTVFHKEGI..COD	..WSH...CSL	SEALLD	SDH	..RRNL	TYC	AGYIANK	LSALL	TCECISAL

Che-2506	.GKLHHQRVILKGKTSRRRIKLN.....RL.....ILFTGI
Che-310	.GKLHQQRIMLGGKAAKRMKLN.....KL.....VLFSGQ
Che-5060	.GKQHQRILLRGATAPKRMKLN.....KL.....ILFSGQ
Bus-52	NER.....KL.....KKFKKH
Bus-559	NER.....KI.....KKFKQ.
Bus-5470	NER.....KI.....KKFKK.
Thap9-Actinopterygii	.ARRETDKIKEGKVVRKKLT.....KL.....IHFYGD
Thap9-Afrotheria	SERIEMTLSKEHLSLFQDYKY.SSFTKTN.KFRHLPSN...NGYPFK
Thap9-Agnatha	.ERAERKRAETPAPAFGLYAKC...ALVW.....
Thap9-Anura	.KSRKQSLVYQTLRSKLTFYH.....ADLLST
Thap9-Aves	CGRHELKTLKGKHLFPSPPLGSCSSLLTHTW.SY.....
Thap9-Carnivora	SERIEMTLPRIHWSLLQDYRC.SSFANTN.KFRHLLSN...DGYPFK
Thap9-Cetartiodactyla	SEKTEMTLSRKHWSSLPNDKC.SSFANSS.KFRHLLSNHSNEGPKIN
Thap9-Chiroptera	SEMLEMK.SSRKHWSLDECKC.LSFTKYQ.....
Thap9-Crocodylia	SGRHGLKRLPKRV.....SC.SSSLKTY.KSI.....QILFVP
Thap9-Dermoptera	SERMEMKFSRKYWSSLLQDYKC.SSFANTN.KFRHLLSN...NGYPFK
Thap9-Insectivora	SERNEKTLRSRKHWSSLLQDYKC.SSFANTN.KFKHLLRN...DGYPFI
Thap9-Lagomorpha	SERPENMTRLKVIIGS.....HMFKFI
Thap9-Perissodactyla	SERTEMTLSRKHWSSLLQDYRI.SRFANTN.KFRHLLSN...DGYPFK
Thap9-Pholidota	SERPEMKTSRRSPRSSLDQFRC.SSFANTS.TGIC.....
Thap9-Rodentia	SERTERKTLSKKH.GSLQDYKC.LSFANTN.KFRHLLSN...DGYPFK
Thap9-Sarcopterygii	.AKLEQWELFKCKIKQ.....KFTK.....TMHCKC
Thap9-Scandentia	SERTEKTLRSRKHWSSLLQDYKC.STFANTN.KFGHLPSN...DGYLFK
Thap9-Squamata	.ECHSTKEADRKQSMRGPRKPL...GHPW.KWPQEILG.LKEWYRAL
Thap9-Testudines	...YGWKRLNRKH.....PF.SSLLKTY.KSI.....QTLFVP
Thap9-Xenarthra	SERTEMTLSRKHWSSLLQDYKC.SGFTKTN.KF.....SN...NGYPFK
Thap9-Primates	SERITDMKTLRSRKHWSSVQDYKC.SSFANTSS.KFRHLLSN...DGYPFK
Thap9-Primates	