## CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep\_msa/HAHPat.psTue Feb 1 12:16:33 2022 Page 1 of 3

	·* · · · · · · · · · · · · · · · · · ·	
Pavo_muticus Pavo_cristatus	MIKGAMGCPVAAIMEESFSCTVANRFYQLLDDESDPFDNLREAELRQQMIKGAMGCPVAAIMEESFSCTVANRFYQLLDDESDPFDNLREAELRQQ	48 48
Gallus_gallus Chelonia mydas	mm <mark>kgamgcpvaavmegsfsctvanrfyqllddesdpfdnlreaercwq</mark> mmkgalgspvaaamgesfgcavanrfhqllddesdpfdvlreaerroq	48 48
Mus_musculus	mkgalgspvaaaGaamqesfgcvvankfhqllddesdpfdilkeaehkrqqc	53
Rattus_norvegicus	m <mark>KG</mark> AL <mark>GSP</mark> VAAA <mark>GAAMQETFGCVVANRFHQLLDDESDPFDILREAEHRRQQQ</mark> L m <mark>KG</mark> ALGSPVAAAGAAMQESFGCVVANRFHQLLDDESDPFDILREAERRRQQQL	53 53
Homo_sapiens Pan_troglodytes	MKGALGSPVAAAGAAMQESFGCVVANRFHQLLDDESDPFDILREAERRRQQQL	53 53
Macaca_mulatta	mkgalgspvaaagaamqesfgcvvanrfhqllddesdpfdilreaerrrqqql	53
Callithrix_jacchus Bos taurus	m <mark>KG</mark> AL <mark>GSP</mark> VAAA <mark>G</mark> AVMQESFGCVVANRFHQLLDDESDPFDILREAERRRQQQL m <mark>KG</mark> ALGSPVAAAAAGAAMQESFGCVVANRFHQLLDDESDPFDILREAERRRQQQL	53 55
Equus_caballus	m <mark>kgalgspvaaaaag</mark> aam <mark>qesfgcvvanrfhqllddesdpfdilre</mark> aerrrqqql	55
Canis_lupus_familiaris Heterocephalus_glaber	m <mark>KG</mark> VL <mark>GSP</mark> VAAAAA <mark>G</mark> AAMQESFGCVVANRFHQLLDDESDPFDILREAEHRRQQQL m <mark>KGGPGGATMQETFGCVVANRFHQ</mark> LLDDESDPFDVLREAERRRQLQL	55 <b>4</b> 7
Rhinatrema_bivittatum	MKGALSSPVSAAMQEGFGCAVANRFQQLLDDESDPYDVLREAEEEKR	47
Xenopus_tropicalis	MRLDTMKQAPSSPDNVAMQDNFGCAVENRFNQLLDDESDPLDFLYQSGVEIT 1102030405060	52
	*::	
Pavo_muticus	*:: : :*:**  ORKNINKVVARRGGPGGKGCATRREPOKORKQLG	82
Pavo_cristatus	QRKNLNKVVARRGGPGGKGCATRREPQKQRKQLG QRKNLSKVVARRGDPGSRGCATRRELQKQRKQLG	82 82
Gallus_gallus Chelonia_mydas	QRKKDEAAAAAGGRKPGPGQRPGPAAGKRESQKERKVLQPESP	92
Mus_musculus	QRKRRDEAAAAASG-AGHRGGRSPAVASGHRPGAGG-RRESQKERKSLAASGAQQP	107
Rattus_norvegicus Homo_sapiens	QRKRRDEAAAASG-AGHRGGRSPAVASGHRPGAAG-RRESQKERKSLAVSSAQQP QRKRRDEAAAAAG-AGPRGGRSPAGASGHRAGAGG-RRESQKERKSLPAPVAQRP	106 106
Pan_troglodytes	QRKRRDEAAAAAG-AGPRGGRSPAGASGHRAGAGG-RRESQKERKSLPAPVAQRP	106
Macaca_mulatta Callithrix jacchus	QRKRRDEAAAAAARAGPRGGRSPAGASGPRAGAGG-RRESQKERKSLPAPVAQRP QRKRRDEAAAAAG-AGPRGGRSPAGPSSHRASAGG-RRESQKERKTLPAPGAQGP	107 106
Bos_taurus	QRKRRDEAAAAAAG-AGNRGGRSPAGASGHRPGAGGGRRESQKERKSLPAPSSQQP	110
<pre>Equus_caballus Canis_lupus_familiaris</pre>	QRKRRDEAAAAAAAAAG-AGTRGGRSPAGASGHRAGAGGGRRESQKERKSLPAPGTQQP QRKRRDEAAAAAG-AGNRGGRSPAGASGHRPGAGGGRRESQKERKSLPGPGAPQP	114 109
<pre>Heterocephalus_glaber</pre>	PRRRRDEAGATTPGPKLGAGG-PRGSRKERKGPAAPGSPRG	87
Rhinatrema_bivittatum Xenopus_tropicalis	-RRRRQEVAVAASAKRD <mark>GGGHRSGKRETQKERKAPAP</mark> EI RRKKKEEAAAKKSANQKSGKKESQKERKAFLA <mark>GG</mark>	85 86
nenopub_cropreurib	708090100110120	00
	*::.*: * .: * .: * .	
Pavo_muticus Pavo cristatus	-TPALPPOPGOKOAPKEEDC <mark>GG</mark> KDNSRAEKODKTEWRPSFMEYSSYETESQAELTG -TPALPPOPGOKOAPKOEECGGKDNSRAEKODKTEWRPSFMEYSSYETESQAELTG	137 137
Gallus_gallus	- <mark>TPAPPPQPGQKQAPKQEECGGKDNSR</mark> AEKEH <mark>KT</mark> AW <mark>RPSFMEY</mark> LSS <b>ETE</b> SQAEL <b>T</b> A	137
Chelonia_mydas Mus_musculus	AAPGAPPOPGOKRAPKRGEOOGWNDNRGTEVKODKAEWRPSFREYRPYEKEROVEFT- DSPG-GPOPP-GOKRTPRRGEOOGWNDNRGTDVVLERAERR-SYREYRPYETEROADLPV	149 164
Rattus_norvegicus	DSPG-GPQPP-GQKRTPRRGEQQGWNDNRGTDVVLDRAERR-SYREYRPYDTERQAESTA	163
Homo_sapiens	DSPGGGLOAP-GOKRTPRRGEOOGWNDSRGPEGMLERAERR-SYREYRPYETEROADFTA DSPGGGLOAP-GOKRTPRRGEOOGWNDSRGPEGMLERAERR-SYREYRPYETEROADFTA	164
Pan_troglodytes Macaca mulatta	DSPGGGLQAP-GQKRTPRRGEQQGWNDSRGPEGMLERAERR-SIREYRPYETERQADFTA DSPGGGLQAP-GQKRTPRRGDQQGWNDSRGPEGMLERAERR-PYREYRPYETERQADFTA	164 165
Callithrix_jacchus	DSPGGGLQAPVGQKRTPRRGEQQGWNDSRGPEGTLERAERR-PYREYRPYETER	159
Bos_taurus Equus_caballus	DSPGGGPQPP-GQKRTPRRGEQQGWSDSRGTEVTLDRAERR-SYREYRPYDTERQADFPP DSPGAGPQPP-GQKRTPRRGEQQGWSDSRGSEVTLDRVERR-SYRECRPSETERQADFTP	168 172
Canis_lupus_familiaris	DSPGVGPPPPAGQKRAPRRGEQQGWNDSRGTEVTLDRAERR-SYREYRPYETERQADLTP	168
Heterocephalus_glaber Rhinatrema bivittatum	ALPLSQPQPA-GQRRTPRRGEVQGWNDSQGTEVTLDRTERR-SYREYRPYETERQVDFTA QQPPTQAQPP-GQKRPPKRVDRGGENENWGAEVKLDRAERRTAFREFRSNDLDRPVEFS-	145 143
Xenopus_tropicalis	STEVQGTQQT-GQKHAPKNTVKATQNENVGSQVKVDRAERRTAFKEVRPNIMDRATEYS-	144
	$\dots \dots 130 \dots 140 \dots 150 \dots 160 \dots 170 \dots 180$	

## CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep\_msa/HAHPatqusTue Feb 1 12:16:33 2022 Page 2 of 3

	:: :: *. * **. :.* **** . : : **:*:* *	
Pavo muticus	KSLFRPIEKLDYERP-RGRGRGRGGMQGRGRGGGINNSFDGFDGRGKREFERQSDS	192
Pavo cristatus	KSLFRPIEKLDYERP-RGHGRGRGGMQGRGRGGGINNSFDGFDGRGKREFERQSDS	192
Gallus_gallus	QSLFRPTAKLNYERP-RGCGRGRGGMQGRGRGGGINKSFDGFDQRGKREFGRQNDN	192
Chelonia mydas	VEKPVDRFDRERPMRGRGGGRGGMRSRGRGGGMNRSLNGYDQRGKREFERQSGS	203
Mus musculus	EKFTDEKPVDRFDRDRPLRGRGGPRGGLRSRGRGGPGNRAFDSFDQRGKRDFERYSSN	222
Rattus norvegicus	EKFTDEKPVDRFDRDRPLRGRGGPRGGLRNRGRGGPGNRAFDSFDQRGKRDFERYGSS	221
Homo_sapiens	EKFPDEKPGDRFDRDRPLRGRGGPRGGMRGRGRGGPGNRVFDAFDORGKREFERYGGN	222
Pan_troglodytes	EKFPDEKPGDRFDRDRPLRGRGGPRGGMRGRGRGGPGMRVFDAFDQRGKREFERYGGN	222
Macaca mulatta	EKFPDEKPGDRFDRDRPLRGRGGPRGGMRGRGRGGPGNRVFDAFDORGKREFERYSGN	223
Callithrix_jacchus	PGDRFDRDRPLRGRGGPRGGIRGRGRGGPGNRVFDAFDQRGKREFERYGGN	210
Bos taurus	EKFTDEKPIDRFDRDRPLRGRGGPRGGMRSRGRGGPGNRTFDGFDQRGKREFERYGGN	226
Equus_caballus	EKFMDEKPIDRFDRDRLLRGRGGPRGGMRSRGRGGPGSRAFDGFDORGRREFERYGGN	230
Canis_lupus_familiaris		222
Heterocephalus_glaber	EKCTDEKLIDKFDRDRAPRGRGGPRGALRGRSRGRGGGGIRAFDTFDPRGKRDFERYSGN	205
Rhinatrema bivittatum	VEKPVDWFDRDRPVRGRGGGRGSTRGRGRGGGLMRNFDGLDQRGKREFERHSGS	197
Xenopus_tropicalis	IEKPMEIMDQDKQTRNYGAGRGGMRGRGRGG-FPRNTENDNIRGKREFDRHSGS	197
kellopus_clopicalis	190210220230240	1)
	220230240	
	: :* : : *: :	
Pavo muticus	DKIEMELTAPMEATAKTAKSPGMSEGEPLNKVAEGK	228
Pavo_cristatus	DKIEMELTAPMEATAKTAKSPGMSEGEPLNKVAEGK	228
Gallus_gallus	DKIEMELTAPMEATAKTAKSPGVSEGELLNKVAEGK	228
Chelonia mydas	DKTGIRTEDKRGGSGARNWGTVKDDLSEMEQTAPVEDTAETEDHQGAPEGEPLTKVAEGE	263
Mus musculus	DK-TNRMEDSMGGCGIRPWGSGKD-TSDTEPPAPMEETSMMEECQGALDEESAAKVPELE	280
Rattus norvegicus	DK-ANRMEDSMGGCGVRTWGSGKD-TSDTEPPAPMEETSMMEECQGVLDEESASKVPELE	279
Homo_sapiens	DKIAVRTEDNMGGCGVRTWGSGKD-TSDVEPTAPMEEPTVVEESQGTPEEESPAKVPELE	281
Pan troglodytes	DKIAVRTEDNMGGCGVRTWGSGKD-TSDVEPTAPMEEPTVVEESQGAPEEESPAKVPELE	281
Macaca mulatta	DKIAVRIEDNMGGCGVRTWGSGKD-TSDVEPTALMEEPTVVEEAQGAPEEESPAKIPELE	282
Callithrix jacchus	DKIIVRTEDNMGGCGVRTWGSGKD-TSDVEATAPMEEPTVVEESQGAPEEESPAKVPELE	269
Bos_taurus	DKIASRTEDNMGGYGVHTWGSGKD-TSDTDPAAPMEETTVVEESLGPLEDESPAKVPELE	285
Equus_caballus	DKTAMRTEDNVGGCGVRTWGSGRD-TSDGEPAAPMEEAAVAEESLGPLEEESPAKVPESE	289
Canis_lupus_familiaris		278
Heterocephalus_glaber	DKIAFRPEDNTGGCGIRTWGSGKD-TSDLELTALIEETPAMEEAHGALEEDSPAKVPELE	264
Rhinatrema bivittatum	DRAGIRAEDKRGGNGARNWGTVKDDLSGMEQTTPMEETAEMEEHQELPDGESETKVDG-E	256
Xenopus_tropicalis	DRARIRPEDKRGGGGPRNWGSIKEAFSEIE-AVPVEEQVEPTETTEATEEEHG-KVPE-E	254
xellopus_clopicalis	250260270280290300	234
	250200270200	
	* .**.**** * . * * * * * * * * * * * *	
Pavo muticus	PMEEVV-QEMTLDEWKNLQQQNRPKHEFNIRRPESTVPSKAVVIHKSKYSDDIQKGELED	287
Pavo cristatus	PMEEVV-QEMTLDEWKNLQQQNRPKHEFNIRRPESTVPSKAVVIHKSKYSDDIQKGELED	287
Gallus gallus	PREEVV-QEMTLDEWKNLQQQNRPKHEFNIRRPESTVPSKAVVIHKSKYSDDIQKGELED	287
Chelonia_mydas	PVEEVAAQEMTLDEWKNLQQQSRPKPEFNIRKPESTVPSKAVVIHKSKYRDDMLKEDFED	323
Mus_musculus	VEEENOVOEMTLDEWKNLOEOTRPKPEFNIRKPESTVPSKAVVIHKSRYRDDMVKEDYED	340
Rattus_norvegicus	VEEENQVQEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHKSRYRDDIVKDDYED	339
Homo sapiens	VEEETQVQEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHKSKYRDDMVKDDYED	341
Pan troglodytes	VEEETQVQEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHKSKYRDDMVKDDYED	341
Macaca mulatta	VEEETQVQEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHKSKYRDDMVKDDYED	342
Callithrix_jacchus	VEEETQVQEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHKSKYRDDMVKDDYED	329
Bos_taurus	VEEETQVQEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHKSKYRDDMVKDDYED	345
Equus_caballus	VEEETQVQEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHKSRFREDMVKDDYED	349
Canis lupus familiaris	LEEETOVOEMTLDEWKNLOEOTRPKPEFNIRKPESTVPSKAVVIHKSKYRDDMVKDDYED	338
Heterocephalus glaber	VEEETQVHEMTLDEWKNLQEQTRPKPEFNIRKPESTVPSKAVVIHESKYRDDIVKDDYEE	324
Rhinatrema bivittatum	LVEEMT-HEMSLDEWKSLQEQVRPKPEFNIRKPDSSVLSKAVVIHKSKYKNEILKEEEEE	315
Xenopus tropicalis	INEGFS-QEMSLDEWKSLQDQNRAKTEFNLRKPETSVPSKAVVIHKSKYKNNISENE-EE	313
venobre_crobicaris	310320330340350360	314

## CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep\_msa/HAHPat.psTue Feb 1 12:16:33 2022 Page 3 of 3

g		
	. ** *** . * . * * . * * * * * * * *	
Pavo muticus	DYHIFRRAVNDITSQLDINFGSLPRPGRGSRG-ARG-RGRGRRVEETGPQPE-IMVHIVA	344
<del>_</del>		_
Pavo_cristatus	DYHIFRRAVNDITSQLDINFGSLPRPGRGSRG-ARG-RGRGRRVEETGPQPE-IMVHIVA	344
Gallus_gallus	DYHIFRRAVNDITFQLDINFGSLPRPGCGSRG-ARG-RGRGRQMEETGPQPE-AMVQIVA	344
Chelonia_mydas	DSHIFRKAANDITSQLDINFGNLPRPGRGARG-TRGGRGRVKRVEDTGPRPE-VVTQIIA	381
Mus_musculus	ESHVFRKAANDITSQLEINFGNLPRPGRGARGSTRGGRGRMRRTENYGPRAE-VVTQDVA	399
Rattus_norvegicus	ESHVFRKAANDITSQLEINFGNL <mark>PRPGRGARG</mark> STRGGRGRIRRTENYGPRAE-VVTQDVA	398
Homo_sapiens	DSHVFRKPANDITSQLEINFGNLPRPGRGARGGTRGGRGRIRRAENYGPRAE-VVMQDVA	400
Pan troglodytes	DSHVFRKPANDITSQLEINFGNLPRPGRGARGGTRGGRGRIRRAENYGPRAE-VVMQDVA	400
Macaca mulatta	DSHVFRKPANDITSQLEINFGNLPRPGRGARGGTRGGRGRIRRAENYGPRAE-VVMQDVA	401
Callithrix jacchus	DSHVFRKAANDITSQLEINFGNLPRPGRGARGGNRGGRGRIRRAENYGPRAE-VVVSFIT	388
Bos taurus	DAHVFRKAANDITSQLEINFGNLPRPGRGARGGTRGGRGRIRRAENYGARAE-VVIQDVA	404
Equus_caballus	DAHVFRKAANDITSQLEINFGNLPRPGRGARGGPRGGRGRIRRAENYGPRAE-VVTQDVA	408
		397
Canis_lupus_familiaris		
Heterocephalus_glaber	DAHVFRKAANDITSQLEINFGNLPRPGRGGRGGARGGRGRIRRVENYGPRPE-VVIQDIA	383
Rhinatrema_bivittatum	DHHYFRKSANDITSQLNINFGSLARPGRGSRGGARGGRGRARRSEELRTDCTPDVVQIIA	375
Xenopus_tropicalis	YHYCFRKPVNDITARLDINFGSLARPSRGRGAGGRGRVRREEAFPHEVVNVLSDA	367
	$\dots \dots 370 \dots 380 \dots 390 \dots 400 \dots 410 \dots 420$	
	. :* :*	
Pavo muticus	PNPDDPEDFPALT	357
Pavo_muticus Pavo cristatus	PNPDDPEDFPALT	357
<del>-</del>	PNPDDPEDFPALT	
Gallus_gallus	PNPDDPEDFPALT	357
Chelonia_mydas	P <mark>NPDDPED</mark> FPALA	394
Mus_musculus	P <mark>NPDDPED</mark> F <mark>PAL</mark> A	412
Rattus_norvegicus	PNPDDPEDFPALA	411
Homo_sapiens	PNPDDPEDFPALS	413
Pan_troglodytes	PNPDDPEDFPALS	413
Macaca_mulatta	PNPDDPEDFPALS	414
Callithrix_jacchus	SPRPVKVSEQRSFFSLKPDLCVPLESHWCGSQSSCFCSRCKMLPPTQTTLKTSLHFPERV	448
Bos taurus	PNPDDPEDFPALA	417
Equus caballus	PNPDDPEDFPALA	421
Canis_lupus_familiaris	PNPDDPEDFPALA	410
Heterocephalus glaber	PNPDDPEDFPALA	396
Rhinatrema bivittatum	PNPDDPEDFPALA	388
<b>—</b>	PNPDDPEDFPALV	
Xenopus_tropicalis	PNPDDPEDFPALV	380
	430440450460470480	
Pavo muticus	357	
Pavo cristatus	357	
Gallus_gallus	357	
Chelonia_mydas	<b>55</b> ,	
	331	
Mus_musculus	412	
Rattus_norvegicus	411	
Homo_sapiens	413	
Pan_troglodytes	413	
Macaca_mulatta	414	
Callithrix_jacchus	LLPGTEELHCTPMERLFWL 467	
Bos taurus	417	
Equus caballus	421	
Canis_lupus_familiaris		
Heterocephalus_glaber	396	
Rhinatrema bivittatum	388	
Xenopus_tropicalis	380	
venobra_crobicaria	490	

.....490.....