



Supplementary Materials:

Figure S1. ClustalW alignment of 80 H1 protein amino acid sequences.

3		
4		
5	Mouse	-----
6	Rat	-----
7	Bull	-----
8	Human	-----
9	Orangutan	-----
10	Amz_snake	-----
11	Cobra	-----
12	Tas_devil	-----
13	West_frog	-----
14	Goose	-----
15	Salmon	-----
16	Sea_louse	-----
17	Bow_trout	-----
18	Pike_fish	-----
19	Smelt_fish	-----
20	Gar_fish	-----
21	Killifish	-----
22	Turq_killi	-----
23	Blu_notho	-----
24	Seabass	-----
25	Tilapia	-----
26	Platyfish	-----
27	Molly	-----
28	Livebearer	-----
29	Stck_fish	-----
30	Putterfish	-----
31	Cone_worm	-----
32	Octopus	-----
33	Jap_fluke	-----
34	Fluke_worm	-----
35	Ch_crab	-----
36	Coral	MSGRGKGKAKGTKSKSRSSRAGLQFPVGRIHRLLRKGNYAERVGAGAPVYLAADVLEYLSA
37	Mar_worm	-----
38	Lucina_H1B	-----
39	Poly_worm	-----
40	Cayen_tick	-----L
41	Star_tick	-----
42	Gulf_tick	-----SLFRSPTGSD
43	Bont_tick	-----
44	Soft_tick	-----
45	Mouro_tick	-----
46	Clam	-----
47	Med_mussel	-----
48	Mussel	-----
49	Chile_mus	-----
50	Cali_mus	-----
51	Solen_mar	-----
52	Lucina_H1A	-----
53	Leech	-----
54	Sponge	-----M
55	Owl_snail	-----
56	Sea_hare	-----
57	Oyster	-----
58	Snail	-----
59	Pearl_oyst	-----
60	Scallop	-----
61	Centepide	-----
62	Pig_worm	-----
63	Roundworm	-----
64	Dog_worm	-----
65	Pine_worm	-----
66	Nod_worm	-----
67	Hookworm	-----
68	Pole_worm	-----
69	Cave_fish	-----
70	Catfish	-----
71	Zebrafish	-----
72	Trout	-----
73	Chicken	-----
74	Mallard	-----
75	Rabbit	-----
76	Bar_midge	-----
77	Ten_midge	-----
78	Fly	-----
79	Arz_bug	-----
80	Tarsalis	-----
	Albopictus	-----

Gambiae	-----
Mosquito	-----
Tube_worm	-----
Mouse	-----MTENSTSAPAA-----
Rat	-----MTENSTSTPAA-----
Bull	-----MTENSTSTPAA-----
Human	-----MTENSTSAPAA-----
Orangutan	-----MTENSTSAPAA-----
Amz_snake	-----MTENSTTAPAA-----
Cobra	-----MTENSTTAPAA-----
Tas_devil	-----MTEN--SAPAS-----
West_frog	-----MTENSAAPAG-----
Goose	-----TDSPIAPAPAA-----
Salmon	-----MAET-AAAPAP-----
Sea_louse	-----MAET-AAAPVP-----
Bow_trout	-----MAET-AAAPAP-----
Pike_fish	-----MAET-VAAPAP-----
Smelt_fish	-----MAET-AAAPAP-----
Gar_fish	-----KTPVMAETAAAAPAQ-----
Killifish	-----MAET--SGAPA-----
Turq_killi	-----MAET--SGAPA-----
Blu_notho	-----MAET--SGAPA-----
Seabass	-----MAET--SAAPA-----
Tilapia	-----MTET--STAPA-----
Platyfish	-----MAET--SAAPA-----
Molly	-----EFLINFIFKRRIEVTMAET--SATPA-----
Livebearer	-----MAET--SAAPA-----
Stck_fish	-----VTMAET--STAPA-----
Putterfish	-----MAET--SAAPA-----
Cone_worm	-----MADAIS-----
Octopus	-----MAETTEQK-----
Jap_fluke	-----MTVSAISGGAIAAAP-----
Fluke_worm	-----MTVSGVSGGSLAAAP-----
Ch_crab	-----MADSAAA-----
Coral	EILELAGNAARDNKKTRIIPRHLQLAVRNDEELNKLLAGVTIAQGVHNMSEV-----
Mar_worm	-----MSEAVSSAAKK-----
Lucina_H1B	-----MS-AAPVKAKK-----
Poly_worm	-----MSDVAAPKAKK-----
Cayen_tick	LFSSSLRCVLVIRHPFLVR---CSSTDTPAPVMSDVEVKPAAPATPKPKGRKP-----
Star_tick	-----AEVKPAVPPTPKAKGRKS-----
Gulf_tick	VLRSARCVPVTSCHFLQFPSPAVPGDTLPTTVMSDAEVKPAATAATPKAKGRKS-----
Bont_tick	-----MSDAEVKPAATAATPKAKGRKS-----
Soft_tick	-----MSETEAA-KAPATPKTKGRK-----
Mouro_tick	--SAFVRVLHVSS-----PFTMSAEAEAA-KPAASPKGKGRK-----
Clam	-----MAD--ATAAPAVAPAKSP-----
Med_mussel	-----MAD--ATAAPAVAPAKSP-----
Mussel	-----MAD--ATAAPAVAPAKSP-----
Chile_mus	-----MAD--ATAAPAVAPAKSP-----
Cali_mus	-----MAD--AKAAPAAAPANS-----
Solen_mar	-----MAD--AKAAPAAAPANS-----
Lucina_H1A	-----MAD--TAVAPAAATPKPA-----
Leech	-----MSDE-QVEQAPATAPVEEKKKAP-----
Sponge	TLFIRICHEITNTRFISSQNQKKNDVRKKQSKMTDA-----AVAPVHKSP-----
Owl_snail	-----MTDA-----AVAPVHKSP-----
Sea_hare	-----MSDAP--AAVAQTKTTPA-----
Oyster	-----MSDA-----VVATP--KPA-----
Snail	-----MEDSTNATPAAATAPAVTTPAKA-----
Pearl_oyst	-----MSDAEVAAPAEATP--VKKGAKT-----
Scallop	-----MSDSEEVTTAAEDAPAPAAAP-----
Centepide	-----MS--ENATAPTGRGRKTAA-----
Pig_worm	-----MS--TEVAAPAPPAATETKK--P-----
Roundworm	-----MS--TEVAAPAPPAATETKK--P-----
Dog_worm	-----MS--TEVATAGSPATAEAKK--P-----
Pine_worm	-----MSDSAAPVAAPASPKAPASPK--A-----
Nod_worm	-----MS--DAAVAAPTPTAPAPV--T-----
Hookworm	-----MS--DAVVAPPTPTAPATA--T-----
Pole_worm	-----MS--DAAPATSP-----V-----
Cave_fish	-----MAEIAPA--ASAPA--KAPKKK-----
Catfish	-----MAEVAPAP-AVAPA--KAPKKK-----
Zebrafish	-----MAETAPAP-AASPA--KAPKKK-----
Trout	-----AEVAPAPAAAPAA--KAPKKK-----
Chicken	-----MSETAPVAAPAVSAPGAKAAAKKP-----
Mallard	-----MSETAPVAAPAVSAPGAKAAGKKP-----
Rabbit	-----MSETAP-AAPAAPAPAEKTPVKKK-----
Bar_midge	-----MSDPAPEVAP--AAPVASPAK--AKK-----
Ten_midge	-----MSDPAQEVEAPVEAPVASSPK--GKK-----
Fly	-----MSDSAVATSASPVIAQAASGEKKVSTKK-----
Arz_bug	-----MADTAANAAP-----AASPKK--GKA-----
Tarsalis	-----MTETATEVVEAAPAAASP--AKA--TKK-----
Albopictus	-----TTTEVAAAAP-AAASP-AKT--PKK-----
Gambiae	-----MADTAATEAPTAAAAAPAPAAKS--PKK-----
Mosquito	-----MADTAATEAPTAAAAAPAPAAKS--PKK-----
Tube_worm	-----MADSAPATAAP-----ATPTK--AKK-----
Mouse	-----KPKRAKASKKS-----TDHPKYSDMIVAAIQAEKNRAGSSRSIQ
Rat	-----KPKRAKAAKS-----TDHPKYSDMIVAAIQAEKNRAGSSRSIQ

170	Bull	-----KPKRAKASKKS-----	TDHPKYSDMIVAAIQAEKNRAGSSRQSIQ
171	Human	-----KPKRAKASKKS-----	TDHPKYSDMIVAAIQAEKNRAGSSRQSIQ
172	Orangutan	-----KPKRAKASKKS-----	TDHPKYSDMIVAAIQAEKNRAGSSRQSIQ
173	Amz_snake	-----KPKRAKASKKS-----	TDHPKYSDMIVAAIQAEKSRAGSSRQSIQ
174	Cobra	-----KPKRAKASKKS-----	TDHPKYSDMIVAAIQAEKSRAGSSRQSIQ
175	Tas devil	-----KPKRAKASKKS-----	TDHPKYSDMIVAAIQAEKNRAGSSRQSIQ
176	West_frog	-----KPKRSKASKKA-----	TDHPKYSDMILAAVQAEKSRSGSSRQSIQ
177	Goose	-----KPKRARAPRKP-----	ASHPTYSEMIAAAIRADKSRGGSSRQSIQ
178	Salmon	-----KAKKAKAPKKP-----	ASHPKYSDMIKAAVHADKSRGGASRQSVQ
179	Sea_louse	-----KAKKAKAPKKP-----	ASHPKYSDMIKAAVHADKSRGGASRQSVQ
180	Bow_trout	-----KAKKAKAPKKP-----	ASHPKYSDMIKAAVHADKSRGGASRQSVQ
181	Pike_fish	-----KAKKAKAPKKP-----	ASHPKYSDMIKAAVQADKSRGGASRQSVQ
182	Smelt_fish	-----KAKKAKTPKKT-----	ASHPKYSDMIKTAIVADKSRGGASRQSIQ
183	Gar_fish	-----KAKKAKGPKKA-----	STHPKYSDMIEAAVHAEKSRGGASRQSIQ
184	Killifish	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
185	Turq_killi	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
186	Blu_notho	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
187	Seabass	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
188	Tilapia	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
189	Platyfish	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
190	Molly	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
191	Livebearer	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
192	Stck_fish	-----KAKKASKPKKP-----	ASHPKYSDMIKAAIVHDASRSGASRQSIQ
193	Putterfish	-----KAKKASKPKKP-----	ASHPKYSEMIRAAIAHDASRSGASRQSIQ
194	Cone_worm	-----PTKKVAAAAPKKV-----	STHPKYSEMVRAAIEALKERGSSRQAIL
195	Octopus	-----AAATTKKAAKAKA-----	SRYPAYNTMITEAITALAEKGGSSRQAIL
196	Jap_fluke	-----LSGGTKKSTKSKTP-----	SAHPYGDMIKKALKELKERGGSSRQAITA
197	Fluke_worm	-----STAGVRKSAKSKKAP-----	SIHPYGDMIKKALKELKERGGSSRQAITA
198	Ch_crab	-----APAPKKAAGKAAK-----	TSHPKYSAMIAAAITSLKERGGSSRQAIL
199	Coral	-----KPSPKKPAAPAKP-----	ADHPYLDMIKAAIVALKERNNGSSRQAIL
200	Mar_worm	-----KPAAKSKKSGS-----	GDHPAYKDMVVAAVAALKEKGGSSRQAIL
201	Lucina_H1B	-----AAKPKKP-----	STHPKYSEMIKAAITSLKERGGSSRQAIL
202	Poly_worm	-----AAKPKKP-----	AAHPKYSEMIVQAAVTSKLERGGSSRQAIL
203	Cayen_tick	-----AAGGPKKAKKP-----	ASHPKYTEMVKKSIEALKERGSSRQAIH
204	Star_tick	-----TAGAPKKVKKP-----	ASHPKYTEMVKKSIEALKERGSSRQAIH
205	Gulf_tick	-----AAGGAKKAKKP-----	ASHPKYTEMVKKSIEALKERGSSRQAIH
206	Bont_tick	-----AAGSAKKAKKP-----	ASHPKYTEMVKKSIEALKERGSSRQAIH
207	Soft_tick	-----SAG-AKKDKKP-----	ANHPKYTDMVKKAVAALKERGSSRQAIH
208	Mouro_tick	-----SAGAAKKAKKP-----	ANHPKYTDMVKSIAIVDLKERGGSSRQAIH
209	Clam	-----KKKAAAKPKKP-----	SAHPKYSEMIGKAI AALKERGSSRQAIL
210	Med mussel	-----KKKAAAKPKKP-----	SAHPKYSEMIGKAI AALKERGSSRQAIL
211	Mussel	-----KKKAAARPKKP-----	SAHPKYSEMIGKAI AALKERGSSRQAIL
212	Chile_mus	-----KKKAAAKPKKP-----	SAHPKYSEMIGKAI AALKERGSSRQAIL
213	Cali_mus	-----KKKAAAKPKKP-----	SAHPKYSEMIGKAI AALKERGSSRQAIL
214	Solen_mar	-----KKKAAAKPKKP-----	SAHPKYSEMIGKAI AALKERGSSRQAIL
215	Lucina_H1A	-----KKKAAAKPKKP-----	SAHPKYSEMIQAAVSNLKERGGSSRQAIL
216	Leech	-----KKKAAAPKAKV-----	ADHPKYAEMIKDALNALKERGGSSRQAIL
217	Sponge	-----KKKTSAPKVP-----	AAHPKYVDMIKAAVASLKERGGSSRQAIL
218	Owl_snail	-----KKKTSAPKVP-----	AAHPKYVDMIKAAVASLKERGGSSRQAIL
219	Sea_hare	-----KKRAQKPKAP-----	PAHPQYKIMVVAISSLKERGGSSRQAIL
220	Oyster	-----KAKKAAKPKKP-----	ASHPKYSDMIKAAITALKERGGSSRQAIL
221	Snail	-----QKKKAAAKPKSK-----	KPANHPKYCDMIKAAITNLKERGGSSRQAIL
222	Pearl_oyst	-----AKTATKKKSKNG-----	PPKDHPMFKDMIKDAITALKERGGSSRQAIL
223	Scallop	-----AEPAAAKKPKSKPKPKP-----	STHPKFRDMAVEAIGALKERSGSSRQAIL
224	Centepide	-----AAAKPKK-----	PKTPASHPKYLEMSVAAINALKERNNGSSRQAIL
225	Pig_worm	-----AAKKTAAAGKPKA-----	PKVPASHPAYGDMVKAADVVALKEKGGSSRAAIL
226	Roundworm	-----AAKKTAAAGKPKA-----	PKVPASHPAYGDMVKAADVVALKEKGGSSRAAIL
227	Dog_worm	-----AAKKGGRGGRPKT-----	PKTPASHPAYGDMVKAADVVALKEKGGSSRAAIL
228	Pine_worm	-----SPKAKKVAKAPKAKAAAPKTPANHPTYIDMIKKAITELKEKGGSSRAAIL	
229	Nod_worm	-----PVKTKAA-KPKGEK-----	KAKATPSHPVYGAMIKAAIKELKDRKGASKQAIL
230	Hookworm	-----STKKVKPS-KPKGEK-----	KAKVAPSHPVYGAMIKAAIKELKDRKGASKQAIL
231	Pole_worm	-----PAKKTAS-KPKGEK-----	KPKTAPSHPVYSAMIKAAIKELKDRKGASKQAIL
232	Cave_fish	-----AAARPK-----	KAGPSVGMIVKAVSASKERSGVSLAALK
233	Catfish	-----AASRAK-----	KAGPSVGLIVKAVSSKERSGVSLAALK
234	Zebrafish	-----AASPK-----	KAGPNVRDLIVKTVTASKERNVSLAALK
235	Trout	-----AASPK-----	KSGPAVGELAGKAVAASKERSGVSLAALK
236	Chicken	-----KKAAGGAKPRK-----	PAGPSVTELITKAVSASKERKGLSLAALK
237	Mallard	-----KKAAGGSKARK-----	PAGPSVTELITKAVAASKERKGLSLAALK
238	Rabbit	-----ARKSAGAAKRR-----	ASGPPVSELITKAVAASKERSGVSLAALK
239	Bar_midge	EK-----KPKSDKPKPKAP-----	RTHPPVSEMVNNAIKTLKERGGSSLAIAIK
240	Ten_midge	EKAPKAPKAEKPKSDKPKPKAA-----	PTHPPVSEMVNNAITTLKERGGSSLAIAIK
241	Fly	AA-----ATPKSKSTAAP-----	PSHPPTQMQVDASIKNLKERGGSSLAIAIK
242	Arz_bug	AA-----AAAAASKKPRVK-----	PAHPPTSDMVNNAIKSLKERGGSSLAIAIK
243	TarSalis	PK-----AAKGDAKKPKKP-----	STHPPNEMVIAAIKTLKERNNGSSLAIAIK
244	Albopictus	TK-----AAKGDAKKPKKP-----	ATHPPANEMVLAALKNLKERKSGSLQAVK
245	Gambiae	PK-----AAAG-PKKPKQP-----	AAHPPINEMLLAAVKALNERNNGSSLAIAIK
246	Mosquito	PK-----AAAG-PKKPKQP-----	AAHPPINEMMLAAVKALNERNNGSSLAIAIK
247	Tube_worm	AA-----APKKPKVP-----	AAHPPVQAQMVNNAIAALKDRKSGSLAIAIK
248			* : :: .: * * ::
249			
250	Mouse	KYIKSHYKVG---ENADSQIKLSIK-RLVTTGVLKQTKGVGASGSFRLAKG-----	
251	Rat	KYIKSHYKVG---ENADSQIKLSIK-RLVTTGVLKQTKGVGASGSFRLAKG-----	
252	Bull	KYIKSHYKVG---ENADSQIKLSIK-RLVTTGVLKQTKGVGASGSFRLAKS-----	
253	Human	KYIKSHYKVG---ENADSQIKLSIK-RLVTTGVLKQTKGVGASGSFRLAKS-----	
254	Orangutan	KYIKSHYKVG---ENADSQIKLSIK-RLVTTGVLKQTKGVGASGSFRLAKS-----	
255	Amz_snake	KYIKSHYKVG---ENADSQIKLSIK-RLVTTGVLKQTKGVGASGSFRLAKG-----	
256	Cobra	KYIKSHYKVG---ENADSQIKLSIK-RLVTTGVLKQTKGVGASGSFRLAKS-----	
257	Tas devil	KYIKSHYKVG---ENADSQIKLSIK-RLVTNGVLKQTKGVGASGSFRLAKG-----	
258	West_frog	KYIKSHYKVG---ENADSQIKLSIK-RLVTSGLTKQTKGVGASGSFRLAKA-----	

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259 Goose KYVKSHYKVG---QHADLQIKLAIR-RLTTGVLKQTKGVGASGSFRLAKG-----
260 Salmon KYIKSHYKVG---DNADSQIKLSLK-RMVSEGLRHTKIGIGASGSFKLAKA-----
261 Sea louse KYIKSHYKVG---DNADSQIKLSLK-RMVSEGLRHTKIGIGASGSFKLAKA-----
262 Bow_trout KYIKSHYKVG---DNADSQIKLSLK-RMVSEGLRHTKIGIGASGSFKLAKA-----
263 Pike_fish KYIKSHYKVG---DNADSQIKLSLK-RMVSGLLRHTKIGIGASGSFKLAKA-----
264 Smelt_fish KYIKGHYKVG---ENADSQIKLSLK-RLVNSGVLRLHTKIGIGASGSFKLAKA-----
265 Gar_fish KYIKSHYKVG---DNADSQIKLSLK-RLVATGVLRLHTKIGIGASGSFKLAKA-----
266 Killifish KYVRKTYKVG---DNADVQIKMALK-RLVASGMLRHTKIGIGASGSFRLTKP-----
267 Turq_killi KYVRKTYKVG---DNADVQIKMALK-RLVASGMLRHTKIGIGASGSFRLTKP-----
268 Blu_notho KYVRKTYKVG---DKADVQIKLALK-RLVASGMLRHTKIGIGASGSFRLTKP-----
269 Seabass KYVVKNYKVG---DNVDVQIKLALK-RLVASGMLRHTKIGIGASGSFRLTKP-----
270 Tilapia KYVRKTYKVG---DNADVQIKMALK-RLVAAGTLRHTKIGIGASGSFRLTKP-----
271 Platyfish KYVRKTYKVG---DNADVQIKMALK-RLVASGMLRHTKIGIGASGSFRLTKP-----
272 Molly KYVRKTYKVG---DNADVQIKMALK-RLVASGMLRHTKIGIGASGSFRLTKP-----
273 Livebearer KYVRKTYKVG---DNADVQIKMALK-RLVASGMLRHTKIGIGASGSFRLTKP-----
274 Stck_fish KYVRKTYKVG---ENADVQIKLALK-RLVAAGSLRHTKIGIGASGSFRLTKP-----
275 Puttérfish KYVVKNYKVG---DNVDVQIKLALK-RLVESGMLRHTKIGIGASGSFRLTKP-----
276 Cone_worm RYIVLNYKVGEDERVNQHLKVALR-TGVKSEMLKQSKGSGASGSFKLGD-----
277 Octopus KYIVKQYKVPDDKGAIAQLKLGLK-RGVRTGALKQSKGSGASGSFKLGS-----
278 Jap_fluke KYIKANYKV---DER-AESHLRRLALV-TGVKSGKIVHTKIGIGASGSFKLADK-----
279 Fluke_worm KYIKTNYKV---DDR-AESHLRRLALV-TGVKSGKLVHTKIGIGASGSFKLADK-----
280 Ch_crab KHIIANNEVD--EKAAATQLKLALK-RGVASGALKQVKGAGASGSFRINKP-----
281 Coral KYIKANYKV---EVG--SHLMALK-RGAASGKLLHTKIGIGASGSFVKAKE-----
282 Mar_worm KYVVAHYKVG---EKVANVHLKLSL-RLVDGGQLKRVKGTGASGSFKIAQA-----
283 Lucina_H1B KHIIMANFNVGKDAAAVNAHLKLMALK-RGVAKGALKQSKGTGASGSFRLG-----
284 Poly_worm KYIVKNFNVGTEKTNTVTHLKLALK-AGVAKGTLKQSKGTGAAGSFRMG-----
285 Cayen_tick KYIMSHFDVGKDSKVVNTHLKLALK-RAVQTGLLKRSGKTGASGSFRLA-----
286 Star_tick KHIIMSHYDVGKDSKVVNTHLKLALK-RAVQSGLLKRSGKTGASGSFRLA-----
287 Gulf_tick KYIMGHYDVGKDTKVVNTHLKLALK-RAVQTGLLKHSGKTGASGSFRLA-----
288 Bont_tick KYIMGHYDVGKDTKVVNTHLKLALK-RAVQTGLLKHSGKTGASGSFRLA-----
289 Soft_tick KYIMANFDVGKDSKVVNTHLKLALK-RAVETGILKHAKGTGASGSFRLA-----
290 Mouro_tick KYIMANYDVGKDSKVVNTHLKQALK-RSVQTGALKRSGKTGASGSFRLA-----
291 Clam KYIMANFNVGKDAKSVAHLKLALK-AGVKNNSLKQSKGTGASGSFRIG-----
292 Med_mussel KYIMANFNVGKDAKSVAHLKLALK-AGVKNNSLKQSKGTGASGSFRIG-----
293 Mussel KYIMANFNVGKDAKSVAHLKLALK-AGVKNNSLKQSKGTGASGSFRIG-----
294 Chile_mus KYIMANFNVGKDAKSVAHLKLALK-AGVKNNSLKQSKGTGASGSFRIG-----
295 Cali_mus KYIMANFNVGKDAKSVAHLKLALK-AGVKNNSLKQSKGTGASGSFRIG-----
296 Solen_mar KYIMANFNVGKDAKSVAHLKLALK-AGVKNNSLKQSKGTGASGSFRIG-----
297 Lucina_H1A KYILANYKV---DEKQANSHLKLALK-AGVKNGSLKQSKGTGASGSFRLG-----
298 Leech KYIAQNYTLGNDKVINSHLKMALK-AGVKNGSLKQSKGVGASGSFKIGNGD-----
299 Sponge KYVVMANYKVGTDLKAIVNSRIKNALK-NGVKAGTLKQSKGTGAAGSFKLG-----
300 Owl_snail KYVVMANYKVGTDLKAIVNSRIKNALK-NGVKAGTLKQSKGTGAAGSFKLG-----
301 Sea_hare KYIILANYKVGDNPTAINARLKTALR-AGVKAETLKQSKGTGAAGSFRIG-----
302 Oyster KYIILANNKV---DAEAAASRLHLMALK-AGVKNGTLKQSKGTGASGSFKLG-----
303 Snail KYIMANFNVGKDEKVINSHLKMALK-AGAKNGNLKQSKGVGASGSFKLGA-----
304 Pearl_oyst KHIIVAHYNI-KDQKAANAHLKMALK-AGVKNGTLKQAKGTGASGSFKMG-----
305 Scallop KHIIRANYSDVQASD--NNHLKMTLK-ACVKNGTLKQCKGTGASGSFKLG-----
306 Centepide KYITGHYSVGKDAKVVNTHLKMALK-RGVSSGVLKHAKGQGTGATGFRVS-----
307 Pig_worm KYILQHYKVGDNLTAVNAHLRQALK-RGVSTGALKQTKGTGASGSFRLG-----
308 Roundworm KYILQHYKVGDNLTAVNAHLRQALK-RGVSTGALKQTKGTGASGSFRLG-----
309 Dog_worm KYILQHYKVGDNLTAVNAHLRQALK-RGVSTGALKQTKGTGASGSFRLG-----
310 Pine_worm KYILQHYKVGSNIVAINAHLRQGLK-RGVTTGALKQTKGVGASGSFRLA-----
311 Nod_worm KYITQKYKVGDNKQINARLRLALK-KGVENGLLKQASGTGAAGRFRLA-----
312 Hookworm KFIITQKYKVGDNKQINARLRLALK-KGVEKGLLKQASGTGAAGRFRLA-----
313 Pole_worm KFMTQKYKLGTEKQINAHLMALK-RGVSSGALTQPSGTGAAGRFRLA-----
314 Cave_fish KALAAG-GYDVE--KNNSRVKIAVK-SLVTKGTLVQTKGTGASGSFKLNKK--QAEAKKK
315 Catfish KALAAG-GYDVE--KNNSRVKIAVK-SLVTKGTLVQTKGTGASGSFKLNKK--QTEAKK-
316 Zebrafish KALSAG-GYDVE--KNNSRVKIAVK-SLVTKGTLVQTKGTGASGSFKLNKK--QAEPPK-
317 Trout KSLAAG-GYDVE--KNNSRVKIAVK-SLVTKGTLVETKGTGASGSFKLNKK--AVEAKKP
318 Chicken KALAAG-GYDVE--KNNSRVKIAVK-SLVTKGTLVQTKGTGASGSFKLNKKPGETKAKAT
319 Mallard KALAAG-GYDVE--KNNSRVKIAVK-SLVTKGTLVQTKGTGASGSFKLNKKPGETKAKAT
320 Rabbit KALAAA-GYDVE--KNNSRVKIAVK-SLVTKGTLVQTKGTGASGSFKLNKKAAAGEAKPK
321 Bar_midge KFLVAAQYKVDVE--KLAPFIKKYK-NAVANGKLIQTKGKASGSFKLSRSAAK---DPK
322 Ten_midge KFLVAAQYKVDVE--KLAPFIKKYK-NAVANGKLIQTKGKASGSFKLSRSAAK---DPK
323 Fly KYIAGATYKCDAE--KLAPFIKKYK-NAVANGKLIQTKGKASGSFKLSRSAAK---DPK
324 Arz_bug KYIAANYKVDVE--KLAPFIKKYK-NAVANGKLIQTKGKASGSFKLSRSAAK---DPK
325 Tarsalis KYIAANYKCDVA--KLSTFIKKALK-TNVEKGLVQTKGSGASGSFKIAEAKKPAGEKK
326 Albopictus KYIAGANYKCDVA--KLSTFIKKALK-TNVEKGLVQTKGSGASGSFKILK--DNKAAAEKK
327 Gambiae KYVAANYKADVT--KLASFIFKALK-AGVEKGTFFVQTKGSGASGSFKLSAAAKPVVEKK
328 Mosquito KYVAANYKADVT--KLATFFIKALK-TAVANGKLVQTKGTGASGSFKLSAAAKPAVEKK
329 Tube_worm KYIAANYKCNID--RCTPFIKKYK-QAVAAGKLVQTKGTGAAGSFKLSAAAKA---EK
330 : : : : : * * * : * :
331
332 Mouse -DEPKRS---VAFK--KTKKEVKKVAT-----PKKAAKPKKAA-SKAPSKPKPAT-
333 Rat -DEPKRS---VAFK--KTKKEVKKVAT-----PKKAAKPKKAA-SKAPSKPKPAT-
334 Bull -DEPKRS---VAFK--KTKKEVKKVAT-----PKKAAKPKKAA-SKAPSKPKPAT-
335 Human -DEPKRS---VAFK--KTKKEIKKVAT-----PKKASKPKKAA-SKAPTCKPKAT-
336 Orangutan -DEPKRS---VAFK--KTKKEIKKVAT-----PKKASKPKKAA-SKAPTCKPKAT-
337 Amz_snake -DEPKK---APVK--KAKKEVKKATT-----PKKAAKPKKAA-AKSPAKPKPK--
338 Cobra -DEPKK---APVK--KAKKEVKKATT-----PKKAAKPKKAA-AKSPAKPKPK--
339 Tas_devil -DEPKK---PAVK--KAKKEVKKAAT-----PRKASKPKKAAATPAKPKPA--
340 West_frog -DEGKK---PAK--KPKKEIKKAAS-----PKKAAKPKKAAKSPAKAKPKVAE
341 Goose -DKAKRSP--AGRK--KKKKAARKSTS-----PKKAARPRKAR---SPAKPKPAK--
342 Salmon -EDTKKAPKVKAVV--KAKKSPVKSAAK-----PKKAAKPKKAAKSPAKAKPKAVV
343 Sea_louse -EDTKKAPKVKAVV--KAKKSPVKSAAK-----PKKAAKPKKAAKSPAKAKPKAVV
344 Bow_trout -EDTKKAPKVKTVV--KAKKSPVKSAAK-----PKKAAKPKKAAKSPAKAKPKAVV
345 Pike_fish -EDTKKAPKPKPVV--KAKKSPVKSAAK-----PKKAAKPKKAAKSPAKAKPKAVV
346 Smelt_fish -EDAKKVPKPKPVV--KAKKSPVKSAAK-----PKKAAKPKKAAKSPAKAKPKAVV
347 Gar_fish -DESKKAP--KPAE--KPKKKATKAAK-----PKKAAKPKKAAKSPAKAKPKAVV

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Killifish --EDSKKP-AKAAAS--AKPKKVAKP-K-----PKKAAKPKKVPKTPEKPKKAAAK--
 Turq_killi --EDSKKP-AKAAAS--AKPKKVAKP-K-----PKKAAKPKKVPKTPEKPKKAAAK--
 Blu_notho --EDSKKP-AKAAAS--AKPKKVAKP-K-----PKKAAKPKKVPKTPEKPKKAAAK--
 Seabass --EDSKKP-TKAAAT--AKPKKAAKPSK-----PKKAAKPKKVPKTPEKPKKAAAK--
 Tilapia --EDSKKS-TKAAAVTAPKPKKAAKPAK-----PKKVAKPKKVAKTPEKPKKAAAK--
 Platyfish --EDSKKPAPAKPTA--AKPKKVAKP-K-----PKKAAKPKKVTKTPEKPKKAAVK--
 Molly --EDSKKPAPAKPAA--AKPKKVAKP-K-----PKKAAKPKKVTKTPEKPKKAAVK--
 Livebearer --EDSKKPAPAKPAA--AKPKKVAKP-K-----PKKAAKPKKVTKTPEKPKK-AVK--
 Stck_fish --EDDKKP-----VP--AKAKKAAKPSK-----PKKAAKPKKVAKTPEKPKKAAAK--
 Putterfish --EEAPKPKKAAPAS--KPKKAAKPPK-----PKKAAKSKRT-KTPEKPKKPAK--
 Cone_worm --AAKKKTAVKPKPK--KTAADKPKKS-----PKKVKKADGEKKKSSPKKKKADST--
 Octopus --AKKEE-----KKKT--KTKSAGTK-----PKKAKAP-----KKVTKSPKKAD--
 Jap_fluke --TVTPKKTVRPKTV--KPKSSPKKKAA-----TKKPKTAKPKSVSSSNPTKPTAAA--
 Fluke_worm --SVTPKKVAPKPTS--KPKTTT--KKVS-----TKKPKVVPKP--STTNPTSKPAAS--
 Ch_crab --DE-PKAVAKKPAK--AAAKKPKV-----KPAAKKPAAKK-----SPKKPAAKK--
 Coral --EKKEKKPKKKPAAKKKPAKPKKPAA-----KKAAKKPAAKK-----AAKKPAAKK--
 Mar_worm --EKPVTTTAKKTVKAPAKKAKAKSPA-----KKTAAPKPAK--TPVKTAKP--
 Lucina_H1B --EKKAA-PKKVVKA-KRTPKSPKKKA-----AKKPAAAGEKKPKAKK-AAKPKKA--
 Poly_worm --EVKAEPKKATKP-KAAAKPKKAA-----AKKPKAKKSAKTTPKKAAPKPKKA--
 Cayen_tick --DKAAAPPKKSPVK-RGPKKAGAAK-----PKK-VAKPKAAKSPAKKAAK--KS--
 Star_tick --DKAAAGPKKSPVK-RGPKKAGVAK-----PKKVIMKTTLAKSPAKKAAK--KA--
 Gulf_tick --DKAAAGPKKSPAK-RGPKKAGAAK-----SPKKAAPKAAKSP-KKAAK--KA--
 Bont_tick --DKAAAGPKKSPAK-RGPKKAGAAK-----SPKKAAPKAAKSP-KKAAK--KA--
 Soft_tick --DKTTASSEKKPKKVAAAKKPAKPK-----KAASPKKAAAPKKEKKAATPKKA--
 Mouro_tick --DK-----VEKAPKKKVAAKKPAAKK-----SPAKPKAAKPAKPKKAAKSPKKA--
 Clam --EAKVVKKKPAKAKKAAKPKAAK-----PKKAKSTPKKKKPAAKKPAGE--KK--
 Med_mussel --EAKVVKKKPAKAKKAAKPKAAK-----PKKAKSTPKKKKPAAKKPAGE--KK--
 Mussel --EAKVVKKKPAKAKKAAKPKAAK-----PKKAKTTPKKKKPAAKKPAGE--KK--
 Chile_mus --EAKQAKKKPAKAKKAAKPKAAK-----PKKAKSTPKKKK-AAKKPAGE--KK--
 Cali_mus --EAKQAKKKPAKAKKAAKPKAAK-----PKKAKSAPEKKK-AAKEPAGE--KK--
 Solen_mar --QAKQAKKKPAKAKSAKPKAAK-----PKEAKSAPEKKR-AAKEPAGE--KK--
 Lucina_H1A --EAK-----KKP--AKKAAKPKAAK-----PKKAKSPKKAKKPAAKKVKKT--PKK--
 Leech --KEEKETPKKKVLAKRAATTKAVKSPAKKVEAAPRKSPPKVAAETKKKPKASPVKKT--KP--
 Sponge --ESKSEK--PSKVKKVAAKKPAAKKA-----STPKK-PKAKKTTTKKTATPKKTK--
 Owl_snail --ESKSEK--PSKVKKVAAKKPAAKKA-----STPKK-PKAKKTTTKKTATPKKTK--
 Sea_hare --ESKSEK--PSKVKKVAAKKPAAKKA-----STPKK-PKAKKTTTKKTATPKKTK--
 Oyster --ESKSEK--PSKVKKVAAKKPAAKKA-----STPKK-PKAKKTTTKKTATPKKTK--
 Snail --KEEKETPKKKVLAKRAATTKAVKSPAKKVEAAPRKSPPKVAAETKKKPKASPVKKT--KP--
 Pearl_oyst --EAKVVKKKPAKAKKAAKPKAAK-----PKKAKSTPKKKKPAAKKPAGE--KK--
 Scallop --EAKVVKKKPAKAKKAAKPKAAK-----PKKAKTTPKKKKPAAKKPAGE--KK--
 Centepide --EAGVPVAKKPAKAVKAAPPAVEKVK-----VEAVKKPTKTPKKKKKKEIVKVKA--
 Pig_worm --EGKKTETVK--AKKPAKKT--TAG-----KAPVVKKPKSPKKAAPKPKKAKSS--
 Roundworm --EGKKTETVK--AKKPAKKT--TAG-----KAPVVKKPKSPKKAAPKPKKAKSS--
 Dog_worm --EGKKAETAKKKAKKSAKPKVAGE-----KKTAAKPKSPKTKAA-AKPKKAKVS--
 Pine_worm --DSAPKPKKAPKAKKPAKAAKPAKSPK-----KKAAPKKAAPKSPKAKAPKAKK--
 Nod_worm --EKTESTAKP-----KPKAPKTKEKSAKSPKKASK--
 Hookworm --ESSEIPAKPKVAKIPKAATDEAKPKKA-----TATKPKAPKATKEKSAKSPKKATK--
 Pole_worm --EKAAAPAAKPKK-----EKKPKAAGTPKKKAAKSPKKAAAG--
 Cave_fish --PVKKAAPKA--KKPAKPKPAAKPK-----KVAAPKVAAPKSPKKAKKPA-AA--
 Catfish --PLKKAAPKA--KK-----PAAKPK-----KVAAPK--AAKSPKKAKK--AA--
 Zebrafish --AAKKTAAKA--KKPAKPKPAAKSPKKA-----KKPAATSVKATKSPKKAKK--AA--
 Trout --AKKAAAPKA--KKVAAPKPAKPK-----KVAAPKVAAPKSPKKAKK--AT--
 Chicken --KKKP-AAKP--KKPA-----AKKPAA-----AAKPKKAAAVKSPKKAKKPAAAA--
 Mallard --KKKP-AAKP--KKPA-----AKKPAA-----AAKPKKAAAVKSPKKAKKPAAAA--
 Rabbit --PKKAGAAKP--KKPAG--AAKPKPK-----ATGAATPKKGAKTTPKKAKKPAAAA--
 Bar_midg --PMKATGEKK--PKA--AAKPKKAGEK-----KKSIAK--KPKAATATKVKKPVAKS--
 Ten_midg --PKKAPATPK--PKS--TKPKRVTGEKKVV-----KKPAAK--KPEAKKATKAAKPAK--
 Fly --PKASAVEKK--TKK--VNASARATKKKS-----STSTTK--KAAGAADKKLSKSAPTK--
 Arz_bug --KKVPAKTPK--EKK--AAATKAAAPKKK-----TAATS--KKPAAAEKK--KAAAAA--
 Tarsalis --PKKAAGEKKKVAKK--AAAKKPAGEKKAA-----AKKPKAAAPKKAAPKVAATAKT--
 Albopictus --PKKAAGEKKKAAK--PAKKATGEKK-----AKKP--AAKPKAGEKKKAAAGAKA--
 Gambiae --K-AAAPKKAAPKAAKTAAKKPAGEKKTV-----AKKAT--KKADGAAAKPKAAAAAKK--
 Mosquito --KAAAPKKAAPKAAKTAAKKPAGEKKTV-----AKKAT--KKADGAAAKPKAAAAAKK--
 Tube_worm --PKKPAKPA--AKK--ATKPKAAKPK-----KPKTPKKKAAKPKK--

Mouse --PVKKAK-----KKPAATPKK-----AKKPKVVVKVPV----KASKPK
 Rat --PVKKAK-----KKPAATPKK-----AKKPKVVVKVPV----KASKPK
 Bull --PVKKAK-----KKPAATPKK-----TKKPKTVKAKPV----KASKPK
 Human --PVKKAK-----KKLAATPKK-----AKKPKTVKAKPV----KASKPK
 Orangutan --PVKKAK-----KKLAATPKK-----AKKPKTVKAKPV----KASKPK
 Amz_snake --AAKKAK-----KKPAPAPKK-----AKKPKTVKAKPV----KASKPK
 Cobra --AAKKAK-----KKPAPAPKK-----AKKPKTVKAKPV----KASKPK
 Tas_devil --AAKKVK-----KKAATPAKK-----AKKPKTVKSKPV----KASKPK
 West_frog --KKVKKPAK-----KKPAPSPKK-----AKKPKTVKAKPV----RASRVK
 Goose --ARKAR-----KKSASPKK-----AKKPKTVKAKSL----KTSKPK
 Salmon --K-KVKKSP-----KKAAPKPKK-----VAKTKK--VAKPA----KATKPK
 Sea_louse --K-KVKKSP-----KKAAPKPKK-----VAKTKK--VAKPA----KATKPK
 Bow_trout --K-KVKKSP-----KKAAPKPKK-----VAKTKK--VAKPA----KATKPK
 Pike_fish --K-KVKKSP-----KKVAPKPKK-----VVKKVK--AAKPA----KAVKPK
 Smelt_fish --K-KVKKSP-----KKVAPKPKK-----VVKKVK--AAKPA----KAVKPK
 Gar_fish --K-KAKKAP-----KKKPAKPKKQ-----KAKKPK--VSKPA----KASRPK
 Killifish --K-KVKKVA-----KKATPAKAKA-----PAKKSAAKPKAK----PVKKAA--
 Turq_killi --K-KVKKVA-----KKATPAKAKA-----PAKKSAAKPKAK----PAKKA--
 Blu_notho --K-KVKKVA-----KKATPAKAKA-----PAKKSAAKPKAK----PVKKAA--
 Seabass --K-KVKKVA-----KKSTPAKAKA-----PVKKPKAAKPKAK----PAKKA--
 Tilapia --K-KVKKVA-----KKATPAKAKA-----PAKPKAAKPKAK----PAKKA--
 Platyfish --K-KVKKVA-----KKATPAKTKA-----PAKPKAAKAKAK----PVKKTA--
 Molly --K-KVKKVA-----KKATPAKTKA-----PAKPKAAKAKAK----PVKKTA--

437	Livebearer	--KVKKVA-----KKATPAKSKKA-----PVKKPKAAKAKAK----PVKKTA
438	Stck_fish	--KVKKVA-----RKATPAKAKKA-----PAKTP--AKTPAK----KASKAV
439	Putterfish	--KVKKAP-----KKASPAKAKKA-----PPKSKPVPKSKAK----PAKKA
440	Cone_worm	TKAVEKAKKPKADKVKKVDKPKKVAKTDKA-----KPKASK--KVKKV----AKTKEP
441	Octopus	--KVKKAK-----VAKPVK-----KPKTPK--KAKTA----AK-KST
442	Jap fluke	KPKPTKPK-----AAKPKK-----AKTPH--KPKTV----KP-KKP
443	Fluke_worm	KPKATKPKS-----TAKPKK-----AKSPR--KPKTV----KP-KKP
444	Ch_crab	--SPKKPA-----AKK-SPKKP-----AAKKAACKPAK----KAAKKP
445	Coral	P-AAKKPA-----AKKPAACKP-----AAKTPAKKPAK----KPAKKP
446	Mar_worm	--KTKKSP-----KKAAPKPKA-----AAKKTAKKAAA----KP-KKA
447	Lucina_H1B	K--SPKK-----AAKPKKAK-----TPKKAGAKA-----S-KPKTK
448	Poly_worm	AKKSPKK-----AATKKAAG-----KPKAAAACK-----T-PKKA
449	Cayen_tick	PKAAKPKT-----AAAKPKVAK-----KPKSPKKAK-----S-PKKPK
450	Star_tick	PKAAKPKT-----AAAKPKVAK-----KPKSPKKAK-----S-PKKPK
451	Gulf_tick	AKAAKPK-----AAAKPKAAK-----KPKAPKKAK-----S-PKKPK
452	Bont_tick	AKAAKPKT-----AAAKPKVAK-----KPKAPKKAK-----S-PKKPK
453	Soft_tick	P-KAKATK-----AAAKPKAAP-----KPKTPKKAK-----S-PKKPK
454	Mouro_tick	AAKPKAAT-----KAAKPKAAA-----KPKTPRKTTPVKKA--S-PKKPK
455	Clam	AAKPKAK-----KPAAKKAAK-----PKKPAKSPAKKK----AAKPK
456	Med mussel	AAKPKAK-----KPAAKKAAK-----PKKPAKSPAKKK----AAKPK
457	Mussel	AAKPKAK-----KPAAKKAAK-----PKKPAKSPAKKK----AAKPK
458	Chile_mus	AAKPKAK-----KPAAKKAAK-----PKK-AARSPAKKK----AAKPK
459	Cali_mus	AAKPKAK-----KPAAKKGAk-----AKKAAPRSPAKKK----AAKPK
460	Solen_mar	AAKPKAL-----KPAAKKVAK-----AKKAAPRSPAKKK----AAKPK
461	Lucina_H1A	AVKPKK-----ATKSPK-----KAKKATKSPKKAK----ASKPK
462	Leech	AAKPKAAS-----KPPAAKPAKKE-----VKKSPAKPKAKAA--ASPAP
463	Sponge	VAGAKKTA-----AKPKKAAPK-----KVKTTPKKVKTVK-----PKKA
464	Owl_snail	VAGAKKTA-----AKPKKAAPK-----KVKTTPKKVKTVK-----PKKA
465	Sea_hare	VT-KKATG-----AKTKKATKSPG-----KKNSPAKKSTAAK---KVAKKA
466	Oyster	AKSPKKAK-----AAGEKKPKK-----VAKSPAKAKKAP-----AKPK
467	Snail	KSPKKAA-----VKKPKAPK-----PAAAAKPKPKPT---PKKKAA
468	Pearl_oyst	KPAKSKP-----AKKVKTPK-----KAAAKKPK-----KAAK
469	Scallop	EKKAKASP-----KKKAAAKPK-----KAKSPKKAAAK-----SKAK
470	Centepide	VKKAKSPK-----KVVEKKKTVKAK-----KVKTTPKKAVIKKP---VSKPK
471	Pig_worm	PKKAAAK-----PKKAVSPKK-----PKASKPK-----TVVKS
472	Roundworm	PKKAAAK-----PKKAVSPKK-----PKASKPK-----TVRKS
473	Dog_worm	PKKAAAK-----PKKAASPKK-----PKVAKPK-----APKKS
474	Pine_worm	AAAAKPKS-----PAKKAAPKK-----AVVKKS-----PAKKA
475	Nod_worm	PKAKSAKS-----PKKAATPKK-----AASKPK-----TAKPK
476	Hookworm	PKAKTAKS-----PKKAATPKK-----AAPKPK-----ATKKT
477	Pole_worm	DKPKKAKI-----AKKSKSPKK-----AAAKPKKAKSPKKPAVKKAAKKP
478	Cave_fish	AKKATKSPK-----KVKKPAAPKK-----ATKSPKKAKTVKP-----KAA
479	Catfish	AKKATKSPK-----KAKKPATPKK-----AAKSPKKAKAVKP-----KTT
480	Zebrafish	AKKATKSPK-----KAKKPAAAKK-----AAKSPKKVAVKP-----KTA
481	Trout	PKKAAKSPK-----KATKAAPK-K-----AAKPKKAAKSPK-----
482	Chicken	TKKAAKSPK-----KATKAGRPKK-----TAKSPAKAKAVKP-----KAA
483	Mallard	TKKAAKSPK-----KAAKAGRPKK-----AAKSPAKAKAVKP-----KAA
484	Rabbit	GAKKAKSPK-----K-AKAAKPKK-----APKSPAKAKAVKP-----KAA
485	Bar_midge	TKKQAAVKP-----AAKK-AAPKP-----KAVPKPK-AAPK-----KEA
486	Ten_midge	---KVAAPK-----AAKKAAPKP-----KAAAKPKKEVVKP-----KEA
487	Fly	KSVKRRAD-----KAKAKDAKKTGTIKAKPTTAKAKSSATKPK-TPKPKT-----KSA
488	Arz_bug	VAVKTKTPS-----KAK-----KT-----AQPTTKPKK-SPKPKK-----AAV
489	Tarsalis	AKKAG-----TVKKAAAPKQ-----KATKPSKTAAP-KP-----KTP
490	Albopictus	AKKAG-----TVKKAAAPKQ-----KATKPSKAAAK-KP-----KTP
491	Gambiae	PKAADGAKK-----AAKKAAPKQ-----KATKPAKAAAAAKP-----KAP
492	Mosquito	PKAADGAKK-----AAKKAAPKQ-----KATKPAKAAAAAKP-----KAP
493	Tube_worm	EKKEKKAKT-----PKKAKAAVKK-----TPKKAAAKPKTVK-----KAA
494		
495	Mouse	KAKTVKPK-AK-SSAKRASKKK-----
496	Rat	KAKPVKPK-AK-SSAKRASKKK-----
497	Bull	KTKPVKPK-AK-SSAKRTGKKK-----
498	Human	KAKPVKPK-AK-SSAKRAGKKK-----
499	Orangutan	KAKPVKPK-AK-SSAKRAGKKK-----
500	Amz_snake	KAKASKPK-AK-SSAKKSTKKK-----
501	Cobra	KAKASKPK-AK-SSAKKSTKKK-----
502	Tas_devil	KAKPSKPK-AK-SSAKKSAKKK-----
503	West_frog	KAKPSKPK-AK-ASPKKSGRKK-----
504	Goose	KARRSKPR-AK-SGARKSPKKK-----
505	Salmon	KAKAAKPK-PK-AAAKKAAKKK-----
506	Sea_louse	KAKAAKPK-PK-AAAKKAAKKK-----
507	Bow_trout	KAKAAKPK-PK-AAAKKAAKKK-----
508	Pike_fish	KAKAAKPK-PK-AAAKKAAKKK-----
509	Smelt_fish	KAKTAKPK-PK-TTAKKATKKK-----
510	Gar_fish	KMKTK-----
511	Killifish	KPKAKTPK-KA-AKS---AKKK-----
512	Turq_killi	KPKAKTPK-KA-AKS---AKKK-----
513	Blu_notho	KPKAKTPK-KA-AKS---AKKK-----
514	Seabass	KPKAKPAK-KA-AKT---AKKK-----
515	Tilapia	KPKAKTPK-KA-AKT---SKKK-----
516	Platyfish	KPKAKTPK-KA-AKT---SKKK-----
517	Molly	KPKAKTPK-KA-AKT---SK-----
518	Livebearer	KSKAKTPK-KA-AKT---SKKK-----
519	Stck_fish	KSKAKPAR-RV-AKPKGAPKKG-----
520	Putterfish	KPKAKPAK-KA-TKT---AKKK-----
521	Cone_worm	KTKAPKAK-KVLKTPKKSASKK-----
522	Octopus	KSKP-----KPKKSASKK-----
523	Jap fluke	VAKK-----TPKKVAKK-----
524	Fluke_worm	VAKK-----TPKKVAKK-----

526	Ch_crab	AAKK-----AAKK-----
527	Coral	AKKP-----AAKKTAKK-----
528	Mar_worm	VKKP-----AAKKTAAKKK-----
529	Lucina_H1B	-KKSPKK-----AKAARK-----
530	Poly_worm	PKKKPAA-----KKAAKKAPAKK-----
531	Cayen_tick	VAKKATP-----KKAAAKK-----
532	Star_tick	VAKKATP-----KKAAAKK-----
533	Gulf_tick	VAKKASP-----KKAAAKK-----
534	Bont_tick	VAKKATP-----KKAAAKK-----
535	Soft_tick	-AKKAPA-----KKAAAKK-----
536	Mouro_tick	-AKKATP-----AKKSARK-----
537	Clam	AKKTPK-----KK-----
538	Med_mussel	AKKTPK-----KK-----
539	Mussel	AKKTPK-----KK-----
540	Chile_mus	AKKTPK-----KK-----
541	Cali_mus	AKKTPK-----KK-----
542	Solen_mar	AKKTPK-----NK-----
543	Lucina_H1A	KSKTPK-----KKATKK-----
544	Leech	AKKAAPPA-AK---PKKAARK-----
545	Sponge	SPK-----KKTAAKKA-----
546	Owl_snail	SPK-----KKTAAKKA-----
547	Sea_hare	APKTTKP-----KKAAATKK-----
548	Oyster	AKKAAP-----KKAAAQK-----
549	Snail	APKKAAG-----AKKAAAKKEK-----
550	Pearl_oyst	SPKKAKK-----AKA-----
551	Scallop	KGKAAP-----K-----
552	Centepide	KLKSPK-----KSRK-----
553	Pig_worm	APK-----AKKAAA-----
554	Roundworm	APK-----AKKAAA-----
555	Dog_worm	APR-----AKKAAA-----
556	Pine_worm	APKKK-----AAPKAKA-----
557	Nod_worm	AAKKA-----AAPAKA-----
558	Hookworm	APKK-----AAPAKS-----
559	Pole_worm	TAKKA-----AAPKA-----
560	Cave_fish	K-----PKAAKPKKAAPKKK-----
561	Catfish	K-----IKAAKAKKAAPKKK-----
562	Zebrafish	K-----PKAAKPKKAAPKKK-----
563	Trout	-----KVKKPAAAKK-----
564	Chicken	KSKAAK---PKAAKAKKAATKKK-----
565	Mallard	KPKAAK---PKAAKAKKAAPKKK-----
566	Rabbit	KPKAAK---PKTAKPKKAPAKKK-----
567	Bar_midge	KPKKAA---APKAAKKPAQKKPKATKKPAAKKA-
568	Ten_midge	KPKKAA---A-KPAKKPAAKP---AKKPAAKKAK
569	Fly	KPKKV---SATTPKKTAVKKPKAKTASATKK--
570	Arz_bug	K-----KAKTPKKAAPNKK-----
571	Tarsalis	KPK-----KAAAPKKAAAKK-----
572	Albopictus	KPK-----KAAAPAKKAAPKKAAAKSKK-----
573	Gambiae	KPKKAAAPAKKAAAPKKAAAPKKAAAPKKAAAKK
574	Mosquito	KPKKAAAPAKKAAAPKKAAAPKKAAAPKKVAAAKK
575	Tube_worm	KPKT-----PKKAAKKPAAKKSK-----
576		

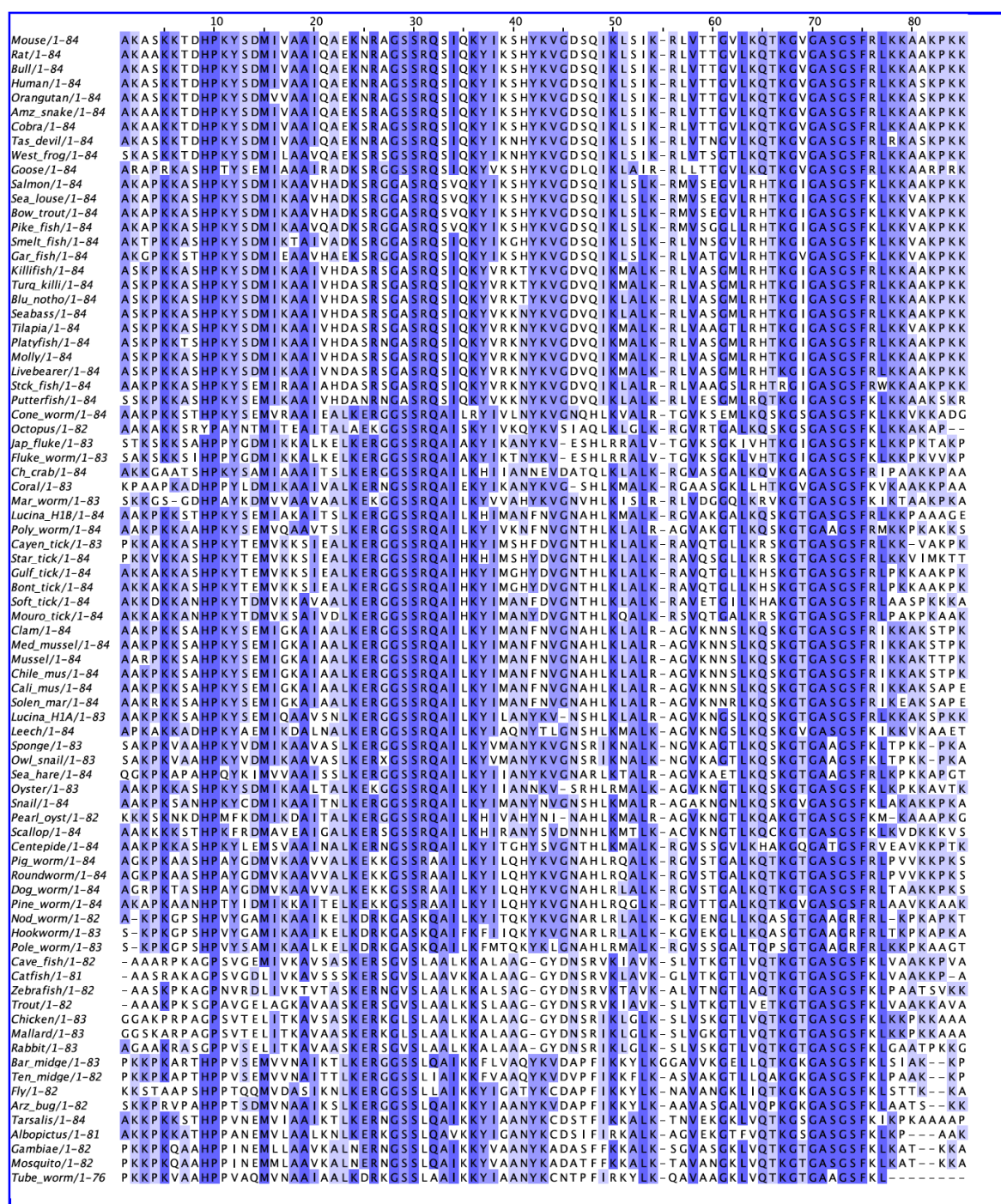


Figure S2. Multiple sequence alignment of the conserved central globular domain of histone H1s from 80 different species. Highly conserved amino acid residues are shown in dark blue and the level of shading decreases for those residues that are less conserved. Mammalian sequences are at the top, followed by reptiles, marsupial, amphibian, bird, fish, worms, cephalopod, crab, clam, insects, mussels, etc.

Table S1. Complete List Of H1 Protein Sequences Used For The Multiple Sequence and Phylogenetic Analyses.

Entry	Organism ID	Phylogenetic Abbreviation
Q6NVM0	Xenopus tropicalis (Western clawed frog) (Silurana tropicalis)	West_frog

P02258	Anser anser anser (Western greylag goose)	Goose
P02254	Salmo trutta (Brown trout)	Trout
P10922	Mus musculus (Mouse)	Mouse
P09987	Gallus gallus (Chicken)	Chicken
P43278	Rattus norvegicus (Rat)	Rat
Q0IIJ2	Bos taurus (Bovine)	Bull
P07305	Homo sapiens (Human)	Human
Q5NVN9	Pongo abelii (Sumatran orangutan) (Pongo pygmaeus abelii)	Orangutan
P02252	Oryctolagus cuniculus (Rabbit)	Rabbit
P09426	Anas platyrhynchos (Mallard) (Anas boschas)	Mallard
P40264	Glyptotendipes barbipes (Midge) (Chironomus barbipes)	Bar_midge
P40278	Chironomus tentans (Midge) (Camptochironomus tentans)	Ten_midge
Q94555	Drosophila virilis (Fruit fly)	Fly
B3FEA3	Ruditapes Philippinarum (Japanese littleneck clam) (venerupis philippinarum)	Clam
O46140	Mytilus edulis (Blue mussel)	Mussel
Q7K957	Mytilus galloprovincialis (Mediterranean mussel)	Med_mussel
Q8MYC2	Mytilus chilensis (Chilean blue mussel)	Chile_mus
Q8MYC3	Mytilus californianus (California mussel)	Cali_mus
K1RJ7	Crassostrea gigas (Pacific oyster) (Crassostrea angulata)	Oyster
D2DLE5	Solen marginatus	Solen_mar
A0A2C9K5S1	Biomphalaria glabrata (Bloodfluke planorb) (Freshwater snail)	Snail
X1ZAF3	Capitella teleta (Polychaete worm)	Poly_worm
A0A023FRV8	Amblyomma cajennense (Cayenne tick)	Cayen_tick
A0A1X7T2H6	Amphimedon queenslandica (Sponge)	Sponge
G3MGS5	Amblyomma maculatum (Gulf Coast tick)	Gulf_tick
V4AZD7	Lottia gigantea (Giant owl limpet)	Owl_snail
F0JA34	Amblyomma variegatum (Tropical bont tick)	Bont_tick
A0A194ANP8	Pinctada fucata (akoya pearl oyster) (Pinctadaimbricata fucata)	Pearl_oyst
I1SKI8	Aplysia californica (California sea hare)	Sea_hare
A0A1Z5KW53	Ornithodoros moubata (Soft tick) (Argasid tick)	Soft_tick
A0A1D2AHZ2	Ornithodoros brasiliensis (Mouro tick)	Mouro_tick
A0A0K1R009	Pectinaria gouldii (Trumpet worm) (ice-cream cone worm)	Cone_worm
A0A210PEH9	Mizuhpecten yessoensis (Japanese scallop) (Patinopecten yessoensis)	Scallop
T1G7G6	Helobdella robusta (Californian leech)	Leech
B9ELA2	Salmo salar (Atlantic salmon)	Salmon
C1BK29	Osmerus mordax (Rainbow smelt) (Atherina mordax)	Smelt_fish
A0A060VV51	Oncorhynchus mykiss (Rainbow trout) (Salmo gairdneri)	Bow_trout
C1BNT2	Caligus rogercresseyi (Sea louse)	Sea_louse
F1LAA1	Ascaris suum (Pig roundworm) (Ascaris lumbricoides)	Pig_worm
A0A0B2V393	Toxocara canis (canine roundworm)	Dog_worm

A0A0K0Q063	<i>Eriocheir sinensis</i> (Chinese mitten crab)	Ch_crab
A0A0M3IK88	<i>Ascaris lumbricoides</i> (Giant roundworm)	Roundworm
A0A0C9RTG1	<i>Amblyomma americanum</i> (Lone star tick)	Star_tick
O18642	<i>Chaetopterus variopedatus</i> (Parchment tube worm) (<i>Tricoelia variopedata</i>)	Tube_worm
C1BYR7	<i>Esox lucius</i> (Northern pike)	Pike_fish
F4ZHB6	<i>Astyanax fasciatus</i> (Blind cave fish) (<i>Astyanax mexicanus</i>)	Cave_fish
A0A140LH24	<i>Danio rerio</i> (Zebrafish) (<i>Branchydanio rerio</i>)	Zebrafish
Q4S4R9	<i>Tetraodon nigroviridis</i> (Spotted green pufferfish) (<i>Chelonodon nigroviridis</i>)	Pufferfish
C3Z7D2	<i>Branchiostoma floridae</i> (Florida lancelet) (<i>Amphioxus</i>)	Lancelet
A0A0B1RT83	<i>Oesophagostomum dentatum</i> (Nodular worm)	Nod_worm
A0A2B4S3T9	<i>Stylophora pistillata</i> (Smooth cauliflower coral)	Coral
A0A0L8GWZ4	<i>Octopus bimaculoides</i> (California two-spotted octopus)	Octopus
U6P4D5	<i>Haemonchus contortus</i> (Barber pole worm)	Pole_worm
A0A2D4N2X1	<i>Nicrurus spixii</i> (Amazon coral snake)	Amz_snake
V8PA09	<i>Ophiophagus hannah</i> (King cobra) (<i>Naja hannah</i>)	Cobra
A0A1A8QW5	<i>Nothobranchius rachovii</i> (bluefin notho)	Blu_notho
G3P2U9	<i>Gasterosteus aculeatus</i> (Three-spined stickleback)	Stck_fish
D2N2Q1	<i>Xenoturbella bocki</i> (Marine worm)	Mar_worm
A0A1A8KG98	<i>Nothobranchius kuhntae</i> (Bera killifish)	Killifish
A0A1A8V9N7	<i>Nothobranchius furzeri</i> (Turquoise killifish)	Turq_killi
W2TF07	<i>Necator americanus</i> (Human hookworm)	Hookworm
A0A1Q3EVA2	<i>Culex tarsalis</i> (Encephalitis mosquito)	Tarsalis
C1LBZ2	<i>Schistosoma japonicum</i> (Blood fluke)	Jap_fluke
G4V6K8	<i>Schistosoma mansoni</i> (Blood fluke)	Fluke_worm
A0A1B6CN64	<i>Clastoptera arizonana</i> (arizona spittle bug)	Arz_bug
A0A1S4H614	<i>Anopheles gambiae</i> (African malaria mosquito)	Gambiae
A0A023EJZ9	<i>Aedes albopictus</i> (Asian tiger mosquito) (<i>Stegomyia albopicta</i>)	Albopictus
A0A182HFW6	<i>Anopheles arabiensis</i> (Mosquito)	Mosquito
A0A17RTC3	<i>Bursaphelenchus xylophilus</i> (Pinewood nematode worm) (<i>Aphelenchoides xylophilus</i>)	Pine_worm
G3W6X3	<i>Sarcophilus harrisii</i> (Tasmanian devil) (<i>sarcophilus lanarius</i>)	Tas_devil
M4B0V9	<i>Xiphophorus maculatus</i> (Southern platyfish) (<i>Platypoecilus maculatus</i>)	Platyfish
A0A2DORM10	<i>Ictalurus punctatus</i> (Channel catfish) (<i>silurus punctatus</i>)	Catfish
I3KZG4	<i>Oreochromis niloticus</i> (Nile tilapia) (<i>Tilapia nilotica</i>)	Tilapia
A0A087YRU6	<i>Poecilia formosa</i> (Amazon molly) (<i>Limia fromosa</i>)	Molly
W5NNJ0	<i>Lepisosteus oculatus</i> (Spotted gar)	Gar_fish
E6ZGX2	<i>Dicentrarchus labrax</i> (European seabass) (<i>Morone labrax</i>)	Seabass
T1JEZ9	<i>Strigamia maritima</i> (European centepide) (<i>Geophilus maritimus</i>)	Centepide

A0A0S7KUC6

Poeciliopsis prolifica (blackstripe livebearer)

Livebearer

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