

Figure S1. Alignment of Phip protein sequences.

Alignment of Phip proteins from the species analyzed in this study and other representative metazoans, showing the degree of conservation of the five WD repeats (turquoise), and the two bromodomains (green). The species analyzed in this study are in bold font.

Phip <i>Nematostella vectensis</i>	-----E-LYFLVAKFLSGGPKRAAE	20
Phip <i>Strongylocentrotus purpuratus</i>	-----MAEKDTGRINDSTTESELYLIAKFLSGGPKESAN	36
Phip <i>Branchiostoma belcheri</i>	-----METTGSTSREASPTSEELYFLIAKFLSGGPKTRAPE	36
<b>Phip <i>Ciona robusta</i></b>	<b>RYCRVFKIIQPSLLFLSISRCRLCNSIGRKMESKNLNLDFLIERFLSKGCPAVSK</b>	<b>60</b>
Phip <i>Petromyzon marinus</i>	-----MAARPSHGGGVSRLESELFLLIARFLSAGPCREAAE	37
Phip <i>Lepisosteus oculatus</i>	-----MASDSKHVAQLKSELYFLIARFLSAGPCQNAEE	33
<b>Phip <i>Danio rerio</i></b>	<b>-----MAAERKHVAQLKSELYFLIARFLSAGPCQDAAE</b>	<b>33</b>
Phip <i>Latimeria chalumnae</i>	-----MSCDSKHIKELKSELYFLIARFLSAGPCQAAEE	33
<b>Phip <i>Xenopus tropicalis</i></b>	<b>-----MSSLNNOHSTELKSELYFLIARFLSAGPCQAAQ</b>	<b>34</b>
Phip <i>Gallus gallus</i>	-----MSGDGGSRHTAELRAELYFLIARFLSAGPCQAAQ	35
<b>Phip <i>Mus musculus</i></b>	<b>-----MSRERKGLSELSELYFLIARFLSAGPCQAAQ</b>	<b>33</b>
<b>Phip <i>Homo sapiens</i></b>	<b>-----MSCERKGLSELSELYFLIARFLSAGPCQAAQ</b>	<b>33</b>
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Phip <i>Nematostella vectensis</i>	ILMHAMFTRHLLPISQQLPRRLDWEGNSHPKSYQET---SYENRHISVDFLAQISSR	76
Phip <i>Strongylocentrotus purpuratus</i>	VLRQRIE-----QNGLFSARFDWKGKQSKLNL---DNCNGHKNDHLLKIVGR	84
Phip <i>Branchiostoma belcheri</i>	VLQQLQ-----EHELLERRSDWLGNTHPQTGPNL---VQRNPHVVSQHLQVCKR	84
<b>Phip <i>Ciona robusta</i></b>	<b>VLREVLN-----SLNIVPKRFDWGGQHVQSYDEW---TRFSDVGDHLLVLCNH</b>	<b>108</b>
Phip <i>Petromyzon marinus</i>	VLVREIE-----QKLLPRRVDRGAEHERSFAEM---VLSHTHLVPEHLLLVQR	85
Phip <i>Lepisosteus oculatus</i>	TLIKEVE-----EKELLPKRTDWTGKEHPGTYENL---VKLYRHVADPHLLQICRC	81
<b>Phip <i>Danio rerio</i></b>	<b>TLIREVQ-----QKELLPKRTDWTGKEHPGTYENL---VKLYRHISPDHLLQVCR</b>	<b>81</b>
Phip <i>Latimeria chalumnae</i>	VLIREVE-----EKQLLPRRTDWTGKEHPRTYENLLMOKVKCYRHIAPDHLLRQCR	82
<b>Phip <i>Xenopus tropicalis</i></b>	<b>VLIREVE-----EKELLPRVDWTGKEHARTYQNL---VKYRHLAPDHLLQICQR</b>	<b>85</b>
Phip <i>Gallus gallus</i>	VLIREVA-----EKELLPKRTDWTGKEHPRTYQNL---VKYRHLAPDHLLQICHR	83
<b>Phip <i>Mus musculus</i></b>	<b>VLIREVA-----EKELLPRRTDWTGKEHPRTYQNL---VKYRHLAPDHLLQICHR</b>	<b>81</b>
<b>Phip <i>Homo sapiens</i></b>	<b>VLIREVA-----EKELLPRRTDWTGKEHPRTYQNL---VKYRHLAPDHLLQICHR</b>	<b>81</b>
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Phip <i>Nematostella vectensis</i>	LCPLLKCVSSVGVQTLGAGRQSLLRGSGFIHPT--VSSLALCNHGA--PLLPPIG	132
Phip <i>Strongylocentrotus purpuratus</i>	IGHLLDKDTRPRVPGVKSLGGARQSLLRVADVKEPPLWSPVHAALYHHR--PIAPPNK	142
Phip <i>Branchiostoma belcheri</i>	VGFLDAQVRSVPGVTRTLGLGRQSLLRHADDFKVKQWKGPTLAAKAGSGHGNLMPVNV	144
<b>Phip <i>Ciona robusta</i></b>	<b>ITSMLDQKS--LNRGETSLQVGRNSLSD---EDIVWKFCHTVANINAK--PMIPPHN</b>	<b>160</b>
Phip <i>Petromyzon marinus</i>	LGPLLREIPPSVPGVCSLLGAGRQSLLRTRKDLGRVWVRGSGALAAALHRCR--PPQPOSS	143
Phip <i>Lepisosteus oculatus</i>	IGPFLLEKEVPASVPGVQSLGAGRQSLLRRTNKSCKHVVWKGSGALAAALHRCR--PPPEPVN	139
<b>Phip <i>Danio rerio</i></b>	<b>IGPFLLEKEVPASVPGVNSLLGTGRQSVLRRTNKSCKHVVWKGSGALAAALHRCR--PPPEPVN</b>	<b>139</b>
Phip <i>Latimeria chalumnae</i>	VEPFLLEKEIPPSVPGVQSLGAGRQSLLRRTNKSCKHVVWKGSTLAALHRCR--PPPEPVN	143
<b>Phip <i>Xenopus tropicalis</i></b>	<b>IGPFLLEKEVPQSVPGVQTLGAGRQSLLRRTNKSCKHVVWKGSGALAAALHRCR--PPPEPVN</b>	<b>140</b>
Phip <i>Gallus gallus</i>	IGPFLLEKEIPQSVPGVQTLGAGRQSLLRRTNKSCKHVVWKGSGALAAALHRCR--PPPEPVN	141
<b>Phip <i>Mus musculus</i></b>	<b>IGPFLLEKEIPQSVPGVQTLGAGRQSLLRRTNKSCKHVVWKGSGALAAALHRCR--PPPEPVN</b>	<b>139</b>
<b>Phip <i>Homo sapiens</i></b>	<b>IGPFLLEKEIPQSVPGVQTLGAGRQSLLRRTNKSCKHVVWKGSGALAAALHRCR--PPPEPVN</b>	<b>139</b>
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Phip <i>Nematostella vectensis</i>	KRLRPNIAQVLGRELSPAVKRLQLAQP-NVYVKQSMHRRILGHLSSAVYCVLPDRTGQCI	191
Phip <i>Strongylocentrotus purpuratus</i>	LSQVNPVNVIRGRQLAGVARLDHIIPG-ERYSRMNLHLRSLSHLSSAYCVLPDQTGRRI	201
Phip <i>Branchiostoma belcheri</i>	YGHAPAAACHVNVNARQLLGVAKRHFLAPAQTTYSKYSMHLRVGLHLSAVYCVLPDRTGQCI	204
<b>Phip <i>Ciona robusta</i></b>	<b>YRKQKQNIHSIKSREYGGCRLLKQVPCVPPVYVYKGMNMLRVLGHLSSAVYCVLPDRTGSKI</b>	<b>220</b>
Phip <i>Petromyzon marinus</i>	VGNPHLVSLLSARERTGCRIRHGHAVPI-TLYQHARMHRRILGHLSSAVYCVLPDRTGQRI	202
Phip <i>Lepisosteus oculatus</i>	YGSPPNIVETAYGRRLNGTYRGLQVPT-AVYQHMKMKHRILGHLSSAVYCVLPDRTGRI	198
<b>Phip <i>Danio rerio</i></b>	<b>YGSPPNIAETIHSRRLNGTYRGLQVPT-AVYQHMKMKHRILGHLSSAVYCVLPDRTGRI</b>	<b>198</b>
Phip <i>Latimeria chalumnae</i>	YGRPPNIVDTTFSRCLNGTYRGLQVPT-AVYQHMKMKHRILGHLSSAVYCVLPDRTGRI	192
<b>Phip <i>Xenopus tropicalis</i></b>	<b>YGSPPSIANTFFARKLNGTYRGLQVPT-AVYQHMKMKHRILGHLSSAVYCVLPDRTGRI</b>	<b>209</b>
Phip <i>Gallus gallus</i>	YGSPPSIVDTLFSRKLNGKYRLERLVPT-AVYQHMKMKHRILGHLSSAVYCVLPDRTGRI	198
<b>Phip <i>Mus musculus</i></b>	<b>YGSPPSIADTLFSRKLNGKYRLERLVPT-AVYQHMKMKHRILGHLSSAVYCVLPDRTGRI</b>	<b>200</b>
<b>Phip <i>Homo sapiens</i></b>	<b>YGSPPSIADTLFSRKLNGKYRLERLVPT-AVYQHMKMKHRILGHLSSAVYCVLPDRTGRI</b>	<b>198</b>
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Phip <i>Nematostella vectensis</i>	ITGADDSLVIKISTKDGRLLATLRGHNGEVSDIAINYENTLVAAGSCDKLIRVWVLSQTTY	251
Phip <i>Strongylocentrotus purpuratus</i>	FTGADDLVLIKIVSDDGRLLATLRGHAAEIVDMNVNENTLAAASNDRVIRVWVLSQTTY	261
Phip <i>Branchiostoma belcheri</i>	ITGADDLNLLKIWSAHDGRLVATLRGMSSEITDMAVNENTLAAAGSVDKTIRVWDMKFLA	264
<b>Phip <i>Ciona robusta</i></b>	<b>FTGSDDSLIVKIVSAWGRLLFTFRGHQAEICDMDISYDNILLAAAGSCNKRIRVWVLSQTTY</b>	<b>280</b>
Phip <i>Petromyzon marinus</i>	FTGSDDDLKIVKIVSAEDGRLLATLRGHAAEISDMAVNENTLAAAGTCDHVIVWVWCLRTCA	262
Phip <i>Lepisosteus oculatus</i>	FTGSDDDLKVIKIVATDDGRLLATLRGHAAEISDMAVNENTMIAAGSCDKTIRVWVLSQTTY	258
<b>Phip <i>Danio rerio</i></b>	<b>FTGSDDDLKVIKIVATDDGRLLATLRGHAAEISDMAVNENTLAAAGSCDKMIRVWVLSQTTY</b>	<b>258</b>
Phip <i>Latimeria chalumnae</i>	FTGSDDDLKVLKIVTTDNGRLLATLRGHAAEISDMAVNENTMIAAGSCDKMIRVWVLSQTTY	262
<b>Phip <i>Xenopus tropicalis</i></b>	<b>FTGSDDDLKVIKIVSTDDGRLLATLRGHAAEISDMAVNENTMIAAGSCDKMIRVWVLSQTTY</b>	<b>259</b>
Phip <i>Gallus gallus</i>	FTGSDDDLKVIKIVATDDGRLLATLRGHAAEISDMAVNENTMIAAGSCDKMIRVWVLSQTTY	260
<b>Phip <i>Mus musculus</i></b>	<b>FTGSDDDLKVIKIVATDDGRLLATLRGHAAEISDMAVNENTMIAAGSCDKMIRVWVLSQTTY</b>	<b>258</b>
<b>Phip <i>Homo sapiens</i></b>	<b>FTGSDDDLKVIKIVATDDGRLLATLRGHAAEISDMAVNENTMIAAGSCDKMIRVWVLSQTTY</b>	<b>258</b>
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Phip <i>Nematostella vectensis</i>	PVAVLQGHGTMTSLQFCPSASDARYLMTSGDGTVCFWKFNPNALYFDPKPLRPIEKS	311
Phip <i>Strongylocentrotus purpuratus</i>	RVAVLMGHTAMITLQFSPVYVRSARYMASTGADGCVCVWWEKETLKFNNKPIKPFQRS	321
Phip <i>Branchiostoma belcheri</i>	PVSVLMGHSAMVTSLQFCPSARQSRLASTGADGTVCFWQWCVNCTFNQTPIKFADRS	324
<b>Phip <i>Ciona robusta</i></b>	<b>PVAVLQGHGILTSLEFSPVYVRSARYMASTGADGTVCFWLWVNNMFEFNKQPVKPFQRS</b>	<b>340</b>
Phip <i>Petromyzon marinus</i>	PMAVLQGHGTASITLQFSPQCRGSVWRLASSGADGIVCFWQWDAASLKFCEKRVKFTERP	322
Phip <i>Lepisosteus oculatus</i>	PLAVLEGHGALITLQFSPQCRGSVWRLASSGADGICFWQWDAARTLKFQSPKFTERP	318
<b>Phip <i>Danio rerio</i></b>	<b>PLAVLEGHGASITLQFSPQCRGSVWRLASSGADGICFWQWDAARTLKFQSPKFTERP</b>	<b>318</b>
Phip <i>Latimeria chalumnae</i>	PIAVLQGHGASITLQFSPQCRGSVWRLASSGADGICFWQWDAARTLKFQSPKFTERP	312
<b>Phip <i>Xenopus tropicalis</i></b>	<b>PLAVLQGHGASITLQFSPQCRGSVWRLASSGADGICFWQWDAAGTLKINPRPTKYTERP</b>	<b>319</b>
Phip <i>Gallus gallus</i>	PLAVLQGHGASITLQFSPQCRGSVWRLASSGADGICFWQWDAAGTLKINPRPTKYTERP	320
<b>Phip <i>Mus musculus</i></b>	<b>PLAVLQGHGASITLQFSPQCRGSVWRLASSGADGICFWQWDAAGTLKINPRPTKYTERP</b>	<b>318</b>
<b>Phip <i>Homo sapiens</i></b>	<b>PLAVLQGHGASITLQFSPQCRGSVWRLASSGADGICFWQWDAAGTLKINPRPTKYTERP</b>	<b>318</b>
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Phip <i>Nematostella vectensis</i>	RPCTQMVCSSFSFGSFLVAGSTDHIIIRVYQMSFGPPE--RIAE <del>LDVHSDHVDISIQFNHT</del>	369
Phip <i>Strongylocentrotus purpuratus</i>	RPQSQMLCFSFSPGGTFLVAGGTDTAIRVYNFNTIPPE--KVTE <del>LEAHTDRVDSIGFCHT</del>	379
Phip <i>Branchiostoma belcheri</i>	RAGAQLLCFSFSPGGTFLVAGGTDHIIIRVYFLSVAGPD--RIAE <del>LEAHTDRVDSIQFNHT</del>	382
<b>Phip <i>Ciona robusta</i></b>	<b>RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KIAE<del>LEAHTDRVDSIQFNHT</del></b>	<b>400</b>
Phip <i>Petromyzon marinus</i>	RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KIAE <del>LEAHTDRVDSIQFNHT</del>	376
Phip <i>Lepisosteus oculatus</i>	RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KISELESHTDKVDSIQFNHT	380
<b>Phip <i>Danio rerio</i></b>	<b>RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KISELESHTDKVDSIQFNHT</b>	<b>376</b>
Phip <i>Latimeria chalumnae</i>	RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KISELESHTDKVDSIQFNHT	380
<b>Phip <i>Xenopus tropicalis</i></b>	<b>RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KISELESHTDKVDSIQFNHT</b>	<b>377</b>
Phip <i>Gallus gallus</i>	RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KISELESHTDKVDSIQFNHT	378
<b>Phip <i>Mus musculus</i></b>	<b>RPGVQMICSSFSAGGMFLATGSDTHIIIRVYFVGGQPE--KISELESHTDKVDSIQFNHT</b>	<b>376</b>

Phip Homo sapiens RPPVQMICSSFSAGGMFLATGSTDHIIIRVYFFGSGQPE--KISELEFHTDKVDSIQFSNT 376
Phip Nematostella vectensis GEFKFLSGSRDGTARIWFFKRSKWEHILLDIIRTLPGGQETQ-VVADKCLNCHMFOVAVDLI 428
Phip Strongylocentrotus purpuratus GSRFISGSKDGTARVRYERQGWKNILLNMSRLPGSKAPKLDGKNKIVKRVMTVMGVNKK 439
Phip Branchiostoma belcheri GDRFVSGSRDGTARVRFERQEWNRVLLNMTATSLPGKSNQL-DTANKYFKWKVMTVMGVLD 441
Phip Ciona robusta GLQFASASCDGRAIWISVVAEAWRSILTLNDRRRLLND---GEFVMSKVRVIMVTWTC 457
Phip Petromyzon marinus GDRFVSGSRDGTARIWQVRRQEWKSLLLDMSSKLPG-NNPP-PVEDKVKLKVMTVMVADR 438
Phip Lepisosteus oculatus GDRFVSGSRDGTARIWQLHQEQWKSILLDMATKLSG-NNPP-PVEDKVNKLVMTVMVADR 434
Phip Danio rerio GDRFVSGSRDGTARIWQIQDDWRSILLDMATKLPKGNYP-PLDKVTIKLVMTVMVADC 435
Phip Latimeria chalumnae GDRFVSGSRDGTARIWQFKRQEWRSILLDMATRPSG-HNPQ-GLEDKIKLVMTVMVADR 438
Phip Xenopus tropicalis GDRFVSGSRDGTARIWQFKRREWSILLDMTRPTG---VQ-GVEDKIKLVMTVMVADR 433
Phip Gallus gallus GDRFVSGSRDGTARIWQFKRREWSILLDMATRPSG-QTLQ-GVEDKIKLVMTVMVADR 436
Phip Mus musculus SNRFVSGSRDGTARIWQFKRREWSILLDMATRPAG-QNLQ-GIEDKIKLVMTVMVADR 434
Phip Homo sapiens SNRFVSGSRDGTARIWQFKRREWSILLDMATRPAG-QNLQ-GIEDKIKLVMTVMVADR 434
Phip Nematostella vectensis WDRHVVTAINDHTLKVWEAETGALIHVLQGHDEMFVLEAHPDHPHFLSAGHDGLVILM 488
Phip Strongylocentrotus purpuratus NDYVVTAVNDKSLRVWMSYNGKLVYELGHTDEVVYVLEGHPKDVRIFLSGGHDGLIFLM 499
Phip Branchiostoma belcheri HDKYVITAVNDKSLRVWDSHSGKLVHLEHTDEVVLEAHPDHPHFLSAGHDGHVIMV 501
Phip Ciona robusta DDQHVIMTSHSDFSIKRVKVTASLHLVLMGHEDEAYCLEAHPNDGRILLASAGHDGIKFLW 517
Phip Petromyzon marinus HDSTVITAVNLTALKVWSSYTGQLLHVLTGHEDEVFVLESHPVDRILLSAGHDGNIWVM 498
Phip Lepisosteus oculatus HDNTVITAVNNLTALKVWSSYTGQLIHVLMGHEDEVFVLEPHFPDRVLSAGHDGNIWVM 494
Phip Danio rerio NDNTVITAVNNLTALKVWSSYTGQLIHVLMGHEDEVFVLEPHFPDRVLSAGHDGNIWVM 493
Phip Xenopus tropicalis HDNFVITAVNNLTALKVWSSYTGQLIHVLMGHEDEVFVLESHFPDRVLSAGHDGNIWVM 495
Phip Latimeria chalumnae HDNTVITAVNNLTALKVWSSYTGQLIHVLMGHEDEVFVLEPHFPDRVLSAGHDGNIWVM 496
Phip Gallus gallus HDNSVITAVNNLTALKVWSSYTGQLIHVLMGHEDEVFVLEPHFPDRVLSAGHDGNIWVM 498
Phip Mus musculus HDNTVITAVNNLTALKVWSSYTGQLIHVLMGHEDEVFVLEPHFPDRVLSAGHDGNIWVM 494
Phip Homo sapiens HDNTVITAVNNLTALKVWSSYTGQLIHVLMGHEDEVFVLEPHFPDRVLSAGHDGNIWVM 494
Phip Nematostella vectensis DLRTGQMIKSFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLICIFGSGSSDPFNKVP 548
Phip Strongylocentrotus purpuratus DLSTGQQLYRFLNTEGQGHGSIYDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 548
Phip Branchiostoma belcheri DLQTGSLIKRFFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 561
Phip Ciona robusta DINDGQVIVFNHLLVQGHGAVFDKAFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 577
Phip Petromyzon marinus DLRSRGAIRTYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 558
Phip Lepisosteus oculatus DLRVGVKIRSYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 554
Phip Danio rerio DLARGVKIRSYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 555
Phip Latimeria chalumnae DLARGVKIRSYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 558
Phip Xenopus tropicalis DLARGVKIRSYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 553
Phip Gallus gallus DLARGVKIRSYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 556
Phip Mus musculus DLARGVKIRSYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 554
Phip Homo sapiens DLARGVKIRSYFNIEGQGHGAVFDCKFSPDGLQFACTDSHGHLIFGSGSSDPFNKVP 554
Phip Nematostella vectensis EQFFHTDYRPLIRDANSYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 608
Phip Strongylocentrotus purpuratus EQFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 608
Phip Branchiostoma belcheri EMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 621
Phip Ciona robusta EQFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 637
Phip Petromyzon marinus EQFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 608
Phip Lepisosteus oculatus QMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 614
Phip Danio rerio QMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 615
Phip Latimeria chalumnae QMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 618
Phip Xenopus tropicalis QMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 613
Phip Gallus gallus QMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 616
Phip Mus musculus QMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 614
Phip Homo sapiens QMFFHTDYRPLIRDANNVYVLEDEQTTAPHLMPPPPFLVDVGNPNPSSHVQRLVPGHGSNVR 614
Phip Nematostella vectensis TARQPPTTP-RAELPPLAEIEA-----AENAALRALIKIFWSLGEI--TGEG 653
Phip Strongylocentrotus purpuratus NALVPIQIQAENGLRLENEAN-----QAASLLDELILRMQQDQDEERGADP 672
Phip Ciona robusta DALVPVVVAADNGVPLIVNEQPDIVADLSP-----LNEV----- 667
Phip Branchiostoma belcheri DQLIPQVGAANGQPEVMGPIPEAPAVVRPQNEDEEAAANILDNMIAEMQRQDGEDADG 681
Phip Petromyzon marinus HQLIPQMV-----AVRNDTGLRSPVGLRRSGDVEGVRRAHGNTVQSASDSDL 680
Phip Danio rerio EQLIPQMGVTSSGLNQLVLSQQAN-----EGSSPLDSMIQRLQQEQDRLRSGS 663
Phip Lepisosteus oculatus EQLIPQMGVTSSGLNQLVLSQQAN-----DGSSPLDTMIQRLQQEQDRLRSGA 662
Phip Xenopus tropicalis EQLIPQMGVTSSGLNQLVLSQQS-----NEVSPILDSLIQRLQEQDRLRSG 661
Phip Latimeria chalumnae DQLIPQMGVTSSGLNQLVLSQQAN-----N--SLLDSMIQRLQQEQDRLRSGEV 664
Phip Gallus gallus EQLIPQMGVTSSGLNQLVLSQQAN-----QEVSPILDSMIQRLQQEQDRLRSGEA 664
Phip Homo sapiens EQLIPQMGVTSSGLNQLVLSQQAN-----QEISPLDSMIQRLQQEQDRLRSGEA 662
Phip Mus musculus EQLIPQMGVTSSGLNQLVLSQQAN-----QDISPLDSMIQRLQQEQDRLRSGEA 662
Phip Nematostella vectensis ALIGEG---ALKLFWREISASEGPGGSRYGMQRSGDVEGVRQAHGNVPIEDVSEADI 709
Phip Strongylocentrotus purpuratus PHEGPR---TPGR---SANGPLSPMSPRGLRRAGEIEGVRQATGNVPVQASQADI 719
Phip Branchiostoma belcheri AQ-----AVRNDTGLRSPVGLRRSGDVEGVRRAHGNTVQSASDSDL 726
Phip Ciona robusta -----RAPGV---QSPVTPSPRNTPLGLRREGVEVGVNRN---SSPSEIASAADL 707
Phip Petromyzon marinus QDEPSELSVPVPLTVHPPSSSEAPRRSPGPRRRSGQVEGVRQNVQSR---FNATASGDL 718
Phip Lepisosteus oculatus GSSSLNRG---NRGS---VGSTSEVHSPPNVGLRRSGQIEGVRQMHNSNAPRSEIATERDL 716
Phip Danio rerio R-----ANRGS---VSSPTEVTSPPNVGLRRSGQIEGVRQMHNSNAPRSEIATERDL 711
Phip Latimeria chalumnae GTSSLNRGNRVLGS---VSSSEVHSPPNVGLRRSGQIEGVRQMHNSNAPRSEIATERDL 720
Phip Xenopus tropicalis SGGSSSRM---GRAS---VSSSEVHSPPNVGLRRSGQIEGVRQMHNSNAPRSEIATERDL 715
Phip Gallus gallus GTSSSRIL---SRAS---VSSSEVHSPPNVGLRRSGQIEGVRQMHNSNAPRSEIATERDL 718
Phip Mus musculus GVSNSARV---NRGS---VSSSEVHSPPNVGLRRSGQIEGVRQMHNSNAPRSEIATERDL 716
Phip Homo sapiens VISNTSRL---SRGS---ISSTSEVHSPPNVGLRRSGQIEGVRQMHNSNAPRSEIATERDL 716
Phip Nematostella vectensis TAMRKRKIAPELKPFAKFEEDRRIHLGRNELMNYLREKKRKPQATAAKAIQEAIV--ALN 767
Phip Strongylocentrotus purpuratus LSFKTRMVPALSRVARFQEEFRKLDEEASGRFKAERKKKVLPSVETDSTDTSYERL 779
Phip Branchiostoma belcheri VAWSKRVVPMPEPALLESDERRVRLGEEELSRKMKRKRPLPAAISRNDSSDS--- 782
Phip Ciona robusta LVVQRRELVPLKTAVMRKRDEIARETFGNEIISYNEEITRKNKHSLNKRAASMMYLNLS 777
Phip Petromyzon marinus LAWNNRLLVPEVAPGLSSTQEGYRHAKEVEESIYERERKRKVPVSAHRSDS--PNVA-- 764
Phip Lepisosteus oculatus VAWSRRLVPELPPAIAASKQEKWRTAKGEEIIRIYKSEKKRALPSQIQREAKH----- 770
Phip Danio rerio VAWSRRLVPELALACKQEIWRKAGEEINIYRSERRRSLHSQYHRENRA----- 766
Phip Latimeria chalumnae AAWSRRLVPELPAVARKQEQWRKAGEEIVLRSEKRRKHTAPSHTPREPKS----- 774
Phip Xenopus tropicalis VAWSRRLVPELSTGVLSKQEWRTAKGEEIIRYKAEKKKTTITNHAVRESKV--SYSKN 774
Phip Gallus gallus VAWSRRLVPELSSGVASRQEWRTAKGEEIVRSEKRRKHHVMSHIQRENKIPTFSKN 778
Phip Mus musculus VAWSRRLVPELSAGVA--RQEWRTAKGEEIISYRSEKRRKHLT--VAKENKILTVSKN 773
Phip Homo sapiens VAWSRRLVPELSAGVA--RQEWRTAKGEEIISYRSEKRRKHLT--VPKENKIPVSKN 773
Phip Nematostella vectensis ERSQRAQSRSSRQASRARERARTRARTQAMAYATRSAMSV----- 808

Phip *Strongylocentrotus purpuratus* -----RRR-----KPKKKTANHNYRTRANQDGTPLHGMEEEEERRRQ 820  
 Phip *Branchiostoma belcheri* -----ERKLRNR-----KGRHQLTHAYRTRTNMAMDTSHSRSR-----S 817  
 Phip *Ciona robusta* QVN-----REKTR-----NS-DYLKRIKPSAHSYSYTRLSMPL----- 809  
 Phip *Petromyzon marinus* ---AKGLKQRKQ-----ASHGLHGYRTRSTLEEPGRPAPLR----- 799  
 Phip *Lepisosteus oculatus* HVQEPAGEGEGR-----RFQPNQHNHYRTRATVEETGRQADTA----- 808  
 Phip *Danio rerio* ---TENAAEEGR-----RHQGNQHNHYRTRAVEETSRQSEPN----- 800  
 Phip *Xenopus tropicalis* HSELELLDIEDPK-----RQSSNSYNYRTRAAPPEQAVPTEDV----- 812  
 Phip *Latimeria chalumnae* QTSERSVDFGEMK-----KQANQHNHYRTRSAAMEEPVKQTEEA----- 812  
 Phip *Gallus gallus* HSHDHLDTNDSR-----KQANQHNHYRTRYAVEEPARPAEL----- 816  
 Phip *Mus musculus* HAHEHFLDLGDSK-----KQANQHNHYRTRSALEETPRPLEEL----- 811  
 Phip *Homo sapiens* HAHEHFLDLGDSK-----KQTNQHNHYRTRSALEETPRPSEEI----- 811  
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Phip *Nematostella vectensis* ---EETEE---SGEDEVIVT---PSDSEDEEWNES---SRYESS----- 841  
 Phip *Strongylocentrotus purpuratus* RVGEEGDTLSDMDFVDEGAMTGAETSEEEVEWRSTSE-HESESS----- 865  
 Phip *Branchiostoma belcheri* RQVPEFDS---SSEVELEMEQGGSTETSEDDQVWDSSSD-SESESS----- 860  
 Phip *Ciona robusta* -----SNDEQDWTETDASSAAEPDAASVENYHANINT----- 842  
 Phip *Petromyzon marinus* ---RAAYDTS---SDENRTG---GPSGASSDDGDEWQSESTTSESS----- 839  
 Phip *Lepisosteus oculatus* ---EENSSS---EGEGDARPVNGDT---SDE-EGKAWPDDSSSSDYSS----- 848  
 Phip *Danio rerio* ---EEHSAS---EGETEVRPPSRSSDEEREKEFPWDESSSSDYSS----- 843  
 Phip *Xenopus tropicalis* ---ENSSSDEAYVESEAVAAGGAT---SEDEKQEWNSDGS-SSDYSS----- 853  
 Phip *Latimeria chalumnae* ---EDETSSS---EEGAVVAANGGT---SEEGE-KVWHSDDSSSSDYSS----- 851  
 Phip *Gallus gallus* ---ENGSSS---DEGEVVVAGGT---SEEDDE-RAWHSDGS-SSDYSS----- 854  
 Phip *Mus musculus* ---ENGTSSS---DEGEVLAVGGT---SEEEE-RAWHSDGS-SSDYSS----- 849  
 Phip *Homo sapiens* ---ENGSSS---DEGEVVAVGGT---SEEEE-RAWHSDGS-SSDYSS----- 849  
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Phip *Nematostella vectensis* -----EY-SDWTEEV---GIRSQPNDRR-----TRVRRLLSSSDDETYTDQPGPSS 885  
 Phip *Strongylocentrotus purpuratus* -----EY-SDWTADA---GMNLQPPKKKTR-----RKTLPWESGGESSA----- 900  
 Phip *Branchiostoma belcheri* -----EY-SDWTDV---GLPKERSRGEKQSQQRKAPRRPLDSSEEE----- 900  
 Phip *Ciona robusta* RKRMRSDSYSEGWSSEENEGSPVSHNNARKR-----RK-----CSEETSICDVT----- 887  
 Phip *Petromyzon marinus* -----EY-SDWTAQA---GVNLQPPKRAVR-----RRAAQRGRGSSSDG----- 874  
 Phip *Danio rerio* -----DY-SDWTADA---GINLQPPKTSV-----KPKKKNASSEEDG---EKKKD 884  
 Phip *Lepisosteus oculatus* -----DY-SDWTADA---GINLQPPKTVR-----HKKNTSSSEE---DGDKKKE 889  
 Phip *Latimeria chalumnae* -----DY-SDWTADA---GINLQPPKAPR-----HKTKEPSSSEDEETEKKQKQP 895  
 Phip *Xenopus tropicalis* -----DY-SDWTADA---GINLQPPKILK-----HRTKKAESSSEDEENSDKFKQKQ 897  
 Phip *Gallus gallus* -----DY-SDWTADA---GINLQPPKIPK-----LTKKAESSSEDEEGPEKQ-KKQ 897  
 Phip *Mus musculus* -----DY-SDWTADA---GINLQPPKVPK-----HKTKEPSSSEDEEENSKQKQH 893  
 Phip *Homo sapiens* -----DY-SDWTADA---GINLQPPKVPK-----NKTKEPSSSEDEEESKQKQKQ 893  
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Phip *Nematostella vectensis* PQ-----RSQPKKEKKEKPPQKKPK-----KPKLD-----NIDDLVLFQYNPPEWLM 927  
 Phip *Strongylocentrotus purpuratus* -----SPSKT-PSATPVKSTRKRRPPK-ALIDDEIDNDKESMSLPEELKPLWIT 950  
 Phip *Branchiostoma belcheri* -----EEDERPKPPKSKPKRKNKPAFVIDMD---QMSLDDIPDEYLPKWT 949  
 Phip *Ciona robusta* -----TETLDENQP-TTSTNISPQTVVVKPI-----EPPFPVPGQPPDEYLPKWT 935  
 Phip *Petromyzon marinus* ---ERAGAPDESPPGGERPRRTRRQKRV-AAQLL-----GQGRPAEELWLPVWVT 923  
 Phip *Lepisosteus oculatus* NKKERKNEKRDKDG---ALPKKKPKERMRKVPVDFQ-----EQGLTLEEWLPSAWIT 943  
 Phip *Danio rerio* NKKERKNEKPKDKG---ALPKKKPKERK---KRIPELQ-----NQGLTLEEWLPSAWIT 931  
 Phip *Xenopus tropicalis* NKKERKNEKPKDKG---SSPKKKPKERKRLPIGELT-----EQGLTLEEWLPSAWIT 950  
 Phip *Latimeria chalumnae* NKKERKNEKPKDKG---SSPKKKPKERKRLPIGELT-----EQGLTLEEWLPSAWIT 949  
 Phip *Gallus gallus* IKKERKNEKPKDKG---SSPKKKPKERKRLPIGELT-----ENGLTLEEWLPSAWIT 951  
 Phip *Mus musculus* IKKERKNEKPKDKG---SSPKKKPKERKRLPIGELT-----ENGLTLEEWLPSAWIT 946  
 Phip *Homo sapiens* IKKERKNEKPKDKG---SSPKKKPKERKRLPIGELT-----ENGLTLEEWLPSAWIT 946  
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Phip *Nematostella vectensis* CTQPCLSYPVQIGDEVYLRQGHERYVKEVMRRKIYDTPNPK-QCYKLGLEAVELCRI 986  
 Phip *Strongylocentrotus purpuratus* DTPRRCPFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QHWTKINLKDHLVVR 1009  
 Phip *Branchiostoma belcheri* DMKPRRSPYVQVQDEVYFRQGHAYLVDVARRHKVYVYINPRK-QPWHKIELREQIVRV 1008  
 Phip *Ciona robusta* QDVARPSPYVQVQDEVYFRQGHAYLVDVARRHKVYVYINPRK-QPWHKIELREQIVRV 995  
 Phip *Petromyzon marinus* HTVPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 982  
 Phip *Lepisosteus oculatus* DTVPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 1000  
 Phip *Danio rerio* DTMPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 992  
 Phip *Latimeria chalumnae* DTMPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 1008  
 Phip *Xenopus tropicalis* DTVPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 1009  
 Phip *Gallus gallus* DTVPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 1010  
 Phip *Mus musculus* DTVPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 1005  
 Phip *Homo sapiens* DTVPRRCFPVQMGDEVYFRQGHAYIAAVKRRKVYHIEPK-QPWHKIELREQIVRV 1005  
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Phip *Nematostella vectensis* VSLHFSSNGVPTLACLKALISPDGTGHTGASFTVKYHDMQDVLDFILRQYDRSID 1046  
 Phip *Strongylocentrotus purpuratus* MGIKYQV---GPPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1066  
 Phip *Branchiostoma belcheri* IGRYIEI---GPPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1065  
 Phip *Ciona robusta* TSIEYEI---GPPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1065  
 Phip *Petromyzon marinus* VGIKYEY---GPPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1039  
 Phip *Lepisosteus oculatus* VGIKYEY---GLPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1057  
 Phip *Danio rerio* VGIKYEY---GLPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1049  
 Phip *Latimeria chalumnae* VGIKYEY---GLPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1065  
 Phip *Xenopus tropicalis* VGIKYEY---GLPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1066  
 Phip *Gallus gallus* VGIKYEY---GLPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1067  
 Phip *Mus musculus* VGIKYEY---GLPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1062  
 Phip *Homo sapiens* VGIKYEY---GLPTLCLGLKLFMDPETRKTGGFSMKYHMDPDVIDFLVLRQHPDQSV 1062  
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Phip *Nematostella vectensis* RNWQEGDRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1106  
 Phip *Strongylocentrotus purpuratus* MKWKLGRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1126  
 Phip *Branchiostoma belcheri* ANWQVGRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1125  
 Phip *Ciona robusta* TKWKQGRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1110  
 Phip *Petromyzon marinus* RNWQVGRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1099  
 Phip *Danio rerio* RNWQVGRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1109  
 Phip *Lepisosteus oculatus* RQWSIGDRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1117  
 Phip *Xenopus tropicalis* RQWSIGDRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1126  
 Phip *Latimeria chalumnae* RQWSIGDRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1125  
 Phip *Gallus gallus* RRWNIHDRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1127  
 Phip *Mus musculus* RRWNIHDRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1122  
 Phip *Homo sapiens* RRWNIHDRFRSVIDDAAWFGTIESQEPYQAEYVQYVQYVQYVQYVQYVQYVQYVQYV 1122  
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Phip *Nematostella vectensis* TSG-----AATSNIPLTDEDQALA-YEPSEADWFG-----GRDEMTSRIMGCVDRL 1154  
 Phip *Strongylocentrotus purpuratus* DE-KNMPESKGGSIPTVDELLALM-YVPGFGEWGT-----DRDCCDRLLKCLQVQV 1178  
 Phip *Branchiostoma belcheri* PAEMDLPDAHIGIETADWKKAM-YNPKSEWSS-----GREPDCQRIACIEYEV 1178  
 Phip *Ciona robusta* TEGMVRSENDRGLPIEELKIDIFHQRPASAEWRKVDKLYVSDVQDCSRISTGIEKLV 1170  
 Phip *Petromyzon marinus* PDDARPPPPEGSVPLTSEERESL-YRPQDGEWGS-----PRGQQRDRITAAALDQL 1152



Phip *Gallus gallus* -----ALRHAPPQMNGKAA-ETSSLVVRT-RSNR---GITDVASTEQPSTSSGG-KPLTI 1539  
 Phip *Mus musculus* -----LPRHNAQMNGKP--ESSVVRT-RSNR---VAVDPVVTEQPSTSSAT-K---- 1527  
 Phip *Homo sapiens* -----PPRHNAQINGKT--ESSVVRT-RSNR---VVVDPVVTEQPSTSSAA-K---- 1527

Phip *Nematostella vectensis* ----- 1395  
 Phip *Strongylocentrotus purpuratus* SHPKQLNGYDKDEDDSDTDEPLANVVKLVKLVNNSKTES---KSGTRGKAKAKRSSAK 1608  
 Phip *Ciona robusta* RLPQKQNKFORSDTT-----SSSKDSS-----FLSDPR 1572  
 Phip *Branchiostoma belcheri* SQPRRTGKVMKGESESEEEEEKKPVNS-RPSRSS----- 1555  
 Phip *Petromyzon marinus* GRP-----SRSSAEAGGAMLSSSSSSSTSSAVGMTTRGGKGRGVAATAA 1556  
 Phip *Danio rerio* -----SSRVLRTQN-----PHSTAV 1554  
 Phip *Lepisosteus oculatus* SLP-----ANRKFVTE-SPSRHLKVHN-----SASTPS 1557  
 Phip *Latimeria chalumnae* KPTA-----TLPKAS-VTE-NTSKHSLQN-----NLSSLN 1567  
 Phip *Xenopus tropicalis* KS-----NHSTVAGKSAMIE-NAAKLLKSN-----TSP-- 1566  
 Phip *Gallus gallus* KPLIT-----K---PNTAGSGKS-VLE-NSTKHSKNQN-----ILPVSS 1574  
 Phip *Mus musculus* -AFVS-----K---TNTSAMPGKA-MLE-NSVRHKSALS-----TLSSPD 1561  
 Phip *Homo sapiens* -TFIT-----K---ANASAI PGKT-ILE-NSVKHSKALN-----TLSSPG 1561

Phip *Nematostella vectensis* ----- 1395  
 Phip *Strongylocentrotus purpuratus* P-----VVKEEEEEKEKEEEDSGEETEIDSGEETEIDEQHVKKKEKEDGSGSEEE 1659  
 Phip *Branchiostoma belcheri* QRNATSGTSK-----VRIKSP-----SSERSDE----- 1578  
 Phip *Ciona robusta* P-----RRSKPHYLPQSSERMHL-----RNIRK-RRNTTVRYVE 1605  
 Phip *Petromyzon marinus* FTNGRAGAAAVGRRRGRPAHRVFRFCAP-----PGGAEDGSRPVCNSKRKSA--EVS 1606  
 Phip *Lepisosteus oculatus* F-----SSDTDNGRSSV-----A---ETSG-KKKVKR-KQKSS--VE 1588  
 Phip *Danio rerio* -----SRENESSAVP-----P---SNGGGARESR-RLRTP---VK 1583  
 Phip *Latimeria chalumnae* H-----PCPTRNTKTSST-----G---ENSEQVHKFKR-RRKSP--IS 1599  
 Phip *Xenopus tropicalis* N-----QASNHLIKNNVP-----K---EKLEKDKPLKR-RMKAS--SN 1598  
 Phip *Gallus gallus* Q-----SENSHNTRNST-----K---ENPEKEKPIKR-KVKSS---VF 1604  
 Phip *Mus musculus* P-----LTFSHATKNNSA-----K---ENMEKEKPVKR-KMKSS---VF 1593  
 Phip *Homo sapiens* Q-----SSFSGHTRNNSA-----K---ENMEKEKPVKR-KMKSS---VL 1593

Phip *Nematostella vectensis* ----- 1395  
 Phip *Strongylocentrotus purpuratus* EEEEEEEEEEEEEADDSEDDSEEEEEEEEEEEQEEDEEPGRKTRLRSSARELRDS 1710  
 Phip *Branchiostoma belcheri* -----EESKEQESEEETRPSRTRSTRSSARELRDS 1609  
 Phip *Ciona robusta* SL-----SEASDD-----AF-----ERLNDVSSRGRVRLSSKAMAA-KLS 1640  
 Phip *Petromyzon marinus* SS-----SSSSSSSSSSSSSSSKATHGKAKENATGKRRRHPGRSS-----GAGKQDL 1655  
 Phip *Lepisosteus oculatus* HQ-----PVNS-----ELSS 1597  
 Phip *Danio rerio* -----LTPGFV-----DHS 1592  
 Phip *Latimeria chalumnae* SP-----QATF-----SKVTSYIYTANS-----KND 1620  
 Phip *Xenopus tropicalis* -----MALRADR-----KEI 1608  
 Phip *Gallus gallus* -----AVNQDC-----KNN 1614  
 Phip *Mus musculus* SK-----ASPL-----PKSAAVIEQGEC-----KNN 1614  
 Phip *Homo sapiens* PK-----ASTL-----SKSSAVIEQGDC-----KNN 1614

Phip *Nematostella vectensis* ----- 1395  
 Phip *Strongylocentrotus purpuratus* ---RRSLTNGNNSR-----RGGRRKARRDEEDSESEEE-----EKE 1743  
 Phip *Branchiostoma belcheri* SSETRTPVANGHTKEYK---TRAKARSQQL-----SSD 1639  
 Phip *Ciona robusta* ----- 1640  
 Phip *Petromyzon marinus* ADGGGERRLNGHGSRR-----PRASSAV-----AST 1681  
 Phip *Danio rerio* SPPQNSLHLNGHSQVTVG-MVRRGRGRP-RLDQTIE---TPV---DTPPPPLPKTSSK 1643  
 Phip *Lepisosteus oculatus* SEFPQNSMQLNGHGGHINYVAKRG--RKPSEAMAR-VENTAKEEPFVKPESLAKPPGKK 1654  
 Phip *Xenopus tropicalis* LHQASSIQVNGHSSSELPKIVKGRGPRKPKVILNNS--NN--YETITV---VQVPPKK 1659  
 Phip *Latimeria chalumnae* TIASGSLQVNGHNGHSPNSFVKRGPGRPKIEATIS-----S---CQVLPPK 1664  
 Phip *Gallus gallus* ALASGSIQVNGHGGQPSKPVKRGPRKPKIEANNS-----T---CEVVHKK 1658  
 Phip *Mus musculus* VLIPTGIQVNGHGGQPSK-LVKKRGPGRKPKVEVNTS-----S---GEVTHKK 1657  
 Phip *Homo sapiens* ALVPGTIQVNGHGGQPSK-LVKKRGPGRKPKVEVNTN-----S---GEIHHK 1657

Phip *Nematostella vectensis* ----- 1395  
 Phip *Strongylocentrotus purpuratus* EEEEEEEEEEGDGGESDH-SNYEAGTD--INSNEGSESSSTESDSDSSDSEVEGHY 1800  
 Phip *Branchiostoma belcheri* KGSDDS---SSS-GDSSSS---SSGSSSSSSSDSEDSSSSSDSSDS-ESDG---- 1685  
 Phip *Ciona robusta* ----- 1640  
 Phip *Petromyzon marinus* RAAPAKRLPSSSE-----SESSDDGDDDDGVGDAAAK--A-NDDKNDGDGE 1725  
 Phip *Lepisosteus oculatus* RGRKSKKELEAM-RESELWDTAEAEAEERDQCASDEAGTSSSVAAVTDT-AADSDIAGPI 1712  
 Phip *Danio rerio* KERKSKKDTESP-RRNFS---HEEELMLPTGGDGGASSTAQD-----SNLS 1685  
 Phip *Latimeria chalumnae* RGRKPKKVQSSSE-LVTEQHA-AR-----V-NKNDNEEAASSTCNSNSDN-NSRKGEVLQK 1716  
 Phip *Xenopus tropicalis* RGRKPKYPRNEA-LQSVSQKPPNSV---VETGKIEQPASSSCNSHAAP-CEKTENEV-P 1713  
 Phip *Gallus gallus* RGRKPKQLQIVE-QQVAEQNTVQ---TTKDLVEEASASTACNSLSE--NNMKEDLVQK 1711  
 Phip *Mus musculus* RGRKPKNLQCAK-QENSEQNMPH---IR---ADVLPSTCNFLSET-NAVKEDLLQK 1707  
 Phip *Homo sapiens* RGRKPKKLQYAK-PEDLEQNNVHP---IR---DEVLPSTCNFLSET-NNVKEDLLQK 1707

Phip *Nematostella vectensis* ----- 1395  
 Phip *Strongylocentrotus purpuratus* RTRRRRTNRRTQKSLKKSRR-----RGQAI GKRRKAKSKHSPRSSPKKRSKVD-----YND 1850  
 Phip *Branchiostoma belcheri* --KTSR-KRKTQNSSSKKR-----KATSHSNVNGKSRSSKRRK----- 1720  
 Phip *Ciona robusta* ----- 1640  
 Phip *Petromyzon marinus* KGRGGG-PRRWPPPRGL----- 1742  
 Phip *Lepisosteus oculatus* KSRRGR-KPKGQKMMEDL---PPEPS-----TVSPKMQTRSSRRQSESLHEP---PPQL 1759  
 Phip *Danio rerio* --DSGE-YPKARGRPRTK-T-----IDTPAPPSPKTLRRSSRRGNEEITPHSTGSAQS 1735  
 Phip *Latimeria chalumnae* KVRRRGR-KPKQKNQT--VE-----PKLKEAPSTKMQTRSSRKHTE-----EPME 1757  
 Phip *Xenopus tropicalis* KRRRGR-KPKVKTEPTSILVAVIPAPSAHELKREETVKIQTRSKCKKSD-----QSEG 1764  
 Phip *Gallus gallus* KGRGGR-KPKRRIKTHPSG-----SDLLIPANVKMQTRSRKRIKID-----EPME 1754  
 Phip *Mus musculus* KSRGGR-KPKRKMKTNLND-----SELIVPTNVKVLRRSRNKKTD-----DPID 1750  
 Phip *Homo sapiens* KNRGGR-KPKRKMKTQKLD-----ADLLVPASVKVLRSSRNRKIID-----DPID 1750

Phip *Nematostella vectensis* ----- 1395  
 Phip *Strongylocentrotus purpuratus* EDDNYVPSHKVSRQTERTRNRQGRHMYYGDFDES DNQSGEEENLQSGEEDDGKSVSSRG 1910  
 Phip *Branchiostoma belcheri* -VAYEHDSYDDGDRPYNTRTNSRGRTRFYHHDHSDVDS-----TDAVSRSVSSRG 1769  
 Phip *Ciona robusta* ----- 1640  
 Phip *Petromyzon marinus* ----- 1742  
 Phip *Lepisosteus oculatus* DGEFEEDERDGSKSPMKTRNQGRRTAFYNEEDSSEEQR---QLLFEDASLFTGTSRG 1815  
 Phip *Danio rerio* EEPVYI GEDGSSKGMQTRNQGRRTAFYNEEDSSEEQR---QLLFEDASLFTGTSRG 1791  
 Phip *Latimeria chalumnae* EDIRTDDETETKGSSEHMKTRNQGRRTAFYNEEDSSEEQR---QLLFEDTSLFTGTSRG 1813  
 Phip *Xenopus tropicalis* -ESLTVSEDNINNTEIQMTRNQGRRTAFYNEEDSSEEQR---QLLFEDTSLFTGTSRG 1819  
 Phip *Gallus gallus* EG-----SEELKDSPEPHMTRNQGRRTAFYNEEDSSEEQR---QLLFEDTSLFTGTSRG 1806  
 Phip *Mus musculus* EEEE---FEELKGSPEPHMTRNQGRRTAFYNEEDSSEEQR---QLLFEDTSLFTGTSRG 1804  
 Phip *Homo sapiens* EEEE---FEELKGSPEPHMTRNQGRRTAFYNEEDSSEEQR---QLLFEDTSLFTGTSRG 1804

Phip <i>Nematostella vectensis</i>	-----	1395
Phip <i>Strongylocentrotus purpuratus</i>	RVRKLTARARARLLST	1926
Phip <i>Branchiostoma belcheri</i>	RIRKLTPRARANLVGF	1785
<b>Phip <i>Ciona robusta</i></b>	<b>-----</b>	<b>1640</b>
Phip <i>Petromyzon marinus</i>	-----	1742
Phip <i>Lepisosteus oculatus</i>	RVRKLTEKAKANLIGW	1831
<b>Phip <i>Danio rerio</i></b>	<b>RVRKLTEKAKANLIGW</b>	<b>1807</b>
<b>Phip <i>Xenopus tropicalis</i></b>	<b>RVRKLTEKAKANLIGW</b>	<b>1835</b>
Phip <i>Latimeria chalumnae</i>	RVRKLTEKAKANLIGW	1829
Phip <i>Gallus gallus</i>	RVRKLTEKAKANLIGW	1822
<b>Phip <i>Mus musculus</i></b>	<b>RVRKLTEKAKANLIGW</b>	<b>1820</b>
<b>Phip <i>Homo sapiens</i></b>	<b>RVRKLTEKAKANLIGW</b>	<b>1820</b>