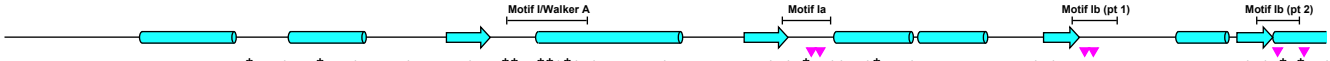


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Hel_Pfu MR-------VDELRVDERIKSTLKER-GIESFYPPQAEALKSG-ILEG-KNALISIPTASGKTLIAEIAMVHRILTQ-----GGKAVYIVPLKALAEEKFQEFQD-WEK-IG----LRVAMATGDYDSKD---EWLGKYDIIIATAEKFD 126
Hel_Afu MKVE-----ELAESISSYAVGILKEE-GIEELFPPQAEAVEKV--FSG-KNLLLAMPTAAGKTLLAEMAMVREAIK------GGKSLYVVPLRALAGEKYESFKK-WEK-IG----LRIGISTGDYESRD---EHLGDCDIIVTTSEKAD 126
Hel_Mva ---------------MTNVLNLLNEI-GIEELRPPQKKVIEEG-LLDKSKNFLICIPTASGKTLIGEMALLNHVLDENYNLTGKKGLFIVPLKALASEKFDEFQKKYET-YG----IKVGMSIGDYDTK----EDLSKYNIIITTSEKLD 124
Hel_Sso MS-------IDDLKLPSNVIDIIKNR-GIKKLNPPQTEAVKKG-LLDG-NRLLLTSPTGSGKTLIAEMGIISFLLKN-----GGKAIYVTPLRALTNEKYLTFKD-WES-IG----FKVAMTSGDYDTDD---AWLKNYDIIITTYEKLD 126
Hel_Mka LP-------LTELDIPEELRRVLERM-GYQELTPVQTKCVERG-LLEG-RNLLVVSPTGSGKTLVAELAGLTEVLRE-----GRKMVYLVPLVALANQKHREFMEKYGRPLG----IGVRLQVGAARLKE(7)PSPRDADIIVGTYEGFD 321
PolQ_Hsa LL-------LANWGLPKAVLEKYHSF-GVKKMFEWQAECLLLGQVLEG-KNLVYSAPTSAGKTLVAELLILKRVLEM-----RKKALFILPFVSVAKEKKYYLQSLFQE-VG----IKVDGYMGSTSPS----RHFSSLDIAVCTIERAN 328
PolQ_Mms LL-------LANWGLPKAVLEKYHSF-GVRKMFEWQAECLLLGHVLEG-KNLVYSAPTSAGKTLVAELLILKRVLET-----RKKALFILPFVSVAKEKKCYLQSLFQE-VG----LKVDGYMGSTSPT----GQFSSLDIAVCTIERAN 194
PolQ_Aor LK-------DPRYGLSPALVANFASV-GVKSIYPWQASCLLVPGLLEGKKHLVYTAPTGGGKSLVADVLMLKRIIENP----SRKAILVLPYVALVQEKLKWLRRIVQD-VE(26)IRVTGFFGGSRTT----ATWADTDIAVCTIEKAN 291
PolQ_Aae LDSSKNLRLVSNWGLPDPIAKAYARK-GITELFQWQADCLSNAKVILECANLVYSAPTSGGKTLVSEFLVAKAVVER-----KRKAIVILPFVAVAREKMFYLQELSP-AG----IRVEGFFGGHNPP----GGFDSVDVAVCTIEKAN 534
PolQ_Tbr PSVDDP---DFFYDLPVSVKDFYATRRGIKKLYNWQHEVLMRD-DIRAGGSLVYSLPTSGGKTLVAEISLLRCLINR-----GQSCLFVLPFVSLAEEKTDAMIPLGDV-LG----FTVDGHYSTRGRF----PLPVSKAVFVCTIEKAN 370
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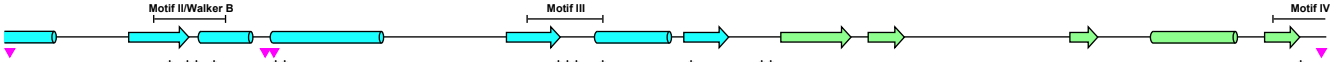


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Hel_Pfu SLLRHGSS--WIKDVKILVADEIHLIGSRDRGATLEVILAHMLGK----------AQIIGLSATIGNPEELAEWLNAELIVSDWRPVKLRRGVFYQGFVTWEDG---------------SIDRFS--SWEELVYDAIRKKKGALIFVNM 246
Hel_Afu SLIRNRAS--WIKAVSCLVVDEIHLLDSEKRGATLEILVTKMRRMNKA--------LRVIGLSATAPNVTEIAEWLDADYYVSDWRPVPLVEGVLCEGTLELFDG---------------AFSTSRRVKFEELVEECVAENGGVLVFEST 251
Hel_Mva SLMRHNIE--WIKDLSLAVIDEIHLIGDNERGGTLEVILTKLKNIN---------AQIVGLSATVGNPEEIANWLNAKLVTDEWRPVELKKGIYLENEINYINNQ-----DSQKKSFKAVKSISRNNLTDLIVDSVNEKGSCLIFCNS 256
Hel_Sso SLWRHRPD--WLNEANYFVLDELHYLNDPERGPVVESVTIRAKRR-----------NLLALSATISNYKQIAKWLGAEPVATNWRPVPLMEGVMYPERKKKEYTI--------LFRDNTARKVHGDDAIIAYTLDSLSKNGQVLVFRNS 254
Hel_Mka LLLRTGAV--DPDDIGVVVIDEVHTLADE-RGPRLDGLVCRLKTLTG---------AQLLGLSATVGNPEELAEYLDAEPIVHNRRPVPLEYHLVINQDRRQKWDR----------------IARLVESEWETEYSTGYRGQTIVFTYS 443
PolQ_Hsa GLINRLIEENKMDLLGMVVVDELHMLGDSHRGYLLELLLTKICYITRKSA(11)NAVQIVGMSATLPNLELVASWLNAELYHTDFRPVPLLESVKVGNSIYDSS------MKLVREFEPMLQVKGDEDHVVSLCYETICDNHSVLLFCPS 479
PolQ_Mms GLVNRLIEENKMDLLGMVVVDELHMLGDSHRGYLLELLLTKICYVTRKSA(11)NAVQIVGMSATLPNLQLVASWLNAELYHTDFRPVPLLESIKIGNSIYDSS------MKLVREFQPLLQVKGDEDHIVSLCYETIQDNHSVLIFCPS 345
PolQ_Aor SLINTAIEECNIGDLGVVVLDELHMLDDEHRGYLLELMVTKILLLQQD--------IQIIGMSATLSNTELLAEWMNANYYISTYRPIPIDDYLVYENAIYPAATS(24)HRIIQPPAFRELANPTTNAMVALSVDTAAAGYGALVFCGS 453
PolQ_Aae SIVNRLLEQRKLGDVGLLVVDEIHLISDSSRGYILELLLTKIRFASERLG----ERIQVVGMSATLPNMELLVEWLGAEQFRTDYRPIELKEMVKLGTCVFDNQKK----LLRKLDPDPFQEIMRDQDNVAQLCLETILEGCSVIVFCPS 676
PolQ_Tbr SLVNHMLEENTIGRIGTIVVDELHMLGETSRGATLELLLTKLLCLRHK--------VQIIGMSATIPNLPDIARWLRASCYIGNYRPVPLRQYAVVGGEVLEDGRE---------VCRSLVAAGHTSESSQLVFLTTEVKGASVLVFCAS 503
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Hel_Pfu RRKAERVALELSKKVKSLLTKPE-----IRALNELADSLE---ENPTN--EKLAKAIRGGVAFHHAGLGRDERVLVEENFRKGIIKAVVATPTLSAGINTPAFRVIIRDIWRYSDFGM---ERIPIIEVHQMLGRAGRPKYDEVGEGIIV 383
Hel_Afu RRGAEKTAVKLSAITAKYVENEG-------LEKAILEE------NEGEMSRKLAECVRKGAAFHHAGLLNGQRRVVEDAFRRGNIKVVVATPTLAAGVNLPARRVIVRSLYRFDGYS----KRIKVSEYKQMAGRAGRPGMDERGEAIII 384
Hel_Mva KRNAVGESKKHN--LTKYLSKAE-----LNDLNSISEEILSILETPTETCKSLSECIKKGVAFHHAGLTYQHRKAVEEGFRNKVIKVICCTPTLSAGLNLPCRRAIIRDIRRYSQNGL---IDIPKLEIHQCIGRAGRPGLDPYGEGIIL 399
Hel_Sso RKMAESTALKIAN-YMNFVSLDE------KAISEILKQLDDIEEGGSDEKELLKSLISKGVAYHHAGLSKALRDIIEESFRKRKIKVIVATPTLAAGVNLPARTVIIGDIYRFNRKIVGYYDEIPVMEYKQMSGRAGRPGFDQIGESIIV 398
Hel_Mka RRNTHRLA-----------------------------------------DLLNERTGLDVAPYHAGLPYDRRRSIERAFERGELAAVVTTAALGAGVDFPASQVIFESLAMGI-------EWLTPREFQQMAGRAGRPGYHDRGKVVLM 544
PolQ_Hsa KKWCEKLADIIAREFYNLHHQAE(12)VILEQKELLEVMDQLRRLPSGLDSVLQKTVPWGVAFHHAGLTFEERDIIEGAFRQGLIRVLAATSTLSSGVNLPARRVIIRTPIFGG-------RPLDILTYKQMVGRAGRKGVDTVG-SILI 629
PolQ_Mms KKWCEKVADIIAREFYNLHHQPE(10)VILDQKSLLEVMDQLKRSPSGLDSVLKNTVPWGVAFHHAGLTFEERDIIEGAFRQGFIRVLAATSTLSSGVNLPARRVIIRTPIFSG-------QPLDILTYKQMVGRAGRKGVDTMGESILV 494
PolQ_Aor RQACQLHASIISEAMPVPAAVDP------EELSRRLDLLAELRSLPSGLDPVLENTLVRGVGFHHAGMTTEEREFIAQAYDQGVLRVLVATCSLAAGVNLPARRVIINGARMGR-------ELVGPAMLRQMCGRAGRKGKDEAGETYLI 590
PolQ_Aae KDRCEQLALHLAEFIYRTLKSGG-(7)QEINRDKLEEALGLLKNCPTGLDAVLGKTARYGCVYHHAGLTADERDIIESSFKSGNLRIIVATSTLSSGVNLPARRVIIRTPMFGG-------SVMNSLTYRQMIGRAGRKGRDILGESILM 822
PolQ_Tbr RQQTVSTARLIARSRKEEVDKEG----GVRYNASSLALVADLRALDSEESSLLSQLVPYGVAFHHGGLVAEERTLIETAFRRRSIGVLCCTSTLAAGVNLPARRVIFKTPFVAV-------DFLTKSRYLQMCGRAGRAGLDEFGESFLF 642
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Hel_Pfu STSDDPRE----VMNHYIFGKPEKLFSQLSNES------NLRSQVLALIATFGYSTVEEILKFISNTFYAYQRKDTYS------LEEKIRNILYFLLENEEFIEIS------LEDKIRPLSLGIRTAKLYIDPYTAKM-FKDKMEEVVK-- 508
Hel_Afu VGKRDREI----AVKRYIFGEPERITSKLGVET------HLRFHSLSIICDGYAKTLEELEDFFADTFFFKQNEISLS--------YELERVVRQLENWGMVVED--------HHLAPTKLGSLVSRLYIDPLTGFI-FHDVLSRMEL-S 506
Hel_Mva AKNEKDVE----KAFLALTGPLENIYSKLSNQK------VLRVHILGLIATLEIKSTSELINFIKNTFYAHQYGNLHG------VLTNVSKVVEFLEKNKFIETLDD(31)TNLSFKPTNLGKRVSELYIDPLSSEI-IIEGLNELKE-- 554
Hel_Sso VRDKEDVDR---VFKKYILSDVEPIESKLGSER------AFYTFLLGILSAEGSLSEKQLEAFAYESLLAKSVVDVY-----------FDRAIRWLSEHSFIREE------NNTFTLTNFGKRVADLYINPFTADI-IRKGLEGYKASC 519
Hel_Mka VEPGRRYHR(8)VAFTLLESEPEPVEVEYDDED-------EREQVLAHLVSGAAKSPGELERVCDESLGFA--------------GDPMRRVKELREMGFVKG----------LEPTEKGRVAARYFTGPRTVHE-LSARAGS-DPLR 664
PolQ_Hsa CKNSEKSK-----GIALLQGSLKPVRSCLQRREGEEVTGSMIRAILEIIVGGVASTSQDMHTYAACTFLAASMKEGKQ-(7)SVQLGAIEACVMWLLENEFIQSTEA(14)GSATLSSSLSPADTLDIFADLQRAMK-GFVLENDLHILY 786
PolQ_Mms CKNSEKSK-----GIALLQGSLEPVHSCLQRQG--EVTASMIRAILEIIVGGVASTSQDMQTYAACTFLAAAIQEGKQ-(7)DAQLGAIDACVTWLLENEFIQVAEP(14)GSATLSSSLSPTDTLDIFADLQRAMK-GFVLENDLHIVY 649
PolQ_Aor CGKSELQA-----VCDLLEADMPAIESCLAPEK-----RGLKRAILEAIATGLVSGLEAIKEYVKCTLLYRTMDK-------KIAYNIMKSALQELVSEDLLHQND--(9)GQAVVASAFTPEDGLFVYEELNRALQ-AFVMDGDMHVFY 726
PolQ_Aae CDGQSSKA-----AWELVKTELKPIASCLDGDG----YSHLKRAILEIIASGVASSTADLESFVNCTLFSCEKKCRFS(27)GESIDPIASCVRFLLEYEFIRMQTN(13)GNACLSASMAPRDGFLLFSELQKSRQ-CFVLESELHAIY 994
PolQ_Tbr LSRKDRNR-----GCELMQQEVEACVSQLLEEK-----STVERALLEFVAIGLIRSLSDARKWGENILFHHAPGPIDK(10)EMLEGIIQSALSKLVERGLMQRLSR(43)GSCSVRSCFGVEDALIVRLELEKLQQSGLILADDLHMCY 826
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Hel_Pfu DPNPIG--------IFHLILSLTPDITPFNYSKREFERLEEEYYEFKDRLYFDDPYISGYDPYLERKFFRAFKTALVLLAWINEVPEGEIVEKYSVEPGDIYRIVETAEWLVYSLKEIAKVLGAY--EIVDYLETLRVRVKYGIREELIPL 648
Hel_Afu DIGALH-----------LICRTPDMERLTVRKTDSWVEEEAFRLRKELSYYPSDFSVEYDWFLSE-----VKTALCLKDWIEEKDEDEICAKYGIAPGDLRRIVETAEWLSNAMNRIAEEVGNT------SVSGLTERIKHGVKEELLEL 634
Hel_Mva KINDMDRSNIDQ-YIFYIISKATEMRPLLRVK-----MDEELELIQE---MDKLKISDYS--IEN--IEAFKNSKMFLDWINETPEEVILEKYGIEPGILRYKVDQARWMTYSSKEIAKLVKLNNDKIYKALLEMEFRIEYGAKEELIEL 691
Hel_Sso EIA----------YLHLLAFTPDGPLVSVGRN----EEEELIELLEDLECELLVEEPYEEDEYSLYLNALKVALIMKDWIDEVDEDTILGKYNIGSGDLRNIVETMDWLTYSAYHLSKELRLD--DHSDKLRILNLRVTDGVKEELLEL 652
Hel_Mka AVAS-------------VRPFERFQLSPSIKRAVERVTRMSVPS-RLDDALSVIHSERKEVIERLPPKEKQKLVSLMKELDCGCDAFPHCEHVSQRASELALKVRLEGKSVYAIPRILEGRYGITAYPIDIANWLEEVVRL--LECAGEI 798
PolQ_Hsa LVTPMFEDWTT--IDWYRFFCLWEKLPTSMKRVAELVGVEEGFLARCVKG--KVVARTERQHRQMAIHKRFFTSLVLLDLISEVPLREINQKYGCNRGQIQSLQQSAAVYAGMITVFSNRLGWH--NMELLLSQFQKRLTFGIQRELCDL 930
PolQ_Mms LVTPVFEDWIS--IDWYRFFCLWEKLPTSMKRVAELVGVEEGFLARCVKG--KVVARTERQHRQMAIHKRFFTSLVLLDLISEIPLKDINQKYGCNRGQIQSLQQSAAVYAGMITVFSNRLGWH--NMELLLSQFQKRLTFGIQRELCDL 793
PolQ_Aor MFTPLQVAATTQ-VDWPIFRDQLDNLDESGLRALQFIGVQPGFVNRMVQSGASLKEDTPEQIKLAVVYRRAYTALQLRDLSNEVPLSVVASRYRTPRGAVQTLAQQCHGFAAGMVKFCQRMGWG--MLAAVLDHMRDRLEAGARADLLEM 873
PolQ_Aae LVTPYSVSYQWQNISWVDFLERWENMDAAMRVGELIGIRDAFLVKGLRG----KIGEADHESLMTHKRFYTALALKRLVDEEPLSVVAQQFQCSRGLLQSLQQVASTFAGIVTAFCTSLNWN--LLAMIITQFRERLFFGVQPDLLDL 1137
PolQ_Tbr FVTPLRDPIDVD---WSIYRDILSQLNETRQRIASMIGVDEFYVNQRAMG---LGDAGGNGGGRAFATRRFYAALALADLLNEVPIGEVEQRYRCNRGQLQNLLRSASMFSSSITSFCRAMEWY--SLEAVLASFVKRLGFGVKPDIIPL 969
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Hel_Pfu MQLPLVGRRRARALYNSGFRSIEDISQARPEELLKIEGIG--VKTVEAIFKFLGKNV-------KISEKPRKSTLDYFLKS 720
Hel_Afu VRIRHIGRVRARKLYNAGIRNAEDIVRHREKVASLIGRGI-AERVVEGISVKSLNPES                          691
Hel_Mva LKIKNIGRVRARRLFNIGIKSKMDILKN-PE--KIISTFG--DKVGKKILDEFG-------------LKYGQQKLSGF--- 751
Hel_Sso VQIGGVGRKRARLLYNNGIKGLGDVVMN-PD--RVRNLLG--QKLGERVVQEAA-----------------RLLNRFH-- 708
Hel_Mka AEEPEMAAAAEALADPWSER-------------------------------------------------------------- 818
Hel_Hsa VRVSLLNAQRARVLYASGFHTVADLARANIVEVEVILKNAVPFKSARKAVDEEEEAVE(20)AAALIVEEARMILQQDLVE 1027
Hel_Mms IRVSLLNAQRARFLYASGFLTVADLARADSAEVEVALKNSLPFKSARKAVDEEEEAAE(19)AAALIVEEAKMILQQDLIE 889
PolQ_Aor AQVTYVKGWTARLLRDNGFRNLRALAEADAKDLVPILMMVNPRKAQRSQTHTSEAERY(6)-KAEVIVASANKIWAFGVQD 956
PolQ_Aae MRIASLNGQRARRLLFNAGVTGLLELANSDPLKIEQILYNCMSFETEQQRKGEEEFETR(20)AAHLLVTEARQYIQLEMGV 1234
PolQ_Tbr MEIKGVQPGRARALWRAGFKDPAAVAACTPAELLKRVKEANPPDSKVVKYFSIR--------SAVVVLREANAWVQQNIRE 1042
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