

Figure S5. Multiple alignments of the homologous Ubi and Mqn proteins, (A) UbiA and MqnP, (B) UbiD and MqnL, (C) UbiX and MqnM. Specificity-determining positions (SDP) are shown by light-blue background. SEED identifiers for the proteins are shown; for their sequences, see the file Sequences S1 in the Supplementary materials.

(A) UbiA and MqnP

fig 364106.8.peg.4488	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	UbiA
fig 386585.9.peg.5246	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 409438.11.peg.4513	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 457400.3.peg.314	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 457401.3.peg.3312	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 469595.3.peg.4401	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GMPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 469598.5.peg.3324	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 469608.3.peg.4217	-----MEWSLSQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPPLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 469613.3.peg.2740	-----MTQTKWQAYCRLMRIDKPI	GSLLLLW-PTYWALWLAGG----	QVPSLKLLVVFTLGVFVFMRAAGCVVNDYADRKF	DGH	
fig 471874.6.peg.3746	-----MEGSMALSKWHAYSRLMRIDRPI	GSLLLLW-PTYWALWIAAQ----	SIPSLHILIVFTAGVFLMRAAGCVINDYADRKF	DGH	
fig 471881.3.peg.3331	-----MTQSKWQAYSRLMRIDKPI	GALLLLW-PTYWALWIAAK----	GFPDWHILIVFTIGVFSMRAAGCVINDYADRKF	DGH	
fig 500637.6.peg.2465	-----MEGSMALSKWHAYSRLMRIDRPI	GSLLLLW-PTYWALWIAAQ----	GTPSLHLLIVFTAGVFLMRAAGCVINDYADRKF	DGH	
fig 500637.6.peg.6923	-----MEGSMALSKWHAYSRLMRIDRPI	GSLLLLW-PTYWALWIAAQ----	GTPSLHLLIVFTAGVFLMRAAGCVINDYADRKF	DGH	
fig 500638.3.peg.116	-----MEGVMTQGKWLAYCRLMRIDKPI	GSLLLLW-PTYWALWLAGG----	GIPDVKLLLVFTGGVFFMRAAGCVINDYADRKF	DGH	
fig 500639.8.peg.2467	-----MEWSLTQDKLLAYHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GLPPLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 500640.5.peg.4409	-----MEWSLTQSKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 511145.12.peg.4157	-----MEWSLTQNKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GVPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 520999.6.peg.1468	-----MEGSMALSKWHAYSRLMRIDRPI	GSLLLLW-PTYWALWIAAQ----	GSPSLHILIVFTAGVFFMRAAGCVINDYADRKF	DGH	
fig 521000.6.peg.17	-----MTLSKWHAYSRLMRIDRPI	GSLLLLW-PTYWALWIAAQ----	GTPSLHLLIVFTAGVFFMRAAGCVINDYADRKF	DGH	
fig 556268.6.peg.2272	-----MENRFLLYRLIRMDKPVGT	LLLLW-PTLCALWIAAE----	GKPSVTLVVIFCLGTVLMRSAGCAINDYADRKF	DGH	
fig 556269.4.peg.1008	-----MLYLRLVRLDKPI	GSLLLLW-PTLCALWIASD----	GKPDWYLVLVFVLGTVLMRSAGCAINDYADRKF	DGH	
fig 575587.3.peg.376	-----METVQHITWRQRLEAYYYLCRFDKPI	GTELFW-PTMWALWIAASK----	GIPDLKILLIMALGCLFMRAAGCAINDYADRKF	DGH	
fig 658664.3.peg.2752	-----MVISMQSSAAQPSRLMLYARLMRMDKPI	GTLLLLW-PTLWALWMAAD----	GHPPLSLVVIIFTVGTFMRSAGCAVNDYADRKF	DGH	
fig 99287.12.peg.4454	-----MEWSLTQSKLLAFHRLMRTDKPI	GALLLLW-PTLWALWVATP----	GMPQLWILAVFVAGVWLMRAAGCVVNDYADRKF	DGH	
fig 100226.15.peg.4561	-----MTSASAALPQQPGRTKAFLRLVMIEHSV	FALPFAYIAALTAMFLWDE---	NIHWGRLLLVTVMVGL---	RTFAMAVNRIIDREIDAR	MqnP
fig 411464.8.peg.2008	MKLPKFTLPRFSLPSCRPGALCGRFSVRGFSVFCRMIRIEHSI	FALPYAW---AGSVMAAG----	GMPPWDKIILLTIAMVGVRSFAMGINRIFDL	PFDPRE	
fig 457398.5.peg.2595	-----MRTPFQGQFADICRMKIEHSV	FALPYAW---AGAFLAAR----	GLPPLRSLIFLTIGMVAVRSFAMAFNRLVDL	PFDRD	
fig 500635.8.peg.1449	-----MISIKAHINNVALHHTIF	DLPPFAF---MGAVLAAN----	GHPRLIDLFWVAMAITTGRAAMAIDNLADLKYDKQ		
fig 537970.9.peg.1538	-----MLQKIKDFSELVMFQHSI	FSMPFIF---IAMLTAAQ----	GWFGWKLLAFGVIASISARNFAMAFNRYADRKF	DST	
fig 537971.5.peg.1298	-----MSVLQNLQKQIKNFSELVAFEHTIF	SSSFIL---IAMVVASMQQYGVAVCGWETFL	LCVLALITARNFAMGFNRFKDRDIDAQ		
fig 537972.5.peg.1533	-----MFAKIKDFSELVMFQHSI	FSMPFIF---IAMLTAAQ----	GWFGWKLLAFGVIASISARNFAMAFNRYADRKF	DST	
fig 556267.4.peg.915	-----MQFLQKVQDFRELVMFEHSI	FSMPFIF---IAMVTAAQ----	GWFGVKLLIFGVIASVSARNFAMAFNRFADRKF	DAT	
fig 613026.4.peg.1062	-----MFEHTIF	SASFIV---IAMIVSSNAFYDSGFFGFKTLFL	CAFALITARNFAMAFNRLCDRIDST		
fig 657316.3.peg.1682	-----MSKLSAHINNIALHHSVF	FALPFAY---MGLFLAAK----	GIPTFHDFLWVTLAMIGARSSALAMDNLDL	KFDKQ	
fig 742725.3.peg.1930	-----MKTVARYASLVTF	SHTVFAMPFALIAFYFALWSTD---	PFEWLLLVKVLLAMVFARNTAMGFNR	YADRSIDAM	
fig 864566.3.peg.1076	-----MNTIWNKFKDILELVVFKHSI	FALPFLF---SSMIVASKLVNDSAWFGFKALILGI	ICAVSARNFAMATNRLMEDIDKD		
fig 888826.3.peg.1565	-----MSVLWVKIKDILELVVFKHSI	FALPFLF---SAMIVASKLVNDSVWFGFSALILGI	ICAVSARNFAMATNRLMEDIDKD		
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(A) UbiA and MqnP, continuation

fig 364106.8.peg.4488	VKRTANRPLPSGAVTEKEARALFVVLVLISFLLVLTTLNTMTILLSIAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	UbiA
fig 386585.9.peg.5246	VKRTANRPLPSGAVTEKEARALFVVLVLISFLLVLTTLNTMTILLSIAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 409438.11.peg.4513	VKRTANRPLPSGAVTEKEARALFVVLVLISFLLVLTTLNTMTILLSIAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 457400.3.peg.314	VKRTANRPLPSGAVTEKEARALFVVLVLISFLLVLTTLNTMTILLSIAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 457401.3.peg.3312	VKRTANRPLPSGAVTEKEARALFVVLVLISFLLVLTTLNTMTILLSIAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 469595.3.peg.4401	VKRTANRPLPSGAVTEKEARTLFVVLVLLAFLLVLTTLNTMTILLSVAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 469598.5.peg.3324	VKRTANRPLPSGAVTEKEARALFVVLVLISFLLVLTTLNTMTILLSIAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 469608.3.peg.4217	VKRTARRPLPSGDVTEKEARTLFIVLVLLSFLLVLTTLNTMTILLSVAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFSAVS-ESLPLSCWLMFLANILW	
fig 469613.3.peg.2740	VKRTAQRPLPSGAVTEKESKALFVILVLISFGLVLTTLNAMTIWLSVAGLALAWVYPFMKRFTHLPQVVLGMAFGWSIPMAYAAVS-ESLPLSCWLLFLANICW	
fig 471874.6.peg.3746	VERTKHRPLPSGDVTEKEAKILFASLVGLSFLLVLTTLNSMTIWLVSAGLALAWIYPFVKRVSHLPQVVLGAAFGWSIPMGFSAVS-ESLPLVCWVLFVNIILW	
fig 471881.3.peg.3331	VERTKNRPLPSGAVTEKESKILFIVLVLLSFALVLTTLNTMTIWLVSAGLALAWIYPFVKRFSNLPQLILGMAFGWSIPMGFAAVS-ETLPLVCWLLFLVNIIVW	
fig 500637.6.peg.2465	VERTKHRPLPSGDVTEKEAKILFACLVGFSFLLVLTTLNSMTIWLVSAGLALAWIYPFVKRVSNLPQVVLGAAFGWSIPMGFSAVS-ESLPLVCWLLFLVNIIVW	
fig 500637.6.peg.6923	VERTKHRPLPSGDVTEKEAKILFACLVGFSFLLVLTTLNSMTIWLVSAGLALAWIYPFVKRVSNLPQVVLGAAFGWSIPMGFSAVS-ESLPLVCWLLFLVNIIVW	
fig 500638.3.peg.116	VKRTCQRPLPSGALSVREAKALFVLLVALSFALVLTTLNALT IWLVSVAALTLAWIYPFMKRFTHLPQVILGMAFGWSIPMAYAAVS-ESLPLSCWLLFAANICW	
fig 500639.8.peg.2467	VKRTANRPLPSGQVTEKEARTLFVVLIALSFLLVLTTLNTMTILLSVAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 500640.5.peg.4409	VKRTANRPLPSGAVTEKEARTLFVVLVLLAFLLVLTTLNTMTILLSVAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 511145.12.peg.4157	VKRTANRPLPSGAVTEKEARALFVVLVLISFLLVLTTLNTMTILLSIAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESVPLSCWLMFLANILW	
fig 520999.6.peg.1468	VERTKHRPLPSGDVTEKEAKILFAALVGLSFLLVLTTLNTMTIWLVSAGLALAWIYPFVKRVSHLPQVVLGAAFGWSIPMGFSAVS-ESLPLVCWLLFLVNIIVW	
fig 521000.6.peg.17	VERTKHRPLPSGDVTEKEAKILFASLVGLSFLLVLTTLNSMTIWLVSAGLALAWIYPFVKRVSNLPQVVLGAAFGWSIPMSFSAVG-ETLPLVCWLLFLVNIIVW	
fig 556268.6.peg.2272	VKRTAKRPLTSGKLPSEAIWVAVVLSALSFLLVLTPLNLTIGLSVAAVLIAGTYPFFKRFFALPQAYLGIAFGFGIPMAFAAVQ-NQVPPIAWLLLLGNVFW	
fig 556269.4.peg.1008	VKRTADRPLTSGKLRPLEAVVWACSLAFLSFLLVLSLNLTVGLSVIALVVAATYPLFKRFFALPQAYLGIAFGFGIPMAFAAVQ-NNVPWIAWFLLLANIFW	
fig 575587.3.peg.376	VERTKNRPLATGVIKAKEAVFVFLALVLSASLLLLFLPIEAFYWSFGALLLAFIYPFMKRYTHLPQVFLGAAFSWSIPMAYAAGV-QTPDLTCWLLYFGNLAW	
fig 658664.3.peg.2752	VKRTKERPITAGLIAPWEALAVAVALSLIAFTLILPLNALTKWMSVAAI VIAGTYPFFKRFFAIPQAYLGIAFGFGIPMAYAAGV-DQVPVLAWMLLAGNVFW	
fig 99287.12.peg.4454	VKRTVNRPLPSGAVTEKEARNLFVVLVLLAFLLVLTTLNAMTILLSVAALALAWVYPFMKRYTHLPQVVLGAAFGWSIPMAFAAVS-ESLPLSCWLMFLANILW	
fig 100226.15.peg.4561	NPRTAHRELVTGAMSVKHAWTGALIALVVF LGAAALLNPLCLALAPVAVIPMVVYPYGRFTNFPQAILGLAQAMGPIGGWLAIT-GEWSWEAVILGLAVGVW	MqnP
fig 411464.8.peg.2008	NPRTANRHLVTGEISVRQAWIFSLVMAAIFVLACAAINTVCLILSVPALLFAAVYSLTKRFS AICHFWLGATLGLAPLAGALAVNPEGLDMGPIMLFFAVTFW	
fig 457398.5.peg.2595	NPRTMDRPLVTGDISVAQTWAFCGVMALIFI IACACLNSLCFWLAVPALLFAAAYSLLKRFTALCHFWLGATLGLAPLAGWISVNPASMDLSPVLLFLAVTFW	
fig 500635.8.peg.1449	QPRMAYRAMVAGRISKREALAFIVICLVLMVLSVLQLQPICIYLLPVA AIPFIIYPFMKRV TGWVHMFGLGLAIAMAPAGGWVGVS-GTITAPLIVLCTAVALW	
fig 537970.9.peg.1538	NPRTKNRPSVDGRISPFAMLI FIFINALIFILMGWLINPLCFYLSFPILLILASYSLMKRLTSA AHLVLGLSLGLAPIAGVAVS-GEIPLWSVWLCCGVLFW	
fig 537971.5.peg.1298	NLRTNSRPSVDGRIKLSALIAFN IINALLFVAVSYLINTLAFYLSVPFLAILAFYSYTKRFS AVAHWVLGVCLGLAPIAGVIAVM-GEVPLWSVLLSLGVLFW	
fig 537972.5.peg.1533	NPRTKNRPSVDGRISPFAMLVFILINAIVFIFMGWLINPLCFYLSVPILLILASYSLMKRF TSA AHLVLGLSLGLAPIAGVAVS-GEIPLWSVWLCCGVLFW	
fig 556267.4.peg.915	NPRTKNRPSVDGRISKAMLLFIFVNALIFVAMGYVINPLCFYLSFPIL IILASYSLMKRFSSA AHLVLGLSLGLAPIAGVVAVS-GEIPLWSVYLCIGVLFW	
fig 613026.4.peg.1062	NERTKNRPSVDGRLSLPALLLFCVINAVLFV FVVSYLINDLAFKLSFPFLFILGVYSVMKRF SCLAHLVLGLSLGLAPIAGDIAVS-GAVHVW TIFLSLGVLFW	
fig 657316.3.peg.1682	QNRMSKRPLVTGAIKPIEVIIL IIVSLCIFLYSASQLAPICLKLTPICLFLLFPYTKRFTFLCHYFLGVALAMAPAGGYIAVT-GELPFGIILLSGGVCLW	
fig 742725.3.peg.1930	NPRTAQRDIPAGRISARNALWFIIVNALLFAATAAWINFLAFCLSP LALT VLLGYSLTKRFTA WCHIVLGIALGIAPVGAYLAVT-GQFAVLPILLTGLVITW	
fig 864566.3.peg.1076	NPRCANRPNVSGKIGRKSVMWIFIILNAIIFILCSYFINTLAFYLSFPVLFVLAIYS AFKRFSSLAHLVLGFCLGLAPIAGSVIVM-GEIHIYSVILCLGVTFW	
fig 888826.3.peg.1565	NPRCKDRPNISGRIGKMSVWGFI LVNALVFIVCSYFINPLAFYLSFPVLFLLAFYS AFKRFSSLAHLVLGFCLGLAPVAGSIIVL-GEIHLFSVILCLGVTFW	

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(A) UbiA and MqnP, continuation

fig 364106.8.peg.4488	AVAYDTQYAMVDRDDDKIGIKSTAILFGQYDKLIIG-IFQIGVLALMAIIGEL---NGLGWGY-YWSILV-AGALF--VYQOKLIANREREACFKAFMN-NN	UbiA
fig 386585.9.peg.5246	AVAYDTQYAMVDRDDDKIGIKSTAILFGQYDKLIIG-ILQIGVLALMAIIGEL--NGLGWGY-YWSILV-AGALF--VYQOKLIANREREACFKAFMN-NN	
fig 409438.11.peg.4513	AVAYDTQYAMVDRDDDKIGIKSTAILFGQYDKLIIG-ILQIGVLALMAIIGEL--NGLGWGY-YWSIVV-AGALF--VYQOKLIANREREACFKAFMN-NN	
fig 457400.3.peg.314	AVAYDTQYAMVDRDDDKIGIKSTAILFGQYDKLIIG-ILQIGVLALMAIIGEL--NGLGWGY-YWSILV-AGALF--VYQOKLIANREREACFKAFMN-NN	
fig 457401.3.peg.3312	AVAYDTQYAMVDRDDDKIGIKSTAILFGQYDKLIIG-ILQIGVLALMAIIGEL--NGLGWGY-YWSILV-AGALF--VYQOKLIANREREACFKAFMN-NN	
fig 469595.3.peg.4401	AVAYDTQYAMVDRDDDLKIGIKSTAILFGQNDKLIIG-ILQVGVVLVLMALVGWL---NGLGLGY-YWSLLV-AGALF--VYQOKLIVNRERDACFKAFMN-NN	
fig 469598.5.peg.3324	AVAYDTQYAMVDRDDDKIGIKSTAILFGQYDKLIIG-IFQIGVLALMAIIGEL---NGLGWGY-YWSILV-AGALF--VYQOKLIANREREACFKAFMN-NN	
fig 469608.3.peg.4217	AVAYDTQYAMVDRDDDKIGIKSTAILFGENDRLIIG-ILQVAVLALMGAVGWL---NGLGWEY-YWSLFV-AAGLF--GWQOKLIFNRERDNCFKAFMN-NN	
fig 469613.3.peg.2740	TVAYDTQYAMVDRDDDLKIGIKSTAILFGRFDKLIIG-LLQLATLLLMVWIGYL---NQLSGAY-YWGILL-AGALF--IHQOKLIAQRERMPCFQAFLN-NN	
fig 471874.6.peg.3746	SVIYDTQYAMVDRNDDLKIGVKSTAILFGQYDKLIIG-ILQIVMIVLLVLVGS---ADLGAVY-YIALSL-SALLF--IYQOKLMVDRERAPCFKAFLN-NN	
fig 471881.3.peg.3331	SVIYDTQYAMVDRNDDIKIGVKSTAILFGRYDKIIG-ILQLVMLALLVGIGIL---LNLKGIY-YWSLLL-VTALF--IYQOKLIAERERAPCFQAFMN-NN	
fig 500637.6.peg.2465	SVIYDTQYAMVDRNDDLKIGIKSTAILFGNYDKLIIG-LLQVVMVGLLVVIGFL---ANLGMVY-YAALVL-TSALF--VYQQQLMVNRERAPCFKAFLN-NN	
fig 500637.6.peg.6923	SVIYDTQYAMVDRNDDLKIGIKSTAILFGNYDKLIIG-LLQVVMVGLLVVIGFL---ANLGMVY-YAALVL-TSALF--VYQQQLMVNRERAPCFKAFLN-NN	
fig 500638.3.peg.116	TVAYDTQYAMVDRDDDLRIGIKSTAILFGRYDRLIVA-LLQLATLLLLLVWVGR---NPLGAVY-YWGLLL-VGGGF--VYQORLIVKRARPACFQAFMS-NN	
fig 500639.8.peg.2467	AVAYDTQYAMVDRDDDLKIGIKSTAILFGRHDKLIIG-IMQVAVVALMVAIGRL---NGLNWEF-YWSVLV-AGLLF--AYQOKLIAKREERACFKAFLN-NN	
fig 500640.5.peg.4409	AVAYDTQYAMVDRDDDLKIGIKSTAILFGQNDKLIIG-ILQVGVVLVLMALVGWL---NGLGLGY-YWSLLV-AGALF--VYQOKLIANRERDACFKAFMN-NN	
fig 511145.12.peg.4157	AVAYDTQYAMVDRDDDKIGIKSTAILFGQYDKLIIG-ILQIGVLALMAIIGEL---NGLGWGY-YWSILV-AGALF--VYQOKLIANREREACFKAFMN-NN	
fig 520999.6.peg.1468	SVIYDTQYAMVDRNDDLKIGVKSTAILFGQYDKRIIG-LLQVVMIGLLVIGVL---ANLGLVY-YGSLVL-AAALF--VYQQQLMINRERAPCFKAFLN-NN	
fig 521000.6.peg.17	SVIYDTQYAMVDRDDDLKIGVKSTAILFGQYDKLIIG-LLQLLMVGLLLVIGSL---AGLGTLY-YISLVL-VAGLF--IYQQQLMVNRERAPCFKAFLN-NN	
fig 556268.6.peg.2272	ALAYDTEYAMVDRDDDLKIGICTSAITFGRFDVLAVM-FCYLIMMSIALFAGWQ---LQFGGW-FAGW---CGALFCVYHFRILNRDRDGCQAFRH-NN	
fig 556269.4.peg.1008	ALAYDTEYAMVDRDDDLKIGIFTSAITFGRYDVLAVM-ACYFMMLIIVLFAGIF---TGLGKWF-VMGWSL-AVLCA--AYHYRLINRDRNACFFAFRH-NN	
fig 575587.3.peg.376	TVAYDTQYAITDREYDLKIGVKSTAILFGRYDIQIIG-VLQLVSLVLIGIALYI---ESLLVPFGIAGLIV-VAGDF--IYQTFKTLDRDPQLCFWAFRH-NR	
fig 658664.3.peg.2752	AVAYDTAYAMVDRDDDLIGIKTSAITFGRFDVAAIM-LCYAGFFGIMAWAGHV---MALSVA-YWGFVA-AVALS--LWYFPMQTRDRMKCF-----	
fig 99287.12.peg.4454	AVAYDTQYAMVDRDDDKIGIKSTAILFGRYDTLIIG-ILQLGVLMALMIGWL---NGLGWGY-YWAVLV-AGALF--VYQOKLIANREREACFKAFMN-NN	
fig 100226.15.peg.4561	IGGFDLIYACQDVETDRQVGKSVPARFGVPAAIWGARACHTVTTALFAWYAVA---TDAGVFF-WLGLLI-VAGAF--LYEHTIVRPTDLSRLNRAFFSVNG	MqnP
fig 411464.8.peg.2008	VGAFDIYYSFQDYDFDVAFLRCSVPSVYGPDTALAIAGFSHAVTSIFLFLTGIA---AGLAWP--WYVLWAGVSAIL--FWEHHLMRPQDLSRVNMVFFTLNG	
fig 457398.5.peg.2595	VGAFDIYYAFQDLDFDLAFDLRSVPSVYGPDTALALAAFSHVMTAIFLLLTGLA---AHLSPW--WYAICLGIGVLL--LVEHRLMRPQDLRHVNTAFFTLNG	
fig 500635.8.peg.1449	IGAFDAMYGAQDEAFDRSQGLHSLAVSYGAAGAFRIATAAHVICILCFLAVGFM---MHLALY-FVGVLI-AAATL--CYQHRIVSPTDFSRVTQRYFMRNG	
fig 537970.9.peg.1538	VAGFDLLYALQDIEHDKKEGLYSIPSVFGVQNTLWISRIFHLLTLIFWALYIIS---SDSGVFM-WIGLLI-STIAL--GYEQFLVS-RNFQNI PKAFFAVNG	
fig 537971.5.peg.1298	VAGFDLLYSIQDMDFDKAKNLHSIPAYFGLRATLWISRLCHIVAVLFWGCFVYE---AHLGVVA-WIGVGL-GALML--SYEQYLVS-VHLKNI PKAFFVTNG	
fig 537972.5.peg.1533	VAGFDLLYSIQDIEHDKKEGLHSVPRVFIQNTLWISRLFHLLTLIFWGLFIMQ---SNRGFLM-WFGLII-AVFAL--AYEHFLVS-KNFHNI PKAFFVNG	
fig 556267.4.peg.915	VAGFDLLYALQDINHDKKEGLYSVPSVFGVQKTLWISRIFHALTLIFWALFIKE---AGLGMWM-WIGLVV-AVVAL--SVEQYLVS-KNFEHI PRAFFTING	
fig 613026.4.peg.1062	VAGFDILYSIQDIEHDKRHNLYSIPARFGAENALQIARIFHIFSFFFALFLRF---STTYHLA-IVGLIL-SACML--FYEH-LIVRKDFCNIPRAFFTTNG	
fig 657316.3.peg.1682	IGSFDVIYGSQDRQFDLDHKLHSMATQFGVANAHKIAAFFHFISILCFIGAGIY---FDLSFIY-YIGVLI-AILT--IYQHSITPYDFSRLTQVYFMRNG	
fig 742725.3.peg.1930	VSGFDVIYALQDAEFDRQHALHSIPARFGIRGAIGISILLHLITVYAIALIGSY---YGAGTFY-WIGAAI-FVALL--IFQHTIVTPRHLDRIPTFGLLNG	
fig 864566.3.peg.1076	TAGFDLLYSIQDMEYDKKVLHSIPAKFGSKATLFI SAFCHVLAVLFWLLFVWQVWGVALGNIA-LFGVII-SGIIL--AFEHKIVH-KNFAHIDKAFFTLNG	
fig 888826.3.peg.1565	TAGFDLLYSIQDMEYDKKVLHSIPAKFGSATLFI SAFCHFLATLFWLLFVWV---APLGGLA-FFGVLI-CGAIL--MAEH-LIVRKNFAHIDRAFFTLNG	
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(A) UbiA and MqnP, ending

fig 364106.8.peg.4488	YVGLVLFLGLAMSYWHF----
fig 386585.9.peg.5246	YVGLVLFLGLAMSYWHF----
fig 409438.11.peg.4513	YVGLVLFLGLAMSYWHF----
fig 457400.3.peg.314	YVGLVLFLGLAMSYWHF----
fig 457401.3.peg.3312	YVGLVLFLGLAMSYWHF----
fig 469595.3.peg.4401	YVGLVLFLGLAMSYWHF----
fig 469598.5.peg.3324	YVGLVLFLGLAMSYWHF----
fig 469608.3.peg.4217	YVGLVLFLGLAMSYL-----
fig 469613.3.peg.2740	YAGLVLFIGIVLSIWS-----
fig 471874.6.peg.3746	YVGLILFIGIFLSYL-----
fig 471881.3.peg.3331	YVGFVLFAGILFSYF-----
fig 500637.6.peg.2465	YVGFILFIGMVISYL-----
fig 500637.6.peg.6923	YVGFILFIGMVISYL-----
fig 500638.3.peg.116	YVGLILFVAIWLAL-----
fig 500639.8.peg.2467	YVGLVLFIGLAMSYWS-----
fig 500640.5.peg.4409	YVGLVLFLGLAMSYWHL----
fig 511145.12.peg.4157	YVGLVLFLGLAMSYWHF----
fig 520999.6.peg.1468	YVGLILFFGMVVSYF-----
fig 521000.6.peg.17	FVGLILFIGIFISYF-----
fig 556268.6.peg.2272	WLGAFIGFAGIALDYMLR----
fig 556269.4.peg.1008	WLGAFIGFLGIALDYALR----
fig 575587.3.peg.376	WVGMIIFLGIFLQLVV-----
fig 658664.3.peg.2752	-----LFPA-----
fig 99287.12.peg.4454	YVGLVLFLGLAMSYWHF----
fig 100226.15.peg.4561	FIGIALFVCALLDLLVRGLTV
fig 411464.8.peg.2008	IISPLVLVGVLGVVL-----
fig 457398.5.peg.2595	IISPVVLMGVILGIYI-----
fig 500635.8.peg.1449	IVSVAIFACTWLSFYI-----
fig 537970.9.peg.1538	YLGIVFFGFCVLDLIFRN---
fig 537971.5.peg.1298	YLGIIFFVCILLDSVVG----
fig 537972.5.peg.1533	YLGIVFFGFCLLDLIFTK---
fig 556267.4.peg.915	YLGIAFLGFCIVDFMSR----
fig 613026.4.peg.1062	YLG FVFLFFIILDSIVRF---
fig 657316.3.peg.1682	IVSIVIFVFTLIDILS-----
fig 742725.3.peg.1930	ITSVCFATCVIIDLYLRY---
fig 864566.3.peg.1076	YLSIIFFIFIWVDLVWK----
fig 888826.3.peg.1565	YLSVVFFIFVLVDLLWR----

UbiA

MqnP

(B) UbiD and MqnL

fig|364106.8.peg.4318 MDAMKYNDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|386585.9.peg.4980 MDAMKYNDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|409438.11.peg.4301 MDAMKYNDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|457400.3.peg.1907 MDAMKYNDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RVGG--PALLFENP
 fig|457401.3.peg.4625 MDAMKYNDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|469595.3.peg.4668 MDAMKYHDLRDFTLTLEQQGELKRISLEVDPHLEITEIADRTL RAGG--PALLFENP
 fig|469598.5.peg.4821 MDAMKYNDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|469608.3.peg.4956 ---MKYHDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|469613.3.peg.4232 ---MKYRDLREFLSLLEQRGELKRISQPIDPYLEMTEIADRTL RAGG--PALLFENP
 fig|471874.6.peg.3370 ---MKYRDLRDFIAQLEKQGELKRITMEVDPYLEMTEIADRTL RAGG--PALLFENP
 fig|471881.3.peg.2519 ---
 fig|471881.3.peg.2520 ---MMKYRDLRDFLSLLEEKGELKRITYEIDPYLEMTEIADRTL RAGG--PALLFENP
 fig|500637.6.peg.2596 ---MKYRDLRDFIAQLEKQGELKRITMEVDPYLEMTEIADRTL RAGG--PALLFENP
 fig|500637.6.peg.6792 ---MKYRDLRDFIAQLEKQGELKRITMEVDPYLEMTEIADRTL RAGG--PALLFENP
 fig|500638.3.peg.2890 ---
 fig|500639.8.peg.4205 ---MKYHDLRDFTLALLEKQGELEKRITLPVDPCELEMTEIADRTL RAGG--PALLFENP
 fig|500640.5.peg.4567 MDAMKYHDLRDFTLTLEQQGELKRITLEVDPHLEITEIADRTL RAGG--PALLFENP
 fig|511145.12.peg.3957 MDAMKYNDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|520999.6.peg.1266 ---MKYRDLRDFIAQLEKQGELKRITMEVDPYLEMTEIADRTL RAGG--PALLFENP
 fig|521000.6.peg.2694 ---MKYRDLRDFISQLEKQGELKRITMEVDPYLEMTEIADRTL RAGG--PALLFENP
 fig|556268.6.peg.1962 ---MKYRDLRDFINQLAAENELKEIVSVSPHLEMTEVSSRVLTQNG--PALLFRKP
 fig|556269.4.peg.713 ---MKYRDLRDFIEQLGRDGELKEIVSVSPDLEMTEVSSRVLHQGG--PALLFKNP
 fig|658664.3.peg.2251 ---MQYRDLRDFLAQLERTGELRRVHRPVSPRLEMTEVCDRL LRAEG--PAVVFEQPV DGA--
 fig|99287.12.peg.4197 MDAMKYHDLRDFTLTLEQQGELKRITLPVDPHLEITEIADRTL RAGG--PALLFENP
 fig|411464.8.peg.1208 ---MGYRNLOECVADLEKVGQLRRIDVPVDPHLELAHIQRRAFRSKS--PALLFTRV
 fig|457398.5.peg.2296 ---MLPRAKRNGG
 fig|500635.8.peg.1448 ---MAYKDLREFIEALESKGLLKRIKTEVDPELEITEITDRVSKMKGEKNVALLFENV--
 fig|537970.9.peg.988 -----MRQTLDLLKAHNEVRIISEPLDIHLEIPHLAYLEVKKPNS--KALLFTNPIDKQRD--
 fig|537971.5.peg.547 ---MALDSRQLIKFLQEHDELTIIDTPLDIYLEIPQLAYIEVKKLDS--KALLFTRPICKKSG--
 fig|537972.5.peg.1697 -----MRQTLDLLKAHNEVKIITEPLDIELEIPHLAYLEVKKPDS--KALLFTNPTRGN--
 fig|556267.4.peg.1586 -----MRQTIKDLKANNALKVISEPLDVELEIPHLAYLEVKKSDS--KALLFVNPVDKARG--
 fig|613026.4.peg.1432 -----MQDFIRFLESHNELKIIDTPLDIELEIPHLAYLEVKKKDS--KALLFTRPIHRKHKSDSTLSGTSTECTQHNMQSSNCHAKQSEISQNLDSKPCHT--
 fig|657316.3.peg.1681 ---
 fig|742725.3.peg.914 ---MYKTLSEYIAALERAGELVRINVPVDPVLEIAELTDREAKSPGGG--RALLFEN--
 fig|864566.3.peg.1472 -----MKEFIQILKENDLLRVIEEPVDVDLEIAHLAYIEAKKGEKG--KALLFKNPIDKKLN--
 fig|888826.3.peg.55 -----MRRFIELLKQNELKIIDEPDVELEIPHIAYIEAKKFEEG--KALLFTQPIREK--

(B) UbiD and MqnL, continuation

fig 364106.8.peg.4318	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 386585.9.peg.4980	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 409438.11.peg.4301	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 457400.3.peg.1907	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 457401.3.peg.4625	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 469595.3.peg.4668	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 469598.5.peg.4821	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 469608.3.peg.4956	-----	KGYSMPVLCNLFGTPRRVALGM----	GQEDVSSL
fig 469613.3.peg.4232	-----	KGYDIPVLCNLFGTAKRVALGM----	GQEDVSAL
fig 471874.6.peg.3370	-----	KGYDMPVLCNLFGTTKRVAMGM----	GQEDIKAL
fig 471881.3.peg.2519	-----	-----	-----
fig 471881.3.peg.2520	-----	KGYDMPVLCNLFGTPERVAMGM----	GQDDVKAL
fig 500637.6.peg.2596	-----	KGYKMPVLCNLFGTTKRVAMGM----	GQEDIKAL
fig 500637.6.peg.6792	-----	KGYKMPVLCNLFGTTKRVAMGM----	GQEDIKAL
fig 500638.3.peg.2890	-----	-----	-----
fig 500639.8.peg.4205	-----	KGYSMPVLCNLFGTPRRVAMGM----	GQEDVTAL
fig 500640.5.peg.4567	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 511145.12.peg.3957	-----	KGYSMPVLCNLFGTPKRVAMGM----	GQEDVSAL
fig 520999.6.peg.1266	-----	KGYNMPVLCNLFGTTKRVAMGM----	GQEDIKAL
fig 521000.6.peg.2694	-----	KGYNMPVLCNLFGTTKRVAMGM----	GQEDIKAL
fig 556268.6.peg.1962	-----	TGYTIPVLTNLFGNTRRIARAM----	GGETVQDL
fig 556269.4.peg.713	-----	SGFSIPVLTNLFGTSRRIAKAM----	GGETTGDL
fig 658664.3.peg.2251	-----	QKYDMPVLANLFGTTRRVALGM----	GAESLDEL
fig 99287.12.peg.4197	-----	KGYAMPVLCNLFGTPKRVAMGM----	GQDDVSAL
fig 411464.8.peg.1208	-----	KGCSFPMLANLFGTKERLHYIF----	RD-----
fig 457398.5.peg.2296	-----	-----	-----
fig 500635.8.peg.1448	-----	KGSKMPVLMNAFGSYERMAMAL----	GVEKLDDV
fig 537970.9.peg.988	-----	INFEIPVLMNLFGSFSRVELLI----	G--DTRQI
fig 537971.5.peg.547	-----	KEFDIPVLMNVFGSHKRLDLLI----	N-KPIPKI
fig 537972.5.peg.1697	-----	TSFEIPVLMNLFGNFKRVELLI----	G--NTQEI
fig 556267.4.peg.1586	-----	VQYETPVLNLFGSFKLVELLI----	G--DVEGQ
fig 613026.4.peg.1432	GPLGEVSNMESKKDISPFRNAQHDKKLHPTTQMTQDLTYTAHIESNLIESNFNSIDSSNQDSNTTTQNI	ESFHIPVLMNVFGSQKRELIATHYNSNADF	FKSL
fig 657316.3.peg.1681	-----	-----	-----
fig 742725.3.peg.914	-----	TGTPFPVLTNMMGSDRRIAMAL----	GVESVDLL
fig 864566.3.peg.1472	-----	KQYKFPVLMNTFCNKKALNLAF----	G-RDYEEV
fig 888826.3.peg.55	-----	KAYKYPVLMNTFCNQKALNLAL----	T-RDYEEV

UbiD

MqnL

(B) UbiD and MqnL, continuation

fig 364106.8.peg.4318	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 386585.9.peg.4980	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 409438.11.peg.4301	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 457400.3.peg.1907	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 457401.3.peg.4625	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 469595.3.peg.4668	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 469598.5.peg.4821	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 469608.3.peg.4956	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIIQGGDDVD-LNKIPIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 469613.3.peg.4232	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLN-SAPCQELVWQGGDDVD-LGRIPIVMHCWPEDAAPLISWGLTITRGPBK---ERQNLGIYRQQ
fig 471874.6.peg.3370	-QDVGKLLAFLKEPDPPKGFRDLFDKLPKFKQVLNMPAKRLS-SAPCQEIQIWAGDDVD-LTKIPVMHCWPEDAAPLITWGLTVTRGPNK---ERQNLGIYRQQ
fig 471881.3.peg.2519	-----
fig 471881.3.peg.2520	-HEVGKLLAFLKEPDPPKGFRDLFDKLPKFKQVLNMPAKRLS-KAPCQEVVLTGGDDVD-LTKIPVMHCWPEDAAPLITWGLTVTRGPLK---ERQNLGIYRQQ
fig 500637.6.peg.2596	-HDVGKLLAFLKEPDPPKGFRDLMDKLPKFKQVLNMPAKRLN-SAPCQEIQIWAGDDVD-LTKIPVMHCWPEDAAPLITWGLTVTKGPHK---ERQNLGIYRQQ
fig 500637.6.peg.6792	-HDVGKLLAFLKEPDPPKGFRDLMDKLPKFKQVLNMPAKRLN-SAPCQEIQIWAGDDVD-LTKIPVMHCWPEDAAPLITWGLTVTKGPHK---ERQNLGIYRQQ
fig 500638.3.peg.2890	-----
fig 500639.8.peg.4205	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 500640.5.peg.4567	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 511145.12.peg.3957	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LNRIPIIMTCWPEDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 520999.6.peg.1266	-HDVGKLLAFLKEPDPPKGFRDLMDKLPKFKQVLNMPAKRLS-SAPCQEIQIWAGDDVD-LTKIPVMHCWPEDAAPLITWGLTVTKGPHK---ERQNLGIYRQQ
fig 521000.6.peg.2694	-HDVGKLLAFLKEPDPPKGFRDLFDKLPKFKQVLNMPAKRLS-SAPCQEIQIWAGDDVD-LTKIPVMHCWPEDAAPLITWGLTVTKGPHK---ERQNLGIYRQQ
fig 556268.6.peg.1962	-RRIGLFLASLKEPEQPGSLSELFSGMSMLKSVLDMRPKERK-DAPCREIVMENDEID-LGAFPVQTCWPEDAGPLITWGLVVTGKPGK---KRQNLGVYRQQ
fig 556269.4.peg.713	-RRIGQFLASLKEPRQPEKFSDLLGMGAMLSLMDMRPRELE-NAPCQEIIVLEGKDDVD-LHSLPIQTCWPEDAAPLITWGLVVTGPNK---KRQNLGIYRQQ
fig 658664.3.peg.2251	-RDVGRLLSALKEPEPPRGLREAGKLWTMAKAVWDMAPRKVS-SPACQEIIVWEGNDVD-LSRIPVQTCWPGDAAPLVTWGLVITRGPBK---KRQNLGIYRQQ
fig 99287.12.peg.4197	-REVGKLLAFLKEPEPPKGFRDLFDKLPQFKQVLNMPTKRLR-GAPCQKIVSGDDVD-LTRLPIVMTCPDDAAPLITWGLTVTRGPHK---ERQNLGIYRQQ
fig 411464.8.peg.1208	-SLAGVEAVLAAKADPAAALKHPLRLSLRALPALPHMLPRRTS-KAPVLE-----NRCA-LSDLPLRVGWPMDDGGPFITLPLVYSEDPARPGLDASNLGMYRVQ
fig 457398.5.peg.2296	-----ECNCN-----LADLPRLTCWPGDGGPFITLPLVYSEDPGRPLNTSNLGMRYRVQ
fig 500635.8.peg.1448	ADELREMMKLPY--VSLQNKMSVVTMIPIKRAINF-PKYVK-HAPCQEVVET-ENPN-LDEIPIILKWPDDGGPFVTLPLVFTKNPKT---GKRNVMGYRLQ
fig 537970.9.peg.988	ANDLAFLLKL----KPPKNFKEIMQTLPKLLSLRYLSPKVVKNRGLCQEVIKTGSEVD-LQSLPIILKTWSEDGGAFITMGQCYTQSLDG---SVRNLMGYRLQ
fig 537971.5.peg.547	AHSLQNLHL----SPPKGIKQIFHKLKELYALRSVFPKYIKKKGQCQEI IKT-QNLN-LFDLPILTTWERDGGAFITMGQVYTQNLNG---TQKNLGMRYRLQ
fig 537972.5.peg.1697	AKEIAFMLKL----KPPKNFQEAFLPRLNLRHLSPKILNTRGLCQEVIKTNNEIN-LTSLPIILKTWSDGGAFITMGQCYTQSLDG---SVKNLGMRYRLQ
fig 556267.4.peg.1586	ASEVAKLLKL----KPPRSFKQALALLPSLLNLRNLSPKILKGRGLCQEVIKQGGSEVD-LEAIPVLKTWSDGGGRFITMGQCYTQSLDG---CVRNLMGYRLQ
fig 613026.4.peg.1432	-ESIANVMKNLLNLSMPKTLSEKLAKLKEWAMRHVFPPKYKKNPPCQERIYTKDSID-LFSLPIILKTWEEDGGGRFITMGQVYTRSLDG---KSNNIGMYRLQ
fig 657316.3.peg.1681	PNELREILRLPY--ISLQNKMDLIHIIPTAKRAINF-PKYVK-KAPCQEVVITDNPT--LDKFPILKWPQDGGPFITLPLVFTTRNPKT---GKRNVMGYRLQ
fig 742725.3.peg.914	TGRIEELFAALTSPRP--DLFDKLRMLPLLGRMSRWLPREVKGGRGVCQVVLQGDAAAR-LDLLPVLKWPQDGGRFVTLPLVHTLDPDT---GVRNVMGYRMQ
fig 864566.3.peg.1472	AEEISKLIK----HIPTSFKAKMDFMNLLSFKNIPPKRLK---NKALYDYEILNSLEELPILKTWEDDAGKFITMGQVYTQNLDK---TQNNLMGYRLQ
fig 888826.3.peg.55	ADEISQLTKL---HIPTSLKAKFDFFTKLSKLRFAAPPKRLQK---EKALYRYELLPSLKELPILKTWSDLAAPFITMGQIYTQNPDK---TQNNLMGYRLQ

UbiD

MqnL

(B) UbiD and MqnL, continuation

fig 364106.8.peg.4318	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 386585.9.peg.4980	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPISVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 409438.11.peg.4301	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 457400.3.peg.1907	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 457401.3.peg.4625	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 469595.3.peg.4668	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 469598.5.peg.4821	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 469608.3.peg.4956	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCVS-----NDLEVPASAEIVLEGY
fig 469613.3.peg.4232	V----LGKNKVIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGNKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 471874.6.peg.3370	V----LGKNKVIMRWLSHRGGALDYQEWCAAHPPERFPVAVALGADPATILGAVTPVPDTLSEYAFAGLLRGNKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 471881.3.peg.2519	-----
fig 471881.3.peg.2520	V----LGKNKVIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGNKSEVVKCLS-----NDLEVPASAEIVLEGY
fig 500637.6.peg.2596	V----LGKNKVIMRWLSHRGGALDYQEWCAAHPPERFPVAVALGADPATILGAVTPVPDTLSEYAFAGLLRGNKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 500637.6.peg.6792	V----LGKNKVIMRWLSHRGGALDYQEWCAAHPPERFPVAVALGADPATILGAVTPVPDTLSEYAFAGLLRGNKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 500638.3.peg.2890	-----
fig 500639.8.peg.4205	R----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 500640.5.peg.4567	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 511145.12.peg.3957	L----IGKNKLIMRWLSHRGGALDYQEWCAAHPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 520999.6.peg.1266	V----LGKNKVIMRWLSHRGGALDYQEWCAAHPPERFPVAVALGADPATILGAVTPVPDTLSEYAFAGLLRGNKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 521000.6.peg.2694	V----LGKNKVIMRWLSHRGGALDYQEWCAAHPPERFPVAVALGADPATILGAVTPVPDTLSEYAFAGLLRGNKTEVVKCIS-----NDLEVPASAEIVLEGY
fig 556268.6.peg.1962	V----IGKNKLIMRWLAHRGGAQDFREHKIVNKGKPFVAVVIGADPATLLSAVTPIPELSEYQFAGLLRGSRTTELVRTLG-----SDLMVPANAEMVLEGH
fig 556269.4.peg.713	V----ISGNKVIMRWLAHRGGAQDFREHKIANKGKPFVAVVIGADPATLLSAVTPIPELSEYQFAGLLRGSRTTELVRTKN-----SDLVQPARAEIVLEGH
fig 658664.3.peg.2251	V----ISRNQLIMRWLAHRGGAQDFREHAIANPGQPFPIVVALGADPATILGAVTPVPDTLSEYQFAGLLRGSRTTELATCLTPSLAQALQVPAGAEIILEGH
fig 99287.12.peg.4197	L----IGKNKLIMRWLSHRGGALDYQEWLAARPPERFPVSVALGADPATILGAVTPVPDTLSEYAFAGLLRGTKTEVVKCLS-----NDLEVPASAEIVLEGY
fig 411464.8.peg.1208	LAGNDYAADEVGLHYQIHRGIGVHHAELKRG--QSLPVNIFVGGPPAFTVAAVMPLPEGLSELRFAGLLGGCRAAMHYSRR-----LPLPVLAEADFCISGH
fig 457398.5.peg.2296	LAGNAYAPDEAGLHYQIHRGIGAHANAIARG--EELPVHVYVGGPPALSVAAMPLPEGLSELRFAGLLGGRRVELARAPE-----LRLPVLAEADFCISGR
fig 500635.8.peg.1448	K----YDSKTTGMHWHIHKNGAENFRDMKAQG--GERIEAAVAIGTDPVVTYAATAPLPRDIDEMVFAGFLRHKSVMVKCKT-----VDIEVPATAEIVLEGY
fig 537970.9.peg.988	V----YDKNHLGLHWQIHKDSVGIFEEYKKAH--QKMPVSIAIGGNPLYTWCATAPLPYGIFELMLYGFIFIKKEKARLVKCVS-----NELCVPYDSLVIEGF
fig 537971.5.peg.547	V----YDETHLGLHWQIHKDSQHFHEFYKKAH--KEMPVSIALGGDPLYIWCQAPLPLGIFELMLYGFIFIREKKPVLCPCIT-----NPLFVPYDSDIVIEGW
fig 537972.5.peg.1697	V----YDRNHLGLHWQIHKDSVGIFEEYKKAH--QKMPVSIAIGGDPLYTWCATAPLPYGMFELMLYGFIFIKKRKAKMVKCVS-----NPLFVPYDSDIVIEGY
fig 556267.4.peg.1586	V----YDKNHLGLHWQIHKDSVHLLLEYRKAG--KKMPVSIAIGGDPLYTWCATAPLPYGMFELMLYGFIFIKKQRAKLVRVCS-----NDLCVPYDADFVIEGF
fig 613026.4.peg.1432	I----HSHNELLMHWQIHKDATHFFHEYKRAN--KLMPVSIAIGGDPLYIWCQAPMPKIFELMLYGLIRAKNPLLAECVS-----NELAVPHDCDIVIEGF
fig 657316.3.peg.1681	K----YDQOTTGMHWHLHKDGASNYRAYQEMG--KDKIEVAVAIGTDPVITYAATAPLPRDIDEMVFAGFLRKSVMVKCKT-----VDVEVPACSEIVLEGY
fig 742725.3.peg.914	L----FSPQOTTGMHWHLHKTGERHYRAYQRLG--KRMPVTVCLGGDPAYTYAATAPMPDNMDEYLLAGFLRERPVELVKCVT-----NDLRVPADCDIVIEGY
fig 864566.3.peg.1472	M----SDKNELLIHWQIHKDGANFYHEYKNAG--FKMPVSIAIGGDPLYIWCQAPLPGIFELMLYGFIFIKKTPAKITPC-E-----NGIFVPYDSVIVIEGY
fig 888826.3.peg.55	V----SGENELLMHWQIHKDGANFCREYKEAG--LSKMPVSIAIGGDPLYIWCQAPLPGIFELMLYGFIFIKRQARLTPC-E-----NGIFVPYDSDFVIEGY

UbiD

MqnL

(B) UbiD and MqnL, continuation

fig 364106.8.peg.4318	IEQGETAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	UbiD
fig 386585.9.peg.4980	IEQGEMAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 409438.11.peg.4301	IEQGETAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 457400.3.peg.1907	IEQGETAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 457401.3.peg.4625	IEQGETAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 469595.3.peg.4668	IEPGELAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 469598.5.peg.4821	IEQGETAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 469608.3.peg.4956	IEAGEMAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 469613.3.peg.4232	IEPGEMAP-----EGPYGDHTGYYNEIDNFPVFTVTHITQRRNPIYHSTYTGRPPDEPAVMGLALNEVFV-PILQKQFPEIVDFYLPPEGCSYRMAVVTMK	
fig 471874.6.peg.3370	IEPGELAP-----EGPYGDHTGYYNEIDSFPVFTVTHVTQRRDAIYHSTYTGRPPDEPAVLGEALNEVLV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 471881.3.peg.2519	-----MK	
fig 471881.3.peg.2520	IEPGELAP-----EGPYGDHTGYYNEIDSFPVFTITHLTRRKDAIYHSTYTGRPPDEPAVLGVALNEVLV-PILQKQFPEIVDFLFTP-----	
fig 500637.6.peg.2596	IEPGEMAP-----EGPYGDHTGYYNEIDDFPVFTVTHVTQRRDAIYHSTYTGRPPDEPAVLGEALNEVLV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 500637.6.peg.6792	IEPGEMAP-----EGPYGDHTGYYNEIDDFPVFTVTHVTQRRDAIYHSTYTGRPPDEPAVLGEALNEVLV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 500638.3.peg.2890	-----MAVVTMK	
fig 500639.8.peg.4205	IEQGELAP-----EGPYGDHTGYYNEVDNFPVFTVTHITQRDDPIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 500640.5.peg.4567	IEPGEMAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 511145.12.peg.3957	IEQGETAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTIK	
fig 520999.6.peg.1266	IEPGEMAP-----EGPYGDHTGYYNEIDDFPVFTVTHVTQRRDAIYHSTYTGRPPDEPAVLGEALNEVLV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 521000.6.peg.2694	IEPGEMAP-----EGPYGDHTGYYNEIDSFPVFTVTHVTQRRDAIYHSTYTGRPPDEPAVLGEALNEVLV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 556268.6.peg.1962	IYPDGNHSGYEHALEGPFGDHTGYYNEPDWFPVMTVERITMRKNPLYLSTYTGRPPDEPAMLGVALNEVFV-PLLQKQFSEIVDFYLPPEAGCSYRFALVKIR	MqnL
fig 556269.4.peg.713	IYPDESHESGYEHAMEGPFGDHTGYYNERDSFPVLTIDRITMRKNPIYLSTYTGKPPDEPAMLGVALNEVFV-PLLQKQFSEIIDFYLPPEAGCSYRFALVKIR	
fig 658664.3.peg.2251	IQPDPTHPSGYQHALEGPFGDHTGYYNEQDWFVPVMTVERITMRDPPIYHSTYTGKPPDEPAVLGVALNEVFV-PLLQKQFSEIADFYLPPEAGCSYRMALVSMK	
fig 99287.12.peg.4197	IEPGEMAP-----EGPYGDHTGYYNEVDSFPVFTVTHITQREDAIYHSTYTGRPPDEPAVLGVALNEVFV-PILQKQFPEIVDFYLPPEGCSYRLAVVTMK	
fig 411464.8.peg.1208	ILPH-LKP-----EGPFGDHVGYYSLKHDFPILQVEAVHHRTGAIWPYTAVGRPPQEDTVFGDFIHELTA-ALVPQVFQGVREVHAVDAAGVHPLLLALGS	
fig 457398.5.peg.2296	LVPG-LKP-----EGPFGDHVGYYSLRHDFPVLKVDVAVYHRRDAVWPFTAVGRPPQEDTVFGDFIHELTA-PLVPQVFQGVREVHAVDVAGVHPLLLALGS	
fig 500635.8.peg.1448	VRTDEMRR-----EGPFGDHTGYYSLADDYPVFHITAITHRKDAIYSATVVGKPPMEDCFLAKATERIFL-PLLQMQPEIIDINMPLEGVFDHCCIVSIK	
fig 537970.9.peg.988	VDTNELRD-----EGRFGDHTGFYTPIEPYPVLEVSATITMRKNPIYLA SVVGKPPLEDKYLGYPTERIFL-PLLQTTTTPSLIDYFMPENGVFHNLILAKIE	
fig 537971.5.peg.547	VDTTQMRD-----EGPFGDHTGFYTPIEPYPVLEVSATITMRKKPIF PATIVGKPPLEDKYMGYLTERVFL-PLLQTTA QGLIDYHMPENGIFHNLIFAKIK	
fig 537972.5.peg.1697	VDTEVLRD-----EGRFGDHTGFYTPIEPYPVLEVSATITMRKNPIYLA SVVGKPPLEDKYLGYPTERIFL-PLLQTTTTPSLVDYMPENGVFHNLILAKIK	
fig 556267.4.peg.1586	VEPT-MRD-----EGRFGDHTGFYTPIEPYPVLEVYAITSKKNPVYLA SVVGKPPLEDKYLGYPTERIFL-PLLQTTTTPDLMEYMPENGVFHNLILAKIK	
fig 613026.4.peg.1432	VDTSRFAP-----EGKFGDHTGFYTPIEPYPIMQVSAITMRKNPVYLA SVVGKPPLEDKYMGYMTERLFL-PLLQTSAGLIDYSMPENGVFHNLILAKIK	
fig 657316.3.peg.1681	VNIGETRR-----EGPFGDHTGYYSLADDYPVFHITCITHRKNPIYSATIVGKPPMEDCFLAKATERIFL-PLLQOTLPEIRDINFPLEGVFHDVCMVSIK	
fig 742725.3.peg.914	VDPSEKVK-----IEGPFGDHTGFYSLEDYYPFLHVTAITHRRGAVYPATIVGVPQEDAYIAKATEKIFLVPPIRAAMLPEVRDLWMPEAGVAHNIAVVDIR	
fig 864566.3.peg.1472	VDLEEFKI-----EGPFGDHTGFYTPAELFPVMKVEKIYAKKDAIYQATVVGKPPLEDKIMGLGTERIFL-PLLQTSVPDLIDYNMPENGVFHNLILAKID	
fig 888826.3.peg.55	VDLENFKI-----EGPFGDHTGFYTPPELFPVMKVDKIYAKKDAVYQATVVGKPPLEDKIMGLGTERIFL-PLLQTTTTPNLLDYKMPENGVFHNLILAKID	

(B) UbiD and MqnL, continuation

fig 364106.8.peg.4318	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	UbiD
fig 386585.9.peg.4980	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 409438.11.peg.4301	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 457400.3.peg.1907	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 457401.3.peg.4625	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 469595.3.peg.4668	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 469598.5.peg.4821	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 469608.3.peg.4956	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 469613.3.peg.4232	KQYPGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDVINAR--DWNDVIWAITTRMDPARDTVMIENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 471874.6.peg.3370	KQYAGH-----AKRVMMGVWSYLR--QFMYTKFVIVC--DDVINAR--DWKDIWAITTRMDPARDTVMMENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 471881.3.peg.2519	KQYAGH-----AKRVMMGVWSYLR--QFMYTKFVIVC--DDDVNAR--DWKDIWAITTRMDPARDTIMMENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 471881.3.peg.2520	-----	-----	
fig 500637.6.peg.2596	KQYAGH-----AKRVMMGVWSYLR--QFMYTKFVIVC--DDVINAR--DWKDIWAITTRMDPARDTIMMENTPIDYLD	FASPI SGLGSKMGLDATNKWPG--	
fig 500637.6.peg.6792	KQYAGH-----AKRVMMGVWSYLR--QFMYTKFVIVC--DDVINAR--DWKDIWAITTRMDPARDTIMMENTPIDYLD	FASPI SGLGSKMGLDATNKWPG--	
fig 500638.3.peg.2890	KQYPGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDVINAR--DWQDVIWALTTRMDPARDTLLVENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 500639.8.peg.4205	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 500640.5.peg.4567	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 511145.12.peg.3957	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 520999.6.peg.1266	KQYAGH-----AKRVMMGVWSYLR--QFMYTKFVIVC--DDVINAR--DWKDIWAITTRMDPARDTVMMENTPIDYLD	FASPI SGLGSKMGLDATNKWPG--	
fig 521000.6.peg.2694	KQYAGH-----AKRVMMGVWSYLR--QFMYTKFVIVC--DDVINAR--DWKDIWAITTRMDPARDTVMMENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 556268.6.peg.1962	KAYPGH-----ARRVMFGVWSYLR--QFLYTKFIIVV--DEDIDIR--NWEEVLWAISTRVDPVRDVLVNNTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 556269.4.peg.713	KAYPGH-----ARRVMFGVWSFLR--QFLYTKFIIVV--DEDIDIR--NWGEVFWAISTRVDPARDTILVENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 658664.3.peg.2251	KQYAGH-----AKRVMMFGVWSFLR--QFMYTKFIVVV--DDDVNLR--DWKEVIWAITTRVDPARDTVMVENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 99287.12.peg.4197	KQYAGH-----AKRVMMGVWSFLR--QFMYTKFVIVC--DDDVNAR--DWNDVIWAITTRMDPARDTVLENTPIDYLD	FASPVSGLGSKMGLDATNKWPG--	
fig 411464.8.peg.1208	ERYTPYEAQRRPRELLTAALHMLGTTQTALAKYVLVAAHEDAPGLRARDVVAFFRHLLERTDFERDLHFITRSTTDTLDYTGFALNEGSKLIWASAGEKRR--		MqnL
fig 457398.5.peg.2296	ERYTPYEAARRPRELLTAALHLLGATQTALAKYVLLAAHEDAPGLCARDVPAFLRHLLERTDFSRLHFLTRSTSDTLDYTGCGLHEGSKLIWASAGEKRR--		
fig 500635.8.peg.1448	KSYPMQ-----ARKVMHALWG-MG--QMMNVKMIIVV--DAHVDVQ--DLGEVAWRVFNNDIAKHDLIVE--GPLDVLDHSSPMKWKGLGIDATKTWPE--		
fig 537970.9.peg.988	ARFPSA-----AKQSMHSFWG-VG--QMSFVKHAIIV--GEDAPSL--ESKDIIPIYILNRFVSKN--CLFSEGVCDAHDHSSPNFAEGGKLGVDCTGEEIEN--		
fig 537971.5.peg.547	PEYPSH-----SKQIMHAFWG-VG--QMSFVKHAIIV--DENVGDLA--DYETFGTYILHRFSPQN--LLITEGICDLDHSSPDFAHGGKLGVEAITPVEK--		
fig 537972.5.peg.1697	ARFPSQ-----AKQSMHSFWG-VG--QMSFVKHAIIV--GEDSPSL--HTSEIIPYILNRFVSKN--CLFSEGVCDAHDHSSPNFAEGGKLGIDCTGNEVEN--		
fig 556267.4.peg.1586	ARFPNA-----AKQSMHAFWG-VG--QMSFVKHAIIV--DENAPKL--QDLEIIPYLLNRFSTQH--CLISDGVCDAHDHSSPEFAKGKLGVDCTQDYAKDL--		
fig 613026.4.peg.1432	TDYPAQ-----SLQMMHTFFG-IG--QMSFVKHALFV--SEEAPKLHKDYKILCDYILDRINTKK--LYSTTGNCDAHDHACERFAISGKLGIDASGEILN--		
fig 657316.3.peg.1681	KTYPQQ-----AKKVMHAIWG-MG--QMMFTKMIIVV--DEHVDVQ--KEKEVWVRVFNNDIAKHDIIVMVE--GPLDALDHSSPMKWKGTIGIDATKTWPE--		
fig 742725.3.peg.914	TDYAGQ-----ALKAASSLWG-AG--QMMFNKFMVVT--ASGRPVR--DVAALAD--LLRRIRIPDD--LMFSRGLDVLDAAPETGLGKLMFDTGVDPA--		
fig 864566.3.peg.1472	AKYPAH-----AQQIMHAFWG-VG--QMSFVKHAIIV--DKNAPSLK--DYDALIPYMLDRFNTKK--ILISEGICQLDHASPNSCFGGKAGLDACEEIQV--		
fig 888826.3.peg.55	THYPAH-----AQQIMHALWG-VG--QMSFVKHALFV--DKDAPNLE--DYKSLIPYILNRFNVEK--IYISQICQLDHASPNACFGGKAALDATCNFNA--		

(B) UbiD and MqnL, continuation

fig 364106.8.peg.4318	-----	
fig 386585.9.peg.4980	-----	
fig 409438.11.peg.4301	-----	
fig 457400.3.peg.1907	-----	
fig 457401.3.peg.4625	-----	
fig 469595.3.peg.4668	-----	
fig 469598.5.peg.4821	-----	
fig 469608.3.peg.4956	-----	
fig 469613.3.peg.4232	-----	
fig 471874.6.peg.3370	-----	
fig 471881.3.peg.2519	-----	
fig 471881.3.peg.2520	-----	
fig 500637.6.peg.2596	-----	
fig 500637.6.peg.6792	-----	
fig 500638.3.peg.2890	-----	
fig 500639.8.peg.4205	-----	
fig 500640.5.peg.4567	-----	
fig 511145.12.peg.3957	-----	
fig 520999.6.peg.1266	-----	
fig 521000.6.peg.2694	-----	
fig 556268.6.peg.1962	-----	
fig 556269.4.peg.713	-----	
fig 658664.3.peg.2251	-----	
fig 99287.12.peg.4197	-----	
fig 411464.8.peg.1208	-----ELALEVHDLPLPEGFGDARCAGPGILVLRGPRHELGRNET-DPRMEELA-----	ACLAHWQORDAFPLVVVADDAAFCAADFDFNFLWVAFSR
fig 457398.5.peg.2296	-----ELGLELRGAPDLPEGFSEPRVAGPGLLVVRGPAHSLERGE PDPRMEELA-----	RRLEAWPEREAFPLVAVVDDAAFCAGLDNFLWVVFTR
fig 500635.8.peg.1448	-----	-----
fig 537970.9.peg.988	PQLEILENEILLKQMKDIFPKA---EILRQYFKETKPNITLLGVKKDSNESLQKYL-----	KESLFQTLQKHILVLLDWEKNDLENLYMILWRVNN
fig 537971.5.peg.547	PDFCALSDEVLLKRITAFISQA---VGLKQYFIHTPNPICIISVDKKSNNLLNAVKE-----	KMQAFENLHNHLSIVIFVDSHKNKLDNPYMLTWIRVNN
fig 537972.5.peg.1697	PPLEILDNQDLLDNLSIIPLS---KTLRQYFLDTKNPITLLGVQKDSHSLQKFL-----	KKSAFANLQKHLRILILLDDSKNDLENLYMILWRVNN
fig 556267.4.peg.1586	KDCEVLSDNALQEILANVLKEGGEVKRVRQIYAETKNPIALVAINKKDSIGKAVLDLGHKKLESKNEQKLELLQKHTRIIVVVDNAKNDLENLYMILLWRVNN	
fig 613026.4.peg.1432	HNFCVSEISELLKAMKNIAN----EIESLHIYKHKNPLIICGINKKDTPILE-----	YATRFYETLRQYGAFFIFVDSNILTNYMLVWRVNS
fig 657316.3.peg.1681	-----	-----
fig 742725.3.peg.914	-----APLETVQLPFPFELSDGIVRVDYALSESWRVLLLSAPRGVRPD-----	VFAFLEKNRVEGIKYVILLDEEVDTSRPGDVLWIASD
fig 864566.3.peg.1472	EELEILEDEKLLELFKTKVEL---LNLKQFYKESKSPIVCILLDKK-EKIEQSFD-----	KLLEF---KKHFRILVFLDAE-NKLENSYMLVWRVNN
fig 888826.3.peg.55	KELEILSDEMLKSLFEKELEI---HALKQFYTECKSPIVCILYDKK-ESVKASFE-----	KLLKY---KKHFRILIFLDKE-NHLENPYMLVWRVNN

UbiD

MqnL

(B) UbiD and MqnL, ending

fig 364106.8.peg.4318	-----ETQREWG--RPIKKDPDVVAHI-----DAIWDELAIFNNGKSA-----
fig 386585.9.peg.4980	-----ETQREWG--RPIKKDPDVVAHI-----DAIWDELAIFNNGKSA-----
fig 409438.11.peg.4301	-----ETQREWG--RPIKKDPDVVAHI-----DAIWDELAIFNNGKSA-----
fig 457400.3.peg.1907	-----ETQREWG--RPIKKDPDVVAHI-----DAIWDELAIFNNGKSA-----
fig 457401.3.peg.4625	-----ETQREWG--RPIKKDPDVVAHI-----DAIWDELAIFNNGKSA-----
fig 469595.3.peg.4668	-----ETQREWG--RPIKKDPEVTARI-----DAIWDELAIFNDGKSA-----
fig 469598.5.peg.4821	-----ETQREWG--RPIKKDPDVVAHI-----DAIWDELAIFNNGKSA-----
fig 469608.3.peg.4956	-----ETQREWG--RPIKKDPQVTARI-----DAIWDELAIFK-----
fig 469613.3.peg.4232	-----ETQREWG--RPIVMDEKVRTRI-----DAIWDELAILEDNHTDAMKSRKPD-----
fig 471874.6.peg.3370	-----ETNREWG--RPIVMDEQVKSRI-----DDIWDQLNIFEK-----
fig 471881.3.peg.2519	-----ETDREWG--RPIVMSDEVKQRV-----DTIWEQLDILK-----
fig 471881.3.peg.2520	-----ETQREWG--RPIVMSDEVKQRV-----DTIWEQLDILK-----
fig 500637.6.peg.2596	-----ETSREWG--RPIVMTESVKSRI-----DDIWEQLNIFEK-----
fig 500637.6.peg.6792	-----ETSREWG--RPIVMTESVKSRI-----DDIWEQLNIFEK-----
fig 500638.3.peg.2890	-----ETQREWG--RPIVMDERVREVR-----DAIWDELAIFNNGKSA-----
fig 500639.8.peg.4205	-----ETDREWG--RPIEKDPAVTARI-----DAIWDELAIFNNGKSA-----
fig 500640.5.peg.4567	-----ETQREWG--RPIKKDPEVTARI-----DAIWDELAIFNNGKSA-----
fig 511145.12.peg.3957	-----ETQREWG--RPIKKDPDVVAHI-----DAIWDELAIFNNGKSA-----
fig 520999.6.peg.1266	-----ETNREWG--RPIVMTQSVKSRI-----DDIWEQLNIFEK-----
fig 521000.6.peg.2694	-----ETDREWG--RPIVMTQSVKSRI-----DDIWEQLNIFEK-----
fig 556268.6.peg.1962	-----ETDRTWG--KKISMSAEVKGKV-----DSIWKELDW-----
fig 556269.4.peg.713	-----ETSRKWG--TKINMKDEVQKV-----DSIWKDLGL-----
fig 658664.3.peg.2251	-----ETTREWG--QPIVMDTAVKAKV-----DAMWDTLFQ-----
fig 99287.12.peg.4197	-----ETQREWG--RPIVKDPEVTARI-----DAIWDELAIFK-----
fig 411464.8.peg.1208	SDPAADVYGTGAV-----VRARHWSCEGPLLLDARIKPFHAPALEEDPAVQRRVDALAAPGGPLHGLIE-----
fig 457398.5.peg.2296	SDPATDSYG-----AHAQTRAKHWSAAPLVLDARLKPFHAPLEEDPAVTRGVEALAAPGGPLHGYF-----
fig 500635.8.peg.1448	-----EGHSREWP--DEIAMSEDIKAKV-----DAKWKEGLLE-----
fig 537970.9.peg.988	IDSKRDIRIFGDIIDATDK--NIADGYKREWP--KETDCDVKILESQKGLLEDFFDEELKEFYRKHFHIDKSYATR-----
fig 537971.5.peg.547	IDAKRDILVTQNLVFDASDK--GKLEGHLEWP--LDTNCNAEVIESLRQKGLLQGIDEAFLERFGILY-----
fig 537972.5.peg.1697	IDSKRDIRILGEIVVIDATDK--NADDGYHREWP--KETDCDSTLESQKGLLSDFSQESLEEFYRKYHIDKSYSTLLDSNQSS-----
fig 556267.4.peg.1586	IDAKRDVVIDSIVFIDATDK--DARDGHLREWP--KETDCSIEVLRLNLEVKGLLDYGD--LEKFYRAFHIDKSYNC-----
fig 613026.4.peg.1432	IDVARDLKIIKECAFLDATAK--GKLEGYDREWP--KDTLCSKSIKLNLLKEQGLLDDIDESFYKQFGIL-----
fig 657316.3.peg.1681	-----EGHTREWP--DEINMSDDIKLV-----DAKWQEFGL-----
fig 742725.3.peg.914	CDPSRDVTIRDGVVLFDCRSKAGGVNGFSRRWP--NVVASSPETIARV-----DGRWNEYGLGKFMLSPSLHYSRLQYGEAAVPAGGPLPGKTTEDT-----
fig 864566.3.peg.1472	IDAKRDIFIKEERLGVDAK--GEAEGYLRAWP--KQTDCTKSVIEDLILRNILEN--NPDLFNKFEIF-----
fig 888826.3.peg.55	LDAQRDIFIKNDCIALNATAK--NEFEAYQREWP--KQTDCKSKVVENLILRNIIIE--DTKLFKQFEIFG-----

UbiD

MqnL

(C) UbiX and MqnM

fig 364106.8.peg.2621	-----MKRLIVGISGASGAIYGVRLQLVLRDVTD---I-ETHLVMSQAARQTLSLETD---FSLREV--QALADV--TH-DARDIAASISSGSF
fig 386585.9.peg.3335	-----MKRLIVGISGASGAIYGVRLQLVLRDVTD---I-ETHLVMSQAARQTLSLETD---FSLREV--QALADV--TH-DARDIAASISSGSF
fig 409438.11.peg.2782	-----MKRLIVGISGASGAIYGVRLQLVLRDVTD---I-ETHLVMSQAARQTLSLETD---FSLREV--QALADV--TH-DARDIAASISSGSF
fig 457401.3.peg.1564	-----MKRLIVGISGASGAIYGVRLQLVLRDVTD---I-ETHLVMSQAARQTLSLETD---FSLREV--QALADV--TH-DARDIAASISSGSF
fig 469595.3.peg.738	-----MKRLIIGISGASGAIYGVRLQLVLRDVTD---V-ETHLVMSAAARQTTLALET---LSVRDV--QALANV--NH-DTRDIAASISSGSF
fig 469598.5.peg.2906	-----MKRLIVGISGASGAIYGVRLQLVLRDVTD---I-ETHLVMSQAARQTLSLETD---FSLREV--QALADV--TH-DARDIAASISSGSF
fig 469608.3.peg.955	-----MKRLIIGISGASGAIYGVRLQLVLRDVTPE---I-ETHLILSQAARQTTLALET---FSVRDV--QALADV--VH-DARDIAASISSGSF
fig 469613.3.peg.1007	-----MKRLIIGISGASGVIYGVRLMLVLRGVPD---I-ETHLIMSNAARQTTLALET---LQLRDV--QSLADV--VH-DARDIAASISSGSF
fig 471874.6.peg.2272	-----MKKLIIGLTGASGAIYGVRLLEVLKPVKN---V-ETHLVMSAAARQTLSLETH---YSVKEV--QQLADH--HY-DSRDIAAAISSGSF
fig 471881.3.peg.360	-----MKKLIVGLTGASGAIYGIRLLEILKSVPS---V-ETHLVISQAARRTISLET---YSLKDI--HALADV--IY-DDRDIGASISSGSF
fig 500637.6.peg.1676	-----MKKLIIGLTGASGAIYGIRLLEVLKPVQD---V-ETHLVMSAAARQTTLALET---YSVKDV--QQFADH--VY-DSRDIAAAISSGSF
fig 500637.6.peg.5858	-----MREIGADMKKLIIGLTGASGAIYGIRLLEVLKPVQD---V-ETHLVMSAAARQTTLALET---YSVKDV--QQFADH--VY-DSRDIAAAISSGSF
fig 500638.3.peg.1553	-----MKRLIIGISGASGVIYGIRLLEVLRSHP---V-ETHLVMSQAARQTTLALET---RSLREV--LALADV--VH-DVRDIAAAISSGSF
fig 500639.8.peg.140	-----MKRLIIGLSGASGAIYGVRLQLVLRDVTPE---V-ETHLVMSQAARQTLSLETD---LSLRDV--QSLADV--VH-DTRDIAASISSGSF
fig 500640.5.peg.2455	-----MKRLIIGISGASGAIYGVRLQLVLRDVTD---V-ETHLVMSAAARQTTLALET---LSVRDV--QALANV--NH-DTRDIAASISSGSF
fig 511145.12.peg.2406	-----MKRLIVGISGASGAIYGVRLQLVLRDVTD---I-ETHLVMSQAARQTLSLETD---FSLREV--QALADV--TH-DARDIAASISSGSF
fig 520999.6.peg.3060	-----MKKLIIGLTGASGAIYGIRLLEVLKPVKD---V-ETHLVMSAAARQTTLALET---FSVKDV--QQLADH--VY-DSRDIAAAISSGSF
fig 521000.6.peg.2344	-----MKKLIIGLTGASGAIYGVRLLEVLKPLKG---V-ETHLVMSAAARQTTLALET---YTVKDV--QQLADH--NY-DSRDIAAAISSGSF
fig 556268.6.peg.2345	-----MVVGMTGASGAIYGVRLMQILHRMDH---V-ETHLVISDAARLTQLHEMG---LSVADV--QLLADK--IY-DVNEMTGRIASGSF
fig 556269.4.peg.1022	-----MIAQPKRLIVGITGASGAIYGVRLRLLLKNIDS---V-ETHLIISGAGELTLEHEQG---MKAREL--SLLADH--CY-DVNEVGAAVASGSF
fig 658664.3.peg.4432	MTQTANSTAQTPAVRRIIVAITGASGAIYGVRLQLQLRESAGV-ESHLMSPAGLMNVQHELH---MAREEV--EALAHV--VH-NVRDIGATIASGSF
fig 99287.12.peg.2494	-----MKRLIVGISGASGAIYGVRLQLILRDVDS---V-ETHLVMSQAARQTTLALET---FSLREV--QALADV--TH-DARDIAASISSGSY
fig 411464.8.peg.118	-----MKRIIVGVSGASGMPLALCLLRHLAALPA---V-ESHLILSPGAHAVLEAECG---LAPSAL--HALADV--SH-DAACLGAAPASGSW
fig 457398.5.peg.457	-----MNGKENKSMRDILVGVSGASGMPLALCVLRALAAMPG---V-RTHCVVSEGAHAVLRAECG---AGPELL--TACADY--VY-EPDNLAAGPASGSW
fig 537970.9.peg.1226	-----MKRIIIGISGASGAGLGLRFLKALP--KE---L-EKYCVISNGAKQVLFSEEGQNEYLEFEAI--QAKDNKIFML-EDSDMGACIASGSF
fig 537971.5.peg.1124	-----MSIKKLVAIGGASGVHLGVKFIECIP--KD---I-ELFVVVSEGAKAVALSEMGQEIESALDRA--RQSRDFR--IY-DEDELDSGISSGSF
fig 537972.5.peg.1595	-----MKRVIVGISGASGAGLGLKFLESPL--KE---I-EKYCVISEGAKRVLSSSEENIQETQKFEQI--KSRVSKVFLF-GDELGACIASGSF
fig 613026.4.peg.1401	-----MSYTPIVLGISGGSCIELALHFIFKRFKDRDRT---L---YVVPQTQNAAMLCQAEEK---QNLRLNLAIRTDNLVIH--DS--MTSPLASGSF
fig 657316.3.peg.1506	-----MKTKGFKRKRIIVGVSGASGAIYAYRLIQVLAD--SG---I-EVHFVASKAGLEVLEYECG---LTMVQL--TQIVHK--VY-DVNQIDSAIASGSF
fig 742725.3.peg.829	-----MEKKRNIIIVAVTGASGSLYARLLCRRLAEANG---VGRIALIVTRNGLAVSAYEDD---PAWMDD--PRFTR---Y-DNDDLFGAPASGSS
fig 864566.3.peg.584	-----MKILLGISGSSSTHLGLKLLKNLE--NK---C-ELYCIITEGAKISFEAENK---KNLEKICQEQQNI--CFLNDNNLSASVASGSF
fig 888826.3.peg.857	-----MKVLLGITGSSSVHLGLKILEILE--QK---V-ELFCIITKGAKKSFEAENK---QNLSQLC-KKFNOQ--VFLNDEDLASGVSSGSF

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UbiX

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fig 364106.8.peg.2621	----QTLGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFAV
fig 386585.9.peg.3335	----QTLGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFAI
fig 409438.11.peg.2782	----QTLGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFAI
fig 457401.3.peg.1564	----QTLGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFAI
fig 469595.3.peg.738	----QTAGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFDI
fig 469598.5.peg.2906	----QTLGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFAV
fig 469608.3.peg.955	----KTAGMVILPCSMKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFDI
fig 469613.3.peg.1007	----KTAGMVILPCSMKTLSGIVHSYTDNLLTRAADVVLKERRPLVLCVRETPLHLGHLRMMTTAAELGAVIMPPVPAFYHRPQTLQDIVDQTVNRVIDQFDI
fig 471874.6.peg.2272	----RTTGMVIMPCTMKTLSGIVHSYTDTLVTRAADVVLKEGKKLVLGRETPLHLGHLKLLVQAAEMGAVIMPPMPAFYHQPKSIQDIVDQTVNRILDQFDI
fig 471881.3.peg.360	----RVNGMVILPCSIKSLSGIVHSYTDTLVTRAADVVLKEGRKLVLCVRETPLHLGHLRLMTQASELGAVIMPPVPAFYFQPKTIDDIVNQTVNRVLDQFEI
fig 500637.6.peg.1676	----RTVGMVIMPCTMKTLSGIVHSYTDTLVTRAADVVLKEGKKLVLGRETPLHLGHLRLLVQAAEMGAVIMPPMPAFYHRPQAIQDIVDQTVNRVLDQFDI
fig 500637.6.peg.5858	----RTVGMVIMPCTMKTLSGIVHSYTDTLVTRAADVVLKEGKKLVLGRETPLHLGHLRLLVQAAEMGAVIMPPMPAFYHRPQAIQDIVDQTVNRVLDQFDI
fig 500638.3.peg.1553	----KTAGMVILPCSIKTLSGIVHGYSDTLIRAADVVLKERRPLVLCVRETPLHLGHLRMMTSAELGAVIMPPVPAFYHRPQRIEIIIDQTVNRVLDQLDI
fig 500639.8.peg.140	----KTAGMVILPCSIKTLSGIVNSYTDTLVTRAADVVLKERRPLVLCVRETPLHLGHLRLMTAAELGAVIMPPVPAFYHRPKNLDDVINQTVNRVLDQFDI
fig 500640.5.peg.2455	----QTAGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQTLDDVINQTVNRVLDQFDI
fig 511145.12.peg.2406	----QTLGMVILPCSIKTLSGIVHSYTDGLLTRAADVVLKERRPLVLCVRETPLHLGHLRLMTQAAEIGAVIMPPVPAFYHRPQSLDDVINQTVNRVLDQFAI
fig 520999.6.peg.3060	----RTAGMVIMPCTMKTLSGIVHSYTDTLVTRAADVVLKEGKKLVLGRETPLHLGHLKLLVQAAEIGAVIMPPMPAFYHQPKSIQDIVDQTVNRVLDQFDI
fig 521000.6.peg.2344	----QTAGMVIMPCTMKTLSGIVHSYTDTLVTRAADVVLKEGKKLVLGRETPLHLGHLRLMVQAAEMGAVIMPPMPAFYHQPKTIQDIIDQTVNRILDQFDI
fig 556268.6.peg.2345	----QCAGMVVAPCSMKTLASAVSGFCDNLLTRAADVILKERRRLVLMVRETPLNLAHLRNMQSVTEMGGIIYPVPVAFYCRPLTIEEMVDQTVRRVLELFD-
fig 556269.4.peg.1022	----KNAGMIVAPCSMKTLASIAHGYCDNLITRAADVVLKERRRLVLMVRETPLNLAHIRNMEAVTEMGGIIYPPLPAFYCHPLSIDEMVDQTLRRVLDLFD-
fig 658664.3.peg.4432	----AAEAMVVAPCSMKTLAAVAHGLSDNLIARAADVTLKERRRLIILMVRETPLNLAHLRNMATAVTEMGGIVFPVPVPGFYQRPKTIDDLVDHTVGRVLDLLG-
fig 99287.12.peg.2494	----PTAGMVILPCSIKTLSGIVHSYTDGLLTRAADVILKERRPLVLCVRETPLHIGHLRLMTQAAEIGAVIMPPVPAFYHLPQTLDDVINQTVNRVLDQFDI
fig 411464.8.peg.118	----QHDGMVVCPSMSSLASIATGAGTNLLHRAADVTLKERRPLILVPRESPLSRIHLRNMIIWASEAGAVIMPFMPAFYSGEDTLEGLMGQFCGRIFDQLG-
fig 457398.5.peg.457	WHGAEPAAMLVVPCSMGTLGALASGATRNLQAGDVALKEGLRLVLTRESPLSAVHLRNMILTREAGAVIMPFSPGFYLRPQSLDLLLLQTSGRIFDQLG-
fig 537970.9.peg.1226	----VCEAMAVIPCSQNTLAKIACGISDTLITRAASVMIKEQRKLLSPREMPSPIVLENMLKLSRLGVIIAPPIMGYAG-DNLKSIEMLIQKWCDSLGI
fig 537971.5.peg.1124	----GIDAMAIIPTSMNLLAKVAHGLCDDLISRCAAVMLKERRTLLLAPREMPFSPIALEQMSRLSNLGVIIISPPNVGGYAKIRNLESMEYFFIGKWLDLKG-
fig 537972.5.peg.1595	----VCEAMVVIPCSQNTLAKIACGISDTLITRCASVMIKEQRKLLAPREIPFSQIALENMLKLSQIGVTIAPPVFGYAG-KNLDEIENMLIGKWCDNLG-
fig 613026.4.peg.1401	----YFETCIILPTSSNTLSSIANGLQSNLLTRVGAVCLKEKRKLILGVREMPLSAILLENMAKLANLGVIAPPVFGYAG-KNLDEIENMLIGKWCDNLG-
fig 657316.3.peg.1506	----PCESMVIVPCSMKTLGSLANGIAGNLLTRAADVTLKEGRKLVLTRETPTVHAHLENMLKLSHAGARIVPACPGFYHRPQTIEELVDMLVGKICDTLN-
fig 742725.3.peg.829	----SFDAMVVIPCSMGAGRIAGVSNLDASRAADVMLKERRRLILVPREAPLGTIHLRNLTTLSECGAVICPAAPSFYPHPRNIEDLCGTIVERVLTLLDV
fig 864566.3.peg.584	----SIEKTIIPCSISLAKIHAGLADTLIMRAAAVALKERKSLILGVREMPFSTLILEHMHKLSQLGVIIAPPVFIASYSHASNLEQMFNFIIGKWLDLLG-
fig 888826.3.peg.857	----GIDKTIIPCSISLAKIHAGFCDTLTRACAVALKERKKLILAVRELFPSTLNLEHMAKLSLMGVIIAPPVFIASYSKIKNLGDLENFIIGKWLDLLE-

UbiX

MqnM

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(C) UbiX and MqnM, ending

fig 364106.8.peg.2621	TLPEDLFARWQGA-----
fig 386585.9.peg.3335	TLPEDLFARWQGA-----
fig 409438.11.peg.2782	TLPEDLFARWQGA-----
fig 457401.3.peg.1564	TLPEDLFARWQGA-----
fig 469595.3.peg.738	TLPQDLFTRWQGA-----
fig 469598.5.peg.2906	TLPEDLFARWQGA-----
fig 469608.3.peg.955	SLSQDLFTRWQGAQDCTK-----
fig 469613.3.peg.1007	EISQDLFTRWDGGHKSQ-----
fig 471874.6.peg.2272	ELDQDLFTRWQGGK-----
fig 471881.3.peg.360	DLPDDLQFQWEGDKPAR-----
fig 500637.6.peg.1676	QLEQDLFTRWQGAK-----
fig 500637.6.peg.5858	QLEQDLFTRWQGAK-----
fig 500638.3.peg.1553	TLPHLFFPRWQGGHRTPD SAT-----
fig 500639.8.peg.140	DLPEDLFTRWQGA-----
fig 500640.5.peg.2455	SLPQDLFTRWQGA-----
fig 511145.12.peg.2406	TLPEDLFARWQGA-----
fig 520999.6.peg.3060	QLDHDLFTRWQGAK-----
fig 521000.6.peg.2344	ELEQDLFHRWQGAK-----
fig 556268.6.peg.2345	-IVDDRIVRWEGTT-----
fig 556269.4.peg.1022	-MADDQTSRWSGMV-----
fig 658664.3.peg.4432	-LPQTLAPGWPGLRSTD-----
fig 99287.12.peg.2494	PLPHDLFVRWQGA-----
fig 411464.8.peg.118	-LSHQLCRRWQGPPDGTI-----
fig 457398.5.peg.457	-LAHSL-GRWADA-----
fig 537970.9.peg.1226	FYK---YNRWGEKMIVLENMLKLSRLGVIIAPPIMGYAGDNLK
fig 537971.5.peg.1124	-IQNSLYKRWKIDTD-----
fig 537972.5.peg.1595	-IPFE-YGRWQGCN-----
fig 613026.4.peg.1401	-IPHDLFVRWDGNVRNQLIIP-----
fig 657316.3.peg.1506	-VDNDLFERWTGPSEV-----
fig 742725.3.peg.829	EVPHYEWGAFHPEPDHQ-----
fig 864566.3.peg.584	-ISHNLYERWQNF-----
fig 888826.3.peg.857	-IDHNLYERWG-----

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