

1UN1

1UN1  
HvXTH21  
HvXTH6  
HvXTH7  
HvXTH1 MKAPSGGLGAYKKA VSCALCFAPDQSI STLHSPPLCLPLCGFAVSRPTFVVGTVFVSS  
HvXTH12  
HvXTH16  
HvXTH5  
HvXTH8  
HvXTH11  
HvXTH3  
HvXTH10  
HvXTH9  
HvXTH15  
HvXTH20  
HvXTH19  
HvXTH18  
HvXTH4  
HvXTH2  
HvXTH14  
HvXTH13  
HvXTH17  
HvXTH29

1UN1  
1 10 20 30 40 η1  
α1 β1  
0000 000  
1UN1 ..MAAAYPWTIFLGMLVMVSG....TMGAA...LRKPVDFVAFGRNYVPTWA....FDH  
HvXTH21 .MLRGSRLRWLVLAVVVAASA...GKAGR.....GLHRDFDAVWG....KRN  
HvXTH6 .....MARMASVLAILLA...WCALA.....AASFDFKEFDITWG....DGR  
HvXTH7 .....MARMASVLSILLA...TCALA.....AASFDFKEFDITWG....DGR  
HvXTH1 WGWGAMGPWRRPCVGGALLACAIAAASCCCFQLQGADAAAASPSFGDNFEITGA....KDH  
HvXTH12 ..MGKPGALVPPVVALAFALV...LGLEL...VSGGNFYEECDATGE....PQN  
HvXTH16 ...MAPRSDLALALALLAA...SVLST...GAKADFDDQFEVIGD....RDH  
HvXTH5 SLPSSSSSCWHSALLVAVMLVLV...VVM DQ...VAMAYLDDDI E V V W G...DDH  
HvXTH8 .....MARMASVLAILLA...SCALA.....AASFDFKEFDITWG....DGR  
HvXTH11 ..MASGPSRTVPCSVLPLLLL...LAGVA...RAAGNFYQDVDITWG....DGR  
HvXTH3 ..MGQARAYLLASLAAFYLV...ALAI P...QVTADMTDEVNLLWG....NCK  
HvXTH10 ...MRTVE LGIVAMA CL...VAVAR...AGNFFQDSEMSWG....DGR  
HvXTH9 .....MARMASVLSILLA...SCALA.....AASFDFKEFDITWG....DGR  
HvXTH15 ...MARPSFSLHCLAVLALA...AAASE...AGFYDQDFVVG...GNN  
HvXTH20 ...MAQRF LAVLAVLALS...QVASA...KSWLDKRFNTDGT...VRT  
HvXTH19 ...MARRLLAVLAVLALL...QAASA...KSWLDKRFNTDGT...VRT  
HvXTH18 .....MSN  
HvXTH4 ALPCSRPKLLLCVVALAFLLA...VDVGR...ADIYKDIQI IWS...ADH  
HvXTH2 ...MKATAGALLAVVATVLLRG...IAAAP...PRKPVDFPEKNYVPTWA...EDH  
HvXTH14 VENMSRPLLVVMAAAIVVVA...CCFAACPVGAGASAGGFYENFEVKWGTDPDPDRR  
HvXTH13 ..MGMSMRALVAVVAFVAVLK...LGLVG...ANFADLCDITWE....PQN  
HvXTH17 QGVMMAPRAVLSVAVVVAL...LATAD...SWLYEEFTDGN...VRA  
HvXTH29 MASSVRQPWLLLVLLVLLPVMA.....TAAVFDNDNYAPTWG....ADG

1UN1 β2 η2 β3 β4  
50 60 70  
1UN1 IKYF...NGG...NETQHLDK.Y...TGTGFQSKGSY  
HvXTH21 ARFF...DEG...RVVELALDR.E...TGSRLQSKDRY  
HvXTH6 GKIL...NNG...QLTLALDK.V...SGSGFQSKHEY  
HvXTH7 GKIL...NNG...QLTLGLDK.V...SGSGFQSKHEY  
HvXTH1 VKTS...PDG...QTWYLSLDN.K...TGVGFQTKQY  
HvXTH12 CWTY...DGG...NSLSLALVSNSSGLSSTSQLLYFSWSSPLNESMCGCSGSMIRSKRF  
HvXTH16 IGYRDDGNDKG...QEFSELDDQ.E...SGSGFKSKAKY  
HvXTH5 SFFYMD...DAGDDEILALCLDE.T...HSGGFHTKEAY  
HvXTH8 GKIL...NNG...QLLMLGLDK.V...SGSGFQSKREY  
HvXTH11 GKIL...GGG...DLLTLSLDR.A...SGSGFQSKNQY  
HvXTH3 VQRDG...TGR...QTVAMSLDR.W...TTSGFQSKIKY  
HvXTH10 GKVV...DGG...RGLDLTLDK.T...SGSGFQSKSEY  
HvXTH9 GKIL...NNG...QLTLGLDK.V...SGSGFQSKHEY  
HvXTH15 VRVN...DDGIAQQVALTLDDQGN...GSGSFQSKDKY  
HvXTH20 GYDA...SGQ...QVVMLNLNQQS...GAAGFNQSKQY  
HvXTH19 GYDA...SGQ...QVVMLNLNQQS...GAAGFNQSKQY  
HvXTH18 TSTL...SSG...DGD...RGSAGKSNNDY  
HvXTH4 TYFMD...GDS...EALALS LDF.N...RGSAGKSNNDY  
HvXTH2 IHYV...NGG...REVQLSLDK.T...TGTGFQTRGSY  
HvXTH14 VEIV...DGG...RLVTLTLNN.V...SGSGFQSRDAF  
HvXTH13 AAMT...DGG...EHLTLSLVSN.I...SGSMLRTRKTF  
HvXTH17 DYNA...QQG...QVASLILTQQS...GGGAFGSRKRY  
HvXTH29 YHLV...DQG...TEHRLTMDR.N...SGAGFHSTY

$\beta 5$   $\beta 6$   $\beta 7$   
 T T T T T  
 80 90 100 110 120  
 1UN1 LFGHFSMQMKLVPGD SAGTVTAFYLS SQ.....N...SE... HDEIDFEFLGNRT...GOPY  
 HvXTH21 LFGRFDLDIRLVAGE SAGTITSFYICTG.....G...AR... HDEVDFEFLGNV...GOPY  
 HvXTH6 LFGKIDMQLKLVPNG SAGTVTAYYLS SQ.....G...PT... HDEIDFEFLGNVT...GOPY  
 HvXTH7 LFGKIDMQLKLVPNG SAGTVTAYYLS SQ.....G...PT... HDEIDFEFLGNVT...GOPY  
 HvXTH1 LFGWFSMKLKLVGND SAGVVTAYYCS D.....LDAAPE... RDELDFEFLGNRT...GOPY  
 HvXTH12 LYGTVSTMILQLVKG D SAGTVT TYYTSSV.....G...DD... HDEIDFEFLGNET...GOPY  
 HvXTH16 LFGEFQVRMKLVLDGN SAGTVT SFYLLTSG.....G...ESAT... HDEIDFEFLGNSS...GOPY  
 HvXTH5 LYARFVDLMLVPPDN SAGTVT TLYLMPEDV.....PWDY... HDEVDLEFLGNVT...GOPY  
 HvXTH8 LFGKIDMQLKLVPNG SAGTVTAYYLS SQ.....G...PT... HDEIDFEFLGNVT...GOPY  
 HvXTH11 LYGRFDMQIKLVPGD SAGTVATFYLS SQ.....G...SA... HDEIDFEFLGNST...GOPY  
 HvXTH3 LFGRIDMEIKLVPGN SAGTVTTFYMS E.....G...PWQF... HDEIDLEFLGNST...GOPY  
 HvXTH10 LFGKIDMQIKLVPGN SAGTVTTFYLS SQ.....G...TA... HDEIDFEFLGNVT...GOPY  
 HvXTH9 LFGKIDMQLKLVPNG SAGTVTAYYLS SQ.....G...PT... HDEIDFEFLGNVT...GOPY  
 HvXTH15 LYGFEFSVMKLVGGN SAGTVT SFYLLTSGE.....G...DG... HDEIDLEFLGNLS...GOPY  
 HvXTH20 LYGFEFSIQMKLVPGN SAGTVS CFYLS SQ.....G...D...EW... RDEIDMEFLGNSS...GOPY  
 HvXTH19 LYGFEFSIQMKLVPGN SAGTVS CFYLS SQ.....G...D...EW... RDEIDMEFLGNSS...GOPY  
 HvXTH18 .....  
 HvXTH4 LYARIDIDIKLVVGN SAGTVCTVYTI SE.....G...PWDI... HDEIDLEFLGNST...GOPY  
 HvXTH2 LFGHFSMHIKLVGGD SAGTVTAFYVPS Q.....N...SE... HDEIDFEFLGNRT...GOPY  
 HvXTH14 LFGFEFTMEKLVPGD SAGTVTTFYLS SKDPTAVG...DG... HDEIDFEFLGNVT...GOPY  
 HvXTH13 LYGSIITLIKLVKGN SAGTVT TYYTSSV.....G...DD... HDEIDFEFLGNST...GOPY  
 HvXTH17 LYGFEFSIQMKLVPGN SAGTVT SFYLS SQ.....G...PG... HDEIDMEFLGNVT...GOPY  
 HvXTH29 GSGFFHMRKLVPGGY TAGVVTAFYLSA ETPYD.G...SD... RDEVDFEFLGNVD...GENVI

$\beta 8$   $\beta 9$   $\beta 10$   $\beta 11$   $\beta 12$   $\eta 3$   
 T T T T T T T  
 130 140 150 160 170 180  
 1UN1 ILQTNVFTGCKGDRERQRTYLWFDPTKFEFHYYSVLWNMYMIVFLVDDVPIRVFKNCK.DLIG  
 HvXTH21 ILHTNIFSDGKGEREQRFVWFDPTADFHTYSILWNP LN ILYIDGTPIRVFKNNE.ANG  
 HvXTH6 TLHTNVTGQGGREQQRLWFDPTNDFHTYSILWNP KH IIFMVDMPIRD FKNLE.GKG  
 HvXTH7 TLHTNVTGQGGREQQRLWFDPTNDFHTYSILWNP KH IIFMVDMPIRD FKNLE.GKG  
 HvXTH1 ILQTNVYRSGVGGREMRHS LWFDPADFHSYSILWNP KQIVFVVDKVAIREYRNSA.KPN  
 HvXTH12 TLHTNVAAGVGGKEMQFRPWFDPDGYHNYTIAWTPCAVVVYVVDGAPIRAFRNYERTHG  
 HvXTH16 VMNTNVAAGDCKKEHOFYLVWFDPSADFHTYKIVWNPKN IIFVVDGVPVIRFKKYD...G  
 HvXTH5 TLHTNIFANGVGNREEQRLWFDPTADFHTYSIDWNP KRITILVDDGVPVIRFRNNE.EHG  
 HvXTH8 TLHTNVTGQGGREQQRLWFDPTNDFHTYSILWNP KH IIFMVDMPIRD FRNME.GKG  
 HvXTH11 TVHTNVSQGGKGEREQRFWFDPTADFHTYSILWNP THILFYVDGTPVIREHRNREAAAG  
 HvXTH3 TLHTNVAAGVGGREKQYRLWFDPSQDFHTYSILWNP QYIRFVLDNKLIRQIKNKM.MNG  
 HvXTH10 TLHTNVAAGVGGREQQRLWFDPTKAFHTYSILWNP QHVI FAVDGTAIRDFKNE.ARG  
 HvXTH9 TLHTNVTGQGGREQQRLWFDPTNDFHTYSILWNP KH IIFMVDMPIRD FKNLE.GKG  
 HvXTH15 VMNTNVAAGDCKKEHOFYLVWFDPSADFHTYKIVWNPKN IIFVVDGVPVIRFKKYD...D  
 HvXTH20 VLNTNVAAGDCKKEHOFD LWFDPADYHTYTIWNPENILFKVDNLFIRSFKRFA...G  
 HvXTH18 VLNTNVAAGDCKKEHOFD LWFDPADYHTYTIWNPENILFKVDNLFIRSFKRFA...G  
 HvXTH19 VLNTNVAAGDCKKEHOFD LWFDPADYHTYTIWNPENILFKVDNLFIRSFKRFA...G  
 HvXTH4 TLHTNIFAYGVGGREQQKLVWFDPSAEYHTYSILWNP RRITIEVDDGVTIRVSDNNE.EHG  
 HvXTH2 ILQTNVFSGCKGDRERQRIYLWFDPTKDYHSYSVLWNLMI AFVDDTPIRVFKNSK.DIG  
 HvXTH14 LMQTNVFAQGVGGRQRSYLWFDPTEDFHNYTILWNP LN IIFVVDGVPVIRFRNQE.ANG  
 HvXTH13 TLHTNVTADGVGAKEMQFYPWFDPADFHNYSILWNP SMIVVWVDSIPVIRFRNYA.SKG  
 HvXTH17 VLNTNVAAGDCKKEHOFD LWFDPADYHTYTIWNPENILFKVDNLFIRSFTRYA...D  
 HvXTH29 TLQTNVFNVDGDRERQRLS LWFDPADDFHEYSILWNP YHLLVILVDDVPIRVLRNLT.GQV

$\beta 13$   $\eta 4$   $\eta 5$   $\beta 14$   
 T T T T T T T  
 190 200 210 220 230  
 1UN1 VKFPF.NQPMKIYSILWNADDWATRGGLEKT DWSKAPFIA SYRSFHT.DGC EAS.V...  
 HvXTH21 VFPPT.RQPVHVFASILWNAE EWATOGGRVKT DWS EAPFVAAYRFDASSACVWH.G...  
 HvXTH6 IAFPK.NQPMRLYSSILWNADDWATOGGRVKT DWSHAPFSASYR GFKA.DA CVVTAG...  
 HvXTH7 IAFPK.NQPMRLYSSILWNADDWATOGGRVKT DWSHAPFSASYR GFKA.DA CVVTAG...  
 HvXTH1 KFPPI.MKPMYVSSILWNADDWATRGGLEKT DWTKGPFVSSYSDFTA.DA CAWP.S...  
 HvXTH12 VAFP.TRPMHAYSSILWAAEDWATOGGRVRA DWT RAFPVASYR GIDL.DA CECY.G...  
 HvXTH16 LPFPS.ARPMTHATLWDGSYWATRHGTVKIHWRHDPFVVPYQGYHANGCVHD.K...  
 HvXTH5 VAFP.TWQKMLHGSILWNADDWATOGGRVKT DWSGAPFFARYRNLRASWCRPS.P...  
 HvXTH8 IAFPK.NQPMRLYSSILWNADDWATOGGRVKT DWSHAPFSASYR GFKA.DA CVVTAG...  
 HvXTH11 VPYLR.SQAMRVYASVWDAEEWATOGGRVKT DWSRAPFVASYRGLAASG CASQ...  
 HvXTH3 SPYPN.YQPMRVFSTILWNADDWATOGGRVKT DWTQAPFTAYFRNYKAT.S CSQG.Q...  
 HvXTH10 VSFPK.SQPMRLYSSILWNADDWATOGGRVKT DWSKAPFVASYR FNADACVMS.G...  
 HvXTH9 IAFPK.NQPMRLYSSILWNADDWATOGGRVKT DWSHAPFSASYR GFKA.DA CVVTAG...  
 HvXTH15 LPYPS.SQPMTHATLWDGSYWATRHGTVKIDWTQAPFVNYRGTYS.NGCVSN.G...  
 HvXTH20 LPYPT.SKPMRLHATLWDGSYWATEK GKIPINWSNAPFVSYRNYA.NA CVSG.G...  
 HvXTH19 LPYPT.SKPMRLHATLWDGSYWATEK GKIPINWSNAPFVSYRNYA.NA CVSG.G...  
 HvXTH18 TPYAG.SKPMRLHATLWDGSYWATEK GKVPIDWSNAPFNVLKNNYA.NA CASG.G...  
 HvXTH4 VFPFA.WQQRVYGSILWNADDWATOGGRVKT DWSKAPFVASYR NYNI.TY CRPS.P...  
 HvXTH2 VRYPT.DQPMKLYSSILWNADDWATRGREKT DWSKAPFVASYR GFHV.DGCEAS.A...  
 HvXTH14 VPYLT.RRAMKVHATILWDGDTWATRGRVKTIDWAHAPFVASYGTYAS.SACVSAAGDGDG  
 HvXTH13 VFPPT.KRPMYGFSSISWADDWATOGGRVKT DWTKAPFVAEYSNMGL.NVCECS.G...  
 HvXTH17 LPYPG.AKPMVHATLWDGSYWATOKGKVPV DWSGAPFVASYR GYSA.DA CVPN.G...  
 HvXTH29 AVEYFPAKRMAVRA S LWDGSDWATDGGRTKIDWGRAPFTAGFRGFVDV.DA CDNA...

$\eta 6$      $\eta 7$                      $\alpha 2$                      $\beta 15$   
 222 222                    260                    270  
 1UN1    .. TT                    240                    250                    260                    270

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1UN1      ..EAK..FCATQG.....ARWWDQKEFQDLD AFQYRRLSWVVRQK..YTIYNY
HvXTH21  ..GASPTRCGGDHLPSSA.....SSWVG...QRLDWWSWMTLNWVRMN..YMTYDY
HvXTH6   ..GRP..HCGASVGTDVAPGTGAA...GEWYN...QELDLTRQQRMRWVQSN..YMIYNY
HvXTH7   ..GRP..RCGASVGTDVAPGTGAA...GEWYN...QELDLTRQQRMRWVQSN..YMIYNY
HvXTH1   ..GPAPPA CAATG.....DSWWDQPPAWALD DGORRDSGWVARN..LVIYDY
HvXTH12  ..GDCVYTCA.....GAFRG...CGGLTGDRGKMQWVQDN..YRIYDY
HvXTH16  ..ATNKTS CPAGS.....DAMMH...RELD DGELSTVAWAERN..CLSYNY
HvXTH5   ..GVA..WCGDEPPG.....STWFE...RGLDAAALRRARDA...HMTYDY
HvXTH8   ..GRP..RCGASIGTDAAPGTGGAAAVGDWYN...QELDLTRQQRMRWVQSN..YMIYNY
HvXTH11  ..DAA..ACANSN.....GAWMY...QELDATALDRLQWVQKN..YMIYNY
HvXTH3   ..NSN..VCGOSSP.....NGLFN...QQQDQMQQQVKVDAK..YKVIYDF
HvXTH10  ..GAQ..RCFAGTMEASAAGG...GSWVN...QELSGMGYRRMRWVQRK..FMIYNY
HvXTH9   ..GRP..RCGASMGTEAAPGTGASGAAGEWYN...QELDLTLQQRMRWVQSN..YMIYNY
HvXTH15  ..GSS..ACFPAGS.....DAMMS...TELDAAKALGTVAWAESK..YMSYDY
HvXTH20  .....ACHAGS.....DRWMR...KQLD GDEWGTVKWAERS..YMRIYNY
HvXTH19  .....ACHAGS.....DRWMK...KQLD GAEWGTVKWAERS..YMRIYNY
HvXTH18  .....ACHAGS.....DGWMN...RQLD GSEWGTVKWAERN..YMRIYNY
HvXTH4   ..GVS..WCGAEPAG.....SPVFN...LAPKARADMQWVRDMG..YVIYDY
HvXTH2   ..EAK..LCATQG.....ARWWDQPEFQDLDAAQYRRLANWVRKE..HTIYNY
HvXTH14  DEDVPSAF CPGDA.....ASWMA...RRLGPDGERAVAWARDK..YVMYDY
HvXTH13  ..ADA..ECAAGCNA.....STAPE...PSQLTKEQMRQLRAVQLG..YTIYDY
HvXTH17  ..DGRPLS CPAGT.....GRWMD...RQLDDAERGTVAWAARRD..YMRIYNY
HvXTH29  ..SST..PCDST.....DLWVNARRHRRLSVREQAAYENVRRD..YMIYDY
  
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$\eta 8$                      $\alpha 3$   
 22                    290  
 280                    290

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1UN1      CTDRSRYP..SMFP..CKRDRDI...
HvXTH21  CAD.RKRYPH..GFPA..CTIPIGRI...
HvXTH6   CTD.PKRFAQ..GVPA..EC SM...
HvXTH7   CTD.PKRFAQ..GVPA..EC SM...
HvXTH1   CGD.RKRFP..TVPE..ECALRTTTS...
HvXTH12  CAD...HEAGKVPGV..CSLPQY...
HvXTH16  CAD.GWRFPK..GFPG..ECGRK...
HvXTH5   CKD.LQRYKGSGLPK..ECVVD...
HvXTH8   CTD.PKRVAK..GVPA..EC SM...
HvXTH11  CTD.TWRFKD..GAPP..ECASK...
HvXTH3   CDDSKRRI...GSSE..DQSQ...
HvXTH10  CTD.PKRVAQ..GVPA..ECKLR...
HvXTH9   CTD.PKRVAK..GVPA..EC SM...
HvXTH15  CTD.GWRFPN..GFPA..EC SRRN...
HvXTH20  CED.GYRFPQ..GLPA..ECNRY...
HvXTH19  CED.GYRFPQ..GLPA..ECNRY...
HvXTH18  CAD.GYRFPQ..GFPA..EC SRY...
HvXTH4   CTDRSNRYNDTTRPK..EC SLPPRP...
HvXTH2   CTD.RERYA..AMSP..ECKRDRDV...
HvXTH14  CDD.PWNL...GRPA..ECMDRLASAV
HvXTH13  CAS.ARE DGKGPVPP..EC DMEQY...
HvXTH17  CDD.GWRFPQ..GFPA..EC SRG...
HvXTH29  CAD.KDRFQNGKLPV..EC SYTT...
  
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