

Additional file 6

Figure S4: Splice site comparison of functional units. Amino acid sequences of functional units included in this multiple sequence alignment come from hemocyanins of Tectipleura (including hemocyanin-like proteins), Lepetellida and Cephalopoda (abbreviations see below). Colors indicate conservation scores: Red/blue: conservation of at least 95%/80% over all FUs; grey: FU-specific conservation of 95% (e.g. within FU-a, FU-b, ...); yellow: splice site positions of internal introns (amino acids which are coded by the first nucleotides at the beginning of new exons are highlighted). “X” symbolizes not known amino acids. Signal peptides as well as tail extensions of FU-h are not included. Included hemocyanins: AcH1+2 (*Aplysia californica*), LsH1+2 (*Lymnaea stagnalis*), BgH1+2 (*Biomphalaria glabrata* hemocyanin like proteins), HpHaD + HpHaN + HpHb (*Helix pomatia* alphaD, alphaN, beta), CaHaD CaHaN CaHb (*Cornu aspersum* alphaD, alphaN, beta); HtH1+2 (*Haliotis tuberculata*), KLH1+2 (*Megathura crenulata*), OdHG + OdHA (*Octopus vulgaris*), NpH (*Nautilus pompilius*).

20 40 60 80 100 120 140

Ach1_FUa : -----ALV-KS-EH-DQ-ETSEEILN-QKSLRVDVNDTS-NLGYAATAA-YHGYPTGCK--DGDR--DVA-CLH-CSPVETFPQWHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-NHLEL-FELVSQQ-FIDSEGG-ARGNVVMQGDINI : 129

Ach2_FUa : -----ALV-KS-EH-DQ-ETSEEILN-QKSLRVDVNDTS-QYGYAATAA-YHGYPTGCK--DGDR--DVA-CLH-CSPVETFPQWHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-NHLEL-FELVSQQ-FIDSDGG-ARGNVVMQGDINI : 129

LsH1_FUa : -----ALV-KNVDN-SEEDIIN-QKTLRVDVADTKS-AKGYAATAA-YHGYPTGCK--DANNR-FVA-CVHGMPVETFPQWHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-PTKLH-FELVSQQ-FIDSDGG-AKKNVVMQGDIEV : 130

LsH2_FUa : -----VH-KNVELNPEEVLN-QKALRVDVADTKS-NKSNALAA-YHGYPTGCK--HQGK--FVA-CVHGMPVETFPQWHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-KPADL-FELVSQQ-FIDSDGG-AKKNVVMQGDIEV : 129

BgH11_FUa : -----LIL-KD-DS-TSEDTIN-RLSLQGVKYEYQLKKS-SYIAS-YGYPTGCK--VGNV--AYS-CSVHGMPTFPQWHRLLYLAHLEQALTEKGGTVGTPYVDWSKPLQKMAF-LDDEKY--NLEGEILDNPWHHTNISL : 128

BgH12_FUa : -----FLV-KS-ES-SEEELDLH-LALQNAVDTS-SKGYASTAA-YHGYPTGCK--AWGL--KGG-CSVHGMPTFPQWHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-IVRL-FELVSQQ-FETARGG-AKKNVVMQGDIEV : 129

HpHaD_FUa : -----LIL-KD-DH-TPEEVLN-QKALRVDVADTKS-SKGYAATAA-YHGYPTGCK--HGSK--DVA-CVHGEMPTFPQWHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-DHLE-FELVSQQ-FIETDGG-ARSNVVMQGEIPT : 129

CaHaD_FUa : -----LIL-KD-DH-TPEEVLN-QKALRVDVADTKS-SKGYAATAA-YHGYPTGCK--HGSK--DVA-CVHGEMPTFPQWHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-DHLE-FELVSQQ-FIETDGG-ARSNVVMQGEIPT : 129

HpHaN_FUa : -----TLI-KNVDH-SQDDVLN-QKALRVDVADTS-SKGYDALAA-YHGYPTGCK--DGDR--DVA-CLH-GDLNFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QYKLP-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 129

CaHaN_FUa : -----TLI-KNVDH-SQDDVLN-QKALRVDVADTS-SKGYDALAA-YHGYPTGCK--DGDR--DVA-CLH-GDLNFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QYKLP-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 129

HpHb_FUa : -----ELV-KN-DK-TKDELYD-QQALRVDVADTS-EKGYDEIAS-YHGYPTGCK--HGGH--DVA-CVHGDPNFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 129

CaHb_FUa : -----DLV-KNVDK-TKDELYD-QQALRVDVADTS-EKGYDEIAS-YHGYPTGCK--HGDK--DVA-CVHGDPNFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 129

HtH1_FUa : -----NVV-KD-SH-LTVDEVQALHGALHVTASTG-PLSHEDITSYHAAPASD--YKGR--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 129

KLH1_FUa : -----NLV-KS-EH-TQEEITD-QAALRELQMDSS-SIGYQKIAAA-YHGYPTGCK--HKDT--SLA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 129

HtH2_FUa : -----TVI-KNVDN-TDDELQALAEAMHDIQOES-DMGYQALAA-YHGYPTGCK--DGHR--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 130

KLH2_FUa : -----VDTMV-KNDS-SSDEVLALEKADLDIQQDS-NQGYQALAA-YHGYPTGCK--DKHEK-NVA-CLHGMPTFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 132

OdHG_FUa : -----NLV-KD-DAL-SEDEVLN-QVALRAMQDET-PTGYQALAA-YHGYPTGCK--APDGS-TVV-CLHGMPTFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 130

OdHA_FUa : -----NLV-KNVDL-SEDEVLN-QVALRAMQDET-PTGYQALAA-YHGYPTGCK--APDGS-TVV-CLHGMPTFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 130

NpH_FUa : -----TNL-KNADH-LHDVALN-QVALRAMQDET-PTGYQALAA-YHGYPTGCK--DSHEN-NVA-CLHGMPTFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 130

Ach1_FUb : --PPMAHGESEHGHEVHDG-SIK-KD-DT-TRE-VNDL-QALTKFQNLAS-VDGYQALAA-YHGYPTGCK--YPNAKN-LA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 148

Ach2_FUb : --PPISHHDDAHEHEFQEG-AV-KD-SR-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--YPSAKN-LA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 148

LsH1_FUb : --TPIAHNEVNEHEHFEG-SV-KD-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--NPNKSN-KA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 148

LsH2_FUb : --PVIEISGPDHDHEK-AV-KN-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--NPTAKD-MA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 145

BgH11_FUb : -----APLSEKKD-IIT-QD-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--NPTAKD-MA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 139

BgH12_FUb : -----PPIQSDVTKD-TV-KD-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--NPTAKD-MA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 142

HpHaD_FUb : -----PVIVQKLEHKEE-SIK-KD-DH-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--FPTAKD-FA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 143

CaHaD_FUb : -----PEIVYLEHKEE-SIK-KD-DH-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--FPTAKD-FA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 143

HpHaN_FUb : --KPIEHNEPEHEHFEG-SV-KN-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--DPTAKD-MA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 148

CaHaN_FUb : --EPIDHNLPGHEHEFHEN-VV-KN-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--NPTAKD-MA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 148

HpHb_FUb : --PPIGHNEEGHEHFEG-SV-KN-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--SPTARD-MA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 148

CaHb_FUb : --PPIGHNEEGHEHFEG-SV-KN-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--SPTARD-MA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 148

HtH1_FUb : -----PPVHHRHDD-IV-KN-DH-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--RPDAKV-FA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

KLH1_FUb : -----PPVKHHQSAN-LV-KN-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--RPDAKV-FA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

HtH2_FUb : -----EAPAFSSDAH-AV-KD-NH-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--FPEATN-FA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

KLH2_FUb : -----KPPVPVAQAN-AV-KN-DL-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--RPDAKV-FA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

OdHG_FUb : -----ADMVVDKGT-NV-KD-QS-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--EPDAIN-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

OdHA_FUb : -----ADMVVDKGT-NV-KD-QS-TRE-VYER-QOAMKQFQNLAS-VDGYQALAA-YHGYPTGCK--EPDAIN-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

NpH_FUb : -----PPMRQIDREK-VV-KD-LR-HDT-EFGYQAMARFMKES-IDGYQALAA-YHGYPTGCK--TPEGN-SIA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

Ach1_FUc : -----ILPEAQIDEVTV-KN-DS-NAEEVLAERALANLKEBS-IGGYQALAA-YHGYPTGCK--DNEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

Ach2_FUc : -----DDAASSTDDIIV-KN-ND-NAEEVLAERALANLKEBS-IGGYQALAA-YHGYPTGCK--DNEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

LsH1_FUc : -----EPKDVSADTIKI-KN-AT-TEAEVVDLQALANLQNDQS-AGGYQALAA-YHGYPTGCK--TDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

LsH2_FUc : -----HPKAAAEHDVHV-KN-VQ-TEEEVVDLQALANLQNDQS-AGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

BgH12_FUc : -----DPVTTNSRSDSIK-VN-ET-TSQQYVDLQAMATLQAKSY-DINQYQALAA-YHGYPTGCK--FDEK-VK-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

HpHaD_FUc : -----QAHDISHITKIT-KN-NH-TKEEVLN-QOALTLLEBRS-VGGYQALAA-YHGYPTGCK--YES-NAEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

CaHaD_FUc : -----QLDETQSVTKIT-KN-NH-TKEEVLN-QOALTLLEBRS-VGGYQALAA-YHGYPTGCK--YES-NAEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

HpHaN_FUc : -----QTKKPADVEVHV-KEN-SQ-TKEEILDLHRLALNLEBRS-IGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

CaHaN_FUc : -----QTKKSADEVHV-KEN-SQ-TKEEILDLHRLALNLEBRS-IGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

HpHb_FUc : -----AGHAVKTESRL-KEN-DH-TAEETLEHRLALNLEBRS-LGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

CaHb_FUc : -----AAHAARKSRL-KEN-DH-TAEETLEHRLALNLEBRS-LGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

HtH1_FUc : -----PTFEDEKHSRL-KN-DS-TPEETNEHRLKALELLENHT-AGGYQALAA-YHGYPTGCK--NDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

KLH1_FUc : -----VKFDKVPKSRIL-KN-DL-SPEEMNEHRLKALELLENHT-AGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

HtH2_FUc : -----IDHQDPHQDTIL-KN-DL-TPEEINSERRAMADLQDKT-SGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

KLH2_FUc : -----ADAKDFGHGRKI-KN-DS-TVEEQTSERRAMADLQDKT-SGGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

OdHG_FUc : -----KESGVVDFELYSR-DS-SS-TDADMNALRKALQAYEDKD-ASGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

OdHA_FUc : -----KESGVVDFELYSR-DS-SS-TDADMNALRKALQAYEDKD-ASGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

NpH_FUc : -----VKSMNISHKGT-RN-NS-TQESLYERQALTSFMADE-NTGYQALAA-YHGYPTGCK--SDEK-VA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 140

Ach1_FUd : -----SOLYGQYREAVTAASYV-RD-ET-SKGEIESRAAFLSIKEDGT-----YANLAA-YHGYPTGCK--LNGR--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

Ach2_FUd : -----SOLYGQYREAVTAASYV-RD-ET-SKGEIESRAAFLSIKEDGT-----YANLAA-YHGYPTGCK--LNGR--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

LsH1_FUd : -----SNLYGKEFRVASTAASQI-RN-DS-SQGEIESRAAFLSIKEDGT-----YKIAS-YHGYPTGCK--DSAGR-TVV-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 142

LsH2_FUd : -----SHLYGKEYRKPVTAASQI-RD-ET-SKGEIESRAAFLSIKEDGT-----YKIAS-YHGYPTGCK--HNGH--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

BgH12_FUd : -----DHWFGKREYQNTALRE-RN-KD-SSDIESRAAFLSIKEDGT-----YKIAS-YHGYPTGCK--HNGH--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

HpHaD_FUd : -----SHLYGREYRDVAIVASHV-KD-DT-TAEEMESRAAFLSIKEDGT-----YKIAS-YHGYPTGCK--HEGR--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

CaHaD_FUd : -----SHLYGREYRDVAIVASHV-KD-DT-TAEEMESRAAFLSIKEDGT-----YKIAS-YHGYPTGCK--HEGR--KVA-CVHGMPSPFPANHRLLYVVOLEQALKEKGLSLICGVYVDWTRP-QHLE-FELVSQQ-FIDSDGG-ARSNVVMQGEIHTV : 141

HpHaN_ _Fud : ----SHIYGQEYRPVVAASQVRNSESSEGESERSAFLAIONHS----EATASFHGKPGLOE--HEGR--KVAACVHGCDPTFSPWHRLYVLEVEHALLSHGSSAVPYMDWISPIKKLKLSKSTYYNSRQQRFDNPFPSRIAG : 141
CaHaN_ _Fud : ----SHIYGQEYRPVVAASQVRNSESSEGESERSAFLAIONHS----YEGIASFHGKPGLOE--HQGR--KVAACVHGCDPTFSPWHRLYVLEVEHALLSHGSSAVPYMDWISPIKKLKLSKSTYYNSRQQRFDNPFPSRIAG : 141
HpHb_ _Fud : ----SHIYGQEYRPLVTAGSHVHNLEHISAGEVESERSAFLAIOEHS----YEDIAAHFHGKPGLOE--FEGR--KAAACVHGSAAPSPWHRLYVLEVEHALLAOGSSAVPYMDWAVPIRSLEKLSSEATYFNSRQQRFDNPFPSRIAG : 141
CaHb_ _Fud : ----SHIYGQEYRPQVTGSHVHNLEHISAGEVESERSAFLAIOEHT----KENIAAYHGKPGLOE--YEGH--KAAACVHGSAAPSPWHRLYVLEVEHALLARGSSAVPYMDWAVPIRSLEKLSSEATYFNSRQQRFDNPFPSRIAG : 141
HtH1_ _Fud : ----GTRDRDNYVEEVGTGASHIKNNDINTGEMESERSAFLAIOEQDGT----YESIAAHFHGKPGKQQ--LNDH--NIAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTAPIDHLEHFDATYFNSRQQRFDNPFPSRIAG : 141
KLH1_ _Fud : ----GHHEGEVYQAEVTSANRIKNENISLGEVESERSAFLAIOEHTGT----YESIAKHGKPGKQQ--LNGN--PISACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTAKRIEHLPHLISDATYFNSRQHHTYFNSRQQRFDNPFPSRIAG : 141
HtH2_ _Fud : ----QADEYDEVVTAASHIKNNDISKEGESERSAFLAIONGV----KENIAKHGKPGLOE--DNGR--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTETTFELSLAEATYFNSRQQRFDNPFPSRIAG : 138
KLH2_ _Fud : ----GSHQADEYREAVTSASHIKNNDISKEGESERSAFLAIOEQEIGT----YENIAKHGKPGKQQ--HDGH--PVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTEKADSLSLINDATYFNSRQQRFDNPFPSRIAG : 141
OdHG_ _Fud : ----GNFGEAGIWEVPTSANRIKNNAITGDMESERSNAFKDMTTGR----YEBIASFHGKPGKQQ--NKDGSKVYT--CIRHGCDPTFSPWHRLYVLEVEHALLARGSSAVPYMDWQVQPFDFHLEALNKRATYYNSRQQRFDNPFPSRIAG : 144
OdHa_ _Fud : ----GNFGEAGIWEVPTSANRIKNNAITGDMESERSNAFKDMTTGR----YEBIASFHGKPGKQQ--NKDGSKVYT--CIRHGCDPTFSPWHRLYVLEVEHALLARGSSAVPYMDWQVQPFDFHLEALNKRATYYNSRQQRFDNPFPSRIAG : 144
NpH_ _Fud : ----GTGTGTQKWREPVTSASRIKNNDINTGDMESERSNAFLAIOEEGA----YEBIAAFHGVPAKOR--GEDGN--IYTCVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTKRNFHLEALNKRATYYNSRQQRFDNPFPSRIAG : 143
Ach1_ _Fue : ----NERQEADGQVGNYLKKNASISPOEELSILKAMAALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWSRQTDHLEALNKRATYYNSRQQRFDNPFPSRIAG : 143
Ach2_ _Fue : ----NERQESDGQLSSYQVKSIDASISPOEELSILKAMAALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWSRQTDHLEALNKRATYYNSRQQRFDNPFPSRIAG : 143
Lsh1_ _Fue : ----GERQKSSGVEVTNYLVKNENISPRVQSISYAMEALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWSRQTDHLEALNKRATYYNSRQQRFDNPFPSRIAG : 143
Lsh2_ _Fue : ----SERQEAGHGVSSFVVKNDASISPOEELSILKAMAALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWSRQTDHLEALNKRATYYNSRQQRFDNPFPSRIAG : 143
BgH12_ _Fue : ----EKSYTSESHVINVRANKERSNPRILSYHAMASLOQNS--PDGQALAAAFHAPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTREGSELFEFLEDDNYHDPLTGKTLPAFVHSHKIGS : 143
HpHaD_ _Fue : ----KERQADGQVQDIDIVKNDASISPRVQSISYAMEALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRASQSLPHFLSDNNYTDPTYTEKHVNPHWASID : 143
CaHaD_ _Fue : ----REARTEDDGVKVHVVKNDASISPRVQSISYAMEALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRASQSLPHFLSDNNYTDPTYTEKHVNPHWASID : 143
HpHaN_ _Fue : ----DEVEDQHGSTSTYLKKNESISPLGYIAEALIALKKITS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
CaHaN_ _Fue : ----DEEQDQLGATTTYLKKNESISPLGYIAEALIALKKITS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
HpHb_ _Fue : ----DEAEHHPGDRAPLLVKNESISPLGYIAEALIALKKITS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
CaHb_ _Fue : ----DDVELPHGGRAPSLVKNESISPLGYIAEALIALKKITS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
HtH1_ _Fue : ----DTHILHDHEEEILVKNIDISPRVQSISYAMEALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
KLH1_ _Fue : ----DSAHTDDGHTPEVMIKDTQDKRKSLVKALESMAKITS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
HtH2_ _Fue : ----SSFLRPDGHSDDILVKNENISPRVQSISYAMEALQAASS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
KLH2_ _Fue : ----RKNIIYDGLSQHNLVKNESISPLGYIAEALIALKKITS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 143
OdHG_ _Fue : ----DHSADIKSEEGNEYLKKNERISLSMNSIHAFFRRMQKKS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 144
OdHa_ _Fue : ----DHSADIKSEEGNEYLKKNERISLSMNSIHAFFRRMQKKS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 144
NpH_ _Fue : ----GSKNATHYQEEHHFVKNERSIYIHEVYVFRMRQKKS--ADGYSIASFTHAIPPCF--SASAKYACCLHGMAATFPOWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 145
Ach1_ _Fuf : ----HDFKREHVPVHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
Ach2_ _Fuf : ----DDYNLEKVTPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
Lsh1_ _Fuf : ----RDYDLEKVTPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
Lsh2_ _Fuf : ----SDHLDLNTVPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
BgH12_ _Fuf : ----EDPHLTLTVPPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
HpHaD_ _Fuf : ----EDVHVVEATPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
CaHaD_ _Fuf : ----EDVHVVEATPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
HpHaN_ _Fuf : ----HDVTLKKVTPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
CaHaN_ _Fuf : ----HDVTLKKVTPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
HpHb_ _Fuf : ----HDVTLKKVTPIHVRNLDTEERLQSKAALRDLOQLTS--NDGQANLASFHGAPARCP--DPKNP--TVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
CaHb_ _Fuf : ----RDIHLRKVPLKIRNLDSEEREIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
HtH1_ _Fuf : ----HKLNSRKHTPIHVRNLDSEEREIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
KLH1_ _Fuf : ----HDISSHLSLKVHLDSTSERDIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
HtH2_ _Fuf : ----RDINTRSMSPPIHVRNLDSEEREIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
KLH2_ _Fuf : ----HGINVRHVGRPIHVRNLDSEEREIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 140
OdHG_ _Fuf : ----NEDADIDTPIHVRNLDSEEREIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 139
OdHa_ _Fuf : ----KQGADIDIPIHVRNLDSEEREIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 139
NpH_ _Fuf : ----EHHEVHPLPIHVRNLDSEEREIQSQAALRDLOQLTS--NDGQANLASFHGAPARCP--DPEHP--KVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 139
Ach1_ _Fuf : ----GASEVSSSSLAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--LNGR--RIAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 132
Ach2_ _Fuf : ----GAEDVSSSTSLAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--LNGH--PIAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 131
Lsh1_ _Fuf : ----GVANVDITSAVAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--YQGH--PIAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 131
Lsh2_ _Fuf : ----GSTQDAVSTSAVAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--YQGH--PIAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 131
HpHaD_ _Fuf : ----GVKKDIHTTAVAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--HENH--SVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 131
CaHaD_ _Fuf : ----GVDKNIHTTAVAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--HDHH--YVACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 131
HpHaN_ _Fuf : ----EGADVSSSTSAVAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--HDHH--YVACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 131
CaHaN_ _Fuf : ----EGADVSSSTSAVAGVGVKDYSTSTSEIDNREALRQVQADG--PNCQALAAAFHGPAGGE--HDHH--YVACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 131
HpHb_ _Fuf : ----EAAKTKAVPVGDSVKNNDTNSDVANREALRQVQADG--PNCQALAAAFHGPAGGE--HDHH--YVACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 132
CaHb_ _Fuf : ----DEEKAARVPVPGDSVKNNDTNSDVANREALRQVQADG--PNCQALAAAFHGPAGGE--HDHH--YVACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 132
HtH1_ _Fuf : ----DHHDDHSGSAGSGVKNNTKAETDNRREALRQVQADG--PNCQALAAAFHGPAGGE--MDPGH--NYSACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 133
KLH1_ _Fuf : ----DHHDDHSGSAGSGVKNNTKAETDNRREALRQVQADG--PNCQALAAAFHGPAGGE--MDPGH--NYSACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 133
HtH2_ _Fuf : ----GRAADSAHSANSAGSGVKNNTKAETDNRREALRQVQADG--PNCQALAAAFHGPAGGE--MDGR--DVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 133
KLH2_ _Fuf : ----GHTDDHSGSAGSGVKNNTKAETDNRREALRQVQADG--PNCQALAAAFHGPAGGE--MDGR--DVAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 132
OdHG_ _Fuf : ----DFKREVKHTVGDIAITNNNSIPSDIKEDDAMARKVQADTS--DNGYQKIASYHGFLPQCH--YENG--AYAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 133
OdHa_ _Fuf : ----EFTKEIKEKREVTIILKNNSIPSDIKEDDAMARKVQADTS--DNGYQKIASYHGFLPQCH--YENG--AYAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 133
NpH_ _Fuf : ----NTKQAEERISGGPIILKNNTSSEIHEBEMAAVQAQHS--SNGYQKIASYHGFLPQCH--PYAACVHGCDPTFSPWHRLYVLEVEHALLNRGSSAVPYMDWTRFSEKELPRTFTYANYSDPFTNLWTLPAFVHSHKIGS : 129

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AcH1_-_FUh : ---GYERVAAKTAKSSASLLKDNDTLAASNRDRLALYKLOQDQG-PNGFEAIAGYHGAPFKP--ANED-KYACCVHGMPVFPWHRLHTVQFEQALKKEHGVFYDWTAPINALSLIGSS-----NHNPFYKHISF : 136
LsH1_-_FUh : ---RFYEKVAEKTIVRDDKLVKNINQDITLDAANRNALNQLONLQDQG-PNGFEAIAGYHGAPFKP--ATGDD-KYACCVHGMPVFPWHRLHTVQFEQALKSNKALIGVFYDWTTPVKSLFSFFGDA-----DHNPFASRIJAA : 136
LsH2_-_FUh : ---RYYEKLAERTVHREDKLTKDNTTLAATNRNALNQLONLQDQG-PNGFEAIAGYHGAPFKP--ATGTD-KYACCVHGMPVFPWHRLHTVQFEQALKAHGASVGVFYDWTAPVRSLSLFGSA-----DFNPFYSITISF : 136
BgH11_-_FUh : -----DSEIETQPALLKNIQEITDGSNNNRDALKKLOSETS-ADNRNIAAGYHGAPNRGP--PHGSD-RFACSEHGLPITFPWHRLHTVQFEQALSRIGASWGVFYDWTDESTALFKLFSF-----EDNPFYRYIQA : 128
HpHaD_-_FUh : ---DYYEKIAQKTEAQEDVLLKNINELSLERSANRNSALNKLONLQDQG-PNGFEAIAGYHGAPFKP--QDQTD-KYACCVHGMPVFPWHRLHTVQFEQALKAHGAKGEGVFYDWTAPIGKIFSLFGSA-----DYNPFYSITISF : 136
CaHaD_-_FUh : ---DYYEKIAQQIEVHDDVLLKNINELSLERSANRNSALNKLONLQDQG-PNGFEAIAGYHGAPFKP--ETQAD-KYACCVHGMPVFPWHRLHTVQFEQALKYHGAKGEGVFYDWTAPIGKIFSLFGSA-----DYNPFYSITISF : 136
HpHaN_-_FUh : ---KPLGVAAASGPGSGVLLKNINQDSQDQAVSRDRLALYKLOQDQG-LGGFEAIAGYHGAPFLGP--ENGDK-KYACCVHGMPVFPWHRLHTVQFEQALKHGSTTGTFYDWTSPGNELPLFLATD-----NDNPFSSITISF : 135
CaHaN_-_FUh : ---KPHGVAAASGPASGVLVKNINQDSQDQAVSRDRLALYKLOQDQG-LGGFEAIAGYHGAPFLGP--EHGAE-KYACCVHGMPVFPWHRLHTVQFEQSLKQHGSTTGTFYDWTSPGNELPLFLATD-----SDNPFSGITISF : 135
HpHb_-_FUh : ---VPQAEQTATTYQSSNLVKSUNSLTLGASNRKQALRELCATHG-PGGFEAIAGYHGYPFLGP--EKGDT-KYACCVHGMPVFPWHRLHTVQFEQALKQHGSIIVGVFYDWTAPGRALPPFLTVS-----HDNPFSSITITS : 135
CaHb_-_FUh : ---VIQPEQEEATSQSANLTKSUNSLTLGASNRKQALRKLOALQDQG-PGGFEAIAGYHGAPFLGP--EKQDI-KYACCVHGMPVFPWHRLHTVQFEQALKQHGSIIVGVFYDWTAPGRALPPFLTAS-----HDNPFSSITIRS : 135
HtH1_-_FUh : --HRGKGHEDEHDDRDLADVLTKKVDFTSLQANAKDRLALYKLOLDS-KGGFEAIAGYHGYPNMGP--ERQTD-KYPCCVHGMPVFPWHRLHTIQFERALKNHGSPMGTFYDWTKKMSSLSFFGSS-----NNNPFYKYYIRG : 138
KLH1_-_FUh : -----KHHEKHHEDHHEDILVKNINHSLSHHAAEERDRLALYKLOLDES-HGGFEAIAGYHGYPNLGP--EKGDE-KYPCCVHGMPVFPWHRLHTIQFERALKKHGSHLGVFYDWTQTISSLPTFFASG-----NNNPFYKHIRS : 134
HtH2_-_FUh : HRGPVEETEVTROHTDGNAHFHKVDLSLSDANNRNALYKLOLHLS-LTGFEALSCHGYPNLGP--EEQDD-KIPCCVHGMPVFPWHRLHTIQFERALEHNGALLGVFYDWNKDLSSLPAFFSSS-----NNNPFYKHLAG : 140
KLH2_-_FUh : ---HHGGDTSGHDHSEHHDGFFTKENGSLSDANDKRNALYKLOLQDQG-PNGFEAIAGYHGYPFLGP--EHGED-KYACCVHGMPVFPWHRLHTIQFERALKEHGSHLGVFYDWTKSMIALPAFFASG-----NSNPFYKHIMK : 137

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160 * 180 * 200 * 220 * 240 * 260 * 280 * 300
 AcH1 _ Fua : DGQ----VVHTAAAV--LDRLFQKVA--PGENTD--FEQ--LNALEYENYVQC--EVOQEVAHNTTHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 270
 AcH2 _ Fua : DGH-----VVHTAAAV--LDRLFQKQVE--AGERTD--FEQ--LNALEYENYVQC--EVOQEVAHNTTHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 275
 LsH1 _ Fua : VENSKTIVRHAAAL--LDRLFQKVEPG--QNTD--FEQ--LNALMYPNYVQC--EVOQEVAHNTTHY--VGGGRNKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 280
 LsH2 _ Fua : KTG-----PRHTAAAV--LDRLFQKVE--AGEHTD--FEQ--LNALEYENYVQC--EVOQEVAHNTTHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 285
 BgH11 _ Fua : SGV-----IHAHTNTV--SRLLWS-----LD--MEH--IHAALEYENYVQC--VQVLELHSAHF--VGGASKYSMSNIDFAAD--DL--LKLAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 290
 BgH12 _ Fua : GDQ----MIRTAASV--KRLFQKYG--PGEHTN--FEQ--LNALEYKDY--NQ--EVOQEVAHNTTHY--VGGGRNKYSMSNIDFAAD--DL--LKLAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 295
 HpHaD _ Fua : PEG-----VKNTAAAV--LDRLFQKVE--TGQYTD--FEH--LNALEYENYVQC--EVOQEVAHNTTHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 300
 CaHaD _ Fua : PEG-----VKKTAASV--LDRLFQKQV--PGQYTD--FEH--LNALEYENYVQC--EVOQEVAHNTTHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 305
 HpHaN _ Fua : GKK----TYKTAASV--KRLYQNVV--GEEHTD--FEQ--LHAFYGY--Q--EVOQEVAHNTTHY--VGGGRYPYSVSSLDYTG--DL--LKLAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 310
 CaHaN _ Fua : GAK----TYKTAASV--KRLYQNVV--GDEHTD--FEH--LHAFYSSY--Q--EVOQEVAHNTTHY--VGGGRYPYSVSSLDYTG--DL--LKLAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 315
 HpHb _ Fua : GDK-----TYHSSAAV--LDRLFQKVA--PGQHTD--FEH--LDAFEYTFDQ--EVOQEVAHNTTHY--VGGGRYSYVSSLDYTG--DL--LKLAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 320
 CaHb _ Fua : GDQ----TYHTTAAL--LDRLYQVVA--PGQHTD--FEQ--LDAFEYTSFQ--EVOQEVAHNTTHY--VGGGRYSYVSSLDYTG--DL--LKLAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 325
 HtH1 _ Fua : I-----NKKTAASV--LDRLFEKVE--PGHYTH--MEG--LDLALEDQDFCK--EIOQELAHNAHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 330
 KLH1 _ Fua : L-----DKKTAASV--LDRLFEKVK--PGQHTH--MES--LDLALEDQDFCK--EIOQELAHNAHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 335
 HtH2 _ Fua : E-----NKKTAASV--LDRLFEKVG--PGENTR--FEG--LDLALEDQDFCN--EIOQELAHNAHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 340
 KLH2 _ Fua : L-----NKKTAASV--LDRLFEKVP--PGHHTH--MEG--LDLALEDQDFCK--EIOQELAHNAHY--VGGGRHKYSMSHEXTSYD--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 345
 OdHG _ Fua : E-----KKTAAASV--LDRLFQ--AS--KGGKNF--LEG--LSALEODDYCH--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 350
 OdHA _ Fua : E-----KKTAAASV--LDRLFQ--AS--KGGKNF--LEG--LSALEODDYCH--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 355
 NpH _ Fua : K-----KMOTAAAV--LDRLFSQVE--PGHHTH--FEG--LDLALEDQDYVQ--EVOQEVAHNTTHY--VGGGFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 360
 AcH1 _ Fub : LNS-----GAKTSADV--SDS--LDNVEP--WGDHTNLF--QYLYLALEDQDFCN--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 268
 AcH2 _ Fub : LGN-----GVVTSADV--LEG--LQTP--FGDHTDLF--PALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 269
 LsH1 _ Fub : LGD-----STKTRDV--SSS--LSDSPK--WGDHTLFL--DALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 270
 LsH2 _ Fub : LDN-----NVHSSADV--QKLSQTP--WGDHTLFL--DALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 271
 BgH11 _ Fub : LRT-----GSRHSDV--SWPEQGVN-----LDDLK--AVLLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 272
 BgH12 _ Fub : L-----NVTHGRDA--SLDO--RIS--SYNGTFLFEARLLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 273
 HpHaD _ Fub : LGG-----DAKTSADV--LPEL--LQTPK--WGDHTLFL--VALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 274
 CaHaD _ Fub : LGG-----DAKTSADV--LPEL--LQTPK--WGDHTLFL--VALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 275
 HpHaN _ Fub : LGN-----DVHTRDI--SPSA--AQTPA--WGEHTLFL--NALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 276
 CaHaN _ Fub : LGN-----DVHTRDI--SPSA--AQTPA--WGEHTLFL--NALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 277
 HpHb _ Fub : LGH-----DVHSSADV--LPL--SQTPD--WGDHTLFL--DALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 278
 CaHb _ Fub : LGH-----DVHSSADV--LPL--SQTPD--WGDHTLFL--DALLALEODNFC--EVOQEVAHNTTHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 279
 HtH1 _ Fub : EEG-----HHHSSMI--DSK--LAPVA--FGEHSLFL--GILYLALEDQDFCK--EIOQELAHNAHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 280
 KLH1 _ Fub : EEN-----APHAKQI--DQRLKPKAT--FGHHTDLFL--QYLYLALEDQDFCK--EIOQELAHNAHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 281
 HtH2 _ Fub : E-----NGRUEHP--DSRLFEQPL--FGKHTRFLF--SIVYLALEDQDFCK--EIOQELAHNAHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 282
 KLH2 _ Fub : E-----NNVHTRD--DNRLFEKPS--FGHHTDLFL--DAMYLALEDQDFCK--EIOQELAHNAHY--VGGGRFTHSMSEYMAID--IFF--HHSNVDRILAIWQAL--LKLAL--LG--PGAPQKGGV----EFC--DLKNSMTHY--AF--FSWDS--PIALTRDHSLEPQTL : 283
 OdHG _ Fub : LHN-----DVFHARNV--DSRLFEKPT--KG

CaHaD _ Fud : E-----DAVTTTDP-QPELFN-----NDYFYQALYALEQYSFCD-EIQREVLHNAHSHWLGGHAKYVSSSLTETVYDFVFFHHANTDRLWAWQELQYRGLPNEA---DCAIN-LMRKPLQPFQ-D-KTLPNRNINIIYSRFADTF : 274
 HpHaN _ Fud : E-----NAVTTTDP-QPELFN-----NDYFLQALFALEQDHYCD-EIQREILHNAHSHWLGGHAFYSMASLMAEDFVFFHHANTDRLWAWQELQYRGLPNEA---DCAIN-LMRKPLQPFN---RTTNDEVTIRKYSRFVDTF : 273
 CaHaN _ Fud : E-----NAVTTTDP-QPELFN-----NDYFLQALFALEQDHYCD-EIQREILHNAHSHWLGGHAFYSMASLMAEDFVFFHHANTDRLWAWQELQYRGLPNEA---DCAIN-LMRKPLEPN---RVTNDEVIRKNSRFVDTF : 273
 HpHb _ Fud : E-----NATTTTNP-QTALFN-----NDYFYQVLFFAFEQTHFCD-EIQLELVTHNAHSHWLGGHARYSMASLMAEDFVFFHHNTDRLWAWQELQYRGLPNEA---DCAIN-QMRKPLKPFQ---DSDNKNVNIKKYSRFVDTF : 273
 CaHb _ Fud : E-----NASTTTNP-QAALFN-----NDYFYQVLFFAFEQTHFCD-EIQLELVTHNAHSHWLGGHARYSMASLMAEDFVFFHHNTDRLWAWQELQYRGLPNEA---DCAIN-QMRKPLKPFQ---DSDNKNVNIKKYSRFVDTF : 273
 HtH1 _ Fud : E-----NAVTTTNP-QAGLFN-----SDYMYENVLLFALEQDNYCD-EIQREILHNAHSHWLGKGQKYSMSLMAEDFVFFHHANTDRLWAWQELQYRGLPNEA---DCAIN-LMHQPLKPPS-D-PHENHDNVLLKYSRQDGF : 274
 KLH1 _ Fud : E-----NEITTTNP-KDSLEH-----SDYFYQVLYALEQDNFCD-EIQLEILHNAHSHWLGKGKYSMSLMAEDFVFFHHATDRLWAWQELQYRGLPNEA---DCAIN-Q-LMHTPLQPFQ---KSDNDEAKTKHATPHDGF : 273
 HtH2 _ Fud : E-----NAVTTTNP-QPELYV-----NRYFYQVMLVFQEDNYCD-EIQREIMVHNAHSHWLGGRATYSISSLYQEDFVFFHHANTDRLWAWQELQYRGLPNEA---DCAIN-LMRKPLHPPD-N-SDLNHDVPVFKYSKPTDGF : 271
 KLH2 _ Fud : E-----NAVTTTNP-QPELWD-----NKDFYQVMLFALEQDNFCD-EIQLEILHNAHSHWLGGRATYSISSLYQEDFVFFHHANVDRLWAWQELQYRGLPNEA---DCAIN-EMRKPLQPFN-N-PBLNSDMLKYNHLDQDSF : 274
 OdHG _ Fud : L-----NSETNRNP-QEELFG-----NKYLYBHTLFVLEQDFCD-EVHFEVLHNTTHSWLGGRDPHSMSSLDFAFYDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-P-LNVMPMRPFS-N-TTANHDMRLTHSAFNDVF : 277
 OdHa _ Fud : L-----NSETNRNP-QEKLFG-----NKYLYBHTLFVLEQDFCD-EVHFEVLHNTTHSWLGGRDPHSMSSLDFAFYDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-P-LNVMPMRPFS-N-TTANHDMRLTHSAFNDVF : 277
 NpH _ Fud : I-----NSHTSDNP-QPELFN-----SDYLYBNTLLALEQDNFCD-EVQLFVLHNAHSHWLGGRDTPSMSSLDFAFYDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-P-LNQHLPFPN-N-VSVNHDRNLTLLNKNPDAF : 276
 AcH1 _ FUE : E-----NSVTEDVQCDYLFLEKQGP-HGFDTLFNQALLALEQEDYCD-EIQREILHNAHSHWLGGRATYSISSLYQEDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 284
 AcH2 _ FUE : E-----NTTTEEDVQCDYLFLEKQGP-HGFDTLFNQALLALEQEDYCD-EIQREILHNAHSHWLGGRATYSISSLYQEDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 284
 LsH1 _ FUE : E-----NSBTEDEVSDRLFKRGP-HGWDTLFNQALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMKDPLKPPFS-FGPPYMLNPLKKEHSHPEDTF : 284
 LsH2 _ FUE : E-----HATTEDEVKEEFLEKVGK-HGWDTLFNQALLALEQEDYCD-EIQREILHNAHSHWLGGSKNLSLGLFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-LMRVPLKPPFS-FGPPYMLNPKMKESKPEDTF : 284
 BgH12 _ FUE : E-----AVYTDDIILVDMKMKMP-LGWDTLMFQALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 284
 HpHaD _ FUE : E-----HSHTEEDIOQSAELFKLGP-HGWDTLFQEQALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-HUKDSLKPPFS-FGPPYMLNPLKKEHSHPEDTF : 284
 CaHaD _ FUE : E-----NSHTEDIOQSAELFKLGP-HGWDTLFQEQALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-HUKDSLKPPFS-FGPPYMLNPLKKEHSHPEDTF : 284
 HpHaN _ FUE : E-----HVDTEDEVQEDKLEKRGPH-HGWDTLTYTQVLFVLEQDFCD-EVQLFVLHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 284
 CaHaN _ FUE : E-----HVDTEDEVQEDKLEKRGPH-HGWDTLTYTQVLFVLEQDFCD-EVQLFVLHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 284
 HpHb _ FUE : E-----HEDVHADI-QSNLFLKRGPHGWDTLTYNQAALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 284
 CaHb _ FUE : E-----HEDVHADI-QSNLFLKRGPHGWDTLTYNQAALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 284
 HtH1 _ FUE : EGP-----GVHTEDHINTERFHSGDHDGYHNFETVLFVLEQDFCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-HUKDSLKPPFS-FGPPYMLNPLKKEHSHPEDTF : 284
 KLH1 _ FUE : EGE-----NVHTKADINRDRLEQGST-KTHHNFIEQALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 286
 HtH2 _ FUE : EGE-----NITTEDEVADIKLELVKGG-HVFDNMFQEQALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 286
 KLH2 _ FUE : EGE-----GVHTEDHINTERFHSGDHDGYHNFETVLFVLEQDFCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-HUKDSLKPPFS-FGPPYMLNPLKKEHSHPEDTF : 284
 OdHG _ FUE : ISE-----DTEKKEEV-SEYLFEEHPV-LGKQTLFDNIALALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 286
 OdHa _ FUE : ISE-----DTEKKEEV-SEYLFEEHPV-LGKQTLFDNIALALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 286
 NpH _ FUE : ISP-----EVMTQADV-QDKLEKQPK-LGRNTMLHDNIALALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 287
 AcH1 _ FUF : E-----DVYTVRI-RPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 AcH2 _ FUF : E-----KAYTVRI-RPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 LsH1 _ FUF : E-----NTYTVRI-RPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 LsH2 _ FUF : E-----KVYTVRI-RPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 BgH12 _ FUF : E-----DITYTVRI-RPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 HpHaD _ FUF : E-----DITYTVRI-QETHDRHV-DGKHSFLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 277
 CaHaD _ FUF : E-----DITYTVRI-QSPHKK-KH-DGKHSFLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 277
 HpHaN _ FUF : E-----KAQTVRI-QPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 CaHaN _ FUF : E-----KAQTVRI-QPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 HpHb _ FUF : E-----GAYTVRI-QYHFRFRAYG-DGKHSFLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 CaHb _ FUF : E-----DAYTVRI-QYHFRFRAYG-DGKHSFLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 HtH1 _ FUF : K-----DAFTVRIV-QESLFKMS-FGKHSFLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 KLH1 _ FUF : H-----DITYTVRI-QEGLHSLT-TGEHSLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 HtH2 _ FUF : A-----NTYTVRI-QEGLHSLT-TGEHSLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 KLH2 _ FUF : E-----DAYTVRI-QDILYHLQD-ETGTSFLHGVLDVLEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 OdHG _ FUF : E-----DITYTVRI-QPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 OdHa _ FUF : E-----DITYTVRI-QPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 NpH _ FUF : A-----EYTVTVRI-QPELIRNKNQ-AGDHSADFVLVSALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 279
 AcH1 _ FUG : N-----GEVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 AcH2 _ FUG : N-----GEVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 LsH1 _ FUG : N-----GEVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 LsH2 _ FUG : N-----GEVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 HpHaD _ FUG : N-----GEVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 CaHaD _ FUG : N-----GEVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 HpHaN _ FUG : D-----GHVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 CaHaN _ FUG : D-----GHVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 HpHb _ FUG : D-----GHVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 CaHb _ FUG : D-----GHVTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 HtH1 _ FUG : L-----NVSTTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 271
 KLH1 _ FUG : L-----NVSTTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 271
 HtH2 _ FUG : L-----NVSTTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 271
 KLH2 _ FUG : R-----NVSTTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 271
 OdHG _ FUG : A-----NTDTTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 OdHa _ FUG : A-----NTDTTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 270
 NpH _ FUG : I-----NETTSRAB-REQLNDPDE-FGSEFFFYRCALLALEQEDYCD-EIQREILHNAHSHWLGGSKEHSLALFYASDFVFFHHSNIDRLWAWQELQYRGLPNEA---DCAIN-E-QMRVPLKPPFS-FGAPYMLNPKMKESKPEDTF : 267

Ach1_ _FUh : V-----NQDTTADI-QDSLFPNPT-INGYNYLYYALSTLEEDSFCDSEIQYEILHNEHGLIGGHTYSMSILDYSAFDPLFMHHSSLDRIIMAIWQELQKLRPFNSA---RCGGA-IMEEPLOPFS-Y-SQINTNDFRMSQPSKVF : 275
 LsH1_ _FUh : A-----NEKTTTQV-QSELYSERK-VHGFPLYFYALTTLEEDNYCDSEVQREVVLHNEHADIGGSGTYSMAILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNGA---SCAGH-IMERPLOPFS-Y-PEVNKNEFTRLSVPNVVF : 275
 LsH2_ _FUh : V-----GKTTTADV-KDELFNPPT-INGFNQLYYALSTLEEDNYCDSEVOYEILHNQHALLIGGTGTYSMAILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 275
 BgH1_ _FUh : E-----KEWTDREV-NLKQLNLLD-PEGTKMLHFSALSILEEDQFCDSEVQRELLHYRHALMGGTTKKYSLAILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 266
 HpHaD_ _FUh : N-----NQRTTADI-QSELYNPHQ-INGYNYLYYALSTLEEDNFCDSEVQREVVLHNEHALIGGNGTYSMAILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 275
 CaHaD_ _FUh : N-----NQRTTADI-QSELYNPHT-INGFNLYYALSTLEEDNFCDSEVQREVVLHNEHALIGGNGTYSMAILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 275
 HpHaN_ _FUh : V-----GQRTSNP-LGALFSTNT-SAGTSLYQITLDALEEDDYCHFEIMLEFVHNRRHFLIGGTETYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 273
 CaHaN_ _FUh : A-----GQRTSNP-LEALFSTNT-SAGTSLYQITLDALEEDDYCHFEIMLEFVHNRRHFLIGGSETYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 273
 HpHb_ _FUh : A-----GKTTTASP-LEALFSANT-SRGHTILYDITLDALEEDDYCHFEASLEFVHNRRHFFIGGTGTYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 274
 CaHb_ _FUh : V-----GQTTTASP-LQALFSANT-TQGHITLYDITLDALEEDDYCHFEISLEFVHNRRHFFIGGSGTYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 274
 HtH1_ _FUh : V-----QHETTTDV-NQRLFNQTK-FGEFDYLYYTLQVLEEDNYCDSEVQREVVLHNEHSLWGGTGQYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 278
 KLH1_ _FUh : I-----NQDTTADV-NEALFQTK-FGEFSSLEYALQALEEDNYCDSEVOYEILHNEHALIGGAEEKYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 273
 HtH2_ _FUh : V-----GHDIVREP-TSLIYNQPQ-IHGVDYLYYALTTLEEDNYCDSEVQREVVLHNEHSLWGGSGQYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 279
 KLH2_ _FUh : A-----GHDITASP-SDLEFNQPQ-LHGVDYLYYALSTLEEDNYCDSEVHYEILHNEHSLWGGTGQYSMSILDYSAFDPLFMHHSSLDRIIMVIWQELQKLRHPFNAA---HCGGH-IMETPLOPFS-Y-PEVNPNDLRLAVPNLVF : 276

320 340 360 380 400 420 440

AcH1_ _ Fua : AHST--FGSYDLSLNGYSVEER-ALKE--QTYDRAAFASRLFGIGGSANVR--VP-SSDKLTGDYCEFAEDFFILCGAIFMAFAIWPYYEITKTQVNGVVALD--GNVQARIFSVNGTEPSN--LIPSPSVSFR--AVGKTD-- : 413

AcH2_ _ Fua : DSSL--FGKYDNLTLNGLMDLETIK-ALKE--QTHDRAAFASRLAGIGGSANVR--VP-GANDVTGDYCEFAEDFFILCGPTMAETFTWPYYEITKTQVHGLDLE--GDHVQARIFSVNGTEPSD--LIPSPSVSFR--ALGKTD-- : 418

LsH1_ _ Fua : DGS--YGYKYDNLTLNGLDNGIK-RLKE--QWSHAASAVSRLSGIGGSANVR--QV-SEDEVTTGYCEFAEDFFVLCGPTMPAFASRPYYEIVUKTVEKGLALD--GNVREAEIFSVNGTQPSD--LPHFPVSYSR--AKGTV-- : 423

LsH2_ _ Fua : DHVL--FGQYEDRTLNGHDVDETF-RIKE--QKHDRAFASRLKLAGIGTSADVVKV--LP-ALDAVTEHDCEADAGHFFILCGPLMPMPFRSKPPYYEITKTVASGLPLD--GNVREAEIYSVNGTLP--LPPG--LPPAPVYSYR--AKGKD-- : 418

BgH11_ _ Fua : DKTV--FDNYDNLTLNGLGIADIK-KRIEM--KKTDRAFAVSKLNGIQRSVNLKQV--KTSSEDEE--DTCESAGEDVXXLCGSTHPPMFRPYYEITKTAVKLGLKLD--ENVRVLTETMYGT--DKINSS--ISPQSPVSEFR--AVGKQD-- : 409

BgH12_ _ Fua : TFKHSLGKYQDITLNLGLDSMAQ-KLKE--KKKPRAFASRLSNIGVSADVVKV--QV-IP-VSNAGTDNYCEYAGAFFILCGPLMPAFANLPYYEIVUKTVQRKPLD--GNVREAEIYSVNGARPDY--LPHFPVSYSR--GSEDK-- : 410

HpHaD_ _ Fua : EHTL--FGKYDNLTLNGLDVKIK-SIEK--QETDRAAFASRLHIGIGVSADVVKV--VS-DSHHLAGDYCEFAENFFILCGPLMPMPFTNRPYYEITKTVKQ--NISLT--SDHVEVDVYSVNGTQPSD--LPHPSVSYSR--AVGTRD-- : 418

CaHaD_ _ Fua : ENTL--FGKYDNLTLNGLDVNKK-KIEK--QAADRAAFASRLHIGIGVSADVVKV--VS-DSHHLAADYCEFAENFFILCGPLMPMPFTNRPYYEITKTVEANISFT--SDHVEIDVYSVNGTQPSD--LPHPSVSYSR--GKGKSD-- : 418

HpHaN_ _ Fua : DYSV--FGYEYESLELNLGLSPAQIV-DLVKK--QSHDRAAFASRLHIGIGVSADVVKV--VLDIDDEHEEDDRCLHAGDFFVLCGATMDTFFRPFFEITHTVERHPLD--GNVREAEIVSVNGTQPSD--LPHFPVSYSR--AAGSHD-- : 415

CaHaN_ _ Fua : DYSV--FGYEYESLELNLGLSPAQIV-ELVKK--QSHDRAAFASRLHIGIGVSADIKV--VLDIDDEHEEDDRCLHAGDFFVLCGATMDTFFRPFFEITHTVEQHPLQ--GNVREAEIVSVNGTQPSD--LPHFPVSYSR--AAGSHD-- : 416

HpHb_ _ Fua : TNSAA--FGSYDNLTLNGLSPKAA-DLKE--QSHDRAAFASRLHIGIGVSADVVKV--VLDLGLHHTKPHCEHAGDFFILCGPLMPMPFSGHPPFFEITKTQVKGGLPLD--GNVREAEIVSVNGTQPSD--LPHFPVSYSR--GKGKSD-- : 417

CaHb_ _ Fua : DSKAA--FGSYDNLTLNGLSPKAA-DLKE--QSHDRAAFASRLHIGIGVSADVVKV--VLDLGLHHTKPHCEHAGDFFILCGPLMPMPFSGHPPFFEITKTQVKGGLPLD--GNVREAEIVSVNGTQPSD--LPHFPVSYSR--AAGSHD-- : 417

HtH1_ _ Fua : DYKQ--LGSYSLSLNLNGLMTPEDK-TEDE--HSKERAFASRLSGFGGSANVVYA--VP-DDDPRSDDYCEKAGDFFILCGQSPMPFRFPFFEITHTVEVHGLVPLS--GHVYKTELSVNGTAP--SPD--LPPQPTVAYR--GKGHLD-- : 410

KLH1_ _ Fua : DYCE--LHYDNLTLNGLMTPEDK-TYDE--SSRARAFASRLKGGIGGSANVVYA--VP-DDNDNRNDHCEKAGDFFVLCGPTMPKQFYRPYYEITKTAVKGLKLD--GHVYKTELSVNGTAP--PDD--LPHFPVSVH--EKGFTD-- : 410

HtH2_ _ Fua : DYAH--LGYDYDNLTLNGLMTPEDN-SYHE--SGKEGVAFASRLSGFGGSANVVYA--RP-AHDEMAVDCCKAGDFFVLCGPTMPKQFYRPYYEITHTVVERHPLD--GNVREAEIVSVNGTAP--PDD--LPHFPVSYSR--ARGHVD-- : 411

KLH2_ _ Fua : DYGR--LGYDYDNLTLNGLMSPEDN-VYGE--AAKERTAFASRLSGFGGSANVVYA--RP-AHDEISDDQCIKAGDFFVLCGPTMPKQFYRPYYEITHTVVERHPLD--GNVREAEIVSVNGTAP--PDD--LPHFPVSYSR--ARGHVD-- : 413

OdHG_ _ Fua : NYNE--LGYDYDNLTLNGLMTPEDN-TMKE--QQHFRSASRLKGGIGGSANVVYA--VPSDDKRSNDCNNHVSFFILCGVHMTDGFEGYPLFEITKTAVKGLKLD--GHVYKTELSVNGTAP--PDD--LPHFPVSYSR--EKGFTD-- : 410

OdHa_ _ Fua : NYNE--LGYDYDNLTLNGLMTPEDN-TMKE--VPSDDKRSNDCNNHVSFFILCGVHMTDGFEGYPLFEITKTAVKGLKLD--GHVYKTELSVNGTAP--PDD--LPHFPVSYSR--EKGFTD-- : 410

NpH_ _ Fua : DHTK--LLQYDNLTLNGLNITQV-ELKE--RSRARAFASRLSGIGTSANVR--HVSVRIDDDKSHDDCDHVAENFFILCGARMEWHYHYPRYEDITSTVQEGIALD--SNVYVIDLIAINGTL--SSS--LIPNPTVDYQ--APGSS-- : 412

AcH1_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-QYKSTQKSDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 425

AcH2_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 425

LsH1_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 419

LsH2_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 421

BgH11_ _ Fub : DHKE--LGYDYDNLTLNGLMTPEDN-HFRFNVFTSREMFVGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 408

BgH12_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

HpHaD_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 418

CaHaD_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 418

HpHaN_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 424

CaHaN_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 424

HpHb_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 424

CaHb_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-DYNSNLKGRSRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 424

HtH1_ _ Fub : DYEV--LGYDYDNLTLNGLMTPEDN-EAHL-RQOEDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 415

KLH1_ _ Fub : DYEN--LHYDYDNLTLNGLMTPEDN-KMHE-NQOEDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 415

HtH2_ _ Fub : DYEGV--LGYDYDNLTLNGLMTPEDN-EYQR-QRQEDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 413

KLH2_ _ Fub : DYEGV--LGYDYDNLTLNGLMTPEDN-EYQR-QRQEDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 415

OdHG_ _ Fub : DYQSD--LHYDYDNLTLNGLMTPEDN-RHEE-DKAKDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 415

OdHa_ _ Fub : DYQSD--LHYDYDNLTLNGLMTPEDN-RHEE-DKAKDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 415

NpH_ _ Fub : DYAE--LGYDYDNLTLNGLMTPEDN-NEEE-HQRHEDRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 416

AcH1_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

AcH2_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 413

LsH1_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

LsH2_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 415

BgH12_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 415

HpHaD_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

CaHaD_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

HpHaN_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

CaHaN_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

HpHb_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

CaHb_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 413

HtH1_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

KLH1_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

HtH2_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

KLH2_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 416

OdHG_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

OdHa_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 414

NpH_ _ Fuc : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 413

AcH1_ _ Fud : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 416

AcH2_ _ Fud : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 416

LsH1_ _ Fud : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 417

LsH2_ _ Fud : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 416

BgH12_ _ Fud : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 413

HpHaD_ _ Fud : DYQTN-FHYDYDNLTLNGLMTPEDN-FVLEQ-NQAEADRVYGLLHGKKAALAT--YVKKP-----G-VDTENYAGCFALLCGPSMEWRFRDLYRHEITDTEELNLHWA--QP--LPTVTLKLTDFEGHD--PIN--PFPKQIIFKAKE----- : 416

CaHaD_ _Fud : DYRN-FHEYDLEFNHLSIPQLE-SLNR-RQEYGRVAGFLLHNIGLSADVTYVVCV-SGPKGKNDONHKAQVFSVLCGELMPFEDRLRYKQIDTIRTKQLKLVNNAASQLKVEIKAAAGTLDPH-ILPDPSSIIFVGT----- : 416
HpHaN_ _Fud : DYRN-LHXYDLEFNHLSIPQLE-ELIQS-RKRNRVAGFLLHNIGLSADVDYVVCV-VGQFGEQDCHHKAATFSVLCGETMPFEBFNRLYKQIDTIRTVRELGLKLDNAANHLLVEIRAPNGSQDPH-ILPDPSSIIFGT----- : 415
CaHaN_ _Fud : DYRN-LHXYDLEFNHLSIPQLE-ELIQS-RKRNRVAGFLLHNIGLSADVDYVVCV-SGKYGEQDCHHKAATFSVLCGETMPFEBFNRLYKQIDTIRTVRELGLKLDYAANHLLVEIKAPNGSQDPH-ILPDPSSIIFGT----- : 415
HpHb_ _Fud : DYRN-H-FDEYDLEFNHLSIPQLE-NLKL-RQRKGRVAGFLLHNIGLSADVVSICIP-NAPDAFGGONHKAQVFSVLCGETMPFEDRLFRIDITKAVKDALEVSAAANCLKVAIRAVNGSYDPH-ILPDPSSIIFDGT----- : 415
CaHb_ _Fud : DYRN-H-FDEYDLEFNHLSIPQLE-NLKL-RQRKGRVAGFLLHNIGLSADVVSICIP-NAPDAFGGONHKAQVFSVLCGETMPFEDRLFRIDITKAVKDALEVSASANCLKVAIRAVNGSYDPH-TLPDPSSIIFDGT----- : 415
HtH1_ _Fud : DYQNH-FGYKYNLEFHHLSIPSD-ATLQ-RRKHDRVAGFLLHNIGLSADVTYICIP-DGRRG-ND-SHEAETFFYLCCGETMPFEDRLRYKIDITKAVKDALEVSASANCLKVAIRAVNGSYDPH-TP-TPTIIEEFGT----- : 413
KLH1_ _Fud : EYQNS-FGAYDNLNLSIPQLE-HMQE-RKRHRDVAGFLLHNIGTSADGHVFCIP-TGEHT-KDS-SHEAEMFSVLCGQTEMSVFDRLYKLDITKAVKKNVHLQ--GD--DLEIETAVNGSHDSH-VIHSPTILFEAGT----- : 412
HtH2_ _Fud : DYQNH-FGYKYNLEFHHLSIPQLE-EIIRI-RQRQDRVAGFLLHNIGTSADVVSICIP-TTSGEQONENKAGTFAVLCGETMPFEDRLRYKIDITKAVKDALEVSASANCLKVAIRAVNGSYDPH-ILPDPSSIIFVGS----- : 411
KLH2_ _Fud : DYQNR-FRYQYDNLQFNHLSIPQLE-ATLQ-RQKHDRVAGFLLHNIGTSADVTYICV-QGGEQ--NCKTKAGSTFFYLCCGETMPFEDRLRYKIDITKAVKKNVHLQ--GD--DLEIETAVNGSHDSH-VIHSPTILFEAGT----- : 413
OdHG_ _Fud : DYQNV-LHKYDNLFSYDLITQLE-HLKE-RKSHDRVAGFLLHGVQASADIVFICVP-TSKHE-ENCAHDVGVFSVLCGKSMPPQFASVFOYEITDQKLLCLNQ--SH--RGVTEVTAVNGSSNSD-IFPHPTIIVVFKQ----- : 416
OdHA_ _Fud : DYQNV-LHKYDNLFSYDLITQLE-HLKE-RKSHDRVAGFLLHGVQASADIVFICVP-TSKYE-ENCAHDVGVFSVLCGKSMPPQFASVFOYEITDQKLLCLNQ--SH--RVVTEVTAVNGSSNSD-IFPHPTIIVVFRQ----- : 416
NpH_ _Fud : DYQNH-FHYRYDNLDFHGLSIPQLE-HELHE-RQTHDRVAGFLLHGIQASAVYRILYICVPTQRGSSKENNNYAGTFSVLCGVTMPMHFDRLRYKIDITKAVKKNVHLQ--SH--RIKTDINAVNGTHFSDH-IFPDPITISEVAP----- : 417
AcH1_ _Fue : EYEEH-FNNYDLEFVGLDIPAD-GFKE-KQEDDRVAGFLLKFGSSAFVNDIVSN-----GKSFEQGYFTVLCGSAEMPPQFDRLFKYEITDQIAANLRFD--DN--SFNISVRLPDGTVDSS-LIPTPSVLFKSAQ----- : 417
AcH2_ _Fue : DYEGH-FNRYDLEFVGMNIPRID-AFKE-RREKSRVAGFLLKFGSSAMVTDICTK-----GMES--FQGGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 419
Lsh1_ _Fue : NYADH-FHYRYDNLDFVGLSIPQD-AFKE-RHEHDRVAGFLLKFGKSAVNDIDAN-----GNC--FPGGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--TFQIKIRAPDGTVDSS-LIPTPSVLFKSAQ----- : 417
Lsh2_ _Fue : NYEDH-FHYRYDNLDFVGMNIPRID-AFKE-KQEDDRVAGFLLKFGSSAFVNDIVSN-----DMSN--FEGGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DN--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 419
BgH12_ _Fue : KYETN-FYRYDNLDFLAGMSISQD-AYKE-KIKHDRVAGFLLKFGSSAFVNDIDAN-----RKC--TEGGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--EIKVHVKSMNGSQSSS-LTASNPVITEPAS----- : 417
HpHaD_ _Fue : AYEDH-FEYQYDNLDFVGMNIPAD-AYKE-RQEHDRVAGFLLKFGSSAFVNDIDAN-----FKK--FDGGHFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 418
CaHaD_ _Fue : AYEEH-FEYQYDNLDFVGMNIPAD-AYKE-KQEHDRVAGFLLKFGSSAFVNDIDAN-----FKK--FDGGHFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DN--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 418
HpHaN_ _Fue : AYKEH-FHYRYDNLDFVGMNIPAD-AYKE-KQEHDRVAGFLLKFGSSAFVNDIDAN-----ATGVC--FDGGEFSVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DE--HLTVHLSKINGTEDSH-LVHEPVIIVVPAK----- : 419
CaHaN_ _Fue : AYKEH-FHYRYDNLDFVGMNIPAD-AYKE-KQEHDRVAGFLLKFGSSAFVNDIDAN-----ATGD--FDGGEFSVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DE--HLTVHLSKINGTEDSH-LVHEPVIIVVPAK----- : 419
HpHb_ _Fue : DYERH-FHYRYDNLDFVGMNIPAD-AYKE-KQEHDRVAGFLLKFGSSAFVNDIDAN-----NKC--FEGGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DN--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 417
CaHb_ _Fue : YYESH-FHYRYDNLDFVGMNIPAD-AYKE-KQEHDRVAGFLLKFGSSAFVNDIDAN-----DTNG--FPGGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 419
HtH1_ _Fue : DYKK--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DHT--KIDGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 420
KLH1_ _Fue : DYQK--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----AGD--EDAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--EI--QIEVITTSYDGTVDSS-LIPTPSVLFKSAQ----- : 419
HtH2_ _Fue : DYRK--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DST--QDAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 419
KLH2_ _Fue : DYRH--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DQS--EDAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 419
OdHG_ _Fue : RYKDN-FHYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----GGE--HEGSHFVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--SA--TIKTKVAQNGTEPAS-LPEAVIRIPPS----- : 420
OdHA_ _Fue : RYKDN-FHYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----GGE--HEGSHFVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--SA--TIKTKVAQNGTEPAS-LPEAVIRIPPS----- : 421
NpH_ _Fue : NYKDH-FHYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----QNH--EDAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 421
AcH1_ _Fuf : DYEH--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----NNV--NYAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 419
AcH2_ _Fuf : DHEK--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----NNB--AYGGRFVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 419
Lsh1_ _Fuf : NHEE--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----SQ--TYAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 418
Lsh2_ _Fuf : DYEE--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----SE--AFAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 418
BgH12_ _Fuf : NHDL--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----QECSCV--TYAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 420
HpHaD_ _Fuf : NHED--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----EB--TSAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 416
CaHaD_ _Fuf : NHED--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----EB--TSAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 416
HpHaN_ _Fuf : DHEN--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DK--TSAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 418
CaHaN_ _Fuf : DHEN--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DK--TSAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 418
HpHb_ _Fuf : DHEN--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----SGN--TFSGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 417
CaHb_ _Fuf : DHED--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----SGN--TFSGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 417
HtH1_ _Fuf : DYED--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----SEN--TFAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 417
KLH1_ _Fuf : KYEL--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----SED--HHGQYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 417
HtH2_ _Fuf : DYET--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----END--HRGQYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 416
KLH2_ _Fuf : FDQD--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----ADD--HSGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 414
OdHG_ _Fuf : DDNK--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----ETC--EDAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 414
OdHA_ _Fuf : DYNK--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----ETC--EDAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 416
NpH_ _Fuf : NYDD--FGYRYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----GNN--TFAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 414
AcH1_ _Fug : DYDR--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----EBC--AFAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
AcH2_ _Fug : DYDR--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----EBC--AFAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 402
Lsh1_ _Fug : DYDR--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----KGH--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
Lsh2_ _Fug : DYDR--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----ENH--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
HpHaD_ _Fug : NYDR--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----HDH--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
CaHaD_ _Fug : NYDR--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----HDH--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
HpHaN_ _Fug : NADS--LHYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----RGH--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
CaHaN_ _Fug : SSDR--LHYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----RNG--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
HpHb_ _Fug : NYEQ--LHYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----HNG--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
CaHb_ _Fug : NYEQ--LHYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----RNG--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
HtH1_ _Fug : EYNR--LSTQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----GHC--VAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 404
KLH1_ _Fug : EYSR--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DGB--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 404
HtH2_ _Fug : DYER--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----NGD--VAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 404
KLH2_ _Fug : DYER--FNYQYDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DGB--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 403
OdHG_ _Fug : DYHK--LGYDNDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DGB--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 407
OdHA_ _Fug : DYHK--LGYDNDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----DGB--EBAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 406
NpH_ _Fug : DYEQ--LGYDNDNLDFVGMNIPAD-ELIQ-RQKHDRVAGFLLKFGSSAFVNDIDAN-----NGD--VAGYFTVLCGSAEMPPQFDRLFKYEITDQISEHNLRFD--DD--HFHVHVKYIDGTEDHS-LVNPSPVITEPAS----- : 404

AcH1_-_FUh : DYAH--LGMEFDNLENGHDVNDLN-NINR-LRDQDRVLAENNCQKQS--FADVHFETA-----ENNVPVLCRFYVLGGERMPMPCFERVFVKYDVEVLQANNVDIH--KPVKIGGQFRIDGHEVQNF-TTYYATFIERPAGVDYD-- : 412
 LsH1_-_FUh : DSER--LGMYDKLENGNSVEEIN-NIKN-LHHQERIEVGILAFCHQKS--LTIHISLIND-----NDEAFDGGNIHILGGERMPMPAYERIMKLDVTEAIRKGKISTD--HAVKARFTSTDYQCNLNHQD-TDYAIIVERHAEQDY---- : 410
 LsH2_-_FUh : DSER--FGMEFDKLENGHDVSEIN-GIQR-LRGNTRYVLGVVLYVROTVGVEVTLSISN-----KKRYPAENFYVLGGERMPMPAYERIAKYDVIDVFHKAKLSDD--KPVVGEFYSSLYNGQA-NNN-VTEEVIVVEKPSDVNYD-- : 410
 BgH11_-_FUh : DHRR--LGKFKDKLN-NVFSCLKDE-DIKL-QKSKNRVAGLMLRVKNS--VTLEVYLQDN-----QVGVNVLGCPNKKPVFHRPYKIDVTDAMKGAQLTTD--KPVKLHLKTGYDGSSSSEK-DM-EVFIERPSGSHHD-- : 397
 HpHaD_-_FUh : DYTH--FGMEFDKLENGHDVQGID-DIKHN-LRHGNRVVLGVVLFQKSS--LEMKIDLIDD-----AGQAHTAGSFHLLGGERMPMPAYERLFRYDVIDVAKQFGITD--HPIKVKVTSTYVNGEPHQEY-TDEIVAVERHADTDYD-- : 411
 CaHaD_-_FUh : DYTH--FGMEFDKLENGHDVQGID-NIKHN-LRHGNRVVLGVVLFQKSS--LEMKIDLIDD-----EGQAHTAGSFHLLGGERMPMPAYERLFRYDVIDVAKKFGITD--HPIKVKVTSTYVNGEPHQEY-TDEIVAVERHADTDYD-- : 411
 HpHaN_-_FUh : DHHL--LGMEYDTTESEHDAAEVL-EIKRR-RHSETRVVLGGAAYCHGQS--FRTAAWVLND-----AGEEFDACNFFLLGSSKMPMPANILWKFDITTAHQAGVSTD--KNIKFHFKETVNGTLFASE-SAYAIFLVREAYTDY--- : 408
 CaHaN_-_FUh : DHHH--LQYDYDTTESGHDAAEVL-EIKRR-RHSETRVVLGGAAYCYGES--YRTEVWVLND-----AGEKFSVGTNFFLLGSAKMPMPASNEILWKFDITNAVRQAGVSTD--KNIKFHFIETVNGTLHHDQ-VAYGIFVIREAYTDYLT-- : 410
 HpHb_-_FUh : EHDR--LGMEYDNLRISGYDVEQVN-EIKKK-RHAETRVYSEAAAYGVSVSEVWVLDE-----EGHEFPADTGYVLGSSKMPMPATYETILFRYDITDAIHKANVSLD--HPVKFKWRTVNYDGTLEEAA-SEYGIVVVREAKTDYL--- : 410
 CaHb_-_FUh : EHDN--LGMEYDNLRISGYDVGQVN-EIKKK-RHAETRVYSEAAASFGVSVSEVWVLDD-----EGHEIPADTGFVLGSSKMPMPATYETILFRYDITDAFNKANLSLD--HPVKFKWRMVNYDGTFFLEEA-SEYGIVVVREANTDYL--- : 410
 HtH1_-_FUh : DHYR--FMYEYDNMRIRGQDIHELE-EVQKE-LRNKDRIVAGFVLSGLRIS--ATVKVFIHSK---NDTSHEEYAGEFAVLGGERMPMPAYERMLKLDISDAVHKLHVK-D--EDIRFRVVVTAYNGDVVTTR--LSQPFIVHRPAHVAHD-- : 415
 KLH1_-_FUh : DSHR--FMYKYDNLNHGHNIIELE-EVQRS-LRLKSRVAGFVLSGIRTT--AVVKVYIKSG---TDSDEYAGSFVLGGAKMPMPAYERLYRFDITETVHNLNLT-D--DHVKFRFDLKKYDTELDAS-VLPAPIIVRRPNNAVFD-- : 410
 HtH2_-_FUh : DQHK--FGMHYDNLRIRGHSIQEIN-TIKND-LRNTRIVAGFVLSGIGTS--ASVKIYLRTD-----DNDEEVGTFTVLGGERMPMPAYERVFVKYDITEVADRLKLSYG--DTFNFRLEITSYDGSVVNKS--LPNPFIYRPAHNDYD-- : 414
 KLH2_-_FUh : DSHK--FMYHYDNPDVRCNSIQETS-ATIKHD-LRNQFRVAGFVLSGIYTS--ANVKIYLVRE-----GHDDENVGSFVLGCPKMPMPAYERIFKYDITEVANRLNMHHD--DTFNFRLEVQSYTGEMVTHH--LPEPLIYRPAKQEYD-- : 412