

Supplementary Figure 2. Multiple alignments of selected protein families

A.

Cluster2

```
CONSENSUS PxxLxxx-xPxx--xxx-xxxx-xxxYDPxxQxxxxxX-----Gxxxxxxx-xxxxxxx-xx---xxxDxx-----xxxDx-xxD--
115239570_gr9 PFGYLF--NWEPGTPA-ETETELGYDADQVWVTPD-----GAIAGV---YTKRITSGS-----NCGD-----CVTDD--ACA--
1302152154_gr9 PFAYAF--TWTEAEEA-QADD-TGHYNEETQVWEIPG-----GGYTMGV---YTKR-TGCS-----CHPD-----YVTDD--ACF--
1084936075_gr8 PFGARAERTPY---TVT-LDAG-SFVYDPAQVNVLTD-----GSGALMSR---STSLAGSCT--TN--WDSKNDT-----SDPY--LMR--
1504406364_gr8 PFAMRYAARQTS---E-PADITSVTQDGLQIAVSD-----GNPWA-----HTALGETSS-----TNSDSR-----NDEGT--DFY--
1605672014_gr8 PWGLRRL-APYP--AVD-APQYARVELDAGTQARYLDA-----GAVVMAPG---HGTSSGTNPPTGTT--GQGD---RNSDAPDSDTGND--TDQ--
1301744864_gr11 PFALQYA-RPQ---TGEPA--PYAFDQAEQVNVLAG-----GGYAAED---TALLARLGS--AS---TAGS-----KTH--WDD--
1806787427_gr11 PFALNYA-RPAR---E-LVVSTPYVDSGLQLNVLD-----GRVAACD---HALLREVCT--TS---TAGS-----KTH--FDD--
1301678086_gr11 PFAWNYA-QPAD---P-APALVSYSDATLQLNVLS-----GRPAISD---RALMAAAGT--TS---KAGS-----ATH--FDD--
1101511595_no PWGLARM-RPYPA-AAV-LPAA-RPVLDPHTQVPAMVGPD-----GAPLTAQAKHKRSETSQETST--TS--LDGTPDQG-----SDQNG--DSD--
1301420005_no PFGTLTS-TQVGDEVV-VDLA-DARLDPVTQTVVGV-----GVALGKP---QTTQKVTTN--KT---SYDHQN-----FNDSTPDT--YQD--
1504264967_no PWALRLVTRDLP--VGP-PPYA-TVTLDPVTQARYADAA-----GRPVEMGKH---GTSRTTSTA--VS---GGDGN--GPQSQTDSDTDDY--ESD--
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Salinispora

```
FVSFGFGQARMP--DNPLDLTGVVYDPTLQVA-TVDGV-PYAEELGGPLA-----ATVROTRD-----GQL-----WDDKD
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Cluster199

```
PL-LP-----GTG-GATAPQHRYPARQLV--VDDT-----GAPVxxDP---xSTIMxTGHx-----GPH-----ERADRPDG-MDSWW
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B.

Cluster 13

```
CONSENSUS PxiXxyxxxx--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPxiXx---xTxTxTx---xxDDx-----xTxTx-xExDDx-----
1003947440_gr3 PYIANVIKEKNFNKTKRFAYN-----KIEQVSFIDE---RKVIKVF-----SSSTRLTKS-VENEDDEDFKC-----
1044887267_gr3 PYTMLYSESEFINASTISNKT-----NSIVKFTTE---PNDED-VL-----NTWTTHTRV-LENQDEDEY-----SL-PSNCERKYEISN--
1102345754_gr4&3 PYIQGVVEVELLDGPALEYD--SVTQ-----MSYTDREMT--RAIHNIK-----DTTIVTDT-IEQSDPDE-----FSLQTTMKTATIENGDPDE
Thuringinin_gr4&3 PYIAKVVEEQTLQNSNVLVD--DITQ-----ISPKNKV---KKINLGP-----DTTIVTET-LENADPDEPYIA--KYVEEQLQNSNVLVD--
1011944976_gr4&3 PYIMNYSETITMKQSVAIQNT--NILD-----VTGTRFTTE---TDDHDEL-----GLATITET-LENSDRDE-----IS-AYSTFQTNVENSDDKDE
1904508545_gr5 PLIDFYMRQ---TNVEFPELTYDRKSGNLFI-NGTKFVLDLNSKT-----VLQTKTFTQRESDDDEKPYTSSIKMRLVTKTDTIREVDD--
1080071630_gr5 PFLARFATER--TEGENIPGWYSYQDLWVVEEDSIPISKYT-LTQTVTKTKVR-QESDDSS-VSML--ELTKTTEAQLERDSDLSMNH--LLELTKTDTIQERDDN-
SFLIQFAEKPKINLDYSII EYSKQNLVSL--KNTIEPAITTYVMGSETETFKTNEPTDSDNDYRFRKRLLDTTSEFTTTEPSSDHYSSSLKLLMTQTITE-SQEPDSDSK
1506242654_gr6 YLLFEYGESPT-YMTDIPPVKYDYDKNLNVL--ESNNTPAISV-LDNQVTEGTGKVHNESSDSDNFCPLNF--GTEFTLVDTQESDSESSILSSSLTMTTRVEMESDSD-
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CONSENSUS -----TxxxExDDxxxxx-xTx---xDDxxx-----TKKTAKIETSDFDELM
1003947440_gr3 -----ETALTEVNDDEDEFKCL--ESTLYSETIENDDDEVSDFPG-----TKKTAKIETSDFDELM
1044887267_gr3 -----EKQS-AMDFTTESIENDDDFIYC--RTFVNVVVEGGDDDFYAN-----TKKTAKIETSDFDELM
1102345754_gr4&3 -----LSL-----ETSMEVRTIENGDDHEIFV--GTTKQFTTIEDSDPDEYMTD-----TTRITKSIEGSDPDEYYS
Thuringinin_gr4&3 -ITQISFINKEKNVKINLGHDDTTIVTETIENADPDEYLD-PDTHHTFTVENNDTYFLDDEHYCGEETRIKTKLENIDPDEYYS
1011944976_gr4&3 -----ISC--AGTMVAVIENSDDDEYLLF--STMETRELAADSEIISYLSMDS--TIMTKVF EATDNDE--
1904508545_gr5 -----MNFNLLTYLLTKTEENKQDE-----
1080071630_gr5 -----WCAGNILELSIKT FVSVREDEDTSMHTYDHQREGLI-----
1305270918_gr6 -----
1506242654_gr6 -----
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C.

LPL family

```
Consensus 50% -----MEKKEFVSLFKESYKLPINYLIRNVYVYTKEEVKRFLNH---YAH-----SNFHQT---TIYDIFY---N-----59
1028378093 -----MEKKEFVSLFKESYKLPINYLIRNVYVYTKEEVKRFLNH---YAH-----SNFHQT---TIYDIFY---KII--IL-----66
1056709131 -----MEKHEFISLFKESYKLPINYLIRNVYVYTKEEVKRFLNH---YAH-----SNFHQT---TM---YDIFYNF---KII--IL-----66
1604649742 -----MNIQDNKELIFSAETIKLPLVYRFL--TKMSTDHVPELRIRIGA--KYSQ-----SKRHGA-DA---YLTFDIE---KIS--NIVLDIPIINDTQQP--79
1502594610 -----MKNKLLKKTITPAKELKLPVYRMM--DEKQTEEVGELYQA--VFTT-----SARHFS-NQ---FKMYISP---KIS--NIIIKKND--72
1107402590 -----MADKRRHNFQELIYNKDLKAVPLVFRFL--EVKKTDEIGELYMHV--KFSS-----SIQQT-KS---LNNYLS---VPS--NILIEDSDCNERVK--80
1033505825 -----MVNKKRQKFEHLVEEKELKLPVFRFL--IKRPTNIGEMYSQV--RFSS-----SSKQT-KS---LNNYLD---TPIS--SIFISKEK--74
1080909573 -----MAYRRKQYEDLIAEKDLKLPVFRFL--IRRETNTIGEMYSYV--RFST-----SKLGT-CS---LNNYTD---TPIS--GIFISEEK--74
1500267439 -----MDINKKELTDEQE LPLVFKTI--YINKMVSIDAENQL--MKYN-----YNIHAV-EM-----RHY---NPNR--RIICLPYDFSQFANK--70
1301770241 -----MEVKPEKKEKTYYPTELRTLPVNFELS--KI I AQNASAKI PYLK--EIVY-----CKMNT-KC---YVPGTFQ---KIS--NIL-----70
105711076 -----MKKKETVPRLEKIFGVETAQLPPIYQLA--ORMPSNAEENHEIR--KNET-----SDLHQT-DP---YDVPYPLN---KIS--KIFDPKVLNNDQS--80
1019511433 -----MSEYLSQM-----HENTKVQVQPT---AAK-----STFYNA-SD---IACFFFY---KIS--LIIDLNDQQQ--52
1032991484 -----MKNIIKQBELKTLBIDIVISQLPVIYKHL--TEIAFSEANTQNV--IVFP-----SNKQT-DK---HKLSEFF---KII--KIH--68
1305268634 -----MFEIKEYKIAKESKTFPLGYNFI--KYNHLSVPKSEY---YVTK-----IKRYS-E---MGVYRST---KIS--KIFDFTPTIQELKNE--74
1405872909 -----MNQKEMGEIPELKVNLPLVFKLL--TKVAVNETPKKN--LFFY-----VAAQ--GM---ALAAEFA---KIS--KIIINWQE--66
1402605514 -----MNIKEYLNTAKKFAKIPSSFKPLFLVKFDKAVSMKSKR--YVVS-----VDAQOS-ET---YQPTGHY---KIS--KIIYKIIQEKNG--77
1502591667 -----MIDKRDIFFKKQDLPPLFLRN--HKIKELQVSKNSSEVTSYNDQ---FFVYS-ET---VECNLSL---KIS--KLLTDEQKQEF--61
1064363958 -----MNHEEKISDYIKKNLKSQVPLVHLKI--ESVNLNDKRVII--KTFK-----NSVFT-NK---MVCFSFY---KII--F-----74
1306133393 -----MTKKQKTIPELAEKELVLSPLFY--LKKTKDINKQISIF--RYDT-----STFYNS-NF---VVSKEFY---KII--MFPNNEYENNDE--77
1701924764 -----MIKLLKLSISEFQELPLVYNYL--IYNELLPs-----DFFPAT-NYSEKYSIIFYSSGDK-KIS--KILDTQLK--68
1017537696 -----MQENKVRISDRDKLPVFCYSI--YFNEMISREIEN---KLFT-----YQNS-E-SI---YGRYSAT---RIS--KIIKMNELK--68
1032986777 -----MKKKKLLKLLLEKTEGQLPVFVKP--IFLNEEDSDSFMQK--KLS-----VKDYQTKNYN--IPDIKI---RIL--KTFKL--70
1202920038 -----MKFTIEFKNNIENFQIFSLPM--FYLEEQPTISIKR--KLPF-----SNFYNG-N---YILDFFY---KII--RLI--66
1306177980 -----MKKFKELGKNGKASKILTLATL--KPKDKNKIRI--IFE-----TQAIQS-TR---VPLKFFY---KIS--RI--62
1057133340 -----MQNNHETLKNLKKINSFILLDLGK--LKVKKNIIDNNENL---QIKG-----NNKIKN-SI---TFSRKLK---KIS--KL--66
1015114672 -----MESKQFINI-FNGL--KLKVERETQKLPKN---NLT-----IQAYQN-SK---NISKEFY---KIS--KII--53
1207124865 -----MNNINKLQEEQHSPLAHFL--NFKELTITVKEQKL--KVA-----IDFYQS-QA---IKTYEYF---KIS--KIIISASRYK--71
1205713717 -----MKARVNIKEEKSGKFAIHLYSTTNTKRLSLVIV--KARI-----SKSLT-DW---LTIIDFFY---KVI--F-----56
1202921271 -----MMKKEQEKIKEELKNIEENMPQLSPNAGTW--HIEVYTKKNDADAEQ---EPK-----LGRYDA-EV---PSSNFFY---KIS--KMFVLP--75
1122343331 -----MKKNCKREAIYNEIKQWITDKDLPVWNTLGVVWVETDKTQNH--FAIH-----LSKYS-EP---SFVNFY---KIS--KMFVLP--75
1604611437 -----
```

1604690910 ---MKEEQEKIKEKQVQNWMAENK...LSLNSDWT--NIDVFENKKNTEFY---KSLK-----LQKYNA-EL---TESDFFY---K...S---KMHIL----- 72
1116761953 ---MMKNLSIQMGEH--DKIKKVIDSNTIHK---NKIK-----VKNS-NN---YQNCNFFY---K...S---KILSFESEK----- 60
1300684408 ---MKKNLSIQMGEH--DKIKKVIDSNTIHK---NKIK-----VKNS-NN---YQNCNFFY---K...S---KILSFESEK----- 59
1806909729 ---MIDDSEKYKDLISIEHPSIYDLH--KISISHQKSNKSK---RFYI-----MKYAG-EG---SILDFY---K...S---KILSFESEK----- 70
1019258132 ---MEDNKAKEPLKFL--TPVPDVKITPEVRG-----NTYNA-GA---FDVIFFY---K...S---LLVTHESNLSINNIEV----- 66
1080819527 ---MKNKSGEAPLAFHVL--DKNDNATKKRFRN---AE-----SKFQT-NN---HPFVFFY---K...S---ILGKKNKG----- 57
1004548170 ---MKKSKDLIEALNAEAPLILKMM--KQTKNLTPNYSTFK---KLFE-----VEKYDS-KA---VRLVQSY---K...S---KL----- 63
1004550496 ---MKKSIQIIKDKS--PLTLKMM--KKSKNATPKMQYK---TLFQ-----VSLYES-SQ---VRVVFY---K...S---KL----- 60
1701928595 ---MQLIKTEPLFHKH--TITETATIKKAKKE---HIL-----IKIGS-DK---ISTEFY---K...S---KILSFESEK----- 61
1701928322 ---MKNDLLKQVPLIQNA--TVQKILQKHTT---KILS-----IKYQS-TQ---NTSDIFY---R...S---KL----- 53
1081398938 ---MKKNIKQVEMFLLYQL--SEVEEIGGGEPQIP---VVSRRPNRVIKMEVYES-VK---TPTGGAP---K...VT---KSFNFFK----- 69
1702143276 ---MKPLIRNKQLPIYQL--EERTPTSGTKT---VLIK-----VKS-NA-T---LKTGFH---R...S---KILSFESEK----- 58
1105847656 ---MPDHLKNIIRN...GSYILRDLPLFSPNEKLPDYRN---LNIK-----SSFNGSGI---YLSKFFY---K...S---KILSFESEK----- 62
1604693137 ---MKNK...KKSILKNL--KPVSGGKA---VLID-----IDRNS-SE---TFSPIFY---K...S---KILSFESEK----- 57
1500393663 ---MNNK...APLFLRSI--EERKISQHKESSENE--KYCY---SQKYGYCI---FRKSNRW---K...IA---ISINNDDK----- 63
1085296070 ---MKNLLKEMKLEKEPLIFSH--NPVDETIKKNREY---RIK-----TRFQS-KI---YCLRYK---DGIN--ISTE----- 66
1095771966 ---MSYKLIKEMKINKEPLAFSLI--ERVDYINTVLRKI---SPYIN--GY---FMKVFH---K...I---RLL----- 59
1102742539 MLFPKNEMKTLKEMGEYKKEPLIFSH--MPMDIKKIKRERPF---RVE-----TSIQS-EI---YCLRYK---DGIN--ISTE----- 74
1604645044 ---MKKSLIQELKHKEPLVFNFI--FPFDDTKARRNNLS---RVT-----TSIQS-EI---HCLRYK---DGIN--LYTEQ----- 66
1085906968 ---MNRK...KKNFLYFLMDVFEKQIESFNDDQQNFS-DIVF---SKFNT-SK---LTKVYD---K...T---PFINLNFHEEL----- 69
1013201691 ---MKNINLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NN---LKVLYD---K...T---PFDIKLFDDE----- 67
1043764038 ---MKNINLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NN---LKVLYD---K...T---PFDIKLFDDE----- 67
1008400074 ---MNLK...INLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NN---LKVLYD---K...T---PFDIKLFDDE----- 70
1012269384 ---MNF...K...INLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NS---LKVLYD---K...T---PFDIKLFDDE----- 70
1403778845 ---MKNINLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NS---LKVLYD---K...T---PFDIKLFDDE----- 67
1074098712 ---MNLK...INLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NS---LKVLYD---K...T---PFDIKLFDDE----- 70
1024086609 ---MNLK...INLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NS---LKVLYD---K...T---PFDIKLFDDE----- 70
1114742664 ---MNLK...INLYYTLTPKLEYLKISLNAPSNNKYNIL---SKRYNT-NS---LKVLYD---K...T---PFDIKLFDDE----- 70
1038225731 ---MKRFLERFNS...EKDLSLNLAL--LAEBEIDENKVEYVMKVEYRSL---CSYNN-KD---HVSFQYF---K...I---IPDDI----- 69
1035268641 ---MTKQENFKLLKNREISLNFNI--TIKQISIAIG--KVA---IDYDT-NR---FHVSTNV---K...V---RL----- 62
1015112256 ---MEKKTSEFQFFKERNL...PYFKDL--KATK-LVVDNNTITIN--KIFN---SNEFNS-KY---CIVREYF---K...I---V---RL----- 66
1086846106 ---MEEKIFKSLNE...LPSARFW--EKLPQKRSQHQKNGK---KVA---IDYDT-NR---FHVSTNV---K...V---RL----- 62
1022634858 ---MKIN...E...L...PYFKDL--KATK-LVVDNNTITIN--KIFN---SNEFNS-KY---CIVREYF---K...I---V---RL----- 66
1017538469 ---MEAKKTKEEIVEHLER...K...L...L...V...NV---TVIEKNKVTG--K...IT---VFSY-T-SG---ISISNYL---K...VT---RPFHE----- 69
1050776254 ---MKKFI...SNL...DK...L...S...Y...LL--E-ADGYSSKNFKNEM--KCEK---AEKNA-KG---YELLSFY---K...S---KILSFESEK----- 62
1008126603 ---MIDKEEIKQVLFK...E...L...S...F...QT--IVRDKVDFSKKNL--K...V...K---SIYKD-GD---YQIFPYF---K...I---QF----- 63
1089032244 ---MTKKEIKVYLK...N...K...E...L...P...S...F...EL--KYRESIENISY--K...I...V---SEKY-T-DN---FPIYFY---K...I---R----- 62
1049905012 ---MEKDLNEFFENK...E...L...P...M...Y...Q...P...K...E...N...D...N...I---E...V...I...H---VEK-NT-TK---YKVRFYF---R...L...P...I...K...L----- 60
1008125305 ---MEKNKIL...E...E...K...L...S...Q...N...I--ELKENLSAVTG--K...V...P---VEKYNT-KV---YPFLQFY---K...I...T---R...I...I----- 58
1085296302 ---MKKVITK...L...K...N...K...L...P...L...Y...N...I...Q--KELSDKLLGDI...P...M---M...Y...S...N---SDLYOT-RG---YVVEGSR---I...V...I...S---K...I...S----- 62
1604691190 ---MKKIT...T...K...N...K...N...K...L...P...L...Y...N...I...Q--KELSDKLLGDI...P...M---M...Y...S...N---SDLYOT-RG---YVVEGSR---I...V...I...S---K...I...S----- 62
1004551140 ---MKD...L...L...F...N...A...L--KTVKSNSKKEG--F...V...T---CSQ...QT-KR---LELNAYY---K...S---N...L...K...K----- 52
1102458186 ---MKNI...I...Q...E...K...N...L...P...L...F...Y...L--EITKRRKTIKRSVQIA--Y...T...K---SKYOT-DF---LLIEEPE---K...L...V---R...L----- 60
1028377461 ---MKKN...E...Q...H...L...P...L...F...Y...L--EFLPKTARMSYD--N...I...V---CKYOT-NF---YGNISV---K...L...V---R...L----- 56
1079182110 ---MKNK...F...E...K...N...L...P...L...K...Y...M--ECFRVNNPKIEDIYKN--D...I...V---CKEYOT-DF---LMKAKPV---K...L...V---R...L----- 60
1506937980 ---MKNK...Y...E...K...N...L...P...L...K...Y...I--ENFRDASAEIQDSHKI--N...V...I---TVEYOT-NF---LMRIKPT---K...L...V---R...L----- 60
1604652443 ---MKNK...Y...E...K...N...L...P...L...K...Y...I--ENFRDASAEIQDSHKI--N...V...I---AIOYOT-DY---LMTMKPT---K...L...V---R...L----- 60
1016680128 ---MKRDEPT...K...E...H...L...P...L...F...Y...I--DVVNSKSRKRYFS--I...I...S---CEKY-T-DF---YAKLNEY---K...L...V---R...L----- 60
1604617185 ---MKRDEPT...K...E...H...L...P...L...F...Y...I--DVVNSKSRKRYFS--I...I...S---CEKY-T-DS---YAKLNEY---K...L...V---R...L----- 60
1011496328 ---MKNK...F...T...P...K...E...H...L...P...L...Y...N...Y...M--EMIKNKREKSIAN--T...I...A---SEKYOT-DF---YTPSKPY---K...L...V---R...L----- 60
1095770552 ---MKK...I...S...E...K...N...L...P...L...F...Y...I--EFSKNKLPKDKSKLT--F...V...E---CEKYOT-EF---LVRSKPY---K...I...T---R...L----- 60
1604643112 ---MKIK...V...E...K...N...L...P...L...F...Y...I--ESFNDQKLLKNNDVI--Y...L...D---CEKYOT-NF---YIRERPI---K...L...V---R...L----- 59
1604648334 ---MKIK...V...E...K...N...L...P...L...F...Y...I--ESFNDQKLLKNNDVI--Y...L...D---CEKYOT-NF---YIRERPM---K...L...V---R...L----- 59
1011495981 ---MKKL...F...E...K...N...L...P...L...F...Y...I--EKLGTKSNKNDKNSINI--H...V...E---CET...Y...OT-DY---LMRERPI---K...L...V---R...L----- 61
1085297867 ---MKKLY...E...K...N...L...P...L...F...Y...I--EIPKTKNVSKIHSMSV--Y...V...V---SEKYOT-EY---HVREKPL---K...L...V---R...L----- 60
1095767320 ---MKKLY...E...K...N...L...P...L...F...Y...I--EIPKTKNVSKIHSMSV--Y...V...V---SEKYOT-EY---HVREKPL---K...L...V---R...L----- 60
1095776607 ---MKKLY...E...K...N...L...P...L...F...Y...I--EIPKTKNVSKIHSMSV--Y...V...V---SE...Y...OT-EH---HVREKPL---K...L...V---R...L----- 60
1604692379 ---MKKL...F...K...E...K...N...L...P...L...F...Y...I--EELRTKNNKNSTG--N...V...V---CEK...F...OT-DY---LREMP...I---K...L...V---R...L----- 60
1604610696 ---MENQ...P...F...E...K...H...L...P...L...F...Y...I--ELIKTKTSGKGNKNI--Y...I...T---CKYOT-DF---YVREKPF---K...L...V---R...L----- 60
1079182107 ---MKNT...P...F...E...K...H...L...P...L...F...Y...I--TKGNVNVNKNRSNTA--Y...L...E---SKY...S...-DF---YVREKPF---K...L...V---R...L----- 60
1079179758 ---MKND...F...E...K...H...L...P...L...F...Y...I--EYFKHKNSKIDSNNTI--C...V...L---SEKY...S...-DF---YVREKPF---K...L...V---R...L----- 60
1079170133 ---MKND...F...E...K...H...L...P...L...F...Y...I--DFDNTDSKMITSNTK--C...I...L...R---CKY...T...-GF---YVREKPF---K...L...V---R...L----- 60
1604802081 ---MKNE...F...E...K...H...L...P...L...F...Y...I--DFDNTDSKMITSNTK--C...I...L...R---CKY...T...-GF---YVREKPF---K...L...V---R...L----- 60

D.

Cluster23 and homologs

1064363960 [red] SKQNNQIKSHSINLDSLITSLNTQEKKEKFLVNLFQDQVRNSDRENEI----LKRNNYNVDSSEYQDYRRRIKE----VD 90
1091210526 [red] ---MKIRIVNFFLSLLFKVDOVRGKYGVL-----VVKI-----TD 35
1091100979 [red] ---ML-----VVKI-----TD 8
1091209206 [red] ---ML-----VVKI-----TD 8
1091136844 [red] ---ML-----VVKI-----TD 8
1091234973 [red] ---ML-----VVKI-----TD 8
1091111073 [red] ---ML-----VVKI-----TD 8
1090995448 [red] ---ML-----VVKI-----TD 8
1091125220 [red] ---ML-----VVKI-----TD 8
1091055562 [red] ---ML-----VVKI-----TD 8
1091167037 [red] ---MKIKIVNFFLSILFKVDOVRGKYGVL-----VVKI-----TD 35
1017537694 [red] [red] QNKIKITQLDYKELQQLAEAIRIDQLRQLPEATA-----KFGADSDELKHIWKILHK---QD 75
1507123407 [red] [red] KKEEKTDSYFKVRKTLKVLKLEDOYRQATTDDW-----KEQGGK---LD 61
1506709129 [red] [red] KKEEKTDSYFKVRKTLKVLKLEDOYRQATTDDW-----KEQGGK---LD 61
1028378095 [red] [red] KKEEKTDSYFKVRKTLKVLKLEDOYRQATTDDW-----KEQGGK---LD 61
1604649744 [red] [red] KKTENYSEVRKTLKVLKLEDOYRQATTDDW-----AP-----LD 55
1604693139 [red] [red] KSTLSPTKEKRNLTLEIDAGTDOAYIPQGGYA-----NYSRQRWSSFKDS---VM 67
1034294064 [red] [red] MAVDLSQAMHACPGAAPFIEAQAQRAALSVGFSVSDVRRERL-LALQDEDQRLYERLASGSVDVTLMP---VK 92
1701082198 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66
1701091927 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66
1701098556 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66
1701107844 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66
1701085478 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66
1701063269 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66
1701088627 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66
1701069525 [red] [red] MDACPGAAKFIAQISISQLAAGPKAPAVTDEAKRHRI-LEHEEEDQRLYEQLASGSVNPTAFKE---LQ 66

1003372624 ---MLVLSAALGALVLPVPLGAVDLSQAMDACPGAAKFIQAQISLQLAAGPPKAPVTFDAKRHRI-LEHEEEDQRLYEQLASGGSVNPATFKE----LQ 92
1200090663 ---MDACPGAAKFIQAQISLQLAAGPPKAPVTFDAKRHRL-LEHEEEDQRLYEQLASGGVNPATLKE----LQ 66
1000489224 ---MLVLSAALGALVLPVPLGAVDLSQAMDACPGAAKFIQAQISLQLAAGPPKAPVTFDAKRHRL-LEHEEEDQRLYEQLASGGVNPATLKE----LQ 92
1000112493 ---MLVLSAALGALVLPVPLGAVDLSQAMDACPGAAKFIQAQISLQLAAGPPKAPVTFDAKRHRL-LEHEEEDQRLYEQLASGGVNPATLKE----LQ 92
1101210601 ---MLVLSAALGALVLPVPLGAVDLSQAMDACPGAAKFIQAQISLQLAAGPPKAPVTFDAKRHRL-LEHEEEDQRLYEQLASGGVNPATLKE----LQ 92
1091018262 ---MDNNTATLNSNLAIVDQLRNKIFSET-----LMQK-----FD 34
1091256281 ---MDNNTATLNSNLAIVDQLRNKIFSET-----LMQK-----FD 34
1091176042 ---MDNNTATLNSNLAIVDQLRNKIFSET-----LMQK-----FD 34
1033412857 ---AQVLPQARPECAAVPQIRTMIDIDQLLVLVNLQPP-----GDTSLDALLLR-----TD 65
1303959073 ---MQLLSAQGKEQFLANAWSVQL-----CA-----ID 27
1300606538 ---FARPQEQPMASVEVEGVNADYRQLLQAQDQIRLVLKDYT-----PQQLQNDPGSARALALXHA-----SQ 86
1049540699 ---MLGMLLWQLATMGHAVAGTGHSSQPD-HQSMNASYRQLLAADADQIRLIRGAT-----VQQLQANQGAAKEMAMPLVA-----SQ 79
1081417263 ---QGVATDSKALQSGHQSMNASYRQLLAADADQIRLIRGAT-----PQQLQANQGAAKEMAMPLVA-----SQ 84
1203949331 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203760654 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203785350 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203805937 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203792350 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203852386 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203773865 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203741733 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203848578 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203948816 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203891105 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203752654 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203955172 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203885689 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203813176 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203894677 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203714212 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203794393 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203978383 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203825023 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1203988106 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1114737733 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203871641 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203765404 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203936693 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203914376 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203897480 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203736703 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203923455 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203714688 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203932523 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203927777 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203878120 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203882381 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203981868 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203910183 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203919133 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203917928 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203960538 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203708059 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203798348 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203901836 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203754395 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203817186 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203940998 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203857187 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203821751 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203966786 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203862519 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203835242 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203729303 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203779155 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203747334 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203719954 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203767106 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203724032 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203963496 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203867268 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203736652 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203783979 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203831230 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203837418 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203974736 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203866957 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203844643 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1203808660 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1084153285 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1084167088 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1082907377 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1084162744 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1082902114 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1082897639 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1085622206 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1084157524 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1082143499 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1904335826 ---MVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 82
1104577954 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1806099227 ---MKMVLGMLLWGWAMPVQAFADAEQPARQOSMNASYRQLLAADADQIRLIRGAT-----AQQQLANQGAAKEMAMPLVA-----SQ 84
1501657983 ---MKNLIKIPVLFVAFIFAYINVGQIDTILRDKINQAKIDQWMMNPKNAN-----SESETSWARH-----IY 65
1090975247 ---MKQSYPPVTTKVDIKRIFAKLILAKIDQIRIKYFSKNE-----KYLDKMMK-----VD 52
1806863047 ---MTCEPRRPIARSLGAEARELRLLRGLL-----SESETSWARH-----TD 45
1091236563 ---RASNKWDSE-----ID 12

1091273272 -----MRASNKWFES-----ID 12
1091169967 -----MAVYKRYANIYSAFIHQARINPKISIS-----LKK-----ID 36
1091193520 -----MAVYKRYANIYSAFIHQARINPKISIS-----LKK-----ID 36
1091190115 -----MAVYKRYANIYSAFIHQARINPKISIS-----LKK-----ID 36
1091254628 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091035071 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091203206 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091210742 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091205158 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091137286 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091173617 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091234491 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091150044 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091199422 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091208725 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1008483832 -----MKYSKIAQINEFAKIDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091132924 -----MTPKYSKVAQINDAKIDQLRNRFPSKFS-----ISGDKKNLAD-----FD 44
1091105593 -----MKYSKVAQINDAKIDQLRNRFPSKFS-----ISGDKKNLAD-----FD 42
1701924761 -----MMITACKTKNI PYSEKMK DLKVMYKIDQIQNIINTSN-----EKVDKSELERKRYA-----IF 56
1504402626 -----VEHDIAAAL ELADMGADQSSAANSDDP-----ARQLAWRR-----LT 41
1502349055 -----VTHDVAALA ELMDAAADHRTAVANSDDP-----AEQLAWRR-----LT 41
1091155140 -----MEKFKNKALAEI SSSAKIDQERSVRQKQK-----LYSLAK-----SD 41
1115923480 -----MPVGRDPERWRRV-----VTP-----VD 18
1505624847 -----MPDPTPPQRRAVA ELLRMAADQARVRENGS-----VAPDNDLMRT-----VD 47
1091169964 -----MKSQKLNQKLI EIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091193517 -----MKSQKLNQKLI EIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091190112 -----MKSQKLNQKLI EIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091068289 -----MVPNKKIKES LLLLEIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091000951 -----MVPNKKIKES LLLLEIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1090982346 -----MVPNKKIKES LLLLEIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091056744 -----MVPNKKIKES LLLLEIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091004012 -----MVPNKKIKES LLLLEIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1090984164 -----MVPNKKIKES LLLLEIEMFDDQLRNRFPSKFS-----ISEEDKKALED-----FD 42
1091392317 -----MSIDRKRIRDIQVAKIDQVRQQWRDVQLNKRHLDRKNNEYKRVIAGLIKLRI-----LD 59
1091393958 -----D-----0

1064363960 SINVLSIKLKE--GYPVFKSKNPKVIAIRIVCIHQ--SFNKQLELFPYIKAYNDGINS EFSFLNRMHIMK-----YGESY-----P 170
1091210526 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 130
1091100979 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1091209206 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1091136844 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1091234973 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1091111073 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1090995448 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1091125520 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1091055622 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 103
1091167307 TITTNILKFLIGT--GDFVVKLGESGVNRFIILSCH--SR--DLKLFESICES--DEILKCTSDREKVAIDNALVRSQKQRFGEIMQIHKNMDGKSVS 130
1091753794 RNNKRVKHIIDT--GWLKSDIGEMANQLWLVIOHQA--IDVQKYLQLEASVKKGASEGWHLAL EDRIIMRRKQKQRYGTQAK--KDKLSGITIYI 170
1507123407 RNNKIVKIIDS--GWLKSDIGEMANQLWLVIOHQA--AD--KLSTMEKYL PMLKEAANKGAEKQAADRIDVELLNKRKQIYGTQYS--IKENG---A 154
1506709129 RNNKIVKIIDS--GWLKSDIGEMANQLWLVIOHQA--AD--KLSTMEKYL PMLKEAANKGAEKQAADRIDVELLNKRKQIYGTQYS--IKENG---A 154
1028378095 RNNKIVKIIDS--GWLKSDIGEMANQLWLVIOHQA--AD--KLSTMEKYL PMLKEAANKGAEKQAADRIDVELLNKRKQIYGTQYS--IKENG---A 154
1604649344 RNNKIVKIIDS--GWLKSDIGEMANQLWLVIOHQA--AD--KLSTMEKYL PMLKEAANKGAEKQAADRIDVELLNKRKQIYGTQYS--IKENG---A 148
1604663139 ADNKRFAELLTKK--GYLGFVKVGEKGTQVWVIOHQA--IDVQKYLQLEASVKKGASEGWHLAL EDRIIMRRKQKQRYGTQAK--KDKLSGITIYI 170
1034294064 ERHLSYLQQLGDS--A--P--VEGRDGLALWLLIOH--AD--DPSLQAKALANPEPIVKRGLDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 187
1701082198 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1701091927 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1701098556 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1701107844 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1701085478 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1701063269 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1701088627 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1701069525 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1003376264 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 187
1200090603 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 161
1000489224 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 187
1001212943 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 187
1010210601 RNNRYLKLGHAVSIP--IEVGRDGLALWLLIOH--AD--DVELQSKALKPEPMVKSQIDASKFA--SDRVLASGKQRFQSGQLR--SPTTG---P 187
1091018262 HISTDVIKALVDK--G--PPENVGVEAARYEIVLLIH--TS--DSYVSTLSNT--PEFRVVDYNKD--DLA--LKDRIILFKGKQCFGTVVVTH--KOKKGKFTV 129
1091256281 HISTDVIKALVDK--G--PPENVGVEAARYEIVLLIH--TS--DSYVSTLSNT--PEFRVVDYNKD--DLA--LKDRIILFKGKQCFGTVVVTH--KOKKGKFTV 129
1091176042 HISTDVIKALVDK--G--PPENVGVEAARYEIVLLIH--TS--DSYVSTLSNT--PEFRVVDYNKD--DLA--LKDRIILFKGKQCFGTVVVTH--KOKKGKFTV 129
1033412857 TRHTGALKAIIRRR--GWP--A--RYDAPTAAWLLAQH--AD--DVRVQMRVTLKIRGSIAGDADSR--EFA--SDRISLQKQKQVYGSQMLVADSGIAELPP 163
1303959073 KQNAHELRREIKL--GWP--I--THGAQA--AWLVAQH--S--DLE--QEAVALTIKIPLLAIKEVAPRHYA--ADRVALKKTIGKQRFQSGQLR--MECAQGRVL 120
1300606538 QONQALALMAK--GFP--I--VAGSDGAGFLVAQH--AA--DRT--F--ADAF--L--GQQA--A--EKG--RYSK--DLA--VDRNRLVSGQPQYGTQ---KADG---L 177
1049540699 RNNQALALIEK--GFP--I--V--L--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--K--F--D--E--F--L--K--N--I--E--V--A--A--G--G--S--Y--S--T--D--A--L--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---KADG---L 170
1081417263 RNNQALALMDK--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---KADG---L 175
1203949331 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203760654 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203785350 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203805937 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203792350 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203852386 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203773665 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203741733 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203848578 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203948816 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203891105 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203752654 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203955172 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203885689 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203813179 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203894670 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203714212 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203794393 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203978383 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173
1203825023 RNNQALRLIDQ--GFP--I--S--V--G--D--G--A--G--F--L--V--A--Q--H--S--T--D--R--F--D--D--F--L--K--Q--M--A--A--S--E--R--G--S--Y--S--T--D--L--A--V--D--R--N--L--I--M--S--G--K--P--O--R--Y--G--T--Q---FRADG---L 173

1203988106 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 173
1114737733 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203871641 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203765404 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203936693 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203914376 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203897480 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203736703 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203923455 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203714688 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203932523 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203927777 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203878120 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203882381 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203981868 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203910183 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203919133 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203917928 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203960538 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203708059 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203798348 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203901836 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203754395 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203817186 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203940998 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203857187 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203821751 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203966786 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203862519 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203835242 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203729303 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203779155 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203747334 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203711954 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203767106 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203724032 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203963496 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203867268 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
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1203783979 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203831230 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203837418 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203974736 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203866957 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203844643 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1203808660 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
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1084167088 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
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1084162744 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1082902114 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1082897639 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1085622206 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1084157524 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1082143499 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
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1104577954 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
1806099227 RENQALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 175
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EANQKFEKINE-GL-ITSKYGEAQAFLIVQHMPREDVFKFKYLLMKKSMA--GYPTNIVAVDRVRNWEKQLYGTOFMPVEGLESTYKL 162
808663047 HANQVLRVVDGWPBRSLVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 141
1091236563 MNKKEKLVKIVYK-GWPBRSLVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 141
1091273272 MNKKEKLVKIVYK-GWPBRSLVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 141
1091169967 NASTRALKQIVSK-GWPBRSLVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 139
1091193520 NASTRALKQIVSK-GWPBRSLVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 139
1091190115 NASTRALKQIVSK-GWPBRSLVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 139
1091254628 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091035071 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091203206 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091210742 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091205158 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091137286 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091173617 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091234491 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091150044 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091199422 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091208725 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1008483832 KNSDDIKSIVSE-ICLPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091132924 KNSDDIKNIVIE-GPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1091105593 KNSDDIKNIVIE-GPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 136
1701924761 KTNSTLKNIFEE-GYPISNLIGKKGKMFNF FILVQH-QDYDLELQKNCLEJY-----CDFAKDRAHIDRVLHHEGKQLYGTOFQ-RDAENNRMTS 155
1504402626 ARHGDFLGEINDA-GWPAALVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 137
1502349055 ARHGDFLGEINDA-GWPAALVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 137
1091155140 MARLRQMIKRVNK-GWTRKLVGKRAHAWLLIQQ-GDDVQKFEYCLIKLIQA-----GEND--- 99
1115923480 QNLNRAVAVDE-GWPAALVGEAAAWIAH-ADHLPDFQRLVLLMATAVERGCVPIQRWAVYDRCSVNDGGTQLYGTOYR-LGADG-VVEV 112
1505624847 TQNALRLIDGFPISVGEDGAGFLIAQHSTDRAFDDFLQKMQAAORGAYSTDLAIFIDRNLMSGKPORYGTO---FRADG---L 142
1091169964 ATHNTKRIIRNK-GYPISNLIGKKGKMFNF FILVQH-QDYDLELQKNCLEJY-----CDFAKDRAHIDRVLHHEGKQLYGTOFQ-RDAENNRMTS 155
1091193517 ATHNTKRIIRNK-GYPISNLIGKKGKMFNF FILVQH-QDYDLELQKNCLEJY-----CDFAKDRAHIDRVLHHEGKQLYGTOFQ-RDAENNRMTS 155
1091190112 ATHNTKRIIRNK-GYPISNLIGKKGKMFNF FILVQH-QDYDLELQKNCLEJY-----CDFAKDRAHIDRVLHHEGKQLYGTOFQ-RDAENNRMTS 155
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1504402626 WF--CEDPERMDLR AVGI AP--FA--E V V A G F A P S----- 168
1502349055 WF--CEPERVDELR AVGV EP--FD--E V V A R F S----- 166
1091155140 E--V N L P R L D R R K T G L S S--FD--E Y K I K E K E W K N E S G R F R Q E S P V----- 143
1115923480 YE--V D P E L D R R A V G L E P--HA--A Y D A R I T R A M----- 144
1505624847 WD--V D P D L Y R R R E V G L E P--HA--D Y A L A R T V D A G C----- 176
1091169964 RP--I D K K N V D R R K I G L R P--LK--Y D L V A M N K K F Y N K----- 190
1091193517 RP--I D K K N V D R R K I G L R P--LK--Y D L V A M N K K F Y N K----- 190
1091190112 RP--I D K K N V D R R K I G L R P--LK--Y D L V A M N K K F Y N K----- 190
1091068289 YL--I D K K N L R R R N A G L E S--FT--V N M K R L R L N V G L N K K N K R K N I K E V----- 180
1091000951 YL--I D K K N L R R R N A G L E S--FT--V N M K R L R L N V G L N K K N K R K N I K E V----- 167
1090982346 YL--I D K K N L R R R N A G L E S--FT--V N M K R L R L N V G L N K K N K R K N I K E V----- 180
1091056744 YL--I D K K N L R R R N A G L E S--FT--V N M K R L R L N V G L N K K N K R K N I K E V----- 180
1091004012 YL--I D K K N L R R R N A G L E S--FT--V N M K R L R L N V G L N K K N K R K N I K E V----- 167
1090984164 YL--I D K K N L R R R N A G L E S--FT--V N M K R L R L N V G L N K K N K R K N I K E V----- 180
1091392317 FP--I D P R R L N K R E I G L E P--FL--A Y N K R M R A L V S----- 187
1091393958 FP--I D P R R L N K R E I G L E P--FL--A Y N K R M R A L V S----- 107

E.

Chryseoviridin precursors

WP_099768145.1 MKDKNSKK PFFA FLE QL D P E T V G G-----GNITIPERDV-I-TKPFVDN--TSPK D L M Q T K PSD D D D F S V P V D----- 75
WP_048502161.1 MKDKNSKK PFFA FLE QL D P E T I G G-----DTGIITD TLKDS-I-TKPSIDV--TSPK D M M H T K PSD D D D A P T V P L D----- 77
WP_034745973.1 MKDKNSKK PFFA FLE QL D P E T I G G-----SNVTNLKDS-I-TNPAVDI--TSPK D L M V T K PSD D D D A P T I P L D----- 75
WP_048506193.1 MKDKNSKK PFFA FLE QL D P E T I G G-----DTSIITNLKDS-I-TKPAVDV--TSPK D M M H T K PSD D D D A P T I P L D----- 77
WP_062648812.1 MKDKNSKK PFFA FLE QL D P E T V G G-----DSGIITIPERDV-I-TKPSIDV--TSPK D M M H T K PSD D D D A P T V P L----- 76
WP_068944162.1 MENKNSKK PFFA FLE QL D P E T V G G-----TIITIPERDV-I-TKPIID--TSKL D M E H T K PSD D D D S A E L----- 72
WP_079242686.1 MESNNSKK PFFA FLE QV D P E T V G G-----SDITLAERDL-I-TKPTIDT--TSPK D M M H T K PSD D D D T I T L P L----- 74
WP_002977592.1 MKNNSKK PFFA FLE QV D P E T V G G-----GDITLAETDL-I-TKPTVDT--TSPK D M M Q T K PSD D D D V I N L P L----- 74
WP_062696861.1 MKNNSKK PFFA FLE QI D P E T V G G-----GTEIITPEKDV-I-TKPSVDT--TSPK D M A H T K PSD D D D V P T L P L----- 76
WP_034710238.1 MKNNSCK PFFA FLE QL D P Q V G G-----TDIITIPERDA-V-TKQIDS--TSPK D L A H T K PSD D D D Y S P T V----- 73
WP_072952774.1 MKNKDSKK PFFA FLE QL D P E K I G G-----GDITLATQDI-I-TKPTLDT--TKPT D M M Q T K PSD D D D T Q V V D L----- 74
WP_089790527.1 MKNNSKK PFFA FLE QL D P E K I G G-----GDITLATQDI-V-TKPAFDG--TKPD D M A Q T K PSD D D D V Q V V D L----- 74
CdnA1 -MENRNSK PFFA FLE QI D P E K I G G-----AVTSALVDNVTNVNKN-D-V-TSSLLDH--TKPG D N V T K PSD D E D G N A V----- 77
WP_029295142.1 MKNNSKK PFFA FLE QL D P E K I G G-----GDVIATQDGPITTSKTADA--TKPI D M A Q T K PSD D D D A P T V----- 74
WP_034682457.1 MKNNSKK PFFA FLE QL D P Q S V G G-----GPDITIPERDV-----TKPT D L A H T K PSD D D D A P T V----- 65
WP_054513233.1 MKNKDSKK PFFA FLE QL E P Q V G G-----TDITIPERDS-V-YSPPG--TMKP D M A Y T K PSD D D D A P V V----- 70
WP_089755757.1 MKNNSKK PFFA FLE QV D P E T V G G-----SGIITIPERDT-----TKPT D L A Q T K PSD D D D V Q S V----- 65
WP_027380633.1 MKNNSKK PFFA FLE QI E P Q V G G-----GITKPEVDT-----TKPI D M A Q T K PSD D D D V Q S V----- 64
WP_002977591.1 MENKNSKK PFFA FLE QV D P E T V G G-----GITSVLADQIITSLQDQ-I-TTPLKDN--TKPD D N V T K PSD D E D V L E V----- 78
WP_03469857.1 MENKNSKK PFFA FLE QV D P E T V G G-----GITSVLADQIITSLQDQ-I-TTPIKDN--TKPD D N V T K PSD D E D V L E A----- 78
WP_073294271.1 MKNNSKK PFFA FLE QI D P Q T V G G-----AITTLAQDT-PTTSLKDT--TDRO D Q V T K PSD D E T G E L----- 71

WP_034710235.1 MNKKKSKK PFFA FLE QL D G Q S V K GG -----VMTAVTLDA-PTTSVLKDD--VTPGQDQV-T K PSD DEAGYEV----- 71
 WP_034710236.1 MKNKKKSKK PFFA FLE QV D G Q A V K GG -----AITSVLVDS-PTTSLRDS--ATQSDQV-T K PSD DEAGELS----- 71
 CdnA3 MKNKNKSKK PFFA FLE QL D PEKI K GG --GVSTSLKDVVTPSLGDT-L-TLKTLDN--CTTPAADTPVT K PSD DEGGFDPGPPGLDPEIHP 91

WP_099768147.1 -MEKKNSK PFFA FLE QI D PETI K GG --GITTPTDVLTVPVRDT-VTTSPPFLDN--ATLPSDQIVT K PSD DESGELEIL----- 81
 WP_048502163.1 -MEKKNSK PFFA FLE QI D PEKI K GG --GITTSTDDVITIPERDN-VTTSPPFLDN--ATPLDQAVT K PSD DESGELDIL----- 81
 WP_062648816.1 -MEKKNSK PFFA FLE QI D PEKI K GG --GITTPTDVLTVPQRDV-VTTSPPFLDN--ATSQLDQVVT K PSD DESGELEVL----- 81
 WP_048506190.1 -MEKKNSK PFFA FLE QI D PEKV K GG --GITTPTDVLTVPVRDT-VTTSPPFLDN--ATSTVDQIVT K PSD DESGELEVL----- 81
 WP_034745964.1 -MEKKNSK PFFA FLE QI D PEKI K GG --GITTPTDVLTVPVRDT-VTTSPPFLDN--ATLPVDQIVT K PSD DESGELEIL----- 81
 WP_034710233.1 -MEKKNSK PFFA FLE QI D PEKI K GG --GITTPTDVLTVPVRDT-VTTSPPFLDN--ATLPTDNLVT K PSD DEALDL----- 79
 WP_089790526.1 -MKKNGSK PFFA FLE QI N PEEI K GG --SVPTAPLTFDFVLTPTKDT-VTTSPTLDN--ATLPTDNLVT K PSD DEIGDLSDPGES----- 85
 WP_062696859.1 -MEKKNSK PFFA FLE QI D PEKI K GG --GITDPSMDIVTLPAQDQ-I-TSVNFDN--ATLPVDNLVT K PSD DEAGELDY----- 80
 WP_089755758.1 -MEKKNSK PFFA FLE QI D P Q A V K GG --GLTTPRTDIVTLPTNDT-I-TSPTFDN--STPTDHW-T K PSD DEAGDLS----- 77
 WP_062696860.1 -MKKNSK PFFA FLE QI D PEKV K GG --G-TTPDPTDVIHVPATDG-S-TSPVLDN--ATTPRDYIET K PSD DEAGNF----- 76
 WP_073294273.1 MKNNSK PFFA FLE QI D PETI K GG --AVTTPLDIVSDTRDV-A-TSPTFDN--ATLPTDHLVT K PSD DEAGI----- 77
 WP_072952773.1 -MKNDSK PFFA FLE QV N PEEI K GG --GIITSINNDVSLPTKDM-VVTRTSQDPI-TLPA DTPVT K PSD DEGGFNPGLGLEPLEP----- 93
 CdnA2 MKNKS K PFFA FLE QI D PEKI K GG -----SGDIITGVLKDS-V-TSALVDN--TKPGD VV-S K PSD DEGGDPV----- 73
 WP_034745967.1 MKDENS K PFFA FLE QI D PEKV K GG --G-TTPDPTDVIHVPVVDV-I-TAPILDN--ATSPSDHLIT K PSD DDSVN----- 76
 WP_048506191.1 MNNSK PFFA FLE QI D PETI K GG --NISSPDSVITAPSIDN-V-TRPVFDN--TAPSDLLVT K PSD DESGELEAF----- 82
 WP_048502162.1 MKDENS K PFFA FLE QI D PETV K GG --GIISNTDNDIVTAPSIDN-V-TAQIFDH--THPSDLLVT K PSD DDDVV----- 78
 WP_048506192.1 MKDQSK PFFA FLE QI D PETI K GG --GVITNTDNDIVTLPSRDN-A-TAQILDH--TSPNDLLVT K PSD DEDIV----- 78
 WP_099768146.1 MKDENS K PFFA FLE QI D PETI K GG --GIITSTNDIVTLPSRDN-I-TAQIFDH--TSPNDLLVT K PSD DEDVI----- 78
 WP_080780036.1 MTDQSK PFFA FLE QI D PEKV K GG --GPITTPDPTDVIHVPVVDV-I-TAPILDN--ATSPSDLLVT K PSD DESVL----- 78
 WP_034745970.1 MKNNSK PFFA FLE QI D PEKV K GG --GIITPEIDVITLPSIDN-V-TRPLDN--TNPSDLLVT K PSD DESVL----- 78
 WP_034682458.1 -MKKSK PFFA FLE QI D PEKV K GG --GIITTPSIDVITPTRDN-I-TSPVTDN--ATPGDHW-T K PSD DESGPLE----- 78
 WP_073294276.1 -MRQENSK PFFA FLE QI N PEKV K GG --LEITTALEESITITPTKDT-I-TSAILDN--TKPGDHW-T K PSD DDSV----- 76

WP_054513230.1 -MKKSK PFFA FLE QI D PEKV K GG -----SMTSELLEN-V-TTALQDT--TKPGD NV-T K PSD DEAGETS----- 69
 WP_034674310.1 -MEKKSK PFFA FLE QI DTKAV K GG -----ASATG-I-TTPLKDT--TKPA DQQT K PSD DESGV----- 64
 WP_089741992.1 -MEKKSK PFFA FLE QI DTKAV K GG -----ASGTG-L-TTPVKDT--TKPVDTHQT K PSD DEGSDI----- 65

WP_027380634.1 -MENKSK PFFA FLE QV D PEKI K GG --GTITSALQDNNTGALKDS-I-TSALQDN--TKPGD NV-T K PSD DEGGDTV----- 79
 WP_072952772.1 -MGEKSK PFFA FLE QI D PEKI K GG --GSITSALQDNATAPLKDS-I-TSSLQDQ--TKPGD NV-T K PSD DEDANAV----- 79
 WP_089790525.1 -MEEKSK PFFA FLE QV D PEKI K GG --GTITSALQDNNTGALKDS-I-TSALQDN--TKPGD NV-T K PSD DEDGDAV----- 79
 CdnA4 M K S K S K PFFA FLE QI D PEKV K GG -----TEVTLSTQDN-I-TKPLYDT--TKPT DMMQT K PSD DDDAPVV----- 72
 WP_029295141.1 -MEGKSK PFFA FLE QI D PETV K GG --TVTSLVLDNTGALKDS-V-TSTIDN--TKPGDHW-T K PSD DEDGTAI----- 77