

LLX01389 ---VKKVKKL---IFLSILSL---LV---QSKVANSESPQDLSVSEALLEGK-QDKNSITWYVQLVEKTSINLKLKLSN--GNEENNELISNQAVNANNITLDSLSA-EEVS--QYLHHSNSNINFWQD 116  
LCA00270 MDQASSTMKNDQALRLVLLVGLGLALMNM---FT---NLVSAVTSNSQALMVAVPLPSDNHVKGAGVYDLDLPEKSERRTITVQAVN-ASAQILKVNVAEITDAQTGANGVVS-VKAT-QANR--KVLPLAGSDLV 130  
BAT07091 MKSVVVKILISTLVVIFIT---LS---ISLKPFRVVVAEEKQDLSLFDVSVTHVDPN-QLGDIKRYVNLQVKKKQNTVKMDVHN-KANTPKRVNVKVANALSTSTNGGIMV-IPTRVQSILTDIDFVMDQV 124  
BCEA0045 MKSVVVKILISTLVVIFIT---LS---ISLKPFRVVVAEEKQDLSLFDVSVTHVDPN-QLGDIKRYVNLQVKKKQNTVKMDVHN-KANTPKRVNVKVANALSTSTNGGIMV-IPTRVQSILTDIDFVMDQV 124  
A1285 1286 c ---SHAQVBAEG-AEITVPEGLG-QDASLGYEALKAEKGGQYPTVNVQHN-NTKKTINDHNAQLVASTNSGSDIDTPPH-QKMV--KTAPLIPDLV 115  
LSA0175 ---MKRRLLIISIMILASGLM---RQ---ATPQVTAATAADAKQVTFMIPELIPDNIGGNKLGYNLKLKPNTEKTKIAANN-FTNKPIKVKVSAKDAQTADDGRIDLSDD-FVSK--QLLPEPGSQV 120  
LSA1727 1728 ---MRKYRRLVIMTMLVGMVLT---LGITGAQAAK---KSTIKLSAANKATFMLMPELIPDNIGGKQLGVNHLKPNQVKTIRIKVYN-PTEHTINLVGVKDATNDNASVDLGSN-ANNQ--QLLKRPGSQV 126  
PPE00557 ---MKKIFTL---VFIFVIST---LT---ANNVHADHKL-ASVSVTHVDPN-QLGDIKRYVNLQVKKKQNTVKMDVHN-KANTPKRVNVKVANALSTSTNGGIMV-IPTRVQSILTDIDFVMDQV 109  
LCA00104 ---MKRRA---LHALMVLV---IS---PFL---LAAGQTTATTEPFAVTPVLPSPN-QKQADAGYVDLQVDPQOQENLQKIRISN-LSDOVQVYTVLAVNPAVITDSDGALADRAM-PELN-QDAR-RENTLI 111  
lp 3413 ---NMGNKLLLLGLMLTLMITLLA---GM---TV---IGHAADTANNVAITDQPMLENEQLLSKDAKYWDKVPKPTISLAMRVN-RSNKKTINDHNAQLVASTNSGSDIDTPPH-QKMV--KTAPLIPDLV 120  
LSA0213 ---MRLKKTGGLA-VGLGGLI---LA---SNQFVSAAEHID-EVEKVSNR-QVDQENREFDGLIEPGKRETIQVLVHN-FSDNKIKVHSEIDNSITQGGGII-RPTK-DGIT--KETSHTLMDVA 115  
LCA00271 ---MKSKDTHHTQMRVQN---ISDNITVKSDDLNAITQDGGGIDTPST-KNLD-RSLKTPFTTVA 60  
LSA0173 0174 ---LKFVRRMLALSIF-AFVGLMLC---QM---TQVQAAAOQKADFEVQPIIPDE-QEDLSLNVNMSLAQQGQTKKTEMRIQN-FDDAITVHSDLRNSMTQVGGVVS-QANT-KGLD-PSLKVPTKTA 116  
LSA1729 ---VFRKLLNLLGLAIGVMGGFA---LS---QQVQADSTTEKADFEVQPIIPDE-QEDLSLNVNMSLAQQGQTKKTEMRIQN-FDDAITVHSDLRNSMTQVGGVVS-QANT-KGLD-PSLKVPTKTA 116  
LSA1816 ---MKKSLR---VELPLLLA---LF---LTPPTAAADTANFSIKKVDTFE-Q-TKAADFYDLAKPNQSTHLIANITN-ASDQOSTYVTLRNGVINDSQIADVPTN-KKAS--QGLNQLNSPTA 109  
LCR01867 ---MKNLE---LLLSIFIG---SI---LITQLPVQAD-ANFSIKKNEQV-Q-TKADAFYDLIPDSTAQSLITISN-NEEQTNKFKVSLNGLTNNLQGIS-AAPS-KATLFPSTSTTLSQLN 109  
PPE00547 ---MKRHSINNOVTKSRRLSTILVIMTLLLI---LH---FPN---SINASGVNNOVTFNAEAILPN-Q-HSEVSVYDLRVPGATQKFLIRLN-ITNAKQIMVTKTNNALTNQNGAIDSKSNAPLLG-GP--TKQLTI 125  
EF00339 ---MKTMRVLIIVTVTCVMALS---IP---SA---VQAEEDDNNTKFTVKNPISPE-QAANTQSVYDLKVPKQVVELSLIN-KTDEELTIDNLANAVTNDNGLIVNDPE-KKPD-SSLKVPPLTTL 117  
EF00981 ---MSRKKVGVIC---LFLTFE---II---VPKVEATEEMKTKFTVTPVLPEN-QVSGTSSVYDLIAPKQSTIVLIDIKN-KTDEKLSVITLANASTNDNGLIVNDPE-KKPD-SSLKVPPLTTL 114  
OEB1273 1274 ---MYKLLHNLILISLGL---LI---INGENASAKTAGFTKVPVSDA---NNHDFELKVNPNFTVTKLILIN-TSSSLKTEAEANATVGDGSLIQNLNRN-TGHR--KTKGKLVKMA 112  
lp 2174 ---VGVFRMRVQIGQVLLVLLAL---LG---GLLGLSPGQAASNTFASGFIITPLLPD-QLDKQAGYVNMKVTPGTSTFRVSVSN-PGKSAITLQVTPVNAITSDAGSVA-VPSK--RHD-PSATTITDMT 122  
EF00404 ---MKQREKFMGRI-AFLLLSIF---FP---SV---VQAEENTSTEKMGFTVESIIPDN-QVDTTKTYFLLAMKPNQKQVQLKS-LQDTPLTIQVGIHTAVSSVGAIDTNVH-PKFD-ASMKDPISSELV 118  
lp 1448 ---MKKMLCLFVIG-GLVFM---SN---TS---PSVQATATNAEVQSVNKPISPG-QEDASSPFEDLKAAGTQKQMRVYN-TDQOSTVVKQLLITFTNDSQIADTQTA-KRYD-ASLKVRFDOA 115  
lp 3678 ---LRLKVVIFQIRLMGVSLGES---LILGQTF---VS---ANNQOSVHNNSNGFVAAEAPKN-QIKHNSFFDLKMASGQQTILRTVYN-VTNNDIKVRTAHTAVTNTNGTIEINPA-KSYD-ASLKVRFDOA 123  
lp 2977 ---MKKMRVIGALLVMLISGLSAV---VF---AQATNIDTNNIGFVAAQVTFE-Q-TKAADFYDLAKPNQSTHLIANITN-ASDQOSTYVTLRNGVINDSQIADVPTN-KKAS--QGLNQLNSPTA 117  
lp 3066 ---MQLLKRIMVIVGTLLGLQVS---SVSGLAASNAS---SSSKTQSNDIGFVAAKIPNN-QIDQNSVYDLKMTKRGQQQVQTTIYN-VTNADIKVQTAHTAVTNGGITEVTPPT-KSYD-PSLKVRFDOA 126  
LCA00970 ---MKKIIIF---SLIALLS---LI---VF---GGAGVQVRAEAGVFTSPALPQN-QIDQS-TYVNLVPGPGETRLIIVKN-TTESAKKLV---SAPQOSNGTLGYPNK--HTD-KSAEYTHSGIT 107  
LX01222 1223 ---MKKYVFPFSL---LFIISFGS---QG---FV---NAQEISSSEKAENNTVFNPIGIS-QKKTQNTQSVYDLKVPKQVVELSLIN-KTDEELTIDNLANAVTNDNGLIVNDPE-KKPD-SSLKVPPLTTL 117  
LSA1810 ---MKKILHLM---LSLIGLFI---LP---LI---MDMOTVQAAQ-AGFTVSAVLPDN-QNEALSSDLVMPKQKTKTIVSVIEN-LEDNTKLSAANNGYVITDSDGTEADKHN-PGKL-SQAEVYQSOL 113  
EFA03601 ---MNQSKRL---VSEFSLLS---LF---FI---FPSISQADAGDGIKFPVPEP-IDKAIQVYDILLVAPDQEQNTLEVLISN-SSEERTFVSVNPAVTSDDGTTIDISQKN-PLID-ETLFPVDFV 114  
LSA0610 ---MRTITKRLV---LGLLGLI---AL---FA---HAQATQAAQVADAFMTIIPDN-QADNQLSVYDLVVPKQVQLKLVN-HKDPIKRVQVNTATTNVGVVNSDNV-NQSD-KTLKVPPLKHL 115  
lp 3072 ---MMLTKRVMQGLGGLVGLVSL---SMGRTGSANT-VGGEAVPASKY-QVDKAVSVYDLKLPKQVQLKLVN-TSTQEIYVHTAVTATTNPNGVVEQATA-DGKN-IDLPADASQLI 114  
lp 3115 ---VQKRRLSLGMLLAVVAS---LI---MMQVVASAOGVGEETPVQSSS-QVDKRLSVYDLKLPKQVQLKLVN-TASEPITINIGIATATTNNGVVEKHTN--NRS-ANLPPYDLSKL 113  
LIN00803 ---MKKISLIT---MLICSLFI---GG---LV---VSSAVSAAG-ENATATPILPSS-QEQDVTYVFKLRTVPQOETIQVKIEN-QSDENQKRVIVNASTNONGIIDLSD-VEKD-SSMKYPSQDL 113  
LSA1818 1819 ---MTHFKVGLGLV---MGVLAFLV---VA---FT---VNOQVHAEE-VTSVAPIIPEN-QIDKRLGYDGLVPGQKEEVSVVVQN-TGKGLLEVDPAPNTAINTNONGVIDSQSD-PKID-KTLKVPPLKHL 116  
FA03978 3983 ---MNRINKSHRNN---CSLLMLL---LG---FT---LMOQPVHASE-ENFAVDLEPAN-QIDNKTYVNLVMPFGKQTEPTVTVN-RITDKSVTVETLHSATTNSNGVIEGESK-SKFD-ETLSYDPMKNA 117  
lp 3451 ---MKKIF---MQLIAVVS---IV---MA---GLTMTARADD-LNMTVQADLPDN-QINQKSVYDLKVPKQVQLKLVN-TTESAKKLV---SAPQOSNGTLGYPNK--HTD-KSAEYTHSGIT 110  
CR01206 1207 ---MKKIQ---LFLSIFII---II---CT---GGAQVAFGGT-DDMTVKKIIPEN-QTNKDLGYFDITLGAQEQTLQVAVLSN-NTEQEMKIDLALSSAANTNGLVIEPTE-LEAD-RSLKVRFDOA 110  
LX01386 1385 ---MKKIQ---LFLSAIFL---TI---ST---GLAQTGYART-DDMTVKKIIPEN-QSNKDLGYFDITLGAQEQTLQVAVLSN-NTEQEMKIDLALSSAANTNGLVIEPTE-LEAD-RSLKVRFDOA 110  
EF02289 ---MKNRYI---ILMILSFV---FF------AFGIETSAAE-LR-SVETEIPEN-QIDKTKTYDLMKPDQEQILKVAAN-STDENLVIDVSVKSAATTNSGVIEGESI-TAID-KSAPADLSEI 109  
LCR00179 ---MLSKRIQ-ENIVGKVLVLIIT---FA---LF---VSRNIVALS-SNFTVSPETPEN-QVDKRLGYVNLVMPFGKQTEPTVTVN-RITDKSVTVETLHSATTNSNGVIEGESK-SKFD-ETLSYDPMKNA 118  
LCR00709 ---MIEKKNVSNILGKIGLVLVV---FS---LC---VCSKNIVASS-SNFTNVPVTPEN-QVDKRLGYVNLVMPFGKQTEPTVTVN-RITDKSVTVETLHSATTNSNGVIEGESK-SKFD-ETLSYDPMKNA 119  
LCA00297 ---MKKTIIF---CHAAVAVM---LM---TPAAAVFASE-ENFAAAMPDN-QVNVKGVSYFDIKMDQAGKQALHVDLRN-DTKEVAVDVGIASATTNGLVVEGQNA-IKPA-KSLKVPPLKHL 109  
LME00909 ---MIVKLYG---SHAVIAM---SS---FF---VNNATAAEE-MNKSNTAIPDN-QIDKSKTYENLKNNSDQDQDLMVTLKN-DTKKDIIVEVGVNTAKTNSNGVVEGKSS-IKND-SSLKVPPLKHL 114  
LCR00188 ---MKIQKVL---LFIATIFT---LG---AVSKEVHANE-ENFSVNPVLPEN-QIGES-GYVNLQMSPGQSQTLITLTKN-TTDKTVVVEELASATTNGLVVEGQNA-IKPA-KSLKVPPLKHL 110  
LX01614 1615 ---MKIQKVL---LFIATIFT---LG---TVSKEVHANE-ENFSVNPVLPEN-QIGES-GYVNLQMSPGQSQTLITLTKN-TTDKTVVVEELASATTNGLVVEGQNA-IKPA-KSLKVPPLKHL 110  
EF02664 ---MNRNK---VAVTIAC---MI---FG---VIGVEAHASE-ENFAVTPITPEN-QVDKSKTYFDLKLAPAGKQVETIQLRN-DTDEDITLIENTVNSATTNGLVVEGQNG-IKPD-KTLRFLKDLV 110  
EF01003 ---MNRKKQR---LFFPILLI---LI---ALVPSNGFASE-ENFAVTPITPEN-QVDKSKTYFDLKLAPAGKQVETIQLRN-DTDEDITLIENTVNSATTNGLVVEGQNG-IKPD-KTLRFLKDLV 112  
EFA04468 ---MRPKQ---LFIITLLV---LG---AL---NNISVSASA-ENFSVTPITPEN-QIDKSKTYFDLKLAPAGKQVETIQLRN-DTDEDITLIENTVNSATTNGLVVEGQNG-IKPD-KTLRFLKDLV 111  
EF01894 ---M-NQQLFKV---LHAISVII---FI---FF---IGSVSEASE-MFVSAAILPDN-QRTKETSDFDLVAPNQTQKIQEITN-QTANDITVVASANAATTNDGLADSHAE-TKDD-PSAPFTNEA 113  
LIN00594 ---MKKSLSLI---FLVPLLV---FG---NTEAAEAGDGVFSVQANIPAN-QIDKQVYFDLKLAPAGKQVETIQLRN-DTDEDITLIENTVNSATTNGLVVEGQNG-IKPD-KTLRFLKDLV 114  
LMO00586 ---MKKSLSLI---FLVPLLV---CG---NTEAAEAGDGVFSVQANIPAN-QIDKQVYFDLKLAPAGKQVETIQLRN-DTDEDITLIENTVNSATTNGLVVEGQNG-IKPD-KTLRFLKDLV 114  
LIN00560 ---MKKIAI---VFVCFE---II---NF---GQVVAARAE-GKFSVAILPEN-QAS-GVYFDLQMAPEDKQTLKVELLN-SGKEQITLVCANTAVNEMGVVDSIPK-AKTD-KTLKVPPLKHL 111  
LIN00555 ---MKKIAI---IFACTHAI---IC---LNQAEAAEAGNSFSVAILPEN-QAS-SVYFDLQMAPEDKQTLKVELLN-SGKEQITLVCANTAVNEMGVVDSIPK-AKTD-KTLKVPPLKHL 110  
LMO00552 ---MKKICAI---IFACTHAI---IC---FPGQAATENSFSVAILPDPN-QAS-SVYFDLQMAPEDKQTLKVELLN-SGKEQITLVCANTAVNEMGVVDSIPK-AKTD-KTLKVPPLKHL 110  
BTH03757 ---MVKKIL---TSLLLITF---FM---VNAFSVAAE-MKFAVTAVIPEN-QIDKQVYFDLKLAPAGKQVETIQLRN-DTDEDITLIENTVNSATTNGLVVEGQNG-IKPD-KTLRFLKDLV 109  
BCU00754 ---MKPIKIVS---SEVAIVFI---LN---IFSITANAEE-MKFAVNAVIPEN-QVDKQVYFDLKLAPAGKQVETIQLRN-DTDEDITLIENTVNSATTNGLVVEGQNG-IKPD-KTLRFLKDLV 112

LLX01389 IYVDETEQAGKLTILAPNEVRETLIN LKIPKEGLKGGIGGINVTKPKESDEEQ ----- EGIINLVSNVVALVME-DKNDVSESHQNEFAEKSNKEEQ----- VIKIKNSNSLLSNMNLKAVIKDQKG-EVVSEI SNEKTAV 250  
LCA00270 ---KID--- RQELKPGETROLPIV LKPKGKOPRGTVLSAIRLSALAPSTTDT ----- SVQNRJATTLGLVLHNGHVAG--- SVSNLRMGQTSLVQKRS--- GQORSQVQNPKRIFLADVSAKINLTSATSRRFSLTHTKLPRI 259  
BAT07091 ---QAP--- DAVTLEENQKTELEVH LITAPNQ--- GGVLGGLLELAHDHQOQKLEKDGILN SVENRREYVAIQLNSEETENSVNKAPLKLNGTKMKNPL--- STVEIADKLTNHNQNLKSKVKTSSKLNMDNKTLL--- KKETKRIDI 259  
BCEA0045 ---QAP--- DAVNLEGNQKTELEVH LITPNQ--- DGVVLGGLLELAHDHQOQKLEKDGILN SVENRREYVAIQLNSEETENSVNKAPLKLNGTKMKNPL--- STVEIADKLTNHNQNLKSKVKTSSKLNMDNKTLL--- KKETKRIDI 259  
A1285 1286 c ---SHEMRKQSLITLAPGASKTIVGS VKNPDKIKVRTNLTNLNLIKHRTSNNE--- POKKGGIKNVSNFAMTVIVVTRDQK--- ITPRLTLTKTKMDDSSG--- VPOVVGQIANHEPTMGGQIKMHAITKLNQTKIKQKNAEKL SM 254  
LSA0175 ---HFK--- LQVVVPANTOKNNVNNV VKNPDKIKVRTNLTNLNLIKHRTSNNE--- POKKGGIKNVSNFAMTVIVVTRDQK--- ITPRLTLTKTKMDDSSG--- VPOVVGQIANHEPTMGGQIKMHAITKLNQTKIKQKNAEKL SM 248  
LSA1727 1728 ---TVP--- KRTSLPAGATKRTAJR VKT-NDGFKGTAKATINLSADQINQNSA----- VKNARVATGLILN-GQQLGKRDVRYLESPIKTRTFKE-GKAAITSVKLNNDPDPVLENAKVKIKLQNGKGFQITTSVKNGKV 255  
PPE00557 ---RIP--- KEVETPNSSQITHS ISFPAKDNGGLIMAGLHETETTTAKKN----- TVSNTVANNIPFVIRGNHDQK--- PKPRLNKLNGTKMKNPL--- STVEIADKLTNHNQNLKSKVKTSSKLNMDNKTLL--- KKETKRIDI 237  
LCA00104 ---SGP--- KEVSVPAKTEKLVITV LKAPSQHEIGVLSGGVYVSPENDSTNK--- SVSGVRFTRNRAIGITITTLRQDKTPE--- NPPLLAMTKAGTGTNE--- YAAVQATISNPSGNQGDITSDYALSKDTGKALITGHVGGQAV 245  
lp 3413 ---TVPN--- EETITPANKRIVRAQ LKPTPKNKGILGSGVQVVKADLHKTKE--- GATLTSKAYNVGIKLT-SNEDPE--- IPKRLADVQLKRRSG--- LKTVIGNQNHASLILGKGTVIAVSKAGQTKKLAADLKSSEM 250  
LSA0213 ---KVFHADVITILGPNVKKVSAT ITMPSEQTKGMIVGAMHIEVQKRETDN----- HSNVSGSAYNMGIVLR-GKPEE--- IYPELKYQGVNPTVRNG--- HPALGTQLNNTKPMALNAKAVVYKNGEYEDKRVYETDSVDV 248  
LCA00271 ---TLDKGGATQLAPKQMKVISAT IKMPKQKRDGMIVGDMHIEVQKRETDN----- GNAVGSNAYVSGVVLVLR-GQNEE--- VFPNVKDYETNPILYQK--- HPALGVTLRNWEPMAISANVSVAVGMDSGDVKTYYA--- DNEMLI 191  
LSA0173 0174 ---KLDKKSSEKILAAQETKILKMT VKMPEDRTNGMIVGDMHIEVQKRETDN----- SSVGSNAYVSGVVALK-GQHYR--- VVPELKYQGVNPTVRNG--- HAAMGKIRNTPQPMVINKVSAKAVVSKRGLFSKHKLVTTSNQSV 248  
LSA1729 ---AVKKSDFVILHLPQETVITQAT IKMPEDNNGILSGGWHIEVQKRETDN----- QTISSNAYMISVVLVLR-GSHYR--- VVPELKYQGVNPTVRNG--- RPAMGVKLRNTPQPMALNVHFKAVVSKRGLFSKHKLVTTSNQSV 250  
LSA1816 ---KIKGF--- VKITVPANGSKKLVITIP IKMPATYNGSILGAMHIEVQKRETDN----- TTKKQIINHYGIEIPVVVTRTPSSST--- EDTKIQKVVLDVAAGMNNY--- HRSIIVLALNTPAARIPRVMKTTVTAKDSGTQVVKATQGVML 241  
LCR01867 ---AET--- TEVEIAENQSKVLLN LTRPSVSSPQILGAIHVSVPNNVEQE----- ENKQKIVNHYSAEIPVVVTRTPSSST--- AQIDLQTEVTAGVTNK--- NKSGILAKLANPTSVMPLSISTKVVQODNNKLLQSTDENLDM 244  
PPE00547 ---SGP--- QTVLLKPKVEVRRVFSQ LKIPPKGKFGTVLGGVYVTPVRAATS----- TSGILSNNTAVTIGAKLE-CTSSK--- IOPKLSLIRKATPGLDNG--- VLSIPATLQNAAPVLLSKLDMRATVQNRHHEILLKRTHKRSIF 256  
EF00339 ---KLEPE--- EHVTPPAKKTVTAKMT VEIPANGHGGVILGGVYVTPVRAATS----- GKSTGLTSRYGFNVATLAMSSETPMYLAETIQLVKVTPTIALG--- NKVQOAVIQNPTSALPEVRLGKVTIKRGGSLAKRILPVSRI 253  
EF00981 ---THEN--- EEVSVPPHQTIVSAKMK VKGDQDPIKGGVVLGGVYVTPVRAATS----- NQTTGLTSRYGFNVATLAMSSETPMYLAETIQLVKVTPTIALG--- AKSLKAVIQNPTSALPEVRLGKVTIKRGGSLAKRILPVSRI 250  
OOE1273 1274 ---GHV--- QRASLAKGRSKLTFK LKIPKQVPRKELGVDVTKKKQIAKTIK--- KAAVYENLNTAVMVPVLEIS-EKDKV--- VHTKLLLENVPEASIN--- VPVILAKINSQTPVTFVGLKIEVLELDGNTVTSKSNNTNMQM 246  
lp 2174 ---SSG--- VVVKLAAHQAKTAVK TTIKPSGQGEVGLGGLVFNPTANAARF----- TTSQGLMLNRAEVTAVALWCOFQVT--- IPVKLVLEDEVKVTPTNG--- QPVLAKLRNTPPTLQGLKIQARVIORTTGTVAATQQLKSGSM 257  
EF00404 ---KIKDGV--- KEIPLKGEKKTITPE ITTPEASANGVGLGSLRVRNNTSEVQK----- KKSGLTPOARVIAIMLT-EDEEFPNQGAMHLKRAASQLANG--- QKVIAARIQNDQPKVQLQELTQGEIRLKGKILKXKHEKRSV 254  
lp 1448 ---THAAGSDK--- VTPPAKKTVTAKMT INIPKGDITGVLGGVYVTPVRAATS----- SKGVNINQKVSVALAVKIT-AKETI--- AQPPLKLTGTVTPLGNNY--- KKVVLATIRNPEPAVVSQKLTITVTRGSSKVLVQNSSDNLLM 249  
lp 3678 ---TIQGE--- RTITIPAEKSKTIVK VKLKPKQVNGVLLGGVYVTPVRAATS----- NKSNVNVNNE SVYVIGKLS-SGKLP--- ILSNCLGVPKAGLNNY--- HRSIIVLALNTPAARIPRVMKTTVTAKDSGTQVVKATQGVML 257  
lp 2977 ---KIKGF--- VKITVPANGSKKLVITIP TTMPTKDNAGLILGGVYVTPVRAATS----- VKGAINISSE SVYVIGKLS-LGTAP--- I- PVLKLSDVAAAGMNNY--- HRSIIVLALNTPAARIPRVMKTTVTAKDSGTQVVKATQGVML 251  
lp 3066 ---KIKGF--- TTIIPANGSKKLVITIP VTMKQAVNGVLLGGVYVTPVRAATS----- VKGSMNIANQ SVYVIGKLT-AGIVP--- QPQLKLDITTAGMNNY--- RRGVFPQENVTAVIVPKLITITARTSNKGVKIKNTIQKNNVQL 260  
LCA00970 ---EAP--- KTDVGAQAQVPTVFD VKIPEKGTGQILGSLVCEPDTVHRSGG----- SGMATNNKAMLVGVVLIQ-TSEAK--- VASELKLMDVKGPTQDN--- QASVLAITQNKPRILGEMTLDGKVVYRQSSKDPVTRSEKGSF 238  
LX01222 1223 ---KNDK--- POLTDQAGHNGVLLGGVYVTPVRAATS----- KKKKGGKGTIHTLALRIA-ENDETF--- VHEILGQVTVQGENL--- HNOVSMALRNPQALGEMTLDGKVVYRQSSKDPVTRSEKGSF 254  
LSA1810 ---DQE--- QMTLQPKKPKTKVNNK VKMPDQILMAGVLKALYVHSDPKAGSTQK--- TDQQGSVKNYAMAGVVLVLR-EHEPN--- HEPANLKLRRIRYSEYNLLEPTVLALENVRAATPGAMTNAKVKSKKGGSLAKRILPVSRI 246  
EFA03601 ---LFAK--- KENLNSVAHAETITIE VIKPAKSKGVLGAVHSDPKAGSTQK--- ATEGAQIKNNYIANNLAVLIQ-ESQET--- IEPFDLKLISGDLDEVNA--- KPTVQLRNPQPTVILSNLITSKIFLEN--- QLYLENTSNEILV 250  
LSA0610 ---KPAK--- KNTITLTAHEQVNNR LSAPDKAKGQVGGISATEVPTIAKTT----- QQTSVRNKAVAVAVVLR-SNDQS--- VTPEFKLGAVTQGHMG--- TNQITANIRNQPFRQNTSINAFTKRNQTKLQTEKROVQ 247  
lp 3072 ---TTAA--- NKITLAKGTSKIVTK VKMPAQKVDGVLGGVYVTPVRAATS----- SAMAINNQAMSVAVVLR-GDHAR--- TKNKLTLGKIDATQNGN--- YNQLSPLQNRATAALNQVTDVQVYRRGSNKVRYKQVNEHQM 245  
lp 3115 ---TTDE--- PQVKLAKGQVTKVTKFQ IKMPAQSVGGILAGGITFLKATAADTK----- KAVAVNNQAVTEAVILH-GSKDL--- TTNQITMKNITVQKONG--- RMAINFPVNHATAALNKVQTNIKIYHRGGSQVYVHQLANGOM 246  
LIN00803 ---TSD--- PLIVEAANSQVLSK LKIPKESKGLVGGITIEPQDETKQE----- QVNNVTRTALQIS-ENDEP--- IPAKLEAGEVLSQNGN--- HNVVSLIKNAPLITTSVEANIKVTKKQTEPLNEVKKDM 242  
LSA1818 1819 ---SPA--- QRLKVPFAESSRTAFT LNAPKATIEGTVLGGVYVTPVRAATS----- HKKGTSLNRYSVILGKLT-QSDQF--- VKPHLRNLRKPLQNLN--- HTALNSLQNTANSVQEMQVDAKIRRAGQSVVHESKQITDLSI 252  
FA03978 3983 ---KTV--- GETVPPQSAVTTLS LRAPEREAGVVAAGGITIEKKNENVSNK----- STVGVVNPQSVKAILIK-NSEKE--- SSPDLKLNKADQSDG--- RNVIKANLQNPNASVMEGLTTSVEYKRETEPVLISIKREKIDV 248  
lp 3451 ---SKS--- QVVTVPAKSKKVTIK LITVPEKKAAGVALGGITIQELSTHAKQ----- SSSGMAINNOAVTIGLQRESDPG--- IKPVMKLVAVKAKQNTN--- RNVTANLQNPVIMHGLKIKSVYTRAGSSKLLTTTKNEMSM 244  
CR01206 1207 ---TSP--- RIVTLAPLTHQKIDIK VKMPNESHDGVLAGGITIEKKNENVSNK----- DSEGITVNTSYTIALLMK-QNENE--- VSPDLKLTIKVSPQNGN--- RNVINVNLQNPMTAMINTMNVKATIKGITDSDIAYVSNPMMQM 243  
LX01386 1385 ---NTP--- KVVTLPELTHQKIDIK VKMPNEARHDGVLAGGITIEKKNENVSNK----- DSEGITVNTSYTIALLMK-QNDNE--- VSPDLKLTIKVSPQNGN--- RNVINVNLQNPMTAMINTMNVKATIKGITDSDIAYVSNPMMQM 243  
EF02289 ---QLKGGESV--- ELPAKSEAVELR VKMPKEEISGQVAGGITIEKKNENVSNK----- QKENTNGLAENFAYTVALLR-ENETV--- VQPELSLEVEPTQRNA--- RSVISATLNEEAALQSMKVTANVKNKKTNNVILEKEQEDMQM 248  
LCR00179 ---NIPK--- KEITIAAQAATLAAR VSMPKGMDRGLAGGIFSKERESNQSN----- SSDGISIKNEQVVALVLIQ-QNTQR--- VSPQLKINEVKTQVNS--- RNVFAANLQNTSPTVLRDMNATATVKGVTNSKMLQTKHADMTM 252  
LCR00709 ---EIPK--- KEITISAHSQVTVAK IKMPPQAGNSVGLAGGIFSKERESNQSN----- TSKGVSTINEYRVVALVLIQ-QDQTK--- VSPQLKMDAKATQVNS--- RNVTANLQNPMTVLDQMNKATVKNVNNPEIKVSEFNSDMKM 253  
LCA00297 ---KTP--- AOVKIPAKGSTVNLND VTMPSKPLHAGGIFSKERESNQSN----- KDAGKGVAINNR SVYVIGLQK-QSTDO--- VAAHVKLVNDVPSQNGN--- RNVLASMENDAATVKNVAVDAKIMARGSDKSVLCVAREGLQ 244  
LME00909 ---KGP--- SSVVIPASSKKNVAE ITMPKESHDGVLGGITIEKKNENVSNK----- KAKNGTIVQNE SVYVAILIK-ETDKV--- VDENLNLQVNPQNGN--- RNVINAEIQNDQSVLMSKVSVDKIKYKNGKPKVTSIKSDMQI 248  
LCR00188 ---SIP--- KEVSLQPNSSQVQVKS VTMKPELHNGVLAGGITIEKKNENVSNK----- NSKGLSIQNKAVVVALLMQ-QNKNT--- VAPDLKLNKVEPSQVNY--- KNVINANLQNPMAGLNQMTVQAEVKGVSNSKLSYKANKEMIQM 243  
LX01614 1615 ---SIP--- KEVSLQPNSSQVQVKS VTMKPELHNGVLAGGITIEKKNENVSNK----- NSKGLSIQNKAVVVALLMQ-QNKNT--- VAPDLKLNKVEPSQVNY--- KNVINANLQNPMAGLNQMTVQAEVKGVSNSKLSYKANKEMIQM 243  
EF02664 ---EAP--- KEITILPKHSQKTLPLT ITMPKDSHDGVMAGGITIEKKNENVSNK----- ADQSKGLAINNE SVYVAILIQ-QNETK--- VQPDKLLGKVPQNGN--- RNVINVSLQNPQAALINQLHLINTVSKGG--- ETLVQSDTEDMQV 248  
EF01003 ---QTP--- SSVRLKPKSEQTVSIN VKMPENTPHDGLVAGGITIEKKNENVSNK----- QDDKSGLSINNE SVYVAILIQ-QNKKR--- VEPNLLKLVSPQNGN--- RNVLVNLQNDQKTYINQVAEAEITKKGHEEVLVKEEANNQI 243  
EFA04468 ---SIP--- QIVTLKPKSQTVAEIT VRMPNERHDGVLAGGITIEKKNENVSNK----- ETKDQSLISENE TYIALLMQ-QILNE--- VAPNLTLEVEKPDQINA--- RNVLILANQNDQKTYINQVLETKIKKGHEEVLVKEEANNQI 246  
EF01894 ---QLP--- KEIHLPKHSQKTLVECO LTLPEKPNHVVGLGIEKRSDEQPAH----- SENGVAIINR SVYVIGLIS-ETDEE--- VQPELSNEVKTQDANG--- RNVLVNLQNPQAAMIKLQVDAASLVEKETKPRLENQESLTM 246  
LIN00594 ---TIPDDQ--- KLLTIPVNGKKTVOVT IEMPDSEIDGVLGAVQPKKNQOTETK----- TKGVLSIKNE SVYVIGMQLS-ETDKQ--- VPKPNLNSIKRPTLNGN--- HTAIVAKLQNDQPVILNLSIDAKVYQDGSNMLQTKHADMTM 249  
LMO00586 ---EIPDDQ--- KRLTIPVNGKKTVOVT IEMPAEVDGVLGAVQPKKNQNTNETK----- TKGVLSIKNE SVYVIGMQLS-ETDKQ--- VPKPNLNSIKRPTLNGN--- HTAIVAKLQNDQPVILNLSIDAKVYQDGSNMLQTKHADMTM 249  
LIN00560 ---KASE--- SEVTLKPNETKINSLD INMPAESDGLLGGVYVTPVRAATS----- DTSKGVQIKNEAVVIGVLT-EKTTI--- VKPELALNQIKAGSNY--- RNVEVNLQNTKATLVGGLAVDAKIKYKNGKPKVTSIKSDMQI 247  
LIN00555 ---EVS--- SEVTLKPNETKINSVD INMPAESDGLLGGVYVTPVRAATS----- DTSKGVQIKNEAVVIGVLT-EKTTI--- VKPELALNQIKAGSNY--- RNVEVNLQNTKATLVGGLAVDAKIKYKNGKPKVTSIKSDMQI 247  
LMO00552 ---NESV--- SEVTLKPNETKINTAA IEMPAENHDGVLGGVYVTPVRAATS----- ESSENDQIKNEAVVIGVLT-EKTTI--- VKPELALNQIKAGSNY--- RNVEVNLQNTKATLVGGLAVDAKIKYKNGKPKVTSIKSDMQI 246  
BTH03757 ---KMP--- KETKVPANSIVTVDIN IEMPSSEHDGVLGGVYVTPVRAATS----- KDEGVQIKNEAVVIGVLT-ETDAB--- VKPDMKLVNVEKPTQING--- RNVTANLQNPMAKLNLSVDAKVVYETGKVDLHETKRENLE 240  
BCU00754 ---KVQ--- KETKIPAKSTITLVDN IEMPNESHDGVLGGVYVTPVRAATS----- SAKVQIKNEAVVIGVLT-ETDAB--- VKPDMKLVNVEKPTQING--- RNVTANLQNPMAKLNLSVDAKVVYETGKVDLHETKRENLE 245



LLX01389	-----	334
LCA00270	-----	360
BAT07091	-----	361
BCEA0045	-----	361
SA1285_1286_c	-----	351
LSA0175	-----	342
LSA1727_1728	-----	354
PPE00557	-----	323
LCA00104	-----	344
lp_3413	-----	344
LSA0213	-----	345
LCA00271	-----	287
LSA0173_0174	-----	342
LSA1729	-----	345
LSA1816	-----	337
LCR01867	-----	336
PPE00547	-----	352
EF00339	DDDDNE	377
EF00981	-----	354
OOE1273_1274	-----	337
lp_2174	-----	349
EF00404	-----	349
lp_1448	-----	348
lp_3678	-----	353
lp_2977	-----	347
lp_3066	-----	354
LCA00970	-----	336
LLX01222_1223	-----	350
LSA1810	-----	350
EFA03601	-----	344
LSA0610	-----	351
lp_3072	-----	347
lp_3115	-----	353
LIN00803	-----	330
LSA1818_1819	-----	346
EFA03978_3983	-----	342
lp_3451	-----	337
LCR01206_1207	LNKK	387
LLX01386_1385	LNKK	387
EF02289	-----	341
LCR00179	-----	376
LCR00709	-----	376
LCA00297	-----	359
LME00909	-----	276
LCR00188	-----	333
LLX01614_1615	QSKEDNSDET	390
EF02664	-----	358
EF01003	-----	364
EFA04468	-----	358
EF01894	-----	344
LIN00594	-----	341
LMO00586	-----	341
LIN00560	-----	343
LIN00555	-----	343
LMO00552	-----	343
BTH03757	-----	247
BCU00754	-----	341

#### Figure 4:

Multiple sequence alignment of CscA proteins. Proteins IDs can be found in additional file Table 5. Colour coding of highly conserved residues: green, hydrophobic (L, M, I, V); blue, aromatic (W, F, Y); red, basic (R, K, H); light brown, neutral and small (P, G, S, T).