CLUSTAL O(1.1.0) multiple sequence alignment Homo ------------------------------------------------------------ Equus ------------------------------------------------------------ Pan ------------------------------------------------------------ Macaca ------------------------------------------------------------ Canis MGTLRMECRSAVSLIPKVSDASEKLLLGPTPQNSLTDKVQVSEISSESSALIRNLLNVAR Bos ------------------------------------------------------------ Mus ------------------------------------------------------------ Rattus ------------------------------------------------------------ Gallus ------------------------------------------------------------ Danio ------------------------------------------------------------ Drosophila ------------------------------------------------------------ Anopheles ------------------------------------------------------------ Caenorhabditis ----------------------------------MFNYSKIFQIHRACSPNRKKIGSI-Q Schizosaccharomyces ------------------------------------------------------------ Arabidopsis ------------------------------------------------------------ Homo --------------MAASELYTKFARVWIPDPEEVWKSAELLKDYKPGDKVLLLHLEEGK Equus ------MFFLF---------VFQFARVWIPDPEEVWKSAELLKDYKPGDKVLLLHLEEGK Pan --------------MAASELYTKFARVWIPDPEEVWKSAELLKDYKPGDKVLLLHLEEGK Macaca --------------MAASELYTKFARVWIPDPEEVWKSAELLKDYKPGDKVLLLHLEEGK Canis GHKKKDDWYLFTF-AGIGVIPKKFARVWIPDPEEVWKSAELLKDYKPGDKVLLLHLEEGK Bos --------------MAASELYTKFARVWIPDPEEVWKSAELLKDYKPGDKVLLLQLEDGK Mus --------------MAASELYTKFARVWIPDPEEVWKSAELLKDYKPGDKVLLLHLEEGK Rattus --------------MAASELYTKFARVWIPDPEEVWKSAELLKDYKPGDKVLLLHLEEGK Gallus --------------MAASELYTKYARVWIPDPEEVWKSAELLKDYKPGDKVLQLRLEEGK Danio --------------MAASELYTKYARVWIPDDEEVWRSAELTKDYRQGDGVLQLQLEDGK Drosophila ------------M-SSEEMLYAQGAKIWVPHADLVWESATLEESYRKGAGFLKICTDSGK Anopheles ----------------MRYICFEDARVWIPHPETVWEGAVVAQDYKQDDKQLKLVTDRGV Caenorhabditis YGRRRHSWQGPVVPAAKLQVLIKGVRIWHRHPTLVWIGATLEEDITFQTRNVRIRLEDDT Schizosaccharomyces ---------------MSHARLSVGSECWVSNNNGHWDAARLIEIKDNGGGKVVATVAKSS Arabidopsis --------------MAASAKVTVGSHVWVEDPDDAWIDGEVEEVNSEEIT--VNC--SGK . \* . \* . : : Homo ----------------------DLEYHLDPKTKELPH--LRNPDILVGENDLTALSYLHE Equus ----------------------DLEYRLDPKTKELPH--LRNPDILVGENDLTALSYLHE Pan ----------------------DLEYHLDPKTKELPH--LRNPDILVGENDLTALSYLHE Macaca ----------------------DLEYRLDPKTKELPH--LRNPDILVGENDLTALSYLHE Canis ----------------------DLEYRLDPKTKELPH--LRNPDILVGENDLTALSYLHE Bos ----------------------DLEYRLDPKTKELPH--LRNPDILVGENDLTALSYLHE Mus ----------------------DLEYRLDPKTGELPH--LRNPDILVGENDLTALSYLHE Rattus ----------------------DLEYRLDPKTSELPH--LRNPDILVGENDLTALSYLHE Gallus ----------------------DLEYCLDPKTKELPP--LRNPDILVGENDLTALSYLHE Danio VSVMAVYKPHFINITYSAMDLLDLEFKLDPKTNNLPH--LRNPDILVGENDLTALSYLHE Drosophila L----------------------KEVKLKADGSDLPP--LRNPAILVGQNDLTTLSYLHE Anopheles E----------------------HTVPLKT-PADLPP--LRNPTILIGQNDLTALSYLHE Caenorhabditis E----------------------VEYAIKS-LDQLPF--LRNPAFLVGKDDLTLLSYLHE Schizosaccharomyces G-------------------------VLE--TVNYQQLQNRNIGQSESPSDLTNLPYLNE Arabidopsis T-------------------VVAKLNNVYPKDPEFP---------ELGVDDMTKLAYLHE : : . .\*:\* \* \*\*.\* Homo PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Equus PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Pan PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Macaca PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Canis PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Bos PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Mus PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Rattus PAVLHNLRVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Gallus PAVLHNLKVRFIDSKLIYTYCGIVLVAINPYEQL-PIYGEDIINAYSGQ--NMGDMDPHI Danio PAVLHNLKVRFIDSKLIYTYCGIVLVAINPYETL-PIYGADIINAYSGQ--NMGDMDPHI Drosophila PGVLHNLRVRFCERQIIYTYCGIILVAINPYAEM-PLYGPSIIRAYRGH--AMGDLEPHI Anopheles PDVLYNLEVRFCDRQAIYTYCGIVLVAINPYAEL-PLYGPDLIRAYRGH--AMGELEPHI Caenorhabditis PAVLHNLQVRFVKGSSIYTYCGIVLVAINPYADCSHIYGEEIIQVYRGAGKSAREMDPHI Schizosaccharomyces PSVLHALHNRYNN-KQIYTYSGIVLVSINPYQNLPEFYNDNLIKHFHKD--PEAAKVPHL Arabidopsis PGVLLNLKCRYNA-NEIYTYTGNILIAVNPFKRLPHLYGSETMKQYKGT--AFGELSPHP \* \*\* \*. \*: . \*\*\*\* \* :\*:::\*\*: :\* . :. : \*\* Homo FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Equus FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Pan FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Macaca FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Canis FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Bos FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Mus FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Rattus FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Gallus FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Danio FAVAEEAYKQMARDERNQSIIVSGESGAGKTVSAKYAMRYFATVSGSAS----EANVEEK Drosophila FALAEEAYTKLERENCNLSIIVSGESGAGKTVSAKYAMRYFAAVGGSES----ETQVERK Anopheles FAVSEEAYAKLEREKCDISIIVSGESGAGKTVSAKYAMRYFAAVGGSES----ETQIEKK Caenorhabditis FAVAEEAHFDMGAFGKSQSIIVSGESGAGKTVSAKFVMRYLASVAASKTRNGGTTSIEAR Schizosaccharomyces YSIASSCYHALTTDSKNQTIIVSGESGAGKTVAAKYIMRYLTSVQGVDHNGVVKRSVENQ Arabidopsis FAVADSAYRKMINEGVSQAILVSGESGAGKTESTKMLMQYLAYMGGRAESE--GRSVEQQ ::::...: : . :\*:\*\*\*\*\*\*\*\*\*\* ::\* \*:\*:: : . .:\* : Homo VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Equus VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Pan VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Macaca VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Canis VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Bos VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Mus VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Rattus VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Gallus VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKRY---RIIGANMRTYLLEKSRVVFQ Danio VLASNPIMESIGNAKTTRNDNSSRFGKYIEIGFDKKY---HIIGANMRTYLLEKSRVVFQ Drosophila VLASSPIMEAFGNAKTTRNDNSSRFGKFTKLLFRNQMGVMFLQGATMHTYLLEKSRVVYQ Anopheles VLASSPIMEAIGNAKTTRNDNSSRFGKFTKLLFLNNHS-MALTGGTMQTYLLEKSRVCFQ Caenorhabditis VLASNPIMESIGNAKTIRNDNSSRFGKFIQINFCERG--RRIVGAEMKTYLLEKSRLVFQ Schizosaccharomyces VLATNPIMEAFGNAKTIRNDNSSRFGKYVTISFDENL---LITGANVNTYLLERSRVVSL Arabidopsis VLESNPVLEAFGNAKTVRNNNSSRFGKFVEIQFDQRG---RISGAAIRTYLLERSRVCQV \*\* :.\*::\*::\*\*\*\*\* \*\*:\*\*\*\*\*\*\*: : \* :. : \*. :.\*\*\*\*\*:\*\*: Homo AEEERNYHIFYQLCASAKLPEFKMLRLGNADNFNYTKQGGSPVIEGVDDAKEMAHTRQAC Equus AEEERNYHIFYQLCASAKLPEFKMLRLGDANNFHYTMQGGSPEIEGVDDAKEMANTRQAC Pan AEEERNYHIFYQLCASAKLPEFKMLRLGNADNFNYTKQGGSPVIEGVDDAKEMAHTRQAC Macaca AEEERNYHIFYQLCASAKLPEFKMLRLGNADDFNYTQQGGSPVIEGVDDAKEMAHTRQAC Canis AEEERNYHIFYQLCASAKLPEFKMLRLGNADNFHYTKQGGSPVIEGVDDTKEMAHTRQAC Bos AEEERNYHIFYQLCASADLSEFKVLRLGDANNFHYTNQGGSPVIEGVDDAKEMAHTRQAC Mus AEEERNYHIFYQLCASAKLPEFKMLRLGNADSFHYTKQGGSPMIEGVDDAKEMAHTRQAC Rattus AEEERNYHIFYQLCASAKLPEFKMLRLGNADSFHYTKQGGSPMIEGVDDAKEMAHTRQAC Gallus AEEERNYHIFYQLCASAALPEFKTLRLGNANYFHYTKQGGSPVIDGIDDAKEMVNTRQAC Danio ADEERNYHIFYQLCASAHLPEFKALKLGKANDFHYTKQGRNPVIDGVDDAKEMSTTRNAF Drosophila AQGERNYHIFYQLCAARS--KYPELVLDHQDKFQFLNMGGAPEIERVSDAEQFNETVQAM Anopheles APGERNYHIFYQLCAGRE--QWPELMLDHQDKFHFLNQGQSPNISKLSDRDQFEDTLGAL Caenorhabditis APGERNYHIFYQLCAARNHQVLKDLHLGPCESYSYLTQGGDSRIPGVDDKADFEALLKAL Schizosaccharomyces LKGERNYHIFYQLITGCTEEQRDKWFLESASSFNYLSQGNCDEISGVDDSNDFTITCRAL Arabidopsis SDPERNYHCFYMLCAAPE-QETERYKLGKPSTFRYLNQSNCYALDGLDDSKEYLATRKAM \*\*\*\*\* \*\* \* :. \* . : : . : :.\* : \* Homo TLLGISESHQMGIFRILAGILHLGNVGFTS--------RDADSCTIPPKHEPLCIFCDLM Equus TLLGISESYQMGIFRILAGILHLGNVGFTS--------RDSDSCTIPPKHEPLSIFCDLM Pan TLLGISESHQMGIFRILAGILHLGNVGFTS--------RDADSCTIPPKHEPLCIFCDLM Macaca TLLGISESHQMGIFRILAGILHLGNVGFTS--------RDADSCTIPPKHEPLCIFCDLM Canis TLLGISESYQMGIFRILAGILHLGNVAFTS--------RDSDSCTIPPKHEPLSIFSDLM Bos TLLGISESHQMGIFRILAGILHLGNVVFMS--------RDSDSCTIPPKHEPLSIFCDLM Mus TLLGISESYQMGIFRILAGILHLGNVGFAS--------RDSDSCTIPPKHEPLTIFCDLM Rattus TLLGISESYQMGIFRILAGILHLGNVGFAS--------RDSDSCTIPPKHEPLIIFCDLM Gallus TLLGISDSYQMGIFRILAGILHLGNVEFAS--------RDSDSCAIPPKHDPLTIFCDLM Danio ILLGINESYQMGLFQILASILHLGNVDVKD--------RDSDSSIIPPNNGHLSVFCELM Drosophila TVLGFSIQQIADIVKILAGILHLGNIQVSKKFNEGSEEEDSDSCDIFHNDIHLQITADLL Anopheles KTLGFDDAEIGDIMKVVASVLHLGNVVFNHRQKSQTSEVDSEACSIASNDLHLNVACDIL Caenorhabditis QLLGFDEKQMSDVFRLLAGLLLLGNVHFENGE--GSSAVSASSCQE-----ISRLCREFW Schizosaccharomyces STIGISESRQEDVFCLLAALLHLGNIEVCATR---------NEAQIQPGDGYLQKAALLL Arabidopsis DVVGINSEEQDGIFRVVAAILHLGNIEFAKGEESEASEPKDEK-----SRFHLKVAAELF :\*:. :. ::\*.:\* \*\*\*: . . : Homo GVDYEEMCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFNWIVDNVNQALH Equus GVDYEEMCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFSWIVDHVNQALH Pan GVDYEEMCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFNWIVDNVNQALH Macaca GVDYEEMCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFNWIVDNVNQALH Canis GVDYEEMCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFNWIVDHVNQALH Bos GVDFEELCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFNWIVDHVNQALH Mus GVDYEEMCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFNWIVDHVNQALH Rattus GVDYEEMCHWLCHRKLATATETYIKPISKLQATNARDALAKHIYAKLFNWIVGHVNQALH Gallus GVDYEEMAHWLCHRKLATATETYIKPISKLHAINARDALAKHIYANLFNWIVDHVNKALH Danio GVTYQDMSHWLCHKKLKTATETYIKPIPKLQAINARDALAKHIYAKLFNWIVDHVNKALH Drosophila RVSADDLRRWLLMRKIESVNEYVLIPNSIEAAQAARDALAKHIYAKLFQYIVGVLNKSLN Anopheles QLDRSELRKWLVTRQIESMNDSVLIPMNKQTAEATRDALAKHIYAELFQHIVQKINRNLA Caenorhabditis KISESDLRIWLTRREIRAVNEIVTKPLTKNEAVRSRDALTKMLYSHLFGWLVDKINEALN Schizosaccharomyces GVDSSTLAKWIVKRQLKTRSETIITSSTLEHAISIRDSVAKYLYSALFLWIVHMINASLD Arabidopsis MCDGKALEDSLCKRVMVTRDESITKSLDPDSAALGRDALAKIVYSKLFDWLVTKINNSIG . : : : : : : \* \*\*:::\* :\*: \*\* :\* :\* : Homo SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Equus SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Pan SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Macaca SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Canis SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Bos SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Mus SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Rattus SA---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Gallus ST---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Danio ST---------VKQHSFIGVLDIYGFETFEINSFEQFCINYANEKLQQQFNMHVFKLEQE Drosophila NG---------SKQCSFIGVLDIYGFETFEVNSFEQFCINYANEKLQQQFNQHVFKLEQE Anopheles GS--------KKQNCCFIGVLDIYGFETFDVNSFEQFCINYANEKLQQQFNQHVFKLEQE Caenorhabditis EKDKLDGTNQKKRPDRFIGVLDIYGFETFDVNSFEQFSINYANEKLQQQFNQHVFKLEQE Schizosaccharomyces HN------KVKRAAYKYIGVVDIYGFEHFEKNSMEQFCINYANEKLQQEFNKHVFKLEQE Arabidopsis QD---------PNSKHIIGVLDIYGFESFKTNSFEQFCINLTNEKLQQHFNQHVFKMEQE \*\*\*:\*\*\*\*\*\* \*. \*\*:\*\*\*.\*\* :\*\*\*\*\*\*.\*\* \*\*\*\*:\*\*\* Homo EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Equus EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Pan EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Macaca EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Canis EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Bos EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Mus EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Rattus EYMKEQIPWTLIDFYDNQPCINLIESK-LGILDLLDEECKMPKGTDDTWAQKLYNT-HLN Gallus EYMKEQIPWTLIDFYDNQPCINLIEAK-MGVLDLLDEECKMPKGSDDTWAQKLYNT-HLN Danio EYMKEQIPWTLIDFYDNQPCINLIEAK-MGILDLLDEECKMPKGSDDSWAQKLYNT-HLK Drosophila EYLKEGITWTMIDFYDNQPCIDLIESR-LGVLDLLDEECRMPKGSDESWAGKLIGK--CN Anopheles QYLREGIEWKMIDFYDNQPCIDLIESK-LGILDLLDEECRMPRGSDDSWVGKLMEK--CG Caenorhabditis EYIREEIEWVRVDFHDNQPAIDLIEGP-VGMINLLDEQCKRLNGSDADWLSQLQNSTELK Schizosaccharomyces EYVKEGLDWRLIEYSDNQGCISLIEDK-LGILSLLDEECRLPSGNHQSFLQKLNNQLPTK Arabidopsis EYTKEEIDWSYIEFIDNQDVLDLIEKKPGGIIALLDEACMFPRSTHDTFAQKLYQT--FK :\* :\* : \* ::: \*\*\* :.\*\*\* \*:: \*\*\*\* \* ... : :\* Homo KCALFEKPRLSNKAFIIQHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Equus KCALFEKPRLSNKAFIIQHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Pan KCALFEKPRLSNKAFIIQHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Macaca KCTLFEKPRLSNKAFIIQHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Canis KCALFEKPRLSNKAFIIQHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Bos KCALFEKPRLSNKAFIIQHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Mus KCALFEKPRMSNKAFIIKHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Rattus KCALFEKPRMSNKAFIIKHFADKVEYQCEGFLEKNKDTVFEEQIKVLKSS-KFKMLPELF Gallus KCALFEKPRLSNKAFIIKHFADKVEYQCEGFLEKNKDTVYEEQIKVLKSSKKFKLLPELF Danio TCALFEKPRMSNKAFIIQHFADKVEYQCDGFLEKNKDTVNEEQINVLKAS-KFDLLVELF Drosophila KFPHFEKPRFGTTSFFIKHFSDTVEYDVNGFLEKNRDTVSKELTQVLSESNM-SLAKQVM Anopheles KYPHFDRPRFGTSAFLIKHFSDTVQYESRGFLEKNRDTVSRELVSVLKASGM-RLCQRLM Caenorhabditis RNPQLAFPKVRSNDFIVRHFAADVTYSTDGFVEKNRDAIGEQLLDVVVAS-KFPFIRTVI Schizosaccharomyces HSQFYKKSRFNDGSFMVKHYALDVSYQVHDFLAKNSDAIPDEFISLLQNSKN-EFITYLL Arabidopsis NHKRFGKPKLAQTDFTICHYAGDVTYQTELFLDKNKDYVVGEHQALLSSSDC-SFVSSLF :. \* : \*:: \* \*. \*: \*\* \* : : :: \* : :: Homo QDDEK-AISPTSATSSGRTPLTRTP-----AKPTKGRPGQMAKEHKKTVGHQFRNSLHLL Equus QDDEK-AISPTSATSSGRTPLTRTP-----VKPTKGRPGQMAKEHKKTVGHQFRNSLHLL Pan QDDEK-AISPTSATSSGRTPLTRTP-----AKPTKGRPGQMAKEHKKTVGHQFRNSLHLL Macaca QDDEK-AISPTSATSSGRTPLTRIP-----AKPIKGRPGQMAKEHKKTVGHQFRNSLHLL Canis QDDEK-AISPTSATSSGRMPLSRTP-----AKPTKGRPGQTAKEHKKTVGHQFRNSLHLL Bos QDDEK-AISPTSATSSGRTPLTRTL-----SKPTKGRPGQTAKEHKKTVGHQFRNSLHLL Mus QDDEK-AISPTSATSSGRTPLTRVP-----VKPTKGRPGQTAKEHKKTVGHQFRNSLHLL Rattus QDDEK-AISPTSATSSGRTPLTRVP-----VKPTKGRPGQTAKEHKKTVGLQFRNSLHLL Gallus QDEEK-AISPTSATPSGRVPLSRTP-----VKPAKARPGQTSKEHKKTVGHQFRNSLHLL Danio HDEEK-ATSPTGAAPG-PGGRTRLS-----VKPDKGKSSQASKEHKKTVGLQFRNSLQLL Drosophila TLEEIDTLCVDSAKSSTLGGRVVISAGRKQQGNDTRRRVVPSKQHRKTVGSQFQESLASL Anopheles VAQEEGGGDGDAKTAPAAGVKIMVSA--------ARTQPMTQKQQRKTVGSQFRESLTQL Caenorhabditis -----GSTAPTSVSSS------------------SSSSTPGKRTIKKTVASQFRDSLKEL Schizosaccharomyces DFYMQ------LVSSQ------------------NKNPRKTAISRKPTLSSMFKSSLSQL Arabidopsis PPLPE---------------------------------ESSKTSKFSSIGSQFKQQLQSL ::. \*:..\* \* Homo METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Equus METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Pan METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Macaca METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Canis METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Bos METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Mus METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Rattus METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Gallus METLNATTPHYVRCIKPNDFKFPFTFDEKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Danio METLNATTPHYVRCIKPNDYKHAFTFDPKRAVQQLRACGVLETIRISAAGFPSRWTYQEF Drosophila ISTLHATTPHYVRCIKPNDDKVAFKWETAKIIQQLRACGVLETVRISAAGFPSRWLYPDF Anopheles ITTLHNTTPHYVRCIKPNDDKAPFKWEAPKIVQQLRACGVLETVRISAAGFPSRWKYEDF Caenorhabditis MSVLCSTRPHYVRCIKPNDSKISFDFEPKRAIQQLRACGVLETVRISAAGFPSRYPYEEF Schizosaccharomyces MTTVSSTNVHYIRCIKPNEEKLPWTFSPPMVLSQLRACGVFETIRISSLGFPARFSYEEF Arabidopsis LESLSTTEPHYIRCVKPNNLLKPDIFENINILHQLRCGGVMEAIRISCAGYPTRKPFNEF : : \* \*\*:\*\*:\*\*\*: :. : \*\*\*. \*\*:\*::\*\*\*. \*:\*:\* : :\* Homo FSRYRVLMKQKDV-LSDRKQTCKNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKLRADK Equus FSRYRVLMKQKDV-LSDRKQTCKNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKLRADK Pan FSRYRVLMKQKDV-LSDRKQTCKNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKLRADK Macaca FSRYRVLMKQKDV-LSDRKQTCKNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKLRADK Canis FSRYRVLMKQKDV-LSDRKQTCKNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKLRADK Bos FSRYRVLMKQKDV-LSDRKQTCKNVLEKLIVDKDKYQFGKTKIFFRAGQVAYLEKLRADK Mus FSRYRVLMKQKDV-LGDRKQTCKNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKLRADK Rattus FSRYRVLMKQKDV-LGDRKQTCQNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKLRADK Gallus FSRYRVLMKQKDV-LSDRKQTCKNVLEKLILDKDKYQFGKTKIFFRAGQVAYLEKIRADK Danio FSRYRVLMKQKDV-LTDKKMTCKNVLEKLVQDPDKYQFGKTKIFFRAGQVAYLEKLRADK Drosophila YMRYQLLVYRSKLDKNDMKLSCRNIVMKWIQDEDKYRFGNTQIFFRAGQVAFLEQVRANL Anopheles YERYRLLCKRAQIVDWHVKATCTNIVRNWLLDEDKYRLGNTQIFFRAGQVAYLEQVRSDT Caenorhabditis ARRYRVIYTKEAALWRDKPKQFAELACQQCLEEGKYAVGKTKIFLRTGQVAVLERVRLDT Schizosaccharomyces AHRFRILLSSKEWEEDNKKLTLNIVNSVIPHDNLNFQVGRSKIFFRSNVIGNFEEAHRAT Arabidopsis LTRFRILAPETTKSSYDEVDACKKLLAKV--DLKGFQIGKTKVFLRAGQMAEMDAHRAEV \*:::: . : : : .\*.:::\*:\*: :. :: : Homo LRAACIRIQKTIRGWLLRKKYLRMRKAAITMQRYVRGYQARCYAKFLRRTKAATIIQKYW Equus LRAACIRIQKTIRGWLLRKKYLRMRKAAITVQRYVRGYQARCYAKFLRRTKAATIIQKYW Pan LRAACIRIQKTIRGWLLRKKYLRMRKAAITVQRYVRGYQARCYAKFLRRTKAATIVQKYW Macaca LRAACIRIQKTIRGWLLRKKYLRMRKAAITVQRYVRGYQARW------------------ Canis LRAACIRIQKTIRGWLLRKKYLRMRKAAITVQRYVRGYQARCYAKFLRRTKAATIIQKYW Bos LRAACIRIQKTIRGWLLRKKYLRMRKAAITVQRYVRGHQARCYAKFLRRTKAATIIQKYW Mus LRAACIRIQKTIRGWLLRKRYLCMQRAAITVQRYVRGYQARCYAKFLRRTKAATTIQKYW Rattus LRAACIRIQKTIRGWLLRKRYLCMQRAAITVQRYVRGYQARCYAKFLRRTKAATTIQKYW Gallus LRAACIRIQKTIRGWLMRKKYMRMRRAAITIQRYVRGHQARCYATFLRRTRAAIIIQKFQ Danio LRAACIRIQKTIRCWLARKKYLRMKHAATTIQRFVRGYQARCLAKFLRRTRAAIIIQKYQ Drosophila RKKYITIVQSVVRRFVYRRQFLRIQKVINGIQKHARGYLARERTQKMREARAGLILSKYA Anopheles RKKHIIVVQSLIRRFVCRRRYLRLKQTALGLQRHARGMLARKRADNLRKNRAAIIIQRYT Caenorhabditis LAAAATVIQKMWKGFLARRKYETMRRSLLIVQASLKAFLAFRRIKYLQMHRAVIVMQSAV Schizosaccharomyces CSKSTVLLQSAIRGFFTRKEYQRTVKFIIKLQSVIMGWLTRQRFEREKIERAAILIQAHW Arabidopsis LGHSARIIQRNVLTYQSRKKFLLLQAASTEIQALCRGQVARVWFETMRREAASLRIQKQA :\* : \*:.: :\* . : Homo RMYVVRRRYKIRRAATIVLQSYLRGFLARNRYRKILREHKAVIIQKRVRGWLARTHYKRS Equus RMYIVRKRYKIKRTATIVLQSYLRGYLARNRYRKILREHKAVIIQKWVRGWLARTYYKRS Pan RMYVVRRRYKIRRAATIVLQSYLRGFLARNRYSKILREHKAVIIQKRVRGWLARTHYKRS Macaca --FVVCRRYKIRRAATIVLQSYLRGFLARNRYRKILREHKAVIIQKRVRGWLARTHYKRS Canis RMYIVRRKYKIRRTATIVLQSYLRGYLARNRYRKMLREHKAVIIQKWVRGWLARTRYKRS Bos RMYVARRRYKIMRTATIVLQSYLRGYLARNRYHKILREHKAVIIQKWVRGWLARTCYRRS Mus RMYVVRRRYKIRRAATIVIQSYLRGYLTRNRYRKILREYKAVIIQKRVRGWLARTHYKRT Rattus RMYVVRRKYKIRRAATIVLQSYLRGYLARNRYRKILREHKAVIIQKRVRGWLARTHYKRT Gallus RMYVVRKRYQCMRDATIALQALLRGYLVRNKYQMMLREHKSIIIQKHVRGWLARVHYHRT Danio RMYIQKTCYKRKQAAALAMQCILRAYMARQLYKALLREHKAVIIQKMVRGWLARQWFKRS Drosophila RGWLCRRRYLRLRHSISGIQTYARGMLARNKFHAMRDHYRAVQIQRFVRGALARRAYQKR Anopheles RGWLQRKKYVQLRTAVLGLQTRARGFMARRKFRAVLDNYKATEVQRFCRGYLARRRYRAR Caenorhabditis RGYLERRKYEQIRDSIIGIQAMFKANRVRRYVEKLRYEKSAITIQAAWRGYLARREQIAN Schizosaccharomyces RSYIQRKRYLSLIKCAIVIQSIVRKNIAYSRYINELRESSATLLAKFWRAYNARKTFRGL Arabidopsis RTYICQNAYKTLCSSACSIQTGMRAKAARIELQLRKKRRATIIIQSQIRRCLCHQRYVRT :: \* . :\* : . . : : \* .: Homo MHAIIYLQCCFRRMMAKRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Equus MHAIIYLQCCFRRMMARRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Pan MHAIIYLQCCFRRMMAKRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Macaca MHAIIYLQCCFRRMMAKRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Canis MHAIIYLQCCFRRMMAKRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Bos IHAIIYLQCCFRRMMAKRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Mus MKAIVYLQCCFRRMMAKRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Rattus MKAIIYLQCCFRRMMAKRELKKLKIEARSVERYKKLHIGMENKIMQLQRKVDEQNKDYKC Gallus LKAIVYLQCCYRRMMAKRELKKLKIEARSVERYKKLHIGLENKIMQLQRKIDEQNKEYKS Danio LKAIVYLQCCIRRMRAKRELKKLKIEARSVEHFKKLNIGMENKIMQLQRRIDDQNKENRS Drosophila RRNIIICQAAIRRFLARRKFKRMKAEAKTISHMENKYMGLENKIISMQQRIDELNRDNSN Anopheles LDHIIKCQAAVRRFLARRAFKKLKAEARTVAHIQKMYKGLENKIIELQQRHDVLSKENAA Caenorhabditis RKKVVMVQCAVRKWLAKRRLRELKIEARSVGHLQKLNTGLENKIIELQMRLDIANARTKE Schizosaccharomyces KKSVIALQCVSRSVLTRRYLRRLQDSAGRTSILYEKQKNLQASITEVSKQLKSNSKKVTV Arabidopsis KKAAITTQCGWRVKVARRELRNLKMAAKETGALQDAKTKLENQVEELTSNLELEKQ---- : \*. \* ::\* ::.:: \* . :: .: .: . . . Homo LVEKLTNLEGIYNSE-TEKLRSDLERLQLSEEEAK-----VATGRVLS----LQEEIAKL Equus LMEKLTNLEGIYNSE-TEKLRNDLERLQLSEEEAK-----IATGRVLS----LQEEIAKL Pan LVEKLTNLEGIYNSE-TEKLRSDLERLQLSEEEAK-----VATGRVLS----LQEEIAKL Macaca LVEKLTNLEGIYNSE-TEKLRSDLERLQLSEEEAK-----VATGRVLS----LQEEIAKL Canis LMEKLTTLEGIYNSE-TEKLRSDLERLQLSEEEAK-----VATGRVLS----LQEEIAKL Bos LMEKLTNLEGIYNSE-TEKLRSDLERLQLSEEEAK-----IATGRVLS----LQEEIAKL Mus LMEKLTNLEGVYNSE-TEKLRNDVERLQLSEEEAK-----VATGRVLS----LQEEIAKL Rattus LMEKLTNLEGVYNSE-TEKLRNDVERLQLSEEEAK-----VATGRVLS----LQEEIAKL Gallus LLEKMNNLEITYSTE-TEKLRSDVERLRMSEEEAK-----NATNRVLS----LQEEIAKL Danio MSERLNTLETSHAVE-SERMRAEVTRLRGAEEDAK-----NNANKVTS----LLEELERL Drosophila LKHKTSEI---------SVLKMKLELKKTLEAEFK-----NVKAACQD----KDKLIEAL Anopheles LKKQNVEV---------VEMRQKLDGMKRLEGELK-----LLQLQLVQ----KDEKLMLS Caenorhabditis EAEKFATASKNLQKTKADLAMMEAERLTLLEA----------RNRVEV----LQEEVERL Schizosaccharomyces LRNKLNILNNSL-------------------SKWK----------CLI------------ Arabidopsis -------------------MRMEIEEAKSQEIEALQSVLTDIKLQLRDTQETKSKEISDL Homo RKDLEQTRSEKKC--------IEEHA---DRYKQETEQLVSNLKEENTLLKQEKEALNHR Equus RKDLEQTQSEKKS--------IEERA---DRYKQETEQLVSNLKEENTLLKQEKEALNHL Pan RKDLEQTRSEKKC--------IEEHA---DRYKQETEQLVSNLKEENTLLKQEKEALNHR Macaca RKDLEQTRSEKKC--------IEERA---DQYKQETEQLVSNLKEENTLLKQEKEALNHR Canis RKDLEQTQSEKKS--------IEERA---DKYKQETEQLVSNLKEENTLLKQEKEALNHL Bos RKDLEQTQSEKKS--------IEEHA---DRYKQETEQLVSNLKEENTLLKQEKEVLNHR Mus RKDLEQTRSEKKS--------IEERA---DKYKQETDQLVSNLKEENTLLKQEKETLNHR Rattus RKDLEQTRSEKKS--------IEERA---DKYKQETEQLVSNLKEENTLLKQEKETLNHL Gallus RKELHQTQTEKKT--------IEEWA---DKYKHETEQLVSELKEQNTLLKTEKEELNRR Danio RKDLQNTQKEKKA--------IEDWA---QTYQDEMEKMISELKEQNQLLKTEKNNLNQL Drosophila NKQLEAERDEKMQLLEENGHAQEEWISQKQTWRQENEELRRQIDEIIDMAKNA--EVNQR Anopheles IRQLEGERDEKMQLLEEKQREEEERARERDAFEQELAKVRREVTEITAVTQ--------- Caenorhabditis ETECDLKEAQRGG-METK---MVELQSRLDQMQSESGQTIVELTEQLEKAKAD------- Schizosaccharomyces KKPSDFSEPVSM------------------DFTSNDEQLVQL-------LQAE------- Arabidopsis QSVLTDIKLQLRDTQETKSKEISDLQSALQDMQLEIEELSKGLEMTNDL----------- . : : Homo IVQQAKEMTETMEKKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMVH Equus IVEQAKEMTETMEKKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMVN Pan IVQQAKEMTETMEKKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMVH Macaca IVEQAKEMTETMEKKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMVH Canis IVEQAKEMTETMEKKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMVN Bos IVEQAKEMTETMEKKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMVN Mus IVEQAKEMTETMERKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMLN Rattus MVEQAKEMTETMERKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKEEMTLMLN Gallus IHDQAKEITETMEKKLVEETKQLELDLNDERLRYQNLLNEFSRLEERYDDLKDEMNLMVS Danio IQEQSQQWTDKMQRALKEETQQLENDLNEERSRYQNLLTEHLRLEEKYDDLKEEITLAVN Drosophila NQ---------------EDRMLAEIDNRELNEAYQRAIKDKEVIENENFMLKEELSRLTA Anopheles IE---------------QARLVSQADTEEIHAAYQRTVKDKDVLENENVALRQEVRRLQR Caenorhabditis ----RVLWD--------EERQRMEAALNTERSARN-------ALDAEMAAMREQLMKNVD Schizosaccharomyces ----S-----------------------KLRQASQQL----------Y------------ Arabidopsis --------------------------------------------AAENEQLKESVSSLQN Homo VPKP---------GHK-RTDSTHSSNESEYIFSSEIAEMEDIPS----RTEEPSEK---K Equus VPKP---------GHK-RTDSTHSSNESEYTFSSEITETEDIPS----RTEEPSEK---K Pan VPKP---------GHK-RTDSTHSSNESEYIFSSEIAEMEDIPS----RTEEPSEK---K Macaca VPKP---------GHK-RTDSTHSSNESEYTFSSEIAEMEDIPS----RTEEPSEK---K Canis VPKP---------GHK-RTDSTHSSNESEYTFSSEIAETEDMPL----RTEEPSEK---K Bos VPKP---------GHK-RTDSTHSSNESEYTFSSEIAETEDIPS----RTEEPSEK---K Mus VPKP---------GHK-RTDSTHSSNESEYTFSSEFAETEDIAP----RTEEPIEK---K Rattus VPKP---------GHK-RTDSTHSSNESEYTFSSEFAETEDIAP----RTEEPTEK---K Gallus IPKP---------GHK-RTDSTHSSNESEYTFSSEITEAEDLPL----RMEEPSEK---K Danio VPKP---------GHR-RTDSTHSSNESECTYNSEFAESEEGSR----VGED--VS---K Drosophila -----GSFS----LHARKASNASSQNEDDVGYASAKNTL-DINRPPDLL--------SKN Anopheles IAADSHELK----THSRSVSNASSTNEEDYGYTSGRNTL-DIRRASPHPYEDPSDSTVGE Caenorhabditis LFESS-TFQKRPSQKKNRDDDSCSRTTSNLSQLTGSFTAETINGV---------HSTSRG Schizosaccharomyces ----------------------MAAKKSELGFVQSQTARENLSNY----YQALQMTVSEK Arabidopsis KIDE-----------------------SERKY-------EEISKISEERI-------KDE .: Homo VP------LDMSLFLKLQKRVTELEQEKQVMQDELDRKEEQVLRSKAKE-EERPQIR--- Equus VP------LDMSLFLKLQKRVTELEQEKQVMQDELDRKEEQVLRSKAKE-EERPQIR--- Pan VP------LDMSLFLKLQKRVTELEQEKQVMQDELDRKEEQVLRSKAKE-EERPQIR--- Macaca VP------LDMSLFLKLQKRVTELEQEKQVMQDELDRKEEQVLRSKAKE-EERPQIR--- Canis VP------LDMSLFLKLQKRVTELEQEKQVMQDELDRKEEQVLRSKAKE-EERPQIR--- Bos VP------LDMSLFLKLQKRVTELEQEKQVMQDELDRKEEQVLRSKAKE-EERPQIR--- Mus VP------LDMSLFLKLQKRVTELEQEKQLMQDELDRKEEQVFRSKAKE-EERPQIR--- Rattus VP------LDMSLFLKLQKRVTELGQEKQLMQDELDRKEEQVLRSKAKG-GERPQIR--- Gallus AP------LDMSLFLKLQKRVTELEQEKQSLQDELDRKEEQALRAKAKE-EERPPIR--- Danio SI------LDMSLFLKLQKRVSELEQEKQSLQNELDRREEQFQRARARDDEEHKKAR--- Drosophila YSY----NDSTSLVVKLRSILEEEKQKHKVLQEQYIKLS-----------------S--- Anopheles SPE----KDQTAIILRMRKLFEEEKSKSEQLRKELARLK----K------------S--- Caenorhabditis SPE--VLLDNMASTFEQLRMINDLRQRNEHCQRETERMKAIIEASTLI---ETLDKK--- Schizosaccharomyces FEYDTEQLPSRVLFYAMDRYFSI------------------------------------- Arabidopsis VP-----VIDQSAIIKL-------ETENQKLKALVSSMEEKIDELDRKHDETSPNITEKL . Homo GAELEYESLKRQELESENKKLKNELNELRKALSEKSAPEVTAPGAPAYRVLMEQLTSVSE Equus GAELEYESLKRQELESENKKLKNELNELRKALSEKSAPEVTAPGAPAYRVLMEQLTSVSE Pan GAELEYESLKRQELESENKKLKNELNELRKALSEKSAPEVTAPGAPAYRVLMEQLTSVSE Macaca GAELEYESLKRQELESENKKLKNELNELRKALSEKSAPEVTAPGAPAYRVLMEQLTSVSE Canis GAELEYESLKRQELESENKKLKNELNELRKALSEKSAPEVTAPGAPAYRVLMEQLTSVSE Bos GAELEYESLKRQELESENKKLKNELNELRKALSEKSAPEVTAPGAPAYRVLMEQLTSVSE Mus GAELEYESLKRQELESENKKLKNELNELRKALSEKSAPEVTAPGAPAYRVLMEQLTSVSE Rattus GAELGYESLKRQELESENKKLKNELNELRKALSEKSAPEVNAPGAPAYRVLMEQLTAVSE Gallus GAELEYESLKRQELESENKKLKNELNELQKALTETRAPEVTAPGAPAYRVLLDQLTSVSE Danio GAELEYESLKRQELESENKKLKHDLNQMRQSLRGSVEAGSGAPGSPAYTVLLDQLNASNE Drosophila RHKPTEDSFRVSELEVENEKLRSEYDQLRTSIKHGVEIN----------ELNAQHAALQE Anopheles STFSTEDSIRASELEVENEKLRQDYNLLRNSIKRGVESR----------EMDAQYGALQE Caenorhabditis TSLKAFESIRVGELEGAYNRLKNDMERLVSG-------ENGATH--------SVFERIME Schizosaccharomyces -----------------HKKLKQLLELV------GVENASLLPN----EVVNKQTKDLL- Arabidopsis KEDVSFDYEIVSNLEAENERLKALVGSLEKKINESGNNSTDEQE---------------- ::\*: : Homo ELDVRKEEVLILRSQLVSQKEAIQPKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Equus ELDVRKEEVLILRSQLVSQKEAIQPKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Pan ELDVRKEEVLILRSQLVSQKEAIQPKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Macaca ELDVRKEEVLILRSQLVSQKEAIHPKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Canis ELDVRKEEVLILRSQLVSQKEAIQHKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Bos ELDVRKEEVLILRSQLVSQKEAIQPKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Mus ELDVRKEEVLILRSQLVSQKEAIQPKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Rattus ELDVRKEEVLILRSQLVSQKEAIQPKDDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Gallus ELEVRKEEVLILRSQLVSQKEAIQPKEDKNTMTDSTILLEDVQKMKDKGEIAQAYIGLKE Danio ELEVRKEEVLILRSQLVSQKEAMQHK---TTMTEPLPYIEDVQKLTDAKEISQAYMGLKD Drosophila EVRRRREECIQLKAVLLQQSQSMRSLEPES----L------------------------- Anopheles ELKRRREECISLKAVLAQQSQSLRSLGQTANGAET------------------------- Caenorhabditis ENERLREEAVELRSMLSSHFEKQSVAGSSGYRRSPRPD---------SGH---------- Schizosaccharomyces ---------YEKRVVFLKQI---------------------------------------- Arabidopsis ------EGKYILKEESLTED--------------ASIDNERVKKLADENK---------- : . Homo TNRSSALDYHELNEDGELWLVY--------EGLKQANRLLESQLQSQKRSHENEAEALRG Equus TNRSSAMDCHELNEDGELWLVY--------EGLKQANRLLESQLQSQKRSHENEAEALRG Pan T-----------------------------------NRLLESQLQSQKRSHENEAEALRG Macaca TNRSSALDYRELNEDGELWLVY--------EGLKQANRLLESQLQSQKRSHENEAEALRG Canis TNRSPAMDCHELNEDGELWLVY--------EGLKQANRLLESQLQSQKRSHENEAEALRG Bos TNRPSAMDCHELNEDGELLLVY--------EGLKQANRLLESQLQSQKRSHENEAEALRG Mus T-----------------------------------NRLLESQLQSQKRSHENEAEALRG Rattus T-----------------------------------NRLLESQLQSQKRSHENEAEALRG Gallus T-----------------------------------NRLLESQLQSQKKSHENELESLRG Danio T-----------------------------------NRLLESQLQAQRRSHDNEVEVLRG Drosophila --------QMRGNDVNELMEAF--------HSQKLINRQLESELKAITEEHNSKLVEMTQ Anopheles --------SLRIHDEGELMEAF--------QAQKLVNRQLESELRAITDANNETLVENNR Caenorhabditis ---CSGADSEDGSSGADLEEDL----------------CIERQCRH----LKNLAENLTK Schizosaccharomyces ------------------------------------------------------------ Arabidopsis -------------DLNDLVSSLEKKIDETEKKYEEASRLCEERLKQAL-------DAETG Homo EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Equus EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Pan EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Macaca EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Canis EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Bos EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Mus EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENLYFEELYADD Rattus EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Gallus EIQSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Danio ELHSLKEENNRQQQLLAQNLQLPPE-ARIE------ASLQHEITRLTNENL--------- Drosophila EIERLNNEKDELQKVMFESIDEF-EDSNVDTLRQNDRYLRRELQKAVAQFL--------- Anopheles IIDGLRTENGELQAILQQHVEQVGEEVDLETVRQNEQYLRHELRKSTAAYV--------- Caenorhabditis MLTNQNLEIERLQQQLRFS-----E--SQTVFRPSDCSLDEAVRGAHKQTQ--------- Schizosaccharomyces ------------------------------------------------------------ Arabidopsis LID-LKTSM---------------------------QRLEEKV----------------- Homo ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Equus ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Pan ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Macaca ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Canis ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Bos ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Mus PKKYQSYRISLYKRMIDLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Rattus ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Gallus ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIGE--LEVGQMENISPGQ Danio ----------------DLMEQLEKQDKTVRKLKKQLKVFAKKIND--LEGGQMD-VSPGQ Drosophila ----------------LVQEELKLANAKLKAYRQDGGQLEHK-----IEEEMIRNKSNGT Anopheles ----------------ELQEQLNELLAKNNELLKKNNILSNRLRDHGLNDSILMND---- Caenorhabditis ---------LLAQQNMDLNDKLTRQSEELAEARAQLRGYSGPL---GLENA-----S--- Schizosaccharomyces ---------------------------------KQALTVSSLFNAVGYKDGVMR------ Arabidopsis -------------SDMETAEQIRRQQALVNSASRRMSPQVSFTGAPPLENGHQE------ : Homo IIDEPIRPVNIPRKEKDFQGMLEYKKEDEQ-KLVKNLILELKPRGVAVNLIPGLPAYILF Equus IIDEPIRPVNIPRKEKXFQGMLEYKKEDEQ-KLVKNLILXX------------------- Pan IIDEPIRPVNIPRKEKDFQGMLEYKKEDEQ-KLVKNLILELKPRGVAVNLIPGLPAYILF Macaca IIDEPIRPVNIPRKEKDFQGMLEYKKEDEQ-KLVKNLILELKPRGVAVNLIPGLPAYILF Canis IIDEPIRPVNIPRKEKDFQGMLEYKKEDEQ-KLVKNLILELKPRGVAVNLIPGLPAYILF Bos IIDEPIRPVNIPRKEKDFQGMLEYKKEDEQ-KLVKNLILELKPRGVAVNLIPGLPAYILF Mus IIDEPIRPVNIPRKEKDFQGMLEYKREDEQ-KLVKNLILELKPRGVAVNLIPGLPAYILF Rattus IIDEPIRPVNIPRKGKDFQGMLEYKREDEQ-KLVKNLILELKPRGVAVNLISGLPAYILF Gallus IIDEPIRPVNIPRKEKDFQGMLEYKKEDEQ-KLVKNLILELKPRGVAVNLIPGLPAYILF Danio TADEPVHPVNIPRREKDFQGMLEYKKEDEL-KLVKNIILELKPRGVAVNLIPGLPAYILF Drosophila SADVG--ANVTKQKSQNPQGLMKFHSSDLD-KILQRLLSALTPRT-VVGLLPGFPAYLIF Anopheles EFHSM--VAVVKKQTQSSQGILKYRQEDES-KIMQRLVTDLKPRV-AVTLAPSLPAYVVF Caenorhabditis -DEEIIRLEAFEKGSIKHSGFLEVYN--VP-EFARIIVCELKPTL-ARLLTKNLPAYLLV Schizosaccharomyces -------LLETDQNSLLFAGVVNFL----------------IFAGISLDLKTQISEFLSQ Arabidopsis ----PLAP--IPSRRFGTESFRRSRIERQPHEFVDV-LLKCVSKNIGFSHGKPVAALTIY .. . Homo MCVRHADYLNDDQKVRSLLTSTINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Equus --XXXADYLNDDQKVRSLLTSRINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Pan MCVRHADYLNDDQKVRSLLTSTINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Macaca MCVRHADYLNDDQKVRSLLTSTINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Canis MCVRHADYLNDDQKVRSLLTSTINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Bos MCVRHADYLNDDQKVRSLLTSTINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Mus MCVRHADYLNDDQKVRSLLTSTINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Rattus MCVRHADYLDDDQKVRSLLTSTINSIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Gallus MCVRHADYLNDDQKVRSLLTSTINGIKKVLKKRGDDFETVSFWLSNTCRFLHCLKQYSGE Danio MCLRHADYINDDQKVRSLLTSVINSIKKILKKRGDDFETVSFWLANTCRFLHCLKQYSGD Drosophila MCIRYTDLTNADDDVRELLSKFVIQIKKMHR-TPHPIENRVIWLVNSITLLNLMKQYGDV Anopheles MCIRYTDLVNMDQLVRSLLTRFVQMIKRLYR-GANSVEVRVMWLANTLTLHNLMKQFGGY Caenorhabditis AAFRNHDEKRDETALTGLFSSVHLVLKDTIS-RSHDLDLLSLWLVNLWRLFNLLRQYSGE Schizosaccharomyces LCSYFTKIVD----------GTVIENDKTLDFYEKPLQAVLYWFATLHKIRSFLVHLLSI Arabidopsis KCLMRWKIFE--AEKTSIFDRIVPVFGSAIE-NQEDDNHLAYWLTNTSTLLFLLQRSLRQ . . : \*: . : : : Homo EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Equus EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Pan EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Macaca EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Canis EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Bos EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Mus EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Rattus EG----------------------FMKHNTSRQN----EHCLTNFDLAEYRQVLSDLAIQ Gallus EG----------------------FMKHNTPRQN----EHCLTNFDLAEYRQVLSDLAIQ Danio EQ----------------------FMKHNSPKQN----EHCLSNFDLAEYRQVLSDLAIQ Drosophila DE----------------------YVKFNTEKQN----QQQLKNFNLFEYRRVILDLIVN Anopheles KD----------------------YMKYNTDVQN----AQQLKNFDLAEYRQVIHETIIS Caenorhabditis DS----------------QPE---WHVANTETQN----SYRFKAYDVAPIRDQLKLRIEE Schizosaccharomyces NSHGKQSVVE-----DLWNPL---ILKFSK----------HFSNL---------ENSFHS Arabidopsis QSSTGSSPTKPPQPTSFFGRMTQGFRSTSSPNLSTDVVQQVDARYPALLFKQQLTAYVET . .. Homo IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Equus IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Pan IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Macaca IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Canis IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Bos IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Mus IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Rattus IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Gallus IY-----------QQL-VRVLE----NILQPMIVSGMLEHETIQGVSGV----------- Danio IY-----------QQL-IKCME----NILQPMIVSGMLEHETIQGVSGV----------- Drosophila LY-----------QAL-IMQIQ----GLLDPKIVPAILNNDEIQRGRQ------------ Anopheles MH-----------SVL-IRQVQ----DSLKQYIVPAILHHDETARGKS------------ Caenorhabditis CY-----------TSLMKKAIE----HVLSPKIVPGILQHESSSDLMT------------ Schizosaccharomyces LV-----------QKLLSCCTEGSINALLNSKCLPEFIDAAD----ENT----------- Arabidopsis MYGIIRENVKREVSSLLSSCIQ----SLKESSCDSSVVNSPSKSSEENLPAKSSEENSPK \* : . .:. Homo ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Equus ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Pan ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Macaca ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Canis ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Bos ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Mus ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Rattus ---------------KPTGLRKRTS----------SIADEGTYTLDSILRQLNSFHSVMC Gallus ---------------KPTGLRKRTS----------SIADEGTYTLDSIIRQLNSFHSVMC Danio ---------------KPTGLRKRTS----------SIADEGTYTLDSIIRQLNTFHSIMC Drosophila ----------------AHGMRSRAT----SIGASSSPEHGGGPAWKQLIGQLEHFYKQFQ Anopheles ----------------RRTMSLD-----------ISPEQG-RSEPELLVQQLGCVYNHLS Caenorhabditis -----------------AGQERRDR----NS----GSVESQRKSLDDLLQFMEIVHTKLT Schizosaccharomyces ---------------TPT-----------------------GMNIYELIDRMNLIHKLLI Arabidopsis KSSEENSPKESSGDKSPQKLSDDNSPSKEGQAVKSSEENSPASSWQSIIEFLNYILITWK :: : . Homo QHGMDPELIKQVVKQMFYIIGAITLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Equus QHGMDPELIKQVVKQMFYIVGAITLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Pan QHGMDPELIKQVVKQMFYIIGAITLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Macaca QHGMDPELIKQVVKQMFYIVGAITLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Canis QHGMDPELIKQVVKQMFYIVGAITLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Bos QHGMDPELIKQVVKQMFYIVGAVTLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Mus QHGMDPELIKQVVKQMFYIVGAITLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Rattus QHGMDPELIKQVVKQMFYIVGAITLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Gallus QHGMDPELIKQVVKQMFYIIGAVTLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Danio HHGTDPELIKQVVKQQFYIIGAVTLNNLLLRKDMCSWSKGMQIRYNVSQLEEWLRDKNLM Drosophila HFGLDNCYAEQIFHQLLYFICAVALNCLMLRGDICMWETGMIIRYNIGCIEDWVRSKKMS Anopheles SFGLEGCYIEQIFKQLMHYICAVSVNNLMLRGDLCMWKTGMKLRYNMGCLDDWVRKMKMG Caenorhabditis TYGGDDIVVKQVIGQMARWMCALALNYMMFRRELCNFEKAIQIKHNVTQIQNWLNAKGLS Schizosaccharomyces SSALQPNLLELTISHMLQHIGQRAFQTLIHGRSPYTWKSASQVSYNASLLINWCHQKGIS Arabidopsis KNYVPLFLVQKMFSQTFQYINVQLFNSLLLEREYCTVNMGIKVKAGLDELESWCSQATEE : . : : .: :: . . . : : .\* Homo NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Equus NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Pan NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Macaca NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Canis NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCSALTTAQIVKVLNLYTPVNEFEE Bos NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Mus NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Rattus NS-GAKETLEPLIQAAQLLQVKKKTDDDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Gallus NS-GAKETLEPLIQAAQLLQVKKKTDEDAEAIC-SMCNALTTAQIVKVLNLYTPVNEFEE Danio TC-GAKETLEPLIQAAQLLQVKKKTDEDAEAIC-SMCNALSTAQIVKVLNLYTPVNAFEE Drosophila -N-DVLTALAPLNQVSQLLQSR-KSEQDVQTIC-DLCTSLSTAQVLKVMKSYKL-DDYES Anopheles -P-DVMKPFLPLNQISSILQAR-KTEEDVHTLL-ELSTALSTAQVLKIIKSYKT-DDCEN Caenorhabditis ---DCRDHFEPLVQACHLLQSRKDP-SNLDTLCGEMTSRLKPRQVVAILQHYDPSDEMED Schizosaccharomyces ---YVNSSLLPLMQSPLVFCLRKNDANDLDVIL-SVCNLLSPFEVVCLLNRYQPCA-GEN Arabidopsis FVGSSWDELKHTRQAVVLLVTEPKSTITYDDLTINLCSVLSTEQLYRICTLCKDKDDGDH : \* :: . . . : .: . \*. :: : : Homo RVSVSFIRTIQMR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Equus RVSVSFIRTIQMR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Pan RVSVSFIRTIQMR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Macaca RVSVSFIRTIQMR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Canis RVSVSFIRTIQMR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Bos RVSVSFIRTIQMR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Mus RVSVSFIRTIQMR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Rattus RVSVSFIRTIQVR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Gallus RVLVSFIRTIQLR----LRDRK----DSPQLLMDAKHIFPV-TFPFNPSSLALETIQIPA Danio RVSVLFIRTIQTR----LRDRK----ESPQLLMDTKLIYPV-TFPFNPSSLALETIQIPS Drosophila EITNVFLEKLTEKLNARQMQKS----NSDEFTIDQKFIQPF-KVVFRYSDIKLEDIELPS Anopheles QIRPAFIEKLTQQLNLRSEQ-R----ESDTYMMDEELVSPL-VVLFKYSEINLEEIDLPP Caenorhabditis GLSPEFLVQIQKKLNERAIANNDPIEDKDKLIMLGTYLPPFDTQPFSYSDFPLETLSLPS Schizosaccharomyces PLPKSFSKAVEAL-SCKYKQSG--F-TNGKITNTNGHAIPIA--ASKNPLLSLENNHIYE Arabidopsis NVSPEVISNLKLLLTNEDE-------NSRSFLLDDDSSIPFDT------------DEISS : . : . \*. : Homo SLGLGF-ISRV---------------- Equus SLGLGF-ISRV---------------- Pan SLGLGF-ISRV---------------- Macaca SLGLGF-ISRV---------------- Canis SLGLGF-ISRV---------------- Bos SLGLGF-ISRV---------------- Mus SLGLGF-IARV---------------- Rattus SLGLGF-IARV---------------- Gallus SLGLGF-ISRV---------------- Danio SLNLAF-LTRV---------------- Drosophila HLNLDEFLTKI---------------- Anopheles ELNLEGLVTKI---------------- Caenorhabditis CLHMQSVCRLV---------------- Schizosaccharomyces ELRLSELINLLAKATL----------- Arabidopsis CMQEKDFANVKSASELADNPNFLFLKE