

**Han Z, Papermaster DS. Identification of three prominin homologs and characterization of their messenger RNA expression in *Xenopus laevis* tissues. Molecular Vision 2011; 17:1381-96.**

## Appendix 1. Sequences used for phylogenetic analysis

>M.\_musculus\_Prom-1, GenBank Accession Number: NP\_032961,  
IALYEIGVLICAILGLLFIILMLPLVGCFFCMCRCCNKCGGEMHQRQKQNPACRRKCLGLSLLVICLLMSL  
GIIYGFVANQQTRTRIKGTQKLAKSNFRDFQTLTETPKQIDYVVEQYTNNTKNKAFSDLDGIGSVLGGRI  
KDQLKPKVTPVLEEIKAMATAIKQTKDALQNMSSSLKSLQDAATQLNTNLSSVRNSIENSLSSSDCTSDP  
ASKICDSIRPSLSSSLGSSLNSSQLPSVDRELNTVTEVDKTDLESVLKRGYTTIDEIPNTIQNQTVDVIKD  
VKNTLDSISSNIKDMSQSPIEDMLLQVSHYLNNSNRYLNQELPKLEEYDSYWVLGGLIVCFLLTLIVTF  
FFLGLLCGVFGYDKHATPTRRGCVSNTGGIFLMAGVGFGFLFCWILMILVVLTFVVGANVEKLLCEPYEN  
KKLLQVLDTPYLLKEQWQFYLSGMLFNNPDINMTFEQVYRDCKRGRGIYAAFQLENNVNVSDHFNIDQIS  
ENINTELENLNVNIDSIELLDNTGRKSLEDAHSGIDTIDYSTYLKETEKSPTEVNLLTFASTLEAKANQ  
LPEGKLKQAFLLDVQNIIRAIHQHLLPPVQQLNLTLRQSVWTLQQTSNKLPEKVKKILASLDSVQHFLTNN  
VSLIVIGETKKFGKTIILGYFEHYLHWVFYAITEKMTSCKPMATAMDSAVNGILCGYVADPLNLFWFVGIGK  
ATVLLLPAVITIAIKLAKYYRRMDSERVEDYDD

>R.\_norvegicus\_Prom-1, GenBank Accession Number: NP\_068519

VAIYEIGVLICVILGLLFIFLMLPLVGFFFCMCRCCKGCGEMHQKQKQNESCRKCLAISSLICLLMSL  
GIAFGFVANQQTRTRIQRQTQKLAESNYRDLRALLTEAPKQIDYILGQYNTTKNAFSDLSDSVLGGRI  
KGQLKPKVTPVLEEIKAMATAIRQTKDALQNMSSSLKSLRDASTQLSTNLTSVRNSIENSLNSNDCASDP  
ASKICDSLRLPQLSNLGSNHNGSQLPSVDRELNTVNDVDRTDLESLVKGYSIDEIPNMIQNQTGDVIKD  
VKKTLDVSVSSKVKNMQSQIPVEEVLLQFSHYLNSNRYIHESLPRVEEYDSYWWLGLIVCFLLTLIVTF  
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EDIVKELEKLVNIDSIELLDKTKGRKSLEDAQSGIDRINYSMYLQEAKEPPTKVDLLTFASFLETEANQ  
LPDGNLKQAFLMDAQNIRAIHQHVPPVQQLNSLKQSVWALKQTSSKLPEEVKKVLASLDAQHFLTSTN  
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>P.\_troglodytes\_Prom-1, GenBank Accession Number: XP\_517115  
IVYYEAGIILCCVLGLLFIILMLPLVGYFFCMCRCCNKCGGEMHQRQKENGPF LRKCF AISLLVICIIISI  
GIFYGFVANHQVVRTRIKRSRKLADSNFKDLRTLNETPEQIKYILAQYNTTKDKAFTDLNSINSVLGGGI  
LDRLRPNIIPVLDEIKSMATAIKETKEALENMNSTLKS LHQQSTQLSSSLTSVKTS LRSSLNDPLCLVRP  
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YYLGLLCGVCGYDRHATPTTRGCVSNTGGVFLMVG VGLSFLFCWILMIIVLTFVFGANVEKLICEPYTS  
KELFQVLDTPYLLNEDWEYYLSGKLFNKSKMKLTFEQVYS DCKKNRGTYGTLHLQNSFNISERLNINEHT  
GSISSELES LKVNLNIFLLGAAGRKNLQDFAACGIDRMNYDSYLAQTGKSPAGVNLLSFAYDLEAKANS L  
PPGNLRNSLKRDAQTIKTIHQQRVLP IEQSLSTLYQSVKILQRTGNGLLERVTRILASLDFAQNFITNNT  
SSVIIIEETKKYGRTIIGYFEHYLQWIEFSISEKVASCKPVATALD TAVDVFLCSYIIDPLNLFWFGIGKA  
TVFLLPALIFAVKLAKYRRMDS EDVYDD

>H.\_sapien\_Prom-1, GenBank Accession Number: NP\_006008

IVYYEAGIILCCVLGLLFIILMPLVGYFFCMCRCCNCKGEMHQKQKENGPFRLKCFASLLVICIIISI  
GIFYGFVANHQVRTRIKRSRKLADS NFKDLRTLLNETPEQIKYILAQYNTTKDKAFTDLNSINSVLGGGI  
LDRLRPNIIPVLDEIKSMATAIKETKEALENMNSTLKS LHQQSTQLSSSLTSVKTS LRSSLNDPLCLVHP  
SSETCNSIRLSLSQLNSNPELRQLPPVDAELDNVNNVLRDLDGLVQQGYQSLNDIPDRVQRQTTTVVAG  
IKRVLNSIGSDIDNVTQRLPIQDILSAFSVYVNNTESYIHRNLPTLEEYDSYWWLGGLVICSLTLTIVIF  
YYLGLLCGVCYDRHATPTTRGCVSNTGGVFLMVGVSFLFCWILMIIVLTFVFGANVEKLICEPYTS  
KELFRVLDTPYLLNEDWEYYLSGKLFNKSKMKLTFEQVYSDCKKNRGTYGTLHLQNSFNISEHLNINEHT  
GSISSELES LKVN LNIFLLGAAGRKNLQDFAACGIDRMNYDSYLAQTGKSPAGVNLLSFAYDLEAKANSL  
PPGNLRNSLKRDAQTIKTIHQQRVLP IEQSLSTLYQSVKILQRTGNGLLERVTRILASLDFAQNFITNNT  
SSVIEETK KYGR TIIGYFEHYLQWIEFSISEKVASCKPVATALDTAVDVFLCSYIIDPLNLFWFGIGKA  
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>M.\_mulatta\_Prom-1, GenBank Accession Number: NP\_001070888

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LDRLRPNIIPVLDEIKSMATAIKETKEALENMNSTLKS LHQQSTQLSSSLTSVKTS LRASLNDPLCSVRP  
SSETCNSIRLSLSQLNSNPELRQLPSVDAELDKVNNVLRDLDGLVQQGYQSLNDIPDRVQSQTKT TVVAG  
IKRVLNSIGSDIHNVTQHLPIQDILSEFSVYVNNTESYIHRNLPTLEEYDSYWWLGGLVICSLTLTIVIF  
YYLGLLCGVCYDRHATPTTRGCVSNTGGVFLMVGVSFLFCWILMIIVLTFVFGANVEKLICEPYTS  
KELFRVLDTPYLLNEDWEYYLSGKLFNKSEMKLTFQVYSDCKKNRGTYGTLHLENSFDISDYL NINEHT  
ASISSELES LKVN LNIFLLGAAGRKSLQDFAACGIDRMNYDYLAQTGKSPAGVNLLSFAYDLEAKANSL  
PPGNLRNSLKRDAQTIKTIHQQRVLP IEQSLSTLYQSVKILQRTGNGLLERVNRILASLDFAQNFITNNI  
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>C.\_familiaris\_Prom-1, GenBank Accession Number: XP\_850831

IIYYEIGIIICAVLGLLFIILMPLVGFCFGLCRCCNCKGEMHQKQKNGAFLRKYFTVSLLVICIFISV  
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HDQLRPKVIPVLDDIKAMAEAIKETREALLNVNNTLKE LKMSTAQLNTSLSDVKRNLEQSLNDPMCSVPP  
VATTCNNIRMSLGQLDDNTNLGQLPSLDKQIDNINNVLQTDLSSLVQKGYKSFNDIPEMVQNQT TTDIVSD  
VKRTLNSLGS DIENMSEQIPIQDKLSDFIGYINDTETYIHRNLPTLEEYDSYRWLGGLIVCCLLT LIVVF  
YYLGLMCGTFGYDRHATPTRRGCVSNTGGIFLMVGVSIFLFCWILMTIVLTFVIGGNMEKLVC EPYQN  
RKLFQILDTPYLLNENWKYYLSGMVLDKPDINLTFEQVYSDCKENKGIYSTLKLENTYNISEHLNIQEHA  
RNLSNDFKNMNVNIDNIVLLDAAGRKNLMDFSSSGVDTIDYNVYLAEMGKTPTKVNLLSFADDLDTKANN  
LPQGSLKQSLKNAQNLKTIHHGQVMPLEQSMSTINQSIKELQHKSSGLRVKVANILSSLD SAQDFLQTR  
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>E.\_caballus\_Prom-1, GenBank Accession Number: XP\_001498729

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HEQLKPKVVPVLEDIKAMAEAIKETKEALLNVNSTLDQLKKSTAQLNTSLSKVKGDL EQSLNDPVCTVPP  
AAATCNDIRTSLSQLDYNNNLGQLPSLDEHIDRVNNILRTNLSSQVQKGYKSFNDIPEMVQNQT TDLISG

IKSTLNSIGSNIGNISKQIPIQDKLSNFM DYINSTETYIHRSLPTLEEDSYRWLGGLVACCLLT LIVIF  
FYLGLLCGTFGYDQ NATPTRRG CISNTGGVFLMVGVSFLFCWILMAIVVTFVVGGNVEKL VCEPYQN  
RKLFQVLDTPYLLNENWK FYLSGMVFNKPDINLTFEQVYRDCKENKGIYATLKLENSYNISEHLNIQDYT  
GNIINDFENMQVNIDNVVLLDEAGRKHL LDFNSSGIDKIDYDAYLA AVNKTPGELNLSLFADNLEAKAND  
LPQGNLKQSLKSTAETIRTIYHDQVIPLEQSMNTAYKTIQELKHNSGLPARVTN ILSSLD SAQDFLIKH  
VSSVIVQEMKKYGNTIIGYFEHYLQWVKISITEHMAACKPVATALDSAVDVFLCSYITDPVNLFWFGIGK  
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>B.\_Taurus\_Prom-1, GenBank Accession Number: HQ159409

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YERLKP KVL PVLKDIKDLAEDMKTNRDTLVRMNTVLTDMKQSSAQLRTSLRDVKTNMEQTLMDPQCSSPA  
AAPTCD SIRSLSVLDGSANFDHLP SLDGHITQLDGLLQTDLSGLVQKANESLSNIPEEVQNQTRDFISE  
FKKTLNSLQSDVKNI STKIPIQKTL SNFVRYINDSEDIYLQYLPTMEECDSYRWLVCLVICCLLT LILIF  
YLLGLLCGTLGYDQKATPTRRGCVSNTGGLLLMVGVSFLFFSWIIMTIVVLTFTVTGGNMEKL VCEPYRN  
KKLFQVLDTPYLLNEDWKYYLSGLVFNKPDINLTFEQVYSDCKENKGLYATLKLDHIYNVSEQLNITKHT  
GDINSNLENMNI RIEDIELDKTGMKTLMDLRSSGIDDIDY AAYLNATERSPTRVNLISFANNLRKANQ  
LPSGNLKTSLSKSHDTLTNIQENQVVPLQNSMNAMHQMKGLQYRTSGLKVRVSTTIFFLNSTQDFLT SQ  
LSEVVVEESKQFGNKIISYFERYLQWVEMAITQQFAACRPVATALDSAVNVFLCSYIVDPLNLFWFGVGK  
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>G.\_gallus\_Prom-1, GenBank Accession Number: XP\_001232165

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AASTCNIIRNSLNQLNINANFSGLPGVSSQLAKVNDVLKIDLSSLVQKGAAFN DTPDLVVNQTKNILSA  
VPYIKNVLESIGSNISNFTKTLPVQKIIADLT IYLTQSEAYVQDYFPVVEQYDFYRWLGCLILCCMVVLI  
VIFYYLGLLCGTCGYDKHASPTTRGCISNTGGNFLMAGVGF SFLFSWVLMIVVLTFTVTGGNIEKL VCEP  
FEDKTLFKVLDTPYLLNQHWKNYLSGILFKPNINLTFEKVYSDCKENKGIYTS LHLEHLFNINEFLNIS  
MYTEDVALRIEHIQINLSKIIILLDEIGKENLLNFSSSGIEGINFGAYL TEINKSVTKVDLLSFANDLEAR  
ADQLPKGALENALKGHANNIRMIHSQQVVPLEQAMSTLNQSIRLLKRTSSELMVKVKNVISAVNAAQLLI  
NNNASLVIVQETKKYMDTIVGYFEQYIEWVKESIAMEVAACKPIANVIDTAVDIFLCSYVTDSVNTFWFG  
LGSSSIFLIPAIIFAVKLSKYRRMDTEDVYDD

>O.\_anatinus\_Prom-1, GenBank Accession Number: HQ159408

AVFYEIGFIISAGLGLLFILLPLVGLCFCLCRCCDNC GEMHQ RQKKN GDCQRGCFATSLFVSSLIISI  
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QERLAKQVLPALDAALTMAGAI RETKEALENVSASMEILQEGTDKLNANLTDVKMNL SNTLNDSACTTAQ  
AASTCNVIRNSLNQLDINANFSRLPGVGLQLSKVNEVLKVDLSGLVQKGAAFN ETPDLVQNQTKNILSD  
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KTLFQVLDTPYLLNGQWKNYLSGLLFQNPINLTFEQVYSDCKENKGIYTS LQLDNIFNVSAFLNISVYT  
EDLTVQFESIKINLSNIVLLDETGKENLLNFSFSGIDGIDFAAYLA EVNKSITKVDLLSFSNDLEARAQ  
LPKGALENALKGHAN SIRMHRQQVIPMEQAMSTLNQSIRLLQKTATELMVKVSQVIATVDAAQLLINNN

ASFIIIQETKKYMSIIGYFEQYVQWVKDSITMDVASCKPIANIIDTAVEIFLCSYVTDVNSFWFGLGG  
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>X.\_tropicalis\_Prom-1, GenBank Accession Number: HQ159400

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HERLGKDVRPAFDAVLNMAGAIKETKEALENVSVSVEVLQEADKLNINL TEAKLQLTSTLSDPACSANV  
AIIPCNKIANSNLNINANFSLPDLTHNLIRLNEVLRTDLSNLVQKGYAAFNLTPENVQNTQTRNIEGD  
MKNVMESIGANITSFSKTIPLVQIMSNISNHITQSEYVREFYPVVEQYDFYRWLGSLVLCMVALLIVF  
YYLGLLCGTCGYDQTSPTTRGCISNTGGNFLMAGVGFSEFISWILMLIVLVTFLAGGNVEKLVCPEFQE  
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DEISARIETLNLDSLNIILLDEKGKRNLEDFSSTGIDEIDFADFLESEVAKSNTKVDLLAFANELEENADL  
LPKGALGNALKGHANSIRTIHIQQVVPLEQSMITTLNQSIKLLQRTSFDIEGKVLVDITAVEAAQNLIINN  
ASSVIKQESKKLMDEVIGYFIQYVQWVKDSIAFDVAGCKPVANVIDTAVDVFLCSYIVDSVNSFWFGLGG  
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>X.\_laevis\_Prom-1, GenBank Accession Number: NP\_001163920

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YCLGLLCGTCGYDQHSSPTTRGCITNTGGNFLMAGVGFSEFISWILMLIVVVTFLAGGNVQKLVCPEFQE  
RSLFKVLDTPYLINSQWKNYLSGILYQNPNNMLTFEKVYSDCKENKGIFTALQIDNLLNLNEFLNINMYI  
DDISAKIETLNLDSLSTIVLLDEKGKRNLEDFSSTGLDEIDFADFLESEVAKSNTKVDLLAFANELEENADL  
LPKGALGNALKGHANSIRTIHIQQVVPLEQSMITTLNQSIKLLQRTSFDIEGKVLVDITAVEAAQNLIINN  
ASLIKQESKKLMDEVIGYFIQYVQWVKDSIAFDVAGCKPIANVVDTAVDVFLCSYIVDSVNSFWFGLGG  
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>D.\_rerio\_Prom-1b, GenBank Accession Number: NP\_932337

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LPKVKGLLDKSGAEIIGFTKMFPEPALQNFSLFLTDSQKNIEAYYPQIDQLDFYRWIGCVLICCLVVLV  
LAFNFLGLLCGSCGYDKNSTPTTRGCLSNLTGGNLLMASVGFSFISWVLMGVVVTTFIVGGNIEKLVCEP  
LANRQIFKIIDTPYVMVHPTTKNFLPGMLFQDPNIDLTIGSMYRDCYENNGLYSALQLETKFNFNFKLNAT  
VFNPENIGNIFNNVNVLDLQGMILLQEGKDNLDIFANTGIGDIDYQAYL TEVNKGVTVVDLLSYANELDAQ  
ADNLPRGALENALKGHASSIRQIHKDQVVPMEQAMSNLNQSIQLEKTSREL PVKVTNVLNAIEAAEYLI  
SNNASHVVKQESDKFIKKIIGYFSQYTEWVKHSLAMEVAQCKPISNIVDSAEIVACSFIVDSVNTFWFGL  
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>T.\_rubripes\_Prom-1b, GenBank Accession Number: HQ159406

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GVVIAAANHNMSLHVKSTRRLINTNIRD LKTFANNTPSQIDYLMGQYITAKNKVLSELDNIGPLLGGRI  
HSQLEKEVVP SLDGALRMAGAMRETKEALENVSSALEVLQEATGRLKASLSDERASLSNTLSDPACTNGA  
VSHTCSSVRATLAQLGANADFSRLADVNQALANVNVILGTDLSNIVQKGYSSFN DTPRLVKEQTRNIVSG  
VKSM LDKIGTEINSFAKMFPVESSLANFTTFLNLQKQTVESYYPQLDQMDFYRWIGCVGALCMVVLVLAF  
NILGL LCGTCGYDRQATPTTRGCLSN TGGNLLMAGVGFSFIFAWVLMGVVTTLFVVGGNVEKLLCEPLAN  
RQLFKIIDTPFLVHPAKKNFLPGMLFQNPNI DLTLGSMYSDCYENSGLYHALQLETMFNINSFLNRTVYN  
KDLAKVFENVQVDLQGISLLEQAGRDALINFANSGIGYIDYDSYLAELNKGVTLDLLTFSADLEAQADQ  
LPRGALENALKGHASSIRQIHRDQVLPMEREMSTLSQSIKQLQRTSSDLPVKVTNILSAIDAAEYLIAHN  
ASHVVKQETR GYMQSLVG YFRQYTQWVKNSLSGEVAPCKPISNMVDSMEIVACSFII DSVNTFWFGLGGC  
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>D.\_rerio\_Prom-1a, GenBank Accession Number: NP\_001108615

VIYYELGFVVCAALGLLFTVLLPLVGLLFCLCRCCDNC GEMHQQRKNADCLRGLLTLLTTTTFIITA  
GVL CAYAANQNLSSQLKGMRRLVKSNLKD LHTFANQTPAQIDY LISRYGTVKEQVLHDLENVGVILGGRI  
HEELGKEVKPALDATLSMTGTMRDTKDALE NVSLTLETLQEGTVKLQANLSVVRNSLRNALNDPVCVDAP  
APEICRNIRNSIPKLEIAANYSSLPDVT DQLNKVNDVLKTDLSQIVAKG IASFNDTPAMVTAQTRNIVEG  
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KDVSRKFEG LKVDLRGIILLESEGKVN LNNFSETGINEIDFAAYLEE VNKGVTRIDLIDFANQLDAQADQ  
LSKGT LQTS LKGHANTIRQIHIQQVVPLEQSMSTLNQSIRLLERTSSDLP LRVEDVLKAVDDAQN LISYN  
ATFVINQETEKYQNIIGYFKQYIDWIRTSLALEVATCKPLSNIVDTVEILGCGFL LDSMN TFWFGLGCC  
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>T.\_rubripes\_Prom-1a, GenBank Accession Number: HQ159405

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SDATTAQLCRNIRQSLSQLQISANFTRLPNVNSQLERMKDVLKMDLSIIVQKGFSSLNDTPHMVTEQTRS  
VVENVQTLMDDIGKNISSFSKIFPVQSCLSNFTIFISHVHAKIEDHYPEIDRMDFYRWIGCITLCCMVVL  
VLAFNYLGL LCGTLGYDKHASPTTRGCISNTGGTMLIAGVGISFIFSWVLMGLVTIIFLAGGNMEKLVCE  
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TMFTKDVVARLNSVKIDLRGIILLEAEGKQNL LDFSEAGLLEINYADYLEEVNKGVTVDLLSFARELEA  
QTDLM PRGGLQ MALKGHAGTLRQIHSQQIIPMEQAMSALNQSMRYLERTASDLPNKVLAVIEAIEAAQYL  
ISHNATHLINQETAKFTATIVGYFHQYIEWVKTALAMEVAPCKPFSNMIDTVEIVTCSFLVDSMN TFWMG  
LGCSTLLLLPSIILAVKLAKFYRRMETEDVYDD

>D.\_rerio\_Prom-3, GenBank Accession Number: XP\_684527

VLNIEKGFLVCVAIGILYIVL MPLIGLIFACCRCCGNC GGRMQQKQTSSTNCKRRSIYCSTFIITVLILA  
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SLQQVVDKLSLEGSLEFSDQNDLSSAVDKARNADVIGQANKGRDFFDSIPQKV KNETQGSVESALSKLND  
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TPGMIPGFNL SKNLNLKISLNIYDIYSNCEQNAPLWTTLHLNELVDLNKYLNVSNYQTQEIYQSFEAAQIN  
IANITILSPDIKSQ LNNFNSASTMNFSTIIQHINDVSGTNLSSAADSLDFLAGKQSNQNISNQLHGAEK  
DLRDIQADITSNIMPLLELNSTINNL SAVASQINASVQNVLQNVGYAQEILNYSQIVRAESKVFVDC  
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>T.\_rubripes\_Prom-3, GenBank Accession Number: HQ159407

ALVYQVGFLVCLVIGILYIVLMPLVGFFLACCRCCGNCGGKMYQKQTSSVHCRRRTLYWSLFTTIVILI  
GNICMFQSNKALNENIDQGPLNLRNRTINNIRTLSSVPQQFNHVVNESYRTIQEVEGNLDDIGPQLGAEI  
QRPLEDALVLTLSVTTLNDDTTATSNQLNNLNSSLRLQSSLNLLQANVTAIRNRINQTLNANCTSCD  
GLRPELQNLILDTSISSAGLNEFQNELDDIIRTNLTSKINEVKDDLNSIPQTVTNDTRD VVQNSKKLLED  
LRTEISQFEKDLPLSTLNDTLRTLEQVHKDILFTTPEVEKVENIRWTIFLIVSCVLLVVL CNLLGLVLG  
PLGLRPNSQPTDRSCTADCGGTFFMMGAGFSFLFSWLFMIIVLLL FLLGGNVYTLICEPWKTGELLQFID  
TPGVIPGLEIGPSLGLKDNLTISEIYNGCKEDKSLWTTLRLYEVIDLDELLNVTKYSEEIERNFENSNIS  
LSNIRLLGPEDKRRQLSISDTNKD VDFNDVTQQVSNLSSINLTTTADKLDQLAQLQTNGPVQEELWNEAR  
DLRTIQSEIEATIDPQLEVITSTIAGLRATVEKMNTVGEVLNRVGATQDFLDANSTLIVKTESRRYLDC  
QTGYFTQYADWANLTITEQVGHCGPMAGTVDSA AVILCSQMVDSLNAFWFGLGWCLIFFIPSIIFSIKLA  
KYYRKMKYADICD

>X.\_tropicalis\_Prom-3, GenBank Accession Number: HQ159403

ALTYEIGFLVALAFGVLFVLMPLTGFCFCCCRCCGNCGGKMHQKQTKKMACKRRFIYIFLLCITLIMLA  
GNICMFYSNSKVSSGVKDGISSYNNMTMENLKTYVNSVPKEVDLIIGQSDSVIQYANNSIIAIDSVLGGA I  
KSEIEAKANETLDLVVQTI NVVNNTANLLVAINDSFNSLRAEQEIIQGNLSDVQTRINNTLNKCGTKCDS  
AKNSVDGLTFDVS YQIPDLS DPLNRMNDFLGSGIDSTLQKVRKAIDDIPETVKNDTRDAVQRVQDQLGKI  
KSTINDTKNAIPITSTVNSALNGLNSISTSVSNVIPQIQNYDYRWIVGIILSCIILLIILCILFGLILG  
PLGLKGTE DPTKRNCASNSGGDFFMASVGFSFISWLLILIVAVLFVVGNSYTLVCKPWANQQLFTYLD  
SQTIPQLNISHYIDTNVNISTLYSDCQRDDSLWSTLNFNQKIDLQKYL NITQYTD SVQNIIDNTNITIKN  
INFLT TDQKDQIMRVVSSGVDTLNFASF KSQLIRNITKIDLLSFADDL DKLANDSSLPENVTTEL RTEAS  
VLRRIDNHIKSNLIPAVDTLDTTVQ TLEATSENIPATLNKTLANIEETQAYIDTQTVGV IKNATTAYVNK  
LVDLFQSYVDWAI FTLR TNFARCGPVAKAVNSAQTIACVYIVDSVNAFWFSLGWCTLFLIPSIILSVKLA  
KHYRRMKSSDVYE

>X.\_laevis\_Prom-3, GenBank Accession Number: NP\_001163921

ALNYEIGFLVALAFGLLFFVLMPLTGFCFCCCRCCGNCGGKMHQKQTKMCKRRFIYFFLLCITLIMLA  
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KSEIEKVANSTLDSIVNTVNAVNDTAKLLVATNDSFNALLAEQDIIRGNLSDVQTKINNTLNKCGAKCSS  
AKSSVDGLTFD VNYKIPDFSDHLKRLNDFLGSGIDSTLQKARKAINDIPQTVKNETKDTIQGVQDELGKI  
KSKINDTKNAIPITSTVNNIKSNWDSLSTQVTQYIPWVEQYDYRWIVGIILCCIILLIIVCILFGLALG  
PLGLKGKEDPTKRNCASNSGGNFFMASVGFSFISWLLILIVAILFLAGGNSYTLVCKPWANQQLFQYLD  
SQTIPELNISRYIERNVNISTLYRDCQRD NSLWTTLNF DQTIDLNKNL NITQYTDEVQKKIDNTNITIKN  
INFLT TNQKEQIKNVSTSGINTLNF TDFNSSLGRNITKINLLSFANELATLAKDSSLSDVATELNAEAA  
ALENIDSRIKSSLIPATKTLYTNIQNLETKSKNLPVSLNKVLTEIDNAQKFVDTQASGVVKNATTAYATK  
LLNLFQSYVDWAKFMLRTNFARCGPVARAVNSAQTIACVYIVDSMNAFWFSMGWCTLFLIPSIILSVKLA  
KHYRRMKTS DVYE

>C.\_familiaris\_Prom-2, GenBank Accession Number: XP\_854455

VVRYEAGYVVC AVIAGLYLLVPIAGLCFCCCRHRRCGGRVKTEHKAMACERGTLM A F L L L T T L L L L I G  
VVCA F V T N Q H T H E Q M G H S V E A V P E I L L S L Q G L V S N V P Q E L Q A V A E Q F S L P Q K R V L E E L D G V G M S I G S T I H  
T Q L K S T M Y E V L A S V S S L G Q A L Q V S M D D L Q A L N T T L V E L R K G Q Q D L E P A V Y E R R E R L L T L L Q E P S C Q G C T E  
A R S R A Q A L E L G A D F S Q V S P V D D V L H R L K G V P E A N F S S M V Q E E N S T F N A L P L L A A L Q T A N V V K E L K K V V A Q  
K P E G L R T L A E E F P G W E A A S R W S R T L E E V E Q S S R P Y L K E V Q R Y E K Y R W I W G C V L C S A V L L V V V C N L L G L N L  
G V W G L S A R K D P S R S E A K G E A G S R F L M M G V G F S F L F A A P L I L L V F A T F L V G G N V Q T L V C Q S W E S K E L Y K F A  
D T P G N L P P S M N L S Q L L G L K K N I S I L L A Y Q Q C R E G A A L W S V L Q L N D S Y D L E K H L N I S Q Y T A K L Q Q E L Q N L K  
V D M K N L D L L S P A A H R D L E A L Q S S G L E K I H Y S S F F V Q I Q K P V V N T N M E K L A Q E L E E L A R T Q G S S V L G Q Q L Q  
E E A Q G L Q N L Y Q E Q V L P Q Q S L V A K L N L T V R A L A S S A P N L Q M E T S S V L D K V A Y L K G E L P T W A T N I L R N E R E C  
F L I R E M G Y F S Q Y V A W V R E E V T Q H I A T C Q P L S G A L D N G R V I L C D M M A D P W N A F W F C L A W C T F F L I P S I I F A  
V K T S K Y F H P V W K R L S

>E.\_caballus\_Prom-2, GenBank Accession Number: XP\_001494215

VVRYQAGYLVCAVIAGLYLLVLP TAGLCFCCCRRRRCGGRVKTEHKAMACERGTLM A F L L L T T L V L L I G  
VVSA F V T N Q R V H E Q V G P S A A A V P E T L L S L R G L F S H V P Q E L Q A V A Q Q F S L P Q E R V L K E L D G V G V S I G S V I H  
T Q L R S T V Y Q A L A S V H S L G Q A L Q V S V D H L R A L N A T S V E L L E G Q Q D L E P A V R E R R E H L L A L L Q E P S C R G C A E  
A L S Q A R A L E L G A N F S Q M P A M D D V L H Q L K G V P E A N F S S M V Q E E N S T F N S L P L L A A L Q T A D M V R E L K K A M A Q  
E P G G L R T L A E A F P A W E A A S R W S R A L E E V E E S S R P Y L K E V Q R Y E K Y R W I M G C V L C S V V L L V V V C N L L G L N L  
G I W G L S A R E D P S H S E A K G E A G A R F L M A G V G F S F L F A A P L I L L V F A T F L V G G N V Q T L V C R S W E S G E L Y E F A  
D T P G N L P S S M N L S H L L G L K K D I S I L L A Y Q Q C R E G A A L W K V L R L N D S Y D L E K H L D I S Q Y T A K L Q Q E L R S L K  
L E V K N L D L L S P A A R R D L K A L Q S S G L E N I R Y P G F L V Q I Q K P V V N T D M E K L A Q E L Q G L A Q T Q G S A V L G Q Q L R  
E E A Q G L R N L Y Q E K V L P Q Q S L T A K L N L S V R A L A S S A P N L Q L E T S D V L D K I T N L R G E L P T W A T H I L K N E S E C  
F L T R E M G Y F S Q Y V A W V R E E V T Q R I A T C Q P L S G A L D N G R V V L C D M M A D P W N A F W F C L A W C T F F L I P S I I F A  
V K T S K Y F R P I R K R L N

>P.\_trogodytes\_Prom-2, GenBank Accession Number: XP\_001143498

VVRYEAGYVVC AVIAGLYLLLVPTAGLCFCCCRHRRCGGRVKTEHKALACERAALMV F L L L T T L L L L I G  
VVCA F V T N Q R T H E Q M G P S I E A M P E T L L S L R G L V S D V P Q E L Q A V A Q Q F S L P Q E Q V S E E L D G V G V S I G S A I H  
T Q L R S S V Y P L L A A V G S L G Q V L Q V S V H L Q T L N A T V V E L Q A G Q Q D L E P A I R E H R D R L L E L L Q E A G C Q G D C A  
G A L S R A R T L E L G A D F S Q V P S V D H V L H Q L K G V P E A N F S S M V Q E E N S T F N A L P A A M Q T S S V V Q E L K K A V A  
Q Q P E G V R T L A E G F P G L E A A S H W A Q A L Q E V E E S S R P Y L Q E V Q R Y E T Y R W I V G C V L C S V V L F V V L C N L L G L N  
L G I W G L S A R E D P S H P E A K G E A G A R F L M A G V G L S F L F A A P L I L L V F A T F L V G G N V Q T L V C R S W E N G E L F E F  
A D T P G N L P L S M N L S Q L L G L R K N I S I H Q A Y Q Q C K E G A A L W T V L Q L N D S Y D L E E H L D I N Q Y T N K L R Q E L Q S L  
K V D T Q S L D L L S S A A R R D L E A L Q S S G L Q R I H Y P D F L V Q I Q R P V V K T S M E Q L A Q E L Q G L A Q A Q D N S V L G Q R L  
Q E E A Q G L R N L H Q E K V P P Q Q S L V A K L N L S V R A L E S S A P N L Q L E T S D V L A N V P Y L K G E L P A W A A R I L R N V S E  
C F L A R E M G Y F S Q Y V A W V R E E V T Q R I A T C Q P L S G A L D N S R V I L C D M M A D P W N A F W F C L A W C T F F L I P S I I F  
A V K T S K Y F R P I R K R L S

>H.\_sapien\_Prom-2, GenBank Accession Number: NP\_653308

VVRYEAGYVVC AVIAGLYLLLVPTAGLCFCCCRHRRCGGRVKTEHKALACERAALMV F L L L T T L L L L I G  
VVCA F V T N Q R T H E Q M G P S I E A M P E T L L S L W G L V S D V P Q E L Q A V A Q Q F S L P Q E Q V S E E L D G V G V S I G S A I H  
T Q L R S S V Y P L L A A V G S L G Q V L Q V S V H L Q T L N A T V V E L Q A G Q Q D L E P A I R E H R D R L L E L L Q E A R C Q G D C A

GALSWARTLELGADFSQVPSVDHVLHQLKGVPEANFSSMVQEENSTFNALPALAAMQTSSVVQELKKAVA  
QQPEGVRTLAEGFPGLEAASRWAQALQEVEESSRPLYQEVQRYETYRWIVGCVLCSVVLFFVLCNLLGLN  
LGIWGLSARDDPSHPEAKGEAGARFLMAGVGLSFLFAAPLILLVFATFLVGGNVQTLVCQSWENGELFEF  
ADTPGNLPPSMNLSQLLGLRKNISIHQAYQCKEGAALWTVLQLNDSYDLEEHLDINQYTNKLRQELQSL  
KVDTSQSLDLLSSAARRDLEALQSSGLQRIHYPDFLVQIQRPVVKTSMEQLAQELQGLAQADNSVLGQRL  
QEEAQGLRNLHQEKVVPQQSLVAKLNLSVRALESSAPNLQLETSVDLANVTYLYKGELPAWAARILRNVE  
CFLAREMGYFSQYVAWVREEVTQRIATCQPLSGALDNSRVILCDMMADPWNAFWFCLAWCTFFLIPSIIF  
AVKTSKYFRPIRKRLS

>B.\_Taurus\_Prom-2, GenBank Accession Number: XP\_599188

VVRYQAGYVVCIAVIAGLYLLAMPTAGLCFCCLRCRRRCGGRVKMEHKAMACERAVLVTFLLLTTLVLLIG  
VVTAFVTNQMHHEQMGPSEAVPETLLSLRGLVSEVPLELQAVAEQFSLPQEQLKELNGVGSSIGKAIH  
SQLKSTMYEALASVLSLGQALQVSDHLRGLNATSVELQEGQEALAPALHGHQRLLSLLQEPPCQGCAG  
ALDKSHTLELGADFSQVPSVDHVLHRLKGVPEANFYSMVLEENTTFNALPILAAQTADMISELKVVAE  
QPRGLNTMGAEFPVWEAASRWSQALEEVEERGRPFLEEVSQYERYRWIAGCVLCSVLLVVVCNLLGLNL  
GIWGLSAREDPHSEAKGESGARFLMVGVGFSFLFAVPLILLIFSTFLVGGNVQTLVCQSWESGELYEFV  
DTPGNLPPSMNLSQLLGLKKNLSILLAYEQCKQGAWLTVLQLNDSYDLEKHLDISQYTIKLQELQKLK  
VDVKNLDLLSPAARRDLEALQSSGLESIHYPGFLAEIQKPVVNSDVEKLAQEGLSQTQGNATLGQKLQ  
EEARGLQHLHQEKILPQQLVAKLNRSVQALASSAPHLQSEISGVLDRVTHLKEELPTWATHILRNESEC  
FLKREMGYFSQYMAWVREEVTQRIATCQPLSGALDSGRVILCDMVADPWNAFWFCLGWCTFFLIPSIVFA  
IKTSKYFRPIRKRLS

>R.\_norvegicus\_Prom-2, GenBank Accession Number: AAN63818

VVRYEAGYVVCIAVIAGLYLLVPITGLCFCCRCRRRCGGRVKTEHKAMACERGTLMTFLLLTTLMLLIG  
MVCAFATNQFTHSQTGPSVEAVPETLLSLRGLVSDVPKKLQAVADQFSSPQKQVSKDLGVDGENLGNIIH  
NQLKSTVYPVLASVHGLGQALQVSDHLQSVNATSVELREGQQLGPPVQAHRRERLLALLQESWCHENCK  
GALSQASALQLGADFSQMPVDDVLHRLQGVPEANFSSMVQEENATFNNLPILVHMQMVSVVKDLKKALA  
EQPEGVRMLAQAFPGSEATSRWSQALEGLEQRSRPLYQDVQRYETYRWILGCVLCSAILLVVICNLLGLS  
LGIWGLFAREDPHSETKGEAGARFLMAGVAFSFLFAAPLILLVFATFLVGGNVQTLVCRSWESGELYEF  
VDTPGNLPPSMNLSYLLGLRKNISVFQAYRQCKAGTALWKVLQLNDSYDLDKHLDIKQYTHELQELQSF  
KVDLKDLDLLNPAARQNLEALQSSGLEKIHRYDFLVQIQKPVVKTDMGQLAKELEGLAQANESLRRQQL  
QEEARELRSLYQEKVVPQENLVAKLNPSIRVLESSAPKLQVNTSDLLDIVARLKGELPAQLNHILRNATE  
CFLTREMGYFSQYVTWVREEVTQHIATCQPFKALDDGHMILCDMMANPWNAFWFCLGWCTFFLIPSIIF  
AVKTSKYFRPIRKRLS

>M.\_musculus\_Prom-2, GenBank Accession Number: NP\_620089

VVRYEAGYVVCIAVIAGLYLLVPITGLCFCCRCRCRQCGGRVKTEHKAMACERGTLMIFFLLTTLVLLIG  
MVCAFATNQFTHSQTGPSVKAVPETLLSLRGLVSDVPEELRAIAEQFSVPQKQVSKELDGVGENLGNVIIH  
NRLKSTVYPVLASVHSLGQALQVSDHLRALNTTSVELQEAQRHLEPPVQAHRRERLLALLQDSWCHEENC  
KRVLSQAGALQLGADFSQTPPVDDVLHRLKDVPETNFSSMVQEEKATFNNLPLLQVQAVSVVKDVKKAL  
AEQPEGLRMLAQAFPGSEASRWSQALEGLEQRSRPLYQEVQYQYETYRWILGCVLCSAILLVVICNLLGL  
SLGIWGLFAREDPHSETKGEAGARLLMAGVAFSFLFAVPLILLVFVTVLGGNVQTLVCRSWESGELYE  
FADTPGNLPPSMNLSYLLGLKKNISIVQAYRQCKAGAVLWKVLQLNDSYDLDKHLDIKQYTHKIQELQS  
FQVDLKELDLSPTARQDLEALQRSGLEKIHRYGFLVQIQKPVVNTDMWQLAQEGLAQANDSLRRQQ



LREEARELRSLYQEKVVPQESLVTKLNFSVKTLES LAPSLQVNTSDFLDSVTRLKGELPVQINHILRNAT  
ECFLTREMGYFSQYVTWVRAEVTQRIATCQPFSTALDNGHVILCDMMADPWNAFWFCLGWCTFFLIPSII  
FAVKTSKYFRPIRKRLS

>X.\_tropicalis\_Prom-2, GenBank Accession Number: HQ159402

VVRYGAGYVACAVIAILFLIFMLVFGIIYCVFQCRGERIFKRCEGMFCHRPVFLLLFLTCTVLLAGVIC  
TFCLNQKVQEEFAPGVYEVTDSLQRFRRSSIDNLPLVLEKISSDFSIPKQKVDELQSFQPDINRTLSAKL  
NQEIYPLLQDSYQTAKQLKEAAQAVVDVNAVAVKLLQKSQSKLVAELSSHRQNLERTLSDTQCKECKEAAA  
IVPQLQQTANYSQIPSLDDYVKKLTQVRKINLTGIFLQGIRLFNEMPQFVITQASKSISETKKALDTIEG  
KINSLISSVPIQYTEPIHKALLEAEKSAVYGKEAERYEYRWIGITLCCVLLITICTFLGLLLGVW  
YLYLQQDGVSSNLRQTGYLLLKGEVYVSFCFSWLLIILVYVTFVLVGGNVQTLCEPWANGEIYSFLDDPN  
NLPPSVSLSNRLGLREDVNISYMYQLCKEGAPIWDVLQVDDPTGMLQSINITQYTAEIKNVNNFTVDLS  
GLTIMTIIAIKTLYEYSHSGIEKVPYDAMLAQIQPPLVTLDLGHLASMLKSLATVQNNDTIRTQLQNEAN  
ALGGIQNGTVREQNVHLSKLNDSLHSLAEHLPMQANINHTIENIRSLQDTLIGGIIQLKNESTCLLRK  
AIAHFTQYLDWVTKLITEDVSSCQSVPRTLNHTVVCNITNPWNGFWFCLAWCTFFLIPNILLSIKSV  
EHFSLLKPISS

>X.\_laevis\_Prom-2, GenBank Accession Number: NP\_001163922

VVRYQGGYVACAVIAALLFLIFMLVFGIIYCVFQSRGERIFNRCEGMCCQRIPVFLLLFLTCTVLFAGLIC  
TFSLNQKVQEEFAPGVNEVTDSLQRFRRKSIDSLPLVLEKIVSSFSVPKQKVDELQRFSPDINRTLSAKL  
NQEVYPLLQDSYQTAKQLKEAAQAVVDANAVAVKSLQKQSKLVAELSRHRQNLERTLSDTQCETCNRAA  
LMPQLQQIANYSQIPSLDDYVNKLTQVRKINLTGIFQQGIRLFNEMPCLVITQASKSISETTQALDTIER  
KVNSMISSVPIKQYTEPIHKVLLAEKSSVYGKEAERYEYRWIGITLCCVLLITICTFLGLLLGVW  
YLYIQQDGVSSNLRQTGSLLLKGEVYVSFCFSWLLIILVYVTFVLVGGNVQTLVCEPWANGDIYSFLDEPH  
NLPPNVSLRNTLGLREDVNISMYQLCKEGAPFWDVLQMDPTGMIQSINITKYTDEIQSKINNSTDLS  
GLTIITTTIAIRTLSEYNSGIGKVPYNTILAQTQHTLVMLDLGLLASMLENLATVQHNDTIRKELQSEAN  
ALRETQNSTVQEQQVQLSKLNDSLNSLAELVPNLQANINNTIKNVQSLKETLINDIIQLKNESICLLNK  
AKEYFTQYLEWVTKLITEDISSCQSVPRTLNIRTVVCNITNPWNGFWFCLAWCTFFLIPNILLSIKSV  
EHITNLKPTSS

>C.\_elegans\_Protein F08B12, GenBank Accession Number: NP\_509907

WIEFQKGWIVLSVGLVAISVLFVVFYFFYKCCVCICSRSSKKQNTDARYDGCKRSMCNLLLFLVLSANAF  
VAFTLLMTSQYAQIGLDKLPNRMNQCVDDLQSYKRSDMRIRKLLIDDYQVLNSTITKQLSTAGYNVVD  
VKKLTGAHVIDVFMNISKVAQEMHDGLESVHGKVRFLNEEGSRFEAEFSRLRNTANEELVKCLENELEPV  
RSMCAKAERLLES LAVTQFKIDQKFLPDATETGLSEIVNANITQVLAASNNQFEQLESRIQHEIDKETYS  
AQNMLKQIGDDLFLVAETISTQLRKVTFEALYSTVSYSVDPKKTPTLKYMQYSWYASLVITSLFILLALI  
FLFGVLYGICGRRPTYNDCCVRSTGGKFYSFGIGAFLLIFVFLAVGTSALMFVGNFNLVCQPMRNP  
LSHPESLSLADRYINLWKAHTPENDIEVTLQSKSPAEIIRACSRNETLYNFYGFDKKYHLNKLQDFEKD  
AYNQLQISLRTTMENMPEIRPLDAFISRSELRDLEKLASVNVSKVSQQGLNAIKHAMDELDLASKTREFE  
ESLDANSGRPKAVTLVLEQIRELEIQFAKPLRSRLEALYSNITSLDEKLSQLQVPVSSLLVKLQHAQALL  
AENMREHFGRAAKEEFQMVNNIDQYIVHVKSQMESEVTSCQPLTQIARQTAAVCAYTIDPYNGTWMCM  
LICLVLLIPIVIISNSLIGLYSKMHAFPKY

>C.\_elegans\_Prominin M28.8, GenBank Accession Number: NP\_496294

DLNDLIFGNGAVSYNQVIQDMVINQIGAIIFWSVGFVFLAALVFGVATCIWQICFSCVPKETSTRSEIT  
GYVYAGLLVTVFAFTLTGLIIFNVAETDLTDSIDNGMVYINQ TASDLNTVINDGTDQVTCEVTTTTTQTF  
GNVNLFI SNYSAIVVGGTATEVGLTAVNAFEYRNFQIQNNATIDAANILLTSM DNINTNGDACTT DKSVL  
QQQIEIMIPTLNALSSGAQTVHTSPEIIALNDQIDLLKKNIQ TQADSASGSINSTQGTINDAMTSIRNML  
GNVQNDLNNVMNSLASAHRDVVTSSAYSGLKIGIRLLITIPACIGCLFCILAFVAVVLSLLKKENVEFLA  
TAVLVAFYLTILISIVLILFSSAAFVLGWL TSAACVP IFEDNNYTLFRLMNQTIAPVGTGSPDTV NIGQL  
LQSCNNPSMTLYTAVDGQTIISADSINQQINLASYRDAANNEIMS QPNSTY TIDNSYLTDSNSLNQIVNA  
ANEANLSVCGNDDATAKYKDYIQKLAVSDALSNQFITNLQTLAANAPNTTSIAKNQNNNYFNQGDLSINQ  
SISDLIINLQTNVFMCRPFVDVYNNGGFVMCEQFGKPIQGLWAAVGLTGLFLFFQSILLLLVYRWLR TNS  
DDLAMYNYRDKNDSTSKYSGTRKLGGKKDQVRPTEELWATPILSSTSNTETRQLPRVRPYDMDIVQPSEY  
DYSYGTGSQSHYPRVQVLPDERHQPMSPNYYDTQYGT

>C.\_elegans\_Prominin M28.9, GenBank Accession Number: NP\_496296

DLNNLISGKESYGETLKSMLSQVTAIVFWSVGIVLIIIAAALCIVTCIWQCCSTCAPRESAVRSEYTG M  
VYLALLATTLAFTLAGVIIIFNLAETDFVDTV DNGVKYANQLTSDMSNVFSNGKNQLTCEVKSSTSQAFAE  
IRSFIRNYERDVTDKAATQVGLTAVNKFVDVAFVKSTS DTVKEKGEKLNAALANINNPSECKTSANELKA  
RVSAMGIALKGLSTAADTVMGSSSELD SVNKMVDVIKAEIKSQSRGAGSVIDSAQKSIDDTTNSIVEFLDQ  
VQHQVEEIKKSIPKYHEQIAGYNSFSTVLGIRLGIIIPAA MGCIYCIVAIVAVILSLIKQDGVALKLSRF  
VIDGFFSSITGSITLLGFAMFAFALGLVVSSICVPVFEDDNYTLFRQMNVPMPAADNKTKTSINIDQ LLE  
SCNNPSMTLYKAIDGKKLISEEAMNKQINLNKYRDMADKKISEQPKSDFKLPQATNYKNHMKAVNDNAKK  
AQSDLSKCKDADLNKQFKEYAASLKKSQALSKQFIDNLAKLAENAPKTSTIVKDLNKNYFTKKEAVLKQ  
AVTKLLKALQDDIFKCRPLVDIYNNAGVLVCEQVGLPIHGLWASIGLGGVAMFFQIIVLLL TFRWLSTHS  
KKSAGKSDKMLKSKESKEKEE KSENKDKKKKKKKSKKDKEEEGSAEKADGDANKNPQDPAAPGEIGRNGS  
AEAGSQPTSVEGKS DAAEGASPMAPGNGKKS AVNTLDVEPK

>D.\_melanogaster\_Prominin, GenBank Accession Number: NP\_647770

GYIVVKNSDTLSLGPKEENDWRDLLAHYWMVLIIWVILVVLIIIVIPFIAVCYCCFCCCRRCRQGCPPCT  
SKQDAQRRFCCGICLLILIIIGLIFGIIIAFVTNKMIDSGFAETSETMKRGSEDTCTYLKDVADHVHLLMM  
YNYEEMETHVLDQLTHAHRHIFLDLSDTSESNSLAEMERVLENMPEALELMRQVEKMEKDLRFYGSQLRD  
GVRGIKRDVNFVANL CQLQMCQKFLISSNIEHIDSSQCLHFDNLPNTKEFVEGMENIVASEYYAIPQRG  
LSRLKKVSDKVKTQLSFVVPMMRDLTKGRTIFREHATNVRNIVEGVLSDIHIKTLHSTKS FEDVYERFG  
HDRVVSLIVCLLILLVLFILIFALLCGCFGRRTGYGDECCSKSTGATCLLLAILLIFCVFSFIALVGL  
FYFMLGMVTYQGACAPLRDQENNTLFRQLDASIDLNHYLPPSES NKEVVQPLKMSSAIKACHANQTIFDM  
MRQHNIYDINDLTRIKVMSHSQENTDSIKVFDEDLSTVVLLTKEERDELKTAGESKLAKYHSSLYMPSLC  
TQFTPMNLNALSEQLYKLSNDLEY PAYGWAKVSFWNEGLNTKAFYRNFVPKLTSLVEKMKANLKKIDELI  
SYENHDFNTIKILTATAINSEQFIQTRGKDYINALGGNLTNSIDQMIDDYIDMIIKEANESVGHCAPLS  
YIYYRGVDLICHRIVDPINGFWVGILLCALLFLPILFVAHRLMCLYKKIYPYLATVGAAGVVEG

>D.\_melanogaster\_Prominin-like protein, GenBank Accession Number: ABH07113

DSIRDVLHKNSTLLDFASNAIKIESGFIALMSVFAILALVPLIATCAWCCGRRSTQEEVDHIRNAPCHIR  
DESLEESLRCRKSAGLVTLWVVFILLTSDFSIFYANSRLSAGIEMTPEMVKS AVHDVEVFLKDLTHLQIK  
QKLDNGFHVSVVERVVKDLEDVDVLLGEPIQAEISAHTGLELAYDSLTTLSLANAELIYRVLMQLQETVGRA  
LKLSQEAAARMEELQIQLSVLQRQCTYRDRPLCDTLRIRSFEENG VVDALKTLQEDQSIFRMRYLGEIEF

GATVKNLTSEVGVSRIFSFPQVKHDTAYERNYTLEQLASIRHRTTANAQQLTSTVNGLLRRLEDTS  
SLQPAYNELKEWADAYWSVGWIAGTVIVWVWMLFMLMSYCCFLCESNAKSGVFFIAVMLICLASICLTIF  
GVFSLAVGGNAEVFVCRSLYDEDYNMLGKLDDKPGYAYAREPQTGIIIGELLRPVGVNRSVVNVGLGQALR  
GCEQNQASYNVFQLDAFVNTSKIADLRQFPKVSTAIDAISSVSGRTLTLSTQSVQNIENMLQTSSFNLT  
YRSSVGAPTPEKDLATFIDQMRVALQIQDVATSSRMTTLGSRSKRLQASILQPLENLQNEILYHLE  
LQRPWAKQVNQTLNHLKSIQSYLENKAGEICHNMTRDYRDLKAYLTTSKATMESQLGDTTTCRPFYD  
TFDASRTFLCRNMVDFINGLTFFIFLTLLWAGTPVGLNLITVQTRLNVMQAAQARSKGRHRRSDRSPE  
HEQRSGSRGRKKQRTSSSATSGRSGKRDQSRERSTSSTARPKPPL

# Alignment of sequences in PHYLIP multiple alignment format

34 860

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X. laevis Prom-2      -----VVR YQG GYVACAVIAL LFLIFMLVFG
X. tropicalis Prom-2 -----VVR YGA GYVACAVIAI LFLIFMLVFG
M. musculus Prom-2   -----VVR YEA GYVVCAVIAG LYLLLVPITG
R. norvegicus Prom-2 -----VVR YEA GYVVCAVIAG LYLLLVPITG
H. sapien Prom-2     -----VVR YEA GYVVCAVIAG LYLLLVPITG
P. troglodytes Prom-2 -----VVR YEA GYVVCAVIAG LYLLLVPITG
E. caballus Prom-2   -----VVR YQA GYLVC AVIAG LYLLVLPTAG
C. familiaris Prom-2 -----VVR YEA GYVVCAVIAG LYLLVPIAG
B. Taurus Prom-2     -----VVR YQA GYVVCAVIAG LYLLAMPTAG
X. laevis Prom-3      -----ALN YEI GFLVALAFGL LFFVLMPLTG
X. tropicalis Prom-3 -----ALT YEI GFLVALAFGV LFFVLMPLTG
T. rubripes Prom-3   -----ALV YQV GFLVCLVIGI LYIVLMPLVG
D. rerio Prom-3      -----VLN YEK GFLVCVAIGI LYIVLMPLIG
T. rubripes Prom-1a  -----AIY YEI GFLVCAAVGL LFAILLPVVG
D. rerio Prom-1a     -----VIY YEL GFVVC AALGL LFTVLLPLVG
T. rubripes Prom-1b  -----WY YEV GFLICTTVGV LLLVVTPIIG
D. rerio Prom-1b     -----TIY YEL GFIVLSVLGV FVLLMPIVG
X. laevis Prom-1      -----TIH YEI GFIIAAVLGL VFLLLMPLVG
X. tropicalis Prom-1 -----TIH YEI GFIIAAVLGL VFLLLMPLVG
O. anatinus Prom-1   -----AVF YEI GFII SAGLGL LFILLLPLVG
G. gallus Prom-1     -----AIY YEI GFIVS AALGL LFILLLPLVG
E. caballus Prom-1   -----IIS YEI GIIIC AVLGL LFIILMPLVG
C. familiaris Prom-1 -----IIY YEI GIIIC AVLGL LFVILMPLVG
H. sapien Prom-1     -----IVY YEA GIILCCVLGL LFIILMPLVG
P. troglodytes Prom-1 -----IVY YEA GIILCCVLGL LFIILMPLVG
M. mulatta Prom-1    -----IIY YEA GIILCSVLGL LFIILMPLVG
B. Taurus Prom-1     -----IIY YEI GIIICAALGL LFVILMPLVG
R. norvegicus Prom-1 -----VAI YEI GVLICVILGL LFIFLMPLVG
M. musculus Prom-1   -----IAL YEI GVLICAILGL LFIILMPLVG
C. elegans Protein 28.9 ----DLN NLI SGK--ESYGE TLKSMILSQV TAIVFWSVGI VLIIIAAALC
C. elegans Protein 28.8 ----DLN DLI FGNGAVSYNQ VIQDMVINQI GAIIFWSVGF VFVLAALVFG
D. melanogaster AF1279 GYIVVKNSDT LSLGPKVEEN DWRDLLAHYW MVLIIWVILV VLIIVIPFIA
C. elegans F08B1     -----WIE FQK GWIVLSVGLV AISVLFVVFY
D. melanogaster ABH07113 ----DSIRD VLHKNTSLLD FASNAIKIES GFIALMSVFA ILALVPLIAT

IIYCVFQSR- --GERIFN-R -----C EGMCCQRIPV FLLLFLTCTV
IIYCVFQCR- --GERIFK-R -----C EGMFCHRPV FLLLFLTCTV
LCFCCCRCRQ RCGGRVKT-E -----H KAMACERGTL MIFLLLTTLV
LCFCCCRCRR RCGGRVKT-E -----H KAMACERGTL MTFLLLTTL
LCFCCCRCHR RCGGRVKT-E -----H KALACERAAL MVFLLLTTL
LCFCCCRCHR RCGGRVKT-E -----H KALACERAAL MVFLLLTTL
LCFCCCRRRR RCGGRVKT-E -----H KAMACERGTL MAFLLLTTL

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|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| LCFCCCRCHR | RCGGRVKT-E | -----H     | KAMACERCTL | MAFLLLTLL  |
| LCFCCLRCRR | RCGGRVKM-E | -----H     | KAMACERAVL | VTFLLLTTLV |
| FCFCCCRCCG | NCGGKMHQKQ | -----T     | KKMSCKRRFI | YFFLLCITLI |
| FCFCCCRCCG | NCGGKMHQKQ | -----T     | KKMACKRRFI | YIFLLCITLI |
| FFLACCRCCG | NCGGKMYQKQ | -----T     | SSVHCRRRTL | YWSLFLTIV  |
| LIFACCRCCG | NCGGRMQKQ  | -----T     | SSTNCKRRSI | YCSTFIITVL |
| LLFCMCRCRD | NCGGEMHQKQ | -----R     | KNADCRRGLL | GTLLFSTSLV |
| LLFCLCRCCD | NCGGEMHQKQ | -----R     | KNADCLRGLL | TTLLLTTFI  |
| ACFCVCRCCF | NCGGEMHQKQ | -----R     | KNADCQRGFF | TASLIATSVL |
| LCFCVCRCCF | NCGGEMHQKQ | -----K     | KNGDCLRGFY | MATLIATSVF |
| LCFCMCRCRD | NCGGEMHQKQ | -----K     | KNGDCQRGCF | STFLFVTLL  |
| LCFCMCRCRD | NCGGEMHQKQ | -----K     | KNGDCQRGCF | ATFLFVTLL  |
| LCFCLCRCCD | NCGGEMHQKQ | -----K     | KNGDCQRGCF | ATSLFVSSLI |
| LCFCMCRCRD | NCGGEMHQKQ | -----K     | KNADCQRSCF | ATFLFVASLI |
| FCFGLCRCCN | KCGGEMHQKQ | -----K     | KNGTCLRKYF | AVSLLVICIL |
| FCFGLCRCCN | KCGGEMHQKQ | -----K     | KNGAFLRKYF | TVSLLVICIF |
| YFFCMCRCCN | KCGGEMHQKQ | -----K     | ENGPFLRKCF | AISLLVICII |
| YFFCMCRCCN | KCGGEMHQKQ | -----K     | ENGPFLRKCF | AISLLVICII |
| YFFCMCRCCN | KCGGEMHQKQ | -----K     | ENGLFLRKCF | AISLLVICII |
| FFFCLCRCCN | KCGGEMHQKQ | -----K     | KSGPFLKKYF | TISLLVICVF |
| FFFCMCRCCN | KCGGEMHQKQ | -----K     | QNESCRRKCL | AISLLVICLL |
| CFFCMCRCCN | KCGGEMHQKQ | -----K     | QNAFCRRKCL | GLSLLVICLL |
| IVTCIWQCCS | TCAPRE---S | -----A     | VRSEYTMVY  | LALLATTLAF |
| VATCIWQICF | SCVPKE---T | -----S     | TRSEITGVY  | AGLLVTVFAF |
| VCYCCFCCCR | RCRQGCPPCT | -----S     | KQDAQRRFCC | GICLLILIIG |
| FFYKCCVCIC | SRSSKKQNTD | -----A     | RYDGCKRSMC | NLLLFVLVSA |
| CAWCCGRRST | QEEVDHIRNA | PCHIRDESLE | ESLRCRKSAG | LVTLWVVFIL |

|            |            |            |             |             |
|------------|------------|------------|-------------|-------------|
| LFAGLICTF  | LNQKVQEEFA | PGVNEVTDSL | QFRKSIDSL   | PLVLEKIVSS  |
| LLAGVICTFC | LNQKVQEEFA | PGVYEVTDSL | QFRSSIDNL   | PLVLEKISSD  |
| LLIGMVCAFA | TNQHTHSQTG | PSVKAVPETL | LSLRGLVSDV  | PEELRAIAEQ  |
| LLIGMVCAFA | TNQFTHSQTG | PSVEAVPETL | LSLRGLVSDV  | PKKLQAVADQ  |
| LLIGVVCAFV | TNQRTHEQMG | PSIEAMPETL | LSLWGLVSDV  | PQELQAVAQQ  |
| LLIGVVCAFV | TNQRTHEQMG | PSIEAMPETL | LSLRGLVSDV  | PQELQAVAQQ  |
| LLIGVVSFAV | TNQRVHEQVG | PSAAAVPETL | LSLRGLFSHV  | PQELQAVAQQ  |
| LLIGVVCAFV | TNQHTHEQMG | HSVEAVPEIL | LSLQGLVSNV  | PQELQAVAEQ  |
| LLIGVVTAFV | TNQHMHEQMG | PSAEAVPETL | LSLRGLVSEV  | PLELQAVAEQ  |
| MLAGNICMFY | SNSKVSSGVK | DGISSYNNTM | ENLKTYVNSV  | PKEVDLIIGQ  |
| MLAGNICMFY | SNSKVSSGVK | DGISSYNNTM | ENLKTYVNSV  | PKEVDLIIGQ  |
| ILIGNICMFQ | SNKALNENID | QGPLNLRNTI | NNIRTFLLSSV | PQQFNHVVNE  |
| ILAGNICMFL | STTYTSETVK | SSSNEITGIL | DDVKGYVSSI  | PQQIQQVLDE  |
| ITIGVLCAYA | ANQNLSSQVK | NIRRYVNSNM | RDLHTFANDT  | PMQIDYILISQ |
| ITAGVLCAYA | ANQNLSSQLK | GMRRLVKSNL | KDLHTFANQT  | PAQIDYILISR |
| IIVGVVIAYA | ANHNMSLHVK | STRRLINTNI | RDLKTFANNT  | PSQIDYLMGQ  |

|            |             |            |            |            |
|------------|-------------|------------|------------|------------|
| LAVGVTWAYV | ANQNITSQIK  | STRRLVSTNI | RDLKAFANYT | PAQIDYLTAQ |
| ISVGVICAYA | ANQNLTNQIR  | GSKKLVQSNF | KDLKTLNDA  | PTQINYVLSK |
| ISVGVICAYA | ANQNLTNQIR  | GSKKLVQTNF | KDLKTLNNDT | PAQIDYVLSK |
| ISIGVLCAYA | ANQHLLTQVR  | GAKKLVNSNF | KDLRVLVTD  | PGQIDYLLSQ |
| ISVGVLCAVA | ANQHLLTSQVR | GAKKLVNSNF | KDLKVFLNDT | PAQIDYLVSQ |
| ISIGIVYGFV | ANHHLKTRME  | RTRNLTDNSF | KDLRTLLHGT | PAQIDYILGQ |
| ISVGIIYGFV | ANHHLRTRIE  | KTRKLAESNL | KDLRTLLIGT | PAQINYVLSQ |
| ISIGIFYGFV | ANHQRTRIK   | RSRKLADSNF | KDLRTLLNET | PEIKYILAQ  |
| ISIGIFYGFV | ANHQRTRIK   | RSRKLADSNF | KDLRTLLNET | PEIKYILAQ  |
| ISIGIFCGFV | ANHQRTRIK   | RSRKLADSNF | KDLRTLLNET | PEIKYILAQ  |
| ISIGIYGFA  | ANHYMRTNVE  | ETRKLSESNL | NDLRTLLNVV | PGQIDYILDQ |
| MSLGIAFGFV | ANQQRTRIQ   | RTQKLAESNY | RDLRALLTEA | PKQIDYILGQ |
| MSLGIIYGFV | ANQQRTRIK   | GTQKLAKSNF | RDFQTLLET  | PKQIDYVVEQ |
| TLAGVIIFNL | AETDFVDTVD  | NGVKYANQLT | SDMSNVFSNG | ---KNQLTCE |
| TLTGIIIFNV | AETDLTDSID  | NGMVYINQTA | SDLNTVINDG | ---TDQVTCE |
| LIFGIIIAFV | TNKMIDSGFA  | ETSETMKRGS | EDTCTYLKDV | ADHVHHLMMY |
| NAFVAFTLLM | TSQYAQIGLD  | KLPNRMNQC  | DDLQSYKRDS | DMRIRKLLID |
| LTLSDFSIFY | ANSRLSAGIE  | MTPEMVKS   | HDVEVFLKDT | HLQIKQKLDN |

|            |            |            |               |            |
|------------|------------|------------|---------------|------------|
| -FSVPKQKVL | DELQRFSPDI | NRTLAKLNQ  | EVYPLLQDSY    | QTAKQLKEAA |
| -FSIPKQKVL | DELQSFDPDI | NRTLAKLNQ  | EIYPLLQDSY    | QTAKQLKEAA |
| -FSVPKQKVS | KELDGVGENL | GNVIHNRKLS | TVYPVLASVH    | SLGQALQVSI |
| -FSSPKQKVS | KDLDGVGENL | GNIIHNQLKS | TVYPVLASVH    | GLGQALQVSI |
| -FSLPQEQVS | EELDGVGVSI | GSAIHTQLRS | SVYPLLA AVG   | SLGQVLQVSV |
| -FSLPQEQVS | EELDGVGVSI | GSAIHTQLRS | SVYPLLA AVG   | SLGQVLQVSV |
| -FSLPQERVL | KELDGVGVSI | GSAIHTQLRS | TVYQALASVH    | SLGQALQVSV |
| -FSLPQKRVL | EELDGVGMSI | GSAIHTQLKS | TMYEVLASVS    | SLGQALQVSM |
| -FSLPQEQVL | KELNGVGSSI | GKAIHSQLKS | TMYEALASVL    | SLGQALQVSV |
| -SDLVIQAN  | DSITAIDSIL | GGSIKSEIEK | VANSTLDSIV    | NTVNAVNDTA |
| -SDSVIQYAN | NSIIAIDSVL | GGAIKSEIEA | KANETLDLVV    | QTINNVNNTA |
| -SYRTIQEVE | GNLDDIGPQL | GAEIQRPLED | ALVLTLSVT     | TLNDDTTATS |
| -SFLTVDQVK | NNLNETGPLL | GGLIQNGLKD | SLNPAFNSIT    | QIAQVINSTS |
| -YATAKNKVI | YDLNNIGPLL | GGRIHDQLDK | EVHAALD GAL   | NMAAAMRETK |
| -YGTVKEQVL | HDLENGVIL  | GGRIHEELGK | EVKPALDATL    | SMTGTMRDTK |
| -YITAKNKVL | SELDNIGPLL | GGRIHSQLEK | EVVPSLD GAL   | RMAGAMRETK |
| -YTTAKNKVL | SDLDNIGTLL | GGQIHNKLES | EVVPALD HAL   | RMTAAMRETK |
| -FNVTKDKAL | SEMNNLGPLL | GERVHERLGK | DVRPAFDAVL    | NMAGAIKETK |
| -FNVTKDKAL | SEMNSLGPLL | GERVHERLGK | DVRPAFDAVL    | NMAGAIKETK |
| -YNTTKNKAL | ADLNNIGPLL | GGRVQERLAK | QVLPALDAAL    | TMAGAIKETK |
| -YNTTKDKAL | SDLNNVGPLL | GSRVQEQLGK | EVVPALDAAL    | TMAGAIKETK |
| -YTTTKERAF | SDLDNIKSLL | GSGIHEQLKP | KVVPVLEDIK    | AMAEAIKETK |
| -YASTKEKAF | SDLDNIKSLL | GGGIHDQLRP | KVIPVLD D I K | AMAEAIKETR |
| -YNTTKDKAF | TDLNSINSVL | GGGILDRLRP | NIIPVLDEIK    | SMATAIKETK |
| -YNTTKDKAF | TDLNSINSVL | GGGILDRLRP | NIIPVLDEIK    | SMATAIKETK |

-YNTTKDKAF SDLNSINSVL GGGILDRLRP NIIPVLDEIK SMATAIKETK  
 -FTLPKEKAF DDLDNINLLV GGSIIYERLKP KVLPLVKDIK DLAEDMKTNR  
 -YNTTKNKAF SDLDSIDSVL GGRIKGQLKP KVTPVLEEIK AMATAIRQTK  
 -YTNTKNKAF SDLDGIGSVL GGRIKDQLKP KVTPVLEEIK AMATAIKQTK  
 -VKSSTSQAF AEIRSFIRNY ERDVTDKAAT QVGLTAVNKF DVDAFVKSTS  
 -VTTTTTQTF GNVNLFISNY SAIVVGGTAT EVGLTAVNAF EYRNFQIQNN  
 NYEEMETHVL DQLTHAHRHI FLDLSDTSES NSLAEMERVL ENMPEALELM  
 DYQVLNSTIT KQLSTAGYNV VDRVKKLTGA HVIDVFMNIS KVAQEMHDGL  
 GFHVSVERVV KDLEDVDVLL GEPIQAEISA HTGLELAYDS LTTLSLAN-A

QAVVD---AN VAVKSLQKQ SKLVAELSRH RQNLERTLSD TQCET-----  
 QAVVD---VN VAVKLLQKSQ SKLVAELSSH RQNLERTLSD TQCKE-----  
 DHLRA---LN TTSVELQEAQ RHLEPPVQAH RERLLALLQD SWCHEEN---  
 DHLQS---VN ATSVELREGQ QHLGPPVQAH RERLLALLQE SWCHEN----  
 HHLQT---LN ATVVELQAGQ QDLEPAIREH RDRLLELLQE ARCQGD----  
 HHLQT---LN ATVVELQAGQ QDLEPAIREH RDRLLELLQE AGCQGD----  
 DHLRA---LN ATSVELLEGQ QDLEPAVRER REHLLALLQE PSCRG-----  
 DDLQA---LN TTLVELRKQ QDLEPAVYER RERLLTLLQE PSCQG-----  
 DHLRG---LN ATSVELQEGQ EALAPALHGH RQRLLSLLQE PPCQG-----  
 KLLVA---TN DSNALLAEQ DIIRGNLSDV QTKINNTLN- KCGAK-----  
 NLLVA---IN DSFNSLRAEQ EIIQGNLSDV QTRINNTLN- KCGTK-----  
 NQLNN---LN SLSRLQSSL NLLQANVTAI RNRINQTLN ANCTS-----  
 TGLLH---VN ETLGQLKPKI DALKTNFSAV RQRINNTMNQ PECMN-----  
 EALEN---SS MGLEVLQEGT GKLGFNLSLV RTSINRTLSD PGCHDEKSDA  
 DALEN---VS LTLETLQEGT VKLQANLSV RNSLRNALND PVCVD----A  
 EALEN---VS SALEVLQEAT GRLKASLSDE RASLSNTLSD PACTN----G  
 ESLES---VS TSLETLQEGT GRLQVSLQSE RASLSNTLND WACSN----E  
 EALEN---VS LCVEVLQEI DRLNNNLTEA KLQLTSTLSD PACSA----N  
 EALEN---VS VSVEVLQEI DKLININLTEA KLQLTSTLSD PACSA----N  
 EALEN---VS ASMEILQEGT DKLNANLTDV KMNLSNTLND SACTT----A  
 EALEN---VS VSVEVLQEGT ERLHANLTDV KMHLSNTLND SACAA----A  
 EALLN---VN STLDQLKKST AQLNTSLSKV KGDLEQSLND PVCTV----P  
 EALLN---VN NTLKELKMST AQLNTSLSDV KRNLEQSLND PMCSV----P  
 EALEN---MN STLKSLHQQS TQLSSSLTSV KTSLRSSLND PLCLV----H  
 EALEN---MN STLKSLHQQS TQLSSSLTSV KTSLRSSLND PLCLV----R  
 EALEN---MN STLKSLHQQS TQLSSSLTSV KTSLRASLND PLCSV----R  
 DTLVR---MN TVLTDKQSS AQLRTSLRDV KTNMEQTLMD PQCSS----P  
 DALQN---MS SSLKSLRDAS TQLSTNLTSV RNSIENSLNS NDCAS----D  
 DALQN---MS SSLKSLQDAA TQLNTNLSSV RNSIENSLSS SDCTS----D  
 DTVEKGEKLN AALANINNPS SECKTSANEL KARVSAMGIA LKGLS-----  
 ATIDAANILL TSMDNINTNG DACTTDKSVL QQQIEIMIPT LNALS-----  
 RQVEK----- -MEKDLRFYG SQLRDGVRGI KRDVNFVAN LCQLQ-----  
 ESVHG----- -KVRFLNEEG SRFEAEFSRL RNTANEELVK CLENELEP--  
 ELIYRVMLQ ETVGRALKLS QEAAARMEEL QIQLSVLQRQ CTYRDRPLCD

-----CNRVA ALMPQLQQIA N----YSQIP SLDDYVNKLT QVRKINLTGI  
 -----CKEAA AIVPQLQQTA N----YSQIP SLDDYVKKLT QVRKINLTGI  
 -----CKRVL SQAGALQLGA D----FSQTP PVDDVLHRLK DVPETNFSSM  
 -----CKGAL SQASALQLGA D----FSQMP PVDDVLHRLQ GVPEANFSSM  
 -----CAGAL SWARTLELGA D----FSQVP SVDHVLHQLK GVPEANFSSM  
 -----CAGAL SRARTLELGA D----FSQVP SVDHVLHQLK GVPEANFSSM  
 -----CAEAL SQARALELGA N----FSQMP AMDDVLHQLK GVPEANFSSM  
 -----CTEAR SRAQALELGA D----FSQVS PVDDVLHRLK GVPEANFSSM  
 -----CAGAL DKSHTLELGA D----FSQVP SVDHVLHRLK GVPEANFYSM  
 -----CSSAK SSVDGLTFDV N----YKIP DFDHKLRLN DFLGSGIDST  
 -----CDSAK NSVDGLTFDV S----YQIP DLSDPLNRMN DFLGSGIDST  
 -----CDGLR PELQNLILDIT S-----ISSA GLNEFQNELD DIIRTNLTSK  
 -----CSSLQ QVVDKLSLEG S-----LEFS DQNDLSSAVD KARNADVIGQ  
 TTAQLCRNIR QSLSQLQISA N----FTRLN NVNSQLERMK DVLKMDLSII  
 PAPEICRNIR NSIPKLEIAA N----YSSLP DVTDLNKNV DVLKTDLSQI  
 AVSHTCSSVR ATLAQLGANA D----FSRLA DVNQALANVN VILGTDLSNI  
 DVTHTCNSIR GTLNQLALSA N----FNGLP DVEAPLANLD AVLKTDLSNI  
 VALIPCNKIT SSLNQLNTNA N----FSVLP DLSHNLIRLN EVLRTDLSNL  
 VAIIPCNKIA NSLNQLNINA N----FSMLP DLTHNLIRLN EVLRTDLSNL  
 QAASTCNVIR NSLNQLDINA N----FSRLP GVGLQLSKVN EVLKVDLSGL  
 QAASTCNIIR NSLNQLNINA N----FSGLP GVSSQLAKVN DVLKIDLSSL  
 PAAATCNDIR TSLSQLDYNN N----LGQLP SLDEHIDRVN NILRTNLSSQ  
 PVATTCNNIR MSLGQLDDNT N----LGQLP SLDKQIDNIN NVLQTDLSL  
 PSSETCNSIR LSLSQLNSNP E----LRQLP PVDAELDNVN NVLRTDLGL  
 PSSEICNSIR LSLSQLNSNP E----LRQLP PVDAELDNVN NVLRTDLGL  
 PSSETCNSIR LSLSQLNSNP E----LRQLP SVDAELDKVN NVLRTDLGL  
 AAAPTCDNIS KSLSVLDGSA N----FDHLP SLDGHITQLD GLLQTDLSGL  
 PASKICDSL RQLSNLGSNH N----GSQLP SVDRELNTVN DVDRTDLES  
 PASKICDSL PSLSSLGSSL N----SSQLP SVDRELNTVT EVDKTDLES  
 ---TAADTVM GSSELDVSNK M----VDVIK AEIKSQSRGA GSVIDSAQKS  
 ---SGAQTVM TSPEIIALND Q----IDLLK KNIQTQADSA SGSINSTQGT  
 ----MCQKFL ISSNIEHIDS SQCLHFDNLP NTKEFVEGME NIVASEYYAI  
 -VRSMCAKAE RLLESLAVTQ FK---IDQKF LPDATETGLS EIVNANITQV  
 TLRIRSFEEN GVVDALKTLQ E----DQSIF RMRYLGEIEF GATVKNLTSE

FQQGIRLFNE MPKLVITQAS KSISET---T QALDTIERKV NSMISSVPIK  
 FLQGIRLFNE MPQFVITQAS KSISET---K KALDTIEGKI NSLISSVPIQ  
 VQEEKATFNN LPLLQVQAV SVVKDV---K KALAEQPEGL RMLAQAFPGS  
 VQEEENATFNN LPILVHMOMV SVVKDL---K KALAEQPEGV RMLAQAFPGS  
 VQEEENSTFNA LPALAAMQTS SVVQEL---K KAVAQQPEGV RTLAEGFPGL  
 VQEEENSTFNA LPALAAMQTS SVVQEL---K KAVAQQPEGV RTLAEGFPGL  
 VQEEENSTFNS LPLLAALQTA DMVREL---K KAMAQEPGGL RTLAEEFPAW  
 VQEEENSTFNA LPLLAALQTA NVVKEL---K KVVAQKPEGL RTLAEEFPGW



VLEENTTFNA LPILAALQTA DMISEL---K KVVAEQPRGL NTMGEAFPVW  
LQKARKAIND IPQTVKNETK DTIQG---VQ DELGKIKSKI NDTKNAIPIT  
LQKVRKAIDD IPETVKNDTR DAVQR---VQ DQLGKIKSTI NDTKNAIPIT  
INEVKDDLNS IPQTVTNDTR DVVQN---SK KLLDLRTEI SQFEKDLPLS  
ANKGRDFFDS IPQKVKNETQ GSVES---AL SKLNDIKGQI SGVSKDLPLD  
VQKGFSSLND TPHMVTEQTR SVVEN---VQ TLMDDIGKNI SSFSKIFPVQ  
VAKGIAFND TPAMVTAQTR NIVEG---VK VLLDDIGNNI TSFSKMLPVH  
VQKGYSSFND TPRLVKEQTR NIVSG---VK SMLDKIGTEI NSFAMFPVE  
VQKGYSSFND TPQLVREQTK GIVSALPKVK GLLDKSGAEI IGFTKMFPVE  
VQKGYAAFNS TPEMVQNQTR NIEGDM---K NVLESIGANI TSFSKTPVVL  
VQKGYAAFNL TPEMVQNQTR NIEGDM---K NVMESIGANI TSFSKTIPVL  
VQKGYAAFNE TPDLVQNQTK NILSDV---K SILDITIGSNI TSLTKMVPLE  
VQKGYAAFND TPDLVVNQTK NILSAVPYIK NVLESIGSNI SNFTKTLPVQ  
VQKGYKSFND IPEMVQNQTT DLISG---IK STLNSIGSNI GNISKQIPIQ  
VQKGYKSFND IPEMVQNQTT DIVSD---VK RTLNSLGS DI ENMSEQIPIQ  
VQQGYQSLND IPDRVQRQTT TVVAG---IK RVLNSIGSDI DNVTQRLPIQ  
VQQGYQSLND IPDRVQRQTT TVVAG---IK RVLNSIGSDI DNVTQRLPIQ  
VQQGYQSLND IPDRVQSQTK TVVAG---IK RVLNSIGSDI HNVTQHLPIQ  
VQKANESLSN IPEEVQNQTR DFISE---FK KTLNSLQSDV KNISTKIPIQ  
VKRGYMSIDE IPNMIQNQTG DVIKD---VK KTLDVSSKV KNMSQSIPVE  
VKRGYTTIDE IPNTIQNQTV DVIKD---VK NTLDSISSNI KDMSQSIPIE  
IDDTTNSIVE FLDQVQHQVE EIKKSIPKYH EQIAG-YNSF S-TVLGIRLG  
INDAMTSIRN MLGNVQNDLN NVMNSLASAH RDVVT-SSAY SGLKIGIRLL  
PQRGLSRLKK VSDKVKTQLS FVVPP----- MMRDLTKGRT IFREHATNVR  
LAASNQFEQ LESRIQHEID KETYS---AQ NMLKQIGDDL FLVAETISTQ  
VGVSRSIFSN FPQQVKHDTA YERN-----Y TLEQLASIRH RTTANAQQLT

QYTEPIHKVL LEAEEKSSVY GKEAERYEY R-WWIGITLC CVLLLITICT  
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EATSRWSQAL EGGLEQSRPY LQDVQRYET R-WILGCVLC SAILLVVICN  
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STVNNIKSNW DSLSTQVTQY IPWEQYDYY R-WIVGIILC CIILLIIVCI  
STVNSALNGL NSISTSVS NV IPQIQNYDYY R-WIVGIILS CIILLIILCI  
-TLNDTLRTL EQVHKDILTF TPEVEKVENI R-WTIFLIVS CVVLLVVLCN  
-FLKTIPKEI STLQQSVSVY SPEVERASLI S-RAIGLILS CLILLVVVCN  
SCLSNFTIFI SHVHAKIEDH YPEIDRMDFY R-WIGCITLC CMVVLVLAFN  
SSLANFTRMI SHTHSQIEDI YPQIDQMDFY R-WIGCITLC CMIVLILTFN  
SSLANFTTFL NLQKKTVESY YPQLDQMDFY R-WIGCVGAL CMVVLVLAFN  
PALQNFSKFL TDSQKNIEAY YPQIDQLDFY R-WIGCVLIC CLVVLVLAFN

|             |            |            |            |            |
|-------------|------------|------------|------------|------------|
| QIMANINNHI  | SQSETYVREF | YPVVEQYDFY | R-WLGSLVLC | CMVSLIVVFY |
| QIMSNISNHI  | TQSETYVREF | YPVVEQYDFY | R-WLGSLVLC | CMVALIVVFY |
| KMLKDFTNYL  | SQTEAYIEDY | FPAIEQYDFY | R-WLGCLIIC | CLVVLILVFY |
| KIIADLTIYL  | TQSEAYVQDY | FPVVEQYDFY | R-WLGCLILC | CMVVLIVIFY |
| DKLSNFM DYI | NSTETYIHRS | LPTLEEDSY  | R-WLGGLVAC | CLLTLIVIFF |
| DKLSDFIGYI  | NDTETYIHRN | LPTLEEDSY  | R-WLGGLIVC | CLLTLIVVFY |
| DILSAFSVYV  | NNTESYIHRN | LPTLEEDSY  | W-WLGGLVIC | SLLTLIVIFY |
| DILSEFSVYV  | NNTESYIHRN | LPTLEEDSY  | W-WLGGLVIC | SLLTLIVIFY |
| DILSEFSVYV  | NNTESYIHRN | LPTLEEDSY  | W-WLGGLVIC | SLLTLIVIFY |
| KTLSNFVRYI  | NDESDYILQY | LPTMEEDSY  | R-WLVCLVIC | CLLTLILIFY |
| EVLLQFSHYL  | NDSNRYIHES | LPRVEEDSY  | W-WLGGLIVC | FLLTLIVTFF |
| DMLLQVSHYL  | NNSNRYLNQE | LPKLEEDSY  | W-WLGGLIVC | FLLTLIVTFF |
| IIIPAAMGCI  | YCIVAIVAVI | LSLIKQDQVA | LKLSRFVIDG | FFSSITGSIT |
| ITIPACIGCL  | FCILAFVAVV | LSLLKKENVE | F-LATAVLVA | FYLTLISIV  |
| NIVEGVLSDI  | HIKTLHSTKS | FEDVYERFGH | DRNVVSLIVC | LLILLVLFIL |
| LRKVTFEALY  | STVSYVSDPK | KTPTLKYMQY | S-WYASLVIT | SLFILLALIF |
| STVNGLLRRL  | EDTWSSLQPA | YNELKEWADA | Y-WSVGWIAG | TVIVWMLFM  |

|             |            |            |            |            |
|-------------|------------|------------|------------|------------|
| FLGLLLGVWY  | LYIQKDGVS  | NLR--QTGSL | LLKGEVVSF  | CFSWLLILLV |
| FLGLLLGVWY  | LYLQQDGVSS | NLR--QTGYL | LLKGEVVSF  | CFSWLLIILV |
| LLGLSLGIWG  | LFAREDPSHS | ETK-GEAGAR | LLMAGVAFSF | LFAVPLILLV |
| LLGLSLGIWG  | LFAREDPSHS | ETK-GEAGAR | FLMAGVAFSF | LFAAPLILLV |
| LLGLNLGIWG  | LSARDDPSHP | EAK-GEAGAR | FLMAGVGLSF | LFAAPLILLV |
| LLGLNLGIWG  | LSAREDPSHP | EAK-GEAGAR | FLMAGVGLSF | LFAAPLILLV |
| LLGLNLGIWG  | LSAREDPSHS | EAK-GEAGAR | FLMAGVGFSF | LFAAPLILLV |
| LLGLNLGVWG  | LSARKDPSRS | EAK-GEAGSR | FLMMGVGFSF | LFAAPLILLV |
| LLGLNLGIWG  | LSAREDPSHS | EAK-GESGAR | FLMVGVGFSF | LFAVPLIILI |
| LFGLALGPLG  | LKGKEDPTKR | NCA-SNSGGN | FFMASVGFSF | IFSWLLILIV |
| LFGLILGPLG  | LKGTEPTKR  | NCA-SNSGGD | FFMASVGFSF | IFSWLLILIV |
| LLGLVLGPLG  | LRPNSQPTDR | SCT-ADCGGT | FFMMGAGFSF | LFSWLFMIIV |
| FLGLLLGA VG | LNAKQSPTDR | SGT-SNCGGV | FLMVGVGFSF | LISWIFMLVV |
| YLGLLCGTLG  | YDKHASPTTR | GCI-SNTGGT | MLIAGVGISF | IFSWVLMGLV |
| FLGLLCGILG  | FDRHASPTTR | GCV-SNTGGN | FLMAGVGFSF | LFSWVLMGVI |
| ILGLLCGTCG  | YDRQATPTTR | GCL-SNTGGN | LLMAGVGFSF | IFAWVLMGVV |
| FLGLLCGSCG  | YDKNSTPTTR | GCL-SNTGGN | LLMASVGFSF | IFSWVLMGVV |
| CLGLLCGTCG  | YDQHSSPTTR | GCI-TNTGGN | FLMAGVGFSF | IFSWILMLIV |
| YLGLLCGTCG  | YDQTSPTTR  | GCI-SNTGGN | FLMAGVGFSF | IFSWILMLIV |
| YLGLLCGACG  | YDKHTTPTNR | GCV-SNTGGN | FLMAGVGFSF | LFSWALMIIV |
| YLGLLCGTCG  | YDKHASPTTR | GCI-SNTGGN | FLMAGVGFSF | LFSWVLMIVV |
| YLGLLCGTFG  | YDQNATPTRR | GCI-SNTGGV | FLMVGVGVSF | LFCWILMAIV |
| YLGMLCGTFG  | YDRHATPTRR | GCV-SNTGGI | FLMVGVGISF | LFCWILMTIV |
| YLGLLCGVCG  | YDRHATPTTR | GCV-SNTGGV | FLMVGVGLSF | LFCWILMIIV |
| YLGLLCGVCG  | YDRHATPTTR | GCV-SNTGGV | FLMVGVGLSF | LFCWILMIIV |
| YLGLLCGVCG  | YDRHATPTTR | GCV-SNTGGV | FLMVGVGLSF | LFCWILMIIV |

LLGLLCGTLG YDQKATPTRR GCV-SNTGGL LLMVGVLGSF FFSWIIMTIV  
 YLGLLCGVFG YDKRATPTRR GCV-SNTGGI FLMAVGFSF LFCWILMILV  
 FLGLLCGVFG YDKHATPTRR GCV-SNTGGI FLMAVGFGF LFCWILMILV  
 LLGFAMFAFA LGLVSSICV PVFEDDNYTL FRQMNVPMPA ADNKTTSIN  
 LILFSSAAV LGWLTSAACV PIFEDNNYTL FRLMNQTIAP VGTGSPDTVN  
 IFALLCGCFG R--RRTGYGD ECCSKSTGAT CLLLAILLIF CVFSFIALVG  
 LFGVLYGICG --RRPTYND DCCVRSTGGK FYSFGIGAFL LIFVFLAVGT  
 LMSYCCFLCE SNAKS-----GV VFFIAVMLIC LASICLTIFG

YVTFVLGGNV QTLVCEPWAN GD---IYSFL DEPHNLP--- ---PNVS---  
 YVTFVLGGNV QTLVCEPWAN GE---IYSFL DDPNNLP--- ---PSVS---  
 FVTFVLGGNV QTLVCRSWES GE---LYEFA DTPGNLP--- ---PSMN---  
 FATFLVGGNV QTLVCRSWES GE---LYEFV DTPGNLP--- ---PSMN---  
 FATFLVGGNV QTLVCQSWEN GE---LFEFA DTPGNLP--- ---PSMN---  
 FATFLVGGNV QTLVCRSWEN GE---LFEFA DTPGNLP--- ---LSMN---  
 FATFLVGGNV QTLVCRSWES GE---LYEFA DTPGNLP--- ---SSMN---  
 FATFLVGGNV QTLVCQSWES KE---LYKFA DTPGNLP--- ---PSMN---  
 FSTFLVGGNV QTLVCQSWES GE---LYEFV DTPGNLP--- ---PSMN---  
 AILFLAGGNS YTLVCKPWAN QQ---LFQYL DS-QTIP--- ---ELNISR-  
 AVLFVGGNS YTLVCKPWAN QQ---LFTYL DS-QTIP--- ---QLNISH-  
 LLLFLLGGNV YTLICEPWKT GE---LLQFI DTPGVIP--- ---GLEIGPS  
 LILFIVGNT YTLVCVPWQS KQ---LIQII DTPGMIP--- ---GFNLSKN  
 TIIFLAGGNM EKLVCPEFHT KE---VFKVV DTPYL VH--- ---PDWKNFI  
 TALFLAGGNL EKLVCPEFQT RQ---LFKVL DTPYL VN--- ---SAWRNFI  
 TTLFVGGNV EKLLCEPLAN RQ---LFKII DTPFL VH--- ---PAKKNFL  
 VTTFIVGGNI EKLVCPEPLAN RQ---IFKII DTPY MVH--- ---PTKKNFL  
 VVTFVGGNV QKLVCPEFQE RS---LFKVL DTPYL IN--- ---SQWKNYL  
 LVTFVGGNV EKLVCPEFQE RA---LFKVL DTPYL IN--- ---SQWKNYL  
 VFTFVGGNM EKLVCPEFED KT---LFQVL DTPYL LN--- ---GQWKNYL  
 VLTFTGGNI EKLVCPEFED KT---LFKVL DTPYL LN--- ---QHWKNYL  
 VVTFVGGNV EKLVCPEYQN RK---LFQVL DTPYL LN--- ---ENWKFYL  
 VLTFTGGNM EKLVCPEYQN RK---LFQIL DTPYL LN--- ---ENWKYYL  
 VLTFFVGGNV EKLICEPYTS KE---LFRVL DTPYL LN--- ---EDWEYYL  
 VLTFFVGGNV EKLICEPYTS KE---LFQVL DTPYL LN--- ---EDWEYYL  
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 VLTFTGGNM EKLVCPEYRN KK---LFQVL DTPYL LN--- ---EDWKYYL  
 VLTFFVGGNV EKLLCEPYEN KK---LLQVL DTPYL LN--- ---DQWQFYL  
 VLTFFVGGNV EKLLCEPYEN KK---LLQVL DTPYL LK--- ---EQWQFYL  
 IDQLLESCNN PSMTLYKAID GK---KLISE EAMNKQIN-- --LNKYRDMA  
 IGQLLQSCNN PSMTLYTAVD GQ---TIISA DSINQQIN-- --LASYRDAA  
 LFYFMLGMVT YQGACAPLRD QENNTLFRQL DASIDLN--- -----HYLP  
 SALMFAVGNF SNLVCQPMRN PLS-HPESLS LADRYIN--- ---LWKANHT  
 VFSLAVGGNA EVFVCRSLYD EDYNMLGKLL DKPGYAYARE PQTGIIGELL

-LRNTLGLRE DVNISSMYQL CKEGAPFWDV LQMDDPTGMI QSI--NITKY  
 -LSNRLGLRE DVNISYMYQL CKEGAPIWDV LQVDDPTGML QSI--NITQY  
 -LSYLLGLKK NISIVQAYRQ CKAGAVLWKV LQLNDSYDLD KHL--DIKQY  
 -LSYLLGLRK NISVFQAYRQ CKAGTALWKV LQLNDSYDLD KHL--DIKQY  
 -LSQLLGLRK NISIHQAYQQ CKEGAALWTV LQLNDSYDLE EHL--DINQY  
 -LSQLLGLRK NISIHQAYQQ CKEGAALWTV LQLNDSYDLE EHL--DINQY  
 -LSHLLGLKK DISILLAYQQ CREGAALWKV LRLNDSYDLE KHL--DISQY  
 -LSQLLGLKK NISILLAYQQ CREGAALWSV LQLNDSYDLE KHL--NISQY  
 -LSQLLGLKK NLSILLAYEQ CKQGAVLWTV LQLNDSYDLE KHL--DISQY  
 -----YIER NVNISTLYRD CQRDNSLWTT LNFQDTIDLN KNL--NITQY  
 -----YIDT NVNISTLYSD CQRDDSLWST LNFNQKIDLQ KYL--NITQY  
 L-----GLKD NLTISEIYNG CKEDKSLWTT LRLYEVIDLD ELL--NVTKY  
 L-----NLKI SLNIYDIYSN CEQNAPLWTT LHLNELVDLN KYL--NVSNY  
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 SGLLFQNPNI NLTFEQVYSD CKENKGIYTS LQLDNIFNVS AFL--NISVY  
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 SGMVFNKPDI NLTFEQVYRD CKENKGIYAT LKLENSYNIS EHL--NIQDY  
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 SGLVFNKPDI NLTFEQVYSD CKENKGLYAT LKLDHIYNVS EQL--NITKH  
 SGILLKNPDI NMTFEQVYRD CKRGRGVYAT FQLENVFNIT ENF--NIERL  
 SGMLFNNPDI NMTFEQVYRD CKRGRGIYAA FQLENVNVS DHF--NIDQI  
 DKKISEQPKS DFKLPQATNY KNHMKAVNDN AKKAQSADLS KCK--DADLN  
 NNEIMSQPNS TYTIDNS--Y LTDSNSLNQI VNAANEANLS VCG--NDDAT  
 PSESNEVVQ PLKMSSAIKA CHANQTIFDM MRQHNIYDIN DLTRIKVMSH  
 PENDIEVTLQ SKSPAEIIRA CSRNETLYNF YGFDKKYHLN KLQDFEKDAY  
 RPVGVNRSVV NVGLGQALRG CEQNGASYNV FQLDAFVNTS KIA--DLRQF

TD---EIQSK INNSTVDLSG LTIITIIAIR TLSEYSNSGI GKVPYNTILA  
 TA---EIQNK VNNFTVDLSG LTIMTIIAIK TLYEYSHSGI EKVPYDAMLA  
 TH---KIQQE LQSFQVDLKE LDLLSPTARQ DLEALQRSGL EKIHYRGFLV  
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 TN---KLRQE LQSLKVDTS LDLLSSAARR DLEALQSSGL QRIHYPDFLV  
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 TA---KLQQE LRSLKLEVKN LDLLSPAARR DLKALQSSGL ENIRYPGFLV  
 TA---KLQQE LQNLKVDLKN LDLLSPAARR DLEALQSSGL EKIHYSSFFV  
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TD---EVQKK IDNTNITIKN INFLTNNQKE QIKNVSTSGI NTLNFTDFNS  
 TD---SVQNI IDNTNITIKN INFLTDDQKD QIMRVVSSGV DTLNFASFKS  
 SE---EIERN FENSNISLSN IRLGDPEDKR RLQSDSDT-N KDVDNDVDTQ  
 TQ---EIQS FEAAQINIAN ITILSPDIKS QLNNFSNS-A STMNFSTIIQ  
 TK---DVVAR LNSVKIDLRG IILLEAEGKQ NLLDFSEAGL LEINYADYLE  
 SK---DVSrk FEGLKVDLRG IILLESEGKV NLNNFSETGI NEIDFAAYLE  
 NK---DLAKV FENVQVDLQG ISLLEQAGRd ALINFANSgI GYIDYDSYLA  
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 ID---DISAK IETLNLDLST IVLLDEKGKR NLEDFSSSTGL DEIDFDFLS  
 ID---EISAR IETLNLDLSN IILLDEKGKR NLEDFSSSTGI DEIDFDFLS  
 TE---DLTVQ FESIKINLSN IVLLDETGKE NLLNFSFSGI DGIDFAAYLA  
 TE---DVALR IEHIQINLSK IILLDEIGKE NLLNFSSSGI EGINFGAYLT  
 TG---NIIND FENMQVNIDN VVLLDEAGRk HLLDFNSSGI DKIDYDAYLA  
 AR---NLSND FKNMNVNIDN IVLLDAAGRk NLMDFSSSGV DTIDYNVYLA  
 TG---SISSE LESLKVNLN- IFLLGAAGRk NLQDFAACGI DRMNYSYLA  
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 SE---DIVKE LEKLVNIDS IELLDKTGRK SLEDFAQSGI DRINYSMYLQ  
 SE---NINTE LENLVNIDS IELLDNTGRK SLEDFAHSGI DTIDYSTYLK  
 KQ---FKEYA ASLKKSQALS KQFIDNLAKL AENAPKTSTI VKDLNKNYFT  
 AK---YKDYI QKLAVSDALS NQFITNLQTL AANAPNTTSI AKNQNNNYFN  
 SQ---ENTDS IKVFDEDLST VVLLTKEERD ELKTAGESKL AKYHSSLYMP  
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 PK----VSTA IDAISVSGRT LLSLTQSVQN ILENMLQTSS FN--LT TYRS

QTQHTLVMLD LGLLASMLEN LATVQHN--- DTIRKELQSE ANALRETQNS  
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 SLGRNITKIN LLSFANELAT LAKDSSL--S SDVATELNAE AAALENIDSR  
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 HIN-DVSGTN LSSAADSLDF LAGKQSN--- QNISNLHG EAKDLRDIQAD  
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 EVNKGVTVD LLSYANELDA QADNLPR--- GALENALKGH ASSIRQIHKD  
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 EINKSVTKVD LLSFANDLEA RADQLPK--- GALENALKGH ANNIRMIHSQ  
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TVQEQKVQLS KLNDLNSLA ELV---PNL QANINNTIKN VQSLKETLIN  
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 KVPQESLVT KLNFSVKTLE SLA----PSL QVNTSDFLDS VTRLKGELPV  
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 KVPQQSLVA KLNLSVRALE SSA----PNL QLETSVDLAN VTYLKGELPA  
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 IKSNLIPAVD TLDTTVQTLE ATS----ENI PATLNKTLAN IEETQAYIDT  
 IEATIDPQLE VITSTIAGLR ATV----EKM NNTVGEVLNR VGATQDFLDA  
 ITSNIPLLL ELNSTINNLS AVA----SQI NASVQNVLQN VGYAQEILNY  
 QIIPMEQAMS ALNQSMRYLE RTA----SDL PNKVLAVIEA IEAAQYLISH  
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 QVLPMEREMS TLSQSIKQLQ RTS----SDL PVKVTNLSA IDAAEYLIAH  
 QVVPMEQAMS NLNQSIRQLE KTS----REL PVKVTNVLNA IEAAEYLISN  
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 QVIPMEQAMS TLNQSIRLLQ KTA----TEL MVKVSQVIAT VDAAQLLINN  
 QVVPLEQAMS TLNQSIRLLK RTS----SEL MVKVKNVISA VNAAQLLINN  
 QVIPLEQSMN TAYKTIQELK HNS----SGL PARVTNLSA LDSAQDFLIK  
 QVMPLEQSMS TINQSIKELQ HKS----SGL RVKVANILSS LDSAQDFLQT  
 RVLPIEQSLS TLYQSVKILQ RTG----NGL LERVTRILAS LDFAQNFITN  
 RVLPIEQSLS TLYQSVKILQ RTG----NGL LERVTRILAS LDFAQNFITN  
 RVLPIEQSLS TLYQSVKILQ RTG----NGL LERVNRILAS LDFAQNFITN  
 QVVPLQNSMN AMHQQMKGLQ YRT----SGL KVRVSTTIFF LNSTDQFLTS

HVPPVQQSLN SLKQSVWALK QTS----SKL PEEVKKVLAS LDSAQHFLTS  
 LLPPVQQSLN TLRQSVWTLQ QTS----NKL PEKVKKILAS LDSVQHFLTN  
 LWASIGLGGV AMFFQIIVLL LTF----RWL STHSKKSAGK SDKMLKSKES  
 LWAAVGLTGL FLFFQSILLL LVY----RWL RTNSDDLA-- ---MYNYRDK  
 FVPKLTSLVE KMKANLKKID ELISYENHDF TNTIKILTAT AINSEQFIQT  
 FAKPLRSRLE ALYSNITSLD EKL----SQL QVPVSSLLVK LQHAQALLAE  
 ILQPLENLQN EILYHLTALE LQR----DPW AKQVNQTLNH LKSIQSYLEN

DIIQLLKNES ICLLNKAKEY FTQYLEWVTK LITEDISSCQ SVPRTLND-I  
 GIIQLLKNES TCLLRKAIAH FTQYLDWVTK LITEDVSSCQ SVPRTLND-I  
 QINHILRNAT ECFLTREMGE FSQYVTWVRA EVTQRIATCQ PFSTALDN-G  
 QLNHILRNAT ECFLTREMGE FSQYVTWVRE EVTQHIATCQ PFSKALDD-G  
 WAARILRNVS ECFLAREMGY FSQYVAWVRE EVTQRIATCQ PLSGALDN-S  
 WAARILRNVS ECFLAREMGY FSQYVAWVRE EVTQRIATCQ PLSGALDN-S  
 WATHILKNES ECFLTREMGE FSQYVAWVRE EVTQRIATCQ PLSGALDN-G  
 WATNILRNER ECFLIREMGY FSQYVAWVRE EVTQHIATCQ PLSGALDN-G  
 WATHILRNES ECFLKREMGY FSQYMAWVRE EVTQRIATCQ PLSGALDS-G  
 QASGVVKNAT TAYATKLLNL FQSYVDWAKF MLRTNFARCG PVARAVNS-A  
 QTVGVKNAT TAYVNKLVDL FQSYVDWAIK TLRTNFARCG PVAKAVNS-A  
 NSTLIVKTES RRYLDCQTGY FTQYADWANL TITEQVGHCG PMAGTVDS-A  
 NISQIVRAES KVFVDCQMKI FLAYIQWANQ TITGNVGRCR PAAAAIDR-T  
 NATHLINQET AKFTATIVGY FHQYIEWVKT ALAMEVAPCK PFSNMIDT-V  
 NATFVINQET EKYKQNIIGY FKQYIDWIRT SLALEVATCK PLSNIVDT-V  
 NASHVVKQET RGYMQSLVGY FRQYTQWVKN SLSGEVAPCK PISNMVDS-M  
 NASHVVKQES DKFIKKIIGY FSQYTEWVKH SLAMEVAQCK PISNIVDS-A  
 NASLIQKES KKLMDEVIGY FIQYVQWVKD SIAFDVAGCK PIANVVDTAV  
 NASSVIKQES KKLMDEVIGY FIQYVQWVKD SIAFDVAGCK PVANVIDTAV  
 NASFIIIQET KKYMDSIIGY FEQYVQWVKD SITMDVASCK PIANIIDTAV  
 NASLVIVQET KKYMDTIVGY FEQYIEWVKE SIAMEVAACK PIANVIDTAV  
 HVSSVIVQEM KKYGNTIIGY FEHYLQWVKI SITEHMAACK PVATALDSAV  
 RISSVIVKES SKYGNMIIGY FEHYLQWVKI SITEQIAACK PVATALDSAV  
 NTSSVIEET KKYGRTIIGY FEHYLQWIEF SISEKVASCK PVATALDTAV  
 NTSSVIEET KKYGRTIIGY FEHYLQWIEF SISEKVASCK PVATALDTAV  
 NISSVIEET KKYRKTIIGY FEHYMQWIEF SISEKVASCK PVATALDTAV  
 QLSEVVVEES KQFGNKIISY FERYLQWVEM AITQQFAACR PVATALDSAV  
 NLSSIVIGET KKFGRTIIGY FEHYLQWVLY AITEKMTSCK PMITAMDSAV  
 NVSLIVIGET KKFGKTILGY FEHYLHWVY AITEKMTSCK PMATAMDSAV  
 KEKEEKSENK DKKKKKKKSK KDKEEEGSAE KADGDANKNP QDPAAPGEIG  
 NDSTSKYSGT RKLGGKKDQV RPTEELWATP ILSSTSNTET RQLPRVRPYD  
 RGKDYINALG GNLTNSIDQM IDDYIDMIK EANESVGHCA PLSYIYYR-G  
 NMREHFGRAA KEEFQQMVNN IDQYIVHVKS QMESEVTSCQ PLTQIARQ-T  
 KAGEICHNMT RYDRDLKAY LTTSKATMES QLGDTTTKCR PFYDTFDA-S

RTVVCDNITN PWNGFWFCLA WCTFFLIPNI LLSIKSVEHI TNLKPTSS--

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|-------------|------------|-------------|------------|---------------|
| HTVVCDNITN  | PWNGFWFCLA | WCTFFFLIPNI | LLSIKSVEHF | SLLKPISS--    |
| HVILCDMMAD  | PWNAFWFCLG | WCTFFFLIPSI | IFAVKTSKYF | RPIRKRLS--    |
| HMILCDMMAN  | PWNAFWFCLG | WCTFFFLIPSI | IFAVKTSKYF | RPIRKRLS--    |
| RVILCDMMAD  | PWNAFWFCLA | WCTFFFLIPSI | IFAVKTSKYF | RPIRKRLS--    |
| RVILCDMMAD  | PWNAFWFCLA | WCTFFFLIPSI | IFAVKTSKYF | RPIRKRLS--    |
| RVVLCDDMAD  | PWNAFWFCLA | WCTFFFLIPSI | IFAVKTSKYF | RPIRKRLN--    |
| RVILCDMMAD  | PWNAFWFCLA | WCTFFFLIPSI | IFAVKTSKYF | HPVWKRLS--    |
| RVILCDMVAD  | PWNAFWFCLG | WCTFFFLIPSI | VFAIKTSKYF | RPIRKRLS--    |
| QTIACVYIVD  | SMNAFWFSMG | WCTLFLIPSI  | ILSVKLAKHY | RRMKTSDVYE    |
| QTIACVYIVD  | SVNAFWFSLG | WCTLFLIPSI  | ILSVKLAKHY | RRMKSSDVYE    |
| AVILCSQMVD  | SLNAFWFGLG | WCLIFFIPSI  | IFSIKLAKYY | RKMKYADICD    |
| ENLLCKHLVG  | SLNAFWFSLG | WCMLFLIPSI  | ILSVKLAKYY | RRMKYSDVYE    |
| EIVTCSFLVD  | SMNTFWMGLG | CSTLLLLPSI  | ILAVKLAKFY | RRMETEDVYD    |
| EILGCGFLLD  | SMNTFWFGLG | CCTLFLLPSI  | ILSVKLAKFY | RRMDTEDVYD    |
| EIVACSFIIID | SVNTFWFGLG | GCSILLIPSI  | IFSIKLAKYY | RRMDTEDVFE    |
| EIVACSFIVD  | SVNTFWFGLG | GCCVLLIPSI  | IMSVKLAKFY | RRMDTEDVFD    |
| DVFLCSYIVD  | SVNSFWFGLG | GATVLLIPAI  | IFAIRLAKFY | RRMDTEDVYD    |
| DVFLCSYIVD  | SVNSFWFGLG | GATVLLIPAI  | IFAIRLAKFY | RRMDTEDVYD    |
| EIFLCSYVTD  | SVNSFWFGLG | GSTIFLIPAI  | IFAVKLSKYY | RRMDSERVEDVYD |
| DIFLCSYVTD  | SVNTFWFGLG | GSSIFLIPAI  | IFAVKLSKYY | RRMDTEDVYD    |
| DVFLCSYITD  | PVNLFWFGLG | KATIFLLPAI  | IFAVKLAKYY | RRMDSERVEDVYD |
| DVFLCSYIID  | PMNLFWFGLG | KATIFLLPAI  | IFAVKLAKYY | RRMDSERVEDVYD |
| DVFLCSYIID  | PLNLFWFGLG | KATVLLPAL   | IFAVKLAKYY | RRMDSERVEDVYD |
| DVFLCSYIID  | PLNLFWFGLG | KATVLLPAL   | IFAVKLAKYY | RRMDSERVEDVYD |
| DVFLCSYIID  | PLNLFWFGLG | KATVLLPAL   | IFAVKLAKYY | RRMDSERVEDVYD |
| DVFLCSYIID  | PLNLFWFGLG | KATVLLPAL   | IFAVKLAKYY | RRMDSERVEDVYD |
| NVFLCSYIVD  | PLNLFWFGLG | KATILLPAV   | IFAVKLAKFY | RRMYSEDVYE    |
| NGILCSYVAD  | PLNLFWFGLG | KATMLLLPAV  | IIAIKLAKYY | RRMDSERVEDVYD |
| NGILCSYVAD  | PLNLFWFGLG | KATVLLPAV   | IIAIKLAKYY | RRMDSERVEDVYD |
| RNGSAEAGSQ  | PTSVEGKSDA | AEGASPMAPG  | NGKKSANTL  | DVEPK-----    |
| MDIVQPSEYD  | YSYGTGSQSH | YPRVQVLPDE  | RHQPMSPNYY | DTQYQGT---    |
| VDLICHRIVD  | PINGFWGIL  | LCALLFLPIL  | FVAHRLMCLY | KKIYPYLATV    |
| TAAVCAYTID  | PYNGTWMCM  | ICLVLLPIV   | IISNSLIGLY | SKMHAFPKY-    |
| RTFLCRNMVD  | FINGLTFFIF | LTLWLWAGT   | PVGLNLITVQ | TRLNVMQAAQ    |

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