## QUERY

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UniRef90_M1UY66
 PEIEDLIDRVRRAHQETFPSLCQLGKYTTSNGSGQRVT NSSADHRVQ SPEQEELTHRLVYFQNEYEHPSEEDVKRПINQPMEGED SSSQEDLINKLVYYQQEFESPSEEDMKKTTPFPDGDSEE SPEQEELINRLQKCFEVGMSKECSVFEGPTNNSSEQRVS SPQQEDVIKQLVYYQDLEHESPETDVKRVTPFPVGETED VTEDEQSVLQEI LEAHRVTFPQTEEAVLSPMSCHDTNQKK
 ANPNDDMPVDKILKAELESDPKVEQVVPSEQ TEDDHTLOEVLEAHRVTSPNTCTPPOMSPAMPDPTVPD SPEQLGMI EKLVAAQQQCNRRSFSDQLRVTPWQTVEKGA TEEENMLLQDVLEAHRLTYKSPAENGKDKENETEKNGNK SSAADEEMVENLLEAETAVEHKTE

■HADSSSGTG
QPWPLGADPQSRD
MDTAVRAHVDTTPDDASDDYSQYREPGQNEPD TPEQEELIHRLVYFQNEYHPSPEDIKRIVNAAPEEENVA PLEDMPVEKILEAELAVEPKTEGGCEPGGGGGGRSRGT VERULEAEKR MPTTS VEYKTENNMEFENTM
VER\|LEAEMAVEPKSESG
YAMPDPTMPD LIT A LVRAHVDTTPDपANDDFSQYREPPGEPPM ATPPV NVIASLVRAHVDAEPPVGKLDYSQYQEMVTSLEK LRAEPYPTTRYGQCIQPS MIAS LVRAHDDSNPSIAKMDYSKYMETEVSSNK ETEDLLQEVLRAHRDTFPQREEEGVPNHPVSNFKGQD TREQEELINTLVYYQEEFEQPTEADVKKDRFNFDGED PQQQEMIEKVV AMQKQCNKRSEGDRPWPQSQDLQNRE VSVNEEMPVEKILAAETAVEQKTE TSHQRNLVEKQANEAREPTQEAVAKVTPWVESGDSHR ALVRSHVDTTPDPSCLDYSHYEE SAAEWELIRMVTDAHRATSTQGNGWKEHAVQEEADGRAP

N 1 IAS SVKAHLDSNPSAGKLNYSRYQEKTNHKEK TWPAKNSSADHRVR SGELEELVNKVSKAHRETFPSLCQLGKYTTNSSADHRVQ V DKI LQAELASDPKLEELDSMQEVKSNSCKVK TSEQEELI HRLVYFQNEYDQPNEDDLKRIANQPTDGEQP SAEEWELIHVVTEAHRSTNAQGSHWKQQSPMASMDDGDK


E $\square E R V A Q N V V K S H \square E T N Q Y T S E W T \square Y S P E E T R S Y Q T K$ QLAVIYKLIWYQDGYEQPSEEDLRRTMSQPDENESQ SPASIPHLILEELLKCEPDESQVQAKILSYLQQEQASRGKH A E DRRAAQNG K S H LETCQYTMEWQTHTYEEDKDYQSK VPAEQRRPLQRPIPPDRGFISLLLRAEPYPTSRYGAQCLQ

TS MLLRAEPYPTS RFALQCPDP L E R L E A E LRVEPKDEQ DGDKHKHLPSFVMPF $I N T L V Q A E A M A Q Q 1$ SAFNPVHHAEIAM E TMAELLTAARPD\|VPEAQSFKD

DVILTVSQAHHANCGYTEEHTRNLVRKPVVVPPS T QEEWDLI RLVTEAHTTTNAQGSHWKQKRKFLSSPDGNK
 Y QD GYEQPSEED LKR $\square M S T P D E N E S$ E $\square \mathrm{DRVAQNVVESHLETCQYTTDWQPYSQEE} \mathrm{\square R} \mathrm{\square FQNK}$

AS PA
NLLTSLVRAHLDSGPSTAKLDYSKFQEPVLPRFK $V G S L N A E M L S R Q V G A A L E Q M G P T P V N D Y D D S$

## S VKAENESRQS KAGAAMEPNDNEDLST

 APPSQRHFTASLISGETGAKLEPEDADENDDVTSHEPELC NPQI GSNPNSNSTQ TKEQQALMKLIVDAYNKHQDPQDFAKKLLQEQY APPEMP LERLLEAELRVESQTGTLSESAQQQDPVS $S T S Q V R E V V D R F L E A E Q M G E Q S G D N A \square P Y L R V G Q N S M \square P P$

## QUERY

UniRef90_B7X6R0 UniRef90-S4RRL8
UniRef90 H2DK79 UniRef90-B7X6Q6 UniRef90-O4433 UniRef90-G1PA29 UniRef90-UPIO00334561E UniRef90-A4F2F6 UniRef90-T1JTR6 UniRef90-UPI0004571C8B UniRef90 K1RA08 UniRef90-UPI000457363B UniRef90-R7U148 UniRef90-UPI0003F0C72F UniRef90-K7ZLP3 UniRef90-UPI0003512B19 UniRef90-T2HRZ4 UniRef90-S7N1D0 UniRef90-V4AY65 UniRef90-W5LKG1 UniRef90_UPI0003340AFB UniRef90-QOIE91 UniRef90-A3EZJ4 UniRef90_S4RTR6 UniRef90_G8Z7K2 UniRef90-C4N544 UniRef90-H2TIB5 UniRef90-EOVS41 UniRef90-E4XGN7 UniRef90_UPI0003EA8776 UniRef90_E2BLP9 UniRef90-H2URS7 UniRef90_UPI00026517FB UniRef90_O76246 UniRef90_H2UYA7 UniRef90_UPI00042BB6F0 UniRef90_H3DM70 UniRef90-Q4H386 UniRef90-B3NLY9 UniRef90_L7LSY1 UniRef90-W5NBA1 UniRef90-H2MLA4 UniRef90_L9KJ73
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 LLKGCCME: MS L RAAVRYDAESETLTLNGEMAVKREQLKN LLK K C CMEI MCCLRAACRYDPVNRTLTLQNGLLLKKNQLNH LL L KA C CDEI MVLRDSYRFNRDDGSVTFTSGLTLLSNKQLKT LLRAGWNELLI ASFSHRSDDVKDSILLASGLHVHRHSAHQ
 L L K A A C L



 $L$ L RA GWNELLI A AFSHRSMEVVKGIVLATGLGIHRNSAHQ
$L$ L K A G W N E L L I A A F S H H R S LL Q S A WM M V
 LL E S A F V E L F I L R L A Y R S N P E K N E L I F C N GVVMMHR T Q C V R L L $L$ L K S C C M E M M C R A A C R Y D P E K E T I T M H

 L R A GWNE LLMASFS H R S DNS K D GV L LAAS ELGQRDENVVQS A

 LL KA G WNELLLI AAFSHRSMNARD GIVVLAT GLVVVQRHSA H S L L Q S G WME ALILVVVS R S L S FTEEELVVFAGNFRRLDRA QCRA LL K A A CRMSQILLRICTRYTPEQDTMTTFSDGLTTLNRTMMHN
 L L K A C S SEVVMMFRMARRYDVVAT DSIL FANNEPYGRDTYHA L L K GCCMEIMSSLAAVRYDPESETLTLLSGEMAVKREQLKN L L K A G S L EVVVVVRMCRA F D P Q N S TVV Y F D GK YA GP DV F K S


 L L Q NC WS E L LI L D HDY R QVVVHGK LVVTGQQVVDYSVIDASQA G L L K S G CLEVVVLVRMCRAFNPLNNTVV LFEGKYGGMQMFKA LL R MTWSELGVLNAAQCSMPLHVALAAAGLHASPMSADRV L L R A GWNELLIASSFSHRS DPLKDGALLDASELDRDSAHMAG LI HACTTEVLMMKTARRYD】KSDTVNNVTNWAYTRQTYRQ L L R A HASEHLVLGVARRSMAYNDALLLGNDLII SRNQPEV


 L L K N C C F EVVMCLRAAS RFDK QRRTITMMGGGTVTK E QVS Q

 L F A S A R R L $L L Q W S W P E L L I$ GGFCHRSAAVRDGI LLAT GLLHLTRENGKK LL L K A C S S EVMMLRMARRYDHNSDSIIFFANNRSYTRAAMKM $L L K A G C D E V L L V R M C R A Y N P L N N T L \quad F F E G K Y G G A Q D F K S$ LL L A GWNELLI AAFSHRS IDDTKDSI I LTT GAAVHRHSALQ L L D S A F LLE LI LIRLAYRSKPGEGKLVECSGLVLHRLQCAR L L R A H A GE HLL L GLLARRSMHLLK D LL L L G N NCII T K H S P D S L L Q S G WME ALL MCVVVWRS Q GCS QELL QFAEN LIRL NEAQARA L L R A H A GEHL L L GL SRRSMHLK DVL L L S N NCVI T R H CP DP

 LL L K A G WN E L L L L K A H A G E HL L L GVAR R S L H L R DVLLLRGNNCDIPR Y C GET L L R A HA GEHLLL GAAKRSMLYYKDILLLGNDHIIPRNCPE L


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UniRef90 UniRef90_UPI0003BCEA90 UniRef90-W5LKP8
UniRef90_M1UY66

A
A GFGPLT $\frac{130}{1}$
140
150
160
AGF


AGFGPLTDLVFAFATQLLPLQMNDTEAGLLSAI CLICGDR



 G G F GT L








 A GVGS I F D RWAPERPRSLRCVKTGE IKVVLLATHPDVLHA
 A GVGGTI F DRVVSELVAKMKEMKMDKTELGGCLIRSIVLIFNPDA
A GVGSIIFDRVTELV SKMKDMQMDKSELGCLRAIVLIFNP
S GL LDD L HVA L L P L V R R Y K K L R M E K E E FVVS L K A I A L A N S D S







 $G G L G A V S D A I F Q L G R S L A S F A L D D A E V A L L Q A V L L L S S D R$ A GVGDIV DRVAELVAKMRDMKMDKTELGCLVAVVLVFNPDA A GL L D DL Y T A L K HLLI S K Y Q Q M H L S P E EVVVTL K A MV LAA S D S SFGDWWI DSIMEFSQSLHRMNLDLS LFACLAALVIITD R


A GMGDAIED MLRRFCRHMYSMKVDNAEYALLTAIVIVSERP











 GWGQELIDQ TLD YVSRI QEVNVDHVEFCFLNAIVLTYPDA $G G L G R L A E P$ L F E F A E GLLS QL HLLD DTEVAALLAALLVVA DR P


 A GVGADI DKI FEVIDEKMQEMQLDRAEWGCLRAVML FSPDA



 GVSPNLDRII DELVTVMRDI GIDDDTEFACIKADVFFDPNA


 P Q L M C L D R I L C E L A I K M K R L D V N R A E L G I L K A I I L I F N S D




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UniRef90_EOVS41 UniRef90_E4XGN7 UniRef90_UPI0003EA8776 UniRef90_E2BLP9 UniRef90_H2URS7 UniRef90_K1Q340 UniRef90_UPI00026517FB UniRef90_O76246 UniRef90_H2UYA7 UniRef90_UPI00042BB6F0 UniRef90_H3DM70 UniRef90-Q4H386 UniRef90_B3NLY9 UniRef90_L7LSY1 UniRef90_W5NBA1 UniRef90_H2MLA4 UniRef90_L9KJ73 UniRef90_Q1L685
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UniRef90_M1UY66

MDLEEPEK
170

LQ E | $P$ | $L$ |
| :--- | :--- |
| $P$ | $L$ |
| $P$ | $L$ |
| $I$ | $Y$ |
| $P$ | $L$ |
| $Y$ | $Y$ |
| $P$ | $L$ |
| $P$ | $L$ |
| $I$ | $Y$ |

180
190
200
LR L A
 A LVVE W K V E KI Q E I YL EA LLRAYDNRRKPRPGTDFA KLL S QDLEEPDRVDQLQQPR EALKLYMRWRRPDKPHMPKLLM
 Q D L E Q P D R V GLV EAR KVEKKI QE DYL EALLQAYVMNHRDRPMTEFAK LL S

 T GLLTVW DE K I E K C Q E A YL L LA F E H Y I N T GLLKEPEAVVEKLQDAVL GAYKRYI A EQRPMQPDVWAKIL M S GLEEPLLKI EKMQEPLLEADR DYVRRRRPTEPHAFAK I L M K NL L D S A HI E S LR E KVVYA SLE AYCRSKYPDQPGRFA KL L L M H I E D V E A V Q KL Q D V L HE A L Q DYEAA GQ H M E DPRRA G K ML M




P
 H GLLE $\operatorname{K}$ P GVVSDPA HVE S I QEKAQCALE EYTRCQYPGQPSRFGRLLL
 S G L S GI S D VD A V ERL

H G L R E P K K V E QL Q M K II GSGL R D HVVTYNAEAQQHYFS RLL G
P GL R S A A R I E R I Q E S F L L A L E H Y V A S R R P H T Q R F F WP K L L M K GL K S T E R V E ML R E KVVYA A L E E H C K R H H P D QP GR F G K L L L
 Q DLEE P T K V D K L Q E P L L E A L K DY $\square$ RK R R P S K P H M F P K L L M MDLEE P HRVVQLQEEPLLEAMKIYAR
K E LT DA A Y I E T L R E KVVYA S LLEVYCKSKYPEQTGRFA K L L L










## H

## K

A

## 

## -



P GLLS S T D R L E R CQQE E FL L AA F E H Y I N H R R K H K V A A H F W P K L L M

 $K N L K D V Q Q V E T Y R E M Y S A T L E D Y M K K N R P D R P D R F T K V I L$

 H GLQEPRRGXATXXXXXXXXHMAAVAGEPQPASCLSRLLG


 $K G L R T C P S$ G GPEGESVSALEEHCRQQYPDQPGRFAKLLL





SPASVPH LLEELKCEPDEPQVQAKDTAYDQQEQASRGKH
S LQTEELAASGIRSHKETTQYRLEWKVFSREEVHDYQSK LRAPPATCPTSRYLVCPMNMSAYVDPQK


STPEDEHLVQNVCKSYRETCQ DRDEDNDFSREEVVGYQRK SPNQKSLIDARLVWY QEEGYEWQYNEADPK LVGGRIPKPPSGG

PSNHR LISA AVNGHKETTPD SGGLDHTAYSEDQSSYSP ADENIDVTGNEPERTEYQMSP AEKRVECKMEHLG
CQPMPKYPYELTP

## TPQLVNAEHMS

 RQVIPNPVNLPDGS PPTERVAQNVIRSHRETCQYTTEWAQYTQEELCSLQAK SEYQMSG
PHGEGGK
NLLNALVRAH $\square$ DSNPSMARLLACPLDMHPHGEGGK ASAEQQETVQNLL HRAADPASPQELRQQACSCGSTRRR

AELDYYAQTVSKSHDETCQYDREEDQQMQDEDESYQSK L A T QL VR A YL EDEHLTQNVLKSYRETCQQLLRDETFSWEEVRHGQPK


QRLVASVVRAHLETCDTLCHPTLACPDNPSPRPVT S I I VSP V DYTSFSPQAVPCYPTPKYPHEPV

QDTSPVSLIMSLGRFQESLSYQEK AELEHLDAQNDSKSHLETCQYLREELQQDTWQTFLQEET
【ER I IEAE QKAESSGDNVLPFLRVGNNSMVQH TAPSSFF $\square$ NQLLQAEPDEKQLCMRVLAS DQREQACRGED EPEDADENDDVTSNDPEFPSSPFSS
$M P S \mathrm{~S}_{\mathrm{M}}$
PSSSSKACP LNAWPVSGAGR
DQPRLLLAAVLRAHMDTCEFTREKVTSMRQRARDCPTY EDK KN IVR QPTTGMTKFHDPSGELQRSNEEVDM $S P A L S L T A D Q M V S A L L E A E P$ S $\quad$ PVVYSEYDPS RPF
$F D N T L L A A E P R M A V N D F D L E Y K P D R \square Q S D M S V P$ DQMVSALLEAEP
$P \| V Y S E Y$ D P N R S F
$R D \square D Y S R F C A S Q C M Q P$



TEEQQALIQELMDAQMQTFDTTFSHFKWNYQPPSKSDGK FSNLLMMYQDGASSSDSSCEED S S S VQE LS DER L IE DES SP T E S QS E L Q Y L RDVSPN SVVP T


QRSCPSRRG $\quad$ CACPLNATPYCGSGK
DELCAS VVRSHRETSQYRVEWKLLSREEDQAYQSK EQNELVQTLLEAHTRYFDQFVQFKPPAH H A Q L G N QPRAPR LADVSMRACACGSKRK
 TEEQRMMLRELGDA QMKTFDTTFSHFKWNYKPPADSGGK LIDELIDRSEPD QA QLQAKVASYFQSAMGMTAP MMNALVRALTDATP RDLLACPMNALHRGGPVR

VS SEDE QLT Q N VLAS HRATCQRLRRGDTFTREEVSAYQRQ VS P M DREFVVQS D D D REWQT QLFALLLQK QTYNQ
 UniRef90 U3J360
UniRef90_Q91766
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UniRef90_S7NRV7
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UniRef90_I3RQB8
UniRef90_V3YXI5
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UniRef90_UPI00042BB27B
UniRef90_M1MEU8
UniRef90_UPI0001

## UniRef90_UPI0001CBACDF

## UniRef90 ${ }^{-}$W4YZB2

UniRef90 V9KCR4 UniRef90_T1EDF5
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UniRef90_T1IWQ5
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UniRef90_H3A5Y4 UniRef90_UPI0003AB8ADF UniRef90_V3Z0C1 UniRef90_H2LSD9 UniRef90-O54915-2 UniRef90_M3ZQX9 UniRef90_Q1AHP6 UniRef90_W5L6G4 UniRef90_F7AWP9
UniRef90 R4I3E1 UniRef90_V8PCF8 UniRef90_G3PF17 UniRef90_UPIO0038EB495 UniRef90_UPI0001CBAC35 UniRef90_A3KNP5 UniRef90_UPIO004574A9B UniRef90-UPIO00359E19C UniRef90_W5M9M6 UniRef90_Q95WF7 UniRef90_O75469-6 UniRef90_Q86B27 UniRef90_W4YDL3 UniRef90_A4IIE9
UniRef90_UPI000 UniRef90-UPI000454B843 UniRef90_L5M1C5 UniRef90_W4Z8L2 UniRef90_UPI000398FF89 UniRef90_U3SWM9 UniRef90_B3M872
UniRef90_U3J360
UniRef90_W5MSM7 ERLS $\square$ SDVCESMKQQLLLLVEWAKYIPAFCELPLDDQVA ERDSTFGDMCKMADQTL FS VVEWARSSVFFRELKVDDQMK S GHEMWQYCAVRLSDAVQYVVEFAKRIPGFRQLCQNDQTA



 NPTDLMANLCNDADHRLYKIVKWCKSLPDFKNISDDDQTS

SESENVRQFYQ YPSASPESVYETSARLLFMAVKWAKNL NYENAVSHICNATNKQLFOLVTWAKHIPVFSNLPFRDQVI
 K ENFLLLTETATSHVQVLVEFTKKLP
 SSQQVWESFSQCFTPAVKEVVEFAKSIMGFQALSQHDQVMM


 QKLSMWHCLASFITPAINSVVEFAKRVTGFPELNQDDQLI
 PQEVMWQLCAVK TEALQYVVEFAKRI DGFMDLCQNDQUV DPHERLHQFYDNLCASFHLI RLWSEKI PGWNDLQRQDRDL TKVHLLNS LVKLAERELVHLINWAKNVPGYTDLSLSDQVLH

 TMMPPVDADCETAARLLEMSI RWVKNVPAFIGLPYSDQLT LSTLCDDADRELVVII GWAKHIPGFSLLPDADQMA
 ENYQ M EYKGAVSHLCQMVNKQIVQLIDFARRVPHF DNLPRDDQVM DYKGAVSHLCQMVNKQLYQMVEYARRTPHFTHLQREDQIL PSDYSFRHITEDTILTVQLIVEFSKRDP DRDNTFS MMCKMADQTLEGLVEWARNCELGKELKVDDQMV SSPCGLDSIHETSARLLFMSVKWAKNLPVFSSLPFRDQVI
 TS SQEIWESFSQCFTPAVKEVVEFAKGUPGGFQELSQQDQVL
 NEASVMTLLTNLADRELVHMI NWAKRVPGFVDLALHDQV H S SLC SIA DHRLYKDVKWCK SLPGFKNI QIDDQI S
 KRFAS $\square N D V C D S M K Q Q L L I L V E W A K S I P A F A E L Q L D D Q V A$

 S D TE Y V Q Q F Y S L LT S S ME


 $R Y R G P V S S L C Q \| G N R Q L R A L V D W A R C L P H F N R L Q L S D Q V L$
- SVDEMWE EFLDCFTPAVKEVVEEFAKSI P









PDNLLEVTARLLFTSVKWAKNTTCFRLLPFRDQLI PAAEMWQRCAGRITEAVQHVVEFAKRLRGFMELSQHDQUV DEMRFDAAFSD LADRELVIDIV WAKQVPGFCNLSQSDQMN $V E D S V D V Q Q F Y D L L T G S M M D V I R K W A E K T V Q G F A D E L$
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UniRef90_P79926
UniRef90_S7NRV7
UniRef90_F8W3X2
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UniRef90_F5CA69
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UniRef90_V3ZZL4
UniRef90_R7T635
UniRef90_L5MCC0
UniRef90-T1HFZ6
UniRef90_I3RQB8
UniRef90_V3YXI5
UniRef90_W8C2E6
UniRef90_UPI00042BB27B
UniRef90_M1MEU8
UniRe_MPI
 L L R A H A GA HLLL G VA K R S LIP Y K D FLLL GND FIMPMHCPELL
L L Q NCWSE LL I L D HLLFRQVV H G
L L K S GS MEVVLVVRMTRMFNTANNTVFFD GKYA GTELLFKS
 L I K T GFF E I WL TTRMARMFNKE EN S V T F ED G S II IP K D E L D V $L L K G S A V E A M F L R S A Q Q V$ TVRKMHGHTEVLEDRIRKS L L R $\square$ S WSELFVVLNAAQSSMPCHLSLAAA GLHASPMPADHV L L R A H A GE HLL L GLARRRSLP FKDLMLLGNDYVLPRGHNHD $L$ L KA GAMEVVLVVRMCRAYNASNHTVVFFEGKYGGVE LFRA
 LL KACSSEVMMLRVARRYDAPTDSVLGANNQAYTRDNYRK

 $L L K A G W N E L L I A A F S Y R S D E V K D S D V L A T G T T V H R N S A Q Q$ UniRef90_UPI0001CBACDF UniRef90_W4YZB2 UniRef90 ${ }^{-}$V9KCR4 UniRef90_T1EDF5 UniRef90-F1QRU1 UniRef90_G3VH22 UniRef90-W5NCS8 UniRef90_H3AN62 UniRef90_F1QK43 UniRef90_G3NED9 UniRef90_K1RGC7 UniRef90-H3A9E6 UniRef90_UPI0003BD3307 UniRef90_UPI0001CBBB1E UniRef90_S4S9Y8 UniRef90_K7FPT4 UniRef90_F4WIM8 UniRef90_W5J5Q5 UniRef90_UPI00046B7573 UniRef90_W4XZR4
UniRef90_B9P3Q6 UniRef90_UPI00042BC9AC UniRef90_UPI000333DA21 UniRef90_B5B833 UniRef90_QOIGE0 UniRef90_H2TEJ6 UniRef90_Q962I5 UniRef90_E2BWFO UniRef90_UPI0001D37742 UniRef90_V5PZS7 UniRef90_UPI00034FCA0C UniRef90_G3P427 UniRef90 Q0JRL1 UniRef90_UPI00035A04B7 UniRef90_Q9YHT3 UniRef90_E9H1N6 UniRef90_A7SD90 UniRef90_E0D576 UniRef90_U5EVK3 UniRef90_UPI0002A4A2A1 UniRef90_Q9U7D9 UniRef90_S7N4I5 UniRef90_H3A5Y4 UniRef90_UPI0003AB8ADF UniRef90_V3Z0C1 UniRef90_H2LSD9 UniRef90_O54915-2 UniRef90-M3ZQX9 UniRef90_W5L6G4 UniRef90_F7AWP9 UniRef90-R4I3E1 UniRef90_V8PCF8 UniRef90_G3PF17
UniRef90_UPI00038EB495 UniRef90_UPI0001CBAC35 UniRef90_A3KNP5 UniRef90_UPI0004574A9B UniRef90_UPI000359E19C UniRef90_W5M9M6 UniRef90_Q95WF7 UniRef90_O75469-6 UniRef90_Q86B27 UniRef90_W4YDL3 UniRef90_A4IIE9
UniRef90 UPI000 UniRef90_UPI000454B843 UniRef90_L5M1C5 UniRef90 ${ }^{-}$W4Z8L2 UniRef90_UPI000398FF89 UniRef90_U3SWM9 UniRef90_B3M872 UniRef90_U3J360
UniRef90_W5MSM7




$L$ L E E A WS E L FL L C A I Q WS LPPL D S C P L L SVVP ELS P S L Q GK T


L I K C G F F E V W L M R MA RM F N K A E G C L T F E D G S
L L K G C C M E I M S L R A AVVRY DP E S E T L T L N G EMAAVTRRGQLA N $L L K A G S L E V V L L R M C R V F D S Q N N T V G F F D G K F A G P E V F K A$




 L L K A G S L L E V V F I R M C R A F D S Q T N T V Y F D G K Y A S P E V V F K S







L E C A W L E $\quad \mathrm{L}$ M M V G L V WR S M E H P G K L L F A P


L L R A H A G E H L L L G L S R R R S M H L Q D D L L L G N N C I I I I I M Q C P E S



$L \operatorname{L}$
 $L$ L Q N C W S E L L V F D HIVY R Ql Q H R K L V T G Q E V D L A T VA A Q A G












$L$ L Q H S W L E L C C L L V F R S CP Y IG Y I R FA E D L Q M T A D E CK K


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$E V G R A R-130$
150
160 E I A R $\operatorname{D}$ V P C R I L
 VYSSPEFVSSSMFDVAASFNVLNLNDTEVGGLFTGUVLSSADR

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UniRef90 H3AN62 UniRef90_F1QK43 UniRef90-G3NED9 UniRef90_K1RGC7 UniRef90_R7VKF4 UniRef90-H3A9E6 UniRef90_UPI0003BD3307 UniRef90_UPI0001CBBB1E UniRef90_S4S9Y8 UniRef90_K7FPT4 UniRef90-F4WIM8 UniRef90_UPI00046B7573 UniRef90_W4XZR4 UniRef90_B9P3Q6 UniRef90_UPI00042BC9AC UniRef90_UPI000333DA21 UniRef90_B5B833 UniRef90_Q0IGE0 UniRef90_H2TEJ6 UniRef90_Q962I5 UniRef90-E2BWF0 UniRef90_UPI0001D37742 UniRef90_V5PZS7 UniRef90_UPI00034FCA0C UniRef90_G3P427 UniRef90-Q0JRL1 UniRef90_UPI00035A04B7 UniRef90_Q9YHT3 UniRef90_E9H1N6 UniRef90_A7SD90
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UniRef90 B3DKN2 UniRef90_UPI0001D37742 UniRef90-V5PZS7 UniRef90-UPIO0034FCAOC UniRef90_G3P427 UniRef90-Q0JRL1 UniRef90_UPI00035A04B7 UniRef90_Q9YHT3 UniRef90_E9H1N6 UniRef90_A7SD90
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UniRef90 W5MSM

170
180
190
200
KGLSDPTKI KRMRYQ|VQVS|LIEDYTNDRQYDSRGRFGELLL

 S G
 RSLSDDNQI ESLLQERSQCALEEYVRSQYPNQPTRFGKLLG


 HGLQEPKRVEDDQLKIIESLRDYFNAKRPRGSYHFSRLLG RGLKDPEQVENLQDQSQVMLDQHNRTHYPSQPVRFGKLLG







 PGLVSLERI EKCQEDFLLAFEHY NYRKHHDSHFWPKLLM




 H GLK K DPKRVEDLQN QVVSCLKKDHVTSTASEQPNCLSKLLG




 KSVVQNRRQVE QTQQERVNKALMMDHTMQTHPGHSDKFGQLLL | $R G L K D P E H V E A L Q D Q S Q V M L S Q H S K A H H P S Q P M R F G K L L L$ |
| :--- |
| $Q Y$ |

## P



## ©

 Q GLS D P Q S V E R DQD R L VEAA K L QV S R NHSTE ENLFA A V I M
 $R G L K D P E Q V E N L Q D Q S Q V M L G Q H D R S H Y P S Q P A R F G K L L L$




##  <br> 

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P THS GS EA I A A L Q DEA Q LTTLNS Y I H T R Y P T Q P CR F G K L L K F LIE NH S LAAK DA Q EKA HAA A L L D Y T L GHY P H C G D K V R Q L L L






 R R L A S F D K M E M R Q M V V D A L M E V A Q K S H P E D T R R V P S L L L

 $R G L S E P H R V E S L Q D Q A Q V M L G D Y V R Y A B L S P P P R F G R L L L L$





K $\square$ K F K H $\quad 3$ T P LLQE QSK E ${ }^{40}$ CDDTGVST RELDYSQFSATDQPTAS VAlQQ P PNPQEYM TANQQFLI ARLIWYYQYEQPSDEDLKRITQWQQADDENE
 TPDQQNLLHYI MDSYSK QRMPQEITNK ILKEEF
 TQXEWDLI RMVTEAHMATNAQGNHWKQKRKFLSAPEGSK $R$ VTAA A R A HMDTCDFTRDKVAPMLQQARTHPSY
EKLLSSLLEAEP PNVYSLNHPNKPY
$P R \square L A R V V R A H L D T C E F T R D P T Y S Q P T \square A C Q C M Q P$ TCHSLRQLACPMNMYPHGRSGR
$P G \square P P L V L E L L G C D Q D E L M V Q N K \square A H L Q Q E Q G C S R G R$ AF $\square$ AKIQENVTLVPEIPGHS LESDEK

PEQQUIVHPPVPMYNPTVPLISHLVSIEPNPYNPQCTP
PHADENVVKDEERGNDDSVDLEYERPLVPAYPEGA ENLVSNI CEAYYKTCQYSREELASYQEGTLQFQNM TDEEQNFVQH】SKAFEKYK $\square$ NPE $\triangle V R$ RWE
STMSPEEF $\square$ SR $\square$ MEAEPPE $\square Y \square M D D \square K K$
$S Q C M \underset{P}{Q} \underset{F}{P}$
 TQEEHQLINN IVAAHQKY \IP LEEAEKF LQENANPE $\mathrm{D}^{\mathrm{P}} \mathrm{T}$ F MPSPM


DVIMCVSQAHRLNCSYTEEDTREDMRRPAES DEF WNYKPPADNGGK $P E A Q P G V P R W G P A W G V P R P$
$S E P \square K E \square C P T V L T P E Q L I G R \square M A A E P P E \prod F L Q K D M R R P \square$ ERPRTVPKLMQELLQCEPDQKVLRQKLLETVEDQMRQ SKEQKDLVQMLLWAHTRMFDQFVHFRPPAHLFIMHQPDP
DE $\square L N T L M E A E P$
P MVYSEHDPSKPF

T A A QE LMMQQQLVAAQLQCNKRSFSDQPKVTPWPDP QSRD
PEES QLCARILACLQREQASRGKHRRLNT
S S PF S D L L A KTIL DAHNRTCLYNSDHVMEMMRKPQHYKNM


E QLLAAVS QSVGSHFSS $\square$ VTHLIDHAEPYPPTACSSS | $P$ | $L$ | $C$ | $R$ |
| :--- | :--- | :--- | :--- |
| $P$ | $R K$ | $L$ | $S R P Y$ | S P A LS LT A D QMVS ALLMEAEP P P I Y S EYD P S R P F


 RAYSHCTP R D LDYSQRSAADPPSSS
$N K M L E A L A A C E P D M L Q V S N \square S H T \quad L D$
Q D L G K G H LT P P S P P N G $\square$ F Q $\square$ P H P M G A N P $\square S$ G
S PE QR GM ME K LVA A Q Q Q CN Q S D R L R VT P WP L LAP DP Q S R E VS D D D NHVI A A VVQAH

Y D V $\square$ N D D D $\square E E T S$ T QEENQLINNIVAAHQKYKVPLEETQSFLQEYANPELSF

A VTE A H M R T C L Y T S E Q $\square$ Q H $\square Q S S \square T P$ QE $\square M$ SKEQKK L IQ TLLEAHTNMFDQFQQFRPPAHLFIHHHQPW

SPHSCHCEMRRT PHLDLLSSKT $\square$ S DAHSRTCLLTSSDE $\square$ T LKK DHALLRTNSSSM



NQSCDDCPGCKETGG
H Y G Q F


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UniRef90_E0VB70
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UniRef90-T1J2S3
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VCLQTPQVTCQAASDVLVKTVSFMKNLPSFQLLDPREDQLL
L Y EVVA TESVVCESAA RLLEMSI K WAK SVVPAFSTLLSLQD QL M
UniRef90_UPI0003EDC43A
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UniRef90_Q95YJ6
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 MLKGCCMEVIVLNAVTDYDRQRGTLKLFSSVVVSRNQLRR LI DSAFDELFVLRLANRSNDSEDKFIFCNGLVLHRFQCLR LLKAHA GEI LILGGV $\square R R S F Q E D D V L L L G N N L I I S R N S S D K$ LLKACSSEVMMLRVARRYDAASDSVLFANNQAYTRDNYRK LLECCWDEILMTGLDWRSVEHPGKLVFAPNDMLDRNEGKC LLKGSAVEAMFLRSAEIFNKKLPAGHTDLLEERDRKSGKX
 LLK A A WNELLIAANVAWCSDQPQQLFLNQSFSYHRNSADKA LL I N S WCEL LLLSCCFRSMVTQGELRVSRGRSVTDHQAQQ LLKA GS LEVVFFRMCRAFDSQNNTV YFDGKYASPDVFKS LLKSSAI EVIMLRSNQSFTMEDMSWTCGSNDFKYKVSDQA

 LL RLTWSELFVLNAAQCSMPLHVAAAAAGLHASPMSADRVV LLKA GTFEVLMVRFASLFNVKKDQTVMFLSRTTYSLQELGA
$L L K Y$ G V Y E Al F TMMLS S L M N K D G M L I A E GN G F DT R E F K N L R


$L$ I R T V W W L D L L M L LLEE E WS ELG L L CADQ WSMPMESS LLST SEEHAQNAPNGKA
 L L K G S VME AMLI RNSCGYNHLTRKINMRA I IE E T L L RLT WSEALVL NAAQCSMPLHVAPLHKNDTGFPSQASVD

 $L L K$ G S F F E I WL L R MVAA FY Q S D KA IDD S LIEN GNASVWN QL T G









 LLQHSWLEVLCLNLVYRSCPYSGYLCFAEDLVVGSDLVK T

 IL L S E GLLLEVLI L R ICRQRSTPHQGAVMMVAKD TLLSS DNVF N LLKA GAMEVVLVRMCRAYNADNRTVFF
$V L Q S N W S E L L I$ GALCFRSLTSNGDMLETGLYVPRGSDQDN L L R A S WA E L FVVVNAA Q F GMP V HVVAP L LAA A S GIL H S S P P L P T


 L CKGSKTEVMFLH GA QLY SQKKECLSMETFCNEDCPPTTTLT

 |LLEDS WRELFLL GCAQLLDPPLDLAGLTDPDKLQ
L L K N S WNE LHI MA LA HRSMTVQQGIL LAATGLTINES LS H A

 L RK G S K T E V MFL H A A Q I Y S Q K E C L S P A S E S TMMKIS N H SAR $L$ L Q S G WM EALLLVGVA WRS Q GRVVGGMVVFA GNVLRLDEA QCRA
 $L V R A A W A P L L V L G L A Q D G V A L P A H E A A A P S M L D Q R I L T A A R P$

 L L K M A WTD L F LL E A S R S P LQQLTY VQQM YAT INAAQTKAMEV I L L E S C WL L V LMMVGLMWRSIDDH GQLIPAPDLVVNRNE E KC L L DN SWCE

$R L K K C L K V G M R$ REGSMPGHVAPLLAAAGLHASPMSADRV

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| UniRef90_P37231 | K MT D\|L|RQ| VTEHVQLLQVIKTETDMSDHPLLQEDYK |
| :---: | :---: |
| UniRef90-Q95YJ6 | K LA DVRRISTGFAASL M HMKLNNPEELVILFSE |
| UniRef90-W5MDI5 | T RAELRSQRTQGLQRI F Y LKLEEDLVPPPPVIDKFLD |
| UniRef90-H8YS99 |  |
| UniRef90_O77255 | ILLSELRTLGMQNSNMCISLKLKNR K L P P FLEEIWDD |
| UniRef90-M5D551 | LLS HI RHMSNRGMEHLYSMKCKNVVPVYDLLLEMLD |
| UniRef90_T1PK46 | KI PELRALLGLKHSAHCNWLRITKP RLPPLFAELFD |
| UniRef90_UPI0003EDCFB5 |  |
| UniRef90-I3MVC0 | RLTEELRTLNHNYSEDLSTWKTKHP KFDNLFSEKWN |
| UniRef90_B4M7S9 | RLP ALR S I S L C CLD HLFFFRII S D R PLDELFIE QLE |
| UniRef90-Q90Y26 |  |
| UniRef90-UPI0002659979 | C $~ P ~ E L E R A C Q \square S K E S L Q A K S R G D A A P G F N L L M E L L$ |
| UniRef90_O42392 | KLA DLR S LNEEHSKQCLS F Q P E S M Q LT P LVLEVF |
| UniRef90-O77245 | KI PDLRTL L T L H S EKLLK Y K |
| UniRef90-Q90ZE6 | LL SHI RHASNKGMEHLYSMKCKNVVPFYDLLLEMLD |
| UniRef90_UPI000344825D | RLPALRAVPASLIS QL F FMRLVGKTPIETLI R D ML |
| UniRef90_UPI000387293D | P PPSLRTVSSSVIE QLEFVRLVGKTP IE TLI R D ML |
| UniRef90_P50239 | T L P DLR TL S T L H T EK |
| UniRef90_Q2MD72 | KLPDLRTLNNMH |
| UniRef90_UPI00032B281 | KL A DLRQL VTEHAQLVQVIKTES |
| UniRef90_A5JPX3 | PLTEEVRSLSMQAEDYLCYMNLS GEVPCNNLL |
| UniRef90-Q95WG3 | CLPTLRMFSEKALENYVTLEFFGKLDMPP |
| UniRef90-M3XKB1 | KLADLRSLSEEHSKQYRSLSTEHTMKLTPLVMEVF |
| UniRef90-E9GRY3 | LPDIHAMSSRGEEYLYFKHLNGCAPTQTLLMEMLH |
| UniRef90-D1MY55 | LVS QVRQLS S L GVDHLNRLRGAETVAVQGLLRE\\|VD |
| UniRef90_S9X9W9 | KI T DLR SI S A K H L E QL Q |
| UniRef90-R7T6H5 | MLPLLRLAPSSHIENI FFRRT\GNTPMEKLLCDMFK |
| UniRef90_F6SMU1 | NMLNLRNLS RLIHSKYLYFKHHFVNVS |
| UniRef90-G9IAQ0 | CLTEVRELSHFHSGLVMSWKKRG SLTPLLCEIWD |
| UniRef90_UPI00042BFE4A | RLPSLRTVSSSVIE QLFFVRLVGKTPI ETLI R M M |
| UniRef90_Q15HT7 | LLSHIRHVSNKGMDHLSNMKRKNVVLVYNLL L L M L D |
| UniRef90-13JEZ9 | LP PLQSVA WQMVETLHLAQLLGE |
| UniRef90-G3NXA2 | MLS SI RHASNKGMDHLHCMKMKNMVPLYDLLLEMLD |
| UniRef90-H2SNR8 | RLPDLRTLNNMHSDK |
| UniRef90_UPI0003F058F4 | KVQELHALTGKHKEYVQRNHLLWPAQLPALYAEMMD |
| UniRef90-G3U1H1 | RLTELRTLNHNYSEILSTWKTKDPKKNNLLSENWD |
| UniRef90_F7AB44 | RL P AL RLM S S N I T E EL F F T GLI G NVPID SI I P Y L K |
| UniRef90_E0VB70 | KI P AL RELSLYHMDALAKFKRSTPLEFPALHKE |
| UniRef90-Q4SBN4 | RLPALRAVPASLIS QLFFMRLVGKTPDETLIRDM |
| UniRef90-H2UNY9 | ALSMLRAI R P PVVAQLFLKPVIGTVNI E EVLMEMF |
| UniRef90-B4K016 | KI PELRSL GAKHFSHLDWLRMNWKLRLPPLFAE |
| UniRef90_UPI00042CB2A8 | ILTELRSLSAEHTQQLLRIHDVHPFA TPLMQELF |
| UniRef90-UPI0003290C62 | ALSLLRFINANVIAELFFRP\IGTVSMDDMMLEML |
| UniRef90_Q06AL0 | LLPPITHIKLLAKQFWFDLKKDGRVMMHKLELEMLE |
| UniRef90-Q0H7E3 | LLSHI RHVSNKGMDHLHCMKMKNMVPLYDLLLEMLD |
| UniRef90-C3Z508 | RLP P El RLI AVQAEELMYLKHLNGLLPSATLLMEMLH |
| UniRef90_UPI0002C46AED |  |
| UniRef90_Q7T031 |  |
| UniRef90-W5QBV8 |  |
| UniRef90-UPIO00457593C | LLSHI RHMSNKGMEHLYSMKCKNVPLYDLLLEMLD |
| UniRef90-M4MDR1 |  |
| UniRef90-G1P3G2 |  |
| UniRef90-W5MJG1 |  |
| UniRef90-T1J2S3 | RLHELRELSSYHMESLQFKRSQPHLEFPPLHKELF |
| UniRef90-A7S286 | KLPTLRDMATRMAEECLFA Q S L L H A $\square$ P Q L T S R M |
| UniRef90_UPI0004431A4D | K GKLRSLCSQHMEKLL S F Q HL HPVAFP PLYKELF |
| UniRef90_UPI0002B477C6 |  |
| UniRef90-J9EP83 |  |
| UniRef90-G8EW03 | LLSHI RHMSNKGMEHLYSMKCKNKVPLYDLLLEMLD |
| UniRef90_UPI0003EBBF56 | ILSHIRHMSNKGMEHLYNMKCKNVVPLYDLLLEMLD |
| UniRef90_UPI0003DE8134 | RIIPELRALGARHANLLDWFRRNWKLKLPPLFAEDFD |
| UniRef90_C1J0L | R L |
| UniRef90_M3Y327 | RLTELRTLNHNYSEILSTWKAKDPKLASSLL |
| UniRef90-13JFE8 | REELRSQRTQGLQRIIF Y L K Le DLVAPPPPLIDRFLD |
| UniRef90_C4MBZ4 | VLP SLR QVD GIVRRFWS SVYRTGKVPMNKLFVEMLE |
| UniRef90_G5BWD3 | KL A DVR SLNDEYSKQYRTLSLENSMKL |
| UniRef90-R4RYQ0 |  |
| UniRef90_U4U5C8 |  |
|  |  |

$K M T D L R Q \| T E H V Q L L Q V I K T E T D M S L H P L L Q E D Y K$ K LADVRRISTGFAASLMHMKLNNPEELVILFSE
 ILSELRTLGMQNSNMCISLKLKNR KLDPFLEE DWD

 KVTML
$C \square P E L E R A C Q \square S K E S L Q A K S R G D A A P G F N L L M E L L$
$K \square A D L R S L N E E H S K Q C L S F Q P E H S M Q L T P L V L E V F$
KI PDLRTLNTLHSEKLLKYKM
 P PPSLRTVSSSVIDEQLFFVRLVGKTPLETLIDRDML LPDLRTLSTLHTEKLVVFRTEHK
KLPDLRTLNNMHSE
 CLPTLRMFSEKA LENYVTLEFFGKLDMPPL
 $\operatorname{IV} V Q V R Q L S S L G V D H L N R L R G A E T V A V Q G L L R E Q V D$

NMLNLRNLSRLHSKYLYFKHHFVNVSLPPLYKEDF
CLTEVRELSHFHSGLVMSWKKRG SLTPLLCEI WD
 MLS HI RHASNKGMDHLHCMKMKNMVPLYDLLLEMLD RLPDLRTLNNMHSDKLLAFRI
KVQELHALTGKHKEYVQRNHLLWPAQLPALYAEMMD







$K$ KPEVRGLS LQTEEYLY DRHLQGDLPCNSLLTEMLH RLHELRELSSYHMESLQFKRSQPHLEFPPLHKELF



 R L
I REE L R SQRTQGLQRIGY YK L E DLVVAPPPLIDRFDD
 $R L P V L R S I G L K C Q D H L F F Y R$


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PQRSS LYSVARSANQTHAAPEQPRAPWWDTSCDALRP SPPEDYD I HCVAQAHRGHSTYTTELSS $\square$ NQCFPF DVIH QVS QAHHAHCPPASPERQPEAACSCGSLLERR


SPEQ LVLTLLEAE PPNVLVSRPSAPF DHLVTVLTATEANTH CY $\square E \square S P V H P S G \square Q G N$
$H \square Y D \square S H Y P A C T D F Q$
NALVRAYSQSDPREDDYSQFSAVETG
QNLSPNRSGVGFSQQSCMCHKRRT RRCPCGSRRR

STLS PEQLVLTLLEAE
PPNVLVSRPSMPF ATSPTEESTQKLTVSHVKGYECQP $\quad$ HRQEQGFSHEPNDE $A$ L V RA HVDSNPSMSGLDYSRFQANPDYQMT

LVQT LLGAHTRMFDQFVKFRPPAY LFVHHRPFP WWDRSYFAQRLRP $E \square E L L T Q S V L A S H R E T C Q L R A E E \square Q L R R G E T W P R V R P$ EPHANTGSRSDSSF $\square$ MPQFMSPN
EPGQSSLSYTSMPHRCNCEQRRT E $\square$ EHLVQNVCKSYQETCQLRLEDLQFSREEVASYQRK

YAMPDPTVPD

## Y D NTQPD ADQMPAAPEEQPRAPLWDASSGVQRP  MPTEHAQF

ETHSALEAPEAQPRTPWWGPLCGAQRP DLEHDTQS IVKSHLETCQYSAEWGQYSTEETRAYQNK E $\downarrow \mathrm{Y}$ AL $\square Q K V V N A H D V T S S K M T T T A H \square K \square K Q D S Q Q M H S$
SKEQKELVQTLLEAHARHMSTMRPLPHLFTHHQHLPDSL E QLVNC L LEAEP
 AEKED LIDQLVAAETLCQQNTSSLAPYDCGKVKWNYED CQEAEKSSKRE
T QEEHH $\square$ MST $\square V$ TAYQKFM $\square$ P $\square$ GETST LLQEFSNPERRG PETQPAAPWWDPPCGAQRR E LDR R $\square$ A Q N $\square$ I K SH LIE T CQYTAE WQTHSYEEVKMYQSK
$K \square C K E P H D C G Q P D$ E TERLVRDVCQSFRQTCQFRDDHDQFSREEVAGYQRK AELEHLAQNISKSHLETCQYLREWQTF LQQEEIENYQNK RCSSNSMDFDPSTTAASSNTRNT $W N Q L I Q G G T P C N S Q R R$

PDPNDPD SSEQKELDHRLVYFQDQYEAPSEKDT $\square$ NNQNMDEYDEEK MNRPCKPF E LLAKT $\square$ GDAHSRTCLFSGEHKPQD $\square$ SKVHYYKNM

TPVPEEQPRAPWWD DCGAHQP QREPGEDQVRAR UVGCLQEPAKGRP $A H M P S G T Y V I E G M Q L N K D G P P$ QE $\square T$
 SPSQEQLVPPLDNLLLSTEPDVVYAGH R L $S N L T D A N V E I E G P L L S$ DAH $D A F R \square T M P S P M$


UniRef90 Q90Z62
UniRef90-G1SCF9 UniRef90_G1SCF9
UniRef90_UPIO000DA85F7 UniRef90-E3UBG5 UniRef90 A0A026X3H2 UniRef90-X1YIN1 UniRef90_Q27547 UniRef90-Q6IVK1 UniRef90_V8NCZ2 UniRef90-G1TXC3 UniRef90_UPI0003C4B904 UniRef90-G5BCZ8 UniRef90-H2SC05 UniRef90-Q4H2X6 UniRef90-H2RT41 UniRef90-Q587L7 UniRef90-W5LNX8 UniRef90_UPIO00203AC06 UniRef90_UPI000359AD9F UniRef90-G1MA81 UniRef90-D3ZQD5 UniRef90_UPI0003EA80FF UniRef90-UPI0003F06514 UniRef90-W5MEX3 UniRef90_V9M9E3 UniRef90-A5A0Y5 UniRef90-C1LEJ9 UniRef90_UPI00042AA886 UniRef90-F7IGQ8 UniRef90-UPIOO03504361 UniRef90-B4MFS5 UniRef90-H3ANH6 UniRef90-H2UA06 UniRef90_UPIO00443458A UniRef90-A6N8S1 UniRef90-R7VEQ9
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UniRef90-W5LHU6
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UniRef90_Q1XE67
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UniRef90_Q4RXZZ3
 VALKSPQVVCEAASAGLLKTLRFVKYLPCFQVLPLDQQLV QR GSLRSPQVTCKAASTVLMKTLRFVKNVPCFRELPEDDQLL QRIWLWWQQFATRVTPSVQRVVEFAKRMPGFCELSQDDQLI

 WW

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\mathrm{L} \mathrm{~S}
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$\qquad$

T EASMMMS TT NLMGDEN K SDFQARVVNGICELTEFAKRLPNFHDI SLQDQVI SVDEMWQHCALRLTDAVQYVVEFAKHIPGFRMLTQNDQIAA
 V CLRTPQVTCQAASDVLVKTVSFMKNLPSFQLLPWEDQLL VALRSPQVACKAASAVLVKTLRFVQNVPCFQELPDEEQLL
 AELDRFFQRCQVRSVEAVREVTEFAKSIPGFINLDLDDQVT

 VVLKNPQVVCEAASAGLDKTLRFVKYLPCFQVLPDDQQLV PPEEMWQRCACRLTEAI QRIVVEFAKRLRGFMELCQNDQIV
 VCLKKPSEVCKKATAVLVKTVQFMKNLPAFNQMPPNDQFS YT NLP HLADLLTTYMI QDUI RFSKSLEDFRSLSSMEDQUIS GRREMIKHMDPCIEKAI KRFI AFAKALPGFKELPIDDQUA ESVQWQVMRIVDWALMUPSFSD DPDEDQS R
TSTSLLTSLNELGERQLVRVVKWAKVLPGFRNQHVRYQKMS LA LIKNPQVVCEAASAGLLKTLRFVKYLPCFQDLDLDQQLV
 TTWRIMSTLNMLGGRQVVAAVKWAKAI PFPGAADNMYETAARLLEIVVKWARNI P

 SAEWMWQQCAHHITNAI QYVVEFAKRI ERTNAWSHFTDVLTPSVVNVVQFSKNLIP
 PMDPFDMHYADVNTFMVQQII KFTKDLPFFRSLPFRDQA\| SCRFSRQCVVDKDKRNQCRYCRLRKCFRAGMKKEDVAAVA TEASMMMSLTNLADRELVLMISWAKKIPGFVELCLSDQVH
 KAFTTLPHITTDLSTYMMQNVI NYAKILKKPFRALTIEDQDS
 $V A D S S P Q V V C E A A A A G L L K T L R F V K Y L P C F Q V L P D D Q Q L V$
 TAEHLLSTLNRLAGKQMIQVVKWAKILPGFRNLPLEDQIT TTDHLLTSLNQLAGKQMIRVVKWAKVLPGFRSLPI EDQIT
 TVWEMWQCCAWRLTEALQSVVEFAKGLPGFMDLCQHDQUV

 $V \operatorname{V} V F$ YRCQCTTVETVRELELTEFAKSIPGFVDLFLNDQVTT
$S D Y K A V C V L S D L A D R E V G A D G W A K Q \prod P G F T D L S D N D Q M H$
 T EASMMMSLTKLADKELVHMI A WAKKIVPGFDELSDYDQVIR VALKNPEYVYEAATRLLGLVDWAQS QAFRCLENSDQLV DQPAPFSLLLCRMADQTFISUVDWARRCMVFKELEVADQMT


VRLCSPHRTCREALDVLAKTVAFLRNLPSFGRLPPEDQRR VQLCAPHRTCREALDVLAKTVAFLRNLPSFCQLPPQDQRQ TSSSLLTSLNQLGERQLLSVVKWSKSLPGFRSLHDDDQDT
 AEDEMWGLWANTQVDSLFRCVEFARGIGGFNALEEADKMN QTFIS IVDWARRCMVFKELEVADQMT
 MSKMVWQKFVA QMVPEI TKAVKFVNRLPGFQA PKEDQMN


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UniRef90-Q27547 UniRef90-Q27547
UniRef90-Q6IVK1 UniRef90_V8NCZ2 UniRef90_G1TXC3 UniRef90_UPI0003C4B904 UniRef90_G5BCZ8 UniRef90_H2SC05 UniRef90_Q4H2X6 UniRef90_H2RT41 UniRef90-Q587L7
UniRef90-W5LNX8 UniRef90_UPI000203AC06 UniRef90_UPI000359AD9F UniRef90_G1MA81 UniRef90-D3ZQD5 UniRef90_UPI0003EA80FF UniRef90_UPI0003F06514 UniRef90_W5MEX3 UniRef90_V9M9E3 UniRef90_A5A0Y5 UniRef90_C1LEJ9 UniRef90_UPI00042AA886 UniRef90_F7IGQ8 UniRef90_UPI0003504361 UniRef90_B4MFS5 UniRef90-H3ANH6 UniRef90-H2UA06 UniRef90_UPI000443458A UniRef90_A6N8S1 UniRef90_R7VEQ9 UniRef90_UPI000359F65C UniRef90_F1L759
UniRef90-M7BEE2
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## 元

R P F S E DME PKF E F A VK F N A|L|E|L|D D S D L A L F VA A I I L C G D R

 M Y E P D F V S A L M Q VT S S L N A HQLLT DTEEL GLLFSAAVLLLSER











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 S L L M A D $\square R G L$ R DVV S R FQE AQV D P T E Y A C L K A I V L F K S D A

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 K A S PLK S LLDSLHDLVKQL HLYCLNTFIQVEFPEMMSEV RLPALRLLNAALTEELFFAGLIGNVQDDSMIPYVL ILPEMAR NQLHAQQLASLRQEHSSEDPSNYTELF

 RLLPALRISAAVTEELFFAGLIGNVQUDSUIPYILK

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PPRSHCLCRQHRP T Y V E A NVGLNPS

ETHS VVPKCMPQWVPTMDS LLKADEPDYSGYDSTDPD Q $\square$ SELLSK K $\square$ ADAHARTCFYTLDQUHDGMYRTAMYKTM

SAEVSEMLSRDSDAYTRTCESFRKAPTQDDAK LDFYKDM LVVEL LDCDPDEVVVQNKIVAHLQQEQSGRARA SAENEELIDNLYSAYSQIFQEALKFKKYRKSPPENGQDQ SRPES ILYQLLSKQHQNDTQWUDHYSYTPCSCPCVDNRR

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\text { PDEEYMDNEVVGAYRQS } \square E
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 HFPFKSSSPEGT VS I A S E L P K D SDKQKELVRTLLGAHTRMFDQFVQFRPPAHLFYDYDVSS TSSLAPYDCGKVKWNYED SMETRELINR TV T DDQQFATPSTDTLMK $\square$ SERS

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HDHCQPD

PRMP QLVMEF LR CDPDELQLQSK $\square$ T A R LVQE QTVWEKH
C S C GTQRR
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$P Q S H P L V Q Q L V A A E E L T P L T T P M L$ LDEEYKV
$\square Y E T \square L T \square S Q A Y Q N F S P Y T D E K \square K V M R C R P D T \square S N V$ MQS LRET I I K QT DVPLLTKNQLCGTNDA

CPCEGNQK


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TTSEWELIR\ATEAHRHTNAQGSSWKQKRKF LPDDDGDK PETSELISRIT STSQQAALIDREAMASLSMQSS

YDNSQPD QGEDGS $\square W N Y K P P A D N S G K$ LDETVAAQQPCSCATRRKLL $\square M Q N V V G A Y R E T C K Q A M R W E T F T P A E \square Q S F Q Q K$ QHQELIKA $\square$ LIEWGQN $\square$ ESERKHA $\square$ AMWEDTEAC VS LDE DNVIISALVHCEPEPLLAM TNGSSSPSLD SSANEDMPVEKVLEAEDAVEPKTE TYVEASVGLNPS IKKHLRSEQHLHAADGKETHGSTGLCGLPLE L WNYKPPANNSGK YSGYDNTQPD SQMKTEQLILSTHEAQKKTLWDWGTLQCRSYNLLSQVSDN


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 SPA S L LT S L N E L G E R QL VTVVVRWAKA I P GF R D L H V D D QM S

 SPNDPVTNDCQAADKQLFTLVEWAKRIPHFCQLPPQDQRW
 N N L T A DA R R L L K M S K K I S A F K N M C Q E D QL A



 VILLKNPEVTCMRASEVLLKTVTFIRNLPSFCDLPQED QLV



 $P$ V P P L L T H FA E $\square$ N T F M V Q Q II K F T K D L P L


 E N V Q E A S T RLL L F LAAI K WA K NL P S F A S L S L R D Q L K
 V SAAALLTSLELGGERQLVKVVKWAKGLPGFRNLHVDD QMT PESDCEQAARDLFFNVHWTRDLVTGANLTLDDQLM



 $G R T A T @ R D I Y A S I H G$
$V V L R T P E V T C L R A S E$ QDTVDA R SLLMK F I T F A AK C L
 AP H LLLLT S L N R L C E KQ L M W I V K WS K S L P GFRNL H DN D QMT







 T LQ E K QLR Y V E H GN K F V E RY I S F C R T L H G F N S L H V E D Q I N SHYTTVSVLSELVDRELVATISWAKQIPGFTDLTLDDQMR
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 $T Q G E L F A L L C R L A D E L L F R Q \| A W$

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 L L R A GWN ELLI ASS SHRSIAAVK D GVL LAAT GLVHVHRNSAHS LI KHGSFEAACVVHSAFIDGDRNSMFLCNQATMDQLKASF
 LL KA GSF ELLAVL RMSRHYDLHRDCVYYA DALDPADAFY T QD

 LL H NCWS E L LV L D H DF RQVQUH GQQV T GQEVAALS F ILSQAE
 LL L R A H A GE HLL L GATKRSMMYK DVLLLDGNGS VVLRNS PEV LLE EA WSE LFLLLCSAQWALHSDGSRAFQGAAAAAAASP CP
 L M K A C W WN E L F F A L G L A A Q C S N V V M N V L LLKACTI

L LK GAAVEMCHI ALNT TFCLQT QNFLCGPLHYADEDGAHG L L K G GAAS I VLGVAYRS IMMDDTVCLANDTLLPKEHAT Q LLQTCKTEVLVLGRTSRCYDVFDEKVVLGNEEKQWRYDREQ L L Q E S WKE L FL L H L A Q WS V P WDLS AV L G CP QARDR DP N D $L L K S S A D E V I M L R S N Q S F I M D D M S W T C G S P D Y K Y R D S D K A$ LI KNNMFEMVLVHSSHLVERNEFVVMGDPHLILPMELLKM L L K E N WCD L FL L SVF QWSLPMDKCPLLNT LQTDPS S

 LLSSALLELFVLRVCQRSSPHQGSVLVAKDILLNPEHSFN $M$ Q H A WMMVFAL GWRS YKNVNARMLVFAPDLVVFNDQRMHD L L E D A WR E L F VL G DA QWA DPVNTMLADVS GMNS DNTDS QK L L L E A S WR E L F L L A TA Q L M P T L D P T P R F R E T L A S F H G M N L D


 $L L S S T W Q E L I D L S C L T D Y S G Q \square F G D T A K Y T P S D D E L Q G F S$ L L K G GC DEMMMVLRSTMTYDGQRNQWHCQEQF GRDGTVDVLK LI KA A F FEVWLV QASRLISTNDRKDTVADGKQUTK QELDF L L K N Y A S Q HI I L GVVSYRSK D N N D S C I PR R C G D H N S T E Y L E N
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 $L L Q Q C W S E L L V L D H D Y R Q V H H G K G V T G Q E V E Q S A D A A Q A G$


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 L V R N S WA P L L V L G MV V D E T Q Q P S L L H M Q LTH S K ER QQER T

 L L Q T T WA E L L SLLA L A Y R S CHPPVVRLMFAS D LIVVDERQA S E L L $\begin{aligned} & R A \\ & K\end{aligned}$


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D $\square$ SRVGTR $\square M D E \square V T P \square N E V Q \square D D T E F A C L K A D I F F D P N A$ D TNCVVGRTLAELVNPMRRDDMDLVEYVALKALLFFNPVV YREFPLADLLEDEAHALSKMQLHQAEYVLLTA A ADGSDRP
 DVNHVLLRYLNDLEFRIRSYGLDHGEFACLKAMVMLFRPDG DVNHVLLRVLDELVEPMRELNPDDTEYACUKALLFFNQNI SFGDWLN
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 LAKGDVYRSHEAFISTFCARWRTDESVILLSALLLFAPHR YYFRDCERGMDQLVAPMKFLKI DDVEFAVALKACVLFNPNA LTDTEKGEKMKNSLEMFWNLDLCAKEYAYLKGDILENPELL NYDVIFDRMLHELTYKLKDLQVDRTELGLLRTVVLENPDD KPFSEGMEPKFEFAVKFNALELDDSDLALFVAAIILCGDR TFPSGNAFFNHAFSNAERVLQQQDQHLGLMAALIVLNADD
 A TLNNLVVRAQELAAKLQSLQVDREEFVCFKFLILFSPEV YRIPGFDRDINELTVRLKDLDVDRMETAALRCAI LYNPSV AKGNIJYEELKKVGTFDERWRMDENDIAIMCADVLFTPTR
 SRMYS
$G F G D W I$

MDTSMYSDHVKFVMSLNQLTKANKT LLTLLFVIERFSSDR GMVTREVHAFQEVLNQLCHLNDDSTEYECLRAGSLFRKSP YCMAPFADFVFELAQRLAEVAPDPAEM LLMEAVIAFSER a GLlGELGAALLQLVRRLQALRLEREEYVLKALALANSDS DSKGATRRKGQEVTVRLRTLNLSTHEFAGLEAVVLFKPDT ARGNVYEEHKRFI NAFRPEWRIDENDMLLLSAITLFTPER SPDYDLCLAMQHIPQEFENLQVTKEEFLCMKTLLLDNTDP
 LGGCNDLISAMFDLCHSLCALNLSEHEMAFFSSMVLLDPS KELIDYLNRIQDYITEMENIEVNDVEYAYLKILISLENTD GIPTTSDDQFFELI KKLHSLQLDDNESCLKF KMVFRD CRAEELFLHTAHLVKRLEALSLSREEFLLALKALLLTNAD SDVGDLVLLALSKI ASQLMQMLLSMPERALLQQASILVASDR GFQQLLCEQMLKKFHYMLKKLQQLSKEEYLLCMKVLLLLSSTVP SAMYDLCLGMRQVSQEFLRLQLTYDEFLSMKVL CGUSLKEMMVDFAHKFKSLGUVTSEVGLFTALILLSADR VELMEMFDMLLAGSSRFRELKLQKEEYVCLKALILLNSSM SPDYDLCLAMQFDPQEFANLQVTREEFLCMKALILLNTVP


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UniRef90-Q9IAK1
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UniRef90_U4U3T1
UniRef90-H9GC11



#### Abstract

$P G L L N V K P \square E V L Q E N V L H S M E D H \square K M N H P D S Q Q \square F A K V L Q$ PGDHASCHTSHDOOEAHWALTPDACGLSDTAHGFGRLLL VEGRSORFDELRTSYKELDRASHYASQGRLARILL VEGLRSQRFDELRTSYDKELDRLASHHETTRTQRLFQLTQ PKLLKPHKMLILRERVMYALKLQLSTERPAESELFHSLLV SRLKDVRPVENLQDQAQMILAEYSSLGHQQNQTRFGRLLL PGLCASSHIGYLQKEAHQALCEVLEPWWPTGQD  PKTVHSDVIKLEQNSYYYLLRRYLESDYPGCRSUFDKLMQ  PRVVHSDVVKREQNSYYYLLRRYLESGYPGCESTFDKLI Q QALRGHGEVRRIYEAVLRALRRTHVSPLKGDVTVCDALVA DGI QDRAKVEGFQEKIVTSALEYTVQQTRPGNRVLLPKILN HGLKCCPYVQTLQQEAQRTLMEFISMMYDRNLSRFSWVLG  


RGLRDPLKTKCFRQEDHTNLQNYTNERQYDSKGRFGDLLL PGVTRREQIDHDQEVTALTLQSYIQQPRPGSRFLYAKLLG RECNDQTSVENARYACLRSLQRRCNQEDDSQDCRSGKLLL AGLCDVQPVEMLQDQAQCLLGDYVRMRYPRQPTRFGRLLM

 RGLKNLVQVEDLQDQAQQTGLOAKHTMNSSPARFGRLLL
SSGKNREMVDFLNRSLDALRDYTKCSYPDKPSRFAHLLL EGLKSQKYFDELRLTYINELDRLINQRKSNCAQRFYQLTR NRLRNPTAVARLRDSAQLALGQRLSSAN YGALRFGKMLL NQLEDHHFIESVQEQVEGALLEYTLCNSSHLLGRFAHLLL KGPSNPGEVELLREKVYASLESYCKHKYPEQQ
PGLHCVQY, QGLQQEAQQALNEHVRLIHREDQHRFAKLNV PGLQCVKYIEGLQWGTQQILSDHVKMTNQGYQNRFTELNN RGLSNISQLEQLNKRYWCVCQDYIESKYPLQPKRFPEIMM PRLVHRDVVKGEQNSYYYLLRRYLESVYPGCESTFLKLDQ KGLECVNDVALTRDRHLAALRMQLERNRPREATLIGQVRN PGLRFRHYVQTLQLEAQHTLMEFSSMMYNQNVGRFAWLGG CEELESAPLVESVQWKLIOCLQYLVEHFHPEEPRKFSQCLQ PGLMNVKEVEQSQDNLLQALDLHLQANHSDSAYLFPKLLQ PSLSDRKTVDDLRQRMLNAMKFGLEARQRDTEMGMKDVVE Le KLLENHHLLVESVQEQVNAALLDYTLCNYPQYVDKVGQLLL RRLHEVQAVQRHLEDVKRTLQSHDLRTYPNQURRADSALD SGLRNVSVVESLRDKVMVCLEDYCRQHHPAQTQRFAKLLD ARIDHSDVI RLEQNSYYYLLRRYLESVYPGCEAKFITKL Q
 PGLMNVHQVEKLQDSULQALNQHLQLNHPDGRFITFPRLLQ

PS $\square K N K E L V A K G Q E K F S T W L Q A Y$ LESDYPVNRQLYPKLLM PSASSTEKVAAMHNDARSALHNY LQRTHPSQPMRFQTLLG

PGLLDARRDEETQEDYMEALQQYDDVKRPRNSALIHRFLA VHIUEAEAVEQLREALLEALLEYEAGRAGPERRRAGRLLL KGTREKSKVEFFRDQSQVVLAQYENDVHPESPARFGKLLL DEGLKSQQFEEMRQNYURELTHQKEKGVVASSQRFYRLTK PGVGQCRLLDQLQEQFADTLKAYGECNRPRPAHQFGKIDA PWLQEKEKVESLHMKLDLSFRQLLRRTRRES NPSERQQLYKLQEKAVKELKQHLTKEC NDEHRDA TLLL ANVRGGEMLEKAQEKYIECLQAYCKVAYPDQPLMFARLMG DHLEDASSVHKLRDAVLQGLHDCVAAQRSSSASHSSQLLM
 KDGLKSQAVFEDRMSYIKELGKAIVKREENSSQNWQRF

PGLKYPQQTEPLQLQVIQALQSQVMHNHPNDRSVFPRLVT YMTESRTKLLRLLDAVTDALVWALSRTTQQQSARLAHLLM PGLLNVKPIERLQETVLHSLELQLKLNHPDSLQLFAKLLQ LEGLKSQAFDEMRQSYLRELTHQREKGMAGSSQLFYHLTK RGDEYQSLRNFRDSILTSLTDAIGILRPNTMILQQIQQLLL
RGLANASQLEQLNKRYWYVCQDFMEYKYPHQPSRFPDLMM


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$K M T D L R Q L V A H H V Q V M Q L M K T E \square D M C L H P L L Q E D M K$ RLPA L R A V PA S LI S QL F F M R L V G K T P I E T LI R D ML MASTLKNI SCSLLVDLFFRPI I GDVDIAAELLEDML

 AT P A L R A I P A S L V S R I F F R E T V


VIS N L R E L S VEHKR I LS S L K $\square$ S H P T D N Y E L F
 $K L L D S M P E M G G G G L L S F C F Y T G V N K V E F P E M L$
 KIS ELHRLNDEVVGVYLLNV NPSSVEPLLIDEIFD



 KLADLRSL

$T \prod P A L Q S \square T W Q M \square E Q \square Q F A K L F G V A K \square D C L L Q E M L$
L L A E L R S I N N A F GY Q I R R H I Q GLLAA MMP L L Q E I
$L L P S L Q A I A Q Q L V E D V Q L A R L F G L V N V D S L M E E L$

VLPMLREMNVAHRNLVSNFKMKMPGMFSDLHQEVFE L L P LL R T $\square$ S AEK K E RMFFMATFGNTS S DDQI ICKMYN $L L P P L Q A M S Q Q F V E D L Q L V T \square F G M C H F D K L L D E L L$
$R \square P T L R H V S S K M A T E C L F A K S F D N L A V P Q V M S F V M E$ LMD S L Q P V V K L H H W T F D L S LIPTKV S FP EMIA E I



ALS L LG S I N A S VI A E L F F R P II G T VN M D D ML L E ML T L F L L K F I D A N V I A E L F F F R P I I G T V S M D D M I L E ML

$P$ L E P L L M E $\square F D$
VI N QV T T V G D E V Q L C I R WY REN WRT R L A P L YA E TY D

 L L T D L R EVV S EQHQQR
RLP S L R S I GLA CYD S P C FMP P $\square$

A L H S L R T L GNA H R TMMLERFREED H L E F P D L Y A E L L F E L M D A I H D I V K K V S LIF CL S T F I Q M K V E FP E M M S E V


 $R M P A L R S L S H C A E$
 V T S T L K S I QP GLL L V DL F F R P VT G D T DI G S L L E D ML
 $L L G S V Q P \square D V N L V Q F L F G K A Q M V S V D F P E M M S E!$

I LT D L R R F C L E HVE
$T L P L L R Q T A G K V L A H F Y G V K L E G K V P M H K L F L E M L E$ $T M P A L K R V G T E N L E E L F F R R T L G K V Q I E K I L E R M$ $N$ L E D M R T L N E N QV S IL V DL L L D A M H D I V K K L $\quad$ N L F C L S T F D S VE FPE MMSEV





VVLDLRVLNGKYSEKLL

$R$ LSDVRQFSVIDNSKMLN
LLSHI R HLSNKGMEHLSSMKRKNVV
KMTDL
LMMDSMHE IVKK VNLYYCLS TY DQMK VEFPEMMSEV AS C S L R AV PA GLVTVDLFFRPVIGDAAMGQLLVEML C L P A L R QA D QVVVRKF WS D $\quad$ DH T Q N L V V P M N K L F L E MLE

SKEQEE L L S D TTEAYRS T L A A MPEMGPY SKEQEELVRTLLGAHSRMFNQFVQFRPPAHLFDHHQRPV

S P N Q E Q F $\square$ P Q L I S $\square \mathrm{L}$ Q G $\square E P E V V Y$ A G Y<br>DNT $\stackrel{E}{\mathrm{E}} \underset{\mathrm{P}}{\mathrm{P}} \underset{\mathrm{E}}{\mathrm{L}}$

DEQR LLATVVRAHDDTCDFTRDPT LACPDNPNPQPLT S PQEEDVATRVIRAFNQQHSSYTTQHGVCNVDPDC $\square P$

S QEEWDLIDRMVTEAHMSTNAQGNHWKQKRKFLSAPEGSK

L I K T LIAEAHANTNHK LE \VHDMFRTR $\square$ MYYKNM
PEQQEMI EKLVAMQKQCNKRSF DRPPWPQSQDPQNRE S P S E D Y $L$ L L Q T Q TAP D L D F E GP L L M T E

E Q MVLYY $\square$ H D A F K Q A L K E F E T $\begin{aligned} & \square \\ & \text { A E } \\ & \text { A C }\end{aligned}$
HDNNQPD
TRDEHWL $\square$ N N $\square V A A H Q K Y K \square P L E E T K K F \square Q E Y A N P E L S F$

Y D S S K P D
SSMSTDF

D Q MVS A LLDAEP

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| :--- |
| $P L L Y S E Y$ |
| $Y$ |

 S PGQD QLIPP LINNLLMS DEPDVIYAGH_YSGYDSTLPA
 S K E Q K E L VR T LLGA HARMFD QFVQFRPPA HLF $\square H H$ QR LP T REQKH V VDRMVEAHQQTCADVTSARPGGMDMPLSCQQV

## 

EQKVLISS LLLEAHTTMFDQFVQFKPPAHLFSHQRPRD
MHQSPF GFFAQNSFMNRSLPPT

E E H QL I K D $\square$ MA A H QK Y TSP L E E TKMF LQK YANPE LS F DMFEQKPN PSERTEMSYEP

LT REQRYTVDRMVEAHRLYRMEDGSHSRL P HLLSP FPFPLPT


LY R A Q D S S NFRAFEW
CASDHAPES
EDPLLDS LI IRAEAAT RELRMTVITKTAEARKQ




TAEDLQLVQELFRA NEPLKAPLDFQF

Y S GYDS T $\square$ P D

S PEDVKFLEN V V A Y WK A Y
P Y P T S R Y GQCMQP $R Q \mathrm{VP} F \mathrm{G}$ TEVTQNS
$P Q P R F T N L D$ PE $\square \mathrm{Y} \quad \mathrm{L} \quad \mathrm{K}$ D M K R P L
$\square$

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UniRef90- $54 V L M 8$

MPLTSHDLLYEGAARLLFMTVKWARGMPAFDTLPFSDQAT KEYQKASDLINHSEVVVRKLIMFVKHLEDFKHLTQEDQIA PELPLLTHFAEVNTFMVQQVIKFTKDVPDFRSLPMEDQI S CRLRKCYEVGMVKCGFVELSLLDQVR
HVFYRCQYTTVETVRELTEFAKSIPSFSNLAKNDQVT TEASMMTLFTDLATKEMVHEVSWAKK TPSALLTSLNQLCERQLLCVVKWSKSLPGFRSLHIDDQDT GQQELLQDFSKRFSPA, RGVVEFAKRIPGFSLLAQDDQVT SRAGGWEDFAREGNPLIQAIIEFAKS:DGFMNLPQETQUQ $P E V F N V H Y V C E S A S R L L F L S A Q W A R S: F A F Q L L R T E C H T S$
$T P H R L L S G L N N L G G Q Q M I S V V K W A K S L E G F R S L H L D D Q M T$ DVTDSMNQQLTLMVEWAKQLQEFQRLPLNTQVA VDDEAFSQFTKTAAEALFKSVNWIKKFEKFTKLPMSDQLI SQTRVTTESGYFEAYL $\downarrow$ RUKFAKRLPGFRSLCLEDCSA SQEELWLDCAEKLTAMIVQTI GWAKQIPGFTELTMLNDQMR
 K N RATLNDVLLKSMHS QLLLVIDEWAKTID EFTQLS GAD QAV DRQKRMEGLIDSMEKFDRGLVQFAKVKKGFRMGMRKEGEYY HRGNQMS TPAAPVT\|YTRYПPSVVKFПSTFAKKПPQF पDVSVADQRA TVQE WEDFSMSFTPAVREVVEFAKHIPGFRDLSQHDQVT SFAALLTSLNELGERQLVHVVKWAKALPGFRNLHVDDQMA WLWQQFATCMTPSVQRVVEFAKRIPGFGSLGQDDQLI

CRLRKCCQAGMVLGGFRNLHESDQFS TAENLLSTLNRLAGKQMIQVVKWAKVLPGFRNLPLEDQIT SQLSSMLPHLADLVSYSIQKVIGFAKMIPGFRDLAAEDQIV C E SAAQLLFMNVQWVRSIPAFTCLPGSDQLL GRMEMTKKAIEQTQHGIMKYISFARIIPGFEDLPTDDKMA TAEHLLSSLNRLAGKQMVRVVRWAKVLPGFRNLPLEDQIT SEASMMGLLTNLADRELVHMINWAKRVPGFVDLTLHDQVH K K T E FAKNDPGF Hi D T NQVT NFSQQFNLLVIIVEPMMQRVISFAFMIPKFIQLSLNDQVV

TSSRLMTTLNRLGGQQVISAVKWAKSLAGFRNLHLDDQMT TSSSLLTSLNQLGERQLLSVVKWSKSLPGFRNLHIDDQTT DSTATLNDVLKSMHSQLLLVIEWAKTLPEFTQLSGADQAI
 FEWQCGDGLLDVPTPQLQRLLQFARTVPGFDLLDFSDQMS DAIRESAAQLLFMNVNFLKSLTPFTQLPMADQLV QPSPTLRHFADINTFMVQQVIKFTKDLPLFRSLPMEDQIS
 YSVIDHVIRMDEQ\|LFSKVLWAKKTAAFRELSTDDQVK PVLPLLTHFAAVDTFMLQQDI KFAKALPGFRSLPMEDQIS SSYFNVHYVCESGSRGI FLTVWWRKVPAFMELSQRAQ1 T PPDMAAEHLKETAAEHLFKNVNWIKSVEAFQNLPDPDQLQ

CELAARLLFSAVEWARNIPFFPDLQITDQVA
 EKLCQLGDSIVYKLVQWTKRLPFYLELPVEVHTR DEWSYTEEESDLASPHI QRLLQFARTVPGFELLDFSDQSC


## PCPEEVEGपSDVVSPRपQRLLQFARTVPGFDLLDFSDQTS

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T TERVWSQMMRQFVSHTRMVVDFSKLTAGFNRLGПNDRRQ DDQYFLQLLAKTFDQELVVLI NWAKAIPGYTTLTLDQQVT TEANVMMSLTNLADKELVHMITWAKKIPGFVDLSLVDQVH



 $L$ F E E S WRE F F IL A AVA Q Y LIA P I N F S QLL I IA Y E Y L N N N R GE T $L$ L K G A A V

 $L$ L K G A A L L I Y A A A L N T T F C L E T Q H F L C G P L R Y R V E D A D H
 L L R LIS W S E LIF V L N A A Q S P L H M A P L L A A A A G F H A S P M S A D R V



 $L$ L

 $L$ L Q H S W S D K L V L D H L H H R $\$ I H N P D E T Q L N N G Q V F N L L S L G L
 $L$ L S H F S A Q H L V M C A A F R S V H L T D A V WL T N E T C L H K D S P K I


 $L$ L K C C W L E I L M L G L M WR S V D H P G K LI IF S P D F K L S R E E G Q C

 I M K G S C S E L L I L L R GVVM A F D P T K N T WN H N F S T G F K G M E V K V
 L L

 LI RAAMPIMLIELSRDFONSSLSYNYFDFPEREKEVIS


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MFSKGFVDACFNVSR LQQREQFSPEE QVLLKCLALTF VDP ACDCRAEDLFMHI DQLVLRDELMAHEEYLLDKALLLTNA D SFEMKLVACIFETAKSIAALLKLTETELALVQSLVLLWPER GLQLEFIN PI FEFSK GMNDLHLDEAE YVC
 VA F M E P $V$ V

 MGMGDLLNAMFDFSEKLNSLALTEEE


 S S FY S LCLLTMWQIPQEFVKLQVTHEEFLCMKVLLLLNTIP


 $M \square F P E A V D R C D E F A A S L Q R \square K L T Y E E V A V L K A I I I T T F R D R$



 MGMGDLLNAMFDFSEKLNSLALTEEELGLFTAVVLVSADR PFMNDQCEQMLKDCNEFVRLQVSYDE YLCMKVLLLLSTVP T F VVV F VI L T M W W I P Q E F V


MVE 1 D MLLAS SRFRMMNLQGEEFVCLKS I LEDAA QDR


 L K M G Q GS G L F E E H M R F V K S L A V D D T V L I L L L M I A L Y S P D R MGAGD LLLNSMF EFSEKLNALNLSDEEM YF DPGAQK DAEE LLLRMTK ITR KLDRDDRTELICLMMFSMF
 K K L S E H M A R L N S F Q Q S V S S M D Q I R SLDNCHNQSVNRSVVI YSMETVCNE DCPPT T LIT GII


 Y K L E K E F R F M Q E V V E K L K Q M Q I D P A E Y S CLi R G V V L F R P C F
VS D A K C A Q M DR A VA F K L A R L G $\quad$ DD Q T E VA L M A A I L LM S P D R CRSNRDCQDDQHHRNQCQYCRLKK CFRVGMRKEDA ESSEDLFAPVLNFFHSMVALRVTEAEYTLLTATALLCSDH


 NFGFASE ELENCLLRSMDKMQFNEMETAFIVMVIVIFSEDRG
 RIVVSS EM Q VF R D V I H Q F H L L K L D N D E Y E C L R E I M L F K K P A V EIMME I F D MLLLAA A TS R F R ELL K L Q R E E Y V C L K A MI L L N S S E LT S S R L F QMHL D F IS C I R QMSVVDEP T IMLLLILIVLIFTPER




SDEARRLRELLLARCAILRIDHSEYACLKAIVLFKGES VAFMD H DR DG QE QV E K L K ALLHVD S A E Y S CLLKA I


 VQFVVE IG DMLVAA T S RVRELGK LQRE E YVCLKAM

UniRef90 BoLSR8 UniRef90_UP10002653983 UniRef90-UPIO003593AB3 UniRef90_UPIo00343FFFF UniRef90-D4AEI3 UniRef90-Q9GLG8 UniRef90-K0J1D1 UniRef90- M7BG00 UniRef90-UPI0002659B31 UniRef90_UPIO0046C981D UniRef90-P41828
UniRef90 F7APJ4 UniRef90-F6MZ73 UniRef90-A0A016TG26 UniRef90-T1H0Q4 UniRef90- Q90Y27 UniRef90-UPIO003594A98 UniRef90-E3W3U3 UniRef90-Q16ES5 UniRef90-A1L1Z8 UniRefoto-H2ZB477 UniRef90-A8XK15 UniRef90 UPIO0042C6BE4 UniRef90-UPIO003597F37 UniRef90_UPIOOO3F16592 UniRef90-UPIO00359C081 UniRef90-UPIO003C00561 UniRef90_DOVY31 UniRef90_U4U0Z6 UniRef90-L5K3N4 UniRef90-I1TE85 UniRef90_UPIoo038BC800 UniRef90-D2H5J3 UniRef90-UPI0003833858 UniRef90-D6WA89 UniRef90-Q16ZW7 UniRef90-K1PTK4 UniRef90-H3AQM4 UniRef90-H0Y4W6 UniRef90-UPI000393CEFE UniRef90-A9QDP7 UniRef90-T1E1D3 UniRef90-F1RXC3 UniRef90-H2RAN8 UniRef90-H2WII1 UniRef90-F6R2HO UniRef90-UPIOOO3841365 UniRef90_V5GWJo UniRef90-UPI0004446B06 UniRef90 Q7PNK6 UniRef90-UPI000273FE7D UniRef90-UPIO00359EA23 UniRet90_V8N926 UniRef90-E4WTS5 UniRef90-UPIoo034F9370 UniRef90-T1PJD5 UniRef90-A0AO3 UniRef90_UPIOOO3F1A273 UniRef90-H3FPK3 UniRef90-EOVGZ2 UniRef90-G6CV63 UniRef90-H2T759 UniRef90-T1GOR5 UniRef90-UPIO0022F58ED UniRef90-H2KR84 UniRef90-H2NXZ7 UniRef90 I3JRZ0 UniRef90-B3MBR9 UniRef90-D7GLE4 UniRef90-GOPEL7 UniRef90-E4XUR6 UniRef90-G7YBR1 UniRef90-D7R867 UniRef90-A1XKQ4 UniRef90-E9GKY7 UniRef90 U6NW69 UniRef90-UPIOOO2247183 UniRef90-B5AJU2 UniRef90 K7J7K7 UniRef90-F4WVF5 UniRef90-F6MDW5 UniRet90_A0A034WJX4 UniRef90-U6HN58 UniRef90-F2DVH2
UniRet90
S4VLM8

170
180
190
200
QDLEQAEKVIVLQEPLLEALKTYVRRRRPHKPHMFPKMLM
 FNVTGRE
HP PKPRS
YPAESSRKLTHLLNAVTDALVWVIAKSSQQQSVRDANLLM $P G L I N V P Q V E A Z Q T I L R A L E F H L Q A N H P Y A Q Y L F P K L L Q$
 LLEGLRRSQQFDEMRASYVVREVVKARQKGVVASSQRFYQLVTM TVGENSTLVYKMRESDSQSLQDCLLTLSPSTNNAAPRMAQ PGLAQQQQQHHWPMDC
SSHGDGTATDATAETLKNALYQSVMPRDGCMEDTDHRTQD VNQLHRTQLQRFQSRATTELREHEMRTYPEDPDRMSLLLL TDGLKSQVFDEDRTSYDKELGRAVVKKE GS SSQNWHRLTK KGAEDSFQIDETRQKVLESFERHVRHTSPDSPRRFSNLLL NENDSPERVRALYEEAKINLINYIQLTYPSQPLRYQTUMK

SKLKN PEAVDG TQKLILSCLKKRSYRKNYPDQSSLVGNAMA


VNQVHRTQ QQRFQSRA DTEDREHEVRNYPEDPDRTSLLLLD PGLSPPACVLSARRKFFAAFEKYVKVNKPLETTRVGDLFF CGLSDPAHVESLQEKAQVALTEYVRAQYPSQPQRFGRLLL DSEPQDSALEREVVWQLVQTLVYLLEKRMKKPMAQFARILD $E G L S S V R Y L E N L E T D L A M A L K C Q L I L N H S E Q P S I F F Q I I D$
VDGLKNQKFFELRMNYTKELDRCKRKNPTSCSRRFYQLTK PGVTDDKS IEHHKDKLI EALKVQVR
PCLKNKQHVENLQEPULQULYKYSK YYHPEDDQHFARLIG
 KDGGLKSQAFEEMRTNY I KELLRKMVTKCPNNSGQSWQRFLT STLIPYGHV
KTTTESAKISSVQDDAQMRLNKHVTTTYPKQPLRFGKDLL SNLYSSHEI LLLQDQT\SLLHEKCGGVRLGHLLLLLPCIVK APLQNPEKVETIQWKLVQCLKYLIAKFHKDEPHRFSAYMD KDGLKSQAFEEMRSNYIKELRRAVAKSTSNSGQSWQRFLDT SHVEAKKRILNLHPKI
EEPESNRKLHHLDNVVTEALVWVIAKPSQQQTTRDANLLM PGLVNASLVERLQESIVQALQLHLVANHRDNAFLFPKLLSQ


 Y TFEEKDHI HRVLDKLI DTLLDHLMAKTGQQQHRRLAQLLL
 ASLQAVSGVEKMQELILDLLSRVCGAQTGRGPQRFGRLLGG DAETSUATVRALLEESAKEALAASYISTCRPGPSNRYRTLLGQ PGVTQREEIDQLQEEMALTLQSYIKGQQPKPRNRSP $P Q V T D K H Y V A E E Q E R Y A L L L L R Y L E S K H P P H R W M Y P K L L M$


KGLSPVKQTE\|LREKAQDLLFHVAGQSQMGSPSRFGNLLM GGSNELEAI QQDRYMMCLKSFVEHSFPQQPARFHELLL APDFLSHKLHQLQSSVVRSLRAACSSDDERA ACLLL APDQAAHCVEKLQEVVLDLLSRACRAPGGAAPQRFGRLLG SQNNRDNDNDDAQDQAQLSL NKY VETTRPNDPLRFGKLLL
 CGLSDPAHVESLQEKAQVALTEYVRAQYPSQPQRFGRLLL ASGQAASCVEKMQELILDLLSRLCAGAARGGAQRFGRLLGG RGIVNRKTVSDGHDNVQAAMLDYTLTCYPSVTEKFRRLVI

 EEPESNRKLHHLLNVVTDALVWVIAKPSQQQTTRQANLLMM NVINHQDHILQLYEEANCAFPKYIKSAHGTHLTKLGSIMR F HRHQ
AGLIHTDWDEKFQSYYTSLLEHY LDNWRFGKAKF DFGKMLT HLPKPRAFCCTTSAQULSSL HNLRDTHRDRDQQYMYYGVLRRVVECEYTGGEQDYEALVR SDTVNLEHI QERYMCCLRSFVEHSAPSQPSRFHDLLV

RGLCDAARVTALQEQTVSVLSDRGAGR】GHLLLLLPPARA
A DLVARESTAKTQEQY LLLLERYCNWKYGPADRTFANLLAA SELHEPVKVRECQEKALQALQAYTDAHYPDTPSKFGELLL



K\|I ${ }^{-1}$
LL P SVRSVRSK
RLC D L K VLSS E E HAK L LL

QVN P VDVE P L MLE VLN
LLSHVRHDSNKGMEHLLSMKCKNVVPVYDLLLEMLN KMAD
 L M D S M H

## $L L L L L P L L R H L I R Q F W Q R M R S E R N A T L N K L L C E M L E$

VETRDRQTARDHQEALQNFRMSDPTSLPALYKELF



$N \square T L A N P \square K Q A E R \square N Y Q S H V M K T Y V N P G I K E M V K$ $\frac{L}{K} L P L D L R E L A E \square R R F W N S V R H E G K V T M N K L F \square E M L E$
$S L P S L R S L N S S \prod T E E \prod F F A G L D G N V Q \prod D S \| P Y \prod L K$
LLTPLSVLSKSI SEDI MFTKVSGVARI DVLMEEL
RL PAL R AVPASLIDS QLFFMRLVGKTPI ETLI R DML



F LD S VQP $\square$ ARELDQFTFD L
RLTELRTLSHNHSEGLSYSSLV
SASMLQQT PPT LDTELFFRPLI GQA

KLLD SMH
 SAANPK ILQEMLFRKTVGEVA』ERLLGDLMK
KLIFMRELT
KLLDSMHNLRNGLTLLC
LLSHVRQASNKGMEHLLSMKCKNVVPVYDLLLEMLN KLADLREL
 KL PDLRTLNNMHSEKLLSFRV
$K$ L D S M Q
LL DNLHDLVKQL HLYCLNTF ISVEEPEMMSEV
I L T PLSVLAKSVSEDIMFTKVSGVARDDVLMEEL
ILSSHIRHMSNKGMEHLYSMKCKNVVPLYDLLLEMLD
LLADLRSDHDAFWYQI QN DQGLSTMMPLLQE I
MLP SLKLISTRGEEYLGFYKHMSGSAPSQTLLMEMLH
RLTELRTLHHNYL
$L L P A L R N V S S Y T U E E L F F R R N \square G P A P L L K L L L D F Y$
K $\square$ T D $\square R N \square N E E H S Q V L L K K D P D G \square Q P \square M K E V L D$ AFRETST $\square$ AH $\square$ G $\square$ D WFREKK $\square$ YGM $\square$ PSSF $\square L S E V L D$
$N L L P L S A L E S E A D E E L F F S N L V G Q V Q D D N M L P Y \square$

LLPTVASLSNTMSENMQFCQTFGSASGDPLLREMF RLPEI QSAASLLLESKMFY
QLPVLRTFSGSFI EDVFFVGFVGDVS $\square D D V I P C L L N$ RLTELRTLHHNYL


$R L P A L R A V P A S L I S Q L F F M R L V G K T P \square E T L I R D M L$



QLSTIRRLSTKFRPYLETIISQCSDFLPPMLSELVN
VTSLLTRMNE EHRAVVKTLKRDRPSKFPDLYVQMFE
LLSHVRHASNKGMEHLLS M
TVTEMKNVSTFT $\square E E V F F R Q T \square G H \square P \square \square R L I S D M$
K LS D $\square R E \square S D T H$
 RLPEVQSAAALLLESKMFY

L
CRR $\square$ LQELLFKPTVGDVSVERLLDDMDN
$K M S D L R E D S D L H S D H Q V R F A N Q D \quad \square H K L Y Q E L$
R\PDLQKTCQLGKEMLTQKSRQGGD LFNLLMELL





