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ETKGGTVKAASGFNATEDAQVLRKAMKG $\square^{30}$
40 RGTITDAANFDALRDAEVLRKAMKGFGTDEQAA I ECL RGTIHTASNFNAQDDAEVLRRAMKGLGTDERALIDII

PQTQGTVRPASNFNAEEDAKVLRKAMKGFGTDEKAlIDVL


## YRGS $\square K$ DFPGADPLKDVEVLRKAMKGFGTDENA】IELL

GTVKPYDKFNAEQDAEVLRGAMKGLGTDEDATTNTL YQGTIKATTYFNAEEDSQKLRKAMKGLGTDEDTI IDIL PVYQGTIKPTPGFNAEADAATLRKAMKGFGTDEQAI I DVV ATQGTVKPAANFNPQTDAEILRKAMKGFGTDEQAII DVV


PTVVAAPDFDPRADAE $\mathrm{LL}_{\mathrm{L}} \mathrm{R}$ KAMKGFGTDEKALIQVL RGTVKEQSGFNALKDAETLRKAMKGFGTDEKAI I DVL GTVTEFPNFDAKKDSEVLRKAMKGFGTDEKSII AVV HGTVTPHPNFNAENDAKVLRKAMKGIGTDEKSII DVI RGTVRGASHFDAGEDAQKLRKAMKGLGTDEDAA I DIL RGTVTAFSPFDARADAEALRKAMKGMGTDEETLKLL PPTPTVRPANPFDARQDAELLRKAMKGFGTDEKAATVNVL
 V RPYASFDAETDAK ILRKAMKGDGTDEKAIVDVL
QMKGTVRDAVGFQPEVDVKALRKAMKGFGTDEDTAIVDIV
QQS RGTVTDFPGFDERADAETLRKAMKGDGTDEES R R A

SRGTVKDFPGFSAGRDADAVRKALKGLGTDEESLINIL
GTLKPAANFDCNADCQRLRKAMKGLGTDENA I IDVL RGTVRPYSDFDPASDAQALRKAMKGFGTDEDTIIEIV


H P T LF P A S NF NPENDCERLRNAMAGLGTNEQDLIDTM DAKEMKDADSGI GTDEKCLI EI L
SRGT\HDYPGFSASKDAEAIKTAVQGLGTDETSLINIL HPTIKLHHDFDAERDAKKIYKACKGLGTDEKAI I EI L SRGTIKDFPGFKANDDAEVLRKAMKGLGTDEEAZI KIL VQQDVQDLYEAGEKWGTDEAQFI Y I L
QQATPTVVAAQPFNPRADAEVLRKAMKGFGTDEKADISVL DAKVAAEILE $\square$ ADTSSSGDKTSLMTIL GTVVPAPNFSASGDAAVLDKADKVKGVDEKT1 D D L FDVKRDAKTHKACKGMGTDEAAC, K RGTVRPAAVFKVDDDVKVLRKAMKGLGTDEGAUI NVV $V$ VQDAKDLDEAGEKWGTDEAQFIYIL GTVRPANDFNPDADAKALRKDMKGAGTDEKADI EIL
 PTVYSADPFDPEQDASLLRAAMKGFGTDEQTVI DVL PTVNPANPFNPEDAAAKLRKAMKGLGTDEAAGIDVV

PTVFPVDSFDAKADATALKEAMKGFGCDEQLILD\|I

 QGT $\quad$ RPAANFDADRDAE LLRKAMKGFGKENKFDSFI F PTLRATPNFCVERDCERLKKAMA GLGANEKEEDIEVMM YRGS KROP YRGSVRPFVHFNAKHDAEFLHKAMKGIGTDEDAILMVL
 PTVYPADPFDPVEDAA ILRKAMKGFGTDEKA\|IEIL
GTVWPAADFNPGQDADA $\square$ RKAMKGFGTDEDT $\|$ VD $\|$ V
EQEGVSVKGSPHFNPDPDAETLYKAMKGПGTNEQADIDVL


RGTVVDFQDFNSKEDAENLHQAMQGAGTDEAS LLEL GSAVQTYPNFNPSSDAAALDKA 1 TAKGVDEATII DIL PSLRPY LAFNPNNDAETLRKAMKGLGCDKNKVI IVL RGTVKPQSGFDANKDAEVLFKAMKGL GTDEATVLQLL
PQTHGTCRPS SDFHPDDDAGVLRKAMKGLGTDEDAII QVL
 A YNPTLRPYPNFNPDQDCEKLRKAMKGVGTDEKACIVDVL
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SARTNAQRQEDKNRFKTMFGKDLISDLKSELGGHFESAJL
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AYRSNPQRQEDRKAFKTMFGKDLIEELKSELSGHYLDACK SHRSSPQRQQI LIDAYKSTDGRDLI DDLKSELSGNFETASV SRRTNEERQKI KTMFKTMYGKDVI KDLKSELSGNMEEVIL
 TSCSNAQRQQULLDYKTMFGRDLVKDFKSELGGKLEKIVL

ANRTNLQRQE $\square E \square Q F K T \square Y G K E L V K D L K S E T S G N F E K L L V$ TARSNKQRQEIALSFKTAYGKDLVKELKSEDSGNFELVVV SQRSNKQRQKI SREFKTMYGKDLIKEFKSEMSGKLLDVIL GHRSNKQRQEIVRMFKQAYGRDLIKDFKSEVSGNFEDLLC A HRNLAQRQEVKMTYKATDGRDLMNDDK SEELCGKFEKVVLL ARRTNAQRQEI EVQFKTLYGKDLI SDDLKSELTGNFENLIV TNRSNAQRQQLALQFKTLYGKDLVSDVKS EVVSGNFEDVLV AKRSNDQRQQUKATFQQATGKPLEAALKHALSGHFEHAVL TKRG\VQRLEIAETYKTLYGKDLINDLKSELSGKFEDFII
 TKRSNEQRDRI A LDEFKTLYGKDLISDIKSETSGKFEDLLI

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T K R G IVQRLE I IE A Y K T L Y G K D L I S NLK S E LGGK FEDVIV VSRSEIDMLDD REVFRTKYEKDLMADLKSELSGSGAKLIL

 P NKNKNQEQFLLLDNKF DYFF DLDKDLK SE LIS GNME ELI
 TARSNDQRQQUKAAYKKAYGKDLVSALKSELGGLFEALIV




THRNNAQRQE L LQTYKSHFGRNQMADLKSE $\square$ S G D L A R L I L
T K R S NA QRQQQA K S F K A Q F GK D L I E T L K S E L S GKF ER LII


TKRSNAQRQEDNLAYKTMLGKDLTDDLKSDLSGYFESILV TKRTNAQRQQIKAAYQQSKGKSLEEALRKALKSPDEDVVL

 GHRSSNA QRQE I K R I Y E VM F A R N L I K D L K S E L G G N L L K V V L
 A HRTADQRVQUVKKFKTAYGKDLIMELK SELDTGHFEDVIV






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E VVCDQLIDSDARADYEAGEGRKGKDCAMFDEDLATRS REYFATRLYKSMKGMGTADNTLI RIMVSRS EEDDVDKEDAGQDAKDLYDAGEGRWGTDEDAFNEVLAKRS EGEEDDLAQAHEDAKVVAESLKGDSTSLETRFLSILCTRS A GAVVGPPVPQRVQNPFWPGFLGDGATSPHTPLPABSRS KG F A DKLYKSMK GAGTDEKTLTRTMVSRS
 ENPDVDGEAADQDAERLLAAGEEQWGTDESTFNALLDTKS ESGRVDPNKAKEDARELLKAGELRRVGTDESMFNMILCQRN EGPP DPAQAQQDAQALLKAGEKKLGTDEAEFNRILCARS GTDKAASGFNATEDAQTLRKAMKGLGTDEDADIDSVAYRN ENPSDDETLARKDAEALLAAGQKKWGTDESVFNSILVTRS TQA HEDAKVVAETLK LADVSSNDSSDSDETRFLSILCTRS


ENQS $\$ NHQMAQEDAQRLYQAGEGRLGTDESCFNMDLATRS ESTFVDTNLARRDAEDLYRAGEQK GGTDESKFDHILVTRS EDDVVSEDLVEQDAQELFEAGEQKWGTDEAQFI YILGSRS EEVEED KI ENDAKDLYAAGEEKFGTDEEKFITILGNRS I QGYLA EVLYNSMKGAGTDDQTLI RVLVSRS P $\square G A T D A D K A K E Q A A Q L H E A G E G K L G T D E E V F Y R I L A H A S$ PRFYVDSEDALQDAQTLYAAGEK DQGTDE DQF DTILCKRS ENQGVDEAAA IADAQALHDAGEGQWGTDESTFNS L L DTRS EGEEDDARAQDDAKEMCDAGNADVASMETRFLTVLCTRS EDDVVSEDLVEQDAQDLYEAGEAQWGTDEAKFITILGNRS DS GYVDPGLALQDAQDLYAAGEK $\square C G T D E M K F I T I L C T R S$
TASFFAERLYRS
MKGMGTDDKTLIRIVVIRC
TASFFAERLYRS $\begin{array}{cc}M K G M G T D D K T & R\end{array}$
EGGA DSNQATQDAKDLIEAGENAWGTDEEKFIIILCSRS EDGRVNEELADNDARALYEAGEKRKGTDVATFINILTVRS

 EDSAVDLQKAEADAKKLYNAGEKRWGTDEAVFNSILALQS




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CARSTPAFFAERLHKA $\square$ KGAGTDEYT LTRDMDSRSGDDLL

 A D R D LA E Q DA K N L Y E A GE GRRWT E E LAAF NVI LAA K R NVVK QL R SVK N K P LGF F A D K L Y K S M








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 SVKOKPAFADKLYDSMKGLGTDRTLIRLMVSR $L T P A Q Y$ D A K QLLRKA VEGAGTDES VIATANN QE $\square A$



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


CALN R P A F F A E R L Y Y A M K GA G T D D S T L VR I V VTR S E I D L V

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D TRANFKRLYGKSLYSFTKGDTSGDYRKVLLILCG

 $\square V K Q E Y Q R A Y G K S L E D A U K G D T S G D Y R K V L L A L V$


D\RAEYKNPSGESLHSALKSDTSGDYEAALLKLCG RVFDKYMT DSGFQI EETI DRETSGNLEQLLLAVV
 NIRKEFKETHDASLHDFI QGDTSGDYRKTLLILCG ATFQAYEKLHGKDIEEAIQSETSGNDEKA YLTLV

EMCSAYQNAFKK
AVFSEYQRMCNRDTEKSTAREMSGDLESGMLAVV LI KREFYDLAGDSLESWI E GDTS GDYRSLLLALV
Q R QAFKSHF GRDLMADLKSEDSGDLARLIL GL
DI REEYKNLYGQSLYSDISSDTSGDYRRTLLKICG T I KERYQQLYKKSLGEAI KSDTSGDF CRLLLLAL L
 EVKREYQA LYGVSLADAUKDETSGDYKKCLLHLDG

Q TKEEYKKNYGKSDYMDDLDDTKGDYEKILLALCG EI LKAFKSHFGRDLMADLKSEMSGTDTKVILGLV E IVTKFQMKYEKSLADMVSSDTSGDFRKLLL ALL VFKEMHEKSLHHMI EKDTSGDYCKALLAILCG A $\square$ NE AYQQAYHKRLEDDLSSDTSGHFKR $\square$

STKEKFHQMYNKSLVETTESDTSGDFKKLLVALL
NI RREFDEKYDKSLHHVI ESDNSGDYLKALLAALCG DI K DA Y QK IY GQSLA GDI DDDCSGDYKRLLLTLLLG Di KVAFERLYGKSLKSWI K GDTSGHYKHALYALVG FI K DEF QKMYSKTLGSFIKKGDCSGYKKLLLALIGG
 NI RAEFVDLFDKSLHHMIEKDTS


Q $\ K$ Q $\square F A Q M Y Q K T L G T M \| A G D T S G D Y R R L L L A D V G$
 DI RESFRTKYQKSLYSMI QNDTSGEYKKALLKLCG DIRANFKKMYGQSLYTTIQEDTAGDYQKALLYLCG


AVFDEYTSHGKRNMADALKSEMHGHTDDALLS V NI KDHFDETYEETLQSTI IGDTGGDCQKALVNLCG



 D RVFQEFI KMTNYDVEHTI KKEMSGDVRDAFVAlV DI RAHFKRLYGKSLYSFIKGDTSGDYRKVLLILCG

UniRef90 U1NXZ1 UniRef90-R7U294 UniRef90-A0A016U0s9 UniRef90-UPI0002BCCCBE UniRef90 M7AP63 UniRef90-K7GEG4 UniRef90-D3TME1 UniRef90-H3BFB1 UniRef90 E1FYF7 UniRef90-Q17A51 UniRet90-H2RYZ9 UniRef90 G1MRM3 UniRef90-L9KT44 UniRef90-13K907 UniRef90-B5x865 UniRef90-V51963 UniRef90-K7G1W1 UniRef90 UPI000344176E UniRef90_C4WSW4 UniRef90-M3WET7 UniRef90-E3TDP7 UniRef90-E9C3C5 UniRef90-E9C3C5 UniRef90-M7A164 UniRef90-F1L7EO UniRef90-S7P3P2 UniRef90-H2MCN1 UniRef90-A9RZF7 UniRef90-V9KHW8 UniRef90-G3PY72 UniRef90-B4GV24 UniRef90-F2UBS2 UniRef90-UPI000333F7A1 UniRef90_E2C566 UniRef90-B5X1G1 UniRef90-C3XZV5 UniRef90 UPIooo2B4128B UniRef90-S9x158 UniRef90-UPI000333DE2A UniRef90 F6UFF0 UniRef90-G5ATS2 UniRef90-M7AVM4 UniRef90 V4A4D0 UniRef90-W1PTJ3 UniRet90_S9YFQ9 UniRet90 A0A059ADJ9 UniRef90-C5YL20 UniRef90-A7RWX3 UniRef90_A0A026W1F1 UniRef90 Q4S3X8 UniRef90-UPIO003C11A7D UniRef90-U6HFD5 UniRef90_V3Z2V8 UniRef90-Q6P2X5 UniRef90-E9H189 UniRef90-G3PZR4 UniRet90-H2XPD2 UniRef90 - V7C7F UniRet90-A9NNL2 UniRef90_M5X1U2
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UniRef90 - V7BV92 UniRef90-UPIO000D57116 UniRef90_F2U100 UniRef90-W9SEI5 UniRef90-HOXLG9 UniRef90_F7HZMO UniRet90_V7C5L5 UniRef90-W5KGM5 UniRef90 V4SW23 UniRef90_-F6HA14 UniRef90_U6H9S7 UniRef90-V9L181 UniRet90_G4MMH7 UniRef90-K1RH12 UniRef90-UPI000443DAD6 UniRef90_A0A016VLP9 UniRef90_H9JK49 UniRef90-G5E2M7 UniRef90_C6THM9

GTIIKAQAEFNAERAADSLLEKAMKGFGCDKNRLLIQVL GTLKPVDPFDCKSDCEDLRKAMKGLGTDEKAVIGVM
 EEDGSSLKGLLHFDPAPDAQVLYKAMKGLGTDEQAIIDIL


RGTI KDFPGFKASDDVQKLKAAMRGAGTDENAIAEIL HQFFGTIKPQ TPKPTVLPAEEFDASADAATLRAAMKGFGTDEQAIIDVL EPTFPTVVPARDFDPARDAARIDVADKTKGTDEQT: DIL

ERGTTKPKANFDADQDAAALKKADEGLGTNEKIV
 PTASATVKAYANFDADRDAKALETAGKGKGVDEDTVLNGL

PTVRPAADFDAEADAAVLRAAMKGFGTDEQADDDVL RGTMQDYPGFSPSVDAEALRKA RRGDGTDEETLISLL QQFFGT RRPQANFHAGETAENLKKAMKGFGCDKQKVVQEL EPRFPTVVPAVNFDPEKDASWIDTATKTKGVDEAIIIDIL TIVRYVRSAPDYFAEVLHEAMRGMGTNDDTLQRVI TIVRYVRSAPDYFAEVLHEAMRGI GTNDDTLQRVI RGTVRPASDFNADGDGKVLRKAMKGLGTDEGAIIDVV HQFGGTIRQQRNFNPVQTAENLKEAMKGLGCDKHKVLEEL VTPPAVF QPTVFPAEDFD QPKPTVVPAEEFDASADANALRKAMKGFGTDEQAIIDDIL


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KYGTLREHQPFDPHADGQTDRNAMRGVGTDEKA I IDDM RPTIRPFTPFNPDKDAEELRQAMKGUGTDEAKI I KVL PPLLTSPRDDAALLYRAFKGFGCDTAAVI NVL AKGGTVKAASGFSASEDAQTLRKAMKGLGTDEDAIINVL

> GTVHPAENFHADNDGKALRKAMKGFGTDEGT!!D!! KYEAKELHNAMKGLGTKEGVI IE I L
$R G T \prod K D Y P G A D P \square R D V E V L R K A M K G F G T D E N A D I E L L$ GTIVGNDDFDTAADVECLRNSMKGFGTDEDQII ATI
 ASLVAPDHFSPTEDAAALQKACKGFGTNEKAIIEVL
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EESGPSLKANPGFNAAADAANLDKA DKAKGVDEGTI I DIL
 GTMKDKANFKVEEDVSALRKADEGLGTTEKTLVEVL

PPVIPSPREDAVKLHKAFKGDGCDTSRVINTL IVPTPTPTPVEDSESLRKAFEGWGTNEKLI I EIL
 AT I DVPEQVSVLADAEALRKACKGWGTDEKAIIVVLI TDEAAILLQL

QEDGNMVDYEK TD QDARELYEAVKRKGTDVTKWПT TM ATLVAPDHLSVVEDAEALRKACQGWGTDEKAVIKVL VVAMDKTPAEFDADEL RYSMKGLGTDEDILVEIL ATLVAPPNHSPVEDAEALGKAVKGWGADEKAII SIL PTVVPADYFDPQDDAN LLRRA IKSFGTDEKA I NVL PPVLTSPKDDADHLYRAFKGFGCDTGAVI NIL


ATLVAPVQHSHDEDAKALYKACKGWGTDEKAVISTL ATLVAPEDFSPGEDALAINRACQGWGTDEKAII S I L PTLRPYPNFNANSDVELLKKAMDGMGTDEAMI I EI L
 NLCKAFLDAVGTDENAGI EVL

SP Y A T V V D NQ DF HPALYYAEKDDRA LRR A GDKDTVVK VL QRAPTVVGVPNFNAVEDAAALRAAMKGFGTDEQA $I$ I $\|$ L

## UniRef90 UiNXZ1

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 GHRSTEQRKEIVKMFKTMFGKDLVKELKSETSGNFKTLLE

| DHKSDSGNGERVIV |
| :---: |
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|  |  |

ARRSNTQRQETKEAFKTपYGKD DDD KSERGGNFENADV TERTNAQRQLIVQAYQAAYGKELKDDLKGDLSGHFKELMV TRDNNAQRQTVAAEYAAKYGTRLMHDLKGELHGDLEEVIL TKRTYSQRRE:AFEYEKKAKKDLDTALKGVLSGSLENVVL DTRAENDLNAIRESYFAQYDESLEAAVESETSGDYKRLLL ITRAENDLNALRESYFAQYDESLEAAVESETSGDYKRLLL TRDNCAQRQVVAAEYMARYGSDLSHDLKKELAGDFEEVIL ANRSWAQRQEI KHAYFEKYDDELVDVLKKELSGNFEKAIL
 ARRTMEQRQKIKEKYKALYGKELEKVLKNELSGNFEKAVM ARRTVAQRQRIKEAYKQSVGKDLADDLSSELSGNFR


AHRSNDQRQKIILQYKTMYGKDLIDNLKSDCGGNCQPTVV ANRSASQRKAI ASRYLALYGKHLEKDLKSELKGNFEDVVL AHRDAAQRALIQQEYRAIYSEELTKRLKSELSGKGEDAIL

TKRSNAQRQEILKAFKSHFGRDLMADLKSEMSGTLAKVIL ASRTKHQLQEリMKAYEEDYGSSLEEDIQGDTSGYLERILV MS GMDLIKDLKSELSGNFEKTVL GNRSGKQRAPLVRAYKTTYGKDLISDLKSELGNFEALVL
 AHRDAMQRAHIQHEYRTMYHDELSNRLASELSGNLEKAIL GHRNAAQRKQARQAYEQLYEEDLVKRLESELTRDFEKAVY AHRDAAQRAAIA AEYRAVFNQDLARRLASELSGNHKRAML ASLSNYGLKTISAVYKDLYDKDLEDAIKGDTSGHFKRLLV ASRSNDQRQQI KAAYKKAYGKDLVSALKSELGGLDESLIV TQRCNAQRLMM| AEAYREVYGRDLVSDLKDNLSDHFKEVMV AHRTSRQRRE:ADAYKAQFGKDLKERLHKELSGKFRQAVE TKRTNCERQQI RAAYQQLTGKSLDDALKKCLKSHLEEVVL GHRTFAQRQELDQTYKTLFSKDLQKELKSESSGNFKNVLM TQRSNAQRQLIJAQAYKATGRKLVADLKGDTHGDFEDVLV
AHRNEEQRSLIQQEYETTFSELLSKRLSKEDHGSVKKATS GHRTAAQRRAI RQAYTQLYEEDFLKRLQSELTREFERALF SHRNAAQRYEI RLAYEGLYHEDLI KRLESELSGDFEKAVY AHRNAAQRNSIRKVYGEAYGEDLLKCLEKELGTSDFERAVL GHRNAVQRKQI RLAYEDLYQEDLIKRLESELSGDFEKAVY VARSNAQRQQIKTAYKTLFGKDLVDDLKSELTGKFETLIV TERSHPHDQKVFERYKSYSPYD DEERDKKEVKGDLENAFV GHRNASQRKQI RESYEQLFEEDLVKRLESELSGDFEKAVY ASRNNKE DRDLNDQYQEAFKRDLAKDIVSDTSGDFQKALL GHRNGAQRTQQREAYQNLFQEDLIKRLESELSGDLERAMY TKRSNAQRLEIA DQFKALYDTDLINLI QRKLGGNFAKTII

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 A L V T P P A M F D A K Q L K K S M K G V G T S E H A L I E I L T TART S R QM A L MLLS P A V Y D S R H L H K A DC G L G T D E Q A L I DVI C T R S N Q Q L




 L WM M T P A Q R D A T L V V


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





A L NED QAYEDAKNLYEAAEKKWGT
SLS CEAAVQEAERLLAAAGEQWGTDESTFNA

















 A L M T P P E E Y LTCQE L H R CME GM GT D E D TLLV E L L C T R T K P E D



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NGEEVNARLASSEAD LLHEAD KDKAFNNEEVIRDLSTRS K P A F F A EKLLY LAMKGSGTRHRTL NRI MVSRA

 VCVRNDARRKHALE QQEHLGGGARVT DVDST

EVDRATADKDAK S LY KA GEK K L G T D E K A F $\square H \square F S E Q S$



UniRef90_C6THM9
F D
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DSAPVDPGATQRDVQTLYDATEGKDGADQUVVCSIMSMRN
E E Q EMD D AKVQUK DAK DLYEAGENKI GTNTSVVFNAILASRS





K A Q L N A T F NHYRDVNKTSDTKDLLGESANDFQKALHTTVR
 $\begin{array}{lllllllll}K T Q V A T F N R Y K D D H G I A & T\end{array}$

RAHLA AVASAYRDMF GNSLKKAVKSETSGNFEHGLLTVLR $P Q D L K A T M E A Y S R M A N R D L L R S V G R E F S G Y T E R G L K A L L Q$ KQHLRLVFDEYLKTTGKPI EASIRGEDSGDFEKLMLAVVK
 KAQLMATFNRYRDDCGTSITKSLLREGDNEFPAALRTAIR KAQLIATFNNYKQDHGTSITKSLRGDPTEEFSAALRAAIR







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UniRef90 C $3 \times Z V 5$ UniRef90-U6HF91 UniRef90_UPI0002B4128B UniRef90-S9X158 UniRef90-UP1000333DE2A UniRet90-F6UFFO UniRef90-G5ATS2
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UniRef9O_C6THM C||ESKPRYFAKQLLYDAMKGLGTRDNDLI R|VITSRSEI DLLA CIKNKAAQFARTVHSA\|TGLGTDDESLIRTCITRCEIDMV VIRNRSAYFAKQLYDSMKGFGTRDQDA RGVVSRSEVDMV

C
C
C
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Y
C
C

VAKNPQLFFARRDHDAMKGVGTDEDTLTR\|IVCRSEFDDE CTCYPARYFAQELYSSMKGLGTKDRDLDRII TTRAEDDMY CVQMAPHFFAKRLHKAMDGVGTDDATLIRI I VSRSEIDDQ

 GSRDDVRGYAQDLYAAGEKSGTDEMKFITILCTRSAPHMM



 SVKNKPAFFAERLYKAMKGAGTDERTLTRULVSRSEDDLL

c

 SARNRPEYFAYKLYKAMRGAGTNDSTLIRRVIVARSEDDCLA CASSKPAYFAERFY LAMKGSGTRHNALI R VLVSRSEI DLK
 CVKNVPAYLA ERIVKSMKGAGTDESTLTRMLVSRSEVDLL GARDHAKIDAESLYKAGEKKMTDEATFNRI LCTRSFGQLR SATDPALYFAKSLRKSMKGVGTQDTRLIRIIVTRTEDDMQ


 SYRYDAGSEVSRLHEADERKQLDDDHVVRILSTRNLFQLR

CTNDP L K Y Y A K L L C D G $\square$ K R F G T DE D S VT R VI VT R A E K D $\square K$
CDNDHKKYYEKVLRNAMGSDGTDEEADTRVIVTRAEKDDK A LK SPQGF LA KCLHNSMKGLGTNNRDLDRVVVTRCEKDMK

CSENPAKYFAKVLHKAMKGLGTNDSTLVRVIVTRTETDMO CALNRLAFFAERLYYSMKGAGTDNSTLMRIVVTRSEIDLV CVRSTPEYFAERLFKAMKVRGGAENQLFNINQHRARVAMN CA AHPGKYFAKVLHKAMKGFGTNDSTLIRVIVTRTEVDMQ
 CIRNPKKYDQKLLCNVI NNMGTDEDTLSRVII TRAEKDLK ANTNTPMAFAEHLNDGLSGAGTNDDQLMRLIVWRSEVDMK
 Y IKDPMDYYAECI NKCDKGIGTNDERLMQLIVSRCEDDLK





D $\square$ K E VY Y K K N S $\square$ S LD D A VA K E T S G D Y K A F L L A L L G
$E$ E K D V Y Y K R N S V H L E H A VA K E T S G D Y K K F L L T L M G E I K R E Y L F K H GES L A D A $\|$ RE D T S G D Y K R CL L LA L

Y IK A E Y L K K Y K T S L N D A VH S E T S G H Y S T F L L L L G QI K QMFTQMYQK LLDTMISSDTS
$K L S R T F T S L S E R S L G E N D T S G E Y K K T L L K L C G$ Y I K A E Y S K KHRKTLNDEVHSETS GHYRAFLLSLLG

 EMKELY L E RNSRSLEDAVSSETTGDYKAFLL TLL G G E I K N C Y L A R Y N R D L V D D I K D D T S G D Y E K L L V R L L G


D .

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# AREEAKKLLGNKERKEKPSKEVFCQAF 

Q G T I F P APNFNPVMDA QVL G GA LQQ GFDCDK DLLIDDUL ESYNPSLKAPK T F DVEK D C I ALLREAMK GDGT DENABI I I L

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

 R G TVAD F P DF DANGDAEALYNAMKGFGSDKEAILDLV P S D D A E Q L R T A F E GWG T N E D L I I

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



SPTQDTERLRKAFQGLGTNEKELLILVL
$\checkmark$ VPDPVPSPTEDAENIRKAVQGWGTDENALI EIL
$P Q V Q G T \square V P A P N F N P M L D A Q M L G G A L Q G F G C D K D L L I D D$
ATLKPAHVPSPSEDGEQLIRNAFQGWGTNE GLLI S I I L
SHDARHDAEILRKAMKGIGTNESDLIKVL
A Q Y D A HE L R A A LK D $\square$ N S A E D $V G V E \square L$
R P T $\square E P T P G F S A S A D A E R \square H R A M K G A G T D E D T L I D N L$
 MK GF GCDEKA I I F I M
VAEDCDRLHSAFQGWGTDEGAIVSIL

WD GNADAQALRGAMKGFGTDEKTVINVL QATDHPSASFDEQRAAESLLERAMRGYGTVDKRVVVDVL

YTPF KYDAKELYDAMKGVGTSEDVI IEIL


 PSPGYDLDRQRSNDNVDRAAD DLRAAMKGFGTAEDKLIDRTL


 $P$ Y D G A A D A E A L K K A M K G F G T N
DFRGSPDAAAARAAMKGFGTDEKAALI R CAL

S PHFDPDMDAQALEKAMKGGGTDDENVI: D L L
A EHYARALKTAMDGVGHNAVALI YI L
VP NPAPSPTEDAESIRKAVQGWGTDENALI E L L

GGTVQPASSMNPRADAEAVAEAFKGMGYKKDVLLEND
A T HF S QES D S L GI L K $\quad$ G V D E L T I N L
 A A Y D A QELLRASMKRMGTDEATLNEIL
$P R \square P Y D G R A D A Q A L R K A M K G F G T D E A T L D E V L$
ATGRDATKDAEALRKAMKGFGTDETTLIDDL
VP S S VP A VA E D A E QLH K A F E G WGTNEK LI I S I L
S VD DEVERLFK A MNGLGTDEQTVIDVI
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M K R $\square$ G S D A Q A I I D L
WDGSSDARALRKAMKGFGTDEKTLI LV A QF DA QELRTALKN S GPAEDVAL EI L
H QP Q T WVP PA P P F DP S Y D V E I I R K A TK GF GTDDEKA L I H V L
PTVTVEPNFFVEHECERLGKRLCRDSVDERKVIQVVM
A N $\square \mathrm{NVL} \mathrm{V}$ DVEA V R K A M K G F GT DEKA LIDA L Y DATLLHNALKGAGTEDEVLI EI L RPTIVDNPNFDAVESAHALFKAVDGDGTNENVIIDII H Q A Q G T I F P A P N F N P I M D A Q M L G G A L Q G F G C D K G M L I S L

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STRSPPQपKECDTVYKHDFQVEDEDDMRSETSGLESYSG
ARRTNHERQQTCATYESLYHTPLRKVIKDDTSGQFRTVLC GHRNVHQRQEIRRAYEEYYQENLIKRLESEDSGDFERAVY YSRSHQQRQQ। VRDFKTLFGKDLIKCLKNELSGKVQDTVL AHRNAKQRSL RQTYAETYGEDLLKALDKELSSDFERAVL


ASRTKSOREDKAYKEEYGSDREDTKSETSG ASRTKSQWKEMIVKAYKEEYGSDLEEDTKSETSGHFEQILV ADKDPFQUNMLRDAFQRRHRRDLIADIKSETSSWFEEGLV CYRTNDQRQELSKHYKASYGRDLIDDLKSELKGDFEDIIV AHRDATQRKQURLTYEENYNENLIQRLQSELSGDGERAMY LKSELSGNLENVIV CTKTNTE TIATKEAYQRDFDKSLEADVKDDTSGNLKKLLV TKRTKAQRLVIAKHYEEKYKKELLKDLESELSGNFLSVVQ GKRNESQRRKI RESYKEKYGKDLIDDLSSELSGDFMKAVI LTRSMEHMNLIREDYLLKRFRVSLEDDIADDTSGDFRKFVY AHRNVAQKKLVRMAYEELYQEDLIQQRKSEVSGSFERALC ATKDPLQUDAGRTAYNRNFKRDLEQDVRKETSSWFQKGLV AKLDPLQMAAVRSTYTQHDRRDLYKDVKGETSGYFRRGLL ATRAPPRLQECLQAYKRDFQVEAEEDIKSGTSSILQDLLL ANKDPLQVDT: RAAYERNHRRKLVSDIQSETSSWFQKALV GNRTVERRQKI ADVYKACYGRDLLSRLKKEDSGKFRKVVL GHRTAAQRAEI AVAYEGLYDETLLDRLHSEDSGDFRSALM ATAAPPRLRECLAVYKHDFQVEAEEDMKSETSGDLRDLLL TNRSTFQRSLI LNAYKAGFGESLKQRLRSEINGDFK CILL TNRSNEQRQDIAFAYQRRTKKELPAALKSALSGHLEAVLL
 HNKGPLQUEVLLQTFNDTFKRKLLADVESETSSYFREGLA

ARADP $\square Y$ MAS $\square R E A Y T K K \square K R N D E D V A K E C S K \square E K V L V$
AHRNAAQRRA $\square$ RRAYAEAYGKE LLRA $\square G D E \square H G K E R T V I$
VTKKNQQRQETRQKYKERYNKDVMSDLKSELSGDLQEVIL AYRDAEQRKQI RLLAYQEKYDESLLQRLQSELTGDFQTAMC CARSNEKDNQURVAYNELFDRSLADDLRDETSGDFKHLLM AHRSSSQRREI GCVYKAQFGKDLQDELGHELSGKFKQAALL VSKDALQVDVLRAAYKKEHGRDLIADAASECGGKLEEVLL


SKKDPDQDNTDRTQYDQRFMRSMVVDREKETSGWFARGDA ASRTGEQLKEFTKVYKKEFGGKLEKDICGDTSGHYQKLLV TSCSNKQRQETKKQFQKDYRKDLVKEFKSEFSFDFKQLLE


UniRef90 U1MTY4 UniRef90-A0A023EP15 UniRef90-UPI0003F06272 UniRef90_G7Y6U9 UniRef90_O82090 UniRef90-A9RFK7 UniRef9O-E9H191 UniRef90 G3T384 UniRef90-UPIO00440CA10 UniRef90_Q9SYT0 UniRef90_A9VD41 UniRef90-A0A059BIN2 UniRef90-T1FMS5 UniRef90_UPI0003594FD8 UniRef90_K7GQ59 UniRef90-G3JNQ8 UniRef90_A0A022RD39 UniRef90_UPI0003D240BA UniRef90-W5E588 UniRef90-Q9LX07 UniRef90-B9GM28 UniRef90-K9JGF9 UniRef90_UPIO002740BB8 UniRef90-A9UPZ0 UniRef90_UPI00032A90EC UniRef90_M0WV56 UniRef90-I3LRT9 UniRef90_A0A044V9K8 UniRef90-UPI00032A8DCB UniRef90_FOZZX7 UniRef90-B9RGD0 UniRef90-F6YYMO
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UniRef90-B3S9E5
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90

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 AMMMPPAEYDAFSLHEAMKGAGTDEADI TEI LDATRSNAEII
 K I DDNCGETKPKSKPKSTKKKQTT ALMKTPGLFDAYETKEADKGAGTDEACIIEDLASRSNEKK QLARGPLLADVYGLFDAMSGPGTKELVLNDILDSRSNADLI




 LWT YDPSERDAKLAKEALKKGIKQLQVLVEIIACASSPN HLL LWAMDPVARDAKLAYKALRKKGGDRWVLI EVACASSPDHL
 LWALDPAERDAVLANQATKMLTANNSIIMEI GSTRSSLDL
 $\square K D Y N L A E Q D A H A L H E A G E T G T G G A T W I M M F T Q R N T E H L D$ ELCHDLPY ILDAKGLYYAMKGLGTNDRVLI EVLTSLWNDEVV




Q $L A R G P L L A D D H N F D A M A G P G T K E V V M N D D L L S R S N A D L$ ALMQTPTKRDVMDLHKAVKGLGTDERVLIDILASRTNEELI ENDANDLRKAMKGFGTDEKAGVDVLAYRSCSQR $\begin{array}{ll}C L L Q G L A L Q D A K T L Y A A E K D R G T D E M Q F I T & L\end{array}$


 | $H$ | $W$ | $V$ | $L$ | $D$ | $P$ | $V$ | $E$ | $R$ | $Q$ | $A$ | $V$ | $M$ | $V$ | $N$ | $T$ | $A$ | $T$ | $K$ | $C$ | $I$ | $H$ | $E$ | $D$ | $Y$ | $A$ | $V$ | $I$ | $V$ | $E$ | $I$ | $A$ | $C$ | $T$ | $N$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $S$ | $S$ | $E$ | $L$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $A$ | $M$ | $I$ | $R$ | $G$ | $P$ | $L$ | $D$ | $Q$ | $D$ | $C$ | $E$ | $V$ | $Y$ | $Y$ | $E$ | $S$ | $L$ | $K$ | $G$ | $V$ | $G$ | $T$ | $K$ | $E$ | $S$ | $A$ | $L$ | $D$ | $D$ | $T$ | $L$ | $L$ | $A$ | $R$ |
| $S$ | $N$ | $A$ | $D$ | $I$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | A L MR GP L



 $A$












G LMMTPSEYDVDCLHEAMS GMGTDESMLIGULDATTTPEED HWVLD PVERQAAMANAATKCDHEEYPVIVEI ACANS PTEL
 WSFGDKAHVNAMALFKA DDRAGTDEDMLIDVLCTATNEEI A IVVRGPLLQDCHVLRTGMAGPGTVEEALNDVLLGRSNAD


 S MF MT P L E LDD T HLLLKHT TKGGGTDEKALVELLLTRSAE EM $G L M Y P P P S Y D A H E L$ WHAMK


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UniRet90_S7ML5 UniRe90_UPIOOO33175A7

PQSGFDPK|LAA 170
190
LTS $\prod^{200}$ LPQFYAKELHDADSG IGGTDEEADIEILCTLS $E G Y A D P A M A V Q N A M V L W E A C Q Q R T E E H R V M L Q V I L C S K S$
$E S S I L D M A K V D Q D V A D I V D A G V G K G T D E S V F I R L F S G R S$ DMAK $\frac{V}{P}$ PEK Y F F K V Y DAGVGKLGTD ENTSVDRHTALINDAHQLNKVFTGKVG DEDT GDFAYDPVKAQEDARNLYTAGEGRIGTDENVFVDVGARQC EDLGVNDDLADTDARALYEAGERRKGTDVNVFNTILTTRS DDGVVHEEVDEEDAQALFAAGEEQWGTDESIFIMLLGNRS EGDEVNMTLAKQEAKLVHEKGKDKHYNDEDVVIVRGSTRS
ETDKVDQALASEDAKALFDAGEKRWGTDESEFNR F DKEVVNMDVANSEAALLHEATERKQLDQDSVLWVLGTRN ESSEVSVELAHQDARDLFKKLDGRFNCESGLFI DLLCGRN SEQKEDEKQDDDEDATRLYKAMKGLGTDEDTIIDDIP SRS DSAPVDPQQVDGDVMELYKATEGKMGTDESKFNALECSRS QGEEINARLANSEADDLHGADCKEKAFTHEDLDRI LTTRT AEESVDMDVAKDEAAQLAEAVRRKKQPHGGEVVRIVSTRS DGDEVNMTLARSEAK LLHEKIKKKAYADDDLIRILTTRS DKEEVNTKVANAEAAKLHEVVKSKK LDDQDDVILI LSTRN FDAKQ LKKSMKGTGTNEDALIEILTTRT DPPADFDAKCLRNA MKGLGTADSVLIEVLCTRT DKVTVNDEVAKSEAEKLHEAVNNKK LLDDDHVVWILCTRN AGDLVDGELARAEAAELHGAVAAKKQPLHGDVVRIVSSRS EGYT DPAMAAQDAMVLWEACQQRTGEHKTLLQMILCNKS ESMNDDYGKANQHAHELEQAGEKRWGTDESTFMKI DTKS EGDEVNMTLAKSEAKLLHEKDAEKAYNHEDV DRIVTTRS ENPAVNPGLVATDAEVLYKAGEGKDGTDEKTFIKILCERS

VIRNTPDYFAEKLHLALQGTEPNHQQVMRI LISRS DATVVNKP EGDDVHAKLAQTEANGLHESDKEKKANH EEVDRULTTRS DDQTVDVQQSAKEAKALYKAGEARWGTDESKFKTLLAARS
 GSDSVDVGKAKEDAETLYKAGEKKWGTDESKFIVEVGCKRS EGDEVNVPLSKKEAK DLHEKDSDKAYND EELDRILTTRS TVRPVKPFHPISDAEQLHKA MKGVGTDEGVVTDVLSNRT ESG\|GEYHKAVQEAHNITRSSDKRGSMDKFDAYKVLATSN MSEPEYDAYELKRA MKGLGTDEDAMIEILCSRT NVHCYFAERLYHAL KGAGTDDGTLIRVIVSRS DSAPVVKADIDRDVDDLYNATEGKIGTDEMRVCSVLSLRN ESDEI DRDRVEADAQSLVEAGEGQLGTDESEFQRILVAKS DGDEVNDALAKSEAKDLHETVTNGD TDHGELIRIVVGTRS ENQGVDEGAARADAEALANAGEGQWGTDESVFNSILIARS DSGAVVSNDLQGYFADRLYKSMKGAGTDEDTLIDIVVTRA DKDKVDAEVAT IDESAMLREADTKK QLDHDHVLYILGTRS SSDKCAYSVPGFFAERLHKAMEG DATNDEALIRIIVSRS DGDEFDENLAHSEANDLHQVIENKAFNNEDEVIRILCTRS DSAPVVPQQVDSDVMELYKATEGKLGTDEMLVCSILSTRN ESAPLDPQLIEAEAKSLHQATAARMVNNVDEVCGII ARAS TPLLY EDAPVDPROVDDEAKLLLHELEHKAYGD DEVVR TTTS $Q G V D Q L A A E A D A D A L Y S A G E E K L G T D E E V F T R I F A R R S$
GGGGVDGELAGAEAAELGDAVVGRGQAHGDDVVRIVGTRS
 EDETVDPQASDDAKULYDAGEGRMGTDDSTFIRIFASRS EDTSVDYELIDARDLSDAGEKRGIIDVAKWINIMTERS VDFEENKERYFAKLYASMEGLGTRDTDLIRVIIARS NDNPVDASKAKEFAQQLHTAGELKVGTEGEVFNRIMVHES DSAPVIPRDVERDVAAI WNATEARSGHEGKTVCEI FTKRN EETPUARNMPNQEAAGLRKATAKGLGKEKMLYPGIMGRT YPPYRYEAKELHDA MKGLGTKEGVI 1 EI LAAST DGPEVNTSDAHSEAK LLHEKDDKKAYSDEEIIRILTTRS QGDKTEEKTSEDEAKKLNKNGKGKLDKKHFK SIIFTKYN DGEEVDGGLARSEAELHEAVKNGENTDDGEDRIGGRS ESY LTKDHHGYYAQKLHEAMRGDGTDEDALTRHIVGRSE SSAPVMROQVEQDVLEYKATEGKTGTDELVCOL SRA VIKNTPLYFADKLHQADQD WKPNYQ VLMRILDSRS EYVPIDQARVQADRHTLYGASSKRLGTDEDQVCGIVLSRS PAVYDAWCIKEAIYG LGTDEETLVEILMTRT DSHPVTPQE EQAVTDLQAGMGGFVGKNVPQVCQ1 TSKN GVALVNAGSIPNFFAERLYKSMRRAGTDDDTLMRIMVSRS



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| :--- |
| UniRef90 $\cup 6 \mathrm{HF} 04$ | UniRef90-L8G731 UniRef90-E2RQ29 UniRef90 R4X7L4 UniRef90_G4VI64 UniRef90-VAA2B1

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CFRQPAKFYAEELHTALGGAGTDDDALIRVITTRAEVDMQ VVHNRPAFFAHRLELAMKGLGTNDNALIRIVVDRSEDDVV CATCTPAFFAEKLYQAMKGAGTRHKTLIRIMVSRSEVDMM
 CLTRPELYFVDVLRSADNKTGTDEGALTRIVTTRAEVDLK



GERDNASTYAETLFSAGEKTKTDEDQFTTTLCKRSATHLL YATDRANLLAEWLHDAMTGLGTKDYALMRLLITRSETDLQ CINDRANKYYEKVLRNAMKKFGTDEDGLVRVVVIRAEKDLK CAQSTPMYLAQRLHKALTGS DDSSAVDRIVVTRSEVDME CATWSEKYFEKVLRLIAKGLLGTDEEALTRVVVTRAEVDMK CAKSLPAYFAELLHESMKSSGFVSGALVSSVVVRSWTDRQQ YADDRANLIAEWLHDSMVGLGTKDYALMRLLITRSEDDLQ WRKSVLDAHALRKALKGFGTDEAVLIELLCTQSSKELA


 C पDSPEKHFAKVVSESDEGFGTDEDSLTRAIVTRAEIDLM
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CFTCPDRYFEKVARDA $\square$ AGNGTDENSLTRVITTRAEVDLK NATDKYMHAAKLLEDSMAGMGTKDHLLISRTI RYHWDLN TAGKKEECDADMURDSMKGVGTSDDDL: RLILAYAEDNMA NTRERAREEAARLYAAGEDRMTDEDAFITVFSTHSFPMDQ
CLTSPEKHFAEVIVRTSILGLGTDEEMLTRGIVSRAEVDME

GLVYPEHYFVEVLRDADNRRGTEEDHLSRVITRAEVDLK AATDRПKCYAKILYDSMKGVGTRDETLTRMIVGHSETDLA C TQNKQLYFADRLYDSMKGKGTRDK【LIR【MVSRSEVDML YVRSPPAFFAKQLHKAMLGTGT
TATDKAMRDANDMEESMKGFGTKDKDVVRVI RCHWDMD APVNPAMHDAHALYKAGQGRGTDERTFI N LVTSPPQHLDW SAKDPADNDARLLEESMAGFGTNDDLLI YAVVHWNREHME GSRDDADQDAQDLYAAGENDRTDEMKFITVLCTRSATHLL CFTCPDRYFEKVIRLALGGVGTDEDALTRVITTRAEVDLK GGRDEGNYDAQDLYEAGEKKWTDEVKFLSULGSRNRNHLL CVWDANNYFVKVLRNAMHESGTDEDSLTRVVVTHAEKDLR
TATDPEDTVVKMLYKSMKGVGTNDDSLTRПMLAHAEHDLA SGTDRADRDALLLEDSMAGMGTKDRLLLNRAVVRAHWDLQ G
GADDRPTRDANLLEESMAGMGTKDER TYRVV RMHWDRA CIQNRPRYFAEKLIKATKNTEKDDKTITRTIVTRCEVDMG GTMDQARRDAEELYQAGEKWGTDEETFNRIFSTRDYYSLR RATNRAEAEAVRLEESMAGLGTKDELLVQRVV RCHWDMG
CSNSMPGFFAERLYKSMEGПATNDEALTRTLVCRCETDLE CVRDKPAYFAYRLHSADHDFGFHNKTVIRILIARSEIDLM



DTRECFRLRYEKSLHNMTQDDTSGEYKRTLLKLCG
 VVKQRFHELYHKKLSKMVEGDCSGDYKRLLLHMI G



NTKGAYQQRFHRSLASRTKGETSGDYGRLMVACTG EI KEVYYKRNSVTLDHAVAKDTSGDYKAFLI T L L G LI KEKYYKRNSVTLESAI SDDTSGDYEKMLLALI G KI KQEYRVRFKTTVTDDVVGDTSRYYMDILLLALVG RI K E E Y I R R N S VP LDRAI AKDTHGDYEDILL A L L G


 KVKEEYKVRYK T TV TKDVVGDTSGYYQGILLITLIG



## KVFEEYQKDAGKSTEDSTKSETKGSDEDAMDA\|V

 EI KEAYEKKYNKSLANAIRGDTSGDYMKTLLALLG
 R I A E EYYRRNSVPL GQAI KGDTSGDYESMLLAALI G KLKG QRRDFQVFIFVLQSDVSGEYGDCLKAICG DI MK A Y EVI YGK SLLNAVKDDTSGDYRQTACVLEG RI KEEYYRRNSVHLDHAIVKDTSGDYEKFLVELVG

 AVFDAYQKUSGKDUEQVIKSEMSGNLEDGMVAUGG
$N V R N A Y E Q R Y K K K L A K R V Q G E T S G D Y Q R L L M A D C G$ II A DEYQRRNSVPLTRAIVKDTNGDYEKLLLVLAG SI A DAFQEKYGQSLVEFIEDDVGGDFKRALIAL GIK DAFQKRASVALEKAIGNDTSGDYKSFLMALDG QCKAAYKHFYKRDLVERI KSETSGDYKK LMAVC
LKQAFLKYGKPLS LiL

DVKEEYERVFGVKVEKRVEDETSGKYKK ULLDLL KVRGEYFNMYNSSMDNA I DGDVSGDYKDFLITLLG
 QVKGAYQARFRKSLASRI KGETRGDFEKLMIACl G
 QVKRAYRHRFQKDLDERVRGETSGDYQRLMVALL
LIKEAYQKRNSVPLEKAVAGDTSGDYESMLLALLG NVKGAYQQRYGKSLGKRI YGETSGDYRKTLLAAI G

 KVKEEYKVRYNTTVTADVRGDTSGYYMNTLLTLVG
T TA NEYQKRDS DP LGRA DAKD T GGDYENMLVALLG LI RHYFNANYPQTLSGMIKADTHGDYQLFLLAIL K IK S EFKRKYGKSLYYFIQ

QVKGAYQHAYGRSLTSRDAADTSGYYEK LMVKCV AI NEAYVRKRKSDVVKAVKKEFSGDAEEALLFLV RVKTAYRNRYSRELRGRVAGETKGDYEKALLLAL L
 LI GEAYQKRNSVPLDRAVAKDTTRDYED LLLALL G
 D IUKDVFRKTTSVALEQAUAKETSGDYKTFVVALVG
$T$
R K E K L
K A E E E N Y G G K T

$N V K A R Y Q H V F R K D L V R T K G E T S G D Y E R L L V A C L$ QIKEEFLNLYGKSLKDCLK
A 1 WK E YVKI TGRDI LNSVDRETSGDFKSGLRA VV AVSQAYKQVYKKDLVKRIEGETRGDYERLLVACV
D TK REFESRYRKTLESKDKSHTSRQFKQLLLAIL
TI RKRYKERYGKSLFHDIKNFASGHYEKALLAI C

UniRef90 F6HB53 UniRef90 G5AJY3 UniRef90-B7QCG4 UniRef90-M0TR96 UniRef90 U6IQ48 UniRef90-U6IQ48 UniRef90-K1Q5Y3 UniRef90-G6CXV8 UniRef90 ${ }^{-}$V3ZTH4 UniRef90-E1ZWM5 UniRef90-A0A023ERFO UniRef90 G4ZK76 UniRef90-A5BX79 UniRef90_D4D862 UniRef90-V9DMM8 UniRef90- G4VI65 UniRef90-H3GAM3 UniRef90_R7S9Y7 UniRef90 S9XG21 UniRef90-J5RCS1 UniRef90-F1LDC5 UniRef90 C5XNL1 UniRef90 B6GYL8 UniRef90-M0SCM5 UniRef90-C3ZND4 UniRef90-R7WE19 UniRef90-K3WZ33 UniRef90-R7TYY5 UniRef90_UPIO00454A103 UniRef90 E9N3B6 UniRef90-F7H9W2 UniRef90-UPI000441C82A UniRef90 U6I8S4 UniRef90-E4YQH7 UniRef90_A9RZN4 UniRef90_Q27473 UniRef90 N1PR37 UniRef90-V2XBM7 UniRef90-Q52MU2 UniRef90 C1BMC5 UniRef90 ${ }^{-}$V5EGF8 UniRef90-U1GEK8 UniRef90_C3ZND3 UniRef90 G6D4P2 UniRef90_V4B5U6 UniRef90-DONJ65 UniRef90 A9NMW6 UniRef90 F1QSK0 UniRef90-Q0UZ96 UniRef90_T1D6G7 UniRef90 UPIO0027420AB UniRef90 ${ }^{-}$FOXOL8 UniRef90-FOWGW UniRef90_K7GZJ5 UniRef90 H0YM50 UniRef90-B3GQS3 UniRef90-M1W489 UniRef90 L7MS27 UniRef90- Q6BCI9 UniRef90_UPI0002C46358 UniRef90_B1B561 UniRef90-Q9FUG6 UniRef90-T0Q810 UniRef90-UPI00046B35D2 UniRef90 H3HB94 UniRef90-UPI0003340B21 UniRef90-TORNQ0 UniRef90_K1QDT7 UniRef90 Q0ZNW4 UniRef90-H3D9M1 UniRef90_G3N8F2 UniRef90_UPI0003D70B54 UniRef90 ${ }^{-}$TOPYS 1 UniRef90-UPIOOO387000E UniRef90-UPI00035A2BE4 UniRef90 E9HIH0 UniRef90-F2VQP1 UniRef90-F7ANV6 UniRef90_G4VL69 UniRef90 UPI0003AD8E34 UniRef90_C1LKN6 UniRef90 W5AA13 UniRef90 A0A023ELAO UniRef90 UPI0003D0E9E1 UniRef90-A2R5M9 UniRef90 R8BEX6 UniRef90 C5X4R1 UniRef90_C7ZNV0 UniRef90-M7BS31 UniRef90 E7F4N0 UniRef90-W5K5P1 UniRef90_V8NDP5



 A D A MYKAMK GA GTKERVGLNE L GTVFPAEEFDAEAAAAGMRDAMTGFGTSEEADISLL GTLKANPNFNVEHDVQVLRKSMKGAGTDERADIDVL

A KE LTHDA $\square$ S G $\square$ GTDEEA I I E $\square \mathrm{L}$ AF L N F S P D $\square$ D CQA I HEA CRGLLGTDEK TL I A AL $P D S D P S P A Q D S E R L N L A D Q G R G D D E Q V I V W D L$ D A S R E A D LLLRKAMK GF GTD E LT L I EVL DASRDADALRAAMKGFGTDEAALIRIL

GYNAQFDAERDRKATKGFGTDEKS LIDVL
QGT $\square$ QPAASFDAMRDAEVL RKAMKGFGTDEAAAI DVV PGYNPTFDADRIRKACKGFGTDEKT』IDVL

AT IVVPRVVPSPAEDAAALLKAFQGWGTDEQAVISIL $\vee$ A P GDFRP QADA L R K A MK GF GTD EK ALI AV L AGRDATVLRQAFTGDAVDLQAATEVI

A ERDAKLAREALGRRGDDRDALIEAA


P Q Y Y A KELHDAMAGLGTDEEA I E $\square \mathrm{L}$
 ATVHGSPDFDPQEDSEVLYTAMKG■GTDEKA\|IDLL


A E Y L CKE L NHCMEGMGT DESVLVE I L



VA NDDVSKDVEADRGAMKGFGTNEKVLIATM TAKPTDFPAENFNPSADAAALRKAMKGFGTDEQAD DIL SAYGSVKAYTNFDAEWDALNI ETADKTKXVDEVTIVNIL


 YGPTQUV HWDANPDAHQLRAAMKGVGCDRKALIMRL PGSAVSPYPSFNPSSDVAALHKADTVKGVDEATIID L

QYDASELKASMKGLGTDEES LIEIV VP NP【P DTNEDC $\square A L H R A F E G \square G C D K E A L L N V I$

EAEAQ ITREATKGAGTSEKLLIPVL GT $\square$ K P AN NFNPSTDCERLHDALMEDHPDEDVIIEVL

ERGT $\square$ KPKAGFNAGDDVAA $\square$ R NA $\square E G L G T K E K \square L I E \square L$
CNETYSACAGFGTDEDRLTKLI


A Q Y D A K QL R K AVE GAGTDESVLI EI M
PTLVPASPFDPNS DAA RLLF DA MN G L G T D E N KI I S V L L
$R P T \prod K Y P L V I D N E K D A E R \prod N K S \prod K P \prod N P D E D V I N E \| L$ E QE GVTVVKGSPHFNPEPDAEALYTAMKGI GTNEQAI DDVL


QGTGKTESNFNAAEDAYR\RKAMKGCGTDEDA\|ID\|L
 VPSPPPTASEDAESLRTALQGWRADKAALI GVL

YFGTVKADPNFNAQNDAEKLKKADETKGVDEAADIEVL GTVRPFPDFHPERDVAVIQAALDKK D DNTLVRIL

UniRef90 F6HB53 UniRef90 G5AJY3 UniRef90-B7QCG4 UniRef90-MOTR96 UniRef90 U6IQ48 UniRef90-U61Q48 UniRef90-K1Q5Y3 UniRef90-G6CXV8 UniRef90 V3ZTH4 UniRef90-E1ZWM5 UniRef90-A0A023ERFO UniRef90 G4ZK76 UniRef90-A5BX79 UniRef90-D4D862 UniRef90_V9DMM8 UniRef90- G4VI65 UniRef90-H3GAM3 UniRef90-R7S9Y7 UniRef90 S9XG21 UniRef90-J5RCS1 UniRef90-F1LDC5 UniRef90 ${ }^{-}$C5XNL1 UniRef90 B6GYL8 UniRef90-MOSCM5 UniRef90-C3ZND4 UniRef90 R7WE19 UniRef90-K3WZ33 UniRef90-R7TYY5 UniRef90- UPIO00454A103 UniRef90 E9N3B6 UniRef90-F7H9W2 UniRef90-UPIO00441C82A UniRef90 U66S4 UniRef90-E4YQH7 UniRef90-A9RZN4 UniRef90-Q27473 UniRef90 N1PR37 UniRef90-V2XBM7 UniRef90-Q52MU2 UniRef90 C1BMC5 UniRef90 V5EGF8 UniRef90-U1GEK8 UniRef90_C3ZND3 UniRef90 G6D4P2 UniRef90-V4B5U6 UniRet90-DONJ65 UniRef90_A9NMW6 UniRet90_F1QSK0 UniRef90-Q0UZ96 UniRef90-T1D6G7 niret90 UPI00027420AB UniRef90-FOXOL8 UniRef90-FoWGW UniRef90-K7GZJ5 UniRef90-HOYM50 UniRef90-B3GQS3 UniRef90-M1 W489 UniRef90-L7MS27 UniRef90-Q6BCI9 UniRef90-UPIO002C46358 UniRef90_B1B561 UniRef90 Q9FUG6 UniRef90-T0Q810 UniRef90-UPIO0046B35D2 UniRef90 H3HB94 UniRef90-UPIO003340B21 UniRef90-TORNQ0 UniRet90_K1QDT7 UniRef90_Q0ZNW4 UniRef90-H3D9M1 UniRef90-G3N8F2 UniRef90-UPI0003D70B54 UniRef90- TOPYS1 UniRef90-UPIOOO387000E UniRef90-UPIO0035A2BE4 UniRef90_E9HIHO UniRef90-F2VQP1 UniRef90-F7ANV6 UniRef90-G4VL69 UniRef90-UPIO003AD8E34 UniRef90-C1LKN6 UniRef90-W5AA13 UniRef90 A0A023ELAO UniRef90-UPIOOO3DOE9E1 UniRef90-A2R5M9 UniRef90-R8BEX6 UniRet90_C5X4R1 UniRef90-C7ZNVO
UniRet90 M7BS31 UniRef90-E7F4NO UniRef90-W5K5P1 UniRef90_V8NDP5

GYRTADQRQN $\square$ K $\square$ MYKTCFGRD $\square$ MQD
CT\SNYGПKTПAEFYEQLYGVSLESDLKGDTSGAFKRLCV GAKSADQRYLVSVRYQQLYGKELRKVLKSETSGDFGRLLQ GHRNADQRKQIKDTYQQLYKESLDHRLQSKDSSGLKTAMI ARPDPLQMALISHTFNSRHKRNLEKD:EKECGGKFRDVMM

PHEDIMKPTLGPKQDFCV
APDDAFQMDVLSRTYEQMVGKSLRKTLEKELSGWVEYTLV ANRSNDQRQKIKAAFKTMYGKDLIKDLKSELSGNMEELIL TPLDAFQMDVLSRTYEQTVGRSLQKELDKELSSWLGYVLE
AHRDATQRKQTADEYEHKYSESLTQRDHSELSGDFERAVY SQLDPLQMAAVRDVYSKQDGRDLYKDVKSETGGEFRDGLL CSRTTSQDQTUKQUYHMRFGVQLEHDUHYHTSGDHQKLLL
CAAAPDHLVAVRRAYRSLHGSSLEEDVAAEQSNPFQSILL GSKSPETRNLI QMRYKELYKKPLKDLVKSETSGNFGKLLR LKHNNAQRLE KKKYNRASNGK KK SCGYपRNACL
CT पS NYG $\square K T \square A Q F Y E N \square Y G K S \square E S D G K G D S G H F K R L L V$
TNRSNAHRQQTAEAF पNFTQQDLLKMLGAVVSGQLETVTT SHRSLEQRQQUAVTFQASYGENLLGQLHKELSGFFRLAVF
GQRNQSQRDS पSEAYKLVFGEDLRKRLKSSUSGKDEKCLT TTRTNEETEAAKNTYFMTYSKSLEDAISADTSGDFRRLLI APDGPLEIEGLKHAYQQRHKRDLMKDVHSETSGYFREGLE VNRSRPHLAALCEAYPKKHKKSLTKVIKSEFSGHMQFTLL GKRTSEERLQUVSGYKQKYGRELAHDLDGDLKGHFRDCTI APDDAYQDDALRHQFKATVGKDLLTVLEKETSGWFEAALR
NKRLTDRLKSELKGDFEEVVV CTRTKPE $\square A E \| V Q A Y E R \square Y N R P L A E H M C S E T S G D F R R L L T$ CSKDNAQRQTLKQKYAQKYKRDLVSDLKSELSGDFEEVIL SGRTNEEMNULKRTYFDLVGKDLAVTLNSELSGDFRKVVM

AKKDPLQMEATRTQYDQRDMRNLITDLQKETSGYFEKGLV CKRSNWQRQVISEAFTKELGRDLIKDLKSEGGGKFEDVIL TNRSNTQRQE
GTQSPETRNRTAARYYEMYKKPLADKIK DKCSGDFGTLMQ GSKSPETRNLIADRYHQLHNKKLKSLVKGEASGSYGKLLR
GKRVSFQREETADAYDRDHRKPLLDEVKSETSGDFRETLV ANKDALQ DDMIRAAFARAFRHDLISDLKDETYGWLREGLS TSRTNKELREVNRVYREEGKRDLAKDVTSDTSGDFQKALL
CSRNNEEMVETKKVYREDFKKELEKDTAGDTSGNFAKLLL CHRDQQQRQR】RHSYN】KYEEDLLKKLKSEDHGNDEKGAV

SGRSNEEDNTKKAFFKNYQNDMVVVLADD\GGDLKKFYD TTRSNGQRQILKNKWSSKYKKHLESRLKEKLSVDYDETGM

TRRSSAQRQLLCEAYKEATGRTLVEDGRGTSGDपEELV GTKTAAERHLTA DRYPEDHNKS ZYE TKRSNRQRQEI AKSFKGQFGKDLIESLKSEDSGNFERLII ATRNNQEDRADNEAYQEAYHKSLEDDLSSDTSGHFKRLLV CYRTASQRDA TI $\square$ AYNNQHG SLAKDLQSEDTGSFLTLS

GHRSLKQRLATQETYKRपYDKETTEHLGSTLTGSYDSLVK TRRSNAQRQQIARSFKAQFGKDLTETLQSELSGKFERLMV CCCNNAEDYLLKKAYNDVLMKEMEQLLKGERCGDDDDGCT

TSRNDCQRLETAKTYKTTFGRDLDDDKCEDCGDFRRVII TSTTPNRMALI RHTYERMHNRSLTKDLKSETSGSFETILV TSPNPWAMAQLVHDYNSRFПRDLAKDIESETRGDGETVLL CRRTAAQRAAIRRAYAFLYREPLDNCFRYKDSRHFWKAMI TNRNPWAMAQFVEAYNSRFLRDLAKDIESETKGSDETGMLI RTTAELRNVKQVYDEEYEANLEDHVTGDTTGYYQRMLV AKRSNAQRQQIKAAYQQSAGKLLADELKKALKSHDEDVVL TNRSNAQRQVLAQDYQNLTKKDLKAGLKKVLSGDLEALML


UniRef90-G6CXV8 UniRef90_V3ZTH4 UniRef90_E1ZWM5 UniRef90_A0A023ERF0 UniRef90 G4ZK76 UniRef90_A5BX79 UniRef90_D4D862 UniRef90_V9DMM8 UniRef90_G4VI65
UniRef90_H3GAM3 UniRef90_R7S9Y7 UniRef90_S9XG21 UniRef90_J5RCS1 UniRef90 F1LDC5 UniRef90_C5XNL1 UniRef90_B6GYL8
UniRef90_M0SCM5 UniRef90_C3ZND4 UniRef90_R7WE19 UniRef90_K3WZ33 UniRef90_R7TYY5 UniRef90-UPI000454A103 UniRef90_E9N3B6 UniRef90_F7H9W2 UniRef90_UPI000441C82A UniRef90 U6I8S4 UniRef90_E4YQH7 UniRef90_A9RZN4 UniRef90_Q27473 UniRef90_N1PR37 UniRef90-V2XBM7 UniRef90_Q52MU2 UniRef90-C1BMC5 UniRef90_V5EGF8 UniRef90_U1GEK8 UniRef90_C3ZND3 UniRef90_G6D4P2 UniRef90_V4B5U6
UniRef90-D0NJ65 UniRef90_A9NMW6 UniRef90_F1QSK0 UniRef90_QOUZ96 UniRef90_T1D6G7
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UniRef90_UPI00035A2BE4
UniRef90_E9HIH0
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UniRef90_M7BS31
UniRef90_E7F4N0
UniRef90_W5K5P1
UniRef90_V8NDP5
 SLVQGNRDADAQALFEAGEQWGTDESIFFNQLVTRSYQQL LI SRP LDP E GEASSILRKATKGFGTKEKLLYPVIMMRTNDVL L WMNEAP ERDA IL LANKA LKKRKRKKLQQVLVEI ACASS P D H L A L V R AL V Q GP L M H DV H S V HEA I K G L GT K E S V L N DV L L GR S NA D L EHDCERLKNAVDRLKAKESVI IDEVMGRRPVVQR


 HWMLDPAERQAVMANAATECI QEEYPVLVEVACANSAA EL AVIE GP LMHDVVSLHSADDGVGTKEWLLNEVLLGRSNADII ALLRHE GP E V D A K D L Y K A E E K R L

 S LCCMA N R D S D A E EA D A L N I E T A I K T K G VDVVVTIVNVI LTNHS SA QR
 Y S F F D K A H V N A WA L Y R A M K G L G T D E K V L I D V EAED F D A E A D AVVA E D A I GRGRDD D DVVVNDILPNRSNA QR
 AI I R GP L A QDCHVVREA $\square$ A GA GTKESALDDVLLCRSNA DM Y LVGGAKWRDAKLLEASMKGFGTKDKQLWRVV RGHWDQRF
 A K V L G P VL Y D C WLI K R A C Q G A G T H E DLL NEVLLLGRTNLLEM
 LIVT GARDEEAQQLYEAGEKWGT DEE IVNKILAHESN A Q L


 GLMLDPVVNY LCK QL H K A M A GMGTNE RALDEI L CS QNNE QM


 QI AHGPLLSDVHNIVDAMSGPGPKEVVLNDILLGRSNA DM GVNDDLADSDARALYEAERRKGTDVNVFNTILTTRSYPHLL ALLLKTPA QF DAE E L R A AMKGLGT DEDTMLDEILVVRTNKE I DVAA L H K A ITTVK GVDEA TI DDD LITKRNNA QR S LVQT K R D D DARSLYEAVKRKGTDVTTWIDIVMSQRSVPHL


 GMMMTPSEYDAHCLHEALDGMGLSDPVLVGILCTRDAKEM

WCNEI YSACAGFGTDEDRLSALI GTKSAGER

A $\square$ A T P P A A F $\begin{array}{lll}D C H Q & M K A \\ D & M & L \\ \text { D G A }\end{array}$
LLA Q P LIE EAEAMII RDATKGAGTTE
AL MYT P F K Y D A K EL Y D A M K $\square$ R G T DE M Q F I T I L L C S R S A T H H
 E I L S S R T P Q QLV
D A Q T L R K A MK G L G T DEDA I I GI LA YRNTA QR
TLFRNPME ILANDLYKGMKNLGSNYQ\|MTDI ALMYPPYRYEAKELHEAMKDHGTDEMKFITILCCTRSATHLL








UniRef90-G6CXV8 UniRef90_V3ZTH4 UniRef90_E1ZWM5 UniRef90_A0A023ERF0 UniRef90_G4ZK76 UniRef90_A5BX79 UniRef90-D4D862 UniRef90_V9DMM8 UniRef90_G4VI65
UniRef90_H3GAM3 UniRef90-R7S9Y7 UniRef90_S9XG21 UniRef90_J5RCS1 UniRef90 F1LDC5 UniRef90_B6GYL8 UniRef90_M0SCM5 UniRef90-C3ZND4 UniRef90_R7WE19 UniRef90-K3WZ33
UniRef90 R7TYY5 UniRef90_UPI000454A103 UniRef90_E9N3B6 UniRef90_F7H9W2 UniRef90_UPI000441C82A UniRef90_U6I8S4 UniRef90_E4YQH7 UniRef90_A9RZN4 UniRef90_Q27473 UniRef90_N1PR37 UniRef90-V2XBM7 UniRef90-Q52MU2 UniRef90-C1BMC5 UniRef90_V5EGF8
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UniRef90-D0NJ65 UniRef90_A9NMW6 UniRef90-F1QSK0
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UniRef90 M7BS31 UniRef90_E7F4N0 UniRef90_W5K5P1
UniRef90_V8NDP5
UniRef90 F6HB53 UniRef90_G5AJY3 UniRef90-B7QCG4 UniRef90_MOTR96
UniRef90_U6IQ48 UniRef90_U6IQ48 UniRef90_K1Q5Y3


RDDNEAYKMMYKRKLEEETIDSETSGHFKKLLVSMTTGGRD S I I K Q A Y E G M Y G R T L E D DLI S D T S G N F K R L MV S LACA N R D





 QEIVVRCYQSEFGRDLEKDI RSDTS GHFERLLVSMCQGNRD F L L K E GF R R T Y N K D L V A TVVRGELSMMTERMFNMALTTGTRD
 VAV K K A Y H A L Y K R S L E E DVVA A R AT G NL R T L L LAAV V ST Y R Y A A V $V$ R T A S Y E M R R Y R R S QEIDDTMFK QAYGKDLDDELKKSELGGNFEKAILAMMQK A ATFRCYKEQHGSDI EEDMKQYSSSQFARMLKIAV $N$ NLLK K T Y F N N L H G K D L A V T L S S E L RHLLKTAYE E EF QRCLLQEDVVEDDTS GAFRRLLEAAQLAAAS R N HQLVVEAYKDAYERDLEGDVIADTSGHFQKMLVVLLQQGTRE

 DEELKA A Y Q N L A R R S L E Q D V QEI QEQFMSLFGESLYDRVNDRDRRDRLLRHVIKGMLL
Q Li I K Q A Y Y T M F N Q T L E S H V W A F WK G S E A K L L L A L A R G S R P

 NK L K Q F Y D K D P K R T L E T D I R T E T T G Y F C K ML L L L L K G Q K G
 A GL R Q A Y T T R I K R D L E K DI T S E T S G DYREA L L A VVR G EEL K S TYAEVF GD SLLEDDI E GETS GHFKRLLVVSLCNAGRE QLVF E E Y K N I A G R TI E Q A I K A E DD G E L K D A A SA I G S A P V G K SIIK S E Y K K A Y K K D L D K A I E S D T S G D F R E LL L A L S K G D KP KMMNAVYVAKYNNNDAKAVDKEFSGDAK K L R I R E A Y R G L L Y K A C L E E E D I A Q E TVVGP H Q K L L LF T L A K A Q R C N A LIVE K Y Q Q L H K R T L E A D L K G D L S A A T E Q M Y M MI V A A R R N
 QEI S S V Y K E M Y K T D L E K D I F S D T S G D F C K L R A T L T K G R R A
 EAAKNTFFMTYQKSLIEDAISADTSGDFRRRLIVI LIQAKRD
 NA L Q S T Y C QL Y R R NLDE ETVVKGE LDSANF ER HLLLMVL SANRA R RVV QMYTKYSKHDMNKVLDLEMKGDVENCFTAIVIKCATS

 LDI R R A Y S S S F D R S LLE E E I $A$ A T K I G G G S E Q K L L L G L L L R E E R $\square$ YLI A L R Y P E L H K T T L LAA ELK GETSG DYGKLL QLL AQ F QMREA YCLQY S N NL QEDI Y SETSGHFRDAL MNLVQQGTRE NLVALLRYKELLYREPL K S LVVKSETSGDFGRLLRMIIST

 TLIALRYPELHNKSLESEI RGETSGDYGKLLQLLAQ Q Q I K K A F Q H S S G K P L E S A L K N A LIK G D L E DVVV L A L L K T
 ALI Q Q D Y RAMYSEDLLCKRLSSELVGKLEMAVLLWMHDPA G $N \mathrm{~N}$ L K K A F F K N Y Q N D MVVVV L A D D L G G D L K T F F L A I V N Q M A Q LKVF E E Y Q K L A G K S IVE D S I Q S E TH G S L E DA MLLA I V K CT R

 QEII RSAYKSTIGR A A R D Y L L K K A Y D K V L Q R S LQ DD $\quad$ T K E S K G S Y R L L MEQLL K GER C
 Q IMK M T Y R A R F G C Y L E H D I T E R TY G D H Q K L L LA Y L G VP R N MQI LE TYSSELGRDLIEDLKSELGGKFEDVIVALM
 A A I Q R A Y R D K Y H K S L L D D I K G E L S G K T E R F F E M L L N A R R P
 M A $\operatorname{l}$ R A
 S SiN NVYNKEYK

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 YSGII DYNLAEQDVQALRQ VEGPWVPI FTQRN $K D N T V D E T L R M L G A Q L L H Q A G A A R W G T D E S T F N R D A S Q S$ DGDETDTGVVRLEAKTLHDADKSQTFNHSEVDRILSTRS A L DRPTFYAKLLHFAIAGPGTRDATLQRVLAMRA ALDRPTFYAKLLHFALAGPGTRDATLQRVLAMRA PSEGWDMEEAEESAQKLYEAGAGCLGTEEAEVGAVLCDKS ENQQVDENKAMSDAQRLYQAGEKRWGTDENTFNMVLASQS ESFNVDQAAAMEDAKQLLQAGELRFGTDESTFNAILVQRN K V Q Y QFNPHTAQRAEADADARYKAGQGRLGTDERTFI GI LVSSS DRELVDFNGAKSEADKI HEADEKN QLDHDDVVWI LTTRN
 ESAPVIP HELEHDCSEELHRAMDGRVGTDQUADCSILAKRS MARPLPEADAALLRKAT KGLGTKEKLIVPVVMGRT
 ENPNVNHQQVQQDVEALYRAGPGKAGTDEIGICGILLQRS
 ESTPINPQTDDTD TRSLQ GKNVTDVCAIFAKAS PGKY FAKVLRKAMKGLGTNDVTLIRVVVTRC PAVYDATCLRKA MKGAGTDEATLIEIMCTRK WCLTSPEKHFAEV DRYS ILGGLGTDEDALTRADVSRA

 $K$ VGY $\quad$ FAERLHDSMAGLGTKDKTLI RIIVSRS $Y{ }^{\mathrm{K}}{ }^{\mathrm{D}}{ }^{-1}$ YD SGVDYVLIQQDS QTF DKEDVVUDSEALADAAAGGDAGRESEWIRILTQRS



GDLMVNQKEVTAAVKQIVEALAKPKNSTNSVLLNAFQHKN ESEIVDEGLAEADAVALFEAGEGRFGTDESTLSFTLANRN E DNPVDPRAVEADVAALKSAARGAAGTEDAICGILLQRS EGDEVDEGLLLHDVYCVVKA EPDQLQVNNDSDCLD VVDGGADLVCPQWSVFSVQR QGSTVNKKDAEEDAKK DHMDGKGK DAPDDEVFKNLMTKKN PSRRVVNDCQAKCDAKRLYGAREGRDGDDEGA VVKLLSDRN ED DVVSEDLVVE EDAQELYEA GEA QWGTDEAKFIMMLLGNRS



 ES GTVVALHVVATHAS QQLLK S F DKK SGGVEK F DAFKAI FATA S
 E ETPVNP QQVDDDMAQl HKATTGKVGT DELPVVHILSHRN K P MF

 K QLLYFASRLGEAMKAKGAKEKVVTRIMVVRC ED DE $\square$ D T LEEVEADTEDLLSALSNTEE $\square N \square S V I V R V L T T R S$


 QGKEVNAQKARKDAEKMNKNG RVDVVDKAFRDVVLKKN PLEDAEALIVRDATKGAGTTEQLLYPVLGGRT $P A Q Y D A Q Q L K L A M M K G D G T D E D T L D E I L A S R N$ ES AAVDAEKAKKDAKTLYDAGEKKWGTDESKFVDVLCRRS R D AVVMRNSLT T

 EGPENPTQAHEDAKKLADVSSNDSSDSLETRFLSILCTRS ETMLLVNMTAVQDDVVDLVE
 E GN Y L D D A LMMK Q D A Q E L Y E A A G E K R WG T D E V VK F L S

EGPEVDP $M E G L$
$E K R A$
 TPAYFAERLYKS MKGLGTDDDTLI RVMVSRC R GTPFDPRGVET DVRELHRVTAGKVGTDEVAVGGIMMNSS E D A P VIA TEI DHKVTELQRATEGTI GAN AVATA QI FTSSS A GEHVDMDVAKLEAA QLSEA IREKR LHGDEVARIISTRS
 $\mathrm{V} P \mathrm{~A} Y$ FA E S L F Y A M K GA G T D D D T L i R M V S R S K P A Y
R G
FAEKL Q HAMKGF GTNND TL I VDF ELIDD D A R DLY D A GVK R K G T DVV K WI NIIMTER

UniRef90-V2XBM7
UniRef90-Q52MU2
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UniRef90-C3ZND3
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UniRef90-DONJ65
UniRef90_A9NMW6
UniRef90-F1 OSKO
UniRef90 Q0UZ96
UniRef90-T1D6G7
UniRef90-UPIo0027420AB UniRef90-FOX0L8 UniReffo-FOWGW UniRef90_K7GZJ5 UniRef90-HOYM50 UniRef90-B3GQS3
UniRef90 M1W489 UniRef90-L7MS27 UniRef90-Q6BCl9 UniRef90-UPIO002C46358 UniRef90_B1B561
UniRet90_O9FUG6 UniRef90-TOQ810 UniRef90-UPIO0046B35D2 UniRef90 H3HB94 UniRef90-UP10003340B21 UniRef90-TORNQO UniRef90 K1QDT7 UniRef90-H3D9M1 UniRef90-G3N8F2 UniRef90_UPIIO003D70B54 UniRef90_TOPYS1 UniRef90-UPIOOO387000E UniRef90-UPIO0035A2BE4 UniRef90_E9HIHO UniRef90-F2VQP1 UniRef90-F7ANV6 UniRef90_UPIo003AD8E34 UniRef90-C1LKN6 UniRet90_W5AA13 UniRet90_A0A023ELAO UniRef90-A2R5M9 UniRef90-R8BEX6 UniRe990_C5X4R1 UniRef90_CZZNVO
UniRef90 M7BS31 UniRef90-E7F4NO UniRef90-W5K5P1
UniRef90_V8NDP5


FFQLLRATFKHYKQNYQVPIIYQAIIMSSGSDDLGSLLRVV $\frac{2}{1 L}$ PEHLLRVCDLYQWRTGRALEEAVRDRFHGDAQVALLSLAS KAQLCATFNYYKDEYGDPITKALTSESPNEFALALRMADR D DLESIMKERYEELYKEPLSKA:SEDTSKDYRKLLVTAYK
 QHLQAVNAWYVKKHKNDLVKAVKKEFGGDAEDALLFLVR FFQLRATFVCYKQSYEVAI DQAINSSGNGDLGSILRGVIL NEHURAIKNVYKLFNGRDLEDDVNSDSTNHFKRIFJLTLLK DA DQHLAALAQAFPQRHRVTLSKMIASEFSGHMKDALLQVAR NAELRADSQTEERYHDPLEKHIEKEFSGHMEDALLLMDR EDDMQYIKAEYHKKYKKPLRDAI HSETSGHYRTFLL DDDMKKIKEAYRVEFKTTVTEDVVGDTSGYYERLEVSMCQ PEYLKMVDAVYVSKYNNNIAKAVDKEFSGDAKRSLNYMVK KQH RLVFDEYLKTTGKPIESS RAELSGDFQKLMLAVVK NQGLQET WEELVAVABVYLLEAVGNDLETAMEKETSGDYREAGLTLAS NGYLEQLKEVYEERYGNPLMEDLENNCRREFERFMLALLC NGQURAISHAYKQKFHKSLEDVIRKEFSGHMEDALLFIVG
VWETAAMDKEYKKASGKGLISATSEAVEGEFGTLLMAMVQ YLQLQATFKDYEQLSGTEILDALETETSGTGKDCYDALVR NADMRA KAAYROTFRKDMVAMIDTEFSGMKDALRY VD FPHLRAMKAAYRQILRKDMVAEVADDLSLLDTKQHFRM ME VGSRRVCGEPCKGWGRTTGPSSGSWSAGPRSTSAASRSME SEQTKATFAEYKKLSGKDПYDTMKKNDKGDAKDAY TT LGK QSQLPYVKAAYRRLYHEELRDRDSGETSGDYKKLLLARSQ VTH LQLVFDEYQKIAEKSUEDSYKSELSGGDFERLMLAVVQQ FDQLEYVFEEYK
VCHLQKVFDRYKSYSPYDMLESTKXEVKGDDETAFLNLVQ PSYLCELDALYSRMYHNNTVKAIQKEFSFDAKRSLVLMVR PQHLKLIDDVYYQKYHNSIVAKAVEKEFSGYAKTCLLCIVQ
 Y DHVEALCKEFAMAYNLALYDVCDAELSSDFRNLVLDLLE DDQURA| WHAYKQRFNLDLDEVDESEFSGPLRDALLFQLR YPHLDRQVFQKYAQYSKHDM

KRDLAKDIDSDTSGDFQRALVSLAK EVDLMKTRTEFKRLHRRSLYQTIAEHTKGDYQVALLSLC SSHLKDLLDRFMKVYGYNFEQVLENKTRGAFRVSVTVVMC NEELNLKKAFFKNYQNDMVVVLADDDGGDLKKFYLNQMQ YQQLWLVFQEFQNTSGQDTVDA NECYDGYFQELLVAVVL NEEMNLLKRSYFDLVGKDLAVTLNAEDSGDFRKAVLQSPQ NQELHELNRVYKEMYKTDLEKDIVSDTSGDFRKLMVALAK HAQVKQTFEEFEQLTGSDI YQSIADTVVGETEDAYISLVK NEEVNLKKAFFKQFQNDLVVVLADDLSGDLKKAJVNQMA NRELLDMKKAYQEEYKKDLEEDVRGDTSGDFRAVLLEELK
P ASQUQLIVQHYHSKFGVHLEDD:KRHTSGDHEKLLLAYVS EVDLNLIKPEFKRMAGKSLSSMI DDDTSGDYKTALLNLC YPHLRRVFQEFDKMTNHDVEHAI KKRMSGDVRDAFVAI GQ PEHLRRVFDAYAYGTLNTVVTEFAKDMGNALVSIGQ PEHLRRVFDAYMKMTGYEMEESIVKRETSGGLKDLLLAVVK KYHIIREVYKAYQKKYGCLLVESIISKKFSNPLRNALNTVIUM EDDLNLKCQFTKMYGKTLGSMMEGDTSGDYRNALLN EDDLQDVKEDYEKCFYQPLAKTLQSETRGGFKNLLLELLN NEEVKKIVDCYEDMYNRPLAEHLCSETDGNFRRLLTMIIV EDDMLSI RNEFKSMYGKSLYSFIKGDTSGHYRKVLLCLC

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UniRef90 F6HB53 UniRef90-G5AJY3 UniRef90-B7QCG4 UniRef90_MOTR96 UniRe990 U6IQ48 UniRef90-U61Q48 UniRef90-K1Q5Y3 UniRef90-G6CXV8 UniRef90-V3ZTH4 UniRef90-E1ZWM5 UniRef90-A0AO23ERFO UniRef90 G4ZK76 UniRef90-A5BX79 UniRef90-D4D862 UniRef90-V9DMM8 UniRef90-G4V165 UniRef90-H3GAM3 UniRef90-R7S9Y7 UniRef90-S9XG21 UniRef90_J5RCS1 UniRef90-F1LDC5 UniRef90 ${ }^{-}$C5XNL1 UniRef90-B6GYL8 UniRef90-MOSCM5 UniRef90-C3ZND4 UniRef90-R7WE19 UniRef90-K3WZ33 UniRef90-R7TYY5 UniRef90-UPI000454A103 UniRef90-E9N3B6 UniRef90-F7H9W2 UniRef90-UPI000441C82A UniRef90-U618S4 UniRef90-E4YQH7 UniRef90-A9RZN4 UniRef90_Q27473 UniRef90-N1PR37 UniRef90-V2XBM7 UniRef90_Q52MU2 UniRef90-C1BMC5 UniRef90-V5EGF8 UniRef90-U1GEK8 UniRef90-C3ZND3 UniRef90 G6D4P2 UniRef90_V4B5U6 UniRef90-DONJG5 UniRef90-A9NMW6 UniRet90-F1QSK0 UniRef90-Q0UZ96 UniRef90-T1D6G7 UniRef90 UPI00027420AB UniRef90-F0XOL8 UniRef90-FoWGW1 UniRef90-K7GZJ5 UniRef90-HOYM50 UniRef90-B3GQS3 UniRef90-M1 W489 UniRef90-L7MS27 UniRef90-O6BC19 UniRef90_UPIO002C46358 UniRef90 B1B561 UniRef90_Q9FUG6 UniRef90-T0Q810 UniRef90-UPI00046B35D2 UniRef90 H3HB94 UniRef90-UPI0003340B21 UniRef90-TORNQ0 UniRef90-K1QDT7 UniRef90-Q0ZNW4 UniRef90-H3D9M1 UniRef90-G3N8F2 UniRee90-UPI0003D70B54 UniRef90- TOPYS1 UniRef90_UPIOO0387000E UniRef90-UPIO0035A2BE4 UniRef90_E9HIH0 UniRef90-F2VQP1 UniRef90-F7ANV6 UniRef90-G4VL69 UniRef90-UPI0003AD8E34 UniRef90-C1LKN6 UniRef90-W5AA13 UniRef90-A0A023ELA0 UniRef90-UPIO003D0E9E1 UniRef90-A2R5M9 UniRef90-R8BEX6 UniRet90-C5X4R1 UniRef90-C7ZNVO UniRef90-M7BS31 UniRef90-E7F4NO UniRef90-W5K5P1 UniRef90_V8NDP5
 VVRNTPLYFADKLHRALQETEPNYQVLMRLLVSRNETDLL $L Q S C S R P N T P K G H S S H I G G M G T S D K A L V R I V V S R E D D E V$
$C I V S P Q K H F A K V L Q N A V G K A G T D E D A L T R I V M H A E K D K$ CAISHW
cals HW
 Y
CVKHRASFFAEQपYKSMKGपGTDDSRLIRLIVTRCE $\square \mathrm{D} \square \mathrm{G}$

## MALEPLELLSELFEKTMKGFGTDEDALSAAVV RYHLVLQ

 CIVSPEKHFAEVIKASTVGYWTDEDSLTRAIVTRAEIDMT KAVQPVMHDVLALEDTMAGMGTNDCLLTERLVHWNKHHLE RATDRAMSDALQLEDAMAGAGTKDLVQRVVRVHWDRMHLD GDRDEFTFVDELLNTVKQDDRDDESKFFPMLAARSYAHLR

GAEHDVYRDTELIEESMAGMGTKDERLCYRLVRAHWNRP TERDSSNHDAQKLYA GEKKWTDEATENTVLATESDAQLR SATDPAMRDATLLEESMSGMGTKDERLIVRVVVRAHWDRN
ANRDEAESDAQELFDAGEGKFTDESTFNMLLALRNFNQLR SVMDPYPT DAEVFEKTMKGFGTDETALSTALV RYHSVLP FVRNSAEFFAEQLNDSMKGSGTDERKLSRILISRSEIDLI CVRSTAEYFAERLFKAMKGLGTRDNTLIRIMVSRSELDML
RAEDLDDQDAWDLCDTGVKRKNDGPKWDSTMTEQSVSYRQ LLRNAPLYFATKLYQADKDAGRSPRTAARIMDSRSET DLL CARDQAAEDAQELFDAGEERWTDESVFTRICARRSWMQIR CARDQAAEDAQELFDAGEERWTDESVFTRICARRSWMQUR G
AASDPAKHDADRपEAAMAGMGTKDQALVRR【VHWDKQRपQ
HAVDRPKFYSEALYQSMVGQGTRDFLLMRVLILRSEDDLL VAKNPPNSTPRILM GAEHDGQRDARLLEDSMKGMGTKDERLVYR VARDHWNKP ARRNEEEHDLNSLFEATEGKVTAKDQVCEDLTNRSDGQDR CVRNDPGFFAKRINDACKGIGGTDDSTLIRCVVSRSEIDLQQ CVENAAAWFARRLRDATQGAGTEDKTLVRVIVSRAELDLQ CENDEATFYCDQLKEAADGMGTNDSKLIRIIVTRSEIDLA W

 RGMNRAEAEAVRLEEAMAGLGTKDNLLVQRVVRCHWNMN
C DQNKPDYFADRLYDSMKG
LI LDP P PA IAE ITFENTMKGFGTNEKEDS DALV RYQNVLD LTLDDPFPTIAKMFEGAMKGFGTDELVLSTAIV RYQKYLPB TSKNRPRFLANADHTATKGMGTRDKDLIRILVSRSEDDLV
 HA $\square D K Y M H A A G L I E E T M V P E A T N H G L L V A R I V H W N P A M L V$

GDRSEDLCVNED $\square$ ADADAR $\square K K K E R K K T T \square I G C F A H L L V Y$ CAKDS $\square$ NYYAKT $\square Y E S \square K G \square C T D A S T L \square R \square I V T C A E T N M K$ QTFNPEDHTAEDI YKAGEGKWTDEATFCNAI CS $\square P P Q F M P$ CVRDKPGYFAYRLYSADHDLGFHNKTIIRDLIARSEDDLL

A $\square E D P G R F Y V E K \square F S S F G G \square G T N E D N \square I R \| I \quad$ I $\| R S E \square D M R$
 ASRTEGVCDARALYEAGEGRKKDCSVF DE ILATRSFPH
CFNS
PPWNMVENDAKALYKAGEKRGTDERTFDR DFCERSRAHDA $M \square L H P \ E T \square A V Q \amalg E R T M K G \square G T D E Y G L A S A \ V R Y Q H L L P$
CAASPFSCTAKAVWQQI
YSADKADYFSSRFHTTGAGAGTADRDLMRLTVSRCETDLG CARSVPAYFAETLYYAMKGLGTDDDTLIRVMVSRSEVDLMM


## C

CADTPAKYFAKVLHKAMKGLGTSNAALDRAAVTRTEVDMK GARDPQGTQANQLYNAGEKLGTDEEVFYK LLAHASFDQLE
VARDPVSFHGAT LKKCFSGSDGVNEKR DYWTVRDHWN P HAMDRAKMDAQRLRDPLYKTVRKDRLFIVRVVSLYWDQFE


UniRef90 F6HB53 UniRef90 G5AJY3 UniRef90-B7QCG4 UniRef90-MOTR96 UniRef90 U6IQ48 UniRef90-U6IQ48 UniRef90-K1Q5Y3 UniRef90_G6CXV8 UniRef90 V3ZTH4 UniRef90-E1ZWM5 UniRef90-A0A023ERF0 UniRef90 G4ZK76 UniRef90-A5BX79 UniRef90-D4D862 UniRef90_V9DMM8 UniRef90- G4VI65 UniRef90-H3GAM3 UniRef90_R7S9Y7 UniRef90 S9XG21 UniRef90-J5RCS1 UniRef90-F1LDC5 UniRef90_C5XNL1 UniRef90 B6GYL8 UniRef90-M0SCM5 UniRef90-C3ZND4 UniRef90 R7WE19 UniRef90-K3WZ33 UniRef90_R7TYY5 UniRef90_UPI000454A103 UniRef90 E9N3B6 UniRef90-F7H9W2 UniRef90_UPI000441C82A UniRef90 U6I8S4 UniRef90-E4YQH7 UniRef90-A9RZN4 UniRef90_Q27473 UniRef90 N1PR37 UniRef90-V2XBM7 UniRef90-Q52MU2 UniRef90 C1BMC5 UniRef90 V5EGF8 UniRef90-U1GEK8 UniRef90-C3ZND3 UniRef90 G6D4P2 UniRef90_V4B5U6 UniRef90-D0NJ65 UniRetgo_A9NMwe UniRef90_F1QSKO
UniRef90_Q0UZ96 UniRef90-T1D6G7 UniRef90 UPIO0027420AB UniRef90 ${ }^{-}$FOXOL8 UniRef90-FOWGW UniRef90_K7GZJ5 UniRef90 H0YM50 UniRef90-B3GQS3 UniRef90-M1W489 UniRef90 L7MS27 UniRef90-Q6BCI9 UniRef90-UPI0002C46358 UniRef90_B1B561 UniRef90-Q9FUG6 UniRef90-T0Q810 UniRef90-UPI00046B35D2 UniRef90 H3HB94 UniRef90 UPI0003340B21 UniRef90-TORNQ0 UniRef90_K1QDT7 UniRef90_Q0ZNW4 UniRef90-H3D9M1 UniRef90-G3N8F2 UniRef90_UPI0003D70B54 UniRef90 ${ }^{-}$TOPYS 1 UniRef90-UPI000387000E UniRef90_UPIO0035A2BE4 UniRef90 E9HIH0 UniRef90-F2VQP1 UniRef90-F7ANV6 UniRef90_G4VL69 UniRef90 UPI0003AD8E34 UniRef90_C1LKN6 UniRef90 W5AA13 UniRef90 A0A023ELAO UniRef90_UPI0003D0E9E1 UniRef90-A2R5M9 UniRef90_R8BEX6 UniRef90_C5X4R1 UniRef90_C7ZNV0 UniRef90-M7BS31 UniRef90 E7F4N0 UniRef90-W5K5P1 UniRef90_V8NDP5

SI RAEFKKKFGESLYSSLQRAVKGDCRPALLALC Q: K E E Y Q R N F NVPLENA Q
VIKE $\square$ FHKRTNATLKHAVGTETCGHYNSFLLALVG

E TK EEYQNDYEKSLAEAVADECSGDYKRMLLS I I TIFAEYEALAGKDIEETIKKEFSGSVEKGMLAIV

D $\|$ RAAYKKKFGKELRDR\HGEVSGDYRKLLLAV KI KGEYFKMXNTNLDDVVRRDTSGVYKSFLMALTG QVKQEFEKKYGKPLRSRVAGETRGDYEKAL LA ML QVKRAYAHRYKRDLIDKRVKGEDHFDYEGVLVACL VVFNEY DR DGKYSMEDTLKFRMRGNTDSALLS IV AVNAAYEKKHKHD I A HAVKKEFGGDAEDALL F L V
$R \square K N Q Y Q G \square Y R K T D T S R V Q G E T S G K Y E R A L V S I I$ AVFDQYSVVAGHGIEKAIKSEFSGDAKRAYLTLI AI CAAFQKRASCTLEQAI AKETSGDYRSFLLALLG HVKRAYKHKFGKNL $\quad$ DRVRSETSSDYQRLMVALL
A $\square$ FRAYE
HVKTAYKKMYNKELRDRTYGETSGDYRKLLLET NI TEAFQELYDKKLCDEI DKETSGNFKQLLLGLL DIREVFRTKYEKSLFSMIKNDTSGEYKKALLKLCG

K VLT R N K S Y S PCDPDESTKKEVKGD DENALLN LV
SI RTEFKRRYG】SLYSFI GEETKGDYQAALLGLC
RI KEEFEQMYNMRPEDMVKDELTG

QVKAAYKHFHKRDLAARVQSETSGDYKKLMVVLL
$D \square K E T F D K D H K S \square A E W \square K G E T S G Y Y E Q L L L A L L$
Q $\square K P A Y Q \square F H K K G L K N R V E G E T S G D Y K R M L S A M \square G$
AI AQQYQQRYQRPLDAAI RSK LS GHMEETLL
QVKEVNETRYGRPLSEAIKDECGGDYKNMLLATV TI K A EYERLYDKTLESDVAGETSGDYKRALLALL G T IK GKYKKKNKKTLNDMVDSECSGDYKKALLK I IG
 DI RECFRGRYEKSLYNMIQDDTSGDYKRTLLKLCG AVSQEFKRVVKKDLVKRLEGETKGDYERLMVACV

KDAKGDSQKALLY L CG
H $\$ K NA YKRDYGKDLRNRDHGETSGYYRQLLLAI

KVIFDRYKSYSPYDMLESI RKEVKGDLENAFLNLV


D $\square$ KASFSRNYEKQLHDMTSSDTMRHFQTFLMLLVG AVNAAYVAKHGNSLERAIEKEFGGKARDALLYHVG TIIRKRYKERYGKSLFHDIKNFASGHYEKALLSIC MMDAVYVAKYNNNIVKAVDKEFSGDAKKSLVYLV K $\square$ R S EF KRKYGKSLYYY $L$ Q
D TK VEFQKRNQKSLSAMLKADFPGDSKNMLLA $\mathrm{DLG}^{\mathrm{L}} \mathrm{G}$ TVNAAYVAKHGNSIERAI EKEFGGKSEDALLYHVG LCQA IDDEMKGD DDSCLTA I
YVAPVYHSMHGNSLKKVVKKETSGNFEYGLLT\|L QVK QAYQSKYNTSLRDRIHGETSGDLRNLLLTIL
$N \Pi K \square A Y Q N \square Y G \nabla S L S T A V S D D T S G S Y R T A L L A L I$
DI RAEFRRMFACSLFSMIKGDTGGDFGKTLLLLCG
 DiKKMYEKYFYKPLAKALQSETHGGFKKLILILLG

Y $\square$ KAEYHNKYKGS $\square$ AEA $\square$ HSETSGNYRTFLLS LVG $\triangle \vee F D$

EYFARVKGTMGGNDRADVKNYVSGDFEDAMMAVC
AAKAAYKKRYGVSFAKDVKDTLSGDYEDATLAL


UniRef90 Tos7T9 UniRef90-Q5DH70 UniRef90-H3FXU4 UniRet90_B8CCQ1 UniRet90 Q9ROV2 UniRef90-B9GM27 UniRef90_UPlooo2B4D642 UniRef90 V9E738 UniRef90 ${ }^{-}$A0A024TUE6 UniRef90-Q5D8M0 UniRef90 C1GNP1 UniRef90 W6UNN7 UniRef90_UPIO00359F1D1 UniRef90-UPIO002BCF02C UniRef90 M7AR77 UniRef90- G1T8F2 UniRef90-L9KRW6 UniRef90-M8A027 UniRef90 B9RGC9 UniRef90-UPIO0042BF75A UniRef90-I1QPHO UniRef90_11JWG6 UniRef90 ${ }^{-}$FoWGW3 UniRef90-C5WZP6 UniRef90-UPIO0045D7452 UniRef90 Q8AVS3 UniRef90-E1FLW0 UniRef90-P91144 UniRef90-UPI0003ADB31E UniRef90- M2WIV4 UniRef90-G5AHT5 UniRef90-K3ZVC2 UniRef90 A0A024G6Z2 UniRef90 ${ }^{-}$F6HB56 UniRef90-D8LG01 UniRef90-W2TDT8 UniRef90 D6RBE9 UniRef90-R7TSZ4 UniRef90-M5VTF9 UniRef90 A0A059BIDO UniRef90_UPIO003EAB318
UniRef90-W9R070 UniRef90-D7FJE4 UniRef90_ROJYC4 UniRef90-GOSAF7 UniRef90-V4S245 UniRef90 FOYFKO UniRef90-V4VU25 UniRef90-A5AJ78 UniRef90_A0A022Q9T4 UniRef90 G5AHT2 UniRef90-UPIO003EE0244 UniRef90-I1LLC1 UniRef90 A9SB32 UniRef90 M3A659 UniRef90-UPI00023B32A5 UniRef90-M4BHL2 UniRef90 Q6IQB2 UniRef90- Q6Y223 UniRef90-UPI0003C84960 UniRef90 D7T207 UniRef90 UPI00023B2A6C UniRef90-O9ZVJ6 UniRef90_11IQN4
 UniRef90- V6LCM6 UniRef90-A8PD83 UniRet90_M4DKS2 UniRef90 A5B3Y6 UniRef90-G2R457 UniRef90-B9T8F3 UniRef90_D7U8J8 UniRef90- V6LMZ8 UniRef90_UPI0001A625FC UniRef90-UPI00023B3745 UniRef90 W6UZJ3 UniRef90-S9XSV2 UniRef90-G1XCZ UniRef90-UPI0002B43CD6 UniRef90 ${ }^{-}$A0A022T5X1 UniRef90-UPIO000E486FF UniRef90_G3JA51 UniRef90 G5AHT4 UniRef90-G5AHT4 UniRef90-B2WAQ5 UniRet90_UP100042B512A UniRef90 A0A024S6H7 UniRef90-E3Q6Z6 UniRef90_C1E164 UniRef90 E5GCK4 UniRef90-K3Z822 UniRef90_I1QCV5
 AEFDARELHRAMKGAGTDESVLIEIL RGTVYGPPDFFPAQASECLRKALSGlETNDRAVNVL PSYTPDIDCDHI YQATKGI GTDEEAI I ATJL EAKGGTVKAASGFNATEDAQTLRKAMKGLGTDEDAII GIL

D $\square E A A V Q E \square H C K Y T G G A A D E K M L A S \square L$ PE $\square$ DCHE IKAAVAGFGTDEGRLNRAL

TDETAllEl
G V L R T F LS FSVDKDVQRLLRADAGQGEPRPSALGEP $R G T V R D Y P G F S P S \square D A E A I H K A I K G Q G T D E H M L I S D L$ RDAT LLNQSLNGDITDDRAATEVI

EDECREDHDACNQ $P R R$ R $V L L$ A EREALLAN LDA
 GTLRTFLSFSVDKDVQRLLRAIAGQGVDCSAIMGVL

ASAGFEEACRETRGARGHPRR\GQLL PQAEAFA IIKEALAGFGTKEDILIPIL

A KDDA E Q WWRACKGMGTNEGRVI GAI I
QAT $\square$ HPSASFDEQRAAESLDRAMRGYGTDKQRVIDUL
MKG】GTDEATVID【I
VS GHGVDETTLIAVL
SRGTVTEASGFNAEQDAQNLRAAMKGAGTDEEAVI KVL
 GTTKAAPVIPAD DDAKELQRSTEGMFANA

ATIDAQEVYNSCHGWGTSDGKLIALL
ERDAAVARQALEESVVNFKALI EIL
DPPNDFEALTKAFSGFGVDEDSMVSIL AT T K V V EC $\square$ S PEEDSHHLKKAFQGFGTNEAS I E I L FSADIDAQEIQRVCTGAASDEAALASLL

ERDAVLLYEALQGGPKKDRAVIGML Y DPEEDAKAGADALKHHKPDGDAICDVL PYSPH VVKCAQQIHEACKGPSFDQETLLSDL

EQEGVSVKGSPHFNPNPDAETLYKAMKG

| $\begin{aligned} & \text { ERDARMARKAL } \\ & \text { ERDARGVKKALLK } \end{aligned}$ENDCREIH |  |  |
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T N A D F VR $\square$ A E Q $\square$ QVA CK G A G T DEAK $\square$ DD V
D LIES IVEAFSGKNVDEKALISTL
ERDARMARKALKRGRQAYGLLIELA DPADDAARLAKALKGRPPDTEPLVELL

HS S QLVQPL D YRPAAERLYKAMKGLGTDEATLIDVA ERDARMARKALKRGSQAYGLLIE $\square A$

 Q GTVKPAVPFDKDADATALYEAMAGFGTDEDAMNALL DRDVDELRRAVKTEKGGETLMIAIV

DRDVDTDYRADRAREGGESDMDEVV
 FHDTEDDAARIAKALLSKHPDTEPLI EL

ADSAAQVLHRAMKGWGCDEDTLTTI L

UniRef90 ToS7T9 UniRef90 Q5DH70 UniRef90-H3FXU4 UniRef90-B8CCQ1 UniRet90 Q9R0V27 UniRef90-B9GM27 UniRef90_UPI0002B4D642 UniRef90 V9E738 UniRef90 ${ }^{-}$A0A024TUE6 UniRef90-Q5D8M0 UniRef90-C1GNP1 UniRef90-UPIOOO359F1D1 UniRef90_UPIO002BCFO2C UniRef90 M7AR77 UniRef90 G1T8F2 UniRef90-L9KRW6 UniRef90-M8A027 UniRef90 B9RGC9 UniRef90-UPI00042BF75A UniRef90-I1QPHO UniRef90-11JWG6 UniRef90 ${ }^{-}$FoWGW3 UniRef90-C5WZP6 UniRef90-UPIO0045D7452 UniRef90 Q8AVS3 UniRef90-E1FLW0 UniRef90-P91144 UniRef90-UPI0003ADB31E UniRef90- M2WIV4 UniRef90-G5AHT5 UniRef90-K3ZVC2 UniRef90 A0A024G6z2 UniRef90- F6HB56 UniRef90-D8LG01 UniRef90-W2TDT8 UniRef90 D6RBE9 UniRef90-R7TSZ4 UniRef90-M5VTF9 UniRef90 A0A059BID0 UniRef90 UPI0003EAB318 UniRef90 W9R070 UniRef90_D7FJE4 UniRef90-ROJYC4 UniRef90-GOSAF7 UniRef90-V4S245 UniRef90-FOYFKO UniRef90 ${ }^{-}$V4VU25 UniRef90-A5AJ78 UniRef90_A0A022Q9T4 niRef90 G5AHT2 UniRef90-UPIOOO3EE0244 UniRef90-I1LLC1 UniRef90 ${ }^{-}$A9SB32 UniRef90- M3A659 UniRef90-UPI00023B32A5 UniRef90_M4BHL2 UniRef90 Q61QB2 UniRef90- Q6Y223 UniRef90-UPI0003C84960 UniRef90 D7T207
UniRef90-Q9ZVJ6
UniRef90-I1IQN4
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UniRef90-V6LCM6
UniRef90-A8PD83
UniRef90-M4DKS2
UniRef90 A5B3Y6
UniRef90-G2R457
UniRef90-B9T8F3
UniRef90 D7U8J8
UniRef90- V6LMZ8
UniRef90-UPIO001A625FC
UniRef90-UPI00023B3745
UniRef90 W6UZJ3
UniRef90-s9XSV2
UniRef90-G1XCZ1
UniRef90-UPI0002B43CD6
UniRef90 ${ }^{-}$A0A022T5X1
UniRef90-UPIO000E486FF
UniRef90-G3JA51
UniRef90 G5AHT4
UniRef90-G5AHT4
UniRef90-B2WAQ5
UniRef90_UPIO0042B512A
UniRef90- A0A024S6H7
UniRef90-E3Q6Z6
UniRef90-C1E164
UniRef90-E5GCK4
UniRef90-K3Z822
UniRef90 I1 QCV5

GNKSPVERC50 VHTRYPETYHKSLDSEMASETSGNYGKLL ${ }^{60}$ CTRTNHQDRPIKEAYGKVFGHDLERGDIGDTSGDFKHLCI VHHNNFQRQKILSAYEDMYEKNLDADIEEETGGFFLGMVV GSKDASQRYLVAYRYKVKYNKELYTLMKKENSGNFGILTQ AYRNTAQRQEIRSAYKST四GRDLTEDKSELSSNFEQVIL GKSHPEQRTLFRKKTPQLFWNDHCVRLLKHEFVRFKNALV
VSKTNEQRYLDWWRYY\|LYKQSLTVWVKSA GDYG\|LLQ GARTLAERYLVSVRYPQ $\downarrow$ HGKSLVDELASETSGDYRRLLL HFCPTLL

SNRSSDQRQQVKQKYKTMYSKDLEEVLKGELSGNFEKTAD ANRSS RNAIVTTFFSAVLSDVFIGLCWAYHGEEEKIQQ AERSSDQRRLIAEAYEAAYGEELKDDLKGDLSGHFKCLMV GKSHPEMRKSFRKGSPHLFIDEDERSHLKREEFARFENALV

AHRSPSERQKTKATYRTVFGEDLAGEVQK LMDELCKLLY CVLSPEELFAVRRAYHNKYKRCLEEDVAANTSGHLRQLLV MGRTNDEUS ILRQVYHEMYQTDLAVALADDLSGGFEKI ITT

VGHNNFQRQRTMNTYEY乌YSRVLMDDLKDELGGFFDDTDS CTRSPRQMRALRDTYQUDYRKSLDKDLTVKVEGVVGKMMH TNRTREQRQLICRAFQERTQQDLLKSLQAALSGNLERIVI

DRLAQDLRAQEKKAKK
ATRSPAERQQTRAAYRASFGEDLVAALQGULVDEDRKLLY MGRTNDEMLILKQAYFDMYQEDLGVAI A GDLSNDFEKIMK VK WQPE HLSTFRNETFEKCEEDLLKFGLKREFKR FKKDAVVV

TSRSNAQRQTLKK $\square Y$ HETYKQD LDKELESELSGDFEELI
GKSHPEKRKAFRKGNPHFFKEHRDKLLKREFSR FKNAVV AKRTIAQRQLIKQAFKAKYGETLEDAVCSDTSGMFKDMAQ AMRTRLERQQIRETYKADYGEDLVKRLQDETSGDLCAALP VMRSDAHLREVLRTYERKYHNFARDALKKNLVGEVIAHIL TS CNQA QLRALQDHYRAKYQRDLLDVVKKEFRGDFQDAVI

ASRSKPHLQDVAAAYYDQRDKPMLNRDRSETSGWYKLFLT VGRKSSHI ALIK QAYQTRYKRHLDQDIANEPPHPYQKILV GKWHSEHLESFRKRTPKFFDDHHDACLTKEFDR FKDVVV AHRNGAQRKLIREAYAAVHGEDLLKDLEKELSGDFGRAVS LSKTAEQRYLIWWRYR\|LYKQSLTVWVKS TSDYGLLLK

CTRSSAQLYLIKQAYYSVFCQTLENHDDGALARGSRPENT PGLSHDQIMEVRKEYKKQKGVNLSKHINMKLSGNFGKAVY


## ■GQSQASACW D DTETLKSELSGKFERLI

CTRSSDELLGARKAYQSLYGES $\square E E D V A S V E G D E R Q L V$ CTRSAEDLLGARKAYHSLFDQSMEEDI AS HV HGPQRKLLV AHRSSSERQQDKVTYRAMFGEDLVGRLRNTLDNEDCNLLY
CQCTPDELFEVTKAFYCCYGKD LSTVIKKETSGK LEDLLL
GNSHKDHRKLFRKASFEKCHDQFVKHDKDEFSR FNNAVV CTRSSDELLGARRAYQSLYSESIEEDVASXVDGDERQLLV PGLTHDQVMELRAEYKERKGVNIAKHIRARLKDNLMKACY

G GRARLE LGY DQEAFMELVGEVPDNRFQNGYMDTQRNE ASHTADERLAIAEAFAGLYGDTLEKWLKKELSGHLEKLMV

AERSNAQRQLIVKEYQAAYGKELKDDLK GDLS GELKNDMV PF LDS GDQMVDLRAEYKKVHNVNLAKHLKA QLS GKVQLAAY

S NRTADDLEATAVVYQSRYGETLLNDLRDHLTGKFEELVV TKRSNNQRQEIKEAFKTKYTQDLVDSLKDELSGDYRKTVK LQRSDAHLRAVLKEYERHYGNFAREALKKNLVGELLAHLL

VTRSDAHLRDVLRTYERYYGNFARDALKKNLVGEVDAHTL VNRDSNMLKLVRQTYSARYGQQLMSDVQRNNS LARIAY PSLSHEQVMELRAEYKDRKGVNIAKHIRARLKDELMKACY PGLTHEQI MDLRKEYPERKGVNVAKHIRSRLKDNLMKACY CTLDEADLFKLQNAYSSRFEKSLEQAMLSETEGKYKRVLL GKWNHEEKKLFRKRSFERWEEHGMRLLKHEFMR FKNAVV ARRQPEKRSGFRKGFPGFFKSHEDDRCEEEYMLHFKNLMV

## UniRef90 TOS7T9 UniRef90-O5DH70 UniRef90 $\mathrm{H} 3 \mathrm{FXU4}$ UniRef90-B8CCQ1 UniRef90-B9GM27 UniRef90_UPI0002B4D642 UniRef90 V9E738 UniRef90-A0A024TUE6 UniRef90_O5D8M0

 UniRef90-C1GNP1 UniRef90-UPI000359F1D1 UniRef90-UPIO002BCF02C UniRef90-M7AR77 UniRet90-G1T8F2 UniRef90-L9KRW6 UniRef90-M8A027 UniRef90-B9RGC9 UniRef90-UPIO0042BF75A UniRef90-U11QPHO UniRef90 ${ }^{-11 J W G 6}$ UniRef90_FOWGW3 UniRef90-C5WZP6 UniRef90_UPIOO045D7452 UniRef90_O8AVS3 UniRet90-E1FLW0 UniRef90-P91144 UniRef90-UPI0003ADB31E UniRet90-M2WIV4 UniRef90-G5AHT5UniRef90 K3ZVC2 UniRef90-A0A024G6Z2 UniRef90-F6HB56 UniRef90-D8LG01 UniRef90-W2TDT8 UniRef90 D6RBE9 UniRef90-R7TSZ4 UniRef90-M5VTF9 UniRef90_A0A059BID0 UniRef90-UPIO003EAB318 UniRef90-W9R070 UniRef90-D7FJE4 UniRef90_ROJYC4 UniRet90_GOSAF7 UniReffo-V4S245 UniRef90-FOYFKO UniRef90-V4VU25
UniRef90_A5AJ78 UniRef90-A0A022Q9T4 UniRef90 G5AHT2 UniRef90-UPIOOO3EE0244 UniRef90-I1LLC1 UniRef90-A9SB32 UniRef90-М3А659 UniRef90-UP100023B32A5 UniRef90-M4BHL2 UniRef90-Q6IQB2 UniRef90-Q6Y223 UniRef90_UPIOOO3C84960 UniRef90-D7T2Q7 UniRef90-Q9ZVJ6 UniRef90-I1IQN4 UniRef90 A0A023EKI6 UniRef90-V6LCM6 UniRef90-A8PD83 UniRef90-M4DKS2 UniRet90-A5B3Y6 UniRef90_G2R457
UniRef90 B9T8F3 UniRef90-D7U8J8 UniRef90_V6LMZ8 UniRef90-UP10001A625FC UniRef90-UPI00023B3745 UniRef90-W6UZJ3 UniRef90-S9XSV2 UniRef90-G1XCZ1 UniRef90-UP10002B43CD6 UniRef90_A0A022T5X1 UniRef90-UP10000E486FF UniRef90-G3JA51 UniRef90-G5AHT4 UniRef90-G5AHT4
UniRef90- B2WAQ5 UniRef90_UPIO0042B512A UniRef90-A0AO24S6H7 UniRef90-E3Q6Z6 UniRef90-C1E164 UniRef90-E5GCK4 UniRef90-K3Z822 UniRef90_I1QCV5
I

| ALRDESTQVDAQRVRKLYEAGKKNG ALFKPAHVLDTLQLYKSUSNRYGDH GLMTPTVLYDVQELRRAMKGAGTDE LWAMHPWERDARLVKEALKKGPQSY MLASPLEHVEAE LRKATKGLGTTE LLA QPLADAEATIIRDATKGAGTNE |  |
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DAETDYKAMKGDGTNEQADIDVLTKRSNVQR ERDALDNIETADKTKGVDEVTIVNILTNRSNAQR ALLDRPCEYDARELRKAMKGAGTDELVLIEILCTRVNKQR ALLDRPGPGDGAEASSVCHASGSAKEVATEGLATRAPARLV ALVTPPAVFDAKQLKKSMKKWGTDEDKFTEVLCLRSFPQL
RCAESPARYFAKALHKAMKGLGTSDTTVIVRVVTRAEVDM LWVLDPSER D GLVSSLAQS
$M A H Q G A A T$
$L W T I D P A E R$ DAQVLYKAMKGLGTDEQAlI DVATKRRSAQR MAIQGRAETDADALHEALKNKNKSNDELRMTSRSKTQL LWTIDPAERDARLANQARMMDDQHAWVLVEVACASAPDHL
 ALFDPAHVYLANLLH SSLCNHKLNRADAVEIACTRTTTQM ALLCNNRE SVKLYDPEEDAKALASALSRNKVDTDKLCDVLPRGSHDQU
LWALDPaERDAVVAREAVEGGVTGYRALVEVFTRRKQDQL TVTQARAEADAKRLFDAGERLGTDESPFYKILLTSPPEHLI QWTMHPWERDARMARKALKRGSQAYGLLIELACTRSSDEL A LMQTPTKRDVMDLHRAVKGLGTNEGVLIVILASRTNEEU

GLMTPAATYDAQChRDSMKGVGTRETGUGDLASKNSQEM NMSAPNLESECKEIHDSWGQLNQ LWAMHPWERDARLMKEALKEGPDSYNVLIEVACTRSSEEL
 LWMDDMHECDAVVAREALQQDNTNYKALVELEVGRKSSHL NGVINRPARDAMLLHHALMDAKHDRQQRVELLTSRDRLHL RMARDRAQCDAMRLQKSLWGNKTSEKVWRVCQLWWDRERL DAEQLHKAFQGWGTNEALIISVLAHRNAAQR YLISSPEDGDVRQLDAAMDGLGADGVALI EFLVGNSQARV ALATSHKAHNADVSQHVAKCDAKRLAVVLEIFSKRSIPQM




ALMYPPYRYEAKELYDAMKGLGTKEGVI!ELLASRTKNQL DSERLRVALQGWGVDQEVII WILGHRNAVQR ALYEGSRDNDVAVRAEAIKLGDTDEET $\square V R I L A T R S K P H L$ GLKDDSAKSDAKILAEAVASSGEEKDEVVRI LTTRSKLHL LWMLDPAERDA पMARDALESGLTGYRALVEVTRRKQEQL ACFEPRYKFWATQ MWSMHPWERDARVVKKALKKGDECYSLIVEVACTRSSDDL ALNDRADKLDTQKLXKSISGGDKKDEEIVRILTTRSKDHL ATALGRWESEAYWANFWYHGDKTRRELLIESLLMGRTNDEI
PGGLDPHPSDAVVVREALEQGDTNYKVLVEПFVWRKSSQ■ QLFKGRYQMWAQYLDDAVRGAGTDEKLLIEMIFLMSDQDQ DAEELYQAMKGWGTDEHRII KVLGYRNSYQR
 QWTMHPWER DANELEKAMKGDGTDEKKII
 ALLSKSTDFFAQELHHALRGSRDDENLLIDCLGTQNYNKL ALMDEPAVMDARCLNNLCQCGGDKMELLLELYPDSATDV NGVINRPVRDALLLHHALTASRKDSLRRELLVSRDPMHM AQELQRVCTGAASDEAALASLLLSKTAEQR NGVINRPARDAMLLNHAKHERQQRVELLISRLVRLHWDRL LRMVEPHERDAQMIRHSLFGGSDNLNIIIEVACTRPSSEL AVALGKWESEAYWANFWYQGDKTRRELLI ESLMGRTNEEV ATALGRWESEAYWANFWYQGDKTRRELLI ESLMGRTNHEIM AGCDGDAEAYAKVCRSAMEGAGTDCKAL: RIVMVTCTHQVM LWAMHPWERDAREAHHVLHQHHPS AGVVEVACTRSADE


UniRef90-UPIO00359F1D1 UniRef90-UP10002BCF02C UniRef90-M7AR77 UniRet90-G1T8F2 UniRef90-L9KRW6 UniRef90-B9RGC9 UniRef90-UPIO0042BF75A UniRef90-11QPHO UniRef90 ${ }^{-11 J W G 6}$ UniRef90 FOWGW3 UniRef90-C5WZP6 UniRef90_UPIo0045D7452 UniRef90_O8AVS3 UniRef90-E1FLW0 UniRef90-P91144
UniRef90-UPIO003ADB31E
UniRet90-M2WIV4
UniRef90-G5AHT5
UniRef90-K3ZVC2
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UniRef90-W2TDT8
UniRef90-D6RBE9
UniRef90-R7TSZ4
UniRef90-M5VTF9
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UniRef90-Q6Y223
UniRef90-UPIO003C84960
UniRef90-D7T2Q7
UniRef90-UP100023B2A6C
UniRef90-Q9ZVJ6
UniRef90-I11QN4
UniRef90-A0Ао23ЕКI6
UniRef90-V6LCM6
UniRef90-A8PD83
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UniRet90-A5B3Y
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UniRef90-D7U8J8
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G1XCZ1
UniRef90-G1XCZ1
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UniRef90-G5AHT4
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UniRef90-B2WAQ5
UniRef90 UPIOOO42B512A
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UniRef90-C1E164
UniRef90-E5GCK4
UniRef90_K3Z822
UniRef90_I1QCV5

QQ ${ }^{\text {AKSFKAQFGKNDEEDDADTSGYLERTLVCLQGSRD }}$ QDI AFAYQRRTKKELASALKSADFGHLETVILGLLKTPAQ VDI K D A Y K R LIF ERDLLES DVK S DTS G S L R KIL LVSVLQ A D R D QECLAVYKRDFQVEAEEDIKSETSGTLRDLLLALAKGGRE
 DGARKAYHSLIDHSIEEDVATHMSGTERKLLVALASAYRY QQDARSFKEQFGQDLDASLKSELSGKFERLIIAAMYPPFK FFTNQAYLARFKKNLEQDMVTEPSHPYQRLLVALATSHKS VATFNRYRDDHGDAG TKKLSDEGSDEFHKAANLADSCD MK MNEVYKSATQSDLVSALESEFSGPESDALVFHVRSA DAVRRAYRSLFGCSLEEDVAACPQDPLRKLLVSLVRSYRC QLI SRAFQERTQQDLLKSLQAALSGNLERIVMALLOR KALKNAYQTAFSNTLEKDVVVKVEGMFGVMLRLLLCSSRD AKNVNLFEELFGHSWKHDGTVLDKVDEARKDVQDIESVDR VEMRKEYKKQKGVNLSKHINMKLSGNFGKAVYVTALLGRWE KTFQEKYGEDLVKVLSGELSGDDKKVILTAMRGEEF FFTKQAYDTRFRRNLDQDMVTEPSHPYQRLLVALAASRKS MKINEVYKSGKSKDLVAAIDSEFSNYEKDALIFHVRSA LGARRAYQSLYSESVEEDVACRVEGDQRQFLVALVSSYRY AAAQTYYEGRYDESLVDKISSEMSGAFRDLLLVLLRGERD AEVKTEYKKKYGSSLEDDVVGDTSGYYQRMLVVLLQANRD AEVKTEYKKKYKKDLTADLQSKTSGDLRVVLLELLIKADRD QQLRETYKADYGEDLANRLQKADQMADNRKQAAAGVGVSP
 LLMKQEYQARFKRQLDQDLDNDPPNPYQKILVALVASHKA MRAMAEYEEKYGRMVEEDIEEATKGDFRQFCI AICQSAR TAAKQAYVRTYRRTLEEDVKVLLNGNAERFVLALLK KLIDRGYNETYGEDLLKALDKELSSDFERSVLLWTLT RAAKAKWEGRHDKSLVDRI RSELHGANETLALELLKGERD KLTFSCYKHDYGHDYTKSLKRGNSTDFEDALKMVVKCULN LGARKAYQSLFDQSME DVASRLEGDEXKLLVALVSSYRY ALLKKTFQEKYGEDLVKVLSGEDSGDLKKVILTAMRGEEF KVFDRSLESDVKADTSGNLKKVVSLLQANRD QEDRKAYEEDYQEDLDKRLESEDSGDFEGLVGLVTSYRY TATMNFYEQHYGHDFEKALSKKDAGEFDQALBAVVQCDRR RMDKDEFKKRYSDDGKKCMEKERKMDFRTAVLMVLEERRQ


RETMKAYEEDYGSSLEEDLQADTSGYLER\LVCLLQGTRE
 QHLYKHFNEDKGSDLEEDGGVSK SSSL NEALYCLGKPAMY FFTKQAYDGRFKKNMEQDMVSHPSRPYQRLLVALAASHKS RULRTAVRSFVGGGPEEDGLTPVVPFRRLCVSLVQGNRD QMLKTPYK KKYK KLMMDLMNGLSDDYRDI LAALMET DGARKAYHSLIDQSMEEDUSNIHGSRRKLLVGLVSAYRY MAVIKCYQETFNKNLIEDLDEESSELKDTIYCLCXPPQY RRIKEGFSKKYANSLTKCMRTELKEDFKKAVLLVLEEQRM LLMKQDYGARFRRQMDQRDSSELSGKLEVALLLWMHDLPG QRVEVEYRKLFNKDLTKTVEGDLSGHWAKLIVAWLHA KK K DGARRAYQSLYSESIEEDVACQVEGUQRQFLVALVSSYRY QEMARAYKAAYGKDLQGRLRRHLSGDDRRAVLCS KE:IGHAYCTVYKKSLGDAISSETSGDFRKALLTLADGRRD DDIKQSYRKADKKELAADKATGEKFKDLVLLQLDTTTRGL QEIKRTYADHYDTSLEEDLEKYTTGHFRYLLHELLRTKRC LGUAADYKETFSTVLHEDVSKSDAGPFKDVILNLLVGERS YL: WWRYRLLYKQSLTVWVKSTDYGLLLKMLASPL
YLIWWRYRULYKQSLTVWVKSTDYGLLLKMLASPL HRVQTEYDEKYGRVVEEDLEEATKGDFREFCLADCQAGR
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QDVY
PHAALRKALKGAGTDEAILNDVLIGRS
 YGSVI DYELIDQDARELYDAGVKRKGTDVPKWISIMTERS EGLEI DAELAGKDAKELY Y SYSGV $\operatorname{S}$ DYNLAEQDAQALQQDQG PHSEGTWVRDFTQRN PYRFQGAGTDEFTLNRIMVSRS
EGPKVKEDSAKFEAK DFANAVKNGDKTNPDEVIRTLSTRS YDCYMDSATVLQDAQALYDAGEK $\square R G T D E \square Q F I T I L C T R S$ HHDELSRHDAKCDARRLYDAKNSGMGSVDEAVIEMFSKRS NDHKKYYEKVLRNAMEHLGT AEDALTRVIVTRA ETERVDEDVARMEAAQLAEAAVRKRRQPHGDEVARIVSTRS

PAARFDAQELRTALKASDSAVDVADEVLATRT

 SEGYWANFFYQSH
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 $E S S \square G E Y H K A V Q E A H N D L R C S D K R G Q M D K D D A Y K V L A T S N$
$P D A G I D E A Q V E Q D A Q A L F Q A G E L K W G T D E E K F ~ D T I F G T R S$ PGNAVDRNLARED
K LCMWMDEQHERDA VVREADDDQQGTNYGADVEDFVRK
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PAERDAY LANEAT KRLTSSNWVLMEDACTRS
 PPNY YAKTLYASDKGTRVDKAAVARVLVSRA EGDRVNEGTARSEAMTLADAVDKKNPIEDDAIVRILTTRS EGDEVNMMLAKAEAK LGHDKUSEKAY FDDEIIRILTTRS NAS HTSAKAAADADALYKAGEGRMGTDETTFINVVLSP EGEDVDKDLA GQDAKDLYDAGEGRWGTDEDAFNEVLAKRS EGDEINVKFSQTEANVLHESVKEKKGNS EEVIRILTTRS PS S EFYAEDIITALSKGNG P PVDEDTLVQUITTRA E EQDMYPAEYVHRDVDTLYRSVKAEKGGESAMLEII $\square R R S$
 PYNPHTAAKAEEEAVALYKAGQGRLGTKEEVFVGURVKAP

 FSKILDSAMKANANEDEKEALT $R 1 V V T R A$ FSKLLDASLNK DADKTTKKWDT RVFVTRA HHDEPSWHIUAKCDARRDYDAKKGGTGSVDEATDEMFSKRS ENTGVDEGAAAADAQALFEAGEGQWGTDES IF NQULVTRS DRNQAQQDATTMTQAGKGAGTDEQAVIRMLCTST
EGNKVNDDLAKSDAKILAEAVPGEKAlIENDEVVRILSTRS FSKILDSAMKANANKNEKEALT RVIVTRA EEEDVDYDLVDDDVRQLRHAVRSEKGGE S LMDSIVTQRS RDA IIVRQGLLPDISNIEAAT HHADVSQH IAKCDARRLYEAGVGKSGTEEAVVLEILSKRS NDAPANPEKIADDLW AAAKGAGTDEQVFMQVLANCQ

 ESQKVDEQLAKKDAQLLYNAGEKRWGTDEDTFTEI LCDRS HMNEWDKDKVRDDAEDLHDALAKDKVDSFFVGKKVITRS
 S S R V D T A A ANDDADFFFKTKPEDWQLPNERVETLFGRAS N HIR H

Y GCKADMS LDACDAKT LTEAMESGKNDDQKT\|TSVLTSRN E E Y P LD Y KLID Q DVA DLYKAVKSDKGGE TMMISIVVQRS
 D N DE T D P D Y D A D I Q L L H D A V E G G L GT D E D A I I G V L R N K T
 E GPPRVNN E V A R R A E A K A L G A A $V$ K

|  | UniRef90_T0S7T9 |
| :---: | :---: |
|  | UniRef90_Q5DH70 |
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PQFVATVDAAYAAKHSHGLVUAIIQKEFGGKAEDGLVYHVVIN



KPH LTKAVYKHYKETSGNGTIEDL GAANLILKETVE ATHLLRVFDEYQKLASKSLEDSIQSETHGSLEDAMLAVVK DPQLRLAFCSYKHIYGHDYTKALKKNGFGEFEQSLRVVVK EK Q L R K A K C S VY Y K RN SVMH

, NSEEKEINKVYKEEFKKDLAKKDUAGDTSGDFQKTLL


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SRDDFAAKQAYHARYKKSLEEDVAYHTSGDFRKLLVPLVS PKQNRAVRSAYEKKHNKSLESLI EREMSGNLKKCMLA
 KAQLNATLNQYNDHFGR
AHHLK KVDAAYSKKYKKS VKA $\quad$ KKGEFKGDAQAALLFHVR HKQLRATFQAYQ\|LIDKDI EEAI EAETSGDLQKAYLTLVR KTQLVATFNRYRDEHGDSI SKKLLDQTSDDFHKVLHTAI R DVDMHMDRDEFMKECKRALEQVISERAMGVIGQFLVTAIIR D THLKKVLRAYERTFNENFARVALKRSNNLVGEVI AHLL N
$\stackrel{P}{\mathrm{P}} \mathrm{A}$

## \section*{}

UniRef90 ToS7T9 UniRef90 Q5DH70 UniRef90_H3FXU4 UniRef90_B8CCQ1 UniRef90 Q9R0V2 UniRef90_B9GM27 UniRef90_UPI0002B4D642 UniRef90 V9E738 UniRef90-A0A024TUE6 UniRef90_Q5D8M0 UniRef90_C1GNP1 UniRef90-UPIO00359F1D1 UniRef90_UPI000359F1D1
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VA R N S QLY F A EK LR N A MCGDKS D H P T II R V IVTRRSEDDMA MK LT P Y P T MAEHILKSTCAGMGTD ELGLSCAILRYQHVLP
$C$ C T P H A YF S K VLD EAMSS DA HKNK GLTRVIVTRADVDMK
 $M V F E P F E L L A D D L F E S T M K G L G T D D E Y G L S A A V V R Y H A M L D$
 A GRD
A ARHELEQDVRDLNHAMAGLGTDETTVCR\FAGRS DAQLR D R P H L H A Y AL F KAMA GMGTKERVI IQVVCTSNNADIA
 CDQN KP LIY F A D R L Y D S M K G K G T R D K V L I R IVMI S R S EVVDML


CLCTPHAFFSKVLDKAMRKDADHNKALTRVIVTQADIDLK CTKNDHSYFAERLYHALKGAGTCDGTLIRIIVSRSEI DLDN $C \square Y N P S M Y F S K L L H R S L Q Q S A T N K R L V T R A L G G S D D D V D M D$

C LTS SPEK HFA EA $\square$ RY S $\quad L$ GF GT DED T LTTRA I DS GSE $\square G M N$ GGRDSYS GIAEQDVRALDEGPSTEETWVPLFTQRNPEHLI
 $\square S R N T Q W Y F A E R L H D A L S S S K P D Y R T \square M R V I V S R S E \square D L S$ GFNNLENSFA
VIM N TP LIYFADKLHQALQ
ERRYP QEYDVDMLYRSVTARKGGESPMLE IVRRRSDABLT

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


C $\square Y K$ K P P NYYAK T LY G S $\square K G \square T G D K A A D E R V M V S R A E V D M D$

 $L L L P P$ A D Y Y A K RLLKEAFKGLGGTS DRVVVRVLGGHDKA DVL
$C L C N P Q A Y F S K V L N N A F K D D A D E N E A L T R V I M T R S N D D M K$
$M$ VF E P F E L L A S L FE S T M K G L G T D E Y G L S A AVVR Y HVLLP CARDQE GYFA DRLYKSMKGAGTDEETVIVIIVVRAEVVLQ


GVINKPARDSLLLQHA $\square$ REKNRDDELRYELLISRDKSHMA




S Y R N VA K S EA A K L HEA $\square E K K Q L D G D E V M W \square L S T R N F F Q L R$ R A
$C \square Y S P S K Y Y C K L L Q K S M Q R P E S N K R L V T R A T L G S D D V G M D$ CVRS K V Y Y F A K RL H H S M A G L G T N D K T L I R I I V S R S E I D L G
 R A L P K
G I I N K P VR D A MLLH H A LT A SRRDRE LLISRLV R Y H WDMA T P RYMA Q D D A K T L Y K A EKK K L G T D E K T F I R V F S E R S GA H L A CMCSPA KYYAK T L H S S DK G SA T D K G A L A W WV M A S R A G V D V D



 FAK S R D $\square$ Y $\square$ AK R L Y E S FN DN D D H R S LI R L M I I S K D $\square G N N$ S M C Q P L G F YV D S L Y W A M K GL G T D D D K LidR I V V GR S E

GTSVKAAADADALYKAGEGRMTDETTEDNDLVLSPAEHVR GTSVKAAADADALYKAGEGRMTDETTFINILVLSPAEHVR
$C \prod Q H P E K F F A K Q L R \quad M K N A D G R E \square L I R T V V T R S G \square D \square K$ GVINRPVRDALLLQHAITASRKDPELLISRLVGRYHWDMQ GVI N K P V R D A L L V H H A L TA S R K D R ELLLI SR L V R R H WD L E

 CLAA A A K Y F S Q V M E GA L R D GA D H H E A L T R V A V T R S D H D M D

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D V VEE Y K RRYQRSLEFDISQTCSGDYCRLVLSVI RVMDEHTNLFGKTIHDRVASETSGDYKNLLLEMI

E DK E EYMNDF GVSDSKKDEEKANGNYRDFLVTLI LTFSCYQHIFGHNFTKDLKFRNCGEFENALRTVI QIK S A YKKMYGKELSKRI RGDTSGEYRDLLLAIV EVAPAYKAKYGKSLRDRIHDETGGDFQKLLLIVL
A ITSQQYKAQFNKDLEKEITSEFSGHLRSAL DLRDAYEEGMQSTLEKDI RNDLSGDFEKFIVALL
 S $\square$ R A E F K K K F G K S $\square$ Y S S $L$ Q D A VK G D CRPA L LA LC
 LVKAEF LKKA GKSLSTMULEDTSGDYKTALLNLCG K I K S VF K S S Y GK DLE DF IE S LDPENDYRDFLL
$K$ K E E Y KVRFKTTVTS DVVGDTSGYYKDF LLTVVG RVFDQYQRSTGQELEEAVQNHFHGDAQAALLGL KVLQRYARYSKNDLNKAI DLEMKGDLEKKL N $I$ CHEYKQHYNHSLFPD $\| R K \square C R G E Y Y R L L T S \square L$

KVLRMYESMYKE
RI RUVYMRDYRQELRTRTQSVVSGEYCQLLLSV EI RSAFKSCYGRNLADFIHESLQSDYRDFLVAV

D\AEEYNKQYGTPLAKK\EDVALGNYKDFLVT LV LIA ERFEQKYDQSLVDALKDELRGKFEKGTVAWV

NTRKEFRKNFATSTYSMTKGDTSGDYKKALLLLCG DIGKAKYKS LYGKKLENEVSSETSGDYRRALLAVVL $\begin{array}{ll}L T F S C Y K H G Y G H E Y T E Y & L \\ L & T\end{array}$

E $\square Q R V Y K K K Y G \square Q L R D A L E N \square P S T D Y R D F L V A L$ $A \vee A A Y Y L Q T Y G N S L V E D L K D E L S G T F L K A$ ALC

A
A $\square$ AK R Y HE K Y G K H L K D S $\square K$ S E C S GNYKRV

EVKTAYKKLYGKELSQRIRGDTSGEYRDLLLP\|V GI KAKFQEKYQKSLSDMVRSDTSGDFQKLLVALL DIK ELGYYKRNSVHLEDEVSKETSGDYKKFLLTLLG

RVKREYYEKYRDTLEDADEEATKGDFCEFMCELC EI AEEYNKQYGTPLTKKI EDVALGNYKDFLVTLV YVKA A YKK L Y RKELRDRI GEETSGDYKKLVLSVV KI MQEYKRMYGKTLQEAI QSETKGDYEKILLVLCG RIRDEYKKTYGKTLHQEILDDTKGDYEKILLALCG
ATFKHYKQNYQVP $\square Y Q A \square M S S G S D D L G S L L$

K TK LIAFKSNFGRNLGDFTHESLQSDYRDFL
Di KEAFQEMYGKSLESWIKEDCEGDDGDLLATL


LVRRAYREQYGRELQDAVREATSGEWGEFCVALC AVDYAYHNMYGKSLKKVIKGETSGHFKHALLTGL ELVRVFRKKYGMELKEADYGSDSGDLRD QLVEAYK $\square F$ GDVVKDTKRDLSGKFEKAVLAVWG S C C IEFQKSQGSTLEDWMRNETSGDYQRLLLALIGG
 A I NEAYKKYTRKNLREMVKDDTSGNYKKFLLAILG
 YVREAVQQRNHVALIEYF ISQKTYGSYQQ
$N \square N S A Y V A K Y K T D L A G A D T A E F S G D A K R A L L F L V$ NINSAYVAKYKTDLAGALTAEFSGDAKRALLFLV

## A $\square$ NKAFVAKTGSSLENLVIRE

DVKRAYRERYGQDLQDAVREATGGQLGLFCSELC AI KRAYRERYGRDMQEAI REATSGEWGLLFCRELC LI RNAYTRVHGRDLDADI RKNCKGDYEKALVALV


RRARFYDPEDDAQRLAKALRGHPPDTGPLIEIL
 RRARFHDPVDDAARLAQALKGHPPDTEPLIEIL

YDAEEDASA\|LKALTPRDPDADVLIDIL


D P E D D A A T L A Q A LK G R A P DVG P L I Q L


P Q Y T G T $\square$ K P VE GY D DEE DCALL Y QVIA S Q DWH QLI R I L
 KEKTRFSAS $\square D$ A E Q $\square H$ A A CD G VGT D DKALVQLI
 Y D P K D DA KL V H S AL NHSK $\square$ NA K TLL $\quad$ K L

R R A R F H D P P V $V$ D D A L R L A K A L K G R E R D P D T L I
PAGPPRPATPPYNPTEDAKALLSALRHFRPPTGPLIDGL

AERDAF $\square$ ANEATKRWTSSNQVLME $\square A$

RADVK GAGTNEMLLTEAD
Y K P S L V P Y S D E D A F
E DD A M K L R K A M K A
LLTMTNDNFEDDCER $\square R D A T D G \square G V D E K V L V D A \square L$
$P$ QHAA QAFHSAFS GllGT REKAV I LCCV
PKNLDPREDAACLYRACEGHGEGEMMI: EABA
HPTVYPAEPFNP E ED TA LLLRTAMKGFGTAEPTLIDVL

EADCRHLNQFFS GNVSPNNAVLE $\square F$

AEQDAKLLFKASKQLVEGDQA■LQSL

YEPTVVSSPGFSTENDVYK $\square R N \quad M T R D E K N D K \square L Q V L$ PAPLGTMM VPGYDPHPDFEYMQGAREKLRKEGDSRFRLL $P$ LD Y DVVD DVQD L R R A VKA DK G GESAM【A V V

ES R T LT K A F S G LGGVNEKSMME L L

P A P LGGT $\square$ K VP GYDPEP DFELLQAARGQAK VDVSTVVVP V
ESECREI H GACD

| $E$ | $P$ | $R$ | $R$ | $L$ | $I$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $Y$ | $L$ |  |  |  |  |
| $V$ | $H$ | $P$ | $L$ | $I$ | $T$ | $I$ |

RTARFHDAQDEAEMLRDALKGRAPDVHPLIDTLL

RKSFNGFFKDHGGVIE
ES $\square R$ S A $\square E S$ LLIDNEP ELLTK $L M$
$N \bigvee R A R E D A E \square L Y K S \square S T F G T D Q K A L L N L V$
MKEFRTDEHTI I D I L
PAYYPEDDCDK $\square$ HRACKGFGTDEKALIADL
R G T $\square$ Y GPP D F H P V Q A S E T L R S S L H G L D T K D Q T I N T M A QDLHNA MQR

AKSAAVQVQAELDGVFGSNEDLLKVL


LEEDMAGWGTDEGRワFER\L

ATSPT IVGMKNFDVNTEVRHLQKLFDKPSPGNELVKEGL
AAAKATEIKTLDDAK DMDGLARSV
N D D GLL L K I T
GWDASA VAARVREAMGSKGPARERRLVASSL
S Q V VA D MK QA DD AK


UniRef90 G4N6H8 UniRef90 W5DXP8 UniRef90－J3LH67 UniRef90＿U7PNX3 UniRef90 UPI0003513CB4 UniRef90－M7SMD5 UniRef90－A0A059AUA4 UniRef90 B3KRQ1 UniRef90 K2S4N2 UniRef90－M1WHS3 UniRef90＿V9E388 UniRef90－UPIOOO42B0226 UniRef90－W3WVC4 UniRef90－G2Y909 UniRef90 UPI0002654A65 UniRef90－R7TKV5 UniRef90－B2AU01 UniRef90－M4FEQ6 UniRef90 V9EBE2 UniRef90－G312P8 UniRef90－W9RHX7 UniRef90－s7ZY92 UniRef90 F2PVA8 UniRef90－A0A059DHL2 UniRef90－G1XKL1 UniRef90－Gos004 UniRee90－UPI0003C164F6 UniRef90－D5G101 UniRef90－A3BTA4 UniRef90 UPI0003EC238A UniRef90＿UPI0003D73A4B UniRef90－UPIO002653520 UniRef90 U6D5U2 UniRef90－W710T7 UniRef90－X6MAJ7 UniRef90 L8G152 UniRef90 A7RWX1 UniRef90－A0A059BJB7 UniRef90 W2QYL9 UniRef90 K7MOL2 UniRef90 V6LIK2 UniRef90－G7Y7L0 UniRee90－UPI000258DAOF UniRef90 C9SAW8 UniRef90－B9D112 UniRef90－B8BEX3 UniRef90 K718D5 UniRef90 UPI0003513910 UniRef90－R7TRM6 UniRef90－W5BIU5 UniRef90 UPI0003D6E8F7 UniRef90－C1L651 UniRef90－A8N3U4 UniRef90 A0A016RU94 UniRef90 T5A629 UniRef90－S9x6W3 UniRef90－H3DK45 UniRef90－UPI00023B2A64 UniRef90－O57570 UniRef90－D7T2R7 UniRef90－UPIo0045410CE UniRef90 A8N3U1 UniRef90－MOWTY8 UniRef90－A7EB97 UniRef90 FOX230 UniRef90－X6MLD8 UniRef90－V6TZH9 UniRef90－B9G381 UniRet90 B9FPC4 UniRef90－E2RTW5 UniRef90－S8CC48 UniRef90 ${ }^{-}$F2DY18 UniRef90－T1 H5X5 UniRef90－C3Z154 UniRef90－K0SP13 UniRef90－K7GWR9 UniRef90－Q4VPP9 UniRef90－A5BKB1 UniRef90－L7UHU9 UniRef90－UPI0003EC1391 UniRef90－E2L4W7 UniRef90 H8N1E3 UniRet90 Q4VPQ3 UniRef90－R7UAT1 UniRef90－C6LNA6 UniRet90 X6NM34 UniRet90 E2RU57 UniRef90－E2RU96 UniRef90－M7X2N4 UniRef90 P19389 UniRef90＿X6LB17
 GRWQPEKRAQFRRGFDERCSDDYVRHLKTEFAR FKTLMV
PGLTHDQVLELRTEYKERKGVNDAKH $\square R A R L K D E L M K V C Y$ CRRTAAQRAAI RRAYAFLYREPLLNCFRYKLSRHFWKALI PGMTHEQLMELRAEYPEHKGVNVAKHDRARLKDEDMKACY

PALSHDQLMEDRTEYKRПCGVNDAKHTKMKDSSNFGKDCH PSLTHHQVMELRSHYKRRKGVNLAKHIRARLKDPGMKACY LS K T T E QRYLI WWRYR L L Y K Q S L T E LVVK S K K DY G T L L E PGLTHEQVMDLRSEYKERRGVNIAKHVRARLKDELMKACY PGLTHEQLDDLRAEYHDRKGVNIAKHIKLRLKDELMKACY CTRVNGEIEAIKMAYQDEFDRDLAEDLENETSGHFKYLMQ VSRPY PGMSHEQDMELRQEYKERKGVNЏAKH RARLKDNLMKACY
GP पS PNDRALVS पRYKELHGQTपRELVKSETSGNFGYLLQ
CTRSSSQQQCTKEAYKSRYKSDTEQDTSMRTNGGFKETLL FGRSNQELEVMRSFVRSNYYKTLEEYVRADVSMGTKDLFD PY号TSDEI LDLRGAYMTRKGVNMAKHIKMVIPGNFGKVCY LGRKSSHIQLIRQAYQRKFRRQLEQDLINALATSHKAHQA PGLTHEEVMALRAEYPENKGVNVAKHIRMRLKDKDEQLMK
PT पS PSQ $\square$ LQ $\square$ REYKS $\square$ FRKN $\square$ AKH $\square K S N T Y G G F G K V A F$
CTRFSKQLIEARQAYHASYLQDLEADPKDEYपDLLRATVQ
FGRTNAELEATKTYVRSCYGKTLEDYVRSDLSMGTKAQQL TSRSYDQRLKIKRMFAKVDGRDLDKDFYTELNGAFRDVIL MGRTNDEDRQUKDAFRKKYSDSLTRCMKQELKRMDERPGR

SSLSASDRSLLIYRYKDLYREERKDTLGRDTVGDFRLLLL ACVTHHERQQLRETFKAVNGEDLISHLQRSSSSMNCSAI S KGATNEQLQDMQLAYNQMFNKSLAQTVRFETSFNFEKLVL GNRSLAQRLEDRKVFEQUYEADLTKALASKMKGNARFLAV VGGUVKGADRKGVNUKHURSRLKDSGMKACY
TARSSQEMKQDCRAYSSMYRQDLIQLL SQQKTTFARVAC
ПKRSHPQRMATKRKFEEMYDMDपETE पKGGपDREYGP पVE DSRTNAERQS VRNYQK
VKRSEAHDRAVLSEYEHRHRNFAREALKKNLVGELLAHLL
VK WRPKVLTTFRNESSS $\square$ F पKF पFERCQDKEF पRFQDVVV

VK LT LQQRDALNDYFVAKTGAD
AHRSAPERQQiKATYRTMFGEDPVGRLHKTLTNELCNLLY PGLTHEQ LLDLRTEYHERKGVNDAKHUKLRLKDELMKACY
DHDNEDQRMQVVLAYGTKHKHHDHKL！RGNTKNKDQD LS KNYPPNQLRNMQRTFQA $\mathbb{T}$ GTFLDAFLKKHDSKDFETLVL
KCEEEYMLHDAAEFSRDSMEMELIGLLWLCDFTVQNLMV TSFSKEHLFMFAKDYQTQTGTDLLSLLREKLNGPLEKLIL
GRRSNQHMQLVRDEFEKDYGKDLVKETENNVSFKFKKLLV TNSSNKQHQFVLEVYNAEYERDLIDDLKGE GGNFE
GTKNAVERSLTAFRYPQMHSKKLKDLMKKENSGDFGFATQ LYHNNFQRQKI LGAYEDMYSRQLRALRETYDTDYRKSLDK GRYVSGYREKUALAFMEQYNVLPADLFKEWGTGYFESLMD EKQTPEQRQATAQKFAEMNGDRLGKELNPEQLGRARNMLA S $\square$ PSPPVRKFPGSY可VIPPLL SPSS
ERATPEQRALLAQ DEGLKAKLKDELSTEEYDRAV ASYGSEQRDKI DPAYHANYGIPPSEAIRKAFKGFYETMIV QGCTTEQCHEVAAQYDALYSQGLLESLQDHCQARTAF AL KYNCQQRVELLKSWPE LETNARKY保CYYGEDLLRL ADFNDKQRAEI HAAFRAATGKTTSEYLDASFKGDYKDLMM ARYKTAERQEI SNAFQAHHGRVISEAIKMYCKGPFQSLMS TPLTFPQLKALDKAYAAGTGKTLLETVSAEFKGNVEFALR SEYSADARQRIAQGYRDQYGKELPDDIKKALKGGSEESLL

UniRef90 G4N6H8 UniRef90-W5DXP8 UniRef90-J3LH67 UniRef90_U7PNX3 UniRef90_UPI0003513CB4 UniRef90-M7SMD5 UniRef90_AOA059AUA4 UniRef90-B3KRQ1 UniRef90-K2S4N2 UniRef90-M1WHS3 UniRef90-V9E388 UniRef90-UPI00042B0226 UniRef90_W3WVC4 UniRef90-G2Y909 UniRef90-UPI0002654A65 UniRef90-R7TKV5 UniRef90-B2AU01 UniRef90_M4FEQ6 UniRef90-V9EBE2 UniRef90-G312P8 UniRef90-W9RHX7 UniRef90-S7ZY92 UniRef90-F2PVA8 UniRef90-A0A059DHL2 UniRef90_G1XKL1 UniRef90-G0S004 UniRef90_UPI0003C164F6 UniRef90_D5GI01 UniRef90-A3BTA4 UniRef90-UPI0003EC238A UniRef90_UPI0003D73A4B UniRef90_UPI0002653520 UniRef90-U6D5U2 UniRef90-W7IOT7 UniRef90-X6MAJ7 UniRef90_L8G152 UniRef90-A7RWX1 UniRef90-A0A059BJB7 UniRef90_W2QYL9 UniRef90-K7M0L2 UniRef90_V6LIK2 UniRef90_G7Y7L0 UniRef90_UPIO00258DA0F UniRef90-C9SAW8 UniRef90-B9DI12 UniRef90-B8BEX3 UniRef90_K718D5 UniRef90-UPIO003513910 UniRef90-R7TRM6 UniRef90-W5BIU5 UniRef90_UPI0003D6E8F7 UniRef90_C1L651 UniRef90-A8N3U4 UniRef90_A0A016RU94 UniRef90_T5A629 UniRef90-S9X6W3 UniRef90-H3DK45 UniRef90_UPI00023B2A64 UniRef90_O57570 UniRef90-D7T2R7 UniRef90_UPIO0045410CE UniRef90_A8N3U1 UniRef90_MOWTY8 UniRef90_A7EB97 UniRef90-F0X230 UniRef90-X6MLD8 UniRef90-V6TZH9 UniRef90-B9G381 UniRef90 B9FPC4 UniRef90-E2RTW5
UniRef90 S8CC48 UniRef90-F2DYI8 UniRef90-T1H5X5 UniRef90-C3Z154 UniRef90-KOSP13 UniRef90_K7GWR9 UniRef90_Q4VPP9
UniRef90-A5BKB1 UniRef90-A5BKB1 UniRef90_UPI0003EC1391 UniRef90-E2L4W7 UniRef9O-H8N1E3 UniRef90-Q4VPQ3 UniRef90-R7UAT1 UniRef90-C6LNA6 UniRef90-X6NM34 UniRef90-E2RU57 UniRef90-E2RU96
UniRef90 M7X2N4 UniRef90-P19389 UniRef90_X6LBI7

ATALGRWESEAYWANFWYHGDKTRRELLIES $\square$ MGRTNDE $\square$ LWTMDPAERDANLVHEAVKKKDENYVVLI EMLVS
ATALGRWESEAYWANFWYQGDKTRRELGI ESLMGRTNAEV
 ITTALGRWESESYWANYWYQGNNSKRELLI
 HYRDHQRMADLEALDKAFSGLGVVDENSLISILANSNHEHK TVADGKWEGEAYWANFWYQGDKTRRELLI ESIMGRTNDE

 ATALGRWESESYWANFWYHGDKTRRELLIESLMGRSNEEI PGERDALLVNEATKRWTSSNQVLMEVACTRTSTQL $\begin{array}{lllll}P G G T D E Q A & V D V V S S R S N D Q R \\ S G K M D Q K A & \text { S }\end{array}$
 ATALGQWESEALWANFWYQSSRTRHELLDESLDGRPNAEIL
 A CYLGR WESEGYWASF WYHGDKTRRELLDEALLMGRTNEEG
AVALGPYESESWFANCWYQRKETRNELLIEALMGKSGDED
RDA $\square$ D LHRAFKGFGCDATAVTALLAHRDASQR


VYDYDK LQ LDVQRIIS A YNDFAKHSAADCHVLTQRTPDQL


$\overline{L L T M P L P E V E A F I L N V A T S G S G T K E R L L Y P I L L G R T N E E L}$ LWMLDTHDRDAVVAREALQQDETNFKALVEIFVGGKSSHV STLQPRYQLWA ECIHHAVAGLGTDEKRLIGYVFMMDDYDK



A VLT EREDADSSE $\square$ NRA $V R$ SNDT AS $\square$ TE $\square$ LCTRNSTA $\square$
 $N G V I N R P V R D A L L V H H A L S A S R K D R E L L I S R L V R F D P A H M$ DAETLRKAMKGLGTDEES LLTLLTSRSNAQR
QWTMHPWERDARMARKALDRHPQAYGLLIE $\square$ AC $\square K$ SS DGL
LS ALCCQAPGTARDTAVE I LATRPDPRIL
 AVALLGQWESEAYWANFWYQGEKSRRELLIDESLMGRSNRELI
 MLYKPRAQLLCELIRGATKGAGTDEKCLVDVLLTDEAHEV RYEADCRHLNFSGNVSPNNARPVLEI FTARSSQEM MWAMHPWERDAR LAHHVLHQAHPA A IVVEIACTRTAEEL
 GLIK S YPEYRGEEVYDSLKGLIDDKWALVDFIDGNDPRSV

## YGEAMEGMNTDQGTLVEILCSKSNEEV

LLALPSDEYDAHDFYKKGKTFGTDEAALFE! ICKAPPEYL DiTVKVEGVVGKMLNLLL CTNRDEGLGIKILSNVSDDDI RCWTNRHEARAKMLKEAI R GADDRDALVDLVILCSTDDW
 TVHRKHSVHDSDI DETA GLGGTDEETLDEIVCSRNNEEL
GLMQGPAQADAARLREAMGGFGADESGVRDTLQGKTPEQD HAWTSRFELRAKLIHESIKGKDDVITLLDLVIACMPDDW

 IVLDDE VDVRCRLI KKAFK GGNDERCLTDTLETTTPEDY MAWEPYPEMKAQNLTTAMK GGKNPKADCDY ILTTNPDEW GLLMGPLAWDVWLLQKALDSATVNETLLEDLFIGRPPSALD

UniRef90_G4N6H8 UniRef90_W5DXP8
UniRef90_J3LH67 UniRef90_U7PNX3 UniRef90 UPI0003513CB4 UniRef90-M7SMD5 UniRef90_A0A059AUA4 UniRef90-B3KRQ1 UniRef90-K2S4N2 UniRef90-M1WHS3 UniRef90-V9E388 UniRef90_UPI00042B0226 UniRef90_W3WVC4 UniRef90_G2Y909 UniRef90-UPI0002654A65 UniRef90_R7TKV5 UniRef90-B2AU01 UniRef90-M4FEQ6 UniRef90-V9EBE2 UniRef90-G312P8 UniRef90_W9RHX7 UniRef90-S7ZY92 UniRef90- F2PVA8 UniRef90-A0A059DHL2 UniRef90_G1XKL1 UniRef90_G0S004 UniRef90_UPI0003C164F6 UniRef90_D5GI01 UniRef90-A3BTA4 UniRef90 UPI0003EC238A UniRef90_UPI0003D73A4B UniRef90_UPI0002653520 UniRef90-U6D5U2 UniRef90-W710T7 UniRef90-X6MAJ7 UniRef90-_L8G152
UniRef90_A7RWX1
UniRef90_A0A059BJB7
UniRef90-A0A059BJ
UniRef90-W2QYL9
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UniRef90-V6LIK2
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UniRef90_B8BEX3
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UniRef90-A8N3U1
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UniRef90-A7EB97
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UniRef90 B9FPC4
UniRef90-E2RTW5
UniRef90 S8CC48
UniRef90-F2DYI8
UniRef90_T1H5X5
UniRef90-C3Z154
UniRef90_KOSP13
UniRef90 K7GWR
UniRef90_Q4VPP9
UniRef90_A5BKB1
UniRef90-L7UHU9
UniRef90_UPIO003EC1391
UniRef90-E2L4W7
UniRef9O H8N1E3
UniRef90_Q4VPQ3
UniRef90-R7UAT1
UniRef90-C6LNA6
UniRef90-X6NM34
UniRef90_E2RU57
UniRef90-E2RU96
UniRef90-M7X2N4
UniRef90_P19389
UniRef90-X6LBI7
UniRef90_X6LBI7

HEIIKQAFSKKYDNSLRNCMKTELKEDFKKA ${ }^{150}$ MMMVLDEQRM ${ }^{160}$ LGARRAYHALYHRSLEEDVAYRVKDAAARLLLGLVTAYRY AVKQAYHERFKRSLEEDVAA HVTGDFRKLEVVEVTAYRY

## H HI

GRDKDAFSKKYADSLTRCMKTELKEDKFKRAVLLVRDERYG LV D E QRM KAI CQTYSVLYGHDLLRVISSQKSSAFNRLAYLRMSDPQS QEI NRVYKEMYKTDLEKDIDSDTSGDFRKLMVALAKGRRA HEIDDSFKKRYGDDLDRCMETELKKDKFRMAVVMAANRQE RHI KDAFDKKYDHSLTKCLRMELKEDFKRAVLAVLEERRM A LLKKTFKEKYDVDLVEFLSSNLSGSLRKVVLTAMRGDDF K SLRKGYSKFF RRIKDGFSKKYRDSLTQCMKMELKEDFKRAVLMVLDENRM EKIKDGFNKKYRDSLRQCMEKELKEDFKKAVLLVL EKKME KDIGGTYQGMFGSILLSSDLIDDDNDSSLLHRGLGSLAMGKRY RLI K DGFSKKYGNSLTRAMRTELDREDFKKAVLMVLEGGRQ LHARQAYHARYKKSIEEDVAHHTTGDFRKLLVSLVSSYRY GVLKKAYFEMYDTDLSVAISDEDSGDFDAVI MKALQEPMV QQ KTAFKTMYGKDLIKDLK SELS GNMEELI LDALFM RA I LA SYKKLYGNEFSKSLKQSKCGQFGK LIA I RDEYRNETGKNLRDTIKQAFYGHVKDALLYILDGA KEIKACFRKRYQDNLEDCMQTELKADKFRVAVALQEKRQP


RKDKAGFKAKY LNS SLEKVVRNELEGNKFRLAVLQLEGAVRM ALI RRHYAAVYHQDLLHRLAAELSGHHKRAVLLWVLDPAS REI AFEYERFAKKAL
KVI KDEYQRRNGVPLDRAVVKDTSGDYEKMLLALLFPTCK QDi $\square E A Y V L A Y D E E L D D V M K S E L S G N F L S V V E G I L D E$

FQVEAEEDIKSETSGULQELLLALAKGGRE AADAVEYERETGKALRDLVGRVDFGHMKDALLYVLDGA KNLKEAWSRLIQQKDKNETCKLFSNGHFRTFCTNILQENRP REILRVYEASYRSNFAREMLKKSGNLVGEMLAHILINGD NDIIKEVYKKNYDTTLEDDVKGDTSGDFEDLLVKLLQGKRD
$S M \square K S T Y Y Y \square F N K D L T W L M R S E L S G D Y R E D I L L A L E R L Q Q V$ LLI SQAYQKMFKRHLDQDIINDPPHPFQKI IVALAASHKA QQV R LA YQQKYRKTLDHAIEFPPFWTFGRLMKHWLKNDKD HLLGKAYNTLHHRTLATDUERSDKGPYGLLMDNDLRVGRH KTISAVYKEQSKKWPSDDEKSHDSGRLSQLVIRINVAC RLIK DSFSKKYDNSLTKCMKTEDKEDFKKAVLMVLDERRM RSGLLKRTLHHTTGBFRKLLVSLVVTSYRY

 MLV SLV VSYRY
 $R L L M Q A F K Q R H G K S L V D A I K D A A S G K T E R I$ FVMALS LQRA YRHQTSYRRRYTIWNQY DWSYRRLLISLCAGRRD QAVKRAYRDRYAKDLQDAVRDATSGLWGRFCCELCDARTP $\square G A R K A Y Q S \square Y G E S \square E E D V A S R V E G \square K R Q L L V A L V S T Y R Y$ RDVTGDTGGHFERMLVVLLQASTQ
RQCLAFYEHDFQVEAAEDVRSEVASPLRELLLALAEGGRE RLLTQAFKQQHNKDLIEAVKDSLSNKIQRVGVMALNCQRT

RLAHAAYDRLYKTPLVKSVLDQTSGWFFHFSNAMLQAPRQ $R L A H A A Y D R L Y K T P L V K S V L D Q T S G W F F H F S N L L E K G R V S ~$
$R E I D Q L Y H Q L Y N D S L G D V V R K D C G N K Y M K L V N A V A T G D R \square$ KQiCRAYSSMYRQDLIQQLLSQQKTTFARVACLRAS LGARKAYQALFHHSLEEDVAYRARDPYCGLLVGLVSAYRY CEVVQNYDLLYGGSVITDIIRHDYNGDWQRLITRI L S SKRV K SUREAYTRAYGEDLLKDLEKELSGDFGRAVFGWTL EEFKQFFRQKYGTSLSDLIAAQVVSGDFREVLLLALEARRG
$K M \square D T A Y V S A R N V N L E H A L L K C L Q G K A E A A A V F H L N M K L K$ AKNVQVFEELFGHSWKH G GAVLDKFDETRDDLHDIETVI R ASTLVHYQKHFRDALKADIRLNMPAD R D IAVVRAYCSLFDCSLXEAUTSKVSSSDQKVADMSSGSHDLD KILAQADKNRLKDELGTEDYDRAMGLMQ AEIKRVYRDLFKKDLEKDVAGDTSGNFAKLLLALVQTRRD HYHRTLASAVKSDWSMKTERLYTMILANNRP NA $\square K A E Y Q K Q T G Q S L D A Q I Q K W D G G D$ RDVTLRLLNPPAA YGTKVCYTKLYGRELEDDEVIGVGTPWQSLVSGWVKHDRK

 ARVKDRYHQLFGDDFESTLRKE $\quad$ GSKWARMVNSWLAFCRS

 QETLRAYSTLFKHDMLQDKATKSKKNLNSMLSTILKANRP

|  |  |
| :---: | :---: |
| UniRet90-W5DXP8 | EGPRVDEELAKEEAAALSGAGAKAAQS |
| UniRef90-J3LH67 | DGPEVNTSLAHSEAK\\|LHEKTHDKAYSD DELI RVLTTRS |
| UniRef90_UTPNX3 | EEVPLDRGLDEEDSATLHHAVRAEKGGE TAMINVVVQRS |
| iRef90-UP100035 | AGEHVDMDVAKDEAAQLSEAI REK QLUGNEVVRII STRS |
| UniRef90 M7S | RPVPVDFDLVRDDVEALYRAVIAEKGGE SAN |
| Ref90-B3K | EDGSVDYELID QDARDLYDAGVKRKGTDVPK |
| UniRef90-K2S4 | EGDVWP LEYRNRDVDAMYDAVRAREGGE SDDL |
| UniRef90-M1WHS |  |
| UniRef90-V9E388 | KTFID |
| UniRef90 UPIO0042B | RDAVVLSHPWERDARLIEKAVMKKGPRHYSVIVEVACTRS |
| iRet90-G2Y90 | ESRRIDGDLLREDIRQLEKCVTSERGGETRMM |
| Ref90 UP10002654 | V |
|  |  |
| UniRef90-B2AU01 |  |
| UniRef90-V9EBE UniRef90 G312P | EDAELIYKAGEGKWGTDENG |
| UniRef90-Ga |  |
| UniRef90-S7 | RDVKLLEDAMEGAGTRNQLLIS ${ }^{\text {SLVVWD }}$ |
| UniRef90-F2PVA8 | DV |
|  | GYAPPDRSKDRDAKMLHTSLKGTAVDRSALLRRMVSRA |
| GOS | D |
| UniRef90-UP10003C164F6 | ENPNVDFELAKNDAKVLYEAGEDTLGTDEKKFI DILCLK |
| UniRef90-D5 | E M |
| Uni |  |
|  |  |
| UniRef90-UPIO002653520 | PaVHLAKAVHKYATTP品D WADPNARTEDLLTRS |
|  | D |
|  | VDVVGRDARLIEDAMAGPGTKHHLLLMARLIRVHWD |
| UniRef90-X6MAJ7 | VF V D N A A M K D |
| UniRef90-L8G152 |  |
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| K7N | darrly |
| UniRef90-V |  |
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## DDVPLDFHLVDQDVDDLRRAVKSEKGGE STMIGTVVQRS

 EGDEVNMTLAKQEAKLVHEKIKDKHYNDEDVVIRILSTRS GSHDTN DAQAK D DAVVRLGAD GKAKSK K D G S H FLL H L L A T Q N DGPEVNTRDAHSEAKILHEKDHHKAYSDKDEDIRULTMWS
 GGDRVDADVAKLEASQLSEAVRKKARHHDEVVQLGGRS EQKLDYPIKGKGGKRITHEILTRKLATKEYTAEKLFCLLY CDDPVDRNQVMSGVVETLAKAAKDKDDTKEYTAEKVVGVNRS ESNHVDQNKA】QDAHKLYSARRCRFGLEN YFUDAFTLQS N
YDAY ELKHADKANRDPDAGDDEAQVEQDAQV
HPERDALELQSALEKKGSSDTVTLVRILTNRS EGSQTSDVAVRSEGITINRXGYKKKLFKDEELVRILATRS QG IQESLIQSDAQALFAAGEQKYGTDEGQFITILGNDT DRELVDFNLAKSEVAKLHEADEKN QLDHDDVVWI LTTRN SYSGVDYNLMRQDAQELHE NEQLDPDGGWIHLFTQRS PDNPVDQTQVLADVETLANACKKR QDLPFFEIFINRS HHDEPSRH AKCDARRLYDAKNGATGSVDEAA EMFSKRS ESRRDDGDLLREDIRQLEKCVTSEKGGETRMMEVCLRS D EPCVRDADI ARDALFGRR IDGDVLVEVVCTRP VSEETARAEAKALVAAV KSAGHAAAKLVE
SRSSLDVDTHAVGAEANTGTLGKLLVADAERLVMDDRERN DPAERDAHLLANEALRNSPTNLVIVVE\|ACTAS VGVEEDVVGATCWTC

GVDEAAAVADATALFEAGEGQWGTEESTFNSILITRS PYET A ATLIKSTCAGLGTD ELGLTCAVHRY RNKT H SE $\square R Q \square Y F A E K L R T A M T H E R V D Q S T I I R \prod C V S R S$ RWMEHDRHYRNNVKTDAHMLLQALEGGNGAAIVDILVTTK GSVILCDDAPEKHFAEVDRASLSGHRTDVHSLARALLARV
PSNVVDYEKПDED
PDNPVDYALVESDVQTLYKAGQDKTGTDEDAFCEVIVNRS D DDAGQAEASAERLFLAMDGMGTDEDA TRSELSGKS YRKSI KSDAEAFRMALDSD NYEVLGSMLATSV EHEPVDDGDPQYAKDLVLAMETNNDFEGDKVFPNDKKGP TTSNQFKAQVDASVNELLEATKGFAHREATFYEMLFLSS DDAVVDPAQVKQDAENLKTWLGGKKPN ARNNV QGDAEALKTALIGVKHPDTDTVIRLLGTTV P RNDPAGDAEALRVALSGKKA DEDAVVQLLGTTT DCDPVSKEEREERKARLLKKVADRRGGNDEDVSKILLARS


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| Ref9 |  |
| Ref90 W5DX | Q |
| UniRef90-33LH67 | KAQLLATFNSYNDFS |
| UniRei90 UPIO003513CB4 | KSQLRATFQQYKEDQGRDIAEDINSRCSSQFGRMLKSAVW |
| UniRef90-M7S | DSHLREVLRLYEKSFSSNFARD |
| UniRef90 A0A059AUA4 | SSELHCL |
|  | 俍 |
| UniRef90-M1 WHS3 | EGHLRAVLGEYERVYGGNFAREALSKSGNLVGEVL |
| UniRef90-V9E3 |  |
| UniRef90-UPIO0042B0226 | SNELDGARKAYHSDFDHSDEEDLASHDKGSERKLLVEGPK |
| UniRef90-W3W | DSHLRDVLKLYERTYGSNFARDALKKSGNLVGELLAHILN |
| UniRef90-G2Y909 | DTHLREVLRGYEERFGKNFAREMLAKSTNLVGELLAHILN |
| UniRef90 UPY0002654A65 |  |
| UniRef90_R7TKV5 | Q P DLE |
|  | KPQUA TFNRYQDNHGEETLKSLEEGDEDDFLGLLRSTI Q |
| UniRet90-V9EBE2 | R NTD |
| UniRef90-G312 |  |
| UniReego-W9 |  |
| UniRef90 F2F | HLREVLQAYEMTYRENFTRAMLSKSRNLVGETLGHILN |
| UniRef90-A0A059DHL2 | ELDMSEl QRAFKRKY |
| iRef90_G1XKL1 |  |
| UniF | DA ${ }^{\text {d }}$, REVLRVYKETYGANFAKDALKKSGNLVGEVLAHVLN |
| Ref90-D5G | DWWI REMAGQYKATYQRDLAKAVMRHSRNDVGETLLHII N |
| A3 | PSQLLVVRQAYLIARFGGALAAAVK |
|  |  | RPHMEAปKREYRSRYGKELQEAVREGTKG YPQLLQAMFPEYSKWAKCDUEDTUSSEMDGDLKDALLVLVK PEKRRKGNPHFFKEDERSFERWDDHRLKREFSRFKNAVVL REHLVLVNDDYKKKYVSDLEEAVRGEFSGYATEALVFYVK



DEHLREVLKTYERAYRTNFARDALKKSGNLVGELLAHLLN KAQI NATFNRYQDDHGEETLKSLEEGDDDDFLALLRSTIQ GDQLRAVLASYRRLYGQELARALKRKDGDSFPGLLRAALR KAQLLATFNYYNDAFGHPINKDLKADPKDEYLKKLRADIR
 KAQNATLNQYKNVYGNDDDQDLEADPKDEYGDLLRATVQ


NAQRQLVADKYMTVSGFQQEETVDRETSGNGEKLLGAVVK KPQLKVVFK NAHLRRVFEEYRKDSGFEDETASTRETSRSLQQiLLAVVK FFQLKATFVCYKQSYEVAIDQADNSSGNGDLGSILRGVIL RPHLTAV TAYDQSQPKTLSKAVKRACSGDAKNALLYILH DPQLRLALCSYKHDYGHDFTKVSKRNGS
DNHLREVLRGYEEKFGRNFAREM
PSYLCELNASYSRMYHNNDVKAlQKEFSFDAKRSLVLIVR YEHLAAMAVAFQQDSGKDLDQVIKQSFKEQSETGYACNIY

FEHLVSTCKKYFEMKGTVLRQDTADDVDLGHEETLREAALD FEHLVSUCKKYFEMKGTVLRQDTADALEHRPEEALLLAHD

YQQLRQTFLEYENDAGXXXXXXXXXXXXXXXXXXWYQ QKQRMEI ALQYETDFGHHDMEMDSRQTGGDDKEGYLADVK QHVLQQVTMAHDDLFGKTI GDRIVKETRGDFKKLLLEVVR EDDLQDISLEYKRKYQRPLEHDI CQSTSGEYTRMICTLLS PQEWEKIVAAYEEHTNKSLETAICMAFPGFEQTAFCAAHY EDDMMKIKEEYFNMNKVSLDDAVVRKTSGGYKDFLM PEELERUKAEYQTMTGKSLEDEIVRKWDGADKDVTLRLLN

RPHDAADCEAYPKKHKKS TTKVIKSEFSGHMQFTLLY VGG KAQLNDI A A AYQQKYGKDLRSELDGELDGRDELELLKQDY PDEWMRI AAAYEETTGMPIDQAI ASRYVKVDQTALILAHH


PSEWKQ\SEAFENDAKKT\EQALIEAYKGDDEDADCCCNA PDEWARISKAFEDSTSRTVHDCMRTVFKGNDLTAAHTAHH PTHMHALVDEYRKSTHSTLTKA DKQCPSGTLQKLFDHAVE

## UniRef90 G4N6H8

 UniRef90_W5DXP8 UniRef90-J3LH67 UniRef90-U7PNX3 UniRef90 UPI0003513CB4 UniRef90-M7SMD5 UniRef90-A0A059AUA4 UniRef90 B3KRQ1 UniRef90-K2S4N2 UniRef90-M1WHS3 UniRef90_V9E388 UniRef90_UPI00042B0226 UniRef90-W3WVC4 UniRef90_G2Y909 UniRef90-UPI0002654A65 UniRef90_R7TKV5 UniRef90-B2AU01 UniRef90-M4FEQ6 UniRef90 V9EBE2 UniRef90-G312P8 UniRef90-W9RHX7 UniRef90-S7ZY92 UniRef90 F2PVA8 UniRef90_A0A059DHL2 UniRef90_G1XKL1 UniRef90 G0S004 UniRef90_UPI0003C164F6 UniRef90-D5GI01 UniRef90-A3BTA4 UniRef90 UPI0003EC238A UniRef90_UPI0003D73A4B UniRef90_UPI0002653520 UniRef90_U6D5U2 UniRef90-W710T7 UniRef90-X6MAJ7 UniRef90_L8G152 UniRef90_A7RWX1UniRef90_A0A059BJB7 UniRef90_W2QYL9 UniRef90 K7M0L2 UniRef90_V6LIK2 UniRef90_G7Y7L0 UniRef90_UPIO00258DA0F UniRef90 C9SAW8 UniRef90-B9DI12 UniRef90-B8BEX3 UniRef90 K718D5 UniRef90-UPI0003513910 UniRef90-R7TRM6 UniRef90-W5BIU5 UniRef90-UPI0003D6E8F7 UniRef90_C1L651 UniRef90_A8N3U4 UniRef90-A0A016RU94 UniRef90_T5A629 UniRef90-S9X6W3 UniRef90-H3DK45 UniRef90_UPI00023B2A64 UniRef90-O57570 UniRef90-D7T2R7 UniRef90-UPI00045410CE UniRef90_A8N3U1 UniRef90-MOWTY8 UniRef90-A7EB97 UniRef90-F0X230 UniRef90-X6MLD8 UniRef90_V6TZH9 UniRef90_B9G381 UniRef90 B9FPC4 UniRef90-E2RTW5 UniRef90-S8CC48 UniRef90- F2DYI8 UniRef90-T1H5X5 UniRef90-C3Z154 UniRef90_KOSP13 UniRef90_K7GWR9 UniRef90_Q4VPP9
UniRef90_A5BKB1 UniRef90-L7UHU9 UniRef90_UPI0003EC1391 UniRef90-E2L4W7 UniRef90_H8N1E3 UniRef90_Q4VPQ3 UniRef90_R7UAT1 UniRef90_C6LNA6 UniRef90_X6NM34 UniRef90-E2RU96 UniRef90-M7X2N4 UniRef90-P19389 UniRef90_X6LBI7

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LLRDPVQYFAEEDRTLLQGTR\SLKRDAFLLVSRSEDDLE GV DN K PMRDAMLLQHALKASKKDKELLDS RLV RYHWDMQ

$R L L V S M C Q \square D L V$
SDTSPWR
G VRNRPMRDALLIHQA $\square$ TESGTRAELLISRLV R LHWHDE
GVVDKVERDAKLLEDAMVGAGTRNHLLISRLIHWNKPHLA GIINKPLRDAMLLHHALTASRRDPELVTSRLV RYHWDMA CVRNMPAFFAERLYYSMKGAGTDDVTLTRIMVSRSEFDLL GAVDKP LDRDAKLLEQADMAGREDLLISRMVRVHWDPYHMD

$\square C T D Y$ VRFNAT ILLHKAMSGVGTNDDTLDRVIVSRCEDDLE $V 1 R N T P L Y F A D K L H Q A L Q N L K P N Y Q V L M R I L I S R S E T D L L$ S DVS P WK
FVTDPYYF WAKKVF $\square$ FFSKNNA FD $\square$ A
A $\square$ QS PTQMTADK $\square$ HSALQ
WAMHPWERDARLMKEALKEGPDSYNVLIEVACTRSSEELL
C ICNPAHYYAKVI ILASFFSFTEP
F NVHPANLCAQLVSHAVKGMGTDDTLLINVTALFRDRYYD A QVNLPLLLVCQLHEAVTSSEVNES QLI RLICLHDEMDQR

GVINKPVRDALLLNHADTASKRDKDLLISRLVHWDHAHME CLTRPELYFVDVLRSAI NKTGTDEGALTRDVTTRAEDDLK CAQLPERHFARAVRAALRGGGAAREALVRTVVTRAGVDVR A ASDKQKFFAQQLYASM
CLTCPDRYFEKVVRQADAGLGTDESSLTRVITTRAEVDLK $C M G N S A N Y H A D K M H G M L K A G Q T R$
$C$ CLTSPEKHFAEMDRESVVGLGTYEDMLTRVVVSRAEIDMK CLVRPE HYF EKVLRDAI NKQGTDEGALTRVVGTRAEVDLK


$S \square R S \square P A Y \square A E T \square Y Y A M K A G Y T R$
LMP PQEHDAYRLQQAMQGLLGTDEETLTEILSDRSRKQLD DILDSAMKV NANEDXKEALTRVIVTRANVDIK CARSVPDYFAERLYAAMKGAGTDDQTLDRIMVTDSEVDSLD CVVSPEKHFAEVVRASTVGYWTDEDSLTRAIVTQAEDDMT $G L K P K R W R D A K L I E K T M A G L G T N E S R L V Y R I I \quad R A H W D M A$

LVVDPFPADAEDFENTMKGFGTNEKELS DASV RYQNVLD YATRRYELLADLLRKAVVTPGKHYEMLTRIIVSRAEVDLC F LY Y P C CAAAFSMNVAFAGSGNDSDRLNRMAMMFR ECK S SGSGYHGGRVDATMAMCDAKTDQRSVLQLLRHRSGDQDR C LATPARYFSEVVAAAVSDGADHHAKETRVAVTRADVDMD


QAXSALLPDARYVFKY DTNCF CVLSLPGYFAERLYMAMMGFGTDEDTLTRVIVSRCEVDMK VA W
GFNNLENSFA
WLCEPSKAAAF LIHRACEGKRGDFRRVCR $\square$
PTQGRADAAAEK LK L $\quad$ VDGAGTDEDA $\square R D V L K G K S K A E \square N$
GAKPRPKHDAKLLEASMKGFGTKDKQWVGRFVWSSQTE $\square Q$ GAlDPNDPNA
WLCDPGQAAAY ICSQCCAERKGNYAR DCRFTSMMYDHCL


TLHCPARGAAY LLS LACQKKG DTDRCCR $\square T G M \square Y D Q A E$ FLNNANEGAAYLI FRAVEEKG DVERCARATAMYYDK CP


UniRef90 G4N6H8 UniRef90-W5DXP8 UniRef90-J3LH67 UniRef90_U7PNX3 UniRef90 UPI0003513CB4 UniRef90-M7SMD5 UniRef90-A0A059AUA4 UniRef90 B3KRQ1 UniRef90 K2S4N2 UniRef90-M1WHS3 UniRef90 V9E388 UniRef90- UPI00042B0226 UniRef90-W3WVC4 UniRef90_G2Y909 UniRef90 UPI0002654A65 UniRef90-R7TKV5 UniRef90-B2AU01 UniRef90-M4FEQ6 UniRef90 V9EBE2 UniRef90-G312P8 UniRef90-W9RHX7 UniRef90_S7ZY92 UniRef90 F2PVA8 UniRef90_A0A059DHL2 UniRef90_G1XKL1 UniRef90-G0S004 UniRef90-UPI0003C164F6 UniRef90-D5GI01 UniRef90-A3BTA4 UniRef90 UPI0003EC238A UniRef90_UPI0003D73A4B UniRef90-UPIO002653520 UniRef90 U6D5U2 UniRef90-W7IOT7 UniRef90- X6MAJ7 UniRef90 L8G152 UniRef90 A7RWX1 UniRef90-A0A059BJB7 UniRef90-W2QYL9 UniRef90_K7M0L2 UniRef90-V6LIK2 UniRef90_G7Y7L0 UniRef90_UPI000258DA0F UniRef90 C9SAW8 UniRef90-B9DI12 UniRef90-B8BEX3 UniRef90_K718D5 UniRef90-UPI0003513910 UniRef90-R7TRM6 UniRef90-W5BIU5 UniRef90 UPI0003D6E8F7 UniRef90 C1L651 UniRef90_A8N3U4 UniRef90-A0A016RU94 UniRef90 T5A629 UniRef90-S9X6W3 UniRef90-H3DK45 UniRef90 UPI00023B2A64 UniRef90-O57570 UniRef90-D7T2R7 UniRef90-UPIO0045410CE UniRef90 A8N3U1 UniRef90-MOWTY8 UniRef90-A7EB97 UniRef90 F0X230 UniRef90- X6MLD8 UniRef90_V6TZH9 UniRef90-B9G381 UniRef90 B9FPC4 UniRef90-E2RTW5 UniRef90-S8CC48 UniRef90 F2DYI8 UniRef90 ${ }^{-}$11H5X5 UniRef90-C3Z154 UniRef90-K0SP13 UniRef90_K7GWR9 UniRef90_Q4VPP9 UniRef90-A5BKB1 UniRef90_L7UHU9 UniRef90 UPI0003EC1391 UniRef90-E2L4W7 UniRef90_H8N1E3 UniRef90 Q4VPQ3 UniRef90_R7UAT1 UniRef90-C6LNA6 UniRef90- X6NM34 UniRef90-E2RU57 UniRef90-E2RU96 UniRef90-M7X2N4 UniRef90_P19389 UniRef90_X6LBI7

DII KVAYRERYGKDLLQEAVRDATSSGWGKFCRELLC EI KEAY LK QHGDKLVDAVAKNTHGHYRDALLAMIG LI KEAYQKRNSVPLERAVAKDTTRDYEDILLALLGG A K A A Y RSRYNKDMQEAIREATSSDWGLFCRELC AVKRAYRDRYGQELAEAVVRGTSGQWGDFCQQLV
 KQDTK
KVK LDD Y REKYGRYTEDDTEDATR
AVKKAYRERYGVDLSEAVRDGTSGQWGEFCRELC RI CSAYRHLYRQDLCTRI RSEVRSEYCQLLLSV AVYEHYNK CGKTI TEDLEAE GDLKDTVECLC


D 1 KQRFFAEQGRALDDT\A LCSFEFKEFLLA\|V QVKRAFREQYGQDLSDAVKEGTKDEWGAFCRALC VIGQEYQRRNS IPLLEK VVNS


## R VK S E Y R R K Y G R

EVKQRYSRMYKQDLVSRLRKEVKGSYRDLMDS $\square$ LVRRAYREHYGHELVDAVRDATS
DI RAEYKK DY DCSLYSSI QTETSRDYMVALLK DCG RVKKVYKKKFKVDLSGRLKGVVDGDFEKFLLRMI YI KAEYHRSYKRSLADAVHSETSGNYRTFLLSLIG K IRTQFKKHFKKSLYQTITEHTKGDYQKALLSLCG
 SIRAEFKKKFGKSLYSSLQEAVKGDCRSALLALC
$S \square L Q V F D E K Y G K E \square \square E W \square Q E Y T K G Y Y Y V I L L K \square C G$

GARRAYHS $\square$ Y EHS $\square E E D V A S H V H G P E R R L L V A L V$
WDCQAY PGN I RADKRDTSGWYETGULE $\square W$ QLTEDYQAYFDVPFKEAIRCATSGAF

Al K RAYRERYRVDLQEAVREGTSGEWGQFCYELC VI GEEYQRRNS IPLEKAITKDTRGDYEKMLVALLG RVNQAFAAKTGWTLESVVRNEFSG

H!K EA Y Q K R N SVP LE R AVA G D T S G DYESMLLALLG EI RKAYKKKHGUDLTEDLQ
QI K E E Y RARFKTTVTCDVVDDTSFGYKD LLLALVG VI K DEYQRRNSVPLDRAVVKDTSGDYEKMLLALL G TI NKEYKVKYGKYL LDDVKKTFDGDYVKGLAKLL AVKSVYEMRYGKTLEQRVSTKVSGRFVESLLAFL DITA QYQVLYNKSMAEA $I$ KKHFSGSYKRGLVALV

D T N A A YRF L Y KK DLEKELRGETSGDFCKLLVALL
DI AEEYNKQYGTPLTKKI ED
DI RAEFRKRFATSLHNMI QTDPSGTTVITLLLLCG KI KGEYFKMNNTSLDDVVRRDASGVYKSFLMALDG SVRAEFRKKFGKSLYSSLQ

H TK NAYKR LYGKDLRNRDHGETSGYYRQLLLAD NIREEFRQWVLKHLQTKNQ GCKYYYKKVYGQAFDERCTAEDKGVYGEAIKLLW AVLASYRRLYGQELARALK
AI RAAYHEQFGGRLEDAVAGKAHGYYRDALLSLV DVPAVYRELYGVTL EDAI EKTGTGSYESTLLILW K I K REYYKRNSUGLEEA ILRNDSGDYQKFLLALL

KVAD IYERRHGKTLGAA ADETSGGYRDMLLALDG
$D \square S A A Y Q R K Y G E D \square R S R \square D S E \square S G$
ASKMRDKEVKKS LE
K CKYAYRAYGSLAMDDRK
RLKQTYQATYFESLARDIREE
NVAHEFQHFSKKPLRAELRS $\quad$ S T GNFRRLLLA $L$
QCKVLY A HYG NLAKDDRKTMSKNLAEACCVLW HVKLNYA DF GNLARDIRRVFKSNFGEACCTMWG $R V Q Q A Y K T K Y R K T L G D R L E S A L S G V L R D L$
A KYAYK






