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 KRWFVTGTDTEVGKTI ASCALLQAANGAGYRTAGYKPVA K R
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 T NAFFLTTGTDTEEVGKTVVSRAALLQAASQRNDQMAGYMPIAA

 $G V F V T G T D T G C G K T A I S V G L M A A L Q A A G L R V L G M K P V A$ KTLFI TGTDTEVGKTVVARALLQSFTQANERAAGYKPVAA AFFIT GTDTEVGKTHVSSLLLKKLDAQRGKKALGFKPLA FVVTGTDTEI GKTLI S S AML H ALLTRQGLRAAGMKPVAA KQSYFIIGTDTNVGKTYVASALVRHFAKAGYQTIGMKPIA AYFI TGTDTEI GKTLISSALLHALGQAGLRAAGMKPVA
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 RGFFVT
 KRFFVTGUDTEAGKTYVTVGLLAAAKRAGLKSLGLKPIAA NKGYFITGTDTEIGKTEVTARLARYFNKHNQDIGVFKPLM

$\qquad$

 THAFFIA GTDTGI GKTHASCTVLHALRAA GQVACGMKPVA $F V \operatorname{T} G T D T G V G K T V V S A G L L H A L A R H H R R V V G M K P V A$ VLMVQGTASDVGKSVIVTALCRIFAQDGLRPAPFQNMA

 K HMFVVTGTDTAVGKTVVARALLQHLAASHFTTVGYKPIA $K R L F V T G T D T G V G K T V I S R A L L Q K L S G G N R C V A G F K P V A$
 RAFFIA GTDTDVGKTTVAAGLLHTARAQGMSTAAVKPVA SFFVVTGTDTSVGKTVASRAIIQAAQNKGMQIVGYKPIA

 FVTGTDTGVGKTHASATLLHALHAAGYAAVGMKPVAA $T K V L M V Q G T T S D A G K S T V V A G L D R D F V R K G V K V A P F K P M A$ | $S$ | $L$ | $F$ | $I$ | $T$ | $G$ | $T$ | $D$ |
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| $S$ | $L$ | $F$ | $V$ | $T$ | $G$ | $T$ | $D$ | $K S F F$ L KSFI G G DEVGKTHISSLLLKLIGQYKHRALGFKPIA


 S
 K GVVVTTGTDTEVGKTCVSAGLLHWFGQAGHRSAGLKPVA AATLMIQGTSSDVGKSVLTAALCRDFMQDGLRVAPFKSQN

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$\mathrm{K} G$ \& L \& F \& I \\
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## 100

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 SPHIAASAAERRPIH LSALSSAGLRALEQQADWLLVEGAGGW

 AP HI A S R S E RKKI T LS D L S Q GLR QL E R SAD WI CI E GA G G W
 A P HVVAAREAGVTLAVPELLAAMRNLQQNADFTLI EGAGGW

 A P HI A A L E A R RPL STDR L A GYCR GVVLGQADFTVVEGA GGW
 A P HIIA A QEVGGAI PLTGLSAGLREIVRAGAEVIVVEABGGW

S P H L A A
A P H
S H A A A H C A

A P H LLA A A AA ATAGVVI DLAADVRAYGALDARADLVVVEGVGGW A P H I A A QRA GVTVIS CEA L SEK YSEELSTGLGA EYTVVEGA G G W A P H I A A G LAA GV QMF S S R I LQ A Y A QMA KACDAVVVVE GVGGF


 AP HL A A REAAVELSVARLRPAVQQLARGADFTLVEGAGGW



 APHI A AMKE GRLIDTASRLEGFDKALLTPNEFALVEGAGGW
 AP H L A A E QVGETVGLDVI ESHFAAMQLDQADTVVVVEGAGGW S P H L A S E M E GF A V D K E II R D R Y N K L I E K Y R Y IV V E G C G G L

 S P HLAA Q ID GVVI EPERIVAHMQKLQQTYDFVLVEGAGG\|


 SPHLAAAAEGRRDTLEPIHAAYALLGAHADARVVEGDGGW A GCFT
DEDS IS EHGGVD YR
LLSASLNALSEQTDHVVVEGTGGW A P HL A A R R A GRDDP T LD ALVA HV D P L A EKRDDLTLI E GA G G W DMHSQUVVHGVPYAYHTVMDALNRLRDTYDIVLMEGAGSP APH DAAREAGVELTAASLDDAVQVLARQADFTLIEGAGGW

 SPHLAAAQEGVRITRAPIRHAFDALVEQADAVVVEGVGGF DTGSQVIVHGKALMMAAVKESYHRLTSNYDMLLVEGAGSP





 A P A L A A E L E GVVH I DIDD H I R E C Y R H L S A A H D I V L V E G A G G L S P H L A A N L E G N P V D L N I I K K D Y Q K A K E K Y D YVV V V E G S G G I AP GLLA A EWA GVVEI A RESILRRRLAEQVRACDVVLVEGAGGW

 D MVAE IIVVHGKRYAMP IVVEALERLQNEYDVLILEGAGSP A P HIA A EKEGVT LSVVRRLEGVI KSLLTPHDFALVEGAGGW S D E DI I F T S DL P F DI F E RMTE GL E F MCQEA DTVVI E GCD G W
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## query UniRef90_16WMC3 UniRef90-D4E9E35 UniRef90 C6CLY8 UniRef90-K8ARRO UniRef90-K8WJQ7 UniRef90 ${ }^{\text {D3VAS }}$ UniRef90-U3CCE7 UniRef90-G7LUN9

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 FTPLSGQETFADWVAREQLPVILVVGGKLGCINHALLTAG

 FTPLSDSDTFADWVQKEKLKVIMVVALKLGCLNHALLTAG
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 YTPLSSEQMYADWVVEHQLPVILVVGVKLGCINHAVLTAQ RVPLNPAETLADLARQLNLPVILVVGVRLGCLNHALLTAE KVPGNEDQDSADLCRRLGLPVVLVVGLRLGCiNHSLLSAE RVPLGSDVFVSDIPAQLDLPVVLVVGLKLGAINHALLTAE FLPLDRQHLLSDWVAQERLPVVLVVGAKLGCLNHALLTCA
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$\stackrel{N}{\mathrm{~N}}$ $T V$ L N D R E L L S DV A K S L GFP V I L V V N M K L G C L N H A I L T A E
 RLPLGDGRYLSELVQQLNLPVILVVGMKLGCLNHALLTQE
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 A VPI TEDLDMAGLARRWGLPLVVVARAALGTINHTVLTVA

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 ALPI NDEEYLYDFVVKENLPVILVVGMKLGCLNHALLTAA



 AEDNDRD IVNMRMAEWADAPVLLVAD DDRGGVFASGVTDE



 RVPLNSREMLSDLAKSLGYPVILVVNMKLGCINHATLTAE RTLITPQQTYSEWLVQTKMPVVLVVGMQEGCVSQALLAAQ


 $L V P L D E G D T G A D L A Q A L G V P L V L V V G L R L G C L V N A L D T A E$


## QUERY

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VIQHAGTT ${ }^{170}$
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 A A ERDGLQLAGWVANDIEPRTSRLLEENLASLAERLPAPCL
 AI VR D GLPVAGWVASCI DPHMQVLEQNI HSLQSRLPVP A A ARDGLPLAGWVANVLDSDMRLRENVDAGQRLRAPL
 Si RASGARLAGWVANQVEPEMLMREANLATLAALI EAPCL

 A QQKGLK KAGWVANHLDHQSESNEGIETLKQRIDAPCL AI RARGLELGWVANAVDPKAQHSDEMVRYLNAHLDAPCL A I INDGLPFVGWIANRINPGLSHYAETVDALRQKLPAPQL AI QADGLPLAGWVANRINPGLAHYADIISVLREQITAPLL AI SAAGLSCVGWVANQVDPAMQEYEANLETLKQRLNAPLL AIAAQGLEAGWVANTVDPHMPHVQANIDALRRRLSAPML A ALANDGLKVVGWI ANQVEKNMPFYTLNIVALKKHKINAPML
 A A A ARGLRLAGWVANTVDAAMLNADANIAALKSRIDAPFL SLQASGVECLGWI GNHDDPAMQRQDENGATLQQRLPMPCW YAKSMGLPIAGDVINGMSDSHDDEKTNPEMIERLCGVPIL
 A $\downarrow$ ARDGLAVAGWVANNGTPEMPCYDENLATLVSMLSAPLL
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 AA RADGCELLGWIGNQ:EEPSLPALAGNLDTLRARLPAPCL AA RADGGLPAGWVGNLI DPGDEACYRDNLATLERTLDAPCM LLEPHEVRIRGFIINKFRGDLSLLQPGLD A A R DGLVLAGWVANVVPACTSREENLS CMNTSRIKIAGWI ANFI DKNMLYPKENIEIIKEKLDAPLL A RARGLTLAGWI ANRVDPDMLLADENIATLHDALDAPCL ALESEQARVKGFVVNRFRGDVSLLQDGLDWLENYTNKPVL TALQAGLSVAGVVINRYPNPDSVAKDNPRIIASFSGLPVL HMQQLGVNCIGWI ANHVDSTMLMQQENIQSLKQRLPMPLL A DAARGLPLLGWVANEIDPAEACMDAMVESLQARLHAPLL YAREKGI PLLGDINGASTPDLAEQTSPEMI RRMTGDPIL A TQQSGVNLIGWI ANRVNPGLRHYAELIELLSKKTNAPLL RIRRSGAGLAGWI GSMVDPGMARCEENIIATLRDLLPAPCLL YMRSRGMPVKGUVLNRFHPGDGMEEDNRLMCEALTGLKVL TLPEERKRVKGFITNKFRGDVSLLRPGLDWLEQKTGKPVL AIRQRGLPLVGVILNHASPNDEAVRTNAESI RRWGGAPLL
 C QQDGISLAGWIANQDDNQYSA QTTDNTLRNTIAAPLL SI DAAGCKIKGWVANTTPEPMPYYQENYNYLNEYLNDRCL
SII ARDGLNLVGWVAN MGQDMPYYDENVAAI NSIITAPLL
 SI DT SGVPLLGWVANRINPCLRHYAEIIKLLHEVIDAPLL AISRAGLPFGGWIANSIESSTLAEKEN|EALRERLPAPLL LARSCGVQLQGIVVNCVQPCSQEDIANADLLKSLTNVPVL AVRARGLTLAGWVANRLDPAMACADENLDFLRRHDPAPLL



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 NK GVFI T GTSSTDVGKTYVSSLIVVKNLRENNVNCGYFKGAL
 AKSLMVMGTASNVGKS

 K SVVI T GT DTDA GKTYVSVLLLDNAINTAGFKTDGFKP PA
A

## A K T

 MLQ GTGSGVGKSVLTAALLRIMKHDGFKVAPFKAMA A P A WF I A GTD T E I G K T L V A C A L L H K L R A K FP R V V G A K P V A A Y FV T GTD T GVGKTWITAS LATFWYRQGYDVGVMKPIE $M F Q G T A S D V G K S I I T T A D C R Q L V Q D G F K T A P Y Q N M A$ A K K L F V T G T G T DVVGK T YV T G LI LDK KL H Q S GE TAA Y Y K A A M SLMVVQGTTSDAGKSTLVAGLDRDLKRQGWSVAPFQNMA AKSIMVMGTMSSSGKSFVTAGLCRIFHQDGFRTAPFQNMA AKAI M I Q GTM S N A GK S L L A A GL CRIIFRQDGYRVAPFRAMA
 L MLA GT GS DVGKSVLATALCRIFDQDGYRPAPFKAMA
 K GI MVVGTTSHAGKSFLTAALCRILARRGWHVAPFQNMA A K AVMVVGTASNVGK SVLCTADCRILYQDGYRVAPFKS Q N







 ARAI MLQ GTGSDVGKTVLVAGLCRLAANRGLTVRPFKPMS
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 KVIM M G TM S NVGKSLIVAGLCRILKQDGYSVAPF QNMA
 FIT GTNTNNGKTII SCALLSEFKKRGIDSCIGMKPDA
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$\square N S A V T P E G G E \square G R A Q A V Q A E A C G \square A P H V D M N P \mid V L L I K P N S$





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Z480
 $L N S F V V T K$
$A G L E D P S$
$A G A E L D R D$
A GAE LRDGTWVN

## $T G$

LNSYVVKGSSWPDDAKALVQASHSGDAQELVVPYTFEPPV

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$L$ N S A VT A D G G E $\square G R$ A QAVQQA QA C E I E P TVVM M N P V L L K P N T L N S Y 1


 $L N A Y V T P A G G E I G F A Q A V Q A W A A G T T P R V E M N P I L L T P Q G$ $M N S A V T P S$ GREEGGRAQAVQAAAAC GDQPNEHMNPVLLMPTG LNSFVTAADGGEMGRAQVVQQAEAAGVECHTDMNPLELMPNT SGAEEKNGF LISPD LSYVKK S GCME \ENTLI NSDALLQLQKN
 SGHLLTVDP
SGHLTVVD P E


 LNS GIT ADGGEMGRAQIFQAEAAGI EPDVRMNPVLLKPTS $N N S G V T P D G M E D G R A Q V V Q A E A A R V A P T A D M N P V L L L X N T$ LNSFITTEDGKEMGRAQVVQAECARIEPQVEMNPVLLKPNS LNSAVTVDGGEIGRSTALQALACGVAPHSDMNPVLLKP QT
 $L N S F V T R D G A E M G R A Q V V Q A Q A A G T E P D V R M N P I L L L K P S S$ $L N S A V T A D G G E D G R A Q A V Q A Q A C G L A P S V D M N P V L L K P N S$ MNS YI T K D GLEMGRAQVMQAEAAGIVPSVYMNPILLLKPSS



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 A E L K A N D I V N M R IIA K Y L A EIN LIR A N DIIA N M A E A A D C P V I L I A D I D R G G V F H L V G T L D



 V E M N L K S R D I A N MA ELLADADVLLVVADI E RGGI FA AVVGTL
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 A V A E I N D R D IV N N M R L A E W A D A P V V L V A D D D
 A E I N L K D IVVNMGMMAN L S D S P V I L V G D I D R G GVV A S L Y G T V
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A E I N L E D F V N M G M A K
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A
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AE I


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 Q1K RDNCDVIGWVANQUDPNMNCYAENLASLHALLDAPFL ALLQEHERWRGVIINKFRGDVALLASGGTMI ESLTGVPVL LLPKDKDRDKGFIVNKFRGDISULQPGLDMLKEDTGLPTL
 AIEARGLRLAGWVANETQADMAFADENVAALEQRISAPCL LLEEERSRVKGFIVNKFRGDIAILQPGLDWLEQRTGIPVL ALESEQNRVDGFVINRFRGDDTLLQGGLDWLEQTTGKPVL ALPEERRRIQGLVINKFRGDVSILESGLRMLENLTGMPVL ALEARSLGIAGVLSCFGPEEEHTAGDIARLVKHDPV LLEEDRKRVMGVENKFRGDVELLKPGTWEEEYTGIPVL ALQEDRKRVKGIVVNKFRGDLRLFESGVRMLESVCQVPVL HLERRDDPVRGVILNNYHAGDAMEEDNRRMIEEMTGVPVI
 QAKVMGLDTAGVVINKYPGGDLAIKTAPRLI EEYSDVSIL


 ALLEEKARVKGVIINKFR

## M

ALLAERARVVGFVMLEEEQKRVKGMI NKFMLDEEDERVKGLIINKFR$F L Q Q R G \square P I V G I M N N S$
Y| ENEQGMKIKKI N INN

MLLEERYRIKGFII NK
CLDSERARVVGFVVNKFR
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| UniRef90-A4CED8 | ATIPYIQNLHIEAED |
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UniRet90 $\mathrm{O31SA7}$
UniRef90－O31SA7
UniRef90－${ }^{-1 \times 4 N 4} 4$
UniRef90－B0PB85
UniRef90＿UPIO00416E2BF UniRef90－J3C9Z2
UniRef90－G5GN31 UniRef90＿W7E171
UniRef90＿L9XYP8 UniRef90－UPI000349BBE7 UniRef90＿C5MIGO UniRef90＿W9GPU6
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UniRef90 M1MKC4 UniRef90－M1 MKC4
UniRef90－UPIOOO4659F28 UniRef90－M3VHPO UniRef90＿UPIOOO4693983 UniRef90－A4TOR6 UniRef90－O66832 UniRef90－UP10004642DDE UniRef90－A0A011 NLG8 UniRef90－UPIOOO3647C6B UniRef90－EOE2D4 UniRef90－Q989V2 UniRef90－A3JVJ1 UniRef90－O2KXN6
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 IMI QGTASSVGKSVAVAALCRIGKQDGYSVCPFKSQN MVQGTTSDAGKSALVTALCRLMARRGLRVAPFKPMA QS $\square M V Q G C T S D A G K S T L V A A L C R I L K R R G I R V A P F K P M A$ AKAIMLQGTGSDVGKTVLVAGLCRAARNRGLKVRPFKPQN TKTVMIQGTASHVGKSVLSSAFCRIFYQDGYKVAPFQNMA KKSIMFQGTASGVGKSLI NTAFCRIFTEDGYNVAPFQNMA AKFLMVQGTASSVGKSLLVAAFCRIFKQDGYRVAPFQNMA KAIMVVGTTSHAGKSLISTAICRILSKRGWQVAPFQNMA AKVIMI QGTASNAGKSLLAAALCRIFRQDGYRVAPFQNMA QAYFILGTDTEDGKTHVAVTLDQQWQQQGLRVAAMKPVA
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K ERLVITGTDTDAGKTVLTIALAAYWQTY KVLFISGIDTNIGKTYATGILARALAEKGKTVITQKMIQ

LAVLGTGSDVGKSVTTALCRDFANRGDRVAPFKAMS ARSLMFLGTASSVGKSTTAAAFCRILRQEGFRVAPFKAQN TPALMLQGTCSNAGKSVLTAALCRILVQDGIKVAPFKAQN GLLVAGTTSDAGKSVVTAGLCRWLARRGVRVAPFKAQN KGFFVCGTDTD TKRVVVAGTDTGSGKTTVALNLLSFLKTRGYSTVGLLKPVS TPAIMFQGTGSNAGKSI LTAALCRILKQDGYDVAPFKAQN
 MFAGTASDVGKSLINTGFCRIFKQDGYHPAPFKAQN AKNLMDQGMSNAGKSITAGULRVLKQDGYNAAPFQNMA $L F V T G T D T G V G K S F F T A S L V R A L R G S G F N A A A F P V E$ MVLGTASHVGKSLLTAAFCRLLAEEGHRVAPFKAMA RP円MFVGTGSDVGKSVIAAGFCRIFRQDGYQPAPFKAQN ARALMIQGTGSNVGKSLLVAGLARAFVRRGLKVAPFQNMS AQAIMVQGTASSAGKSLLATALCRVFAQDGYTVAPFQNMA AVLI AGTTSDAGKSVIVAGLCRALTRRGIRVAPFKAMS K ${ }^{T} L \operatorname{MLGGTTSDAGKSTLGAALCRLLMRDGVAVAPFKPMA}$ AKGFFVTGTDTDVGKSFVSACLTKVLNAK FCVSGTDTDVGKTVVSALL KAVFITGTDTDVGKTFVSALLTKAW SLGLKASYWKP円Q ASGLLVAGTSSDAGKSVITAGLCRVLARRGLRVAPFKAMS
RAFLI TGTDTGVGKTFI AYNLAYALKEKGIKVGYGKPV TSARVIVGTDTGAGKTVFAAALTDALAG GVKCYWKPVQ KKNIMFLGTASSVGKSTIAAAICRYLKNQGFSVAPFKADS AKNIMLQGTMSNVGKSFLTAALCRIFRQDGYSVAPFQNMA ALLVGGTSSDAGKSLVVAGLCRALARSGVRVAPFKAMS K GVFVTGTDTGDGKTLVSATLARAWNAD YWKPVQ GLLVAGTTSDAGKTAVTTGLCRALARRGVKVAPYKAQN RLLITGTDTGVGKTFITYNLAKELKERGYKVGCLKPVE $R K V M L Q G T A S N V G K S D I A A G L C R D F Y Q D G F A V S F Q N M A$ AWFTTGTDTEIGKTFVACALDHALRRSGARAVAMKPDA $A$ LMVQGTGSDVGKSVLVAGLCRAFANRGLRVRPFKPMS MIQGTTSDAGKSTLVAGLCRLARRTGARVAPFKPMA
 AHGVMUGAGSNVGKSMLVAGLCRACVRRGLTVRFKPMS TQPLFITGTDTGVGKTYVSSGLGNLLKEKGVNVGYVKPIVE MQPQGTMSNAGKSLLCAGLCRDFKQDGYKVAPFQNMA


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 NNAAVTADGGEI GRAQALQARAAGIAATVDLNPILLKPNT SGLDGG S LGiMKPDQSGVG GDRERVRNLLDLPPQRLLPEA MNSFPTPEGLGUGRAQLVQAEAAGIPCKVEMNPVYFQAPTN TGVSV GEENADSYRLRHGSRGNQQEEDVVSVTLPDPL MNSYITLDGKEMGRAQVLQAYAAGLEPEAYMNPILLKPTS MNSYTTNEDAETAMAQVLQAEAAGVEPSYNMNPILLKPKE LNSAVTVDGGEI GRAQAVQALAAGVEAQVDFNPVLLKPES LNSAVTEDGGEI GRAQALQALAAGLAPHTDFNPVLLKPTT MSNDNRPGGGE GRGQWLQALACGVQPTVHMNPVLLKPQS LNSYVTREGGEI GRAQAVQAEAAKIEATVDMNPILLKPQE LNAYVTSTGGEUGYAQAVQAWAARVSPWVEMNPILLKPQG LNSFITADGKEMGRAQVVQAEAANKKPDVRMNPILLKPTT LNSYITDEGLEDGRAQAMQAEAAGVKPSYHMNPILLKPSS LNAYVTPNGGEDGYAQAVQAWAAGVVPQVEMNPILLKPQG $L N S Y U T R E G L E M G R A Q A V Q A Q A A G I E P S V R M N P I L L K P S S$
$S G A W Q D E Q G I I W R N D D V E R L I A A T G Q T D R A L L N P Y C F P S P I I$
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SGLYVTRDGAEПG
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$M N S F V T R D G R M G R Q V V A Q A C I D P H R M N P L L K P N S$ MNSMVTVDGAEDGRAQYMQAQAAGVEPAARMNPVLLKPGS CGGE EGGDTARVAAMLGLTPAEAADRLLPEAYRFNHPV
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TGLE
NNSMV
sco TDTDYVRQVTQLDPDDHFWERFRLSQPL NNSMVGDDGGCQGDTETVKQLTNFPEDRFERPQVELDIPL LNAYVTAERDLPADGSLLCSITGQEIKEAVP SGLDG LNSYVTKNGLEMGRAQVVQAEACKIEPDALMNPVLLK PS LNSFITPDGAETGRAQALQAEAAGIEPSALMNPILLKPTT $N N S V V T P D G G E I G R A Q A L Q A F A C G L E P S T R F N P V L L K P G S$
$T G V A E$
$M$ MSNNVDGAGAEMGRAQWVQALAARATPEPAMNPVLLKPGS TYREVPEDGSLLSKAT
LNSFITEEGLEII GRAQAFOAEAANGSMMPRFLD AGC TEEGLELGRAQAFQAEAANG AGAAVAADGGEDGRAQATQADACRAPPRTLVNPYAFRAA LNSAVTANGGEIGRAQALQALAAGIEAHTDLNPVLLKPTG MNSYLDKYGGEMGRAQVFQAEACHLLPRAYMNPILLKPSG S

TNAAVTVDGGEIGG
ESGDSATVAALARLPPERLHAPAYALQAPL

Unirefyo_I9L8

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UniRef90_UPI0003741572 UniRef90-A8TIT6 UniRef90_Q3AZ88 UniRef90-K9RN47 UniRef90_UPI00039BB00C UniRef90_UPI0003685826 UniRef90-A7FSG1 UniRef90-FOTCF4 UniRef90_UPI00047578CC UniRef90_UPIO00410CCA3 UniRef90-X5XMM2 UniRef90_UPIO00363D698 UniRef90_UPIO003811BB1 UniRef90-E3PXB5
UniRef90-B0KCS6 UniRef90-B0KCS6
UniRef90
F7NPX 7
UniRef90-M1WYJ4 UniRef90-R9LHM6 UniRef90_UPI0003B5FF57 UniRef90_Q1NTP9 UniRef90-13VRF7 UniRef90-F8DPR7 UniRef90-X6L5N5 UniRef90-UPI00031A2DFD UniRef90-B0C6S8 UniRef90-B8GDE3 UniRef90-14D6G8 UniRef90_UPIO003803DA3 UniRef90_Q0FF58 UniRef90-D814Y3
UniRef90 25 OZ 19 UniRef90-Q114H6 UniRef90_Q017N4 UniRef90_K5Z7D4 UniRef90_E8RH99 UniRef90_Q2LY95 UniRef90-Q67N26 UniRef90_UPIO00466EABB UniRef90-A3YVP6 UniRef90-A8PQ70 UniRef90-Q982F7 UniRef90-B3E2Z5 UniRef90-A7H6E5 UniRef90-B7URT2 UniRef90_C7P137 UniRef90_C4Z7P1 UniRef90-E8T2M6 UniRef90_LODAX1 UniRef90_C6VU80 UniRef90_Q31SA7 UniRef90-B0PB85 UniRef90_UPIO00416E2BF UniRef90-J3C9Z2 UniRef90-G5GN31 UniRef90_W7E171
UniRef90_L9XYP8 UniRef90_UPI000349BBE7 UniRef90_C5MIG0 UniRef90_W9GPU6
UniRef90_D3DIQ6 UniRef90_Q7NJR0 UniRef90-_13XC69 UniRef90-M1 MKC4 UniRef90_UPI0004659F28 UniRef90_M3VHP0 UniRef90_UPIO004693983 UniRef90_A4TOR6 UniRef90_O66832 UniRef90_UPI0004642DDE UniRef90-A0A011NLG8 UniRef90_UPIO003647C6B UniRef90-Q63WA1 UniRef90-EOE2D4 UniRef90_Q989V2 UniRef90-A3JVJ1 UniRef90_Q2KXN6 UniRef90-G8PUR1 UniRef90-R6SJT4 UniRef90-UPIO0037F1616 UniRef90_19L8Z9

90
100
110
N A Q S QVI I K GEPVVWGAVVEALDR|LUEEYELLVIEGAGSP TTGAQVIVQGKAALMPAVLESFQRLAAQCDLIVVEGAGSP DRQSQVIVMGKQTLDPKIQAVYQSLADENDVAVLEGAGSP GS $\square Q V V K V W G K E V F W D A V V E S L S S L L D A E Y D V C V E G M G S P$ SQASQIVLQGQVYGWQAVEESYAYLAERHQVIVIEGAGSP SPHDASQI EGNPVEDDKVKHAYEEVSKKYDYIVMEGSGGD DRSSQVVLMGKPI GDADALAAYADLRSRFDVVVCEGAGSP DVGAQVI I HGHSI GCMDAQASHQRLLATYDTVLVEGAGSP SPEEAAKHEAMTLD DDLLDDFTLPVQDRPYIVEGAGGA
 D GAQ V H GKR GHARARESFTRL




 $D R K A Q V I$ I Q GKPRAMEAVLDSWGRLTQAYEMVLVEGAGSP $D D G S Q V I V Q G K V F G M D A V L D S W T V V G E G A D V V I V E G A B S P$ D T $\square A Q L I \quad I \quad H G K V T T Q \square K A K D Y F S E Q E Y E V L V I E E G A G S P A E$ NMTSQVII RGQDT GWQADQDSLRS LAS EFDLAVCE GA GSP

 DTGSQVIVNGKRSFLPQIMMAAYESLAAENDIIVVEGAGSP SP H LLA AREA GVQ IDLLK HLVVDCYR QLAA QADVVVVEGAGGW EVGGQVIVMGRPVANMKVAEAYDELAAAEYEVVVLEGAGSP $D K N C Q V I L R G R V Y D S M D I K E D F Y K L S Q S Y D I V V I E G A G S P$ $D K D S Q V I V M G K P Q L I P Q Q M E A Y E G L A A S E N D A V I L E G A C S P$ $D V G A Q V V V Q G R R V A T A S V L E S F R R L S A A H D D V I V E A G A G P$ $D V G A Q V I V H G H P V A M D A V L A S H H R L D D R Y D A V I V E G A G S P$ A P P L A A K R A G QVVDDLDPAWQAVQQLQSQFDWVLVEGVGSG



 A P H I A A A DSGVVID K ER LLK A VWF HER P DD S L V I E GA G G W A P PVASEKEGRLI QLDKIWSTFTTLREQKDFVLVEGLGGL
 $D V G S Q V V L N G V A W M D A E S C A A L A R L R A S C D L V I M E G A C A E$ APFFAARNEGRQVDWQR ILETLDEKKRARFAPLIVEAA GGV






## A


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

DTGS QVIVNGKRTLIPEIQKAYDKLAGQYDIIVIE GAGSP


 A

## D <br> S

SMTSQVILLKGKPPGWWQAVVAEALDAELDQSQYELVVICEAAAGS

 $D R R S H V V L R G Q P R L R R V V V E E L D S L R R D F D V V I D E G A G S V$ SPWAAA P L E D DAEIDDATADVPPPRTDAPLI DEGAGGLL D R R S H V V L M G R P W G Q VA A H E A F D E L A S R Y E V V V A E G A G S P
$A$
$A$ $\stackrel{N}{N} N S S Q V V V L G K P V G D E V L K N S F E G G L Q N E H D V V V M E G A G B A$

 $N N M S Q L I D M K G K F V R N D S S R Q Q V Q R Y Q K D F D \| V V L E G A G S P$ SPHRPAEIIDGQSIDETADDLRSPRVLPTP

 SPHFSAE EEGVLI DVVENLT


UniRef90_U2M2K4
UniRef90_UPI00046AC8BD UniRef90_Q92CK0 UniRef90_UPI00037230FC UniRef90_UPI00047B9E8C UniRef90_D3E0W2 UniRef90_UPI0003B40F9C UniRef90_UPI0003B5CE33 UniRef90_G6EZF9 UniRef90_UPIO003741572 UniRef90-A8TIT6 UniRef90_Q3AZ88 UniRef90_K9RN47 UniRef90_UPIO0039BB00C UniRef90_UPIO003685826 UniRef90_A7FSG1
UniRef90_F0TCF4 UniRef90_UPIO0047578CC UniRef90_UPIO00410CCA3 UniRef90_X5XMM2 UniRef90-UPI000363D698 UniRef90_E3PXB5 UniRef90_B0KCS6
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UniRef90_I9L8Z9
$66 E A B B$



F

AE\| N|L|ND ${ }^{130}$ 140

150
A E IN L N D VVNMRVAKHLHAPVVLIDAD|IDRGGALAS|LVTLE
 A E L N L R E R D LAA N L A A R H F H D P V L L

 A E I $N$ N L R S R D L A N L A R A A F D L





 A EI NLLRDRDNMGMAELVVDAPVLLVGDDDKGGVGASLA GTM

 A E I N L R A R D I A N M A E A V D C P P V I L V A D I D R G GVVE H L V G T L E A E I
 A



## 












UniRef90 U2M2K4 UniRef90_UPIO0046AC8BD UniRef90_Q92CK0 UniRef90_UPI00037230FC UniRef90_UPI00047B9E8C UniRef90_D3E0W2 UniRef90-UPI0003B40F9C UniRef90_UPI0003B5CE33 UniRef90_G6EZF9
UniRef90_UPIO003741572 UniRef90-A8TIT6 UniRef90_Q3AZ88
UniRef90_K9RN47 UniRef90_UPI00039BB00C UniRef90_UPI0003685826 UniRef90_A7FSG1 UniRef90_FOTCF4 UniRef90_UPI00047578CC UniRef90_UPIO00410CCA3 UniRef90_X5XMM2 UniRef90_UPI000363D698
UniRef90-UPI0003811BB1 UniRef90_E3PXB5 UniRef90_B0KCS6
UniRef90-F7NPX7 UniRef90_F7NPX7 UniRef90_R9LHM6 UniRef90_UPI0003B5FF57 UniRef90_Q1NTP9 UniRef90_I3VRF7 UniRef90_F8DPR7 UniRef90-X6L5N5 UniRef90_UPI00031A2DFD UniRef90_B0C6S8
UniRef90_B8GDE3 UniRef90_I4D6G8 UniRef90_UPI0003803DA3 UniRef90_Q0FF58 UniRef90-D814Y3 UniRef90_Q5QZ19 UniRef90_Q114H6
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UniRef90_Q67N26 UniRef90_UPIO00466EABB UniRef90_A3YVP6 UniRef90_A8PQ70 UniRef90_Q982F7 UniRef90_B3E2Z5
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UniRef90_Q31SA7 UniRef90_A3X4N4 UniRef90_B0PB85 UniRef90_UPIO00416E2BF UniRef90-J3C9Z2 UniRef90-G5GN31 UniRef90_W7E171
UniRef90_L9XYP8 UniRef90_UPIO00349BBE7 UniRef90_C5MIG0 UniRef90_W9GPU6 UniRef90-D3DIQ6 UniRef90_Q7NJR0 UniRef90_I3XC69
UniRef90_M1MKC4 UniRef90_UPI0004659F28 UniRef90_M3VHP0 UniRef90_UPI0004693983 UniRef90_A4T0R6 UniRef90_O66832 UniRef90_UPI0004642DDE UniRef90_A0A011NLG8 UniRef90_UPIO003647C6B UniRef90-E0E2D4 UniRef90_E0E2D4 UniRef90_A3JVJ1 UniRef90_Q2KXN6 UniRef90_UPIO0036FF06A UniRef90_G8PUR1 UniRef90_R6SJT4 UniRef90-UPIO0037F1616 UniRef90_I9L8Z9

[^0]
## 



180


200 AVAADNAMVRGFAVNKFRGDRSLFDAGRDDIARRTGWPSL
 A L Q E D R GYF Q GFI I N K F R G N R E V L E P G I R E L E R L T G V P V L
 $Y$ L K N R D I Q V C GU L L N N F K $\quad$ D M P M E N D N L K M I E E L L G G V D V I AVLAD QALVAAFVINKFRGDSRLLEPGLQMLHSMTGRPVL ALLSEQARI KGFVINRFRGD $\square$ ALLLQP GLLDWLEAHT GKPVL
 AVLEDRERVVGYLI NRFRGDASLIDD GLAAI TDRTGWPSF ALRHRNLPVLGLILN L A K Q S KV E L L G I I L N C C S QMTP EE DA D WA T I
 YARQAEDEIAGII L NGYQDGEEANKDNAMMI EAFGDVMVL


## ,

 | $L$ | $L$ | $D$ | $D$ | $E$ | $R$ | $E$ | $R$ | $V$ | $K$ | $G$ | $V$ | $I$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $L$ | $L$ | $E$ | $D$ | $Q$ | $R$ | $R$ | $I$ | $K$ | $G$ | $I$ | $I$ |
| $A$ | $V$ | $M$ | $E$ | $D$ | $N$ | $A$ | $R$ | $V$ | $A$ | $G$ | $F$ | $L$ |
| $A$ | $L$ | $E$ | $S$ | $E$ | $R$ | $R$ | $R$ | $V$ | $A$ | $G$ | $F$ | $V$ |

## 

## 3




## 

$\square K$ P C
A CK Q Y GVVEVALVYNLYPETDKUIADNME
ACPE QQAQ!RGFVINRFRGD DSLFQPGDDWIERRTGKPVY



 $A L R A R S I P L A G \square A F \|$
LSEAERAMVAGFVI NRFRGD A
MQFYEEN GLYYL SRSMMK

A I AND GL



 A L R A A




 HLKNRGINRVFVVMN A L L S D E DRAKAFV DNKFRGDD
 AL R A R S I P V L GV A F I







 AL R A R K L P P L G V I M S GPPS D H L A L R A R G C N L L G I V F I
LEE DEKERVVKGLI I I NK FRGD


LA R LT G V K L L G I I L N C F Q P R S A Q E DA D W D L I Q S L T H I P V L


| UniRef90_U2M2K4 | $\mathrm{G} \mid \mathrm{V} \text { V\|H H } \square \mathrm{E} \text { Q } \mathrm{L}^{210} \square^{\square} \mathrm{D} \text { E E D S } \mathrm{V} S \square_{\mathrm{D}}^{220}$ |
| :---: | :---: |
| UniRef90-UPI00046AC8BD | G V I P WFD |
| UniRef90-Q92CK0 | GVI P Y L E E E D S V S L S G K N LD S S A L |
| UniRef90-UPI00037230FC | GVLP Y L S L L D D E D |
| UniRef90_UPI00047B9E8C | GVI P Y I E DLTT\D E E D S V S L |
| UniRef90-D3E0W2 | A K |
| UniRef90_UPI0003B40F9C | GTIPWLD G $\square$ W $\square$ DVE D S $\quad$ LD L |
| UniRef90_UPI0003B5CE33 | GVLP Y L H DLHLEAEDA |
| UniRef90_G6EZF9 |  |
| UniRef90_UPI0003741572 | G V L P Y L H GLDIS S E D A |
| UniRef90-A8TIT6 | GVV P WFA D A A L P A E D A V A LD |
| UniRef90_Q3AZ88 | A QLPPLHP L |
| UniRef90_K9RN47 | GCLP Y L D DL D K L A Q $\mathrm{C}_{\text {A S D L E L E K L }}$ |
| UniRef90_UPI00039BB00C | G VVPP F R D I F IEEEEDSVVVD R K L |
| UniRef90_UPI0003685826 | GII L P WMAEEADDA |
| UniRef90-A7FSG1 | GVVPY T R L Q L D E D G |
| UniRef90-F0TCF4 | GVLP Y D D D L K L P E E S A S L |
| UniRef90_UPI00047578CC | GVI P WLA EL HLEAED S |
| UniRef90_UPI000410CCA3 | $\mathrm{G} V \mathrm{~L} P \mathrm{P}$ Y H G L F L D A E D A |
| UniRef90-X5XMM2 | G V V P WL K |
| UniRef90_UPI000363D698 | GVIP Y F N E $\square$ P E E D V I A E Y |
| UniRef90_UPI0003811BB1 | G V I P W |
| UniRef90_E3PXB5 | GVVP Y T NLNTIEDED S |
| UniRef90-B0KCS6 | GVVPYMDVHI DEED |
| UniRef90-F7NPX7 |  |
| UniRef90-M1WYJ4 | GII P Y L EHPFPAEDS LDL |
| UniRef90-R9LHM6 |  |
| UniRef90_UPI0003B5FF57 | QEIP F |
| UniRef90-Q1NTP9 | GVLP Y L A E L G LP Q E D S |
| UniRef90-I3VRF7 | GVVPYMDVYVDEEDSA |
| UniRef90_F8DPR7 | GVLP M S D D D D E E D A G K A LDVA V I |
| UniRef90-X6L5N5 | GV AP WFPQA WK |
| UniRef90_UPI00031A2DFD | GVLP Y L H GLLQLEAEDA |
| UniRef90-B0C6S8 | GQVPHLSDPTNRAALAEVLDLEML |
| UniRef90_B8GDE3 | GVIP Y R L D L P S E D S L S |
| UniRef90_14D6G8 | GVVPYFKR』P D E D S V A |
| UniRef90_UPI0003803DA3 | G EV |
| UniRef90_Q0FF58 | GV L P WF |
| UniRef90-D814Y3 | G V L P WLD R V W $\square$ D S EDA |
| UniRef90_Q5QZ19 | A SIP P L P G WT EEDLS |
| UniRef90_Q114H6 | G II P HLKK D 1 T D LD KLA K A LD LE |
| UniRef90_Q0I7N4 | CELPPLEELNAAALTRQW |
| UniRef90-K5Z7D4 |  |
| UniRef90_E8RH99 | G V L P WYK H F H $\square$ E A E D A |
| UniRef90-Q2LY95 | $\mathrm{G} V \mathrm{~V}$ G R I $\mathrm{I}^{\text {d }}$ |
| UniRef90_Q67N26 | GV I P Y L A D L G L D E E D S A G L |
| UniRef90-Q6ALU6 | GVVPYIH QLGIP E E D S |
| UniRef90-UPI000466EABB | GV L P W |
| UniRef90_A3YVP6 | A CLIPPLPRDDRQALDAEHW |
| UniRef90-A8PQ70 | S LV P Y Q EKKIDD D D W R LIN |
| UniRef90_Q982F7 | G R L P Y L D P LT D K TL R A A M I |
| UniRef90-B3E2Z5 | GTI P Y L H NLP P E E D SVVS Q L L $\square$ AVL |
| UniRef90-A7H6E5 | A RLA HVRD I A ERQ |
| UniRef90 B7URT2 |  |
| UniRef90-C7PI37 | G V V P Y R K D I Y DEEE D S |
| UniRef90_C4Z7P1 | GVIPYVRLDILEDEDS |
| UniRef90 ${ }^{-}$E8T2M6 |  |
| UniRef90_L0DAX1 | GVLP Y R P D L Q D Q E D S L T D |
| UniRef90_C6VU80 | GVLPYFRDIHIE Q E D S V S L E L |
| UniRef90-Q31SA7 | A ELEP L P |
| UniRef90-A3X4N4 | G VI P WF WE A WK |
| UniRef90_B0PB85 | GVMP Y L HVDIDDEDS |
| UniRef90_UPI000416E2BF | AVLP Y I S GL WVD A E D S |
| UniRef90-J3C9Z2 | AVLPYLS GL Q L A E D A |
| UniRef90-G5GN31 | ACVEHDAELPMAADALLALL |
| UniRef90_W7E171 | TEIPHMEKL |
| UniRef90_L9XYP8 | T V P P V D D M P A E E |
| UniRef90_UPI000349BBE7 | GELEPLAAVNP T S LKA A F |
| UniRef90 ${ }^{-}$C5MIG0 | A NIPHSKPND |
| UniRef90-W9GPU6 | G V I PWLLEVWLD S E |
| UniRef90_D3DIQ6 | EV P R V S GLL L P P D $\square$ R NA L |
| UniRef90_Q7NJR0 | GVLP WL EMAL P E E D S |
| UniRef90-I3XC69 | GRLP R L ELLTP D R L R Q A F |
| UniRef90-M1MKC4 | GVMPYEKFDIEDEDS |
| UniRef90-UPI0004659F28 | GVIP Y $\square$ S CDI E D E D L S E K L N |
| UniRef90-M3VHP0 | GVIPYSDELWLDAEDS |
| UniRef90_UPI0004693983 | A EIPP P L D R V D A A A VEEALLA R T $\square$ A P L |
| UniRef90_A4T0R6 | GTLPWHPDI WLD S EDA |
| UniRef90_O66832 | KV PR ${ }^{\text {V }}$ Q DVEELP K D $\square$ |
| UniRef90_UPI0004642DDE | G V V P Y S D K I E D E S |
| UniRef90_A0A011NLG8 | GVVEHGT TPAEA |
| UniRef90-UPI0003647C6B | $G \vee V P W L G D$ |
| UniRef90-Q63WA1 |  |
| UniRef90-E0E2D4 | GVVPYQKLGI E E E D |
| UniRef90-Q989V2 | GRLP H L P K T L R A M $\square$ AS F D LDL |
| UniRef90_A3JVJ1 | GV V P WFTDHLLPAEDA LDI A |
| UniRef90-Q2KXN6 | A Q P P Q L V VD A A |
| UniRef90_UPI00036FF06A | G IV |
| UniRef90_G8PUR1 | G R L P L L K E I T P E |
| UniRef90_R6SJT4 | GVTPYL HVEIEDEDS |
| UniRef90-UPI00037F1616 UniRef90-19L8Z9 | GCLP YL E DLD QLAA Q $G R L P L L N A V T R E T L A A A F$ |

UniRef90_UPI00046FDE5A UniRef90-E1YM05
UniRef90-A4F8D5 UniRef90-K7RUS5 UniRef90_K8NDZ5
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UniRef90_D5BRB5 UniRef90-W1IUU0 UniRef90-V6L2B9 UniRef90-G0HRU7 UniRef90-A0A031JXW1 UniRef90_UPI000225FB6C UniRef90_UPI00036E6C7D UniRef90_D4J6M8 UniRef90-F1Z6F1
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mbmatasdvakslvitalcrillanegirpapfksos KGVFITATDTEVGKTFVSALLLKALLKONIKAGYFKPVA VLVITGTGTEVGKTVVTAALAALAPGR VAVLKAAQ Gl LIAGTSSDAGKSLMVTGLCRVAARRGDDVAPYKAMS TTRLIVSGTDTDVGKTVFCAGLADALDAD YWKPVQ RYVVTGTDTGGKTVEAAALTAALGAS YWKPIQ RLVVTGTDTDVGKTVESAALANALDSY Y Y WKPIIQ AKSTMIQGTASDAGKSILTAALCRVLAQADYKVAPFKSQN RGLVVAGTTSDAGKTTVVTGLCRWLARRGVRVAPYKAMS avLI GGTSSDAGKSLLVAGLCRALARQGVRVAPFKAMS KAYFITGTGTDIGKTLVTSILYKVLGRLGIKTTDCKPFQ AALVAGTTSDAGKSVLVAGLCRWLARQGVRVAPFKAMS SLLI QGCGSDVGKSTLVAGLCRLFANRGLIVRPFKPMS
${ }_{\mathrm{N}}^{\mathrm{N}}$ SDFAVVGTDTDVGKTVASLMLMRFLIRAGHAPYYWKPVQ ALMLQGTCSNAGKSLITAAVCRLLARRGLRVAPFKAMA
$R$RAL MA 1 VVGTDTEDGKTVFSAALTGALGASA $V$ ML
T K N
A
SSK
MFQGT

K GlVVVI A G T T S D A G K S V V V V T A L C C R A F A R R G V T V V A P F K A Q N

A P A L F V T G T D T D $\square G K T V V$ S A WL C R HF G C D
PALLVAGTTSDAGKSVVAAGLCRWLARQGVKVAPFKAQN
QAFYVQGTTSSAGK SLGCTGLCRIFKNNGLKTVPFQNMS
ALLIA A TTSDAGKSVVAAGVCRWLARTGARVAPFKAMS
FIT G $\square$ GTDVGKTIASAILTEALEAB
APAALI A GCTSDAGKSVGVAGMCRLLARRGVKVAPPKAMS

VI T G T N T DVGKTYT TA SVARSAIVQGVRVTVCKPAQ
$A V M L Q G T G S D V G K S V L V A G L C R L L D A N R G L D T V R P B K P B M$
A
M।
$A L V V A G T T S D A G K S V V V A G U C R W L V R Q G$
CGTDT DVGKTLI S SFFVRGLVSYGVSVAPFKAMS
 NK V TGSLLVAGT ARTLM A RTLLVGGTGSDVGKSLIVAGLARAFTRRGLRVRPFKPMS

T
T P C L M $\backslash Q$

| $C$ | $M$ | $Q$ | $G$ | $A$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $L$ | $V$ | $T$ | $G T$ | $D$ |
| $G$ | $L$ | $V$ | $A$ | $G T$ | $T$ |

    \(R T L I V T G T\)
    

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

YFVS Gld T D A GK S YCTA WL AK E L T GE GHRVIT QKFI Q
$T L M F Q G T G S D V G K S L V V A G L A R A L T$
$\begin{array}{llllllllll}G & G & H & R & V & I & Q & K & F & Q \\ R & R & G & L & V & A & P & K & P & M \\ \text { W }\end{array}$
K T L F I T
D T DAGK T I V T T A

A A GLA GALGAYYWKPVQ





ARALMFQGTGSSVGKSVLVAGLARACVRRGLQVRPFKPMS
K K L $\mathrm{F} V \mathrm{~V}$ G $\square \mathrm{G} T \mathrm{E}$ I G K T V S A A IL L T E A L Q A D



$S R T L L V A G T A S H V G K S T V A A G L C R L L A D R G V S V A P F R A Q N$


GLLLAGTSSDAGKSLITAGLCRLARDRGLSVAPFKAMS

A

| T | F | V | T |
| :--- | :--- | :--- | :--- |
| K | G | T | F |

    KTLFTTGTDTDAGKTVVTTA
    



## UniRef90 UPIO0046FDE5A UniRef90-E1YM05 UniRef90 K KRUS 5 UniRef90 K8NDZ5 UniRef90-UPIOOO3B785B4 UniRet90-LOEXC4 UniRef90-G2HC71 UniRef90-E3DP30 UniRef90-UPIOOO37614BD UniRef90-A0A023D275 UniRef90-H6MY35

 UniRef90-D5DB40 UniRef90-UPI00047EAEBD UniRef90-UPI00034AA435 UniRef90-J2GPV4 UniRef90_UPIO0036AF23B UniRef90-B114G0 UniRef90_UPI0003687DA1 UniRet90_MOBM47 UniRef90_UPI0003B3F51F UniRef90_S9TR62 UniRef90-H3ZLB0 UniRef90 F3X289 UniRef90-D7GDX9UniRef90 UniRef90-UPIOOO2FCAB51 UniRef90_K9VHP5 UniRef90-UPI0004763AC3 UniRet90_KOAY18 UniRef90-Q6NHE6 UniRef90-A0A022LKD4 UniRet90_Q893G4 UniRet90_R5UON4 UniRefolo-18QNB88 UniRef90-V8QMII 1 UniRef90_UPIO003463DDB UniRef90-S5ZL60
UniRef90
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UniRef90 W1IUU0 UniRef90-V6L2B9 UniRef90-GOHRU7 UniRef90-A0A031JXW1 UniRef90-UPIO00225FB6C UniRef90-UPI00036E6C7D UniRef90-D4J6M8 UniRef90-F1Z6F1 UniRef90-A0A024FFS6 UniRef90-UPIIOOO35D30F8 UniRef90-UPIO004678E14 UniRef90-K9YL50 UniRef90 F6EY97 UniRef90-M6HSA3 UniRef90-A0A059IJK2 UniRef90-D8J6Z0 UniRef90-G1UUH9 UniRef90-UPIOOO3758908 UniRef90-B7RIE7 UniRef90-D5QHR2 UniRef90_UPIO00404B00D UniRef90-UPIO003B74F71 UniRef90-R5F651 UniRef90-B4VTQ7 UniRef90_UPIOOO46930C5 UniRef90-E4TJT3 UniRef90-LOAE09 UniRef90-M0СМ87 UniRef90_UPI0003B78289 UniRef90_UPIO00422D90E UniRef90-J3A617 UniRef90-K9SNE1
UniRef90 W8VNZ UniRef90-A9BCGO UniRef90-F8EU79
 SGCQTENGFLVSEDLLYVEKFTGTKMEHDLHCPVRYQKPL TGVAAGEDGD NNSMVCADGAEDGRAQYL AGHEDG
SGLLDGADGE
AGLDS
LNSCVTPDG ETDSETVH MNS NNSMVCADGAEADAQAVQAEAALVDPEVNMSPILMKPNA SGLAD NNSVVTLDGGEDGRAQALQAYACGLEPSTRFNPVLLKPGG $T G Y Q D E T G G Y P D \quad D H W F E T R L G V A D G D Y Q L K P E T$ NNSMVTLDGGEDGRAQAVQAAACGVEPSVRFNPVLLKPGS SLGUMKLMQSGEGDREWYQKIFSLEQSPEEITPLYFKAPLL NNAAVTADGGELGRAQALLQALACRTPPTVHMNPVLLKPQS NNSVVTLDGGELGRAQAMQARACGLEPSVRFNPVLLKPGS
 TGHPPDDDAEFVGDA CGDPAAATCLRRLEPAK LNSFVTSDGKEMGRAQVLQAAACGLAPDVRMNPVLLEPTS NNAAVTSDGGETGRAQALQARACQIAPLADMNPVLIKPHS MNSAPSIDEGGELSRAQYLQALACKKKPSVRFNPILLKPEG AGTDEEGHG
NNSMVCPDGAET NNAAVTADGGEDGRAQALGATAAGVTPEAAMNPVLLKPGT TGCDGLSEDDETHRRDMGDGLDPEDEDGTTCPIVFTYPA SLGTMKLLQTGTGDRELYTRLFPLDQSPEEGNPLHFDAPL NNAAVTADGGETGRAQALQAFACGIEPSVDMNPVLIKPEA MNAVDIGENGKVAGSQVVQAEAAKTKPLPEMNPILLVPNS MSNNSMAGFGEI TGNEDVSEDIAA LINSTVT TD MNSVIPDGAETGRAQAMQAAAAGTEPSAAMNPVLLKPG SRFFVTSEGKKISTAQALQAEAAGTEPSVLMNPILLIPKT
 AG D LDEHSSYKVQQYDSNTKSIFFPNAYALNTPA NNCAVTDDGGEDGRAQALQALACGLEPDVSFNPVLLKPGS
TGEPAGS
SNNAAVAQGGET
NNAAATPDGGE GRAQALQALACRVAPSTDMNPVLIKPQS
NNSMVTPDGAE
SGLLEVTADGGT
TGCEGVSQDIQM
MHR
NNAAVTAEGGE
MSNNPSGEWGE
MNSWDTKDGKE
LNSYVTKAGDE
NNAAATSDGGE
KEESQ
MNSFVTREGAE
TGYPPDD
AGMEEEGP
AGIDEEEGPGGETG
SGAA MGRAQALQARAAGLAPSVHMNPVLLKPET LUS AKA LNSF LTTEGLEMGRAQVMQAEAAGIEPSVRMNPILLKPTS
AGK
TGNVGHSEDDDLHRRMGTGY
NNAAVTADGAEI GRAQALQARAA RLEAPTADTM
TGLMKLLQTGMVGDAEFYERFFDDVE
AGVDP EGDKEVAA SGDPASHTPLRYDAPL
AGVDPT
LINSFVTLNGEE GRAQALQAQAAKILPDVRMNPILLKPSN
NNAAVTADGGEVGRAQALQAQAAGLEPVVDMNPVLLKPET LINSFVTEQGEEMGRAQALQAVACGLPADVRMNPVLLKPTS
A
NNAAVTEDGGEDGRAQALQAMACGRNLSVHMNPVLLKPET NNAAVTAGGGEปGRAQALQARACGVAPDVDMNPVLLKPQG SGSE-TVDAGTVKSLISNTSSVFHPESYLLKAPL NNAADTADGDEMGRAQYLQALAAKVKPDVLMNPILLKPSA TGNVGHSEDIDLHREDMGITPFTPEDKEQITFPIVVYSYA
T G T
AG DNFSEDDS
TGCDNFSEDIDEHRKHSVKAYVSNQKTVFHPNSYALHTPA MSNNDGDEWGEIGVSQFVQARAARTTPTTDCNPVLLKPRG
 NNSMVCADGSEIGRAQYLQA TAAGVEPSSAMNPVLLKPGS MSNAVVTDGADESTAQYVQARAARVRPTTDHNPVLLKPRG
C GS
SGLTETDRGT
SGIEDG
TGLAE
TGHPPDDDASF


130
140
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 L V V $\underset{P}{ }$ V $V$ T R E E L L
 A EI NLKAHDLVNMAMHAGARVLLVGD\DRGGVFAALVGTM
 MVPVTAEMMMDDLAALYGMPVILVARSGLGTINHTLLSLE AEINLRDTDDANLAQAADLPVLLVTDDRGGSLAHLFGTTAB

 AETNLRAGDI ANMAHAADVPVALVGDIDRGHVIAALAGAH A E D N L R A T D I A N L A R A A D I P V V V V G D I D R G GVVA H M F G T L A FVVPLKS E Y L V A D L A R D L K L P L V I A A R P G L G TII N H T L L T I A LVPFSRTHMLADMVQRFGIKPILVARAGLGTINHTLLSIE $R \vee P D S D G R E V V D L I A D L E L P A L V V A R S G L G T L N H S A L T V E$ A EINLIHD VVNMRMARYAGAYVALVADDDRGGAFAAALAGTM A EVNLRAGDIANMATAADLPVILVVDIDDRGGADAAMVGTV VEI NLK DYDIA NMARHANAKVILVVADDRGGSFASIVGTM


 Y V P $\operatorname{L}$ S E A Y R T I D Y Y VA E H G L P V V L V






| $A G E$ | $N L$ | $R$ | $S$ |
| :--- | :--- | :--- | :--- |
| $L V$ | $P$ | $L$ | $G$ |
| $A$ | $E$ | $G$ |  |
| $A$ | $I$ | $N$ | $L$ |
| $R$ | $D$ |  |  |


 FVPLNDEDCVIDLIQP DYKVIVVSRHYLGSINHTLLTIE




 A EI NLR A GDDANMARAA GVVPVLLVGBDDRGGVDAAMVGTR



 A EVVNLRAGDDANMAQAA DDPVIVVGDIDRGGVDASLVGTD R A L S Q D N A F Y S D WVVVK E K L P V I L V V G I Q A G CVV N H A L L TA Q
 A EVNLRARDDANMARAAGVPVVLAGD DDRGGVDAQUI GTAQ A A PLLD DY LVVDYFA DLNLPIVLVTNNRLGCINHTVL SVK



 GSSP I T D D L T I A H VAA D S WA LDD TI L V A P
 SEVVNLNDIVNMRMAEYAKADVLLVGNIDHGGLFGSIL GTM A E V V A I NLR D V VMRMARHAFARVLLVADI DRGGAFAS V G







 AVINLAB

 AEINLHD R DLANVAR DSGADILLVADIERGGVFASLVGTL





|  | 210220 |
| :---: | :---: |
| UniRef90-E1YM05 | G HIP F K K D N P D D |
| UniRef90_A4F8D5 | GVLPEGA A A D P A F G D $\square$ AR |
| UniRef90-K7RUS5 | GVLP Y V H G VWLD GEDA |
| UniRef90_K8NDZ5 | GRLPRLS PLTRESLRGAF |
| UniRef90-UPI0003B785B4 | GRLPRLDPLSPDSLAAAF |
| UniRef90_LOEXC4 | G R L P K I S PLTPD |
| UniRef90_G2HC71 | G V V P Y L R D L GLP E E D S |
| UniRef90 E3DP30 | GVIP F L K D D L P S E D |
| UniRef90_UPI00037614BD | GVLPWLP GLWLDSEDA |
| UniRef90-A0A023D275 | A ELP WLE QV D A A AVAS |
| UniRef90-H6MY35 |  |
| UniRef90_D5DB40 | MTV PVFTHIDEELDA |
| UniRef90_UPI00047EAEBD | GVLP WREELWLDAEDS |
| UniRef90_UPI00034AA435 | G CLIP Y LA DLD KLA QLA S NLDLEI |
| UniRef90_J2GPV4 | GMAPWL |
| UniRef90_UPI00036AF23B | GVVPFAD R L W L A A D S |
| UniRef90-B1I4G0 | ALVPEDA GLEKREPVLRL |
| UniRef90_UPI0003687DA1 | GCIP HIEEDNPPEEAI NLFER $\square$ A |
| UniRef90-M0BM47 | TLAP I ST DRPGPA AVEDALDPDV |
| UniRef90-UPI0003B3F51F | GVVP ML E R L P E E D S V S |
| UniRef90- S9TR62 | $\mathrm{G} \\| ~ V P \mathrm{WF}$ A EAA |
| UniRef90_H3ZLB0 | GVI P Y VD K LP E E D S L A E F |
| UniRef90-F3X289 | GRLP RLATL NRETLTEAF |
| UniRef90-D7GDX9 | GVMPWLEDVWF D GEDALQVD |
| UniRef90_K5YTQ4 | GVLP WF S N A A |
| UniRef90_UPI0002FCAB51 |  |
| UniRef90-K9VHP5 | G L L P L D D P T D L A K LA K D LD LE R L |
| UniRef90_UPI0004763AC3 | AVIP Y L P ELP E EDS PYRHADTS |
| UniRef90_K0AY18 | GVVPY F ELS $\square$ E E E D S |
| UniRef90_Q6NHE6 | G S 1 |
| UniRef90-A0A022LKD4 | G V L P WS P DVWLDSEDA |
| UniRef90-Q893G4 |  |
| UniRef90-R5U0N4 | E V V P Y I P E |
| UniRef90-I8QNB8 | GVVPFRS G L W L D VEDS LDL A |
| UniRef90_V8QMI1 | QQLPLLPEVPSAALRAALSNLS |
| UniRef90_UPI0003463DDB | GVLP WLD GL WLDVEDS LALLSVDR |
| UniRef90_S5ZL60 | A TIP Y M H L ELEDED S |
| UniRef90-K5C4Q8 | G V |
| UniRef90_A4FM88 | $\mathrm{G} V \mathrm{~L}$ P WA E D L W LD A E D S |
| UniRef90_V6SS51 | GRIP Y F D Q N |
| UniRef90-E2MU00 | $G \ V P F \square P G L W V D A E D S$ |
| UniRef90-UPI000255614F | GDIS F ETS GDFRNSKA Q L D $\square$ S CLL |
| UniRef90 U7JW42 | G L V P |
| UniRef90-UPI00037A8410 | GV I P WLA A ARQPAEDAVVLD A A I |
| UniRef90- F3X2W3 | GLIP WL S ELP S E D A VA |
| UniRef90-D2S739 | $\mathrm{G} V \mathrm{~L}$ P WLP GAAVDVEDS |
| UniRef90_UPI00030AC8CE | TEFPRLNNID K N |
| UniRef90_W0ADU6 | G V VP WL H Q T A R |
| UniRef90 E8UG62 |  |
| UniRef90-C7QGK0 | G V VP W L P G $\square$ R LDAEDA |
| UniRef90-B0UH14 | GLI P H F P E A A R |
| UniRef90-M0NFT9 | GVLP Y D D PGLPEEDS |
| UniRef90_D7E611 |  |
| UniRef90-F9N624 | GVVPA |
| UniRef90 D5BRB5 | GIL P WFA D |
| UniRef90-W1IUU0 | GEIP Y L L R P E E R D L S H Y L D $\mathrm{S}^{\text {V }}$ |
| UniRef90_V6L2B9 | GVLPHRHGLG】DEEDGLRISL |
| UniRef90 ${ }^{-}$G0HRU7 | $\mathrm{P} \vee \mathrm{P} \mathrm{P}$ |
| UniRef90-A0A031JXW1 | GRLP R L D P LT P E T LA A A F |
| UniRef90-UPI000225FB6C | GLVP WFADAAR |
| UniRef90-UPI00036E6C7D | GKFPKVNLPLTARALAQY |
| UniRef90_D4J6M8 | GVVPYMHDI DDEDSLA DRLD |
| UniRef90_F1Z6F1 | GRLP $\\|$ VP DLSPAT LAAAFAD |
| UniRef90_A0A024FFS6 | GRIP Y F D K NVIK E Y A ERF |
| UniRef90_UPI00035D30F8 |  |
| UniRef90_UPI0004678E14 | GLA P F F A D A A R |
| UniRef90_K9YL50 | GYFP Y LE NLS S LE DLLAK |
| UniRef90-F6EY97 | GRLP HI D PLDAENLRSAF |
| UniRef90-M6HSA3 | G IV P Y I K NLELP E ED S |
| UniRef90-A0A059IJK2 | GVLPFFPDLPAEDALDVH |
| UniRef90_D8J6Z0 | G V L P Y D D P GLP Q E D S |
| UniRef90-G1UUH9 | GVV P M L E D L P E E D S V F F K L G $\square$ T P |
| UniRef90_UPI0003758908 | GRIP Y F D Q N |
| UniRef90-B7RIE7 | G V L P WF |
| UniRef90_D5QHR2 | GLVP F LD R VDLP A E D A D L |
| UniRef90_UPI000404B00D | HISP |
| UniRef90_UPI0003B74F71 | A NLP Y R H Q LPEED |
| UniRef90_R5F651 |  |
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| UniRef90-E4TJT3 |  |
| UniRef90-LOAE09 | GVLP Y D D P GLP E E D S |
| UniRef90_M0CM87 | $T L P P L A D D E P G D A V A G V R E H L P V$ |
| UniRef90_UPI0003B78289 | GVLP WL H GVALDDGEDS LDL |
| UniRef90_UPI000422D90E | GVI P WL A DVWLD |
| UniRef90_J3A617 | G V L P Y D P G L P A E D S |
| UniRef90-K9SNE1 | GRIIP H L Q P Q D R E V T |
| UniRef90-W8VNZ0 | GHMEK H D Q $\square$ T P R L Va D Y |
| UniRef90-A9BCG0 | A ELPHFNKLSAHLLSSEW |
| UniRef90 F8EU79 | A EIP F L |
| UniRef90-L9X743 | ETIP PLS GESPAAMAAGVVDA |

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 YFi SGIASTDAGKTVLVAAFCRILANKGYNVAPFKSQM VFFVSGUDTDAGKSYATGYLADKWNRQGVRTITQKFIQ RLYIAATSQHVGKTTCTLGLMAADRARGKKVSYCKPVG SKG MLQGTASNVGKSILATAFCRIFAQDGYQVAPFKSMA ALM AGGDGSDVGKSLLVAGUARALVKRGLSCGAMFKPMS TFFITGDSTEVGKTVVSAGI TEALQADGOYWKPIQ AI FIGATGTDVGKT, LSALLCKYGKSLGLKKLYKPIIQ $K N I M I Q G T G S S V G K T L I V A G L C R I F A Q D G Y R V S P F Q N M A$ KVLFVSGDDTDIGKSUATGYYAKHLMQQGYSVITQKMVQ

$$
\begin{aligned}
& A V F V S G U D T D A G K S Y C T A W Y A N R L \\
& \text { AFAVVGTVTNVGKTFVTAGLVGWL } \\
& \text { QTFVTGTDTGUGKTVFAAA }
\end{aligned}
$$TQ

 VLF SGMD TD GKTYATGMVAKVLMQQGDNVITQKLVQ
 NKIYFVTGDSTEVGKTDASAIITEALEADYKYWKPDQ APALLVTGCTSDAGKSVVVAGMCRSLARRGYRVAPFKAQN ALLIAGTTSDAGKSMVVAGLCRLLARKGMRVAPFKAQN RVFAVTGTSTDVGKTVATAA LLAAAGHGGSVAVCKPVQ KEFFISGIDTDCGKTYITGLLAYHLKKSGKKIVTSKLIGQ
 A PFTGTDTGAGKTVLTALLEAHLRSQGVNALAMKPVC GLEVTATDTGVGKTEVVCGI AEAFRRRSPRDGLCKPFA ALLVAGTCSDAGKSIVVAGLCRLLARKGLGVAPFKAMS RPVVFTATGTDDGKSYVTAGLDKAFIRAGQQVQALKPVL TLLVTSTHESTGKTALTLALGKLAQERGNAVGYMKPKG
VLVISGTGTGVGKTVVTAAVAALAADRGQRVAVFKPAQ KALVVWGTGSGVGKSLFAAGLLRHFRRLGLKAAPFKAQM QRATVGGDTGVGKTVVSALLARALNAEGGRVGWKPIVQ TNHLLVLSTGQHVGKTTLSLGLVKTLQAKNKLVAYCKPVGG KAFFTTGTGTETGKTVAVSVLFDSDKALGKKVTПFKPAA ARCVMVLGTSSGAGKSWIATAGCRHYANQGLRVAPFKAQN

## UniRef90 UPIO004289098 UniRef90-E4NUT9 UniRefefo-HOFEU7 UniRef90-D7B481 UniRef90-K7R8E7 UniRef90 O9CJT7 UniRef90-V5WI07 UniRef90-UP100046F5BCE UniRef90-Q2CAB2 UniRef90_SgVTU5 UniRef90 J6H9D9 UniRef90-F4F6Y8 UniRef90-UPIO0047BAB90 UniRef90-K2MPT9

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NNAAVTEDGGEПGRAQALQARACGVPASVHMNPVLLKPQS
NNAWVD $\square N N G E M A Y S Q A V Q A W A A G U E P \square C A M N P V L L K P Q G$
TGNAD TSED $\square$ QKHRE TMGQGWFQEDHDK $\square T M P E \prod F S Y P A$ AFPAYLPDGRADAGSVVTQAEAACREPESDMNP ILLLRVAG SGTDDAP GSDMGVRQLT GLDPARLYPPAATFGASLL $M N S F V T A D G G E \square G \square A Q A M Q A W A A R L S P T I D M N P V L L K P K G$ TGSRV DA LR LDQAGAGTKMSLSEDNPFFFRCPA LNS YVTEDGKEDGMGQAFQAWASGDEPTGDMNPVLLKPSG NNAAVTADGGEIGRAQALQARAARAVPSVHMNPVLLKPQS AG ALLENSDSKKVENLISNEESFFYPEAIKLNTPM A GAYERDGVRRNEDADQLDAAANVALPPEDRTPFLLEAAA
 SNYSYKWDGFEDSQAQAMQAMAAKIEPSPHMNPDLLKPLG TGCEFLSEDIEEHRRWMGLDERFLEDKEGLTAPQIFAYPA
 QEFVELGELRVDKDA LLFARGMDFELRAELHSPVITGRGV S GV NNAAVTVEGGEVGRAQALQARAARVPLSNHMNPLLLKPQS SG TGEPDGSGD TG
TNFMOT VT DERLTGGMDSGLHETVLGTEFDRYPEPGL LNSFVDTEGGELSRGTVIQAEAGYEDPRAFMNPVLLKPNS QEHVETETGURDKDVILFKDHFKLQDDYSLMSPVLEPRGF MSNADGHGFGEDGVSQYVQARAAGVVPTTDHNPVLLKPHG
TGEPEGE
TGCQDVSED LLHREDMGLPLQDVDRD GTTCPYVFSYPA NNAAATRGGGELGRAQALQARACRTEPTVHMNPVLLKPQS
 MNSVIVEGEYEDARAQWLQAI AAKTDPSRYMNPLLLKPEG AG D D F PGPDGEQPRGEDGRAQALQARACGVPPSDHMNPVLLKPQT NNAAVTADGGEVGRAQALQARAAGVPLSVHMNPVLLKPDS
$T G V D S A P D A T I L L E S C R K V N R N E G L K T E D I T A Y T F P L P A$ QGDGETDDRWE GVSQFVQARAARMTPTTDCNPVLLKPRG MA LiNATPGGGE GTAQAVQAEACGDPPEVRHNPVLLKPDG SGLEPGEPG ETDSQCVARLSGAAPARILPELWRLRLPA TGMGPGEPG DLAVI GHLSGVTRTLELA TGRRVGDSEDILAGDVAAVKEMTKLGENHFSNKFYHFKEPV $T G N V G R S E D L E L H R A L T V G H L L D D E D R E L T A P V I D F S Y P A$

 T GVARDLS S GKMGDU1T HRQLMGDPLQPCDVCPYRFEKPA AG SGDFSDTHKVKSKISNSKSQFFPNAYELNTPA S NFFATAGGAKMADVQAIQAVAARKEPDPDMNPDLLKPDG A G E
 MSNDAHGVGGEI GRAQGMQARAAGLAPSTRFNPVLLKPGS NNAAVTADGGE』GRAQALQARAARVPLSVHMNPVLLKPET TGVAPAEPGD LAEVSRLAGDVTTVESYRYPEPL TGCKGDSED ILA HRKLMESDLLPEDK S GLTCPVVLSYPA
 $A G P R \quad S D R R L$
${ }_{T}{ }^{\text {G G GNS DN }}$
SFISS TTGVPAYDS ITFSFSEPI



 TRLQSNVGKTLDEDPMLARELLGLDAEMHQMEPIVYSPTF UNSYDTKDGLEMGRAQVTQAEACGIEPDVRMNPILLKPAG
 AGN LENSDSNIVHELSG AYCHPEAYRDHKPL TGVIDCPDGSELLS LVQELNPEFKDDSVEDIVPITYELPA





UniRef90 UPI0004289098 UniRef90_E4NUT9 UniRef90_HOFEU7 UniRef90_D7B481 UniRef90_K7R8E7 UniRef90_Q9CJT7 UniRef90_V5WI07 UniRef90_UPI00046F5BCE UniRef90_Q2CAB2 UniRef90_S9VTU5 UniRef90_J6H9D9 UniRef90_F4F6Y UniRef90_UPI00047BAB90 UniRef90_K2MPT9 UniRef90_Q7VB41 UniRef90_C4UFF4 UniRef90_A3M2V3 UniRef90_H0UIW4 UniRef90_UPIO00237E7AB UniRef90_-A7I9K5 UniRef90_UPI0003770155 UniRef90_M4YLU9 UniRef90_V5SCJ7 UniRef90_UPIO0029AF2EA UniRef90_NOAHA8 UniRef90_A2BYJ7 UniRef90_V6AR62 UniRef90_UPI0003819F35 UniRef90_R7P9Z3 UniRef90_UPI00037F61C2 UniRef90_UPI00036EE477 UniRef90_UPI0004761B59 UniRef90_UPI00046EA416 UniRef90_UPI0004057858 UniRef90_V6HPD6 UniRef90_F9EJM7 UniRef90_C6APT9 UniRef90_F8L7K1 UniRef90_MOIRS1 UniRef90_C4LIG1 UniRef90_B3EPV8 UniRef90_UPI0001D2F065 UniRef90_D0CNX6 UniRef90_Q97CS0 UniRef90_J9QSI7 UniRef90_D3RVX9 UniRef90_D5AS56
UniRef90-A6QBZ9 UniRef90_M0CFN2 UniRef90_E3CXN0 UniRef90_UPI0002FDDDC0 UniRef90_W5TIX6 UniRef90_F8E3L1 UniRef90_R7L6P5 UniRef90-R5ATF4 UniRef90-M0I0P7 UniRef90_UPI00031FBD1E UniRef90-E5WKV9 UniRef90_N0BGQ4 UniRef90_Q4FUW0 UniRef90_UPI00041EAD59 UniRef90_KOILF9 UniRef90_F6GF53 UniRef90_C4LJ98 UniRef90-Z5XB64 UniRef90_W8S6J9 UniRef90_L7K9N8 UniRef90_UPI0003658740 UniRef90_X7YDB1 UniRef90_UPI0003B6F76D UniRef90_E7C584 UniRef90_C6V599 UniRef90_IOIGB3 UniRef90_M0CXM0 UniRef90-T2RDC8 UniRef90_C7MZ13
UniRef90_UPI0003B4BBC0 UniRef90_LOK3K5 UniRef90_Q9Z6L7 UniRef90_E0UPH6 UniRef90_W2PNY8 UniRef90_UPI0003778E25 UniRef90_A0A024HEN9 UniRef90_I8UHZ0 UniRef90_UPI000466D413 UniRef90_I2K796

130
140
150
160


 $A E I N D R D V V N M G L A R H A G L D V V V V G D I D D R G G V F A A M Y G T V$


 A EII N D G D F V N M G M A E M V D A P V I L
 A EVNLRAADIANMAEAVKVPVVLVGDDDRGGVIASIVGTH



 A E V

 LVVPMNLKETIA D LI LLP T D K I I L V S R HY L G S I NH T L L T DE



 $G V G S V C D M S N A Q V A Q L L D A P V V M V V E G G G I G T I D K L D M M E L A$ A E I NI K DQD IA NMAKLLNQTPVLLVADDDRGGALASVVVGTL
 A EVNLRKNDI ANMAEAADIDVIL A GDIDDRGGVIAQIVGTH



 GVGSIVNFSNARVASELKLDLI I I A S G GLLGSSF DAMAVNK

 AETNLRAGDIANMAHAADLPVVLVGDDERGHVDAALVGAB

 A E I Y L R D DT N M H FA E R A DVVPVVVV G D LDDK G GTMA S L VGT W
 $M$ VP V T R D F F M I D L D GEIVNLHDRDLANVAEFANADILLLVDDERGGAFAS LYGTD










 LVVRGESATLLDVAA QTLAPVVIVVAPGLGALNHAELTVDD

 MVPDLA K K LLT WE G LI K S LLK CP V L V A A K N Q L G VI N H G L L T I I



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

 GVGSICELNNAQVAAELKDDAVCVALGGLGSSFDQLMNRE


 $M V P V T K E Y M M I N L A K E D N A K V L L V T P S K L G C D N D T L L S M S$


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UniRef90_UPI00046F5BCE Uniref90_UPIO0046
UniRef90_Q2CAB2 UniRef90_-S9VTU5 UniRef90_J6H9D9 UniRef90-F4F6Y8 UniRef90_UPI00047BAB90 UniRef90-K2MPT9 UniRef90_-Q7VB41 UniRef90_C4UFF4 UniRef90_A3M2V3 UniRef90 HOUIW4 UniRef90-UPIO00237E7AB UniRef90-A7I9K5 UniRef90_UPI0003770155
UniRef90- M4YLU9
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UniRef90 V6HPD6 UniRef90-F9EJM7
UniRef90-C6APT9
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UniRef90-M0IRS1
UniRef90-C4LIG1
UniRef90-B3EPV8
UniRef90 UPI0001D2F065
UniRef90-DOCNX6
UniRef90_Q97CS0
UniRef90 J9QSI7
UniRef90-D3RVX9
UniRef90_D5AS56
UniRef90_A6QBZ9
UniRef90 MOCFN2
UniRef90-E3CXN0
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UniRef90-F8E3L1
UniRef90-R7L6P5
UniRef90-R5ATF UniRef90 MOIOP7
UniRef90_UPI00031FBD1E
UniRef90-E5WKV9
UniRef90_NOBGQ4
UniRef90_Q4FUW0
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UniRef90_W8S6Jg
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UniRef90-G2HS34
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T L P P
AE
GTi PYIRDTPEEDMAG
GTLPWDPGLWDDSEDA $\quad \square D L E$
GTLPMLPELPEED
G\|MPYVPDHRLPEEDGVDFDL
 GRVNE ENYFDRSA 1 SKYADL SVMPY $\square$ DDEDEEEDS
GVLP WAVDL WLDAEDS
GAIHRLEEISSSA $\square$ QA $\square A \square Q M K P$
GI
GIMPWLNEDFPPEDSVKDD
$G E L P Y L P R \quad P E Q R D L V K Y L D L S L L$
GVVRYFS GLP E EDSL
AEFPA $\square$ TPMGPDAVA
GVVPHFSPLPSEDSLSRHRDLPV
$G \vee V P Y$
GLLPYFD
GRIP YFDRN
GDI AHMSP PSPDAASKALDVNRL
AEFPLIQNI
GVIPK K K L PNEDS LDDR DHL
$\mathrm{Y} V \mathrm{~V} \mathrm{P}$
G VLP Y
GVIPCCKDFK IPDEDS $\square$ S $\square D$
GCFP Y L DD D $\square$ T L A Q $\square A S D L D L$
GVVPF F
LHI PYFDKNVIKYYAEKY $\square$
GCLPAGAGEFSAAEFAQ
G
G VLP Y A D $\square$ K $\square$ EEEDSKKY $\square$ N $\square$ SVI
GCIP F DP SKPSMKDFESLFGATLL $G \underset{V}{V} \operatorname{P} Y$ P P G L P E E D S LAA GYIP

GMVPFAPAALLPAEDAVALDRAP GRLGRDERLTPDTLRHAF
GILPYQS GFLPGEDSFDY
G R V
GMVRWFERTP AEDSLA
GLMRWSERLPEEDSLG
GVLPYDDPGLPEEDS
GVLPYDPSLRLPAEDS
GVIP E GAGQWSPERFAD RLPYYSNFP

T LPP P LDVSEPSAVVTGVREHDPP
GRLP MLSELT
GMI PHLENPSSAVGDSEFL
G\|LPFMD
GRDP YFD Q N
GVIPKDEFNLPEEDS

Gl 1 V P Y S D GL WLDAED
GLLRW
GVLPAGAAGLEPAE
GVLP Y A DELWLDAEDS
GSMPAGSGRLERAEATARDDLRSL
F 1 DP Y LGK S
ATFPHLKEVTRDS ILS
AKLPRHREADAA
GlLPY L T D LTNTREDAQ
GVLPYAEQLWLDAEDS
F L L PRQAEEAKFDQ
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GVLP
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GCDPDLKDLP TMADYAKLLKSDLI
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AVV P MRHGHGLPEEDG

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UniRef90 O6AK53 UniRef90 UPIOOO346EF6B UniRef90-F21A92 UniRef90_UPIO00462FOEA UniRet90-A5V5Q4 UniRef90-D2RRG4 UniRet90-D2PSW2 UniRef90-TOYH49
UniRef90-F4KQ13
UniRef90 F8E4G5 UniRef90_UPIOOO37352A7 UniRef90-Q18KB9 UniRef90-M8E1R4 UniRet90-K3W676 UniRef90-F1YHQ8 UniRef90-Q5L5F7 UniRef90_ABB7A4
UniRef90 B8iBW1 UniRef90-UPIOOO3B76B93 UniRef90-UPIo00365E6F1 UniRef90_W7ILW4 UniRef90-A5V1W1 1

UniRef90 E1UUY9 UniRef90-W4ECA6 UniRef90-L1JYPO UniRef90-A5G8804 UniRef90_F9VPE1 UniRef90-UPI00047EF3BE | UniRef90_LOKASO |
| :--- |
| UniRef90 ToBD | UniRef90-B1Z8C9 UniRef90-D7BY99 UniRef90-W1JF70 UniRef90-UPIO004723947 UniRef90_MOE7L5 UniRef90-AOAO24Y116 UniRef90-A6VHG1 UniRef90-A0B8D7 UniRef90_F5LAZ6 UniRef90-NOAUS2 2 UniRef90-N7WUX7 UniRet90-A6TJEO UniRef90-D5UNP4 UniRef90-UPIOOO424CDA6 UniRef90-F8FEM8 UniRef90_UPIO004138223 UniRef90-UPIO003B3ED61 UniRef90 ${ }^{-}$W0SJV8 UniRef90_UPIOOO377C437 UniRef90-D3F020 UniRef90-F8D7B1 UniRef90-S7T815 UniRef90 UPIoo03660F77 UniRef90-K1WIA 1 UniRef90-E8X1C7 UniRef90-T2RE55 UniRef90-KOS9R6 UniRef90-T5R3B6 UniRef90-K5Z9N9

UniRef90- X6DFO6 UniRef90-M0Q5C1 UniRe990-UPIO002DEE9DD UniRef90-UP10003065801
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KNLYVAATSQHVGKTTTTLGLVANFNERGLRTGYCKPVG SDGFFITATGTSVGKTYTSALLLKY GGGLYLKPVQ $K E F M L A G V S S G V G K T T V T L G L K A L A N R G Y Q V Q P Y K$
$T P T I L V A G T A S H V G K S T V V G G L C R F A N A D V R V A P F K A Q N$ SRRLVIAGTGSGAGKTTVTIGLMAALKRKGHVVQGFK AQAVYVAATRQHVGKTSTCLGLLQGLTSRIEHVGFLKPVG

TLFVAGAGTEIGKTYVTAALTRALRASGRPVRALLKPVA $R K L V V A G T G S G A G K T T V T L G G M A A L R S R G L R V Q G F K$ MISGTGTDVGKTVVTAGVAALARAAGRRVAVLKPAQ TLLYVASTETFVGKSATCVGLLTRAQRDGFRVGYMKPVS RLVIAGTGSGSGKTTVTLGLMRAFARRGLKVQGFK
THTVMLAATGMHVGKTTLSLGVFKGLEKRYGRVAYCKPLG KKIFIAATGQHCGKTTVSVSLMHLARKKYGRVGFIKPIG
 NPRVVI AGTESGVGKTTVTIGLMAALDKQGYNVQPYK RLVIAGTNSGAGKTTITLGMMAALARRGLCVQGFK ALFVVGAGTEDGTYTTAALVRRLREQGRRVRADKPDA VLVITGTGTEVGKTVTTAAVAATALAAGRSVAVLKPAQ $R \square V V A G T G S G A G K T T V T L G L M K A F A D S G \square R V Q G F K$ TPTTLVTATGDSAGKTAITVALARLAADRDRSVGYMKPKG AVAAGRSVAVLKPAQ KRVIVADRSSSGKTTVVAGLSAMVRMNLNVQAFK SRRLVIAGTGSGVGKTTVTIGLMAALRNKGYVVQGFK KRRUFITATDTDAGKTWVTAGAVRSLAASGDDVRAVKPVA LGAVYWKPVQ
A LLAGTHSGVGKTTDSDGDMGALKKRGEKVKPFK
LCVTGTSTGVGK TVATAALAAALLPTAGVTVIKPAQ RRLVIAGTGSGVGKTTLTTGLMAAFRKKGYVVQGFK GLII AGTGSGAGKTTVTI GLMAALQRRGLRVQGFK TKTVFIASAEPYAGKSVIALGLVNMLDSKTQKVGFFKPII KGFFI TGTGTDIGGKTWLACVLLRHWRAEGRVVAAFKPVL
 ILVSSLEESVGKTAI TLALARLAQAEGEGVGYMKPKG RLIISGLSGGSGKTVVSLGLARAFARAGTVVAPFKK VIVVSGTGTEIGKTVVTAAVAAAAAARGRTVAVLKPAQ RSYQIYGANTNVGKTILSTVLCKAFARKYPSEAYLKPVS AFLVAGNASGVGKTTVTQALIAALQRRGLVVQPFK
 AVFVSGTGTDVGKTVVTAALLRALRLAGVAAQAVKPVQ

AFVLAGTGSGCGKTTVTGGLLRVLQQRGLRVQPYK ALLVAGTDTEVGKTVLTSALLAYWQQH VVVTGTSTDVGKTVATAALAASAVAAGLRVAVCKPAQ RLIIAGLNGGTGKTITSLGTTRAWSRKGKCIKPFKKA VLVVTGTSTETGGKTVTTAALMAAVAVKAGRSVAVLKPAQ KGFMI AGVSSGIGKTTVSMGLMSLF RRLVVAGTGSGVGKTTLTTGLMAAFKKKGYTVQGFK GLYGGTQGFSGKNLVTLALGQQFQREGHRVGYMKPVG KGFM1 AAPASGSGKTTLTLGLDRALKRRGEALAPAKA

UniRef90 A0A024GJH4 UniRef90_UPIOOO471280B UniRef90-D6ZDC3 UniRef90_UPIo00365C4B7 UniRef90 R2NPR7 UniRef90-UPIIOOO36E21AC UniRef90-DoL1Y6 UniRef90-E4NT63 UniRef90-UPI00036FABDA UniRef90-MOAEL9 UniRef90-E8TZE5 UniRef90-UPI00046FD93E UniRef90-A9A602 UniRef90-UP10003B7436C UniRet90_L9ZXM9 UniRef90 ${ }^{-}$W4G1W9 UniRef90_UPI00037D8A19 UniRef90-A815C0 UniRef90-W9boGo UniRef90-10RVJ3
UniRef90 O6AK53 UniRef90-Q6AK53
UniRef90_UPIO00346EF6B UniRef90-F21A92 UniRef90-UPIO00462FOEA UniRef90-A5V5Q4 UniRef90-D2RRG4 UniRef90-D2PSW2 UniRef90-TOYH49
UniRef90-F4KQ13
UniRef90-F8E4G5 UniRef90-UPI00037352A7 UniRef90-Q18KB9 UniRef90-M8E1R4 UniRef90-K3W676 UniRef90-F1YHQ8 UniRef90-Q5L5F7 UniRef90_A9B7A4
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UniRef90-UPIOOO3B76B93 UniRef90-UPI000365E6F1 UniRef90-W7ILW4 UniReffo-A5V1W1 UniRef90- E1JUY9
UniRef90 W4ECA6 UniRef90-L1JYP0 UniRef90-A5G8Q4 UniRef90-F9VPE1 UniRef90-UPI00047EF3BE UniRef90-LOKASO
UniRet90-TOBDX5 UniRef90-B1Z8C9 UniRef90-D7BY99 UniRef90-W1JF70 UniRef90-UPIO004723947 UniRef90_MOE7L5 UniRef 90 -A0A024Y116 UniRef90-A6VHG1 UniRef90-A0B8D7 UniRef90_F5LAZ6 UniRef90-NOAUS2 2 UniRef90-N7WUX7 UniRef90-A6TJEO UniRef90-D5UNP4 UniRef90-UPIO00424CDA6 UniRef90- F8FEM8 UniRef90-UPIO004138223 UniRef90-UPIO003B3ED61 UniRef90 ${ }^{-}$W0SJV8 UniRef90-UPIOOO377C437 UniRef90-D3F020 UniRef90-F8D7B1 UniRef90-S7T815 UniRef90-UPIO003660F77 UniRef90-K1WIA 1 UniRef90-E8X1C7 UniRef90-T2RE55 UniRefoto-KOS9R6 UniRef90-T5R3B6 UniRef90-K5Z9N9 UniRef90-X6DF06 UniRef90-MOQ5C1
UniRef90-UPIOOO2DEE9DD UniRef90-UPIO003065801 UniRef90-UPIO00381AEC7 UniRef90-Q720N8 UniRef90-UPIIO00366CD81 UniRet90-C3WE44 UniRef90-UPIO002F2519F UniRef90-G7Q3R7 UniRef90-M3KHG8 UniRef90_UPI00041AF8ED

QQHDPVGDNLRDKDAYLLFKE ${ }^{60}$ YFKLVHDYQHMSPVIFPNGF ${ }^{80}$ AG TGGRDGEPGDAD FEAARLGAEAVEFVRYADP TGSEGNTDSE TGPFPDTD FYQACHIEKQNTVHFYSMSLEA QEFVDDGDLKVDKDALLESKTMNFDLSAELHSPVILGRGV MSNNSAERGGDAGDAQYVQARAARVTPTTDHNPVLLKPRG CG DDDQSDADVKKLS PETLIHPESYLLRTPQ ATMETANQWGEDGVSQFTQARAARLMPTTDVNPVLLKPRG MSNNPGGAWGEIGSAQYFQALAARAEPDVRMNPLLLKPEA VGPDYDDTGWHSAVSGVASRNLDAFMLPQPTLNWLY SNFGYATPDFEDSRAQAIQALAAKCPDEPDFNPDMLKPLG TGVEGTSPG DAQDIACWLGNPEPLAVFEGVRLRHPM TAFPTDD DAGYVQRDCG DDSAATRLRTFGEPL QQHVPVGGGLRDKDSFLFKEHFGLVHDYKDMSPVIFPDGF
SGVPPLSDGFVESDTARLLDAQGLALDEEAVEPWRFSASPL
 TGTANGDDD TGTDAGDDD
$T G C V G \square S E D \square L A H R Q \square M G \frac{L}{R}$ TGVGPDEEGDA
$A G D L H T G D S D F$ AGDLHTLDSDF AGLADG
$\qquad$ TDSDTV
DEDPLLARELLDEA AVVKPAQTGVTADEAGDLQDVERLGGTDDE
QQHVT TNGПTADK TGTK

VGPDYDTASDTVKLSKLINKY
MNSEVGPDYDIAYHSRITKRASRNLDSFMIPDTL

QQSVLVNDGADRVDAVAKEПFHLSRCQYADMSPVVIPPGY TGVAPGEPGD SGSLNHSDSAIVH VSVTHTPEGAFDEDAAFTRESFALSGARCHPESYRFSHAL SGVPDLSDDFSASDTALLLAAQDLPVTPETMTPWRFAAPL LNAF LGRDNGEMAFAQAFQAMCSSREPTSHMN
TGVAPDEPGD VSVIRTETGVHDDDAAFVRDHALPDPLERVAPVLVTQGVV TGYPEDD

DAAFVVARTGLAREDAMVTLYTAA
QRFDDGRVVKVDPDVEVLRNYFKLNLSWEHMSPVVFPSGF PKCTEFNGITMDKDAALMAKDYGLEDDAAFMSPVVLGKGS LNSFPTMDNGEDAFDQAYQAFAKGIEPERYMNPILLKKPA CGPDYMDPSYHTAVTGRHSRNVDSWMDE

## VGPDYIDPAYHTALLHRPSRNLDTWMMP

SGVPPLDHPDDTGRLLAAQGLAVTPETVAACSPWRFAAPL TGVRADEPGDT AEVARLAGAVTQAELARYPEPL AGLEG ETDTEVVARLGGLSADRIVPEHYRLTMPA
 TGGVVE GPQEPGDAAEVARLAGGAL LSEGLET LINPDNLLK


CGLDADG RNEDDEVLLAAQNGGDADLISLYRLALPA SGLE EETDSEIVARLAQASPQRILPEAWRLNTPA VGPDYDDPQFHQYVTG1PSRNLDSHLTDPRVLE
TGFAAGADLDENGQLSDAAEVARLVPEATTVEHRRYPDPL CGPDYIDPTYHTAVTKRTSRNLDSWMLEKNVVK
SQQEP
CGPDYUDPTYHRAVTGRASRNLDSWMLS
SGFDPGQAFADPGHHTKIAGRDSVNLDSWMDTA YSASLTQ ARQDKDALLMQKLLKMDVPLEMVTPVM AMAA TRGESNVGKT烏EDPMARELLDDDAEMHDGEPVVYSPTF GPDYDDAAWLGLAAGRA TGLSHGEPG DADAGEAARLAGAPGVTGTERARFPEPM GGPDYLDTTHHTRLAGRPARNLDTWL

VGPDYIDPSYHFDTGR

AGRDNNHGGGEDGRAQWLQATACGVAPSVHMNPVLLKPQT
VGPDYLDTGWHTAVCGVTSRNLDSFMLPTPTLN
APAVLKPFQSGVGDRELYQRLFFPQTSLEATIAQYFEAPL TGVADDDPG GADGQEVRLFGDSVHLVELARYPDPL GPDYDDAKWLALASQHPCTNLDPYL.
VGPDYTDTNYHQAITGVASTNLDSFLTDDDAM
 AVPHK DENQ DGDEDAHFMQQADGCGPDYDDPTPTYHTAV TV GPDYIDPAYHKSASGVDCFNLDPWAMR

## UniRef90 A0A024GJH4

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UniRef90 UPI000346EF6B UniRef90-F2IA92 UniRef90_UPIO00462F0EA UniRef90-A5V5Q4 UniRef90-D2RRG4 UniRef90-D2PSW2 UniRef90-TOYH49
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UniRef90-D5UNP4 UniRef90_UPIO00424CDA6 UniRef90-F8FEM8 UniRef90_UPI0004138223 UniRef90_UPI0003B3ED61 UniRef90- W0SJV8 UniRef90_UPIO00377C437 UniRef90_D3F020
UniRef90_F8D7B1 UniRef90-S7T815 UniRef90_UPIO003660F77 UniRef90_K1WIA1 UniRef90_E8X1C7 UniRef90-T2RE55
UniRef90 K0S9R6 UniRef90-T5R3B6 UniRef90-K5Z9N9 UniRef90 X6DF06 UniRef90-UPI0002DEE9DD UniRef90-UPI0003065801 UniRef90_UPI000381AEC7 UniRef90-Q720N8 UniRef90_UPIO00366CD81 UniRef90-C3WE44 UniRef90_UPI0002F2519F UniRef90-G7Q3R7 UniRef90-M3KHG8

 UniRef90-UPIO00471280B UniRef90-D6ZDC3 UniRef90_UPI000365C4B7 UniRef90-R2NPR7 UniRef90-UPIOOO36E21AC UniRef90-D0L1Y6 UniRef90-E4NT63 UniRef90-UPI00036FABDA UniRef90-M0AEL9 UniRef90-E8TZE5 UniRef90_UPI00046FD93E UniRef90-A9A602 UniRef90_UPI0003B7436C UniRef90-L9ZXM9 UniRef90-W4G1W9 UniRef90_UPI00037D8A19 UniRef90-A815C0 UniRef90-W9B0G0 UniRef90_IORVJ3 UniRef90_UPIO00346EF6B UniRef90-F2IA92 UniRef90-UPIO00462F0EA UniRef90-A5V5Q4 UniRef90-D2RRG4 UniRef90-D2PSW2 UniRef90-TOYH49 UniRef90-F4KQ13 UniRef90_F8E4G5
UniRef90_UPIOOO37352A7 UniRef90_Q18KB9 UniRef90-M8E1R4 UniRef90-K3W676 UniRef90-F1YHQ8 UniRef90_Q5L5F7
UniRef90-A9B7A4 UniRef90_B8IBW1 UniRef90_UPI0003B76B93 UniRef90_UPI000365E6F1 UniRef90-W7ILW4 UniRef90_A5V1W1 UniRef90-E1JUY9 UniRef90-L1JYP0 UniRef90-A5G8Q4 UniRef90-F9VPE1 UniRef90_UPI00047EF3BE UniRef90-LOKAS0 UniRef90-TOBDX5 UniRef90_B1Z8C9 UniRef90_D7BY99 UniRef90-W1JF70 UniRef90_UPIO004723947 UniRef90_M0E7L5 UniRef90-A0A024YI16 UniRef90-A6VHG1 UniRef90-A0B8D7 UniRef90-F5LAZ6 UniRef90 NOAUS2 UniRef90_N7WUX7 UniRef90-A6TJE0 UniRef90-D5UNP4 UniRef90_UPIO00424CDA6 UniRef90_F8FEM8 UniRef90_UPIO004138223 UniRef90-W0SJV8 UniRef90_UPI000377C437 UniRef90_D3F020
UniRef90_F8D7B1 UniRef90-S7T815 UniRef90_UPIO003660F77 UniRef90_K1WIA1 UniRef90-E8X1C7 UniRef90_T2RE55
UniRef90_KOS9R6 UniRef90-T5R3B6 UniRef90-K5Z9N9 UniRef90-X6DF06 UniRef90-M0Q5C1
UniRef90 UPI0002DEE9DD UniRef90-UPI0003065801 UniRef90_UPI000381AEC7 UniRef90-Q720N8 UniRef90_UPIO00366CD81 UniRef90_C3WE44 UniRef90_UPIO002F2519F UniRef90-G7Q3R7 UniRef90-M3KHG8
 LVPLNEEDTILDIIGP DYNVIVVSRHYLGSINHTLMTDW




 AELHASDVVNMRVARHAHARCLLVTDIDRGGAFAHLYGTW Y DGYGTDCSSAGMAKQ $\square$ GCPVILVDDGKAVSTSAAATVMG A E DNLQKYD AANMAQKANASVLLISDDDKGGSFASLVGTM
 $G V G S I C D D N N A Q V A A E L G M D A D C I A L G G L G S S F D Q L L N R E$ MSPVTEAATGLDWLRALGVPALLVSGSYLGADSHALTACE SEVNLRANDIANMARAADVPVVLI GD DDRGGVDASLVGTK LVLGSAGVTLRDLAVDLDAPVLLVVAPGLGTLNHTALTLE
 LVRLNKDRTLADVAELLAAPVLLVADPRVGTLNTTALTAE

 LVGLDEDHDLADLAARLSTPCVVVTRSGLGTLNHTGLTVA AEINLRENDIANMAEAVDCPVLLVADDDRGGVFAHLI GTLD GVGSIVNDSNARVAK\LEAGVIMVVEGGDGSTIDMLMSTA YAPLSNNYFMDDLDKKFSLPAIIVAEDILGTLNHTIMTYK FDGLGTDKDCADIAKKDGIPVI LV DDGKATSTSAAAMVHG YDPTNDKGSTAEI SILTQSPVLLVIGAQSMARSAAAVVG GVGSIVDDNNARVAAELG DDMVLIANGGMGSAFDLALNYA



 LVRFDDGGTLADVAWSLGAPVLVVAHAGLGTLNTAALTAE AEGSVVDLSADQVSDMLEAPVLLVTLYRSP LSSLDALLAVQ GVPLATRRYNYHFGLSLGLAVLLVVPNRLGCLSDSIVYGH YDGKEDTGSTAEDA LTAASPLLVVDVRSMGRSAAAIVLG GVGSIVNLNNAQVAGALGLDVVII APGGLGSSFDQLLNKS GVGSVI GLNNARVAKLLNAPVVMVTGGGUGNVIDSVLNLA YSPESNDGSTARIVSQLLEAPVLLIVVNIDRGGAFTSAYGAY
 YDP LDSEGSTAEVSRLLQAPVILVVNAASMARSAAAVVLG MSPDTEAATGLDWLKSQK DPALLVSGSYLGADSHALTAVE
 YDPLSNDGSTAEVAMLTDSPVLLVVDVRSMARSAAAVVGG

 YEGYEGDGSTAQUAKMLRAPVILVVDARSITRSAAALVRG
 MVPLSDGWLVSDWAAMSDCEVWLVIGCRLGADNHALLTLD




 MAP
 LVPDAADYLVRDFARDAGDPLVIAARPGLGTVNHTLLTDD EVGGIVDDTDVDVAEVLDARVLLVAPYKQPGDVDDVLAA FDGGDGTYSTAELAKLLRAPVILVVVDATKMTRTAAAVIQG
$L V R F D R G G T L A D A A R L L G A P V L V V A P A G L G T L N A T A L T A E ~$
 YDGFGIDCTSSYTSKKLKSPVILVVAGKAMSSSAAAMVLG AVGSIVNVNNAKVASMLGASMLLIANGGLGKAFDELLNRV CVPLNEREDMLDLMSDLDLPVLLVGGNGLGALNHSLLSLA AEI NLRAGDI ANMAEAVDCPVILIADIDRGGVEHLVGTLE AEENGRSRDVANMATRADVPVVLVGDUDRGGVDASVVGTH Y D GYGTDCSTAAMAKQLGCPVILL VDGKSTSIAATVMGFQ GSPVTYELTVADLAAAWHLDVVLVVPVRLGAIAQAVANVA
 FDGLGGIDRDNSSUAKCTKTPVILVVDGKAMSTAAAAAVGM LVHFDEGSTLADAARLLGAPVLVVAQAGLGTLNSVQLTAE
 Y SPLDNRGTTAEI SVLTNSPVLLVVNCASMARSAAAIVKG Y S GKYCGVDGDSVA QALGAKVVLVDRYLQEYNYDYLLAA FDGALDGKSSADLARTLDLPVVLVVDCARQSHSAALTSGF

## UniRef90 A0A024GJH4

 UniRef90-UP1000471280B UniRef90-D6ZDC3 UniRef90-UPI000365C4B7 UniRef90-R2NPR7 UniRef90 UPIIOOO36E21AC UniRef90-D0L1Y6 UniRef90-E4NT63 UniRef90-UP100036FABDA UniRef90-MOAEL9 UniRef90-E8TZE5 UniRef90-UPI00046FD93E UniRef90-A9A602 UniRef90_UP10003B7436C UniRet90_L9ZXM9 UniRef90-W4G1W9 UniRef90_UPI00037D8A19 UniRef90-A815C0 UniRef90-WgboGo UniRef90-10RVJ3UniRef90 O6AK53 UniRef90-Q6AK53
UniRef90 UPIO00346EF6B UniRef90-F21A92 UniRef90-UPIO00462FOEA UniRet90-A5V5Q4 UniRef90-D2RRG4 UniRef90-D2PSW2 UniRef90-TOYH49
UniRef90-F4KQ13 UniRef90-F8E4G5 UniRef90-UPIOOO37352A7 UniReffo-O18KB9 UniRet90-M8E1R4 UniRef90 K3W676 UniRef90-F1YHQ8 UniRef90-Q5L-5F7
UniRef90 A9B7A4 UniRef90-B8IBW1 UniRef90-UPIOOO3B76B93 UniRef90-UPI000365E6F1 UniRef90-W7LLW4 UniRef90-A5V1W1 101

UniRet90 E1UUY9 UniRef90-W4ECA6 UniRef90-L1JYP0 UniRef90-A5G8Q4 UniRef90_F9VPE1 UniRef90-UPIo0047EF3BE | UniRef90_LOKASO |
| :--- |
| UniRef90 ToBD | UniRef90-B1Z8C9 UniRet90-D7BY99 UniRef90-W1JF70 UniRef90-UPIO004723947 UniRet90 MOE7L5 UniRef90-A0A024Y116 UniRef90-A6VHG1 UniRef90-A0B8D7 UniRef90-F5LAZ6 UniRef90-NOAUS2 2 UniRef90_N7WUX7 UniRef90-A6TJEO UniRef90-D5UNP4

UniRef90-UPIOOO424CDA6 UniRef90-F8FEM8 UniRef90-UPIO004138223 UniRef90-UPI0003B3ED61 UniRef90 ${ }^{-}$W0SJV8 UniRef90_UPIOOO377C437 UniRef90-D3FO20 UniRef90-F8D781 UniRef90-S7T815 UniRef90-UPIO003660F77 UniReffo-K1WIA 1 UniRef90-E8X1C7 UniRef90-T2RE55
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UniRef90-UPIOOO2DEE9DD UniRef90-UP10003065801 UniRef90-UP1000381AEC7 UniRef90-Q720N8 UniRef90 UPIOOO366CD81 UniRet90-C3WE44 UniRef90_UPIO002F2519F UniRef90-G7Q3R7 UniRef90_M3KHG8

TLEKHGI ${ }^{170}$
180
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 GLVQAGMEEYTGLWNGVPNSSSEE DGLDAFEERTGVPVL ELKPDGMRERGALUTKFRGDPSELESGDDELKRSRTGVPIL
 NLIENKYKKKGFVLNKFRGDDDVLKPGFRKI KQLTKIPVI ACAARGFTRGTLLLGSYPNPGSLHERNLANLKRLGGWDFA A LRARDVPVVGVVLNRYPPQSVAERTNPAELERLCACPV MLLKHGVQLKGVILNKVDPAKDMVQDYFSRALKKRWDVLV TLRLHDVPLRAVVV
TVPADAAMIQGFIVNRFRGDPADFGSGMDLIAGHTGWAAL SLAAHGMPCAGLVIGSWPDPGVAEQGNREALARL APVR ALAVHGVPCAGLVIGSWPAPATVHVSNRCVLAKL APVR VLQQRGGTLAGMIYNRYGEVDRE
ALRSRGLVPAGVVVGSWPDPDLAMRCNDTDDPDMGAGPDS ALDSREIEDAGLIVNGERNEASE
A A EAGVRCAGVVGTWPEPGLAARCNDGDLARTAPDL ALRARDIPILGAFIGDP AVDAFGDRLAGVIYNDVADADTLETDVVAALEERGIPVF ALRVRGDPITGLVTGSWPEPDLAERCNAEDLPATTGVPLV ALPAERARVKGFIINRFRGDLTLLKPGDDLERETGLPVL LLFREEKVPVIGVIVNKVKPEMDETGHYLKRKLEQMGYPLEL
 ELLPDDVRNIGVVIKFRGDKSLLAPGIQTVEDRTGIPVL LCKQYGVKVRGVI LNKVRPDMDMVAEYFPKALKQWGMPLI A 1 DAAGVRTRGLVIGSWPDPDLAMTCNLADLPRLTGVPIV AMRARNLS LGIILNQYP KEEEDWLLRTTGLPFL RFVGKRLKGVILNQपEETRDDFQSHVVPFLEQHGI AVL Th HHAAVDLRAVVVSETPGAPTPPETVAEAVARHAGVRVL ELEDKKEKDCGFIINKMAGDKSLLKDGDDFIEKKTGKKVL ALRTRGDACAGVVVGSWPEPDLAARCNLED RYLGDRLLGVLINEVEAPKIDFVKNRAPFDEQRGVPVF F LIRHKMDFAGVVLNDHFAESPRHADNAAELESEFPGKVV FRQEPQVQWAAVLVNRCGSEGMYRLVKAALEAACGGPVI
LYKQDGVDVRQLLVNK
LTLPESVRRKGFII NKFRGDEKLLNPADKWLEEKTGMRYL

 TLRAHDVPLTGIVVSESPEAPTSVETVAGQIARHAGVPV ALRARGLDCPGVVIGSWPAPDLADRCNLADLPEAAGVPLL A L R
FQREPKDCTAGVIVNRCGSQG HYSTVKKATEQECGTPVL AADAFGDRLAGVVFNKVSDDESDDQDGIPFLESK GITVF A ARAVRGDTTLGVVVGSWPHPDLAARCNLADLARSSELPLG

 KLNSMGRSPARVILNAANAGDEWLLEPVAQAITPFLGAGCL AMRSRDIPVLGVAFI OSGSEANDTETTI AHLLGRVKRL
 A DDAADVACAGVVLSRWPEPGL QLLDPRVRIAAVFANKVGSEG NFESREVQVLGVVANRVGAEGEQVRDVKDAVEAECGIPVI FETFDPDLDIGGVIFSRTGSRVHYEYLKTAVEQHCKTPVL ALAGVGAGVTA\|AVNETPDSTVTDDATLETLSRHAGDPLV YLKKHGLEVIGNIFNQVSRPLLAKTEGLRHLLEQQGHRTL AARAGGTVAGVAVTPWPSAPGVIEADNRATVARLGDVGV C FDPGLRPSGVILNQTAGPRHRDLLRESIERYTDVPVL ALRARSLEPLGUVVGSWPAPDLAARCNLADLIPESAGAALL sLHDRGYD
TFDPT पPTAGVILNRTGGP RHDALLTAADESRCKTPVL YKEDKEVNIKGVIVNNVKTKN HYELIKEAVEKYCNVEVL LCEKHNVPIAGVVINKVFPEKYEQTKMSKALMDNYGIPLL LLASEQARVRGFVINRFRGDMALLQPGMEWLEQRTGKPVL


|  | GC $T$ PD $\square$ SD $\square S^{210}$ RPTMA |
| :---: | :---: |
| UniRef90 A0A024GJH4 <br> UniRef90-UPI000471280B | GCIPDLSDLSRPTMA |
| UniRef90-D6ZDC3 |  |
| UniRef90-UPIO0036 |  |
| UniRef90 UPIO0036E21AC | GVLP Y |
| UniRet90-DOL1 | SAYPHSP |
| UniRef90-E4NT | GVLPYDDPGLPEEDS |
| UniRef90-UPIO0036FABDA UniRef90-M0AEL9 | GV |
| UniRef90-E8TZE5 | ATIPMQWNHGLPEE |
| UniRef90-UP100046FD93E |  |
| $\begin{aligned} & \text { UniRef90_A9A602 } \\ & \text { UniRef90_UP0003B7436C } \end{aligned}$ | $\begin{array}{ll} \mathrm{G} T \\ \mathrm{G} A & \mathrm{P} \\ \mathrm{~L} \\ \mathrm{P} \end{array}$ |
| UniRef90-L9ZXM9 UniRef90 W4GIW9 | GCDPQLDDHPSMSDYSKLFHSDLI |
| UniRef90-UPI00037D8 |  |
| UniRef90-A815C0 | GLVPFYARपPAEDA鸟G |
| UniRef90_W9B0G0 UniRef90 10 CV 3 |  |
| UniRef90-10RVJ3 | AVLPASAGTMDAADFAA |
| UniRef90-Q6AK53 UniRef90- UPI000346EF6B |  |
| UniRef90-UP1000346EF6B | GVLP |
| UniRef90-Y21A92 | GrLPAGAGGLSRSEFAA |
| UniRef90-A5V504 | GRLPRLDPLD |
| UniRef90-D2RRG4 | GV |
| UniRef90-D2PSW2 |  |
| UniRef90-ToYH49 | GVLP P Y LT DLFLD A E D A |
| UniRef90 F8E4G5 | G RVPYYKNF |
| UniRef90-UPI00037352A7 |  |
| UniRef90-Q18KB9 | SVIP Y ${ }^{\text {d P GLIPAEDS }}$ |
| UniRef90 M8E1R4 4 | L RESDLE |
| UniRet90-K3W676 | ATVPRLPA DEFRARAPGWVDAAL |
| UniRef90-Q5L5F7 | GRL NYEKSTSKATVQNYAN |
| UniRef90-A9B7A4 | GLLP QLS GIPVEDL |
| UniRef90-UP10003B76B93 |  |
| UniRef90 UPIOOO365E6F1 | G WLKREDGLRVPERHLGL |
| UniRee90-W7ILU |  |
| UniRet90 A5V1V | AVLQ C D P QLIA SIVA DL |
| UniRef90-W4ECA6 |  |
| UniRef90-L1JYP0 | GC\P Y YEA |
| UniRef90-A5G |  |
| UniRee90-F9VE |  |
| UniRef90-UPIO0047EF3BE | GY ${ }_{\text {GP }}$ |
| UniRef90-TOBDX5 | G Y $\square \mathrm{ERHDHLA} \square$ PERHL |
| UniRet90-B1Z8C9 | GALIPQGAAALPPAD |
| UniRef90-W1JF70 |  |
| UniRef90-UPIO004723947 | G wLKRDDGTD\PERHL |
| UniRef90 M M E7L 5 |  |
| UniRef90-A0A024Y116 UniRef90 A6VHG1 | G |
| UniRef90-A0B8D7 | GAl QRNDEMHLAMRHपGL |
| UniRet90-F5LAZ6 | G YLERNSDLHIPERHLGL |
| UniRef90-NOAUS2 | G FLKRDDELTIPERHLGL |
| UniRef90- ${ }^{\text {U }}$ |  |
| UniRef90-N7WUX7 UniRef90 A6TJE0 |  |
| UniRef90_A6TJE0 |  |
| UniRef90OUPIO00424CDA6 | G Y LKRESGDEDPERHLGL |
| UniRef90-UPI0004138223 | TVIPWEKQSPTMREDT DAL ${ }^{\text {V }}$ |
| UniRef90_UPI0003B3ED61 UniRef90 ${ }^{-}$W0SJV8 | GCMPRKENIVMPE RHLGL |
| UniRef90-UPI000377C437 |  |
| UniRet90_D3F0 | A TLP AL |
| UniRef90-F8D781 | GVLP R TLIA GVT |
| UniRef99-S7815 | GAVPELAPEAFRAAAPRWL |
| UniRef90-K1WIA1 |  |
| UniRef90-E8×1C7 | PRTPEI |
| UniRef90_T2RE55 | YFPPNEKFK |
| UniRef90 KoS9R6 | GCVPDRPGCPALLADLERLFRTELI |
| UniRef90-K5Z9N9 | GVLPYLTDFHLEAEDA |
| UniRef90-X6DF06 | GVVPWL |
| UniRet90_M005C1 | G |
| UniRef90-UPI0002DEE9DD | GTLP YLADP |
| UniRef90-UP1000306 | GR P P AGSGA DAARFA |
| UniRef90-Q720 | G Y LPKNAAVA $\square$ PerhपGL |
| UniRef90 UPIOOO36 |  |
| UniRef90-UPIOOO2F2519F | G YVKRNESLSDPERHLGL |
| UniRef90-G703R7 |  |
| UniRef90-M3KHG8 | GVIPR RLV |
| UniRef90_UPI00041AF8ED | G YFPNNPDUVMDSRHLGL |




UniRef90-UPIO0037851AE UniRef90_I5B1F3 UniRef90-W3Y5L3 UniRef90-B1 XHZ8 UniRef90_UPIOOO464848F UniRef90-Q6VTD2 UniRef90-B8NRK4 UniRef90-D4TQU3 UniRef90_UPI0004110D07 UniRef90-G4TJ33 UniRef90-R7EMH6 UniRef90_UPIO0037812FE UniRef90-L8M5U8 UniRef90-T2BFJO UniRef90-B8GUF7 UniRef90_LOHG64 UniRef90_V4L033 UniRef90-W0DNN6
UniRef90 A1VDZ2 UniRef90 U5DEH7 UniRef90-E6VZVV9 UniRef90-B6ABQ4
UniRef9- S8DYT5 UniRef90-S8DYT5
UniRef90 C4XLT8 UniRef90-K9RFF2 UniRef90_I8QTH1 UniRef90-UPIO00349B223 UniRef90_K9QDD8 UniRef90-S6AJI2
UniRef90-H1Z1S1
UniRef90-UPI0004787D26 UniRef90_A8FK97 UniRef90-W9B6Z5 UniRef90_UPI00047CE41F UniRef90_W9ZNF4 UniRef90-D6Y9M9 UniRef90_Q39S23 UniRef90-B8GFJ7 UniRef90_UPIO002001102 UniRef90-Q8YNA2 UniRef90-K4RH82 UniRef90-UPIO00429920C UniRef90_UPI00047C21C3 UniRef90-E0QK33
UniRef90-Q8DHD3
UniRef90-A5D033
UniRef90_UPIO0042A2A73 UniRef90-N0BIQ7 UniRef90-S7TWS2 UniRef90_UPIO0047E9D69 UniRef90-KOIBT4 UniRef90_UPIO00470E674 UniRef90-W4H127 UniRef90-U2Z1P5
UniRef90-V6HTU2 UniRef90-D3FUB6 UniRef90_Q3SG30 UniRef90-Q30WB1
UniRef90-K6VWQ2 UniRef90-F6EIZ9 UniRef90_Q31PX6 UniRef90_-J4TX44
UniRet90-Q9ZN34
UniRef90_S2Y134
UniRef90_UPIO003B38A61
UniRef90 K9B736
UniRef90 F6B671
UniRef90-R4WA86
UniRef90-S2JKK2
UniRef90-I3DJP1
UniRef90_E5Y7F3
UniRef90_UPIO00237B5E8
UniRef90-W7VMX6
UniRef90 B1W1S3
UniRef90_UPI0003A63F68
UniRef90_Q2J6H9
UniRef90-A8MET2
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UniRef90_UPI00039C5C59
UniRef90- Q6ARS8
UniRef90-K2AD39
UniRef90_UPIO0047856B8
UniRef90-A4J9E5
UniRef90-F8KQ30
UniRef90_G5GMV2
UniRef90-D7E960
UniRef90-D2BG58
UniRef90-W9XFC7
UniRef90_Q2RI09
 PKLISYKGRKIDMDAALISHIYRLDDDLEFMSPVVVESRT GPDY DDAGWLSRAAGRPCYNLDTY LCA
VGPDYDDPGFH
CGPDY DDTKYHEKACGDPSYN LDPFMAS

TGP LDDADDRH $\square$ QRHA
GDKETYQS LIN NDD

TGSLVAKSGPDY IDDPAFHAAASGRPCVNLDAWAMRPQTMD C DSDHSHVSRYRPHGSPDDPEC
TKYHEAVGGRPSVNLDTAMAS
 A GTPTDSE GPDY $\square D P \square W \square G H A A G R P$

GPDYIDPLWL GRAAGRP
AMPHERGGVLGDEDAFFVQDVLGLDEPAEKVTPVLVTQDF $S F V E P K S D S L D E E D V Q L V A T M L D L P P G R V G Q P \| A Y F D E R T$ AMPIEVNGKLGDEDAVFVQDVLGIGEDPELVSPVVVTQ
T G P

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

VGPD GPDY DDPMWLSVASGRPCRNLDFFMM
VAMDY $\square D P S Y \square T G V T G R M C R N L D S F V M N$
VGPD Y I D P S Y H T F $\square T \mathrm{~N}$
AGTPTDSE F
VGPDFDDPGYHALAAGAPGRNLDPVLVGEDLIGP QGAKVGPDF IDPSYHALATGRPARNLDAFL TGPQAEADD RH RRQYVPG $\square$ NSKC DSQFSRPL VGPDYDDPGYHALAT GRPGRNLDPWLTG PKCQLFND TVDMDAALMARDFGLEGD $\square N H M S P V V L E R G S$ GMDY 1 D P S Y L $T$ GVI G R P
DSAELGAGGDDDDDVRFVGQILGLSEA ELVPSVHLQSAD NSLSTSEGT LVEEDVQFITHSLNLSANRIAPT ILALDEAS TGUNTQERSDADLFLEENQHIDSVDLNLEDDSFYRFVLAA A G

## VP T DSQK $\square Q T$ T T

PKTK Y G
VGAD Y D DGYHRLSTGN
TYQPTTDSEETEADVSFLQK
TLNLENVRPTLLTL
NGKRV PGGVDLDAVLMKEVLGMNVPLEKDA
DY DDPMFHQHVTGRACRN DDPI LTSET YVQQCFTRHSQAM TSPEYHDGKLVDGDALNTSKMUGVEDE DDDCPIVLNAPY

GPDY IDA A WWLALSAGRPCYNLDTFL
CGPDY DPMFHRNVLGIPSRNLDLFLMGSMG
VGPDFIDPSYHTFVTKRQSRNLDVWMMG
TGGDSMMDARFLHSHMDASRLTCETL FSWDTPV RGAKSGPDY DDSRFHEAACGVACFNLDA
 CGPDYI DPTFHRA $\square$ TKR
NN TSKEVRDHDDNLILTRFGLDDPYEKTYAYSLHEAR
GPDY DDPDWLGMAAGRPCYNLDFHMM VGPDYI DPGYHAVAAGRPGRNLDPNLVGASEDLI VGPDY I DPGYHSLAT GRPGRNLDPVLTSPELVGP TCFEDSSVKPDDEDVRFDAETLNGSEDQRYPTMVMLDPTS TGVNDADNHSSDA HDFDQDNRLLDLTGKDISFYRYHKAS

VGPDY $D \mathrm{DPGYHALATGRVGRNLDAYLCG}$




 VGPDYIDPGYHRDA
TGTATGEPGDVDS
 GPDY $\square$ DPAFHAFAS GELCFNLDPWAMR
$T G V G P G E D G \quad D V D V R D L T G D T D V H E L A$ CGPDY DDPMFHSRITGTKSRNDDMVLCGENTVK

T G P VGPDYI DPGYHALATGRPGRNLDSVLVGEDLIGP VGP I EEADDEHVKRFAGGHGNDSTACLYRYDDPV SGPDF DPGYHALAT S GPDFIDPSLHRLVTGRDSRNLDLYMME

MQALACGLEPHTDMNPVLLKPES CGPDY DDPGYLS LAAGRPCRNVDSWL
GPDF DDPSWLTKVAGHTCRNLDSYLMERQS
TGDNAKQEHSDGA $\square$ FLEENDK DDSTLEDSDISFYRYVLGA VGPDY DDGYHQLAS GRTGHNLDTWLVPKDRL $V G P D Y$ ID P THHTAICKKPSRNLDTYMM
TGPQAEADDRH TRYVPGIKSRCQSQ

## UniRef90 M0AKD7

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UniRef90 A1VDZ2 UniRef90-U5DEH7 UniRef90-E6VZV9 UniRef90-B6ABQ4 4
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 TRQFLDGE $T$ THDQLVIPLDITAAELERKCDFLIIEGAGHA NPFFASMANGVDL EQHMHEVYVSHAKDADVCIVEGMMGM
VAQRDTGQDQTDYPQKLKDDLGADASDITFIEAPKSL TGKHSRNLDSYMMDDEKIKYIVEESSKDADISII EGVMGL SPHTAAQQKKFTIPRDDDIVAHKTLSDWANFALVETAGGV APPUAAAKENRTUDLGLVWRTFLKLQRERDFLLVESLGGL A SPHLAAQKARQVISDERMRDYFQKCAKRNAKVYVETAGGT PSHN LDSWLVPEDKVSSDVFARYSADADVAVVEGMMGM RDTITRRLLGKDTQDYAQAL SPHKGRILENLSY CVNLLDFHTQD D E K A QV Q A Q E Y Q Qll AQVQDDFRFGCRGADIALVEGVRGL AEQITDSFASHAAGADIVLVEGNRGL KVKAFSNQC FDRAFQEGSDRDLRQQLC ASVRSLAA ELVLVEAPATL DFKVKAFSGNMEGLLDRIVESYKTLAESKDVTLVAGSGSM SPNLSAEFENKEGSLSDFNRFDLLSQDNV MVMVEGVGGV TSHNLDAWM CGASGVADDYKRQTAGVDAVVVEGVMGL LKQRLCGDDTTDYQQVLKNEYLQH NSGDLVLIEGSGNL AAARRAGRPAVDLG DLAARIGKLATDHDLVLVEGAGGL NLHS PGCEYALVEGVMGL FDGVKGTGEE AKHHQTSEY ALVEGVMGDFDGVMGSGEEAS GQDE VAEFQRHSVGADVSLIEGNKGL PDEISDSFTHACKGADI AVI EGVRGL


GPELIAPLDAHATAHAAGTGAASRPADपAVIEGVMGLYDG SPHLAAKLDGDPTSDASTVAQTKKLLSQHRYATLETAGGV EESIVPLFLHGARNADVAVVEGVMGM TKRFDDGEDPTDWPAERITEAVREGERKNDYLII EGSGHG CRNLDGYVMTADEDRGIYNHGCQGAEVALVEGVRGL

 SPHTGMQVEKDSYN GLEDPLPKSDNLVGVML TSSNLDEFM SN UKARLTGTDQQDYRQALAAYHSTN GPFYLSSHGAYEGAEEKIMEAFNEVGSFADVVLLEGPATL


VHPQDVLRSFLSHAHPHDIAVIEGNRGL MKEALCRGAEGRDFGVMEGVMGF $K Q G V L D C F V G A C G A D V A V D E G V M G L$
 TCHN DDWUMGAMGAERLKALAGGAETLVVEGAMGL

 LFQHGSAGCDMADVEGVMGL VQRRLA QTDSTDYLTQLQQ YRDRPPGDIALIEGAGRL

 GPLFAHGARGCDVAVVEGLK APAAAAEHEGVVLPT保 VEQAVRGQADPEDDQRQVKEHFQTDASGRDRMFIEGGGT YKH

LT DARDRALFCTSFGDAD
ADRPARNLDPVLVGEDRIAPLFRHGAAGAELSVVEGVMGL APDAAARVADPPLELYNAVDADREEADKHDLVLIEGAGGL PGRNLDAYM CGTELVAPLFAHGSAGCDLAVVEGVMGL D DLIDDLAHKHGENRLLIVEAMMGL apataarrsgravoldelian gita drduvlvegag gl QLLSENSDGMDI SVI GGVMGF SPHपAAQRSHTADS $\square R R D \square T S A S N H T G E A W A F L E T A G S$ LFAHGASGAELAVVEGVMGL KEFCRRSFAKQATQADISIIEGVMGM ETGSQVVVQGKRTAMAPVLDSFNRLKSQHDLVIVEGAGSP I RQNFDRHAQAADIAIVEGAMGL
SPFVAARFHDPPDDFKVIEHKLDKLQKHCDLLII EGVGGL
AEVFFHGLKNRED
$\qquad$
ALVEGVMGL SPHLAA QLDGDPTSDASVVAQVKDLLSQHRYAVLETAGGV


## UniRef90 M0AKD7 UniRef90-UPIOOO37851AE UniRef90-15B1F3 UniRef90-R5MST8 UniRef90-B1XHZ8 UniRef90_UPIOO0464848F

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UniRet90 S8DYT5 UniRef90 C4XLT8 UniRef90-K9RFF2 UniRef90-18QTH1 UniRef90-UPIO00349B223 UniRet90_K9QDD8
UniRef90-S6AJI2
UniRef90-H1Z1S1 UniRet90_UPI0004787D26 UniRef90_A8FK97 UniRef90 W9B6ZZ5 UniRef90-UPIOO047CE41F UniRet90 W9ZNF4 UniRef90-D6Y9M9
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UniRef90-UPI00042A2A73 UniRef90-NOBIQ7
UniRef90-UPIOO047E9D69 UniRef90-KolBT4

180
190
200
$A F \quad G D R|L| A G|V V| F N N|V| A D A D Q L E T D|V \bar{V} P F| L E G R \quad G|V| N V \mid F$ LIFREAGAEVRVLVPNKLDPAKPATDSYIEKAFANYPFKVV
 Y R L F F D QVVEVGAGVI LN R L
$R F D G D R L M G V V \stackrel{A}{1}$ K $1 / P P E$
G
YQQDKSVDIIGVIVNNVNTE

 TLHTRGYNI DVVLMFKDDYYQNH
INFRPDDRI A GVI FNRV GSLRHYRMLQEVCEDDNVTCL FKNYDEINI AGVIVNNL GSKSHAQUIAQAIEKI GVPVV QFL GDRLLGI TI NDVPPEDWEDVQNIVPYLEKQNI PVL ILKQRDDKI LALVLKSEDHFS
 CQQAPELTI AGVILNQVATSRQHSIIVEAVTETTGI QVV QAFERDIQI A GVILNRV GGSRHGSKLRAVI EHYTDIVVL
 LLKNRNDNI GFVTNGEYRPDDFN SLLLRGYI I DLVLLFKDAYYRNFEYLTPYFLSER $\qquad$ FIRFDRLRFCGVALNNAGSPSHAALLAEAFRAALDPDIPLW QL $\quad$ GERLIGVAI NDVPASHLQAVENMRPFLEQQGLPVL ALAHRGLDLAGVVIGSWPE ALDSRIKVAGLVLNRV CSFDPKI KI A GLVLNRV YAFDRNINIAGVILNNLGGG FMAFDKVRIKGVILNQVDSE YKODKDVDIKGVIVNNVK A LTRDRTL R F A GVVIVNRVGSP YRNFDGVHVAGVILNKVGSP S LH LRGYDLDSVI LFDDPEWGNH
 LY RME GADL RMLLVNKLIPEKR FMAFDEVKI CGVILNNVMGE RHKETSALSYLVRAFGUVVV ARD

 T L RMRKI PI LGLII SKEQN FLDEDKDLKI RGLI LNNVNTDSHYNDLKSADKKVSDDKVLD

 SVF GERLKAVI FNKLTGYKRSYUEGVASLLQRNDLEIL CLFDPDLGI KGVILNRI AGSRHEQNLRRNI EHYCGVPVV
 NNFYKGIKVAGVIFNFVNTPS HYSFLEDACKDVGVEAL SLLLRGYDVPWIVLIEQDDLGNAAADADRAAE LNI SVF FAFDPKVRI GGVVLNRVGSP RHEGMLRRALDERIGLDVEL KAFDPELKLAGAFTNFIGSKSH
 YAFDCDIQIAGVILNNLGGSRHESKLRAVI EHYTDVDVI QLDEKSLDVVAAVVNRASVTPAEKDNIIKSLECKLAVYVV ASYDSVVI AGVILNRVGSP RHEMVLRQACARVGVPVIF ATFDPRVRI AGVILNQV GSDRHEHVLREACDRAGMPVL
 LLK SYQLDYK IAI NLRGNNTAFYSVSLPYIIE
FAS WDEVRVGGVILNKV ASDRHEELLRDALDQAGVPVL
 ALRTRGLPVSGIVLGSWPGPTPVEVDNRRRLGEYGBPVI

 MLDPR VNi AGVIINKVSSSKS YA TFKEADERYTGTQCLL LA HFEPVNLAGVVLNRVAS SRHAALIRQSIETYTGIPVL
 FASWDEVRDGGVILNKV ASDRHEALLRDALDESGLPVL YLLNYRSLRFAGIVLNRVGGARHEQMLRAALEPLDVPIL

 HAAEAG 1 RI AGVILNRV GSARHRDILTAAADRAGLRVF | $S L V I R G W S I L G V \square V G W K E S K W G N L E F L R R W F E R E T G G E Q V$ |  |
| :--- | :--- |
| $F A S W D G V R G G V I L N K V$ | $G$ | FESMAGGRLIGVI ANNLASP RHLDLVREAI ETHCQARFL AVPADNAMIAGFLINKFRGDPRLFDDGYRLI EARTGWRGF

 Y L I A HKI PCH
FTYDRELNLAGVLLNRD GSETHEEMDREAMSGDDLRVY SEYDKDVNVAGVVLNKV GSQRHAQMIKDALPS YKLDPCINI A GVILN QAGSMRHYEICRNAIEKYASTPVI S HVRGYDLDSVVLFDDPKWANH

| Ur | 210220 |
| :---: | :---: |
| UniRef90_UPI00037851AE | GGFNYSPANPT |
| UniRef90-15B1F3 | GALPKLK Q E D P |
| UniRef90-W3Y5L3 | GAI YRDDRMHSPE RHLGLTP |
| UniRef90-R5MST8 | GCLRKFDALKEE SRHLGLD |
| UniRef90-B1XHZ8 | GLVPRILRSVTVRELVKRLNAEVL |
| UniRef90_UPI000464848F | G YLPPNNALS LESRHLGL |
| UniRef90_Q6VTD2 | GVLP Y V VDL HLE A E |
| UniRef90-B8NRK4 |  |
| UniRef90-D4TQU3 | GCLP Y Lie DVND\EADAE |
| UniRef90_UPIO004110D07 | GFIPRL PALALPSRHLGL |
| UniRef90_G4TJ33 |  |
| UniRef90-R7EMH6 | GY LPKQKELEQE S R H L GL |
| UniRef90_UPI00037812FE | GCV LRRPEMSLPERHLGLTP |
| UniRef90-L8M5U8 | AVLPRLLNSVSVRELARRLEAK\\|L |
| UniRef90-T2BFJ0 |  |
| UniRef90_B8GUF7 | GAVV HEDPALLQ |
| UniRef90-LOHG64 | GAIPRME EMQLAMRHLGL |
| UniRef90_V4L033 | GAIPRLP |
| UniRef90-W0DNN6 | GMV SENADLQ L L E R H L G L |
| UniRef90_A1VDZ2 | GVI P K D P |
| UniRef90-U5DEH7 | GLLPELLLESVSVREDANQLGARVL |
| UniRef90_E6VZV9 | GVIPHD |
| UniRef90-B6ABQ4 | F HIP T M |
| UniRef90-S8DYT5 | S V |
| UniRef90-C4XLT8 |  |
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| UniRef90_18QTH1 |  |
| UniRef90_UPI000349B223 |  |
| UniRef90-K9QDD8 |  |
| UniRef90-S6AJI2 | GAVHHDKRL E VERHLGL |
| UniRef90_H1Z1S1 | GAIPR KEEMKLTMRHLGL |
| UniRef90_UPIO004787D26 | G YFPPNDEFSLDSRHLGL |
| UniRef90_A8FK97 |  |
| UniRef90-W9B6Z5 | GAVPRTAEL EVPSRHLGL |
| UniRef90_UPI00047CE41F | GALPRDDRV EAPSRHLGL |
| UniRef90-W9ZNF4 | A L PRDDPNEDEAVLADY |
| UniRef90_D6Y9M9 | GVI Q RVD GVVVP S S HLGL |
| UniRef90_Q39S23 | GAFDWSPANPTLNNDARLL |
| UniRef90-B8GFJ7 | GADPRLE E M HLAMRHL G |
| UniRef90-UPI0002001102 | GVMPRLLRSVTVEELSRRLDADVL |
| UniRef90-Q8YNA2 | A MLIPKLLRSVSVGELVK Q L K A EVL |
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| UniRef90_UPIO00429920C | GV LTR R P ELSVPERHLGL |
| UniRef90_UPIO0047C21C3 |  |
| UniRef90-Q8DHD3 | GMLPRLDR SVSVKELVRQLNAEVL |
| UniRef90-A5D033 | GVFPQRPEIVSP |
| UniRef90_UPI00042A2A73 | GVLRRQDNIT $\square$ P D R H L G L |
| UniRef90_N0BIQ7 | GII |
| UniRef90-S7TWS2 | G AVP K LD |
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| UniRef90-K0IBT4 | $\mathrm{G} \\| \mathrm{VRR}$ NSE@RMEERHLGL |
| UniRef90-UPIO00470E674 | G Y C PKTPAFA $\square$ PS R HLGLQ |
| UniRef90-W4H127 | A LPKLPPQPTP |
| UniRef90-U2Z1P5 | GALPREAGLSHPSQAGERLDLDR |
| UniRef90-V6HTU2 | GG FSKHPEHAFPERHLGL |
| UniRef90-D3FUB6 | G Y LP T L P E |
| UniRef90-Q3SG30 | GAVQY DPALQ |
| UniRef90-Q30WB1 | PEEPTLGK PTMGDVKKWL GASVL |
| UniRef90-K6VWQ2 | GV L R R D P L T VPSRHL GL |
| UniRef90-F6EIZ9 | GVVPRDGNV SLPSRHLG |
| UniRef90-Q31PX6 | GLLPPQLLRSVSVTELVSRLNAEVL |
| UniRef90_J4TX44 | GA LIRRAALALPERHLGLTP |
| UniRef90-Q9ZN34 |  |
| UniRef90-S2Y134 | GVLR RAPQVNTP SRHLGL |
| UniRef90-UPI0003B38A61 | GALPKLKNLPPERHLG |
| UniRef90-K9B736 | GAV |
| UniRef90-F6B671 | G A MP |
| UniRef90_R4WA86 | G A V/P R V Q ELA TVVGDLIA DELGGAR\|VL |
| UniRef90_S2JKK2 |  |
| UniRef90-I3DJP1 | G F $\quad$ IEKNDTDNDSSRHLGL |
| UniRef90_E5Y7F3 | GE!PRLAENPIPE |
| UniRef90-UPI000237B5E8 | GAIPRIEDL A VPSRHLGL |
| UniRef90-W7VMX6 | G AV P |
| UniRef90_B1W1S3 | GVI R R A P QVA P P S R HLLGL |
| UniRef90_UPI0003A63F68 | GVV MQDAD L A $\square$ PSRHLGL |
| UniRef90_Q2J6H9 | G V L P |
| UniRef90-A8MET2 |  |
| UniRef90-X7VFH8 | GADPRTDEL SVPSRHLGL |
| UniRef90-M5G9F9 | GVPPRLEDKSEDA |
| UniRef90_UPI00039C5C59 | GV L HRRQAVHAPSRHLLGL |
| UniRef90-Q6ARS8 | G YLPRNLDFTIPSRHLGLHL |
| UniRef90-K2AD39 | GVVPFFAD A SRLPAEDALDL |
| UniRef90-UPI00047856B8 | G Y $\quad$ PR R A A LALPERHL GL |
| UniRef90_A4J9E5 | GAMPKGTQFT】PD RHLGL |
| UniRef90-F8KQ30 |  |
| UniRef90_G5GMV2 | GA LRRDAALALPERHLGLT P |
| UniRef90_D7E960 | GALPP K N Q V V S VPSRHLGL |
| UniRef90-D2BG58 | G Y L L R NKDLVIPERHLGL |
| UniRef90-W9XFC7 |  |
| UniRef90_Q2RI09 | $G A \backslash T P$ |

UniRef90 K9X117
UniRef90-UPIO003B4CED6 UniRef90-ROKQC7 UniRef90_UPIOOO472A408 UniRef90_K1YRT3 UniRef90-E1QGQ5 UniRef90-U5E6Q1 UniRef90-I1X521 UniRef90-TOMTZ5 UniRef90-Q3AE09 UniRef90-D8KNB8 UniRef90-A0A017RWR9 UniRef90-WGKAL9 UniRef90-V6F757 UniRef90-UPI00036CF8F0 UniRef90-UPIO00467B4EB UniRef90-K2P5B4 UniRef90-Qow5z8 UniRef90-R8ZT39 UniRef90-D1AFJO UniRef90-D3E1B6 UniRef90-A0А059мм 38 UniRef90-Q2NHQ3 UniRef90-D8RQVO
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TARA A GERS GVGKT TVTLLTLLASLCRRGAKVQSF
A R L V A A T T S GAGKTTVASGLMAAFTARGLTVQG
$A V Q V Y G A N T G D V G T V V F S T L L G S H F A K R K W R V Q Y \square K P D S$

 S GS GK T T L A T GLLDGA L R R A GH R V A A P F K
 $K G F I I S G T T T G A G K S T M T V G I L A A L K H L G L K V Q A F K A$ GVVIA ATSSGS GKTT:ATGLIAALAQR MVVAPFK

 | $V$ | $Y$ | $S$ | $A$ | $A$ | $H$ | $K$ | $S$ | $S$ | $G$ | $K$ | $T$ | $T$ | $V$ | $S$ | $G$ | $G$ | $C$ | $A$ | $A$ | $L$ | $A$ | $R$ | $R$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $D$ | $V$ | $R$ | $P$ | $F$ | $K$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $L$ | $S$ | $A$ | $A$ | $H$ | $K$ | $S$ | $S$ | $G$ | $K$ | $T$ | $T$ | $V$ | $S$ | $V$ | $G$ | $L$ | $T$ | $A$ | $A$ | $L$ | $T$ | $A$ | $R$ | $G$ |
| $L$ | $R$ | $V$ | $Q$ | $P$ | $F$ | $K$ | $K$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



 $R K I L I A G T M S G S G K T T V S S I I M S A F A N \quad V A P F K$ $V V L A \operatorname{GTGSAVGKTTISTGIMKALSDE\quad NVQPFK}$ $R L V V A A P A S G H G K T T V A T G L M A A L R A A G H T V$ K RVVLTGTGSGVGKTTIATGIMKALSDEHK』
$A F M V W G C N T D V G K T L V S T G M A A A L L D P G K H V L Y V K P V Q$ TPTVVIAAPSSGSGKT TVTTGLIGALVRAGHRVAPFK


VVAAPSSNSGKTTVATGLMAAFRAAGLSVSPHK
$R F V V A G T G S G S G K T T V T L G L L R A F A R R G L T V Q A F K$
 MIT GTSTTEVGGTVVATAALAAAAMAA GATVAVCKA A Q


 A K Y L L I GS DEACSGGTGI ILAA A R QLQEKGVSIA Y G K P IG


K K I LIA GAMS GSGKTTLSSILMSSF ENVAPFK
A MF A APSSGQQKTTVTAALARMLRNQGKRVRVFK

A APSSGSGKTIVATGLMAALRARGLAVSPHK

 $\square I W A S N T S S L G K T L V S A G L T M A S P D P K K R F V V Y L K P V Q$ $A \operatorname{LVV} G A P S S G S G K T T V V A A L A R A L T Q Q G K K V R V F K$

$R L V V A A P A S G S G K T T V A T G L M A A F A A A G L T V S P H K A$

$L L L A A A H K S S G K T T L A T A L C A A L T D R G L T V Q P F K K$
S GS GK T TIA T GLI G A L R R A GHTVAP FK

RAFQI Y GANTNVGKT IVSTIL CKALKESR DASA
$R G I V I S S N S S G G G K T T I S L G L M K A L K N R G F D V Q G Y K$







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TGPDYIDTAFLSKAAGKRAGNLDMH

TGT T GPDY $\square D P S Y H A L A S G R P G R N \square D P V L C P P E L D A P$


VGPDF $\square D P S H H T A \square C G R A S R N D D A F M M G$
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VGPDYDDPMYHSRDCDRPCRNDDPVDTMPEYFSPA $S G \square$ CGPDY $\begin{aligned} & \text { CDTAFHSQASGRPAFNLLDSWAMDGPLI }\end{aligned}$
VGPDYDDPGYAA LAA GRPGRNLDPVLVGEERDAP

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VGPDY $\square D P G Y H C L A T G K P G R N L D P V L$


N
Q VGPDY DDPGYHALASGRPGRNDDPWLTDESRVLP QGFKVGPDFIDPMFHTAATGRPSRNLDSFLLEKGTLQN Q PRA

CGPD Y A DTKYHAMVCGRPSVNLDDSFMA S
TGFPDDSDSRFVYRKFSDFFAMS
 TDRENSRDTKKTEDVNFLATTDKLSSNQVVKTGYHALAVAD T DRENSRDTKKTEDVNF LATTLK LSSNQVKTP LLFL TGDEPGAPG ADADVERLTGGRVGATLELARYPEPL GPDY $\square \mathrm{D} P \mathrm{~L}$ WL GRAAGRA

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D E
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DTNNQNKEDEV LLEEKI I EKYKS
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SKY
YN $\square$ STVAKFSSECDVA VVDGLDGLFDG HDTVRAIVARASQDADAAVI EGVMGF
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 GFRTFGVRFGGVILNR A ALAHKDLDSAGLVIGAWPAPGVAEDDNRDALARLAPVR MALNKDVNVMAVVANKVNAQNLELDENV RMLRDFLPEEVV ALTSRFIVVFGFYLVG PENPLQEDNATVIVKLGGVSFL
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 S L D P R R V K L A G V I LLN K V $\quad$ A S D R H L E L L
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Q $\square R N V G R N V V G V I F N R A P A G S E R H A E L D R D A L P$
 $Q L F$
MI QAFGSQu A GYIL N H V N I L
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QMLD E S S N I VGGVI A N QLG S K S HFE IVVK A A VE QECGDPVI F I HF D QVTV A GVI LN QVARP RHEQMLRGALEKYC GVSVL



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$S$ LF L R G
AI KAAGLECAG V G I G S WP SP GLDAERCNLDDLPALTGVPVV
 SLK S R GF DV D A I AMF TSPD DPYKNAEYL
S E L GEEHLA GVVLN A VN P S M Q M A E DVVVPALES LGMP I L LA HY R G L R L A GVV A N RV G G E R HVVEMI R A GLLS AD I S L L R S Y DPAVRLAGGVLNQVGSP RHEEVLRAACDEVGLEVV

 A GFRDDI QVVGLI ANACAS QRHR




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| UniRef90-B7JUE8 |  |
| UniRef90-D7HWF4 | GCIPYRAELPRTRDVAELLGAQVL |
| UniRef90-H0E510 | GALVRDERLVAP SRHLGL |
| UniRef90_W5Y1A9 | G S L |
| UniRef90_F8X493 | G YLPKNENLSVPSRHLGLS $\square$ |
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| UniRef90-UPIO0047A3000 | $\mathrm{G} \quad \mathrm{Y}$ LPKGAVPDMPSRHLGL |
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| UniRef90-X8IXZ3 |  |
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| UniRef90_A3KK19 | G A V P |
| UniRef90-L1MG80 | AVLP Y L E G L W D A E D S |
| UniRef90_F3ZMK8 | GVLRRTKELFTP SRHLGL |
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| UniRef90-A0A024JP69 |  |
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| UniRef90-B8EQF3 | GALPRDKK\ELPE R H L G L |
| UniRef90-K0B8L3 | GUIPP KNPSLNMPSRHLGL |
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| UniRef90_UPI0003F9597A | GVI P Y |
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| UniRef90-W1N525 | A AVPRDAGLALPE RHLGL |
| UniRef90-UPI000361D88F UniRef90 B7AB25 |  |
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| UniRef90_A0A024JX45 | GAI PRTAELELPT R R L GL |
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| UniRef90_U2K1T1 | GY $\\|$ PKLLE $\square$ P S RHLGLSL |
| UniRef90_U4KXR7 |  |
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| UniRef90-D5E7L1 | GVI P R |
| UniRef90-E9V0B0 | GMLPRDESLASP S R HLGLL |
| UniRef90_C6L9T0 | G Y V P K V T D CLIE S SRHLGL |
| UniRef90-B1I354 | GAI PRRREIHAPTVAEYY |
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 $K G F M$ A A P A S G G K T $V$ V GVGKTT T GII GYLSKK HKV I P
 $T R \| I V I T S G K G G V G K T T V T A N L G M A L A N M G Y Q V A L V D A D L$ $R L V L A A P T S G A G K T T V T T G L M A A L C A R G L R V S P H K$

KNLI FI
 A
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 QR L M V A A L T S GA GK T S V T M G L T A L WR QA G K TVVQVY
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$S R$



K S Y $\quad$ Y C C S L R E H V G K S L L

A
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$K A D M V S A P K S G S G K T T V T L A L A D A L R Q R G V R V R \| A K$




A APS S GS GKTTVVVCALLAQAL K D R GLDS PAA AK


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K


$R I L V A A P A S G H G K T T L A T G L M A A L A R R G L A V$

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A R


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$A F V V A A T H S S A G K T T V T A I V L D L L R E R G L K V Q A F K$



$R \prod M L A A P A S G G G K T T V T C G L L Q A L L N C G V S P A A F K$
A K S L F A P T S M E S G L T S V C L G L L R A L E R E GVVSVGF Y K PVVH




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$S G P D Y D D P A F H L A A A K$

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QELVP LED GMIDKDARILQEFSGDPLDPRVVSPVRLGSGF SGPDY DD P AFHRAACGRPSFNLDSWA
VGPDY DDPGFHAVATSRPGRNDDPMLS GEQRVAP
SAHKVGGPD I DPTYHALATGRPGRNLDMVLCGAGRIIAPLF
$V$ GPDY I DPSYHALAA GRPGRNLDPVMVGEQTIGP
TGTDSGDD D C GPDY DD T K FHER ACGRPSVN LDLFMAS DA H
 NEPQLDD RDPD $\square$ DLMLE HFK $\square$ NMEYADTFAYTAAEA GPDY $\quad$ DP AFHRAA QPRKGDNGEERSTADIAHHASVSPDTPFELEYVERMDSND GPDY $\square D P$ A Y HKAAS GVDCFNLDPWAMRPELIS
 V GPD Y I DP GYHALAT GRPGRNLDAVLDGEARLAP

 CGPD Y $\square D P M F H T R V I G T K S R N D D T F F T$
 SGHKVGPDY IDPGYHALATGRPGRNLDPHLVGEGRVAP
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 $G L R N L D L L L G G L E R V V Y T A V E A E C R L D D Q A L V K D K R H S ~ Q L A A$ $T G V G P G E R G G B A D E V V R L A G G P G V T G R E L A R F P E P L$
 TSF DWTPA DGPLPDPLI D D DVRFVGSTLGLAEDQLI PS LH

 T GPP D F
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Q $\quad P R A G G N A P D Q T T S D V R K S S G Q P A A E P L P M S R V E S L L$ VGP D Y I D P M F HR Y L TGGRPCRNLDPDVLTSSEPYVQRCC
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 S GP D Y I D P A FHRRRITGTAASRNLLDLFLLGGRH

CGPD Y I D PMFHKKI L G I TS K N L D D F FT DEAQTRT IF


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R GAKSGPD Y I DPGFHAAATGGPGVNLDSWAMAPS L L N NA LA GPDY IDPAFHTAASGKPCFNYDPWAMRPE LLL



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 T GPDFLDTMVLEKASGAPVYNLDLWMG
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UniRef90 K97315 UniRef90_UPIOO04787010 UniRef90_UPI00037F1B29 UniRef90_K9TKG1

$F D G Q$ $F D G Q$
$S T G G$



 Y DGQS GFGSSA ETAKRMGWPVVLVVDDVGGQAQSAAAAAALG $G V G G \| V G L S N A R V A E \square L S A E V V E L S G G G Q G K A L D M L V D L B$ Y DGGSGFGTSAETARRMGWPVVLVLDVGGQAQSAAATALG Y D G ALLGT E STA H V S K LLLRAPVVVVVVDASAA GRSVGGAVVQG



 F D GlVA GF GSSAE TA QAMGWPVVVLV DDVVSGQA QSAAA TA L G RHHPYAERLNLEISRALDADIVVVAVPGNESTTDDNHRLE FDGAMDGKSSADLARLLDLPVVLVVDCARQSHSIAALVWG
 $F D G R S G S G A S A D I A E M M G W P V L L V L D P A G Q A Q T A A A V A A G$ D M GFQN
F D GVIA DHASTAHVARLLDAPVI LVVDVSGAARSDAADVAG


 HDGRIGTDSSAHVAALTRTPVVLVVDVSRMSRSVALVAGM RKHPFANAVNAEI AKTLGAEIVEFVATPGTDNPSQLLKERDE
 DTPD GARGAPSDVAAARFDDVVILLVLDVVSGQGQSAAATA$L$ LVLDDEGGTLADAARLLGAPVLVVAAAGLGTLNVTALTAE



 E Q GF Q N AVS A A REA LVRYDRGGTLADAAQLLGAPVLVVAAAGLGTLNDAALTGE



 $E M G F R N A D A S A D E A$
 F D GP GRMGAAS DLADRFGVPVLLVLDVSGQS QSAAAVARG RKHQFASALNYEIAKT LNAEIVVFVTALGNDSPAQLKERDE


 $Y$ VGTGSEASAYELAAATATPVVLVVDGRGAGLSAAVL QGM GPDVVE P L S A A D GVIVVTTDGERSCSAAETTIK FDGLDHDCSTAELARLLDLPVVLVVDVTKTTRTSAALVLG RKHPFANQVNAEIAATLGAEIVLVATPGTDNPAQLKERIE | $F$ | $D A$ | $A$ |  |
| :--- | :--- | :--- | :--- |
| $H$ | $G G G S V A$ | $L$ | $A$ |

 $Q L P \| N F$

 F D G Q $\square$ G G A S T A H I A T L T R T P V V LVV D DS H A S R S G A VVV G M
 Y D G

 ERGAQMAMHHADMAVIVTNPEVSSVRDSDRMMGMLDSTTE
 YDGHT SASADIARMFADPLLLVIDGSAMAQTFGAMVYG Y D GVS GN GASA DI A RRMGWPVVLVI DVS GQAQSAAAA ALGG $F D G I P S E K A A A D L A R L G Y G D V L L V L D V S G Q S T S A A A B A K G B$ LAVI LVVDCA

 $R K H Q F A Q A L N F E I$ AKTLNAEIVEFVMSQGTDTPEQLNERDE Y DGENEKGSAAHI AKLLGGDVVVVVMDVWGMTRSGAVLGGL FDGS PS A A DLARRFDVPVVMAVINGQSMATFGALAVGM
Y D GVGG GE GS S Y QL A EVVTKTPIVVLVVDAKGM GRSVVVPLI A G
 FDGVAGTSTWADIARVTETPVILIVDCKGSSLSAAAVVQG RSEAY $\operatorname{CARLDVVEARNLGSEVILVSAPRSCSASDLDBSAR~}$




UniRef90_UPI00034D6B08 UniRef90-G4E4H7 UniRef90-U1NY43 UniRef90-K9SJ09 UniRef90-M7T7J1
UniRef90
VgWKQ8 UniRef90-GoGCF5 UniRef90_Q0FSL4 UniRef90-D2Q365 UniRef90-UP100036BD37A UniRef90-R4LH68 UniRef90-A0AO24JXQ4 UniRef90-R5SQB9 UniRet90-N9XO19 UniRef90-G1UUO3
UniRef90-DOD4Z9 UniRef90-KOCNQ9 UniRef90-A6X051 UniRef90_13VRF8 UniRef90-UPIOOO4658280 UniRef90_UPI00047BB856 UniRef90- QORJEO UniRef90-UPI000362FDF2 UniRef90_N6W118 UniRef90-J3Q2D5 UniRef90-R6R4D8 UniRef90-D5BEA2 UniRef90-UPIOOO3484880 UniRef90-A6CXG7 UniRef90-B8IUS4 UniRef90-D5QB46 UniRef90-H1HS14 UniRef90-M3BIQ6 UniRef90_UPIOOO34D27AC UniRef90-A6UQC1 UniRef90-H2GAY3
UniRef90 SOJ. UniRef90-SOJGT1 UniRef90-UPIO00371EAA5 UniRef90 UPIOO029B520A UniRef90-10EK75 UniRef90 - X1RFPO UniRef90-UPIO003774DD3 UniRef90-S9QYI6 UniRef90-GOVQU1 UniRef90-B7JZA7 UniRef90-UPIO0047B73E8 UniRet90-S2KTT6 UniRef90-QOBUD7 UniRef90-D4GJ622 UniRef90-K9S4Y1 UniRef90-UPIOOO3634831 UniRef90-LOKUR3 UniRef90-STHT11 UniRef90-L9Y1Y0
UniRef90-Q9ACL1 UniRef90-D0X066 UniRef90-UPIO003635FE9 UniRef90-R9P825 UniRef90-F4CJH4 UniRef90-K9TWE8 UniRef90-Q1J2D0 UniRef90-H8G7U5 UniRef90-UTUQU5 UniRef90-R71M78 UniRef90_10XAJ3 UniRef90-UPIOOO3769426 UniRet90-UPIO00289B13F UniRef90-MOD5L9 UniRef90-F1YSM6 UniRef90-R6G2N2 UniRef90-L8M314 UniRef90_UPIO0046360BA UniRef90-UP100026CDB35
UniRef90-UPIOOO3672FOD UniRef90_Q92P48 UniRef90-A7NH13 UniRef90-G4Z3Y9 UniRef90_L8ELF6 UniRet90-M4X069 UniRef90-R9J978 UniRef90-C4K6R2 UniRef90-G5IHX3
UniRet90 U7G4Z8 UniRef90-K9z315 UniRef90-UPIO004787010 UniRef90-UPIO0037F1B29 UniRef90_K9TKG1

Sy NPTIIKI VG/VVLINRIV
 AADDLGDNLAGVVFNRISDTAFEEDDVIPFLESKGGEVEF SLKLRGYDVEMVVMFR
SKKYRDVPFAGVIMNRVASPRHERLTRLGM EKAGTKVL YFMCQGVNVRGVVFNKLIPDQVRHYITEELLQERFPIRI

 STAGQGLSCAGVVIGSWPSP
LHFRQDIRFAGVIFNRVGSP LHFRQDIRFAGVIFNRVGSPGE
SLKEDKKRVKGUIVNKYNGDLDE

 Y DEYDNVK KGVIGNRVGSE KHYKLLKECILERDLGUAF LRDFRGVRIAGVVLNRVASP RHEDLIRRAMAGVNIPVL LDDAKG| EPAQLALNRIRPGMVRNMMSVEDVQELLALGL GAFDREVQVAGVGLNRVGGGRHATKLRQAVEYFTDVAVL

 SFNNRDVKVVGVVANKIQEEN ERNVAEIVRATHLPVL VACTKNKNISGVI NKFDDADTAQQANLEQUFNTSPIRVL
 FARDDTVRVAGVLLNRVGSERHRTMATRAVTADGLPVL ALRSRGLVCAGVVVGSWPEPDLAARCNVSDFPE YLNAHKISHHMLNVRDRRAYTQUCKPYUEHLNTTLKTPIL LQQYRGLPVSGVLANRVGSPGHA EMLRESLP PGL FKSFDELNIKGVIFNKIRGDGHLNK DKEAVKYYDGTEIV FARACGANVAGLLGGKLPGADLRTRLTLVEASRASGVPFI
 $\stackrel{\rightharpoonup}{\mathrm{L}}$ $\stackrel{\rightharpoonup}{\mathrm{Y}}$

## F

## $\stackrel{L}{L}$

 LTQSKNKSITGVIINKLNAPVDEQGRTRPDLSEISPLPIL SLDPR VKLAGVVLNRV GSDRHLAFLKSALEPLGLPVL FMEYRKDRIAGVILNQMTAM $R \| I Q N T E L A G G L E N E S G D M E Q V Y H L V V P F L E K K G 1 K V F$ AAFRADSHVVGFIVNRIKPMVYEHFKG AWEKASGLKAL

 I A R S D G S G L A G Y V L N $L$ QHRE GLRFA GVLANRVASPGHA



 $A Y A D R D Y D V D V V G L L A A R A H G G R H E E G I R T$




 A R H R D DV R V A GVVI L NR V $\quad$ G S D R H E GMMLR D A L A G I A M P V R


## 

MAFDPEVR\|A A CVLNQV G S





KNEHPELNLKGVVENFVNEGHYN
L L E A N GVVK K I N L I VN RI K P A M V E A N D MM E D V Q E I LA V N L

| UniRef90＿UPI00034D6B08 | $\text { GVLIR REDNTTMP D RH\|L }{ }^{220}$ |
| :---: | :---: |
| UniRet90－G4E4H7 | TAFGY碞PRPDADPSRHLG |
| UniRet90－U1NY43 | GA V］QDQELA ${ }^{\text {a }}$ |
| UniRef90－E5Y612 | SETPALC NPSVGEVQK WMNADVL |
| UniRef90－K9 | GVIPRQVED KLSDRHL |
| UniRef90 M7 | R HLGL |
| UniRet90－G0GC | MVEDLSKP |
| UniRef90－Q0FSL4 | GVLPRRGDLTLPE RHLGL |
| UniRef90－D20365 | GV $D R R D T$ RLTVPSRHLGL |
| UniRef90－R4LH68 | GA MPRMRTSAVEAPSRHLGL |
| Unielo－A |  |
| UniRef90－R5SQ | G YLPKDALLEQGSRY岛LD |
| UniRef90－N9XQ19 | GVMPP NDPTNGLA |
| UniRet90－DOD4Z9 | GALPRRGDLTLPE RHL |
| UniRef90－K0CNO9 | GT DWSADSPRATDVAKHLNASLL |
| UniRef90＿A6X051 UniRef90 ${ }^{\text {I }}$ UVRF8 | GALP R Y ${ }_{\text {G }}$ |
| UniRef90－UPIo004658280 | GALPRHAP可APE RHLGL |
| UniRet90＿UP1000047BB856 | GA |
| － |  |
| $\begin{aligned} & \text { UniRef90_UPIOO0362FDF2 } \\ & \text { UniRe90_N6W118 } \end{aligned}$ | GLVPWQSDAPRVADEARALDAEVL |
|  |  |
| UniRef90－R6 | GYVPkVEDCVIE SRH口GL |
| UniRee90－UPIo003484880 | G |
| UniRef9－A6C | GCVPWKIDLIATRAI |
| UniRef90＿B814 | LARDTALA |
| UniRef90－D5QB46 UniRef90 H1HS14 |  |
| UniR |  |
| UniRei90 UPI00034D27AC | A WYGADPREAGFETPSRHLGL |
| UniRef90－A6UQC1 | GAlKRDENL AVAERHLGL |
| UniRet90－H2GAY3 |  |
| UniRet90－SOJ6T1 | GIV |
| UniRet90－UP10002 | GAVP |
| UniRef90－10E UniRef90－x1 | G |
| UniRef90－A375W6 | GVMPRLLRSVTVGELVRRL |
| UniRef90－UPIO003774DD3 | GAVP WSFDLI A |
| UniRef90＿S90Y16 | LPRAAGLVAP |
| UniRef90 GovaU1 | GCFP DMPDCTFSSRH |
| UniRee90－UPIO0047B73E8 | GALPR DPADA俍ERHपGL |
| UniRef90－S2KTB6 UniRef90 Q0BUD7 | GA A |
| UniRei90－D4GJ62 | GCVPWSFDLIATRA |
| UniRef90－K9S4Y1 | R HDA |
| UniRef90－UPIO003 | GYVPKVEECVLE |
| UniRef90 LOKUU | GVIP HMLCSVSVA EIVVEYNAE |
| UniRef90－L9YYYO | GQIPESSPLTDEETRAAYDDL |
| UniRef90－Q9ACL1 | GAIPRQRKNPFPE RHD |
| UniRef90－Doxo |  |
| UniRef90－UP10003635 | GAlPR DAALAHPSRHLGL |
| iR |  |
| UniRef90－F4CJH4 |  |
| UniRef90－K9TWE8 UniRef90 Q1J2DO |  |
| UniRef90－Q129U1 |  |
| UniRef90－H8G7U5 | G $\square$ LHRDDHVSPSRHLGL |
| UniRef90＿U7UQU5 | ， |
| UniRef90＿R71M78 | EYKRFQLESRHLGLKM |
| UniRef90 IOXAJ3 － |  |
| UniRef90－UPIO00289B13F | GYVPKDERL SLKSRHLGL |
| UniRei90－F1YSM6 | G\DPESPDVLKASNVGA |
| UniRet90－R6G2N2 |  |
| UniRef90－L8M314 |  |
| UniRef90 UPIOO | GYLPSLVQAAELS DLDARLDLAA |
| UniRer90－UPIO0036672FOD | GA PRRGRDPTMS |
| UniRei90 ${ }^{\circ}$ O92P48 | GV LRQDAALKLPERHLGL |
| UniRef90－A7NH13 | G FLQRDETLTLPERHLGL |
| UniRet90＿G4Z3Y9 |  |
| UniRef90＿W1EQ34 | WS D L |
| $\begin{aligned} & \text { UniRef90-L8E } \\ & \text { UniRefono-M4X } \end{aligned}$ |  |
| iRef90－R9J9z | ENDKLYıSRH |
| UniRef90－C4K6R2 | A C P WHa |
| UniRef90－G51HX3 |  |
| UniRef90 K9Z315 | GV WF KHQKIIEDP |
| UPI0004787010 | GALPREA |
| niRef90－UPIO0037F1B29 | GYi Pr NNPE\STEERHLGL |
| UnRef90＿K9TKG1 | G |

UniRef90_UPI0004765C9D UniRef90-FOTAF5 UniRef90-F8A001
UniRef90
K9RR92 UniRef90-D1BBI1 UniRef90_UPIOOO34735B2 UniRef90-Q97JB1 UniRef90 Q20EV4 UniRef90-U5MPL5 UniRef90-W4UBR6 UniRef90_O8TV27 UniRef90-F4B7K3 UniRef90_J1ECD7 UniRef90-A0YQM7 UniRef90-F9UA52 UniRef90-B1XPG4 UniRef90-F9YQN7 UniRef90-R2P734
UniRef90 R6K4Z3 UniRef90-M5E910 UniRef90-A6NSE9 UniRef90_A0A031JZL5 UniRef90-A4XOL5 UniRef90-R9T5H2 UniRef90_UPI000404AE80 UniRef90 Q91471 UniRef90 ${ }^{-}$E7DRR4 UniRef90-UP100046A6CCB UniRet90-O4G386 UniRef90-D5VQG8 UniRef90-UPIO0045E672E UniRef90-L8LPH4 UniRef90_UPIO00361824F UniRef90 B9P2F8 UniRef90-W8R4N7 UniRef90_UPIOOO4056917 UniRef90_X7ZV33 UniRef90-N2JEYO UniRef90-A6MVS1 UniRef90- E4TKC8 UniRef90_UPIO003119BA6 UniRef90-LOAHL6 UniRef90-HOJBV7 UniRef90-H7EXR7 UniRef90-Q4JA17 UniRef90-UPIO0047D7B63 UniRef90_H8FTL2 UniRef90-UPIO0046D7458 UniRef90-FOLJ33 UniRef90-A0A024FYX2 UniRef90 F5XHK2 UniRee90_UPI000360DA32 UniRef90-A3WUH4 UniRef90_UPI000303BD85 UniRef90_A0A011 NV22 UniRef90-C1MMW2 UniRef90_UPI00047E2610 UniRef90-Q82JD2 UniRef90-E1L6T4 UniRef90-UPIO0047EDFB0 UniRef90-E31096 UniRef90-F2R3Z1
UniRef90 E9NPY5 UniRef90-R4X0K7 UniRef90-11X411 UniRef90_UPI0002FF4B82 UniRef90-A9A102 UniRef90-W4GA64 UniRef90-G4SUW4 UniRef90-B8FUT1 UniRef90-N6X6P8 UniRef90-W0EOX2 UniRef90-M1AMX4 UniRef90-D8GNV1 UniRet90-Q2IV79 UniRef90-B5HMJ6 UniRef90-D5E6U6 UniRef90-R6Y8Q6 UniRef90-Q9T3P6 UniRef90-C7NPU9 UniRef90-B11HD5
UniRef90 BOMDC8 UniRef90-A1 V3Z3 UniRet90-F8ABQ8 UniRef90_B5YGKo
 TRVITVASGKGGVGKTTITANLGVALSTYGEETIVLDADV ARSHYVASPEGDTGKSTVAGGLGDLLARTVQRVGVFRPVA $\stackrel{A}{A}$ SRVIVITSGKGGVGKTTITANLGTAVAQLGKKVCLIDADF
RSIIIASNSSGGGKTTVTLGLMKALVSRGLEVQGFK
RTVVVTSGKGGVGKTTATANLGMSVARLGYRVVLVDADD SIVITSGKGGVGKTTTTANIGTALASLGKRVVVIDGLR AVAI AGVRSGCGKTSLSTGLVRALREEGTRVRPFKV
RIVI SSDRSDSGKTLSSGLMRALSKRGKVRPKKA Al LiAAPASGQGKTTVTAALARLHARQGRRVRVEK
SRI ALVITSGKGGVGKTTCTANIGMALAKKGRQVAVID SRVVVVTSGKGGVGKSTCTANLGSALVKLGKKVALVDADF
NKSVYVITPDAYSGKSLVSLGVMQMVMRTPKVGYFKPIL

$$
\begin{aligned}
& \text { RVMTAATGSGSGKTTIVCGDCQCTKDMGLM } P \text { PA } \\
& \text { RVHQIFGADTDVGKTDFSSAPARTLNAHGEAVSYLKPVS } \\
& \text { RULLCAPSSGGGKTTVTCAMLQALVNRGLSPASFK } \\
& K
\end{aligned}
$$

AAPGSGAGKTTVTHGLDRAFRDEGLLVQPYK
KGGYFKPFK
ALLIAAPASGQGKTTVTAALARLHARQGRRVRVFK
SRGLLISAPSSGTGKTTGMLGLLAADRGQGVNVQPFK
KRGVVLLGTSSNAGKTLLTTSLTYHL
ARSI YITSAEGDTGKSTIADGVDDLLTRSADRVGVERPVA
TRIIVITSGKGGVGKTTISANLGMTIASLGRKVILVDADF
ALLLVTAPASGHGKTSVTAALARFHSRNGLRVRCFKTGP
VISSPSSDSGKTTLSLLI SCWAFAKGIKIQTFK
AKVLVVTSGKGGVGKTTSTAALGAALAREGKNVVLVDDVG
SIYIAAPEGDTGKSTIABGIGHRLTATAPKVGVFRPIT
ALLVAAPASGQGKTSVTAALARLHTRQGRKVRVFK
ARVIVITSGKGGVGKTTTTANLGMSLVQLGYQTALVDADD
KKAVLIASDKSGSGKSLFTDFLSKYFTLKQKSVLPFK
TRIIVMTSGKGGVGKSTCTANLGMALAQRNQRVAVVDADF
ALLIAAPASGQGKTTVTAALARLHSRQGKRVRVFK
TRGUYVSAMAPGSGKSLISLGLASMLQGHADRIGFLLPDS
APGVIISAPSSGSGKTSVTLGVLRALSRRGDTVG
TRNLYLAGLDAGSGKSALALGVMDLLTKQTGSVAVFRPVV
RVVIVTGRGGGAKTTTTANLSTYFAQREYRVLALD
TRSVYIASPEGLTGKSAIADGLLDTLTREVGSVGFFRPL
ARTIVVTSGKGGVGKTTTSAN:GTALALDDKKVCLMDMVG
ALLVAAPASGQGKTTMVAALARLHARQGRRVTVFK
ARVIVITSGKGGVGKTTTSANLGMSIARLGYRVCLVDADD
RLLIGAPGSGSGKTLITCALLRILSKKGYNPSGFK
TRSVYVTGDDRGDGRQVVELGVMELLTRQVDRVGVFRPD
RSVYVASVTGETGKSTVALGTLIAALTRRIGRVGVFRPV
AHACIVAGTHSGCGKTTITLGLMAALSRRGHVVQPYKAGP

ISAPSTDAGKTTLSLLISCWAYRKGLKLQTFK
ALFVSAPASGQGKTSVTAGLARLHRRLGRRVRVFK RLFI GGDRSQVGKSTVCLGILGALLQLGGHLA Y IK PAT SK
 $A \operatorname{LV}$ AAPASGQGKTTITAALARMHTRLGRRVRVFK QSVVI A GAGRGSGKSVVVLGFMEMLSSVKQKVGFFRPFA $R V V V I T S G K G G V G K T T T T A N D G L S L A R L G F V V A D D C D V G$ AIVVTSGKGGVGKTTTTANI GTALAALNKSVVVVDDTG GLIIAAPSTNSGKTTVTLALLAALRRRGR\|VQPYK
TRSVYVTGDDRGDGRQVVELGVMELLTRQVDRVGVFRPLV I T GKG GVGKTTISGTIARLLARDGYDVLAIDADP
 LAVAGTKGGCGKTTTAAGIAEAFARADVPAVAVDADR $R L L F T A P Q S A G G K T M V T C G L M A A L G K K G K K V Q G Y K$ AL FVAAAASGQGKTSVTAALARHHRRLGRRVRVFK


UniRef90_UPIO004765C9D
UniRef90-FOTAF5 UniRef90-F8A001
UniRef90-K9RR92
UniRef90-D1BBI1
UniRef90_UPI00034735B2
UniRef90-Q97JB1 1
UniRef90_Q20EV4 UniRef90_U5MPL5
UniRef90_W4UBR6 UniRef90-Q8TV27 UniRef90-F4B7K3 UniRef90-J1ECD7 UniRef90_AOYQM7 UniRef90-F9UA52 UniRef90_B1XPG4 UniRef90_F9YQN7 UniRef90-R6K4Z3 UniRef90-M5E910 UniRef90_A6NSE9 UniRef90 A4X0L5 UniRef90-R9T5H2 UniRef90_UPI000404AE80 UniRef90 Q91471 UniRef90 E7DRR4 UniRef90_UPIO0046A6CCB UniRef90_Q4G386 UniRef90-D5VQG8 UniRef90_UPI00045E672E UniRef90_L8LPH4 UniRef90_UPI000361824F UniRef90-B9P2F8 UniRef90-W8R4N7 UniRef90-UPI0004056917 UniRef90_X7ZV33 UniRef90-N2JEY0 UniRef90-A6MVS1 UniRef90 E4TKC8 UniRef90_UPI0003119BA6 UniRef90-LOAHL6 UniRef90-H0J8V7 UniRef90 H7EXR7 UniRef90-Q4JAI7 UniRef90_UPI00047D7B63 UniRef90 H8FTL2 UniRef90-UPIO0046D7458 UniRef90-FOLJ33 UniRef90-A0A024FYX2 UniRef90 F5XHK2 UniRef90_UPI000360DA32 UniRef90-A3WUH4 UniRef90_UPI000303BD85 UniRef90_A0A011NV22 UniRef90-C1MMW2 UniRef90_UPI00047E2610 UniRef90_Q82JD2 UniRef90-E1L6T4 UniRef90_UPI00047EDFB0 UniRef90-E3IQ96 UniRef90_F2R3Z1 UniRef90-E9NPY5 UniRef90-R4X0K7 UniRef90-11X4I1 UniRef90-UPIO002FF4B82 UniRef90-A9A102 UniRef90-W4GA64 UniRef90-G4SUW4 UniRef90-B8FUT1 UniRef90-N6X6P8 UniRef90-W0E0X2 UniRef90-M1AMX4 UniRef90-D8GNV1 UniRef90_Q2IV79 UniRef90-D5E6U6 UniRef90-R6Y8Q6 UniRef90_C7NPU9 UniRef90-B1IHD5 UniRef90_B0MDC8 UniRef90-A1V3Z3 UniRef90-F8ABQ8 UniRef90_B5YGKK

RGAKTGPDY
DPAFHEAVTGQPSFNLDSWAMPSPVLEGLL AMANLELILGMEGKSVTLHDVLSGAASDEDADYEGPGGVK RSSE QSFKVGPDYDDPMFHRRLTGRPCRNLDVILTSETYVQDCF RGTAASAEGSEDYVVELLLAHDGVDLTYEDCVGVTYDDLH $G L R N L D L L L G L E Q R V V Y T I I S G E C T L E K A D V K D K R T P G L N$ VGPDYIDTAFHESVTGK LSRNLDLFLMGEDGVKASF GLRNLDLLLGLENRVLYTAMDGQCRLDQALIRDKRWKNLS $N L D V L L G L E N R I V Y T I D V I E G R C R L K Q G L I X D K R F Q N L C$ VGPDY $\square D P G Y H S M A S G R P G R N L D S V M C G D E D M A P L L$ GPDYIDPTYLLEVAAGLEAFNLDVWMM
GPDFIDTGYHKI ATRG】PS INLDLF CGPDFLDPHWHQLASGAPVHQLDLWMN
$G L R N L D L L L G L E N R U V Y A L E G E C R L E Q A L V K D K R Q P N L V$ TGPDFLDPMILGRAAGAAAAPLDLWM
GLRNLDLLLGLENRVVYTADEAECRLEQALVKDKRQNGLV ESKT QKDNHIATMLAHFNDEMEYDEAYVFTRAEVA
$\square K C \quad G P D Y \square D S M F H S R V L N M K T G N \square D S W F C D E N T \square K$
TGAASEADE GHLRTFAPHVEAHTLVQFRDPV CGPDYDDPMFHSEIIGAKSRNDDLEFCGENLD GPDFLDPMVLEVASGAPVLQLDGFMC NGPDYIDPAFHRVAAGRLSCNLDGWSMAPP


SGPDY TDPAFHTAASGRASFNLDSWSM THEYA GLKNLDLLLGLENRUVYNGLNGECRLTQALIQDKRQPNDT RSTDQNDYVLE DGKVFVAKIGGDVRDVPSLYLLREEM
 DFlDPT VGPD Y LD Q Q Q LS S TGGP ICR RLDVF LS GEEWVQ QPFPLDQGRERSCVANTLNDASPEPLPLEQVERQLADGEL LRNLDLVMGAERRVVYDLINVVNGDLVQALI RDKRVPT LS RLGED R DYILELLLAHASAGLPYERCVGVTYQQLIH GLRNLDLCGPDFLDPMILARASGAPVYQLDLWM GLRNLDCGGPDY DDTLHLKNATGNNAYNLDT AVDADRQLPNLHVVAAVDRKPTDADLEKATDVDDVVHSRP CGPDFLDPMILARASGAPVYQLDLWM CGPDFLDPMULARASGRPVYQLDL
EADEGPD $D$ D M M M EFGLTEKTARSGMTRAEA SAKVGPDF DDP AFHAAA NDEHADDGDP $\square$ VTT $\square$ SEHYRL GEKHRNCVGVTYSAVR DLY LPN LGGHFGLENVKYTVHS ILKNPNDDPEWA GYKHSH GLRNLDLHLGCERRVIFHVIEKNCRDNQALIKDKRLENDS

VHDGLDMLADLLVHQPGDTQSYADADGVTYETAR LRNLDVI LGGENRIIYDIVDVARVKLHQALIKDKRFNDHL
 TGVAE CGREPGDAAEAARLAGPVTARELARYPAPLAPA $G \square R N L D L L L G D E R V M Y T A M E G E C R M E Q A L I R D K R W R S A A$ CGPDF $\square$ DPMFHRKVLGGPSRNLDVF LQG DDGIN VHDGPDRLFELLRARYRLAQDPATVYGMDYHEAS LDIILGKEDEVCFDAYNALEDKSMADDVVMVQDNDYFLPA VRS GRQPDYVLELLLAHDGVDLPYDDCAGVTYEDVH G GMMCGPQGVRVAFARGLHASGARPWPHEHIWTALGEPPG
 GLRNLD LLLGLENRILYLEGQCRLDQALIDRDKRWKNL

DY DD PLWLDA QA
$V G P D Y \square D Q E Q \square S S \square G H P M C R N D D \square F L S G E E W V K N$ TGPDFLDPMLLERASGAPV HALDLGM
QCEEPQLVARFCEHYGIAAQPDGPVVFYAGFTRAFLDQPD HAGEEKDDLI E NR VYVTYRYQLEWPYESMYGCTDEEAR $\square R N L D V V M G L E N R D V Y D I V D V T S G T L K Q A L I K D K R F E N L Y$ CGPDFLDPQIHAVASGAPVHNDDLGMC
P RGSSEDNLTALTRSRYDLPFPPEMLYGCTVETAR LRNLD LLLGLENRVNYTVVEVLNGDLDQALVRDKRWSNFE $L R N L D V L M G L E N R I V F T I L D E D K C R L K Q A L I K D K R D P N L Y$ HHSPDRCGPDY DDPAFHAAAAGRP PASYNDDSFAF DMNLASSLG DTSPPKLLRARYRLSQDRAGQYGGDYKEAS LRNLDVVMGLENRIVYDIVDVVKCKLRQALIKKDKRFEELF GLRNLDLLLGLENRVVYTAMEVDEGQCRLEQALIDRKRWK QLPNVHVIGGDVDREPTLATIDEGDAVSDVAARSPRESN
 TGPDFLDPMLLARASGARVYSLDDGM


jnet

UniRef90-UPIOOO4765C9D

UniRefoo-FTAF5 UniRef90-F8A001 UniRet90_K9RR92 UniRef90_D1BBI1 UniRef90-UPIOOO34735B2 UniRet90-Q97JJB1 UniRef90 Q20EV4 UniRef90-U5MPL5 | UniRef90 W4UBR6 |
| :--- |
| UniRef90 | UniRef90-Q8TV27

UniRef90-F4B7K3 UniRef90-J1ECD7 UniRef90-AOYQM7 UniRef90_F9UA52 UniRet90-B1XPG4 UniRef90-F9YQN7 UniRef90-R6K4Z3 UniRef90-M5E910 UniRef90-A6NSE9 UniRef90 A4XOL5 UniRef90-R9T5H2 UniRet90_UPI000404AE80 UniRef90- Q91471 UniRef90-E7DRR4
UniRef90-UPI00046A6CCB UniRef90-Q4G386 UniRef90-D5VQG8 UniRef90_UPIo0045E672E UniRef90-L8LPH4 UniRef90-UPIo00361824F UniRef90 B9P2F8 UniRef90-W8R4N7 UniRef90-UPIOOO4056917 UniRef90_X7ZV33 UniRef90-N2JEYO UniRet90-AGMVS1 UniRef90 E4TKC8 UniRef90-UPI0003119BA6 UniRef90-LOAHL6 UniRef90-HOJBV7
UniRef90-H7EXR7
UniRef90-UPIO0047D7B63 UniRef90_H8FTL2 UniRef90-UPIO0046D7458 UniRef90-FOLJ33 UniRef90-A0A024FYX2 UniRef90 F5XHK2 UniRef90-UPIO00360DA32 UniRef90-A3WUH4 UniRef90_UPI000303BD85 UniRef90_A0A011NV22 UniRef90-C1MMW2 UniRef90-UPIOOO47E2610 UniRef90-Q82JD2 UniRef90-E1L6T4 UniRef90-UP100047EDFBO UniRef90-E31096 UniRef90_- 2 2R3Z1 UniRet90-E9NPY5 UniRef90-R4X0K7 UniRef90-11X411 UniRef90-UPIO002FF4B82 UniRef90-A9A102 UniRef90-W4GA64 UniRef90-G4SUW4 UniRef90-B8FUT1
UniRet90
N6X6P8 UniRef90-N6X6P8
UniRef90-W0EOX2 UniRef90-M1 AMX4 UniRef90-D8GNV1 UniRet90-Q2IV79 UniRef90-B5HMJ6 UniRef90-D5E6U6
UniRef90 R6Y8Q6 UniRef90 Q9T3P6 UniRef90-C7NPU9 UniRef90-B11HD5
UniRef90 BOMDC8 UniRef90-A1V3Z3 UniRef90-F8ABQ8 UniRef90_B5YGK0
 EKDALLAAIAAAAQTAANGGAMVVLVTTPEVPSIDSDALKTK\| DRGSTAHI ADLLQLPILLVVNAAGTSRSAALVHGY DVGPTELAFNARIAANLGAPVLLVLSGRDRSPAMSEVSVS EMGFRNAIVAAQEA


$\qquad$ $\checkmark \vee V \bar{V} P E T S V R A D R V G^{G}$ FDGQTGRGSSAEDATTTRTPVVVVVDTAHASLTHAAVVAG FDGHGEGTSTAHVAALLGVPVVLVVDCRSYTVAAEVRGFD YDGDGLDYSTYQLSEGTKTPIILIINCENDGSTAGAIIKG | FDG |
| :--- |
| $D C P A G T E S A B$ |

DCPAGDE
$F D G T P G$
EMGFRN EESNVFDFNALIAAAREALVTPEVAAVRDADRVVG FDGLGVDCSSAGIAGSLNDPVLAVVKDNFSSUEHVQMEVN YDGQGFSTSSYEIADITDTPVILVVNCRGMSNSIGAVLKG HSPGPSGTSQADLDRPLRDPTLLVGSSRLGGDSTTRAAYE YDGVAMGTSAYHLSKATGTPAVLVLDGRGMGLSAAAAVKG FDG DPSAADLAERFGFPVLAVVDGSAMATFGALVHGL FDGAAGNGSGAGMARRLGWPVVLVLDVRAQAQSAAATALG IDGWTGNLSGMADARDLGAEVLLVSPATSPADDK円CMLDY FDG NPSAADLARRFGVPVLGVINGAAMAQTFGALAYG FDGAATGKSDADAAKWLGWPVILVVDARGQGASVTALVEG FDGVCGNGASADTAALMGWPVVLVLDVSGQSVAATALGFK DEGF QVADHTAKEAIVVVTPEVTSIRDADKVIG LTGADKNDSSYQVAKKLGFPVYI I ASCNLSGLEGAFLYKK
 ENGFQNAIAGAKEA FDGSTSYSSTANISKLLNAPVIFIVNAR GQVASLLATVR REFNHTSRDNTHLAKSLDAEVILIAAQGNDTLKRMAERDE ERGATDAMRYADVAIVVTNPEVSSVRDSDRIIGLLDSKTE DVTSPAELSNARIAVNLGAPVLLVVRAKGRSADDVAHVVE FDG TPSSADLARRFNVPVLGIIEATGMAQTFGALAYG ETGFHNADGPANEA

 FDGS PSAADLSRRFGVPVMAVIDGSAMATFGAMAHGM YDGLYEDYSTYKLSELTHTPLILVINCSNLSSTVGA乌VKG GQDAAVEFDNARLANNLGAMVLAVVSAKDMSAAEAADAVD FDPGQPDGSTASLALATGWPVVLVLDGRGMASAAAVLAGF ASPTPHEYSNTRUAVNLAAPVLTVVGGYGQSTSDALVASQ ESGARHAMYFADEA IVTNPEISSCRDSDKMVGYSSSSLR D ${ }^{\text {STGGTETNARGAANLGAPVVLVVHGRDRTPDEVLATVD }}$ EQGFKNAVVAADEA
ERGATLAMRYADEADVVTNPEVSSVRDADRDG GMDDSKTVV LVRFDEGGTLADAAALLAAPVVVVTTAGLGTLNDAALTAE

 GRGILESIVELAQRFALTVTQPDWVSDRNAARTDQ DVDSPTEFSNARVAANGGAPVVLVLNGHDRTATDLAAVAE HDGTTCTGSTAELALLLDLPVVLVIRARMARSAAAMAMGY ATQLPDEALNARLANEFGASVIPVVGGKGQPAESVRSETR
 YDGLADDGSNSNLAAQLDAPVVLVLDSQGMTRGVAPLALG FDGLGSTHSTANVAK LLSLPIVLIVNAKGGSLLALFKGFQ FDGT PSSADLAAAFGVPIVAVISAKSVARTFAAMAFG AVGSTCGVSNADIAAALQLSVLLVGKKGVGDAVDSFLNAT GESIIFEFDFNADVANNLDCLLMPIIQGGNRSNEQIIDALA EQGFRNADVGADRA $V V V T P E V S A V R D A D R \| I G$ YDG TPSAADDARRFGDPVMAVTDARAMATFGAVAHGL 11 DCPAGIDAGFIADTPANEAVLVTTPDDTSQRDADRVTG EHGFENAGVGADRA TTGAWGNGATADDAAATGWPVALVIDVAGQSQSAAALALG DTQLPDEALNARLANEFGASV1PVVGGRAQPAESVLAAYR RVLKDSSAVTMDMIEHLGDLMLTVVEPGKRSMETASRTKK
 GVEPL SVAD RVIVVTTDAKRSIEGARVTVE Y DGKGUDYSTAHDAKVLNDPVVLVLTPKAQSATLCAE:MG YDGLGGTTSAYELCSITGTPAVLIVDAKGMSTSVLAQIHG FDGGGTPSSADLAQAFGVPVAAVIAAQSMAQTFGALAFG LLPPGTGDATVAQVEPLRGGVVAVTTPQKVALSDVVRSVN

UniRef90 UPI0004765C9D UniRef90-FOTAF5 UniRef90-F8A001 UniRef90-D1BBI1 UniRef90-UPI00034735B2 UniRef90_Q97JB1 UniRef90 Q20EV4 UniRef90_U5MPL5 UniRef90-W4UBR6 UniRef90-Q8TV27
UniRef90-F4B7K3 UniRef90-J1ECD7 UniRef90-A0YQM7 UniRef90-F9UA52 UniRef90_B1XPG4 UniRef90-F9YQN7 UniRef90-R2P734 UniRef90 R6K4Z3 UniRef90-M5E910 UniRef90_A6NSE9 UniRef90-A0A031JZL5 UniRef90 A4X0L5 UniRef90-R9T5H2 UniRef90_UPI000404AE80 UniRef90-Q91471 UniRef90 E7DRR4
UniRef90_UPI00046A6CCB UniRef90_Q4G386 UniRef90-D5VQG8 UniRef90_UPIO0045E672E UniRef90_L8LPH4 UniRef90 UPIOO0361824F UniRef90_B9P2F8 UniRef90-W8R4N7 UniRef90_UPI0004056917 UniRef90_X7ZV33 UniRef90-N2JEY0 UniRef90-A6MVS1 UniRef90 E4TKC8 UniRef90_UPI0003119BA6 UniRef90-LOAHL6 UniRef90-H0J8V7 UniRef90-H7EXR7 UniRef90-Q4JAI7 UniRef90_UPI00047D7B63 UniRef90_H8FTL2 UniRef90_UPI00046D7458 UniRef90-FOLJ33 UniRef90-A0A024FYX2 UniRef90 F5XHK2 UniRef90_UPI000360DA32 UniRef90-A3WUH4 UniRef90_UPI000303BD85 UniRef90_A0A011NV22 UniRef90-C1MMW2 UniRef90_UPI00047E2610 UniRef90_Q82JD2 UniRef90 E1L6T4 UniRef90_UPI00047EDFB0 UniRef90-E3IQ96 UniRef90_F2R3Z1 UniRef90-E9NPY5 UniRef90-R4X0K7 UniRef90_I1X411 UniRef90_UPI0002FF4B82 UniRef90-A9A102 UniRef90-W4GA64 UniRef90_G4SUW4 UniRef90-B8FUT1
UniRef90-N6X6P8 UniRef90-W0E0X2 UniRef90-M1AMX4 UniRef90-D8GNV1 UniRef90_Q2IV79 UniRef90-B5HMJ6 UniRef90-D5E6U6 UniRef90-R6Y8Q6 UniRef90_Q9T3P6 UniRef90_C7NPU9 UniRef90-B1IHD5
UniRef90 B0MDC8 UniRef90-A1V3Z3 UniRef90-F8ABQ8 UniRef90_B5YGK0


AF IGE K DLTLKVATMVNRIN
LAF FQPDLPFSGVLGNRV GSQRHSD LLRDCLP PGMRWF

 FLEENGVKVEGGI LNKVY NFELFEKLKKLAEKYNIKVC ELRTQHAEVIGVVANRCAPE
 ATFRPSLTVAGAVANRV ASARHADLL


$L A H Q A D L P F A G V L A N R$ GSSARQTELLKASLP SGMRWF L LEANGIKQDTLLVNRDRPQMVKANDMMADVKE\|LADPLD LVLGEDINVAGVVLNNVGSE KHEKMLINAI EYHTDLKVEF LLEANDVKFTKLLINRIKPKMVQEDQMMRDVDD LLAVPLL $V A R R D G V P V A G V I I N R S N G V T$ ETLESRLEAPVL LAHYRSLPFAGVLANRSGSP
SSFQPDLDFDGVLANRVGSHGD LLRDSDPPSDRWYGA
LREYRNANVRGVIFNYIASE KHLDYCKKSIPE NVEVL VARRERVSLLAMMVNR A MAEDAVEAI REKSGRPVY DRDRPGPGLAGVVFNRVRSSRAQAADEAACRAACPDVALL QAEADHAVQLGSIVNRVDPEQDRLRDN
KLKADGDEYVGVILNKVRESQDVVDKIIETVEDDIGVPVL AI EN RQPVVQTLLI NRYDANRVKSDECLSDI E EMLGLLSVL VLRQHHAHPVAVI ANRTTP EADEATRTALAEHCDL VT




 LATSE
AA LDE GLR $\square$ A GVICNEVGGPGHREM $\square$ RDALAHHCPAPLL NAFRDGLGCDVLAMIVNRVAAEDRAAIAERLAARDPVPCY LLEANS YNTKLLVNRVRTDMDQRNDMMRDVQEMLGIPLL LARRDDVPFHGVLANR
YAFDPAI QICGVILNKV GGRRHEAKLRAVIEHYTDVKVL
 GLRHD
LLEAADDRSPR LI DNR DRPHMVKRGDMDSD DDDLA $\square E L L$ AHYQPGLPFAGVLAN HVGSARHADMLRAALPAGMRWF LMMERGGDFLVSIVNGVEPE
LLECDG\RDIVMIVNRVRTDMDKGEDMMSVLQEMLGLPLL


 LLESSEI RNPELIVNRLRPNMVKKGEMMEDIVDDLSVDLI LLEANDFYNVRLVANRVRPEMIQQNDMMDDVQGMIGVPLL MAGRLDVPVVAGIVVNQC



G
A V DPD D DP E EVSRAAAFGEPL



SVIPPNEEEDPTLKEDAEALEATFL
G Y $\quad$ Y K REKGAE LP P SRQL GA


GAVPSMNELKRVSEDASLLSAEVL

GSLPRRKEI EMPE RHLGL
GVVPDSEQVITASNRGEPLVLD
G V
GLIP
LQLASLPRNPQASLPGRHLGLQL
G Y A V G IVVPESEEVLRASNIGSPVTLA


GVIP F DEDVPESVNVG
GVIPESAHVLTS SNMGQ
A ALPELLSAPTVRAQAAAVNAEL
$\begin{array}{cl}\mathrm{G} \\ \mathrm{G} & \mathrm{V} \\ \mathrm{D} & \text { P E S Q DVLKK A S NVG }\end{array}$
A R 1
GALPRTDDS $\square$ PERH $\square G L W$

GILIPYDTQULDNTQDGVLI
$G M V P R D A S L G T P \quad S R H L G L A L$

GAVQRDADLQ】DE RHLGL
GFLP FDEN D

$\mathrm{G} \mathrm{V} \mathrm{I}, \mathrm{P}$
G V
MRDAEAA $\square$ PERH $\square G$
GVIPEDSEVIR
G
$G V V$
$G V T$
$G$
$G V V$



[^0]:    ## 

