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AI SKSQLPRTRKTLTQDLINAGLTPGMTVMVHSS M T MKKIVESTTFPRTKQSITEDLKALGGLKKGMVLVHSSLS MSEVVVSTPSPRTRQSLAADLCDAGLTPGDNLIVHSSSLS MNEVI LGSSQVMTVQSLKDDLARLGVAQGDTLIVHSSLS MEAA QRTSVPGTRESLAADLKELGLGEGETVIVHTSLS VYKDQKHPNTRDSKKDLFKAGLENGMTIVVHS MTEVTRQKQMLVTKERLVTDFRKLGLKEGMVVIVHSSLS KDVIARTSSPNT円DSLTKDLYKLGVKPGDTLLVHVSMK HDII K Q T RLPVTVSGMVRDLRKLGIREGDHLLVHSSMS MKELIDKTDYPRSRETIKRDLVQLGVHSGMTILVHSSLS MSEAVSRSTSLITAETLRKDLESLGVREGMTLIVHSSLS KDTINATERPHTDTSLDSDLRKLGVQSGMTVLVHSSLS MSEAVQFSKQPQTRKSLAEDLRNLGVEEGMTVLVHSSMS
REDI NRTEDPDTDHSLAQDLSRLGVKEGDTVLVHSSLS MSEIUQQTSKPRTRSTMKQEFRKLGLKEGSTVIVHSSLS MSEVIQKKKIIVTKERCTEDFHKLGLKKGMTVIVHSSLS MKEIVGKTKEMNSVNTLVRDFRALGLQKGMTILVHSSLS MK HVVQATDHPRTKDTLKEDGRRLGUTGGMTVMVHSSLS SLKIITK ME E AVWRSKKPTKDVVGKMVE
SEITQKTPEPRTVESISRDLTRAGVRKGTMLVHSKK MSELINESTRSPVTVASLKSQDLKRLGGVKGDVLLVHSSLLS
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MK E
AI EQVDEPGTVSSLASDLR
MKEMQQSKEPITK K MKRLIEHQAEPDTKERIKADLVQLGVRKGMILLCVH MKKLVQQ MEE $\square$ K GN

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SGELITIGTVKDLEALGVQPGMNLLLHSSMK

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 S L G Y V C G G P V A V I EA L M A TVVGSEGTVVVMP T Q S G DLLS D P A F A L G WV C G G EVVAVI LAALMEVVTTERGTVVMPAQTANNTPDAF
 SI GWV NGGAVSVVQALMDLVTTEEGTIIMPSQSTDDSDPSE
 SLGWVCGGPVTVI HALQDVLTPTGTLVMPAHSANMSDPA G $K L G W V C G G P Q V A V H G L L Q A I G T S G T L V M P A Q S S D W S D P A E$ SLG WVVGGAVAVVQA L M DVV E E TGGTIVVMPTHTAAEDSDPS E SMGWV CGGEVTVI QALMETIT DKGTIIMMAQTTNNSDPSF SIG WV NG GAMAVI EALIQVITEEGTIVMPAQSGDWNEPSK

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S L G WV C G G A V A VV Q A L M DV T
LI G TLVMPTQS GDLSDPTH

 K A H WI C G G P V TV I L A A L Q E L V G E T G N I V M P A Q T G Q L S D P E K
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 K L G Y V C G GA Q TVV I EA M M TVV G DEGS I MMPA QS WK NLDD P D A ALGWVCGGEQALVQALVDAVGSRGTLVVPTQTMDNTDPAG


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 SI GWI VGGAEAVI LALLTEVLGKEGTLVMPTQSPNLTNPET


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$W Q$ \& $N$ \& $P$ \& $P$ \& $V$ \& $P$ <br>
$W$ \& $E$ \& $W W Q$ \& $T$ <br>
$W$ \& $Q$ \& $P$ \& $P$ \& $V$ \& $P$ <br>
$W$ \& $A$ \& $W W P T$

 WGNPP V P E E WWDD I 

$W M M$ \& $P$ \& $P$ \& $V$ \& $P$ <br>
$W$ \& $E$ \& $S$ \& $W$ \& $W E T I$ <br>
$W$ \& $N$ \& $P$ \& $P$ \& $V$ <br>
$P$ \& $E$ \& $E$ \& $W W P$ \& $V$
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 RNEMPAYDPRTTP TMAMGKIVVCFRT R R S MPAFDPAVT P TYGMGRVAE LFRT
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 WCNPSVPKEWYDAI WCNPPVPESWHEI WQNPPVPEEWWET WGNPPAPEAWWDTI WK N P P $\operatorname{W}$ P P A P WVA I WENPPVVPK GWMEEI WQ N P P V P S E WVDD I WRRPPVVEAWWAT

 | $W$ | W D P P | $V$ | $P$ | $E$ | $A$ | $W W A T I$ |
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| $W E$ | N | $P$ | $V$ | $P$ | $E$ | $S$ |
| $W$ | $Y$ | $Q I I$ |  |  |  |  | WQR P PVPREWWPI I QETMPAYDPHLTPTRGMGAVVEVFRA WD N P P V P Y S WWK PI K DTMPAF DPAYTAPTAMGKVAETFWK

 WQNPPVVPEAWWETI RRTMPAYEPGLTPTRAMGAI PECFRK WENPPVPESWWKII WE N P P V $V$ P D N WVGQ TV WCNPP V P E A WWE TI $\mathrm{G} V \mathrm{H}$ WT V P E E Y WQ I WSNPPVPEAWWQSI G V H W WE E P $\ddagger$ E W WWD I I GV H WVVDES DWDII WSDPPVPEAWWDTI WGAPPVPESWWQTI WT N P P V P E S WF D P
$G V H W T V$ WRDPPVPEDWWPVI WCNPPVRESWWEDI WRAPSVVPKEWWET I WGAPAVVPREWWQT

 WRNPPVVPNDWFETI WRNPPVPADWWPVI | WE H P P | V R R W W | W |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| WE N P P | V | P N E WVIE T | WGAPPVPASWWPT WQNPPVEESWWQT

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 GVVHWDADEAD WDTI RENWPAYDKVI T PTNTMGAVAEMFRS WENPPVPESWWNMI KNEMPAFHPEITPTRAMGKVIETFRK WENPSVPSPWFHDLYQEMPAFDPRRTPTFGMGRVAETFRS WMNPPI PENWHQPFRDYAPAYDPHLSELRGMGKIAECFHR WRHPPVPEAWWPVIREQTPGFDPACTPSRWMGAVAETVRT WRSPAVPESWWPVVRAHMPVFDPALTPTRGMGAIAECFRR WMNP P L D E S WWE LV REEMPAY DPA WT LT G GMGGIV E T F R G WMSPPLLDPRWWDLVRDEMPLYDPHLTVVTMGMGAI PETFRK WGNPPADPKWWQLI RDSMPPFDPDATVTSGMGVIPETFRK


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200 K K I Y $\quad$ D L D G Y V L L I G G V G Y D S N T S I I H L








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 GRRLYE Y D G Q V L L L G V V G Y D N N T S F H L G E H HAP H Q Q Q V VR S A
 E R L Y K K H A F V L L L G V G F G N N T S F H H L A E Y R D P Y R NV I Q K G S
 A K L Y Q L R T K I L L L G V D N D N N T S L H L A E ERAA GTAAKVVVRRA
 ARFYELGGKVI LLGVDYDVNTSFHLAEYRAKNYTETDNAS





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 A RLYEADARVLLLGVGHGNNTSDHLAEYRASYPGKEEEGA G K I Y Q A L G A K ARAYDRDADVL HLGTGYSTNTSIMHLAEYRDFDKEYTT S SA A RLYELD GCV MLL GVGHRNNTSIHLAEYRANYKQVIDSKA ARLLAKADARVLLLGTGYDSCTAFHLAEYRVPHPPTEPSSC




 A RLY D L N A Y I L L L G V S H R N N S S L H L A E Y R A DF P K L C C D G A GRLLYELD GKVLLI GVVGYDKNTSLHLLADANYVGKHNVTEHS A ALERVRAKVLLLGTGFDSCTAFHLAEYRDPRPRLERSGC
 QKMY DLDA Y SLL LVGVVSYENNTSEHLA EYQVDQPST』TQS S A R L Y E L D A K V L L I G V G Y D K N T S D H L A DVVRAD Y P H D CIIE H S
 GALYRLNA QAL MI GVVYECCTALHLAEVLSGRTGTTRSGC GRLY Y AD A DVLLL GVGHDSNTSLLHLAEYRQATPPRQREGA
 AR L E Q K R A H L L L L G G G G Y D S C T A A F H L A A E Y R R D Y P S K E Y R T K G A
 A AVYDRGGRVLDLGGTGHDTNTSIMHLAEYRADFPKRVTNEA A K I Y $\quad$ H L D G F S L L L G V

 A R L E DL D A KVLLI GVVDFDKCTCFHLAEYRDESKKFDNRFA

 GKLY QI D S QIV LEG VDNDSNTSSLHLAE ERSTKVKNRLGKA

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210
220
230
240
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 AI ME A GKRVWKKLYDIVEEDNCFVEMGTDFEQAGNVVVSK P L LEA GKRVWK TY LDD I DF D TES FVVDLGEAFEKTGCVKNSK

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 A MMED GKRVWGTYRDYEKNSDLFNKI GRAFEKKHMVVETGL SIIENGQPVWRDYNDDEFAVGEFEEI GADLDREYDVTKGL

 PI LIENGMRVWKEFEDLVVDSDCFGYI GEVFENNHKVINYK PVSRQKVT QWAEFEEPDYDS DRFLEI GTAYERATQYHKQR
 PI LIENGKRVFKQYK D IVE K T ELLFMFLGEEFEEKYNVNTYN AI MEE GQRI WKWFEDYDYDSDDFAQLGADYEAAGGVANGK AI MED GQRVWKRFADFAYDADDFPILGAHYELERDVRRGE $P V L R A G Q R Q W V T F E E P D Y D D G T F P P V K A A F G A S G A V T V G Q$ PLLRDGERVVFEYED DR IDDSDDFEELGSDFESEVGVTAGQ

PI I KN GKKIWAKYQDI EFND DLFSAI GSEYESKYQYSTAR PI I E N G Q R V WK T Y R DI D ID S DI FPELGADFEHSRAAIIGQ
 PI TENGTRRWARFPDLLEWNSDDFGRIGEDFEETGLVRQGL PIRKDGQRVWAAYSDFRIDSDDFETI GEAFAETGLVTEGR

 $A$ I R TP GK R E WV T Y T G V L D E S D F P A L GA A F E A T G VVVTVDR

 A MMKD GERKWVTYS TLYVDGEEFIVDIGDFEKKYRVGNTK
 A V M E N G Q R V WK A Y E T L AI QNPD GRA WV S DD DIDDFHSED FTTMLGEAFENTAAMVTVDH P I DE NGKRVWRE FDD YE LETE T F ETMI GKTFE EAFP V N RGV AI ME E GKRVWKAYETLVVNGEDFNEI GEAFERERDVVKVK AVLPD GGRTWVDFTDVLLDEEDFARLGADFENTGAVTSGP
 A I I E N G D R V WK A Y S T L

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 A VMIN G K R E W IT Y E T L A V D G E D F E D I G R D F E K A Y QV NK I K PI IENGERVFKSYEDIVFKTEDFMFAGEDFEEKYNVVKDK AVVVDGEREWDEWADLDID DGDFPDCGEAFERAHAFETGE
 AI MED GHRVWKAYET LYVDGE DFCEIGKAFEMSHVVKKQT A MMVNGKREWVTYSTLYVDGEDFEEI GKAFEETMTVVNKVS $A V N Q D G E R K W I Q F E D D D L D T E H F N D I G Q Q F E Q K H S V Q K G V$
 A MLIDNGKRKWVEWGELNHNSDDFEQLGNDFESNDGHKPGK PVRMK GRRQWVTYQDGDYHEENFEAI GKAFEASAVFRFRR A V N I N G Q R V WQ T Y D C V D M D S D R F P E L V K D Y P AV RLPD GTTRWTTWTDVVTDED DFDRLGADFEATGGATTGQ PIPRE GRNEWRKQDD』AYYEEDFHKMGESCLARVAGHRGK

 $P$ TPD GWRTVT DV DLS DEGFEELGHDYERDRPVVRGK


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SERPDSFDQLVAEFRTLGVTQGMNILLHSSLK ETQPMPHTVGSLAADLRDLGLSTGDTVLVHASTR QPTGPLVTRASLATDLRTLGVQAGETLLVHTSLS
 MTELTQKLAHPVTVDSLUVDDKNLGGIKKGDILLVVHSSLS DA: DRVQEPCTDSSLTEERRDLGVEPGQTLLVHSSLS LNEMIKNTSEPQTVDTLVESLKKLGLYQGDTVIVHASLS
 MEED KT VVTHNKLVADLKALGLQADSDVMVHCKLS MEEMETSIALQTRKTIDDDLRRIGVREGMTLIVHSSLK MGDSVEKKAVLGTQADLAEGWRQCGLGKGHAVIVHASSLS MKTPQKA TSOPV GTEVDLR MKTPQKA】SQLITQKELLEELKELGVGAGMILEVHASLS

TAPLTRGRLAAELRALGLGAGDTLLVHSSLR MEEVISNNGKPITVKELVNDFTNLGLSKGDVVIAHDSLR

ETRQMVTKSMLIADLKQLGVTPGMKVEVHSAMK
 DA $\triangle$ AATPRPVTASSLTHELRDLGVTHGDVVIVHSSLS LLERSGGPVTRGRLVADGRALSVGEGDVVMFHTELG KDVVAETNMVTKTQLKEALHELGVTPGMKLFVHSSLK MTNEIHASTVLNTVDTLTRDLKNGGEEGDLLLVHASLS QADLERDLRGLGVAAGGVLLVHASLS MRE TASAVPVNTEQLVAELRALGVHEGSTLMVHTSS ■PDPASPDAVPLDRDDVGDRALGVREGMVLLVHVSMS保 DAPSVSAVPHSRARLSRQLAALGVECGGVLMVHASL MTELILKTPAPRTRSSLARQLAEGGVTGGTLLVHSSLS

TNPRSPLTRSSLTRDLSALGVREGDTLLLHSSR LTDSTKKSLIPVTEKHLEQKFIVKGIKQGDVVMAHVSLS LETMI QKGQKPYYRPDLERLLNNLGVTAGDTLILHTSLK
 MNDSDEKGDTPVTSKDLEQKFTNLGGKRGDVVLAHVSMS DLLKRSDGPVTRRRLAGDVAALGVADGDVVMFHTQMS KELIERAGGPVTRGRLVRDLEALGVGAGDTVMVHTRMS LKEEVESTSTPRTLESLVLDLKKFDVDYDDTVIVVHVSQS MSEKLIETV VTATNDLTRDLAALGSLTGATVMVHTSLS RELIERADGPVTRCRLVRDLKELGVGPGDTVMVHTRMS

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UniRef90_D2MM75
$S$ L $G Y V \mid C G G A{ }^{5}$
50
$Q$
60
70
80
ELESGEGTMMPTQSWKNLDPKT
 S M G WI A G GPKAVVI DALLMETITTPEGTIVVMAQSAENSEPSY S LGWVCGGAVAVVQALLDAVGPDGTLTVPTHSGDNSDPAG $K \bigvee G W V N G G A T A F V D A L M S V I D P A G T L V M P T Q S G D W S E P S N$
 $E L G W V C G G P Q A V V D A L Q R V V G A D G T I V M P T H S P G N M N P A D$ $S$ S M G WI A G G A Q A VV EAL I ETVLT E R G T L I MP A Q S A D N S D P V Y ALGWV A G GAEAVVRALLDAVTVTGTLVMPAQSSQLSDPAN SLGWVVGGEQAVVLALEAALGEDGTLVMPSQSWQLCDPAY
 QAGWV C G G GVAII KAFQKAVTESGNDVMAS QSTNDSDPS K KLGFVVGGAETLI RSLLE II GEEGTLMMPS QTWKNLDPST
 ALGWVCGGPVAVVRALLDVLGPDGTLVVPTQTGDLLSDPAL ELGWVAGGPQAVVDALQRVLTPQGSLVMPAHSTQYSDPSV.
 AVGPV R G GARGVVDSLLDVLGADGTVVVYAQTPDNSDPSR S L G WV S G G A E AVV LAL F D CLL GDEGTLVVPA QS GDNSDP SE
 SFGYI PGDASTVI TALRDALLGPQGTLVMPTQSSDLTDDPAT $R \square G W V C G G P R S V I E A L L Q V V G P E G T I V M P A Q S S E L S D P S G$
 SVGFI PGGAPSFI QSLLSALGPS GTIVVPTHTGDNSDPAA
 GVGFVVGGPQAGVEALLAVVGENGTVVVPTHTPDNTDPAG SLGWV CGGQLDVI QALQDVVTEAGTIIVPTHSADLTDPAE



 SI GWI S G GA $\square A V I L A L F E V L G E N G T L I M P A H S G D L S D P S$ G



 SLGWV A G GPVAVILALEQVLGEEGTLVMPTQSSDLTDPS G
 $S L G W V V G G E Q T V V T A L E E A V G P A G T L V M P S Q S W Q L C D P A Y$ AFGYVCGGAQTVVNALIEAVGYSGTLLMAMQCSDNTEPSA
 Q 1 G WI PGGAQALIEALQEVITPDGLIMMAAQSTDNSDPKN $K L G W V C G G A Q T V I E A I Q D V V G P S G L I M M A T Q S G D N S D P A E$
 AL GWV A G GPQSAVEALLAAAVGAAGTIVMPTQS GQLSDPAN SI GFI P GFAPS LI QSLLSALGPSGTLVAPTFTGENSDPAA
 QI GWI PGGVQALI EALQEVVTTEGLIMMPAQSTDNSDPKN SI GWVCGGPQAVVDALLRAVGGEGTLVMPAQTGDWSDPAE A L G WV N G G S A A V I G A L I T A I G P D G T I V $R L G T V V G G E Q A V V R A L L D V L G P D G T L V M P A Q S W Q L C D P A P$ KLGWV CGGPQTVI EALQETVGPDGLI MMATQSGDNSNPAE SLGWVIGGAQAVLEALRGVVGPHGTLVMPTQSWQLCDPAF


 SLGWVCGGAPTVVHALTDVVGARGTVTVPTQTMDNSDPAT S L G Y V I G G S E CLL Y N A L K NVV G E E G T I VV P S Q TVVEDS D P A T SFGYLI G GAAMMIDTVLNCI GPEGTLVMPSQSVNNMNPKF AVGYV A G GP T T L I $N A L L D V V G S R G T L L V P C G W N D A P$ K I G WV I G GA Q TVVVSAL I DI I GKE GTIV MPAATPACLHPND


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UniRet90-UP10003B437F1 UniRef90_UPIOOO373D008 UniRef90-UPIo003FD7BE2 UniRef90-E5AL97 UniRef90-G8S510 UniRet90_UPIOOO34COFB1 UniRef90-S9R9T1 UniRef90-_1 CYT9 UniRef90_UPIO004668C20 UniRef90-C8NHB2 UniRef90-A0AO23BMR3 UniRef90_S3ZNFO UniRef90-10UZU3
UniRef90 P29809 UniRef90-W9G2A0 UniRef90-UP10003F5CD65 UniRet90-ETMNF3 UniRef90-UPIO0036B37E2 UniRef90-Q5FMY5 UniRef90_O4ROX5
UniRef9O_D2MM75

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GVYWQEPEEWWDVI RENTPAYDKMVTPTNTMGAVISEMFRQ MTMPPVPDEWHETIRDQMPPYRPDMTPTQGMGAIAETFRS WRRPPVPEDWWPVIREQMPPFDPDLTPTRGMGAVAECFRR WS APPVPEDWHEP WOHPPVPOSWWEARAHMPPYDPRTTPSRGVGVVPETLRT WENPPVPEEWWETHRETMPAFDPRKTPCPYMGVVADLERT WENPPVPEEWWEEIRQNMPLFDKDRTPSTGMGVIAESFRA MGHPPVPESWYDTVRETMPPYRPESTPTQGMGAIAECFRN GVHWDAEEAWWPTI REQWPAYDKADTPAGGMGVVAEMLRT WENPPADPKWWNLIREGMPPYDPDLTVTSGMGMVPEVFRK WMEPPVPENWHQPI REQLPAFDPYFSGLRGMGKIVECFHR WRAPAVPQNWVETIRASQPPFDPRTTPTRDMGAVAELFRS LRDPGVPEETWDAVRAGMPAYDPAWTPTRTMGAVVEALRT WSAPPVPETWWDTIRATMPAYDPRSTPTSGMGRVAEAFRG WQNPPVPEPWWPVIREHMPAFDPAVTPSQWMGVIAETVRT
WRNPAVPKEWWPTI YEEMPAYNPEETPTFFMGVIPETFRK GVHSEAPTEWWPTI WMRPPVPESWWPLI RAEMPAYRPDLTATRGMGAVVECFRR WTRPAVPEEWWAP1 RAAMPAYDPRTTPTRGVGVVPETVRT WTSPPVPEEWWETVRAATPAYDPLITPSRGVGVVPETVRT WSAPSVPAHWPEQI REHMPPFRPEVTPAREMGAI AECFRS WNQPPVPKSWDQT RDTMPVFEATTTPTREMGQIAESFRT WPDTRVPATEWAGLRATLPAFDPARTPSYGVGVLPEEVRT WENPPVPAAWWPAI RATMPAYDPRTARTRGVGVVPETVRT WQNPPVPQAWWDTI REQMPAYDPDLTPLWYMGVIPDTFRR WSNPPVPQEWWDVIRSTMPAYKAEETRTFFMGALPEAFRT
WQAPPADPKWWNLIREEMPAYDPYLTVTNGMGRVAELFRLL WCEPPVPESWWDTI RASMPAFNPHLTPTRGVGTVAEVFRT WKNPPVPESWWSVI RATMPAYQPDLTPTRSMGVIAETFRK WKVPPVDEAWWPALRASDPAYDPEKTRTLAVGTVPETVRT WRNPPADPKWWD WMMPPVPEEWHEPI WQHPPVPAP WWPVI WCNPPFPDEWVPE WKYPPADPKWWDI
$W R N P P V P P R W W P V I$
$W$ WGNPPVPVEWWETV WENPPVPDDWVEVI MGNPPVPDSWADT WGNPPVPESWWQT WSNPPVPSDWVETI GVH GVPKAWWDVI WCEPPVPESWWETHR
WQAPPVPAAWLDT T LINDSVPRECWDDVRASMPAYOPADTPTRGMGAVAELERT WSRPPVPEAWWPEIREHMPAYDPDLTPDRGMGIIPDCFRK F NDSLTLEEDTIIKENMPDYYPDITPTSYMGIIPETFRK GVHWEAPAESWPVIRAHWPAYDKDITPAVGMGAAAEMGRK WENPP G WPGTRVPEEQWDRLRERLPAFDPDTTPAFGVGVLPETVRA WEYPPVPKDWDE II KENLPPYNPKTSYSSTMGEFSNFIRM WSRPAVPEDWWETI RQEMPAYDPAKTPTRSDGKVPELFRT WEAPPVPVEWWQTI RAEMPPYEADKTATRGMGRVPELFRN HYRERVDAGAVDAVRASMEPYDPALTPAPSMGALAETVRT
WQYPPVPDEWHDVIRDAMPAYSKELSYSKAMGAFSQFIGGI WSDPPVPADWLDDVRANLPAYDAHLTPTRAMGQVVDCFRQ WRAPPVPESWWQTI RDSTPAFDPAMTDCRRVGVVPETLRK YDFATWPAEWQEAVRAEHPAYDPADSEAHANGRLPEALRH WSQPAVPEEWWETI RREMPAYDPAKTVTRGDGRVPEVFRT WQNPPVPADWHE I HREWPAFDPDVTPTRGMGRI AELFRT WEAPAVPQAWWQTIRDTMPAYDPADTQTRGDGTIAEHFRT WADPSVPPSRYDDVRAALPAYDPAWTPTRTMGLVAEALRT WEAPPVPVEWWQTI RDEMPAYDPTKTVTRGMGRVPELFRS LQEA PAEWWPAI RDHLPLYYSPATTPSQTMGAVAELFRT LADSSVSSAQWPTVRGNLPAYDPAVTPTRTMGRTAELFRT QYRARVGEREREAVRAAMPAFDPAITAAPSMGRLSEAVRR WEAPPVPSNWVETLREEMPAYDPATTPTRNMGAVAELFRT WAGPEIPAAWWPRIRETMPAYDAQRTPCRALGDVAETLRC WE YPPVPEDWWPVIRAESPPFDARVTPTLIAMGRLAETLRT WEYPPVPVEWHDLIRDSMPAYNTSRSFSKAMGSFSNFLGD
WQYPPVPQDWHDDI RETMLPYDPQRTPVDALGAVVAYFYR YDFLTWPRPWRERVRAEHPAFDPDRSESHDNGRLPEVLYR WGETKIPENWDPKIVEHLPDFDपNTTPTTMGA\PETFRN WHHPPVPVEWHDSIREDLPAYNKKLSFSKSMGSFSNFGGD YDFTDWPRDWQDALREEHPAFDPLLSEAHAYGRLPEADRR YDFTTWPKEWQDQIRAEHPAYHPGLSEAHNNGRLPEALRR YDLAEWPPAWREAARAEWPAYDPLLSEARGNGRVPEALRH WVAPAVPESWHQEI RDLMPAYDKKTTKTRSMGSFSEYIRV WEYPAVAPTWYKEI REAMPAHDTKTSDVHYMGSVVENFRLV LINDPAIPPARWPLIRQHLPAYDRHATPTRTMGAVAELDRT WEYPPVRKDLIQVVRDNMPPYDPQTSATEGLGVTPEYFRN YDLADWPPEWRDAARAAWPAYDTRFSEAHGVGRVPEALRH


GR|LYELD GYVLLTG|VIGYDKNTSLLHLADVRAEYPHTVIESS ARVY DLNGDVLELGTDHGMNTSLHLAAEYRSTDFETVTHAG $E Q V Y R L D G Q V L L L G C G F E S N T S F H L A E Y R T A Y P G R R R R R V$
$G A$
$G$ ARLEEAGARVLLLGTGYASCTAFHLAEYRIAGP RVRNSF KTLYDLDARILAVGTDYDTSTAMHLGEYRAPHAPVKTEGA
 ARVYELEGDVCFLGTTHATNTSLHLAEYRVDDLGTAPQQS
 ARLYEAGAYVLLLGSGYGNNTSFHLSEYRANWKGKVTABAB AKMLQADVKI LEIGVGFDSCTALHYAEFVQENRSTSPQGA GVLHRSAARILLLGAGFDACTALHLSELKAWPAPRDAEGS A ALYRQDAQVLLLGVGFDKNTSLHLA A ELHRRDARILLI GVGFDACTALHFA
 DKLYHLNGYVLLIGVGYNKNTSLHLA ERMAELGGRALLLGVDHERNTTLHLAE A R L E E ELHARVLLLGTGYDTCTGFHLAE ARVYDREGSVLMLGTDYETCTSLHLA AKLYQLKAKVLLLGVDFNRCTALHLAENRDFGKMRVEAGA ARLEELDARVLLLGVGYSVCTAFHLAEYRVPGQGSREYGC ARLERAGARVLLLGAGFGSCTAFHLAEYRLPAPGTENSF ARIYELRGEVLLLGVGHENNTSTHLAECRANYPQTYTAKA ARLYELDGHVLLLGVGHGSNTSVHLAEYRAEYKKEVANGA ARMYENDAYVLLLGCGHDSNTSLHLAEYRTDYAGKEEQEA AVLNGIGAHVLMI GTGWETCTTLHLAERLSNPQPTFEDGT ARIVDLGGFVLLLGVGHDSNTSLHLAEYRATFPRVVQEGA ARMEGLSARVLLLGVGYHRCTCFHLAEGRVSSPK MENSF

 GYVYANDGYVLMLGTGYETNTSMHYAEHFVPGMKQDKQKS QKLYDADGHVLMLGTDYDTNTSDHLAEFMWHGKKEIEMNA
 ARVYDRGGDVLLLGVGHGNNTSLHLAEHRDFEKT RTRERA


 SKLYELD GQVFLL GVGHDKSTSLHLA



ERLYRRSGYVLLIGVGHDKNTSLGHLAEARGKNTKPKVWGV
AVVEWLDGQVLLLGVGHDKNTSLHLAEARSGHLPRVANGA
A RLYELKGSVLLMGVDYTRCTALHLAEYRSEIRPVILRGA
ARLEEAGARVLLLGVGWEVCTAFHLAEYRLPGRPRQTYSC
DKLYNLNAKVLLVGTDFESNTSIUFAES

ARLYEADARILLLGGTYATCTAFHLG
ARLYDADAQI L GUGNNTSLHAAENR LINREREKS AKLEAADAWVLLI GVGWDRCTALHLAEYRLQSPPLVDNSF ARLVEAGGRVLLLGAPLDTLTILHHAEAVADAPRFVTYEQ ERFIEADGQILHIGSPWDTTTVWHYAEY GLDRPDVEDGC GKMYGMRAKVLLLGVGYHACTSFHLAETRLPSMPVKRMGA GRLYEHGAKVLEI GNGYDANTCFHLGEY DAPSPPMIEKGA ERMIERDAKILHLGSPDDATTLWHYAEY GIDEGPVKPFEC GALVDLDASVLLLGVTAAKATVLHLAEHRASYPRTVPNGV SAI EACNGWSLLIGVGYEKCTMLHLAEHRSGTDRRVRNGA ARLYEADARILLLGTGYTACTAFHLAEYRTPAPPRRTYRC ARLHELRAQVLLLGTGFGSCTAFHLAEYRVPSPPRRTYRC

 GKMYKLQSKILMI GTEFETNTSHHLA E QKLYDAGAKILMLGTTFETNTSLHLA EKVYDFNFEI LLLGGVGFNRCTMMLHFA UniRef90-I4X7C2
UniRef90_UPIO004167EA UniRef90-A0A021VQS0 UniRef90_F2L7S3 UniRef90- W7BIH UniRef90 X4ZD68 UniRef90-W8YW57 UniRef90_G2GFF6 UniRef90 G2MFY6 UniRef90-UPI000248651B UniRef90-UPI000380384F UniRef90_S3ZGY3 UniRef90-C6J556 UniRef90-F5LLA2 UniRef90- OPIOJJK9 UniRef90_UPI00035ED94 UniRef90-E9E4S6 UniRef90_G9N113 UniRef90-V9GE13
UniRef90-M7N9R2 UniRef90-D1BXF3 UniRef90_UPI00035CC86E UniRef90_G8SLS2 UniRef90_UPIO0037954EB UniRef90_D4GXH3 UniRef90-W4F6V3
UniRef90 Q5VOW2 UniRef90-K8E5J8 UniRef90-D3ST88 UniRef90_U4KL72 UniRef90_UPIO003451DB2 UniRef90_G6XF20 UniRef90-LOAOS6 UniRef90-W4CSW UniRef90_S9SU88
UniRef90-F8F969 UniRef90-UPI00045E5942 UniRef90_B9Y9Q2 UniRef90-F3NAU4 UniRef90-H3NKM9 UniRef90 B1YES8 UniRef90_C4L2Q1 UniRef90-HOBHF3 UniRef90-M5A2P3 UniRef90-GORVQ3 UniRef90-D9WWB4 UniRef90_U6B8U8 UniRef90-D6XX8 UniRef90_F4H2T8 UniRef90_U1N071 UniRef90-F5XLY-UniRef90-UPI0003B437F1 UniRef90_UPI000373D008 UniRef90_UPI0003FD7BE2 UniRef90-E5AL97 UniRef90-G8S510 UniRef90_UPI00034C0FB1 UniRef90-S9R9T1 UniRef90-R6D195 UniRef90 UPIO004668C20 UniRef90_C8NHB2 UniRef90_A0A023BMR3 UniRef90_S3ZNF0 UniRef90-IOUZU3 UniRef90-P29809 UniRef90-W9G2A0 UniRef90-UPI0003F5CD65 UniRef90-E7MNF3 UniRef90_UPI00036B37E2 UniRef90_Q5FMY5 UniRef90_Q4R0X5

UniRef90 R9KHP3 UniRef90-U1P3K3 UniRef90-Q0ZQ43 UniRef90-UPIO002DE1610 UniRef90 M9T094 UniRef90-A0AO11QVP3 UniRef90-W7C946 UniRef90-W7B120 UniRef90-LOIFQ4 UniRef90-F3M515 UniRef90-D3EHH2 UniRef90-UPIOOO3749695 UniRef90-I4X7C2 UniRef90_UPIOO04167EA1 UniRef90-A0A021 VQSO UniRef90-F2L7S3 UniRef90-F4FAT5 UniRef90-W7BIH2 UniRef90-X4ZD68 UniRef90_W8YW57 UniRef90-G2GFF6 UniRef90-D6EKJ2 UniRef90-G2MFY6 UniRef90-UP1000248651B UniRef90_UPIO00380384F UniRef90-S3ZGY3 UniRef90-C6J556 UniRef90-F5LLA2 UniRee90-UPIO00365AOCO UniRef90-K7SJK9 UniRef90_UPIO0035ED941 UniRef90-E9E4S6 UniRef90-G9N113 UniRef90-V9GE13 UniReffo-M7N9R2 UniRef90-D1BXF3
UniRef90_W7ZZZ0 UniRef90-UP100035CC86E UniRef90-G8SLS2 UniRef90-UPIO0037954EB UniRef90-D4GXH3 UniRef90-W4F6V3 UniRef90-Q5VOW2 UniRef90 K8E5J8 UniRef90-D3ST88
UniRef90 U4KL72 UniRef90-UPI0003451DB2 UniRef90-G6XF20 UniRef90-V9RNSO UniRef90-LOAOS6 UniRef90_W4CSW UniRet90-S9SU888 UniRef90-UPIO0045E5942 UniRef90-BgY9Q2 UniRef90- ${ }^{-3 N A U 4}$
UniRef90 UniRef90-B1YES8 UniRef90-C4L2Q1 UniRef90-НовНन UniRef90-Dobk85 UniRef90_M5A2P3 UniRef9O-GORVQ3 UniRef90-D9WWB4 UniRef90-U6B8U8 UniRef90-LOEAV6 UniRef90-F4H2T8 UniRef90_U1N071 UniRef90-F5XLY1 UniRef90_UPIO003B437F1 UniRef90-UPI000373D008 UniRef90-UP10003FD7BE2 UniRef90-E5AL97 UniRef90-G8S510 UniRef90-UPI00034C0FB1 UniRef90-S9R9T1 UniRef90-RED195 UniRef90-I1CYT9 UniRef90_UPIO004668C20 UniRef90-C8NHB2 UniRef90-A0AO23BMR3 UniRef90_S3ZNFO UniRef90_IOUZU3 UniRef90-P29809 UniRef90-W9G2AO UniRef90-UP10003F5CD65 UniRet90-ETMNF3 UniRef90-UPIOOO36B37E2 UniRef90-Q5FMY5 UniRef90-Q4R0X5
UniRef90_D2MM75

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All RJVIDGQRIVWKGYETLAVDGEDFSAlIGEAFEQTGQVHHVS AVLIDGDRQWVEWNEI DYDDGDFQACGDVFEETHAVETGA PVPEGDRVRWVEQEDVYFEEDFQTMGESCLTRTPGHRGT AVRTPSGPRWTTVTDTSVSDEGFAELGDDFEGSRPVARGT PILLDKQRVWQTYQDVDLDEDQFPAVGRKLEAAGLVQPSK AVILEGKRVRKYYQEKAYDSDQFTKVGEAYEKTHGDHKQT ATLVDGEREWVEWDDDDFTEDFSECGEAFEREHAFESGT AMIIDEERRWVTYTTQEVDDRDFVPLGAEFEQKHRVAVHQ PVRVQGVTVWEAFQDTNYHSDDFEALGASFEAQCAYIHGR AVMTAQGRRWRTVRDTA $\frac{1}{M S D D R D D L G A A L E R D E A V V S G E ~}$ ALLKDGQRDWQTYDCVDMDSDRFPEIAKAFP GEISEGL AMTVDGQRRWVRFEVAAGYPDDFPEIGQALLRQGLVRAGR PVLVGGERRWVTFDEPVVDDADFVAAGEDFAAHGGVTTGA PLMIDGRRQWVRFEDAEPDSERFVPVGASADAAGDGAQGP AVTDTGQRWARWEDVATDEGDFDQLGAAFEATGRARDGQ
PIMVGGEKVWQSYDEVTSNSEEFTASGRDYEKTAHQPTT A IMEEGTRKWVTYETQAVDDGDFVRLGNDYDKEMNDKDHR PMLRNGVREWVVFEDLAYRDDDFNVVGEAFERDCPLARGR P GPAGWEVRAEVSLTSERFDELGHDFERDRPVRRGT PVLQDGPGWERWTE STYSERFDEGHDFERDRPVARGR PFIVENGARKWVEFDLPEMDVDKFIDPGGKELVDSKYGERKK AVDDGSGRRWHRYRDVDFDTSDFPALGEAYESEHPVTRGR AVMTDEGRRWTTVREPSTSDDRFDELGADYERERPVARGT PLLVNGERRWVEFTELEYDSEDFERLGADFRDTGLVKQGQ PVLDDGVRQWVEFPDVGDDSDDFDRAGADFEARHSVVRGK PVLQQGNKQWVKRRDINITSDDFDRLGADFERDGEARRME AI RVDDERRWVRFRMPQTDVDRFPAVGAKLDGHAMLKHGH PI SAAGSRRWTTFENDDLDSSDFDQI GEGFLRSDVVHRGK AVTVDGTRRWLTVEDTVINGDDFEELGADFERDCDVRRGF AINIDDQRQWITVKDVAITDEDFERLGADFERDCKVVRGT PVRRAAGRTWESFEDINYHSDDFEALGAAFEADCAYKRGK AMLVGGERKWVEYDMADLESDDFPPLGLAFEREHAVTRCK AVRRTDGTEWLTWTDVQDDDGDFVALGAAFEATGAVRVGR PI DENGAR WKEYSEPAYDETHFASI GALYEEEYDVTTGL PVMTKSGKQWISFKDLNFDSDDFDRI GSDFEADHLWKQGK AVADEGGSRWVTWTAPVTDASDFPVIGAAYEAVGAVAVGP PLLRDGERVVVEYDDIEVETDDFEAVGEAFERQRGATEGP AMLDEGKRQWVTFNMLNVDSDRFLEIGNSFEKAHHVHYGT AVLAEGEREWRQWTDI ELTDTDFQACGDAFERAHAVETGT PILENDKT TWTEYTDIELFTDNFLTMGTDFEAENKCDNGT PVLEDGERVLRDTEELETSTDDFPEVGAAFEAQHDYREGA AMNIDNKRQWVTYEDKAYDSDQFVEIETEFDKKHKVNTDT A TMKDGQRHWVSYHILEP门SDDFNEVGMAFEAQNKVRFGK PLQUEGERRWVRFRLPVVDCSRFPAVGAGMDGSPDLHHGH PIEHGRRVWKRYDQPALDSDHFLPVGQSLIDAGLARRFP ALMVDGRREWVEWREPWPSDEDFEAVGAAFAATGQERRGS PMLVDGVRQWVEFSDYNWNSDDFAQLGADFDETGRIAKGF KMPVDGNEQWITYDDDNNESDDFNKIFDDFKNTNVVKEGL AMWINGKREWVTYTTQAVDDSDFLRLGEEYERETGLTARR PLLVDGERRWVTFDEPEVDDADFLAVGAAFAGSGGQRTGT AVELEGKRMWKKYDDDDIDSEDFNKAGKRDEEKGFVKKGK VVGDGGGRAWYTYTDVRLDSSPARMGAAYEADGDLVRGR KVVINGKEKWETF DNVDLDYDDYGELQESFFNTMPPKTET KMKQGDEEVFDRYQHRIIDSDPFGPI GEGMDDEPFVTTGK AVVERGERKWRTFEHVDVNSDPFGAI GENDVKQKDVRTFS VVTSRGVRRWWEYEDVALDDGDFAALGAAFEADGDVRAGR KLLTKDGEKWDSLKNI ELDYDDYLEVQKNFMEQYTVNHTS PMLTDGERQWVTWTDLEANEDDFDQI GEALIATTDIERVGP A KVDGQRQWMTVEDLVPDDDDFEDLGADFERDCQVVRAK PVLVDGRRVWRRFRDIDTESWPFTVIARDALAAGIGTRGR KVKEGTTERFDHYRHRQDDSDAFGP\|GEGLESADFVTSGL AI RENGERVWRWF
PVLTDGVRQWTTYEEVDLDEEVFEETGRTFEETYPVHTGK PLLVDGAREWVWFDEPVVDDADFEAVGAVVSASGHETAGT ALMENGQRVWKTFEHTDVNSDPFGAI GENIIVKRADVKTFT AMLVDGRRTWVTWEELDVHDHDFEEVAEAFAATGLVRTGR PLLVDGRRRWVAFDEHIVHDEDFPDVGRAFQETGLERSGH VVAPGGVRQWWAYEDVALDDGDFAALGAAFEAPGDVRRAP VVRDGGGRRWWEYEDVALDDGDFARLGEDFARSDAVRTAA PILENGVRRWAVYEAPALDDEEFAPVGRAMKDRGAVKTFS AVMTTGRRAWVTHDDVALDASDFEHLGTAFEGTGAVTTGR KISTLKGEEWIEFKNIDLDYDDYLEIQEEFMKLHQVRKEK PVLVDGKKQWVSFKNVLDIGDDFLDVQKEFFQKYALKQCS P ElVDGQRVWRRFSDIDSENGAFDYI GAELVKAGFGRSGL P| FHNTKKVWVEVEDMGNDSTYFPKIGASYLKNRNASDGK
Q PITVDGQRVWRRFHDIDSQDWPFEAI GRDMVAAGIGRKGL PI TVGGERVWRHFHDI DEDEDPFGVIADDMVEAGLGRSGD
 AMIVDNKRKWVSYEDKNYNSDAFSVIVDEYKKKVNITEGF KVKTAEGDVWRKYLDLQLDSDUFLKKVGQMMRKKNMVRETM $P L I V D G R R Q W V E W D E L W V A D N D F H A V T H A F A A A G L Q R \square H T$ TI DQD GK T I WT D Y Q NV DLD S Y DFNELGETFEKKCPFK S QK


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LGNGILSMMSQRALVDFAVEWIGEN $V G \square G D A K D F A Q R A D V D F A V E W F E$
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 $V G V G D A T L L S Q P A L V D F A D E W F E A N$ $V$ G D A F V R L I R Q R QL $V$ V D WA A T WM K R N VGKADCIL AEQRAMVDYAVSWMEKN V G GAVGRLEGLAEAVAYAEEWL L G Q A K T R L V EMMK P LV E F G $\square$ D WL V G S A T C HL M S M P DI V D A A A GLLM V GAARAHLMDQRALVDHATAWFTR L GEGRGVLVAMRPLIDHALR
V G A A E S R L MR QRELV DFAVVDWLATH L A GAPSK I F DMRDLV D Y VSE I I S E I G N A EV RFLE QRP L V D WA A A WMERN

 $V$ GAATAKLVDQPTLVEFAADWF $V G E G Y G I F V D M Q L L V D H A V N$ $V G T A D S R L D F D L A P A V A Y A E S W L T E H$ V G A A T A R L F P L A E A V A Y A E G WL A E H $V A G A T A M L M P Q R E L V D Y A V G W L E R H$ V GSADTALMPQRPLVDYAAA WMR QH I GQASCFL GRQRVLVDYAQA WL $V$ GSAPSRLGPVAQAVSMAVE $V G L A N C Q L I P Q R V V V D B A$ V $V$ GAA DCAA L S LP E A TVL Y A K K WF Q E H $V$ GA A E C R L F P L R E A V A Y A T S WMN K N $V$ E Q A DCVLAD QRLMVDYAVQWLKSN I G Q A D A R V DD M DLLLV D F GVVE WI V G DAE SRRLMSQRALVDFAERWMAA H VGQATARLVNQTELVDFTKRKLIEK
 V G S A VA R L M P QR DVV DFA T S WME DH $\checkmark$ G A A E A R L F P LA DAAA Y A Q K WL V A A A T A T L LDD QPA L VD FA E D WF E S N
 $V G N S K V K L F N Q K K A V D F A E S W L K N H$ $V G A A T A T L L E Q P A D V D F A T E E W F E T N$ L G L A E T K L Y Q F K K I V D F A V G Y L D K V G N A E T RLLMSQRELV DFASVVWMSAH V GAA T A RLI FSMPVAI DRARA L GA GH G L R RVSARV A V E H A A R Y WQ $V G L A E S R L E F S R A L V D F A T N W F$ I A A S A A QL VP QREIVD Y GVK WLERR VGEAVS YLI PQREMVDYALGWMNRN V G GA DV R L L E QR P LV D WA A A WM E R H A G M A D L K L F K A D A AI D E A VRYFA K V G A A D C C R L $V$ Y G S K $\square Y C F S M R D C V D Y A D K Y$ Y Q E K V G Q A T SHLVSAKA
I HEATCYLI P TWEPVQHARS WLR
$V$ G A A A C RLV RLRPAVDFAT GWLTEH I N D S NVYL F D M K E CVV D F A E H Y Y QLLK V G T GVARLAS QRAVVDFAATVMSAN I G A A ECRRLFS LREVVVEYARVWMDKH V GAA E CHLLGAAELVRFGVGWDER GQAKSYR】DAKA

TGDATAKVFADRDAVDASTTWFTAH VADAAARLVPLRALVDLAADWFRR I H E A T C Y V I P Q H A L V A L R S WL R $V$ GEAK A QL L P TRP LV E Y A A D WF T T H $V G S A D S R R V P D S E L V R F A S A W F R R H$ I G A A P C R L V R L R A A V D F A T G WLTA H V G S A T GRLFRFPAAVAFAMGWL \begin{tabular}{l|l|lllllll}
$V$ \& $G S A$ \& $G$ \& $R$ \& $F$ \& $R$ \& $P$ \& $A$ \& $A$ <br>
$V$ \& $A$ \& $F$ \& $A$ \& $M$ <br>
\hline

 

$V$ \& $G$ \& $N$ \& $A$ \& $R$ \& $S$ \& $M$ \& $L$ \& $S$ \& $G$ \& $R$ \& $A$ \& $V$ \& $D$ <br>
$A$ \& $A$ \& $\square$ <br>
$A$ \& $G$ \& $A$ \& $A$ \& $V$ \& $A$ \& $R$ \& $L$ \& $F$ \& $P$ \& $L$ \& $P$ \& $A$ \& $A$ <br>
$V$ \& $A$ \& $F$ \& $A$ \& $R$ \& $D$ \& $W L A$ \& $A$ \& $H$
\end{tabular} VGGQA TA A R L


 V G T A D S I L CVA K T L V D Y G T N Y F D

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


 $V G S G S T K V L D F N N L I D F G K S F Y D K$ L G G C K $\quad$ IT T L F S A A N A I D

 $V$ G A A P S H L F E A P

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1
MKILADSPSKPHGVEDLLTGLDTLGVIGPGDAVLIHCADS HAFNALSHDFSALGVVFGQVVMLHSSLR HELLERSGGPVTRSGLVRDLRALGLAEGDLVMFHTRMS MSEEI $\square$ NTVT TKNDFKSALRNAGIKDDDTVLVHTALSS VMAATPAPRCRSSVAANLRALGLCEGDAVVVHSSMS LKDIVSKTNKPVTKNDLDKGLKELGVENTELLMVYSNLK QELLRRSDGPVSRGRLADDLTALGLRRSDTVLFHTRLS MSENLDETVVTKNDLKEAFIDEGIKSTDSClVHTAMS RETVERTDAPLSVDRVAADLRELGVGAGETALVHSSLS MSENLINTVT TKADFQQALKKVGINATDACLVHABMS ERTAAQLHELGVRRGGVLLAHASMR MTEADARSSGPVTQARLVVDFQRLGUTPGMTLLVHASTS MEELLNHSGGPVTRSRПKHDLADLGLKDGDVVIFHTRMS MSDALDNNLLMPIGKSDFLINFKDLEIGEGDILIAHVSLS MLKTGSGPVTRKDVRDALSPLEESSDVMLHVSLN VTKNDLKHAFKELNTKNSDVCFVHTAMR MEKTMKGLKTPNTVQSLTHELENLGVNKGMVILVHSSLS HTAVSLTADLRELGVEKGMTLLMHASSR LLKRSDGPVTRTRLARDLTALGLGDGDTVMFHTRMS vis RUA QALLARSRGPVTRSRLARDLAALGVRDGDTLMFHTQLS DGKPITQKNVVDVLTELDDIKRGDTVVVHSSLEK AFTTLNQDTATVSSKEEIVQQLMSLGUQKGMVLLVQADLQ RAHLARSFRALGVRPGTTLLVHAGLR TRSSLAQDLAALGVRPGETLLVHSSLS LLARADGPVTRDRLVGDLRALGLTEGDTVMFHTRMS EMSAEPVTVESIISDLRAI GVEPGQTVLVHSSLS MTDL NiPHTHAHLVDAFQALGI RAGQALMLHASVK
 QLAVQLRLLGRPGMQLLVHASLR ETHTRRTLAAQLREIGLGADSSVMVAGLR
 EKRKLVTPDDUTALKDIGVQKGQA LMVHTSLS
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 MTQAMTRPQVGSRFDVLCRQLTELGLADREIVLVHTSMR VSHARMVEQLQSLGVREGGVLLVHTSFK KDVIEKSSRPQTVKTLVKDLKNTGVREGMVLLVHSSLS VTVSRMVEQLRSLGVREGGVLVVHTSFK AEFARLGVRPGATVLVHASLR LTGELTAAGVEPGATLLEVHAALR MSALGIAPGDVLMAHAALS
AMKDПFKEESKDKWDKEGKKEGRKEGIKEG M IIA RSGLVAD RALGLPAGGTVLVHASLR THFWTIADLVSDLAALGLGKGDIVLGHAGLR TTPATRTDLREDLRRLGLEEGDLVMVHAGLR EEESGPGTGHDLRAGFEALGLPVGATVVVHASLS TQHPVTQERLKQLLVDLGVQPTDSLLVHTALS ■HEPATAPATPWSKSELVRQLRDLGVRSGDMVMPHVSLR

TATDLYDLFDRLGLRATDSCLVHTSLS
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50 60

70
80
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$\qquad$ SFNFIIGGAQTVIE ALGGYVAGGADVVLDAALADVVGPQGTLVAFCGWN KFQFLPGGAETIINTLEETL SDGTLMMPSQVSTNCDAVP A $\mathrm{T}_{\mathrm{G}} \mathrm{WMPGGVPAAVDALLAAVGASGTVAVPTHSTQLSDPAG}$ ATGL GGRARVDA
A A
 GGPETIVQ R $\quad$ GWVCG C G

## L

EK
ADGYVAGTOT I A BVGA
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 S $\square G Y V C G G A Q S V$ DEA

A WGPVDGGAATVLAALRAVLGPRATVVVPSQTPANSATSS RVGRLLNGPDALGGALLDAVGPTGTIMSYTDWDAAYDELL RLGHVAGGAESLVRALLGHVAPGGTVMVPAQTWLNLDPAR QVGKIVGGPDAIIDALRDVIGPAGTI LGYCDW QLEDELR KLGYLIGGEQMLIEALMETVGYEGTVVMPTFTPQMADPAC SFGYVVGGAQAVHLALRDALGPDGTLVVPAFTPQLCHPST RLGRAAGSPRNLLRALQCVLGPLATVVVPTQTANNSTTSR AVRPVEGGPLGLIGALRAALGPRGTLVMPTMTGGDT KFYYVPGGPESLVQALEETI NQGTIMMPSEVTTNCDPAD STGWVSGGAVAVI LALEEVLGKDGTLVMPTCSGDDSDPAK AVRPVEGGTLGLIRALREALGGEGTLVMPTMTDGES RIG VGPGTVLRALLDAVGPEGTVVVPTFTAGNSDTSR NTGL
 $R \prod G P I A G G P V T A L A A L R D A L G P A G T \prod M V P T Q T A G N S D T S P$ QVKPVENGPLGLIAALQAAIGPHGTLVMPSMTDE SI GPMIAGPDTLIAALRQAVGAGGTI MAYADWQGAPEDAC SLGPVLGGVNTVAQALDDTLGRRGTLMAYDDWEDGAEPED AFGRVDGGVATVLGALRDRLGPQGTVVVPAFTGDA
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 AFGYIPGGER\IVEALKD\F SEGNIVMAAQTADLSDPAE AVGPVEGGAASVVSARRAVGSAGTLMGYASW W DGRSP GTGGAAPELVRDACLDLGGGGTLVVPAFTPENSDTSR RVGRLLNGPDALIGALRDAVGPGGTILAYTDWDAAYDGLL SVGTILGGPDALVDALLDVVGPSGTVLSYQDWELGYD SIGWVCGGAVAVIDSLIECIGKKGNLVMPSHSGDYSEPSY MPTHSGGLISEPSE

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LD D PALLDGSARARVVRELLDAFDPALTPTRTMGR|V|AELRRT LYRAGMTPEEVAAYRARMPVFDPATTPSQGMGVIAEHVRT YEFTDWPAEWQAAVRAEHPAYDPRVSEAHHNGRLVEALRR WKYPPVQKSLIQQVVKAMPPYNPTTSMTEGDGVTPEYFRT



 A Y LA GMTPE QAAAAFRADMPAF DPAATAPA QGMGRALAESSVRT WEYP P V R K G L I Q IV R D NMPP Y NP A T S IT VG LGGVTP E Y FRR
 WCDPPVPESWWET:RATMPPYDPRLTPTRGMGQIAETFRT
WEYPPVRSDLMETI RDNMPPYDPTSSATEGGGITPEYFRT YDFLDWPRDWQDALRAEHPAYDPDLSEAYNNGRLPEALPR WEYPKVPKEWTEKIKQESLSYDVNLSSTRGMGKFSEFVMN WENPPVPEGWI DQVMDSMPPFDLHTASCRRLGRTPELFRT WEYPPVKENLIQLI RDSMPPYNPQTSQTEGLGITP WEAPPVPEEWWQTRDTMAFHKAYTPTFGGGKPEFRS HLTQGLTRHQLLAYRENMEPFSAASTPSYGMGRLAEVVRG YDFTDWPQT WQDARRAEHPAYDPVLSEAHNNGRLPEALRR AYHAGLTDEERRAYEDRMPGFDPAVTPSFGVGAFAEHVRR AELGEWPAAWQDAVRAEHPAFDPVLSETHDNGRLPEALRH WLYPPVAPEFWDII RKALLPYNKDTTPSKGDGVIPETFRK YKSGTVPRACWPEI RQAILPFNKRLSTPVNMGEVTVQFMR QKKTVERVYWDDVRASSFPFDRKLSAPQ DAALSLQF DR HDANLSSEEGEFIVKDNPPDYYPDLTPTSYMGDIPEVFRR WQAPPVPEDWWPLIRAEMPGYDPRTSPTRGMGRIPDAVRA WPRP WQDAVRSDPFVYDPVLSEAHDNGRLPEALRR MENPPVPESWHDTIREEMPPYRPALTPTQGMGAIPECFRN SLPDALKAVYLEQHPPFDPATARVRENSVLAEFLRT MDLPDEERALYYAEHPAFDPKDARVRDHGLIAEFFRT AHLAGMTPTQAAAFRATMPAFDPATTPSTGMGRLAESVRT DDDGNVPAELRDDIVEPPFDPASSRARRFGAIAELVRT DENGRVPPEW RAHTAPFDPAVRAARDNGVLAEFIRT VYRARVAGAQVTAVRAAMPAFDPHTTPCPRMGRLAESVRT GVYWQEPEEWWPVIREYIPAYDKRTTPTNTMGVVPEMFRQ GVYWQEPEEWWDVIREYUPAYDKRITPTNTMGAVAEMFRQ AHREGMTAVEDAGYRERFPPFDPARTPSAGMGAFAEHVRD DSAGRVPPEW RDH ${ }^{2}$ PAYDPAASRARDNGVLAEFIRT VYRAGLSDADRDRYVAAMPGFDPDTTPSYGVGGFAEHVRA $G V H G L P P E A W P D L R A A L P G F D P A T T P S G G M G T T A E A V R T$
$D D$
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UniRef90 E3F0Q9

A R|L|YS $\|$ G A K VVVLLG|V|GYESCTALLH|L|AESRAGGPARVRNGA A RLYDADAHVLLLGVGYDRCTAFHLAEYRPGRPPRRTYRA





 D Y L Y Q NH GKI I F L GTDYETCTMLH YA AR Y Y E A D A Q L L L GT GF GRCTAFHLA AVLADRDAHVLVI GTGWESCTALHLAAPRDRPAPPRRLYRC
 A RLIA H S GRVLLL GAP LDDTMT LLLHHA EALVRSKREVTYE Q
 D YVY QHHGKTI FLGGTDYETCTMLHYAESVIDNRTECSAAT QQLYDMDAHVLLLGAGYDGNTCFHLAEYK GRRLYE E E A YVLLL GVVGYEPCSAFHLAEYRQPGAVRRRYDC
 GRMEQAGAHVLL WDVGFAANDAFHLAE YRVGRPPTTAGYS

 GKLYNNNAKIVLIGGTDFESNNTSIHLAE

 GALLYRAAA HVLDM NVGFEVVCTACHLA
 ARIHDLDGDVLYLGTTHATC AKLVA $\ E G Y V L M L G A P L D T I T L L H H A$
AKLVESGGYVLMLGAPLDTITLLHHABYKMRHKNVVRPC
 GK L C WE G G Q V L M I N V G F S V C T A F H L A A E Y R I P P K P P L R M Y E C

 GRRLYELD GYVLLI GVVGYDKNTSLLHLADVRAEYPHMVRESS
 GALYRGDTSILLLGVGVEKCTALHLA
 GK LVVEA E G K V L MLLGAP LD TM T L L H HA E H L A D F P R I L R Y E A







 A R L V E A G G K V V M M G A P W


 GRVVHS LDD G QV L LL G V T H S E NT T L H VA E A LAA GVP Y S V S H P C

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



 E R FVGGH G G K V L L L G A P L D S V V V V L H Y A A P L Y A A D A Q L L L L R V G F E V C S A F H L A E Y R T TPPPPRRTY R A K VA A A P
 GRLYELELKY
DKIYELNGKVLLLGASYGSNSSFHLAEYRADYPRHKDCYA
 A DLYN LDD GKVVVMLGTNYESCTSLLHLA DSTI GRPNLTTEKAP



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UniRef90-H8MJK3 UniRef90-UPIO0037E98E4 UniRef90-UPIo00362A43F UniRef90-UP1000462F348 UniRef90-C4NV15 UniRet90_O093C4 UniRet90_Q03U53 UniRef90-C1IUZ3 UniRef90-E4NFH6 UniRef90-C9ZCF3 UniRef90 H5SHD6 UniRefofo-ABE6U1 UniRef90-19KBT4 UniRef90-B3RBNO UniRef90-V8E3V6 UniRef90-UPIO002626D34 UniRet90_D6S595 UniRef90-Q01515 UniRef90-UPIIO00476AE48 UniRef90_L7FC55 UniRee90_B8/K10
UniRef90_UP100036375ED UniRef90_TOD755 UniRef90-K2D8M0 UniRef90-MOQFW4 UniRef90-UPIOOO46A358A UniRef90-Y1PCY8 UniRef90_DOLKX3 UniRef90_E3F0Q9

PMLID GRRTWVSWDEPVVDDEQFPSVGAEFDRAGGSQSVM VV DDGDGRRWAEFEDVELDS GDFAAL GAAFERTGAVVRGR PI TVVD G E R V WR R F H D I D S E T D P F E A M A R D M T L D E S G K T I WT E Y Q N I D M D S Y D F N E L G T E F EA K H A I K K V K
 PILVVA GERVWRE F H D I D SER GAFDY IMTELLDAAGS GRTGR
 $P V D D G G E R R W V T F E E P V S R D D F R E I X A A F E R E R G M R R G T$
 VVASEGGRRWWEYEDVALDDSDFARLGDDFVRAGAVGAGR A MVD GERRWVRFHTL CTRPERFLPAGAALDGHVMLRHGH TFDEQGKTT WTDYQNV DLDSY DF NE LGGDFEK QYPFN QVS QRVWRQFRD DSE E EPFEA A R DMLS A G $\square G R Q G R$

$R V L T D D G P R W T H F V D V D L D D S D F G Q L G H W L E T R A P D A R G R$ PI LVD GERVWRRFHDUDSED GAFDYI GRDMRAAGDGRRGT LV RDRGDRRWVDAVDMRLRDHDFAAL GEAFERTGAVRVAT YVLRD GRRERLDFEAP HLDASPEAEVGVELDREPFTRPGT PV L E H GE RVWWRTY WDVDTED WPFTVI A QAALDA A G I GT S GT
 PI EK G GNDHWI KMLDKEMNTSSYKADGANMEERGVVK LDE P I ENNK Q T DWK DMLDDLDYHTKS F SEE GEAME ERSVVVKTSY
 VPTPD G GKK WTEYEDVRLDDSDFGAI GAAF TRGMARKGR AVLRDGTREWVT YT DVELDDEGFPELGAAFE
$P V L E G G R R D W R R F R D G D S S Q D S F E T G V R D M L A T G A G R R G R$
$P I L R D G R K V W V T V E D Y D H D D Y S F E Q \square A R D Y V A Q G G G T R G K$ $P L L R D G E K V W V D V E D F N H A D Y S F E E I A H A Y L A T G R G T H G L$ $V V R G A H G P T W T E Y L D V E L D D R D F E A I G A A F S W N A E R R T Q$ $V V K V N Q E G E W T A Y E D V A L D D G D F A E I G R A F P D S \quad R V R R G R$ PI LVDGRTVWRRFEEFDTSDPYFATVVEDFLAAGGGARGT
 V MEKCAKGSW
AI L LDD GRR DWTSYETVAVDGEDFAA I GEAFEQTEQVRHAA $K L A D G G G G R W D E Y R A M R L D A S D F D R L G A D L A A R S W V R N G T$ PFATPE GVI WRMVE EFDTSDDYFATVVQDFLATGRGAQGC FVTENDRRELRRFAALKLDDGDFGTAGKDLLRHSWATTGQ WMRDADGRREVRCRSGVFDDSDFARDGAAFEATGQVRAAP P L L V D GE TVVWRWFEEFDT PED YFATVVEAFLDATGRGKRGE

 $F V N D N G Q R V R Q T F E G L D L D D T T F D H I G G R L A D Q R S F A R K A R$
 $P$ L MVSGRKE WVDIK DI $V V E V D G V V Q T V D I A E T D H C C R N F Q L A G G W L A A Q G L A R E G K$ $V \vee R R G G V R T W V W Y E D V A H D D R D F G E L G A A F E E T G V V R R G R$
 P L L E D G R V V V WR WITE E F D T G D P Y F A T V V AVVME E GKRRVWKA YETLYYVNGED FNEI GEAFERERDVVKKVK Y L T D A D R RI QRE F LAA D L D D S D F P R I GA R L D A R P D V R C GP $P$ TLE S GQLLRWQEYGEVDHCCENFRLVDA WLDEQGLQRVGQ PFLEGGQTVWRTVEEYDTDDDYFDQMVRDFVAAGGGRQGK
 LVTEDGGGEWV HFEAPDDDDRHFPGMVPVVANGCAVNDGP

 PI SVA GKPQWRSYQMVE LEEPYDFNAMGAAFCQAHPVIQQP PI REDGGVRWKRAEDFDSNPDAVETDTNAYVELRRMREGL
 TPPKWFVVEKP E HEWEWDYPAFAK L EP DCKERGI DKT IT PMPGPD GR DWEAATDFDSNPDAVETAA RAYVAT GRYREGM P $\square M V N G H R S W R R F R D \square D T E Q W P F T V I$ A E D MLAAT G $\square$ G H H ST P FA R P A GT E WR I I E E F D T G D P Y F A A V V D D F V A T G G GRE G L P LRAD GHTVVWEVVEEFDSNPDGVETMATAYVALGRHTEGQQ $P$ P LR D G Q K V WV DV E D Y D H A D Y T F D G I A R A Y V A E G R G T Q G S VK V G E R I WCETLDVANDNG GFPVVGREFERVMGADVKA

VVGERG NWI S Y E D A L A L D D D S D F P F A T Q A G V H WR M $\square E E F D T P D D Y F A D L V R D F L A T G Q G A H G S$促
$P$ VMMNGKRQWLRYSE LD F D SEDFAA IGGADMEKCLE $\square K S G F$



250
260

|  | 250 | 260 |
| :---: | :---: | :---: |
| UniRef90_UPI0003643BC3 | G A A L C R V ${ }^{\text {M E L A R L }}$ | DFAQAR |
| UniRef90_UPI000477DAAD | $V$ G A A E A RLL F SLR A AV | D H A V G WF D |
| UniRef90_UPI0004117773 | $V$ GAATS L L FEAP DVV | T F G V D W |
| UniRef90_D5H3A2 | L N N G V I K A I N V K P L | D F A RKWF NKK |
| UniRef90_L8GG89 | $V G S A S C R L F G C K A S V$ | D F A V L Y Y Q Q K |
| UniRef90_D4W2N0 | G GAVCRL D F F R L I | D F GTNYLK |
| UniRef90_UPI000466AC9F | V GAARGHL FEAAEVV | E F G V R WL E R |
| UniRef90_UPI0004698F7C | L S K G $\square$ I K V $\square$ N L R P L | D F A REWFDQK |
| UniRef90_V4HEQ4 | $V$ G T A D S T L CRMR PLV | D F A VE WMAEN |
| UniRef90_B5H9R9 | L G G R T A R L F S LR D AV | DHARGWMTE |
| UniRef90_F0NRS2 | L N NG $\square$ I KV DDA H A L | D F A REWFK Q |
| UniRef90_E8WC99 | $V \mathrm{G}$ S A P SRL F P L R A AV | D F A V G W ${ }^{\text {WT E }}$ |
| UniRef90_Q5FT81 | $V$ G S A P SR L FPL G E A |  |
| UniRef90_D0R422 | L N N S F $\square \mathrm{K}$ V 】EMRP L | D F ARD W |
| UniRef90-P29810 | $V$ GA A D S Y L F A G PV | NFA $\square$ W W |
| UniRef90-F3A1S9 | QK T S V L Cld LK S CV | D F A K E Y YRRK |
| UniRef90_V5WK79 | $L \mathrm{G} \\| \mathrm{G}$ T V R I L P S R E L V | D F A V A Y M D Q R |
| UniRef90_17KGT2 | L V S G I I K V I N T R P L | D F A K K WF I |
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| UniRef90_UPI000380E246 | G A A D S R L F P LR WA | D |
| UniRef90_P30180 | V G A A D S HL F EAR DVV | D F GVA WME |
| UniRef90_UPI00037CDC34 | A G Q R P T RL FRLD E AV | G F A TK WLR E |
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| UniRef90_K7VR60 | Y K G Y L S V Y N F R DVV | E Q A I E Y YKLL |
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| UniRef90_W4C9Z2 | $V$ G E S V S Y I P Q R E M | D Y A L G WMNR |
| UniRef90-E2PXA5 |  |  |

## VGAADS LLFEAGEVVEFGLA WLAEK

VGDADAYLFAAQDLTRFAVQWLESR V G NADS Y L F DAA DLVA FAVA WLEER L G GT T A T L F S DT D AVV H AVVTWMSEK $V$ G GASAMLFSVP EAVD HALD WMTEN I GAAPSVVLVPAAEMAD FAVRWLES R


LG NG ILSMMRQRT LVDFAVK WDE E N V GAAPSACFPLASAVRFACQWLSEH I G L A P SVLVDAAPVCAFAVTWLQRN V G DATAHLVPLVPAVDAAQEWFSTH



 V GHA HAR L CDAR P L V D V A V L N N S F $\square \mathrm{K}$ V 1 K $\square \mathrm{K}$ P L I N F A R V WW K K K

VGHADAWLCDARDLVRVAVERLR
V G G GEAALFPLAAAVAYARVWLAGN L G G A R A R L F P I K E A V A R H A D R WM S E K L N G A R II T F P I R T L V S R A R E Y Y R N K I GAAPSVLVRAREVV P FAVVD WLESSR L G N CE I R L MRQRRDLV DFA KK WI E EN
 $V G S A D A L L V D A P A M T R F A V D W L E R R$ VARAVSHL FDARRLLRRGVEWL E I GA A E CRLMESRPFI AFAARRLQER V G DA S C HLV V $\quad$ AA D AV DVIAAK WL VN N I A T G T $\square A$ AV L P MR P LI D F AR D Y YR K K

L G Q H H A RAD G MRA L V D FA RA YYRAK $V$ GQAHC Y L F EAR D IV SFGVD Y LQRH V G R A P S F L M P DREAV D LAA K WY
FA GKP TFAFGMRDAV D TA QHLM

I G K A NVKLLRLREEL HLYAQELE K N $V$ G A A R C $\quad$ H L V A A A E S Y L F D A G A V V R F Gl E WI E R K I GKAPSLLLEAAPLVAFAVRWI ER | $V$ | $G$ | $C$ | $A$ | $H$ | $C$ | $Y$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $G$ | $N$ | $A$ | $F$ | $S$ | $Y$ | $L$ | $A$ | $Q$ | $D$ | $V$ | $A$ | $F$ | $G$ | $V$ | $S$ | $Y$ | $L$ | $E$ | V G N A A E S $\quad$ Y

 V GR A P S Y L F E A Q D SGR PVVQFRMRPVVDEA R QL WA GKTVTLCDMRAVVDHAVDQM VGEAPALLV EAAPLCRFAVAWLEER $V G L A E S V V V D A G S I T A F G I D W L E R H$

VA A S S A K L I D QRGMVDFATAWDARN

 $V G S A P C Y L F D A Q D L V S F G V T Y L E Q N$ $V$ GHA H A R L C A A A D: V A VA TA K L

UniRef90 TOS3N1
UniRef90-L1L3X5
UniRef90-V2HYB5 UniRef90_E8N1F UniRet90 Q82BJ UniRef90-E6TVM6 UniRef90-R9L4Q6 UniRef90_O51405 UniRef90-D3VKT5 UniRef90-D6S4 UniRef90_14YQJ7 UniRef90 Q7NNC7 UniRef90-BOCEMO UniRef90-UPI0004782D6D UniRef90_F2JHE6 UniRef90-P08988 UniRef90-G4RCL7 UniRef90_UPI0003701C4C UniRef90 F8FIW3 UniRef90-UPI00036A05AC UniRef90-UPIO0036EAEC7 UniRef90-UPI0004777B15 UniRef90 L7RT71 UniRef90-R7BOU8 UniRef90-W4D1G4 UniRef90 UPI00036CD573 UniRef90-C8X794 UniRef90-H3SPV8 UniRef90 UPIO004199CAB UniRef90 R7NCF5 UniRef90-A6CUY6 UniRef90-K0J2H3 UniRef90 UPI0002881E90 UniRef90 SoFLU5 UniRef90_D7V3H⿳ UniRef90_L7ES23 UniRef90_R5DTS UniRef90-R7HA27 UniRet90_R6VSG3 UniRef90-UPI000465108F UniRef90- A8ZK93 UniRef90_UPI00031BE6C1 UniRef90 F7K911
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 UniRef90-SOESRO UniRef90 R9K174 UniRef90 D9SRC9 UniRef90-L8EA4 UniRef90_R6JVK5 UniRef90 UPI000374CCD8 UniRef90-B5JLRs UniRet90_-_3KMX3 UniRef90 XoY5D7 UniRef90-R7ZRD3 UniRef90_UPI0004660D95 UniRef90 UP1000472D43E UniRef90 V60599 UniRef90-C6D1P UniRet90_U4KKM7
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T R S AL LEDLVRL DVGRGD L MV HA S R

M Y $\square$ S S E QL K Q DLI N V G V C A G D T L M V H A S L R WT A E A L A D D L V A L G L A S G D A V M V H A S L R

MS D F LS S T K A E E L
 H T LE S L VK QL E QLG I D S Q G TLLVH S S L K REQI A E A L R TLG GVGT GHIAFVHS SLS MPATPNEI AQQLADLGVRSGDLLMVHASLK HSRASLVRDARSLGISPGDTLMVHASVR

 VT V L
Y T K E D LKE Y LK A M GLT GKE TI LV H S S M K $\square T$ K H RLDS DFQDDGIN PN GTLLVHSSMK YTK E HL I N D L K R L G I N K F G T L K K V H S S F K Y T K Q DFLNHLKDLGIDENGTLLVHSSMK TQNVLMRELTDLGVKRGDMLIVHSSLK
 $R Q G A \square R G R A D L V H D L R G L G L R A G D T V L V H S A L S$ Y T K N DLKNQLKNMGLTGNETILIHSSMK

 K K K QLIT K S QLIQQDLRK LGVCK K Q TI ML H S S VR H T K A S L M K Q L E Q L D I D K H G T L L V
 T QREWR DS ELVNQLLT L GVVPGGVLVVHS S FR S R A T L V A QL RALGGVRDGDVLLVHTSSR

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

S QI RK DLSLLGIK K G D HVLVHAS LN
 Y T A K ELLKE QI A TMGLN GTETILLIHSSMK Y T K Q DLK N MI K E M GIID S T D TVFIVHSSMK


ERDAEDLERLGVSPGETWLVHSSFK ERLVSELKRIGI E E G D TVLV H S S F K MTVSFDELVLNFQKI GLTSGDVLLVHSSYK VTREKUV Q GLRRLGLEGGEAVMVHS S LS
 $\square T V E E K$ L $\quad \square$ H QL


VT P A E LDEALDA L G L D GT Q S VMVH A S LR


MMHTRQSLLNDLERSGIVRSGTLMVHASMK ME LLYYKYNDKD IN K E DFKRA L K K L G I V T G D T I F V H S D IM
 R R P I R LA E L E G DLA A A GL P D GAVVVV H S SLLS M K Y F LE Y N G K K Y S N DD L I E A FK K L G I T K G D DL C V H T E L F VT H A GL A A D LA RLLGIA Q G D TL F I H S S L K
K D S GETVTKARLVDSLRAAGVHEGTDLLVVSSMS

 VS P A QL DE GL G A L G L D G T Q HL I V HA S L K K T L I D D L R K L Gll K E D D T IL L V H S S Y N H T K Q S L L A DLKALGI DPNGTTLAHLSYK MSYKKEDLCNALNKLGLETGDCLMVHSSWL VT E E EL S Q ALA EVGLD G T Q HII A H A S L R


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| :---: | :---: |
| UniRef90－L1L3X5 | AYHEGMSEREKAEFRASMP |
| UniRef90－V2HYB5 | DDVPFDPATTPSRDLG｜VADTFWR |
| UniRef90－E8N1F1 | DELPFDVRSTPCRDMGIVADTFWR |
| UniRef90－Q82BJ1 | AYREGMDEREKAAFRAGMPPYEPDVTPCPTMGVLAECVRT |
| UniRet90－E6TVM6 | （ |
| UniRef90－R9L406 | ，WSYDNKDHPRFEVELSPV CVGILPELFRK |
| UniRef90＿O51405 |  |
| UniRef90－D3VKT5 |  |
| UniRef90－14YQJ7 | TLNGAQLDEEMRHNWPPFKPDTARVPGFSLLNQFLVD |
| UniRef90－Q7NNC7 | ElPVFDKR】AAARDHG |
| UniRef90－B00 | － |
| UniRef90－UP10004782D6D | PS $\square$ KPVI PPFDAATSRAPDH |
| UniRef90－F2JHE66 | NAENPKFDVVHSEV CVGG |
| UniRef90－G4RCL | DEAGRVPTAWRDR\｜AGFDPARSRVRDHGIF |
| UniRef90－UPI0003701C4C | HGGAGDSAVDAARDRVP俭FPDFP PTAMGAVPN |
| UniRef90－F8FIW3 | WSYTNAQNPRFHVAASPT CVGTLTEL |
| UniRef90－UPIOOO36A0 | WSYIKADNPRFYVDQSPS Cl |
| UniRef90－UP1000 | SPVFDPDRDPSE |
| UniRef90－LTRT71 | AEQEREVLEKLPAFDAQTARSRENGALVEL |
| UniRef90－R7B0U8 | WKTVNESNPVFDVSNSES CV |
| UniRef90－W4 |  |
| UniRef90＿UP100036 | WS |
| UniRef90－C8） | DPDVPPEVWP LVRDHपPAYDPAGTPTRTM |
| UniRef90－H3SF | WANINAENPRFDVENTPV CII |
| UniRef90－UP10004199CAB | AFRGEVPPFDAATAPARDHGVIAAAV |
| UniRet90－A6CUY6 | WDKHNLANGUYDPKTEPS CVGILGEIFRQ |
| UniRef90－K0J2H3 | WAYTNQGNPDYHVDNSESNVGILTELF |
| UniRet90－UPIOOO28 | WS Y INAENPRFYVNESPS CVG |
| UniRef90 SOFLU5 | VF NVLETPCWT |
| UniRei90－L7ES23 | IVQARASTSSSAQCTAPVFGVGVLAETVRT |
| UniRef90－R5DTS1 | WKTVNSENPVYNPYETPS CVGILTNLFMK |
| UniRet90－R7HA27 | WKTVNESHPVFDSQKEPS CVG |
| UniRet90＿R6VSG3 | W |
| UniRef90 UPIO0046510 | WYSMSEYHNEYDP |
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| UniRef90－UP100031BE6C1 | WANINVDNPKFHVDASPS CDG L PELFR |
| UniRef90－UPI000470A38A |  |
| UniRef90－A6UBL6 | FEPATTATSDLG |
| UniRef90－W0RCU5 | EPFDPERTPAAAL |
| UniRef90 D4K7U3 <br> fo－F1CGM |  |
| UniRef90 G9R | WSNVNDENPVFDVRETK PCVGL |
| UniRef90－G8QVP1 | WATVDANNPVYSVNESPA CIGI |
| UniRef90 GOJ5B4 | KTVNKAQPVFDELNTAS CVGAL |
| UniRef90－S7VC11 | KTVHKTQPVFNELTTAS CVGGLTEFFRT |
| UniRef90－R9K174 | WSTINEQNPVYHPAEEPS CVGLLS |
| UniRef90－D9S | WKSMSESHNEYD |
|  | NPPVPESWWKITRRETPPFDPLDTPTRGM |
| UniRef90－R6JVK5 | WKTVNADNPVYNPQTTPS CVV |
| UniRef90－F5XZ73 | EGRVPPRWRDQU PGFNPSTSARD |
| UniRet90 UPI000374CCD8 | AlVTAESPVFDVRETACN VGAVPEETART |
| UniRef90－F3KMX3 | GKPFNIKKTPSK MGUISELVR |
| UniRef90－X0Y5D7 |  |
| UniRef90－R7ZRD3 | KTVTASEPFFDHLTTPS CVGALPEYFRT |
| UniRef90－UP10004660D95 | LNGKQMSTEEQDAWPAFDPKTAPPPEYGVLNSALRR |
| UniRef90－V6Q599 | WRQTNEENPTFNPETEQ |
| UniRet90－C6D1P1 | WRNVGTDNPVCDNLYTPT CIGALTELFRK |
| niRef90 U4KK |  |
| UniRef90＿M319X9 | PUFDKERTPSYKMGVIAETFRA |
| UniRef90－H8GZB66 | NAR ${ }_{\text {SPPVPD }}$ |
| UniRet90－A9SGB61 |  |
| UniRef90－F219F5 | QपNY $\square$ QK\RE FDVRNEPSK MGA |
| UniRef90 UPIOOO37 |  |
| UniRef90－UPI00047COFEC | NPGGVDPRKEPS CVGI |
| UniRef90－UP10002D52BA1 | difdVent ka tva |
| UniRef90＿Q11235 | SPIVHTH |
|  | VP |
| UniRet90－B9KDIO | DKLNSPTK MGALN |
| UniRee90－A0A031GJFO | PGGtVRATCAM PDYVFDPRRHGTH M |
|  | VF N |
|  | K KG】AFNRQETPSKNMGAFSEYDRT |
| UniRef90－UPIOOO3B5EBF5 | HRLISR R S R |
| UniRet90－O9RST9 | NRDSRVSRD｜l｜ler |
| UniRef90－E7G6A8 |  |
| UniRef90－FORUA4 |  |
| UniRef90＿G4SYV0 | DFLLLS TPMDVTRSPS |
| UniRef90 K9ZW |  |


|  |  |
| :---: | :---: |
| UniRef90_TOS3N1 |  |
| UniRef90-1L3X5 UniRet90 V2HYB5 | OPGAVRSLUPQTSAFAGLGPRAAELCADAD |
| UniRef90-E8N1F1 | GVLRSDSP HAFAAWGAEAAF |
|  | AvR SAHPQTSLAGLGP |
|  | HSVAVI GSKKHELVSGHETSHPCDKTSPY |
| UniRef90-R9L4Q6 | PGVIRSWHPTHSVAALGRDAQAFTADHRFDTPCARGSSW |
| UniRef90 Q51405 | PGTLRSGNPGASLVALGAKAEWF |
| UniRef90-D3VkT5 | TKGAI RSQNLGASVVALGNNAEFFTENHSLNYGYGNDSPF |
| UniRef90-D6S4H4 | KEVLRDNHPDYSFSAWGK |
| UniRef90-I4YQJ7 | GAL R SAHPDASTVAVGPHAAEL |
| 90-Q7NNC | WPGALRSDHPDAGVVAIGPQAGWITGEHP |
| UniRet90-BOCEMO | PGAVRSLNPGASMVAI GAQAEWLCHGH |
| UniRef90_UP10004782D6D | GASVAALGA |
| UniRef90--2JHE6 | GVVRSLHPTHSVAAIGQDKEDF |
| UniRef90-P08988 | NVKRSAHP FAFAAAGPQAEQ |
| UniRef90-G4RCL7 | GALRSANPGASMTAMGAR |
| UniF | WQGRFRSRHPQASVAA |
| UniRef90-F8FIW: | RPGVVRSWHPTHSVAALGRDAAAFTADERFDTPCARGSAW |
| UniRef90_UPIO003 | RPGVVRSWHPTHSVAALGQDAVEFTKDHLFDTPCARGSAW |
| UniRef90_UP10003 | RPGAQRSHHLLHSUAALGPHAEE |
| UniRe990_UP1000477 | QPGAKRSAHPDSSMVALGPLAETVV |
| UniRef90 L7RT71 | YPGSVVNDHPVARVVRGRAARHMSKQPWDYAFGKDSAL |
| UniRef90-W4D1G4 | RPGVVRSWHPTHSVAALGVDAEAFTADERWDTPCARGSVW |
| UniRef90-UPI | RPGVIRSLHPTHSVAALGKDAAEFTSDERWDTPCHRESAW |
|  | LPGAVRSHHPHRSFAALGPHAAEIVAVHDLDCPNGERSPL |
| UniRef90-H3SPV8 | RPGVIRSWHPTHSVAALGRDAAAFTADERFDTPCARGSAW |
| UniRef90 UP10004199CAB | RPGVRRSGNPGASVAALGAGAEAFTADHPLDFG |
| UniRet90_R7NCF5 |  |
| UniRef90_A6CUY6 | REGVLRSLHPTHSMAALGKNAEQFIAEETLTSPCPRHGAW |
| OJ2 |  |
| UniRef90-UPIO002881E9C | RPGVI RSWHPTHSVAALGKGAQEFIAGNEWDTPCARESSW |
|  | 㑑 |
| UniRef90_D7V3H | RSAALHSAHPRSAFTALGAQADYITSDPS |
| UniRef90-R5DTS1 | RDDVVRSLHPTHSMAGIGKDAAYLAGEENCNTPCTPGGCY |
| UniRet90_R7HA27 | RE G |
| UniRef90_R6VSG3 |  |
| Un | REGVLRSLHPTHSVAV |
| UniRef90_A8ZK93 | FSYVAVGELLAQWILTAEQPWQYRDGPGSPL |
| UniRef90-UP100031BE6C1 | N |
|  | RPGVCRSLHPTHSMAAYGAGAEYIAGEEENNTPCTPGGCY |
| UniRet90_UPIO00470A | RPGVRSWHPTHSAAALGKDAAEFTSDERWD |
| UniRef90_A6UBL6 |  |
| UniRet90 WoRCU5 | A |
|  |  |
| UniRef90-F1CG | V |
| UniRet90-G9RPH61 |  |
| 矿-G88VP1 |  |
|  |  |
| 00 |  |
|  | RSIHPTHSVCG |
|  | RNGVVRSLHPTS |
| UniRet90-D9SRC9 | KEGVIRSLHPTHSVAAYGNDSEYVKGEEDVATPCAVGGC |
|  | P |
| UniRef90 F5XZ73 | TPGARRSRNPGASVAAIGAQAQWLTDDHPMDFGYGERSPL |
| UniRef90-UPI000374CCD8 | MEGVLRSTHPTHSVCATGRRADELLADHEKDTPCGRHSPF |
|  | ATHRSLHPTHSVCACGPLAEELTGGHEVDTPCGL |
|  |  |
| UniRef90-X0Y5D7 | DVITRSWHPSHSVAAAGPLLAEELVADHHTSAACGRGS |
| UniRef90_R7ZRD3 | S AG |
| UniRet90-UPIOOO4E |  |
| UniRef90-UP1000472D43E | GVERSNHPDSSMAAVGPHAAYLTHPHPKDDA |
|  | GVKRSWHPTHSLAAYGKPSEVFTEGEQFDTPAHPNGWI |
| UniRet90_C6D1P1 | PGVVRSLHPTHSVAAFGKDAEFIAGEEHLQTPCGVGGTY |
| UniRef90-U4KKM7 | GVVRSLHPTHSMAGLGKNASKYLSNEEYSTPTPAKGA |
| UniRet90-H8GZB66 |  |
| UniRet90 V9SGB6 |  |
| UniRef90 ${ }^{-19 \mathrm{KIV} 1}$ | RSYHPTHSMVAFGKRS |
| UniRef90 ${ }^{-}$F219F5 | GVKRSESPTEPVCCFGPKADWF |
| UniRef90-UPIO003706982 | AAGAERSAHPQTSFAALGPAAGKLLAGHRPDCHLGED |
|  |  |
| UniRef90-UP1000 | QVCRSLHPTHSVVAVGQGAAYDANDAHASTPCPRDGSM |
| UniRef90-UPI0002D52BA1 | SKDTQRTVHP |
| UniRef90_Q11Z35 | RSFHPMLSFIALGAEAERIVTGVQTLASPY QP |
| UniRef90-W9HBL9 | S HPTHSVVALGPRADWLVADHHHSFAFDADSPL |
| UniRet90_W6LP80 | REVVRSLSPTHPLLAWGRDTEAFLAGHDQAEPFGSASPF |
| UniRef90_B9KDIO | GGVKRTNDP |
| UniRef90 A0AO31GJFO | SVSAWGRHAVHLTEAHHHAPSFGMDSPW |
| UniRee90-EOYOW7 | MESVSVDGPDALMYVKGHHTDTPYGQQSPW |
| UniRef90-UPI0003B5EBF5 | PEALRSFHPTLSFIALGAQAAPITAAQTLDSPY GQPV |
| UniRef90-Q9RST9 | RAAARRSFHPALSFVALGQEAERVTAAQTLDSPY |
| UniRef90-C1CVF8 |  |
| UniRef90 F7G6A8 |  |
|  | TPNGIRSAHPTHSVVAFGRDARSFTDDHLITTTPCPRQGAW |
| UniRef90-G4 | PLAVWGDKRDEFVQGHSCLVPFGVGSPF |
| UniRef90_K9ZWE4 |  |
| UniRef90 UPIO00441358C |  |

## UniRef90_TOS3N1

 UniRef90-L1L3X5UniRef90 V2HYB5 UniRef90 E8N1F1 UniRef90_O82BJ1 UniRef90-E6TVM6 UniR Refo_-R2L4Q6 UniRef90-D3VKT5 UniRef90-D6S4H4 UniRef90-14YQJ7 UniRet90_OZNNC7 UniRef90-BOCEMO UniRef90-UPI0004782D6D UniRef90-F2JHE6 UniRef90-P08988 UniRef90-G4RCL7 UniRef90-UPI0003701C4C UniRef90-F8FIW3 UniRef90-UPIO0036A05AC UniRef90-UPIO0036EAEC7
UniRef90- UPI0004777B15
UniRef90 L7RT71
UniRef90-R7B0U8 UniRef90-W4D1G4 UniRef90 UPI00036CD573 UniRef90_C8X794 UniRef90-H3SPV8 UniRef90_UPI0004199CAB UniRet90_R7NCF5 UniRef90_A6CUY6
UniRef90 K0J2H3 UniRef90-UPIo002881E9C UniRef90-SOFLU5 UniRef90-D7V3H9 UniRef90-LTES23 UniRef90-R5DTS1 UniRef90-R6VSG3 UniRef90-UPIO00465108F UniRef90-A8ZK93 UniRef90_UPI00031BE6C1 UniRef90-F7K911 UniRef90-A6UBL6 UniRef90-WORCU5 UniRef90-D4K7U3 UniRef90-F1CGM3 UniRef90-G9RPH6 6 UniRef90-G0J5B4 UniRef90_SOESRO UniRef90-S7VC11 UniRef90-D9SRC9 UniRef90-L8EA49 UniRef90_R6JVK5 UniRef90_F5XZ73 UniRef90-UP1000374CCD8 UniRef90 B5JLR5
UniRef90
F3KM UniRef90--XoY5D7 UniRef90-R7ZRD3 UniRee90-UPI0004660D95 UniRef90 UPI000472D43E UniRef90-V60599 UniRef90-C6D1P1 1 UniRef90-M319X9 UniRef90-H8GZBB6 UniRef90-V9SGB6 UniRef90-A9KIV1 UniRef90-F219F5 UniRef90-UPIooo3706982 UniRef90-E4WME4 UniRef90 UPIOOO47COFEC UniRef90-UPIO002D52BA1 UniRef90-Q11235 UniRef90-W9HBL9 UniRef90_W6LP80
UniRef90 B9kDIO UniRef90_A0A031GJF0 UniRef90 EOYOW7 UniRef90-UPIO00404C110 UniRef90-UP10003B5EBF5 UniRef90-Q9RST9 UniRef90-C1CVF8 UniRet90-E7G6A8 UniRef90-FORUA4 UniRef90-G4SYV0
UniRef90-K9ZWE4
UniRef90_UPI000441358C

GKLLYNNNAKIVLIGTDFESNTSIIHTAEH ASLYAADAQILLLRVGFEVCTAFHLAEYRMPGPPPDRTYR GRVHEADGQVLLGGVGHDANTARHAELMGGVPYGVPHHC GRVYQRDGQVLLLGVGHTENTTIHLAENLAGVRYRRRKRA ARLYAAGAQVLLLRVGFEVCSALHLAEYRMTPPPTRTYRC YKNAMEHGY| MLIGVDDESNTT: HTCEEDAQVPYETTTSE GKLLDRKATVLLVGVDLRRNTFLHGVEEWVD: PGRLTMLY SKLVACQGKVLMLGAPYDTMSLLHHAEHLANIPRIMKMLI ERFVKREGKVLMFGAPDDSVTVLHYAADADIPRRVTYEM SKLVEDGGKILLLGSDLNNVTILHYAEARLPNKRVIGRTD ARLAEAGGKVLMLGAPWDTMSLLHHAEHDADTPHVRRMEV GKLLDRNAQI MLLGVDLRRNTFMHGVEEWVDIKGRLTDEM ARVHELDGQVLLLGVGHDANTTLHLAELLMAKVPYGVPRHC
 DWMHRHGAQIVLIGVGHNRNSFLHYAESLVPHHRRKVRRF GKLLDRKATVLVGVDLRRNTFIHGVEEWADIPGRHEMLY WKLYERDAHVLMLGVPYLRCTFFHVIEQLVQYRRWREVEA
 GKLLDRKAEVVLLGVDLRRNTF: HGUEEWVDVPGRMTDSY KTMYDLDSWTLLLGVG
GKLLDRQAT MMLVGVDLRRNTFTHGDEEWGDTPGRMTAEY ARLVAAGGRVLMVGAPLDTMTLLHHAEHLADLPRRVRVEY


 DRLRQRNAKILLVGVGHERNTFTHSVEEVLNIPNRKPMEL DRLKDAGGK|LLVGVGHERNTY:|HSVEEVLNVPNRMSDKT DRLKDCGGKILLVGVGHERNTY: H AKLCEVSGSVLLLGSPTGDVTLLH HAEHLADVPNDDRYRM GKLLDREAAL LLI GVDLRRNTFMHGVEEWADIPGRVSDEY GKLLDRKADILLLGVDLRRNTFIHGIEEWLDIPGRMREQL GRIVELDGQVILLGVGHDSNTTLHLAELMSKVPYGVPRHC GRVHDVDGLVLLLGVGHDADTTLHLAELLAGVPYRTRKHV ERFVRGGGKALLLGAPLNSVTALHYAEAVADIPRWVTYEM GELLRQNAQVMMVGVTFACNTSVHCMEELANVPGRLTEHH GKLLDRDATILLVGVGLNRDTFIHGIEEWLDLPERLTKEK ARLPQIGGKVLFLGCGSKPNTSMHAVEEQIIPPYLKVSHM AHLHRLNGELLLLNTDQRSNLLLHLAEVWAEVPYLLSTLR
 DRLRERNAKILLLGVNHDRNTFIHCVEEILQVPNRFTEKP

DRLKDAGGKVLLVGVGHERNTY\HSVEEVLNVPNRMPMEL AKLVEMGGKVLMLGAPLDTMTLLHHAEARVPNKRRKRFEV RKLVETEGSILMI GCGVRPNTTMHALEEYLEPPYDYGEDC
 ERI A QRDGRILLLGVGHEASTAMHGFEQLAGDP ARLREADGFLLELGCGLRPNTSMHGVEEWLVPPYDFGEER A LLPK LGGRILFLGCDFTVNTMMHAVEEQVMPPYLLEDEF $E R L V N M G G K V L L L G A P D D A V T V L H Y A E A G A D D P R R V T Y E V$ GYMLDRKAKVLLI GVNHNRNTFIVGGIEEEVDVPDRMTDER GRLGSADAKILLIGCDFDRNTFIHAVEEMMDVPNRFTAA GKLYQlDSQUVLFGVDNDSNTSLHLAEERSTKVKNKLGKA GALY $\operatorname{CLLDGYALLMGVDFGSNTTVHYGEYLAGMPLLTRY~}$


UniRef90 TOS3N1 UniRef90－L1L3X5
UniRef90－V2HYB5 UniRef90 E8N1F UniRef90 Q82BJ1 UniRef90－E6TVM6 UniRef90－R9L4Q6 UniRef90－D3VKT5 UniRef90－D6S4H4 UniRef90－14YQJ7 UniRet90 Q7NNC7 UniRet90－BOCEMO UniRef90－UPI0004782D6D UniRef90－F2JHE6 UniRef90－P08988
UniRef90 G4RCL7 UniRef90－UPIo003701C4C UniRef90 F8FIW3 UniRef90－UPIO0036A05AC UniRef90－UPIO0036EAEC7 UniRef90－UPI0004777B15
UniRef90 L7RT71 UniRef90－R7B0U8 UniRef90－W4D1G4 UniRef90－UPIo0036CD573 UniRef90＿C8X794 UniRef90－H3SPV8 UniRef90－UPI0004199CAB UniRet90＿R7NCF5 UniRef90－A6CUY6 UniRef90－K0J2H3 UniRef90 UPI0002881E9C UniRef90－SOFLU5 UniRef90－D7V3H9 UniRef90－L7ES23 UniRef90＿R5DTS UniRef90 R7HA27
UniRef90 R6VSG3 UniRef90－UPI000465108F UniRef90 A8ZK93 UniRef90＿UPIo0031BE6C1 UniRef90 F7K911
UniRef90 UPIO00470A38A UniRef90－A6UBL6 UniRef90－WORCU5 UniRef90－D4K7U3 UniRef90－F1CGM3 UniRef90－G9RPH6 UniRef90－G8QVP1 UniRef90 G0J5B4 UniRef90＿SOESRO UniRef90－S7VC11 UniRef90－D9SRC9 UniRef90－L8EA49 UniRef90＿R6JVK5 UniRef90－UPI000374CCD8 UniRef90－B5JLR5 UniRef90－F3KMX3 UniRef90－X0Y5D7 UniRef90－R7ZRD3 UniRef90＿UPI0004660D95 UniRef90 UPI000472D43E UniRef90－V60599 UniRef90－C6D1P1 UniRef90＿U4KKM7 UniRef90 M319Xo UniRef90－H8GZB6 UniRef90－V9SGB6 UniRef90＿A9KIV1 UniRef90 F219F5 UniRef90－UPIO003706982 UniRef90 E4WME4 UniRef90 UPIO0047COFEO UniRef90＿UPIO002D52BA1 UniRef90－Q11Z35 UniRef90＿W9HBL9 UniRef90＿W6LP80 UniRef90－B9KDIO UniRef90＿A0A031GJF0 UniRef90 EOYOW7 UniRef90－UPIO00404C110 UniRef90＿UPIO003B5EBF5 UniRet90＿Q9RST9 UniRef90 C1CVF8 UniRef90－E7G6A8 UniRef90－FORUA4 UniRef90－G4SYV0 UniRef90－K9ZWE4 UniRe90＿UPIOO0441358C

CVVKATG NWMEYEDLDLDDGDFGEDGARLPRD LVTEGE TVLRDGKAVRI DYEENDHCCERFDLADGWLKEKGLQREGP CLLRDGAT $\backslash W V E Y G E V D H C C Q N F A L V D G W L D A V H A Q R R G R$ VVEERG NWTSYEDLADNDGDFASI G ALDPRDLLSERA II DEAGGKMTVKLHDWTKPPTNFNKLDALFESKGIMTKQK TITPDGTEIPVRRHCGLPWSEHFWKVEEVLEYRGALLRKGK PLLKNDHVEWVK LEEFDFHEGYFKDIVEQFCCSHPIVKGV PVLDAGEKVWVSFNNVELNYHDYEDLGTHFDQKYPVKKIAN PLLPNGQTVWERAEDFDSSGDAVETIARAYVALRRHQEGR RVPGEGGHRWVDFEEFDTPANCFERIASDFLACGFGRRGR RMLVDETVVDVGTEEFDMPTDYFAQITQEFVDARYAHTGR PLAAEAGVAWQAITEFDTDEDYFASIVVDFLASGQGQQGQ VINEKGEELSVRRHCGDHWSEYFWKVDDYFKEKGVMHLGK TILQDGKLVRVDYLENDHCCERFALADRWLKEKSLQKEGP PYLVDGERVWVRTGDVGDDNGRFPQVGAEFEAAGEVRDGR TVLPDGTEIPVRRHCGLSWSQHFWKVEEVLERRGAWYRGQ TVLPDGTEIPVRRHWGLSWSEHFWKVDEVLESTGAMRKGQ KVREPDGQKRPYSPKPGFVGNDFNKLGAILEERGLAQVGA PLLDDGHKVWQKTEEWDSNPDAVERI TRDYVATRKPARGK PVLVNGERVWRDMEEFDWPDRFFARI VDGYLEKTNNRGGV SVIDNSGNSHTVYMRKHYNSEDFVKLAQAYUDCGAARNVM TVTPGGDETMVRRHCGLSWSEHFWKVERELEEGGAMRKGK
TVLPDGTADSVRRHCGDNWSEHFWKVDDVLREEGAMTLGR PLATPQGTEWRVVEEYDPPEDYFGRIVADHLATGAGRRGK Q1 TMPDKSПKTVYVRKHYNSEDFVKLDQALLECNAMTRVK ITITKGDEATETILRRHKSPENYDKLERPFVRQGDGHWGT SI DSDGTKHSVRRHFGKTWSDHFWKVDDYLLKGGAMHDGK VADYAGEKIRARLRNWEKPETDFNKLDALYLINTGUMKMKQ

AETLLG
SSPFAAVGASYEATGAVRSGR YIVMPDGSKKKDYPDQPHDSEDFVKLNQAYDDCNAAKEVK VVWPQGQRDVYMRKHYNPDSEDFVKLTQAFTDCGAAKNTV TTILPDGREKEVYMRKHYNSEDFVKLNQAF DDCGAVEVVT PI LQNGQRVWMDFEEFDWPDNYFETIVKDY四ATHPAQTGK TVLPDGTEIPVRRHYGKNWSEHFWKVEDVFEQRGVMYKGT YTVMPDGSRKKIFMRRHYNSEDFVKLTQAFYDTGAARQVL YTETPGGEVISVPSRRHCWSEHFWKVEQVLETGGALRRAS TVVENGSRVR】AYDENDHCCQNFSLADVWLRRNGLQKEGQ TVRGPDGAPTRAYDENDHCCARFALADDWLRARGLQREGP TVVDEAGAQHTVYMRRHYNSEDFVKLEQAYLDCGAARNTK PMLRNGEVAWKTASEYDSN
PLFVRNQSGRPSRRHQNANSDHYVKDEPVMFHRNILRRVP EMLDGTAVTVPSRRHDGHPSENFPKVQDYLFEKHILHNGT LQLSNGNAIKKTYQRHGFYEQRYDRLLDVLEPA EYRTGK V KVGQERWRTMRGKPGCTEGFVKIEPLLRQAREVRYGT EVVMPDGGGKTVYMRKHYNSEDFVKLNQALDDCKAAREVT VMPDGS品KESHVYRHYAHDSEAYTKLEQAFYDNNVAKQVK

## VIEYNMADGWKKCDDQPHDSEDFVKDNQDFDDSGVVKKVK PLETAGYTTWRFDEEFDTTDPYFAQVVREYLASGHGTQGL EIDYKGEKSRKPYR VRVVGFEGFGQRYEREGSVRVGP

TY TSDGTLLSKKYHNFSGFEQRYERПEPLLTEASK SLGK ILTDARGRQITSAVRCHSFKGYVQRYDEALDPEGADKRGQ PVLDKGRKVWQQVSEWDSNGDAVEQTARDYVADGRHREGV KVKVNGQVIDPQRRHYGSTSEKYNKLYQPFLDYGVAVEGK TI GPKGDRHYTQFRHCARGSNTFTKLEPEALSTGVMTLGK PI TDHGDHVQKTYKHYNHDSENFKKCEAYLIEKGIVKKGF ALLKDGKRVIQTFEEKEYNSELFLKDGETFEQEKGNHKKE VPVDGAVVPTAFPN CSADFDRLEPHVQGA QVT
LTRNEDGTПTKRLSHAHYNSENYVKFEPYFYYGKALSYGT EVFHVLVKQQVKVHNPEQSSKRCDELLPLFESKGVMKRST VVAPGGVRRWWEYEDVALDDSDFGALGAAFEETGDVRKAL PI LIEGETVWRQFEEFDTPDDYFALIVEEFLGTGRGVRGN TVKVDDRKMHRHEAACGDTSLNYDKLEPAFDEDGAAHYCD KI KKDGNHQYNTSCKFYVRYLDKNRLKDNLLKRDDMKSVK
 VI DYAGQCPVRVISAQANSLRREERYVAELKRQGGLRHRR


 VALDGGVLPTAFPNCSADFDNLQPLMHF SMRSAV DYKVI，CHDKSVINMDVLRHDFKGYQQRYLDNTDYQVGN
RMLDGTLVPRPNSGHLGHVAENFPKVEGFLREKGILKEGK PSPMTGQVDDYDDSEUANSARCEQRLVDRLNRCGAMKHKR VVVNGEVRRTSFPN GSADFGRIAPHVR
VNTPGGRDWVTYIDTGVNAYNFAELGEAFE


FGDAEVRDCDTVRLTEVLTRMLQAN VGAA D SVLVDDAAETTAFAVA WLE ER FADADSLLCDAS Q $\square F K V V R H \square L$
$\square$ G E A R S F L A S A K GMA D I V Q A FL K R N
F G D A DVRRICDTVKM T E I I T L L M L
FGDANVRICDTEKMTTLLNALLKEK $\square G N A E V R$ Y $\square D A G R M F T F T \square D L L G K N$
VGHAHCRDFDLADAVASAVGQLT
FGDADCILCDAAKIFEVTRHVLAPN


VG GARSYLLDAQSLTQFGVQWMEEN F G D A E A R V C N TVVRMT D L L F E M L
FGNAECDLCDARG
I G N A H A R L V R S R D I V K I A M E QL
$V G S A H A R L V R S R D V V A V A R E R L A R$
FGDARCILCDAEGLFRVTRHVLAPN
FGNAECLLFRGKDLLADTDELLKK
FGDAKVLYHSTQELYDALEPLLEKN
1 LEAKSIVMMASAI WEKGIKYLKQ
I GSMPA QRMNVQAVVSMAVALLK
VLEAKSVVMDARAI WEKGI QYLQQ
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FGDADSLLCDAKGMFNVVRQ
VGEAPSVLVSAAEVCAFAVSWLERR U L GASAVRLDGPGLKR LVLEKLRE ALNGTAYLIDLDAVMWRARERLDE IGKSRVKIMKANDVYKRTVEEMKKN
VLGATAYLLRAKTVWEKGFEVLEKN LLAADCMLVD
TGATKSHLFEAAD VVKYGVRCLK
$\square$ GDATS QLCDTVKMTEFVTYLLNQ
FGNATTRLMGAKQLRAMVAKHLKQ
FGDAEVLYMNAKELEEVIKKWLRE
$\square A D A P S K I F N L K E 1 L D F A E N Y L N T N$
AGNALLRLYRVRDLVDETVRLLNR
LGNAKVQПCDAKGCADT
I GKAKTLI FDASKMLEVMDDEYHSN
 I GDARSVVASASRMMEVTSRFL
VGAGTILAVNAQKLYSTVFKLLKE VGGATLRLYRVRDLVDATVRLLSQN LGDGEAWVIRAADMF GNTRLLLRCRDMVECA FGGANIC FNTKEYKDA乌DDA乌NK VGDAASWL $\quad$ PAQAFYAH
VGEAPALLADAKAFKRVLLDAYKEN VGNGLVRSYQLADFDSUSEEVIKNN VGSALLRMYRVRDLVDTTVRFLQ
 $V L E A K C Y V L N A Q A V W E K G L A L L K K$
L G D A T V
I G N T H L M L I E M A D CVVD D MVVK
$L G R G R I T A F R V R E L V D G A R R L L$

UniRef90-M9RRT5
UniRef90-X1EG85 UniRef90-A8FNO1 UniRef90_UPIO0035DE44A UniRef90 U4KP16 UniRef90-UPIO0031F3D11 UniRef90-LIQH93 UniRef90 R7GIF6 UniRef90-U5Y2NO UniRef90-UPIo0046CD54F UniRef90_H8C2T9 UniRet90 J1QFE1 UniRef90_UPIO0037E77E3 UniRef90_Q6Q222 UniRef90 W9FKV2 UniRef90 UPI0002FA44D8 UniRef90-R6WDK9 UniRef90_FOK9Y2 UniRef90- UPIOOO35COC65 UniRef90-F0RM88 UniRef90 UPI0003B54DF9 UniRef90_UPIO004010131 UniRef90-E6RTJ2 UniRef90-H7YSEO UniRef90 G8XCV1 UniRef90- T2LJEO UniRef90-UPIO0040EB346 UniRef90_E6LAZ3 UniRef90- D4JEZ2 UniRef90-UPIO0037086C2 UniRef90-D3IFT5 UniRef90-W6KDY7 UniRef90-W6K8F0 UniRef90-U6RHZO UniRef90_UPIO004151217 UniRef90 10X7U9 UniRef90-UPIO0046E9164 UniRef90_UPIO0029ABFF1 UniRef90 A7H287 UniRef90-FOJDX0 UniRef90-N9V9K7 UniRef90-UPI000406B691 UniRef90 UPI00041C1B4F UniRef90-D3RU67 UniRef90-R7KML9 UniRef90 UPI000237CA5 UniRef90_F8N5X9 UniRef90-F8KXY9 UniRef90_J7S111 UniRef90 A0A038G5X5 UniRef90 A9A1S3 UniRef90-A4F0Q4 UniRef90 V4HKX8 UniRef90_AOL6S5 UniRef90-X1E837
UniRef90 E8N255 UniRef90- A0A016KKX9 UniRef90-F9DON9 UniRef90_I4KG54 UniRef90 B7C823 UniRef90-W4QDUE UniRef90_C3XKL8 UP10003034C07 UniRef90 E6RTT3 UniRef90-E8UAF3 UniRet90_R5RHV2 UniRef90 UPIO0035DC270 UniRef90-A4FFQ3 UniRef90_UPI0003B586DA UniRef90 R9LV85 UniRef90-W4LUT2 UniRef90 L1N193 UniRef90 UPI0003787A90 UniRef90-UPIO0031610C7 UniRef90-S3ZNR4 UniRef90-U1KJM1 UniRef90 R6N491 UniRef90-N1NGY8 UniRef90-A3YDR7
UniRe990 V6F716 UniRef90-K6DHU0 UniRef90-10G3YO UniRei90 A0A026F9M6 UniRet90_A4SHG7 UniRef90-H5SCV7 UniRef90-R5J988 UniRef90_D9VBG9 UniRef90_R6G4G9
UniRef90 R7САХЗ

10 $\qquad$ 30
 H T L E S L K K QL K A M GL N S D D HI LA H T S MK
K K F T NEDFLQAL DA A NVYPGDMVFVHS SLF
! $\quad$ N NLINDLKNMNLK GDEVILVHSSCK
 K K L L L K T V W A F G P E D VV R T I R R L GVVR P G D V M MV H A GWR MKYFLEHNDKKYSDKDLIDAFYQLGIKRGD\|LCVHTELF IS A E QL QHDLQ QL GVQQ GD TL FLH S S L K

QELLRGAGGPVTRDR\GEDVAALGLGPGDTVMFHTRDS ENDKVWT K E EL DADLKK GGIPE GVLLHLKVSLR
 M NF LYYEFSNKK】S S ED FK LDA FK K L GI K E G DVVVFL H S D I T MKAILEANGKLVYERDFLGALKQIGIKSGDSVCVHTELF

K TYN Q D D I E N D F K K L G V E E G D T I L I R A S L G
N K S A V S P A E L D A G LAA A L G L D G T Q H V L A H A S L R
M M V T K K E L K E S L L A L G V T K G M T L E V H S S L S
V T K E M L K N A L I D L G V E K G M V L E V V H S S L


MK Y F LIE Y N D K K Y S N R D L ID T F LIK L G I K K G D L L CVH T E L F F LQA K M S VT K S EL I K E LTA L G V E A G MI L EVVH S S L S D KI Y S K K D F Y E A L E R V GII E R G D CI C V $\operatorname{C}$ H T Q L K T Y T A A N D Y TYDELVDA Y R L L G V E E G R L V Y V T S D L G S P A E: A D A L Q S V G A S R D DV I F L H T D I S RKKFTTHELMDVLK SMGMKEGGVVVGIHSSMT VT K K E L K E SLLK A L G I E N G M T L E V H S S L S $V$ T K K E F K D A L D N L G V K K G M T L E V H S S L S
 MKYFLEHNGKKYSDKDLIDAFYQLGIMRGD』LGVHTEGF

 SKRTITKEELKS AL QKLGI EK GMTLEVHSSSLS

 Y NADDIVAVMRELGMHKGSTVCIHAAMR

 GHPLKLEEVEAVLDQLRVGSGDRLSIHSHSM TKEEIVGTKLK QI QI K K N D S I FII H S N L G

 SVPRFAAALDELGI TAGKTILLHSSMD
 K K F TVVDLVNLMCEMGMKPGS TI VI HCAAK RTY TADDVVGVMCA LGMRA GSVVVI HA S M K E $\square Y$ T K E D F K Q I FIDDLGGI QK G S KV L L E A D LD
 MKALLKSHESLIDYPKDDL

IT F D S LRNDLKKMLGVS S GDLL F L R I I S Y K $N N L I Y T Q R N I L D A Y E R V G V S A G K T V Y I T G N F G$
 $N K L I T G D Q I L E G L T Q L G I K K G D T L Y V R A R D S$ $M \mathrm{M}$ T K E DLLKK FKK NGI QK GMVVMVESKGM
 MKEA $\square \mathrm{A}$ E L R K T L G A L K K ELLDDKWNSAGI CQ G DTVLIDH S N I R


$\square T$ K S DF $\quad$ S K I N E L G L S N S T $\square \mathrm{C}$ L H A S F K Y D R D D LVA AL R A A GLKAGDCAFVSTSLG K E P $\square$ S A P QL R S A F E K L G V K A G A TVV WV Q S S WN K Q A $\square E$ Q A L S E L G ll P K G S A L $\operatorname{M} V$ V H S D A M $\square T K E Q L K Q D L L R \square G V Q K G D V L Y I K A S Y K$

THR $\square I N L D T L I Q D L R D L G \square S S G D T V F \square K G N L G$ I T Y G DLVRAMKEVVADECDALLI HTDLS


FCKH $\square$ I GEEQA $\square L N V L M D R \square G T E G C L F M P T F S F S T L D P S C$ AVGRTAEKNV LLLSI DDAI GSEGTAIFPAFT

$Q L H \quad L G F P F F R I L A L R Q L V G A A G T V V F P T Y$
$L L M Y \square 1 Q R E Y G V I$ DAFLDTVTESGTLLFPMFT


P LA Q H QVA P A ALCE TLVEHC K T GNVIMPTMC

$S L G L V D K G P E T W I E A F M D T \quad G C T D V C P A F F Y Q S P \square R K N$ MLGAAP GGLCALLSALQEVVGASGSILLAPAYSYTDSR SR ALES L R NGAENFIDCD DEKVGDNGTI MFPTYNWDFC
 RTK GFPDTAQTVLDSFLHAI GQEGTLLLPDFNFDFT VVA QFPGMGNAQG1ATFWMHLEQGDLLVPTFTYS



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| UniRef90-X1EG85 UniRef90-A8FNO1 | QQGVKRTNDPTESFADKGA |
| UniRef90 UPI00035DE44A | R P |
| UniRef90-U4h | RSDVHRSLHPTHSVVASGKKASYIKGEEDKTTPTPKDGVY |
| UniRef90-UPIO0031F3D11 |  |
| UniRef90 Lid | GVLAKRITESHPLTPQFGIINSPL |
| UniRef90 R7GIF6 | REGVIRSYHPTHSIAGVGSKASLILQDEEYNTPCQPGGAY |
| UniRef90-U5Y2N0 | QNGVVRTNDPDFSFADNGDNKDAFLSDTK SCFG |
| UniRet90-UPIOOO46CD54F | RKGVVRSLHPTHSVAAYGPKAEWL |
|  | QTGVKRTNDP面SFADKGA |
| UniReef90-JICEE1 | \PGVKRSLHPTHSVAVWGAQADYLTNGHHQAPSFGEGSPW |
| UniRet90 UPI00037E77E3 |  |
| UniRef90-W9FK | MPGAVRSRHPDASLAALGPSAAALMADHPWD |
| UniRei90-UPIoo02FA44D8 | HPDMVRSKHPDQRFTATGKLAHELMDNHTPES GAYDVL |
| UniRef90_R6WD | YEGA RS HPTHSCAAVGGNAEWFVCDHELDTPVGANSPF |
| UniRef90-FOK | SEDTVRTVQPIFSCSVWGERKNEFLNDSL |
| UniRef90-A0RQW6 UniRef90-UPIO0035C0C65 | QNGVVRTNDPIFSFAISGDNQDAFLNDTK SCNCGKNSVY |
| UniRef90-F0RM88 | RAAAQRSFHPTLSFVSLGEEAQYVTRRQSLAQPYG PV |
| UniRet90-UPIOOO3E | LPDTYTGQDTI STSGWGKHGKEAV TSGLDYP |
| UniRef90_UPI00040 | Q D |
| UniRef90_E6RTJ2 | QTGVKRTND |
| HYS | QQGVKRTNDPIFSFAVKGA |
| UniRef90_G8XCV1 | GARRSAHPDASMVAVGPLIETLTEPHELGHALGEGSPV |
| UniRef90-T2LJE0 | QEGVKRTNDPDFSFALKGTKEELFLKDTT SCFGENSVY |
|  | LIPDTVCGEDVISTAGWGKHAEEAVKGGP TGESENCVY |
| UniRef90-E6LAZ3 |  |
| UniRef90-UP100037086C2 | FEHVRGTHPLFSFLAVGTYASQLIAAERPDWPLG PL |
| UniRef90-D3IFT5 | RSTNVQHSVCAWGQYAEWLTKDHHKSTCWDELSPW |
|  | LIPDARRSFHPFVSYTALGPQAAEIVNDVAR HAFGPESPE |
| UniRef90 W6K8F0 |  |
| UniRet90-U6RHZO |  |
| UniRet90-10x7U9 | MPD |
| UniRef90 UPIO0046E91 | YPGVLRSLQPTHSMAGYGKNVKEFIIDDLKSNTPGSPLGTW |
| UniRef90-UP1000 |  |
| UniRef90 A7H287 | SGGVRRTSDPIFSFAVKGAKADIFLKENS SCFGKDSVY |
| UniRef90-FOJDX0 | KPEAVRSFH |
|  | LP EVARTRDP FSVAVWG |
|  |  |
| UniRef90 ${ }^{\text {D3RUU67 }}$ | GKGVVRSLSPTHPLLAWGHDAAKFIAGHEQDRPFGPDS |
| UniRef90-R7KML9 | MPDTVTGDGПFAVSGWGRNANEAAKGG |
| F | HPGMVRSQHPVRKFVAILGKLIAHNIIDNHTYKSY ADAVL |
|  | (eGTVRSTVQHSVTAWGKHAEWLTQDHNCNNCWDEKSPW |
| UniRet90_F8KXY9 | LQGKVRSGNPLQSIAAIGPHAEYISGGNSL SGYGLNSPW |
| UniRef90_J7S111 |  |
| A0AO38G | G |
|  | SSLRSDDANFSIAA GKNAKFFTEFSPID SFGVDSFW |
| 4 | RSLDP SYSVAALGARAQEL |
|  | AFGEN |
| UniRef90 AOL6S5 | DRTAI RSWHPTHAMVGWGQHAEALLADHHKGHPFGP |
| UniRef90-X1E837 | HPDAVCSTHP |
| UniRef90 E8N255 |  |
| UniRef90-A0A016KKX9 | RKGVKRSLNKLHSVCAFGKYADYLINEHHपSTCFDEKSPY |
|  |  |
|  | VRSRHPLNSVVAFGAHAKKMVSREKENAPCGEGSTW |
| UniRet90-B7C8 | DVYRSNHPVYSFAYWGNFDEDVLK VDVNDALSFHGSL |
| UniRef90-W4QDU6 | MKGRKRGNHPLNSFASIGPPLAKELISEQSPTNVYG PL |
| C3XKL8 | QTTKIRSNHPMFSFCGSGKRAKE |
| UP1000303 | PDRIRSTHPICSYAALGPHAEA |
| 6R | AGG\\|RTDDPIFSFFIKGYRQNDFTSK LLKTCFSSGCVY |
| UniRef90-E8L | TPEAERSFHPALSYVAVGPDARALLNTQSLES |
| UniRef90 R5RHV2 | NPNVSVSAHPTLPFAVIGAKAQELITEHKDNDSFSNYDIL |
| UniRef90-A4FFQ3 | SRHPDSFAALG |
| UniRef90-UPI0003B586DA | VTRTTHPVYSFAFWGNTKEKEI DQRSNFP |
| UniRee90-UPIO00380A58E |  |
| UniRef90_R9LV85 | ESGRSTHPVYSFVMLGRY DQKQ |
| UniRet90-W41 | QKEAVRSLILPTKSVCAIGKYATE |
| UniRef90-L1N19 | EFVRTAHPMYSFFVWGKDTDQ |
| UniRef90-UPI0003787 | DACRSTHPQCSIVAIGRHARALTEGHGPAD GAYEPM |
| UniRef90_UPI00031610C7 | NTHSIRTGHPIYSFAVIGKNSSLFKSIDDK SGYGSDSPF |
| UniRef90 S3ZN |  |
| UniRef90-U1KJM1 |  |
| UniRef90-R6N491 | SLDTNFSMIGI GKS SNDLLLSHIDSYYFDENSPY |
| UniRet90-N1NGY8 | SQNPGASVVAIGNNAEFFTENHSLNYGYGNDSPF |
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|  | QPGALRSCDPMITSVVGLGPSCAPLFAALPP TSYGEDCLF |
| UniRef90_K6DHU0 |  |
| ef90_10G3Y0 | + |
| A0A026F9 |  |
| UniRef90- $\mathrm{A} 4 \mathrm{SHG7}$ |  |
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| UniRee90-R7CAX3 |  |

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UniRef90 R5J988 UniRef90_D9VBG9
UniRef90_R6G4G9
UniRef90_R7CAX3

 RRLREAK GKILIFLGCGSCCNTSMHGVEELAVPPYVFKMTY D K L F K S N G K L L F L G A D F H S C T Y L H Y i E Q S F Gil P Y R Y L K DF



 A L T Q N N GK DL NFG NK C C FT F V H Y P DECAKVVYRY F Q GL

 D L LARKDGK IVLLGTDIVVGYTFTHFDEERARDSYRYYKEF
 Y R MT K L N A L V V F Sil G L P F Y D I G T F V H C V



DYAIHNGGMALLLGVD\|YKLTAMHYVE

E L LTRE G GK F ML L G G L A Y G H A L TH Y A E
 A WL A GHD G WI A GFACHPDDRDT F TH Y V IH N G G K A L L L L G V SRLLERDALILCVDTGFESITHTHYVEDRFADTLAVPDYE


 GRLYRNGGKVLFMELDGSHLTEIHIVE

 QKLA Q Q Q GEVMGLGVGLESYSLLHVPE



 S F L N EK NA F NL LI GV LPE K SLLMVQALDSNEYQQGKT V VQRA

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



 A LL M DL D GK I A S L D L D Q N S M T F Y H HV E EME QV D Y R Y F K G $\square$


 ARMARWPAKCVSIGLGSNWTAFI HHADWLARVPFRYDKHG GYLHK Q NAKMLII GLDYRSFTFVHHVEEMEKAPYRYHKNF





TI SSNGTKRDKEVVFFARDFEDFERLDVIAKNTGDAKQAK VVLPDGRR

 TLFELVKEDQKRYFHKHHDSENFDRIEELLIEKKLIEFYQ I YVNNGEETKRTYKFFARDRLNDDPD ETWLTERNQFYKVP SIMENGERVFKYFYDYEYDSDDFDLI GEEFEDRYNDNKMQ IIMDSYMRKHYN PTKPHDSDDFPKLDEALLYYGVMKEYS
 IIDENKQUHKKQYVRKENGYPNEDKUKDFMISTQNYKNUI
 TVLEGGRPKRYEYGETDHCCENFRLLDDWLEAEGRQRLGR
 TLTNRDGKTYDKVYTFANTSQNYDRLGEALLPEGTVSFGK K GK $\square$ KD GENYVRYLDKNVVLET ERLKKHLLEEK MMSETL SKDENKNDNYKS IFYYVRDDLSVDKUVNLLQKSGNFLECE YRNDKDELMLFRRKDPGLCSSSFYKFYAHYVKNK LLDTGY EDNGEVTEMAFPNCSADFGNGAPQVQDLVGRRVQ PSEEINRKYPPEEWFMHPPVKAWYKIQDMAYEKGLIKEMS PTDEINRKYPKWFMEAGHPPKAWYKI QEMAYEKGLIRETA GILINEKRKEKTDTDQQSY LCDDNK NP IIQQETQNYKKDAN IIDENKQTYYKNUQYYVRNLDAYEKI DNFLTSKPYQKQUN
 CTEEKNKKYPPEEWFMHPPVKAWYKUQDMAYNKNLIKKAY Al $\square \mathrm{NQGGKQLKNFLNLDVDQERMEE}$

KVAA GVWAEFPNI PGESHRFDEDEPLLVP VGTVREVQ
 PVFKDGQRSNRRFFAFAGDDYDFTRFQTDLLAAGLAKQAS FNSEDEYRYRDAEGNVAMQRMDFPKVIERSFNKSQFKKVA E $\square$ NRIYPPGEWFMEAGHPPVKAWYKI QDMAYENGLIRESF ASSEEVNKIYPPNEWFTECGHPWYTIQKMAYERGLI KEAM IVTDE GIIKKDFYKHYAHLSMHYKKTEQRLDELGII TKHK L I QTNDEVVEYNLHRHTRSVRDFHQFGNALHNMNALKVAL VI DELGGQKREKRINYYVRDVCSLDKDNEIVRQTRYYKSIK PI S INGEVRHVWYEHC GLKRDGVRKIVEELKKRGS LLKAP
 K IY P PDK WMIEAGHPPVKAWYKI QDMAYEKKLI KEAF PEPMPGTVIDREGNRIDCPTRVLSREANRLRRE
$P S S E D Q K K Y P P E E W F I E P P V K P W Y S D Q A Q A Y E K G L I$
$I$
$I$
$I$ FTEEWTYR L
$P Y P V T R G D N P V R Y L N Y G \square E Y N \square K P F E S L L L Q R G \square A R S \square S$
DMRVVDWRGQQRRVSVFDHNPVFRHCYPEMERDGVVKRVY YSLI DGLQTKRKFSHFVRDSTDLTKDEKDSIDLGLLHKTN


VNYYDYETKQDKTFERNWCGVGFNNFDPFYRDAGADKEGR PKGVWECPGFPGCSDGFDAVAPSLED VTRRGR II DENNQKYEKK DNYYVRCEDNDSTI AKLLEESGSLKKKS FLKEVNFRHKMWTCDRLYDRAHNSKLDDTYFDKEKFSRKR


AKDTNGST LVEV G GGCSEGFHK LDQ VVSGMTKNVT ILTTENKRIKGEFYHFETLKVNYFRVQQQMLENGDLKAFP TYTRGIVETSV GSCSEGFNKFAPLLTE IVSQQAK IITDENSQSKKARKENTKSDLDVEKQ AALKQDNNFNRDE VVP HGGRVVATAFPNCSADFEHVAPFVQA GRYYYNSKNKKDWYDLFCPQGFFNFYQKKDKDS IVVSGY KKT\QPWY LYYVYNNINUVRDRNRK\FD IVRKEHTVNS IPP PILVDGRRTWQHFHDIDTDQWPFTVI ARDMDAAGDGTRAH VI KKGKNNAVKTFLVTE DDGMEEELLGYCYK SVQ DEVNNKWVDWREDPGCSRGFDKLYRQYDHDEDLTVGR YKKHGKEKEIHTFLM NRPHTGLIRQFLNGSNLNSFE VVDYSGNTQUVDTEAHDMKKMNHPRFVASYVQKD CREDLT YRDDQGQVRVFHRRDPGCCSNSYWKFYGAYVRHGILTTGR Y VNNNGDESYRTYQLFVRNLTTHVNAGEKLWENGIGEKPK AAD SRVIMVETGPCSEGFPRDEPWL R R LLARTAR LVDKSGNPVEYRLHRHTKRVRDFHQFGSRLQRSDG1HVFH KVK KIF DENNHLYEKE UVDRNPRFQNNKKKFRKTNKKNYAK PLLGKNDHVEWVK VEEFDFHEGYFKDVAEQFCCSHPVVKGV LI RDDQGEHWWMYAVPVRLDDCAFHRLGRMAEEAGI WRHAP TI NEDGDEDVRTYSMYVRNFTQDNPIGNEDERQGASHHF AI FHGSTTYRWRTREGDEGTHTYLNRNGAFDAAWDGRHFR YIDRDGNSS DKSYK IYVRD IDRGVKTDGELMWKAGVYRGP

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

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| :---: | :---: |
| UniRef90_M9RRT5 | $\square \mathrm{L}$ R G S $\square$ VVIS A A T V V K LIE E N $\square \mathrm{E}$ |
| UniRef90_X1EG85 |  |
| UniRef90-A8FN01 | FSNSCDVLDNSKAYLED T M A A L N |
| UniRef90_UPIO0035DE44A |  |
| UniRef90-U4KP16 | FGDAVVRKMKADELSTFIEKLLDQ |
| UniRef90-UPI00031F3D11 | VGNGHVSQFAFSDFVDVVTEHLMDN |
| UniRef90-L1QH93 | IGNAQCRFFNMKLGVDFARDWILRN |
| UniRef90-R7GIF6 | FGNAKALLFNSCEAFKLIRY\\|LRKN |
| UniRef90-U5Y | G S |
| UniRef90_UPI00046CD54F | LK H\\|VVTVVDAGDAV |
| UniRef90-H8C2T9 | F G G D Ni Fil SNVKQIFNSVLESFKKN |
| UniRef90-J1Q | VGDSQSWLLPAAGFLT H L Q WLAER |
| UniRef90_UPI00037E77E3 | GT CRARAl P VR S V |
| UniRef90-Q6Q222 | VGNAEARLLARSRDIVSAALERLRRN |
| UniRef90_WS |  |
| UniRef90_UPI0002FA44D8 | VGNADAVLT D M A G T L V E M K L R E |
| UniRef90-R6WDK9 | ALDADCVLMDADAV |
| UniRef90-F0K | VGDGS I LSVDARKLYDEV |
| UniRef90 | S S TITAINAKDYFNEVLKVLK】N |
| UniRef90-UPI00035C | VGNAYSIISPAKETYDIDLSVLSNN |
| UniRef90-F0RM88 | $V G R S T L Q L Y P L R A L V D R A V D M L ~$ |
| UniRef90_UPI0003B54DF9 | 1 GKCKVMFFDI WSVVSLYENEL |
| UniRef90_UPI0004010131 | IGGDCKVMFFDIWSVLSLYENELKRN |
| UniRef90_E6RTJ2 | FAKNFIEIYN |
| UniRef90-H7YSE0 | FAGSTLNLDKSQPFYKDLLETFKQN |
| UniRef90-G8XCV1 | VGG A Q CYL F D A Q D IVT F GVT Y LEK H |
| UniRef90-T2LJE0 | FAKNFIEIYNAKEYI QALCKSLNNN |
| UniRef90_UPI00040EB346 | GDCKVMFFDULSVVS |
| UniRef90-E6LAZ3 | V S $\square \mathrm{K}$ A K |
| UniRef90_D4JEZ2 |  |
| UniRef90_UPIO0037086C2 | VG S C R $\square$ R R $\square$ P V R E V L A |
| UniRef90-D3IFT5 |  |
| UniRef90-W6KDY7 | \GK K G I F S Y S M S P VA S |
| UniRef90-W6K8F0 | L G Y GRVVAVRAADAFEA |
| UniRef90_U6RHZ0 | 1 |
| UniRef90_UPI0004151217 | I GDCKAMFFD ${ }^{\text {d }}$ WSVVSLYENEL |
| UniRef90-10X7U9 | IGNCKAMFFNIWDVVSIYENELKNN |
| UniRef90-UPI00046E9 | FGDADVLMMNAK |
| UniRef90-UPI00029ABFF1 | F GDTPI TLLKVRALSEVVRAEFER |
| UniRef90_A7H287 | FAGDFLESYDAKEYVKALGNALKQ |
| UniRef90_FOJDX0 | I GKGFVYSVGARNFYDECTK\\|LAK |
| UniRef90-N9V9K7 | L GRIVPVWAVRCADFAAV |
| UniRef90-UPI0004 |  |
| UniRef90_UPI00041C1B4F |  |
| UniRef90_D3RU67 |  |
| UniRef90_R7KML9 | I G S CK Y M C F G I WDVV G L Y |
| UniRef90_UPI000237CA5F | IGNAICHVTPMDQTLKIDTEIMKE |
| UniRef90-F8N5X9 UniRef90 F8KXY9 |  |
| UniRet90_F8KXY9 | V |
| UniRef90 A0A038G5 | L G Y I P F V L V DVT P MVV Y |
| UniRef90-A9A1S3 | L G R GLI Y SI S S Q L F S L VK S E $\square$ R K |
| UniRef90_A4F0Q4 | L GRGQl GlVI R CRQLLD |
| UniRef90_V4HKX8 |  |
| UniRef90-A0L6S5 |  |
| UniRef90-X1E837 UniRef90-E8N255 | I ANASEVQVIPLTSSLLERVRGMLSE |
| UniRef90-Q2M5Q9 |  |
| UniRef90_A0A016KKX9 | 1 S NLRVSMF DVD RLLVDLAM Q |
| UniRef90-F9D0N9 | LSNLLVKVFESKPCLD |
| UniRef90_14KG54 | S E DVNLSVIE S A QLID F |
| UniRef90_B7C823 |  |
| UniRef90-W4QDU6 |  |
| UniRef90-C3XKL8 | L GASSDYLIF Y A |
| UniRef90-UPI0003034 |  |
| UniRef90-E6RTT3 | F A NSClVClD A R K Y K A N L K A L K K |
| UniRef90-E8UAF3 | AGNARLRAYRVRDL |
| UniRef90-R5RHV2 | VGEGEAVIT DMS T |
| UniRef90_UPI00035DC270 | LGNSFIESFSMRDFYN |
| UniRef90-A4FFQ3 | VAAAESHLDFDAAAVVRFGVDWI |
| UniRef90-UPI0003B586DA |  |
| UniRef90_UPI000380A58E |  |
| UniRef90-R9LV85 | I Q D D D EFFDMR |
| UniRef90-W4LUT2 | 1 HGSKFYTAHSRPLDEAMSKLAEQH |
| UniRef90-L1N193 | WLD $\dagger$ PVRLVDMAQSYSVYENDLRYN |
| UniRef90_UPI0003787A90 | VGNAYAlCAPAAQCYA I EHAlLSR |
| UniRef90-UPI00031610C7 | VGHG MRTVRARDMYTFTKGLID |
| UniRef90-S3ZNR4 | VGGS RWSAYPAKETLT A AVVA A M T |
| UniRef90-U1KJM1 | FGQYDVTLVN |
| UniRef90-R6N491 |  |
| UniRef90_N1NGY8 | $\square G S A N T L L V P A K E M L N Y A 】 Y W M E ~$ |
| UniRef90-A3YDR7 | FGEAQVRI YRFKEFID |
| UniRef90-V6F716 | VGRARVYVADYADYFRFALDALL |
| UniRef90-K6DHU0 |  |
| UniRef90-I0G3Y0 | LSNLWMWSIPARDA |
| UniRef90-A0A026F9M6 | LVDSGLRVAKAQD\FEFVSD\\|ID |
| UniRef90-A4SHG7 | CQRVPVWAVSCRD |
| UniRef90-H5SCV7 | LGNGWI EAI P LPALIEAVQACL |
| UniRef90-R5J988 | I GTS TALLINMNIALNLERRILSTN |
| UniRef90_D9VBG9 | 1 GDADCQVMDCVPFVGFARRRLAE |
| UniRef90-R6G4G9 | V GKALATC C $\square$ |
|  | VGNSSIIACFTE Q A A Y K EVVE WL |



| UniRef90_X1V8W7 |  |
| :---: | :---: |
| UniRef9 | -_UPI00038319F5 |
|  |  |
| UniRef90_G8Q1S6 |  |
| UniRef90_D2Z5S0 |  |
| UniRef90_C9P0G2 |  |
| UniRef90_UPI000374EA8A |  |
| UniRef90_Q7MXQ7 |  |
| UniRef90_R6D9H2 |  |
| UniRef90_K1IJG5 |  |
| UniRef90_R6HPG5 |  |
| UniRef90_A0A038G2C0 |  |
| UniRef90_R9M507 |  |
| UniRef90_I0AID3 |  |
| UniRef90_A0A017T2W9 |  |
| UniRef90_UPI0004109033 |  |
| UniRef90_R1IQY2 |  |
| UniRef90_G6A223 |  |
| UniRef90_R1GGA2 |  |
| UniRef90_UPI00036A008E |  |
| UniRef90_C4XUN0 |  |
| UniRef90_V4IMD4 |  |
| UniRef90-B0C3B1 |  |
| UniRef90_A8UWR9 |  |
| UniRef90_D1PFE3 |  |
| UniRef90_C7XD01 |  |
| UniRef90_UPI0002ECAB40 |  |
| UniRef90_F4F4W9 |  |
| UniRef90_F2NTQ6 |  |
| UniRef90-L2SZC6 |  |
| UniRef90_A0A011Q989 |  |
| UniRef90_E4TGF0 |  |
| UniRef90_C5EXQ5 |  |
| UniRef90_B6ASM8 |  |
| UniRef90_R5RLA9 |  |
| UniRef90-X0ZJR7 |  |
| UniRef90_R6A106 |  |
| UniRef90_UPI00036D58B8 |  |
| UniRef90_UPI00034AB7E2 |  |
| UniRef90_Q1YPS8 |  |
| UniRef90_R5DN05 |  |
| UniRef90_G5QCH3 |  |
| UniRef90_D4IX35 |  |
| UniRef90_UPI000363C0E8 |  |
| UniRef90_L0R8Y3 |  |
| UniRef90_A7MSJ8 |  |
| UniRef90_B6R6R2 |  |
| UniRef90_I9S2L5 |  |
| UniRef90_UPI00036746BA |  |
| UniRef90_Q989U0 |  |
| UniRef90_X1EKR6 |  |
| UniRef90_M9RA48 |  |
| UniRef90_D5E4H6 |  |
| UniRef90_C3FDF3 |  |
| UniRef90_F0NVE0 |  |
| UniRef90-X5P3Z1 |  |
| UniRef90_UPI000371420C |  |
| UniRef90_R5EPI9 |  |
| UniRef90_W2UFC2 |  |
| UniRef90_X1H316 |  |
| UniRef90_K6HB74 |  |
| UniRef90_E8TIL7 |  |
| UniRef90_UPI000370AA79 |  |
| UniRef90_K0Q5R5 |  |
| UniRef90-E0QBK3 |  |
| UniRef90_H7XBV4 |  |
| UniRef90-F5WTN5 |  |
| UniRef90_UPI00037C5509 |  |
| UniRef90-E5Z6V2 |  |
| UniRef90-L9WYE3 |  |
| UniRef90-M0PP76 |  |
| UniRef90_T0F888 |  |
| UniRef90_D8JAL2 |  |
| UniRef90_M0EEX9 |  |
| UniRef90_UPI0003627707 |  |
| UniRef90_H7XTS1 |  |
| UniRef90_UPI000373E7B5 |  |
| UniRef90_M0ECR4 |  |
| UniRef90_M0D859 |  |
|  | _J0L601 |

HLKK DEEAKWP LLSALRDLVNRGHTVVIPSFTFSF
$P L K G R V A G P D E V I D F F L Q L V G P E G T L A M P A M \quad P \quad D F$ GMLTYGGSVAELMEVLFDLVGSKGTLLMPGLSTNMS Y L GLP E GAK A MI Y S S R R VI GDS GTLVVPTFTYSF KFGKALLTKNDFLKTLLEVLGKEGTLLMPTFTYSFDETFY Y LGAEGYSPEDVVCLLQSLVTDEGLIMMPYYPPKNSH NLN ANYSPQEVI KLLQSSIVTKNGVIMMAYYPPMNSD AVAQFPGGMHAFWLGMQEWLGNEGTLUVATFTYSDTRRSC AFGDPNLKRKQYLDALYESLLSVGTLIDFPSFTYSFC N LTPYRDDPGKLLKTFLRITGBDRTLAMPAFFF
 GIASFPVSPDAVINSLKDVVTSNGSIVFPGFTYFF ATRPVEGGPRGLIAALREALGPHGTLVMPSWSGD LLNTNLDEAE I CDIILQVIGPNGSLTVPCY
 KVGYFNKNMTDWI D DFAELLGPAGTII IPSYTDDFSRFA
 ALAPYTGPEVVIEALERRIGPDGVLVMPAFGYDF
ALAPYTGNSLQLLGML DDLCGPKRTLVMPAFYFG DPRY


SLKAT GLSPPLEVI NKLRGLIGEEGTLAMPVI,
 RF IGGFAGTPDDAL RVVQTI GES GTLMMMPTFTGLASDYA
 ALAPQPLQKWDVLYALEQLVRKGWTLVFPAFTFSFC Q
FVSKVLGGMQT\IESCMELLSQNGCMIVPTFTDNCLDPV

 $G L P N L K L S K K E L L G H G L D V L K K K N L L V P T F T F S F C N R E E$
GLKT\GDTAEEF DEFMKKQVAEKGTFVLPCFPTTND
RASPVKEDLRGTYESLRE LLGKYSTLCFPAFTFRN
VIP YLE GGLLNFYNNLFQYVDSNGNLMSDSYTFDRSPLMF LVNT DMTPEELLDLLLDDVGETGSIVSVCF
RAGRRGLTAEQLLESFLALLGEEGTLLLPDFNFDF FGFPNPNLKEVYTVLLHLNVP TLCMPTFTFSYC


A $\square$ GRS $\quad$ EEAARTFGVTANDDV KATLLQFYASFANGDESR KLGYKKSKEEGDMSFLEKLLNENKTILLPSFTFSFT KLGFEKNY LKGLLMDFLEQLIDMNKTVLLPSFTFSFPK
A $\square R N V S A D E V T L L K A \square V R$ VSASSTVILPAFTDSYCATRH AFRTPTDGLRGDLLAALRALVADGTVALPAVTFEFCRTKE NFGLPS LKRSFLLEEVYSSIEKDGTI VFPTFTFSFC $G \square P N P N I G K V G V L E A L A S I I L D V A T V L M P S Y T F S F C N G E R$
HLKPQNVD IKELLSVLKKLIGQGKTDADPTFTFSFCRGKS ALRNVTANE $\square A$ L LIEG $\square E R V S A S S T V I L P A F T L S Y C A T R Y$
ATRNVNANE $\square A$ L I EA D ERTDATSSTVILPAFTLSYCATRR QFQNIDGDNRKKLNFLLDCMKDNDTLAIHTFNWDFC

$$
\begin{aligned}
& \text { GFDPFYSK ILDGDQSHM KDGTVCVFGDCEFNSDVLV } \\
& \text { GFDPFYSKi ILDSUQSHM KDGTVCVFGDCEFNSDVLV }
\end{aligned}
$$

DVNAAFDGNP YDVLREELTDQESVLAPGFT
$G V S G L V G G P A A L R D A L R E F B D A D T V V V Y A \quad G \square S D V A A$

RLGRSSNRADVLESALRTYTGQES VWLPAFNYEFTST DVKQAFQCDP YDFLLDRLDENENILVPGFTPAFRDSA G G N $\|$ L $\square$ PAFSYS $\square$ T

PAFDALVTPSN ${ }^{1100} \mathrm{~V}$ GA\|PEHFR T
$\square K N S Y F D V N Q S K S E$ VGILGDWFRE T NARSVEEY $\operatorname{ZSP}$ PKPDENVY $\square Y N V Q K S R \square K T G G L P T A L H K$ S $\square$ P P R D

GTQERFNVETSVSNC
GQEGTLIMPTFTYSF E WA EWAK

SEGEVVFDKINSKTK
GNHV
NNENYDRATSPSE
GTAEKYY $\square D Y Y$ RANPQFSVRRTPSQ

KKSAGDYEIFDREDSKSK DGVEYSQNGYRGELETDPSPYDADAND PSMGAFAKAVLN

 QGAMDT

FTHQPRLDLRRTPSQ
GLT E
$R D Q \square S A K K K \| F N A K K T A T E S G M L A E I L R R$
 YKNEPSPEKLKRDFVYPECVYNPKRTPVVS GLLPTFLMR YQQNGHRGQWHFEHTEPFDVSSNHDEPS MGAFAAAVVN AVAAPTDMRPARNGVDYAAPPDTLLEPSPADGLLPAVLVG


TAGKNLASEPA $\square F D L K N T K P E$ PKTK】ADLR\|LK

WP F Q LT P
GS GLYDREHTPSE
 QVFDPNTTPSR YEWAR $Q G N D F D M Q N T K S S M G D L T N V F A H$


TAPTEKSRPYDPKKT $\square C W T G \| L P N K F L C$ NSKLIPSWSEПQTPGE $\square S$ Q S PL

PPMSSEKY LLRKAPHNY
VGNEYVRK APHNY RTAKSGMGSFSECVRK AEGKPFVFDETPSQ MGALTEAGRK
 FHWTETRSEA GVLADLVMR

GK S RK F NVDEDPVQ VGSFPEYMRT


FHWTETKSETGVLADLVLR VPNTGVLVE WFLD NKEEYDTKNSFSKMGALNEYVRK YDVEKSKSS MGALSEFFRK

FHYRNS $\square$ S E VGLLGS WFLDE FHWTKTKSETGVLADLVMR WFPAFNYDFCDFDLAKSVS Q VGTFAEYFRV $K G L A Y D \square L N S K S Q T \quad G A L G N I A L K$ KDMVPYTS NQER LVLSS KDMVPYISNQERLVLSS | $G V L G N L$ | $A$ | $L$ |
| :--- | :--- | :--- |
| $G K M M Q$ | $M$ | $K$ | $\begin{array}{ll}G K M M Q L M & L \\ G K M M Q L & L\end{array}$

 $\square$ GAMKWILA


GFGKHQPDT $\square$ T TGA $\square$ NDF $\$ WR VYHKEHSR PAFGAFSRLFLD VYHKRFSRPK HGAFVRQFHQ
conf
sol25
sol25
sols
solo


|  |  |
| :---: | :---: |
| UniRef90-UPI00038319F5 |  |
| UniRef90- ${ }^{\text {UP2ARC2 }}$ | SSMHPDYSFVYLGAAAAELMAD |
| UniRef90-G8Q1 | RSRHPINTMVA\GQLSETLMEG |
| UniRef90- D2Z | GVI R SthPRHSMCGFGPMAEEILEG |
| UniRef90-C9 | DSYRSNDPSVSVAAVGR |
| UniRef90-UP1000374EA8A | QTGVKRTNDPIFSFA |
| UniRef90-Q7MXQ7 | AA GVYMSVHPTKAVCV |
| UniRef90_R6D9H2 | MPGVYKSVHPTKAVCVWGKDA |
| UniRet90-K11JG5 | GVARTRDP FSVAVWGAGR |
|  | GVRRSLD |
| UniRef90 A0AO38G2C0 | LR St ip lis |
| UniRef90_10AID | VITRTSSPTHSFALWGKITKDDİETNSPESPL |
| UniRef90-A0AO17T2W9 |  |
| UniRet90-UPIO004109033 |  |
| UniRef90 R1IQY2 UniRef90- G6A223 | FRTEHPMNSYAAVGPLAQAVLAPQDDFNVYGVY |
| UniRef90'R1GG | RTSVVRGTHPLNSFAAIGPLAEKLTSAQS |
| UniF | QPEAVRSLLPMMSVAAMGEK RYLATEVGHESIGKGCTF |
| UniRef90_C4XUNO |  |
| UniRe990-V4M |  |
| UniRet90 B0C3E |  |
| UniRef90 A8UWR9 | DRVRSFHPFTSFTA G |
|  |  |
| UniRef90-UPI0002ECAB40 | HPKRLRTDHPINSFAGVGPKAGAILAQQTDADVYGH |
| UniRef90-F4F4W9 | RPDAVRGRHPLNSFAAVGPEAAHIIDAQSPDDVYG |
| F2NTQ6 | QNGTL GS GIMQ SGWGKHA |
| UniRef90-A0A0110989 | MPATVRSVHPTHPVADWGKDAEEIAAGHPAATPC |
| UniRe990-E4T |  |
| UniRet90_C5E | RSTHPMFGFCGI G |
| UniRef90-B6AS | GAARTDHPUYSFVVVGPLSEQUMACPSKT T |
|  |  |
| UniRef90- R6A1 | YEEVQRSKHPVYSFAYWGGYRKDWMGD |
| UniRef90-UP100036[ | SEGVVKSTHPTKAVCVWGKDSKLIVSGHENSTPFY |
| UniRet90-UPIOOO34A |  |
|  | RRGSVRSRFPINTLVSLGPLLSTQLQDEF |
| UniRef90 R 5 DNO5 | QPDAKRSVEPMMSVSMIGEDTSVI DE\GNVSCGEGCTY |
| UniRef90- D41 ${ }^{\text {a }}$ 35 | AHDLEATSYDKTSAW |
| UniRef90-UPIOOO363C0E8 | K QSGGSAFGTDSAL |
| UniRe990-LOR |  |
| A7M |  |
|  | VRTGHPVYSFCVI GKEAPKF RHL |
| UniRef90-19S2L5 | QEHVVRSND |
| UniRer90 OPPo936746BA | PAYSMVVTGL |
| UniRef90 X1EKR6 |  |
| UniRet90-M9RA48 | STSFVRSEVP 仿 S |
| UniRef90 D5E4H6 | FNPMFSFAVKGRKESLFLNSNS QSGYGKG |
| UniRef90-C3FD | KNPMFSFVLEGPRKKRFLATRT NSGYGD |
|  | OpSRRTKHPAYSMVVIGRDADAR |
| UniRefo--5P3Z1 | V |
| UniRef90 ${ }^{-}$R5EPI9 |  |
| UniRef90-W2UFC2 |  |
| UniRet90-X1H31 |  |
|  | LDGVQRTNHPIYSYAIVSGPLILLELLK CKNSTTFGEDSSF |
|  | ELPAGRTK |
| UniRef90 UPP1000370AA79 | NHAEWR |
| UniRef90 K005R5 | ELIPAGRTRHPAYSMVVTGPRTRELCDTEWWQCPFGDDSDF |
| UniRe990-EOQBK3 |  |
| $\begin{gathered} \text { H7X } \\ \text { F5M } \end{gathered}$ |  |
| UniRet90_F5WTN5 | R |
| UniRef90-UPIO0037C5509 | S |
| UniRet90-E5ze | FSFAJKGAKAD |
| UniRet90-L9WYE3 |  |
| UniRef90-T0F888 | LGAKRSEHPLFSYAAFGPEAGF■ ENTGKSAFGYDS |
| UniRef90-D8JAL2 | DCEYRTDDPTNSTLVRGPYRFD DCR |
| UniRef90 MOEEX |  |
| Uni | YRTDD |
| H7 | RTDDPIFSFFIIKGYRQNDFTSK LLKTCFSSGCVY |
| niRef90-UP1000373E7B5 | Q |
| UniRef90_MOECR4 | DDA HS LVKG |
| iRef90_MOD859 |  |
| UniRef90_JoL601 | KNPEKRSSDPMFSYTVF SQDTVLQDRE】RSTFGDND |



UniRef90 X1V8W7

## UniRef90-UPIOOO38319F5 UniRef90-K2AZC2

 UniRef90-G8Q1S6 UniRet90 D2Z5S0 UniRef90_C9POG2UniRet90_UP1000374EA8A UniRef90- Q7MXQ7 UniRef90 R6D9H2 UniRef90-K1IJG5 UniRef90-R6HPG5 UniRef90-A0A038G2C0 UniRef90_R9M507 UniRef90-10AID3 UniRef90 A0A017T2W9 UniRef90-UPI0004109033 UniRef90-R11QY2 UniRet90-G6A223 UniRef90-R1GGA2 UniRef90-UPIO0036A008E UniRef90-C4XUNO UniRet90_V4IMD4 UniRef90_Boc3B1 UniRef90-A8UWR9 UniRef90-C7XD01 UniRef90-UP10002ECAB40 UniRef90-F4F4W9 UniRet90_F2NTQ6 UniRef90-L2SZC6 UniRef90-A0A0110989 UniRef90-E4TGFO UniRef90-C5EXQ5 UniRef90-B6ASM8 UniRef90-R5RLA9 UniRef90-X0ZJR7 UniRef90_R6A106
UniRef90-UP100036D58B8 UniRef90_UPIOOO34AB7E2 UniRef90-Q1YPS8 UniRef90-R5DN05 UniRef90-G5QCH3 UniRef90-D41X35 UniRef90-UPIOOO363C0E8 UniRef90-LOR8Y3 UniRef90-A7MSJ8 UniRef90-B6R6R2 UniRef90-19S2L5 UniRef90_UPI00036746BA UniRet90-Q989U0 UniRef90-X1EKR6 UniRet90-M9RA48 UniRef90-D5E4H6 UniRef90-C3FDF3 UniRet90-FONVEO UniRef90-X5P3z1 UniRef90-UPIOOO371420C UniRef90-R5EP19 UniRef90-W2UFC2 UniRef90-X1H316 UniRef90-K6HB74 UniRef90 E8TIL7 UniRef90_UPIO00370AA79 UniRef90-K0Q5R5 UniRef90 EOQBK UniRet90-H7XBV4 UniRef90-F5WTN5 UniRee90-UPI00037C5509 UniRef90 E5Z6V2 UniRef90-L9WYE3 UniRef90-MOPP76 UniRef90_TOF888 UniRef90-D8JAL2 UniRef90-MOEEX9 UniRef90-UPI0003627707 UniRef90 H7XTS1 UniRef90-UPIOOO373E7B5 UniRef90-MOECR4 UniRef90-MOD859 UniRef90_JoL601
 PILVQGQRVWRRFHYDDSEDEPFEAIVRDMFAAGIGRQGR
 FVIVDGDFEESRVLRERAPRWGALHFGEDLMAAGLLKSAT PINKNGNKIKKSFYRRNNKYKSRELWFGKKLSSSAVKLTM SGELYTSTLWVRDLEDAGSEANFERFNEYVSEKGSYVRSI
VI LK DGSKTEVTMVHRADMVDSATPTSEYTRNDNAYRRTK KLENGDEKEVRTYVHMDSALSAGDYVASLYCETY KRVN MVRPWYCDYFVRRLDLA SEEDDLSRLVEALKNQDKWHQGL VTL DDGVGQHDPYVMSAPDSHKFVRIERAFLRPGVLTVWK TIDDENGAFQHTHADHTQCMSFAELKEDLFREGALRUAP PIGVSTNGEQK LKEIPGCAKGFVKFEKYLDDKNLINKQE TVLAEGRPVRIDYGENDHCCAGFVVADAWLRERGLQREGR CIDENGESTLVKTYVHDMKVVSKEKFVRKYLJKKAWNTYR
 DPDRRVTMVEVGSCSEGFPRLEPTLLHPNVRTVV


TVQSSDGRNPETFPKGGYDP $T Y Y F N \square L D T S N Q T \square T R S G V$ PVIRNGKDYRS TYDEDDKKRDKNRKFFNHFKKNGQILEAK IIKKSKRETPLRIRERHRWTKYFAEFYNDLQTAGILKSAV A TTASRGEDWYSVRNFRDEUERNNTVDGKVKERKA KWGM DID GAVRMVEVGSCSAGFPKLEPVLDDQNTM
$\square$ ITKEGKH■EKE』LVRKDFFQNNNK DKK VVKQTPHTKYN NTVIKDDNYPWLYSVRTLSETSFPRVAEKALKEGTWKKAP KVIGDFGEDRGDFYHFCLPKVNFFRI QEEMIANGUIKKQV VITRQGEQATTSATMYVRDENDFELLINALRESGRISSVP
 KVQRVKTSVFKTFFQLSLNAEEKQKC
TVIHEGKQHRVTTFVHD
YIEKNFKTVDKGFVQKSIIRERRPHWGADLVKQG\|LRTSS IVMNNGVVEEKTYCLHVRYNHVEPRTDDLILKNGEGDVIL PLLREGKRVWVTTSDWDSNPDAVERIARDYLARTRVAQGP PVKDWYQDVVYKDRDDGEVSEKLVRVQKDLKEAGVLEEQY CELQDGSQSKQTFTYFARNFCNWNLAWEEFTNQMLVKYED K EIDGKKQQKPFYADNPFDKNFDQFDNF LKMEGILKQSF PINTYNEESYVKRCVNYEGDTFNVT TTDERGVTTDRTYSIYVRDVTNVDPAGEVLWSKGLGSRPN RMEKNEYDLFVRYATVSPNSNSYMYEEDMYRNSIAFKKQ Y IDQNNMKKKVTYKYYVRDPAKVVRTGD LLITNIKAYSKYY PVYVRDVMGRPEYRFLARDVAR D DYELKDVIRDFA RILMDGRQNKEEFYFFYKYSFFMLKFEEHLLKKGLLKEVK PQTDCDFTMHVRPLGVHMDYDWPRLYEELQAEGIMRLSD PVDFGSGFSNRRFELFARSKRRFDRIKNELMKDKLLRKSH PKDKNGEVKWHTFVDDLDKYDDFNDFGTYFEEKHKIVKVP SVYARDVKGRPEYSFLAHDTQRDVR GFEMRDVLRQFP SGTADFGTGPVRRDTALKSTLDFAPVFDRDRESGAMARAE VIDENGIRHENEFSTYGNCRLNPVPVVHDMNELKMLSESD SIKVGDEIYEDEYKLFIDRDDGVVPKIYNDLFERNLAKTMP KIDENKYVDVVAKTRIEKNPFIUNYLWDIFRKLNVLNGGK ADFGSGEEDISSVMFVRESDMNFSGILDDGNAKNLIKKVN STYVRDVVGRPEYRFLSRNVAR DVHELKEVTREFA SVVNGESKSSVTVKYHVMPSYDTEK SSRDLEKAGLLRSFP SVYVRDVAERPEYRFLLARN YTDEKGFTQLKTYDMFVRKDTDVNGLENLFIKENVMELKK DKSVMTYDDVVPN YTRU HDLVFNSKLLLYEQ VIRKTGCLKKDKTVVSYLD IVPNYSLI HDLVFNSKLLLSEQ VI DEDGQKREKRINYYVRDVCSLDKINEIVRQTRYYKSDK GVMHDDGETTELIEQDTNYYDSDFWKLQRDLENAGVLETYD SGLVKRNGDVRRVAHRDPTDDRYRRFARRKVRADALTDAS RTEVFRGEHYIG-TDYSAFLRRRDLPGENFEFD VIREDGSCESITHRSHEYTTWNRAKIREDLERAGVLDSYD RCTEEDGCVPVEVRTSPFYSWNKPKLTRRLERDGVLHRYD IITDENSQSKKARKENTKSDLDVEKQUADLKQDNNFNRDE
DGVLFDGSGDHEQTTQVNYEYTMPMTQTYLAETGALTKHD PTEYERTEQTYETLVSPLYSWNKPKI MRRLRRAGALSAYD


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| :---: | :---: |
| UniRef90_X1V8W7 | $V \mathrm{~L}$ A A TVVHLID A K A M WQ A GLLIA A I I K R N |
| UniRef90_UPI00038319F5 | VGAA ESYL F E T A EVID FA TP WI E H K |
| UniRef90_K2AZC2 | CS LGTLLQSFKEA D A Y H $\square$ A MELL R Q |
| UniRef90_G8Q1S6 | ID GI I V EVLS A K K L ID F |
| UniRef90_D2Z5S0 | LK G S PI S F Y D Y E A L A E |
| UniRef90_C9P0G2 | V G R G N V |
| UniRef90 UPI000374EA8A |  |
| UniRef90_Q7MXQ7 |  |
| UniRef90_R6D9H2 | F GFSFI Y I D N T DLY NKVKMEYEQN |
| UniRef90_K1IJG5 | $F G R L L P V W A V R C A D F A A V A K E ~$ |
| UniRef90_R6HPG5 |  |
| UniRef90_A0A038G2C0 | YR G V P L Y C V E A S El |
| UniRef90_R9M507 | LG D GE I A CI T EE DII F Q A VT D R $\square$ R R |
| UniRef90_I0AID3 |  |
| UniRef90_A0A017T2W9 | VGHAHARLARARDIVQVAREHLAEN |
| UniRef90_UPI0004109033 | YYFTPFFAVDAKELTD |
| UniRef90_R1IQY2 | VGESTWT A YP LEALLLDVCTQAFR |
| UniRef90_G6A223 | V G R S L S G L VD A |
| UniRef90_R1GGA2 | $V$ G G S RWQAFP A R |
| UniRef90_UPI00036A008E | C G D S F L Y V VE EK A S Y A L L VE K $\square$ R |
| UniRef90_C4XUN0 | A G L G A V T F F R CAPV V A F |
| UniRef90_V4IMD4 |  |
| UniRef90_B0C3B1 | K LF T F K $\square$ Q D F F D A A VHDY E S K |
| UniRef90_A8UWR9 | LG Q GKL Y A Y D T K LFFE E S A I D L L K |
| UniRef90_D1PFE3 | I D GVVPVYM T R S K ELFN Y |
| UniRef90_C7XD01 | LHQAE L N R Y K DLLD |
| UniRef90_UPI0002ECAB40 | $V \mathrm{G}$ LS D WT S Y S LE S L L E N C T R A $\square$ I L |
| UniRef90_F4F4W9 | $V \mathrm{G}$ A S R WR A F P |
| UniRef90_F2NTQ6 |  |
| UniRef90_L2SZC6 | $\square \mathrm{G}$ Y $\square$ R G Y C C N A K D M F E K G $\square \mathrm{E}$ F |
| UniRef90_A0A011Q989 |  |
| UniRef90_E4TGF0 | $\square G N \square D \ F$ L $\quad$ A VA S D Y F K V A Y K M A K E N |
| UniRef90_C5EXQ5 | FGGSKVY Y F C T K P F LE YV IK R LQE |
| UniRef90_B6ASM8 |  |
| UniRef90_R5RLA9 | 1 G R A |
| UniRef90_X0ZJR7 | $\square$ H R A T $\square$ T VM R H R E F M D |
| UniRef90_R6A106 |  |
| UniRef90_UPI00036D58B8 |  |
| UniRef90_UPI00034AB7E2 |  |
| UniRef90_Q1YPS8 | ELGVLLIEMDD A R E L N N F L R A |
| UniRef90_R5DN05 | LG DSQlCCIMNEA GVYK CLGQADKEN |
| UniRef90_G5QCH3 | $V \mathrm{G}$ GA Q SRLID A A DIVS F GIIE WL E A R |
| UniRef90_D4IX35 | IGGGCNLGIVDAKEMMDVLISLSKK |
| UniRef90_UPI000363C0E8 | TP F GLI TL M K C D ET L K F M T T R $~$ K K N |
| UniRef90_L0R8Y3 |  |
| UniRef90_A7MSJ8 |  |
| UniRef90_B6R6R2 | EGGG LR SVRA Q I F EVISSELIQNH |
| UniRef90_19S2L5 | LG D S S I S V E EKVAA D |
| UniRef90_UPI00036746BA | I N N E F F SVI ELKK K A LD L M IE D M K N N |
| UniRef90_Q989U0 | L G G T Y A RLV DVK D MES I LVR A M R |
| UniRef90-X1EKR6 | VGE GAlS MI E S D CLF K E G Y K Q LD K |
| UniRef90_M9RA48 | L S DA I F F L N T R S L K E F |
| UniRef90_D5E4H6 |  |
| UniRef90_C3FDF3 | L NHIT L E A A N GQVI SELLA S Q MIIK E |
| UniRef90_FONVE0 | 1 L K G Y I R I I P VK PL V D E A R R Y Y T K K |
| UniRef90_X5P3Z1 | I G G T H A MLVDAREM |
| UniRef90_UPI000371420C |  |
| UniRef90_R5EPI9 | F G D GHLCCFKEDD A Y K VMLDLFD K |
| UniRef90-W2UFC2 | $F$ G A G R L CLELNSARNVYLDLLD |
| UniRef90-X1H316 | $\square G K A N S W W V N A K E F C D I L K K$ |
| UniRef90_K6HB74 | M G E S E |
| UniRef90_E8TIL7 | LGGGTYARLVSVR D M |
| UniRef90_UPI000370AA79 | DL F Q P C Y A E AR S M LD F CLA K L N Q |
| UniRef90_K0Q5R5 | LA GTYAKLVNVRDMEAVLVPAMR |
| UniRef90_E0QBK3 | FENLCIKKKI DLS K A Y DVIVVK DIE D N |
| UniRef90_H7XBV4 | FENLLCIKKI DLS K A Y DVI V K DIIE D N |
| UniRef90_F5WTN5 | LD GQ Y I Y GV K Y R D F I D Y L K EVL |
| UniRef90_UPI00037C5509 | LD G Q RVY GV K Y R D F I D Y L K EV L |
| UniRef90_E5Z6V2 | FA GDFL ESYDAKEYVK A I G N ALK Q |
| UniRef90_L9WYE3 | L N G L P L Y VT P $\square$ R E V D Q F V R T Q M |
| UniRef90_M0PP76 | V G DVRI Q G C R A S DV |
| UniRef90_T0F888 | FSKATAKLY D |
| UniRef90-D8JAL2 | LNGLQVFAFRARD |
| UniRef90_M0EEX9 | L N GLK K L F F T L G DLK S S L VPR LK E |
| UniRef90_UPI0003627707 | $L$ N GLL R L L F F T L G DLL |
| UniRef90_H7XTS1 |  |
| UniRef90_UPI000373E7B5 |  |
| UniRef90_M0ECR4 | LQ G L NVMA ${ }^{\text {L }}$ S A R D L |
| UniRef90-M0D859 |  |
| UniRef90_J0L601 |  |

lupas_21
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sol25
sol5
sol0
jhmm

jpssm $\quad \overbrace{}^{90} \quad 100 \quad 110 \quad \bigoplus_{-}$

140
150 160
jpssm $\quad 210 \Rightarrow 220 \rightarrow 230$


[^0]:    lupas_21
    lupas_14 14
    lupas 28
    jnet
    conf

