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FAPVVPGRP



 F A P V V P G R V F GFP A D H GVVH Q GY R I E WWY V T A N L K D A E GRE FA QVVPGKVFSFPQDHGPHDGYRIEWWYLTANLKDAEGNA FA RATVPRPFTFPRDHGPHPEYAI EWWYYT GNLQSVEGRR Y A QVVK G RVVFSFP E D H G Q H P GF R I E WWY DT A T L K D E K G Q D FSPVVPGRAFSFPADHGAHDGFRDEWWYLTADLSDAQGRH Y P P VV A G RPDLQFPA DHGAHP DYRTE WWYV T G WV T DEE G V E FT QVVPGRVFSFPADHGVHDGFR】EWWYLTADLKTRDGQR FAPVVPGRADE WPRDSGAHPAYRTEWWYAT GWLLDTPDHRP FK QVTP GRVFSFPADHGAHDGYRVEWWYDTANLKD GQGRE
 FA QVVPGKTLEFPRDHGAHRDYRDEWWY I TANLKDAE GHR FKSAVPNRVFSFPKDHGKHPEFKTEWWYFT GNLATADKRE YERAYAPRPFAFPADHGSHPTFRNE WWYVT GNLADPT GRQQ FTNP $\square$ PN KSFNFPSDHGSHNEYRDEWWYLTANLDGED GTP PGQS LRLD A DF GA HPDYKTE WWY AT G WLTTTAAGK Q FS S P Q R GVAA P T F P R D H G P H P D F R V E WWY VT A N L Q T A G GE Q Y A QVTPGKTFSFPA DHGPHPGFRIEWWYLTANLADHGGTP FARVTGPRPLSFPADHGAHPDHRTEWWYFTGNLTSETGED FS S IP TR GVEELVFPKDHKPHPGFKDEWWYVTANLQTADGQR FAEVVP GKPLSFPADHGAHPGYRIEWWYVTANLKDAS GAR FERVIEPRPFVVFADHGPHPTEQTEWWYYTGNLTADNGRR FAMPQRGQQLSFPQDHGPHPDFR】EWWYLTANLEDADGRD YTRADLEPREFHFPEDHGPHAGFRNE WWYWT GHLA TADGRE Y T QVTP G RVFS F P E D H G Q H P GF R DE WWY VT A T L K D D A G Q Q FERALKPRPFVFPKDHGAHDAFRSEWWYFTGNLDGADGRP ALPERRREFPRDFGSHPDLHTEWWYITGHAKTSAGRE


 F A V P V P G R P L VF P R D HA A HP D Y R DE WWY L T A N L T G D D GR D F T PVMKGVEI TFPADHQAHLDFRHEWWYLTANLTDEKGNP FARVTGPRPL QFPEDHGAHPDYRTE WWYFT GNLTGEDGRA
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 FARALKPRRFSFP QDHGPHNQYRAEWWYFTGNLRNAQGRR

FARVLEGYRI DFPEDSGAHPDFRTEWWYITGWITDDQGHE FAPVLPGRQLSFPLDHGAHAEFR\｜EWWYLTANLQDAAGQA
 FA QPQRGTLFTFPKDHAAHPEFRDEWWYLTANLQDAQGRD TPVVPGRALSFPRDHGAHPDYRTEWWYITGWLRGEDGVE FAVPERGHSPAFPTDHGPHPEFRDEWWYLTATLTGADGRD VTP GRAFSFPADHGAHPDFRTEWWYVT GTVKTAKGED FA QVVPGKEWKFPQDHLSHPEFRTEWWYLTANLESEEGET Y DAVLPATPRSLPRDHGAHPGHRDEWWY ITGWLERDAAAP F EPVV K GNKLEFPKDYGSHPEYRAEWWYFT TNLES ES GK Q VTP QSPMQFPNA LGSHPDFPDEWWYVT GWLQSASGKP Y A RALLGPRPLVFPEDHGPHPAYRHEWWYITGNLFDEDGR H
 FAll PAPDPLFDFPADHGSHPDYRIDWWYLTANMT GADGTA FAAVTPGRSFVFPADHAPHPDYRIEWWYLTANLSDAEGRA ARALPPRTLVFPRDHGAHPDFRTEWWY TGGHARAGDGRE


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 $R G F Q Q T F F R S A S R F A P R Q 1$ DMAHAAMADPQTGHLLHVQRAA


 HHAAERY F GF Q F T I F R T GS A WA S S S I YM A H F A L S D DS GGRFYA F E R F
$F G V Q W T L F R Q A T G W G D S T V W M G H A A A T S A T A R H H A A E R Y$ FGVQWT LFRSAPGWSAP LVWLGHAAATSAT RGHYAAER H

 | $F$ | $G$ | $V$ | $W$ | $L$ | $F$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
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A RAGFDLAYARTGNTDVKLDD
$G R Y R T R \square E A E D$ AREGFGLAYAKEGDTDVKLQDWQFVRGADGRYRARIAARD AREGGGGLA YAK E G N T DVVRLD D WRMI R E EN GRYETTVQAR D AREGFDLAYARQGNTDVKLDDWTLVREEDGRYQVDMRTGD ARSGF GRAGFSTGRAGVWLGDWSFEQDGDGYRARVDAED ARQGF GRAYAA E GDTDVVKI D DWQFKR SAD GRYQASVVRTG D ARSGF GLALLADTADT DVYI DNWSLLRREATGRYRARFPARAD
 A REGFGLAWARPGNTDI KLDDWRMVREPNGSYRVTI RSNE ARVGFERAGYATERTHVWLDDWSFE QSDQHYATRVVAE D ERALDPLAGATVGQTRAWIE DWSLT LAD GAYRTRIIRAD D ARGGVEQAGVNAAPFAAWIDDWALRSTASGPMQLTAKDPR A R Q GFGGAYAKPDNTDVRLDTWRMVRAPDGHYDVSADAAG ARA GF GLA YARE GNTDI LLLD DWHLLLRHADGSYEARDTARA ARQGFGLAYAKPANTDVKLDAWKMIRAADGHYDVVADANG ARGGVGQAGVRAAPFEAWIDDWRFVSQASDPMQLSAMDKN A RE GLLGLA YAK VG D T D DK L E D WRMAR QPD G SYA V H V E A S G SRGGIGQAGVTAQPFEAWIDEWHMRGDDLDTQDLTASGTG D RALEP LAG AAVGHTRAWLGD WE LA LVD GEYRTRDATDE

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 ARAGFGLAEAAREDMAVHI GDWSLRRAPDGRMEAA $\operatorname{LA} A$ AA D ARGGVGQA GVEAQPFHAWIDDWSLRSSGDDHLQMQARGE G
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 $F D Y T L T F A P T Q P V L W Q G E Q G F S R K G P D P A H A S H Y L S W P Q L$
 $V E L V L D L E A R K P I V V Q G E D G Y S Q K G D A P G N A S Y Y Y$ TV P R R L

 F S Y T L RLDADKALVLEGDAGYSRKSE F S L
 $F S L D L H F E P T Q P V L L Q G D D G F S R K G P D A T H A S H Y L S W P Q L$ F A Y H L Q L D S E GP L V L M GK Q GY S EK S G Q G QA S Y Y Y S QP F Y F T L L A L T L $F$ S Y DL A L Q A T G P L V A Q G D H G Y SVVK S A E

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170
180
QVS G II NRQGEDTPVT GTAWLDREWSSEYLDPNAA GWDWI $K V A G T V T R E G K P I A V T G T A W L D H E W S T S V L D A N A A C W D W V$
 TVEGRLT LD GHRQSVAGRAWMDHEWSSAYIPEGAD GWDWV $T V A G S L T R Q G R P V P V S G S A W L D H E W S S S V L D A D A A G W D W L$ $K V S G T L K R G T Q Q E T V H G T A W L D H E W S S T L L A D E A V G W D W I$


 QTD GEL QL D GKNY QV S $R V T$ G S V T RPSTPTPVVGGSAWLD HEWSSTVLAS DAVVGWDWL QV S G QLARNGAPVAIT GTA WLDHEWS T S V V L D A DA S G WD WL $R \vee T G G V V R P G E T \quad T V T G M A W L D H E W S S T L L D A N A A G W D W L$ QAS GTL Q DDGQTYTVNGPAWLDREWSSQPLTANQTGWDWF
 TVS GTLHLP D Q T IEVVTGRGWLDREWS S A ARGTLRLGDRAHRVTGEA WLDHEWSS A ARGTVTLLDGRA DEVVSGTAWMDREWSSSQPLAS DATGWWDWF E DS G T L R L S E Q A F P V T G R A WLD H E WS T A Y L A E Q A A G WD W I Q A Q G T L S L E G E S Y P V

 Q T S G QQ | $Q$ | $A$ | $D$ | $G$ | $R$ | $V$ | $T$ | $D$ | $G$ | $K$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $Y$ | $Q$ | $V$ | $S$ |  |  |  |  |  |  |
| $P$ | $\square$ | $S$ | $G$ | $T$ | $V$ | $R$ | $G$ | $E$ | $T$ | $L$ |
|  | $Y$ | $Q$ | $V$ | $S$ |  |  |  |  |  |  |
| $E$ | $A$ | $S$ | $G$ | $S$ | $L$ | $E$ | $M$ | $D$ | $G$ | $K$ |

 $Q A S G Q Q Q I D V G Q D Y Q$
 $K V T G S V T P P N K R V D V$

 QV S G S L QV D GREVQV S K A GGH T F KGS T YEV G GQA WLD RE WS
 $R T S G S V T H A G A A Q A V$ DVS GTI G LID GKNQEVVTGKT WLD HEWS S QALDP DA S G WD WV
 AAEGTVSFANTAASVTGSAWLDREWSTSALDASQAGWDWF SVS G S V F LD GETHEVTGEA WL DREWSS QP L A S S QT G WD WF $K V A G T L T L D G R A D A V T G Q A W M D R E W S S Q P L A K D Q K C W D W F$
 $P$ TRRGEVVMV DGRA YP VV G E S WMDREWS T S A L G K A QVVGWD WF D A K G SVVI E GK T H QV T GKA WLD REWS S QPLTANQSGWDWL T T R G S L RIT DK DYPVTGNS WMDREWS TSALSKE QS GWDWF

 QVQGEI EWQGQTHRVS GQAWLDREWSSQPLSADQQGWDWF E V T G E V T T D GKA H Q V QV A G T L D L P D GP VA V T
 $Q V S G T L N D P D G P V T V$
 AV S GTLRLRGKPHEVTGRAWLDHEWSS
 MTE GNV R I G GMAF P V K V S G T L K L D G R T L A V AVSGTLRLDGEPVAVSGHAWLDHEWS S AVNGKL RLDDQSL Y V NGSAWLD HE WS A ATGS TI DGNAVEVNGQAWMDREWS QAQGELEI E GRRV P V R CVD G V L I I D G E E T D V QVT GNLLTMP E GEMSV
 EVVN G R L R R A A A T T S A V V R G D G WYDRE WS S E GL T E K QE G WD WF
 $N V K G M L E L D G E T Y R V K G K G W F D R E W S S S M L S D Q Q Q G W D W F$
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 $R V R G D V T R A G K R T P V T G E A W L D R E W S S N Y L A R D A Q G W D W T$ QVSGTI ELPD GPVKIT GH GWLDREWSSQPLAED QS GWDWF


## QUERY

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 GI NL D D G G S L MAFRMRRRDGSTLWAGGTLQEGEQPAR LLS SV HL D D G A A L MLLYRMRQKDG EPY LTTGTWIDAADGSTELLLH GANLTD GAALMAFKVRAADGRAVWAHAALRTADGHVTQYG G A N L D D G G A L M A F Q I R N R Q G D K L W A H A A L R D K S GVVVTM S L HL D S GEHVMMLYRMRQKEGAAPY LT GTWWAAADGQTETLH
 GI NLHD G G S L MAFRMHRPDGSTDWSAGTLRQADGQVEALA
 GINLHD G G S L M A Y QMRRAD GS KLLWA G GTVVRPGASVVQLA SLQLD D GR DL MLLYR LRRRRDGSDPHSAGTVI GKRGESQHLT $G L N L D D G G A L V A F R I R G R D G G T V Y A G G S Y R R A D G T D T R F R$ SLTVDS GDKLMAFRLRG SLHLDS GEQVMLYRMRHKEG
$P$ P Y L
SLHLDS GE QLMLFRVRQKDG
R
ALH M R DLYRRRLRNGGDPYLTGTWIDKEGHTQTLH
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 S L H L D S G A QL M MVF R V R Q K E G A A Y Y L T G T Wi N P D G S T L R L S
 SL HLLAD GAKVMLLFQVRQQ GGEAYRAGTWDGADGQAQVL K S I QMD D GTEELMAFHMRKADGTTERRPF GTFVVPVQGEPMHLS A L QLDD D G R D L MLLYRMMRHKD GS DP F S K GTLLITAD G QTARALS
 GANLD G GGALMAFQLRSRTGAKLWAHATDRDASGKMT QFAA S L H L A S G E K L MA F RL R E E Q G E Y I S A N WI S A D G K T S P I N AL HL T S GEKKLMLYRMRQKDGRD Y I S GTFVVPAGD KR QL T ALQLAD GRDLMVYRLRRNDGSDRHSAG LVVGPDGESRRLA S L H L A S G E K L MAAF R L R D DK S G Y $\quad$ S A N WI S A D GRAS P V D S L HL P G G E K L M L F QL R G EA G G S Y RA G S WI GA D G A VN S L A A L QL E S G H D L M Y Y Q L
 S L QL A D G D R L MLLYR I RYKNGT PY LT GNWI SAD GTTKML H ALQFSDNSELMFYRLRRKDGRPDFSAGSLVRADGSKVMLK GMNLD D GS A L T A F H L R R S D G S A L W G G G S FRPR D GAA R I F R S LT F E D G D K L M G F Q L R Q T D G T A F S S G T W DGP D G A TR A L Q GLNLD D GSALMAFRI RRKGGGS LDWA GGSYRWPDGHVTRLE SLHMED GNKLMLFRLRSADDS HYYSGTWWTAEGETIPLR A L R L N N E T S L V V F QL R D K T G E P S Y S N A K L M Q Q D G S GI A A A
 AL RLGEETS LMVF QLRDKTGKSSYSHAKLMNQDGS GTAI Q AL QLE DGRDVMVYRLRRNDGRDRHSAGDVVDAEGNAQVLS
 $G V N L H D G G S L M A F R M R S K D G A P \square W A A A T D A P P G G V P A S L G$ S L H F D S G E K L M A F R L R D D K D G $\quad$ L SLQLP DGGRMMGFGLREAGGG LYTSATWIXADGTTTAYP


 SLHLDSGDKVMLFRLRQSDGAANYFAGNWIGTDGQSVQLA S L H L D D G R Q L M L Y R L R Q A D G Q



 GINLDD GGALMAFRMRDADGHALWAAATVRDAA GD RRYA S I H L D D G S A L MVS QLR E H GEKPYFF GS RSWKN GKVVK LD
 S L H L P D G E K L M L F Q L R S S D T D A P F Y A G T W I A A G G H A T P L D

 GMNL ED G GALTAAFRLRRPD GTADVWDGGSFRAPGREPESRR
 GI NL GD G GALMAFRMRDESGAALWAAAS LRTGGGDRRFR S L H L Q G G A K L M L F Q V R Q A D G E P Y R A G T W DA A D G Q T R A L S


$S$ SFEDGEK MMGFQL RQSD


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90
SRGG|V|VAE|V|EAAPFGAV
100 110 ARGGI GQAGVEATPFRAWINDWSLQGSNDARLQMTANGKG

D WS MQAETLSSP|L SVVTASAAD
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 ARAGFGVASASEQDMAVKLRDWSLKADGGRYSAELPATG ARGGVGQAGAEAASFRAWI DDWTLA GRPETGMHVRAGGDG ARGGI GQAGVTADPFEAWIDEWSLSGPDFDTLSMTAA GPD GRGGI GQAGVVAEPFEAWIDDWRMTGDPLSALELSAAGEG ARGGGGVAGAVASPFETWWDEWALRGNSDSQLSLNGGGTD
 ARGGVGQAGVEAQPFRAWINDWSLQGPGVDRLQMRARGQG



 NRDAVGLAGAQAEPYS LWLDD DWRMAGPGFDA L A LLSAS GP D $Q R G G A G L A G A Q S S P F R V W L D D W S M T G P D S S A F P D R R L R A E G B$ AR G GDGQA GVEATPFRAFIDD WLLETRRDDSRRLRVAASSDKS
SRGGVGGQAGVIDAKPFEAWIDAWEMKDRTDAPDTLKASGAD
 ARGGTGQAGVAAAPFHAWIDTWDMAADASAA LQQTAQGED
SRGGVGQAEVVAEPFSAWID D DVI

 AR G GVGQA GV A MD P FTA W A R G GLGVA GVE G VA P F R A H I D ARGG $\quad G Q A G V T P V P F R A F I$ $\begin{array}{llllllll}N R G A M & L & A & G & A & A & Q & F \\ A & K & V & W & L \\ A & G & G & A & G V V & K & P & F \\ Q & A & W\end{array}$




ARGGVGQAGVTAAPFSAWI S R G $\square P E L A G V S A N P F A V F I$
 $\begin{array}{llllll}A R G G V G Q A G V & D & A & S & P & F \\ \text { A A A A R }\end{array}$ A R A GFGVVA QAS E S D T A I R L
SRGHPG LA GTQTSP LVI KL D

 SRGG I GQA GVLQK P YRTWLDDNWHMRGADWGALSSLSAA G TA AR GAA GLA GAQRDP LRRVWLDEDWSWRS LGGQGPFP LIEFED D D
 ARRGFGLADAS GTDTAVHIDDWSLLERNADGRYRDNVATS G SRAASGLAAGARNERYHVWLYDWKAEGRNNDGFPI RLLQAGS
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 S R D Q S A L A Gl E S QPFRAY L D D WQ WL S ST K DL FP L NVVKAK R S R K S A GL S GAQS VP Y R V WL E NWSAE E A R S G L G A G A D Q N H T R V WI R H WF L Q Q TS S G Y Q AV I Q G K N SRGVVQQAGAQTNPYHVWLEDWSATEDEPGVVRLQAQTSD
 ARQGFGLAASART GDADVAI RDWRLRRVAD GRWQTAVVAEG ARGG I GQA GVVAEP FAAWI DEWRMA GPS LSSVVRMQAT GPD AREGFGVA QAATA DTD LRRLR DWTLQRD GPDHYRARLAS R D SRGAVGLA GA QATPFRVWLED WALTGSESAPLRLHAQE GE AR DA A GLLA GASAPVGRVWLEDWQLA GLDGDTWTLAFTADG ARGGQGQAGVMAAPFSAWIDDWSLAAAGLDQLTVRAEADD S R GA GE LIA GAVGGEPFRDVWL E D WSAEE DE T GVQRRLVAM DE G ARGAAGLSGADLDPFRVWLEDWRLIAGNDFPWRLEAVEGN

A R G GI G QA GV S L K P F RA WL D NWSWRAA TSNP FP L E F S D D D


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TASGTLITLIDGRA\|VV|EGVAWMDREWSSQP|LASDQTGWDWF RVSGEVERDGQRLAVTGSAWLDREWSSQPLASGQSGWDWF DIS GTLKLPEGDVAVTGSAWLDREWSSQPLGETQTGWDWF QVSGMLDLPGGPIAVAGHGWLDREWSSQPLAEDQSGWDWF TASGTLTLDDRQVAVTGRAWMDREWSSQPLASDQTGWDWF ATRGTLRLKGQDFAVNGKAWLDHEWSEEVLHPEAAGWDWD AVSGTLTVAGRRMPVSGRAWMDHEWSEALMHPDAVGWDWI DTE GTLSGGGREYSVS


 HASGEL E D D GRRRVEVV


TVSGEVEREGQRVAV


A 1 Q G T L GTawLDREWS AVEGTLTLPEGEVAVQGTAWLDREWS | $L T Q G T I$ | $R M G N E R F K V$ |
| :--- | :--- |
| $A$ | $R G H S W F D H E W S$ | KTTGGTVTVGEETVAVVK ATEGTLVLSGDTLSVTT

 SVS GEVFTPQGTYDI

 AVTGSLALPTGNVDV KI S GTLTLPEGDVDV | $Q V S G Q V T L Q Q E S H Q V$ |  |
| :--- | :--- | :--- |
| $A$ | $T$ | KASGRIVIDDRPVDV GMAWMDREWS

 TVTGTL TVLP TGAVEVSGNAWLDREWS
 RAEGRLLLPSGTVEV A IVGTL QLPEGDIAV R EVAGVVELPEGP, NVTGNAWLDREWSSQPLADNQTGWDWF $\begin{array}{llll}M V G G R M R & G G K V R E V \\ S T E G T D R & G A D T R S V\end{array}$
 TV A G TLLFLP E GPVEVV保
 A LD GVI ELNGKSVKV S AVGGTIVLDGKRMAI RITGHLDLPDGTVEVQGSGWLDREWS KVSGTVERDGKTIQVNGDGWLDREWSS QVAGELVQDGRRQSVS S
 DI N G S I TLDDDQYNVT GKGWYDREWS RVRGHVGLQGQRHGVSGSAWLDREWS


 | R |
| :--- |
|  | DI SGEI I RHGKVEHV

 DVHGTVSINGESHQVS
 KVTGEVTMDGKQHEV ESVGTI I VVGDESFKV QVSGDVSIK GHSQAVQGEAWKDHEYS PTHGTI TINGKSFTVSGLTWKDHEYST
 QVS GRVDRGGRSAVVTGEAWLDREWSS RVEGNLLFPDGPRAVTGRAWLDREWS SNYLAPAAQGWDWT R $\begin{array}{ll}A V Q G R L \\ P T Q & L \\ T\end{array}$ AAEGTLRDDDREHRVTGQAWMDREWSTGALAEDQVGWDWF
 DARGSLRDGDEVHEVSGSAWLDREWSTSAALAEDQAGWDWF QTRGD U WRGDEHFTVTGESWLDREWSTSAALAEDQAGWDWF DIDGVI EDDGKQYNVRGRGWFDREWSSSMLSAKQLGWDWF

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 SLSLDSGGKLMGFRLRDTMDGTVYSATWITPDGRTTAYP GMNLDD GSALTAFRLRDKEGNAVWAGGSFRSAQGELDRIFN

 AL RL NDATSLVVFQLRDKTGKASYSHARLMQREGSGDAI K SLHLGTGAKLMLFQVR EDQGPPYRAGTWVDAQGQARALVQ
 ALVLD GGERVMGYRLRATEGAEPYAVATWI AADGTSPTAYD


## 


 SLHLA S GDKLMLYRLRQKDGQN YPFGNWI NAAGDTQMI A ALQLNDGTDLMYYQLRDKSGKPDQSSGKLVKPNGESRNLI GMNLDDGSALTAFRLRRADGSADWAGGSFRPRDGAVRAFG

 GMNLEDGSALTAFQLRRQDGSALWDGGSFRAANGSTY IAK SLHLPGDEKLMLYRLRQKDGREN LFGNWIMPDGRSAEIA

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 SLSFDDGNKMMGFRLQQTDGNN FTSATWITPDGVTTAYT SLHFESGAKLMGFQVRDDQGA FTSGTWIHADGRVEPFR GUNLYGGGGLMAFQMRDGEGRADWHAGTLSEEDGASRDHG
の SMVFDDGVRLMGFTLHDEDGSD YTQATWIEPDGTTTAFP ALRFNNQTTLMLFQLREASGQPHFYAGNLMQPDGSNQPLA SLRLDDGAKLMGFVLRGERG DFTSGTWITPDGTAQPLA


 AL R LD D G S A L MLLF QL R D S S G D K H F Y S GRRMFPDGRGHN T GI NLAD G GALLMAFRMRDAQGQTRFAHATWRDAAGHLRQFG

 S I H L D G S A L M $\square$ S QVRREK N A LDP FYF GSRSWP D GRVVQL G
 GI D L D D G GAL MAF Q $\quad$ DR DKA GRKFWA GGTDRAA DGSTHALS AL QLD NRSELMFYRFRRKDGRPPNSTGAWFPADRSK LPPL T
 AL R L N D GSALMLFQLRDEKS $\square$ SAFYSARRMFQDGTGRNI H S L H L D S G E K V M L S L Q F D R G T A L M L Y V L R K E D G T S P T S G G T F I S A D G TVVQP L T

 | $S$ | $Q$ | $L$ | $S$ | $D$ | $G$ | $S$ | $E$ | $L$ | $M$ | $Y$ | $Y$ | $Q$ | $L$ | $R$ | $H$ | $Q$ | $D$ | $G$ | $T$ | $P$ | $D$ | $F$ | $S$ | $S$ | $G$ | $L$ | $W$ | $V$ | $P$ | $P$ | $E$ | $G$ | $E$ | $P$ | $V$ | $H$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $L$ | $H$ | $L$ | $D$ | $T$ | $G$ | $E$ | $K$ | $V$ | $M$ | $G$ | $F$ | $R$ | $L$ | $R$ | $D$ | $E$ | $S$ | $G$ | $P$ | $D$ | $F$ | $T$ | $A$ | $A$ | $T$ | $W$ | $S$ | $P$ | $D$ | $G$ | $N$ | $P$ | $T$ | $P$ | $L$ | $P$ |
| $A$ | $R$ | $L$ | $E$ | $D$ | $G$ | $S$ | $S$ | $L$ | $M$ | $L$ | $F$ | $Q$ | $L$ | $R$ | $G$ | $Q$ | $D$ | $K$ | $S$ | $S$ | $F$ | $Y$ | $S$ | $G$ | $R$ | $R$ | $M$ | $F$ | $A$ | $D$ | $G$ | $S$ | $G$ | $R$ | $N$ | 1 | $A$ |

 SL QL D D G S A L ML Y GLLR QENGDTMDSS GTYVSSTGETTQIDD
 A L H L A D G R D L M F Y R L R R R D G N D P F S G G T L V A A D G S A R N L R
 SLHLGAGEKLMGFRLRRGTSDFTAATWUDADGTPHPMP GMNLDD GAALTAFQLRRRDGRPDWAGGSWRAPGQADRSFG A L QLD D G R D FM F Y R L R R N D G S D P F S R GVLV E A G G Q A R S L R S L H L A G G A KL M A F RL R G G G S E E D Y L S G S W IT P Q G QVT A L G
 AL QLD D D R EVVMYYRMRRED GS DP Y S K GLIVVAP DGGS QLI R S L QL Q D GHDLMFYRLRKQSGADPHSAGKWVQPDGQAQTLV


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| PGAFHAEAL |
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| A DE | RGEV $\square$ FKPVRTWKSPLT



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DGAFAAMPVR AKVA
SDE DA DEVL DWH QI DTS $\qquad$

Q
D


DGYATAEPLESGEVA

| $D$ | $G A V$ | $A$ | $T$ | $P$ | $L$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $A$ |  |  |  |  |  |
| $V$ | $Q$ | $L$ | $P$ | $G K$ | $T V$ | $R V$ |




D G AL A L T P L R T A SVE





A A EVVVFSAERWWT
M $P^{\prime}$


 TNDI RLT PI DY T S VEGK

D GR LIA A E P L GVA EVVA
$P$ N G QMTPLE WQSTVNG


S
 G H S YP T K W W

S E D I R
NTEWQLDVLDTWHSPTS


 | $R$ | $D$ | $D$ | $V$ | $L$ | $E$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $D$ | $S$ | $I$ | $K$ | $L$ | $E$ | R S DV A F R Pla V WR S R A DGAFQADPRRHVTVA


PEHVELEPLEHARMP S

S E DVVNLEVLRTWRS D

| $A$ | $Q$ | $D$ | $V$ | $E$ | $K$ | $P$ | $L$ | $R$ | $Y$ | $W$ | $Q$ | $A$ | $E$ | $S$ | $G$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $C$ | $Y$ | $P$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $N$ | $N$ | $Q$ | 1 | $R$ | $M$ | $K$ | $P$ | $Q$ | $H$ | $F$ | $R$ | $E$ | $V$ | $S$ | $G$ | $\square$ |



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 Y GLQ WT LF R Q G VD WQTP QL WLA QFAI T DLATGQHLQDERT


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 Y G F H $\quad$ I T F F F R V A S Q WA A R H V W M G H T A
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F
F
V

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



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## S



 SAHLDS GRRDLMMYFLRKKDGSEKESSGTLVESNGISRHLD SLH LANGEKLMLFRLR GARAYYSGNWI GADGATHLLA ALRLSKETSLVVFQLRDSTGEASYAHAKLMHEDGSGQTFS SLHLNSGHKLMAFRLRGGDNHSDY LS GSWISPDGEDMPLS SAHLDDGRDLMDCQIRQADGAPNYGFGSLSRSNGTYEILS GMNLDGGGALTAFRLRRQDGSALWASGSFRAANATQQVFE GANLTDGSALMAFKVRSRDGHADWAHAALRNRDGRMTTFN $S L H L N N G D K L M V F N M R N R \quad G E Q Q F V T G S L I T P D G Q V T P L^{\prime} A$ AI QLEDGVELMLYQLRLTDGRPPHSSGSLIYPDGRIEHLP
 SLHLTEGRALMAFRLRQRDGNAHYVYGSLIDASGNVTALD SLHLNDGRKLMAYRLRGGENGGDYLFAHLFDAEGNTQQi G SLHFK DGYALMVYQLRNTH G KHWLS G S WI S P DGSSQTLK
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 S I H L E D GHKLMAFRLLRDQAQGADYRSGTWI TPEGQATSLA
 $V F D L D D G R T L S V T Q S R H$ DQQLP YTYGTLADRSGKKVI S L S S VLHLDNETTLSUSRYRHA QQLPYLFGALSRKDGKVVKLS ALQLDD GLDVMYYQLRRPDGTPHELSGRWMPLDAGDALLIE GFNLADGAALTAFVLRQRDGSPVWAGGSFRAAGGAVQAFG S LHLDDGRRLMAFRLRGGGDDGDYRSGSWDAPDGTTRPDG
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A D
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 H D T $V$ V R F T P L R H WT S P A T G T R Y P V V Q Q Q M A C P A G R F T I TA MV



 N G E L Q L E PLL A I S DV G G R DV P T S WR L R L P SR DVVDV T REDVELTVVLDTWKSPRGG E YPSRWK L NGAFTARA
NGAFTARADE Q QSDVNGRSI
SEQIGMTATAWQQTQSG



A
AESTLTPLENADVA
EAQFSIRALRQWKSPTT


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F KSFRFPQDHLFHKGFRVEWCYFVGDLQTDEGRE FAVPQEGVALSFPTDHGAHPDYRI EWWYVTANLVGEDGKQ FSFPKDHSFHSDFGLEWCYFVGHLESTSGNR FSFPKDHNFHSDFGLEWCYFVGHIKAESGNL
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 5
f

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 Y GFEF VI F Q V D R K S F P KII Y L A H F Al T D LIN R R S F S Y D Q

 Y GLQ WTLLFR FRSDWNN QH $F G F Q A T F F R Q A Q A Y Q H G Q M H L A H M A L L D A G S G K F L H Q E R L$

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 Y G V VWN F F K L A N G WQ N S QL F L S H VA V A A N A Y Q V WK E Q R D YSFHDTTFLVNGMMNMMVNHVSFADYQTGRHYDDQRS




 Y GYEELS F F R S D G D S WN P E L Y P V H F A I S D L S K K R H Y T S Q T i




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100
110
120
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 ARGDIGHASAHAQPFEVWLDDWQLRETNEGAWRLQVQGND ARGGIGQTGVTLSPFQAWLDDWQWQG GDQPLPAQVRAAT A A GNVGNAYVKRQPFTAVVDDWQWASESNGMFPSTATSPS ARASI DSAAASDTDTELRLRDWSLKREARSGYRARVAGND
 ARGGDGQAGISQRPYRVWIDDWQWRSLGRTPFPVTAGAKD ARGGNGQADVVADPFRAWI DHWQMASDGDGHWDLEVAEPE SRGGVGQAGMNVNPFKDWIDNWVWDSSGSTPFPGELNASS AREGFGRAGAALGDTRATLGDWHLTREGSSLYRARVGSAG ARGDVGHAGARAEP $\begin{aligned} & \text { RAVWLD } \\ & D R G A L D Q L E A E G Q S S W R L Q V A A D N ~\end{aligned}$ AAGGVGNAGVNATPFSATLDNWQWQSTTERPFPASLREDT SRGGI GQAGVLMNPFRMWIDDWDWQSSNNFSMPLHVKTDD ARGGUGQAGMKSAPFQLWVDNWKWRSMGATPFPLEVSTDD WREVPGGFGATGEPVLAWAGRWADADGDDGTFTLSARDDG SRGHSDLAGAGGSPFSVYLANWRWQSQTEALFPASADGKA ARGD $\square G Q A G A V A N P D D \| W L D D W R L T Q Q P D G A L R L Q V N T P Q$ GRS GQVNITAQPFEARLDDWQLASKEATFLPLNLKAQQ AR VGQANITASPFEAYLDDWSLKSAESNFLPLKMTAKQ ARGGTGQAGVTLAPFSAWI DDWQLGADGSGDWLLQARADN ARGGDGQSGTNVNPFK\WI DNWGWQSDGYTPFPLDISTND ARWPADTAHASSTDTNVTLRNWSLRRTGTD LQADIAGKD GRA GQVK IQADPF ITQLDNWYLRSETETFFPLTLHAEE ARGDVGHAGATAQPFSVWLDHWHLRASGHVGWRLSVATEH RANDPR LD

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 ERKLGGMAGYDSK KI FSGDFVLHVEGKTKFHLVAHSPE ERELGGVAG QDKTNLWSGDYRMEVTGPADFRVTATDSG DFWGYGAGASRDELEVFVANWRAERAPDGSHRIRAAEGG
 S R D Q A E L A GV DAS P L R V Y L D D WQ WN S S S D D L F P L K A N S E Q



 ARGGI GQAGVQAQPFRAWINDWSLQGSSGEHLQMVAGGDG
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 A R GG $\square G G V G \square R Q R P Y Q L S D G N W S \square R S F S E R P F P G R D V T D Q$ WFSNKNI YARTDRYEVAYKDWK A GGDMERHTGTARTKD

 AR WA YPGAWASTEELMDVVGIA NWHMSSTTTDKQFTANA HTGG


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UniRef90_Q1N063 UniRef90_UPIO0035F23A5 UniRef90-B6EHP9 UniRef90_UPIO00255B4A6 UniRef90-F9RYL4 UniRef90-K6ZFY9 UniRef90-A0A059KIH6 UniRef90-E4PKU8 UniRef90-IOK198 UniRef90_UPIO003734818 UniRef90_UPI0002E02415 UniRef90_U3A8X7 UniRef90-F7SRM5
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-

F S WDLLSLSPS QPLL LQ GDAGHSRKGLAPGLASHYVSWPQ|L

 MA I DL NLT Q SRPPVLQQGQDGLSRRGPEAGNASHYYSLVQQ


VAI DLELEA QKPPVLIH

 LGFALQVAD $V \mathrm{~V}, \mathrm{~V}$ S $L$ | F | Q | $L$ | $D$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |
| $H$ | $Q$ | $C$ | $T$ | $E$ |
| Y | L | $T$ | $L$ | $N$ |

 | Y | $A$ | $I$ | $S$ | $L$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $S$ | $L$ | $K$ | $L$ |  | F S I K L S I NQE GP VI



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F

RVIAGTLLRQGRRQAVDGRAWFDHEWSTALLGDGAVGWDWL $E \bigvee R G E L K A N N K V V S V S G Q G W M S K E W G S G L L A E S Q K G W D W F$ KTTGGKVFDD GQPVEVVTGTSWMDHVGA ERLLAPMKQA GWDWF ATTGDLRLKGENIAVNGYSWFDREWSTSALLDNNQSGWNWF PTEGTVTVAGHRHAVHGVSWKDHEFSTSVLSPGTVGWDWF QVA GFLV SD GKRLAAAH GRA WF DHE WS TA A L G D GA V G WD WI
 ATEGRVVTGGDTLAVTGLSWMDREWSTSALGANQVGWDWF $K T Q G L I$ RVSNKTWKVLGTSWFDHEFTTHSLGKNEVGWDWF
 RIIE GTV T LG DET LAV S GK GWF DREWS S QFL KA GQQ G WD WF $R S S G T V R L E G K T L P V Q G S F W M D H E W S S T V L A P N A Q G W D W V$ $A D E G T V$ TI E GVRHQV S G S G WF D R E WS S Q FL R S D Q T G WD WM QANGGTVN A L G I K E G T L K
 $N V S G K L T F A G E K Y Q V T G N A W Y D R E W S A S L L D K R Q L G W D W F$ AV R GNVT LD NKVYSFVGKG I LEHEWGSGLL DENQQGWDWF AI D GEI TIIDTVTFTVVGQGWFDREWSSQYLREDQT GWDWM
 AVEARWQPEGAPRTLTGRGWLDHEWSETLLLHPAVGWDWI
 KAKGSLILNGKEVAVHGQAWLDKEWGNHLISDSTLRWDAF
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 QAKGNITTFAGETYKVTGDAWLDREWSSALI DPSQNGWDWF
 QTSGSLSDNGEPKVK
 $K \vee K G S L T F A G K T Y K V I T G T$ KV AV RGSVVTHDNQTYTIVTGQGLLLEHEWASGLIGEGRQQWDRF $E V T G G V Y W Q G R W Q K V T G Q A W F D R E W A S Q M L G Q D Q L G W D W F$ QVKGTLTGNGSPFNVKGTAWLSKEWGNNLLNTDRSGWDWF
 AVSGTATIANKQDPLTGAAWMDHEFSSSQLTSDQDGWNWF
D

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1745826

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 EANGTLTYQGKQYHVSGNAWYDREWSASLLDKTQRGWDWF QTTGGS R LK GKS L K V R G WS WMDHEVVSSSQLAP QQRVGWD WL $K T R G V V E L N G Q K Y R V N G E S W F D R E I N S D Y K T D K L K G W D W F$ $D V K G E L W W Q G Q W L N T G S A W F D R E W G S A M L A Q D Q Q G W D W F$ DVKGEVLWQGQWLNVTGGAWFDREWGSAMLADDQQGWDWF A S T G E L T S D G K V L K V T G R A WL GAQGTI QRGNQ\|YPVKGLAWLDRAWGAVPVPAGPVVWDRF
 QVS GHLLDDGT GWRSVVK GEA WLDDREWS SALLLD DRFVGGWDWM STQGELILDNGKK DQI S GNSWMDHEWSNTALSDPSNSWDWV

DVT GEV EF D S QYHTV K GRA WLDDRE WS SAFI DP S QA GWD WF

 $\begin{array}{llll}E & T & K & G S \\ A & L & Y & L \\ L & L & G K & E\end{array}$


D | $D$ | $S$ | $G T$ | $V$ | $K$ | $I$ | $N$ | $G H$ | $H$ | $E$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $T$ | $K$ |  |  |  |  |  |  |  |  | A TR G VVV

 QV K G N L GVVNS QP I Q V



 EAS GTIRIG NQDIKVA GSASTTQVVWG A L A G T L V F K G K E I P V T G T A WF D HEF G SV K A DVI LGKQTQALE GKA WLD HE WS S K S S G T L Tli GNQ A I EVVMSGMAVVFNQVWG $\begin{array}{llll}A & F \\ S & D & P & S \\ L & \text { T A G W W W W }\end{array}$ | $F$ | $P \square G G W D$ |
| :--- | :--- |
| $F$ | $D$ | F DL S S K D $\square$ S WD W I $\begin{array}{lll}F D D & S & Y A G W D W F \\ R L I & G Q E Q Q G L D W F\end{array}$


$\qquad$

$\qquad$ TLGS G G G WD WY GWDWF $S S M L A R D Q Q G W D W F$ $S K M L A P E Q K G W D W F$ $N N L L P N A K Q G W D K L$ QP $L$ A A GQTGWDWF QP LA A NQTGWDW | $Q$ | $L$ | $A$ | $A$ | $N$ | $T$ | $G W D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $W$ | $W$ |  |  |  |  |
| $A$ | $T$ | $G$ | $T$ | $G$ | $W D$ | $W I$ | K ALAK GQS GWDW I $D M M G Q K Q S G Y S H L$

$Y M G T T A V S G W D W F$ QLMMP GAVGWDWL
 HGLYQA $L Q Q Q$ G WQ WF QLRAKLDIDDGVSHALTGRGWLDHEWSHGFMPEGAA GWDWV

UniRef90_A0A011 MXU8 UniRef90_C9QL91 UniRef90_M1YYK8 UniRef90_A0YFV6
UniRef90_K9PBN4 UniRef90-C7RP36 UniRef90_A0A024IG12 UniRef90_UPI0003B7AE85 UniRef90 B3E118 UniRef90_UPI00039DA631 UniRef90-A6EXZ3 UniRef90-A6GQA8 UniRef90-N6X691 UniRef90_UPIOOO3958952 UniRef90-F2G8N1 UniRef90-Q21YA2 UniRef90_Q1N063 UniRef90_UPI00035F23A5 UniRef90-B6EHP9 UniRef90_UPIO00255B4A6 UniRef90-F9RYL4 UniRef90-K6ZFY9 UniRef90-A0A059KIH6 UniRef90-E4PKU8 UniRef90-IOK198 UniRef90-UPI0003734818 UniRef90_UPI0002E02415 UniRef90_U3A8X7 UniRef90-F7SRM5 UniRef90-B4UAHO
UniRef90-A1S9V3 UniRef90_A1S9V3
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UniRef90-A1TXE7
UniRef90 Q481B3 UniRef90-A8T1W7 UniRef90-B5FCI5 UniRef90_UPIO00363A209 UniRef90_U2ZID2 UniRef90_D1CBD7
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210
220
230
240 GII N|LAD G GA|LMAFRMRDAGGTTLYAHAAWRDAGGR|LRQFA VVHLDNDMTISVSRSRHEKQLS YSFGTLSSNDGKVERLD
 SAQFEDGSALMLYGLRREDGGKPFSGGRWI DGDHDVE LI G G $\square$ N A DGGALMAFRLRDARAATVFAHATWRDAAGHVRQFA GMNLFDGHALTAFRLRRADGSTLWTGGSFRAAGNAIHRFA A L QL D S GYDL MYYQLRTAS GRPSFSEGAWVDPSAQKTS LT

 GLHGDQGEALMAFQIRNRDHTKPWTHAALRQADGTVRNFS ALQLDSGGRIMAFRLRET GLNLDDGRAL MVTQUR
SLHLDDGSKLMAFRMHAST G N
 G
N
K GQAYTAGTWUGPNGEAQSLK SIVDSK S SK L M M F FIIRGE KSYDYQS GQEPYRYGS
 ALHLDDGRHLMVFRVR GAEDYFSATLVAADGTAVALK
 GMNLDDGSALTAFRLRRADGSTLWAGGSWRRAGQQAQAFG

 S I H LA D GRSLALTHYHNPQD IDRYDSGTMAGKDGSVINI D AFHLEDGRSLMVNRYRYQ GKMPYLSGTLATRSGEIVFLD SLHLNDGRKLMAYRLRGGENGTDYRFAHLFNADGQTELI G ALRLADGRDLMLYALRRADGTVDFRRATLVTPDGAVRWLD AL RLDDGSALMLFQLREQNAKSFTHANRMWPDGRSQTLE ALHLDSGDKVMAFQLRQQDGG FLSGTWIPESGESVALP SI QADDQGGLMAFCIRNGQ
 VI NLTPTETLTISRYRHHEQ GI NLFDGSALTAFQLRDQAGNMYLYGSUISNSGRDTLLND RDAGNAMWDGGSFRSGSGQRFGFT


 SV RLNENTALMVFRVR S VVNLDEESTLSVNRFRHQNQAPQLSATLMRNDGKVVVLE SLQLDNDTEYMLFVLRDNRGRWDGQFGTFIDKDGRKRELK
 ALHLDSGDKLMAFRLRGSEQ KF V V S GTWIPKEGNPQALG
 A QLKDGRE MVYRMRRKDGADRHSTGAWIDAAGKVQHHS SLRLADGRDLMLYVLRRADGSADWRNGTLVGRDGRARVLS
 SIVSDENQGLMLFCIIRDARQYYDYCSGTRIDQQGNATLI E SI RLD DGRDIMAYRMRTRKEADPFSTFAWVDANGDASHQR SLMLDDGTELVIYR円KNKY GNVDKSSAAFVDKYGGKINDD SLRLSTDKALMIYRIRSSEQ DFVYGSLMYRDGRIEILD SLRLSSSDKALMIYRIRSSEQ DYVYGSLMYSDGRIEILDD
 LL QL DDGRELLI FRLRRRDGGTP $\square$ NSGFLVDRAGK QQSFD SIMLDDGREI II YQIKDKDGKDKSSYAAI I DK S GNKINLD GLQLADGHNLMLFCLRPAEGNAPHCDGSLI SANAEVITLV CI QLEDGSDI MAFNFRKTDHSNSESFGTIRFSSGKKIYFE
 ALQLDDGQDI MA WRSHDVRGTVVPNWGTLVAPDGSTRHID
 0

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 SLHLDTGDKVMAFRLRDDQDGY
CLSDVSGGDYVFFRFRESSALSPEDFGTYRDPKGKVTSWT SLMDDKGGDYVFFRFRESSKVSPEIFGTYRDVRGKVTYWS LFRDQDGRVLSLVKSHHQEKUHPYSFGNLYTPDGKHDALS GUNLLDGGTLMAFRIRNEKAASIHAHVDARDRAGRA A KGG A $\square E L D D N R Q M L F D F K G S D$ SDVEKSGSUTDAEGRTVTLN GFNFDDGSALTAFQLRDTQQQTLWAGGSHRTVQGQLRTYK


UniRef90_A0A011 MXU8 UniRef90-C9QL91 UniRef90_M1YYK8 UniRef90-A0YFV6
UniRef90 K9PBN4 UniRef90-C7RP36 UniRef90-A0A024IG12 UniRef90_UPI0003B7AE85 UniRef90-B3E118 UniRef90_UPIO0039DA631 UniRef90-A6EXZ3
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UniRef90-N6X69
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UniRef90-F7SRM5 UniRef90-B4UAHO UniRef90_A1S9V3
UniRef90_A3JAL7
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UniRef90-A6D6Z5
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UniRef90_W6RK44 UniRef90_K5CGB1 UniRef90-BOSAT5
UniRef90_U3B114

UniRef90_UPI000363B302


SYEVQFTPLIRHWQSPRNGARYPVQDEVVRFGEHHDRTRPVI
D S DI T ITPLDE TVLRNGKRVPLQWSIVVPKHGIDVNT
 ADDYVLTVKRTWRSPHSGATYPAAWTLTDPDQELAITPQM

 $G N D \operatorname{lin}$ S




## 

PDEVRFTPGRRWSSAAT
A GQL N L KPGTQDEGAATGAR

## 

T I RAVDT
DKELRMLYPLETHQL
A D A WRA E P A R ERVA A T R D
VVSMTP D D HQG


NNDVTLQVLKTA
QHDISLRVVEQUT TTPS



UniRef90_A0A011 MXU8 UniRef90-C9QL91 UniRefefo-MM YYK8 UniRef90 K9PBN4 UniRef90-C7RP36 UniRef90-A0A024IG12 UniRef90-UPI0003B7AE85 UniRef90 B3E118 UniRef90_UPIO0039DA631 UniRef90-A6EXZ3 UniRef90 ${ }^{-}$A6GQA8 UniRef90-N6X691 UniRef90-UPIOOO3958952 UniRef90-F2G8N1 UniRef90-Q21YA2 UniRef90-Q1 No63 UniRef90_UPI00035F23A5 UniRef90-B6EHP9 UniRef90_UPIooo255B4A6 UniRef90-F9RYL4 UniRef90-K6ZFY9 UniRef90-A0A059KIH6 UniRef90-E4PKU8 UniRef90-IOK198 UniRef90-UPIOOO3734818 UniRef90 UPIOOO2E02415 UniRef90-U3A8X7
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UniRef90-A6D6Z5
UniRef90-D01F83
UniRef90_Q3JAR0
UniRef90-D3P9E2
UniRefofo-E1ST74
UniRef90-M6FCU7
UniRef90 - V4 $4 \mathrm{HIQ4} 4$
UniRef90-S3VY61
UniRef90-V6HJ05
UniRef90-10xT93
UniRef90-D7CRF3
UniRef90-C9P523 UniRef90 UPIIOOO31B89D5 UniRef90-UPIO0036EFBE6 UniRef90-D6TKH8 UniRef90-B9KY26 UniRef90-UPIO0047556E6 UniRef90-A1SV64 UniRef90-T1XY77 UniRef90-V7D5D2 UniRef90-S3UFH2
UniRef90 W6RK44 UniRef90-K5CGB1 UniRef90-BOSAT5
UniRef90 U3B114


DDQELSTTVPTPVSYWEGLVHV QALNNDLWLPFIIPYGEGPVKTTVGTHQAFGFMQLTGY ADQELT TASATYWEGALRYEGHGGERGRGYGELTGYV DDQELTTKRPAPVAYWEGVVKV DGSLEGRGYLEMTGYA

ADQELVLN
PPG DYWNAGLYPYWESPVTVT
WDGN F WNEGLYPYWEGPVRVT

DDQELDSRNSTGAVYWEGLSELDSQQ
VRDE

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UniRef90-UP10004770205 UniRef90_C5AKH6 UniRef90 UPI000379839C UniRef90-UPIO003457A77 UniRef90-UPI00037E3049 UniRef90 Q0G366 UniRef90-UPI0003B3A5EB UniRef90-UPIO0037A66F4 UniRet90-UPIO0028A2EFC UniRef90 UPIO003820FC4 UniRef90-E4U8KO UniRef90-UPI00026C7A2A UniRef90_UPI0003B698F0 UniRef90- G8TQX1 UniRef90-A0A010QVK9 UniRef90_B9E528 UniRef90 LOA6E3 UniRef90- F2NK81 UniRef90-UPI000373D4BD UniRef90 A3Y7S4 UniRef90 $\times 1$ SO48 UniRef90-U1PKYO UniRef90-19C3G5 UniRet90_D7BGE6 UniRef90-D3PR56 UniRef90- 445442 UniRef90-A2SS46 UniRef90_UP10003B479B6 UniRef90_Q72JY7 UniRef90-W6TCFO UniRef90 ${ }^{-}$W6TCF1 UniRef90_UP100023798FD UniRef90_F4GK26 UniRef90 BoDLB8 UniRef90-K7QVQ4 UniRef90-E1RDO2 UniRef90 A4H9X9 UniRef90 ${ }^{\text {D2B1NT }}$ UniRef90-H8JOY7 UniRef90-M6HQL1 UniRef90-E9BE17 Uniinefol-J4JUV2 UniRef90 LolZR8 UniRef90-Q4DD12 UniRef90_10ROS6 UniRef90_T2KMRO UniRet90-K2M8L8 UniRef90-G2P3R9 UniRef90-U6EDK9 UniRef90-K0K260 UniRef90-LODWU5 UniRef90-X0XHV3 UniRef90-J3AUZ1 UniRef90-K2R6T9
 $P P \vee R L P A D D A V H D K L$ TE WWYY S GHL Q T D S GE K
 $Y P V P Q P D V L P E L P R A H G A H P G Y G G E W W Y W V G H L R D A E G Q R$

P P V S LP A D D A P H T MLLT E WWY Y S GH LQ T A S GER
PPPLVTLPADEGPH DSVIEWWYFNGLLTDDRGQE ARPDKMPPVKLPADDATHENLDTEWWYYSGHLQTES GEH
 FEPVLPNDKVVTLPSAY QAQREFKHGDWHFFANVVDHSGKK

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

 Y S L A TVVPGAVRFPR DLGP HYDY QTE WWYYTGNLLETAD GREL


FEQPAP

PAHAAAGVS LP GDESPHVSAGMEWWY $\square$ T GHLSGKDTHS
DLLP H GDF P $\square E W W Y$ MT GF LK T E K GRN
F VEVVEDRPSRFPADHGAHPEYRGELWTLFGQLTAASGGR $\square T L P H D E A A H R$ QPAE WWY MTGFLLDGTDKHS

F D P A VQPRA D D L G P H G D L MEWWY LS GY LPA Q A $P \square D L Q \square H D C P H A S S T \ E W W Y V N S H L T Q A D H R Q$ A 1 S L PKDETSHR QPVEWWYMTGHLTDPQGRQQ P D D A A A H D L P H N A A I E WW W $P$ VAVVDPA A DLTAHPDRLNESWYVTAHV TAGGHH RLP A EF GPH NHRLE WWY LSS A LP E E G
A DPGFPVVHMPADQAAHPNATQEWWYTVGHVR A GGHK $P T L V D P A A G L T Y D P D Q P N Q S W Y L T A H V T A G G H R$ DPNRQPQ PSDFGPH NVATEWWYVSGYLPESG VDPSRPPS PEQWDPQP APDEWWYVSAYLPESGE PLP Y Y P P L E F P R D E A A H H E H L I E W W W Y F N G K L T T D D G E H


SFEQEWLSHKKA SEWWYATGFVKDEAGNE
 E
R V DPTRAPQ ADNWGPNPS PVVWWYVSAYLPEAG

NAVLFPEDEWPHDEL VEWYYWT GHLKTDDGRW PHKGKP L DLLETH DLP HDSSSGTEWWYFHGHLGETES GRA
 LVDPGRPPS PDTWWGQAA A P LDEWWYVVSAYLPEAG

DPDRLLTADNWGPNNTPLEWWYVSGYLPEEG
DFDTEWLLHRKC SEWWY ATS ILRDEENHLL

 $V$ D P GRLPE PEDWDPKP A QL E WWYTS GWA E DLPYKAEYAVNSWFAIGH TVVDEHR
 1 PPRR



PA LQ WWY A NAHLKGEDRPS
PAVDDPAADLGRHAPGPKPTWYFDSSVK A NGQE $F Q L V P G D G Q L E F P A A E G E H P D Q E S D T W F D A G Q L D A A E T D R$

$F R L V P G D D Q L E F P A A E G E H P D Q E S D T W F D A G Q L D A A E S D R$
FALVPGDRQLDFPAAEANHPDCESDTWFLAGELTGES GRG

$F Q L V P D D D M L R F P A A E G Q H P D H E S D T W F D A G E L N G T S$ G R S




RFPEDHGDHPEQFGEYWFFA GRLNG $\square A D N S$


UniRef90 M6LY33 UniRef90-A0A011 Q5G8 UniRef90_UPIOO036C21FE UniRef90_D5EPW0 UniRef90 U6ZU46 UniRef90-AOAO11PGM5 UniRef90-U1DGZ9 UniRef90_UPI00036BBB60 UniRef90-C7RQH5 UniRef90-D3D491 UniRef90_E3BQC8 UniRef90 D3D477 UniRef90-W8F2S8 UniRef90-K2AD46 UniRef90-ADL815 UniRef90-D3CVNO
UniRef90 UPIOOO2F06768 UniRef90-L8JRV4 UniRef90-N1U8J1 UniRef90-C5AKH5 UniRef90-R4KGK8 UniRef90-A0A040WPF2 UniRef90-101NB7 UniRef90-B6APX7 UniRef90_WOB7Q0 UniRef90 Lot2J9 UniRef90-A0A034TN16 UniRef90-E3IVW4 UniRef90 ${ }^{-}$W7WA42 UniRef90-C6IOM9 UniRef90-F9UER4 UniRef90-LOT3T0 UniRef90-F5JI52 UniRef90-Q9RVI8
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UniRef90-G8RSA1 UniRef90-LOIZR8
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UniRef90
LODWU UniRef90-X0XHV3 UniRef90_J3AUZ1 UniRef90_K2R6т9

YGYETSFFK ${ }^{50}$ GIIIFGKNREA ${ }^{60}$ PVVHFAIISD ${ }^{70}$ NKTHTTSQTIV YSFHLASFLRRGTLTHTVF HGSLLDHRTEKRYTEQ FGFQSTVFRLASSFGNRQLYGAHSALSDLNQGRYLHTERV GFQVFRAAF GSQQLIMAHVALSDLNTGQYLHTERV

FSFHLATF $\square R Q G T \square T H T V H G S D D H R N G L F S E$ YSYHYVTFQ GEAVGAAVPHLLQASLGDHKAGRHDTGEQI YSFHLASFMRKGSFTHAAF HGSLDDHQNEKLYTEQ YGFEVTHDRLDALATEPVAYNGHGAL SDDTRGTFTQNMSM FGDQWSFYRVAHGWSNSELY FGVEYVFFHFNLN GKRDWQMVNFALTDPQAKQFRYDYKV
FGYEVVFFAFKTGLLMRDQLI QAATTDVEGQKFHFGQKV YGFETMVVRNDGLDTAPVIYNVNMSVTDLTRGTFKQNRDIU FGVELCFFAVDASADHTTVQMDNAAVTDDDNDKFYSKVTY YGVEYVVFHFNPRNKHDYL MTNFAVTDPANNLFLHDYK YGYELSFFK GDFGKNREAFPVHFAISDGENKKHKIDAQV FGYEVTVFQTWPIPSGEANYTWHFAVTDVTNKRFQSEERV
 KGYEATFFRFNSPWDTHGLMSDHAALTDTEKTKF TWMEKT
 FGYEVTVFQLWPLGSGPATYSWHFAVTDVNNKLHKVEERV YGFETLINRVDGLSTAPVIYNGNFA【ADLTRGTYSSDNVP

पGFQATFFRMKGPWAPRETFGFHGAVSDGDRKTFTSTER YDFQLGTTRRASAWAANAVYRGRLTLDRADAPGVQSAARL YAYEMVVFQ\|VGDANTQPVYDAHFA $\ S D L D R G D F R F K K Q V$

LAFHWAQFKVSPPNFPTDVFFSHVAVTDTTGKVTFDEQN CSLFFASFFRMATGRDEQTQQYHYAAISDVSTQQYYTDSLV YGFELVVFQVVGVAGLTPVYSSHFAI SDLNRGQFSFEERT LAF HWAQFQVVPPNGPLPIMIDSHVAVTDLQTGKVTFIEQN LSLFASFFRKI IGDATQEPQYGHAALSDTDNHRYHAVSLG YGFMAN HLISGDAKTGHTLSTVSLDDEDTGWYTKSEUA

पAFHWA YGYEVQLTRRGTMFGTQGSADSKVSVTDEESGAYTSEQKA LAFHWAQFKVNYRGDPYHA GHLAVADLRANTFENESQS LAFHWAFFKYYAPEGPYPFASEHLAVTDLRADRFDFQERH LSFDVAVFNSADNVKGRVYTMVHMQLADLDHKKGYGAAK $L G G Q L H L F Q R P S A W A S H R Y F L A Y F T R T D P D A K T F H V E R R Y ~$
$F S G F A S T R T V I D G E A \square Y M H S V S W A L T D T D N Q K Y Y P D S L A$
YSYQYTVIKASDPMMTP WDSHVATTDFNNKKHYFTKKT LAFHWAQFKVN FRGVPFFTSHVAVTDLRNNTLTETEQT LADQWAAFKAYTPPAPGPYFAMHLAVTDLEADRFLFNERT $\square A F H W A \square F R \square G P A F \square P G P F H A S H L A V T D L R E D R K F F D E R F$

FGYELVFFVVMGNQKMQVVNH AVTDVQDEGFYYTMDR LSMFSSLFERDLUGEKLAHVNAGAAISDPRTPDEVVSPRP LNFHDMLFPMPGGGSAGQ ACAVSITNETTGWYSADDUV LAFHWAFFKAYVPFFPGPYHAAHLAUTDLRSHQKFFDERF
Y S CQYTF L R MR LTF $L K P F I L M \quad A A D T D F Q T K K H Y Y T Q Q F$ YGVQLMFWRYGLTDDENQVVEDHFAVSAAGERHYRMRPVV YALHFAFFKAYAPPSYRQLDAAHLVLTDLRTGARRFLEVS YAFHFAFFKAYAPPSYRPFHAAHLALTDLRTGKRRFLEVA LN Y $V G L V L V F T R H L A T R A E G E P L R A H F A M T D H T A G R H T S A V W V$
$F S Y Q F T L A Q V N L F G V T I R L L I C$



पAFFVSFFRRAEESCPTTTTKHHWALTDGKHQKYYADPRP FGLQVHTRDLPSR AEAAYRWTFSVINKTTGWYKDYDAM SFAFLTDFNKNRPGGTIVADFYTMALFDLDTGDYYTDYDM YGYELSFFK GDFGKNREAFPVHFAISDLENKTHTDSQTV LAFFASFFRQAGDNCPTYYDACVWALDDLENMKCYADPRP LSAFLTIFNKNRPGGTVVADFYTMALFDLDTGDYGTFTDY FAF LTTFNKNRPGQSIVADFHTFALGDLDTGEYYTDYDM EFSFFTSFFAFKDPKNEHYDACTWALDDVTEKKYYPDSDL YTYLLIYFRSYAGFDGFRIIN
FSFFSSFFAFGDSNADDVYDACTWALDDVAEEKYYPDRRT YTWMTSVLKSGPAGVSHGAWLMHRAVREALRGDTAQDHRV SFAFLTIFNKNRPGGSVVADFYTLALFDLDTGEYYTDYDM YGULVSFYRFGLSDWDNQIFEMQLAVARAGEEHLQARPFA LGFRLAFYRLASAWAAHQMYWASLVLEEPSASWAHADERV VGFEFTVEKRWVAGSNDFAYGGHEAVSDPETSEHLEDEVA

## UniRef90 M6LY33 UniRef90-A0A011Q5G8 UniRef90_UPI00036C21FE UniRef90_D5EPW0

 UniRef90_U6ZU46 UniRef90-A0A011PGM5 UniRef90_U1DGZ9 UniRef90_UPI00036BBB60 UniRef90-C7RQH5 UniRef90-D3D491 UniRef90-E3BQC8UniRef90-D3D477 UniRef90-W8F2S8 UniRef90_K2AD46 UniRef90-A0L815 UniRef90-D3CVN0 UniRef90-UPI0002F06768 UniRef90-L8JRV4 UniRef90_N1U8J1 UniRef90_C5AKH5 UniRef90_R4KGK8 UniRef90_A0A040WPF2 UniRef90-10INB7 UniRef90-B6APX7 UniRef90-W0B7Q0
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UniRef90-A0A034TN16
UniRef90-E3IVW4
UniRef90-W7WA42
UniRef90-C6I0M9
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UniRef90-E4U8KO
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UniRef90_K2R6T9
 ARTAGNPSDGRRDGFNLTFGKWQLQGNGEKHD ARMAGKD MREGW QARADSQSMS RVAGDYAEKFKDQPGHITRYPNG YRHGW QARASVDS LDLAVGPVRATQDPTERDDIEAADPD SRTAGNPSQGRKNPFAAWIDDWSLAGDPDAQMQVQAHGPG
 ARTAGNPSDGRRDGFDFSFGDWRLQGVGAQH KARMAGKD
$V G L Q P D V V P G S G G F N N T V G T T H M D G K N G V N H L F A G F S D$ ARGGDGQAGILNNPFRLWVDNWQWNSTGHAPLPLSVATDD VATQADVVPAGGGYNNTVGLLHADGKNGVNHLTGSFSDNS QR LPQ QLEPKLPLS LHAEKKDQTWTGDGEGRYHLQAAHQG VLKDPEDLDSKFDLTTDKTGNDVVTAKGGGGLHLHAEVDG YSIQNDQTPA GGGFSFDVGGVHMDGK NGVNHIWGGFPD



 RRTFKKSVSIESKPFAGURLDTSFLA GSSPETLHLREEFNG
 V S
 AGGGF $\quad$ V VAGP $\quad \square \mathrm{H} \square \mathrm{DGKNLVNHFSGGFS}$

ERRGFGRSVATQDPFSVSTGRNRLDHKDATTLALSFRVAD TRAAAGLAGADAQLRSVWIEDWSLS $\operatorname{L}$ S DGEPMRLVAGGEG $\square V G P L T N S T D R F D L D V A G F Q M$ GGSMGTYYAKASPPD

ES PQLGTGKASYPPLKLRDGDWTFEQTVSGP RGEFK LDA DPVALGLAQVSEERLFLDYDGNQFEKQADGSYLLTLADKE APGGF SVQPDRFDQNVLGFQMGGGSSGQYYAKASRSD P A $\square$ GSGSASFPPLK LTNGGWTFQQNGSA FDLKAGP



TLSH RH IQ DDSMKV VSPKALAKKETDGMLIECTGDD VAGTTGLINFSTGPYTYSVGKQTLQSQSDALFPLRLQAA DQDLLAPRGRAEPGPRLEVGGWRLYREGPGGFPRRGEAPG DQDLFAKRGEALPGPRLALMGWRFYREGEGYFRDEAPG FTAGKGTEVATEG LHIKFKDGLMSGDLDD DH MANADF


 DRILKNKAVYTQQPFSDTLEDCAMRVAQKGPFEMHLIEKD VK LI NKAVWSQQP SS T A DCAMRVAQKGPFEMRNTADD
 ERRLGGMAGYDSKQ I FSGDF ILK DESNSKFHLIDAHSPE DRLLKGKAVYTQQPFSIA LDDMRIAQEGSARFSMTNAADE
 APGAQPKMSVEDGHLCEMLY
 PVNYES DSETELNIVADQWATKRNSENQYTI SATSPY AEGFVKK EXKENEYDIFNDE GF LEGEGDDRYKLHNPVRN
 VAGTT GLLKFSNQPFHYEAGNNK I SQENDLFPLRMVQAWG DAGDYAW STYGLD DTAPGLRWTGDAQ RMSVSLDVPW
 TMPPVSDDEEGKADMEI NSFSYAFSESGGF IGIKAEAGN UniRef90_K2R6T9

UniRef90 M6LY33 UniRef90-A0A011 Q5G8 UniRef90 UP100036C21FE UniRef90-D5EPW0 UniRef90 U6ZU46 UniRef90-AOAO11PGM5 UniRef90-U1DGZ9 UniRef90_UPI00036BBB60 UniRef90-C7RQH5 UniRef90-D3D491 UniRef90-E3BQC8 UniRet90_W8F2S8 UniRef90-K2AD46 UniRef90-A0L815 UniRef90-D3CVNO UniRef90-UPIOOO2F06768 UniRef90-L8JRV4 UniRef90-N1U8J1 UniRet90_C5AKH5 UniRef90-R4KGK8 UniRef90-A0A040WPF2 UniRef90-101NB7 UniRef90-B6APX7 UniRef90_WOB7Q0
UniRef90 Lot2J9 UniRef90-A0A034TN16 UniRef90-E3IVW4 UniRef90 - W7WA42 UniRef90-C6IOM9 UniRef90-F9UER4 UniRef90-LOT3T0 UniRef90-F5JI52 UniRef90-O9RV18 UniRef90-UPIOO04770205 UniRef90-C5AKH6 UniRef90_UPIO00379839C UniRef90-UPIOOO3457A77 UniRef90_UPIOOO37E3049 UniRef90- Q0G366 UniRef90-UPIIO003B3A5EB UniRef90-UPIO0037A66F4 UniRef90-UPIO0028A2EFC UniRef90_UPI0003820FC4 UniRet90_E4U8K0 UniRef90-UP100026C7A2A UniRef90-UPI0003B698F0 UniRef90-G8TQX1 UniRef90-A0A010QVK9 UniRef90-B9E528 UniRef90_LOA6E3 UniRef90-UP1000373D4BD UniRef90_A3Y7S4 UniRef90-x1S048 UniRef90-U1PKYO UniRef90-19C3G5 UniRef90-D7BGE6 UniRef90 D3PR56
UniRef90 V45442 UniRef90-R7EY82 UniRef90-A2SS46 UniRef90-UP10003B479B6 UniRef90-Q72JY7 UniRef90-W6TCFO UniRef90-W6TCF1 UniRef90_UPlooo23798FD UniRef90-F4GK26 UniRef90-B0DLB8 UniRef90-K7QVQ4
UniRef90 E1RDO2
 UniRef90-A4H9X9 UniRef90-D2B1N7 Uniinef90-H8JOY7 UniRef90-M6HQL1
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UniRef9O_G2P3R9 UniRef90-U5WPJ4 UniRef90-U6EDK9 UniRef90-K0K260
UniRef90
LODWU5 UniRef90-X0XHV3 UniRef90-J3AUZ1
UniRef90 $\mathrm{K} 2 R 6 T 9$
$\square S L D L T L N N N S E \| L L H G N K G K S V K S R D P N F Y S Y Y Y S T P R \mid L$ FSLDLQLDDRNAPVLHQAPGTPVAGLLDFAASYYTSRPRM GRLELKLDPDKPLIRFGERGLSRKGDDPASVSWYWSYTR GQLSLRMEPSKALLAFGDRGLSRKGAAPAAVSWYWTYSRL FALDLQLNDRSPPVLHQAPGTPQAGLLDFAASYYTSRPRM GDLDVKVSAAKPAVLQGKQGYSEKSPAGNASFYYSYPRM FSLDLQMSDNRPPVLHQAPGTPVAGLGASGTSYYTSRPRM LISNGTMTQSTPTALHGOAGVIPYGPFGESASYYSQTNM
 FAYDVGLDATGPLVLHGQNGYSVKSAGAGQASHYYSQPFF LSYGLTLKQSTPAALHGGSGVIDYGPFGESATYYSQTNGL VATTLSTEPSKPVLLHNGTGYETYGEYTKAG YYSYPRL LSLDLFDSGDSDLLLHGDRGKSTKSRKNPNYSYYYSTPGL VTI DLNFVPQKPVALVGGDGK RILDLTLDPQKPLWEDPDHQLVTGDGPQDKAFYYSYPET
 FALDLKTSSDMPFVLHNGNGVVDYRPDAK TSAYYSSTAL FGYSLT DNSHVPYQKQGEQGYSTKSADGRVASYYYSQPF QSFDLTFTPLSPPVWHAAHKKFRTGPRPGDYAYYYSYPQV

GPLR\TLLPQKPPVIH PPGYSGV PEDGQASYYYSQPFY GPLRLTLLPQKPPVVHAPGYSGIV PELLTGAMYYQSITRLC VGATLT HPQTAPVRHGDDGVVR GTAGEDMFYYFMPNC LNVRLTPQKGPVIH PPGYS GSPETGYLYYQGMTRL DACKLVLTPTKPPTRYGNNGADEFNKD KTMTYYYFDPRL GTDDVTFRPQGNVLYNMGTGYFPMFGDAKYPNYEYAFPTM पK पR DTPAKAPVIH PPGFSGAPETGFMA


YQGITRL VNLTKPLKGLVVHPPGGSGTRETGRLYYQSITRL LK FNLILLEPRAPFFLHNENGLMPMAE ATNSYYYSSPHF
 VGCELNFMPFVNPVDHGNNGLVTGTRGEELRFYYFDPAC
 $T \square Y Y S$
$M Y Y$ Q S

LTVDLDLLKSVKPPVLHHGNGYIDYPFGG YTFYYSQT M FGFDLRFRPEKGPTLNYKDGVMR GVTNDSSMFYYSFTRM GRVE EALATSPVIMNGGTGVF PLIDMMDHQYS IQVRLTPLKPAVVH PPGYSGTPETGR

MYYVS
ASYYYSFTRM

FSYRLQMDYGKGPFWHCNHGKDFMGTQSEETTFYYSYPNM TSUDITTNQTKGYVLNGDEGLMP SVGGVGTLYYSVPRLL V VRLRAPRKPPVVHPPGYSGTEETGRL VEDLRFRPLKPPVVHPPSGTAETG G
G
F
D

UniRef90 M6LY33 UniRef90_A0A011Q5G8 UniRef90-UPIO0036C21FE UniRef90-D5EPW0 UniRef90 U6ZU46 UniRef90-A0A011PGM5 UniRef90-U1DGZ9 UniRef90-UPI00036BBB60 UniRef90_C7RQH5 UniRef90_D3D491 UniRef90_E3BQC8 UniRef90 D3D477 UniRef90-W8F2S8
UniRef90-K2AD46
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UniRef90 LOT2J9
UniRef90-A0A034TN16
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UniRef90-W7WA42
UniRef90-C6I0M9
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UniRef90_XOXHV3
UniRef90_J3AUZ1
UniRef90_K2R6T9

170
180
190
STRGELLTLINGKK DQ|IS GNSWMDHEWSTPFLLSHPSNSWDWV TAHGTLTVEGQRKAVRGEVWFDHQWGD FEAANDRWNWF

 A AEGTVQ DGGQAMQVSGDVWFDHQWGDDPGEAAQDRWNWF
 SAQGTLTVAGTAKAVRGEVWFDHQWGD FEAAELGWNWF KVKGTLWDHGVLVNVTGDAWQDHQWGD FAPGTGGWDWF KALGGTVTDHGVKVY TTG TATGTLEVNGQVHEVEGELWYDRQWNCNSVTNK GIGWDWF QVSGNLTLPDGTDPV G R A WLDREWSSQPLAQDQTGWDWF DVSGKLFDHGLLVNVTGKAWMDHQWGN WNPGKGGWEWF
 STKGELTLDGKKI RI SGNSWMDHEWSSPFDSNQQVSWDWI HTTGTIYDNGVPIKVTGQSWQDRQWFNF QVEGRI RNGQVVENVTGTGWFDHQWGRSHTDTFKTGWDWF SFHGKLSDKGTWQTVSGKAWFDHEWTKSTLGKNQAGWLWL EGNGELRDNENKYQVAVRGGMDHAF QMNKNNDVVWDKF DTEGTVYDNGVP 1 KIIGTSWQDRQWFSMAFDENGSGWNWF $D V S G K V T D D G K T H Q V S G K G W D D R E W S S Q F L D D S Q Q G W D W F$
$H V T G T L F D H G S P V N V T G T A W L D H Q W G N$

 ATSGTVWDHGVPVKVTGTSWYDHEWANGIPGDANSGWTWF DVSGTI GDDGKNQEVTGKAWLDREWSSQPLASNQKGWDWF GMQGTVAGKDVTG GVVAWLDHQWG GMSAGTQARWDWL
 ALDEGQI NGRT VKGEAWLDHQWGNQIPGQAAD WDWM DASGYI EQNGSKHAITGDAWYDREFGSVYRDEAGAAWTWM QTSGALTLNGRTEKVRGRSWLDHQWGPLPDAA GNASWSWM G $\square$ S GTLGRDGVETGVTGKAWLDREWSSNLLTPGAVGWDWT $\begin{array}{ll}N F T G E V A G & R P V Q G Q A W F D H Q W G T Q V P G R S G V \\ Q T T G T L T\end{array}$ DTSGTLTLNGRAEKVRGQSWLDRQWGPLDPTTGRASWSWM EASGTVAAGGETREARGLVWLDHQWGDQQPGAQARWDWF ELRGTVLG REVRGTAWIDHQWGEQMSGVAAL WDWY $N T T G T L T L N K K T Y K I$ EGDSWMDHQWGDFTLDSNAGWEWF SVQGSW G G K E PVVSGNVWLQHAWGA DPLPGGPVSLHRF EVNGTITPGGESFDVEEGCWWYDRFGTARAKKQQLSLNWF
 $D V T G V V, N G R E A \quad R G E A W F D H Q W G D Q \quad L P S R S V T W D W F$ $R$ R EGRW GARP LA GVA WMDHQWGGVQRS GTAAT WD WF A L E GR DI H G $\quad$ R EVVWGEA WMDH Q WG GQLS GREAL WD WF $H V S G K V T D D G V T H Q V S G K G W \square D R E W S S Q F L L D S Q Q G W D W F$

 A AR GTITDDGKTSPIEGSAWFDRQWQNQDGDDAAFKWSWM ALEGADAG $\quad$ RAVVRGEAWMDHQWGDQQGSSQGSSPWDWF | $D V$ | $Q$ |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $T$ | $L$ | $N$ | LVKSRLSDDGEELQLSSGTFWYDHQWGTGFMPAGAVGWDWM

 DT NGTI TAENRTWKVQGQTWFDRQWESTENAQFDQRWSWM K T T G T $\quad$ K $\square E E K T Y Q V T G N S W F D R Q Y S S$ G N L K D G Y P H WA WM
 STTGSVVKIDGHHHVVTGVTWMDHQWGTSPTKPGGGGWCWF $P A L G R V V G E E A V A G E A W L D H Q W G E Q L S G V S A T V W D W F$ QV D S R L S $\square$ G G E K $\square Q L$ TGGK F WY D H Q WGT GF MPQ G S T G WD WM
 AMT GTL CWGE E $\square H Q V$ S GNS GHDRQWGGTAGDPRARSHEWR STRGELTLNGKKFK
S VT GYVVV K GVVK R EVT G L G WY D R E L G S EVD K E A K Y S WS WL L A MT GTLRWGDMVQQV S GSGHVDRQWFPSGGRPRARSHE WR TMTGTLRWGSSAESVVGNAGHDRQWANSGGADGDVRWEWR A MTGTL RWGAVDEKVAGSAGHDRQWGGPTGDDRSRAHEWR
 $T V S G N I S L N G I T E S V T G T S W V D R Q Y G D F Y L G E \quad R Y E W F$ DVVGKLTVGDSTDNVK GD GWYDREYGS GS SRENY GM WH WF $H V D G T L R R D G T Q R R V E G H A W F E Q D W G S T Y Y D V E R T T W E W A$ $T M T$ GTLCWGEASEQVTGTAGHDRQWFPTYADPRGRSHEWR






S LHASNMSQLS IFH $\square$ AGNNESEAGERAAVETRADGSRHY
TINFDNGVDLSIWRQFDRANRNPFTGDTTSHPDPADAPEC
TI NLDNGVDLSI WRQFDRTDRNPFSGATTSSPDDUEVA IDD




GI QLGNGWEISCIHARNTDPATEFTRATAVAPDGSV
MAQFDEDRQMTMY TPHTDENLAYYGQTGEEPPGTMUVQV
NLNMPNGDAVA DWDAVRADG DTHTWATVLRKDGSYEVAS
WLELADGSALRCLQLRRRGAGG $\square \mathrm{P}$ R GQCLWLSSGNEPALL
SLRLDDGSSLMLFQFRD


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## 23798FD



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A "
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$\square \mathrm{T}$ GDDGRQ
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Y WY A LWLT A ENGHG
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N $\square$ N ET QA GS
E WWYFDAH LDDGAK $\overline{L V}$
WWA S SYi Y A S DNRP
$\square E W W Y F D C \quad D T E D G \square K$
PS Q $\square \mathrm{D} \square \mathrm{P}$ Q D
LT S A N S T E QNSGSYWSSAFATTTTGRQ

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E WWYADGHLQDG
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AKYVY
YLIA\|DHILTAPKN
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YMT【SHLLTT $\square \mathrm{PS}$
VCRSS!LDGQTHDYWVD■TY
YAFFVIFAR $\square S G F S S A S G \square D M H \square G A \square D \square A N G W F R Q R T T$ VGFLVKRRPEDPPMARPWVEIT VYQPDGSRRQUAQRY LGFEWHQSVTAGGSATEFLVMN YYDASHLMSYASDGSKPVYRASVLD TDPTDDFHKYDR YGF EMTM MRMDALGTEPVI WNGH $\square A$ S S DITTRQTFKQDEA T NSFWISSFVSGSNGHQYFILSHRASVLDITNPSПRAQFST IGGVMITTAQKEAGWSDEESGCASKVTDDGKGRLDRRNRW YLVISHYL
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VIFMTKDL SAPNKPDSPMDRDNDDLPDGRSFSFDRDY YFIVSHV GNPGPGYYRYSILDVSNPSYYRQYAY $\square G V N F S L Y Q V A S G E G Y N P F V Y F N V Q M P D G T V K N H F M M F K D$

YVLLSHAFVLPSG TVTVRTSLLDASNPENYWQSTK FLI I HHQFST FCKSSVLDLKTLKY $\square K N V Q H$
$\square T$ FFT K DAAAPSRG $\square$ AP Q $\square$ A $\square D \square D \square P D G R T \square N K S \square H F$ YFS $\square$ ACD SKAAKPGSTNSLVSLLDIETGEYY




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YFYF $\square C D F Q Y Q R N V T G R T A P E G T T V L S D A S D F S H Y A S E R V$ LGFRKSVAQVNQAGDNPNVA $\square N Y T A$ ADGTKVDDYRAYTP YFAVGHD SAKGSTPKGAN $\square$ R $V$ SLLD $\square$ NDSKYFGTEHS
WS VS $\square$ S F NHMARGD $\square 1$ GT $\square P D L L V V V L H G E N G K T F G G M \square N$
$\square$ TSFVCNLQQGWRND DQRPHTRVLVAYDDKDEAKFY SHAD YHVTTN VAGGVVGAGKQGYMIAGMLGAEDLSDFSSTGTT IVFFTKKMTNDKKGLTPQVTLNIDKADGTKKSFYGDSK YYVITA DGTTELGAYGINILDLNTLTTVYSTTEDTSFNF WFLQVAFFYDTEGDGPTGLIDLNDA KDGKKLCDLHKR

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 cnntdgsafongatiny inv

TRGHपGVAWNSPSRWARYD
SGDGTGVAYPSYVSMARYDPASGDLVPFGYTGRGDP SGDGTGVAYPSYVSMSAQGDDPTQGLHDEADMADEATDTP AEAPSATVGASTTEMHVYSTVGSLIGDRSEMRFKAVNGN APENTTF WTSDGDFRASFEDYGMETDDKNPLHTYSSVEN VDFTPDTFTASAEGCDVRMGENVFAGD LHMYTVRGNVEG SDTANTSIYSDTGIFFNTVSNFTFETDGDGKMRTWGNYNS PRKGGQIAYSKPGNFRFVCGPDSF SGSKNVLPMRAQVND

四 TPG TPNATYNASAFRYDDSNKVAHQYSTKPDLVSVQHAE DLSPMDSTSAHPDYCNVKMGD SWVRDMGDHYELSIMVRG AFLDEADCSFSEERCDVKDGPHTFRGDLE TYQVHVEVKG AQVQNGLPGLATKYFGFVSSDPV NPLDQMRI WCLTER TRGALGVA WDSPNKSRFWARYDAAGAPDPGYTLDVRGDP N【GNLEYAQFVEDSपD【K पGQHGFQA乌SDDNLRAFSKHKN SGRR

PADSF
SAADDHADVRTAGNRFTGN पSHYETHAE $\square \mathrm{DD}$ QGSEADPVSVADINGANITLPTYGFEAVDPADTLATWSTSD EDT SVRKDRCKVVIGNNRFEGDLD TYHIVINGDE NLPLQNNSTTKNGKLRIEAPGFEFSSNSNDSISTMVSTDH CEVNSASKTLLEDSLSUQFPDFSFAGAAPDKMQLSATAPE

DPETF SASAGSCDVRПGENRFAGD पHTYT $\square$ SVS DEE GRNHLVPGVISNKTYDIDSGILRQYASTADLVHAESSDPH NPVVHGQKGVSGGPCDVQDEKCYDK YDEGRYVLHFDSGD AFADMDHTQMSADKCDVHFGPDYCTGD FTEYDVHVSTAN ARTALAKTYGPTG\｜LNFTVPGFAFQSDALSG\｜RIFSNTAD PASSFN ASREECNVTVNGNFFRGSDLNAFQDHVVVDD SADSPV


TAES DDAVS DSADS पGTRTS LRMSGGLDD पETTGATDS HAYGPGVNLFFNNSFEVRYPNWHDYAEYTQPDKL SAGNATLTDTANPRYNVNVGGGGFEALSADTYSTHANGEG WRVPFTPTDSDFDPSSVRVDNVSWSFGQDAMKLSHNTSEG A VVVEDATMATDHCELNFGPSQLTGDNWQTYDVHDEPEA DP NAVFSNETFYYKADKFETYSTASDLYSVKSTVEG KKRY价LINASSPGVNVEFED SWAEGEYPNWHVHAEDKD LRHWSSSADLDSVKHAQGQLPN ASFDPNVLND DYQWFSNSPDSFTTDGNWDN DPTGKFVTTGSNGNFNYTVGEWNFKGWATNESNMTAGTP QSRGFG

D
TREDFAFFGADSDNCAVAVRANATASRGKN
GSDPAEVVAKGHD AYRKNYFRSNGDGEYHTFTTVP
LRHPVTTAEDRLHLAVDSLMEDQDLDTSYRLAITRDD

## UniRef90_D8EXK6 <br> UniRet90-W6T8V9 UniRef90-UP10002FF3A1B UniRef90-W3WYU2 UniRef90-V2WQD4 UniRef90-UPIO00379FA42 UniRef90_W6LDP9 UniRef90-N4VLM1 UniRef90-UPIO003684FEB UniRef90-D1AHI8

 UniRef90-LTLL5Z4UniRef90_M3TFX7
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UniRef90-X0X6Q6
UniRef90_C7ZFD8
UniRef90-U5E3C2
UniRef90-B9JZA1
UniRef90-UPIOOO36410CC UniR Refo Wo UniRef90_17ZW28 UniRef90 UPIOOO37C6D60
UniRefgo- W5TC93 UniRef90 W5TC93
UniRef90 UniRef90-M2XHD4
UniRef90_UPIOOO46 UniRef90-C7ZKN4 UniRef90-L2FHE3 UniRet90_B5HS46 UniRef90-A7NHUO UniRef90-UPIO003B6E071 UniRef90-UP100041C4B12
UniRef90-19C1L5 UniRef90-F9FMC1 UniRef90_K4QY79 UniRef90-A8L4J2 UniRef90 B8LUY4 UniRef90-K9EZN8
UniRef90 H5S997 UniRef90-Q00870 UniRef90_W6XYS4 UniRef90-ROJW64 UniRef90-B8FJA3 UniRef90-Q2U8E1 UniRet90-A5VOX9 UniRef90-R1H2S9 UniRef90-N4TT69
UniRef90 $\times 8 A 422$ UniRef90-X8A422
UniRef90 UP 100036 D 876 B UniRef90-UPIO002EEE203 UniRef90-Q5B0M5
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UniRef90 A1VQR4 UniRef90-A1VQR4
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UniRef90 -L2FCZ1
UniRef90 Q0CC0
UniRef90-UPIO00469A839 UniRef90_UPIOOO372785E
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UniRef90-D9WFW4 UniRef90-N6VQ58 UniRef90-N4V4X0 UniRef90-UPIOOO4692EE7 UniRef90-25AR46 UniRee90-B2IKH7
UniRef90-WGT4MO UniRef90-S9U813 UniRef90_S3C8.99 UniRef90 G9MZA4 UniRef90-M7TEB9 UniRef90-W9JDU0 UniRef90-O469C5 UniRef90-B2WA41 UniRef90-F4BYL2
UniRef90-UP1000364A5C1 UniRef90-UP1000364
UniRefolo $05 A Q E 6$ UniRef90-F9G476 UniRef90_LEVGB
UniRef9__K9FVV8

- $\pi$ 「ாの
140
150
160



$\qquad$ $V$ SVDLF F E TVVNSFRQHSKN D D A N T F C Y Y FP M M Y G F E L L L



 VVLDL T F ENEVP P WMPGRGG ETNF GDGGDFGWCVGAPRA







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







 VGAKLLRFTNTVPSWKP G R GFNYKNEDTGKDSWVVPPQPCA



 VKVDVTLDAEDRPWRPH TGY LVFGELLGDTQCEFADPS M



 $V$ T A E V $V$ T L $A T F N L T F E P R G P N L Y H G G S G V H W W G T G G Y T N E I A Y P$ QL
 I A C D L H Y H A L V E P F RQ G TAA L A A L G D D D Y Y Y S VP K C
 $L T F D L T Y A A T S T A L V N G G M G L F A F G S G G R T Y E W G L P N C$ $V$ VVDL E LVATVVESWRA GS GAMYFDEALTVFNAHVVPAPRA
 F GADVVTITATTPSYRPGTGGRWDVDGRHFSWFVAVPGBG ASFDLILHATSRAAYYY GTGTYRYVNDTMYNWVFPAT




 $\begin{array}{ll}\text { T T } \\ \text { A } \\ S \\ S \\ S & \\ \text { S }\end{array}$ | Q Y | $A$ |
| :--- | :--- |
| Y |  |

 D Q L D L R F V A Q T Q P F R P G S GYI T F G D
A HLEFKINYTQPYF QGENGI AEFT VSFPKGPNFYDAGSGIYMWGTDADGMFHYFFPCA



 FRWDLVYEAAADPWYA DPT QTKTGQS GWMKWLVYMPSA
 FGFDVVVVKRTTPSSYRPGSGGARWDVEGRHFSWFVAVPGAG

UniRef90_D8EXK6 UniRef90-W6T8V9 UniRef90_UPI0002FF3A1B UniRef90-W3WYU2 UniRef90-W6KIS3 UniRef90-V2WQD4 UniRef90_UPI000379FA42 UniRef90-W6LDP9 UniRef90-N4VLM1 UniRef90_UPI0003684FEB UniRef90-D1AHI8 UniRef90-L7L5Z4 UniRef90-M3TFX7
UniRef90-C7ZCQ3
UniRef90-X0X6Q6 UniRef90-C7ZFD8
UniRef90-A3V9S3
UniRef90-U5E3C2
UniRef90-B9JZA1
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UniRef90-A7NHU0
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UniRef90-R0JW64
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UniRef90-C7N2U2
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UniRef90-W9JDU0
UniRef90_Q469C5
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UniRef90-Q5AQE6
UniRef90-F9G476
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UniRef90_K9FVR8

LGSGTLINYQGKQI KIVIFGKTWFDRQWSEQPMEVGFQEWTWM KTTGTLTVKKKTYDLNGDSWFDRQWQQQNF KLTDEWSWM RVAGTVTVDGKTTEVTGRGYHDHNWGVGDMKRLIDKWYWG QSSGTLTMNGTTHVI DSFTWFDRQVSFGAPKN DVSGSI RVDNVDLTVDGTGWYDREWYQPNTKPTEGSWIWWG

 D $\square E G T V T D K G K E Y K V D H T A W F D R Q W G E G L L A K S S D A W D W \square$ KTTVTLNKNGEKEVLNG DGYHDHNWGTCILSEDIHHWYWG KVTGRMQDGSDDQEVSGRGYADHNWGVGDMRKVI DRWHWG TVAGRMRVGDESWDVVGTGYADHNWGVGAMPKVIDQWHWG RTTGTVTLNDRTEAIDPKTWYDRQAGFG APRNWTWF DTGGYVVVGKKRDNVKGKSWMDHQWANVSYTPNNQ WS WF
 RVTGSIE LDG DRHEVTGRGYHDHNWGVGDMKK』IDRWHWG RAKGSMTIDGDVFPVDAKVWFDRQWAKSEAADNQSHWTWL RVEGSITI GAETKTVTGRGYADHNWGAGDMKSVIDRWHWG
 KAEVTYSVGGKSTTTSGVGYHDHNWGNEDMDKLMHHWYWA
 AVTGSVTVDGVRTDVSGRGYADHNWGFGDMTKVI DHWHWG KTEGSLTVHGEKLADKSHTWYDRQWGNTAAAIPSNWTWF RTAGTI TLDNKTISVDTSTWYDRQ LDSHAPKNWTWF DAQGTVTYAGEQVAMQGQAWFENTWGGAMGSAGDDSWEWA SYRGSLRWRGVE EAVWGDGWLDRQWFPEYVGADRYSHQWA QTTGTVTVDDGEKDPVTGETWMDHEYGAFGDSANPVKWNDT
 RTEGSFKVNGKKVDIKSFAWYDRQFGS $\quad$ LI QDSFDWI HVEATYGVNGRTSTTTGVGYHDHNWGNAPMDKLMHHWYWA KASGTLLDHGVLVNVTGTA
KTTGSLTIQNTTVTIHSKTWYDRQWG NVAQAWYWF KVSGTVMVEGKTYQVSGLGWDDHQYDSDPFGKPFVGWCWM
 WVTGSI NVNGTDVAVESVGWLDRQWGPGAPTK GWDFY WVTGNLTYKGEVIDIKSMSWLDRQYGPGL GEAGWY LW RVEGDLIIKDEVIDVQGSGYHDHNWGNCRFHEDFWGWYWG DVSGTLVRDGQTRQVRGRGYHDHQWATGLLLNFWNRWDW $\begin{array}{ll}V T D G H F T V N R K F D T I & S S S T W Y D R Q W P D V P M D P A K S N W T W F \\ R Y R G U L R W R G V E E P V H G E G W L D R Q W F P E Y V G A D R Y S H Q W A\end{array}$ KTNGSLTMNGTEVTVNSFTWYDRQWFPQDVGADRYSHQWA KTDGHLVKNGAKATIDPKTWYDRQGGDNPQTPG NWTWF AMTGTLCWGEEDHQVSGNSGHDRQWGGTAGDPRARSHEWR RTSGTLTLNGKTQKISGESWLDRQWGETPVDDPTMRWTWM TVRGSYEVAGVRSDATGGGYHDHNWGNVGMTAIINDWYWA ITMGNFVVNDTRDPVRSLTWYDRQFASGIGSAASQNWTWF DVSGTLVVDGKEYDVKGTGYHDHQWPSVQTFFFWNQWVWA
 RTSGTL QL GDGKAPSKSHTWYDHQ GAGGI KGPPDAFTFF QTSGSVT NGEK $\operatorname{CDVSGVTWMDHEYGAFGTADNPVKWVLQ~}$ NVEVTYSVDGTSTTTTGHGYHDHNWGNAPMMSVLNNWYWG WVTGTITTNGTTVAVKSDAWMDRQWGTG GAINGWWFF DVEATLTMKGVTKRLKGTGYHDHNWGYTGDENMMNHWYWG AVTGTLTYDGQTVTVNGQGYHDHQWMNDSPMAAFHHWFWG KTTGWISVNGTKVNVRSLTWYDRQWGVIPSD FSWF
 $A V N G T A Q V A G E T \ K I E G K G Y H D H N W G N A G I E G V L K A W H W G$

 EVEGRLAVPGRTWRVRGTGYHDKNWGTLDFGAVLREWHWA

 WTNATVVQDGATTSLTGGSAYHDHNWGNHAMGSGLDHWY WF HLTGTLTLPSEKRSVSGRAWDDRQWGDFGLTATLFWEWS

 EVTGTVEDDGEKFIVKGTGHHEHAWSPKAVTKGDNGWDWF WVT GTLTVNGT EWGTGASP FTTGTVTINGSRHEDRSTAWYDRQWGVGL A DNGWYWF
 NVTGSFTIGNRTVDID GTGYHDH DWGRFPLNDPQFTWABA
 $M T S G T L Q P D D P S A S V S$ WY DRSWGHLGLPNGGNTWF



## UniRef90_D8EXK6 <br> \section*{UniRet90 W6T8V9}

 UniRet90-UPI0002FF3A1B UniRef90-W3WYU2 UniRet90 WGKIS3 UniRef90-V2WQD4 UniRet90-UPIOOO379FA42 UniRef90_W6LDP9 UniRef90-N4VLM1 UniRef90_UPIo003684FEB UniRef90-D1AHI8 UniRef90-LTLL5Z4UniRef90_M3TFX7
UniRef90-C7ZCQ3
UniRef 90 -X0X6Q6 UniRef90_C7ZFD8
UniRef90-U5E3C2
UniRef90-B9JZA1
UniRef90-UPIO0036410CC
UniRef90-W0E7M1 UniRef90_l7ZW28 UniRef90-UPIO0037C6D60 UniRef90-W5TC93 UniRef90-M2XHD4 UniRef90_UPI000463A148 UniRef90-C7ZKN4 UniRef90-L2FHE3 UniRef90-B5HS46 UniRef90-A7NHUO UniRef90 UPIOOO3B6E071 UniRef90-UPIo0041C4B12 UniRef90-19C1L5 UniRef90-F9FMC1 UniRefofo-K4QY79 UniRef90-A8L4J2 UniRef90-K9EZN8 UniRef90-H5S997 UniRef90-Q00870 UniRef90-W6XYS4 UniRef90-RoJW64 UniRet90-B8FJA3 UniRef90-C7N2U2 2 UniRef90-Q2U8E1
UniRef90 A5VOX9 UniRef90-R1H2S9 UniRef90-N4TT69
UniRef90 $\times 8 A 422$ UniRef90 X8A422
UniRef90 YPIOOO36D876B UniRef90-UPIO002EEE203 UniRef90-Q5B0M5 UniRef90-UPI0001C3711F UniRef90-UP10003657C92 UniRef90_A7F1R8 UniReffo-CTYJK2
UniRef90 A1VQR4 UniRef90-A1VQR4 4
UniRef90 G7GQ83 UniRef90-W7E019 UniRef90- 7 7B3P6 UniRef90-W6T3Y5 UniRef90-G9P4J7 UniRef90-L2FCZ1 UniRef90_OOCCO3
UniRef90_UPIOOO469A839 UniRef90-UP10000372785E UniRef90-A0A010RA86 UniRef90-C7ZJR1 UniRef90 Q5BF41 UniRef90-M3BMG6 UniRef90-GOUYM2
UniRef90-D9WFW4 UniRef90-N6VQ58 UniRef90-N4V4X0 UniRef90_UPIO004692EE7 UniRet90_Q5AR46 UniRef90_B2IKH7
UniRef90_W6T4MO UniRef90_S9U813 UniRet90-S3C8.39 UniRef90 -G9MZA4 UniRef90-M7TEB9 UniRef90-ROIV8 UniRef90-O469C5 UniRef90-B2WA41 UniRef90-F4BYL2
UniRef90-UPIOOO364A5C1 UniRef90-UP1000364
UniRef90-Q5AQE6 UniRef90-F9G476 UniRef90 L8EVG8
UniRef90_K9FVR8
 AI YLDNGDIISLLDSVGTTDTPRFM SVLHTDGTEHATD ALYTENGTLVYAMVHTQKKYGSHWSQPSVMVAQGRDVALD ELNFPGSALSVWAYDGVTGQSPYQFATVRV GHSMQVL SLHLSDGSQFSLFHVMDYEATKTKECFGVYISNGKKHMCS SVQLSNGWDGTFYTVWDYDGKKEVRDRTAAAIISPEGERIE GVHLDNGWDLTVYVVRDEDRAVERRFAVAVAATGESGPLD ELNLPGSADKASVWAWDGPGHETARFAGVRVNGOSYHVL GMTHNEDASGAISLWDTYSGGKRNAFATILNRNGTQVNVN RGKIGDYFFVLACVYSEKEYGYAPAFDFLLAKDGKDIADN RLYTQDYTFLYAIVGTQDRYGNLQIKPA MLAKGDEILLS RLYTAEYSLLYAVVATQEKYGKLQLAPVMLAKGDSIVLS QLHFPGSESIWAYDLVDTDTVMTNRFATVRFGEESHLILA GI QLDNDVEMVVFKLV VNNKKFYFGSVMDENGES YK QLHFPGSEIKASTWAWKMPDDTDYQFATVRVDGDSQLVL ALSGGPDWHLMLSRHHDRPTGTTRAASTVLFDRGQPVAL GLTFSDKCAISFWDVMEPNQRS TFLTYLREDGVQMNV RLYDDDYSALYALVKTKERLGAHESRPLMLAYKGEVIMLS TLQDDESRTLACVELRRAEGGRPEPGCVLVTDDGQVRAFR RGAAGPYSVI ASYITAEKKYGYTTFPVFMLARDGKLIADD
RLYVEDYSLLFADVLGRRRGAHEAPLMLAHHDRIIVLS RLYVEDYSLLFADVLTQRRRGAHEDAPLMLAHHDRIVLS RLYMDDFTLVYATVLTQKGYGAHWATP LMLAHGADVVLS ELHFPGSDVKASWWAWDLVDDESTRFATVRVGNG YYVL GVQLDNGWESSALQKYVADQRDQVIVATAVAPEGSV DQQLDNGWTLSNYFLSKAGEDPPPSYSTLQSPDGQMYYVA GLSFGAGAAISFWDVMGED KRWTFDTCLGEDGVQTNVE $M L H F E E S E W L M C A W K W E D R V D G P K M F A T V R S S L N G R D S V V$
$R G A A G P Y S V A S H D T A E R A Y G D A E L P D F M L A R D G K L V A D D$

ETHTEPGAVLSVWNWTD DTSGNKNFATVRDALGTQSTVP YLNLTNKDTLMTIGLQLADGSASSYYASIKEGKLDVTILS RAHLGGYTLIFVEQVALRKYGSARDPVFLLAKGDQVLADD QMH C PTSKLSVWIGDNDVTNQFSRFATVRGDNDEFQVL TLYLSNGWSMSVWHVSSTNPLKLSRFATVLFPNGHTEVHT RIQNPQYS VVYGWVI PKDKTGPIVTPLLIARDCE LLLS GRQQSDGYTLLVFDSVDATGNVRFPWFCVQDAQGNVV QVH GQRTMSIWVWDTFDGQRSQFATVRDKPGDHQVLA QMSLDNEWELSLWRHHERNREDPFSGATVTDPAGQT LLF QLHVPSTSKLSUWTIDDEKTGQFNRFATVR GDGEELQVL TiNFDNGVDLSMWRQFDRTNGNPFTGVTTSYPDPATSPQC SVRLPNNDTLALWDAVNSKSENSW ATVLHPDGSYDLAA RGQAGPYSVIASY ITSHEKFGYQPПPDFMLAKDGQ\|VADD QLHYDNNEKNSQFRIWDYDSNPRVQFATVLGFEGQQQVLS RQQNDDYTMVLFDCVAPATNDYRRDPDFFIEDKEGNVIFFD GLALGGEEAISLWDVY SGNTRYAFATVADKFGAQT GVHFPGSEKASIWLSDNKDPAQHLLRFATVRTDYGLEEVV DMQQDNGVCISNYATYTSGNQKAKSEATVQRADGTTYLVE NFYLPNGWVIGGWRTQPVDDTPVSSFATVLFPDGHHEVHA RAKVGDYTVIACD\|IAEKKYGNKRLPVFMIAKDGE ILNDD RMYT DKYVIYLYDFVTSERFSFKRLPLFMVADNQT QVHPPDGTEDELYSIWAWNDNGNKQFATHRTGGRAEQ\|VL RGTVGPYTVISSATHSSDKAYAMGDSFMDQKNDTDA AED EGHVAGSRDLSVWAIDGEGGGPGVRFATDRRGDGAQLVV
 GRADVHGLTVVSASGDEVLVN VLYVDDSDLILWMNVVESGDPPFKSRSVNICARGKSWHHL RL H
TLRLSDGCQLSVFEMVNSVSNQREAVALLTSNGTVRH K GLDLGAGRYLSVWDT CI HFDNGWDMFVGKMYSEKRYDSSKFG
CLHFDNGWDMFVGKMYSEKRYLSSKFG RAHVGDYTVVYV RMTTKGGEDNLPTFYLATADGRVVTDD GLH $\downarrow P K G H V L S I$ WTGDTDADRAPVRFATVRNAYG AQTVC SFRFQSGASVHIYNFYNGHQEAVYQ GRQNIGQYSVLI YDMVEKFGLAQUPDFTDDDAQGHRENTD GRDVAGYGQILVSDKSGSKSPNSEFDGTLVTSEGKRIL
 HVTLDNGWNTYESNYYPTPQSIINPFGTLLTDNGETITLK NFYLDNGWVI ASWITRSPDKTSVQAFATLVRPDGHQEVHV PLQLVDGTRLCVWALNPVGNYHKSFGTVLKPDGSHEVVT
 S NPAKNFSLS DWENRTEDNPKAYLG G DQKEGES EFS RAE GPYTVIASEMDAEKKFNDESITVFNISKDGKTUADN SLY YDDSELILVTYLDDDSSTSASSSRTHRHTHSRSIHDR RADVGGGSUVSASVRFRQDGREVPLLFVVR

|  | Tk |
| :---: | :---: |
| UniRef90 D8 Une | TKPLVESAGDYWISPTGQRYPTSWIVD |
| UniRet90-UPIO002FF3A1B | NGEVELTEGPIVHNAVADRTYPAWIDRLRIPGVKLTVREIV |
| UniRef90-W3WYU2 | TWTPNMKNTWVSPKSGLVYP配EWTLDFEGDYLDVQS |
| UniRef90-W6153 | DUSLEMENRWVSLVT FIVYPSHFSVNVPSMGL |
| UniRe990-V2V | CTEHMFECKSSWTSLETLNEYGTKWR |
| UniRef90-UP | DLDCAGTEERD SVQSFAE |
|  | DTSLEDENKWVSLIT FMTYPSH |
| UniRet90-N4VLI | KLDEDSARTWT S P N S NTT |
| UniRee90 UPIIO003684FEB | A DITYDHIWTSSRTGNQYPASIHISIPPIENL |
| UniRef90_D1AHI8 | GQLLRLLTEKDLQLIDQETGKPYGNLLECSYKEGDK |
| UniRef90 M 3 TFX | VLSEGPNAYDPVARREYPTSITLERPGEFLDV |
| C7ZC | DESWTSPNTNT |
| UniRef90 $\mathrm{x0} \mathrm{\times 606}$ | TTKVKINSLK |
| UniRef90-A3V | PQGHDAVPVRFWRSPATGADYPVQWSV |
| UniRef90-U5E3C2 | ETVLTEGPERFDATAGRAYPTWDELRVPGERLE |
| UniRef90-B9JZA1 | DAQVEYDRDWT S S T GQRYPAVAHITAPATNL |
|  | EAEVSEGPMKYNAIVANRAYPEWLR E E P G V |
| UniRergo- 172 | QSVPTVEPGNSWTSPHTNATYHQAWT |
| UniRef90-UPI00037C6D60 | KVT EEDGRYTDT ${ }^{\text {a }}$ |
|  | TGEMRLREGPKRFDTTAGRDHPEWI ELSVPGQRLD |
| UniRer90- UPIO00463A148 | GELEVTPGPMRFHPVANREYPSSLRLTVDGVRDV |
| UniRef90-C7ZKN4 | P LEFTPDYKRTYESATGRVTYPDDWKL |
|  | SPDYSNTWTSPNSNLVYPL |
|  | EMI |
| UniRee90-UPI0003B6E071 | - |
| UniRef90-UPI00041C4B12 | DDVARQD |
| UniRef90-19C1L5 | A |
| $\begin{aligned} & \text { UniRef90_FFFMC1 } \\ & \text { UniRef90_K4QY79 } \end{aligned}$ | SSKLTFEELGRYTDSVTGKPVGNVTRYTYTDGDLEV |
|  |  |

VTKFARNDSVWT SVHTGDKWVQEFDLMLEGTSLSTSSVR NPETNFQVLPTDTNARPNALLIPNGWTLTVKDHSWNVTAWS AQY LTMTARHFVRHAA GREYPQ
PLEWKPTYDRTYQSTAADTLYPGDWEDDTSGFGFQLSSTL LED DUHPTGPWVSPVTNLTYHNGYTLNLPTLGGSLEVTV
NTMEGKCLEMGRDERFQREYPTHLTLATDAQGVKMNLDI
VSEFKPS SRQWTSSCSKATYSDDWVVAVDGTMMEDSSVR TDEYHDEPLSYCRVRGDVRYFLDAYRLHVPGLNLVVVSTP TYTLSPDYSTTWYSSCSNETYPLAWTLEFQGEKLVAKSTR
 AAKTRFRATEAYTDTKTGKPV
VTEFTPSGGTWTSPGCGGTYPDDWT $\square$ A $\square P G T R \square Y \square E A \square R$
 RFNVTIEPENAWTSPNSNYTYQTRWFLDFDGDFGDUKSVR RFTLEEHWEDSWWSSTSNRTYPQSWTLKFDGDYLRIKSVL TTPTRTWTSGVSGTTYNMQFQUDIPAFNLVVTSLM HTKVTFEKSG四HDDETGKPV
 AS DTKVERSDTHUNDFTKK
PVTEKVSSNRTFTSPATGVTYP DDWT $\square$ A $\square$ PGPELRLSSTR AGKVVFTATDVGDDEQTGRSVAGRLHFEYRDNGLVYTLEY PVGFRADYTRQWYSQASGKLYPGDWVVTVGEVGFRIASIV YEPQTVTVRESAPRPHPDAAYPRDYYSTVHWSYHHG RENMSPGNATTWTSPVTNTTYAQDWKLLFDGDTLAGKS AVDEQLVCDE GTVKRPHPVTVKPTSTDC
HA $\square D V F E P D A V W T S P R T G K T Y P Q E W R L G \square E G R G \square H \square K S V I$

PVKWEPKYERSTKSQGAGADYPDDWT LE DAGYGVDVASDA MLPLRLTTSGDVDGPGHQTPTRMEWSWASERGTI TLTATN NITWIPDLSHDFHSDSTNKSYPGAWTVEDPSYDUKVKSRT DKVIVRQ NGYVKSPNDGNWVSWGWTYEFP
AA HTEVEVLDSYVQASTGKRYPKKDRYTFTSDTTTVKTDS
TDDRVVLEETWTSLVTFLTYTTAYTIDPPAMECKUKATF
DAD EVVASQPFVSNQTGFTYYGRHKVSIPGDGAEFD IRQ NVDLKIT
VDDPVPSTTNTWTSPVTNTTYHNEFRLGDSSDDLK DDGKR MLP DIUPENSWVSKETNITYYASFTLSFPEKG
PS TVYTP TK WWTSP TTNMSYPWYGELKTPKGTFYVSPST A DATSRAWGVSRNARNGRLYKFQLDLALKNTSLRMTKYA GGQVKAKYADYSEYA 1 DNATHPARYNUSADNGDWSLE
GEEVTL
PFEPDLSPDTDWMSPRSGRVYPQQWKDGDEGRGDSDRSTL VSDDQLVCDEGVKTPDTGKPTDCDYLVKTTGDNLTAQVRF
CTWRTET

UniRef90 D8EXK6 UniRef90 W6T8V9 UniRef90-UPIO002FF3A1B UniRef90-W3WYU2 UniRef90 W6KIS3 UniRef90-V2WQD4 UniRef90-UPIOOO379FA42 UniRef90 W6LDP9 UniRef90- N4VLM1 UniRef90_UPIo003684FEB UniRef90_D1AH18
UniRef90 L7L5Z4 UniRef90-M3TFX7
UniRef90-C7ZCQ3 UniRef90-X0X6Q6 UniRef90-C7ZFD8 UniRef90-A3V9S3 UniRef90-U5E3C2 UniRef90 B9JZA1 UniRef90-UPIO0036410CC UniRef90-WOETM1 UniRef90 ${ }^{-17 Z W 28}$ UniRee90 UPI00037C6D60 UniRef90-W5TC93 UniRef90-M2XHD4 UniRef90 UPI000463A148 UniRef90-C7ZKN4 UniRef90-L2FHE3 UniRet90_B5HS46 UniRef90 A7NHUO UniRef90_UPI0003B6E071 UniRef90-UPI00041C4B12 UniRef90-19C1L5 UniRef90- F9FMC1 UniRef90-K4QY79 UniRef90_A8L4J2 UniRef90 B8LUY4 UniRef90-K9EZN8 UniRef90-H5S997 UniRef90 Q00870 UniRef90-W6XYS4 UniRef90-RoJW64 UniRef90-B8FJA3 UniRef90 C7N2U2 UniRef90_Q2U8E1 UniRef90-A5VOX9 UniRef90 R1H2S9 UniRef90-N4TT69 UniRef90-X8A422 UniRef90-UPI00036D876B UniRef90 UPI0002EEE203 UniRef90- ${ }^{-25 B 0 M 5}$ UniRef90-UPIOOOO1C3711F UniRet90_UP10003657C92 UniRef90 A7F1R8 UniRef90_C7YJK2 UniRef90-A1VQR4 UniRef90 G7GQ83 UniRef90-W7E019 UniRef90-R7B3P6 UniRef90-W6T3Y5 UniRef90 G9P4J7
UniRef90-L2FCZ1
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UniRef90 K9FVRR

KEQEVPSED ${ }^{290}$ DPKYEG[LINGTYQGKPVV ${ }^{310}$ TGYVEMVG
EKQEIMSSMKKLSKY EGSIVTGTYQGSDTGRATVEL HAHNL
PDQEMYGSNALVDSAYEGF TTVRGQGQESGFGVVEMV SAQEFNTVMMPGGGFFEGCMVGKGGNS SLKGFLECKNY■ ERANQETRTMCAVRYWEGRVKIDGGQTVSGLGEVEE VSPRQECVTFTLGDFWKGRVSVSGTGSTVGTGFAEEHKNY DDQEMYGGKALVDSAYEGFIEVKGSGQEEGFGVVEVV LLDEPEFAHNGSMT QGCVQGTYKGRHVGGLEMIG ENQDIIVRNRFH
HAQSLLEDTPVLGSKFMRPVTDRLIGRP GY HAQALLDDVPVIGSALLRPVTDRLIGRPGGY PDQEMYGPRAIGDSVYAGFVTAKGRGQRVGYGVVEM KNQEVIF GADNYLENP

## PDQEMYGPDDLVDSAYEGFDTASGKGQKKGFGVVELV

 DDQEIPGPGGLTV WEGAAEGTLDGHDEGPARLELAGYA HAHDL
## HAHDLLSDVP

WDDAPGPDAPGVAV RVAGSAEGR WEGWGWVESNG EDQEL WAAGGFATYEGFVTVNGDGKVTGFGLVEDQG

HAHDL
HAHDL
EVQEIVHAHDFLA
EDQELVGEDALQTAY EGFTTFSGNKPVQGYGLVEIV PDQEMYGEKALIDDAYEGFVEATGSGYTEAFGVVELV DGHEDRTLIDAGSGWWESPVTGTMGGTPVGQAFLQ GDPAPAHRMP GVDYLTGPTRGTMAGRPVGYGFNER
SRPEFVYPRGQGHSGGQSLCRVAG HVGKALLEMDG PDQVIEADEDTGFPQFSGYVKVTKAGC\|PVRGF

EDQEDDAAAGGGF EGYVTGSYKGDPGARGF DDATFNAEDWSLAS EMPVDFTDSGQFAGTGYAEVIGY
DDQETVGTTATQTAYEGFVTFNGNKKVQGYGLVEVV KHPNLDVP GLGTTDEEYVEVSGDGEPV
AAGEMAQEHAAATTLYEGYVDVTFQGQNIGWGVAE TAHRLIEAMQLP

NDQEDCDKEGT DGTY EGY TVSGRGEHSGYGLVEVV LAPAPAHRMP VQDYGTGPLEGTMEGRDTGYGFNERT ADQEMVGTSSLETAY EGFVTYTGGGKKVGFGIVEIV EPVVPAPAHGLPDEYMEGPYRYRGGGQPV DDQEFNASQPFQPTY EGFVSFKGDGS $\square$ NGNGF

NDQETYAKNS $\square F S S S P F T \quad T V K G R F F G Q K T G F A$ GDQEIQPNT WGGFVKVERSGQTTGYGVGDLV DSQEFPV 可TKPTYEGGATGTFEGKKV PAGEMAYELGAA $\square$ T $\square$ FKGYATVSGKEN $\square$ TGYGLVE

PDQEDQTAGVPVISY
VKDEFTSRQKMG
GDQETAGGSAFPTAY EGFVTFDGEGQEVGFGVVED SGNHLLS
QDQE KGSGAGMFYSGVVEGSपFGQEKGFGFVD■V GDQELAAKGNDGAGПYMGFSTFEGDGEDVGFGVSEL

ADQE $\backslash \mathrm{VGGNA} \square \mathrm{QTAY} \mathrm{EGFVNYTGGKNDTGFGLVE} \mathrm{\| V} Y A$ ENQLNTGSHGSEPEAYNGFVTFAGQGTETGFG\|VE【V
DPQEDNVDDFS
PHQEFNTl LAGGYGFYDGCVTGTAGVEHAVHGFVKПT
PAGEMTSPTTPLNTDYEGYAIASGGQRVSGWGVAE
PDQEDQG AGVPIVTYTGFLDVT
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| WWY | D A V | S E D GRQQ |  |
| :--- | :--- | :--- | :--- |
| E WQHF | I V | H | T E G L | WWY IDALSDDGQGSV



T F Y $\square$ T S D Q G D Q
ADEHMHPPTDQRSWQFYFNWSDVDGRS
PSNDTTVDWWYFDVVSWDHRSEI PGSGYSWWY $\square \mathrm{DA} L S D D G K H G$

AARPEGFKEWHHFVVH GRG
TGNVP $\square G / V A G D R G P R F D R Q \square S W W Y \square D A \quad L S D D G Q H G$

UniRef90 S9VAU2 UniRef90_H1LCVO UniRef90-R1GDC2 UniRef90_V6JGQ6 UniRef90 A3TS11 UniRef90-L2FT70 UniRef90-B6H917 UniRef90_Q5AWU5 UniRef90 C3AMP6 UniRef90-UPIOOO310173B UniRef90_D7B7Z8 UniRef90 W9Y1M9 UniRef90-S0ELB7 UniRef90_W9HL06 UniRef90 K2RP82 UniRee90 A0A010RIK8 UniRef90-K4DXQ7 UniRef90-W0ZBF6 UniRef90-T1HJD4 UniRef90-UPIO00361CFD4 UniRef90-W6KIR0 UniRef90-K9F4R5 UniRef90- TOKOG2 UniRef90-A0A031LRK6 UniRef90-U2Y192 UniRef90 UPI000344B25C UniRef90-M4RYQ4 UniRef90-M7TCF2 UniRef90-UPI000248933C UniRef90-Q8EVP5 UniRef90-Q2SUV2 UniRef90-K2R891
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UniRef90-_JNIV8 UniRef90-S9XBZ4 UniRef90 A6GI62 UniRef90-Q01TM2 UniRef90-UPI0003FD6C6E UniRef90-Q0CW44 UniRef90-Q5AR52 UniRef90-Q4WVE5 UniRef90-A1V310 UniRef90 K9FPB3 UniRef90-G7X8V8 UniRef90-Q8GDDO UniRef90 W9L253 UniRef90-12JQ75 UniRef90_UPIO00382703C UniRef90-Q64C98 UniRef90 K1ZHP8 UniRef90-B2HIU8 UniRef90-Q2RJC7 UniRef90-A4HMX4 UniRef90-G7CBL3 UniRef90-K9HXD8 UniRef90-Q09885 UniRef90-W0E6N6 UniRef90-B3Q799 UniRef90-UPIO0016A5660 UniRef90-×5MHF2 UniRef90 F4CX35 UniRef90-C4JU71 UniRef90-C5FKC5 UniRef90- LolXD9 UniRef90-A1CBD1 UniRef90_C7ZQ87 UniRef90-s8B1Y2 UniRef90 A8L800 UniRef90_UPI00016A709C UniRef90-G4N564 UniRef90- TOKDX4 UniRef90_V5XJM8 UniRef90-A9W6B0 UniRef90-Q090W8 UniRef90-H8Z3P9 UniRef90-S0E4A0 Uniinefoc-F5R100 UniRef90_J3K2H3 UniRef90-A3SDS9 UniRef90-H6MSJ2 UniRef90-G9NHX3 UniRef90-S9TRD3 UniRefofo-LOJ219 UniRef90- ${ }^{-1} 5 \mathrm{KPP} 1$ UniRet90-H8FR68 UniRef90-G20734 UniRef90-XoS257 UniRef90 K5VS14 UniRef90-S4XRR8
UniRef90_L2GHGO


VVFHTKLFTSPQVGLEPKDQ\
QLETPDGRVCNVL FGLEVSFSRHASDGEGSVTYAAEVSIVDHEKKKYYAAYLA


## D पDAGGVARपSKD

MG $\square R \nabla S V I N P G \square V F V K \square D \square Y K \quad D G G \square K S H E \square K K Y F \square W D F Y$
$\square T F F T T N P T N T K G G F N P N \square K D E F S K V S D \square$ D $\square Y$ VK K VFDADFAAAPGDGPGQTATLVHGTAAAVDRHFTRYST Y HV WAFVSLIVAGDVTHRASGLWGGQVLVTTHAQGETDGGRRY YSPNYIEGLTSRNATPNNFPAVSVSVYHKKQTEYYSFKEY
VARVIVMVHRDGAWSGAVERFVGAAFEAPAG RPTLRF VQAIFSYLVNNPLNQPGGLFWFGIADM
 $\square T V M$ KTFEMADNGALVMVQ पT VM FENMGPEGLGAPYPGGLIAVQUSGSFSNGTAFTL

> TAAAVDRHFTRYSD DSLVVTFF SSSAEAFPF的TNETSVLSVANGTVFTDYVP


FFVF DAADTVGAKGARDVARVFYNKDLGGEKF TQFLVCYLLFDPGNLTGTGDAEVLAV VYNGMPLIGGF TCFLVLNYHPKS $\square F T S D G N P G V N L S\|Q\| N D E T P R L F V H K F$

## $\square A$ VY D GE GRARLT LART

GWVRTGПMPNGVAWVNALLDMPT\ALTEWE
ALTIICF $\square G S V F S P Y Y A W T R R K G P T D P A R H Y G A S A N R W$
$\square A F \square G S \nabla F R H R G K \square D P R E Y C A V N A C L Y$ GEQRRWAMT FSPYYAFARRRAPADPLDHCAI NVALYHEAGKRWTMTERR VFDTDFAAAPGDGPLQTATLVHG TAAA DDRHFTRYS

FSSFVIVFFTSSANAFPF IVWDWASFTTDRRQTHAEVARD TVCFFTSSSVAFPF LVPPGYIW W ASFPNGTVSTRIVH $G G W \quad \square R L G L Y P N Q Q T A W I N A L L C G P D M A T V A \square N D F E$

Y $\square$ A D G DPRDVATVLSSTAADDAHHYRAYS $\square$ AFVQVIUSNVAGDRTTCQFNTKVFNLKDDGKPHDWCTTP $\underset{W}{L}$
GWVRLGLIP NQQTAWDQAFDCGPGDPTDVIDDQA IAFIGSVFSPYYAWDAARDPFAHVVLYGERGNRFAMTERN L LVNFSLVDEAGAAASRPAEVARLIVVGAHGAQGWTGDLD FSPYYARARQRGPADPEHFCALNAVI YGASGKRWAMTER IFFTSSFFSFDLLNA DDPLNVYVFYNNGGDGFSFPDSSTS IAF $\square G S V F R R R P G A A D P H \quad A H C A V N V A D Y G D K R R W A M T$
AMVQVIYSNVAG $\square$ HTTCH $\square$ NTK $\square Y S T D P Q \square P H K W H S D T \square$
FG 听RTGLNPADGKADALLILIRDGQLEYVYPGVGT VVTFYTAGASFNGGATPNKVLITYTFTDLNVQLQAEDVRG
FRLLVNFSLVNEASAAGPRLAPRVIVIAHDGQWAGADERF LTFIGSVFRRRGGGAAEPLDHCSVNVCLGAAGKRWSMTER

YSVVAVFFTADPGADFPGAADLGTATTTPNNSFVTADGAD


UniRef90 S9VAU2 UniRef90-H1LCVO UniRef90-R1GDC2 UniRef90 ${ }^{-}$A3TS11 UniRef90-L2FT70 UniRef90-B6H917
UniRef90-Q5AWU5 UniRef90 C3AMP6 UniRef90-UPIO00310173B UniRef90 D7B7Z8
UniRef90_W9Y1M9
UniRef90-SOELB7
UniRef90-WHLO6
UniRef90_K2RP82
UniRee90 A0A010RIK8 UniRef90-K4DXQ7 UniRet90-WOZBF6 UniRee90-U1FJD00361CFD4 UniRef90-W6KIR0 UniRef90-K9F4R5 UniRef90-TOKAG2
UniRefocolaionilRK6 UniRef90-U2Y192 UniRee90-UPI000344B25C UniRef90-M4RYQ4 UniRef90-M7TCF2 UniRef90-UPI000248933C UniRet90-Q8EVP5 UniRef90-Q2SUV2 UniReffo-K2R891

YQDS QVSTSQQTCDGKFQQMTNENECLYSIIKYHNKE YQDS QVS■SQQTCDLKFGPNYLVGEDFTHYNFHVEPEK AGEAVDDVKVSADS DNVQTSVLAVSGDLD QLDISGTTDT PPVTTNQPSVCALAGCLKYD

ATKKAYNLKWSANG
A PGTGSNEFLDFRSEDQNDTSPRVSDNYTDLNVSTAG
 AKGSRLNAKKDICDVNI NKSYLKYQDGQYVLHFEEGY GDPDDFFASKDSCNVKUGKNYFAGNLK TYEI HFEDED DRRLPRAARWREAPDDLDAGDVVLRGDGHGGLLVEARGEE IGNLPSEVVVAKDRCDLQYRKNYFRSNGLSKYHDFVDPDG VGNLTSDRDSLDLK $\quad$ GGHHGFQALSDDNLRAFSKYKD QAYNPDEFHSSRDECDVTVTRNFFRGTGLKEYHDSVTVEG ADGGDGTTSLHTDMLDLQYGDNRLTNTSFSWYKLSLSGTT PADQFSAATDRCDVRDGKSSVTGDLD TYDMHLEVED SEELFGDFYADENSCNVKIGKSTLHG GPSTYEDYITTGS
 PFKVEFGRESFLAEDERSYHLVSER DR LDDPQLLRD PARMMAQATR GRGGLLVARGEESGFRLRLSDPQGGGASGDDGRPHERTDT ASEEVPLI K $\square K G K Q V M E C H \square N E T T G D$

DCYFNKNKCEVKMKDNFFIGD LDKYYIYVRSPK


 TSTNLDQFSFENDHTCF RAAN IS DDLDEGKSAYRMRSSVND GRHRMELV DGAYRLQLREHRAG SPGGVVPSFSARNDSADVK $\quad$ GGDNGDTVIDDPNTCRRI F GSTRRD
 NLT GDGPHKWNS DPLSNFMF DESMLDS F GADNLLSLITLNE E G ITAATKGAVLEWGGGGVR GEWSFAGKDHREYTVSIMNPG
 ATAATVTGLEAEGTN S S GEWSSTGFSWSQYEI IIIS S EK
 A MTERGREALVRDDSTLA $\square$ GPSALRRWDGTA GDQWTNTHL ELD F V V G


APLPADPFRTRTGTAELDMEATDPYRVTVRGRG AMTERGAASLARDATTDRDGPSGLRWEGGV DQFSFENDKTSFVAKNCSVVLEDQKRYRIRAS DND ERGADALTQSDDALTDGPSSVRWNPDQTLTVELDEMG

DPRRMFAEAPR

ARGAVGSYG RYEPTGMH G WS GSRDMSKYDDSVDNKE AALPDDPAAVRADAYELSLG WQ ATADLARYHVSFNTT SDP PAQDSQVRTVGDGSSGSWEGGFSWQGSPTDHYRIAANNAS WFSSGQNLSQYEIVVSSGK WGGRNRIVGELDAHYTLELAVGG


A VTAEERSVPVERGLAVGRDTYTMR EPFQRWRTELTGRT RTIGGDGSSGEYRG $I$ GDWVGSSDMSQYVI RLDSPS
 DQSEDD VTADLGNDADGGNRMAVRPDGRVVDIDADLDD NRNAVHRSTDT GFSEDYTAFYADDCAVESEDGTTYTVKGNDEQ

| UniRef90_S9VAU2 |  |
| :---: | :---: |
| UniRef90_H1LCV0 |  |
| UniRef90-R1GDC2 |  |
| UniRef90_V6JGQ6 | A |
| UniRef90_A3TS11 | V |
| UniRef90_L2FT70 |  |
| UniRef90_B6H917 | V |
| UniRef90 Q5AWU5 |  |
| UniRef90 ${ }^{-}$C3AMP6 |  |
| UniRef90_UPI000310173B |  |
| UniRef90_D7B7Z8 |  |
| UniRef90_W9Y1M9 |  |
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| UniRef90_W9HL06 |  |
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| UniRef90_K4DXQ7 | F |
| UniRef90 W0ZBF6 |  |
| UniRef90_T1HJD4 | L |
| UniRef90_UPI000361CFD4 |  |
| UniRef90_W6KIR0 |  |
| UniRef90_K9F4R5 | L |
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| UniRef90_U2YI92 |  |
| UniRef90 UPI000344B25C |  |


SKIDLHFDAETKPFRPG TGYDTFG NVETYY DCVTMM

 VQLNVHTTPTGKNLY TGGGGGDTLSSDDPGYSWYWSMPAG I S V DLTVHQTSRALYYGGSGA WMYVDKP $\square$ YGWAMPAA I KYHAVMTSKLP MWRPNTGHWFYGDQDEHFAWFDAQPSA IN LTAK A T RTTESWRPKTGHLLFGTEKSKEFNWVVPVPQGA
 $F G F D V V I K R N T P S H R P G S G$
$V$
$V$
 LDDI HMTNTTSPWRPGKG HVWSKDDEYFDWLVAVPQG FEVELTLKPTQPAVLHGNKGVVGLKDDWGHDMFHYLIPHM VADVTITRAAPSWRPGAGDTYFDSKRTHYDA WVVPVPYG VGVALRFEVAGDGMSFGTDGNDPAHVLEDSLADVGHYEQFV
 V EFDLTTFSTFAPILLNGGFGF $P T G F Q V N W$ LQVDL WLTPTAPALTWFGGFGFF ESNTTVYEWSMPAD LEA

## GRDFS LGHFNQH T

WVY DLS LE LD K S S V IGGCTK G
WK GSTPG
$G M$
V
DEANDELSANVKSWRP ETGFQQFGEK

 F S L V G QLTTFK S P K L L K G T



 DGYWSQRNPKSPPRYPCDVKERRASE QLIDPNMY LAAS QP DA TA A N L T FTRRTAPGFVVGKDGTSSYFGT DPANSMMHAFWPRC $F A V D L T L T A T G D V T W F A B G L F Y E H \quad D A D T R Y$
LQVE GRLTLTS QVPHHLP C GVQAKRSVLE IVA G WVNLIP D A DTYNLT FKRSSPGFMDGGKDGTSYFGTDDENMSHAF WPRC IS FP K K A RVVRGEVVIPHETTVPQVLDGAGRHVWWPFAPRS I K LD M T $\square Q P$ T G GNFYY G G G G GVQR GPDPP GWSWYWANP T T
 I QWNLTYTMMDVGSWF GAPEPMLLVGHRPDDWMQWLSYMTGA VK LIHLAYFPQMPGWKFAKNSDFFFGDGPE GNSHWVLIPRA $V$ H L D H F S P VEWPK P F G G G G L F S S $\square$ P F L N Q Y WHP YR L G G M D QS Y $D P A V L L A G G A G L \sqrt{E} W T S A G T P$
 SIIDD T TVHQDAPPFKIDGEDGNSTYGTDPPWASMHTTWPRT
 $R V R V T P T K D F F V L N P Q G N H R W W P I A A B C A$


EVDLT Y E GVSPMFTVKEDGSSLEDDPEKSFAKAHYEQHM ARASVRFEARGVSPMHGGEPTAPEHETGDQFSRGHFNQHT
 QAYD DPAALLRRGEGRRQVAVAMDVVWTYQYRIPRY
 LGYK I K LIK SVAPAHYPCGPATRGGLSEEVPGVGWANAMPDA
 I E V A V N CT T T GLLK FVVDRSPGYTA HDPANN HA A GWWPVPRA F G V DVVAD

 $V R V R P R A L L A A Q P$ F T L D T H G L H R R WWP M A $P$ D C
1
$P$ R
 VEGTFTVKSRGPGHYVCGPGQNMK VLPNVGWVNVMPAA
 NS L N LTMTRVAPGFVAGTNGTSNFGTDPPWGSMRHSPPRC


UniRef90_SgVAU2 UniRef90_H1LCV0
UniRef90-R1GDC2 UniRef90-V6JGQ6 UniRef90-A3TS11 UniRef90_L2FT70
UniRef90-B6H917 UniRef90-B6H917 UniRef90 С 3 AMP6 UniRef90_UPI000310173B UniRef90-D7B7Z8 UniRef90-W9Y1M9 UniRef90-S0ELB7 UniRef90-W9HL06 UniRef90 ${ }^{-}$K2RP82 UniRef90-A0A010RIK8 UniRef90-K4DXQ7 UniRef90-W0ZBF6 UniRef90-T1HJD4 UniRef90-UPIOO0361CFD4 UniRef90-W6KIR0 UniRef90-K9F4R5 UniRef90-TOK0G2 UniRef90_A0A031LRK6 UniRef90_U2Y192
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UniRef90-H8FR68
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UniRef90-X0S257
UniRef90_K5VS14
UniRef90-S4XRR8
UniRef90_L2GHG0

180
190
200 MVS GTVVIVIDGEEMQVVEGVGSHDRLDSSDALSGNHGNWSHF KVSGTI LI DGEQKAVSGSAYYNHQWSNDSPTVAFHHWLWG

 | WLWG |
| :---: |
| WYLY |
| $W$ L | TVTGWI WPVGKPISVDGRGYHDHNWGNFNLSSDQAGWEWA LTRGWI A VNGTRLAVRSLTWYDRQWGGAPP

 T I EANLT DGDKMVQLNGTGYHDHNWGNIGMEK LMNHWY WG KVALSYNYDGKEIKTSGSGYHDHNWGNNSDMELFNHWYWS
EAAGVLHFRGRSARVTGRGWHERAFGGDILPARDASWSRA LPS GTLGTNVTVVPENSTTWDDYQWGPGY AD GGWHDW QLTGEVTANGTKTKVEGNAHHDHNWGNVPMETDLDNWLW

 TVVTARITEGGTTTETTGSAYHDHNWGNHLMGSFLDHWFWG KVTGSLTYDNKEHDFKGNGYHDHNWGEGDLGQVMEEWYWG RVGGELRVGDRSYPMAGGGLRDHSWGPREWSGLRYH RWV
 KISGSLTVEGKRYKITGTGTVVHQAMPTSLENADVGWAWQ
 TTTGHIRVGDQQWPVTGHGWRDHSWGPRYWT NLFAYRDF

 KTKATI R DDNS DEEFLGTGYHDHNWGNTSMDKLLHHWYWG RGTVQHGGATTDVSGDCTYEYARGTSPYSAAKDPWDVF DASGTLCAAGACERLT GVITWEWG EVKGDLTISGKTIQFEGLGYHDHNVGFKPMKDDFEDWYWG RLSGTINIDGKDVETK SRGYFERQSGEFGDSGGHWGY RVEGNIVSKGKVVDVTGTGLFVHALQNGKPQHDASSWEFA RAHGSVELEGGALRVAGLAYHDHNWGNFRWGDDF CWEWA SVSGTLRVDGKTYQIAAPGYHDHNWGEWDL NNVT WN WA $R V R G W L Q P P G A S S P V S V T G W H D H N W G R F N V A D Q R S G W E W G$
$A V E G T$ AVEGT TTKEKTYDLGGRGMF DHALQGMKPHHAAARWNFV RVEGTDTTKEKTYD TTGRGMFDHADQGMKPHHAAARWNFG MAEVDMK DHGSTDKFRGPGYHDKNWSDRPFTDSVRSWYWG
 RLEGHLVIDGKQHEIDPEALFERQWGNFHIGK

 KVKGFVEIDGTKHMVEGEGYCDQNWGNMNFSKFASKWYWG NASGTVGFNGETWSFSARLYCERNWGTGF PEHWWWG EVSGTLKVAGDKKNFKGYGYHDHRRYNFPDAQALSGAYLG TVSGTVTAGDRSYTVTAVGQRDHSWGVRDWWGME WVWS RVEVVLEKPALSWK GRAYFDTNDGSEPDEKGFKDWDWC $R V E G S V A R G R V V D V T G P G M F V H A D Q N G K P H H L A S S W E F A$ RVEVELDRPDLKW SGHAYLDRNWGAEPLEDAFAYWDWC RVEVDLRRPNLSW RGEGYLDTNAGDEPIETGFRHWEWA
 $A V T G H I V V G D E E F P I D G H G W R D H S W G P R Y W ~ Q A D W A Y R G F$
$A G D V N M N I D G S D L R F T G L A Y H D K N W A S V P F S Q S V R S W Y W$ NASVDMEI A GSRLLQFHGSAYHDKNWGDAPFATTAKTWYWG $E V S G T V T V D G D E V S V S Q M G Q R D H S W G V R D W W A M D \quad W V W S$ RVE GTVT TK E K T Y DLA GRGMF DH A DQGMK P H HAAAARWN F V E GEVVKFQDGDHHMSFTGYGYHDVNWGSRPFYDSVGGSWYWG ASTGTDTVNGTVLDAA GAFHLERQVSSFPLGGNQSDWTWG



 $R$ VSVQLSHPHLHW S G D GY L D S N WGSEPLEQGFTD WD WS D A A V DVV I N GQN】K FTGNGYH D K N WG D A P F LA S L N G WY W G
 $N V T G T I T$ T K EKV HDMTGRGMFSQALQQMKPHHAASRWNF $\square$ KVEGTI DTPEREIDCS GRGFFVVHALQGMKPHHLAARWNFA
 $N S T V Y F N W S G T A V E F S G T G Y H D K N W G N V P L G S T F S S W Y W G$ $R V E V E L S H P \quad R L R W S G P G Y F D T N S G G V P L E K S F A R W T W S$
 $R$ VEVELNHPDLRW S GPGYFDTNSG IVPLEKSFVRWTWS TA E GT MMTKDGP DDFKGRAF LDSHALLQGMK PH HAAAAKWNFC $H V K G T L A \square G D T T Y A \square D G F G L R D H S W G P R Y W Q A D Q Q \quad Y D W L$


UniRef90 s9vaU2 UniRef90_H1LCV0 UniRef90-R1GDC2 UniRef90_A3TS11 UniRef90-L2FT70 UniRef90_B6H917 UniRef90_Q5AWU5 UniRef90_C3AMP6 UniRef90_UPI000310173B UniRef90-D7B7Z8 UniRef90-W9Y1M9 UniRef90_S0ELB7 UniRef90-W9HL06 UniRef90-K2RP82 UniRef90-A0A010RIK8 UniRef90_K4DXQ7 UniRef90-W0ZBF6 UniRef90-T1HJD4 UniRef90-UPIOO0361CFD4 UniRef90-W6KIR0 UniRef90-K9F4R5 UniRef90-TOK0G2 UniRef90-A0A031LRK6 UniRef90-U2Y192 UniRef90_UPI000344B25C UniRef90-M4RYQ4 UniRef90-M7TCF2 UniRef90_UPIO00248933C UniRef90_Q8EVP5 UniRef90-Q2SUV2 UniRef90-K2R891 UniRef90-WORN23 UniRef90-UPIO003792C07 UniRef90-J9NIV8 UniRef90_S9XBZ4 UniRef90_A6GI62 UniRef90_Q01TM2 UniRef90-UPIO003FD6C6E UniRef90_Q0CW44 UniRef90-Q5AR52 UniRef90-Q4WVE5 UniRef90_A1V310 UniRef90_G7X8V8 UniRef90-Q8GDD0 UniRef90-W9L253 UniRef90-12JQ75 UniRef90_UPIO00382703C UniRef90_Q64C98 UniRef90-K1ZHP8 UniRef90-B2HIU8 UniRef90-Q2RJC7 UniRef90-A4HMX4 UniRef90-G7CBL3
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UniRef90 L2GHGG0
Oninelizargu


QLHVPSTSKLSLWT DDDEKTGQFSRFATAR GDGEELQVL GLRFESNDSLSVWDYKTEATADEWRFATARTAHGDLIV RGTLGPYTVISSAVVFSEKHDSVLVKTFMDQHEDTVVADD



 ELHLE ENPDQ SINDDDESQLVLA Y $\operatorname{DGFAGEPTYTAVSYRHEDGTASGQYD}$ LATFEDGKGLMLLKVFAPDGTARSEGALLIDDGEYDEVMDMD
 KVNSNSYSEIMMTRFWGQKKNDDY G M M M N DEPKDIQFC RAKVGPYTVISCFLTTVKKYGYTKFPIVFMIANEDKLICDDD
 A GRAGD LTL YGVQPPDSLGTRSSLFLYVVDSLGFRALVR WLYDSNGDFIHGWVVGATVERPTPAWATVWHPNGDHEVLE
 QYSQPD
VSHEPDGSATLL GGVVKGDGTWQGVVGRVTA NFQTPTYTAVMMEYTTPPSYGSTVVNGGGIVKDGEVIVYA HGRL GRYSLVWFDVMGRDGKEYFSA WV TEAGNVIVLC

 NFQTPTYSAMMMEYTTPPSYGSTTVNVGGIVKDGE IIYA
 HAQAGPELSVHFWK LEEMGQTGIRG YVDKNGHDAQVV
 RIIFTDNVTAIFA DIVHKDGKSKFT
QAHDFDNADASVAF SGGLLQFGP $\square R Q D V T G V V V R \square G$ $R F Y A N D Y T F L W A A F R G N R D Y S G Q E D T A M Y L A K D V R Q V L S$
$L I$
$L$ AL LLQHKKFTAAMMFKTPPSYGSTIVNNGGIAMKD KIISA RGAMRDKTVIVLYEAERRDGSRVDLAVTF DAEGNKQEF T SDDLDADTQLLLAHV,QVDGHPALTSAYLRVVGKCAHRDD
 $\square$ ANFGEDRALMILKNIRADGTSRRRGVLLV DGGEYHEVT RTR G GSYSVVWFYVLTPQQTEHVSA YIAKDGKDRHTA ALHLDDGTHLHGVDIR DPGAPPAGDGYVQQPGQQPDA $N F Q T P S Y S A V M M E F T T P P S Y G S T V V N V G G I V K D N E V I V A G$
$H A R L G D$ HARDGD Y Y S WVWFDT LDTHETEYVSAYVSKAGKVLTHQ HGQVGPYSVVWFSYLASNDTNGKEYVSSYVARNGTVLVSS

 AVHDDDGTHI HGLDDR
RAPLKRGSA M L Y VVRRRDGSGQNLTLRF DADGTRREMP SLEPDNPWSVVLVRMADRGRTVARYQALFLWGGGESRVFR RAKRRQGGAVVLYEANRRDGSAL SLALQVNRDGSVEPFE HATFGD YNLVFFDMLDKNN VERVGGYVLKDGKVVNTC $R S S L R G G D T A V L Y D V Q R R D G T A P H S L A D H F D A D G G C R H F A$
$N F Q T P S F S A V M M E F T P P S Y G S T V V N V G G D A K D G E D I I Y A$ $N F Q S P T Y S A L M E Y T T P P S Y G S T V V N V G G$ AKDGE I
 HGRAAGPSVVWFDFLAVDGTE YTSSYVARNGRILNAA

 NFQGPTYSALMQFTTPPSYGSTVVSVGVVAKDGE VVVG


UniRef90 SgVAU2 UniRef90-H1LCVO UniRef90-R1GDC2 UniRef90 ${ }^{-}$A3TS11 UniRef90-L2FT70 UniRef90-B6H917 UniRef90-Q5AWU5 UniRef90 C3AMP6 UniRef90-UPIO00310173B UniRef90-D7B7Z8 UniRef90 W9Y1M9 UniRef90_SOELB7
UniRef90-WHLOL UniRef90 ${ }^{-}$K2RP82 UniRee90-A0A010RIK8 UniRef90-K4DXQ7 UniRef90-W0ZBF6 UniRef90-T1HJD4 UniRef90-UPIO00361CFD4 UniRef90-W6KIR0 UniRef90-K9F4R5 UniRef90_TOKOG2 UniRef90-A0Ао31LRK6 UniRef90-U2Y192 UniRef90-UPIO00344B25C UniRef90-M4RYQ4 UniRef90-M7TCF2 UniRef90-UPI000248933C UniRef90-Q8EVP5 UniRef90-Q2SUV2 UniRef90-K2R891 UniRef90-W0RN23 UniRef90-UPI0003792C07 UniRef90-J9NIV8 UniRef90_S9XBZ4 UniRef90-C01TM2 UniRef90-UPI0003FD6C6E UniRef90-Q0CW44 UniRef90-Q5AR52 UniRef90-O4WVE5 UniRef90-A1V310
UniRef90 K9FPB3 UniRef90-G7×8V8 UniRef90-Q8GDDO UniRef90_W9L253 UniRef90-12JQ75 UniRef90_UPI000382703C UniRef90-Q64C98 UniRef90-K1ZHP8 UniRef90-B2HIU8 UniRef90-O2RJC7 UniRef90-A4HMX4 UniRef90-G7CBL3
UniRef90-K9HXD8 UniRef90-Q09885 UniRef90-W0E6N6 UniRef90-B3Q799 UniRef90-UPIO0016A5660 UniRef90-×5MHF2 UniRef90_F4CX35 UniRef90-C4JU71 UniRef90_C5FKC5 UniRef90-LOIXD9 UniRef90-A1CBD1 UniRef90-C7ZQ87 UniRef90-S8B1Y2 UniRef90 A8L800 UniRef90_UPI00016A709C UniRef90-G4N564 UniRef90-TOKDX4 UniRet90-V5XJM8 UniRef90-A9W6BO UniRef90-Q090W8 UniRet90-H8Z3P9 UniRef90-SOE4AO UniReftol-F5R100 UniRef90-Q5BH63 UniRef90_J3K2H3
UniRef9O_A3SDS9 UniRef90-H6MSJ2 UniRef90-G9NHX3 UniRet90-S9TRD3 UniRefofo-LOJ219 UniRef90-X5KPP1 UniRef90-H8FR68 UniRef90-G2Q734 UniRef90-Xos257 UniRef90-K5VS14 UniRef90-S4XRR8
 ПTDVKIEMLDTYVQQATNKEYPSDI RYTFSKGDILVT PVDNTTRAWDTSRSPKTGKLYEFQLDLSSRNSSURVTKPD ALDASLEVSRHTLSDVPGA
VPVTSLVPSRTYTSHSSGAVYPDDWTLEDGDTRLCDSSVR $V G K N T$ TAFDVWKSEYSGRNYFNQVELD PSRRFD HQLI RFEPDTDPNTVWKSPRSGLVYPQRWELGUEGRGLEVSSVL QS पT K $\square$ QRED! IEHPETKK
A T TRGLRPWTSLTTLNTYPTACDVEVPDGRLRTTAWF PVKNDTQPRNPWVSSLSNDTYYSDYVIDIP
LVTFKPDYTRTFQSASSKDVYPDDWTWS DQDDEVLGSAVL PFTFKPGGVWTSETTNFTYPSTWELEFDGEKLVITAVR GSKVSFSAEGIEHDDEVDRPVADTLHFEYQNEGTVFVI DDLLPLRLVTSGDVPGPGHPERLEWTWESDRGRDAMTVTN DATVSVTPSELYKN SAGKYQPGVLQVS LDDLRLD RNKWTPDGFGRRVDCALRAPAGAFRLTGTVRR DFHVNPTVASQPGPDRPSALMPTTWKYLILGDNSQPPLL GQVDADKPDPKLTLDGFEMEVPQSFRWI AHHQGLD LAVA SVVTDWDERKDPRNVRDGVRT ATRSVTDEADVRTVAPL A WDALRGLRPWTSLTTLNTYPTACDVEVPDLRLRATAWF AKDVRDE NGMMVYSFVLEVQKEDVSLQUNM DFD A TDWTDAKDPASVRIIVRTETGGEILSMAPLR ANNTNFYTEEKQLSNTTGKWY
ADVHVLSVQARPAVAPDGNEMRFAWRVRDRHGRTDATVDT AVDNTSRAFD TWKSEFSGANYKFVLNFSTRNATLNMEQAD PRD $\square$ AYVDDRVVTVGGRTDRVPSRG

VGNTT TATDVWKSPVSGKNYFQNFKDDLPSREASFH TVDNTTEHVGVTMDPET EWPEPTRIAYEWDGKDAENYE DGDVQVDLQGVRPASATPLTLPPVMSLLAPGSRDVPEELV

GSTNTATHTESAQDPESDWPEPKS $\begin{gathered}\text { KWAWEGKTQDGKDVQ }\end{gathered}$ GCEPDSVLVRPWFPPGRGTPAPSGYSLRY
GATNSATHTASAHDADSDWPAPTSTKCVWDGKSKDGKDVH ADVHFRVTSAQARPAVGPLPETFAWRVRDRHGRTDATVDT ACDPS $\|$ LTVRPDGSPGTGRYPPRVGDLP
GINNSATHTDSSQDAESDWPEPKS $\square K W V W G K S K E G Q E V H$ PPPKAPLGATGWRVARGTR
VGPKS RAWDDEASPRTGLKYFNKFFDDDPARNFTFDKWD DVDDDFEMNDDMTTEDGKRVVNADIVDTAGRSTRFQGVP


DEVIRVTPPAVVRSQDTDGHWRVR
SGNLVVQV YEQENRDGTNYPVEDDVQGGSQ TSGVTMETDESYMSSETGVVYPTRWRVECPTHDLRUVATL GPPPVMLPTRGWRIRRASRSQPEAARV
TVPDVMEHVETTLDPDT REWHEPTRI SYEWDGKDAETYT PPPNHKLPRGTWRSPRSQADEPPR【VETLEDTPFYTRSVV PPQLLPLPRSGWKVDRSARSE
A DVHFRVLSAQARPGSEMRDPFAWRVRDRRGRDDATVDT HAEIDSDWDDNWTAGTARMKTESGTDYEVSGKVMSLIPLR DLDVWTEWDDNQEPAAARLGVRTAGTAVIDARTLTLAPLR SCADDAVAARPYSKDGTPLRFPPKPGDPVPG CAGASTIPPMRSTDPRSTTDTLPTGFRDETGGKVSLVNTTV ELLEAV TARETFADNNLPTATTITYGDLTATVDIRG TTN NSAVHTGSSHDSDSDWPQPTSIK
CSGDKVRPTGYPPVVSTGSPSGYSTEIADPK
CHADALRVVPTGSSGTSARYPPRAGDVPDGQFDDGAEGWL
EHGVAFVVDEHRRTSPDGRRMRLPHRLSWAARDDAGRPWL HVEIRKDSENDWKEP
YGGVTQTATHTKSKSDSVNEWPEPEEDK
P LAATDPPTGDWRMPRRSRS
DEELSFSTSGRFQPPHPCLPRPMALLAPGMAADLPGTLEV PPARVPDPTTTWR $\square$ ARATRSEHP
TTGLRVRPVGTPYPPTLGSANPTQMTLNMTDALLTVKQTQ APAERTLIPGTRWGDARATRSE
GTTNSATHTEASQDETSDWPEPKS $\square K$ WVWEGKTKDGKTVT
TGEFEDSFVGEDHVPQSGNGWPNMDR $\square E \square S G N H \square L S D A V N$ A TDVDYTFGRVPQVPESAR
CEGIKVRPSTYPPTPTTGSPSGYD $\square E \square$
SPPMSALPRGAWGVERVSR

SPPVADDPRGVWGVDRATR
GCKSDVTHDQTNSDSENDWPEPTTDKYTWAGTTKDGKPV ETDADYEENTLYHSARAKVKTAKGEELETEGKVQSFTPLR CSGLRVRPVGYPPTTQTGLPDGFTVSLDVGGQQGTDA

UniRef90 S9VAU2 UniRef90-H1LCVO UniRef90-R1GDC2 UniRef90_V6JGQ6 UniRef90 A3TS11 UniRef90-L2FT70 UniRef90-B6H917 UniRef90_Q5AWU5 UniRef90 СЗАМР6 UniRef90-UPIOO0310173B UniRef90_D7B7Z8 UniRef90 W9Y1M9 UniRef90-S0ELB7 UniRet90-WOHLO6 UniRef90 K2RP82 UniRef90 A0A010RIK8 UniRef90-K4DXQ7 UniRef90-W0ZBF6 UniRef90-T1HJD4 UniRef90-UPIo00361CFD4 UniRef90-W6KIR0 UniRef90-K9F4R5 UniRef90- TOKOG2 UniRef90- AOAO31LRK6 UniRef90-U2Y192 UniRef90-UPI000344B25C UniRef90-M4RYQ4 UniRef90-M7TCF2 UniRef90-UPI000248933C UniRef90- Q8EVP5 UniRef90-Q2SUV2 UniRet90-K2R891 UniRef90 WORN23 UniRef90- UPIOO03792C07 UniRef90-J9NIV8 UniRef90_S9XBZ4 UniRef90 A6G162 UniRef90-Q01TM2 UniRef90-UPI0003FD6C6E UniRef90_Q0CW44 UniRet90-Q5AR52 UniRef90-Q4WVE5 UniRef90_A1V310 UniRef90 K9FPB3 UniRef90-G7X8V8 UniRef90-Q8GDD0 UniRef90_W9L253 UniRef90-12JQ75 UniRef90-UPIO00382703C UniRef90-Q64C98 UniRef90 K1ZHP8 UniRef90- B2HIU8 UniRef90_Q2RJC7 UniRef90 A4HMX4 UniRef90 G7CBL3 UniRef90-K9HXD8 UniRef90-Q09885 UniRef90 W0E6N6 UniRef90-B3Q799

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|  |  |  |
| PDQEMVAEGGLLPTY EGYVTVSGNQTVEGYGLVEL RESEVRPDSGTSEAYWEGPVTFFGH GDQEMVDPGSGAVTYGGFVTVKGDGKNV TGY |  |  |
| PRQEAVSVAPSGRDEAHADAEGTMGGRPVGHGLWE |  |  |
|  |  |  |
| DATFPDQEFTTLFAQWLGAVQVSGDGTVTGKGFLQCCG |  |  |
| PEQFVP LR HVTAAADGTRADTGTDDGRH GLGUVE $\square$ $P E Q E F V T F L M$ QPSFWEGVVSLKGDGSVEGEGFM DA $\square \mathrm{N} \square \mathrm{ND}$ WSMFS S LPVVYSDPNLPDGVGYCESFGF $P D Q E M V A E G G L L P T H G G Y I T \square S G N R T V E G Y G L V E D$ |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| NRREEGGRTLLSRIVAEGHSRFTWDG VTGYG MTEYI |  |  |
|  |  |  |
| NRREENGQELLSRIAEGHTRFTWDG VV |  |  |

$P M \square F G \square G T G Y \nabla G G Y R W E G$
ERDGRPAGRGY $\square E$
EGTWEGEEV

PMLF G $\square$ GTGYVGGYRWEG ERDGRPSGRGY $\square E$
AELD
RDGELIPSLP
FATFYLSPDPM $\square$ T $\square$ FESP $\square$ SAF $\square$ DGQPGG
N

A NQEMDT WLA QPSV WE GA VKVRGDGSVS GDGFV HAPAPDGRVSHFPRAW CRVTTADGRTGVGWVE
E D $\square \mathrm{H} \square \mathrm{S} \square \mathrm{DAP} \mathrm{\square G}$
SA
PMLFG $\square$ GT GYVGGYRWE G $\quad$ ERDGRPSGRGY
NRRTPDGEMLTRDT EGMTEYTCNGQ VGYGLSE
NRRRTEDGTELRSRVAEAFSEYMWDGR TGYGUME
HNGLVIASAGPSYTRW $\square G N S T G$
HAPVLLTAPDGR $\square$ SHFPRAATVTTDDGRSGVGWVE
MANVSGTR $\square$ A GDNRYY FRWAGSMTGQ $\square Y$
DRGT $\square$ DS PWRFGASYFEGVVKGRV HSGRGY $\square E$

R A Q
$\square \mathrm{D} \square \mathrm{E} \square \mathrm{Y}$ S R W $\square \mathrm{GS} \square \quad \mathrm{E}$ GTV
A E
SEQKPDDETAPGY $\square R \square G G D \square R \nabla T A G G T E D A T G$

G V $\square \mathrm{E} \square \mathrm{PT}$ HDRAQTVIREGACRAT $\square \mathrm{DGEP}$

UniRef90 S9VAU2
UniRef90-H1LCV0
UniRef90-R1GDC2
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> P P R P A A

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WYF DAFSRNTSA TFY $\quad$ MMDPDGTT

## WWF DVVSEEDDT

D WWYFDAVSDDGDSS WWYVDAFSAD $\square H D G D G S D$

## FEDDFDA DMMAEWWYLNGDLVGQNGKD

ERPEPLRPSD DDELAHPPTDSESWYAD FVDAPQG FDWYYFD I DSEDSRS

RDFG WRYF HF $\square$ DKAGSR

$$
4-20-1+0
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FD WWYFDVASTSSANET WWYVDA LSDDGRHG AEPDGFKEWHHFVVHT ANGFR

> PDAADE WWFVT WHAEEA

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FAF $\square$ PG $\square F K G K T P D T T H \quad S F D Q \square V D G S A \square K Y H Y \quad \square R Y$ $\square P$ WKETFYRDESANATVSMHMTVSANRSPDTRCHQSASQV YS LVLVFFATANGLWDGDPDDGTAVITDPDGSSDNSEAAG LY IVFATFVSNLGPGTRNSGIS LVVYDKENGTRFFTKEF L GGW FRLGLVVANQTAWVHALVCGPDMPTVAVDA FSPYYALARRRGTADPDHHVSINVALYGNAPRRWAMTER
YYAS $\square S F \square A T P G T G F T P S \square F P N D A \square L A T V A S P E F A H Y G L L$ VAA QFYPGWFSE SNAVLLNVVWPNGTSYANVI $\square A \square A Q V \square Y S N V A G \square H T T V Q F N S K \square F Y L D G S K P H L W C S T Q L$

YSLVLVFFATANGLWKPASVWVDGQTSAPDGPAHNF TAD FSPYYAFARRGAAADPLNHCALNVGLYHSAGKRWTMTERA LAMHMTV SANRSPSTRVNDAAV S QGHHSTMQVC


LTFSPYYFRGRRRGDDNPHDYCSLNVCLYGTHRRWTTERR LLINFSLNNEAFGADEARDTPRVIVIARDE HWSGAV HG T LAAVGSCFSPYYAWARRRGDSDPLNHNYGACKRW FSLHTHPFQFNDSILDAFVYFGKRQDF HKFLILPRD PSFHATFYREASGGSAPENY IVI

ESLVVTFF SSSAEGFPFLDANETSVASFANGTVFADSVP GFLQVIYNNTAGLRVTVQFNCKLFYPNNEKPFLWASDPV VGGWI NAGLGVIPNQGHAWMPTVAVLDFDAP DPERL LAILFNAGLSSGLLGGNNETVPYFSISGLENGEYCNYVAW

GPDQRLLVNFSLTDETAHDRQWSGAV
\GGWVR $\square G \square M P T T W G P G \square P T\|V V A E\| L D P A D P W S \Pi T T D R \Pi$ LGVMWH MGTMLDDPRLWHLV1AVTQPDGT VHSTKG $R \square W Q E \| A V V F L P D G T L A L A K A T A P A H S A E N$
A $\square$ NIVFFNTGDFAANPHPLTVQ\SGT FDNGTQFSGEALD $\square M L Q V I Y S N V G G \square H T T A Q F W$ NK $\square$ FDHDGGKH $\square$ W

RAAAPSAVDPHDFCSLNVALYGDCRRWAMTER RRRGRGEPEHFCSVNVALYGAAGK RW

TVCFFTSF LVPNKG $\square \mathrm{DPV}$ V $\square W A S F T V S V Y A V H S Q K A V I E T$ Y GLT T I A A I GSVFSPYYAKERRRAIVDPAQHCSDNVAVY PRWQESMFLSAGLGGAHRVANVWSALVTSDGRRWRQNH

AYATVRTGGTLHAVRA
DGDPRDVATVLSSTAADGAHHYRAYS $\square$

FSFFVVLLQTNDGAEKPQSYMLSFNYFDGETEADFDDTNV $\square G G W F R \square G R \square A T A W V H A L L D M P T V A V V D V D V P \quad \square P D D P W W$

 $\square T-V F Y N S G P S S L G N P G G P L S D Q V T G V A N G T A F G T D A D$ SNAQ IIYSNVGGDHTTAQFNMK】FD HDGPGKH LDCSDP L
$\square$ N LVEHKTD $\square$ F G LDEAKPYMTMVAKA PDTEPVRFKGEPVW $\square T V V F F E R G P T G F L G N V T T E N T L S V T G T M K N G T V Y N D Q S$ LTFSPYYFRGRRRGLDNPHDYCSLNVCLYGTHRRWTERRS $L L I N F S L N N Q T T A Q G G F R L V P R M I V I \quad G H E D R W H G E D$ SVMCQ』 $V$ HSAVGLWYPQ $V Q F T F K \Downarrow Y D S K T G E Q F W K S F V T$
G $\square$ GGTMR $\square$ GHEPNHEGG $\square$ AA $\square$ WF G LVT A DGQRYR RN
$\square G L V Q V \square Y S N V L G V R K T A Q F S A K \quad \square F R P D G K H L W$ FGGWV RLGLLMPNQETAWIDNALVLPTVADNDFHAAL TAFVGSVFRFARRRGPTDPLNHCAALYRNTGNRWTMAERV


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UniRef90 A0A024J) UniRef90-A0A024JXK7 UniRef90_H8IK01 UniRef90-19CJ81 UniRef90_АоАо24К389 UniRef90_COGIG9 UniRef90-A0A031MDP7 UniRef90-K5VKW1 UniRef90-TOGK89 UniRef90-T2GUQ0 UniRef90-H1 G630 UniRef90 B2HF38

UniRef90 M7T7G1 UniRef90-W3WLD8 | UniRef90-K4RER8 |
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EFAHT ATDPDHRYRVTDRG RAASHDDPAGVLRGDPGE VAPGAGQFGASNAPFREWFGGMVDVSHEQGASGLTPDDHH PEAAADSYRCDEPFRTWTKTFHGAARVVSPDQLVADTDG ASEGAFDTNDESGDTGNWLGSGSFYGTNDEKYVVKLNSSP CSDPLRDYGFDEPQTSFYAENDALENEAGDTYTTKSAVND DRGAL SRDASSLAMGPSALAWDGT TLTI ETDE
 SPDG ATVSNGPRGVR GSWTFRGTNDEKYEVKFRSPE SRDGY AGD YHPLEMMGWQ GSADLSRYRVFFNDTV GRGAARWAMTEATPEQLA $\square G P S S$ SWDGTRUIVR DDEKA ERLDVGSQRRSPDRFGAGNTNFVEE PLGIEVDDPA DEQMHSFGADNLTHLNDQG SDAGEDRTRLTVGPLR\EV QEPLRRLRLVCDDE ARD CAVRRASTVVAFGDDLTDAGAYPRYTVRADYAH $A Y G G$ GLAGPDEDPFQRWTKGLRGAVSVVSGEQLLAGPFA
SREAFGTPYVNYNYPD GSKSLTGNHDSGYHLDYETDR SSTPLNNFEISEDKASFYADDCALESADGNSYTIKLNDEH VRDALELGHAVTTPLQTYRVDLRARGQAYADAGALLRGEE SFGG TMKNDEDGПSSVWN DNGADT ATCGATMKNDEDG\|SSVWNGGASFTGTSLDQYTVA $\square D N P$ SDYGFD ESQTSFYAENLAFENEAGDTYTIKSAVND DEAKTNFYADNCSVESADGSSYTl|KSSTNK
ERG VGNQSGKFDFVFDNARFNGEDTDT
DASANANAVINADPWEVRGDSFELGHCAPTPLLRA KAVTQEAAALTDGPSALWSADGTGTDDПDEPDPQRVRGR ARFDEGDVDISATLGDLADGGNRMLVRPEG YRVIVDLPA PPSGLDKRSSKADQFSVTYKSHPDNPDFPESYTFNANGQD
पTAPLTDADRLVDGFGALGG RYRQTFDGRVRHRVSDDD
ASDSDNDFAFSSDKQSFKSKEGCSMDI SEDGKS
$P A D V S S V T G E A D E L A L D B P G T P L R T Y R V T A T G T G$
ARSAPSLV DGPSDLSWDGNALTNEVTAP DPGRDRGR
ARSAPVPDPPDPWVRTDDVELGHAAEAPYRVDVRARG GEARVSRDRDCFAVGPSAlLWDGD TLVIDAE

UniRef90 G0RB27 UniRef90-A0A051U661 | UniRef90-G7GLT7 |
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140
150
160
R A LLJNLKIITKTAPGFQAGKTGTSLYGTDLKNSMRHAFWPRC $\square R G E L R F T S A S R P F V V R N Q P L G D G R \square S W L F \quad V P R L$ GAFDFADGPAGSALLTGTADRHFEQSG 1 TVDFE LTS S T H P R YP D GTNYPSKSASVELAPLIYADPAG


 $\square S$ GTLTMNE PVKWPDS $\quad$ VFS PGSMGYYNF LTFM V E F D L T L K GK GP L W D S M F K GF Y A T G K T G QV



 A GVVGK TMMSRAPA HVACGLRLPGASFEFAPYLYAVPDS L S Y D LT WT A D FPA L WE PHH L QRRGDR LT LEGRRFVQ A G
 DA Y TLTFNRSSPGFV DGKDGTSYFGTDAGSMSHAF WPRC VGFEMHFEGTHPAYNYA GH R DGCPSAVADNRFEQS GL A GVQVTFESSTTPA QFPCASGEQSF DLGSAPF GWANALPD A $V R V 1 P \mathrm{~T} T \mathrm{~V} T \mathrm{~K} Q \mathrm{CF} \mathrm{V} L \mathrm{~N}$ E DGNHRWWP V S I DLT I R GKHYAPLWDTEGYYAKGTAEDGQFYAHTEQQV $V$ D MDL Y F QTNVEKTVVD KCDYPDNTTTY ERSYG QA Y D EAFNLVFTR L $\square G T P \quad L P Q R \square R G R R \square R \square T$
$1 R$ GE L H F T S TRPFVVRNEP $V P D P R R \square R G T V K L Y P R T V A G Q P Y F L D G A G R H R W A P D A P G A$ FHLDLT L Q NEMEADLP LSMD LYYEKNAE KSFEWKVFMPGA VKGTITINSNAPHHYGCNTTTDPANEDEFYTGWATSCPGG
 $L V V S L D F E R D D R G F K V G E \quad G K T Y$ L $L$ G G DKSSAAGFVSWPRC RSVDLKVSRVAPGFVVGKNGTSYFGTDPKASMRHAFWPRC D E V DVVA C R A T G A K F V D A S P G Y T A Y D P V Q R H A A G WWP L P R A


 AAIEVVSLS YVAD IVPERE GY I D S QLDNHYVVY R S $N L V N L T L K R K A P A F Q A G K D G T S Y F G T D P A N S M F H R F W P R C$





 $H K V E L R W K G E R \quad D Q F D G T Y E A A Y P D Y A F S S H Y Y T E Q H G$ TATPLRLRGTVRVRPAGLTGKSFALDGAGLHRWRPDAPCS


 H GIK GTFDSVVAPPHYPCAASRNVDVQVCPHVGWANADPD G $P$ VTGLLPVRGVVTLEPE $\square R S D F A T D F G T D G R H L W A P \square A P R A$ A GVDL H F H D S PVV V WN G S E A E EVVAS S $\square$ A P N H K A A S G
 LSCDLVWTAAFPA LWEPHH LQRRRGDRLT LEGRRFVVQ AG RS IN L K IT RTAPGFK A GK S GT TKKYGT DLE NTMGHAFWPRC E GEHTVLLETELLAFEAWGPAF DLGKLNNDSWATAHYE Q H G VD M D L Y F Q T NVDKTVDESVNSLNFTTYERSYGRL


 | $T$ | $G V Q$ |  |  |
| :--- | :--- | :--- | :--- |
| $V$ | $L$ | $T$ | $F$ | SCLLNLTFTRLLTPGFVVGGNDGTSNFGTDPANSMRHAFWPQC

 $N \mathrm{~N} V \mathrm{NLTV} \mathrm{T}$ TRTAPGFQLGEDGTSYFGTDPANSMRHAFWPRC QSI SLKFTKSAPGFVVGKNGTSYFGTDPANSMRHAFWPRC
 $Y R V D L R A R A Q A Y P L L R G E P G T P V W A T D G A P Y K Y R Y E I P C$ HEI S I TFESTAP GHLPPC GTNS SAGET EDLP H DGWAN LLP GA $\square R V T P L F V N E R A F T L D S$ NGRHQWRPDPPSA
H GVVELDFVSVSRPFVVNNQ PVGAGRLNWLVVPRLD
 $L E L D L E V E D F Y P R T D F F P S D A G T V S D D F A S A$

 RSYD DPGG VRVIPRAAVTAQQAFTL NAE GNHRWWPD A PSA
A YALRGEPGSPALVWATDGTPYKYGLTTR

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190
200
AAEGT\|ITTKDGPVVFKGRA DY $\square Y A L Q G M K P H H A A A R W N F A$ RAD G S L R G G REHRVQ G LA YHD HN WGRFRWGDDF GWTWG
 DATVVMNFGGSPMNFQGNGYHDKNWGD』PFDSAVQSWYWG


 QLS GTLE E I G G S SVDF TGSA Y DE K NWGR DF P Y G W DWV T A Q GWLRWSDKRISFSGFGWRDRGWGTQ\|MWD TSWDLM NASVDDVINGTMVNFTGVGYHDQNWGPSTVVTVVK S WY WG
 $R V E V D L Q Q P G L R W L \quad G H G Y M D S N \square G T E P L E Q G F R Y W D W S$

 SVA GVV RAA GEEFRVTAA D WT D R S WGVVPDP GE G G G WDWC
 IT GAL RLD GRRMPFET T GHRDHSWGTRDWAAVQQHWKWF $N A N V D V V I N G T R D K F S G A G Y H D K N W G P S A V V G V V K S W Y W G$
 VAE GTLTWDGVEHPFSGFGWRDRGWGTQLMWN TGWDLV
 KVEGFFVIVKGTVKVDGQGLIDDHALQDMKPHHAAARWNFA $R \bigvee E V E L S R P D L S W$ S G G G A Y F D R N WGTEP L E D A F VY WD WS RADGWL R $A G G A D H R V R D L A Y H D H N W G R F R W G D D F$ G WT WG $R \bigvee E V Q L D Q P A L S W A$ GHGY LDDSNWGSEPDEKAFRYWEWS RASGRFSY IDKMLT LT GRAYFDSNRGT $\square \mathrm{N}$ GKKKEMDHWHWA A ASVSVVLDGTPFEFDGQGYHDANWMTQPIDAFMDNWYFV
 RVEGSMMTQTGEVNFNGKAFFVHALQGMKPHHAAARWNFV
 $M G E V D M Q Q H G S T V K F R G P G Y H D K N W S D Q P F T D S V Q S W Y W G$ SVV GK IITK D GEVVDVT GRGMLSHADQ GMKPH HAAAR WN A A DI S V D L V T T T GPVKYS GVGY H DKNWGS QLFPS TF NS WY W G $M$ S GTV A DGEDRYPVNGYGYF EHLLFGTLGWLEP Y L G G WN WY TVT GKMQTEKK TYDMK GKG LI $\square K$ A L Q G MKP H HAAAK WN F $\square$ $R A D G W V Q I G G R E H R I R A L A Y H D H N W G R F R W G G D F G W T W G$
 $K V T G T F S W D D H T F T F T A R G Q R D H S W G P R D W W S A D \quad W V W T$ $T V S G T V V V D G R V H T D D G V G Q R D H S W G V R D W W A M D A W T W S$

 QANDDLTDNGTE F KVT GVGYHDKNWGDASVITSPKY WD WG $T V S G T V K T P S K E Y D M T G R G L Y V Y A D Q G M K P H H L A D R W N G V$ $R V T G Q L T V D G K T F E V N G W L V R D H S W G P R V W G L N Q B H E W F$
 $R V E V T M E Q P D L D R W$ S GAGYF DTNWGSEPLEDGFAC WDWS KASGTVEFSDSTWTFDARLYGERNWGAGF PERWWWG
 AVEGTIATKDQTYDLGGRGVF DMA LQQGMKPHHAAARWN G NASVD MT DA GS R L R F H G S A Y H DK N WS DVPFTSTTTRTWY WG $R \vee S G S V R D A P A D S W T G T G Y F D T N R G D E P L E D G F S Y$ WN WS

 SLS GTI R H DGRTMPLDTMCTFEYARTTTPAKP IGERWDFF
 A A K GHFKVGDEKFEVSGF GLLRDK SWGPRYW QA DH WYWL

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


 $K$ I T G E L RT P Q GE K E ITTGYVY Q D R Q WG N I LI QE WVK N WI WT TVSGTVTVGDATYRLESVGQRDHSWGVRDWWSMD WUWS HAVVSLTLRGEE DQYNGVGYHDKNWGDVPFAS DVQNWWG $R \vee E V E L S R P D L S W$ S G H A Y F D R N WGT EP LIE DAFVY WD WS HAT GWI RMRGREHRFDGDVYHDHNWGRFWWGDDF GWEWG LAAEGHYVQNGQAHMFKGGSMFVHADQGMRPNLVASSWNFG
 RIT GHVRLGERDYQVDGLCHRDHSWGTRRWDT LLNHRW口 QASGLLVHKGHAVQVKGPGMFVHAlQGMRPNLVAARWNFA QVEGSII TA E GPVVDFR GRGMFVVHALLQGMKPHFAAARWNFAA $E V T G A V T V G E Q H Y A V D A D G Q R D H S W G V R D W W S$ V $V$ M N WVWS



| UniRef90 G0RB27 |  |
| :---: | :---: |
|  |  |
| iRef90-G7GLT7 | v |
| UniRef90-R8B9 | R VVTEPYSAVFW |
| UniRef90-W9X172 | G D |
| UniRef90-B8LY40 | G |
| UniRef90-A0A | F |
| UniRef90-H81 | RAD |
| UniRef90-19CJ81 UniRet90 A0AO24K389 |  |
| UniRef90-C0GIG9 | NNFSGTS |
| UniRef90-A0А031MDF | LP D N |
| UniRef90-K5 |  |
| UniRef90-ToGh | ONSEDEKL |
| UniRef90 T2GUQ | ALLHLDDGTHLHGVNDR DPGAPAFSIGYTQGAD |
| UniRef90-B2HF38 | LDDGTHLHGVND QLPGTPAFSVGYVQDSGGN |
| UniRef90-M7T7G1 | RGRLGP YSVVWFDGLDTEGDEHVAVYVAKDGA |
| iRef90-W3WLD8 |  |
| K4RE |  |
| UniRef90-G2W | TPTYSA |
| UniRef90_B8NLS4 | QTPTYTAVMMEFTTPPSYGSTVVNVGG1VKDGE I |
| $\begin{aligned} & \text { UniRef90-UPIOOO3699 } \\ & \text { UniRef90_KUQH9 } \end{aligned}$ | A GADLSVHFFEVHVAGRTYLRGSYVYKEGHMAEVTT |
| UniRet90-Q132K | RGALRDKTAI LYEAERRDGSRLDLAVTF DAQGNM |
| iRef90 - |  |
| D7 | K Y |
| UniRef90 AOQY |  |
|  |  |
| UniRef90- X7UL | DDPWS |
| UniRef90-13YAF5 | RAELKDGGTAVLYDAARRDGHRTEL G LHFDPAGDVERTD |
| H11 |  |
|  |  |
| UniRef90 U1GLD4 | A VMMEFTTPASYGNTVVNVSALAKD |
|  |  |
| UniRef90- A8L7Z2 | SGDYTA MVWTDSGASAQF |
| UniRef90-W6PSN8 | , |
| UniRet90_B2WG |  |
| UniRe990_14B | HILD D G HL |
| UniRee990-W3X8 | AGAYSVVIWFEVLAPSNDTHYSG YLIKDGQ |
|  |  |
| UniRef90 A1UFI |  |
| UniRef90-A1UD26 | ADGTADTAYGEFEPNG VRVSGGVVI |
| - | DDGTHSHLVHAKARGGDY |
| UniRef90-UP1000378 | DGSHLHAVEDRIPRGVPGDPGVGYLQRPG |
| UniRef90-UPIOOO362 |  |
| KE9 | AFSVHFWEFYALGRRQV |
| Q2Ul19 | SLVWYDLLD |
|  | PTYSAVLMEYTTPASYGKTV |
| UniRet90_AOA031 |  |
|  |  |
| - 5 W |  |
| UniRef90- X0BFO7 | OARDG |
| UniRef90-B6HJQ8 | QTPTYSAVMMEYTTPPSYGSTT |
| UniRef90-A0A022T | R GPYSVVWFYVLTPQH ${ }^{\text {a }}$ |
| UniRef90-A0A037URU4 |  |
|  |  |
|  | NFQTPTFSAVMMFTTPPSYGSTTVNVGGVVKDNGTTNSVA |
| UniRef90-S5VIM9 | D RFLMVVVQEDADGHRSLNDATLVRPGHRDRQLG |
|  | NVNLGDGUQL |
| UniRei90 - UPI000361265F | HGQFPSGRTFELFHLTGVDGRQETHAIV V G RESYA |
| UniRet90-A7HXQ1 | PMNFGRDFGMMISVVTNAEGKQHQ GGMVLKDGKYDLIK |
|  | N |
|  | PSHSAVMM QFVTPPSYGCTVVNVGGSAlVGA |
| UniRef90 U5WJ46 | AVHLDD ${ }^{\text {a }}$ |
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| 矿 |  |
| C4JRZ6 | Q |
|  | S |
|  |  |
| UniRef90-E4ZR | CFQSPSYSAIMEFTTPPSYANTVVRVAGIASDD |
| 矿 |  |
| ef90-D5P4L4 | A P A |
| UniRef90 M2UNM7 | $V G P$ YTLVWFDAMLRDGHEYTSG YVSKNG VLQLIA |
| UniRef90 W9BLK9 | RASMGEESALYYHVDRRGDG PLLSALIRFAADGTLSEFS |
|  | STADGVSAI QMTTSQYGKRGAGSGGVSVNVG |
| UniRef90-K0 |  |
| Ref90-H0E5J9 | GPELSFGSIWHGIDGSVRQ |
| effoc | V SAlQMDF |
|  | N |
|  | ALALDDGTALHGVDIDR DAGMPPIGIGYSQRAGEMEHFA |
|  |  |
|  |  |

UniRef90 GoRB27 UniRef90-A0A051U661 UniRef90-G7GLT7 UniRef90-R8B9W7 UniRet90 W9x172 UniRef90-B8LY40 UniRef90_A0A024JXK7 UniRef90_H8IK01 UniRef90 ${ }^{-19 C J 81}$ UniRef90_АоАо24к389 UniRef90_COGIG9 UniRef90 A0A031MDP7 UniRef90-K5VkW1 UniRef90-TOGK89 UniRef90-T2GUQ0 UniRef90-H1G630 UniRef90-B2HF38 UniRet90-M7T7G1 UniRef90 W3WLD8 UniRet90-K4RER8 UniRef90-G2WQ82 UniRef90 B8NLS4 UniRef90-UPI00036998F9 UniRef90-K5UQH9 UniRef90-Q132K7 UniRef90- UPI0003679A4F UniRef90-D7E9A1 UniRef90-A0QYZ9 UniRef90 ${ }^{-}$W7HQG2 UniRef90 G5CKL3 UniRef90-X7ULYO UniRef9-13YAF5 UniRef90-H1XXF3 UniRef90-R7SZ17 UniRef90_U1GLD4 UniRef90-S2JJK1 UniRef90 R7YG97 UniRef90-A8L7Z2 UniRef90-W6PSN8 UniRef90 B2WGE9 UniRef90 - 14 BKD 1 UniRef90-W3X8T6 UniRef90-W5TMB3 UniRet90_W2RZ66 UniRet90_A1UFE8 UniReffo-A1UD26

TEGNKVTHKATKKDTTSDWP ${ }^{260}$ EPTQVQFDWS ${ }^{270}$ ATSKDGKPV ${ }^{280}$ RD पRVEPV

SAGLQVRPVGT PYPPTLLTPNPT QFT\VM
GHTNSAKHLETNTDTENDWPEPKS $\square$ NFTWDGKGKEDNEIH
ELAVDYE
TVD SRESFDDNGपP पEATLTGNPGEDTANVDV
PPLAAPDPTSFWRMPRETRSDDGRARV
$P W R \backslash E L Q A G G E \square H Q \square R G E \ V A P M P F S F V G P V E M T \square G T D R T$
PC
CSGMAVSMTGTDNNFPPAQPAGFHDSARVEGEGQDEVDVM AKVHKSETLESETEPFSNYLLPTQ
TVD PPRRQGLPTSAW
AVNFREAFGS $N G \square P Q N T T L I L K P G D \square T A N \square D V R A$

WPQAETTYRPGTRHPES
GVDSTVAHTRTKTDSESEWPEPEADKFTWSGKTKDGKAV
SVQVDFE HDADVSHRSMTAIVADDAGRTTKVSGRT CSNMTVRATNSTWPPVRGTGAPGGFHISASEGEGQLEDDV QPPLMTLPRSGWKVSRSARSERDAKVLIRT
GDEDT DKEDNY DTEPMNDRTRPETVKFSTSDDNDT DNA
SVTAQHTLGDDDPVTTTLTLQPGDIEATVDDQGHAPVKLV TLDNTVEHVKVENDPEAEWPEPKDIKFTWKGKDKDGKELV PLPNHRLPTP IVQVARS
VPPHATLPTTAWपMQRGTRDDPQQ
A SSSAKHTATNKDSENDWP

HTEMKGDPDNDWPEPGTGDAMPAVTTLKAADGGTEFFARL
TFAFASYVERFTGNPRTGLAMPAVTTGKAADGGTEFFARL
 AES $\square$ TVRPDDTAYPRGDDESWPSGYTUE
PTTVKHT KSAPDVDCNWPEPKA $\square E \square E W K G P G A S G K S V$
DYTVYTDYAGEATYDGRNTAVIAADGDPTGTDNHFVPVTQ AAEMAANGLG $\square$ STT TMAPLPLTFYVKPTGHALMAKDGR AV SRWTDDTAVNTVELDVQGRKVVIDGR1 R
AKLISEAPLTSDLAAAGG DYVLEITSEDGPVTTTADV TLDVDWQGDSRLDQTAFQCDUVRATRVEGDVFGVFPLPAA CAEKAVEVRQW GANATYPPTSGIIATNEGNLTKEVII PC TAKHVTAEPETEADWP
DAEYDYT APPPVMLPASAWRVPRETR ADPGTAVT VDTL PPPAPLATTSVWRIAR
DEVDRMTPPALVRSQVGDGHWRDR
SCDDKSVITRPW GGNATWPPA
GTTNSVAHTETGQDEGSDWPAPKSTKWEWSGKTTDDKALT CAGVIVTP
LRERCDLPLRYWKMPRETR
HDDVVAGEADGVSHRGGMDFADGQRFGARGEVIDGVLCQ HTGSTQDPESDWPEPTSSGRHPERAVLHपGGPR
ERGVAFAVDEYRPSAPDGRRMRLPHRLSWPWLELRAT DDC PGHEAVH D PAEVDVTDDPD L W D DATNAAEPYSFTLRTATGAVTVRAEVV
GCDNTATDKAVEADPESGWPAPTNVAFVWHAKDKDGNPV LLTE ELQTVS $\square R D S F G P \square P \square H A T L S L D P G E L T A D \square E V$ CSNMTVRPTG TSN TAASHVETTQDSDNEWPEPTVVKY
PNSVVVRP
GPNNSATHTEKKQDAENEWPEPDAASYVWDGKTADGKDVH DCDVRHTATK EDPDTHWPEPTAAAYHWQGKTADGKEVT HDFEVPHFPKLANSSNPDANDFQAETKDPGKLSTVFTLS TVESRETFGANGLPQTASLRLNPGDVTADVDVRG SCAEGRHSVRPWPTNTTGRAQGGLEVYYKDDDGDGNVTTGA

NKLVAVTAQTVWPDEDS
VTARTTFADNG $\square P \nabla S A E V D Y E P A G \square T A A \square D V R G$ DVDTAVT
GKLAAVTAETRWPDEEPAATAGVISRAVHSKTAHDPDTSY SPDAKAEHTQVKGDPDNAWPEPGSVSFKWSGTSAEGKVVS $P L V E L Q T V T A Q Q T L G A D D L P V A T T L T \square Q P G D \square E L A V D L K G$ A PALERLQRTPWRVDRSARSE

QVVDSRESFADNG GPGNATLQLAPVGDTADVNV


A ELIE

RGQAPDGRVSQFPRVW ATDTTADARSGVGWDE
$P Q \quad A S H V V Y E S Q A R L S W N G Q \quad T G Y G L C E R T$
HKTVLTADPDVATYRWDGSVSG
RGQAPDGRVSQFPRVW AAVS TGDGRR GVGWDE
HALNASDWRVSHFPRAWVAV VTTDGR S GVGWME
FADYPFHVSPTTVLNEAGMTVEFDGKPGVGWEM
KHKTLLTADPDVTIYWTGSVSG
SAQFPRAWATVR TADGR TGVGWLE
AVLE K S WGP
E G Q E P K

RGHAPDGRTS LIFRAW AADT TADGR TG $\square G W \square E M$

| RTADRAARM VAKFPRSWA RGQAPDGRVSRFDRTW | GQMSVRYANGHGGWGTGE GTVTITNDGRK GVGWLE $\mathrm{G} \\| \mathrm{V}$ TTDGCR GVGWLE |
| :---: | :---: |
| GDVVLGADPSPVSSHWE PNFVLN <br> H D Q I V Y A R A L | GATRFTWDGADGHGLSERT GAARLTIDGNPGG GWMEM GSVTGGIEGQEQGRGAYE |
| $K A F A N \square R \square D F D P \square T Y \text { Y }$ EDTPFYAR | $A P V T V T \square D G V P G A G W C E$ SLIT GTLGGEPV |
| A E V N |  |
|  | G P |
| E P L E LDDVEVLTSSPDAV PWRFGHGRGYVSSYRFD | $\begin{aligned} & \text { IGPAD DWQHGT WR GRGWV } \\ & \text { GF VKGRAC } \quad \text { SGRGY } \end{aligned}$ |

$\square Q \square A P \square S \square A G P S$
$\frac{L}{N} R \operatorname{RKDANGEDLNTR\square TEGMTEYRCNG\quad MTGY}$
RAHAPDGRVSQFPRAW VAVSTHDGRSGVGWLE
HAPSPDGRHSRFPRAW GEVT TADGR TGVGW $\square E$

A D L
A DLE
PQNVMRSRDGFSASYVRWSVDGTNQSEETAQGVAE HAPVRDTAADGRVSQFPRAATVTTADGRGGVGWLE PQ QEFNNYARY LASVEGSLSGSQDRSYSGVGDWEL AS HLLD

HAPVLDGRLSQFPRAW GTVT TADGR TGTGW $\square \mathrm{E}$
DAPTE $\square$ T WAAPS $\square$ PEAQGP $\square \mathrm{DGT}$
AS LDGD
HAPVLLTAPDGRVSQFPRAVTVRTADGRTGTGWLE
$R G Q A P V R L V A T \quad D G R V S G T A D G R \quad T G V G W L E$

UniRef90 G0RB27
UniRef90-A0A051U661
UniRef90_G7GLT7
UniRef90 R8B9W7
UniRef90 W9X172
UniRef90-B8LY40
UniRef90-A0A024JXK극
UniRef90 H8IK01
UniRef90-19CJ81
UniRef90-A0A024K389
UniRef90-C0GIG9
UniRef90 A0A031MDP7
UniRef90-K5VKW1
UniRef90-TOGK89
UniRef90-T2GUQ0
UniRef90-H1G630
UniRef90-B2HF38
UniRef90 M7T7G1
UniRef90 W3WLD8
UniRef90-K4RER8
UniRef90-G2WQ82
UniRef90 B8NLS4
UniRef90 ${ }^{-}$UPI00036998F9
UniRef90-K5UQH9
UniRef90-Q132K7
UniRef90 UPI0003679A4F
UniRef90-D7E9A1
UniRef90-A0QYZ9
UniRef90 W7HQG2
UniRef90-G5CKL3
UniRef90-X7ULY0
UniRef90-13YAF5
UniRef90 H1XXF3
UniRef90-R7SZ17
UniRef90_U1GLD4
UniRef90 S2JJK1
UniRef90 R7YG97
UniRef90-A8L7Z
UniRef90-W6PSN8
UniRef90_B2WGE9
UniRef90 I4BKD1
UniRef90-W3X8T6
UniRef90 ${ }^{-}$W5TMB3
UniRef90 W2RZ66
UniRef90-A1UFE8
UniRef90-A1UD26
UniRef90 W9X64
UniRef90-UPI00037879EE
UniRef90_C0ZQ34
UniRef90_UPI000362848B
UniRef90 A0A031JKE9
UniRef90- Q2UlJ9
UniRef90_W9Y826
UniRef90_A0A031JZO0
UniRef90 J6UH82
UniRef90-LOHOE9
UniRef90-U5WK28
UniRef90 X0BFQ7
UniRef90-B6HJQ8
UniRef90-A0A022T8W1
UniRef90_A0A037URU4
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UniRef90-S8B177
UniRef90-S5VIM9
UniRef90 Q2T2V7
UniRef90-E9EB16
UniRef90_UPI000361265F
UniRef90 A7HXQ1
UniRef90 D7EC06
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UniRef90-U5WJ46
UniRef90 K5VYX4
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UniRef90-M2UNM7
UniRef90_UPI00036FD790
UniRef90 W9BLK9
UniRef90-K5WTW4
UniRef90-KOVFK
UniRef90 H0E5Js
UniRef90- UPI0004413937
UniRef90-M2MY50
UniRef90-X5KWL7
UniRef90 Q219T6
UniRef90-J4JW41
UniRef90_UPI00026CC433

UniRef90_KOVQG3
UniRef90_W9BL06 UniRef90-Q8TQ62 UniRef90_UPI000304DC74
UniRef90_B0UCM4 UniRef90 M5A4R7 UniRef90-UPI000362FD3D UniRef90_F8B0X9
UniRef90-U7FYU3
UniRef90_S9PFB5
UniRef90-A4ACR6
UniRef90-H6R4T7
UniRef90 C1BAV6
UniRef90_UPI000466CCA6
UniRef90-H5U293
UniRef90-UPI0004623027

1 PALDPEP ${ }^{10}$ V A AEDEFAHEELWNESWYFD ${ }^{20}$ FDDTEAGV ${ }^{40}$
 SFMSEWWYQNGRLVGEDGEK WWYVDGVSDDGRHTV

PEDEAAQPEGFKEWQHFVVH GRMAG
NKAKMQWWY VD LVMSDGSV WWYVDA ISDDGRQ

YFNAHNRDGAT

TEWWWVQVAAPAVDGQP




ETDGFELRLTPTDPLR ERGRYRVS $\quad R R R G$ PRDTVENVGFHVPYLDFTYPEGKFYGSALKGYRLDYAYDN
 AMTERRRRSVARDAASLSGGSSLAWDGSA LTIRVSEVT ERFGESATDVSAD LGVLTDGGNRMTVGPDGDLPGVRDLPG AQGNKSVIQVRTDGTHARLEMVNLSWDSNHELRWVGSLDE $R T \square D S S R M R V S K D G \square R \square E V P G V T \| V R E D T N P Y R F V F D D E R$


 ADHTRVRTDGDE DNQDVAEPYRVSLRGRG





[^0]| UniRef90_KOVQG3UniRef90_W9BL06UniRef90_Q8TQ62UniRef90_UPIO00304DC74UniRef90_B0UCM4UniRef90_M5A4R7UniRef90_UPI000362FD3DUniRef90_F8B0X9UniRef90_U7FYU3UniRef90_S9PFB5UniRef90_A4ACR6UniRef90_H6R4T7UniRef90_C1BAV6UniRef90_UPIO00466CCA6UniRef90_H5U293 |  |
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GDVSVELQSVRSADNGLPLSTTLTLAPGGDRVQAHVRA GDEVSI SQGDWVDTKVKGHDVERPASVQDSAPDLNDS ISA WPRLEVNYRSGTRHPESARDH
PP D PA ALPPT LDWR
CTIDADWNDAGEQTAMRCHVRYDVTGEVMSMDPDR HA QLQMRASR LGRAPDCTLPPPM
$L V E T A T \square S S T \square D G R D Q A T A Q S \square Q \square E G K S \square A L I P \square R$
 \THATVEASRVDMDAVNN HITAVDVRGKKHEFFGTAVG



HAPAPDGRVSQFPRAW Q

NRRTTPDGEQLHTR $\square$ TEAMTRFECDG HEG $\square$ GMSE

NRRQTDAWRHTR $\square$ T
EAMSRFHCDG
$K P \square E V E \square R T V T D \square P$
GAP WYSFSPAY
QGHAPDGRDS RFPRADGSV ATADGR TGVGWDE P IDPHERRNVDTDYEFLDGRCTVREWGRVI


[^0]:    lupas_21
    lupas-14
    lupas 28
    jnet conf sol25 sol5 sol0
    
    jhmm
    jpssm

[^1]:    lupas_21
    lupas_14
    lupas_28
    jnet conf sol25
    sol5
    sol0
    jhmm

