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 Q M P I Q L L K DS N A R A Q A V K L L N H L V T Y N TAAPV H E D


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A E ETLQMP 

$L$ \& $Q$ \& $L$ \\
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$L$ \& \\
$L$ \& $K$ \\
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\end{tabular} $\begin{array}{ll}K & M \\ R & R \\ K & T\end{array}$ T N A

N N A $\begin{array}{llll}P & E & Q & R \\ A & E & A & Q \\ A & Q & A & Q\end{array}$ LQSPI QLFRT QSPE DKIVEVVIQQYLI QNNEENVPMN ELHQMPI HLMKTKSPEAQAVEVLQHLVQDTQQHIRED
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 $Q M P$
$Q T P$
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ELL L STELL \begin{tabular}{c|ccc|cccc|ccccccccc}
\& $V$ \& $E$ \& $L$ \& $N$ \& $H$ \& $L$ \& $V$ \& $N$ \& $F$ \& $N$ \& $V$ \& $A$ \& $K$ \& $V$ \& $H$ \& $E$ <br>
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$T$ \& $Q$ \& $Y$ \& $L$ \& $V$ \& $D$ \& $H$ \& $I$ \& $H$ \& $E$ \& $Q$ \& $V$ \& $P$ \& $S$ \& $D$ <br>
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 V L N H L L A H TVV E S V H E D
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 $P \| I M Q N L D D P A P K A D E L I K R L A E A N S D G I D S E$ STE T L W S P I QLLMK I S D A Q A Q IV V D A L N N L A T K K K E SEILLQTPDHLLRVTHAEAQUVSTLNHLVASNVAKVHED
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 PILLMQNLDNPVPKAVELI KNLAEANENSIDNS


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


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ELLQAPDK L VK I S N A K A Q T A E VMNK LLAT DNVENLHEN P $\quad 1 \quad M M Q K L D D P V P K A T E L I M R L V Q A N T N Q L D S T$ $P$ I TMQRMD DVVQQQAERLLTTQLAETTSHQPTSA $P \bigvee P G S K \square K N L N K E D E D G L R Y L A D D E N F P K C D G K$ NVVQQAQELAKEIVQTPNADTGED
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 Y Q G N S $\square$ Q A S K Q $\square$ D GVQA $\square$ Q K L A K Q $\quad$ VQ Q P N A I P G D N
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 A PLK K L EL I Q L L R Q T D
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 <br> <br> } 418881 DP H A V Q L R T L K L D P H AV Q M R T L K M F V N R R E L K P E I


 | $Y$ | $P$ | $K$ | $L$ | $A$ | $R$ | $S$ | $V$ | $L$ | $F$ | $K$ | $I$ | $Y$ | $Q$ | $N$ | $A$ | $G$ | $D$ | $A$ | $P$ | $E$ | $I$ | $R$ | $V$ | $A$ | $A$ | $V$ | $M$ | $Q$ | $L$ | $M$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | $\begin{array}{llllllllllll}Y & P & K & Q & A & R & A & V & L & Y & K & I \\ F & P & K & L & A & R & S & I & L & Y & K & I \\ Y & Y\end{array}$



| $D$ | $P$ | $V$ | $R$ | $I$ | $Q$ | $G$ | $T$ | $A$ | $L$ | $Q$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $P$ | $R$ | $V$ | $A$ | $R$ | $S$ | $V$ | $L$ | $F$ | $K$ |
| $A$ | $P$ | $K$ | $L$ | $A$ | $R$ | $S$ | $V$ | $L$ | $Y$ | $K$ | $\begin{array}{lllllllllllllll}Y & L & N & T & M & E & D & H & Q & V & R & C & T & A & L \\ F & Q & L & M & R & T & N & P & P & P & S & M \\ M & K & T & D & P & P & L & T & M & L \\ Y & Q & N & A & G & D & A & E & E & V & R & V & A & A & V \\ M & Q & L & M & K & T & N & P & P & A & Q & L & L\end{array}$

A P KL A R S V L Y K Y
E PRMVQELALQ
 NPTVGRSVEFKI Y R N P S EAEPVRVAAVFQLMRTNPPADML



STVTA H L LE ERDMQVVNFAYTYFKSLSRSMTPDNHFLSTA STGLTA HL MK E K D M QVVVNFA Y T Y F R S L S R A M T P D K H DV A DA

 $S T V A$
TNVAK LIKKSDQSEAVSSFTYSLIKS LSRSTD HSVAAV QRMAEHTHSDPSKFVRAAVKSAIESAAEADEYDNEELAEN QRMAEATNSDHSEQVNAAVKSAIESAALLHTPQQQELAQN

 QRMA Q NTNSDHSQQVNSAVKSAIESAARLQTPS QQELAQN MTUANSMLNEPSMOVENFVYTOLSAMARMKTPSFHEMASA


 QRMA Q H T N Y D H S R QVVS A A V K S A I E S A A S L H G P K S Y Q L A Q N

330
CSVATKMLGSK\DRDG
CNVAVKLLNRKLDRM CNVVAVKMLNAKARRL




 CNI A I K KLLSPRLDRL







 CRMVI R B A NVA CNVAVRLLSPKFERL




ASVAVKILAPKFCHL A SVAVKILAPRFVHLN CRMALKVLSVKIQR AKAAVHMLNP
A NVGLR』LGQR
AKAALKFLNPE
ARTAVNMLTPR
ARAARDLLSTK
ARAAKRLLSP
AKSAVEMLTPK
SRAALKVLGRK■
AHSAKPLLTSK
ARSVMNIMNKE
A R S V Q H LLT P
AESAKPLLTTK
AKAAVHLLTTQ


 E1 ADELQE SQUP
 SSIQNARAPRIVAQLVKTIAEDFQNPSIIPKSN STQSAKQVNGVQLARKEAQETAEDPRQiTQKS SचATKPS $\quad \square N \square Q Q V A K K L A E E V Q T Q A E D C N G M P D R E$ DHSNKEKADEEALQESVRWQQLRYGEE TRSVSKLIDEDASDLGNPSTDPKSN KNUEKQLVNGLKKLCAQTKGDVRPE

KEDAKED EKFVDVVSNR KVKKLCEGI ARGLREAITEE KSAKSIAQEIGNEIQR PDSMPESQ NVE ILAEE I CKEMQQAPEE E L LAKA LLKKSPFQWMEKKMMAEKFLTSLRHSUEDKDESDKSE

```
SSAEKKQNPV
NVQKLLQDMAQQ QNPNNMPKAD
SSAEKKQNPV NAQKLVQELAQQL QNPNNMPKGD QNVPEQI KSLAKQWVQNPGQПPEEN VENLVTEUSDEIKQGMASEKTISKH QTP TQLLR DSDAQAQ IVETLHHLVANNVAKVHED NVQKLLQDIAQQL QNPNNMPKAD
VLMNKHEDFARLVKTLVSQLQSDEKGVDDA KS THKTDEDEPITMAKT LASQUGQDPNS TDDE SLVFDQUSSSAKTQ
```



``` EEDGRDESLSMSFEDSVE EVNPFKVLPTEQKLEQLQDIFRQIGE QEDNTPE S TQASNKDNVVSTVEKLAKEVGEQVLDGTGKN PFAIVVPTKTKIQQLQE: FLLQIQETDQNT PE ELLQNPVQLLRTENVDAQIVELANHLKTYNTEKVHED
ITTSKKQVQDKLKELCLTTENGIRPE
PSTEEEVAELVRKLC LRSGMSFE
ASLLFDGPDAQKTSGSSПAA ITEILNLLVGESQAGПSPK S DQADKQVDIVAEAQKVAMRVVQKPSAGPGQN
MKNKYEKFAEGLHQLAEYTDDDIKES
MKNKELLKEAIKKD
\(K K Q N P A Q K L V Q E D S H Q L Q N P N N M P K A D\)
```



NAQKLLQD $\square A Q Q L \quad$ QNPNNMPKSD FQDTNNKEKFVAGLNHLAEYEDDDVKES TKSTPPPQQTVKTIQELQTLHVSEQNAQ

AKEDFVQGLDKLAEYTDDDTKES
FEUTESTSPPKQAEALKTHKKDSQ
FENTRSTSPPKQAEALVVRRLCQEAQQATSFE
KNHROAGOL
TENKVEMUKKMFSLMAKQDEQGEAEE
VDNANKLEEACKSTEQDIRSE
EVTPSSLLYEWEETQSQASVVTVVRKLCQA QTTSFE TKSTSPPKQAEAIVKTLQELQKLHVSEQ K ${ }^{\prime}$ NHKQELIEQTVQKMVRAMELGIEPE QEDQGVSVVKKIAQQI GYEMQSPSADPGQK UKNHEVVSRLIK SMLESSEEKGLEELA TKSTSPPKQUVKTLQELQHESVEQNAQ

VKSATS $\square A Q E \square G N E M$ QNPD
ARAEDVLRQLVDSSGEVIQSS NAQK LLQDIAQQL QNPNNMPKSD TKSTSPPKQl LQTLQELQK LHDSEQNAQ TQMKKEKI QALCQDIAADLKNGПSSE DNVVKLANEMGEEIVQDASSMSGLN SEVAPFEKFPLEKKMDLIKTIIDRIQE EEHNTPQ KEMIKRDSRDLSVEMGGADTPE


UniRef90_F7BS91 UniRef90-Q7PQM2 UniRef90_E0VZ52 UniRef90_Q90WM8 UniRef90_B0W351 UniRef90_Q49MF7
UniRef90_V9HZ08 UniRef90_V9HZO
UniRef90_G8IIT0 UniRef90_E0VZ54 UniRef90-B0WU63 UniRef90_UPI0004418BCA UniRef90_A0A023FYX2 UniRef90_Q49MF8 UniRef90_K1PFG1 UniRef90_Q19V51 UniRef90-G3P5E5 UniRef90_A0A026WAJ5 UniRef90_C3ZJ91 UniRef90_K7J0R1 UniRef90_U4UYX7 UniRef90_UPI000383D53F UniRef90_H3EHI3 UniRef90_A0A023GNW9 UniRef90_A7XS62 UniRef90-G3LSH9 UniRef90_O02024 UniRef90_Q05808 UniRef90_A0A023G0E1 UniRef90_B9V417 UniRef90-W0M288 UniRef90_H3EJ56
UniRef90-O17428 UniRef90-O17428
UniRef90_W8EAE4 UniRef90-UPIO003F05BF2 UniRef90_D6W7J2 UniRef90_A0A026WD79 UniRef90-F4WXZ8 UniRef90_UPIO003F05BFC UniRef90-H2WDV0 UniRef90_-T1HDI9 UniRef90_G0M7Q0 UniRef90_Q9U5D7 UniRef90_G3FMM9
UniRef90_K1QKD6 UniRef90_UPI00035A2514 UniRef90_UPIO003C46C13 UniRef90_E9HQQ7 UniRef90_M9TKT0 UniRef90_Q94637 UniRef90_B5ABL8 UniRef90_A0A023GME3 UniRef90_S4NS19 UniRef90_Q9U5D6 UniRef90_E3LCE2 UniRef90-Q7Z1M0 UniRef90_A5A3J2 UniRef90_B7Q406 UniRef90_M3YQN7
UniRef90_B1B544 UniRef90_-V5H340 UniRef90_UPI0003F18BF2 UniRef90_L9L2M6 UniRef90_UPI000328DE4B UniRef90_Q698K6 UniRef90_P18948 UniRef90-R4VDM5 UniRef90-Q9U5D8 UniRef90_UPIO0042C25B4 UniRef90_F1SCV9
UniRef90 F1KQS3 UniRef90_UPI00035A0DFD UniRef90_Q0ZUC7 UniRef90_H3F167 UniRef90_Q9BPS0 UniRef90_UPIO003340CBC UniRef90_UPIO00359E3D0
UniRef90_K7J0R2 UniRef90-K7J0R2
UniRef90-Q9N4J2 UniRef90_B7Q381 UniRef90_Q27309
UniRef90 S9WGZ6 UniRef90_C3Z052 UniRef90_Q9U5F1 UniRef90_Q2VQM5 UniRef90_H2WP64 UniRef90_G0MWJ3
UniRef90_C3YVH5 UniRef90_E3LE68 UniRef90_G6DGS4 UniRef90_UPI00032AFC8A UniRef90_Q9PUB1

70
80 T DNKFTIL A RVGRTMHY Q D V



 TLAK F NMLVEEELRTMDAK QME QAS QE LHFK SLLA WK S F C D A
 TLARRFSILTTRVI RTMNAQQLEEKTAQELYPRRNAWMAFRDA



$T$ LEKFT I LI R LI R LM NVQ Q $\square N D V Q K N K F N S A E T W V V Y R N A$ $T P K K F L Q L V R E L B K M S Q A Q L K Q F T S Q E K E E A E A R K L I D D A$ TLEKVTI L SRRLIRTMNAEQI SEVQRDLYSRRNA WVAFRDA


 F L S K F N V L V R R I A S M S S E Q L
 A P L K F I QL I Q V L RV A S L E N I EA I W S Q F KAR P E YRR WI L D V









 S P R QF S E L V S AMR S L S Q Q DME DV HKM L K ENE KT Y K F F LD A


 A A H QL A RL V D L L R T C S R S E I Q T I H R E L K T Q Q KV R D I IVV A TP DK F L E V L Y S FVVLLD Y N Q I D DFYHRYS GSTD HKEAFFL E V



 G G L S S F L M L F Q S M M T L




 A A ELLF LTLVLEL QGLSPE ELLLELLWRQSSKCRDNWQPLVDA
 ATHQMARRLTELLGMCS KQELLLKVVNQFDEKTQKKDVLVVA


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

 A PGMFTELVVFSLRKLNNKDLQTVFHTARNSPKAKKFFMDA $F$ L S K F N IL V R RI A S M S T E QL
 STRKFMDLVEEL RSLHQDQLETI EQKDWRQKNARKVLLDA

 NTHEFFA Q L V R R L F R T C T D





## UniRef90 F7BS91 UniRef90-Q7PQM2 UniRet90 EOVZ52 UniRef90-Q90WM8 UniRef90-BOW351 UniRef90_Q49MF7 UniRef90-V9HZ08 UniRef90-G8IITO UniRef90-EOVZ54 UniRef90_B0WU63 UniRef90_UPIO004418BCA UniRef90-A0A023FYX2

 UniRef90-Q49MF8 UniRef90-K1PFG1 UniRef90-Q19V51 UniRef90-G3P5E5UniRef90-A0A026WAJ5 UniRef90_C3ZJ91 UniRef90-K7JOR1 UniRef90-U4UYX7 UniRei90-UPI000383D53F UniRef90-H3EHI3 UniRef90-A0A023GNW9 UniRef90-A7XS62 UniRef90-G3LSH9 UniRef90-002024 UniRef90-Q05808 UniRef90-A0A023GOE1 UniRef90-B9V417 UniRef90-W0M288 UniRef90-H3EJ56 UniRef90-O17428
UniRef90 W8EAE4 UniRef90-UPLIOOO3F05BF2 UniRef90-D6W7J2 UniRef90-A0A026WD79 UniRef90 F4WXz8 UniRef90-UP10003F05BFC UniRef90-H2WDVO UniRef90-T1HDI9 UniRef90-GOM7Q0
UniRef90-Q9U5D7 UniRef90-G3FMM9 UniRef90-K1QKD6 UniRef90-UPIOOO35A2514 UniRef90-UPIOOO3C46C13 UniRef90-E9HQQ7 UniRef90-M9TKT0 UniRef90-Q94637 UniRef90-B5ABL8
UniRef90 F1KQ6 UniRef90-A0AO23GME3 UniRef90_S4NS19 UniRef90-Q9U5D6 UniRef90-E3LCE2
UniRef90-Q7Z1MO UniRef90-A5A3J2 UniRef90-B7Q406 UniRef90-M3YQN7 UniRefolo-1318544 UniRef90-V5H340 UniRef90_UP10003F18BF2 UniRef90-L9L2M6 UniRef90-UP1000328DE4B UniRef90_Q698K6 UniRef90-P18948 UniRef90-Q9U5D8 UniRef90_UPIO0042C25B4 UniRef90-F1SCV9 UniRef90-F1KQS3 UniRef90_UPIO0035A0DFD UniRef90-OOZUC7 UniRef90-H3F167 UniRef90_UPI0003340CBC UniRef90 UPIO00359E3D0 UniRef90-K7JOR2 UniRef90-Q9N4J2 UniRef90-B7Q381 UniRef90-Q27309
UniRef90 SgWG 6 UniRef90-C3Z052 UniRef90-Q9U5F1
UniRef90 Q2VOM5 UniRef90-H2WP64 UniRef90-GOMWJ3 UniRef90-C3YVH5 UniRef90-E3LE68 UniRef90-UP100032AFC8A
UniRef90_Q9PUB1
130
140
40 TFL


150
160
EEKLIPEVIDDLVTSSRIKKDATEL TETVMHEYFLLVTSNAVQHQEYKNTTAALSYCDFLNRAQV DLEAISLLKDLTNNQKIKAYPVLRE VMLGYGTMVAKYCA TGTLMHEFFLLATSTAVQHQETLNATALIAFSDFLNRAHV
 TAEYLQTFFDLVKHPEVTSQYNVYNSALLFAFTNLVRMAQV

 SKDMIREVMPLLKK DLEALTLIQSMFSEKKIQENPVLREVVMLGYGTLVSKYCV CTPSATNDMEIAKSKQAQQDKNLRKVAWLAFGTMVEKLTQ TETYMRNFFDLLKSAEVQKQAHLNESAGLSFTNLVHRVYG

 SKAMMTQSFDLAMSPEVQQQKGLNTSAKLAASALYMMAQV
T

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TKEMIGALIA KELVQYYSKSQQ ARRS



DHDAIDREARELLMDKKNVQFFILRRD
T K D MLTEDIAKMMNTVHGTK
T S D ML L I A K T L VD T E
TA S M I D T L A P L L Q S
TLEMIS AVVAPS S P A S Q
$S$
$S$
$S$
28DE4B

M5
$\qquad$
T

UniRef90 F7BS91 UniRef90 Q7PQM2 UniRef90_E0VZ52
UniRef90-Q90WM8 UniRef90_B0W351 UniRef90_Q49MF7 UniRef90-V9HZO UniRef90 G8IIT0 UniRef90_E0VZ54 UniRef90_B0WU63 UniRef90_UPI0004418BCA UniRef90 A0A023FYX2 UniRef90_Q49MF8 UniRef90_K1PFG1 UniRef90_Q19V51 UniRef90-G3P5E5 UniRef90_A0A026WAJ5 UniRef90_C3ZJ91 UniRef90_K7J0R1 UniRef90- U4UYX7 UniRef90_UPI000383D53F UniRef90 H3EHI3 UniRef90-A0A023GNW9 UniRef90_A7XS62 UniRef90_G3LSH9 UniRef90_O02024 UniRef90_Q05808 UniRef90_A0A023G0E1 UniRef90_B9V417 UniRef90_W0M288 UniRef90-H3EJ56 UniRef90_O17428 UniRef90_UPI0003F05BF2 UniRef90_D6W7J2 UniRef90_A0A026WD79 UniRef90 F4WXZ8 UniRef90_UPI0003F05BFC UniRef90-H2WDV0 UniRef90_T1HDI9 UniRef90_G0M7Q0 UniRef90_Q9U5D7 UniRef90-K1QKD6 UniRef90_UPIO0035A2514 UniRef90_UPI0003C46C13 UniRef90_E9HQQ7 UniRef90_M9TKT0 UniRef90-Q94637 UniRef90 F1KQP6 UniRef90-A0A023GME3 UniRef90_S4NS19 UniRef90_Q9U5D6 UniRef90_E3LCE2 UniRef90_Q7Z1M0 UniRef90-A5A3J2 UniRef90_B7Q406 UniRef90_M3YQN7 UniRef90-B1B544 UniRef90-UPI0003F18BF2 UniRef90_L9L2M6 UniRef90_UPI000328DE4B UniRef90_Q698K6 UniRef90_P18948 UniRef90_R4VDM5 UniRef90_Q9U5D8 UniRef90_UPI00042C25B4 UniRef90_F1SCV9 UniRef90_F1KQS3 UniRef90_UPI00035A0DFD UniRef90_Q0ZUC7 UniRef90_H3F167 UniRef90_Q9BPS0 UniRef90_UPIO003340CBC UniRef90_UPI000359E3D0 UniRef90_K7J0R2 UniRef90-Q9N4J2 UniRef90_B7Q381 UniRef90_Q27309
UniRef90
S9WGZ UniRef90_C3Z052 UniRef90_Q9U5F1 UniRef90-Q2VQM5 UniRef90_H2WP64 UniRef90_G0MWJ3 UniRef90_C3YVH5 UniRef90_E3LE68 UniRef90_UPI00032AFC8A UniRef90_Q9PUB1

ASSTCPNAVLQQLHDFAAEA|L|SKGHEEEMA|I|A|L|KA|L|GNAG NNRSAYHKVVP WFA HQLREAVKAGDSVKVQVYIRCLGHLG

 N N R S A Y H K IVVPWF S H QL R E A I N E G D S V K A Q V Y i NA RNAH H Q Y L P Y Y E Q N L K R A V A N G D S R K D QA Y I RAA GN FA S N S S $\square Y$ Y N H Y I P F F A E E L K K A I K D G D S P R I Q VY I LA L G LT G
 S N R S A Y H K IV V W L A H Q L R E A V N N E G D S D A S RTCHPKLLEP L H N L Q A E AVVREKDENKMVLAMKA I GNAG D RGSCRPEVV SHFFNYSVTPSHTEHEYEDTTYQRAAGNRA S N R S DE H K L V P W L A H N L R E A V H R G D S V K T QV Y K T R C EN D L DI A NVIS A L E D Y V D N N N K E N V VL S L R AL G N S G DKGTCSPEIV SHFFNYSVGPVEHEPEYESTVIFIRSAGNGG ENPACPAELVVR DHELAVQANNKNDEGLIMALKVLGNAG

 NRNESNN QVI P Y L S E QL Q S A V S L A D S Y K I H L Y I R A L G N V G

 N N E TAA H N Y Y L


 $A$ V P T C P A E L L K P I H E L A A E A DA KA D DA E DT L LVVK VMM N A G
 GHRACPREVVKDEFVAEELYQQFTKAATRYEKTLAALKTMLANSG
 $\square H$ P D C G D D S I Q QVVLR Y L E S H L G S G CR M K I L V A L K A L M M T G

 NKLS $\quad$ KY Y T YI P Y MAT QL R K A I E E G D S HR I Q TYYIMALLGNF G

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



 DS D T K H M E Y M P Y L E EKKL K SA F E K G D S Q K I I V H I Q A L G N T A QK QCTRRQMKEKY I REEI EKMNQAESRYE KVLVVVKA I A N A G HHGTCNPE IVVSHI FNYSVTPAQTHDEFKSTVYLBVAGNGG


 $K T Q D L P R Q L K E K Y V R V F M Q H F S A E S T Y E K V L A L K T L G N A G$ N R S DIH Y P T Y I P Y M A N QLLT E A I I K D G D S R R I Q TY
 E HDECKPSLVSHFFNYSVKPEDKQPEYKRTAYI KAAGNLA












 $\square T Q Q Q A T Q Q L D D M N Y L L T Q \square Q E N G D T D H V Y L I L K V I G M N M G$ SHSCDSNDVVNVLADDLGKRCDSPDEDLVLLALRAAARNMG NKKS A H N H Y I P Y L E E E L L L K A V D A G D S R R I H T Y T I A L G K T A ANPDCNKELARSLYLTGGENCYARDARTTLVVLKALGNLG AN Y T A H S Y Y P T H MY GR L T H K H D A F V L E E I Q Q VYil Q A I
 ENSEMAMQLRKLYSQELLTCLDNAQSDEKLVCLKAMGNAG

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

 T H R V T T Q D $\quad$ L L



KDKYVRAVLYS IMRNTAEPYEVRVAA LINLFMAHPTAEMM LPRKITAVL $\quad$ PPVFKNKNEHPETRVAAFHQIMQTAPEKNVV KPKLARGVFYRIYKNTGEAHQLRCAAVTALMSTNPPASML

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A
APS R N N L I A L
$A N$
$L D$
D E L W L
 RTILANTYY ENGDLDSE

MPRKIHKI LLPI


RNRQARAVLYS YMNDMEAYELRCAAVYVVMKTNPPLVML




UniRef90_Q9PUB1

UniRef90_F7BS91 UniRef90-Q7PQM2 UniRef90-EOVZ52 UniRef90_B0W351 UniRef90_Q49MF7 UniRef90-V9HZO8 UniRef90_G8IIT0 UniRef90-EOVZ54 UniRef90-B0WU63 UniRef90_UPI0004418BCA UniRef90-A0A023FYX2 UniRef90-Q49MF8 UniRef90-K1PFG1 UniRef90-Q19V51 UniRef90-G3P5E5 UniRef90_A0A026WAJ5 UniRef90-C3ZJ91 UniRef90 K7JOR1 UniRef90-U4UYX7 UniRef90_UPI000383D53F UniRef90-H3EHI3 UniRef90-A0A023GNW9 UniRef90_A7XS62 UniRef90_G3LSH9 UniRef90_O02024 UniRef90-Q05808 UniRef90_A0A023G0E1 UniRef90-B9V417 UniRef90-W0M288 UniRef90-H3EJ56 UniRef90-O17428 UniRef90-W8EAE4 UniRef90-UPI0003F05BF2 UniRef90-D6W7J2 UniRef90-A0A026WD79 UniRef90 F4WXZ8 UniRef90-UPIO003F05BFC UniRef90-H2WDV0 UniRef90-T1HDI9 UniRef90-G0M7Q0 UniRef90-Q9U5D7 UniRef90-K1QKD6 UniRef90-UPIO0035A2514 UniRef90_UPI0003C46C13 UniRef90-E9HQQ7 UniRef90-M9TKT0 UniRef90-Q94637 UniRef90-F1KQP6 UniRef90-A0A023GME3 UniRef90_S4NS19 UniRef90-Q9U5D6 UniRef90_E3LCE2 UniRef90_Q7Z1M0
UniRef90-A5A3.J2 UniRef90-A5A3J2 UniRef90-M3YQN7 UniRef90-B1B544 UniRef90_V5H340 UniRef90_UPI0003F18BF2 UniRef90_L9L2M6 UniRef90_UPI000328DE4B UniRef90_Q698K6 UniRef90-P18948 UniRef90-R4VDM5 UniRef90_Q9U5D8 UniRef90_UPI00042C25B4 UniRef90-F1SCV9 UniRef90-F1KQS3 UniRef90-UPI00035A0DFD UniRef90_Q0ZUC7 UniRef90-H3F167 UniRef90_UPI0003340CBC UniRef90_UPIO00359E3D0 UniRef90-K7J0R2 UniRef90-Q9N4J2 UniRef90-B7Q381 UniRef90-Q27309
UniRef90 S9WGZ6 UniRef90-C3Z052 UniRef90-Q9U5F1 UniRef90-Q2VQM5 UniRef90-H2WP64 UniRef90_GOMWJ3
UniRef90-C3YVH5 UniRef90_C3YVH5
UniRef90_E3LE68 UniRef90-G6DGS4 UniRef90_UPI00032AFC8A
UniRef90_Q9PUB1

QRMAEQTHYDPSTYVRAAVKTALESASEAEFDDDYEFSQN QRMAQFTHEDPSTQVRSAVKSAUESAALLKTKTNFQLRKN

QRMAEKTDENNSPQVSALVKSLIESAANTEFDDDSELAQN QRMAEHTHYDPSKYVRAAVKTALESAAEADYDQYNEFAEN QRMAQFTNEDQDQQVNAAVKSALENAAKAHSESRQELAQA TRMAQFTNTDFSGQVNSAVKSAIVESAANLNYPEWEELTRN QRMAQFTHEDPSNQVRSAVKSAI ASAAVLSEESDSELRKN QRMAQQTNEEPS LYVRAAVKTALEYASQADEYEDRTFANN
TAMASAMLHEDNLQVVSFVYSHMTSITNSRHPDYYRLAS Y RHMADLE QRMAEFTHYDPSQYVRAAVKSADETATVADEYDNYSLAEN
 $\square T L A N N L L T E K S D Q V S S F V Y S Y M K S M T R N T S P D L A S V A S A$ QRMAQYTNYDKDEQVNSVVKSLIE SLAE LNNDPEWQELSDK ELLAQQSTQRETSNQVGRFVYTTLRSCAASRLTRDQRMRRT QRMADFTNYDVNKHVNAAVKSDIEVLSQLQDEEFRELSNA HRMAQYTKTDSQEKVNAAVKSAI ESASNLESPRFAALRNA A QVRRTQAREQSTQVGSFVWSHLLQLLETVDDPLKQSLREA

 QRMADFTNYDHSHQVNAAVKSAVESAAACTDSSDQQLVNN

QVMAQMTHDDPS $\square Q V R A V L K N G \square L T A A S L K E P R F W H L S R A$ DQUANHDEEFEPSTQVYSFVYSSFTQLAQQSDLPEHQSVAES QRMAEFTNEDHSKHVNAAVKSADESASELDTPQWQELAEN

 QRMAEFTNQDQDRHVNSQVKTSI ESLIDNDEQSEWKDLAEK VT $\mid A A E Q L I V E P N N Q V A S F V Y S H: R N L A N N T V P M M R P V A R A$ AHUVAQMEKESNQHVAAFTYQVI RQFAKSTNPCYQQLSVR A HIVAQMEQESNQHVAAFTYNVI RQFARSTNPCYTSSLALR QHMAEQTNYDHSKHVNAVVKSAIESAANGEYSAHPEFVEN
QQ $\square K E T L M S E E V N Q V G S F V W T H L M N L R E S S S P Y K E T V K T M$ GKMAASLKNEEDDQVGAFVYSHLTNLRDTSDPHKQDVARA NQVQQTLQEETSSQVGSFVWSHLSQLQETDDPDKQULREE
 RH H A A
 QAMAEMTKEDPSTHVRAVLKSVIESVAEDKNPRYFHLAQT QHMAEQTNYDYSKHVNAAVKSAI ESAARGEYHAYPEMLQN QRMAEFTNQDQDRHVNSVIKTNVDALARNLEQPEFQDLAAK
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 NRIVQLLLPREKNEQVKNFVATHTANILNSEDFY DQDLKTLL


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 SRIARLLPREQNEHVKNFVATHI ANDLNSEDDSDQHLKML SEVRKALEKESVNQVGSFVWTHLTNLLRTSSPQKQGIREK QRMAEFTNYDTSKYVNSAVKSTI ESLAQQDNHEYQGLLDS









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 $T K S T S P P K Q A E A A L K T L Q E L K K L D V S E Q$
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A S $\square$ A F E S T
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D K S P V Q
K N K M E H IE K I I N TMIDRHME D S V Q Q Q D
STLIFDHTP
SVRDSHEELKELLKDLCRLGFPD DRN
K E T F

$P \square S L^{T}$ K S S S P P K QA E A V V K T L Q E L K K LiFT S E Q
PS KD A A V N L M R QL V NLDET E GER

TKSTPPPKQVLNTLREL ERLSVSEQNAQ S I IF E S P Q PVVLVR S S SA D A V $R N P Q Q Q E T L I S A A A G L L D S L A E A D L E S T D F K F N E P$
 $S N L L F D H T P \quad S A K P$ T K S E $\square K L A R D L L K E M C A L G F P Y G Q R E$
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 K DKEVGT I I DEMKE LEEN

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 RANLFSKLVVNLRGLSSEDUTSSLPRLIEVSS PRUTLQA RANLFQDFVSELRSMEKDALRTLLPKL METSSSTTHQA AASHFAKALHFLRRVPEEACPQTLEKVRQRQKMESLFLDG AAEKFGKIVKVLRLSSKKDIISTYQKVKNKVLDKKIFLDA SAGQFAQLVRUMRTSSKDDLMRIYSQVKAHQLEKRVYLDA SPRSFIDLIHHLRAAKKEDVLQLLKMSENKEVLPQLVDA ATHLLSRLVVMFRMFTLEELSIVHSVYYVHCDKRSMIEHS VGPLVAEAVRLMRQVPDEKVQETLAQVSGCPNYRKLFEDA
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| UniRe90-L7LW | DEETIELVVPLIDHPKTKNE SQY |
| UniRef90-V5GJN1 | EVCEH VKPKRPVWVNCQL |
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 $T H P T E T Q D L L D \square A D Y L L E Q \square Q N T G D E D Y T N L I L R V I G N M G$
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 VNYHNTWDVATKYFNYLVPAYDRDTNMKGCRQLRRQGDAA KK TE S Q N QV DP Y L S Q Q L D E A V M Q A D S R K D HViA R A L G S V G DELUAVVHRVEKVCHRELKQRFVRRMDDEKVLMLKTLANAG KESTFIT E QY IPY LE Q QLESRNGD Q DVE Q FVVYI S AL GK LGG NEGKVTPEVVAEFMAFMLGGSDCSGDE DQTYLTMLRAMGNMG


 E GWRRSSREI K Q E V V K E L Q M L M R S T V F D D R

 VEKKTIPEIHSVAEFMASQLDCTGAKDHTFMTLRVI GNMA
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 A N G $\square$ D K DQFEE YV QK YFNMY LN D R D Y E QKMLFFLQ GLLSNLQQ SHYCEGDVLKKVSEEFVKKVDDKAKEDTVVAVLKGIKNSN VHSCCDNVPEVVKQAVHKIREKVTREQENDVVSALKALGNTQ Y N T D C I S N M V K W I T E A L E R E F E R R L Y E R MV V I L K G L G N IG YNTPCPREPIMPL LTMAEESRKANNEMEKILVLKALGNAG HYQGEPVNLQRYIVRFVDHDMNEQTYEMKMVYLMAMKNVQ
 E Q Q TVT DELVA DFMLSSLDGNECTGNEDKTFQTLKAMGMMG

 KQQTVGPELVADYMMSLDGSDCSGEKDKDYLTLKALGNMG
 RKRYSPNSY Y S Y F A K QLLKEADEKNDRQRVHTVIVVALSYTGG EHTCENVEVKQAlHK\|REKAKTREQENVIVSALKALGNSR
 L L Y C C P Y E ML L D D Y V R Y L K T GD DHRE L K QRYL NMMAQFEKA DT DYE K VLAALK S L A N A G




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F $\underset{T}{ } \mathrm{~V}$ E L I LILRSQAMFAFRKI IDHV TLESTMPMIKSVVLECTRSPKPSVLIQKAAMQARRKM HAESAVPTLGLQRCAANAELSMELRVVALQSFRRMSCV
 $\stackrel{\square}{\top}$ LTTHTLEEKLKN CTNDNEMNMAVRDAAVQSHRRDSCT
 LAAA PLASVVLSSCAVSKNNAPE\|RLAAI QAFRRIPCS



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TKSTLPPK QAEAVLTT LLQE|L|KK LS $\square$ SE Q VK SLAAE E I K S DMKK P A Y I P E R S T H $\square K K$ D S S MV S K L D E V L K QVCE K T K E S V VE D



 EP QS QQTLRIKAVPTKLKEVIGWSPGNEEALTD P NTVNKVNFFLEK LEEKTTKPFTVD SVLDSLQVVASDLKENSDSE QD
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 EVNK QKLL N SLS A YTENTVKE E DNVMNALKETCKTLGNEASSK
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$\square K$ D Q $\quad$ VP M I E D L S A K V V S D I K S Q V K EVVAKVTNNVGAN VA T A A T LVRRLCLA QTTS LE
 $\square K$ S S P D D DAA AVKA S A E E H D TVVQ K ATLVFDHTPAVKPSHDE L VKA AREQLVEMCALGFPNDQRE V V LK VK N M LS E A A D Y LK Q $\quad$ K EK S A D WK H G Q D PVKAVVQLANDILIDPDSLDP K D $K$ DP S LVVP E L E QTTLR Y L CEDT T DGVVEA H $\square D K I V K E Q I K H L L K E L V E K H K D D A E K Q$ E EVKTILRDMCAS QTVTLH D M L K E Q I DS M I K A L S E F D N DK L K G Q E NPD QQ I K QELLK S TVVESTN GNVGGK K H T P S T K P T RTEI K DLLKKMCVS GFP HI K R E VD Q V T N L L K D I C S S VE N Q I E P K $T M K D P Q L A P E L D Q L M K E V C E K T K D T V E A E$ L I N $\square R$ N PD S L N QP I I E ELCD D C D S L K E Q KII ID GI REPKENNYEN
ENPEQQI KQELKATDDSYANNVGKK $\square K$

 $V L K V L Q E L K K D T D S E Q N H K$
 K D A A DL Q GEPRVGEDRH A ATPRS I IFENPKSDSQSNLETI KQEL KTYNNNNVGKL TLQ S L CQHTEEGVESE

 K D P S MVT QLDRIMS QI CRKTRDNVERD
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 TAKKFVELIRLMRHSDVDTLLELSTAPHKKALARKVYLDA FLSKFNILI RHLATFNSEQLTVLSNKNAAKNAMWIIYRDA HNTTISVLLYYLGMLDRADLGKAYSRDYKEETDRNMFLETV RAHLFRRLVTVVRGMRVEALRSAVPEALAVSRMVLTMQV TLLDAMAALQLFQAMSLESLKAVWKNVESDEELKNLFTEM FSETFTAFVHSARLLDYPSLSQLFRANSDCKTGKKHIMDA Y FIQLVFQLKDLTISQLKTLWQEASKCRNDWQPLLDA AARSFLSFIQSIRKATKEEILQU IR SENKELLPQIVDA TGDKIIQLTMVLGSGSKRQLQSLWEVLGETATARKVLIDT ATDLFLTLVSQLQGLSGGELMELWRDSSKCRDNGQPLLDA SAKKFVELIRLLRQSDTDTLLELAAFPHQNKQARKVYLDA AAKKFSHLVSVLCRSSKNDLAYYQMDFDKAHDKKLYLDA RAHLFHKLVTIVRGMKAETLSTSMPEALAVS RVLTYQV F DDUF SSFLHTCKSLDYKTLSVLLQRSATCDQGRNHVLES TITK F I I MVVRVMNVVSF
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 VIPSVF T N F L H T I K Q L D Y E A L T Q L L R S TS DCE K GK N HV I D A T A A L V A K K A L H L L R R R V P E T V V V E
 T S S K F V EL I Q L MRY S K K E DLL LT L Y N Q V K N K S L A R K V Y L D A

 A S G V F A R L V A G L R G L A Y P E L R A NLLFY R F V T GLL R S L H N S T L S P L V P K M M E T S S S V T i Q A FSETFTNFVHSARSLNYPSLS QLIMRASDCRGGKNHILAA
 A AHFELLQLMRYSKKEDLLSLYQQHKNQSLARKVYFDA
 FSEMFTNFVHSARFLDYPSLS QLLAARANNCRNGKKHIIAA


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## D

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 T GEALKALLPLIFKNKSPM LIPRQSVLGVSALVHNYCA NTLLADKMLEFCMSSEVQNHEQMSVTCYMTFGSTVAQAVA SSKVVEELLRFADSGVVKRSPAVHQTTWLADGSVMRGVVG TKEALKAASKLLEGNP S\|KVMQQLQEILTGPKFQEKRT\|LGAASUAFAEVVRSNCA NTEVLESMLELIEHGKT $\backslash S E G M$ YYYLPATMVVNTFCQ TEEMLALLAPLIK STKTHRELDMAEYHPS HQDPHRASFYALSHSVNRFYF
SKPALNAAKPLLDNAAFSRR NGKAVEALTPLFESARPK

CTHAMKALKPLFESTRPMPYPT CIHAMKAKPLFESTRPMPYPTLKESVAASSMVNNYCN TESMLQSLLEVLSQQKDGSTELKESVVIIMGALLRKLCD DVKAI QALEPLFKSSADGS SAKLAAASMVNTYCR DKETL NLAAA QLL KYKPS SPNVPKETYLAVGNLVSKYCA SALLI HDMLEMAKYKPSKP NEKMLKALMDDWNGKDGSSD DKESVIIIMGALVRKLCQ SRDLVEEMLEMAKFKSSKP SEELLHALLRVFKGSFASND IRETVLITGGALVRKLCLI SRLMVKDLLEMAQSKQSKP DRQT LLALAPLLRREAEDPAEAQLSESALVHGYCS TKASПKAVIPLLDN APHTAYLGTGSFAGRFCN TLELLMSEMLRMAQYSPSQ TKPALKAAKLLLDGNPSRE TKEMLNDAMMTALGNPSRE TKEMLNDMMMTALS OK NRQLKEQSLLTLGSMI HHFMV PSKKLLVQMEELLNLDDSVSVEVKEASI FCFATGIRKTFE

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 WDQK FT DVYI P Y LA QE LMDAQQQKH HNSK L TYYI DA L G NIG

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





 Q H R C E H A E GLLK K LTM K L K Q P TNN R H D E N D LI Y V L K A L G N F H




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

 NHRCNNVDQVSRFLS Y LE QRLEKGCAARTHSALKA I GNMG AK G DD K E K F E E Y V Q K Y F N A Y L S S D R D F D Q K ML






 $R F Q A S C G E Q V E F F M Q T I Q E T$ LINA GCGEKLI YALLK SUGNSG EHDEVNDPLLNRCLDHFMDHIVAEPTMEMKVYMMAMKNVG K R P Y I S P Y FI K Y L F Q EFEN A YRR Q NTTQQMQVY VH T LG NT G HKPHCHE E LKQKI E EDDLASSSSEETQRRQTQSAFKSLLGNMG A H P E S D L VVN K WI P F L Q R E L R E S S S T E K K NIVITT S L G L L


 HTPHCHQEPVERIAE ILAA KVEGHCSEEALAAFKAGLGMG





i N N D C I E L L E E V


 N N DVVDCVIE E I H A L L L LH L Q Q E I S T G C A PR L H N A L K A I G N M G
 HNRNCHE E LAE T L GNKL QRQCS ASE DE QTVTTVLKALGNMG
 HKPHCYNELARALK QKI EEDLLSSSSEDTQKSALKSLLGNMG



 SEGVVTPDNDVYEFVTSSILGADCPGEKEDTFDTLRVVGNMG






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UniRef90_UPIOOO3F0993A UniRef90-H9KD98 UniRef90-A7TZD9 UniRef90-H9GITTO
 QTASLKLVRPLAEN REGDDKHSKVQVVA乌QALMKDARH MPDH1 Y Y QP L EQTFTNQT QDVR AACSAMRRM KT
 HSKMLSVFEPYVEGKK AEDKNVSKFQRLLMVSSGSTLSAF HI MVLKPIIKYL QSAVPSDDRI QQNAIIMALRNPGDK HLNNA $L_{\text {GEKVKQLALDKSLPPRVRVAALEVIQSDPCR }}$ AALEESPRLKASVLKCLESPAASLPVQKAALQALRKMME HLCDEVLEKVITGLAQNRKNSNRVRVTALETYLLADPCK LEEKDSKLLK EECIDDVGGFLSTEVRVASADAHRRMPS



 L IPAURLIPHVKSG SVPHAVRPHVI FALQPIAAV LETDSNRLQECIVEDAGG FFLPMEVRVASUDAHRRMPS VMDVAEVLDRYMHSEQKKVNN ROMAVQAFRL SK VSASHPLLSRCMLSSSAALS QLRLAAIVHAFRRFPCS






 DNLVAPLLDKVIQCAGPDASS RVRVAALQAYPRAAS

 FLA APLLDKVL GCAGSGVSSRVRVAALQAFRAASS HPKAVEALVPYVYGESEDDSEYVQFI RQIA YAGHPAAQK PAVIASPALRAAVLECVNHPAVDPLVQQAAI QAYRLT VVSKEQELRRIIEGECAVASELGTEVRVEAVNVFRRHDCH VLENVNPSVKQSLKACIRSNVASPDIQKAAIQALRKM

 VAリSGDHLDTVVQCFQEKDN PTEVRVTAGKAFSDTPCH V VTPAVTSAAVTCLIEEHEVPTSIRVAAAEVFRQAKCY VPAVATSVLRCMGTEGA $\quad$ DNRIRVAAAQAFRKAKCH LPEG|PVLAKYAESEVGAYS DPSRDTVAMTVRYDPAL VLS VAEKVVLYMENENK KVSARSRCTSLQADRVSRPV $P A V V A S P A L R T A V I N C V N K P T A S L A V Q Q A A!Q V Y R L T P C$ LPEADPLLTQFSESAAGPITS

 DPKIKTTLVKCMRQPATISS VQLAAIQAFRRM VETAA LLPGLLRGCAADESLPTEVRGAAGQAFRRMPSC EPVERYDQLTFMFSECTKNKQIVRDISKAALQSMRRFVMS TLVVAQLLDKVVLC FPSTVPYMMRCAKECPT V



## UniRef90 ${ }^{13 \mathrm{~N} 8 \mathrm{HO}}$

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UniRet90-UPIOOO265793C UniRef90-G1UIS8 UniRef90-UP100045DAD92 UniRef90-B4NHW7 UniRef90-A0A026W5F4 UniRet90_G3P546 UniRef90-Q29NB0 UniRef90-UP10003B59CF2 UniRef90 UPIO00258E917 UniRef90_O9GR96 UniRef90-D2SM19 UniRef90-T1J9X6 UniRef90-I7AQA8
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UniRef90 A0A026V UniRef90-A0A026W332 UniRef90-H2VBD 1 UniRef90_O9GSG2
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## 

290
300
310
320
$N K|I| A R T L I P R E Q N E Q|V| K N F|V| A S S H \mid A A N I$
QRMAEFSNDDPDVKQVVAVQSAI RSAANLKEPGNLNLARA
 QK FA S M T WF E P S Q QM A T F T N S L L I D S



 K N L L L S I











 GSIKADLDHEQDNQVGSFVWSHLTNLAKSNSP EVVKTTLKNETSSQVGSFVWSHLTNI LRSEDPVKQTLIQ MNMYWFMVYEKNEHLYNYHVSTLKGIANSVDPCLTPAREM RTMAELTHSEPVNQVVSARQAAIRTAARLRGTRFYNLAFK
QNTVTKISYEENTQVRGF:LSNLLNLQQSDAPEKQRLRR QNVVTKSYEENTQVRGFVLSNLLNLQQSDAPEKQRLR
 GRIVIAELGRERNQEVASFAYSALRSMANSTLPCMKQSARR NELKALLDAEKVYQVGSFDTSHLASSLRASVDP KKKKNTLKFEEVNQVGSFVWSHLKNLAKSSSPLY EAQUEKLSEEEENTQVRGFVLGHLTNUQESTCPTKENLKK AQUVSTMERDSNQQVAAFTYOLLNSFAKSTHSCLQEAR NELKAVLDQEKVYQVGSFITSHLASLRASVDPTREAARAH

## 

## R

## K N T

 K T I K H T L K M E E V N Q QV G S F V W S H L L N L Y N S A S P


 QEI VT KI S Y E ENTQVRGFI LSHLDNLQKSDAPEKQSLR N QI SEE IVN S E KVV QV G G F I ES N L R GI R D S T D
A R V V N A L P N ll Q D Q QV K S F V I S H I T N M L S S S G S E T Q A LR H K





T GL W S F L K T E P V N QMK A FCCYS H I Q N V V E S S E P T L Q E L K K N N E I K A L L D N E KVVY QVGGS F LTT T HLAASLRAS A DP




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UniRef90 UPIO002A4A472
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UniRef90-H9KD98
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UniRef90 H2 UES4

ARSAVN【LN P
A GQF GRLLR
AKVAWPLLKS
VS SLVV R R K FD
ST WAMRFAKKYD
LS E
A Q A VRKLLNPK
LQLLMRRVDH
RVLKDMMTHNYGRF
CHLALK $\square$ MNPWF VR $\square N$
ARHAL
ATDALCLAKP
LT EVLK
ARSVRHLLNPK
YRMALKVLSEKSQR
AKEKLGQLK PK
VEAAL
STWAMRFSKKYD

LQEAFK
AN V V P I
AKAVQPFVAKE
AAQFSHILRKPSDK
lRD L LP I MDPKFSR
I N LGMKFSKRKFSRF LQLLLRRVAH
$\square S$ Y M HRH $\square$ P QK
VRQVLKMRAHNYERF $V Q N V L$
$\square R$ D A $\square$ R T M D P K F S R

AKKILRF $A Q T V \vee N L L S D K$
AAVVFPLMKP VQSFV LRQKFS I Q N V L

A Q NAVDLIDDEYD

V Q NVL
$\square R N L L$
Vs
1 Q E A LTK

Q N M VKK F D T R K F S R

F LD VLK
QVMK DMDSHNYDRF

LQDA 1 P ПMDPKFSR VRQVMRT】AHNYDRL ILNAL
AQQTLDMDANQ RVLKEMVAHNYNRF LD A M
$\square K \square A M$

| SYAAL QRMGEKCPR <br> AKKLLKlVR <br> TQLVVPLMR <br> LK DMLIHNYDRF <br> IQEAMKMSSNYDRF |
| :---: |
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|  |  |
|  |  |



KTENTVEAD
P S LKE HWQS VQK E L
A PKNLSKAT



$V$ S A VKETCKHAD $\square$ SRAS
 K D DVLAATMKEWLITASS N L L S K K A E

 $M K K D P S M V V K$ LDAMLK EVCQKMKHGVQED VK DKS A K EA ALDT LMRELVSLPD SE GER
$L K E L C D T G D Q V I Q K$


$E S L I T$ A A S S MLL R L A E D A E LQ F GEP
$S L L F$ QKPETYTSKN $\square$ NS $\quad L K T \square L S D L V D S T T E Y \square K K D$ E AV E Y L QENPVTKTET D
$S L V F Q E D \quad H P E A Q K G G V Q T M V E L L R S S C D S$ R $\operatorname{LIV} T E D$ TMDSRDLI A TVKELL IAAAVE Y L K T EVVNLK

EAFKLLSMMVVTMDKS PVVAVVIDATMQKLLNTVLSETNE GEE

$\square S P$ QNEFDMERTSNLLS QVAVTI DGKANENRDSV
 LLES F RRS QLY A SRVQQRPKKEVTETLNHLCKAVDS QI K S N

 $T P V V D \square S T P K V Q A M L Y E A V Q Y Q Q E T P D T H Q Q T D$
 TS LLLYE DP DQVSEDNS D DVVNTMTQDCNS DTNGI S S E EVTPTTPMEFTK FVENP口TNVETCD
 A ATTQKPKNMEMMFSRKKYIVNVLKTAAQSTGPAVLAE ESPKKLVAKLAD DLSTDNMATVRS

## $\square \mathrm{D} N \square \mathrm{Q}$ H MLLSD $\square \mathrm{HS} Y$ Y N E D H $\square \mathrm{H}$ TREP D DNQMEMRAKA 1 DQRLA GGKNED DK E K K A I E K FK E L A A L S N D E ERK D <br> HK TF QTDKT S QNEN QVDQLLT T



NGHEKQTFD
D T SKAA
 S SLLYDHTPSVHESHDEDKAS RELLMELCVHGFPNIRRD
 VK R L DE VLKK $\quad$ T K Q D L T T E D LLKESSPFP EMKNKHEVVGRLIMKSVIE TEEKGDELA

PSAKKQLSAVRRHL HPETLSQTV<br>DPDVQHMLEDI HQYLHEDH苗HREPD  

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UniRef90_G3UER6
UniRef90_UPI000395AD75
UniRef90_UPI0002989208


A A SHFADLIYH $\square R G L S T M E \square S S \square A N L Q C D$
$A F \| D A$ SGKLFGDLIKSMRSAPYAKVAEVYESDENKPKDKTAFLDVV
 RAGLFHKLVSGLRALLRNETLSRAVPEMRAASGWLTW QA TVGLWGRFVRAARPLDFPSLSQLLARPTMCEDATKHMLDA

 RAGLFRQLVSEFRGLKGD\|LNSAIVEMTDGSPSLTW QA
YDTAVSDLIKVLSEMDYDS LKK $\square Y R D V Y R Q E T \square R N D F N E \square$ S I T TQA PSLVDA
SAKKFVEFDRLLRQSDSDTLLEDGAFPHPNKVARKVYLDGG

 V $Q$
SATSFTDLIRLMRNADTDTLLELA LVPHENTLARKVYLDA WK HDDNR L HVMSYMNVASLNKVFSEDEDDKDARNGFLTM


 Y A DLVVQLLTVVNALTVEDLYELLKTVVPLEKVRKLLLDA A A S HVAKAL HYLRRIPEEMVQQTLQKIVGCSDHQKLFLDA



 VTMKILSV SRGLTMLTKSKDKADYREMKAKASSKSLFFDT


K HLL L P S S
$L \vee D A$

| $P$ | $T$ | $L$ | $Q$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $T$ | $V$ | $H$ | $H$ | $\square$ |
|  |  |  |  |  |

SK RMVN R VQR R L L R F FS PARSFSEAIKAVSLLDYQGMEEVFDKIVKKTQMHRTFVEV SPSDLIKKNQMLDHLSSRDULTLVRKYSCDDEKLQULLDC TTKKFLKVVRLLRQMKKENDFQLLRTADHTVVIFLIDA TPAYMIELI QAVSGMTEEELKKTIPEVVRRQQPRQLWI ELL TTWQFHRFI QMLRDAKKRDVLQLLRK APEKMVTFFI DA TAWQFQRFIQMFRSAKKSDVLQLLRR APEEARPFLLEA


TSTEILDLIQLMRVTTLDNLEHLWKQVSGNDEHRRWFLDL AAATFTDLVSNLRGLTLSEI GSLSKGDCA AFVDA | $\square P R M D T E$ |
| :---: |
| $A$ | TTRSAVRLVQLLRKSEK DEEVLDLLKKAVVKE DM P FLIDDS TPAYMVELLQQAVSGMTEEELRQTTKQLSEEEQLRRQLWELD SKRLINRRVRLLQHFNSAKLEELHKKLTGGKAAMRIFHHI




LP A C A S H P C L L Q LS NLIN S GT A S E SVYS S LALLLS N P L GMA GSTGS IVMI AKFI QNGEHKEHHQ K WLKS L A Y I S N P



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

VVEVT DER LLKF LEARYKAGDDTANEAGQALVVAFNHLSA LAVCGSKDCIA QLASLINSGVTS TVFSALALVYQP
 L T A A Q T K A CLLA AL SE Y L D T K K T Q T T M L E K K F L Y A S A L S S R P






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130
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SRQMVKDLLAMAQYKQSKPYEPLRQSAMYALSNAARKLYK S DDLVKECEVFLT LGGPDPDVHQAADLSFATLVHNVFM TPKRI REMLNMAQYQPS RASFYGLSHAVTKFYN DEELLRALLSKFKGSFASND DRETVMGIGGALVRKLCQ DKNTLNQAASQLNFEDVVKPSAHKELYLSVGSLVAKYCA
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 DTDMI EQVLALCTQQEGLTSTGKATACVAAGKIISKGCS SKELLRLVLDKLNGKEL DPAAWWETGUVAGKYLAGKLCR SGELLQLVLDKLDGRQLAPAEWETGI AMGSLVGKLCQ MKHGKESGD MTYQTYLLSGSTVVNTFCK
EPVSVALAQEFLTTPFSKSHPLLWNTVVLKYGSLVHRYCV

SEKVVKSLVSLCK
SEELLRTLLDKFNGK AARLEHQSCWLTGSMGCG
DTDMLEQVLGLCTMNEGLTMPTGKATACVAAGKLISKGCD
TQELLLQLLDTLI HLDENVVWDVRRAALLSFAHLVNQHIDH DTDMI ERVLDLCLQSTSQATS DGKATACVAAGKIISKGCN TKQLLLNLEELMKSEVVSGHRDLKFATALSVSRLVYQACD PEARVREIFNTAKEQQS TSGMI ESLA

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 EYDCSKLQYEKYVKYVKTELAQAKDYPAKVVLIQTLARLDN MKLCKSQEVEDAKEFLLSGLEEAQDESEMKIYLLALKNAL
 SGl CDHP SVLEAKKLIDEGLEKAEKPADUKNHLKALCKNAG DQATSTPEVKEVAKFMFMLGDCSGDEDSTFLTLRVIGVMG AEGKVTPEIQAAADYVSEEGDCTGDQEHTYLTLLRVTGNMA EHNCDGVPQFDQLLAKFTEVLSREKENHVIAALKGLRNVK QYEKHDKEYVFYVPYFVQQLESAQSEEEKVMAFFPLGNDA AEKKLIPEI HSVAEFMADELDCTGDQDHAFLTLRVSXNMA WVPFCQMEISDEMARNLGRNCQDQSDKKLHLTLRAFGNDN ENMCKRELKEKVVRKLMDMFRRSETRYEKVLMLKTHANAG NNPSDSUVASQLVPYLAEQAKIARDAGERMAFLTALGNGG SDGCK HDTPCPEAADRPLLNMAEKDRSGNDETEK LVLKAGGNAG

 NVMPEVNDVLTDVSKFMEVLUNDCPAEMSFLVLREGVGVMG H HNHHCYEELVEALGNKLQRQCSPSADERTQKALKTLGNMG SEGVTPDTAVYKYMASLLGADCAGDKDLTFLTVRVVGNMG AGRTNKDVFEEYVQKYFNDY DNSNDYEQKMLYLQGLSNLQ EKMIVTEEIVADFMVSLLGTECSGDAELTYLLTLRAIGNMG NEGCKLKAVVEAKKLILGGLEKPEKKEDTMMYLLALKNAL QHGCQAGEVSKKFTDSLKQCKTKKEEERDVYULKG|GNAQ EHNCAKFSEVEAFQTKLCKPNNKNEEDALLASLKGLANM NLEDFNER MCRFDEFFVGNHEPTYSSKIAYMMAMRNVE
 KEQTEVVDPLRYLRHFMDHVRNEPMFHMKMVYMMAMKNVR AEGVTPITAVYEYMADLLGADCAGEKELTELTLRVVGDMG

 HTPACYEEPVARIAELLATVVSHCSEDKEVALKAVGNMG DHTSCTLEDYEKYVKAVVEKLEQSKDFHVVTVLHTLSKLLR
 QHDHYSTE EKYIKVYYKHLKEAKTFEEQLVWLHGLKNDQ
 MSEDDCSRDADIFEDNLHDSCSEEDEKKDLMSVRAGIGNMG HDTHSPV LQQYVKVYYKKDKEAKTFEDQLVWLHGLKNDE ESRFVREKFLPYLTQELESSQSWAKRNEGIVALGMLP DPQQCEQPIVGEVKTFLEGLESAEFEDGQLMFLRALGNAR DVTKLYSDTRSRUVGLI GSQLTKAGVEPKVMALKTAGNAG VKEQCSDP VVDEFRQLVIEGLSACTEECKLMYLRAMGNAG ALDGDCGQLVSSLVR LGEALFQEPSDAGQLTLKAIG GN
 TKYSRQQPYEKYVLEYMNKLRSSHDYKVQMTYLMGLCNMR DPECQGQKLQNEVFDKLEYEVARENREALKNYIHDARNLK MHQKMGIDDQRGIVNELRAMVSATTTEEKLRLIKTMGNFG LKEGCDSDIDRMFNERLCRLEDDEQHDDMLAALKALGNTGG AKMCESQEVLFAKNLLLDGLKSSTEDSEMMPYLLALKSAR $M K L C G L Q E V G L G M E T V L R R L R D T K E N S E V I D Y L L S L Q N A L$ QKLCGLQVVERGVETVLRGLGGAREEPRVVVSLLALGNAR KNACHGAEIESIFKKFSCKVNTKKDEDRVVSILKSIGNAK HSNCGESEAVQAIVQYLEEQHDRRKRERVIVLLMSLGNMG NADCTPTMAAKYFNYLVPQYERNLEEKERTMYIKVAGNFG YTDPSVFTTVGQ\|VQ
SHSNCGNEPVKRIVDNLVAKTGRGCTEKAVYVLKATGNDA QPEFKQRVDVQMKLSEIAKMLNDKDDHEKIMYIKAIGNAG EHRDCPRDIKEDFVRELEEFKRAETRYQKVLALKTIANSG VGLCKLQVVKAAKHTLVDALKKLTQQEADTKMYLLALKNAL SQVYCTPEKLQQYVERLSQALRQSTDFKQVVYLNGLSKIQ

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REPTERL 250
260
270
280

 YHQNRRVVHEVRSA
$Y H Q N Q R V Y E V R T S$
$F Q R Q Q E N V E V$
$Y$ DKVIVDELYNFVKETSNAPNVRTISAFIVALMKCYPNYMEV $H$
$A$
A D
1 INAEVKKELSRIFHQNYYEKSVRLAAVELLLSNNPSYMDU AAKLKKTALDI MKNRNDDSEIRIKAYLLAVIDCCPCGKSA TNKQVKDNLLNDLEDKNEEAEVRUAAYQGVMRCACSHSLL MDSDVRSALIQQYQNVEAPAQKRMAAYLMLMRNDPEVAB
 G R A K L L K G A S E VV F Y N R E E D S E V V R L K A A F L V M V E C P P N P K L A




 $\mathrm{C} D$
G T

$R H Q T$
PEE E E HLVN I

 $I T$ D E VK K T L N R II Y H H R N RLXXPTPAA A

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


 V A EPKRVR CK E E V L R P A V $E K L V S I A V R P A$ E

| $D$ | $S$ | $V$ | $L$ | $T$ | $Q$ | $K$ | $A$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $L$ | $A$ | $A$ |  |  |  |  |  |
| $A$ | $D$ | $A$ | $L$ | $F$ | $E$ | $V$ | $V$ |
| $A$ | $F$ | $P$ |  |  |  |  |  |

APMARIFEVVFPIVVDDT


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KNLLLST GEVEPELSKYLLAKLQNILRSDRPVRKIISEA EKVMQVANKDTSAELTHYVYTALKTAMHAEEPCYQLLAQR RNILLSVGGEDPNEMSKFVVVRUNDLDHFRHPTSQVIRQV EKVMQVANKDSSRELTHYVYTALKTAMSAQEPCYKLLAER

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L S K S D MAV V H N D R F
RRQVLKDMSHNYDRF L R Q K V L T K K D
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I $\llcorner\mathrm{DAL}$
LYNVKPRKKRKFSR
AKSVMPMAKP
】NEAMKVVAPYFD
SREALHRLKPKFDK
VKKALRTVDTEF
AEAVVALMRPMF
ARSLLEI
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L K
TELAALNQSP
$\square K K L L P A L T H$
VNRCLKW\KP
I MDAL
CSKVL
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R VKK M V A H NYDRF
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FRKVLRDTRRR
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ARRCLKFMTP
A Q
$\square \mathrm{K}$ K L L P A L T P K

ARE』VATL
VNAAL
1 S Q
ARMVFPLIK
I Q EVLK
AARA1HM
LA V V K
I QEALK
LQD\｜LP\｜LSQEF


ARRSLKFMTP
LKKTFDMDKRKFSR
】RAVWT Q $\square$ R P F D
MKELLK

LE Y V M P $\qquad$

LR D QVVYNYHRLLS RTG I RAAWTQDRPKYSQF $\mathrm{L} R \mathrm{D} P \mathrm{DV} \mathrm{HNYDRF}$
MAHLVNFLPP
$\square$ RAVWT Q！RPKFS QL
AESVLPMMKP
$\square R Y \| A P \square V A$
LEEALK
IS K D

पDQVAEELVSGEपETEAKK
पEQVAEELVNGELDEAKK
$P V D T V E A R T A V R G L L D Q L A G L L V L D D L E V K D D$
TANMKPLHLDRSVDIKEAALAVLRELADLYKTNSGRK $S L V S Q P F K R M C T Q C S S L K D Y L K T V G N R R V R M D D S K V S$
 LKK KF KKTVENFEED FVKK G
 $P \square I D F D \square T N D K E K F \square P A F N Q L A E Y E D D D \square K E S$ MDTSKAA

 KQKAKRDVSQA

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


$$
\text { VTQMLK } \mathrm{T} D \mathrm{~A} A E K R T A
$$

TDQUVNSIMEY IKK TVDDLSHRMEEN
TS $\square E L Q L E P$ FACPDTGCP $\square E Q T \square D E Y R N A D E S N A D G T G K$ S QLA QF VK K L RK GFNKVG T I E


PKQEVANDIKTMETLSSSVQNDN
TKENMANTS
PS $\square$ PK K $\quad$ K E NRENDSENNLGT SK
LQLQKEENDDKTFPNLVNELRDNDSNLGNLL
DVVEKYRNSDK SE

$\square E E$ Y R S A $\square E$ A S S $\square G T G K$
PQEVGQTVRMLCSLTSDPGMV
E $\square V A E N R E H \square K S D$
SPMVLVKPD L LKKEA LRRLSE\|VESEAYYVDPS
TKAASPPGQAEAAMKTLQEDQSLHTSEQ $\prod K \| I S Q D E L K N K T Y E L L F K I A T K D A D N I V K D$ ISAIKEQTLEEQLKASLDDLQ S SVDVGKS KNLKKVVNEVRKNLQTSKVAT
 NNLMKFVKDVRTSLSNESVGKKE
$P$ L HFEEDKSPVQDVLT T LREEVT LAAGSDQGQK ISADKEQTLEDQLLKASLTELQSSADVGKSS

$$
\text { A D A LVAA T QS A LT K LE P } \quad \underset{S}{G} \operatorname{M~S~K~}
$$

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UniRef90－GEDFE7
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 AVRSFLAFUHHLRTAKKEE！LQULK SENKEVLPQLVDA
 TPALVLKLVHMVSLLNTDQLKQALPQALQSKTYRSGYMDA
YADLVSQLLTAVNLKEYDLELLLQTVVPLENVRKLLDDV RAHLAYKLVAVIRKMEAETLRAALPEALGLS RSLTYQA TTWQFHRLIQMLHSAKKRDVLQLLRKASEKTV PFFIDA

SANGFLQVLNYFRHSSKEETTAVLKDPK NKNTLPSLLDD STENFVELLRLMRHSNTEALDDLSP VNEEGLARKIVLDA KLSKYLKLLRAFRNSGKASGEEVLTHKDSYNIVKQLIDV

VA LK L LILHSLFGVMPFEDVSQMYDQAVAKSNVRRLFDDL TAWQFQRFIQMLRSAKKRDVLQLLRTAH EEMLPFIVEA TPGLLLQLVKAVAVLNDEQLKQTVPEFLQRPVHRSLWVDL

 AAWQFQRFLQMLRGAKKRDVLQLLKR APEEMLPFIVEA TTRQFNAMVKMLRHAKKRDLLQLLQKAAGNEEVPFYLDA SASAFLKLLPLVRNASPEELHKILKTPARNQRIKMQLLDGI

 LLNRDQSALDELNLENLEKLYNEDEEMEELRSDFUQM


VSQEFDQLVFQLKDLTFSQLKTLWQEASKCRNDWQPLLDA TTWQFQRFLRMLHSAKKRDVLQLLRR APEEMLPFVVEA
Y LAKYLTVLEKFRNCGKEETLSTLMD DNNQETVPQLTDT SAEVFLQLLEAARTSNDEDUSKALEEAKNAK\｜LPQLYD\｜
TSDK $\square$ NMLRRALAS SEYNEपMGFVAQVWENKEWSQUVVDA
RANLFSKLVSELRGLSDEAVSALLPKLFGVSS PTTLQA
 GASAFVTLLPIVRQSSKDDILALLKD SKNKQILPQLIDV AASAFLKLVPLIRDSSADALSKLLKSPKNH DLLPQLYDLL TLSKFNIVSRIFRTMSYQDVYDVAQKYFVSDQERKFVRDA TMSKFNILTRAIRAMGHEEMYALAKKFSKRVDAWVTFRDA
 RAGLFHKLVSGLRALRNETLSRAVPEMRAASGWLTW WGA LALAYVKLIPGAR】TRQEQFEDLLTEH SEVMPRQLVDLL

SRFDQVIREMESYSKEDFDTD KKFADNEEDMKFLI DA
 SAAVFUEAVKAARRSSLQDIFNVIN SKRNTKILPQLMDI
KLSKYLK LDRAFRNSGKASTEEVLT HKDSYNTVKQLIDV SPSKF乌SLRR【ISYMGYEELEKILSSTSEGS DSRQLLLDG

|  |  |
| :---: | :---: |
| UniRef90-UPI0002C45030 | VTSAQTPDSLEAILDFLDFRDSSİLQERFLYA |
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| UniRef90-05EG54 | LGQAGSKSAVEVAVHLVKEEVLSLYEATRLFRQLVFSAYV |
| UniRef90-UP10003C2A505 | LPSCATESCVFLMKEIIVSKEVEEDKTESFLWSLSFILKP |
| UniRef90-K1R7Y1 | 1 PMVGTEAAVRQISKFIMNTDVTGALIESWLVSLHFIPPP |
| UniRef90_V9NJZ2 | LGKAGSKSAFEVAVYLVKEKLLSRYESARLFRDLVFKSYV |
| UniRef90-B707E5 | LS Lagtdanaktvir LLLeqk |
| UniRef90-A5WUQ7 |  |
| UniRef90-UP10003C2A084 | AVAAQSTASLVALSEFLDSNKKQEPLVEKFLYAAAF |
| UniRef90-T1FHS8 | LPTAQSAAVVPAVVDLI AS |
| UniRef90-E9HJQ1 | SGSNVGVILIRDLI LEGSLDVWSAARLVAY |
| UniRef90-T11P65 | QTSEAFQSAME |
| UniRef90-T1GCS0 |  |
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| UniRef90-B70 | HVAFGLQL |
| UniRet90 | AVAAQSVASLAALSDF |
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| Ref90-K7JJH4 | LCYVGTDASAATIRDA RFGEDTDTEAFDV |
| UniRef90- U31874 | AVAAQSVASLAALSDFLDFSKEPKSLQETFLYAAA |
| UniRef90-F6S | AVGAQSSASLAALSEFLDSKKKQVSLHEKFLYSA |
|  | STLPAHQAAM KI DRQDETGDETER |
| UniRet90_Q9NAW8 | QAGTPPAFK |
| ef90_E9G6 |  |
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|  | ATGMNPH LFGLNLIKNEEVSKSDADNFYSKIQLINLKV |
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LRYTPSNPVFSFVKSFVKSTDAREKYADRAYFTMPFRLKV LAACGSEGCIALLSDLMRNRELEEQQAQAFLSTI ALIPHP LAAAQTRAALSVLMKELDFSTENTGYMERALTGUAFSSHP AGAVQTKESHEIIMKLIKLINSFEDDKIERYLWSLANGIRP $\square G Y$ VQTPEAHASVLKKПHFKEEHQDLSERYLWSLSLSSHP VAATQTTASWEAALELLDSNDDQAETDEKFLVNAAFNSHP FGSASTLPAHQAAMKKLRQDAIGDETERYLWALSLSPTP LVTCNREPCIHATTYLATNNHLSDNYITVLLYTLTKTNVK AVAAQSVASLAALSDFLDFSKEPTSLLETFLYSAAFSPRP LPACGSENCIILLTDLMRNKEVEEEQALSLLTTDALVPHP AVAAQSVASLAALSDFLDFSKERKSLLEKFLYAAAFSPRP VAVT QTNAAHEAMVE ILDFNNADMLDTDRYLVSVSYDSHP LGHAQTLKSHTAVLKHLHDNEKHADLMERYLWALSLSTHP $\square M \square S G T N P S M L V R E Y \square L K G K \square A G E Q A V Q A \square A A L P \| V Q T P$
पMQCGRPQCYAPTLQWLKREKAHPLLTDAVTYLVALLPGP I PHGRSNACAKF KYLVVKEKDNVEDALSLMRKLPFNUAN VAAAQTAESYAAADEVINFQSENLDLAERFLQVVSLSTRP
 LAEAGTPPAFKVAKEATVEKKLRGYEAAGVFSTLVGSDRP LGADQTFESHKAVKTMIDFKEDDFYNAERYLQALAVGGKP MVYSGTFDSMKFVKDKYDKGELQKMEPYWVLYALEHTANP LFQCGTSECTSAILQUYRTGDGVSDETDALVYALSHRADP AIAAHSTPS DAVTEFMLQGRKQTSLLENFLYAAALSPRP AIHVRTEASLNFLEWCLENVKFQFP LMAANSGESIEAAVELI DSNKLSDSTTDSWNNLANAKHP LGAAQTVNTHKAAFKLLKTEKYDVNLCERYFWALSMAPTV LVYGLS LLQANP
AAATQTPAAHEALMQLTTFTDESA DDPERFI LASAYTTHP MMSSGSNPSGVLTLELIEKGSGKGERADQALVMLPMVIRP

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UniRef90 T1FHS8
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UniRef90-E9G6F7
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UniRef90-V8NTE7
UniRef90 K1QFM6
UniRef90-E2A7J6
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UniReffo-E2B8X1
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UniRef90-Q9TUI6
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UniRef90-F6XQV0
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UniRef90-K1Q6R4
UniRef90_F8SLS8
UniRef90_-НзсіW1
 NEALLKALIAVVKAKKL
TKELLKELTGLMQSQKTHPESRLYTNAVVQMSSLIYRACV DKETVVLLDELCKTTETVLKPLVKVAVCDALGEAVKKACE TAGMINSLAPLLES PGASQTTFLGITAMVHNFCS TK AMLTDLAKML DKETVELLLDLCKTVELPLEPYVRVAVCDALGEALNKA
STEVLDLLLDDATSGVLEKDRLDYTTSHVPYGKMLKMNEV SQVLVKEMLATAKIKKPRP PATWKTGYYALSNAVRRLY TKKNVEYLLMRLLESEGPEECSHLRQTVLLTIGSLGNKADV SEKLLLEFQQUTTEAKGSGEGDQLNNAALAVASLVGKTCS KIEMLKSMLELLQTQRND EPKLEEVISFTVSSMVHSYCK TKENLNQAVDLVTNAAPKES GEYLLKGMLELMKKKVPNES DRESTALGMGAVVNSFCK NDEAVKALTPLEESPHPM SPR PSLLLAAASMVNNYCR SPALMTELSEACEHVKPKRQ VVWVNCQLALSSAAGKTDS
 NK
PKEDLLEAMEILLHLDEKISHDVKKAGILGFASMVYRMYE NEELLRALISKFKGSIGSND GVRTVMI IGGALVRKLCQ TKEMLNLVLEKLKGKV SDPVIMETGVVVIGAIVGKMCK HVDVARDILRLRSEETMQNDKVSETYALAAGAMARHYGS
$T$ KTVMHEYFLLVTSNAVQHQEYLNTTALLSYCDELNRAQV
 DTDMVEQVLGLCTKSEGLTMPTGKATACVAAGKIVSKGCD TKELLRLVLDKGDGKQMVMPEVRDTGMVALSASLVGKLCR PTKELLLDLEELILINNGLPSSVKKSSULSYAYLISRGVKK
DT的VEE
SKDMI REVMPLLKK NGKALLAVSSLINTYCK N DDV K DILRRLRSEETMQNDKVSETYALAAGAMARHYGS
 PAP PK IMHSLITNGEEGLHHSL GLMNFATLAHDACP HDDVASDVLR RSEETMQNDHVSETYALTAGAMMRHY DADU AKNILKRSEETNPNDKVAETLAATAAAMA PEEYRAFLLGLIKKPFPKDSRLYEAALNTLGALLHTMKK

 TDAMAHMLLPLLQT STKRQPMASEGAFLGLGALVRNMCA SKELLRLVLEKLNRKNGSKATRWETGNIVVGSLVGKLCQ

 SEAALDELTAVFKQKDGSDK KVRETVGLTLGAVLNKFCN SRRMVKDMLAMAQYKQSKP NPDVLKDLLERHRKNDNYPDKVVKETVLTVAQMAFLTQG

 SGELLRLVLDKLDGKQLAPAEVRTGVVAVGSLVSKLCQ DAEVAKNLK RSEETIPNDKVSET ALTAAAMAR SRLMVKDLLEMAQSKQSKP SSKLISSINALTELLKQ APEVRSKTLLAGSSLVYQLCR SHDTLENLLKDSKNDVEENEKRESVALSGGALVYHTLCD N TDILEDMLKKYKTYTSDPRKVRDTLILTLASMAKGLRE SPLMVRDMLAMAQFKQSKP

SAQTDRDTFNTAKEOQ

HSQALLEDMETMSKLGLDFPQEMRHAGILSFALMVSHCV SEYLLGGLLKLSKKIKSEK KSETALLSLUAGTKTFVI DPD MKDVLK RSEETILINDKLSETLALTAAAMAKRY TESLLHEFFLLATSDTVQHQEGLNTTALEAYSYFVNQAHV TEKLLHEFFLLVTSDVVQHQEYLNVTALFAYTDFVNQAHV

DRKIVEHLFGLLEQESIKKHLKLIRESVIQTLATLTRQ
SKELFSLVLDSLNNKLNQATSETGNLIGGSLVGKLCQ SKT YIGAAKKAL GYLGVGALLRQYLQ QPHILEELQLLIKNQHKSNK LWYTIVLTMASAVNKFAR NMKAL QALEPLF R RASEAHMSSAKLSAASMVNKYCR DATLVRDMLSMAQHRQSK GEYLLKGMLELMKKKVPNES
TRELLEFTVKFLSTQREES

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UniRef90 - VaNJZ2 UniRef90-V9NJZ2 UniRef90-B7Q7E5 UniRef90-A5WUQ7 UniRef90-UPIOOO3C2A084 UniRef90_T1FHS8 UniRef90-E9HJQ1
UniRef90 G6DFE7 UniRef90-T1IP65 UniRef90-T1GCS0 UniRef90-K1PY02 UniRef90-M4MD62 UniRef90-A7LGD2 UniRef90_B7QGE3
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 NPSKANRETVNEWVRFLQELETEEKRPEVRLTLTAGGKTG QTPSVPKHLLPFYVKVLEEALKTTTDFKVLVYLNALGKVA STSCNLVPAVQMVTRILEGYLGRNCSSQIQLVLKAIGNAG


 A PRVCRTVKIDEWQKKYYGASS HSRCCEEEIPK QILEEFQDISVNRNSFADRALVYVMAALQNVGG

 Y G N CLL E Y S T IVA E Y V N Y VV E E M K S C C E E E E C K L L
 EHDECKPS LV S HFFNYQIMPEDKQP EYKRTVYMKAA GNLAA
 Y NQCTVVQ D L K Q Y V L


 A AV
NNRSAYHKVVPWFARQLAEAVKAGDSVKVQVYIRCLGHLG

 Q QLCP N K E V E H S ME T I L T G L R S A E K E H E A V TH L L A L G N T Q
 TAKVTAPLHNSLTEAVREKEENK』ALELKA』ANAG K T R CEND LDI A NVISALEDKI GYGCYVDNNILL

 KTTCDPELI DTNFIPYLVRELGNQGKDQRLIMLQALSNLG
 QTHQSNNMLVHNVEKVLLQKLDNCDNRCQEVLLRCLGNMG F S L I K Q D Y I DNVVVK Y F R M Y S D C P Q Y LD R MV WL Q GL C N $\quad$ G

 $M N L C G L Q D V V L A K D T V L Q K L Q Q S K K D S E K V M H L L S L K S A L$ QTPGAGQELRDYLMSRLGSECAAGSEQDVHLTLRVLGNMG D S PMKTVVESNP K
$\square S$ VA Y Y N K M I A V I R E IN NVVY
TKAENCESKVAQEDRNLIK LKEAKTEDEETMYTQFVRNSG Y Y Q DENHPLVKE LSD YL NQLENCQDEYCKVKYLKTLRNLK
 $\square$ S E E Q C S Q V V K D D V L E HF T S G L i d S D N R D T R L V A MI EKARVSLELGGDTCTGDECKLVFLRALRNLR
 NNPETPQAI KDTAK H L L K M L T D Q D K A E K I I L A L K A V G NL G Q QLLC G L Q E V E R G V E T L L V G L R S A E E E S QV V I Y L L A L G N A M

 QK LDC G L Q E V E R GVV T L L R G L K G A E K E S E VVV I
 $E G D V A Q F T L L Q A V E E T D D N G F D Y A E D A D R Y V F L D A D K N L Q$

 AVTGDLLDI AD YLSEQURDDCTGNEDHTYLILLRVLSVFS EAMKVKQDYFDSSIVKYFRMYSDCPQY LDDRLI WL Q GLLC S L G
 NQQEKASDLVKD IHTYFTNLKTCASEDCNQLYMRVFKNLG GTPSVVEKVKDSLELGLYS CTGDECKDKFLRSLGNLG NNRSAYNYYPVYSFGRFADADYKIVAHK SNRSAYNYYPVFSFGRLSDADYKI I EHK
NHPSFK A E LVVKK IMMF L L R K L D E CK E D H C V M Y I R A L Q N L K
 NTTPEVT DVLT DVVKFMEVLLDSDPAEMSFLVLRVVGVMG



 DVSEFVVKDLLNNCLEEAASNSSPDADEMTVGVLRRVVGGVMG Y G N C L E Y S TI A E YVN Y VE EMK S CEEEECCK LLVYVRSMGNAG

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210
220

 $K P E V L P V L V S Y L N G T A E N D Y Q L V E F V K K A V L L A L S H V V E Y$ L AATSLTPVLSLCAFQKSNPTEI RLAAI QAFRRIVCT TQTMDPVLEKCFSRKNNTMG KPEVLPVLVSYGNSTAENGYELVAFVKKAVLEAYRDHVVDY HPEALKALVPVVLGKHHEQSESCQYLRLVTLYALRHSVKH

 YGHTLDSMLEMAIKRAPDDDESANDLRVY I KGL APYK KQEFADVLMNVI QPSTDPLLMKVVEKGGK\|S K\|S\|ASTLQLCSQ AGSTRDRVWALQALKAIPRQ
 $V P A V T R A A V K C D E E E G \quad$ VA PPASLKP\MKLLPGFGSAAASLPHRVPVDALLADRNDAKK TRGAVHYLERYV SDTNQPEYRRSAALWALKRSSNH

 IGNDERFLWP I LRKEVK IQNDGD R DRVATAFALFGGUS LPEGIPLLLKYAEAGEGHDSHLAT LPETI PILLEHAE EGPAAVSSAATSALRRFARH
 HPEI
LAVGGLGLDDVLLLLVPY $\square R G E D V T A R \square A A \prod M S L E R L M D F$ KPEVLRHLDGYVNGTAHNMNESAEFVRRVAI DSLRDVATK TRKA! HYLERFICPKGHA KEHHRMSALWALKQ LP S TIPTLLEHAE KGPTAVTAAAISSLRPLACQ



S P ATAESLM
QTAS LK K L VRPDAEN QMQAVSPSLISS LDRCAKKDKHSKFVQVVA




SEKSDSVLLEIVDTASKKSV ARADKGDSKD



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UniRet90-UPIOOO20E41CE UniRef90 UPIOO0441A08F UniRef90-Q9TUI6 UniRef90-T1K9M3 Uni Refo - Q4SP71 UniRef90-F6XQV0 UniRef90-EOVGP3 UniRef90-G3P570 UniRef90- W4Z138 UniRef90-A0A026WL08 UniRef90-Q8NoN0 UniRef90-T1J1M1 UniRef90_R7VSK8 UniRef90-UPIOOO258E524 UniRef90-H2MBB3 UniRef90-UPI00032A215E UniRef90_UPIO003871230 UniRef90-U6P6E3 UniRef90-UP10001CBB3A6 UniRef90_U4U3N1 UniRef90-H2VBDO UniRef90-Q1JUBO UniRef90-Q29020 UniRef90_L5KRE2 UniRef90-G6CJW1 UniRef90-B3MU72 UniRef90_UPIo002247A76 UniRef90-Q49MF9 UniRef90- Q49MGO UniRef90_U5ELW9 UniRef90_UPIO004627COE UniRef90-UPIO003EC602F UniRef90-Q961S9 UniRef90-V8NZE9 UniRef90_U61B47 UniRef90- j9JJT7 UniRet90-T1H8T6 UniRef90-V5NDSO UniRef90-H2RM56 UniRef90-K1Q6R4 UniRef90_F8SLS8
UniRef90_H3CIW1 A

2 $34 F C 964$ N




#### Abstract




QAAAVQPLLQTVYFDKDEDYELRAVALSLLLLTTPPEPVL


## A

YSAEA D LQSKALSLLRNEHPELTGK $\quad$ Q P V F K N THS S KVK QAMRRIVHKKRKSYEKRLGAANDS SEVKRAMRRTFHEKRKSYEKRLAAAEILLDSQPLPMDV MTKEVKSTLRKIFHQTYQEYDKRLTAAEILLVTEHSQMDL DELKSAAHRIFYQPRRDSSVRTIALDVILENEPSEEVLJ

S S DKVTP LA S YPKELNPVVRVIYQNTTENVQTR LDAFDVWMNTQPAQWEV
DPRQVKRAMRKПFHEKRKSYEKR【AAAE!LLDNTPDPMDV DDESTMQSLKYULLEDKEPRSMREAAYDVLENVQLDSDELL

DRDAAHKVFYQ GPRRDSSARTDADDULESDPSEDTL FTFENKRSLLRIFHQTKYDSSVRLSALNALLRIGGSVVEL SD VDDILLRVETNSDEDVEVRIQAYRSWARHLTQEKLA ALSQIYEELMPITENKGEQFEIRNIAFLTLATWGPGHAWW VSDEVKNAALRMFYQPRRDSSARTLALN:ILENEPSEEVIV













 A D
HSSKVKRAMRR\|LHEKRKSYEKRLAAAEDLDDNEPSPMDV



LGDQVREVLLQTFLDNVSPGEKRपAAYपMLMR APSQSD■ LTPRLTSSVLKCIKSTEPSLLIQKAAIQALRKME
QDTRGYNVLLPGLMDDNEHGQLRISALHALLSSGDRESDF


LWDKHFKHCFEMF LDRKYDSSARALALD L L D M M L S Y E D L DSARV
DEVRDVFMEVLREYT

HRDQFESILFYQLRKRRFDSSARTLADDIILSLRPTQEQL


 $D E V R D V F M E V L R E Y T$

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QQIKETHMSEEVNQGRSAVNSERSSPARSKHPANSVLVSR QRMAEFTKLDTNRQVNSAVKSATQSLMKDKSPEWKDLVAK


QLMQQLLSSENNSQVRHYVISATKTTANNHNPCNTHV
RKIFHSLKKEPVNQVATFVWSHLNNLGQSSLP
NDIDKELF EVNEMSTYLLSRLKELAQN NYKDRDK NNI EKLVNNEPSNQVGTFISTHLRALKESNDKSKEAQKQN RNIVLSAMYDQTEFVSTYLMKRMKDLSES DPKFRS
TTILADALL
DHDVHYNDKEANSKDDSFPQKKKKSKNRHRNP QH DNLLLA ANEMETEMATFLLLKVQSYAHHHYPDNSLASR QQVVLAAKTDLSFEFGTYVYTALKSVVKDKRPVNSLLASR THLEENQTRMEMYWQYTAQKNPLLIRNLSDSSNGLTHANFAKDT

TNILLAMETETATFLLRKVQSSLRA
IN I ILGME DTNTEASKLLLSKIQ
RDFVKYLSKDPAYEVRKYLSQRLELLAESD
KK DASRTWFDPSHQVAVFTCDDRSVSGTRSSEDESTSTK EKVMQVANKDTSAELTHYVYTALKTAMHAEEPCYQLLAQR

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DQLDVGLSLLEDEHIHNYHRSNIQNLELLDALEMNNTAAR俭

RDLVKY UNNDSAYEVRKY LSQRQEQDAE EEGLLSCQYQTHFEISTYVIKKITTEAEDDNBMNLKEK QQLAVSTWHDPSPQFANFVTTTMYSUSDSNAMGELANT
RELVSY LAWDRAYEVRKYLSQRLEQLAETDE
GHLVEYLATDPAYEVRKYLSQRLEQVSEKDP RLAKD
 DMVSKILKQEQNEQVKSFVSSHVYNIMTSTDAEAKKVAKK

KEVLLRDAKEK PE円SKFTTAKVTSLQSNHP
AQVRRTQAGELSTQVSGSLGANLEGTLLFSPASFDPRSAT
ITNVLLAT KELAPEMQRYILSKILGTVYS HNHPTRQV RRVVAALHTEGSEQVRAFVASHLANIAGSEDPGVQGLRKR RAVIRY：SDSEDEQVAHYTLSLMKMMKHSENPCYAGFSLL EAVKMTLKSETSSQVGSYVWSHLTNLLRSEDPMKQTL QNITMSLSYLKSRELANFILARINDLIKTGHP
KDLLLSLERDREYEVKQYLVQRVKEI SERNDEFFK EMVKKLLKQEQNMQMKSFVTSHVYNIDS STDSETQKLGKK KDFLHYLKTDSSVEVKQYVMQRLQMLADEDRNFNQRLSHEL
 KDLAIIIDPTEPTDQLGNFVTMHMNNVLLYGDDSLASLKES


DNПAKEDETETATFL
DQUVRLMEVERDPQURATYKT四TTSEVPEHEETVHH TNLVLSLTDQDNLELTAFMQRKIKDVLKNN EELLKKVAQDKNFEVKQYVLQSVLMLADS CPKWQQRVKD DMVNKMLTQEQNEQUKSFVSSHUYNIITTSTDPAQEVAKK


A G $\square$ MEF $\square$ K NDKVYEMKQYLLQK $\square$ RMYSEKCEEFKQNFTT■


Unire H3CIW1
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LKKLLPA ALA
VRRVLKMVVHNYDRF $V \mathrm{~V} \mathrm{~S} V$ I L L VK
$\vee R$
$\square \mathrm{L}$ S V
ARSVNHLLTH
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■QNAMAMKSTQFSR
MKELLK
ARKVLKQ $\square R$ P

LTKVLK
1 R VTKK L

LR Y V VP M WN P R F D K
VRGVFTHLKP
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\K Y A AVSPTMSR L K R T LDP ILSS QE F 1 N

L N Q V L
DSQLMRMV
VS RIIKHLCKP
L N EVL
$\xrightarrow{1} \mathrm{RK} \mathrm{V}$ QK
LMEVLK

VNLTVTMMRAF
I K DIL K
VEEAL
ARYAMKELKQWKGRF
$!$
1 R S
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| V V $A$ |
| :---: |
| MK DI |
| LR A A |

VK K A $\square$ RTVDTEF
A S LA QK G L S T A L R R
F LDDV LK
VE E A LK
VKEALK

Ls
IN Y A QKGLS TAFTR

TK DVLK
$\mathrm{L} \mathrm{Q} \quad \mathrm{K} \square \mathrm{Y}$ K P R G S R
> $\square S E \square K E Q T L V E Q F E L S L E Q L Q$ TEDVGKSS LEELVQTAETEVQLF SLI IVQPGQPDLPLEGLEKDVVGNLTCVREHQTKGQSTT AKLTDLVGALRALPPDSASSE ADLVGDLRKLPQDEKE RGP MPPLHTLS $\square \mathrm{DS}$ I RAKLALTMRHLDCFHQHPDPGS SVISELKGQTLREQFERSVDQLQQ DEHDGKSS

## LKEQTLQSQVEDMDEQL KTEHDGK S K MAYLVQGNKDTASDT

S S A A L VS S LHLS K G S S EVVKRWVNEAQEAVSSD ED VVQLLRSPKDGKARDDAR

$$
\begin{aligned}
& \text { KD DQKN } \square \text { ES S } \quad \text { K CVHRYD D K } \\
& K D F D T L V K E L R A D P G E T A R D E
\end{aligned}
$$ AKLDDLLPTLAKRERRDAARL

$$
\mathrm{K} E \square \mathrm{~A} A \mathrm{~A} P \mathrm{~S} D
$$


ASLEARDRQLVKGGVLDDLLRALAKREDL V D SSAALTSSLHLAKTSDVVKRWVNEAQEAVNSDNIMVQHH ATKTAAVMKKYRQRDMTTKSDD

VLLGQKNKKNEDAKAVNHDYEMGDSHTCEA SSAALVSSLHLTKLDAPEVVKRWVNEAQEAVNSD

HMTK $\square$ S D VVKRW WNEAQEAASSDN $\square M V Q Y H$ 1 DKLIDLLDDNDKSVQKN S Q E

KKNELADLVAKYRSHLYDMGDSHTCEE SSAA LVSGLHLLK $\square$ ND $\ V R$ RWSNE $\square Q E A \square N S S H P M V Q F H$ K LQELQDEDFESE
DVVKRWVNEAQEAVNSD
DVVKRWVNEAQEAASSD

 DVVKKRWVNEAQEAASS D

RHLNEMGDSHTCEK
 VEALSALTMAQTTTEH HMMK $\square$ S DVVKRWINEAQEAASSDNVMVQYH

TKSPLSPA LLEAVIRRLENDEKWYVRRA
DVVKRWVNEAQEAASSD L E ELANSDDEPRREE


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UniRef90 C3Y4M4 UniRef90-T1ELN6 UniRef90-S4R7N9 UniRef90-T1HU18 UniRef90-R5DRU2 UniRef90-EOVLD3 UniRef90-G3Q863 UniRef90-B8MU63 UniRef90 T1K6S6 UniRef90-GON6F9 UniRef90-K9REX3 UniRef90 D8LKX1 UniRef90 UPIO00383214D UniRef90-•3CJ99 UniRef90 B6QWM6 UniRef90 B3KND4 UniRef90-UPI00045D8F44 UniRef90_C5LDA7 UniRef90-H9UE25

| $\square A L L Y$ V $\square^{L} L^{\text {L }}$ |  |
| :---: | :---: |
|  |  |

SPRDFGRWRAADEGMNNETDHEVFDRAYNCSAYREYLLDG $L \vee D L$
$\square A L A Y A K L L P L A R \square T Q Q D Q F E E L L K K Y \quad P K L A S Q L V D L$


TADERTKCVNMLRLLDSDLKLLADQFVHCTNGRHLIIDV TAEKF FVNYLRQAVVDLLDSDPKRERFDQSTHLILWRL ARSDA LERLRALFMLHPSEAAKVPADIRMDPLAASPMLGA TALFRVNLAEVDRAVT GLAQGASEEVHSEQVLEA
 SMQQLDQRLSKGTDATNARYPGLGA RSSCFNK LVQLLSRDSPTNLTIVAERYITNNAYRNDVIDS TAR LRRTALLFRQAEVERAVALIRQGSADAVRSEQILEA A L G DALLFGELVNAVVLASKDELIEVVKE EDNQPILGGLVNA
 TPERLAMLLAFRHDSTEVAAELLRQGKMEEALSERMVAA HSSMFARIVQEARHASEAEWRAVIMQP ENEPVLHVLANV $N \square Y H A L G L L Y H \square R K T D R L A V T K L V A K L T R M S L K S P Y A V C M$


 HSKMFAEVVQEGRLASEQDWKAV $\operatorname{LMMHP}$ ENEPVLHALGNV ALSLLHQI RQSDRLAVSKLVTQLTKSNDRSPLAQCSIDRY RI S C F HN I MEALE HLLSP DDLT RVANKYIEAKENRDAI TADA




HSLLYGQ VVQEARLAKREDWEAADR YPENDHVLSVIANA AASALGN GLEAQETVPILNKILQNKTESAKVRSSIADA TPLLLGTLVNLLKSPSLEMVEQLAQDGQDGTTARDAVLQA ALGG LLYHLRKNDRLAVSKMLNKFПKSGMKSQFAYCM
 A



UniRef90_Q29LY6 UniRef90-E4X4B5 UniRef90-Q17174 UniRef90-UPI00047852DS UniRef90-M7BNP8 UniRef90-B4MV71 UniRet90 V5HDM9 UniRef90_C3ZZJ9
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## LGAVQTFEAHNATFSQFYSDAATNTEQEKY|L|QSLLAVVATHP 

$L L P C T T M A C F S V K N Y A D A K G V V P K P L A S A W M V T M A L Q N Y P$ LGTS GTPEAQRFLLGLAENPVASSMNALRAVIALGGVASP
$T$ GEEVA E LV R K L C L A H S M
LGAVQQTFDAHNATFSHLYHEADTTSEQEKYLQSLAVGTHP L $\square$ QSNNFPTLRAFRHLATHGHVSDAYLPLAFHSWSFLRDN L G S VG T E A A QR L L L Q Q L T A E GAPAK LI QRMLI SYVSMNTP

 $L$ GAVVQTGEAHNASFGHFYK GAETTPELEKYL QS L AVGTHP $L V N I G G S P E A Q Q Q L L D V L N T S S S V S K Q Q A B D M L K L A F L L K E P$ $V$ A Q A GT R L A Y D N L A R F II D D S D M V


 EGAGTDSPMFDFDENCLRHKEIVIVEAAHAIVNLKNT LS A A S T P E A L Q TLS R AVEDTTLAPPVRTDAVAALGMAGSP

ПA RVRSDVS QQ\| IK HVLN VTEAGHAEAQQAVINALTDQNRSHLTKMRALAYLHDFE YP LSAASTPEAVQAL AEVTGDRADPQDDRMDSAAALGVAKDP





 LGSAGTLLTHRFAREFLSNEEAQ

 LGTLGNSESLKIAREVLLEQGPDFLEDYLFGAAHT T S H L 1 ATNDSSPYFEFIDE S CL RHK EMVVYEAAHAIVNL K T


LGTIGGNKDAVLPLDQDLEDKNEPETMRDRT TRALDGDERA
 LA GAGHAEAQAALRELIVSKEAREHPGAHAMMVAGFFREP














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## UniRef90 Q29LY6

 UniRef90-E4X4B5 UniRef90-Q17174 UniRef90-UPI00047852DS UniRef90-M7BNP8 UniRef90 B4MV71 UniRef90 V5HDM9 UniRef90-C3ZZJ9 UniRef90-U2S2U44 UniRef90 ${ }^{-}$S4AA11 UniRef90-B4JD86 UniRef90-F9TPP3 UniRef90-S9P6U7 UniRet90_Q9XZD3 UniRef90-99K7B2 UniRef90-UP10003592F17 UniRef90-B7PDP4 UniRef90-G6DMC5 UniRef90 K1PZP6 UniRef90_Q093N5 UniRef90-W8FT51 UniRef90 K1QYH7 UniRef90 A7BVV7 UniRef90-L7U288 UniRef90-F8CGW0 UniRef90_S9QFU6 UniRef90-A9B2X2 UniRef90-A6G297 UniRef90_A9AX29 UniRef90 UPIO003FOE044 UniRef90-Q1DGD5 UniRef90-R7V605 URe9 UniRef90 C3YT91 UniRef90-U2U1S8 UniRef90 A0A016TSF9 UniRef90 V51805 UniRef90-Q1DER6 UniRef90 Q66JI9 UniRef90-Q12WQ2 UniRef90-C3YT82 UniRet90-A7S1W3 UniRef90 U2SI15 UniRet90-U6PXR8 UniRef90-K8ENS88 UniRef90-T1ELN6 UniRef90-s4R7N9 UniRef90-T1HU18 UniRef90-EOVLD3 UniRef90-G3Q863 UniRef90-B8MU63 UniRef90_T1K6S6 UniRef90-GON6F9 UniRef90-K9REX3 UniRef90_D8LKX1 UniRef90-UPIO00383214D UniRef90-13C199 UniRet90_B6QWM6 UniRef90 B3KND4 UniRef90_UPIOO045D8F44 UniRef90-C5LDA7 UniRef90_H9UE25| REV |  |
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[^1]
## UniRef90 Q29LY6

 UniRef90-E4X4B5 UniRef90 H1ACK9 UniRef90-UPI00047852D9 UniRef90-M7BNP8 UniRef90 B4MV71 UniRet90_V5HDM9 UniRef90_C3ZZJ9UniRef90_U2S2U4 UniRef90-E3FXD7 UniRef90-S4AA11 UniRef90-B4JD86
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U9TPP3 UniRef90-S9P6U7 UniRef90_O9XZDD3 UniRef90-J9K7B2 UniRef90- UP10003592F17 UniRef90-B7PDP4 UniRef90-G6DMC5 UniRef90 K1PZP6 UniRef90_Q093N5 UniRef90 W8FT51
UniRef90 K10YH7 UniRef90 A7BVV7 UniRef90-L7U288 UniRef90-F8CGW0 UniRef90_S9QFU6 UniRef90 A9B2X2 UniRef90-A6G297 UniRef90_A9AX29 UniRef90 UPIOOO3FOE044 UniRef90-Q1DGD5 UniRef90-R7V605 UniRef90-V3ZES3 UniRef90-C3YT91 UniRef90-U2U1S8 UniRef90 A0A016TSF9 UniRef90-V518Q5 UniRef90-Q1DER6 UniRef90 Q66JI9 UniRef90_Q12WQ2 UniRef90_C3YT82
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[^2]|  | UniRef90_Q29LY6 |
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UniRef90 Q29LY6 UniRef90-E4X4B5 UniRef90-Q17174 UniRef90-UPI00047852DS UniRef90-M7BNP8 UniRef90-B4MV71 UniRef90 V5HDM9 UniRef90-c3ZZJ9 UniRef90-U2S2U4 UniRef90-E3FXD7 UniRef90-S4AA11 UniRef90-B4JD86 UniRef90-F9TPP3 UniRef90_S9P6U7 UniRef90_Q9XZD3 UniRef90--9K7B22 UniRef90-B4KL02 UniRef90- UPI0003592F17 UniRef90-B7PDP4 UniRef90-G6DMC5 UniRef90 K1PZP6 UniRef90 Q093N5 UniRef90-W8FT51 UniRef90 K1QYH7 UniRef90 A7BVV7 UniRef90-L7U288 UniRef90-F8CGW0 UniRef90 S9QFU6 UniRef90 A9B2X2 UniRef90-A6G297 UniRef90-A9AX29 UniRef90 UPIOOO3FOE044 UniRet90_Q1DGD5 UniRef90 R7V605 UniRef90-V3ZES3 UniRef90-C3YT91 UniRef90-U2U1S8 UniRef90 A0A016TSF9 UniRef90-V51805 UniRef90-Q1DER6 UniRef90 Q66JI9 UniRef90- Q12WQ2 UniRef90-C3YT82 UniRef90-A7S1W3 UniRef90 U2SI15 UniRef90-U6PXR8 UniRef90-K8ENS8 UniRefo-UniRef90-S4R7N9 UniRef90-T1HU18 UniRef90-R5DRU2 UniRef90-EOVLD3 UniRef90-G30863 UniRef90_B8MU63 UniRef90 T1K6S6 UniRef90-GON6F9 UniRef90-K9REX3 UniRef90 D8LKX1 UniRef90 UPIO00383214D UniRef90-।13C」99 UniRef90_B6QWM6 UniRef90 B3KND4 UniRef90_UPIOO045D8F44 UniRef90-C5LDA7 UniRef90-H9UE25

HRQQFESUF ${ }^{250}$ RRRRFD ${ }^{260}$ SARTGA LDV ${ }^{270}$ VLRPSAEQ ${ }^{280}$ DER FDFLTG TMEENTNPAETRQMALLTLWKC PSTELR FPKEVNPLVRAVLLNVSEPVDVRTLAFDVWLKSVPTKWDLL

PGEAVETLLLATLAAEGVPQVRGALVRSLGTREPDERIV ANRTV
 AEAAGLLLDSALVEDEEHVRYHAALQYGRHPKALLNGL DPAADQMLAASMLEDP $\square P E V R R A A I F A S S F R P \square M P L M$ QSPEDDAVLLHALNDSG TVVRSAAHHAF SFSTSHRQLLESLFYQRFDSSARTLALDQFVGMRPSDEQL DPEAAQNTSWS
GPDLWDNRVLKYCNRKEQDSSTRTTALATLLESDPDYDLL SYAEHRQQFSSMERQRRYDSSARTLALDILLAMRPSAEQL QSLAVSRAAVQLEDDSKQMALRAAVFDVLILTEDETVL YDT L FPRK HNVLMNFL
STDQ DEDTEKLLQEAKKSS DDAELRDFAYKAAVMCANTSQLD KSADALLEAAVN DPEVKQAAYEV
EDARADEMLTTHYES EKSDAVRAAAAKTLSKMTPSEAGП DPRADQ LAQHLLEDPAPEVRQAAVEA
PGAAVDALLDQVMLDDPSARVRALAVKADSQRVASAHM
AEAPVQAAAMDSLLDSDTLVRLRDVALAGGMKTENYHPLV AAETQALLLQAYTNETSPV
P ELDAFPHLGDSLRDEDSRVRARLASATADSRSHPPSAMV DTEANALGNTAYRSDTSEIVRHTARELLYANGDSPSL PGAAVDALLDQVMDDDPSPRVRALAVKAVSQRVTGAH L FPRK HSIMMTFL
$\square D T S \Pi I D R L L R \square F R D A C P \square P Q S Q T F A T D V L M N T \square P$
HHDHAANLMLNTAKYDGDDT VRYEALLQ
HQKAADEILRVALEDPDGH VRYAAAL
PAD YDTKLTHVLIKLFRN TCPTPTSTLAVDULLNCVPEQQNV FPRK HSVLMNFL

QEAATRML DDALMSEPAR
YPRKHMTFLSNMLRDDGGFEYKRADC $\square$ S DEENPDESGL DNGSSTDLFIRLLQDKTEFLSVREAAALSLAKPGNEQAV
 TERAVQAVYLDALNGRT
YDSKLANVLI RLFRNVCPQPTESQLADD LLVKCLPEQQHV FPHKHRTLFLSNILREEGGFAFKKAIVDSIFKNIPDAKDL AADEILRVALD DPVGHVRYAAALDYL SHPKASKL
FPRK HSLLMSFL
YPRKHMNFLSSMLRDEGGFEYKR
FPRKH
DNERVFNALKNSLVDES PQ $\square R \square N A \square E A \square M D S D N P Q A \quad V$ FPRKHTVLMNFL YPRKHMNFLSNMLRDDGGFEYKRADCDIS IGEENPESKEL SPD IGETVIRRLENDRDSHCSVRAAIEALGTQSPSPDUL YETQLTQKLIRLFRNTETPTSHSQUAIDVLGKCVPDHQNV SVSQUQSVLTKLATSPETESEVRSEAFWVVLNAASCGSDA YPRK HSVMMTFLSN

YPRK HSVMMTF LSNN YPRK HAVLMNFLF TMDREEVRVRGDWLLVQGELEGWFL
$V$ VEKVHMQIFPLLFMRADPEPEVRCVACDRLCLVVKHKADR




AHLCEFDEDCEHTVLATK L LHL
DPLIQVMLDEYN LRIEAAUYDAFDALSRSKDPEHFALRTA KG $\square$ EHA $\square$ WHANEDD $\square$ DS $\square$ VNEF $\square E N \quad H G D H P H A K H M R R R$ ATMLLRTET
THLSEFIE
QTAQRQU D DRYVN ${ }^{\text {D }} \mathrm{Q}$

ET $\square$ RTC $\square$ MEDEDEEVKKNALIAAYNL
AHLCEFTEDCEHTVLATK TLHLL
EAV $\square R$ RLENDRDSHVRHAAIEALGTMRRDENDGDSD $\square R R$ R QTLHQSQYKFTNPIETNPVVTMLES ILNSTD
ATLLLRTET
TPI KLLLNNEES LEVRFKSAEALGK $\square$ AA QLEQSHSE VVRK QQILSDLLGESSMVMMA
NP ПCDDLAKEPE DDVRAEMLRFL
EAV $\square R$ RLENEEDSEVASK $\square E A L L W K H D E F \square F P F F \quad D \square N A N$
VK L VLIMRH
DMMEDLLLHDPSDAVRSFGASLMKVAA
TLI K LLDDSDPELRK


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| :---: | :---: |
| UniRef90_Q29LY6 | S K V |
| UniRef90_E4X4B5 |  |
| UniRef90_Q17174 | V R |
| UniRef90_H1ACK9 |  |
| UniRef90 UPI00047852D9 |  |
| UniRef90-M7BNP8 |  |
| UniRef90_B4MV71 |  |
| UniRef90_V5HDM9 | A S LVM |
| UniRef90_C3ZZJ9 | VE DVLD S L |
| UniRef90_U2S2U4 |  |
| UniRef90_E3FXD7 |  |
| UniRef90_S4AA11 |  |
| UniRef90-B4JD86 |  |
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| UniRef90_J9K7B2 |  |
| UniRef90_B4KL02 |  |
| UniRef90_UPI0003592F17 | LRE Q L I D N F |
| UniRef90_B7PDP4 | $A S L V M$ |
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| UniRef90-F1KUM8 |  |
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| UniRef90_C3YT91 |  |
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| UniRef90_A0A016TSF9 |  |
| UniRef90_V5I8Q5 |  |
| UniRef90_Q1DER6 |  |
| UniRef90_Q66JI9 |  |
| UniRef90_Q12WQ2 | A E A $\square$ |
| UniRef90_C3YT82 |  |
| UniRef90_A7S1W3 | $R \mathrm{R} A L \mathrm{~F}$ P A L R P R E F R L G |
| UniRef90_U2SI15 |  |
| UniRef90_U6PXR8 |  |
| UniRef90_K8ENS8 | $\square \mathrm{R} Y$ |
| UniRef90_C3Y4M4 |  |
| UniRef90_T1ELN6 |  |
| UniRef90_S4R7N9 |  |
| UniRef90_T1HU18 |  |
| UniRef90_R5DRU2 |  |
| UniRef90_E0VLD3 |  |
| UniRef90_G3Q863 |  |
| UniRef90_B8MU63 | A $\square$ N A L D T Q S P W |
| UniRef90_T1K6S6 |  |
| UniRef90_G0N6F9 |  |
| UniRef90_K9REX3 | L I VA LQ S E S P R |
| UniRef90_D8LKX1 |  |
| UniRef90_UPI000383214D |  |
| UniRef90-I3CJ99 |  |
| UniRef90_B6QWM6 | A T S A L K $\square$ W A Q R |
| UniRef90_B3KND4 |  |
| UniRef90_UPI00045D8F44 |  |
| UniRef90_C5LDA7 |  |
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| lupas_21 |  |
| :---: | :---: |
| lupas_14 |  |
| lupas_28 |  |
| jnet | - |
| conf | 9999998223788999 |
| sol25 | B B B B B B |
| sol5 | $\begin{array}{ll}B & B\end{array}$ |
| sol0 | B B |
| jhmm | $\longrightarrow$ |
| jpssm |  |


[^0]:    

[^1]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    jormm
    jpssm

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    cont
    sol25
    sol5
    jolmm
    jpssm

