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 VESQHHE $\square E S R \square V D \square N A M M E R \square V K S \square S E L T D Q Q E V F C F R$

KD $\square$ TENDTNDRMMTQKTEEDLSNLQQKQEMFVFQ C $\square$ EHEI KTLED LQDEYDFK
 AVLGKVKEMDAKVKNVKDRVIEDEQDIKNLEDDQDEYDFK A MSQKHLQQNQRFEELRLITQDTENELKKLQQTQEYF I Q

AMSQKHLQTNQTFEELRLVTQDTENELKKLQQTQEYF\|IQ VSAHRQICERFEYIQRFTQETEAELRQIQHKQEQFI IQQ
AVEGQQFEDESR LDDLRALVEDFVRSDTQLKDLHDVFSFR SDKNAKI NKDLEHLYALTQDAESDLRKLQSKQEYFVIN METDSQRCLDRKI EELRGKVQEMEHHVKSLEDQQDEFDFK

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 HAS $\square$ MQQFEF $\square F G K T Q E T E N E \square R Q S Q H K Q E S F V I Q$

QDEHDFK
 QCMEHAMCCLEEQQDEFDFK $\square M M E H Q N E L V N K V N N L K M S V Q E M E K H V Q A L E D M Q D D Y D F N$ SEKQKNLELTIAEVKKRVQVTEQNIKSLENCQDEFDFR TMMEHQNELVNKVNNLKMSVQEMEKHVQALEDMQDDYDFN IMMEHQNELVNKVNNLKMSVQEMEKHVQALEDMQDDYDFN MVEKQKKIMNAIHELLLQKTKVTENDSKNLQHKQESFDIR MVVEKQK LDNKVKEMRDRVQMVDVNDKNVEDLQDEYDFR
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60
70


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 Y QELLQA QLT QLAA QL NPQERMTREPTLQQKRVEL AEKHQET

 $Y$ L

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 Y Q THNMENDAEKTEQMKVLQQLLNRLDASRKSMLSGMSVL

FKTMQNGGNGHR
Y HECTKIN A HLQHLQTQMLNQQKVSAMVQLRMSTLVDKGLKET Y QECQNKIHNETKAMEQAIRQRIGELREMRIAFSEKQQET




 Y H E CTK LIN A H L Q H Q Q D L QL S Q K V N GVV R L R L M L ME K L D D
 YHECQS QQNF QREQQEQ L N H K L A GLLMQTRR L L A D
Y Q E $\square$ Q A QFPP LA Q LN P QER L S RETA LQQ K QQEL AE K HQK T Y QESQTRHDSEQRLQKQKLSQNAQQLLQMRMQLADKHHET $R R Q K E Q Q E Q L L N H K V A G L M Q L R L T L A D C L K D T$
Y M $\quad F T S S S L D P H Q N Q Q Q Q L V Q T T A N Q L D R M R K E V L D T S K A G L$ Y QELG Q QL T K K K NEVD QL L QLEA A K L L Q QR T S L A E K H H K T YKTHMMENEKEKKEEMRILQELLLNRLDTSRKALEGRMSSVV


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 YQTSLKQNDPNRQAREKQLMAERKEVDQNR@DLAEKHQQT
 SKT Q ERLS RETALQQQK QLQRREAQTLQQYRVELAEKHQKT SKTLQQSREEEELLNREKACLDRAMFMKLNEMRRGVVSQMSEVV
 Y T ILHQKSDTHLRQQQ
 G AKAANTLQKYRLGLAEKHQK T $R N L Q A Q S G N D Q S D K Q K E L D S K V R N V K D K V M E V V H K \| I E L$

 CKTSQNREHNDQKQEQLLLHQMYLMLDSKRKEI DHKDRED Y Q TF M M E GP HQQQRE RMQKG T A GPRRTGLNPP QS V L A D I G K H MKS LQ S RMPKE DQQEEMADRRMFTVQGDKREVVMKEISNV YKDF Q T K E Q Q D SKK QMARLQVMLQNLDQNRKQILQSMTEL Y Q T HK M E A VTD K N E R K K M F Q SLI N K L N D Y R K S TLLA DLLNKL $M K S L Q S R G V Q M N G P M P K E \square Q Q E E M A I K Q M$ MK SLLQSRGVQMNGPMPKEI QQEEMAI KQM FS DCQ NKEAQLR QQKE Q QLA Q M A QEILDHLRVALSKKYEVT






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| UniRef90-G3UQY3 | Q K NFL Y N |
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| UniRef90-H2MK17 | I EKFTLLLI TRL |
| UniRef90_S4RD74 | LEEKTNELFITTLVK |
| UniRef90-E0VNH9 | L N NLVT QLLSTLVT |
| UniRef90-L7M9Q1 | L N A HI T S L L S S L T |
| UniRef90-I3MQQ8 | Q A QVTELLQSL |
| UniRef90-S4RXL5 | LNS TI T ALL S AL |
| UniRef90-13Y0V5 | L N K RVDTLLTNL |
| UniRef90-UPI00046B197F | RSA QVKELLQRL |
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| UniRef90-Q676C6 | LNTTITALLST |
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| UniRef90_UPI00033169B6 | LDASVTELLQRLLHRAF |
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| UniRef90-UPI00032/ | Q ${ }^{\text {a K I }}$ |
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| UniRef90-UPI0003F0A017 | QEA QVTELLQRLL Q |
| UniRef90-A3KMT9 | LQERTQSLFKQLLQ |
| UniRef90-H2L880 | LQ T R T N SLLQ TLL K S S F |
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| UniRef90-E9G1W0 | L NTQI TQL |
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【QKDLEASRDESQRMEEK $\square$ KAMHEDEEAFVFP VVISNCLREERR $\square L A A A N M \square Q M T E Q D T K Y \square E D \square Q D D F D F N$ QDEFDFR QDEHDFK
HQQLLEQFDF LINKRTLETEKY LRQSQHKQESWVMQ VSERQRNVEHKVAAIKNSVQMTEQDTKYLEDLQDEFDYR ERKYSELDTGLQTVRQKVNDAGEEDRSLQANDESGSLQ MTSSQQEK $\square$ GAR $\square$ SEMRKA $\square Q A \square K N S I D Q L E L L Q D T F D F R$

ERKYSELDTGLQNVRQKVSVVSEEDRGLQANDESFSHLE VMLDKHKELDSKVRNVKDKVMCIEHEIKTLEDLQDEYDFK

# AEVINGGQELQMLVRVSENDNRNLEHQQLEDHED 

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EENKD $\square$ QGRFVND $\square$ NE $\square$ SR $\square Q Q A \square A Q L E R E H$ MEDLQDTFDF $\square R A T \square Q D L Y S C T Q K T E E S L R E A Q A A Q E Y F V I R$ AMSQKHLQUNQTFEELRLVTQDTENELKKLQQTQEYFIIQQ
VMDDKQKELDCKVRNVKEKVMCDEQEDKTDEDDQDEFDFK EVVNAVQQLQDMVRTNENDNRNLMKEYE
EENKDLQGRFVNELGELQRLQVADQQLEQNQ
 QDEYDFK

$\qquad$
A
 VVSERQRSMEHKVSAGKNSVQMMEQDVKFLEDLQDEFDFR DEFDFK
QDDFD $\underset{\sim}{\text { I }}$
VT NRHAEDTAQCEQCVKTTQETENQLQKVCR LQEYMMDT EENKDLQGRFVNDLGELHRDQLAI GQLESDQ


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A LEERMKQFEQTLSAVLYQFQE LQKNNAHLQHMQ


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Y HELKNKGHMNYLQQQRKLNALVAQUTQSQMELVDHMKEN ENTLKNREHEMNGLTQKQLEEMCFKLKFKRGEVVGQLAEV FKTQRILESTVPNRRMQELQDMLNKVDRSRKEVLAQIQGL
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 Y QIQQNQLNHNQELQDKKLRDKAELLLNYRLLVDHMKEN GTTVTDETEKCEQDKVLRVMLNRDNNGRKSFLSETASL YK TTQNPADPELQAQTQQLQAMLNSLDQNRKGVLAKMQTL YQELQKRTTHLQQQEVMQLPEKLNRILQNRSNSIDLDSDS
 YKNFE $\begin{aligned} & \text { MARSHPDDKHLKKKRDELQQSLLNE } \\ & \text { K }\end{aligned}$ K E A QLK QQKEQ DD DKLTKMAQEILRHRIE LSKKFEQT
 QDQLQ HARHSMTEMQRRASQLYSVLTTKREEVVKKLNDG YKMYYRPGQDHYAQHDQALQAKLQSADRQRREVVAQGQQ $Y Q E L Q Q A P A Q Q A Q L N P Q E R L S R E T A L Q Q K Q V S L E A W L Q R E$
CKTLQNRG
K MKEVVHKIIDDL
HLLLLE LA QHQKMVNDR LQLCTGKR $\square A L V D G F R K T$
NEMNGMTPKELEQEKLTVNRMCLELKAKRQDVVLQLTDL
RAEQAFAAKQSMAEMQKRATTLYELLQKRSEIVQKLHDG

 HQGLQQDLAKQRQDC\|KLLDNRTVKLHCERHELVTQMKKV NAQLREHARAALVQQERNVNETVTLITGKRLNLVDNFRKT





 $K Q Q L Q D E K V Q V D S E$ LISSSAPLLLFDYMSLLQMYEKT EHDHQSQARISVSDMQKRASQLYNALMEKRCNLTQKLNEG
 QNSWQSQNVELVQSKEQECDRMARSISQTKQVVLQRLVRV YKTLKSQGDMQTRQKMQQLEQMLTALDQMRRSIVSELAGL KETUQGLSEMDTGAKQKRIQQDEYNATDCAQERVQFLCDA
 KQGPEAGQVSVSLHTLIETPANGTGSREALPTLLQES

NGAQMEILQRVQQEFARSETMLQEQUNKLNES YQEDQAQFAQLAQLNPQERMSRAQTLQQYRVELAEKHQKT QDACRDQGVTEGMKKRVPVGQHLGLAQSLANVEEKCQKQ
QKTWPSQSRAVVEQECVKQTA I $\quad$ H QRKQMMLSVLEQLVS YQE $\square Q A Q F A Q L A Q L N P Q E Q Q R E A Q T L Q Q Y R V E L A E K H Q K T$ NQTRAMMGAQDGQQTKENQESQLKTEGKLQGNDLPALILEAB YQEDQAQFAQLAQLSPQELQREAQTLQQYRVELAEKHQKT $Y Q E I Q A Q F G P L A Q L S P Q E R L S R E T A L Q Q K Q V S L E A W L Q R E$ YKTLKSQNQSVTRQKMQQLEQMLTALDQMRRSVVSELAGE

 $R E A L Q Q G A E A G Q V S L H S L I E T S A N G T G Q R E A T P L L L Q E S$
UniRef90＿E9NSU3 UniRef90＿J9P7J4
UniRef90＿G3VBL5 UniRef90＿UPI000395D27E UniRef90＿V8P7P9 UniRef90＿HOZKL5 UniRef90＿G3WWX7 UniRef90＿UPI0003EC6058 UniRef90＿UPIO004442059 UniRef90＿C3Z8E7 UniRef90＿D1LXF1 UniRef90＿UPI0003D78A53 UniRef90＿UPI0002657227 UniRef90＿K7S4C5 UniRef90＿UPI00038BEAB6 UniRef90＿V9KDD7
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$\square T N L R Q L Q S Q V L D D E L I K W K R E Q Q L S G N G V P M Q S N W N T \square Q$ L N I A E AVQ S DL I S E EL A E WK K R Q Q I S C I G GPPNACLD QL Q $L G F F E T L R D L L L E E R$ EA WKDRQRQACI GNNCDTRRLGQL E L N LAA E H TQ NV L I Q E E L V E WK S R QQ MA CI G GPP N A C L D Q L Q I A NLLR QLLQ S QVV L D E E L I K WK R E Q QL S G N GVVPM Q S N L N T L $\operatorname{N}$






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 V H NVVA L L Q N QL I S D Y L Y D WK N R Q K L Q Q V G VP F D CMM D E I Q





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


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 KWFTANAEDLEHLLQLLQQTLKDLQQKDTYDQDQLKMCDPQ NWFTTVAESLQQUHQQLKKLEELEQKFSYETDPIPQQKQGA EWCELLADLI WTTRQQVNNVARNKTVVELRQPHLAEMLDE N
D WCESLADTLWANRMNTKEFER DRSKLALDSPSFADPVPG A WCESLAETI WNTKDQI RLAMKNKQKLNI EEPNLPDFLPQ T WCESLADI AWRNRQQI KKIIDLLRRQLPI SPEGQEDQLPL EWCELLAELDWSTRQQVCNVGRINSKVELRQPHLAEMLDD
 A WCTGVAGALFQLLRVLRTLQELRAKVSYQHDPLEMEPGL E WCEMLADIA WQHLQLVRRLEMLLTKMPTTGASLKEKFS S S C

## K WL

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 Y WF T TV A E SL QQVRQQLLKKLEELEQKYTFEQDP ITTKNKQV A WCESLAEII WSTKDQI RLAIDKNKSKLHVEQEDVPDLLPQQ NWFTAVAESLQQVRQHLKKLQE LEQKLTYESDPI TQKKAQI DEFEFLADQNWQLNMFSCWMLDLLRRAPQLNDGLAQKLTA EWSECMADAVIDRSRQHLKKRESLLQQLAALPGP
NWF TSVAESLQQVRQHLKKKQELLEQKFTYDSDPDTQKKAY NCS
QWFERLLDIILHSLQQVDKLDKLQQDMLQDGEQKGDLHT
 LEFEFLADQNWQLNMFTCWMLDLLRRAPQLNDGNAQKLSA TWCE QLLGVNGKLRQELMLIGEPD
K WF TQVGDGMFQLRKFLLK LEELLDKLSYDEDPDKDQKPI EWCELLADLIWTTRQQVVII SEQQAQLLLKSD
 QWYQSLATIIW K KSLRQLVHLEGQPIPNPLPN CDFELLAEHNWQMRTFASWQDDLDRRGPQLTDNNAQNLST QWYDSLADLTWRNHEQDEQAAALRARGPLEMSLEQQIVPM TEFEMLAEQNWQLRTYACWQMDLDRRGPQDSGHVAQNLNS DWFTAVAEGLQQVRQQLKKQQELEQKYTYENDPITQGKSA
 N
TWSEQLLIVNGNLRQEL
$R C V E M L V D M D A K I Q T F V S N L$
K W
ERCESLVD\YFQLQQEVGAAG_GEDEPK】RAS NWFTMTAQSLFQQKRQLDKLGELIVKVTYESDPDPQQRPQ
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SWF S S VMEM
ERCESLVD VYSQLQQELGAAG GELEPTTRAS NWFTNVAEVLLRVRELLQKLQEQSNTYSNDTSSFSASVAE
KRCENLVD $\quad$ YFQLQQQV

MEFEF VEHNWQLNMFACWMCDLLRRAAMGDDPI MEFEFLVEHNWQLNMFACWMCDLLRRAPQLNDGLAQKLTV VCEK LAE E I WQNRQQ $\quad$ RRAEH $\square C Q Q \square P \square P G P V E E M \square A E$ N
K WF T GVAES LQQVRQQLKK $\square E E \square E Q K Y T Y E Q D P \square T K S K Q G$ E C
ERCESLVDTYSQLQQEVGASG
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| E9NSU3 |  |
| :---: | :---: |
| Ref90-J9P7J4 | RKAQVMELLQRJL |
| UniRef90-G3V | Q GVTELL |
| UniRef90-UPIO00395D27E | VEQRLQEQL |
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| UniRef90-HOZKL5 | L QDLLTNKL |
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| UniRef90-C32 | L STTTA |
| UniRef90-D1 |  |
| UniRe990_-UPIOOO32788A53 | Q L T Q $\backslash$ KALLLSA |
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| UniRet90-UPI00038BEAB6 |  |
|  |  |
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| UniRet90-85×3 | GRALSLFRNLLEHS |
| UniRef90-UPIO | LKEQIIFLLKSAF |
|  |  |
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| UniRef90-B0XAD5 | SLVEVTNLLKALITTTF |
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| UniRef90_UP10003C25 | LEHRIREQLT S |
| UniRef90 UPI00 | LESQLKS【LSAL |
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| UniRef90 F8J2H5 | LNDATTR1 |
| UniRe | WDRTFS |
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| UniRet90_UP10004 |  |
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| NiRee90-E3N | - SEQMNKLLFMLVSQSF |
| UniRef90-S4RQ37 |  |
| UniRef90-G3PSI1 | LEAR |
| R |  |
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|  | VEVTN |
| UniRet90-Q61A | QL N |
| UniRef90-H2WLH6 | ERLNKLL MLVSQSF |
| UniRef90-H2UT58 | LQERLGHLLQVLIQSS |
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| UniRef90_W5LoQ | AF |
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| UniRer90-H9WV6 UniRef90 $^{\text {H3DQY3 }}$ |  |
| 4XU | ESKVVLTM ${ }^{\text {a }}$ |
| UniRef90-H3F2S5 | ILDQLTKLLCML |
| UniRef90-R71 | LLSGITKL |
| UniRet90-A0 | 1 |
|  | L ERALTLEKYLI |
| UniRef90_GOMR | NQLLFML |
| UniRef90-M32 | SRSLIRNLL |
| Re |  |
|  | LEENLARLLKTLIQNS |
| UniRe990-W8B1F1 | ; |
| UniRef90-G3S | V |
| Un | MEEQVKY |
| UniRef90-X1V | MTTQYLSS |
| UniRef90_UPIOOO2657226 | RLIR GLLM S VF $\downarrow$ S |
| UniRef90-UPI0004545EA7 |  |
| niRef90_H2T |  |
| UniRet90_UP100033 |  |
| Un | DEKFTLLLITRLIENA |
| UniRer90-UP10002C43492 | LLerLns/VLSalvVes Sf |
| UniRet90_A0 |  |
| UniRef90-E3NFV3 | ISEQMNKLLF MLVSQSF |
| G3RL |  |
| UniRef90_-H2QD18 | VNAT■TD\\| I SALVTSTF |
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| -V8PIU3 |  |
| UP10003 |  |
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\text { K H } \square \text { H K S H L IT WRQRHHC L NEERK LIE }
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MQDVDHLVLKVLD DQNTRQTMHQLQEELNWE LHMITLDAENDWKN!QQLRENLNGL


LT FMKS VLQLQDRRKRTHSCKEDMNWN LNQRKEEMQFNVQKLKHKLQQVTQQQLRDAKK
$\square$ QKKEEMQFNVQ $\square \mathrm{M}$



VHELQARRQAQPAPTGLQGS ${ }^{50}$
VHELQARRQAQPAPTGLQGS ${ }^{50}$
70
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UniRef90-E5SV51 UniRef90_W5LH29 UniRef90_H9GFL8 UniRef90-W5L312 UniRef90_UPI0004443F0C UniRef90_13K1M6 UniRef90-A7S084 UniRef90-R4GG43 UniRef90-UPI00042BAECD UniRef90_Q4RVX1 UniRef90-B3RID7 UniRef90-F6T9C4 UniRef90_UPI0003BCD495 UniRef90-B4JXT5 UniRef90-G1P7M3 UniRef90_UPI0003B3C2AD UniRef90_Q5U256 UniRef90-F6TZM5 UniRef90-F7EAF6 UniRef90_B3MSN5 UniRef90_Q24151 UniRef90-B4G3D5 UniRef90-P52633 UniRef90-F2U6J4 UniRef90-B3RME3 UniRef90-R7TJC3 UniRef90_UPI0002A47F66

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A FTSYNQRKQHMTQQE\|QQLQEQCR\|LASTRSSLLQD\| KRVV

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$\square Q M D D P Q F P M Q E N L H T N S L D$
SRESALQQKQATLLQQREAQTLQRYR
RECYTAEEELLSPEYNKLQQFLNTWEPQRQECGPGLAEA $K K T L Q S Q A A K E I$ KEEELRIVKEMFLRRLNQMREVVIYELVNA MKSLQSRMPKEI QQEEMAIVKMFTVQGDKREVVMKEISNV $K Q E M Q G Q N E M E V K Q K Q N R I A Q L E W K Y Q G F T K T R L Q L L Q E A$ YQEFQ DELVKRRKQEVTTLSTEANNDIALMQSLNRQLQAN ESFQQMKGNTRAPLSQNSMDCQFPMQENDPASSLQSLQGLL QMKGNTRAPLQQNSQDCQFP MQENLQASSLQSLQRLFMK
$L N E V K M T Y Q Q K G E Y W T S R C R D L$
$A G K V Y E L S Q A R K D L I S A L K K S$
LKTQEKAGSSQSNVMMDKQKQLD QQVNDLKK
QSVELNA $Y Q E \square Q A Q L S S D T S D P P A E R V Q R E T S D Q S R K A T L E A W L T R E$ RNS WQS KVEQKVELVQQECLKMARSUSQTKQVVLQRLVSV $R Q N F E S Q G S F Q Q N T H D Q Q L E Y N D Q A M A T K R S Q L L K E S M E L$
$K T L A L Q T E L S N K G R Q L T V E M R L N M V Q N$
Q D
KHNHQHNGLDKTMAE DQKVQSK\QQDDFNDNSMAKLLEA Y H HWNK LLEEHPECRYQPVPNSKY LSSSQGDAEKFAK
 W

 NMGFHNQMHNVASLHMQ

VLV
$K \square K H K \square Q Q V A M V Q Q Q L R D F H N Q M H D V A S \square H M Q W E V L V K E Y$ LL L K S L D EKAS VNLLRRS

EDLATMLQGT YHGFVQVENEFKS $\square Q Q Q Q A A T S D P Q L K Q Y \square A S M V D E A Q Q L$

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| UniRef90-H3DCB4 | LQERLRQLLQVLI Q S S |
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| UniRef90-B3MSN5 | LREQVK】A QKNLVIS AF |
| UniRef90-Q24151 | LLEQVQNAQKNLVCSAF |
| UniRef90-B4G3D5 | L L ERVRGA Q |
| UniRef90-P52633 | LI SRLDEVLRTLVTSSF |
| UniRef90-F2U6J4 | I LHAI NKTLA |
| UniRef90_B3RME3 | 1 FQELESLL |
| UniRef90-R7T | V DEELNS |
| UniRef90_UPI0002A47F66 | LET LLH SLID |

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
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sol0
jhmm
jpssm

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[^0]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol0
    jhmm
    jpssm

