## QUERY

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S L T A K E K $\square \mathrm{A}$ L I M N A A ERFALI K E NLLQEI L N P D III E GI L A ER NP K I Y WG T S
 T L S A G E R R F S L I I T R D L

 SENLAAEVLNPELLESILAERNPRDYWGTA


 Q T K F D D L TLSATERYELIT RNLGEVLGS QELLKL CQERVITCYWGTA
 $T L T L E D K F T L C R S V A E E C L Q D A D L R R L L E K K P H I V Y D G F E$ $L S V Q E R L A L V K L V G E E V V S E E N L A A L L A K Q K L R C Y D G F E$
 ARFN ELI




## MNNEEK\ELIKKGTVEVIEEEELKE\| LSKENP\AYTGYE

 LSVDEALAELTRGCEAVI PEEELRKKLAERPDRIKLGMD K V D Q I
S VE E S I E L

| $D A Y E S$ |
| :--- |
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| Q M D |

$V Q T A D D E$
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M S Q
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 K A P LLEVVSYRAKYYEYVVKSILKSSINVPI EKGRFVTGSEY K A P L E L V T H R A KYY E LV I K S V L R A I GVVPIE K L R FVVLGS S Y
 KAPI ELVQHRARYYEFLVKSVLKSIGVSIDKGRFVEGSSY K APDELVEYRAKYYEYTI RAMLQAVGVSTEKLRFVLGSSY KSPFDLLDARSAYYREAI EGMVEAAGADPDDIEFVRGREF KAPDDLVNFRAKYYRY I TALLEEADHVPDDKLEFVLGSDY K API ELVRHRVNYYRHVLTAVVKSIGVPTDRLVFVVGSSY KAPDELVKFRAEYYKYAGKALLKAVGVSDDKLEFVLGSSY KTTPELIHHRAEYYQFTVTSTLKACGVDTTKLRFVRGSSF KAPDELVENRVKYYEKVIRALLESVGVSTEKLEFVLGSSY KAPIEKVQHRCAYYEKLIKSALKMLCVDDDRIQFVKGSEF GDFDEVRKDRAKADFNKKAFIALGGLDESKKFVLGSEY KSTYDVLGHRTKYYAFLLKAVFTALGVPDDKLEFVTGTSY GTMEEI

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 T GK S A T R P P LTT P E E I E R NA E TYKE QV F D P E K T E V V F N S T





 SGRNSSTRPALT LEQQTR DNGESYFQQALDKNKTMVVVNSEW S G K N T T R P P Q L S R E K ITA K T Y A E Q A F K I L D K K D K T I I R Y N S E W




## QUERY

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## Q <br> <br> Q

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$M$ GKMSAADMIKLAGQYTVARMRDDFTKRYRAEQAlIAlHE MATMPAADLVGLAAKHTARMDERDDFAKRFRGGQP IAIHE QMDDDYVLDLHALELETTLNRASRAMSED QSGESTKVSQ VSDKDYWALVLKVMKMTSLARMKRALT IMGRDEAELDSSK
LEKLGAAGLVQLAAQTVARMLERDDFSKRYKSGQPVADHE


M LGKLDSF DMIRLASELDTVARMREDFKVRFREGNPISIU HE QLDEEYTLDLHAAELETTLSRAKRAMAEDAR GDHAKVSQ QNAHEYWTRVDDVARKFNVARMQRCCTIMGRKEADDSAAQ MDKFSAAEMI QLAGKTVARMLERDDFDKRYKGGQSIAVHE WSSNKYWP VMDIARRNSVWFVNRCGQWMGRSETEVSAAQ WMNAFSAADFVRLASRYTVARMRDDFEKRYRDGRPDALHE MNGMTAADLVRLSSHYTVARMRDDFYKRYQSGQP:A:HE
 FKKMTSAELINLSSKMTARMLERDDFSKRYKGNKP:SIHE MDALNYYDMVKLDAQFTSQMLEREDFHKRFNAEEPAALHE QGEREYTDDVQRLSAQVAQRDALKAGAEVVKQVESPLLSG VKDKDY WALV DRVAKNTSARRMKRALTDMGRDEAELDSSK WGNELGAEGIIRLAGRYTMLMERDDFSTRYESGEPDGMHE CDALGS RGMI QLASRYTRMMERDDFTKRFKEGTPVISVHE



 ARAHEYWPLVMDIARRNKLPREIRCSQDMGRNEQDELTAQ FSEMTAADM1 RLAAQHTARMLERDDFSKRFAAQQPIAMHE
 MEPMGAAGMVQLAARTVARMLERDDFHKRYTAHQPI AM H WMNQVGAAGMIKLASQYTVARMRDDFDKRYRANQPIAVHE QLSRDYTLDLFKLANVVQNDAKRAGADVVKQVANPLLSG
 MSQLNAADLLKIASTHTARMLERDDFGKRYQNNQP SHI HE WCSKLNAVDMIKLASTMTVARMRDDFSKRFSSNKPISUHE VSDSAYWELVLRTAKSMSVARVKRAMDDMGRDAEEAEKSK LEKMSFADVLGLTSRTVAQMDERDDFSKRYKNGQPDSDME QFDEEYDLDLHALEAETSLARSNRAMAADKGDETATVAH GGKLGAEGTVRLASKLTVARMRDDFTKRYKAGP SA HE
 FGKMAAADMI RLAGQHTARMLERDDFARRYAAQQPI AT HE MSKMSSSEMLQLAAKTVARMLERDDFNKRYKAGQSDADHE
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UniRef90-C1FAC9
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| $L$ | $Y$ | $P$ | $L$ | $M$ | $Q$ | $A$ | $D$ | $E$ | $E$ | $H$ | $L$ | $G$ | $V$ | $D$ | $A$ | $Q$ | $F$ | $G$ | $G$ | $V$ | $D$ | $Q$ | $R$ | $K$ | $F$ | $V$ | $L$ | $A$ | $E$ | $E$ | $N$ | $L$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $I$ | $Y$ | $P$ | $L$ | $M$ | $Q$ | $A$ | $L$ | $D$ | $E$ | $E$ | $H$ | $L$ | $G$ | $V$ | $D$ | $A$ | $Q$ | $F$ | $G$ | $G$ | $V$ | $D$ | $Q$ | $R$ | $K$ | $G$ | $F$ | $T$ | $L$ | $A$ | $V$ | $E$ |
| $L$ | $L$ | $P$ | $S$ | $L$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $L$ | $L$ | $Y$ | $P$ | $I$ | $L$ | $Q$ | $V$ | $L$ | $D$ | $E$ | $Q$ | $H$ | $L$ | $D$ | $C$ | $D$ | $V$ | $Q$ | $F$ | $G$ | $G$ | $V$ | $D$ | $Q$ | $R$ | $K$ | $L$ | $F$ | $A$ | $A$ | $S$ | $T$ | $E$ |
| $W$ | $Q$ | $P$ | $K$ | $L$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

















 $F L Y P$ L C Q GY D SVVA MK S DV E L G G T D Q K F N L L V G R E L Q K H Y G
 $F$ F Y P L M Q G Y D S V A L E A D I E L G G T D Q K F N L L M G R T L Q K E F G











 $L L Y P$ LM Q GY D S V A L E A DV E L G G T D Q K F N L L V G R E LQ K Q Y S



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








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

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${ }^{1296}$


210
220
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 Y K E R A H L M N P M V $\operatorname{M}$ P G L L A G G K M K YRKRAHLMNPMVPGLKGSKMKI DLLDDSPDVVAKKIIRKAEC YRKRAHLVTPMVAGLNGGKMKIDLLDPPESVAKKVRKSEA Y E K R I H L M S P ML P GL N S D K M K I D L M D S K E A I WR K I R K C F C

 F K S P V $\operatorname{V}$ C L H T P I L L G L D G T K M S S S K G N N A E S Y A Q R A H L M N A MV P GLLA G GK M K I D F LDD GP K DV A K K L K A A L A







 Q A P Q V VI T M P L L E G L D G V Q K M S K S L G N Y V GI T EPP GEMF G YESPTCLHTPLIA ELSSGGEGKMSMEDSTEDIEEKVNGAFC


## O



## QUERY

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\section*{

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E IV A ARFHG EDAELKAQMDSGSLHPKEIKKQLARELT ARFHG EVRAI AKGLAEGTLHPRDVKMRLAREIVSFYHGPEAAMQA DYDSLEADLEAGELHPMDAKSALAVELDALIEPGRQQLD

 SFEDD $\square$ A A D Y E S GELSSEAD

 N PGADKK ALLALDLEVE
E T KELKKKKEQG LLNPMEAKKMLSAEIVT_RFHG A I DAMREEVAAGTLHPMEAKKSMARTITAGFSSAEQADRA

 SYDMLAREFAEGKLHPKDAKVANAAKKLNSDLEPMRKSDKS S Y E Q L IKVALA QE IVARFHSQQAAEDALAADVVNR
 AK ELALEVGRFHGPAVARRALED FEARFKR

 E D DMKVAVQAGSLHPKKAKMDLAKEIVTSRFQ

 ELARLKQGVADGSLNPRDVKLQLARELTT RFHD 1
K K
 AKK ELAAREMVV
AKKA AKLEMFKEEKLSPVDLKAGVAAGDNQLLEP IDAEYEN KEELK
 KAKEMLAFEDTK RFHGEEKAKEAAKFFEEMFK F KKEDP NYKELEQAFVDG LHPDDLKNATAKYVNMLLEPVHTYFEK D $\square K N Y V K A M E N G E N P R N G K G \square L A K E I V K I$ TYDS LEADLESGDDHPADAKEALAA Y LDTVDEPGRAKVRD RLKE L KAALLEDGKTNPRDDKRELAATLDSM I AELKANCASGQMNPRDAKMELGREIVA El DK 1 EAGLAAGEDHPNRCKRNLAQNIVA QARSLRAEVESGALNPRDVKDRLAREL VKFLLADEL $T Y E E L$
$D$
I

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 I K DQLTLIMRGVQEI YSKEDLIKKLEKRPLRIKLGMD

 S PEVENDLQTVLRGCDELLVQSEFAVKLQNSPLRIKLGDD

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 ETKKLENILKNTSEVVSEE ELKELISSKGNDKIYI GFE
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 SVRHALDVTKRGCEELLI ESEWIDQKLTGKPGRIK LGGD

 MS V S S D Q MAGEEALABLLRGTEQVHSTRELRERLASRPLRVKFGVD
 MEINE

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RSS $\square \square R H N R K E \square I T L N K N Y H K S R M G K Q R V L S G V Q$ $\square D S \square M Q E \square K K G V A E \square I D F S R \square K S L I K N K N F Y I K A G F D$ QERKKRVVESG円Q
MEEQKKRILSG:Q



 MSSD FNWLYRGTTE $\square$ FPNENLEQRLSET
$\stackrel{P}{\mathrm{P}} \mathrm{K}$
K R RVLSGVQ RKKRIVFSGUQ
$R V A T L L G \square A E E C D T E E E L R L L L R G N P P V C Y D S F L$
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UniRef90_C5ZVN2

P T A P D H|L|GHT|VLLNKMRQFQDLGHQVIVFLI|GDFTGM|IGDP $P$ S G R M HI A Q GIL R SVNVN R D D S G A I F R F WV A D WF A L L N N

 P T A DLHLGHTVVLNKLRHFQDLGHEVLELIGDYTARIGDP P S A D I H L G H TVVVL R K L K Q F Q DL GH QIV LI I G DFT GRI G D P
 P T A D D H L G H TVVVL NKMR QLQQDMGHNVVI F LI G D F T S M I G D P P T A D I H L G H TVVVLNK LRRQQN FGHEVVIFLI G DFTGMVGDP
P TAPD HLGGHTVVLQQKMKHFQE LGGEV HFLI GDFTGEI GDP
PSAPDHLGHAVVLRKLKQFQDLGHQVVFII GDFTARIGDP
PTAPD HLGHTVLI NKLRQFQQQLGHEVI FLI GDFTGMI GDP
P S GHMHI A Q GIVKALNVNKCTSCGCTFVVWVADWFAMMND K
P S A D I H L G H T V V L R K L K QL Q D L G H E II I I I G D F T GK I G D P P TP P L H L GHAV PL RKMRQFQDLGHKVTLII GNGTALI GDP
 P T A D DH I GHSVVLLRK I RQLQ DLGHRAVI I I GDFT GRI GDP PS GRI H L GHY L QI K K MI DLLQ NAGFK II I L L A D L H A Y L N Q K $P$ T G D L H L G H TVVILNK LRQFQD LGGHEVIVFLIGDFTATVVGP
 PS GRMMI A Q GI KAVNVNKCTAAGCEFVFWVADWFALMNDK




 P S P D L H L G H S VV L R K L R E F Q D F G H E AI LI I G DFTAMMI G D P
 $P$ T P D L HL GHAV PL RKMRQFQDLGHNVTLI I GS GTAAI GDP






P S P D L H I G H A V V L K K L R D F Q D L G H T A I L L I G DF TA Q I G D P
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P T P DL HL GHAVIL RKMRQFQDLGHKVI MLI GDFTAMI GDP
P K G RFH L G F L M GLL LKMKS LIDDKGDE GIVLI S DMEAF L DNE


 $\square S$ GF L H L G S LI STFK I NDFVVKA GVDCTVVFLADWHT LL N K M PTAP D HL G HTVVLLQK MA L L Q K F GAVVVQF LI GDFT GMI G DP
 P S A P D H L G H TVVVLNKLLKQFQEN GHTI QL I I G DFTGKI G DP P S A P D H L G H TVVVLNKL R Q F QENGHVVQQLLI G DFTGKI G D P P TA APDHI GHAVLLLLKLREFQDDGHQVLGLI GDFTMMI GDP PSADDHLGHAVVLRKIK QMQDLGHHVVII I GDFTGKI GDP $P T P D I H I G H A V V L R K M R Q F Q E L G H K V V L I I \quad G D F T A M I G D P$ PTAPD H L GHTVVTLQKMAF LQQKHGA I I QFLI GDFTARI GDP PS GTTTMGNYIGAIKQFVRLQHAYECYFCIVDLHADTVPQ P T APDHLGHTVLLQK L RTFQQQLGHTVYF II GDFTAMI GDP



 PTADFHVGNYLGAIRRWVPDQETHDTVYCVVDLHAITV P TAPD H L GHTVVLNKMRLLQQKHGGDVQFLI GDFTAKI GDP P S G DLT L G S Y MGAIK N WV AMQDE Y DCVY CIVD MHA I TVVR Q


 $P S G R M H I A Q G I K A M N V N K C T K S G G T F I F W V A D W F A D M N D M$ PTGDVVHIGNWLGADRNWVELQENYETMVCVVDLHAMTTPB P S P D L H L GHAVVLRKMRDFQDAGHKVVLII GDFTATIGDP




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## UniRef90 E6WPS5

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UniRef90-D7CQU8 UniRef90-S3DJD6 UniRet90-F2JMN7 UniRef90 A8FBY5 UniRef90-K9T5T0 UniRef90-L8EPD2 UniRef90-BoP8C9 UniRet90-A2YSO9 UniRef90-A4XJI5
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SGKNATRPPLTEAEVKQTYAKQQFKKLDKDKTKIVFNSD
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GTMEEI
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TGKSETRKVLSREQVLNNAETYKQQVFDENKTQVVFNSSW
 SGKSKTRPPLTANAQSYLEQCRLILRDEPELLELRFNSEW KVS WNTRDARSEYFYQICSSF DDQLGLDKVRAMKSSEMDS TGKAKGRKALSTE QVLENAKTYEKQUFDKEKTADVRENSEW

 GGSF E N DR KV S K Y Y E DAF R LVCP EANVVLGTDL
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SGRSVQRQMLSE E EVVRRNAQTY LDDQFFDVDRAEEI RWQST W


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D P K E
DPQE
VP A E
D P Q Q
N P K $\qquad$ LR R H T


NPKTLAQDTY T
EQDPK I A ALYLAC GI D LDD HATI F VQSHV SGKSATRKVLDDDTGAKNAKTYKEQVFDESKTEVMFNSAW
 D AKT LAQNTYNLA T PADLRRQTREAA


 D P K S S GK S K T R P Q T R R N S E S Y VA Q A T K I L D P N P D K L L E L R Y N S E W K N CMRPR L N K T D I L K N S T T Y K E Q I F K L LDP K K T D V F F N S S
 NPKTLAHDTYT
D P T A
E P KA LRRD T I SA L
GDMEI IQ TVGRYMIEVVWKSIGMNHDGVEFLCSSAEINSRA
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$M M D D A A G A D P G Q \| R F V R G T D F$
D P RELLRQRT LE
NPK K I L REKTE E

\section*{UniRef90_E6WPS5} UniRef90-FOW4M3 | UniRef90-17M9D6 |
| :--- |
| UniRef90 | UniRef90-D5V990 UniRef90 W1TUV3

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WF GQMSAADMDRTAGQHTVARMRDDFSKRFAAQQS\|A\|HE TNGASYWLRVMDIARRTTIARTVKCCTHMGRKEKGMLAAQ INKNDYWLQVDDVARKFNITRMKKCSQUMGRAESDELVSQ WFGKMSAGDMIQLASQTTVSRMRDDFSKRYNSQTPI Al HE LGKMNFADVLTLAAKTVARMLERDDFQKRYTEGRPISLHE LKALSFEQVIQLAGQMTARMLERDDFEKRYKGGQSIS SGE

 FGKMKLEEDVLVLTSKYTGARMRDDFAQRFKEQKPIVFHE MDKLGAAGMLQLASRTVARMMERDDFKKRYANGQAIA AHE LSK TFGDVLKLTGSTTVARMLERDFKLRFENQRPY Y KNE LLSLDLKGLLELCSKFTARLLERDDFTKRYQSQTP:ALHE
 LNELGAAGIDRLASQQTVARMRDDFKKRYASGQG|Al|HE
 IHADTYWRMVLDGRQNTIARDKKCCTПMGKTEGTLTAAQ WSDPLGARGLIQLARYTRMMEREDFTKRFKGGVPIAVHE KRAHEYWP VVMIGMRNNDPRILRCCQDMGRSDQDLSASQ LGKMGFKEVIQQAKVTYAQDAQRDFKHRDQNELDESQQE
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 SUEMKFADVLELSAQTVARMLERDDFSKRYKAGKPGGMHE VANPDYWELLLQ1 AKNSSLLRIRRALPGMGRTEEDADFSK

 LSKGSFEET K ASTMTVARMLERDFKKRYESQDPDSTHE QGSREYTLDVYKMTSVVGQHDAKKAGAEVVK QVAFDLLSG <br> \section*{\section*{}} <br> \section*{\section*{}}
 M DKMASGLIEETTTFVARMLEREDFEKRYKSQMPISGISE YNDFTLA DVIHLTSKYTVAQMREDFAKRENEGSPI AIITE LSALHLQDVIELAGKITVARLLERNFSERLGAGKP:ISLHE
 LENLGFKEVIRRLTSLLTVARMLERDFKKRYTEGVPIUSUHE PAHAQAGWDMQCI SYVGELERMTQYKDKAQKHGESIPAGL WLGDMTAQDLDKLTARYTVARMRDDFKKRFKENKPVADHE PEHAQLGWLMNCDTGFGEASRMTQFKDKSAKQGNDRTTGG PEHTELGWIMDCQSHMGELERMTQYKDKSKKLLK SMPVGL PAHAQLGWVLDCYTMFGELSRMTQFKDKSAKNADNINAGL SAHAELAWLENCTTPRNWLERMWQFKEKALKQGENVSMGL PEHAQLAWVLTCMTGFGEAGRMTQFKDKSGKQGSNTNVGLU LSKAGADGLIAGASTFNARMLERDDFTKRYKNETPNAISE PQHAELGWLLGCYTQFGELSRMTQFKQKSQQHADNITAGGLC
SAHSELAWLLNCVTPGNWLERMDQFKEKAVKQGENVGVGL SAHSELAWLLNCVTPLLNWLERMIQFKEKAVKQGENVGVGL$\varphi$SASNSYWTQALD ARRTTITRVKKCCQDMGRLENKLTAAQLA PSELCWLLNCLTPLNWMERMIQFKEKSIKQGDNVS:GLLWLSKLDSEGIILLASKHTVARMRDDFKSRYMSAKPI FIHESAHAELA WILNCFTYMGELSRMTQFKDKSQKHSDNINAGLTPAHAQAGWMLQCVAYMGELERMTQFKDKSAGKEAVVSAGL
SAHSELTWLLNCVTPLNWLERMDQFKEKAVKQGENVSVGL
PEHAQLAWVMNCLTGFGEASRMTQFKDKSAKQGADRSVGL
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DEYWPRVMGISTHRKIGVVRELRECKK
DEPMNFL DVINLASKYTVARMRETFRQRMEKNDPDSTHE
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## UniRef90 E6WPS5

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UniRef90_C5ZVVN2
$F|L Y P| L V Q G Y D S|V| A|L| K A D V|E| L G G T D Q K F N L L M G R G L L Q E H Y G$ ILYPLMQCADIFFLKADVCQLGLDQRKINMLARDYCDLVK



 FLYPLMQGYDSVALKSDLELGGTDQKFNLLVGRELQKEYG

 FMYPLVQGWDSVAL EADVELGGGTDQKFNLLMGRELQKKEG




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



F
$\stackrel{ }{\mathrm{F}} \mathrm{F}$

 $F$ Y Y P L L Q G Y D S V A M K A DV E L G GT D QK F N L L V GR QMQ EAA G






## L L F Y














 $F L Y P$ L L Q GYD SVVEMKCDI EMGGNDQK FNLL MGRHMQRVYG LS Y P PL M A A D LLL Y E T DFVVPVGED QK QHLEELTRRDLA ERF N




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


 $F$ L Y P L M Q GY D S V A $V$ V A DVVELGGTD QKFND A V GR DLLQR H F G


 FTYPALMAADILLYQADLVPVGIDQRQHLELTRRDIADRFN
 LD Y P V LMAA D I L L Y D A D KVVPVGGED QK Q H L E L T R R I N D K Y G
 $F T Y P V L M A A D L L L Y Q T D L V P V G D D Q K Q H L E L A R N I A R R F N$ FFNP CMQCAGIFFLEADICQMGMDQH
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UniRef90 C5ZVVN2
Q

220
230
240
QA P Q\| V LT MPLLLEGLLD GVVNKMSKSLLGNY\|G\||AEPADD\|VN $\square K K P V I L S H H M L M G L K E G Q E K M S M E D T P E H V D R K I S N A F C$ NNYKLHTPVIVSHHMSDPMSADFMEDTEEDVNKKIDGAYC KEPQVCITMPI LEGLDGVQKMSKSLGNYi GIINDPAGVMYQ


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\section*{K

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## 

 K A PVCI HN PV L T G LID GE GK M S S V D D D DAT I K S K I K K A Y C FYPMHHRLLPMKMSKS DPQSADFVHDTPEDIRQKVARAYC

Q A

## UniRef90 E6WPS5

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 KI MEVPDKLILKYFELAT KLMKVEDPYLQTYFELCTDLDAPEED
KVLSI S DDLMWD WYELLSEEKSLEE KLMSIPDDLMWDYWELLT CI LILDDDTI DRKFKRADTDSEAE VCYREGKDGDNNLMT LINLLDEPKVTDTDTVVRFDRETKPGVSNLLT DYSTLTGA I SMLDEPKVI EKKDKRAVTDSGHEDRFDPEEKAADSNLMT CVVYMLEKPDILRKKKKAVTDSEACVRFDPKEKPGSVCTGR
 I I E LLDDPKVSKKIRSAVTDTEREDRYDEQNKAGDSNLLS

 FVLMLDDDTVVRKFKRAVTDSDDKPGVTNLMSIYSVFTGR KLEKVPDDQI QTYFELLT $K L Q G V P D N L L S Q Y F E L L T D L P D E K L P E N P R D R Q M L L A W E$ PSKPEDENPCLDYVENIDFSVPEATFT ПT LLDS PDVITKKIKRAKTDSELGLEFGNPSRPEADNLLT KAMLVPDALLYRYFELCTSFPLGE K 1 MSII SDNMMWNYYELLS LDRSLKEDNQLKTDVKFGKNPRD

 DP


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


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$\square K$ LRLLARE
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$V N A L L D D M K N G R N P Q E \| K R I L A L E L I \quad E R F H D$
 EAADARKAI DAGGLNPRDLKLRLAREL
VKVELA QEIDTRFHSSADAGNALA K N N F EARFRDGVIP
 EI RKI E QEMREGKLNPRDAKARLAREIVK




 SYEEVEAMYREGKI HPADLKNATAEALITLLEPVRRYFQG F LSKMEKE $\square$ NEKTVNPRDYKMWLAREIVR
 TFEDLVVADYVAGGD NPRDAKVALAQEIVA
EVEQFKQDLTSGMNPRDLKRRLGRELVTL
I KVALAK LIV VTRFHSNKDADQAL
$\square$ KDEFSKEIIERFHHEGY LIKA
AKVALAQELVARFHTP
$\square K F L L S A E I V G K F H G D A A A E D A R R D F I A R F$
EITEENORTAKRA $\square$ NAKTIAA $\square$
VKLELAE ITTALYHGKNAMKEA
ELDAIDKSFEDGTADPYQLKRALGRNLVDL
IKFLLGEE
$\square E E F K A G \square A A G T \ N P R D V K \square W L A K E \square I A$

> EVHPMEAKKRLAERLV ARFHG

E DEEMKEKVEKGEYHPKEVKKKLARYIVS QFHS
AKVMLARE
QLNEIKAKLNRDDFNPMQLKKELAAELVR
SFRELESKYLNSEVHPMDLKKALTEILINVILPTSNKYHDS E $\square E E L K D N V E N G S K H P K K V K E E L A M E I V D R F A G F G E K A K D$ S DEKLEEALLEAKENPRDAKRRLAREIVAM
EVEAIKLKLNNTETNPRD RIQALLAG HPVAAHRELARQVVAWLHPQADLDAA
 ELAA I RAAMEAGTVNPRDLKMRLAREVVS QFHS

DDTDAED LKAGQVNPMEYKKRDAREDLLQLYP


HAKEMIA LE I I ERYH





LHPREAKATVAQA VT, TVRFHG

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T \DE\squareKDA LEQG V NPRD \KYKLA Q|I VS LLDE A QMYYDT
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GEAK
D
V A K
K E S A D N A HK UniRef90 D5V990 UniRef90-W1TUV3 UniRef90- X0R5D3 UniRef90_UPIO004163FA4 UniRef90-13U9P1 UniRef90_A6VQD1 UniRef90_V4JG8 UniRef90 B5YF91 UniRef90_Q47V01
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E D M P E QELALKAEE

EEAAQYAAQ
EFEKVFAKKD $\square$ P
E E
EERFRAVAKG
NQA SLVAAAFP
EEKTKSAEE
PADALAAEEAF

EEDSD【IK
DASARAAQEAF

EKAAEAAE
EEAARSARE
AFSRKA $\square$ PEN $\square$ P

PK\DD\|LAEG
VH S K R
$R L I Q D K A Y$
$D A D A K G$


| SELDRVLEEG |
| :---: |
| LLADKA |

D Y LD S VLREG
DKLDAVLAEG
EAARLMKDKA
$\square \quad \square$ A DKAY

DANAKILDQ
E E L K R I L N K G

KELSDKAY
DELDRILDEG
 QYMQDRAY
NKEAKF LDKGY
GA】HDVLKKG
E PELLAEAYP
$A Y \backslash Q E \| \quad L Q K G$

 EEKKVI FSGTQ | $V$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |
| $V$ | $G$ | $D$ |
| $V$ | $L$ | $R$ |

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P T G S F H|L|GNY|L|GA|V|RQWVVARESHDAFYMVV|DLHA|I|T|VQ PS GMITLGNYLGAI KHFVEYQDEHQCYYCIVNQHAITVPQ P T GKLLHVGHYVGSLKRRVELQNSDK IYDMIADAQALTDNA PTGDI HLGHSIPVRK LRRAFQDAGHTAVLII GDFTAQIGDP PS GDLTLGNYLGALKNWVLLQDEYECYYCIVDLHAIT
 P T G GM TI G N Y I G A I N Q WL K L Q E D H D C Y F M L V D L H A L T D R Q

 PS GDLHLGGNYLGAI KNWGARADEFDCYYFMADMHTIITVRQ P T GNL HL GNYLGAI RNWVENQHQYENYFCVVDLHAITVVPH



 P S GT I T L GNY I GAMKQFVELQNEYNCFFCIVDQHAMTVPQ PS G T I T L G N Y I G A M K Q F V E L

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





P



 P S G K MT L G N Y L G A I K N WT E L Q D N Y D C Y Y S I V D L L A A I T V P Q P T G K L H L G H Y V G S L R R R V E L Q


## P

P
P T S Y HL GNYL GAVK QFIQLQEDYE

P T G R L

 P T G R L H V G H Y V G S L K K R R V E L Q Q N S G E F F Y I M I A D A Q A L T D N A P TADSHVGHFLGMMVMAHMQRAGHRPDCLI GGGTAMVGDP
 P T GK L H L GHYVGSLRRRVQQNAGDKMFVFMADVQALTDNA P S G NLTI GNYLGAI GNWKAFEEQYNS IVCVADMHAITVRQ


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

P T G N L H L GNYL G A V R GF I E MQ H NYD S F F F I A D WH S L T T H P S S D S H L G N Y V G A L T N W WV K M Q D D F D A I F C V V N E H A


$P T S N F H L G N Y L G A L Q Y W V G M Q D D Y D A B Y F I P D M H A D T V A Q Q$ P TADSHVGHFMALCLMKRLQMAGNRPIALI GGGTAMI GDP P T A DS HI GH LLLPVLALLRRFQQAGHTPIALVGGATGMI GDP
 PS GNLTLGNYLGALRNFSKMQEENECYYCVVNQHA\|TVHQ

 P T G NL H L G NF L G A I K N WV A L Q A D F E C I F C V V | $V$ | $K$ | $T$ | $I$ | $N$ | $V$ | $N$ | $K$ | $M$ | $R$ | $A$ | $G$ | $C$ | $K$ | $V$ | $K$ | $I$ | $W$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $G$ | $S$ | $A$ | $D$ | $W$ | $A$ | $A$ | $Q$ | $L$ | $N$ | $N$ | $K$ |  |  |  |  |  | PTGRLHLGHYVGSIANRVRLHQRYESFRIIADDHMLLTTRN

 PTADSHVGHFLGMMVMAHMQQAGHRPICLIGGGTAMVGDP


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UniRef90－R6X7P1 1
UniRet90＿R5BN32
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| :--- |
| UniRef90 |

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UniRef90－
U3Z537 UniRef90－ $\mathrm{R6}$ TJ38 UniRef90＿UTPAW4 UniRef90－Q4JTJ1 UniRef90－D9V553 UniRef90－A0A023DXL1 UniRef90＿R7G548 UniRef90＿G5H581 UniRef90 UPIOOO37BD018 UniRef90－FOGWYO
UniRef90
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90
RENTRF ${ }^{100}$
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DPAQ

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TGKSEVRRHVANNAKTYLDQVR LIPQEPKDLRRRTLE VLALYLAAGLDP DNPEKVRQNVIEVALDYMA CGLDPAKSTLFIQSQI
D
NPASLAADTYA
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A A
DPKELRERVF RG
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K

## D D S D

D PQT
DNPGKVIENITEKMAL R



DPALLRERSLRSA AQLLAAGLD
SGKTDMRKMMTPETDEQNGDCFRF TDFSEDKAVMANNADW
KNPEKVRNSVLQ
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嵒
EHPE

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UniRef90
R7JO558

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| UniRef90- $5 \mathrm{VOH9}$ | UniRef90_UPI0004774A7F UniRef90-UPIO0037AB93A UniRef90-UPIIOOO469B800 UniRet90_R5PTW5 UniRef90_R5PWW0 UniRef90-G2KU23 UniRef90-UPIOOO35D198E UniRef90-G5CSB2 UniRef90-UPIOO047D6B1B UniRef90-FORVTO UniRef90-F9DPX5 UniRef90-UPI0003B4604E UniRef90-P57956

UniRef90 H5UU18 UniRef90-D9VUS6 UniRef9OOPIIOOO46FOB45 UniRef90-UPI00041E47FC UniRef90-A8G188 UniRef90-A1R460 UniRef90-J21EB7 Uniinefoo-05Z1B0 UniRef90-Q5FAF7 UniRef90-UPIO003B66DA8 UniRef90-B1YBP5 UniRef90-F9MPG8 UniRef90_B6WAS3
UniRef90-G5BDM5 UniRef90-G6A155 UniRef90-M7ZVP9 UniRef90-D9T1M9 UniRef90-UPIOOO225E814 UniRef90-TOJSU7 UniRef90_Q9НКТ3

PEHAQLGWVIMNCLIAGFGEASRMTQFKDKSARHGADRTTGLL PEHAQLAWIMQTLAYVGELERMTQFKDKSQGRGDSHPAGL PELTELTFYYANLVTVARLKRNPTVKSEMRGFGES:PAGF SAHSQLSWVLNCMAYMGELNRMTQFKEKSKKNAGNVNAGLD AELLCELSFYYMNLVTVSRRLQRNPTVKSEMRNFETSXIPVGF PEHAQLSWVLNCYAQMGELNRMTQFKDKSAKNANN: NVGGL PAHAELTWLLNCDTPLNWLTDMDQFKEKADKQGENVGVGL HQHAELAWVLSCYTMFGELSRMTQFKDKSAKHADNINAGL SAHSELTWLLNCTTPDNWLQGMIQFKEKALKQGENVGTGL SAHAELTWLLNCITPLNWLERMIQFKEKALKQGENVNAGL PALAEMTVFFLNMVSLNRVLRNPTVKAELEQKGFADTAGF PQLAELTMYFLNLVSVGRVKRNPTVKAEQKKFGESOPSGF
 PAHAQAGWMMQCVSY GELERMTQFKDK SEGKDAVSAGL PQLTELTFYYMNLVTVSRRNPTVKNEDKMRNFEASUPTGF PEHAELSWVLSCITGYGEAARMTQFKDKAAKQGDGTTVGL SAHTELAWILNTFTYMGELERMTQYKDKAKQHKTNNNIGGL PEHAQLAWVLNCYTQMGELNRMTQFKDKSAKNESNDNVGL SAHTQLGWMLQTISYMGELERMTQFKDK SKGKEAVSAGL PAHTQAGWVLTTGSSGGELERMTQYKDKAQKOSQGVPAGL 는
 PALCELTFYYMNLVSLTRLE
WMKKLGVDGLVRLAGLQTRFLERDDFQKRMNERLPGHLHE
TAHSELAWLLNCITPRNWLERMDQFKEKAVKQGENVSVGL
 LGKLSMIDDFLRDVGKNFTINYMMSKESVKRRDETGUSYTE
 PEGYELNLLFEMMVTVPRLERLPSLKDMARDAHNEMPFGL PAHAQAGWMMQCISYI GELERMTQFKDKSSGKEAVSASL PQLAELYMYYMNLVSVSRLHRNPTVKQETNKFGESIPAGG LGQ SLISFLRDYGKHVGVNYMLGKDSDQTRLEHGUSYTE KEHVELMWVLNTMTYMGELSRMTQFKDKSQKSEANLINGGL AAHAELCWLLNCVTPLNWLERMDQFKEKAVKQGDNVSVGL PAHAELAWVLNCYTMFGELSRMTQFKDKSKKYASN|NAGL PEHAQLAWVLMCDTGDGEARRMTQFKDKSAKQGGDNTTGL PETSELTVYYLNLVTLGRLERNPTVKSEDQQKGYDDSIGF PELTELSFYYMNLVTVSRRNPTVKNEDQMRNFETSDPVGF
 PELTELTFYFLNLVTLSRLERNPTVKSEVRNFENSLPAGF AEHSQLAWLLGCLTGFGEASRMTQFKDKAQKQGEGATVGL LIMQLNYVGFLRELGAHFSVNRMLTAECFKQRLEKGLSFLE PALSELNMYLLNLVTLARLERNPTVKAEMQQKNFN:PAGF PAHAELAWVLNCYTMFGELSRMTQFKDKSAKNAQNINAGL PADAELTMIYMNVVSVARRNPTVKHEDQQKSFKESVPAGF AEAAQLSWVLECLIGYGEAARMKQFKDKSARQEDEESVGLD
 PAHAQAGWIMQCVSYI GELERMTQFKDKSEGAE GVSAAL PQLYELSFHYMNLVTVSRLQRNPTVKAEDAQKNFSIPVGF PEHTQLAWVLNCYTYFGEMGRMTQFKDKSARHAENINVGL
PEHAELTWILSCLTGFGEASRMTQFKDKSAKRGEGTNVGL PEHAQLGWVMNCLTGFGEASRMTQFKDKSAKGGNSASVGL
 PEHAQLAWVLNCDTGMGEAARMTQFKDKAQKQGSDASVGL PEHSQLAWVLNCYTQFGELSRMTQFKDKSERHNNNVNAGL PQHAELAWVLSCDTGFGEASRMTQFKDKSARHGDNATVGL MNCLDFLRDGKHFSVNAMLDKESVKQRDDRDGAGUSFTE PAHTELTWLLQCLTGFGEASRMTQFKDKSQKRGADRSVGL PQHAQLGWIMTTLSYVGELERMTQYKDKASKQGDS: PAGL K ELTELLTYL DNLVSLSRRNPTVKNEDKSKNFETSLPTGF SEHTQLSWLLTCMVRLPRLQHLHQWKAKAAQQKHDGMMGL PQHAELAWMFNCVARLGWLNRMTQFKEKAGKNRENATVGL DNRNEYWPLVMDIGRKNN|LKRVTRCCTMMGRSNEELTAAQ PEVGDLNWLFQNLATVPRLERVPSLKEMTRDAGKDMPYGG



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| UniRef90 E8PN | UniRef90-UPIO0047B3C08 UniRef90-E5WE50 UniRef90-R6X7P1 UniRef90 R5BN32 UniRef90_UPI00029AFE73 UniRef90-K2BR93 UniRef90-UPIOOOOEOEFO7 UniRef90-UPIO0036192C0 UniRef90-A0A033 UniRef90-K2EAE5 UniRef90-R5SJ98 UniRef90-UPIOOO37CC31F UniRef90-Q2JSX8

UniRef90 R7FQP5 UniRef90-R6H2C5 UniRet90-J9ZAU1 UniRef90-K9YKL6
UniRef90 - XoTNZ8 UniRef90-UPIO0046949C3 UniRef90-S1QVQ0 UniRef90-R7L2T8 UniRef90_A0A011RLE0 UniRef90-V5WHR7 UniRef90-К6С2M9 UniRef90-C5NUFO UniRef90-O5HNH6 UniRef90-T3GCG8
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| :--- | UniRef90-G5H581 UniRef90-UPIO0037BD018 UniRef90-FOGWYO

UniRef90
UVOH9 UniRef90_UPI0004774A7F UniRef90_UPIO0037AB93A UniRef90-UPIOOO469B800 UniRef90 R5PTW5 UniRef90 ${ }^{-R 5 P W W 0}$ UniRef90-G2KU23 UniRef90-UPIO0035D198E UniRet90_G5CSB2 UniRef90-UPIOO0047D6B1B UniRef90-FORVTO UniRef90-F9DPX5 UniRet90_UPIOO033B4604E UniRef90-P57956
UniRef90 H5UU18 UniRef90-D9VUS6 UniRef90 UPIOOO46FOB45 UniRef90-UPIO0041E47FC UniRet90-A8G188 UniRef90-A1R460 UniRef90-J21EB7 UniRef90-25Z180 UniRef90-R6R1N8 UniRef90-UPIOOO3B66DA8 UniRef90-B1YBP5 UniRef90-F9MPG8 UniRef90-B6WAS3
UniRef90-G5BDM5 UniRef90-G5BDM5
UniRef90-G6A155 UniRef90-M7ZVP9 UniRef90-D9T1M9 UniRef90 UPIOOO225E814 UniRef90-TOJSU7 UniRef90 Q9HKT3

170


200 LTYPPLMAADILLYKTDYVPVGEDQKQHIEITRDLAQRFN

 FTYPISQAADITAFKATTVPVGEDQSPMIEQTREIVHKFN FSYPVLQAADILGYQADQVPVGEDQKQHLEQTRDIATRFN

L


 LTYPPLMAADLLYNTDLVPVGEDQKQHLELTRDLLSERFN
 F T Y P V L M M A A D D L L Y Q T N L L V
 LTYPPLMAADVVYNTNIVPVGDDQKQHEETRNVVDRFN
 FTYPILQAADILLYRPQYVPVGEDQRQHLELTRDLAQRFN





 LGYPVLLQSADILLPRAHVVPVVGKDNEAHVELTREIAARRFN



 LD Y P V L M A A D L L Y D A D L V P V GE D Q K Q H L E L A R D I A QR F G

 Y A Y P ML M A A D L L L Y R P H L V P V G G D Q R Q H L E LTTMN LA EREN




 FTYPVLMAAD LLYQTNAVPVGEDQRQHLELTRDLAQRFN $F N Y M I M Q G Y D F L E L N C V M Q M G G D D Q W S N$ LILAGADLIRRKE | $L$ | $T$ | $Y$ | $P$ | $V$ | $S$ | $Q$ | $T$ | $A$ | $D$ | $T$ | $A$ | $F$ | $K$ | $G$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | FTYP TLLMAADILLY QT DLVPDVGDDQK QHVEITRDI ATRFN



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## F F

 F T Y P FT Y P L L Q VA DI L L Y Q A N A V P V G E D Q R Q H L E L T R DLLA E R F N

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




 IIF YPCMQCAD: F F LLKAD I CQLGMDQR
 $F N Y M L M Q S Y D F L E L N C D M Q M G G D D Q W S N$ LI $\operatorname{L}$ G GADLIDRRKE


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UniRef90 R7FQP5 UniRef90-R6H2C5 UniRef90-JgZAU1 UniRef90-K9YKL6 UniRef90-X0TNZ8 UniRef90_UPIO0046949C3 UniRef90_S1QVQ0

UniRef90 R7L2T8 UniRef90-A0A011RLE0 UniRef90-V5WHR7 UniRef90-К6С2M9 UniRef90-C5NUFO UniRef90-O5HNH6 | UniRef90-T3GCG8 |
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| UniRef90- 5 VOH | UniRef90-R5VQH9 UniRet90_UPIO004774A7F UniRef90_UPIOOO37AB93A

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UniRef90-H5UU18 UniRef90-D9VUS6 UniRef9OOPIIOOO46FOB45 UniRef90-UPI00041E47FC UniRef90-A8G188 UniRef90-A1R460 UniRef90-J2IEB7 Uniinefoo-05Z1B0 UniRef90-R6R1N8 UniRef90-Q5FAF7
UniRefololupiooo3B66DA8 UniRef90-B1YBP5 UniRef90-F9MPG8 UniRef90-B6WAS3
UniRef90-G5BDM5 UniRef90-G6A155 UniRef90-M7ZVP9 UniRef90-D9T1M9 UniRef90-UPIOOO225E814 UniR Ref90-TOJSU7 UniRef90 Q9нKТ3

STYGDTET\||PDPY\|LKETAKO II YDLQDPSSKMSKSTAN NRYHEVFVLPEDRTPKVGAR $\square M S L Q E P T R K M S K S P N Q N A F$
 NRYSPTFKIPEPF IPK VGAK DMSLQDDPDSKMS K SDKN EN G


 , D P ENPVLVKMPDPM SLTD GTKKMS KS DPSEMSRDNLLDS P D DEP LIRKEGARVMSLTD GTSKMSKSDPSEMSRIHLLDDAD
 $N$ T Y G E V L V

 K K Y N
 SRYKKTFVVPE GKILLDGSAK DY DLDQDPTSSKMSKSGEN DKKG




 SRF GKTFTPPEPY ILKDTAK DY DLLQEPGAKMSKSASS PA G


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KHYGEVFPVP

, NRFSPTVVVP EGYYPK GGARVMSSLQEPTKKMSKSDSNENA
 Q $\quad Y$ G DTF RMP
QTE A GF TMP SRYKKTFVVPEGFIPEGAA SRFGKTEVMPEPFIVKDTAKIVDLLQEPTAKMSKSASTGNG

 $N$ N 1


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

G
D
L
 A LY G E T L V E P Q I P G I Q $T 1 Y Q E Y F T E P Q S W G L D G S G K M G K S E D D E K T L T K K V M R A V T$
$S R F G E T F V V P E G F I P K A S A K V Y D L Q D P T A K M S K S A D S D A G$


 GKDSHAMTI KLLLNNSEGKKMGKTVK GAVWLDADKPFEAF Q


 HTYKEDFREPKAPGIDDGSNKMSK SLLDNKKEVGKRKVMSMFT
 K A Q V A N L K
$H L Y G E V F P V P D M V G T D G A G K M S K S S D D A A T V V R R K V M G M Y T$
 AK PA Y GLLT FT LLTT TSDGRKMGKTEKGALDWLDAEKPY DFY Q


UniRef90 UPI0003A488E2 UniRef90_UPIO002DD604F UniRef90-UPIO004096ED9 UniRef90-K9SDE5 UniRef90_UPIO0047E443E UniRef90-D4JB35 UniRef90-U1M708 UniRef90_V6MA97 UniRef90-UPIOOO3665A39 UniRef90-B9DzB4 UniRef90-A6POL3 UniRef90-UPIO003741658 UniRef90-UPIO003468A11 UniRef90-R71BS6 UniRef90-K2AT70 UniRef90-R3TWY5 UniRef90_N2A8T4 UniRef90-E8PNN8 UniRef90-UPIO0047B3C08 UniRef90_E5WE50 UniRef90-R6X7P1 UniRef90-R5BN32 UniRef90-UPI00029AFE73 UniRef90-K2BR93 UniRef90-UPIO000EOEFO7 UniRef90-UPI00036192C0 UniRef90-AOAO33UVX6 UniRef90-K2EAE5 UniRef90-R5SJ98 UniRef90-UP100037CC31F UniRef90-Q2JSX8 UniRef90-R7FQP5 UniRef90-R6H2C5 UniRet90_J9ZAU1 UniRefofo-KgYKL6 UniRef90-X0TNZ8 UniRet90_UPIOOO46949C3 UniRef90 STQVQ0
UniRef90 R7L2T8 UniRef90-A0A011RLE0 UniRef90-V5WHR7 UniRef90_K6С2M9 UniRet90-C5NUFO UniRef90-O5HNH6 UniRef90-T3GCG8
UniRef90-R7JQ58 UniRef90-R7JQ58 UniRef90-R6TJ38 UniRef90_UTPAW4 UniRef90-Q4JTJ1 UniRef90-D9V553 UniRef90-A0AO23DXL1 UniRef90-R7G548 UniRef90-G5H581 UniRef90 UPIIOOO37BD018 UniRef90-FOGWYO UniRef90-R5VQH9 UniRef90_UPI0004774A7F UniRef90-UP100037AB83A UniRef90-UPIOO0469B800 UniRef90-R5PTW5 UniRef90-R5PWW0 UniRef90-G2KU23 UniRef90-UPI00035D198E UniRef90-G5CSB2 UniRef90-UPIOO0047D6B1B UniRef90-FoRVTO UniRef90-F9DPX5 UniRef90-UPI0003B4604E UniRef90-P57956
UniRef90 H5UU18 UniRef90-D9VUS6 UniRef9OOPIIOOO46FOB45 UniRef90-UPIO0041E47FC UniRef90-A8G188 UniRef90-A1R460 UniRef90-J2IEB7 UniReftoo-O5Z1B0 UniRef90-R6R1N8 UniRef90-Q5FAF7
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UniRef90-G5BDM5 UniRef90-G6A155 UniRef90-M7ZVP9 UniRef90-D971M9 UniRef90_UPIOOO225E814 UniRef90-TOJSU7 UniRef90-Q9HKT3

PKGTIUEKTTAKKVKSAVTDTDTVTRFDRAEKPGIVISNLD ${ }^{260}$ ISLLDEPEEUVKKLKRAQTDSDNRIAFDKENKPGUSNLMS DPNHDRVEDPGKVEGNPVFTYDDAFARDEHFAEF APDYQ KREKTPDALIPQYFELLT YILLKDDDTIRRKDKRAVTDSFNKVRFSDEQTDYSKDSGE DPNHIRDEDPGSLEGNTVFTYLDAFCNDQHFEEYLPDDYK
 DSDS

1 RGLEFDNPERPECNNL
DAGKVKYSDDQPGIKNLDT VITKKKKCKTPVRGLESDTEHCVRYDRESIYSAVTGK TLAKKIKRCKTDTIRELEFDNPDRPENNLLTLYMLLSGK TDAKKIKRCKTDTIRELEFDNPDRPECHNLLSLYAILSGK DPTRLKPTDPGHVEGNPIFDYHDAFNPNKAEV DPNHI HVEDPGQVEGNMVFTYDDVGKDK
DPDHIRVQDPGKLEGNTVFTYLDAFGNDEHFAEYDP EYA KDMWVPDALLESYFRLLTDDEEAET TTPLDDDKQ EKKПKSAVTDSEGDVKFDKENKPGПSNLLS
 DPDHVRVEDPGKDEGNTVFTYGDAFSTEEHFAKFIPDDYA LVNLLDDPKVSKRDRSAVTDSDGDDRFDRETKPGSAFSGR

 NQKNDEPNVAAKKDKSAVTDSDGVVKYDKENKPGSSDSGQ K $M$ STPDELIILYFTCMTRVPMEIVEEYTKEMKKGENPRN

 $\qquad$ DPNH:NISDPGKVEGNMV RLMSIPDSLIASYTTLLT LIKKKIKKCKTDPDMGLAFDPGQRPECNNLLGDYADFSGK DPTHLRVQDPGKLEGNTVFTYMDAFS KREHFGLYLEYN
 DPNHVRVEDPGQVEGNVVFTYDDVFDDDKEKV DPNRVRADUPGKVEGNPVFMYHDVFNPDTAEVIYS\|LGGK DPNHIKDEDPGQVEGNVVFKYLD
FWINQSDEDVIKFLKYFTFLEKEEINRLEQSKNEAPHLRE F TLLADDDSUKRKIKRSVTDSLG VVKYNDEQPGDKNLDD DPDHLRVEDPGKVEGNTVFTYLDAFS RAREHFQRYLPYA
DNLDPPEELTKKIKRAKTDPQMGLEFGNPERPETDNLLG SVRILDSDDVVRKFRRAVTDSGTE VCRGEGKDGVNNLMT FWINTSDEDVIKFLKYFTFDDKAE EQLEASKNEAP LINLLDDPKVSKR1RSAVTDNDGEVRYDKENKPGSALGDK DPGHIK DPDHDKVTDPGKLEGNAVFTYLDAFATDEHFKAFDP DYE DASAPADVITRKLKRAVTDLGNEVRYDTAEKPGVSNTMD DPDHIRDEDPGKLDGNCVFDYLDAFCNDDYFAEYLPDEYQ YWRNVDDADVQKCLSLLTFLPMEEVRRDGALKDQADNEAK DPEHINDDDPGHDEGNIVFTYLDVFGTKK EPGHLEGNAVFTYLE AFSTDDDFANFWPE Y ASVYLLDSRDDURKFKRAVTDSDTVVKRAEKDGDNNGMT DPNHIHVEDPGQVEGNTVFTY LDDFADDKAKV
EFMEDPKSAVTDNERD RYDPENKPGVSNAKVTHSGMTGR
 RVRNAVTDPARVTUK VVKDVGHPEVCNVYKYHCVFNPD DPGHLKASDPGKMEGNTVFTYLDAFAVPEDFAKFSNSSYP VRGLLEDPKVAKKIKRAVTDSDEPPVVRYDLDVLSGVTGK EPKVTEKSAVTDTDTVIRFDTENKPGVSNLLTILSTLTGE DSGPTEPNSMMPEATQNLETLLQTASSE LLARLDPNVTKKKIMRAVTDADGEIRYDPAEKPGVSNLLT LIGNLDDPKVAKRKKKARFDTENKPGVSNLLSLMSGVSGK
 YWRNVADADVIKCLKMLTFLPLDEIKELDEKLEGQELNK FWLKVADADVYKFLKYFTFLSLEEVGVVEAKDKASGSKPE NPKGIPPKTSAKRIKSAVTDDLGEVHFDREQQPGSALTGE
$P$ RRDTEYNPVLELLRISAFREERRLVKRPEKYGGDLEVW DSEN
DPDHDKVSDPGKVEGNTVFTYLDAF CEDYHFEKFYPEYK VRDTDSPEE $\square V N K F R K A V T D F T S E V T Y D P G S R G G V S N E V A$ PPK VVKNPCDEYDQYDVFPWFDKFEVVRKENNGGNKTFL DPNRVRADVPGTVEGNPVFEYHDDFNPDRAQV DPDPLPDN
YWRNVDDADVEKCLALLTFLPMEEV
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UniRef90 R7FQP5 UniRef90-R6H2C5 UniRef90-JgZAU1 UniReffo-KgYKL6 UniRef90-XOTNZ8
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UniRef9- 5 9 UniRef90-C5NUFO
UniRef90 Q 5 HNH 6 UniRef90-T3GCG8
UniRef90-RTJQ58
UniRef90_A3Z537
UniRef90-R6TJ38
UniRef90_UTPAW4
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UniRef90-D9V553 UniRef90-A0AO23DXL1

UniRef90-R7G548 UniRef90-UPIOOO37BD018 | UniRef90- FOGWYO |
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| UniRef90- $5 \mathrm{VOH9}$ | UniRef90_UPIO004774A7F UniRef90-UPIo0037AB93A UniRef90-UPIOOO469B800 UniRef90-R5PTWS UniRef90-G2KU23 UniRef90-UPI00035D198E UniRet90 G5CSB2 UniRef90 UPIOOO47D6B1B UniRef90-FORVTO UniRef90-UPI0003B4604E UniRef90-P57956 UniRef90-H5UU18 UniRef90-UPIOOO46FOB45 UniRef90-UPI00041E47FC UniRet90-A8G188 UniRef90_A1R460 UniRef90-J21EB7

UniRef90 $\mathrm{Q} 5 Z 1 \mathrm{~B}$ UniRef90-R6R1N8 UniRef90_Q5FAF7 UniRef90-UP10003B66DA8 UniRef90-B1YBP5 UniRef90-B6WAS3 UniRef90_G5BDM5 UniRef90-G6A155 UniRef90-M7ZV59 UniRef90-D9T1M9
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UniRef90_S31I43

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IY S ILEDEEMYS GKGYGEFKGDLAQVVINVIMKPDQERYES TVA EI E KEYE GK GYGDFK A GLISDVVVGAIKPI QDKYES


 A I D QL V P Q Y T D K M Y G H L K G DV A T A V V D M L T P I Q T R F H A SI K ELEQRYEGK GYGEFKQD TANAVIDTLGR IQERYES SI E E L E A QYAD K GYGDFKGDLAEEVVK FLVEF QEKFN K LKM KLGGEELVRFYHGEKAAK DA EE YF I NT F $N L D E L K E H Y R K G G L G D V K D K R F L N N V M Q E E L S P I R A R F E K$

$N L D E L K A H Y Q R G G L G D V K V K K F L N K V L Q A E L A P D R A R R K E$ DLDEMKDHYRRGGLGDVKIKKFLINVLNREFAPIRERFEN

SRDEVAVECAD MGWGKFKPLLTEATDEALTPDQDKY DLDQI F QGCEKGTLPCTRCKKDLARLLVKALAPFRERRKE NLQELKEHYQRGGLGDMKVKKFLNSVLQEELEPDRNR R A QKALAKEVTTLVHGKEAYEQAV
NYDEIEQEF DGKGYGDFKTAVGEAVADHLEPVRTEY QELKDHYRAGGLGDVKDKRYLNEVLQAKLKPIRERREA
 AELKEHYSRGGLGDMKLKRRLNDVMQDYLRPIRER AQKALAENVTKFI HGEAALKDA ПYSNLSKKSVEEIVGYGIFKEDVAEVVSEADRPDREKYNK SLDELKAHYRRGGLGDVKVKKFLDAVLNETLEPIRERRKQ LYA ILAAGAECAAMGWGRFKPLLAEATVAALEPIQARHDR IYSAFEDESEFSGRGYGDFKLAVGETVADALAPVHERFD HKREAQKALAENVVSFI

SVENFDQAYQRGEDQPADLKHKVATILNEMVEPARRSLE

MRNKDY乌EK $\quad$ Y
$P Y$ VYEVLKK G
 N】YKRGAEKAY ETRRLLSDKAY
$G Y$ D R VLK A G DEVVKILEDG EKVNEILKNG A A EVMAK L

KELDDDLDRG $\begin{array}{lll}\mathrm{E} E \mathrm{E} \\ \mathrm{P} & \mathrm{D} & \mathrm{L} V \mathrm{~V} \\ \mathrm{Y} & \mathrm{DQG} \\ \mathrm{RA}\end{array}$
 AELERILADG

DELDDLLDQG EVLDEILDKG

PEVYN LLKKG AELDRILHDG PEVFE L K K G EEVIEILKNG

GQ V VA K G Y


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        ARL\ADKAY
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FAEDKDA

Y

D Y LE K TY S M G
E EVYEI LRKG
AELEQVLQQG
AELNRDLANG
AELDRILAAG




 | $P E D$ |
| :--- | :--- |
| $P Q M A K L L$ |

A ELLENLLARG
PELDS LLDQG
YELKKGTEKAY
AELDRTLAEG
P EL D S L L A K G
DEKDQ1L
$A \in \square D R \square A$

S DFEQLA $\square D G L P$
 $P G A K L L D E$
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D Y LE K L E L A Y P
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PSGTDT LGNY LGAMKNFTSYQNEHECYFC\|VNQHA\|TVPQ P T G NL H L G N Y L G A I R NWVK MQA GD DC LFF L A DLHA I TV Y N PSADSHFGGHLVPLLGLKRFQLAGHKPII LI GGATGLLGDP P T G S L H LG N YL GAVRKWT QLQKSRENVICIVDMHSIVMP H


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ITELLDDDPKVSKKTRSAVUT ${ }^{260}$ GREVVYDPENKPGVSNLLS ${ }^{280}$ FWYNTDDRDAVQFLKYFTFLSLEEIAEDEKEFMAAPHQRA DSEEPP T DRLLDDDTVIRKFKRAVTDSGSETVYREDKDIYGCVTGK DPNHLRVEDPGNVEGNPVFTYLDAFCKNEHFSRYFPEYN FWLNVMDADADRFLK FTFLSLDEDEDDRVKFEAAPHERL GIMSFPDEDITSSGLLSYELLTELPGLEGLDKKIKANPML
 YLLDQPDVIMRKFKKAVTYDLANKPGVSNLMSDYSACTGK D

1 RGDAFDDPARPEAHNLDTDYMDTSGK DNLDDTPDLVRKKI RRARTDAVTGLTFDDPERPEAANLDA NPASDPPDVIRKKLSRATTDSGREVKYDPANKPE $\square S N L M G$ DSGPTELNSEKPQVIENLFTFGQITS

R\|AFDTENKAG\|SNLMGLYSGATGK
 DPNHLSVNDSGQVEGNDVFTDDAFHPD DPNHIRIEDPGQVEGNTVFTYLDALVQSDSFEKYLP EYK DPD DRVQDPGDTKNNPVLPSEVKGLEERPEARNLVNDYA
 SDLSVDDADLTAKKTKKAKTDLEGDMPSEPKGLEGRPEVE DPARUKKDDPGNPDVCMVYYYHKWFS SEPGLEGRPESD DPDH KVVDPGKMEGNMVFHYGDVF YWRNVDDADVFKCLRLLTFVP
DEPDVTRKKIMRAVTDVSFDREGKPGTSNLLSTFSALSGR FWINTDDRDVVKFLKYFTFLDQAE TDRLAEAVATHPEKRE LISLLDDPAVTDSEREDRFDPVAKPGVSNLLTDQSAVTGA NPGSDEPSVIRKKISRATTDSGSDVRYDPANKPEVSNLMS
FWIDTADADVYRFLKFFTFMDLAEINALLEEDKNSGKAR DPQHПQVSDPGHIEGNVVFTYLDIFDPDKAQV
FWINTADADVYRFLKFFTFMSLEEDNADEAEDKTSGKAPR DPGHLRVSDPGKVEGNVVFSWLDAFHPDKSLV VIGLLEDPKI SDEQANTYYDVAEKPGVSNLLSLLSATSGN SAKRIR SAVTDDLGVVNFDRVNQPGVSNLLVIVSADTGE
 YLRNIDDADVENCLCLLTFLPMDEI KRDSSEGAEINK DPKSDSPELI RKKIRSAVTDSEGKIAYNPDQKPGVSNLLT SRINLTDDADK ITAKKURKAKTDAESLKELEERPEVANLVS DPTHLRRDDPGHVEGNPVFTYDDAFCKDEYFAEFLP EVKK
 DGDEPP VVRYDVQNKAGVSNLLDILSATTGK VVNLLDDPKVSKKDKSAVTDNEREARFDPQNKPGSALSGK DQGPSEPNSTKPDYDENLFTLMRLVS DPNHVRVEDPGKVEGNVVFTYLDLFDSNKQEV CKDKK DPNHVRVTDPGRDEDNTVFTYLDAF SELSDDDK KKKAKSDADVDPSEVEGLDGRPEADYGALSNK DSMLDDEKTDMKKFKSAVTDSEGVVKYDKENKPGVSNTDE DPNRIHASTPGRVEGNPLF YHDUFNPNKEEV DPDPLPE TVEGLQGRPGAENLVGDYAALAGM LINLLDDPNVSKRVRSAVTDTEREDRYDMENKPGSALTGD YWRNVQDADIERFLLMFTFDPVAEI RSLVAPGKNPNE DSEN
 NPKSDSPDVIKEKIKKAVTDFTSDISYSPKDRPGVSNLVN SRINLTDDNDTVAAK RKAKTDADALPSEAAGLAGRPEAE DPEHIHDEDPGK DEGNMVFTYDDVFDTDKEKV FWIINTSDADVYRFLKFFTF
DPARKRRTDKGDPQKCPVFDLHKDFSTEEERK
DPDALPSE VEGLEGRPDARNLVNGYAALNEQ YWRNI DDADVLKCLRMLTFLPIEQTDEMDKWEGSQLNQAK DPNHLKVSDPGQVEGNVVFTYLDAFDEFPEEKNDAGTGK
 SRINLTDDADTVALK RRAKTDPEPLPSEARGLEARPEAR DPARVRRTDPGDPDKGLIGDYHKLLFSDLDP FFVNVEDSMVINYLKIYTFLSREETEEYERKNNEHPELRE LINLLEDPRIGKKIRSAVTDTEREIRFDVENKPGVSNLGS
 DSRAPGEPKDTEG SADFQIYQAFA FWTNSADADVYNFDRYFTFLEVSATAEDEAQDKAAQGRPQ DPLH NISDPGHVEGNUVFTYLDIFDTDKQ DPARIKKTDPGHPEVCTVFVYHGMFNQEE DPEPLPSEAKG EPGEPKDPDGC $T D F G \| Y Q A F A R P S E$
$T A F D V A N K G G V S N G$
FTFILSIDEDDAIEA
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ITFSALTGRTVEDGRGYGDLKKELUGEAV|ADFTTPVRDQVQS AQKLLAREKISEALFSGDIKELNAEEI
A Q DLLA K A YEGKM Y G HLLKK K TA DA V VAMLEPLQARYHA TREETEKEF DGKGYGDFKDAVGEAVAAELEPLQKRY loll
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| UniRef90-R5APU0 | ERL L K K A |
| UniRef90_S6A8Z9 | P Q ${ }^{\text {P E I L K E G }}$ |
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$R \mid V \bar{V} G \prod_{Q}^{40}$

| $V$ | $L$ | T | G D R |
| :--- | :--- | :--- | :--- | :--- | :--- |
| T F | Y | G F | $D$ |

$\square K E R G \square Q Q A T H E D E D R E D F G K E S V V T H Y Y G G D$
QQCTDVDALSACMDKKA TVFVGGTD
 $E L Q Q R G L A Q T T D A E A L Q Q L L D D G Q I S L Y C G F D$

ERRKRVLSGVQ
$\square S E R G \square H Q \square S D E Q G \square D A L F A K E T V T A Y I G F D$
N S S QPRTVSG Q
E L L E R G $\square$ K Q F THEDETRELLEKEK
$\begin{array}{lllllll}K & A & R & V & F & S & G Q Q \\ K & P & V & L & F & S & G M Q\end{array}$


$K \vee S G Q Q$
$M S G M$
$\begin{array}{ll}R & V L S G M R \\ R & G \\ R & A\end{array}$
$K G R I F S G M Q$
$R V L S G Q K$
E LVAR G L A Q VT NEEE $\square$ KEM $\square$ N N GKA T F Y
K K T V L S G VQ
$R V L T G D R$
$\square K E R G \square A Q C T N E K E L R E L F D K E$
G S Q I D LQARGL GS Q T T DQELSNLLDSE $K \square A L Y C G F D$ E LQ WR GMDHQTTHPELAEKLHQEKYTLTCGFR

 LK WRGLADCTDLEGLSERLSKAPLTLYCGFD ELS WRGLIQSTDLDALKEAC EQPITLYCGFD
 PRVFSGDQ $M R I V S G l Q Q$


$R \mid V S G M R$
$P R K V[F G \square Q$
P V V L T G D R



| $R$ | $L$ | $V$ | $S$ | $G$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| I | V | S | G | V | Q |

$E \square Q W R G \square A Q H T D L E E \square R K T L A Q G P V T F Y C G F D$ E LQ WR G L VK D $\square$ S DPK IIDD IINE GK A T FYWGT D $E L Q T R G L I A Q A S D L D Q I Q Q Q L N Q P Q T V Y C G F D$
 LS P QE QA A L VE GRA N L IP E K I EA A QAA G R P FVVVK Y G D D


E L E WR G LI K DVVS S P E LR E K L N A G GMT FY I G T D ELRWRGAIQLSDEEGLEK LLEDKSVGDYCGTD VER GMH Q CTN DDELDAAFAK EPVTAY IGF D

 \begin{tabular}{cc|ccc}
$P$ \& $R$ \& $F$ \& $S$ \& $G M Q$ <br>
$R$ \& $F$ \& $S$ \& $G$ \& $\square$ <br>
$R$ \& 1 \& $S$ \& $Q$

 

$R$ \& $L$ \& $S$ \& $G$ \& $\mathbb{T}$ <br>
$R$ \& $V$ \& $L$ \& $S$ \& $G$ \& $I$ <br>
$Q$
\end{tabular} $R \vee L S G M R$

 $L D T R G I H B Q T D A E G L D A L A A K S V V P G Y I G F D$ $\begin{array}{rl}D R F A \\ E & V \\ L & L \\ \text { E W }\end{array}$ $\mathrm{K} T \mathrm{R} V \mathrm{~L} T \mathrm{G}$

D LE WR GA $\square$ QMT DEE G L R A L T N E K A V H Q CTDLEA LD KRLNQGPAAAY IGF D



UniRef90-F8HY63 UniRef90_UPI00047B1BFC UniRef90_U2KP15 UniRef90 H2LX03 UniRef90-A0A024QBH3 UniRef90_UPI00036159AC UniRef90_F2LV87 UniRef90 C1N230 UniRef90_UPI00037E29BD UniRef90-UPI00046FB5CC UniRef90 R5YJE8 UniRef90_R6GIW9 UniRef90_E3T693 UniRef90 UPI00036B2E11 UniRef90_A0A026WQJ1 UniRef90_E3GH40 UniRef90_UPI0003FB5FB8 UniRef90_UPI00036DD332 UniRef90_UPI000479A471 UniRef90_Q1IJU0
UniRef90_UPI000258F719
UniRef90_R6IBA9 UniRef90_R7FNT5 UniRef90_R5D7M2
UniRef90_Q1RIE3 UniRef90_W4C200 UniRef90_M0Q6D1
UniRef90-C9KK49 UniRef90_K9DA46 UniRef90_V9H7R5 UniRef90_F6DR36 UniRef90_UPI00036CFC00 UniRef90- V2RIL9 UniRef90_W9QZC1 UniRef90_D2Z4M1 UniRef90_UPI00036E01DD UniRef90_V5UF16 UniRef90_UPIO0037199DD UniRef90_UPI00036DECB8 UniRef90_C2GG24 UniRef90_W7ARA0 UniRef90_V4HIS8 UniRef90_I9L4R5 UniRef90-H5Y103 UniRef90_K2GA51 UniRef90_UPI0003B70C10 UniRef90-R5H919
UniRef90 Q8SZU2 UniRef90 F2LKW6 UniRef90_UPI000237B100 UniRef90_C9QGZ4 UniRef90_E1QI75 UniRef90_UPI000471F265 UniRef90_M5XA04 UniRef90_K0YUN3 UniRef90_UPI000377438B UniRef90_R6T2K2 UniRef90_F7YR05 UniRef90_UPI0004716130 UniRef90_UPI00040686F6 UniRef90_L8PIJ2
UniRef90 R7CPT2 UniRef90_D3F099 UniRef90_UPIO0036F23CB UniRef90_B9YB97 UniRef90_UPI000469FA4D UniRef90_UPI000470AE55 UniRef90_B9XHF6
UniRef90 C7LRV0 UniRef90_F8JFM4 UniRef90_F7VI51 UniRef90-W6AAL7 UniRef90_D5ML78 UniRef90_UPI0003FC7C38 UniRef90-R7MHZ3 UniRef90_T0FZL5 UniRef90_C5XYV2
UniRef90_W7CK27 UniRef90-G8YQD2 UniRef90_Q1QT98 UniRef90-V9XDA1 UniRef90-Q7UQA4 UniRef90 ${ }^{-}$C8NIZ8 UniRef90_M3EBP5 UniRef90_V6F0T1 UniRef90_UPI000475DAAD UniRef90_F81025

P

P


P T G N L H|L|GNY|L|GA|I R N WVRMQDGGDCFFF|L|ADLHA DTVHN P T GKLLH GHYVGSLKKRVAMQNSGEYYDMIADKQAFTDNA PTADSHVGHFLQVIA MSHLQQKA GHRPDIFLI G G GTAMIGBP
 P T G D S H I G H L V G A L T M L L K R F Q K A G H K P P I A L I G G G T G M I G D P
 $P$ T GALHLGNLVGAL K NWVRLQEDYERFYFVADWHALTTGF
 ATSDSHLGNYIGALQQFVTHQESHDAFYFIANMHA ITVE


- P S G G L T L G N Y L G All R R F VMQE S GVQ T I Y C V V D M H A I T V W Q P T GK L H L GN Y M GA LAN WV K Q

P


## 

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P

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## \section*{.} <br> \section*{}

$P$ S G G L T L G N Y L G A MK R F V D M Q N E F Q T V Y CMMVAD L A A I A A K W P T G N L H LGGN Y L GA I R N WV A M Q E G GE C C L Y F L A D M H A I S M P H





 P S G T L H I G N Y F A M M K R M I Q Y Q N

元
$P$ S A D SH I G H L S S LL V VA K R L L E Q H G H H P I L L V G GAT G Q I G D P


## 

 CTARSHVVGS L MQ IMIL R R LQQ A GHKP V L M G G GT TKV G D P



| S |
| :--- |
| P |


TTGTPHLGNYVGAIRDAASRDHNVLPFYFLADYHALTK
PTADSHIGHYASFVTAKRLMLHGHKPIILVGGATGLIIGDP
PTAPSHVGSLVQIMMLRMMQAGHKPVLMGGGTGKIGDP

PTGRLHLGNYLGA NNWKDQSEGCTYUYGIADLHAITAPS PTGPSHAGHLVPLLALKRFQRAGHRPIVLAGGATGMIGAP

PTGDMHIGHLIPFMLLRRFQLAGHKPVILIGGATGSIGDP
CTAESHVGGGLMQDMLLLRWWQKTGNKPDVLMGGGTTMRIGDP


## UniRef90_UPIoо03B407DE IRe90 Fsh

 UniRef90-UPIO0047B1BFC UniRef90_U2KP15UniRef90 H2LX03
UniRef90-A0A024QBH3
UniRef90_UPIOO036159AC UniRef90_F2LV87
UniRef90 C1N230
UniRef90-UPI00037E29BD UniRef90 UPIO0046FB5CC UniRef90-R5YJE8 UniRef90-R6GIW9 UniRef90-E3T693 UniRef90 UPIO0036B2E11 UniRef90_A0A026WQJ1 UniRef90-E3GH40 UniRef90-UPI0003FB5FB8 UniRef90-UPIO0036DD332 UniRef90-UPIO00479A471 UniRef90-Q1IJUO UniRef90_UPI000258F719
UniRef90-R6IBA9 UniRef90-R7FNT5 UniRef90-R5D7M2
UniRef90_Q1RIE3 UniRef90-W4C200 UniRef90-M006D1 1 UniRef90 ${ }^{-}$K9DA46 UniRef90-V9H7R5 UniRef90-F6DR36 UniRef90-UPI00036CFC00 UniRef90 - V2RILC9 UniRef90-W9OZC1 UniRef90 D2Z4M1 UniRef90 UPI00036E01DD UniRef90-V5UF16 UniRef90-UPI00037199DD UniRef90-UPI00036DECB8 UniRef90-C2GG24 UniRef90-W7ARA0
UniRef90 V4HIS8
UniRet90_B7RGW3 UniRef90-19L4R5
UniRef90-H5Y103
UniRef90 UPIOOO3B70C10 UniRef90-R5H919 UniRef90_O8SZU2 UniRef90_UPI000237B100 UniRef90-C9QGZ4 UniRef90 E1 Q175 UniRef90_UPI000471F265 UniRef90-M5XA04 UniRef90-KOYUN3 UniRef90 UPI000377438B UniRef90-R6T2K2 UniRef90-F7YR05 UniRef90-UPIOOO4716130 UniRef90 UPI00040686F6 UniRef90-L8PIJ2 UniRef90_R7CPT2 UniRef90 D3F099 UniRef90-UPI00036F23CB UniRef90-B9YB97 UniRef90_UPI000469FA4D UniRef90 UPI000470AE55 UniRef90-B9XHF6 UniRef90-C7LRVO UniRef90-F8JFM4 UniRef90 F7V151 UniRef90-W6AAL7 UniRef90-A5D2V66 UniRef90-UPIOOO3FC7C38 UniRef90-R7MHZ3 UniRef90-TOFZL5 UniRet90_C5XYV27 UniRef90-W7CK27 UniRef90-G8YQD2 UniRef90_Q1QT98 UniRet90-V9XDA1 UniRef90-Q7UQA44 UniRet9o-B3DWV UniRef90-C8NIZ8 UniRef90-V6F0T1

D PKE
90
0 AGTBAA 100
YLAVGl DPKKSTLFNQAAV
RDPEKDHNSLLEVALD NANCYLAVGIDPKKTTIFVQSAI
SGKTDMRKMLTPETIQHNANCFLFLDFSEGNAIMANNADW
SGKTEMRKMLDENVEKTKEQLNRFIGFDGKTALAQDNKEW
DPDQ LIRSNILDLTASLLACGDDPEKAILFQQSQV
SNESEVVKGYSEK KQQi ARILDEDKGENPVVSRNNHDW
SFKAETVAGWVQKI RNQLTPFLSFEGDNAAVMNNYDWFGG
HDAAALKASTRSSA A
SFKDDARQLMTVDTDERVFSNYLTYGEGPTDALMINNADW
QDPAELRERTLRTAAQFLAA
DPKMLPV NVKSILAEY LAAGLD
SGKTDMRSMLTKEQIEHKKQMERFDDFSDDKADLVNNADW DYQEPAQLRAKDVE TAADFLAAGLDPKHSSIMVQSAV QDPAELVARTRRTAAQYIAA GIDPEKSTLFVQSQV DGRQDLRQKILTRENTLLMTATLVACGVNYKRSILFQQSKV SGRQDLRQVMTQEREKFKKVFEKFLTFEDDRAMMVNNAEW ADPSNVL

LREQSEAVAALFVAAGUDP ADTSDUKASCTELL!DFLSA PKRLYDNVLTMCATLLAC
SDTSKLQENVMEMAIDWLSA
IDPQDLRNNTYDILSFYDAAGLDPEKCCLFKQSDUI
SGRTDMRQMLTEETDAHNAECFKF $\square D F S$ GKALMLRNSAW APSELKRSVIETL
ARPQLLGQNLHEDTRDYLSA
TGRTDMRKMLTDEDI EHNCECFRFIGDFSDGKAIMVNNGDW DDLSKVHRNVLEVALD Y Y

SGKKDERQEDIEKNAQGIKKQLSHFFEGDSPAIMVNNADW DNPEN TKE $\square R$ RQMVLSWLAA GLDVEKAPIFIQSHN DPKTDKGCDSKARDTAADYDACGVDPSKASVFVQSHV ANSSVIKGNCREVLLDWLA DDRGKVHRNVSEVALD DPKE STREQLNHNTTQVNEQLKRLLDFEASEN RDVGERSMLSDETVRENLGQUSKFVELDGEKGELLNNADW SGKKEERKLQSLEQINKNVEGLRAQLGQITRFTMVNNYDW HNPKK! ADNIFNVMADYLAVGICP पDPATLRHNTREDAGFIAA
SKVSERTGNPQEVVEQWTQK VKMQF
ASDPREDAGRTFDMAVANFAA
DKTENLKNDVIDVA| DWLAS

HDPDKVRRNVLEVALD YLAVGID
SGRSDRPALTDEDIARNTSTYREDFDPARTTLCLQSAL SGRSDERPALTDEDARNLSTYREQFFDFERAQFRHNGDW HNPNKV

EPDK

## DKQLL


DPALLRERTRRTA
RPTTERPMTTKEAVSKNF
SFKAVERSLNTEETVKNWVESLKKQVTDLFGYEVVNNYDW
KDPKELRS
NIREVAAA Y LI A GVDPK
RQSGERTLNPKEVVSQWAQRLKSQDGRILQFVSNYEWTAD
SGRSSERPPLTDEDIARNDSGYQQQFDDFERADLRFNGEW
SGRKSERVLQSMEQVQHNAECLKEQMKNLFGFRMVNNYDW
SGRKSERVLQSMEQVQHNAECLKEQMKNLFGFRMVNNYDW
SDTSGDKTHVPEMVKDWLAS
 SGKDESRPVITDEMIQKVFEKFTTFGDGPTDAIMVNNDDW SGKTVERQLLTKEVLDTNIASGKVQLRRLLDEDAAANPAR D
DPAE
PAR LHQSRLE V VAA
QEPEKLRHQTLTQA
LPIEAKTLKENDKSMVALLLAAGGUDAEKHLLFNQSAV
DAELLRRQTFEAA
ADTKSDRDNDCEMADDMLAA
CQEPERVROSTLE AGLDPSKALELQSRL
RPTAEREII SKETVEKNI DGLTKQVKMLLDKCEVVNNYDW
SLRDEARSLLTVERIGRVFERFLTFGDGPSDAVMVDNADW AYNLDRARAGCYNIELWKA GGMDGKVGFMWLSDE
SGKKEERQEQVNKNVESLRGQLETIFDFSGDNIMVNNYEW
KAEELRR
NRHEVVASULAAGLDENKCILYQQSSV
RDVGERTMRNSDTVAEWAGRRFVDEDNSPTGAVVVNNLDW

SQSMEQVQHNVEKLTAQMKKLFETTDEDQATLRLVNNYDW
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ADPSTGRQNI RDVALDFLSA G GLDPERSTVFIQSHV
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T

UniRef90_UPIO003B407DE UniRef90-F8HY63 UniRef90_UPI00047B1BFC UniRef90_U2KP15 UniRef90-H2LX03 UniRef90-A0A024QBH3 UniRef90_UPI00036159AC UniRef90-F2LV87 UniRef90-C1N230 UniRef90_UPI00037E29BD UniRef90_UPI00046FB5CC UniRef90-R5YJE8 UniRef90-R6GIW9 UniRef90_E3T693 UniRef90_UPIO0036B2E11 UniRef90-A0A026WQJ1 UniRef90-E3GH40 UniRef90_UPI0003FB5FB8 UniRef90-UPIO0036DD332 UniRef90_UPIO004 UniRef90_UPI000258F719 UniRef90_R6IBA9 UniRef90-R7FNT5 UniRef90-R5D7M2 UniRef90-Q1RIE3 UniRef90-W4C200 UniRef90-M0Q6D1 UniRef90-C9KK49
UniRef90_K9DA46 UniRef90_V9H7R5 UniRef90-F6DR36 UniRef90-UPIO0036CFC00 UniRef90-WRIL9 UniRef90-D2Z4M1 UniRef90_UPIO0036E01DD UniRef90_V5UF16 UniRef90-UP100037199DD UniRef90-UPIO0036DECB8
UniRef90 UniRef90_C2GG24
UniRef90_W7ARA0 UniRef90-V4HIS8 UniRef90_B7RGW3 UniRef90-19L4R5 UniRef90-H5Y103 UniRef90-K2GA51 UniRef90_UPIO003B70C10 UniRef90-R5H919 UniRef90-Q8SZU2
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UniRef90_C7LRV0 UniRef90-F8JFM4 UniRef90-F7VI51 UniRef90-W6AAL7 UniRef90-A5D2V6 UniRef90_UP10003FC7C38 UniRef90-R7MHZ3 UniRef90-TOFZL5 UniRef90-C5XYV2
UniRef90_W7CK27 UniRef90_G8YQD2 UniRef9-Q1QT98 UniRef90_V9XDA1
UniRef90_Q7UQA4 UniRef90-B3DWV1 UniRef90_C8NIZ8 UniRef90-M3EBP5
UniRef90- V6F0T1 UniRef90_V6FOT1 UniRef90-UPI000475DAAD UniRef90-F81025
UniRef90_R6Z8V0

## \section*{}




## 




PAHAELAWLLAGTAR\|GWLNRMTQFKDKAGKNREGASVGL PELSELTEYFLNLVSUARLQRNPTVKTEDQQKGFGDPAGF
 SEHAELAWIL GCMTSMPRLRHLPQWKMKSGQKNEG SVVGLD


 PA HPQLSWVLECTTSMGEASRMTQFKDKSAKQDH VV L GLE
 PAHAELAWMLTCVTPFGWLGRMTQFKAKAAAQETGVGDGL PAHAELA WVLNTVTGFGEASRMTQFKDKSQKQGADASVGL



 KEHAELALLLGMSTPLSWLERVPTYKDKLQNWKDNNTYGF

 PEDAELTDLFSMFVTVNSLRHNPTDKAESKNSSDELYYGF

 MNCLDFLRDIGKHFSVNAMLAKEAVKQRIEREDQGUSFTE

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




PALAELAMYYANLVSVSRLERNPTVKAE $A$ AD F GASIPAGF PEHAQLAWIFNCVARMGWMGRMTQWKDKAGKNAEAASLGL
 RAHAELMWLLSSVTPVGWLNRMUQFKEKSRKAGDNVGVGL TSELDSADDLLRDLGKNFRMGAMKDAVARRLKSEEGUSYTE
 MNVIDFFRDVGKHFSVNNMISRESVKQRLQRPEQGUSFTE AAHAELAWDFNCVARLGWLNRMTQFKEKAGKNRENASVGL


| K |
| :---: |
| Y |
| $L$ |
| L |
| $T$ |



UniRef90 UPI0003B407DE UniRef90 F8HY63 UniRef90_UPI00047B1BFC UniRef90_U2KP15 UniRef90 H2LX03 UniRef90_A0A024QBH3 UniRef90_UPI00036159AC UniRef90 F2LV87 UniRef90 C1N230 UniRef90_UPI00037E29BD UniRef90_UPI00046FB5CC UniRef90_R5YJE8 UniRef90_R6GIW9 UniRef90_E3T693 UniRef90_UPI00036B2E11 UniRef90_A0A026WQJ1 UniRef90_E3GH40 UniRef90_UPI0003FB5FB8 UniRef90_UPI00036DD332 UniRef90_UPI000479A471 UniRef90_Q1IJU0 UniRef90-UPI000258F719 UniRef90_R6IBA9 UniRef90_R7FNT5 UniRef90_R5D7M2 UniRef90-Q1RIE3 UniRef90_W4C200 UniRef90_M0Q6D1 UniRef90_C9KK49 UniRef90_K9DA46 UniRef90_V9H7R5 UniRef90_F6DR36 UniRef90_UPI00036CFC00 UniRef90_V2RIL9 UniRef90_W9QZC1 UniRef90_D2Z4M1 UniRef90_UPI00036E01DD UniRef90_V5UF16 UniRef90_UPI00037199DD UniRef90_UPI00036DECB8 UniRef90_C2GG24 UniRef90-W7ARA0 UniRef90_V4HIS8 UniRef90_B7RGW3 UniRef90_I9L4R5 UniRef90-H5Y103 UniRef90_K2GA51 UniRef90_UPI0003B70C10 UniRef90_R5H919 UniRef90_Q8SZU2 UniRef90 F2LKW6 UniRef90_UPI000237B100 UniRef90_C9QGZ4 UniRef90-E1QI75 UniRef90_UPI000471F265 UniRef90_M5XA04 UniRef90_K0YUN3 UniRef90_UPI000377438B UniRef90_R6T2K2 UniRef90_F7YR05 UniRef90_UPI0004716130 UniRef90_UPI00040686F6 UniRef90_L8PIJ2 UniRef90_R7CPT2 UniRef90_D3F099 UniRef90_UPIO0036F23CB UniRef90_B9YB97 UniRef90_UPI000469FA4D UniRef90_UPI000470AE55 UniRef90_B9XHF6 UniRef90_C7LRV0 UniRef90_F8JFM4 UniRef90_F7VI51
UniRef90_W6AAL7 UniRef90-A5D2V6 UniRef90_D5ML78 UniRef90_UPI0003FC7C38 UniRef90-R7MHZ3 UniRef90-T0FZL5 UniRef90-C5XYV2 UniRef90_W7CK27 UniRef90_G8YQD2 UniRef90_Q1QT98 UniRef90_Q7UQA4 UniRef90_B3DWV1 UniRef90_C8NIZ8 UniRef90-M3EBP5 UniRef90_V6F0T1 UniRef90_UPI000475DAAD UniRef90_F81025
UniRef90_R6Z8V0

LDETELFTLLPEPMDPTAARDMSDRDGNAKMSKSDPSEQSR





 $\begin{array}{ll}T \\ Y & Q L Y A L\end{array}$


 SKFGHTFPIPRTLVSDGPRQRIKSLRDP TRKMSKSHT


 KKYGDTFPDPHS LVNE NASQRDKS LDRDPDKKMSKSD KNQK Y L Y NE VFPEPQAPGDDGRKMSKSYGNTPEEMWERDRMMTT NRK E N I L S M P K A IT P K V G K R DM N L S D P T Q K M S K S V K D P K G GK D A H A MT I T L L L N S E GK K M G K T A S G A V W L D P N K P F E F Y Q GNAKMSKSDGSKKMSKSDSSRKAR
 $N V A V Y G L T N K L L T K S D G K K M G K T A G G A L W L D A E K P Y E F Y Q$ RAKAF VPEVGRRLPGDDGKAKMSKSLGNADEDRAAVKNVYT
 GKETYGLTTLPLVTKADGTKFGKTESGNUWLDANKPYRMYQ






 H DYFF P L T EPVIEGADGSKKMIDNLTDDADTI AKKI RKAKT N D F CAALFT LDPAPY DP DGGAKMMNMTDDAADTIMQKVMKKAKT








 GKEAYGFTVVPLI T DST GKKLGGKSEGNADIWLDKNKTS SYYQ
 GATVNVGTSPMITMSQGMKFGKSEGNAMWIMLSPYKFYQ
 R S E QV I LT M P I L P G DD G E R K M S K S L G N Y I GVVT E P P E E IV G
 GS KA Y A LT DP L MLLKA D GTK F GK TA G GA V WL DP EK P Y E F Y Q G F D L Y G L T T P L L T T S S GAKMGKTAA GA I WL NEDMLYY Y WQ


 NTYGETFVVPEP PGDD GQKMSKSYFA GEKEMREKVMMDKT ALY GEVLV EP Q P P GTD GRKMSK S Y S D S P E Q VAA A K I K P MVT $H$ H Y G H FVV LP E A C G LD G R K M S K S Y F A P EN QL R K K I K T N S L

 HTY QA GFFPLPKT LLLTPSKK ILDSLLRDPSKKMSKSDPDPSAA


 GAES Y GL L T I P L M L K S D GTK F GK S A G GAV WL D P E K P Y E F Y Q QRYGHTFVVPRATSPGVAARVMNLQDPA SKMGKSDDT QAE LFGGLTSP LLTTSSSGAKMGKTVGGADWLNADMLSAWWQ



|  |  |
| :---: | :---: |
| 硡 |  |
| UniRef90-UPIO0047B1 | YWRNVDDKD |
| UniRef90-U2K | YWRNVADAD |
| UniRef90-H2LX03 | TTTT DSPED |
| AOA | FWLNTDDRD |
| IRee90-UPIO | L |
| UniRef90 ${ }^{\text {C }}$ CN2 |  |
| UniRef90 UPI00037E29BD |  |
| UniRef90-UP100046FB5CC | RUDULDDKALTKKIKSAVTDDGTEIAFDPENKPGVSNLLT |
| UniRef90 R5YJE | DEGPQTPNSPKSEPIANLFTDMKI |
| Re | QARKADMRATTDSL |
| UniRef90-UPIOOO36B2E11 | LIKVLDPNVTKKKIMRAVTDTDGET |
| $\begin{aligned} & \text { UniRef90_AOAO } \\ & \text { UniRef90_E } \mathrm{E} G \mathrm{H} \end{aligned}$ | YWRNVADADVEKCLAMLTFLPMDEV HRLG |
| UniRef90-UP10003FB5FB8 | DPDPLPSED |
| UniRef90-UP1000367D332 | DSGS |
| UniRef90-UP100 | DPARVRRTDPGDPDKCPVGDLHK |
| UniRef90 Q1IJUO | DPARVRRTDPGNPDVCPVGDLUHKIFS |
| UniRef90-R61BA9 |  |
| UniRef90-R7FNT5 | E W YLADDKTVRKKFMSAKTDTGCEVKYDVENKPGDS |
|  | D |
| niRef90-Q1RIE3 | UNLRDDNDLI HQKIKKAKTDHLSFVSYDKEARPEDSNLLD |
| UniRef90-W4C2 | DPARVHKNAPGHPDICPIFAYHGAFRSDAERV |
|  | YWRNVDDADVEKCLSLTFDP |
| UniRef90-K9DA46 | DPLHLKVSDPGHIEGNVAFSYLDA |
| UniRef90-V9H7R5 | FWLKVADADVYKFLKYFTFLS |
| 6D |  |
| UP100 |  |
| UniRef90-V2RIL | DTKRQRKTDAGDPNVCPVFDYHKVFSTDEER |
|  | R |
| UniRef90 D274M1 |  |
| P100036 |  |
| UniRet90-VJUF16 | APLHLKVED |
| viRef90-UP100036DECB8 | FWIRTDDRDAIKYLKYFTFLTKEETESLESDHQERPEKRE |
| UniRef90-C2GG24 | Y |
|  | FWVNTDDRDVVKYLKYFTFLTESEIADLDAKQVEQEPHLRA |
|  | D |
| UniRef90-19L4R5 |  |
| UniRef90-H5Y103 |  |
| UniR | FWVNVDDRDVIKFLHFFTFLDFDELEELEREVQERPEQRT |
| $\begin{aligned} & \text { UniRef90-UPIO003E } \\ & \text { UniRef90 R5H919 } \end{aligned}$ | DPQRVRRTDPGNPEVCLIGP |
| UniRef90-Q8SZU2 | NPKATSPDLITQKTKKAVTDFTSDITYNPGKRAGVSNLVN |
| UniR | SDPGTVEG |
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| M5XA04 |  |
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| Unil | KTLRLPDEALPTWYELLLGEPVPAGAPPRDAK |
|  | Q |
| UniRef90- UPIOOO469FA4D | FWLNQDDRDVVKYLKYFTFLSKE |
| A | FWRNTEDADVGKFLKLFTEL |
|  | F |
| UniRef90_C7LR | NSQAPEEPKETEGCALLF EMFRAFATKD |
| F8JFM4 | E |
| UniRef90 W6AAL7 | YTGGLLDDNQVRNKTKAATTDSENLVRFDMENKPGSCITKT |
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|  | D ${ }^{\text {d }}$ |
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L E R D



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A E L D R L LA K A
EEMARLMEQ
GEDFDLS LG
$S Y \square E E \square L R N G$
ELLNE $\square$ FAKG
E Y L L K $\square \mathrm{L}$ H Q G

E E F AK


PHQLKA」LKA
AEIDRTLAHG
A ALDA LLKAG
$D Y$ VRDALRQG
DEVKDILNDG
$R \square A A D L G Y$
DKAQLI
EEVRRIMAQG
$N^{\top} L D E \begin{aligned} & I \\ & I D D Q G \\ & I S D S A\end{aligned}$
$A E L D R V L A D G$

SEMKRLMDD
$\square E A$
GEVKD DTA

PALKEGAEKA

DTLREGARKA
EIVQEVLEDGW
ETLQEGARKA

N NEARAL
K LLTD K S Y
 $D L A Q R G L A Q T T D L E Q L A L F R Q P Q T L Y C G F D$ $E L Q W R G L \frac{1}{1} Q H T D L T K L R E A L S N G P V T V Y C G Y D$

MERGFDEQVT DENAVRKADEAP PRACY SGGQD ELKWRGLHDSMP RVEDHLSEAMRSAYVGFD DLKYRGI I Q MT DEDEI NKMLESEKISLYCGAD
 $E L K W R G L V Q V S T D E E L E K L L A G E P I T Y Y C G F D$
$P L V F S G V Q$

| $M R$ | $V$ | $G$ | $G$ | $Q$ |
| :--- | :--- | :--- | :--- | :--- |
| $V$ | $L$ | $Y$ | $C$ | $G$ |


E LQTMTHTTLPVI LT GDR
YR F G GVK

E E QLLK EMT T A Y I G F E LQWRGLAQSTDEAA R RDADDDGP LTVYCGFD E F IDNKGFHQCTDLDRRLTADTKETKGAABYGGF D R V L

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4455
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110
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EAKE

## DPRALRRRSRVAA

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 RDVGERTLNTADTVADWAGRRFVEFDDSPTGAVVANNLSW SGDEKTLIHNQEADKKQLDKFLDFESGASNCAELVNNYDW D
SAKNQTE
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 SGKTEMRQUITQEQ\DENKAGDRF DDFNNDQALLLDNAQW EPGA VRAATRHVAAAYLAAGDDPARSILFNQSQV D PERVKSSRKEI AATWLACGLDPEKVCFYRQSDI DPAELSRRT DFKAQERQARVQRSTLE I AACWLATGLDPEQVFFYRQSDV SFKAQERQLNTPDVVEAWVEKLRFVDFDAGPQSAVVVNNL SFKADERKDEVDQNVDA IKGQMERIFDDDNAAVLVNNKDW
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$\qquad$ RSTLE MTA TVACG D KKNK FQSEN D
S GKEES
SFKDEARKLMTPEV, QNVTSKKVFSSFNKVVYNNKDW QQVFANYLNFGDGPQDALMVNNAEW SFKSERSLNSAETVAAWVNAMTPHLTQPGMVNNADWMOS RMSGERTLQPREVVEGWVEKLRAQISRFLSFEVMVNNDDW RMSGERTSQPREVVEGWVEKLRAQGSRFLSFEVMVNNLDW $\square W Q D P E A D R A Q T R Q Q$ A AVLLAS GIDPVRHVLFNQSAV QDPA DLRRHNTRELAAGYDAA SGKTEMRQ $\quad$ LTREKDEMRRQFARYDSFEDKKAMMINNADW
SGDEKTLRHNQDAUKRQLSHFLDFESDDANAAVLVNNYDW SFKADERQLLSEAQIDKKQMET DFDFSDENAAVLVNNKDW SGRKSERMEKVQHNVDALTRQMKRLFGGDSNDTFVNNYDW RPTAERTMNTKETVGEWVGYLQSQVQRFDSFERMVNNDDW D
$P A V L R Q S T L D M A A A L L A C G V D P G K C D L D Q Q S Q V$
 S NSEEVVAA WVVR DRA QVAKFLDFEG PNAALMVSN LE W A NTSNLKQ NDRDVILDFLAGGLDPEVCTLFLQSDV NAST $\quad$ LR GWRREAFAMLLAVVGLDPNRSAI FYQSAV
 E P A RL R RLSSRQAA QLLLAA GLDP QVCTVVVQSHV
 SF KA A R L NSSETVQGWVASLLPASEGLAAPLLVNNADW D A K T
 D K Q Q L K K ${ }^{\text {R }}$ K AT A ERVLKTKDEAVRDA AMY ACGL

$P A R V R R L S R Q A A$
$D P D K L R E R T R R T M$
$R Q T S E R V L N S P E V$
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 K E HAELNLILSMYTPMGWRCPTFKDQKEQLTQKDLNTHGF
 P E I P ELTVWULTCCLTAKGLMNRAHAYKAAVQENEQGVTMGLL
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๗in
 M
S PY QLNNVIDFLRDYGKNFSINTMDAKDEVSSRLESGDSYTE PYGTELNWLMGCHTPMGHLNRMTQWKSKLQLQEMDANLGLD
 EYHANVSWLLECNTYYGELSRMTQFKDKSLKN VNFTSGL TAHSEL GWLLNNVARVGWLNRMTQFKDKAGKNREGASVGGL
 AAHSQLMWLLSTMTQMGKLERMTQFKDKAGKNAERAGLGL LLPLNYLEFLRDVGQHFSVNRMFDSVKQRLDREQSLSFLE DGVIA FFRDLGKHFSVNAMIQRESVKQRLARPDQG|SFTE KEHAEAHLLESMFVPVPWRNPSYKEMLQNDQNKDLNTYGF

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F D Y P V TMA $170 \quad 180$
190
200 F D Y P V LMA A D|I L LY Q T S QVV|P|V|GED QK Q H|L|E|L|ARN|I|AARFN

 F D Y P VLMAADILLYQA QLVPVGDDQRQHLELTRDIARRRN FAYPSLMAADILLYRATHVPVGEDQKQHLELTRDIAAQKFN
 FSYM L L Q A N D F V Q L R C TLQQ

 FTYPVLMAADPGHGGALEVPVGEDQRQHLELARTLAQRFN YSYPVLQAADVLVHRATHVPVGHDQAQHLEFARKCARTFN $F A Y Q I L Q G Y D F Y Q L N D N L Q \mid G G S D Q W G N M V A G T D D I D R K K S$


 FTYQILQSVDFMHLDVQLQUGGADQWGNITSGIDMIHKIE FSSYP I L MAA D ILMMFNAAKVPVGGKDQVQHLEMTARDAARAN

 F T Y QL L Q A Y D Y L H L N C K L Q M G G S D Q WG N I T T G S E L I R R T N F C Y P V L M A A D L L M F N A N R V P V G K D Q


 $F N Y S$ S L Q S Y D F R E L N V T L Q M G G S D Q W G N I V S Gll D L VR RMN F NYMILQAYDFRELGCRLQMGGSDQWGNIVNGIELARRMD FTYPVLMAAD ILI YKATHVPVGDDQKQHLELAR RDIAARFN


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



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



 F S Y QIL Q S M DFLHLGVQLQI GGSDQWGNITSGLDLIRRKKE



 FA Y P V L M A A D L LA YKA THVPVGED QK QHLELARDDAAT F N $F N Y M I F Q A Y D F M K L D C L L Q \| G G S D Q W G N D V N G V E L D R R S K$ $F$ N Y M I L Q A Y D FVVEL N K R L QM G G S D Q WG N V V N G I D L G H R L G


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 FSS Y P V $V$ L Q A A D
 LTYPVLMAADILAFDADEVPVGGDQAQHVELARDLAQRFN

FSYALLQQSDYAVLNCTLQDGGNDQWGNITSGMDLTRRLH FTYPMLMAAD LLLYDANFVPVGKDQLQHLEDTRDVAARFN


 $F S Y Q L L Q G L D Y L H L G C T L Q T G G Q D Q W G N L T A G V D L I B R V E$
 LT Y PVLMAADI LAYRTEEVPVGEDQTQHVELTRDLAERFN


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 SK QLYALTSPL LTTSSGGAKMGKSLNGAVWLNADSPYDFWQ

 $H R F G E T F A V P E A L D P K D A A K I T D L Q E P T A K M S K S S S S P Q G$
$H R Y G T I F Q L P E T$
 H LYYGPVFPEPKAPGVDGRKMSKSYNNSTAEDKERVQQMVT DAKAFGLTVPVVTKADGTKKTEGGADWLDPEKTSPYEFYQ GASVHVLTTPLLTDSSGEKFGKSAGNAVWDDREMPYAFYQ GAPA A GLTVPLLLKSDGTKFGKSEGGA WWDPEKPYEFFQ GSETYGLTI PLMLKADGTKKTAGGADWLDPEKTTPYEFYQ HTYKELFVLPEVVGLDGRKMSKSYFDTEKRLRKMDMK DQT
GNKGYALTCPLIVKADGTKFGKSEGGNVWLDAERPYKFY $G N K G Y A L T C P L I T K A D G T K F G K S E G G N V W L D A E R P Y K F Y Q$
$G A S V H A L T T P L V T S D E G K K F G K S T G G G S L W L D P E M T S W Y Q$ KHYVAVFDEPEPMGDDGKAKMSKSLDTQEEVMQKVRKADT GNEVFGGVCPDVTKADGGKFGKTESGNVWLDSRSPYKFYQ NDYGLGHDFFVMPFEQVEK DDPVLPGLDGRKMSKSYN SQYGETFK $\mathrm{L} P \mathrm{EPKMSKSYGNTDNFFDDEKKLKKSVMGDLT}$
CPQLYALTSPLLTTSSGAKMGKTAAGADWLNADMPYDYWQ
N
T
S
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G
R
G
$K$










 GP K A F G LT IP LM LAKA D GT K F GK TA G GA I WL D P K K P Y E F Y Q STYKKDLFTPNKKMSKSDQNSKNY IDSEQDIRKK
GESVHALTAP LVTDAEGRKFGKSTGGGNDWLDPAMTSWYQ QGEAFAVTCPLIKKADGSKFGKTETGNDWLDPKKPYKFYQ KKYGQTFN ADYETELFTPR@MSLRDASAKMSKIDSDEVDADKFRKAKT $H D Y G E H F V L P E A P G L D G R K M S K S Y D N T D P L F A P K A E L K K L$
$T R Y G V E F F P Q P E P M D L G E A T R V M S D R D G T K K M S K S D E S D Y$ $T R Y G V E F F P Q P E P M L L G E A T R V M S D R D G T K K M S K S D E S D Y$
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$T$
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$H L Y R E Y F T D P E V V I E E D V A T$ QRYGPAFVVPRATNP PAVGAVMDLQEPGAKMGKSHES

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 K LMSSISDDLMWNYFELLTDL PLSE FWVNCDDADVARF LALLFTFLPMDEDNHVKTDEGADLNKAK D P EPGEAKDPN DSTVFD $\quad$ Y RAFANE DPGSAEGLKKRPEAKNLL

DFS
SRINLTDDADADATKKVKKAKTDPEPDPETVEGLKGRAEAD
YWRNTDDRD VITNYKLK

FWLNCDDADVYRFLRYYTFLSVEQTEQLEATDKAQVGKPS

K $\square$ RRAKTDPEP
LP SEVDGLEGRPEARNLVGLYA




VKVTDSPEEIVVLKFRKAVTDCTSAVVTYDPAARQGVSNLVA
SDFS DAKK IRKAKTDSAPLPDTVAELEKRPEVNNLLGGUYA

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

GIGLTDSRDDUVKKINAALTDSELNDTYDPVDRPGVANEGR
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DSTPLEEPKNPD TCNVFTIYKLLA
FWDNTSDEDAARY
DSRQPGEPKDTDG SADFQLYQAFATPQETAAF
K IRSAVTDNEAK IVYGDEKNKPGDSNLLT DYASLTDS


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 ALSDTTKQAVLTEYGGGQFKMALVDLAVAKLGPI
GQKRLAEEMTTMVHG NLEEMKEHYMRGGLGDVKCKKTLLAVMEETLQPIREKRND THAAMEVDHQSAGLDTARYKDVVADAVIQKFAPIKERLEK Q QVLSQEPDDQGKGYGELKREIGQTVYDFLSDLKAKYKD Y Y SLEVERKYAGSGYGTFKKDLAALVADTFTPIRERY AQKTLAKEVVTLVHGEAAYAQAV
VAEVEENCRGGKIGCVACKRHLAENDDKLLSPFRERREP AQKALAAAMTTLVHGEEALEQA AQKQLAADVTE
 AQRRLAEEVTKFVHGEDAVKTA
AQRRLAEEVTRFVHGQAELEGAAQKDTEVLKERGRYE

$\bar{A} Q R$ RLA
QVASUEQDCRSGADGCDDCKKMCAAADAEEMAPMDEKRSR LQKRLAQEVTIMVHSEEDYYAAV
RYDAFAAGEREGMGWGDAKNYVADRDESEDGPMREKYHP
GKKDLRSRFTNPGTGYGDLKKALLETDLDYFGYRKEYVR
GKKDLRSRFTNPGTGYGDLKKALLET LDYFGPYRKEYVR
$T E \square A Q S C R Q A T \square G C V D C K K C D A E K M V N S D A D \square H V R R Q E$ PMDEIAK【SALGGAE【NEVKKILATE TITA IL

AKKVLATEATALCHG
K LIANEA
SVDEVLAEF GGQGFGVFKPKLADVAVEFFGDVSARY S
IYSSLKEEEHFKDYNYGN LKKEVADLVVEVLTDDQTKYNS AQKTLA SEVTT TLVHGADATRAVQAASEALFF
IEARKNGMRSKELHPKEVKDELAKFDMDQLSSPSENEEA T L A A YEATK $\square$ AHG
A IAETEKEREFAGQGFGAFKPKLAELAVERFGK DSARYEA QTAAMHQKFLDG DAWGEAKKELFNLVNDEDGEAREKYNA S DDE L LGKFEGQGF GTFKPALAEI AVDVLAPDTSKMDP ETRQLRKAYADG DAWGDAKQLLFERIDREIAPMRERYDA ILAEEVTRLVVGEEGVAAAKRITE
RLADEITEFIHGSEGLEEAKK VTEAD
PQRRLAAEMTRLVHGEEEDKVEAATA
$A Q R E L A R E V T A R L V H G D D G L E A A E R D T Q A L$
$A Q R R L A Q E M T N ~ L V H G V E A T K A V E L D A Q A L$$\quad F G R$ AQRRLAQEMTN LVHGVEATKAVELAAQAL
ALGGSFDVSKVCEEMNKHDFKKELADLII SVVSPDREK DND
 A QI TLAE MTRFVHGEEMDAQA
SPIAAAEKFKHSKHS EFKSS $\square$ AD DVVGSLSPFTKSYQA AQKRLAEEF
LQKALAEEGTVRVHSQEALDMAL
$\|$ YTS L EVEQEFEGKNYGEFKKCVADLVVTKILETQEKYNS

$N L V T T Y A A L A D G G K Q F S A F K P A L S D L A V A K L T P I T S R M N D$ AKI LLANEATKMLDGKEEAEKALE
 A QRILAEEMTRFVHGQAGLESAQQRDSQALFSGQLNQLNL AQKALAASVTELVHGGEKLAQVLA
E I K E I DR D CKN AV LGCVECKKRLAERIIFEDEKTWDKVEK ALAELTPQQVHGGEGFGPFKQALTDVLI GRVEPIAKE ALSDQSVDAVLADVGGKEFKPMLVDLAVEKLSPI
AI $\square A F B A$
LQKRLAEE पTTMVHSKNEFENAV
AQKRLAEEFIHGNDGLEEAKK VTEAL
AQRRLAEEVTRFVHGQEAL
$\square$ HAAVEVVRQSAGLDTARYKLLVADAVIQKFAPTRAED


$T Q Q N V R \square G C T T A G I G C D E C K S W V A D A V V E H L A P D Q K R Y E S$ SCDEI A QEHRSASL RALKTHLARRVADHLEPI REKY KVDELKAHYRRGGLGDSVVKRMLNERLQALLEEPI RTRFEN
 IYAGLTEKT $\backslash D E V V N Y G E F K E A V G K V V S E F L K D L Q E K F$ AKKILADAATRMVHG
AQQVLAADELTELVVHGKGALAAAAQRDSELLSGEVARLGE Q IA QMRAKYEGGNYGYGHAKQELFELIVEKFKDVREKYEY LQKKLAEEDTA FVHGRD A ALAKAI QA
 A QKALAAD
AKKQLAYELTKLCHSEQAAKSALETAV
LYRAFARRQLEEGMGWGDAKQALYEHLEALLAPMREKY
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10 20 30 ELK A R GF S QCT D $\square$ D S LLS S RMDSSP\|T F YVGCD T Y L T G $\square Q$
 E LEWRGLDQST DLD DLLREATKE PI TLDYCGFD E L E WR GL A Q H T D I D A L R S A L N S GPVVTFYCGF D


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

 ELQWRGLA Q S T DEAALREA IDGGQVTVYCGFD

A L E L L K R G L K Q C T N LEA A L T T L M D K E R VV F Y V GVV D
 LDERGGHQ DS DPEGGDAACMKGPワTAYVGYD $L$ QE R GL DE WS S P E ELLE DLDNSKELTA YV G F D E L S WR D A DQ TT D E A G LRR R LTEEK K S V S L Y C GVVD


MT L LE

 $L S E R G L H Q \square T D A G A L D A L A M K E V V T G Y V G F D$ MS P R P T R V L T G $\square T$ | $R$ | $V$ | $L$ | $T$ | $G$ | 1 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $T$ | $M$ | $T$ | $T$ | $G$ | $l$ |
| $R$ |  |  |  |  |  |

$E \square R W R G L L K E M T E G L E D A L N Q E G P K T A Y D G Y D$
$M R V L S G I Q$ E L E WR DAD $Q$ Q T D A E G L R E LTTNEK S DS L Y C G GVD ELQWRGDHDVMPETE AHLMEKMRSAYVGFD P I IF S G IQQ $E L S W R G L V Q V S D A D K V R G Y F A T P G R T A Y C G F D$
 $E L R W R G L V A L T T D E A L A Q A L A A A G P I T A Y C G F D$

LS ER G $\square$ H Q $\square$ T H P VE LD A A A A S G VVT GY $\quad$ G F D

$\mathrm{T} |$| I | F | M | Q |  |
| :--- | :--- | :--- | :--- | :--- |
| I | F | S | M | Q |
| Q |  |  |  |  |

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



$$
\mathrm{T} \nabla \mathrm{~V} \mathrm{~T} \mathrm{G} \ \mathrm{~K}
$$

$M R \vee L T G L Q$
$P L \vee E S G V Q$
QEDEA A IDK DPFRVLTGDR DLKWRGLVKDTSSPELEDKLNNEKGTFYIGTD $E L T W R G L I D N I M P$ GTAEQLLNKEMTTGYVGF D

E $\square$ LS R S VKE $\square$ LP SEA L K E M M A E D K M K Y

| R | V | L | T | G | I | Q |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| R | I | L | T | G | I | T |

 E L K WR GLLHDMMPGT E

HQCSD



 E Q WR GLA QSTDEDALRKAFADGPVTFYGGFD $D$ L K W R G S L SER G VVH QC T D LD G L D A R L S D GPVVA A Y I G F D MLLERGFN QCTN ED GF D TY LLA GKP A V G Y L G S D




K N N K VR I F S GMQ $D L S A R G L I Q D T T D D A L R A R L E A G P I T_{L} L Y$ C G F D I I E R GLA D CTNLQELDD YLNK GMVTAYIGYD EVTWRGLHDVMTEEHLLE QMRA
 $L$ K E R GL L D CTN E DELLRKA CAE G SL S V Y C G F D
$\mathrm{E} \square \mathrm{Q}$ WRG $\square \mathrm{QD} \square \mathrm{MPETE}$

[^1]UniRef90 U2L2K5 UniRef90_UPIooo34A19AB UniRef90-M1N3R6 UniRef90_UPIO0036F5232 UniRef90-S2VM65 UniRef90-L7LOM4
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 S T G T P P H L G N L L G A I LIP A I I E M N P E E N E S F
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P PTGDSHI GNLVPRMLLSFYQRCGHKPVALVGGATGMI GDP PTAPSHVGNMVPLISLLRLQRAGHRPIFLAGGGTGLIGDP PTGSLHLGNYUGALRQWVALQEDFDALYFVADLLSGTVNP PTAPSHFGNLVQLIVLRHLQRAGHRVICLVGGSTGLIGDP PSGILHGGNYFGAMKQFLDFQNSYEGFYFI ADYHSLTSDT TTGPLHLGHYVGSLDSRLAFQDSHEQFLLLADMQALTDNA ATAPSHVGSLI QIMMLRRLQQAGHRPVVVMGGGTTKVGDP PTGKFHLGNYLGATRIWKDMKADQQLFFGVADLHAITVPK PTGTFHLGNYLGATRVWEDLCAQQKLLFGVADLHALTIPK ATAASHVGHLMPLMTMRWLQKLGHRPILVLGGGTSQVGDP PTGMPHLGNYMGAIAPALELAQEYHAHYFI ADYHALNSVR PTAPSHHGHLVQLVVLRHLQLAGHRAVALVGGATGLDGDP
 TSGTPHLGNYVGSIRVRHSKAPGVESFYFLADYHALI$K$ PTGRVHIGNYVGAI RPA ERNSNSESFYFLADLHALIKCH PSGKLHLGNYFASI KQMVEAQGQSEMFMFIANYHAMTSVA PSGHLHLGNY LGALQHWVELQNSHHCLYCVVDMHALTVNP PTGALHLGHYFGTIKNRVIQQRGVETWILI ADYQVITDRE PTADMHIGHFSSFLTATRLAKYGHKPILLVGGATGLTGDP
PTADSHVGSLVPGFLLVHLQRHGHRPVALVGGATGMIGDP PTGNLHLGNYLGAI RNWVRMQADSQCLEFLADLHA ATGASHLGHATNYIILEKFRQDGHEVIFLIGDFTSRIGD T TGDPHLGNYVGAI RIAASSASGVESFFFLADYHGLIKCD $P T A A S H V G H L V Q V L T M R R L Q Q A G L R P L A L V G G A T G Q U G D P$
$P T A D S H I G S M V Q U L L V H L K N G H K P L A L I G G A T G M I G D P ~$ PTGRLHLGHYFGTLRNRVLQERGVDTWVLVADYQVITDRD CTAPSHVGSL!SIMMLTWLQKLGGKPIALMGGGTTRVGDP PTSDSHLGNLLPLFMLEHFRRFGYKSLILLGGATGMLGDP

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 A T A D S H V G S L I Q I M L L R WL $L$ Q K T G H K P V V L M G G G T S R I G D P P TAASHVGHLTQVLTMRRFQLAGHKPVALVGGATGUIGDP

 A T A S S H V G H L L N I M L L R WF Q K T G N Q P I T L M G G G T T K V G D P
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100 F F I F $\begin{array}{r}110 \\ \hline\end{array}$
120
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K P T SERQ

T L S P P K E L L H S NTMSVA Y N SA E L K K Q N S I

 RPTSERVLHTKEQTAEWVASDQEQVRPFLNPAVMVNNLDW S S Q N GA V L K Q N A LIK A A A A F L
S G K
S G K
 S F R DE QRK L LTP E Q I K K V Y A R I LIRYG D GP T D A I MV N N A D W S GK SKERN DMVRKNIEGVVRKQLEHFMNFDCGEIIVNNYDW
 S GRKTERQLVQTHANAEKLKKQFIDRFGEDTNDTIVNNYDW
 D G Q QLRENTYSTA
 S GRDETRTMLTDEKLAGNDAS IKGSFEQQLRF DDINN D DW D
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E
EPDE



D P A QLK R
 K D A E RQ LQ S M E R $\square$ GA S L A K $\square R A Q V E R I V G G S V W I E N N A D W$ DPAA LRERTRRTA

## R K K

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UniRet90-UPIO003820FDF UniRef90-UPI00035F731E UniRef90-E6L7Z4 UniRef90-A1QZF9 UniRef90-A8ZUK6 UniRef90_UPIO003755E18 UniRef90_UPIOOO3FA73D2
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UniRef90_W3RLJ2 UniRef90-G9YFI2 UniRef90-Q492T7 UniRef90-JoLM31 UniRef90-UPI00041E9690 UniRef90_R7DS34 UniRef90-K1EAX6 UniRef90 ${ }^{-}$Q2NAL6 UniRef90-UPIIO00466AEB8 UniRef90-UPIOOO4712E49 UniRef90-R7NGL8 UniRef90-H6L792 UniRef90-Q1NJM9 UniRef90-W4AKL3 UniRef90-UPIO0041AOBE1 UniRef90 B6GY74 UniRef90-S7VJH8
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202B39



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160
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 $P$ QHS Q L H WL L S T LA S M GY L N R M T Q WK S K S N DK Q S N V V K L G L



 P E I T $\quad$ E L S W WVL T C M A A K G L M N R A H A Y K A A $V$ V A K

 PA A N Q L M L P F $\quad$ L




## 




 PAHAELMWILSN促 LLDSLSLRDVGKHFTVNWMMAKDSVKTRUAREDVGDSYTE

## P

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170
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 FS Y QLL QA LDD YL ELGGCT LQL GGS DQWGNLTAGVDLDHRAE


 $F S Y Q L L Q G L D Y L H L D C T L Q V G G S D Q W G N L L S G V D L V H S A E$ $F S Y P V L M A A D D L L F D T Q I V P V G G K D Q D Q H V E D A R D I A A L K A N$ $F N Y Q L L Q S Y D F Y M L N C K L Q D G G D D Q W G N I V S G V D L I M K K K L$ F NYMLL Q A Y D F LK L D C V L Q M G G S D Q WG NIV A G I D L V R R V L Y D Y P V L M A A DVLLYNATHVPVGEDQKQHLELARDDAT KFN $F N Y M I M Q G Y D F V E L N R R L Q M G G S D Q W G N I V N G V D L S H R M G$


 LT Y P V L H Q A C C D L L F C K G N I V P FTYPMLMAADULLYDAEI IDVGGKDQLQHDEMTRDVASRFN F S Y Q L L Q A M D WY HL N CEVQ
 F NYMIMQAYDYREYGCRLQLGGSDQWGNIVNG ELCRRRDD F MYPVLMAADVLIFNADKVPVGRDQDQHI EMARDFGQRFN
 $F \quad \square Y P$ TLL MA A D L L L Y D A S I V P $F S Y Q L I Q G N D F H H L N C L L Q M G G S D Q W G N I T T G T E F V R K$
 $F T Y Q L I Q Q G Y D F V H L D C T L Q M G G S D Q W G N I T T G T E E L I D R M M D$

 FS Y QL LQ GM DYL HLLGCTLQT GGQDQWGNLTA GTDLDRRAT
 $F N Y M L M Q S V D F L E D N V T L Q M G G S D Q W G N i \quad T S G V D L V R R M D$


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

 F SYVLLQSMDFRELGATLQTGAQDQWGNVTAGAD Y IGRTE
 Y S Y P V L M A A D I L M F N A N TVVPVGG D Q I Q H V E M A R D DA A R F N


 F A Y TLLLQ GLDD FVVTLNVTL QVAGSDQWGNIT TGDELSRKME

 FTYPVLQAADVLLYQASHVPVGEDQKQHLELARDVAQKFN





 $F S Y Q L I$ Q GYDFYHLGGCNIQMGGSDQWGNI TTGTELI$R R M G$

F

 FSYVLLQSLD Y L ELGGCVLQTGGSDQWGNLTAGVELVRRAD F
 FMYPVLMAADVLIFNAHQVPVGRDQDQHI EMARDFAQRFN
 $F N Y M I L Q A Y D F L E L N C V L Q M G G S D Q W G N$
F C

## F S

## UniRef90_U2L2K5

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## UniRef90-A8ZUK6

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UniRef90 C9Y8R6 UniRef90-C5BRQ0 UniRet90-C6CTFO UniRef90 B9D5A2
UniRef90 A9IWQ8 UniRef90-W1TR46 UniRef90-R6H3Q3 UniRef90 FOP2B6 UniRef90-F6GGG8 UniRet90-U3A373 UniRef90-K2FJX9
UniRef90 G8R4N5

220
230
240 GHECFGLLTFPLIIMRADGQKMGKSEHGALDASLTSVYDFFQ HDYGAGYAFPIPPGDDGRKMSKSYFLPENRLKKLVRRGPT TPQGYALASPL GAKVHALTVPDVTDSEGKKFGKSTGGGSLWLDPEMTSWYQ GVSLHALTVPLVTSSDGKKFGKSTGGGSLWLLTSPYAWYQ GGEAFALTCPLITKADGKKFGKTEQGNVWPNRTTPFAFYQ NDFAAPGFFPLPEPDDGSAKMDNDTDDADADAQKVKKART KKKYFPLTSKRIMSLQDGRVKMSKSDPSDLSRDSLTDTDE NTQYFQIPEPLIMQESAKMMRINLYDSNDVISKKISKATT SEQVHALTTPLITDSEGHKLGKSTGGGSVWLDPEMTSWYQ


 GDQVFGWTNPLLLNSSGTKKTEGGAVWLDPKRTSPYRFYQ
$N G F N T G L F F P Q P E P D G G K K M D N L T D A D T G A K D R K A K T$

 GTKVYAMTVPLILKPDGTKFGKSEAGKSVWLDKSPYEFYQ ARFGDTLVVPEPHLLKESARIMDILQEPTAKMSKSSSTDKG HVYVVDEQVATLPGLDGRKMSKSYGNTAPLFARSGEDRKL QIEEDVATLPGLDGRKMSKSYNNTDPLFEGGAKAGRRQPG KIYGNIFAVPAYQDPKDGAKDMNLQNPSTKMSKSAPKNDK HTFGDTFVLPTIPGLDGQKMSKSYDNTVPDFAKADKKRVM AGKGYALTCPLITKSDGSKFGKSEGGNWWDDADRYKFYQ HLYGPTFPTPEALISPAKRVMSLKEPTSKMSKSHADEKSR GLEAFAMTFPLITTADGKKKGADYLDPEMTP PAPADFHN ERYAGGEQTPTI DGLDGAAKMSKSLGNTVMLRMSEDETAK GESVHLLATPLITDSHGQKFGKSEGNAVWLSPEMPYAFYQ QQYNVEFFSAIVPGTDGQKMSKSYGNTVNMFASKKTLKQQ QEA AFGLTTPGRTGASGGKMGKTAQGAVCLNAESPYDYWQ KQK LS KRKILSLSSPERKMSKSDPDKIYVNDDPHAIKKKIKRAVT HHYGDVFNGPDVPGIDGRKMSKSYFDNKDDLRKKUMKDKT ANYKDHTNTALVIGQDGRKMSKSYF GTAVHVLTTPLITKADGTKFGKTEGGAVWLAPDMMSFYQ GTTVHGLVTPLLTKSDGVKVDENIVMTIPGIDGQKMSKSYN HRYGEHFVPPQAPGLDGRKMSKSYDNTDPGFSKKDKTDSR HHFAEVFVLPEAQGLDGRKMSKSYNNTEKQLKKHINKDKT
 YAQRIADLNFGVSMQTDEEKRQGFFPLPEALATRVMSLRD GPELFGMTMP RVEGDASGDGALGKTGGNGEKMSKSRGNTVELD QGEAFAFTCPLTTKADGTKFGKSEGGENIWLDKKPYKFYQ NDFCPVFTLPDPIDPPEAARDMSLRDGTAKMSKSPSEMSR KEKFVFITTLDENPKTGEKMMSKSLGTGVFDDWDANKMFG NKMEDVMT DPGTDGQKMSKSYGNDIDPPKQLKKQVMSDET QPEAVVGEQAVLPGLDGRKMSKSYGNTDPLFAMKIVTDSK HASVHCLATPLMVKADGTKGGAVWLDPEMTTADPYAFYQ GEKAYALTTPLITKADGSKFGKSEGGNVWLTADKVYKFYQ KDQLYALTCPLLTTASGAKMGKTAAGALWLNEAQDYDYWQ GGNAYGITFPLITKSNGTKLGKSDNNENIWLKTSPYKFYQ GSQLDGGTVPLIMTASGKKMGKTEAGAVWLDADSPHDYWQ GGDAFALTCPLITKADGGKFGKTEKGNVWLDAKSPYTFYQ GGKAYGLTYPLLLTASGQKFGKTEEGTVWPSRTTPYKFYQ PEAGVHLATPLTTKADGTKFGKTESGTVWDDAERPYAFYQ GPKAFGLTVPLLDKSDGTKKSAGGADWLDPDLLSPYEFYQ QRPLFGLTTPLLTTSTGAKMGKTASGAVWLNAEKLSAYAF GDRVHAFATPLITKADGTKKTESGTDWLDPDLMSPYAFHQ ASQLYALTSPLLTTASGAKMGKTAQGAV WLEESMVFDYWQ YKEVYGLTSPLLTTASGAKMGKTANGAVWLNEEKLYDFWQ GAEAHALTTPLVTKADGTKKSEGGAVWLDPELTSPYAFHQ HVYGREFFTLPEAVDDEQVSTLPGLD GRGKMSKSYG HHKVDFFTLPQVNCTETKRDMSLTDASTKMSKSPSENSR GAHAHGLTVPLVTRSDGAKFGKTADGAVWLSAERPYEFHQ DNEDFGLTTPLLTTSDGRKKSQGGADWLNGNMLSPYEFWQ SEKAYALTCPLITKADGTKFGKSEGGNVWLSAESPYKFYQ DKEGWGVTFPLLLKANGRKKSEDGAVWLSPERLKPYKFYQ


## UniRef90 U2L2K5

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UniRef90-A1 QZF9
UniRef90-A8ZUK6
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UniRef90-UPIO003FA73D2
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UniRef90-G9YFI2
UniRef90-Q492T7
UniRef90-JoLM31
UniRef90_UPI00041E9690 UniRef90-R7DS34
UniRef90-K1EAX6
UniRef90-Q2NAL6
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250
YWRNVADADVRKFLLLIFTF DSTPVEDPKDPD TSAVFQLLEHFA YWRNTEDTDVTKF LK L YYTT LPMDEDAK DSA LQQGAEDNEAK YFVNTADADVTTYLRWFTFLTRDELAEMETEVRERPFKRE FWLNTADEDVVHMLKVFTFRTREEIEELATAVAERPQERR YFVNTADADVIRYLRWFTFRGREEAGEEQATEEKPHERLD FWVNTSDEDAARYIKGTELSREEVEALEAEQAADPGKRP DPEPLPETMEG DEGRPEAKNLVGDYAALSGK YFLNVEDASVVKLLKVFTDRSQEEDAELERLVDEEP MIQMK』KKSKTDSUIG\|SYDIQNRPDISNLLSIASVTSGV DSD

AlDSTPVEQPKDPDKCNLYNTYKLFA

GKGVVEDPKKAAKADKVRYDPAAKPGMSNLLTASAVTGR YWLGVEDASVGQLLRVFTDRGPDEDADALEL
VMSIVTDSTPLEEPKN DPDHLRVADPGKDEGNVVFSYDDAFDDDQHAV FWRNVDDADVGRFLRLFTDMPLDEDARLEALEGAGTNEG DFTS DHMYYDEENRPGVSNLITIISGIQRK DSTTDRFN
DSKEPGEPKEDE ESSTFNIYKAFASEKLTAELTNK
FWRNTADADVPRFDRLFTELPLSEVERLSDLQGAELNE NSQETHE VKDPQQCSVFALYSLFA NYIDDPEKELLKVVKTIVTDPKDPDTCNVYKIYALVANED FWLNAEDSKVIDYLK
SPGEPKDTE
GSALFQTYQAFASEEE
PRLDSTVFQVWQAFASEEKSVYM
SHVEPKDPD
 GMTSDETAKLIKRAKTVTYDPENRPEVSNLLRLAGLASGQ FWLNQADADCEKYIKKYTFLDKETHDDLEEHKRKEPHDRE ETEDS PLEEPKDWASCNCFAIIYSLMASESE
$\square S L T D D A D T \square M Q K V R K A A E P L P S E K A G L E G R P E A A N L V G \square$ SIMAQPDENMNQLFDDTTF LSSLEEI G
$\square P G E P K D P D A N P I L T Y S A F A G A D E S A A F R A E D A S G$

FWRNTEDADVARFDKDFTFDPDDEDA ARLEKLAGSEDN
FWLNDSDEEASRF GKFYTFGQKDEUEHLLYTHNKAPYKREV
YFRNTEDADVRKF LYY LTTELSKKEVEELSKWEGSELNE
FWLNVSDEDAQKY DKIFTMDPKAEI EABA IAGHLEAP


 WWRNTEDDDVARFLRLFTELPRDEVHRLGQLKGSEDNEAK





FWRNTTDADTGRFLKLFTEVPVEECE


Y MLQ S T D A DVVRRFMRMLTVVBAE
S Y I S LT D D L K T L T Q K R L A G A P T D S G K G E V I P T A G G VA N L L $K$

UniRef90 U2L2K5

AKERLLAYEATAlVI H GKAEADKALLS GA
RTAAVRKRLEEGGMGWGELKNELFEVLNTTFGPMRERYDA K $\square$
A QRRLAREMT T L DHGEDATASVEQASQALF
A QRVLA QDVTAWVHG
AQKKLAAEMTTLIHGQG
LQ HREAKELTTMVHSAQDYETAVE
TCESLIEEH AKDPGYRVLQKRLAEEVTVMVHG REAYE TDAEVLAEFAGQGF GAFKPKLADLAVSVMAPDRRLLAD
STADLEKEFKDKQNS HFKDFVSQS\ISKVKP円REKYQA ALTDSDKETVLHNFGGQQFKPALAELAVEKLSPIAAEM $N$ N E Q A CTNUENFSTKQFKEQLATELLIDNUAPIRHK GQRRLAQELTDLVHGPEQTRQVVA
A QRRLAT
KQEELKGRYERGGEGYGHFKAYLNELVETYFKEAQENYEN
$A \vee L A F E A T R \| A H G$

AKKVLATE
AQKRLA WEVTS
$A L D A K A K A D V L R E F G G A Q F K N A L V D V C V T R L A P \square$
AQRRLAEEVTAFVHGDTALKE AENLTEAL
A Q IL A E EITRLVHGKSGLK TA
DPRTIAE E IGDSGAGALLKNYLAESVNSFDAPHRER
Q $\square K E M R S N Y E G G N Y G Y G H A K Q A L Y E L I \quad D E K F A T V R E K Y N D$
AQKTLAREMTKLIHGQEGLDQAL
$\square H S A L S G T A V A D G R G Y G D L K Q E V A D V V V A A V E P Y Q R R M D E$
ETAEFAQAFAEG $\square$ GWGDAKQRLFERVEAEDAPMRERYEA GMAWGDAKNALYELL EGDVAPMRDRYNP A 1 DDLS DEDVSEKYNYKDFK IEAANKVSKFI LK IDQSEFNE EI EALEAEYAE NPRGLKEVLAAEEMEEALIASAQKATNI RLAEVRGDYVNGGAMYGKIKLELVD\｜LWEYFSQARQRRQE AQKMLAEEMTKFVHGEEMLEQA
LQKRLAEEVTTTVHSAEEYEKAV
$\|$ LSHLEGVSCEDIVADFHLKEHVADRDAYHLQETRDRY


KQNELKEKFLAGNFGYGHAKNELLESILNYFGEAREK R EELKARYRRGGLGDAAVKRRLEDILVALIAPDRTR KKALADAATTMLEALKARTTS S DQEVEKDDEHFK NFKDFKNYVTEVIIEELKEPRLEFEK PMEEVERDVAMMN NFNDLKNYVTDVIVEEGRGPRELFAT YKEGDAWGKAKELLFELLEEKINPLRKNYE
VK K LLA THVTG V VHGADA
Q QEDLAARYRAGGMGWGEAKTA $\square Y E V L E E \square I G P K R A \square Y N$
AQRALASD
QIADIRAKYEAGGFGYGHAKQALFDVLWNKYARQRELFND E IEELERQTVEEPF KRAAQRALADDVTDLVHGDAER
TAKLRQAYADG DAWGDAKTVLFERIDQEI APMRSAYED Q De ILRKKFQSGGISWGEAKQELYQVMNAFLIEAREKYNK GQKALQARYERGGEGHGHFKMYLNELVWDYFADAREKFDA TLAALKERPEVDNLQFSHFKTALADLAVHKLAPD DPHALAEE IGDQGAGK $\square K Q V L T E A L D G A L S P L R A R$ AQYSLAREVITFDHGEEEYNKAL
LQRKLATEIT TMVHGVDELHKA
IETMKANYENGNYGYGHAKQALFELILKTFETERERYND YATMAGTDVESGGEGFGKFKPALGELLAEQLGPDSARFDR D KVMKSENPRDAKMRLAWEI VK I
QVAEMRANYLGGNYGYGHAK LALLNLI TEKYAPQREKFSE LLGWGEAKSRLVQCIERELAPMRERYES
AQRALAEEDTTLVHG

## ADQTAAVIAASRADFGQ


AKKVLATEATA LLHGRDKAEAAAE
A QKALAKNMTKFIHGEENYKKS A
AKK』LATEATK■CHGADTAKK VSESLIKAFE
HMRELQK
MQRALADELTARVHSSGDLENA
AQRKMA Y EVTARVVHGDKAVVERVLEDLTQDLLEEDR
AQKR $\square$ A QEVTAFVHGPEAVQE AEK $\square$ Q Q $\square$
RVLAHEA
K I L AFEATK $\square$ CRGETEATAAQDTA
PQRRLARE
AKKVLATEATA MVHGREAALRASEA ARKTFEE K 1
AQRTLADDMTTLVHGEEATRQATEAAAV
LYQAFAAQAFADGDGWGDAKQQVFERIDQEDAPDRTRYE P DTD TA HEFKDQYHS KKKEYLA QQLCKKLTPGRDRANP A QRVLADEVTALIHGPGEVRRA
$\square Q R R \square A E E V T \square M V H G Q E Q L D N A$
YKKKL LA DTLTRFVHGKKNLDFAVKR】IDKLIQEDQE
IIEAIEASMSADGYVPNTAQKRLAEEVTRFV
FVELFEKMY ISDGDRYGDDKKELADAIYRELKPDQVKRQE

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UniRef90 Q2NALE
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PE $\square$ D R VLA E G
NEVRD\|LLEG

K E P K K L E E

NEMVRLLDD

T EMKKLADPGY
$E A \square A \square G A E K A$
$G E L D R \square L A K G$

DQMED LLQAG
ENLKKILKKG
AFSKKLKAE
GQLREILRQG

PALDKVLADG

EKLKENMDLVY
E EAFE
E EAQQLADQNY

AKLKMAGEKAW

D Q DD D L S E G


EALAKGAEKA
ESLDAGLARG
EQLQKGAEKARP
GE LIAE LD D

G A $\square \mathrm{A} E$
$K Q V K E Y Q Q G$

D D F T Q L L K D G $\square \mathrm{P}$
LE H K


$P T A P S H A G H L V P L L A L R R F Q R A G H R P D V L A G G A T G M D G D P$ PTAPSHAGNLATLLILTRFQRAGHRPI GLVGGATGLI GDP P TANSHVGNLLVIMGLLHCQRAGHNPIALVGGATGLI GDP PTASSHVGSLIVPIMALAHMQKNGHRPIALIGGGTGLIGDPD

P T GR L H L G NYMGALYNWVR LQDEYECYFF P T A P S H L G N LVVQLVLMRRLQQLA GHRP LGGVGGSTGGL GDP


 $P$ T G DLLH L G N Y F G A V Q N WV R L Q E N Y D C T F G V V D Y HAMTMM Y
 P TA D S H I GH L C G I M ML R HF QR C GHKP F L LV G GA T GM I G D P
 P T G A L H L G N Y F G A L E N WV K L Q N D Y D C Y F F V A D WH A L T T G Y


 P T G H L H L G H Y H GVVLK NW WE L Q H N Y E C F F F V A D WH A LTT H Y


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

 P T GRP HL GNYL GALKQWKHLQPDTKLFFCIVDLHAMT TPH S S GRPHLGNILGAIVPADQLENSEESYDFI ADFHSDTS S K

SESKETYNNTLLIEMIITDWL
100
AFGD ${ }^{110}$
120
 SGKDESRKLLTQDADAQVFHRLDDFSDSPTGAVMVNNDEW SGKSDTLVRNVNGTRKILSNTLKGNSDEDEKVVVLNNYDW KPSKERPMISKEQVLKNVEGLTKQAK ETFGFDVVNNYDW KPTSERTLNDRDGVAGWVDKIGAQLRPFLDFDNNLDWTEG GVGEMKERVYSLLTD DPSE
SGKS MRSNIIRLTAGLLASGLDPKACILEQQSQV SGKSQERNHNQEA KRQLAKLLDFDSDAPNAAALVNNYDW VADNLSEHVEDLVLDYLADGVDPARSTITHSAV SGKTEMRKMLSKNAVSIQNQIEKFLAEDVENVRFVNNKDW SFRADERPLLTPDKIDDFAAYIKYDTGQPNSALMLNNAEW
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D
SGKSKERNLRVARSRLE A AATWLA A GGADPQATTFFVHSAV
SGKSKERNLTILEAVQRNVEGVRKQLAHFLDFDCGKNSAL GGNNAKKLYESRQSVAALYLACGLDTQKSTMFFQSDV EAEMLKENTYATA ATWLAFGLDVEKTTFYRQSDV GGRMELRQDDMAENTYTDAAAYLAAGIDPAKASDFAQSHV DPELL VNRSRLETAATWMALGLDTDKAVFYRQSD QEPAEDRNRTRVTAAQYIAG
DPERTRRSVVE RKAKRDALA $\qquad$ $A \rightarrow G \mid$
DASVIERNNITR
DASVLKENTYSTAFQNHQKY IWEKNRGPLKPVKLVNNADW T DAETLRQNTYATA KPNAERTLNSKETVAE WVVRTRDQVSRFPNAARVVNNLDW LDPADQLRR NTRQMTASVIA ADPSKVKENCYE LLDWL SGRTDLRRMMKDLFDRFLQFDDEWKYLD NPAKLRSMASEQL AVLIAAGIEPDRV FVQSD SGKDRTRKDLKDENDNKNTSKIKLIFSKFVNLKKNNNYKW SGKSSERNKTLRHNQECVKAQLGNFLDFKSKTENVNNYDW DMTLEKTSQFALENALDFDA AGFKP ENTKI
AQLVHEDLASQTRSTTAAFLAAGDDPKQHDVFNQARV D SFRDTSRPVLDGAADDIKGAFTRYLGSD DKVVVDNAEW SFRDS SKPDPERLLARTREAATLLLASGLDRSLVYDQSQV SGNEETLRHNDACDKEQLSRFLDFESDAPNAAELVNNYEW DAKTLRENTYSTA RHNTDQMTATLLACGUDPARATLFLQSAV RDVGERTLNEADTVAEWTERDRGQLERFVDFDESDNNLDW SGRSTERSLNSSEVVAEWVARFLSFDDGPTGATLVSNLDW SGRKTERNQMGETNHQDCLWDDKYKHKDPELRVVNNADW SGKTEMRKLLNPEMDE $\square K K Q \square S F \square D F S D N A L L V N N N E W$

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DAKLL KDPQTVVE TSESMGNVALDYLAVGLDPNKSTIFDQSQU SGKSEERNF LSEETLRNQLTKFLNFDCGSNSADLVNNYDW


## Q

PEMDEESTKAVAATWLACGDDTERTVFYRQSDD
ARGE
DGELRKENTLA
NM VAAA WLA
NMTLDETRGFAYENALDFVA
LGLDPDRCTMFFQSTV
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 3 为 Q E H T $\quad$ E L MKEFTFLDFLRDLGKCITVNYMMSVKKRFNGEGDGMSFTE

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MKGYSFLDFARE GGKH TTVNYMMAKDSVKRRLNGEASDGE PFTTELSWLLTCMTPKGLMNRAHAYKAVYDLNDDGVSMGL TAPMSADDFL REDGKYYRVGTMLTK KAVAARSEAGISYTE L LSPDKYDDFLREVGSCFSVNRMLSFDSVRSRREQSDSFDE MKDYGFLNFIRDVGKHITTVNYMMAKDSVKMRSREGMSFTE PALNQLLLPFLSLVSEAELHRNPTVRAEHELSGRALSGLM KEVLELYWVLSQYTPMGLLERAHSYKDKVAK G
 IEEHAMQWLLSNETTLGEENRMTQFKDKSLKATEKIPTGGL $P Q V T E L T W Y L N C M F P Y Q R L T L A H S F K D K A D R D S$ DVNAGLC
 PEHAQLAWVENCITGKGEASRMTQFKDKSSKGGADVSVGL SAHSELMWI SCTASVGYLSRMTQWKSKDGRVGNKLKLGLL


PAAN QLMLPFLDSLVTEAEMERNPTVKAEQEASGHA LTGGL
$P$ QVTELLSWY LSSCFYPY QR LTTLA HSFKDKADRELE DVVNAGLL
TAPMSADDFLRDTGKHFRVGKMDSKDAVSARSEAGISYTE PQDAQLSWILGSLQTTSKLARLPQYKEKQERFKKGDIPGL
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 LSSKKYVDFLRTVGDKVTVNKMLTYESVKSRRQQPLTFLE IIDTKNIKTLYPIAAEVAKRDNFSNTKAVFGFENETNTGM PQHAELAWDFNCVARDGWMNRMTQFKDKAGKDRENASLGL AGYHTELMWYLNCQTPYPMLANAHSFKDKSDRLADVNAGL LDGLGGLDFLGQVGRHFSVNRMLTFDADRSRLEHSLSFLE PA H TEAYLLESTAYFGEMRRMLQ FKEKSANQEEVRLSLL DDGLGYLDFLSRAGRHFSVKRMLGFDADRSRLEHSLSFLE PQVTELSWYLSCFFPYQRLTLAHSFKDKADRLE EDVNAGL PQHAELSWILGCLTTMARLTHLPQYK EKKANMKE| PLGGL TSEMSAI DFLRDVGKHFPVNRMLARESVSARGGDGLSYTE LSELLKYDPFLRDGGKCFSVNRMDKAESYKLRSEEGMNFDE PAHTHLSWCLGCTCTMPRLAHLPAYKEKSANLK DVPLGL PAHSELHTLLSMITPLGGWVVPTYKDQQEQLDREDLNTYGF KQHTELAWILMCQASHGGLHRMTQWKSKAQSQATNSSAGF PELAELSMYYMNLVSLARLERNPTVKTEDSQKGFGDPTGF FKGLGFLEFLRDAGKNLTVNYMMSKDSVKSRSGTGIISYTE PAHFELNVLFSMDTPLSWRVPTYKDQQEQLKEKDLATYGF PEHAELCWI LSCFCSYGELSRMTQFKDKSQQVKEGISAAL PEDPELAWLLGCVTGKGLLNRAHAYKAAMDRNDANVSVGL MKDFTFLDFAREVGKHDTVNYMMAKESVQKRLNDGQSFTE PEANQLMLPFLTLVSNAELSRNPTVKEEVQAAGKSVNAGM PEHVQLGWI MTTMSYVGELERMTGYKDKAAKQGDSVPAGL PRUSQLSWILGSLQTVAQLQRLPQYKEKAVKFSRNVPVGL PEHAELHLLLSMITPLGWRVPTYKDQQEQLREKDLATYGF HEYWPLVMGI SRNHRVGWLASLH WM ADPENVKCNQ QAHAELMWILSCTASAGYLSRMTQWKSKMSLAEDANAMGLL
PADHEMLVI FLSLVTEAELHRNPTVKAELEAAARPMSGLL
SEHTQLNWILTCMVRLPRLQHLHQWKAKTAKQKHDGTVGL
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UniRef90 E4UDC3 UniRef90-R6EY11 UniRef90-F4CU78 UniRef90-A7GWZO UniRef90-UPI000466C3DD UniRet90 D4MAK7 UniRef90-D4XV92
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RATAHA GTPEITNSDGTKFGKSEGNAVWLDPESPYAFYQ HPMPQTLVTPTKKVLSDQHSCVYVTDEPDITAKK円RRAAT NAYCDVLVEPRLPGLDGNAKMSKSLDDADTLRKKVMSMYT EGTAFALTTPLLTKADGTKFGKSAGGNVWPNLTSPYKFYQ QAVGKEFFELPEPLFTESPKDRSLAAPNRKMSKSLGEKHY ARYGNHFVAPAAPGLDGRKMSKSYFAPRETLRKLIYGUQT RENVFAMTCSLLTNSQGEKM
GQEAEAFCLTCPLITKADGKKFGKTESGNVWLDRPYAFYQ GKQVF GLTAPLLTTSSGAKMGKTAKGAVWLNGDKVFDFWQ Y
EKQALLSKTPS LGGDDGQKMSKSRGNA DMLCATEDETAA HHYGETFVLPDYQGLDGRKMSKSYNNTPKRLQKLINKDKT RVYED IFTVPE円MSLQEPTKKMSKDDTPKDIEKKIKR YYKTSFFPRPKQVVQPTTASRDRSLRDPSKKMSKSEKSER $\stackrel{+}{\mathrm{H}}$

ESEVTKK KKKAFC HTYQPY LIAPQTPHLKMSKSHANPDDSPQEIKKKVMAART GKKTGHGVLPDPQGLLGQGAMDLGTDGQKMSKSRLRASED K K Y GEFFPVPKS LTSMKKVKSLRDPSSKMSKSDPDKLAT HRYMKATEI PKVLG GDGQNKMSK
GPKVYGLT P LIMLKADGTKFGKTAGGADWDDPKKPYEFYQ ENDAVGLSSPLLLKADGTKKSESGALWLDENLTSPYELYQ RKSVHAMSTRLITTKADGTKFGKTESGTVWPTLTSPYAFSQ RETKPT $\square$ M $\square$ PCDRS $\square$ T GRDPKWN $\square$ FMDKEHVSHR $\square R R A \square C$ YMY
WPVPVALHTPLVSSLKGGGRM NMDDSGSDERKMSKKAFC HRFGKDI FVELLVGLDGRKMSKSYFDTPKQRQKAVNKILTT YAYKTDLEFPRUMSLTTPRRKMSKSDSA $\square K S L L H V T S S P K$


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UniRef90－UPIOOO3B41387
UniRef90－F1Z9D5
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UniRef90＿R5Y7T3 UniRef90－UPIOOO364324E UniRet90－K6W754 UniRef90－C1BP85 UniRef90－D4IN17 UniRef90－UP10003716402 UniRef90－E9S6C2 UniRef90－M9R5F3 UniRef90－J9C5W5 UniRef90－G4QAX4 UniRef90＿S3BDX1 UniRef90－J4HZL5
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UniRef90 COQEI6 UniRef90－E9FWE8 UniRef90－H2BUT5
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UniRef90 F4LMQ1 UniRef90 ${ }^{-}$F4LMQ1 1
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UniRef90＿R6H4Q


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 FWLNVDDADVVNFAKRLTTLPGSERGRUEKLDEKKELNEAK LIRRARTDGERR NCITFDPQGRPGVSALLSTAALCTGR ASEPLEAPKQWQ NCNVYNDAKLFGDE CWVAADDRDVERLLKLYTF QPLEDVRLLMEEHAAHPERRV DYLLDDPELEYKKVLKAVTDSENKIYISND KPGVLNLLN俭 N SLEPGVPKDPDDAHLFEIYKAFA LTNVLDEPKVAKRDKSAVTDDDTVVAHDRANKPGVTNLLE
 NSLEPEEPK DPATCTLFADYKAFA DSTPLEDPKDPE
DSE
ETDSTPDEEPKDTDTNTFDPEGRPGV $\qquad$ EAA FFLINSEDAMVISYLKVFSFRSREEI EELERDTMEKPQMRA GPRSDSRETIIEKCQKAQSDTAGAVTYDKKNRLAVSNLLD
 VIFVLDEDQVRRKVKRAKTDGGSKPAYAPETRPGMANLLD
 YWLINTSDEDAEKYIRIFTFLDQKTVESLIAERTFHSEAQ AGSKKDKKAKTDPE ADPGEVEGLEGRPEADNLVGTYA FWRNVDDRDVGRFLALFTEDPMHEVRRLGALQEAELNEAK AAGTIPAADIRRKVMRAVTDSEDEVRYDPQEKPGVSNLLT FWRNADDRDVGRFLADFTERPMDEVRRGGALQGAELNEAK S IDSTP品EEPKDPDTCNLFALYKLI A DPKSDPADVVLEKVKKSVTDFRSEVTFDAKERPGSLVSGK YFFNTADADVIRYLRWFTFLSADELGELERATAERPQQRA YWhNADDRDVVRFLKVFTFRTQDEIAELEKAVADRPAARE FFVRMPDSEVEKLLKLFTFПPLPEVELLDREHNREPEKRK YWINTDDRDVARFLALFTFLPLEEIKDUEKLEGADLNSAK

FWLNTDDGDVIHR RRFFFDDRARDEEDERAVASEPFRE DS QGITSFDPVNRPGVSNLITVVSGLLNK DPDH DRVEDPGK DEGNMVFHYLDVLVVQKMLKN
FWDN SADEDVSRFIRDFTLFSKEELEALEAEHAKAPHERL GFGRTDGRKMSKSYRNTTLLSDPEPARVRREDIGNPDLCP GFGVFEEEARLFKKVGSAVTDTGAEQAQFTLIVAAGHVTEH
FWLNVSDEDAEKYTRTFTSपDRETDEGLTEEHRQDPGRRV FWRNTEDADVGKFLK LFTDLPVAECERLAALPGAE $\square$ NE

SRGEDSDEEDEEKCRKAVSDFESRDSYNRDTRPADSNLDD YFRNUDDQDUGRFLRFFTDLPDDE乌KKLESGKNQEUNE
PPKDTQGNPCDEYVEH V VLPWFREFEVVPPD GGNRTY DS DTAKVLKKAVTDSDRQITFDPVQRPEVSNLLLIASLCTGQ $\square R \square T D S P E E \| V Q K F R K A V T D F T S E V T Y D P A S R E G V S N M V S$
FWINQDDRDVVKYLKYFTFLSKDETDELAEKVQKEPWKRE YFLNSSDSDIVNFLKLLT LEKEEIDELLLESSKKPELRY


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TCNE\|EYSCANASTGCTDCKKTLI

E $\square E A \operatorname{LEASMKQPGYAPNSVQKR\square AEEVTRFD}$
A QEKLAEE
DPAVLAEEDGDGGGAR DKAVVTEAVNEHLAPDRAR
IHASIRIVEEYSNLDTGGYKLLLADALSEHFRPIRERF
LQKRLAEE $\operatorname{LTCMDHSREEYEKAVE~}$
LLCQDREVAAG $\square G S A G S A A \square K R T V T E A V N E Y \square A P \square R S R R K A$

LQKRLGEEVTCMVHSREDYEMALE
QLEGGLSWGEAKDKLY ILLNE ILLSPMRERYES
A QKRLALEVTTTVHGPQA
EVSEVATRYHDKGH GKLKADVTEAVEEVMRRPRAEFEK
■LKALLKEPVNQS $\square S Y$ Y LDLKNALTEATVNLLVNDQRKRE
KI 1 AT E
LQKLLAKETT DMVHGEQEYENAL
APQEI AEEIGDG GSGLLKKVATEAVNTFLAPHRAR
GQKALQARYEKGGEGHGHFKAYLNELI WAYFKDAREKFE
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■YAALDAEFHFKDANYKEFKEQVALCVKNLLIDDQEKY
EVADLKSKYLAGGFGYGHAKQALFELIRDTYQEEREKFEK
TLAE ITPDAVCQQFNFAPFKQQLADLMVAT IVPDGEQM
AK $\backslash A F E$
QTAEYRQAF $\square$ DG $\square$ GWGEAKKMLFNLINDELKEAREKY 1 LSAVTGTNEFEGKMYGHLKVAVADAVVEALTPVRTRLED I YS FFNAEGKTAEASPRELKAAVSEAVIKGMDGFARRYDT EVQQLETRYLNG DAWGTVKQELFEYLNELLDRPRKDYNE A HRKLA QQVTLLVHGENGLKSAITEALYSKSADSDARLQP Q DDEMRFKYLAGNYGYGHSKKALYELI DHKFEKQRARYNT DPHEDAEEDGMG GAGEDKRYTYQVVNDYDAPQ
QVEQMMQNYAGGNYGYGHAKQALYELI DEKFAAERERFNT
A QKALAEE
LYSAI TKTPLSE TWST DD LKMNLAEKDDNRDEPDREKFES ELAE I HEGCLNAGIGCVDCKKKLMAHLTEMMDPIQKRRAE A KE ILA Y EVTKLVHGEDKAKKALEDA
LLAACTREKADRFDSYGQVKEAVAEALIEELRPVRER KILAFE
HMRVLQKRLGEEVTLLVHGKEAYEKA I
$K L K Q \| H D D Y K S G K M L T G E L K Q \square L D E K I N K F D A S H Q Q K R E K$ GLADMTREAVLKEFGGQQFKPALADLAVHKLAPD
QVEDMRQKYLAGGFGYGHAKQMLFEVLWKKFQKEREDFN
I V LA NEA
L L AVC S GQPVEAYEGYGA $\square$ KRDTAEAVVET $\square R P \square Q E R A D P$
1 I LATA A
LQKRLGQEVTVLVHGQQDYEMAVE
QQEEMRKNYQGGNYGYGHAKQAFYELLIEKFASERERY
PVEEMCREAVGK NTGQYKLLVAEALIEHLDPDRERMER A QRRLARE
AQRTLAEDVTTLVHGADELARVVA
AQTLLAEDVTLLVHGEKGLKQ AER $\square$ T DA $\square$
TVLAFE


LQKTLAKD $\square$ T $\square R$ VHSEEDYNMA
VFDEAREGCTTAAIGCDECKGWLADAVVQHDAPDQERYEA EQLLAVYQDPNQQLSYKDLKEAAKTALGQLIGGFKEK QSAAFCAA LAEG MAWGDAKAALFDCLDADUAPLRTEYDA
LQRRDAEEVT TMVHSKEDLDMADA
AKK』LATE
SPEA $\square$ AAR $\square G D G G G G \square L \square K K T L T E S D N E K D R P \square R A E R A R$ Q $\square E K M A E C Y R S G$ G $\quad$ GWGEAKKELLFDVMNHFLEEPRETYKE
$\square Y$ CAVT GAN I ITVVES GE LIKK QLSRAVAERFLPDREKFKG
$G \square E E L L E D Y G S G T V H P R D \square K P A L A K A D N Q U Q$
SRSPEELGTLHAGLSLKNFKTLVAEAVAESLDGDSARYN
APEDIAAEIGAGGGGALK ALVTEALNEHLLRPLRQR

AQRRLAEEVTKFVHGEEGLAEA
AQKRLAEEVVKLVHG KKALETAL

TEEALLT TWQSGVLHPVDLKKAVTEALDRDISPLR
EYAEFESNLKNG MAWGEAKKVLAAKIGEELEPLTDKYN TPEELGETMKGYKDS E LTKQVVIEVLIDELLAETRVNFDR QTAELRKKYLGGNFGYGHAKKEFLELILEKYAEERKAFNN $R \square R K I H D E Y R S G S L L T G E L K G L L D E K I N T F D A R H Q E A R E R$

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UniRef90 ${ }^{-}$A9RBJ
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PEIDRLL
RQYLADKA

PELDS I LAA G
KYLDHIAAEG
GDMDA I L KKG
SELNE
EEIDAALKKG
DE $\square \mathrm{DAA} \square \mathrm{K} \square \mathrm{G}$


D QLD K F L LK

A E L S R L L A D G

E ENFD $L \square K K G \square P$

GELAALDE
DHLEKVCKNG

NEDEE $\$ L R Q G

UniRef90 R6H4Q3

UniRef90 Q2GEI8 UniRef90-E2B667 UniRef90-K214A6 UniRef90-UPIO0047EE18B UniRef90 F7ALH5 UniRef90-J9JRX2 UniRef90-E3T616 UniRef90-10JXN3 UniRef90 ${ }^{-}$E9UOH5 UniRef90-l1HUV9 UniRet90_W9GS38 UniRef90 W8R108 UniRef90-V5HHI7 UniRef90-U9U4W9 UniRef90_Q2Y6L3 UniRef90 ${ }^{-05 P 9 K 5}$ UniRef90-UPIOOO3672C38 UniRef90-R4VJQ8 UniRef90 M1RITO UniRef90_UPI0003B4735A UniRef90-C5A9T1 UniRef90 UPI000404131D UniRef90- UPIO00333D545
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QLLQRGVQEVFPPEEVVKDFSSK QCVYCGFD
 $R G L H Q C T D D V A L D E L M A L Q P \square T A Y \square G F D$ $S R G D R \square L S G M R$

E पQWRGLIQVSTDEALEEALSGDP TNYYCGFD | $P$ | $D$ | $R$ | $l$ | $F$ | $S$ | $G M R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $H$ | $R$ | $V$ | $L$ | $T$ | $G$ |
| $D$ | $R$ |  |  |  |  |  | LE E S LH R E P H R L L G G R LD A Y E N K K P F Y L Y T G R G



MSFYE E L K WRNLIDCNNEDQQVKEQ\AEHPFRVLTGDR ELAWRGLAQSTDLDALAAEAARGPLTVYAGFD ELHARGLVEACTNE LDSVVLEGSSLRVYCGFD $1 L D K Y$ Y Q GKP F Y L Y T GRG RILSGMR MLLTGDR
LDAYENKKPFYLYTGRG
TKTELPELFDRRPQTIYCGFD
TRGLAD $\operatorname{DTRPDQLEDELQKQPQTVYLGVD}$ QLQERGLA QVTDEDALAERLAQGPTSCYSPGDV LQERGLKQFTHEEEIRKLLEKEKVTFYDGFD FDE DNQYUQDCLQEQNARULI YCKKDU LDNYEKGQGFFLYTGRG
 $K K V L L L T G D R$
LEERGFVKDVAGERLDWVLTEKP \GAYVGVD $\square R R G L Q Q V T R S T E L Q L S G Q K M K Q V L Y S G I D$

QCTNLELLKEHMQS PQKAYDGFD
$\square L D R Y E K G K P F F \square Y T G R G$
TPQLIERFEF $\square R R G \square$
SPELLERFEKVRRG】
VFSHRELEKILKGEPFYLYTGRG
 A DGPKVVI CS G I G EGRPWALYTGRG
DALNNNKPFATMTGMM
VVKAMREKSDFAVVSGMM QGKPFYLYTGRG
 HLIRRGU-FFSHRDLHT 1 LQGKPFY LYYGRG



VI LTGDR
MRRGD VFGHRDLDKVLEGEPVAVVTGFM
E L K Q R G LVS QVS QP E LR T K L N G N K $\square K$ K Y C GVD $M S V L R \| L E E R G L V N Q \square A G D R L D E Y E A G R G F F L Y T G R A$

T P D K


VI FS GVQ
MTAVS GIM
ELLDAYEKGESFYLYTGRG DKILDRYEQGKPFFLYTGRG
$\square E \square M E R G L V N Q V D R D A L N K M W T E R R V G V Y M G V D$

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UniRef90_E2B667
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PTGYVQLI $\quad \frac{50}{L L G A V D V W V E D Q S Q Y K R F F F M A D D H S \mid L D G G T}$
 ATASSHVGHLVNVMMLRWLQRTGGRPITLMGGGTTMVGDP
$P$ T GNMHLGHYFGTMRTWAPQDMGUDTWILVADYQVIVTDRD PSSAMHLGHLIPFIFTKWLQD GIVFNVPLVIQMTDDE PTADSHIGNLLVIINLLHWQRANHKVIALI GGATAQDGDP
 PSGRLTLGNLLGALRPMAA SADSSAFYGLSDLHALC
 PHLGNYAGAI RIVASREADADSFYFLADYHALIKCD PTSDSHVGNLLADVLMLHMQRMGHDVIAVIGDSTAQIGDP PTGDPHLGNYLGAI TSWVSQQNNQSILYSIVDGHAQTUPK CTARSHIGSLMQI MVMRYLQKFGHKIVVLLGGGTTKIGDP PTGKLHLGHYHGVLKNWVKLQHEYECFFFVADWHALTTNY PTGRLHLGHYHGVLRNWVELQQEHECFFFIADWHALTTAY
$P T A A S H L G H L V Q L L V L R R L Q L A G H Y P V A L V G G A T G L D G D P$ PTGSLHLGHYHGVLKNWAKLQSEYPCFFCVVDWHAGTTHY $P$ TGPLHLGHYFGTLQNRVRQDDGVDLFVLVADYQTITDRD PTGUPHLGNYLGAI ESWVKQQDEYGSVYSIVDLHSITAPQ
 PTGD $P T G A L H L G H Y F G T L A N R V R Q R A G V E V F V V I A D Y Q V I T D R D$ PTSHSTVGHLIQITMILLMQRQGHLPVILVGGATGLIGDP PTAPSHAGHLVPLLALRRFQRAGHRPIVLAGGATGLI GDP
 PTGUPHLGNYLGAL RNWVDLQQSDELYFSIVGYHA TVMPQ SSPRLH GNYEGALRNWVDQEQGYHMFCMVADWHALTTMY STGSPHLGNDLGGVIPSVNKNTKHSSFDFIADDHSMVQDN PSSAMHVGHLIPFIFTKWLQDFDVPLVVQMSDDEKYLWKD PTGDSHVGHLLALQGLFHFQRAGHNVI ALVGGATACLGDP PTARSHVGHLVPLLSLLFHFQLRGHQIIPLI GGATGLI GDP
 PTADSHVGHFI A MMFMAHMQKYGHRPIALLVGGGTGMI GDP PTGNDHLGNYLGADKNWVRDQQNYEVYFQUADHALTDKY
 PTAPSHLGNYLGLTLLKRFSQRGHKUVVILGGMTASVGDP


$P$ T A PSHVGHLLPFMALFWMYLHGYNTFSLLGGGTATIGDN $P$ T GS L HVGHLVVPMMCLLHFHLRGHRIIPLI GGATALIGDP P TGKLLH IGGHYIGGSKKRVE』QDQFNNFIMIADQQALTDNA

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

P S S D M HVGHSVVPFEFTKY LQ DF DCP LVIMMSDDEKFMHSK PS GKMHI GHLVVPF LLT RWF QKF DVNVVI MFPDEEYWAK KV PSSSMHVGHSVPFEFTRYMQEFDCPLVIDLTDDEKFMHS R


 PS GKMHI GHKMIVVDQLVWWYQTKGADI YI P I A DMESYSARD
 P T A P S H V G H L V P LMMPDF WMY M H GYR AV T L L G GATAK I G D P


S S G S L H LG H L VP FMF T K WLQEFDVP LVDQMTDDEKF LDWNE PS GNTHLGHMMPWIFNKWIQD

 P T G QL H L G H Y V G S L KS R VA L Q DTH H Q Y L L L A DT QAM T D N A $P S G K F H L G H M T L G L Q Q A Y Y Q R L G F K V F L C I A A A E A Y A D R K$

P TAQSHLGNLVPLMVLLHFYVKGHDVVTVIGGATGKVGDP
 P TAPSHLGHLLPLMVLFWLVHHGHYTVSLVGGATAKVGDP P T A DMHVGHLLPMMPMFWMWFHGYPAVTLI GGSTARI GDP P T A E S HL G NLLP LMMVLLHFY IKGHDVYTLVGGATG』VGDP
 $P T G R L T L G N H L G A \quad L R R F T D R G G \quad F Y F V A D L H A M T$
PS GS L H MGHLIPFTFNAWLQKFQVPLVIQLTDDEKFLFRD PSSNMHLGHMVPFVFTKWLQDFDVPLVIQLTDDEKFLFKH


UniRef90_Q2GEI8
UniRef90-E2B667 UniRef90-K214A6 UniRef90_UPI00047EE18B UniRef90_F7ALH5 UniRef90-J9JRX2 UniRef90-E3T616 UniRef90-E9UQH5 UniRef90-I1HUV9 UniRef90-W9GS38 UniRef90-W8R1Q8 UniRef90_V5HHI7 UniRef90-U9U4W9 UniRef90_Q2Y6L3 UniRef90_-Q5P9K5 UniRef90_UPIO003672C38 UniRef90-R4VJQ8 UniRef90-M1RIT0 UniRef90_UPIO003B4735A UniRef90-C5A9T1 UniRef90_UPI000404131D UniRef90-UPI000333D545 UniRef90-F6XXD3
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UniRef90_G5BSIO
UniRef90_UPIO0004411677
UniRef90-F4ZSS0
UniRef90-D1TY11
UniRef90-H1D9Z1
UniRef90 G0R267
UniRef90_UPI00037AAFC7 UniRef90-B3R0B5 UniRef90-H6N5W4 UniRef90_UPIO0035DE53D UniRef90-E1NU60 UniRef90-K0JP29 UniRef90_L6BAF9 UniRef90-Q0V5G4 UniRef90-UPI000444A6C1 UniRef90-D4FMJ4 UniRef90_K1PF69 UniRef90-W2UZZ0 UniRef90_UPIO003B5F9F8 UniRef90-J2NYQ0 UniRef90-X8JQU5 UniRef90_UPI0003726D3A UniRef90-W9YGL9 UniRef90-Q74MK6 UniRef90-V9DDF7 UniRef90_G2RB33 UniRef90-Q8ZTU5
UniRef90 Q0VPR UniRef90-Q2NGK2 UniRef90-F6D3V5 UniRef90_UPIOOO2247938 UniRef90_J3NG15 UniRef90_R5XTG9 UniRef90-B4JYN8 UniRef90-K2AE02 UniRef90-E3NOI3 UniRef90_M4YPE0
UniRef90_R4U261 UniRef90-W7KLJ9 UniRef90_C6WKW3 UniRef90-H1RZ26 UniRef90_V4JZ83 UniRef90-C0QU98 UniRef90-E7QAC8 UniRef90-S5ZDU6
UniRef90 N1QC33 UniRef90_A0A016Q6P4 UniRef90_C5DIL0 UniRef90-J8PH41 UniRef90-W7D073 UniRef90_D2PX12 UniRef90-UPIOO03506022 UniRef90-FOWEF1 UniRef90-M2QQG5 UniRef90_C5GDH9 UniRef90_G5EDY2


RQTNERS $\square$ NTRDTVEGWVDS $\square R T Q \square E H Y \square N G A T M V N N \square D W$

 DPAA

$G V G A$
$D P A L$
S KETEERKVGHLSRNLGELLLDYLAAGIDPDTATVFAHSAI RDTGERTLNAADTVLIWTERURGQLEKFVDFDEVENNLEW SGKSSERPIT TAVNAEADSNTDQK VLTDNSTDTVVNNVDW DRKDEDSRVFMIENAKDIM SMEGFDPERTFIVSNLEY

 SGRTKEREMLAAEQVAANHQQLFADGRAWGSFTVLDNSAW SGRSTERPLTARETVEYNVAQLTAGGKQFFERAQKYNFNW
SGRKTERMEKVNHNVKALSAQMKRLFGGDANVTMVNNYEW
 SGRTDMRTMMTRETVQHNIDCIKF IDDSDGKA ILLANNADW KQ
NLS YEEVQKWAYENVLDIIAA VGFDPNKTFTFYDSE K PQULKEQII KUIMKYDASGDNLKNVNLFVQSDD SFREERKKMNFEDGEVNKKGI DNEVKRILPEAQIVDNLEF
 RNPEK $\backslash K N S L I Q V A L D$ V

 KMKVEDAKKMARQNMKD I I SVGFDPTKTFTFNDFDY KFFKDDT LHDTRNMAYENALDF DALGFDPDTTKI LL DT SKKAERTLDDDKTVNQNVAEDTAQMKGDIPDVKVVNNADW

 VPRREA $\$ R $\ G V E E Y I$ ANFLALGLDPSKTEFYFQTAR

S I S QQLQR F FKNGLEYYRNRCALTEDVPSGKYTPRNNFNW VES LDEVEPYVRQDILNDAA SGRLTSRANTAEHVI DSNFRSLRRIGTSVGKRDILNNAEW TAMEETKRQSNVSNIQGQLQRFFENGLAYYYKGRYGYPNDW TAlEETKRQSNVSNIQGQLQRFFENGLAYYKGRHTNNYDW
$D \| R E D N V K S G S Q Q L Q R F G N G L D Y Y N V S P G K Y T P R N N F S W$
$D P K Q$ MRHVPRRLAALTRETATLMLAAGSPPGTVFVQSDV
 QTLEESRRMMLENVKDDIT

SVGFDMNKTF I FGNTDY
TDRLAPRAKMAAMSDERYAAKHGYESEWDWRRAIVNNNSW

## UniRef90 Q2GEI8

 UniRef90-E2B667 UniRef90-K214A6 UniRef90-UPI00047EE18B UniRef90_F7ALH5 UniRef90--g9JRX2 UniRef90-EЗT616 UniRef90-IOJXN3 UniRef90-E9UOH5 UniRef90_-l1 HUV9 UniRef90-W9GS38 UniRef90-W8R1Q8 UniRef90-V5HH17 UniRef90-UgU4W9 UniRef90-Q2Y6L3 UniRef90_-25P9K5 UniRef90-UPI0003672C38 UniRef90-R4VJQ8 UniRef90-M1RIT0 UniRef90-UPI0003B4735A UniRef90-C5A9T1 UniRef90-UPIo00404131D UniRef90-UPIo00333D545 UniRef90-F6XXD3 UniRef90-R7YLD6 UniRef90-UPIO0035DFDOF UniRef90-W6M3Q7 UniRef90-UPIO0045EA59E UniRef90-Q2NJG7 UniRef90-10RVU9 UniRef90-A4RSR2 UniRef90-F4PB07 UniRef90-Q4P9F4 UniRef90-W5X8Z2 UniRet90-U3X5P7UniRef90-P23612

UniRef90-F4ZSS0
UniRef90-D1TY11
UniRef90-H1D9Z1
UniRef90 GOR267
UniRef90-UPI00037AAFC7
UniRef90-B3ROB5
UniRef90-H6N5W4
UniRef90-UP100035DE53D
UniRef90-E1NU60
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UniRef90-L6BAF9
UniRef90 OOV5G4
UniRef90-UPI000444A6C1
UniRef90-D4FMJ4
UniRef90-K1PF69
UniRef90 - W2UZZO
UniRef90 UPIOOO3B5F9F8
UniRef90-J2NYQO
UniRef90-X8JQU5
UniRef90-UPI0003726D3A
UniRef90-W9YGL9
UniRef90-Q74MK6
UniRef90-V9DDF7
UniRef90-G2RB33
UniRef90-Q8ZTU5
UniRef90-QOVPRO
UniRef90-Q2NGK2
UniRef90-F6D3V5
UniRef90-UPIOOO2247938
UniRef90_J3NG15
UniRef90_R5XTG9
UniRef90 B4JYN8
UniRef90 K2AE02
UniRef90-E3NOI3
UniRef90-M4YPEO
UniReffo-R4U261
UniRef90-W7KLJ9
UniRef90_C6WKW3
UniRef90-H1RZ26
UniRef90 V4JZ83
UniRef90-C0QU98
UniRef90-E7QAC8
UniRef90-S5ZDU6
UniRef90_N1QC33
UniRef90_A0A016Q6P4
UniRef90_C5DILO
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UniRef90-D2PX12
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UniRef90-FoWEF1
UniRef90-M2QQG5
UniRef90-C5GDH9
UniRef90-G5EDY2

PQHVELCWLLGCITPMGLLINRMTQFKDKSNREGVTPMLSIL
QESLRFVRNLGKYLRMGTMLGRASFVQTRLNSDTGMSFTE VEYMGSSSDFYRNVVKIQQHVTFNQVKGITGFTDSDSTGK YKGGGVIDFMNNDGRHFRMGTMLSRDSVKSRSGSGMSFTE LIGAHELAWILRDAGKHGLVNYMLQKVSRRLESEDGISSFTE PAHRSLSYLLECVAHTGELGRMDQFKEKSRRVGASVRASL QNADKYWPLVMDLARKNSVRRVRSVLSYYFRRDGNNEMME
PALNQLMLPFLSLVTAAELRRNPTVKDELLSGGRPLSGL PALNQLMLPFLSLVTDAELRRNPTVKDELALSGGRPLSGL YNGQGVDPFLGTVGRHFRKMMCRTSVQQRIRSGEGLSFTE PAHSELSWLLNCI DPDGWLSRMTQWKTKDQEQKNGLDGGLD


TGGLSALDFLRDTGKHFRVGTMDRIVASRLDSDEGITSYGE PEHAELALLLGMSTPLGWLERVPTYKEEKLRDKDLSTYGF EALNQLFLPFLSLLSVAEI GRNPTVKDEMTASGQSAMSGL SEHTQLSWILTCMVRLPRLQHLHQWKAKTTTQKHDGTVGL MMSPGFYKNVVKIQKHVTFNQVKGIF GGTDSDCIGK MERLPFMEVLKVLGPGVRLGAMRDTVKNKMEKGDGMSFAE SELNQLMLPFLSLVTDAELRRNPTVKDELAADGRPLSGLL | PELLELTWMLTCVTTAKGLMNRAHAYKAAVADNDKGVTMGL |
| :--- |
| $P A L N Q L M L P F L S L V T A A E L R R N P T V K A E S E A T G E R S M S G L$ |

 YADMSFLDFLRDVGKYSRLGTMLAKDSVKSRSESGGSFTE PEHTELAWILNCITAMGKLNRMTTWKSKLAMDDKELSLGL KEHAELHMLLSMITPLGWLERTPTYKEKQADLGSAEPYGL SLVTELA WYFNC FYPYKRLVLSHAFKTEMKKiNQSDSTGL YQKQGLVDFLAAVGGHFRMGTLLSRVQTRПRSPEGMSLAE LKDLSLLEFLRTVGFHSRVNTMLTRESVQARSQQGASFTE LSKVSLLLDFLRDYGKVVNVNTMLAKDVVASRLLEDGASYTE


Y TGGAFDENTCAMASRTT DNQ KGTF GFNDSNNVGE TKHLYSAAD GFMGGAFYYNVCFAAKYDTLNQIKG AFGFNDSNNIGE PAHAELQWLLSCTASTGYLSRMTQWKA $\square K P$ V PEHAELHLLLSMMTPLSWRVPTYKDQQEKLREKDLSTYGF DVKNLAYI IGKKVTFNQMRSIYGFNNSTNDAH KVVQNLAYLLGRKVNLN EHIGTNPAFYQNMIRQKCVTFNQVKGDFGFGDSDPDAK WNKQPMLEVLQRLGRHVRVGPMRDMVKRKMTEGDGLSFAE YKD DNVI DFLRYGKYFNVNYMDDKDIIRRRLDEGGTYTE MGKCPAMYQNIIR
M CPPFYENVVKWKVVNANQARATF GFTPEDCMGK KNTETRYPLALEVAKKVTFSTAKAVFGFTGESNGGRGFFT LEKLSLIM FLRDVGKDFNDSYLLNKENGSSRLENGLSFTE VREDGALTWVLECVCSYGEAARMDGFKEKSTGRDSVRLSLC PALDEELTLMYLNFVTVARLERNPTDKEEDQARGFGUPAGF
WK D $\square K M \square D F \square A D F G R H D R V Q S M \square A R D S \square S R \square Q T K N G L G E$ LDNLNYLSRMYRAAVRVARLINFSTAKAVFGFDGETSLGLL AATHRLLNNNMWLGNGTLYDFAKRIVKNKMEKGDGMSYSE WHDMKMLDFLGRYGRHI RVQSMRDSVSSRLGSQDGDGFNE WKDTKMLDFLTDFGKHIRVQSMDARDSVSSRLETQNNDGE PAHAQLGYLLECTSYVGELSRMDQYK EKGRDRPMTRAS PEHTELAWI LGCLTNVPRLLRLPQWKMKCAGQNNDGNVGL DQHDYPQVLKVQKCVTYNQARGIFGFTGSDNDGKSAFPAV WLKEPFFEVMKTMGEAVRDGPMRDTVKNRGQSGKGMALSE
 YA Y PVVMVADILLYNAEVTPVGDDQTQHVELARDVVLRFN FTYQVEQAYDWLQLNCCFQIGGSDQMGNIMSGYDLIAKST
 $\llbracket S F P A!Q A A Q \| F R D R A D I Q P C A \square D Q D P Y F R M T R D V A P R \square G$
 FSYPVLMTADILQYQSELIPVGQDQKQHLEDARDIAKKFN FTYPVLMAADILLYGASEVPVGDDQRQHVELARDIAVRFN HNY LANQVSASNTTKVDVWLLGMEQHEANLLARRQCKKRR FSYPVLMAADILMFNAHRVPVGRDQIQHVEMARDIGQRFN FSYQMFQSYDWLYLKCRFQIGGGDQLGNIDSGHDLLRRTR FTYPVLQAADILLYKSTHVPVGDDQVQHLEDTRNIAEKFN LGYPLLQSADILIYRATRVPVGEDQTPHI EFTREI ARRFN FSYVLLQSYDFVELKCVLQI GGADQWGNIVNGDDLGRKDG LGYPLLQSADILVYRAGHVPVGADQVSHI EMTREVARRFN
 FSYQVLQGMDFMELNVTLQTGGSDQWGNLTSGTELVRKVE

 LTYPVLQAADILLYKSTHVPVGEDQVQHMELVQDLAQGFN | $\\| S F P A$ |  |
| :--- | :--- |
| $F$ | $Q A A P S F S N S F P D I P C A D D Q D P Y F R M T R D V A P R D G$ | LTYPVHQAADILFCHANVVPVGLDQLPHLEQTRVI ARRFN

 FSYMILQSLDFHHLKVRLQLGGSDQWGNI TSGLEI IRKLE F S YLLLQANDYVELHCVLQI GGSDQWGNI IA GVRLVRQKL
 FAYPVLQAADILLYKATHVPVGEDQDQHLELSRDLADVYN LGYPVLQTADILLYKPYGVPVGRDQAPHLEI GNDI GQRFN
 FFYQVLQAYDFYHYGCRVQLGGSDQLGNIVSGYEFIHKLT FTYQLLQAYDHKTFGCTI QVGGSDQWGNIIAGDDLIRAN FTYQULQSVDFGTLHVQLQUGGADQWGN\|TSG\|DM\|HKDE FSYNLLQAYDFACLN
F N Y ML MQGYDF WY
YSYPVLMAAD LLLYNATLIPVGNDQKQHLELTKNYANRFN IF FPSL Q IVPTFFEKKRLIPAS DDQDPYWRI QRDGAESGG LTYPALMAAD LLLYNADYVLVGADQKQHLELTKKI AERFN
 LTYPV $\quad$ MMAADI LLQQAHEVPVGDDQAQHVEDARVLARRFN MAYPI SQAADITAFKAEMVPVGDDQQPMIEQTNEVVHKMN FSYQLLQAYDFLTLNCTIQVGGSDQWGNIISGIELINRTG F $\square Y P V$ SQAAD ITAFKASUVPVGEDQDPMIEQTNEIVKTFN YTYPILQAADILLYKSTHIPIGEDQRQHLDLCEDLADSFN FNYMILQGYDFWYLDCDLQIGGSDQWANIVNGVELVKKRE LTYPVHQAADILFCKANLVPVGKDQLPHLELTRVI ARRFN
 FFYPLQAADLLYQADFVPVGEDQRQHDELTRDLGQRFN FFFCAI QSAAAFATSFPHIFGDNPQDPYFRQCRDNAEQMK
 ADILVHRATHVPVGEDQRQHLEFTRECATNFR IF YPSLQ DAVPTELRRELI PCADDQDPYFRDARDDADADG


LS Y TLMQGWDFFELNKQLQ\|GGSDQFGNIVVGDDHDDRFG FSYMILQALDFKHLGVDLQCAGSDQWGNI
$\square G F P A A Q A A P N R K L H C D I P C A D D Q D P Y F R M T R D V A P R G G$

TMESAPAFIDPTIIEGKPMI PGEGDDQDPHFRVTRDVAPGMK

 L CYPASQAADI TGFKATVVPVGEDQAPLI EQTNEI ARRDN

 26P4 FMYPLLQGWDFWHLGGQMQQGGSDQYGNITAGIDKKPSTW FTYQILQAYDFYHLNVAVQVGGNDQWGNITAGIDDISRDG FTYQULGAYDFYHLNUSVQVGGNDQWGNITAGUD FTYPCLMAADLLLYGTDRVPVGDDQDQHVELARDLADRFN




## UniRef90 Q2GEI8 UniRef90-E2B667 UniRef90-K214A6 UniRe990 F7ALH5

 UniRef90-JgJRX2 UniRef90-ЕЗТ616 UniRef90_10JXN3 UniRef90-E9UOH5 UniRef90_-l1 HUV9 UniRef90-W9GS38 UniRef90 - W8R1Q8 UniRef90-V5HH17 UniRef90-U9U4W9 UniRef90-Q2Y6L3 UniRef90-Q5P9K5 UniRef90-UPI0003672C38 UniRef90-R4VJQ8 UniRef90-M1RIT0 UniRef90-UPI0003B4735A UniRef90-C5A9T1 UniRef90-UPI000404131D UniRef90-UPIo00333D545 UniRef90-F6XXD3 UniRef90-R7YLD6210
QRYGEYFRTPTIL KKKEATRTMSLTNPTKKMSKSDP RKQVYGlTIPLITAEGGKKFGKSLMNAI WLSSMKSSSFYQ DAHVFGLTTPLLTTSDGRKMGKSQQGAVWLNADMPYEFWQ YPKPALLHSTFFPALQGAQTKMSATDSAKQDKNKVNKHAF NAKVYGLTVPLITTDSGDKYGKSAQNADWLNSDRPFELYQ AKKAHGLVWPLMKTAAGTKFGKTEAGTVWAARTSPFKFYQ NTFGEVFRIPI IPGDDGQKMSKSYFGDLEEFKRRVMSDKT TTYGRVFAVPQAVHPAAGARПMDLADPTRKMSKSAGDEHP NKPVAVLHNPAMENRRHPAWAD MEDDKEDDCFKDEKAFC GRYAAGHSVPLLMGLDGTKMSDNLGDTADETAARDRSART GNGKELFTLPTLPGLDGRKMSKSYDNTHPLFASAKALKST
 HVY
LPQLYGLTTHLLLTSTGEKMGKTADGAVWLDAEMPGNYWQ YGKEAGFEENAUAA DKKMGKK AGK $\square Y E S \square R K R Y$ H
YPKA LTETPKLLGTDGRKMSKSYNNTEEETTSKDMKMFT GEHVHA $\square G T P L I T N A D G T K F G K S E G N A \square W \square N P D M P Y T F Y Q$ RKYSPDK PYFPEPDALLSDAP LLLGTDGGKMSKSRNNS KKYGEFFPVP
YPKPALLHSTFFPADQGAQTKMSATDSAKQTKNKVNKHAF EKEPYGLTVPLLTTASG QKFGKSAGNADWLDKDMTSVYQ
 HLYGEHFVLPEAVGLDGRKMSKSYFEPEKALRKLIMRIKT KKSDAGVSTPLLLNSDGTKKSEKRVLWLDPDMTSPYEIYQ GVTVHALTVPLVTAADGAKFGKSWLDPEMTT PYYWYQ PSADVGLTFPLLLKSDGTKKSEQGADWLSTSRDSPYKFYQ YPKPALIHAKFFPALQGPGTKMYDNDTLAQTKNK RPQHIITPTKRVLSLRDPTSKMSKTDTPQQVANKIKK
 YPKPALLHSTFFPALQGAQTKMSATDTAKQ1KTKVNKHAF


YPKYDESEFPRVMSLKDATKKMNLIDSPELDYDK䍝KAKT YYKAAMISCKFFPPLTGITGKMSSTDSEEQUKRKVFRYAF NLYGNVFKIPTETKLNYLGNKIKSLLDP QUKKMSKSNH DHKAVGLTFP LLLDSSGKKFGKSENNA DF पDQNGTSPYV NDYGTTFAVPKGVSPDFAARVMDLSDPARKMGKTGSTDTG SVYKEILVEPKGYFPPKGHGRLPGIDGNAKMSKSGNNADY

 NTKQNVLKRAKALLPKKGKGRLPGDDGKAKMSKSLNNADY
$N K F G K V F R V P Q V L F S N T A R I K S L R F P E N K M S K S D Q S S K G R ~$ NKFGKVFRVPQVLFSNTARLKSLRFPENKMSKSDQSSKGR
 SKYKEVFNTPQAQI KSLAKDNDLQDPTAKMSKSATSMSG
 HTYVMSSTVNTAKMSKSPKSRVLIDDSEATVQQKVRQALT HDYEPGFEEAVDAAIKKMGKKQSKI
EEYGFITFHRFMTGLTGEKMSSSKPKSADYDTDSLKDAVK

FPKCALLHSTFFPADQGAKSKMSATDTPKQTKNKTNKYAF NTYGETFKLPT IDGVDGVKMSKSYGNTDEIKKQIMSMVT AAKPSLIFSSFLPALQGAQTKMSASDTPNQIKNKINKYAF YPKPSLI YCKMCPGLSGGDKMDYTTDTPKQVKKKVGRAFT GENNCGLTMNLLTKSDGTKFGKTESGAVWLNKTKPYEFYQ GTYGEVFAVPSAVVP GTAARVRDDADPSRKMAKSAVD HQPEAAALIPRFGRLPGVDGKAKMS
PEPPAATYQKFDRGLDGGKMSSSKPEFTDFDTDPVEEAVR NLYDQUFPEPEAPGIDGRKMSKSYSDDRETVNRKVLEMKT $K G L P F G 1 T V P L L T T A T G E K F G K S A G N A V F I D P S I N D V Y Q$ RYKTAEI LSKLVWGDTGPETKMSASDPPDVVKKKIMNAYT RLKDHGLTVPLLKTSSGEKFGKSAGNAVWLDRSMTSPFD DHEPVGFTVPLLTDASGAKFGKSAGNAVWLDEFKAFDLYG KGLPFGGTVPLLTTATG EKFGKSAGNAVFIDPSDNDVYQ $K Q Y K K S F Y Y P Q V V$
$R E Y G E T F V V P Q V V$ A $\square$ ATRVRDLATPTAKMSKSDAD KKYGEFFPVPKAILSTTKKIKSLRDPTVKMSKSDPQKLAT YLKPATMYSKFFPALQGSTTKMSASDSAEEMANKDKRYAF YPKPTLIHAKFFPALQGPQTKMYMSDTPGQUKNKINRHGF


UniRef90 Q2GE18
UniRef90－E2B667 UniRef90－K214A6 UniRef90－UPI00047EE18B UniRef90－F7ALH5 UniRef90－J9JRX2 UniRef90－E3T616 UniRef90－10JXN3 UniRef90－E9UOH5 UniRef90＿－11 HUV9 UniRef90－W9GS38 UniRef90－W8R1Q8 UniRef90－V5HH17 UniRef90－U9U4W9 UniRef90－Q2Y6L3 UniRef90－Q5P9K5 UniRef90－UPIOOO3672C38 UniRef90－R4VJQ8 UniRef90 M1RITO UniRef90－UPI0003B4735A UniRef90－C5A9T1 UniRef90－UPIOO0404131D UniRef90－UPIo00333D545 UniRef90－F6XXD3
UniRef90－R7YLD6
UniRef90 UPI00035DFD0F UniRef90 W6M3Q7 UniRef90－UPIO0045EA59E UniRef90－Q2NJG7 UniRef90－10RVU9 UniRef90－A4RSR2 UniRef90－F4PB07
UniRef90－Q4P9F4 UniRef90－W5X8Z2 UniRef90－U3Q5P7 UniRef90－P23612 UniRef90 G5BSIO UniRef90＿UPIOOO4411677 UniRef90－F4ZSSO UniRef90－D1TY11 UniRef90－H1D9Z1
UniRef90 GOR267 UniRef90－UPIO0037AAFC7 UniRef90 B3R0B5 UniRef90－H6N5W4 UniRef90－UPIO0035DE53D UniRef90－E1NU60 UniRef90－KOJP29 UniRef90－L6BAF9 UniRef90 UPIOOO444A6C1 UniRef90－D4FMJ4 UniRef90－K1PF69 UniRef90－W2UZZO UniRef90－UPI0003B5F9F8 UniRef90－J2NYQO UniRef90 UPI0003726D3A UniRef90－WGYGL9 UniRef90－O74MK6 UniRef90－V9DDF7 UniRef90－G2RB33 UniRef90－Q8ZTU5
UniRef90 OOVPR UniRef90－Q2NGK2 UniRef90－F6D3V5 UniRef90－UPIOOO2247938 UniRef90＿J3NG15 UniRet90＿R5XTG9 UniRef90－B4JYN8 UniRef $90-$ K2AEO2 UniRef90－E3NOI3 UniRef90－M4YPE0 UniRef90－R4U261 UniRef90 ${ }^{-W 7 K L J 9}$
UniRef90 C 6 WKW 3 UniRef90－H1RZ26 UniRef90－V4JZ83 UniRef90 CoQU98 UniRet90－E7QAC8 UniRef90－S5ZDU6
UniRet90 N10C33 UniRef90－N1QC33
UniRef90－A0A016Q6P4 UniRef90＿C5DILO UniRef90－J8PH41 UniRef90－W7D073 UniRet90＿D2PX12 UniRef90－UPIOOO3506022 UniRef90－FoWEF1 UniRef90 ${ }^{-}$M2QQGG5 UniRef90－C5GDH9 UniRef90＿G5EDY2

DPKELTEKKIDSAKTDSTLGFSPEGLQDRPEASNLTNLAA 280 YF $\square$ RTKDSDVKKLIKKLFTFLSLDKINE IVDEHMKNPEQR\｜ YWRNTTDADVERFARLYTELPLDE EVEVANLLTLASLCGAG | DSDRV |
| :--- |
| SGGRDTVEEHRQFGGN $C D Y D P A S R P E V A N L D T D A S \square C G A G$ | FMIRT DDADVEKLLKMFTFLSLPE DAELMRRHKATPDKR\｜ FWVNTDDSDVIA YLKKFFTF

DSTPПESPKPTKGS\｜LVALYKLVATESEYQEFDTSMGKGG GSTFLLDDPDAVRRKVARAVTDSAGDVSRDPSRPGVTNLI PPKLAEGNPCFQYロKRIILPWFGKFEVVRKRENGGTKTFL
 $\square A R \square V T D S R \square P D P D D S H E T \square Y Q A F A$


YFRNVADVEVGRLLRपFTELPMNE $\square$ AE $\square E N \square Q G E A \square N E A K$ EQGDTE
DPEK【RKNDPGHPEKCNVFSYHKПFTNDDETSN FWLNTADADVVERLKVFTFLGRAK IAEYEQKVADEPFRRE $\square P \square G A T A D E T A K \square I S R A K D S D R T \square T Y D P A N R P E V S N C Q$ SGGRDT四EHRQFGGNCDVDVSFMYLTFF吕ED FFVRTADADAERYLKLFTFLPLDRDRTDMDEHHLAPERRS N SLPPEAPKDPDTCTLFELYRAFASTEETTAMAAFLGT ELRSTEDETLYRRAKTDAHRTUTYDPVDRPEVASLLLTAA YFLNVSDKEVINYLKMLTL
YF NTADADVIRYLRWFTFLSADELADLEEATASRPQERV YFLNVADADVIRLLKMLTFVPLAELEYERHMSQPSYQVNT

DPGTPEGCAVCQY LKVYSPTWQTQWQEDRD
DSKSDEKNPENDY FFVRQQDDSVERYLKLFTFLPLAETDHTMQLHSKEPEKRG FFLRSSDADVGRYLKMFTLLSLERVDTVMGTHNQNPEAR FWLNQDDRDVVKNLKFFTFLSQDEUGELAQKVETEPEKRE

D S $\square S S V I L F Y K N Q K D F Q \Pi K N R P E V Y N L L K D Y Q T L S G L$ SGGQPTVELHRKYGGNVCFQWLYNFFEENDEK DSGCDDASTIHKKПMRSTTDSDNCTFYDTNEKPGDSNLLN VFQNLDDKLIPDYLRKLTFDNDNEIESLVSKSSPQNLKLT
 LSDDSE
TVVFVLDSDLVRRKTKRAVTDDTGVQYAPETQPGVANLLE DPNHLK DSDPGKDEGNVVFTWLDAFHPDKAKV
YFVKTADNDVERYLKLFTFLPINQMNLLMAQQRKDESKRL FFVRTADEDVLRYLKLFTLLPLSEIEAUMEKHNRAPELR LSDSPD
YDLTDSNDDDVSKTKSAVTDFTSHDSHDKENRPGVTNLID YFRNMHDQDCINALYKLTEDPDDEDQRDEKLKGQALNEAK AVTDSDRHITYEPDRRPEVANLLITAAEMTGR SRIVTDSRAPKDPDNSHLFTLFQAFA
 SGGQDTAEKQRELKADVPFQYDTFFLEDDEEDFEED TK
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## KVKSAKTGGRESLKEQKLGGMPDKCSTYELLVYHLIDDDK

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FFFNQEDKETGKLLRYLTFLSEAEDKGLEERHAQDPASRF SGGQPTMELHRKYGGN AAGTVFVDPPDLVRRKIQRAVTDRVGVRHDPEGQPGVS
 FFYNT
GGRATVEEQRKLGEVCTVFHWYSVLFEEDDKK


DaVGTPPDVIRRQVMRAVTDSENEVRHDESAKPGVTNLLE VNVADSPEEIVLKFRKAVTDFTSEVTYDPSSRPGVSNLVS
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## K VLIATEA

 A QRRLA WEVTS

K पEQTKQDYTSGALLTGDDKKTLIE!LQPLIADHQQR $A Q H V L A Q E F V E L V H G K D A K Q A$
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SFDQK LAATLRS TG DCVSEYELSVLLKK $\quad$ PP VCYVWCD


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$\square V K A \square R E K T N F A V V T G M M$ ELKQRGLVHVSQPENLWTRLKGEKDKLYCGVD L E ERGFVKDIGRQTLDWLLTEKRIGAYVGVD


LKDYEAGKGFFLYTGRG $E L \square R A R G L V Q Q \square S E D A L K Q L R D G K R P R L Y C G A D$ $R D L N E \| L D L Y E N G Q Q F Y L Y T G R G$


KPFY LYTGRG SNKPFAVVSGMM EVLDAYERGDKFYLYTGRG
 EAMRNDEPFAALSGFM
 TKEELLEALRTSNYYVLTGUM
$\square K R G V$ FFSERD $\square H R \| L D G E P F F L Y T G R G$

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PTAKSH पGNLLP पMILLNFY $\square R G H D V V S L I G G A T G K V G D P$
 $P$ TA QSHLGN LVPL MVLLHFYVKGHDVVTVI GGATGKVGDP

 P S G P M H I G H I I P F F A TK W W L Q E F G V N L Y V Q I T D D E K F L F K P $\begin{array}{lllll}P & T & A & A & H \\ P & S & \text { G } & \text { V L MP L M V L L H C Y V R G H D V V A L V G G A T G R V G D P }\end{array}$



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S G G GATKEEQEKNGADLSVD\TYEYDT FMDEDD E
 P LK NAKCNPCLEY K KY I LP WFGKFEVLRTGENSGIKTFM $T G G Q S S V E A H R D P E V D V P F Q Y M S A F F E P D D D E$
$Y F M R R S D D D V D S L L K L F T F D P A E T D G M E R H R E D P A M R L A Q$ $S G G Q D S \square E K H R E L G A N L E V D \square P F K Y L S F F L D D D A$
$F L L N Q S D T K V E E L L N W L T F K D Q D V I E K H N Q D K T K R \square A Q K T$ SGGGDTDENHRKFGANLEVDISVKYLSFFDEDDAE
SGGQDSAEEQRKYGANLEVDVAYEYLRYDMEDD
DSQNVSYSPSERPGVSNLLTLWSSFDTQNPKREE
NA ITIIDPE DSAGIDEAKDPS KSNDYADHSDFLDEKE MGGVPEDCVIYEMLLYHLLPSDS
FFFNTLDADVLKFLNIFTFLDDPNVITSVVESHNKSPNDRY YFMRTADADVERYLKLFTFLPLDSIALLMSQQAHDPGKRL




$K \square$
S GGQPTDEHREKGGDCE $\square$ D $\square$ S YQY LTYFMEDD Q
NA $\square W \square D P N K N S P Y F V Y Q F F M N V A D A D \square E R Y \square K \square L T L L S D E$


 SGGRETLEEHRQYD DDVAYTYLSYFLESDEE


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310
320
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LARVEREYRAGDLLSGEDKELAADR\VEFLEGHQDR R $H V L A F E V S T L V H G M A D A D M$
KLEE $\square R K E Y G A G R M L T$ GEVKQLLIQVLTELVERHR
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EI F ALDERLTSD M PQAVKKYIAEVIVK
$L L E R Y \square A C K N G E \square L C G Q C K R Y L$
E LERTKVAYEKGEMLT GEDKADCDREDQKYVAAFQER
ELAHIKKEYKEGRMLTGEVKQRLIAVLSEIVARHQ
FRAELE GGLAWGEAKNRL
AQTTLANETTELVHGSDGLRKA
LERI GNDYKSGKMQTSEVKK』LSDLISKDFAEHKARRNA RSKEILAYEVTKIVG
E L E R I RVA Y QK GEL LT GE DK K $\square$ A DET T T P VVEE HQRRYK LEKVKEECLNGTLLCGDCKNRTCQLLSEFMDDDQRHDKQ ELLEHUKKEYGEGRMLTGEVKKRDTEVLTEMVERHR

F L K K C Y D D Y K S GELLS GEMKKHCDET LQTF VKKFQER

E L E R VREEYGS GRMDS GEDKQY LIFEVLREMMTEDREKVE GKENLKQKFLTPGTGYGDLKKQLLQDTLDYFAPYRKEREK KLQKLADGYKSGDILSSEMKKECIAVVQEYVSAYQER MVGEVSAKYVVGEMNSCYVKSLAADVVVRHVQAKRKGVTD ELDKLKVDYKAGKLLTGEVKAMLINILQEL QREHVEK
$R \square E E \square K K S Y S S G E L L T G E \square K A \square A \square E E \square T R V I T A M Q S R$
D $\square$ S DMKKHNENPELRTWQ SALDWKAVVETI
RMNQLAKDYRAGTLSS GEMKDHCDATI QKIVGEFQ
KLAKVYEDYKKGELLTGELKKLAI ETLQKYVEEFQE
 $A$ AHNLAFEFVS LIHGSQ K KALEEA
K $\square K K \square A H E Y S T G A M T S G E D K K \square C V D V L A N F V E S Y Q E K$ KLK SI YEDYKS GKMLS GELK A $L E D L A K R Y R S G D L L T G D M K K R C \square E E L Q K F V T A F Q E R$
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lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm


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UniRef90 ${ }^{-17 J 6 X 1}$
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lupet
nonf
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sol5
SOIO
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D E L K Q

E A R A K $\square$ T DE
DEDDDVEAEAY


QFV $V S_{S}^{R L L} L D E G Y$ IGADK

DVVDKFMDPHYP
EEANE $\square$ A Q
$\underset{R}{\mathrm{E}} \mathrm{E} \mathrm{V}$ R R F T E
R E
$G K \square D E \square A$


[^0]:    $\qquad$

    $\qquad$

[^1]:    $Q H L L E G \backslash R S$

[^2]:    lupas_21
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[^3]:    lupas 21
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