## QUERY

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 YKLVLVVRNDLKMGKGKIAAAQCSHAAVAAYKQMKQKD EYKMVLVVVRNDLKMGKGKIAAACGHAAVGAYES GVRNT EYKLVLVVRNDLKMGKGKVAADCSHATLGCFKKGTR日R E KMVLVRNDLGMSKGKVAAQCCHGAVGAYQKAVKS NCKLVLVVRSDLNMTRGKIAAACGHATLACYKTLMRSN NYKMVLVVRNDLKMMGKGKIA S QCSHGAVGAYQRAVTRT E E CKKMVLLVRMDDLKMEKGKMAAAQCGHAATLAA YKAALDK T Y K MVIVVVRQDLKMGKGKI A A QCSHAAVGAYK QLNKHK CKMVLVVRTDLGMTKGKIAAQCGHATLACYKTUQKAN EEYKLVLVVRTDLSMGKGKIAAAQCCHAAVGAFEKALKKD EECKLVLVVRTDLGMTKGKIAAQCSHATLACYKALVRAN E E H K L V L V V R T T D L G M G K G K M A A Q C S H A S L A C Y K R A V K E F K L V L L V R R S D L G M T K G K DA A Q C S H A T L A C Y K T L Q K T N E E Y KL V L CVVR S DLLAM GK G K I A A Q C GHA S I GA Y T D S LLK N N VIE E CK M V L GVVRMDLKMMDKGKI A A Q C G H A T L A S Y K T A L R M H
 E ECKMVLVVRTDDLGMTKGKIAA QCGHATLMCYKAALARAA E E Y K LV L L CV R K D L K M G K G K I A A Q C G H A A V G C V L K A Q K T D
 DCKMILVVRNDLKMGKGKIAAACGHAAVGAVENARKN MEECKLVLVVRTDLGMTKGKIAAQCSHATLACYKALRKGN ELKLVLIVVRSDVKMEKGKVAAQCSHAAVTAFKQALRRQ E ELLKMVLIVRQDLKMGAGKIASSQCAHAATGMYAELLQSH MK QVIVVVRSDLEMSKGKI A A QVAHASVVIAAFEAYYN H
 NFKMTLVVRSDLGMTKGKIAAQCGHATLACYKAAKKVN $D L K L V L V V R N D L G M S K G K V A A Q C S H A T L G C Y R N A D E D C$ EWKLVLVVRSDLKMGKGKVAAQCAHAAVSAFRQAGARH E ECKLVLLVRTDLGMTKGKIAAQCSHATLACYKHHAKNP E D Y K QV V I V R S DL NMSRGKI AVQVA HASLDAAFEAYKER DCK QVLVI RT DLGMTKGK I IA QCCHASSGARQKA LK D S


 NCKMVLCVRQDLNMGKGKI AAQCGHATLGAYRQAERRQ E ECKLVLVVRTDLGMTKGKIAAQCSHATLACYKALSRAP MEEMKLVLVVNDSLKMSKGKIAAQAGHATLAACDTLRGAN MDFKMVLCVRQDLGMGKGKVAVQCSHATLGAYKQAKKHY E E CKLVLVVRTDLGMTKGKIAAACSHATLACYKTLYRA H


CKMVLIVRNDLKMGKGKIAAACCHGTLGAYKSATKKF MGGFKQVIVVRSDLRMSVGKTAAQAGHAAVLALERTRRMR E H CK M V L V V R T D L G M S T G K I A A Q C G H A T L A C Y K A L I EVKMVFVVRQDLKMGAGKIASQCAHAATGDYGALMRSQ MEDTKMVLVVRADLEMGKGKAAAQCCHAAIAALELATHHA $K M V L C V R T D L G M G K G K D A A Q C C H A T L G A Y K L A L R K T$ EYKMILV R T DLK M R K GKVAAAQCSHAAISAYKQIQRKN EECKLVLAVRGDLGMTKGKACA QCGHATDACYKALLRAAD E E Y K MV FCVVRNDLKMGKGKDAAQCGHAVVECVLKSLKT Q E A H K L V L C CV R T D L K M S K G K I A A A V E E CKMVLVVRTDLGMTKGKIAAQCSHATLACYKALTARA E Y K L V L CVVR S DLAMGKGKI GAQCGHASIGAYLSAVETK NYKLVLLI RTDDLKMGKGKVAA QCSHAAVAAYKSATKY
E E Y K MVLLVRRKDLKMQKGKIAAAQCGHAAVGCVLKAQKYD EYKMILVVRQDLGMGKGKVAAQCCHAAVGLCRQLLKNN MSEFKQSIVVRGDLRMSRGKLAVQVAHAAVSAVLEALRNR
 Q Y K MVLLVRNDLKMGKGKMAAQVGHAAVGGYKQDMRSN $K M V F L V R S D L G L G K G K V A S Q V A H A A I L C Y Q S A Q R S N$ ECKLVLVVRNDLKMMGKGKVAA QCSHAAVMANEYDMLNF
 $E \underset{Y}{L} K M V L V V R Q D L K M G P G K V A S Q C A H A A M G M Y A E L M Q S N$ ECKMVVFAI R QDLKM K K K GKI A A QCCHAAV SLYRMMFQKN $D K M L V R N D L K M G K G K I A A Q C S H A A V G A V E K L A Y S N$ E EVKLVLVVRTDLGMTKGKIAAQCSHATLACYKYLTAYT S KLKLVLVVRTDLGMTKGKVAAQCSHATLGCYQKAVEQC E E C K L V L V V R T D L G M T K G K I A A Q C S H A T L A C Y K V L S R A A SEN KLVLVVRNDLKMGKGKVAAQCSHAAVMAYESSREKA E P HKMVLVVRNDLKMGKGKVAA QCGHATLGAYKRAVKRT
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 LE D C K L A L V V R V D L G M S S G K I A A Q C S H A T L A C Y K A L G K S N MGSLKQVIVLRRDLDMGKGKMVAQGCHASVSAVLETVKRN
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 $P$ L L L K R WE Y L G Q A K I AL K V D S E D D L L T L Q A QA M S L GL V A K $P D L L Q L W E F Y G Q P K V V V K A P D E P T L I D E A R Q T R G I G G Q T T$ Q E L L N H WE NLGGQPKVVVVK V D S E E ELL L S I A A N S R S K G L P T T P A A I R K W Q N G G Q A K IV A L K V D T E E A MMMEI Y R TAA K A N K L N C C $P E W L K N W E V D G Q P K V V L K V Q D E Q S L L V L S G Q A T R K G L P T S$

 PRLL R A WENCGCAKI AVVRVDSEAELLMSIVRSAE QRHLLNTC P EMYNKWKMTGQPKVVVKTDSEQDLLDDLCKKARSLLGLNGS $P Q L V K Q W E R L G Q A K V A L K C P D E A T M K G L E A K A R S L G L A A R$
 P K LL R H WE WT GQA K I AL Q Q K S EEDI LLLLQATA QSLLNLVAR P E GLL K A WQ M T G Q A K V A L K I D S L E E I K KI A D N A K K M G L I T S PDLLKRWEKRGQAKI AVVQKSEKELTELRWKALDMGLTAE

 D P Y V R K W F NE G Q R K V V L K I N D Y E E M K E L K N E A R R H K I N T H


 P DVL R R WERYGQMKVALKCTSEEDMQLLQA QALSLGG CA Q P NLL R K WR N S G Q A K I A V K VVESEENKMMEVVYK LAAKQKK L N C C P SLLLK H WE YT GQA KI A L K L E S E D E MLLLLKA KA K S L G L C A R PNALRRWEDQGQRKVVLRVPSEDEMLVLADKARRAGLVTA RSLLRQWEQYGQAKIVLSCKNQQEMNKLKEAADRCGLPT F REWFNEWWNS GQKKVVVMVR GEEE LVKKIYMEA ISN GL PA S H DLL QK WE GS GQA K VVVVKCES QQEL HN I A A A A RQN GILT Y $P$ LL L R A WETS GQA KV AL K CD S E D K L L E L Q A DA L S L G L P A Q

 REWFTA WWESGQKKVVVKVSSEGELLELYEKARQRGLPAS K K V L R Q WENF GCAK I TTLKANS KEELLVDLRNKAKELGVVS Y
 R SLLLSKWESSGGQPKIVVSCKHEPEMNDLKAKAERAGLPTAF P K AV R A WE MLLGQA KV CLLKVD S E E E L L S L A A K A S E H GLIN Y QKVLHRWERQGQAKIAVQTKS QDEMMTLLGQARSLGI TAE




 K DLLKRWEYGGQAKI AI KVESEKELLDI EREARKLLKLPNY
 P GLVRHWERTGQAKI ALLKASSED QLLLELEA DAKSLNLCAR QALL L K WE QCGQP K I VV T CKN Q Q E M N K L Q A V A E K I GL L T F PRVVRAWSRQAHAKVVLKTPDEASLFELQRKARQAGLVSY
 PEVLKHWEYCGQPKVVVKAPDEETLVGLLTHAKMLGGLTVN $P Q V L R Q W E R L G Q A K V A L R V N S E D E L L M L Q A Q A V S L G V C A Q$

 QRIL RAWEGAGQAKIAVQVKSEDDLLELMGKARSLGVTAR

 PISLINTWRYYGQAKIAAVVDNLE QLEQLEKKAEESNLITK $P K V L R M W E N A A Q P K V V V$ KAPDEDALVVSLSKKARSSGLETC G D WVVNA WVS G GQKKIVLVVDSVEDLI RLKAKAESLGLPTA R D WV D L W R S Q G A K K V V V K G E N E Q T L I
 P E L $\quad$ Y K E Y K Y N G QP K VVVV K C D S E E E L L L R L A A Q A R L L R R

 LD L L K R WE S L G Q A K $\operatorname{T}$ T L K C P N Q D E M D L L Y A K A I S L N V N A Y MAALR HWQKQGQP KVVVVVEDEAAFFDIVRTAQKEDVVNC
 P E V T E A WES TGGQMKI VL QVVPD Y H S L T R LR ES A CD I G L P N C
 PHADECWETLGQAKVALKVESEEEMLELARRAKELGLVHY D E I L PALLQRWERGGQPKI AV QAKSEDDL MTLQAQAVSLGL CTR KELVDEWRQNGQPKVVVKAPDEASLLQLAEHGRGIGVVTS
 PA LL R R WERTGQSKV AL RADS DEDLETMEAMARSLDNLCAR P T L L R H WERTTGQAKI T V QAKSEEELLLILLQAQA QS L NVVCAR REIVVR WVE E GQRKIVVRVDSEEELLSSVYRKALELGLVAV $P$ E L V N R WE I




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 PKALQRWENCGQVKVVTKVESEDDMLALKKVKAKESKLPCH LE WFRAWESSGQKKVVLIVNSGDELLRLREKAEKLGLPTF HKMLKKQWEVFGQAKVTLKTNNEKELMDLEKAAKEAGLPHY KEKDRKWENSGSAKVVLKVQSLEELYELKEDAKRNNISNC KEWLYK WLEEGQPKIVVKVPSLDELNKRYEKADELNLPTT KQLVERWLEQGQKKIVLRVDSEEELLDLYRRAQELGUTAV PNVVKEWLREGQKKVVLKVNSEKELERDKGECEKLSGLPVA AKLLDRWERLGQAKI AVQLKGEDELKKLRAAARAQGVTAE PGlLERWERLGQAKIALKCSGGEEGGTLAGVAASLGVVAR

Z BAWELSGQKKVVLKVSSEKELLEENSIVKETDLPHS
 REALRQWSRQGQAKI ALAMPDEATMMDLEAKARARKLPTY KEWFEEWWKSGQKKIVVKVSGEMELDELYEKAVRNGLPAS QTALHQWEACGQPKVCLRGASTLELRQLQAEAAARGLPTF KEW RAWERGGAK AVONNEAG EA AAKAKALGGVC KELCNRWLNHGQAKITLKCPNKEVMDELYAMALSLGVNAT KKLAEEWLNSGQKKVVLKAESLEELLNLHKKAIEKGLVAVV KQVIRGWETYGQKKVTLKGDSEEQLLELQKMATFKGVTNA PKLLQFWERTGQAKIALQAHSEEELELLQAQADSLGLCAY KEMAERWIDKEGQKKVVLKVKDDDELMKIYEEAKKQQLNVA SPFLKPWEMSGQPKIVCRVDSGEEMESVGSKARDLGLIVA PTVLSWWEASGQPK VLKTPGEEGLYKLMQEAKKRGVVST

## R





 R DVF NE WY D E G Q R K I V V K V N D L D E I M E I K R M A D S M G I V N E S D A Y W A W E N G G Q R K V V V V $\operatorname{Ci}$
 K E V A A K R W L Q N G E K K I V L K V S D E D S L DK L Y K A F E F K K V P C A
 R A V R R WK D E G Q T K V V V V K V



 E T L L S G WE E S G CP K I V Y K V N S K E Q L L E L E K K A T Q Q G L N S Y REWLERWLEVGQPKVVVKTNSLDDLLARIEKARDEGLPTH PELLLKEWEYCGQPKVVVKASGEEELTELLTKAKMLGLIVN PQMAKMWQMTGQKKIVVSTGNEKGLQELSKVAKSHKVLSC NVA R R WEMYGQPKI ALKVGDEAEMAELEAKAVSDGMPTY
 $P N Q L R R W E Q Y G Q P K$ I A L K V P P T E D E M DILL K A K A M S L
 RRAANEWKGSGQQKVVLQVDGESALFELADTADREGLPHA
 $\square K K W E S E G A K K V V L K V K T$ LDD E L L L K I Y E A V K N S G L P H Y
R K A WQAEGQKKVVLRADSERAL FEIVKVAERS GI STS
 RK A WLDEGQKKVVLLKASAERQLFELKTDAERAGIPAS SK LIIK K WES DGYAKVV CKVD S LEE ELLDDLKKEADKNNVSNY P EMIH K WK R S GQAKVVVVKAS DEATLL KMQS QARKLGLEAN K D LYK A WQR S G C K K V A L Q C P D E A A Y M E D C A E A Q K A G L T Y Y


 P E $\square$ A
 QEEWRAWMREGQKKVAVKVIDSEEIILELRRQAITHSLPHA
 RA WFD A WF EGGGQAKVVVVVK SME ELMEMIRKRAESYRM PVV P AFVK QWETGGQAKVAVKCPDEPTMLELESKAKELGI A AR K Q Y L H D WEVTA EAKI CLKAD S DKE L DNL F QKCLQQRLNCY $P$ D VAAD R WVVGA GETVIVVVQHD G C C L R S L HAAAAVAA NL NT S RAVLRRWESEGQKKI ALKCRSATELRRQLAAAAKAARLPHF PEWFSVWW TGQEKIVLKVANDKELEQVKQDADEFDVPWS



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EELKMVLV $\frac{10}{V R Q D L I K M G A G K \| A S Q C A H A A T G L Y A E L M R S H}$ EECKLVLVVRSDLGMTK AQCGHATLACYKTLQRQA MSP $\frac{\square}{M K Q V V A V R T D L G M G K G K D A A Q V G H A C V M G A E R V R R S H}$ MDDYKQCII TREDLKLSKGKLATQAAHAAVSSVEKASKST MVVARKDLDGKGKMAAQVAHAAVNLALYSEKKN EECKLILGVRSDLKMQKGKVAAQCAHAAVAAYEDLAETN ESYRLLLTVRTDLSMGQGKI ASQCAHAALECYLKASKFK MKMAVLVRTDLDMGKGKIAAQVAHAAVSLVKRSKAEW MKMTIVVRADLSMSCGKAAAQVGHAAVECTLKALNRW EEYKQAIVVRRDLGMGRGKAAAQAAHASCGAVFLIMEEW MK QVLVMRADLKMSRGKLAAQACHASLGAYKKADERS ECKLVLVVRSDLGMSTGKIAAQ HATLACYKTLLASN FKMVFVVNMELEMGMGKI AAQVGHAAVGLYRFLLQDE MK QAIVARVDI GMGTGKLAAQVAHASLSAYEDTGERA MTEYKQCILVREDLKLPKGKMAVQVAHAAISAAEWAK EDTKMVFCVRNDLKMGKGKDAAQCGHATVECTLIS DEKQ MEFKQCIVIREDLKLSAGKLAVQVAHAAVMAVERAEKMD MKQAI VARADLGMGKGKLAAQVAHASLSAVEDTDSRS
 MGKGKIAAQCGHGAVGAYQKAVHRT MKQA\VARRDLGMGEGKLAAQVAHASLSAYEDTGRRA KMVVVVRNNLGMGKGKI ASQCAHAAVECYKTGLKTD HKMVLVANMSLKMGTGKLAAQVGHATLGVYRQAMNSE KMALLVIQQGLKMTKGKAAAQCSHATLGLYRYSEAYN VSEFKMDVVRKDLDGGKGKMAAQVAHAAVSLALHSMKNE ESVKMALVVRKDLKMRNGK AAAQCAHAAVGVIEEILAFW FKLVLIVNMQLKMGKGKVVAQCCHATLGNYRISERHC SEYKQVIVVREDLNLSRGKLAVQVAHASILGYELVDERT EEHKMALLVREDVAMGAGKLAAQAGHAAVGAAMATRDRS ПMEFKQCI IVREDLKLSSGKLAVQVAHAAVLAMERADK KLAALVVRGDLKMSKGKTAAQCAHAAVICVQDSQERN
 MVI AVRRDLDLGKGKI AAQVAHAAVSCALTSMKKN EYKQVIVVRADLKMSRGKLAAQAAHAAVEAVLEIHPEW YKLVIVVRKDLDUGKGKLCAQVAHAAVEAVLNQLEKD HKLVFVVNMSLKMGAGKLAAQVGHATLGVYRLALKSE $F K Y K Q C L V V R A D L K M S C G K K C A Q L A H A A V M A A E H A D K G I W$
$M V V M V N D I K M G K G K I A A Q V A H A A V S V L D V N N D W$ MKQAI VARTDI DMGTGKLAAQVAHASLSAYEDAGDEA LK QCIVVREDLRLSTGKLAVQVAHASIMAMEDARK KQVI AARTDLGMGKGKLAAQVAHASLSAYEDAG

## MEYKQVIVVRDDLKLSRGKLSVQVAHASILGYEASNK

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EVKLVLVVRTDLGMGTGKI AAQCSHATLACYKYYLSRA EDVKMILVVRKDLKMGTGKIAAQCAHAGVAVVEEVLHPW MKQA VARAMGKGK CAQVAHASLGAALEAMKKK VFDYKMVIVVREDLNLSKGKLAAQASHAAVACALKTKKNK $F K L V L V V R N D L K M G K G K V A A Q C A H A A V A A Y K$ A $\quad$ A A K K Y RTKLVLVVRGDLKMSKGKTAAQCAHAAILCYQQSQQDQ D YKMVFVVNCSLNMGVGKACAQVAHAALGLQLFLSKTY MKQTIVGRADLGMGEGKLAAQVAHASLQAYEDAAKSA YKMVLIVNSDLNMGVGKVGAQCAHGAVGLYKTLQSKY KMVLVVRKDLGMGVGKIAAQCAHAAVAVVEELRAHE SEQKMVLVVRGELRLTPGKMAVQVAHAAVMLVTPDRSRR YKMVFIVNAELNMGVGKTAAQVAHAAL GLHRT LLDDP MEYKMVIAMRKDI KLSPGKMAAQAAHAAVSCSFASKKKN MKMTI AVRKDLEISCGKAAAQVGHAAVECVLLAMRRW EYKQVI LI RTDLGMSAGKKCVQSCHASVSSSDLVRKQE $\begin{array}{rl}E P L K M T L V V & R R D L K M G T G K D A V Q S R R S S Q M C V G S G A D R W\end{array}$
 EQKMVLLVREDLNMSSGKVAAQCSHAAVGLFQRLHPTV




R S L L Q WE QCGQPK|IVV|TCKNQQEMNK|L|RDAADNTG|LIPT F A RLL QRWERHGQAK I AL QDKGEDA LLALLMGTAHSLGI TSE
 R R

G G Q K KVVLKAASERELHELS EDADREGLPNA KK ЏENWKNGGQKKVVLKVPSLQDLYELKEIAEKKEIPTA



 $R R W L E S W R R Q G Q A K V V L R V D S L H E L Q E V Y R R A V E E G L P A S$ $\square P \square L R R W E K S G Q T K V A L R C S N E E E L L L T L Q A Q A Q S ~ L N L C A R$ PKML L L W W D Y G E T K I A L R A D T T E R L L E L E K E A K A L $R R \quad E W K G G G Q K K V V L K G D G E S Q L F E L A D V A D R E G L P Y A$ P S VLE A WK REGQKKIVLKVNSVEELFRFKEAARRADIPTAA P ELLFRYWHEHDQTKV AL RVVESLE EL EMMLEK EAKK HNLVCA RSVVSEWKAE GQKKVVLRVSGVSDLFRLREDAERAGI PSA K T QWKGGGQKKVVLQVDTEKKLFQLADNAERDGIPNA
 K K $\qquad$ K WY D E GM K K V A L K A N S Q R E L Y ELLK T DA E EA GII SA A
P R T E WK G S G Q K K V V L G A D S E S Q L F E L A D K A D T Q GV P Y A
 REAVEAWTRHGQVKIVVRGNSTEELLMDMCKSAKDGGCFCY P EMLLKRWEENGQAKI TTLQVPNKEEMDMLYAKA DSGGVNCY $K R I F R E W L D Q G Q K K V V V R V D D L K Q L Y A V K E K F E A A G I G T S$ VQWYD A WHA S GSSSKV AL QCS DEAA MMA L A K HAR QVVNL P H Y P S ALRRGWEHMGQAKI CVKCPTETELYDIQAKAQSAGLVNY K K WL E E W $\square$ K E G Q K KVVLKVS S LDELLVVYYNNAK SLGLPA S RE $\qquad$ K WKME GQKK I VL K V V K NL E ELLMKVFEKA K SLLGLPA A PMLMGRWECD GQKKVVTLGVKNLRVMNELLGEAKTARLTTA RIVRRDWKE EGQRKIVLKARTLQDVFRLRDEAERAGVAAA RELLQSWLAMGQPKIVLKVDKYEELMKLQEESSRKGVTAA

 K D IV V K WR EE GA K K I V L Y V R S L D E L M S I Y N Q S I S L N L N T V R R AL D A WRLDGEMKVVVKGENTEQLLEMFKQAKDLGL FA Y KK NWFME GQKKVVLKAPSERALYEDKVHAEQAGI STS
 E V VE E WMQEGMRKIVLRGRDEEHLGQLRSEAESLGIPAA RKAQKA WKGDGQKKIVVKVDGESALGELAEKARVEGLPNA K IVDA WRKS GQK K I V L K V K D L Q E M M MV K Y K A E KE GLV T A R R F S G Y G K H L V T K K V V V R V $\operatorname{S}$ G GV E E L R K M L L L L W E E Y G G E T K K A V WK N WK N T G Q K K V V L R V S GMEALRDI VI QLEK N N L M Y F A EKLLACWQDSGEKKIVLSGKDELELDDLAKKALELDI P H Y

 FKMLLCAWEDSGETKI CLLKGKNAA ELL ELL E KNAQQLLEL P C Y QEMFHSWLQQVGQKIVLKVQNEEELLNLADKAQRAGLDTA PK LVA HWERTGQAKI ALKANSEEQL E ELLEAMAKS LINLCAR E D AL NE WD Y F GE K K I V L K GE NTEEHL E A L F N K A K E M N V P C Y R K
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 $P D D L K R W E R G G Q A K I A L Q V K S E E E L L L L Q A Q A V S L G L C A A Q$
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 R R E WK G D G Q K K V V L


 $P$ L V FF E K WY A E G Q R K I V V K V D T L R E L Y E L K A S A E S M G V V S S RKWLD K WLA E G Q K K V V L A A E D A A HL Y Q I Y E TA K R L D L PT A K I VWK Q WWNT GQKKIVLK I K T L E E L L S I Y R K V L K E K I L C F V SWY D A WRF A GSKKV AL Q CENEEQLVMEAYRAARREGI PHA AP L L M R WEK T G Q A KV A L K C A D Q A E M D L L F A K A M S Lin i N A Y RKMAQQWDED GAKKIVLQGSNTAHLMELQALAMSLELPNY Q K N L K T W K S AL D NWKEGGGQKKVVLRVVPALKDLGELKKEKARREGFPTA PRWYDAWRASGCSKV AL QCPDEAAMMALAKHARQVNDPHY REMAWKWDHAGAKKIVLLQGTNMAHLLELQALAMSLSLPTK P G A L R R WR R G G Q A K I V TR V E D E A A L L E L Q ERAR A L G L G A P


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 E P VK MALVVRRRDLKMSNGKDASTAATSPRSAENPVSALW
 VEPCKLVLVVRTDLKLPAGK I A ERCGDATLASYKTLIARN EFKMALLVRHDLKMGKGKVAAQCSHAIVHCYEEGLRLK E YK LVL CVVRTDLCMGKGKIAAQCGHASIGAYADSVRNN

$K M V I V V R T D V D M G K G K V A A A V A H A A V V E V L K V N E S W$
 CKMVFVVNTELCMGAGKMAA QVAHAAVGLYQTMTDTW MAIAAVRKDLDMGKGK DAAQVAHAAVECSMKDSEKR Y K MVVFIV NT S L GMNDGK TA A QV G H A S V G L F R R L Q K S Y

 MSAGKI A A H

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



 FEYKMVIVTRE DLGLLS PGKLAA QVAHAAVACAFSTKKNN
LDDFKMVLVVRNDLKMGKGKIAAAC $M V V V V R T D L D M G R G K I A A Q V A H A A V G A V \quad L S S L S$ YKMVFVVNQDLKMS $\quad$ KGKTA GQVGHAAVGLYRELDENQ

 MK QVIVVNA ALK LDPK GKLAA QVA HAAI GAFLEASAAA VE P C K MV L I V R T D L K M S P GTVVSTH $\qquad$ QAT L A CYRALSKAN E Y K M V V L V V N Q K L K M E K GVVI V G Q C G H A A I S A F T K T L I I $M K M A V I R N D L K M G K G K M V A Q G G H A D I$ EAFLQAQKRK

 E R K M A L V L R GELLRLDVVGKSAVQAAAHAAVMLVEQARRAD $M G R G K V A S Q C G H A V L G A Y K K A D K R H$ EPLKMTLVVRKDLKMGTGKIAAAQKGDMTVDAHEGHWDEW $M G K G K I A A Q C S H A T$ L G L Y K K V V S R A


 K M I FVVV N S S L NMSVVGKTAA QVA HAAADDLYREDTSHE VDEVKKMVIAVRK DLDLGKGKDAA QVAHAAVACALKAEKK E
 S D CKMVVFCVRT DIVKMTK GK IVAS QCCHACLGVVEKKILKRN
 REDLP M GA GKV A A QA GHAAV GAVVSVVMEN
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 E PMKMTLVVRRDLKMGTGK IAVQSRRGAVSSYRSSGEHW HATLA CYK S L SK F N M Y N A K QVIV V R R D L K M R K G K I A A Q S G H A CVV E A V L LAA LA K E

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 E L K ETV K V V R Q DLRMKS GKIA S QCAHAATGMYAELVHRN



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 EK A L T D WT N S G Q M K V V L K G E D S Q H L E S L E V L A A D A R K L N T Y K K T L K K WLLD D G Q K K V A L WV K D E S E I I RASLKR WESEGQKK I CLLRVD GA DALAA A GKAKEKGLABY

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 Q A K L V R H W E R T G Q A K I A L K GVVS E E QLL L E L E A I A K S L S L C A R S S K A D Y WA S Q G S K K 1 V L K G T D D E H L

 K E WA E E W L A E G Q K K V V V L R V


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 M MKQA I ARTDVQMGRGKLAAQVAHAAV AAADAAA KMVIVINSGLNMSDGKTASQAAHAALGDYEVMKERE NYKLILVIRTDLKMGKGKVAAQCAHAAVAAYKAAVNY MSNIVQYIVVRSDLRWPLGAVIAQCCHATAAVMSQHTEDE RLVQYVVVRSDLSWPLGAVITQACHAATAAIHQHYSDP YKAKQLIVMRKDLHMRKGKIAAQAGHACVEAVLLAPAKK YKAKQLIVMRRDLRMRKGKI AAQAGHACVEAVLMAPRKR KMVLCVRRDLAMTTGKLAAQCSHATLGLYKTMVAHH MGTGKKCAQSCHASTSSADVVRVKN SETKMVIVMRKDLNMTKGKYVAQGSHAALGVVLDIQKHH YKSKQLIVMRRDLKMRKGKIAAQAGHACVEAVLMADAGE MAGIVQYVVVRGDLEWPLGAVIAQACHACSAVTHLIFHDDP MSNVGMYI IVRSDKKWPKGGVISQCCHAATASLHLIFASDE YKSKQMIVMRRDLKMRKGKI AAQAGHACVEAYLEEGARE MSNIVQYVVVRCDLRWPLGAVVAQGCHAATASIHAFRTHP MEEVKOV VMRKDLNMRKGKMAQCCHATLGVYELMIKNH MEEVKQVIVMRKDLNMRKGKMIDAGSHASVDALLSLFSCT LRMVLLVRTDMPLSRPELAQQAARTVLGLFKKQFKRK MDDIIQYVVLRGDLGWPDGAVIDAQACHACTAVIHLFYNDS VIVVRKDLNMSAGKVAAQCCHGAVGLVLLMASNL ■R पKMVLVIRRDVKVSPNE, FT DSAGAAVSLVQKVAREW QYIVLRRDLNWPDGALTAQGCHAATAAIATYFTHP MGFKLHVIIRLDLGMTKGKICAQASHAVLGLYKDLMETN KFKVVLVARNDLKMGKGK
E KKMVLVVQQDPNMKSGKDASQCAHAATGTYAEDMQSD LVQYVVI I RKDLKWTAGA\| $\backslash A Q A C H A T A A V V H T F K D D P$

QYVVLRRDLSWPLGSVVTQGCHASVAAVWN YRHH ECKMILGVRMDLKMDKGKMAAQCGHATLAVYKAAVKQR KMVILVRTDLNMTTGKDAAQASHAAVRLYQTACKDG MSG $I V Q Y V V V R G D L G W P \square G A V I A Q A C H A C T A V I H L S Y N D A$ SEVVQYFIVNKELNMSAGKTAAQGAHASLMSYLETLKAA NVQYYVLRNDLSWGFGPLAAQVAHASVAAD YAFREH $N\|V Q Y\| V I R S D L G W P T G A L L A Q A C H A C S A A L H E F R E P$ MSVGKI AAQTGHAILGNYQLLQKSQ LVQYVVLRRDLTWPMGSVVTQGCHASVSA DWENKDD $N$ FRLMLGIRNDLKMQKGKVAAQCGHAAMAAYAKTLND NFRLMLGI RNDLKMQKGKVAAQCGHAAMAAYAKTLNI MDLVQVFFVNKSLKMRKGKISAQCGHASLGGVKKTAKVY LKKVQYVIVRKDLRWPFGAVIAQACHACI AVIVENMDHD KLVIVCRNDIPMSAGKLAAQAAHAAVGAYRRHCTEQ RVKQVIVMRTDLNMRKGKMVAQGAHAAVAAVVENLTDP ME RLKMVLVIRGDLKVAPQVVTTLAAGAAVDLVEAAHPHW MAGLVQYV I RGDLK WQLGALMAQACHASTAVTHLFYHDP EKFKMVLVVRKDLKMGKGKVAAQCSHAALSAYKQVQVRN
 MS QGKMAAQVAHASLSAYRKASK
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MAALVQYVVLRKDLGWPLGALTAQACHAATAVIHLHYEHP LVQYVVVRSDLKWPI GAVI AQACHASTAVLHLFREDP LVQYVVLRGDLQWPLGALVAQACHAALAVVHAYYGQA MEHL LVQYIVVRKDLGWPLGSVIAQGVHAAIAVWEYRDDPF AK WS CHAALLACYQTLQVDN MGKGKVAAQCAHAAVAAYKIALMKN ATLKCYKTLHLKN YKSKQMlVIRRDLKMRKGKVAAQASHACVEAYLDHADED KLVCLVRKDLGMGTGKVAAQVSGTPENAYARDPPDQ QYVVLRRDLAWPLGSVVAQGCHAAVAALWVHRDHP LVQYVVVRKDLGWPLGSVVAQACHASSAAMWTYRDET DCKLYIVVRNDLKMGKGKVAAQCSHAAVSAYKKLGRTN NFKMVLVVRDDLKMGKGKIAALNA A GMYKKLLQRA $L \vee Q Y V \vee L R G D L P W P L G A V V A Q G C H A A L A A A H R H R E H P$
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 SETRQQQWK QA G QK K IV L Q DS S K E DVV F T HV E R A ER D G L P T A
 VTYCSPSNDDSMHKVTLEVKGEA QI LNLLAEKLKA GGI A H K DT QA Y L K DL D N M H KVVVLEAK DEAA L M K L V V K K K K E H DI K H K


 P K AL R L W E R Q G Q R K V V L R A S T E D E M L S L A G V A R S H G L I T S





 A TKKA Y V D D L D N M H K V V L G A K K D E E A L L R K L R K L L L E W W L D P A L R P WE EGGGNH I K V L G V D S Q N D ML L Q Q A A AR A L S S L A T H NTREYLS DLDRMHKVVLEAKDEES LCMLAE QLLQQNSVVDH Y TQAYLADLDHMHKVVLEVPDETALNALCSKLTDEDI N H L L D T W I S Q G E K K I V L K C D S E R QL F E I R D K A A A FA I P N H
 $D T V L L Y$ L N D L N R M H KVVVL G V E N A E Q L $P$ V L F A Q WA SLDD F P Q Q T Y E A H S L Q E L E S A D Q E A E N L E L E S F NTIA YTENLDS MHKVVLAAPTVTKKLALCEALRAANDIMK

 $P$ DVL
 ACNRWNNGGQRKLVLRVGGEKQMDDVVRRARERKABADA


 | $T$ | $T$ | $S$ | $M$ |
| :--- | :--- | :--- | :--- |
| $Y$ | $E$ | $M$ | $L$ |
| $L$ | $L$ | $D$ | $N$ | P H TLL Q Y C S P E N M H K V T L E V K G E A Q M L N L S E K L T A A G I V H K P K L L K R WR K S G T A K I A $\operatorname{A} V$ R V D S E E Q L L E L E K K A K K L P K L L K R WR K S GT A KI A V R V D S E E QL L EL E K N A K K L N I L T S

 H TKKLY L E DLLDNMMHKVI L Q A D N E T T L R N L A L L L K E N N I L H K
 K E WHF L WCRGGCTKIALKG DGLEAI QQI RSAARCRGLAC K R WY L WWN MV G C A K I A L K K G P D V E T L R R V L V S A Q E R G L P C C NTGQA Y L A D L L D N M H K V V L E I IA D E P A I R R A L A E K L V V E K K I


 F T K S Y L Q D L E N M H K V V L K A D D E A QL T E IV VT K L T N N N I D F Y D T V K $\quad$ Y L L $N V L E Y$ TA DLDDNMRKVVLLEAK DEENLCCSLAEALLQQNDVDSK A E EWLGA GGKK I ALSV NEEEMLKRFQMAKDQGL PAA
 $R V L L R Q W E Q F G Q A K D V L T C K N Q Q E M N R I K E T A A Y R G G I P T B$ NTRAY LQQQLDSMHKVVLEVADELTGLTSLSETLNQAGI DHK

 DTAEY LA Q S GS MRTVVVEEAPDEAAL SALAERLQQNGI DHK
 $P Q L A R H W E V T G Q A K I A L K G T S D E Q L L E L E A D A K S L N L E A R$

 NTKEY L K DLD NMHKVVLEVMDEDVLMELTLKLKLDNI DHK





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$L V Q Y V L I R K D L P W P A G S V V A Q G C H A V T K A L W E Y K E H Q$


K $V$ QYVVVRRDLTWPTGSVIA QAVHASVAAVWASRELT


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




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

MAKLVQYIIVNGEIANPKGALIAQCCHAVAAVNHLFSDS $V L W L N P D V P M S A G K A M A Q A G H G A Q L A W W Q L S G A E$

$L V Q Y V V L R S D L E W P L G S$ V VA QACHAATAALWLSRNEE VLWL NP DL RMSAGKTMA QT GHAA QLDA WWALDSAA $E L K M V L V V R Q D L K M R T G K D A S Q C A H A A T G M Y A E L M Q S D$ $L V Q Y V V V R R D L N W P T G A V D A Q G V H A A V A A V W R F R E Q S$
 $K L V Q Y V V V R G B D G W P T G A V L A Q A C H A C T A A D W M F K E D P$




QYi I L R R DL A WP LG S IAA Q VAHASVAALETEKTNE $N W V Q Y Y$ I
 YA P S SLEMPA GKLSAQTGHAYGDSLHVAERMD
 LV Q
 VL WLNPEL DMSAGKAMA QAGHGAQLA WWEL

 $Q Y V V I D R S D L L K W T G A L I D A Q A C H A C T A V T H L Y Y K D E$
$M V L V C R K D L D M S P G K L A L Q C G H A T V G \square Y R R L W R K N$
QYKLML CVRNDLKMMKGKMCAQCGHATLGLYRKFANSR

VLWLNPEVEMSAGKAMAQSGHGAQLAWWQLDAAE $V L W L N P E L D M S A G K A M A Q T G H G A Q L A W W E L D D E A$
 $V L W L N P E I$ TMSAGKAMA QA GHGAALAAWWDLSSVPE
 $V L W$ WP TLM QYVVVL R K D L
 D Y QVVVIVNRDLGMSKGKVLSQFGHADDSLHERLKDH $V L V V R Q D L K M G A G K I A S Q C A H A A T G L Y A D L L A S N$ LWV NPELEMSAGKAMAQAGHAAQLA WWGSDERA

 $L C L W L N P G L D M T V G K A S A A Q V G H G A M L G G V K L M S A$
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 LRLLKMVFVVRSELDDTAQEVAAPSTSASLSAGLQDHQRW


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RSARDDWRGDGQKIVLQGESKRQLFTLADSAESEGLPYA RTARAWQRDGFPLAVRPARDGAHWSELADATGGGLP RA AWRDAGFPLAVRTAEPDRW RERTSGGLP DT DEY RDDK MMAKVLK KGEDVKETESYLVAKGIDHT DTVEYLKSAGHMTKIVLKIKKEEDVEEIVGHLVSKNILDH ARSWRDAGCPLAVRESSARRWTELLAAESDGTSVP KGFWKSWKNSGQKKVVLKVSTLEQLTEVVKKLKS RT, HTVAYLQELGRMRKVVLEASDETVLRELAQA LEQQGGIP PDLVRAWRNNGSAKLALK GTQEDLNKAYYDAKTGGMPYV RVLLRQWEQFG AAADCKNQQEMNRDKETAEHRGTPTF R QAWRDRGLAAAVRTADSAGW AALTGGLP NTDAYTKNVDDMHKVVLAASTDSELISLSETLEAANIDHK REEARRYEGSGMRTVVLQVSDEGELLKLREKLVQKQVGHK
RK

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$\square$ L W DEQPEDYATCLAVKPYPKEEVQ TIRDRSYQEEPKGALTVVSLPPMPRILGQRFDGEFSL TVVDER RVYDAGRTQVPAGSNTIVALGPDDRSKLNDTNELKL VVRDAGFTEIPAGSATVVADHPA VVRDAGFTEIAPGSCTVVAEGP VVHDAGFTE ปAPGSCTVVADHPADRSAVPP
 V VVRDAGFTETAPGSCTVVAEHPA VVADAGRTEV
LWID LPEK LPTCLSTKPYPKSVVSSFFKKLKL LVQDAGRTQVPAGSYTVLA LVRDAGFTE WPA G



VVRDAGFTEDAPGSCTVVGRFPA
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RIFDAGKTQVKAGSKHSCGTG
VVADAG
VVRDAGFTEDEPGSCTVVADAPW
L WTEQPENTPTCLATKPYVKADVQ
$L V R D A G F Q E E P E M D P T A L A S T P D R K S A G R V F K G L K L L$ VRDAGFTEIAPGSVTVIAEVP
L W DEQPENEATCLATVPALKSRAFPLVRRVKL
【W VEDDMPVCTAVKPQPRNVVHKHपRHपR $\square$
LWR EQPENULTALALRPYQK
VRDAGFTETAPGSVTVIA
QVRHSQTTTVPKTSVVVVALGPAPSDVLEPTTGSLKL MARRSEMTVAKPSDVVVVALGPAPSNVLEPITGSLKLF


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UniRef90-V9XDI5 UniRef90_V8CRQ9 UniRef90- U6MKP8 UniRef90-M3EAS3 UniRef90 W8P8X3 UniRef90 UPI0003725B9A UniRef90-UPIO00360404B
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FEYKMII VTRNDLPGSPGKLAAQVAHAAVACVLLTKKNK KLVQYVIVNGELNWPVGALAAQCCHATSAVNYLYRDD LRLKMVFVL KNHPKKKLSAQEAAVFTSSAASVREDW MRQLII ARKDLQMSPGKLAAQCCHASLAGYRAEDMDE VLWVQKDLEMTVGKAAAQVGHAAMLAVFAGADD
VLWVNPTLEMTVGKLAAQVGHAAMLVVRLMSL $L V Q Y V V L R K D L N W P L G A V V A Q A C H A A V D A L G L S M A G N$
VWM QYiLLRSDLSFSRGAVIAQACHSSVYSDEKYRN VLWVNPGLTMSTGKTMAQVGHGAHLAWFDLSDVA VLWTNPELDMTVGKLAAQVGHAAMLAVKLL


VLWVNPGLEMSTGKTMAQVGHAAHLA WMVLPEVA VLWLNPELEMTAGKAMAQVGHAAQIAWWRLNDAQ MR LVMQVVRRDLGWGVGPLMAQVAHAATAVIHETRGDP
 EVRMALVVRTDLGMQKGKIAAQCGHAAVTCYKXMNARN VLWCNPELEMSAGKAMAQAGHGAQLAWWAL VLWVNSALEMTVGKAAAQVGHASMLLAGALDV QYVVLRRDLTWPLGSVVAQGFHH MCLVLDPRLEMTVGKSAAQVGHGAMLAVRLLDEED LI NPHLAMTVGKAAAQAGHGSMLAVRLLTD WVNPHLDMTAGKAMAQAGHGAQFAWWGAGEED VLWVNAELGMTVGKAAAQVGHASMLLAGALSVRR VLWVNSALGMTLGKAAAQVGHASMLLAGALPE ALNADLDMSTGKAAAQVGHGSMLL AAAMD $R L V Q Y V V V R A D L Q W P G G A V I A Q A C H A A T A A V H G Y Y H D S$ VLWLNPEVDMSAGKAAAQVGHATMILAALLHAAA VLWLNPGVEMSAGKAMAQAGHGAQLAWWDLDDRA VFWLNAPLGMTVGKAAAQVGHAAMML A AGAT MVO
 VLYVDRGLGMSVGKTAAQVGHGSMLL AAAQP VLWVDASLSMTVGKAAAQVGHASMLL AGAMS $R P T L W V N P T L E M S V G K L A A Q V G H A S M L A V K D A G M D$ LVQYVVLRGDLSWSLGAVVAQGCHAALAAAHAHWHHP VLWLNPALEMTAGKAMAQAGHAAQLTWWALDHRA VFWLNPELRMSAGKEMAQVGHGAQLLWWAMDDAA SKYVMYILVNNDLRMSKGKISAQVGHVVVNPSKESLEDY VLWLNPGVPMSAGKAMAQAGHAAQLIA WWDLPAPA VLWI DPALEMTVGKAAAQVGHASMLL AGAMT VVWL NPEVDMSAGKTMAQAGHAVQLAWWELDGER $V L W I$ DSALEMTVGKASAQVGHASMLL $M Q V V R R D L G W G V G P D M A Q V A H A T S A V L H E T E R T$ $V L$ WL NPDVPMTAGKAAAQVGHATMLLAALL ELYQFIVLRKDLGWPLGALAAQCAHAAVSAVWTYREDT LVMQi IVRRDLGWGVGPLMAQVAHATSAVLHETRNDP QVLWLNPELEMSAGKTMAQVGHGAQLAWWEDSDTE VL WANPGLEMTAGKAMAQAGHAAQLA WWASDAAG WIPEALPMTVGKAMAQAGHAALLARDDAPPAD LVLWVNPALEMTVGKTAAQVGHASMLGVRLMSE $7 V L W V N S A L G M S L G K S A A Q V G H A S M L L \quad A G A M S$


QYVVVRADLRWPFGAVMTQACHASVAAMHRFREQP
 KMYI AINSDLNMSPGKVGAQVAHAVYDYLYNKILDT QYI ILRNDLPWGLGALAAQAAHASVAAIHTFREHQ VLWVNSSLGMTVGKEAAQVGHASMLLAAALSTAR

VLWLN P E LDMSAGKTMA Q T GHGA Q LA WWE LS DE E $M Q I V R R D L G W G L G P L M A Q T A H A T A A V L H E T R E N P$ K C Y V I R N D L D M P E G K F G A Q $\quad$ G G H G $\square D A D V$ WK E VD $\square K \square$

 LVQY L V L RKDLSWPAGALVAQACHAATAALHVHRDHP WV D R T L EMSVGKAAAA QVGH GVMVLI A EMD VLWI DAAL GMTVGKAAA QVGHAAMLL AGADDV L VMQL IV R R DLA WGVVGPLMA QTA HAAVAV I HETK QRP $L \vee M Q 1 V R R D L K W P V G P L L A Q S A H A A T A D V H R F R D H$
 $V$ I YVDASSLEMTVGKAAA QVAHGSMLL A A A M D



## UniRef90 XотзС6

 UniRef90-U5EGK9 UniRef90-K2GBG7 UniRef90_D4K3E9 UniRef90_LOB154 UniRef90-V9XDI5 UniRef90-V8CRQ9 UniRef90_U6MKP8 UniRef90-M3EAS3 UniRef90-UPI0003725B9A UniRef90_UPI000360404BUniRef90_M3V161
UniRef90-E1ZCX8 UniRef90_UPI000368BF04 UniRef90-A0A058Z782 UniRef90-M5GBF3 UniRef90-H3G380 UniRef90-D2PSR7 UniRef90-C7Q7G0 UniRef90_UPI000455D659 UniRef90_F4E590 UniRef90-I2K2B7 UniRef90-E2L910 UniRef90-F8JWR2 UniRef90_W5THQ7 UniRef90-MOS541 UniRef90-H6MVJ4 UniRef90-UPI00036D586A UniRef90-UPIO003650632 UniRef90-W2EKD7
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UniRef90 F1YET7 UniRef90-Q5YRQ0 UniRef90-A4F8Z0 UniRef90-A3FPZ5 UniRef90-W6KJ55 UniRef90_A9URI7 UniRef90-W5BC82 UniRef90-D2VQW5 UniRef90-T4DFA0
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UniRef90 ${ }^{\text {DOLCZZO }}$
 EDTVEYFKDDNMHKVVLEAPNQESLTELSKVLTENDVKHK PDVLKYWHEHDQTKVALRVDSLEQ
KRWFLWWGQVGCAKI TLKCPESAMLDS $\square Y E V A L A S N L P C C$ KATYEEWFDGSFTKTVVGAKNRNQLDKAKTI AEEDGLVFF

 GDEAKTY LA A GMRTVVLQVPGEAELLKLRDKLEQSQI GHS RE A A RAA GFPLAVVRTAGPADWP

RK AWCEAGFACAVRTATPARWKELLAS AGLP
PEETVRWR $\square A G C P L A V R E A T P D R W R G L L A A D A A G H \quad A V$ DHMHKASRPGWGGLQKWGAEDEAQLRKLATKLGEAGVAHK $R A$ R A WRDAGFP LAVRTVAPGRW A E L A A S GL P TVV
 KIVVKGESTEQLMDLLKKTAKDVGVCAY RKT WVEDGFRLAVRTASAAQW KQLVRSGLP
 E ITKSLDEYMKEQKKI ILKCP GYKLEELEHAGG PTMLRRWYAGGQAKI ALKCPHEEDMDL
AKLVRHWERTGQAKI ALKGVSEEQLLELEADAKSLNLCAR
 DQAF A WAQRGFRCAVRDADPAQWQLCALVHGDAAPRTVAA
$P D V L A C C T D R N L D S M H K M K G E T Q L R N L A N K L K K E G D D H K$ ATARDWRAAGCPLMVCAADDSTWTRLLA AERAGDAVA ARAWAEHGFALQQVREVPARTDFDTKVANAQRAGDVVV


VYAWAAQGFRCTVAEADPGRWAELRRSVAEGGAVA

 RA A WRDA GFPDAVVRTAAPP
AEQAASWSADGFRCAVRDADPGRWAEVTA LVVAGRAVA
R Y LE GHKHGVGDF IILLQAKDEESDQKLAEKLQEDKI DHK
AR A WY DAGCPI DVVCSSAESKWAQLLDADRRGEAIA
 VDRCRQWAVAGYRCSVRSADPHQWARALDEVRAGRGVA

 RE EWAATGFPLAVRSAHGPAQWATLLA RA SWREAGFPLAVRTARPAHW ASUVDSGRP
TVVQSY YQ D DN K M H K V V L C T D S S E S L I K L S N L L K E S G I IH K $K K Y K L W T K D D K F A K I V L$ RAQEKDLIVNFIGTEKKRR
 PEQCQDWAHTRFACSVVRAD EQQWRRARALVEAGQADA RA A WAEAGFP LAV RTA DKERWRELVVAA GLP EK QCWAWA QNGFRCSVVRDAS PK QWAEAV DR LKRSEAVA ET QA Y L D D L K K N M R K VVVMQTA D QA S DE R L A S L L A A A D P P
 REYCSKENMANMRKVVLEDKNES QLTALSSEKLKGGDGUEHA

 RA A WREAGLTVSVVRTAPARDDFDAMAA A GLP R E RLLA GWREA GFP V TVV R RVDA A Q WA R LLA QPVAR D Q D L A WR TEAADWYDRGCPLDVRMPGPQRWAGLVEQAATGSAVP




 DVIA Y L S D MPNMHKVVLGA NEQELI QL R NRLCSAN I D H
 $R T A W R Q A M H K V V L E V P N E E S L K K V A E K L K E N S \square A H K$



## N

 H TVVAY L W E L L E RMMRKVVL R D RLLE R W DD D G L R VAAV REA D P A R WQ E L S TAAVARAA GV A A V





| UniRef90 XOT3C6 | $\begin{array}{lll} \text { GHTE } 90 & 100 & 110 \end{array}$ |
| :---: | :---: |
| UniRef90-U5EGK9 | L W |
| UniRef90-K2GBG7 UniRet90-S9VDB0 |  |
| UniRef90-D4K3E9 | IRDACHTEDEPMTLTCUGFRPLPDEDAHQISHKFHL |
| UniRef90-LOB154 | LF |
| UniRef90-V9XDI5 | AVRDAGFTEVAPGS TVIAV PGTVDE |
| UniRef90-V8CRQ9 UniRet90 U6MKP | VRDAGFTE |
| UniRef90-M3EAS3 | RDAGFTEDAPGSCTVVADHPA |
| UniRet90-W8P8×3 | V WDEDPERDPTCISLRPYKRSH口PDVVDY近 |
| UniRef90-UP10003725B9A | $\checkmark$ VDAGFTEVAPGSMTVV |
| UniRef90-UPIO00360404B | VVQDAGFTEIDPGSHTVIAEHPA |
| UniRef90-M3V161 | AVRDAGFTEIAPGSVTVIA |
| UniRef90-E1ZCX8 | L RDAGFTIEQPEDFATCCLSTAPAPKSAVAPLLKKLK |
| UniRef90-A0A058Z782 |  |
| UniRef90-M5GBF3 | WLEQPENTPTCIA A APNRRS |
| UniRef90-H3G3800 | VVQDAGYTQPPGSRTVLGLF GPVQAVDAVTGHLKLL |
| UniRef90-C2PSR7 | LVRDAGFTEI APGSCTVVA |
| UniRef90-UPIO00455D | WVEQPENVPTCLALAPNRRD |
| UniRef90-Y4E590 | V TRDKGYTQLEPNTLTCLNYGЏKTPEQLPE WVRNLKL |
| UniRef90-E2L910 | AVHDREL GTMTVLGTGPAPV |
| UniRef90-F8JWR2 | RDAGYTETAPNSCTVA |
| UniRef90_W5THQ7 |  |
| UniRef90_MOS541 |  |
| UniRef90 H6MVJ4 UniRef90-UPI00036D5 | $V R D A G F T E G A P G S V T V I A$ $T V Q D A G Y$ $V$ |
| UniRet90_UPIO003650632 | AVRDAGFTEIEPGS |
| UniRef90-W2EKD7 | VVRDAGFTEIEPGSATVVADAPWLRTGVPEV |
| UniRef90-W8A9A2 UniRef90 H6R866 | AVRDAGFTEAPGSTMV |
| UniRef90 UPIO0003713784 | $\frac{A}{1} V R D A G F T E V A P D S V T V V A$ |
| UniRef90-H3BF69 |  |
| UniRef90-UP1000363ED7B |  |
| UniRef90 c9YVU9 | LVRDAGFTEVAPGSSTVVA |
| UniRef90 UPIOOO3F0605D | L W W |
| UniRef90-H0R6X8 | VRDAGFTElAPGSVTVIAECPD |
| UniRef90-H210E0 | DAGFTEVAPSSLTVVALL |
| UniRef90 L8DK00 | VRDAGFTEVAPGSTTVI |
| UniRef90_UPIooo363B7F6 |  |
| UniRet90_UPIO0035049C5 | V WTEQPENVPSCLALLRPYPKDQVHPHLLKRFKLL |
| UniRef90 UPIOOO31FFC74 UniRef90- UPIooo29853CE | VVRDAGFTEVAPGSCTAAAEHPA |
| UniRef90- В6АСЗ9 | L-WNEKPEDTPTCIA |
| UniRef90-UPIO001924DAE | YIDDQGVTQTKPGSLTVVGF YPSNDMSEKFKMYKLL |
| UniRef90 E2PVU2 | VVRDAGFTEAPNTCTVVA |
| UniRef90-D9UGH2 | VVHDAGFTEVVPGSATAVA |
| UniRet90-T1VMK6 | V RDAGFTEVAPGSMTVIAV |
| UniRef90 R7SNN4 | IQHHLWIIEQPENVPTCLA |
| UniRef90 C4LJZ1 <br> UniRef90 ${ }^{-}$W7SGS 3 | $V V V D A G F T E V A P G S R T A V V$ |
| UniRef90-A4S117 | LWR |
| UniRef90-M2R4K7 | HHLWIDELPENVPTCLALAPNPRENKVKKAL |
| UniRef90 NoD 5 W2 UniRef90 C1E481 | WWY AGF EQPEDYPTAVATRPYRKDEVSADFKK |
| UniRef90- UPI00037C093E | VVRDAGFTETEPGSCTFVADAPWLRGRV |
| UniRef90-C8XFW8 | SVRDAGFTEVEPGADTIIATRPDP |
| UniRef90-F1YET7 | VQDAGFTEIEPGSMTV |
| UniRef90 Q5YRQ0 |  |
| UniRef90-A3FPZ5 | L WVVELPESTPTCIA |
| UniRet90-W6KJ55 | VTWQQAPSQLPAATATVVALGPSPSSRLS |
| UniRef90-A9UR17 | WIEHPEMEATALAARPIMYSTAPKCLKK |
| UniRef90-D2VQW5 | WVEQPENIPTSIALLKPYPRS |
| UniRef90-T4DFA0 | VDRGLTEDPKNSTTCVNLGDFNEDEIPSTTKR |
| UniRef90-C6LOH2 | (lieqPEDLLSAI GLRPYPKELVRPYUKHLPLL |
| UniRee90-F6ES69 | VVRDAGFTEEAPGSPTVIA |
| UniRef90 G6D036 | L RDAGWDEQPENVATCLALLKPYPKDEVKKFVGKFKL |
| UniRet90-UP10003: | RDAGFTEDAPGL |
| UniRef90-UP1000441764 | LWILEQPENEPTCVAIAPNRK |
| UniRef90-H6X3Z5 UniRef90 R9SVP9 |  |
| UniRet90-H8GAR9 | PVRAGFTEVEPGTVTVV |
| UniRef90-V6LDI9 | G Q $\square_{\text {d }}$ |
| UniRef90_L-5KS28 | LWL |
| UniRef90-A0AO22LRQ4 | AGYTEVAPGS |
| UniRef90-A0AO59MN20 UniRef90- W4JMZ1 |  |
| UniRef90- J9VZM2 | YHL W |
| UniRef90-S4XCP9 | VVQDAGYTEVAPGSVTVVA |
| UniRef90-GOHA61 | VVQDAGYTEIAPGSFTVV |
| UniRef90 UPIO0036F870E UniRef90 M8BR99 | VVRDAGFTEDAPGSCTVVADVPWPKS |
| IRef90 DoLCZ0 | AVRDAGFTEDAPGSVTVIA |



UniRef90 I1CLT4 UniRef90_UPIOOO36E034D UniRef90-W7J1W3 UniRef90-E2MXH8 UniRef90-L1MKB4 UniRef90-V6LUMO UniRef90-RTWLXO UniRef90-T1MLDO UniRef90-W5Y2R8
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UniRef90-C6WNM9
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UniRef90-X7EDT2
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UniRefofo-F4QKV2
UniRet90-T1JCY8
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UniRef90-M3UVP6 UniRef90-J9HZ64 UniRef90-UPIO003C45711 UniRef90-U5E310 UniRef90-C2GJN5 UniRef90 H5UR63 UniRet90-L2GNL3 UniRef90-C1MTH8 UniRef90-UP10001FFE35C UniRef90-U6GJS4
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UniRef90-W5WO96
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UniRef90 MOUE62 UniRef90- J91296 UniRef90-s8F1W2 UniRef90-S2YYH1 UniRef90-X5EBZ1 UniRef90-K0.JPC1 UniRef90-D8HSQ1 UniRef90-R7S9K0 UniRef90-G3MA66 | UniRef90-W5XW11 |
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UniRef9——uPlocous

NTKEYLDDपDNMHKVVDETKNENSLEKLLAEVLSTHOVPF ${ }^{80}$ RT AWRAAGFPLSVRSAERTEW DALTRSGLP HDADENWAALDHRTAVRTWAAAHPGADPEAAWRDHGVVAV EDAWAWAQSGYALDVKEVPREQWPAPELRAVE LE WVLQWAERGFDLQVREI SAEEFDKQCARADA STEIENWKEHGKIVLFYVEDFEEFQRLSSVAKAQKVQSD ALAWAERGFACSVRDADAQQWE AVRARMNSGEAV DTAAYCNLDSMHKACTLEVKGETQLKNपAEKLEAAGV EEEARAWAATGFDLQVRGVDAAEFARCCAAEGSSTPAV
 AAVHTWAACGFPLAVREVPP RAEFEAHCGEPGVAV EKAWTWAETGYALAVREVSTAEFTADMSRAVVS
 AE DWFAAGCPLDVRAADPERWAELTAAAQRGT AA DKYTSFENLPNLRTVVLSVENESSLLDYHRV NKYFDVWKKTGQKKIVLKIS RT AWREAGFPLSVATATADRWLELTVS GLP RDRLDEWI AQG LPVAVREADAVQWRRLSECAEAGVAGTA RARLDRWIAQGRPVAVREADRPRWRSLSEAVAGGTPVA EAWAVRWALDGFPLAVREMPRE AELARWAADGFRCAVLTPSRAEWDALVARPDAI RDTLAVWREAGESMDVLGAEDAANLDALLVFGASSHRPTT DTVAQWAGAGYPVVVAEADAEQW DRLCRAVDDGRAVA

 SLVDDYENEDGGSKVCLWANDEDHUHKDHAEIQKLGVPCA
 KDILHFWRKNGQAKIVVKATQSETNEDIKKCRMNNILYN REEARRYEGSGMRTVVLQVSDEGELLKLREKLVQKQARNE YTSRYQADLGQMRKVVLQVDNDRHLQEFASTLRSRDVRH DERRKTWQAMDFRCAVRPATKEHWGDDPDRAWREHS ST WLDSWEQQGEAKVVLKLPDEETGLQQVKEAMLSGLNAC DEAQTWYDAGCP LDVRLASAERWSALVAAADRGA A A A REPACNHEHSP VAAAADWAEREFRCAVRDAG GARQWAELVAEVNAGR A AVV GDLLARWHAA DCPVRVESAPESRWAELLTSVHDPERAWR GTMDYLGLLEDMTTVVYGПGEKDMCSI MEGLDSFGVKYH RAYCAPGA 1 PVA E DET ARAWRVAGCPIAVCQPSRQRWA FDWVQSWARRGFELCVVETDP FEEVKRWAARDFVLSVREDDSEG DACTRWEQAGFPLVVREVSGGDFAGLREQMRALAGTPGA ATRLRE WADRDFRCAVRQADHATWRRDPASAWRDRGVVAV VEDAWSWACMGFDLQVRELPDEARAEFQRWVQDPHVVHV ETDKYMEDMDNMHKVTLGVDSEAELDAAREKLEKKNLLHR AAAW ADDGFPLHVCEVDAARARQLRAGSGRSSGRTAA LDWUADWAARGYPCAVRTATAAEWAALEERABDSNGTV EVMEYMKDDSHGRKITLKVPNERELGRNVKRLQDSNVDYY DLVFGWLGAGFPVRIVAGSTREWNAVLQGE K SDELAAWAAKDYRVAVRTPSPARWKELCEAGWRDDRVVAVV VDEARDWAETDFRLSVREVSATDFRTACAQDG
RVVEYDDKLETMHKVVLGIKNLGQLRKLQELMCEA NVQHHTESYMCSRKVTLSVESEEELLGVSKTLQDNGTEHR PKSLRRWERCGQVKVVVKVESEEDMLVLQGRAKSMNLPTH PESVNEWARKCWPKISLKCKDDKELLE QKRAEEGGINHY PETKAYLDDLKNM-VKVADRKGIVKLAALLES
RDRAREWRAAGFPLHVCEVDAQRFADRRAAAERGHRDAV EELKE WAALDYRCAVRTPSPAEWDALLAR AB PGVV RA AWADRGFRVAVRAASVAQWKELHEGAWRRDRVIVA PNVKTY允EGEGMRKVVMETVDEDSLRSLVSKLLDSLKIPYH FKEWYGERGNKQKKIVLRGKEKELNKLIELGA PKTARQYRSQSAAKIALHTGTNEEDEALYERFREYA-GAT EQAWQWAQEEYALSVREVPREVFNQALSQDPERGWDAV SSGYNKWKLCGEGKVVLVVGDLSEFKTDKQKSKEENLPCS N
RAYVAPEALGSMTKAVLELKKGEPQLDRALSEKLAAACRAHH DELAA WGERGYACAVRTATVDQWKQLHAGAWRERRVVAV




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UniRef90_UPIO0040D9A19 UniRef90 K6V4R6 UniRef90-I3EHPO
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UniRef90 F4CSM6
UniRef90_D7T7N9 UniRef90_UPI0004792E58 - $10 \times 727$ UniRef90-F9PM29 UniRef90-D7E7J1 UniRef90-D1AAH3 UniRef90_E6ZU63 UniRef90-D9W877
 APARAAWGRQGHPCAVRTAEAADWADDPEAAWRDAGLVGV PADLAVWASRNDRCAVRVASPAQWVRDPHGAWEEQGLVAV TNEALAWANAGFPLNVIECED DEFIRATEMPGAVClV ARARRRWLDAGARVRVVRGVPWDEHVRRSTAA GEGDEAWLKV HAPVGIRHLSRKDFDALSQRASGP RE A WA GQDFRCAV R IPG $\square G R W N E L H P G A E P G \square A W V$ LIE WVRAWA AMDFALNVREVAPDTF ARYADNPDA NTKEYLSD DDNMHKVVLETKNEGS DEK KATVLTEHQ TPH

 GEGARRYLAGGMRTVVLQVSDEGELLKLRDKLRG ET IAA Y L S DLK NMRKVVLQAPDLPSLLKLSSLLSAPDQPTQ APALAA WREAGCPSRVL RTPSAA WQQLLTDVARDHRLLAV | $P$ | $E H V$ |
| :--- | :--- |
| $D$ | $T$ | PD TVGYTSDLENMTVVVLMADEHELKDVADEGSQRLANN RA A W DDGGL AVVDEPDADWDRCVKDAT KDLYNKWKKGGEAKIVL CGSSEETLSAYNNS ITKKGILCVV K EVYYEDWIDCGDFTKTVEAAKNRTHLLKAKAMAEEMGL RHTLETWRHDGFRVRVVTPTVEHWDSDVARVR

QVAAPAVRTAPTSDWWCAASDDARAARYGVA VPAYAVRVPGRERWAALQGDVEAG A A V
R E
Y $\square Y$ MWENCGQVKVVLKTETKQYCLDFLMVAKSPQL $R E \square Y N R Y L N G R L T K T V C L A R N L N K L E Q A R D M A L E L G L V F G$ RE QWRADDFRVRVDEPREAEWAAATRPVA PAMRRAWAEDGYRVRVV VPSREQWETTTR

 QHYVSAAHLGSMHKVVLQTPATSEARKVYEEAVSAGEEEE AVQAYDAE GDSMRKVVLEVHGEEELDRK DAQRAAWREAGFPLAVRVAPAERWMR GALTRSGLP

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| UniRef90 R4T2M4 | RDAGFTEVDPGTVTVIA |
| UniRef90-A0A059F502 | EWLEH |
| UniRef90_UPI00040D9A19 | AVRDAGFTEVAPGTVTVIA |
| UniRef90-UPI00040AD32B | $V R D G G F T E V P P G T M T A I A$ |
| UniRef90-K6V4R6 |  |
| UniRef90-I3EHP0 | V W |
| UniRef90_A7ARU8 |  |
| UniRef90-S5SWZ8 | A VR D A GFTEDAPD S LTVVAT |
| UniRef90-UPI0003673CC3 | RDAGFTEIAPGTLTVLARRP |
| UniRef90-IOV5N2 | R DAGFTEVEPGTVTVVA |
| UniRef90-UPI00037BA6F9 | RDAGFTEI APDSIT TAVFGP |
| UniRef90-UPI00037F4522 | VRDGGFTEVPPGTMTAVA |
| UniRef90-UPI0003B627AD | VIQDAGRTEIEPGSTTA |
| UniRef90-UPI0003729AA9 | AVRDAGFTEVDPGTVTVLA |
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| UniRef90-S2J1Q6 | KVKW\EQPENDPTALATAPLRS |
| UniRef90-17LB30 | VV DAGFTEVDPDTTTALGL |
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| UniRef90-F6S0H6 |  |
| UniRef90-J4GJQ1 | LTA H H L W DEQPENVPTCLALAPNRRD |
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| UniRef90-UPI00037983CB | LVRDGGFTEVPPGTLTAVA |
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| UniRef90-UPIO00475473C | AVRDAGFTEVAPGTVTCTG |
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| UniRef90-D1AAH3 | $\vee \mathrm{V}$ DAGFTEVPPGTTTAVA |
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| UniRef90_FOVPQ3 UniRef90-D9W877 | V VRDAGFTEDAPGSCTVVADHPA |

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