



## QUERY

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UniRef90_A9KMU1
 KI A A GADAIVLDVKTGSGAFMKSLDDARLLAKAMVDI GNR K 1 A S G A A D A $L \mathcal{V} L$ KLAS GA D A I L L D V K K V G S G A F M K K E E D A R R L A E WM V K I G N R K I A S G A D A I V L D V K T G S G A F M K D Y D Q A R E L A E A M V

 KL A A G L D A L A MDV K VG S G A F MP TYEA S L E L A R S I TA V A N G KI A A GADAI VLDVVKTGSGAFMKTLDDAEALABAMVRIGNN K L A S G A D A I V L D V K T G S G A F M K N ET D A V S L A K E M V KI A C G A D RIV VLDV K T G S G A L M K T V KI A A GADAIVLDVTTGDGAFMKNEKDAERLARTMVQI GKL
 KLA G GA D GYVLDVVKVGS GAFMK TIE QA TEELAEAMVGI A K A KLATGSDAVLLDVKCGNGAFMKTPELAKELSKTMIISIGKE KI A A GADAIVLDVKKAGRGAFMRSVDEACTLARAMVAI GHQ
 KI A A G S D A I VLDVVKVGRGAFMKTLDQAEQLAHTMVQI GHLD
 K L A F G S D T I L L D V K F G E G A F M K TIIE E GK E L A S S M I K I G K S KI A A GAD AI VLLDVVVGGDGAFMKTEEDAVALAEAMVQI GNN K L A S G S D A I C C D V K V G S G A F M K T L D E A K K L A K L M M V N I G K L
 KI A A GND A I V L DV K VGGS GAFMK D D Q A G E D L A R T M V K I G R S K L A S G S D A I V L D V K V G N G A F M K T DV Q A S QL A K V MV E I GT R K L A VGA DALVLDVVVGS GAFMKDVESATKLIEIMVSLGKK

 K A G G A D A $\quad$ A
 K I A S G A D A I V L DVVKYG E G A F M K T A E D A EKKLA TAMMV S I G K S
 K I A S G A D A I V L D I K V G S G A F M K T I E D A EI L A K T M V S I I G N S KI A A GS DCI LLLDVKA GS GAFMKNVEDADKLAKAMVEI GEN KI A A GADAIVLDVKTGAGAFMKTLEGSKDLAHAMVSI GNN KLAEGLDSLVMDVKVGNGAFMPTYELSRALAQSIAQVATA K I A S G A N H L V L DVVKVGA GAFMKT DE DAREELAK TMVVEI GK M K L A A GS D K V V D V T T G S G A FMK NTRDA K K L A K H MV A I G N H K L A C G LD A L V MDV K VG S GAFMPTPEAS QELAETVAEVASR $K L A L G S D A I V L D V K T G S G A F M K T V A E A E R L A R L M V D I G N G$
 KI AS GSDAIVLDDVKVGS GAFMKDLDEARKM AKAAMVQI GNS KLAA GLDALVMDVKFGSGAFMNEYERARELAQSITEVATR K I A A G L D A L V M DVV K T G S G A F M E T L E D A R A L S R S I I GV A G E

 $K L A A G L D V L L I D V K V G N G A F M S T A D N A T A L A D A L V S V A N G$ KI A A G A DVIVLDVKVGGGAFMKDEESAVKLADTMVRIGDN
 K L A A G N D G I L L K L A S G A R I I L L D V K VG D GA FM K T I E D A KV L A Q K M V K I G T N KI A G G A D A I V L DVK T G S G A L M K SLLD G A L E L A R L M V D I G R H
 KLAAGSDAI L L DVVKTGSGAFMKTIDDADELAQEMVNI GEN KLAAGADAIVLDVKTGSGAFMKNLDDAKALAKAMVITIGKG K L A T G S N C I L L D V K K C G N G A F M K N L E O A K K L G L L M I E I G K R
 KLAA GLDALVMDVKVGSGAFMATPERSRELAESVVAVGTG


 KLACGSDTILLLDVKYGKGAFMPTPQKALEELAEAMLDDIGKH KI A A G A D A I V L D V K V G S G A F M K S L D N A K E L A E T M V A I G K A
 K L A A G S D A I V L DVVKVG D G A F M E N HE D A S V L A NLLMV K I G N N

 K L A T G S H C I L L D D V K C G N G A F M Q N I E D A K K L G S L M I


 KLASGADAIVLDVVKGS GAFMKTEEEAFALAREMVQUGKN KLAS GADSIVLDVKTGSGAFMKTLDESKALAQEMVNI GNK KLSAGLEAL AMDVVTGNGAFMTSLEDSRALASS IVAVANG K L A A G A D A I L L D V K V G R G A F M K N Q D D A K E L A R A M V A A A M R KI A S GADSIVVLDVKTGSGAFMKSLQDSKRLAKEMVIIIGKQ KLAAGLHGLVLDVKTGTGAFMATLEDSRALAESLVHVANG K L A A GLLQS LVL DV K L G N G S F M T D P D E A K I L A R S L V D V A N G
 $K L A A G L D V L V M D V K T G N G A F M A K T E Q A Q E L A A S I V A V A N G$ KLAA GLLDALVMDVVFGS GAFMQRFEDA EA LASSSIV TVVSKG
 $K L A A G L G G L V M D V K A G S G A F M A E T N E A R A L A E S I V A V A N C$ K I A A G A D K L L LDDV K C G S G A F M K T V D D A DA L A K E M V S I G E E


## QUERY

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210
220

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 DLTELSVTLA GQMLFLA GAVDSVDQGMTKALEQLENGQALL
 DVVEVTVTIGAQLLLDAKDETDFEVAKRKLAKSLIMDGKALL DLLELSLVLGAHMLIAAGVTDDLETGDNMLKQTINDGRAI DLRELVLAL GSQMLVLAKQAKDLNQGKQKLLQAI QSGQAL DLVKL CLNL GSYLLYLGGUVNNIDDGKNKLAKTLKDGSAL DLRQLCLAGGKLLLMSNFADDEDEAKEILETNIRNGKAF DLTEVCLQLAANMLYLADKG TLDDCRRLAGDALSSGAA
 RLDDV Ti TLCAEMLVLGKDADNTEQAHQQLQAVLDDGSAA
 DLYELSMEEAEKLLLVSGHSQTEEEARKVLEEKISSGKAY DLEDLCMALGSQMVFLAGKASSLEDAEVKLREVIANGKAG RLHEATMALSAELLVNGKLAVNRDEARAKLQAVLDNGKAA DFYEHCVETAARMLLISKKAESMEEAT KMAKRTLEEGGAL DVKEVSVALAGMMLSLGLENVSHSQGKRMAKKALSSGQAF DLKEVCDELAANMLFVAGKGETVELCRNLAAEAAEKRTAL DLEDLCVALGSYMLVSAGKADSLEEAADKLRGTLKDGSAY DLHELCLTLGSNMVYLAGHAKSVQEAREMLEEVIRNGKAL RVYDVTMALAAEMLAVSGVATDVADGFQMASEALESGKAA RLAEVVFTLSAEMLVMGKVTESHAEARKRVEAAVRSGEAA DLHELCCILGAHMLVLGGKAQDEADARRQLEQHLQDGTAL RLWQVTLALADQVLLCAGLASTAEQAREQLLTVWCNGEAL DLYELCLELGSHMVAGAGKAQNCAEAKEMLAGTIKDGSAL
 LVELCLAVGGTMAWLAGKVPDPEAGRRLLARHLEAGDGL DLEELVFALGSRMVLLAGKAENLEDARGQLEQALAQGKAF DLTDVCIELLASNLAYMAER DTLENCKTRVKEVIENGKAF DFEEILYSSGTTLLLLANKAKDEQEARLMLDEEVISNKKAL RLHAVVMALCVEGLLAGNLAATRQEAETMLLRSLDSGAAA RLYQVTHALATEMLVQAGUATNADDAAMRLEKTLASGEAL DLTQVCDELAANMLHMADKG SVQECREQAGKAVEDGSAL DLNLVTSVISGHLLTLAGMJKTYEEGYDMSLKTLKDGKAL DETTVALTHAAYMVQLGGAFKDFDSAYEKLKDLIKSGKAL DITHLAEKLSGIMVYLGGKAKTPEEGMEMTAAALRDGRGL DLVELCVELGALMLVAGRKVQNTQEGRKRVRETLENGQAL DLVELSLLLGSHMLVLAEKAKTLPEARAMLENALSSGAGL DVRELCLVLGSHMVYLAKKADSVKAARAKLEEIIDSGQAV DLKEVTYALSSSMLQLAGRVKSFNEGDKLSEQQURNGKAL DLIKLCLTLGAQMLKVAGMVETESEGREQLKEVLNSGAAL RLWDVTVALAGEMLVSGGLAKDSAEGRDKATDAFSSGKAA DL DEVCIAALASMLFLAKNEHTEQECEKMARKAVEDGAAL DLMEVTYALGTELALSTGKASSPEEARDMLRQSIQSKSAL DLRNLGLELAAHMTVLAGAFSSYEEAYQALEQKLDNGEAF RLHQVTMTLADQMLLLSGDAASKEEAAAKLNDALDSGRAAB DLRELAVELAAHMTLLAGVYQDYSEATQSLESLIDNGDAL $R L D Q V V V A F A A E M L V A A G L A T Y K V E A E A L V R R A L E S G A A M$ DLTQVCVEVAANMLFLAQKG SMEQCREMVKKVIHEKTAV
 RLYEVTAALAAELLALAKLIAPDAAAGRALADRSTADGGAA DLKELCLYLGADALVKSHKASDTNSAKDILNKHLTDGSAY AFHAVTVALCAEMLVLGGLATDIAEASRKVEDARDSGRAA DGTDCVELAANLLYLAGKG SMDSCRNMARGQUANGEGF



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UniRef90-G4RFR2 UniRef90_DOCWE5 UniRef90-A3Х8С5
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 KMSGRGLGHTGGTIDKLESIPHVNVALDKENFFNIVKKVG KMSGRGLGHTGGTI DKLESIPGFRTDLGLAEVAGQVREI G KMSGKGLGFTGGT| DKLESLKGFNTN:SEERFINQVNDIG KLSGRGLGKTGGTIDKLESFPGWTSELSNDEFVDNVNKVG KMSGRGLGHTGGTIDKLGSTPGFNTSITMDQFISNVNSHG KMSGRGLGHTGGTIDKLESIKGYQVERSKEEFIEQVKDDG MISGRGLGHSGGTLDKLE KMSGRGLAH KMSGRGLGH MISGRGLGHTGGT DKL KMSGRGLGHTGGTVDKL KMSGRGLGHTGGTIDKLE MMAGRGLGHTGGTVDKVE $M \overline{M S}$ MISGRGLGH KMARGHGGTLDKLEA KMSGRGLGFTGGTVDKMQS KMSGRGLGFTGGTVDKLE MISGRGLGHTGGTLDKMEA KMSGRGL GHTGGTVDKLAA M MI SGRGLGHTGGTLDKLEA MISGRGL GHTGGTLDKMEA KMSGRGLGHTGT DKLE MMSGRALGHTGGTLDKLEAV MLSGRGLGHTGGTEDKKAS
 MLSGRSLGFTGGTLDKLE KMSGRGLGFTGGTLDKLE MTAGRGLGHTGGTLDKLD QLSGRGLGHTGGTLDKLEAM
 MISGRGLGHTGTLDKESFGWTPELSEAQFLTQAHEDG KLSGKGLGQTGGTADKLESDPGDTTDISDEDFKAQLKEDK MLSGRGLGHTGGTLDKLES QLSGRGLGHTGGTLDKLE MDSGRGLAHTGGTLDKLES KMSGRGLGHTGGT:DKLES MMSGRGLGHTGGTLDKLEA MISGRGLGH KMSGRGLGHTGGTLDKLE MLSGRGLGHTGGTLDKME

KMSGRGLGGFTGGGTLD KMSGRGLAHTGGTLDK

 $\stackrel{M}{M}$ | A | P |
| :--- | :--- | :--- |
| P |  |
| K |  | KGFNTSLTTRQFLQAVEDVG PGFNGHOTPAQLQRDLDEVG

$V$ QGWRGEMTEAEFLDRARRGG PGYQVEDSEQDF:KQVKKDH PGYNATPSGPLMGRVVREVG PGFNINDGGRDFIEVLKKSN
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$P G F N V M Q T S V E M T N D I N D V G$
$P G F R T A L S M Q E F G E V I A Q C G$
FP G F K T N FTTF D E F V V K I I E K T N
P GFRTALLTE E QLRTQQI G DI R

A G WR A E L T N E E L L R Q L E D V G

P G WR A DVDVVDEMRALLERTG
P GWRADL GPEELRGQLREVG

A G WR A D L S V E EMT N QL A D

 FPGFKVEID F A E F V R R I V N K T N P G F R V S L T S Q E MTHMMLR T V G $V A G W R A R L S N D E F V R Q L S E V G$
 $P G W T A E D T H D Q L L A Q L Q D V G$ K NF EFSSTTTK E E L M D I A G K T G



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|  | UniRef90-V712F5 |
|  | UniRet90-F8HCR3 |
|  | UniRef90-D0LL72 |
|  | UniRef90-K9ZXB6 |
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|  | UniRef90-R5PZ |
|  | UniRet90 G40UY0 |
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KLLAAGADIVIVLDV|KSGSGSFMETEDKARELLATELVIVIVGKL KLASGADGIVLDVKTGDGAFMKTDEDSKALAREMVQI GTL KLAGGADRILLDVKFGRGAFMKTYSDALELAKTMVA GRV KI ASGADAVVLDVKAGTGAFMQKTEDALLELARAMVQI GRQ KLASGADKIVLDVKVGRGAFMKTDEDAKKLSETMI KI GNN KLIIENDGLVLDVKVGNGAFMKTVDDALDLSKRMI EVGKQ KIAAGADKILLDVTVGQGAFMKNMSDAEKLSETMVALGHE KLAEGADALVLDCKVGTGAFMKTDDDARALSQAMRVIGQA KiAAGAQGIVLDVKYGSGAFMATLEAKTLADIMVGUGKN KIASGTDALVMDVKTGAGAFMKTDEEAEELARTLVEIGKG KLACGADAVLLDVKVGRGAFMKTAEEARTLAALMVDGRQ KLAEGANGIVMDIKTGEGAFMSDIKNAKALAKSLRDTAKR KIASGTDALVDDVKTGTGAFMKTLDQSRLLAKALVEDGKQ KLAEGDDSLVMDVKVGDGGFMKTLPDARALAKSIVSVGNA KIASGTDALVLDVKTGSGAFMKTEEDAKELAQALVNI GRS K| A SGAEKIVLDVTVGKGAFMKTMENAELLANEMI EI GKL
 KLAAGLDALVLDVKCGSGAFMKTAGDARALAQALVSTANA KLAAGASAILLDVKTGSGAFMKTQEDADRLAQTMVADGEA KIAAGADAIMLDVTVGDGAFMKTLEQAEELSKTMVSLGKE KLAAGLDALTLDVKSGSGAFMKTLDDSMGLAESLVSVANG KLAASPDALVLDVKVGSGAFMKTLDEARKLAQALTETANT KLAMGADCILLDVKTGSGAFMKTEQEAVQLGEAMVRTAKL KVAEGSEALVFDVKCGKGAFMKTLSDAEALAVSLVGTAKA KVAEGADALVFDVKFGSGAFMKDAADGEKLARSLVDTGTA KLAAGLDGLVLDVKAGGAFMTDMADAERLARSLVRTSKG KLAEGLTGLVLDVKHGSGAFLPEVERGLELARTMIALGAD KMIVENDGLILDVKTGNGAFMTTIEDAKDLANRMI EVGKQ KAAEGLSSLVLDVKYGRGSFQCTPTDAENLAKLLVAVGNG KLAGGAQAIVLDVKYGDGAFMKTRKKAEELARAMVRIGK■ KMAEGLDALVTDLKCGNGAFMKNTEEARELARTIVRVAKN K TAEGTANLVLDVKVGSGAFMKELDQARELARTMVDLGRD KLAGGAKGIVIDVKTGAGAFLPKLADSRKLANSLVSIGTR KLASGAHTVVLDVKVGAGAFMRTLEDGRALARAMVDIGTR KAVEQLSTLVMDVKFGEAADFPSQEKARELAHALVGVGAR KLATGANDILDDVKCGNGAFMKDLKSAKELAQTMINIGKE KLASGLDALVMDVKVGSGAFMPTPEKSRELAKSVANVATQ KLAADDDCIVLDVKVGSGAFTKTTDDGRLLATKMVDIGKS KAAESDFALVLDVKYGKAALYKDINSARSLAQLLVTVGNT K ПAAGADAIVLDVTTGAGAFMKNEEDA\|RLAETMVRIGNH KLAAGARSIVLDVKVGQGAFMKTLEEARLLAQTMVGIGQG KIASGTDALVIDVKTGAGAFMKTLEDSKALARALVDIGKG KLAGGADCI VLDVKCGSGAFMKDIENAKMLAETMVGI GKS KLAAGLGGLVMDVKHGNGAFMSEYEDAKALARALVDVAVA Kía LGTDALVLDVKVGNGAFMKDLSSAVELSKLMVELGKK KLAGGLEGLVLDVKCGSAFMASEADARALATSLVEVANG KI AEGTGSLVLDVKVGTGAFMRQLDQARELARTMVGLGKD KLADHSDAI ILDVKTGNGAFMKTLPDARELAETMLKI GKG KIAEGTAALVLDVKVGSGAFLKTLDGARELATAMVELGRD KLAAGLETLVLDVKWGTGAFMANYEDAKALAESLVLVANG KLAAGAKNIVLDVKCGDGAFMKNLDDASKLANEMVSI GKR KI ATGSDVI ILDVKCGNGAFMKTLKDAKLLGQKMLAI GKY KIAGGANGFVFDVKWGRGALMESYQDAVALGRLLVDLSWE KAVEGLSTLVVDVKFGGAAVFPDQEKARELAKMLVRVGVIS KLAAGLDGLVLDVKQGSGAFLHSPEAAMTLARALVEVARG KLAAGVGGLVMDIKVGSGAFMATEADARALARTMGETAAA KLASGTNALVFDVKVGNGAFMKTTEDARALAKALVGTSKT KAAETLGALILDVKVGKGAVMKSSQEAEDLARNLVNVSNG KLASGLQGLVLDVKTGSGAFLKSFEESEHLAGLLVGTGER KIATGSDGVVLDVKSGSGALLKSNSEARELAQLMI ELGGD KLAAGDEALVLVKVGSAFMKTMEQAEALARALVSTAOG KLAEGTGSLVLDVKVGSGAFMKDLGGARELARTMVDTGTD K1 A EGTGALVLDVKTGSAFLPEESDARELASTMVELGHD K AEGTGALVLDVKFGSGAFMRDPERARELAETMVRLGSD K AEGTSALVLDVKTGSGAFMSDPKKASELARVMVDLGTR KIAEGTSALVLDVKAGSGAFMTSDDDARRLAEDMVALGGD KLAEGTGALVLDVKVGAGAFMKDVESARELARTMVGIGND KIAEGTASLVLDVKTGSGAFMEDESMARELARTMVDLGSD KGAESLCALILDVKYGKAAVFKDIASAREMAQSLVEVGNK KTAEGTAALVLDVKVGSGAFMKNLDDATELARTMVELGAD KLAAGLEGLVLDVKTGNGA LLRDAAQAKRLAYSLVEVAKG KIAEGADALVLDVKTGSGAFMRDPDDARTLARTMVGLGEA KLAAGLSSLVLDVKSGNGSFMAEARDARRLAENLVTVAGA KIATGSDGIVLDVKCGNGAFMKSDSEAKQLAEIMVGIGKH K AGGADKILIDLKVGRGALIKDENEGYKLEKIMKTIGKK KLAESDKSLVLDVKTGNGALMADEQQAAELAESMVSCGKG Ki AEGTSALVLDVKVGTGAFMKDEASARELARTMVELGTA KLAAGLQTLVLDVKTGNGAFMADHEQAKLLAQSLVDVANG KLAAGLQSLVLDVKVGNGAFMEKSRDATALANSLVEIANG KI AEGAGGLVLDVKVGSGAFMKDRGSAEQLARTMVGLGHD KLADQSNLI ILDVKVGDGAFMKTIEEARELSRRMVEIGNA



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 DI RDFI CQLA A $\square \mathrm{MLK} \mathrm{K}$ GGGKGDSDRE R SAA CAG LAEVI SAAELGGVLLSDAGVVGDAQAGRDMIAEVIRDGRAA ALGKLSLTLAA HMLTMCGRG TLEQCLAAAEQAVDSGTAAL
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 RVMQVTRELAVEMLIAGKLVANREDALAKLEKALTSGAAA DVVELTLTLAREMLALAGRPHEDVDAALKNGKAM DLTELSLELSADMLTLSGMG NRQTCLNLAVDALRSGAAL DLKELVVCLGGYLLWMVGKSDTLDSGKKTIARNLDNGEAL D E V A A GSQMVAGKATTLEARNMLARA A
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 DVRELTDALAREMVLASGI EGADAVDVAEVLDSGKAL ALWDLTAALGGEALALGGI AADAADGAGRIEQALESGAAA DIVELTLALAREMLASAGLTPGAGGGVKPADALADGSALD
 DVVELTLVLAREMLDAAGI KELMDPA DALKNGAAM RLHQVTKALSAELLVSGNLAKSTDQAEVMVENVLGSGLAA DMVELTLALAAEMLDAAGLSDVDPA DVVRLTVELGREMLDAAGLG GAKDPADALRDGTAM $D V V E L T V A L A T E M L A A A G V T D V D V D A B A B K D G R A M$ DLQGLVTCLGGRLLSSMSGKAPTPESGEQEDARVLADGTAL RLREVALALGAELLNNKQMNLDTEAAWGALNDAITSGAAM
 RLEDVTLALAAEMLVAARIAATAKEGLARAREALSGGAAA DLNYIVCESAALSLCQAKLFPDFDSAFKACQDKLHNSEPGL $D L E D L V V E Q G G Q L L A A S G K A D S V E E G T D K L R Q S I R N G T A L$ DVVELTLADAREMLDAAGDDADPERA LASGAAM RLETVVVALAAEMLVSSGI CPSLKNGEVKAREALTSGKAE RLEDVTLALAAEMLQSAGLASSNQDGLRRAAETLAGGRAA DLVELVLELARRMLALAGVDDDPADALAD DLKEIVYEIVY LIALKYKGEDVKTFDEASKKDDKVIESGRAM DLMELVAMLGGALLDTGAVADLAEGRRRVSEAVESGAL $D$
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| UniRet90-V8BK48 |  |
| UniRef90 |  |
| UniRef90 ${ }^{-11}$ | EKMRAWV |
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| UniRef90-V712F5 | DFLAELVEDQGGDKRVI YDPE LLP |
| UniRef90-F8HCR3 |  |
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| UniR D4LFI2 |  |
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| UniRet90-Q6MSE5 | G |
|  | P |
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| UniRef90-G4QUYOUniRef90- X1JU19 |  |
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| UniRef90-F6CCR9 | M |
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| UniRef90-O1YHN4 |  |
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| UniRef90-B3W9T5 NAFKQLITAQGGDT SVVDDPRK $\square$ P |  |
| UniRef90-E8V4T8 |  |
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| UniRet90-R4UDİ |  |
| UniRet90-C7NFD1 |  |
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| UniRef90-UPI00037AD933 |  |
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| UniRe90-O76E1K1 |  |
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| UniRef90-HOROL4 UniRef90 5954 G 5 |  |
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UniRef90_A0A024JTY2

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160
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 KIAERPDSLVLDVKFGKGSFNSHVEESLELAKKMI QTGEL KLAASTDALVMDVKVGSGGFMPTRGEATELAESLVRVGGQ KLAAGLDGLVLDVKVGSGAFMKDLAEARALAQALSGTATA KAAAGSTHVVIDIPVGETAKVRSMEMAEKLQNHMETVGDA KAAERLSALVLDVKFGEAAKYPTQESARELARSLVEVGTQQ KAMGSG KLAAGLQGLVLDVKVGSGAFMRDLAQAKALARALVETANG KYAVGADLVVIDIPVGEHAKVRNPEEGRKLAREFIVEGGER KYAUGSQYVLI DI PTGKGVKVETLEEARSLAKDFIELGKR KAAAGSSHVVIDIPVGKTAKIRSEEDAEKLKYYFTVVGKS KLAEGTAALLLDVKVGSGAKMRSADQARELAKMMVGLGAA K AMGAKNILIDLKVGSGAFFKNLRDAEKLGEKLKLIGKN KGADGADHVVMDIPTGPGTK KKNVEGRKLARDLINLGDR KVACGSTHLLDDIPTGPTAKVRSAREADQLRKLFEYVGER KLAAGLQGLVLDVKAGSGAFMKTDAEAMALARSLVDTARG KVAVNADAVVFDVRYGAGALLPDHGSARRLAGLLVRLGGA KKAAGANCLVDDIPTGAGTKVPTDEEAQAFARDFMDLGEK K TAEGARSLVLDVKVGSGAFMKTPADARELARTLVDIGTT KVAAGSTHLLLDIPVGPLAKVRSMPEARRLRKLFEFVAGR KI AAGATHIVI DI PVGPTAKVRSRETAEHLAHHLSEVAAS KI AAGATHVLIDI PVGPTAKVRSEEAANRLAASFQTVAAN K IAFGSNHVVIDIPWGKSVKVHSLKDAQNLARKFVYLSKK KFALESDYI FI DI KYGQGAFCHDIETAKKI SNDMKNLAKK KVAAGATHLVLDIPDGPTAKVRSMPDAQRLRRLFEYVARR KAAMGSQRVLIDI PVGALTKVRNPAAADRLSRSLVAVGAA KGAVGAKHVVIDIPVGEGAKISDMKRGRELSSDFVELGRR KLAAGATHLLLDIPVGPTAKVRHMRDAMQLRKDFEYVGDR KIAAGATHVLI DI PVGPTAKVRSQEAADKLANSFMTVGER KVAAGSSHVIIDIPVGKTAKVRSESDAKHLEFYFHRVAQE KVAAGAKQVLLD PVGPTAKVRSAEKAQRLRQLLESTGRA KTAAGVTHLLVDIPVGSSSKVRTPTEALRLRKLFELVGDH KI AAGSTHLII DLPVGPTAKVRSAEAAEALAAGLSSVGDS KIAVGATHVLIDVPVGPTAKLRSELEFFKYQNYFSLVGKA KLAAGADAIVLDVTTGSGAFMQEYKDALKLGKDMVDIGSE KVAAGATHVLIDIPVGDTAKVRSAEEALLLQSYFEAVGNA KMAAGSTHVIVDIPVGPTAKVRSAEEAHVLKAMEVDVAKE KLAAGSTHLLVDLPVGPTAKVASALDAMRLRKLFEFVGDH KIAAGSTHLVIDMPIGTTAKVRSIEHGKLLKSSLESVAQE KKSAGSTNVVVDDPGEGAKVESLAEARELAEDFNRVGDH K IAAGATHVLIDIPVGPSAKVRSRASADKLADTFRQVAAE KVAAGATHVVIDVPVGPTAK】RSDKTFDRLKKYFS\|IGTA KLAEGAGALVLDVKVGSGAFTDSEAQSRDLASAMVALGAA KLAAGATHLVVDMPIGPTAKVRSPADAAALSGALQKVAAE KAAVGATHVVIDIPVGPSAKIRSDQAFLKLKEYFVIVGKA KAAAGSSHVLIDIPVGRTAKVRSPQAAALLETLMKHVAKG KAAAGSTDVVIDIPVGATAKVRSQEAAVHLSEKMVAVGKA KVAMCANHV期 KIAAGATHSVIDVPVGPTAKVRSDADYECLKQMLEQVAQA VAA LKLHATVIDDPYGAGEWVKTKEEAMSMAANLDRLRSII KIAAGSTHVLIDMPVGPTAKVRSEAAADSLGSRLAHTASA $K \operatorname{AAGSTHLILDMPVGPTAKVRSQEAADALSAGLVAVADA}$
$K L V A G S T H V V D V P V G P T A K V R S Q S E A V R L R K L F E H V A D K$


## UniRef90 S9RNU6

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UniRef90 ${ }^{-}$D3T1T7
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UniRef90 ${ }^{\text {Q1GQ92 }}$ UniRef90-K2BB51 UniRef90_UPIO0045EB5AD UniRef90-E4TUD7 UniRef90-B8D2U0 UniRef90-K2FHX5 UniRef90-B2UE73 UniRef90-R7UY47 UniRef90_UPIO004651661 UniRef90_UPIO00466BF4F UniRef90_W1KKQ8
 FTELGHVLAVEMLCLAEPGLMRQAAEARVRDAVSSGRALD $D V V E L T V A L A R E M L A L A G K P D A D P A A A D A D$ $\qquad$ GRAM RLHEVVVALAAEMLQQAQARRSAEEARAAADAADDSGKAL DLEELVIAFAATLLDQTKKA $\square$ H $\square$ KEARAQAVACLASGRPR DLEELVTYLGGYLLSMCGKARSSQEGAGKIAEVLRDGTALL A $L E H L T V A L G G E V L A M G G L A A D A S D G E G R L R A A L A G G E A A$ DLKELVCQL GGHLLARVGTAATAAEGAERDAEKLRNGKAL RLHEVTMALSAQLLVTGGDAGDAARA
DVRALSLELSAQLIFLAGAAWSVDEARGLSRRVLESGRAY DVVELTLALAREMLALAGMPHVDPAPABLDGRAM DLIEITVVAGGALLQQAGLAPNQEAGETQDAAAIAEGRAA $D V \operatorname{V}$ LTVRLAVEMLELAGIDDGRDPA QTLRDGTAM RLHRVTLALCAEALVQAGLA GSADEGEALATRALASGAAL




 EVLSSGRAH
 DTRELS LQLSAHMLLLANDGNSFEESYAUAKDTLESGKALD DVVELTVALADEMLATAGIEDVDPA RTLNDGTAM DLRELSLALA GWMLFLGGVTRTAEEGRQSAEEDLTSGEAD RLYEVTLALAGEMLCLGKLAPSAAEGERLAAARLEDCTAAA RLGRVVLELAAEMDAAAG
 DMVDLTCALAEEALAAVGIVG RLEEVILSVGAEMLLLGGLVKNVKTARFMLNGVI EMGLAA DLDDVTLALSGQMLVQGGKSATLKDGQAMSRENLDNGKAW AL RELTHALSASALI QVKMFDDGAAAEKCLRERLASGQAM DLKERVVLLAGELLE ELSGKV TLDTGRQTALQLLDSGKAY $D L R Q L V T A L G V R A L P V A R V L H G L G A G R S R A$
L D KL I FNNIFSN SYKAYF GLLT P E E K DK K ITY DKLE E G K T V RLHDLTVALGGRLMALAGGAEGEGEEKIAEAI ASGRAM RLRDVTLALAQRLGV
 SLI QK SCVIAGI ALEDAGKA NRGEGANLADEILRSGKALL SLVEKA GLAGULLEMGGAAP RGMGRKMARELLESGKAY

 KLEELLRKIASE FYAKKYQTSDTEGDEKFNEDLKEHKGY SLDEKSASLAGMLLEMGNVAGKDKGYDLADETLKNGKAL DLREKSLQLAGRMUEFDTYVRG GEGYSUARDVLDSGRAL




DLARRACELAGALIEDAGRASPGTGAALAAQVLADGSAW DLRTKA LLLAGRILEESDIIPBFGKGETIATNLLENGMALD DLRERALMLAGGLLEFCGKAAD GTGTVLARQLLDSGRAW

 DLHDLVIKLGGHLLHEAGVADTPEAGQQRVHRVI RDGKAK A DLRERALALLSAALLDMAPGSSAGTGGERARSVLDSGRAD


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| :---: | :---: |
| UniRef90＿S9RNU6 | ERMGRMVIS GLGGPSDFVESWSR |
| UniRef90－F2WUD8 | AVFRAWVAGQGGDARVVVGPD L |
| UniRef90－D3PUB9 | DAWRAMI SAQGGDVDA |
| UniRef90＿LONLB1 | E $\square$ F A R MV HALGGPSDF $\quad$ EK P A Q Y LP |
| UniRef90－B9XSV2 | QKWDEMI VA Q G G L L EV |
| UniRef90－V9KGQ0 | A QFQAMLVAQG |
| UniRef90＿Q28N09 | RVVF A E MV／A ELLGGPVDFVERWP D RLLP |
| UniRef90－R6GTY8 | NKFYEFVHAQGGNVHVADN |
| UniRef90＿C3Z938 | Q K F CDMMVA Q G |
| UniRef90＿UPIO0016A47A2 |  |
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| UniRef90＿E4A0Y4 |  |
| UniRef90＿A0A024JTY2 <br> UniRef90 UPI00036ADEBB | DRFRKLVAAQGGDLSVPLP |
| UniRef90－UPI00035F815C | DVWEAMI A GQGGDPRASLPQAD |
| UniRef90－UPI0003D0A65E | R I F Q A ML Q A Q GVA P S VA |
| UniRef90－G7V9S2 | R QFKKLIEFQKG |
| UniRef90－EOVQW6 | KHFEKMLVCQG |
| UniRef90－UPI0004673E42 | EVFARMVAAQGGPLGFADNWARFLL |
| UniRef90＿UPI00037E491D | SRWKDIVRAQGGDPDAELPEAAHV |
| UniRef90＿D9V569 | EVWARMI TA Q G G P PAAALPRPA HV |
| UniRef90－E8X300 |  |
| UniRef90－W5X2G9 | AKFEELCKLHKGDL |
| UniRef90－V5XA26 | DRFRELVAAQGGDLTA |
| UniRef90－UPI00047AC7F6 | KVFTQMVAAHGGDTTPLGQPA |
| UniRef90＿UPI00047C7FFC | ERFQKMVSALGGPADFLEKAERHLP |
| UniRef90＿E7N877 | DVWRDMIARQGGDPD |
| UniRef90＿UPI000466E2DF | E C F GRMVAALGGPADFVEKSVA Y L P |
| UniRef90－V5WGX5 | ECFWKNAELQGGDKDAA |
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| UniRef90－X0YWW4 | EQFARMVSMQGGPGDLLDHPDKY L |
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| UniRef90－H1YWY7 | EKMKEII K I Q G G P P DV |
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| UniRef90－K6TQ34 | K K FESICKAQG |
| UniRef90－F4BX26 | A K LMEIIA A Q G G P PNV |
| UniRef90＿UPI00041D6520 | DRFAAMVAA Q G GDLGVPLDP |
| UniRef90＿W8GFB5 | KTFLITLENQNVK】KDFKDSK】F T |
| UniRef90＿Q12Z64 | TKFKEI I K $\square$ Q G G N P D V |
| UniRef90＿E1VJL0 | EKMNALI HAQG |
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| UniRef90＿UPI00047DCF03 |  |
| UniRef90－W7QES3 | EKMQS 1 R A Q GKKPFDLDNLA |
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| UniRef90＿UPI0002559C39 | EKFRRICDAQGG |
| UniRef90＿UPI000377B722 | EKFKEITKAQGGNPNT |
| UniRef90－P47717 |  |
| UniRef90－UPI000237705E | ARMNAIIAAQG |
| UniRef90－J2TNV6 | AKF\AI CEAQGG |
| UniRef90－D3RWW6 | EKFLEI VEAQGGEDR |
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| UniRef90＿UPI000360A0B8 | EKFASI CNAQGG |
| UniRef90－UPI000361064D | KKFQAI CEAQGG |
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| UniRef90＿D3T1T7 | EQFRTIVAAQGGDPDV |
| UniRef90＿D6V402 | RKLQSI I A A Q GEPP |
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| UniRef90＿UPI000422D375 | SKF $\square$ S I C HKQ G |
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| UniRef90＿Q20Z21 | K Q M K I I D NQG |
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| UniRef90－X8ABH6 |  |
| UniRef90－Q1GQ92 | SKFQRTCEAQGG |
| UniRef90－K2BB51 | KKFMAICNAQGG |
| UniRef90－UPI00045EB5AD |  |
| UniRef90－E4TUD7 | KKFTAI CEAQG |
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| UniRef90＿UPIO004651661 | AKFLAl CEAQGG |
| UniRef90＿UPIo00466BF4F | AKFQRI CEAQGG |
| UniRef90＿W1KKQ8 | E A M E R L \( |
| ) A A Q G |  |





## UniRef90 Q12E97

 UniRef90-R7X749 UniRef90-Q46S32 UniRef90 UPIO0036F769D UniRef90-A6E5E8 UniRef90-G6CAV6 UniRef90-H2P4X1 UniRef90-M6SXV4 UniRef90-L8J681 UniRef90_H1S4H1 UniRef90-W4KXE9 UniRef90-X1AKK5 UniRef90-C2FXB4 UniRef90-K2DY58 UniRef90_A0A039JP44 UniRef90-X1U1T1 UniRef90-K6U9J4 UniRef90-A5FSJ1 UniRef90_Q39SQ6 UniRef90-F2JNT8UniRef90 B3QMY0 UniRef90-R6EGN4 UniRef90-B9M5M2 UniRef90-W0EFH6 UniRef90-UPIO003712979 UniRef90-W2E541 UniRef90-E7GBB0 UniRef90-J1GZG6 UniRef90-N1ZV16
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K|V|A A GSTh|V Li
140
150
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 KLAAGSTHVVIDLPFGARARVKGAGEAHEMARLFEQVGAG KVAAGSTHILI DIPVGPTAKI RSQSAAQE LK KA FEQVGRR KAAAGATHVLIDMPVGPTAKVRSAGAAEALGDRLSSVGKA K $\backslash A A G A D A I L L D V T V G E G A F M K T V G E A R E L A Q T M$ KLVEGLSALVVDVKFGGAAVFPNQEQARELAK KAAAGSSHVVIDI PVGKTAKIRSEEDAEKLKYYFTVVGKS K $\square$ AA GSTHVLIDD PVGETAKIRTQADAERLAALFTEVGSA KYTAGATHVIVDLPFGPQAKLKSQAEAQALGALFEAVGAG K $\cap$ AAG DKI L L DVTVGQGAFMKS LDEEAEHLSETMVSLGRE $K L S \square G V K K L V L D I P V G E G T K F S T P G K G K Q F A Y V F K E I A Q N$ KAAAGSTHVVIDDPVGETAKMRSTKMAQEDQDHMEAIGKE K $\square$ A A GSTHIVIDI PVVGTAKVRSDTAAQNLEDLFKMVMNE

 DIHMGVFHPDYNLGVKKAMVMHGFDSDGNPALDE $\$ S I
YAVRGVYSSELLQPV AEVMREDGYKKALVIFGSAPGSN TNPAGADCQVLGVY A LVEPMAKVLFNLGVKRAMVVHGEDGVDEVISGKTKVCEV AYAPEVSVQMIDILAE
 ANAPYQLL GVSALSVLPTMAKALQLQRAIVMVGED T NPAGANRQVLGVF SAE LVEPLAKVLAQLGCK T NPAGADHQLLGVTPVMASVLRSDGLKRALATQUSEL KD TNPAGASMQI MGVY TNPAHANLQVLGVY DETLVEPLARVLNNLGVK K VVRPAARVLGNLGVRGVAVCSEEMVEPLABVLHNLGVR

 ANPAGANMQLLGVY DENLVEPLARVLANLGVK ANPAGASMQLFGVY SEELVEPLAHVLHNLGCK AEAPGAEHAVVVYGRDGMDEVSLGAATLVGELKDGEVRE SNPAPLTGQLLGVPVGEVLLKLGLKRALVVC\|TTTTATTV TNPAGASAQVVGVY PLSNPADARFQVLGVFAPQWTRPMAEAVAAASHVCEVENG


 ANAGGANH VLIVVGMDGMDEATLGASTLVGELKDGEVFE Y LVEPLAQVLI SGLGDRRGMVVRLDEVSMSAPTTVCEMRDG SNPAGANMELMGVY A GASMTDVSAMVVYGLDGMDEDSASDKTAVCELKDGKTRT A YSPGVSLQMVEVMAE $\square G M D T R V V E L C K G A I T E H E V T P E D$ $T N P A G A N R Q L L G V Y$ V TNPAGANMQVMGV YEEALVEPDAEVLTNLGVKRAMVVYG YLVEPLA QVLTSLGVKRGMVVYGMDKLDEISTKICEINN AHPKRLAKVLVELGVKRGMVVYGMDKLDEISS L SAPTKV NLVKPLA QVMANLGVTDGMVVYGQDGLDEDSTTVCEVRNH SNPAGANMELMGVY DQELVEPLAQVMMKLGVR TNPAGAKHQVIGVF DFKYSLI MAEALSEHVLIVAAE $T V V R G V Y N E K M I M P T D E T M K E D G F K K A M S N G K C G M D E D S T$
$A N A S M L A H V L Y N L G V K R A M V V Y G E D G M D E D S ~ A S A P T K V$
 LQPTGG QVI GVFSSEF ITTTMAEARAMVLHGREKLDE ANAVCGDGHDDEVTVTGPTHCCEDRDGKKVSYD TVP SNPAGVKHMLDGVF SAAWQP LAEVLRELGTEKAWVVHG
 $T N P A S A K A Q V M G V P V A N V L K N L G V E R A M V V G A G G L D E A S T$ AGAPGAEHALVVYGRDGLDEISLGAGTRVGELKDGVVSE ANPAGAQKQVIGVFH VIVYGESKALCELGTK ANPAPDSGQLMGVYMEDGALIETIGEVLLLERAMVVHGDD TNPARADRQVLGVYRKDLVK TNPAGADRQVLGUY KDGSKTST■AEVRELGSKRALVVKN QYAEKLAETLRRLGSEHVLFVKDGLDECSIAAETDVVELK
 A L A EKLANALSRLDTVHALVVHGDGGVDELPNLIFEVRAG ANARRADALLELGAEHALVVHGDGGLDELSLSGTQVAER D LVP LLAHAL QRLGSEHVMVVFSADEMDE ANPAGADRQLMVVSSLDGLDE S S I SAATRVSELKDGKVHT



 VNPAKPNDMLLGVYTPPELLMPMAQALQLTGVKRAFVVHG
 $D \square Q \square G V Y S A D L L K P \square A E T L K Q L G L K R A M V V H G S G L D E \| A L$
 TNPAKADYQVLGVYVVHGAKTAYDKDGE VKEYNFSAEA $A M P K Q L V G V F S L E L A R L Y A Y D Y Q Q T D K R F M I L H Y D E D S L D T$
$T N P A G A K A Q V M G V G G K Q W V R P D A E V L K E L G S E H V M V V H S$



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UniRef90-A0A039JF UniRef90_A0A039J
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 $L G M Q V R A F A T D G S K P I G R G V G P A L E V R D V L Q V L N G S P E A P$
 $V G L N V K V I I T D G S Q P V G R G$
$F N$ H S E I I I A D G S QPVVGRG $\square$ GPALEAK DVLSVLQN

 I GKT TA AILDDNGDEDLDRAQDTGLKENDEALEVVLEGKMENP


 WF R S T


 R GMPT TVVCEFNGD E P QDFGGLT P C E K S E L V V L D I L N G A K G A K
 C E L R D G F Y R T S VI QP E D F G L E T A K E N A Q I T R GI L N G T IT G
 Y E I H P E DF GLDPMASNRALKVVDTP E Q S RELLLLAVVLDNS P D P






 Y E IS PEDF SMD $\square$ A S KED LVVGGDANENAEIT LAAVLNGEK GP F GMKTVVP AFECDASKSTAAENAATVLAVVLEGREGGP


 R GMVVVYCEI KD GPE QF GY G GK P DV NA A DT R A I I N G E D R G P













 H A L R Q M I VAAP E DVGLLERAPREA LLRGGDVAA IL S GEDRGP A G RIDE T Y V I S P E EVVGLVVRAPVVSSIE NA DMIRRVLQ GVVK GP K
 FELHP SDLLGLQMDQVLGG GDA QVNA D II RRILLNGEHGA


 A GENHMAALLEK GAYPLLE EAGGDSCENA EILLKNVLEGTAAA P


 A







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EKMKRIIEAQGGNDDL
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| $K$ |  | $E$ |  |  |  |
| $K$ | $Q$ | $L$ | $E$ | $R$ | $F$ |



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$T K M Q Q F C Q$
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t TLRRLI E

EKFEALRQYQGRDV
EK LLE YVA



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SKIKEWVS IQNSEPDLLEKGDALL
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DVLARLV
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KHGNRSATSKSGSADMLEAM R H GNRA $\square$ S S L S GVA D T L E V L KHGNRAASSLCGTADCQEAL K H G N R S V KHGNRSVSS QTGSA DVL E QLL
 K H GNRSVTSKS GSADMLEAL K H GNRAASSKS GSADVLVALL K H G S R A LTS VCGT $\quad$ DDAVEAL K H GNRSVSSSSGSADVLERL KHGNRAASSRSGSADLLEAL
 KHGNRS KHGGNRAASSKS GTADCLEALL KHGNRSVS KHGNRAAS KHGNRS $\quad$ GS SKS GSADVQ A L KHGNRAASSLS GTADCQQA L L K H GNRSVT K H GNRAV S K HGNRSI
KKGARLV
K H G KHGNRSVVSSTGGSADVLI
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KHGNRSASSKVGSA DV A A L
K H GNRSASSRVGSADVLETLL
K H GN R S $\quad$ S GV S G S A D I FE Y F
S S S G S A DVLE A L
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K GRAASS SAA
K H G N R A V V S S R S G S A D V L
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K H G GRSVVSSS GA A DVL E Q M

G|I $|P| I \mid Q Y$ A V ${ }^{70} D V A R L \mid D T V^{80}$ GLDMEAA GRTAEKTLNEIG GAANVVADDPE K A V K M L E E V G

 $G V S L E C T P E Q T E E L L E E N N$ GVQNSNS LLRRQRELLNDKN GLQLELS DTAFK S CLL E $\square$ A G GMNLNLSLENTAKMLE ETG $G V N$ QL Q A E QVVARCVVEVG GVDVDCSVDVVKASIIENAG GFNI NLDS Q All E D CL N HI G GVNI E L E P E R V A RVI E E V G G V I I D L E P GTVVNLTP E E A GLLCLDEVG | $G$ | $V$ | $N$ | $I$ | $D$ | $Q$ | $P$ | $P$ | $E$ | $K$ | $V$ | $R$ | $E$ | $E$ | $L$ | $R$ | $S$ | $I$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $I$ | $S$ | $L$ | $S$ | $F$ | $S$ | $K$ | $K$ | $H$ | $V$ | $E$ | $E$ | $M$ | $I$ | $Q$ | $E$ | $N$ | $N$ | GAKVELLPEKVARLI E EVG GANI A QDPKKALEMLEKVG


 I DI QATPEEAKRALKTKG GF D L N S E P N K V N E T I E K F G
 A GAKI DLPAEKVAKLI E E I G A G V N L N L T P E Q V A R A I K E I G
 G V A L D F T S D E V E QLL E T N G A G I K E L T P E Q A A R CI E E L G GV N I E A T LE QQRKA L DEAG $G V N L A A A P D R V Q A A L T Q V G$ GINLGANPDKVQAALSDVG GFDL N S E P S K V N E I I E K F G GVNVDMDAESLGGQI FEQTG GI KI D L K P E D A R QVLE E N G GVVNI S I
 $G V S L D L T K Q Q M Q E V L R D N G$

 $G V N$ L G A P L L K V R A A V E QV G GI K V D MS P Q I A E K C L F E C G | $G$ | $V$ | $K$ | $I$ | $E$ | $L$ | $T$ | $P$ | $D$ | $E$ | $V$ | $G$ | $R$ | $C$ | 1 | $R$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $A$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $G$ | $Y$ | $F$ | $F$ | $T$ | $S$ | $D$ | $I$ | $D$ | $K$ | $I$ | $R$ | $Q$ | $S$ | $L$ | $D$ | $D$ |


 K LR R NLDPSDAST QLADNG GVNI M A E P A KVV A C V E K A G

 $G \vee N$ I A AP P EK QLLQ A L D A G
 G A S I E L G K E Q V E QV F D E VG
 A G V R L G 1 G I N L E E I P P H E E E S V


 G V N I H L T S D A A A Q CLL N D I N | $G$ | $V$ | $V$ | $D$ | $L$ | $G$ | $P$ | $E$ | $G$ | $V$ | $K$ | $K$ | $C$ | $V$ | $N$ | $E$ | $V$ | $G$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $I$ | $N$ | $L$ | $A$ | $L$ | $T$ | $P$ | $E$ | $Q$ | $V$ | $G$ | $E$ | $C$ | $V$ | $R$ | $E$ | $V$ | $G$ | GI D L D L P L E R A GEA L R E TG

 G 1 GVDI A LS S EKLS TVLNEVG A GVRLDLNAEQVAECVARAS $\mathrm{G}, V \mathrm{~V}$ $G V N$ L GAP P E K T Q A A L Q E V G $\mathrm{G} V \underset{\mathrm{~N}}{ } \mathrm{I}$ GI R V E L T P A EAAA Q S L R E H N $G Y E F T N D V D K D K K S L D E A G$ $G V K L D \square T P E V T A R C I A B A G$ G V N L K AP S D A I E A A L S E V G $G \perp N L D L G P E D L G R V F E K A G$ GCKI PETPEDAKKSMDKTN $G V N L D A S P E V D Q E A D D T L G$ GLLSV T Q D P A V A A K Q L D A L N G $l_{\mathrm{I}} \mathrm{H}$ L D LDP A E KLL GK I F D Q T G GI PLESN L LT QLE HLLQKE H G L K L G L A P E E L L E R C L D E T K G I P I Q T S P R E AVE S L K E H N


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UniRef90_F9L9E3
$\square$ NPE
130
F OLIMG $V_{F}^{140}$
150
160
SNPVGVKRQLIGTARPGYVSTYGEAAARLGTERTLIVSGD Y LVEPVAKVLDKLGVKRALVVYGDDKMD A NPAGAPNQL $\square G V F A K E W V K$
PLAAVLAHLGSEISSHDGLDEDSDAAPTAVAEVLKKDGSR TNAAVEAD GLMGGVVVNGAGETSIAAPTELE YRAG FH

$S N P A G A E Y S V L G V Y$ DKQWVTPMAEALKKAPTDVCEVTPA
SNPAGVEKQVIGVKDAAADDI LDSKRAMLLSSNMDEISVS
TNPAGAKRQVMGVFHEHVMDVHSADEMDEISFSGDTYV
YAVRGVYSLDMLEFVGEAGDGCDDEASTVGATHMAELMPD TNPARAQYFLLGVYHSRGTDEDTLGENEVVEDRNGRLRRF ARVPFAVVGVYDVDVGKMAKAQSFGMQRALVVHMSPLGPG TNPAEARSQVLGVYCADLAVLANLGTQRSFVI HGCGGLDE


 TNPANPDYFLLGVYVEPVAKVLDKLGVRELKDGYYRTMTT | $T Q L L G T S R P D M L E S T A E V L K N M G R K R A V V V S G D G L D E A G L$ |
| :--- |
| $A N P D M L L G V Y D E Y L V E P V A K V L D D E D S A S A P T T V C E L R D G$ |

SNPAGVEKRQVIGVFHKD
SNPARCKRQVIGVY STQYAEKLAETLHRLGSE
 A GAKRSDKLVFVVHGKDGIDEVSIADATLVGEVDDGEVKL ANVKGSTH N VVVHADDGLDEISSAAPTHVAELKNGEVTE A GAPGVFHPLQRLGSEHVMVVYGMNGMDELSLSGETLVGE SNPAGVKRQLVGVFDGRWV E P IIARALAELGTEKAWV TNPVTLDTQFLGVYRRDH LMKMAAVLQRLGRKRS VVVNG TNPAHIPNQVVGVF
SNPAGAKRQVVGVPHGSGDDEDTTTGETDVAEWKDGFVRD

 NQLIGVDYQERUVKULDGMDELSTTSKNKICLLKNNIITN VNPAGTEYQI ${ }^{\text {V }}$ GV AHASMMSSVLQKI GVTSAMIVHGQDGLDEISLTRVIVEKG AHRLGAEH 1 MVV HSKDGLDEDSQASATHVAELKNGEVTE AHAEMLMAPLAEVLTRDGVKHRDGLDEDSAAAPTDVIVIN TNPVTLETQLLGI YSRMAAALHRGGRKRALGAGYMDEASL | $L L P$ |
| :---: |
| $L R P V G L N D E R A$ | EYMELIARVMSKLGAEDVMVVHSEEGLDEISISGKTYAKD SNPAGVTRQMVGVGSRQWVQPLAEVLRNLGAESDWVVHE SFPKKQMVGVF A GAMGVFHPVMIVHGMDGLDEDSGSAPTLVGELRNGEVRE NPAKPKYQVLGVYQ EDLIQPMAKVDKNLGVE $K L V V P V A K V L R N L G A E R G M V V H G \square G G L D E V S T F G R T L V$ VNPARPDAQLLGVYSEEWVVPMAETLQRLGVKRAMVVHG SRAKNMVVGVYDLGVERAFVVSGKDNMDEITTTTETVISE TNPAGAPNQLMGVFHPDLVGIQVRVLQRLGAEHVMVVYGM SNPAGVDRQLVGVPEWUVPVAETLKELGAVSTWYDEITTT TNPAGAQRQVVGVFAE WVKPLAQALMLGSEKAWVVHG ANAMGVFHPVLIVHGKDGMDEASLGAATLVGELKDGAVHE A LDPAEIGYKRAVVVYGEGVGEQSVIDEASTIGTTYDAELKE AGAPGANH VLVVHGDDGMDEVSLGAATMVGELKDGEVSE K LCEPDAYALAELGTEHALVVHGDGMDEITNTGETYVAEL $T \mathrm{~N} P \mathrm{~A} G V \mathrm{PNQV} \mathrm{L} G \mathrm{~V} \mathrm{~F}$

THPMDLETQLMGLYQAD LDQRDLAQVLRLAGRRRAVAAL NPAPV THQLMGVYVGDGRKRAYVEDSISAPTDFDFIGR I | A YAPHVTAEGMDVGGGMDEYSPELKDGR |
| :--- |
| $T N P A G A A Y Q L L G V Y S R E L A K R Y A E V L V K L N T K R A L V T P E D$ |

 TNPAGADRQLLGUY DRSKTET』EGS DSAPTRRTELRNG
 TNPAGAN LVVGVYYGEGSFBGEDSDTGPTRVSQLQHG
 S
 A GAPGAKHJVLVVYGKDGMDEVSLGAATRVGELKN VNPMRPSGQVIGVFSRERVDEATLADVTDLAVLENGTVRT

 SFPKRLYAYLYQYQEGSFSILHADDGYDEI SLTGDFKMIS SNPAGVKHQLLGVGFAPQWLRPDAEVLKSLGSKHVWVVHG
 PLANPANPKYQL LGVVNSAEKNLENVARAVVVSQGLDEAGLD
 VNPARPNDQVLGVY DPAWVKPLAQTLQLDGCERMVLHG YQLVGLYHELDEITLCDETK VVEVKDGKDLEYTIAPEMFG ANPAGAKRQLLGVKVWTVHGSDGLDEMTTTPTFVAALENG TNPANANAQLIGGVYDTAF DEKMANTLKEI GAN SFPAKQLVGVFSLEDARYAYDYQESEAKSLTGSFKMISNG


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 GGLUSVVTLTPEEAGLPTYSWEEDRNARIMMSILNGDNGP
 DITHATLLITDDENPENYGIGPEFNAKLTRDDLSKK VGGA A ELLK D GQQVRE YTIN P T Q F SVVDNA D E SKMMVLDDVLSSGKTGGAA GTVKRS LLTPEGUEPLAPWGSVDAAAQGIVRILKGVSTPT GGMPNYVIEDKGNESREFFLDPEESARKIMRVLRGEKSFD TFRAADYGLEEAPLAALAGGAPEENAALTRRLLAGEERGP MILDVTPPIEKFSFDPLDFGIRCTLESLKVLRDVLSGERGA

 GETYVTEVVSEEGIVSFTFSPEPEESVKVALSVGLRGEEGTP HGRTQYALLADGQUSLHSFLGNAKENAEGLLSVLQNQASP Y Y RTT EELEDNPELSHKDDGVG AGPEVNAQUTRDULNGTLSGP HVLETDVVELKHGEIVRFTVAPKLESAELLKAVLEGRANE

 YELVD EELGVQRRELAQVCIRTSPEEFRMGFSVLEGEEGPH YQUTPEEAGVESKSLIGLDVTSADESLKLIKGALGKDNDE LKREYTVHPSDFGLPVYDSVANKEESVQCIQRALANEDGP VHAETQVASVDGGEVTTFTVKPPLETLIGSDAHKNEGKAG AGHMDEAVLLEEGELIPFTLTPKKENAQLLDVLSGKEGA | $H E L R D G A V T S Y F ~ D T P E Q F G U E A V N S T Q E S L N L L R S A N Q P S ~$ |
| :--- |
| $F K I T P E A V G L P R A A D A D T G G A P E Y N A A E S D$ |

 EVKSATLNPKDGLTPAPTTAGNVAENGALLQAVLQGKGTQ MV DDPQDVGLQRGNDSD DQ $\square$ NTKEDAGKSFVDVNNDTANK


 A GKNHLVLMEKGEEEVGLPVYPNADIRDAYRVLRGEMGA
 GKIETKT ITPEEAGLSRSADKRENAR\|VLEILKGNKGPA NGQ RTFELTPEDAGLPRAHADADKGGDAAASLRGEGKPS FS I HAMEGYDEDS LTGDMISNAEESAKMFESMLKGKGTK Y RVSP EDVGLAMHGVSADRVANVEESRQVIGALEGKDPAA RGLPTSALEFDGDKPEDYGGSPAENAQDTIDILTGKEQGA
 IGKKVNTFTITPEQFGLKRASLE LLRGGDGTEDLSAGEEKGA NGMKDGEVREYMDHPADFGVASKEESVQCDQRALANEDGP GETHVAALLTPEQVGLARHTREEDRGGDSAAALRGEGAKG A G LD SVAAEFSDGAALADDTGGSPAENAQADRRLDAGETGA YE HPEDYGLSMMSNRGIKVSNREESRQVMEALNNVEGPA DGTPQDMLGTPGMVDEGRTFDSVEASALCIVRLLKGKETK FAYTFNAHIIFDPESIGFQGGGKEENAEILINIMANKADE YE $G H P E D Y G L A M V G S R N D R V E D A D E S R R V L G A L E N Q P G P A$ KDGKVSTY TLTPEALGMGGTPKENARDLLCDFKGQKGPK HVLVVHAD T DVVA LLA RSVRDPAESLEMVRSVLAGQTGP Y GINHYTLLNEGEISQGSGGDAKENARILISVLKNEPSP QSEGTWRPEDFGDDPTSLRVADRKQSAERFERILKGEGDA FG $\square K T \square$ PTEEKIASRKTAEANAKA DLHVLSQAY DGMKTDAYLIENNQ DHSFVLTNPQESAKIIETLTGVSRNA RGDNTDAEINDGEDPQAFGFTPCINAGUTYDILSGKEQGA LGLRTHSLEAVMG GDAETNAMIIDRNILQGEQGAYR
 NGIDTRVVELRKGSVSVHQVTPEENAAVVLDVLQGKSDGA Y Si EVKII SNTSEQILKKPSPECKLESIESAKIVYDGKGST WELK DNEDDEDMGSPLGSAQENALTLRAVLSDEKGPKR SGMHT DEPEEFGFNRLADHGGNAEENTATLLS ILKNQASP AELRDGEDTEY IITPEQFGDT RASLDSLKVSGSAE $G E V T E Y E I H P E D F G L Q M V S N R T L K V Q D A Q E M L L G N N K A G$
$A E L N P A E L G L K A A P L S A M A G G D V Q Q N A E I L L K A V L Q G R G T P$

 $R G M V T T S S U S P N H F P L Q P A T L A D L A N A E I V R R L L R N E D R G$
$Q D G E K L Y G P E D\|N L P Q A S S\| Q G G E T \| A E S A A D F D N G K G T E$ S GLKTDVVALENGEI REFTLEPEDFGLPALDDIRGGGADN
 DGKFDTYEVTPKDFGDDYSESPDESAKRLIDVVSGKDNED
 SGLPTQVVELRDATLHEYQLTPHAEDSELDQVLKGKAPRAA
LGRQRALI I TDNMDEAALYGRNHYTLLDHGKISQGSFRAA FKRAFHADIQGG A $\square$ RRFTVTPQEVGLPTVRGGDPEENAEDLDRTLKGEEQSP HGEVRRYKDTEMGLPRGPQVETTEQSAELIDEAIVKGEANE GEKLYSPQNLGLEKLTPGGETVEESAKVFENVLKGEGTES

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UniRef90_UPIO0047E4114
UniRef90_UPIO0047C7622
UniRef90-F5S5M0
UniRef90_F9L9E3
 YRDAVLIFNSAALIAAGETEDWKEGAARAAEAI DSGGAQ KRTAVDLLNAGAALYVGGAAESDADGVKKAAEMIDSGAAD PARDIVVLNAGAAI Y AANLTDSLLAAGMDKADRVI AGGAAR R

DMVLLNSAAAIYCAQENATFAEADEQAKDALDSGKAS
$K$
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R
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## K

R
 $Y$
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 VR D I V LL L N A G A A L Y C A G V A S N V T D G V K R A R E A V A S G A A Q

## R

A AQRDCALNAGAALHVAGKCDRWED A TDMVLLNAASALQVAGKANSLSEGVIKIAKQAI DSGKAY A YRDVALLNAAAAFVVAGHAKNLKEGVALGAKSLDSGGAM | $S Q N S V V L A N S A A A L V T A Q E G L S F P D A V A K A E E V L D S G K A L$ |  |
| :--- | :--- |
| $R$ | $D$ |

  K

 YRD DVALNAAAAFLVVADKVETLREGVELAGRVLDEGRAQ
 AKQN ALLNAAFALQASGKVETLEEGKELAEEALRSGKAR
 A RDIVQLNAGAA YAAGRAETLAEGVATAGEVLASGEAA YLETAVLNAGLGFFANGKADTLAEGIDLAREIIASGKAY
 SAVNAVLLNAGAGLFTAGRTNSDAEGVREAREADQSGRAA
 $\square A D A F V L N A A A A L M V S G F D R N D A E G V S L A R E T Q Q S G K A L D$ EAAFFCMNAAAALYDAGMAPDYKKAADMARQALASGAAF


 AQTDVVALNASLALRVGNVVSDYATGISRAREVLQSGFAW SAQDIVTLNAAVALYAADRCDSTSDGVDEVKKAI QS G ARRDI AVLNAGYALHVSDRFDTLDEALAAAARESI DSGAAD

 A QRDVVALN A ALLAFEVAGKVAEYETGVVLARQILSSGAAR R $\quad$ LEVTVLNA GLGGYANGKVDS IKEGIVALAREVI ASGAACL

 $D L G E T T V L N A G L G F Y A N G K A A S I K E G V A L A R Q V I A S G Q A D$ K S D DVILNAMFALYTADFVKHPADAKPLIQEAIRSGKVY TATNIVSLNAGAALYLSDKASSUQEGVQLVRTAA HSGSIS SQNQVVIANSAAALVTANPEDSFQDAVAKAEDVLLSGKAL


| UniRet | EV10 260 |
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| UniRef90-UPIO004799F45 | EKLEQ |
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| UniRef90 B3T8W1 UniRef90-A1WT6 | DKLENFVKNOCGD\KKLEEVKKL |
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| UniRef90-H5WVD4 | AKLS QFVA LT N G |
| UniRef90-UPI00036AB4C8 | DVLGRLVA |
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| UniRef90_Q3J897 | E K |
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| UniRef90_UPI00036AAA3F | RKLDEFL |
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| UniRef90-G7J5E0 | K T |
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| UniRef90_UP10003749FAF | KKLEE |
| UniRef90-C2M7P9 | E |
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| UniRef90_UPIo0047C7622 UniRef90 F5S5M0 |  |
| UniRef90_F9L9E3 | K QYMKM |








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| UniRef90-G4RKE1 | R HL EA I I M A |
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| UniRef90_UPI00037FDF62 | A KLR Q L Q EVQ |
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K H G GRSVSSSSGSA DVVQAQ

GYRLDLLS PERSAELLDRD ${ }^{80}$ GINVSAAPKTLSRALDEVG
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 GYSFTNDQDLLKRSLDAG GYTFTNDQDLLKRSLDAAG GVVNLS L P A Q TVMA Q A V R T GVNLNQTPGQVAEDI KEI G GVNI RMSTEQARKALLDEL G GI NLNLT TEQQALMLLENVG GI SLDLHEEEVE ELLEENH $G V K L N G D \square K E Y K Q A L D E V G$
 NVNINLSPEQI AQSI DNVG A GVVLELTPEQVKHCVDSI G A G V Y L D L T P P E Q V A R S V D A V G
 GI KI D L S A A E K S K Q A L D N N L GVDI QGEKTEVEEALERVN GVN H H LIS SEQAKQCLDEIG GLNLKASTKKTQEAVDEVG VNI DCGIDMVQKCLDNVG
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 GVK DAAAETVAECI RQAH
 HGVKFTNDPDKLLIRSMEECN

 GI ALDFQPHEVDELLKLTN $G V R \square G L D P D C L A R C L A A Q A$
 A G INLDLNMQQTERCDRDMG $G V N \mathrm{E}$ LTPPQRVRQVAEEAG
 GVN L ML E P EKNAK K V K K D TN $G V N$ L A A T P E K I Y D A L

 GVK K SAPSEKVAGALDEVG $\left.\begin{array}{c|c|c|cccccccc}\mathrm{G} & \mathrm{V} & A & \square & S & P & Q & T & A & R & Q\end{array}\right)$ HGCQI A LVEPNQVI LDRTNF

 $G V N$ E $\llcorner$ G P E Gl GI N QMAPEQALAALAATG
 GL NL RAD PQTVVAALPS S $G V 1$ D DDPEGVKKCVEEVG $G Y N$ Q G P P E R A K R LI E Q
 GARDDLSPEQCARCI DEVG GAHINLTPEQVADSLERCG GVNVHISAHKARQALDEDG GLDI NETPAVSYESVLQENN $G V$
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140 150
ARAPG|V|ARDDL
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 KLALGAKHALVVHACDGLDELSLATDSYVAELKNGADHE TNPAGVPNQLLGVFSGS
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SLEEARAKAYDYQD VFAKDLTKTVAEVLVRDGMKRTEGNLDEMTITGTSHVADG TNPAYVTRQVVGVFARDGLDEVSLATGTVVAELRDGVVSE AGARNLVGILVRVLQRLGSRHVMVVHGRNTIJGETWVGER
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ANPGGAEYQLI GVPDARAAFSV ANPAGAKAQV GVADESMMOVVQNAADHGAVDQHTAGED位 ANAPGSKH VMVVHAADGLDESSVAPTYVAELRDGVIKE NDLMGVFHPDMVVWGRDGMDEISLGAATLVGELRHGQVRE VQLMGVYDECLIRPIDETMDKLGVRRALVVHGSGLDEVAL AGAKGSDHVLMVVHGRPQDGSTVGLDEVTLTGESLVGED TNPVSLSSQLVGVY RQDKLMTLADVLHRI GRK NQLIGVFSTDFNLGDDNDAVVS SNPAGVERQLDGV
$A F P K N Q M V G V Y N$
RQVIGVYYIETLMKTGRHAMVK
P IIAEGAEH VLVVHSRDGLDEI
SNASRAKAMMAPGVY
SPSLTEVI AGAMVNLGVE ANAP YNGQVLGVFVGDQVRVQRLGSSHALSVFGREVGEL TNPAYNTYQLLGVY SEELLDTVANALLKLKHAMVVYGKD VNPAQPTAQVMGVYHKD LLQTVAQAQAVVLHSREGMDE VNPLAPTAQVLGVYYHPALVPSUAKALALLERQRFDGNLV MRPTGQVVGVNDVLYQLGTRREKLDEAGLADKTDDAVVSN LRPTG EALMKVYDAKLVR PITAETMLQMGMKRAAVVHGSGLDEVAD GQVMGVYNVLSNLGCKKAMVVHGMDGLDEI ATKVSEVTN AGAPELGAERALVVWGRGMDELSLGAASMVGELRDGKVRE TNPADADAQVVGVY DEALVPTLADALRMSVDRAGVVHG $\frac{L}{A} A P D Y Q L L G V Y D V V H G S G C D E V A L H G N T Y V C E L K D G E L N E$ TNPASAKRQVMGVF
ALVKRDMDGVFD KAWCTPFAHALAQLGTTHAWVVHGSDG LARLGLERAVVVHGHG GDDEASLAGVNQLRLVEGGTVRA NPARVPFAVVGVY
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 VNPSTPQNQLVGVFNLEVARVYNY ALAPN QVMGVFVGDQVRVQRLGSSHVLIVHGMNGMDE RQLLGVYSTVARLGHEHSVVVHGSGLDEUALHGVTEVAEQ ANPAHPTHQLDGVY DETLLE PLANVLKKLGVT ELLVPLAHVLSELGVKRAILIHGQDGLDEVTLTGKTVMLR YQLIMGVYAPELGLKTGMVVHGAGILDEAIHGPTQVAEIRDG LNPAGVKRQMVGVF
AGAAGSDGLDEITLTGP TRVAEFKDG LIDAEYDDHPEQ AGAPGSEHALV VYGTCGMDEISLS GETMVGEL

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

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 Y GTNTY TLLED GQISQQHNFTYEDLVNADVLLDVLQQNQASP



 YRINAVDAGLDVQS LD GLLVVSSAESRALIEAAFAGDNM $H V L V V H A D H T D 』 A E L Q Q G N 』 R C Y S V T P E D F G L Q R G N Q D D \square$ A GHMDEATLLGENHIALLYAGGNARENSVILERRVNNEKGA
 RALIVVGAGTVEDAVMGTTGDPDENARLLREVFAGRGRPA


 D P I E L GFKQYESSEVLGGGGNSEDNAGIDRDVFSGKEKG EKMTV TPEKVDLPYYSNEA IGEAKENAEI I GVLKGEKGA
 VRADRDTVAHYTVEPDLDAVCGGGSLEERVAARVLDGDTTSP NVMVVVHGRDGDELSDSGDTVVGGELVVVKEALDTLRVDGSHP Y DI H P E DF GLRRMYASRNFQVENA QESKKVLDALNNKATPA



 $H G L E D G E V R R D W L D P A A L G L A P D L E N R A I L E A V L Q G G G T R$ CGRETDVVEVKDERVVEYMLSPEAESAALI QSI FKNGENK
 QIS E F V L K P P E D F F E P F D P S V S S K E E A K $\quad$ R L L DR

 A E LLR DGR ILTY E I E P E Q F GLLRRHEENAK I IHDVFS GARGA F A M T R N Y E R I Y R P Q A L G F S A V R P E E L E D A A R I F L N N R A E A NGMDTK IVELKE GEDFGI TLAANVEDLRVARDLLTGK ETGP WQ 1 N P DEYGMAHNSLLD LAV S SAQESSLALI KQAFA GESGP Y E I E P E D F G L A M A S S R N L RVD SVA E S RAML E D A L N GV H G


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 A G L D I A F L Q G D R I T L L S NA S S S A L E NA E I L R S V LQ G K G TV

$\stackrel{+}{\mathrm{H}} \mathrm{G}$ GETNYWR IHGSGD $\quad$ TTVGSKGGDCFENAETLAKLLNGGENN
 Y E V H P E D F GI A M A A S R N L A V A G P A E S K M V L D A I E G R E G L P
 $F N L T P D D F G V S Q M P D S A L A G G E P A E N A A A L A D L Q G E G Q N A$

 R A L V V H S E G L D E M S P L G P GVVR C TLL EN A K V L R R V L S GER GP




 NQQMTS SEFDPDTYGFHYAPS DSLENADVTRQILS GDLVGG
 $F G L P V C A N L N D \quad I V V A S A A E S L A M D D \quad R V L A G E A G A H$ $K G G E V R V H P S D F G L P V Y D A V A N R E E S V G C \square R R V L A N E D G P$


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240 YL ETTVLNAGLGFFANGKTNTIKEGVALARKLLADGSAL ARRDLAVLNAAAGFVIVGKATDURQGRAMAEELLDRGAAH KLSDAI ALLNAGSLYTADVADSTEDGFKLAKESIKNGKAK R DDVVLNAAAALYVGGKARDLRTAADLARELIDSHAAY KAVDMIALLNAGAALYAADLAEDLKAGVAKAKETI LSGAAA RVRDVVALNAGAADYAAGMADSLQVGVQRAQQVLANGQALL YL DTVVLNAGLGFFAYGKVSTUEEGVLMARKVVASGEAK ALMKVSDLGFEQITEDKDKGGDTVESSARTFTNVLSGKGT HRDAlAVLNAGALLYLAGPADNLADGTRMALDQLASGRVS AK DDMVLLNAGAALHAAGRAESIKEGVARARQIIDSRAAL KAADTITTLNAGAALYVAGVTRDWKQGVALDADDVICTGQAL R DVVLLNAGAAI YVAGVAESLEQGLEKAHVAIESGAAK QAQAVAMNTA LLMKLFGHEDIKQNAQQVLEQLTTGKAF AKRD\VVIAAFALFDEGSA DDLKDGDQKANAALDSKKAM YRDTVLLNAGLGFFANGKADTIQEGIRLAKESI DSGRAL QTDAVVL NASLALQVGEVTPDYPTAIEKARNIIESGSAW DARFII 1 NAAAGVYAADGASLRSAADHVRAVLASGGA PARDVVLLNAGASLYVSGVADSLRDGVERAREAIESGAAR TDII ALNAGAALYAAGNATSIADGLAQAQAAIKSGAAR ARDDVVL NAGAAI YAANDADTLSGQEMANTAADNGVAM KAADMIVLNAGAALYAADI ASSLKQGVEDAHDALHTGLAR KAAELIVMNAGPALYAADLATSLHEGLQLAHDALHTGLAR KRTAVILNAGAALHITNQL SLEEGFALAADILANGSGL DEHNQAVAMNTALLMKLFGNDDI KANAEKALNIMANGKAF AQADVVALNAALVLWAAGLEPSIAAGLERARQALGDGSAW IDAQSAVAVNAAAAI YVSGAVQTLEQGVVEAMRIIESGQAF SYRDVVLANAGACLYVSGLANSIADGVQSAAMAIDNGNAY $A$
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 A QAAVVVLNAAAGLLAAGAVSTWQSGI AQAQECLEAAAAW

 H I D A V A V NTA M MLMRTRGERNLKANVQRVRELLRTTDKA Y

 RKRDVVLLLNTAAALYI GNSCNS LIKEGLLDLAAHLI DSSSKAY | R |
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| R | R D V A L N A G A A L Y V A GVA E NI A D GI D R A R K A I D S G A A R A D A LVLLAN A A A A A L Y V DA G E A D S L A A G G V D D A A R E S I D D T G A A A HKAAVAINVAA MLKIAGMGDDLKVNTRAVLELLGSAKAF

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VRDAVL L NSAAALVALAPLADQLRAGMARAAESIDDSAAR

 VR D I V L L N A G A A L Y A A DVV T S I T D GVVRAAREAVAS G Q A L HQQAVAMNSA MLMSDFGYPNLKQNAQADMDDIATGKP F R D D V L L N A G A A L HVAA H P D L S I Q A G I D L A A K TI D D G K A F FKTDTVILNAAMALFAAE DRPDLAQSIALARDILSSGKAY A HNAA I AANVAPLLLMAGQVKSLKEGAERVLAVLAS GKAA A HREAA！FASA IACYVGGIANCIMEGVCMAREAISHGTAK $R \quad D V V L L N A G A T L Y A G N V A A T L D E G V D M A R E A I D S G K A R$ QRDIVLLNAGAALYCAGVAGTIADGVRRARE


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 RQLTGAFAPDLIFPMAETLQMLGSEKAWLVTTAVAALEGD MAPDMAETFARR GHSVLLVSGDDGMDEDTTTTTVGDG ANAFHSDLVGDQVRVLQRLGSKHVEASLGAPTLVGELGQV TNPANAKRQVMGVF H LLLGARPELVELLAETDRQSHDRKAAVVAGGYDEVTPL YAVIGVYHENLLIPLLTKTDTPTLN KQUVTKMAKAAQK SFPKNTDSNFTVVHALDGYDEVSLTGATKVITHSTE GMD TNPAGADRQLMVVSSHDGLDELSISAPTQUSETYDGTPEE TNPVKLETQLMGIYYHTRFAVHRDLLEQTAQVLGKLGRK
 ANPAGARHQVLGVYEARWVPVLGDEDAVTGMTHVCEVRDG LQPTG ALPRGVYSREMIRPVSDVMQEIGYQNAVVLHGSDEDSDKG QPSSGLDGCLAEVYARRGLLVRGDDGFDEITTTTTSVSNG
 AFPQNQMVGVFSLTDKNYSIVHDLDGYDEISKIMSNTAES SNPFSPQFQI $\quad$ GVYQ
VNPANVNFSLIGVANDEDARDYQYTLQR LNPARPTHQILGVPTSRHV PLMAEVNANETKIINK VNPAKPKFPMIGVY SLEDARIVQYLLQKKGLS RALIGVYSPELVLPHGGGDDEVALHAPTQVAELCDGTLRH TNPAGAPNQVLGVFARE WVRPLAEALQGLGSEHVLVVH RQVMGVSVHVMVVHSEDGLDEISLAAPTYVAELKNNEIIRE TNPANAKRQVDGVKVGAALLELGSEHALVVGAGGLDEFSL QWVAPLAHVLKRLG SEAAWVVHGSDGLDEITTTGPTTVA AAARGSNR VLVVHGDDGLCELTVTAPTHVVERRDGKIRE VYDPRLTAPVARVLGDLGARRALDETATTGPTVVAELIDG
 TNPAGATVQVLGVY KEELLEPMARLLYNLGVK TNPAGADAQVVGVYHGAGLDEDGVHGESTVAEVEGDSVDE SKPKNQLVGVFNLRLYNYLYQKTDKNYVILGYDETSLTGD
 ANPAGVKRQLLGVFAE AWVEPVAQALSQPTAVAELVGG AAAVGCMAPVMEVFAGRGLVMRGEDTAAPTRVWLVREGTV LCYPLACTLQNVVHGSGCDEKTLELRKGQDKQYMLEPKD S $\mathrm{F} P$ AGPFGLIGCAFRMPDMGGAFAHQGVRALIVRDGMDEDSVC ANPAGARYQVLGVYEPRWVPDLGGVLAALGAAHVTGMTHV $D L T E P V A Y V L Q R L G T K R A M V V A G L D G M D E L T N A A E T K V S E$
 PVAEVLRTLVMAVHSEDGLDEISSAAPTQVAELRHGEVRE ANPAKPSHQLLGVY SSADGADAALAPLMAGRALVFRGGDGLDEMAQTVTADSDV VNPSDPQNQLVGVFSLELARIHSTDEYDEVSTDAFKVIS S TNPAMPDREVMGVFTPMAEVLGSLGMKRAMVVHGHGGMDE AQATGADARMAPIMAGSALVFRGDDGLDELTT TATSQV HWLKPTANVLANLGSERTLVIHSRDHLDEISTCVHGEFKE VNPMRPTGQVMGVYTREGLDEASLGDLTDLAVLCDGKVEM SNPAGATHLVVGVF KPELTRTLAEVRLLGARGATVVHG SLPAYQLLGVADLKDGDGAVVNNLD AQATGADARMAPIMAGSALVFRGDDGLDELTTMTATSRV AGAPNLMVEVLRQLGSQHVLVAHAEDGLD EVSLAAPTQT YASRGLSAIVFR GRDTGLDELSTVGVNQAWIVSGGAV TAPAGVRRQLT GAFSKDIAMAETLGALGSEKAWL ANADGDYAKELLSAYSEGAKKALDESSIDAKTEVIDENK
 HLLDTVSQVALSLGYKRALFVHGLDGLDDEVSLGKKRVQEN SLMAPLAEVLTRLGVKHAMVVHSQDGLDEISAAADVIVDN AFPENLYGYLYQDTKKNFTLLHSDDDEISLTGNTKAURNN TNPAGVKRQLT VNPVRPTGQVIGVCDPNLVVPDAHALRQLGTELA\VVHG YAAVGCADPRMEVFAGRGTVFRGDDGLDELTTATTSTGDD
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 $H V M T T D A E L K D G E N P E D V G I V N G L V V A D A T A S L K L I D K D A S$
 A GLAADET LSTMLNPQQLGLTPGNVDENALILRHVLQGKGTT DGEQDYRPETLGLARLLYGGATPDEAADIVRRVLENRSTA
$H P E Q G G P V Y P L E A D V G G G G P E T N A L I V R R V L N G E T G A T$ $A G L T D L A V L S N G Q Q E L G L A P A P T H E N A A I L T A V L Q G K G T Q$ Q T K K D D L Q NMYTIAVGLNRGKLEEI QVNTPAESATLIVRKILVGEANA


 VI K S M EI HP E D A GLIPVHRGGTPQENSAAMDALLNGEAGA


 $N P E D F G V Q K \square K Q S E D E G$ G GKTVVEESAQQMFLNIISSGKGTE








 L G L K R A L V CHDE F S DF Q TTM Y T L L E N E V I S S L K R E EV Y A NGEKIF SASELGFENISSYSGGSQEESAKIFMNILNGKGTK


 GATMTDSNGTEMLEPVVDFGDQAVKASEDVLNDLNGKGTEA





 FKVVVTPAKE S Y S P E DLLGFGGES DE EAAKDFK DI I S G DGTP
 Q IRRRLTVTPEDA GLPRATAGGDPETNAAARRAVLGGARGA TESVVV D A V D L P R S E P GD R G G D A A F NA DA A L RMF A G E K G P F G L K S H P L E A L K V Q SVQ E S V K N K R DCLD L L Q G G G S E A F S I L H S L D G Y DE I S L T G P T I K N N K E VK ESADLLFLDN GK G T



 WEVRD GE DQE HSLDP PLDRATVVEDLRGRDADVVLDGBAPG $K G E K L L T P Q D P R N K P E D D F G G N T V E E S A S I K V L A G E G T S A$ LGSNRACLFDDGSAP■GFAVDAQVNREDVLSILKGKEGPK WRVVR D GRVVTQEAF DPRDVGIV DA A HNA DVAR RVVAGERGP WPKKYHCAHASSDDVVVETPA QSLDALAESV FAGBA GPA $K T V D P Q A D G L I D K A P V T E L L R G G D V E E N A D D L K A V L Q G K G T T$ S GLDEFTVVGPN GEVIDDRTLHPEEENAEI TRALLTGGGTP

 AE LK D GE $\square$ HRYT LTTPEDVG DERQQLVRTTAEDSLRGEGPAA SEVVE F DA EMF DMAR DVEDLR GGNA RQNA EAAEVVLSGGGGERA
 $R \mathrm{GLVV} H \mathrm{GE}$ GLDDEVVNPRGET $\square$
NGKITTYYEITPEDFGMSRATGTPEENANMDRVFSGKDKGP Y T VTPE DVGLQS DS LVGLEVTDP QA SLALI RDAFGKAAAR H GRQAT LTLLTPEQFGLSSRCGSAQVNAADTRSVLAGBPGAP S E R MLT A E DF GVVT I K Q E D $\square$ VY G G DT DESSA A IFK K S GK GT VH GS DGTADEIVVCGPTAVAVLENDKIIDDILGGTPDEN REKLDEAGLADASTPAELGLEPSPENAQILQSVLQQGGTGQ GS SVRR WS GUDPR E $F G V S Q Y P L D S \square A G G \square A G G T P E Q N R E M D R A D Q Q G K G T D A$ $D V E R F T D D P A D Y D Q A H G L V V D T A A E S A D L I R A A L G G B P P A$ D GQDT E FE IT P E DVGGLARGGGEPAYNAAALMDVLKGA K NA UniRef90_Q6C7L2
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HNAA DAANVAAVLVMQGDY SNFKDATQAVQNHDESGAAF HVRHAVLLNAAAGLVAAEFMDRFASADRRAEEAVDSGAAR QNNAVLANAALGI NTDDNNDTFEQSMEKAQDSLFGGKAA K DVVLLNSGAALFVAGRVESIAAGVSMAKEVIDSGLAG VRDAVLLNSAAALVAAAPLVEQLAAGMERAAESIDSGAAA R DIILLNSAAALYCANLCLTYEEADHKAADAI DSGLAY A AQRDVVALAGAALRTAGQVER ADGVAQAREVMASGAGW RDAVLLNSAAALLALLEGDLVEQLRAGMARAAESIDSGAAR
 VRDAVCLNAAGGVLAADSYAPRLKEAVERARRVLDSKLPL AYRDAVLLNSAAALVVAGRASDLKEGAGDAAESIDSGAAR AF LE VSLNSAAGLMVMNQETDLLSAYKKVKSHILNGSVM
$R R Q A V V L N A A G A L M G D K A D S F V E G \square K L A N E L I D S G A A Q$ KAADMI ALDAGAAIYVSGDTRSHKEGVQMAEDMIHNGEAA R AVVLMNAAAALHIAKPQLDLAAAFELLARTIDQGAAA EAQNNVVCANAGMALATVKNLEPKAGFELAKEALDSGKGL ATAMSALLDGAQGAYVADKVDDLKGGAEMARASI DSGKA AQQDVVALNAALALQVSGLIPVGEKGIALAKELLASGAAW
 EAVKMIALNAGAAI YVSGVARSLRGGIELADDLVSTGQAM

|  | 250 |
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| UniRef90_C3N518 | NKLNEIISSLNG |
| UniRef90-A3M784 | EKM |
| UniRef90_A2BWT1 | D K F |
| UniRef90-K9W7Z4 | S K Lie QLvo |
| UniRef90-W2CRP1 | QTLKRF |
| UniRef90_UPI000380FFC7 | LT FERLVE |
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| UniRef90-R9CUT9 | ECLK Q L |
| UniRef90-S2XGW1 | S VLESVV |
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| UniRef90_UPI00036FE7AE | QKLQALI S |
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| UniRef90_UPI00047CBA81 | K K Q EL |
| UniRef90_UPI0003713D8A | A KLEQLIQ T T G |
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| UniRef90-A3Y8S0 | VKLTELAA |
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| UniRef90-J2K9B9 | K SLELLLK K |
| UniRef90-M0QLS4 | SVLD RWVALS G |
| UniRef90-U5T1G7 | T R F D R F VA |
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| UniRef90-F21113 | K K Y K E L |
| UniRef90-I3RG16 |  |
| UniRef90-K6D3U7 | Q K L N D L $\square$ T A |
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| UniRef90_U2XGS5 | TELERLIQ |
| UniRef90_A3XR49 | ERLNKLIA |
| UniRef90_A4EKG3 |  |
| UniRef90-K9TBP6 | T K V e Q L V ${ }^{\text {a }}$ |
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| UniRef90_UPI000395AF7E | TIMQAL A Q |
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VSGTTTDVVGTGGDGRNSSTATSLVLAGMGYKVV
VLDTAGTGGDGANTTTGASLIAAAGGCKVV
DRHLLDVGTGGDGANTSTASMFVAAAAGARVA
GKYVDTAGTGGDGFNVSTAAALVAAYLGARVA
RTVRDDVRTVDTCGTGGDSSNSSAAAFVAAGAGLKVAB

TTDLCGTGGDGKNTST\ASFVTAGAGVKVA RRTEVPGPSLDTCGTGGDTFNDSTAAALVAAAAGQPVA LQQDVKTLDIVGTGGDGANTSTSAATLAAACGAKVA
QKIQHDSPVIDTCGTGGDGANDSTAVAFVAAAAGVKVA VDTGTGGDSFNVSTTAAFVVAAAGGQVA

RPLLDIVGTGGDHQNLSTLSALVAAAGGVAVA
VIDVVGTGGDNKNTSTCACFVVAGAGYKVA
EKRLVDIVGTGGDGANLFNIDSASAFVAAAAGV
HGDIVDCCGTGGDGANTSTTAAFVAAAAGVKVA ID 1

 RلAVSGRTLDVVGTGGDGLNDSTMASLVAVGAGAKVV

VPGPT LD SA
MDIVGTGGDGTNSTMSSLVAVGAGARVV
$P V V D V G T G G D G V N I S T A A S I L A A A A G A K V A$
VDV VGTGGDGAKTSTTSMFVAAAAGAKVA ADVVGTGGDGHNTSSAAAMVAASCGVKVA


|  |  |
| :---: | :---: |
| UniRet90－S2XVM4 |  |
| UniRef90－D9TP | FLYAPKYHSA MKNVAQIRRELGLRTVFNILG PL |
| UniRef90－A0A031GPE7 | TGFMYAPNH HAAMKHAAPVRKELGVRTIFNILGPLTNP |
|  | G GFMLAPVF HPAMKAVIGPRKELGMRTIFNILG P L |
| UniRef90－AL | GFM FAQKFHPAMRFVGPVRREGG |
| UniRef90－T2BER5 | LAFFHAPYFHPLVGELRELRAK Lill |
| UniRef90－E0S 588 |  |
| UniRet90－R6KR | MSFLFAQQY HKAMKNVGKERKELGTRTIFNLIGPLANP |
| UniRef90 UPIIOOO3B53849 | IGFM FAPYHHPAVKAVSEPRREVG |
| UniRet90－A1BE13 | LFAPMY HPSMKAVAHVRRELGDRTIFNMLGPL LiNP |
| UniRet90＿OSH |  |
| UnReeg－DVMCB4 |  |
| UniRe90－M0MCB4 | QOYASGF KAVAPVRAALK |
| UniRef90－UPIO0047B13C1 | ПHHPAMKVVAPVR |
| UniRef90－M0MP11 |  |
| UniRef90－UPI00029 |  |
|  | NAMRHVAGPRGELGT RTIFNLLGPL |
| UniRef90－A0A02 | APVFHPALRFAAAPRREIGTVFNVLGPLTNPAAP |
| UniRet90－UPIO003E | AG MRFAAPVRAALKTRSIL F |
| 230 |  |
| UniRe990－W6N3 | FLLFAPMYHSAFMKNVAGIRKELGVRT FNLLGP TNP |
| UniRet90－W8AEV0 |  |
| UniRef90＿F2LU | K |
| UniRef90－H0E | GFMEAPAH HPAMRHVVPVRRA |
| UniRef90＿UP100035EA49F | FLIAPAYHTGFRHAMPVRQKTRTLFNVG |
| UniRef90＿A5B8K2 | MMSPKY HGAMKIFAPVRKKLGVKV |
| UniRef90－W5Y522 | FLFAPAYHPADAHVMPVRRVPTIFNTLGPI |
| UniRef90－14VRP1 | \GFM FAPNHHPA MKIVAPVRKEMGVRTLFNIT |
| UniRef90－E1QT46 | APAYHPAMKNVMPV |
| UniRef90－UP10003F | T C C Alk |
| UniRef90－XoUT57 | FAPAFHPAMKYAAVPRREGGRTVENAGPL |
| iRef90－UPIO00379EB68 |  |
| UniRef90 ${ }^{\text {A0A037ZDH5 }}$ | PAIRHVMPTRMELGT RTIFNILGP号 |
| UniRef90－D50FZ1 | PNHHPAL RHVGQVRRELGFRTDFNLVGPLCNP |
| UniRef90－UPI0002E7571C | I CVL HAP旨HPAMRNVGPIRKELAVKTFFNMLGPMVNP |
| UniRef90 K9UL | FAPGWHPA MKAVASLRQELKIRTVFNLL |
|  | I CFMMAPMH HPA |
| UniRef90－UPIOOO35F00A3 | M MAQLHHPAMKHVMPVRQELGCKTIFNITNPAGVK |
| UniRef90 A1VGC0 |  |
| UniRet90＿G8YLC2 |  |
| 俍et90＿R8APK1 |  |
| OL | K NV |
|  |  |
| 22E |  |
| UniRef90＿W5YQ67 | MFAPAH HGAMKHAIDGPRKELGCRTIFNILGP |
| UniRet90－C6PZU9 | HNA MKNVAPRKELGRTIFNLLGP |
| UniRef90－UP1000406D5A3 | AFCF AAP |
| UniRef90 W9GEF5 | FAQTFLPSFRHTAVPRRGVGTAFNFLGPLT |
| UniRef90－A0A024UDE5 | PHFHPA MKH |
| UniRet90－K9X | APGWHPA MKSVAPLRKTLQIRTVFNLLGPL |
| UniRef90－UP10003B392F8 |  |
|  |  |
| UniRet90＿UPIO004105D93 | FLFAPQYHAG FRHAAPVRQTLKTRTI FNVLG PL |
| UniRet90＿B3QM44 | AFLFAPPLYHPSMKAVASLRRELGILRTLENLLGPL |
| UniRef90＿M5G |  |
| UniRef90－UP100036B7F9B | GFLFARAF HPAMRHVAPVRAELGIRTVFNLLG PL |
|  | A |
| UniRef90－W9V3v0 | SH HGAMKHADGARKS |
| UniRef90－K2ILC9 | APQYHPG\AHAMPVR KALKTRTLFNLVG PL |
| UniRef90 R7JB33 |  |
| UniRef90＿C8S2L6 | MRHVGPVRAELGTRTIFNILGPLTNR |
| UniRef90 U3A5B9 | PAMKAVIGPRRELGG MRTIFNVLGPL |
| UniRef90－D5USL9 | SVRFAGATRKE |
| UniRef90－D6Y9 | C FAPVYHPALTRAGPARKE |
| UniRe990－12B8 |  |
| UniRef90 UPI0003AD5A0D | FAPLYHPALKYASRTRSELL |
| UniRef90 U2FTB1 | APAH HGAMKYAVGPRRELGVRTIFNILG PAL |
| UniRef90－W10J06 | CFLFF APLAPAALHGMAKVAPVRASLGUPNVENDLGPL |
|  |  |
| UniRef90－C7M083 | HPamag VAPVRRALGV |
| ef90＿M1FGP1 | VGFMFAPAH HGAMKHALGPRKELGCRTLINLLGGPMTSK |
| UniRef90＿UP1000377 | CFLHAPMF NDALKVVAPDRRELGVRTFFNMLG P PL |
| UniRef90＿U1X061 |  |
| UniRef90＿Q2BK25 |  |
| UniRef90＿D3 | PA MRFVGPVRAALGVPCVGPLTNPATPK |
| UniRef90－UPI00047CBBBA | AF NMAPLMAGV |
| UniRef90＿D7W975 | NFTFLFAPAYNPA |
|  |  |
| UniRef90＿UP10003 |  |
| UniRef90＿A8IBN0 | HPG MKAV |
| UniRef90－C6M5J9 UniRef90 H8WZ70 | SA MRHV |
|  |  |
|  |  |



UniRef90_H0EAH9 UniRef90_UPI00035EA49F UniRef90_A5B8K2 UniRef90_B8J164 UniRef90_W5Y522 UniRef90-I4VRP1 UniRef90_E1QT46 UniRef90_UPI0003F5C48A UniRef90_UPI000464CDB1 UniRef90 X0UT57 UniRef90_UPI000379EB68 UniRef90-A0A037ZDH5 UniRef90_D5QFZ1
UniRef90_UPI0002E7571C UniRef90_K9UDA9 UniRef90-17DQA0 UniRef90_UPI00035F00A3 UniRef90_A1VGC0 UniRef90_G8YLC2
UniRef90_R8APK1
UniRef90-G0L1I7 UniRef90_E7R050 UniRef90-W2EX44 UniRef90_W5YQ67 UniRef90 C6PZU9 UniRef90_UPI000406D5A3 UniRef90_UPI00029A6D8A UniRef90-W9GEF5 UniRef90_A0A024UDE5 UniRef90_K9XQA3 UniRef90_UPI0003B392F8 UniRef90_G8S866 UniRef90_UPI0004105D93 UniRef90-B3QM44 UniRef90-M5GAN4 UniRef90_UPI00036B7F9B UniRef90_R5NZ83 UniRef90_UPI000366BB08 UniRef90_W9V3V0 UniRef90_K2ILC9 UniRef90_R7JB33 UniRef90_C8S2L6 UniRef90_U3A5B9 UniRef90_D5USL9
UniRef90 D6Y997 UniRef90_I2B850 UniRef90_UPI0003AD5A0D UniRef90_U2FTB1 UniRef90_W5TDP3 UniRef90_W1QJ06 UniRef90_M0LRM9 UniRef90_C7M083 UniRef90_M1FGP1 UniRef90_UPI0003777931 UniRef90_U1X061
UniRef90_Q2BK25 UniRef90_D3R5V1 UniRef90_UPIO0047CBBBA UniRef90_D7W975 UniRef90_UPI000255D59A UniRef90_UPI0003B556EE UniRef90_A8IBN0 UniRef90_C6M5J9 UniRef90_H8WZ70 UniRef90_Q15RZ7


 TNPAGADA QVI GVYHGS GMDEDADHDTTTVAEVI GDNVDG SNPAHARHQVLGGA DPALAEKMARALHLLGTQ YQMMGNHAPVHKLL $\quad$ AEVVLRSGGRKRALVVRGNDGMDE $\bar{V} N P L V P T A Q V L G V Y H \quad P S L V A P M A E A L E R L G R E R F L V V H G$

 A LA T GCRHMVVHGETET GAAFEPSDSGPTHILLELHEGVMAR

 ARP
ARP TYHLLGVYAPELVKTYAEAVALGHQHTFVVHG


 $P \quad D A Q V Q Q Q L G M E V V F G S G A L H G E T Q V A E L Q D K E Y T L T P A D$ L NPARPTRMLLGV AKPAMLHTMADALLLAGGYDELTTM
 $T N P A Q P G A G L D G V P V I A G V F A E R G A S A L D V R G N D G$ $P$ LSNPS DT YA QLI GVFSRAF LLGVMFDASR ILDNMNNVAEC

,
$\frac{N P A R V P F A V V G V Y}{L L}$

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

 A A LI GCAYVLADVFARRGLLVRGDDGLDEITTTTTTSTAWS
 GHVVRRQLVGVV D PRWRRPIVQTLRDEGSGQVWSVSGAC G SFPKNQLVGVFNL ELLARIYSYLYQN
 $R Q L T G A F A D D L I H P M A E T L R T L T D E M S D T G K T V V A E L D K D G$

 AFPKNQMVGVFNL ELLARMYGYLYQN T NPAGADAQVVGVPVLARADSHDVSHALVVHGSGMDEDAV
 DLCRPMAEVLQRMGSEHGLDEDSDASPTHVAELKNGEDTE AFVKG $Q \vee L G$
$Q N Q L V G V F \cdot N G E L$
A R A TY QVI GT TRTADV
 NPAKCQTSVIGVYT PSLLD LGGQVLHLMGVG L R P T G QV I GVVY S L A GARHQLVGVV DVVA E D G L D E DS I A A S T R V A E L K D G E V E T A A AVGVMASVGALRGDSALVMRGEDGLDEFTTTRLWLARD
 $G Y P R G G M V V G V A D R T L G P A F A E G L R L L G V E R A A L S W A$ TNPAGADRYVLGVYHGSGADELVLGENDVVEVGKG VNPCRPAYQLLGGVA NLNQMRLYSSVYEKLGQG $\bar{F} Q L M G V A R P E I G E T \square A R \quad V F R E L G R K R A L V V H V H G P T T D$ NPAGVKHQVIGVF SEKLCRPMAEVMQQLGAE
 TNPADADA QVLGVYHGSGLDEDTDHDETAVAEVHGDDVEE LAPVVAQAFADRGGKDHVIVVRGDDGLDELTTTSTSTVVR
 A QAVGVFHPRMGVFAARGCVFRGDDGLDELTTTGTSTVWV

 TNPANADAQVVGVPVLARALTKEVERALVVHGSGMDEDCLD S LLE PVAHVL AAI GVVRHAVVHSDD TLCRGSEH IMVVASKDGLDEDSDASSTHVAELKNGEI F E VNPIR NQHVLLGVFNWKMLRMHSIDGYDEI STDSFKVVTK
 HMA $\square$ GCMAAVYAANGQSGMVYTSNE GLDEMAPTGISVVEF LAA R G DTA LVFRGSDGRDKLTTSGSSAWEVRNGKVQEYLV


 $P D P \square Q S R \square L V Y S E K L G G E \quad N Y A Q A A S I L A K K S H I H K R$


## UniRef90 J3VTR7 UniRef90-S2XVM4 UniRef90-D9TPR3 UniRef90_A0A031GPE7 UniRef90_Q18FI8 UniRef90-A5UT95 UniRef90-T2BER5 UniRef90-Q7NGU2 UniRef90-EOSS58 UniRef90-R6KRU3 UniRef90-UPI0003B53849 UniRef90-A1BE13 UniRef90-Q5HPH3 UniRef90-D9VSZ9 UniRef90-M0MCB4 UniRef90-E1W5Z6 UniRef90 UPI0004 <br> UniRef90_UPIO0047B13C1 <br> UniRef90-M0MP11

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UniRef90-Q2W3A9
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UniRef90_UPI0003B4054C
UniRef90-Q30VM1
UniRef90-W6N317
UniRef90-W8AEV0
UniRef90-F2LU55
UniRef90-H0ЕАН9
UniRef90_UPI00035EA49F
UniRef90-A5B8K2
UniRef90-B8J164
UniRef90_W5Y522
UniRef90-I4VRP1
UniRef90-E1QT46
UniRef90_UPI0003F5C48A
UniRef90_UPIO00464CDB1
UniRef90-X0UT57
UniRef90_UPI000379EB68
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UniRef90_UPI0002E7571C
UniRef90-K9UDA9
UniRef90-I7DQAO
UniRef90_UPIO0035F00A3
UniRef90_A1VGC0
UniRef90_G8YLC2
UniRef90_R8APK1
UniRef90_G0L117
UniRef90-E7R050
UniRef90_W2EX44
UniRef90-W5YQ67
UniRef90-C6PZU9
UniRef90_UPIO00406D5A3
UniRef90_UPI00029A6D8A
UniRef90-W9GEF5
UniRef90-A0A024UDE5
UniRef90-K9XQA3
UniRef90_UPI0003B392F8
UniRef90_G8S866
UniRef90_UPI0004105D93
UniRef90-B3QM44
UniRef90_M5GAN4
UniRef90_UPI00036B7F9B
UniRef90-R5NZ83
UniRef90_UPI000366BB08
UniRef90-W9V3V0
UniRef90-K2ILC9
UniRef90_R7JB33
UniRef90_C8S2L6
UniRef90_U3A5B9
UniRef90_D5USL9
UniRef90_D6Y997
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UniRef90_C6M5J9
UniRef90-H8WZ70
UniRef90_Q15RZ7
UniRef90_M2XXH2


RALVVYTVDDYTDDPHDYGDDSKENAK ILLDILEGQKGPK

HAALPRRYEVTAA DLGGLAPAPREALRGGDVVAVVVGGLSGE
G G
HGEPGDDEVTYVYEDSGSRDEEY\|VSPEATRMLRSKGFDR


HIVHPEDFGFDRCPI EDLAGGNREENAIIIRNILDGAAGR
SGENIIYEVSSERALKKYSLSPQTNKQUALNDLSGTDHSS


A GLDEVVAVVGETQVSLEYGGSPDTYELDAVAGGTPAANAR


HGETVAAEVT GGNEVDEYTLEPGLEDHDVAD AGGGEENAAA
$L R V S D G H V D E D R D S P A D F G M D T C E E L R G V A R A L L A G D R G P$
$F S V T P E E V G G K R A P A D L K G G D S A T N A A A M K A L K K G E Q G A$
$R V L R V A D G H V D E D E T F G M A T C A V E E L R A V A R E L L S G V R G P$





$A D V R D G T L V P E D F R P D D D A G G E P G E N A D V L R R V L A A G A D G$
RGEITTRYQLTPEDFGFGFAGGTPEENRDILTRLL QGKGE
RALVVHSEGLDEMSPLGPGVXNFGDPRCTLEDLRGG KD
GPARMALLGAGSMSPMGLAVDGKDEAVAMLVGMLGGEGPR
GPARMALLHAGSVTPMDLAVDGKDEAVAMLRGILDGEGPR
WELRDGEVTHYELTPSDLGVGTYENARLMRESFAGRGPQA
$D G V V R E Y E V E P E D F G L A M A S S R N L K V E D A L Q A L T G E P G V P M$
DGVVREYEVEPEDFGLAMASSRNLKVEDALQADTGEPGVPB
VRDGTATETTFDPADLGRAVPDDLRGADAARDLFAGAAGP

| WVVRGGTVTEERRDPRDRGADASFNADVARRLLAGETGPV |
| :--- |

$H$ SLVVHGI DGDE ISTSGRSL
GGEVVTGVIDPTALGDPRTTAEALRGGDAAQVLGGKPGPV SD GTDELTITGTSYVAALENGAVIEAITGGGQPG
 TSI DPVELGGIDPAPDTALAGGDVAENAAILTAVLQGKGTE VGVSWVAAGNPGGSVSEME DHPPEENAKAFAALLQGKGTP
 A AVVFGAGGYDELTPLGPAVRDREEAVRVLRELLSGAGPQ GTINVQY I SPKDFNLPEHTUSEVKSGKEEFKVSDNKDVPN S GLDEVALHGPTAAPLERGGEAGENARQLTQLLQGQGTTA



RALVVC
 QWV RGQQSDRQVVD TRLGLQLVESLRGGGAP G HALVVHCAGLDELNPIGYTLTPDLEGGDADEFQGGEHCEN

 $A G L D E V A V H G E T Q Y P L G E D A G G T P E N C Q V T E L L L Q G K A S P$
 WQLE DGVIDRNFTLHPLHDFGIPTHSLVEVVEIGDGTNDPE A Y L LT P EAVVGLGRAP LAKGGTPQENAERARRLLKGE EKGP Y G I V N S DID GY D E IIS LIT GY G GA T P D E A A E I F D S
 H I L H T H V A E LIK D G Q VT E Y S I T P E L E V



 $V R D G T A T A T A F D P A D L G B R G A D A A F N G R D A R E T A A G G P G P$





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7CBBBA

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



UniRef90_M2XDH2

## UniRef90 J3VTR7

 UniRef90_S2XVM4 UniRef90_D9TPR3 UniRef90_A0A031GPE7 UniRef90_Q18FI8 UniRef90_A5UT95UniRef90_T2BER5 UniRef90_Q7NGU2 UniRef90_E0SS58 UniRef90_R6KRU3 UniRef90_UPI0003B53849 UniRef90-A1BE13 UniRef90_Q5HPH3 UniRef90-D9VSZ9 UniRef90-M0MCB4
UniRef90_E1W5Z6 UniRef90_UPI00047B13C1 UniRef90_MOMP11 UniRef90_UPI00029A1D5F UniRef90_Q2W3A9 UniRef90_A0A022LLB1 UniRef90_UPI0003B4054C UniRef90_Q30VM1 UniRef90-W6N317 UniRef90-W8AEV0 UniRef90_F2LU55 UniRef90_H0EAH9 UniRef90_UPI00035EA49F UniRef90_A5B8K2 UniRef90-B8J164 UniRef90_W5Y522 UniRef90-I4VRP1 UniRef90_E1QT46 UniRef90_UPI0003F5C48A UniRef90_UPIO00464CDB1 UniRef90-X0UT57 UniRef90_UPI000379EB68 UniRef90-A0A037ZDH5 UniRef90_D5QFZ1
UniRef90_UPI0002E7571C UniRef90_K9UDA9 UniRef90_17DQAO UniRef90_UPI00035F00A3 UniRef90_A1VGC0 UniRef90_G8YLC2 UniRef90_R8APK1
UniRef90_G0L1I7 UniRef90_E7R050 UniRef90-W2EX44
UniRef90 W5YQ67 UniRef90-C6PZU9 UniRef90_UPI000406D5A3 UniRef90_UPI00029A6D8A UniRef90-W9GEF5 UniRef90_A0A024UDE5 UniRef90-K9XQA3 UniRef90_UPI0003B392F8 UniRef90_G8S866 UniRef90_UPI0004105D93 UniRef90-B3QM44 UniRef90_M5GAN4 UniRef90_UPI00036B7F9B UniRef90_R5NZ83 UniRef90_UPI000366BB08 UniRef90_W9V3V0 UniRef90_K2ILC9 UniRef90-R7JB33 UniRef90_C8S2L6 UniRef90_U3A5B9
UniRef90_D5USL9 UniRef90_D6Y997
UniRef90_I2B850 UniRef90_UPI0003AD5A0D UniRef90-U2FTB1 UniRef90_W5TDP3 UniRef90_W1QJ06 UniRef90_M0LRM9
UniRef90 C7M083 UniRef90-M1FGP1 UniRef90_UPI0003777931
UniRef90_U1X061 UniRef90_Q2BK25 UniRef90_D3R5V1 UniRef90_UPI00047CBBBA UniRef90_D7W975 UniRef90_UPI000255D59A UniRef90_UPI0003B556EE UniRef90_A8IBN0 UniRef90_C6M5J9 UniRef90-H8WZ70 UniRef90_Q15RZ7




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#### Abstract

$D \boxtimes A E F \square K \square N T A F A L Y \square A G K A R D P R D G Y E Y S S Q Q L \quad P Q L I$ $R$ D V VA L N A GAALFAGKKVD S DND GFVVLTNALI DS GKAY  AKTEAALYAAAMTCYVSGKASCIDEGVCMAS DSLES GQAS SKR DVVL LN A G DALYVVA E QVESIIKHGVVERAKY LI DT GMAM  DLRDIVLANAGAAIVVAGAADSLMAGVERAREAI DAGHAA HANAVAANVALLLKLFGH DDLKQNVQNVLAHLSSGKAF LE I VA L N A GA A L Y V A G VA G S VA D G V V A R E VI A S G A A M $D L R D V I L A N A G A A I Y V A G E A D T L E T G A D D A R A A I E E G D A A$ VRDAVLLNSAAALVAFDGLSRGDDLAPAMAAAAI DSGQAA Y R D IVV L N A A A ALVVA GKVD T LIG DGARAA E Q A I DR G E A E VR D A V L L N S A A A LVVAFA D LV P A M R S A V $P M L D M M A F N A G L L V V L M E D A M P I S A A M A R A R Q A V A G G A$  PVRDAVLLNSAAALVAYDLRPEEGEALVRVAETVDSAAAA KLADAI ALNAGFSLYVAGVVDSDEDGFKLSKESIMNGKAK NARDVAVLNAAATIHVSGRSSSLTEAGAMARESLDS GAAA RAHEEAVAMNVALLLVVVFGNEDLRDNAQRA LTTAGHS GQAY EYNAKVLNAAAALLVSGHVSTLGDGVAVARTTHLSGKAL A MLD MV ALDNVGLAVVYLEENMDMALCMARAREAVSGG   R VR D MVL L N A A A L M TAA DE LTGA L GAA YERAGRA I D S GA A N R D A VLL NTAAALAALEGTLVEQLARGDAKGAEAIDS GAAR


$R L I N A A G A L A A Y A G F S G D L T A D L R A G L D L A A H A V D S G A A S$ A YRDSVVLFNGAAALIVVA DKVA DWAE GVVERIA EAI D S GARAM YR DTVVLNAAVA LIHVSGHGNDDQGDGLAA AASVLDN GAAH
 $A Q R D V V A V N A G L A L Q V A N L V P A H Q Q G \square E L A T A V L N S G D A W$ A YRDAVLLNSAAALVVAGAASDLKTGAEMARASIDDSGAAR AYRDAALLNAAAALVVAGVAGDLKAGAEQAAESVDSGRAM AMRDMLVENVGMALULLHDDRPLEDCMNEARRAVHAGAGR
 QRHAVAANVA ALLLRLFGHEDLKHNAEQALAVLAGADQAL QNNVVCAN A GI AI A TVVKNLSPKE GFE QA K E S L L LA G K GLL RDAVVLINAAAA LVVALDDGPGDD DLLGSALLARAA EAVDTGGRAA K A R DM A L N A GAA I Y V A G LAA A TPM D GV E LAA LDA I G S GLAA A R Q N N VV CAN A A M A I S T V T N C T G L E G F E K A K E S L L S G K A L
$P V R D A V L L N A G \square A L A L A R P D S G P S Q A M A S A A E A D D S G A A T$ A IGNTIAYNAGAGLYVYGLANTDKHGYEVAKAALKA GEAL

 A QTA A V AVNVAA LLRRAT GVQD DFKVGVVEMADAEMQS GRPM A Q DD A ALEAS A IT CYVVGGMGSCDDEGMSMSKESLES LAAAM AVHD Y I L L N A A ALLVVVAGKATNWRDGVRLARESSMESGKAR
 A H H D A V AVVNA GA ML Y V I GK A E S I A D GTEELAS QII N D GTA A KAKS II ALNAGAA WL GGEA DSHQD GVVKAFEMMD Q G LAAL
 A YRDAVLLNAAAALVVADRAASLPEGVEMARESIDDS GAALL AKRDVILANAGAAVYVAGETDTLEAGVDAAREAIDS GAAA R D A V L L N A A G AVA A Y E GLVA D S I A S HL PR VA DAVD S GA GA


 $P \vee V D Y I L M N T G A L A V V G G L A S S W K E G T E L A R K S V S S G A A K$ $N A A D L V L A N A G A A V Y V A G L A A D D L E A G V A S A R E A I D D S$ GA A A V R D I I V L N A A V A L WV D G R S A T I V D GF E L A V D A I S S G R A G KARDMI AL NA GAA Y Y G GLLAATAKE GVQLALDALGS GRAK
 SDESLAALIQAADMDALAADATSTLAREGVALAKETILDSGAAA RTTALIV AD GS LI DASAP LGERFRQAHAlAEQAVDSGRAA VR DAVV L N A A A GLVAALGALDTRDSAAMERARGSI DSAAAA AHRDAV AATA GAMFY L Y GEAPDFKA GTERA LQQLL N D G
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