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## QUERY

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 PMRLALHRGTSRTDQMLAEAMQRGVEDGSLVLEHSPRDLA EMRLEVRASFDLNEGWLTEVFAWGRSRGELTFTGTPGE
 A VKDEVLAFTEVNVAWLKNTLD G Q
 MVMKEVQTFADVNVAWLSRVLSAAA AMRLALKRGTAGII ERLARAIETGMKEGSLSIDGDPYSTA DMRQALHEGTQRFI GRI AACIEEGDAEGSLHTVLEPQATA
 TMRLTLEAGTSGIISRLAQALETGVAEGSLTDDDTPRTVA KVRHAVQSFYKANENWLAKVLAEGEAQDTLVAGGNPEAAA DVADEVRAHFGSDTAWLESVLDSAARGKRVKLTASVQAEA SFRARLKETFEDWQVRFAACLGEARKAGELAPEADAERFA AMRLALKTGTTGDIERLSHALEAGVAEGSVVIEDKPHATA PMRTILQDGTMQIVRRLARCMEEARADGSLPDLGDSQHMA
 PFRKRLAAVLRDWEARTARCLRAAQQAGHIPKDADCDSLA AMRDALKEGTFAMLDRLERTLTAGLEDGSLADDGTARDTA TMRSVLKRGTSGGTSRLGHAIEAGVAEGSFAVSEDPQATA TFRALLLADFTEWQDKLAVCLKEAQRQGLCDKSKDPHAAAA
 SYRASLIDAFHDWESRLARCLEAAQHRGEIPASVDCEQAA DMRSIMSAGVDDVIERIAGLI DLGKQDQSIQADTEASTLA
 TFRDALNLVF QRWEKRFIVCLKEAQHQGNDDKADAPEADA AMRRVLQRGTCGDTDRLGDAIEAGVAEGSLSITGDPYAVA

 $V M R V A T K V G T T A V L D R L E R M I A D G V A D G S V S D D G T P R A T A$ NVVLVSREFFSKNLSWLTAVLLRNETKSGTI T TFRKRLDRVFEGWKKQFNQCLKQAVEQGELSESMDDEQLS
 TMRDTLRDGTDRVVQRIAQCLEEARFDGSVPPTLVADATA QVRAEVARFFGDQNDWI ERVVREGQAAGQFRADLDAAMFA
 VMR ALK K GTA GII ERLARAA EAGVAEGSLKVEGEPHTIA DMRVVMDNGVAAVIKRLAAMIKAGQKDRSISSPLSAHQLA RFRARLEEVFTSWKKRYAACLREAQRAGELAPELDPSVVA


 E L R A PVDETLD WL RGRLAGDVEEGQKQGLFPPSLDGEEDA
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| :---: | :---: |
| QUERY | E TFMATVHGAMLSARAHGDAATFGATTRPMLE |
| UniRef90_F8JCQ8 | EVF\\|ATIHGAMLSARAYGDPQVFGQITNPLLDRV |
| UniRef90-J1TDU3 | EAFMATVHGAMLSARAYGTPAVFDLILEPSLQRL |
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| UniRef90-J5N588 | EVFMASVHGAMLSARAYGTPEVFPTILAPTLQRL |
| UniRef90-I0RQ68 | EMFMATVHGAMMSARTHGDPSMFSTI TRPLIEERL |
| UniRef90-S3HVK2 | EAFLLATVYGAMLSARAYGKADVFQMILEPALNRL |
| UniRef90-10G9K2 | EGFMATIHGAMLSARAYGDPKMFGV |
| UniRef90-UPIO00365E112 | MA LMATVHGGMLA ARVYGDPA AFANVVQQGVEQLDA |
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| UniRef90-UPIO00365541A | QTFMSTIHGAMLTARALGNAESFQAI SRVAI SRLSA |
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| UniRef90-W0HC48 | ESLYQLWLGASLLAKVNKSSAPFDTAMNLTKRLL |
| UniRef90-19MIN6 | EFLYTSWEGALI RMQVNRDLLAPDDKFDEHSFDRI |
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| UniRef90-Q0ACL6 | EAFWDGWEGAVMRARLEADARPLDVFIT TYMEGL |
| UniRef90-UPI000466F352 | RA $\cap \mathrm{FAAVSGAQLMARGRAD} \mathrm{\\| ALFDALLNS}$ |
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| UniRef90-I1DTT0 | QSLYQLWLGASVMVK\\|VRTKQPFETAMRTTRQVL |
| UniRef90-I3CR89 | TMLYQQWLGASLLSRLLGRDRAPME |
| UniRef90_UPI00037B8 |  |
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| UniRef90-N6Y220 | AFFWIGWEGAVLRAKLERSAEPLEVFADFFFASL |
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| UniRef90-W2EI93 | VFVLSAWEGTLVRARAERSGEAFDAFFSLVFGTLLA |
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| UniRef90-T0AUE2 | AFFW ${ }^{\text {a W WEGAVL RAKLERSAKPLDVFA }}$ |
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| UniRef90-Q5QZY2 | RMLYQMWMGAALLAKपS Q |
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| UniRef90-A3ZWC7 | DFMlS AFEGVLIRVQVNNDIAPVVEFLHFVFEVL |
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| UniRef90-K1Y0V6 | ENLISSFQGALLRSKVKKSPEPLRNF |
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UniRef90-I2BMZ1
UniRef90 F2R8R5
UniRef90-V4YFE8
UniRef90_C3A6B0
UniRef90_S9RE36




A V E R V T A Y L R R R E R DVL
A E QL EA Y FA A WQD SQSFE DCQ GCCLA V K L G A E V A D L S E

PAQRRLRAYFDEDTT WLEAA GWRGCLVGNMS LDEMPE HS E
S D PA A A L R RYP E T FRWALEN ENRMCLLSGFMAAEY DDDP E
QDPLNGLRQYPElFRRSLEN DNRLCLGSYMAAEYNELPE



$S D \stackrel{A}{V L}$


| $R$ | $E$ | $A$ | $Y$ | $F$ | $D$ | $L$ | $F$ | $K$ | $S$ | $G$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $K$ | $G$ | $L$ | $L$ | $P$ |  |  |  |  |  |  |
| $R$ | $A$ | $Y$ | $G$ | $R$ | $L$ | $Y$ | $L$ | $G$ | $G V$ | $E$ | $Q$ |
| $G$ | $L$ |  |  |  |  |  |  |  |  |  |  |

    \(S P V D R L Q R F F L W F H D H F A A S G Y\)
            RDRLTDYUEIFAEGYRTYLLP
    

|  | $L$ | $C$ |
| :--- | :--- | :--- |
| $G$ | $G$ |  |
| $L$ | $C$ | $A$ |
| $G$ | $C$ | $I$ |

                G \(H E K\)
            \(P L R R L K A Y F D D R V A S F A R G H T Q G C C V L G N F S A E T V V D H S E ~\)
    
DAAAKLIA GYGDFFASSSLRD GMMP

$L$
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$C$

A A DRLASYAEFFSSEIIVEGSFP LGTALAAELGALP K





DARSRVFTYFERWRKQLSPDPVNRCLVVKLSAEVADLSA

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RERLKKSFETLTTAFENACSKGCLGGNLGQEMSDQYD
QS A AK R L R L Y F E D L I S V Y GQGP DS GC L MGNL T L E I A A H S D
QSAAQALMAYWASWTS AS LDDGSDCRCLVVKLSSEVADMSE


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



D PMARLRAYVRLFATTYA QDG RLCV CGMLGAEVDALPG

A $\square N K L Q A F V A F Y R K S W R T V S N G G C P L M N A A T E A D D T F P$
Q QL S D Y A DLGFYFA LKK N D QKMC L C GLGAA EMDVLDE
QR $\mathrm{L}^{\mathrm{L}} \mathrm{T}_{\mathrm{T}}^{\mathrm{E}}$
QR L

ARRRL HYFER RWA DT EN G CN
$D$
$C$
$C A N$
$L^{-}$
AN R CLLVVKL $L$ G GE


UniRef90_A0A023UUA8 UniRef90-WOMSW5 UniRef90-N1WMA7
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 A V K DEVVQA Y A DVVHVA WL S KV L L A A G G V V $A \mathcal{L} E Q T S R Y F D M Q I A W L T G V V K R G T D A G E F V S A M Q P A D V A$
 $P M R E A D E G G G Y Q Q T L A N W I$ G E Q V V K A G WA D G S

 AFREKLHDSLERLI AFVRGQLELAHEQQLI PSHLDPDATA





 K V RLLEV KRFFNENLA WLT A A HSANGDLDPT QSA SMRDQTVQFFNMHLAWLEKVVDDGKAKGEFTKAPNGEQAA T I R D K T L I L Q N Q H R D F L DQTL Y D GVVK DGSF VLTLS I R D T A
 $S M Q Q L T Q R F F E M Q L T W L T R M L E Q G D K L K Q D P K G S G A R Q K A$ DMRLALDDRGAAQVI ALLAQSLKQGVDEGSLTLHSDATTAA PMRMVLQDGMEGVITRLANVVSDAVNDGSLPGDTDTRGLA
 $D M S Q L L Q K L V S D D L T H L A R T L E E Q A A D D G T V V P L E D P A A S A$

 TMCEKL RGVLDDGLSRAMGDVLNEAAARGELAPGVEPYEAA


 PFRARLNQILTGWQHQFEACLLLEARTA QE I A P D S D CA S L A


 K F R L K V S M A F E E I E S FVVKTCCLD D AVVAA GEVIDN SVVNTK K TA T M R V E A R L L M R E I Y A WL V L T L E E GRRRE GK L R F Q G D A Y D K A $A L R D R A Q Q A M N S W R D M I C R \| I Q K G \square E K G E I R R P T V D A D E V A$ LI R GRLLEQDFAS LTQHFSAGI RAAQAAGSVRADLDPDELAA

 E V A D A VA GFF R L N L D WL T A A FR D A Q Q S GRVVAS GQR PA A L A
 RLKNQVTRSFENWDKKDSKVIVVQGQENHEIKKEDDADEYA

 E LRAP AV DELFD WL RHRLAEVVVEGRARGELPATADPEQLA
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 D MRAVLA G GMREWRGFMEKLLDEGQEKGVFRKELNP QTTA

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





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保 DS DDSRRRWAD WYGADELAAERGCGYGSLAAEIDKKDL RESLQSLIDTYAKVLEPDNRK TCLCTCLLPEFNNLSE PLERIVNFTQSAMKGMGKDYKRGCLVGNLNQELNHLSD
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S


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KEKLLVYPELYKNSFTRLLFAGGCPILNTAAESDDTHP
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E P LD RLK RHFRA WKTAKDRGYTAGCFIGTMASEIMADTHE
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A R E R
S R R R
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VERVISYLER QRDSL RGCRMGRMTYDADVLAP

PQERLI RFFVANIGGCEENLDGGCFI GNMCQEMSESSE

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$L$ L R L L D D D F D



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 SI QQELRNFFDLQVNWVLKISSQN VSPEITDSND EA EFKNRLMQSYTAWQDQI ENCLNQAKQQGTI SKTVNT QLMS
 DMRQDLNFGVNKLTERVATLLEEGQQEGSIPAHDQPVKMA AFSNSVANELNKWQDCFEKCIEEGQDANSIKKEESAKEMS EFRKKVGGVF EAWTEKVK LVLMEMFKSSEPIAPDEVEKDA



 AVRDAVAA HLEALRGRFRRTIVTATEQGELAMHADAERLLS AL R EKAMEAFRGWKTHVVKVI KA G DAS QEFRRKDVDA E QTA PAHKLIAAENFQGWDGAVRECVEQMKDR VLPKGTDRAQAA A A R $\square S L N E H F N T W Q G L L T A G L T R M D D D G V L R S D A D P E L L A$
 $P \| G G Q V D M I L Q R S V A L L A D C L E Q A R R Q A E I P S D T D C Q A L A$ ELRRQAV QELRNT QVTWLTGVLGALMPAR KKGTSVASSLA
 EFNARLMQSYNAWQAQLTQCLDLAQQQHSDKADDDTS QMS EVASRVQA GLDDTREAFYHVLIVAQASGELAWTRDPHQLA GLQQRLTRRRFFDVQLSWWTRVMDEGDAA GELARGR GAREKS A ARAALLKEAVDRYRDALEAGLDRAQREGSVRLDKTARSSA ELLRKPVE E Y F GWLT GRLA E LLLDEGRAA GELD QALDP LA TA


 ELLR R L L V D F L E D I E NR QA R S T L A A LAF A S WE GLI A A D GL R R M Q A N G S L R A D A D P D A L A SARLELARSFAEWQSYLSAGFAAMRDNDELSAEADVDDLA

 | $A$ | $L$ | $L$ | $R$ | $L$ | $E$ | $Q$ | $L$ | $L$ | $C$ | $A$ | $W$ | $A$ | $L$ | $L$ | $A$ | $Q$ | $S$ | $L$ | $K$ | $D$ | $A$ | $M$ | $T$ | $T$ | $G$ | $D$ | $L$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $A$ | $E$ | $T$ | $D$ | $C$ | $A$ | $A$ | $L$ | $A$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $S$ | $Q$ | $V$ | $L$ | $T$ | $R$ | $A$ | $F$ | $F$ | $E$ | $T$ | $Q$ | $L$ | $D$ | $W$ | $L$ | $E$ | $R$ | $T$ | $I$ | $S$ | $E$ | $A$ | $A$ | $I$ | $Q$ | $K$ | $G$ | $W L$ |
| $L$ | $A$ | $K$ | $P$ | $A$ | $K$ | $S$ | $Y$ | $A$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | EVK ES S I A RFFRE L QP DME KLVQQGMDRGEFRKGDEPGPAA

 $D F R A R L D A V L L G W Q Q R V A D C L B S A Q A E G V L A A H A D A D A L A$ S I Q K RL QEIFEEQVQUI AEHLTAAVD DGEIELDVDPRLAA






 $T V R V R L Q E \prod F D A Q V Q M V D A V V T A A R D R G D V T V T V T K A A A$ A MRNALNAGSKALI STLTVAI DRAEREGTVKLLSNTSDGCA QLRKKALTAD DMSWKNKIVSLI NSGRDNREFRADVHAEDDA
 QLK E V T K N A FM Y WK D S I V Y LI E K G I E Q Q EF K P E T N P E E A A
 K S R A AFLDNVF QVWSVLI ERAM KEAQERGEVAKDRAPA LLLS



 $P M R D A L Q Q G A G K I T A D Y A R T L D A A E Q Q E S L S D L Q P P A Q M A$




 A $\square R L K V R Q M L R N S T Q A B E D L E E A R L K D G L E S Q L P S A D L A$ A MCREADA LLQQDVLGFFDETLA A GLA D G S DP HVDDVA DTA







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UniRef90-X0MLT1
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LE A F S QQVDQAS GQD G LRGCFVVFAAVEMLPKDK WEA WRTGLVDRGRWACP』GSLATQAAAVDA DAASAVDAFVGWWRQVLRSGFRAGCPVVAVTVECHDDAP D S V A S L R A WA D A IV A L $P R Q A V A G Y L D V V E R S L G D P Q R R G C M L I N A A L D V T A Q D P$
ARQKI R A LLLQRVEECAEGADGRGCDVVNTCIEVSABDP


$P$ LQRMLN F MH DARA GMTKHDRRGCLI GN LGQQEIDMDLPD D D PL A S LQR LLEE K I NTADESVVIRGCPLNNLIQEMS PLDE NATDKLIAFGEAFLQLSEGKPMGGCPIFNAAVEMDDVEE DPREKI RALL TRAAHDDRGCLAVNASIELGSRDS




ALD GVVRAVVRRFAAEATGDRRRGCLIVNTAAELAPHDP
 S P K A AlR A F S R QVEDS S GKEGLRGCFVVLSAVEMLPADE


 \begin{tabular}{l|lllllll}
$P$ \& $L$ \& $A$ \& $L$ \& $R ~ S ~ C ~ F ~ N ~ I ~ M ~$ <br>
$P$ \& K R F E E L V E H I <br>
\hline

 

$T$ \& $E$ \& $H$ \& $L$ \& $C$ \& $C$ \& $A$ \& $V$ <br>
$E$ \& $N$ <br>
$A$ \& $N$ \& $Q$ \& $S$ \& $D$ \& $Q$ \& $Q$ \& $V$ <br>
$C$ \& $C$ \& $H$ \& $R$ \& $A$ \& $K$
\end{tabular}

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 RLLAFCHMIKSEMEKHWQRGCLVGNLIQDIVNLPI | $P$ | $F$ | $R$ | $R$ | $L$ | $K$ | $R$ | $L$ | $V$ | $E$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | A $Q$ $R R E R R A G G V R C I$

SPLSA I D S I I R
 E GMARHGWQRGCLVGALGQELGGGLHE
ARQKLRAVLQRDEEFTRYPDGRGCLVVNTADEVSSHDA

REFLRAFAT
E A I K A YF E S L I E DLLE Q S DYS GCLLG DMMGEI SCAS E REKVVTTLLWWAVEPDEDNPDGCLVVNATVELGPHDP


 D DPLKKAFSVLFD VVK Q S L E D P E K K G C F L N T S L T L G D H D E


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DVDTRSLDSFNEAEQMFEQLI QWGQREGEFSSDHDAKEMA A ATRLVERNWDQLEAVLRSALVRAQAQGELPADRDPLAMA DVAAVANDTMKDTEDMITKAI EKGQQRGVFTKTHSASSLS ALQEKAREAMDSGAGMVRNVEGIKKCEVKQGVDPEFVA NMQDSLTKMSEETRGWMQDVLNEGLKKKEFNFTETADEKT AVRMAVAAHLEALRGHFQRAI ETAVQRGELPQASDSARLS PLRQKAADAIYSWKNKTEALIKKGIVDNELSANLEPEEVA GFRERTEATYTLWMESISSALLRGQYEGKVKRHVAPDQVA QFRQALQVILERWTEVLAQALARGQEAGHVRGDVVAAEAA EAAERVDRSMGRSEALFETLIREGQADGSIAQAIDPGATA SFRMTIRNSCTRVIDCIEEDYLSAQAEGSMRNDVPARQLA A RKA AFKILRTMRESVDTVLENGIRHGQLKRNVEVDEFA DVRARLKGMYKAWTDALATCI QQAGGAGKLKSPAPAEAVV GACAEAEADFCDLEDALCEALGRGKTDGSLVNARPANELAA GLLAPMADAFAAVHTALATVLREAVDLGELPPDVDPERLA EATSKVNDAFLINTERLLEQLI TRGQASGEI PEHHRAADLA EVAPRISRLFRRLQDLYAAAIDRAQALGEIDPEDDERTLA
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AADRRVERNWEHIETLLHSALSRARAQGEIMEGRDPRAKA D TREEVASGLGEIRAFFLRHLRAGQADGTISPAQPAEDLS SVAASLEQDYGVRLAA RTVIESGQRDGDIAPGKDAGTLA EVTEKVQGAFSKSENYIYRLLKEGQKNDDTLKKQNGHELA DLMKPIRHFMDDWAAAFFKLYSVG
 GFRYGLQQILDRWVEVMATALADGQLARKVRADVEPEEVA NVLLPINEAIDMMI NWMVKIIEDGIRNQELKPSIHPYDTA EVKAVLRKGFDQLIEAIRATVQEGQRAGVITREKDALALAA QLREPLEETLGWLRHRISGLIREGDASGEISSELDPDDVA PVFRAVERHKEGVREQLAALARQAKFNA ARABA NMQKKLRELVNLI LK WLTDLLEVGLQTKVFSFNEQPQIKA AVAEWVARNFQRLQKALEKLLQRGQKSGEVAATKCPRALA AIHDRVKQDLANWLGYLTHKVTQVISAGQFKQNVSAEQFV ALKKKVERVILSWKEQLVYF EQG LLGEFKAHSDPEKTA AAARLVEAGWEQLEETLLHSALVRAQAQGELTQDRDPRALAA EVDEKVTETFIKTETLLFDLLKRGQEPGEI PKYYDDKELS EVSARIARLFRRLQDLYAAAI 1 RAQA $\square G E I D P G L D E R T L A$ KVASRVEASLLDMENRFYSFLLRAQKEGRLKGKHNLRELS EVATKITEMFTKTETLFYELLKHGQEQGEISKHHDIKGLS LCRSTMSAVVQEWSENLAVVIRQAQQAGTVRQDDDALQLA AAARRVEASWDHFET Y A SAALTRAQAQGELLPAERDPRALA LLREKALGVFYTFLNIEGGLEEEGDQNEELKPDTNTEEVA AACRRVEHSWDQLETLLHSALLRAQAQGELDQGRDPRTLA DVKDAVTLFFREVEPVVIKIFKQGKDNNEFNKTVHPRQMA GLRDHLASAFARWEREFAELCHQARDAGALGEGEDPDRLAA $N \bar{Y} Y K D L N N V I S G W Q K K V E N Y L L E A Q K Y K F I S K N D D C R Q M A$
$V V H G C L K E I F D E Q V D V V H Q V L E A H A G G D L V A E R A T R A S A$ RITRTVHRLLAGHFAFFRQALSDARDAAKIDSGADVALLA EVVRERVGAHLSRVEGLMHGALEQAQARGELTADREPRDLA GIRHIVQEQARQSISSVQELLLEKAQKMNEIPAEKDPATLA
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$E D V A G U Q G A L V A R S Q D D P A V F T V E K R L R E R T T A$ ED VAGLQGALVLARSQDDPAVFTRVKKLRERTMA LHE QAVLQGAFLLAKARGGPQVAADSMDHLER RHLLGVLVGVRALARARPERSLLEDVIAPALALLS GHLVGVLMGLRVLARARPRRGVLDDVVAPALALLS RFLLNTRNGLYVLAKDATDRQVLEDAAKVAMSDL SYVFSACQGGLI SSRMTGRAEEFDLVIKHLRSTIYA TKAYAMCEGGILVSRVSGNSDQMNLLVGLLKAEUAA TGLLAAVEGGYLLSQTGRDPRLMQSALDMALGHVAS EYLHNTSVGTRAMARTSTDKEKLNRIIHVTMKLL $R M L L V L M Q G L R V V G R A S G D P A R V R D A A E Q A L T L L$
$R F I F N S L N G L R V T M K F D A S K K M F E D U V N V C L I S L K A$ KFMLCLLQGLRVVGKTGPSKAAMSAAVEVAMKVL TVFI STLLEGALALSK LYENQEYMKRAVHHLRSFL RHTQTVIQGAFVLAKAGNDPSLATESLDHL DVVIAALLSSLILDKVIQ KNILKSVKASLLKST EQWLAQVEGVLLMAKARQDADTVLHLLPALETLL SFFVAAAEGGLAVGKVMRSHEVSAFAVLQYKNSLR LIFVAGVEGCVGLGKNAQSVDARRCLGQLI
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RMLLVLMQGLRVVGKASADPARVRDAAEGALALL LLFLSTLEGSLILGEMMKDPLLI KQTADNFFLLL H DFFWMGWQGAIMQAKLTRSNQPLDTFISTFMAQ

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 $K L L F D Q W Q G A L L Q M K D E K S T Q A L K R C L T L L L D$ RFVVATISGMRVMARGGADRAALESTATTALSAL GLLLTVHRGMEALGKAGTDGSTLRGLTETALAHLA SMLLYLVQGLSLVSRAGLDRTAALAAIIDTAVDGLRA KRFFSLIQGAVFMSQTTDDKSYTTDCMNVILDTI SFFVGVMQGVRVLGKVRPEEAALRPMIEVALETL RFFVNTIKG KRVSSKSTNDRAFFNDIVQTSL
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 RFAVMVRDYFTAWIDALASALVR TGRKPKEARMLA QVMRENEDMFEEVQQLLEKLINSGQEQQLISNHFSSKELA RVRDAMAASQRDWGAFLERCLREARDLGEMDASTDVPQLA PVRDALASSVATWQTALRRAVELAQAEGQLSQEADAHQSA EVAAFVKESHLATEELFANLI RKGQHSGEVKAMADAQTLS RFGAKVRTLGEVAFAQRLESAVAVGALDPGGANA AVARQVESSWDFLETTLFMALCRAKAQGELSPDADPRAQA KFENLTREHQMYLSAGFQGE ERGQRSGEAAKDTHAAALA
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 PhREACSRVYDGWlQAVSGYLSTGVEEG NAHSLA
 ELLMAP R R FLDDWAQAFAQLYRPAFDE VVDQMATNMFHRSEKMFQDLI EQGKVNGEFSRDDDSEQMA DIAGEVSSGFEGLRALLCRAVRRGQAEGGLTQEVEAEALA QLARSAAAVFARWQEALAALFLRHGLIAEERG R RRLA RFADKVKGYFRAVDWAVALNGALLRSG RDAEEAAGWT D DDRAGEVFRAWRARLTVLFAAG ALVAA AEVFDQWESLLAESLHEHGADAE ABSQAVQVA VLFQAAANHFNTWRTHLVKMFDRAAKHAG KEDDALLAWT EVSELLARDLDRRLALLTGVFAAGQAAGETDPAKSPRDLA DVQQQTRKSLEYIESVFHRTVKRGQEMGEINSDLDAGHIA KFEVLTRE EDKTLITANLTAWQAALTAVFSLAQKNNEIDSQANSQELAA P RLACEATFKSWQSDYTEFLEAGY PAEDQAKSLA E AAAVVAY乌AEVETFFRRNFEAAQRAGEADQSVSAADAA

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| UniRef90_Q11R54 | FSMl AL VEGAIL I HRATKNRAYSDYVFES |
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| UniRef90-A8UMS8 | KRLDSMI QGAl F M Y T M D DFYMQDSMDQ |
| UniRef90-D8J273 | EEVVGGI QGALVLARALDQTDVFADAMKRFQKRL |
| UniRef90-G7VWA0 | A Y L N T I LGVR\| MEKS GS S HEQle AVLRTSFAMM |
| UniRef90_D2AUF9 | LVATYQGlSLLTTNTFRDPEL M T S Q |
| UniRef90_UPI000467BE75 | FELEAVCRTGAAHALLYYDDTSLI DRATRAMTTRLEA |
| UniRef90-UPI00036961E0 | FEI HGLILALHYEARFLRNPSATDRARRGFLHILA |
| UniRef90-UPI00036CEEA7 | HYIL L A WLGL RTMVKTTNDYQKLKNILDVTLSVL |
| UniRef90-F7SC22 | TALLGTVFAIRVMARLLDPNPKRLRALADHPIASL |
| UniRef90-T1VHN8 | EEAVAGI QGAIVMSRALDD GAVYSRVT T R |
| UniRef90-D3Q1N2 | RFVLVMLQG\\|RVLS GSAVSAERIDDAARQTLAALS |
| UniRef90-S3ZLS6 | RFVNATI GGMRVSAQAGADRAALESIADTALDALR |
| UniRef90_UPI00046FC81A | QTLVVSLIGLTVMMKSRPDRSFIDNSVETILTLI K |
| UniRef90_Q2NRQ3 | LLMLALL QGMRVVGKAGRQREEMMAVAALV |
| UniRef90_S9QIE3 |  |
| UniRef90-UPI0003ACDEB5 | LSLLTALQGGNLLSQTLGNAAPLRASMNAALSHI RA |
| UniRef90-A6WA33 | QLVVATHRGLEALTEAGVDAGTLNRTADAAI D NLT |
| UniRef90-A0A011PZ71 | K GLLAMIVAI RVVLGRGMWDESSLKTI A A Q A Q RLLR |
| UniRef90-F8FJG6 | GYLHNVWI GLRVM |
| UniRef90-M7Y0V8 | EEVVA QI QGAIVLARALDEPAVFTRAMTALKGRVAA |
| UniRef90-K0VKQ9 | HVLATLEGAMLTANILDDRSMFDSGSAA |
| UniRef90-R9R7H6 | III GSAIKGALMLNRIIPPHDACSRT |
| UniRef90-IORLB9 | TLMVAAVEGAVILCRARRDHTPLDDVRNELKPLL |
| UniRef90-UPI000375933B | TSIICLVEGSLILSRAHKSTQPMDAAAGTLKTLLAA |
| UniRef90-UPI00036C82C1 | YLI QTLVEGA HLTGQ TIF R S A A A |
| UniRef90-T2E1N6 | $R Q L V A D F E G A D L L A R I Y G E P G Y$ P D GVTRRALEQLA |
| UniRef90-UPI00016AFE6D | RMIVVFSRGLTVI ERVYHDPDRLHATARSFTKLL |
| UniRef90-U1LHG6 | RFL HNNLIGLRVLIK T N Y TQ K ELESII R L A L S VL |
| UniRef90-U2ZY17 | RWLRVTSQGLSVSSRMGSVPGDLTGVVRMALA |
| UniRef90-B9M3A8 | GYLISSLGGUKMVVKGGADEERVREIVAVILRAL |
| UniRef90-A0ACZ8 | AFVIAAVEGAVIMCRAEQSTAPLEAA |
| UniRef90-J3D9U4 |  |
| UniRef90-UPI0003651CFA | ASEGAVVLARAERSDAPFDAVADYLMARVRA |
| UniRef90-A0A017TD60 | RFLTSALDGLRVSATVDPSSQALRDM |
| UniRef90-UPI000380D080 | TLIVAAVEGTVALCRAKRSTEPLDRTATQLQTLIAA |
| UniRef90-UPI00047110AD | DMFISTLEGVLVLAKSSHDPKAVKRALSLYKQL |
| UniRef90-F8JQF7 | $\checkmark A T V S G M R V L$ |
| UniRef90-D4H2G3 | MVLL NNAQGLFVVSRSGVSVEKLS I IVSSFLKVL |
| UniRef90-M8D3R6 | QTLVVSVIGLTVMMKSRPDRSFINHAVEVTLSLI |
| UniRef90-Q12PW1 | QYLMMGI YGLRTFAHTHKDGQQLA QLAKK |
| UniRef90-M4ZHR6 | EEVVLGI QGALVLARATNDEAVFGRALDARFQRRL |
| UniRef90-UPI00040533F9 | TVFHALTEGGILLALDTMKSGKPLEA\AEQ |
| UniRef90-V4RGX5 | RAFSALMFGLRVLARTRPHRATMEGAARPLL |
| UniRef90-13TTF5 | VTAVADIQGALVLARADDDPGLFETRLRAIVVTALTA |
| UniRef90-UPI0004783689 | $V \mathrm{~V}$ MLTGLEGAMLLCRARQSTEPLHQVARYALIRAIEA |
| UniRef90-L7U563 | EDLVVSVQGALIVSRGTDDADVFGDTLRRQQARLKA |
| UniRef90-UPI0003606878 | VFVLSSIEGALLLARVQHDTAPLRNDAARLTDVIAA |
| UniRef90-Q745E4 | TFAVASLEGALLLARAHRSTRPLRDTGRVVADTLRA |
| UniRef90-UPI0003B5E660 | $R G I L A A I Q G G V V M L Q S T G R V D Y L D A G V N L A$ |
| UniRef90-W6U3P5 | \KVVFAMI EGAI L CRRVLES DEQMRII HEA |
| UniRef90 D8HSC7 | A ALLA GI QGGVVVMLSTGRDDHLEAALDVGIGNLRA |
| UniRef90-K0VT17 | VAGIQGALVLSRADDDKRLFI R S L K ALA K RLEA |
| UniRef90-UPI0003B60746 | ALLLSVLRGIETLGRAGHPAEALRSAVDAAMAMLAA |
|  |  |



## UniRef90_IOHML7 UniRef90-K2K6D5 UniRef90-D3QAS3 UniRef90-UPI00040F1802 UniRef90-A0A023NUP5 UniRef90-UPI0004675036 UniRef90_N1W4P2 UniRef90 D4DWK0 UniRef90_UPI00047827AF UniRef90-W0A9V8 UniRef90_H8DTF5 UniRef90_UPIOOO35C6075 UniRef90-F4CEA5 UniRef90-UPI00037549D0 UniRef90_UPI0004653819 UniRef90-UPI00035C2A1E UniRef90-UPI00045E7B94 UniRef90_UPIO0045E7B94 UniRef90_UPI00036B725A UniRef90_UPI00035CCC65 UniRef90-UPI0004211943 UniRef90-UPI0004786A68 UniRef90-UPI000377E153 UniRef90-K9X9H1 UniRef90-D6V728 <br> UniRef90-D6V728 UniRef90-IORDR4 <br> UniRef90_UPI00046A42E6 UniRef90-X8DS13 UniRef90_UPI00035DE28F

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 DVVRDNHESGQTLQRFLERNLRDAQSQGEVDKALDPKRAA DVGAEARRFFAETLA WLR LDALRGEAAEAEAMLDAAFE EFQKKAKDLLSTWIQNTKKNLDGAKKQKILKKANTDTRKLA
 RFTLKVQGYFAEWVAALADALERAGRD VAD ADSALAALA AMRAALQAALERQSARFEATVAK VFPGNDSDLG EVKKRVHHKFNT I NRDENDLSTGQAQQVFRRDENARVMA
 AMRSHIESTLHRDATQFSLAI ARGQQAGQFDASLDAEEVG E LIAVVANAFDTMLNHWERAI TAADAAGELPTSIVPADLA $P V R Q A T A E F F A D Q Q R W V A G V L A E A$
$P \vee R D R L A E \square H R E L L R T I A R V F A G G \square T E G Q L R P D A D P H Q F A$ ELLDLVAATFGEWKSLCAAALRR SGVPDAEADRVA AARRLVAAVFRRMEQALTHALI RDGEPAMTDPPEDLAA
 KFE ILTREHQMYLTVIFQETVERGVKTGELEANTDTKAVS
 DHRDAAAAAFERWCGLLAASLRDAGAD PDRADGLA PLKDKALAVLHSFKNCIETDI DNGKTHKEVKGDVNEKGVA GAEALTARLITTWHDQISAGIRSMQQQGKVAATIDAKQEA LFGSRVAKYFSDWDDALTPVLRQ LGHGDDARGLA EVR ALAANAFSADREALQEQLQR TARVLVRERLGQIEAFFADKLYEARAEGTLSEADEPATMA
 A $\square R Q A C W N S I S G H A E T L V S D I E A A L D Q C R I T E T F T A E S L A A$ ALLARPVRQALDANQSRLAAFI RGGQEDGSVDPADNVEHSA
 TLRPY IESTLDLRGGTQFSLVIARGQQSGDFDRNLDPEEVG EALDAAAAAFGDWQRRLAAALAQVQGHAPAAAARLDAT EARTVVTGLFDAWESALVRGAEAMR PGGEGSAAERA


 $P V R Q V A K L H K Q K L L E Y V T R C I D Q G D E N$ D EAAERVAAAFAANEDLLLDLI RLGQSDGSDPKTDEAVTAAA【A QRELDAAAGDYRRWEARLQVALVEHG HSEQAATGDA EAAERVAAAFAANETLIA DLLRLGQSDGSDSSEDDVAATA PVRNALRGMLEGDGLVLEERLEAAPDAVARDRLSPQDAA LLAAASKETVKEDEGKIA LVLENGDNKGEFKLPVSPDQFA $L V E R L F K R H V D L L E Q A L Q Q A I E T G Q M S G E I T S T H Q A S D L V$ DIVAIVAAAGAKRMSHAHLEFTRLSNAGLE GPDLAVSEVMRALDDWTAGQFTELGR G E 1 ARRTTGNVSRLETALYGALLRARAEGELAAGVDPKAAA P I SDVA DRYRRKMVEWIAELI EA $P L R L L Y A D L F A R W Q T A I A G L V A R A Q Q A G Q V P A D R D P E E T A$
 P $\square$ RQATADVFD SWLRSMASRFEAAGM TADTARSSA

 TLDAEAAVVI RRLLDW AGQQFRALGLDPDPDDLA AAQAVSAQLVRRWQECVRAGDEATQAAGEANPADDPDRTA AAQSDANKLFT LLEQTWLRRQFTGA DI RALVLEGFTELDKAFAACFGVAKEKGELPESADPVVLA TALTAAAEVFDEWESLLAGSLREHGAE NARQAFADLVARDTALVQKALSEAAERGEF TGDPESAA
 GLDRGPVTRHJRGLI AHMEGWVREMGVA SGSKDPDGLA GTAEVI TELLAQWQRADRAGVVSMQASGQVRADLDPDRTA EADDWVHLKWTDTEQLI RDLIVEGQKSGEFSKTLNAVEDS PMRDHVAQLMDNWRQALERAVGLAVEEGHFRPDTDPALVA D D NKKSIGEVTTAEQLFKEDI LWGQQDGEFTSEYDAGELAA QICSVLRGNLNAYENTLAEQIQKALDNNEFKSSKTAQQLA
 $A A R Q F V Q R N K A L L L A R L D R A E A A G A T D P D A L A$ A Y Q IA L K K I I E E WQA A L $\quad$ F L ID R G K L E K S F Q Q N IE S K A VA $D V R Q A V T E T I A V L I D E L S A L S Q A G$ $R$ FALLEVRRYFADWTDALHGALLDRAGGHPAASAA GLAA EVRDLARQTYQAVEGIFAEVVEQAKKDGDLPSATEPAELGG
 K F E V L T R E H Q M Y L A A I F Q E S I E R G DQ S GELLKS DMNA KA I A

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UniRef90-R8ZS11
UniRef90-J3CV32
UniRef90-R8ZTL3
UniRet90 NoGMO
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UniRet90-G5M405
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UniRef90 E4RQJ5
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UniRef90_C4RKX5

10
STANQFNDPEREGTPVGIL DPKAQLLGWAQFIAGRLAADADRGCAFANSVAELPDKCH AHDRMQQMDEASNRVFSK DCQGCDFANTALE ITHDEE AGPADRIRSFПR\|LIVNGSD\|QRYGCPVGTLSTELAKLNH DPQEQLRLFFDAVESSLVNSRGRGCFMTNTTLGSSVRLP AREAVNGFLLATAEAYSQPDTPGCLIALGGLHQAAIPE PAQALTAYUDFYSARHRDAMGKGCPVAALAADVPRLGA PTEGVLAFFDQFIELSKQGKLQGCFFIATASEIPSHQN ASCQRGCFCINTMVELAPHDP REQLGELLGLYAASSGAEGKQGCMVAGSATEMATMDA PDDFIKAWVRILSREARMSQLYGCGMANFRAQIHPGET SPQDRI QLFITLLIRNQSKDMRHGCPVGTDCMELAKLRH PSQAIG QVFHALENRIVSSDKKGCPIATTAMETAGKSV RQGVLDYYDHLLLSCKVSSFAGCLYVKDSAKVCEFSE DTPADKFLAAFDALGEWFEEDSYRGCMFINAGAEYNCKDD SPAGALKDFVAQVGETADGPNGVCMLAKTLAELTGEHQ PEEADEEMLDYLSKEHREATETGCPVSALGSEMPRQAP

SDPAKGIAEMYAAASDYFRSG QRVCLVGVVA GGASRD SPLEALRTFVSTLMDTGKSVPSGMCMLVKSVAELTVENA DPGEALRDYFTAVATCFTSKDTPGCFMINTSAALAASST YKMMRGLL

LGVERYLSQQRDHP
RLRAMDA
QALHDYFTAUATCFTSKE NPHDKLRAMMRHFARKIA SAREKLRMLLYAVVDA-PDGDRGCPMSNTAVEIPEPGH KAYLDUVLECQSCDASRACLLTKALNEVAEQDE
 LLAEIQSFFETFMELSKTERGKGCFMCNTATELALHDD DARETI RAFVAVIDEVTCGPGQASCLIVGAAMERAHSDA DPAESI QAFLQDLSSQFTCPENEGFPVGLLAAETADKSE PMVRLENF TNDACEGUKKNFTRGCLVGNMMQESPELPQ GCPASNFTQEMTP ENS AFRELFEQDAAEEDQRGCFCLNTMVELAPHDP DPWQRLKALAGGGRSFRDQLMSYGCPYATLCLELEKEET DPKGRLDALFDVRQAKFAEGCFRGCFAVSAKLEYACRNP PEKQLTQUVETYLSALRDNPGHGCSIPALGAE円ARESP PAEADRFAFGALTSLVRDSDYQGCPVSVVTGEMGAESE
PEERTGSFTHMLIGNRAKTKLYGCPVGTAA GAAED DARDRLLALVDMTVDDMRQPGYRGCATLNVTSEFPDESH SARDALDAVADGFRVQLTETGYRGCPVVAVAVEADNPP APAEAGMSGLLALMFSGMSCSEDVC

VEHFVDFWDRVLAESDTAGCPVVNAAVGSATEDEP AGPAAGLRAFLALWRGVLKSDYHAGCPVLGVSVETDELPP PREALLGMFDGLHSMDGSGTFCGCLFI INAAAEYQAHDH $\square Q R \square Q S M Y A R W V K R V S V E \square A S G C \square Y \square S G A V E Y D D R P G$ AYFDWLLEDPDEAARNGCPFGTLATELRAMGS $\square R A F D D E Y S R H R D N A A G C P \Pi A G L A A D T L R Q A S$ PVERLAAFVDWFLYGPGEDDRQSFHVAMLAELRGQND RDNPDQACLFPCLAGDMPRQPD DHRAKGCFMVNTCVELASHDA DDPRDPDGAFADMWSDVLRSDFEGGCPVVAAASSRDESPE PREQALTYMAYLSRENLEQVERGCPLAALASETARQTP DPLNGLKQFVRGVLQCQSAAPSSMCMLVKSAAEDTEDQA DAATGIDRAVGALLKFLTESDQRGCPLATVALDAAAASE DNAADRLREFVDYWQHLLTEGGTAGCPVAAAALGSADDEL

LDSUSAFFSDYVEHGKGKGCLLINCITEELGFDDL
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UniRef90 UPIo002F17D69 UniRef90_UPI0003A8C912 UniRef90-A1ZDZ4 UniRef90-UPI000305F369 UniRef90 A8TT25 UniRef90 UPIOOO38FDF8A UniRef90-F7XHH5
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80 DEAEDLIG

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 SFGNALRQLLITWQSAIQLVVEKGKKSGEUKESAEPVHAA SVRADFTTGLKDYLAGMQALL PIRQACTDGYASWHAVITEYLT GQGDAAGKAATLA RLQKVCSVTYLK WQNLLSTLL QKSGMEESRVEP VS AVREQLIASVKAWRAALLRALSQAKEEGHLRPDTDPNLML EAANVKSHAMQEETLSTFLAQRQQRGELPAHCRPQELA
 etaqliqadLQraltalstivaagortgemas grdpmod a EVRRITQHLANWQLAT TQVLQKAIDQKEIVTERNADLRA GYRQQLSALHGWQRQVADCLRLAQAAG
LFQESLRRAFLTWIJALAKLLVEAGQAPEM RVAAKIDSHITQRLTKAFRKALSNAQQGQEFKSNTNAHARA QVAERLRATTQLLELTLFEVIAEAQGRGEDPAGQSAADLA KLRQACQNAYQEWENLFAGKLRSAGGREFAGEKAAEIS DAARTVKRHAMQEQTLDQFLRQRQERGETPAHCNPQALA SFIKVLQN LDESWQALVAACLSDAGSSGEISSNGDAANL ELAAANKETVREWEGKIAALVLENGANNGELRKEVNPMLQFA
 QIEAASEAMMADMTG $\qquad$ GHSDP KTRKAFAGKLDEMVEMMTDFIPNL

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 GFRLRTLSMQEQLNQLIVDADMKUSDD LREGLAFSQVG PHRCTV EGGRVLTETFTERLSSAQQRGRLRADMSSESAA
$N$ FRFPLNDGMTQWTEKLASLLLQDLHADWS QLTSVAGADFGHWREALTRAFE VDG CEPSEAASLA
 AYRERLREFDRALRERIATLVADGLEAGEFRDDVEPEATA
 EARSAVTDGVRAQIDWDFEKLAGL PITDEL A DETDRRREA RFREKLRKSDDQLRETLEELLRDGLEAGEFRSEHDPEETA SVRAIFTSGLKDYLKGMQALL TVREELVQGRASMVDQLEARLQRGQRDGDVPTGADTEAGA E IADFVEKESHRVEDAYLLALSRAKEQGDLGDRQDLRALA
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 PVRDAVLDALS RWTAYVTGELSTAVEAGRLPPLTDVDQLA AYRRALKKVLDEWKQAIDRUTERGKKEKTIKKSVSSHAVA EVKLEFENGIEQLIRFVTDNLQKNQKDNVEGQ RKKA EG HESART GHWRERLGAKFEEVMVNYPPRGPVRAQDLA


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100 110
MTIINSMTEGGVMFS $\square$ AHKDKGPLLLISKQT
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TFYATVQGMSI LAR DGGSYEALKNVANGAMA
$\square A V I A L L E G A L I L S R \square A G D A S A L N A S K A A A R T L L S S$ RSVLAA ELLGTALAIA RSEPD GARSDADLAADARGLLLK $S F L V A N V F G L F T L A A R A V N N T A D W D N Q V T M D K Q F L G A$ RLI I A A MEGAIVMCRSSRDPAPLDD
$Q S L V 1] T M D G L T V L T K S G P D P A$
$T V V V$ STIE G AVI V S R A T Q S T Q P L F S A A DVVEAALI
$R L M L C V L Q G M R V V G K T G R S H D D M N A D V S L A L K V L$
$K$ QLEF I V Y E G V L Q S Y R L L D D K K S LD E E A E T L I P S L K

 RAML CMMYGMRVVGKTGRSLKDMVAVVDIAMRL
$C Q I L L L K E G A I V I S S L M G N S K P$
HY IUQ QMA G L RTFAKMNN DK A LLLNQMIE D DFA H
QLAS ATVHSSADRSRARVSRKDLEADVKGAlD
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K A LI A E I Q G S I L L L K V T Q D L S L L R Q N F Q L I K E R L
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TI ALLS A I EGA LLLA A K T QH DL A P L H A V GE H L R A



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EDAVLRDHGALVLAGGLGDPTPFRRVLARLQAELLA
 GFLAMAF QGLRVMGADIPDRAALERAAEVACLNCLR
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 TA AV V A S I E G A V I L A A R A A R S T Q P L E A T A E VV L A Q L V A A



 $R Q \vee I S S I Q Q G S I V$
$\square T$ S A A L E G A VVLCR A T R D L D P L R QV H T QLE F L L K S $A L I V A C V E G A M A M C R A K R S M V P L D D V A Q Q L$
$A H L L D L D G A D T V A V M G D T T A A D N A Q C M A R T L L$
$R Q L Q Y L E E G A M S M A H E G$
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R Y L N N A Q A G LI VTAAK TV S EPAVVLE DI DRVVTLS





$T H L M G R S Q G V A A L A Q A F A D P A D I V E A E V Q Q M T D$
LVTVSAMVGTLVLARAVDDPQLSDALLDAALKQ


FELLNGVI LAA D Q S I Q Q L H R D P Q A P D R A R R A

IS L L A E S V G A IV L S RALD D S SLLSNE DLDDACRANL
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1




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 LCGVVQAWGEATRPG $C P$ G S L F L Q VGRSEP
A A PEKP LAA AVAELYSTAHCQQAGDGCALAAGGSEASRHAP RGCLLVNAATERAAHDA D D P $\square E A \square Q N F \square D S A K R F E A D S Y F N G V P I A N V V L E D S K T N D$ LKALVTRYLSWSRNDKEHPSPLEFLVTDAAHKEE


REKVVFQMVMYYTESHGEAGRKGCLVVGGANDFALLDD


ANPENPLLEAVSFYLSMGHRGERMGCP』VALGSDAARQGQ
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 LEQYFS I K D S GCVF ANFA DETMES DP $K E R V L G \square F D A L R E W F D D P A F R G C A F D N V T A E D Y D A Q E ~$
$A M V R Q W T D E Y G E G F T K G C P V A A A T V D W A D S T D D$


 DRFLRNAAGIVFTAPEHPGCMDSTAVLNCAE ENE DVKTAVVEGYFRATAACFTECDKPGCFFICTSSALSAGSE

 E KLGGAVIVE Y LIS A A HR D S A E Q G C DMM A LDA GE DA R S S D E A GFAAGCPVAAATVDSADAVA $A K G L F K E D G \square G C L M G V I A I D A T Y A L D P$ D LR R A TTEFFHSAAAVLTEP QAPGCMVVLAAVNVSESAF



 TSAA QLVEEVYLS LGRE GMAS GYTARGCAIAPLVVTEAT QDS L R A A A D L H T R Y
 WERWRDAYEEQGDR CPDGTLSLYLGRSTP

 A A Q A WRD A V
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 D PATAI ARCATLLA E DLLRGSDTD GCPVAATALEEI DGRSP
P E A RI L N M F AVLK GWF E S E GFRGCAFINTAGEI GDPAD
 S D P Q Q A L Q A L F D A A I A S M T S GSPRGCLSTRTAT EAVALDP

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 PVRQLAKAHKQKLFDY PAVQVARRHKKAVEDWLADAFAQAGLAGE RLDVAPAALA AVRDVLVKMHRDWQKEMHRATAQADEENHLPANQAADQLV EVRHVATRRDKEMTDLVSRQLPDWGQ PSAHEHA PIHVQAGEHKRLLLEYFTDLCRKAGAR DPDKLA PIRRALVDARAEGEESLR\|RLEQAIRDGDLPKTADCSSLA KVREVLERHHATLVGNLRAALEAAADQGQLRADVDPRAAA KARHALTEGVSAQLAVLEPLMPG TVAGMDGDADQRRQA PAVQVLQDHRRRVREYLTVLARQAGQ D RAMVQDTLGELDKAFAALLRTAQKQGELPASADPVLLG EVADT S HMLKQWQQTLAEQIA DAQQANE亡SNQCDSQHLA TTRDAFTAKMSDWIALMAAQMPDGTAA ERRRA



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 P H K R I A A IVVD GYLSSVHRD DP GHGCAA PA L G AE I A R E S T

$$
\mathrm{T}
$$

PAEGGMRFFQAAAGEMSES GYAGCPVAPDVLDMPEEES
 SNPLDAVMMEF Y L S P G HLGGERADGCPPLAALDGSDAARCSE


 A YVSASHRDAPADGCPLAGMGSELARADD D P E T G L R E S F G H V DT R L LD T S N P GCMMM A A E Q L LA LVVDS YLLE P A A D D S LDP
 PA GQMLALFDVLDEWFHEEGFCGCLFIKAGAEFQDHSD D DPRAQ I L GLARFIADGLSE $\square S H R G C P F I N S \| A E L P D R T H$


$$
A V L K D E Q R R K C F \square M H S A \square D Q V P H D P
$$ S P QE F I H R WM A L L K K QV K T GR Y F G C P L A R F M G S L D QP D E SSPLLKGI EAMLNAMASKPSTAAEPGCLGIGADCEFGRSDA D DP RDEVLGVFGYLEQCFAEDDWRGCAFINHHAELGRQDP SARAALVHDMVDVYVAAHRDHPESGCASAALAVDAGRHGA HRDNPEK GCVAACLTA EDARHS D


 A T P A V R L E A L VA A WF D F V E K RVVLP GC F L L A A DS S E Y R A R P G

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DNPVEATQYFTAESAERFEKDNYF\|GPITALVLETSSTSE
$P L Q Q G L H D T L N S F A T R A L R E G T A G C M G V N A I C E F Q Q E D E$ AEMVVRQWTD EYET GEGFDGGCPDVAAATVVDCARTA D A P P GQAVRA $\square$ MEAY $\square$ S E H $\square$ A S $\square E R G C P V S A L A S E M P R Q A P$

LKVFLED F AVLQREAKSGCFADQNALVVEHADTD S KAA AA AYVDRY GGSHVREGRRGSLPAAFTQEAATR A
 PQQQALQQAMARA YSETHVVKSDIETGCAT AASLGSEMPRRAP PEQRLAA LVQHY LVAHRDRPDDGCVAAALGGEMARRDQ
 P EKRLSTI I D YLSAVHRDDPGQGCAI PALGAEDARESP AK DWLQTFASYYLGYKRTCDGDSCTLPSLSPDVMRADE SPRAHLLGMFDALRDWFAQPDFHGCAFLNASGEIAADADD E S GHPRGCLMDSAATNCSTBP NPVEQLYVVLECVSARMEKPGYRGCPFLNAAVEFPDANH A F A R L R G HL R A KTA D PAA S R R GCLLLAKATA E LA GEAR



RAFAKYLQNY LR N GT LGGGCPVVQMGSELAREAE A D P F D A D PVP QLLAAFCD GF F DHLER R

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DVKASFETGIKEHLESHGRFIAE DVKASFETGIKEHLELELGRFIAEARYR DLGGTLKAIDQGWIGALRDALIA AAQSDAAGLFTLFRVWLGRQFTR A ADVFGRNRDRLIAALAGCLTQGGKSGVFASAERSDGMA TVSHSFTQGVQTLIETLMPLV QRODGE TDDEKHQEA KTRKAFAAKLEALIDLFADYIVD VRGRTARKRA A LAEACQASFEEWMAMYRDALVAAGDR PARAVTLA KVAELTKQHKAGFQRVLTELAAA ELRDVLLGEDTRWRAALRRTVTLATEAGELKADTEPAQLV PVREFLAAKRRNNLTGVAARLRRAVEEGDLPEDADDERIV TLREKVRGNLMHYFRGi SAV DEQGQEAGALNREMDPNALA AARQFVFRNKERLLARLTELATAAGAD EVAALTDSAGRALHAAIESLLAEARRSGELATEDDGADAD ATREAAAKGFDDLVGVLAKRSSRRRKEA AHAEA D RRALQCHFSAWEFAFAEVLHR AAGKSAKPAGTKAGA ELRKACQAVFKDWQDULQRLLEEGTDA RFRAELAEFDRMLRGR|RSLIEDGRDEGDFRSDVDPDETA GLRAVTA P 1 HVQA PARRLIEDHKADQARRLTALCVRAGLSG QARKRFEAGM VKLQRLVALEFEGLD PVRQELVKIVTLWRAALTRAINQAKEEGHGRAQEDALTEA ELKAVVRDIIDRYTSRLEELLREGISQGCFRQDLQPAETA
 A IAELSREHFRQVEQHLTQVCSRA OSGTEPTALIPAHVA TSQAEYRRGLEGYFSALTEVLDRAHQSGTEPTAAEAREQA ETRAAFSGRAGEMIDMLGSRLGPG KVSQVLKSRQPIQEAMLTRFLEQRQRAGELPAYSDVQGLA KVHDMLASARTNWLAYVEQTALEARQAGEDTEGTDVSQLA
 TTRAYLDDLYASNQRLLLKR DEQAQDDGQVPKRTDPAT LA GLRQRFTAGVRGTDALLSS RARMASTLKPRQREDKA D IAHHVSSLRLQTLGLFTARTERGMKEGD RQDANAGSLA AFRSEFTELSAA LVRNLTAGLGAMVDRGELRRTADPNAMA PVRIIAKEHKEKV SVAEHAKELFGLQRPR G RKAVRKHKEEVEGLVTAGAGGMMDEAEDFA S ILEMLQSTDEEFDIRFEKFFSDGQKYGCLKPGQDPKVLA DVRAVVGYRQQLREQMRARLERDKAAGMLPQSADAAALS NLRKACNDVFEAWSTEFSQVLEDNGYEKE VGPGANKLG EINQLTAHSAERLRRAFEQTLRCAQEQGELVPGTDAPAAC STRAAAEAAFTRWTGAVAGALRDMG VGPERSRPLA EVRHAATVHTKEMVDLLARQMDWGQPQ EVGAFLRDLHNKNVDGFEARLREAQQAGELPAETDPRALA EVLAKGHALFDLLLNGIARALNNAMQKGQUPSRVPADLLAA ELRALRSRVSQALGRRVTERIVEGQALGEपSRSGDPNESS DVRRAATRRIKEMIDLVARHSPDWGQAG PSRQAFTAGIEAQLALLQECAPPGEEGSAPTPCVA EVRQVFTSELERMVSFISTLAEVDTSKGS
PARARFNQGVERFEKA ADCLAALERDA AEATA KTRKAFADKLDQMIDMMADQILD DPRKAARKQA ETRDAYTAVLRKLIADVAAGLQEASKAD ANETTAEDRA PVRVVARMHKARLLAFVRERFDAYADDAGDERRGLAR DA ELRTACKSVFMDLQDVIKRLLYEGVENK PVHERVRARREANLTGEARIRRGIEAGELSPDTEARALAA PVAERVAAYYKRYEQALAECLRAAGAAGDARADDEPGAFA EVRAVSTQRDKEMITLIENELSDNEQS PLREACHEAYKEW ASVYEEKLRQ TGCSESRAKEA DVMRSCQGRRAENVETTEGRIRSDVAAGELPADTDAHALAA KAHERIVRGYDQIITTQLQSVIAEGLERREFASAVAAREAA PMRQASHDVF ESWLAALARRLADAG DAPDRARELA G REAVRRHKEEVEHFLIQULQEWRTQTGKALTAEVEMTA EVRRAATDHDKEMIDLFARQLPNWGQ PA PEAHAA DVAPIIERHFNYLGTLFRSLLYEAIDQHECRTDLPDVETV ELASADKARHAQREETLLRFFEQRQARGEIPASCNDSMLV SLRKGFYELMQHFQKJLTEVIARGCASGEFRPEVKPEEAA ELARVHDRYAAEVLEQLRADLESARSTGELASDTDDPTTAA




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UniRef90 H8WBJ1 UniRef90-S1SQJ1 UniRef90_C9ABW9 UniRef90-F4CW44 UniRef90-D9XEI3 UniRef90 L5NKE3 UniRef90-D9QNQ0 UniRef90-V6JP45 UniRef90 F4LI64 UniRef90-A0A016XLD2 UniRef90-A3PFZO UniRef90-UPIOOO3B70629 UniRef90-A0A024HGW8 UniRef90-UPIO0037C5748 UniRef90_UPIO003776B25 UniRef90-E6WD72 UniRef90 ${ }^{-}$G4IOS9 UniRef90-UPIo003782DEB UniRef90-W5XXT9 UniRef90-F4CTI9 UniRef90 - 121 J47
UniRef90-S6HVG7
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1 RAODEALDEFVREDVDTAKPAGCMLLARACAEMMDTP ${ }^{\frac{10}{20}}$ A D GRRAVE GFL R SLA KMLADPALP GCFI I NGTADCSTIPA TDPVAAVRALTGFYEGQLADGQPRGCFAIGTATTEAVEDP PRQALATAVDMYLSQLDGAECGMCPLPNLAMAIPVLSQ DNVLDGLQAFLVK】ARNCSDPGCRACLVVKTLLESSNTNT

पEKLTALLNWADEVDFQEDSNGCYLINAAMERGSDDP DDACAALTALAGADEDLGCAEDFRGCPFINAAAEYPRPDH

VERTLREAATAYTEPGHPGCLVVHAAANCS
EGVTGDNTPTGCLLATSALS PGEQILALARFDAEGLPAVSHRGCPFINSLAELPDHAH DDPRAQLRLYLELAERAANAGPYRGCGLSNAAVEYPDPDH ADPLDRVLAY DDFRRALVAGEDADYCLVGTLVQEAYG SD $A Q K R V S V F F D Y Q D A M T P R R V A Y G C P V A K L M L D G P A D D D$ ASP DPAALVDAFTAFWRKLLQQSDAAGCPVVSMAVSAVPGS DTSARLRSFFEMLIVNMTDGTQRGCLTTRTALDAADSSA
A EPRDRLIALLFATPADALAGPVLRGCPFHNTAMEAAGGMA KARVRRIVATFDKLYSGGRSPCVLGQLAG

RLDETMRRWIVRTRDEGHTGCIFTAGAFELDDREG PRGRLVALFETVLJDGEGTAGEQLRTAMLAANAAPCDD QDPRGGVLAVFDAYADHAAERGFRGCGLLNAAEDPTGDE $\square A R \square S K \square C D S W F S Y \square Q Q G F \square G G C F F T N A V L S S D V A A$ $R \square H S M F H R W \square Q Q \nabla S \square E \nabla E T G C$ CVIUGAVEFDDRPG DPVRQDAQYFEDDTERASVEGYRGCPFVNVSAEFPDASH保 SSGREALDDLFAYYRKQLQHSEFRGCPVVAVAVEAGDKPD ASPVVRLKCFDRILIVNQTKDMAYGCPVGTLCQEDAKLEH AVETSCTSN
Q $\square$ AA $V$ F DA $\square Q R W Y D E P V F R G C A M V N A A A Q H E V$ AASHDE

## dTMEGLRRWRDALVEYपRपQCRGGCP\|GSDGSEVAETNP

 ADPRAQLEADFDAFETKACNKDVLGCPLSNAADELHEEGH AEVVEAYVRSSVEVFTDPDTPGCFMVCASAALSSASD
LRETATLRGWLRSAFEEACPVFSTTLSDDAELA
 PREAIERILIRASARMQTEPEHPGCLMVLAGAAGSADHE AKESTRSYLEVTADSQTDPNQPGCMVVTSATNCTAASS
 PLINKLKAVFEWHHEWFGEADFSGCMFINASAEFRDTST PRERILALFDLAIAAAPGRDYRGCVYLNAVTEFPDPTH PGER\|LSFVQLLIVNQAKGMAYGCPVGTLCGEGAKDDH $A\|D G \Pi R A M\| D \quad R V V R E A T T G C L G G T A T E A G Q H E$ SAADKVRAVCRTTTAGIRSPGFRGCAFLNAAAEYPDPDH DPARGIQLFIELWKAQLAETEMQGCPVVA AVLGRTEAP PAAEQRRLLRDWLKTYLSTRGHRGCVIPSLSADVARAKP P■KALQRFPEMVVEN DEAPAKACMLSKTLLELAHANH $\square T R \square Q A L F D N W M K R T A V E D D Q G C L Y I D G A L E F E D R V G$ RAQURAVGDAYVRFSREKPTLIFRLVAQFAADPDESSE DPKDTLRQMLEATYATAGDKPAAGCPLAALGAEASRQAP ANPPGCLLVQGGПACGSGSE PREA LERTDRGSARMQAARTHPGCLVVSGASNCSPENE SPVEPLLAIANSIDADGIQSPGFRGCAFLNAAAEYPDDDH DPLPRLTGVCEAWARAMAPGYPGGCCVATFSHEFDGRPG
 $G C P V A P V V L D S P A N V P$
$P C V P T S S A E L A L L F P$
पAEQKMHPCVPTLSAAELALLFP DDPRRQI EAVFDVRRDLMAQKDYQGCLAMKAGQEYIGKHE
D D P
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S 50
70
80 SGQAALEGLAGQRADREDLSAAAANGELRSTAD』DALA T V E L A L R A A L Q G S E M MV L D R L V R A Q R E G D L P E A A MP E A L A
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 EVVEQSLRDRRNANDAAFESRI RADVVAAGVLPPDTDSAALA GCREEYRHVDAELTELLRDILVRGVEAGEFDVDDPEAEA

 PARLVAEAHKRELRRRLIDMARRMGAR EPEVLG P LA RVLTNRWHATHELLRAA $\square$ RERGQRDGS ITANPTPSAELA



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 PARVVPIA EYKAWI RGFLAELDARADGDAATDAEAARLGG DAAAFVERHKRELIANLDATADAAGAE NPEALGG EARQDLREAFAHWLGAI EVL ARDSGMPPVRARHFA
 A I R T R L A R F DE Y LLD RV E S VV A DGVV VGEFD DEVDPAVAA





 QSAAVI D RAAAAFAR WRDA DS QR LVVA D GMAASAAPA VA TA

 AVRADTARHLGRYLVLLTGI ATRAGAA RHRELVRRSDGGI RSAFADVIIRRGAETGRFDPAVDPDEAA


 S AMLRRLGRGDSSCLATLLSQVLEDGVEAGTFQVEDPTLLA $T V R A I T T R H L G R Y L E L L T G I A D R A G A A \quad D P R Q L G$ PVHAECRRAALRAWHAGI ERALRRADGMAEKAAGSRA PVP GARAAA GAALRRDWESAVAESLLHREGGVPRDRAATMG AI Q A A A A SVVFHDWAD QVTEALVVGDVVSRAQA EPLA GVRALLAERRSAVRRNVAACVRRAAETGELPADTDPPSMA DLGEAL R QVH QHLA DMLA GLL ER GRSAGDIRRDVDARTAA $H V Q E V L A D Y R G Q M E A G I$ K DRLLDRGVREGELAADTDTAAAA $P$ SRE RANE DMVLFGD WL E RQFR $E$ ELGCGESSRRDNA $D \quad I \quad H$ Q A A A R HK QL LT D Y L E S L L DE L H A A A K P P S A K K L A EV R HAATE G DERL DAMFA SEI DAPPAAAAKRA PVAKAVARH RAWLRRLLTQLREAGSPDPEGDADVL

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 AVRSAYGRKMHKFVRKIADTLE GSKGDRERRA P LA QEAN QHLLLKMEANFAELFQEAQTAGDDA ASHDPMA LA $P L A Q E L A D L R T R T R E V L A L R F D Q A Q A L G E L P A S S Q P A A M A$ $P$ V V R E A L VG S V Q T W L T A L N R A V A Y A K S S S G E L D D T V D D Q QVT
 EVRGALGGGLGRQVARFAASIEGA DDTLARRAA EI RPLVQQKALGSTQRTVAKRFQAAVESGELPPGANVQVLS $N V P F E L A A R R A E N E D Q L R E R F V R A K A E G D L K P T S D P A A B L A$ $P \vee V A L L A A E R Q R T R A G G M A C V E R A D A R N E L K A S P S T A D V A P$ $R V R D E L A G G V R Q W R A T L V R E D T$ TA $\square G N G D L P P D D D D P H Q A A$


 $D V$ S D R A P F S DA D L H QU F V R C V R E A R E D G E LIA D DV ETRSAYTAEDKRLVEDVAAGLPEQKTQGQ $\qquad$
S ERRR

$P E P A$
 DVK A AFEAGIK A HLDVLGRFIGGAGDEVS
 $E V R A P F Q N G \square E A H L Q V L D E L I P A \quad S D G T K Q Y \quad E K A$


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1

- 10

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PQGWLATFVGYY पGHKRTCEGESCALPS LSADVMRTDP
PLATLRRLSVRSYTDHSRPDDAANHVSSLAADLGD P LSAI IEYYSDTHRRGEDDCCPLAFLTTDIGQRDD RLRALIFGNWMKRTS IDEDSGCUYISGAVEFDDRTG ARAGFARLLTETAAVFTDPSHRGCDMDCAAVNCAT N E D DRAWLAA YLDWLLEDPAEASQLGCPF GALATEDRADGD KQRLLNYL LSVI EMQCDS SLRGCFVSLCVAESASHPQ

 PRDAULRVFDGLDEWDRQDEFCGCAFINAAAEFHRRDH DPEAARLALIDYLSAANRDNPGDSCPVAAFAGEDEAVDS
 DSPEQLFKALRRYLSPVHAEHPEQGCLVPS LGGGEDGRADP
T DPHQKVLAFFDKAIDEQPDMEFRGSHFLNAAGEYPPETD

A E RLRALIDDVQDASERGHAAGCMVVFMSPGLRERDE

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 aQPR EDSAKRAEA GLHRRAVEGFENVRQSMAEVLRHGQAAGTVPTGLDPERGA ETRRAYTEKLQQLDAEMAAGLPDEVSSGSTATP REDRA ELTRLLALGWHRKRSQLERLI SRAGDAGELPNAPTPATAA $N V R$ STYTRVLQGFDEII REAMPEGQKISETEAMHKA PVRDALAESVGTWLAAMRRTIVQSQECGDLRADADASQLL
 $E V E N A D R E R R E A N D A G F E S R Q R A D M A T G E L P P D T D P S A$
$P A A D R A A E V V A H Y R Q A V A Q R T E A L$
$I$ SAMDA ILTIUSSHQAFLTEFFNKEKAQGNLDQSLDVAANV AVLAEVRSHKRAFHDQIASWVNAA AQGNLDQSTAAAEP

 PV H QLAASYKAATQDYFRGALERG $P L Q Q S F D Q G F E A S V G \| L S A T Q A T G T P E G D \quad G V V Q P E R L A A$ QLTSVAAE IDFSRWRDAAAKESY LRDGAFAAEASALA RVQEWLAEHRRARTVS IVERLNEAARDGELKPGTDAEALG ATREVFERGMLTDHARIAAVL DDPDQA AERGI VAACME HRNWMHSTMTALLTA KNGYPSATQA $R$ VAR $\|L D R D L R E R T A L L A G A \square R A G Q\| D G S V A G G V D P D D G A$


UniRef90 S5Y6F1 UniRef90-A0A024YY40 UniRef90_B8EIR7 UniRef90 A4JB40 UniRef90-W4NMU4
UniRef90-A0A059DTE5
UniRef90 UPI00035CDCB2
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UniRef90_V6JNH0
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UniRef90 D4ZLS9
UniRef90_UPI00034927FC
UniRef90_UPI00041EA7E7
UniRef90_UPI0003642F47
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UniRef90-J1IMQ6
UniRef90-G4HYM5
UniRef90 UPIO0047BE196
UniRef90-UPI0003B4E0B9
UniRef90-C2CRC0
UniRef90-UPI00047EEF14

 $\square T V V D T L E G A E M T A Q V T R S R T P L L V A G R H$ LIARLVA $Y G I F A Q L M G S L Q L A R V \square A D K A L S D Q V L A$ D A L A AVL EGIVAASQTYR
HLVLSACVGAVALSRAVTDPKLSKQILDGVLSQD $R F T 1 A A L E G A L I Q C R V S G D E A P L R L V A E$
$R V V L A Q L H G F V L V A F G L D D \square A G F T D A V Q A T \square A$
ILTLALLTGGVTLARAVSDPALSERIAK

VMM
$\square A L V N S L E G A F V L S R S L R D T E A L E V A$
RF GAVI QGMSQQARDGATGAALQGVADAAM
VFLVVQGAYTVAKVLNDPVLYQRSIGQLRALL
NYI MTFIHGSAVLARSGQTLDELTQAA
$V C L M A B E G A D V T A S I T G D P G A A R A G Q E A A R A L I$
 AFV LLTMTGLQV AARAGANVQSMHAMADFAVDLL RQLQYLMEGAVSMAHDEGPADQADDARDAAEQLLRA DAQYAMMVGAI T LARATKGNSLSDEFLEAARNLL DTTLAAMEGAVVLCRSARSLQPLHDVTAQLEFLIKA DCYATLMHGLSVQARDGVPKKRLHDLIAVAMQVLDA WA LMCQAFGGILLARAMASPETRDQLLHSLVAAVR SQLLIFLDGGMAGARDTREDSPLKTARELAI QLLSA $V L V S T V I S G L R V T A Q A G V D A E T L R R V A L S G L R A L$
lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm


