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10
20 A I E Q D A K A A

30
40




 D EVTVVDG \begin{tabular}{ll|llllllll}
$R$ \& $A$ \& $D$ \& $T$ \& $A$ \& $G$ \& $K$ \& $D$ \& $K$ \& $A$ \\
$D$ \& $D$ \\
$D$ \& $G$ \& $L$ \& $K$ \& $F$ \& $A$ \& $G$ \& $E$ \& $K$ \& \\
\hline

 

K \& V \& S \& L \& K \& V \& $A$ \& $D$ \& $A$ \\
K \& I \& V \& I \& N \& A \& V \& D \& G

 L 

$K$ \& $I$ \& $G$ \& $S$ \& $A$ \& $L$ \\
$K$ \& $G$ \& $L$ \& $S$ \& $L$ \\
\hline
\end{tabular}


$\qquad$ $\begin{array}{lllllllll}G & A & T & I & E & L & V & D & S \\ G & V & D & L & T & V & T & D & A \\ G & V & S & G & Q & F & E & D & A\end{array}$

$\qquad$ | Y K F D |
| :--- |
| S T L | | A Y F |
| :--- | :--- |
| P D | | $\mathrm{N} K$ |
| :---: |
| V K | | V | S |
| :--- | :--- | :--- |
| V | M |
| M | V | A V

$\qquad$ $D \square K / L$ G L S M S S

TVNPFFVSIKEGVEKEA
I V I G A A MPIF D DK WLSYLY D A I R A Y D

 TLA I VVSTLNNPFFVTMKDGAESKAKELDGYNLIVLDS
 T $L R \left\lvert\, \begin{array}{llllll}\mathrm{V} & \mathrm{G} & \mathrm{V} & \mathrm{V} T & Y & T \\ \mathrm{G} & \mathrm{L} \\ \mathrm{L} & \mathrm{A} & \mathrm{M} & \mathrm{N} & \mathrm{T} & \mathrm{Q}\end{array}\right.$ TI ALVVSTLNNPFFVVMKEGAQQEANKL KLALVI STLNNPFFVVSLKDGAQAQAKKM D GKLLALVVS LAV STLNNPFFVELRDGAQEAADAA GLIV $\mathrm{P}_{1}$

## $\square \mathrm{K}$



 D G L
 I G V S MALLF


 N FMSVVVRKAIEK D GK S AP
$L T$ $D V Q L L M N D S$



 HVDVQFFDA

$T$ G GMLV T T SVN P F | $L$ | $V$ | $G$ | $V$ | $S$ | $S$ | $T$ | $L$ | $N$ | $N$ | $P$ | $F$ | $F$ | $V$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $T$ | $M$ | $M$ | $E$ | $G$ | $l$ |  |  |  |  |  |  |  |  |
| $T$ | $G$ | $M$ | $L$ | $V$ | $T$ | $T$ | $S$ | $S$ | $N$ | $P$ | $F$ | $Y$ | $A$ |


| $\square$ |
| :---: |
| T |





















$\qquad$


$\qquad$ S| NDY |
| :--- |
| $K M D$ |
| $K$ |
| $E M$ |
| $K$ |
| $K$ |

A $D \vee \vee D A$ $\begin{array}{llll}G Y & N L V & G & L D \\ G Y & L & V & V \\ G & S & A\end{array}$ $G \vee E V \vee V$ GVELVVVNA \begin{tabular}{ll|llllllll}
$V G$ \& $V$ \& $T$ \& $L$ \& $Q$ \& $I$ \& $E$ \& $D$ \& $A$ <br>
$D$ \& $V$ \& $D$ \& $L$ \& $V$ \& $M$ \& $V$ \& $D$ \& $A$ <br>
\hline \& $Y$ \& $S$ \& $L$ \& $L$ \& $L$ \& $C$ \& $N$ \& $T$

 $G Y K L \vee M V D A$ $\begin{array}{lllll} & 1 & T & T \\ G & G & D & A \\ R & S & A\end{array}$ 

$G$ \& $Y$ \& $T$ \& $V$ \& $L$ \& $C$ <br>
$G$ \& $N$ \& $T$ <br>
$G$ \& $L$ \& $L$ \& $G$ \& $T$
\end{tabular}



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Q N D Q SK Q N D Q ID VLLA K GVKA LAA I LVVDPAAAGTVIEKAR



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 QD DI A R QL N Q I Q N F I A Q K V D A : I Q N S T S T Q N D K I D L F I T K K V G A L Al N P Vid P K A S S T I I S K A K

 Q N D S A K QVV N DVV D L L Q Q G V DV L L I N P T D S A A Q NDPSKELLSNVEDDTVVRGVKAILI NPTDSDAVSNAIIRMAN Q N A Q P T Q N E K I

 $N$ N D P A T Q L N Q V E DLI Q Q H VN A I I L N P T D S Q S L S T A V E Q A N Q N N P A K E E L A N V $\operatorname{V}$ Q D L M MV Q A P K L L L L I


 N D D L A T QL Q GVVEDLI Q Q KI DVLILDP PVDSK GTIPAAA AA N



 Q N DV A K QL D QI N N Fi A S GVVDAl IVVNPVDTSATQAMTAAAA





 QNDAS QQAN QL QN F V S G S L S AVIVNPVDSDAAGPSVRSAN







 G G D
 D Y DL Q N D P S K E E L A N V E D L T Q NDPAK QIS D $\square E D L I Q Q Q G V S A L I I N P T D S A A V V S A I E S A N$
 $D N H A G R Q Q V Y$ LDVVLSQKRVD GLIVAASTSDDAL MS QHLAA G GLLYEK QRDYI RMLAEKRVDGILVMCSDLTE ELRGMLDS

 GDDAAK QTNDVEDLI SRNVSVLIVNPVDSDAVAPAVKDAD

 EGDPERLRHNLEVLLQKRID GLLLMCTESHSASAEVVFGQ ETAYDEQNNMDETMLSGGVDAFVISPDQSDSVASVI G D H D LAA K Q T Q Q F E D F I T Q K V D L I L L S P F D S K Gl A A A Q Q A K
 E G A NDQA T Q T N Q i E A F Fil

## QUERY

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 AKNLPIVF LNRQPSDADMKTYDKAWYVGAHAEQSGTMSGE

 KQGCPIVQIDRKVPDANY $\quad$ PTVTIDNLISAYNATK
 ENKI PVLTVVDRKA




 ELDDPIVVLDRPSD KAGUPLVYLNDAPENDGR DPEKQAYVGSKETDAGRLGAE

 QAKIPVITLDRVASKG EVVSHIASDNRVGGKMAGD
 RANI PVLTLDRGAS R DADIPVVAVDRTVNGA
 EAGVPVVTVDRSANG RHSHYGAGVFVCNDYALLFTACE KAGIKVI TTGRELEGA QGDVVSHI A SDNVAGGKMAGD KAGIKVVVTHLGYDEVRHGIVVAGE NAGI PLVYVN RLPVNDGKDPPKQAFVGPDERESGTLQTK
 DKEVPVITVDRSAEGG EVKTHIGASNVKGGEMAGE
 AAGVPLVYVNRQP $\square N V D S$ LDPDQAFVASNESESSRQGF NAGUTAAADVSAPG ADVTVMTDNDAAGQKACQ
 QSNIPVITLDRQSNG GKTTTHI EKMPVVTVLDRSNGAVLNTEKVTTHYVASDNDKGGAMAGE GQNVPVVFFNKEPSRKALDSYDKAYYVGTDSKESGVIQGD KANIPVITLDRSVSGGT
SPNIPVVVMDWGTMSFESDK $\square$ VVSHIA SPNLPVVVMDWGTMSFESDK $\square$ Q
 QAKMPLVYVNRTPGDKT LPP PGVVFVGSDERESGTLQME
AAGVIVAAFDVSAPG ADVTVMTNNVKAGEEACQ
HKNVPQVVLDWGTECDFANVINDNARI GA
KRDLPMVVMDWGSHHDDTDRIEDNAELG
NANIPVI AIDRSSDGGTL LTTVASNNEEGGKMAAE YPSVPMVMMDWAPFEGRGD IIQENAQLG
 QHDDPVI FFNREPVPEDLSQWNQLYYVGCEAKQSGEMQGE RLNVPVVTVDREDS KDIPTI IVQNTAGGRMATR $S V P L V N A C E R I V E D \quad D R Y P V V E L D N H G A A Q E V A R$ A ANVPVITVDRIVA

NSGKVVSHIASNNDEGGQMASD
 LHGKTHGSGFPLVMACEYFQGMQLDPTVSDDNQQAAEKAMT AAG IAVVAVDVGAVGADATVMSDNAMAGAESCK AAGDTVVAVDTAAEG ABATVTYDNVQAGEDACK
 NAGIPVITVDRSAEGG LANSPANATPPVVDACERDPGCGLPTVI DDNEQAAFEATT QTALPMVLDDRALAG LERPCVQTDHVQGGMLATQ HPGI PKVVMDWGPESSSADK I DDNSEEGGYLATK AANIPVIAIDRGATA GELLAFLETDNVEMGSKAAD
 TANVPVVCPRSSDGGSDENGQ DPAVD EAGIPVI AIDRSSDGG KYSVPCVLVDRMDAGA RPAI PIVVMDWGPLDSKVDR DVNIPIITVVDTDAE $\square$ A AGlPVVALDGSAEG SDAFPVVLACEYMDE KAG円SIVYLNRMPTE KAGISIVYLNRMPTE $\quad D P D G T Y Y V G S D E R S A G Q D Q Q$ KKGIVVVNIDEKVDMEQLKKSGGSAFVTTDNVKVGAKGAK YP R L PMVMMDWSPFAFGGD
 I QDNSAQGGYLATR GKVSFVGTGNDNAAYQGG GIDTVVMSDNVQA GK LDA AE PD DTYYVGSDERSAGQDQGK $V \square Q D N S F L G G E D A T$ AA GVNATVMSDNFQAGKLAGE




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UniRef90_B9DUXO

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$180 \quad 190$
190
200
M A WLS G A VVESLKAQGIDDSEQDGMDAA KWDAAQAKDKVDAWLSSGKA $V V K T L N D A G K T E E L Q L D T A M W D A A M A K D K M D A W L A G P N G$ NKQVL ENYPDDKVLFEQTANWDRAQALSLTEN WLQTG SVKALTDAGMTVEQLDLQRGDWDRNKGQEIAQN DLAKFG



 $Y K K A M H E R G D H I S Q E W U D E G D Y S K E S G Y K N M K R I L N L K N R$
$V H D V I K K E C S G M K V V A E Q T A E W S R L K G N D L M T N W L S A G L E ~$
 SHDELTTTQGQKSNQLATDTGMWDRVKAQDKMQSFLTSKG FHNI ADE QLLDVI A
 FHNGADQ KLDVAAKQSADFDRTKGLNVMEN L SVSTMEFYPNSGVPVAKVLQDTAMFQTAEAEELLEKWLADG FMKAVKSGNM DLLASQPADFDRTKGLNVMENL LAAAN SVQAIQDAGDEVEALAVDTAMWDRVKGQEKMQTFL ASHG YRDEMKSLGLWEEAVVIQGN YQLKQAKEAVLQADQT VKET LAA GDCKGTIADEQSAAWTRTNAMDLTTNWI TA GR


 YRAALTQYQ FKQAVQAHKF EILASQPADFDRTKGLNVMENLLTAQ
FHN I VDGIDG TEVVVANQTANFDRTEGLTVMENII QGV FQEGVA TSPDIKIVASQSADFDRAKAMTVMENI DQAN VHEVIATPECFMKIVEEQTANWSRTQGADLMSNWLSAGV

 $V V E S L N Q Q G V Q A E E I Y S D T A R W R R T L A R N K M N E W L V E N R A$
$V K E V L K K M$ YYDVMEAGECAVKVNVIDQQTANWSRDQAQNDMTNWLSTG CMEVFEANDGINVVSNDQNGDAAREGGMNDMQGL $\qquad$ FHRALREAGVPEHAARVAEGDFTSPGGYRAARELLTTGEA F HSVLDDKSNVKFISSSQAADFDRQKGQSVMENII QGN FKDALK GSANVKILNSQPGYDREESLNTVENLI QS VVKELNAKGDQTEQLALDTAMWDTAQAKDKMDAWLSGPNA FHSVI DTQKDПKVVAKQPANFDRSKGMSVMENI FKQALQQAD DDLNSQWDDEGNFECDGGYSAMQRLLKRGKQ
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 FYRALNEANIPVNQDWUDEADFEANQAKDAAQQLDTMKNR

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 YLS CL E QAA IPSNPKWVLE GDFSFGSGYSLGRTL LS GA
 FAQAVKANDF KKLLASSQPADFDRTKGLNVMMENLLAAQ FDERLPEVCPDVTLVVTQPGDWNREKSQRVMEALLVKY FHSAVDGVEGVEVVAKQAADFDRAKGLTVMENILLQGN YRRALSEHGDA DPKLTFVGDYS DDAGIAAGRSLD ADAK WRQALQLVGLPSDLL VHGDFTANGGYVAMRRLLRDRAA YKRALKEANIDFDEKR\|FEGNFECDTAVETADKLFADPEE FNKQMEEKYPNDEIVARQPADFNQEKALNVMTNI LQAN
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 K D 1 E

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$A$
$A$
$A$ R S
 PNFDAVFAHNDEMALGAVK ALLKGKKAIIVGFDGNADA D Q $\square E A V V F A N N D D M A L G A I E A L K A A G Y Y Y D P V V G V D A T A P G$ EFDAVDANNDEMAIGAIQALKAAGRSMDSVVGVDATQDA P DVEAVFAHNDEMALGAYQAI QSSGK DILVIGFDGNEDA EHFDAIVANNDEMAIGADMALE ESGKRGNTVI GVDGTDDA
 PEFQNVEVNNDSMALGAINTLKKHG VIKLPI FGDDGSKTA S DVQAV F A Q N DEMALGA L RAI QA S GK DITIVGGDGTDDA

 D GIVEVISNNDEMALGAVEAYRKAGYEWPVIVFGIDGGLDDA




 SDIN AV FAHNDEMALGALEALEAKGLEDVVVVGFDATDDA PEINGVYAANDEMALGAVQAIIKAANRTGIVVVSNDGTADA
 P S S DF V

 A AFDGVLA NNDEMALGA $\quad$ Q A M K A A G $\square$ D MASV $\square G V D A T Q D A$ $S D L D A V F G A N D P M A L G A Q L A A K Q L G R T D I I I T G V D G A P D T$

 P DVVDII YA TAE N SVVLGGAKAA L E S A K NK DVVKIVGFDDLTE E A NKI EVVIA N N DAMAMGAVEALK A H N K S S I P PVVGVDALPEA PEI QAVFAHNDEMALGALQAIEAAKKQLLIVGFDGGADA P S A I F V C N D M M A M G A I NA A H E L G D S I P E Q L S I I G Y D D L
 P DVV GVFAENDEMALGAIKALGSKAGKSVQVVGFDGTPDG EAI D IV A A N NDEMAI GA A MALEKS QK KL LI GGIDATPD G







,
DKPTAAIVCHNDEMAA
 E K I D G V F A I N D P T A I GA D L A A K QLLGRS GIVVI TS V D GA P D
 K DIQ AV FAHNDEMALGALEALAAAGLKDVLVVGFDATEDA

 P E ID A V F G H N D DN A V GAA A N A I E Q S G R F Hi I F V I G I D G N R Q A A N $\quad$ Q G L

 $T R$ R D $\square$ Q


 D NMAAI IA N NDDMALGAVAALEASNMKGNVLVGIDATPDA PNLKAIVACNDTMALGAVQAVANAGKTGQIVVGTDGAPEA $P Q A V F A G N D A M A V G A Y Q A \square W Q K G L R \square P Q D I A V V G Y D D \square$ GTDDAVFGVNDPTSI GAYDAAKAANRHEFFFVSVDGSKDA


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UniRef90-W3AQ73 UniRef90_W3AQ73
UniRef90_R1IAV4







 QLS QI L E P QLTT I K Q P A Y DM GLLA A A RMLI KLVVEGK KLKK K ELA S L V N P ELTTTMA QPKYEMGKHAARDLI QEIIE GS D QDNN LAA M K S G D LDDVTVF QSAK GQ GA GAVDA AVRLAK GENV

I K S V V K GEMTATVAQQPDLDMGSLAVENAVVVIKGEKVE










 LA A I E A G T M T A T I A Q QP A ELL G K Q A V EFGKMISPALTTI QQPVREMGRKAASULLSLINGKDPE


LA A MA A G DL DVTVF QNVVGQGRGAL DAADKLARGKKV E


 L A S MQA GE L DI TVVFQNAAA Q G G G A L D A A V K L A A G E S V E
EK S L K K D P N S L LAA S A S Q D P Y V MM A G E A



 HI A A R M S P A L T T I H QP K F RL G K A A V D A I L Q K L S N A D A P
 L K A L A S D K I Q Q TV




 ALLA KA ATPE LTT TI A QPDYEMMGRMAANL LI DLIDEKKKDEK
 VKAVND G RMAATV A QK P E LI GE K A M Q T A K E: T Q G K K V D K S
 PFAEYCEPGLTTI HQPRAE DGEAAMK LLMDLIDEGKEAVG EKALKDKKSLFAVAQNPYTMATMAVQUGYDILNGKRPAKS VA ALE GNTLIESSSA QDPFFMARKAVQQEGVGILNGQKPAQD MA AV K R G DMAATVA Q QPA LIG S LGVVETA GKILKGEKVVAN


 DLAAYFAPPLTTVHQPKRRVGKTAFEILLERIKDKE
 EA R L K D P T I E G S AT Q S P D K M A QLAA V V GY QMI N G K P P K Q T VA AVVA GK MLLATVAQQPDQMGKTAVDTADTDAEGETVE $R M A S M V R P Q L T T V A Q P M Y D \square G A V S M R L L T K L M K K E A V$
 GFS QLCDPP LATIQQQPT IEMGRRAADTVIRA VVGKP



 $D L A A F L T P P L T T I H Q P K D E L G K L A V D K L L R R M D D A D A P S D$ VELI K TD DMAQTSAQHPKA QVVKA I ELAKDLLLAGKKVE

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 $V \mathrm{LI} P \mathrm{YQQ} \mathrm{L}$ TQANYQQF
LINFRPQLI R
QNLLLN DQ EKVWVPFELVTPANLDKY LWVPFELVTPANIDKY K EI P V D D L L I EK
NTGUVDGKYVWIDYKKI TKDNDSD DKKVY P PEELVTPANLKDY

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$\mathrm{N} \quad \mathrm{FINIPFQLITKDNVDEF}$ IEHGVEYKVVKVPYQDTNSNNLDAF I PVPLKDITK NTG DTDGKYVWIA YKKI TKDNDAD

ID QLHYVLPVKLIERDS
DKEVWVPFELVTPGNMGEY RNK LIKEGRYYVSEYQPVYSSNVEDF $P Y V I L D N Q L V T Q D T V D$
VNSPLHLVEKNTPFT
T
T $\square \mathrm{P} \left\lvert\, \begin{array}{llllllll}\mathrm{V} & \mathrm{D} & \mathrm{L} & \mathrm{K} & \mathrm{L} & \mathrm{V} & \mathrm{T} & \mathrm{K} \\ \mathrm{V} & \mathrm{P} & \mathrm{L} & \mathrm{K} & \mathrm{L} & \mathrm{I} & \mathrm{T} & \mathrm{K}\end{array}\right.$
Y V V P P V V P P

$\square \mathrm{P}$ VE L E
KKLELPSTFVSKDNVEE
 $K \square D N K M I D V P F E V I T P D N V D V Y$ NEAQVVQLEPTLVVRNSVK
TQWESHSKT Y Y L B B Gi DKENLGQF I VI PYRLI TPENVVTF T $\quad$ VLLLE P HPVPEAPRVLVLTPELIVRESVGK



HKTVQLEPKLI ERKTVK
NPNILI!PVKLITRENVSSY
 SMTVQPELIVLR

TQQQVFEMDLS L I S R D S VK
TD S P Li
$V T B V L T P E L M$
QF MLADKLIVR

RT ILDPFELVERES


$K F V L K D E L V I R$
IS PD DEAKEVWDPFELVTPENYKDY LLVLTPALI NRGSV RTVLI PVDSVSKETLDSF



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 AYDLERQVRQLDAFTEERMDVVLAAANSEAVGPAVQRAQ NGDAAAQLSQIENMLNKDVDVLVITPFNGEVLGNVISEAK DSDPEREKAYDDLLKNKLADGVILMASVMGKDELTLLA NGDSQTQYSQSQNLDAQGVDVLVIDPHDGQADAPIVDQAH
 DHNTREETKLLRTLLSQNVEGMVVTCSGGQNSDFSAKTVA

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QNDSSKQQDQAQNAQSQGAKAVIINPVDSDAAGPAVAPLL
QNLPEREERYAQMLRRNEADGLIVLGHRLPPTAREIVQQR









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 N N D A S T Q L K R QVV D N DVEVVQREWL R V L HEEKRVVDGLII A SVGGDEAA A A EA LR

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DNDPAA QNNA I ETMYI
G G D S K R R L Q Q N L L Q T L
 DEDPAKESTYVAAALA EKMAGVIISPSGNAATVNRLIQAR


 D WD A GKEAR HL RALRQARVDGAI I NP HWT A K E E
$\emptyset_{\text {G G A N S }}$

VA D NFD D L S GПD LA M SE S Y A H N

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| QK NLLPP P M V M |  |  |  |
| :---: | :---: | :---: | :---: |
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SSSVPVVL

## ${ }^{R}$

G L S P P TVVLVDRE DD AAAEQQEN GLSIPTVLVDREDD\AEQQPCDEIPSVNIDYEQAAYEATK
 FTSLPLVVMDWGPDNKHTDII QDHSFEG
KK GIPVVDLDQEFNAEELKNAGGWVI
$\qquad$ G D G A A
A A
G G
SA GTDN Y TA
$G C D A R T A S$

GYCTTD KQKVPVLLVDSDA KFDGKTTFIGTDNYTAGQEGGK DANIPLVYI NREPDARWADNNWNVTYVGCDARQSGTMQGE RNLPPMVMANEFAPE LDELPTVHDDNLTAAFDAVN
 WDIP VVLFARDELPAGQFD YIGIDNIAGGRMAVE
 PA G S I P ANPPPMI SVVCE E I EMP GLLP F I GIDDNQAAAR LA T E $\stackrel{\rightharpoonup}{\mathrm{V}} \mathrm{P}$ $\square P G M$ G $\triangle \mathrm{V}$ V DKGYR\GlVGKYIE VNDEIPLAM YGTMPMVMMDS GPEQAGY K R R DAGDPSFLIDREDTQSGMAV

 |  |  |
| :--- | :--- |
| $V$ | $G$ |
| $G$ | $E$ |
| $G$ | $L$ |
| $Y$ | $D$ |
| $Y$ | $T$ | L VPQ

KAG $\square V V V A V D V A A A G$
$W G P E S S Q A D K \square$

$A^{G A D A}$

LDDSEQGGYMATN GADATVQTNNVQA GELISAED
 EAG DSGEYVYISTDNLAGGKA G GE
 AHGIPTEDGDPQKRPDKEVYPKLAALVASDEDHTGFNAGE

 SWGIPVVLLGRKVPGANCD YVGMDNVMGGQLAVD DAGI PLVYVNNTPSDVH E LGGPKAAFVGSDEKVAGTLEAQ

RHSVPTVLDRLTGGEA




KAGVTVVIVNQQIADPSAADC

AKNI PVVAYDRLIEA



| $L$ |
| :--- |
| $A Q G \square P V V V M D W W F T E L D N A D$ |

NEFSYVCSNNYNGMHKLDE
THIDETASERGGYLATK
KKGKPIVNIDEKVDMKALEGANVEAFVTTDNVKVGEKGAQ

QK PVVLIDRELPGVSAD TVLVDNEHGAETATA
QKGDYLVNLDEKIDNLHKANGNVEAFI TTDNVAVGAKAAQ
RASVVPVFTLDRTVS
QADIPVVAVDRSSNGGADEASFVASDNVAGGAOAAA


ESSSPDVFIGRRVDS DNDPSVNVDNCKAAYKATN
$\begin{array}{llll}R D C F P L V V L D R K L P N & D N & F H V & D V D N E Q G G F M A T K \\ A A G D P V F M D V A S D G & E V & S H I S T D N Y R G G E L A A E\end{array}$


UniRef90 R8ALT3 UniRef90_R3WCY8
UniRef90_|3DCB7 UniRef90-A0A023NS11 UniRef90_Q65VW9 UniRef90_UPIO0035E7C3B UniRef90-H1XX09 UniRef90-Q4KEX1 UniRef90_S2KFK7 UniRef90_H8IGH4 UniRef90-W7Y4L0
UniRef90 Q8R8P3 UniRef90_UPIO004787E4B UniRef90_KOY552 UniRef90_K6B7Y8 UniRef90-A8F6U7 UniRef90-B7GK85 UniRef90_UPI0003062A78 UniRef90-E8N1H0 UniRef90_S9QYJ1 UniRef90_D9SQ91 UniRef90-D9SQ67 UniRef90-E3D851 UniRef90-B4SNB0 UniRef90-E1SQY8 UniRef90-G9WJ20 UniRef90-W0QPY3 UniRef90-R5HI19 UniRef90-IODU83 UniRef90-D5W8J7 UniRef90_UPI000255D602 UniRef90-E4S7A0 UniRef90-A0A024Q9W1 UniRef90-K015P6 UniRef90_A6VWF1 UniRef90-E1ID23
UniRef90 ${ }^{\text {Q9CN8 }}$ UniRef90-G5I9V8 UniRef90_UPIO0047B50F9 UniRef90_UPI00047E9BCD UniRef90-IOVJC5 UniRef90-U5BVC6 UniRef90-G1WX77 UniRef90_G8MY75 UniRef90_W816W1 UniRef90_UPI0003767D92 UniRef90-A4IPB9 UniRef90-H5UXF8 UniRef90_UPIO0040EBA29 UniRef90-ROPJ18 UniRef90-A9D0S7 UniRef90-S9SM48 UniRef90_G8MP41 UniRef90_A7N1L2 UniRef90-F1VVZ6
UniRef90-D2C0M7 UniRef90_UPIO00373E962 UniRef90_R6T4J2 UniRef90-R5PKE5 UniRef90-C2BGG2 UniRef90_UPIO003768D0E UniRef90_C4WZL5 UniRef90-F7KPC1 UniRef90-UPIO00465E988 UniRef90_I8TM66 UniRet90_S5SYF5
UniRef90_R5YMQ2 UniRef90-S5UP84 UniRef90-M1ZE97 UniRef90-A0A024Q8Z9 UniRef90_UPIO0041B967C UniRef90-V3TNK8 UniRef90_S3K1F6 UniRef90-R9MX20
UniRef90 H5WJV8 UniRef90_UPI0002627AC9 UniRef90_A9BJP9 UniRef90-I3DSJ4 UniRef90_A3K917 UniRef90_UPI00047BD2ED UniRef90-H9UAN4 UniRef90-R5MMW6 UniRef90_UPIOO03736C85 UniRet90_-4H8Y8 UniRef90_N2J969 UniRef90_R9SR06 UniRef90-G9A784 UniRef90-A0A024KAJO UniRef90_UPIO00362DC2A UniRef90_U5L618

Y $\square$ Q A L R R A G|I A|VEERYMTYGNFTFEA GAQAVVSQLMA QPS P YRQALK DNRLPFT GRFVSSGELTVVGGYEAAKELGLQKN Y L N A L E E A K I A VN S N WI I D S H F D FE G GF N GMN QL L N KK P Y Y R L A L E A A R L P C N P A LTAALGGDF S DEA A G E R A

 CRSVLNHHPRDKLLSDDHNGGGTYSGGDEAMTYLISAA QMKILQQPHDDSGKVKVVGD Q WVD S WLA EKA LQQIMENAAN K
 QKKVLQQDKGDIDKIVGE QWAK DWSTQEAYNDMQNAGTMANN


 Y K Q A M I S H D L E DH S S Y I Q E GE S N L E S G Y H Q M $\square R L D S$ VHEVV GS MCSSFLTMTN E QVGGGWSRE GGQNLMTNN WL S S G


 Y R H ALTK A GLAAADDNWVCSDE LSFEGGYRAMHA L L L A R Q FD GNARGKLS DVAKQTAGFDRSQGLSVAENI I QGH
 FMQAMKQASLNNIPDEY I FS DFEFAGGFNSMNKLLALANP

 Y A K ALLSEASHSVDESLVVVKGDYSYSSGGEAFN QFVDD D QV WRTALAADAGCGTGEGLLWHGNFTSQGGYEAMHAVLRAPEP HTETMKKWK DPVT DEYIMEGDDSFDAGYNDGKQLLSLPNK

 A K E A L E K A G L Q $Y V Q V L R R C G D M V D P Q Y D A R G D F T F E A G S K A M Q Q L L D L P Q P$ Y ME AL K Q A N I P L N Q D WI DECP K GTQ E ES F Q ITTK EE I F E K S F LMAMEEASVKMKPGDFYQGNYD DKSGERGARYLMER Y S E A L R A A GI EMDDTLLVPSATTRQGGRMAVKRLLQHPNP Y R A A MH E A GL A DP D GYEAR GD Y L L E T GQ L C C G Q L F A L A E P
 WL R A L A E Q G V T A P E S WV G T G S P D M Q G G E A A MVVEL
 YHRAMAEANAEVDERWVQS GEF TYEGGAEAMSRLLDDQPSP

 LRAT TLAEAGLPLAPALCRYADFTSMGGYQQARALLALDPAA






 YRRALTSSAGLPHDDDLVVSGNSESSGAERATAALLARPEP YRRALKENGLEVDEKKIVLQNFT】ASGYEGDMALLER Y Q N AL M D Y HL H L H S RWHI Q G DF TRE G GYRATK LL I A QK K L



 FQDFANEYK DDYK IVE GEYTHES GDSDAK K DK S L P




 F DS A A E Q Y CRAMKEAGQTIQPAWLLNTEFTSAAGYTAAAHLLJEKS
 VH D F CVVE R DID PAVLAAMEAEYTVEGGKAAMERLL ARRG




P N R K M P N K T F E T K L I $\quad$ R E S V K D Y K K I L L K P EL I NRS S I

NPQKTYRTFVLDPVLVERESVA
T K D T A E LTT QVVLPHEV I HRNSVA
QR\|VTPN\|VLR
ATGQPKSQVIRLPTRSVTRETAKQF SNG $\quad$ KKEVP SYLLEPDVIVTK DNDD D
P Q T K I L T P V L R
EHELVRRESTVKY

PHDSPVEKRLVTPVVVVVESTAA PY D

K F VLTD E ELI V R
QPELP A RCETVPVELVER
 K L I K M D V Q L V E R
$\square \mathrm{D}$ VT Q Y Y V L
QT LD F
$E \stackrel{F}{P}$ S L G R QVVLP P A LVGR D SVA
TK S P
SDFQT I MLE P E LVQR N S V R Q $\square$
$N$ LLED GKY RMPYAKVGPD DVDE Y NPEADANVLVLTPKLVERQSVK STARAPARRRVVSPRLIVRES
Y S TKVVTPTMKL
K Y $\quad$ LD T S II P R D S T K $\square$ T K

NPEMTLPTQLIVRES
VI E M H P E L V DR K S VK 1

VNMELETELLDSF
GUDEHYTGCDYVKVTSDNAKE
 Y R R Q K V EF Y P E L I V R E S VK D
$R T \square L H P E L V I R$
P P I VLP T T L


| $R$ | $V$ | $F$ | $K$ | $V$ | $D$ | $S$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $L$ | $V$ |  |  |  |  |  |
| $I$ | $M$ | $L$ | $S$ | $P$ | $E$ | $L$ | $V$ |
| $I$ | $R$ |  |  |  |  |  |  |

TPERES QRTLLPPRLVIRDSVA
T T GLLE E K Q LV DCVLI TPENA
$G N T T I L L P S T L V T R E N V G S Y$ HEKRVFEMQPE VVVRNTVKK
 $K E \square T \square D T L L V T K D N \square D E$
TTTKV





 EH GRVVYMPCRLV E R GS LAD S K DI VY D MELL I KRESV SPS F SLP T KL V ERQSVK


 UniRef90-UPI000478CBE5 UniRef90_UPIO002378E33 UniRef90-D9RZ47 UniRef90-16AF94
UniRef90-S3JPM4
UniRef90-F4CFL5
UniRef90 ${ }^{-}$W4Q6M3
UniRef90-B1B9Y6
UniRef90-M3КВ15
UniRef90-G7UH40 UniRef90-UPI0001E89C6B UniRef90-A4IPB8
UniRef90-A8F7K2
UniRef90-Q899C2 UniRef90-B9C138 UniRef90-A6LC98 UniRef90-Q891M4 UniRet90_10RWB6 UniRef90-G8MWX4
UniRef90 E3PWT1 UniRef90-UPI0004783200 UniRef90-A0A037YY24 UniRef90-A0A011A276 UniRef90-G8LVD3 UniRef90-A0A037Z7M4 UniRef90-UPIIO0047066D2 UniReffo-bgK1A6 UniRef90_W1N6Y1 UniRef90-J3D775
UniRef90-14Y
UniRef90-UPIO0036CDB11 UniRef90-D3EJK1 UniRef90-UPIO0037ACBBE UniRef90_Q883G4 UniRef90_UPI000360912A UniRef90-N4WUK5 UniRef90-C6XYJ0 UniRef90-H6LF52 UniRef90-D1xW93 UniRef90-UPIO0036901D5 UniRef90-W2EMI8 UniRef90-UPI0003B5859A UniRef90_C2FZN1 UniRef90-U4VVX9 UniRef90-K6BJZ9 UniRef90-A6LRD5 UniRef90-JOMKM3 UniRefofo-10 MMB1 UniRef90-D2QN47 UniRef90-H2JKH9 UniRef90-W7C1L9 UniRef90-D6DTB6 UniRef90-S6JLQ1
UniRef90 E6XFIO UniRef90-C9KNC7 UniRef9O-GoGBZ9 UniRef90-UPIO0046EAA2A UniRef90-D1BVU5 UniRef90-UPI000407AF8F UniRef90_V2XHQ0 UniRef90-UPIOOO477725C UniRef90-LOEHQ1 UniRef90-N4WKZO UniRet90_LOM444 UniRef90-A0A017HMM7 UniRet90_E8RVP1 UniRef90-R3U8V6 UniRef90-G2TI14
UniRef90 - D9WAO1 UniRef90-UPI0002EBA960 UniRef90-UPIO0047BC80C UniRef90_K6ZWG3



 KNDVPVIFFNRELVEGDMGRWDKDFYVGADAEQSGVMEGE DAGVVADEMDEGSGLPHVQVDNVAAARGAVE OAIDAYTSFDNETVGKTQGE DAGDTPILFTNTQPASDYLKPDKYMYVGSYEDDAGNMQAE DEGDPVIAYDRLIED ANTDRAFYLTADNVEVGRMQAR KAG| KVVSYDRLILDADVD



TSQUASDNVAGGKIAGG F P

KNNVSFVLVDRYDD
AAGVKVFVVDSTLD PKANFVTLVQSSNANNGQLVGQ
REGFPIVVLDRKLD, HEFVY N $\square$ PF LIMFSI DHEALLSSH
$K M N F P F V L I G R H M Y R S G D D E$ ELRIPTVLV
AAGQPVVAVDVYANG
$\qquad$ QV KEAPA AAATVODKKAAYEAVK DSDUPMVFFDRUCTGULTDR
$N V K F V M V$ AKGlPLVPVNASL NSPDVAASVQPDDVAAGAKEMN KQGUKIISYDRLI KNSKYVDYYATFDNFKVGVLQGQ DDPVDAFENQDSPEHD TVAS
 YY 1

$\qquad$ |  |  |  |
| :--- | :--- | :--- |
| $Y$ | $S$ | S | GVDRMLD NELQUPTVLVETTDKEKSFPSVITINNEKAAYDAVS $A A N D P V E V N A E I N Q Q G A A \quad K A Q L V S N A Q G A A D G A Q$ QSGCPLVLLDRALPVLDVD ANKUPTVLI NAELSTSGLAE AQLVSNNAQGAALGAQ AAGDPTVFDVVAAFDVAAAGADVTVMTDNVKAGELACQ



 EQDIEVVAYDRLD MESPHVSYYATFDNFQVGVLQAS MQTELIDAPSEVVLGCDPDDSGMLSGVLINNETAAYELAT TKGIPLVFFDRUSTSTDASRVVVDDYIGAFNAVTHLIETG
 DQQTPLIVGGDQLDHPLCDA VLLDDYVIPDDETG
KEGMPVILFDRVHD A G G PLVVFNRKPE VK DP SSMAYVGSDSVLGGEMQME DAGUKVVNIDNQLDDVLKSKNDQDPFVGPDNRKGAAQVGD LCKRIIIDSHDPTVLVSGLSYKYSLPYVKVDDYQAAYSATS VPGM YMQYGPVLINRLVPGYAHRCVCLDNVSGAVMATR KAGIPVLTIDRSVSGGVVALH RKNIPLVLFDRYVESI DVSKVIVDNEAAAFKATE



 KEGLCLVTFDRSLTNSEHVQFDG VGVDNRQGVYDATR QMNLPLVTFDRQUS PADPYVCSDNYAGGQLAT EAGIPVINVDREFSSPFAA RSTRTVGNYGMGVSAGT SKGVVIDTDEKDDAKALGEGGLYAYVATDNKEVGETGAG

Q MDHTPGMVLINRIVPGYAHRGOCVGLDNVSGAVMATR AAGUPVIAYDRLI RDTENVSYYATFDNFQVGVLQAN DEKTLVVSVDRQI GGGKHP VPHFGANNVEGGRAMAD KRKVPVILVDRGI NPRENGRLIVKEYEGA
DLDFLESRGVRTITDDRSQSDHPYSSGTVDHKKGARLAVR RSGVPCVFLDRMI GDGHDHPYDQ RGVGAENAFHGEQLVR KRGLVVAAFDRKGQG ABEVVACSVGVDNELGARLAGQ


|  |  |
| :---: | :---: |
| UniRef90-U1FNE1 | STKAL |
| UniRet90-Q8EP89 | YLRALKEANDEVNEDYDYKDEYAYQTGUEAVEYLIGL |
| UniRef90 ${ }^{-10}$ | AKEVI AKHPNMHVVLEDTAKWM |
|  | YRDALQKYGMNVEQELI R Y |
| UniRet90-R | YERALTDNNDAINPDIIRYGNTDHDNGYKVMAEL |
| UniRef90-wo | FHSVV DHYTGLKMVAQQSADFDRNKAME |
| UniRef90-UPI00037197F1 | YKKALADNNDEFDPLVYLCNNNSD |
| UniRef90-F7V3M6 | FKRALKEYPNDKLVESQ SAKYDQDTAASTMAD |
| UniRef90-F888S4 | AMEALKPYLANGSVKVVLNESANFETDTALTVMS |
| UniRet90-UPIO0047B6EC | YKTALREANISDNELIIEGGHRYKSGYEGA |
|  | F $\square$ RSLAKHQLEVDPMHIQEGDFDYEQGYECMKRILLCET |
| I2BNW | YQRALREAGI EVLASRTLESDFTSTGGYAAAVEL L S |
| UniRef90-W6UGE0 | YEYALKDAGI |
| UniRef90-R6RMX5 | YLDCLKENNIKFDDKYVFYGNFDFDSGYLNT |
| UniRef90-C9ABU1 | YLDALKEFGLQRKDSWHVV TKFQFEDAYEKA |
| UniRef90-UPIOOO3B72E99 | SVNTLKKQGVEDDKLGYA A A WNRAQAQTKAAQF |
|  | R D |
|  | ALSVLQ GKVNIGKSYDTKDWKPENANANMEGADSAIGK |
| UniRef90-UP1000478CBE5 |  |
| UniRer90-UP10002378E33 |  |
| 俍90-D9R247 |  |
| UniRet90_16AF94 | Q |
| UniRef90_S3JPM4 | FHEAVDGK P ANVVASVTANFKREEGRI |
| UniRet90-F4CFL5 | H |
| UniRef90-B189Y6 | EAMKNYSIDYSELITGEGDFTLEGGMKATEE |
| UniRef90-M3КВ15 | GLNEGRVRFEVVGQGWGMWNNEGGLKMMED |
| UniRef90 G7UH40 | FKETLKANGKF NVVASVPANWSREQAFNAAST1 LQQ |
| UniRef90-UPIO001E |  |
| UniRef90_A41PB8 | FRRALSDHGIELDQRFIIDSDSKDEDAKDASQKILALPER |
| A8F7K2 | YKKALSQANIELSEDYLITAPYNKNMEAGYM |
|  | YKKCLEENN |
| UniRef90 B9C138 | CLSVLKK GNFEILSDNQNGKATRDGGLAVAQS |
| UniRef90_A6LC98 |  |
| UniRet90_O891M4 |  |
| UniRet90_10RWB6 |  |
| UniRet90_G8MWX4 | AMSIVLKPYIDQTKFDQVATLRWDGATAQARMDNLLSAHYT |
| UniRef90_E3PWT1 |  |
| UniRef90_UP1000478 |  |
| UniRet90 | QMNVLKPLIDKNQTKVIGDQWAKDWLPEEALKIMENAANN |
| UniRef90-A0A011A276 | FDSVIKGKNLEVVYKSNCEGWLSEHAFDY |
| UniRef90-G8LVD3 | YMEALTEAN P Q N NLYYEGNFHRESGMEALPY |
| UniRef90- UPIO0047066D2 | YQTVLSQ YPDMKLVASDIASWDRTQGYNKTQSM |
| UniRef90- ${ }^{\text {ar }}$ | VCTAAGLPAPLQAVRLGANGREKCEA |
|  | YETVLSQYPNLTRVASEV AN |
| UniRef90_J3D775 | Y |
| UniRef90-14YL62 | RGL A DPYDADVVSGSSSA |
| UniRef90 ${ }^{\text {D }}$ EJK J 1 | AMSVLKPYMDSGKLVQI ATLRWDGALAQSRMDN |
| UniRef90-UPI00037ACBBE | QMEVLKEAMDAGKIKNVGEAYTDGWKPEVAQKNMEQFAND |
| UniRef90_Q883G4 | FQEGLKGF |
| UniRef90-UPI00036 | YKQALEKAGLELTDDYVIEGG |
| UniRee900 N4WUK5 | R |
| UniRef90-C6X | LSNRLK |
|  | YHKAFKENN |
| UniRef90- UP100036 | VEDFVSAHPGMK |
| UniRef90 W2EMI8 | FRSAMQAAKRKV |
|  | YLDALAAHGLPLAEELIVYCDTMTLEVGTLAMQRLLTKAL |
| UniRef90 | KEHNYPYQEELTILDKMS\\|KGGMEGTRKMMQLKQR |
| UniRef90_U4VVX9 | VEAVIAKYKQMAVIEK QTARWQRNEAVDVVS GWLLNQ |
| UniRef90_K6BJZ9 | K AMDK |
| UniRef90- A6LRD5 | FLLQALRDNNISHKKNLIKEKGFGFIIDGVEG |
| UniRef90-JoMKM3 |  |
| UniRef90-10JMB1 |  |
|  | GTYIAKF SG\\|KLAAKQTADFDRAKGMSVME |
| UniRef90-D2QN47 | ALEKHNLP SDQYVLHCDYTQEN |
| UniRef90-H2JKH9 | FRAALAEYGL |
| UniRef90-D6DTB6 | SKLLEYGVTPNPAWIRTSHASQSDGARVAEAL |
| UniRef90- $56 \mathrm{JLQ1}$ | EMETLKK NPGTKVIEMKTANWSRAEALSLTED |
| UniF | SLTTEDGRKK |
|  |  |
| UniRef90-G0G | QALRDAGVEEDPSLTWQGETVEGFGDFNAIQLGKQAAY |
| UniRef90-UPI00046EAA2A | ADTARRAGUWQ |
| UniRef90-D1BVU5 | FADALADCG QEVDHRVAAEFTVQSGEAAA |
| UniRef90-UP1000407 |  |
| UniRef90_V2XHQ0 | AKA AFEAAGAKLVDSQPADWDRTKAMDVA |
|  |  |
| UniRef90 ${ }^{\text {N4WK}}$ | YNRALKEYQLP DEDQIYYTDQDFDYGTQAMRHLLQLEKK |
| Ref90-LOM444 | QRALREQGITAPESWIGTGSPDMQGGEAAMVEL L GRN |
| UniRef90-A0A017HMm7 | VLQPMI |
| Ref90-E8RVP1 |  |
| UniRef90_R3U8V6 |  |
| UniRef90-G2T114 |  |
|  |  |
| UniRef90-UP10002EBA960 | ALT D H |
| Ref90_UP10004 | KAAMAKAGLQLDPDLVWQGAGUGGYGDTEGPEL |
| niRef90_K6ZWG3 | IRQSSQHNNPDQHIAYGSPDYAGGREAMEHLTEQG |

## UniRef90 U1FNE1 UniRef90_UPI0004035E08 UniRef90_Q8EP89 UniRef90-A0A038CQ47

 UniRef90-UPI0003460B91 UniRef90-R5XGX5 UniRef90-W0F681 UniRef90-UPI00037197F1 UniRef90-F7V3M6 UniRef90-F818S4 UniRef90_UPI00047B6EC7 UniRef90_EORIK6 UniRef90-I2BNW0 UniRef90-W6UGE0 UniRef90-R6RMX5UniRef90 C9ABU1 UniRef90_UPIO003B72E99 UniRef90-A6UGZ3 UniRef90-S2ZQA0 UniRef90-UPIO00478CBE5 UniRef90-UPI0002378E33 UniRef90-D9RZ47 UniRef90-16AF94 UniRef90_S3JPM4 UniRef90-F4CFL5 UniRef90-W4Q6M3 UniRef90-B1B9Y6 UniRef90-M3KB15 UniRef90-G7UH40 UniRef90_UPI0001E89C6B UniRef90_A4IPB8
UniRef90-A8F7K2 UniRef90_Q899C2 UniRef90_B9C138 UniRef90-A6LC98 UniRef90_Q891M4 UniRef90_IORWB6 UniRef90-G8MWX4
UniRef90- E3PWT1 UniRef90-E3PWT1
UniRef90-UPIO004783200 UniRef90-A0A037YY24 UniRef90-A0A011A276 UniRef90_G8LVD3 UniRef90-A0A037Z7M4 UniRef90_UPIO0047066D2 UniRef90-B9K1A6 UniRef90_W1N6Y1 UniRef90_J3D775 UniRef90-14YL62 UniRef90_UPI00036CDB11 UniRef90-D3EJK1 UniRef90_UPI00037ACBBE UniRef90-Q883G4 UniRef90_UPI000360912A UniRef90_N4WUK5 UniRef90_C6XYJ0 UniRef90-H6LF52 UniRef90_D1XW93 UniRef90-UPI00036901D5 UniRef90-W2EMI8 UniRef90-UPI0003B5859A UniRef90_C2FZN1 UniRef90_U4VVX9 UniRef90-K6BJZ9 UniRef90-A6LRD5 UniRef90-JOMKM3 UniRef90-10JMB1 UniRef90-D2QN47 UniRef90-H2JKH9 UniRef90-W7C1L9 UniRef90-D6DTB6 UniRef90_S6JLQ1
UniRef90 E6XFIO UniRef90-C9KNC7 UniRef90-G0GBZ9 UniRef90_UPIO0046EAA2A UniRef90-D1BVU5 UniRef90_UPI000407AF8F UniRef90-V2XHQ0 UniRef90_UPIO00477725C UniRef90-LOEHQ1 UniRef90_N4WKZ0 UniRef90-LOM444 UniRef90-A0A017HMM7 UniRef90_E8RVP1 UniRef90_R3U8V6 UniRef90-G2TI14 UniRef90_D9WAQ1
UniRef90_UPI0002EBA960 UniRef90_UPIO0047BC80C UniRef90_K6ZWG3



 PDDDGVFCGNDAMAMGAYQALLTAGKAAEVKVGFDGADDV GNVDALFTVNDLLADGADKYFNQNNDK\PEQIADMGFSNW PKVKAVLCCNDLMAAGAVTALEENGDSGVLVAGUDGNYDA

## TNDEMA






 KNLI GVYSANDGMAGGIITALKAAGDSNIPVTGQDAELAG QPYDCVICNNDSMALGGVQAMNELGUSDIPVVGDDATADG

 P KVVKGIVAHNDEMALGAVDAVSAAGK DDVIVGFDADDDA $P D I K G V F C G N D A M A M G A Y Q A T V A A G K Q D Q I K I G F D G A E D A$ P
 PDLIGFYANNDTMALGVVEAVRAMDKAKQVAVGTDGDSDA

 E S ID S V F C A N D E $\quad$ DA M G A K K I D G M F AVCDD Q E A I G A DLDA A K Q M N R K E F K DV SVVDGS P E V DAFFAV P D V E A I F C S N D M M A FG GI K V L L R N G Y K I P E DIIA I M GFD N $\square$ D Q I D GVVA Q N D D M G L G A L Q AL K E S GRTGVPIVGID G I E D G
 $N K I N A V V A S N D S T A G G A I Q A L A A Q K L D G K V A D G Q D A D A A A A$ $P D V K G I M C G N D D L A T Q V F R A L S E D R M A G R V C V G Q D G D D M A$
 S S L D A V F C A G D E $\square$ A M G A I N S L R D K E I S S V P E N V D V I


P

P $P \quad$ A ALVTANNAMT
 $N K V D G V V S S N D G M A G G V V A A L E A Q G L A G S V P V G Q D G D K A A$ $P N I T V F F G R A D A M A L G A A Q A V V V A N L Q P V V V V G F D G B D A G$
 $P$ T A I V T F N D Y V A LIF A M R Y V K S L N L Q Q I D F V S Y A N L P


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

 PEV GVVVMIS DRVAYPAI Y A MK QK G L R I P E DV A IVS F N N E P $P H D D A I V V A D D E L A M G V L N A A L D A G V K V P E E L E I V V T S N N T$ GGIS A AI C Y Q DVV A L GVMQS L R K M G R E P GR DF A LV G F D D P PQLDGI FAGSDLLIAAYALKACRESGRRVPADVRIIGYDGT
 PNLKAI YCCND TMAMGAVEAVKKSGK DIKVCGTDGNDDA $P D V A G I F A E N D E M A L G A V Q A L V D R A N Q E I V V V G F D G T E E G$ S DIT A I F A GN DP S A L G A L A A V K A A N R L E I A I Y G VV G S P D A
 NYADK QL N P Y D GLS DGGLL S S Y GA A DL P MP CVVTGQDAEDVPS AHPDVILCLND DMAMGALEA
P

T A I I V DPPTAVVAYNDYMAAGAMS ILDENHDSTPEDDISII GFDDGG


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|  |  |
| iRef90 A0AO38CQ47 | AMKTGMMTVTVFQDAKAQAFGAVDMAE |
| RiRef90-UPIO003460B91 | SAHTQPTLSTVAQPAYETGQTATKHILDQ\\|HQPENSTS |
| UniRef90-85) | M 1 |
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| UniRef90-UPIO0037197F1 | G |
| UniRef90-F7V3M6 |  |
| UniRef90-F818S | LTDVANG |
| UniRef90-UP100047B6EC7 | DMAGKVYP |
| UniRef90-EORIK6 | KFASIFSPSLT |
| UniRe990-12B | QMGRYVYPALTTVGQS |
| UniRet90_W6UG | PISRVIRPTLSTINYPG |
| UniRet90-R6RM | IFSELLDVPLTMHQDII |
| UniRet90-C9ABI | VLINLLEVSLTSVEQDV |
| UniRef90-UP100038 | DKEGQASAMFELASVLARGGS■DEL |
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| UniRef90 UPIOO | L N R ALl |
| eef90-D9R2 |  |
| UniRef90- S3JPM | A |
| UniRef90-F4CFL5 | VHAVADGR |
| UniRef90-W4Q6M3 | KMSVTYEPKLTTVAQPKYElUGKQAMELLLKQ |
| UniRef90-B1B | QP ${ }^{\text {demGKACE }}$ |
| UniRef90-M3k | I |
| eef90-G7UH | YASLKRGELTGTVDSFPVLTGEVAMDVMLRLINGQKIVEN |
|  | P |
| A41PB8 |  |
| UniRet90_A8F7K2 | FASYFRPPLT |
|  |  |
|  | SLAEVSDPLLTSVDQHGYELGADAMRLLIERLNG |
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| UniRef90-10RWB6 |  |
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| 3PWT1 |  |
| niRef90_UP1000478 |  |
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|  | CQR VEGTQNMTAFKSVEEEARIAAEYAVKLGKGEPLEG |
| UniRef90-A0A0372 | YAASMFYPKLTTVSQPMYDMGSVGMRMLIK\INKQD |
| UniRef90-UP10004706 | VTGETGVEG |
| UniRet90_B9K1A6 |  |
| 1N |  |
| 3D | DWEDKSNS SAA |
| Un | D'S |
| UniRef90-D3EJK1 | 1KSIVAGEQTQTVFKDTRQLLEQAVKMAESVLKGEEAEVN |
| UniRef90-UPIO0037ACBBE |  |
|  |  |
| JP100036 |  |
|  |  |
|  | A |
| UniRef90-H6LF | W A A WTRPQ T TVAQPMYD GA |
|  |  |
| f90-UP100036 |  |
| $\begin{aligned} & \text { efgo } \\ & \text { efan } \end{aligned}$ | TVNPAYEAGGTAGDLLMSRMSG |
| UniRet90_UPI0003B5859A | SVDQSCEQMGQAAVRLFFELRENETEAVA |
| UniRe | TFSEFITPSLST DQQAVKMGKECANLFLEKITNKKLAKN |
| UniRef90-K6B. |  |
|  |  |
| UniRet90-JoMk | PIA AYTDPQLTTVRYPVVSMARLATELALLGA |
| UniRef90-IOJMB1 | PLAETVEPKLTTIKQPIDEMGTKSVELLIKMMNNKDSMVE |
| niRef90 X0SPA3 |  |
|  |  |
| UniRee90-H2JK | PWFVHTDPPVTA AQPTGELGRAAVRALVDRIEGRTP |
| Ref90-W7C1L9 |  |
| 㖪 | , |
| er90-S6 |  |
| UniRef90 E6XFIO | 'TAML |
| UniRef90 C9KNC7 UniRef90 G0GBZ9 | LS A |
| UniRee90-UPIood | ALCSLNHPSITTIRQPMEEMGRLAVELLKQVEGVSVSPG |
| Ref90_D1B | M |
|  |  |
| ef90_V2XHQ0 |  |
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| niRef90-A0A017HMM7 | V |
| UniRef90-E8RVP1 | LERURDSEMAASVEQNPGEQIRSALRAVVANLKDKTPIVS |
| +90 |  |
| f90_G2TI14 |  |
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| UniRef90-Q8EP89 | DEKNVVLPHR |
| UniRef90_A0A038 | Q K F |
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| UniRef90-W0F6881 | RSFPQK PPVAVELVTNKNVDDY |
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| UniRef90-F7V3M6 | T MTPDTI I TKENVDDY |
| UniRef90-F818S4 | PPTKYLHGDII IPMTLVTKQNVGQ |
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| UniRef90-E0RIK6 | K H Y L P H K L I R E S VQQ |
| UniRef90-12B1 | P $\mathrm{V}^{\text {c }}$ |
| UniRef90-W6UGE0 | TN SUILRSELIA |
| UniRef90-R6RMX5 | $\square K$ A ${ }^{\text {¢ }}$ |
| UniRef90-C9A | R Y VQLT PR RLI K K N S V S K |
| UniRef90_UPIO003B72E99 | S D TVENGRYIRLPYEKVTS S N I I K Y |
| UniRef90_A6UGZ3 | DGAYGIDPIVLPTTL <br> AKDKVDPTVVVPVQS |
| UniRef90-S2ZQA0 <br> UniRef90 UPIO00478CBE5 | AKDKVDSPTVLVPVQSL EYVTSDDTYVWVPFTPV |
| UniRef90_UPI0002378E33 | SPGGTEMNSVFLAPVP |
| UniRef90_D9RZ47 | K KVDTGVTVI TKENV |
| UniRef90_16AF94 |  |
| UniRef90_S3JPM4 |  |
| UniRef90-F4CFL5 | RT F RKKLPIAVVDVT QEN $\square \mathrm{NQ}$ Y |
| UniRef90_W4Q6M3 | K IVLKDELII |
| UniRef90_B1B9Y6 |  |
| UniRef90-M3KB15 |  |
| UniRef90_G7UH40 | SRVVSTPQALI TKENADAF |
| UniRef90_UPIO001E8 | Y NLL STEIVER |
| UniRef90-A4IPB88 | SHR】MLTPSLIERESV |
| UniRef90_A8F7K2 |  |
| UniRef90_Q899C2 | $V \mathrm{~L}$ Y NL |
| UniRef90_B9C138 | D TST@LLDP\LV |
| UniRet90 A6LC98 |  |
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| UniRef90-E3PWT1 | DQKEYYLKT TVI KR |
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| UniRef90_G8LVD3 | K ELLVFDPVLKV |
| UniRef90-A0A | EKKHYVLE Y QLI ERNSCKK |
| UniRef90_UPI000470 | LYDCS LI TPEN |
| UniRef90-B9K1A6 | R HV |
| UniRef90_W1N6Y1 | DSEKQLFDCMLI TEDNVDQY |
| UniRef90-J3D775 | T I R L K P S L |
| UniRef90-14YL62 | VI LLEP K L I TA D N $\square$ K D Y |
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| UniRef90-D3EJK1 | DTESYDNGDKVVPPVSV |
| UniRef90-UPI00037ACBBE | GPK GVEMNSFFI APQPITKDNL |
| UniRef90_Q883G4 | QLLETV |
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| UniRef90_C6XYJ0 | TEQAYF HIVVESEL |
| UniRef90-H6LF52 | GDRAVKNVYVPHEVYI |
| UniRef90-D1XW93 | $\square E K R \square$ |
| UniRef90_UPI00036901D5 | Y N WVP Y Q T T T Q A N T Q F |
| UniRef90-W2EM18 | GRTVVLPC |
| UniRef90_UPI0003B5859A | RQIVL |
| UniRef90-C2FZN1 | T $\square$ EK ${ }^{\text {K }}$ ( VLPPLLVT |
| UniRef90_U4VVX9 | N WUPYKTITQSNYAEF |
| UniRef90_K6BJZ9 | GVIETPVELVT |
| UniRef90_A6LRD5 | S Y N EKVVESIIMP FEII ERETVKK |
| UniRef90_JOMKM3 |  |
| UniRef90 ${ }^{-}$ХОSPA3 |  |
| UniRef90-D2QN47 | TNTIVPRETKVMETQLIVRR |
| UniRef90-H2JKH9 | V T L P A RL V V R |
| UniRef90-W7C1L9 | T |
| UniRef90-D6DTB6 | I I LP P A L V VRE |
| UniRef90_S6JLQ1 | KWGDGSDKLYILPWVPVTNGNAD |
| UniRef90-E6XFIO | DKQ】 L Q A ELI ${ }^{\text {L }}$ |
| UniRef90_C9KNC7 | K RITLENLL |
| UniRef90_G0GBZ9 | Q Y M F P P ELIV |
| UniRef90_UPI00046EAA2A | $A S \square G V P R T \square Q \square Y A P V V T A D N V E E F$ |
| UniRef90-UPI000407AF8F |  |
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| UniRef90-UPI000477725C | RS VEVKTVTKQNVEKF |
| UniRef90-LOEHQ1 | TP VETFLINEENVQEY |
| UniRef90-N4WKZ0 | D HELV |
| UniRef90-L0M444 |  |
| UniRef90-A0A017HMM7 | D T T T Y D N GVKVVPPVPVDK |
| UniRef90-E8RVP1 | K S LT PVVLTRDTLA Q |
| UniRef90-R3U8V6 | PEKKVPNK! |
| UniRef90-G2TI14 | PRKYEVKPELVVRES |
| UniRef90-D9WAQ1 | R PERPPRTVRLPCAFV |
| UniRef90-UPI0002EBA960 | $P$ P L R S P TLVKRDSV |
| niRef90-UPI00047BC80C | A HVS A M P QLVV |
| UiRef90-K6ZWG3 | S D K Y Q K $\quad$ P F L V K RESA A K |



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 SNDNATQUGQVETLINKKVDVLVVLPADGKALLTQVGLKAT SQSQQTQNTQVQKMIDDGCDVICVVNVDRTDPTAVIDAAK DEHILEKELEYLQTFKQNQVAGMI AATNYPDLAEYSGME EDDVQVQLAQ ETMITAMDVDCLVVAAVDSSALINALKTAK DFDVEKEKEYLKVLKEKMVDGVIYMSSSLQD
NNNPVSQNDATENY QQQGVKGUMVDADDVNGTMPATAEAA NSDKEKELDYLASLDAKGVDGLIYISGYDDTLYTSVRR
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 QDDVNKQVAAVEDLVTKGVDVLLLNPKDPDALVGVTKLAK

 DENPRKEQNLLT LLSEKKRVDAIVVATAGGGNEDFI RYLB

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 KERVEKENSMI ENAITTN

Q QE
$R$
$R E D$ DEDPAKEAAYASAVLIT


 EGSDEAEQRAVNLLIDHGVDGVIVWFPDADDGPVGKLIE
 Y H QADKERHAI EVLIRRQRCSALVVHAKMLSDEELI GFMQS D E DVTTK E A Q Y I DI A VLLE N M A GVVI I A A A S D D S D L H P L L S


 ETADDEEVVNMVNNADNRGVAGIVLAASDPDALIVPPVKKAF NKDQFTQNEIIDTLKNKEVKLLIVELVDDNAPKEVI NRAK ND A E E R E C Q I M N N L L L S G L D GI L I S T C A S N Y Y D H I H K DM


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D DKDEN $\quad \mathrm{D}$ Y Y L N I A RQK Y ID GL I M


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 RHRVPTVFGDRLVDPPGDGEPPLYDQVGAESTEATARLVQ LP WVACCEFDSSVG TQNIPIVFFNRTVED DAA HSPVPIVLAG S S SVNDDYLDQAAYEAVS GMNYPVVFLDRTLEGA EEKVPFVLLYSTI KKGPI RAGIPVVNLDRIFSSQQA KGDVP VAFNR RCWI GGDNYGMGLNAGH KGDVPIVFFNRELVEGDINQWNKDFYVGANAVESGUMEGQ DAGIPVI AYDRLILGSKH VDYYASFDNEKVGQLQAT EVGQPVISYRLL MNTDSVOYYASDGRGGKMAE ILDL NELDLKTL LVETKDKEGKLPSVT DNEEAAYDATK AKNI PVIAIDAVLPAGQQK AAQVVDNUKGGE\LGN DAGIVVVNIDVELDAQKKDAGLELAFVGPDNRAGAKMSGD GLEUPVVGIDRKP DRGYTVGII GRHIE HPSTPCAYTDNVKDSQEVDA NADPVIAVDRSS WSSNGEVASFVASDNVAGGKQAAE
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PAADYVTTVGFNNLANGE
$N M K V P V V L V S S Q T D F A N V P Y V K$
ANGFPMVFFDRVLDEDQTHK KAG\|P NHGMPLVIFYDRICTGVECSRVVVDDYMGAFNAVTHLIQTG EHNDPVIFFNREPLRSDMDLWDRVYYVGAKPAQSAELQAD DAGVKIIAYDRLIE NTPNVDYYVAFDNYKVGELQGQ SSG\|PIMLIDRKIEGGGLD DRGUVVVNUDNQLDPDVLKSKGTEPFVGPNNRQGAREVGE VK

 ESGNKVEAYDRLVVYDDNSGNVDYYATFDNFQVGVLQAT ERGVPLVFFD RANDSLNDPSVVVDDFKGAYYATE DAGUPVVYDRLTRGTDD NVDYYATFDNFKVGVQQAT DAGVTVVNFDVTLDKDALEAPRDFLFVGPDNADGAEMVGN AAGIPVIATDAQTPNGTEGDNVAFVGVDNTKAGEDIDGK DAGIPVSLVNAEI AETGLA EAQIVSNNAQGATПGAE KLAAYEATGGRVAVIGRHEHSGDA VMPDNRDGARLLGQ DQGMPVVMFDRVVDEDPCDK VA VLDDDREGAKLGVN KAGDPVFT DDKAEG DVKSHVATDNYAGGKLAAK VQHQSIVFINSYA KLPNIISYVSNDEDMGSRMALQ DAGDKVVDLDGNLDQA!LDGUEVTFRIGSDNVLAGAQGAE DEGKAVVQFDKYSE K K AKNLPVIDFNRPVDTNADKSYSKAYFVGTNAAEAGKMQGK GLGGKVIAYDRLLISGRDTKAVDYYVTFDNYNVGALDGR DHEVPAVFFDRVCLER NTKKVSSVVVDNVAMARDLTA DAHLPVVTLDRSI

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 EPGM $D E G \| V V I A Y D R Q Q N A D V D$ RQGFPIVVLDRTLDN DSGTP EF VY YI SFDNEKVGTMMAQ DSGTPLVLVDRFSEET QLQDPMVLVETTSKEGNDPSVTDDDFNGAFTAVD ENGTPVVIDSGINS DGKYYQSFLATDNRAAGKLAAE EYNIPIVLISREPPNKDDKSYGKSIFIGTADEQAGVLEGE DKGVPVVFFDRTNS AKD PVVLLDSDV DWE LLN

 P LK AED


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Y R R G V V Q E H G|LDAATELVTGGAGLLEDGWETLLAVLLJALKP P YCDALKKAGIKLRAAETRYCDDTIDSGRNAAHSL L L A A H

 Y R H GLAA A A GLLP F D ERRILVVHGHSEAAAGAERATAAALLDDLGSR Y M D AL R DA GllaP DERWRINVNS LDDYEAGASAAALLMMTYA FKQAHTKH RLLE GKVI QCGFRTEDGERVAKELIEKGE YKRALE EA G $\quad$ ELLA D NLVI A NE D S Y D S G $\square E D W S E L S K L E N A$ A LEDLK Q A Y R Q CLLKNYG $\square$ A Y D N S L L F Q T D Y S L T G G SVVSVK K ML A L K K S FDDALK NYPNIEKVARQSAEFTVESGQKKMSELLQAQ $S V N T L D S S G V E V E K V G Y A D A N W N R A Q A Q T K M S Q F I D D Q Y P$ AMSVL KS YGQTALNQVVTTLRWDGGTAQKRMDDILTSAYKT ALDVLR HADVNFQUITTASSSFKDAQTSAKELDAAY VMSVL QKYGRTSFEETCIL RWSQEVALQNCENYLSGFYAD Y E K A I K E A G A K LDDEE LI HLAA GLKVVKC GY EAA E K F I K S A H


 YMKALTTFAQLPYDQELVENGQFNENGGYEAFRRLWFKSLDD

 A MSVLKPLI DKGT I HLVYDKYTEGWDPATAEKNMASAQNG Y LK A A K K H RLLKYDPILI VS S DLTKE GTYDAMRQLTTMRRK $F K Q G I E E G K N D E D V A T G D G D W L R D K G Q Q Q A D A L D G A B N$ YVK AL E Q A GYNI D Q S IVFS G DYRF Q S GYE I A DKLIL
 Y QA AL QKYGL EVVEEYNQYCFHGGRLKEEVESAVQTLLNP
 YR DA AT KYGLKADDRFFRDCDNRADA ELITTPELLSQEEAP

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



 Y KA A L S A Y K V A F D D S L V Y F G DV S DNA GRQA DT HLLAA LAPA P
 YKQAL $\square D S G M T F K E F Y V \square P \square K S S V E S G K E A \square D \square L Q B$
 YKKAV E ENLLE Y DDNLVVYFSS LNA A E GFKGTNE ILLSKH
$F D G V L S Q Q Y D L E K V G E E D A N W D R Q E G Q E K M E Q L S K L S R Y$ LREALAEHGRQLPDQLVRYADFDRDSGAEATAALLDAE Y $\quad$ E A L E S A G D K I D T D L I L K L D A DD D L N D K T MA R I K H F L K G

 FMRALE EHGVSTA G I MYQQADFSYRETYEFSRRLI QDN Y H K A L K E H ELLDFDP NWIP HCK K D DT E E E GFAFAK QLMMESS N

 YQKALQQQTTVGPISSQDIDTDLSTESAAKALRQLLTAE



 A Y QK TMENH GLESDF YEVPRS F D QELYKQ I IH QIF S E H FEAAMKEANME VVSSQQSADWEMSRANTVAS SMGSEH
 A $\square$ A VV R E R A NLVVWHVHNAFS LDDLE P SVAR A LIE S
FKEEIVENHKDIE VVS DQYS DGDHAKALAKAT DDMTA N RDLVYQAPYNWCRMSHFMLGAEGISQDMQS GKKV Y LL A MN E A G IT P Q Q S WQVRA D P Y L H G GEQA MVELD LGRN
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 QMEVLKEA DDSGK KKNVGEAYTDGWLPANAQRNMEQFANN


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P TAVLICYNDLSATGLLAAAA QRGTQVIPEALLSVVIGYDN 240 PDLTALFATNDLPAFGALQAAAELGLDVPTQLSVSGDTDI
 KDEVII ANNDAMA GAIEALOKQNYNNTIVVGIDATPKA K EVGVANDAMA GA EALQKQNYNNTVVGIDATPKA PAPTALVTANNAMT| GALRALRAHGLSVPGDVALCCCDDDF
 ${ }_{P}^{P} R A$ TAFFA P K TAVFCS KSFDALWNHDDDLA
E

$\begin{array}{r}\mathrm{P} \\ \hline 1 \\ \hline\end{array}$
ITAIFAANDEMALGVYRACRELGITIPEQLTVIGVDNN PNIKAI FAENDEMALGAIEALGARAGEEVKVFGFDGTADG PRPTAIVCGNDIIAMGALDEAQSLGLQUPEDISVVGFDDV DQ ELVVICNNDDALGAIDADERAGPGTIK AGIDATPPG $P$ TAIVAFNDYVALDAVQYARGQQMK INEDITFVSYANG PD DQAIYSHNDPMGEGARIJAAQNAGKNDLKDVGIDGLPDG ENCDALFAGNDLMAYGVIKRLRELGKNVPNDI EVVGYDNL PDVNVVVTESDVCVLGALKALAQAGKTDEDLIGADGQKEA DRPDALFVSSDRLSILSCLTALMKLNPLAAEQLSMAGFNNS DAFFAV NDDTAVGILYAAKRMGYRVPEDISICGFTNG ETVELVISNNDAMALGVIQRLHDMGRRWIPLVGIDGIDEA KTLDGVLSPNDTLARALLTSVQQAGKDVKTFTGQDSEVES P TAIVCLNNGMASGVL LQLNQQGVDIRIVVASYGSIIEM PNLKALLAGNDSMALGAVSALRAAGKVGKVQVGYDNDDAD ENDEVVFCNNDDMADGVIAALNEVGYNEIIVIGVDCTDTA
 $P$ $P$
$G$
 P DVVE GIVMC A N D S M A V G GVVM A L E A A GRA G E I KVVGF D N I G A V P A D M T T L Y A T G E P A L L G A V S A V T S Q G RTVDVKVVFGWDGLTK S A SF D A IVCSSSDEVAVGAIN ALVREKNDKVPDEVSVMGFNDT PDID GVVA GNDEMALGAINALEQEGMLDEVEVGFDGNNDA





 DKID AVI SMNDNMAAGAIDVVVKDNAKF DMLVVGGVDGAAEA

 $D \square Q$ $G \vee L A$ $\begin{array}{ll}\mathrm{P} & \mathrm{D} A \mathrm{~F} F \mathrm{~T} \\ \mathrm{P} & \mathrm{T} A \mathrm{~V}\end{array}$ A N G LANAVVS LA RNNVAGQVPVGQDATVEG PEALFV TNNLMTVGALECLAKKRLRAPDDIAVVGFDDD
 D A I LIA A D A FFAV N D S M A L G A I A A VK S A GR A GEVQQVGFDN P
REATA LVTANNAMT $P D L T A V I A G A D L I T I G A M R H I G A L G L S V P G D V S V I G F D D D$

 RESDAIMCGNDDDASSVVRALSERRLAGKDMVGQDADLEA $P Q A \quad I F Y A N D E M A D G G M Q A L E E N K H H D P N D I N S I I D G D D D \square$

 $N N V E A D I A T N D N M A I G I I E S L Q A M G Y N N D P V V G V D G I P E A$ P E
P E $P D \square K G V V A D N D R K A$
P Di K A L L A A N D E M A
 $P$ D A V Y A A S DYA A L G A L Q V L K E E N $\square$ A V P N T I A L V G F G NE P DID GIVFA G N DLLMAVGA L K A I K K M G K R I P E D V NEVAAVVASNDGTAGGAI A ALEAQGLAGSVPVGQDGDHAA QSVDAI F CNNDTMALGAI QGLKNYGLDYSKICGVDATADG





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 DS F P F VID ${ }^{110}$ 110 LSFPFVDVDHYQAAKTAMQ PSAFYI TFDNKEVGRLQAR
$\qquad$ V IDANYEGAFSATE
PHIS VLGDGKEGARQLVK N RGVVTI DYDRWTLGGVAD DE $\square \mathrm{PY} \mathrm{Y}$ CSDNYKGGELAT $M D S D A V S Y Y V S F D N V V V G Q H L G K$

 KVNAPIVILDRHFNNTQWDG STRTPUVLAG AMDDVD EHNTAHVLINRAPKEYEGN AAGIPVFLVDRSVDASVAKGEDYVTFVRUNSYKVGE


 H A Ql P F $V$ VQAIS A DP S Y


$\qquad$ HPS CT | $\mathrm{Y} V \mathrm{~T}$ |
| :--- |
| S |
| V V |

 YNMPFVLLDRVYENHEFVE $S K K V P V L V L D R M D S G L E G Q \square D N$
$M Q Q T M D H S P V P D V L A G S V D E S ~$
 MP


 QGDTPVIVVGRLIPELAGR CVYLDNVAGGYLAGK QAGDPVVVI DHRGNKGML PSVDVDNYSGARLAME DAGIPLFTVDTATPHAINNTTSNNYNIGA ARNVPVISYDRLI
 ATVVVKGDNEGIGVNAGE
 RDGFPVVCUDRGLKNLKSDRFGTFPVVKSDNETGAFAATE
 $R H E V P T V F V D R V V E G P G G V D G P$
$L E K N D S V V L A R E V Y G E L D G$

 $A \square G V P L V V \square N R D V S Q A R D R T S D K Y P S V Y A D N E Q V G R L Q A R$ $A \square G V P D V V I N R D V S Q A R E R \quad C V F F E Q Q D A A F Q A V D$ A AGKPAVLVDRKF QTGEYASWVGPDNEA DGKQNGE $D A G \| L V V N I D N R D D P E T R D K G L N D P F V G P D N R K G A R L V G E$
 NNGMPAI

 AAGDTP LVYVNREPDNVNEDPATQAFVASNEDESGTLSAF





DRGПKVIS WDSGVAPEGR\MHDNP $\qquad$ SSNALDGKMCLQ







 | $C$ | $F F E Q Q D A A F Q A V D$ |
| :--- | :--- | :--- | :--- |
| $Y$ | $S F D N E K V G E L M G E$ | QANI PVVVVDRYPAPGQNKNADYVAFLGPNNEKAGSGUAE VA G P VIEMMDSVT PCLDMAVGFDNVEAARQMT

 AAKIPVVIIDSDIETPQR VSFVATDNYSGGALAAK
 RHAVPSVFLDRMVTDAGPHVDQVCA PVVVSGTNGKDDNIASVNDDFESAAEEDTE



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UniRef90 $14 Z 1 F 7$ UniRef90-UPIO003626436 UniRef90_KOWGX1 UniRef90-W0F1G4 UniRef90-COCOK9 UniRef90-UPI0003756B67 UniRef90-F5T4G0 UniRef90-UPIO00364636D UniRef90-A0A011A271 UniRef90-M3EUS3 UniRef90-K6C6E5 UniRef90-UPIO00407476A UniRef90-V6JFV1 UniRef90-M4UD03 UniRef90-H2ILK0 UniRef90-A0A024PDL2 UniRef90 H4FDE6 UniRef90-D7CJZ2 UniRef90-A6T629 UniRef90-B6B116 UniRef90-V2XL47 UniRef90-G7M548

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 QMEVLKAA DDRGDVKNVGEAYTDKWLPADAQQNMEQTKNA YKAALAKYKIPFNPDYLQNCMHGGMUQEEVEVAVKRLITP YRRALQEAGI AEDPALVVDGQFNENGGLDAVNGLLDARV FREAMKLNDLAYSDDYVLETSFGPRSDLSEIEAWLDR MT AFEEDARRGLQHVEMHTDLHGFDFPEYERLAERL LDEEH YHGVLDKVANYKKVAEQAVPDWKAEEAATLFEQMWTEQKG A MDVLNKYIDEGKLVIDKATANWSTETAQSRMENILASYYA F LEVI GKNKKFNIIRSESADFDKVEGKKVMNDVLNSESR
 YQEALNEAGI DFDESGVFEGNYT TVASFENGQALADQMLAA FDDAVAGQSGMTVVASQSGDFARDKGRQVMETLDDQSH YESGLKHFGLPFDSQAVQTGEFSFDDGYRAMQRLDEKQAD YREALTENGIPDEEANI TYCHHGGSNQKEVDAAVQYFLSM IKKAAADAGLDFDDTVVEYAPYSMGGGEQAAQRLLSRARH
 WEAEFFEKRPDVKDVAEDIANWNKDEAMTLMED WSGAN

 Y LDAMSDHGLEVRPDWLCEGDF LETSAFRATMQLI EENS $Y V Q A L Q E A G V L Y D P D K V I W F H T E D R K V H P Q E G Q R R L I S K G ~$

## Y

Y

## 

 AMDVLKKYIDSGKLVQVATANWDSEK AMHLLQPYGQTEMDKITTLRWDGPTAQKRMTQVLSQSYRS
 VKGALENASGIELVEAPDYGNWSSDGGLTVMESLGLAAH


 YHDVLDD YPEMKMVAQQTANWSQTEAFTRMEAI LQTN VHDVIIMDMCNFMTIIDDEQTANWSRDEAQDLDMTNWMSS FLEAVKQGIFQSKEEWLITSNFSVEDGYESMKKLLDCKEG SVSTINNAGLKTQQLALNVSNWRRDLAQNAVNSLG LQYD FRQVLQRHSYADPIV GVPGDYTYEGGYNAALNLFHADHP

 AMKTLKPYSGQDKLSQAATQQWDPATAKARMQNLVAKSYS YRQAMAEYGVTPDKRWVISVPFNEEGGERAAHLLLNSGD MKAQLKDFPGLNLVTTVYGDDLADKSYREANGLLTSQPNV
 FETVLSK S DKVDLIATINGDWEKPSLIAPLEKLLDS
 F LD WMRANAPGDTVLDPQYGGGDQLVSADITKAV LAAN



 Y R K A L E K H G I S W D A G R V K Y G D A T M T R G Y E L C R R E M D L L FK AVMSDNDVV ILDE YYCDGWKAE LAGDYVYNNPDRIGEA LE S ALLTAVGHRR LVVQF QYA GDSED K GLLAAA ENMLQA H PA YEAAMREAGLTPRSVMMEEASSFSAGGDLLDREA QRRY $F Q D A M K A G G M K V V S V Q S G E W E D D K G N A V A A$
$A M S V L K P Y D D ~ Q T K F D Q V A T L R W D G G V A Q S R M D N L L S A N Y A$

 YR HGLA HA GLAHDERLIVVHGDSESAGAERATAALLSSLAAP LKHVLS QHGLQLDDNMI YNGDETYKDGLRAYEQLDLAQ
 YKE F V K S $\square$ GS K EVVV DSVVNAGNS DEVVVENTKN ALLI K F S K D $\square$





|  | 290300 |
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| UniRef90－D3P3D0 | GPKKK K M T S L F LT P $\square$ A $\square$ T K D N L |
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| UniRef90＿UPI00046FC4E0 | N |
| UniRef90＿UPI000421B86D | GTVK D P K G D R DV P SVLVTEKN】K Q |
| UniRef90－R5R9G0 | D T ES Y D NGTGVIP PVFADANNYKE |
| UniRef90＿S0FLY0 |  |
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| UniRef90＿UPI00046E7C3E | E Q H L Le P T L V I |
| UniRef90－B9NVB6 | V KVEDR】FTKENAAD |
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| UniRef90＿F4C3N8 | YEHES 1 VL GTELI ER |
| UniRef90－A0A059ECM9 | HE MLLPTELVIRSSVQNI |
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| UniRef90＿UPI00035ECB14 | $E T L Q Q \quad K$ L V T K S TVQE |
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| UniRef90＿D7CRD0 | T T $\quad$ RFDPVLVA R D S V |
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| UniRef90－M4UD03 | L G GVIE TPVNLVT R |
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| UniRef90－H4FDE6 | $\square \mathrm{H}$ L I K P E M R $\square$ R Q S T A P I R R |
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| UniRef90＿D4J1P8 | T L L PVSYi E R E S |
| UniRef90－B6B1I6 | D Q K VYıP F K L V T P A N M G F |
| UniRef90＿V2XL47 | Y T V ${ }^{\text {T }}$ |
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| UniRef90＿T0BFZ9 | $\square \mathrm{T}$ |
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| UniRef90＿R1ATA7 | KTTETE\｜K T I K L L P Q L V L |
| UniRef90＿A0A022LNS0 | D TKSYDNKVKVVPPTVVTKDNYKE |
| UniRef90＿G9Z317 | A NSFTAELVI R D S VAPVSAS |
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| UniRef90＿F4C5L6 | D D S G $\$ K GRK V VLESKLVNQ  \hline UniRef90＿Q28MQ4 &  \hline UniRef90＿R6WM73 & $\square E \mathrm{~K}$ |
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| UniRef90＿UPI0004632858 | VGEA GKVP Y LK I E P I AVTR D NID E |
| UniRef90－Q79DH8 | R MVKLLDLLKVDKSNVAKF |
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| UniRef90＿A0K781 | RKQADMS GVVETPVDLVTK |
| UniRef90＿UPI00047DB8DA | DEKTYNNGVKIVPSYLVDKENYK Q |
| UniRef90－14C1C5 | NAR！D T G VELLVTR |
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A R G V P V V D D D R A S
EMGVPTVLGGRPVG

RNGPGISARDR
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100
G 1 D GA Y A V $\mathrm{V}^{110}$
LNPYSYVIDNALGARAE
YTSSVVANNTLNGERLLGK

NRANVPIVFAGSVDPEHQSPSVNDGITVNNYRGARLATE
ASGIPVVAYDRLI RESPDNIDYVAAVTDAVAKLVSR


## 

$K S C Y A V C F D Q L H A T Q L A V N$ $K K \quad$ IV VIVLGRADDGYDYSLFIGPANEVIGRNAGQ

 S Q GMPVVMF D R V T N DVVFCDK
RT AGDTPFVLLNRHIPAIADR CI SLNNELGGY LATR $P P R L P L V V 1 D R R L P G V A A D \quad Y V L V D N L G G A Y R A V E$


AKGITVI AYDRLI RGTP NVDYYATFDNFQVGVLQAE
 KVGGLPLI QFDRVTDKVKCPR DNVPIVVNDNFLGALRSTR QRN PVVAYDQF L



Q IPTVHTIETDTRDDCW
PLQVPYLLEDQ
KAGI PVLVVDRKTEGQQ NDTPDGDRIVEVDDQGGYAVAK VANDP QMDE YS IP YLFIQGYFEELSESPGVLVDDERGGYLITK ELDKPFVLLDRTFDTDNCNQ ESNDPVILVDRA DDGEAGTHY TTAIMSDF DWEGEQCAK $Q Q G T P L V F F D R A A D B A D S S A V V L D D F Q G A Y Q A V A$ DAG\|IVVNDDNRLDPEVVSSKG\|IPFVGPDNTKGAKLAGD

 KADDPVITVDRQI KTSDDSLITAWVGSDFKKEGVKAAE $R \square K A P V V T V D H R V P G T K D D \quad D N D A V A S D T R L A A S I I T E$ QS SMPVVVSGTNGKD IPGMVLIVRTLPGFEPR EVAEI GKRLPVLLVNGRDPKSGLN RVVAVDERHGAELAAE GIPVALVLTQSQGRVKLPAFKVDDVRAVFDS
 KANLDPAFAINDMPDTDGMKQQGVSMVVQTDQREGGKFIGQ YDSKPA IVFFDRVYE
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 EGGMPLVTID K












 SISLLPLVSLDRQ S S KS IPFI ASDNYQGGVLATR




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 YRDALLATGMTELVAY GDFSEESGSAAMREL $F V R G L A D G Q L R Q N A K T N F D G V A Q G W G G W N N N G G L K A M E D H$
$Y R E A L A L A G$
$A$
 YRAALRDHGI PFDPTLIAPGDFSFASGVAGAERL LALD YKQALS SKRIGYDEGLIFQTDYSY SGAKAGYALAQALQD AMSVLQPLIDSGDIVIPSGQMWDGAEAQARMDNLLSANYT Y LDAMRAGG $\quad$ VEDPMPP DE DEDHT LTAAAADYQQMLADPG

 VLKELENKKIPTQQ
 YLKALRENGDEDNEDLIVKIENDDDNCSNKMESLI KNQEF YKSALAKYDI EVDDDLI I Q SDFTDDEGPIIVDQLRSAK HQRALAEYQLTADPALFFEGDFRETGGSKGLESL LQSG YQQALRDAGI HGRPSHASVPSYSADELAPVDQALAMQEPP Y IIELNKNRIEFHPEYIIGGGYSYEDGYKGIKKILSLPNL
 AMSVLKPY IDDQMGMDKVAT LDRWDGATAQARMDNLLSAYYG Y VQAMEKA GLEVRPDWRIPGPRTKQGGFEVAPQFLALKDK YKYALK QSNIEFDPDLVVENCIVQESGEEAAENL YHN FKDVLEKHDLSYNLIEELPSSSPNDKSLKDKELLTNKK F DDALNEHGQKFK LIKTYVAVEPVSGANAGDEILRDFPFK YKQALKDANDADDEKQDEFCNFTKESNLSASRKLLYSPNP FKEACLDKRPDVQLLASKSANW RTADALKDVALWLKLF S I L E I NDAGVKTQELASQVCDWEKSCAKTSIESLF LKYG
 CRQALEEAGLYDPQREDFVTSNSSLALGAELFERMHRAHS FVRGLAEEGLDFDPSQVVYGTLTKQGGYEATDAVLATKP
 YVKALQEANITYDPDKVIWFHTEDRGDKPREA ISSLIKRN Y L DVMKRNNFPTNLFVYGNYRFDSGY K V FVKGLDSSKF KIVAEQDGEWDMDKAQAVMENII QAQGG YQEALLRAHGLPANDDLVYSLPAMTHEDGRQGME QFLNQH
 $\begin{array}{ll}Y R D A & L\end{array}$

 YLDALKEFDI PVDERLITYGTPDELGGEQAMTDLGGRG $F L K K M V Q S G L E V V R K E W V M H G G F S V D S G M M F M N Q L L Q M P K R$
$F L Q A H R F Y Q L D V L E G Q V Q Y G D Y R F A G G Y Q A M M R M L E H M E S$ $F L Q A H R F Y Q L P V L E G Q V Q Y G D Y R F A G G Y Q A M M R M L E H M E S$
$F R Q M L E E S G Q T Y F P E L V L P G Q H R E K D G R E A A D R R L S L D P A$ YETVLTQYPDLKKVAKEVAANWDRTQGHNKMQSM LQAH
 YRNALSENGUEVIDENIVEGDFQMESGYKLGKEILNRKKR YFAAAK E C F RQVLVQKNDPYRVVRYEHVSTFEDGENLVP\|LDKNNRDD FKDYI QN NSNSNIVIGAADESSDSYLLIEAELAAKKILNQH F LERIEAEAPGDEUVFQQSGDFTREGGQSVTEQLIQSQ AMDTLKPFSKQTTPEQVATLRWQQETAQKRMENLLTSSYN Y L Q A L R ERKILIERELVFCKK GGYESGYEGACHLLSLPNP GARASARALGLPADAHLEVQAHTEAGAPALRQLLGRR YRDELQAH CPQVSAQVVQGAFDEASGYRAGEAL G A LSEL NGKVTI A QSFDTKDWKPENAEANMTKA G G I G G $F K K A M L Q A G U E V G D D Y V Y R Y D G D F T M E S G Y Q G A A E L L K L T$
$V I D R D L N E N G U K T N E D A T E D C N W E K E C A K E K D N S L F D ~ K Y G ~$




 FKEGI SAYPNUKLVSTLYSDSNVAKAMDVTNDMLTS FKKAISEFSGMEIV QTVYCDSDKAKALTDTQD\|VTAH AFRATLARHHGVVAENAEVQLNDGAMLDNVLRQFH ARHR YSSVLSQYPDLKRVGKEV ANWDRTQGYNKMQSM LQ Y $\square R A L E E A G M P D D E S L I V E T D N T Y D E A Y E S W N A L G K L E D R$ YRKAMQQFQDEVREDYILNGNYRFQGGYACAEKLMKM RHDAFLEQVKRQDVEYTVRQTDDNGFKYKDYEKLVSSEER YKSVLYENGFHFDSNNFVRLEETSTNMRRDDEAYLNQVER
$Y C S T L M Q Y G L P F K N E W V V E C D R R Q Q S A A D A A E E L$
$A$ AHSVLDA DPS TTNVGEQAVPDWDNDKAVTIFEQLYTAADG
 Y DDALADYGPLREELIINDKAMTYDAGVKACNKLFGLKSP




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\(N K L N Y T P S V L I S K K N V D E S\)
\(\stackrel{V}{Y} T\)
MRYTVETELVV
T
D T E T Y D N G VK V VP P VS \(\square\) D A S N WE E \(\square\)
TK EFRGK LIVRDST
EGFVEHRNI QFPVHF\ERD
PKKI LLRVNKI TKDNVDQY
LN LDE NERYYMI PLTKVEK
LHPNETDQLLIVPVSLI SR
DTETYDNGVKTVPTYLVDKDNYQ
YTTEIDETELVL
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VQK IEPKLII RESSGAVSAD
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DTKTYENGAKTVPPVVVYKDNWEK

K N Y VLP VK LI MGKTTL
TKVLVPVFPITK DTVK D Y
N L S DDFSHKILKSQLV $\square R$ $\checkmark T V D F T \stackrel{1}{P}$ TKENDAQF TNYTLDNGVLRLPYKDYSK
$P \square$

I DTGATLVTKENMNQ RHVDLGFEVVRE
NPQAPTQQISLPVELVVRSS

D S H IVMEPQIVVRSSTT
$\square T$ I I LIEPE EI $\square R K S T K E$

S Y TPPP LVLK PELLVR
TKQNDLSSVVETPVVLVTK
APFGGEMRL RESVADF
${ }^{H} \mathrm{E}$
PALQLTPELIV,
$E T\|L T P D K\| Q Y V D E Q V F T K D N$
T N
NKTTLLKPELVIRES DNGVCYLGHEIVERESV

EK QLLF

$T \vee \perp P \square E F G$
$T V \sqrt{Y}$
G LI $\square$ T DVLVVDKENDDEF TQLIITDREY DTKTYNNGVKVVPAY LVYKDD

ADAA V V QLIV
TRDKVDSPTKD $\quad$ PA QLVTKDN $\square K$
VNREVIYTPQLIV
TEYKFD ${ }^{\text {T }}$ GVGV
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D E L K P V F I D S DLI VRES
D HLVLSSKL
VLLP A R LVIR
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T I L P V
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ENRLMKEDEVGOSLLNKQVDGVIYMSNRLPD HDSYEREVINVEHLANRSVDGLLVSLSAETKDYSHCEKGH DKDPRAQLDLFEAMIMARYDAUIVTPLDGMNLVPGVLKAN ADDKAKERDYLRMLMANQVDGLIVAPASAGANLG|EEYH YHQPDLERKAIQFMQERRCDALIIHSKADPDDE HALDELL DYDLNKQFSHVDSFIVSKVDLILINAADARAGEPAVKKAR ADSNEDQVRLVEDMIQSGVDA\|CILPDVDSNGIVPALEKAW GRNLENEFRYHDLLWQHRVKGI ILAG GGLDQPDYKQUL EDDIPNQLAQDENMITKGANVLVIAADDGTTLSNALANAK
 HWHPEEENAA| DVLLGRKVDALIVLGGAVADERLLEVSAT EDKKERELEYLKLLISKKIDGLILNTTGENDDFDASLS DDNEEKERRYUDVALQERVAGVVLS PTGRATNVDRLS SSPTEKTRRYVRLGGNVDGALVVASSHHSGDHFLASV GYNQEKEELQLRSLLGWNIDGLILTERS HTPGSLRMIE YHDPVKEKNAINLLINSRCESLVIHSKGMSDAELIKLASE TESLEKEDTNATTMFNSRVDGLLVSKAGTTDDEEHFSPFF NSTKQREKTYSQLCRERRVDGVISSGKTMEDPYLQEVV NQSHDKEVEVIEMLSNGSIDGFLLSMAKETEDHDHFKESI
 EFDVARQKNQVKDF|LVAGAALVLCPCDSRGUGPALQEAT
 GYSEEKEEQRIESLDSYNVDGVVLSESHHSERTKKMLKIA

 HDDPEHERKVVQLLHERRVDGMIVA PSANPRELVSYLG TGTAKDQERVLEQMLIARRVDGLVLATAARHD PLVRRCM AESLEKQNKVFATLREYRPDGMI CPAGGTTVAN R ILL DENAEKSRDLYEVLDERQVDGFI A APTERTESQDMLESLK NNDPEKLKQCVQSMVQQGVAGLLFSPVRGVITSELLTMTK NENPEYEKDVVRHMTNGRVDGVVISLTSPDDDTEHLMHLQ DNDTNQQNNDIQGMIADKVDLLLIAADDGNTLSQTLADAK



 HERQEHEDKAFSTLLRNRVAGUVSHSVETQTFEHFRQQI A LDKNKQMQQ YYFIKLKVKAIFINPVDWKQ KKPALIDAAK LGQLDKEKSYASMLIRHQVDGMIVCSYNRGIEAYRNPKLL ENSVAEEKRKDSLLLERNVDGLVVIPVSDVGSHFTTPALV
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 DSGRPLVLGDRAAQGDDAETF CVAVDMGGISYESTK

 QKQLERHEKYGLKIDALAPQGLEMPYVMDNDYEAGKKDTE

 DYNUPLVLFDRISDKVDCDK SEGTPMVFIDVAPRKKNISVIHVNYDQGIT
ERGTPVVAVDRPLLKNTGDQ GEADPVVFGGRPMHARGASGRPTDYYVDVDNRLGAVQGTR
 TPGMVFINRNVEEDASR NNGADDNRGAYDATE KKHIPVLFFDRVPEN NNCTGVVINNTQA ENKLPVVLIDRLVPENFDQ DSDUPCILDDVPI STECDTDTVGYVTTDNVLGAKKAVD

 DKGVKIYAYDRLI R RDSGNVDYYTTFDNFKVGVLQAE SYQLPYVL!DRVTDNQQDDGCIGEADYKGGKLQAE
 SKGVPsVLIASEIPRLS DN TVTVDDYKGGYLATS DRGVBVELDHTPMSN
DRGVPVVLLDHPTP
SQNKEIVFIDSQTNVQNNPW
TRQMDAVAGDPVVELMDSVSPCLDMAVGFNNYEAVLETEE
RREFNRTKTPIVLAGSVEIEGEFSSVNDDYQKATYDVVN $A Q L R R L N V P V V V V D P A A G V A A T D V P A I G A T N W T G G L A A T E$
$R H Q V P T V F L D R V V D G S T G G A D R A D G A G G A D G A G G L A D G$

 RRDVPVVLVDRV
 SRNIPALVT WAFDASQSRPSIGFDNRGSMRSLAR GMREFCRAYAPLPVFSTGMADEGSYYVSFDNYGVGKLQGE LIGGLEQVPGMVLINRITPGYEPRCCVGLDNVCGAEMAMR DLDRLESQGILTLTDDRAQFSHPYSAISVDHQSGAKKAVS IGDAPWVQCAEYAD
DKGDPVLVLDRKVEGDA KGAVSCVGINDVDAAQSVIS HSKTPIVLAGS亩DQEEFGSVH DDYAAADEAVA


CSVSVDDVEGGRLAAE D EAGUSLVQFDRVTEQVPGPR $\qquad$ IVNDNGGGALRSTQ
VISSNYDAGVGCAK PIVADDHYDSPGDPVVGSDNYEGGKLAVQ

S
$K G G V P V F Y D R V P T N F N A N$
$E K G I V A B V D I E S R G A D I$ RSKTPIVLAG
 EQDFCFVLVGKPYEHADRUGVSTDNVFGAQMADK QNNMPLQLHLAPSSEFANKSYGKAVIIGSNEEQSGTLQGK SRGLPMVLIDRADRDQDSGGQDPTVGTTNHSGAADAAR DAGDPLVMANKVVLLRRSPHDQDPSVGIDNHEATYMLAR DAGMPLVMADRRMQTHGQP WEWEALVSWDMVKSGTUGGE DSNIPVIAFD GMPVVLVDRRTEGADFD SRSLPLVILDRRVEG SLINFPIVTFDR\|ISN NVFKKIVQCSEYIEE NDPTVEIMHDDSSPNFL EKNIPVVAYDRLI MNTDALTANYGIDQQYAAARYLIK RQYGLI AVCNEYVADSDTLMDALTYYVRADQESGMYAGAK NAGIKLILIDSKIDEDLEEM TYIGGNNENAGLQMGK TAGVP EAHIPVVLIDSAIADAGKPY YQAFLSTDNEKAGALCAK SQGMPVVMFDRNADEGACVDLN
 KHDIPVINVNDGLDQGYE
EEGVRVVGYDSMLVNGPGDVQ
 SiVTVNFQAGQLSCQ VPVVSHVATDNYAGGVEAGK


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Y R Q Al 170 N
Y RKF Y R K F L A D H D Y E E A L R Q H H I P P D D K E L I K Y C K H G GR D Q
 A $\square$ A AFEAAGMMVVVAVAGNWDRNEAYNIATNMVKA Y QAVLSAKDVALDQWTLAFGMSPT LKMMRI RQLLTTHEQ $\square R$ R AF K D E G L A L P A D L V R L YR KAVLE EA D V VY D DR MVVVKAFPD E E G GN YAMSEVVMS RDGLG
 A EA YMKENGDE YE IVVDKQADNADPVQSDDKVTTMIMA N YK DAMDA $\square$ GMKCE E Y I I H C D F S R K G GYEACNLL $L$ A MSVVLQKSGQT GMQTVGTLLRWDGSVA QSRMDNLLSANYTD WQ Q A L A A A G I A A P D A WV GV G S P D L Q G G E A A MVVEL

 FVKAMSEVGIVEVNEDYPYRYDGDFTLESGYQGAAKDMSAS FLSATERVGIRVPEMCDFHGDHTAEGGSRGVEHLLSIKQP

 YEDAMREAQLQPNSVMMEDASSTFTAGAELMREA QRRF
 Y K Y A L L D H G I V F E E K N V I N S D L G E E S G D R I V E Q I L T T N N P K


 FKEVI DKHNSENPSSSAATIVVSEDGQKDKSYKAAEDA L QA H
 A MS S V Q P L I D K GVVVVVVKS GQM WD GAVVA QARMDNNLLSAN Y S
 YR LGGLGRGGLLSWNPELVVSGHSSREGGAAATAKLLALLPDR YENAMTKHQLTPQVIDATAHSSSFTLGGELLHQALDABKB YKDALLEAELPTRDEY IIKTEAT』QKGYESAKQLLSLDDK A LRA L KAA GL GREAMREVTVPAMNARAGQEAA LRLLLSDGR
 Y K Q A L K D H GI P Y DE NLL F E $\square$ S E S YL A GEV DS D Q LK DA
 Y R Q GL T S A RLP Y D D HLVVVHGDSESAGAERATNALLSS TA P
 YRNTLARHGDRFDPALVVEGFGTRELGGRSVQSLLELDDEP
 A QATVGASGARF SFFETPT LNPQ\|GREDGERLSGMPVG

 A Y DALLKSYKTKFEQVATPTWSTDTALENMQNTLASYYSDG Y WS AL A A R GVP LDDERLLFA LGAFTDDSGRTAMRELSLSRGGB
 YQEALNAFNPDLDPQKVVYAHFDLGS GYQSUQSLI QS GF YKA A L H A WS LDDYQAVVEYA SE LSSSSAGMAAMDVLLAAAETAR



A YEDLVKSPDTYEIT DLFNEEATAVT DRRI FEE H

 C R DL L K K Y P GIVK L V S Y S H N G S G S F S G GLE S M T Y L M L E Y

 YEEALAKAGLPDRDDYHIHAE LLKS GGREAVHQLFQLDEP
 FATVYAEAGHP $\square P E H C V V T G D F T V A C G A D A V K R A F D A G L D$

 A K A SLE A A G DK I EAETSSKDSVVEDKD QDQKV DK LLKT LQQ H $F$ VGYME ENEPGI E DVDDQYGGGDQAKSADLAKAI LA AN $F Q S V M A E H P G C V G E V L A V$ DLDDRPSDDAQVRLCLAQWR $F L G G F Q G D Q N L I D V L \sqrt{H} G R F S$
 LI E A MR D N GLE F KKENEVLLDELS


 YDEAMVEAG $A$ LEKNHFLTSSRSSFTDARDLLTRADDC FRKY I ES HS KLQQVVGPYY SQSQMATALNQTTTDVLSAN FKEALMKRGFEVDDQA LLKVEDDENCGDKIKAF LTD GK
 FEN WITTENAPDVGIVGEKQNADWDRSKARDLAETWWI K K H Y L A A L


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 DGVDGVIVTRDVTAVGILNSVMDAGKNIPKDLEIITASAT NPPDALFVASDRLSTG CLDSTMKKYANHHHDVLVAGFSNS
 PDGUFCTDDLTALLVLQAAKQLLNABPQALKVIGYDGT
ATALDASDGLIALGVVEABQEAGLAMPADVSFLMYDDF
PKVDAVFT NNDPAVGADLAARQLDRRGLI ASVDGAPDI DDIDWVIGGNDECAMGADAAMENAGWKGIGVSGIDCNKDA PDINA|FSGESGGTPGVGKALEELLGVTDQVVVCMDDTDMN DRVHGVLSPYDGLSUGIISSLKGVGYPMPIVTGQDAEVPS QGISAVFAYNDSMAAGALTALKDNGIQVPQQLSQUGFDD EVFSAMFAANDQMAYGARLALARKGVRVPDDVSLVGGFDDL D EPPDALLIGNSTMALGVLEALASRGLRSGQDVGIVSFDDA PDDDALFVASDAMASGALSTLADRGHNVPRDVAVVGYDNS EATDSLVCTNDDLALVGAMFECQRQGLRVPGDMAFLMGDHGH
 $P \quad$ T A I DS SNNLMTVGVMRGFRDDRLDVVKDIALVGFD DF PEMTAI FCASDLMALGVLKAAKQLDRKVPEQLSVAGYDDD
 AD: DSVIAPSDUHAIAYDHELHARGKKIPEEVQIIGYDD\| PDLKGVISGNDEMALGADAALKEAGLEGMVVGGFDGSPDA $P D L Q G V Y G T N E G A A T G V V K A V Q E L G R A G T L T V G G F D S G K A G Q$
$D R V D G V L A P Y D G L S R G I I S S L R G V G Y P W P I V T G Q D A E T P S$ NHIDSVICSNDVSALKIMK WLHDLHFHHPYDVGVDGYDD

 PLPDAVFCANDLLALGVQRELLQAGVKVPTDVAMMGYDDIT NRKTLIFAANCWLLPIVYMGLKELRNLIPTTIGLLGFDNT EAMME GQRDGR EEGGGHGH P TAAFAASDQMAFGVYEAVRRRGLRVCDDFEVVVGNNT P
K
P
 PKDTALLCHRPATAI GALYGIKRAGKYUGQQVAILGFDDV
 $T Q L D V A L C S N D S T A L G V A Q A D D Y S G K N T V I V V G Q D G D D A N$ P DAVVAANDKMALGAMELLKELGGRVPQDIGMSGFDDA LQLSAVFAYNDAMAAGAMAVLKENGUTVPQHFSLIGFDDV DFDGIFCSDDALALGAMRACLEAGFKVPDQVKVVGYDND PKDDLVYAHNDPMAEGAYLAAKAVGREKMKF GGIDA DPDG AKATAAVVGDDELAAGVLNGAQDAGVKVPQDFEI VTSNNS ERPTGVFATNDLLAMGLLQGFVTHGLRVPDDMAIIGYDD茴 QQVDGAFAASDLSALGALRTLKELNAALPEKVKISGFANE PDTDGLFASDDLMAATCLKVANELNINVPDQLKVVGYDGS
 PNLEAVFADNDLAALGAEEAAKQSGNNKIEIAASVDGSPDF


P
GETDAVYCYNDLIALGFMKEAASLGGRRLPQDVSVTGIDNV PDLKGVVTSTDYLATPVVNVLKEQGLT MPVTGADGISKM PDLKGIYGSNEGSALGVVQAVKELGIDPAAVVGFDSGEAQ GRRVALLASNGMVALELALMLQRLALRMPQDVGLLGFDELL NEFDGVFCSDDLLAYVLYAWATNNGVAVPDQMKIVGYDHG VENDG| FAVSDVIA AGLLKALNTKNIKVPQEAAVIGFDNG DNQLDVACANDSTADGVANASDYKGGNTP ITGQDGDVAN P DAVIAGSDQVAAGIIAEAQTMQLKVPEDLAVLGFDDQ PDTNLIAGLNDYSTVGVARADKEMNLNKEVHVGFDNDDEG QYLDG| FCTNDDDADGAILACHEMGIAVPEQUSVVGYNAF YDGLLAVNELFAVTASK\|LQGMGKEDPKDVA\|VAFTDG DTQAFVASA DSVALGVPALKAAKLDGKAFCGMDVETSA PDLKAIFANNDTMALGLVEAVKASGK DILVVGVDGIGEA


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260
270
DLGDYITPKLTTVRQPVYQLGQESVKKLTKLIKGQE
 EMASLMTPTLTT S SPPLRLIGNLAAEKLIAVLNRQEV KEAIIAAGRLTGSTTFSQAAWTRGALIYTLKLLSKGLSVPER RFUQAYHPELTTDMQPDTDVVTLMVELLLQRMADPDCQLE
 EAALKANTLVESASQDPWATSRTAVEUGVGLMNGRPPAS
 MKA LRGDQYSTVFKDTRELARVTVGMVDAVLGGKEPEDN P\ARYTDPQLTTVRYPIISMAKLATELALAGAAG
PMSAMISPPLTTIHQPALETGHAAADMLFAHIIA
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LISSFSTPSLSTIDQHGDTVGEAAELLLDREQNKTANKE ELDMYVQPTIVTL NAWVI GNKAGEMILERUKNKAVS QLTEYVDPPLTTIRMSGRDI AASAVYALLN
PWTTLIDPPLTVVAQPANEVGRVAAELLLART GDGTRKA RYATRGP $\square P L T T V A Q P T K E M G I V M A D T L L R L L A G E K P K$ PWTRLTTPPLTVIAQPVYNMGVAAAKALIRQMEGLPPAAP DTSQVVNPQLATVLTPRERMGQQAATMLLARTNG HI ARHIYPRLTTHRYPDNVMANEALKLSLQLVNNE LISRMVEPNLSTINYPSYHMGEVAMKNLINHLDDED DWADSFSPRLTVMDQPCEATGAMAVQLMMAR NDPDSARQ QLASYASPPLTTVSQDKFQLGYQAATMLIQMLEGSAQPHA LMSQFIDYPSLITHQSSYQMGHYAAELIHKIAAN VDAVKAGELTYTVLQPVAIFAEEAVRQADHFUTNGELMVA MQAIDEGKIFADPIQHPDQUGKRVAASUVSYFRGEEVPKE
T

PLAKLIFYPSHSTIVEQPARELAKQAALGLDAVLSGGNDVTNK EWSDLVEPPLTTMAQPAEEGGRRAVRLLLARTKDPERPHE DVGQSITPQLATVITPRLE GGRAAQELLARUN
LLSTTTSPMLTTVSQPDKEMGGKVVDLLLQEMEESKP EFSAAAAVPLSSVRQPTYQLGRDATELLLEECDDEGA EWTNVASPSVTTIVQPAYDEGYQAGRILIDRIDEG
D TGQVTVPRLTSILTPRERIGETGATQLLARLNGETVE RLTKMVRPRLSSVAPPRYDIGAVAMRLLTKVMNDEEVVDD PEARWASPPLTTVRQPLVEMGRLAARTVLRLAQGEE
A WADLFSPRLTAIAQPSREDGAQAVRVLLERLN
PLLDMLHPPLTTLRDQHREMGRQAARLLMGML
AEAAQWYPALTTVNRQLEMGQSAAELLDRIA
DAFDFFYCPLTYVKQPLVEVGQQAVNILLKKINNPEKEEE
 PTA ALLKPSLSTVTQPAFEGGQAAVQQLILAM KEKPARY LKNIVDGKQSMTVYKNVNDEAAATLEVAKSVLSGQTPAAY V ARFSKPSLTTVRQPMKREGALAVDSLVRMLDGEEV P $\downarrow$ ARYTSPKLTTVRYPUVSMATLATELALQGAAG APAAFSNPALTTVRQPMEGMGSTAVEIVVESLD
 KKAVEQGRLSATFTYPTN GKEALAAAKKIL K\TEIVRPKLSSTTQP पYDTGAVSMRY乌TKLMNKEETAE SFAASAAVPLSSIRQPREALGRRAAELLFE R EDAAAD PFAEMDDPTLTSVEQNAFEMGNQAARSMIESLGKEDPVD KTMIHDGFMTATSAQFPNKMGHTAAEKAYDULKGKRLK YYAPLLQFCHYAAAQPLDLIGEAAAQLLI RRMEGDK PTSRVIEPNLTTDNDRAFQMGQAAASLLIRQDDDTDSFVE $L E H L K D S L L V A T A A Q F P R A D A Q K A V I L A L Q K L R E E S A G H$
$L G T V A R P R L S S V T Q P L Y D G G A V A M R L T K M M N K E D E Q K$ FEAMVAGEANCTVECNP LLGGPLFFETAAKLKNGETVEKW MLAAYAHPPLTVAQDKYQLGYESSRLLTAMLQQET YMSEDSRPPLTTVDDQDYELGYQAAKCLIDKVNNKQEPS QALIKKG\|MTGTVLQDPRELATADY VVGMNMISGRYPGEG
PMAAHHQPPLSTVHQPMREMGEAAARTLLAHFEG
AWTRLTTPPLTVVAQPVYEMGAAAASALIRQDEGRPPVAP PYGEYASPALTTVDDQSEKMGELAMQKLLEALAGKR ES MDLLRAREDDYEAIFHPDDQA VAVRILCDVVNGRTPDLAA MDA RDGLMIGATTQNPVGDGYETVKAAVEALDGKKLP PWSPLAG LLSTIEQQTYEIGFSAMTCMLSRLQGEQCP PASMMVDPFLTVVSQPAYEMGSTAVEVVLQAI DN FTRLLQTPKLTTMSQPTDQDGHVLSSTLIDDL ENEDVSTD DFSAVTEPSLTTVSQPGYELGAESVKSLVRKITGE DFAKVDNPSLTTVFQPRFDMGKLGAESLIQFLAGKKPQQN PLSRVVARPLTTI HQPVHEGGDRIANMVADALEGKS DKYLEEGUIDTLIVQKPFNMGYLGAQTAVESVRGKKMEKN QGFVRDGTVQAIAVQGSWQMGNQGVRTALDVIERKPAP MLSKYASPTLTTAGQKGEEMGGLAAAKLIVGLESDHQEDE YESLKKGELSATI DSFPKYKGQDSVEVALRILGGQEMP


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INEKQK 1 LP VELLSK 300 V D G $\square$ HVQLP YELLKK
DEMRTVVPTQLIVRES $\qquad$
$\square \mathrm{L}$

TPELV
QSLRFTPRLIERQSVI
YVA RTVLLPPTLVTRANVNDY
 SVDSGVTVTTAENVDTY
DTKTYDNGVKVVPPVPVTKENWRQ
NPELDSTQ $\square M \square Q P E L V L R Q S V$


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TTTTLQAKLV
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A Q F T
NTEYSGKK LIFMP VLVKRASV
TVRDAPEDR DR
MTVIKTD IVVRLETQLVERES
 EEKQ LLFDMLIDESNVENY
$V$ VID GFYWYDATNTDDED $\quad$ A
DTKTYDNGVKVVPPVSVDKSNYEE VVLDVD

$$
\mathrm{V} R \square \mathrm{P} P \mathrm{R} \mathrm{~L}
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GHAHQQVMFQPELVVRES
$\square D S P R V E L A T E L V V R D S$
TTPSAAA SPQAEVRRVLLEPRLVVR

HELVADDRL
DTESYDNGVKVVPPYVITKDNDD

QPNAKPKK $\square R \square$ QPD LVIRES
VDCGT $\square E K T Q T L K T R L I D K E N A A S \square$
K TVELLPYGFIKRSS
NKTEHEHQSVRFTPELVVR
$E E \square H \square P \mathrm{~V}$ RI
RDVIVPISLISKENLLKY
ME
IVLPVQL
EGFPATDVFEPTLHVMKEN
FETDT LKTDLVVRASSMRKENT
TTE
$L I P T E L V T K Q N V S Q F$
VK S VD GVF TS D $\square$ A A DVID
K R VIVPYEVV
T NYKFDETTIRI PYHPYT TALPNRPTVIPATFVARSS

GYATEEPRLIVREST】
NQTYEGRKMDLVEFEAVDKSNA ■D S G $\square \mathrm{D}$

QNKVVNVELI
CNDPEKI I LDDELIVRETTNKF
$\square$

$K L I D T G V V M V D K Q N L D$
TYET $\square V$ IVKTSLI ERES
$E \square Q Q \square D \square P V L L V D V M P V T K D N D R Q W$ RVI WTPQALI DSTNV
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CDK
QKGHPFIVLDQKRAEGFSD SVLTDDYDGGRQAAQ EDT ESTLPSVVIDLPLLSRHCGGPDYSYVMTDNVAGMAMATR GLGGUVALLG QQG|KIILIDNFVYDT
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 KSNDPIVEVINDINAPDDTAKALVSFYDM VPAVMITKQMEGFSSVY YSHYNGGQQDAK DEGTKVIAYDRLTKGVDVDLPGCYVSFDNEKVGEMMAT
 DAG|PVINLDRVEP NGKLSYRTWIGGGNYGMGVAAGH
 TADVPVIEMMDTVSPADEQA MAEIPVLLSDRAIKPADDNSLYATFIGSDFLEEGRRAAR DAAAPVIADDRSA AD DKGKVETLVASDNREGGKMAAQ AAG|PVITWSEKDEGADAWIAVNNYDYGFENGKIAGQWI
 ASGWP RTVVALDQDFGPEVPMVGSDHVYGGKLAAE QRGVKVISYDRLI RNSPDVSNYATFDNFQVGVLQAG KAGUPVLVVDRKDDGGNTHKNYTAYLGADNDEDGRUAAR EKGFPIVFFDRAAPGLNTHKKEVSVVIANNKGAFDATE A EGVP A A GMVIALDTPTE
A AGVPYVRVSPFLNP
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DYPENLRVPVVTIEENSGIIQGDCVQTSCTQGAYEITE DYDVPCVLLDTKPLKGT SRSYVYTDHKYGAYLATK KVRKISGTIPDVITGKDDKTAVH SVVVIDESGGMDVVMD HADTPKVI MDWGPESSQADK I DDNSEEGGYLATK QLGIPIVLADGHV KYADFSGAFVDNIKGAYESTE DAGVKVFTWDSDAPASQR K NGFYVAAADDVKGGEDIAD HKTUPSVLLGAS SDEDEYCVNA V V VDNRAGGRMAAE TWGFIDKRRVAHVVSWCNVSREGQYFAGFDNARAAGDAAE

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## \section*{\section*{WLAEQYKDATEDVNDVENPSNNALQGTTGSAPANDRKAG    HMIKCGS HMIKCGS HMIKCGS RNIGCILGEAQSQTTVDRLNA RNIGCILGEAQSQTTVDRLNA RNIGCILGEAQSQTTVDRLNA <br> <br> <br> <br> <br> <br> LLLNKGCKKI ILISGPNGLKTPANMRKK <br> <br> <br> <br> <br> <br> LLLNKGCKKI ILISGPNGLKTPANMRKK <br> <br> <br> <br> <br> <br> LLLNKGCKKI ILISGPNGLKTPANMRKK    <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> <br> <br> <br> <br>  <br> <br> 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 YLTGLG HRRIGYIKGLINTSTAAQARFDG YLTGLG HRRIGYIKGLINTSTAAQARFDG YLTGLG HRRIGYIKGLINTSTAAQARFDG YLTGQQG YLTGQQG YLTGQQG <br> <br> <br> Y <br> <br> <br> Y <br> <br> <br> Y <br> <br> <br> yLTELG <br> <br> <br> yLTELG <br> <br> <br> yLTELG <br> <br> <br> HRRI AYi AGFANHGASRWRGNG <br> <br> <br> HRRI AYi AGFANHGASRWRGNG <br> <br> <br> HRRI AYi AGFANHGASRWRGNG <br> <br> <br> HSRI AVI EGRRNSLTASERMKG <br> <br> <br> HSRI AVI EGRRNSLTASERMKG <br> <br> <br> HSRI AVI EGRRNSLTASERMKG HKRIAIINGPE\HSPCKQMEEG HKRIAIINGPE\HSPCKQMEEG HKRIAIINGPE\HSPCKQMEEG <br> [^0] <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br>  <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br>  <br> <br> <br> } <br> <br> <br> } <br> <br> <br> }

HLI KLG
Y $\square$ HKKIALVGGEMRVVSTYKKYQS

ALAKDT
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 DEKGHRQUGVVLPEQRAWNDQLQRF
HRRIVAVI


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## UniRef90 A0A022L103

 UniRef90 UPIOOO47B4DB5 UniRef90-M9RUC7 UniRef90_A6M1U1 UniRef90 E8LHE5 UniRef90-UPI00047DAD3C UniRef90-H7EIK4 UniRef90-E1WAQ4 UniRef90-UPIOOO3B73665 UniRef90-E6W7J7 UniRef90_19KXC3 UniRet90_G8QWH2 UniRef90_UDDSE4UniRef90 J9E323 UniRef90_UPI00037A6353 UniRef90-A8F3L8 UniRef90 B6ERT8 8
UniRef90-U2N1A8
UniRef90 O1Z706 UniRef90_UPIOOO3628357 UniRef90-A0A023Y1E7 UniRef90-F4A7AO UniRef90_M3F9Z7 UniRef90 R2QF73
UniRet90 F4GLH3 UniRef90-UPI00039CCF24 UniRef90-C7BNA1 UniRef90-UPIO0037B27CD UniRef90-UPIOOO36345E5 UniRef90-UPI00035C14B8 UniRef90-E6LE76
UniRef90-R6CNE4
UniRef90-F8FOY8 UniRef90_F7Y3P5
UniRef90-10×973
UniRet90_F4GYC5
UniRef90_Q2S8C2 UniRef90-F4A267
UniRef90-W1SIF9
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UniRef90 UPIOOO3 UniRef90_W6ADV2 UniRef90-W1N914 UniRef90-UPIooo36111F4 UniRef90-UPIO00422DB65 UniRef90_A4ST26 UniRef90-AOAOT1 MM92 UniRef90-D2Q8V2 UniRef90-UPI0003FB7EF2 UniRef90_UPIOOO47A7406 UniRef90-A0A023NV24 UniRef90-R5X948 UniRef90-UPIOO047E7AF4 UniRef90-N9YWBO UniRet90_UPIO00362EC95 UniRet90_C6PV06 UniRef90-UPIO003B3959A UniRef90-R8W050 UniRef90_Q38Z77 UniRef90_-161S2
 FEEKIAGGNAHLKVIASQTGDFTRAKGKEVMQAFAQKAN LEQVAQEV PNYK IIKSQTANWDRTQGYTKMQSUIQA B N LKRVLEENSDEFNKDNVVYTDATFENGYKKAKMLISKK AYEDVLLAAARDPDTYEISASFEKDTHDTTVNKLIFDAGN AEEFASENGMPFGNCSVIACPHTLEAGREAARAF DAGNP
YYDALAESHIPANDRLVTFGEPDESGGEQAMTEL YDKALKTNDIAADPDLIDKDEMSRGDDNCTEQUETLIKN WRDAQAEYGLAADDTLIFPASYSRQGGYDAAWRMINNH
FYSV FREVLKDHPEYRIAYSKSGDFLRSRGYELAI EFLGEMY YCDAMREAGLDSLPVIEMPAHTEA EFAAIEPLDRGP FEAAMRAYGMAYSRDSILHADFTDEGGAKALADLDGRH F LivLKRNGDKFNPAYELMADFDNHTSELAMDEFLGRKDLD FTARLKELAPDLEDLPTRYVDNDDAKAAAAAEDLDTAYG
 FQDTLDKHNDPTC TAYHGDYFTQSGYHACNEL DASK MKKELEDPKYKGMELVKVAYGDDDDQKSFQQTQGLLQAYP FRDALAAFGTDA VGGEPGDFDEASGHRAGQELLAAGALD YLQAMNQFGLEVREEWVEYGDYYEDSGYTAMKKI DQAPKR YLSFLEKHELEPKDFQUQ TTARSTTLKNLEUKHDLET YVKALTERGIPVKESHITW AHKVLDGK VKIAYEQSGLWKDTV YEVAMKSAGLKPGKVMTPNSSSYTLG HAQAMRQARLPVDPAWLTESAPNRLEAALLNEAGARTKY YVTTMERLGLTPQVVAVTPQNDWRFEDIAFEAARRMLEAP
 Y LNCLEDNQLAVDDSLVVFGDFSFESGQQAMKQY LHQ FLKRMKEKYPNDQVLEPQYGGGDHLKSTEIAKAVINGN FRASLVANGLECLPHYVSPENVDTASATASTHAILSDPSS VMEGLAKLGYNVNVVAEFGANWNLDSARQ YLSL WLEGKH AMGVLQPWGETDFATDATPAWNGDTAASRDGPLLDTHYAS YVQALRDHGLSVDERYRAEFESFGFHSGALCMEGLLRDKP YIQGLRKCGLLYDPNLVIKSDWTFEGGYNAVKEGMALGK YMDAMKDHHLPVEESWI QKGDFNVDSGYECMKPDMEDSK WKRAMDEAGLSTEGRLFEAPYNRYDAYRVA KGILAGP YRLSMKNHGLEYNEQFVGHSDYHEQGGYLAGSRICRLACD FQQYLSANRISLTDVIECPAPENMNASLVYQLVKQYAANS FTKVMEENNIEITDKVYAEGWRAEAAGEYIYENMDK AADAVRLAGDPACLEEVRMPAMTVASGRLAAQDLVARAHR SVQAL NEAGVKTQELSSIVICNWDEECAKSADRSNLLTLD FEDALKTYG FKVTAKQDAQFTVESGTKVTSND LQQAH SILTLQPETVEAGRENLVYESYUEGWSGVRSRFEMQQDAHG YEKAMQENGLQAKSVMTEAPSSFSLGADLLQKTLT KY
 FHSLAD DATKLDVVEKQSADFDRTKGLNVAENV LLQAN MMDGLASLAPDAETVAVQSGNTTESGMEAVETTL AKH FL ALFKDSDEDREEWIRDGRSSEQGGYESFDRIMTSQER LEEAAEKYG WNDVAQQSGEFTQAKGQEVMESM FEETLKKHGVEVLDLTMEWNLFDHQSYWDAAAEALEKYPD FEETLKKHGVEVLDLTMEWNLFDHQSYWDAAAEALEKYPD VERALAVVGGLTPVHVVPHALSSVALGRQLEQQLSARSH FDQLINE NKRFKVGNIIHGDWEKESVKGPLKTIS LLQN FKAALHEYGDEFTPAFVKHCDHGGMDQGEVELALKELLSM YQEGINEAGGEFLEKEIQYADAVADKAVTSMEAIMQNHPE YQDAMRAHGLAPLPVLSLPS SHTASNAAQLRALIDED VDDADENQGDEDDPRLVGHDVTDGAEEGGRTAMENLLDRD FVRALRESQDEPRPEWVKQGYFSYESGVEAGRALFAEKTR YEAALESHGVKDRKEYVKTADQTMFSGYVVEELFSGDKP MLKSLE NNDLEVVGEQWVENWDPAKAMSYAENWITSYG FMQVLAENGLEWLPQREVHGDFTMHTAARAMDDLLARPNR FQDALKKNNLIYDPEQSTFTVDLQNADYQANDADFITRTA CEAALGEH EGIDEVTKQNGRQERTHAMTVTENMIQA YKRAMQEYDPHMQPLVISEDVKQLRQRLDELDEQQDALPE FTDYDKANSKDEQVGPYYS AMAAMADFGLTGQHLLTEQSSSFTLGGQLLDQALVR AMAVLNPYIAKGKLVVRSKQTAISKISTLRWEGATAQARM AWSVLGKYYKPADETEWQSIGGDNWDRQKAQNEMENRIDNS YLSG\|AAAGGDTDPALVTQGDYTQESGATAARQFMALSDR YKDAMAGAGTAYDPKYVVQGEFTFGSGVLAARQLFTLPEP YFRAMEDYGI PVRPEYVVQGDYVYQGGYRGDHELWKLNEK Y LK ALKKFDI PLNQNYIKKCNFKKENSYNAMKELLNLDKN
 YCKALEVNG|ERRDNFILEGDFTREGAYRTAKE Y EVGKNG YKKALALLNNIPFNERYVFKGDYGERLAYELTKKMAALLME FLRAMEQRGLTLNVDENPENSSSLQAGYQLGKQLFGAQG YQVALVSHQLTVNPDWQTT TPLSKQGGYQVAQQV $\square D$

## UniRef90 A0A022L103 UniRef90_UPIO0047B4DB5 UniRef90-M9RUC7 UniRef90_A6M1U1

 UniRef90_UPIO0047DAD3C UniRef90-H7EIK4 UniRef90-E1WAQ4 UniRef90_UPIO003B73665 UniRef90_E6W7J7 UniRef90-I9KXC3 UniRef90-G8QWH2 UniRef90_U7DSE4 UniRef90-J9E323 UniRef90_UPI00037A6353 UniRef90-A8F3L8 UniRef90-B6ERT8 UniRef90_U2N1A8 UniRef90-Q1Z7Q6 UniRef90-UPIOOO3628357 UniRef90-A0A023Y1E7 UniRef90_F4A7A0 UniRef90_M3F9Z7 UniRef90-R2QF73UniRef90 F4GLH3 UniRef90_UPI00039CCF24 UniRef90-C7BNA1 UniRef90_UPI00037B27CD UniRef90-UPIO0036345E5 UniRef90-UPI00035C14B8 UniRef90-E6LE76
UniRef90-R6CNE4
UniRef90-F8F0Y8 UniRef90-F7Y3P5
UniRef90-10X973
UniRef90_F4GYC5
UniRef90_Q2S8C2
UniRef90-F4A267
UniRef90-W1SIF9
UniRef90 E8LUA6 UniRef90-UPIOOO3773948 UniRef90-B9CLC4 UniRef90-LORIU7 UniRef90-R9JGP4 UniRef90-UPIO0047C50F8 UniRef90-K0K546
UniRef90_G7MD68 UniRef90-D2AYW9 UniRef90_UPIO00479402E UniRef90-U2MZA9 UniRef90-UPI0003B62887 UniRef90_19C1P7 UniRef90-W7CP87 UniRef90_V8FSX0 UniRef90_C0C4T0 UniRef90-B1L917
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UniRef90_FOZ0B4
UniRef90_UPIO0036F3286
UniRef90-W6ADV2
UniRef90- W1N914
UniRef90_UPI00036111F4
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UniRef90 A4ST26
UniRef90_A0A011MM92
UniRef90-D2Q8V2
UniRef90_UPI0003FB7EF2
UniRef90-UPI00047A7406
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UniRef90_Q161S2
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D P A T A V $\quad 210$ 220

220
230
K DRAVAHNNMALGAYQA RRDRLRDPEDISFDGFDNL




 PR ALFASNEGQAIGCIRAFSEYGLRVPHDVALVCFNGT




 QSFTAI FAANDNMAMGADRADHDAGLQVPQDISVLGFDND D LKG GI SPTTVGGAAAARYVSDSSYKGKVVINGLGTPNQM


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 $P$ TAAVCYNDTVALGGMLGGLAR GGI RPGKDFAGITGFDDID $G F P T R I L C A N D R C A V G V M A A V Y Q H G L R D G R E P G C D G H D D Q$
$P N D N V L F A H N D D M A I ~ G A I S A I V A A G K K D I I I V S V D A V K G A$
 PDLKGYFGANEGSAI GDINAVKELKMEGKVVI GYDSGKDQ
 TRLDGILAPAD IISVPLLDVLRDHGYPWPVVTGQDADVAA GQFSAVFAASDELAMGALSCAYRHGVRIPDDLSIDAYDDT
 KHFSAI FAAANDQTAYGAI KALLHDHGYRVVPEDVASVVGMGAS DRPPAI FCSTDDQADGVLRAARELRLDVPGELAVAGFDDL
 GLHCEAYLANDDIACEADAAFRELGYA DPQDIADAGFDNS $M K V D G D M C G N D D L A S R V I Y A L A E K R L A G K K D V G Q D A D D E A$ P DAMFCANDLMADGVLQVLARAGVRVPEDVAVVGYDDA


 NQUHVVYAHNDDMALGAIKADEEYGLRDILIVSVADTAAA SSIGQAIFAQNDEMALGAVEAAKSAGK DII IVGFDGNDDG NVEADI ANNDAMAI GAVKALQKYGYNKVLVVGDDADPEA PDLDNVIVICSNDSVALGAYEAMVSAGKSDAKVCGQDADEKN



 RHLDAVLSPYDGISIGGISSSLKGVGYKMAYVSGQDCEIPS PDIE YI FAHNDRMALSAWETAKTLGLKKDKFIGVDGLNTG DPPQAIFSGSDRLATISSDSULKKMGUKMPQDVALAGFTNS G $\square A D I A C N N D D M A I A A A R A A K G N E A Y K N T D F M G F D G \square K S A$







 $P$ D L D G L F C T N D D LA VGGA L L Q C Q A K W DP VP Q Q A A A G S N A L





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$250 \quad 260$
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D A AFSQPPMTTIRQPFFDVGRRAAMELLDKDDNK
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 CEALLDGTESMSVAQEAYDMGYKSVAATVAKLNGTELPEF VENVESGVIGATAMQFPLKMASMGVABLVVEFAESGQTPDP PGAMLVWPHVTTMRQPVEALAYAAADILLTRQEGEEGE PYASFYTPPITTVSQPVLEMAKQAVDLLLDQMKEKD EDSSLITPGLTTIRQENYKDGYMAARHLVS\|IKGEKP IQRVIAGTQESTVLKSGVAYPRELDTQVIDYRVGEATAAD EMAEFSE LTTIEQPVQLMGEMAAWSVMERLR PQCKYTTPKLSSVKQNIPMIAQTTVDNLTA DM
ПAA TQQPDSAFTSAQYPRDMVRLGLGLGLAKHWGASTAPA PFAELLTPTLSTIVQPAHEMGREAAAMLLADIEAES QDFVRNGTLQG\|AVQGSFQMGEKGVETIAKILGGEKVE DПGHAMTPKLA STVTPRKETGSEAATMLLARLSGQPLPD
 VQAIVKGKQSETVYKDTRELAKATAQMIKDLVDGKEPEAK HMSAHPLINLTTVHFPQHETGAMAARLLLRRIN
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ELSVMVNPKLTSVRQPLVELADAACELLLRRMNGDE LETKYFNPSLSTVNQAKYELGEПGMELLINEMKNPGNDKK Y DANLTVPKLTSIDYNYKDYGKKLVDTAI KVSKGQEVAS EQFDMFGLDNYYLERNPWEMGKAAMEMLLERLKN K K DILNSGGMDISFVDGPTTELGNDAMKILMENIKNDENFKV RQYLKSGAVSGLMLWDPAKLTYYTAKVVNAYLDGKQPEDG SYAALPKDTLSTIDQRKSALAESAVRLLVSLI E


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290 VND TRFIERE 300
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H Y
KTEVIETHLVIRES
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ALFSGS
LIVRESVD
ETYKADGEVILGPPTGFDKSNIDKY GDKQTLVPRLIV NQHIVFETKLLKRESCRKY ELQPVF\|DSELIVRES
$K N Y L L P V K L I$
VLLPPALVERSSVKKD
A T T S LT S GS QLL T P VSVTKANVK D
$T \| V P \nabla$
Q EPEQVRLEGKLVMRASA
E I DP F E $\square$ K
K RVDSGYLWADKSNLD
TDRNVIDQCFIVPFDPVTK
DVTSYDNGVMVVPPQLVTKDNY

DEFEDDNRK $\quad$ K $\square D P$ VSVTAQN $\square D D$
APREHEHRQVLFTPDLVVRES
T N Y K F DGNTVKLPYSKYVK
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TKYKFDNR L $L$
I Y V S FTPVTMDNVKD
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LDTGFMW YDKSNDD
$\square D G G Y$
DTKSYNNGNKIVPPVVVTKAND
 $\square \mathrm{NS}$ GVS $\square 1 \mathrm{~T}$ K D N A Q K

D T G $\square$ D


KPNIDPPSLVLPTTLVVR
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K M $\square \mathrm{D}$ T G VVFVTK DNDDK
D PKTYNNGTYLVKPVLVDKSN
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E $\quad$ DYPKR $\square R \square K P S C \square Y R E S V Q$ $V Q M V Q P R \quad L V V R E S$
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ETVSFSNGVLLIPGVTITKENVDEF
K P T LGMQQKMLS VE L VERDS VQ
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 AATAEGQDEVVNSLDAQNVNA:ALAANDPDALVPVLKKAM GEDPKQQRTVVDQLLARQVDALILA GGDADSKENYVKYLTNGVVDGVVLYGSYLNDRKVLDYLKE
 DDDPDKEKKYIEMLRAKQVDGLI DFPTG
DGRPEREREVLQGI REQRIDGLI FSPTTVGADEDADR DENHLYEKDNLLLLQDFNVDGYLLNLCHETANEDVVFKQUM QKASMSPLRARSYFSQNKVDGVI MM RGGLMSLKALNL PDDEAAQRRAMELLVGRQVDGLLLSGLHRPGRDFVESL ETDATMQAQVIQDLIAQDVDAVCVVPVDPGADEPVLKEAM NNDRSTEKRILENLLSQHVDGVIIEPTKSAFSNPND LINRDDKEEQYAEMLMRNQVDGIIVGTHNRGILN HSDPATEARAAETFMSMNVDGALVA PLGDHSDQAVHDRD

 NNDFQQEKEC:EKMITQGVEGLIVEPTKSNQYNPLYVRLK GNDYEDELQYITMAKQNKVDGII


## 

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 KENQSDQNESLENALNEDFNLFILISKNLSDDEDTFNKDQ GNDRER KT LAQYLAAHRVDGVLLVSMHHAAGDPLDDLLE QASAAEQVKIMDSLIKQGVNAI SLSVLDSSSTNPYIKKAQ QGDKTQFQTVADGMISSGVKVLMIVNLDSGTGKAVLDKAK
QSQFSKQDSDVQDLLAKGADLLVI APLNSDGWDPVLQAAA GGKPEKELYYLDMLRQNKVAG|VGITYNDDENN HNQVYEETQALESMLANGVQGLIVEPSKSNPNMEDYAKLK
 EGSEEKQSEQFRQMDDRKVDVILVDAVDARAVEPDVRRAK







 NNDAEEEDRALEMFRSRQVDGMLIYPRSHRKLDHL VRFO
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DYDUDREYQLVRTFLGWSCSALVITAGLDR R

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90
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120
RVVLMHERSASVRKFAVVTDDVEGARMATR ADKYLNAAK $\square \mathrm{P}$ IAEVMGLAENPGRDNVGFDNFQAGFDMTT
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 VPCVLVNCFDAERE FPSIVPDEDGGGYAAAE Y LS FKEQNVPF I MI NA YYELALEVPF FCLDDVQSSYLATAE CKDVKEQNVPF MIN AYYEEL

$D D V Q S S Y L A T Q E$
$S D N A Q F V G Q V Q$ EADVKIINVDTQVKEMDY VDAYDGSDTDLIGETIIK LIDHCLSKNTVVVT $\square N R G E D H G R V S S V M N D E L L G M R L A F D$ EAGVPVVILSDRMM QVVSDDSGFEAWVGGNFVKEG KEGIPFNLFNTNIPDYQPNPDVSYVGQDSYQSGVLAGK $N \square D H \| L N A N N V P Y!M L D Q N P L N T G D Q V I I D D F E G G R M A A K$ KNQELYKNMVDQQYPLVFMDRIVSDVKVDTVV
TDTTALVLLGERVIDGPTHHVAIDNQRAAREVTE
EAGDP LVFFDRGPP
RSNIPVLTGDRGAS
TSGDASHVIVNDSIKAALMVE $G P G G P P V V F \quad A G E W N P D D D Y P V V R \square D D A Y G V S L A V N$

DAGIVVVTHEGA
GAGVPVVLGGRPLYPPRHPVH
YVIDIDNVGGAASATR
 KSR|LPFVLMDSRP \DHSAP DLLAMWEHPETPDPBALDCVA $K T M P D V D F V G T N H R Q S T G L I T E$ DAGDPVVVADVDVENEADPQDEQ A
Q
NK VDFAHAGALAAR $F Y Q 1 P Y V F \square \quad Q G Y Y A Q M K N K P H \square L M D D C L G G Y L V G N$


 RVNIP II LESREPAA FDDKSYNKCCYVGTRDEEAGGLAQGG



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K A N\PVVVISSDTGGT
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ERGSPVVLVDR $\quad$ D


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A A Gll
$K$
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 NAGSNVSADR
 K S G

 R K Y S R IIGK E K E K H MVFF D S QL Y E H K T N WV K






 $S$ Q GVVK VI A Y D R P I P A K P A D $\quad$ P
 $D C$ P $A V V Q \mid$


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HLLQHG
130
MLLAS GKRR】IVYF
Y L FARG
HL $\square$ Q L G HRN $\square \mathrm{L}$ G $\square \mathrm{FKSD}$
DNQGLNRYKG LMUERGYENUVCLSAKKGRRTQSKLTGPLNMVVSLDRLEG TLQKSQCCKPLMIAGNAGN LI SKG
YLCRTGAPPCFFEM
LAADY LDPEGGDVA
DLIMKCPDGGK』A
$H L V S L G$
TCGNWLADY C EAQGRGDE
HLMQRG
G
140
150
160
H T A VACLGGPESAPPVADHVEG G S M S DVRDEQRYLG LLHYGCEKGTLVVVHDDKEV

H T Q $\square \mathrm{G} \square \mathrm{I}$
G P A Q GRQT G HF ปDKGHQKLAMLLPDEAPQNIEKRWNG

## HLLKRGARRPALL

VKNEEWASRGlQHLIDNGHER\AMDAP
HLIS GHTR】AA IGRQT
HLISCGC
Y $I$ MEKV
HLFELG
HLLDRG
QKDAHLQGPSTVRNAVERANG
GEKAKV $\backslash Q \operatorname{L}$ E G $\square$ AGTSAARERGEG
HRRFGHVAGPLFHVPGKLRYDS

$R L V G A G \quad R R R D A T V A G P A D M A A G Q D R L R G$ HLI QQGHRN IVGFYKTDD $\square$ Q GVKRMK G
RLI GRGC
EYILHFNGPAEDETPAQLRRQ $Y L C R V G \quad D P P V F L A M P R V N F N A D E R E T A$ HLLDLG

HRE $\triangle G L L \square G D G C G G L$
A A $\quad$ DNGDAFRAA YVYVPG $\square A$

QMAQMTLEKLAQDNEGKAN IVK $\square$ WTAG DDSQGKDRRDV FAPMKRRHKG Y $\quad$ LIKKNHKKLLLITTKDDDLQGKYRMKG VDNDKGGYDATNLLIVEGHNKDGIMTGLLSSEPTTDMDEG ELMKS GCKS $\square$ AFIG
HLLATG RRR $\square$ AF $\square$ AG GPEDNF DAAERLRG ELLERGAKQLAY $\square G G T N \square H E N E T T$ ELLERGAKQLAY $\square G G T N \square H E N E T T \quad A Q R K R G$ EL II SNWNEKKSF DDKNKDNVLQYIMLMGQENNLDSVKETEY HLLDLG HRQVAVLAGLPYASNAIERTEG YLI SLG A LVEE E L AAVEAAKAAGWEE $\square K A$ YLTKELTKKGF $L M A E V L$
$H L L D T G$
WL L
HRRI A Y I SGPQGDT $\square$ SELLRHQG
GNSTANKIVMMNGSPADPNAAMFRDG AK RTSLAFVGGTRAIVQVAQRAGG YLVNLG AKTTGGKCNSIVEGQGTVGSSPADVRKKG WL $\quad$ GGDGHRRIGLLMDDAEHYHLAERFDA ILANAWNSNKGFDKNKDNDMQYILIKGPSDSNDTADRNKY NKAAAALAADKMAELIGQEGE ALIVHDQTSRTGVDRRDG H LTARG DKDLGTTDMDCLGEQMGGSGKVGIVTGBESTVYGAQRRLDG GLIDCLTE KKATKPVVAYLNGSPTDNNATLFKEG QM
ELVKAGARKPAFI GS $\square$ TSVF HLFDCGHTA TAGlFA PENFGSAKGLTDHLDD LGHRRDAVRGLDDLQGHKRYSG
 YLADHLSSGNQVA IIEG\｜PSAYNSQQRCDG A VNALGE HLI ERGCRNUVFA NAEHKKVVMMNGEPADPNTALFKKG YL L NRIGS GKIVKLYHSAHPGVYQ
 KF HLLKLG $H K R I A M I G G R E D L Q C S S A R E D G$ $S L V Q H L K A K N V P T D G G G \square \quad$ LDQ YAAGIL NGRGNTVEI RGWNGSTSDAERHAG HL $\square Q Q G H Q N I A F I C S D H A \square S D A G D R L E G$ $H L V G L G$
 HLI QLGHRR TNNYDAVYDMIQVSLEKGYQDFVMITADTSLSTRDERASG LDNYRGACEAVEYLIAQGHRRIAHIAGPDDHRDARARDAG EFTKNHCKYVIHLCNDE H LIDG
$H Q N D A F \cap G G S$
SEMDRRGRKHVVYLAVRD
HLI EKGYRQIVYVGARLSQDYRAS
HLISMGHRNISGIFSHINRQGHLR
HLTEGG
ALLE GHHRD IGVIEDD
FRDEEGVYQATQMLI QAGHKK TG INAPNDGEAAPGRRVG
KAAA WLKAYLEATGRGDEK DNVVDIQGTUGASAQDGRTKG
（IGMOKGCKNLLISDRDVPTMERLRG
S VDHMKASGVPDGAG
HLIEFG
Y L
WLAEK $\square$
HTSI ALI TGMPQSVVSARLRFDG

Y｜L｜

IIE N G
$S H L L$

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WRKAMADAGRPTEGLLHRAPYNRYDTYEAA $L$ R R|L L A A P YCRAMESAGLA VGRIAPNKVSSVS $\quad$ VGTGMMTLA RQMY
 YKRALMDNRIEFNPDLVI SAEFSKENGYGAVENLI KDGKL YVNAMEQAGLQARSLTAKSESSSVSVAKKMARKVMERY
 Y I KALGGEAKLHFHPEQVLSFNTETKQELPTNLEHFSTSNR $Y L Q M M E R L G H N P Q V L R V A G T G W E F E R D A Y E$ GALLQILDAGQQ A K K V L P E K FP K $\square \mathrm{N}$ L V A TVVY G D D D S V K STN EA K GLI A S A FEEA A RAEKGFEVVARSDTNGEFEKALEAAETVVGKEH $F D Q A A V A N G W Q K S K L N M V C T A Y T R E A G R V A C Q T L D L K T G$ FANDLAE H SNWKMLDMQT GEFTQAKGQEVMESF L K S K Y
 FID YFGENNDTGR\KIVRDEVNDWEDKEACQKNLDAL F E K
 Y R QVL Q Q A GI EPVVLTVDFNTPNSERPRLIRERLD LVV
 Y K EA L T A A GLLP Y D EA L A P P T N S Y H R S D GA E DMA SLL L A T A
 FMTAVK GSDMELLVASPADFDRTKGLNVMENL A A A N FRQALSLLNCAPD QAWFAEGPFTLASGKKAAMAWFALPET FTAE L H DA G DT LDPDDR IVA SNFEVD GGTAA GAALLDDPDR AVARQKEAYPNMKLLEAEPRVESQDNGETAYQTAKELKKY HREALDAEAGLPDPPELTVHGDFSHEGGARAMRELLDAA Y $\square$ K A HRKY Q AFEDMMQQRGLDPHYYEMEMPLDREDQLAVIRRABLDEH Y $\square$ T T MQRLGFEPRVIGTQSENWHFEEHGEAVLDAEFGRGR FRAAMREAGDETDAGAVLQDRDS DDAGYAACMQLMAANC A WQDVREANPGDEEVAQFGTLDNPDANSVANQARSVLQAN YVKAL QEAGCAYDPDMVIWFHTEDRAVKPAKVLELMLLES G


 $F Y$ A E A E A Q GYS V L K L L


 Y M A G E E

A Q D A ARER F DEVVVA A NP GMVRVLRELDSMRAEAGRLGGVGQLLALABA




 $F D H E A E A D G V E H V V Y E K P D P D V D D E S Y F N$ V $\triangle$ V YMQSCLRHGI RESERNVMWFATS EREDMFSSAEDKLVS LL

 A LGELL NGAVDIAASYDTKKWLPEVAAENMRKALVKVGA RNHRLPAQQRVI EGKAS GEYGDTEMAELGFTLAAQVLALS
 YCDAMRAAGLRARAPLE LDFHQRRLPSSMLTAA, LDRPR

 $I H E G L A S G G Y K T L A E F D T P N W$ QPANAQQWAAGQITRFG FVVDGLK NYPD DR I A EARGNF LKEEAK LQMSNLILSE Y

 F $\square$ D A L S E K N L D Y Q KL V I YHDTLARHRIEADPRLVVAGDFS ESGGLLALDNGLAAN Y L Q AL SEAGIVF EPVTADPQGHSVMKGYWAMDQLMSAANR LEAVLK E Q GI D S R KVVERRWNS F D F D GYFELLARLI LENY


 CEA YLE QA GIP WSTVRVAVGGGTTRGGYAAAARL F $\square R A M E A R$ R L T D H


 W $\square$ K A L Q K H R $\quad$ RSP $Y R D A D T A W G L P E L A V E D G D T A A G G A D A M R R D L Q S D$
 GAEEVVKNYPDDEVL GSANASWDYAQGKAAVESMLLSAY
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## 

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 PEVKGILGTSSFDAPGVARADDELGLKGKVFTAGTGMPEA $P D L D A V F A A S D D M A L G V L R T L R E A G R R V P E D V A L V G Y D D T$ D MPTALACYNDEMALSSLDDLREKKDKVPQDISVVGYDDS PQADGI FASNDMDAASVIYEAGRRSPEDLKVVGYDGTADT


 GE!TAVWAS WDEFAKGAVRAIEQAGRTDIKVYGIDMSDED

P




 D GI A II CANN D DMAMAAARTGKANNYANNDYLGFD GDQAA H T I WL QS SK TYK SA IMKA $\square$ NDFK K Q N G

## 

NKI EA A IAANNDSMA I GAVK GLLQKYGYNNKIPVVVGVDAFDPGA $P G V K G F F G A N E G S A \cup G V L N A A A E L K K E K L V I I G G D S G K Q Q$ P DLDDAVFAAS DVMAS GARHVLRES GRRDPDDVADVGFD DS $D L K G L V A V A S S T I P$ GVVAQAVQQEGKAGEVAVIGYGSPAT $K D I K G V L A A N D G L G N A A I Q V L K K N K L N G Q V P V G Q D A T V Q G$ $P$ GI K G V Y A E N D E M G L G A V A A L K G A GK K D I K I V T V D G T R N A
 K GKTAVVCYNDKLAVRLLKLCRDRDIVVPGDISVVGDDDS
 NVRALLCANDNMALGAAAAVKAASKRNSMY I GFDNUSAV GNVA AVYSANDGMAGAVIEELLEAGVTELPPVGQDADLEA



 DHUDLVFAMNDPMAAGVYEASRKYTGKTPFIIGGVGEGGA KTFSAVACYNDSMAAGALAALNDNCDPVPQQMSLMGFDDV

 $\frac{L}{D} R$ F T A 1

 P H T Q A I HFAND DLAAGA L LA A Q R Q G L S VP G DI A I A G FN GL A GCTAA L C F N D H M A L R LIVD Y L R Q N G R N I P P E D L $P W L T G L V C G N D R M A M G A Y D A I R E Q G L R V R D D V A V I G I D D$

 D Q IK GIV VA A N D G TGGGAI A AL KAAGVDPIP PVGNDAT DAA $P$ E R P D A V F VA S D L M A R G A L A V L T A A G V R V P D D I A I M G F D D S P DLD A V F C A N D DLLA L G $V$ VL F E CQ R R H l


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NVAEYYDPALTTVHQPRRALGQLAANTLIALDQKAPLEPP $P V A A Q L P V P L T T V R S P A R E L G G T A V R G L L D L T I G R D V E S$ NKE LLENDLVAATLWDPADAGYAMASLATKULNGDKIADG


 QLAHQVHPALTTVADQTAAI AELSVSSLIRLI DAHEMHPG ISAMREPGSAWTVATNPAVVGEVSVRTLAMMLAGEEP FIAAENGAVKLTTIAHPQEKLGAMAAELLLEKIKGVPDEES LQLMQNSPWLASAAVDPTDGGRDQVRYLYQLLNGEQPEEK ALSKLGNVKLTTLNHPKDQMGHDAANWI DEAI E


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

 CLESI PKNDI LASAVQQPFDMGELALEQMDNYLKGKKV

 TFATATEVKLTTIRHPKVDMGDKAAETLI QMLEKNG
EWTNFSSPSVTTIVQPAYQEGMEAADDL:MEI E G
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 P L G Q HVT PQLTTILSPREEMGRDAAKELI RRLSGKNV




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| UniRef90_L7FAF3 | $\text { ASPGET DRTRRFPSHLVV/RR }{ }^{290}$ |
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| UniRef90-A0A017RUB2 | K L L P Q A R V V T K L I IR E S |
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| UniRef90-H0HTY7 | $V \mathrm{~L}$ L D T N S A A M A P P Q F D K S NIE E F |
| UniRef90-R9NFD0 | TYEEV V ( F M $\square \mathrm{NKDNVDMY}$ |
| UniRef90_Q12GN4 | $\square \mathrm{R}$ L K P E |
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| UniRef90_UPI00035DD726 | $\square \mathrm{RHVYETK}$ K L I K E TVGG |
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| UniRef90_UPI00047C3D04 |  |
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| UniRef90_R2XHU6 |  |
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| UniRef90_F8FKD0 | K T I D T G F HWY DK S N M D |
| UniRef90_D6X6U1 | PQIVLP TEELVVRDS |
| UniRef90_R5FLY0 | VT WDAENK@LLL GPLII DK D NVNDF |
| UniRef90_I0GYR3 |  |
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| UniRef90-C6IZ69 | V |
| UniRef90_E6UF57 | VD Q P R D L F T P E L VT R E S VA D |
| UniRef90_V5X848 | P R H I R V P T T |
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| UniRef90-U2NEG2 | GDPT LVPEEFIVFP T L V S R Q SV |
| UniRef90_E4RM28 | ILYAPANLITE D NAAEF |
| UniRef90_UPI00047752DB |  |
| UniRef90_UPI00047ABF00 | VQ】K L E P S L I |
| UniRef90-D3VI16 |  |
| UniRef90 UPI0003806766 |  |
| UniRef90-W0NGZ4 | M T LY D T P A Q LFVP AV, VT A E NLK |
| UniRef90-F5IWE5 |  |
| UniRef90_UPI00046FF4B7 | TH LFHPTLV $\quad \mathrm{L}$ R HSVA Q Y |
| UniRef90_LOA190 |  |
| UniRef90-B7GGV7 | E V Q D V Y Q P E L VR D S A N |
| UniRef90_UPI000371CC7E |  |
| UniRef90-K9DZ36 | V P |
| UniRef90-J0BWQ7 | D P R VT M |
| UniRef90_G5IBA5 | D |
| UniRef90-N4WKZ7 | K R I V P HEV |
| UniRef90-N6W7R6 | V |
| UniRef90_L9UD36 |  |
| UniRef90_S0FYF5 | K NVLF S P QLIR G SVRQLEKENVTE |
| UniRef90_D7C664 | $N$ L ELLPTTLVVRES |
| UniRef90 F3PBL6 |  |
| UniRef90_D3A9K9 | T $\square$ Y LD T S V V I |
| UniRef90-R6EEV8 | Q YVDEEVFAAVK DVAKDSA D |
| UniRef90_J8TU46 |  |
| UniRef90_D5ALP2 | T T L Y D T P S ELEVVP AV V T R E N $\square \mathrm{K}$ |
| UniRef90-W7DT16 | $\square S$ S L V P T S L V K R E |
| UniRef90_UPI0002D7ED0D | R H V T I L E T ELLV $\mathrm{V}^{\text {R E S } V}$ |
| UniRef90-M4Z9V0 | $R \vee V D L G F E V I$ ER |
| UniRef90-R5IUR2 <br> UniRef90-UPI00046F4529 |  |

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[^2]
 GVVFTHYDNDYFMTVLQGILGATMERNQNVLLFTD $\square$ T
 SPPDRGNPILDQFLTSVVNAAEAH GYHVMLFPH MSVGDAMPQKTSQNWVEAEDMFKASCEEQSGUECTVQFA VALVMSYDENQFYPLVDEKLSQKLQKQ GYHVLMFDS VTVAVVTPYMANATTKYAITEQFEKYAKEK GWNVTVTDT THALIVPSVWYPFFSEFAYYVEKRDDK EDYKLLLCNS TTVGFSQVGAESGWRAANTKSVQESLTKENGFDLKFSDA ITVGFSQVGAESEWRTANTRSVKEALAPPEFNLRFSDA DLLVGLLLPEKENTRYEQFDYPFFKELTRDEGDVVYANA VGVMLPYMHHPYFSAVDEGDSKEAL RYGYQLLLFQT
VT 1 TV GYSDPVASSNA QQAVARGQEEAAKE F MT
$\qquad$


$\qquad$ $\begin{array}{llllllllllll}F & T & S & R & F & N & D & M & R & F & L & G\end{array}$
 $T$
 VG T LALML
TVGMVLPELQNPGFPAFAEVIGGAAAEQQGL G
ALVLPELDVPYFAELGRHFLLTTAEEH GRTLLIEQ
TVGVITTDSYGRFGDPVMRGAEDSLAAGEMDAFLDCDG EVLI GLI TKTNTNPFFVKMKEGAQEKATEGGKVSSFAGRF
DGTVAFLMPDQASTRYEQDYPGFAAEMKKLESCKVIYQNA QEVATKA
 A A A A LVVPN

$T$| 1 | $G$ |  |
| :---: | :---: | :---: |
| 1 | $G$ |  |
| $L$ | $G$ |  |
| 1 | $G$ |  |
| $V$ | $V$ |  |
| 1 |  | $G$ |
|  |  |  |
|  |  |  |I G G I $\operatorname{C}$ T T


 IGLI LP QFQGSYF GSLLHQAA QGAEQARK TLLVMDS


## $D L N \vee G$ <br> oul


$\qquad$

|  | $I$ | $G$ | $L$ | $I$ | $F$ | $P$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $T$ |  | $G$ | $V$ | $L$ | $T$ | $Q$ |
| $T$ | $V$ | $G$ | $V$ | $I$ | 1 | $P$ |
| $T$ | $V$ | $G$ | $L$ | $I$ | $T$ | $K$ | $\begin{array}{ll}P & D \\ P & S \\ P & G \\ P & T \\ Q & S \\ P & D \\ K & T\end{array}$


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









UniRef90 A913E7 UniRef90-SOES79 UniRef90-UPIOOO381E320 UniRef90-A5UVN3 UniRef90-1017A6 UniRef90-K0ZC74 UniRef90-M2PZY3 UniRef90-E8U1Q7 UniRef90-UPI0003B7AF48 UniRef90-1017X2 UniRef90-D5H1Q9 UniRef90-GOL5N2 UniRef90_UPIO002F79474 UniRef90_UPIO0047E58BA UniRef90-D2C7T9 UniRef90-12EWW3 UniRef90_S1SZT8 UniRef90-A4IKM8 UniRef90-K8EWS2 UniRef90-G7ZFRO UniRef90-R4L3J5
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## UniRef90_U2J4M5

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 DQDTARELTHLQLFEEQRLAGULTSPVGNVLARLRKVAAR NADFNLLVSRIEDAVTQRVDAYVLGMGDPAQMSKGLEAAQ NNSETKQTEMLNTMTQFGVDGILMSLARKTTKVDDVLRTT QQKQENQDQAI RSY円AQGVDYI AFSPVVETGWDAVLEEAK
 NESYSLEKQYVERLKANRVDGIVGSETYDEGHYEHVENVT NYDVEREDEVLERLRMKQMDGLIV VASHEVGWELFDAY TGDPAVEDEYI QMIKQNKVDGII GITYTDTDKS
HYSPEEEERLI RTYLQFQPDGULLTGTDHTDVTRTYDSA


 HDDSEQAAVALRAMRGRVDGLLVM APHDPPESLERALL RGNPAMEKFYI EMVQKKQLDGIIMTN
EGDEALEGAALAMLADRGVDGVI WFPVRDHDSSGGALE DNDKDKEREYLLSLTSQNIDGLI INGTGYNG KLLKDVL DRGANHAADYLRQARRKRVDGVI ADAADFGDHAELKDLG NNNHDMERKFLEK LTOHFDGVIIEPTRSALSNPNINNLE DDDPATTRAYLDQIAGTLAAGVIVMNTDLAERELIEVAGR QRDAGLEEKYLRMMQTMRPAGIIYTCNPHPDFQHQVEKDA NMDDAKQAADVQDLISRGVDLLVSANTQRALDPVVSRAM HEREDDEHKAVRTLLRNRVSAVVISHSVETRHFDHYKKIV RDDPDRESHHLRKLLERRVDGIIVAGRRTDPRRPLGDDLP DGDTDSQVQAIENLVAAGAKGILITPSDPQALAPSVKRAQ SADAARQQQQFNAAISQGAKVIVLDPVDSTAAASLVKMAQ
QESYKIEKANAHVLLSNRVDGVLI SMSCQTKNFEHFRTFE
 ONDPQKERKGUKKMMEDGLSGLIVEPGQSNPNRDVYDKGK EGDIGLEQQAI ASLDERGADGLVWFPVQDLDAQTV
DGSSAKQDQQiEHILQKPDDLLIVSPNESEPADAPVVDRTY HDNATGELAAVRSLLTQRCDAIML
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 DYRVENEERLLRAMLARRPEGVILTGGSHTPAARAMLQAA ADDIAKERDYMKMLIANQVDGII HWHADEEADRVELLIGGRVDGVVILTGNMTDGQILKFS DQNNHKEDQVLNTLLSKQVDGIL YMGNNGTPELRAEIV DGDNAAQVTALENMTTAGAKALLTTPSDTKAIVPSIEKAR
 DGR RDLDGETITKMSRWQVEGLILATDHHRELVP HGRTGDAREWMRNLRARASGGVILVT SDLEPTLHEEDR
 KDDTSSQRKLVEQMIVSRVNALVIAPADSKADVPVLKKAL ARHTERERELLCVLRAHRAKAVVIIGGRTTDKAATARLAE $R G D P G R E Q H Q L K A L L S R Q V D G L I V V G A R P D P R E P L S G D A S$
$G D D R K R E Q E I G G L S R Q V D G L V F Y T S V D R Q W I D E M I T$ GDDAREDALVQGMREQHAAAVLLVGGVVPDAAYERRMVG
HGKQENQDKAI RSFITQRVDVIAFSPVVESGWGPVLREAK AYKPEVEEEQIKALVARGADGLLLIGYDRDPSVYEYLK GESLADEEKAVKMLLDKRVDGLLIDCPTSRSAHAHILDAE GYDPAKQLATLQK DEDQVQALIVNPDDDPADVSQUNRMD

## N

 KHDPELEEEALNYLLNKGCRNIVMHSKAMSDDQLIRVASK KHSAEEEDFNL
NNDVEQEKK GNRSHPDASWIDGVIRRSPHGVILV FSKLTNEEHKRLD GGKPAKELYYFDTLSQNKVAGVLGITYNDDESS
H Y S ALLE E EKMVRTLLLSQAPEAMIITGGGQTKACQQLLQKA H E F D L A R Q Q S Q L E N Y TVVQ K V A A V V V C P T D S Q G I G P A A R A N

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 LGAVPLVLIGERPSGGLTDH VPVVYAFAPSSDPDDC VPVVYAFAPSSDPDDC DAGVLVIALDTPFT PPNVADA SQGIKVIAYDRPVPDAKVDF

पEPF SVTSNNYDMTFKTIN SVGVDNFQAAYRMGQ KHGIPVVFFNRVCEETDS SKVYFDNEAGGKAISE AAGGPUATPNTKAYG GNAGDVGWIGVDNYTVGYELGT ETGLPTVFTNAVYPENGNAP TPGLPTVVMDRKATG RQGVPVIVVDRKTSTEHYN
DQGUPVIVTDSDAP DSRR QRKYSRHLSNHELASLLQSDVS DSNDPCVLI DVES
NLGFPLITIERFLDEGT
DAGVPVIAYDRLAEG

ERGVKVIAYDRLIRGSA
 ITVDFAAAGALAAG
 VVDDNVAAAREAVT SVVSDERGAARLAVE EENFHNLDESSLPSVVVDLHSDTSSVVYSDNYQGSVLAVA EENFHNIQDPFLFLSRCGASYNSVSYVINNDFRGAYLAAN NIHLPIVAFDRVYAS WDLPATPIEHTVGFSNAEAAGAMVR NIELPDVAFDRYUAE RSKTPIVLAGTDDSDH KAGVMVI ALDTPTD NRNLPIVAIDRVMNEDIPD

 EVAKQQIPC ITFDNAHYPQLDAPYLGAANWSGGLAATE QLGMPAV SGPRSAA AHYQEALTSVDSDNYGGAREMVE DAGUVVNIDNKLDEGALKEKGIVPFVGPDNRKGAKVVGD
 ASGTPLVMLDR PV YARALDAAGSRLVLVGRPAPAPDLPVTVVDYDNRGGAFQA DAGПPVILTDRAVDEK DTSDYKSFIGSDFVLEGKKAGE $R Q N V P A L T A W A Y S P D Y E H P A I G F D N R A A M K L L T Q$
$V V L F D R D I S V G L D$
$V$ RAGRPVVLFDRDISVPGLD DKGVFVVTVNNDIEG TKRHCYVGSDYYNGG MPVVQCTYNDEVSG LF GFVIVERGVPGMEEQSQNLSD SVMVDHLGGAIINAVE QVK YPRFLGGVDDMDDEISQTRQPVMVVNRKLRKHQSHCVC QVKQP MMVANRRLRKNQSHC $\square C C D H K G A S F N A T A Y D$ FEDTKVPVVLTSVNTDSKKGKKYYSSVGIDNSKSAYKAVR EQD|PFIVMINAYYEENSQD LDVPFLSLDDVQSSYLATN TPTVQMETEDPGVSTDRHFSKSVPCVTSDNYTGGRUAMR QAKIPVFTADIRAKDGQ VVGBIASDNKAGGRVAGE


UniRef90_A913E7
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UniRef90_UPI000381E320 UniRef90-A5UVN3 UniRef90-I017A6 UniRef90-KOZC74 UniRef90-M2PZY3 UniRef90-E8U1Q7 UniRef90_UPI0003B7AF48 UniRef90-1017X2 UniRef90-D5H1Q9 UniRef90-G0L5N2 UniRef90_UPI0002F79474 UniRef90_UPI00047E58BA UniRef90-D2C7T9 UniRef90-I2EWW3 UniRef90_S1SZT8 UniRef90_A4IKM8 UniRef90_K8EWS2 UniRef90-G7ZFR0 UniRef90-R4L3J5
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 YRQALMEAGLPDCEKWI F PGKYFEEFGYHQAERLLALDPQA
 $\square M A E V L R Q W P G V Q \square V A Q S T G D W T R D S G R R L A E E$ V $\square V R T G$ YYEAMQQAGLHVDPTWVHRSESSFQAGYETVQRWLQWPED AMDVLKSGQTEFTQVATQGWLPKNAQDRMAALLTSTYQGD FEDTIKGNKNYHDAARADCLGQTELAMPKVQEVIKKGDSF FNDVLEEAGLA PYRREVGHYSFSGAQEATRKLFCS G AKTAVEE LNGTALVEFFDTGAMNDEAGRRGVQELDSRPVS FRDYLEDNGI DYKEIFLQEPVKDFTPYV Q
 FKEVIGE DDRFVIVRSQSGDFTRAKGKEVMEAFLKAEGG YKDKI VFQEEWIKKDGKSSEEDAKEAFTTMMRSKEK YRDCLLKHDLEVNENLI LTTNFEVESADEPTQSLLDLAEK

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

 F QDEAEKAGLDVLEKKDNTTDTASGGQPDAAALIN K K


 EKAFLDACNNRLNSSNFNVYTDDRHDTGSVEDSLFFLNNY FEKALADAGAPGDPSLVFEGSFLSPSGHDAANWLVEKYGS HRMNGLELSPNNTITYNTEEKSTKPDEMLEKILSDTNE FESGLAARGHVAKSLVVARTRDS DEGGYEAAMAL DRKH KDHVI DKAADESNDRKIPRMDSEYAMGYELTMEL LHEG ARQVFSQYPDDKVLDTVYSDWSPVKAKQQMQAMIAKYGH AREAAQASNGTLPDAHVERAMFSLEGGQAAATRLLDR YKYALQQNGIDFDPGLIVENCILQENGGDAAEELYRA YRQALEAAGLPLDPRLEREAPRYHREGARAMDALLDGPDP MAEALAAQGLEPVGHPLFGSWTEAWGRFAVAQLLRAKE
 YHAGLDKSGYP LAE
 Y $\square$ S A YQEHRDLVMLSEMVMYQSSDNMHNVFTR DES L LARP F RSGLNDEAECVFHVETAFSDDLEPTVGEADDR
FTDGLKE Y I SNDNLIRLVGNWQPESAPTALDRD DRHT $\square$ FRS I IDKASGYEIVDVRSSNISRIEAAAKQTKLMLSEH YQS GL QQTGDKLNHTLVVEGDNSMLAGYVAVQRLDLEQQ
 FDEVCRRHGVEHHAVDPGQVFYDDMNYYPVIRSA LEQY A LSEIDDGRVTVAATYDTDEWSPADAQSEMAQADQRDGK FIEAMNKSNINVNDDYVDGYFDYESGQEAMKKL LLCDD FKAALNKASIPQTDQQIVYCTDNDSMYKQVKSLLQSGHRP AMSVLQQSGQVGMDKVSTLRWDGAVAQARMDNLLSAYYSG


 GYDAFMEEFQLEPHVFHFHS TARSTALKNLEIKKILEM YRDTLNRHRIPVDAGLIVDGDFQESGGLLAVDQL LASQ YKEALA $\quad$ VA K DDYNEKFVYE $\square P \square T Y Q A G E A L A D K L L H$
 YEQTMHKHGLSPVTYTVDFSLGYEEKSADFNRIF YTKVVTQNDFEPKILEVNCDNFP
$Y R D A H R A A G V D P D E R L I ~ R V G D W W Q E S G F R H A A E D K L G L L K N ~$ YRAALEAAGVPVDDALVVPGDFQSASGFRGAGTLLDLPAP F $\square$ NAYMAHPEISYDSETVMYQSGQDMTKVLEQVARILDKP

 FRAGLAESGVDLPESSVRHGEFGRDGGYRSAAELV ADG

 YRDALRAHGADHVEELDTTGTYTRASGYTRTRDAVRAGVE FADVIKAD PKFKIVASQTGQFTRTDGKQVMETF RKSQ
 FKSRMQRDPDFQLATVLENNDDD DYAYEKTKELLTAHPE

 Y K E A L
Y K K R A Y IKALGEAKLRFQPENVFSYNTETKENLSTDLKDFDNENR
 F $\square D E A E S G G L D Y \| V Y E E P D P V M D D L K Y F G$ NFFKVREH

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UniRef90 A913E7 UniRef90-S0ES79 UniRef90-UPI000381E320 UniRef90_A5UVN3 UniRef90 I017A6 UniRef90-KOZC74 UniRef90-M2PZY3 UniRef90-E8U1Q7 UniRef90-UPI0003B7AF48 UniRef90-1017X2 UniRef90-D5H1Q9 UniRef90-G0L5N2 UniRef90_UPI0002F79474 UniRef90_UPIO0047E58BA UniRef90_D2C7T9 UniRef90_l2EWW3 UniRef90_S1SZT8 UniRef90-A4IKM8 UniRef90_K8EWS2 UniRef90-G7ZFR0 UniRef90-R4L3J5
UniRef90-I7CR82 UniRef90-D3F482 UniRef90_UPI0003B54AE8 UniRef90-A6AMQ4 UniRef90_UPI00046F996C UniRef90-R2SU46 UniRef90-W0AHM7 UniRef90_C6PXB7 UniRef90_UPI00042A13AE UniRef90-N4W7U6 UniRef90_UPI000344E12B UniRef90-R5NM06 UniRef90_UPI000375E6A0 UniRef90_Q57276 UniRef90_UPI000237CA1D UniRef90-D9WTG1 UniRef90_UPI0003707B8D UniRef90-UPI0002FF8A27 UniRef90-A0A038FV04 UniRef90-W0F3F9 UniRef90-COCUK5 UniRef90_UPI00041597FO UniRef90_Q03HQ8 UniRef90-E8RP44
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UniRef90 B6B273 UniRef90-B6B273
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 QPDDA FAANDPMALGVVDAVEALNLTGSDVVGFDGLPEA $R R P T A V V A L D D T L A I G A M R A A M D A G L R V G P D F G V T G F D D A$



 $N A \square S \square L A A G V Y G T C R A V M Q L P E E K R P$ LII AF DTVPTT




04D

$A V P D G V L S D N D T L G R A D I T A D E Q A G K P V P V V T G Q D S E D E S$
$N$
PYPDAVFVANDHMAIAAMDVRLELGLRVPEDVGVVGFDDV
SRPDAVFATNDLVALGALQQLTRSGVTVPEDIALIGYDDI
K QL

PRPTA

ERPIAVVICYNDELAI QIMDVI RS LDDLTIIPEDVSIVGFDDF

P A L D A V FA G S DVTTAA GAR QV L R A S GRR I P D DV A L V G Y D D S







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UniRef90-SOES79
UniRef90_UPIO00381E320
UniRef90-UPIO0038
UniRef90-A5UVN3
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UniRef90_D5H1Q9
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UniRef90_UPI00047E58BA
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RQTLTPGELITRDTVTE PKQVILPPRLI VR
 VNSRNVIVPCRIVERDSV

TAKMYPVKYVQ】PGVLITRE
PSNN I ITKTVE $\quad$ KTTLVVRDS
$R \square \mathrm{QT}$ V
SPTHKGDPAQLVPVVVALTKANDEE $T G N V P R K Q E E L P T R L V V R$
$\mathrm{T} \| \mathrm{I} \mathrm{P} \mathrm{V}$
1 I


EKPE E L K TE LIIRRESV
RGTGTRRTVTVDTGLVKRATV VC IY L G S K L EIRGSTV

FD GPPRREV DPFELIERESA
KENLEKDYIHFEPKLI TAEN
$M Y A V R G P E L V V R E S T$
DERPASLYNIEYTPKLITR
Y E !
ELLFEPELVVR

(VGTLCTRETED
$G \underset{F}{V} H V \operatorname{V} P G B G L V V R E S$


EMSF $\square$ PD D L VR
K VY


K $\square H R Y L G K L V L R E S T$
SGDFSPESIVLPSELVIRES
RTSVIVPVELVIR
SNKK $\quad$ PAQLVPVSLVIRES

STFDLRRERVVIPSVLI ERES
DTKTYDNGKKIVPPVSVDSTNWKQ SSTKNDHA I KVVPVALVERES

SNYVLPVKLI
T DTGV
Y 1 FPDE
$V S F \| L A Q U Q R D S T$

$A$ APERRHAVLATELVVR
LGGVIETKVELV
EYTGPQPRTVKMAAEVVLRES
GVEKLPCRLVVRGSTLST

TAGGRGDWDNPRLVKR
EEF ${ }^{T} Y K N E G K L$
TSGMRNII FEPELIRRESV
SSES IAPRKI I LPTQLI KRD
V STRFQ PLLVRRDSVAQ
GY $\square S K D T L F S S Q L I V R D S V A$
TTDGENKHVI LDTELLVERS
E Y Y
N PQDYTPQRA $\square$ LITVLIERDS
T

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lupas_21
lupas_14
lupas_28
jnet conf sol25
sol5
sol0
jhmm
jpssm

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UniRef90 IOGLY2 UniRef90-R6FQT8 UniRef90-UPIO003FEB353 UniRef90_G7LYR5 UniRef90-UPI000344DF70 UniRef90-K9DWH1 UniRef90_A6LYR2 UniRef90_U2A0Q9 UniRef90 UPI00047D7522 UniRef90-A3PNU0 UniRef90-E6WMU4 UniRef90_E0ICY8
 GYDVEQQLSLLQQ I APEDQALVINPVNDPLIAEQLINKMI KDTATKEKKYLDMCKSNRVDGIILCSG N

ETEDENFAEVERMVYGSYVDGI I LLYSRVNDRDMSFLR KNSDGVQNETLDLLSESEVDLIIVADVSENAVNMALDI

 EGNDDLENDAI NMMLEYKVRGILYSTWFHRTTDIPETL PVCDRRPPHS I IDMLRQIADGVIVILPYESDYLESMTTAH HTDPA GRDTYYYLESGLAADGVVVFDGTLPEEALATRRRP GRKDAQQQAQDQTLDAQKPDAVIETDGTASVLEPWLKKKDR


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UniRef90-IOGLY2 UniRef90 R6FQT8 UniRef90_UPIO003FEB353 UniRef90-G7LYR5
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UniRef90-A6LYR2
UniRef90-U2A0Q9
UniRef90 UPI00047D7522 UniRef90-A3PNU0 UniRef90-E6WMU4 UniRef90-E0ICY8
 AQGDFVITVNNDIAG TNRHCYVGSDYYNGGTTACA VEYNMI NTGNDPIVLLEKNFEKGKLGIQCDNYQGGCLATE PKNDPMKRFPFVIVGKPHEHDNEDTHVDNDNFTAGKEDTA Y Y LSLEKSQIPY ITMI NSYYDELEPLSLTMDDEAGGYKQTE NRHIPMVFFDRTI SDISVPGVKSNDYTQS SRNYPLVLIDRRRIKEISVPGKN ASTVVLDNLLASKKAVD READFVLVNCFSPVPGAARAVVPDEAQGGQSATE $T$
 D A Gl P L FTVDTASPSS $\square$ NVTTSDNFY I G SMDKED DPDEFLKALNQMHRQVPVVIVGSRVDGCDCLFVE

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lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
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| UniRef90_F6A355 |  |
| :---: | :---: |
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|  |  |
| UniRef90-UPI0003FEB353 |  |
| UniRef90_G7LYR5 |  |
| UniRef90_UPI000344DF70 |  |
| UniRef90-K9DWH1 |  |
| UniRef90_A6LYR2 |  |
|  |  |
| UniRef90-UPI00047D7522 |  |
| UniRef90-A3PNU0 |  |
| UniRef90-E6WMU4 |  |
|  |  |

A WDLLLQPYNK ${ }^{170}$
190
200 FRHRTERDNKDFKVQDWQK DSVQGWK A EQAQKDMESYAKG REKAFERDICNKQUVEVLEHEDDD LLAYDGTRRDLQEHPEI

 PTN【I
 YRAALEAAGIAFDPDLVLEAYPDQEGGYGATAELLKR YRDVLAQARLPYDPNLEVDGDF LRKSGFEAAQKLLALSDR




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lupas_21
lupas_14
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sol25
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UniRef90_F6A355
 DSYIFKNE IKLL T I L PVD

LTRKNESI VYEPELI IDR
T T T LESNIIIR
NLTSNNICNI KFEP LLLERESVSD SALKDECPAI ERASVAV
Q $1 \overline{V L P T} Q L I V R E S$
ATY LGGPSELVVPALLVTKTNAAE \NHTPE



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     $P R I D D G l$
    
    
     P 1 E
    
    
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