## QUERY

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 N S S L Q A A A L R Y A A R G WH V F P V A

 K A A L S A A V R G WHVVFP L RP G DK R P A I D R WEAA A T D
 P TA L A HA E Q GF S V F P L H P N S K R P V I A R WE Q H A T R D SA DII L E WA L Y CA A M GWPVVFPLVSATKRPAI R GWE QRATVD DEIL E H A L F Y H T Y G L S V IP L K P K E K IP IV E WG E Y Q K ER

S Q DVLE WALYCAAMGWHVFPLVSASKRPAVRGWEARAT ID LTSALKFARGGFPVFPVAARGKAPLTEN $N G L K$
$\begin{array}{lllllllllllll} & E & L & L & E & A & A & L & Y & Q & K & R & G \\ L & A & E & W & A & L & F & P & V & N & S \\ L & L & G & M & G & W & V & F & P & L & R & P\end{array}$
K S


PIVDWAGAAAERGWCVFPLRPGTKRPALHGWEQRATTD WALKYADIGLLAVFPLKPKDKRPATENGCKAAT DHALHYARLGLAVFPIRPRSKQPLTAHGFKDASKD NDTMKAAALDAAGRGWHVFPLRPGRKRPAGHNWEQRATTD $L L N S A L A A A E Q G W H V F P L R P H T K R P A L H G W E Q R A T T D$ DWALYLAAMDWPVFPLRPGTKRPA LKEWENRATTD
LVRYALAAAARGWHVFPVAPGDKEPPRGRWSKVATTD AALACAARGWHVFPLTPCGKRPDFTNWETNATTD STTTVDAALDAAGRGWHVFPLRPGGKRPAGRTWEQRATTD NPLLDQALNYAQEHFKI FPLKVNSKEQULKSWKKEATDD SKMLSAAVQYAENGFRVFPCVPNGKSPATKNGCKDATDD QKDLSTALAYAARGWPVLPCNPRDKRPLVPKSGGDSKAS NDKWQAVKQYYKKGWP VP LDHTPGKHPAEDLTEGFKNAS
 N S V L E Y A KL Y A S L G W W $\quad$ I F P
 S SLLEAAL DYARRGWPVFPCDPRTKRPYLAKGTGGVTKA

Q Y A L A Y A KMGMAVVFPLAPRSKRPVVMEQGFHKASTBD
AAREFARAGVPVFPCAPNGKRPLTHGGFHDATTD
E WALRYAHLGLAVFPVKEKGKAPATPHGCKDATTD
 NPMLD HALNYAQEHFKI FPLKVNSKEQDLNSWENEATED NDLLNAAHTAAERGWHVFPLIPDDKRPAVEDWENRATED SSMRDAAFAYARRSWPVLPCAPGAKTPLTTHGFRAATMD S A Q L A S A LDA A S R GWHV FP LIDPGDKRPALSDWEPRATT D
 D A AL D A ARKGWHVVFPLRPGAKRPALHHWEQRATT D S DLLA TA L GHAERRWHI FP L RPGDKRPAFPGWEDRATTAD L L NAALAVAQRGWPVFPLKPRGSFPALHGPEHRATTD $M L S Y A$ QL Y L K H G L S V DP I K Y K D K K P A L E S WK E Y Q E R Q NTLLLNA A L D A A A E R G W W HV V MALRGFSVFPLVSGGKKPAVATGFKAAT DD $M L D V A L F Y$ LA L G W S V LLYAALDAAERGWAVLPLRPGDKRPALHGWEERATDD E WA L H Y A E M G L A V FP L VCR DKVP AVVGGCKVAT T E A A L RAARRGWHVFPVRAGTKTPAVTDWENAATTD SVSMVEHALDYARHGDPVLPCNPATKQPLVPRDEDANGNP

LL NDAMSYAKRGLLQVFPDTPNSKDPDKGGTQGSKEAT


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MLEHALALAVRGWSVFPCHPGTKQPLVKS GEGGLKLA QDMMSAALVYAETGFPVFPCR NKKPITDHGHKDATTD ERGWHVFPLHPGDKRPALHGWEQRATTD
TATLREVALAAAARGWHVLPLRPNDKRPAFPGWEARATTD NEVL R MALK YAE $\square G \square P V M P L H G K G K H P \square F N G W Q E D A T T$ MKAALDAAERDWPVHPLRPGAKPPALDGWEQRATTD TATLREEVALTAAARGWHVLPLRPNDKRPAFPNWEARATTD LSAALAVAERGWSVFPLSPGRKKPPDKNWPRHASTD LL Q M A L K YA Q N GVVSV FPCVVPNEKRPATMNNGFKSASSMD
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AFLCEREDQPLPVLTHTVITGRKGTHLYFTHPAGEQLRNT






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S L RLGWE S E F Y I R L WE S E F EA L P E T WMVV L TAAALLA E Q R G A P V $A$



 L Q GE E ELLF S QLLS LN A VACMTPRN GTHFWFT QPA GEP VRCS



 GWAA A EA GE E LPP G D T L T V R T P S G G L H L Y Y R V P A G V V L R I T K E IM E P Y I $\begin{array}{lllllllllllll}\text { E } & \text { W T } & L & D & R & L & K & A & E & L & L & P & P \\ N & S & L & A & V & R & T \\ N & M & K & K & L & E & K & T & Y & G & N & L & P \\ K & T & V & N & Q & K\end{array}$


 GNIKHNGFIELLPDTLSQTGGGGRHYFFRSSEGGA KDS A AAEANGASGFGETFTVATPSGGWHLYFTRPAEAERRNT $H L A L L A E A W G E A W P H T F T V Q T A S G G W H F Y Y Q Q R M G R P R C R T$ TWLREWELDEGTLDDTCRTVTGRGGYHLLYKTDREVPCSDN AI NRAHDAGKLGHWEVVTRTPSGGAHLIYPATPATQQRSW TLKEWQKEHGDLPETWISDTGNGGYHYFYR DTAANKN TPDGVDSFTADCPETFRVRTPSGGVHLYFTQPPGARLHST K EVMEPY VEKFPKTRDVRTPNDDWHFYYYVDKD DPCQ DN A WRAESAGQAYPWNTHTVVTGRGGEHLYFSAPTGTELRNT
 GLEELESEYGVLPETLKAKTPSGGFHYFFQHPGGR A PDGAANFGALEPATFRVRTAGGGEHLYFRAPAGVRLRNT Y $\square$ KGKD $\quad \square A P T P C V K T K R \quad G E H Y H F K H P G F T I Q N F A$ APDGAANLLALCPTTRTVRTASGGAHLYFSAPDGAHLRNT EADGRDGLAVLIDPTYTVTTGRGGTHLYYQHPNGPALRNT P LLCA EAGQQPPLETFTVTTPSGGTHLYFTAPDGDELRNT

 TPDGVTSLQALCPATYRTRTASGGHHLYFTAPPGVRLGNS S LAAFEAEHGALPPTDTCTTPSGGKHIYFVHDGSMSVKST | $A P C G A A T F E A L C P D T Y R V R T A S G G M H L Y F T A P P D V R L T N T$ |
| :--- |
| $A V R D$ | TPNGVTTFTALCPTTRTVRTASGGVHDYFTAPPGVRLGNT VLRDWQNKHGKLPETWQSITGRGGYHYFYK DAIVVHN KFRGARNGADVLPPTFEVITPH GRHLYFDAPPGIEVRNS A WE WVTAAHGDVPTTHTHITPSGGLHLLFAYPESITITNS SLEVLEDTYNKLPETLTVKTASGGRHLYFKLPEGVELPQK

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 ARHGAEVFAALCEDTYTVTTGRGGTHLYFRHPTGAAQRNT $A L A A L S A L P E P A P S T F T V A S P H G G W H L Y Y T A P V Q P E L S C T$
$G M L X E W E T N Y G Q D Q T T T V Q T P T G G L H Y Y F R G Q Q F D P C D$ DFADDP LLGDKAYSTW】TKT AVLADEHGQQDPTQTYTVRTASGGYHVYRDDVDKGVFFR RWNREEEAGQPWPETFTVATPSQGKHLYFRAPAGDELRNT


QUERY
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 TTDLDE WALY L A L LMGWHVFPLRPNSKTPTGRTPEQRATTD
 VDYPLAAARRGWHVFPLAPGSKRPLVK WSRAATAD DAARHYVSLGVPVFPCVPGEKRPLVAHGFKDASTD ALEYAALGWPVDPLHSPGKHPRTKNGVKDASSD DSALDADQRGWRVFPQAPRSKRPA!TRWEQRAT LDD DAATLFARAGVPVFPCVPGEKRPLIRHGFHEATSD MMDAALKYAEANIPVIPLHSKGKHPLYTGWYKNST
 DPMLDVADSYQAQNWPVFPCRYRTKTPATSNGFRGAT DLFEWAKHYQEQGFSVDPVNPKGNKDSAVEWKEFQQRR NPLLTAALGHAERGWHVFPLRPDDKRPAFPGWEPRATTD DAALSAAARGWFVFPLRPGSK DPA TTRWQQQAT DD A A MLLAE GGVPVFPCAPGGKTPLLIRDGQGFLDAT $D L L A A A L D C A G R G W H V F P L R P D A K R P A F P N W E E R A T T D$ VLT E GLR R H R LG G S L LP L HYKQKKPAVRSWKRYQTTR $M L A S A L R Y A E R G M F V H P L L V G A K E P R W T N W E E R A T R D$ ND ILTAALDAADRGWPVFML GRSKRPVANCTCHGFYAD ARELAAAGVPVFPCLPGGKRPLTTHGFHDATTD AA GRFTDAGVPVFPCVPDGKRPLDEGGFHAATAD I LEAALDYHHRDWSLIPI QPRTKVPACPSWKPYQTER NELAEAAVCYAERGWAVLPLHSPGKHPLTQHGVKEASKD ALD YANKGWSVVPLHSKGKHPRTQNGLKDATT MMDAALKYAEANDSVVKPLHSKGKHPLYTGWYKNSTAD MDAADRYAARGWPVLPLHGPGKHPRTARGLKDATTD ELLLKAAEEY LLREGFSVIPVDGRSRKPALVDWKKYQLSP $N P L L L A A L D Y A \emptyset R G W P V F P C S P T T K Q P L T R K E D G G L H L A$ EHGWPVFPLRPGSKRPALHGWEQRATTD EAALA $\square A S A G \square P V F P V A V A G K Q P V T R H G F H D A T T N$

A A LIE YAGRGWHVFPCSQAGKHPRTRNGVKDATTD $D \square R A D A D T A A D R G W P V F P L R P G D K R P A G R T P E Q R A T T D$ LDAALGYAARGWPVFPCNPKNKRPLLGKDRDAQKKA ERDWHVFPLRPADKRPALHGWEDRATTD
AFSYAVKGWPVFPLAPRSKKPYRDSRGLLDAT DRDDAARELARAGVAVFPCVPGEKTPIVASGFRRATTD ELLTAA $\square$ RYAERGGYRVVPPCAPGNSTPAFTDGWFERAATTD A ARELVRSGVPVFPCVPGGKRPLTEHGFHDAATD DMREAALA WAARGFKVFPDAAGTKKPLVADFPAVATGN DAARSLASAGVPVFPCVPGEKRPLTRRGFHDAAND
$M V E Y A L H Y Q K \backslash G F S V I P I D K T S K R A V T K \quad F K D K T$ NEKYEGALRGAKLGWAVIPVHSTGKHPIRGGWQNGP A PLLA SAATSAERGWPVIPRHPRAKRPAGRKPEQRATTN TTGMVRHALAYAARGWPVFALAPRAKVPLARS RGHHDA
 GVPVFPCVPGGKRPRVEHGFHEATTD SDRLDTALY LIARHGAKVFPLHGVGKHPMARLAPRGLINA ALHTALAGHHVVPLWPRSKRAVFPDWESAATTD E WALALAAEGLEIIPLRNGTKLPAIXEWPAKANNN



 Q A A L S YAR RGWPV FPCRERDKAP YGGS GVKDAT R D DKLDYAKKY LS LGGLLVFP LQENTKS QVVTS WLDEAS K D


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 SLAALEAKHGPLPATLEQRSPR GRHLFLRSNHDVKK SAN
 SDEALEDEFGKLPGTLISQTGGGRHHFFSRPEGGGUSS Q ICGAGVLRNLAQPTYAVRTPSGGWHLYYRHPGTDDAGGL GFDGLAALPPLPASRTVRTPSGGAH1YLRDPSGLRVQNS SWQQATEAGLLDGWAVQVVTPSGGLHAYYPAAADEQR ESLEELKRHTALPTTLSANSGGGGRHLFFRCPEA QRTDG ALLAARAREPDPVDTLIVATSRDGQHRYFRRPPGTTLRST GFAGFNRAHRVAGWEVLVRTPSGGMHAYYPAHRDRHQPSW TTSADEATHGKLPDTVTAVTGRGGRHYVFKYPQGRSTPNK EIKQ RGVEDVGPVVKTG KGWHLYFRHPGHPVQNA DWGGATTGWEVLTDTYTVATPSGGHHLYYRAPQGPELRNT GPDGAAHLLRALMPSTRTVRTPSGGAHLYFPAPLAARLHNT EVLAELALYGKI DDTWIVETGKGFHYY LKVKNPDPNKFT EWAGALVGMDVFDHTYTVTTGRGGTHLYYQHPPGPDLRNT GPETMLRLAKSMGETYAVSTPTGGRHLYYRDPDGGLLPNT APCGATTFKALCPATYRVRTAGGGSHLYFTAPDGARLTNT
$A F V R A G A A G L V G W G L L V S T P T G G Q H A F P A D P G V E Q R S W$ AFVRAGDAGLVKGWGLLVSTPTGGQHAYFPADPGVEQRSW QWAA SFSELAAKLPTVET SRGRHVYARABDFAARRR DSLAARTPGARVTPTLTVRTPSGGRHLVYRAPAGVAVRNT SLVALQKKHGPLPATRTV TTPSGGDHLLFTYPEGMKIQCK ASLH HLVNEGLLPHTLRVITGSGGLHLYYRHPGQP GYRAFDHAHRVSGWAFLVSTPSAGMHAYYPATPDRDQRSW SFDRADAAGLVGGWEVLVRTPTGGMHAYYPATPGVEQRSW RWA AE SLYELVKRHGELPETVEQITGSGGRHLLFRMPEGRAI DSLEELDTNERLPDTVESLTGGGGRHLLFKCRGD



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QANEA }\square\mathrm{ YRF L EMKSMNRKNDE VEEG DYQGKR
E
KRPYTANCN\squareYDVLASVPADPL G DE DLIDRGCLQDLGGEV|
\squareT E LGGT D P A H P पD A G R L
N K
GQA DTP\squareA A LP E S पA D D
                                    Q DDE PNE DELLAS A P D WLLE RAR
LLDL|AT GDVHP\DAGALREFGDPRPVRSS WER
```



```
        VT CHRP\A DL\PE WLT \PPPP LLLRDQPEQP\D\LG
    HKPEE E\AELT WEEYQTLLSFD EGKKRT\PR
    L P D WLDA T L LT PA P L P P
```



```
DRDYR ENRANRVNPDDRADLATELDPKKPKTLGTQV
VDETVP\squareAPA PAWLLEEFAKQGTTR
```

            \(\square S\) SHPDNT D \(\square\) AD \(\square\) PKW W
        K DHSPFDRTPAEAPE
            FVNKPEKTAELSWEEYLT LLRTL ERNETL
    GRAYTWCPGPEDGLSPPTEALL
ASTPAWLLS $\square$ LQPAPRA VRAP
HGDADVEPVEAP
G $\square \mathrm{E}$ GANGVIAAAPAWLL

LQSTG LVEPSPVDASRLRNFLD
KDTDT DAEAPKEII D ILKSEQK
EGGYRFESDPETTA APAPEWLLELLRPKANEQEAEAV

$G D \square R A G Y V L A G G V D Q S \square R A V D A K T \square R D F \square D$ VDHHPDDVPPAEMPD

GGTYTPVWEADPQ P $\square P G W \square A V L L E$

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S

AK R $\square$ A A WLE G

| $A G G V S$ |
| :--- |
| $P R Q A R A$ |

V

A P G T R

VA L L K E
R K

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 LA H A L R A A E R G H P P V MLS QALAYAEHGWSVFPLV GKTPAIPRGHGYHDAT RLRAALGYAARGWPVFPCEPDGKAPLGALAPHGVKNA R D WP V FP I R P GDKRPAGRTPEQRAT LD
$D L L G A A L D Y A R A G V P V F P C V P Q G K A P L T H Q G F K D A S T S$ A A MSVLD YGL HVGP LRAGEK LPPLLKAWPERASR
 MLE HALLKYAASGKSVFPCMPEDKRAAAKRWEGGFKAA DAARHYVLLGVPVFPCVPGEKRPLVAHGFKDASTE LL LAA LDAAGRGWPVFMMGGRSKRPVANDCPKDAHAP TDRGNLAVSYAKKGFKIVMLHGSGKHPIYSNWGKKATT ECGWPVFPLRPGDKRPTGHRPEQRATTD E RGWP V FPLRPGDKRPAGRTPEQRATLD
$P L L N A A L R Y A A T G L A V F P L R P K T K T P L I S R G G R G F H D A$ AL A WA EA GIIPI FPALAESKRPHVTGWQDKATTD LMAAAALDCAARGWHVFPDRPDAKRPAFPNWEERATT D NPKLDAALDYASRGWPVLAIM A GTKMQPAVNGGPRW NAT A A GE LA RA GVP V FP CA PA GKRP IPER GF HEAS I D
 NPLLAAALDYAGRGWRVVPLHAQGKHPRLKAWQKEASAD NDML RMAI S Y VER R D WAVFPVMPNGKHPLVPNGVK DATKD $T G E L L S A A I Q Y A E S G W P V L P L Q D G D K K P Y$ G G G F R R WREEA

 $G V P V F P C V P G A K N P L L K P D E E G F H T A$ LL H A A MEYAERGWPVFMMAARSKRPLANCERHGFYSA

 QEYF D R GFSSLDP LK N N S K VP A $\quad$ DR WK K Y Q Y T K A L WY A K Q G WS V FPLAPNSKQP L LR Y G GRGLH DA AALRYAAE WPVF $L$ L $\quad$ GGRNKRPVVNCPPCRAADP LQTAKELAEEGWPILAANSNADBLHRWGETQ TEMVE HALA WARRGFAVFPCNPDSKRPLVPRDKDEQGKP

> LVNYAKSYASHGFSVDPDV NKRPLI K FANRP
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> $\begin{array}{rl}D H L Y A \\ A & A \\ A & H \\ L & G H\end{array}$
> A H E L A R H GVV V FP CAP GGKRP DPDRGFHEATN D
> A A REFADA GVVPVFPCVPGGKRPDTGHGFRDATTD
> LT A A QWCARRGWPVHPLAPGRKTPAANRWCHGFHAA
> RAAHAFARTGワPIFPCVPNGKQPMSAAGFHDAS

EAACVFAAS GVVVVPVAVGGKQPDTRHGFHDATTD $M L E A A Q Q Y A S Q G W R V F P L H G P G K H P I T A H G F K E A T T D$
 $L T H A L V A A G R G Y A V I P L T A R A K D P A V A S P H H A D H D A$
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 S D S ML LA A I E LA GRGWPV FPCREHPKAP YVRGGFKSAT T D
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 A A A T L A N A G I P V $\underset{P}{ }$ F P CVVP GA K QP L T A H GF K S A T
A A R S L A A A GVVPV FP CVVVE G K R P L T R R G F LDA A S S D TPILTAALDAAGRGWPVFML GRSKRPVANCCRPVNGQP N E R A K L A $\operatorname{V}$ V GY A K R G F K I V I L $\quad$ H G S GK H P I Y K N WE E K A T T

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E A
E
$79 C 109$
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PA


DNA T T E WWRE WPD A NLGVAT GET
NA $\begin{aligned} & V T \\ & 1 \\ & \text { I S S W WWTRK WP KA }\end{aligned}$

NI FMQWLQKWPWANVGIVTGNIDSNLLI LDVDGGEGIDN
RTEQWGEDYPDANI GIVPGAASGVMIMDCDLRHGAN
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VD
DVYYWFQQKPQS
QVSEWWRRWPAA PTISKVKEWWLKKPWANNGGIPTGVSGVEAVDVDVHSGFP PT RDEVTQWRGKYPGCNWAVVTGKVSEVVVLDMDGPEGEA荷TQEDIKRDWTQAPHC DG RVEAWWSRTPEANLGVPTGAVSGMVVVDVDVHDGRQ P DQVLA WWEHRP YNIGGSCRAAGLLVVDLDVPHGRD ATDPALRRMFAAAPWATGYGUACGPHHLVGLDLDTKNGAD RDPEQI RAWWGRYPNAG DGLPCAPNGLAVVDIDPRNGGE TTDPRIAAWWRYCPEA NVACATGAPAVDVVDVDNKPDGD
 PA QI HRWWQWQPEANIALVTGARSRIDILDI DVHPGGD SLDELSDWDEENPMACNFGVATGKQFLTVIDVDKPKRAG TTDEKI LFWWQRWPDAA IGCPTGPALGAWVLDVDEPDGRD PA HVETWWMRWPDA NIGIPTGPSGIEVVDVDVPRGPA DTPARLAAINNAVPGGQLAVRTGAVSGLAVIDVDPAHGGD

RALI ERCWQHAP
 $\stackrel{L}{T}$ T D P
 PT DQLRRWWRKWPDAMPAIPTGSRSGVAVLDLDRKNGKD
 PS RVEAWWRARPAANVGIPTGAVSGLVVIDVDVHNGYA PTEEELREWWEKWSSANLGLVTGRVSGVVVVDLDGEDGVR S IDDQVEGWWRSRPTANIGIPTGTASGLVVIDVDVHGVNG PA QVGTWWAAWPEA NVGVALGPESGVVAIDVDTKAGE ST DNKVKEWWTKKGWANNGVATGKMSGFFV DDVDGEKGKE STDPDLDR RWWADGKPHNIGIAVPRWYLVLDVDPRNGGN CADGQVEEWWARWPNANLGGPTGSASGVDVVDVDAKSGFP ANDEEVDT WYVTFGEPNNIAILTGNKGLVVIDDLDDDEKMP
 P DQIRYWTSARYAGCNVGIATGPSNLVVVDLDTRKSPD
 TTDPQVREWWTKYPDAYNVGLACGP

## 

「 $\frac{L}{T}$ ATKEEVDADWTKHPTAS GVGAGQT PA
$\qquad$ NMDP GG

## 

 $\stackrel{\square}{\mathrm{S}}$
## 

G A T
ALARWFGGTGFPRNIGIATGA
ATVDEIEAlWKRYPFAK
TADPAVRRLFAAAPWATAYGI ACGPYHLGIDDTKHEA TSDPRVRALWRRWPSA NVGLACGPSGVWVLDSDGKDGEA TREDEQSTWLTAHSNGNGGLPLGGA DDII EKYWNRHPNALIGVPTGGV 94

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120
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 SLAVLAALRGRPDPTLRVRTPSGGLHLWYTARPGQEWRCS EWDGVDVFADLWSDTFTVTTPSGGLHLYFRAPVGSRDRNR AFRRATRAGLLPEPDAVVTTPTGGRHLYYPTDAERE RRSW AFGRAQEAGLVDGWQLLVSTPTGGMHAYYPATPGGGQRSW $T W A V L A A L R G V P S P T L R V R T P S G G L H V W Y R A G D N R R W Q C S$
$G F V A F E R A R E V D G E L A R V R T P S G G M H V Y F P A P M F E P Q R C W$ $G F V A F E R A R E V D G E L A R V R T P S G G M H V Y F P A P M F E P Q R C W$
$A L D A D R A G L L E G W E L L I H T P S D G G H A Y Y P A T P G L V Q R S W$
 RWAAERRVGESVTPTYAVRTGRGGWHLYYQAPAGVRLTNT ESDKDLNHDEWFKDTLTEDTAHGGYHFYFRKPKNEEITQN GLAAEEHHVALPPTVTVRTPSGGHHLYFSGPPSPPVPNS

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 GEATFKKLGYDDPETVQTNTQSGGRHLLFKYDSSIPQQSK GMKSYKRLKGAVIPTQTQRTASGGLQLFYRKPKNADDKQL SLEALQEKIGRLPETLRVESGRGGTHYYFRHPGIP GLLREWEHARLIPKTLQATTPSGGRH|YLKKPQGVSMAQN RGLATLVADGLAPRTAYVITGSDGLHLFYRHPGTPQLRNT ALEQLKGELGSIPDDVVQDTGSGGSHICFRYAGPECRST ALQQLKQEHGELPRTWSVLTPNGGHFYFKHPGGDTLRSY | $H$ | V |
| :--- | :--- | ES KKLNHDEWFEDTLTERTAHNGFHFFFTKPKDMK】SQN A S L K T L V $\operatorname{L}$ A Q G L T P P T R Y V V T G S G G L H L Y Y K H P G P H T K I L AFNRAHRAGLVDAWELLVRTPSGGLHAYF SPAKAEMRSW AFQRATDAGLVDGAGLLVRTPTGGAHVYFPATPGREQRSW E SLS ELVAR QLVPRTLWVRTGSDGAHLYYRHPGLH

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】A D D A VY R F LD G P K G N K G Q E S LH

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G D

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 WGT

A GYS $\square$ T A G G D REPRPVDATALRDFLDPRPE
T T PHH

VE QLAA A


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WAD
RGHDLIEMAPAL


WADEST
K Q G L P G $V E T \square P E P \square N P \square T E E H A K A \square R R$
GCDDAAEAFAP
AELIRFLAREAERR

VESMAT RPVALLDAQQLRDFLDPRPK

A G T Y LP VGE VR QPAV
$\square P T W L A Q E L E R T G$

TDAEVP DAEAP
$G L P Y T A N C E L L D V \square G L L P T D P M$ DFEKNDRDADEAAGVKL AEHH PLRGAPVAPLPEWMAARLAKPERKAARP NGFDPS $\square K K \square G P I P D K \square K A D L M G N K \bigsqcup L I P E G Q R$
W\PGALSSLTVGNVKRLAAKPAPSVARFDGYKN WD MVHSPTSGEMTEAPLELDNVLRE
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GPACSPDEVALAEAPQWLLERLRRKG
GKPYTANCHLLEVIGSDPALPRNVESSLREALKAEGDEL APP QGLLDLIK DKQKMPPTLVAEVLQGMRRRTKT
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$\nabla A D \square A A$
GCS $\square$ DEVE $\square$ A E P D E WLI NLIT F K E $\square$ P E V I E E

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UniRef90 G2KQ16 UniRef90－G2GJA0 UniRef90－F4A0E6 UniRef90＿X1SM18 UniRef90＿UPI0003625D20 UniRef90＿UP100035D6D7C UniRef90＿G6X027 UniRef90－A0A022LAJ9 UniRef90－W7VKH0 UniRef90－D9WZ12 UniRef90－UPI000365C9C7 UniRef90 X1NET4 UniRef90＿UPI00037BE4FE UniRef90－H5Y6B0 UniRef90＿UPI0003605F24 UniRef90＿COVRQ9 UniRef90－A3WYY3 UniRef90－B4VAU6 UniRef90－X1G581 UniRef90＿UPIO003801CFO UniRef90＿U5VV30 UniRef90－UPI00029AA99E UniRef90－Q82FN8 UniRef90＿UPI0003B38317 UniRef90＿UPI00035E830D UniRef90－S3Z9W4 UniRef90－G4HZHO
UniRef90＿G5KEQ6 UniRef90＿UPI00038294D8 UniRef90－UPIO003652DCC UniRef90－UPI0002E6ADE2 UniRef90－Q8GR27 UniRef90－W9GGV5 UniRef90＿X6ZSR7 SSDPATAARQLAGAGVPVFACVPGGKRPALPGSRGFLDAT LTHALLAAERGYPVIPLTRTKLPALRSPHHGVHDA LI QAAFFYADKGWQVHPCESQGKHPRRDRWQERATTD GWKVFPADPDNKKPLIDEWQKKASNN $\square A T A K W C A R Q G W P V H P L A P G R K T P A A N R W C H S F H A A$ DVACWLA WHDFAVFPLRPHGKRPACGNGRCTPHEA RGWPVFML GRSKRPVANDCRDNPHDP LTAALAYARHGQPVLPCDHPGKHPLLDRHGLHDASTD LECALAAARRGFPVIPLS RTKLPAVRSPHRGEHDA RGYPVIPLT RNKLPAI RSPHRGRHDA RFEYALKYAALGWPVLPLRSAGKHPLL QKGLLDA QLLEQALLYAAYGWFVFVLSA DKDPLRNCPRCRAGAE FRFVLVKAKDKGPIEKDWQKGANYP LLTAALDHAACGWPVLPLRPGGKRPALHGWEQRATTD KLEAALFYARDNDPVVPLHGPGKHPGLNGGPYKATKD MVDYADNYQKMGYSVI PI SRSGKTPALIRSPHHGVADA SPDPRTVAHWCAQSGWPVHPLAPGRKTPAANRWCHGFHAA $\square G V A L S L A A R G L A D V D P L A R T K L D P A L R S P H R D A H D A$ AAVAYARRGWAVLPCAPGAKLPLLPNGFHGASTD EYALQYQK LGFAVIPDHPHKKRPLI EFADKP RTEF DQKYLDRGFSLI PLKNNSKVPAI R WKRYQNTK ERGLSVI PLS RTKLPALPSPHRGVYDA NE LLESAQAYHENGIQQVIPVKSGTKKP EGFWKQYQEKY MI DLALSLATAGTPVFPCRPENKRPYTSNGFKSATVF MVDYALHYQKLGYSV $\quad$ P DDKKSKRA DTK FKDKT SQS LREAATAYAVAGWQVLPCHPRAKSPMLTHGFKDASTS QSLLVNAKQYAERGFSVIPTD NKRPLIKFADQ K K ALWLAARGMPVHPLAPGTKTPAGNRWCHGFHAA YVHPLLVGAKEPRWLD WEARATRD QAA $\square$ AFARRGWFVFPCNHRNGRPLVTGGGLHQATRD EHA $\square$ A RGWHVFPLRPHAKRPAFPNWEDRATTD R R DAAMTYVERGWHVFALSAGKSPLCPTCRTGAHRA
 EAAADLAARGLAVFPLPPGGRRPTGPWRTQCLTDP DYAEAYARNGWYVLPVHPGAKRPQTRHGHKEATRD $\square M N F A D A Y A K K G F S V I P I S P E S K R P L D K$ PI FANDP DAALAYAQAGFFVLPV ARGKHPVGKGWPDKSTTD
$\square D V A S W L A G R G Y P V H P L A P G T K T P A L G R W C H G F H A A$ EAALAYAQAG $\square R V \square P V S R G T K S P A G G A W Q H R A T T D$ NGRLLNAAIRYAELGYPVFPCVPGGKVPLTQHGF

MLDAALAYARHG $\square P V L P V R P G G K H P R L R$ EYALQYQKLGFSVIPINPKNKMPLI HGLTEA
PVLEAALAALERGWSVLPVANEGKKPLAPSWEADQRER $R$ VALDAAAAGLFVFPVQPGGKLPAVRGWEQRATRD TPTLAAALEYAARGWPVFFLGRTTKRPVANCCHGFYAAS NADKSKAAAYYARLGWPVFPLKPGGKAPLTPRGFKDATCD

AALDYARRGWEVHPLKRGDKVPATRHGVLDATSD
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 EVVTAANR AARGGWAVFLRPNEKMPADASPHHGAHDA DLLTAALRYAAHGWPVFML GRSKRPVCPACPRADEDP
 EYYQKGYSLIPDKHNEK\PAI R WKQYQYRQ
 RGLRVFPCTPRGKTPAVARGFRAATTN APAYREAGFPV TP LRADSKAPAVTSFPSFVHNP
 $\square R \square A R W C A S N G W P V H P L A P G R K T P A A N R W C H G F H A A$ $L V N Y A \square Q Y A K K G F S V \square P T V \quad G K K P L V K F A D R \quad E P$ NTVLVEAKNY五NDGWHVFPVHSAGKHPRIDPGLKGASTA LLESALAYARHGDPVLPVHRPGKHPRLRHGLTEASTD VVDARWCAEGGWPVVPLAVGRKTPAGNRWCHGFRAA QAALQYARQGWPVFPCRSRAKSPYTATGVKDATTD LKAALYYTGWGWPVFPLRDGEKRPACRECFRFKDAT DALNAACAYARAGWYVGPVKPGTKHPLGRGWQSKTTRD

EAAEAYAKTGDPVVPVRPGTKHPGGQCWPQRATTD
DLLTAALDYATHGWPVFVLGRSKRPLANATADRGHNP
$Q ⿴ 囗 十$ Q $L V A A G U S V I P M M P G S K A P A V R T W V Q Q Q T R A L$


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 ATPERVAQVVAAVPDGQLAVRTGAVAGLVVVDVDPAHGGN
 STDPTIRAMFATAPWATGYGIACGPHHLGIDLDTKNGAD ATDTKLNAWFKKWPKANTGIRTGAASGFFVLDVDPRHGGD RHDPEIAEMTARHPDGMLAVRTGAPSGLVVVDVDPRHSGH CGDPKLSKHLGK DGNYGILCGDKGLAVIDADSPEV P DRIRAAWAAGPFNVGMATGPAGLLVIDLDKPKSSAD


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 PHV LRRWWSDWPDALVGMPTGERTNVWVLDMDSYKGAT FSENEIRRFWHEQPDA NITAWRTTDFFVIDIDVSTENGY PSEAVAAWWEQWPTALIGLVV DPPGAVVVDVDPRNLEE TTDAEITRDWWRQEPGAFGVAVSCGKAGLVVIDVDTRSGGD PTEEVIERTWGRAP FANIGVACGPSALVAVDLDVPHDGD $P$
$A T$
$P A$
$M T$
$A$
L $G$
$P T$
$A$
 PAEDRVAAMFAGHPDRLLAIRTGKVSGIAVVDVDPPEGLD MTAEEIEKFWTNNPQA NIALKTDKFFVIDDIDVHGANGFE A RVREDWR RTAGDNVGVGCRASHVVGLDLDVEGDGQ
 TTDDRTLRAWWETEPGFGIGVACGPAGVVVDDVDAHSGFD VT RVGSWWTQHPDA NI GLPT EGLLAVDVDGDDNPW ATPSEIENFWDGYPNANNG ATGTTNFVVMDVADIDSVE ATPSEVENFWDGYPNANVAVIALKTTNFFVIDDDKHNGF RAQICRWWSGDESAFNVGIACGPSGIVVIDLDTSEPLD

 TDVEK: K GWFEHVPGA NLGG RLDQVKLLVVDVDRHGDDD ASTABKKFKQYPSANVGG1 P PTGTFVLDI DGSAGKE TDARIRELFAAAPWATGYGIACGPHHLIGIDLDTKS GTD ASREELDAWSMNFREP NIGALTGKEGMVIDVDDPSKGP TTDPRIDAWWTATPSAGVGVACGPAGLVVIDIDAHSGFD VRDEALKOWPDDM QGNVGLFPGPSGLLVIDVDVKKGKE SRDEQNAWWGTYPGAN GA TPPKGVVVIDIDPRNGGH THDQEACGCLTCHGRGQLALRTGTAAGVVVVDVDPAHGGA PRLDEV WWSRWPEA NVGLRTG GI AMDVADIDDSAE ASREEI LAWSMNFRDP NIALDTGLK LVVIDVDDPSKDP SSDPRIRELFAAAPWATGYGIACGPHHLIGI DLDTKSGTD PATKRRYWTD PERNDAVPTGASSGFWVLDIDGEKGAA T EQVAEWWSKWPYA NIGI RVVPEGCLVVDVDPRNGGL A PRADQAVWGRYP
 LS QUNWFGGEAPLSNIGLVTGGSNLTVIDVDDKFGAE TCDER RWWRSAPEAG VGVRGGPAGVVMDADHNGY
 TDADTVRQWWARHPTANIGIATGVA FDAI DVDVPEGTP PQD ADTWMDHPDAGVFLHVGRSGGDVLDVDTPDNDP
 ATPDRVAAlVTAlPRGQLALRTGTDAGVVVVDVDPGHGGA TADPAVRALFAAAPWATGYGIACGPHRLIGVDLDTTSQQT PSADELRSHFASRVRG VAVDCGADGLECLDFDQPGVFE VA RVVEAWWARFPSA NIGMPTGAASGVVVVDVDVNGYD VA QVEAWWARFPSANVGMPTGAASGVVVVDVDVNGYD
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120 ALRRAREAGLLPVPLAVVRTPSGGMHLYYPASEVVEQRSW SSAALREAALRIPDTVVVVTPSGGRHLWLTGPPDVVVPNS NFD NFD ELKQRVDIPDTFRVIT GVHNFIAEGFKIPTTAGAHTPSGGFHLYFNSGGEELPNS TVAVLAALRRMPSPTLRVRTPSGGLHVWYRVGQSRSWQCS
$A P A A R D A E Q V P W P D T L T V R T P S E G R H L Y F R C P E G L S V S S D$ DSLAEDVTHQLVPRTLWVRTGSGGAHLYYRHPGGREIASR
GWHGFRHLRDEIPAGPQVRTGRGGRHLWFRTGFGNRVG GVTDLVDLAARWPWTRTVITPSGGRHLWLRGPAEAVVPNS GLTALRFLAEPIPPTVTVLTPSGGRHLWFTGPPSPPIPNS ALEQMKRELGPIPDDVVQVTGSGGSHICFKYAGQECVSTT RSLGKLEQAGLLPGTVQQLTGGGGLHMLYRHPGHHVKSRS TPCGVTTFTALCPTTRTVRTASGGRHLYFTAPAGIRLGNT TLSNLDRKNGGFDQTNVASTGSGGLHELFQNERGVKNKVR ARAALRELALRIPATVVVLTPSGGRHLWLTGPPDVVVPNS TLAVLAALRGTDEQTLRVRTPSGGLHVWYQAGPGRSWLCS A WA EDMAKEGASPDGPLVATPNDGNHWUFRQDG SLGNG GFATADALGVPTDTLTATTGRGGCHRYFVVPDGAPLITS ELMKVL PEI NKTTRVITKR APAALRALRFTIPETVVVLTPSGGRHLWLTAPPDTVVPNS
 NTAWKKTI RDI WNETWVGNSASGRPHIYURTP FPLRSR E ADLLHDLPP TRTVRTRSGGRHFYFHHAG LGNS ESLKEWELSQYIPKTLTATTPSGGKHDFLKKPKGDEL GSNPSTVLDDLLPDTLTSWSGRGGRHLWFAAPALPEGRRW

 EQTGEVLREGVLPD
$E W A G A R D G G G I I D A$ SLAGNEHLGNGITATYQQSTGRGGSHLFYLHPDGPPLGNTM TMRDLMA EGGLPETCAQRTGSGGWHLLYEHPGGYVM SMKKWDGDKYUTP TLQAKTPSGGKHIFYFKRDDMTIGQN AVLAALAAGQPWPETLTVNTPSGGRHLYFAAPEGCTIGSF ESTKALHRPDWFLNTLSEKTAHNGLHFFYRKPKNMKMTQV ELAWLRTGIVQFSRAESVGSERGHYGFFTTGDEIFRSG TLA LLAAYRSRPNPTLRVRTPSGGMH $\quad$ WYYRAPGGPRLRCS PAWLQKHLDSTVFRCSDTLDPTHGGHYFFALRDGQRFGNS GRHGLRHLGGVLPGGPQVRTGGGGWHFWFPRKRDETPLGG ALLK QL NLQPHVRTGSGGFHVYFPHPGWKVQT LDN GCGGATTGREVLPDTYSTMTPTDGEHLYYRMPEGVELRNT VDTALMPPTYCVRTGSGGWHLYYAHP GRPVGSR QWDALAADPNLHVYGLAHTASGGCHAYLLPEEGPDKNGV ELDRLVAQHGPLPQALTHYSGRGGRHLFFQCPPGYGKLT GVQTLKRLNELPSDTY EEQTPNDGLHYLVFKLPDKLDMKRR SYNSL SSAALREGALRIPPTVVVLTPSGGRHDWLTGPPDVVVPNS ELFR RKKLDEAEKTTKIKTKRCFHFYFSNNG KHKDR
 TMKTLQEEHGKDPETLTVKTPSGGWHLYFQKPDDKHTGNN ETWEALTRYRELPETLLVRTGSGGHHFWYRLPHEGAIR R RDVFPVTREHLSGRGNVHVVYLVGDGFAQRDK DTDARLIAADLTPPTARVLTGSGGLHLYYRHPGGRPCSQG GWHGLTHLGGELPAGPRVRTGGGGWHLWFR PMGFGNRVG ELLFK LLPEAEKTTKVKTKR CFHFYFSNNG KHKIR SALLREDALRHLLPETVVVLTPSGGRHLWLTGPPDVVVPNS TLRALVKKHGALPDTRTVLTAR GAHAWFAYPGPDPTTVG GV LA $Q$ ADYRRMFPHGSCPHTGRTFTGSGGLHLYFTDPYDGETRGK SLALLEALYEGLPLTYTQRSASGGYHFTYRAPPQUVVTDK SLAVLAALRGEPSPTLRVRTPSGGLHVWYRATDGRRWQCS TLSUKNLSHPEWFNTLCORTAHDGYQFFFTKPKER DSQN EFFGQKLWDKLLASTFVVKTQR GPHVYLRSNVLIPGQQI SWA EALSEHG EPQTLIVAQGSGGMHVLFKYNSALKTSTN TLALLAALRGAPEDTLRVRTPSGGLHVWYRAPDARSWQSS SSAALAELALRRDDTVVVLTPSGGRHVWLSGPPDVVVPNS VLATETLIGCEIPSSLASVTPSGGVHVFLRQPDDGGDRDR HWVTLRDDPDTMPDIHINTTPSGGFHVLVGDDTG DLLTEALTETPAPFQYTRRNDLARRHYVYTQPTGR RFG EWLWPLLEFAVFDPTTSDPEGKRGHYVYRQRPGDRFGNG ESLAKWENLNLITPTLQAMTASGGKHIFYFKHQDISMTQM
 DAITELRLLALIPDTVTVLTPSGGRHLWLTGPPGVTVPNS
RWADDQLAPDLLRRLVIVRTPSGGAHAWYRCDVIQGNQPT GLSGAEVFAALCPATFRAGTASGGEHLYFTAPVGIRLGNS SFARARRAGLVEGWETLVRSPTGGLHVYYPAAEGVEQSSW
RGEKWCHENLGRAPVRIGLPK


PPTASMPPAAVPK
G D
G

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\text { VE H S P K D G S } \square \text { T E A P } \square \text { E L I K VLQ K }
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GRAEQGANNVVP LRAESRGADLDEVADLL
$T V T A P A A P L P P V L L A R L L$
SKEGGTMVTPSKELIQAIKKQYGD


WQDTATGY
PAEELI QLIDEKGKPA $\square$ SEKK $\square$ ERYH PKGKTQTSEL

GPYTWLHGDWADAAS $\square$ APAP PELVR $\square$ LREPKKKR
GGTMVT
$W$ DYPTAP $\square A P M$
SSENGT $\square$ TTATPEL

WLNHLPMKDVPKDM
WRA DDLGTP $\square \mathrm{PK} \square \mathrm{PSE}$

VRPGAELPSAPAALEEM

VGD
GRPYTRTGGPVAPLPE
RRPGHGLP ISPAALRAM

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T R T A Q GVY R P VGG T RLLP A P L P D WLRDELVRTG
ADDTVPEHALTDDDVRV
WVPGQAVREMPP
$R R P G D G L P V G P P A L R E L I E G P V A A A L R D L I D$

GDPWA R】AAAPAWLINAV
W VARPLLETDLTS $\square P \quad \square F D A T Q L R \square$
GRAYAWWPFVPPEKWAP

LTNRKPMDQPAE ELIHLIEEKGK GVES $\square$ ARPKNLPAF $\square E Q R V A E L G L K A R L T Q E A P K K$

GRPYQ W $\quad$ P GHPMQEMPPALLT

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UniRef90_V6UKP9 A A R S LA SA G VPVVP CQVEGKRP LTRRGF LDASS D
 TS VLRKYGAQLLENGYSILPDPAGRKGPI EPQWQKDQ TEEQRRFYCEDFT GRGGRLYPISNRNKKPLIDKDWPNKATTD L V D A A L A Y A A R D L F V F E A R Y K G K K T NGRN W G G T K D $M V$ QKA QHLDHQRGFHVEPTDHRGKHPAV A WGTWAVN
 M $\square E$ QAKEYAHAGFHI DPCRSPGKRPLIRNWQNAGV

ELAAP LVAAHGYPVFPDKP DKRPHVVAGGFKSATTD
 AVRAASHGFAVIPCDPS GKRPLIDKWGNFKSQP E Y A RHYHK LG WVV HP LSS P GK SPTTKNWSK SKKP $M \square E A A$ Q R Y A S L L G WA A I P V G A

K A Y Y E L G F C V L P A I K G K K R P S L N N WREF IS E R

 MVEYALHYA R L G WFP V V F P L L R P NGK R P A L R K WE QRAT T D
 $N P \square L S A A L R Y A A C G W Q V L P C L E Q D G K Q A G K P A K H G A K S A$
 AR WCA GNGWPV HPLAA GRKTPAAGKWCHGFHAA DAALIYASWGWPVFPDRPVGKTPATPNGFKDATTD EFALSSYAAKGLPI FPLRPNTAKPLFP KRASGDA
 T DP RLLA H WLI EHGMYV FPLRPYSKRP FGNCRRCKDNR D R A A Y F A R L G F GVV FP MP T N K K M P R A K G WP D L A M T
$\square E H A L S ~ Y ~ A ~ A ~ Q ~ G Y ~ G ~ V ~ L P ~ L ~ R ~ P ~ G ~ G K ~ E ~ P ~ L ~ G ~ K ~ L ~ V ~ P ~ H ~ G L ~ K ~ N ~ A ~$
 E R G $\stackrel{F}{L} A$ D D $\square$ A ERAMK LAARGGLLTVFPCC EDKRPTCK WGDVAS S D A R WCA A Q G W P
L A R A GF D QD Y $\square$ S R S WP I I P L C P P D K R P L L R E WQ H $\square \mathrm{S}$ V
$M L P A A V T Y A D Q G W P V V$ V $V$ L GRTKRPV ANCEPCAQA GP

 S S P LEA AVAYARLGYAVFPLTPGEKRPHGRLVPHGLKEAA

L Q S A L S LAA E E GILPVFPCRP DKKP YVEHGFKDST TN


LR GAL D WVERGNGVFPDLHSPGKHPRTASGFKEATAD $D K R V K Y Y$ L
 SEALMDAALGYARRGDAVMPDHNPGKHPRLRHGVHEASRD NKNKTTAVIGYAAKDWYI FPVVKNQKVPDGIAVPH GHEDA
 D NL I N Y A V A Y A E K G F Y V L PMM R K K K P M I
 QHAPA LAAD GWSVVFPLVPRDKVPAGSHGHRDATTAD ALLYY QALGGWPV FP L KA GSKEPATLLKGFKDATT
 $L \mathrm{~V}$ N Y A VA Y A H K G Li

 R GLLAVIPL S L T KHPA LRSPH HPAS HD $R Y L D R G W H P V A L A D G G K H P V L S G G S S Y A D V D$ A A LA YARMGWHVFPCWPPGKHP GH LVPHGQEAA E YAQRYAKA GMYVLPVA NKHP IMKADQPA

 $A M V W D R R G L P V I P C S R D D K G P M V A G F G R D A T A P$ T A E LTR H A L D Y A A R GWP V FMM GA G K V P L CRPCR H G F Y A A $L V N Y A L A Y$ Q A K G L S V LP $G K Q P L D$ FADKP NGWRWC I EHVL GYARLGYAVLPLLPGEKRPLVPHGLLKEASRD LT HALLTAA GHGFRVI P LT RAK LDPAVRSPHHHDHDA DAAETYAKAGLHVI PVKPGTKNPDGRGWPARATDD A F L A Q T L S L P L R D GFP TPAEK G WNRWCH



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UniRef90_V6UKPP

ATESD ${ }^{90}$
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AWKRAADAGLVSGAGLVRTPTGGMHAYFPATPGREORSW ELLK AD VGPDLFNTCYVKTKRGGYHEYFFTNGDDIBRTS GMKSYQTLKGLI APTGAQLTASGGNQLFYKKPKNDPVNQV AALMAEHTEEIIGKTMT RVGRAPKTLLVYRTDIPFSKRK AGLESLARHEEEYGDTFTVKTPSGGGHLYFKYPEGQEMRND
 ENLRNWEHARLIPKTLQATTPSGGRHLYGKKDPEMSDSQN HTMNNLIRRALLPPTAYVVTGSGGLHLYYRHP GFSTLQAKGWSLPATRTHRTKKGGVHYLFRAPDGLPLKSS EYQFRCN NLCKLLGLEDSKLQTLVTETQSGGDHFWFRNPKGPPLKKM HL TDGVDTENWIISKRTDGRCHFFFKYDPDLLQTT AISRVEALLPDGLEMPIATTPR GRHYYFAHREGMKNAVG SMAELQHLALRDPETVTVLTPSGGRHLWLTGPPDTVVPNS A WLREKDKGLKSPSTPSA\KTGKGFHIWFKHPSED
A ALQQLLEGRSLPRGPVSETDNDGQHHLFRYDDALPKRQG HSMA ALALTEGLLPSTVTVLTPSGGRHVWLSGPPDVAVPNS SLLAKLKAGYELPMSTYGEQTPGDGLHLFFKLNGNQPHKRVU APCGAATFKALCPSTYTLRTASGGEHLYFTAPSDGQLGNT
 TLALLAALRGRPSPTLRVRTPSGGLHVWYRTPDGPSYRSS AIRAARREGLVHGWETMVRSPTGGLHIYFPAADSEQ SWA AMSGKLPVHGQVLTGNGGRHLYTPVTGAR SLADLEGQHGT QTPRAQDPSGRLLLFFDCPE SG AMHR LGDEPHVRSASGGYHAYVRHPGWPVATTN ALDA TTTHEGAWPDTLTIATPSEGRHLYFRRPAGLEVASD ASLEKLTAEYELPDVRTHHTASGSLHFIYRADPDRPIKSG A WEGLRQEHPALEAAPRQRTPKGGRHVFLRLPEGVRL GNGGINGLYGFLPDAFIVQTGS GYQFYFKIPVGLDHNLR ELLK K V DWHDEHCAR ALALLAAYRGVPDPTLRVRTPSGGLHVWYRNPDPATCSTG
 TLDRSLMTPTAAVATGGGGWHLYYRHPAGHPVKSR TLALLAALRGKPSPTDRVRTPSGGLHI WYRNPHPETRYRS WLAEMEAKHGA PETARASTANGGTHI FFKHVAGDRNRAA HL EKDSNGDLPETAKYDTPGSGDRLLYKYPNDIELKTK FMANLD AR LDTAKSKTA KGYHWMFAHP GFAVRNH GFPALQAARRVDGFAWMVRTPSGGLHAYYPHDAGTEQRSW RLKGE YPTLGDAPRQRTPKGGYHVFLRLPEGS QRVR YTENADKLAAALBRHRTRRSGFHLLYRDPA VETRNS GAAGLLELWERVNGGWCERSPSGGVHWFYRVEGDVPGNVK SLLGDDVFPPDHGKVSTVREDS GEHWYV GWAALVDEHGEAP TLTHRTGR GRHLIYRQN GTKVSNS RLLOKEDSKGDLDNTWTFKTPGGGLRLLYRDPKGVSLKKY GLKALRDLDGDLPTGPVVRTGAGWHLWFQPSGFGNRVG DFIKDKELGPKTLTQRSASGGTHYVFKANLEHSY G GFLSFNTFEEYFEDTLSQTTAGGGMQDFYLKPDGVEDPQ\| TLAALLAAYRKEANPTLRVRTPSGGLHIWYVNTEPAVRYRS PWMNERGL SLDPTRVVRTNRGSHYYYAHSSERPL ESLARLEQAGSLPDGYVVTAGNAGDHLYVKA ALAALEAQHGPLPVTAEQSTGKGRHLLFAWPGDRTVRNS GELTVHHYGWALSGAA TVETMSGGMHAHFKANGRTDKRLC GFDDEYELPKDLMPPTRCVLTGSDGWHLYYRHPGGPEVSAA KL EEKDPDLWKTCRVRTPELGYQFYYELDADQEVRSC TLALLAAYRDQPNPTCRVRTPSGGLHVWYSNPRETRFRCS
WLAEMETRHGRILPATARATTANGGTHIVFAHPGVRNR
 TLAA LRELARPDPATVVVLTPSGGRHLWFSGPPDAAVPNS ASDKAEAEHGALAPTRRVRTGSGGWHLYYAMPDGSDVRNS
 EWHSAHCTY MRATRTHATRSGGALHMLFRHREG MRNS
 DLRMATEAGEPWPDTYSVITPSGGVHLYFRQPEEGPCATG HTFVRLLADGVLPATVTANTGSRGLHLYYAHPGGMRVNK AWIGEK K PDEPRPVTLKVKTGGHGFHYYFQYPSGDEQYSC AWERLKEEHPTLLEAPRARTPRGGVHVYLRDPPEAVGRDS GLLAALARLARADPRVTVLTPSGGRHLWLCGPPGLAVPNS A WMQEKHPDEPLPMTLKVRTGGHGFHYYFQYPSGDEQYFC



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UniRef90－D6X9W1 UniRef90 A8USZ8
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VA D $\square$ A A $\square \frac{\mathrm{S}}{\mathrm{V}} \mathrm{T}$
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W

PDD $\quad \square$ PTMPEKFKEELLKLLEF DNN $\square K \square S \square Q$
WP鸟HEERS GTYR VPGTGS PPPAPCPDA


GNEFFT
पp N WLVELLQKQERR
w
GKAKVPNWLLDLVVHARPWARL $\square K E W \square A E R C$

ESDFWMLG PDETPEAPDALLELL
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VND DP $\square$ AEAPRWGSKP
HRD

GAD $\square$ STCSE $\square$ PDE $\square A S$ RWAP $\square S K R E R E \square R G D C D R \square A V T A$ w

WDNQLP【ITAPKEL

Y $\square \mathrm{F} \nabla \mathrm{E} \square \mathrm{AP} \square \mathrm{MPAP} \mathrm{\square} \quad$ WLLEMSKK

PYVFAETVPTAPAPF WLLEMSKK
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SRQSAA

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EKGYSP $\square P \square M P G N K V P M F K G W N E F C V E R$ K L D T A LD LAAA GRAVFPV GNDKAP RCPRGHLAA TELKEYTEHYLKMGLTPDKVKFRDKAPAGP WESATITR E PVRVARWFAGRGYPVFPLAPGRKTPDRGCRRCSQHAT ENGYNPLP AMPNSKDPAYKGWNDFCTTR TDVRTAADAWHDAGYAVLPVKAGSKAPDVTTWKASQHER LLAVLQRYVRKGYPVVFLLGRSKRPVANCCPKVEDDP EKAQLLARHGLKI FPCN EDKKPVCK WSEVATNC LLQAALGASDLGWNVLPVDHH KRPTAPSWKPLQTQR $T S T R A S F A N E L A A E G F R V F R C R P R S K Q P A A K R W P D V A T N N$
$E Y Y Q K G Y S L I P L K N N S K F P A D R M W K Y R R R R ~$ $R$ DD QVIE MVQRGLYYVYP $V$ VPNGKQP AGFYVGPVKRGTKHPGSVLGKGWHTKT MEMAGRGWKVFPCSWGRKNPSLNE WEEFETRLD
 $T$ QQQSHALSLMQSGFKLTVL NGKRP LDQWQHNP DA GF R V DP L $\quad$ T $\quad$ RAK LDPAVRSPHHHDHDA
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 E A A A D Y R D A R L D L I P L R R R D K V P A D D K R WQ E R S Y D H
 WYV I PI KRGTKHPLGKSWQRQSTRD SEDRLK DFEF LS DSFS LIPLVGGFKRPTEANWTKWCV TS VLA ALDLVESGYEI YPLSANTKTPP KGHHGY LEAT TSVLRKY GAQLLENGYS IP I P K GRK GP IEPK W R Q
 E L I K WVAF Y VQAAK WRVVPCKSPGKHPRVGKWEQRATN D MANEGWPVFPLVPRSK $\quad$ VPAGSHGHLDATSD H G Y A V F F P L G G R T K RP A L P S P H R S A A P P

 V F P L K DRSKEPATSHGHLDAKP
 $E L F Q A G \square S V V P V A T G T K R P A \square A W K Q Y T Q Q R$
QAATE LQK S GWS $\square Y P$ P $\quad$ S PGTK $\square P \quad \square K G S S G W N D A T$ A LT WV S R GIPVVPBCGRTDKAAMAAGFGKSATER
 E A L S LAA EA GWYV FPV S QA GK P LVVK WS TEA NAER DE WLI RMAQR FNFIQLK GKVPI ESGWAKYS Y $N A E R D V A R L L A Q G Y \square C L P L R T G G K H P L C S D A F Q L S Q K P$


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$4 C 46 E E$

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| :--- |
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| P |
| L | ASLEEILNWFTNFKELKNTGLVTGEK LVSIIDVDYPSLLP ATADEIKKLWRKYPTASGYIALKTDKFFVVDIDRHEGAD PTRNQAESWFAGSHPGLGLICGAASGLEMLELEGRAVAD SDQNTALAWFKKHPT YNLGLCDDLSHLLVVDVDMHEPTK

K A G
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 K N N K EL N N FLS Q N R NATGFSLLTTGKS SII VI DLDKN H G D G $P A V$ I ARWTERHP GCNWGAT QPGVIVLDDVDRNGGS LTVDEVE N QAPTWAKNYNLGMRTGDS LLLVVDIDDH GAAL

$\square$ DEEWTK


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 DW FEANRDKLPATRTHRTRSGGLHLWFKHRAG LRSS EHYVVLEEYGLLFETWIVETG KGVHVYFLVDWKDPNASK QLLGVDVLRLLAQSTMTVRTPSGGLHLWFRADARTAWRGS AMLA A MLP GALIETGLDQDLWM A WEALRRDFPALEAAPRQKTPKGGVHLFLRDPEGVKL ADAWYQEHCARIPATRTHKTRKDGLHLLFRHREN MRNS ALLRKWGLSPNALSGSGSPHVYFEHPGWHVRTVA GLRADAAPHGGLDPTFTHRTPSGGLHLYFHANSRATGSN ELEK FSNLLPEAEKTTRVKTKRGGFQFYFSNNGGDP

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E
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 VNDWWDSHWFGLGS EVATVSGGRHTRYAVDPGEDVQTN EIVEERYDKQFPDTMTVRTPDGGWHFYYQVNKEDDTQFN EVLEFNGIDETMPPTFAVKTGGRGYHYYFKYPTDGKKYSN KGMWDDLKGVDTSDWVKQHRTAGRHWLFRFNPALELKHA RFTEWGLLGRA AAEHSDSLMMAQRDHHTER GKHYLLRHTDG VRNS VLQELVNKLGMLPKTVLVYTQSNGTHMYFKLPKNRQFKRK SIDGQKSFDDLIKSTFAVKTPNGGTHDYFKYREGDKSK DRMDSDQGYKLPADTYDEQTPSGGLHLEYR EDFKKRGLGEVIEKP\|LQKTVNNGYHLIFKCNEHRQSANG GRDSLAELAAPLASAPHVLTGHPGHHFYFRKPAGVVL ADYRRLFPNGSCPYTARTLTGSGGLHLYFTLPYSGETNAH
 EWLMKLQRGKTLSPDTYIEKTAGGGLHYFFKYTGDKVRKV AEDMAEHADEICGKTMTRVGMAPKTMLVYRTDPFQKRKDT SWSSKSHEAALDNRPTARSPNGFHVYLRTRDPTAMPS $P P A S F S A L Q D L I P D T V T V I T P S G G R H L W L T G P P D V T V P N S$
$N F Q K L I E P L G D T P D V P C Q I T G S G R Q Y F F E W P D G T T V R G N$ RWRTGLGLE JLPTTREVRTRR GSHLYYRLPDGCPALRA PWRALALLGAVLPATVRVATPSGGAHLWLSAPAGLTVRNS LIDGEKSFFELIKDTFTVKTPNGGSHLYFKYRDGLKNK VSALKLRPE HRTLCVHTGSGGWHFYYRMSG TEDMKDEDNGLDPNNPTVDTGSGKCHYYVFTDKDLATQVG KSDEQQVLPLLPLAPRVKTGGGGWHFYCQGVPAGTHFIK KSLERLVADVGLDRCPCVFTGGGGHHYYLQKPSDFP DATGLTELWDRTTGGFELSPSGGVHWFYRANADVPGNTK RLDRTLMTPTATVATGGGGWHLYYQHPGTPVL NYKK DASMYDPFPSTYTE!TPGKGDHFFFKDPDGVIIQQE DWAGMREAGADWPDTYTVLTPSGGMHLYYRQPEDGPCATG MLE WAKILEGLLDRDTIVATGGGGFHVPYRC ESVTGNTK GFKALVASGKPLPATMHYTSRSGGRHDLFDAPDVEC T RFVASNNFE VRDTFTVKTA KGEHRYYLYPENKEVNSF


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UniRef90 ${ }^{-} 6$ VLL09
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VGR|LIAPG
$V D \| R G A G G Y|L| A G P G S R T L H G$
NGKPPSWVTTIETRGEGGYALVPGSP

HPSGDRYEWM
S S A R K L P GV DL R GLLGKYLAAAPTT
A GRRAP G L D D V R G A G G Y L V G P G S VT
$\qquad$

 $R S K T P G Y E G L D D L Q G N G K Y V V L P P S I \quad H P N G K Q Y E W E$ AKG DNRSWLEIIRADGNYI

$R G T D G Q K T V G V D M R G E G G Y I I \quad \square A$ $K L A S R P S T G L I E T K S E G G F L I V A P S \quad H G P V H P T G R P W T$ GAFAPFGGDVRGKNGVIIVAAPTPHDYRWVRMGEDPTLL $T$ T ARKMPGLDLRGLGKYLAAA P
RS VIKGTFDI RGIGGGQVLCPGS LHPETRK




$H V H G A L G P G \quad D I K G R T G Y L V A A P S R$
$V G K L G P G \quad I \quad D I R G S G A N A I S F G S \quad$ TSQKGMYRWD

VSAlA PG I DI RAD G G
$T \square S L G K F F S S L E I \quad R G E G A L V V A P P S V T R Y K F \square L G P Y \square P \square R$ A GSDHHGPWQLDVRARGGYIVAPG


 S GSLK N P P P GLLDVRADGGMIVLPPS HLSNGAYRMS AGVLAPG
STKNLFGLG $\quad$ KE L H A K G R QVVAP P S K $\square N G$
ATRKTKG D GVVDLLS D FVVTSPST
NGTGKLGAGWGEI RGQNGVIVVAPSV HPSPEG EYR
 PKG DNKSWLEIRSDGNFAIAPPPS

GTVKHVATNLDDRGWGTYGLA P G CV V
$S R G R L L G B W Q I D D R A D R S Y A V A P G T C T D G R Y V P E G T C R R$


$T N F I P N$ P $V$ V

 $K W K E P D V D G H V E I$ K GS G T Q V TA E G S V H P DT MG K I HNAVDVRGEGGYIVA

 K P LGG K R LE WDI D L LGE A GNVVVMSPS I HEAGSVVKMD



 $F$ GK G $\quad$ H $\quad$ H K THRYK W
PKWADKNWPGVDI CANGSIAVAAPSV
NGNGQLGGAWGEVRGQNGVIVVAPS YHPDGGEYRW
 $F$ VDEE GTEHA I EVL G DGQQFVGIGGELPETKKYRWT S SLY A GMRRDGHVKALGGYVVGSPSMLDHSPFDVDPSPDE
 $T R L V$

A S RLLA P G R L $A N Y A P G V D V R T D G G G I V L P G S K$
 A AKEGK

| $P$ | $C$ | $W$ | $E$ | $L$ | $L$ | $G$ | $G$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $G$ | $V$ | $V$ | $G$ | $D$ | $V$ | $K$ | $A$ |
| $G$ | $G$ | $G$ | $Y$ | $L$ | $V$ | $A$ | $P$ |

 $T V G K R P E Y P G I D F K K L G G Q V V P G A V$
 TGAFAD IFGRDD
A G G D LE NPPMVDVRG GGGYVIAAGS
IA MAAEGGVLI ESR
$V G T D V H G M Q G V D D R A G V G M V I Y N G K A L S H A P V L A H A P T$ WT
$P \mathrm{P}$ K H PKKVS I F DV R GVGGQVVAPFS I
$L H F G M R R \quad I G H V K A L G G Y V V G S P S V L K$
HPETNE $\square$

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UniRef90_C7CJL4

 $N P \square R D A A Y R Y \amalg D A G Y R V L P A D A Q R K F A T L K S Y K Q Y R K K P$ LDNALQAAAHEFGVIPLSLR K LIPALASPHKGVHDA
 FPRVPLVNYSK\|PI IP WKDENNWV SQTLS QYARKYYENGWAPVAYEQGTKAPKTQGWQN NK N $F A Q R Y L S Y G Y R A L P D F P G E K R P L V P H G L K D A T G D$

 A D D YFS R G LivV I P L VR G DKR PMVSEWQK K
 CSRPGKVPLLTKWQDKATDN

TRSLLQETACVYAAAGワAVLPLHSAGKHPRLAHGVLDASAD SDCRTAAFFWYGFGLLKVMPVIPGNKASALKWDPWL QD LKKNGKAPLVA GSFNGEDKA ERGLPDVIP LSSP T K LDPALP S P H R GVVH DA DFANSY |  |
| ---: | :--- |

QAALYWFDRGSS $\square 1$ P VLP GTKRTAV MWDPWNS G
$M G Y R V L P L H P G E K R P H G G L V P H G L K E A$ DAAIALASERLTVFGCGPDKKPKGP WK AL WLA S Q GI HV HP LLP GR K IP A GRYCHGVRAAT
 $M L D Q \square E R L A R A G F A D H W L H P K Q K R P \square G E N W W S T K P$

 R A A Q LY R E A A G W G G L L

TK L DAALALLHHAGLLCVIPAAAGTKAPGTGRWRDYMT TR TK D F R K VA K K F ID D G Y S V I P V N A S K N P A I K G W L E Y Q D R A L D C L L H Y L S R G WKVVVPI P K G S K A P IMMPRW Q W D L R T K E C R R $\quad$ UA Q H W W AKFFA EAGLDVFP
 K WE H $\square K Q Y Q Q A G A Y V F M A L P N Q K H N G I A G G F H N S F N K$ DAALMLLRRANYYVTPDVKYGEKNPVFRGWNKRENLL NPLLREALAALERGWSVLDRIHAAGKQPHAGLWKPLQQQAA L D K A L Q LA A LG MYV FPLN GNKRPTDPEGQ GGFYH G MIE EVK PLVEAGFSVHLLARPKSKDPAND GWSEAPVVY VIP A A S GTKAPGTGRWRDYMTAR $A L Q L A Q A G V P V Y P L A P G S K T P P \quad K G H H G Y R E A T$ LDAALALHHAGLCVIPAAAGTKAPGTGRWRDYMTTR $S G D A L S A A R W Y R D R G F M P V P D P R Q G K S P V I L K W Q Q L \quad R$ $V$ D A A LTAAARGLALFPLPPGGRRPA PGWQRHCTKD
 EWQP QYAAHGUATFPVDGKDKRPAVKGYDK $\square G T K V$ PCHARG LWCHSFHSA D A MQAYVDAGYF LI R LQRHDKVPLDKNWTHFQANP
 EKRPATRHGLKDATT

NE L T S $\square$ A H K L A K Q G $\square$ K VF P $\square$ Q A N S K R P VT A H G Y LD A T D N LERALKLQKDGFF DYPLASNTKVP LGGGSNGSFHAA


 A ARFY Y K N G L Y V IP VMPNGK S L P P K M Y N GY Q HA S

 LH N A LIF Y A A C G L R VI PV VR GTK A S L G T G WS L E E K A S RWE HVR Q Y Q R A GIV V F M ALDPN QK H N S I E G GF H N S F



> HWK QLA ED P EWQRTE
 GFYVLPVVKP GTKNPVGKGWHEKSSRD A A QAALKASMRVVALQPRSKVPDTRFCAS GADSA TPDLRAAARELHDAGLCVLPVRAGTKAPDVRSWDQYKVNR
 R P E D C R C GTP T C H GF WA A T


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 ANDAQLRAWFDNDMDQGIGLVTGGDVELLEVEGVAMAMMG PTGDDGIERWF WRFAGNVGI GGGFANLLILDGDAMAMMG PTEKQNEVWFS SANAVCI LTGEVSLEVLDFDGGRAFD TSDPRDRAMFEAARHATGYGIACGPHYLIGLDDDRDAEK

 LG DDYLND KFPEGNNVGLVLGVSGLVDVDCDCEE
SAT LEAWWRACPECGVGLLPGPE VLVLDVDAP
SEHENLFDWIVREPK MNLGLRLDTSNLLVVDVDDNNGRE



 $T L D D R I G Q W W S \square R P D L G V G V A T G P A G L V V I D V D A H N G F H$ VRRVAAWWRRWPHAN GLATGGV G VVVCDVDSNAGLR LNPEKINEHWTDHPEHELGGIVGGNDLIVFDADGPESLA EVKKWVA EGGNYGILTGKSGIAVIDDDTHNGVS TADPAVRALFSAAPWATGYGIACGPHHLIGIDLDTGGAAG TDVRLVRRWWAEQPDA NDGAPCALNGWAVLDIDPRHGGD
 TTDDLVVRKWWREEPDA NIGGAPCKLDNGWAVVDDDPRNGGE LS RE E ELDAYWKQHPDHEVVGCIVGDK SREEAI RAWWTREPGAGVGILA PEEVLVLDVDQAEV DVTVRPAWQGWHDDDLPADPVGKHNMVVI DCDVAK PN TNRHYITAWWAKMPDAG VGVAAGPSNLVII DVDRHEGVQ PAT

## PVDVE!DRW


GQEAEAERFWSEYPK TTDPDIKRMWRHPNRA NIGI RLEESGLIVVDIDDPDPPE C DAIARLQR GGGNVGVRDRDTDVVI ADTKFNGP PTDEQUAAWCRDQPADANLMLRVGLVGUDVDSYDGKTGGR $P T E E Q L H Q W F A H G H P G V G V V G G A V S G G L V C L D V E V D E G V F$ $\begin{array}{lllll}M S D S E L U K Y F K & N C W G L G F V C G N S R T I G L D W D T K Y F L D D ~\end{array}$ LTAEDLPRYFN DGQNVGVLLGEPSGNLTDVD LDDCME ASPEEI DKWFSR SKNERI NDMWREFPDA VPSI SCGPSRLVVLDADQKDGGP




 | $P T G D D I R R W F R K F$ | $A G N V G I L G G F S N L L I L D F D D A A T Y L$ |
| :--- | :--- | :--- | :--- |
| $P G E D R V A W F A H G H P G V G I V A G A V S G L V A L D V E G R A V D E ~$ |  |

 $P T V D D L P R L F P A R P A C N L G L L L G E P S G L I D V D L D A P E$ PGR

TTEAR $\square E A W W G R T P S A G V G V S C G P A H L V V L D V D A H S G F D$
 A SGQQVVRAWWKASRQG G GLPTGTH

 NDET RKWWDEPS RNI GLMLKQHNLIVI DCDNHEGVN
 SRDAR RAMLA ANPAGNVGVGCRASDVVGLDLDRPDGVA GQDVLK DFNQ GYNVGLALSMSNLI ADDCDVDEGLK PA AVAGWWRRWPQA NI GLVTGTV LDVCDIDTNDGLIH KNKNTI DSWFGVGGRGFNLGIACGKRGGVDIDVEDSKGNR

 S KKLAKQFADASAFGLVCGRVGLTVLDVDSK QN D PEPEEVEGWP WSKADGVAVICGHQFWWCLDVEHQH ATWEEIKRGLER
GLDTEAAVLRLISA DMNLGVRLGKPSLHVI DLDVRMDDE DTDTS $\quad \square P G T T A Y G L T G E K S G V M V L D D D R N H G T G$





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$T L G L L A A L R G A T S P T L R V R T P S G G M H W Y R N G G H R W C S$ RVLLDVLDVVRPAGPVVRTGH GWHLW MAGGLPSRI
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 A $\square R A G N L L L P K T G W I S G R R G R S H W W Y R V G A P P Q K A S$ GFAATCAAYGPWPNTFTVRTPRGGLHLYFAA
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D D LT P P P DEAPQMPE

E F T Q L WT P DVP LPPCPEV

G D

G D

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$R G \square E V V H P E V P D W I A E \square$
GEP
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VI NP VE MGLDDLLELPEE $\square R \square K L I T$ QETTK S LHAGGADTIATLDREVSDALLELARM

E E

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TY Y $\quad$ RDPDD DAPLSEVPV
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LQPA DLKRGIPRISADLIDEL
LQ SGGPDT $\square$ A VLNREHSDALLE LARMLDE
$\square H A G G A D T \square A T \square D R E V S D A L L D \square A R M$

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KQLIDDGCS LIPVRDKDKTPCDSAWKQYQTER

 GTKAPLGK WTAAMTER NECLNYCKD NGCSVVAVRAGSKAPRGGSWKTFQSER LD $\square$ ARP RLDWGLE CFP G $\square$ GKRPAVHEGEHGHNSA | $L R V A R M G W H V L P V R A G S R A A C F R G A V D H A T T C$ |
| :--- |
| $E S Y L K A G L N P V P L N K G D K \square P N T S G W G L P D G E D$ | ETAESYLKAGLNPVPLNKGDKDPNDSGWGLPDGED

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 SSDFQTHGRALLGNGYLI I PIIKPGHKRPALDNWNARQAR AERLQDAGLRLIPVKDGGEKRSLVHHGGYNSF AVKY DS DERCVIRCESNSKAPDI TS WKEEQ AR

 YYAS I GAALAP IPHGAKNPLGIVGSVY LDCS
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TDDPEIVETWPELDAAGGYGVLG
PDAAQI AA WARSRFERGNLALR
KDPEQA
$\stackrel{\mathrm{P}}{\mathrm{Q}}$
QDVS EML
TWWGEHPN YNI GL GLDGVLVFDIDDANGNE QTPEERELMLRQAEAGYNAAMACKKSGVIVIDIDYHDAMD


 NHWEELAEWLAKHPQGGNVGIDLDRSPLVVVDVD QHGKD P EQI DKWARENPGGNFGVVAFASNLIIVDIDTKGDNG ANYEKLRSLCKD GENYGLLMGKNGLFCLDFDLYKSPQ A 1 SRATRR RCLGEG TVDDAlAHVDAK VTDEFIEYHSYQYHRANLGVNLASSRLIVLDSENLAATQ TTERGVEYHSYQYHRANVLGVLTRGDWCIVDDDNHVDGEN VTDEQI QLWSQANPNANTGGVI GEVSGVLVVVDGPVNGYG I DDPVLQKHDS SGGNYGVIP SSTI AVV

 PS REQVEEWFTVDPKAGNIALRGGH GLLIGVDVDDKPGAE NRAQ T DDHDKAQSWDDRYPDLNFADSTGPAGLVIVDLDTNKNGW
P A TPDHLRSWLSSDFAKGGVGI QTKHFPAVD
 LTEQQARYYFEHEKYGLAAAMGQRSGGLIMLEI EGRATTK

 LSKAEAVHW MEDGGNVGI AGRPDDLINVDIDDED

ATREQVREWFSGAP PGLAVLCGGVSGLEMLEDEGRAVAE P DS Q YRED LSNSNI ALLTGMTNFVAFDFDTYNGGK

 N NGFT
RQIGEIQQWVR SGGNYGIVPKSDNLVILDSDSRQF


TSDLGVHEAAKRMERLHNVLI RP
 PSEDLARWAACWPGCGWRVVCGPSGLEALDVDRPDGVA पSEFDFQE

DARVCNWQDQYADRNVALGGEGVVL
 PDDAQIGLWAREHPASSNLGLRLGUVGIDVDAYDAKTGGQ TPR
LT A S DTPRFANQ
 PTEEVLHKWEREDKPAVWAMPTGPVSGCFVLDADTLE SVA HAAVI AA WCGKYPP ESGGDKGKPKGYWVLDADSRE
 LGAADL
 LGVDQAVRWMQQ GGNVGDAGRPDDGI NV DIDDDED $\begin{array}{ll}L \\ P & \text { TE T }\end{array}$ T T LIEEVET W A TVWPDAA
 AVDTV SS DPDTAAYAVIPRAGFMVIDMDKAKQEG WTDTERAALV FPSGCNYGMRT PAGGLADDVDHYDGKT KNE WKTWNNGLNDGVKTGRSKITII DIDQKPIP LN
 ATEGELWTS $\quad$ EFYGTSSLAIICGKVSGVI DVDVKYKPGI D SRDETIRAWWSTCPDANIAGVLGAGVGL $\square V L D C D P R N G G E$
 PKPEQIDGQDRAYPDHKNTGIICGGSDVAI DI DVPDANA ASQDEIRRWSTSYPDSTNTGLLCGR LAGVDVDRVPEL
 ATENHLKKWLSNGFAQGGVGILTKHTPAIDLDVQDLEILDQ MSPAEVGRAGAKRRGDVNI GLVTGEPSVHVVDVDDRNVEE NTKEQVASWAKKYTN NGIGIVTDKTPAVDi DVYDKEASD

## UniRef90 F4YXQ8

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GLATDNPFKRLCKDVPRVETGSGGLHTYMSKPEDVSTRDS
 MDFQEYLTKGLDTSEWDMSNRTGDRHVFFRYD PELDRR A WLDLVGEMPAHVEYPQVRTRSGGLHAYFAWDPRVKSSVQ EFNKFSEKYGHPKSEFVVKSKSGGFHAYYAKPESLAVKTVV AAALERAAGVPLPQTWTSTSRSDGSHAFYRVSLLAGDRGW TLAKADGRADQUPSTYIETTPNGGRYY DLKALEVLGAKLPRTLTQSTASGGRHLIYSAKGGPPDTKT ASYAAEKFPD\ASAGLIVETGSGGKHLYFSLPADVKTVQT TTLAVLVQDGALPSTPRTTARTDGSGIFYRIP VST GSIIELDFKDADRNTLSVRTQSGDRHFYFRMPEGFPSFNH SWESLTRSFPALLEAPHSHTPRGGTHCYGRVPSGVALRAC GLRSLKDFQGTISDTYLEKTAGGGWHVFYKCED KKET $R E E A W A L W A E L C A S V P H V Q S P S G G W H V Y C T V P D G V D A A T L$
$E K E K E N L K K N F G E N V Y V T E T P R G G F H V F E Y E D A C M D T$ KKEKENCKDFGLDPSEWCVITGSGGWHFYLELDPDGAAVQEM AVVDA GFTLTVITARGGSHVWLRVPDG而EARGL GFESTEHTPYYARNTLVQTTPSGGRHI IFNKREGVAY SMRRAQQAGLVDGWMFLVATPSGGTHAYYPAVPGQQQRSW GTSELSQELGMLPATWS STAHGARHLFYKVPEGLAWKGG RLEILDYLKE TFIVKTGSDGYHIYLKIKDECPAKKD $F T L M E K G F P E L E A K D R I H K T P S G G Y H L L Y R V A N P P S A F P G$
$G M A S I L A W P D T L Q D T V E Q T P T G G L H A F Y L I P S G Q D K P K H$ ELIADNSGLGDVLRRGYTERTASGGLHLLWRVDDGQGVENM
 SDAVWTALQTGAIHTMTRQGGSARAHYVFACKPDENYG TLAEAVRRWGPLPPTVMSTSREDGVSRLYRLPSPAALTTQ TIVAWC EEHIGPTLQRVGDAPKTLLVYRATPFPKLSSR

 LKTKTDTAREQGRAELWQRTPSGGYHWYVRLADDFPHNTK AEEAMAKLLEMFPDAPSVISGSGGRHLYFVTEPFRSRRLA KTINALIPDELLNRLIIQSTPSGGLHYUYRCPEAVIDKNK KTTADDLKETLTARSRSRGSHAWYFEAENAEARND ALHQLLKSYEDTPMTLSVNSARGCHVYLRRASGTYAKSD
 ALDTEKYGEFPWDYAYAQATPSGGVHYVFQLPPGMRVKNA GLDGEKAGERDVWDYAYAQATPSGGVHYVFQLAPGMRVKNA STDGLTAHAFALPGTVTVLTPSGGRHLWLCGPPGLAVPNS
 K WRKNHNVEPFNTFTVKTAH GYHYYF DAGHTGYGN SELVDENTPETFTVQTGSGSDHYFYRS KFSEN GVAREFSLWQRLRAGYLEGTPSGGGHLLYRVTGGTVLRNT GVLNQLALGELWQRGWLDRSPSGGLHFHYRVADEVGLKKK VHLGALEKHGQLPETLLGQSGTGGPHDWLRATGE ALSALVRRHGPLPPRPMTRTGSGGAVLFFRH DGEPLRGQ DWKS KIPDNLLRKLVVAKTKSGGYHLMYRT SVVEGNQK LVLHLLGLNREQRRTVVSKKGKKGATI FARA VKADKST GI QDLKHLEEKLPLTLKQKSCNGGYHLDFSDEGIVKPRGN LLSTLNDLKQFKEPVRDETSQNNGDHVYFRLKQDKGQKLT NLCGVEAYRLLLARTPVVRTRSGGLHVYFRYSEGVQKDRC ADLSHQ FAEWCRDNLGVSCERVGILLVYRAEDSDWGKST EGARDEAEFGPLPDTVRSASGSGGEHDLFRTDLD IVRT GFESVKHDPYYAQNTLVQTTPSGGKHIIFRKRKG\|EYNOS E पAARFDA QEHLGATCERVGNAPKILLAYRAESEGWGKAT AWFKSHDINETIQDTYVERTASGGLHAFYLIDEG KTK DSEALQAVNGLLPETFTVASPHGGHRYYYIDSKDVHKSIE AVARMEALGLHPH VRTRKGAHYYCRDPSWVVSNST AHRLERLARDMLGDTPLLRDGKPKRLLVYRAD GFESYEELVTNAQNTLVQTTPSGGKHIIFKKRTGDEYGQK HLLGAFQLTVAPAKSRIEGNPHQGSHVWLRVPKGDPMALS DRAWWFESRRLP ILLMPQVRTPSGGFHTYVRVPDGVDLQLV GLADLEAKLGPLPSTWRVTSPSGQR WYRVPAVAEYESA
 REYVEAGAGFA\|P WAHIQDTQSGGQHYAFRAPDWPVKNDS EFAAVRTEHGGFPRGPIADTGGGG
T LK G HPPDPATYTVRTPNGGLHDYDRAPAGAD S $P P A G W D T \prod A A L C P P T L T V L T A G G G L Q A W F R V E E A P E Q W H$
 AVEGLD
ATLSAFEVEVGCPATWTSTSRSDGEQRFYRVPEGLVWP LLIAWCEKH 1 GPT VQRVGNAPKSLLVYRTNEPFNKIV ADRCVKEAHDALENAPRVLSGSGSQHLYFTSDEPLRARSK


UniRef90 F4YXQ8 UniRef90-X7EDJ9 UniRef90-H6MQY8 UniRef90-17JBZ6 UniRef90-F2NZ19 UniRef90-Q52PS4 UniRef90-D5UXG2 UniRef90-K6SNK8 UniRef90-M1NJK8
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UniRef90-X0SBP6
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UniRef90-UPI0004798D5B
UniRef90-F4FNL3
UniRef90_K41049
 PFSDMPVD $\square$ GDG FTUAPPSRRDDGGASYTFR
G G
$M G D Y \prod K \square D \square L T D N K G G G S N V V L P P S T \quad H A S G Q \square Y K$
$\square 1$ NAIKG VDVLSNTAVMTAPSTMTGGQY



PEMDLAAPGAGDAKTGGHYVLLPGSV
$A P C G K D G Q \quad F C D V K \quad Y N G Y I M I A P S V I N G K$




$K Q R \square I S A M D G I D L L N S G G V I V A P B V D G$

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

PSNRLQ $\quad$ PPGMI DVLA GARYVVAPPSR DD
GQK I G YLP GVVD IKA DNSYFVLAGS QTKGKYKHNGDKPKM QAARA AVDFRGDGGY IVLPPSSV
A DEG G V V D I L Q P GRYSVVVWPS V
PLYDPNSKHIGEIFFSDCFVVGPGCT HPSGEMYCW
$N V K \square A G R Y N F L E T R G E A G Y \square L D P P S M G Y G V H A D N E \square P L I D S$
II NA A K G V V VLS NTAVVTAPSTMNG
$K L A D D R P Q V L I D E K S E G G F L V V A P S R G P V H P T G Q \quad P W T$ SPAPED GGGIEFVQYGHRYVI CAPS LHPSGRQYVWF NGAGAF GR WGEVRCSNGVIVLAPTPHPDADTKGGSYRWR KSEGAFG WLVDI RSTNSYI I GPTSVT


L G Q Y
LALSS T GEVVLAETR GEGGYSI IAP TP

$P T D D A \quad$ GEVRANWQYVVVPGSYVE TDPEEVPAD
APNKDANPAA IDDIKTGRA ITAFPPST
GLD SK SNP TGIDDRA GESLAAVP PS T
PASEAE $\square$ KVLAETRGEGGYTVVAPS H GTVHES GRPWT T NVLGDEKHCVDDRGEGGLLVLSPSVAESK
E GL L A P G
A GRLLAPG

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

 GQK $\square S Y$ Y L S VVDI KA DNNYFVLA GSRTQYK HNKTKDVREYN
 PAEKVSALQ GVVLLTNKHGVIVAPSVIN

$\square P T D N K G G V R T D W Q Y V V A P G S Y V P V D$
$C G K D W C D E C$
$D K Q N L D P$
$K \cap V P G F D I R G Q G G Y V D B P D$

 PACEGAKKA LVETKDGNGDTNAVGSYYDGRDGGPA GYYKR



G GTDKLGQG VD $\quad$ GK GPKSYVMGVGSTFKGR
PGAGRLG WQLDLRAGHSYGIAPGTVT
GKYVVNGHCQVEE LGDGQQFVAFG
FTDDPKEKTKVVELLDSGQHFVVFG

$1 \begin{aligned} & H \text { P D T GK A Y E } \\ & 1 \\ & H\end{aligned}$ HPS GKRYRYS HP D G $\quad$ D Q Y Y R WR
SKTYEDF LGL I E I L G D GQQF V A


$\square G Y L P S$ V $\quad$ K A H N N Y F V L A G S Q T

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UniRef90 ${ }^{-}$UPI00037DB6DF UniRef90-G8PCA2 UniRef90-Q5G7M2 UniRef90 UPI0003B7526C UniRef90-G2ISR4 UniRef90-X5DJW4 UniRef90 X1HSR2 UniRef90-H9YSK2 UniRef90-B8KQ39 UniRef90-B7RVJ8 UniRef90 UPIO0035FOBCC UniRef90-UPI00041927E9 UniRef90-L8FCR3 UniRef90 G2PB23
UniRef90-UPI0003803A1B UniRef90_D7VN35 UniRef90-UPI000469D122 UniRef90 V4XWA4 UniRef90-L7ETS7
UniRef90-UPI000370B176 UniRef90 X1D604 UniRef90 W4AB41
UniRef90_UPIO00237E6FB UniRef90_R9ZXK4 UniRef90 UPI0003FB35B5 UniRef90-R7LVM2

WD


GNTDTALSEVPTQA
WYRPDGSPAAVGE $\square$ P R PED LTE L P QSF $\square \mathrm{DA}$

GRNYNVLS GSVDD $\square$ DHAPSA $\quad$ VVEF $\square K R E \quad E R R K \square E$
D S D G T

WK G LIEEKSK $\square$ CRKRDFSGDEFKD $\square E$ K A $L E D K G$
YQ
$L Q Q \underset{Y}{L} G P S G R V A S T S G P S A P V D A A G Q R D F D D P R P Q P R S \quad L$

WDD
RCNLINUCRSLSE
LQ A GGPDS IVT LERETSDALLE LARMLDVMPRRE SPDGEALEDEAPDPEELPWLP EAWDRYL
 DRDWTD!AVAPP WLDEMARKRTT T I LLYES I K GAPSDDSEPPKK LVELLEKK

WE
MQGKFNLET LEEDVP\| T T AEERNLLLE


A $\square$ G G A A P A R $\square$ P T $\square$ T A A ERTA $\square$ F

K A HRY VY E $\square$ PSE $\square \mathrm{L}$ P $\square$ P K $\square \mathrm{LI} \mathrm{K}$ K

GQE YRVTNETGLVPESDLTQFCRVLE

W

S RKFVT $\square$ A R L P
GPDG RLLPEGVVPVVEDLAELPE
WVDFFGGLTAANALPT $\square$ T K E Q $V E E A D K A F E R M A E E H G F V R$

G N
SADDAGRYAVLDDRPLISPSALPE
WTDFFGGLDAASDLPVITEAQVEEALQVFEAMAEECGLAR

EQADAGYYTVEREKP VSSLRYEELPEVFKQANRSTGVEL
WPEDSPLTVADDDLPVTEDSVRAWLE
E S A YAG SPGDLAVPLEDVEVAEAPKWL
TTP Y
SDPDGAGC EDVP LVTR $\square$ PE L $\quad$ PAK

WVGNSPLDVPFGDLPE DHAETDDAFVAEADAHLASDGTAV WPDASPLTVPFSDLPETTEDELRDFVAVAEEMLRAAG
S Q
DPEGNVS LTPP
$W V T E Q N L A D \square Q D Q \square P L \square T V E Q A Q A L D D Y F E$
R R

UniRef90 F4YXQ8
UniRef90-X7EDJ9
UniRef90-H6MQY8
UniRef90-I2FJH7
UniRef90 I7JBZ6
UniRef90-F2NZ19
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UniRef90 UPI0003B63ECC
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UniRef90 UPI0003B7526C
UniRef90-G2ISR4
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UniRef90 UPI00035F0BCC
UniRef90-UPIO0041927E9
UniRef90-L8FCR3
UniRef90 G2PB23
UniRef90-UPI0003803A1B
UniRef90_D7VN35
UniRef90-UPI000469D122
UniRef90 V4XWA4
UniRef90-L7ETS7
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UniRef90-R7LVM2
UniRef90_UPIOOO4685B3C
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VT G S K S

A G N

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Uniref90＿UP100034АВЗАС
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 Q VA GHYWA A GLLPVVPALID TKK■VRMSVSCTSAMP

 E WA R WYVE Q G】ALVVIEPGNK IP KGKA WQRPGGYY
 VK Y A R A L A DA GLDP A L LVVQP GTKYP A EK DGP G GV H LA MENAKTLVQLGWHP IPLGGGGKVLLVSGVTGHEGVDD



A ALE YATHGGAVAP FDP S K GRGGKSCWNVVGYR D T P D L R A S A REMHDA GL C V L P I KA N G K A A DVRSWK P Y K DQR ARLDREA GWAPLP I PP GAKYPPPKGYTGHHGHW



LATNDKRTLDKY $\square$ GRYRKAP E QAK QA $\square$ HNGFK LIP L R LGGKRRPRLGKWEE R QL
L L S VA E H A $\square$ A A GMKVLAA A EPRAKNPDVRFSPNGNSAT $D V F D A A V E Y A A N G \square P V A P F D P K G K G K S C W N L V G Y R D D T$ R L DA N GC S P L P D G P R G K S P A F K K WE T F C D RQ A K Y L L K K N $\square$ Q VI P L N QYK K P S V T $\quad$ T A D VE NAK T L V QLGWHPIPLGGGGKVLLVGGVTGHGGVD D E A R R L L

 EHGKNLLANHYMI DP I K Q GMM R P V VMDEWQNVRLTA

RKMA $\square$ K GYPCMVLSKEKK SP LIHKKPDWATSN



A GHGAK LI R LR GKEPVGR WK DLP S
R R M M A L G F HL V R L H A G T K K P I GA G WN DAARTP NAAERLLDDNGYE PID LIKPGQKAPALDRWTSVVIDD

A ASRYVEAGYKLLP LGPDGKKPLIANW SAARGC ME Y Q K C IT D L G L R I LP L L E K G K P H L V N HR Q Y Q NQ L NHAKQLAEKGYHVVPI PLGKKYPAI QGW QNLD

RTLLANGY $\quad$ I PVPVDGKRPKIRGWSKF H


 D T L VETAVRYAERHWDVVPCVVTP GA HP L R DWA VAQAA S S RALIE NGYRYVP AKGKGPIIMDWPNFSQRP
 T P $\square A A W A R R Y \square E T N L A L V P I D D P G Q K A P K G N G W N K P G G Y Q$

 $P L T D D K N P A R D R G G L D N$


LE TAVRYYRRGWNPVPIPFKMKGPQDKGWQDR』IR RS LIA Y GYR P VACSGKA AVMGNWQR SR




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DT A G G ${ }^{130}$
140 150

T GTQYQWY


HPNGKPYKW
160 SAWFAAVKQRLEVLGRGQQFVAAPS YHVHPDTGK PYE ELDD A RGVEFKS LGGRQVAAGSV

| $Y H V H P D T G K$ | $P Y E$ |
| ---: | :--- |
| $H P E T G R D Y A ~ L$ |  | FHDHPDTKRYEWL S SVYLDEWGKVEILANGQQFVA





## -

 LKEYPGVDFKSSGGVVGCGS $\square K F P G L T V G N V E V Q D H H R Y C V S W P S ~$$T D L D N G L E I I A D V$ LHKS GS F Y E D K HPEGRMYEWR
 $K R I T G P G E A L$ EI RATGQQSVLPPSP HPVTGQYFWL $V W E D D F G Q H A V E: L A D G Q Q F V A Y G \quad \square H P D T K R D Y Y W$

SLSWPNEK
F A LTPGGEHVGEVLGAGRFTVLAPTD $\qquad$
GPSGNPY YGQKLGY LDGVDIKAHNNYFVFAGSVTSKGTYTNNEKP QGFHLRSRHNIDVKGRGSYVVAPGST SATVPDHSEGFSIYAGDAYVLIPPSR
THNG
GQEDFKGRDGYVVMGGSVLPD



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


 $\left.\square A V T V E G V G Q F T V K A G N S Y V \frac{A}{L} \right\rvert\, P P S$ YNDHPKTKKYTWT
 RHPDGGDYK

NPTLKAFG TGF LDVRIARGAQTVLPPTD
HPDTGQ PYA
GQK\DYGPSVDIKAHNNYFVLANSQTHYKHNDQDVTEYN GVLGAGVEIVQRHHRYSVAPPSVHD

 HPDTGDLYRF
 SAWFADPKQRIEMLGRGQQFVA SFKTDDGNPVSYE TPESPQGH LDDLGYGQYFVA KKLVKRKETDLEVLGDGRQFVAPPSDHPDKRT K NAADAMSKPVMDVRSQKSQIVTPPS AGAFR TFGEVRGKNGVIIAAPTP
 NHNPLPGVElITDK

HPDTGR $\square$ YRF PQAKVGDGGLID
!PFAKMKSGQVE\|LGQGQQFVAFG SRPEDPGTGR PYA
 LDPD S GTHVGDFKGAGSFVVGPDSVRNGKVYQTAGSPW


 FKG GKKHPLEVLCLGQQFVA




 SLNWPN
ELTSPRGGGTVDVLA GPKFLVLPPSYLGHLNPYNPGAGWT
 AHGKGELDAGGEI RAKNWYVVAPGSI HPSGG円Y $V G R L P N G G V E L L Q R H L R Y S V A P P S V$ H H S GNLVRAF


 GAY LINGKCQVEAFGERTQFVAFGT
P G
VD DK STMAYAL GPG

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# WVDFFGGLTSAETLPVVTKEQDAAAVEKFEEMAQKHGLVR  GNPY LSVQRVEPEIGNLSEIGL <br> NKNFRGKYTVVRDLPDI ELLPELYNWLIN <br> EQPDAGYYTVERETAVAS $\square$ RYEELPEVFQQANKS <br> WRKGCAPWEIAPP PLPS W L A DLLR 



HN $\quad \square Y D S T K T \square K P M P K N V L D K D E T A F Q G A G$
G GCRPDEMEVA I IPE
$\square D G E N P L N N A A D D L E E \| S L D T A R E \square A A E F D R Y A K D \square G W T M$

GRRYTP DRREDRDPDLSDA $\quad F \square R W$
NSQGQTI GIPEDDI PELPPSWLEGL
WlE DSLLD I H $\mathrm{S}^{2} \mathrm{Q}$ DLPSVNDKQVKNUIT
LI D Y LEPYRVQAEAGE

GPDGT LLPEGEVPRVEHLSELPE

GRAYTMC


WT TERTLLDPVEE LPLLTADHRKAMEAVLA AHGWQP G E

QDYA
WET
DETRHP $\square$ AE $\square$ S P D A
GKDF $\square H A N \square M P D W L I E$
LKSPNELDIAAAPDWVINKMLKE

 G E RTLLNTH $\square \mathrm{D}$


RKVLLQCAKSFNDTP DSTEDFRTLENNFD GGDPLVSNTPPNGSTD\|PEMDWEEL
 DDDPLRCSLSEAPM

WP LGETPDDVA LS D LDPVIDHTE DAAF $\square$ AE

 $N L N L P D K L V E I D E \square D F$
EEDRD DEYD E LTPLLTEEKLQEVFDDFPEKKKK
WVSASPLDVPFYTLPEIDAETIDGFVADADLYLASVGVAV

GVDSPENNTADLDLEELSLDSARLITAEFDRYAELQGWTR
$N S P A D V E V A \square A P Q W L V Q W D D \square Q T Y$
WS NGEP $\square S \square$ P $\square$ H D $\square$ PE $\square$ TP DA VDAF $\square$
$\stackrel{G}{\mathrm{~N}}$
N P P A D G L L E L P G D LV K
WVNGVPPSREV LIPELPAELVTLWQNW


SE LLDGSVMDTPPAPE DLPDLP
SPDGNTAEYLPR RPADLPELPEFDDSPQERRG
WF NGSPAETP $\square$ AE $\square$ PE $\square$ TPEA $\square D E L L A Y F A E R G$

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 DLIIASHELIMQGFAVYLLSQGTNVPYEGSTGRGHLD DT ITWLLDHGYPPLPAAPYHKDP DIPNHQDFQHRD DWAQFYIDAGLALVPIEPGEKGPKGKGWNKPGGYF DAAPDYWDGGWRVLPMRRRTKKSPPGGRTGYDGED RAVEAYRERGWATLPLPPRSKKKPPTGYTGHTAPY D■RKY地 DLVQQGYKVYLLAQGTNSPYKGSKGHDDAT DYVHALATLGAAPLLVYPASKKPAVRTPQRRADNR EQALNCINRDFSVIAGYPPGKRAVIRGTSSG

## NERLTSALEHTLKGWNVLPLPPNKKKPPSKGFTGA

 DWARRYDETNGLLVVIVEPGEKGPKGNGWNKPGGYF PADKRWQDRAYRSAEAYRVRGWGTDP罗PPRSKEKPDTGFTGRAAEY
 LDAARDW亡SLG\｜GVVGVDGFKRPVNKQRYGASDAP QAADCYAAHGWPVVPCVQDGPHPVWRDWQGRASTD DWARRYDQTNLALVVPMDPGTKRPDTGYQWQQYPFTP SSRMDAADEYAS DGWPVMGCPAPAEHPVSAAWAVEATTD RLVTNGYAILPIAPGTKKPGYPQWNRHASRA DRDAQAEALASWAALVPVPQGTKGPRAKGWDSDAQWA ELLETALTLAATGVPVLPLRAGKTPVCHAWAAATTD EQADYCTNNGDHVVAGYPAGKRMIIKGTAEG LRTALDLAAAGVPVLPLR HGKVPPCHAWA AATTD
 WFIVPT QGKRPLGYRWEQYPFTP DGATELWNAGWRVLPTRPGDKEPIVKNWKQFQTNM ELLRTADEYADLGWPCFPCPDPGAHPVSAAWAHQASVD NSDYLKKLLVPT QGKKPLGYQWEQYPFTP NSDYПIKSHELIQQGFAVYLLSQGTNTPYKGSRGHDDAT DAASALVRAGFRVLPTVPTDRKPVGKGWQHRSTIR
FPCTSPGKRALLKGWME PNFQ AARLIARFGVHVLPAMPKDKRPGGSGWFGGQFYN GHFLDP DPPRSKEPPPKGWVDLATAD
LRRAAQRYAMHGWAVTPCRПMGCHPAVESWEDDASTD WARRY円ETNLALVP IDPGEKAPKGNGWNQPGGYF SEHDRTALTLAAHGVPPLPLRPNMKTPPCHGWAAATTD DDDTDLRLKLLRGGYRPVPVKAAGKRPMMKGWETVCAS EYLGALAGGGCAPLLVYPASKKPADPHWHKLATTD RAAHEYLVAGWPVLPCDNGSPHPVDRGVPGRCGQR
$A$ ARLASAGLPVLPLRPNMKTPPCHGWAAATD
 AAEAYDAAGFQVLPL NGKAAAVKGHHGREGAT STADSSWARRYDETNHALVPIDPGEKAPKGMGWNKPGGYD TNDYLQTALA LAASGVPVLPLRVGKVPPCHAWAAATTDR

 $R G \square W P$ P TTAPDKQPDGLEWGRERH HAERYRAAGWFTLPLPANAKYPPPGGFTGGSGGW
DH LRTALS $\square A A D G \nabla P V L P R$ RGKVPVCHAWA AATTD AALNYDERHWDILPCPALGSHPAHRDWNKQDTAQ SDRLKTALS LAACGVPVLPLRPNMKTPAVCHAWAAATTD EAALAYAEQGWSVLPLPHGQKWPPPTGFTGHDARLD LHAALAYAALGWPVLGCPDPAAHPLSAAWAVEATTD NQHLNTALLRLAAEGVPVLPRLRPNMKTPPCHAWAAAATD RI ATVLDYAAMGWPVVPCPDPGAHPLSPAWPLLATTD TDYLPAALGLAASGDPVMPGRPNMKTPGPCTCPAPCHAA
TTELTK ALALLPQEWVLTPVNGEKKSYLKDWQNKKDNR STDTVGAAMNYLGTGMRLVVLRPDSKKPVEKGWQNAEPKG RKYDEQGLKVFPLVKGAKHPWGEDWDKKNRNP MVDAALEYA A LGWPV GGCPAPGVHPDSAAWAMEASTD MLDAALGYAELGWPVMGCPDPAAHPVTMAWGVEASTD QLLDAAVRYTERHWDVCPCASPGAHPARADWAEGATG QKITAVLEYAQLGWAACPCPDPGAHPLSPAWRLQATTD


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UniRef90-X7ZC68 UniRef90_UPI000364C614 UniRef90-A0A024E8L4 UniRef90 $\mathrm{Z} 5 \times C \times 2$ UniRet90-B2ZNY3 UniRef90-C2KID9 UniRef90-B9MSA9 UniRef90-X7U507 UniRef90-G5JD64 UniRef90-A2RHA3 UniRef90-G1BRR7 UniRef90-_L5EZD3 UniRef90-IOPAC2 UniRef90-I3UZE8
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## $\stackrel{P}{\mathrm{P}}$

 TTVAD EVV




 TTPSAAREYLTAHPGAG VGLLHSESQTAALDIDDGAALAA PAVLTSPA WTA GWQRAAAIAYHPGGAGLTVVDLDDA A A


 QS L R EQRTC F LY A A QP TGI GL LC GQNSQEFLVSVDCD GF S P QDSMLGVWFRDR KTGIGTLAGGEHWLGWIVDFDVKDFAS

 PTVITSPGWAAA WRRAVCVGYHPGGAGLTVVDLDNATAVD



 P T D A Y L D R Y V V T F G GA V
VA R VA GWWRQHP
V D A D QAEAFWQKHPR
PNVINSTPWERAWRKAA GVAYHPGPSRLCSLDVDHVELVL LI P N F A K H N A L C K R D E N Y G I L M G P N N A ADETEDTRWTKAQRNCTNTGLVCG
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 ESVV Y P K G D N L A VR L P A GVVGI DV DA H S GK D


A S A V A YHP G G A GL T VV D L D D A N AVE
IT G S QV H R F F G E K P Q
 TEESLRRVYAAHPRAGVGLKLGPQGGVVLDVDNPERA

 PAVIDASPA WA A A WQRAVCVGYHPGGAHLTVVDLDDADA I
 MTE GE I R S WLRRQK GWTGLVI PDGYDVIDDD P AVVVASPS WAA A WR R A V CVVGYNP G GA G L T V V V D L D D A D A $\square$ PTHGQLETWRREYPDGNAALYLT DGLLCVD DNNKK QRP


 T T DR DVV DS WR R A WVVQA A A VA Y H P G G A G D TVV V D L D D D A D A V


$\square \mathrm{NLLD}$ D YE R R WWS
T DTIRRWWTATPDA NI I LIPTGRVFDV

## $D V$

 SS DRRMVGWWWTRRPAAPI ILATGTDGAPCAVSLPAAAAP


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| UniRef90－W1V6z9 |  |
| UniRef90－X7ZC68 | TLAAAVARWGALPPAWTTTSRDDGVS |
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| UniRef90－A0A024E8L4 | HVLYDLDEDDLDAMALVFPTVVGRFRDMFRVPDGVELSRV |
| UniRef90－Z5 | TLAEAERRWGPLPPTIRSTSRLGGMR FFRVPADIAFEDR |
| UniRef90 B2ZNY3 | QLAALEAELGPLPKTYTSRTGVSGIRFFL |
| UniRef90－C2KID9 | SLTQSGHTLNLDNEVWEMTPRSGSHTEFKVPKNVSVKND |
| UniRef90－B9MSA9 | VDL YLP |
| UniRef90－X7U507 | FLADADADPGTTPTVRTPRDGGHFYFTVPKGDELPEQ |
| UniRet90－G5JD64 | RL GKLPPTVSFTSQRPGRQ |
| UniRef90－A2RHA3 | RLDWE |
| UniRef90－G18RR7 | AA |
| UniRet90－10PAC2 | SFLDIATGDADSQLPPTVVTPSDGGHFWFTVPEGVEMPT |
| UniRef90－l3UZ | Q LSELLGMDLLADAYPTSVGNPARRDMFRVPDGVDLSWH |
| UniRef90－UP10002DF1E | SLADLAAAFGLLTSAPHVLTGHPGHHFYFRKPAGAVL |
|  |  |
| UniF |  |
|  | WLRSWGQT RGLYVEDMTVETPGGGGHLYIVMPDGWADGY |
| UniRet90－K9WF |  |
| W7 |  |
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| UP100047C | PLPPTVAFTSGRPGRQYLFKI |
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| UniRef90＿UPIO00345B25D | VMALARMDRSGTRPGPVAAVDAQRYLFFVRSPADEDEWWS |
| UniRef90－s9R6T2 | 兂 |
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| 9x |  |
| ef90＿W6S344 |  |
| UniRet90＿7kGY1 |  |
| UniRef90＿UPIOOO369C0 |  |
| UniRet90 A0A05876B6 | ELLGVD |
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| UniRef90－UP10003 | R LERDDLPVGPVASFGGDRHLFFVATRGAPVDED |
| UniRef90－F3NJ36 | R GEHW YRGAMTSRNAVR |
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|  | － |
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| UniP | QVLWEVDLDALPLHFPTVVGNPARMRLMFRVPAGVELSVH |
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|  |  |
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| UniRef90－UPI000477C3FA | VWA RGTLPPTRTVATTR GEHWVYRGAMR |
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| UniRef90－A0A031IUA | FVLFDQMGLDLDAMAVVYPT IVGRFRVLFKMPDDIELTRH |
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|  |  |
|  | P |
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|  | AGRALEVVDEVFPETWALRNRTDGEKRLYRVPKGLINWRSN |
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|  | $\square$ |
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|  | SNALVKLIADDHLGYTPFSRVGRPRIVLVYRQAPVSPHRFA |
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WR TPPSSVDGDPVLAPELLK DWNHWD VF K

GGDGS QC DGLEDIPDVN
ELRFVGELKEPLK DEADLL

RTDGDY $\square$ P L N NTETNEPLT FD DS DCPDWLLE
DRGQAPDGIHVNDR $\square P$
GTKFVIYYRPED LIPE $\square D Y \square E L$
GRDYAWLLEVIDEKAAARAS RTLENAVDN ELL
NKSGQVIENLDDLPDVSELPV
$W \square N G N P L D V P V S D L P \square V T P E Q L H A Y R S R V E E \| L A A R G E \square N$

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WRDANGLPD D $\quad$ GELLA $\square$
$R P P R \square P G R P S N P \square P G G A P A \square E \square P D V L A V L A D A C E$ WPDE G L A D L D G S LDPE IDAAQAAAFLDEA
G

WRDASGLP LI S DLWDVFKRGAEAACPWLPKDAKPAGKQK GRPYAWIGDIAN IQPIPDAPLSAWRQQLAAKGRKE

WQEYVG $\square Y P L V T Q T S K P E E S H Y K Q$
MPDGTDAPETVVPEPHELPT LPRWL

LSDN GHDPEVDLDEELLGV


$$
\text { VR P LIP P A N E } \square \text { P E A D } \square \text { R E } \square
$$

WPECSP $\square \mathrm{DVS}$ DHELPVVS
RAPET $\square G W R \square P P$

TVGDTPMWEKGPEAPMLPARWLEGLRR

ED
V S P S S VR WT L P T S T
WNEH DE!LP LPDAFYADLDRHL
WT TPQGLPVDVP $\quad L A E D P A \backslash P$
$G D Y T V A E D R E L A T V S A E R L V E V L$

P Q D G H P LP D P $\square \mathrm{A} V \mathrm{~V}$ D

GRDYPATEELVDA $\square$

RSPY
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G R D


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SD

SSSIDDEWA

K R G S R

R K T S R A
PK


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 PAAVVSPEWAAAWRQAVCVAYHPAGAGLTILDLDDADA㑆 PRVLTSPAWASAWREAAAVAYHPGGAGLTVVDLDDA
 TDPAAAEAFWERNPN HNLGVVLGPSRVCSLDVDDRHVLY PNVVTGPSWSSAWKQAAAVAWHPGGMDLTVVDLDHADAV A V G DTIRRWWTADPNA

AVGA RRMWAKHPGAA $N L A M E$ VG ATSA RRMWAKEPRAS LDFDVIVERREAFPTATGVLLPTG T DTVRRWWTASPEA保 FSPQQLLAHLNRGRRPASYALPAGRAFD PAVLNSPAWVRAWWEAAAVAYHPG PTDIE TGWWDKWPDAGVCVADDH LDHAAVAER

KRYPDPLNFALEVGRSRRIVVDCDTTEQRE PATLAGAAWATAWKHATAVAYHPGGTELTVVDLDHV ATVA RRMWQQWPDAS ILLPTGRTFDAI SVPETAG PRVINSPTWRRAWREAAGVAYHPGGAGLTVVDLDNAEAI TGVI TSAVWAPMWHRAAAVAYHPAGAGLTVVDLDDAHAV DWELTPRDLFKYARMGANWGMRLG RYIDDL ATGYGLPLASNHACSVDPDNVRGMR ASATTLRRMWSKHPGAA VLLPTGRAFDVV DDUEGAG TDTAVIASWLTAWRQADAVAWHPAGAGMTVVDDDSPDAV AT AVRRMWSKQPRAS LLLPTGRTFEAALDVPEAG
 PGVDVRKWWTENPEAS RLLPTGRAFDV VVGLDVPEVA PDTLTSPQWAADWRHATSVAYHPGGAGLTVVDLDN PAVLASAAWAGPWREAQALAYHPGGAELTVVDLDNADAV LKQSQLFKELVAKKSTGIGVCCGPSGGLLFLDHDGPSAA AD AAYAHRVAGGNLAAVMGVNSRMIAFDAEDVLPAK



| lupas 14 <br> jnet <br> conf sol25 <br> sol5 <br> sol0 <br> jpssm |
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lupas 21
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conf


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A V L S
A PEGDT TT E AFLRGLTLELPPTVAYTSGKPGRHRLYQVPQERAIATQ AADTWAREYLPATRTVRTTRGGEHWYRGAMQSANAVR LLALARMERMGLTPGPVTRTPHRRTEFFVAAAKLPELVRD A WARAS LPATRTVPTTR GEHWIYRGSMQGANAVR A WARETDAA PKTRTVPTTRGGHWI YRGAMRSATSVR DFLKSHTF PKDTPDMKTGRGGYK\ILKSKKQPPKNF SLFDLEADMAAGVRTTSTRPGSGGRSAFAEEPDLSWLKFS CLALARLERERRELGPVAAAPD RRMYFFVLPGATAKVI clla Larmermal RKTLVQLLGELPPRRWRANSNK RKA CLYLLAVDGD AEALLNAVTTMLGPDPRMRDNSPKFLLAEQLEGQMSKRKL A WA

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## SWA

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 CLALARMERMDVELGPVTSTPGRRMLFFVLPGUPDLVRN FLALARMERMS DP GPVTRTPDRRMQFFVAAAKTEDLVRR LLALARMERMELTLGPVTWTPDRRMHFFVLPGASVKVPDLE SFQMLLEQRPELRLTLLEKTQSGGFRTGVRVQKPLEF TN K A WARAT
PEECDRSFQELLEQTFLEKTQSGGFRIGVRVQKPLEF TWA
 EWLQIKGIDLSADDGVQIVSGRPNRGLLYKLPDGQPLPTK GUNDACELFGGPMSNIFATTPRGGDHLYYRAEPGRGRD
 A WARAT 【 VFSSPQAFEPLLNVAPRFRTPSGGYRVILAFTEEPDW TA AAGGKDLVRETFRYSAW PRDWHKYVSCPDVPAHFRG WARA VLPATQTVPTTR GEHWLYLGAMPSANAVR AAQSDWVSHGDTLPPVTVRTPGDGRHLWLRLPEGDPTTLR



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1 GALWGGEDGFAVLWNRRYVLIPPSTRPE GAYEDT DAARKLGPSSLDLRGEGDYVVAPPSRVGNR GAVQWA QGWSPELDDLVVRGEGTYVPAPPTRI
CHLDCVPETVEETPGRDSFVLGAPSAL PSGGRVTW LGWDAGALGLVGRGEGHYVVGPPTRVGGR
 QSFSVGNDRVVDLLCHGRQTVVPRTI RALABPTTDPYVWN K LHSPDGD LLELRWNK $\square$ Q SVIVGQHPETGAYRW VGMWTSPDGYA V LWRDRYVLIPPST
DG $V D I L K S M S Y A L G P G$
$\square G W A L P S L D L A B L G E G S Y V A A P P T R V$
PGVDI K
PGVDIK
LHK S G D R Y R W
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DGLHALGSAALDVRGEGDWAAAPPT PG

V DIK STAAY
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IHRLAGDMGII ELLANGQQFVACGT HSSGARDEWD
RTE A A
$\square G W S P E R \square D L V A R G E G D W V V A P P S R V G G$ PGVDワK
A AVDIKS LMQARWRGPGGTMTALPDVVRGLAVREETTPAR $P G$ V $V$ K SRMSYALGPGS
VKDEDGSVEQI ELRWDGTQ S IVSGSHPMTDGYRW $\square G \square D D P N G G V I D V L A A G R Y A M A P G S$
SHSDSKFTGKI ELVGTGKQVADPPSV HPDTDTYKWA QGWSPSS $\square$ DLVARGEGDYVVAPPTRM GRHGSS VQWA

A G WNAAS $\square G \square R G \square \quad G E G A Y V V A P P T R V G G$
VRKLGWSPLALDLKGEGEYVAAPPT RYGSRGAVQWA KVLMAGGF VGDYRGAGGQVVMP SQ RYGSRGAVQNA F SLLSRGGDHVGECLGAGRFTVLSPT $\square G T G K S Y V N \square N C P D K$ SCKVKTGKDHLEFRGKNDASILPPS FHPNGRKYKW D G $\quad$ FS RGGDHVGD $V$ VKSTMSYALGPGS

 KVQCPDGSMMLEFRGKGGQDVLPPT $\square \quad H P D T G K Y Q W G$



FSLDRDRSRMGELLANGGHTLLPP
HKLS DRNHTIVELEKTGGQCIGPGS
$T V G A N G \square P Y R$ LH PN GNRYE $\square \mathrm{Y}$ SYSEPDSSEAKE SYSEPLSSEAKEAQGRGGFAVMAG
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$V$

[^1]
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GRD Y
R QPTAANRWDPD
$\square R A P Y D E G G S V P \square P D P \square A V L D \square L A D A S E$ RRPSQANRWLPDVDELIS P

P Q T L S A


LS L N G H $\square$ PEVNLEELLGV
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GG LLPDEPPADTGEQLETLWQRLAEQ $G G \quad L P D D \square P V L S A E D F E A V W A M L E$

G

】DWHDDC
RRPTAANRWLP DAAELVSALAYACGREG
RRPTPANRWLPDAEELISP
GREWVHDCDSEDDLMPIFFERLKKD EGKSRPFEV

D A D D R P L DEPPPPDPD DPEAW GNGD FNNLPTLPDGLLTVWREMLTNAPKVESKQT GSDAVWLPDVESVLDALVEA

WE YFVAYPPTVAKPE
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[^1]:    lupas_21
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