

## QUERY

 UniRef90 NoBEW7 UniRef90-D3RX42UniRef90 D1CDA3 UniRef90-I3R661 UniRef90-G2MK65 UniRef90-MOCJO9 UniRef90-UPI00040C6B4E UniRef90-D2RGP9 UniRef90-W9DVC0 UniRef90-E3GXU1 UniRef90-U2YFH7 UniRef90-F3KIC6 UniRef90_D7EBMO UniRef90-UPIoo03735AA4 UniRef90-U1QXZ9 UniRef90-E7QTV2 UniRet90-G0LMW6 | UniRef90-F7XQA6 |
| :--- |
| UniRef90-Q5UZ | UniRef90-Kobag9 UniRef90_OOWOK1 UniRef90_J2ZCB2

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UniRef90 KOICL6 UniRef90-A6UTH6 UniRef90-Q2IRR6
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UniRef90 - 12 LLAO UniRef90-B3T118 UniRef90 UPIOOO3ACFOB7 UniRef90-R4VUP2 UniRef90-W2ERE4 5
$+$

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80

V
VSAEGRTRRLEEFNPSERAKE\|AAR\|GKPAEFVQAVLIE VVSKSEGRVRKLEDYKPSSKAVKIAKKIGKTPEFVOAVME
 VVSKAEGRFADLDDFPAGPRARELAARLEKDPRFAQAVLE


## $\begin{array}{ll}\mathrm{V} \\ \mathrm{I} & \mathrm{V} \\ \mathrm{I} & \mathrm{V} \\ & \mathrm{V}\end{array}$

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IIV K K A E GRKADLASAFPA S A A A I A A A A D

V Y $S$
$\mathrm{I} V \mathrm{~V} S$ ..... 
$V$ V $\operatorname{S}$ K A E GRRYA R LLS E ITT P S$V$ Y S K A K G N T R D L L S T I Q PI V S K A E G C Y V DL D E V T P S A R A R E L A A E L G K D A R H V Q V V L NIV V S K A E G R L R R L L E E Y T P C E K A
$\begin{array}{ll}1 & V \\ I & I \\ V & V\end{array}$$V$ SK V G GQLV PAP D

$I V S K A E G R V L V A D D \quad R E K A D E A E T V R V V A R$
$V V$ S K A EGRAF DLLSAFPASERARSDAARDEKAPRAARAVLE
$1 V$ S K A E GR LRRRGD DRTA

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| :---: | :---: | :---: |
| QUERY | EVLLD P P F L VKAKFGNVCVNAGTD | D A S NVEE G S L L LP |
| UniRef90＿N0BEW7 | ESEEILIDDSPLLLVKAKFGNICVNAGI | DASNVEKGYI I L |
| UniRef90－D3RX42 | ESEEVLIDD Y PFLLVKAKFGNVCVNA GI | DQSNVEK G L |
| UniRef90－D1CDA3 | ESNRIVRDRGII I SETRHGFVCANAGV | D A S NVRGEEVCLL |
| UniRef90－I3R6e | ESVDLVMDEPFLLTETRFGHVGVNAGI D | D R S NVPPDHDLLLL |
| UniRef90＿G2MK6 | ESTEVVMDKPFILTETHCGHVGVNAGI D | D R S NVPD H D L L L |
| UniRef90＿M0C | ESTELLDDCPFLLAETRFGHIAPNAGV D | DRSNVPDHDLLLL |
| UniRef90＿UPI00040C6B4E | E S VRVVRARPVLIVEHRDGFVMANAGI D | DQSNVDP QRALL |
| UniRef90－D2RGP9 | ES DEILIDDYPFLLVKAKFGNICVNAGI D | D R S NVES GV |
| UniRef90＿W9DVC0 | R S K EVLVD Y P I F L VETHNGHVClV A GI D | DESNV D |
| UniRef90－E3GXU1 | ESEELVI GHDFVI TETHHGFVCANAGV | DESNVKK GFAKPL |
| UniRef90－K4MGI4 | R S R DiLl E S P I FLVETNNGHVClK A G I D | DASNVDKGFLVDL |
| UniRef90＿U2YFH7 | ES T DLVMDEPFLLTETRFGHVGVNAGI D | DRSNTGGAELLLL |
| UniRef90－F3KIC6 | ESKQlI R N N G I L I VETKNGFI CANAGI D | DESNVK H G F VTL L |
| UniRef90－D7EBM0 | RSRECLVESPI MLVETYNGNVCDNAGI D | D D S NIE K GFl L DL |
| UniRef90＿UPI0003735 | ES DEVVKVGPHVIVAHRLGFVMANA GI | DESNI G G GRVLLL |
| UniRef90＿U1QXZ9 | ESTEVI IESPFLLTESRFGHVGVNAGI | DRSNVP DA DILLLL |
| UniRef90＿E7QTV2 | ESTELVMEAPFLLTATRFGHI GVNAGI D | D R S NTGDADLLLL |
| UniRef90＿G0LMW6 | E SVEVILE S P FLLTETRRFGHI GVVNAGI D | D R S NVP D A D L L L L |
| UniRef90－F7XQA6 | R SVVECLVVEAPFILVQLE S G Q I C V N A GI D | D D S NVEE G L F L DL |
| UniRef90－Q5UZQ7 | ECEEVLVEAPFIL GVTK K G HITVNAGI D | DRSNVPGADLLLL |
| UniRef90＿K0BAG9 | ESKRII RSNG】LIVETHHGFICANAGI | D E S N I E E |
| UniRef90－Q0W0K1 |  | DRSNTES GY ILLL |
| UniRef90－J2ZCB2 | ESTEVIMEAPFLLTETRFGHVGVNAGI | DRSNVP GS DLLLL |
| UniRef90＿B3T7X7 | ESKRIV R E NGII I VETKHGFVCANAGI | DESNV Q ${ }^{\text {D }}$ Y ATLL |
| UniRef90＿UPI000381F660 | ESRRVVRARP HLIVVEHRLGLLIMANAGI D | DQS NVDS GVALLL |
| UniRef90＿E8N4V5 | ESRSVL R R L G T I I VEHRNGFVCANAGI D | D H S NV R G D WVLLL |
| UniRef90＿D8J7M1 | ESTELI TEAPFLLTETRFGHVCVNAGI D | DRSNTGDGEILLL |
| UniRef90＿UPI0003782A09 | ETNEVVKMGPNFIVETKHGFVCANSGV | DESNSLD Y I K PL |
| UniRef90－A0B514 | ESSEILLLDRPFLLVVTRFGHVCVNAGI D | D Q S NVPP GK L L L |
| UniRef90－Q46E62 | LS REVLVVEKPFMLVTTLAGHTCVNAGI | DESNI ED GFLLYP |
| UniRef90＿UPI00036E | ESRRIILIT T G H I I VETKKHG\VCANAGI D | D R S NVNGEYVTLL |
| UniRef90－D1Z | NSTKVLMKRP L L V Q TVWGNVC口NAGTD | D R S NTES G H l L SL |
| UniRef90－D1JIJ8 | EAKEVVKKMNHIIVETKHGFVCANAGVD | D E S NVE Q GKAVLL |
| UniRef90＿LOHHQ5 | A S T DI I MEHPFILSELSFGHI GVRA GV | DQS NI E D G MV |
| UniRef90＿K0B3C5 | ESKRII RKNGILIVETNDGVICANAGI | D ESNVK E |
| UniRef90－G8PRU1 | ESTRVVRHFGTMI CEHRLGFI SANAAV D | DESNSGDET LIL L |
| UniRef90＿C7NNP7 | ESEELVMEAPF L A VT HFGHITVNAGI D | D R S NVP GA DL L L L |
| UniRef90－F6CXN6 | QSNRIVRAMGVLI A EHKKGYI CANAAV D | DESNADP GQLIL L |
| UniRef90＿U7P8Q0 | ESTRVVREEGTLI A E H R L G FIICANAAV D | DESNVGEETII L L |
| UniRef90＿V4XJT9 | ESVDLLMEAPFLLTETRFGHVGVNAGI D | DRSNVPDHDLLLL |
| UniRef90－K8PLL8 | ES DEVVRHRPNMIVAHRLGGVMANAGI | DQS NVEEERVLLL |
| UniRef90＿A5USE0 | ESRRIVRDRGVLI TETHHGFICANAGV | DESNVA G GFVTL L |
| UniRef90－M1 XN81 | ESEALLTEAPFLLAVTRFGHVTVNAGI | DRSNVP GA DLLLL |
| UniRef90＿D1AF58 | RAH P PGETRIVETRHGLVLAA A GV D | D A S NTPPGTVLLL |
| UniRef90＿UPI0002627 | ESKSVIRRKGVLI VENNQGLI MANAGI D | D H S NVEEQDWVLLL |
| UniRef90＿UPI000374409D | ESEKILKVVAPHLIVKNKQGlVVCANAGI | DKSNI E GDFYIL L |
| UniRef90－K6GJC4 | ES QKVVRRMGVLIVVEKLGFI HANAGI D | DRSNIDKNVLLL |
| UniRef90＿L0L2M0 | ECDEI FGGVP GAALT 1 T R G TLSPNAGI | $D S S N A P D G C V V L L$ |
| UniRef90＿H1Z127 | T TEDLILD R P F VLS QLKCGHVGVR A GV | D N S NVED GTI I Y |
| UniRef90－E5ASS3 | ESAEIVAHRGVLI TAHRLGCVMANAGI | DHSNVDEDSVLLL |
| UniRef90＿V6KKD7 | RGPARIVETRHGFVMAAAGVD | D A S NTPAGTVLLL |
| UniRef90＿UPI0003679520 | ESREVVRQRPVII VEHRLGYVHANAGI D | D R S N】I D P R V L L L |
| UniRef90－D7DTT7 | EANEIVK■GKFII TETKHGFVCANS GV | DESNSSKDVKPL |
| UniRef90－Q648A3 | DAKEVVRERNII I VETKQGFICANAGV | DVS NVEE GKAVLL |
| UniRef90＿B8GG71 | A SEELI LEEPFILSALLTCGHI GVRA GV | D HS NI E D GKVILL |
| UniRef90－Q12UL3 | NSVEQiVVEPVLLVENLNGHVSINAGIID | DDSNVDDRYFLHM |
| UniRef90－K4MDG8 | ECDEIFGGVPGAALT $\square$ GTKGTLAPNAGI | D S S NAPD GYVVLL |
| UniRef90－K2MJJ8 | ESDELVKVGQHII A A HRLLGLVMMANAGI | DESNVGGGRVLLL |
| UniRef90－D5QEF2 | ESARVVRALPPGLILEHRLGFVMANAGI D | $D Q S N V P D G Q A L L L$ |
| UniRef90＿E1IDB2 | ESRRIVMANGVLI TETHHGQICANSGV | DESNVAGGRIVLL |
| UniRef90＿W4LJ70 | QSRRI AMDRGVLI AETHHGLICANAGV | DQS NMEGDEVVVL |
| UniRef90＿Q5NW69 | ESTEVVRSCPGVIVAHRLGMVMANAGI D | DQSNVDHDHALLL |
| UniRef90＿F2KRL8 | ESEEVLDDYP FLL V K A K F G NVCVNA GI D | D R S NVVEPGF |
| UniRef90－F6D1M5 | ESNEII KVVGPDFI I E T K H G FVCANA GI D | DESNVDGGLAT P M |
| UniRef90－M0M985 | ESTELLMDEPFLLTETRFGHVSVNAGI D | D R S NV P D N D L L L |
| UniRef90＿17LK91 | S S S DIL LE H P FIL S EVPP S G H G V R A GV D | D H S NI E D GRI I I L |
| UniRef90＿V4XFX7 | ESTEVLFETPFLLTESRCGHVGVNAGI | DRSNVPDDDLLLL |
| UniRef90－D1CAW8 | EARRIVRANGLI I A ETRHGFVCANAAV | D A S NVS P D QV SL L |
| UniRef90＿Q8TWR1 | EAESIVRVGPFi I T EVVRGGMVCANAGV | DESNAPPGYVIVL |
| UniRef90＿K0ICL6 | ESAQILRAKGII I SETKHGFVCANAGV | DQS NVE GDSAVLL |
| UniRef90＿A6UTH6 | ES SElVMMGDKFI I T E T K H GFVCANS GV | DESNSND A 1 KPLL |
| UniRef90＿Q2IRR6 | ESSEVLRVRPVII VEHRLLGLVLANAGI D | DRSNVEGETALLL |
| UniRef90－C7NXP1 | ESEELVLEAPFLLAVTRFGHTTVNAGI D | DRSNVPDADLLLL |
| UniRef90－A0A031M2D6 | ESRRVVRAFKHLIAEHRLGF\CANAAV | DESNVEDNTVILL |
| UniRef90－D7A1S6 | QS DEVVREGPRVVVAHRLGFVMANAGI | DESNI P D GTVLLL |
| UniRef90＿16Y881 | K GKTLI TENTIGIVQAAAGI D | DASNVDTAELVLL |
| UniRef90－14EDG2 | ESARIVRDRGLI I A E T H HGFVCANAGV D | D A S NAA GREIVLL |
| UniRef90－W7T4P0 | ESVRVLARKNTLI TQNRLG VVQAAS GV D | D N S NVS Q A El AL L |
| UniRef90＿M4IH39 | ES DElVKVGPHVIVAHKLGFVMANAGI D | DESNISHGEVLLL |
| UniRef90＿LOKZY8 | RSRECLISS PVLLVEMKNGHICDNAGI | DESNVE E E ILL ELL |
| UniRef90＿E6N921 | NAAKILRGHGVII CETHHGFVCANAGV D | D A S NSGGAFLI T L |
| UniRef90－S6GI25 | ESSQIVRRDEGLII A K H R L G Fi C A N A AV | DESNVDQNHVILL |
| UniRef90＿F8AN06 | ESNEVVKVVGKFII TE T K H G F V C A N S GV | DESNSSNAMK KL |
| UniRef90－I2J | ESREVL R R R PVVI VEHKLGYVHANAGI D | DRSNTQSDRLLLL |
| UniRef90－B3T118 | ESARIVRDRGVII SETHHGFQCANAGI | DASNIP GNTVALL |
| UniRef90＿UPI0003ACF0B7 | $R A H A R G E T R I V E T R Q G L V L A A A G V 10$ | DASNTRPGTVLLL |
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| UniRef90＿UPI0003628CDC | QS KRVVRAFGTMI CEHHLGGIISANA GV | DESNSEP G $\mathrm{D}^{\text {V I TL }}$ |
| UniRef90＿J6UCI6 | E S S EVLRHRPGLIVAHKLGLLVLANAGI D | D H S NVD G D HV L L L |
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## QUERY

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140
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P LD P D G S A | E | $K$ | $L$ | $R$ |
| :--- | :--- | :--- | :--- |
| E K | I | $M$ |  |

 PAN \begin{tabular}{l}
G <br>
$G$ <br>
$G$ <br>
$P$ <br>
$R$ <br>
$P$ <br>
$A$ <br>
$A$ <br>
$A$ <br>
$G$ <br>
$S$ <br>
$A$ <br>
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$P$ <br>
$P$ <br>
$S$ <br>
$G$ <br>
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$G$ <br>
\hline

 

$R$ <br>
$R$ \& $V$ \& $V$ <br>
\hline
\end{tabular}



N GRCFRRGVV
PL N P D K S A E KI M K R L R E I T G K R V GVI I T D T N G R C F R Y GVV
 $P$ L D P D A S A R S I G K R L E E RTG F HLLP V I I T D S F GRP WR S GI V
PKRPS QSAERI HE GLLPES



P

## P






P E R P S E S A A R L
PENPSLSA A

## 

P

## 

P
PKRPSESAARLADGLEDAFGVRLGVVTD

PTDPDASAARLRQALLERYNLEVAVII SDTFGRPWREGQV
PESPADSAERLSSALS VPVVVTDTSGRPFRYGQR
PEDPDASARRIRARLREDTGARVAVLVTDTMGRAWRMGLT
PENPDRSASSIHQKLLAKTGCKIGVIINDSDGRAWRNGTIG


$P K D P D H S A R E L K K Q F H R L C G V D V M I I I N D S F G R D W R H G T A$
$P K D P D A S A A G G D R D G V R E A L G V R V G V V V T D T F G R P W R E G Q T$
$P$ V D P D M S A Q A L R D T L R V R C N V DIIA VI I N D SA GRA WR N GVV
P E N P D Y S A K KI R ERIIK ELLTNLDDVGVII NDSMGRPRRNGSC

P H D P D G S A K S I G L H I A E L C GK DV S V I I
$P$ R D P D G S A A A L K A R L D A E Q G V S V G V I
$P$ VD P D E S A R R V A D A L Y A R T GCRIIAVLV



$P$ V D P D K S A S D $\quad$ R $\ddagger$ I K L E N A A G S E I A I I I
$P$ K R P S E S A R R L S D E L G $\quad$ R

$P V D P D A S A E R I R R G L A E R A G V I D I$
$P E D P D R S A R E L R R R L R E L V G V D V G I$



$P$ K D P D S SAR RII CA A L E E T F G V R LGGVI


$P$ D P D A S A E R I R R G L S E R F K A E I A V I V T D S F G R P WR Q G I V

$P R D P D G S A A R L K G R L E D A F G V S V G V I I N D S F G R P W R N G V V$

$P D D P D A S A H R \| R S G L R R L A G V D V A V I$
PKDPDASARSI CAALE Q A T T GKK L G V V I






$P$ V D P D G S A Q Q L R A A L K A K T G A D
UniRef90_B7RX41

## QUERY

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UniRef90 C7NXP1 UniRef90_A0A031M2D6 UniRef90_D7A1S6 UniRef90-I6Y881 UniRef90_14EDG2 UniRef90_W7T4P0 UniRef90_M4IH39
UniRef90_LOKZY8 UniRef90_E6N921 UniRef90_S6GI25 UniRef90_I2JLA0 UniRef90_B3T118 UniRef90_UPI0003ACF0B7 UniRef90_R4VUP2 UniRef90_W2ERE4 UniRef90_UPI0003628CDC UniRef90_J6UCI6

GFADGDSGVKAMKDWDGRKDLYGRELEVTVECVADEDAAF $G \vee S I G L S N V I A L K D W V G K K D L V G N E L E V V V E A V A D E V A G M$
 $G V A L G W A G L S A S R D W R G E T D R D G R E L$ GVVTVESVVDELAAA GMA G WA GMPASRDWRGETDRRDGELLQVTVVQSVIDDELAGA


 GVAVGLYHIHP IVNWRGEKDLFGNILQDTEESVADEIAGA GVAI GWA GMPASRDWRGETDRD GHEL EVVTVESVVDELAAT
 G V
 GV A L G WA GLP PARDWRGETDRDGREL SATVVENVVDELLAAA GI AI G $\square$ A N I E P VR D W $\square G E S D L D G N R L Q \square T Q E A V A D E V A S A$
 $G V A V G C A G I A A V H D R R G D V D L F G H E L K I$ TVQGI TDEVVASC GVA A GWA GMPASRRDWRGEPDRD GRELGGVTVQNVVDELAAAA
 G V A
 $G V A \quad G W S G L S P I R D W R E A T D I H G R K L E D T L E A V A D E I A A G M$
 $\mathrm{G} V \mathrm{~T} V \mathrm{G} C \mathrm{C} A \mathrm{G}, \mathrm{I}$
 N CAA G I S G M S P I DD Y E G T K D T F G K T L R V T A DA IAAD E L S S A $N V A V G L A G V P A T I K E Q G N S D A H G R L L S V T E P A F A D E L A A A$ GVALG GWA GI SAMRDWRGEHDREGRELTATVEAVVDELAAA
 NVA GLARVPAR】DMAGERDAFGRVLSVTMPALADELAAA GVAI GWAGLPASRDWRGQPDRDGREMGVTVQNIDDELAAA
 $G V A V G W S G L P A A R D W R G E S D R D G R E L G V T V Q A V V D E L A A A$



## 

UniRef90_B7RX41


| QUERY | R R C L K R C L |
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| UniRef90_NOBEW7 | RK\I K |
| UniRef90-D3RX42 | SRKIR G S |
| UniRef90-D1CDA3 |  |
| UniRef90-I3R661 | RQALR D W |
| UniRef90-G2MK65 | RQALRGW |
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| UniRef90-D2RGP9 | R M H L K K |
| UniRef90-W9DVC0 | K K GLLR |
| UniRef90-E3GXU1 |  |
| UniRef90-K4MGI4 | RKGLL |
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| UniRef90-F3KIC6 |  |
| UniRef90-D7EBM0 | K K G L R |
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| UniRef90-Q5UZQ7 | RQALREW |
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| UniRef90-J2ZCB2 | RQALLRQW |
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| UniRef90-F6D1M5 |  |
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| UniRef90-V4XFX7 | R R AILRDW |
| UniRef90-D1CAW8 |  |
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| UniRef90-K0ICL6 | R |
| UniRef90-A6UTH6 | R K |
| UniRef90-Q2IRR6 |  |
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| UniRef90-W7T4P0 | RLGGTNES【 |
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| UniRef90-I2JLA0 | R |
| UniRef90-B3T118 | R |
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| UniRef90-W2ERE4 | R Y G |
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| UniRef90-J6UCI6 | R |
| UniRef90_B7RX41 | R |



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UniRef90_A0A024H8U6
$\qquad$ G1

55EE26

 LISKAEGNVI KLGDIIPSEESI II AKQSKKDSKLVEAII N
 IVSKAEGRVRHA $I V S K A E G R G V D L A E F D P G P R A Q R \square A E R \square E K D P R F A Q A V L S$ $V V S K A E G R L V D L S G V T P S A F A R E F A E R T G K D A R Q V E V V L R$
 L I S K Lie GRI LKKEEDKVSKEA LEDLAKKVGKEPEVVQA D D
 1 VSKAEGRIMAADSRE IVSKAEGRVAEAPDREAA $\quad \square D A E T V R L V A R$




 IVS K T E GRMV DAP VVSKAEGRARRLEDYSPSPRAEEVAGRLEKDPRFVQAVLE



\section*{| I |
| :--- |
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| V | <br> } IVSKAEGRLTTGTRAEAVDRA



 A A A K S E G N V I NLL E N I K P S P K A L E L A A N DT G K D A H L M E A L L L I S K A E G N I I K M D DVVEVS D K A I E I A E K K K K K D P K I V

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 IV V K A E G RVVVEA S D $\quad$ V R E D A A DTA E T V R V I















 IV S K A E G R 1 $V$ FSKV G GRVVSSPT DPEERDAARRLLVDQEAVRVVAR

 AV GTA ERRVV KLLA S VT P GERAK MLGEQY GI DPREMELVELQ
 IV S K A E GR SRRMD
 1 V S K A E GRFRLQADS

|  | E S S SVVRAVPHLI T R HRLGHVMANGGII | DRSNI DEDRALL |
| :---: | :---: | :---: |
| UniRef90－A5ULV2 | ESREVVAVGPFI I TETKQGFVCANS GI | DESNVDE GLDATPM |
| UniRef90＿UPI0002558B7B | ESSRLVRTS GTI I A EHRDGFI C A N A AV | DESNVDA GKVILL |
| UniRef90＿UPI0004761111 | ETERVVARRGDVI SQTRHGFVMAAA GV | D A S N TEP P TVLLL |
| UniRef90－M0CY | ESEELLTEEPLMLADTRFGHVTVNA GI | DRSNVPDSDLLLL |
| UniRef90－A0A023X269 | ESRRIVRVGGLIIAETAHGFVCANA GV | D A S NVP G D CVCLL |
| UniRef90－C7QCH3 | RGPTRIVQTRHGFVMAAAGV | D A S NTPA GTVLLL |
| UniRef90－Q47LX1 | ETVR VVARHGTRIVQTRHGLVMAAA GV | D S S NVAP G HVLLLL |
| UniRef90＿D5VU18 | EAKEIVRGKNFII TETKHGFVCANSGV | DESNV $\square \mathrm{G}$－ 1 K L L |
| UniRef90＿R9SMH9 | EAREVVEVGPDFITETKQGFVCANS GI | D E S NVGG GLA T PV |
| UniRef90－D9UPZ3 | $E T V R \vee V R R G P L R I V E N R Q G L V M A A A G V D$ | D A S NTA A G VLLL |
| UniRef90－M3C081 |  | D A S NTPEGTILLL |
| UniRef90－A2ST43 | S STE I I Q E Y P FIL SEVPCGHVG\R A GV | D N S N I E GENI I I L |
| UniRef90＿H5U0T3 | NRTLI TENKLGLVQ A A A GV | D G S NVPT D Q I AL L |
| UniRef90＿S6HFH1 | ESKRIVREEGLII A E HRLGGFI CANAAV | DESNVDSDHVILL |
| UniRef90＿E1RDL7 | QTEEIVLLEYPFVLSKMS S G HVGVRA GV | D N S NVERGHVI I L |
| UniRef90＿D5E8B5 |  | D GSNAPA GHVVLL |
| UniRef90＿F8JG59 | ES D D VKVGPHLII A HK LGFVVMANA GI | DESN】S H GELLLL |
| UniRef90＿D9WK63 | RGRTRIVETRHGLVMAAA GV | D A S TPAGTILLL |
| UniRef90－M0QDN0 | E S VRVLRKNRTLI TENRNGLLVQAAA GV | DGSNVA T D R L ALL |
| UniRef90－D7E5Y2 | $\text { ECDE II GGVPGAVLT } \square T R G N L S P N A G U$ | DS S NAPD GYVILL |
| UniRef90＿G7WMY7 |  | DRSNVGEGRILLL |
| UniRef90 J1L1R6 |  | DHSNI E D GMI I L L |
| UniRef90－B9L434 | ESARIVRDRGLI I A T T R H GFVCANA GV | $D L S N V P$ A G Y A AL L |
| UniRef90＿UPI00047 | RTHER RGETRIVETRQGLVLAAA GV | D A S NTEPGTVLLL |
| UniRef90＿UPI0003B48 | ES R E IL R A R P V VIVETRHGVVQA N A GI D | DK S N $\square$ D P QVLL |
| UniRef90－D2 | R GETRIVQTRHGLVMAAAGI | D T S N TVP G TVLLL |
| UniRef90＿A3Y717 | QS NRIVRSMGVLI AEHKLGFICANAAV | DESNAEEDQLI TLL |
| UniRef90－LOICN4 | ESTEIIIVETPFMLTETCFGHTCVNA GI | DRSNVP EHDLLLL |
| UniRef90－W6PQF2 |  | DASNAPS GSVVLL |
| UniRef90＿Q2NEI0 | NTKKI I RQTGLII I TETPHGFI CANSGI | D N S NCRE G Y VTPL |
| UniRef90＿V6ASJ1 | E AQRIV RQGGVII TETKHGFVCANS GV | DESNLP K GFA S LL |
| UniRef90－U6E9V7 | E SVEVVEVGPFII TE T K H G FVCCANA GI | D ES NV |
| UniRef90－D3DZL4 | ESNEIVVAVGPNFIVETKHGFVCANS GI | D ESNVED GLLA T P M |
| UniRef90＿UPI00037DD4B6 | Q NHLGIVVQAAS GI | D A S NVA G D EVALL |
| UniRef90－H5SDD3 | EARRIVRDRQVLLVETRQGLVVCANAGV | DRSNVGE GRVAL L |
| UniRef90＿Q12UZ4 | ECDEVI G GVPPGAALTLT NGTL S P N A GI D | DGSNAPEGHVVLL |
| UniRef90－I011R7 | DSNEVLRRRGLLVVEQRSGWVCANAGV | D R S N I E P D WV SL L |
| UniRef90＿Q47WW9 | ESKGVLRAVGIVITTEHNLGFVCANAAV | DESNIDKD TLLL |
| UniRef90＿A0A031LZG1 | ES S DI I R T R RQL I T R HRQGWUC A N A GI | DQS NLLGE GRLL L L |
| UniRef90－M5APN4 | ESKRVI RQGPVLI TETHHGFCCANS GV | DQSSSGA GRILTL |
| UniRef90－J5KAU9 | NSEKI I S SNDNVI VTKHNGFDNVNAGI | DRSNDPSEQVLLL |
| UniRef90－G61 | ESSEIVRAVPNLI TR HRLGGLVMANAGI | DRSNLGGGNAVLLL |
| UniRef90＿UPI000255EE26 | RTH P G GRTRIVENRLGLLVLA A A GV | DNSNTPDGTVLLL |
| UniRef90－UPI0002E686BB | RGTTRIVESRHGFVMAAAGV | DASNTPKGTVLLL |
| UniRef90－A4AEE7 | RAHE $\quad N G V T R I V E N R L G M V A A A A G V$ | DASNTPEGTVLLL |
| UniRef90－B6JBS3 | ESTEVVRRQNVMIVAHRLGFVMANAGI | DESNDDDGKVLLL |
| UniRef90＿UPI0003B36C52 | E TVRVVRRGPLVI A E T R H GLVVMAA A GV | D A S NV S LD E I ALL |
| UniRef90－U1Q126 | E S V EIL L L E S PFLLTE T R F G HVGVNA GI | DRSNVGHE ELLLL |
| UniRef90－D6U5X6 | ESKRIVRDHGVMıCESHHGFI CANAGV | DESNI GGERVLLL |
| UniRef90－N6VZC7 |  | DESNVLG I K T L |
| UniRef90＿H1YWD0 | E S D SIV G G IP GFLLCMKS G TL LP N A GV | DGSNAPEGTVVTL |
| UniRef90－A0A031JCV1 | ES S AVVRAVPNLI TRHRLGHVMANSGI | DRSNDGA GQALLL |
| UniRef90－J2DV89 | E A A SVVRAVPHLI T R HRLGHVMANSGI | DRSNI GPDRALLL |
| UniRef90＿A9WAK9 | ESKRIVMANGVLI TETRHGLVCANS GV | DESNV D G GRLALL |
| UniRef90＿UPI00047B | ETKTVLRTRPGLVVEHRLGGHIMANAGI | DRSNTGEDWVLLL |
| UniRef90＿UPI0003B54687 | REYEGGVTRIVENRQGIVGAAA GV | DASNAPEGTVLLL |
| UniRef90＿UPI0002897409 | TAKNVIIVEHK乌GFINDNAGI D | DRSN】P ENKVLLL |
| UniRef90＿Q2FR57 |  | DGSNAPE G HVTLL |
| UniRef90＿UPI00036898EE | A SRPYPGGLTTRIVENRQGLVLAAAGV D | DNSNTPEGTVLLL |
| UniRef90＿UPI000363F712 | K GRTLI TENRLGIVQAASGV | D G S NVD G GEL AL L |
| UniRef90－A7IAE3 |  | D A S NAPPGCLVPL |
| UniRef90＿UPI00037159D1 | $R \mathrm{GPLR}$ L V ENRQGLVMAAAGV | D A S NTPA GTVLLL |
| UniRef90＿UPI00024885C9 | ESTEVVRTRPGLIVRHRLGLLVLANAGI | DQSNVDHDDALLL |
| UniRef90－A1B132 | ETRRIVRKFRTI I CEHRLGFVVSANAAV | DESNI GE GAALIL |
| UniRef90＿UPI000380DAFA | EADHVLRRGRTLI T Q NKLGIVVQA A S GV | D A S NVA T D Ela ${ }^{\text {d }}$ L |
| UniRef90＿UPI0002FAE320 |  | D A S NVFS DELALLL |
| UniRef90－F0T6L4 | E SVEI I KVGPNFI DE T K H G FVVCANA GI | DESNVET GFLKPı |
| UniRef90－F5Z5U2 | ESTRLVKVHKHJLTEHRLGHISSANAAV | DESNTDPGELILL |
| UniRef90＿UPI00014CBE0B | ESSKILTEKNVII VEHRLGFINDNA GL | D R S N I D N ${ }^{\text {d }}$ V L L L |
| UniRef90＿UPI000471411D | E A A RIV R DRGLI I AQTHHGFVCA NAGV | D A S NVGDETVLLL |
| UniRef90－Q1NHC8 | ESSAIL R A VP HL I A R H R L G HVMA N A GI | DRSNIE G D A ALL |
| UniRef90＿A6NZX0 | ES REVYPDRGILMSRHRLGWTCANAAI D | DHSNAPQGQAILL |
| UniRef90＿UPI000377A074 | RGHTRIVQTHHGFVMASAGI | D A S NVDRSQLVLL |
| UniRef90－A0B969 | ES DE IL G G $\square$ P GVV L T L K D G F L Y P N A GV D | D H S NAPPGYVVLL |
| UniRef90＿D3F5L7 | ETRELLRERGVLVCVTHHGFVCANA GV | DASNSPAGTLILL |
| UniRef90－UPI00036E4703 | R GP TTIVQTHHGFVMAAA G | DASNVDK T HLVLL |
| UniRef90＿UPI00047C6279 | VSVI A R R N S L I T E NRLGGVQ A A S GV D | D A S NVAT D Q I AL L |
| UniRef90－Q1AXF0 | ESRRIVRERGLII SETHHGFVCANAGV | D A S NVP GETVCLL |
| UniRef90＿D7BVI5 |  | D A S NTPA GTVLLL |
| UniRef90－I2MZ71 | $R G S L R I V E N R Q G L V M A A A G V 10$ | DASNTA A G TVLLL |
| UniRef90－T1VNH | GRTLI TENKLGGIVQAAS G | DGSNVDGAELALL |
| UniRef90－M9SSD0 | R VENRQGLVMAAA GV | DASNTPA GTVLLL |
| UniRef90－F4B | ESSDILIE R P F L L TVTHFGHI GVNA GI | DQSNVGDEMILLL |
| UniRef90＿UPI00037BE716 | SRVTPS GFTTRIVENRLGMV S A A A GV D | DASNTP EGTVLLL |
| UniRef90＿Q46A57 | ECDEIF G GVPP GAALT T T K GVLAP NA GI | D A S NVP E GYVILL |
| UniRef90－A0Z5U9 | ESRTIVRSRPGLII E H C C G HVL A N A GI | D A S NI D E ERVLL W |
| UniRef90－A6NZX2 | ESADIVRMAPVVI SRTRHGFVLA NA GV | DASNAGGGRLVAL |
| UniRef90＿UPI00035C20B4 | A GHTRIVQTRQGLVMAAAGV | D A S N $\square$ D P G TVLLL |
| UniRef90－F7XMT1 | CDEVIG GVP G AV LT T T D G TL S P N A G | DS S NAPE GHVVLL |
| UniRef90－UPI00036AC098 | ESKRIVRDRGVII SETKHGFYCANAG | D A S N |
|  |  |  |

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UniRef90 D5E8B5 UniRef90_F8JG59 UniRef90_D9WK63 UniRef90_MOQDN0 UniRef90_D7E5Y2 UniRef90_G7WMY7 UniRef90 J1L1R6 UniRef90_B9L434 UniRef90_UPI00047ACCE4 UniRef90-UPI0003B48B10 UniRef90_D2PMD8 UniRef90-A3Y717 UniRef90_LOICN4 UniRef90_Q2NEIO UniRef90- V6ASJ1 UniRef90_U6E9V7 UniRef90_D3DZL4 UniRef90_UPIO0037DD4B6 UniRef90-H5SDD3 UniRef90_Q12UZ4 UniRef90-IOI1R7 UniRef90_Q47WW9 UniRef90_A0A031LZG1 UniRef90_M5APN4 UniRef90-J5KAU9 UniRef90_G6E808 UniRef90 UPI000255EE26 UniRef90_UPI0002E686BB UniRef90-A4AEE7 UniRef90_B6JBS3 UniRef90_UPI0003B36C52 UniRef90_U1Q126 UniRef90_D6U5X6 UniRef90_N6VZC7 UniRef90_A0A031JCV1 UniRef90_J2DV89 UniRef90-A9WAK9 UniRef90_UPI00047B9BEF UniRef90_UPI0003B54687 UniRef90_UPI0002897409 UniRef90_Q2FR57 UniRef90_UPI00036898EE UniRef90_UPI000363F712 UniRef90 A7IAE3
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$P$ LDPD GS ARGLLLAAL|AGPEAAGDG\|VVISDSFGRPWRHGVV
 P EDPDASARRI RA GLAERTGVRAGVIVVDTFGRPWRNGLT PEDPSASAERI AETL




## P

PE D P DLAS
PEDPDASAA
P K DPSAECR E L R A G L $\begin{aligned} & R \\ & R \\ & R\end{aligned}$
$P D D P$
$P D D P D$
PPDPMAAAA
$P$ P D
P EDPDGSA



$P L D P D R S A A Q Q R E E L G E R V G W T P A V I V S D T F G R A W R N G G V$
PVDPDASARRI RARMRELTGANVAVIVNDTLGRPWREGLV


PKRPADRA
$P V D P D A T A A R L R A G L L E R A D D E V G V V V$


## P



PENPDKSAA
PADPDAS
PQDPDASA A


PVDPDATCRAHRARFAE LGVDVAVI MS

$P$ V D P D A S A QRI A E A L E Q D G V R P A V V I S D S F GRP WR L G V V PEDPD GSARHLCASLRTRFGIAVGVIL PEDPDASAARLRRELRELLSVDVGVVI


 PKDPDKSAEVIRKY I E K K T K K K $\square$ AV I I PKNPD GSAERIHNEIFEKTGGRAGII ADSRTHAMRLGCS PEDPDASA
$P$ VD P D GSA
PLD P DASAAALRAALGAADDNA
PK DP A

P EDP S L S S QKI Y E DI TSSKTNKNI SVI I
PADPD ALA H DL R K T I LEEKTGCVVVAILI ID SRTHPMRYGSG


P K D P NQ SAVRRIKEEDAHRCHTRVGVIVADSRTHAMRLGCS
P E D P D A S A R A I R R GL R D Q LG VD DGVVVVD T F G R P WR T G L T
$P$ VD P DAS A Q AI A A GLLAAA TGIDEPAVLIVVDSLGRAWRMGTV
$P R D P D A S C R A L A L R L A Q R F G A S V G V V M T D T F G R P W R M G Q V$
PRDPDTSAERLRGELAERRGVNVAVVITDTMGRAWRLGQT

PKDPDASAREI AESLCKYYGAPI GVVI

$P$ P $\quad$ D P D A S A R R L
$P$ P D P D E S A R R L R A A L E E R T G V S S M P V L I S D T H GR P L R E GI I

P S D P K R A A S R I R T E L S N GV R G GV I
P R D P D A S A R A L R A R L
PEDPDASAARLRA GVRERLGVEVAVVVTDTMGRTWRNGLT


P EDPDASARALRAGLADALGVDVGVVV
$P$ D P C S S A Q R

P E D P R K S S E II R Y RLE QRYS CRLGVI I


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

 UniRef90_A5ULV2
UniRef90_UPI0002558B7B UniRef90_UPIO004761111 UniRef90 M0CY78 UniRef90-A0AO23X269 UniRef90-C7QCH3 UniRef90_Q47LX1 UniRef90-D5VU18 UniRef90-R9SMH9 UniRef90_D9UPZ3
UniRef90_M3C081 UniRef90-A2ST43 UniRef90-H5U0T3 UniRef90_S6HFH1 UniRef90-D5E8B5 UniRef90-F8JG59 UniRef90_D9WK63 UniRef90-M0QDN0
UniRef90'D7E5Y2 UniRef90_G7WMY7 UniRef90-J1L1R6 UniRef90-B9L434 UniRef90_UPI00047ACCE4 UniRef90_UPI0003B48B10 UniRef90-D2PMD8 UniRef90_A3Y717 UniRef90_LOICN4 UniRef90_Q2NEIO UniRef90_V6ASJ1 UniRef90-U6E9V7 UniRef90_D3DZL4
UniRef90 UPIO003 UniRef90_UPIO0037DD4B6 UniRef90-H5SDD3 UniRef90_Q12UZ4 UniRef90-1011R7 UniRef90-Q47WW9 UniRef90-M5APN4 UniRef90-J5KAU9 UniRef90-G6E808 UniRef90_UPI000255EE26 UniRef90_UPIO002E686BB UniRef90-A4AEE7 UniRef90-B6JBS3 UniRef90_UPIO003B36C52 UniRef90_U1Q126 UniRef90-D6U5X6 UniRef90-H1YWD0 UniRef90-A0A031JCV1 UniRef90_J2DV89 UniRef90 A9WAK9 UniRef90_UPI00047B9BEF UniRef90_UP10003B54687 UniRef90-Q2FR57 UniRef90_UPIO0036898EE UniRef90-UPI000363F712 UniRef90-A7IAE3
UniRef90_UPI00037159D1 UniRef90-UPI00024885C9 UniRef90-A1B132 UniRef90_UP1000380DAFA UniRef90_UPIO002FAE320 UniRef90_FOT6L4 UniRef90_F5Z5U2 UniRef90_UPI00014CBEOB UniRef90_UP1000471411D UniRef90-Q1NHC8 UniRef90_A6NZX0 UniRef90_UPI000377A074 UniRef90-A0B969 UniRef90-D3F5L7 UniRef90_UPIO0036E4703 UniRef90_UPIO0047C6279 UniRef90-Q1AXF0 UniRef90-D7BVI5 UniRef90-I2MZ71 UniRef90-T1VNH4 UniRef90-F4BYRO UniRef90_UPI00037BE716 UniRef90_Q46A57 UniRef90-A0Z5U9
UniRef90_A6NZX2 UniRef90_UPIO0035C20B4 UniRef90-F7XMT1
UniRef90_UPIOOO36AC098
UniRef90_A0A024H8U6

 GVA GCSGINPLWKRAGEKDLYGRELQTSEVATGDELAAA NVAVGLANVPSKIDMAGERDAYGRVLSVTVPALADEIAAA DVAI GAAGVRPLDDFRGRSDAYGNELSATVTALADEIAGA GVALGWAGMPAARDWRGESDRDGRELGVTVEAVVDELAAA NVAVGVAGMAP LDDYRGETDEHGYALEASVLAVADELAAA DVAV GCAYVNALLDHRGTDDAFGNELLVTAAATADELAGA GVAA GVSGI LAALWDRKGEKDDFGRELKSTEVADADELASM GVALGCSGIDDRWKRKGEKDLYGRELQTTEVATADELAAS DMAI GAAGVRVLDDLRGGTDAHGNPLTATVVATADELAAA

N
N $\vee$ A
$G \vee A \quad G L A$

DVAI GAAGVHVLDDLVRGTDTHGNALSVTVVATGDELAAAA DVAI GS S GI AVVTHPYDGTTDSYGNRLVVTDIAVADEIA G A
 GVAI GWS GMTAI RDFRGDHDLFGHVLEITEEAVVDEVAGF $N V A I G V A G M R P L R D Y R G Q R D P F G N E L R V T V I A I A D E L A A A A$

## G N G G N G D D




 DAAI GAAGLKVLEDYRGTQDTHGNLLDSASAAAVADEIAA A $D V A I G A S G V A V L D D L R G G T D T H G N P L G M T D T A L A D E L A A A$


## ,

N
G
G
G
A

## 

$$
\begin{array}{l|l|l|l}
\mathrm{G} & \mathrm{~V} & \mathrm{I} \\
\mathrm{D} & \mathrm{I} & \mathrm{~A} & 1 \\
\mathrm{~N} & \mathrm{~F} & \mathrm{~A} & \mathrm{~L}
\end{array}
$$

促 A

## > ! <br> <br> 

 <br> <br> }| $D$ | $A$ | $A$ |  |
| :--- | :--- | :--- | :--- |
| $G$ | $V$ | $A$ | $L$ |
| $N$ | $V$ | $A$ |  |

N

 D I A $A$





 DVAII GSAGVRVLD D LIRGGTDAHGNPLHATVIDALADELAAA







UniRef90 A5ULV2 UniRef90_UPI0002558B7B UniRef90_UPI0004761111 UniRef90-M0CY78 UniRef90_A0A023X269 UniRef90_C7QCH3 UniRef90 ${ }^{-}$Q47LX1 UniRef90_D5VU18 UniRef90-R9SMH9 UniRef90_D9UPZ3
UniRef90 M3C081 UniRef90-A2ST43 UniRef90_H5U0T3 UniRef90_S6HFH1 UniRef90_E1RDL7
UniRef90 D5E8B5 UniRef90_F8JG59 UniRef90_D9WK63 UniRef90-M0QDN0 UniRef90-D7E5Y2 UniRef90_G7WMY7 UniRef90_J1L1R6 UniRef90_B9L434 UniRef90_UPI00047ACCE4 UniRef90-UPI0003B48B10 UniRef90_D2PMD8 UniRef90-A3Y717 UniRef90_LOICN4 UniRef90_Q2NEIO UniRef90_-V6ASJ1 UniRef90_U6E9V7 UniRef90_D3DZL4 UniRef90_UPIO0037DD4B6 UniRef90-H5SDD3 UniRef90_Q12UZ4 UniRef90_IOI1R7 UniRef90_Q47WW9 UniRef90_A0A031LZG1 UniRef90_M5APN4 UniRef90-J5KAU9 UniRef90_G6E808 UniRef90_UPI000255EE26 UniRef90_UPI0002E686BB UniRef90_A4AEE7 UniRef90_B6JBS3 UniRef90_UPI0003B36C52 UniRef90_U1Q126 UniRef90_D6U5X6 UniRef90_N6VZC7 UniRef90-H1YWD0 UniRef90_A0A031JCV1 UniRef90_J2DV89 UniRef90-A9WAK9 UniRef90_UPI00047B9BEF UniRef90_UPI0003B54687 UniRef90_UPI0002897409 UniRef90_Q2FR57 UniRef90_UPI00036898EE UniRef90_UPI000363F712 UniRef90-A7IAE3
UniRef90_UPI00037159D1 UniRef90_UPI00024885C9 UniRef90-A1B132 UniRef90_UPI000380DAFA UniRef90_UPI0002FAE320 UniRef90_F0T6L4
UniRef90_F5Z5U2 UniRef90_UPIO0014CBEOB UniRef90_UPI000471411D UniRef90_Q1NHC8 UniRef90_A6NZX0 UniRef90_UPIO00377A074 UniRef90_A0B969 UniRef90_D3F5L7 UniRef90_UPI00036E4703 UniRef90_UPI00047C6279 UniRef90_Q1AXF0 UniRef90_D7BVI5 UniRef90-I2MZ71 UniRef90-T1VNH4 UniRef90_F4BYR0 UniRef90_UPI00037BE716 UniRef90_Q46A57 UniRef90_A0Z5U9
UniRef90_A6NZX2 UniRef90_UPI00035C20B4 UniRef90_F7XMT1 UniRef90_UPI00036AC098
UniRef90_A0A024H8U6

A T/LVTGEGAES
 S GLL M S K E G K A E L V $V$ K GK L $L$ D
S E L V M N K KV D $G$
$G$
$A$
$G$ P A AlL L $G V P A A V R G Y R Y A E G S S A R E L V M P P E R D L F$


 GDLVKGKAA GYPVAVVSGLAHDGAEGARALVRAARDDMF $G D L V K G K A A \quad G L P V A V V R G L P H G D A A G A R K L I R S G P D D M F$
 A DLVKGKLD S GLLM S KE GK S NFL R R I I FRGLV $V H D$
$W P$ T
 C Q L V M G E G G E S V P C V I VRRNAPVRVVDEDVPMPDLFSREEECMY AS L L M GQAGAGLPAVIVRGFQAAPERSASVLVRDKERDLF GELVKGKAD GLPVAVLRGLPHGADAGARALVRGAADDMF
 A QII MGEAGECTPALLVRGAPVDVNESVEMHLFSRNECMY A NLLMGEAGDGTPAAVLRGLALP KAGWR LRRPRELDVI ANFIMGESNNGVPAVVFRN CARWTGHDNLHFSRDED A ELVMGGKT EGCPAVIV RGFRYPGEGSARELLMPA ERDLD GELAKGKVS GVPVAIVRGLGNDDGPGARALVRSPEEDMF ASYVMGQADEGSPVVL MRGAK LPAEQGSAALL RDRDKDMF GELVK GKAD GVPVAVLRGLPVGQHGGARALVRDAEQDMF S GLL MS K S GKC PVVI FRGLE WQTESSASDLVRAAN ENLF ANLVTGEGDDGTPAVVVRDFDFGDHAGGASLVRSVEKDQV AELVMGEANECVPAVVVRGTGLPVGDYAGVATIDASECLIF A S L V M G Q S D N Gld
A ELVMKKSA
A S LVMM GQANE G P
ASLLMGQADE
AGLVMEKLA
A $L$ ME
A QLLM GEADECIPAA,




 A DLVKGKA TGRPVALVRGLPSRPMATARDLVRPAENDMF

 A S L V M G Q A A E G L P V V V H H R G F S E A A H S P A S V L A R P K A Q D MF
 AELVMGKVDR IPV
A NLLAMGEANE GVP
 A T L A M GE GDE GVV A VL I R G L

 GELVK GK S S G V P L A V R GLL GRLDLD GARS IQRPS ER D L F A GLLMGQGSEGMP VII RGFDRTAKNDAFDLIVKKEDDLV AELVMGESDEQTPAALVRGLDDEFGEFEGDDLIAPDECIF A DLVVK GK S K GCPPVALVVRGLLSHTAA GTARSVVVRPA DK DMF
 AELVMGEADECTPAALVRGLPVGDQTGVDTI $\operatorname{DIDADECLF}$ GDLVKGKAA GLPVAVVRGLDADDGAGARALVRPAAEDMF GS L L M GQADEACPVVLVRGLPAGRGGSARDLI RPAHMDLF
 A DLVVK G K L G R V P A A V V R G L D ERED G S A G D L V R T V D E D L
 SGLLMSKQGKCPVILFKGLEWEPDSKASDLLRPTQEDLF A GI L M GQGNDGQPVIIDKGFNRDSKNDAFNLIVNEEDDLV A ELVMGKLDDQRPVAVVRGYAYPGAGTAQQLVMPPERDLVF
 AS L CMGQADES
A E V VKGK $\square D$ A QLVMGEGDEG A DLARGK DS
GELVKGKSD
A DLVKGKLG

AEELVMGKK | S | $\vee$ | $P$ |
| :--- | :--- | :--- |
| Q | P |  | GDLVKGKAG GD L V K GK T $G^{\top}$ $\qquad$ REPA VVVV R GA PA QD D S GP A A A I P P NIDP P H E C M Y GDLVKGKLG K GKS GVP ANLLMGEAGDG ADLVKGKAA AELLMGEAG AALVQGEAAEGNP AELVRGKA GELVKGKTA AQLIMGEAGEG

GE LVGGKAGE
A NLVLSKTS

| UniRef90_UPI0004182C4E | R |
| :---: | :---: |
| UniRef90_A5ULV2 | R |
| UniRef90_UPIO002558B7B | R |
| UniRef90_UPI0004761111 | R Y GS R D V V |
| UniRef90-M0CY78 | R D A L R E W |
| UniRef90-A0A023X269 |  |
| UniRef90-C7QCH3 | S L G T T EAM |
| UniRef90-Q47LX1 | RYGSRDVI |
| UniRef90-D5VU18 | R |
| UniRef90-R9SMH9 |  |
| UniRef90-D9UPZ3 | RLGTSEAV |
| UniRef90-M3C081 | RLGTS E AV |
| UniRef90-A2ST43 | RKAMKR |
| UniRef90-H5U0T3 | R L G T A E A $\square$ |
| UniRef90-S6HFH1 |  |
| UniRef90-E1RDL7 | $\square \mathrm{K} A$ L R K |
| UniRef90-D5E8B5 | Y S Ni |
| UniRef90_F8JG59 |  |
| UniRef90-D9WK63 | RLGTS EAV |
| UniRef90-M0QDN0 | RLGTEEAL |
| UniRef90-D7E5Y2 | Y SNISK |
| UniRef90-G7WMY7 | R A R L R |
| UniRef90-J1L1R6 | R K A |
| UniRef90_B9L434 |  |
| UniRef90-UPI00047ACCE4 | RFGSRDVL |
| UniRef90-UPI0003B48B10 |  |
| UniRef90-D2PMD8 | S LG T R E S |
| UniRef90_A3Y717 |  |
| UniRef90-LOICN4 | RQA LRE W |
| UniRef90-W6PQF2 |  |
| UniRef90-Q2NEI0 | R |
| UniRef90-V6ASJ1 | R |
| UniRef90 U6E9V7 | R K |
| UniRef90-D3DZL4 |  |
| UniRef90_UPI00037DD4B6 | R $\square$ G T D E A $\square$ |
| UniRef90-H5SDD3 |  |
| UniRef90-Q12UZ4 | Y S N $\square \mathrm{K}$ R |
| UniRef90-1011R7 |  |
| UniRef90-Q47WW9 | R |
| UniRef90-A0A031LZG1 |  |
| UniRef90-M5APN4 | R |
| UniRef90-J5KAU9 | R Q |
| UniRef90_G6E808 |  |
| UniRef90-UPI000255EE26 | RLG S A E A Y |
| UniRef90_UPI0002E686BB | RLGTS EAII |
| UniRef90-A4AEE7 | RLGTDEA I |
| UniRef90-B6JBS3 |  |
| UniRef90_UPI0003B36C52 | RMGTSEALL |
| UniRef90_U1Q126 | RQA VR G W |
| UniRef90-D6U5X6 |  |
| UniRef90-N6VZC7 | R |
| UniRef90-H1YWD0 |  |
| UniRef90-A0A031JCV1 | R |
| UniRef90_J2DV89 | R |
| UniRef90 A9WAK9 | R |
| UniRef90_UPI00047B9BEF |  |
| UniRef90_UPI0003B54687 | RQGADEA Y |
| UniRef90_UPIO002897409 |  |
| UniRef90_Q2FR57 | $\square \mathrm{GS} \mathrm{LK} \mathrm{K} \mathrm{A} \mathrm{Y}$ |
| UniRef90_UPI00036898EE | RLGSDEAY |
| UniRef90_UPI000363F712 | WLGTAEA】 |
| UniRef90-A7IAE3 | M GVF R |
| UniRef90_UPI00037159D1 | RLGTSEAV |
| UniRef90_UPI00024885C9 |  |
| UniRef90-A1B132 |  |
| UniRef90-UPI000380DAFA | RLLGTAEAVV |
| UniRef90-UPI0002FAE320 | WLGTSEAV |
| UniRef90_FOT6L4 | R |
| UniRef90_F5Z5U2 |  |
| UniRef90-UPI00014CBE0B | R |
| UniRef90 UPI000471411D | R |
| UniRef90-Q1NHC8 |  |
| UniRef90_A6NZX0 | H P |
| UniRef90_UPI000377A074 | S L G T A E A $\square$ |
| UniRef90-A0B969 | $\mathrm{G} V \mathrm{~L} \mathrm{R}$ |
| UniRef90-D3F5L7 |  |
| UniRef90_UPI00036E4703 | S L G T A E A |
| UniRef90-UPI00047C6279 | RMGTAEAV |
| UniRef90-Q1AXF0 |  |
| UniRef90_D7BVI5 | RLGTS S A V |
| UniRef90-I2MZ71 | RL GTS EAV |
| UniRef90-T1VNH4 | WL GTEEA |
| UniRef90-M9SSD0 | RLGTSEAVV |
| UniRef90-F4BYR0 | RSRLDN |
| UniRef90_UPI00037BE716 | RLGADEA Y |
| UniRef90-Q46A57 |  |
| UniRef90-A0Z5U9 | R |
| UniRef90-A6NZX2 |  |
| UniRef90_UPI00035C20B4 | R Y G S R D V V |
| UniRef90-F7XMT1 | Y S N $\square$ S R |
| UniRef90-UPI00036AC098 |  |
| UniRef90_A0A024H8U6 | RLLGSA E A |

UniRef90 R0F782 UniRef90_L2TWZ0 UniRef90-M4S5Q9 UniRef90_C7R2Z8 UniRef90-S7XLD8 UniRef90_UPI00037B4390 UniRef90_D1BJD1 UniRef90_M2WTG9 UniRef90-UPIO0036DC4E3 UniRef90-B2TEW3 UniRef90_UPI00035D380A UniRef90-D5E9A7 UniRef90_K9CQ34 UniRef90-E1RII1 UniRef90-E4NC25 UniRef90-A71837 UniRef90_A2ST46 UniRef90-F4BVR2 UniRef90-T0YFD6
UniRef90 U2YJV1 UniRef90-UPIO00368036D UniRef90- A4X3H0 UniRef90_UPI000465A3E1 UniRef90-J2H0G6 UniRef90-LOHA23 UniRef90-D2BEL1 UniRef90-N1UXF4 UniRef90_UPI000473F4D8 UniRef90_UPIO003627210 UniRef90-UPI00030997D2 UniRef90-AOYCL8 UniRef90-J9SNY9 UniRef90-UPIO0035FB671 UniRef90-W7J0F8 UniRef90-J2VIH8 UniRef90_H0R706 UniRef90_KOIHH5
UniRef90_UPIO003 UniRef90_F6EFY5 UniRef90-A8L9S7
UniRef90-C8XIK0 UniRef90-C8XIK0
UniRef90-UPI00036D258F UniRef90-A5V3B7 UniRef90_UPIO0036EC3A3 UniRef90-J5K8R9 UniRef90_UPI0003763DF3 UniRef90_UPI000475C2CC UniRef90_UPIO00466220B UniRef90-UPIOOO35
UniRef90 XOMVH4 UniRef90-U1PJN4 UniRef90-E5XU19 UniRef90-G7GVB7 UniRef90_UPIO003F5622B UniRef90-UPIO002379325
UniRef90-UPI00037A04F8 UniRef90_Q9CCK2 UniRef90-Q2JF17
UniRef90_UPI0003B49AC3 UniRef90-L7L861 UniRef90_G4HVE5 UniRef90-B4RH08 UniRef90_UPI00040B58AE UniRef90_UPI00034AFBC8 UniRef90_A1SG18
UniRef90-D0LD14
UniRef90-C7LY82
UniRef90_UPIO00369015F
UniRef90-UPI000474B012
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UniRef90-E6J6F8
UniRef90-TOAW42
UniRef90_UPIO0046266AE
UniRef90_Q2FQL2
UniRef90_UPIOO0361D179
UniRef90-F4CTB9
UniRef90_T5KE52
UniRef90-JORYD9
UniRef90-D1BZK8
UniRef90-D1BZK8
UniRef90 X1A0G7
UniRef90_UPI0003FBAFOD
UniRef90_UP1000466F571
UniRef90_UPI0004782AA7
UniRef90 KOBCZO
UniRef90-A0LWC4
UniRef90_UPI000349AC26
UniRef90-A0RUC6
UniRef90_F8AYS1
UniRef90_H5XIQ7
 LQVFPVTGLPEFRPGDDVAEQ1AQAPWLVDDDIVVITSK 1 SIRAVPGLPMVTAGDDLAADIA GADRIATGDVLVVAQK LQVWAVHGVPEVTPGMSVAELVAQYAGLHDGDVVVVTSK I TLTGVEGLPLVSEGDDIAALIVDALELLDGDIVVIAET




 K PGDD:A A I C Q R V G L E D G DV L V I A S T

 $F S V Y G \square G L L V S G D D \| I D R V C E A$

$\square R \square R P \square T G L P E F R P G D D V A S A \prod A A A A P W A D G D V I A L A Q K$ N R RPDTGLPEFRPGDDVASA!AAAAPWADGDILVVTSK



 $R L S V W A P D G L P E I T P G D D L G E L I$ ADLLRPRDGDVVVVTSK
 RVWALPG』PEVRPGDDLVKLVASAAQLADGDVVLVTSK LTDF P V L G L P E F Q Q G D D L A A A
 $V E V L P V R G L P E F R P G D D L T G A I A A A T P W R S G D V V V V T S K$ L QLFAV GGGLPEFGPGDDLAAASIAAAAAPWSDGDVVVV



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



 $V T V L P V R G L P E F R P G D D V A A A I A A A A P W A E G D V V V V T S K$ $\square T V F A L A G \| G E V H P G D D L V A L I A T G V E L A H G D I L V V T S K$ | $G$ | $V$ | $A$ | $D$ | $G$ | $D$ | $I$ | $V$ | $L$ | $V$ | $A$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $S$ |  |  |  |  |  |  |  |  |  |  |
| $G$ | $R$ | $E$ | $G$ | $D$ | $V$ | $V$ | $V$ | $V$ | $T$ | $S$ | $K$ |



 LKTLEKNNAELKDGDVLVI STK

 $R \mathrm{~L}$ S V Tr A

## UniRef90 R0F782 UniRef90-L2TWZ0 UniRef90 ${ }^{\text {M4S5Q9 }}$ UniRef90-C7R2Z8 UniRef90_D9PXP0 UniRef90-S7XLD8 UniRef90_UPI00037B4390 UniRef90-D1BJD1

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UniRef90 N1UXF4 UniRef90_N1UXF4
UniRef90_UPI000473F4D8 UniRef90_UPIO003627210 UniRef90_UPIO0030997D2 UniRef90-AOYCL8 UniRef90-J9SNY9 UniRef90-UPI00035FB671 UniRef90-W7J0F8 UniRef90-J2VIH8 UniRef90_KOIHH5 UniRef90_UPIOO036560AB UniRef90-F6EFY5 UniRef90_A8L9S7
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UniRef90_F8AYS1
UniRef90_H5XIQ7
 DPEERDALRRRLIDEESVERAVA Q
 VLSK S EGRUVAAPTVDPDERD
 VVSKVEGRLVTAPE VSKSENRFKNLSEDN $V V$ SKA AGRQADLSAFPAGERAEEDARRVQKDPRFAQAVDA
 IV SKVEGRLYYKVPSDPEARAAARRAARKLISDETVRGVARG



 IMSKCEGRIVAA D PADPDERDALRRTLIDDSEAVRVLAR
 IVSKAEGRSQPGDDREA

> VVSKAEGRVRAGT

I I SKVVERMVAAPS
AVSKAEGRVI QSD
IVSKVEDRLIK
IVSKAEGRAVPASE
 $V$ VSKAEGRVVQASDVKVSDAKDLATEDADTAETVRVVAT


DPEQRDA LRRR
PEHLDDAFEAAL PEHLDEAFEAALAAETRRV NDNESIEKLIQQ


 IVSKAEGRLVTA PADPEERDALRRSLVDEETERVVAR IVVSKAGRYVQAADREEA ALATAEGRAVRDDDVVPSEEALLLADRHALEPRDAEVVLR VVSKAEGRVVAAADRE I VSVAEGCVYNLSEDKPSEKARQDAKRDF SAHRVEVALR


 VVSKAEGRLVALD

पSKAEGRपRRQERDAAVAEE
REDAI DR $\overline{Y V A N S Q G R M V D L G G \square S P S R E G A D Q A R D Y R I D P E M E R V V A R}$ IASKAEGRLV PA GADREAARLAAVEAETVR

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UniRef90_UPIO003 UniRef90_F6EFY5 UniRef90-A8L9S7 UniRef90_C8XIK0 UniRef90_UPI00036D258F UniRef90-A5V3B7 UniRef90_UPIO0036EC3A3 UniRef90-J5K8R9 UniRef90_UPI0003763DF3 UniRef90_UPI000475C2CC UniRef90_UPIO00466220B UniRef90- XOMVH4 UniRef90_U1PJN4 UniRef90-E5XU19 UniRef90-G7GVB7 UniRef90_UPIO003F5622B UniRef90_UPIO002379325
UniRef90_UPI00037A04F8 UniRef90-Q9CCK2 UniRef90-Q2JF17
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UniRef90_B4RH08 UniRef90_UPIO0040B58AE UniRef90_UPI00034AFBC8 UniRef90_A1SG18 UniRef90_D0LD14 UniRef90_UPI000369015F UniRef90-UPIO00474B012 UniRef90_D5UW06
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UniRef90-X1A0G7 UniRef90-UPIO003FBAFOD UniRef90_UPIO00466F571 UniRef90_UPI0004782AA7 UniRef90-KOBCZO UniRef90-AOLWC4 UniRef90_UPIO00349AC26 UniRef90-A0RUC6 UniRef90_F8AYS1
niRef90_H5XIQ

ESTRVVRSF ${ }^{90}$ ETDEVVRKRPGLI VARRDRVDGPPL ESSEILKVV RANAT ESVEVMRRGVTRI
A SRVHPGGVTRI K G R T L
$R G S T$
R
 $T A R V \vee A A R G A T R I$
$\square$
$G R T V$ T

E S A E M M R P H | E | S | D | $S$ | $I$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| E | T | T | V | $V$ | $A$ |

RTHE

T K G
R G P A R

## E S VE V IR

$R R G V V V$

E A E K V V $V$ R K G R T
$\begin{array}{lllll}\text { E } & \text { S } & \mathrm{V} & \mathrm{V} & \mathrm{L} \\ \mathrm{E} & R \\ \text { R } & H & V & 1 & R\end{array}$
ESDHVIRRGVPGFL

## $E A \vee R \underset{V}{V} \underset{V}{L} A$


EA QEVMARRKGTT


QKNTRI
$K N R T L I$
ESNEVLTEKNVI
ETARVVARRGSL

K N A T W
E A D R V I A EATRVVARRRFMI $R G R \quad V$
$K G R T L$ $\begin{array}{lllllll}E \\ V & A & R & R & G P & T & R \\ A & Y & P & G & G & T & R\end{array}$ $R \mathrm{D} Q \mathrm{~L} \mathrm{M}$

 | $E$ | $T$ | $A$ | $E$ | $V$ | $V$ | $R$ | $E$ | $H$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $E$ | $V$ | $L$ |  |  |  |  |  |  |  |
| $E$ | $E$ | $R$ | $V$ | $V$ | $A$ | $R$ | $M$ | $G$ | $H$ |
| $E$ | $T$ | $A$ | $R$ | $V$ | $V$ | $R$ | $R$ | $G$ | $G$ |

## E SLERVR

K The il

$\begin{array}{lll}E A & V R \\ R & A & Y \\ D\end{array}$
$\qquad$ $\mathrm{G} \mathrm{V} T \mathrm{R}$

ESTM $\quad L G G$

| $G G$ | $R$ | $W$ |
| :--- | :--- | :--- |
| $G$ | $R$ |  | $V N R T L$

,

|  | $K$ | $L$ | $P$ | $G$ | $S$ | $G$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | EAVRVLAKGRTIL


$\begin{array}{llllllllllll}\text { E } & S & D & R & V & V & G & G & \square & P & G & Y \\ E & T & V & R & V & V & A & T & R & P & R & R \\ \text { I }\end{array}$
E S DE IVKH H R P NL I $\begin{array}{llll}K & G R T & W \\ K & G & T & K\end{array}$

| E | $T$ | $V$ | $R$ | $V$ | $L$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| E | S | $D$ | $K$ | $I$ | $F$ | $G$ |

$\begin{array}{ll}\text { G } I G G G \\ R & R\end{array}$
R G D T R I V
ESDAVLGG
$E A V R V L A R G R T V I$ TV

S F GTMIICEHRLI 100 GFI SANAAVDQSNFE

110
C E H R L G FII S A N A A V V D Q S NVFSHELALL

 $V$ E NRLGGLVMAAAGVDSSNTS DGTVLLL $V$ R HRR GYV H A N A GI D Q S N $\square R S$ D R V L L L $V E N R L G L V M A A A G V D A S N T P D G T V L L L$
 TRHRHGWVCANAAIDDESNVEDGTMLLL VQTHHGFVMNNAGIDESNVDRSTMVLL


 LAGK WDLI L P N A GVVDES NAP D G WV TRRL TETRHGFVCANSGVVDS TE N R L G G V V A A A S Glv D G S N V D VQTHHGFVMAAA GI DASNVDKTRLVLL

 LCMK G GTLLANA GVVDASNAPP G CVVTPL \begin{tabular}{lllllllllllllllllll}
\hline$A$ \& $Q$ \& $A$ \& $H$ \& $G$ \& $F$ \& $V$ \& $M$ \& $A$ \& $A$ \& $A$ \& $G$ \& $V$ \& $D$ \& $A$ \& $S$ \& $N$ \& $T$ \& $E$ <br>
$V$ \& $G$ \& $T$ \& $V$ \& $V$ \& $L$ \& $L$ <br>
$V$ \& $E$ \& $N$ \& $R$ \& $L$ \& $G \|$ \& $V$ \& $S$ \& $A$ \& $A$ \& $A$ \& $G$ \& $V$ \& $D$ \& $A$ \& $S$ \& $N$ \& $T$ \& $P$ <br>
$E$ \& $G$ \& $T$ \& $V$ \& $L$ \& $L$ \& $L$

 V E HKL GFI NIIN A GI DLS NVP E NLIALL L $V$ ENKLGLVMAAAGVDASNTPEGTVLLL 

$V$ \& $E$ \& $S$ \& $R$ \& $H$ \& $G$ \& $V$ \& $M A$ \& $A$ \& $A$ \& $G$ \& $V$ \& $D$ \& $A$ \& $S$ \& $N$ \& $T$ \& $P$ <br>
$V$ \& $G$ \& $V$ \& $V$ \& $L$ \& $L$ <br>
$V$ \& $E$ \& $R$ \& $L$ \& $G$ \& $Y$ \& $I$ \& $H$ \& $A$ \& $N$ \& $A$ \& $G$ \& $I$ \& $D$ \& $K$ \& $S$ \& $N$ \& $I$ <br>
$S$ \& $S$ \& $D$ \& $E$ \& $V$ \& $L$ \& $L$ \& $L$
\end{tabular} TENRLGGVVQAAA GI D G S NVVRS D QL A L L VETRHGLVMAAAGVDASNTPAGTVLLL

 $V R T R L G H V M A N A G I D D S N V G T D R V L L L$ TENA Y GLVQAAAGVDGSNVPSDQLALL


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

 $T Q N K D G V Q A A A G V D A C N V D S R E I D A L L$
 $V$ QDHR GLVVMAAA GVVDASNTPS GTVLL
 TENRNGLV QAAA GVVDGNVARD QI A L L

 I E N GLGGVVAAA GVVDGSNV GR GEVALL

 T E N R N G IV V A A A G V D G S NV G A T E L A L
 SRTHHGFVCANAGVDASNADPDHLILL AQHRSGLVMAAAGVDASNVAPGTVLLL $V R T H L G L T M A A A G I D S S N V P A G Q V L L L$
 ARTKHGFI CANAGIDDKSN】EKGSVLLL VE N R L G V G A A A G V D S S N C QP G T V L L L TE N K L GVVGA A S GVVDA S NVAA A D T V A L V N RLGVVGAAA GVDASNTPE GTVLLL $L A K V N D F L D A N A G I D Q S N A G P D K V I L L$
 VENRLGLVMAAAGI DESNVAGERLLLL

 $\vee$ A SK GLQ A A G D A S N R R D $L T L K N G T L L P N A G V D D S N A P E G T V V B L$ R T K Q GL I T A A A GVVDASNTPD GTVVLL A A HRLGFVMANAGIDDSNDEHHRVLLL
 TS SLD S MQA A A GVD G
 AD $\begin{array}{llll}K & S & N & A \\ A & S & N & V \\ S & S & N & V \\ R & S & N & T \\ A & S & N & V \\ A & S & N\end{array}$

## UniRef90 R0F782 UniRef90-L2TWZ0 UniRef90-M4S5Q9 UniRef90_D9PXP0

 UniRef90-S7XLD8 UniRef90_UPI00037B4390 UniRef90_D1BJD1 UniRef90-M2WTG9 UniRef90-UPIO0036DC4E3 UniRef90-B2TEW3 UniRef90_UPI00035D380A UniRef90-D5E9A7 UniRef90_K9CQ34 UniRef90-E1RII1 UniRef90-E4NC25 UniRef90-A71837 UniRef90-A2ST46 UniRef90-F4BVR2 UniRef90-TOYFD6 UniRef90-U2YJV1 UniRef90_UPI000368036D UniRef90_A4X3H0 UniRef90-UPIO00465A3E1 UniRef90-J2H0G6 UniRef90-LOHA23 UniRef90-D2BEL1UniRef90 N1UXF4 UniRef90_UPI000473F4D8 UniRef90-UPI0003627210 UniRef90_UPIO0030997D2 UniRef90-A0YCL8 UniRef90-J9SNY9 UniRef90-UPIO0035FB671 UniRef90-W7J0F8 UniRef90-J2VIH8 UniRef90-H0R706 UniRef90-KOIHH5
UniRef90 UPI0003 UniRef90-UPIOOO36560AB UniRef90_F6EFY5 UniRef90_A8L9S7
UniRef90_C8XIK0 UniRef90_UPIO0036D258F UniRef90-A5V3B7 UniRef90_UPIO0036EC3A3 UniRef90_J5K8R9 UniRef90_UPI0003763DF3 UniRef90_UPIO00475C2CO UniRef90-UPIO00466220B UniRef90-XOMVH4 UniRef90_U1PJN4 UniRef90-E5XU19 UniRef90-G7GVB7 UniRef90_UPIO003F5622B UniRef90-UPIO002379325
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UniRef90_B4RH08 UniRef90_UPI00040B58AE UniRef90_UPI00034AFBC8 UniRef90_A1SGI8 UniRef90-D0LD14 UniRef90_UPI000369015F UniRef90-UPI000474B012 UniRef90-D5UW06 UniRef90-UPI0003B54EA2 UniRef90-E6J6F8 UniRef90-TOAW42 UniRef90-UPI00046266AE UniRef90_Q2FQL2 UniRef90_UPIOO0361D179 UniRef90-F4CTB9 UniRef90-T5KE52 UniRef90-J0RYD9 UniRef90-D1BZK8
UniRef90_X1A0G7 UniRef90_UPIO003FBAFOD UniRef90_UPIO00466F571 UniRef90_UPIO004782AA7 UniRef90_KOBCZO UniRef90-AOLWC4 UniRef90_UPI000349AC26 UniRef90-AORUC6 UniRef90_H5XIQ7

PKEPDTSCAR
140
150
PKNPDKSAQSI RSGLQHLLGVSVAVIITDTMGRAWRRGQV

PEDPDYSARQI REFLWEKRTVNVAVIVSDTVGRPWRSGQT
PEDPDGSARRILGALQELTGREMAVI I SDTQGRPFREGAV
PLDPDATARQLCRALRERFGVRLGVVITDTVGRPWRMGQA

PEDPDASARALRERLRELLGVTVAVVVTDTMGRAWRNGQT

$P Q D P D A S A R A L R A G L A K R G L D V A V V V T D T M G R P W R N G L A$
PRDADASARIIGERVEE ITGCRVAVVVTDTNGRAFRLGQT
PDDPDGSAAALRRAVHDALGDDIAVVIIDSLGRAWRKGTC
PKDPDESAKRIHDKILDEKTGKETGVLVIDSRTHAMRDGCS



$P \| D P D R S A R R I R D A L R A R T G C E V G V I I S D T F G R P W R R G V T$


PADPDASARALRDGLRERDGIEVAVVVTDTMGRAWRVGQT
PVDPDASARAI RADLRAASGAEVAVVIADDSMGRAWRIGTV
PVDPDASAAAIRASI RARGGVPVGVIVSDTFGRPWRNGQT
PVDPDASARRLRAELHRCCGVNVAVVITDTGGRPWRNGQT
PVDPDASARTi RSALTQRLGLRIGVVVTDTAGRPWRDALV
PEDPDASARRLREGLREALGVDVGVVVTDTFGRPWREGQT
PENPDRSAAELRRAVADATGLDVAVI ITTDTMGRAWRTGQT

$P V D P D A S A A A L R G G L R E R L G V E V A V V$

$V \vee V T D T M G R A W R T G Q I$










P
P E D P D A S A R A L R A GL R
PEDP TASARRLIHEQLQGA PVIVTDTSGRPFRYGQR



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

DASAAALRSALRDRLGVDVAVLVTDTMGRAWRNGQT
PLDPDASARRLRGELQARYRAAPAVIVSDSLGRAWRLGTT
PTDPDDSARR


P
P
PEDPDKTSRDI RKKI EHVTNKKIGI,
PS DPDATA Q AI CTALRDKTGLNLGVLI

P

## P

$P$ LD P D A S A A A LA R E L R A RTGARVAVVV
 PADPMKEAEEI RTEIVKDLTSKSCGIIVTDTCGRSFRRGQT
 P EDPDRSARALAAGLRAATGAEVGVILSDTLGRPWREGQT

PK D P D G S A R E L K A ML D P D D G L G L GVVI N D SF GRP WR N GVV

PTNPYQTSEEI RRKI F LKKFFI HVGVI LVDSRLMPARDGTS


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UniRef90 UniRef90_U2YJV1
UniRef90-UPI000368036D UniRef90_A4X3H0 UniRef90_UPI000465A3E1 UniRef90-J2H0G6 UniRef90_LOHA23 UniRef90_D2BEL1 UniRef90-N1UXF4 UniRef90_UPI000473F4D8 UniRef90_UPI0003627210 UniRef90_UPI00030997D2 UniRef90_A0YCL8 UniRef90-J9SNY9 UniRef90-UPI00035FB671 UniRef90_W7J0F8 UniRef90-J2VIH8 UniRef90_H0R706 UniRef90_KOIHH5
UniRef90_UPI0003 UniRef90_UPIO0036560AB UniRef90-F6EFY5 UniRef90_A8L9S7
UniRef90_C8XIK0 UniRef90_UPI00036D258F UniRef90_A5V3B7 UniRef90_UPI00036EC3A3 UniRef90_J5K8R9 UniRef90_UPI0003763DF3 UniRef90_UPI000475C2CC UniRef90_UPI000466220B
UniRef90_UPI00035CFD92 UniRef90-X0MVH4 UniRef90_U1PJN4 UniRef90_E5XU19 UniRef90_G7GVB7 UniRef90_UPI0003F5622B UniRef90_UPI0002379325
UniRef90_UPI00037A04F8 UniRef90_Q9CCK2 UniRef90_Q2JF17 UniRef90_UPI0003B49AC3 UniRef90_L7L861 UniRef90_G4HVE5 UniRef90_B4RH08
UniRef90_UPIIO0040B58AE UniRef90_UPI00034AFBC8 UniRef90_A1SGI8 UniRef90_D0LD14 UniRef90_UPI000369015F UniRef90_UPI000474B012 UniRef90_D5UW06 UniRef90_UPI0003B54EA2 UniRef90_X1ETC3 UniRef90-E6J6F8 UniRef90_TOAW42
UniRef90_UPI00046266AE UniRef90_Q2FQL2 UniRef90_UPIO00361D179 UniRef90_F4CTB9 UniRef90_T5KE52 UniRef90_J0RYD9
UniRef90_D1BZK8 UniRef90-X1A0G7 UniRef90_UPI0003FBAF0D UniRef90_UPI000466F571 UniRef90_UPI0004782AA7 UniRef90_K0BCZ0
UniRef90-AOLWC4 UniRef90_UPIO00349AC26 UniRef90_AORUC6 UniRef90-H5XIQ7
$N \backslash \operatorname{A}|I \quad G \quad L S K V P A T D R E Q G N L D A W G R P L E V T E P A F A D E| I A A A$ DAAI GSAGIAVLHGYAGTRDAQGNVLEVTEVAVADELAAA
 $G V A V G V A G D S P V W D R K G E L D L Y G R S L Q T T R V A V A D E L A A A$ D I A I GA A Gl R V L D D L R G TVVDAS GR P L A V S V TA V A D E I A A A


 $N V A I$ GAANVPVIVDWDGRVDAYGRPLQDSQPAFADEVAAAA DFAI GSAGIHPLRDHRGETDAYGNELHVTQMAVADELAAA B

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UniRef90_H5XIQ7

TG|LVVRKNGRTPAVLLRG|LDWPVDSRGAD|ILRKKQEDMF A D L V K G K V A G $\quad$ DP V A V I
 S DVVR GK NNGRPLAVVRGLPPGDHGGARSLVRLGEDDLDF A SLVMGGQADEGVPAVIVRGYPWGATGSARELLRPRELDVVF T DLVK GKVG GLI PVAVVRGLAHHDAVGARSLVRDGADDMF
 AELVKGKTS GRPVAVVRGLAHEDGPGARALVRLGDTDMF GDLVKGKTGGMPVAVARGVALPDDGGASDLI RRGEEDLF A DLVKK GKA R GLLPVAVVRGLGHDDGPGARELVRDPASSMF A GLLMMGKDSFTPVVLVRGLSWD DDNGARQLVRPLEEDLF AELVKGKVD QVPVAVVRGLSYTDGPGVTELVRDAEHDLEF
 A S L M G Q A GE GRP PVV ARGGDAGNE GSAAEELIREPAMMD R AELVMGESD A DLVKGKA TGTPVAVVRGLLT ANFVMGESNNGVPAVI FHN
 A QIVMGEGDEGIPAAI IRDSGVPIEASGEIPTIPPAACMY AELVMGKA TGIDPVAVVRGLDPSVFGS
A S L L M G Q A DERCPAVL L R GLDDLA GDGTARDLLRPRDRDMF A DLVKGKLGGVPVAVVSGFPTRDDGSTAADLDRREDDLI

 A DLVKGK L T GVVPVAVV RGGRVGDDATARDLVRPADEDLG A A L AMGEGDEGAPVALVVRGASAEDGPGAAS GL RPVEQDMF AELVMGEADEC | G D | $L$ | $V$ | $K$ | $G$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $D$ | $L$ | $V$ | $K$ | $A$ |
| $I$ | $S$ |  |  |  |  |
| $I$ |  |  |  |  |  | A GLL M GQSNEK

A A DLVKGKLDA GEVK A AVPVAVVRGFAPAENGTAADLIRPHDEDLF
A

## A

A
 ADLVKGKLT

A

## A

 A GLVKGKLT AELVMGNADE

 $G D L V K G K A \quad T G R P V A V V R G D P H A D A B P A R A M V N K D D D L Y$ ANLLT GEGA A D LVVK G K \begin{tabular}{ll|l|ll|lll}
A \& $D$ \& $L$ \& $V$ \& $K$ \& $G$ \& $K$ \& $L$ <br>
$A$ \& $D$ \& $L$ \& $V$ \& $K$ \& $G$ \& $K$ \& $L$ <br>
$A$ \& $G$

 

$A$ \& $D$ \& $L$ \& $V$ \& $K$ \& $G$ \& $K$ <br>
$A$ \& $D$ \& $L$ \& $V$ \& $K$ \& $G$ \& $K$ <br>
\hline

 

T \& $D$ \& $L$ \& $V$ \& $K$ \& $G$ \& $K$ <br>
$A$ \& $D$ \& $L$ \& $V$ \& $K$ \& $G$ \& <br>
\hline
\end{tabular}

T A MP
$\begin{array}{lllll}A & L & V & K & G K A S \\ A & D & L & K & G K D L A\end{array}$
ADLVKGKL
A S LVLGEGGDE
A D L ARGGK D
A E L A Q GK L G
$A D L V K G K L A$
A NLVATKAA
AELVMKKSD
A DLVKGKVS
A DLVK GKLG
GDLVKGKAS
A QFL LGEADQ
A D LVVGK A A L A G
A A L A M GE G D E
A N L I M GESSN
A DLAK GK L G GV P AV HF R
A DLAK GKLLG
A D L V K GK A S
A E L L M GEAAE C
AELVMGQADEK
A S L L M GQAAEARPVVVVRGLQLITGASSASLARPKS QDMF

ANHKMGELG
A DLVKGKGAE
GELVKGKAS A NHGMGEAAESVPIAV LRG
$A D L V K R K D S$ S
A DLVKGKLL K AVPVAVVRGDTVGDDATARDLVRPAE EDLF

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| UniRef90-C7R2Z8 | A R G K E A |
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| UniRef90-D1BJD1 | A QGS A E A Y |
| UniRef90-M2WTG9 | WLGT |
| UniRef90-UPI00036DC4E3 | RLGTSEAV |
| UniRef90-B2TEW3 |  |
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| UniRef90-K9CQ34 |  |
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| UniRef90_A2ST46 |  |
| UniRef90-F4BVR2 | 】GA呐 |
| UniRef90_TOYFD6 |  |
| UniRef90-U2YJV1 |  |
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| UniRef90_UPI000465A3E1 | RLGTAEALL |
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| UniRef90_LOHA23 | M G A F A |
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UniRef9O-G3C9C2 UniRef90-COR3V0

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 I A AWAPPGDPEDAPGDDLATAIGDALDLRSGDILVVTSK
 LQLLP DPGLPEVRPGDDLGALVAASVGLLDGDVVVVTQK RLEVWAPVGMGEVRPGDDLADLLADDGDVRDGDVVVVTSK VEVVPVRGDPEFRPGDDLTGALATAAPWRSGDVVVVTSK DEVRALAGDPEDEAGDDLVELIVAAAALRDGDILVITSK




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IK P K E S TF A I LD K Y LPDKENSVVA DS SK VTAPDGVPTVTSGVDLGALLTAADAWPDGSTGVADSK MK $\downarrow$ SP VTRR VHVHDD【YEILEESLPLAENS IIALSSK
$\square T \square T P L T G \square P E V R E G D D L A D V L H A G V R L A D G D V V V V S S K$


LTVYAPPVDEDTRPGSDLAAMLVNR\|DLKDGDILVIASK 1 QCGEALEKI LDYYI PLREKVVLDITSK
 RVWALPGLPEVRPGDDLAKLI AAAPALADGDVLLVTSK


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UniRef90_E2SFM6
V|FSKTEGRM|V|AAPT DPEERDAFRRRLIDDETVR|VV|AR $L L S R A E G R F V D L A T V T P S P T A E E L A A R V G N D P R L V E L V L G$
 IVSKAEGR IRAGTDRDDA ALATSEGRAVELDSVTPRSEAVRDAAQYHMDPRVAEVVDR AFSKTEGRLVAAP RDPDERD
TVSKAEGRLVAAADRE
YVSNSQGRMLDYDS $\square K P S Q K A N E \square S$ YVSNKAGRVVAAVD
VVSKAENALVAIDPTDPHA
VVSKAEGRVVEAAD

## VPADPADREAVRR

$V \vee \log$
 1 VSKAEGRVRVAD GREQAlIADETVRAV VVSKCEGRIIAA PADPEQRDALRRKLI DEEAVRVLAR
 VVSKA G GRAYDLADDFPG


 I SLCEGAI ADPHTVTKDDLVKREAEAF
$V V S K A E G A L V D L A T V E V S A R A A E L A A E L E K E P E L V Q L I L D$ $V V S K A E G R V L T A A D \quad R E Q A T T Q E T V R V V$
IVVSKAEGMQVPDAA $V V \operatorname{SV} A E_{\text {G }}$ $I V S K A E G R I V R V T G D D R A A R L D A D E A E T V R$
IV S L A A ENRLLVAKSEDSKK
VVSKAEGRV
$R \square G E R E G \stackrel{L}{L} L^{\prime} \mid R$
 VVSKVEDRVVRLNTVTPTPRAERLAELTGRDARLCQLYLD VVSKAEGRIRAAAE AVVTAEGRD SN SSNDKPSDLANQDHEK DPKNPRVIQKI DD

 $V$ FSKVEGRUVSSPT DPEERDAARRRLVEQEAVRIVAR

 $V V S K V E G R L V R V D P G D D R E A V R Q$
 $I V S \square W Q G R C V E L N L I E D K D E L \square K K E A E F Y D D R E K V P$ IVSKAENRYIDDNYVSPGKKAKSLSQLTGKDAARDQVILEE $\begin{array}{ll}V V S K A E G R V V A A D D R E & R A D T E Q T V R V \\ I V S K A D G L L A T & D A E R T D L V L R R\end{array}$
 $V A S K S L G$ L IV V SKALGVVAPEDRDAAVERS
 IV V LCE GAVVELDKVSKDELIKKQADAY
$V V$ SLCEGRIVSSHKASSKYPLIQQ IVSLCCEGAIVDSNVITKDA
 VFSKTEGRMVAAPA DPDERD ALRRRLVRE $V$ VAKAEGQVRT

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AI STAAEGRDIDALSNVKPSELANNEDHQK\
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$V L A D H Q G R C V K I E D$ I
I I S


VV SUGGEGRCI KVGGSVDKDKLIDAKEADKFLDP



1 I TCENHII $\quad$ KK TKGK S
I V S KA E GRLV PATS
$V L S C E G A V V D V K T T T$ A NKYDMDERYVELIL E
$\square A S K A L G L V T H D P D \quad K D R V V H G E T E Y V V A E$ I V A L S E G R FC


V V S K A A G R L A S VA D R T
II S VCQ K RI DR KN A Y S K E E L I R K EA S A $\square$ A
$V \vee$ SKA E GQV
$I V$ SKA E GRRVVEA A DREAA




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 SEWTTPRGRTRI AETRRGGVVMAAAGVDASNVTPGSVV L
 VATRANAGGLTRIVENRLGVVGAAAGVDASNTPAGHVLLL ESDUIFGGVSGFVITSSDNVMAPNAGIDKSN SQGKLILY Q S R R I L R R R G DLI SETHHGYVCANAGIDVSNVEPGTAALL $R P \quad Y P D G S G V L D R I V E N R L G L V M A A A G V D A S N T P D G T V L L L$
 ATRDHA

VTR
 Q S S E E V V R R R G V

EAAAVLV GRHVVTVDRRGlKG
$E S D V V F G G$
RGRTLI TENRG

GT R E | A T R | $V$ |
| ---: | :--- | :--- | :--- |
| $I$ | $V$ |

R A H
ESQE $\perp$ GVL GRV R AR A
GRVVRHRLGFVSSAGVDKGNVALPAVSLL
LSR D KKNYI GCRLENGLLKLTSGGIDRKSVD EV F LI

| E |
| :--- |
| E |
| E |
| E |
| R |

S K
ETGDLE $\quad$ DDNNY IGAWLPNGMRLTSAGI DK
EADHYLGEDGHGVLTVKEGLLLPAAGIDDE
RA岛E


 E S D A $\operatorname{V}$ V $V$ L
 ETGDI NIENQYIGAWLPNGMRLTSAGID K QSRA I VYGHGVLITEHESGHVMANAGVDRSNTSANTDDLL

Q T K D L S G K
EADAYDPG
$\frac{\square}{E} C$

ECENY $\operatorname{CGVVPGALTTDNKYGLLANA}$
 ESRRRLVAARRTAVVVAAAGPVMAAAGVDASNVVGBVVLLL
 E S R EVVRRRRGVIVVEHRDGFVMAN

ATRERTAGPDLIVVENRQGIVMAAAGVVDVSNTLAGTALLL E S E A Y $\operatorname{l}$ I Y

## R S T




QSRR\|AMDRGVLIAETHHGLICANAGVDQSNMEGDEVVVL S STHLVAARRSYAVVRTRAGTVQAAAGLDQSN SGGDVVLVH

$R G P T Q Q V R S R L G L T M A A A G I D A S N V E A G H V V L L$
ES LG F L G H A L G I I TVVREGVVTPNSSSIDRSNAPGGAAVLDP E A DA V G V D HN YL T I K D N I L DP

E S Q R V R E R GVI: C E T K H GFVVCA N A GVVDTSNVVGGGVVVLL

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UniRef90 C5CGP9 UniRef90_B2KAS7 UniRef90_C5TD37 UniRef90-X1JTU4
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P

UniRef90_E2SFM6

P L D P D A S A A R|L|RAR|L|A DEFG|L|R|V|A|V|V|TDTMGRAWRTGQT $P$ TAPDAAAARLRSAMTERCGVELGVVI SDSMGRPFRLGTV
 $P$ V D P D A S A R R L


 $P$ LDP P DASARALLRAALRAARGLDDLGVVVTTDTA GRAWRD G LV

 P D E S Y K V $P V D P D A S A A A L I R A G L R Q R L G Q D V G V I I D D T M G R A W R T G Q T$
PADP DGEAR
PKRPSESAREDADALR PASESARETADELGGVVILTDTCGRPFRFGQR $P$ D D S A A GL R A GL R E R L GVDVGVVVT DTLGRTWR IGQT
 $P V D P D G S A A A L R A A V K A A L G V D V A V L V T D T M G R A W R V G Q T$
 $P R D D L K K S V N T L G M W L K E H Y G V H M G V I I D S D S H T T P M R R G V L$ PADPDASARR L RAALPGRPAVVIADSFGRAWRHGQA PADPDSSARGLRRGLQASSGVRIGVLVTDTAGRAWRQGLT

PRDPDQSARELRDQIFQLAGTRVAVI I S


P LD P D A S A R GL R A R L HE LT GANVGVVI

P

## P

## P <br> P

P

KDPD GSAGRI RREILEKAGRQVAVI I


PKDPDKSAKKVSEYLSLKKKKQVAVI I

PEDPDESAR RLREGI EAQTGADVAVVL


PLDPDASAATTRAA FAAAGVDVAVVI
 P A D A D A S A D A L R R DL T R R F G C P V A V V I
$P N N C D E E D A K Q Q I \quad A E K D I Y E K T G G K R V A B V I$



PK DP CAS A K R I R K E I M DL T GK E V A V I I
$P$ K D C Y K T A S E L L V K E L

$P$ QEP QLTTSKK IWE Y L R K KHH I K L G I I I
PEDPDASARSL R RGLAARLGARPAVLV PRDDLASTNALGLLWLKDRYRENDGVIIVDSHTTPMRRGVL $P \mathrm{~V} D \mathrm{P} D A S A A T L R A E L R E R L G \square T V A V V I T D T M G R A W R N G Q T$ P H DPD G $\$ CE QI H DALVARHGVRVGVVLSDTAGRAWRVGQV P K D S F D S A K K I R NYMKK NK L K K L G V I I

 P LD A D R S A D ELLR S RVVE E A F A V R I GVVV

$P$ LDPD A S A R A L R A T L R D RTGANVGVI I






GVAI GAAGLPALVDGRGDADLCGRTLEDTFTALADQLACA



 DMA GAA GLRPLLDLRGGVDAHGRPLSVTVTAVADEVAAA


 | $E V A$ | $G C A G L V A L D D Q R G A R D R Q G Q E L Q A T Q I A L A D Q V A A A$ |  |
| :--- | :--- | :--- | :--- |
| $G V$ | $A$ | $G W A G M A A S R D W R G E H D R D G R E M G V T$ | DVA GSAGリPVLHRYGGAVDAQGNDLLVTEDALADEDAAA

 DAA GAAGLAVLHRYAGAVDGQGNEVVVTEVAVADEDAAA

 DLAA GAAGVVVLEDLRGRSDSHGRRLDSTITAVADEIAAA


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UniRef90-A0A017P UniRef90_A0A017PKS5 UniRef90_W5WL44 UniRef90_G7H457
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 AD ASLVMGQTDAGKPVVHLRGLQWDAPAPAADLLRPKQQDMF SELVRTKLS GVPVAVVRGGSHDDDRGAGALVRPSAEDRF AELLMGEADECTPGVLVRGGGMPDTDEVGAEGIAADECLEF ANHKMGEGDETMPLAAVRNSDAKDTDSPKEMADSHDECMY ADLVMGKSS
SELVRGKAD ADLVKGKLG ANHRMGEGA ADLVKGKTS AHLLMGEGDD
ADLVRGKAS

ADLKKK LGALPVVVRGMALDDDGSARDLIRPVADDLF ADLVKGKLA GIPVAVVRGLPFDPDAGTRPLVRLGPGDLF ASIIMGQTDAGLGVVVIRGASYTDDENA ADLVKGKLG AVPVAVVRGLAVTDDGSARDLVRPGADDMF ANHKMGEGDELLPMAII RGAKLTDRKSSEETAIPYDECVY AVLCMGEGNEQTPLAAIQNAPVTFHNQMTALLCLGGEEDLY ADLMRGKASTGQPAVVVGGLTAEDGPGASTLVRPADEDLE ADLVKGKASRMPVAVARGLGDPESPGAKTLARLGEDDMF ASVLMDQNNEGRPVILIRGVDYD AGLVMGQRGTGDPAVLIRGLDYKWSEN AELVKGKLTATPVALVRGFAVDDGRGVRSIVRPPAEDMF AVLTMGEAAEQCPLAMIQNAKVQFTENPAALDVSPERDMY ADLVQGKLA GRPVAVVRGLALGDDGGAGSLIRPEGSDDF AELVMRKSLR VPAAIVVRGWEFEFKKTASKLIIRPKQNDFF AHALMGQTNEAIPVVLIRGAPYTMDEFASM ADLVAGKADR VPVVLVRGLGRHDEPGATRLVR REGDMF AALIMGQRGTNKPIVKISGVEYEFNENDDSLSRVPKD AVLMMGEAAERCPLALI YNAPVTFNENPRDLQFAPEDDMY ADLAKGKA EAVPAALVRGLPLEAHPRGRDLVRTGPGDWF GDLVKGKLGGGVPV
ADLVKGKAHRGVAAVVRGLATGDDAGAGRLVRTGPTDWF AELVKTKLGG GLPMAVVRGLAHEDGPGARALIRPAEDDMF ADLVRGKTA GRPVAVVRGLDHDDGPGAASII RPAEEDMF ADLVKGKLIADDPVAVVRGLPVDADEGTRPLVRLPADDLF AVCIMGEGDEQTPIAVVEDLDLVEPTNSNPLELDRYDDIY
 AALLMGQRDENVPVVILKGL
AELVKGKASGRPVAVVRGVSHDDGPGARVLVRTGPDDMF A DLVKGKV EAVPAAVVRGLGTENGDAARNLVRAGPEDWF AGLLMGQRGTGIPAVIIRGLDYKWSE ADLAKGKVH GVPAAVVRGLGRFVPASARDLVRAGPDDWF ADLVKGKSTRVPAALVRGLGHLVVGPASALSRTGQDDWF SALLFGQADEQLPVTVVRGLEYEDGEGV PNSGGVV AVLCMGEGDEQTPIAL EEAPVTFHSSMSTLAIAEDEDLY AVLVMGEGDEATPLALIEHAPPTLQEDVASLGINETVEDV ADLVKGKLD G GAAAVVRGGTPRDDGSAADLVRPGADDLF

A
$A V L V M G E G D E Q T P$ ADQEEPPPNQEEDQS IIDDPSDD【Y AGLLMGQRGNMVPIVTI RGFEYEFDRDA
AVHEMGEGLEKIPFVIVRGAN
AGVVMGEGSEQTPLALIKNDEFQDSDPTDSLKDT四EEDY ADLVKGKLS GVPVAVVRGLRTGDDRPGA
AS SV
A LLEMGEGAECQPFAVITDTPYKPQNADYGFEMTEKDDDF ADLVKGKTS GVPAALI RGLLGEVDAPGARSLVRTAAGDWF AGLVMGQMNESTPATLI RGYDYEPE
ASLLMGEADEKTPLCVIENAPVVFCAKDKE DKYP $\square E Q D \square Y$
AQFLLGEADQQTPVVITRGSNTEFTENPQTTEMPPEECLY ATLATGEGNEQTPIAIIENYKIKFQNRAKMICVSAKEDLF ADLVK HAHGGRPVAVVRGLAHDDGPGARGLNRTGADDLF AVLCMGEGNEHTPIALI EDAPPTDQSDDSALDINEKEDLY ADLVKGKLTGPVAVVRGLHPTDDGSARRLDRGTEDLF AVLTMGEGKEKKPLALISDAPVEFTNTTKELKDDDQEDDY
 AELVMNKLD NVPVALIRGYDYPRGES
ADLVKG AARGLPMALVRGAGYLDNGGASALCRDRAEDWF ADVVMGEGAEQTPLAVIRNAPLPTVEEEKSVKISMQEDVY

AELVMGESGEMVPMA VEGLDRLVDGAARETYVSPSECLY


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| UniRef90_D0LGF6 |  |
| UniRef90-UPI00047DDC8C | RLGS A E A Y |
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| UniRef90-B3TBB6 | VR G L K |
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| UniRef90-UPI00039AD300 | RLGTAEA $\square$ |
| UniRef90-V6ARR7 | VR |
| UniRef90_UPI00040239ED | RLGT D |
| UniRef90-G7CNE0 | WLGTEEAI |
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| UniRef90-UPI0001FFF0BE | WLGTEEA【 |
| UniRef90_D2SFL3 | P Y G S |
| UniRef90-UPI00035DC283 |  |
| UniRef90-K0KE76 | RLGVIAEAV |
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| UniRef90-G4R7X2 | RFGSTEAY |
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| UniRef90-R7XUT2 | A Y G A R E A V |
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| UniRef90-H6RKY2 | P Y G S R |
| UniRef90-X1GQT0 | A PLL |
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| UniRef90_DOZZS4 | G P L L |
| UniRef90-K2DSQ0 | A PLLQSA |
| UniRef90-A0A017PKS5 |  |
| UniRef90-W5WL44 | RLGTDLA |
| UniRef90_G7H457 | RL GTDLAV |
| UniRef90-UPI00037DED49 | GYGAREAV |
| UniRef90-V5MLE9 |  |
| UniRef90_UPI00046E9E92 |  |
| UniRef90_X5J8G6 | A P L L T |
| UniRef90_F2M3N9 |  |
| UniRef90-K1YK83 |  |
| UniRef90-K2DX73 | S P L L T K A |
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| UniRef90-B2KAS7 | Y P F K K L L |
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| UniRef90-K1YSN1 | R I GL |
| UniRef90-C5BXE8 | A QGAREAY |
| UniRef90_E5AJA9 | GPL |
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| UniRef90-K1ZGA7 | K P L F E K |
| UniRef90-UPI0002EC3AF5 |  |
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| UniRef90-W4L207 |  |
| UniRef90_K9B638 | R Y G HVEA |
| UniRef90-17JES7 | S P |
| UniRef90-E9UYB1 | GF GAREAV |
| UniRef90-H1QRR8 |  |
| UniRef90-G3C9C2 | F R G |
| UniRef90_C0R3V0 | S PLLMRA |
| UniRef90_UPI0003B77A0F |  |
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UniRef90 ${ }^{-11 L X 0}$
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UniRef90 $\cup 6 E C 24$ UniRef90- F6D3M8 UniRef90-A6UV32 UniRef90-R9LHSO UniRef90-O27706 UniRef90-F8ALU7 UniRefofo- ${ }^{-10 V J H 7}$ UniRef90-K4LHJO
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UniRef90_W9GMK9
 THELHNFPKIERKCNLAELIREGFNIRDNDVLCIASK QVTVLPLTGLGEVREGADLAALLAGALAPREGDVLCVSTK

FSLEPFPELQPGEDLAGATSEGTELDGDVVVVASK SLIGVERPEVRKGDDLASLICSSVSLRDRDVVAVASK TSVIPVGEVPEVVEGDDVAALLARALTLRDGDVLVVSAK RVEVLPLHGVPEVAPGDDLAALLLDGPGLADGDVLCVSTK
 LTAYAVPGVGRVRPGTDLGALRASGLDLKDGDVVVVASK
MNVTAVPD DPEVRAGDDपAGM\TERVDLRPDD\|VCVAST


| F | P |  |
| ---: | :--- | :--- |
| P | L | $\mathrm{Q} T$ | GL MKAYPIGTR | $D$ |
| :--- | :--- | -

ELPVKTR

 ELNAGTDSTNDGDTLVVSEK
पE TIP VPTR $\qquad$ VTVQDNIADLVEAGAKIGENDVISVAES YIKPGEGLWK1MERAGELVDGDFLVVSET PVPT ERHPIKT VK乌1P IPTR
FA PT PVMAGDD DADGIOLVEEADDVETSEK




K LR DPVPTR $\quad$ LTKDDVLEDVLDKYAKVQPGDTIIMSEK

$\square \mathrm{P} \square \mathrm{K}$
 RNEDLAEAAAGAEVT RNEDLKNEIENGFEIKNGDFLVVSEK


AEGDDLDALLTQ

FAlp T

| L | P | P | P |
| :--- | :--- | :--- | :--- |
| I | P | P | R |

$\square \mathrm{P} \square \mathrm{K} T$
MK VMAIKT

 NG

> |  |  |
| :--- | :--- | :--- | :--- | :--- |

SEK K
C
TEK
T


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UniRef90_A0A022KVW3 UniRef90 F6BF57 UniRef90_UPI000316683C UniRef90-R6Z821 UniRef90_UPI000380EE79 UniRef90_C7MBC0

H LAA K SKDKASLIHR
$V V S D A E G R Y V A D A D V T P S A E A V D L S A R T G K P A A V V Q L I L D$ $V V S K A K G Y L L D V S K V R P S E R A I R I A S A L G M D P R W V E L V L S$ LVSKALGLRAP $V V S K A L G U V \quad \square D P A G K Q E A D A$
LVSKALGLRVGAP
i VAKAEGALASAGSR $A D R E D V V A$ A Q TVRLVAR $\because V S K A L G$
VVSKAEGRAYDLDDFPAGPRATE $\square$ ANRLEKDPRFAQAVLE
SRWGGRTGDVVVVSSKLVSKA LGLRHEPPVDREQVVRE 1 VS LCEGAVADA R MCK I I S KNEGSI LS L L S SVKPSLLA DGTASSYGKDPRLVELI L S S $V V S K A L G L R A A P A D R D A A V A A A A V R T V A R R R$ $A V S V A E K R Y V D L A S V L P G P E A L E L S A Q T G K P A E V V Q L I L D$
$V L S K S L G R A P A A D K D A V$
$V$

$M V A C T Q G R A \square P L S A \| V P G R L A R L L S R F V T K M P E T M Q M A D E$ MVSTAEGNFI DEEQFKPS ILAYLCYYKI F LKEEK DK SLRK AVACTASRA

 I I SFAQNRLVPVETDEKHALATRQEADLYLDPAQ $L V S \square A$ AVACTQRRA 1 PMKD DHPRPLAKF LCKFVLLK DPETMEMALQQ PLATSQGRLVDETEFKPSFSAYFLAEIWSKYGYFLGPLLG PISISQGMIVDEAEFEPTILSSILADVWSKYGY LLGPI FR FVVTSENNLVDEKEASPKFWAYFL GPLLKTRKDRIKNLRK AVACTQKRAIP DDQ DHPRPDARFLSRFVLRMPETMEMALR PV SVAQGNLVDESRFEPSDTAVLLADDWSKYGY LDGPDLG
 AVAGSQGRGVRPEEVKPGLWARLISQFIVGDPFALQAVMN


 $V V A T S E D N F V D E S$ LAD P P K F WA Y F L G P L L G T R G D R V K N L R K
 I


$\infty<6$
I
V
V
V

## $8 \begin{array}{ll}V & V \\ V & V \\ I & V\end{array}$










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C6F69
2724 A
51528
 QTKKLKISKNFIGGWLPNGLFLTSAGVDKQEIDAGTAIVL
 ESDFCFAKMPNFCLTLKNHRLIPNAGIDDESNCNAYV LL

R A T
R R H D
RTVTSVVQTPHGAVMAAAGI DGSNAPDG LLLL
A ERDTPA GVTRVVESVA GPVLAAAGVDASNTPEGGLLLL $R T R H T V A R R R F G V V R T P A G T V Q A A A G L D R S N T E D G D V V L Q$
 ESTDLLMDAPFLLTET RFGHVCVNAGIDRSNVPDNDILLL

HTVRVVAEGLTQVVESAAGPVLAAAGVDASNTGATDALLL EADALFCEKSGIYLTKKEGDLIPSAGIDESNTDQPFVGLY ESKRIVRENGIITVETNHGFVCANAGIDESNVQDGYATLL HGGTVTSVVQDPSGPVMAAAGVDGSNAPEGP LLL
 RATGGGRVTRUVAAAAAGPVMAAAGVDASNVGGEDVVLL GGYVILTTVKNNTLIPSTGTDESNANSGYYILDW RGHTLITENRDGDIQAASGDDASNVFSDELALL HSRRVVAE NRYVMLTMKQNLLDPTAGIDDESNGKGYFILW


ECGVDRDLFAADALS GQKGWFYQVAGKKASTDDGHYVVLG MPKRESLKHKQMII ETRYA LKKYAEGGVDLTNVPLTYANPL



RTYGYPPS ECGTPR LIFAAAVLFHKRGWFYTVAGYKARS $\square D G P Y V V L G$ IIKKRTIKNLRKLPDEARYHKELIEAGVDLSNAPGTCVSLG
 ECGT DRILFAAAILFG DRGWFYN DAGYKARSIDGHYVVLG MKRRTI RNLRRMPPEARYGLKKHEAGIDLSNVPGTLVSLL RHKQVV DDNVGLITYALKPAS EGGVDLTNVPGTYAALL
 ECGTLRILFAAAILFKRKGDFYRIAGPKARAI DGPHVVLG

 T R K



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



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$N V A \prod G L A G M S A M K D Y V G Q T D P H G N V L R V S T M A V A D E L A A A$ GVAI GWSGLSASRDWRGQPDRDGREMGVTVQNVIDELAAA

$D L A D G A A G D V A L E D \square R G G R D D A G R A D T V T V R A D A D E D A A A$ VIS GAAGVGPVR RAVTEHGGKR QVAI GIDYGI HPLRK TEVIDSQGETIGFQEETLCDMIAAC G I S I GFYGLYPLKDYRGEKD IGFGRRMKMSQSNIVDALA
$D L A D G S H G \square R V L D D \square R G G S D A D G R A \square S V T A R A \square A D E L A A A$ GI T L
$G L P D A \square D G \square E A N K G V I G V K G Q \square G E N M G S T P \square G C S E N \square S V E$ GLPIAIDG:EADKGVFG $S L P \| A V R G i \quad K S D A Y L L G$
$R F G K K \ G P T P D A S S K E L$
 DIGGNILGTTLDRADNDVRIL
G $\square \mathrm{P}$ T A $\square \mathrm{DG} \square \mathrm{E}$

VGFLLARI
 $S L P \square S \square A E \| K N N W G M F G Y$
$L L G R P L G V S Q E H N I D Q \| A R A$
$S \square P \square A V E G \square R S D M G F F G Y$ DLGGNTLGSSASSTDHQLMVL L LG RLLGPTPLGI SEEIAAA EGAVGAAGLAVLHGYSGAVDQHGKELEVEVKVLSDNPA DAAVGAAGLAVLHGYSGAVDQHGNELLVTEVADAEDAAA Y GVElL
$\nabla T$ A LiP Y A GLWPTSLSRRRLAAAL

$V L A V S S \quad P T E G R V I R Q L L G G N V L G S T L D G E R Q L V R \| L$

G
PAA $\square$ A S $V G \square E S Q R$
VA D EVIAS A
SLPVSASGTKNNWGL

| S | L | P | I | A | V | D | G |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| A | I | P | I | A | S | E | G |

$S L P \square S V P G \square R S D T G F \square G$
ALPYAINGI
PNVSKHFMEKVMKDNP
TE ILDAMTPDVSEKLLLDVFRNNP

A LP $\square \mathrm{A} \square \mathrm{DG} \mathrm{I}^{\square}$
GSTDKTTNKLV LQVL
A $\square \mathrm{P} \square \mathrm{A}$ M D G $\square$
GVSDGVDGAPAARLLLDNP $D \square G A N V L G K P R K D M P D E \square Q V F$ FGNASQKTP $\square \mathrm{C} \| \mathrm{V}$ KN
ALPDAIDG■
D 1 GAS KEVKEKSNFKQ GEK LUENNP
DRRMDRAH $\square R A \square$ $\square R D N P \frac{L}{K}$ G VD K K F $\square$ E S $\square$ F $\square \mathrm{DNPS}$

## T V VM D

AND $\square G R N V L G S D V Q V A G D R L A T F$
EVLAASAHV
GEILGAYNLP

## DMNTVREELRDNP

GVSKGVDAQLMSK ILIDNP
$\square G C A N \square V G H S S G \square S M D I V K K Q D N A$
ADCUGAS KGVSKSYVERL
F LD N P S
$D \square A \square E L G G V S P \quad D \square K G K E E W \square K G L L Q D N P A$

TDAPG LKERYEAM DNPA
F
$N V L A A S P G V E$

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A GlL VMGQRGVNTPVV｜R TRGIVEYGFHESA
A GLLMGQKGKMLPIVKIHGIDY
ADLVKGKAS GGPAALVRGVPTGVDVPAREDSRTGADDWF AVLVMGEGDEQTPLARIMDAPFPTPEELAALTIAPEDDLY ATLTMGEGKEQTPI VLI KNAPAPTPKEERSIYIDSKNDLF A GVILGQRGRGVPVAVLRGDGYTDAGVASILHRAPAQ A ALLARQTSESIPVVVVRGISYEWEGGLRDFSMRQPTEAL ADLVRPKNA GVAAAVRGLPPHLVPGARELVRTGPGDWF ADLVKGKAS AVPAALVRGVPDSPAVPAGDLNRLPPEDWF ADLVKGKAS GTGAALVRGLPDAAAAGARSLVRTGPGDWF ADLVKGAARGRPVAVVRGVGDHPGPGAAGLNRADEDDWF A DLVKGKSD GVAAAVVRGLPEEFASGARQLVRTGPGDWF A Q LLGEADEQTP VVI IKGAPVTFDKPPSSMQMDPEECLY
AELVMEK LSR VPVAIVRGFDYQAEGSARELIRPADRDLF ANLVAGEGAGGTPAVVVRGFEFGDLPGSENHFRADEGDYV $A D V K G K A S$ GDGAALVRGDTHEDGGGARSLVRTGPGDWF
$A V V C M G E G N E Q T P L A V I E Q A P Y H S H P T S R E L R I D E T E D L Y$

A DLVKGKTAR VPAA LVRGVPDADPGPAGADSRTGAGDWF A GII LGQRGRGAPVAVLRGIGYESDAGVASML
ADLVKGKAS GПPAALVTGLPAADAAGAGTVVRTGPGDWF A GLVMGQRGTGIPAVLIRGLDYKWSEN

ADLVKGK LGGGAAAVVRGLDDGTGPGARSLVRTGPTDWF EG $\llcorner\mathrm{K} \square \mathrm{AN} \square \mathrm{AE}$

KDNPLGQGHESTPLGTVR
KDNPLGQGHQSTP\｜GII R
SDNPLGQGHQSTPMGVIR
$\square \mathrm{ELLK}$ GGFAGCTPLAVVGNHNDK
】E E L VR
AEEYMQKLLEGTPAVIVRKYD
K DNP LGQKAQSTP品 I IR
AENFMSKAFEGTPAVIVRSL
GNEDEGTPIVIVR
ADLVKGK T A MPVAVVRGLSVTDDGSARQLLRPGTEDLF RDNPLGQSCQRTPVG』LR
GDNPLGQGGECTPMGTLR
DNPLGQDDQQTPMGI I RK L


AS $\square$ T D $\square$ SMGVAVIRG $\square \mathrm{DVGTNEP} \mathrm{\square NHDT} \mathrm{\square GPFADWF}$ $K D N P L G Q S L E Q T P\|G\| I R$

KDNP $\square$ GQCSEQTPMG $\square$ R

QGQGDELTPFClVRRDD
AGNADEQTPFVILR
KDNPLGQGHQQTPMGI I R
KDNPLGQGHESTPLG\｜VR
K DNPLGQDHQSTPLGVIR
K DNP $\square \mathrm{D} Q \mathrm{CS}$ QQTP $\square \mathrm{A} \square \mathrm{V}$

F GNDDEGTPLVVIKGF GQCSEQTPMGILR GNAEQQTP IVVIKNY

ADNP LGQGRQRTP LAALVDLGEPGTG


ADNPLGQGRQRTPLALLVDL
KENPAGNGDQQTPIVLLK
GNSEQQTP $1 \vee V \mathrm{~V}$ K S YKEQTAE $\square$ SDD $\square$
GQDDECTPFVLIR
ADNP $\square G Q G S E Q T P M A G V$

GNAAEQTPTVLIR
$K D N P L G Q T N E Q T P L C!V R$
A D N P LGQGSEQTPMAVV

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RAVIRASL
ALGHVEAV
A RPSLESV
ALGHREAL
R T G
AMGHVESL

R
R Q A $\square$ R G W A L GHREAV GPFL

R R P S L E S V
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GLGRVEAV

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UniRef90 C9RCR5 UniRef90 A4X5E7 UniRef90-UPI000370C03E UniRef90-F6CHJO UniRef90-C9LSV6 UniRef90-K9SXP9 UniRef90-K4LE43
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UniRef90_Q7V849 UniRef90-F4LRY9 UniRef90-F4LRY9 UniRef90-L8MXI3 UniRef90-A3Z1U4 UniRef90-K9VDP2 UniRef90-R7PMH5 UniRef90_U9W090 UniRef90-A9BAN7
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UniRef90-B5IIG7 UniRef90-UPI000403B18B UniRef90_JONOP6 UniRef90_W0GW49 UniRef90_D8G742 UniRef90 R5BGX1 UniRef90_-Q892Y4 UniRef90_D1BL59 UniRef90-Q2RJT2 UniRef90-E4LAH2 UniRef90_K9RZ14 UniRef90-E2ZD56 UniRef90_B1X3P7
$\square$
 ,


IP VKTHVVMKEDDLFGDVVDKYTKRRKGDIIFCSEK IIPVRTHIVTEKDDIVEVAKKYAGADPGDVIAVAES


 $\square Q A V A V P G \square P M L T S G D D V A A V L A N A V S W P D G D V V V \frac{1}{I} A G K$
$\square P \square R T \quad H \square I T D Q D D \square V E V A R R Y T E G L P G D V L A D S A E S$


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

$$
\mathrm{K}
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K A E V LP V V T
        VMP\KT
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VLP $\mathrm{V}^{\mathrm{K} T}$
EVLPLKT
VAAI GLKT



LLGPDDDTVDVLRHYAGDQPEDVLFSEK


G L i
$V$ K Q G D S Y I D L F K E Y V S P Q E G D I I S S S E K

K A E V L

Q V L P VP T HLL T Q L D T C C P D


NLLEDPVKTR ILLTDKDDIVDVIVESYARVGPDDDIDCTAS
QMKLL I P I P T R LL T A A D D I V D A V Y E Y F LI I GP H DVV CVA E S







L F V SEK



VQ $\square$ GE NY



E V I P $\operatorname{P}$ V




UniRef90 Q8RBN7 UniRef90_UPIO002FADF94 UniRef90-UPIo00362E174 UniRef90-K0AV12 UniRef90_S3XWKO
UniRef90_UPIO00047D3FB3 UniRef90_C9KNG4 UniRef90-A0A037Z277 UniRef90-A0A037Z277 UniRef90_D7JG40 UniRef90-A5DOP8 UniRef90-UPIO0026299F4 UniRef90-A5DOS9 UniRet90-B4WPN1 UniRef90-M1E7Z4 UniRef90-UPIOOO37AOE7C UniRef90-UPIOO037CCC61 UniRef90-X4RFD8 UniRef90-B2A1Z7 UniRef90-C7QF66 UniRef90-C9RCR5 UniRef90-A4X5E7 UniRef90-UPIOOO370C03E UniRef90-F6CHJO
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UniRef90 $07 V 849$ UniRef90-F4LRY9 UniRef90-F4LRY9
UniRef90 L8MXI3 UniRef90_R7FAK8 UniRef90-A3Z1U4
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UniRef90 R6X759 UniRef90-AOYJD3 UniRef90-BOC514
UniRef90-E6PGT4 UniRef90-UPIO0036EA34F UniRef90-Z9JMYO UniRef90 R6IHN8
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UniRef90 B8HY65 UniRef90-K9SLX8 UniRef90_Q10WK3 UniRef90-UPIO0047AA355 UniRef90-R5SNZ7 UniRef90-A1HOF3 UniRef90-Q31K19
UniRef90- $\mathrm{B5IIG7}$ UniRef90_UPIo00403B18B UniRef90_JoNOP6 UniRef90-WOGW49 UniRef90-D8G742 UniRef90-R5BGX1 UniRef90_O892Y4 UniRef90-A9WSE9 UniRef90-Q2RJT2 UniRef90
UniRef90
K9RZAH2 UniRef90-KgRZ14 UniRef90-B1 $1 \times 3$ P7

 IIAAMQGRSWFVWE KPSFAAKQLSRFVTRTPATMQLAA N VVA TGGRAYLPENVKAGLLARFLCRFPKRHPAAFQLAIN $V V A T T Q G R F V R P E D L K D T V A Q F C C R F D P D Y P H G M Q S L M D$

RTKRLLKN


VVA SQGRSYFLWERKPSFAARKQQKFVVRTPETMQLADQ VVAISQGRAILPETVKPGWLARFLCRFPNKTPAAMQLALE VVAVAQGRDFNVTDIRSGAWARLLSRYVLRTPYGVEVGLP



PVAVIQGRYAHPSTTNPGWLARLLCRVFHPTSSLLQTLIN IVAMTQGRSIPDVDIKVSPAARLLSRFVMKNPWSMQLAIID PVATMQGRFRHPSTIRPGWVARHLCYYFLPTSSLMQALVD

 VIAVAQGRIFNVTDRSGAWARLLSRFVRRTPYTMQLADQ
 VVARSQRYDSCD AEDIQKKLRKPKSTAVIS VVARSQNRYYSCSD
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 VVA TQGRAMRCEEFHPGPLAKVLSHLFPAKGYSMQSLID
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 VVAITAGEFTRPEDLKVSWQAKFLNRFIHPDGYGMQAAMD

 IV S DQGRVIQKSDVKVGFWAKFLSRFAKKTPYSVGNPLK VVALTQGRMVRPEEMNPCFLARVLCRFARQKAYGMQLAMD
 PVAIMQDRWHHPSTVKPGFVAKRLCYFFLPTSSLLJQLEVD PVAVIGQGYAHPATVEPGWLARLLCRAFHPTSSLLIQTLI D PVAVIQGRYAHPATVEPGWLARLLCRAFHPTSSLLQTLID PLAAMQNRLRHPSDVRPGALAKRLCYYFLPTSSLDQVLVD PLALTQGRFRHPTDIKLGWVAKRICYFFLPTSSLATACMQ VIALCOKRIVYRKDIHPGFWAKLLCRFVHVTPHKMQLIIM VVA TGGRDTRPEELNPGFLARIMCRFVPQKGYGMQAAMN PLALMQERFRHPRDIKPGWVARHVCYYFQPTSSLATAVGL PLAVMQGRYH PPETVTPSGLARLLCRVFHPTSSLDQSLID PVALMQGRFYHPSQVKPGWVAQRVCYFFMPTSSLMQLLVN PVMCQNNVVEKKDVKUGFWARFLSKFAMDEPYKLQLAV N VVALTGGRTTRPEELRPTWQARLLCRFVPAEGYGMQSAME LVARAQGNYVTDDEVAACWQADI NRKFKGDIGGVVFPDLS VVADTQGRFTRPEELNVCWQARLINRF HPDGYGMQSAMN IVAMTQGRSTPVWDLKVSAAARTLSKFVVRNPWSMQLATE VVADTQRRALLPEEVPGRLARFLCRFPGKDPPAMQLALD




## UniRef90 Q8RBN7

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UniRef90-O7V849 UniRef90-F4LRY9 UniRef90-F4LRY9 UniRefefo-L8MX13 UniRef90_R7FAK8 UniRef90-A3Z1U4
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正

ASRTFNGTPVRLTFTSNGTVEFNGGVRTSNVSDGVLKLL EAGRTVNAAAASVVGKRRGWFYVVGGHRTS ECGTIRMLFAADII DRRSGDFYKLIGSKARYIDDEY IILA EAGLARITYAAALLRGKRGVFYEHAGADVRAIIDGPTAKLP DVGKVRILLGSLALLGVKGWFFVIAGKQVAMIDDVAGTMP VEGKWRVAFALFALVGQSGGFYKWGGEQTALIDDVTVVYG AGAETVYGLDELCTSPRNGSGYPNYGLLGSNSTEEKYKLF DVGRDLLGCVAAAVTKPFGGFYKVCGKKAYADDGPCYTLP TTMELAA REVGLPVLGRRGVFYEVVGDNVRAli DGPTAKLP ETGTPRIVAALGKLAGRKGDFYRVAGRHLTLI DDRHMLL G E


## TGSNPWGLT

EAGGGSNSDMDKGLIKLL EAGLARIVAASAAVVGRKGLFYQLAGPAVRAlDGPTAKLA ESLRVLAGCAAAAVGKRKGWFYLVAGRELALIDDRHDILG RVLAAAAAGAVGKAVGRRGLFYBVAGSAVRAIDGPTAKLA
 VEGKWRVAAALFAIVGKSGGFYKWGGG
$N S G A W Q V G A F I V G A L A K G L Y M L A G$
EVGPTRVLLA WLVGSLQRGWFYRLAG EGILPRILWASLKLQGKNGIVFYEVVGHDTNAII VSGPVRVVAAFLGLVGQRGGFYQLAGEQARLIDDVTVVYG VVGPVRVIFAFVVGTGKPGVFYQLAGEQARLIDDVTVVLG VEGTGRVLFALFALVGKGGMFYRWGGRETALIDDVTVVYG
 ESGAWRVAFAFVVSRNRFALVLKALAM VARATRGGKVIVQ QVGLLKVLWASLALEGKKGVFYEVVGQEVSGLDGFYDLLL QTLIVDVVGPWRVVAGKPGVFYQLAGEQARLIDDVTIVLG
 EVGPSRVTFAWI ILFRDKGYFYNLAGKQARLIDDQTVVLG AEGGARVLWAVICCVGESGTFYRMAGKQARLI DDVTGTMP


## A

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AEGEWRMLFWFIVLFGKRGVWYAHCRRASLVDDVTGTMP
SAGVLRIL IGALLAADTRGVFYKVVGNEVWAI DDDKGVLIT ETGRARILAAAAASALTRGVFYRVAGTLARDIDGGHHLFP KEGEWKMMFAFLCVFKKSGVFYQMAGRASLTDDVTGTMP EVGELFIGGAIAKIFGHKGGFYQLAGEQARLIDDVTGTLP EAGRVLYAAAGGAVGKRKGLFYELVGNQDAA! DGPTAKLA MQVALNLAGLPRILFACFGTFYRVAGHQDSQIDGFYGILG AAGKWRLAFWLFVLFGKSGVFYAMSGEQTRLIDDVHIVLG $M Q T T D D L C G P W K V L F A K R G I F Y S Y L G N N D N A I D G D K G L$
$M V G P W R V F A F L V V L G R P G V F Y Q L A G E Q A R L I D D V T G T V$

## I

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UniRef90 Q8RBN7
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UniRef90_S3XWK0
UniRef90_UPI00047D3FB3
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UniRef90-A0A037Z277
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UniRef90 C9LSV6
UniRef90-K9SXP9
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UniRef90-F4LRY9
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UniRef90_R7FAK8
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PEDADGTAERII REKI DEKTGKDVDVLTFD ${ }^{1300}$ GAYKDPDTGTY ${ }^{160}$ VYHPHQWAAGAGAWLRSYFSADIGVVIFQDLDPHPFRRGQR PKDPDKVAADDTATLRSALPPGPGTVI IDSN
PENCNEICREASKRLGNVCVAVVGV
PKDPDLVAAHLVDVREVETFDGVVVMDAN PYHRHKDADKVCQRI KDKTGDDAVIVDANDLG

PRDCQTVVEQUQDKLKKLTNKNUEVMUYDPVGKUWELADP
PYNPNKVAREMKEKLGNEF VV LDANDLN
PKDPQKVVEKD KGATGAEAVITDVNDDGN
PKDPDQVAARLSTA DRQA D $\square P S A L R D S F A G T V V M D A N$
PKDPQAVVDKIKKA
PFDPSQS QQLVDQTYEETGLKAATVDVND
PRDPDKTAEEISQFLG GVRVAIVDANDDGVAWVVGC
PQDPDRVAQGISSAIRAADPAEFGTVIIDAND

PDNPHKTADNI KDGLYARFGGRPGVIISASAGEPGRGGVL
PADPGKAASELADRLRKVLPAQAGVAIIDAN
PKEPQKVVE ABVRATGAEAVIADVNDDG
PRDPDRVAQETSSAIRAALPAEFGTVIIDAND
PQDPDHVCAT:SAAVRAALPAG VVILADTFGGTVVIDAN



PQDP GEQLCDQAAAALGVSVAIVDVNDGGR
PKDPDGVARRLSAKVRAALPAELGTAIMDAN
PADPQGVVDRVQRE
$P E N P Q Q V V E E I$ KEKTGLSAA $\square V D V N D$


PYDPD SPAELCNAAAESLGVSVAVDVNDLGR
PLAPTKLCRQAAAELG $V G V A \backslash V D V N D$
LSMPDEVGNQVMDEEFATTRTRL
LSMPDEVGNQVMDEEFATTRIRLEAATVDVN

PYDPDQ PERCCQELAQADGVPVAVVDVNDLG DVGQE
$P D N P Q K V V E E Q R E \quad$ TGLAAAIVDAND RVKVL
PYDPADTNELCEETTRETGA YGAVI ADVNDLK RAA LL
PYDQFIVLQKUVQDIYEATGLKAAIVDVND
PNQPQ KVAEAFCDEAYKK■GLNDAVVDANDDGRVKDLASS

PDDPQKVVDQLQA
PYDPENS QELCDRTQRETGLSAATVDVNDL KRVKIL
PKDPDAVAEHLNAVIREVVPER WRDGFA
PYDPSKVAEEITSGTGA FGAAVADVNDLK RSCVL

PFDPDET DEVCDELADRLGCHGAVIADVNDLK RSAVL
PKNPVRVSESIVEGLGOCFGAAVADVNDLKRSCCLGCT
P FDPHAVADALMKATGA YGACVADVNDLKRAAILGH
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PYDQMDVSKDYCESVSRSDGVHVAVVDVNDUGK
PEDPEGVSKETKERLGGFCGGAVVADVNDLKRSYVLG




PYDPDD PQAIVNEILEETGLEAAIVDVNDL
PTDPEGVAARLGGLLREQLPAEHGTAIIMDANDLKA G G

PYDPQDPQAVVDRIERETGLKTAIVDVNDLKMGAV
PYDPHEPGA FCARMAAALGVGVAVVDVNDLGR
$P D D P Q N V V N T L Q K E \quad$ TGLGAAIVDVN DLLKAV
PKEPVKVCND】QQEDGDDC

PKDADKVAERIVQRTGSYGAV MA VADVNDDKRAAVLGH

## E

PKDPDKVAEKVS RTGCYGAVVADVNDL KRSAGL



PYDQTENGRQLCYELAKRDNVDVAIVDVNDIGR

UniRef90 Q8RBN7
UniRef90-UPI0002FADF94 UniRef90-UPI000362E174 UniRef90_KOAV12 UniRef90 S3XWK0 UniRef90_UPI00047D3FB3 UniRef90_C9KNG4 UniRef90_A0A037Z277 UniRef90 ${ }^{-}$A0A037Z277 UniRef90_D7JG40 UniRef90-A5D0P8 UniRef90 UPI00026299F4 UniRef90-A5D0S9 UniRef90-B4WPN1 UniRef90 M1E7Z4 UniRef90-UPI00037A0E7C UniRef90-UPI00037CCC61 UniRef90-X4RFD8 UniRef90 B2A1Z7 UniRef90-C7QF66 UniRef90_C9RCR5 UniRef90-A4X5E7 UniRef90 UPI000370C03E UniRef90-F6CHJO UniRef90_C9LSV6 UniRef90 K9SXP9 UniRef90-K4LE43 UniRef90-A5GKX0 UniRef90_UPIO00369E9E9 UniRef90 UPIO00477563E UniRef90-UPI00037171E2 UniRef90-NOE2K2 UniRef90 E0P2R6 UniRef90-A8LVP2 UniRef90-Q019E9 UniRef90 F4LRY9 UniRef90-F4LRY9 UniRef90-L8MXI3 UniRef90 ${ }^{-}$A3Z1U4 UniRef90_K9VDP2 UniRef90-R7PMH5 UniRef90 U9W090 UniRef90-A9BAN7 UniRef90-R6X759 UniRef90 A0YJD3 UniRef90_B0C514 UniRef90-E6PGT4 UniRef90_UPIO0036EA34F UniRef90 Z9JMY0 UniRef90-R6IHN8 UniRef90_UPI00035E5DEB UniRef90_U7URE6 UniRef90 W1TXZ8
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UniRef90-D2RJ30 UniRef90 UPIO003704350 UniRef90-F9N3S7 UniRef90-Q7U847 UniRef90 A3TQ63 UniRef90_Q7VC73 UniRef90_X1PHV3 UniRef90 UPI00037D8219 UniRef90- C0GII2 UniRef90_K9SD45 UniRef90-K9TM03 UniRef90 UPIOO0423239B UniRef90_Q05T76 UniRef90-B8HY65 UniRef90_K9SLX8 UniRef90_Q10WK3 UniRef90_UPI00047AA355 UniRef90_R5SNZ7 UniRef90 A1HQF3 UniRef90-Q31K19 UniRef90_B5IIG7 UniRef90-UPI000403B18B UniRef90 JON0P6 UniRef90_W0GW49 UniRef90_D8G742 UniRef90 R5BGX1 UniRef90_-Q892Y4 UniRef90_D1BL59 UniRef90_A9WSE9 UniRef90_Q2RJT2 UniRef90-E4LAH2 UniRef90-K9RZ14 UniRef90_E2ZD56 UniRef90_B1X3P7
 A GSLASYGV

D $\square$ G R N V L G L A A S R
EREHYE
A Q F
GVTDKVDGQMAAKLLIDNP FGNASQKTP DC\| I KN
VVSPGFNGINAlIEAMKEK\KNKNSNLVGTMETLTDLLGSL
 $D \square$

GRNQLGSDLDVPGEVATF
LKAVK L $\mathrm{L} A K \mathrm{SENTNEQLL} \mathrm{\quad VQALLDNPA}$ SKGVDPREIEDMMKDN

F GQD $\square L G R D A D \square P D A V L A A$
DRA $\square$ A WAGVDMKTPGG ESVTDATAAL
ELAADHPAIGASYNLRSASLREGSKLKTTPRSVTSILGTM DLGCNILQATTVAEEKIVEDF

FGQD ULGQDADLPDAVEAF
$D L G C N V L G$
TDAAGQRTRMEQMA KVDNP


$G L A C A \square \square V D N D R A V K\|L A S S S G V S D A\| L T E$
 GVSDGLNGELAAKLLLDNP FGNASQKTPDCVIKN
 $\square G R \square K V K V A S S R G C D E A$ $\square L H R A L K P N P A$ KKALRPNPA
 ASSAGCDE DLLRRALRPNP $\square K$ A VK I L A A T S D

NKKL

## $\square K$ A V

NPK K Kll 1
K LLA A T S D T DVDLIT S A
$N$ PLL EKALISNPA GWSKGVDPDKVAETL DDNP FGNGSEKTP DCII

LKAVKI LAHTADLSTKILE QALRSNPA $G L A A A \square V D V D L K R V K \square L S A T Q G A P L P L I E E A L R S N P A$ AASSGVS TSLLHQALISNPA GT VVMD AND $\quad$ GGRNTLGKAAPLSAEHYEQF GVS K GV
$N A D E V A Q S$
$V$
$V$
$V$ GTSKGSKGLDPNEDAR\LIDNFGNASQKTPDVITKN



AVKVLAASKGVSHQLL
$\square K A \square R K N P A$
DIGRNVLGSDVADD TSRFEEMF


GSPGV
$D \square R K V E K M L I D N P$
$N \square G V E V M G V S N D \square P Y D$
$G \vee S \backslash A L L E$
$C \nabla A L G H D$
LK A VK K L A A S S ELDS T DVLE

 CVAL G DDTDLSKATLESVE EALRTNPA $C V I L G K C R N V T \square T D E Q \quad L C E \square V R D N P A$ K $\ddagger$ L A A SAGLLDPKRLAQ LIDDN $K \square L A A T S G V A A S Q G C D E A$

PTAVLESALRDNPA LLQRALER R PA

T $\square$ A S V P D Q $\square$ A M $\square$ VKVAASSPGCDELLGRADRPN

F $\mathrm{L}_{\mathrm{L}} \mathrm{E} Q A$ LKSNPA
MTPIVIIKNFASI
GTSRG $\square$ DAKK $\square$ AQLLIDNP FGNDSQMTP VI IKNYASV
$D \square \quad \square G \square T \mathrm{DR} \quad \mathrm{RY} \square \mathrm{QA} V \mathrm{TEADRDNP}$

GASEEF LQSALRSNPA YSRG $\square K P Q E V A$

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UniRef90-K9RZ14
UniRef90_E2ZD56
UniRef90-B1X3P7
UniRef90_R7MZW3

ADLLAGSADQGTP【VIV/RGM

A D N P LGQGS Q Q T PMAVV

CDLTS GS GDK GTP VLI QGY
CDLTSGSGDKGTPIVLI QGY
$K D N P L G Q S A Q Q T P I A \| V R K A E$
ADNPLGQGRQRTPMAVLVDL
GNADEQTPVVLIR
PAGNADEQTPIVLIK
ADNPLGQAREQTPFAVV
AGAVM MSSPDCPVVLVRG■P
ADLITGSADAGTPIVLVRGFKH
$K D N P L G Q G A Q R T P L A V V$ FGNEDEQTPIVVLK
A D NP P L GQGGAQRTPLALVVDGLRLLDPNAPAS LATDLATD $F G N D D Q Q T P I V V I K$

GNAAEQTPVVLIR
ADLVAGSADAGTPIVLVRGFQYE AGNANERTPLVLVR

A LLPAGNADEQTPVVLVR
GNANEQTPVVLIR MGQDDEMTPI MLLCR

VDNPLGQAREQTPFAVV
GNANERTPLVLVR
GNANERTPLVLVR

A LLMGNAAEQTPIVLIR
TGQGHEQTPLILIR
AGNANERTPLVLVR
GNADERTPVVLI RPDP
HNPFGNASEKTPIVII KNF
LDNPAGNADEQTPVVLI
GNGDEKTP LILR
GNADERTP LVLIRPLSPGD
GNADEQTPVVLIR
GNANEQTPVVLIR
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ПDNPFGNGSQKTPVVVIKNY
ADNPLGQRSTGRPFVLVR

AGQSNEQTPF LVRR
ADNPMGQKVTTTPFVI DR
GNADEQTP $\quad$ VLIR
ADNPLGQGSEQTPMALV
GNADQQTP VIVR
FGNASQKTPIVVIKNY
GQGTEQTPFILIR
GNSDEQTPVVLI R
GNADEQTPVVLIR
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GNANERTPLVLVR
GNADEQTPVVLIR
GNAAEQTPVVLI RNYDYGSGE
GNADEQTPVVLIR
DNPQGQTTETTPMSIV
GQEGQCTPFILIR
PFGNASEQTPIVI I KNY
GNADEQTPIVLVR
GNANERTPLVLVR
KDNPAGQSDELTPLILIKKADL
AGNANERTPLVLVR
GNADERTPLVLIRR PTREEGAR
S E
S G
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GNADEQTPVVLLR
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FGNASQKTP $\|$ VVIKN Y

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V L P VR T


 LELKPVRTR UVTPKDN\|D\|IERYAD■GPDDVVSVAEK - QPGDIVTIGES
 KVEVIPVKTAVLTEQDNIIDVI KKYTAVTKEDI I CIIAES



 VK $\square$ NE D Y $\square \mathrm{D} \square \mathrm{I}$ NKY V KPEEGDK $\square \mathrm{S} \square$ SEK VRGVRA P ILLKEGDN【VAlVVDS LEFADRDVVGTTES LLDFATGRETGDTVVI SEK DDPAEVLRHYAGLQPGDVLTIGET QVFPDRT HLLAQLDDDPVEVVQRYVHAKPGDIVTMGET LELLKPV GTRULTDKDNUVDMDEKYTDDGPDDVVSVAES

VKQGENY IDDIFKEYVSPEEGDTVSSSEK VEVGESAAELVKKYLPLQPGDVLSDTAK

DDPVNTVIEYCKGQAGTI TISEK


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

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LIARAGNY 50 $\quad 60$
60
 $V$ MSNGGRRFRHPKGVHPGLLAKLVCRLFHPTSSLMQSLI D IVARAQGNYATVDQI ATBVKNKVKSEKIG $1 V \operatorname{SLCQKD\| IPKESVKDSRLAKFLSRFAVHNDYKMQVAIM}$ ATA V VE GNYRYPGNI QPGWLA WRLCFFFPSKAYGMQTLI D IVARAQGNYASVDDIAADVR

AKLGGETVGVLFPILS VVARAQNNFVSVDYVAEEIRR AKLGLKKDSMVGVV
 $\begin{array}{llll}V V A & S Q G R Q L R P E D M Q P R F S A R V L C R F V P Q K A Y G M E A A M L \\ P L A & \text { S }\end{array}$ IV AMTQGRSIPVWDIKVTNAARFFSKFVTRNPWSMQLAI D




 VVGDSEGNYVTVDNIVSDLNAKF
$M \square A \square C Q N R V V Y K D E L H V G F W A K F L S R F A S K N T L K M A Y C D Q$ HTRDLVKD IVARTQGNYVSLQD\ATEDNEKFMGDLFP LLSRNRFSSLL VALLLEGHSVPMDSIMHTGWQARLLARFVRPRPEKMQYVLD

 VVAIT QGRVARPEDFKVCFLAKGLCRFVPQKGYGMQSLMD
11 A LICQNRIVKREDVK IGFWAKFLSKFASHPDTGVGVGET $V$ MA MCT GNVRRMEDMKLGFFAKHMAKFAMHEPYKLQLVDD VALLLTGRTVAVDD $\operatorname{VA}$ VGGWTARVLSKF $\square R P Q P A K M Q Y V M N$ PLAI MQNRYISPQNLEYSLFSKALCYFFHPTSSLMQLLIN $P L A B D Q G R W R D P A S V K P G W V A R R L C Y F F L P T S S L A T A C L Q$ VVGIASGNYVTVDDIAEDDKNKFPNKEV VVARADGNYASTTDIA EDVKAKLGGETMGVVFPILS VVARADGNYASTTDIA EDVKAKLGGETIGVVFPILS VVARAQGNYAT DDDIA T D DQAKFGEEKVVIFPDLSRNRFS
 VIAMCQKRVVTEDEVKPGFWAKVLSRFVHQTPVKMQFAI N $V V A R A Q N N Y A T V E D I A A D V R \quad K K L G G E T I G V V F P I L S$ II GLCQKRVVYKKDMKVGRLARFLSRFASHSPYKMQFAI N


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[^1]

$170 \quad 180 \quad 190 \quad 200$
Q L LAAS DGV

D $G \square V P A R$

AGTVVMDAND TGRNALGRD TAASAAVLEAAF GLDPQRLAQ』LIDNFGNASQQTP乌VIIKNYAQA
$K S L L T V R K A K E L H E F V R D N P$


$\mathrm{G} \quad \mathrm{G} \square \mathrm{P} \square \mathrm{KR}$
LE E $\square M R \square$


A V T R S LP A
ATLSAVL
$K \square L A A T S G L S T A L V E R$
S LR S NPA L G C S D DLR E S $\square$

P A E E LIKFVRDNPS
GASAGGDPKKLAHDLDDNP FGNASQRTPIVIDKNYAA
 VLGHSSD』KLSDEELKGLIRRNPS Q N QLGKCD DFPLT D D Q $\square$ Q D A M K D N P S
$G \mathrm{~V} \mathrm{~V} \mathrm{~L}$
A S S NKK VNK L L K R N L I S N PA


VD L L K
$G N Q L R D W K Q D Q L \quad L A L$

$N \boxtimes E \square L G K A S S \nabla T$ LD D $\square R$ D N P A
$G \square A \square V S G A E V L$ GFAGPGTFPH $\qquad$


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lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
ssm
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GNADEQTPLLLVR

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A LLLA GNAAEQTP VLIR
YGQGHQQTPFVVVKGV
$\square$ NNPFGNASQKTPIVIIKNYGL
RDNPLGQGDRRCPIGLIR

NPL GQGKEMTP $\square \mathrm{C} \| \mathrm{V}$ RGL
CDDT S GS GDKGTPVILVQGY
KDNPAGQGKELTPIILIR
SDLTSGSGDKGTPVVLIQGY
ADNP $\square R$ QR $\square T G T P F A \square 1 R$
GNADERTPLVLIR
GQGKELTPIILIRPLE
CDLTS GSGDKGTPVVFIQGY GQGKELTPIILIR

GNGDEKTP VLIR
RTNPAGNADEQTPLVLIR

VDNPAGQNRQ $\square$ TPFILIR

- AGNSDEKTPIVLIRN

GQSRE $\square$ TPFILIR
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\hline sol25 & B B B \\
\hline sol5 & B \\
\hline sol0 & \\
\hline jhmm & \\
\hline jpssm & \\
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[^0]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0 jhmm
    jpssm

[^1]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    jhmm
    jpssm

