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| $Y$ | G P A P |  |
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| $G$ |  |  |

$\begin{array}{llll}T & N & L & \\ N & N & P & A \\ L & P \\ G & P & A & P\end{array}$

## $\stackrel{p}{p}$

YN ${ }^{\circ}$ a ${ }^{\text {a }}$
E NLGGPA P
Q N M GPS P
$V$ N M GPA P
$\begin{array}{lllll}Y & N \\ Y & N & L & P & A \\ G & P & A & P\end{array}$
$\begin{array}{llll}F & N \\ V & N & G & P \\ G & S & P \\ G & P & A & P\end{array}$
$Y N L G P A P$
$Y N L G P A P$
YNLGPAP

YNMGPSPEPNLTTVLWS EHLL $\left.\right|_{P}$





QUERY
UniRef90_UPI00047BB2CD UniRef90_Q2JPN9 UniRef90_EOUE50 UniRef90_Q9CPG6 UniRef90-F7Z604 UniRef90-UPI0003458898 UniRef90_NOAT28 UniRef90-H9ULQ9 UniRef90-D4KPG9 UniRef90-B4WRR6 UniRef90 K9Y9K4 UniRef90-UPIOOO2893505 UniRef90_A6TQA1 UniRef90-W8AHV8 UniRef90-E015G5 UniRef90_C8WEN9 UniRef90-A0A021VPJ3 UniRef90 F9RZ26 UniRef90-R5QAY2 UniRef90-W4CTE2 UniRef90_B8D1B0 UniRef90_K1LWJ5 UniRef90_A0A017RXQ7 UniRef90-E3H745 UniRef90-UPI0004707A0B UniRef90-B9DKM6 UniRef90-B1YK07 UniRef90_U2RAT2 UniRef90-D5ELH3 UniRef90-W7CQT3 UniRef90-U7D5X6 UniRef90-M5DZ77 UniRef90-V6IU96 UniRef90_UPI00036117D8 UniRef90_H3NER1 UniRef90-Q47E92 UniRef90_Q47E92
UniRef90_UPI00037B56B2 UniRef90-V7I3D1 UniRef90_E7B652 UniRef90-C6WJY3 UniRef90_UPI00036BBA5E UniRef90-V5WHS1 UniRef90-R2PQJ7 UniRef90-C9RPI5 UniRef90-R4LC53
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UniRef90_R5JCZ4 UniRef90- TOPFD1 UniRef90-J8TNB7 UniRef90_U4KSF6 UniRef90-IOXBB9 UniRef90 F8WW32 UniRef90_C0BY64
UniRef90_J0L5E2 UniRef90_K4LT04 UniRef90-D1BGJ1 UniRef90_UPIO003FDBC0E UniRef90-R5LEV5 UniRef90_UPIO004768480 UniRef90_Q0AY44 UniRef90_R7H6J1


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GEYPQFGNNDPRVDDL AVD $\stackrel{580}{\mathrm{~L} V} \mathrm{~V}$ R F MK K $\square$

QKDH T Y R D A $\square \mathrm{P}$

 GEYPQFGNNDNRVDE $\begin{array}{llllllllll}G D Y P K Y & G N D & D R V & D & Q \\ G D Y P K Y G N N D & R & R & D & S\end{array}$ GDYPKYGNNDERVDS | $G E Y P$ | $A$ | $F$ | $G N D$ | $D$ |
| :--- | :--- | :--- | :--- | :--- |
| $G$ | $D$ | $R$ | $V$ | $D$ |
| $G$ | $S$ |  |  |  |
| $G$ | $K$ | $G$ | $D$ | $D$ |

GDYPKFGNNDNRVDS

##  <br> G <br> G

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## G $G$ $G$ $G$

GAFPAFGNNDERADA

GSYPAYGNNDDRADQ
$\begin{array}{llll}G E Y P K Y G N D & D & R & R \\ G & D & T \\ G & P & A & G N N D \\ G & R & D & E\end{array}$
$\begin{array}{lllll}G D F P K F & G N N D P R & V & D & S \\ G D Y P & K & G N N D P & R & D \\ G & E\end{array}$
$\begin{array}{ll}G D Y P K F G N N D P R V & D \\ G D F P R Y G N D D D R A D E\end{array}$

$\begin{array}{lllllll}G & D & P & R & Y & G & D \\ G & D & D & R A & D & D \\ G & Y & G & D & D & D & R \\ V & D & S\end{array}$
ND Y P R Y GNND DRVVD
$G D F P R Y G N D D D R A D E$
GAYPAYGNNDDRVDQQAGELVYFMTQIRRHHTYRDSTPT



GKYVPYGNDNDETDQLAVMVARKFMNYLRRHETYRHAKAT
NE FPLLYGNNDDRVDALAAEVCNEFSNNLRRHPAYRAAEHT
 GDSPRYGNNDDRVVDRMAADLVMRFMEKGRREPLHRGAKPT
 G D F P K F G N N D D D R V D Q $\quad$ A C E Q A E K F Y H A L C Q Y S L Y R Q A R H T












QUERY
UniRef90_UPIIO0047BB2CD UniRef90-Q2JPN9 UniRef90 Q9CPG6 UniRef90-F7Z604 UniRef90-UPIO003458898 UniRef90_NOAT28 UniRef90-H9ULQ9 UniRef90-D4KPG9 UniRef90 B4WRR6 UniRef90-UPIOOO2893505 UniRef90-A6TQA1 UniRef90-W8AHV8 UniRef90-E015G5 UniRef90-C8WEN9 UniRef90-A0A021VPJ3 UniRef90_F9RZ26 UniRef90-R5QAY2 UniRef90-W4CTE2 UniRef90-B8D1B0 UniRef90_K1LWJ5 Uniferovokiwh UniRef90-E3H745
 UniRet90-B9DKM6 UniRef90-B1YK07 UniRef90-C8XCT6 UniRef90-D5ELH3 UniRef90-W7CQT3 UniRef90_U7D5X6 UniRef90-M5DZ77 UniRef90-UPI00036117D8 UniRef90_H3NER1 UniRef90- Q47E92 UniRef90_UPI00037B56B2 UniRe990_V713D1 UniRef90-E7B652 UniRef90-C6WJY3 UniRef90_K9HLM4 UniRef90_UPIOOO36BBA5E UniRef90-V5WHS1
UniRef90 R2PQJ7 UniRef90-C9RPI5 UniRef90_R4LC53 UniRef90-K6WWQ UniRef90-G8LV60
UniRef90-R6NO45 UniRef90-L8ENX6 UniRef90-V8CC19 UniRef90_UPI000361CB36 UniRef90-D4LB44 UniRef90-D5ESF4 4 UniRet90_D6XUK9 UniRef90_JON6Y4 UniRef90-E6U8V7 UniRef90_18R2T7 UniRef90-F4GJK5
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QOF2V3 UniRef90-L1 M8U3 UniRef90-R6Q9K0 UniRef90-UP100037E0E5C UniRef90-R5QA50 UniRef90_UZKQE7 UniRef90-F7NKS6
UniRef90_FORYP8 UniRef90-D4JVN6 UniRef90-E8QXD2 UniRef90-F2JQP5 UniRef90-A0A037ZAM3 UniRef90-S3ZUK5 UniRef90-B5JCZ4 Uniref90-TOPFD UniRef90_U4KSF6 UniRef90_10XBB9 UniRef90 F8WW32 UniRef90-JoL5E2 UniRef90_K4LT04 UniRef90_D1BGJ1 UniRef90-UPIO003FDBC0E UniRef90_R5LEV5 UniRef90_UP10004768480 UniRef90_QOAY44
UniRefol_R7H6JI

## Q

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- SNVVYGKKTGNTPDGRRAGAPFGPGANPMHGRD MSVLTITSNVVYGKKTGATPDGRRAGEPFAPGANPMHGRD
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UniRef90_D5ELH3 UniRef90-W7CQT3 UniRef90-U7D5X6 UniRef90_M5DZ77 UniRef90-UPI00036117D8 UniRef90-H3NER1 UniRef90_Q47E92 UniRef90_UPI00037B56B2 UniRef90_V713D1 UniRef90_E7B652
UniRef90_C6WJY3 UniRef90-K9HLM4 UniRef90_UPI00036BBA5E UniRef90_V5WHS1
UniRef90_R2PQJ7 UniRef90_C9RPI5 UniRef90-R4LC53 UniRef90-K6WWQ2
UniRef90 G8LV60 UniRef90_R6N045 UniRef90-L8ENX6 UniRef90_V8CC19 UniRef90-D5APM6 UniRef90_UPIO00361CB36 UniRef90_D4LB44
UniRef90-D5ESF4 UniRef90-D6XUK9 UniRef90-JON6Y4 UniRef90-C9LUW1 UniRef90-I8R2T7 UniRef90-F4GJK5 UniRef90-Q0F2V3 UniRef90_L1M8U3
UniRef90_R6Q9K0 UniRef90-UPIO0037E0E5C UniRef90_R5QA50 UniRef90_U2KQE7 UniRef90_F7NKS6
UniRef90_FORYP88 UniRef90-D4JVN6 UniRef90-E8QXD2
UniRef90 F2JQP5 UniRef90-R6YQM5 UniRef90-A0A037ZAM3 UniRef90_S3ZUK5 UniRef90-TOPFD1 UniRef90-J8TNB7 UniRef90_U4KSF6 UniRef90-F8WW32 UniRef90_C0BY64 UniRef90-JOL5E2 UniRef90_K4LT04 UniRef90_D1BGJ1
UniRef90_UPI0003FDBC0E UniRef90-R5LEV5 UniRef90_UPIOO04768480 UniRef90_Q0AY44
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QK GAVAS LT S VA K LP F A Y A K 6 | 660 |
| :--- |
| $K D T S ~ Y ~ T ~ F ~ S ~$ |
| $V P P$ |




QKGAVASLTSVAKLPFAYAKDGI

| $S H$ | $G$ | $A$ | $V$ | $A$ | $L$ | $T$ | $S$ | $V$ | $A$ | $K$ | $L$ | $P$ | $Y$ | $K$ | $Y$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

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

 N S G S L A S L N S V A K L P Y D D S Q D Gl


SHGMLA
 $\begin{array}{llllllll}K & K & G & A \\ E & \text { L } & A & S & L & N & S & V \\ A & A & K & L & P & Y & S & D \\ A & A & Q & D & G \\ N\end{array}$ THGALASLLLSVKMPYKEAMDGI
 R K G A I A S L A A S V A A K L




| $T$ | $K$ | $G$ | $A$ | $L$ | $A$ | $A$ | $L$ | $A$ | $S$ | $V$ | $A$ | $K$ | $I$ | $P$ | $Y$ | $E$ | $H$ | $A$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $D$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T | $H$ | $G$ | $M$ | $V$ | $A$ | $S$ | $M$ | $L$ | $S$ | $V$ | $G$ | $K$ | $L$ | $D$ | $Y$ | $D$ | $D$ | $A$ | $L$ |
|  | $D$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |




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 | $S$ | $Y$ | $T$ | $F$ | $S$ | $I$ | $V$ | $P$ | $N$ | $A$ | $L$ | $G$ | $K$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $E$ | $A$ |  |  |  |  |  |  |  |  |  |  |  |
| $S$ | $N$ | $T$ | $F$ | $S$ | $I$ | $V$ | $P$ | $E$ | $A$ | $L$ | $G$ | $H$ | $E$ |$E_{E} \quad$ T


 $\begin{array}{lllllllllllll}S & Y & T & F & S & 1 & P & Q & A & L & G & K & G \\ D & D & D & N \\ S & N & T & F & S & 1 & I & P & D & A & L & G & K \\ S & E & S & E\end{array}$

 \begin{tabular}{lllll|l|llllllll}
$S$ \& $N$ \& $T$ \& $F$ \& $S$ \& $I$ \& $D$ \& $P$ \& $K$ \& $A$ \& $L$ \& $G$ \& $K$ \& $E$

$D_{1} E \quad A$ 

$S$ \& $L$ \& $T$ \& $S$ \& $T$ \& $V$ \& $V$ \& $P$ \& $S$ \& $G$ \& $L$ \& $G$ \& $R$ \& $T$ \& $R$ <br>
\hline \& $D$ \& $E$ <br>
$S$ \& $Y$ \& $T$ \& $F$ \& $S$ \& $I$ \& $V$ \& $P$ \& $N$ \& $A$ \& $L$ \& $G$ \& $K$ \& $N$ \& $E$ <br>
$L$ \& $L$ \& $S$ <br>
$S$ \& $F$ \& $T$ \& $F$ \& $S$ \& $I$ \& $T$ \& $P$ \& $G$ \& $T$ \& $L$ \& $G$ \& $K$ \& $D$ \& $E$ <br>
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\end{tabular}




 | $S$ | $Y$ | $T$ | $F$ | $A$ |  | $T$ | $P$ | $A$ | $T$ | $L$ | $G$ | $K$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |$K_{C} E \quad D$



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

T K G AV A A L A S V A K L P F Q H A H D G I TS SGALAAFASVAKLPYEHSTDG|l K N GLL L A S L N S V A K I P Y E Y Y A L D Gl


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





 K N G LL L A S L N S TAAK L N Y D F A Q D G l

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

 Q K G C CVV A S M K K S $V$ V A K ESGFI A S ALLSVAAKLDPYANADDGI
 M E G A L A S L N S V A K I

 E N G A L A S L L N N S V A K | $R$ | $S$ | $G$ | $A$ | $L$ | $A$ | $S$ | $L$ | $S$ | $S$ | $V$ | $A$ | $K$ | $I$ | $P$ | $Y$ | $H$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $A$ | $A$ | $L$ | $D$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |
| $K$ | $T$ | $G$ | $A$ | $L$ | $K$ | $S$ | $L$ | $L$ | $S$ | $V$ | $A$ | $K$ | $I$ | $P$ | $C$ | $E$ | T K G L I K S L N S V A K L P Y H Y A L D D Gl TRGAVASLSSVAKLPFAHANDGI K N G AL A S L N S V A KLLSYKYCKDGI E S G A L A S L L S V A K L P Y K Y A T D G I TKGALAALASVAKI PYEHALDGI




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UniRef90 UPIO002491FB7 UniRef90_B1IN03 UniRef90 U1WSM5 UniRef90-R6D016 UniRef90_UPIO00255581D UniRef90 U6R2A5 UniRef90_L1QHDO
UniRef90 Sзкзz2

ENWQGFNKGEWTEKVDVRNFIQLNYTPYTGDE NE QFKKAWEGFNDGDWADEI NVVRDF I QQNYTPYEGD D FKKEWDGFNKGKWTDNI DVRDFIKKNYTPYEGDE K K F DP WSDFKEGKWHKNI DVRDFI QKNYTPYEGDE

K P Y E GFKE GVWQEKI DVRDFI DRNYSEYKGDG MFK QWNGFKTGHWTE I I DVRDFI QKNYTEYVYDE EFSRAWEGFNPGEWNEKVNVSDFIKRNYTEYTGDS QMPQEWE FKS GKWNNTIDVQNFI QTNYKPYDGDE G F V G G H W T K E I
F NS GKWQSEI
NAWQGFKQDIWCTEINVQNF FKMYWEGFKNGVWSNEINVVRFINE Q N QE WESFKGRLWKEECNVRDFIQNNFTQYNGDE WDKF LGSKWKKE INVRDFI QSNYTEYTGD D TRPEWDGFRGVNWQQKVVVRDFIVQNYAPYTGGP MLT QWA GFKPGNWDDNI DVQNF A ANY LPYD GNE FK S GVWEVELNVRDFVSQNVTPYDGDS
NEWYNFKENIWKNEINVVENFI ETNYQEYTDDY
K QTENPWE GFNE GRWQHEVNTLDFI KRNYKEYK GDD MT SVMK QE WE GFK Q GR WDT SVVNVRD FI Q N NYTMY D G DE MQEAWR GFTGGGE WT H L I I

FTPGEWNSTINVYDFVVKNISPYQGDA MRE E WT GF NN GA WA K E V MQEAWEGFEGGTWTDEVDVRDFIQRNYTPYEGDE MRPEWKDFVGGKWESEINVRDFIQKNFAPYDGDE

$\qquad$
 MREEWTGFTPGDWEKEI NVRDFIQQKNYTPYEGDE
 AEKTPAMMFKQWEGFNTGKWSDGIDVRDFIQKNYTPYTGDA

S D $\square$ NE K F A E A WK GFSEGE WQNA VNVRDF $\square$ QKNYTPYEGDE DCDVKSF $\square$ NRYTTLYDGDA M T K A WD GF K GTA WQEN $\square$ S V GQF VQDNYTPYDGDE

TEVTENFEQAWDGFKGTNWRDKASVTRFVQENYKPYDGDE DRTATDAWRGFAGTGWRER VDVRDF $\square$ QANFTPYEGDA VS D F WR TVKLN N E YSDAWAGFRGEEWKNADNVRDFDQHNYTPYEGEDE NFKE GRWNHE $\square$ N $\overline{\mathrm{V}}$ T D F $\overline{\mathrm{V}} \mathrm{K}$ T N $\square$ T P Y E G D A Y T Y D S

Y T Y D S

UniRef90＿B1C847
UniRefogo－E3PV55
UniRef90－Bos UniRef90－R1AWY5 UniRef90＿E3HCG6 UniRef90－UP100047DD663 UniRef90－A0A037Z185
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UniRet90－R6D7U8
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UniRef90 A6E815
UniRef90＿R7HGQ1
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UniRef90 F9N5K4 UniRef90－R6GC91 UniRef90－V2ZAA1 UniRef90－X4R8F3 UniRef90－H3NKMO UniRef90＿R5W5L9 UniRef90－R6G2H9 UniRef90－E1ZD18 UniRef90－COB1J2 UniRef90＿V4HWRO UniRef90－R6UQU6 UniRef90－R6TOL9 UniRef90－Q71Y98 UniRef90＿UPIO0025560AA UniRet90＿O01DR9 UniRef90－R5SH12
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SFLAGPTQRTQKA LQKVKTLLA LEREKGGVLSVDAD DPST SF $\square E K S T P R T T K \square N E K \square N K \square V E M D A K G G V L D M D N A \square V S$

SFLAGPTERT傗 VKKDEDTKNHYEEVGFP FDTDRVTS AVPCVEADRAILVTESFKETEDQP\｜ITRKAKALEK RFLNTAPAVCAERAVLITESYKETEGQP MSIRRAKALEK SFLTGPTDRTRAVWETVSALFP EERSRGVLDVDTATPST

ПTESYKETEA的PMLRRAKALEK LLLVKPEMCTERA R TVTESYKQSEGEPMVTRRAKSI AD LYGPTDRVSQADDRFVKTAPADCAERAVLNRRAKALEN TYDTKKSSRTTRLVDNTFKKMPETESDRARLVRRAKAFSH LLNAKPMVCVERA KLTTDSYSEHADKPMVLRRALCLEN AFLAQATPATTALWQKVMVGIDRENATHAPVDFDTNIATT AVLDKKPYMDAERAILVTETYKEHQDKPANLKRAYML QN SVLTKKPYUDAERALLATEAYKEHQNQPSTVKRALML

RMHQYREEVLNKKPYDCAERA LDATRAYMLQN SFLSGPTERTKAVWNKCLEALAEERANNGVRSLDPSTVST SDIGPKSERTTKLVEDLYAKMPETESARAVLIRRAKAFAH TERMNKYREDVLNKKPY DAERAVLATRAYMLKE TD $\square$ PK

 TPRMNE FREK VTOSYOUCAQALVAKAYLK VTQSYQQHCDEPAVLKRAYMLEEN YYakMPETESYRAKLDTESYKETEDQPI DTRAKAFSH AKPSVSIHRA MAFTQVTKENEGDPKIL DRAKCFRR पQTKPR】S $\square K R A L A F T E S H K N T E G Q S M I L Q R A E A F K H$ VTESYOKHOAKPNVLKRAYMLQN EADEKTSVERAKLTESKATEGEPMVTRRAEAFAH VLDEKPYUDAQRAVLAATVVYREENQNQPRVMVRAFMLQK RALAFQY EVLDEKPFVDAERAVLCTESYRQTTNQPPVLRRALSFAH ESLKAVPRTSMERTRTVTDVYKKYEGQVSQVDVLRALVLLE LDEKPFVDAERAVLCTESYKQSTNQPPVLIRRALSFAH MTDAYKMYEGSVSVPEMRALAFKY
 SFLAGATDATTKLWDSVMEGVKQENRTHAPVDFDTSVAST


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UniRef90
B0S3H3 UniRef90-R1AWY5 UniRef90_E3HCG6 UniRef90-UPIO0047DD663 UniRef90-A0A037Z185 UniRef90-R5MJE9 UniRef90-SOFHQ8 UniRef90-R7KUL9 UniRef90-R6AB31 UniRef90_UPIOO03750034 UniRef90-W8T837 UniRef90-R5JY58 UniRef90-H3NLJ9 UniRef90-K8DZK6 UniRef90-FOSUW1 UniRef90-J5VUJ2 UniRef90-R6H243
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UniRef90 F9N5K4 UniRef90-F9N5K4
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UniRef90-L1QHDO
UniRef90_S3K3Z2
$\square$ TSHAPGY LS KEEDVIVGLQAEEPLKRTCKPHGGFGVVKK MEK VASHKAGYVDQENEVIVGLQTDKPFKDAFMPNGGDRTAEQ

TDK DPAGY DDKE DE LIYGMQNSEDFRDNFMPRGGDRVAEK 1 LNE EDPTI RDSELIVGSLTKNPRSAQVFPEFSNKWLVK L L GMSIFI QDDELIVGNQCSMPRSAPIFPEFSCKWVED ILAGMPTFT QDGELIVGNQASKPRSAPTFPEFSCKWVEA $V L R K M T I F I Q K D Q Q V G G N Q A S K D R S A P L F P E T E A G Y L E K$


ELLKEYGAELLPKETDDMFNY ПTTHNDGIVKKAYSPD\|KKAR SLEAYGFEMNKELESSFNAFRKTHNQGVFDAYTDEMKAAR
 AVEAYGYELDQKDEDYFAYKTTHNDGVFRVYNEAMKTAR AAEAYGYHVDEETDHTYTKVRKTHNQGVFDAYTPEDRRAR


A

A

A SLLT SYYGYYK P N E N F H K K I $\underset{\text { G }}{\text { S }}$ ACQAYGYNDDPQLEDFF
ACRAYDMTLNPGLD AVHENGDEVDPRVTDDF ELDIYGYDMHTKIEEFKKYRKTHNDGVDVYIDERSFR ALESNGYEVDDEMSEDFNKWRKTHNQGVFDAYTDEMRLAR A CHEYGYEVDEEVARIFTDYRKTHNQGVFDAYTDEMKLAR


 EL NSYGYKLDESI DKYFNEFRKTHNDGVFDAYTDEMKLAR
 ACSDNGYEV DPEVSEFFSTHRKTHNAGCFDAYNQEMRACR

 ACESNGYEVDPRIVEFYSKYRKTHNDGVFDAYTAEMRACR A I H EA G LIEVNPEVKE $\square F T R Y R K T H N Q G V F D V Y T P R D R A A R$ AL Q S Y G Y E L D P EVVEKFF S $\quad$ H R K T H N Q GVV DVVY D K D I K A A R ALKEYGYEIDPNVRTDFKKYCKTHNQAVFDAYTPEMRRCR


M F D CY T P EMR LA R ALES YGYEPG EKLKVF A DEVT THNDLT F S I TYT DKMKQAR



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UniRef90 R1AWY5 UniRef90 E3HCG6 UniRef90-UPI00047DD663 UniRef90-A0A037Z185 UniRef90-R5MJE9 UniRef90_SOFHQ8 UniRef90-R7KUL9 UniRef90-R6AB31 UniRef90_UPIOOO3750034 UniRef90-W8T837 UniRef90-R5JY58 UniRef90 H3NLJ9 UniRef90-K8DZK6 UniRef90-FOSUW1 UniRef90_J5VUJ2 UniRef90-R6H243
UniRef90
R2NUX UniRef90-A9KP13 UniRef90-R6D7U8 UniRef90-E1L1Z9 UniRef90-C2CHV5 UniRef90-A6E815 UniRef90_R7HGQ1 UniRef90-R5L9H9 UniRee90-UPI00034D806F UniRef90-R9JIM4 UniRef90-R7G181 UniRef90-F9N5K4 UniRef90-R6GC91 UniRef90-V2ZAA1 UniRef90-X4R8F3 UniRef90-H3NKMO UniRef90-R5W5L9 UniRef90-R6G2H9
UniRet90 E1ZD18 UniRef90-E1ZD18
UniRef90
COB1J2 UniRef90-V4HWRO UniRef90-R6UQU6 UniRef90-B8CF70 UniRef90-Q71Y98 UniRef90-UPIO0025560AA UniRet90_O01DR9 UniRef90-R5SH12 UniRef90-O32797 UniRef90-C6BVU8 UniRet90_D6XC58 UniRef90-S2S8E88 UniRef90-R4K6E2 UniRef90-UPIO0047844E2 UniRef90-B2TMN7 UniRef90-R6F538 UniRef90_UPIO0041C4451 UniRef90-M1N4W4 UniRef90-UPI0003C7C408 UniRef90_F5ZJE4 UniRef90-R2RMJ3 UniRef90-E7GE78 UniRef90-F3LKQ3 UniRef90_SINIG4
UniRef90_R5VEF8 UniRef90-F7JP01 UniRef90_B2ISH7 UniRef90-R5OZR1
UniRet90 FOZOD1 UniRef90-FOZOD1 UniRef90-UPIo0046523DE UniRef90_E2SL65 UniRef90-U2ASW6 UniRef90-8518RO UniRef90-F6DKL9 UniRef90-UPIO002194DF3 UniRef90-A5ZM80 UniRef90-F2LTL4 UniRef90-R6MNXO UniRef90-G7V7P2 UniRef90-G5F2V7 UniRef90-UPI0002491FB7 UniRef90-B1INO3 UniRef90 U1WSM5 UniRef90-R6D016 UniRef90_UPIO00255581D UniRef90-U6R2A5 UniRef90 L1OHDO
niref90_S3к3z2

## MDPTVKKFFEDWVTTHNDAVFDLYTDEMRRAR

$\square L T E H G \square S V D P G L H D V L S Q T M T S V N D G \square F R A Y T S A \square R K A R$ EFDRIGKRI SDQLDETFKYWEKTVSELAASYMPKETVAAM ELDRISEDVKAKLREAFTYWDKTVNEIASQLMPAESLEAH GLEAYGYEPDPFVTRVFGTYRKTHNDGVFDAYTPEMRAAR

ELDRDSENTKAKLRQAFAYWDKTTNEFAAAMMPPQALEAH



E LDTFEKRDKE QLRS I A P F WQNNNRARAGAMLPEEVQVYM

 E LDDLL E K R D K E Q L L R S


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E


RAHLLLGLPDAYGRGRLIGDYRRVALFGVDTLIEGKRRDK
HAHTVTGDPDAYSRGRDIGVYAR LADYGADY LMKEKAKE W NSNVFTVGNYFFNGGHYAVDYGKVLEKGFSGI IAEVEETM

NDVVYTVGNYFYNGGHTSVDYAKATGQGLSGVIANARQAL NQIVSVGIHLAGSTGHIIADYEKVLNKGFKGLKQEVIEKLC NTKVFTVNYHFNGLGHISVDYPKVLEKGFLGGIKETENAI

NNNTFTPGNYYYNGGHVTVKYEKVLETGYEGLIREVEEED DLGGTKEGNDTSGDAHIAVNYEKVLKLGLINFKERTEKKM $K$ S GVLT GLDPDGYGRGRII GDYRRVALYGI GYLVRERELQF ETGFFGEGKMNSGDAHLAVNYQKVLEFGLKDFEARAHAAK ETGFFGEGKLNSGDAHLAVDYGQMLKVGLKGYKERTLKEK

ESGFFGEGKMNSGDAHLAVNYEK LKYGDRDFEARTKQAK SLGFLTGLPDNYARGRI IGDYRRLALYGLDRLIEAKQNDL ETGFFGEGKMNSGDAHLAVNYQKLLQFGLRGFEERARKAK ETGFFGEGKLDSGDAHLAVDYEQLLKTGLVGYEKRVRQLK EHNDFTPGNYFYNGGHVTVKYGEVLDUGFSGIKAKAEAEM ETGFFGEGKLNSGDAHLAVDYQQVLKTGDDGLDLCVVEND ETGFFGEGKLNSGDAHLAVDYEALLRLGLKGRERAVRLK EHNFGTPGNYFYNGGHVTVQYDKVLEVGLKGGIREAAAEL FSGEAFVSDLSYHGGDTCPGYDDLVKKGDNGGKREAMEKL TGUVDNDSKWRNAVGETTPDYQDVFKKGFAGLKEQAAEAL ETGFFGEGKMNSGDAHLAVNYQKLLTEGLRGFEEKTKQAK EHNIFGTGKYFYNGGHVTVKYGEVLAGGYKGFEDKAKAEK
 EHGUFTEFMEQRAPGHTVLDDK円YRKGFLDFQREDAESL ETGVEGEGKLNAGDAHLALNHARLLREGLRGYEERTRAAM

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UniRef90 R7M150 UniRef90_UPIOOO3750034 UniRef90-W8T837 UniRef90-R5JY58 UniRef90-H3NLJ9
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UniRef90
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UniRef90 $\times 4$ R8F3 UniRef90-X4R8F3
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DEVVIS S

210
220
230
240
MLE ENIRVAEEI SHEID ALKEIK KMAEKY


| D | S | V | S | P |
| :--- | :--- | :--- | :--- | :--- |
| A | R | L | S |  |
| K | K | L | P | F | A GIH LMMTEEN

D KV

| E M T | E | G |
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| $P$ | $M$ |  |

TTSLLKR
$N \mathrm{~V} G \mathrm{~S}$

T T S L
I S
L K K
I S L E K E E L T
$L \mathrm{~L} T \mathrm{H}$
$\mathrm{K} D \mathrm{D}$ MTSDN

| K | D | L |
| :--- | :--- | :--- |
| Q | $\mathrm{K} \square \mathrm{V}$ | $\square \mathrm{E} \square \mathrm{D}$ |
| S | S |  |


| E |
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| Q |
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EMMRLREEVSEQUKA

E NLS H D
A ATPT
A ATPST GE MTTE H T

$\begin{array}{lllllll}\text { M } & S & D & D & V & R \\ \text { E } & R & P & E & V & V & R \\ M & T & E & A & V & R\end{array}$ $\begin{array}{lllll}M & T & E & A & V \\ M & D & D & D \\ V & 1\end{array}$ | $Q$ | $L$ | $R$ | $E$ | $D$ | $I$ | $S$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $Q$ |  |  |  |  |  |  |
| $R$ | $R$ | $E$ | $E$ | $F$ | $S$ | $E$ | $Q$ |
| $R$ | $K$ | $R$ | $E$ | $E$ | $V$ | $K$ | $E$ |



A
G R V M T D D V
C GEMTP
M
$E L D K S$
$D T M G B$ $\qquad$ M M P D
H W $\square$ R F E H W
D S T

RANEPFSSQWAR D Y T E ER
A QFEDEMNVYTIKKR
$D G L Q G D E E I A E Q D K S L N A L K E M A Q G Y$
 TS L Q ERMEK GED LEMTI QL REEI A EQHAALQQLQEMAAKY

A A VT G S
$\begin{array}{llll}\mathrm{K} & \mathrm{N} & \mathrm{L} \\ \mathrm{K} & \mathrm{K} & \mathrm{l}\end{array} \mathrm{l}^{\mathrm{T}}$

$\mathrm{NR} \square$
GVDSEDELKLRFEVSEQDRSLERLKA
MA
D A $\square T E$ E $\square$ NE E N S Q K SLE DMKAMAK MY
 E H S E K T D P E Y I K K E R Y S K L A K E L A D Q

 EALDYA DAERHFLEAVIDANQAVVDGAGRFAEDQEDARDC



EKCNVVSDMDYESSLK AVIEYANRYANMARCMAELLKDASNC
 A DLQ GRDERGEDLEATI RLREELAEHKRADLDQIQQMAANY


Q A L D LT K P E N $\square$ H K Y H F Y R L A K E L A S Q T K R K N E L L E $\square$ S R $\square C$ RHLT
 AKLSLAD GDYQF LEAVMISCDAAVTYARRYAELLVIA QNC VALDLTDPASID KYHFYALAKS LAENAKRKKELLEBADDC

Exticictut
AGCSVGDGDYAF LD
DHCNV GD GDYAYANRYAK LAALE M
SQLS MENP EDIDCEGVVAYAKRDAEKCQRKAELLVIASNC SQLA




 GALDLT DPESVD DPAVRRWARRYAT DARELAERERMA A D


 K A MS I A CDA IMMY A A MAREMAE KE T D PVVKEELLDQ A HNC N S L D L T D Y K I A FA A R Y A D L A A T M A E T E K R R K E L L E I A R I L


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R2NUX UniRef90－A9KP13 UniRef90－R6D7U8 UniRef90
UniRef90
O1L1Z9 UniRefe90－C2CHV5 UniRef90－AGE815
UniRet90 R7HGQ1 UniRet90＿R5L9H9 UniRef90－UPI00034D806F UniRef90－R9JIM4 UniRef90－R7GI81
UniRef90 F9N5K4 UniRef90－R6GC91 UniRef90－V2ZAA1 UniRef90－X4R8F3 UniRef90－H3NKMO UniRef90－R5W5L9 UniRef90－R6G2H9
UniRet90 E1ZD18 UniRef90－E1ZD18
UniRef90－COB1J2 UniRef90－V4HWRO UniRef90－R6UQU6 UniRef90－B8CF70 UniRef90－R6TOL9
UniRef90 Q71Y98 UniRef90＿UPIO0025560AA UniRef90－Q01DR9 UniRet90－R5SH12 UniRef90－O32797 UniRef90－C6BVU8 UniRef90－D6XC58 UniRef90－S2S8E88 UniRef90－R4K6E2 UniRef90－UPIO0047844E2 UniRef90－B2TMN7 UniRef90－R6F538 UniRef90－UPIO0041C4451 UniRef90－M1N4W4 UniRef90－UPI0003C7C408 UniRef90＿F5ZJE4 UniRef90－R2RMJ3 UniRef90－E7GE78 UniRef90＿F3LKQ3 UniRef90＿SINIG4
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250
260
270
280
GYDI SKPAKDFKEAVVQWTYFAY｜L｜AG｜IKEENGAAMS\｜IGR\｜S GYDiskPaKNAQEAVQFLYFGYLAAIKENNGAAMSLGRNT


## G $G$ $G$

$\begin{array}{r}0 \\ 0 \\ 0 \\ 0 \\ \hline\end{array}$
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GYD

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## G

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$G F$
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## R

RKVPA
GCDVSRRPATNAAEAVVQWLYFVGYLAAVKEQNGAAMSSDGRTD
 RKVA QPAETFHEAI QAFWFVHLVIQQESNGHSISPMRFD


 ER V P A K G A K S F Y E A C Q S F WF 1 QMLLQQIE S S G H S I S P GR F D
 GF DIS R P A M N A Q E A V Q WL Y F A Y L A AVVK Q N G G A M S L G R T A



AKVPYEKAETFYEA DQSVWF $\square Q L L L Q \square E S N G H S \square S Y G R F D$ G LEELGRPAHNAQEAVQWWVYMAYLAAVKEQDGAAMS LGNVS A NVPEK GANGFYEACQSFWFVQQLLQIESSGHSSISPGRFD S RVPPYEPATTEAEADQSVWFI QCILQQIESNGHSLSYGRFD S K V P Y E P A S S F K E A I Q SVVWFI QLIL QI E S N GH S L S Y GRF D



 RKVP Q H P P ETFHEAI QTVWFTQLGSILSENSLALNLGRFD
 NKVPAHKPDTFHEALQYYWFVHLGVITELNGWAFSPGKLD A KVVPYEPATSFYEAVQSVWFIQLILQDESNGHSLSYGRFD RWVPRYAPRDFWEALQMYWFMHLGTI TELNGWAMNPGHLD T HV P A Q A P R D F WE A L Q S Y WF V H L GVI T EL NWDAF NP GRLD ERVVPYEPARSFREAVQEVWFSQVLLQIESNGHSLSYGRFD


 V K V P A GCDIS GPATNAQEAI QWTYFGYL AAVKS

| $A R$ | $P A$ |  |
| :--- | :--- | :--- |
| $K$ | $V$ | $P$ |
| $P A$ |  |  | $K V \vee P A H K P E T Y W Q A D Q M Y W F V H L G V T T$




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480


ILLMALNGGKDEVSGK QTGPEMESFQSKPLNYEDVMKRDK ALLYALNGGRDEISGDQVFYRTKKLKADLLNFDEVMARFD SLLYA NGGUDEVSLITVVPNDERITDDVLDYNKVKANYD


K T L REDT RMSVVVENADDLGLERECPDDLCSALTDDC\|GR KTVRELTRMSVIVENAIDLGLEREVPDILCSALTEDCIGR KAIKELTRVSVIVENAVDLAGEREIPDILCSALTQDCI GR PTMEWLSGVYMKSLNAIHFMHDKYAYERIEMALHDRDILR
 IQMDYA DKLLVNADNAIDMAHAERCPDPFLSSMVDDCMKR KTLRYLTRMSVIVENSIDLSLEREVPDILCSALTDDCDGR





 K QLKYFIDIKI EGNLII ERLYAKHMPAPFLSILIDDCIKK







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$T F A T G \square S G \square S H A V D \square S A \square K Y G H V K A \square R D E N G A A D D F D A D$ $G Q G V G V V A N A G B C D L D A$ Y N Y T GPGNVANSMAA $\begin{array}{lllllllll}G M & S & V & V & A & N & A & G & D \\ G & S & L & A & A \\ G & I & G & A & N & V & G & D & S \\ F & M & A\end{array}$ $\begin{array}{ccc:cc:c}G & K & S & G & G & A \\ T & R & A & T & G & V \\ A & D & S & F & M & A \\ S & I & V & A & D & S\end{array}$


GK QVGワANLADSWAVLKKLVFEEHKLTPQELWHALRQMLI




GQGFGVVAMADSLYAVKQLVFDEKKVTMKELKQALMALAS GKHVGIANLSDSLAAIKKLVFEEERISSSQLWHALETDY G K Q Q


 G K F S G L L G T Y A A D S M M A A V




 GK QV G I A $N$ N L A D S


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 NRAPKYGNDDDYADAVAKEAARDYCEEVNRYTNPRGGRFQ NKAPKWGNDEDYVDSLGKEVANIVCEEVSKHKNTRGGVYR




ND APKYGNDD DYVD QLVVDAYDTYDDEDAKYPNTRYGRRY $N D V P K Y G N D D E S V D Q L I$ TEA Y D S Y I D E I A K Y P N T R Y G I R Y



DTVSVMRSSGETVGEDAAVLVDAFARKVAYYRNPRGGMFQ HDAPKYGNDDDYADKLVTAAYDIYVDEIAKYPNTRYG\RY NEAPKYGNDD D Y V D QLVVEA Y D S Y I N E I K K Y P S T R Y G I R Y MT A E $\square$ A GS M EREVVAA L LKTVVVDAFAR DVA YTYTPR G GI F Q NDAPKYGNDDDYVDQLVVEVYNSYDDEMKKYPNTRYGIRY E D A P K Y G N D DD E V D E L V V N A Y A S Y I D E M K K Y P N T R Y G I R Y

 MECPKYGNDD DYVDA A LDEVTDFYHREVRSYGDYF GVPF N NEAPKY GNDDDYADKLVTAA Y DVY DE EI A KYPNTRYGDRY $K Q D Q K F T E D H D M D D E F A R D V A Y T Y T R P L Q K Y H N P R G G Q F H$ NKTHKY GN DDDYADSSDMKEVVFEEFFKNDIDGRPTYK GGQFR
 NKTPKYGNDDDFADEIMT TIFD IVYQEVNGRSNTK GGVYR




$L I S K G E A \square D K E \square V I D A K S D V D E F A R D V A Y \square Y T P R G G Q Y Q$ S SPPK Y GND D D Y A D S|I MK A|V F E F Y Q GA|VT GRPNMK GGTYR



#### Abstract

QSILTITSNVVYGQKTGNTPDGRRAGTPFAPGANPMHGRD TSILTHTNVVYGKATGADPDGRKAGEPDSPGANPSYGAE VSVLTI TSNIVYGKSTGSTPDGRLMGEPFGPGANPMHNRD LSILTITSNVMYGKKTGATPDGREHGKAFAPGANPMHGRD $V$ VVLTITSNVAYSKQCGNSPNGKKEPEFFSPGANPSNKA QSILTITSNVVYGKKTGDTPCGREGGKPFGPGANPMHGRD   PGLYPASANVPLGSVMATPDGRKAWSPLADGVSPGSGYD


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

S GTSSTSANVGQGKGTLATPDGRHAGTPLAEGCSPEHSMD SGTSSIISANVGQGRATMATPDGRNAWVPLAEGCSPSHNMD
 SGTSSUSANVGQGKGTMATPDGRKAWSPGAEGCSPSHNMD

A GLLYPVSANVP LGA QTGATPDGRLAHTPVADGVSPSAGKD SGTSSISANVGQGRGTLATPDGRNAGTPLAEGCSPSHNMD A GTSSISANVGQGYGTMATPDGRKAHTPLAEGCSPAHAMD










 $\mathrm{V} N \mathrm{MLLP} \mathrm{T}$ T C H|VYFGDVMLASPNGR|L|AHKP|VEG|ISPEKGAD


RKGAVASLTSVAKLPFTYAKDGTSYTFSVVPALGKEDAV QNGLLASLNSVTKLPYEYALDDGISNTQTISPDALGHNEDE TNGALASLSSVAKLPYASCMDGISNTFGLTPTALGSLSCD KGGFLDNASLSKLPFHYANDGUSNTDQGAPKMFGKTTEE VKGAVASLASVAKLPFAYAKDGI SYT FSGVPAALGKDEDQ
 THGPTAAANSVAKLDHFDAASGTLFNQKFTPTSLAGDNGL

## SCGPTASVLSVALDHELASNGLLNQKFHPSALEGEKGL


KKGPTSVLKSVSKLRTDE\|VGGVLLNQKVNPQTLAKEEDK KNGPTAVLKSVSKLSTEDILGGVLLNQKVNPQTLAK EE KSGPTAVFKSVSKLPTHEIVGGVLLNQKVTPQMLST DE


$\square$ NGPTAAANSVAK DDHGDASNGT DFNQKFHPSVLNGVTGL THGPSAVIKSAAKMDH LINTGGT|LLNQKFTPSVV|AGEDG|L|

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| UniRef90-E3PV55 | RITNNLGGMDGYFA |
| UniRef90-B0S3H3 | RITNLTNIMNGYFN |
| UniRef90-R1AWY5 | RVNNLVSILDGYFS |
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| UniRef90-W8T837 | Rilantvsil ${ }^{\text {digy }}$ |
| UniRef90-R5JY58 | RAEKLVSAMDGYFD |
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| iRef90-K8DZK6 | RVANLIN |
| UniRet90_FOSUW1 | RKKILADLLDGYFL |
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| UniRef90-R6H243 UniRef90-R2NUX7 | QIMSNLVTLULDGGMML |
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| UniRef90_R7Gl81 |  |
| UniRet90_F9N5K4 |  |
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700
 QKAFHLNVNVLDRNLLDDAME QDAFHLNVNVMDRELLEDAME QGAHHLNVNVLNRETLVDAMD QNAHHLNVNVLDKEKLEDAMD QKAYHLNVNVVFNRELLLQQAYE
 NGGHHININVLDRSTLEAAMN
KGAHHLNVNVLNREMDEDAME $\square K G H H \square N V N F D R A \square L E A M K$ QGAHHLNVNVMDRDMLMDAMA QGAHHLNVNVFGKDKLLDAME

QQAHHLNVNVLDRETLLRAME SGGHHVNINILNRSDLLEAME K GAHHLNVNVLNREMLEDAMV NKGHHININVLNRETLIDAMN K GGYHLNVNVFGRELLEEMDK
QVENLVNVLDGYME MFGDSDMC
R D NLVNIMDGYF G
 $\stackrel{\text { F }}{\text { F }}$

M
$Q \prod T N V G W M D A G M$


K GAHHLNVNVLNRETLIDAMN
QDAFHLNVNVLQREKLLDAYH QGAHHLNVNVLNRETLMDAYE K GGHHLNVNVLNKETLIDAMN

GNGHGLYHAN $\square$ NVLRKEQLEDAVE
FANNGGHHLNVNVHTKEELLDVLD QGAHHLNVNVLRRETLIDAME KGGHHININVLQKETLIDAME
$R K T N L V G L L D G Y F H H E A Q V E G G Q H \square N V N V M N R E M L D D A B$ RADNLVHVLDGYFD QGAHHLNVNVFGDEKLHDAME RGKNLVSLLDGYFG KNGHHLNINVLNRKLLEDAHI R $\square E N L E T M L D G Y F S \quad K G A H H L N V N V L N R E M L E D A M E$
 QVLNLI AMLDGYFD

 ENLKAVTEAYFQQ NGGFHVQYNVISRDTLLDAQA

RKDTLVHMVDGYME NNLKAVTE TALK N N L K S YFD ENLKAVTE

KNLGSLIRSYFD

 \GGWHI QFNVVDAATLRKAQG TYFQNGGFHVQYNVI SRQTLEEAQE $R K G M H I Q F N V I D K K V L V E A Q K$ FTPTGGQHI NVNVFDRDLLLDAME


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L K L M A L L
$$ UiRef90-V4HWR UniRef90-R6UQU6 UniRef90_B8CF70 UniRef90_R6T0L9

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EAF VSF $\square$ RGYFD QKGSHTQFNVVSKEMLLDAQK NHL ADFVASYFTMDGHHIQFNVIDRAVLYEAQK


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UniRef90_UPI00047844E2
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UniRef90 R6F538 UniRef90_UPI00041C4451 UniRef90-M1N4W4 UniRef90_UPI0003C7C408 UniRef90_F5ZJE4 UniRef90_R2RMJ3 UniRef90_E7GE78 UniRef90_F3LKQ3 UniRef90_S1NI64
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H P E E Y P T LTTVRVSGYCVYFAD LTKEQQDDVIARTFFEEM QPEAYKNLVVRVAGYSAFFTALDKSLQDDIIARTEQ D P E K Y K GI I V R V A GY S A F F V E L D K A V Q D D I I D R A E Y A N F




HPEQYKH LVVRVAGYSALFTTDSKSLQDD\|IRRTEQ HPEKHRDLIVRVAGYSAFFNVLSKATQDDIIGRTEH


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$T N R \square Q R \square K D A$

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UniRef90_K6W9B3
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 S F T A
 $\qquad$ SVETEVKVSSERARDILETKAYKEHAGKSKYVVRAYAVKE K S EllP K GKSIPVQRALAAFKY KMLSEKRYAS DEQALI ITETYKQNEDKPVI IDKALALLKNS
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KPP $\square C V E R A E H Y T E S Y \quad Q E H \square A K P V V L R R A Y A L A N$ MLSQPRYVSTEQALI DTRTYKEHEGESAQMKRAYAAYEH L R GMNDRIKK LRRKQSEETTPHDFMERAMLMTDAYKMKE SFVTKPS $\mathrm{V}^{\mathrm{T}} \mathrm{S}$ ERALL VTDFYRENEGRYSTPVLRAMNFKN

TQPTVCTERA DATTRAYKEHEMDQVVVKRAHMLDDE TFEAEPSLS $\square E R A L I E$ TRFYKENYGKYPIPILRAMNFYE T G LT PRDERLRAAYLKVK P QVAKENGKVETPLLRALTFQH LLLAKPYVCAERAVLTTVEYR MHADKPVVLKRAYMLRN


 S I NAEPH SMERA ILMTEAYKKYE GSVETPVLRALSFKH
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-

## 

EFETMPFNVHPEEDQETFP | $E$ | $F$ |
| :--- | :--- |
| $E$ | $T$ |
| $E$ | $E$ |
| $E$ | $E$ |




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220

## 230

E|L L A|l|AENC

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 EAMK IS C C E A I I R F Q R Y A Q Y A R E LLA E K E K R KA E L L TA A A A N C E G M K L A C D A I M|I LE R Y A A Y A R E L A E D E T R K K E L L Q


 K NAGGENS DQEFMLRYHKLMDEKANKETEKASMLKVAENC




 E TCASDKQDFYMMRYHDLLLKEAAKTS QHASTMKKVVAE I C
 K A MDI A CD GAII FARRHAEEAERMADPKRREELLKKIA QVC

 EAMALCCDA IVTYKRYA QYAKDMAQNLADKADLLEIAAANC

 QREQF LDHAVADTLEAVSDHDGRYAT QEPRRSEDETIALLNC
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 E KL D YEN P D DI E T E GVMMIYARRMSEDPKRKA ELGQKI S E I N


 R A M DI C C D A I I L K R Y H D LIA L E KA A E E K R K A E L E Q $\square A A C C$ KAMDI A A DALLI YA QRYAEKL E QLLA QEERKAELLHMAS DC K A MDI S CDAVI, LLERYHK LALEMMEDEARKAELLQDAANL QAHCRDAPDNVFYQRYARLA EALAQQCQRREELLAMA GI S E K VDD $\square$ S E N D G F K K K R Y S E E L A K K L





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 R N L S V S P P K S F H E AVVQS L WF L F V VLQ M E S NA S S F S PGR V D



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 GITTLK E S S TY T D F A N I A T G G I T P D GE D G V N D DV



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420

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 N D K A $I V V$ H H K D A L D Y A $\triangle$ V G C $V$ V























## UniRef90_R9MJT9

 UniRef90_D4LJT1UniRef90_K6W9B3 UniRef90_A6TKU3 UniRef90_U2JZ67 UniRef90_G9Y7W5
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UniRef90_U2BHB9
UniRef90-A5N1L4


530

GQGFGVANMADSLYA $\begin{array}{lll}G Q G F G & A & N M A D D \\ G R Q V G l & A & N \\ G & L & G A \\ L & A \\ A & A\end{array}$ | $G$ | $R$ | $Q$ | $G$ | $A$ | $A$ | $L$ | $G$ | $D$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $T$ | $L$ | $A$ | $A$ |  |  |  |  |  |  |
| $T$ | $Y$ | $Q$ | $G$ | $V$ | $G$ | $I$ | $A$ | $S$ | $I$ |

 | $G$ | $K$ | $Q V$ | $G$ | $A$ | $N$ | $L$ | $G$ | $N$ | $S$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $A$ | $A$ |  |  |  |  |  |  |  |  |
| $G$ | $D$ | $Y$ | $G$ | $L$ | $G$ | $S$ | $L$ | $T$ | $D$ | $L$ |


 GLGTVTDSLSAIKKHVFDDKIVTMELLLKALADNFK
 G Q M I Q V A

 | $G$ | $N$ | $Y$ | $I$ | $Q$ | $G V$ | $G$ | $T$ | $G$ | $T$ | $I$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |




$G N Y \backsim Q G V G U G T L T \quad D C$


GMMMI QVANLAADSLA A
GK QV GI A NL GNS L A A $P Q A F G V A D S G D S V Y A$


G N AVVGl:A
GK WS G L A T YT D S M A A A


$$
\mathrm{K} \text { K }
$$


GK D Y G I GT I S D ALLS S I

G Q GI GIA A L S D SLLH A L K G MVVF E Q Q R L G F D D L GQR I R A R L I
 GK D I Gla N L S D S L Y A


O
$G K Q V G I A N L A G N S L A A$ $G$ L Q V GL L N A A N S F A A AKWSGLATY S DS MAAA

560

$$
\left\lvert\, \begin{aligned}
& \mathrm{K} \\
& \mathrm{~K} \\
& \mathrm{~K} \\
& \mathrm{~L}
\end{aligned}\right.
$$

ค日

R K L V WE EKKY T LE Q $G Q M I Q V A N L A D S L A$
$G R D C N G V G L P D V V$
    $G Q G V G V A N V G D S L M A$

 $G R Y M Q G V G I S D V T D A$




K K CVVYEDK S I S P K E L WD AL T N DF Q




K Q MV Y DEKR DEPQA L E H A L Q T N F E

TQYVQLVGLGTVTLIKFNVFDNQKFTMKELI DAMNDDFK
 G N Y I Q CT GLAATVTDSLSVLVKHVVFEDKTFAMETILDAVAK CLDMGYGTVVDSLAAVKKLVFEDKRITMTELIDALGCNFE

K K L V Y E D K K IT L L N QL N S A L N N N WE








LA AVKYNVVFDHSSRFTMKKELMDAALINN
A A


## UniRef90_R9MJT9

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UniRef90_G5GJG7 UniRef90-X0PS46 UniRef90_G4KZA5 UniRef90_K8EEC7
UniRef90_X2GYA3 UniRef90_UPI000371B3B2 UniRef90_UPI0003B40B23 UniRef90-R6VXQ2 UniRef90-D1B6M6 UniRef90_Q74BE0 UniRef90_F4GJ42 UniRef90-R6XDK2 UniRef90_I9MFW2 UniRef90_F6DK28 UniRef90_E7GH06 UniRef90-R6UNY2 UniRef90-F4DG30 UniRef90_R6G2Q3
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9DA0

A G G L

 T QAPKYGNDSDYVD DLIVSAYSSY IDE E I EKYPNTRYGLRY


 GYTPKYGGNDDDAAD QLMVDAFNAFYHSSVNGRRNMRGGTYR GHTPRYYGNDDD DYA D D M M K E V F E Y Y R S QV T GR P N M L G G M Y R


 NRAPKYGNDDEWVDEDGAKWARYFNKKLKNYTNYR GGPY H
 NKAPKYGND D DYAD D M MRSVFDLYRNNVT GRPNMKGGTYR

 HRVVPKYGNDDV WVD E L G A K WA Q F F R D T L R N Y T N Y R G Gll Y H






 YPAPACGSNNE EV DMM ARRCASMMYCYEVEKYRNPR GGQFQQ




G

## 



 EN A P K Y G N D D 1 D


 DFEPKYGNNDDEYAADSLIME EVVFS FYYK SVVTRRRRNNRGGGTYR



 N RAPKYGN DVD WV DELGAAKWALKFRNK L R KYTNNYRNGEYH Y H TPKYG NDDDEADRHAVEVFEDFHDSVVGHQSPRGATYR GHVPKYGNDDDK WVD E L G A K WA GYFRERMKDYTNYRGGPY H




 GHAPKYGNDVK WVD DLGTKWAGYFRERMKDYTNYRGGAY H NFEPFFGNDDDEAADTIAVQVYNDDLAAADEGKPNTKGECFH











UniRef90-E8LWQ1
UniRef90 A0A010YDP8
UniRef90 G9PRR

MKKA WRGFTGTKWDEVNMRQF $\square$ QDNYTRYDGDA

Y S P Y D R R S T N D D

UniRef90 UPI00041CF1FE UniRef90_UPI000479B5CA UniRef90-R4K8C1 UniRef90_UPI000469C3C3 UniRef90 E7G882 UniRef90-LOM6L3 UniRef90_UPI0003776B33 UniRef90 A6TKL5 UniRef90-R0B9W5 UniRef90-A8F6C2 UniRef90-Q30WW3 UniRef90 UPIOO02899AE3 UniRef90-E5Y2N6 UniRef90_UPI00034D3EBC UniRef90 R2RF16 UniRef90-R7B9M0 UniRef90-DOGPY5 UniRef90_B0P051 UniRef90 R6UK85 UniRef90_F6CM77 UniRef90-S0SCV5 UniRef90-R9JZX2 UniRef90_UPI00037F0961 UniRef90-E8LWQ1 UniRef90-A0A010YDP8 UniRef90 G9PRR7 UniRef90-R7B2F9 UniRef90-UPI0002195434 UniRef90_C0QGR8 UniRef90 K6U1G0 UniRef90_UPI000468D15D UniRef90_UPI000429C9CB UniRef90- W3APH6 UniRef90 - 14A4E8 UniRef90-N9XQT4 UniRef90_E1RA88 UniRef90 E5Y2N4 UniRef90-UPI0002F2201B UniRef90_UPI0004053F59 UniRef90_UPI000463FF84 UniRef90_E3G4R1 UniRef90-A1VAP8 UniRef90-R2SDP6 UniRef90 C6Q323 UniRef90-E5VHX9 UniRef90-R5WUA3 UniRef90 G5HD78 UniRef90-R6DTA9 UniRef90-15AQH6 UniRef90_K2DMD0 UniRef90 R6QGH8 UniRef90-B6WXM2 UniRef90-H1BJ82 UniRef90-E6MIT9 UniRef90 N1ZE80 UniRef90-R9MRT1 UniRef90-D1AJA5 UniRef90 XOPU04 UniRef90-R5J414 UniRef90_F9MU78 UniRef90 UPI0003B71C84 UniRef90 NOBKU3 UniRef90-O28823
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$\square$ NAKPA ${ }^{\frac{50}{\square}}$ S CERAQ $\square W T \stackrel{60}{E}$ SHKKTEGQH ${ }^{70}$ VA $\square$ R RAQAFY ${ }^{80}$
$\square Y$ TESHKQTEGEAVIVRRAKATAH L L L R A MAFRR
$C \prod M \square R A D A F R R$ EGEPVI 1 RRAKATAH

QMTEGEPY $\square$ T R RAK G $\square K Y$
RAMAYTE $\square E K A Y P P P V L R R A M G F R R$
$\square E$ GA $\square$ S K TH VFKETEGEPMVVRRAKAFKR $\square Y$ TESHKQTEGEPTLIRRAKATAY

LYTESFKQTEGEPYILRKAKAFAH
LYTQSFQESEGEPYI I RKAKAFAH
 TF L DDRNYD TDVERLR LVTETYKKYEKSGLSRKVCAYAFEN TFDNVRPMIDI ERAKYFTESMKETEGEMLCL RWAKAMKH TF LDRPYDIDVERLRLVTEAYQNNQAMPRILQQCAYAFEN
 PCIS A ERLRLATEAHQKFTCEPPVLIRARVFDY

## LRARSFKN

SF LIEKPTEATNK $\square W G M \square K D \square Q K Q E R A K G G V L D M E T E V V S S$ LR A L A F L R EFLDKKYWDDIERLRLVTESYKAHPKAPAKLQC AYAFRH

RPKI DVERAKYFTESFKVTEGQPLQLRWAKADMH TFLDRPYEVDVERLRLVTESYKEHEVCPRKLQCAAYAFEN पE G A LAK T R A F R

ETEGEAL $\frac{1}{1} V R R A K G F R R$
THPS $\square$ S LIERALIETEVYQRYEGKDPAPV DRGDFFKT AYロDREFCIDSQRALLITQGYKANEAAPANDIRAKALAH
 LDRTRPR RIDVERAKYFTESMKATEGQPLPLDRWAKALMH

F QKTEGQPLI LR WAKA LKY
AVAMKT
LWDSRPC TTAERDELQTEAYKKFAGDA IP DFRAKVVKY SFSEKTS YVDVQRAKLFTESFKETEGQPLTLRWAKALYH TFLDRGYDVDVERLRYFTESMKETEGEYGYQQHEHLDEKLKVRAKAFDN
 DMDVWDALYMTEGFQASEGQPWADQKATYKN

LERAKERE $\square$ S $\square E R A$ LLYTESYKETEGKSQIRRAKSFYE LYTESYQKTVGEPTIMRRAKATVHILRRNKAT ADVQRLNDVTEGYKKYNNLPQEKKVAC VFRD
 LYTESMKETEGEPMPIRQAKALKH
 R WAKAMYH A HAFEH



VDPSVKA GVERARLITQAHKENDGEPNCDLRARGDEN $F K E M E G Q P W I \quad Q R A N G Y Y N$ $\square L S A V P C \square D T E Y \square E F M D D V Y K E N K T D P F I I R R A K L F N K$ WTQFSKNKNNKAKSRPVFIAEATRHVL

## A GAVSH

SQSMSMSRAQLLMESYKETESLHFFRRRGKAIRK RRAKLHEH S F A D A VP MLD S QRA LYF T QS MK LTEGKP LVW RWAK ALY H $F L M E A P Q V M D P E R L Q F L H D V Y T E Y N G E P V V Y / D R A R L L L E R$ VDES $\square R T$ GLERARLITESHK QT TGEPRVIRRAKGFAN

DGERTK पYTDYYKAHEAEPNDLKR AHCLYE KPTERVER乌KRM\VDA $\quad$ PYYVESERAVLVRRAKAVEK YKANEHLPAIVM RRARVVEK
TQTMSMARAQLLADAYE EYAGYSFYRKRGYSIA K $D A V P Q V E S E R A Q L I T Q S Y K E T E G Q P T D \quad D R R A K A V E K$
 T K P AVC I E RARY VTRF LKEMSA DSDPMGT RA EAVA H

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


YAENAS $\square Y \square D E N Q L I V G R S G P G R Y G \square L Y P E L D G D T \square D E$


VLKNKSTYTYPD E TLAGNYTSRRVGG■IYPESGDSVLME 1 LQEMP I R D DHQLLCGDFSAKPMGPEFFPDLAATWDVD ILDNDT I FI EEDD LLCGSGASKPFGMEMQYEYGVWTKDE VAEHIEVHID GHQLLAGRIGGSPRYSDMYPEIEGDFYAS



ACTTYGYEPSEKDHEDFTKYCKTHNDGVFDAYTDEMKLVR ELDQDPYQ DS DESKRI FPFWRGRSLDEMAETRLRAAGLWE EAVNHPFEDKQEADELCKWWQRTVADEVEGRLDDEQIKGS A I E Q L P F D DD P D D A QV DP Y WK K TV HEDL AKEV P K D T L K VT E I L H S P F E ERE E I I E L CK Y WQ R T V D D L I NV R L E E E Q I K G S E F NGDPY HTKE QL L A TIDD Y WK K T L F E NV W S QL P E EARVVA W E L D T D P F Y L R R E E D K Q $V$ V
 ELDEFD F QVSE ETK RVLQQ Y WK THQ DEVLA NL P N DNRLA E


## A $\square$ K T $\square$ P F D $\square$ T P E D A K $\square \mathrm{I}$ P Y WK K T F HED L A K A LPRETKK L T

ELDTDPFYLSEENKK LFP YWRKCVLDRWNAMMPEDVRTMR ID D F D P Y DI S P E D REI L P Y WE K S ME DLSK T A L P A H I E E C I ER D E S P F E I D P Q D DEE I I P Y WK K T Y Y E D L S S S L P P E DV L K V T EFNGKPYPLDERPGDQFDYWRKTVYENLRKNLPEECNQAW EVQNHPFKEKQEILDLCSWWKRTLDDYINVRLDDDQLKGS AVVKDLP E D A K R VI E E I A P Y WK K T Y H E A L A A A L P P E I M K L T
 ELLDTD DS T R P K V F M D K I A P Y WR K C V L D R WNA MMP D DVVRTMR E LID GKP Y R WE D R P G D KF E Y W N K T V Y D Y Vir K N N L P K E MVN D A W E I D TM M S R P Q D K F K F E L F P Y W Q K S M K D S I E C N i G E D I K A S V

 E L E V R R E E D A R I L R R E E II A P Y W W S R N I
 AI RESPFIIDDKQREEDTPYWQKTYHEHLSQALLPEEDPADR EIKNHPFEERPE LLELCEWWIKTVNAGVEESYTEEMKK
 ELD GKPYRWEPE DEKI A EYWNKTVYDYVRKNVPKEVVNDAW
 ELLD F D P F Y L S E E GK K $V$ V E E F A L P R GKVK I TP E L R K Y D D K GVE A WY DVDLLRVG T


IF K F HKRRLNPHRWKLFPFWNRN】IRKAFPT\|RQQLTFAV YIIDNYGRWEDEEQMEI GEYFRETGKEKWDAFLGDEEHK GG
 AL G D P PR DLE DAADKE A P MVE S P Y C E Y K E E M R E $ل A$ E Y WK Y T DQ T K G E K Y F T P E E $\square$ N I M


 EF DTMGRVADPF QDEAFKYWDKTTSALADSYMSQEAKDCM EFETMEHRVADELHEAFKYWPKTTSELAASYMSEETHEAM




UniRef90 UPIO0041CF1FE UniRef90_UPIo00479B5CA UniRef90-R4K8C1 UniRef90_UPI000469C3C3 UniRef90_E7G882 UniRef90-LOM6L3 UniRef90-UPIO003776B33 UniRef90_A6TKL5 UniRef90_RoB9W5 UniRef90-A8F6C2 UniRef90-Q30WW3 UniRef90-UPIOO02899AE3 UniRef90-E5Y2N6 UniRef90-UP100034D3EBC UniRet90-R2RF16 UniRef90-R7B9M0 UniRef90-DOGPY5 UniRef90-BOP051 UniRef90-R6UK85 UniRef90-F6CM77 UniReffo-SOSCV5 UniRet90_R9JZX2 UniRef90_UPI00037F0961 UniRef90-E8LWQ1 UniRef90-A0AO1OYDP8 UniRef90 G9PRR7 UniRef90-R7B2F9 UniRef90-UPIOOO2195434 UniRef90-C0QGR8 UniRef90-K6U1G0 UniRef90-UPIO00468D15D UniRef90-UPIO00429C9CB UniRef90-W3APH6 UniRef90-14A4E8 UniRef90-N9XQT4 UniRet90_E1RA88 UniRef90_E5Y2N4 UniRef90-UPIO002F2201B UniRef90 UP100004053F59 UniRef90-E3G4R1 UniRef90-A1VAP8 UniRet90-R2SDP6 UniRef90_C60323
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UniRef90
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UniRef90 F9MU78


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HNH LTGTPDTYGRGR\|VGDYRRVADYGDDFLTNEKVKDG WCHCDVTIKTQNGGGDSCPGYDQFLLRGMGGIRQRALDAM EAGFQTNLYHYAGTGHLADDYGKLMKLGFNGLIAEAKEKR YDSRF IVNETASFRSSIVHDYEK LKRGFKGIKEEAQEKL EAGFQTNLYHFAGAGHLADDYAKLMKVGYNGLIENAKAGL AVGGVDDNKDECAPGETTPEFPDLLPKGFKGUQDEAQALL DTGQYIIRKAVRGWGETTAGYKQIITEGDESICETMRSKR

 DNGVFIDKRDMRGSGEVTASYKQIIDEGLVGIIKKRVLRRK


 EAGSWTVSEMFAEKAWNCPDLDRLVKRGVRGLI ADIDEQL SGGGFAMSGYGLGPGFFLVCFEKIIREGARSVIEEAKRN1 YSATTVQPPLFVTASSLVPNYESVLENAQDNLHFMDKDDQ KAGMFYENVSVASGGSGADYPKVLNHGMRAVLDDLKERGL

DKSGMDYDVMNVSLGSGCANYNMILTKGARGVLEEVEQDY GNGCFFARKPNLPQGHYSPNYQKVIAEGFGSI KREIRQK ANGVFTVGNYFYGGGHDCVDYGKILRKGFKGIVAEV DEAM GAGVFSVGNYFYGGGHVCVDYGKVLRVGFRGVIEQVKEAL AESVGEQGAWVCNKAWHVPDVSRI VSKGVRGLIADVDEQL
 HNNPALVMNVFDVQGHLILGIKNVLSQGFSGGMAQAEEAK
$M F Q V S S M E A P S F A S G Y I V P P Y E T V L E D G L L A E W I E K I D N W ~$

UniRef90_UPIO0041CF11FE
UniRef90_UPIOOO479B5CA UniRef90_R4K8C UniRef90_UPI000469C3C3 UniRef90-E7G882 UniRef90-LOM6L3 UniRef90-UPI0003776B33 UniRef90-A6TKL5 UniRef90_Rob9W5 UniRef90-A8F6C2 UniRef90-Q30WW3 UniRef90-UPIO002899AE3 UniRef90-E5Y2N6 UniRef90-UP100034D3EBC UniRet90-R2RF16 UniRef90-R7B9M0 UniRef90-DOGPY5 UniRef90-BOP051 UniRef90-R6UK85 UniRet90-F6CM77 UniReffo-SOSCV5 UniRet90_R9JZX2 UniRef90_UPIO0037F0961 UniRef90-E8LWQ1 UniRef90-A0AO1OYDP8 UniRef90 G9PRR7 UniRef90-R7B2F9 UniRef90_UPIOOO2195434 UniRef90_C0QGR8 UniRef90-K6U1G0 UniRef90-UPIO00468D15D UniRef90_UPIO00429C9CB UniRef90-W3APH6 UniRef90-14A4E8 UniRef90-N9XQT4 UniRet90_E1RA88 UniRef90_E5Y2N4 UniRef90-UPIO002F2201B UniRe990-UP1000020533599 UniRef90-UPIO00463FF84 UniRef90-E3G4R1
UniRef90-A1VAP8 UniRef90-R2SDP6 UniRef90-C60323 UniRef90-E5WHX UniRef90-G5HD78 UniRef90-R6DTA9 UniRef90-15AOH6 UniRef90-R6QGH8 UniRet90-B6WXM2 UniRef90-H1BJ82 UniRef90-E6MIT9 UniRef90 N1ZE80
UniRef90
R9MRT1 UniRef90-D1AJA5 UniRef90-X0PU04 UniRef90-R5J414 UniRef90-F9MU78


RNCGDGTMTEEVIRपREEDSMQ $\square K A D K E M K E M A A \prod Y$ ERLELTREEDTRCDAVIRYARYGDYARRKAEMQLSQIC EALSKKDPEVAY而ERYADLAEEHAEKEKRKAELERMAFNC ANLDPNMEKKPFLEAVIILAADYAKKERRKQELLGDAERC EKLDKRDPEYDMHEAAKKYIMRYAQDPVRKKELEAMADNC DAVDANYEKRDFWQATVIVNEGLRDLVRRKAELLNITASDC A

 QSLNDTEPGADTLEGLEILAARYGKEALRLAELGTGAQUC
QQ DDSDTEKRPF DEAQ पWAERHAK $\square$ AKE $\square K E \square K \square I A E \square C$
AALDDAHGEDVLKQRHADLAEKMAEDEKRRAELLKTAEVN EKI DYWTACIIGCEGLITYAHRMAEDEKRKKELLTIAENC RELDDMNPARHSEEAVRDAEDECDPGRRQELLEIARDC KKLDLTQPDADKKNAAIKFANRFSDCKRKAELENLANIC AALDMHDPEKKYIERYAVLAEEMAANAKRKAELEQIAVNC AALDPACEKKPFLDAVVIWAKRHAEEARRKAELLRMAANA QKDDTSASSKAYYEAVI QYCKRFAGYFKEKAEYRELSDMA
 NSLDLLEPDSLKKRQFGRDADKCEEEAQYKKELLELAKIC PDNEFYQASKIVLDASARHILRYAELDEKMMEAEKIAEIS DQQPANDGMQRHFERYAQLAETMAQDPARKDELQEMAAMC AE DQLGDPEGDYFNKYAALAKKMAETAERQKELDRDASNC AKVDFWEACIIQCEGLISYARRMAKRAEELAELMELAENC ESLDPNCEKKPFLDAVVLWAKRYAEDPQRKAELEMI AEDC PKLVFYKTAE V SEAMUSYANRYAKLAERREELLR AE: C
 AQLDPFNEKAPFLQAIIDAADQKENNPRRRQELLEAERC A HL HPGAPDYEEKMEQYRFAETAAEYAQRKSELEQMSANL DALDGYDDNGDKYHYYALARRMAEEERDPTELKEDAR C EALDLTEPGAIDKDNYLQALLISAEGDERRSELLTARTC QAMLIAMKAVVGWAQRHRLAKITAEDPKRKEELLEISEDC AKLDFYKAEIKAADAVILLAHRHADLDERKAELLKIAE V D EKLEFYRGVKISMEALGEFGDRYAAEATRRQELEKIAEVC HEFEQEGDFGESDYQYNFYRKRYAKECERLKELLEMADTL
QAADFYQAAR $\square A A G G \square T A F A E R Y A D \square A R R K A D L E R \square A D A C$ EKFMITYEDYRRHEFWLGLKEMYAHRYRDLAELEEMARVC RELRYTTADSTEYEAWVRFAGRYAEDEQRKAELGEMARIC WEAMVIAMKAVVAQRYARLIARDMAEDAKRKQELLEDSDTC


RKLAFLQGПK\VLEAFVKWAHRYADDAKKKAELLETAEDC DQLQVCDAAII FSKRYAQECARQAENHERKTELLNMADSLL SKMDKKDPDYIKKQQFHRYAQKARDMAAAKAELLQMAANC SKLDRTEPDFIKKEQFYHYAHRYADEAARLAELEQUSQNC SKLDRTEPDF KKEQFYHYABRYADEAARLA ELEQQSQNC NALDEDDPS SYNAA RFAHRYADKARELAELEQUAANC EAGKADDAAMI SCEAAKILAERDAKKAEEAAELLAAAKRC QAMIIACEAVISWARRHARAEKEEADPKRRAELLEDADDC

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UniRef90_E1YHT7
 AWVPENPARDIWDALQVVAFMQUI IQTETNGDSVSPGRLD RRVPEHPPKTFHEALQAI WFAQSLETLEENQTGISLGRVD LHLSKRAPESFHEALQSLWFLFVI LHMESNASSFSPGRID
 EKLSTEKPATFYEALQLLWMTSDGGQYESNASSLSLGRMD RQVPYNPPRNYYEAVQCFWFVQLIDYCGQNGSSVSGGR1 D
RKVPAHAPETFWEALQHYWFIHVGITYETNPWSFTPGR TRVPANPPATFHEALQAVWT QSLFLLEENQCSTSLGRFD KKLSLEKPSNFKEALQLLWMTSVAQYESNASSLSLGRMD DA:AENPPKTFREAMQLHYFDFVGLFDEGNAGGYSPGRMD DVVPEHAPQTFRQADQMYWFTHI GVTVENNWDAYSPGKLD DVVPENPPKSFREAMQFMWFTQLGGILSENPLAWNPGRFD GKVATEPAGTFLEALQLLWYTSSVLQMESNASSDSLGRDD GTMMEQGARSFYEGVEVCYMVHVLQMIESNGHSFCYGRFD QWVPENPARTFHEAVQSVWLTVVSRLEQCIGAVGNGRMD TKLSKEKPANDQEGLQLVWLTSUAAQYESNASSMSLGRMD HAVAGGAPKTFWQAMQLFNLATALIQVESNGHSTSYGRMD AHVPEHPARTFHEAVQSQWFTQMFSRIEQTGTIVSNGRMD FQIA G GVPQTFWQAAQLLFNFAVTMTQI EGNGHSIS YGRMD RRVPA HAPSNFWEAVQMYWFVHLGTITELNGWAMSPGHCDD DQVPEKPARTFREADQSMYYYQTCDFMEQNAASYNPGRMD


GYDDSEPASNAHEAVQWTYFGY AA DKTQNGAAMSVGRDS YRVPEFPPETFHEALQSLWFVQSLECLEENQTGISPGRVD
 RQI AGGVPKTFWQAMQLENDATTLIQVESNGHSISYGRMD AFLADNPPATFRQALQQIHFLFMGLYMESNAGGYSPGRMD HRVPRYPAKTFYEALQSLYLYQDCIFMEQNAASYNPGRMD DVVPAHAPRTFRQALQMYWFTHVGVTSENNWDSYSPGKLD RQIAGGPARDTWEALQLWLLATDIILINSTGHSVSYGRMD AHLMEGKAQSFYEAVETVYLTHLLMMI ESNGHSFSFGRFD AWVPENPARTFHEAVQAQWFTQVFSRIEQTGTIVSNGRMD QRVPKYPARTFHEALQSLYFYHMSLFMEQNAEGYNPGRMD ERVPRYPARTFYEADQSQWFTQMFSRDEQTGT DISNGRMD
RNVPANPPRNFYEALQSMLTYEFCDFMEQNASSYNLGRMD RVVPENPPQTFQQALQMVWFAHVYFQIEVCTTACGFGRFD AKVPEQPAETFREALQSQYFLQMFSRLEQTGATDSNGRMD HNVPANPAKTFWEGIQAVWFTLLLVHIESNGHANSDGRFD HAVAGGTPKTFWQALQLFNFATMLICVESNGHSTSYGRMD ERVPGEPARDFWEACQSQWFVQMFSRIEQTGTTISNGRMD ATMLEQGARSFHEGCEIVYLIHDWQMLESNGHSFCYGRFD ERVPENPPTSFREALQFVWFVQLGGIISENPLALNPGRFD RNVPLHPARTFQEAVQAIFIVLLAVHLESNGHAISGGRFD KKISTGKPESFHEALQLLWYVCVILQYESNASSVSLGRVD EWGAGNAPRDFWEAMQLMVMATNLIMVESNGHSITWGRFD KVVPENPPKTFYQAVQMVWFDHLYFHIEVCTTACGFGRFD THVPENPARNFREAMQSQWFTQMFSRLEQTGT\|ISNGRMD RRVPAEKPESFHEAVQFVWFVQSALHQENYEQGI SMGRDD RKVPAEKPETFWEAVQFVWLVVQALHQENYEQAIS SGRID RNVPLNPARTFHEAVQSUYMLLLAVHDESNGHAISLGRFD EWVPEHPARDFRDALQAQWFTQLFSRLEQTGTDI NGRMD EQIAGGPAKTYWQALQLFNLLTTLIEMEANGQSLSYGRFD AKVPWQSAETFHEAVQSVYMTWVALIDESWGHGMTLGRPD RYVPSHPARTFQEAVQSIFMVLLAVHMESNGHADSLGRFD RRVPRYPARSFQEALQSFYFYHISIFMEQNAAAYNPGRMD RHVPAYPARGLKDAMQSKWFTFLLCHSDERYSSGYGHKED RHVPEYPARTFYEACQSIIDSYEYACFMEQNASSYNLGRLD

KRVPRHGANTFFEAVQAMLLTHTSLFQES $\square G E S \square C V G R M D$ NRVPEHPAETFQEALQSLVFGLLMVFYDTRTFGMGYGRDD RKVPYEPADSFHEAMQSFWFTFLLACPSPTTTA GRFD RRVPAYPARTFHEAVQCQWFVQLFSRDEQRGTTISNGRMD RHVPANPARGLKDAMQSKWFTFLLCHSMERYSSGYGHKAD

RWVPENPARNFREADQSYWFAHLLVEDEQMGCANSPGRFG NWI MENPARNTWEALQAVILYQLMLVADGQQHGLSQGRVD ERVPENGATNFYEACQSFWFIQQMVQIESNGHSISPGRFD RRVPEHGATTFWEACQTFWFLQSMLQIESSGHSISPGRFD MRVPEYPAETFQEALQSFYFGLLMIFYDTRTYGMGFGRVD
R VVEFGARNFWEACQSFWFIQUMVQMESNGHSMSPGRFD


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300
310
320 QYLYPYYKKD IDEGHYT IDDQDQDLLDCLWLKFNEIVKVQD

 Y YP F Y Q K D K N A Gl I D D Q Y A L E L L E C[L WL K F N E I V Y L R N QLL G H F Y E T DVA NKVLT REEAGEILDDALWVKHSDD I KA G T
 Q Y V Y Y P C C Y E A G I

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## Q







 QYMWP YYKKDI DEKNDT QNEALDEMLDECFYLKACEVYEVR D
 Q WL Y E L Y QK DI A EKR Q WL Y P Y Y EADKS

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 V L Y Y P F Y K R D DR N G T L T R E Q M Q E L I QYMWE Y Y K R D I D N K T L S R E K A L E I I E C M Y L K S S E V F EVVRD Q Y L Y P F Y QK DL E E GVL T D D Q A I E L F E CM WV N M A F I D L Y L S Q YLLP Y Y L K DL KE GRIID RKQAFEILLANLLWI KTNEIVPPPFD

 Q WL D P Y L Q H DLLK Q G Mi T K E F AL E L L E V Q F V K L N N P T K L K D





 QLMY P Q Y K S D I A S G K I D D E Y V V QL F E C F R V K I M GK R Q F WP Q Y M Y P Y Y R K D I E T G I M T D E K V L E L I


 QYA GWF A E NELLK LG T LTMATLQDYSDA FF L K L N DND MLLS K Q Y M Y P Y LLKED K Lil S KEFAQEDLVDCDWI KLLNDDN KTRD QYMY P YLLEA DK S QF LTF C C FK S D $\square \mathrm{D}$ T GY Q Y MY P Y L K D D




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UniRet90
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ESSAKCFAGFPTGYTVALGGLDKYGHTAVNPLSYVMLDIY QSSAKCFAGFPTGYTVALGGLDKYGHTAVNPLSYVMLDIV FSSVKNNGGFSTANNIVLGGDDREGKDAVTDFSYLCLEAE GATARYFAGYMPFDNMCVGGQKREGGDATNDLTLLLMDAV ESSAKCFAGFPTGYTVVLGGLDDYGRSSVNPLSYLMLEVY EPAATHYAGFCAFQNVCI GGVDMDGLDAVNPLSYLMLQAT SGSAKFFAGFPTGYT LLGGLSEVGRSAVNALSTLCLDAY ANTADFFAGYNQFQNLTVGGRTRDGKDATNELSYMCLKAT EHSAKFFAGFPSGYTALLGGVNDYGQSAVNELSYDCLEAY YGHTKFSQGYPLYSNLVVGGYKKDGTDGANDLSYLCVEAM YGHTKYSQGYPLYSNLVVGGKTPQGSDGTNELSYLCI EAM PAGAAFTEGYSHWEALTI GGKTRDGRDATNELSYLILRSK QQSAKSFAGFPVGYNALGGGLDSFGRSAVNELSYLFLEAY RGGMALNGRYAHWEAVTIGGOTPEGRDATNELTMLMLEGS KGTVKVNGRGFGGESLTIGGVDQQGNDATNDLTMLMLEAS GVTAKESGTYNDFTNINAGLKRDGTDGSSEVTYICLEDF SYYSAAFAGYVMWPTLLVGGQTPDGHDASNELSYYALEAS WAHTEFSAGSPDYQNITTGGQTPDGKDAVNPLSYLILRAT GVSALESGTYNDFVNISLGGTTTDGKDAVNDLSYIFLEIL
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GESAAFSAGYNMTVQVCAGGDDQYGNDAVNDLSYMTI QAT KWYATSFAGYPMWEILVVGGQTQDGKDATNDLSYLICLEAA PAGVKFNEGYAHWEAVTIGGTDADGRDATNELSYLLLENK WPDTSMFLGYHMADNLAVGGQTEDGKDAVNDLSYI ILEAC RGSMALNGRGFGGESLTI GGVKRDGTDATNDLTMLMLEAS PCGGAFNEGYAHWEAVTVGGQTPDGRDATNELTHLILKSK YGHTRFSQGYPGYSNLVVGGLMPNGKDGTNTLSYLCIEAM AASAEFSAGYNMTVQVCAGGIDKYGNDAVNELSYMTI QAT ANTADFFAGYTNFENLTVGGTTVDGKDGTNTVSYMA: QAT SNSAKFFAGFPTGYTALLGGLTSEGRQSVNELSYLFLEAY GS SLMASGVNFGGEALLVGGVDARGNDDTNDLSYMVLDAH DWYATAFAGYPMWQTLVVGGQTPDGKDATNDLSYLCLEAA PTGGAFNEGYAHWEAVTVGGQTPDGRDATNELTYLILQSK SLLELYFSGQATNQALT:GGDDANGNDATNDLSYMMLEVTX WPDTEFFLGYQMFDNLAI AGQTVDGKDATNEVSHLCVEAC PTGGAFNEGYAHWEAVTI GGQTPQGMDATNPLSHLFLRSK ADTVERNGRGFGGESLTVGGDGPDGEDATNDTMMVLEAS WPDTEFFMGYQMFINLAIGGQTVEGKDATNDISRMCIQAC ATTARYSAGYPMFQTLCCGGMDSEGNDAVNDVSYMMLQAT RQDREFFAGSNDLFILTLGGI NPDGSDASNDCTNAULEAA EVTAQYAAGYCVTVQTSCGGLDQYGNDASNELSYMMLQAT ETAGAMLGGMTSWEVIIGGQDSEGNDATNELSFIMLEDA DAATASNPGYTSGQLMTLGGVNKDGSDASNPVSYMMLQCC E ILAKTLGGLTSYQVVTTGGMDKNGEDATNELSYILLELMM DVMTPNLSSESHFHNCVICGVDPKGRDATNELSFAFLEAA KANRAKNSGMAKWYNWT GGVDENGNDATNELSYLLLESA PQGNAFTQGYAHWEAVTI GGQTVVDGEDATNDLLSHLI L R S K RQLREFFAGSNDLFDFTLGGDNPDGSDASNDCTNALEAA GSYAKTLSGGTGQTMTVGGLDKDGRDASTELE

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RHVVRLT NPQFTVRFHKNTPNDFKLDRVAEIDKGTGMPAMF Y H D RHLKI $\overline{\mathrm{K}}$

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R K L $\mathrm{K}_{\mathrm{L}}^{\mathrm{L}}$ $P$ Q

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 REF PLHYPDLAARLHSRSPES FLLWDVATTVKGTGHPKLL
 L S VRT ENMGPSPEPN TVVYSSADPANFKKYAAKISVTTSSDDYE ARM QN $\square$ QP TLAL WYTPMMPAY LMKAVDVI RTGCGQPQFM GRMF LA
A HV QL PAP
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UniRef90 UPIO0041CF1FE UniRef90－UPIo00479B5CA UniRef90－R4K8C1 UniRef90＿UPI000469C3C3 UniRef90 E7G882 UniRef90－LOM6L3 UniRef90－UPIO003776B33 UniRef90＿A6TKL5 UniRef90＿Rob9W5 UniRef90－A8F6C2 UniRef90－Q30WW3 UniRef90 UPIOO02899AE3 UniRef90－E5Y2N6 UniRef90－UP100034D3EBC UniRef90＿R2RF16 UniRet90－R7B9M0 UniRef90－DOGPY5 UniRef90－BOP051 UniRef90－R6UK85 UniRet90－F6CM77 UniRef90－SOSCV5 UniRet90＿R9JZX2 UniRef90－UPIO0037F0961 UniRef90－E8LWQ1 UniRef90－A0A010YDP8 UniRef90 G9PRR7 UniRef90－R7B2F9 UniRef90＿UPIOOO2195434 UniRef90＿C0QGR8 UniRef90－K6U1G0 UniRef90－UPIO00468D15D UniRef90－UP1000429C9CB UniRef90－W3APH6 UniRef90－14A4E8 UniRef90－N9XQT4 UniRet90＿E1RA88 UniRef90＿E5Y2N4 UniRef90－UPI0002F2201B UniRef90＿UP100004053F59 UniRef90＿UPI000463FF84 UniRef90－E3G4R1 UniRef90－A1VAP8 UniRef90－C6Q323 UniRef90－E5VHX9 UniRef90－R5WUA3 UniRet90－G5HD78 UniRef90－R6DTA9
UniRef90＿15AQH6 UniRef90－K2DMDO UniRef90－R6QGH8 UniRet90－B6WXM2 UniRef90－H1BJ82 UniRef90－E6MIT9 UniRef90 N1ZE80
UniRef90
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UniRef90 F9MU78 UniRef90－UPI0003B71C84 UniRef90＿NoBKU3 UniRef90－O28823 UniRef90－R5F213
UniRef90－G7LUJ7 UniRef90＿FOZ275 UniRef90－H1CLJO UniRef90－G1WPQ7 UniRef90＿COC5J5 UniRef90－SOG2Y2
UniRef90 G4Q4X6 UniRef90－R4KEI2 UniRef90 B1Q4S6 UniRef90－H6LFYG UniRef90－UPIO0036762BA UniRef90 A8ZWO7 UniRef90＿Q30WU7
UniRef90 V7l496 UniRef90－B6WUX6 UniRef90－KONMO5 UniRef90－FOJEY8
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U4KI57 UniRef90－R6CSU7 UniRef90－E5YA81 UniRef90－H6LFY7 UniRef90－H21E47 UniRef90－UPIOO0471 F285 UniRef90－X8HD06 UniRef90－B8FA81 UniRef90－17GG444
UniRef90＿E1YHT7
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NDSVGYQMEDARDWNNCGCIVVIPHYRKTGEWTAAIVINVINFGC GDEGCMAADQRRDYNVGCVELAPKGFQGRVNGGFLNVAR NDEGIIPLEDARDYSVVGCVELSTPGKTYGLHDALFNLLK FDDAHVKMMDARDYCLMGCVEPQRSGRDYQWTSGYTTFTC
 NDEVCVPAFDARDYGTVGCVEDSDPGRTYGLHDALENLLR
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N SDEIGMKQLMKRDWVGLGCVEANMPGKMSQWSAGHYNIARA NDEVGVSQEDARDYSVVGCVELSVPGKTYGLHDAMFNLAK
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 $N$ N N D K K G M S L E E A R D Y CVVVGCVVELSLD GK E Y GWH A A Y VN T P K



 N D E V M R R P I Y Y G
NDDVMR
F D D A H DKMMDAR DYCLMMCVVEPQKS GKMYQWTS GYTTTFTR ND GK GMS LEE EARDYCVVGCVEPDLPGAEYGWHAAYVNTPK NDEEGAKFDEAMDYAVSGCAECRMPNRDTYTSGNYI NFAA N D R K G M T L E E A R D Y C V V G C V E I D L P GK E Y G WH A A Y V N T A K N DLLAVVMRI E D Q Y G WA P V G C IV E A T V V P G K W D F A A G S WL N V G K

 CDEVVVIPAMMTREYASMGCVVETADPGRWGHRATGMVNFGK
 ND D 1 M R P I Y G D D Y G I A CCVVSAME DGKRMQFFGARANLA K ND DEGASSLKEAYDYSVVSGCAGERMPNRDTYTSNAY DNFAA ND DVMRPVWG DDYSICCCVVSATETGKEDQFFGARANLAK

 NDKMG DDKK DA WN WAPVGCDIEATDPGKWDYAA GPWLSVGK NDRKGMTLE EARDYCVVGCVEDSLPGKEYGWHAAYVNTAK NDEEVVVPLYEAALDYAVVGCTEARMPNRDTGTSGGYI NFAA H DEELGI P K E D A L D Y C P $\square G C V E T G V P G K Y G H R A T G M V N W G K$ HDDA GURMSEA WD WT P C GCCVETNNLE GRLLKSYTTDGEIISMG G S D RTGYQMEDAKDWNNCGCVVPHSRKTEFWTSSCNI SFAA


 NDEVI FKEEDLWWNS TVGCVVEIAPFGNSFTSSAALI NLAK


 N D K M G V A E E D L L V D W C P D G C DI E A S I P

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ALLEYALINEGKSRMTGEKMGLLSERPCR VVDALN NVDRLTCNQLGPNTGEPE 1 ME TLKENVDR
AI ELAMNNGK TASGAQAGPQTGELTS ALELTLNHGKCLLTGNQTGDDLGSLET ALEVFSNGYGPQGERUGSQTGELAA IMELSMYELRDK
$V V D L A N N G V D R L T N E Q \square G P Q T G A P E$ CFEAALFDGVCQMSGVQMGLRTGKAE CLETVLNGGVDPGTGKRVGLETKKPQ AMELTLYDLCDEKNGKKLGLETGDPAS
S VMELAMQRGYDHYTDKQVGMDVGAFT VFELAMNRGYDHYTDKQVGTDVGDFTKMKTYDSVMSDIH ALEFATNEGKSRLSGKKLALDEKDPKTFSTYEEVEEAFY VMEKVLYNN NVNKTDTKLTDGGDKENENGTLEKINGEDK VLEVVLNHGNDPKTDVKLDDGDK VLEMALNDGKDKAFNEQVGPRTGD PRNFGTFDELWQAYL VMELTMYSFK
MMEMVLNGGRSLNTGKQLGPDSGSLET ADEMVLHGKMLKHGDEVDGDETGNPDEMSSDEVLASVD MMEMVINGGRGPNAGMQLGPDTGSLET YQTFDEVLESVD LLEYALSNGVDLLTGKQVSMKTGELSEFKTFDDLYAAFE CLELVLHNGVDLITGKEVGLKTGDPT KFTSVTEVMDALKK TLLIVMNNGVDPESGKRVLPGYGDFTAMMESYAEMTA WD

UniRef90 UPIO0041CF1FE UniRef90_UPIo00479B5CA UniRef90-R4K8C1 UniRef90_UPI000469C3C3 UniRef90-E7G882 UniRef90-LOM6L3 UniRef90-UPIoo03776B33 UniRef90_A6TKL5 UniRef90-ROB9W5 UniRef90-A8F6C2 UniRef90-Q30WW3 UniRet90_UPIO002899AE3 UniRef90-E5Y2N6 UniRef90-UP100034D3EBC UniRet90-R2RF16 UniRef90-R7B9M0 UniRef90-DoGPY5 UniRef90-BOPO51 UniRef90-R6UK85 UniRef90-F6CM77 UniReffo-SOSCV5 UniRet90_R9JZX2 UniRef90 UPIO0037F0961 UniRef90-E8LWQ1 UniRef90-A0AO1OYDP8 UniRef90 G9PRR7 UniRef90-R7B2F9 UniRef90_UPIO002195434 UniRef90_C0QGR8 UniRet90_K6U1G0 UniRef90-UPIIO00468D15D UniRef90-UP1000429C9CB UniRef90-W3APH6 UniRef90-14A4E8 UniReffo-NoXQT4 4 UniRef90-E1RA88
UniRef90_E5Y2N4 UniRef90-UPIOOO2F2201B UniRet90-UP10004053F59 UniRef90-UPI000463FF84 UniRef90-E3G4R1 UniRef90-A1VAP8 UniRef90-R2SDP6
UniRef90_C6Q323 UniRef90-E5VHX9 UniRef90-R5WUA3 UniRef90-G5HD78 UniRef90-R6DTA9
UniRef90_15AQH6 UniRef90-K2DMDO UniRef90-R6QGH8 UniRef90 B6WXM2
UniRef90 H 1 BJ 82 UniRef90-E6MIT9 UniRef90_N1ZE80 UniRef90-R9MRT1 UniRef90-D1AJA5 UniRef90-X0PU04 UniRef90-R5J414
UniRef90 F9MU78 UniRef90-UPI0003B71C84 UniRef90_NOBKU3 UniRef90-O28823
UniRef90-R5F213 UniRef90-R5F213
UniRef90 G7LUJ7 UniRef90-FOZ275 UniRef90-H1CLJO UniRef90-G1WPQ7 UniRef90_coC5J5
UniRef90_SOG2Y2 UniRef90-G4Q4X6 UniRef90-R4KEI2 UniRef90 B1Q4S6 UniRef90-H6LFYG UniRef90_UPI00036762BA UniRef90 A8ZWO7 UniRef90_O30WU7
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a Leqalnngfse sGrrLgaqtatae eqnsfvkferavk MLEMVINGGKFLDSEEQFGPDTGSLET YQSFDEVLQSID | $M$ |
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|  | AVEMTLNNGKDPATGDTLMKGEGDLTA FSDTHAIVEACK MI EFVMTDGVNRKSGRKVSVQTGN PVKFDTFEKFKDAVE ALELVMTRGYDHYSGKQLGUDVGDPREFSGYQQLYDAFE LLELVMNNGCDATGVQLVKVNGKAGRDYESYDDVWAAWN VCELALTNGRNPKTDEIISIDETGDPRS FGSYYEFKEAIK ALEMVLYNGKMKKYKDKVGPDUEKMEDEVLDFNKVVKSYN

| C |
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| $\mathrm{V}, ~$ | MMNGRSRKTGEQISRGDPRDFKTFDDMAAVK MI EFVLHNGVDPRTGKLMGLQTGDPLA FKNDEEFKDALK VLETLRNGRLAKYGDELLTIETGDPKDFKNYEEREEAFF MUETLNNGKDPASGTTLLPGDGDLST LKKSDEVFSAFK AVEMVLRNGRMKKYGDIVLGEETGDPRNFKTWDEFWNAYV VLEDMLHNGYDPASGDRMLPYTASEEVDFQNYEEDWQAWK VVDMVMTNGKSRLTGEQVSTRTGDPRDFATFDDFMSA VK VLETTVNDGTDPATGTLLFKKTDKK TTDCE 1 MEKVLLRNK ENTGD I MELALYD IUELTVNDGYELTAKERDGLATGK MLEIVLHNGIDPSTGKLMGLQTGDPREMKNNDEEFKEAGKK ALEYALNEGTDIMFGYRFGLEGKKPESQT

 VLETTLHDGTDPKTGYHFV DLEKRAEDCGSVRDLLEKLR ALEMTLYNGRMQRYGGELLGLETGDPLDFPTWEAFWQAYL VMEMALNHGRLFGESEQIGPDAGGYDT FESFEEVLGAVD MLERALNNGVSRMTGRQVGDPTGDARKFTTYEQVWDAFC MIEFAMTNGVNRKSGRKVSAETGDPASATEYGDFEHAVK
 MI ELTMENGKDPLTGNQLGLQTGDVES FTSFDEFYQAFC ALEMALNEGCQLGSGKLIGAQTPPVSS MTCMQDVLDAYD ALLQALNNGVNPFAFTRTGPATGYL YEMENDDQVLAAVK

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 AMEDALTNGFDEFTNDQLGPQTGDAA CFETALYNGYDATFNDQQGPETGNAE EFETFDQLFEAFR GVEYA NGGKDEKHHMQCGPEDAPITSEYLDFDEVMHKYD PI MMA HNGENPLTGFKRGLKTGYL YDYQTFEAFKEAFA VLETVNGK VGNKQLGPITGDITT FKSDDDFYAAFK VLEITHNSGRDADNKQVGPVTKDMTGQFTDIEDFFDAFT VLEDTLNNGRCK GKQLGPKTGEDE ELDSMEK LAAYQ GLEALGDGYLRVMGKALGPKTGNPKKFKTFDQVLEAFK


UniRef90 UPI00041CF1FE UniRef90_UPI000479B5CA UniRef90-R4K8C1 UniRef90 UPI000469C3C3 UniRef90 E7G882 UniRef90_LOM6L3 UniRef90_UPI0003776B33 UniRef90 A6TKL5 UniRef90_R0B9W5 UniRef90-A8F6C2 UniRef90_Q30WW3 UniRef90 UPI0002899AE3 UniRef90-E5Y2N6 UniRef90_UPI00034D3EBC UniRef90 R2RF16 UniRef90_R7B9M0 UniRef90_D0GPY5 UniRef90_B0P051 UniRef90_R6UK85 UniRef90_F6CM77 UniRef90_SOSCV5 UniRef90_R9JZX2 UniRef90_UPI00037F0961 UniRef90_E8LWQ1 UniRef90_A0A010YDP8 UniRef90_G9PRR7 UniRef90_R7B2F9 UniRef90_UPIO002195434 UniRef90_C0QGR8 UniRef90_K6U1G0 UniRef90_UPI000468D15D UniRef90_UPI000429C9CB UniRef90_W3APH6 UniRef90_14A4E8 UniRef90_N9XQT4 UniRef90_E1RA88 UniRef90_E5Y2N4 UniRef90_UPIO002F2201B UniRef90_UPI0004053F59 UniRef90-UPI000463FF84 UniRef90_E3G4R1 UniRef90_A1VAP8 UniRef90_C6Q323 UniRef90_E5VHX9 UniRef90_R5WUA3 UniRef90_G5HD78 UniRef90_R6DTA9
UniRef90_I5AQH6 UniRef90-K2DMD0 UniRef90_R6QGH8 UniRef90_B6WXM2 UniRef90-H1BJ82 UniRef90_E6MIT9 UniRef90_N1ZE80
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UniRef90_G7LUJ7
UniRef90_F0Z275
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UniRef90_C0C5J5 UniRef90_S0G2Y2 UniRef90_G4Q4X6 UniRef90_R4KEI2 UniRef90_B1Q4S6
UniRef90_H6LFY6 UniRef90-UPIO0036762BA UniRef90_A8ZW07 UniRef90_Q30WU7 UniRef90_V71496 UniRef90_B6WUX6 UniRef90_K0NM05 UniRef90-F0JEY8 UniRef90_R4KI57 UniRef90_E5YA81 UniRef90_H6LFY7 UniRef90_A6M0P1 UniRef90_H2IE47 UniRef90-UPI000471F285 UniRef90_X8HD06 UniRef90_B8FA81 UniRef90_I7GGX4
UniRef90_E1YHT7

GKD|LSNGGAKYN|L|A|V|KK|LV|F E DKAATMAE|L|DAA|L|AANWE GK DMGEATAA NS L T A V K KVVVF DEK IITMMKE LK Q A L D T D F S
 GRWTGMADYANAMMAMRELVYREKTVTPQQMGQALRDNFC GQMDQVANLADSLAADQKLVYEEEMI SKHELLVSLQDDFK
 GK D $\quad$ GE A N L S D S M Y V I
 G $\square F A G L G T Y A D S M A A V R R L V F D E A R Y T M D W A G F E Q M R R D C$
 GK D NGGVA D YA D S MVVAVVK K L V F D E K K K V D D MA T L L A D A V K H D F D





 C E H M G L

 K D Y IIGVA DLLDN SLLDAVK K L V F D E K K V T M M R R L L D A L D A N M C
 $L M A F G \square A G L S V A \square D S L S A D K Y A K V K P \square R N E E G \square A V D F E V E$
G $\square$ WT G $\square A D L A N S \square M A V K K V V Y E Q R F A G L A E L I Q A L K A H A C$ GI GPQASGLGTCTDSLATIKFDEHKVTGAELLQAVKDNWK
 GKD DE G GAVVYT SV G D S L A A I E Y A VF E K G I L S L GE E I R Q LMD GRDNGVADFADSLVAVKKLVYDEKRLPMHTLLLEALAAADFQ

 GKNDGPSVVGDSLAAVKKLVFDDQTLTLKQLRDAMDSNFC
 $F M A F G \| A G L S V A A D S L S A I K Y A K V K P D R N E D G D T V D F E D E$ Y K Y F E FIDG Y A TVVV D S L S A I K K L I I F E E K R L T K K ELL L E A V N N


GD G
CDV GMATCADSLAAI KQLVFDEKRCTGAELLEAVKHNWK







 CK F M G Y G T V I D S L A A

 K D Y $\square$ G VAD LI N S MEAV KE LVVEKKLV SMEDMVNALNADFE GMDGGSVVVVDSMAAM KKLVFDEKKYTMTE LMMALLRNNWE
 $G V C D Q G T$ G M A VV A D S L
 GMFDGGFGTVIID S L A A A V K K K R V Y Y E D R T T I S M G E L L A A A L D A A N WE GMCSGSVVVIDSSLAAIKKLVFEDKKYTMAELMDALIKNNWE GMCEEGI DAANSSLLAB KHLVFFDTRKDTMEQQMTAAIMANFE GQWHNDILNTVASDSLVAMKFDEKKYTMQELDTALKANWQ TFATGI AGLSHVADSLSAIKYAKVKVIRDDQGCAIDDKTE GMPQGMADLSTVVNALHAIKE LVFDKKLDWVGYEDMQKMC GK D C G $\square$ G NV A D C L DA 1 K K L C F



 N G WHN P DT T V VA GNSSLVA I KF D D K K Y T M E QL V E A L K A N WE

UniRef90 UPI00041CF1FE UniRef90_UPI000479B5CA UniRef90-R4K8C1 UniRef90_UPI000469C3C3 UniRef90_E7G882 UniRef90-L0M6L3 UniRef90_UPI0003776B33 UniRef90_A6TKL5 UniRef90-R0B9W5 UniRef90-A8F6C2 UniRef90_Q30WW3 UniRef90-UPIO002899AE3 UniRef90-E5Y2N6 UniRef90_UPI00034D3EBC UniRef90-R2RF16 UniRef90-R7B9M0 UniRef90-D0GPY5 UniRef90_B0P051 UniRef90-R6UK85 UniRef90_F6CM77 UniRef90-SOSCV5 UniRef90-R9JZX2 UniRef90-UPI00037F0961 UniRef90-E8LWQ1 UniRef90_A0A010YDP8 UniRef90_G9PRR7 UniRef90-R7B2F9 UniRef90_UPI0002195434 UniRef90-C0QGR8 UniRef90-K6U1G0 UniRef90_UPIO00468D15D UniRef90_UPI000429C9CB UniRef90-W3APH6 UniRef90-14A4E8 UniRef90-N9XQT4 UniRef90_E1RA88 UniRef90_E5Y2N4 UniRef90_UPIO002F2201B UniRef90-UPIO004053F59 UniRef90_UPI000463FF84 UniRef90_E3G4R1 UniRef90-A1VAP8 UniRef90-R2SDP6
UniRef90-C6Q323 UniRef90-E5VHX9 UniRef90-R5WUA3 UniRef90-G5HD78 UniRef90_R6DTA9
UniRef90_-15AQH6 UniRef90-K2DMD0 UniRef90-R6QGH8 UniRef90-B6WXM2 UniRef90-H1BJ82 UniRef90-E6MIT9 UniRef90_N1ZE80 UniRef90-R9MRT1 UniRef90-D1AJA5 UniRef90-X0PU04 UniRef90-R5J414 UniRef90-F9MU78 UniRef90-UPIO003B71C84 UniRef90_N0BKU3 UniRef90_O28823
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UniRef90-G4Q4X6
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UniRef90_B1Q4S6
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UniRef90-Q30WU7
UniRef90-V71496
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UniRef90-KONM05
UniRef90-F0JEY8
UniRef90_R4KI57
UniRef90 R6CSU7
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#### Abstract

GF|V|PKYGNDDDYVVDQ|A\|E\|ANWYYRETHQYKD|V|FGSPFN CESPKYGNDNDYADKVMKEMTNDFFDEI EKHRDIDGRPYT NKYDKYGNDNDEVDYLSSDVLRHFEDTHEKYENPRNGFFT LNVAKFGNDVEEVDLIAARDIRFDENEHRQYQMLY GPFT GHAPKYGNDIE WVDHLGAKWAEYFRERMKEFTNYRGGPYH GHAPKYGNDMADVDEELARDVIDFTEQEHRRYHMLYGGRLT  NHVPKYGNDDDEVDHMVAMVGDMYCDTVKKNRTIRGGHFR NKTPKYGNDNDYADDIAKKLVDY IVQUVESYSPVRKASRR RNAPKYGNDDEYADGIARDIIDYTEKTINGFKTLY ARLI  NKYEKYGNDDDEVDAMGSELDRLFCKEVEKYDNPRGGKFT   RHVAKFGNDDDAVDEIVKDVFDSYLKLLPQYRTQRYSCYT GNAPKYGNNDPYADSIGRAIEEHALSFSRRYPTAFGGELD  MTAPCYGNDDEYADEVANKVDSLNVLYGQKYAKELGMHND GHDPHYGNDDDEADELFSFMFECYCRHDKGRQNPRGGKFS GHEPFFGNDDDYADDLMKRVYNSLFNNIDGKRSILGPTYH NAAPKFGNDNDYADGFARELFNYCADYVERHKDARGGQYC DEAPKYGNDDDEVNELTGDMFCFDADYI ESFHS KFGKMT  GDFPKYGNDDDRADDLGVELVTKFSNELKKHPLYRDAKHT


$\square E A P K Y G N D \square T E D D E \square A R D \square 1 H F T E Q E H R R Y R M L Y$ GRFT GHVHHYGNDDDYADELFKFMFDCYTGHDSGRKTYRKGQFN MHTPKYGNNDPYPDAI AKEVDRQALEFTKKYSKEDGVHDD
 GYAPKWGNDDPDVDAVVMELCDFDIK IMAELKGDLGNPKM


 GNFPKYGNDDDRVDDLAVQLVKKFSNELKKHKTYRDAEHS DHAPSYGNDDSYTDEI GQLLDLEAQKFTHKYGKEDGVHMD GDFPRYGNDDDRADEVATNLLSTFGGKLKHDHTYRDSKPT

 GYVHHYGNDDDYADELFKFMFETYCKH $\square$ GAGRKTPRGGDFS GYAPCYGNNDPYADS GHEDDRLSVEFAKYSQKDLGMFYN TEASKFGNDQDEVDKUVADVVYSYYETMRKGKGPKVSCYT GYVPKYGNDDDYVDS VAKKLADYFYKDVTSYND VYGHHFV DNAPKFGNDDDYADKWVVAVEDYDGSSMEHGKGPDPCCFS NDEDKYGNDDNPELDDLECAK FFRLYAKEVGEKYSNPRGGDF GHVHHYGNDDDYADELAQFVIDCYCKNVEHRPTAHGGEFM NFEGKYGNNDPYADSIAQLLDRSAQEFTKKYSQEDGVHLD GYAPKYGNDSEADRYAKLVLEMYCEEVSRYRNFRGGRFT LQSPKYGNDDDAADKYTKMVLEWYCEEVNRHRNFRGGKFA NKAPKFGNDDERADKWVVELEDYDYKSSKYGKGPVPCCYS

 QKCRKYGNDDEEVNEWASHMLTYGIADEHEQNHDYKKSSKMT WNAPKFGNDNPYVDEUATKYYDLVADEWKRNTTYSGTFPL
 NG $\square$ DKFGND DPKADA WMK WVGDHYSDSDHAGKNTRGGQYL NKAPHYGNADENADKYLSFAASTYANAINRATGPRGNHFS NDAPKYGNDDDYADSLVRECYDVYVDEDAKYPNTRYGDRY RRLEKFGNDHAEADRWTRFVMDDADAMEMGQTTRGGRYN

 WNAPKFGNDDDYADAMATKYYNLIADEWKRNTTYSGTYPL YDAPKHGNDYPEDEEFVQQYYHDVDEDHNS DGPDCFGYRT GEFPKYGNDDERADEEAVWWLDKTVAMEKDKKNKMYSGVAPM $L D V P K Y G N D D P E S D A Y V Q R L V E D F K T Y T E C G P N Y F G K H C Y$
$G Y G P H Y G N D G D E V D E L A A W V M N D A N N Y V S A A T N P R G G N W A$ H

GYEPKYGND $\square$ A E VDD L VDE GY R I I ENVWY Q $\ P$ S A Y G H H F E
 HRAPAFGSDDPYADDIAKEVCAFFCKTVASKQTLRGGPFR



HGTLSTSNNTPFGL!TGALPSGRLAGKPLADGDSPAQQTD PGVYSVNANVAMGMVTNATLDGRKMGEAISDNMGPVHTHD LRLVPFTSHVPFGKVVSATPNGRKAWTPLADGSSASHGAD
 PA LYPVSSNVPQGLSIGALPSGRRAGKPLADGCSPSQGCD PGILPVSGNTQFGLEVGALPSGRNAWKPLADGVSPNGGTD $V G F L P T T C H V Y F G G Q M D A S P N G R H A G D P L P D G I S P E K G A D$
$P G V Y G V S A N V A F G L I S G A S D E G R K D G E P T S D N M G P V H T H D$ MSTSNLTSYVPNGFDVGATPDGRLATLPDNEGASPCLGAD VRYVPFTSHVPFGRVVSATPNGRKAWSAGSDGSSASHGAD PGILPVTVNTLFGLSVGALPSGRKAASPLADGVSPSGGTD LSVLTITSNVVYGKKTGTTPDGRKVGEPLAPGANPMHGRD
 A GMLPVSGNVPDGQSVGALDSGRKAWTPLADGIGATGGTD FNVHS QTVNVSHGAVCGATPDGRRAGEPFCDNASPMMGRD LR YVSQSSNVPFGSVISATPNGRKAWTALSDGASASQGAD
$F S Q S P V T G N V A F G S A V G A T P N G R K A G K P V N N G I S P C N G S E ~$ PGVYSVNANVAMGLNTNASVDGRKAGEAISDNMGPVHTHD VRYVPFTSHVPFGKVVSATPNGRVDWFPLSDGSSASHGAD MSTSNITSYVPNGFVVGATPDGRYAGTPLNEGCSPTQGSD A GMLPVSGNVPDGKSVGADPSGRNAWAPLADGIGATGGTD TAFMGI SNYLPTGKVLGATPDGRKAKDPI NEGVSPYTGTD


 $F G V D S Q T M N I P H G E V T G A D P D G R L A G E A F C D A A S P M M G R D$
$L R L V P F T S H V P F G K V V S A T P N G R L L E T P G S D G S S A S H G A D$ AGCYPMTTNVAFGFMTSALPSGRMQGSALNSGVSPSTGMD
 YSQSPVTGNIAFGKSDGATPDGRKDGQPVNNGISPANGSE
LRVVPFTSHVPGGKVVHATPNGRKAWMPLSDGSSASQGCD PGVYSVNANVSMGHQTVASDDGRKNWEPVSENMCPVMTHD TAAATITANVPLGYGVGALPGGRLANTPLAEGISPYQGRN K GPVPVTGNISFGSRIGATPDGRSAGEPVNNGVSPANGSE PGILPVSGNTPFGQDVGALPSGRKAWTPLADGUSXPNGGTD PLAQSVAGYIVNGPKTAATANGRYAGEALDDGI SPYMGCD
 AGVYSNTSHTHFGSDTSATPNGRRAGETFASGFAPENGAD
 36762BA


 PNADSISAHQPGGASTGATPDGRRTGEVLADASSPDHGKD VRYVPVTAHVPFGRVVAASANGRLLAWTPLSDGTSPSPGAD $P L A Q S V A G Y I V N G P K T A A T A N G R H A G E A L D D G C S P Y M G C D$ PDAYSLSYHNYFGAKMGADPTGRKAGVALTDSVVSAMPGTD $P$ LGQSVGHYVTVGSKVGPTPNGRDHGEAADDGISPYMGAD TSILLTI TSNVVYGKATGALPDGREAYKPFAPGASPSYGAE


FGTFTMTVHVDYGSKTAATPDGRRKGEALAEALSSRQGFD
VAPHSLGFHAGTGAKTGADPDGRCAWEAMSDGVSPRQGTD $\square D \square A T L E S H L K Q G A G T$
$P S F F S Y G V H V L E G L Y \square G A T P N G R L A G T P V S N S L S P T N G S E$ PTGQAVGLYMEVGSRTGPTPDGRLGGEAADDGISPYMGTD

UniRef90 UPIO0041CF1FE UniRef90_UPI000479B5CA UniRef90_R4K8C UniRef90_UPI000469C3C3 UniRef90 E7G882 UniRef90_LOM6L3 UniRef90_UPI0003776B33 UniRef90 A6TKL5 UniRef90_R0B9W5 UniRef90_A8F6C2 UniRef90_Q30WW3 UniRef90 UPI0002899AE3 UniRef90-E5Y2N6 UniRef90_UPI00034D3EBC UniRef90_R2RF16 UniRef90_R7B9M0 UniRef90_D0GPY5 UniRef90_B0P051 UniRef90_R6UK85 UniRef90_F6CM77 UniRef90_S0SCV5 UniRef90_R9JZX2 UniRef90_UPI00037F0961 UniRef90_E8LWQ1 UniRef90_A0A010YDP8 UniRef90_G9PRR7 UniRef90_R7B2F9 UniRef90_UPI0002195434 UniRef90_C0QGR8 UniRef90-K6U1G0 UniRef90_UPI000468D15D UniRef90_UPI000429C9CB UniRef90_W3APH6 UniRef90-14A4E8 UniRef90_N9XQT4 UniRef90_E1RA88 UniRef90_E5Y2N4 UniRef90_UPIO002F2201B UniRef90-UPI0004053F59 UniRef90_UPI000463FF84 UniRef90_E3G4R1 UniRef90_A1VAP8 UniRef90_R2SDP6
UniRef90 C6Q323 UniRef90_E5VHX9 UniRef90_R5WUA3 UniRef90_G5HD78 UniRef90_R6DTA9
UniRef90_I5AQH6 UniRef90_K2DMD0 UniRef90_R6QGH8 UniRef90_B6WXM2 UniRef90-H1BJ82 UniRef90_E6MIT9 UniRef90_N1ZE80 UniRef90_R9MRT1
UniRef90-D1AJA5 UniRef90-X0PU04 UniRef90_R5J414 UniRef90_F9MU78 UniRef90_UPI0003B71C84 UniRef90_N0BKU3 UniRef90_O28823 UniRef90_R5F213
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UniRef90_F0Z275
UniRef90 H1CLJ0
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UniRef90_G4Q4X6
UniRef90_R4KEl2
UniRef90_B1Q4S6
UniRef90 H6LFY6 UniRef90_UPI00036762BA UniRef90_A8ZW07 UniRef90_Q30WU7 UniRef90_V71496 UniRef90_B6WUX6 UniRef90_FOJEY8 UniRef90_R4KI57 UniRef90_R6CSU7 UniRef90-E5YA81
UniRef90 H6LFY7 UniRef90-A6M0P1 UniRef90 H2IE47 UniRef90_UPI000471F285 UniRef90_X8HD06 UniRef90_B8FA81 UniRef90_I7GGX4

TSTP|L|AAMRSAK|V|NQE\|HSGGT|LL|N|L|L|NHE|LV|ATKRG

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


 RKGPTAADK SVGRLNVESMS LGMAHNFKLVHGCLETEEGR
 R TG P T A V L R S L G K L P H T C C D D G G T L L N L K F A P A S V E G E A G R
 TSTPLAAMRSAAKLNQDIHSGGTLLNLRLNQDLVATMRG
$\begin{array}{r}\text { T } \\ \square \\ \hline T\end{array}$
 $T K G P T V T L L S I A A T K C M G A K E R A A R L V N L K L N P A S V A G E E$
 KNGPTAVLLSNYTSKNYGHRDRAARMLNDKFTPKCDEGEE


|  |
| :---: |
|  |  |
|  |  |
|  |  | A

A
A VMNS V A NME Q Q H A WD G T L Y N I R F D P K AVV $\begin{array}{llll}T & L & L & N \\ V & L & L & N \\ T & L & L & N \\ V & S & N\end{array}$ N V K
N QK
NMK
T F S $F \stackrel{P}{P}$ DVL

LK GP T A VIVNSVSRTNDEEMEDGMVHNLKLMHGMLESEEGA V NGPTALTNSVSKVDHSKAGNGTLMNMKFPQEAVAGIEGR I Y G P T A V L L S N F Y S K N Y GY R N R A A R L L N L K L S P S C V A G E E
 RFGPTAILRSLDKMPHACLDGGTLLNLWLTPAVVQG EE T N GP GAVLK SVVAHLPHDRFVQQTLLNMKVEPEMLNSEN GU
 KE GPTAVINSVAKLPNQK IAAGGQLLNMKFTPSALE GE DNL
 $E N G A L A S L N S V A K I P Y$
$L N G P T A V L L S N Y K T K N F D Y E D H A A R L L N D K L S P S C D E G E N$ QN G L L A SL N S VA K LD Y E D A LDD G $\quad$ S N T Q T I N PD A L G H N DE E


 V NGPTAVLLSNYNTKNMGMRDRFARMLNDKFTPKCDVGEQ TQ GP TA V I N S VA K LP N H MVA A GQLLNMMFAPAA LQ G D E N L




 I NGPTAVLMSNYASKNYGYRERAARLLNVKLTPNCVDGEE REGVT A AII K S A CKLN Y E MLS N G S S LTVNLD S
 AKGPTAVLLSNY QTKNYQFRERAARLLNNLKFTPSVVAGET VK GPTAAIVNSAKVDHGFATNGTMLNDRFPEDAVAGTEGR Q N GP T A T M R S V A G L T H T K L T N G S V L N M R F D P N A L K D R A G

 V N GP TA L L K S V S HL P HARF T Q GTQL NMKFEPDLIM GENGM



## K



 T N GPTA V L K S VS R $\square$ DASRHK GVLLNQRLSN LMMHSDAGF HEGDTALI KAGATADDTVRYGANHFNVKLVPAALE GPAG $K K G P T A V L K S V S K V N A R K F K G M L L N Q R L S A E Q M R S E R G F$


## CEGPAAVIDSAGRVDHTELYGVLFNMRFTPESLKTKEGR

K Q GP T GVLGSVAKLDHSLISNGSSVNDKLMPSMFQGBEE K K GP TA V L R S V S K V QK N QKA N L L N QR L S V P DM R S A H GF D

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UniRef90_UPI00034D3EBC UniRef90-R2RF16 UniRef90-R7B9M0 UniRef90-DOGPY5 UniRef90-B0P051 UniRef90-R6UK85 UniRef90-F6CM77 UniRef90-SOSCV5 UniRef90-R9JZX2 UniRef90_UPI00037F0961 UniRef90-E8LWQ1 UniRef90-A0A010YDP8 UniRef90_G9PRR7 UniRef90-R7B2F9 UniRef90_UPIOOO2195434 UniRef90_C0QGR8 UniRef90_K6U1G0 UniRef90_UPIO00468D15D UniRef90_UPIO00429C9CB UniRef90-W3APH6 UniRef90-14A4E8 UniRef90-N9XQT4 UniRef90_E1RA88 UniRef90_E5Y2N4 UniRef90_UPIO002F2201B UniRef90-UPIO004053F59 UniRef90-UPI000463FF84 UniRef90-E3G4R1 UniRef90-A1VAP8
UniRef90-R2SDP6 UniRef90-R2SDP6
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UniRef90_l5AQH6 UniRef90-K2DMD0 UniRef90-R6QGH8 UniRef90-B6WXM2 UniRef90-H1BJ82 UniRef90_E6MIT9 UniRef90_N1ZE80 UniRef90-R9MRT1 UniRef90-D1AJA5 UniRef90-X0PU04 UniRef90-R5J414 UniRef90-F9MU78 UniRef90_UPI0003B71C84 UniRef90_NOBKU3
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UniRef90-R5F213
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UniRef90-FOZ275
UniRef90-H1CLJO
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UniRef90-C0C5J5
UniRef90-S0G2Y2
UniRef90-G4Q4X6
UniRef90_R4KEI2
UniRef90-B1Q4S6
UniRef90_H6LFY6
UniRef90_UPI00036762BA
UniRef90_A8ZW07
UniRef90-Q30WU7
UniRef90-V71496
UniRef90-B6WUX6
UniRef90-KONM05
UniRef90-F0JEY8
UniRef90-R4K157
UniRef90-R6CSU7
UniRef90-E5YA81
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UniRef90-UPIO00471F285
UniRef90-X8HD06
UniRef90-B8FA81
UniRef90-17GGX4
UniRef90_E1YHT7


KKLVDDVMS QAFFA | Y |
| :--- |
| K |
| P | QGNKMVNYLLAFMKBA


 ELKGQEVQDNVVDGRILRDAQK

E E LQQLVYFDD $\begin{array}{lll}K K K V D F I & R T Y F S \\ E K L G K L I & R T Y F R\end{array}$ QHIQRNVVSADTLKKAQK
$\qquad$ AQMQFSYVDNETLLQAQA - MGGHHVQFNVVSSELLREAQK
 N
$\square$

 MK NKFVNF IVAYMK F VAF L Q A S VL $H \square Q F N V V R R E D L L D A K V$
$Q M Q F S Y V D N E A L K R A Q A$

D
GTRKDMSLI RTFCD EKFANFLRAYTK KKH YHNQFNVLSTELRKAQK LKLWH Q
$\qquad$ $L \mathrm{~K}$ L Q H 1 MHVQFNIMSSATMRAAQK LKLWHVQFNVINKDTLIDAAQK
 EGVKK NLI R S Y F K NGGHHVVQNVVDD K T L DAA Q E DSPNSTKELMNYLRSLCSLGVFHTQFNVIDTETLIKAAQK R S K E S C L K L DA L L R T F F N R L H G Y H VQ Y N I V S R D T L I A A Q K HKLASLI RTYFT $K \square N N L V A \bigsqcup L D G Y F T$
$A H \square 1$ LLLRTASMLGNAQMQFSYVDNEELKRAQK DNLIAFIDQYIVK RGAMHVQFNIMSSATMRAACK


 Q Q A | $M$ | $H$ | $Q$ | $N$ | $M$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $Y$ | $A$ | $A$ | $M R$ | $A$ | $A$ | GGHRLSAFLRAFLD MDIFHIQFNVVGQDILRCAQE







E Q L H A L I R T Y L H D L G G K H $\square$ Q F NVI S NE $\square$ MK D A K Q
$R \square N K M \square G L V K G F F A \quad S G G M E V Q P N V V S N Q T L L D A Q K$
WHAYMNTWHD LN IDDHVQFNVVSTEEMRAAQR

UniRef90 UPIO0041CF1FE UniRef90-UPI000479B5CA UniRef90-R4K8C1 UniRef90_UPI000469C3C3 UniRef90_E7G882 UniRef90-LOM6L3 UniRef90-UPIooo3776B33 UniRef90_A6TKL5 UniRef90-ROB9W5 UniRef90-A8F6C2 UniRef90-Q30WW3 UniRef90 UPIO002899AE3 UniRef90-E5Y2N6
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UniRef90_R6UK85 | UniRef90-F6CM77 |
| :--- |
| UniRef90- SoSc 5 | UniRef90-R9JZX2 UniRef90-UPI00037F0961 UniRef90-E8LWQ1 UniRef90-A0A010YDP8 UniRet90 G9PRR7 UniRef90- $\mathrm{R7B2F9}$ UniRef90_UPIOOO2195434 UniRet90_CoQGR8 UniRef90-K6U1G0 UniRef90-UPIO00468D15D UniRef90-UP1000429C9CB UniRef90-W3APH6 UniRef90-14A4E8 UniRef90_-N9XQT4 UniRet90_E1RA88 UniRef90 E5Y2N4 UniRef90-UPIO002F2201B UniRef90_UP100004053F59 UniRef90_UPI000463FF84 UniRef90_E3G4R1 UniRef90-A1VAP8 UniRef90-R2SDP6

UniRef90-C6Q323 UniRef90-E5VHX9 UniRef90-R5WUA3 UniRef90-G5HD78 UniRef90-R6DTA9
UniRef90_15AQH6 UniRef90-K2DMDO UniRef90 R6QGH8 UniRef90 B6WXM2
UniRef90 H 1 BJ 82 UniRef90 ${ }^{\text {E6MIT9 }}$ UniRef90_N1ZE80 UniRef90-R9MRT1 1 UniRef90-XOPU04 UniRef90-R5J414
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UniRet90_NoBKU3
UniRef90_O28823
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UniRef90
R4KI57 UniRet90-R6CSU7 UniRef90-E5YA81 UniRef90 H6LFY7 UniRef90_A6MOP1 UniRef90-H21E47 UniRef90-UPIO00471F285 UniRef90 X8HDO6 UniRef90_B8FA81 UniRef90_17GGX4

RPEDYKDIL 730 JUGYSTOF 740 SK SMODA 750
 NPQKYSDLIIRUAGYSARFVELAKELQDD: YPANYKGLVVRVAGYSAFFVELSTEIQDDII ARTEH N
H

 HPEQYRDLMVRVAGYSAF NPDKYSGLLVRVAGYSAFFVDLNKALQDEDI


\section*{\section*{H}

## \section*{H} <br> E <br> D

 NPEKYRNLLVRVAGYCAQFVSLMPEAQEAC NPENYRGLVVRVAGYSAFFVDLNEKLQNDI DPEKYRNLIVRIAGYSAYFVDLSPDLQNDLI





UniRef90 FOSW32
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UniRef90-F0YTG2
UniRef90-C7XCZ5
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UniRef90_S2KRM2

KETEGMPAVMRRAKANEK
LLDSPQRVDTERLIHLLDVYRKY GTEPADRDRARVFEQ VDLE GPKLDMWNFW KFDPDI MRRAKALA H DASPRDEVERARLITESYKETDGQPTVLRHALGLKK EKSPR $\square$ QK L M DA $\square$ YEKMPE $\square E S K R A V L I R R S K A F E H$


EGEPFVIRRAMAFKY
KSDRTDF LK DTGYAKMPEDESDRAVLIRRAKAFKH DAVPHIES DRAKLLTESYRRTENEPMVLRRAKAMDH

TERMNKYREDVLNKKPY $\square$ DAERAVLATRAYMDKE

PQEQLE $\square$ MEAYTKAYQDSEREDKATRE $\square \mathrm{NC} \square \mathrm{K} \square 1 \mathrm{Y}$
$\square V K P P V C T E R A Q H Y T E M Y \quad Q Q H \square D K P \square P V R R A \square A L A H$ MENYTNAYKKH $\square$ NDNKA $\square$ RE $\square E C \square K T \square F$

MT LLEQAYTLYQDEETGRRYAD_AFYY


R K A Y A VK Y

E Y C $\square$ HF TNVYREENDKY $\operatorname{LREAKCLKM}$

$\square R$ CAKA $\square$ AS R R AKATAY
 TERMKEFREEVLDEKPY $\square$ DAQRA $\square L A D R A K M \square E K$

UniRef90 FoSW32 UniRef90 UPIO0025556DE UniRef90_G2TCX3 UniRef90-E0QH07 UniRef90 Q8L1A3 UniRef90_UPI00047356A4 UniRef90-14C671 UniRef90-V4FI92 UniRef90-UPI0004674BEF UniRef90_A4J854 UniRef90_G7LUM6 UniRef90_B8FI5
UniRef90_UPIO0034AB9DF UniRef90-K5VDU1 UniRef90-A9KN53 UniRef90-A4GK17 UniRef90-F4AA78 UniRef90-T311X7 UniRef90 R5GB72 UniRef90_UPI00035CF80A UniRef90-A1RF33 UniRef90-R6J4M6 UniRef90 UPI00036D2248 UniRef90_G1V073 UniRef90-B9M011 UniRef90 R7G068 UniRef90-E6MIT5 UniRef90_Q7AGB3 UniRef90-R5C3N9 UniRef90 FOZ3X0 UniRef90-R7D4X2 UniRef90-R0LD22 UniRef90 B2TL41 UniRef90-UPI00047DD495 UniRef90_D4N180 UniRef90-W6CHK3 UniRef90 H1AJF4 UniRef90-F5YF08 UniRef90-G8UI84 UniRef90 ${ }^{-}$FOYVZ7 UniRef90-B6FX01 UniRef90_VOPR57 UniRef90-D1ANR4 UniRef90 R9LTH4 UniRef90-R4KAN9 UniRef90-B7CD02 UniRef90 ${ }^{-}$R6LMF2 UniRef90 E2SNW2 UniRef90-L7WQA2 UniRef90-R6MR39 UniRef90-UPI00036D7327 UniRef90-UPI00016BFDA6 UniRef90-X0U2F6 UniRef90_R5IZ82 UniRef90 X0T8V1 UniRef90-S0FN65 UniRef90-T3E3P1 UniRef90 G9RZJ8 UniRef90-N9W5G9
UniRef90-R6TYY3
UniRef90-G5ILT2 UniRef90 T4H1K5 UniRef90-S8CTE2 UniRef90_R6ZG60 UniRef90 F7KFQ6 UniRef90-FOZ126 UniRef90-UPIO0046F3BDA UniRef90-N9WWS0 UniRef90 R9MJN3 UniRef90-R6NVF0 UniRef90-R5AFQ7 UniRef90 ${ }^{-}$FOYVI7 UniRef90 ${ }^{\text {R5XX63 }}$ UniRef90_UPIO00472C68C UniRef90_C0CUZ2 UniRef90 X2N7K6 UniRef90_C0D3D3 UniRef90-EOW4J8 UniRef90- W0FP20 UniRef90 ${ }^{-}$S0EPM7 UniRef90-B7CCC4 UniRef90-R6ND32 UniRef90 F1TG12 UniRef90-R6J307 UniRef90-XOSYU0 UniRef90_UPI00047A3752 UniRef90-A5HUQ1 UniRef90-FOYTG2 UniRef90_C7XCZ5 UniRef90 A4GKI6 UniRef90-UPI0003F976F2 UniRef90_S2KRM2

TF NNLPVTM RNDELIVGADTKNPRSTEDCPEFSYDWVEK IFTQLPVTI REDELVVGSIT TNPRSTEI CPEFSYDWVEK NVLNKSTLVLQEDEFIVGYHAEDPNMFPLYPELSHMAVQD QPDEFIVGYHAEDPNMFPLYPELSYMAVQD DDWSPFAGSTTSKFKGVLLYPELVGLMLWP $\square$ II $\square$ GDDS LIAGTTTSKRDGCPLYPEGSAVII WN

VLQKKTLF $\quad$ DNNPLVGSVTSYPAGVYVYPEYGSEWDAE VEDNISIGIT DHSQIVGYWGSAP HTUSWRVDGASUVNE ILEELPVII RENELI VGTAT $\square Q Q R S C Q M F P E F G P Q G L T D$
$\square V K N L P V V I R E N E L I V G S A T V A E R G C Q T F P E F S F D W L I A$
AEEPTMVPGYPEDSFLATQD $\square F G M K E E A P L M D C C K Y W D G K C \square E D$

1 FFNDPVVI
RDNELIVGALSVKPRSTNLCPEFSFDWVEK DDNLFVGAMASTVNG $\quad$ YYTYPE WQVGWMIE
 RAGELIVGSLTVTPHSTQDYPEYSNRWLQD

CCENMPVII RPEDYLVGYRDVDVKSAGLFPEWSGPEFFD ILENTPIVI QDDELIIGYHAEDPEMFPLYPELAYMAVQD

 $\square L E N M S \square Y$ E E E S M $\square$ A GNQASSNKDAP $\square$ FPEYT $\square E F V \frac{V}{V}$
$\square E P Q D K \square A G R \square D F \square P \square G F G C V T S G G G Y C V F N$


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

VLKHMALLILDDELIVGGVKE\|IPTAEQQALYDKV 1

ES D DLLA GRLDD $L P \square G F G S V T S \square G G Y C V F H$

【AEHLPVHD KDDELVVGCPD


LH D
QTNH LVVDMEDDLIVGG\|VGFSPQYGGLYTYYNEE $\square$ AQD
$\square$ AKE $\square \mathrm{P} \square \mathrm{W} \square \mathrm{S} \quad \mathrm{D} Y \mathrm{HMFAGTQDDSFARSY} \mathrm{\square NPAFTVDSFSG}$
 $\triangle I E T I P L Y L T$ DSQIFAGSQDDAFARSYINPTFKVEEFSG

TDDDENQTFGTQDDSFARSYDNPSFRDEEFAG VLENYPVT I REDELI VGSVTPTMRGCLWFPEVSDWLIDE $\square L E H V E \square S \square$ RDEELIAGNRTVKPRAG $\square$ MSPEMDPYWLLN H $\square$ ANRT $\square$ W $\square$ KHDELI I GNQASEDRAAP $\square$ FPEYTVSW $\square$ EK VLDNMS $\square Y$ Y EDKS $\square L A G N Q A T K N R N A P \square F P E Y T M E F V M N$

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UniRef90-XOSYU0 UniRef90_UPI00047A3752 UniRef90-A5HUQ1 UniRef90-F0YTG2 UniRef90_C7XCZ5 UniRef90 A4GKI6 UniRef90-UPI0003F976F2 UniRef90_S2KRM2

DPFCTDDEVER\| 130 KAYDGGDEHHPAVKKDRFF 160
 EFDTMTRMADPFEHEAFKYWDKTTSSLADSYMSPATKDCl Y LRDYSPQPADEAAA INEYWKPHSLQSKCQPYFDPADLGR
 ELDTMPYRTNPGHNDIFPYWKRNFREWVRDKYNNPHCQQQI EFDTMTR $\square$ ADPF Q $\square E A F K Y W D K T T S A L A D S Y M S Q E T K D C L$

ELDQPSSRDRELLAEAAAYFEDKNRELAQQLLGLDPKEGV ELYNEPGDMPEKVAEDNDYWAQTAVDKVARILDPEDAVKF E WETVDEATKKELKE IFDWWKETTSSYALSLMDENTKEAM

ELDTVTRTADPFYRKVHSYWKKTTSELADYYMAPETKLAM YI QNTRYAPQPEAKEI NEYWKKHSLLSKCMPYFEPYELER ESLKK F LIKETMPEYDDLDNAFKAVLYPPSVIS DM

EFKTMTRMCDPFVHEVFKYWKKTTSELATSYMSQDCLDCQ E KVVENSKTPELKAVLDYWGKRDHEI YEKRYGYDARPDY EFDRLNDRKKQQLDSVVGYWEKTTNELATSYMDPETGDCM AREWVGKSVDDVGHRY PVMTR【LAKEWFNKSVDDIGHKYEQMVPEMR D YLTDYAPQPKDEAQE ILNYWKPFS $\square Q A K C E P Y F D Q A D L T R$ EFDTDPFY ISDENHEVYKYWKKTTSELATSYMAKETLTAM EFDT $\square$ DRMTDKFVIEVLPYWDKT $\square$ NDLT $\square$ S YMEEDSKNSM

MRKED $\square$ P VLVKVSKYWDGDSVEDVYAKMDPEYDQFS
 E DDDFEKRDKEQLVSIAPFWENNNRARAGAGLPEEVSVYM AKEWVNRSVDDLGHKY EQMVPGYE $\quad$ KENGMK
 K $\square R$ AFKELLSEERARVDK $\square Y$ DF WQDHDTKA $\square Y C Q D \square L N E T$ EKMVPDYDVKEA EAMR ПE $\square$ CRYWQNKSAEDTCWKWGTLHPEYD EIDDAGFSVSEENKRDCPWWRQTVQDRCYGMMSPETKDCD QSELVSEEDKKRVDKVGKYWE LREFKEQLPEDQRYRVDLLYDFWQDHDIKA IGCQDVLNDT

T DQERTRVDALYDYWQEHDVKS $\square Y C Q D V L N E D$ IS RPGNQNDMQWGNSFDSLLLQKSEEWVERYAPEWFVSY KLRAFKEQLDQERARVDALYAYWENHDTKADYCADGLNED
EQHYRDAGVEFENWEDGSRDEK HFVYNYGAETMQLLR PKYLTQEERELFAKY YYMNEL $\square$ LKVYHRWWDMSVEDRFKK VAF Y Y T N G W L K C R
VFPDER $\square$ T L L RTVRT $\square$ PE $\square$ HTEE EK $\square$ MDMLLF WRKTTTRK $\square E A A F T E D M N K V L$
 I LDD A YPEDWNQEFLEAVSYWKENTLKKLNDRFTEKHADLE

D $\square$ YTPEEWNE $\square$
Y C D G D $\square \mathrm{DP} \square \mathrm{G} D \square$ T S E R $\square \mathrm{E} D \square \mathrm{RE}$ Y N N H T QF D A $\square$ R R A Y D $\square \mathrm{A} G$
EMEEDR
 YCDPTAVFGDDEPNDEFTAERKFAETEYAEKLREVYAEAE

GEWSDYY
YCDPAAVFGDVVPNEFTEERKAKDEFLKTEYAKKLKKVY $\square D T \square C T R E Y N P T F N E V H P Y W K R C S F A S Q Q K Q D P D E V R E K Q$
 ERFWDENDTRSLFYNETLTENTVGKF

E $\square$ DDAGFAVSEENHEVCPWWRQTVQDRCYGMFTDEQKGLL E पD QFEKRDKEQ QRE $\square$ APFWQNNNRARGEALLPEEEVRVFM

$$
K \square F P N Y \text { T E N E Q }
$$

PFK $\square$ RPEVADR $\square$ NRE $\square$ FPFWEYENRDRVGGSYTPKAQE $\square M$ FNSYRKTQWNP KHPYTELMPVLE
YLQKYAPEPADEAKEDADYWKPYSLQTTCEPYFEELKAAY WAVDYAYF LD HSPVVIHPDEMNWQLEEARLYKYPEECQRL

UniRef90 FOSW32 UniRef90＿UPIO0025556DE UniRet90－G2TCX3 UniRef90－EOQH07 UniRef90＿Q8L1A3 UniRef90＿UPIO0047356A4 UniRef90－I4C671 UniRef90－V4F192 UniRef90－UPIO004674BEF UniRef90－A4J854 UniRef90－G7LUM6 UniRef90 B8FF75 UniRef90－UPIo0034AB9DF UniRef $90-K 5 V D U 1$ UniRef90－A9KN53 UniRef90－A4GKI7 UniRef90－F4AA78 UniRef90－T311X7
UniRef90 R5GB72 UniRef90－UPIO0035CF80A UniRef90－A1RF33 UniRef90－R6J4M6 UniRef90 UPIOO036D2248 UniRef90－G1V073 UniRef90－B9M011 UniRef90＿R7G068 UniRef90－E6MIT5 UniRef90－Q7AGB3 UniRef90－R5C3N9 UniRef90－F0Z3X0 UniRef90－R7D4X2 UniRef90－ROLD22 UniRef90－B2TL41 UniRee90－UPI00047DD495 UniRef90－D4N180 UniRef90＿W6CHK3 UniRef90 H1AJF4 UniRef90－F5YF08 UniRef90－G8U184 UniRef90－B6FX01 UniRef90－VOPR57 UniRet90－D1ANR4 UniRef90 R9LTH4 UniRef90－R4KAN9 UniRef $90-$ B7CDO2 UniRef90 E2SNW2 UniRef90－L7WQA2 UniRef90－R6MR39 UniRef90－UPIO0036D7327 UniRef90－UP100016BFDA6 UniRef90－X0U2F6 UniRef90－R51Z82 UniRef90－X0T8V1 UniRef90－S0FN65 UniRef90－T3E3P1 UniRef90－G9RZJ8 UniRef90－N9W5G9 UniRef90－R6TYY3 UniRef90－G5LLT2 UniRef90－T4H1 K5 UniRef90－S8CTE2 UniRef90－R6ZG60 UniRef90－F7KFQ6 UniRef90 FOZ126 UniRef90－UP100046F3BDA UniRef90－N9Wwso UniRef90 R9MJN3 UniRef90－R6NVFO UniRef90－R5AFQ7 UniRef90－FOYV17 UniRef90 R5XX63 UniRef90－UP1000472C68C UniRef90－C0CUZ2 UniRef90－X2N7K6 UniRef90－C0D3D3 UniRefto－OOW4J8 UniRef90－W0FP20 UniRef90－SOEPM7 UniRef90－B7CCC4 UniRef90－F1TG12 UniRef90－R6J307 UniRef90－XosYuo UniRef90＿UPI00047A3752 UniRet90－A5HUQ1 UniRef90－FOYTG2
UniRef90 C7XCZ5 UniRef90－A4GKI6 UniRef90＿UPI0003F976F2 UniRef90＿S2KRM2


AAGLFTESARYTVGAGNDDYASFTDRGLKEl！RETEARL LSGADGWGAPTSAYGYSGKNYEYYLKRGFEDII ADDEDHY

EHNVFTPGNYFYNGGHTTVOYDKVTA TGYEG MYRWASMEAPAFATGS\｜VPPYETVAEDGLDELAAEKIDLW E GRWVPAYD】AVEKGLESVIEECKKNL
AGGVETGNYYFGGDGHVCVDYGKVLKDGFKGVIAEVVEAM QAGLVADFFSWPAGGGNLD YPRVYREGLASMI KEVEERM AENVFTGNYYFNGVGHIAVDYARVLARGYKGII QDVVAAM SLICMFDSGYTLPQGREVINYFYPLQYGYDGLI KMCEEGM SVICMFDSGYTLPQGREVINYFFPLNYGYDELIKMCEEGK
NFADATCFPPMTDTGHNFPYMRYLYLGAEGVKKECEEKL NFADATCFPPMTDTGHFNFPYMRYLYLGAEGVKKECEEKL
$M Y Q V S T M E G P M F A S G Y I V P Y E T V L E D G L K R I E L K I D L W$ AHNMFTPGNYFYNGGHVTVDYGKILAGGFSALIKKVKDELL NHSVF $\square G N Y W F T G \square G H\|I D Y A K A\| G V G Y R A Z V E A A A V L$
AVMDSVVVMFDSFQGREVMNYYMPDQYGFDEDQKMCDDRD RLKVWNVDRPDPLAGE VPEENTFNESADPMPDYKKWEFY KYKAYRDTVWADPQGREIVNYYMPLEYGFDRDIEMCDEKD ETGFFGEGKMNSGDAHLAVNYQKLLQFGLRGFEERARKAK RIMDSVISMFDSPQGREVINYYMPLEYGFDELCDEKIAE TVGRF IDPKYTARDSGMMLDYPKLLEKG $\square G G L R Q E D F E K F$
TTGRFDDCKYFMATARपSGMYQK【MKGGDNGLIENKQEHN KNGGVMSGYAQASTGHRVLDYEKLLNKGAKSGLAQDEEKL SVVCMFDSGFTLPQGREVINYYYPLEYGFEGUKEDAREKI ANGVFTVGNYFYGGGHVNVDYGKI LKKGFRGVLEETTAAM ATGUTKEGNMTSGDAHLAVNFPLLLEKGDDGLRDKVAEDL TTGRFIDCKYTARLSGMMLDYKKLVGRGLNGLDEEIEAHN NENSVWGHHPPHWEKVLKTGMDKIYESDIPDQ TTGRF DDCKYFMATARDSGMYKKLVTLGDNGLDDQSYPTN TTGRFDDCYPFMATARDSGMYKKLMAYGLEGLKELIRSQK

## ENGWNAANHTNNYKRLVVTGDGGLERTNGYDENAKSQK TIYGHHPPGYEKII QKGIVGLKKDVQKKL P YWFASFGHLGDDYEDLVFNGYDS I IKRAQTRL

EDRQDHETHAFHENGRVFNMCPDYGMDMADGFTKKAEK $\square R$ CKEK $\square$ AEFPF $\square Y E P E \square A T P D Y E K \square M R \square G P G \square I A E A G E Y R$

VVFFVEQCTGHLTPDFRSALKSGVRHMDAD TDTQL VGSYPTAR■ALTIPDDDKLVRMGIPGLRDEKQKEN AHHFDHELGYGSN I CADYRSVIADGLDRRREEAVLRL KYKKTGGNMGKD DRGRTIPDLDKLIQLGIPGLRVEVEANR

KNKYYDHEKGTVCN TSPNYAYTTQHGDEARKQETRKRQ DSTSEA ПFF ПEQVTGHLIPDVRPMLRSGVQG\｜KEQUREKL KEHWTHEKGDVGNKGVCPDYSGLLAEGFQRLERKIAAAR EADFFIE QVTGHLIPDVRKLLACGTKGMREERKDYF PYTKEV自FFFEQVTGHLIPDVRFAIKHGIDSIKDKSGDGY GSRGGGDQSWTNKTHYTPDFSULLEKGVGGALADVEQRK TESESYTKEVIYFTGHLIPDFRFALKHGLKALINEMKNK

 VDAKYPAVITARLSG TYLLDYPKLIVRGGUGLEQETRCFL
ATGlIKEGNMTSGDAHLAVNFPLLLEKGLDGLREEVAEDL LKGSLNEWSAM GHVVPDYERLVQKGLGELHTEKKKSF ETGVFGEGKLNAGDAHLAVNYERGLKDGLRGYEKRVKEYK

RAGAFTNKTELSLLGHNSVNYDNLDDKGLNA【IKEAEEKL HLLFTEPFHN पCPDYA乌LLNEGLEEKRRQTETRL
ERVAFF配DKATCVSHTVPDFERVLKYGFDGLIERARQDT KYQLVHA $\square$ GASQ HFCQDFT $\square G \square E \square G F G G \square K E K L L K Y$
HPA \IESPGFANGFNS TVPPYETVLEDGLLKRTADKTDNW GFEARKVGAGGFSLAHTCPDLGUGitGGWSGLERKNRAK

UniRef90 Fosw32 UniRef90_UPIO0025556DE UniRef90-G2TCX3 UniRef90-EOOHO7
UniRef90
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UniRef90 R5GB72 UniRef90-UPI00035CF80A UniRef90-A1RF33 UniRef90 R6J4M6 UniRef90'UPIOO036D2248 UniRef90-G1V073 UniRef90 B9M011 UniRef90_R7G068 UniRef90 E6MIT5 UniRef90-Q7AGB3 UniRef90-R5C3N9 UniRef90-F0Z3X0 UniRef90_R7D4X2
UniRef90-ROLD22 UniRef90- B2TL41 UniRef90-UPI00047DD495 UniRef90-D4N180 UniRef90_W6CHK3 UniRef90 H1AJF4 UniRef90-F5YF08 UniRef90-G8U184 UniRef90 ${ }^{-}$B6FX01 UniRef90-VOPR57 UniRet90-D1ANR4 UniRef90 R9LTH4 UniRef90-R4KAN9 UniRef $90-$ B7CDO2 UniRef90 E2SNW2 UniRef90-L7WQA2 UniRef90-R6MR39 UniRet90 UPI00036D7327 UniRef90-UPI00016BFDA6 UniRef90-X0U2F6 UniRef90- R 51282 UniRef90-X0T8V1 UniRef90-S0FN65 UniRef90-TЗЕ3P1 1 UniRef90_G9RZJ8 UniRef90-N9W5G9 UniRef90-R6TYY3 UniRef90-G5LLT2 UniRef90_T4H1K5 UniRef90-S8CTE2 UniRef90-RGZG60 UniRef90-F7KFQ6 UniRef90 F0Z126 UniRef90-UPIO0046F3BDA UniRef90- N9Wwso UniRef90 R9MJN3 UniRef90-R6NVFO UniRef90-R5AFQ7 UniRef90-FOYVI7 UniRef90-R5XX63 UniRef90_UPIO00472C68C UniRef90-COCUZ2 UniRef90 X2N7K6 UniRet90_COD3D3 UniRef90-EOW4J8 Niefo-worp UniRef90-B7CCC4 UniRef90-R6ND32 UniRef90-F1TG12 UniRef90-R6J307
UniRef90-XOSYU0 UniRef90_UPI00047A3752 UniRef90-A5HUQ1 UniRef90-F0YTG2 UniRef90-C7XCZ5 UniRef90-A4GKI6 UniRef90_UPI0003F976F2 UniRef90_S2KRM2

210
220
230
240
GREHTDSEKSY\|SAMLRCAEARSDEDPSEKK QLLUWSTAC NYNKSEGDRKEYFEAMDTADQAAEQYDGRYEEI ERIIAEAC
 NKLDMD DPEVI SYNAA DIFAHRYADKARELAELLLQI AANC




 D RIDQNWEAMITVLEAAIRFAKRYARDEKRKEELLRRIAETC


KELLHLGDAD YAFYDAVIDRYAKRYAAEAKRLAELLMDSSNC NSMI I ADKAVIS WARRHARAESFETDPARREELLEMAEDS


NK LD A NDPERAFYEAV DRYSKK A A EMAARKAEELDQDSKNC MS L E M R L P N K EK FY F Y E R Y A K R Y A A L A R R K A E L I S L A E T C
 S R L Y F Y E A VKL VLLE GI Q T WHLLH YA DEA K RLLKE YEEEI A E I M




DK DFYTGCK VMEAVSDY DFRYAKAAARRAELQEMAVVM E MLDDEYRAMLI SLDSVVIVAKRYADQDRRKNELLHMYQIC K QQEF LN G II I S IGQALLSNF YERYATAAMAAA GKIDLDA D DL
T QLEK T A E Q K E F LQ A MLDDVLS IVT DFA AR YREEA LR VGN L DKAAA GGGNVK LYEGMLLVLEHF $\square E \square C R F Y K E L K \square M A D V L$

QTKMLPDEKKENLRAMRRLAHRYAEKGERVEEWRDMERTLL GESSFYTALLMMLDTVCLAADTYRQQAERLADLLKTA HTL


ENPS L N EKERVF LN SMYQCJIDEKYEQYALLDNETEDAHTL NKFCGQMEKAAYLEGQLAILKARYRDAASDAGNTLSADS L A S GT E E E K K I Y Y Y T A R Y A D L A H E K W
 E A M K I S L G A L




$E C L G I L R D S I A F H R D M C R E E K D R A A D P G R R R Q L Q V L E D A L$
HGEQFLKADD IVLVAVSEHDERFAALAREMAELLAMAENC F HSALLS $\$ K GVVYLRNWT ILAAAHASNEDDKANMEDVSKRL



## UniRef90 FOSW32 UniRef90_UPIOOO25556DE UniRef90-G2TCX3 UniRef90-EOOHO7 UniRef90 Q8L1A3 UniRef90_UPIO0047356A4 UniRef90-14C671 UniRef90- V4F192 UniRee90-UPIo004674BEF UniRef90-A4J854 UniRef90-G7LUM6 UniRef90 B8FF75

 UniRef90-UPIo0034AB9DF UniRef90-K5VDU1 UniRef90-A9KN53 UniRef90-A4GK17 UniRef90-F4AA78 UniRef90-T311X7UniRe990_R5GB72
UniRef90-UPI00035CF80A UniRef90-A1RF33 UniRef90-R6J4M6 UniRef90-UPIO0036D2248 UniRef90-G1V073 UniRef90-B9M011 UniRef90_R7G068 UniRef90-E6MIT5 UniRef90-Q7AGB3 UniRef90-R5C3N9 UniRef90-FoZ3X0 UniRef90-R7D4X2 UniRef90-ROLD22 UniRef90-B2TL41 UniRef90-UPIO0047DD495 UniRef90-D4N180 UniRef90_W6CHK3 UniRef90_H1AJF4 UniRef90-F5YF08 UniRef90-G8U184 UniRef90 ${ }^{-}$B6FX01 UniRef90-VoPR57 UniRet90-D1ANR4 UniRef90 R9LTH4 UniRef90-R4KAN9
UniRef90 B7CDO2 UniRef90-R6LMF2 UniRef90-E2SNW2 UniRef90 LTWWQA2
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UniRef90 G9RZJ8 UniRef90-N9W5G9 UniRef90-R6TYY3 UniRef90-G5ILT2 UniRef90_T4H1K5 UniRef90_S8CTE2
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| :--- |
| UniRef90 EOW4J8 | UniRef90-W0FP20 UniRef90_SOEPM7 UniRef90 ${ }^{\text {B7CCC4 }}$ UniRef90-R6ND32 UniRet90-F1TG32 UniRef90 XosYuo UniRef90_UPI00047A3752 UniRef90-A5HUQ1 UniRef90-FOYTG2 UniRef90-C7XCZ5 UniRef90-A4GKI6 UniRef90-UPI0003F976F2 UniRef90_S2KRM2


R GNVKTKGVSNFFEAVQALILLHEMLLFENHTGSMSLGRLD ARVPENGATTFYEACQSFWFVQCLLQUESSGHSUSPGRFD HRIPAEPCKGLKDAMQAKFFTFLICHAIERYASGYAQKED QRVPAEPCKGLKDAFQAKWFTYLICHALDRYASGYAHKED RRVPEHPADGFKDALTTDWVCWTALNLENPNVGFSAGRLD ERVVENPARTLDEAVNSMWITWVGLHMESMNAGLSLGRLD

RHVPENPPRNFREADQSWWFTH配TQDEQSGCGSSPGRDG ERVPAKAPRNLQESFQMDMLI QTMCRFEASEGAWPARPD RKVPEQPATSYYEA पQSFWF QLILQ $\begin{aligned} & \text { ESSGHS } \\ & \text { SSPGRFD }\end{aligned}$
ERVPAKGANTFYEACQAFWFVQLLLQDEASGHSTSPGRFD QRIPGEPCQGLWDCMQMKWYVYLMCHAIDRYASGFAHKED

DRVPENGATNFYEACQSFWFVQALVQTEANGHSTSPGRFD EWVPEHPARNLREAMQSHFFCHIVAEIEQVGCGYSEAYGG DKVPENGASNFYEACQSFWFAHALIQLESNGHSGSPARFD
EHI AHKQPRNFREALQMIVMVHMASVNEDAGSMSPGR EHIAHKQPRNFREALQMIYMVHMASVNEDA\|SGMSPGRIG RQVPAKPARSMHDALQAYVFFKTLCRNESMDHANGPSCDG HRVPAEPCKGLRDAFQSKWFVFLGCHALDRYASGFAQKED
HRVPEYGATNFYEACQSFWF QMLLQVESSGHSISPGRFD RRVPEYPAENFWEACQAF DFTQMUQLESSGHSVSPGRFD
ENDAHKRPASFREADQMTLCLHYGVVNEDPQSGQSDGRDG DWVPGNPARTFKEALQALWFITMGGWQNDCMTVHAPLRFP HNIAHKQPSTFREALQLTFLCHLAVVNEDPQSGQS UGRDG SRVPYEPATTFAEALQSVWFIQCILQUESNGHSGSYGRFD GWIAHKQPRTFREALQLTYIIHMAVINEDADSGLSPGRVG GKIKTQKPETFQEALQULWLYALLS ERVPAKPPRTLQESLQYDLFIQNFSRTEAVEGSWPARPD
DYIKENKPKTFHQALQLEWITYALCA EKAPYEPCTGFYEALQLVWFCQFSLNLLADTSLLAAGRAD FWIEKYQPRTFDEALQMIETCHFAVVNEDAGSGLSPGRDG
 SAR RNNPKTFHQALQMFWLYALLA SRVPYHPAETGHEATQAYWFAYCMV NSGGEYVPVGRED EYYLEHKPATFHQALQLFWLYALCA AVIRTQKPSTFHQALQLEW Y EKTSMQKPETFTEALELVWMDQLIGNLFGNGSALSLARFD

SK DPANAPETLLEALQFDRLLHYAMWCNGNYHNTTGRTD DNFTKGTAESFYEAIQLIHFTQNDDNDIYQRSVVALGRLD ENDSKDKPDSFREA】QLAWLYSTVC MTYTIHIASVNEDADSGMSTGRFG RHVPEFGARSLYEAMQSYLLLWQVMCLEQNPFAFSVGNAD KHI QDQAPENFQEGLQLYWLYSVIS DQMNTGRMD DRI PHKGASTFREMLQFFRILHYTLWAEGEYHNTDGRFD
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HTTKTEGAQNFRQADQLLRTLHFSTWEAGNYHNTLGRFD TRLLSDVPHTLQDALQMQRII HFTMWCAGNYHNTLGRFD RKVPEHGAENLYEAI QSFILI WQTMCLEQNPFAFSVGNAD RKVPEHGAENLYEALQSLRLLHYLAWLEGNEYHDGLGRFD KAVPAHAPQSFDEALSMFRIIHFTMWCGRNYH NTVGRFD RKVPGEGAENLFEALQAFILI WQTMCLEQNPFAFSVGNAD RKVPEHGADDLYEALQSFMLIWQDMCLEQNPFAFSVGNAD RKISSQPAETFRESVQLLWFGHLGTILESFEF DNYGRLD KKVPFNGAENLYEAIQSFIILWQMMCLEQNPFAFSVGNAD KKVPWQKPDTFYEAVQSAWFMQLIYYYENNSVAQSPGRDD

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 Q Y M Y P F LiCA D K S QYMYPYLKND $\quad$ NIDRKFAQELVDCLWVKLLNDVNKTRD TLLWPYYKADKKFQPMDHMGAVELVEMERLKISEHGAGKS SLL LWP YYKA DK S F QPMEYK DAVVELV EMERLLKI S E HGA GK S QV L Y P LLY R Q D V D R GRELHPAADA L E L L C F F WL K I G D HV PM M P Q WL Q P YY VA DMEK $\square K$ SKEAHA IGLI GNFYMRCTDHFPDTP
 Y Y HGPF YEK DVQDK TLTEEEA T DVI GEFMI RAYEVGGFGP Q Y Did P F Y Q A D $\quad$ M

 Q Y M WP Y LIE A DKS $\quad$ DS KEFA QEML QYMWPYLEADKS IISKEFAQELLDCLFVLLNHVNKTRD Q NLEPYYQADKAAGLI NYEDAVFMFENLVI KLLNEI GYYFG QYMYP Y L E K D S S $\quad$ L S E E Q A Q E L L D CLLWL K F N D V V K V R D



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QFLYP Y Y R H DLD A GLLT K DEA LEELLEEFFVS CNN R D Q IL W P Y Y K N D L E K E K I T R D F A L E L I E E L N L K L T WV T L L P T V Y L G D F C A R D I D S GRI K E D E A L K M V M S I




Q Y M Y P F Y Q R DLEN GTWT K E EAFDLLEEFF LVCN K D

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 D Y L G D L L E R D L D R G L Y T G E EA V A Y I C S F F K LMM R E A R R T

 K Y L WWP Y L K K DL E N G S C T L E E A E E L V E E L $Q V L V K Y L D K D K D T D E D Y L K K C T E L E E C B I I K A A W R L D N T T$

QILNPFY LA DWQKLDSAHAQAVEDVSHFFLHCSDHVP LS T TLLWPYYKADKKF QPMDHMGAXELVEMERLK DSEHGAGKS
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340
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360 ANEMCYQNVTIGGTTVSGELTSNP\|TLMCLIRAT GFQNVTVGGCDSCGKSLVNDLTLILLRAS EVSAQAFAGYAVFQNLCVGGQTEGGLDATNEVYMCMEAT EVSAQAFAGYAVFQNLCVGGQNEEGQDATNEVSYMCMEAV RAYREIFPGSNDLFILTVGGTNARGEDACNDMTDALLEAA RAYREIFPGSNDLFILTVGGTNGDGSDACTDMTDALLEAA EAAEQLFGGTGANQATVGGMDSQGNDSVNDVTYALLRAT DLANFYFGGSSSDQALTLGGITPDGKDAVNDMTYIFLKMVT EVGAQAFAGYAVFQNLTVGGQTEDGLDATNEMSYMCMEAV GVIAARQGSGHTGHTINLGGLDAGGRDATTELDYILLDTQ RWAREGMQGITGTWVWTLGGVKPDGSDACNALTTAFLRT DGTATAFAGYQMWQNNCGGQTKDGRDATNPTSYME:EAM R V N R E $\square$ F
 A NTANYFA GYNQF QNLTVGGKKRNGTD GTNDDISYMCLKAT

 $M G V V G G V L S G N T F N N V C L G G L T R D G Q P A A N R L E M L L L E A G$ $M G V V G G V L S S N T F N N L T M G G L T K D G Q S A A N R L E M L I M E A S$
 K DSSEGFAGYSLLVQNLDAGGQNAAGEDVTNDLSFMSII AT AVS A QA FA GYQVVFQNIGAGGQTADGQDATNDIMSMMMETV

A GVSGGVLS GNTFNNLSLGGQSYDGRSAVTP VYLI EAG
 $S G V T G G V L S G N T F N N L S L G G L A R D G L T A V T P L E Y L I V A B A$
 GVVGGVLSGNTFNN TLGGLKKDGSSAANRLEYLIVEAG
 $K$ WARE GLQG DEGTWVWT LGGGVKQD GSDACNDMT DA LLQA
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 H N Y C F GQAANHTMMTAVVGGVGPDGHDATNELSYMII E L V HMSEET T GTKDTLEYLTLGGINADGTSAVCELSYDMLEAA


SDLYP GMQQ GDNGQS LVLGGRDPEGKYLFNDLSRMCLQAS $D L Y P G M Q Q G D N G Q S M V L G G M T P E G K D G F N L L S R L C L Q A S$ WA $\quad \square$ SQNLII GGKSNEGEDMTNPSSYALLDAY

 WA IISQNIIISGRD IDGGNDLTNPTTYALMDAY
 WA
 ETDCRVIVGGYGRRNPENADRDCMTALEACRTVRELIL TSSARYFAGFPTGYTALLGGLTESGRSAVNVLSFLCLDAY
 TSSARYFAGFPTGYTALLGGLTESGRSAVNVLSFLCLDAY GSHSKASAGSPLYQNVTIGGQDGQPMDAVNPLSYAILESSC AF $\square Y \mathrm{DY} V \mathrm{~V}$ Y GTT AVVCGVGGNFPQGEGGANEVTMLCLKAS



SGSET LFAGSGSNQALTVGGTRYENVDAVNDMTYIILKAT RAYREI FPGSNDLG ILTVVGGTNAKGEDACNDMTDAILEAA TGY $\square$ Q G GYGP D





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430
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NDEVIIPMEDAREYNIIGCVEPGKAGKTDGWAAFFNMVR NDEVGIDDYDARNFGLI GCVEPSVPGKEQGWHAGFFNVAK NDEIVIPEFDAYNYAAIGCHETAVGGKWGYRCTGMDNFAR NNQTGMNFMMRRAWCLGGCLEPGGASPTCGTGIHFTADPK NNQCGMNYMDARAWCLGGCLESHYNGKTTWDPGGFTGLPK NDEDIIPEDDAYDYSAIGCVETAVPGKWGYRCTGMMNFPK NNQEGMNFMDARAWCLGGCLEPGGGASPTCGTGVHFVALPK NDEVNDPEEDAKQYVPFGCTEFVIDQGKSTGTPNDCMNLDK NDEVNVPAVEYEQYIPFGCGEFVIQGKSVGTPNTLLNLTK NDRAGVNTVDAREYUHSTCVETVPICSNIQVATPYI: NPTK
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$V$ MELAMQR HANNP
$P$ L E MVVFS S GY E N $\quad$ G K L V G A P P T G S V V

$V F D \square A D H G G K N \quad R D G K Q L G P V T K P M P$


VLETTLNNGRCRGDKQLGPKTGEDDS FKDFEEGYAAFE

 $P$ E MVFSNGYEK GERVGDQTGDVA EMKSFDEFFAAYK

 PLEFMLSNGIDFKSGKHIGPAYGD PCECETWEDFYAQLL
 $V L E L V L T N G K D Y R T N L Q V Y P \quad P H N K K L E T F E E V V N Q F K$

 I L Q L A L N E G $\square$ D P M D N $\square$ K A GP V V V V S S L N E
 I L E L V L F D G V D P R T N V R V F P A T G K VLEITTLN GRCN GKQLGPVTGELE LE VMLAALELDSDEKI FDAYQ
 $\square L Q A A L N Q G I D P M D R K K A G P V F V K P D D R F K T F E Q F Y D Q Y K$
 $F V \underset{L}{L}$ A L N G G H D MLTTGRLLTYYESKPA E E I


 $T V Q D A C E$
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## LS F TKAVSDAAMEKLE




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


 CNALKKALTEME $V L E L A L C D G Y D W S F N D Q Y G P H T G D P R D F K T F A E L W E A Y R$ $I V \frac{1}{L}$ A $\mathrm{P} M \mathrm{M} R A M K N C$
 UniRef90_UPIO0025556DE UniRef90_G2TCX3 UniRef90_E0QH07 UniRef90_Q8L1A3 UniRef90_UPI00047356A4 UniRef90_-14C671 UniRef90_V4FI92 UniRef90_UPI0004674BEF UniRef90_A4J854 UniRef90_G7LUM6 UniRef90 B8FF75 UniRef90_UPI00034AB9DF UniRef90_K5VDU1
UniRef90-A9KN53 UniRef90_A4GKI7 UniRef90_F4AA78 UniRef90-T3I1X7
UniRef90_R5GB72 UniRef90_UPI00035CF80A UniRef90_A1RF33
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UniRef90_R5AFQ7 UniRef90_FOYVI7 UniRef90_R5XX63 UniRef90_UPI000472C68C UniRef90-C0CUZ2 UniRef90_X2N7K6 UniRef90_C0D3D3 UniRef90-E0W4J8 UniRef90-WOFP20 UniRef90_B7CCC4 UniRef90_R6ND32 UniRef90_F1TG12 UniRef90_X0SYU0 UniRef90_UPI00047A3752 UniRef90_A5HUQ1 UniRef90_F0YTG2
UniRef90 C7XCZ5 UniRef90_A4GKI6 UniRef90_UPI0003F976F2 UniRef90_S2KRM2
$R E \square R A Y$ 490
510
520
KEFT DA NGKGMKA CN G S F WGRLYYAPFLSFTMKGCVQK
 KQMEYFVRHLAQADNAVDYAHMERAPLPFMSALVDDCISV EQYQYAI NLCICTKDVSRYFEQRFLQMPFVSAI DDGCMEL




 K QME F F V K K L V R A D N S V D Y A H R R Y G Q L A F V S T MI E D C I G R



 K QLQF C E DVL R R G A W I A S MLLA A E Y L P V T T WR S L L T G G C I E S
 E Y Y A $\operatorname{E}$
 K Q Y A Y V T SLV VIR A K DVMRHFE CQVMQMPFVS S IDD GCME L A QSDYFVSLLVNADNADDVAHAERCPDPFLSGMIDNCDK R
 $R Y L D \square S N R \| V N R V N N M Q M D D W R K Y N M P A V N S L L K A D C F K K$ K Y Y E Y WELICRDIS T LE WNVMRDFPCPLLSAVTYDCLAR
 E Y Y E L L T C D V L A K K T N N N I Q H D



 ELLL D Y Y F E L S VVY A Q K H S Y E V M N E E V S S F L F N N S ILL M D D C L K R



 $\square$ VF H LID FIIDEQHETVGKMRIEDCFENAVTWTEGGTKY H






 EMCENTKNLYI FPAPF LSSLMMDGCL ENGRDDSLSEGMDYN
 $D K \square N A Q A D E L C K R V N G V Y$
IF YKNVE E Y T DKMAAAANAASEAI L KVPF L SVVMMGGAKY N KNVQHFVDEMAKAANGASRA DSTQ RVVFLS CLMMGTKYN
 S ELLHMF MRKYREFGTWWKT DNPCDFFSATMPS C DE GA EYN FFAHEMAKSANGASEADST, QRVPFLSCFMGGQQGTKYN


E QLE WL V I Q C Y N VMLLE N Y G N L A D $\square$ CPSPLLSVLID GCVE K
 K QMQFFIDDQSTF GLVEYYMLDDEFVNPSPLVSSVFGGCMQQ




 $K E V V$ V S A D A L V A L K N S Q Y LDWQ H K V W P E M I T S T CM H G P I E K

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R $6 N D 32$ UniRef90-F1TG12 UniRef90-R6J307
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|  |
| :---: |

GKTYGNTNAADSLAAVKYWVFDKKKYTLRQVVAAGKNFE GKD $\square G \square A N L S D S L H A L K G L V F E Q H R L S F D E L G E K V R A R L I ~$

G $\square \mathrm{C} \square \mathrm{GV} \mathrm{SNT} \square \mathrm{DS} \square \mathrm{FA} \square \mathrm{QK} \mathrm{LVY} \mathrm{DEDTAMVDCLINDWGFNM} \mathrm{\square}$
GRHMGTPNVTDGTYATRTAVFDQHTCTAEELVSAMRADFK GRDTGIPDMINTLAAIKKWVFDEKKYSLQEVLDAMRSNFV YRNVGIHGAGSGTNGLKKLLEAKRRN FEGSEELRRKLH GRDVGVADVADSLAALDEVVFQQHKYTMAQQLKALRNNFT PDSEGVTGLADVIDSFCVLDTLVFKMSAGELLAAMQADFD GMDVTTVVAANSLVA KKLVEEEKKYTLEQLSQALKANWE GIDASNGGLAVVADSLAAMVFEKGRYSFAEMVELLDADWS YQGAQLLGLPNLVNSLLNDKKYVYEQGLVSLGICREVVQT GKDVGVPNVIDS YAMKKLIFEERMYTMEELLDALERDWE

UniRef90 FOSW32 UniRef90_UPIOOO25556DE UniRef90-G2TCX3 UniRef90-EOQH07 UniRef90 ${ }^{-}$Q8L1A3 UniRef90_UPIO0047356A4 UniRef90-I4C671 UniRef90- V4F192 UniRef90-UPIO004674BEF UniRef90-A4J854 UniRef90-G7LUM6 UniRef90 B8FF75 UniRef90-UPIo0034AB9DF UniRet90-K5VDU1 UniRef90-A9KN53 UniRef90-A4GK17 UniRef90-F4AA78 UniRef90-T311X7
UniRef90-R5GB72 UniRef90-UPIO0035CF80A UniRef90-A1RF33 UniRef90-R6J4M6 UniRef90-UPIOOO36D2248 UniRef90-G1V073 UniRef90-b9M011 UniRef90-R7G068 UniRef90-E6MIT5 UniRef90-Q7AGB3 UniRet90-R5C3N9 UniRef90-FoZ3X0 UniRef90-R7D4X2 UniRef90-ROLD22 UniRef90-B2TL41
UniRef90-UP100047DD495 UniRef90-D4N180 UniRef90-W6CHK3 UniRef90-H1AJF4 UniRef90-F5YF08 UniRef90-G8UU84 UniRef90-FOYVZ7 UniRef90_B6FX01
UniRef90_VOPR57 UniRef90-D1ANR4 UniRef90-R9LTH4 UniRef90-R4KAN9 UniRef90-B7CDO2 UniRef90-R6LMF2 UniRef90-E2SNW2
UniRef90-L7WQA2 UniRef90-L7WQA2
UniRef90_R6MR39 UniRef90 UPI00036D7327 UniRef9O-UPIIOOO16BFDA6 UniRef90-X0U2F6 UniRef90-R5IZ82 UniRef90-XOT8V1 UniRef90-SOFN65 UniRef90-T3E3P1
UniRef90-G9RZJ8 UniRef90-N9W5G9 UniRef90-R6TYY3 UniRef90-G5ILT2 UniRef90-T4H1K5 UniRef90-S8CTE2 UniRef90-F7KFR6 UniRef90 FoZ 126 UniRef90-UPIO0046F3BDA UniRef90-N9Wwso UniRef90-R9MJN3 UniRef90-R6NVFO
UniRef90 R5AFQ7 UniRef90-FOYVI7 UniRef90-R5XX63 UniRef90-UP1000472C68C UniRef90-COCUZ2 UniRet90-X2N7K6 UniRef90-COD3D3 UniRef90-EOW4J8 UniRef90-SOEPM7 UniRef90_B7CCC4 UniRef90_R6ND32 UniRef90-F1TG12 UniRef90-R6J307
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 NRCLKYGND【PEADKYMKEITDLYCATVRDQKNNRGYSYQ

F GYSDE
KRAPKWGNDDDYADGTITRFYEETIGEMRKTTNYSGGPVM GFAPKWGNDDPYADTII SNFYEDI GEMCKITNYSGGPVN QKVPKYGNDDPGANENAQWLVTYLDEAFRGKDNYRGGKYR NDIPKFGSGSEEAVAMANRUTKWAHDYYGSGPHYRGGKYT NCCDKTCSGAESTDE
$G N A P K Y G N N D P Y V D S A K E V D R E A L E F T R K Y S K E D G V H F D$ $G N A P K Y G N N D P Y V D S D A K E V D R E A D E F T R K Y S K E D G V H F D$
$G Y A P K H G N G D A E T D A L I R R V Y D D A W T L F H S G D D Q D N F F G D$ GYAPKWGNDDDYVDDLMLRCLRTLAKHSRVMRCTSNNTGP
NKYEKYGNDTDEVDALGSELLRLFCKEDEKYDNPRGGKFT MTTKNAGLLKESSHLSI
GYAPKWGNDDDYADG| TKKFYED ${ }^{\text {GAGEMRK }}$ KTNYSGGPVM GNSPKFGNDDDYVDDLFVKLWDHYNTTCLSETYYLGLQWU GYVPKYGNDNDYVDSLADEVSDFYYTETRKYKDDFGSKFN GEYPKYGNNGAEPDHMVRRVNDS $\square F K N V D G G G N Y R D \square K T S$
LRSFKYGNDTPEVDGTLAEFEDWYCGCGDKYESTYAKPFY LRAPKHGNNIEMVDEILKDYEAWFCQVCRNYESLYGKPMY CDAPKFGSDDDFADKWCRYAHNLYNTSDLKRRNSRGGVLQ GHAPKWGNDDPYADGGISKFYEELLGELAKVTNFSGGPVL
NGAPKYGNDDDTVDTLLARAYQTYTDELKQYHNPRYGRYY VNAPKYGNADPYVDQLLRDYQMYLKDYLPTLKSYYGKPEY GHAPKYGNDDDYVDD GRQLHVDFAEDHNRRPDYMGRPTT


WNCGKYGNDDEEADELANDLYEFVAKGNRDRGLKKGMDYF MS LPKYGNDEEECDELANDLFEYVAKGMRNKGIDNNMDYY NKAPKYGNDDDYADEULSKVMKDFESKIEDWRTKQDKLLI GYEPKYGNDDENVDEFANDLYEYVAKGIRNRGDQHGMDYY GYVDKYGNDKTECDELANDLGEYVAKGIRARGDAGLGYYL NKYPKG GHVPKYGNDEDLPDTYARQVAEIFCQEVAKNGPERGGVYW GYEPKFGNDDDFVDSIAVQLADWYADALEGKKNDRGGCFR NKYDKWGNDDEEIDKLANELWNLFCSEVVNHKCMRDGHYN LDAPKYGNNDDYADNLLKNYEVWLSKVCEEAQSGYAKKMY HNCPKYGNNDPEADAEAVEVASRASDUVSRDKNYLGNPFR GFAPKYGNNDPEADAMVLKVYDHVARALECTETVGLDHYT YEEAKLGDDNDSVDG\|AAKLVGWFADSLEGRHNERGG\|FR GYEPKYGNDDDYADEDMQEIFNAYYNEVTGRPTVCGGEYR DEAPKYGNDDDYADLIAADLKNFTEQEHRKYKTLYGSVLS YEAPKMGNNEELPDSIUAGDLLEAFARAVKGKKNVRGGCFR KDAPKFGNNDAKVDDEAAEVANRVSDMVASKKNYLGNPFR
 GYADKFGNNDEKVDNEAAE ASKVADVVAGEKNYLGNPFR WNAPKWGNDDQYVDGGAVDLAEFCLRETSKYKTFSGGQL



GEAPKYGNDDPYADDDAVS LHEY DCRKVSDQAKPNGFHYN NRFEKYGND $\begin{aligned} & \text { DDDVDNISAELLRHYCKEVEKYRNPRGGQFT }\end{aligned}$

GY $\square P K Y G Q E N D D A D D F A R T V V T D \square A K M F V T R R N R F G G \square F R$ SPAPKFGENDKEISE DGSYIIETYCNS IKSSKKDFNIRFT DEMPKVGNADAAVDSELRFLFDCFADKRKDRPGSGSAMYY SNAPKYGNDHALSDGYADLAARRDFHSALARHCNTRGGPYV
 DYEKKFGLCDEYVLDRDSQELDGTVSETIGGKLTANGYNV G Y
G QVDK F GNDLD DVDRMAVKVSE HVREVLESKRNIKGFFFR K RCPK F GNDQEEADGMLKSLURRGVCLTAKQAKRVGLDSYL

UniRef90 FOSW32 UniRef90_UPIO0025556DE UniRef90-G2TCX3 UniRef90-EOQH07 UniRef90 Q8L1A3 UniRef90-UPIO0047356A4 UniRef90-14C671 UniRef90- V4F192 UniRee90-UPIo004674BEF UniRef90-A4J854 UniRef90-G7LUM6 UniRef90 B8FF75 UniRef90-UPIo0034AB9DF UniRef90-K5VDU1 UniRef90-A9KN53 UniRef90 A4GK17 UniRef90-F4AA78 UniRef90-T311X7 UniRef90 R5GB72 UniRef90-UPIO0035CF80A UniRef90-A1RF33 UniRef90-R6J4M6 UniRef90 UPIOO036D2248 UniRef90-G1V073 UniRef90-B9M011 UniRef90-R7G068 UniRef90-E6MIT5 UniRef90-Q7AGB3 UniRef90-R5C3N9 UniRef90-FoZ3X0 UniRef90-R7D4X2
UniRef90 ROLD22 UniRef90 B2TL41 UniRee90-UPI00047DD495 UniRef90-D4N180 UniRef90_W6CHK3 UniRef90 H1AJF4 UniRef90-F5YF08 UniRef90-G8U184 UniRef90-B6FX01 UniRef90-VOPR57 UniRef90-D1ANR4 UniRef90_R9LTH4 UniRef90-R4KAN9
UniRef90 B7CDO2 UniRef90-R6LMF2 UniRef90 E2SNW2 UniRef90-L7WQA2 UniRef90-R6MR39 UniRef90-UPI00036D7327 UniRet90-UPIO0016BFDA6 UniRef90-X0U2F6 UniRef90-R51Z82 UniRef90-X0T8V1
UniRef90 SOFN65 UniRef90 ${ }^{-}$T3E3P1 UniRef90-G9RZJ8 UniRef90-N9W5G9 UniRef90-R6TYY3 UniRef90-G5LLT2 UniRef90-T4H1K5 UniRef90-S8CTE2 UniRef90-R6ZG60 UniRef90-F7KFQ6 UniRef90 F0Z126 UniRef90-UPIO0046F3BDA UniRef90-N9WWS0 UniRet90_R9MJN3 UniRef90-R6NVFO
UniRef90 R5AFO7 UniRef90-R5AFQ7 UniRef90- $55 \times \times 63$ UniRef90-UP1000472C68C UniRef90-COCUZ2 UniRef90 - X2N7K6 UniRef90-COD3D3 UniRef90-EOW4J8 UniRet90-WOFP20 UniRef90-B7CCC4 UniRef90-R6ND32 UniRef90-F1TG12 UniRef90-R6J307
UniRef90 - Xosyuo UniRef90_UPI00047A3752 UniRef90-A5HUQ1 UniRef90-FOYTG2 UniRef90-C7XCZ5 UniRef90-A4GKI6 UniRef90_UPIo003F976F2 UniRef90_S2KRM2

TGTYTVQDHAKMGYLLTGALIPDGRTAGTALSNGFASIVQGKD ${ }^{630}$ AGLYTVHDQSVMGKKTGALPDGREKC $\square \mathrm{SLSNADSAVQGMD}$

PTGQAVGПYmeVGSRTGPTPDGRFGGEAADDGTSPYMGTD PVGQAVGLYMEVGSRTGPTPDGRFGGEAADDGISPYMGTD VGYWTMTVHAGLSEVTGALPNGRKDGENFASGITPVSGVA

पRLVPFTSHVPFGKVVSASPNGRKAYTPLSDGSSASHGAD NGAFSLSDHNYFG\|LTGALPNGRKKGTPLTDSVSATPGSD $\square S P Q N V S G N \square H Y S S V V G A L P N G R R L G D A L D G G \amalg S P G P G L D$
PGSYTVSAHVPपGAVVGATADGR【SGEQLADGGSPMLGKD PVGQAVGLYMEVGSRTGPTPDGRYGGEACDDGITSPYMGTD PAALSI SAHGPFGRVCGATPDGRVSGVSLTDGISATPGTD SAFMGปSNYVPTGK』VGATPCGRKATKPLTEGVSPFVGTD
$\square D Q Y T K S V H N M G K V T G A \square P T G K K A G \square A \square T D G S S A M P G T D$ VCQMSVSTHAPQGAATLASADGCLSGTTFADSMSAYPGTD ACQTSVSTHGAQGAVTLAGADGRLYGTTFADSMSAYPGTD PGGVSMSVFVPHGAVCGALPSGRKAGKPLANGVGAVIGAE PVGQAVGLYMEVGSRTGPTPDGRFGGDAADDGISPYFGTD

AGTSSTSANVPFGAQTMATPDGRKAHTPDAEGASPASGTD $\square C Q \square S V S T H G P Q G F V T D A S A D G R D A G T T Y S D S V S A A A G T D$ PSAYSVTGHYPFGMRSWASPDGRKAGETFTDATSATPGTD

ACQTVSTHGAQGAATLATTDGRLAGTTYADSMSAYPGTD LCQISVSTHGPQGFDTLASADGRLAGTTYSDGSSAESGTD LVLSNNQNTEWGNQTAASPDGRLSEMYMNPANNPQGGAD IVDSNNQTNTDWGHQTAASLDGRKSGVYMNPANNPQGGAA PSYFAWIDHGRMGKDAAATPNGRKQGEALSENLGASQGMD ACQUSSTHGAMGSATMASADGRLQGTTEADSMSAYPGTD


VVVINNQVNTEWGRMTSASADGRLSSMYMNNGNNPQGGAD PGSYTVSAHVPLGAVVGATPDGRFAGEQLADGGSPMLGQD

PG $\square G T F E G Y \nabla G D G A P C G A S A D G R R N G M P \square A S D \square S P V P A A Q$
PMVLTF TYAPLAAAQLGATADGNNMHTMVAQGLTPQSRSM AGCGTFEQYPLQGLGUVASPDRNSNDPLAPNLSPYPGTV DWLVNNNSPWAFEPKVKATADGRLNGEAFSTSLAPSHGDK
PGFYSVTHVAGGRVGALPSGRKAGEPFAASGGSCNGRD PGFYSVTCHVAFGRRVGADPSGRKAGEPFAASLGSCNGRD
 KFGLSSPSY SRGKVASATDDGRNAGEPFAVHDSPGSST

PS LFQ FMGHTYAGPFMGATPDGRHKDEF LAHGMNPMPGRN $1 \vee V \square N N S A N T S L G L L T G A G A D G R H A F V S M A N A N S P Q A G A D$

## UniRef90 FOSW32 UniRef90_UPIOOO25556DE UniRef90-G2TCX3 UniRef90-EOOHO7 UniRef90 O8L1A3 UniRef90_UPIO0047356A4 UniRef90-I4C671 UniRef90- V4F192 UniRef90 UPI0004674BEF UniRef90-A4J854 UniRef90-G7LUM6 <br> UniRef90- UPIO0034AB9DF <br> UniRef90-K5VDU1 <br> UniRef90-A9KN53 <br> UniRef90 A4GK17 <br> UniRef90-F4AA78 <br> UniRef90-T311X7

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UniRef90-R7G068
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UniRet90-D1ANR4
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UniRef90-E2SNW2
UniRef90-L7WQA2
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UniRef90-UPI00016BFDA6
UniRef90-X0U2F6
UniRef90- R 51282
UniRef90-X0T8V1
UniRef90- 3 TE 3 P
UniRef90-G9RZJ8 UniRef90-N9W5G9
UniRef90-R6TYY3
UniRef90-G5ILT2
UniRef90_T4H1K5
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UniRef90
R6ZG60
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UniRef90- N9Wwso
UniRef90 R9MJN3 UniRef90-R6NVFO
UniRef90-R5AFQ7
UniRef90 - 5 KXX63
UniRef90-UP1000472C68C
UniRet90-COCUZ2
UniRef90 X2N7K6
UniRef90-COD3D3
UniRef90-EOW4J8 URe90-WOFP UniRef90-B7CCC4 UniRef90-R6ND32


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QLGPTAVLKSVSKपDNYLLSNGS LLNVKFTPATLEGDQGL
KKGPTAVLKSVSKVD STTQKANLLNQRLSVPПMRSRHGF VNGPGALLNSGLKLDSVKMRGGSVQLNMKLHPDADKNLD
VNGPTALVMSATVGNDAVKWTATHMNMKVQPDQLKTRKGR
RNGAYALFESATCWDHSRSQNS QMNTKLHPNAVKGTEGS LHGAYALFESACCWDHSQSQNS QMNLKLHPNAVAGIEGS SNGLLSNFNSMGKINFYGNFDTQ WNVRIDGGSCDTPEGR

H DGPTAVDGSVGKDPTAADLGGVLLNQKDNPATDENESDK KNGDYAIFESATVYDHSQNQN AQMNDKLHPSAVKGLSGT $T S G P T A V D H S A V K L D D P V V Y G S T H F N M K F H P T A L T G K E N D$
$K N G D Y A V F T S A T C Y D H S R N Q N A Q M N V K D H P S A V A G D N G T$

KNGPYALFTSATVWDHSRSQNS QMNLKПHPSATKGПEGS NNGDYAIFESANVYDHSMQQNS QMNLKLHPTAVKGLNG KSGPTAMLNSGAKFDAKYH AGSQQNMKESPSMFNQNREF KSGPTAVLNSGAKFKAKYHGGSVQNDKFTPRMMHEDKEK RNSPLGVVRSISKGDQSYGDGGIATNFRFSQSFAASAEGK QNGPYAVLSSATVIDHTMSQS NFKNTQNMKLHPAS

KNGPTALLNSLSRFDAKYH GGSVQNTKFTPNMFNKNRKI KNGPTAVLRSLSRFNAKYH GGSVQNIKFTPRMMHEDKEK VKGPTAVIKSATKPDLLRYYCGCPLDIVGNKNEFDGDVGM NSGPTAVLNSLSKFNVKYHGGSVQNIKFTPRMMYEDKEK KSGPTACLNSLSRFQAKYH GGSVQNUKFTPRMFNEDRTK
TEGSTALLNSVLKLSHKDVTGAHALNFKTSPSFVKDREGT KNGPTSILKSUTKPDLKELEGGTPVDLSLNKNEISGESGR SQGPTAALKSAAKLNYLLATNGVAYNLKLRPGYLKGDEG CEGPTSIIKSFAKPHLTRVANGGPLTVELSDTMFRN ED KNGMTATLNSHAKDNYELATNGVAVNVRLSPQNLEGDEND
 CNGLGFRTLSAMKLPYEKFSGGVASHFGIDPKYFTAQTME KSGITALLHSMSKYDHSLHSGGVTNNMRUSKELFQNSYEK KNGVTSLLNSMSKFDHSDH AGVINNVRFSKELEQTSYEK TNGPTAVIKSCAKMDH DKTGGTLLNQRFAPSVVQGEKGL QKGPTSVIKSFTKQHLDRVVNGGPLTGEFDQSVFSN SKGPVSVVKSFTRPCLKHTVNGGPLTVEAHDTLFRGEE
 HSGLGFRVLSGMHLPYEKMNGGYASHFGINPGYFKADTFE ENGLGFRMLSNMKLPFDKMNGGYASHLGULDKYFKAPTYE NDNTATLLDADKRLDYTEFPGGAVTYMDIPVVKDTMQP ENGLGFRVLSNMKMPFDKFNGGYASHपGVDPKYFKAETYE

KNGLTAMLNSILKPRHDNH
KNGPTAMLNSLVK■RTDपH AGSVQNMKFSRSMFTQKRDQ MQGPTAVLK

D पP PNPAFRN $\square Y$ QAMESYKSDAVTYG $\square$ SNASPVDMN $\square D E T$
SCGDTAAMNSCTKMPFYYFSGGASTMWDLDPHWA
QKPTAHTLESLKALNLNKLAAGATTDCIDYKANNVEHTA VDGVLSVLKSYSVIDYSRIMNGGPITIELSPSVFKSDDGI RLGPTALLNSVAHVDSNLAPNGYALNLRFDPHTLAGDRGV KANGEPVINLDHMLNANTVQNGYTYNLSLTTRDRGHFEED
 DШAEVLDFASSLSYPVN CLLNGNVVDYVIPPVYLNNSDKL

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AKATRHLINSYFA
700 年 ${ }^{710}$
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HDTNTDHVQFNVVSTDEMRAAQR WNSYMKTW HDLNTDHVQFNVVSTDEMRAAQR WHAYMDTWHD LINDH:QFNVVSNEELRAAQR MLDHFAPLWKGYFAGEKPDPGGDEI QFNVMDHETFLDAMA SREKTVNDMFSYVKTYFD पGGMQLQLNVVTSDMLRDAMA
GTQK $\square$ ASF $\square R T W C D$ T $\quad \square R \square W H L Q F N V N K E T L L K A K K$ $R K$ L $\quad$ AALDKDYMDRNGSHI QFNVVSSETLRKAQA QLWRAYMRTWAD LGLDHUQFNMVSDKTLRAAQK
SK L S DF $\square$ RAFMK
K TWLA YMNT WY D
GSKKLVDLVRTYFE RNLTS M I K S Y F A
LGGFHVQFNTISNDTLLKAQE

D Q $\square$
KKL
RKL
K D

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$R K L L D V$
QRAYMR
$R K$ LLD V
$\begin{array}{rl}\square L & R \\ K & \text { K Y Y F } \\ \text { R A }\end{array}$
KK L
LDDTRSYMR
KGGFHVQFNVVNSEVLRDAQA
IK A $\square M K T Y F F R K G G C H L M V T V V D K K T L E D A D D$
VK SFWKSYMDTWYN
KGD Q NVSETLRSAQR
RALLVEFDKYFMDQDC
GAKKLIDD SSSYMR
IDKGNMGAKMLDMDRSFMDN
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IK s
VK A L F R TYFK
KRMESVLK
VK
GVDVLQ GLLEGY
$\square$ R S
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KRLMS $L \square K S F C A$
GIDTVAALLKTYMQ

NREQFEVLLKTYFK $\qquad$
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VK GLIDRYFD
VN ALLKTYFR

R G G A H $\square$ M $\square$ TVVGKED $\square$ K K A ME K G G G Q $\square \mathrm{M} \square \mathrm{S} V \mathrm{~V}$ S K GE $\square \mathrm{E}$ D A Y Q

FP LIED $\square$ KKF $\square$ KHYAQGTVGGNLIT $\square$ T CANVKTYEEAVK
SEKLIADLLMTFFHNGAQVFQGNTTDVKELIEAQK G I INKF DESDGNMMTLADYQKDYELSVNSSDKEASKAAYE
 TELLFSRYMKAFADQNGVLVQMCVSSVNDLEAEHK
WNAYMKTW $\quad$ AK
WNAYMKTW $\quad$ AK $\underline{V} P$ ULRDAFKKGLYQLQLNVYDRATLIDAKL

ARF $\square \mathrm{NH}$ FTRDFFQKHGVQTNLNDVDLKELKKAMD

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KPEDYSGLVVRVAGYSAFFVELSKE DQDD पIRRTAHE
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$\square T K Y R K T Q G N Y M D Y R N F P E D R Y D H \square K P G \square D \square Y G \square D S G \square G S$ GCVCDGRNFRRFDNEMPKYWVGTFDRGDANEDKPHELDET KWNPDYPYDH LHERDERYD I I HG $\square$ GDDAHFAPDYEMGL QF DLYYRDHPDELIVGVMPSFSMGLGKRVMPYLTDEEQDPA PYTELGKEFS W $\square$ GP $\square Q N F \square R M G \square I P E D Q P S D \square K E \nabla W A K Y N T F P G E G G R$

K VF P N Y L T ED E K
LS T WMGFRKENEPEF $\square Y$ YYEKYN LQQ GCGGMNHLCPD

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$\square N \square Y$ VD T ${ }^{170}$ NGTGHFFP 180 IDEDLI LSHNDKLLGNMPTDYSKCSYWSIAGDLQRKREKM ASG\|I KEGNMTSGDAHLAVNFPLLLEKGLDGLRAKVAERR


TAAGFFGSLNEYSATGHNVPSYERLLEDGVDGLFADKKSMA LK GQLNE WSAM GHVVPNYEKLVQRGLNGLDEEMQAAR EYPGYRRLGNLTPDYRFLLENGVDGUGRMLEDK DSHFNSDFNDGDALGWGGFDEKIRKYREIHKGDKEKQEFY $\square K K Y R \square T Q A G F G G M N H \backslash C P D M E I G L R E G W K G L L E K \square R Y Y R$ GHVVPDFQIILDNGLQALIEEMQEDN $R \square G W G G L L D K \square A R Y R A D N G A P E Q Q H F Y D Q H E R A D R S D Q G W$
$Y Q M G V T E$
 AAA $\square G H V V P D Y Q V I L D K G L Q A D A D D I D D K K L$ MNHCAGD E DGDKLGWGGLLDKDRHFREFNDTSFYDGEEC $\square Q G F L R N L S E A S G V G H V I P N Y K K A L D L G L A D F Y E A S V L A L$

RAAT T T NRTELSLLGHNTVNYERLLKGG $\square R E D L E D C D R K Q$


$$
\square \text { N Q WS NF GH } \square \text { CPNHEK VT R R G } \square \text { R A } \square \text { I DEC } V \text { AS R }
$$

GHVVPGYEALLAYGDRGLSGR DDKAQ FRWFNLS LSP TSGVGHVVPGYEALLTHGDRGVSRQDDEAQ
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 L $\square G V \square E W I G R H V D Y A K K M A E T A E T E E D R E H Y D Q V A E V N$ KAVAGNMDRLYFYEAVIKYLESDETDLEAKKEYSDLVEIL

DTCTDPERK VVFANYAAAAEGQAELYRRDQEKPNHAERL QA $\square$ A ASDPQAEY $\square D G L A R T A H E T A D Q E \square E R K N L E A L Q H \frac{C}{L}$


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280
 EHI AHQPPASFWQA LQLCYFVQLVLQDESNGHSVSFGRLD
 RKDAHHKPDTFVEGLNLVFLLNCALH QTGEPMSDGRLD
 GELCEHEPRTFREAVQ FDAHFQAVDRTFYAGGALGALD KKLAKSKPDTFLEAAQLVFTMHCCLHIVGGPISIGRLD

 EKLSKDKPDTFIEAVQGIFTLHSCLH K KI PMEKPDTFHEA LQS $\square$ YFYHVALHSSLDLLS $\square$

EHIVAHKPRTFREALQLTYTDHDASVNEDADSGMSLGRFG
$R R \square P A E P C E S F T D A V Q C \square F D M N C A L H W$ TGEDTS SGGRDD

$R R \square A S G A P E T V L D A L Q L V L A C H A T L H \quad D C G E P V A V G R D D$ KKCSS
 K F L ELEPATSLLETCNNLLI FYKHLPSITSYP VYLGNFT

UniRef90 X1AH50 UniRef90_UPI00047EB064 UniRef90_K8C3H7 UniRef90 Q8A3J9 UniRef90-R9HMA1 UniRef90-I6ARKO UniRef90_S2KI19 UniRef90-UPI0003466F99 UniRef90-T2GGV4 UniRef90_R6N7Y2 UniRef90 R5H4V4 UniRef90-C3Z553
UniRef90_UPI000360EDBD
UniRef90-C3Z558
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UniRef90_R8Y5Z5
UniRef90 K7WJK5
UniRef90-D9SUM7
UniRef90_U2BKS8
UniRef90 T4K1L8
UniRef90 K2R5BC
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lupas_14
lupas_28
jnet
conf
sol25
sol5
SolO
jhmm
ssm
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UniRef90_X1AH50 UniRef90-UPI00047EB064 UniRef90_K8C3H7 UniRef90 Q8A3J9 UniRef90-R9HMA1 UniRef90-16ARK0 UniRef90_S2KI19
UniRef90 UPI0003466F99
UniRef90-T2GGV4
UniRef90-R6N7Y2 UniRef90 R5H4V4
UniRef90_C3Z553
UniRef90_UPI000360EDBD
UniRef90-C3Z558
UniRef90_JOMVV4
UniRef90_SOFWE3
UniRef90-R8Y5Z5
UniRef90 K7WJK5
UniRef90-D9SUM7
UniRef90_U2BKS8
UniRef90-T4K1L8
UniRef90 K2R5B0
UniRef90-UPI00035F4FA3
UniRef90-K7WJM6
UniRef90 UPI00018174D7
UniRef90 D4JFR7
UniRef90_Q8XZ58
UniRef90-D3AUK5 UniRef90 U2RHU6 UniRef90-D0ZBF3 UniRef90_R7GFB2 GPYPQGASLGQWDQQDTVGGTVADGKPAYNDVTRLFIRAS RAHREGQPGANDLHIITIGGLDENGNDATNDLTNVILEAS EDHMDYNAANNFLQNIIVGGKTPSGDDATNDCTYVILQAF FFNDTHYSQQGGGLTPSGDADMVSRVSFLVLEDAV A GVN G GVLS GNTFNTLSGGLKEDGSTGANELEEMMFL A ALL

 TVNGRIIVGGKGRENVEAADLFCKIADRVCKDTR GPYPKGQSVNQWQQQVTVGGLNADGSWEYSDVTLACLRAS SGK LLGDTGQII VLGGIDPNGDYFCNEYTHDFIEVM

TI TD S F CHANLGPHKTKAGEMIMRAT


[^0]
 $B B \quad B \quad B \quad B$

UniRef90 X1AH50 UniRef90-UPI00047EB064 UniRef90 K8C3H7 UniRef90 Q8A3J9 UniRef90_R9HMA1 UniRef90-16ARK0 UniRef90-S2K19003466F99
UniRef90-T2GGV4 UniRef90-R6N7Y2 UniRef90 R5H4V4 UniRef90-C3Z553 UniRef90_UPI000360EDBD UniRef90-C3Z558 UniRef90 JoMVV4 UniRef90-SOFWE3 UniRef90-R8Y5Z5 UniRef90 K7WJK5 UniRef90-D9SUM7 UniRef90_U2BKS8 UniRef90 T4K1L8
UniRef90 K2R5B0 UniRef90-UPI00035F4FA3 UniRef90-K7WJM6 UniRef90-UPI00018174D7
UniRef90 D4JFR7 UniRef90_Q8XZ58 UniRef90-D3AUK5 UniRef90 U2RHU6 UniRef90-D0ZBF3 UniRef90_R7GFB2
UniRef90_R6XXA5


[^1]

UniRef90_X1AH50 UniRef90-UPI00047EB064 UniRef90 K8C3H7 UniRef90 Q8A3J9 UniRef90-R9HMA1 UniRef90-I6ARKO UniRef90-S2KI19 UniRef90-UPI0003466F99
UniRef90-T2GGV4 UniRef90-R6N7Y2 UniRef90 R5H4V4 UniRef90-C3Z553 UniRef90-UPI000360EDBD UniRef90-C3Z558 UniRef90_JOMVV4 UniRef90-SOFWE3 UniRef90-R8Y5Z5 UniRef90 K7WJK5 UniRef90-D9SUM7 UniRef90_U2BKS8 UniRef90 T4K1L8 UniRef90-K2R5B0 UniRef90-UPI00035F4FA3 UniRef90-K7WJM6 UniRef90 UPI00018174D7
UniRef90-D4JFR7
UniRef90_Q8XZ58 UniRef90-D3AUK5 UniRef90 U2RHU6 UniRef90_D0ZBF3 UniRef90-R7GFB2 UniRef90_R6XXA5

 ND
GDKALVEGFMKRRR $\square A V G C N W M S D P G \square E Y T M N D V K \square N M A K$ NETLIMDNMVKFGYGTSACWEPLVDGRSSCQNNPFRSIVA NDDAG P ETEAVNY DPYGCGEYVIDHASTGSPNGLINLLH NDDRLVPAEDARDYTCDGCYEPVI QGKTEWAF SYVPLLPB QDDRLCQLA WSRNYAADGCYEPMLAGATGFSFN NVTPMT NDEVIVDADDAENYGTSACWEPLIPGRSSDQNNATLNLLI GHKGMMNEKDABERQAVGCGWSAVPGKEFCMNDDK NCVK FSKNGFP VEGRMRVKCGCNWVAIPGREYPGQDVRVNMAV
 HDDRLIPDEDARNYTCDGCFEPVFVGASEFAF CTFPLLD GDNSLVNGFVKCGYTAGGCHWMSIPGMEYTCLDVVKVNTAK S CNDGCPLQLARMRAKVGCNWTADPGREYPLQDVRCNLGF
NDPTWNSKVDI RNYACDGCYEPQFPGENWFSLGG FSTLD HEEKNTRQMIEHHWALVLCMAPGVGKKTRTEGGGLIWDDK NDDVM $\square H \square Y$ GTRDYCVDGCWEP LINGESDWTFGMMIN GMT
 N NDEGMTVE EARAFALGGCLEPGCWGKTYSIAGHFIANPK
 EKNTRQMIEHYKHWGLVLCMAPGVGKKTRTEGGGLI WIDK NDDKIIPAEDAHDYACDGCYEPQFVGANWFHLGGGVTLDQ NDEVNVPAVMYEQY $\quad$ PP FGCGEFVI QGKSVGTPNTLLNLVK NDNAAVRREDAHDYACDGCYEPQFVGANWFHDGGGVTLLQ





|  | UniRef90_X1f |
| :---: | :---: |
|  | iRef90_UPI00047EB0 |
|  | UniRef90-K8C3H7 |
|  | UniRef90_Q8A3J9 |
|  | UniRef90-R9HMA1 |
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|  | UniRef90-UPI0003466F99 |
|  | UniRef90-T2GGV4 |
|  | UniRef90-R6N7Y2 |
|  | UniRef90-R5H4V4 |
|  | UniRef90-C3Z553 |
|  | UniRef90-UPI000360EDBD |
|  | UniRef90-C3Z558 |
|  | UniRef90-JOMVV4 |
|  | UniRef90 S0FWE3 |
|  | UniRef90-R8Y5Z5 |
|  | UniRef90-K7WJK5 |
|  | UniRef90-D9SUM7 |
|  | UniRef90 U2BKS8 |
|  | UniRef90-T4K1L8 |
|  | UniRef90-K2R5B0 |
|  | UniRef90-UPI00035F4FA3 |
|  | UniRef90_K7WJM6 |
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|  | UniRef90-D3AUK5 |
|  | UniRef90-U2RHU6 |
|  | UniRef90-D0ZBF3 |
|  | UniRef90-R7GFB2 |
|  | UniRef90-R6XXA5 |

$\underset{P}{C} \underset{L}{L} \mid E L L T L I N N G T D M F T$
460
KKTMDMAKTFHSYEQFLDFY L

VFEVSYTEMMNEQKDHSTSRLWMLFNEHKAVQTSAD CLDHVLKGGK EMMNEQKDHSTSRLNMTFDSLLSAVK


 $V F E V A F Q E M M L A Y H D A A P T D K E K Y A P S D E R L Y D V Y R A H D K$
$A L H$ $\begin{array}{ll}A V E M T L N E G & T \\ V F E V A Y G E \\ A V E M A L N E G & T\end{array}$
 AFEYAM DMMKHEESVAL AFH YAM
P L E CA $\qquad$
ED DRCGEPS LDEAL FQGDFV CCECALNQGRSYLFGQTVSLNSRPADQUDSFEELLE LYE


AFHWAMEDMRPENKGTKV ILELVLMNGKDYRMNDQV DLLKKIHDG
V
 $M L E V A L N Q G R Q M Q S G K N V S F$
$C F E K T Y N N$ ПKEVADRSRGEEDFFTRTGP $\mathrm{L} / \mathrm{R}$ R L Y Y E $\square$ S

FEPHNKPLDTYEEVVEVF K
DLKALNSGASTFLRGMK VLEKALNSGASTFDRGMKGSYRSSPANE I A CCELAFYDGFDYSFN $\square Q T G P K T G D A T$ MLEALDQGRQMQSGKNVSFRSPPATA CFEKTYNNDEFTACK L


[^2]

N $\square A \square D G A G L A T V A D S F A A L E Q L E N K D S W N T \square T E Y L R N N F S$ YQGAQLLGGLPNLVNSLLANGEYVFDRTLDDCRSVIKNNYE

 CRDIGMGNLVNSLDNGKRALSFDKGRMNLDDDIVGVLDDNFE
 GRDHSNGGAADAIDSLYAI K K LVYYDPTLPDLLTCLKCDWG
 GMCDDGAGLATVADSFAAISFEDLTRHMQFNYSDFDRQMM

 GRDFGGTKYSNMANTUCADIKKWVEKGYFGLGDVLDAMRW
 GTD ILTVSLGNTDDALSNINR\|VFENRTLDLSEDYPIINS GRMTGISTVADSLYVLEKLVFGEQVIALDELVACLRSDWG GNTPGEQAAADSLAAVKKLVFDDKKYTMEDVVNAMKADFK YNVFGPCFLANTINALWAI RQATADTTLSELVQALLCNWG NETYGNDNASDALYAAKTLVYDQKKYTLKELNEAALHNYV
 $N Y G V L T V G L A N A V D S L L D N I ~ K F E E K K F T L D Q V R S D C R E S N D$
$D R F S G M F G V V G L A E C V N K I G A E N K E ~$ EKFTGMVGVV
ENFTGMVGVVG/VAEC[VNNL


[^3]NY $\square$ PYFGTDNEEVIE पTNR $\square \mathrm{FNTVKTVISVK} \mathrm{\square NY} \mathrm{\square GGRYK}$
 GREDKFGSASTEVLDLCNQLDDCVSHAVEPLKA NGNAV PPAPKFGNDDDTADAMALRVHNHLCSVTAAAATHVGRTYL DEAPKFGSDDKELNAFARQLVGRCVSI HMNFDPFEFTVT EPYPKWGSGHSEVDALGTWVVRTCVEVIRKPHPALQGVIT NRGPKYGMDEPEVMDLTNRI IDMIDDEEAGR YRFG SQSERYCQGDSLGDQWAQRLTRDFAEVVKAQPVAGGKQLV KNIRRFGSPGSRAQDWAVRIRDYYVALCKGSPTRKHHLMV
 HDFPKFGHENAELKELGTWMFENVLTILRDNPERRFGFVV LHSERYCGGDTAGDAWAKRTSKTFSDMVREQSRYPE CFF
 GYAPKWGND NFSEKFGNDDPEDNEVTKMDLDYYYEAVMSSKAFFNDRFT
NFEQKFCDDEKDI DF ITNDLLSSFYKYLCQFKNKFKGKYK ARSPRFGHGNKLVDRHAWRLIDSFVDSIERPGKPFNLVVT GYAPKWGND ENVPRWGRGCQRVAE $\square A$ VRVMDQYRRKAMAYGTPAHFCMQ GYEPKYGNDПEDVDEMANDLYEYVAKNDRQRGDDEGMGYY PD DRRGNECQRVAGMAVQVMDQYRRKAMAYGTPAHFCMQ SSLKKYGTENTQVAQLVEQMTDRVYNNLSSYRNRFYGKV DKFGWS EYADELGVRVIERLQELVHNYKTKYCED GVAARYGQ DEAANALGYR:SAWLDAFVRAAKKGLYCSDCD FGHNNEKAEALAAKILAKIEEMVNNHKGLYCS


PGFFSWANTVGFGQSVGATPDGRLAQTP\|SHGANPTPGFV KFGLLSSPAYISQSVRSPATLDGRKSNEPYAVHISPVSSSII AVIINNGANTTLGLHTPATPDGRLAGAPMANALNPAPGHD $P G V G T F E D N V G L G M E M G A S A D G R L S G Q P T A D D F A A A P W P D$ $P G I G T F E G Y V G D G L G C G A S A D G R R N G M P D A S D L S P V P A P Q$
 PGWFSWSKTIHFGRQVGATPNGRKAGASVTHGANPTPGFR
$P G L F S H G D V Y A Y G K T V E A T P N G R F A G D A I S H S S E P D P F A R ~$ $P G G G T F E A Y V G Y G L N S A A S A D G R R S G Q P I A S D L S P A P V P Q$
 PGDGTFEAYVGYGLNSAASADGRRSGQPI ASDLSPAPVPQ PGWFSWSNTLEFGRNDRATPNGRHDGEAI SHGANPHSGFR


A G LG T FEQYPQQGMGワAACAD RDRNDPDAPNFSPVPGTA A GMFSHGD VVRYGETLPATPNGRKYGEPISHSNEPDPGFA

F G LS SPAF $\square$ S G SNYMASFDGRKNGDAFGVH SP LSNTT
PGVGTFEQYNFGGSFGGATPDGRRAGAPLASDLSASPYPQ
$P G V G T F A S Y V E Q G L G C S A S A D G R L S G Q P L G T D M S P A P S P L$ LIVISNNTNTDWGHQTDASLDGRLKGMYMNPANNPQGGAA PGVGTFASYVEQGLGCAASADGRLSGQPLGTDMSPSPSPL $K W G L S A S N Y V E S G A V V G A T F D G R N K N E P L$


GNNNHYEMHAQVGUDTDGGTDDAPGCRV


[^4]TTAFTE $\square$ MSFASK $\square \mathrm{D}$ YGNGGFNGNVVD $\square$ I TPDFMNK
K DGASLS LAT TIAK DQPGYGNTAPMQWEDDPTFANMDN D $\square$ SEVVRFARSLDYPYN CLNGNVVDFDIPSSYQKHPEKL


 $K D G A A T A Q A T G G A L C Q P G Y G N T A P L Q L E F D P K L S A E E G G \|$
$G V D T F S P V L K A N A V A L T Q A G Y G N S A P L H B D D D T G L I Q H S ~$
 VDDASLSLATAVAEDQPGYGNTAPMQWEDDPSLAGAGC





N $\square$ S Y T S $\square$ T NFASEDHYEKAFNGAVT DL
MVE K
D
D पPATDASKG TRATDAFGFANGAPVDLN DDEHMGENR
KSGPTAVLNSLARFDARYH GGSVQNI KFTPRMMHEDKEK D $\square$ PATDASKGITATDAFGFANGAPVDLNDDES

DEPALPKHDKQTAKFHPYFKSGTGDTFPFDEMSSKNPAST P IGHLMAVA PHHAYYPAGISDILTDDPTVKSNPQAL


NFDKF $\square$ I $\quad$ L

## Q $\square \mathrm{A} \square \mathrm{K}$ Q G F F Q M Q M N $\square \mathrm{V}$ S S N T L ID A K N




NF LDDKFEDQF LDNLETSFENGDMQVQ\NVVEPKKLDEAKK SPEALTKA


GDGSN LTVT TADQATFLAAAN
GAGSN $\square$ LTVTADQATF TAAAN
F S VY S T D A
MQLCLGAFSAGMREFTA
NVSGND
LIINGAFDKGMRYFTAYNEDNDVVRVT

DPAGYPELVVRVTGFTAYFSMLSPQFRQLVVDRD
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UniRef90-T2GGV4
HPDRYPNLVVRVWGFSAYFNDLPEEYKDNLIVRAE
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UniRef90 C3Z558
UniRef90 JOMVV4
UniRef90_S0FWE3
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UniRef90 K7WJK5
UniRef90-D9SUM7
UniRef90_U2BKS8
UniRef90 ${ }^{-}$T4K1L8
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UniRef90-K7WJM6
UniRef90 UPI00018174D7
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UniRef90-R8Y5Z5
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UniRef90 K2R5B
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UniRef90 U2RHU6
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UniRef90_R7GFB
UniRef90-R6XXA5
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lupas 21
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lupas 21
lupas_14
lupas_14
lupas_28
lupas_28
jnet
jnet
conf
sol25
solO
solO
jhmm
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
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    sol0
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    jpssm

[^2]:    lupas 21
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    conf
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    sol0
    jhmm
    jpssm

[^3]:    lupas 21
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    jpssm

[^4]:    lupas_21
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    jpssm

