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 $P R A R D L G V P F D G T P G K F N A$ PRARDLGIP $\operatorname{CR}$ VGETGYYNS PRARDLGI Q F E G $\square$ G G K Y N A
 \|R D G I P GVMK P GAF NA $K R P R E Y G I R F G M P T G S L N A$ K R A R E LG I Q $\square G V L P$ GAL N A K RARDMGI P F E G G T GRYNA K RLR D Y G I E I G V I P G E L N A
 $R L R D H G V E I G L K P G A L N A$ $P R A R D L G L P L E G T P G K W N A$
 K R A R D Y G I E I G L K T GEN N A K R A R D Y G $\|$ E $\quad \mathrm{G} \quad \mathrm{L} K$ T GK H N A
 RARDFGI QI GMEPGYYN N ARDLGI HI G V I P GK H N A
 RARDWG\|PFVGKPGPQNA $P R A R D V N V N I G G F P P G N Y N A$ K R L R E L G V K I G M P T GK R N A l K T L R D Y N V K I G K L P G S K N L

 $R C R D F G I K I G V L T G K A A$ $K R \square R D Y D \| S I G M S T G K L N S$ $\begin{array}{llllllllll}R & A & R & D & L & G & P & L & D & G \\ R & I & P & D & G & R & L & H & L & A \\ R & T & W & P & G & P & K & N & S\end{array}$ (V) \begin{tabular}{ll|l|ll|l|l|lll|l|ll}
$T$ \& $D$ \& $V$ \& $K$ \& $G$ \& $V$ \& $E$ \& $V$ \& $G$ \& $H$ \& $A$ \& $T$ \& $I$ \\
$I$ \& $I$ \& $R$ \& $G$ \& $D$ \& $G$ \& $A$ \\
$T$ \& $D$ \& $V$ \& $E$ \& $G$ \& $V$ \& $T$ \& $V$ \& $G$ \& $Y$ \& $S$ \& $T$ \& $I$ \\
$I$ \& $E$ \& $G$ \& $E$ \& $G$ \& $K$

 

$T$ \& $D$ \& $V$ \& $K$ \& $G$ \& $I$ \& $E$ \& $V$ \& $G$ \& $H$ \& $T$ \& $T$ \& $L$ \& $I$ \\
$T$ \& $G$ \& $E$ \& $G$ \& $E$ \\
$T$ \& $D$ \& $V$ \& $K$ \& $G$ \& $V$ \& $E$ \& $V$ \& $G$ \& $Y$ \& $S$ \& $T$ \& $I$ \& $I$ \\
$E$ \& $G$ \& $S$ \& $G$ \& $E$
\end{tabular}

 | $T$ | $D$ | $V$ | $A$ | $G$ | $V$ | $T$ | $V$ | $G$ | $H$ | $K$ | $T$ | $L$ | $I$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $T$ | $D$ | $V$ | $K$ | $G$ | $V$ | $E$ | $V$ | $G$ | $Y$ | $S$ | $T$ | $I$ | $I$ | $S$ | T DVVK GVVVGHSTI I S GNGK


 $T \quad D V P B V R V G Q V T I Q Q G A$ $T \quad D V A C G V V G Q Q V T L R E G A$ $T$ DVV T G V E V G Y S T I V S G N G E T DVS GVKVGHTTKCLGD D $V$ K G V K V G H V T LI R G K G K


DVA GVKV GHTTLNIGDS T D V A GIV K V G H H T K I E G | $T$ | $D$ | $V$ | $S$ | $G$ | $V$ | $S$ | $V$ | $G$ | $Q$ | $L$ | $T$ | $K$ | $I$ | $Q$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $T$ | $D$ | $V$ | $D$ |  |  |  |  |  |  |  |  |  |  |  |
| $A$ | $G$ | $V$ | $K$ | $V$ | $A$ | $H$ | $V$ | $T$ | $K$ | $I$ | $K$ | $G$ | $E$ |  | $T D V G N V Q V G Q V T V R E G$

 $T \quad D V Q G V L \vee G H C T L I \quad K G S G D$
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 $T \quad D V A G V K V G H V T L N D G E$


 $\begin{array}{ll}T & D \\ T & D \\ T & D\end{array}$ $R$ LLRDHGGEVGFK GGKHNA K R A R D Y GL K $\quad$ G L K T G T H N A A RELGI PFEGEPGEYNA I $P R A Q E L G I D P G G Q P G P L D A$

 | $R$ | $P$ | $R$ | $E$ |
| :--- | :--- | :--- | :--- |
| $R$ | $L$ | $R$ | $D$ |
| $L$ | $R$ | $P$ | $F$ |
| $R$ | $G$ | $G Q P$ | $G$ |

 R A REMGI K I GLTP GK Q NA I K RARD L G L P FP GETGRYNA K R A R D C GI K $\$ G I LP GA H N A RARESGIVI GVLP GNLNA
 K R A A D YGLL K 1 G LIPPGPLNA KRAREYGIVVGVLPGKHNA
 K R LREYGMSVGLP T GE WNS
 RARDLGI KIGYEPGELNA $R$ R $A R D V L P N G R W P A G S K N S$
 PRARAFAI PFDGEPGAFNA $P R L R R D L G L V I G L P P G P L N A$ $\begin{array}{lllllllllllllll}K & R & I & A & D & G & L & I & G & M & E & R & G & A & L \\ P & R & A & R & D & L & G & P & F & G & G & P & G & K & L\end{array}$ PRAREAGVVLGGPP GPENT
 K RII R D Y G V E I G M K P G S L N A K RLR D Y G V T I G L E T G A Y N A I
 $D L G I H I \quad G V Y P G R F N A$ $R A R D L$
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R PRALGVPFGMPTGTNNAI
$R \square R K \bar{G} \square I K T G V L P G K W N A$ GPRARDLGVPFAGKPGANNA $K R V R E Y G I Q \square G T L P G P L N K I$



## QUERY

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





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| $L$ | $V$ | $K$ | $G$ | $K$ |

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.VK $\square$ G S G P$L$ K P G R G P $\left\lvert\, \begin{aligned} & \mathrm{V} \\ & \mathrm{V} \\ & \mathrm{R} \\ & R\end{aligned}\right.$$\begin{array}{ll}R & R \\ R & G \\ R & A \\ R & V \\ R & A \\ R & A \\ R & L\end{array}$
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LVVGT GPVRTGVTVIHPRGRASADPVVGAWFTMNGGNGKTM

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VGHGLDAALDAK DASGYWWLPIVAETWDGFLNDINGFHVQEKHAHDAI RNAK

 K D D L L F WL L P K T V D A A WS L P V V A E T WD G WL N D I N G F H V K K P Q D A F D A L D S A K Q GEDWWYYPVVGETYDGFLNDI YGFHVKEKHVLEAINNTK K E D WWWAFPVVAE TYD GF L NDI Y GF QI QEKNVLLEAI N NTT


 E N V R S $\quad$ L N P V V G E T N D G F L N N D S GD S F F L L P V I G E T Y D G R L N N D I $\quad$ N G F H H V

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## E E E E E

1 KGDTGTINNPIVVCECNDGYLCNS \begin{tabular}{ll|l|l|l|ll|llllll|lll}
$G$ \& $E$ \& $V$ \& $E$ \& $W$ \& $F$ \& $L$ \& $P$ \& $V$ \& $V$ \& $G$ \& $E$ \& $T$ \& $F$ \& $D$ \& $G$ <br>
\hline

 

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

 | $H$ | $N$ | $E$ | $H$ | $L$ | $W$ | $M$ | $M$ | $V$ | $V$ | $A$ | $E$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Y$ | $D$ | $G$ | $I$ | $L$ | $N$ | $D$ | $I$ |  |  |  |  |  |
| $F$ | $D$ | $F$ | $G$ |  | $L$ | $P$ | $V$ | $V$ | $A$ | $E$ | $T$ | $Y$ |
| $D$ | $G$ | $V$ | $L$ | $N$ | $D$ |  |  |  |  |  |  |  |
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 \begin{tabular}{ll|llllll|lllllll|lll}
$G$ \& $E$ \& $V$ \& $E$ \& $W$ \& $F$ \& $L$ \& $L$ \& $P$ \& $V$ \& $V$ \& $G$ \& $E$ \& $T$ \& $F$ \& $D$ \& $G$ \& $H$ <br>
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\hline \& $R$ \& $V$ \& $K$ \& $S$ \& $V$ \& $N$ \& $F$ \& $L$ \& $V$ \& $G$ \& $E$ \& $T$ \& $N$ \& $D$ \& $G$ \& $Y$ \& $L$ <br>
$N$ \& $D$

 QF S D G WA M P V V A E TY D G S L N D I N A R VI T K Q H V L D A I K N A K NEKVQSVNALVGETNDGFLND 

$E$ \& $T$ \& $V$ \& $R$ \& $S$ \& $V$ \& $N$ \& $P$ \& $V$ \& $V$ \& $G$ \& $E$ \& $T$ \& $N$ \& $D$ <br>
$N$ \& $G$ \& $Y$ \& $L$ \& $N$ \& $N$ <br>
$N$ \& $E$ \& $V$ \& $R$ \& $S$ <br>
$V$ \& $N$ \& $P$ \& $V$ \& $V$ \& $G$ \& $E$ \& $T$ \& $N$ \& $D$ \& $G$ \& $F$ \& $L$ \& $N$ \& $N$
\end{tabular} $\begin{array}{lllllllllllll}K & A & A & A & W & M & L & P & V & V & A & E & T \\ W & W & D & G & Y & L & N & A \\ E & A & V & R & S & V & N & P & L & V & G & E & T \\ N & D & G & W & L & N & D\end{array}$


 $E Q V R S V N A V V G E T N D G Y L N D \| R G Q H V S T T D V L N A I M N A S$

 | I | $G$ | $D$ | $T$ | $S$ | $T$ | $V$ | $N$ | $P$ | $M$ | $V$ | $F$ | $E$ | $C$ | $N$ | $D$ | $A$ | $Y$ | $L$ | $N$ | $D$ | $I$ | $R$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | GEDDE WF L L $\quad$ P V V V G E T F D G F





## 

 $1 \mathrm{GT} T \mathrm{~S}$ TVVPVVVAE




 ENVGS VNAVVGETNDGFLNDI RGRHVKEKHVLEAIIA QAS
 $\square G D T G T V N P V V G E C N D M F L N N I R K Q S V T K K H V R E A L E T A$ $P$ G M Q P WG LiP V V A E T W D G R L N D I

 FGRTGTVNPVI A ECNDMFLNDIRARCITKEHVFQAIKNA


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$\begin{array}{lll} \\ G V & \text { Q } & \text { N H G G G } \\ \text { G }\end{array}$


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


 GALVLSNF GRKEDLLINGVAAGEIINA DDPEE GVLLLTNYGRMEDLIFNGKNVGRMLKEEDKKGKEAA GVLVNANHGRRPELTMGGVPVGQRYGAAPTQSSSLSPDPYS
 $G V L V Q A N F G S R A Q L T A A G V P V G R A L L D T L A W \square Y G K P K A K Q$





 GALVLSNFGLKDDFTLLTKELNDKITMPEKL
 GCFVQSNYGLREQLLI A GDPVGQELTDDMPEEKS RAD
AALVQANYGSATHLRVGGFPVGR\|LAKEKADALAEAAAHK


GALVQANHGLREWL



| L | T |
| :--- | :--- |
| L |  |
| Q |  |


GAFL QCNFGKRYE
QI D GVPI G QEL GNYAFK SVLD
$G V L V Q N V H G P L G R D S K A P N P M Q E T R W A P N P$



$G V L V L S N F G V K Q D L T V L G H P V G K L L T D C S G K R E Q Q$
ATLV QANYGKKP HLLR Q G VPVVGR】LAEEAAKEAENDAAKK
GALVMTNMGQKRDLTIAGKQIGQDIINTDGDD
$G V L V N S N G G R R H Q L Q I G G V P V G R E I T E L T P E W$ A ALVQANYGRAAHLRIGGFPVGRTLAKEKKDTLAEDMAHK GTFVQANFGQREDLTILGKNIGLQLKE PRMTQNTA AALVQANYGRQHHLRI SGVPVGR\|I ADEAAKPRNEADESK GVFVQSNFGKRRNFMIRGHRVGAELAE PRIQEGTP

 G A G WRP DLK GDGGAP

 GV L T L T N F G SLLP DL T I N GQP V G S QL Y N S M H S LIE E I

 GALVMSNF GRREDLRVDGVPVGRAL R SPEFATGSFHDR
 $G V L V Q T N F G G V \quad L Q Q A G V Q V G Q A L G S Y Y F K G A L E S H A$

 QCNYGARRELRIA GVPVGEE\|PDLLP

GVLTLTNF GSLEQLRINGKQAGK』IKQR $G V L V L T N F G S L D D L K N G K A V G K E L K E V$ $G C L V Q A N F G L R P L L K V L G V P V G E H L T A D R L W$

## QUERY UniRef90_B3SZY2 UniRef90-UPI0003B73118 UniRef90-S2E3A9 UniRef90_M7Y314 UniRef90_Q7N4R4 UniRef90-Q1IKE3 UniRef90-H5TBY1 UniRef90-W7QYR1 UniRef90_UPI00047B8EC1 UniRef90-I2GK48 UniRef90_UPIO004201C2B UniRef90_I2GSFO UniRef90-UPI00047E64E0 UniRef90_W8TBI0

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KTSD
D GSCMM
VVIATDAPLDPHQLKRLARRAALGI GN GGMG

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 DKADGSCMIVVATDAPLDSRNLERLAKRAMLGGGKTGGUA TQNYGSVIAVVATDAPLDTNQLNRLCKRVGLGGGVGSYA QASGHSIIVIIATDAPLLPHQLKRIARRSSLGGGRTGGFG KEDGGSVMVVIATDAPLFHRGLMRVAKRAVLGLARMGFYG RSGDGSCMIVVATDAPLDARNLKRLAKRTLLGGLGKTGGDM



 EKSDGSCMIVVATDAPVVLERNCERLAKRATVGLSRMGGYG EKADGSCMIVVATDAPLESRNLERLAKRAMMGLAKTGGIAA
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 GSADGSCMMVVATDAPVDARNLERIAQRAMMGLARTGGDA
 AKKDGSIIVIIATDAPLTPIQCQRLAKRATVGLSKVGGYG DPADGSCMMIVATDAPLSSRNLERLAKRAMLGLAKTGGDA
 KSKDGSCMIVVATDAPLDARNLKRDAKRAMLGGAKTGGGA TS A DGSSMMIVIAATDAPLSDRNLTRRLARRAFLLGVARTGSPM PEGSGSVIAIVATDAPLLPVQCKALARRVPMGLARTGTTG STADGSCMIVVATDAPLSARNLKRLAKRALFGLAR $\square G G \square G$
 NNVDGSCMVVVATDAPLTSRNLERLAKRAFMGLAQSGGGIA TTPDGSTMIVIATDLPMCSRQLQRLAKRAAFGLARTGSIA AAEDGSVIVMIATDAPLHPTQLQRLAKRATDGLARVGGNG

QUERY
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UniRef90-D6TW7 UniRefoo $14 \times 5$ YO

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330
340
FRGVVQATEEA
$L V N Q L A S$
340 M T G N N A K $\begin{array}{r}350 \\ V\end{array}$
360

 | $F$ | $E$ | $A$ | $T$ | $V$ | $Q$ | $A$ | $V$ | $E$ | $E$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ |  |  |  |  |  |  |  |  |  |  |
| $F$ | $A$ | $A$ | $A$ | $L$ | $A$ | $T$ | $E$ | $E$ | $A$ |  |$|$

N



 | I | N | $M$ | $V$ | $S$ | $A$ | $E$ | $T$ | $M$ | $E$ | $G$ | $I$ | $N$ | $G$ | $N$ | $K$ | $V$ | $Y$ | $A$ | $L$ | $P$ | $H$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $A$ | $M$ | $K$ | $L$ | $I$ | $E$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $V I N A M V A A E T M E G I N G N K A Y R L P H E S V R B K$ YN S LTA A E S MT GKD GHK IIEAL PK D A L L S I I N S L V M M A Q T M E G T Q G H K



$F$| $F$ | $K$ | $A$ | $A$ | $E$ | $A$ | $V$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $E$ | $E$ | $A$ | $I$ |  |  |  |  |
| $F$ | $G$ | $I$ |  |  |  |  |  |

## 

F L A A I E A T E E
$\begin{array}{ccccccccc}Y & L & A & T & V & Q & A & V & E \\ F & R & S & S \\ E & A & T & E & E & A\end{array}$


F MAAI E
YEAVMEAT


T 7

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## 



## \section*{.}

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## 



## 


FEATIQA
FMAANEA
F R A A $\mathrm{A} D A$
$F$


$\begin{array}{lllllllll}F & E & A & T & A & A & T & E & A \\ F & D & A & T & V & Q & A & V & E \\ F & A & T & & & A & T & E & \end{array}$
FRAGVV EA T
$F N A T V Q A$

| $F Q A A V$ |
| :--- |
| $F D A A A$ |

F RAAGEAAEEA
$F E A T V V Q A T Q E A$
$F R A D G E A T E E A$

F LAA TI E A

FEAAT QAT
F L
$\begin{array}{ll}F & G A T \\ F & \text { Q A A } \\ \text { I } & \text { E S }\end{array}$
$F$ L A V A D A T

$F E A T A Q S V E E$
$F E A S A D V V E$

| QUEF | P |
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| UniRef90 S2E3A9 | $\checkmark$ L ${ }^{\text {L }}$ |
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| UniRef90-G21 |  |
| UniRef90-UP10003786668 | V |
| UniRet90-V6S6M6 |  |
| UniRef90-UPIO0042A0962 | 1 M T |
| UniRet90_A4ARZ7 | LM |
| UniRef90-M7YBCO |  |
| UniRef90-S2D4U6 |  |
| UniRef90-K1LKC3 | M |
| UniRef90-F4LON9 |  |
| UniRef90-S9P437 | FVS ${ }^{\text {A }}$ |
| UniRef90-14BWJ6 |  |
| UniRef90-UPIO0036C4A91 | ILDA |
| UniRef90-D3L1J2 | TIKKHR |
| UniRef90-F8EEM1 | TLK K |
| UniRef90_UP100047C56 |  |
| UniRet90-O8RA | M ${ }^{\text {R }}$ |
| UniRee90-D8PA44 | L |
| UniRef90-TOPHU9 | -MKK |
| UniRei90-UPIOOO3629271 |  |
| UniRef90_E3QHE2 |  |
| UniRef90 UPIO0041C9D2 |  |
| UniR | WI |
| UniRef90-12ETU0 |  |
| UniRe990-L8JMZ6 |  |
| UniRet90 UP10004789300 |  |
| UniRef90-M7NY48 UniRet90 E3FLH6 |  |
| UniRef90_E3FLH6 | A |
| UniRei90 - UPI00036C58D6 | TMKKY |
| UniRee90-UPI00036FD9B8 | I MEKY |
| UniRef90-UP1000477B97F | 1 L |
| UniRet90_N4VGA6 |  |
| UniRet90_E4RQF2 |  |
| UPI0002F28E |  |
| UniRef90_UP100041484¢ |  |
| UniRef90-UPIO0046F6BEF | LMK K Y |
| UniRef90_G2SL16 6 |  |
| UniRet90_UPI0003F771B6 |  |
| UniRef90-H1XYK9 | 1LK |
| UniRef90 UPIIO0007719D2E | ILK |
| UniRef90-F8Cl |  |
| UniRef90 D5BJ |  |
| UniRef90-UP1000369921E | 1 IRTRR |
| UniRet90-M7SYE6 | -M K Y L |
| AзY |  |
| UniRef90 UPIOOO35C3B |  |
| UniRef90 A0A010S7L2 | $M Q$ |
| UniRet90-S6GCN2 |  |
| UniRet90_G3JE30 | ■MDKYH |
| UniRei90-D1C393 | VMARY |
| UniRef90-UPI000467897B |  |
| UniRef90-UP1000288DB08 |  |
| UniRef90-D1C570 | \\| LRR |
| UP10003138635 |  |
| UniRef90-D6TTW7 | VMRKYR |
| UniRef90-14X5Y0 | LLEK |
| UniRee90-UP100047443 |  |
| UniRef90_L7UDX9 | VMKKH |
| UiRe90-2GCOR2 |  |
| UniRef90_A6GC52 UniRef90 B4UJ81 | R |
| UniRef90_B4UJ81 |  |
| UniRef90-LOFYY4 |  |
| UniRef90-UPIOOO3A1F83C UniRet90 UPI0003698740 | LLRK |
| UniRef90 A0MTO1 |  |
| UniRei90 - UPIOOO289EFOF |  |
| UniRef90- WORCP2 | AMRKY |
| UniRef90 ${ }^{\text {C }}$ - ${ }^{\text {d }}$ |  |
| UniRet90_UPIO004295FD2 |  |
| UniRef90-UPI00040A1F7B |  |
| Ref90_M5F2C1 |  |
| UniRef90-M2SM97 | LMQKYL |


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| :---: | :---: | :---: |
| UniRef90_X2HF38 | LT G G N NA | D\|V|C G|I |E|V|GY S T V |
| UniRef90-A0A024PDP1 | GGMLK GPRNK | DVPGVSVGHATL |
| UniRef90-B6YW86 | K APELG\R\GYAHGKKNSI | A DL GVKVGHAT |
| UniRef90-H1PRW9 | KI GFPSGKNNL | T DVEGIKVGH |
| UniRef90-K2APE2 | $D \square G V N \ G F S P G K F N A$ | T DVA GVVKVGHAT DE G D GR |
| UniRef90-UP100035D5B |  | T DVKGIKVG |
| UniRef90-UPI00037D93E9 | PRARELGIRLDGEPGTWNA | T DVP GVEL GYRTLVEGEGS |
| UniRef90-S9PJ76 | PRARALGI T FGGQAGPLDA |  |
| UniRef90-G4I292 | PRARGLGIPDPGEPGPHNA | T DVP GVEVVGVT T L S G D G |
| UniRef90-Q67K73 | PTARALGLVTGLPPGPQND | C DVP GVVRVGHATRVEGEGP |
| UniRef90-UPI0004646D32 | PRARALGI PFTGTPGRDNA | T DVT GVEVGYTTLI S G D GQ |
| UniRef90-D6TT14 | RAREAGI ILGGLPPGTTNS | A DVA GVRVGHTTLIR GNGA |
| UniRef90-K6DGF7 | RLLRDLGI TI GFKTGKYNS | T DI Q GVKVGHV |
| UniRef90-Q1IT02 | PRAADLGI NVGVLPGPLNA | T DVD GVLVGQ |
| UniRef90-K8WLA1 | RTRDLGI I I GHKPGLLNA | T DVAGI SVGHS |
| UniRef90-UPI00037D6AA3 | VRIGVLP GTY Y A | T DVA GVQV G |
| UniRef90-UPI00046D95F1 | RARD L G V EFEGTPGKFNA | T DVP GVEVGHVSLI EGDGR |
| UniRef90-R7KKQ5 | RPRDMGI E $\square$ G L HPGANNA | T DVVK GVLV G QV |
| UniRef90_W1SHV2 | KRARDLGLPPPG】PGEFNA | DVP GVEI GF T T I I E G E G Q |
| UniRef90-UPI0004415006 | RVRALLPNGRFPPGPKNS | DVEGVLCHVQSIVE P |
| UniRef90-UPI00047538D2 |  | T D I P GV MVG HV |
| UniRef90-M7NAN3 | $R M R T H G 1 E T G L L P G P L N A$ | T DVA GVQVVGHSTL ${ }^{\text {d }}$ S GDS |
| UniRef90-G4NHJ4 |  | T DVP GVLVHTETIRSADG |
| UniRef90-R5B4H0 | RMEKGK L N | $T \mathrm{D} V P \mathrm{G} V \mathrm{R} V \mathrm{G}$ |
| UniRef90-E5YAV5 | $R \square R D \square A R \square D G F P C G E Y N A$ |  |
| UniRef90-E6TZQ4 | K R A R D WNIN】GTLPPGPLNK | T DVK GVTVG |
| UniRef90-UPI0003B4BC97 | PRARD $\square$ GVPFDGTPGPLNA | DVA GVEV GFKTL $\square$ S GE GA |
| UniRef90_U2EB74 | KR $\square$ R D Y GVT $\square \mathrm{GLK}$ T GHRNA | S DV |
| UniRef90-UPI000373 | GRLKPGPLN | T DVA GI QVGHCTLSKGS |
| UniRef90-C6XWV7 | RARDYG\NIGVLPGLLFNA |  |
| UniRef90-10JT49 | R $\square$ R DFGI D G TLT GRRNA | T DVEGVRVGHCTLSERST |
| UniRef90-V8QQD7 | PRARDIGI S GVLSPGKLNA | DVNGVLVG |
| UniRef90-D1C3H6 | RARELGI T IGGYSPGKYNA | T DVP GVAVGHTTVHWGDAT |
| UniRef90-A0A021WWQ8 | PRARALGLPFTGRTGPFNA | DVEGI A V GFQTI VEEETP |
| UniRef90-M4NDK4 | PRARDLGVPFDGTPGPLNA | DVA GVAVGQ |
| UniRef90-R6RNA9 | $R \square R D Y$ GI QMGTFPGPRNA | T DVA GVTVGHCTI DTPDSK |
| UniRef90-A0QU64 | ARDYDI I G L Q G P L A | T DVDGVRVGHTTLVSGSGP |
| UniRef90-R1GHQ4 | PNI R YPPGPKN |  |
| UniRef90-D4K1Z1 |  | S DVPGVTVGHCTLAD |
| UniRef90-X5QAJ4 | RARAFAI PFDGTPGRFNA |  |
| UniRef90-F6CX48 | RARALLGLPFPGMTGPNNA | T DVPPGI QV G |
| UniRef90-W5XBZ6 | RARELGI PFAGTPGTWNS | T DVA GVEVGHCTLDPLD G S |
| UniRef90-H0U5E8 | K K V R ELGIVIGT LP GRKN | T DVS GVKV G H V T i D R P L |
| UniRef90-E2SRA2 | N | DVRGI R V G |
| UniRef90-A0Z9A0 | R A R A L G $\$ P FAGK T GP L N G & DVLGVEV GHKTLIS GE GP  \hline UniRef90-UPI00047A362D & $R$ R R D M GIVIGVLPGQYNS | DVNGVAVGHTTLVKADS |
| UniRef90-Q6C2X6 | PRARDLNIPLDGTPGPNNA |  |
| UniRef90-L7ZMY4 | KLLRDLGFSI GTLP GRRNQ | T DVP GVKV G HVTI R E EMDE |
| UniRef90-A4CHS9 | RLRDHGIELGLRPGTHN |  |
| UniRef90-H1PJY8 | PRDCGLELHHKWKS GKLNK | T DVNGI K V A N |
| UniRef90-LODHN9 | PRARELGI PGVFPPGPLNA | T DVA GLKVGHTTVIE G D |
| UniRef90-UPI0003080C46 | KR\REYGIT T G T L P GKRN | DV A G V K V G H |
| UniRef90-B2A3K9 | RIIRDRGI PGSLMPGTKNC | T DVS GVCVEH |
| UniRef90_UPI0003F86F63 |  | T DVP GVRVGHATRIE G D GP |
| UniRef90-W3WVB6 | K R $\$ RELLPKGDYRPGPLN &   \hline UniRef90-R6DNH2 &  & T DVKGVRVGH  \hline UniRef90-G7WFT4 & K TPRELGLWMGIMPGKNND & T DVP GVRVGHVSLIQ G S G P  \hline UniRef90-G9P729 & $R \square R Q L I P H \square R W P T G P L N$ | DVP GVLA HTESIHSSPH |
| UniRef90-UPI0003625513 | $R \mathrm{ARD}$ YGVPGVMAPGNWNA | T DVK GVMVGHIS LVEE G |
| UniRef90-H3KHQ8 | PRVRDLGIEEI GLQPGKWNA | T DVE GVLVGQVSL |
| UniRef90-W7CWT7 | KRVREAGYTLPGKTGEYNA | DVA GVEEVGYKTITFGEPS |
| UniRef90-UPI000478B5AE | RARALGILLQGTPGPANA | T DVGGVLVGYSTIVKGEGK |
| UniRef90-UPI000402E363 | RARDLGL RLT GVTGPHNA | T DVPGVQVGYTTLVDGDA |
| UniRef90-R7KPR8 | GKRPREWGIS F GVLPGTYN | T DVK GVKVGQVTLI D D A |
| UniRef90-F2JZ03 | RAREMGLPFSGKTGANNN | T DVA GVQVG |
| UniRef90-UPI00039B1DC8 | ARDFGI VCGMPTGTHNA | T DVPPGVKVGHTTIREGN |
| UniRef90-UPI0003B56A97 | $R \square R E L G I K I G F D T G E L N G$ |  |
| UniRef90-14D8H4 | RDLGLWLGQMPGTFND | T DVP GVVRVGHVSLVK G A G P |
| UniRef90-T5A933 | WP T GPL NS | T DVPPVVA H T L S V |
| UniRef90-A0A016P |  | T DVP G |
| UniRef90_UPI0003771C0D |  | T DV HGVKVGHHTI HV |
| UniRef90_UPI00047B0E10 |  | T DVK KI RVGHCTI D T SENK |
| UniRef90-A0A016F | RLLRDA I P GAYLPGPKNG | T DVP GVLA HTT I RDESG |
| UniRef90-K0JYZ1 | RARDLGI RLLGDTGPLNA | T DVPGVEVGYT TLIEEGA |
| UniRef90-LOIX12 | PRARGLGI DLPGQPGPLNA | T DVDGI EVGATTLI EGPS |
| UniRef90_UPI0003B790D6 | RARALGLMFDGTPGPFNA | DVA GVSVGYTTLIS GNGP |
| UniRef90-UPI00046EAE6A |  | A DVPGVSVGHVTLHEDRP |
| UniRef90-UPI00046A0408 | PRARDLGIPLRGEPGPWNA | T DVPPGLTVGQVTLVTDAPV |
| UniRef90-L8MJD5 | RARDLQI QF G L Q PGPL | T DVPGVRVGHSNVR G |
| UniRef90-G9NQS6 | $R$ L R DLGIQVGWPTGPKNG | T DVP GVLVHTKSIHTADGS |
| UniRef90-B9XH71 | LPP GPL ${ }^{\text {d }}$ | T DVP GVRVGQT TVIE GDS |
| UniRef90-UPI00047C5822 |  | T DVPGVRVGHHTLRAGDGP |
| UniRef90-C5D0U9 | RARDLGLRFPGKTGPANA | T DI P GVEVGQTTLDHGDGA |
| UniRef90-UPI00047D6188 | RARDLGIPGDFQPGTHNA | T DVK GVKVGHVTLHQGKS |
| UniRef90-R7ZNQ6 | RARDFGFEF GVIP GLL A | T DVE GVKV G QVTL $\mathrm{T}^{\text {E G E S }}$ |
| UniRef90-G7LNU9 | RARQLGLRFDGPTGDHNA | T DVP GVMVGYRTI $N$, |
| UniRef90-H5TWN1 | $P R \square R D L G V T \square P G T P G P K N A$ | DVAGVEVGYT TLIE GA GP |
| UniRef90- X5XZ60 | RARAFGIA FEGTPGGFNA |  |
| UniRef90-C5FR14 |  | T DVFGVKVNTQELFSDDGT |
| UniRef90-Q2S188 | RLLRDLGVA PGFSPGSLNA | T DVA GVQVGHRTRMEGDS |
| UniRef90-UPI00037A9A46 |  | T DV |
|  |  |  |


UniRef90_X2HF38 UniRef90 X2HF38
UniRef90-A0A24PDP1
UniRef90- BAY Y 8 W 8 D UniRef90-B6YW86
UniRef90 H1PRW9 UniRef90-K2APE2 UniRef90-UPIO0035D5B69 UniRef90-UP100037D93E9 UniRef90-S9PJ76 UniRef90-G41292 UniRef90-Q67K73 UniRef90_UPIO004646D32 UniRef90 D6TT14 UniRef90_K6DGF7
UniRef90 Q11T02 UniRef90-Q11TO2
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UniRef90 G9P729 UniRef90-UPIoo03625513 UniRef90-H3KHQ8 UniRef90-W7CWT7 UniRef90 UPIO00478B5AE UniRef90-UPIO00402E363
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UniRefon- UPI0003771C UniRef90-UP10003771C0D
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UniRef90-UP100046A0408 UniRef90-L8MJD5 UniRef90-G9NOS6 UniRef90-89XH71 UniRef90_UPI00047C5822 UniRef90-C5DOU9 UniRef90-UP100047D6188 UniRef90-RTZNQ6 UniRef90-G7LNU9 UniRe90--X5TWN1 UniRef90-C5FR14 UniRef90-Q2S188 UniRef90-UPIIOOO37A9A46 UniRef90_UPI0003665C75



## UniRef90 X2HF38

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UniRef90-F2JZ03 UniRef90-UPIOOO39B1DC8 UniRef90-UPI0003B56A97 UniRef90-I4D8H4 UniRef90-T5A933 UniRef90-A0A016P865 UniRef90-UPIOOO3771COD UniRef90_UPIOOO47BOE10 UniRef90-A0A016PTF9 UniRef90-K0JYZ1 UniRef90-LOIX12 UniRef90 UPIO003B790D6 UniRef90_UPIIOOO46EAE6A
UniRef90_UPIO0046A0408 UniRef90_L8MJD5 UniRef90-G9NOS6 UniRef90-89XH71 UniRef90_UPI00047C5822 UniRef90-C5DOU9 UniRef90-UP100047D6188 UniRef90-RTZNQ6 UniRef90-G7LNU9 UniRef90-H5TWN1 UniRef90-X5XZ60
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## UniRef90 X2HF38

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UniRef90-I0JT49
UniRef90-V8QQD7
UniRef90-D1C3H6 Unir Ref90-AOAO2 W WWQ8 UniRef90_M4NDK4 UniRef90-R6RNA9 UniRef90-A0QU64 UniRef90-R1GHQ4
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UniRef90 C5FR14

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$G V L V Q A N Y G L R D S L R I A G V P V G Q Y L R D D R D Y S A P N P A A G$ GILVQSNFGRTRDLEI NGFPLGEKVYKED DMA EAA GVLVQANHGARERLM DGVPVGRLLPPPPTVIMPGGP GALVQANYGRMRDLRVAGAPVGRQLDDELAAASAHLAAAK GALVLSNHAVFDDLVVAGTPUQSLLDAHDP AALVQANHGDRPWFTVLGAPVGKLMTQDCD GVLVQANMGARRQMTVAGVPLGLALTEDMPNVQRSAGGP GALVLSNFGLQGDYПTDS $\square$ SFREYL
GVLVQCNYNWGGSLRLGDQWVSEKLPVGEHCYTDPS TAPQ GVMVQSNFGGV LS DGVSVGEYLKKFSFSNQLLNNV
GCLLQANFGRRNEFKVAGRPLGKDSKAPNPEREAEGLPKV GALVVSNFGRREELR NGRNDAKADNRVVPYMPPSFDER GVLVQSNFGGV LTWNGRNDAKALNRVPRNYRYD GALVLSNFGGEGNLVIGGRHYGSELPELKARQKSDTDEAS GVLVQTNYGGV LT AGAPVGKELG RYSFAPPREEETQ GVLVLSNFGKLEEFRLNGNQVGVQLRDRLNNNTDQSDAD GTLVLSNFGSKNNLERGMPVGKYLNQNNSVNTDQDEKPE GVLVQANYGKKQHLRIGGVPVGRELEKRRRMQAEELDDKK
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GVLVQSNFGGL GVFLQANFGSRRELTVAGVPLGDQLADDNPMEAYMFRGG GAFVQANFGSRHELTVGGVLVGQSIADDNPMEDTDWLI GALVQANHGVRKWFNVLGAPFGLLHNENLI HP GTLVLSNFGRKGDLTL PDGRHPTSDFPE GALVVSNFGEERDLLLPGRG GMLALANFGQDRDLIISGVPTGELLTDQAKGYIP GALVQANYGTKDNLRVGGIPVGKVLEDQQPEANGKGAARE GVLVQANYGQKEDLC:GGVPVGRELASTETLSSTSTAPGV GLLVQSNHGKLKDLTIDGVRVGGEKKYEELVNVEDKNS AALVQANYGRLQHLHISGVPVGRDLQKRAAAHDKEYDEAK GVFLQANFGGRRELTVAGVPVGEALTDDNPDEDGDWEKT G GVLVLTNFGLGEDLTILGKPVGEADR ARAEEA GVLLQANFGSRKELVQGRPLGRDSAAPNPEAAGSDARRA AALVQANYGRMPPLKIAGVPVGRILAAEAAKAQAEYDAAK GVLVQSNYGG DLTIAGVPVGRELSRQQKENN GVLVQANHGRRGRLRVNGVPVGERIPTDEVPSPFDAVVRT GVLVQANMGDRPWLSVLGVPVGECMPGPGGQHNEPAA GVLVQSNYGG1 LT DGVQVGKALNQYYLQDTVEAR R
 GAFVQANFGSRSEDTA AGIPVGTRVDVPNPMETEPWLEHD GVFVQANFGKRRNFTLRGARVGPDLVE ABAMREGTP A ALV QANHGKMKD LR G GVPI GWLL EAEAAK DEARLAR VK GALVQANYGGV LRID GVPVGERLGRYDFRGEGGEEAPG GAIVQANHGMRNSLMVEGYPVGRYLNTEKDPSPFATADLP

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KPGTGSIL 250
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A E $A E G L G S I I V V \vee A$ PPGAGSVI AVIATDAPL LPGQCKALARRVPLGLARTGTTG
 P A GA G S CI GIV V A T D A P L L P G Q C K A L A R R R V P $K M P D G S I M M I L A T D A P L N D R Q L K R L A K R A S F G L S R T G S Y A$
 NPADGSCMIVLATDAPLQAHSLERLAKRAFMGLAKTGGGGA

 NKK D GS I I I V L A T D A P L H P L Q L Q R L A K R C S L GLARVGGNA

 Q K G G S V V
 NKDKGSVI I I VA A E E H R G S 1 I I IV I A T D D A P L











## D

 A E D K G S IIMMI A T D DP L S S R Q L E R LA N R A A I A L G R T G S YM S R D D G S CMIVVVA T DAP L D D A R D L R R LAA R A IF GMGR T GA S Y
 GA G G GS I I VVVVA T D A P L L L P H Q C T R L A Q R A T I G I A R I G G T G N R K D G S I L V V V L S T D A P L $\operatorname{L}$

 E S A D G S CMMI I A T D A P L GA R N L E RMAAKRAMLGGLA K T G GIA


 $\square H E$
$Q P E$
$Q T P$


D K K D
PPGAG
$P$ PGAG
D G A GSVI AIV
RDNDGS 1 VPGAGSVIVIVATDLPMDARQLKRIAKRAGFGLARTGSDA
 DKKDGSIIIVLATDAPLSADQLQRLAKRATGGLSRVGGYG SGDGSAI MVAATDAPLSARNLERLASRALVGGLARTGSNM A








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| UniRef90-LOIX12 | L L |
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1
 LHLQKGKTNC $P R A R G L G L P M P G V T G P L N A$ RARQLGUTLGGTPGELNAI
RAREMGDEDGFMPGAKNS
RARDFGVPGVFKTGKFNA
 LRSGELDLI
 PRARALGLPMQGHTGTDNAI K K LRELGI KVGLPPGSKNCI KRLRELGVVI GYETGLWNA
R $\square$ RE

RTRDLGVVIIGEHPGPHNA 1
RARDCGIIPFDGTPGPGNA KRARDGGLPMPGTPGPQNA

R R DREELELNSRWKRGPRNL PRARALGIAPEGEPGPWNA

## $R \square R D Y S \square T P G M Q P G P \square N K$ <br> MPLQKGKNNC

RGRADGLQFSGRTGPWNA
RPREYGI QFGLQPGQNNA $P T A R E L G Q Q G L Q P G \square Q N A$ KSVREYGIPGVLPPGPLNA
PRSSDLGI PGGGQPGALNA
KERGVKIGLQPGDKNC1
RFREAGYLFPGKTGINNA K R】ADYGI HV GMKRGALNSI


PRARDIGLHFSGKPGPHNT $P R V Q D L G L T \ G G E R G P L N A$ GVLPAGALGTI
 KR】CDYGUS IGEHPGKRNK
PKECELQLENRYAKGEKNLL
$R$ R DLLPNLRLSPGPLNS

RARELGGUPGVLPT
$R L D R E G Y S V G R L P$
KRLDREGYSVGRLP
RAREHG $\square$ PFDGTP
GPFNA
RARELGDPGVLSPGAHNA $P R \square R D L G Y P G K F A P$ K S ARSYGLWMGLTPGPKND

GK G $\square$ RAYGYT $\quad$ G GKCG $\square$ RNTI
RLRDVDLHLGFKPGPKNA RLRELGVLGLPPGRHNA RARDLGI SLDGQPGAHNAI PR\LRDLGITIGALPGPGNA RLRELLPEI Q IRTGPKNGI
 RLR RDGI GVGGESGPWNA
$R V R E A G L R L G F S P G K L N S$ $P R \square R D L G Y P G R F A P G P Q N S$ LES GAMDNI

## $H \ G R \square P G P \square N A$

K VREKG】IVGKLPGRKNCL
$\mathrm{K} \square \mathrm{RARG} \square \mathrm{Q} \square \mathrm{G}$

MEKGPLNLL
RARDFGDPFSGATGKYNAI

RARELGI DLEGTPGTFNA
RARDFAUVVGGTPGPHNAITDVPGVRVGHTTLVAGTGP KRFRELGFSVGLSPGKYNA
PRARDLGFACGNLPGALNSIADVPGVLVGHRTLI DGD
 DVPGVKVGHTTLYEK

 GDVQGVSVGHVTLDDG GDVOGVSVGHVTLDOGE
$T$
$T$

 | $T$ |
| :--- |

$$
\begin{aligned}
& T D V P G V K V G H H T L A E G D \\
& A D V G G V G V G H V Y Y C K G D \\
& T D V A G V R G G V T V E G G
\end{aligned}
$$

TDVPGVEVGHVTLVEGDA

DVNGVKVGYST1 DEGNGK

TDVPGVTVGMVTL $T$ PVGVHVHTQELFGAQG DVVGVEVGHVTLT
TDVPGVEVGYATLVEGD
TDVKGV1VGHKTLV

$$
\begin{aligned}
& \text { TDVPGVRVGHVTLND } \\
& \text { TDVPGVLVGTQSVI } \quad \square P
\end{aligned}
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 DGRTGTVNPVVCECNDGFLNDDQGLHVRKEHVLTAMANA
H TYWCMPVVLETYDGVLSDI


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 RKEVDHK GVLVQANYGLIRDWLTVLGVPVGRHLQDDRM GVLVQTNFGGF NVDGVAVGEKLGGYM PWQKE GVLVLSNFGKMRNLTIDGAVVGKQLDSEFDY AGRR GVLVQANFGGV LTVDGVPVGEALGQHYSCYFGDSDVLN GVLVQCNYGSRRLFSVAGAPVGEEIPDLLRSCYFGDAPPPP GCLVVTNFGNKDDFPF GVLVLSNFGEMGDLLVDGRKVGQKIAS IEP GVLVQANHGDRKHFEVNGVP GGHVLTKKVVPFPRMSETTP GCLVLSNFGRKEEFQ WARYFSEGEALS GALVQANYGVREELRVAGYPVGRVLAEVASPFKG AGHVG GALVLSNFGDRELLRVDGVPVGRLISDRFNHVPRRGPA GTLVLSNFGRAGDLVLPD GVLVQANHGTRDWFEVGGVPVGQHMRENLVF

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 GALVLTNYGRLPDLRGGDPVGKRLAALLSDKQG TTE GSLVQTNFGDPEDLQTVGAPMAGLLGQYYLKD QAEVAS GSLVLSNFGALTNLR GGLELGELLESKNDNDQDEKFEAE AAFVQANFGRRDELRIAGVPVGRLLADADADAGARGDWAA GALVQANFGERRELTVAGVPMGRALADDNPMRDG ARM GVLVQSNYGGD GMMDGPVGEELNQFYGQDH GMLALTNYGRLEDFLLNGVPVGLKLKUNSGGEVP
GVLSLTNFGNAHECKFAKWQQEQUICTKMQ NSA GALVQSNYGRLKNLRISGAPIGRILFEEAKAAAAEADKAK GVFVQSNFGRPRDLRVNGAPVGAELPPPPPLGPGADKS GALVQANFGARRELTVAGEPVGRELLADNPMEQQPWP G GVLTQTNYGGV LEAGDPGRYLENYPYR ARPDAVL AALVQANYGRLYSLTIAGAPVGRILWADKERDAAAKEAAK GAFVQANHGQRRELRVDGYPVGRVLQD MKYDPSPFGEQD GALVQANHGRRERLCVDGYPVGRFLAVPSPFDRTGNGAP GVLVQANYGGADTFHVGGVPVGAVLKEEREAVQKGESEKE GALVLANYGRDPQLVLAGHALGPQLATRLATSQKSLAA GVVVQANHGGRPDLRIADVPVGRLLMDEDRKKAAEVPEGG GALVLSNFGARPNLRIAGLELGKKFVSHNVRGSEEAIIHD GALVLANFGKLAALTLAGQHIGNGLRRLRKTVPEA GCLVQSNFGKKEELRLFLYPEGEGLS GVLVLSNFGKREEFAMANW SDRYMK ${ }^{2} \mathrm{EP} \square \square \mathrm{QPDAP}$ QGEDODTTPDYYGAQDNL GVFVQANHGRRERLSVNGVPVGADVGADAVPLPETPRS Y AALVQANYGQLRDLRIAGVPVGKTLTEDAASDPEEVAQAK
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UniRef90 A1UNS4 UniRef90-F2IWV2 UniReffo-U7GJV9 UniRef90-Q119L8 UniRef90-R9LYH4 4 UniRef90-Q4WF24
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GHGSGDIA GFTTATTIDHDEKSDLISMRALLENRIDKL GHNSGDIFLAFSTANGQDNPWRAPDLMNDDVLNDVHLDLF
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4

F T G|V VEATEEAVLNALLDAARDTVGRNGESFALLPHDEVRA FQAVIETTEEAVI RSLMQAKTTEGRNGRVVEKAP Y L A VVVESVEEAVV NAMLAAETTTGKKGGVVKADDTEKDKA FSAAAEAVEEALI NADVAGEDMDTDDGVRVPGLDSQTLDQ



$F M G V V Q A M E$ E $S$
SSMLLSSPVEGREGRKRRSL
LLNSLFAAKTVKGGNNKEVQRLPVEKGIKK
I HALYHAQAVQGRDNH
VNALVAAQTMTGVNRVTAHALPHHLLRE ALNALLGARTMTGRRNRTVHALDPDRLRD WNALCMAKTTSGLGKCLEEEPYAKVKD VYNALCMAETMTGYLGRKVEALPLDRVKE VVNAVVAATTVTGRDGRTAHALDHNLFRQ
 ISSLYHAKTTVGVRGNKYMGL

DHARLK
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Y MDAVRD
$F Q A V V D A$
$Y \quad L A T V N A$

## F

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F R A A A DVT
$F R G V A E A T$
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F Q A T I EAT

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\section*{} Y E A VV Q A V | $F$ | $E$ | $A$ | $T$ | $E$ |
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| $F$ | $Y$ | $V$ | $S$ | $E$ | $F K A V V E L$

$\begin{array}{lll}F & Q A V & E \\ F & R L V & T \\ L & A \\ F & A\end{array}$
F F A A A D A TE E
$F H A V V E A T$
LDEAVVQAVV $F R G \square I E A T$
LESAGEAT
FAAAAEAV
FVAAADAVEA
FESAADA
FQAVSDST
LYA VAEAT
FRAVAASVDES
$F E A V V D S T E Q A$

$F Q A A A E V T$
$F Q A D I E A T$
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FDLVIEATEE
$\square \frac{L}{} N C M V A A R T L^{T} G P F G V T A H A D D H D L L T Q$ FEATADAVEEAI YNALCMAESLQGFQGHTDEALPLARLKE FNATIDAVHEAILSSMLHAESMVGYSGFKAESLLKDILKE $\left.\begin{array}{lll|lllllll}\text { Y E A } & \text { V } & \text { Q A } & V & E & E & S & V \\ F & Y & A & V & I & E & A & T & E & E\end{array}\right)$
$\begin{array}{lllllllll}\text { F } & Y & A & V & I & E & A & T & E \\ F & E & G & V & I & E & A & V & K \\ F & E & A & M & A & D & A & T & Q\end{array}$
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 LLQQY

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 IGRTTTVNPVVLECNDGPFNDI QALAITEDHARLALGNA GAVDWFLTPVI AETYDGFMHDVTKFAVLPSHVVEGIDSAS GGRLPTVNPLVFECNDGYLNDVQAMAVDRVHYETACAAAC VGRLATVNPLVFECNGYLNDMQSLPVAEAHYLRAYDAA VGVMGTVNPVVGECNDAFENKMSALYVAEAHYLRAYDAA GGRDWTVNPLVLECNDGYLNDIGAMAVVPEADYEEACTNVV DGRTATVNPVVMECNDGPLNDUQALAVTEAHAAAALAAALL LGRTSTVNPVVCECNDGSLAD:QAMAVTARDAEAALEAAR DGDTGTMNVVVGECNDSYLNS RLIGGVKPEHAKKACASAS
 ELTTQWALPVVAETYDGRLNDLYGGHVRPGHAVAALDAAR

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MDKVRSINPVVGETNDGYLSDI
DGRWSTVNPLVGECNDGYLND
$V G D H M W C L P V V G E T Y D G V L N D ~$ VFDHMWCLLPVVGETYDGVLND NARGVTEAHARAALDHAA
 S QY WCMPVVLLETFD GVLNDIVWGQHVVASHVHEALAAAR

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GMLALTNFGQLEDMLINGVPVGLMMKRMNHDEILCQVP GCLVVSNFGKREEALEADWR GVLVQSNFGATEDLVINGDRAGERILEEKERRRKMAAA GALVLANFGKLPQLVVAGQRLGERLAKQRAQEAG GTLVLTNFGRGHECRFPGW IPPEEPAPETPVAEEE GVLVLANFGRAGDLVLPDGRRPEVPKLRKSDFASVDA GALVLANYGRQPQLLLAGHAVGERLAALQAER SLIPAVN GMLALANFGLLKDLLINGRPIGQLLSVGAEGYCP GALVLANFGRLPQLIVAGDALGRTLLGAEGYAESTI G1LALTNFGCAGDLVLPD GRRPSPQADA
 AALVQTNYGRMVDFRISGAPDGRLIHAEQERLARTDPTNP GVLVQANYGSKDNLCGGVPIGQLKEQSQQEEEEESAKE GALVLSNFGKLPALTVAGRPFGRLLSERLDRGVAVGRRRA GVLVLSNFGKLRHLRVNGHMLGQDIKRRMAREETHETADN GVLVQANHGQRPWLTICGVPVGQHMQDGDTPDH
GVLVLANFGRPGELRL PD PGRVAVPDKDE GALVLSNFGRAGDLLLPDVPVGEALHDADGPREADPKGDS GVLVQANHGKRDWLNVLGVPGEALHDADLPEEL
GCLVLSFGSREEFKSLHYQLKQDGSGLQ ADFAAWDKDY GVLVQANHGRRPDDQLGKPVGQLMPEGTFDRGM PR P AALVANHGARPELNGCGEPVGQAWDENEPSGAPEPPPAA
 GVLVQSNFGATRCLTMNGVPVGREVLREAEGQELPSPSGT GALVLSNFGTPDSLDYGGRLLGAALAGQLRQET GALVLANYGTPSMLTFAGQRIGPQLAQR LAAPAAADA GVLVQANYGLAETLCDDGPVGRTLQREGKLSAKPADAPE $G V L A Q V N Y G G V$
$G V F V Q S N F G L R H E A G V P V G Q L A G Q Y Y L R E F Q D R G D A$
$F$ GVLVLSNFGRKEDGRUELLKSG GGLVVSNYGNRKQATFADWEHGGVLAERL_QAHTQAPAGQ GVLVQSNYGGV LSIDGAPVGVRLGRYYLR EEVEN GALVLSNFGSLEDLVINHRALGKELKKV GALVLANFGRLTMLTVDGTPLGRMLAERAAKAAKVAKAAM GVLVQANYGSQENLH GGVPIGRLIKSKKASGAVSLLENKE GVLVQSNYGGR LAIAGVPVWASLPE
GALVQANHGQRDWLKVLGVPVGKALGEQ
GALVQSNFGG ELTVCGVPVWANL
GVLVQSNYGGAGQLTVCGVPLDRARPD
GVLVLTNFGSRSCLRIAGRPVGRILAE
$Q$ PQGL GVLAF EGLKRAE GALVANGAFDDLHLGTKAADHIMSLLEEESANAFTMD GALVLSNYGLMPNL! WGGELIGRRIMSLLEEESRQAFTVD
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 KA A E GS II IVVVVTDAP LDPHQLRRIA QHA GMGVTQVGGH G QEERGSVIIVLATDVPLESRQLKRIARRAGAGLARLGSFY



 TA G A G S V I A V V A T D A P L L
 ASKMDGSIIVVI AT DAPLDHPVQLDARLAKRATVVGVARVGGWG

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KHR5 ..... HR5HSL641B8900004134EBAER5ZRP1 2625846 R6S480 Ref90_D6DET2 UniRef90_Q020G1 UniRef90-Q1LNI2 UniRef90_E9DX02 UniRef90_L0A1E7 UniRef90_U4JYZ5 UniRef90_V6MAB8 UniRef90_Q8CVA7 UniRef90_A0A022GYU9 UniRef90_L1QAR6 UniRef90_E6LI11 UniRef90-B2T6F5 UniRef90_G9RTI3 UniRef90_C7Z5I6 UniRef90_UPIO004656115 UniRef90_U3HDB1 UniRef90_UPIO003B4BEBE UniRef90_C1CYH1 UniRef90_UPIO0035FB952 UniRef90_E4QZU9 UniRef90_A8F3S8 UniRef90_UPI0004630180 UniRef90_I3CTU3 UniRef90_UPIO00478ED76 UniRef90_R5G969 UniRef90_D5AT31
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 EQYSGDLMLAFSTGNRGDPPPEVARE\|PLRMVG MMGSGEFCLMVNN VDAR WN DNGSGDIAI AFSTANTYEHHAGKADETVYMRDDHEVMNQL GHGSGEVMIGFTTAGRLQGKDSPEDMTS TCDREDLMNQA
 1 GHGSGDIALAFTTAGRVPHDA GHGSGDIALGFSTAQPIDHDETRGIVVPIVIMESRIDIL


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GH GS G D $\quad$ I A L L A F S T A Y T L


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TNGSGDFAI AFSTSPDSR ERPGTTVQDAKSLLPN
$Y H G S G D V C$ I $A F S T \quad Q R G S \| E E K G K T$
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$P$ DD RVRE


 v $\stackrel{\rightharpoonup}{\Sigma}$

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


$V$ P $\square K$ E VLQ

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& \text { Po }
\end{aligned}
$$

$$
\begin{aligned}
& E F L P Q
\end{aligned}
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FD A VA E A T
Y TA A A E A T
$F$ D A A A E A V E


F H A A A D S V
$F E A A A D A$
$F Q A V I E A T$
$Y M A T V Q A D E$
FA A S AEAT
$F Q A V V E V$
$F H A B A D$
$S$
$F B A A A A$
$F$
$V$ A V A E A T
$F R M T V S V V$
$F R A C A D C V$
$F R A M G E A T$
F E
$F$
$Y$
$F$
$F-L A B E S$
$F Q A D V A E A$
$F R A A A E A$
$F R \vee V A A A S$
$F R A V V E C T Y$
$F Q A A A D T V E A$
$F H A A A D S V E A$
LSAA A A D A T E
$\begin{array}{lll}Y & Q & A \\ F & D & A \\ V & A & V \\ E & A & \end{array}$
$F R A$ A $A E A$
$F Q A V A D S A$
F A A A A E SVVE
$F Q A V T E$
$F$ TAAAEAVE EA
$F S A A$
$F$
$F$ A A A A A V E E
$F E A A A D A T$
$F R A V L D A$
EA
$F R A A V E A$
Q A A A E A EEA

## A


$V$ V $N$ A $\operatorname{L}$
$V$ N A L FA A E G V V G R D GHQRRRA L


R D


RDRLAE


## AP



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| UniRef90 J2W7P0 | M $\mathrm{L} K$ A |
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| UniRef90-I3RBZ7 | 1 MEK Y |
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YKKGPKNNLCDVPGVRVGHLTLEDS FGLSAGRLPGPRNTIADVAGVTVGHATLAEGKT ARDFGLVCGTLPGPLNAITDVPGVTVGHLTLHAGD LPR
RARADGLPG FTPGRHNA DFPRVGVLPSGQLDA
$R D{ }^{-1}$
AGG
RIGMLPGELDS GDVRGLKVGHAQVWTD
KR $\square$ SDYGYR GGHHEGPRNKI TDVPGVRVGHATVESGN LPSGPLDGI TDVAGVRVANLTIERGSA
RAHGLICGLEPGPRNTITDIGGVSVGHRTLNTGD
KQALDFPRUGVLPSGPLDTVCDVGDVTVGHCTLADG
RARDDGLPFAGEPGTLNAITDIAGLHVGMTTLDEDRP DKDFGLTCGTLPGTLNAVTDVPGVRVGHVTLRDGD LPPGPRHAISDVPGVEVGHATLADG
H $\square G V L P G A R N S I T D V A G I T V G H A T A G G S$ GVRMRELGLDGPMDPGPDNAITDVPGVRVGHTTLVSGHGP RLPSGAKNTLCDVPGVTVGQVTCHEGE (L)WDAPRLPTGPHDRLSDVAGVRVGHCTLADGE

RARHFG $\square P G P M P T G P L N A I T D V P G V A V G Q V T L D R G D T$ GHRARDपG VIGHAPGEHNAAT

RAREAGVVIGI DPGPLNAIT
GRLPRGPRDA
RSRQT FRPRFPCGATNSL
RARDLGUAPGTDPGPLNA
RLRDLGFPGVYETGSDNA
$R Q L G Q P R S A C G P A N R I$
RERRLLFTPRLPTGATNSISDIAGVRVGHSTLNAGE RARDLGACGLPPGSRNSLADVPGVTAGHRTLVRGEGT RARELGLGMGLPTGTHNAITDVPGIRVGHATLIRP
PRLSDLNALGPYPGRTGSV
GARDADTDVAGVTVGHATDADG
TADLGYTPGQLPGPKNSI LDVPGVHVGQVTVGKD RVRALDLHGGFPPGRLNSITDVPGVLVHTTTI RGPPNP RFRELCSPVGHYPGPLNAITDVTGVSVGHMTLDDGDRT RARDLGVPGVFAPGRWNAITDVDGVRVGHATVTEGDS RrardlavVVatagrail ADVPGVTVGHCTLDAG
 ■RRFVKVGDGLTGEKNNICDVEDVKVSHYTLKNDE
 RFRELVSPPDYETGPLNKI TDLEGI EVGHFTLDEDAPR RARDLGLTGRFAPGPYGAI TDVPGVRVGHVTLREPPT KTARELGLQGRLAPGPGNEI
RWRDSGLVPRVPCGARNDI SDVAGVTVGHATLAAGD PRARDLGLPGDGDTGEHNAI TDVPGIRVGHTTIRRP
 $R \square R D D A R T G G F P C G E Y N A V T D V K G V R V G H S T V 1 / K D G A G$ RARDFGIPLTGEPGDWNAI TDVPGVQVGYVTLVEGD RVRELGLVGSLPGSNATIDVPGVRVGHTTVVDP PRARDLGLGTGTLPGRHNAITDVPGIRVGHTTVTAP PRADELGAGAGYARGRINA:
RARDLGVPGTLDTGPLNAI

PRARDLGLA MQRGPHNA
$\begin{array}{ll}T & D \\ T & D \\ T & D \\ T & D \\ T & D \\ T & D \\ T & D\end{array}$ v
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$V$ | $R$ |
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| $R$ |
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| $L$ | GHD VT C

$\qquad$ REGERT
HATVHSD MQRGPHNA

RARSLGVVIGALPGPLNATTDVNGVLVGHTTVDDGA
 $P R A R D F A L D P H L P P G P L N A L D D V G V A V G H R T L R G D G T A$



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130
140
150
160 MQEVVRSLNVVV|GETND GRTND|I R A R P|I|TAAA|V|RTA|L|ESAK MGETLWPLPVVGETFDGWLNDIAGQHVTEVDVLAAAEAA ADVGYFTMPVVAETFDGFLNNSVAFAVQPSHVRHG|AAAT RGRTVSVNVLVGETNDSQI SNIGKRAVEEEHVLAAIADAD EEVRSVNAVVGETNDGRLNDI RARGI RGEDVLRALAEAS GAELASVNPVVGECNDSVLNNISERVIGLKEVMAAVKDAV A LGGER WLMPLVVAETYDGWLSESEHFVLRPQHVLEALRRAT SPD D WALPVVAETWDGYLNDTNRAHITTADAVSAIEAAA EGVLS $\operatorname{VLNPVVGECNDGHLSDIRSRPVREEHVRAALDGAS}$



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IGREGTVNPVVAECNDGFLNDLRLRSVTPEMARQALDAA
 VGRWSTVNPLVLECNDGYLNDTQALAVTEKHYDEACASA QIDYDLPLPVVGECDDSYLNDSRGPPVPLETFQAAFKSAS GGRWPTVNPLVFECNDGYLNDDQAQAVAEAHYEQAWRGAA LGITDVPLPVVAECDDQLLNDI QARAVRPSDVVALLNRAH GRTGTINPVVMECNDGYLSDIQAMALSEADAEAALLNAA I G R G A T V V N P L V F E C N D G Y L N D Dill A L A V Q E A H Y A E A C A V A A VGRRVWAMPVVAETYDGRLNDI TAQPLTEAHVLAALDNAA IGRTGTVNPLVAECNDGPLNDLQALVVSEAHALAAAEAAS IGRWPTVNPLVFECNDGYLNDLQAFAVRDLHYHAAHLAAG
 EDADWFIIPVIAETFDGYLSD:GKFSLTPSHFVQGADGAE GGRTATVNPVVMECNDGWLNDLQQMPVTTDMVKMALHN
 EGVRS VNAVVGETNDSGLNDIRARAVSIADARRAIAEAR $\square G R T G T V N P V V G E C N D M F L N D I R S R S I T T E H A R R A$ TVRAA
 EAVRSVVNAVVGETNDGFLNDIRRRRVTDADARRAIENAK I G RLDP T L N P L V F E C N D G Y L N DI QRMAVAACHYRDALDAA I GRKS TVVNPLVLECNDGQVND


$E K \vee V S$ L $N$ AVVGE
IGRTS TVVALVLECND GRVND
$\begin{array}{llllllllllll}L & G & R & T & P & T & V & N & P & L & A & L \\ \text { I } & \text { E } & C & N & D & G & W & L & N & D \\ & G & R & G & S & T & I & N & P & L & V & L \\ E & C & N & D & A & Y & L & N & D\end{array}$





 $\square G R W P T V N P L V F E C N D G Y L N D L H A F A V A P S H Y D D A C R A A$ G V S F F N P L


 M
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 HEQTTTINPVVGETNDGALVAI RDRPVGPEQVAEALVVAA
 YE Q T T T L N PVVGETNDGFLSDI R SRPLGDAEVAQALGSAA $N G H V T S I N A V V G E T N D G R L N D I R A A R P T V A E M L A A L L A N A R$
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D , UniRef90 B5SLH UniRef90-B7CB53 UniRef90_W5WFD8 UniRef90-R4X766 UniRef90_UPI000377C6B0 UniRef90_UPI0004716B3E UniRef90_UPI000376808E UniRef90 UPI0003B620F9 UniRef90_K2FNF7 UniRef90-D2B1H5 UniRef90-G9ZCP9 UniRef90_M2U5K3 UniRef90_B1M7R7
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 V


## R <br> V




.
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 D K G S I V A V L A T D LP I N E R Q I K R L L K R V E I G I G R T G S Y A
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Uniretor

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 पGRRPTVNPLVLECNDGRVSDI QALAVTEAMANDADMAAA A A QWMLPVVVGETWDGYLNS:NAGAVRPEHARAALDSAA YEDTVTLNPLVAECNDSWLSDIRARAVTTAHVEQALESAT GELKSF LLPVVAETFDGYLSDDCKMSVKSTDGVRSUNEAS VAVGHEVVPIVPTAVLFDLLSDWGNRPDPGFGYAACEAAS GGTPDQVVPIVPAAVIFDLPVGEWSTPPTADFGYRAAAAA FDVGDTKVPIVVGAVLFDLGDSKCRPDKKMGYKACKVAT GADPARVVPIVPGAVIFDLVGDWHIRPDADFGFMAAENA FDVGVTKVPiVCGAFDLVVGDHTIRP DKDMGYEACLNAT GFATGVKVP VPSA LFDLLNGGDKSEMDEHFGKSAVASA FDVGVCKVPVVTGAVLFDLGGSYKVRPDKEMGYKACLNAS TGRGPSLNPTVLECNDGYLNDMQAFAVTEAHYAQALANA LEVAGHIVPLVPAAIIFDLSNGWAKNPYPSLGKQAYENLN GGRWPTVNPVVFECNDGYLNDGHAFAVTPAHYAQALADAR $G G A P G Q V V P V V P G V V F D L G D W R V R P T A D F G Y R A A D R A A T$
$G A E P A R V V P I V P G V I F D L V A W D D R P A E F G R L A A A A$ FDVSGHRVPVVPAALLFDLDKAWGRFPPYRELGYEAANAA
 FEVGPHRIPILPAALLFDLDKDWGRYPPYRELGYQAAANA YPVGTVVPIVPAAVIFDLLVGSATVRPNAQYGYWAAQNDK YKVGKAIIPLVPGAVIFDLNTKNNPHVPWRNLLANQAYKNK PADPSRVVPIVPGAVIFDLGDWNDRPTAEFGYRAAAEAAV

 FDVGVTKVPIVPGAFDLGLGDYKARPDKKMGLYQACKNAA FAMGPFNVPIVPTAIIIFDLRNGWHKNPYPAMGRQADENA

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FDMQVAYAP VCGASLEDLGDPKCRPDREMGYEACKNSE FDMQVAYVPVVCGASLFDLGDPKCRP DREMGYEACKNSE
$M G E P G Q V V P V P S A L L F D L G G T W G H R P R A E D G R A A Y A Q A S$


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 ASRRARDAGAFSPDAPLSARQLKRVALRAAAGLARTGSVY KLPDGSDMIILAVDIPMSDRQLKRLAKRA APEGNSCMIVIATDLPLDARQLGRVARRAVFAMGRVGSDF VREQGSCVVVVATDLPCSTRELTRIAGRGVEALARVGAAF TSPRGSCVVAVALDVPCTGRQLERVAARGVLALGRVGAAY

## QPVGNSCMVVVATDAPVEGRQLGRVANRAVFAMRGVGADY

 $P Q D R G S V I, V Y G T D A P L D S R Q L A R I A R R A G A A L G R L G S Y W$H T Q G N S C IV L LVT DAP DDAR QLARDARRGVFALGRVGASY

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FEAAMDCVEEAVVDA LLAADTVRTPDGRVAHALIPAEAVRA FAAAADSVEQAIVDALWCATRVTGRDGHARRALAAPELER

F NATTEATEEALLNSLTMATTVTGYNGNTQYAVPHELITR FAAAMDAVEEAVLDALLAAETVHAPAGHRAYALPHAAVRR FTAVLDSVEEAVVDALLAARTVRAPGGRTAHALPHAVLL

FAATMDAVEEALVNSVLAAETTVGPEGRTAHAVPDDRVRE LLAA AVEAAEEAVLNGLWNAEPLTGYDGLRLPVL
$\square T A A D E A A E A A L V S S L L A A E T T P G K A G R T A H G L P R D V L S R$ GTLASEVMSRA】TNGVKAAK
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GSLAVEVVEKSiVNAVKNAKSLGG
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FAAAADSV
CTAAAQCVERA IVDA ILSATTVAG $\square P G Y R$
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A RAVYFAT
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GSRASDCVARACNRAI YEGKAV
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GSIAVEVMEKS LLNAVKNAKQDNG
$G \square L A A E V M A A A V L D A V K S A K S K F G V R G Y A D \square A L S \square$
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GF LDAARTMERAVINA IKSAESAYGFKAYR
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GILATDLMAKAVNRAVKKADSAYGLKSYK
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GSRASDCVARACNRAVYEA
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GALSAEILAEAVIRAVRAAKPAGG
GSLATEVVEKSVINAVKNAKA
A R GVY A ATA
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GULATEVIATSIRNAVLHAEGAYGLPAHK
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$G V L A V K C V E R A V V R A V K K A R S L H G Y$
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GTLAADVVAEAIARGVRTAVRAGG
GTLSAYVMEKAIIHRAVTQTQSAYG
GAMAAKVISRSI ANAI YTSKS
GMDASNVMEKA LIRAUKEAETLNGVKAYK
LAA GADAVTRAVVKAMRAATSVDGPGG
A EAVARAVVNA
ARGVHDAT
YTAAADVFARAVVHGALAATTV
GEAAA TAVQRADVKAVLASADPVA G
G LAARVVEQAVVRAVKSAES DGYKAYK
FRAAADMTQEAAVLNALCMAPAMPGRNGRDYPCL ADWLME GA ADAADCVARAA ARGVVWHAETMPG
A ARVFAR A MVVGVLAAASVPG
$\begin{array}{ll}G Q A M A D C D A R A & V Q A V L R A B P L A \\ G V L A A D T M A M A A & K R G M M K A E G A Y G\end{array}$
MEAGADCVARAVVHAVLAATSV
CSAAARVFARAMVHGLLAASSAPG

UniRef90 E6SA8
UniRef90 Q2T686
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UniRef90-W8AH53
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UniRef90- H6R3L7
UniRef90_E3PXA7
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UniRef90 R4KBJ1
UniRef90-UPI0002628459
UniRef90-W4EP43
UniRef90 UPI000367F693
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WLRASR

A L
$R \square A R$

2030

MK T GPRNLITDVIPGFLVGNATD ATGSITDVPGILVGHHSRLDDDAT K GQI IDDVPGI KVGNVEDLE NGTILDIPGIRVGHAE
ETGPRNALTDVAGLLVGHHQALDAEVT
MRPGPKNS $\square$ T DVEGLRVGNAE
PEPGPRNADTDVPGGKVGHHHRRDADAT
TPGSNNLI TDVLGI QVGHAE

G P R

I T DVV D G LLLVVGNA


FNAI TDVEGIKVGHAS
MT A K $\square$ GS:
MKPGPKNLITDVSGLLVGNAQ
YKTGPRNLI TDVSGLRVGNAQ
$R N L$
FRTGPRNLI TDVAGLLRVGNAS
$N$ RLTDVP $\operatorname{P}$ GI A V GHYHRLDDDVV
QPGPYNAITDVPGVLVGQVERT
MRPGPRNLITDVEGLHVGHAE
$M H P G P Q N L I T D D P G L R V G N A Q \quad$ R

GPMTAITDVPG円RVGHMQKNDG
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MMTGPRNLTDVPGLKVGNAS
GKTGKENYLTDVQGILIGHFTSLESA
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M DP GPRNLITDVPGUVVGNAQ
MTWQAGPRNSITDIAGLRVGNA
MTGPRNLI TDVPGI SVGCAE
TRGPRNL: TMD: DGLSVMNAQ
MTTERSNSI
MRQGPRNLI
RNLI TDVVGGLSVGSAE
TPGPTNLI TDLPGLLVGNAS
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MATGEYNAITDVPGVLVGQYERTED
WRPGPRNLI TDVAGLTVGNHS
GSI T DVVPGIKVGHHTLTRRP
$M T P G P K N L I T D V A G L R V G N A Q$
$M L P G P R N L I T D V P G G L V G N A Q$
$\square T \mathrm{D} V K \mathrm{~K}$ I Q V GHAQ
$\square K A G P D N L I T D V T G L S V G N A$
GQPGPRNLI
1 T DVVA Gll RVVG
T E GLKVGTAEDLE
MKTGPTNSITD: $\begin{aligned} & K ~ G L L \\ & E \\ & G\end{aligned}$
MRPGPRNLITDVAGLRVGNAE
$M Q P G P L N L I T D V A G L R V G N A S$
FRTGPRNLITDVAGLRGNA
$G T \mid V D V P G V K \vee G Q V Q$
MKAGPFNAI TDVPGIKVGHYT
KDY TDDPGUKVGHAHNKDG
MRPGPRNLI TDVDGLRVGNA

MKPGARNLITDVPGLKVGNA
LRMRAGARNLLITDVAGLRVGNAQ
GHDGRSNSLTDVEGLISVGQSQ
$M T P G P R N L I T D V P G L L V G N A Q$
RPGPRNL: TDVDG: AVGNA
F N S I EGIKVGNAQN $\quad$ N GP
I NKI QGI RIGNAQ
WTPGPRNLI TDVAGLLVGHA
$M V P G P R N L I T D V P G L L V G N A Q$
A T DVVKGIKVGHA
A 1 TDVVPGVLVGHYQRL

YNNITDVEGI KVGHAS
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160 FDVGVAKVPIVTGAFDLGVGDPKCRPNDEMGYKACKDAN
 FDAGVAIVPIVPAAVIFDLNGDPAVRPDAEMGY】AAQNAS PADPAKIVPIVSGAVIFDLLGAWDIRPTAEFGYRAAAAA

A Q

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

 FKVGGYRVPVVPAALLFDLGKDWGRYPPYREGLGHDAKNQAV



## L

 FA A GF P V G T A V V P
 ERDVVVPIVPTAVLFDLGRGGGFQARP DRDWGRQAFEAA T FEVLSVRVPLVPAAILFDLLNGGDKAWAENPYGRKALAAA $F P V L S A R V P L V P A A L L F D L L N G G D K D W S E N P Y G R A A L Q Q A$







## 









FA A G P A K I P L V P G A L L F D L L N G G E KA WD E R A L G R A A Y D D A



$F A L V H Q P G V P P S P V L A S G G D K N W G E T P P Y R A L G R A A V L E A$
$Y P$ TGK T V V P I V P GA V I F D L NG DYR R R P D KA MGYRA CL N A



VEVGGFRVPVVMAAMLEFDLDKGWGRYPPYRELGYEAAAAA
Y N V G V G V V P P I I P A A V I F D L





FAMRVPVVSIVPAAILYDLDNGGDKSWGEAPPYRAAV SHA
$F Q V G S A V V P I V P G A I L F D L L N G G D K A W G E N P Y G R A A F D A A$
F GETPHVSPVVPGAVLFDLPNGGDKAWGEMPPYRAACERA








## UniRef90 A3JN12

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UniRef90_UPIO004746ECB UniRef90-A6TJH2 UniRef90-V9VYH4 4 UniRef90-EOMK27 UniRef90-F2J4Y1 UniRef90-UPIOOO4792558 UniRef90-R9LMW5 UniRef90-H8GA70 UniRef90-B2TLA6 UniRef90-A0A024KCU7 UniRef90_UPIOOO3795615 UniRef90-A6FK11 UniRef90_C1AVW5 UniRef90-C7MWDO UniRef90-K2MG51 UniRef90-14YQH2 UniRef90-UPIO00469F7AE UniRef90-B6B7S0 UniRef90-N9WDW9 UniRef90-F4LT42 UniRef90-UPI0004772B70 UniRef90-A0A023D7A8 UniRef90-D7CJ54 UniRef90-UPIOOO46A0D41 UniRef90-D8EYT8 UniRef90-A0A0591QD5 UniRef90-A3JXN1 UniRef90-B7CB93 UniRef90-G6YJT1 UniRef90-J2GZP6 UniRef9O-UPIIOOO35DF09A UniRef90-UP100036D569C UniRef90-UPIO00225F97D UniRef90-11U2 UniRef90-UP10003B601A6 UniRef90-UPIO0039DAEFA UniRef90-C8S2Y2
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UniRef90- $19 \mathrm{CMK2}$ UniRef90-I9CMK2 UiRet9o UPTJH2476ECB UniRet90_A6THY2
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240
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 GAMVVVNAGEI RDPKNGKTDAGAHILDLI SYVIDNKDNNF AA A ATVNAAGATFDPRTGLPWGVGSDGADHFARAAADPPK
 GALVAVNAGDTRHFWAAPFEEGVEFGGLGMPQPFPQDARE GAIVAVNAGD IIDPNNNSI DAGALNEDKTEFDNTEEDMDK GAVVVANPVGSVLDPRTGLPWGLGLPDEFDLPTPTLDAAK GAAVAVNAGDVKHPHTRQILAGARWLDCCAYLEQHAQSEA A MIVVNAVGEIRDP LNGKVIAGACLLDDQAEMDESSESLQ GALAAVNPGRSRHFWAAPFEIGNEFGGLGYPSPMPDNARK GA VAVNAGDVKDPNTRE:LVGARNAETAQWLEQHAQSQA GAAVAVNAGDILDNEDAGVLTDDKDSLDNTENDMDSQYDN GAAVAVNAGEVRHPKHGITLAGARADEYLTQLANPFQATM GTIIAGARGER GFINTAEYLLKFGAVWDLKDISGE GAVVAVNAGDVFDPETGEVIAGKIISTEEAIDENDGREKS GAIVAVNAVGEVRCHVTGERLAEELDD $\square Y$ Y DMEKASFQF $\square$ GALVAANPPGDEHFFAAPFEIGDEFGGQGVDPATGLMQAM GALVAVNAPGGQHFWAAPFEMGEEFGGLGPDPRGGLVSPE GAAVAVNAGDGGHFWAAPFENDGEFGGLGDPSPGPALPDR
 GAALAAANPARTRYFWAAPFELGDEFGGLGGYSPMPDDARA GALVVANPGGVIDPTTGDPWGSDDLDVHRLRTPTQDEVKR GALVIVNAAGSGRLYGERYGLGDEFAGLRTPTDPPPDLPG GALVAVNPPSGRHFWAAPHEMGGEFGALGVDPASGVAAAM

 GAAVAVNAFGDDYTPDNQVLAGCFDRKKNEFDPTDQWLSQ
 GALVAVNPMGCAHFWAAPFEMDGEFGGLGPDPVPGFRPLPB NALGRATMGETPHFWAAPFEVGNEFGGRGDTPTLPADDAL
 GAIVAAVNF GDIVVNPGQEI IA GAKAEDGKRFANTWEDMKK GAALVAANPPGERHFWAAPFEAGGDEFGGGLGPDPAAGMLRSP NALGSPVCGDS GQFRASDFELNDEFGGYRANSEDPSAREQ


GALAVVNAS

| $G A$ | $V$ | $A$ | $V$ | $N$ | $C$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $G A$ | $L$ | $V$ | $A$ | $A$ |  |
| $G$ |  |  |  |  |  |

GA LV A AN N G G N P NFWAA P
GALVVVVNAGDGPHFWAAPFERGDEFGGLGLPSPDPADAAV

 GALVAVNAGGTPHFWAAPYEDGDEFGGLGLPHPMPDPARA GA AAVNAVGRQULAGARREEGQGFRDTMAA MGGYRVVI
 GA IV A V N C G DVVVDPGAYNKETKKF LDNSENDLLSSSTEN PKN

 GALDVVNYGD V VDPK T G QVIA GVRLCTLD DWK GEGQALNQ A ALVAANPPGDRHFYAAPFEMGDEFGGDGPDPNGGLGLTL GA L VAVNCGQVIDP P T GEKLAGPVLDTEEDMLDAFAD KQN

 GAIVAVNAVGEVRDPSTGEDLAGADRDSLSWMDDAATPPV GA IVGANAHGRAWDPVSGELYARWLEDHTPPAYSYMFDSP
 NAAGSVTVAATPCFWAAPFEDDAEFGGLGLPSPDPPEARR
 GALVAVNAPGHPHFWAAPFEVGAEFGGLGPCPEAVPLTLP GALVAVNAGDTKHFWAAPFEHDNEFGGIGYPSPMPANATN $G A L V A V N A G D G P Q F W A A P W E L G G E F G G L G Q P F Q F T P D D E P$
 GALI A VNPPGTGHFWAAPYELDNEFGGRRWPSPDPA DAPA
 S A I V A V N A M G DI F D D E K N K Q GAVI AVNCGDVVDTSTGKIIAGVLNKGKNGFADTEDEKKN GALVAVNAGESRRHFWASPFEIGDEFGGLGLPNPYPADADP
 GA L A AVNAGEAVDFAT GDHEVAGEFGVSWPDRPGSVPPDR

 $A L L V L N P L G E A L D P R T G E L Y A R R F D L D G E V P E L G V P D G A G$



UniRef90 A3JNI2
UniRef90－T4VZ58
UniRef90＿G7CL08 UniRef90＿UPI0002D6C9C6 UniRef90 U7QU60 UniRef90＿UPI00036E56C2 UniRef90－XOVOL6 UniRef90－UPI00047607E7 UniRef90－TONJ57 UniRef90＿UPI00046513FF UniRef90－UPI00047841E0 UniRef90 B1HVT7 UniRef90＿K8WUI8 UniRef90－HOHS19 UniRef90 ${ }^{-}$R7ZEW0 UniRef90－D1CDK3 UniRef90＿U2NLG1 UniRef90＿S9U5T8 UniRef90＿UPI00047C3D03 UniRef90－Q8R934 UniRef90－U4WMQ4 UniRef90－UPI00046855B3 UniRef90 UPI00037567A3 UniRef90－D7A174 UniRef90－A0A017RV96 UniRef90 E4KQ44 UniRef90－X5XA67 UniRef90＿UPI0003FF7471 UniRef90＿UPI000371FC62 UniRef90－Q0FPC5 UniRef90－X6L217
UniRef90＿UPI00037918EF UniRef90 IOGJ11 UniRef90－SOKRZ3 UniRef90＿UPIO004777690 UniRef90＿X7EI88 UniRef90－B9QZN9 UniRef90－14C6Z0 UniRef90＿19CMK2 UniRef90＿UPI0004746ECB UniRef90－A6TJH2 UniRef90＿V9VYH4 UniRef90－E0MK27 UniRef90 F2J4Y1 UniRef90－UPI0004792558 UniRef90＿R9LMW5 UniRef90－H8GA70 UniRef90－B2TLA6 UniRef90－A0A024KCU7 UniRef90＿UPIO003795615 UniRef90 A6FKI1 UniRef90－C1AVW5 UniRef90－C7MWD0 UniRef90 14 YQH2
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$C G P A A D C F E R A V V A V L A A T T V A G$
GSRDSDCVARACNRAVYEADS
GHLATKVMEEA ILAGI QAADKDAGVESYT
$G L L A A E V V A R A V L R G V C T A E S A Q G Y K$
A RGVHA ATA
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GVGADRAVERAILDAV
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GMWAAEVLAYAVHNAI $\square A A N S V E G$
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AVKAVERA $V$ VRAVKEAESAYG $\square K S Y K$
GHAAAQC $\square$ ARA $\square$ ARAAFEATPAPG
ARAVYEATA
ARAVYEATA
GVLATNVLEEAD $V$ RAVRDTSSLFDYKCHK
GVMA $\square E$ AMEKA $\square$ MNAVYAADA
$C E V S A T V V Q R A V V S A V V T A T V A G$

ARAVWEAT
ARAVWEAT
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$G F L A A A N A M E K A V V A$
$G$
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G $\square \mathrm{MAVKAMEQA} \mathrm{\square VNAGT} \mathrm{\square ADSAYG}$
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A R GVYHA
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ARAVYHA
A RAVARGVY
GF LSAQVMETADINADKSSESVLGYKSYK
GSLGAKVMARAIANAIYFSK
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LT G R P GP L N LI T DV A GLLVGNA WKAGARNDITDVSGLGVGQSE

IT D I K G I K I G N A Q
R NLI T DI A GIITVGHAQ

TGTIVDVPGVLVGHAQ MK P GPLNLLTDVTGLSVGHAT $\square$ L D V P Gl LV G H A E MTPAPRNLI TDVPGLKVGNA M K P GPRNLITDVTGLRVGNA

R V G H Y T
$K$ D S IT
MKPGPLNLI TDVAGLLVGNAE MTPGPRNLI TDI PGLKVGNAQ
 MRPGPLDNLCDVAGVRVGHATDGEG

SLNDI D DIT G GHAQ

| $H$ | $N$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $L$ | $L$ | $T$ | $D$ | $V$ | $A$ | $G$ | $V$ | $R$ | $V$ |

PMNSTT D I S G TQVGHYHRLDPDAS | $L$ | $T$ | $D$ | $V$ | $G$ | $G$ | $I$ | $K$ | $L$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $I$ | $T$ | $D$ | $I$ | $E$ | $A$ | $S$ |  |  |  |


P Gll E V G H F T
NELT D FKI GHAQ
Y RPGPRNLI TDVAGLRVGNAQ MTTGEHNAI T DVRGVRVGQYQRVGD LKPGPRNLI TDVPGLLVG


F N S $\quad$ E GMRI G N S Q K L N G P

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 $\mathrm{P} \square \mathrm{N}$
 A P D K TVA QVDALVLSGGSALGLDACSGVANVLRAQGR
$P E R T V P A V V A L V L D S G G S A F G L D A A S G V A W L A E A G R G$





P

| $P D$ | $C L V$ | $E$ | $R$ |
| :--- | :--- | :--- | :--- | :--- |
| $P$ | V |  |  |

 $P$ E N
$P \square N L V D K V H A D V G L G G S A F G L D A S G V M Q F L E E R N \square G$ $P E R T V E R \square D A L D L S G G S T F G L D A A G V V A W L A E A G R G$ $P V N M V E K V H A \quad V \quad$ V $P \vee N$ LV VVVHI CLLSGGSAYGLAATGVMQWLEEQGRG $P A L S L V T Q V N A L V L S G G S A F G L D A A G G V Q A G L R Q G Q G$ $P G T A T D, V V Q G V L L T G G S N F G L A A A S G V M N W L A Q N G \square$ $P E Q T V N A D A L V L S G G S A F G L D A G S G A Q R L A E L G K G$ $A P D K T V P A V D A L V L S G G S A Y G L D A C S G V V D G L R A M G R$


 APENTVQGAHALVLDGGSAYGLAAADGVMAALESAGR $P R N L V Q R \square D A V V L T G G G A Y G L D A A S G V M A W L E E R G R$ PTAS $\$ NETHA $P \vee N L V D T M H A$
 $V L L T G G S A F G L A A D G V V S Y L E E R G V G$ $V \vee L A G G S A F G L A A S G V M Q Y L E E R G V G$
 $P E N M V Q A D H A V V L$ S G G S A Y GLLASS GVVMD Y L A S K D $\square G$


$P S N L V Q Q V H A \quad I V L A G G S A W G L A A T G A V R W L E E Q G V G$ $P K N M V G B A$
 $P E N L V S T V D A V C L S G G S A Y G L A A D G V M R W L A Q R H R G$ RPENSFSKAHA CLSSGGSVFGLGAADGATAALSARGH PHNTVERVHA P H N TVVRVHA STNLVDKVHA

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 $F Q V G V E V V P I V P G A V I F D L R S A W G N R P D A S F G Y A A C E A A$







 GP HGVVAAVPIVVPGCVLD DLGNGGNWKENDEF ILQALDRQRP

 F DVGVTKVPLVGESCDDFDLNDDQAQAVAEAHYEQAWRGAA
 GHPVGVVGVVPIVPAAVDFDLSFGSAKVRPDMGYEAAKDAS GF VAGGQNPIVPGAII FDLNNGGDKTWTNAFLGQQALAAA

 $G N P Q H Y P V P I V P A A V L Y D L D K N W G K R P P Y Y H L G V K A L K A V$





 FAVGPARVP IVPAA LIFDLLDWGRFPPYRDDGYEAATNAG $G V L N D \square N A L H D S A A D A D K A D E T A R$
$F D V G V T K V P \quad V C S A V L F D L G D Y R V R P D K K M G Y E A C V N A Y E$ V P V A D D R V P I V P GA I L F DLL L N G WGRFPP YR DLLGYAAAADAA
 FPVGGMNVPLVPQAILMDLNKDWGLHPYREMGYEAFQARS




 GDLLGHVVPIVVPAAVI FDLDVGGWDRRPDAGFGAAA LAAA $G V R V G P V V P T A C V F D L G R G G D W R A R P D G R A A V E A A A A S E A$

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


 $F N V G V G R D P I V P S A F D L L V G D M R D R P D A A A G Y A A C V A A G T$ F DMK G $\square Y \mathcal{P} \quad V \operatorname{SGACDFDVADPKAYP~TKKMGYQACQNAS~}$
 $G L R G T P A I P I V P S A C A N G G D K A W G L T P P Y R E L G M K A V A A A$




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UniRef90-J4JUT4
UniRef90_UPI0003775B2D UniRef90_A9DZF3 UniRef90_LOKAX6 UniRef90_M2Y524 UniRef90_M1Z439 UniRef90_R6PK12 UniRef90_L7F800 UniRef90_A0A058VHC4 UniRef90_D8IEG1 UniRef90_UPI00036C7560 UniRef90_V6MBY8 UniRef90_UPI0004641042 UniRef90_B8IHU7 UniRef90_J3HPM8 UniRef90_C9U103 UniRef90_F8EUV4 UniRef90-A3VC56
UniRef90-D8HSN9 UniRef90_R6S3F7 UniRef90_UPI00041BC8DC UniRef90_UPI000470ACFF UniRef90_A5UY86 UniRef90_K2HNC4 UniRef90_Q0G1B9 UniRef90_R0DLS4 UniRef90_R7RUU8 UniRef90_UPI000371BD21 UniRef90_D4XI68 UniRef90_V6MBN4
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UniRef90 ${ }^{\text {T1VSRR }}$ UniRef90-UPI00037A1D79 UniRef90_UPIO0035F3538 UniRef90_UPIO003719C47 UniRef90-U6EW77
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UniRef90-G8RWR6
UniRef90_I5BTN7
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UniRef90_UPI000237B633
UniRef90-B2IJE2
UniRef90-D1VTD2
UniRef90_UPI00037856B0
UniRef90-Q28UC3
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UniRef90 L7F800
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UniRef90-D8IEG1
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UniRef90_-V6MBY8
UniRef90-UPIOOO4641042
UniRef90-B8IHU7
UniRef90-J3HPM8
UniRef90-C9U103
UniRef90-F8EUV4
UniRef90-A3VC56
UniRef90 D8HSN9
UniRef90-R6S3F7
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UniRef90-UPI000470ACFF
UniRef90-A5UY86
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UniRef90-Q0G1B9
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UniRef90_UPIO00371BD21
UniRef90-D4XI68
UniRef90-V6MBN4
UniRef90-B9JSV5
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UniRef90-COE3M9
UniRef90_UPI00047AA0AF
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UniRef90_U5E4H5


 $G A L V A V N A G A G P Q F W A A P F E M G A E F G G L G F D P T K P P A L K G$ AVNAA GEAVDLGGAYAADHEVDGEFGVRWPDRPGDVETTK

 GAPVAMAELSGEFGLTRPPADEQAEFGGLGSPARLTPEARAA GVLVQANFGG HLRVDGAAV GALVAANPVGARHFYAAPFEVDAEFGGMGPDMESRKMASM SALIVANPVGSVFDPRTGLPWGVRLPDASEDAAANAVAAK AALMVANPVGSVYDPRTGVPWGAMADGDEFFGLGTPDGAD GALVAVNVGEGPEFWAGPWEMAGEFGGFPPARRFDPGFEP GAVVVVNAMGTRQFWAAPWEDEGEFGGGGPYPTAEPAPAK GAIVAVNAGDVCDSVTGEILAGARNLETGDFLNSAQMMRK GALVVVNAAGDAVDTATGLPWDEEFGLIAPPADQDAAYAE GALVAVNAGNTPHFWAAPFEIGDEFGGLGMPHPLPADART GALAVVNAFDSGRPFAADHEVAGEFGVRWPERAASVPGR GALVAVNAAGSA DDPDTGRPWDPTAGLRAPDPAEVEAGRQ $G A L V A V N A G G G P H F W A A P Y E Q G R E F G G L G F P S S L P P E A A A$
$S S I T V L N F G D I T D Y E K S I Q I D G C Y D R K N Y N F L S T E D L Y K N$ AA A AVVNAGEAVDLDTGAFWAGGDPGEDPPAPGWAARPAA GALVAVNAGDSRHFWAAPFEMDAEFGGHGPAPAFNAQADP


 | GA |
| :--- |
| $G V A V N A G E G P E F W A A P W E L D A E F G G C G A G T P D D W P A T K$ |
| $G E V$ | GALVAVNAGDSPHFWAAPYEQNGEFGGLGWPAAWPPEAKG GALVGANPPGDRHFHAAPFEDDGEFGGLGPDPAAGLMAAM GALVAVNAFGD LDDKKGK IAGEQGDF INTYQAMKEEEDK GALMAVNSPGSDLWASFWEQNREMGGMKEQLYHSFQSKF NALGEVRNPENGEVLAGVRDVESGKLLDSDDVLGKNYRSF

 GALVLSNFGQRSSMT IVGRPFGRRLAAAAARDDEPA GAVVSVNFGDDFDYDTGEKLAGLLGEDKKSFRSSEEELIK $N A C G A T N F P G G A H F W A A P F E Q A G E F G G L G L P H P L P A L K G L$
$G A V V A V N A G V V Q D P V T G E\|L A G A R \square R D A L S W M\| E Q S A P P V$
 $L V V V N A T V G D G P H F W A G P F E I G D E F G G Y G P P E A F A W P A P G$
$N A L G M V T V G N T R H F W A S P F E M V E E F G G L G M P H P L P E E A A A$ GAIVAVNAVGHR ILA GARTED GKGFRNTMAA DMQGHGVVK GALVAANPVGSPSFWAWPFEDGQEFGGKRPDSSFDAMARLD GALAAVNAAGEAVDDTTGRAYAADHGDFGVTWPSRPADDP GAAVAVNALGD\YDWKNGKKVAGLLAKDKKSFLCTEDEVY $G A L V A V N A G Q G P H F W A A P F E I G A E F G G L G P A H A F P D P H L P$
$G A V I A V N P P G T S S F W A W P L E Q N G E F G G E G A P Q L T E A \ A E G$ $G A L A V C N F G D V Y D L L A G V R A D D G S L A D T M A L L R A M V G V P P$
$G A L V A A N P P E T G R F R A A P F E L D G E F G S R G A P A A R P E T V G A$ GAMVAANPPETGRFRAAPFEDDGEFGSRGAPAARPETRGAA AA LVQANHGLRPWDNDCGEPVGQAWDENRLL
$G A V V A V N C G D V V D P R T G E \| I A G A L N E D K T A F!D S T K D R T N$ GALVAVNAGEGRHFWAAPFEREGEFGGLGFPDPMPADAEA $G D V L D P N T G G R D L A G A R T A D G K Q L L D T R A A D L A G D L P R A M$
$G A M V A V A G H V F D P K T S E I L A G P R I M D S V E L M T T H S F S P I D$ AALVAVNAGHSRHFWAAPFEQDGEFGGLGMPSSFSPDDSA GDI WDQDH IIAGALRPNGTFVNQTRAGLEGDPPGTSGS
GALIDVNAGDTPYFWAAPSEQNGEFGGLGWPAEMPGMDRT $G A L V V V N P P G E R H F W A A P F E D D G E F G G L G P D P S A A G A A V$
$A$
$G V V N S G D N G S I L D A G A Y H P E K G F L N S K S I V L E G E E I V S$
 GALVVVNALGSGQFWAAPFELDAEFGGLGLAGPFEPAQEP GALVAANPPGDRHFWAAPFEIGAEFGGRGPDPAQAMHPAA GVLVVANPVGAVIDPVTGLPWGGDDLAHHGLSAPDPAQAK $G A L V V V N A A G S V L D P R T G V L Y G E Y G G A E P A R L A Q A R D A D T$ AVVVHENGRVVAGPRLEDGSLGERLLPEAASRLGWRERGA
 GAA SAVNAGDVFDFDGKEDADGKLLSTCQAMKDNDYQSKN VGDVVDRATGLPWMTDLIDEFALRPPSPEQDAGFAQLKSP SAMVCVNFGDI FDY DA GPKVDGKIINTMENIGKDAQSFSE AVVNAMGAPVFGPADLQPPLEARRRAPGPQDQPGVPFATP GAVAVNFGDIIDPQRGHIIAGLQEQGRFLNSETLLKQTN $G A L V A C N A G D V I D P D T G A V V A G A R L D S R R A L L R G E P P K P L$
 GALAVLNAAGEAVRAATGEPYAAEYEHEGEFGVARWPERP GALVAANPADGETFWAWPFE DDGEGGQRPGDLAAAAARL AAAVVANPMGNVIDEATGEFFAAGDHGVVDKQAFRALERP A A GIVANPMGD VMNPDTGEFWADPRRKVAVDKLPAA GAMVAVNCGDVIDPNTGEVIAGCILSTEEDLVKNYDNNKN



| UniRef90＿A3W444 | HTMDGDLI IFAAAMGARPAPDLLAGQVM 310 |
| :---: | :---: |
| UniRef90－R5Q4W4 |  |
| UniRef90－S0FIW | HSFDGDTIFALCTGQV |
| UniRef90－A0A058ZJJ1 | HTMDGDLIFAAATATAP |
| UniRef90－R4TFFO | HTFDGDTVFADATGD |
| UniRef90 UPIOOO3609631 | HMFDGDTVFAMATGTEAPIADPRV |
| UniRe | HPMDGDLVFGAATGRVPLEEPALQLSADGHAASLCLSRAL |
| UniRef90 M7 | HTLDGDLVFAAATSAVPLSDPVVEMARLSPA |
| UniRef90－K2AEN4 | Hill |
| UniRet90－K7YWF6 | HTFDGDTVFAVATGAWGQD\｜ENRAD LVNR■GLVAADVL |
| UniRet90－A3SUE0 | HTYDGDLVFGLSTGAHEVAESLPL |
| UniRet90－TIVSR8 | HPLDGDTIFALATGDHTPNSEIAVPAAFPNDLP |
| UniRef90－UPIO0037A | HPLDGDTI FALSTGLTESATGDPVALGPAFLAELPRV |
| UniRef99－UP1000 | HTA |
| UniRef90－U6EW77 | HMFDGDTIFTLGTNKVT |
| UniRef90－UP100030B77A2 | HTFDGDTIFALATGEE |
| R6 | LDD GDVFALA |
| UniRef90－I5BTN7 | HMFDGDTVFALATGARDLPAAEGPFGVTTRAAG $\square$ DDL |
| UniRef90－UP1000237E | HDGDTMFALATGTGAALPAPG |
| UniRef90－82IJE2 | HAMDGDLVFAAATSTARQSPSPRELTE凹GALAADCLARAD |
| UniRef90 D1VTD2 |  |
| UniRef90－UPIOOO3785 | HSFDGDTVFAAATGAR |
| UniRef90 Q28UC3 UniRef90－S9QK08 | HTMDGDLVFAAATGAQPLSDEGDPLMLGHAAALCLSR |
| UniRef90－C2B | HTFDGDTIFSLATNKV |
| UniRef90－UP10002D98B2E | HTMDGDLVFALATGKSGIAPDPDSTTDLYAAAGATMARA |
| UniRe | 俍 |
| UniRef90－UPI0003775B2D | HAMDGDTVFAVATGRAATRPSLRDQTEGGLLIASNCLARALI |
| UniRef90－A9DZF3 | HPNDGDLVFSLSTAAR |
| UniRef90－LOKAX | HTMDGDTIFALSTGDK |
| UniRet90 M2Y5 |  |
| UniRef90＿M1 | MDGDTLFALGTGG |
| UniRef90－R6PK12 | HTLDGDTLFCMSTEELD |
| UniRef90－AOAO58VHC4 | GSGDIALAFSTAYTIPHLDAERGMP VQVMLHETR AI NALL |
| UniRef90－D8IEG1 | HT\DGDSIYAMSVGD |
| UniRet90＿UPIOOO36C7 | D G D |
|  | MDGDT， |
| UniRef90 UPIO004641042 | HTMDGDLIFALSTAEK |
| UniRet90－J3HPM8 | HTFDGDLIFALATGTAGRAPE |
| UniRef90－C9U103 | HTMDGDT FALSTGK AKDGQADVTA GADAASVMADA |
| UniRef90－F8EUV4 | DGDSLFALSSG |
| UniRef90 A3VC56 | HTHDGDLVFAAATGARALASPDUDLMHUGHAAATCLIARA |
| UniRef90 D8HSN9 | HTFDGDTVFALATGAHELPDASGPFGAAARPAALDAD |
| UniRef90－UP100041BC8DC | HTMDGDLIFAAATGAQ |
| UniRef90＿UP10004 | HTMDGDTIFTLSTEKRSLDDPEPL |
| UniRef90－A5UY86 | HTFDGDTVFVLATGRR ASPGLLPLGAVAVDVL |
| UniRef90－K2HNC4 | HTFDGDLVFAASTLR |
| UniRef90＿O0G1B9 | HTFDGDLVFASTGRHDGPQTSAER |
| UniRef90 RoDLS4 | GNNSGDVFLAFSVANPQPMPQSAGPE |
| UniRef90－UP1000371BD21 | HT吅 ${ }^{\text {d }}$ DVFAVSTGRI |
| UniRef90－D4X168 | HTMDGDT FALGTGTSGKPGNVML |
| UniRet90＿V6MBN |  |
| UniRef90－B9JS5 | HPADGDTVFAAATGEKPLPD |
| UniRet90－G8PRA5 | HTMDGDLLFVISTGKRKMQDPMVELLELGAYAAQTVSRAI |
| UniRef90－Q1GD67 | HPHDGDLVFAAATGKKKAP AQSMTDPAADMLAL |
| UniRef90 ${ }^{-}$M1PW42 | HTMDGDTTFSVSS |
| UniRef90－S5YQK7 | HTPDGDLIFAVSTGA |
| UniRef90－B9NTA4 | HTGDGDLVFGVSTG ACHVDPAAMAMDGH |
| UniRet90＿L7LEW5 | MDGDTLFAVATGQTEAAADRQL |
| UniRet90－UPIOOO37E66 | D GDTV |
| UniRef90 A0A023X4A2 | HTLDGDVAAAATGEL |
| UniRet90－Q6N381 | HPLDGDVVFAAATGQVEVEPLAGLTELGTDAANTVARAL |
| UniRef90－A9VY63 | HTLDGDVVFAVATGAVPLGDEVADLARLGAAAAET |
| UniRef90 X 8 K664 | S |
| UniRet90＿P53425 | DGDTVALATGAVEATATADVPVAMSP |
| UniRef90－C7R | DGDT FALA |
| UniRef90－J5U829 | GDS YAMSVG |
| UniRefoto－ALAO59NZQ0 | DGDTMFFMSTGEVP |
| UniRef90－G2FS16 | RWGCGNDEMAFSNYPWIHPQAKPLIDDNAEFL DPF |
| UniRef90 UPI00036E | D |
| UniRef90＿UP10003B5CC99 | D |
| UniRef90－A3V2L |  |
| UniRef90－ROEHX | HTFDGDVVFALASG AVALGADPMRRLLLAKGGSAAADCL |
| UniRef90－UP1000365564B | HPLDGDTLFAVSTAEETQVQDSMLI |
| UniRef90 COE3M9 |  |
| UniRef90－UPIOOO47AAOAF UniRef90 U5RM6 | DGDT／FTVATGKVKA DVVV |
| $\begin{aligned} & \text { UniRef90_URQM6 } \\ & \text { UniRef90_U5E4H5 } \end{aligned}$ |  |

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UniRef90_LOKAX6 UniRef90_M2Y524 UniRef90_M1Z439 UniRef90-R6PK12 UniRef90-L7F800 UniRef90-A0A058VHC4
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UniRef90 X8K6C4
UniRef90-P53425
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UniRef90-J7LWW5
UniRef90_A0A059NZQ0
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UniRef90-UPI00036EB5CF UniRef90_UPI0003B5CC99 UniRef90-A3V2L8
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UniRef90- R0EHX7
UniRef90-UPI000365564B
UniRef90-C0E3M9
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UniRef90_U5E4H5

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GHFAATCDARA ARGVYHATP
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GTAAAEVFTRAMVHGLLAATGLDG
ARAVWEAT
GAAAADCLAQAVLVGVIAAESVAG
A R A VAR R VVYESALGALDPAYKEVHGK
GHAASLCLARA ARAAYHATPAAG
CAASAQVVERADVTA DLDATSVAG
CAAAAVCVERA\|VNAVLAATAVAG
ARAIHEA
ARAVHEA
GMLAVKVMERAVLNGDKNAKS
$G A A A A D C L A R A V L V G V L A A E S V A G$
CAAAARVFARACVHGLVSAVGVAG
A R A $\square \mathrm{Y} E \mathrm{ATA}$
GMLAAKS $\square A R S \square A N A \square Y C S D A S Y G$
YSAAADVFARAVAHGTLTATTV ARGVFEATAE
GHAAATCDARADARADFEATPAE
GTLAAEAMSMAIANAIYSSRE
ARAVYSATAAP
G $\square$ AAADC $\square$ A DAVLGGVLAAES $\square$ AG
ARA I F EA
GHAAA $L C D S R A \square A R A \square Y T A T P A E G$
GA TAADCVTRS TGRAMWEAKS
GTLAAKAVEMAV IRA $\square$ KGASS $\square P G$
GILAAKVTEQAVLRAVKMA
LEASADLVTRAIVVAVVAAESVTGPGG
FEAAAEAVEQAIVAALWRAETVAGRDGHVRRAD
GS LAA AVMGRAINNAVKNAESSYG
ARACA RAVVYA I
GTLSAEVLAAAVVNADKAAEGAEG
GHAAATCMARAIARAVFHAGAAQG
A $\square G V H A A T A L P F P G A L P A W R D R F G G L G$
A RGVYSAT
ARAVVQA
GSAAADCDARA
ARAVYTASAQP
CSAAARVFARAMVHGLLAATQAGG
GTLAAQVMSEAILRAVMSAETAYGF
GHAAATCMARAI ARGVHAATPAPG
GADAA DCVARAVARAVYNAESL
ERSVTQA
GHAASVC $\square$ ARA $\square$ AR GVFHARRAPG
ARGVYQANRE
$Y$ L A A VEAVEESVLNAMVAGEDVPTVKNKTCSALPVERLRA $G M \square A T S V L E E A 乌 1 \quad R A V R$
GVMAAEAMADAVQRADLAARAVEGF
GALSAEVLAEAVLSAVKHAERAGG
ARA $\square$ ARGVYEA
GTTAAVVLEEA $\square 1$ RGVKAANS $\square R P R H G$
ARGVYNATEYP
CHAGSLCLARAIIARAVVAATPAEG
GTAAAEVTARALRNAVKEAKSLGG
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CHAAATTMSRAVARAIHAAEARPG
ARA $\square$ ARA
CEAAAVVTQRAVVGAVLAATAV
$\square A A G A E V V A R A I V K A V R A A S G T D G R D G$
GA WGAEAVSRAVLRAVRHARSAGGFPG
GLLAARVMERAVVSAINKAGPLFG
ARGVYEATADPFKDA
A TGVHAATRLPCLD
AVIATEELEKALVSGVKSAKGDLG
GAAADDCLARAVLVAVLAAESVAG
Y
GTLAA V VMGRA $\square$ NNAVKNAEASYGFK
QSAAAEAVRLAILDGILAAESVSTEAG
SVMAVKAVEQALLNAVFHAEST
$\square$ MAVSDASE EACLNSLFQAETMVGVDNQVREK】PVEQ\|IT
AAEVTARATLNAVLAARGLTTAEGLHLPA
A A A GA $\square \mathrm{C} \square \mathrm{S}$ RA $\square$ ARADVEATAAQG
CAAAARTFARAMVHGLLAARSVAG
ARA $\square$ A RAVF E A
CEAAAQCVEEA 1 VDAVKSAQ
GMDSAHVMERADIEATKGAEADSNYKCYR
GFLAAEVMEKA $\downarrow$ VRAVKSADS

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Y $\square K N$

G P H N A|I T D $\mid$ V|P G $|V| T|V| G H R H R \mid L$
T L T A I D GI K V G H A T
$R N L I T D V P G L L V G N A T$
$L R P G E R G G V D V E G V L V G H D Q R F$
K G S I T DVF GI KV GHS Q IK K G
$P G P T D S L L D V A L S V G H W Q R L D P E G T$

$K N L$
GARDAL T DV P G L HVV GHSQRT
GAL DDVPGLAI GHVSLGD
$R N L I T D V E G L R V G N A E$
$\square$ L T DI P GI R I G H A
$N L L T D I P$ PGVRVGHA

LT DI E GFRI GQA
$M \square A G P K N L I$ T DV P G LLVVGNAQ
GAMGAITDVTGlVRVGHVQRFGRESD
S V T Q I P G F Q I G H A Q N L E
S I K D I E G I R I G N A Q N F T G G
I Tr D E G I I K I GNAE
LP P LLDALT DVVGI RVGHAEV
L P A GPR G T
G S I T D $V$ P $\operatorname{C} I \mathrm{~K} \vee \mathrm{G} H \mathrm{H}$
$R P G R H \underset{N}{N} A$

$G V P A L K N L L T D \| A G V R V G H A E$
$M K P G P R N L I T D V A G L R V G N A E$
$G H V G Q S N T L A D V A G L K I G Q A Q$
$K N L L T B D A G V A V G H A$
PHPPGPHDALTDVPGLRVGHAQRTGD
S I T DVV G GVLVGHAQ

I S S E GFQ I G Q A Q DLLE G G
P T GPADGLT DVHGLRVGHA QRSGG $R \vee G H A Q D L S K A$
$T P \square K N D T \square T A \square D G \square K V G N A T$
K NLL T DI P GVRVGHA
M R P GPRNALTDVHGLAVGAE
$R N D L$

GAS GA T D D A GI MV GHHS
MTSGARDAITDIDGLKVGQT
NEI DGFAI GHDQD』Q GA
M R K G Q N N L i
DVPGVLVGHHQRLGD
MKPGPTNSMSDVGGLVGAQ
GPSANRL $\square$ GQGTKVHAKGS IT DV P G LVVGHAEDRS G G S I T DV A GLKVGHY T
D RIT DVA GVLVGHHHRVD
P Y P T GP P G A A L T D D
GRTGPLNLI T DVEGLKVGQA
L T Q Q T

ETDALTDVAGLRVGHATRAGG
GA I T D V A Gll E V GHY T
MTPGAKNLI TDVM GLMVGNAS
$P G P R N L I T D V P G L S V G Q A Q$

| $G L P G E H N A$ | $T$ |
| ---: | :--- |
| $G$ | $D$ |
| $G$ | $V$ |

NDALTDVAGLRVGHATRTGGGWL
TGTIVDVPGIRVGHAQ
$L P P S D A G S I T R V A G I E V G H F T$

GRAGS

L T DVVNGIKL GHAE


$G P G R P G P L N L I$ T DV A G L R $V$ G QA Q
$L K P G P R N L I T D V P G L T V G H A T$
GRHD S
MRPGPRNHL IDVAGLAVGHAE
$D V A G F W L G H V T$
DLASIRIGHAQ


$L N \square L T D \square G G \boxtimes A V G H A T$



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LRVGTTVVIIIVIPAAVLIFDLIMGDWGRRPDATFGYAACRART FPAGPVRVPIVPAAVIFDLGVGDAKRPDREMGYQACLNAT FAVGTARVPIVPGAILFDLDKGWEGHPPYLQGGRDALDAA VVVA QVPI VAGAVIFDLTTGDPKПRPGAKEGYQAVVNA GIPMGAPGAVVPIVPGAVIFDDWSARPTADSGCTASATAS LQVGSTRVPVVPQAILNGGNKDWGLHPYREMGYAAFKAAG LQVGPARVPIVPGALLFDLNKDWGRRPPYWDLGGYAAASTA FDVEVARVPVVTGAFDLGUGSANVRPDEKMGYEAAQRALM EGNPGPRVPIVPSAVIFDLVGESSSRPTARDGRASDDVAE FQVGPVRVPIVPQAILFDLNKDWGREAPYRELGFKAAEAA FDVGVTKVPVVVGAVLFDLGDYRDRP DKCMGYEACQAAG FAVRDALIPVVPGAIVFDLNKQWGRYAPYRELGYAAAAAA GVVGMGGAGVVPIVPAAVIFDLIPVGGWNADFGYLIACDAA FDVGVARVPIVPGAILFDLGESGDRPDRKMGYQACTNAFS FQVGTATIPLVPGALLFDLLNGGDKGWDERALGRQAFDDA FAVPGGLVPIVPAADLGRGGDFSARPDEEMGYAATAAAAE RDVEVTCVPNVSGADLFDKKGNAMRPDAEMGYLACRNAG
 VRVGPGPTQVVPVFDLGRGGDWRARPDGRAAVEAAAATGP IGRWPTVNPLVFECNDGYLNDLHAFAVGASHYDDACRAAT GLPVGVGVVPIVPAAVLFDLAGDVRPDKEMGYVAAQNAS GEDGSEVVPIVPAAVILDLGGEFTHTPSAADGARGWREAM FPVRDINVPIAPGAVLFDLLNGGDKNFGDASLYWRLAAAA VRVGPDPVPAACVFDLGRGGDFRARPDGRAAVEAAAASGP LNARGAVI PLVPGADMFDLDKAWGRFAPYRDLGYAAAVAA FAMGVPVSPIVPAADLYDLDNGWGETPPYRALGMQAVRDA FR\|RDAVIPIVPGAILNGGNKAWGRFPPYRDLGYAAANAA FRVGPPVVPAAALFDLGRGGDWRARPDGRAAVEAAARTMP FPTGVRPVPIVPAAVIFDLA\|GDADRFPDAAMGYAACSAA EEVLS VLPVVGECNDGVLSDURARPVHEEMVRAAMDTAS GGMKDUVVPVCQASLFDLSGSSDAYPDREMGYLAAQNSE GDTGFGLVPIVLASCLFDFSVGEKLSWPDREMGAEAGRNA FPAGPVRVPVVPAAFDLGVGDPKVRPDDREMGYRACVNAA FEVAGHRVPIVPGAILIFDLDKGWGRYPPYRDGGWRAAEAA YEVAGHRVP VPGAALFDLDKGWGRYPPYRDLGWRAAEAA FQTGGGVVPIVPAAVIYDLEYKSNKYPDQEMAYQACLNAD GFAGVPKSPVVPSAILYDLANGGDKAWGEEPPYRAALAAV DDVGVGRLPLVPAAVLFDLGDMRDRPDAAAGYAACAAAS FEAAGQRVPVVPAALLFDLGNGGDKAWGYAALGRAAFEAA GYRGPVRVPIVPAAILFDLVNGGDKDWDENPYGQAAYAAR FAVGPHRVP VPAALLFDLANGWGRFSPYRDLGYEAARAA FPVGAQVVPIVPAAVLFDLPRSAWGNRPDADFGYAACEAA FAVRDALVPLVPQACI FDLNKDWGRYPPYRELGYDAARQA FRVGPAQIPLVPGAILFDLLNGGDKGWSDNPYRADAYKNA TPTDVGPLPTVPAAVIFDLYYAKGRRPDAQLGYKAAQAAK VPDWGGVVPIVPAAVLFDLPLGAWSARPDADFGYRAAKAA VAMDGGVVPIVPGAVIFDLVGGWGCRPTAEFGYAAVKSAA GFRVGPVVPAAALFDLGRGGNWRARPDGRAAVSAAAGTEP GAPGVPPSPIIPTACLYDLANGGNKQWEMEPPYRQALEAA
 ■GRTSTVNALVCECNDGSINDIDALAVTPADAEAALDAAR PGHVVPVVPAACVFDLGRGGDFGARPDTGRAAVEAAAGPE MDVGTSLVPLVPAAVLFDDHVGNASRPDAPAGYAACAAAS GFALGPAIPLVPGAINGGNKDWVDNPYRA GGRAAFEAA YGLVPGVPPSPVVPAANGGDKAWGEAPPYRDLGRAAASAA VPLGSGVAPDVPAAD YDLDDPKAR TSAEWGYLAAEATA $G G E V V P I V P A A V C F D L G R G G D F G S F P D A S F G A R A L A D A E S$
$G V R V G P D P A A C V F D G R G G D F R A R P G R A M V E A A A S G P$ VGYGVVPIVPAAVLFDLAVGDYRVRP DRQMGYQAALAAS FDVAVGRLPIVPAAFDLLVGDMRIVP DAAAGYAACAAAS AEHPDKDVPVPAATEDLLLGKWDSRPTASTGREATRAAT LDVGVGRLPLVPAAVLFDLGDMRDRPGAAAGHAACADAS VAMEGGVVPIVPAAVIFDLPVGGWQCRPTAEFGYAAAESA VAhDGGVVPVVPAAVIFDGPVGGWRCRPDAAFGYRAAETA FDVGVGVVPIVPGAVLIDLADSKVRPDPNMGYAAAKNAS
$G F A V G N V V P I V P G A I N G G K A W A V N P Y P R G G A A L N N A A ~$ GGEPGRVVPIVPAAILFDLGGAWGHRPRAEDGRAAYVAAT FAVTGGVVPIVPAAAI FDLGRGGNFSARPDEAMGYAATAD GFSGVPPSPVVPTAVLFDLANGWGMTPPYHDAADDAVEAV GMRLGHAJPIVPGAVLHDLAKDWGEEPPYHALGRASVDTA GDAAGHVVPIVPAAVIFDLVGAWAHRPDAESGRLALDEDT GAVVGFRVPI APTAIVFDLANGGDKPPYRDLGATAVRAAS
 FDVGVTKVPIVAQAFDLFVGSHNVRPDKAMGLEACQAAK FAVGPARVPIVPGAILFDLTNGWGRYPPYRELGYQAAADA FAIRDVRVPIVPQALLFDLLNGGDKPWARGEGAMAAVAAA
$V A D G V V P I V P A A V V F D L P V G G W Q C R P T A F G Y E A A R T A A ~$ EGKPGPRVPIVPGAVIFDLLLGDERPTAEDGAEAVKRAVA FQVGSVRVPVVQAILMDLLNGGDKDWYREMGYEAFRTAA

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UniRef90 Q7CWR UniRef90-UPIO00361FC0C UniRef90_UPI0003FE5E2D UniRef90-UPIO00309F939 UniRef90-UPI000363F441 UniRef90-E31170 UniRef90-T0JWI6 Unineftoo-A4YRX8 UniRef90-U5WL78 UniRef90-LONIB8 UniRef90-IOJN24 UniRef90_UPI00046A8A91 UniRef90_A0JZ54 UniRef90-J1H8F4 UniRef90-R7D4L5 UniRef90-D6AKP6 UniRef90-UPIO0016A6A5C UniRef90-UPIO004185FEF UniRef90 A3TQ52 UniRef90-UPIO004224EDD UniRef90-L1L872
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UniRef90 HoQPU7 UniRef90-UPIO0047D7E74 UniRef90-UPIOOO3B3FAC6 UniRef90-UPIO0036DAEC2 UniRef90-Q218K8 UniRef90 R $574 E 8$ UniRef90-O8NMQ3 UniRef90-B8FEG6 UniRef90 UPIOOO3765D61 UniRef9-UP10002FCD3D3 UniRef90-IORKL2 UniRef90_C2CLJ5 UniRef90-W6WVU1
 ,



SEE $\square A$
190
200
SEELAEGNVGAGAGAVAGALLKGG|LIGTASVVL|ADGTRVAALL DDPVAMGAVGAGTGATVGKAQGGVGSACKCLDSSGLIVAA
DVDHEGSVGAGTGCTTATVKGGLGSASAMT RTDTREGNVGAGTGAVAGSLKGGUGTASAVLDDGT KEETAQGIVGAGLGASVGKYKGAMKSGLGTASMKVGDLVV STHLERGSVGAGTGARAGALKGGMGSASVRITDGATGVTV GATFALGTAGVGYGLTTYDLKGGLGSASAVTSNGFG QQDDREGSVGAGTGATVGKMKGGLGTFAFQV GELKV GAPVEQGCVGAGTGAVAGGLKGGVGTASAVMDSGATVAALV GGDFALGSAGAGYGATVARMRGGLGSASERLTFGGESVVV RQELAEGSVGAGTGATVGKVFGALGTGSLMVGAGVAVNCL $G T D V A T G T V G A G V G A R A G L L K G G V G T A S \| T L P S G V T V$ GGAFPLGTVGAGTGATTATVKGGLGSASAVTSSGAGHVV
 VLPLEEGSVGAGTGCTVGKMKGGUGTCAFR OGDLMV ADNYQDGNFGVGTGATVGKFRGMMKSGDGYAVQIGELKV NNNPKMGNYGAGTGATVGKVLGAMKSGLGFYAVQVDDVKL R TGPVGQGSVGAGTGARSGGLKGGVGT AAEFTLGSVGAGYGATTANLKGGLGSAS NGMVALV

A

## G

 GASVSEGCVGAGTGATVGKMKSGVGT 
## טס

N TEAFEIGSVGAGTGALTAMLKGGLGTASAVLPDG
 GEAFATGTVGAGTGATAGQLKGGDGTASAVVRAGAAGARV GDRVAVGNVGAGAGARAGVLKGGLGTASARLPELGVTVG
 $A G P V A E G S V G V G T G A S V G K L F G G M K S G L G S V C A G P$
$P A T V E G S V G A G T G A T A G K G L G G V G S W S E T V A D G T$
 $\stackrel{\rightharpoonup}{\mathrm{G}}$ GAVAGLGNVGAGTGTQVGGMRGAVGTASAVLPDGTDGDWV SETVAQGNVGAGTGASVGKLNGAMKSGLGSASLTLPSNAV GDPHVSGNLGAGLGAAAGALKGGFGQASAVFPEGLAGVTV GTEVAVGTVGAGTGARVGVLKGGVGTASMRL DSGVTVV EKDETMGNFGAGCGASVGKLLGAMKSGVGQSSDKVGDLVV SEGVAQGNVGAGTGAKAGGLKGGUGSASVVLDSGVTVAAT GHDVERGNVGAGTGAVIGRYKGGVGTASLTLENGVVVGA


## R




 | $G T H N G S G S V G A G T G A T$ | $A$ |
| :--- | :--- |
| $G$ | $R$ |
| $V$ | $C$ |
| $V$ | $R$ |




UniRef90-D9XN64 UniRef90_UPI00036D598E UniRef90_G2P093
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 GVLYGEHYGPRRPSAAEHAEAMRRLTDARAESGRRQAASM Y AL AVVVNGGVVDPNGALLAGALNEAGYLVPCDNFGEEDK GA $V V V N A G N V V D P T T G K I V A G A K H P E T G E F V D V V E R D A E$ NAVGNVNVGDGPWFWAAPFEQNNEFGGYGLPSAFTADPAA AVVNAATVGEGPHFWAGAWEDGGEFGGHGLPCPVPAEAGE NALGCPLMGEGPHFRAAPFERNGEFGGLGLPVPLPADGGA AALAVVNFGDLKNPETGEIIAGARDNTEKTIINQPEDNDG
 GALI ACNAGDVVDPDTGLPLAGARTADRRALLRGEPPHQL GALVAVNAGGGPRFWAAPWEIGDEFGGLGPAMPPPGPPPA GAIVAVNCLGDVIDPSDGTVVAACRTDSGPGNTEDULSHS

 GALVVVNSGNGPHFWAGADEEGGEFGGYGHPERVDAQKRQ AALVAANPPGDRHFYAAPFEMAGEFGGLGPDPASGLMAALD
 GAI VAANSAGSVYDPLTGRLWGEETLAVLAERERAKAEQQ AVVAVNSGGNVIDPATGLPWMSDLTAQFGLSAPPEEQTK $G A L Y G H L Y E D P T A L P A P E V H A A A L R R L A E A R E D S D S A A S V$
$G A$
$G$ GALVVVNFGDVRDYATGKMIAGARLSPDSPEFADSAARQQ AALVVLNPFGDVWAEHGPIIAGARLPDRDPALLPHFGTPA GTLVLANFGAAGDL
GALVVANAAGSAVDPATGALYGEFWQGRRVAYPAAAARRT GALVACNAVGDVVDPANGQTVAALDRCTAAALDRGEPLHPL GALVAANPPGDRHFWAAPFEVDGEFGGAGPDSAAAGEDLP GALAAVNAPGGRTFWAAPYELDGEFGGLGPPDDWGLDAKRP GALVVVNPAGSPVDPADCSLYGVRYGLGGEFDGYRAPSGA A ALVVVNAVGTGELWGARHLVEADVRGDPGWPEGGLPARP GSAVDPETGSLYGELFQGRPEARVHEAALRRLAELSERNA GALIACNAGDVLDPDTAQVDAGARLDTRRALLRGEPPQPL AAAMVVNPQGAI FDPATGLPWGAELGNEFSRYGVDRRGEV GAAVVVNAAGDVVDTETGLPWGLAAPPPEQLAAYAARRAE GALVVVNSAGLPWLAAHAEEFGLVAPPADQRSAYSDRHGE SSIVALNAGDIFDYEAGKRDAGKFLDTCALYEKSDKDYNQ AALVVVNAHGDHHFWAAPFEMDAEFGGLGPDPTGGYTAPD GRPYAVGLGLDGEFAHVGEPSGADDEAARERRAAQPGPSA AVPVETEPVETKPVETAPVETAHGDYAPHPPPNDASSVRE GAIVGVNVPGTRNFWSGPFEFGQEFGGLGAEDWGEAKINP GALVAANPPGSDVYWA WPFEMDGEFGGRVPTGPANAHDPM GALMVANPVGSVLDPETGLPWGGQPPDDRDRERFAEDSAK
AVVNAAGAGDGPWFWAAPFERDGEFGGRGWPEAFTPAAGA AVVNAAGAGDGPWFWAAPFERDGEFGGRGWPEAFTPAAGA GAAVAVNAGDVYQANSTKRLAGAYNYHEHKADDTVEASQS AA GVVANPGEVVDLTTGALFGRPEVMGVGVDKLKSAAET GAVMAVNCGDVVDPKNGAVLAGKSFASTEKDMAGFYDQDS GALAVVNAGDGPRFWAAPFE DDAEFGGLGSEAEDDPRAWF $G A L V A V N A G D G P H F W A A P Y E E G G E F G N C G L P V D F D R Q A K G$
$G A V V V V A A G D A D D P A T G L P W G L R R P P A D Q I A A Y A A R H Q E$ $G A I V V V N A A G D A D D P A T G L P W G L R R P P A D Q I A A Y A A R H Q E$
$G A V V V A N P G S V V D P R T G R L F G A P D E Q A V N L E R F A V L R H P A$ VAANAATVGEGPHFWAAPFEEEKEFGGFGLPQTFDNRMRM
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UniRef90_UPI000363F441
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|  |
| :---: |
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|  |
| $G R P L$ |
| QEGGN T T |
|  |
| L R L K G T |
| NAPANS |
| R F S GN |
| P P V L ${ }^{\text {T T }}$ |
| PKL N |
| P A GANT |
| R F A G N T T |
| S D ENT T |
| A S PM N T |
| K G V R A T T |
| R F S G N T T |
| ESRKNTT |
| P P P L N T T |
| F F SGNT |
| S S VG N |
| NAKE |
|  |

250 260
270
280
${ }^{280}$
GVVATDAGFGKPECRR\|AVAAHDGVARAVRPA

 ACLATNGKFSKAQCQKI A GMAHNGYARSI F P T


 G V V A T D A P L P VA Q L Q R L A M T G H D G L A R A V R P A CVVAT DAPLT QTQAKRI ATMAAAGMARAI HP F


 A I I A T D A T L T K A E C Q R V A V A A H D GI G R A TVP A



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CEAAAVVVERA VDA $\square S A T S V$
ARGVYEATALPVDGAQRAYRDIHGRG
ARGIYEAT
GHLAAYVVQKA पRNGVKKA TG GDGVRSYS
$\square A A G A D V L T R A M V K A V L A A E G V D G P G G$
CEAAAECVQAA IVNAVRSATPGYG
ARGVYEA
$G V L A T R A V E Q A V L R A V T Q A R S A G$
GMLAANVLARAI ARGVYHARPL
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S S LAA HVVEQAVLRADQGAQA
Y EAT
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G L L A A A V E QA L L A VKKAASLGGY
GTLA A DVMSEA L L SAVKNAESAYGY
GTIAA IVVMGKA I NNAVRNAETSHGFKCH
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L S A GAD LVTRA
ARGVYSATALPFAGALPAWKDRFG
ARAVFAATPRP
ARAVARGVY
ARGVHSAT
$\square A T G A D V L T R A D V K A A H A A T S V D G P G G$
GA DAAEVLARAIERSVTQAWSLGGVPGMRRDA
MA DQALSEA VVDAAKSATPMFG
LAA GADVLTRALVKAVLAAETVDGPGG
GlMAAEALSEA 1 RNGVVKAQSAYGFKGN
CRAV
ARGVYEANALPFAGAL
ARGVYE
ARAVYEATA
GlTAAEVVKEAlLNS
GSAAADCLARAVARGVHAARLATG
ATMAAEAVARATVRAVLAARTLATPEGLVLPS
ARAVYHA
GA IAARVMERAVIDGVRSARDDCG
CHAASVVMTRAUARGVHAATPAEG

A R GVY E A T A
Y A AT
GTVAAVVLEQA VVRGVKAAQA
GVMAAEAMA $\square A V Q R A I L A A R A L E G Y$
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GAAAADCLARAVLVGVLAAESVAG
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ERAA
LAA GADLVTRA IVRAVRAARSHEGPGG
$A V M A A E A V A R A T L R A A R M A H G \square T L A G G G W \square P S$
GHAAADCLSRA $\square$ ARAVYSARPAE
FNAGATT\SRA $\square$ AKAVLSAES
LHGAGEVVTRAMVRGVLAAESVTTPAGSWR
LAAGADLVTRATVRAVRAAESVDGPGG
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V R A A
SAVAANAVERA $\square V H A V L A A E T$
GAAAADCLARAVLVGVLAAQSVAG
GAAAAEVLARAVLVAVLAAAERVAG
A RA $\square Y$ EAT
MEAGADCVARADVHALAAESV
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ARA $\square$ ARGVHHA
HAAAV VTRRAVINAVVAATSVAG
ARGVYEATALPFPGALSAWKDRFAR
G $\square$ MA $V K$ A MEKA DEHAAKKAQSAFG
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a RAVARAVYEA
ARAliARGVYEA
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A R GVYEATADPVANA
CAAAADCVQDA\| DD A $\quad$ TSASP

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GSIEI ENIRIGSAE


THVP GFTI GTAEDREG
 $M R P G P L N L I T D V A G L K V G Q A$ RPGPRNALTDIPGLEVGHAT
 I


A H GCDT QVP GLLAGHWT

G GRPGPTNSIT DVAGVLVGHCTRDEPGWL
$R P G P K N D I, T C D A G L[R V G Q V E$
K NLI T DIE GI S V G H A
$N S T T D V G G \square L V G H Y H R L D P D A A$
$G A R N L L T D A G V R V G H A$
 L C D V P B I H L G HVT
RTGARN LI T DV P GLLK G

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

$T$ DV A G L
GCIT DVV GI K L G H A
L N L L T DVVE GVAV GHS T
GTIS DVA GVVTVGHAHR $\square$ DDEAT L T D V G GL R L G HAQDMEGG
$G V T G A T G A I T D V A G I R V G H V Q$
PRAVSAASPVRGAPGRLNLMTDVAGLIKG
P GVVR GHATRTGD
$P H F Q I G H A T$

IRVGHATLGD
$\square$ M D $\square$ G G F K $\lfloor$ G Q A E

N NLLTDIKGVQVGHA
I P GV R V G H A Q


$G P R N H L C D V G G L V G N A E$
K N
$G \quad T \quad D V A C G B R V G N A C$
MP HARLNLL T DV A GL S V GHA T

A I T D V P G L RV GHA GRV
GTLLTRVEGLWVGHAS
DALTDVRGLRVGHA
K N L L T DVVGVRVGHA
LT P GPR N N
$N \mathrm{~S}$ T D V G G I R V G H Y Q R L D P D A S
K NLL T D I P GVRVGHA

VE G F E $\square$
LT EII ENIKI GHA
NRI TADA GI SVGHAHRVDADAR
$L N L L T C D E G V S V G H A T$
$G S I T$ D A GII E V GHF S


PFSPGPRNLIT DVDGISVGQSE


 $D V P G V R V G H Q S L G D$
GS L DDV PGVKVGHA I MEVGGFRVGHAQ
GSLVDVPGTKVGHA
GLKVGHA
$\square N L T B D D E G V S V G H A T$
$R K N L I T D V A G L R V G H A$
$R L R P G P R N L I T D V A G L A V G N A E$



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UniRef90_K8NGU1 UniRef90_K8NGU1
UniRef90
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UniRei90_R7WIW7 UniRei90-K6WDC4 UniRef90_L8TP04 UniRef90-S4XFA4 UniRef90-HOR6F2
UniRef90-UPIOOO371F79A UniRef90-H5V1B7 UniRef90-V2XWX1 UniRef90-UPIO00471B698 UniRef90-B6AXK3 UniRef90-S5ROR6
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130
140

160 LDVGVGRVPIVPGAlLFDLADGRDVTPTAAMGYAAAASAS





 $L P T G Y A T V P I V P A A V L Y D L G V G S A Q R P D E A M G Y A A C E A A T$ GF DVGVGIVPIVPGAVLFDLAVGDAKVRPDFGYEAARAAR FPTPGGVVVIVPAAVLYDLGRGKVHRPPGAEAGYQAALAV GARPHEVVPIVAPAAVIFDLRGDWGRWPDAAFGHAACAAA T VAMEGGVVPIVPAAVIFDLPVGAWGARPTAQFGYEAAASA GVVPRSLNVVVGETNGGYLTDNFGRHVGKEQVFEADDQAR $G M D V G F G N P P A A V L F D L P V G D A R \square R P D A D G G F A A C A A A A N$ $F A V G S V R V P I V P Q A I L M D L L N G G A H A P Y R D L G Y Q A F E N A A$ $G P D V V V P I V P A A V L F D L T L G S S S V R P$ SAEWGMRAASEAS
 $G F A G V P P T P V V A A L Y D L A N G G D K P P Y A G L G A A A Y R M A G$
 F DVQT TKV PIVPGA LIFDLGDGNAKRPDQDMGFKAC ENA Y


 GAPGVPVSPIVPTACLYDLNNAGDKNWQLDPPYRQAAGKA
 FAI GDARVM V V P GAVVFDLNKK WGRAPYRDFGFTAATNAT $G V R V G T V V P A A C L F D L G R G G D F R A R P D A E S A D E A A A A B V P$ $H N V G R G V V P I V P A A I L F D L G G D F A D R P D A A A G Y A A C D A A T$ LK K G D ALVPIVPRAI LFDLNKDWGLHPYRDMGYAAFKAAA



 $G L A V G P V R V P I V P A A D L V Y G D A S I V R P D A Q S G E A A C D A A S$

 MAA $\square E N A T$
VKMPG GRVVP VIPGA VIFD LVGA WANRPTAEFGYQAAAAA FHVGNAIVPIVPGAI CFDLLNGGDKAWYRELGYAAAAAAS LDVGVGRVPIVPAAVLFDLAVGSADRRPDAAMGYAACEAA



 $F D V G V A R V P L V P A A V L F D L G D A R D R P D V A A G Y A A C L A E G C$
 $P G Q V V P V V P A A C L F D L G R G G D W R A R P D G R A A V E A A A A S E A$ FA MD G G V V P
 $G V R V G A D P P A A C V F D L G R G G D W R A R P D G R A A V E D A A R S A E$ FAVRDALIPIVPGAII FDLDKAWGRFAPYRDLGYAAAAAA


 F DVGVVAKVPIVCGAVLFDLGDPNDRPDKEMGYLAAKKA FDVGVTKVPLVSTSCLFDLGDTQARPDVEMGYAACLAAE
 $F$ Q V G P V $V$ R


 E EKPGPRRVPIVVPGAVI F DLLLVGPSRP GPEE GAAADARAALAA $G G A G V V P L V P A A V V F D L P V G D W Q R R P D A D F G Y L A A R D A S$ GD DQ GHVVVPIVPAA AVI F DLVVGSWDRRPDA GFGRRAMLAAA T FADVPGGVVPIVVPAADLGRGGDFSARPTPEMGYAAAVAAME
 G D L
 GA DVVGYGIVVPIVPAADLLSVGDPRVRP DKAMGYAAAASAAT


 $G V R V G P V V P A A A L F D L G R G G D W R A R P D G R A A V E A A A S T G A$

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UniRef90_UPI000372296B UniRef90_W3RG91 UniRef90_D5WVW0 UniRef90_A9BZE4 UniRef90_C5CU81 UniRef90-UPI0003B64ECB UniRef90_A7HPV1 UniRef90_G2LID6 UniRef90-A1TN51 UniRef90_H4F5K1 UniRef90_G2NHV6 UniRef90_X5M290 UniRef90_UPI0004626A97 UniRef90_K6P4E7

G A TV A VN A R GD\|V D WK D GKKVA GL L N A DRKTFA DTE EAVY GA AVAVNAGEDRHPGHGGTAAGARGDEPGSFDAPLPFAGM AVVNAVTVVGEGPWFWAAPYEDVKKFGGRGMPPTATAAAAAA GAYMAVNACGEGDH ILAAGALSDDDSHG DSVHELLMMKGFQR
 GALVAVNAGDGRQFWAGPWELDGEFGGMGLPRDFPAAHEP A A LVVANPPDGETFWAWPWEVAGEFGGARPVTEMDSMGRD GALVAVNAMGGRHFWAAPFEI GAEFGGLGPDPASGLQPLP A IVAVNAFGDVRDPATGR ILAGPRGEDGTYLDTTALAAGR S S I V A L N A G D I F D Y E A G K R A A G V Y L D T C A L Y E K Q L K D Y N Q MALVAVNSLGRPFDPLTGRLYGEEFLAEGERALLPDRSRY

 $G A L V A C N A G D V L D P H T G Q L L A G A R T A A Q R A L L Q G D A P R E A$ AALVAVNAGDGPHFWAAPFEEGTEFGGLGQPAHVSAEERA $\bar{V} A \quad V N A D G E \square V D S A T A A V D A G D R G S E K G A Y A M G L S D E E A G$ GSAVDPTTGGRADEFDHVGVGSAEELDAEARARAESLDPDAA G A A LA CVNCPGSEAFWAWPYE DDGEFGGKRPAPDYRMEPGE AA LVAVNAGDSPYFWAGGEFGGRGLPAAMPEDAHRDADKG A ATVAVNAVGDVIDPSTGRQ\|AG\|FDRKKNQLAEQSFNQN

 GA L AVVNC A GEVVADPNTGLPWGLRPPPPBEQVAAFAARBRE A A GIV ANPVGEVVVDPTTGTLYGAPGRPAVDVDKLAADPHP GALVAVNAPGSRAFWATPYE $\operatorname{L}$ ANGEFGNHGQGEDWMPTEPT GAVVAVNAGDVY DWK TGQKA A GLLDADRKT F L D G E E A L L H GWFWSAP F EQNGEFGGRGLPQSFTPDMLAPRLLKGAADRA $G S V L D P E T G V L Y G E L F Q G R P E E R V H E A A C R R L D E A A A G N G$

 S A MVVAVNA GDVF DY GA GPMVD GK MLLRTMM F IDDK LDA S F K D


 GALIA CNAGDVIDDPATGLVLA GARLDDTRRALLDAGVPPRREL

 GALVLSNF G S KD D F $\quad$ LG D RLDFA CATREPAAAAEAVE GALVIVNAGHVVDPQTGLPWSADQUARFGLQPPPPDRVKN $A V V N A V V I G D G P W F W A A P F E V G G E F G G C G Q P P A F T P D A R A$
 GALIADVNAGDVIDDPDTA QPVA GARLDTRRAALLRGEELPKP L NALGSAT $\square$ GDGPHFWAAPFERDNEFGGFGMPELIDAR LRL AALMAANPPGSGCFWAAPFEMDGEFGGGGWPSPMPNFAAQ
 GALVACNAGDVVDPETGRPVAGARTADRRALLAGDAPRTDL GALVSVNAGDGPHFWAAAFEEGDEFGGLGLPAKVSAADRA GSAVDPRTG GLYGEYGAGRPAAATHEAARRRDAELRAARG $G A L V V L N A A A D V A D P A T G L P W M A S L I D E F F G L V A P C A B A Q L A$
 GSVLDPRTGVLFGEYGGEEPAAAVHEAAQRRLAQARAANA $A V V N A V T V G D G P W F W A A P F E M N G E F G G R G L P T S F T P D P A A$ GALVAANPPDGETFWAWPFEDDEEFGGRRPGAMPTADEPM $G V L A V V N A A G N V V D P A T G L P W M A D L V G E F A L D R A P P A E Q A F$ AVVNAVTVGDGPWFWAAPFESESEYGGRGLPPSFAPDPAT $G \bigvee L C A A N G G V A P G A H G G A A P G A T S A A A P G A N A A E V R S P A P$
 GALVAVNALGDVKDEVSGAILAGLLNEEQMLYKEATQQKN
 NAVGTAT $\square G E G P H F W A A P F E Q N A E F G G L G L P M D H S L D R L K G$ GDVIDHNTGQ PVAGARTEDGKALLDTRRALLRGDSPMPDL
 GALVVVNPS GEVIDDAT T GLDP WSAY LVVEEF GLDTAP P S E E P K AAFGSTVMPGSARFWAAPFEKASEL GDQGQHPAPDSLPGA SAAMVANPGEVIDPRQSGRLYGAPGSTAVNAAAYRALPBPA A A LMVANPVGSVVDPRTGLPWGVGTDGAESFGLRAPGAAE GAVVMVANPVGSVI DPATGLPWAATALDLDTYGLTPPDAGD
 A A GVVVA NPVGAVVDKT TGRLFGDGARAAVNVNKFNELKGLL A MVVAVNADVGE IVRDP QT GQTLAAGACLLDDLPAYVLDSNGDN R F
 GAVVAVVNAGEVRDPATREVLAGPLNPDGLLDEDSHEDLDR Q
 AATNAAVIGDGPWFWAAAFEEDGEDGGHGLPAQVPPSARAA GALVAVNPAGAVTMPGGGLWAGPLLLDEDGVPPSAPGMPA GSVVDPRTGVLLF GEYGAGEPAAAERRLAREREATEAAGGG



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GTLGA QVMAEA|IL|RA|V|RSAESAYG
GM WA A E TALVYYA I
GYपAEEA DR पA TLDAVRSAESMGGR
S A A A A T V T Q R A I V N AV L A A T P V
A A A GAVCLSRAI ARGVYDATA
S HAAACVLARAI ARGVHAATALPG
GSAAADCVARS $\square A R G V F A A R$
GVAAALAVERAVLNAVRHAASMGGLPAARAWSCPV GILAA K TI S R SIA N A Y Y S A E D S G G G A Y A A D A VTRA L L R AVLL S GSAPG
GAAAADCLARAVLVGVLAAESVAG
$S A M A A E A V Q \square A V L C A V R A A Q T \square R$
A R G VF E A V A
$G \nabla A A A K V V E M A D I D G V T E A E S L L G$
$M E A G A D C V A R A V H A L L A A T S V$
G N L A A D CLLT R S I A R AVV Q A R P
CMLAASTMARAI ARGVYEAETL
C MLLA T K V V A E A I I D S V K K A K T T L L
$G A A A A D C L A R A V \vee A G V \square A A D P V A G$
A R A VA R GVY E A
GAAAADCDARAVLDGVFAAEAVAG
Q NAIVDAV
GALAADTLARA $\operatorname{LAARGVYAATPWPG}$
GALGARVMAEAILRAVRAAQSAYGF
ARGVVYEGRALDFADALPAWRDRYG
LAA GA D MVT RA VVRAVRAAESVDGPGG
GT IGAVVVMSHAIVRAVMAAESLTDPD
A R GVVY E A R A L P V
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A Y VMAK AI A N A ARSAKSVDGYK
F A A A A EATEEALYNS LSQAVT TTGRKGRTVHAMPL
AR GVYEATALPFAGSLPAWKDRFAR
GAFAAEVVAQA LLDAL
GTMAAEAVARATLRAVLAARSVT
A R G\VY E A T A
A R A M A R GVYEA ECLGAAVSWRARHGR
A R A $\square \mathrm{AR} \mathrm{A} \mathrm{V} \mathrm{Y} \mathrm{E} \mathrm{A}$
STMAA EATARATLRSVLAARSLTTAEGLHLPC
CH LDA T LVTA R A I A R GVVHA A T A L P Y P D
LA A G A DVLARAVVKAI RAARGVDGPGG
GAAAADVLARAVLVGLLAAEPVAG
Q S A A A DVVRLA ILDGIARA DAVSTPAG
LA A GAEVVARA $\square V K A V R A A T G V E S R D G$
ARGVYHATA LDPAGALPAWQDRFGR
GSAAADCLARADARAVFEARE
$G A A A A D C L A R A V L A G V L N A Q P V A G$
ARGVYEAAALPFRDALPAWKDRFAR
LDA A A S GARVALGRALGAATAVTGRKGRVVK
CHAAATCDARAIARGVYTATAMQG
C Y LA Q E A MK LSVV DD A I K S A E S V
GTLAA K VMAKAINRAVLMAEPAYG
CRVAADVVQRAVVDAVLAADS
A R GVVY E ATT LTPVPD ALPA
AA EAVA $\quad$ A TLLRAVHAARSVT
A R A $\square A R G V Y$
GHAAS $\square C$ L A R A $\square$ A R A VY $\square A S P S A G$
GAAAADCLARAVLAGVLAADPVAG
ARAVARGVYEA
$\mathrm{V} N \mathrm{~A} V \mathrm{~T} A \mathrm{~A}$
$A A V V V$ E A VVDAVLSATTVAG
CRVAANVVQRAIVGAVLAAEPVAG
QSAAA DVVRLA L D GVASAEPVSTPAG
A S T A A D CVVERAVV HAVLAA STMFG
A A A D MVA D A IV D AVVVAT SVA G
$G M L A A E V M A A A V L D G V R S A C S A H G V R G$
GALAA QAMERAIV RAVQLA QSAYG
GAVVA QVVA EA I ARAVVR SAES GGGLDPAHR
GHAAS LCVVARA A R A Y Y E A T P A K G
CHLATIVMARA A R GVVMASALPAE G G
ARGVHEATALPFPGALPAWTDRFG
A R A V L R G V
$\square A A G A D V L A R A \backsim V K A V R A A R S T E G P G G R$
$\left.\frac{L}{A} R A \square A R G \right\rvert\, Y E A$


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UniRef90_R5TBX3 UniRef90-E3DLF8 UniRef90_A0A059DSB4 UniRef90-M3V2Q6
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VTPDGHGWATGTTVV|RTSGATAAVDVVGGGPGTRETDLLID ${ }^{80}$ DFEAGTGCTVILCPGAVAAVDVRGGSPGTRETDLL DTRRPTGCTVVLARGAVAGVDVRGAAPGTRETDLLA S GDGWDTGTTVVLAPGAVVAVDVRGGGPGTKETDALD DESGRTGCTVILPKGAVPGVDIRGGAPGTQ
 D LA AATGTTVVLFGGAVAAVDVRGAAPGTRETDLL

$D \square A \square G S G V T A D L F D P A V A A V H V G G G A P G G R D T D L L$ DAGVKSGVTVLTADAPTAGVHVMGGAPGTRETDLL
$\square \mathrm{GAG}$ WATGTTVVLPPGTTGAVDVRGGAPGTRESDLLD
$\square G A G$ GWLSGTTVVLAPGADAAVVDVRGGGPGTRETDAL WARGVTVVLPPGTVGAVDCRGGAPGTRETDLLD $D S E N K T G V T A I I C E G A V G G V S V R G A A P A T R E T D L L$
$D S G Y R S G T T V I R T E G A T A G Y S Q M G G A P G T K E T D L L K$ HDDRLWS GVTVIVP DEPMLAAVDVRGGGPGTRETD
$T G V T A L V S T S A A G M V A A V D Q R G G G P G T R E T D$
VTVVTAAAP MVASVAVMGGAPGTRETDLL KSDDGWDS GVTVVLPPAGTGSVDVQGGGPATHETDALD DYNGGTGITVILPKGARAGVDIRGGGPASRETPLLN DARRPTGCSVVI ARGAVAGVDVRGAAPGTRETDLLE DLGLGSGVTAIVFDKPAVASGVVGGAPGGRDTALLED $P Q W A T G T T V V R V A G E G D R V P M V A G G P G T R E T D L L D$ NVQAATGCTVI LCRMSPAGLDVRGGGPASRESQILN PVSSGVTVI CPAGAVGAVDVRGGGPGTRETDLLK GWLT GVTVVLPPGTVGSVDVRGGGPGTHETDALD A GQGALTGGTVVLPPGAVTASVEVRGGAPATRDTAACLN
 T GVT $\qquad$ WA

HDPR LRSGTTVLTAAAPFTAAVAVGGAPGTRETDLLD VKGVSVVGDPMTAGVDVRGGGPGTRETDTLN GWLT GVVTVVLAPGAVAAAVDVRGGGPGTKETDABLD HDAALRSGVTVLT GDAPFAASVDVMGGAPGTRETD GWLTGSTVVLPEGAVAGGDVRGGGPGTRETDLLD

LG N G WACGTTVVVPPGTVGAVDCRGGAPGSRETDLLD GWLT GVTVVLPPGTVGSVDVQGGGPATHETDALD GTAENRDGLTGVVVVLAPGATAGVDVRGCAPGTRETDLLD NQKNATGCTAVLTEGFT IGADIRGGAPGSRE DALTD


T G/VTAVCPAGAFAAVDVRGGGPGTRETDLD GAVAAVDVRGGGPGTRETDALD $\square G \square G D \square A D G S G V T A D I F D E P A V A S G S V G G A P G G R D T A L L D$ DPPGTGVVVSTPEGATAAVDVRGGGPGTRETDLLD GWLS GVSVVLPG GAVVGVVDVRGGAPGTYGTDAFY A GTGASLI LCRGAVCGVDVRGGSPGTRDTDALN DHKLKSGATVLTADAPTASVVHVMGGAPGTRETDLL GALTGTTAVLPEGTVTAVDVRGGGPSTRDTLALD ALTGCTVVLCEGAVPGVSIPGSATGTEEIDLLK DNEAKTGASVLYFRGAQAGCDISGGGPASRETPLTD GMESTGVTVI RADGALAAVDVRGGGPGTRETDLLD
AVPGPGALSGTTVVLAPGAVAAVDVRGGGPGTRETDALD
$\qquad$
 GYDTGTTVVRP HAKVKTGVTVI LPDPATCAVDVR GKGWLS GVTVVLPPETVGSVDVR NDTAKT

G WL
G WRT

(VGAVGGVDVRGAAPGTRETDLLD
 DLDAMTGVTVLRAFEGAKAGCDCRSGGAPASRRETPDLTS
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UniRef90-UPIO00374A201
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UniRef90-Q1YJD8
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UniRef90_UPI0004056AD9

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

QPENAVSHLHALLLSGGSAYGLDAAGGVMRYLEEGVG
$P E K T V Q K \square H A V V L S G G S A F G L E A D G V M R Y L A E Q G \square G$


LLK PHNTVERVNATVLAGGSAFGLAAADGAMREDESRGG APDKSAPGVDALVLSGGSAFGLAAAGVMDADHEAGRG PTT LVSAVDAVVLTGGSAYGLAASGAQRWCEENGRG $P V A D A E$ VIHSVVLSGGSAFGLDAAGGVMYLEKKNTG $P \mathrm{THLVDRDHA} V M L A G G S A F G L D A A G G V R W L E E R G I G$ $P S M T V A E V D A F \quad V L S G G S A F G L D A A G G V Q A G L R A G R G$

PENLVGGVHATVLTGGSVFGLAAADAVTVALSQEGN PSNTVQTAHA IVLTGGSAYGLAAADGVMGVLESEGV
 $P T T L V P T V D A \quad V V L T G G S A F G L V A H G A Q R W C E E Q G R G$
 PHNTVERVHA $V V L A G G S A F G L A A A D G V M S T L E A A G G$

$P T A \quad L V Q H \square H A L C L S G G S A F G L A S H G V M R Y L K E Q G \square G$ PSNSVR HVDAVVLTGGSAFGLAADGVMTWLEEQNRG PRNLVQTIDAVVLTGGSAFGLDAAGGVAWLEEQGRG PHNTVQRVHA VVLSGGSAFGLATADGVMRTLDSRPV A GGLVDRTVA G ADALVLSGGSAFGLAAAGVMDALAEAGRG PRNLVSRIDAVVLTGGSAFGLDAASGVAAWLEERGR PRNVVRTVDALVLTGGSAYGLDAASGVMAWLEERGR | $L L$ | $A P D R$ |
| :---: | :---: |
| $P C N L V V$ | $L$ |
| $P$ | $V$ |


 $P A N S V R$ HVDAVVLTGGSAYGLAADGVMTWLEERGRG PTTLVRQVDA VVLAGGSAYGLASAGAQRWCEENGRG PHNTVQQVHA I TTLSGGSAFGLDAATGVMAELESRGG PRKTVQKDHAVVLSGGSAFGLAASGCVKY LAEQGVG SRAAVDKAHA
 PENTVERVQAL $\qquad$ VLTGGSAFGLAAEGVVRYLRERGLG

PTEMIE K
AHNTVQQVHA PRNLVQR PAMTDSTIDGL
 PVCNRE
V
NRE

## V V V VLS

 PVCNRE VVHSVLLAPDKSVA VAVATGGAFGLDAAGGVMKKEEGRD PREDRRAVAALVLSGGSAFGLEACTGVVDGLVAMGR $P G S \prod T N R D H A \quad V C L A G G S A F G L E A A S G V R R Y L A Q K G G$ $P L N L V D A V D A V V L S G G S A Y G L A A D G V V A A L A D E G R G$ SMTADNPL PHNTVERVHA $N A V V L S G G S$ $P R N L V Q R V E A V V L T G G S A F G L A A A D G V M R G L A Q R K V$ $P V A A A Q G \| H A V L S G G S A F G L D A A G G V M Q Y L E R N \square G$
$P S N G V Q Q V H$
PRNLVERVHA DGGLI EKVVA $P T T L V S T V D A$
 $P G T L V D T V D A$
 APENTVAGIDALVLSGGG

## N <br> 

 $G V V L S G G S A W G L A A T G V V R W L E E Q G H G$ $V V L S G G S A F G L A A D G V M R E L Y A E G R G$ IVLSGGSVYGLAAADGVAWLGQQRDG$V V L T G G S A F G L A S A T G A Q W C E E Q G R G$
$\qquad$ MLAGGSAYGLAAADGAMQELERQGI VV GGSAYGLAASGVMGWLEEQGRG SGGSAF GLDAAGGVQA GLREGRG VF GG
G
G
G A A A F VVLSGSAYGLASTVGVMEYLKQNGG PVVVTGGSAFGLDAAS GVTAWLEEGPG

$P A N L V Q Q V H A$
RPENTVAVVHAVMLSGGGSAWGLDAASGAMRWLEEAKLD
PTASVRHTHAL
$P H N T V Q Q V H A$

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| UniRef90_L7L243 |
| UniRef90_IOI109 |
| UniRef90_F5Y136 |
| UniRef90_V6K3Q5 |
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| UniRef90_R7CTG7 |
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| UniRef90_I6Z0K7 |
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| UniRef90_H8IMS1 |
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| UniRef90_D7WBZ5 |
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| UniRef90_F0M9X9 |
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| UniRef90_M1NN020 |

GDTRGHVVPIVVPAAVI FDLIPVGAWDHRPDADFGAEAVRAA FDTGFARVVIVVPAALFDLPVGRADAWGPEAGYAACEAAA


 FAVP GGVV P IV PAA D G R GGDFSARPTPDMGYAATAAAAA EGRVVPIVPGAVLFDLGRGGNFGGRP DASFGYRAAENAR

$G T L F G G I I P L A P Q A I L F D L L D W E R F S P Y R S L G Y D A A R A A R$ FDVGGQRVPIVPAALLFDLLNGGDKDWPYNWLGREALEAA
 VP L S G GTVVPIVPAAVI F DLVGGA WKNRPDTEFGYRAAA LAAD YRVGPPVVPAAALFDLGRGGDWRARPDGRAAIEDAAATEP GVA $\square A G G G V V P D V P A A V D F D D P V Q C R P T D E F G Y L A C A A A A Q E$ VAMD G G VV PIV PGAVI FDLVGDWALDPTA EF GYRACEAAA YNAGAYKVPIVCAASLYDLENGKFAYPDKEAGYRAAENAQ

 ESNPGPRVP VVPAAVIFDLGDPNHRPSPEDGAAAVRAALD



 $\square$ N S CHN PV P I I P TA VLYDLANGWGNTPPYYQLGKTALQKA GDEQGHVVPIVPAAVIFDLPVGEWHARPDAEFGARAAWSA

 $G W G G V V P I, V P A A D V L F D L P D G S W S A R P D$
$P D A T A V V$
$P$

$M D V G V G K V P D V P S A D L F D L G G D P H V T P N A A M G Y A A A R N A D$ VA L D GGVVVPVPAAVI F DLDPVGGWKCRPDA DFGYRAAAAA FPVGVPVVPAAARADLGRGGTWRARPDGRAAVEAAAARPE $P$ GGVVSVPI, VP GAVIFDL LVGDPYHRPTAAD GEAAVM DAF D

 $G V R V G P V V P A A C L F D L G R G G D F R A R P D G R E A V E A A A A S E P$
 $F A M G A P D V P I V P G A V I F D L G R G G R W D A T P D A G F G A A A C D D$
 $V A M D G G V V P I V V P A A V I F D L L P V G G W G C R P T A E F G Y A A A C A A$ FAVPGGVVPIVPAADLGRGGDFAARPTPEMGYEAAAAAAAE AEQPAKVVPIVPAAFDLLLGRWDSRPDAATGRMAVKNALD
 GFS GVVPPTP IV P GA L L Y D L A N G G DKN WT G DA P YA A AF K T A

 GFAD SP IVVPIVPAAFDLLVVGDPSIRRPTAADGAEADVRACS $V R V G P P V V P A A A A L F D D G R G G D W R A R P D G R A A D E A A A A A S ~ G P$


 GDVSVTVVPNVCAAVLFDLKCGRDRPDETMGREAALSALR $V M V T V V P N V C A A V L F D L K F G S M E \| R P D G A M G Y A A C E A A L R$
 FPTPAGPVPLVTAAILYDLGAKRGDHPNREMGEVAAAAAN WPA GPGVVPDVPAALEDDLGGSWRHHPGPDEGRAA Y LAAAS
 PA Q VVVPVV PAACVF DL GRGGEWKARPTTAATAGAAAVAAAA E
 FPMGGP DVPAAVCFDLGRGGDFGAFPDAGFGAAADAAAR S Y APGPAPIPVSPIVNANGGDKDWGLEPPGRALGVKACKAA FAVP GTVVPIVPAADLGRGGDVKARPDADMGYQAAAAAYA F D TGFARVPLVVQS DIVDLGSASVRPDSDMGYAACQNALR

 FAVGDVRVPIVPAAILFDLANGWDRYPPYREFGYAAASSA FKSMGKLVPIVVCGAVLYDLNQKEYHYPTAQYGLNACKNA Y DTGGA KV P L V C Q S C $\quad$ Y D L G $\quad$ G R A D R P DAA A M YA A C E D A E





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UniRef90 F0M9X9 UniRef90-FOM9X9
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UniRef90-U1YPX3 UniRef90_D6Z7R3 UniRef90-M2QTD8 UniRef90-M1N020 UniRef90_R6T0M6 UniRef90-UPIO00474DECE UniRef90-A1TD21 UniRef90-F8JNE7 UniRef90-H2G6U9 UniRef90-X7F1T6 UniRef90_UPI0003667D38 UniRef90-E8W2A0 UniRef90_UPI000378F99D UniRef90_A0A017H8D2 UniRef90_UPI0003B6632A UniRef90_R6B505 UniRef90_D6TJU6 UniRef90-W9ATP4 UniRef90-B8HCX9 UniRef90-F8DY52 UniRef90-R5TBX3
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180
190
200
 GARVPEGCVGAGAGAVAGQIKGGVGTASSVLDSGAVVNAA TGPVAEGSVGAGAGATVGKIVGRPMKGGIGTASWTIPGGP PGNYEDGSRGAGTGATVGKMKSGDGSAAYEV
GHDVGRGNVGAGTGAVIARYKGGVGTASATLDADAVVVRAL THPVGQGNVGAGTGAVVGVLVGGVVGTASTVLVDGS $A P N Y R D G N F G A G C G A S V G K M K T G I G S C A V Q I$
$G T D F P V G C Y G A G T G A S V G K M K S G A G Y A E I V I$

## MP E G

PGVFE $\square$ GSVGAGTGATTATVKGGDGSASADTRHGAGGYTV APEFALGTVGAGTGALTATLKGGLGSASVVLPDGGALVAV TKQVAQGNVGAGTGATVGKFLGMMKSGLGTFALEDDTVQC DAPD WGAVGAGAGARAGTLKGGVGSAS VNVGDGIVVG GAPVAQGNTGAGTGAVAGGVKGGIGTTSLVLPSGDTVNAA GAAMGVGNVGAGVGARAGALKGGVGTASTALPSG
RGEAAPGAVGAGVGARAGVLKGGVGTASTMLPCG KDNFVAGEIGAGTGATCGGIKRSMQS TQPVKSGRTGMGMGAGWGM
 GHAVVVGSVGAGCGATAGVLRGGFGVAQARV
GEGVALGSAGAGTGALTAMHKGGLGSASLVLESG
GHDVGRGNVGAGTGALLGRYKGGVGTASVSLEGGVLVITV
LNNPQSGCVGGGTGATVGKILGAMKSGLGIACVKIGELKV ADP A EGNVGAGAGASVGKLFGAMKGGUGSASITVLGVTV KGSFALGTVGAGTGATTATFKGGLGSASARSSAGHAIVAV D 1 SFDLGRAGAGYGADAGHVRGGVGSASDDD GDGIVV GVDFEVGSVGAGAGARAGALKGGVGTASVRIPDGAAGITMV QQSGRAGTVGAGTGASAGADKGGFGEASAVVAA GRTVAV S GDVGRGNVGAGTGAVVGQYKGGVGTASITL
NAEFATGVVGAGAGATAGQLKGGIGTASAVVSSGAQGAKV $G G A V E Q G N V G A G T G A V S A E M K G G V G T A S A V L P D G T$
$G D D R A S G S V G A G C G A T A G V L R G G F G Q A S R R V V I V$
GSPFALGDVGAGKGT DCFGLKGGDGSASRQME DGGRTFTL
ATACPQGNIGAGMGATVGKMKGGFGTASVQLPGGLVVGA
 GPAFALGTAGAGAGAQTARVKGGLGSASLVLETGA
 GAGVPEGCVGAGTGAAAGVLKGGVGSASTVLESG A A EVAEGSHGAGHGATTATLRGGTGTASLRL PDSGHVV

 GHDVGRGNVGAGAGALIGRVKGGVGTASVTLDNGV
EHSVAVGNIGAGLGASAGALKGGFGQASAVFPDDGAGTTV
S SEFLSGCNGAGTGATVGKLLGAMKSGAGYHEDSLGGLCVV



GAPVAEGSVGAGTGAVAGQLKGGDGTASVRDPSGVTVAALV $K G A F A L G T V G A G T G G T T A T V K G G L G S A S A V S S R G H R I V A V$

 GDGIQPGCHGAGTGATVGKMKGGIGTYALR G


 GAPVASGSVGAGCGAMAGRLRGGVGQAABDVGVGDYRV GAPVAEGSVGAGTGAVIGALKGGVGTASRVLDSGVVANAA
 SNDI RLGAAGAGYGATAGLYPGGLGSASETIN $Q N S P D L G S V G A G T G A T$ DGPAGSGSVGAGCGATAGVLKGGFGSASCRV $G A A P P A G A V G A G T G A D V G G I A G G V G S A S E V L A D G T V V G A L$ SADFA $\square G T A G A G \square G C T T A T F K G G L G T A S T L L P S G \square V V A A L$






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 UniRef90_IOl109 UniRef90_F5Y136 UniRef90_UPI0003637EDE UniRef90_V71495 UniRef90_A0A024H0C4 UniRef90_UPI000476F996 UniRef90_E9SC27 UniRef90_R7CTG7 UniRef90_I3UA59 UniRef90-G9ZYQ9 UniRef90_A8LJL9 UniRef90_S0FZD0 UniRef90-I6Z0K7 UniRef90_L8EZA1 UniRef90_H8IMS1UniRef90 UniRef90_R7KCK2 UniRef90_C1ADL1 UniRef90_-I3TH98 UniRef90_X1KPT8 UniRef90_D7WBZ5 UniRef90_D0DB54
UniRef90 F0M9X9 UniRef90_F0M9X9
UniRef90_R6QBB3 UniRef90_F0Q5M7 UniRef90_UPI00037B6166 UniRef90_C8WB34 UniRef90_D0L9M8 UniRef90_F4XAB8 UniRef90-UPIO00248724A UniRef90_U1YPX3 UniRef90_D6Z7R3 UniRef90_M2QTD8 UniRef90_M1N020 UniRef90_R6T0M6 UniRef90_UPI000474DECE UniRef90-A1TD21 UniRef90_F8JNE7 UniRef90-H2G6U9
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UniRef90 UniRef90-B8HCX9 UniRef90_F8DY52 UniRef90_R5TBX3
UniRef90-E3DLF8 UniRef90-A0A059DSB4 UniRef90-M3V2Q6 UniRef90_B7A6E5 UniRef90_UPI0002885512 UniRef90_U3GT36 UniRef90_UPI0003740560 UniRef90_B9J6Y4 UniRef90_H5U4T0 UniRef90-AOLNB7 UniRef90_UPI000372E2F9 UniRef90_UPI00047BA101 UniRef90_R5HAB5 UniRef90_Q16DV8 UniRef90_W7IIZ3 UniRef90_UPI00036598D7 UniRef90_K1E1D8
UniRef90_R5QCM2 UniRef90_UPI000376E6F8 UniRef90_UPI000477D8F2 UniRef90_E3GGG6 UniRef90_UPI00040422FE UniRef90_UPI000255EF04 UniRef90_UPI00047BB6CB
UniRef90_UPI0003061D47 UniRef90_IOGPV5
UniRef90_UPI000374A201 UniRef90_UPI00037ABB7F UniRef90_UPI000348302A UniRef90_Q1YJD8 UniRef90_R7BU75
UniRef90_R5IMS7 UniRef90_V4IBH3 UniRef90_V6KMI8 UniRef90_L8P8Z4 UniRef90_UPIO003615FA2 UniRef90-R6YYX0 UniRef90_Q1AUM2
UniRef90_UPI0004056AD9
 GAVSDPHTGRVLAGVRQHDAEGRFIGFVDAVSLLAAGEAP GALVACNADGDVVDPDSGRLVAALLDTRRALLRGEPPRRLE TVAAIAVVNALGDVWDSGHIIAGALRPDNTFVNQTRAPPN $G A V V A N F G S V Y D D G K L M A G P R V A G F P V S T E D L M D R G M E A$
$G L P V V V P H E P S L A S S A R E G S R G T L D A R F R A P E P A H L$ GLPVVVPPGEPPSLASSAREPGSRGPTLDARFRAPEPAHL GAVTVLNAGDVFDSKSAKKIAGMLNADNSGFADSLEPVQN GAYMAVNACGEQDKILAGALADDDRTDISSHRLMLEGYER GVLVQTNFGGV LTMNGAPVGKELGRYYKNDPIQLDHVS VAVNAPLVGEGPWFWAAPFEQNEEFGGAGLDAEFRPEHLE NALGSATMGPGRHFWAAPFEMGTEFGGLGMGAVDPAALPA GAIVAVNALGDVIDYDTGRPDAGDTEREDMYKEDARQRD GSVVDPRTGVLYGRYGHGVPLAPSPDAHAAAQRRLAEARS GALAVVNAAGEVADRATGLPWMADLAHEFGLSPPPPEDPL AVVVAVNPVGDIVKDGETIGGAKDGKKFVSTLSLIEKVSG AA VGLNPAGSPVDPRTCLPYGEECQTAQAGRGGPNDGSD GALVACNAPGTPCFWAWPHEDDDEFGGMPADLDGGDPVAA GVLVQTNHGGV LQDNGFPVGDRLGNYY AAAVVANPDGSVIDPDTGRFFGDPARPAVDLDAFAALVRP GALVAANPPSGRHFWAAPFEMGAEFGGLGPESRRMAAMAQ GAVVVLNAFGDVFDTNGNRAAGLLFSSTEEEMYKSGQPKK GALVACNAAGDVVDPESGRPVAGARKARRALLAGDVPNTLL NALGSATVGEGPHFWSAPFEEDNEFGGLGLPQAGGARDTA GALMVANPPDTGLPWAAGKDDLERHGLRTPSGPEIARLAP俍 DGGVVVGALGDVFARGAVPGQAPAAPGP GALVAVNSSGSVYDPHTGSLWGEEALALLAERARANAEEG AALVALNSHHPAVDPASGLPYGFPLGATARRRGGAAVPWA GVLVQTNFGATPDLTVCGDPVGQRLWKRFQ AVAVNADGEVRDPKTGTTLAGARQEDAGSFDDPDPFGHT GALVVVNSAGDVIDPGSGLPWQEEFGLVRPPADELAAYAD A AGVVANPVGSVVDPRSGRLWADPDVRVDPEKFSQLK GLD GALVAVNPPSGRHFWAAPFEMGNEFGGLGPDPARGLQPLP AALVCVNSFGSPT LWA WPLEDEGEFGGVRPPDWGAAKVEA GSLVDPVTGALHGAWTEVGDEFRACGLHAPVPDTAVQADE GALAVVNAAGSVLEPETGLLYGEDFEGRRRRLAEVAARNP GALVAVNAGAGPHFWAAPWEDGAEFGGLGPAMPPPGPPPA AALVVLNAGSTVDPRTGHTPEAAEVDAARARAVELGSEALD GAYMAVNACGEVETTLAGULSDDEKTILSSHDFMLKGFER AVVAVNPGGNVVDPATGLPWMASDSAEFGLTPPPADDKK
 GAYVVVNACGEVFDGAGVFSRSRKKIISSHELLMLSGITRE AALAVVNFGDLKDPDSGQIIAGAKIDTEKTIINNSDUDLN GALACVNAPGTDVYWA WPYELDGEFGGVRPPDWGAAKVNP VGALDQSTGLPFDLTDADLAAGLKRPDPEECSAVAALAAK GAMVAVNFGDVIDPLTGKLLAGVFLNTENILVKEYENKNN AACVVANPGSVVDPNTGAVV CRPNEHVDLDAFKALPPD GSVLDPRTGVLFGEYGAGEPPAYPAAAEQAREEREAAAGG NALGTATDGDSPHFWAAPFEKTEEFGGLGMPETIDTRLRL GAL VANPVGSVDDPTTGLPWGATEHDLAYYGLARPDAAK ALFVVNAFGDVVDPDNRKILAGTRKDRTRLELVDSDAEGF GAVIAVNCIGDVWEHGRGFADSERLLLERYETQTDIGSNL GAVVACNAAGARDDSGRGFADSEAWLVAHGQRQRDVFSGK GALVAANPPGSRHFFAAPYEMGNEFAGLGPPVRTKVLHGT ALAVVNALGDIVDPKNGRIIAGREFANTAEAIKDGAPPAG VAVNAVGSPLSPDGRVDVPEPDPVAVQAHEERQAAEAQALD AAVVVVNFGDVFDPENGQK円AGLMDAERTKFVDLEEAPQD SALVVANPVGEAVNPEDGTLWGDPSARVDADAFSKLRAP GSAVVDRTGALYGAHVAAEPAPEVHAAALLRVAEARERQG GAVVSVNAGDVFDDESGDKLAGMLSADLSEFEDTEAAMYE GELWGARHLVAEDLDGLGDWPAGVAPRRPVPSELEAARSA GAVIAANPPGTDCPWAWPYEDENEFGGRRPPEDYLKAAKN GAVVVVNA GDGDVYARGKKI ADFGMSVGLVYRAVAGKDA GALAVANAFGSPCLPDSGALLAAQYVEDESLRPRVPDPSE AAGVVANPVGSVIDPASGRFYGDPSRPAVDTAAFSSLERP AAVNGAGSPRTGEVYGSWEAVGGEFGGLRAPDAGEVAAGG VAVNAVGSGTGRHFWAAPFEMEGEFGGLGLPTPGPADADP AVNAMGDVVDESGKIIAGAKGNGEFIDTEKCLANGEFAKL GVLYGRYFTQHPGPGGRAVWPSPETHERAQDPAPDAP GALLVVVNAAGSLLDPASGTLYGRRLDAAREETERRHAGSG GSAVDPETGVLYGELFQGRPPAHVHEAARRHDAEVAAKNA GALIACNAGDVVDPDTGGPDAGARTEDRRALLRGEPPHTL GAVAVVNPGNVVDPRTGSFIAGMRSAPDSLEVVSMEEAMP AAG\|VANPVGAVVDTRDGTlWGAPG\|APVDVAAFRADQPL

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F NAAADVLGRAVVHAVLDSKQV
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GY $\square$ A E E A $\square R \square A V L D A V K S A E S M G A R$
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QSAAADVVRQAILDGVAHAEPVSTSAG SAAAANCVERAIVMAVLAATT GY $\square$ A E D A $\square R \square A V I D A \bigsqcup K N T E T M G G$ M
ARA
GRHAAEVVQRA $\square$ VDAVLSAESV
GMLASKVMEKAVINADESAESSYG
CASAADAVSEAI AQAIFNAEP
$\square A A G A D V L A R A V V K V R A A R S V Q G P G G$ ARGVYEATA LDPVEGA
CRVAVTVTQRA VNAVLAADSVAG
GVLAARAVECAlVNAVRSADSLHGY GILAARAVEEAVVRGKAAESLHGR GHGAA LCCLTAABRAVYAATPQPG LSAAPGVFARA AHAVLAATSTITDWG $G V A A S E A V S E A D L R A V R L A P T V R G \square P G$ QTAAADCVSRAIVRAVLAAESV
GTLAARAMQQA乌KRAVTAS
VDAV
$L A A G A D V V T E A V V R A R A A R G V D G S G G$ GTLAARVMAMA KKAVLETEPLYG
$\square H T S G E V V T R A M V R A L L A A E S V T T P A G T W R$
MR GVYEA
GTLAAEVMERADENAVLSAK
AAADAVTLA $\quad$ VDAVLAATAVRTP
ASA $\square \vee D A V A$

QSAAVEATRLAVVNAV
GTDAAEDMAEAIQDAVKAAK
LAA GADAMTRAVVKAVLSAESVETPAG
$\frac{L}{D} A \operatorname{A} A D V L T R A V V R A A L A A E T V D G P G G$
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RDALTDVPGLRVGHATR
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GSITDVAG TRVGHHQR DDPEAT VCDVD GFCYGNYT
GPTDGLTDVAGLRVGHAQV
NALTDVGGI RVGHYQRLDPDAS
DLI TDVAGLRVGHAT
SI TEIP GFKFGHFT
LTDVAGLRVGHA
PAGSLTQVDGLLVGHATDREG
G $\square_{R D D D}$ TDVVAVRVGTAE
P $\frac{\square}{\mathrm{R}} \mathrm{S}$ I $\mathrm{D} D \mathrm{D}$ DGI GVGHHQRT
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RPGTRN L DT D $\square \mathrm{DG} \square \mathrm{S} \nabla \mathrm{G}$ Q A E
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GS LCD $\square P$
GLLVGHYTDLE
AGGISVGHA
FGAVPGRVNGLADVPGUAVGHAPARDDAGK

$\square R D \square A G F R \| G Q E$
$\square T \square P G \square Y A G H A T \square A E P G \square$
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LS SITQQIPGI YAAHYTNEQDA
$K T G P T N S L D A G G L T V G Q A$
$\square \mathrm{A}$ G VF A
EGLLVGHFTDLE
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TLTVLNGVRVGHATHLDK
NDALTDVAGLRVGHA
TPGPGNA TADVPGULVGHHQRL
TLSDLPEFHVGHA
$P$ VGTLCDVA G LDRVGHWS

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S S ND T N N D NR R G GHAS
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1 T DI K GI KVGHAQNFS GP
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$G S D^{T} D V P G D V G H A Q$




## UniRef90 D4LUC0 UniRef90－B2A815

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UniRef90-UPI0003770399
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UniRef90-K7R587
UniRef90-H5WPW2
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UniRef90-R2RVI8
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## くロー

130
150
160
LDVGI AKVPLVCQSDIIFDLTDPYTRP DKAMGYEACVGAW VPTGYAKVPIVPGA LIFDLGDPRTRP DANMGYQAAKNAA
 GFPSVPKAPIVPAAILYDLNKDWGDTSPYAGLGGKAFAAA



 GRAEGPVVPIVPGAVLYDLSNPGDKNWGTEPPYRRLAAGH $L D V G C G R V P V V C S S C L$
$G G Q V V P V V P A A C L D$
$G$ FDTGVARVPIVPAAILFDLGDPRARP DAAMGYAACQAAS FPVVGHTVPIVPSAAIFDLNGDGSVRPDREMGMHACSNVS $\square G D G V V P V V P G A V I F D L G R S G V F G N R P D A S F G S R A A R A S R$
$G K A G A P A$
$I$ FDVGVTKVPLVCASCIFDLGDYKIRP DAKMSYKACINAE $V R V G P D P V P A A C V F D L G R G G D F R A R P D A A A A V E A A A A G A P$
 FPVGDVVVPLVCQSDI FDLYKRSDVYPDKAMGYKAAKQAK FNTGVARVPIVTGAVLFDLGDPKARPDAAMGQAAAKAAKR GLDTGFAVPLVVQSCl YDL GSATVRPDKAMGYEACLLNALK VRFGRTRIPLIPAAVVLDLGFDNHAVRPTADDGYAAAVSA $Y P V G P T R V P V V P G A V L M D L G D H R V R P D A A M G Y A A C Q A A N$ FDTQVAKVPIVVGVFDLRVGSPNVRPAKEWGYKACQVAS YDTVFARVPLVVQSDLYDLGDSKVRPDSKMGYEAAKLACE FPTPAGPVPIVPGAVLYDLGRGAVFRPPGLEAGYAACQGA LKVGPACVPIVPAAFDLWVGDASIRPDASAGYAAALAARR GDRVGPDPPAACVFDLGRGGDWRARPDGRAAVEAAARTEP $G P D G P I V P I V P A A V I F D L P V G S P A A R P G A D C G R E A L T A A V$
$F E L L G N T I P I V P G A F D F L P G S G N A W P D S S Y G Y E A A R Q A F D$
RDVGIGVVPNVSGASLIFDLGMGRVRADSSFGYRACEAAFS GDVELTRVPNVCAAILFDLGDYRIRPDAAMGYAACENAFR FAVGDKVVPIVSGAVI YDLLGKGYDYPDSDMGYRAAKNAV VNVGVGVVPIVVSACLFDLSDVRPGVAEGAAAVRAAFEHA AGSDVPKSPVVPSADLYDLANGGNKKWGEDTPYRVLRAAY
 FRTREAVVPIVPAADLGRGGDVMARPTEQMGYDAAAAAGA LDVGVGIVPIVSGACVFDLGNPTVRPLAAGATAVADADDT

 FPTPGGPVPIVPGAVLYDLGRGALHRPPGPEAGYRAALAA LA $\square G G E G L V V P V V A G A V I F D L P V G A W G N R P D A G Y R A A L A A$ FDTGVVRVPIVTGAVLFDLGVGSASAPDMLMGRKAAEAAT VSVGGPVVPAACLFDLGRGGDWRARPDGRAAVEDAARSPF FRVGPEPVVVPAAVLFDDEEAAWGRVPDAEFGHRACENAR
$F E L G G L H V P I V V G A C L F D L P Y G K P E H P T A E M G A Q A T R S A D$ F PTPGGGVVPIVVGACLFDLPYGKPEHPTAEMGAQATRSAD
 FPVLGPLVPIVPGAFDLLLGRWDSRPDAATGAAATAAADG YNTGVSLVPLVCQSCTFDLGSSKVRPDSTMGYEACAANSD YNTGAALVPLVCQSCIYDLGDPKIRPTAKMGEEACRQAFA GFRVGPEPGNTGGAVDGPVPNAWGRVPDAGFGHHACEDAS $F D T G I A K V P L V C Q S A L F D L G V A C A N R P T K A M A Y A A C E N A S$ $M G \square T Y V P N V V G A S L F D L R I G R S D V R P D Y Q A G R K A C E E A F N$ FDTRYCKVPLVAESCDYDLGGCGDNVRPDAAGGYACEEAFNE $V A M D G G V V P I V P A A V I F D L P V G G W A N R P T A E F G Y A A A D A A$ FEVGGMRVPIVPGAILFDLLNGGDKDWPYKGLGRDAFDGA FDVGLTKVPIVPAAVIFDLGIGRADVWPDATMGYAACVAA
 HLPTPVRVPIVVQASLFDLDKDWGRYPYAEDGYQAAQAAQ $G G D G L P A V P V V P A A I L F D I T N G G D K A W G M D P P Y R R A A T G Q$ APDPPGRVPIVVQASLYLPAGWGRYPYAEMGHQAATSAR GFRVGPVVPTAALFDGGRGGDWRARPGAAEGREAAEAAAG


 FDVGVTKVPIVCGAFDLVVGDHTIRP DKNMGYEACLNAT | $Y D T G F A K V P L V C Q S C D Y D L G D G R A D R P D A D M G Y A A C E N A K$ |
| :--- |
| $G D T G G H V V P I V$ | PMPVPVVVGAILGDLKNGGNKGWGMEPDYRAGGRKAVEAAL $\square S \square G V G R \square P L V P A A V L F D V G D M R \square R P$ DAAAGYAACRNAG

 VRVGGGVAPIVPAADIFDLGRGGDPKARTSAEWGYLAAQA
 VRVGVVPVVPAAVIFDLGRGGRWTARPDAEGGRQAVEAAA FETAYGIVPLVAASSVFDLGDSTAYP DSSMGYKAAVASE FDTGFARVPLVCASCLYDLGDPAARP DAGMAYQACLDAA
 PAHVVPVVPAACVFDLGRGGDFRARPDGRAAVEAAAAGEP FPTVVVPVPDVASADLFDLGGDPTDYPDEAMGYHACQQAV

## UniRef90 D4LUC0

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UniRef90 R4PV05 UniRef90-A0Z6P7 UniRet90-B5GQ01 UniRef90-UP100036F97CC UniRef90-R5FNW5 UniRef90 D7CRD3 UniRef90-G1WGZ8
UniRef90 - O4JX05 UniRef90_C4Z7E6 UniRef90-R7CLT2 UniRef90-UPI00040229BF UniRef90-UP100016C0EDB UniRef90-R2VHT6 UniRef90_GOVLK5 UniRef90-UPIOOO3665B57 UniRe990_B8G670 UniRef90-UPIO003627FE7 UniRet90_BoT2R5 UniRef90_M9MJL6 UniRef90-UP10003B78F41 UniRef90-O5FP42 UniRef90-C6X065 UniRef90-UP100034A7C83 UniRef90-R7QV41 UniRef90-B1BD76 UniRef90-R6XKT9 UniRef90-UPIO003677F29 UniRef90-DOJ4P1 UniRef90-UPIO003A3CC10 UniRef90-D9TBQ4
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170
180

200 NSNPQEGNYGCGTGATI GKFAGAMKAGVGVSAFRTGELKI NSNPQEGNYGCGTGAT GKKAGAMKAGVGSAFRTGDLIV GSPVEEGNVGAGTGARVGGLKGGVGTASAVLDSGDTVNAV AGPVAEGNVGAGDGATVGKMKGGVGTASAEL ENGVWV A GEVFQSGNFGAGTGATVGKMKGGDGAAAFRYGDLLAGAIV PTKLEQGNVGAGTGATVGKLMGPMKAGLGAAAVALGPIKV GAPVVAGAVGAGTGAVIGHFKGGVGTASTVLESGVVANAV AAVAVGTVGAGVGARAGVLKGGI GTASTTLPAVVAVNSA HGTFALGSVGAGRGAMAGVIPGGLGSAS CALEGGLVV SGPRAEGCVGAGTGATVGKLGGPMKSGLGARAFQLGSLQV GAPVECGNVGAGTGAVAGGLRGGVGTAGTVLEGSGVTVAA





 $K N N P Q S G S I G A G T G A T V G G M K Q S Q K S G I G Y Y A M Q U G D L K D$

 $G H V V E R G N V G A G T G A L I G H Y K G G V G T A S V T L$
 $S R R V A E G S V G A G T G A L A G G V K G G V G L A G Y T L E E G F G$
 GTA GVLLPS GITVAAV
 D T P FQS GNFGA GTGATVGKMKGGI GAAAFRC GDLEA



SQEFAAGNAGAGAGAAVRRYKGGVGTASLRMAGPNE
NAP LARGNVGAGTGATVGKMKGGLGEA VQAC GALIC
 ERDRELGNHGAGCGCTVGKLRRGAMKGGLGRATAGSGEEVVC
 SRHFA T GSAGA GTAARA GA K G GVVGTASVVLSAGPAA GAV



 $T V A G D N G N V G A G L G A S A G A D K G G F G Q A S A V F P E G L A G V C V$ GTD T R T GN I GAGTGATVGGMKQSMKS GLGIAAVVSVKNFQM




 $G G Q F A L G T T G A G T G A T T T P L R G G L G S A S T I T P S G$ $P$ GS
 Y IDA LNA AKDGAGF GARAGNSERGGLLGS
 NGEDME GS I GA GS GATVGKVLGGMK GGL GTY TVVQQGDLMV $E N N P R C G N V G A G C G A T V G K L Y G G D G D H A V Q V A A V V V V N A M$ $R$ DFEVGSVGA GA GARA GALK G GVVGTASMLI A D GAA GVTV SREMVQGRVGAGYGARAGGVQGGVGSASYQLEDGS PD GAGAGAVVGKVF GHERAMK G GLGGTASFTVDD
 B $\mathcal{A} P \vee R Q G G V G G G T G A R G G$
 ATPP GEGSVVGAGTGAVVGGLKGGTGTASTRLASGA MNDPREGNFGAGTGATVGKMHGAMKSGQGlYALQHGDVQA
 A GQFA LGGSVGA GTGATTPLVKGGLGSASLMSESGHVVAAA GGEDVR E GCVVGAGTGAVVGLLLKGGVVGTASTVVLGSGMDTVNAA

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UniRef90 M0QL19 UniRef90_UPI0003677F29 UniRef90-D0J4P1 UniRef90_UPI0003A3CC10 UniRef90-D9TBQ4 UniRef90_UP100036D1D00 UniRef90_R5R4Y7 UniRef90_UPI0002FCCC4D UniRef90-G9YHS7 UniRef90_UPI0003B4A683 UniRef90-KOYJI2 UniRef90_UPIO003040D1B UniRef90_G2G7S5 UniRef90_E8N622
UniRef90_B6FW18

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240
GATVIAVNALUGDIYDHHNGQ|I DAGMDSDDRKSFADSAQFDY ASLVAVNF GEVIDPETGQUI GGERDSGGYNDDNDDGERSI GSPVDLSTGALGDFFAGRGPVARALAEVDVYGSSPGAADP GALAAVNCPGTDAFWAWPYEIDGEFGGARPPDWGAAKVNP AAGVVANPVGSVVDPVTGLLYGDASAPAVDTAAFAQLERP $A V N C V G D V L D D G A I I A G S L A D D R M G N D F F N G D S D G S A A N G$ $G A M V V V N P T G E L I D P T T G L P W S E E F G L T A P P S E Q L A A L A G$ $G A V V S V N A C G N V V D P F T G E W V A G M R A E L A A F A A A G S M Q M P$ $G S A V D P R T G A L G E L D T E G V P S P A V H T A A Q L R L A E A R E K N G$
$G E V V D R A T G$
$G$ GALVAVNPVGAVLTEGDEDFLNAPFAGSADPFPGGSRLAE GAVSAVNAVGNVVDPATLQPIAGMRAEEAMDAMGEQVTMP GAYGDPAFAVEGTPGRPAYPAPEVHAAAALRLAEARERSS AALVVLNYGGVRDPETGRWLVGPPPALSATAWPGAEARPG GALVIVNAYGD\|LGEDGKILAGARDSPDSHEFADAAESRR GALAVVNSNGRRPWEAGGHRLPRPSAAQRAAVVAAMNAPP AALVVANPPDGRTF WA WPWEIAGEFGGVRPAGDQDSMGRL GAIVSVNFGD IFDYESGKMDAGLLDDDKKGFRNSEEEEKN $G V L Y G E L F Q G R V$ $G A V D A V N F G D V V D P G T G R V V A G L H K N G E F L R T E T T A P V T D$
$G A L A A V N M P G S E F W A W P F E I A G E F G G A R P E D W G A K A N P$ GAA ICTNAGDIYDADSGKRIAGNKVSCEELMYDMYVNPPA VVAVNAWGDVVDRSGQLLAGTRDENGFIPGTALIFQGAN GAVVVVNA MGDVYAEGRK $A$ G LDMNESRTEYKIAAPKDL
 ALAVGNAWGD VVDWRTGK IVAGARDPETGGWDDTESYLAMR GALAIVNALG
 GALAAVNSLGHPFDPLTGRLYAEGLLEEAERALLPDLDARY AVTVAALVAVNAVGDVLNPATGQVLAGARDDCGGRAPATL $D P L T G V L V G R Y F Q G R$ PGYPEA GVVHEAADLARLAAADRERGG GSVVDPSTGWPWGLAAELGSDGALLARGLGGTKLPPGTTG
 $G A V V A V N C$ VGDVLDGGTIIAGALADDRLSFADSEAAAG AVIVLNAYGDVIDKI DAGAKKPDGTYADTVSLLIGGAAKS GAVSAVNAAGDIWDPDTHKPDAGVLNEDGTGLASTARSHG GALVAVNCPGCDAF WAHPYELNDEFGGSRPPEPASQANST GSAVDPRTGALYGAHDGLDGEFPDS LPDRAELEAWGGPAA VAVNAPLVGEGPHFWAAPFERAAEFGGDGAESDLALRCKG GAVTAVNACGTVVGPLAVAPAAGAPLDEKGSACDAASAQMP GAA DAANPPGTDCPYAWTYEVDGEFGGKRPPENYALSVAQ CAA AAVNAFGNVVDPKDGDPVAGTLSNEGRPLDLAGSLAA A A LVVAN ASGSVVTDPETGVLYGEELGQGRRARGAECAERNG

 AAIVAVNPYGEVFGHDGRLVGASTAPTALREEQHYSAAGN $G A L V V V N A V G N A V D P L T G V V Y G R Y L D G P V S P P P P E A H A E A$

 AVGIVVNNPQGAVFDPATGLPWGKRLKSKNLLGTKDTA DML TAIVVVNAGDISDYETGKKLAGLKNADREEALYQFMAPRD AAIVVVNAGDIFSPQNGQKIAGLKTPDRSGFLDSVHEPHD GALTVVANPAGEVVDPAT GLPF GWPDLGFPGEFGLVPPSADE $G A L V A L D A L G B D V D A A G T Q V A G V L S A D K K S M R N S A M Q E T A$ AVI AVNAVGDVFDEEVGKII A GARKPGESKF LDDYYQKEEA GAVVSVNAVGDVLDE QGQILAGMRSRDGQGFADTRRVMLE GALVIVNAVGDVADPATGLPWMAALTEEFGLVAPPADCLA VALGSAIVGDGPNFWAAPWEMEAEFGGRGVAPDWPDPHAA GALVVVNAFGDVVDPQGRDDAGARGPGQTLVGTGALLRGG
 AALMVVNAGDGPHFWSAPFEQGDEFGGLGFPSDLRLRMKP GALIAANS F A GE DYADAPPGDGPVEMPKLAKHRR VAVNAAT $\square$ G DGPHFWSAPFEQGDEFGGLGMPAHLSTEDLR GSVVDPPRTGGLRP GEVEHAEAVRRLATARAESERRRAA SV GALVGVNCPGCDAFWAFPYEIKNEFGGMRPPADFSLDPDD
 GAIVAVNCLGDVVIDSETGEDIAGVLNENKTGFRNTEQNKN
 AA LVVVNSFGSADGAAGFTPGTDDMPKVVFV
GAIIACNAGDVFNPFNGELLAGARTADRDALLAGEEPKPVV GALACVNSFGSGAFWAAPFEDGAEYGGRAPGPDRDPP GDP GAMVIVNPAGSPVDPADCYGIGNEFAGYKAPPPTPPAAAA GALVVANPVGAGRFWAAPFEVAGEFGGLGAPAPTMPPTKM
 $G A L V V L N A A A G S A T V P A T G V L Y G E L A A D G D P H E T D R R V A G T D$ GALVVVNALGDVYDEKNTVLA GMRRADCLAEEGLHVWDKN GAVVAVNAGD DFDMDSGRRLAGMLTPGLDGFADSEAAADN
 VAVNAP LVGEGPWFWSAGEFGGRGLPARFTPDHVLPRFKG GS AVDPETGVLYGELFQGRPDAKVHDAARGR LAALAAARNT

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UniRef90 M5A2Z3 UniRef90-M5A2Z3
UniRef90-L1LTK5 UniRef90_-R5LPJ2 UniRef90-UP100037DDOCB Uniinefol-L5N279 UniRef90-Q0BXH1 UniRef90-D4IZK8
UniRef90_E1SVD5 UniRef90-10GUV4 UniRef90-EOXQ00 UniRef90_UPIO003B6170E UniRef90-UPIOO04769931 UniRef90-UPI0003770399 UniRef90-W3ASE4 UniRef90-K7R587 UniRef90-H5WPW2 UniRef90_-V6JYC0 UniRef90-GOHA67 UniRef90-K2HAU6 UniRef90-F5YMH6 UniRef90-R6GZB8 UniRef90-U1Y1J1 UniRe990 PYooo376C52E UniRet90-D5RGX1 UniRef90-N1V5J1 UniRef90-U2VGA5 UniRef90_UPIO003773B54 UniRef90-G5F4H5 UniRef90-D6K3P8 UniRef90-G8N8V5
UniRef90-F6ES63 UniRef90-R4PV05 UniRef90-A0Z687 UniRef90-B5GQ01 UniRef90-R5FNW5 UniRef90-D7CRD3 UniRef90-G1WGZ8 UniRefefo-Q4JX05 UniRef90_C4Z7E6 UniRef90-UPI00040229BF UniRef90-UP100016C0EDB UniRef90-R2VHT6 UniRef90_GOVLK5 UniRef90-A3TYF3 UniRef90-B8G670 UniRef90-UPIO003627FE7 UniRef90-Bot2R5 UniRef90-M9MJL6 UniRef90-UP10003B78F41 UniRef90-Q5FP42
UniRef90 D9WN66 UniRef90-C6XQ65 UniRef90-UP100034A7C83 UniRef90-R7QV41 UniRef90-B1BD76 UniRef90-R6XKT9 UniRef90-UPIo003677F29 UniRef90-DOJ4P1 UniRef90-UP10003A3CC10 UniRef90-D9TBQ4 UniRef90-UP100036D1D00 UniRef90_R5R4Y7 UniRef90-UPIO002FCCC4D UniRef90-G9YHS7 UniRef90-UPIo003B4A683 UniRef90-KOYJI2 UniRef90-UPIO003040D1B UniRef90-G2G755 UniRef90_E8N622
UniRef90_B6FW1


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$\rightarrow$

R S Y D N T T GAlI ITNAAFTKSQLCKI A GMTHNGYARSIRPV
 NAGSNTTLGVVATNDGGAKPQVEKLAKGAQHGLVKALSPAB GLGQNTTIACI ATDAALTPGEAQRVARMALSGFSRAIRPF
 MADGNTVLGCIITNAAMDKAGATRLAAQGQNGIARVIRPA

 | $L$ |
| :--- |
| $Q$ |
| $T$ |

| 1 |
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 ARSLNTLI
AVANTTVL
LAGGNTVI
EAGTNT

NYVA GTTI
$F G R D N T M I$

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G G F A A D A $\square \mathrm{E}$ R A V A K A $\square$ S A A Q

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 F P






 Y N T GY G L L P I V C Q S CIIF D LGGK S N IR P D R E M GYKA C Q N A \(\square A\)
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 \(M P V T P E M V L R G \square K R A R\)

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 RTELEEGCVGAGTGATVGKMAGPMKAGLGARAFQRGPLMV GAAVAEGSVGAGTGAVAGQLKGGDGTASVRAPSGVTVAAT GAAVPEGCVGAGTGAVAGRLKGGVGTASTVLGSGVTVAAT \(D G P V A Q G V V G A G T G A V A G G L K G G D G S A S A L L D D G T A D L A T\) AEPLASGSVGAGTAAMAGALKGGVGRASVKLDESAGGYEV

GREFAVGSVGA
GDPARGRVGAGTGATAGKYLGAVPGGLGSVCLERHGVRV.
EAAVAEGSVGAGUGATVGKMRGGVGSASETVAEGAAAGVTV
ASSDSACAI GV \(G D Q R L H G R I G A G A G A Y T S H W R G P D G R G L A Y A Q R R L G D L V V\)
\(A G P V P E G N V G A G A G A T A G K M K S G L G T A S L C D P G G P V V A A L\)
\(V\) \(\begin{array}{ll}G A P V P T G A V G A G T G A V V G G L K G G V G T A S T V L E S G & V \\ G R E P V S G S V G A G T G A A V G K L Y G S Q K A G D A F H A A Q L G E L Q V \\ V & V\end{array}\) \(D D V P E S G T V G A G V G A M A G A!K G G F G Q A B R V T S A D G K Y F V A\) STSINLGAVGAGKGAMAGAHKGGVGSASAADAGGAALIAV ADPVVRGQVGAGTGATAGKYRGAAVGGDGSVMDERYGVQV AMADAPGATDRAAGAVVGGLKGGDGTASTVLPGGATVAAT




 YTKEFCGSI GAGSGATVGGMERAAKTGDGVYAVSLGELQM NFDGPTSNIGAGCGATAGKDRGGFGQASREV
QEAVLEGNHGGGTAMRSHGFKAGTGTSSRVLKGGDDEYTV
ENAPQEGNYGAGTGASVGK \(\square A G V M K A G L G M F A V Q S G A L Q V\)
FNNKEMGNVGAGTGATVGGMEYAMKAGLGLAELAFEGIRV
ENRPQGGNHGVGDGATVGKYGGAMKAGLGIAAFQAGDVKV
SGDHARVETGAVGAGTGAVVGGLRGGVGTASTVLESGITV
PEGWYSGRLGAGAGATVGKLLGGLGSALLRV
S GDHARVETGAVGAGTGVVVGGLRGGVGTASAVLESG1TVV GTEVAQGNVGAGTGALNAALKGGDGTASADLGGGVVVGAV \begin{tabular}{l}
\(A G P V P E G N V G A G A G A T A G K I Y G R P M K S G L G T A S I C I P G G P\) \\
\(G E Q V L R G R V G A G T G A Y A H R R P G G L G H A Q R\) \\
\hline
\end{tabular} KADPA \(\square G C V G A G T G A L A G G L K G G F G Y A E A A V T L G D D T A R V\)


T GPVARGSVGAGTGASSCGLAGGVGGAATVLGDGTTVAAL



\(D A E V S Q G N V G A G T G A T V G K I F G G M K S G L G T A S F K S Q E L I I\)
ADPVTSGPVGAGAGATAGKYKAPVPTGLGSALARWRDLRV
VAAAGGAFPLGGRGAMAGLHKGGVGSASLDLD
SGRTGEGS GAGTGARSGTLRGGLGSFAVRLPSGTV
\(G G P L G G C V G A G R G A K A G G F K G G I G T A S A V C P D G S\)
\(G D T F T S G T V G A G A G A T S G K W R G G V A P G G L G V A H G R C G D A S\)
\(G D T F T S G T V G A G A G A T S G K W R G G V A P G G L G V A H G R C G D A S\)
\(A V A A P E G R T G A V G A G T G A V V G G L A G G V G S A S A V L P D G T V V\)
GGEVPDEGNTGGGTGVCCHGHKGGTGSASRVIEGKGVQYTV

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UniRef90-X1AFP9

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240 GAVVAVNAVGNYDPTSGNTLSGDRNLKDGGFIDAEEAGRD GVIVALNACGDDYFPDYDQENNLE NSEEADLEMYEKDMK AVNALGNVRTTDGTWLAGCRVMDPLEALYLVAQNAAPKKS GAIVAVNAGDDYDDDTGKQLAGLRGEDEEFIYAMEAQKAA AAFVAVNPGQDDVYWAWPFEVGDEFGGRRPEDWGAAKLNP AVVAVNALGSVIDPASNRVLAGPRDPDGTWELILAAPLQG GAIVAVNFGSVKVPWAAPYEIEGEFGGMGMPDWGSAKANP GAAVVVNAGDI FDPDTHERDAGMRTPDGKGFADSTADKGI GSVADPATGVLYGRDYAGERVGRADAAAREETARRTAGAV



 A ALVVLNA LG NVVYDGQGRFLAGGRFPDGTPVPHAQALAGK


 GA L L CVVVNA F G D \(\operatorname{L}\)



 A A A V VA N P M G S V DD P A T G L L Y G D P T Q P A V E L D T F N T L E R P
 \(S V I V V A N P A G A V V G P D G R L Y G D P D A G T \| Q P E A R E K D D S G S\)
 GALA G GVNCPGTEAFWSWPFEID GEFGGQRPP DWGAAKANP



 GA LAAVV N F GD V V D D H G RII I A GA RA P D Q S L I G T S A L L R S A D
 GALCVVNAFGDIDDGRGEVSDDAV AVVVGDVWCGDRIVVGALNPDGTFVNQTRAMLAGQPAPKS \(G V M V V V N A F G D V F D W E S G K Q \square R G L L D S K R Q N L L S T E A E A L L\) A AMVVNSFGAVIDPEGRDYGMPAAAGASKEALAQLDQESS NSFGSPYVPGTPHFWAAPFEQGAEFGGRGVGPHTGGADFP A A IVAVNAGASRHFWSAPFEVADEFGGSGFPQRFEPENTA AALAVVNPIGDVLDEMGGILAGPGTGV GASAFAP GTLLGAHLLRPEDAPGLDVDDAALLALTSPDVAGFGFTEP
DPDGVLYGRHFGSAPAAPPPDVHAALDRLAEASDRNG VVNALGDDFQDGVKDAGMTTDDRKGFVSAEQAVLKNQYSD GALYGAWTEVGGEFGARGLRAPFPDAAVHDRARERLAAAR GAVSAVNACGS \(D R D P D T G A P D A G M D D E E G A A L A T A L D A T P\) GALYAELYGEAGGTPGGGAKPGEAKGGDGEETARRFAASA GQLYAVAHGLPGEFPDLGSPGAGADAAYRARHTELGESGL
\(V V N A C G N V Y D R G R A D G G V M E G R Q H I L D A C H S Q E A A L G\)
\(V\) SALIAVNAGDGPHFWSAPFEHGEEFGGLGFPPDSAQAAKP ALVAVNADGD REPATGKDVAGLRKSADSREDADTEAVIG SAAVVANPVGEVVDAATGRLFGAPERAPVDPEKFADLPSP GVIVQNNCQKDGHVGAEGYREWQGCRGN
GAVMVVNALGDVVLAGLRTPDGGALASTQQYVWEHMEAVS GALTVVNAVGDVLDEQGNDLGAVFLAATGKERRWGAPKI GALVVVNAAGSAVDPATGALYGSYHEPGRPAFPDPRAAAG GALAAVNADGEVVDPATGVTRAGDRSQDGTWGESRRSPAS GALVVVNAVGAAVDPTNGVPYGAYFAAAGRRLAEARKASA AALNAAGLAVTGLPFGAALGLAGEFPARGGDDLDRPLPAF VVAALVVVNPVGDVWCGGRIVVGALRPDGQAMLSGVPSPN AALCVVNAFGDVDHGGDPVPLDAAESQWRPFDLAAE GVALVLNAAGSGVDPASGRLWSDRAGADDSPDTSAARGRA GALAVVNAFGDVIDQQGRIIAGARLAPDRHFMAGGAYQPV GAMVVVNAGDVFDYQTGKKVAGVVTPDRRNFLPTQAQQAL AAGIVVNPQGAVFNPATGRLWGFDLAGTKFPAPGDGQPGS A VVVDPRTGRLYGDWLIASERRPRPFPTGFNVSHGPPPSSA GALAVVNPIGDVLDEQGGVLAGPGVG
 VGTAAV LIDDGGADPATGLPWGATDSDLAYHGLTPPDASK GAlVAVNCFG
GALAVVNPGDVYDP GGRLVAGHGDREAWMRAEP GALAAVNPPGGEAFWAWPFETDGEFGGGRPDPSARAVDPV AALVAANS \(\square G T \prod G T P S G \square W V G \square D L P T V H G D P A A P S P G S R\) GALCAVNAYGDVD AALIVCNSLGEVVAPDGTFHAGDVLASRAAATRVPPQPVG DAVVAVANPWGDVIGADGSPLFVTGGG AA GEPVSDP GALVAVNAPATGEVYGAQEPLGGEFGGDRAPSAEEVAAWG AALVQANYGKKRDLR DGGVPLGRDIEGREAEAADSAGSHE SALIAVNA \(\operatorname{LGGDYENGKVIAGALNDKKTEMKQGESKGG}\)
\(A V V N S F D N G S I L A G A Y H P K G F L N S K I V L E G E E I V S\)
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保 GMGANTVLTAVVTNGGGTKTQMKKVAAMASNGLVRAVSPV GCTTNTTVGAVVTNAALDKTAMNKVAALGSNGUVRAVRPV GPPMNTTLAVVATNAVLTRAQAQKIAGGTAHDGUARAALRPV


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GVAAAEVVTQAULHAV
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RMAA
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FHAT
SLaVIDA
RQA
RSASDE
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GSAAADT \(\square\) ARA \(\square\) ARGVYSARPGTG

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G VR A G H WT
\(R\) VGHAQRLGD
\(\square \mathrm{A}\) G \(\square \mathrm{S}\) VGHWT
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G F
TGSLTDVAGDEVGHATRRGD
MTPTRGRGILDVPGLALGHAGTDTRDR
LT GSAGSIT RVAGI EVGHF T
LRVGHYTNTE
TLTALEGFCVGHWT
\(P G G S V V S V P G V R V G A A Q A V T D\)
\(T \square P A G V R M\)
T LT G \(\square\) P G F R VG H WT

GVRMGHWT
VPGVRDGHATTPDGA
\(\square\) P
TLTAUSGFQVGHWT
\(\square \mathrm{E} G \square \mathrm{~K} \nabla \mathrm{G}\) G Y T

\(P G \vee G V G E V T R T E\)
\(\square E G \square L V G G Y T\)

DFPGVRVGSA IVDGFK【
DFPGVRVGSAHYAEGP
\(R N A \square T D V P G V L V G H V T R \square G G\)
\(G L A L G H A T D A D G A\) VA V G H WT

D F P GVRVGVAEYADGP \(G F R \mid G H\)
\(V E G L V G G Y T\)

VD G F S

D F P GVEVGVATYPEGP
D F P G VRDGTAEYAEGP
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\section*{UniRef90 A0A045KVS9} UniRef90-UPI000478BD8B UniRef90-C7NKJ9 UniRef90_K0EXG1 UniRef90 UPIo0047BE28D UniRef90-R4LX02 UniRef90-UPIOOO34B0853 UniRef90 UPI000288975D UniRef90-UPIO002F96605 UniRef90-UPIoo037B3DB1
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 PRTLVPTVDAVVLTGGSAYGLVAAHGVQRFCAEGPG PCNLVEKVHA IVLAGGSAWGLAATGAVRWLEERGVG \(E L H \backsim L E L D A N V P Y \Vdash F A G G S A F G L A V A G V M Q W F Q E Q G R G\)

\section*{LL APEKRVERVHALLETGGSAFGLAAEGVVRYLEERGDG} PGTHSPGADA VVLTGGSAWGLSAALGVQQGLAADGR PS KMVSQVDAVVLSGGSAFGLAADGVMKLLHERERG PGT LGYGADAVVLTGGSALGLSAARGVQDTLATSGC
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पGydmaeldot VVeaggswygleattavatalkddgr PEKAVERVHAL \(\square L L T G G S A F G L A A A D G L M R G L E Q G R G\) PVFEPGGAADHADADVLTGGSSYGLTAAAHLTQLLIGGG


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\(P M H R S Q S V\)
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 \(P G H R R D Q S V E N A T V L T G R S V F G R A D S G V M L S G Y N M G R G\) GGYLHPELDAIVLAGGSWYGLEAATGVMTALLDDGE LGYNYAE LDY YLAHAVCLTGGSVYGLGAGSGVAAELLTRAG FNHAVCLAGGSVYGLSAVAGVAEALFDTVE
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ASNHARSNNRAVRGПCFAGGSYゆGLEALSGC V!EELKM SNN RALRGLCFAGGSFLGLEAUSGC VIEELKK
\(\qquad\)
VGRyeefnhavcVaggssyglaantgVQQelllitag G Y \(\square\) DA \(\downarrow\) CLS GGSLF GLQT \(\square H G V M A G \Perp S E L R S\)
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\(V R G A A T I P G V P G A V V F D G D K N W G R F S P Y R D V G Y A A A A D A ~\)
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\(G P V E R G V V G A G T G A V V G G R W K G G V G S A S A R S G V V A A L A\) GPVERGVVGAGTGAVVGGRWKGGVGSASARSGGVVVAALA TDP AEGNVGAGTGAAVGKMKGGI GTASVTVE

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\(F T V K D A G G A G F G D A F G F A G G V G S S R T\) KNHVYRGTVGAGVGARAGTLKGGIGTASLVLTVGPAAGVT QNKIYLGQVGAGCMA GDGKYGQGAAFRKIFVFTAVNAL DDAPAVGTVGAGVGARAGARKGGVGTASRSLPSG PGVTV
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 GALCVVNAFGDVDDGAAEDAAL \(G V L A V V N A A N V V D P A T G L P W X X D L V G E F A L R A P P A E Q A F\) AVVNAI GSADGPWFWSAPFEQGDEFGGFGLPAKFGPAAAA GALVVLNAAGSVVLGRGELPEARVHEAARVRMAECAAAYA \(G E L Y A A Q A L S A Y G L T M P G V D A P A E V A R L V A T A A E R G T A Q E\)
\(A L V V V N A A G S A V D P R T G E L\) \(A L V V V N A A G S A V D P R T G E L W A A R H L T A A D R T P P P D P D D R A\)
\(G A L Y G R L Y E G R T D C P D P E V H A A A L R R L A E A A E D S A A R S A A\) GDVVVWVLVAVNAFGDDDDGRLPTTTVSVDALREVVSFGT GSVVDPVTGRLWGTTAEPEPTAEGLRAILARGIGGTKASG GSAVDPETGVLYGEDFGGRPEPEVHEAALRRLAEVAARHA
 VVNAVGLPVPGPAGPVEPGPV
 GALI ACNAGDVVDPDTAQVIAGARTDD A YAVVNSLGDVRDRSGK VVAGARLENGEFADCERYLLAGH GALIAANPPDEKHFWAAPFE \(\square D N E F G G Y G V S Q D \square P P S G A L\) GALAVVNPGDVYDLEGRVRAGPGRFREYRPVD
\(A L V V A N P M G D V L A P S G R P H P A P A D W L E R A D A D D G T A R D A V\) A AVN
\(P\) WGDVDATDGTPDLPSSDADPAGTP AVVTANPMGS IF DARGYGDEVPAVPVAVLNEQVERARADN GAIVAVNFGDIYDYDNGKMIAGEELIK TVNNNLSFTSNN \(G A L A V V N P D G D V L D A A G R V I G G P G V G P G A A A F \quad T P\) GTAGAASVIAVVAVNAWGDVIDP SGRPVFDPEAPVVASP GALVAVNAGDTRHFWAAPFEMDDEFGGXGQPTPWPQDAAA ACVVAVNFGEDDVDGSAA LRDARRHGEPRPGPDFDESEGG GVLVVVNAGAVRDPRNGAWIAGARARSGRDSPPRPGRATE FAVVNAFGNIVEEGK\IAGVRKKEGGFGDFVEEGDFHPPK GALAVVNPVGDVY GCIAVVNPIGDVVG \(S P D G R L L A G H G R R E A F L E A A D G\) \(A V\) RDVGAARVVAVVVVNAWGDVVPGAGPVGEPRA GVISVVNS \(\square\) GNIYDESGRLVAGEESEEFIV
GAVTDRDGNVVACHKGTNWPMGAAPASLQPDWNGDKDTQE SAAMVANPVGEVIDPHTGRDYGAPGRTPVNVDAYRDDPHP AA L A VVVNA AGLPLGVQNPSVAMEHGGLK GAIVDRKGKTAACYQGEGWPEKIDIAELLAKFPDGDDQQQ GSVFLEEAGVGVGVLAVVNPVGDVLDERGQPLGQPPGAPA \(A A W A V A N P M G D V I G Q D G R V L A G L L R G G R H V R V V D A D A D D A\)
\(G V L V V V A V G S V V D G Q G R L I A G P G D\) GVLVVVNAVGSVVDGQGRLIAGPLGDDGRPDDMDYAFRGM GAVVAVNAGDVFDPETGEVIAGKIISTEEADIENIGREKS GSVTDPET GVLYGELFRGYPAPDVHEAAGRRLAGVAARNA GALAVVNAAGEVADRATGLPWMADLAHEFGLSPPPPEDPLD \(G V L S I V N S G V R V E A V V V V N A W G D V L G R D G E P L F G A G E D A A\) \(G L P W M A E L S G E F G L T R P P A D Q L D E L A R L P S P \square D P Q D A P Q\) AVFTVANPYGVVVGWPADITVNDLMHNLPESRKAGWATPS GVLTVVNAIGEII NEKGEIIAGVNMNGKIIPSQE LIKKKK LAAVVPNPVGVILDRAGRVVRGRHPVHDYAEAFAEHRAAE AALVGPSYAPDGLPDAAGLGLPGEFPSA ULDPAVELTPPA
 GVAAVNAFGDVRDADGRIVAGARGENGFADTAAMDAAASP SALIAVNHGPADDPWPSLVPADDGDVGEAPGDPAPFSASP AVI AVNAVGDVYEEELGKIDAGARKPGE
\(G E L K V L A V V V V N A V G V V M D R D G R V L R G N D Q P D D P T G A V T P\) WAFVVTNCLGNVYDPASGVCLAGSRGKEGPPSTFPF GVIVVLNSVGNLYDESGKLIAGNEFT \(T A L A V V N\) A WGDVLGPDGRPVCGGAGTDQPVAS GVFVILNFGDVYNFDGKNDTGSEELSYRMDNGNDWQDFTG \(G V V V A A C Y P D S G W P P L R T E A L M A G Y P A S R Q P G W T G A P N A D\) GAMVAVNFGDVYE
GVISVLNS \(\square G N \square Y D \square D G S L L A G N E A R S \square E N H N\)
GVVTDRDGNVANCFKGQDWPLMRGAPDSLRPDWKATESEP GVIVDRDGTVVRGNYDTATGTRRHLDSDYATALDAAAVPR AAFV \(\square A N P Y G V S D K W P D G E V K T S K L M Q G F P E S R E T G T A A V\) GVILDRSGGVVRGNYDETSGARRHPAEDYEAADADARLTA GVIVDRQGRVVRGLRHHPREVLVPTAPAAAGAPAEPVGTV VVVAVGVVVDRDGRIVRGNVHPDTLERRLPVEDYADSAAG
AVMALAAC
 GVIYDYN GKI LRDRREI IKDDDVLDP GSIVNSK GELIRDRKS:PVNVNVLDP GALAVVNSAGEVVDRATGLPWMTDLVEQFGLRPPPVEQPLD G \(I F S V L N P V G C \square F N K K Q E C V L G H R S Q T \square K E K R Y\) ATE
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 N IVTNTT GAVITNAKFTKSQMGKI ASMAHNGFARAI KPV
 PSATNTTIAVI ATDALLTKAEAKRLADAAHDGFSRALWPS A GLGNTTI GAVVTNARLDKVGCLLVCQGAHDGLSRAIVPP RTDSHTTLAVAVTDGADGRSACQRLAANVSAGLARVIVPF YPEDSTVLIVGFTE GKFSSPELQULAQCMNSSLASCVKPA F GHTTLLAVGVEAPDAKAEARQLADAAQGVLGRVI RPS
 NKVMGTTLGVVITNAKLTNSDACRVAGSAENGFASVI RPY FERKNTTI SVVVTNRAMSPAELQRLAVQVHTSMARGIQPA A A K L N T T GAVLTEAPVTTAAQAQRLAMTAABCDARAVRPA
 T A V V
 VFRNNTTI GV
PPPLNTTLAVVATDADLSKAQAQKLAGTAHDGTARAVRPV EEPLNTVIAVVATDAALSPAACRRVADSAHDGLARSIRPA LG D KNT T GVVATMAPLSKAACRRVAVTAHDGLGRADRPA




 PAGENTTLGLIVTDAALTKTECLLMAQGAHDGYARALTPP
YQSGNTTMSTVVTNAKLSDVDLAQLATQVHSSMHRADQPF LNTTLAVVVFELLLSREELLDSVPVVHSALAGCIRPF ENTLGTTLGVVITNAKLSNSDACRLASIVENGFSSVIRPY


VMGTTVGVVLTNAKDSNSEACKLASVVENGFSSVIKPY VEKKNTTVSVVVTNVSLSHAELKRLAAQVHTSMGRAI QPF AEHGNTTLTVVVTNAALDDRELDHFARQVHGSMHRAIVPF ESAKNTTVSLIVVNQKMDPADLKRLAVQVHTSMGRGIQPF
 AEPGNTTLTVLVTNVRMPEFALRQLGTQVHSSMHRAUQPF QGAGGSVLLLTVTDAPLSVTALTRLARASVAGLFRTG GTALDNTIGVVATDADLTAAACRRVAVAGHDGLARAVRPA NSPKNTTLTVVITNLALNAVELEQLSIQCHTNMAVTIRPF KSDKNTTLTAVITDLSSLNVIELEQLABQCHTNMASIIRPF
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HTADGDAAFVLSAGTQPPADPMLLGALVQDAVAAA \(\square\) TDAV HSYDGDAVVALATGE
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\(H \square S D G D T V F A D A T G E R P L D A G E P \square \quad A L N E V\) HTPDGDAVFVLATGAV
HPDDGDTI FALSTGTADVSDTLRAAPS DPAFAAEP DLAAV HSYDGDAVVALATGESEAEADLDLLRAVAVDVMADAIR NS LD G DTVVFI AT
H TLD GD TVVFALATGAVQVPPDPADPAALSPE TGLLTAVV STMDGDALYAVSTGEI EADKG AADSTEIGADASDLMWDAL
 \(H T M D G D T\)
\(H G M D G A V T\)
\(H\) ATGDGDVLYAVSTDEVIGEQDSD DAPSAFGGMNVGALGA \(\downarrow\) HRVDGDAVVAAATGTVPAASAEDP \(G T F D G D T V F A V S \quad P L G T P \square D D P A L A \square R A E S \square A V R A L\) H
HTDDGDTDFLATTDEVPSFDARQTDSPSVASVGADASEAM \(G T Y D G D T L F L V A F G K V V P R N Y L L L V E G I Y H A I T E A T T N S V\) NS LD GDTVFAI ATNRV
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NS LDD GDTVFTTATNEVEA
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GA \(\square A S E V M W D A L L E A\)
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EAA \(\square\) ERA VREAD

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