

## QUERY

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 A A L D GARSILLVVRFGE DA DLI GAMLREEAWTRGRLVSKVRE A A L D G A R DI L SE QF GE TAEEVLGKLVREHLFGQGLVMS SVVD A A L E G A R A I L V E R F A E D A D L I G T L R E R M W S R GVV V A ALDGARAILVERFTEDADLVGDLRERMWERGRAVSRVKE A A L E GA R A I L V E R R F A E D A E L I G A L R E S F W S R G R LVV T L R R
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| $M$ |  |  |  | AALDGARAI

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 AVLD GARYI SAL EGARY | $A V L$ | $D$ | $V$ | $R$ |
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A ALD GARQILVRFAEDADRGRGR
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A ALDGARY
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UniRef90＿Q1MZ00
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UniRef90＿R1H051 UniRef90＿UPI0003F97840 UniRef90＿UPI00037CED3A UniRef90＿Q0A8L6 UniRef90＿LOGV82 UniRef90＿R9SUA8 UniRef90－E9CMY2 UniRef90＿U1LBS7 UniRef90＿J5PUC8 UniRef90＿W7QFH8 UniRef90＿UPI0003804980 UniRef90＿UPIO000E10DDE UniRef90＿UPI0003B3D6E9 UniRef90＿A3WJ57

## UniRef90＿UPI00040F7607

 UniRef90＿E3ITU8 UniRef90－UPI0004157300 UniRef90＿UPI000361B61E UniRef90＿R7C444 UniRef90＿A0A015M631 UniRef90＿L0G5R9250
260
270
270
AS LKVGAPGTLHPCEVMDAERFGLSNQGRAADKWLAEVVR VALGVP DEPEPHPCENIVAAHFSIRRDQGPADQWLKEVVR
 L T L L S V D P E D G R S H F E D K V A R R R F G I V D Q G R P A D A WL T E C CA R


 $V$ K L G L G E E Q Q P H P C E A M I A

## 「「


 $V$ SMDADPQKDESYGEHII A QHLGGFNFSNRAADA WLASSVVQ
 LAIVK F S E E EA T HPCE GMVAEFWKVVMDEGRPA DTWL K E VI R

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


L

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## 

 L E L L A GE D D P D A D C R H Q A S R F Gli A D R GR P A D A WL M E TVV

 LII



 $V$ SGDPN D K L S A S P C E A MV A GF Y K I E N Q GRAA D R WL A EVVV

 L A L A WQ P E DVVPS E Y E A I I A T Q V G V

 $V$ S L K P K WD S P H N P C EMMRI A T HFFK I K N D GRPA D Q WLA D T V R $V$ E A D A D D P A L I A P A V R K V A D A Y G I A E R G R P A D K WL M E VAR





 $V$ T L L V E E E K $\square \mathrm{N}$ S Y L E R QL DG N $V$ S
 L

## －

L MEPESEEAPDRYETAI A
L E L I A G G G E G E S P A
LNLDAGDDTD YEG
L NADPQFEETPSQAEG
L S I E P S A E D P A QFCA Q
LALNADPNKDDNQVESMI
$\begin{array}{llllllll}L & D & L & D & P & G & D & D \\ L & A & D & Y \\ N & I & T & L & D & P & Q & A \\ D & R & E & C & C\end{array}$
 L S L DPA ETAKKDA EVEQMIADFVGFS DQRRPA DA WRGQVVQQ
 V S L D A D P D N R H SHCED II A QHIGGLVDS GKPAHSWLK QVVQ

 LA I K VG DEEARHPCETMVAEHWQVQDKGRAA DGWLAEVVR

## QUERY

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UniRef90-C9Y291 UniRef90-F4AND7 UniRef90-K2LY70 UniRef90_UPI000348C212 UniRef90 - 12 JEZ2 UniRef90-D6YB33 UniRef90-H5WXG1 UniRef90-G8QN57 UniRet90-Q21CQ2 UniRef90-G8PNN5 UniRef90_UPIooo3943C85 UniRef90_U1IUW1 UniRef90-X2H5Q8 UniRef90-HBLON4 UniRef90-K2KJNO UniRef90_SgSCF5 UniRef90-Q65QE6 UniRef90-H8YX39 UniRef90-UPIOOO37FB3A6 UniRef90-UPIO00465F9A4 UniRef90-W9A414 UniRef90-UPIOOO422CBC2 UniRef90_UPIOOO47E2755
UniRef90-UPIOOO35EB1B1 UniRef90_UPI000363FA2D UniRef90-G2J2Q0
UniRef90-UPIooo36858FD UniRef90-E7RXT9 UniRef90-M1F9M1 UniRef90-16T8E5
UniRef90-Q1MZOO
UniRef90-l3CCM9 UniRef90_V5SGX9
UniRef90_UPIO00366DC9D UniRef90-C1DA96

290
300
310
WT WK VK LYY THLLET DLF GELRD GAEDEA TSVFARNLHDLLL WT WRVKLLTQNETDLIFGKLREAAEEEAI QVFARNLIKDLLL


WT W WA WR L K I $\begin{array}{lll}\text { G } P \text { H } \\ \text { W } \\ \text { W } \\ \text { W }\end{array}$ WA WR TK G GPHVETDLLMGDL R R R A E
 WA WRTRVFFRRLD D L RMRLWQAA W A WR T K L R L S I E L D L R A R L W W A A A E T E A V R V WT WR DK V L M H L E T E L M S T L R E R A E D E A I N V FA R N L M D L L M WT WKI KLSLQMETELIGRLRDAAETEAIRVFASNLKDLLM WT WKI KI A L HMETELFGVIKERAEQEAIVVFAKNLNDLLM
 WA WR TAR
 WA WRTRI LVRLG IVDLRGRLWQAAEDEAV RI FAANLRDLLL WA WR T K I L L
 W T W K

 L T WRAK L H L H L L T L D L WT WRII L LMYMETELMGRVRDAAE
 WT WK I K V S L L L E T D L M G S LR E K A E WA WRTR MVHID DLRGRLRQQA E WS WR V K V Q P Y L E N E L L G R L R D TA E WA WRI K L M H METEL MG IL REK A E WA WR T K WT WRVK L SL S L E R DLGA RL R E DA E WT WR K V K $K$
 WT WR V K L LT H L E T E L V G R I R E S A E E E A 5r WTWRTKVLVHLGGDLRTRLRQTA
 WTWRVKLSLSSERDLIGARLREMAEEQA WT WKI KAALHLETELMSALREKAEDEA I WT WRI KCSLHLETELMTALRERSEAEA

 WT WRVVKI L L H L E TEEL M G TLLREKAE
 WT WR L K I L L H ME T E L L WT WRI K I L M HMETELLMGGLKERA QTEA D G Y R RLL AP TVERDI R N QL T D K GEE Q A WA WRT R M M R L D L D L R M RLAREAAA E EE A
 D S Y K RF I GPA I EREIIRNELT EKA DE QA WA WK I KLATHLENEMLGATREFAEQGA WT WK I K L N THLLETELLGRRVRELAEEEA I FA WRI K LMHMETELMMGNLREMAETDA WT WRVKLKLSLETELLNALRERAE WA WRTR I LI HL GAD L RLLRLWQTAEAEA M S WR V K L L L L $L$
 GTWRIKVLLHLESELMSTLRERAEDEA

 WT WKVKVLTHMETELFADVRERAESGAISVVASNLKDLLM WG WR TK L L V S S G LDDTRMRLLK E KA E E GA


 WT WRIKI LLHMETELGGALRERAEHDA

 D C Y K R L MK P S ME T E V R L Y TK K K A D E D A

KVFANNLRDLLL
HVF S R NL N DLL M

RVFARNLHDLLL
K I F A G N L R D L L L
R V F A R $\quad$ N L K
RVFAANLRDLLL
RVFASNLRDLLL

R V F A S NLK L M

| $R$ | $I$ | $F$ | $A$ | $A$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $V$ | $F$ | $A$ | $A$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |

R V F GRNLKDLLL

KV F G D N L K DLL M

| $R$ | $V$ | $F$ | $A$ | $R$ | $N$ | $L$ | $R$ | $A$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $V$ | $F$ | $A$ | $N$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ |
| $L$ | $L$ |  |  |  |  |  |  |  |  |  |

DV F A R N L T A L L M

R V F A M N L K D L L L R I F F A G N L R | $T$ | $V$ | $F$ | $A$ | $R$ | $N$ | $L$ | $K$ | $D$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $L$ | $L$ |  |  |  |  |  |  |  |
| $Q$ | $F$ | $A$ | $D$ | $N$ | $L$ | $H$ | $D$ | $L$ | $L$ |
|  | $M$ |  |  |  |  |  |  |  |  | QV F A K NLK L L L L $\begin{array}{lllllllllllllll}R & V & F & A & A & N & L & D & L & L & L \\ K & V & F & G & D & N & L & R & D & L & L & L\end{array}$



 \begin{tabular}{ll|llll|lllll}
$N$ \& $V$ \& $F$ \& $S$ \& $K$ \& $N$ \& $L$ \& $K$ \& $D$ \& $L$ \& $L$ <br>
$R$ \& $V$ \& $F$ \& $M$ <br>
\hline

 R V 

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

| $G$ | $V$ | $F$ | $S$ | $S$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $L$ |  |  |  |  |  |  |  |  |  |
| $R$ | $F$ | $A$ | $A$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |

RV FARNLHDLLL
K V F A R N L G D L L M
EV F A L N MK DL L M

HV F A R N L K D L L L
D $V$ V $F$ F A
R V F A S NL K DLLL
K V F S R N L K D L L L

| $H$ | $V$ | $F$ | $A$ | $R$ | $N$ | $L$ | $H$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $V$ | $M$ |  |  |  |  |  |  |  |  |


| $R$ | $V$ | $F$ | $G$ | $A$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $L$ | $L$ |  |  |  |  |  |  |  |  |
| $A$ |  | G | $E$ | $N$ | $L$ | $R$ | $N$ | $L$ | $L$ | $L$ |



T V F F S K K N L R Q L L L

| $R$ | $V$ | $F$ | $A$ | $T$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $E$ | $V$ | $F$ | $A$ | $T$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ | $M$ |


| E | V | F | $A$ | $T$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| T | V | F | $A$ | M | N | L | N | D | L | L |
| N | L |  |  |  |  |  |  |  |  |  |

NI F GENL R NLLL
DVFAKNLKDLLM
QVFARNLN SLL L
K $V$ V
DV F S R N L N DLL M

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


| $R$ | $V$ | $F$ | $G R$ | $N$ |
| :--- | :--- | :--- | :--- | :--- |
| $R$ | $V$ | $F$ | $G$ | $R$ |

DV F A T N L R D V L L
NV F ARNMQDLL M

| $R$ | $V$ | $F$ | $S$ | $A$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $V$ | $F$ | $A$ | $S$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ |
|  | $M$ |  |  |  |  |  |  |  |  |  |


|  | $D$ | $V$ | $A$ | $T$ | $N$ | $L$ | $R$ | $D$ | $V$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $L$ | $L$ |  |  |  |  |  |  |  |  |
| $N$ | $F$ | $A$ | $K$ | $N$ | $L$ | $Q$ | $D$ | $L$ | $L$ | $M$ |

R V F A A N L R D L L L

| $Q$ | $V$ | $F$ | $A$ | $N$ | $N$ | $L$ | $A$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $M$ |  |  |  |  |  |  |  |  |  |
| $R$ | $F$ | $A$ | $D$ | $N$ | $L$ | $R$ | $Q$ | $L$ | $L$ | $L$ |
| $R$ | $V$ |  |  |  |  |  |  |  |  |  |

R V F A T N L

| $E$ | $V$ | $F$ | $A$ | $K$ | $N$ | $L$ | $N$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $M$ |  |  |  |  |  |  |  |  |  |
| $K$ | $F$ | $A$ | $D$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |

SVFGTNLKDLLL
A I F S A NLR NLLL
K $V$ F




Uniplo

## UniRef90 M8DD66

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UniRef90 G2HOW3 UniRef90-UP1000472C1D3 UniRef90 A4CEU5 UniRef90-UPIOO004761A68 UniRef90-H6M4C0 UniRef90 NoAKR2
UniRef90_W9BCV1 UniRef90-R5Q415 UniRef90-UPIO003462D19 UniRef90-X2H960 UniRef90-I31MN4 UniRef90-K0J632 UniRef90-D5UYE2
UniRef90 D1BET4 UniRef90-H1XTJ9 UniRef90-S2XCT2
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QA|L|QGAMD

AVLDGVRD
A ALD GARAI DALQGAKD A A L EGAR R A
AALDGARAI
A A L Q G A R A
DALQGARD AVLEGAKY TAL DGARA


EALAGARD
SALDGARDi
DALNGARD

| A A | E G A R R |  |
| :--- | :--- | :--- |
| A | D | GARA | E $\mathrm{E} L \mathrm{E}$ E GARF A ALAGARD AA L DGARY AALEGARAI

AALEGARAI
EALAGARDI AALEGAGHI
EAALQGARDI
AALD GAKDI
tatigatrol
AALA GARDI
SVLDGARF
EA A A AKD
D ALCAGARD
KALDGARAI
 AALEGARD
EAA AGACD
A ALD DARY!
AVLDGARY

KVLIEGARA
D A L A GTKD
SALLTGVND
A ALDGARQ
TALNGARD
A ALDGARA
DVLNGANDI
A ALEGARHI

EALQGARD
A ALEGARHI
EALQGAMDI
A A L E GART
EA I Q GAK D

| $A$ | $V$ | $D$ | $G$ | $V$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $D$ | $D$ | $D$ | $G$ | $A$ |

EA L $L$ Q GA R $A$
$\begin{array}{lllll}\text { E } & A & L & G & A \\ A & A & D & L \\ E & G & A & R & H\end{array}$


E A $\mathrm{L} \mid \mathrm{A} G$

180
190
200 A A QGAKDII AEMMADEPKI RA WVRKYVWDRGAVITKAKD



A ALQGAMDLLERFAEDADLIGRLREDVWRGGEAVSKLRK
KVLGGAMA LIAEELSEDADVRKVVREYTWKHGMLVSKAK
EQLDGARADVVERFAFDADLVGELREEMLSRGHMTASVAE
 EALQGARDI I A ERVNEDLKAREVTRULFERQAVI SSKGVK
 DALAGAKDIIAEHIS DDAGLRKWI RNETFRNGRLESSVKY EVLEGAKYVLMERFAEEPNLVGELRDFMGQRGELKSVVVT EALQGAMDI I AEGDADDADI RKWVRRFTWDHGVLHSKAKD LMERFAEDAALLLAKVRDYLDWKNAHLVATVVS
 DAVQGALDI I AE RWGGDDASVVGEWVRTWLSEVGVVRARVAE LAERISDDAAVRQWIRDETFRSGQVTSEVKK
 $L$ SEER WA E D A A L V K G L R R $L$ IG R F A E NA E L L GEFR QHL WQ HAVLVARCVE


 A E WIN ENASLLREKMRN LF LIK E GVR R S R V IP
 ME R MA E D A NLL L D KVVRTY L QKNA EL Q S RVVAT

 $A E F V$ S E H Q EAR E K MR H LYYAT K GMFRRTK V I T


 LVERFSE HADL TG S L R EAMWSRGALKASVRE
 IE R WG E D A A L L G Q L R S W L E S E GV L R A R V I D








 I A E L V N E N A E A R T A M R N Y F Q Q K A V F K S A V I K
 I A E R $\quad$ V $A$ I A E G L S E D A N L LG R L R N H M K S VG R L A A T V VA



 I A E WVI D D A E S R K WVI R Q E T F K T G VV E S S V K E



 I A E WU S D D A T Y R D Y I R N Q T F N Q G QIIN A T V K D





 $L$ S E R WA E A P A V V A P MR E WL W Q T G H L I S Q L R A




## UniRef90 M8DD66

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UniRef90_UPIO003B61947
UniRef90 E6VMC0
UniRef90-L6QDIO
UniRet90-R5VKU6
UniRef90-D3Q774 UniRef90-D2UAU1 UniRef90-K4Z9U3 UniRef90-H1XZW6 UniRef90_UPIO0046D7684 UniRef90-UPIOOO4749424 UniRet90-GOA2C2 UniRet90-R5WTJ9 UniRef90-UPIO0036A01AD UniRef90-S6BEH5 UniRef90_U5S702 UniRef90-Q82SV2 UniRet90_L7U599 UniRef90 B8CUZ4 UniRef90 ${ }^{-}$W4RXA5
UniRef90 G8LTW0 UniRef90-C6X×62 UniRef90-C6RAM7 UniRef90-B21GR3 UniRef90_UPI0003B576BE UniRef90-F8WYL8 UniRef90-G2HOW3 UniRef90-UPIOOO472C1D3 UniRef90 A4CEU5 UniRef90-UPIOOO4761A68 UniRef90-H6M4C0 UniRef90 NoAKR2 UniRef90-W9BCV1
UniRef90
R5Q4415 UniRef90-UPIO003462D19 UniRef90_Q1GITO UniRef90-X2H960 UniRef90-I31MN4 UniRef90-D5UYE2 UniRef90-D1BET4 UniRef90-H1XTJ9 UniRef90_S2XCT2
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 WT WK 1 KL DAYKRLIQMKL WTWRVK WA WRTRIKTAMETEVRMLRKK WA WRTR KTALALDMRMRLIWQQAEVEA
 WA WRT R V S VGL A VD TR VR L W Q

 LA WRA KL S DH LDDVA L K RRLRRE LAA E
 F A WRVKLLUTRLDLELKNRLRE

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

 D S Y K RL L G P S ME TEIIRNLLSKEKADEEA
 DGYKRLMEPAI EREI RNELTEKAEERA

 \begin{tabular}{lll|l|l}
WT \& WR \& L \& $K$ \& $I$ <br>
$A$ \& $W$ \& $R$ \& $V$ \& $K$ <br>
$W$ \& $I$ <br>
$W$ \& $W$ \& $V$ \& $K$ \& $L$

 

$W T$ \& $W K$ \& $V$ <br>
$W$ \& $L$ <br>
$W$ \& $W$ \& $V$ <br>
$K$ \& $L$
\end{tabular} WG WK TKL D GYKRLI VPS S GLDVRMRLK


 WT WRVK L S L S MMLE L MG DL R S R A Q DE A LS WRAKI
DSYKRRL WA WRTKL MVSAT VDARTRLLR
LA WR GRVGTRVDIDLR LRRLRERAEKDA D S F T R L I F P S I QREVVRSALLTEKADE HA



 WT WK V $\quad$ K L D G Y K R LI | $L$ | $T$ | $W$ | $V$ |
| :---: | :---: | :---: | :---: |
| W A | WR | I | $K$ |
| $K$ | $L$ |  |  | F GWRTK L K T T L T L DLDA DL RERAEAEA D G WR T K L L I $\operatorname{S}$ S S G L L

| $K$ | $V$ | $A$ | $E$ | $N$ | $V$ | $R$ | $Q$ | $L$ | $L$ | $L$ |
| :---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $H$ | $F$ | $S$ | $E$ | $N$ | $L$ | $R$ | $N$ | $L$ | $L$ | $L$ |

NLL
DV F A A NL K DLL L
RVFARNLKDLLM

| $E$ | $V$ | $F$ | $A$ | $T$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ | $M$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $V$ | $F$ | $A$ | $D$ | $N$ | $L$ | $R$ | $E$ | $L$ | $L$ | $L$ |

K V F A T N L K DLLL
Q I F A G NLRNLLL
R V F A D NL R QLL L



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

EVFAKNLRDVLL



H I F S E N L R N L L L
QVFGKNLKDLLL

| $G$ | $I$ | $F$ | $S$ | $E$ | $N$ | $L$ | $R$ | $N$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $L$ |  |  |  |  |  |  |  |  |  |
| $D$ | $F$ | $A$ | $R$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ | $M$ |

RVFAENARQLLL
RVFAANLRDLLL
NVFAR NLHELLM
R V F F G K N L
$\begin{array}{lllllllll}S & F & A & A & N & R & D & L & L \\ A & V & F & G & D & N & L & D & L \\ M & M\end{array}$

| $Q$ | $V$ | $F$ | $A$ | $Q$ | $N$ | $L$ | $R$ | $S$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

R V F A E N I R QLLL
RVF GANLEDVLL
R V F A E N A R Q L L L

| $R$ | $V$ | $F$ | $G$ | $K$ | $N$ | $R$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | E | $L$ | $L$ | $L$ |  |  |  |
| $M$ |  |  |  |  |  |  |  |

$R$ V F A G N L R D L L L
R V F F A S N L K

R I F S R NL R ELL L


K V F A T NLLK KLLL
R V F A E N AR QLLL
K I Fr A T $\quad \mathrm{N}$ L R R D V L L

RVFARNLKDLLL

| $H$ | $V$ | $F$ | $T$ | $E$ | $N$ | $L$ | $R$ | $Q$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $L$ | $L$ |  |  |  |  |  |  |  |
|  | $V$ | $F$ | $A$ | $R$ | $N$ | $V$ | $Q$ | $D$ | $L$ |
| $L$ | $M$ |  |  |  |  |  |  |  |  |

KVFARNLADLLM
DV F A K NL K DLL M
K V F
D $V$ V

GV F GENLRDLLL
E

|  | $V$ | $F$ | $A$ | $R$ | $N$ | $L$ | $K$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $L$ | $L$ | $F$ |  |  |  |  |  |
| $V$ | $F$ | $A$ | $Q$ | $N$ |  |  |  |  |
| $L$ | $K$ | $D$ | $L$ | $L$ | $L$ |  |  |  |

K V F F A E N V
D I F S M N L R HLLL
NV F A T N L K D L L L
G V F
AV F A E NL R NLLL
H I F S E NLRNLLL

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

$G V \operatorname{F} A \quad G \quad N L R B L L L$

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

DVFGANLRDLLL

| $H$ | $I$ | $F$ | $S$ | $E$ | $N$ | $R$ | $N$ | $L$ | $L$ | $L$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $V$ | $F$ | $S$ | $R$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |


| $K$ | $V$ | $F$ | $S$ | $R$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $V$ | $F$ | $A$ | $R$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ | $L$ |


| $R$ | $V$ | $F$ | $A$ | $R$ | $N$ | $L$ | $K$ | $D$ | $L$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $V$ | $F$ | $A$ | $R$ | $N$ | $L$ | $R$ | $D$ | $L$ | $L$ | $L$ |






## UniRef90＿H5TAQ5

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A A L | ${ }^{\text {G }}$ AK F
$A V L T G A R A$



| $A$ | $A$ | $L$ |
| :---: | :---: | :---: |
| T A G A R A |  |  |
| A | A G A Q D |  |


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




A  A $\quad$ G A M $\quad D$


 M E Q F A E D D A E L L L G E L A E R MA DEAA RT WVVRQYTMD H GMMVSEAK T

 I A E WV N E D A D T R K A MR E L F L K E G I L T S E V I I K D AL Q GAR D, I SEVVVSD DPDVRRKRAREDTSAE GWFVVQVKD


## E

## S <br> 

| $A$ | $A$ | $E$ | $G$ | $A$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $H$ | $L$ |  |  |  |
| $D$ | $A$ | $Q$ | $G$ | $A$ | $Q$ | | $D$ | $A$ |  |  |
| :---: | :---: | :---: | :---: |
| $D$ | $A$ | $L$ | $Y$ |
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E

E AL N GA AK EALQGAR D D AL L G A S D \begin{tabular}{l|ll}
$D A$ <br>
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 A A L $\begin{array}{lllll}A & G & A & R & D \\ \text { A } & \text { G A } & R & D & I \\ l\end{array}$ A A L E G G A R $\quad D$ 

D A I \& $N G A A K$ \& $D$ <br>
$D$ \& $V$ \& $L$ \& $G$ <br>
$D$ \& $N$ \& $D$
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| $V A$ | $L$ | $A$ | $G$ | $A$ |
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UniRef90_H5TAQ5 UniRef90_GOHETO
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UniRef90-D5D9Z2

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AEQE
AEQESYEMYYAYDEPVKRMPPHRILADNRGEREGFLK
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PETE KVQDEKAVFEMYYSYE GQEQAGAKFRDYFEHEEPLAKIVPHRTLALNRGEHENLLR DQAEEAQTFLMYADYREPVRTLPSHRVLAMFRGRNEGVLS GKEEEGEKYRDYFDFSAPLSRCPSHRALAIRRGEVEGFLR GKEETGAKFSDYFDHAENWAT TPSHRALA TDRAAKEETVT QE AEKDEKGMYE AEKDEKGVFEMYYDYQEPVRT:ASHRVLALCRGEKEEVIK GKESAGAKFADYFEFGEAFTSLPSHRLLALDRGEKEEVLS EKETRSVYEMYYEYSEAVRTVAPHRTLAVNRGEKEGILK GKEQQAEKFKDYFDYREALNKIPSHRALALLRGRNENLLA GKAEAGAKFSDYFDHFERWATVPGHRALAMLRGWNEEFLS PEEE SVYEMYYDYREPAKKMPPHRILADNRGERENDLK GESMEPTPYEMYYDYKENVKNPPRRILAI NRGEKEKILT GAAEKGAKFSDYFDFAETFTTLPSHRVLALDRGEKEEVLS GKKDEDSVYRMYYDFKEPVSKIARHRVLALNRGEKEDFLS GKEEAGAKFSDYFDHEEKWASAPSHRVLALLRAQKEGVIS GSSEERTPYEMYYEYSEQVFKIPPHRILAANRGEKEKILS s QEKDEKSUYEMYYDYSEAVRSIVSHRILALNRGEKEDILK GKQEAGAKFSDYFDHVERWAGVPSHRALAMLRGRNEETLS GKEAGA
A GE E
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EKASEAlK KDEKS PEAE
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GKEEEGAKFKDYFEWE
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ENAE AVYRQYFEFSQPIVRLQSHQVLALNRGER
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| UniRef90 H57 | VTLDANPENKGEACER ILHTLNDDHTQSARDEWLIKLAVV |
| UniRer90－GOHEIO | T S G Didec |
| UniRef90－R9GXU5 | NVLPPEEDALASLERLFL KNRSMAAD |
| UniRef90－C4G | A |
| UniRef90－W3AT43 | VKIEAPEED LRFMNRH1 GAGRNKETAKYL |
| UniRef90－D5D9Z2 | VSIDAPTDRILSYDHKQV！KKRDSSAES |
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| UniRef90－UPI00046CDF38 | NLMPDDDETASSFRSD\ARAFEDQDAGRPA |
| UniRef90－R7DGM0 | V S |
| UniRef90－Q0EXI2 | I RVEVPDASGMGHCEAMLARHFSMGRGRPADK |
| C7RM66 | LSSDVPNPCEARLARRYGVDRGRPADRWLADTVR |
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| 2 G | VSISPDEDAAVERLERQFLRGLPGSK |
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|  |  |
| UniRef90 W2ECR UniRef90 |  |
| UniRef90－R7 | VKIEAPTEE |
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| UniRef90－D3FR | AGIEFQAEKMIGEIEKRYMS |
|  | K EAPERUGY RKOLMVR ENPOTSEFLEKVIE |
| UniRef90－B7GFP8 |  |
| UniRef90－G4L8G3 | $V$ SLKSDETKILNYLNRQLI KDSSSPAASL |
| UniRet90－R7ANN4 | ， |
| UniRef90 W0 | WQ DAPVDD |
| UniRef90－M0C | MIAATLGVDASHPPGTQWLVGTVR |
| UniRef90－H3SI |  |
|  | SKKGKCRPYLEEAIA |
| UniRefo－X6 059 | － |
|  | KПSEYLRKQ |
| UniRef90－F4A6M0 | N S 1 |
| R6AN92 | N |
|  | VS QAPQAK EDAMRRTFI TNPNSPCATQVDEA A |
| UniRet90 UPIO002885218 |  |
| iRef90－D2RM | 研 |
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| E5Y464 |  |
| 隹 | der |
| UniReefo－Q8ESK |  |
| UniRef90－A0A024P， | VSVQPPEEAILQYLDRNAIQKTT $\mathrm{C}_{\text {GK }}$ |
|  |  |
|  |  |
| A0AO17HH48 | FEEGPDKELGAPRCEAMVAARLHPSGDG PGDRWLRDVAS |
| UniRet90＿UPIOOO37664F2 |  |
| UniRef90－K206E4 | LSI EVDRDDTVKTSQRMIAAAYQVAGKG PADQ |
|  |  |
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| UniRet90－UP100047BFE61 |  |
| UniRei90－UPlooo372519A | L Di EVDADDPVKPVEAMTAREFRVKTQGTPAER |
| UniRee90 ${ }^{\circ}$ UPI00041FC0C0 | VSLKPPTER HEFLRQHVI KSSASKQVVD |
|  | VKVT |
| UniRet90－C0E9B9 |  |
| $265 A 71$ |  |
|  | G PGDMW |
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| UniRef90－W8YL61 |  |
| UniRef90＿V5XE93 |  |
| $\begin{aligned} & \text { UniR } \\ & \text { UniR } \end{aligned}$ | S |
| $\begin{aligned} & \text { UniR } \\ & \text { Unip } \end{aligned}$ | DRILSYLDRKL |
| UniRei90－UPI00046F9F7F | $V S L Q L D T E R I L Q Y L N N N V I ~ K N E H S T T V S ~$ |
| Ref90－L5T | 1 ALKYQPDDTPSEYEQIIARRFKVSDGHK WLRDTVR |
|  |  |
| 矿－S9ZUE7 | T |
| UniRef90＿UP10004078 | L L E |
| UniRef90 UPI0003FB3E56 | LTFDGGDDEPYQAMAAQCLG $\quad$ DDRARPGAATAWLADTVR |
|  |  |
| UniRef90－X7FDL2 | EGMVRAALGATGDA |
| UniRef90 V4YKV6 | VKLVVPEDPAHSLAEGMIAQALGWRHSGRASDDLLRKCVS |
| ee90 R5IKU9 | EQl ${ }^{\text {GYL }}$ K KV |
| UniRef90 F4LS96 | K LVPDDE：SUK K K M KRE KESSP |
| niRe 9 －UPI00047547A6 | A M |
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| e99 |  |
| Ref90 W0U2B3 |  |
| UniRef90＇R6QRM8 |  |
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| UniRef90-R9GXU5 | S A |
| UniRef90-C4GES0 | A A |
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| UniRef90-T0UB36 | Q |
| UniRef90-UPI00046CDF38 | A A |
| UniRef90-R7DGM0 |  |
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| UniRef90-C7RM66 | A A |
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| UniRef90-D4L3A1 |  |
| UniRef90-Q67K87 | Q |
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| UniRef90-R7BHY9 |  |
| UniRef90-Q1Q3A5 | A S |
| UniRef90-W2ECR9 | Q |
| UniRef90-UPI0004198836 | Q |
| UniRef90-R7JUB7 | Q |
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| UniRef90-R6AN92 | A A |
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| UniRef90-D2RMX1 | Q A |
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| UniRef90-E5Y464 |  |
| UniRef90-A3K7J7 | A A |
| UniRef90-R6GHX1 | Q |
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| UniRef90_C8VX48 | Q |
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| UniRef90_A6GN97 |  |
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| UniRef90-R5UIW5 | Q |
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| UniRef90-B8FHU3 | A S |
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| UniRef90-X7FDL2 | A A |
| UniRef90-V4YKV6 | A A |
| UniRef90-R5IKU9 | Q |
| UniRef90-F4LS96 |  |
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| UniRef90-R6QRM8 | Q |
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 GKEEE GAKYLDYF EF S E TLLNRISSHRLLAALRRGETE GIL R


 E ELDEKKVVEMYY DYEEPVVKSIVDHRVLALNRAEKEDVVR GKHTA GAKFADYFDFAEPFTSLPSHRVLAVLRGEREDVLS D A VD E Q E K F K M Y Y E Y S E P VK T I P S HRMMLA I RR G E S E N V L Y

 GKQAA GAKFSDYFDHSERWAT TPGHRALAMLRGWNEEVLS GKQSDGAKFKDYFDFAEPLDTLPSHRILALFRAENEGVLTV GKEEEAAKYQDYFDFSESMKRCTSHRLLAARRAESE GLLLK GA N D P E G K F Q M Y A D Y R E P A A K I DKE P E D TVVY R L Y Y D F K C P V V R R l Q G Y Q V L A A M R G E R E DV L GKE E E GA K F R DYF D W S E P I A NAP S H R I L A A R R R G E S E M V L

 EAD E R S V V E MYY DY R E P V R K M P S H R V L A V NR G E R E GV L K DAK K K M Y E Y R E PVKTIPSHRMLAVRRGEGENVLY PKAE

SVVYEMYYE F D E A L S K K V A G H R TVLA A I N R GE K E K I L T GKEEAALKYKDYYE WSESLLKNAP
 K K E E E A Q K Y S D Y F C F S E E L R K C S S H R L L A MRR G E A E GF L R
 DAEDEKAVYEMYYDYQEMI AKMQNHRVLAFNRGEKE GI L R GK E E E A A K Y R D Y F D C H E P P L


 K GKDEQ GVVYQQYYDF TS TLK QLVSYRVLAI NRGEKEKVL R SAKDEKSNYEMYYDFREKVNRI PSHRILLADNRGEKEEELGK GKEEAGAKYADYFDYSEAINTIPSHRALAMFRGRREEVLH GK Q E A G A K F S D Y F D H S E R WA S V P S H R A L A M L R G R N E D V L S

N S E N D E K K V Y E M Y Y E Y E E P V F R R I V P H R V L A L N R G E K E G V L R LALNRGESKNCLK $\begin{array}{ll}K & D \\ E & E\end{array}$ K A LDDEK GVYE DYYDF DE PI K K L VS HR IL A I NRGEKE GVL K GSSEEPTPY EMYY DYKEAV DKI PP HR I LAI NRGEKEKVL S


EKTE
SVYY E MYY H HE





 A K K Q A A I K Y S D Y F E F R E P I K T IP S HRAL A L L R GKK E EL L N


 PETE SVVEMYYEF NK S D D A Q KF S D Y F D F Q E E P L K R C S S H R L L A M R R G E N E G L E K Q Q K S V Y E M Y Y D Y K E S S L EKKSDESKFKDYFEFS AKKEEAAKYADYFDD K DK DLLK S V Y EMYY E Y N E Q L $L$ R R CP APAAEAAKFSDYEDFVQPVATQP GESKEPTPYEMYYDYKEEVVKKIP DKKDSDTKFTDYHDYAEAI SKI P SHRRALA I NRGE GAEDSGAKYKDYFDFSEPLRRLPSHRILALLRGEK GK DQE GAKFS DYF D HRERWWSDII P

KPEEVKSVYYRMYYY F R EPVVSKIA NHRRLAVNRGEKEEFL Q




| UniRef90_R5P9D8 | Q |
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| UniRef90-R6K7V8 | Q |
| UniRef90-UPI00035EEACF | Q A |
| UniRef90-R5JM38 | Q |
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| UniRef90-C8NGU9 | Q A |
| UniRef90_D0L967 | A A |
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| UniRef90-C0XSA0 | A A |
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| UniRef90-UPI00047D5DA1 | Q S |
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| UniRef90_L7EIP4 | Q S |
| UniRef90-L0D774 | Q |
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| UniRef90-R9M4B0 | Q |
| UniRef90_D7GUR6 | Q |
| UniRef90-W6WDM7 | A A |
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| UniRef90-F1VX63 |  |
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| UniRef90-L8Y261 | M A |
| UniRef90-R5YE32 | Q |
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| UniRef90_B6FVY5 | Q |
| UniRef90-H4GKC7 | Q A |
| UniRef90-R5EP70 | A |
| UniRef90-R5QA43 | Q |
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| UniRef90-M1ZK01 | Q |
| UniRef90-J9GU24 | A |
| UniRef90-C1A311 | A S |
| UniRef90_L1N887 | A A |
| UniRef90_A6UPD5 | Q |
| UniRef90 M7N9S0 | A A |
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| UniRef90_S0FPF1 | Q |
| UniRef90_R7FAC8 | G A |
| UniRef90-W0DVB9 | A A |
| UniRef90_D9STI8 | Q A |





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UniRef90_A1HNM0 UniRef90_Q898V8 UniRef90_K1VS84 UniRef90_W7CTD0 UniRef90_UPI000364513B UniRef90_R2SIU0 UniRef90_F8N753 UniRef90-U2NKV5 UniRef90_K9SDC9 UniRef90_B3QUX6
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UniRef90 D4L7D9 UniRef90_K9TQW6 UniRef90_UPI00037AA199 UniRef90_D3E1E4 UniRef90_K9V3Q2 UniRef90_R7IIK6 UniRef90_Q01R15 UniRef90_G5JI90 UniRef90_I6ZZW1 UniRef90_A0A024Q5G5 UniRef90_C7LUY4 UniRef90_E4T2E0 UniRef90_W4L7X8 UniRef90_HODEZ8
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| $\mid$ A K E K G|L|EP|L|ALRTVWE QQDMDFSKEAPSYFS E EHEMESEE I A REKGL LPL A EWLLS LP NQEVEAEAQKY I NEEKELT TDE

 TAREAGLEPLAQALLVAKPEVAPEHAAAPFVSEAKGIADDLE


 I A A K E Q GL L E P L A E L I P A S K P V S S L R E E A A K Y I N E E K G I M T E E I A A E K G L K P L A E A I WN G E K D D I K E Y A S E F I N E E K E V K S E E I A K E R G L






MA E E K G L
MAKEKGLAPLAELI PQAPKVSLESEAAQYIDAEKGVKTVA
I A K E R G L


MA
VARERGLEPLAQAI AHHNQDALDAAAA
I A K E K GLL E P L A E F I H S L N E GNFMMEEAAAKY I S E E K E VV K T A E


MAREK GL E P L A L V L L E Q K G T D P QA EA L P F V DP E K GVVA S V D
VA R E K GL A P LA E A F A Q D G Q D P A V L A E G Y I D P E K GVVN S V E






IA R D K GL E P LA LI L WE QSDPTP LS QVA ARF G
EA K R K G L



EAKRK GLE P L A E WL Q QS STESVVETAA EA YL NDE V E SVVE





I A R E N GL G P L VE AI FA D R K A A PE K L A E G Y L S B E A V A T V K










$\square A L E A G L G A L A B A L L R N P A L H P E Q E A A G Y L K A N P G V D D A A$

## UniRef90 $10 . J 109$

 UniRef90-V6Q5Q1 UniRef90-C8XKA3 UniRef90-19LB22 UniRef90-Q3A645 UniRef90-L1Q2H1 UniRef90-UPI00031A9F72 UniRef90-H3NLP7 UniRef90-D6EB47 UniRef90 EOUUN4 UniRef90-C6Q1R0 UniRef90-S4XHD1 UniRet90_UP100047DF1CE UniRef90-UP10003B5FDDF UniRef90 UPIO002UniRef90 K5BA70 UniRef90_UPI0004071D70 UniRef90-G704V1 UniRef90-UPIO0037E1880 UniRef90_BOPAF3 UniRef90_R5AEJ1 UniRef90 UPIOOO40E6F3F UniRef90-E1YLL3 3 UniRef90-N1V217 UniRef90-AOYJE6 UniRef90-K6D2S8 UniRef90_A6CTJ1 UniRet90_UPIO003F6C106 UniRef90_UP10004711FBF UniRef90-D4J7Q4 UniRef90-R5D3G2 UniRef90-HOR4Q5
UniRef9O-A1HNMO UniRef90-Q898V8 UniRef90_K1VS84 UniRef90-W7CTDO UniRef90-UPIOOO364513B UniRef90-UPI0003667170 UniRef90-R2SIU0 UniReffo-F8N753 UniRef90-K9SDC9 UniRef90-B3QUX6 UniRef90-UPIO0047EF57F UniRet90 W1SAS6 UniRef90_R7CZD7 UniRef90-A8ZSRO UniRef90 R5FOM6 UniRef90-EGMLP8
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UniRef90 D4L7D9 UniRef90-K9TQW6
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UniRef90
I6ZZW1 UniRef90-A0A024Q5G5 UniRef90-C7LUY4 UniRefofo-E4T2E0 UniRef90_W4L7X8
UniRef90 HODEZ8 UniRef90-UPIooo36AC87B UniRef90-F3YWLO UniRef90-K9UJJ4 UniRef90-W2VAN4 UniRef90-E3CV76 UniRef90-D5AM50 UniRef90-R60YQ2
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EVEAGVNDII
1 AAEWIISDDPSYRDQ\|IRKQTFQKGTI QSADKN DVLSGAHEIMAETISDEPKYRQWLRNFAERTGVLVTEGKQ AALAGARAI LTERFGEDADLVGELRELLWQRGGLVSTVRD
EALKGARDI
AALEGARAI $L A E Q V N E N E R A R N D V R N Q F A R Q S T L T M A H V V K$
$L D E H$
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 D D A L A A GAR D$\begin{array}{lllll}\text { D } A & A & A & G & A \\ N & C & D \\ A & A & M & D \\ M & G & A & K & D\end{array}$ D A L L M G A K D
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## D

## D

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A ALD GARQ
A ALAGAMDI
EALAGAVDI
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UniRef90_UPIO0047EF57F
UniRef90_W1SAS6
UniRef90_B9JAJ3
UniRef90_R7CZD7
UniRef90_A8ZSR0
UniRef90_R5F0M6
UniRef90_E6MKST1
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UniRef90_UPI00036AC87B UniRef90_F3YWL0 UniRef90-K9UJJ4 UniRef90-W2VAN4 UniRef90_E3CV76 UniRef90_Q11SL8 UniRef90_D5AM50 UniRef90_R6QYQ2
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A D K DEKNDFEMYYEYQEP|V|RSIVSHR|IL|A|LNGEKEG|VL|K VEKDEKKVYEMYYDHQEPVAKVASHRVLAMNRGEKEDILK AGHEDAARFADYHDFSESVVKSMPSHRILAMFRGESTGVLS GKEEEAVKYRDYGDYSEPLKKRCTSHRLLADRRGESEGLLLK GKAAEGAKFSDYFDWSERLERMPSHRILAILLRGEREGIL D DFA GKV S K FEMYY DY QEP L R EVVPSHRMLAMRRGEKE DV L R
 GK E E E A A T F Y S Y F E Y E E E K I
 E HPE GS T K Y E M Y R N F Q A A V K K I A P P H N NKENETTPYEMYYDYKEAVKSIPAAHRILAI NRGEKEKILLS


 EKA
GKEAAGATFRDWFAWDEPLRTI PGHRALAMFRGEAE GFLS
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## G

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D
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D
DYPEEPTPY Q A E D E Q E V F A M Y Y D Y S E A A N K G K E D E G Q K Y R D Y F D W N E P KMKDEAQKYSDYFAFSEELLRRCSSHRRLLAMRRRGETE GVG R SEADGARKFSDVYDFSEPDLRRCTSHRLLAMRRGENE GFL R
 N S K E E K S V Y D M Y C D Y S E A V K T I A P P H R A L A I N R G E K E D F L K
 $\begin{array}{ll}G K Q & E \\ G & G \\ G & A\end{array}$ GME E A GAK F R DYF D WK E P V A TVVPSHRMLAMRRGEKE GF LV
 AEAE SVVY E L Y Y Y E Y S
D Y P EGT
E EKD
D HPEGSTVY
GK E G S T K Y E M Y R D Y Q A K K V K D A D S VY D MY Y Y S E EVA K AP GHR L A MF R G Q G L
 GQEEAGSKYQDYFHFSEPLDGI PSHRVLAI FRARTDEVLSS GVPDPEGKYKMYVSYAEPASKIPSHRMLAI RRGAKEGIL T


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 S GKEEA GATYRDWFE WDEPLARIPAGHRALAMFRGENEKF LAK NA D DP K K TY G DYY Y E H K E P V DK MP P H R I L A V N R G E K E K V L Q K LLKDEK S P Y E MYY S Y R E S I K K I P P H R I L A I NRAAERE GYI S



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UniRef90 A9KST1 UniRef90-R7B6B5 UniRet90-F4XYT6 UniRef90-D4LTD9
UniRef90-K9TQW6 UniRef90-UPI00037AA199 UniRef90-D3E1E4 UniRef90-KgV3Q2 UniRef90-R7IIK6 UniRef90_Q01R15 UniRef90_G5JI90
UniRef90 - $167 Z \mathrm{~W} 1$ UniRef90 ${ }^{-A 0 A 024 Q 5 G 5}$ UniRef90-C7LUY4 UniRefofo-E4T2E0 UniRef90-HODEZ8 UniRef90-UPIooo36AC87B UniRef90-F3YWLO UniRef90-K9UJJ4 UniRef90-W2VAN4 UniRef90-E3CV76 UniRef90-Q11SL8
UniRef90-D5AM50 UniRef90-R6QYQ2 UniRef90-R6SC50 UniRef90-H5SA53 UniRef90 B8HZ35 UniRef90-UPIOOO2197244 UniRef90-M1KNS8 UniRef90-UPI000472CF75 UniRef90-COQBU3 UniRef90-R5NDW3 UniRet90-F7V7RO UniRef90-M1WQZ29
UniRef90-UPI0003F6317C UniRef90-li3VYN1 UniRef90_U4KJT9 UniRef90-UPIOOO255B10F UniRef90_D9SH56

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| :---: | KDNNTDKYIEESVS RSKNREIRQFYQDMIK NKTTVADMLLNDAIT RLGDLPGDAWL RKMAG TNPSVTESAVVAAYE

 SRSKQRSLREYRALLLK TANADLRAF LSKMVK
 RDQHSPSAPSVLEAl|E GSSRPGDRWLTEVAS K KPTMQVSARVALABK VSTDVEEKQCTDQIQKKYI HGYGK VKITAPTEKIMNYLKGKVIKR GKM DNPHNDYLVVAVA LELSFDEDYVMSYLESEEVY TKKATLLREFYQTMLK


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 VTVEPEAEKUHDYLVKKVIKEKFFPY
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VTLDGGEDAEYH VKI EAPTEDII RYLEKQVITR VSVDVDADYATGLLAGLFV




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| $K$ | $G$ | $E$ | $E$ | $S$ | $S$ | $Q$ | $Q$ | $V$ | $A$ | $D$ | $A$ |
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 $V$ E L T F D E A A V L A D L E S Q $\quad$ E L R A

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| UniRef90_IOJI09 |  |
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| UniRef90-V6Q5Q1 | Q S |
| UniRef90-C8XKA3 | A A |
| UniRef90-J9GBU4 | A A |
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| UniRef90-H3NLP7 | Q A |
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| UniRef90-A6CTJ1 |  |
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| UniRef90-H0R4Q5 | A A |
| UniRef90 A1HNM0 |  |
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| UniRef90 R7B6B5 | Q |
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| UniRef90_D9SH56 |  |





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EAlKKGLLEPFAKWLLINFNNGDVEKEADKYLNEE JVLTVE
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KAKEKGLEPLAEWI WAQAGADIQAEAMRYIDEDKEVPTAE KARAAGLEPLANMIMLDTSGDPLADAAEYVNAEGGYATAE I A K Q K G V $\operatorname{E}$ E P L A N MI L K Q Q K S G D KLLEVVA N K Y L N P K E E VV N T P E LADEAGLEPLADKLWFQSEADAELLAKRYINNSKGFPDTK UAKEKGLEPLADWLLADKENDVLVEAEGY:NEKNEVTSAE AARQKGLEPLAYKIFAQKGCDVGEAQAFVSAAKGVESVD


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UniRef90-D9PF22 UniRef90-D9PF22
UniRef90_KONSH6 UniRef90-UPIO002897A54 UniRef90-UPI00046A9133 UniRef90_R6D833 UniRef90_D1XV50 UniRef90_B7JUZ6 UniRef90-R5CLI1 UniRef90-UPIO00378182D UniRef90-K9Z613 UniRef90_UPI00047EA32E UniRef90-KOYHF4 UniRef90-GOUEE5 UniRef90_A6TLF6 UniRef90-F2IC94 UniRef90_R5KE59 UniRef90_E6U4E3 UniRef90_AOAO23BQC2 UniRef90_Q6MCK1 UniRef90-R7J7G2 UniRef90_18ANM4 UniRef90_UPI0003751BCD UniRef90_K6QJ54 UniRef90-14BJL9 UniRef90_R5TK14
UniRef90_A0L7M6 UniRef90-12EZB5 UniRef90-L8N2J6 UniRef90-K9VE59
UniRef90 H7CYJ2 UniRef90-D7WXT8 UniRef90-R5HSM0 UniRef90-J9DJS9 UniRef90- X8ING6 UniRef90-T4W6E0 UniRef90-B9M315 UniRef90_R7BXK6 UniRef90-R5SIV1 UniRef90-W4QA55 UniRef90_R0GEW7 UniRef90-R8ASQ4 UniRef90-E7GC62 UniRef90-Q4L7U8 UniRef90_A4ANB2
UniRef90-E8WHR3 UniRef90-F5RLX6 UniRef90_UPI00047AB4EF UniRef90_U2M314 UniRef90_UPI0004764B8B UniRef90_UPIO00475004E UniRef90_Q60A39 UniRef90-UPIO0037A59DB UniRef90-TOCVT7 UniRef90-R6ZDW3 UniRef90-V7I2J1 UniRef90-R5KT52 UniRef90_UPI000427A6CD UniRef90_U1YLP9 UniRef90_UPI0003629DFE UniRef90_E6W1D2 UniRef90-UPI00037E67C6 UniRef90-R5KF05 UniRef90_K2FJG5 UniRef9O-E6PSV9 UniRef90-K9T3D8 UniRef90_UPIO0025587B3 UniRef90_R6D719 UniRef90_A6C5P8
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$\begin{array}{llllllllll}E & A & A & G & A & C & D \\ A & V & L & A & G & V & H & E\end{array}$

D A L Q GAN D
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| $D$ | $A$ | $L$ | $N$ |
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A E I V S D N A E Y R K VL R F LLLV V S G S|I V T S L L K K




 I A E M I N E D A Q Q V R A K L I A E K $A$

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UniRet90 - D9PF22 UniRef90-D9PF22 UniRef90_UPI0002897A54 UniRef90-UPIOOO46A9133 UniRef90-R6D833
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UniRef90-Q4L7U8 UniRef90-A4ANB2 UniRef90-E8WHR3 UniRef90-F5RLX6 UniRef90-UPIIOO047AB4EF UniRef90_U2M314 UniRef90-UPIOOO4764B8B UniRef90_UP1000475004E UniRet90_O60A39 UniRef90-UP100037A59DB UniRef90-TOCVT7
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UniRef90 U1FRLE

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NATDEFKTYGПYYDYNEPIINK\| VPHRTLAVNRGEKEKIILN KPDEKSNYEMYYEFAELVHKLPSHRILAI NRGEAEDFLK DKEEEASKYRDYFKWEEPVKTISSHRFLAI MRGVNEEFLS EEHDENEVYKDYYDFSEQFNKVVSHQMLAINRGEKEKVLR AEEDEQDVYAMYYDYEEPVRRVPSHRVLAMNRGEKEGILA VDADEKTVYEAYYDFSEPVSKIPNHRILAMNRGETEGKLR

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 GKEEAGATYRDWFDWDEPLSAVPSHRALAMFRGEREGMLK GKKDEADKYEAYLDRAESAARIPGHRLLAMDRGEAEGVLR DYP EKKPYDMYYGSSEADSKPNHRVLA NRGEKEKKLK KPEEKTAYNMYYEFSEKVNHLPSHRILALNRGESEEFLK AAKDEDSTYRMYYDHREPLRLMPSHRVLAMNRGEKEGFLK KAEDEKQTFSMYYDYKEPIKRIANHRVLAMNRGEKEKVLS DHPEGTIKFEMYRNYQDRVRNIAPHNLLALCRGEAEGVLN DFKNAKTKFEMYYDFQEPVKTLPSHRYLAMLRGENEKVLS GKEEDGIKFEDYFDWSEKAFAAPSHRMLAMLRGQKETVLS DEKDDKQVYQDYYDFTAPLAKVADHQYLAMARGAREGILKK

KME EEDSVYRLYYDFE
 EYPEGSTKYEMYRTFQGSVKKTAPHNLIAMFRGESEGLLR TKEDRRSVYEMYFEFEEKISKLPGHRVLATNRGEKENYLT EENEASQAFLMYKEYSEPLKTLPSHRILAI NRGEKKNFLK DYPEGSTKYEMYRSFTCKLTKiAPHNILALYRGEGEKILS EEEAGGQKFRDYFDFSQAPASMPSHRVLALFRGEKEGVLA GKEEDGAKYRDYFDFSEP TVDMPSHRVLALDRGEREGVLR
PE GKEEEG VYEKYYDYK
GAKYRDFDFS
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 VAKI A P TKKDDAQKYLQYFDWEEPLSRVQGHQLLAMNRGEKEGFLK SSVKGPTKFEQYYDFKEKVKTGPSHRYLAI RRGEKEDI LD GKEEEGAKYRNYFQFEEKLSRCQSHRLLAVRRGEEEGILR GAEEDVSNY
A A
NDADSQKFQDYFDFSEPLDRMPSHRVLAVLRGEKEQALA NDADEAKVYDMYYDYKESIKYDKPHRILAI NRGEKDNVLS



 NAEDEKEDFSMYYDYSEPVKKIANHRVLAVNRGEKEKVLS QELDSEGVYQQYYDFSAPLSAMNSYRVLAI NRGEKAKILS A AKKKRSVYENYFDFAEKVDGLPGHRILAI NRGENEKVLS NSKDEKSVYDMYYEFSESVRTIAPHRVLAINRGEKEEYLK
 KPDESSVFEMYYDFEEPIKKIAGYRILATNRGEKEGILQQ A GKEESQKFENYFDYAEPLSRIAAHRLLAMLDGESEGWLN QSLDEKSVFEMYYEYDEAI RAIVPHRILAMNRGEKEGILR QGKDENGVYA $\square Y Y D F Q A P L A Q L A A H Q V L A \emptyset N R G E K E K V L R$ GKEEEGAKFRDYFAHHEPIAKVPSHRALAMFRGRNEGILQQ K NPDEDGDYEMYYDYNEKVQYIASHRILAMNRAEKEKVLN KADDEKKTFAMYYDYVEPI KNVANHRVLAMNRGEKEKVLS TKKEEAQKYRDYFDWNESLSRCPSHRLLA I LDRAENESFI R E G A A EDA QVFQMYDGYSEPVRTLPSHRTLADNRGEKKGCLN
PEEKTVYEMYYDFNEGVNKIANHRILAVNRGEKEKKLK EEDADTPYQNYYDYAEPVKRIVGHRILAIDRGEREGALK TKEEEAQKFSMYFDWQENLLKTPSHRILAMLRAESEGFVR
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PDVESVYEAYYEFREPI KHAMPHRVLAMNRGEREQIL R
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 GKAEEGANFRDYFDYAEAI ARVPSHRALAVFRGRSQEVL
 GKADPDSKFRDYFEYAEPIARVPSHRALAVLRGVSEGVLK NAKDENKTYEMYYDYSEAVSKIKPHRDLAI NRAEKENVI T K A E ESGQEYRDYFNYSEQVVKVPHHRTMALNRGEKSGAL R




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 I A L E A GLEEPLAESLLAANPLLNPEEEAAAQYLRANPGVADCTK





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 DA IDN GLLEGLAKIIMSFPTKGNDDEUTKKYLNDKQVKTKVE
 EADKNGLEGLAKIILSFPKE SHYAVDKFLNDNVKTKE VAKENGLIFLAQLIVKNTANDEEEAEKYTS EPFATAA DADNNGLEPLAKMI MSFPTKGDDTS DTSKF IA E EKGLKPLAEDI NKDFS GDDLEESEKFINEEFGI K SGQ V

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## UniRef90 H8XS97 UniRef90-E2ZAZ7 UniRef90-R6LY63 UniRef90_DOLLY3

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## UniRef90-L8LUN8

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TKKDEAQKFS ${ }^{210}$ QYFDWSEPLLYKAPSHRLLLA $\stackrel{230}{230}$ RAENEGFVVK VDEDEAGPFATYKDYSERISLMPSHRILAVTRGESDKILK GATDESKTYEMYHDYEERVKYDKPHRVLALNRGEKEGILS QKSAAAQNFRDYFGFSESLQTMPSHRVLAVDRGEKEKILAB GKEEQAVKYKDYFDYQEPLHKIPAHRFLAILRGKKEGLLK ENAD

SVYRQYYDYHEPVAKVASHRLAMDRGEKEEFLK GKEAAAEKFADYFDYAETLHTVPSHRALALFRGRREDMLD GKEAEGAKFTDYFTFEESLKRVPSHRLLAMRRGEAEGFLS
 KAEDEKETFSMYYDYSEPIKKIANHRVLAVNRGEKEKILT GKETEKEVYEAYFDSSELLSRCPSHRLLAMLRAEKEGVVR

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 AKAE EAQKYRDYY DYE KNEDEAQKYQQYFDWS GAEDAGTGFAMYDGYREPARTDPSHRLLADNRGERKGCLS GQEQAGA K GLKDETSPYEMYYKYSEAVNRIVSHRDLADNRGEKEEFLS NA乌DENS KAEDEKNIFEMYYEYE A S
NAKDEKGVYVNYYDHK
 SEKDAAQKYKQYFDWSEPLKRIPSHRLLAA DDAESEGLLKK NAEDEQGVFEMYYDYAERVKNIVPHRVLALNRGETLKVLS

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 QKNDPQEEVYATYY D WE LDPV K K I A P Y Q V L A I N R A E K A G V I Q SEKDENGTYEDYYDFE QVVSKLTSYRILAI NRGEKE GIL R GME EK G $\square$ K Y Q N Y F E WK E K A L A AP S HRI L A L F R G E K E R YL T
 TEEEKAQKFQQYFDWEEPLKKTPSHRFLAMFRAYSEGILR NA HPEE GKFRDY LELLSEPIARMSSHRLLAALRGAKRGVGS
 EHPEGSTKYEMYRNFGMSVAKIAPHQLLAMFRGENEGILIT
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 QEAD DK QVF Q $\square Y Y$ D F S E K V $V$ V K H D DEN KVVYEMYYNY QEKVK TLVSHRILAI NRAEKEKVI N GK D D QESSKF R DYF DF E E M L S R C P G Y R V L A I R R A T E E G V I R ESEFAND F LDNYQDFSKEVRFLPSHQLLALNRGENKQALK ETADEKKVFQDYYDFSEKVKDLQGYRVLALNRGEKLGVLK K N P DENKVVYEMYY D Y HE R VVNRIVVHRILLAI NRAENEKVI T GK E Q Q G A K Y A D Y F D A A T P V V R S V S S S H R L L A A M L R G E E E G I L K QKREKRAVYETYYDFREPLMKATGYRVLAMNRGEKEKIL R D Y P E G T T K F E MY R N F E S K L T K DA P H N I L A L F R G E A E K I L V A NLDEK QVF Q IVY D F S E K I A D M Q GYRTLA L N N GE K L G V L K QSLDDKNVF QIVYYDFS DKVVKMQGYRTLALNRGEKLGVLK GKDPEAAKYKDYFEWSEP LAAKAPSHRILAMRRGEKESSL M
 PDRE SVVYEAYYDYE ERLTTKTLPHRVLAMNRGEREEFL R GKENEGAKFRDYE EHDEKLKGAPSHRALADFRGRNE GII S
 KMKDEAQKYSDYFFFSEELRRCSSHRLLAMRRGENEGIL K P S $P$
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| UniRef90＿H8XS97 | FKITLSPEDKEEALSRMMDKALIKNEG |
| UniRef90－R6LY63 | $V \mathrm{DLSADDDYIISFLEKKLI}$ K KDESTESAS |
| U5WX19 | GGA |
| UniRef90－DOLLY | ARVELAPEPVLMRIELQQ MGLDRSSPFSGQMSEAI A |
| UniRef90－A1SV | A |
| UniRef90－UPIO0041AD004 | V S 1 |
| UniRef90－R6GTV1 | VSVDFD\NKADNTVC |
| UniRef90－UPI000377D13A | VRLRLDSEEEHNCEARIASRF |
| UniRef90－UPI00036701DA |  |
| UniRef90－UP100034979A7 | LKKLKFDEGAVLSHLADRLVANVRSRAKNVREFYAAM |
| UniRet90－F4FRK | VK，FD T HTOQF AKRE円KY |
| Uniref90－D3Q1M7 | LKi SVDKEEALDHI A M E K RFFVTSSNESCT |
| UniRef90－D8IGQ4 | VKVVADPTTVINYL NFRLVRGHQPNAATELV |
| UniRef90－13DLD2 | $V$ SLFLLEEKEKKHVDNLLLRSFS KEEALQELF |
| UniRef90－Q03E21 | AKIEVDPQGDERYLHFRLI GKKTGEAVGIVEDAYQ |
|  | VDAARAVRLLTERTV |
| UniRef90－R6YT | EDYAKVLDHITGEIV KAQDSITAPYVK |
|  | KVLIDDAFAVRVCEAFFV |
| Ref90－UP1000360CA5E | S VADeER M T |
| UniRef90 R5WQ83 |  |
| UniRef90－V7H | VKIGLNDDFVLRYLGQT LHLAKDGKESSV |
| UniRet90－R5N | VNI ECDDEKIINFLYSKII RKESYVES |
| UniRef90－UPI0003821C54 |  |
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| UniRef90 AOAO23C | LKLKSDEEYLLRYLHSQLILQ |
| UniRef90 F9VAZ7 | KFEHNEDKI LRFFENRFAARNN KDENSECAKYMS |
| UniRef90－R7H |  |
|  | VKISFGENEII DMIFSKI GVNNKKNNEL |
| UniRef90 J8acc4 |  |
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| UniRef90＿UP10004670 | LNI EPSAENSAQLCANMI AEHYRLDIKYKAASPWLLNVVQ |
| UniRet90＿AOAC |  |
| UniRef90＿D9R4R5 |  |
| UniRei90－UPI000317E34B |  |
| UniRef90－U5L493 | TAlRPNDDMMQSYLKKKWL K K NLI |
| UniRef90－U2TLB3 |  |
| UniRef90＿U4KSF5 | E |
| UniRet90 L1NVE5 | KVQVAPEDTLPFIEDNL！KSEGETANFLRKT1罡 |
| UniRef90 B7CD | VSIS SNEEYIENWVCRRFU RGTNSGTSEY |
| UniRet90－UP100029A7B5C | VK |
| UniRef90－C6X4L2 | TKIEDDKDEADDLIEQAVI |
| UniRef90－L8LUN8 | VDI K I AEEEVMA YLEGQEI L TKSTII |
| UniR | AKIETNEEIILNYFRFRII SKNVSP |
| UniRef90＿UP1000 | VKFSHDNEKFIEYLKGKVIKH |
| UniRef90＿UPI0003B32 | VHVLPDGDRA ME\｜IHASYPGKKQVCPKARDQ |
| UniRef90 R7HK89 | VDUSUDGERMTERDASRML |
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| UP10003B39BE0 |  |
| UniRet90＿M5J7x | DPDDSYYYQY |
| UniRef90＿Q1WSR3 | NTDDDYAL |
| UniRet90＿UP1000463304E | RIRPEDDRCLREIKKHFV R R ${ }^{\text {a }}$ |
| UniRef90－R5ZNN66 | LKI QKPEENI：DFIERDVI K K K S |
| UniRei90 ${ }^{\text {U }}$ H2BWB4 | LKIEVDTIQSLDLISGIIL KSGANNSKKYIREAIIE |
| UniRef90－F4BYW7 | LRLAVNEDDALAVLEEIFI |
| UniRef90－UPI00046F60F8 |  |
| UniRef90－L8LQY4 | GLD C （ QEVVLS |
|  | LSLRPVEDEALRQLTRLVVTGRGKD |
| UniRef90－R6AQC2 | VKLDYDLD Y it Sele ekil |
| UniRer90－B6G820 |  |
| UniRef90 E8SKK2 | VKIEMDKTRLAQNIKKQEV |
| UniRef90－V6SIE1 | LSVEVEKEEALGFDEDNDI KNNNETASQLK |
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| UniRef90－C3RQ13 |  |
| UniRef90 R6VKM5 | VSVEVDAERIIE |
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| UniRef90－UPI0003478B01 | VD\DFEESRVINYLESKVI KTK】PTVRDFYQVMVK |
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| 44 | VSFEHNDDKMLRFSVRFKQKASSTMNSNY |
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|  |  |
| UniRet90－D1PYG9 |  |
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## UniRef90 H8XS97 UniRef90-E2ZAZ7 UniRef90-R6LY63 UniRef90-DOLLY3 UniRef90-A1SVS2 UniRef90-UPI00041AD004 UniRef90-R6GTV1 UniRef90-UPI000377D13A

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UniRefolo- 4 4T9S4 4 UniRef90_C4V393 UniRet90_UPI000467C3A1 UniRef90 AOAO17RYN4 UniRef90-D9R4R5 UniRef90-R5JBF0 UniRef90 UPIO00317E34B
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## UniRef90-L8LUN8

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D SYKRLLEP 290
310
320
 DSYKRLIFPQLEREIRNELFERGEKQAITIFSENLRSLLM
 DSYRRLLAPSVENDMRVELKMRSDRAAVDVFADNVRNLLL KAWKGKLAGQLETQLITRLKDDAHENAMDNFASNLKALLM

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D S Y K R L L H S S $\quad$ E N E T DK A A K E K A D L



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MTH QY TQKALQMPQSG $\quad$ GKGEATLQLLSEDCTTPF NI HNKLAKQLG KPAQVNAFVKLYDEGATIPF NEARIVANVIKKLDEGSTVAF ASTNTEL
DS $\square C R \square I A G E \square Q A$


IS RYRKD QT GNLDEVVIDEQDAKLNKQFEE\|VKRKEAVLKS UniRef90_E1 X1X7 UniRef90-W1CT17
UniRef90_T0RX48



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 VAKEK GLEPLAAAVFACKVKDPAVVAGKYLND AVSSSE $V$ A K E K G L E P L A A LLLFA Q E R DCPPEEAAAA D Y L S A E K GVVETVA



TARA LGLE L L A K VI MA QNAT D I E S I A RKY I T
EA DA L GLE P L A KM M M S P P N G T L E DLA S K F V K D D
IA REA GLLDLT RLI LLQNVA DLLSTQAEKFI S EAFPTVE
$V A K E N G L E P L A K Q L M S Q R V T D M E Q L A L R Y L S D K D V A T V E$

 V A K E

A A K E A G L E P FA L WM L T F Q K E TVV E S K A S K A V A R K L G L K E E K

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UniRef90
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E

## D <br> T

 DEKREGKKFKDYFEFSENLNKVPSHRLLAMLRGRQENVL G E EKRE GEKFK DYF E H S E S L A R L P N H R L L A MLR GR Q E N V L G
 NAEDEKEVVFQQYYDYKERIIKFDPNHRVLAISRGEDK K IL S GKDEEAAKYRDYFDFSSSPLKKRCTSHRLLAAIRRAEAE GLL K D E K D A Q GIV Y A A Q Y Y D D Y S E E S L A K EEK D D A KFS QYFDWSEPI SKAPSHRLLAMLRAEAE GFI K
 K A E A V K D K Y K D Y F E F E Q R V S E L A S H R F L A M R R G M T Q K V L K


| UniRef90 UPI000409BD28 | MNUEDDPEGSGE EALEF\\|EN NTDKNNKETAHQLIKLADK |
| :---: | :---: |
| UniRef90-E4L379 |  |
| UniRef90_UPI00036725AC |  |
| UniRef90-M5DXF |  |
| UniRef90-R5I2M2 | V KV DVDKDRTLDR\YS SVLR GKPSPSDAAALDEIDYAVE |
| UniRef90-R5SH60 | ATVLLDRELALLPLLRRAVV KPGSAAMEFVKAAAE |
| UniRef90_UPI000407E307 | AKLVLPD |
| UniRef90_UPI00035EB6FA |  |
| UniRef90_UPI0001C37BEA | I AVT LDEEVAATDII F GKYV K A N NACGELVRNAAA |
| UniRef90_R5GH75 |  |
| UniRef90_U5Q8H3 |  |
| UniRef90-H1ZBC6 | $\overline{M N I A V D K E D A I ~ Q F I E E Q T I I ~}$ |
| UniRef90_R5M1W8 |  |
| UniRef90_UPI000370D2EA | $V$ S S HNFDKMQRFFLARF K K V V N Y I E D AVT |
| UniRef90-C2M5. |  |
| UniRef90-E6MGK1 |  |
| UniRef90_R5AXA3 |  |
| UniRef90-B4U3Y0 |  |
| UniRef90-UPI000476050D | LS LS L S DPEAPARLVRMFV R R D S P ARRLVESAVR |
| UniRef90-U7V963 | $V$ SLNFEEKDRES VERYLLKDFKNKELNFLHKE\VV |
| UniRef90-D8MFD6 |  |
| UniRef90-W1Q1Z1 |  |
| UniRef90_G2SRN3 | $V \mathrm{~K}$ L ELD DERIL L Q MYR HYA K N HEEDSAEYVKKACN |
| UniRef90-U2QVB8 |  |
| UniRef90_U6BD91 |  |
| UniRef90_U5P486 | $V$ GFEHPVDRLI R HFEARFKSKNG Y M E EVI S |
| UniRef90-R5Z3B6 |  |
| UniRef90-R7IGK1 |  |
| UniRef90-UPI000363141B | LKV DI EEDEALQ M M Q S I I K K K E A I H L K A |
| UniRef90-C4LJC0 | L S I D P G D D P Y V GLIA D DADL G S A $\square$ D H D GPAADWIEKAI Q |
| UniRef90_W7YWT7 |  |
| UniRef90-H0KQA3 |  |
| UniRef90-R6CBD9 | VKI ES D S D R MIA QIE R R V I PR G G Y A IL DAAVT |
| UniRef90 C7NE81 | V DI D IDEKN EETI I NFILNTEENKNLTEFFRGVIK |
| UniRef90-B1C7U8 | $V \mathrm{GI} \mathrm{SV}$ DKEQALL $\quad$ YI I HKHVIKNNKNSAYKYMTD |
| UniRef90_J4WI58 |  |
| UniRef90_G6C6L8 |  |
| UniRef90_R5BJ76 | $V$ SID TDAQRSCDKI YYDFC K A H F PGGELAEQDKLAVQ |
| UniRef90_UPI00047CF530 | $V \mathrm{~K}$ I NPDEEKCMAAILRR NMGEKGIVQNDVTMKCAS |
| UniRef90-E6UGH0 |  |
| UniRef90_G5JT43 | I S FEHHLDDKI DR F Y QVR F KVR |
| UniRef90-M2PMY8 | $V \mathrm{~S}$ I E I D K E K Y Y Q Y |
| UniRef90-R5SH1 | $V \mathrm{KLEAPEERILTTYL}$ |
| UniRef90_R5MD68 |  |
| UniRef90_F81036 |  |
| UniRef90-R5V4W8 |  |
| UniRef90-UPI00020D9D74 |  |
| UniRef90_M1PGD3 | $V$ SLKPSEELLALALLLRSRY SKQGKLS Q Q M L A ME |
| UniRef90-E4RUU9 | $V \mathrm{GLEDEKE}$ D A ENQL Q R L L L K G L PEAKEQVNLA L |
| UniRef90_UPI0003636062 | LS FVVHNVDKMTRFLAARFKEK NQY |
| UniRef90_Q1JW78 | LTLET P R D E L K E I ARLFA A A PRSPWQEFFTSVVA |
| UniRef90_J1F565 | $V \mathrm{SIQVD}$ |
| UniRef90_E7NY50 | VKI VVDIDEAIELLCQAHFTFHNKY H K E A I A |
| UniRef90-R7MEX9 | V KI D F D L K V T S W E S K I |
| UniRef90-U2LK57 |  |
| UniRef90_D5SP95 | I KVSWDKHRA QFVT GKILNVDARCYNQFMNEAI A |
| UniRef90-K0DDM7 |  |
| UniRef90-UPI0003B4095B | LKI EIDNDEAI DFI E Q VVL K K G T ESAKQVQFA I K |
| UniRef90-UPI0003B6416B | V T I DVDVVD A I A DLQRRRAD\H N N Y H K D A I E |
| UniRef90-D9VQL5 | L DLEPEEPSDPSTYE GVIARRFG口ADR |
| UniRef90-UPI0002191CA0 | GS I EADAEADARYLKFRLV GSKTGEAADVLVAAAN |
| UniRef90_D4H0R8 | LKI E ID EDMCLINAIAK I CA G GKGMEDNEITTKKSMR |
| UniRef90_U2LWM8 |  |
| UniRef90_D1AGQ3 |  |
| UniRef90_Q2BJK7 | $V \mathrm{SFILDSD}$ |
| UniRef90_F4LMR7 |  |
| UniRef90-E3PUI3 | V K L N Y L E K T T V SERA Y I K S D H K A VMA D T I K |
| UniRef90-F5YPP7 | V T I DVDENTAAELLQRRKYVLNNDYH K C A I E |
| UniRef90-E4RJH0 | VKIVCDEDKAV K I I NDHFEFEKNQ Y Y PFll |
| UniRef90-H2J4P9 | $V \mathrm{~K}$ L L E E K Y I E K L Y K F Y L T K Y E N N K $\quad$ I I K E GL D |
| UniRef90_UPI00020D9AD7 |  |
| UniRef90-A6H2G4 |  |
| UniRef90_D2MLP5 |  |
| UniRef90-A4C0A5 |  |
| UniRef90_T0DNJ3 | $V E I V V$ DEEYANNMILSK HFADTSVTSYKALVDCAS |
| UniRef90-V2UTG9 | LKVDGEDEAPLSRVELEYA L L D |
| UniRef90_F2NWV7 |  |
| UniRef90_Q1QEI3 |  |
| UniRef90-A9BHM7 |  |
| UniRef90-X1NNC3 | $V$ S MAPPQDCALTRSLENIF |
| UniRef90-E1PTB1 |  |
| UniRef90-R5RY34 |  |
| UniRef90-B1MZ34 |  |
| UniRef90_N9TS23 |  |
| UniRef90_R7KKE5 | VKI ALLSEEEKPHPCQSLIAEEYF G $\square$ K D L L G A A D S WLQ EVCCR |
| UniRef90-G2Z6I0 | L NVA I EK E E A $\square$ D F IS Q NV $\square$ K |
| UniRef90_UPI00035EAC71 | LKVDGEDAP FII EKII SNLELDAKQP |
| UniRef90-C2BIJ8 |  |
| UniRef90-E1X1X7 |  |
| UniRef90-T0SZW4 | $V \mathrm{~V}$ T Y P E EVA V S H V S K Y |
| UniRef90 W1CT17 <br> UniRef90 T0RX48 |  |

UniRef90_UPI000409BD28 UniRef90 E4L379 UniRef90-UPIO0036725AO UniRef90_M5DXP4 UniRef90-R512M2 UniRef90-R5SH60 UniRef90-UPIO00407E307 UniRef90-UPI00035EB6FA UniRef90_UP10001C37BEA UniRef90-R5GH75 UniRef90-U5Q8H3 UniRet90-H1ZBC6 UniRef90-R5M1W8
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UniRef90 U6BD91 UniRef90-U5P486 UniRef90-R5Z3B6 UniRef90-R7IGK1 UniRef90-UPIOOO363141B UniRef90_C4LJC0 UniRef90_W7YWT7
UniRef90 HOKQA3 UniRef90- R6CBD9 UniRef90-C7NE81 UniRef90-B1C7U8
UniRef90 J4W158 UniRef90_G6C6L8 UniRef90-R5BJ76 UniRef90_UPIo0047CF530 UniRef90_E6UGH0 UniRef90-G5JT43 UniRef90-M2PMY8 UniRef90-R5SHH8
UniRef90 R5MD68 UniRef90-F81036 UniRef90-R5V4W8 UniRef90-UPIOOO20D9D74 UniRef90-M1PGD3
UniRef90-E4RUU9 UniRef90-UPIOOO3636062 UniRef90-Q1JW78 UniRef90-J1F565 UniRefofo-ETNY50 UniRef90-U2LK57 UniRef90-D5SP95 UniRef90-KoDDM7 UniRef90-UPI0003B4095B UniRef90-UPIOOO3B6416B UniRef90-D9VQL5 UniRet90_UPIo002191CAO UniRef90 D4H0R8 UniRef90-U2LWM8 UniRef90-D1AGQ3 UniRef90-F4LMR7 UniRef90-E3PU13 UniRef90-F5YPP7
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UniRef90-W1CT17
UniRef90-TORX48

290
300

QTMKKKIVPAMERRIRTERTEAAEDGAI TLESENLSQLLLL

 DAYDRLIYPSLEREMRAALTDKASEGALKMFALNLKPLLM Ds

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G
Y YKRLIFPSI ERETRSEMSANAAEESI KVFAANLRQMLL YKRLLRPSLEAELAAESKQRADVEAVRVFSENLSQLLL

 SYKRLLEPSDSNETLQEVKDKADAKAVEVFSDN

位 DGLVRLLSPAVEREIRGDQSDQADDHGITVFSENLKNLLLM DSLSRLVYPSIIKNEVRNDYTEKSEVEAI DIFKDNLEKLLL QIWSGKLKNKLFKELFNSQLEASGDESIKVFCKNLEALLL
 DGLKRLLSPAVIREIRGDQGDTADDHG\|SVFSQNLKNLLM YAYKRMIFPSLEREVRNHLTDKAEEKAVNNFSTNLKSLLM YGFKNMLFPSISNEVRNLLTQRAEESSIELFSKNLKELLL DAYKRFLDPAVTRELRQELTQLAQEEAVKVFGDNLYHLEM
 KAYKNYIHSSLDLELKGELKKLSDESALDVFGVNLKNLLL KIFWLGKIRPQ1 RHSLLTEKRLAAEAEAMQVFAENLRHLLL
 SLWKDKWRPH| EHRLLTEKRLTAEAAAADVEANNLQHLLM DSYQRLLKPSI ETEFANNSKEKAD

DAYKRFTQPAVARELRQELTVLAQGQAПKVFGDNLYHLLM DALDRLI IPSI DREIKTDLFKKAEDEAIEVFAKNLEDLLL WTWRVKV NLTLETELFESURERAEEEALRVFGDNLKDLLL DSYKRLLEPAI SNETLQEAKAKADTKAI AVFAGNLSQLLL
 KAFNNY:HGSLDREMKTDLKKLSDESAGNVFGVNLKNLLE

| UniRe | 28 | A |
| :---: | :---: | :---: |
| UniRet90 | E4L379 |  |
| UniRet90 | UP100036725AC | V S |
| UniRef90 | M5DXP4 |  |
| UniRee90 | R512M2 | A |
| UniRef90 | R5 | Q |
| UniRef90 | UPI000407E3 |  |
| UniRef90 | UP100035EB6FA | A S |
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| UniRet90 | R5GH75 |  |
| UniRet90 | U508H3 |  |
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| UniRee90 | R5M1W8 |  |
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| UniRef90 | C7NE81 |  |
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| UniRef | J4W158 |  |
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| UniRet90 | J1F565 |  |
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| UniRet90 | UP10003B4095B |  |
| UniRef90 | UP10003B6416B | T |
| niRet90 | DgVQ |  |
| UniRet90 | UP10002191CA0 |  |
| UniRee90 | D4H0R8 |  |
| UniRet90 | U2LWM8 |  |
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| UniRet90 | F4LMR7 |  |
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| UniRet90 | E4RJHO | Q |
| UniRef90 | H2J4P9 |  |
| UniRet90 | UP100020D9AD7 | Q |
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| UniRet90 | A4C0A5 |  |
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| UniRet90 | V2UTG9 |  |
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| UniRee90 | A9BHM7 |  |
| UniRee90 | XINNC3 |  |
| UniRet90 | -1PTB1 |  |
| UniRet90 | R5RY34 |  |
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| UniRee90 | -1×1) | Q |
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| UniRef90 | TORX48 | Q |

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UniRef90-IOUT50
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UniRef90_D4XVU0
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UniRef90_K6WU06
UniRef90_H9KEH1
UniRef90-K4E9M8
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UniRef90_G7YCY4 UniRef90_K1SRX6 UniRef90_E9BAN9 UniRef90_R7L9Q0 UniRef90 A4H6I3 UniRef90_A0A023EY82 UniRef90_K1Z4F9 UniRef90_G0V0X0 UniRef90_X1T6I5
UniRef90_B7Q3H7


AT LG DVRREQDDAALRLLDEQCTUPF
 QMHWD I VQVLS ERTNI QUWVCANI I R LI FNDDNTI P F HE L VA E QL $\quad$ G $\quad$ G K L A

QA LMKMLVKELG MD V D WDVVVTEMANTCGTDNRD SKVI NLINS GNTLPF | L | V | $E$ | $T$ | $G$ | $A$ | $A$ | $H$ | $R$ | $I$ | $R$ | $A$ | $A$ | $V$ | $A$ | $L$ | $L$ | $D$ | $A$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $I$ | $N$ | $S$ | $V$ | $P$ | $F$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $S$ | $E$ | $I$ | $N$ | $N$ | $V$ | $D$ | $R$ | $R$ | $I$ | $T$ | $E$ | $N$ | $V$ | $V$ | $K$ | $L$ | $F$ | $K$ | $E$ | DEVVNNVEK NI A E N L V K L F D E D H T I P F


$N \square H E L L A E$


A EMQN IDRRTART IIKLFEE ENT IP F

 | $L$ | $Q$ | $Q$ | $Q$ | $Q$ | $E$ | $Q$ | $S$ | $L$ | $E$ | $L$ | $L$ | $E$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $A$ | $T$ | $P$ | $F$ |  |  |  |  |  |  |  |  |  |
| $R$ | $E$ | $R$ | $H$ | $V$ | $R$ | $E$ | $A$ | $V$ | $A$ | $L$ | $M$ | $D$ | $E$ |
| $L$ | $E$ | $C$ | $T$ | $V$ | $P$ | $F$ |  |  |  |  |  |  |  | MS D GLLWDIG E IVVSKR C A T N Y T V


 VK S VN T R L A E E LS

VGEGQVAAAVR LLDDGATVPF $N$ V E K $\square$ G A R M S I S P A l A R F V V E Q T K R G S TVV

E S IVLA QVEKDPEKLAKNLVSLLSEGCTLP F



MD VD WD V VNEVATTCGTDRRTTS R VI GLFNS GNTTP F I A K DVHVEK PVVANVVQLLKE DNTVPF M T D $\square$ K A R V I D T $\square$ DLLT D E V Q $\quad$ I D R K L
$E R \square L L P L N A D R F V L T Q A K E G A T \square P F$
$R L L L P L H A V R F V L T Q A K E G A T V P F$




VARYRKERTDGLDEGQLRAVAAAHAEWTRLESKRESAFEA MVRYRKEMDNHMDADAVRDVQLVYQELCSLAKKTQSVIQT


 I ARYRKEWTGSLDEVQI RAIILERWQYMMQLEDRKEEVIVRL
 I
I
A R Y Y R K K E A T G G A I A R Y R R GVTGGSMT P D QL R DL K D S Y E Q V K VI K HRAA T I I K A $I$
$I$
$I$
$I$$R$


 I A R Y R K E K T G S L D E T QL R DII WER Y T Y L S E L D K R K D T I L E A I ARYRKEATGGMDERALRRVADRLGELDKLEQRRDAI LAA I A RYRKERTGNDLDENDIRSI DE LINAKENNLHKAKQTAI N W I $\begin{aligned} & \text { C R Y R R D Q S G G }\end{aligned}$ I A R Y R K E N T G S L D E V A I R D I E E T Y D Y V L L K L E T R K E E I L R L I A RYRKDAVDHLMPDRLQELYESYQHIIQLKKKVKSVLET $\square$ A R Y R K N M T G GMEPD K L
 I A RYRK DMTGGGMEPDK L R ALLKESFDHAKMI K QRA HT I L K A LARYRRDETGHLDEKALRQLIDDMEELQEVQRRRAFMLKS

I A R Y R K T A VD NLMP DRLQELYETYQNVIQLKKKAKSVIVT LARYRRDETGNLLDETA I R QLLDMAE ELSEVQRRREFMLKS


DARYRKEATGNDDPDADRADRSKDSQCKKVIEKVGHAYTD

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




LE K E E K LTT E D ITK Q D L LDCA K S DD E LDD H MY AP F K P A N K S $L$ A D
 L E K S G DL N P A LA R A VAA A A D T P T R L E D L Y L P H R P K R A T RA S I E E LGGK M T P E L M K N I ITEA K T L L K E V E D I Y K P Y K S K K K T K A M
 $L$ K K S S N K L T P E E I E Q S L L S A R N L S E V D L V Y G P L K S H S Q S L A E UniRef90_K1SRX6 UniRef90-E9BAN9 UniRef90_R7L9Q0 UniRef90_A4H6I3 UniRef90-A0A023EY82 UniRef90_K1Z4F9 UniRef90_GOVOX0 UniRef90_X1T6I5
UniRef90_B7Q3H7

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UniRef90_UPI00037F4F80
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UniRef90_F9UKJ9
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UniRef90_C8Q161
UniRef90_L2F7A7
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UniRef90_UPI000360615B
UniRef90_A8EWB1
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 OARQAGLEPGAEALMRDGSAPASELAASFRGSSDEEDPR TAMKQGLEPLANLLQSAKLSKEAFMSEAKRFVRGEVKDVA EAAALGLEPLAKT:MQNRDESFNVFKEAAKYUSEKLPNTE QAREAPETALSDYQAPAPVQDDNGEAEASIFEDKEKQ QAREAGLEPAALALHQ NDSPTDADADYQDPEPTVNEKG VADANRLTPLADILEKAELEAEAFEKKAQSFVNEKVESVK TAMLDGGLASLADKMQSMGYPVORLNVNKFVKGSEHINANE
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UniRef90-FOLRF7
UniRef90-R6ZBB6
UniRef90_TOT5U0
UniRef90-D4XVUO
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UniRef90-A4RY29
UniRef90-H3CPT
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UniRef90_B7Q3H7

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| UniRet90-O7NDT8 | EALAGAA | LAEAAAERAPLLRAWVRAYLL |
| UniRef90 ${ }^{\text {D }}$ | FAIEQAQY | d |
| UniRef90 UPI000464B62B | QTI EQVKY | AQIISQDISTREFV |
| UniRef90-UP1000 | D L L ${ }^{\text {a }}$ | AEGCSADPELRARLRRLFVR |
| UniRef90-A6Q872 |  | YAEQPKEREVLRQMVQR |
| UniRef90 F9UK.J9 | FAIEQAKY | SQWISQDVETREFIVKEQIKNY |
| UniRef90-B3PNC1 | AVIGQTKY | AQTISQDIEARENIKKEIYQYGWI |
| UniRef90-D5V6R7 | ALKGASD | RYADDFKSKEIVRNNILNH |
| UniRef90-C80161 |  | E W |
| UniRef90-L2F7A7 | EVLQG | W |
| UniRef90-D1B1Y3 |  | S |
| UniRef90-UP10002558ADA |  |  |
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| UniRef90-R0FII7 | SALNGA | ERLTENADLLGRLRTYMQSEA |
| UniRef90 W4V9D4 | DAINGAMD | VAEDISDDPQ RSVVRDAFIKQGVI |
| UniRef90_I0U | EALEGARA | L D RAATDPALTGRLYDKLVATGTI S |
| - | SAN GA | WANADLKESLNSLKESGV |
| UniRe990_C4L139 | eatplub |  |
| UniRef90_-_OLRF7 | A ALDGA | VMER AEDANLEK R Q HLTR RAE V SRVVE |
| UniRet90-R6ZBB6 | K A | VAETVAEDPENVADLRSFTEGT |
| UniRef90_TOT5U0 | K ALAGAC | LIESFSEDNRLLS WVYNETWSYSS |
| UniRet90-S3GE44 | EALPFVQA | I GEEWGEEAALRQTLRTKVRNEA |
| UniRet90-D4XVVU0 |  |  |
| UniRee90 F7xR07 | DAIAGACD | LAEETAHCNANRAALKSFYLSAGV |
| UniRef90 E3H5G1 | EALDGARA | DDRALTDPTLLAERLHERMVATGMIS S |
| UniRef90- 'w | EVEKGVQH | I AEVVSKDKTTVDYLRSCVKDMGQARKKTKK |
|  | DAINKS | E DVAN |
| UniRef90-E5VUH | EALQGAKD | EMISDDAKYREWIRRSFKENGR |
| UniRef90-UP10004729C | FAKEQTN | L A |
| UniRet90 UPI000441E896 |  | ADMVAKD |
| UniRet90_UP10002C30001 | D ETGV | LADMLAKDKDT ${ }^{\text {a }}$ |
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|  | QQ |  |
| UniRef90 M 7 A534 4 | A ALDGARY | I ERASEDAELVGSVREKFWADGALRTIMRS |
| UniRef90 L8GVZ9 | DVIEGVKH | AEMVKGGARDLFERIAYI NATRAAESDSSK |
| UniRet90-R6YBK7 | EALQGACD | AEGFSDDAADRKRLRAMLQKNGVLRS |
| UniRet90-A4RY29 |  | AERAANETSAREAARRSTWQNGRLQCALTT |
| UniRet90_H3CPT9 |  |  |
| UP10003 | GVQ |  |
|  | D E EGVQH | L ADMI AKDKETLDF!RTLCQSR |
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| UniRet90 D6x0 ${ }^{\text {d }}$ | G | A AV STDSE |
| UniRef90-UP100021A7C13 |  | A |
| Q3EUM7 | G | A EMI SDEATYRSWIRNIVTRKKGMSSSVKG |
| et90-U61QP8 |  |  |
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|  | G1 |  |
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| UniRef90 E2BQE | A ${ }^{\text {a }}$ | ADUVSKNKELEKVILLRKTSV |
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| Q29 |  |  |
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| UniRef90_D2QZJO | EVLLGVGH | R |
| UniRe990-AOAO34WFQ7 | KVLQGICH | SHNDSKHTGVLEELRRLQKVHRIVNNAVHS |
| UniRef90-V605L2 | A VE GAR |  |
| UniRef90-T2JJ30 |  |  |
| UniRet90- C1FHE5 | A AMRG |  |
| UniRef90-K2FEC8 | W W | I GAEV |
| UniRef90-UP100026577 | DLLQSDRY | RRSRAVLDLMEDDSRQ |
|  | AALLGAHE | S DQPEYREWIDR ${ }^{\text {a }}$ (RKFGM |
| UniRet90-G6DD39 | KVEAHV | VADII YKDTRIVIEQMRNLLQSSRVKSTKMKY |
| UniRef90_UPIO00258E611 | Ql KDGl | 1 A |
| UniRef90_UPIO0046F3796 | GA |  |
| 隹et90-K6W |  |  |
| UniRef90_H9KEH1 |  | TIFDKVKEDQNE |
| UniRef90-K4E | Q ${ }^{\text {a }}$ | Q |
| UniRef90-X0X | AGSRD | $\checkmark$ |
| UniRef90-H9JAN5 |  | A |
| UniRef90-G4VK34 |  |  |
| UniRef90-G5C9T9 |  | DMIAKDKDTLDFlRKLCFYITTYFLSIMVI |
| UniRef90-K1TXF4 |  |  |
| UniRef90 U6HS53 |  |  |
|  |  | AADIISKDSENVDKVQNWCNESNRDMUVSKK |
| UniRef90-G7YCY4 |  |  |
| UniRet90-K1SRX6 | EAIOGA | MVS |
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| Ref90-X1T615 | QALQGARD | IVAEWINENKQARDHV |
| UniRef90 B703H7 |  | WLVRMSKSPG\\|MLTATKSSSAAKKAKEALTE |

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210
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NAKDEQKDYEQYYDFDESIIQSLIKEFRTLIA|IDRGEKVGIVLS DFPPGSTKFEMYRDYRIDVRSVAPHNLLALFRGEAEGVIA SFKEDG VFKNLLAKSEKIAYHPSYRYLAMMRAVREKELS NAEDEKETFHMYYDHKERVSKIPNHRVLAISRAENDK I S DANDEKQVFLQYYDFKERVKFIPNHRILAISRGADKKILS
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KDEDSVYRMYYDFSEPVAKDASHRVLADNGEKEEFLQ GKDSEGAKFADYFDFSERIRSIRSHRVLALLRARQAGIVK GKKEKSEKYRDYWDHKEKVAKAPHHRLLAMFRGEKEKLLK QAEDEKEDFAQYYEYEEKIAGUVPHRVLALNRGERTDVLQ GKERDGEKFKDYFDHHNPSAKC
ADEKTPYEPYYDFSEPARKDPNHRDADDRGEREGKDR EAADDKKTFQUYYDFSEKVGK QGYR LALNRGEKLGLLK AAEDEKEVVAQYYDYEEKVVGIVPHRILALNRGERTDVLOQ DAHAAHSVYQMYWDYAEAVRDIKAHRVLAINRGEREGILD GKPKDDDKFQDYCDFTANVKRVQHHQILAINRGENDKI LT

RDMQCFLLSRAKKNLQSSHKYFRPYDILATNRGENLK ILT STASDGSVYAHYENFSKLARYAKAHQILALNRGEKQKFLK AAKEEDSVYSDYYDFSEPVKRLQSHRVLAI NRGEKEGFLK NGKAAADALRDYYEFNAPLRRVKPHQTLAI DRGEAAKVLR
 VNEKDVDKFLLYQNFSCNI RNIQHHQLEKLMPLKKKNCLK AKEKEGDKYKDYFNYEERLKRSPSHRLLAVRRGEK
ATKENSEKFDNYFDFEVPLKYIKPHQVLAINRGENLKILS KEKDVHRKYETYYDFNANTNY $\backslash K P H Q L L A \backslash N R G E A Q K F L N$ EEKDEK
 GQESTGAKFSDYFAFSDRTRSIPPHRVLALHRAKDAGVVR KKVDEQKKYEQYFDFK LNVNYIKPHHILAINRAESQKII S AACSASQKYEQYFDFKMRERNIKPHQILAINRAESQKVIK


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

K N K T DASKYETYYEFQQDVRYLKPHQVLADNRAEKQKFLT GKEEEGAKFRDYFDHHEPLSTVPSHRALAMFRGRNEGVLQQ RKAEEKDKFEHYFSFTCCTKYLRPHQDMALNRGENQKVLS R
ARRASRDAARDYLSFERD DQR DQPHQYDALCRAETAGVVR E K K D QVVPK F T L Y F D F S LLKI S R I K P Y Q I L A L N R WE NLLWUL N T GK E C S D N F R DYF D F A R K V S A M E S H Q L L A LiN R G E Q Q G FL L
 EGKDTD RKYEMYYDFDTNTT II KPHQQLAINRGEA QKIL S GKDEEAAKYRDYFDFSSPLKRCTSHRLLALRRAEAE GLLLK

K E K N M H R K Y E $\square$ Y F D F N T N N R S $\square$ K P H Q I L A $\square$ N R G E A Q K L APRKKKKKFAAYENRRWSVQRISAHNVLALQRGESKGVLL GKEEAGAKFRDYFDWEEPVPKAPSHRVLAMRRGEKE GFV D S MKETK DTYK $\square Y$ F D WK CPSHF VK S Y QTL A L N R GEDEK IL S FPRKKSAKFSPYNNRRWYVGRISAHHVLALQRGEAKGVL Q
 GKEEEAAKYRDYFDFSEPLGKRCSHRLLADRRGESEGLLKK
 S GNIISQAEFEKYFDFKHSDKELYPF IFFLALKRGESLDKI L K


PEEKTPYENYYDYGEGVNKIPGHRILAI NRGEKEKVL N
 EDEKSAYEMYYDFNEKVNRLPSHRILAI NRGEKEKFLLK KPRKKVARFAYYDKKSWSVQRIAAHVVLALQRGEAKGAL K KK T N A T D K F E N Y Y D F R K S Y L Gil K P H Q V L A i N R GEE Q H E L K



UniRef90 17LL83 UniRef90_Q7NDT8 UniRef90-TOJRK9
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UniRef90 L2F7A7 UniRef90_D1B1Y3 UniRef90_UPIO002558ADA UniRef90-UPI000360615B UniRef90-A8EWB1 UniRef90-KOWAH8 UniRef90-UPI0002625F62 UniRef90 R0FII7 UniRef90-W4V9D4 UniRef90-IOUT50 UniRef90-F2K142 UniRef90_C4L139 UniRef90-F0LRF7 UniRef90-R6ZBB6 UniRef90-T0T5U0 UniRef90-S3GE44 UniRef90-D4XVU0 UniRef90-W5NHU7 UniRef90-E3H5G1 UniRef90-W4XBF9 UniRef90-E5VUH5 UniRef90_UPIOO04729C80 UniRef90_UPI000441E896 UniRef90-UPI0002C300D1 UniRef90_UPI0003C296DD UniRef90_LOWLU7 UniRef90- M7A534 UniRef90_UPI00033334C1 UniRef90-L8GVZ9 UniRef90-R6YBK7 UniRef90_A4RY29 UniRef90_H3CPT9 UniRef90_UPI0003EDD303 UniRef90_UPI000274043F UniRef90-X1VH61 UniRef90-D6X0H8 UniRef90_UPI00021A7C13 UniRef90 Q3EUM7 UniRef90_U6IQP8 UniRef90-D2NPD4 UniRef90-E91RW8 UniRef90-A0A026WA20 UniRef90-E2BQE5 UniRef90-WONUH5 UniRef90_Q29BD4 UniRef90-J9G4Z4 UniRef90-D2QZJ0 UniRef90-A0A034WFQ7 UniRef90_V6Q5L2 UniRef90-Q17DE1 UniRef90-T2JJ30 UniRef90-C1FHE5 UniRef90-K2FEC8 UniRef90_UPIO002657745 UniRef90_W7AZN4 UniRef90_G6DD39 UniRef90_UPI000258E611 UniRef90_UPI00046F3796 UniRef90-K6WU06 UniRef90-H9KEH1 UniRef90-K4E9M8 UniRef90-X0X512
UniRef90 H9JAN5 UniRef90_GOUBM0 UniRef90-G4VK34 UniRef90-G5C9T9 UniRef90_K1TXF4 UniRef90-U6HS53 UniRef90-T1FPB5 UniRef90-G7YCY4 UniRef90_K1SRX6 UniRef90-E9BAN9 UniRef90-R7L9Q0 UniRef90-A4H6I3 UniRef90_A0A023EY82 UniRef90-K1Z4F9 UniRef90-G0V0X0 UniRef90-X1T615
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V R $I$ Q $\square$ HE G $\square$ T K S $\square \mathrm{LREDWVAKANVDFQQE} \mathrm{\square HVA} \mathrm{\square S}$
 LSIDAATPNARSVYEREVAAADR DPVQVLNTVDWLAATVR

VRVGVDTQAAVTRLGSR VGFDHNTDKMIRFMASRFKNK

WPRRQGPFAPVLDAA\A $V$ K LVFDETLFLKRALSKF K LKI DINDKLVKHNLSNMF VKITVD LDDAAVEQVQEAVH VKVNIPDRVKSEFCRWCVNRRWRORYHRDAIT L S D EYENVRSGYEREVAARWRPSGYAREHMKILRRAVE



 VKVNISDGVKNEFCRWCIQNRWRPRGFARPEMKGLYNSLD VKVNVPDGVKNEFCRWCVNER

 FD VADHQALLDLIRKDY RLVHHQPAAASDDVIEQAIA VAL QPGEES PLPRILRDVPPRH VKI DFDVAWATSAAMKAMV GSRRDGGGCYNVVSEAVE



VKVVLPDS DFNEF RKKCDKWTSLRGDRVRQDVVKRA VKMTIPEFFEKEFKAHCYKQYNAAITASKLHSKLLNDSIN

VK LSFS DR VVSQ RG VVGRYF LPH DHPTHHVLLWRAFD LKVDVAPPVALSRLRRIPVQVLNTVDDEDRVLGWLAATVR VKI AVVDAFERAFKKSRIAWRQERGDNMKMHWDLLSDSI D
 IKIVIPDTFEKTFKKYCLSRYSFAANVTRLHMDLFSKSVE
VKMDTNDY LKRD LSRF $\square$ SEQYMSQG LQYP LRRETFNRALE $V S \square S P D S D S C V E R L R R R F V$ V
VKIVTADYVKND IVRFTRELFMNEGLRYPLRNQVFEQAFE L SLNF DEPPKESYCEQD DMDHGGLRLNNAPADSWRKGVVS $\square K L Q F K D N V K G D L Y W F L K K E Y L Q E G T A S R K R T E L F E A S F D$
VSVE WD DTPAVD A A R R A L VR K G L R GEKAAE VEA AVK
 LT MVCEKHFKK LLE E QFHERCLLDPATRKLIRDALD V K V I IP D WF Y N K LE R F C LTTLWK $\quad$ S N Y WV H K G L G
 V S I T P D D D E C L E R LD R Q F V
$\square K \square I L P D F F E K E F K T Y C Y K Y Y R \square A M D V S K L H S K L L N N S D D$ $V K M I P H S R S K Y T F F S W A R R K F V G F Q R Q E D P K A T M R L T Q C L D$ L R S SPPQ D DP LA L LEAMAV K GENAASQEVVEAAB $V$ V $V$ V V VP D WF Y N N L E R F C ITTLWN G $\square$ $V$ K V L T Q Q R S E S L F F A WS RK K F L G M Q R R G D P A T S R L L K Q CL






 | V | D | M H T V | R E Q Y P A L | N R L |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |


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V

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#### Abstract

290 300  320 DAFERLFKNALTGEVRALKKQEADLASI QTFEANLRELLL  DSLERLILPSUREIKSDLEARAESEALKLFAENVETMLL DSLKRLI YPSUGREIKTDLFERAEAEAAKLFAKSVEQMLL DAYRRLLGPSLEKEARKALRERAEEESTAVFAANLRDMLL   KL WLE KWRPHI EHRLLTEKRLNAEADA I EVFANNLKHLLM   D G L K R L L L P S L K REA I TALKEKASSEA DELFGKNLKELLL


D S Y DR LLAPS $\square E T E \square R Q E \square K Q Q A D K S S \square G L F S K N \square R Q L L M$
DSYERLIY
AAWRKRLHPRDAERTRENLFETAEREADDVFTSNDRDILL LVWKEKLLKHTERKILSTLKMDAEHNAVRVFSDNLKDLLVM EAYKKSVFPADEREIVRGELTEKAEEQAIDVFSKNLKQLYM

 DSYKRLI YPLLCREFRSKLTSDAEKESVMMFGRNLRQLLL DSFKRLIYPLLCREFRAKLTSDAEKESVMMFGRNLRQLLL
 $K \square W L V K W R S Q \square E H R L L T E R R L A A E A D A L A V F A E N L K H L L M$

DSFKRLIVPLLCREFRAKLTSDAEKESVMMFGKNLRQLLL D S L L N R L L L D A WS R L L L F P S L E R E I R G DLLT D M A D E Q A I H T F A L N L R P L L M



DSYQRLVKPLIKREDRAE $\square K$ QNAERASCQVFSSNDKDLLL YAYTKLIK KLVVRRVRSEMKQKAETAS DEVFVTNVKQLLL

DGWKRLMKPCLTRKLRARMTSDAQETSLIVFGDNLRR\LMM TAWRSHLRPRLAERIRHQLLDAAAQHATEVFASNLRDILL Y A Y K K Q I K P Q M DR R MR S EMKENAERAS IEVFATNVKQLLL Y A YKKMMKPLIKRRLRSELKERAETASI NVFATNVKQLLL YAYKNLIKRLVIRRVKTEMK $\square R A E T A S I E V F A A N V K Q L L L$
 DSFKRLLKPSUETEFAGQSK

ECYSKK LQQPLLSRQLRSDLNESAKKAADDVFAQNLKQLLL WT WR $\square \mathrm{KVLMHLETELMGTVRERAEDEAINVFARNLHDLLM}$ EAFTKKLVPLMSRTVRSELTKRAEKASVEVFANNLKQLLL

DGVKRLLRPAAERETRARLRDDADRRAVRDFGANVAALIL


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YAYTKFDKPLVIRRVRSEMKRKAEDASDEVFVNNVKQLLL EAAYENI MKTTHNGI RRDLKKSAEKEAITVFAHSLRHILIM DGFKRLL SVSIETDVRLETKKRADREAIVKFTDNLRELLL DAYSRLIGPWLSRQVRSELTVAAQKEAIKTFTTNLEKYLL

 DAYKRLLKPSIETEFSA
DGWKRLMKPCLTRK RRSHDTSVAQEDS LNVFADNDRRMLM LA Y DKHLEPRMCDQI KNKLKKIADQASID SFASNLKNLLL DAWKRLI EPHLIRGI RSRLTAQAQDTSLDVFSENLRRRLM DGFKRLI KPAIEREIRSQLTEKAEDGAITVFGQNLKQLLM
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ENLI RLLDEENTPTF

 QDVP F D R H D D $\quad$ I A R F
 I D Q S DIVNVLNMLHHKFEVP F


 NKEQELPDNQGDIVRFLELHHGQSDIPF



GMHRKGPSTVNK TREALNLMNQKFEVPF $K$ I REALNLMNEFFEVPF
 K I K E AL N F MRNYF EVVP E I A NVI G MLLH Q K F DI P F K I QEALKFMNQQFEVPF

K पRET पKF $\square$ NQSREVPF IE HVLRFYHEKLEPAY


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


QEERSPSKSNSALER ITREVLGFDRNDYEVPF VNKE DI A K FL E L HH QK LLE I P F

 QKI K E A L G FMNQHFEVP F

पF VQQYEVPY
A L F VDEFEVP Y


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 $V$ A R Y R A A E T G HLL P P A A L R A V E A A V A GAAA

$\square Q F Y R K E Y \nabla P E \square E \square D D \square W T \square Y K W D E K W C Q L L Q R K A N M K K \square$
VQRYCKEYSAGGHGDELY LIQDLDLKWDKLDRKRKVLQTN

 L LYYGK D

1 IA F Y R K E Y VPE LSVY D LWKVYKFDEK WT QLQTRKNNMMRL
 E WLA Y H Y S Q DLLR A $\square K$ E E E S T P E E L R D V H N L L Y Y A H E I P A M Q EK M K R K MYYSHE $\square$ PAMQEAF RKKERERIDRQEK $\square$ AARRKELENAA
$\square Y$ T Y K K D I F E TFT LQQDLWN I Y D LDE K WA H LVNS K RNL E G IA QYRK QVADELDEDVLWYVHSMAMRWRALARRKEDRERA EKERKKQDRRQARLKA
I A F Y RKEHVQY LKMKDLWK IYHCDA QWCNNREKKHLLLKQQ


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VWTHKRDY $\square$ S YFNPVELLS LEELWQKFCS LLDRRHAMDAL
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VLDMQRYQDAD $\square E R \square D R V N S F D E \square R C W V Q F Q \square Q R K D F Y T$
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 $K L P R K R T L Y T$
FKKTQKLKDEDDDTDRMVQSDEEDSDVYNHFTDVDDDFYS


 NRSGSYA
T $\square$ RSGPYA
 YENA QLT $\square D R L L D T L R R K A E S P E E V A D D V E A K Y R P K K \square S A Y E$ LAEAEDGGAETVEDFPDDEQNNDPEPET $\square R Y A N R S G S Y A$ K K P $\square R K G P Y Y$
LE RMRD Y Q LQ LKKR QLS SA DTVEELNDWYAFFMRLYRTRAE
 WK QTPLA DPA I GRALGNA QSKRLLDRLLSRRVKLETMGESAN
 M GKN NK T $\square E S$ Y EA V L K E G R S EE S I S DL Y D LF Q MI K R DL Y T

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Y A R L G A T DEEVR K R $\square$ E A ME D DEE QVE T K K HKAPSR $\square$ S P Y E Y S R L G VEDTYYYSEEILPADKRQEENSTHKHKMAPSNSVSPYA MRRMREY QEAKRRPI SDADT LEQLT DI HANFQS DRNDKYQ


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UniRef90 ${ }^{-10} 4 \mathrm{CFF}$ UniRef90-10YWH9 UniRef90-U4TUM8 UniRef90-UPIOOO2C49B37 UniRef90-E5SFA2 UniRef90-V4KR45 UniRef90-F2AWI7 UniRefogo-B40D1 UniRef90 F1A117 UniRef90-GOMEE4 UniRef90-F6RDY3 UniRee90-UPI000265261D UniRef90-E2AOWO UniRef90-E9H3P9 UniRef90-S8E185 UniRef90-B4L5F2 UniRet90-V2YS57 UniRef90-P34703 UniRet90-S8A9V8 UniRef90-B3MQ64
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 TCSKAGLEKMRMDELEDAKETPEEMASSYTCA MFNSPQ DCRKAGLSSLIARKDGNFGSLVTGNEAEASTYTCETFQTGE VLREAAAWPGKKLLVGETEVAKEPEEMALNYVSAMFEHPQ DYUKAGLWKMGMDFWEDLNESPEVIASKFTCASLE WCATIDDSGLSQALRAAAAGSGARSSEGFTCA TFSKAGLWEVASRFGCDPKETPEEVASNFTCA
N NCNK A GLLGSLLSSKF GNPEE ESPEQQIA SMYYCET

 I CRQS GL GTLAKKFGLLTPDQFGENLRDNYQRHETEQHTTD

 L CVVEA GL A ELAARKY GLLTPEQFGENLQDNY QRHDKQFNSPE

## VCQEAG

LCLKGGLKALADSQVQVPTPHVALAETCMPYपSADFPSVN I AREHGLEAPCRDVLNGKFVDMR KFTAHDQHFV $V C V K A G L K G L A A Q F T M S A T V L G G V L A G \square L T D G E N E F P T \square P$

 I CKDNGLLKMASNFGLTAAQFGENLRDNYQRHENTMPSAE I C R K R G L T G L T K R F G L T P P E Y A E N VVR D S Y Q R H E V E F T S A E LAKEF GTNYME GNLRHTPDLSMDPDVEAELYVDSNFPDPD




MCRKAG I LEMAKRFGDSPEQFAENLRENYQRHDVEFMMVD $\square A Q E F G I N L M D N F M T N M P T E D P S T A A T Q F I C L E A D D T M E$ TLRRKAGLEPVVREMCDDPRMMPEEFAAEHVVPGSAFDSPE LCDKA GLNSLAKRFGLSPEHFAENLRDNYQRHEVDFQTVE

 L A Q R L A A V R T L A E S LLA A E P S A A E T T T E G E A A S P E P A S N D V D V F RKA GI CGGAK HFGLTTPEQYAENLR DNYQRNEPRFMTTE RARRGRIMKLVEAFGIDANQDVHGQPAPVMNPDKAYSSPE IA RE F GQNLMDN YTTNK P K D AT D P S S S AL GH $\square$ C $\square E A D S K$ D
 C Q S A G L
$L$
$L$
A A K F G G L A K K F G G L T P E Q F G E N $\downarrow$ C R K A GLLD G L A K K K F GLLT P E H Y A E NL R D N Y Q R H E V D F K T A E
LAKQS $\square$ ASK K LAEGYGワQPHQNPHTYAEQFADPDSSASSAE V F RKA GICGFAK HFGLTTPEQFAENLRENYQRNEVNFMTVD FAKK S IVSKLA DAFGGQNDLHPDVLADDQVDSDPKA QTPE
 K $\square R K$ S RVVYNLVKA F F P D E P A E F P N N ELLA D S C L D D S R D F K T S A


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 $D \square E T G V Q H I L A D M I A K D K D T L D F D R K L W R P R G$ S D R A HA Q VVLA E LVAKKDPRARDAVARAFD ARGTSAAP






 S V K E G I I D I I A K E I WM Q D E T Q N F I K E L L S Q K G V A K R R S V V $T V L K G A R H M A A V E I D S E P C V R R Y V R F I V M D N A V V S T S P T A A$ EVLLK GARHMAAVEI S CEPCVRKYVRSNYLDMVELSTSPTP A V L K G A R H M A A V E I S C E P C V R K Y V R S N Y L D D V E L S T S P T P
 AVLEGARYMVAMQI AREPDVRQVLRRTFQERAVPQKKGKK
 DV L R G A R H M A A V V E SVLKG A R H M A ALLEI S CEPCVVRKYVRSNYMDNVVISTSPTP A V L K G A R H M A S L M M S C E DP F R K Y V R S I A V L K K G A R H H M A A
 AVLKG A RHMASSLMLSCEVPFRKYVRSDFMDKALVSTNPTM AL REGT QKVLA EMTARS PAVVEAARGALRRCALVKCTAVA
 AVLKK GARHMAAVEI S SEPCFRKHVRSDFMEEAVVSTRPTP AVLKGARHMAAVMLSSEDPFRKYVRTMFFDKALVSTNPTL

 QVLEGTR HMVAMQI A R D PLVVRQCVRETYYKRATVSVVPTK
 A VLKK G A R Q M A A DEI F SEPSSVREYVRNVYMEYALVSTAPTS EVLKKGAQHMVSMQI A H DP LVVRKCVRETFYERAKTTMRPTK EAL K A A R Y M V A V M I A M D P L V R R C I R E T F F E R A K I S I A P T K AVLEGARYMVALQI AREPLVRQVLRQTFQERAKLNITPTK $K V L Q G A R H M V A M Q L S R E P L V R Q C V R Q T Y F E R A K V S T K P T K$ $N A L S M A K D V L A E R A A G E P S A R A A A R K S A T E Y G R L T C E R T K$
 EALKGARYMVAVQISMDPLVRRCIRETFFERAKI CVTPSK $D V L K G A R H V A A T Q L A S D P N V R A R M R E D Y L R H A V V F T D A T L$ HLAAD I SKDENVK QAVIDDM
DVLKGARHVAAYQVASDPNVRQRMRDLFHRFASLTTVTTK AVLEGTRYMVAMQI AREPLVRHVLRQTFQERAKI NIMPTK EVVLNGARYMVACEIARRDTVVRCVVRETFFERAKLCVVAPTK DVLK A A RYMVAT QLA HEPLVRQCVRSTYFERAKLSVVKPTK AVLEGARYMVAMQLAREPLVRQCVRQTFNERAKISVQPTK AVLTGARHMVAMQI SRDTLVKQNVRQMFDENAKIMITTPTK
 RVLKAVRSVLA QEMSFDPQVRKAMRKDWESFATVTVKPTY SALKKAAS QLLTTTEFSKDPSIR QQAREFMEYFGVVTVNPTE DVLHAAKFMVARQLAKEPLLRKCVREGYYERAKLSVRPTK DVLHAVKFMVARQLAKEPLLRKCVRELYYERAKLSVTPDTK EVLQAAKYMVALQi AREPLVRKCVREVVFERAKMTVRPTB
 DVLH A GKFMVARQLAKE PLLRKCVREFYYERAKFSVRPTK MVALQI AREPLVRQVLRQTFQERAKLNITPTK

 ALLHGARQMAVSEVVAEPEVRRFVRNKFMPAAVI STEPTP EVLQAVKYMVALQI AREPLVRKCVREVFYERAKISVAPTR

 AVLEDARRMAAFEDSHEPSVKKYVRGDYMENAVLSTVPTV GALAKLDATIAKRLDGDPRIVGAAVRWLSRNAK EVIHAAKYVVARQLAREPRLRKTMREVYFDRARINDRPTK QALSAASFVLVQELSKDPAIRQQARDFMDTCGLVTVNATA $R \mathrm{~V}$ LQAT RYMMAQEI GY DPHVRYSVRMDYRKYAHITTAPT■ S AL N GAKFMLAAKEI SRRQPVVRQSVVRDKFRTYANFWVKPTK A VLEGARYMVALQIAREPLVRQVLRQTFQERAKLNITPTY GVLQAARYMVALQIA HDPLVRQCVRQTYYERAKISVRPTK
 K GANDMLA E QI A K E P S VV R K FVVRE SFFERARFDVIPPTK E L L GRARMTLA TELGKDPLLRQRIRDAFKS DAVVSVLPTE EVLHAAKYVVARQLA QEPLLRKTMREVYFDRARINIIRPTK
 $M V L N G A K F M L A K E L S R Q P Q V R H S V R Q E F R Q S A H F W I K P T K$ E ALKAAKMMLAEEFFMNPVLRRVVRQKDFDNGQLHVKTTD



K GVEEDDEFHQYLEGMAALDVFGTDLYMRVEKAEKEGFVT K GKKEVDEYSFKYLKNKPVKELTGEQFLKMCLAEDEGLLS K GSK E II DCYTFK Y L K N K P V V R S L Q A D Q Y L K L S M A E E E K L L K K G L K E I D C C S DiK Y L K G K K E I D N N H F KY LLK S K P L R D L H GE Q F L K M WHA E QE N L V K K GMKE I D CFTMM Y L K E K P V R D L T G D Q Y L K L H I A Q E D K L L T E IDDEN HNLLYP DK F L K DK P V R Y L VD D Q F L R L MVA E Q D K L L T SVID E L H P M H P F F L T E K P I T E F K D G Q F L H L L K G E S D N L L T
 $K$ G Q K E I D C Y Q M K Y L K D K P V R D L C A E Q F L K L NVAA D D K L L T

 K G R K DVDE Y S F K Y L K N K P V K E L R D D Q F L K I C L A E D E G L L T


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NGDENSPVYSMMK VAK K P V S D LF G D Q F DK L M M A E E E K L L E


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

 R GVVVK I N E T H P Y F N F K Y L L H K K L S T S Q F L Y i L R A E Q E H L V N K GRRDT I D Q T H P L Y $\quad$ D K S K K PV R S L T A E E F L F Y H K A K E D G L V D UniRef90_M2QMK3



## IT F L E E F E G N A D Y V E K A L Y Q L D Q F A K H V Q E WN K L R A E C V Q 






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UniRef90 A8WJL UniRef90-UPIo003D778AE
UniRef90-11PWW1 UniRet90-E4Y341 UniRef90-D8QTN8 UniRef90-E5SBBQ8 UniRef90-B9IHKO

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 D STKRFLIPSI ERKVRKKLLDRAENSAIIDCFAKNLRELLL


| DAWKRLLKPRGKREADRRRVDAAKVEAVACFASNVKHLLL <br>  <br>  <br>  Y S I N T Y TVVPMLERGVKRFLSKKSSEERSSVTVFGRNVEQMFS DALDNFLLPSMVKEARSLMSGRAKSWLLMEYGKAL DAFFNFLLPSMEKEARSLDTAKA <br> EGLLDKFSSMELRRDKALRKKRAEDGSCSVFRSNLKALLL DAVSTFLLPSMERETRVVLTGRAKQWVATNCADQL <br> KCFNE IADKY LCRCDWNNATKVAEMEALECFSRNLKDMLL <br> D A L F GFLLPSMEKEARSLLASRA <br> DALERFLLPSMEKEARALLTSRA <br> DALLFNFLLPSMEKEARSLLTSSRAKNWLVMEYGKVL <br> DAFDKFLLPSMTKEARSLLNSRA <br> DALNNFLLPSMEKEARSLLTSRA <br>  <br>  <br> DAFLNFLLPSMEKEARSLLTANA <br> D A L F N FL L P S MEKKEARSULTSRAKNWLVMEYGKVL <br> D TIISNLLLPS SMEKEARALLNAKA <br> D AVHGFVLPSMEKEARSLLTSRAKTQLLSEYGQVL <br>  <br> DTISNFLLPSMEKEARALLHAKA |
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EAVVAF LIPS LQEELRREWRDSAQDVVLRRCGDAMRKRVM RALTQFLYPQMAKELKSKLIAEAKESIVRV

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

$M A L Q S \| L Y P Q L A K E L K T K L V A E A K E G \square I K$
LAALN R MVIP HLKK KELRTNLIAEAKECVMRACCRKMYNW LAALSKFVVPPSLVKELKAKKLDNEAHEFVVKRACCQQLYNCL EA L E Q HLI PVGI K WTREWVREEAEDYLADQCSQULRD LA L K K WV ETIEQHLIPAGIKWLREYIREEAEDYLANVCSAQL
MA T T EMLVPYMRDELYNT LEEA
1AAMEKLL



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| UniRef90_UPI0004411187 $\downarrow$ WM H K R D Y $\\|$ S Y F D A VEELLS LDD DLJW K Y R S L L E R R A A L D T L |  |
| UniRef90-G7L2P7 TAMYRKEKCSSLDLEQLWALQDDDRKWLLLQKRKSALQKR |  |
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| UniRef90-L8X3F7 IVWHRRDY S HFERVELLTREEDWKKFRALLERREATFRK |  |
| UniRef90-F4P408 - |  |
| UniRef90-K5XGS5 $\quad$ TWAHKRDYLCHFDTS D T R T R RELLQKYRSLLERKRVLS T L |  |
|  |  |
| UniRef90-W2RQ41 I Y Y NRKDYLI HVDRT RLWEDFEQDLKFRALIEKKRRALSKA |  |
| UniRef90-L1IIY7 ILA Y R K EWKPELRAEDLWTIY DLDARYCFLKQRK |  |
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| UniRef90-E9H8M1 |  |
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| UniRef90-S6BSK0 | TWQHRRDYTPLLSQNDLWNDFFDCTKFWSLHSKKQD\LKL |
| UniRef90-H2WA76 |  |
| UniRef90_UPIO00440793F \Y A HRRDF】ELLNQDDLWRL |  |
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YS D LG $\square$ ND D LVVPFCEAASS DDADDD DYSFFEKFRKS LYYN MEYQEQSDDSTLKRVNYTETLEQLTDVHANFQSDRSDKYQ YEN【DAHDEYYEGQLVNMDSVEVVADVTKHKDPSRMSAYE EVKKPKMPSRDSAYE


Y $\square E \square H V N D P V V D E Y F K N Q T T A S T \square Q D \square Y L L K N P N K K H L Y E$

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 VARGTIVSRLADKVHFPDDQDLPPRAYAEQFIVTESCPTAE DAKKNNDGGLVNLLPEDHHESPLVAASQFVSPR ESPDPS
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UniRef90＿E9H8M1 UniRef90 ${ }^{-}$B4MQH7 UniRef90 E9HI32 UniRef90＿S6BSK0 UniRef90＿H2WA76 UniRef90 UPI000440793F UniRef90＿A8NF94 UniRef90＿S3DQ53 UniRef90＿C5PIH2 UniRef90 K8EAY3 UniRef90＿D8LQN4 UniRef90＿W7UB84 UniRef90＿S6EUK4

ETLD QH｜LLPVVIVIKWTREWI REEAEDY｜L｜ARQCASVLIRD DALTKDVMPELRRELHAVLLQESKDYVLKCCRRRLYDWL MADDEMLLPF LDEGEMEQKLLDEAKQSVIYKCGRAMYSRL EALEKHLI PQAITTWTKEWLREEVED $\square A A L S K F V F P A L V K E L K A K L L N E A Q K F V K R A C C Q Q L Y N W D$ YAAKQVI FPACSKWLKEQLLVSA

 LAFD KIVSIMSRLVKENIKNDCEGKILDECRNVLDDSLD DVFRQL
EALETNLYPTMERMLVEVRQRKAKD LALSKFVAP
DSVQMALKQWV PD DLDKELKAKLQEEALRSCTAKDYKWL LVLSK FLIFPLLEKKLVEKLLNEAKGFVLRACCQQLYNWL EVLSKRF $E$
$\square$
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| lupas_14 |  |
| lupas_28 |  |
| jnet |  |
| conf | 59 |
| sol25 | B |
| sol5 |  |
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