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 REK LVHI I EDLLK
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E L E E R FAVLK QALLE D HVE GL A R R S



## 

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AEQSAALL AASYQDLNPADLAEI MQE
Q $\ \mathrm{QE} \square \mathrm{LE} L!$
L V G Q S V V A L L E
EFVD A VLDAV
IE E I K E L I
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D MQG
Q A D D
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EI I ELL
$N Q A A$
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KK F QLAN
 E EF $\quad$ Q L $L$ RRMVR RRLS SLHPAEVAHLLESLL
 D I L E N I S A L L A GKLRKEKL
$E K \longdiv { L } A L L E$ E H G A

L A
पFEQVSEYपN E S


QVE Q RLD QLS HALNSGMFVHVRQMLQNMAASD@ALILESS E A L D DERLA DVI E E LLPED D QK DLL L A H L EDFS QLREHLRAND DQAFRSEFLDLHDYDQGQFYLKL EEIKK LLEAKKQFKQLRKY LSEMNIA D IAE ILDEEL


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 DEAA GV
HELLK EVVDELYYVDDAVD IVEEMPANVVKRJLRQADPEMRK E R A A D I L E EMDPDDAADLLGELPDDKADVLLELMDPEESE


## K

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## S

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 T TVABEALAMARNDL
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## K


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 E ESAPV
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## $E \operatorname{LRQLVNQLALLLE}$

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## Q H V E G L T Q A L P

 A$E L R E L V R Q L Q M L L E A G D L Q G A K$
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$\stackrel{\square}{\mathrm{F}}$
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 D R VMI V S S LLEDT K GIVSQMEP ENQQHLINSMTD D PERQVSILEEGMDS
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$P$ E
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PEK $\square$ QAI AFRLLPKDKA IEVVEYL D
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 TEELKEVLDELYY DDDAVDIVEEMPAGVVKRIVLKHADPDTRK KELRETVNELYVDDTVDVIGEMPATVVAKILVNASPDMRR

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 KELDKELLDEGYMDDTVDLLEELPANLVTRGLEQVDREKRA


 K R A A D I L E LIMQPDDAA DLI GEMMKPDTADELLLSLMEPDEAA

 REIHYIVHEMDFDDKUDILEELPANVVDKGLEKTPKSERR ERAAEVLEEMEPDDAADALAELPTGTSDVLL E LMMDPEDSA D
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 ERAADVLEEMEPDDAADLLNELPDPDAESLLELDMQPEDAD EAVAELTEGLEADDVVDILQHLPETDMQEVLAAMSEQDRH

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ADTA H|LLE
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VEETRD ULGKEDYTK LK SVIHKYHPDDTAEFFEEL FI RQVAEALDHHETDRVYALVEPLHPADIADLFEEL T Q A
 $R D L V R S Q L Q \| L L D Q N N L K G A K S L L I P V Q P V D I A E A I A S L$ $\square D V A D L N Q L K W D L N R L Q A V D V G E Y I T Q L$ QDAEQQVMRLSELKAADVARELHDM
QRQLKA INQALDSGRFMHVRKTI HDMPACDIALLLESS


DLVEQLVHKQNVSELQKKLDADHPADVAYILLEALL DLNE LKELLNQALGSGTFIQTRRMLNSQPRTEVAHMIESS



DEVVA D QL

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ESELDKLNTALEEGAFRQIRYTLNKLRPSEVAQVY
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UniRef90 UPIOOO37DF27B UniRef90-R7HGM7 UniRef90-UPI0003FE8471 UniRef90_A6LYQ9 UniRef90_UPIO0035F05CA UniRef90_G2IY80 UniRef90_UPIO002490D3E UniRef90_UPIO00408815A UniRef90_UPI0003A3D55E UniRef90-H3NPX1

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EPEDQWKVLTHLCPSSTRAEVVVEMEE SREQANEVLEALNDE $\square A A D A V Q E M$
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$\qquad$
VS DAGDRARLIRLYDREFDGEILSEL DES PSAQAAA LEELSSDHDVDVLGEM PTARMDEVVGELPDARVADALEEMSEPD NEDEATYLI KLLESDKTSDVLTELLDEDV QLVI I EHFPQ俍
 RNEEIVLAFR\LPKD\AVEVFSYLEDD AFERAADID AMNPD AAD GA ELADAEQQEYIIQSDTD


 PEKHRSRFI LLLDPE QUADLLEELERDEGQQYGVLVKLGV DDKNKSILFRLLSTEKAADVFSEL DSNE QEALI SSMND
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 ERAADVLGEMDPDDAADVLSELDEHRADVLLEMMEPEDQK




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D R TA D V L D R ME P D D A A D LI S A LP T A KGE E L L D L M E P E EA E

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S R A A D VLLEK MP A D EA A D ILE K IDD DHKA E E I L N E M E K E T S E A N V V D AL E E M D T D D LAA E T L S S L P E P V L A D I L D S M D A Q D R L D E L V D A V E S LD T D E I A D L V E D L P P DVVVA E V Q KE I A E E L E EMDS D DAA DI I A E L P E GRA E K V I A Q I E D E K R E $V \operatorname{L}$ E K S G Q V M D L M D N D D LAA L L L E G L S P G R I E E L L A G M K Q E E S Q E E L VEALE G L L T D D MA DL L Q S L P EA VI Q E T L S S M K K L D R D $N$ QL M E LI H E M S P D D R T S L F E E L P S D I TM N I F S L M K E T D L N
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| UniRef90-G2IY80 | QL Q S A |
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| UniRef90-H3NPX0 | II NQYLQ |
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| UniRef90-UPI0004777A9E | QL R S A |
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| UniRef90-E8SEN4 | EIKA |
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| UniRef90-Q08TP7 | VARQL |
| UniRef90-D3QDZ5 | El ${ }^{\text {a }}$ A |
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| UniRef90-17K8X0 | N |
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| UniRef90-V9XMM0 | PV R R L |
| UniRef90-U2T2P7 | NQ |
| UniRef90-A0A031FRW1 | DV $\mathrm{L}^{\text {D A M E P D D }}$ |
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| UniRef90-F1Z735 | A I E S A |
| UniRef90-R0EQB3 | R V R Q |
| UniRef90-E6U6A8 | EVREL |
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| UniRef90-UPI000475880E | D V R M L L |
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| UniRef90_UPI000465537F | E L N |
| UniRef90-M5DFV9 | QL R A A M S Y PE |
| UniRef90-Q3A6Z6 | EI EQLLKYDE |
| UniRef90-G8XBD5 | D 1 VEL L R Y D E |
| UniRef90-Q5WK29 | E EL |
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| UniRef90-F5RCP1 | QLRAAM |
| UniRef90-K2GML1 | EI K DLLHYEE |
| UniRef90-V9VNU5 | E Q S L |
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| UniRef90-Q60CJ8 | QLESV |
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| UniRef90-R5ECW5 | QLRAAM |
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DLKAGI DIGRLLDSETTSEVLVMDVD

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 NAFDRMRLVKLYDREFDGDLSEL PPKERKLLWELIEAKNEGEVLQYLSEDEGVQEEVIKKNMP DAKTGLTI FSSLDNATAAEVLEEMEAD AQVSFMESLSV TSEHRAVVVLWLPPELLAETLPEL DDGDREEVLERVPH PPRQRAIVWNMVSPEDDGEVLLHLGDD NAFDRRRLDELYSNEFDGELLSEL PENITREVAWRIMDDETLATMFDNLEV PEAMQAI AFRLLSKQEATEVYEHL
 SEKARLVLYHFLSPQEAADMFELISE PDKHRARFL LFLKVDLLAHLLEEL

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UniRef90_UPIO00417B5A6 UniRef90-G5GG93

UniRef90 A0P AL9 UniRef90-UPI000427FDFD UniRef90_F6BFS4 | UniRef90-R6Z241 |
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EKS S K|VMDDMDND DLA D M|L|GE|L|VERDEEY|L|ATMKKEESN KELSYI IEDLYVDDMVDMLEELPANVVKKVINNANPSTRT KELSYMLEDVMSNDDMVDMLEELPANVVKKVMNNANPSTRT
 MDASRLLSAMDPDDAAELVSELDYDKAEKLLRLMGVKEQH SEVLEALDQGKLKRIARLFHKLHPARIAGLLESLPATERA EKLAAVTEGMESDDIAYVLRSLPDDKYQEVLAQMDATDRH DEGRHLLSEMLPDDLTALLEDLPKDEVRQLLRLLPFRSIIR ERLAAVSEHFESDDLADDLLQHLPEKIVKEVLASMSTQDRT DKAAEVLKEMPADEATDILDGMDAAKVEELLNTMDKDSSD GTLAEALQELDSDDAAAVVEDLEDDQRERVLAAMPDVDRA NELVAAAGELDIDDDLADFVEHLPETVTQQVLKALDADDRA EVLVEAVRELDSDDVVDLVEDLEEDQQEAILEALEDSDRA NYASEVLQNMSDDDAVDVLNLLSKTQRVSLLTIMDKHKSE QKGADILVAMFADNEADLLQAMPARKVANYLALMPADEVK
 QYAADMLSHMFTDNAVDVANKLDKLQAASYLTALMNKESAQ NELNETVSDLFFDDKVDFLEEMPANVVKRTLRNTSEAERK RYLAVMLSCMSTDNAVDLLKELDPSVAHRYLRMMPDDSEA DKTGKVLDLMDNDDLASLLNELAPERDKELLSGMKKEESLI

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 EYASKVLEDMSYDNAVDIMNKLSK KDVASLMDRMNPDDAADILITMPKERASEILKKLSKKGHAS SKMVEVFDSMPNDEIADILDDEVDEETAEKLLMGMEKEDAD



S
 EMI AR FDEYMDSDDAADVVA DLDEDVQKEVLNNDE DEQA G




 K EIIA D ETIVHVLQUMPYDDAVDI I QNMPEEL AEEVLDSMQDDCSD S Y A A S L L G A MYSDNAVDVLNS LNRNQVN Y Y L H L M PVESAR K E V S QL L R H L D A D E GA DLL HVVLPENRHDRVL RKIA HAERE
 A DLLAATEDLDADELADLAADLPPDIVAEVQKGLTEAERA A ELLRAAAATLDDADELAADLAPSLDTGLVMEVVLADLDNEERAQ S Q A S D I I E EMMS LDNEAA DL LDS DL P K D KA E GIL K EM E Q D DA E T QVF QIVVEAMSPDDRAELEDELPAGVVKRLLQRLSAAERAQ K ELLK E I L D D L Y M M D D T V V L L L E E L P A N L V T R I L N A V D S S KR N AVAK A L A A MGRDA IAADLLMMAMPNKAQQI MAMVPEEDLE E ETREVVLAS LTTPDDRTALLQELPATATGRLLEMLPPGDRR






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 H Y A A D L L S A M Y T D D A V D I L N K L N K D Q VAA A YL T I M D K E S A R A QVA EL A G Q L E T D D AVVA I E E ME E E D Q R A V L A EL E P A D R A
 G D $\quad$ A A AFH HLLES D D DA E LIA S L P S DAGAEVLAARLDSADQA TAVAEAFDNLDPDDRAELLDELPAAVANTLIADDTPBEERD
 K E I A E EVV E E LDD S D D A A D D DGE L S Q E R Q D A V L S Q I D E E H V K KEASNDVDNLMADDATDLLEEMPANVVKKILANARPDTRA

 REVLDALAEHKLKRIARLGRKLHPARIAGLLESLDAAERA


K V N R L L K Y Y E E V V L L R Y D E EVRELMEYPE

 S V
R I EKALAAYPE RALTLLGYPE AVEKSLTYYE RVEALLSYSE EI RELLEYD


 EVVKQLINYDD STALLMGYE HVRAAMSYPE
$E$ K K LLL H Y E E




 VTAELLGYE KIVK K K L L E E Y Y D E | $L$ |  |  |  |
| :---: | :---: | :---: | :---: |
| $L$ | $E$ | $E G L$ |  |
| $E$ | $K$ | $F$ | $P E$ | Di R DLMKYRE VTATILGYP El R E ML HYED EVRVLMEYE

 E I TE L L A Y Y E

 RLQSMLSYPE

 $A L L E G L S Y P$
$\square V Q D L M N Y P$ RL EKALLSFPE RVEAVLAYDE

 E I SKKLMSYME A L R R LA S Y E E A V E ELLLHYPE $R \vee R S A L S Y E D$ QL LA A MGYPE
 ATAMLLGYAE
 RAQRLLGYPD AVEKALSWPD
 EVRSLMDYED DVCLI Y SYDD $\begin{array}{lll}R L E T A M A Y P E \\ Q L & \text { RTAMSYPE }\end{array}$
 GVRNLID YEE DI REMLQYDE D V A S L MI Y P

K T K T LDMD Y E D AVEQAMAFPE
QI KDLLHYEE

 $E V R S V L S F P$
$A T G V V L G Y P$
 E 1 E ELLALAYDE
 RLEETVLASYE

RVQAALSYPD I TLE LL GYPE

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UniRef90-UP10003B71B9B

| UniRef90-V5ECXO |
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UniRef90 M4х $\mathbf{4} \mathbf{8}$

F VEA|V|GDA|I ENRDRKT $\operatorname{LIRD|LICQD|L|HNADLAD|LTEQ|L~}$
 QQLKQVTKALNSGQQVQVRRMLAETAACDTADLLESS EREIVLLKQLILARKTDEIKDULSRGHPADVAEALEET
ERLEDVDDATEAD EELLKS1 QNPNVEPSTNQLKRLLHGMHPSEVAHTMESL
 TREYVDQVEEAIERQDRDFAKSTMADMHPADITTVLYEL E
MEYYYYMLQAALE

${ } \quad \begin{gathered}M \\ L\end{gathered}$
E T G D T L K D L L
EDTENAKEQFDHLIEQEDRLQMREFLNDQNDSDVAELIYDE
QYEHHWEKLQQALAQDHMEGFRSEFLDMHPYDQAIFFME
 QTELLLNQLNEALGSGMFVHVRQMLLNMAASDI ALVLESS ERARHEAQVTALIQKGDPVDFRDVFLTLHPGEQADLEGEF
 ETKMILQTVRKFIRKEASENVAKILKKLHPADIAKIVQNL
RQUDRNEVEAMI SARRWRALKERLSGSAAPEVAELLLDL
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ELLVDKI DELIKNRSVKALRELEEDVTYHDFAQAFESL
KRWDKLKYLLNDMHP ITEVDVMRIL

LIEEQVENLTTALDRKDRDAVTTLLEEAHPDDVADALEEV
AAVVRALEEERFSIMPRLLRPLHPADQADLIERL QHYVEELVDITRSPKEELDDRLSDYHDNDIADALTKL EGLIGEVASAVSKKVSQVRQFCNQLPLEVVEVSKF E
 WAYLEKKDIDSLKRLLSNAEDMEI LIDVI RDL

REH $\underset{F \mid}{\text { VIP }}$


EALTSLSDTTDWNQLKDRLELNP QDFSKD LSLIRSSSPAVLSERLQDFHENDLAEVLREL ESLLDEI QDKISDNDMEILKVLLKDGYAADIAELIDEL LEQW』PDUTESLKAKTSNDFQRIVDEFLPYDLAKKHSHL

RALDAALRDERLSVASELLH DVQSMLQHEQWREVREAFTALAPQAA
QLYVDHVQSMLQHEQWREVREAFTALEPADVAELLEDL TKEYLEETEKAVKAQNLEPLKAEMKDMTPAELGYGLQDC a TKEY $\square Q Q$ VEEA $\square A Q Q D S E F M L S S M E G M Y P A D I T Y V L Y Q L$

QLTEQLHKAVSDQNTDYIQQLLQGLVAEETAEILEAT
 REEYTYYLFLDSKNKQKEAFREEFLDLHPTDQTEIFKQM


K E F $\square$ S T F $\operatorname{F}$ S N N
$\square N N \square \square P K \square F T A L S K K D Y T K I K N I K K Y R S A D I A D K I S R Q$

## UniRef90 V4RTY3

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

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UniRef90_M4X3Y8

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120 E LI A D A V T E L E A D D A V Y V L E E L D D E V D R E E V L R A L A A D D R V
 ELI AA ATEDMD DDD LGEVLRRSLPEPVVQDVLSAMDATDRA



 D WGMK LL L Q ELQS DELADVLEELPSNVTSKILAYTPQEKRA D AVAAL FA DLDPD D RVVELLDELPATVAARLLHGLPS GERE

 EKRQE IVEELDYDDATDIIDSQMHKDDQHEILEEDMDKEDAV


 D R A V D L F K T A ELLLNELPA D DRTS FLLEELPSEVVVKELI K LLDDPDERR


 E S VGGELVFSNDEA D D RAA L L D EMMPA K VA S R L L R D L L P P Q E R K E R L A R A A A GLLDTEDDLA Y I L R S LIP D S L Y K QV L Q S M S DQ D R S REL LAATSGGMDMDDLAD FMQDLPRTLTGEILHSLDNQNRQQ PFAVRVLNDMFSDNAADLMTELPDDFMNELFELMDETEAT

Q E ET R RLLTDMSPDDRTPLLEELPGQASQKLLNLLSPEDRA Q A F R D D L L E A M D D P D D R A R L L G E AP A K F A R H V L A GLL S P R E R T

 VEVVV A A F D H L D P D D R A G L L D E L P A GGVA R A L I Q QL T R A E R D E VAAA G V V E E M E P E A A A D L L A A E L P H E R R S E A I L E E E M A P E E R Q
 A QIV R F L S VLDD S D D AVVDLI G ELLDEDEQARILQAVPAKARM GDLJARVTAMSHDERADLFNRLTPEQQQALLPGIAHAERE



 H GLA E I IS QMS A D DRVDDLI KN IDDEERQERLLMMMAKSERE SEVVAELLAADLPADDRVDLLHDVAPDVVEEILDPLPLDERR
 S Q V
 NYAANILEDMSYDNAVDI MNHLSKRKIATLLAIMDKDDAK H Q
 E WG M E I L Q E L Q S D E L A D V I A E I A P F I
 ERAADI L E EMSPGSAADALEDLDQDVAEEILANMEPEAAA

 ERTA I L D L M D N D DLA DLLDEELSPEQKDEFLKGMRDEES Q


 DEAAKVLSFMDSDDAVDILDEMDHSTQEKLVGLLDEESGH
 HEI I QLTEALET DDIA DIIQSLPDEEKSSLLAKMPESSRA GRAA E L L S R M E P D E S A E V L R DLLD D E HR E D I L K A M D S K M A K






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UniRef90_V5ECX0
UniRef90 ${ }^{-} 4 \times 3$ Y8

RLRRSLDYPE
AI EESLSYPE
 LINEFLNYPE RATQALSYQD E K K S L I K K L A E
 RI K DVLE Y P VLERSLEYPE ELNKLLSYED LTAAMLGYP TVNLLL GYPE RI REVLQY HI RNLMTYAE DIKQLLTY ETALLMGYEE QVNQLLQYSD MTAELLGYPD $P$ VRRLLTH

 KVKRLMSYAD $K L R L L G G$
ATSTLLGYP RAEQALSYPE R LLEAVLAYPE EVKDLMRYPD SIVDLLRYDE RLEAVLSYP EIHSLSRYPE RAQQLLGYPE MTAALLGYPD DVRRLASYPE


 RFETALSYPD
 DI RRGASYPE DVRLLFSYDE KV N QLLS Y S D RL R RALLEYPE DI RQLLTYE S IKFLMSYPE ETNLLMGYE K VNQ L K K Y D EVASLLGYP
 E: S TLLRTME ELKELLKMAE NI QRLRS Y
AI E DALS S PE
 K $\mathrm{V}_{\mathrm{R}} \mathrm{RALLD} \mathrm{L}$ Y P E ALQASLD Y PD QL $\quad$ AAALGYKE LI NNILKYKE Fi LDLLHYED EI RRLLSYPE IVKSIMKYP DVQELLAYEE $\begin{array}{llll}\text { ATAT } & \text { LIGYAE } \\ \text { DTIE MI RSFDE }\end{array}$
 $F \vee \square N L M K Y P$ PVRRLLKH LTAVVLGFP VTQALGYDE
 F 1 D DL L P Y DE DI KMILSYED Di DDLLHYEE QITAAMSFED A V Q TAL S Y P E
 NI KFLLSHQD RLARSLDYPE EVFTLLSYP MTGVVLGFP LLQEGL SYPE QV REVV V
N I
DK S

UniRef90 H5YOQ4 UniRee90-A0A037ZLS4 UniRef90-UP100040B1CFD UniRef90-A6GVR4
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UniRef90_R9VJC7
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UniRef90-UPIO002D71ABF UniRef90-Q1GFC9 UniRef90 UPIO003FB28B2 UniRef90_UPIO00370424D UniRef90-UPI0004083C50 UniRef90-M3VEW1 UniRef90-C7PCB4 UniRef90_UPI000367B985 UniRef90-H3NHZ1 UniRef90-UPIOOO37E42C8 UniRef90-R7ROU9
UniRef90-I5BON6
UniRet90-R5JHAO
UniRef90-D2MM23
UniRef90 R6QPC0
UniRet90-R5BHF2
UniRef90-X1GTZ6
UniRef90_UPI00036E5A82 UniRet90_A2AO24
UniRef90 B6G1Q4
UniRef90-V71HA6
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UniRef90-G2DQ00
UniRef90-D9QVA8
UniRef90-W3ALT9 UniRef90-UPIOOO370A2DB UniRef90_B8GT66 UniRef90-M4VEC3
UniRef90 E4U8W5
UniRef90-G9SLV3 UniRef9O-UPIOOO3B44A2B UniRef90-E7C6P0 UniRef90-AOLKX5 UniRef90-UPI0002899FC8 UniRef90-UPIO00369CF12 UniRef90-UPIo002DA8E3D UniRef90-S2X8F0 UniRet90_-R7ZRG2 UniRef90_UPIOOO36847C0 UniRet90-G8NPH6 UniRef90-S3A4J3 UniRef90-M7P268 UniRef90-UPIOOO3784243 UniRef90-E8R5V7 UniRef90_H2AHS3 UniRef90-UP100047B9502 UniRef90_UPI00047CAF57 UniRef90-A3ZZV2 UniRef90-UPIO0047D1FAF UniRef90-B8EP79 UniRef90-UPI00028A28B6 UniRet90_G8R5X6 UniRef90-W8QV82 UniRef90-UPIO002F038C2 UniRef90-W5SZS4 UniRef90 X1PPG4
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UniRef90
R5XOZ6 UniRef90-Q7UXN8 UniRef90_R7BKS7
UniRef90_K2GLR UniRef90_UPIO00420A7A6 UniRef90-Q2CDU7 UniRef90-G1UR79 UniRef90-A5EUV1 UniRef90-UPI00047E965E UniRef90-UPIOOO2487575 UniRef90_EESD63
$\qquad$
20
S Q Y I K P|L|ENRTSALQLTREKEQLIRQLHPAD|I|ADEI|EDM

 R S ALL H RLLR P A D L A D D L L E D L $Q \square K \square L T A S L K R L L R R G A T K Q Q L D V L K K T H M A D L S T A F K E L$ ES L Q D V V G G RVEA TLA WL DNHPP HLI A D QLAR M ES FKEVI A TEDKLE I KK F L D $E G V L V E R D L L D S N D I A G L G R W L A G H A P Y E D D E L A R A$
 TEETVEAVIEALAADDDAAVGELGEERPEDVADLLEQL
 NGYLNELTRTLHELHPADMAAVLESL

$$
\begin{aligned}
& \text { K RVA QI LFALDRDDRDALVELLMDPLHPADIA DLIVEML }
\end{aligned}
$$ REEYKKYI I QEI DKENTDKV HETVIDDLDPT DQAE I YR E L



E E Q
Q $Q$ YVK E AKWMQ

N K LI
HS
R A DFVA AVEEA IA E GDS GHVK E
TKDLLDKVEKAVDTKNSQFVEN
QDLLDEVKS LI ENHKYFELREELLS
D $\square$ K Y L VDE $\square$ KE H L S N D N FA E V
MEEMTAEDKKLIARED EALL
MTAETKKLIAREDEALS

$D V I D N L P E E L I A T R D W D A D R G \square L$ T D RYI Q AI VEAL R NGDEDVVSRELA DL S EA DI A E L I I E K V


 T K D Y L K NLE EAI ENK QDS A I R EMMLD GLLHAADI SMILLDQM
 Y DRDYNNLI VK Q K Y T S E L L KA E L K K K M H Y A D V A E V L E S L Q A Q S A E Q LVAT F
QENYA Q $\square$ SEVIES GDE
D LE D F LA C GEA
D GK $\square \mathrm{K}$

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

YLPEL R EMLAAENDHQGLLEFCTAALHPDVDLIDEAFE E L


TSEY IN QLEE DV I A GNAEMHLLEEL N
CELDDTHAADI AEVVDQM
T S E Y IN QLEEDVIAGNAKLFKNDLNDTHAADIAEVVD QM
DH D
VA F L P R A L L E D E K K Y A G A A L E W L E T Q P P Y A I A D E L A R M

K L E T V V R K L I R R N A R H P L E E N L L

LE N R L S R I H L A A L L E Q D R T S E L L I D



$\begin{array}{r}T \\ \\ \\ \hline\end{array}$
N


QT GEK QEDVIE S L L A R Q H Q N D D


## UniRef90 H5Y0Q4 UniRef90_A0A037ZLS4 UniRef90_UPI00040B1CFD UniRef90_A6GVR4 UniRef90_E4N4X9 UniRef90_K0NGM7 UniRef90_UPI0004665DA3 UniRef90_UPI00036A411B UniRef90_UPI00036131F6 UniRef90_UPI000381753B UniRef90-A3UJS0

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UniRef90_G8NPH6
UniRef90_S3A4J3
UniRef90_M7P268
UniRef90-UPI0003784243
UniRef90_E8R5V7
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 S E E QRPKFLDVLLETE QQASLDE EVIDRD E QQLELVV QDNV














T EA E Q C R Y V $\operatorname{L}$ R SLL



## A

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## UniRef90 H5Y0Q4

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UniRef90 UPIO002F UniRef90 W5SZS4 UniRef90-X1PPG4 UniRef90-D4H8E4 UniRet90-FOSQ60 UniRef90_R6BKL6 UniRef90_N9U291 UniRef90-E1V4J4 UniRef90 E9S2C9 UniRef90-E8XP55
UniRef90
R5XQZ6 UniRef90-Q7UXN8 UniRef90_K2GLR8 UniRef90-UPIO00420A7A6 niref90-Q2CDU7 UniRef90-G1UR79
UniRef90 A5EUV UniRef90_UPIO0047E965E UniRef90_UPIO002487575 UniRef90_E9SD63

ERASDU DEEMPPDEAADI TSELSSEKSEELLLSLMESDDAE AAVAEAVRDLESDDVVDLVEDLEVPEQQAILNALDVADRV PEIASYIEELMDSDDGADMLKLLGEREREEVISYFDKLKSE EHAARLVDEMEPDEAADALRDLHPRERETLLDRMPREEAA SKLVDVFDHMPSDDAASLL NLLDEELSDQLLSKMQKEESD HIFRELVEEMDPDDRARMLREAPAKVAKKVLAGLSPRERR QELLALALEDLDADELAELAPDLPKEVVHEVLESLNAEERA RAFRDIVEGMDPDDRARLLGEAPAKFARHVLAGLSPRERGO AQUAEALGELDSDDAAYLLEDLEDERQQEILAAVSAEDRE EKSRKVLDDMDNDDLASLLDDMSPERTKSFLSGMKKEEST QELLAAVEDMDADDLAELADDLPHQVIAEVLQTRDEEERA ERIADIVEEMDPGAAADLLAELPEEQSDAILEEMEPEERQ TEAVEII NNMSPDERVKLLDKLPPQLVRKLVAQLDTPQERE
 LYAANMFDDLNADDAADFLAEMDDDKATEVLSIMQQEEAE RQDADALSEMDSDDATAVVEELDDNRLEDVLSAMPDADRR
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K T I S K I F R Y LDD TNDQATM I GMFPQHKQNE I L TMM DE DD DK E $R R V G L L F Q Q M S N D D V V D I L G N D P \square G \square R K K Y L N M M K G S S Q D$ A N L A R L VGG MP S D E R T DL Y K R L D Q S QR D A L L P A L A Q A E R E E KL L A A I I N E M D A D D A V
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| QETQNFLL |  |
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| UniRef90-R7KXL7 ${ }^{\text {a }}$ ( PAERKRLLRVLDVSVLAEIFEYVPEDSA ALFLDEMDM |  |
| Uni | GSTDQAVLFRLLDKDRASQVFEYL DVAHQAELLDEFRE |
| UniRef90 A0A022LUB0 ${ }^{\text {a }}$ ( DRD |  |
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| UniRef90-D4GK35 PEEARLALWSLVPGEKRGHVLVEASETVWD SLTEEMSD |  |
|  | DENTGAIIFSSLDTAKAADVLEELDEDV QVSLTRALST |
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|  | KGEHRYVVLTLLLPKDRAAEVFSHLPSEEA QAEYLKTLPP |
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| UiRef90-A71893 $\quad$ D HDQRMAVFASLDNEHASDTDEEIE PNVQRDLTASLDC |  |
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| V6G |  |
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| UP1000474C117 SPQESAAALALLPDDRAVEULDKPELDDP AE V ${ }^{\text {S }}$ |  |
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| NQQ ADDQEQA VLR R HLDPQLIA AMLEALEAGKF |  |
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| UniRef90-UP100036C79F4 TPVRAAVVFRLLDRARAVEVFTAL DARHQADLI GALHS |  |
|  | KKEDRYRLYSVLNPETLADVLEY SEKDNEYVGELNL |
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| UniRef90_G4RBZ5 UniRef90 FOL4N |  |
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| UniRef90-M5QFB6 ${ }^{\text {a }}$ |  |
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 ES I ME LI K ELDED ELVVDTLQELPANMVGKL MNHFDEE GRR W R V $V$ Q E S DV S E L T K DLLGA Q D I A E I L L D T V H E S V K E A V I D N L D D S T R E ARAADVLEEMAPDNAT DI AGEELDPQEAEAILVEMQPAEAD EKKSS K V L

 QRAADVLNRMDNDDLAADMMAAVVSVE E QEFLLLS LMERE E S D K K KA A VVVSEMDADKAVF VLQ HLDKKTRDDLI ELI GNDARR
 ERAADI L E EMPADEAADVLDGLQEDKAE EL
 D K L Q S L L E E L Y F D D M I D F L E EMP S NVVVK RV L E N Y K H EN R S

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 R A $L$ LQ A M E P L D D D D D Q A W L V R Y M P R D L T G R L L T S L L E P N L R A D K V A D I L E E MP AD E A A D V L D G L K E D K A E E L
QQAA DLV S ALDSLDDAVAVI DGLGDEHADSSMMETLPAES QE

 E A A A G L
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H K L S I L L N D M E P D D R T A F F E E LLP E E I TTM K L I K T L S S K E Q A A D L A E I I G E M M S S D K R A D K K V
 $N L A V E I L D G M S A D A A A D V F Q E I D K A T R T R L Y A L L K P L T R T$
 K K T L L D F F D S L D P D D R V A L L D E L P A E V
 DEVADVLSRMRADDAADAIMELPQERRQNVLDRLPTATKM E Q Q M L V V A A M E D D D L T Y M L D V L N T E E K H K L L S T L E A E Y S A A RGS RLLLA E M S A D R A A D V L R E L L R R P A D R S R L L



 GQVAAVLGRMGADDAADAI GGLPQERRRPVLDALGAKQRLL E E QVLVVVQNLEEPDDAA DVI NEFGKS ERLDELI NELLDAS D ETAA A GII I E E M D P G A A A D DL L A E E L L S E E R S S D A L L
 DEVVALFE QLPS DDRADI FNRLSKDARQKLLPELTKSERD

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

 E T L T A S I N ALLP E P Y A V E L L D G LiP E E L A D E I RE SLLDP KA R Q K K Q A Q V L S E T E A D S A A E Y L K Q L E K A E R K A L D D L M D D D S K K GRAAEILNGMSADRATDDFHDLLDWPSRNRLVSVLSPETKKT
 $P Q V A E D I G G L D P D D R A S L F D E L P A S V A E R L M H G L D A D E R A$ E A I A E A V R E L D S D D A D G I L E D M A E E D R E E I LAA A L P L A E R I K QL I N L I K Y L D L D D A V E I L S E F E T K D L V N T L S N L G QL Q R S EKAARVVVSMDSDDAVVVLDDDSETKKNEVVEHLDADAKE
T QVLKLLGEMGSDERADLFNLLDEDRREALLRRRMAHQERE P QL H D L V E E IDDVD D L I E L L D E L P D A DY Q Y A CS R M D Q S E K R




| Q9PDH8 | RLEQAL |
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| G4D4R5 | N |
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| UniRef90－Q31DX3 | QVQALHAYDD |
| UniRef90＿D1CH48 | DI R DL |
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| UniRef90－14YKP | ALQRSLDYPE |
| UniRef90－D6V | A |
| UniRef90－K5AEM | tVRRL |
| UniRef90－R5DMK | DIALISSFDD |
| UniRet90－F9PS | E $-\mathrm{NM} \mathrm{\\|} \mathrm{~L} \mathrm{NFKE}$ |
| iRef90－K6TCM5 |  |
| UniRet90－R6RTP | E |
| UniRef90－H8z8 |  |
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| UniRef90－W6TN4 | a |
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| UniRef90＿UP100035E |  |
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| UniRe90－R7K |  |
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| IRef90＿A0A022LUB0 |  |
| UniRef90＿UPI0001BC2D3C |  |
| UniRef90 D8F UniRef90-D4G | R\｜KSVMQFD |
| K6 |  |
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| UniRet90＿Q98MM2 |  |
| UniRet90＿Lor4Y1 |  |
| UniRef90＿F3z218 |  |
| UniRef90－A7789 | K R A ${ }^{\text {K }}$ |
| UniRef90－D3SA | A Lit ${ }^{\text {K }}$ |
| UniRef90－J5KNFO | RVEESLDYPD |
| UniRef90－V6DGF1 | KVV 矿 |
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| UniRet90＿A6DPG0 | DITKLLSFDE |
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| UniRef90＿E6Y | E |
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| Re90＿D4M898 |  |
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| UniRef90 A9NGU5 | P V |
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| 俍et90＿G4L2W3 |  |
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| UniRer90－CM 34 |  |
| UniRef90－UP10003B2F6D9 | 俋 |
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| ef90 J3H |  |
| ef90 U2S |  |

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$\square$ SEKDQH ${ }^{10}$ OR ENH ${ }^{20}$
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AMATLLNEL30 EALRTFLA ASAHRVDLALWLSQLL
ETINKTLNGTKEETEEEMENIHPVDLLEELEQY TKELTDNLVSLI NEKRVVEI NNSLHALHPSDAAEVLSNLL

$\qquad$


AEALAERLSRपHFADAVDVTNDT


AAATASRLADIRTGDAVEVVNE
LQELVAKEASKEIVEFLAKQSEYEAVELVESF
EERDYEAEI EKIIDSNSDDEKRKQLDDYHESDIANVVEKL D Q VVETVGUNENGML LIAE!LALI DP
 E KLLIE ELLQPMMA
 LEALGKACEGLMNAH ETKELLSQNKKEQLKKI FYD DEGEQLQSHLESSSLREITALVA ILDMVRRLNRRAADDHLRKLTDKLHPADMAWVLQALL LADPENQKDVCAFLDGLSDTEDALLLESF $\square Q A H K A \square C E A \square A A D D R E R \square A G L L P E \square R A D T A E D E A C$ EERRIVFRELLAK DPADVAEVLADL EVSQLVERLNDAHHDEQRVVFEDAVDQLEGTELALLLESL
$\square Q E L V D E G D S A T L K T L F A E L D A S T A R T L E S F$ EK LERAFHKQTSQLLKHDVADHDPDDLAYAVTRL NKLKQLLLTENDFMVEEFLSDPPYDIAGELKKL ELSNLIEEEVVDAEADEQGRLVDKEATREPCEEVALLLESL

HELSEMHPSDIAKILK FEPLDGHARSDAVRRLSDRFGELKAAEAADLLEEA D VVRGSLTDEDSSSLDEKTSQLEPEEIALVLEAM
 LRAGHAARFSDSGGATTAERVERLNAL ELVGTLDRLLEQGDQGA TRNLLVELHHADTADIMDVM
 EFEPLDGHSRSADARRPTARTRR DVSHVVHLLTEAEGDEQAEVFSEVLTEAEPGTDALLLESL AELKHAVRQLSSSDGDVLAAL ENKEQLDDVEEAKALEDAHLDDTLEHELSAADLTEHLKTL DLSTLIEDVIDAGKPEQEVLLGKLLNQKEFDALALLEESL AARAFMNNSRVASIAERVESL EKMFNEEQDYपIN

DDSAE $\square R$ EENEQपNEAKELLDSHपNETपDEELS AERVEHLNTL AADLAQHLKTL पhPADLAALDRR EDQDYLNN DKFTNNQTTSRLTELLNQ NPNDV MKKLLNE LVTQNDLDA DKVLRHPSYDVAQE DKRF

MHSQVATLIETLDEHSPESTNKATSELTPDDVALALEST DLIEEVISHSDLSEIAATIAQADEDEMASLLESL D ALQNLL RH PAN VSLARMTHPSDLCDALS QL


PAELARQWARR
 DTFEEMDSGNAADIMEEMDPDDAAADMEEM DIFEEMDSGNAADIMEEMDPDDAAAI MEEM LDAE $\square \square K A \square E S$

TEDLSFLK

## UniRef90 n9м9т6

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UniRef90-M1Q0R8 UniRef90_UPIO00465573E UniRef90_UPI000409CBA1 UniRef90-R7GJ63 UniRef90_UPIO002882F43 UniRef90_UPI000185070D UniRef90-K8FA16 UniRef90-K8FA16 UniRef90-K8FA16 UniRef90-K8FA16 UniRef90-F8JC96 UniRef90-X1RVM7 UniRef90-UPIO004756DDD UniRef90-K2EU46 UniRef90-TOHX02

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UniRef90-A4BK53
UniRef90_J2L115
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UniRef90_UPIO004133BBB
UniRef90_L1IBZ7


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| UniRet90-B4UGH7 | D |
| UniRef90-D6GTM3 QREENIISEMASDDLADMLGEVDEDVKEKIISKMDHEQAE |  |
| DOR | DNVAEIVNQLes |
| Refio ${ }^{\text {G9E }}$ |  |
| UniRet90-G8LJ08 | AVLADAVRDLDSDDVVDLVEDLDAAQQTAL |
|  |  |
| UniRef90_UPI00046F81A5 |  |
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| UniRef90-UP10001 |  |
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| UniRef90-K8FA16 EAAAALIED D D P F A |  |
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| TRKAEILDEVAPDERVDFFEQLPEEMVLRFLSIMEEEEAQ |  |
| UPIO |  |
| LV |  |
| UniRef90 ${ }^{\mathrm{K} 12 \mathrm{Z}}$ |  |
| UniRef90-UPIO | VTLLAQDLPPEDVTELL |
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| UniRef90-U7NVX0 ERLLPILEEMGSDERADLFNLLDEDRRQAL |  |
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| 保90-UP100036EF316 QEVET VQGLDAQEVAEVLEVADDDTRARVYASLEGGDRA |  |
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| KEMKELIEKMPPDEAVNILDDISDRRLKKVMDLLDHTQAY |  |
| UniRef90 D7VPG1 | KELSEFLNNLKPDLR |
| UP10003703307 EEWDGLFADIS AED |  |
|  |  |
| O-EOUT58 DELSHAVSELESDDQLEFMQELDENVASKVFNTLDAEDKK |  |
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| LGHAVGELESDDQVDFLEDIDENDASQVFDTLHEDDKK |  |
| AOR |  |
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| UniRef90-G4D3Z5 AELTNTFSYMTNADVADLLGFLSTSRRKELLRYMKDSDSD |  |
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| 990-UP10003828CA7 QQLRTLVEGMEVDDLIELLDELPQRDYAYACSRLDASQRS |  |
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|  | PALTDLLDALDTDDAADLLAELPDEVALRVLPAL ED |
| UniRef90-A0A022MIJ2 EEDA ${ }^{\text {a }}$ |  |
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| Ref90 MOQE10 |  |
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| UniRef90-EOT2X2 KALLQTLQSLPLERRITLGRQLPQPLTGRMLTLMEGEQRS |  |
| UnRef90-AGCJL5 $\quad$ EQAARFVNLMSDDRVADVMAEMEEE PRAKLFARLDRTTALL |  |
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| UnRef90-A9CDL5UniRe90-9D2T0 |  |
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| UniRef90-C2TVU0 NKAKKLLNLQP\DETVDLLLAVHPEKQAQLMAYLNK可 KH |  |
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| UniRef90 G4QEI6 |  |
| UniRef90-R8ARV2 |  |
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| UniRef90-X5MKNO SIQRGLLSELSPGEASTIAGQLDDEERTQLFSNLDDGIRE |  |
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| UniRef90-X1GND8 |  |
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| UniRef90_UPIOO |  |
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| A4BU59 |  |
| B4UGH7 | D $V$ RA |
| UniRef90-D6GTM3 | EVRSLLGYEE |
| UniRef90 DoRNQ3 | LLEEVLAYPE |
| UniRef90-G9E7T4 | QVENLHAYED |
| UniRef90-A8LJ08 | AVEQSLQYPE |
| UniRef90-A5z540 | DI DLIQSYDD |
| UniRet90-UPI00046F81A5 | - |
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| UniRef90 X1AEU7 | D F EEMD D |
| UniRef90-X1AEU7 | D |
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| UniRef90-D1C5U0 |  |
| UniRef90-14EJK9 |  |
| UniRef90-A9GUPO |  |
| UniRef90-M1 00 R |  |
| UniRef90-UPIOO04655 | ALK K |
| UniRef90-UP1000409CBA1 | QVNKLDTYAD |
| UniRef90-R7GJ63 | DIHLIESYDD |
| UniRef90-UP10002882F |  |
| UniRei90-UP1000185070D | V QS\LS |
| UniRef90-K8 |  |
| UniRef90_K8FA1 |  |
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| UniRef90 K8FA16 |  |
| UniRef90-F8JC9 | SपK LLLA Y HE |
| UniRef90-X1RVM7 UniRef90-UP1000475 |  |
| UniRet90_UPIOOO475 |  |
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| UniRef90-TOHP | SLRRLLAWPE |
| UniRef90 K1ZH |  |
| UniRef90-UPIo003691D66 | HVETLQGYAD |
| UniRef90 D4XUV1 |  |
| UniRef90- XOULK | ELITRLASMAP |
| UniRef90-K0C4M1 | HYQQSVQYE |
| N1 | QVRKQLTFRE |
| UniRef90 UPIO0036EF316 |  |
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| Rer90-D6YW08 |  |
| DVPG1 | E |
| UniRee900 UPIO004796AFO |  |
| UniRet90 UPI0003703307 | Y YEDAQQYDE |
| E0UT58 | E |
| UniRef90-ADT8Y | E EELDTYDE |
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| UnRef90_UP10003B77 |  |
| 俍et90_A0R5Q0 |  |
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| UniRef90- 77 L5G6 | KV |
| UniRef90-UPIO003828CA7 | WLETALTYND |
| UniRef90_H1H294 | NVLALSSYP |
| iRef90_A7GZ63 |  |
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| UniRef90-A0A022MIJ2 | K V LT L M |
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| IRet90_M0QE10 |  |
| niRef90_C0x |  |
| UniRef90-C8PJB5 |  |
| UniRef90-U4KRK1 | ELERLTKYDE |
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| UniRef90-J2L15 | A ${ }^{\text {a }}$ |
| UniRef90_Lotax |  |
| UniRef90_30H47 | K |
| UniRef90_A9CJL5 | SIKHLMGYP |
| UniRef90_B9D | El LRIRSYDE |
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| UniRef90'L11BZ7 |  |


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 RDDLLARVIDIVSHPEAEELPSLISDYSDADLADLLESVG LLALLEENNTHQLTELLASNQQPAEMARAWPVL


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