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 MA HLLKTVYQEQUKPKLKEDFGYKSDMEDPRIV KVTIINMGV MSNFKTLYEKEVKNSLMKEYNYTSVMMQVPKITTKIVINMGV
 MSRLKVQYNETIKPELLKKENYDSIMQVPRLEKIVINMGIV
 MTRLLQDYYRNTVVSELTNKFGYKNVMEVPKI TKVVGNMGL MARLAELYNKEMVPALMKDQNYKNIMEVPKLVKIVVNMGL MARLESKYKSEIVQAMQEQFGYKSIMQVPKLSKITLNMGV MARLRDYYRDTVVKQLMDQFQFGSVMEVPRITKITLNMGL MS GLK KKY DEEVIPAMMDKFKYRNVMEVPRLEKVVINDGM MS LL KEKYNKDIVPAMMEKFNYSNVMEVPKLKKVVLNMGI

 MA RLLQE Y Y R T E I V K K L K N Q F K Y T S V M QV P R I N K I T L N M G L V P R L Q V Y Y R E T V V P N MARLY
${ }^{1}$
 MA R L Q E H Y K E lV V T K E L M K Q F A Y K S V M E V P R F L MA KLLKE T Y VK DI A P ALLYK K F G Y K S V M Q I P K L D K V V V N VG C
 M S R L Q K T Y K N E V V G KLL R D K Y Q Y K N I H Q V P K L E K I V V N C C T
 PR L K A V Y K D Q I R E Q M N K K F N Y D N V M Q V P G L T K I V V N M G V
 M A R L T R L Q E K Y T S E $V$ V C K G C L M E K F MA R L


 MS RLD S Y Y K E NVVVP ELLIDK Q F G Y K S V M E V P R I S K I T L N M G V L K K K Y Y E E V R R P E MMK R F G Y E N P L A M P R L L E K V V I N Q G L S RMK T LY Q E TA V P Q L Q Q Q F K Y S N V H Q V P K V V K V T V N R G L
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N AL K E K Y T N D I V S G L M E K F N Y D S V M E V P K I E K I V I N M G V

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


 P R L K A H Y R E V V R A E L K K K E F F

 MS R L K E R Y R R E VP R L K K V Y K E T I AP P A L I K E F G Y T T P M Q V P A I K K I V V

 RMMRKQYAAE E V V P A L I K R F G Y K N I N E M $M N$ LIK E K Y K S E I V P A L M K K F N Y K S V M Q V P K L E K I V I N M G V | A | $R$ | $L$ | $R$ | $L$ | $K$ | $Y$ | $K$ | $E$ | $I$ | $P$ | $Q$ | $L$ | $V$ | $E$ | $K$ | $F$ | $G$ | $Y$ | $E$ | $N$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |


 PR R L R Y E Q V V R P E L Q R Q F GY K NP M QI P R L E K I V I N M G V


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 EGPVGCKVTLRGERMYEFLERLVSVA PRIRDFRGLNPK E G Q P I G GV K V

 D N WP I G C C M V Q G M P I G C A V
D G Y P i G C K V T L

EGMPVGCKVTLRGEEMYEFLVKLINVALA


E GWPI GCKV T L R GKRMYEFLDRRLVTI ALLP
Q G Q P $\quad$ G V $Y$ V $T$ L R RARMYE
E GMPI GVKVTLRRDRMFE





E GMNI GCKVTLRGERMYE FLDRFINVAVMRVRDFRGLSAN



E G M P I GVKV T L R G S R M Y E F LD K F M N I A L P R V R D F R GVV P Q
EGMPVGARVTLRGERMWEFLDRLVTVALPRVRDFRGISPR
E E WP I G C K V

 E GMAI G A K V T L R G D R M Y E F L D R F VV Ti A L P R V K D F R G L N P K Q G Y P I I G C M V K G MPI GLKVTLRRDRMWDFLEKLLNVALPRIRDFRGVNPN
 R G H K I $\quad$ GV $V$ M V E G N P I G V V K V T L R G Q R M W E F L D D R L V
 E GMPI GVKVVTLRGEKMYEFVVYKLFNVSFPRVRDFRGINGN A GMPI GAKVTLRGKRMYDFLQKLIDVSLPRVRDFRGISKK E GHKI GVKV TLRGQRMYDFLDKLMNVALPRVRDFRGVKAN E GQAI GCKVTLRKDRMYEFV DRLI NI ALLPRVRDFRGLNPK
 Q GTPI GCKVTLRGERMYEFVDRFFNVALPRVRDFRGINGN


E GVAI G C K V T L R G E R M Y E F F F K L L V S I A L P R V R D F R G L S K D

A GLDPI GAKVTLRADRMYEFDDRLVTDALPRVRDFRGLPAK
E D WP V G C K V T L R Q E R M Y E F L E R L V A I S I PR I R D F R G I S P K
 EGNEVGARVTLRGTMMYEFLDRLVNVALPRVKDFRGIKST

 E G M N L G C C K V T T L R R Q GMNVGAKV T L R G D RMYYFAD K L M N I VL P R V R DFR G V S D T

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| $E$ | $F$ | $R$ | $G$ | $L$ | $S$ | $T$ | $K$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $E$ | $G$ | $W$ | $P$ | $I$ | $G$ | $C$ | $K$ | $V$ | $T$ | $L$ | $R$ | $R$ | $E$ | $R$ | $M$ | $Y$ | $E$ | $F$ | $L$ | $D$ | $R$ | $L$ | $I$ | $S$ | $I$ | $T$ | $L$ | $P$ | $R$ | $V$ | $R$ | $D$ |

 K GHRI GCKVTLRGNRMYAFLEKLINVVLPRIRDFHGLSPH E GMP I G C K V T L R R E R M Y E F L E G M P I G $\quad$ V K V D DMP I GCKV T L RNERMYDFLQRLI SI A I P A GWPI GCKVTLRRDRMYEFLKRLI SI AIIPRI RDFRGLSPK

 E L Q P I G C M V T L R G S R M Y E F L D R R F V E G M K I G A K V T L E G Q AI G A Y V T L R G E R M WE F L D R L L T L A L P R I R D F R GII N G K ENMPI GCKVTLIRKSRMYDFIDDKLFNVALPRVRDFRGVSEK


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

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UniRef90 ${ }^{-} 6 \mathrm{GQ} 60$ UniRef90-D6GQ60 UniRef90-R5V1×3 UniRef90-N4WXHO UniRef90-D1VTMO
UniRef90 J6LH61 UniRef90-W6KBV1 UniRet90-D4K9G8 UniRef90-R5IT98
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REQLVFPEVIDY K TDK VRGLEVVII VTTA QFDGVGNYTFGLAEQSVFHEIDVDKIDRVRGMDINVVTSA QFDGVGNYTFGLAEQSVFHENDVDKADRVRGMDINVVTSA SFDGRGNYSLGUKEQLFPEVDYDKIDRIRGFQITVVTTA SFDGRGNYSLGIKEQIVFAEVEYDKI DKLRGMDICITTTA


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| UniRef90_B9KZX5 <br> UniRef90-A0QL00 | RTDREARRLLELLGMPF T D D GRA RAGBP |
| UniRef90-UPI0003757550 | ANDDEGRALLKQLGFPFKE |
| UniRef90-X0TT96 | RSDEEGKRLL |
| UniRef90_UPI000472F05C | K T D DEGRALLRAFNFPM |
| UniRef90-R7HHIO | KSNDEARSLLKA |
| UniRef90-DOKXI4 | QNDDQARALLEC |
| UniRef90-UPI00047CAF45 | NTDQECFALLKHLG |
| UniRef90-K9F027 | KTDDEGRALLRHLGFPFKE |
| UniRef90-R4VM96 | ETDEEAMALLEGFGFPFRK |
| UniRef90_UPI000382DFBF | KTDEEGRALLAAFKFPFRQ |
| UniRef90-B5EFR2 | K T DAEGKALLK ${ }^{\text {L M G }}$ |
| UniRef90-F9ZXK4 | K S DEEGLALLLK ${ }^{\text {L }}$ |
| UniRef90-UPI00037092DA | RNDEEGRALLSAFN |
| UniRef90-B111K0 | KSDEEAREFLR ${ }^{\text {K }}$ |
| UniRef90-UPI000475C329 | ENDEEAKELLS |
| UniRef90-UPI00016C0058 | KTDEESRELLTQFGMPFQK |
| UniRef90-K1ZE79 | K T DEEGRFLLRAMGMPFRK |
| UniRef90-14BV33 | KTDEEAYGLLKELGMPFRQ |
| UniRef90-K1ZGX6 | KTNKEAYALLEAFHFPFKE |
| UniRef90-H5SFZ8 | QTDEEAYALLQEFGFPFRK |
| UniRef90-A8TZK1 | KTDDEARELLKRF |
| UniRef90-F2NJC7 | PTDEEAKFLLRRLGM |
| UniRef90-UPI00034C67F4 | ETDEEGRALLKEMGM |
| UniRef90-U2WC30 | T S DVEARELLRA |
| UniRef90-R7M5S5 | KNNEEAFELLKELGVPFRK |
| UniRef90-K0B167 | NTDEEAKEFLALLMGMPFKK |
| UniRef90-K2B2B0 | KTDKEGKALLAAFKFPFKE |
| UniRef90-R6CBT6 | KTDEESRELLTLMGAPFAK |
| UniRef90-D3QZ89 | K T DEEGRELLKLEGMPFAQ |
| UniRef90-E1XOL0 | T NNDEGRELLTLLGMPFAK |
| UniRef90-UPI00041BBA44 | KTNDEARALLEAFNFPFR |
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| UniRef90-E1YG77 | T T DAEGKELLKLLGMPFR |
| UniRef90-R6N9M1 | KSDEEGRELLRLLG |
| UniRef90-A0A023X565 | ETDDEARELLRMLGMPFR |
| UniRef90-C8PW33 | K T D DQGRALLKAFGFPFK |
| UniRef90-G5ZX99 | KSDDEARELLRGF |
| UniRef90-A7HWS3 | KTDDEARELLRKFNFPFTK |
| UniRef90-LOA3M1 | KTDEEARALLAAMGFPFRK |
| UniRef90-F8J573 | KTDDEARELLKGFN |
| UniRef90-T1C3D5 | KTDAEAKALL |
| UniRef90-F2NMR5 | K T DEEARALLELLGFPFRK |
| UniRef90-K9RYU0 | KTDEEGRALLKALGMPFRE |
| UniRef90-DOLIB3 | K S DEEGRALLRH ${ }^{\text {M G }}$ |
| UniRef90-M2U323 | KTDDEGRALLRH |
| UniRef90-D6GQ60 | KTDEEARELLRL |
| UniRef90-UPI00036F8CFA | ATDEEARELLR |
| UniRef90-R5V1X3 | QT DEEAKELLTLL GAPF $\mathrm{L}^{\text {L }}$ |
| UniRef90-N4WXH0 | DS DEEASELLHQLGMPFQK |
| UniRef90-D1VTM0 | QTDEEAKAFLEKMGMPFAK |
| UniRef90_J6LH61 | RSDAEGRALLQAFNFPFRQ |
| UniRef90-W6KBV1 | RSNDEAKALLAGFDMPFAK |
| UniRef90-D4K9G8 | KTDEEGKELLKALGAPFAE |
| UniRef90-R5IT98 | T T DEEAKELLTMV |
| UniRef90-G0VNI0 | TTDEEGRDMLKMMG |
| UniRef90-A0P868 | KTDEEARALLAAFS |
| UniRef90-R5FTK4 | K ND\EGRELLKLMG |
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| UniRef90 ${ }^{-K 5 X R D 8}$ | KTDAEAKALLKGFNDPFAK |
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| UniRef90-M9UAR4 | TSDNEGRALLTAFHFPFRQ |
| UniRef90-X1UZT7 | KTDEEGRHLLGLLGMPF $\mathrm{D}^{\text {K }}$ |
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| UniRef90-C2BEZ6 |  |
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| UniRef90-R7BRC5 | KTDEEARELLKLLGMPFAK |
| UniRef90-R5T082 | K T DAEAKALLEMLGLPFEQ |
| UniRef90-R6AG07 | KTDEEAKELLRLLG |
| UniRef90_A0A017TDM2 | RTDEEGRALLTELG |
| UniRef90-D9QTG1 | ETDEEARELLS LMNMPFKQ |
| UniRef90-Q5ZYN1 | KTNEEAKALLEAFN |
| UniRef90-UPI00036F5EB9 | KTDKEAKALLARFD |
| UniRef90-H5SJZ3 | ETDEEALDALLKALGMPFR |
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| UniRef90- Q83166 | S SDDMARALLGELGF |
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| UniRef90-R6T8X3 | RTDDEARELI RMMGAPFAK |
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UniRef90 S9QX83 UniRef90_S9QX83
UniRef90_Q9TL23 UniRef90_Q057B6 UniRef90_UPI0003B5E38A MA T LLK E K Y T S E
 MPRLQKAYKETMVSAL MKELGLSNIMEVPKLDKIIVNMGL MAFLKDLYKNKVAKDLQKEFAYSSVMOLIPKEKVVINAGL PRLKKHYEDSVKKAMOEKFAYANVMOMPRLDKIVLNMGV MS WLK KYYEEEVVPKLMEKFGYKNKLEVPRLKKIVLNMGL MT ELKEKYLLKEVVPHMMKTFSYKNDNQVPVIEKVVLNMGV MARLQKHYRDTVINQLRERLGCQSVMAVPRIEKITLNDGA

 QRLKAAYLEKVVPLLKDEFSYANDQQVPKUEKVVVNCGU | V | $P$ | $R$ | K | T | $\square$ |
| ---: | :--- | :--- | :--- | :--- | :--- |
| Q | R | L | K | E | K |
| Q | Y | L | E |  |  | L K K R Y H N KEVYST MTRMKKKYVEEVAPALMEKFQYKSTMQIPKLDKIVVSVGC MSRLKEKYNSEVVPALIDEFKYSSSMAVPRIQKVVLNMGL MTTLKEKYTNEVVAALTEEFKYTNQCQVPKLEKVVLNMGL MTRLEEMYKEKVVPELTKEFGYKSTMQIPRIRSVHLNDGL ARLKLRFRKEGVPALMKELSLKNPLQVPRLEKIVVNMG M V

V
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FKSTQKA

M
V
QRLENFYH
MS WLKDYYDNEVRKRLMEKFNYKNI YEVPKI




VQRपKTLYLESAVLKLQETFGYKNPHQUPRIKKUVINCGL
PRLKQFYDTQVRARLAQQFGLENPHQAPTLEKVVVNCGV
LKTKYTEDVVPALKEKFGYKNDHQVPKLVKIVLNMGV

■SRLKTEYKERVISAETEEFGYKNVMQVPKLRKIVISRGI
VQRLEKKYHDEVVKKLKKEFSYKSVMQVPKVTKITLNMGL

## 

V V

MVALEKOYKEK
ARMQEKYTAEV DPRLKAKYNDDIAAALKDQLGDENVMQIPKMDKIVINMGM PRRKEKYLNEVVKGLKDKFQYKSVMQVPKVTKVVINKG1 PR R KTVYRETVRPAMKEEFNYKNDMM PRLDKVVLNDGV
 VARMRNYYRDEVVPALQRQFNYDNVMQVPRMQKVVLNMGL MLRRLEKYFKDEI SPKLHKEFNYKSPMQIPSVKKVTJLMGL





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UniRef90 T0Y7T9 UniRef90_D1AVG6 UniRef90-B1AIN2
UniRef90 E0MJQ2 UniRef90- X0WRF9 UniRef90_F8AA49 UniRef90-V2Q910 UniRef90_Q3J8S6 UniRef90_A0A059CIQ1 UniRef90-R7FPA1 UniRef90_F2LXT0 UniRef90_C0JWV9 UniRef90_D7CVE9 UniRef90_Q3A6N5 UniRef90_R5D8Y0 UniRef90-D8EWN0 UniRef90_15B4A9
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UniRef90_Q08ZI6
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UniRef90_R7MCS4 UniRef90_P51302 UniRef90_D2Z925 UniRef90_A3XJV7 UniRef90_E0RQ93 UniRef90_K2C829 UniRef90_P14807
UniRef90_F8GHM0 UniRef90_UPI00037BD1A0 UniRef90_E4UDX9 UniRef90_B3EP49 UniRef90-K4IG02 UniRef90_UPI0003B56899 UniRef90_M5RDG1 UniRef90_Q8HTL1 UniRef90_UPI0004222C40 UniRef90_S5M325 UniRef90_Q89A78
UniRef90_HOUL92 UniRef90_G9FI73 UniRef90-M4ZYC9 UniRef90_A1ZGS7
UniRef90 Q0P3L4 UniRef90_A3JN35 UniRef90_C6C197 UniRef90_Q1MPQ2 UniRef90-W4LUN5 UniRef90_E8WZJ2 UniRef90-T2GDA3 UniRef90_Q0FA91 UniRef90_R4YJN5
UniRef90_F4GL70 UniRef90_B0VI19 UniRef90_FOSJ98 UniRef90_D1AGU5
UniRef90_R6J4U2 UniRef90_A9TXG3 UniRef90_G2J9K2 UniRef90_IOGKG8 UniRef90_S9QX83 UniRef90_Q9TL23 UniRef9-Q057B6

GEA|V|NDTKK|V|KSA|V|ED|L|T|
 G G A L










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






 GDAS QNAKLLES F SKE L S I





## 

GA A V A D K K L I





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

 GRAA GQPS LMEAAI S DLTA A







## 



GEA A GNAK L L L D A A MN D L L


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


$G D A S S Q A K L L D G S$ L $L$ L L T T

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 UniRef90-H6RE26
UniRef90- TOY7T9 UniRef90- D1AVG6 UniRef90-B1AIN2 UniRef90-EOMJQ2 UniRef90 XoWRF9 UniRef90-F8AA49
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UniRef90_S7TZX1
UniRef90_Q08Z16
UniRef90-K6GHUO UniRef90_UPIO00377E24D UniRef90 MORT13 UniRef90_UPIO003745E82 UniRef90_UPIO00402C939 UniRet90_M3TWC5 UniRef90 WoGKN4 UniRef90-UPI00036C8B7C UniRef90-V5WFH1 UniRef90-UPIO0035C1A87 UniRef90-R6QLX9 UniRef90-E8R3T6 UniRef90-C7BEX9 UniRef90_R6EQQ6 UniRef90-F8C596 UniRef90-UPI000472C7A5 niRef90_G2LPZ4 UniRef90-R7NE14 UniRef90-UPIO0034CA962 UniRef90-UPIOOO47079E5 UniRet90_LOESC9 UniRef90_E1NU33 UniRef90-Q9MUU5 UniRef90-G2KQV1 UniRef90-W0RLL6
UniRef90_R7MCS4 UniRef90-P51302 UniRef90_D2Z925 UniRef90_A3XJV7
UniRef90_EORQ93 UniRef90_K2C829 UniRef90-P14807 UniRef90-F8GHMO UniRef90-UP100037BD1A0 UniRef90 E4UDX9 UniRef90-B3EP49
UniRef90 K4IG02 UniRef90-UPI0003B56899 UniRef90-M5RDG1 UniRef90 O8HTL1 1 UniRef90-UPIOOO4222C40 UniRef90_S5M325 UniRef90-Q89A78 UniRef90-G9FI73 UniRef90 M4ZYC9 UniRef90_A1ZGS7
UniRef90 Q0P3L4 UniRef90-A3JN35 UniRef90-C6C197 UniRef90-Q1MPQ2 UniRef90-D6SUM1 UniRef90-E8WZJ2 UniRef90-T2GDA3 UniRet90-Q0FA91 UniRef90_R4YJN5
UniRef90_F4GL70 UniRef90_BOV119 UniRet90 FoSJ98 UniRef90_R6J4U2 UniRef90-A9TXG3 UniRef90_G2J9K2 UniRef90-10GKG8
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110

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 EGMPI GVMVTLRKNRMYDFFTRLVNVALPRVRDFRGVPAR E G Q A I G C K V T L R H NVMMYE F L Q R F F N I A L A R R V R D F K G V S P K


 EEMPI GISVTLRGDRMYSFLDRLINLALPRIRDFQGISST
 E GMPI GCMVTLRRDKAYEFLDDRLINVALPRVRDFKGVSKK EGMHVGVKVTLRQDRMWEFLDRLFNVALPRVRDFRGI SAD

 Q G Q AI G C A V T L R G D R M Y E F L D RLI SVAL PRVRDFKGVSPK
 E G M P I G V K V T EGATVGlAVNLRGNVIGSF DRLVNLGL
 E N M P I GVIK V TIL R G E K M Y E F F L
 EGMPI GAKVTLRGKKMYQFLDKLINI ALPRVRDFRGVSKD
 E GMEVVGAKV T L R G N R M Y E F M D R L I N I A L P R V K K D F R GVVN N EGNAI GCKVTLRKERMYEFLDRLVNVAIPRIRDFRGLNDK $E G V N I G C K V T L R S G K M Y D F A Y K L E N V S L P R V R D F R G V S K N$
 QKMPVGGVVTLRGERMYAFLDRLINLALPRIRDFQGVNPK Q G MPVGAKVTLRGENMYVFVDKLININLPRVRDFKGVSKN

 Q GYPI GCKV L R G Q K K WD F FERLIVIA PR R R R R GL S N N E G Q A I G G V K V
 EGMP G VKVTLRREKMYEFIDRII NIA


ENMAI GCKVTLRRAHMYEFLDRLVVIIALPRVRDFRGIINGR E GQEI GAMVTLRGARMWEFLDRFI AVADRRVRDFRGLSTR
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Q D Y P I G C M V T L R R V R M Y E F L



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 E GMAI G CRVVTLRGARMWDFLD KLLMNFALPRVRDFRGVNDR E EMP L GCKVTLLRGDQMYDFLDRRLITVAMPRIRDFRGI SA K DGYPI GCKVTMRADRMWEFLDRLI DI SLDRVRDFRGLNGK E G Q E I GA M V T L R G D N M WY FLLERRLI M L A L P R V K D F H GVV K P N K G M P I G C K V T L R N E VM Y E F Y D R L I $\operatorname{S}$ II A I P R I R D F R G I P A D EGMEVGCRVTLRGPQMYEFLDRLITLLALPRVRDFRGVSRT E G Q KI G T M V T L R K E K M Y E F L D R L V TVVALPRVRDFE GV S K K
 E G V P V G V T L T L R G D V M M Y S F L L D R L L

 Q D M P V G I S V T L R GERMYAFLDRLI NLALPRI RDFQGMSTK


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UniRef90_15B4A9 UniRef90- S7TZX UniRef90 Q08ZI6 UniRef90-K6GHUO UniRef90_UPI000377E24D UniRef90 M0RT13 UniRef90_UPIO003745E82
UniRef90_UPI000402C939 UniRef90_M3TWC5 UniRef90 ${ }^{-}$W0GKN4 UniRef90_UPI00036C8B7C UniRef90-V5WFH1 UniRet90_UPI00035C1A87 UniRef90_R6QLX9 UniRef90-E8R3T6 UniRef90-R6EQQ6 UniRef90-F8C596 UniRef90_UPI000472C7A5 UniRef90_G2LPZ4 UniRef90-R7NE14 UniRef90-UPI00034CA962 UniRef90-UPI00047079E5
UniRef90 LOESC9 UniRef90-E1NU33
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UniRef90-T2GDA3 UniRef90 Q0FA91 UniRef90-R4YJN5 UniRef90-F4GL70 UniRef90_B0VI19 UniRef90 FOSJ98 UniRef90_D1AGU5 UniRef90_R6J4U2 UniRef90- G2J9K2 UniRef90-IOGKG8 UniRef90_S9QX8 UniRet90_Q9TL23 UniRef90-Q057Be UniRef90_UPI0003B5E38A

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 ERDDDALDALLARLGMPFR ETDEEARELLRELKMMPFK
 ETDKEAKALLTQQLGLPFKK KTNNEARALLKAFGFPLK KTDQEGDALLKSLGMPFAE KSDAEAKALLDAFNFPFK ETDEEAYALLKHFGMPFK GSDKEAKHLLTLFGFPFPK

 PTNDEARDLLAEFGMPFK $K T Q E E G Q A L L K E F G D P F K$
$K T D E E A K A L L A B A S F P F R$ KTDEEAKALLAAFSFPFR
NQKDEAFSLLQKMGMPF VK LSDREGYALLSAFNFPFR KTDEEAMALLAKLGMPFAR KTDEEALALLKGLGMP DNDEAGYALLDAFGFPFKK
 STDAEAKALLKLFNMPF
 QTDVEGKELLRLMGMPFR NTDKEGKSLLTLLGMPFKK LDDNGARTLLKAFGMPFR
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SLLGMPFKK SSSDKEGKVLLDLLGMPF NTNEEGHALLKALNFPFR KTDEEGHALLKKLGMPFSK KTDEECRALLQELGMPFQK RNNDEARTLLTKIGDPFRK KTDEEGQALLAAFGMPFQK K S DDEAKVLLDGFNDPYKK KNDAEGHKLLSLLGMPFKE K S VEEAEALLSCFKVPFR KTDEEAKALLEFMGFPFRK RTDAEAKALLKHFNMPF TEDREGFALLQALGMPFR KSNQEGECLLTEFDFPFQK

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UniRef90-TOXYY2 UniRef90-UPI00046399BB UniRef90-UPIIO0037C54AA UniRef90-UPI0003C10246 UniRef90-A8F4S3 UniRef90-Q8EUC5 UniRef90-COPQ27
UniRef90-C5J5U4
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MTRLLETGYKDN|IVPE|LSKEFGYSSQMQVPSMKCVVL|NMG|L NRLKT RYGTEIVPALMKERGYKNDMEVPKLEKIVLNMRL



 LE K K Y L K DV K P A L M K E F N Y S S I M Q V P R L E K I V V NMTA
 E R I R S A M K E Q F G Y T N E M Q I
 P KLLK V E Y L G K I VP V L K K E E F K Y A N L L L



 M DR L Q E F Y K K NVVI P Y L DN K Y S Y S S K M QV P R I L K I T L N M GL
 $\begin{aligned} \text { S S } & L \\ \text { V Q } & \text { Q K Y E K }\end{aligned}$



 VP TLLK K

 S R L K L A Y K D K V I P N L M K Q F GY K N V M QV P K L D K V T I N M G I V

 VP RLLK S K Y K E E I V T A L K D K F N Y K S V
MNK LKEDYY QDVIP
 P RLL K A LIY A A S i V
V I K L L Y $\begin{aligned} & \text { E } \\ & \mathrm{T} \\ & \mathrm{K} \\ & \mathrm{K} \\ & \mathrm{L} \\ & \mathrm{L} \\ & \mathrm{V}\end{aligned}$


> PRAKK Q Y N E Q

KLLYE T KV F D HL K T K F NYSNVHQVPKI TKI TIINRGL P R L K Q K Y Q E E Viva
A N L K K E Y S D R I A P A L M K Q F N Y K S P M Q I P A L T K K I
 F K K L Y L E ELRRPKLQEEFNYSNVHQIPYMKKIVINMGV PRRYHNKEEI LK K K Y RDEIV VALMTEF




 YKNVQLVPKLLKI SINRGL


UniRef90＿C8X463 UniRef90＿R6GK01 UniRef90＿UPI000377A68C UniRef90－I4ALU9 UniRef90＿K1XKN3 UniRef90－＿T0XYY2 UniRef90 UPI00046399BB UniRef90＿UPI00037C54AA UniRef90＿UPI0003C10246 UniRef90－A8F4S3 UniRef90＿Q8EUC5 UniRef90＿C0PQ27 UniRef90＿C5J5U4 UniRef90＿F4MMF0 UniRef90＿UPI00046F984B UniRef90＿UPI0003B5801A UniRef90＿Q7VQD6 UniRef90＿S5RPD0 UniRef90＿LOBIG9 UniRef90＿UPI0003B7AD36 UniRef90＿Q8M9V3 UniRef90－L0RWI5 UniRef90＿UPI00035F7F23 UniRef90＿Q06SG6 UniRef90＿R7JJP7 UniRef90＿D3DH72 UniRef90－Q32RN3 UniRef90＿G8R2L4 UniRef90＿X1JX11 UniRef90＿P47409
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UniRef90＿D2R5U9 UniRef90＿D5EJU7 UniRef90＿B4CUY6 UniRef90＿UPI0001744E66 UniRef90＿14B7E4 UniRef90＿UPI00035C1E0B UniRef90＿UPIO003667BBB
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GAATA DKK L V D Y A l D E M S

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GEAVRNKKLLDDAVALELAS
GEAHTNPKALEAAVEELAL
GEALAANRKLLDASVAADLGV



| T | $Q$ | $A$ | $V$ | $T$ | $D$ | $K$ | $K$ | $Y$ | $V$ | $D$ | $S$ | $A$ | $V$ | $E$ | $E$ | $L$ | $S$ |
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| G | $E$ | $A$ | $V$ | $K$ | $D$ | $T$ | $K$ | $K$ | $V$ | $K$ | $Q$ | $A$ | $A$ | $E$ | $E$ | $L$ | $T$ |
| $G$ | $E$ | $A$ | $V$ | $A$ | $N$ | $P$ | $K$ | $I$ | $L$ | $D$ | $T$ | $A$ | $V$ | $K$ | $E$ | $L$ | $E$ |
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E GMPVVGCR|V|T|LRKRMWDF|V|DK|LINFA|L|PR|V|RDFRG|IADR EGQSI GVKITLRGDKMYEFFDKLVSIAFPRVRDFRGISGK EGMPI GCMVTLRNVQMWTFLDKLLHIAMPRI RDFRGISPK EDMPI GVRVTLRGDQMYEFLDRLVTVSMPRVRDFKGI SDK QGHPI GCKVTLRGKLMWFFFQKLICIADPRIRDFRGLPVK K GLPLGCKVTLRGNIMYEFDDRLI NI ALLPGVKDFRGIPVK EGMPIGVMVTLRGDVMWEFLDRLISVAMERIRDFKGINER EGMPMGGKVTLRRERMWSFLTKLI EVALPRVRDFNGLNPK S GQADAVYVTLRGRRMYEFFDRLVNI VLPRVRDFRGLSPR EGMVVGAKVTLRKDRMYEFLDRLVTI ALPRVKDFRGLNGK K GMNVGLKVTLRGLRMWNFLYKI ANIVLPKVRDFRGLNPN EGQAI GAKVTLRRENMWNFLTKLISIAIPRIRDFRGLSTK EGVPVGLAVTLRGNDMYNFLDRLINLGLPRTRDFQGVNPN



 QGQEI GCKVTLRRKRMWEFFERLISIADPRIRDFRGLS $\square K$ ENYPI GCMVTLRRARMYEFLDRLI TI ALLPRVRDFRGVSGK ENMPVGDCLTLRGDKMYSFLDRLVNLALPRIRDFQGISNK EGMSMGGKVTMRRTRMWTFLNELINVSIPRI RDFRGVNPK KKMPVGVSVTLRGDAMYAFLDRLINLALPRIRDFQGLNRK EGMPMGGKVTLRRDRMWDFLEKLINISLPRVRDFRGVNPK E GVPIGVMVTLRGNRMYQFFERLVSFALPRERDFKGLPKK EKVPVGVFVTLRGDRMYSFLDRLINLALPRIRDFQGISAQ K GMPI GVRVTLRASKMYEFLERLIAVALPRIRDFKGINEK KGMPVGLKVTLRKERMWDFLDKLISIALPRVKDFKGLNPR A QMSVGVCVTLRADAMYAFLDRLI HLALLPRI RDFQGLNSN K GMPI GAKVTLRGEKMYEFLERLVWSSLPRIRDFNGIKKN SGMAI GLKVTLRGERMYHFFDKLVNVALPRMREFHGVSRD A GQLI GCKVTLRNKKMWSFDEKLI YIAALPRVRDFRGLSLD KGAPI GVSVTLRKDKMWNFMEHLINDVLPRVRDFRGLNPR A N IIAI GVMTTLRGNRMYMFLDKLFNDVLPRIRDFKGVPDK Q G Q E I G A K V T L R G N S M Y EF L Y KLI HL AL PRVK DFRGI NGD E GMP I GA R V T L R G D R M WE F L D R L V S I A L P R I R D F R G L S D R EGMSLGCMVTLRGDYMYEFLDRLVNVALPRVRDFKGVNDK EGNEI GVMVTLRRSRMYEFLHRLINVALPRVKDFRGVSPX | $E$ | $G$ | $M$ | $P$ | $V$ | $A$ | $C$ | $C$ | $V$ | $T$ | $L$ | $R$ | $G$ | $T$ | $R$ | $M$ | $W$ | $E$ | $F$ | $V$ | $D$ | $R$ | $L$ | $I$ | $S$ | $M$ | $A$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | A GARI GCKVTLRGDRMYEFLDRFVVTALPRVRDFQGISPN


 EEMPLGCKVTLRGDRMYEFLDRLINIALPRVRDFRGVKP



 E EMPI GMKVT L R R E K M Y S F L E R L I N L A L P EGFPVGIMVTLRKEQMFAFLDKLISIAL EGMPI GARVTLRGTNMYEFLDRLINVALPRVRDFRGGIRRT K K M P il G V M V T L R R E R M Y E F L E K L
 K GMKLGCKVTR RKDRMYDFFERFI LMALPRIRDFKGVSVK
 KKMPI GAKVTLRHDKMYEFLERLVRVALP EGMPI V V T R GDRMWEFYDRFVQVVV MYEF
 EGMEI GCMVTLRGRRMYEFLDRLISLALPRVRDFRGVNPN
 DGMPVGASVTLRQDRMYAFLERLI HIVTLPRVRDFRGI SAE K GFPI GCMVTLRGKKMYEFLDRLINIALPRERDFKGLSMS A GNP I G V K V T L R G D R M WE F F D R L I S I A I P R V R D F R G L S P K
 E NQPLGVTVTLRNTLMFSFLERLINLVLPRVRDFNGLNPN K K M P V GVVCVTLRGETMYAFLDRLI HL ALPRIIKDFQGLNWK
 ENMSI GMFVTLRGEDMYSFLDRLINLALPRIRDFQGLSPK K GATVVGCKVTLLRRNKMYEFGLERLI YI ALLPREKDFRGFSVK EKMPVGMFLTLRSEKMYSFLDRLINLSLPR\|RDFQG\|NKN Q GMPVGGKVTLRREQMWNFLSKVLNIAAIPRIRDFRGLSPK ENVDVGGCKVTLLRGARMYDFLLDRLI TLAALPRVRDFRGVRST
 EMBLGMTLRGEKMYTFLQKL

 EGMPI GAKVTLRKDRMYEFLDRLVNI ALPRVRDFRGVSAK

 Q Y Q AI GAKVTR R GPRMYEFLERLI KMALPRIRDFRGVSPR A G E A $\operatorname{l}$ G $\operatorname{G}$ V K V E G L A 1.



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| UniRef90_E7A9T3 | N |
| UniRef90_B3E0J6 | V |
| UniRef90_F0QR47 | N |
| UniRef90_B6BLS6 |  |

K NMHEVVI 30
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MSVFAKAYRETVLPQMREARGYANVNEVPRL P R L K A T F R E T I L K A A M K E E F G Y T N D M Q I P R L D



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MARLKEDYKS
SRVAPALKEQF GYKNP
K E A V P S L M Q K F GY K N R F Q V P N V
SK ITA T L MKTFNYK SVMQVVP KVVM M N S L Q E K F K





 S A L Y T Q Y K T V T VA K L K E K R G Y K N I M Q V P R I S K V V L


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R L K E L Y K K Q D I P K M R E K F G Y K N D L A V P K L D K V V V N V G F
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 $M$ QR L H S V Y L L E T V PRRLEQRYTK E IL P KL M T E F S I K N R L A A P K L L K L TVV N V G V L Q E K Y $\square$ K E A V P A M L A K F G Y K N K L M N R L K Y H Y ENVI R Q D L L Y K C N Y N N I M EVVPKIVVKIIVVNGSI M N R L K K E TYN K TI A P S L I K EFFK LE N AMEVVPRIVMKVSVN A GI

 MNRLLK E K Y L K E I K K I L L K QE F G V K N TMA I P A L K K I V I N V G I
$\square K E K Y N K D V V S K M K E Q F G F K S A L Q V P R I E K V V I N V G I$
 PRMKQRFEEEVLPRLSEAAGTRNRQALPRLQKIVLTSGM
$P R \square K E L Y Y S K V Q V D L A K K L S D K N K D M S P K F E K V I I N M G L$

 K T K Y K E V V I Pr K



SRYRLFYETVVRPELLAKFQYKNVHMVPRVEKVTVSVAT


N WR T $\square \mathrm{P}$ K $\square \mathrm{KE}$ E VT V H C M V

TWRN $\square P K \square E E V T V H S M D$ MET $\square K$ QK EKKAYE $\quad L K S K Y G Y K N V M A S P K L L K V V V S V G T$ VP NL VA E F R Y L N L M Q V P T V D R I V V N I G I A N $\square$ K DE Y D Q G $\square$ R P VLM R N N S Y K N P H T $\quad$ I P K

 S WHNII $\square$ H H F E N Y Y WNVVRK DMLRKF QYSNTNE

V L P L L R K P T T F R N
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$\square$ NR $\square$ K K E Y E E G $\square$ K P $\square \mathrm{L}$ I K N S P F K N P H T VP K L K K $\square Q \square$ N R C L |  | P K N | I | P | K | V | D | K | M | T | I |
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| P | E | L | H | A | M | G | V |  |  |  | P H NV P E L T S I S I NLL $\square K$ GE Y E K G $\square$ R A V I K K N N F G NP H T 1 NI P I I E S I T L N C Y T

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UniRet90-K2ANP9
UniRef9-K2F9C8
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GEAAQNSKGLDGATKDLLTLITGQRPVKTRARVSIIATFKLIR GSSPELKTALEEAINDLAAHTGQPVKTKAKKSISNFKLR GEAVRDSKKAKSAVNDLAKM AGQQAVGTKAKKSHAPFRLR SGMVEKGALENAAADLTITGRKPVYCLARKSVSNFKLR

 GEAALDKKLMNAIGDLEKIAGQKPVMTLARTSIAGFKI R
 GAA FNVKVLDDVVEELKLLSGQSPVITKAKKAISNFKLR KDAVADKKNMERGTEDISQTTGQKPRIMKAKKSISSFKLR

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KGALGDSAYMHVAGILLQS GSGVKDRNKNDFVIDRLAK

 GSAVQNPNDVEVADNSLKAL

 KGADDDSAHLHVAGMVLQAVT

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 QGQE GCKVTLRGKRMYEFVERLI WAALPRVRDFRGLSPR
 ENMAVGVKVTLRNK品MFNFLEKLIVIALPRVKDFRGVSKN KGQEI GCKVTLRGERMYEFLERFVWAALPRVRDFRGLPTR EGQPVGMKATLRNDRMWSFLEKLFKVALPRVRDFKG1 SKS EGWPI GCMVTLRRAKMYEFLDRLITIVLPRVRDFRGVSVR DGMPVGCRVTLRGEQMWEFLDRLINVTLPRIVRDFRGVSPK KGLDVGCMVTLRRARMYEFLDRLVNVAIPRIRDFKGLPAN EGMPI GAKVTLRGARKEAFLYKLTRLVLPRVRDFRGISGK EGEEIADMVTLRGKRMFDFYQKLTTIVFPRLRDFHGIKKE
 KGTPISTKVTLRRNDMYEFLDRLINIALPRVRDFKGVNKK KGSNAGLKVTLRKNKMYEFLDRLVNIALPRIKDFRGLSPK EGMPVGVKVTLRGENMYAFVDKLCSIALPRVKDFQGLDRN KDVPVGIAVTLRGEVMYSFLDRLVNLAFPRTRDFQGVSPY KGMPI GMFVTLHGDKMYSFLDRLINLSFPRMRDFNGLNDK EGQA GAHVTLRGDRAWEFLDRLISLADPRDRDFRGLSPK QGTE GASVTARASMYDFYKL HA PRVRDFRGNK KGSNAGAKVTLRSSRMYEFIDRLINIALPRIMDFRGLSSK QGQVVGAYVTLRGDTMWEFLYRLVAVALPTVRDFRGPPOK KGDIVGYSVTLRGERMWAFLDKLINIAIPRVRDFRGLDDM KGFPI GVKVTLRGDLMYNFLYRLVTVVLPRVRDFKGVSHK KGLSVGVKVTLRGRRMYEFIDKLI NVALPRVRDFRGLKPE EEMPLGVTVTLRGDKMYSFLDRFI NI ALPRSRDFQGLNPK K GDA: GVKVTI RGKKMYH
EGQT GLKVTLRGDRMYE
EKDP GAMVTLRGKKAWYFFEKDANVC
KDUPLGLKVTLRKNNMYY
EGQPI GAHVTLRGDRAWE

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UniRef90_G8XP91

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| :---: | :---: | :---: |
| UniRef90 Q14K87 UniRef90-UPI0004636774 | NV |  |
| UniRef90-X6KX28 | FDGRGNFAMGMKEHIVFPEI EFDKVDEVWGMD |  |
| UniRef90-UPI000375BCAF | FDGRGNYSDGTNDQSIFPEIEDDKVKRQQGMDI |  |
| UniRef90-E7A | GFDGRGNYGFGL NEQLIFPEVVYDDIMVTHGLDIA A I T St |  |
|  |  |  |
| UniRef90-OQR47 | GFDGRGNYNFGLQEQLI |  |
| UniRef90-K2GKZ0 | SFDGRGGYNLGLKEQIVFPEIEYDKVDAVRGDNVSITTSA |  |
| UniRef90-UPIO0035EF943 | AFDGRGNYTLGL |  |
| UniRef90-X1A) | SFDGHGNYTFGLSEQLIFPEIEPDKVYKTQGMD |  |
|  |  |  |
| UniRef90 UPIO003768140 | SFDGKGNYTLGESESTI FPE: DAGKI DKIGGLLEI |  |
| UniRet90-J9ZCC2 | AFDGRGNYTTGGREQUIFPEIKYDEVSLI KGMDITFSTTA |  |
| UniRef90-EOTJS1 |  |  |
| J9Yx12 | GF |  |
| Ref90_D5V3 |  |  |
| UniRef90-D8RU54 | DGKGNYNVGI SDQSVFPEIKFESIDQQRGF |  |
| UniRef90-P14757 | GFDGFGNYNVGLSEQSIFPE:EYSSILKNKGMNI |  |
| UniRef90- M4X4N9 | AF |  |
| UniRef90 UPIO003643 | SFDTRGNYTLGFKENLAFPEMGVESGELIHGIEITITTNA |  |
| UniRef90-UP10003B395 | G $T$ NSYNYSFG\\|KEHIVEPEVNFDKVDKIRGLDI TMVT S |  |
| UniRee90 wo | RGNYNL |  |
| UniRef90-12F | SFDGRGNYAMGLPEQLVFPEVVPDQUKRVQGMDIVIVVTTA |  |
| UniRet90-M4QKQ8 | NINNTGNFSFGGRDLLVFPEIVYDKLSRIYGAHITIVTSA |  |
| UniRef90 K2FUC | SLDDQGNLNDGFDEH1 AFPE:KVEEVERLHGLEEVA |  |
| UniRef90_C6K |  |  |
| UniRef90 K2F120 |  |  |
| UniRef90-K2ANP9 | DEFGNYSLGIDEQLFPE!D |  |
|  | DGKGNYTIGFKEQLAFPEISGESADN |  |
| UniRef90-F211 ${ }^{\text {a }}$ | SFDSEANYSFGITKEHVIFPEVSFDKIEKLRGLDI TVVTS |  |
| UniRef90-UPIOOO3E | QFDGRGNYTFGLQEQSVFHEIDQDK1DRVRGFDITVV |  |
| UniRef90-XOVXE6 6 | DQEGNLTVGFREHLAFPE, KADEVDNVHGLEVT |  |
| Unireef9-D6PDE6 | NIDRSGNLTLGFKEHVAFPEI KADQTDNVFGMEIGAV |  |
| UniRef90-D1G. | DRNGNYNFGLKEQLVFPEISYDSVDQVKGLN |  |
| UniRef90 K2FR | AVDSRGNLNMGLREHILFPEVSPEKVRHIFGLQ |  |
| UniRef90-AOAO23 |  |  |
| UniRef90-UPIOOO36A0E58 | SIDAKGNLTLGFKEHIVFPEII DGEEVSGIFGFEVS |  |
| UniRef90-A6Y EB3 | FDSSGVNYNIGLDNLLLFPELEYYLFESLHGANLTIVTSA |  |
| UniRef90 K2 | MGNYSVG\| |  |
|  | CFDGNGNYTMGI SEQLVFPELNPDKYTR |  |
| UniRef90-V5RXD7 | AFDKGGNYNLGTEQSILFPELSFEETQVIHGMQปTFVIKN |  |
| niRerso-w | DKNYT |  |
| UniRef90-K2DGJ2 | SFDGHGNYSIGLRDQGVFPEIPYEVGGKKNGMDVCIVT |  |
| UniRet90-K2EQA5 | AVDAGGNFNFGI KEHTIFSEIMPESVKNVGFQVNIV |  |
| UniRef90-R5B9Z6 | G Y |  |
| UniRef90-X725A5 UniRef90 101H7 | GNFSFGLQEQGT |  |
| UniRef90 D4DRN6 | 㑑 |  |
| UniRef90-UPIOOO4786387 | SFDKFGNYSFGUKEHVVFLEVNFDKVEKIRGLDVTVVTSC |  |
| UniRef90-DOEVS1 | SFDGLGNYSLGLEEQLMFPEINYDQI DQLRGMDI TIVTSA |  |
| UniRef90_K2FZ52 |  |  |
| UniRef90_K2FDH1 |  |  |
|  |  |  |
| UniRef90-UPIO003608887 | A TDEMGNYTIGIAEHTIFPETVDEELKDVFGLSTTIVTTA |  |
| UniRef90-K2DJ77 | GFDGRGTYTLG KEDTVFPEVNPDNVRNHGVQ1TUSTA |  |
| R1F4H6 | E |  |
|  | G K DUNIFPEISLENUDRPHGLQUT ATSA |  |
| B9FA | DGHGNFT GGLRDQGVFPEDPYEVGGKKNGMDVCIVT A |  |
| UniRef90-L8F |  |  |
| UniRef90- 1 P613 UniRef90 X1EP11 | SFDGRGNYTLGMKDQLVFPEIDYTKVERQRGMNTTVVTSA |  |
| UniRef90-G2YWG9 | GDGSGNLSFGFNREGTILFPEMYPPRLIPGFHVTVKT ${ }^{\text {a }}$ |  |
| UniRef90-V7PY18 | D $\$ GNLTLGTKEHTDFPETGDEELKDVFGLSUTUVSSA  \hline UniRet90-T1A782 & G  \hline UniRet90_K1WMN6 &   \hline UniRet90-A0F & DKAGNYTLGLKEQLI FPEINYEDVEQTQGILISLVLSS  \hline UniRef90 ${ }^{\text {O }}$-11 |  |
| UniRee90-X1 |  |  |
| UniRef90 G9NFJ4 | GN |  |
| UniReef90-M40C61 | NEREK SFGVKSLIFSEVEFDKLKRNYGLDDISVINA |  |
| UniRet90 A0A015KOC4 | DGNGNVAMGFPS |  |
|  | GDSSGN |  |
| UniRef90-G0W | NRFGGLSFGPEDVRFFPEIDQDLWPR |  |
| Ret90_S3D7U1 | GDSSGNFGFNREGAMLFPEI ENY |  |
| UniRef90 UPIOOO3A | DGRGNFNMGVKEQ I FPEID |  |
| UniRef90 A0A023JEI | DKAGNY'LGLK |  |
| UniRe90-1CuO | ding |  |
| UniRef90 |  |  |
| UniRef90-P49547 | GNYTLGLKEQLIFPEI DYDDVDQTQGFSIT LVFSS |  |
| Ref90-KOKBQO | GDKTGNLSMGLEEISFFPELEQDQWSKTYGM |  |
| UniRef90_G8XP91 | GF D K Q A N Y Thal |  |


| UniRef90_Q14K87 | KTDKEAQKLLSSMMGMP LTRE |
| :---: | :---: |
| UniRef90-UPIO004636774 | RSAEEARDLLTRL |
| UniRef90-X6KX28 | QADDQAKALLKHFNMPF $\mathrm{T}^{\text {L }}$ |
| UniRef90_UPI000375BCAF | ANDTDAHELLTLMGMPFTK |
| UniRef90-E7A9T3 | N NDKEAFKLLELLGMPFSK |
| UniRef90-B3E0J6 | K TKKEA ID L L S A M |
| UniRef90-F0QR47 | K NREAS ${ }^{\text {S }}$ S FA QLGCPFSK |
| UniRef90-B6BLS6 | D S DKA GFALLEKIGMPFSK |
| UniRef90_K2GKZ0 | K T PKEAFALLQAFRFPFKE |
| UniRef90-UPIO0035EF943 |  |
| UniRef90-X1AXE0 |  |
| UniRef90_Q2NIW6 | KNNTQAKKLLEL |
| UniRef90_UPI0003768140 | K NNEQGFALLKALGMPF $\mathrm{L}^{\text {K }}$ |
| UniRef90-G7SQ58 |  |
| UniRef90-J9ZCC2 | RTDNEGRALLKHLGI PFKK |
| UniRef90_EOTJS1 | KNDKEAKYLLHLLGGLPFKK |
| UniRef90-J9YX12 | K S PEHSYALLEKLNFPF $\square \mathrm{K}$ |
| UniRef90-D5V3U8 | T S DKEAYRLLELVVG口PFTK |
| UniRef90-D8RU54 | NS DKE GQRLLSLL GMPFK |
| UniRef90-P14757 | K T DLLESFSLLK |
| UniRef90-UPI000374BBEE |  |
| UniRef90-M4X4N9 | K S D K E GFELLSALNFKFKK |
| UniRef90-UPI000364350F | K T A E EGLALLSEVGFPFKQ |
| UniRef90_UPIO003B395B2 | K SKQGTLELLKEFNFP |
| UniRef90-W0ITC3 | ETDEEGRELLKLLGMPFRR |
| UniRef90-I2F3A3 | RTDEEARRLLALLGLPFKR |
| UniRef90-V5RRS1 | P EDEHSKYLLAELGMPFRK |
| UniRef90-M4QKQ8 | K TKNETEALLSA |
| UniRef90-K2FUC0 | K NRKEG $\mathrm{Cl}^{\text {T L L K L L G FPFAK }}$ |
| UniRef90-C6KIL5 |  |
| UniRef90-K2F120 | K NKEKGKKLFEMLGI P FKK |
| UniRef90-F8L3W3 | GNEEQCDELLTQL GLPFKR |
| UniRef90-K2ANP9 | SNKQKS QRLFELLLGIPPKK |
| UniRef90-K2F9C8 | GSNEAGFALLSKMGFPFRK |
| UniRef90-F211H3 | NNKEASKALLDSFDFPFYK |
| UniRef90-UPI0003B77DDC | KTDDEGRALLKAL |
| UniRef90-X0VXE6 | K $\square$ REE G L EL L K L M GFPFKR |
| UniRef90-D6PDE6 | NSDDEGVELLKLLGVPFRK |
| UniRef90-UPI00037039AB | TNYEEGLELCKQFGFPFKK |
| UniRef90-D1GJS0 | QTKSEGI |
| UniRef90_K2FRV7 | TSQAEGLELFKLLG |
| UniRef90-A0A023HHW5 | K NKEES I F L L MQL G |
| UniRef90-K2BZN8 | K T REQGFRLFELL G ${ }^{\text {P P F K K }}$ |
| UniRef90_UPI00036A0E58 | K T K E E G L ELFKLLGVPP K K |
| UniRef90-A6YEB3 | K TKEEAKLLLS S |
| UniRef90-K2DRN2 | K DKVRNLALLKHLGFPFKR |
| UniRef90-A3ZLF9 | K S DEESLELLS |
| UniRef90-V5RXD7 | EDKAHSRALLEKFGMPFEK |
| UniRef90-W1V947 |  |
| UniRef90-K2DGJ2 |  |
| UniRef90-J3LJG6 | K T D NEALRLLTLLGMPFSE |
| UniRef90-K2EQA5 | KNREEGLALFKLMGFPLKK |
| UniRef90-R5B9Z6 | K T DEEAHALLAAFGLPFKK |
| UniRef90-X7Z5A5 |  |
| UniRef90-101IH7 | S T D E L S R A M G G G P P V V |
| UniRef90-D4DR | KTDEEAKALLS |
| UniRef90-UPI0004786387 | T NKKHTLALLEEENFPFNK |
| UniRef90-D0EVS1 | KTDNEG |
| UniRef90-K2FZ52 | DNKEHNKALLQAMGFPFTK |
| UniRef90-K2FDH1 | KTQTEGEVLFRTLGFPLQE |
| UniRef90-J9Z2B1 | T NDKEGYELLKLLM |
| UniRef90-X0YVS3 |  |
| UniRef90-UPI0003608887 | NTKEEAEALLRHVGLPLQK |
| UniRef90-K2DJ77 | EKNTEGY |
| UniRef90-R1F4H6 | PSEEEAFLLLSALRFPFRQ |
| UniRef90-K2AP71 | K N N Y G Y VL L K AL GFPFK |
| UniRef90-B9FAU8 | K T D NEALRLLTLLGMPFAE |
| UniRef90_L8FR92 | TSDRHARLLLKALG |
| UniRef90-X1P613 | P NDEQGRRLLELL |
| UniRef90-X1EP11 | ESDKAATALLEKLGM |
| UniRef90-G2YWG9 | T S D R H A RLLLS A M G VP |
| UniRef90_V7PY18 | K TKTEATDFFELLGVPFKK |
| UniRef90-T1A782 |  |
| UniRef90-K1WMN6 | TS DRHARLLLSSLGVPF |
| UniRef90-A0A023HAA5 | S S Q K G M L FK F LR |
| UniRef90-A5CCK0 | K S LL K A K A L $\quad$ K M R D $\square \mathrm{P}$ F |
| UniRef90_X1MF96 |  |
| UniRef90_G9NFJ4 | TS DRQGRILLMEALGFP |
| UniRef90-M4QC61 | RSTEELECLLT GL |
| UniRef90-A0A015K0C4 |  |
| UniRef90_X1KY50 | GS DKKAKKLLEKLEMPFVK |
| UniRef90-M2YPL4 | T NDRDARMLLQSIGI |
| UniRef90-G0W8Q4 | QTDEQTRALVSAFQLPFHK |
| UniRef90-S3D7U1 | A S DRHARLLLLSSMGVP |
| UniRef90_UPI0003A7165F | KTDAEAKALLAAFKFPFR |
| UniRef90-A0A023JEIO | SSPRNGMLLFKFLRF |
| UniRef90-I1CU00 | FTNTEGRLLLSAFSV |
| UniRef90_G3AW28 | RTDEQARLLLSSLLGFPFH |
| UniRef90-C4Y8W1 | RTDEAARTLLSSLGMPF |
| UniRef90-P49547 | T APKNGMVLFKFLR F |
| UniRef90-KOKBQ0 | QT DTEARRLLSAYGFP |
| UniRef90_G8XP91 |  |

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UniRef90_Q5CX79

1
10
20
30
40 MNT RKEYEKGIIKPILLKNSPFSNPHSIIPKLKKI Q|I NRGL




A RMKERFLNEDTPALMQKFSYSTVMQDPKDEKVVVNMGV SNPMRNPKVEKVVVHMGV MRRPRI EKTVV HM GVV
 V $N$ R L $\quad$ K T T Y L E K K

P R L K Q T Y H S T $\square$ A P D L M T LT Y T H VN N $\square$ P E I R E I T I A S N V
 Q E L W K N N P M L K P R NPMRTPKI DKVVVHMGV T NPMREVKI DKLCLNDCV N N K NVPKLESVVVQSYN MREPRVEKVVV HMGV DLLEK N VT WHNDP QI K AV SL H A F M
 MRE PRVVEKVVV HMGV M N L L Q H Y Y K K I I K R D L I N K F S Y T H L E E DP QL K K I I L N F GC FK S L Y K R Y $\quad \mathrm{V} P \mathrm{Q}$ Y R N L L K L

 MRDPRIEKVVVHMGV MREPVL E KVVV HM GV T F N N $\square P \mathrm{P}$ L K R V T V H A F I MREPTVEKVVVHMGV


T N P M R D L K V D K L V L N C S V
PMRK P RI EKV TII N I GV

Q N P MRELRLEKLCLNLCV MAKLLH Y Y K D E V VN K L M T E F N Y N S V M Q V P R V


TAMKD $V Y \square D V V V H M G V$ MRE PVVEKVVV HMGV
K D T MAEPRI EKI TIVNDGV
S RLQ E K Y M K E VAP A L M E K F GYKNVMEDPKL NKIVI NMGI M Q DV HI D K V V V H M S V $P$ VE T K K S K K D N VM R G L R I E K L V L N I C V NHPQELKVDKLVVNISV MKA PK I E K I I V H M G V
N P M Q E LR
Q QEVVWEKEPMKK PRI QKVVTVNF GV

 KDKVIS ILLEKWRSNPMRIPRRGM

PMQQPRIEKVVVHMGV
K L S K WN S NPMLKPRIVGVTVNISV MAETQTVNPMRKLRLEKVTVNI GV KAVTKKAN

NPMRDI KI MKLLCLI CV


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UniRef90_W3X4V9 UniRef90-GOSE17 UniRef90-V5GCB8 UniRef90-XOT1E4 UniRef90-F8KQ75 UniRef90-A7TMM5
UniRef90-M4QA19 UniRef90-S8BGZ8 UniRef90-N1JPR3 UniRef90-R7K9H4 UniRef90-F7VYZ7 UniRef90-JOMU93 UniRef90_V9GH70 UniRef90_Q12ZT8
UniRef90_U1P2T1 UniRef90_U1P2T1
UniRef90-D5G7B5 UniRef90-U1HHW6 UniRef90-W9R1N5 UniRef90-W7U1W1 UniRef90-G9YKH4 UniRef90-H6BYY7 UniRef90-D1ZOT4 UniRef90-V9DC47
UniRef90-F6BD87 UniRef90-D7E8S2 UniRef90-B5XGS0 UniRef90-B9WC54 UniRef90-D2RUD9 UniRef90_G1XUJ2 UniRef90_A0A058ZB13 UniRef90-MOCIS2 UniRef90-16N5U5 UniRef90_U1PPI0
UniRef90_D91XF3 UniRef90_H1YWQ3 UniRef90-P50557 UniRef90-V4XWL6 UniRef90-W2RVY8 UniRef90-R4WA18 UniRef90-X1ACX3
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UniRef90_Q975J3 UniRef90-A8E675 UniRef90_S5TRT1
UniRef90_Q5CX79

|  |  |
| :---: | :---: |
| G | A |
| GSLATRKKDFDEFEKVIT K | T GQK S RVYKSKKAIS S F KLR |
| P A G A Q K E Y L HVCRAVVQA | S GAFPEVT RVK H GVVQWGVR |
| RLDRTDAVVLETTVRDMY | T GQRPTITKASKPVSGSAYR |
|  | A GQKPLSTFAKKSISGFKI R |
| L | S GQVPEVTKNRVGVA Q WGV |
| K QVVESSAPLHVAGMAI QA | SNVRVRTHKMKGSIAKW |
| GRAVA Q S A K PDDIIK K I T A | T GQKPVVTKAKKAIASFKTR |
| KDAILENKTALLS MVMAI QC | T GLLKPEI 1 N AK T GVAP WK LR |
| PAAADNKEYLDVARAVVQAI | GEFPETTRTRSNVDHWGVR |
| GEA $\square$ NDKKLLENAASDMA | S GQKPLIT K ARKSVAG |
| PEAGDDSAHLHVAGMVVQAI | TNVRVTAHKARQSVAQWG |
| KESKENQLLP PITA A LQQLQQi | T GCKPQPVYARTDVPSWK |
| SEAVADKKVMDHAVSDLTKI | A GQKPVVTKSKKAI A GFK |
| PEAQENSANLHVA GMIVQA | SNVRAVSHKARHNVVGWG |
| SQAKENPLLAI SASLQQLQQ | GVKP $\mathrm{P}^{\text {P }} \mathrm{L}$ Y SRTDVPS WKV |
| P QAKK S Q ${ }^{\text {PVTTVAKAVI QS }}$ | T GVRPQATHVQHSVAQWQI V |
| PEA $\square$ QEPDYLLVARTMLL L AL | T GTTPEDTKTKSNVVQWRI Q |
| KEAAENSGWL HVAGMAVQAI | SNVRVETFKSRSSVAPWG |
| GEA $\square$ Q NQRALEAATNDLSLI | S GQRPVIT RAKWSIASFKL |
| GDYAKDMKVMQNDAQTLS | A GQKAVI TTAKKS |
| SEAKDNSLLATDSAALQLQQI | T GVKP NAIYSKSDVPNWK |
| KEDSKDKKNLSKILILMELL | S GQKPVMVKAKKSI S Q WKL |
| $K G A A Q N S G W L H V A G M A V Q A I$ | S NVRV |
|  |  |

$P \square G L K N P D M L I A A R A V L L A M T G T M P E M T R S K S N V V Q W H L Q$
G D A VA NS KVLDS A VNDMQLIA GQKPVDTRAKKSDAGFKDR GESGQ HLVDAEGULETITGQTVVRSYAKRTLPAFTIK $G Q G G R D L G Q G E E \square \quad G L D V T G Q Q P V R T V A T M T E P A F G I R$ RGALLKDSAYLHAAGMVVQSITGVRATVHKSRENDSMWELR

 PEAVQDPDHLLLVARSVLLALTGTTPEITKVKSNVVQWRIK



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UniRef90-G8BRH1 UniRef90-G8BRH1
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UniRef90 F7VYZ7 UniRef90-Jomu93 UniRef90-V9GH70 UniRef90-Q12ZT8 UniRef90_U1P2T1 UniRef90_D5G7B5
UniRei90_U1HHW6 UniRef90-W9R1N5 UniRef90 W7U1W1 UniRef90-G2YKH44 UniRef90-H6BYY7 UniRef90-D1ZOT4 UniRef90-V9DC47
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UniRef90- AOA058ZB UniRef90-MoCIS2 UniRef90-16N5U5 UniRef90-U1PPIO
UniRef90-D91KF3 UniRef90-H1YWQ3 UniRef90-P50557 UniRef90- ${ }^{-} 4 \times W L 6$
UniRef90- W2RVY8 UniRef90-R4WA18 UniRef90-×1ACX3 UniRef90-11GH87 UniRef90-F1VY49 UniRef90 D7FN46 UniRef90-C6A173
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S G D S S G N $\square$ A F G $\square P$ A DA $\square E V N$ Y D M Y PP K M $\square P G C H V M V K T S A$ S GNRFGGLSFGSEDVRFFPEDEQDLWPKTFGLHVNINTTA
 SGNKFGSDSFGLTPFFPEIDSNQDLWPVSFGMHININTSA TGDGAGNLAWGFQPSQMMFFPEVYPAKMIPGCRIFVETTA TGDGSGNLAWGFEQMKLFPEDEVNYWKMLPGCRVFVKTTA SGDSS GNIT F GLEPENIEVNYDMYPAKMIPGCHITVHTSA

GFRWA GQ $\square W$ WWVKRTAHF
SGSRFGSVSLGSEDVKFFPETDQDLWPATFGMHTNFNTTA KVKGKQGYSFGFSDSFDFPEVEYEKFQSSYGFNLNCQTTS



 QFDDTGNFSFGVEDHTDFPSQEYDPTTGLYGLDVTVNLVR


NFSQNGNFGFG DTEHDDL GLKYDPSTG $\square Y G M D F Y V V L G R$ TGDSAGNLAFGPDEVKLFPEVEANYWKMMPGCRVFIKTTA GFDGRGNYTLGLKEQLI FPEIEYDKIDKARGMDITIVTTA







 $S F D G$







QFDRS GNLLS Y GVE EHTDFPGQSYDPM\GワYGMDVNVILEK


| UniRef90 A0A023HBT3 | $\mathrm{S} \square \mathrm{DRNGM} \mathrm{\\|} \stackrel{170}{\mathrm{~F}} \mathrm{~F} / \mathrm{L} \mid \mathrm{RF} \mathrm{P}$ |
| :---: | :---: |
| UniRef90-K1X638 | K DNSHAKALLEGLGFDFK |
| UniRef90-C7YU13 | TSDRQGRLLLEALGLLP |
| UniRef90-D8SCN6 | ES RLLEAKRLLMLMGL |
| UniRef90-Q4E956 | VS DKEAKELL LALL |
| UniRef90-C5P761 | RMDKDARLLLNAMG |
| UniRef90-M4G814 | K S NRHARLLMQSLGM |
| UniRef90-C1GPK4 | T T DRDARLLLNAMG |
| UniRef90_UPI000379C48D | S DKKKSLEFLRRLGFPDRK |
| UniRef90-M7NVF4 | K T D Y ECRLLLLSGFGDP F |
| UniRef90-J4W801 | T S DRHGRLLLEALGFPF |
| UniRef90-A3GUR6 |  |
| UniRef90-R1EFD6 | D S DREARLLLRTLG ${ }^{\text {L }}$ LP |
| UniRef90-C5DI94 | QNDVQARTLVSGFAFPFH |
| UniRef90-C9YDW8 |  |
| UniRef90-B2VVP8 |  |
| UniRef90-G8BRH1 | QT DAQARTLI S GFQI |
| UniRef90-W3X4V9 | K S DRHARLLLQSLGVPFH |
| UniRef90_G0SE17 | T S DRQARLLL Q A M GLP F |
| UniRef90-V5GCB8 | T T DKDARLLLSAMGIPF |
| UniRef90-X0T1E4 |  |
| UniRef90-F8KQ75 |  |
| UniRef90-A7TMM5 | Q NDLQAKSVIS GFQVPF |
| UniRef90-M4QA19 | HEVEELKKLVSAL |
| UniRef90-S8BGZ8 | K S DKDARLLLSAMGVPF |
| UniRef90-N1JPR3 | T S DRQARLLLAALG |
| UniRef90-R7K9H4 | K T DEEARELLK L F G M PFAK |
| UniRef90-F7VYZ7 | T S D R A A L L L Q SLGMP |
| UniRef90-JOMU93 | T T DEEGRALLRHLGFPFKE |
| UniRef90-V9GH70 |  |
| UniRef90_Q12ZT8 | P G Y R V S K R R $\square$ A K R K $\square$ P |
| UniRef90_U1P2T1 | P G Y R VAKR |
| UniRef90-D5G7B5 | G NDVDAK L L K A M G LP F |
| UniRef90_U1HHW6 | NTDKDARLLLQTVGIPF |
| UniRef90_W9R1N5 |  |
| UniRef90-W7U1W1 | K G F R VGR R K L K R VGAPHR |
| UniRef90-G2Q7Q7 | TS DRQARLLLQAFGV |
| UniRef90_G9YKH4 | K NDEESRDMLALLMGMPFEK |
| UniRef90-H6BYY7 | T CDKDARLLLE Q $\mathrm{C}^{\text {L }}$ |
| UniRef90_D1Z0T4 | P GYR $\mathrm{D}_{\text {KRRKAQQQE }}$ |
| UniRef90_V9DC47 | NQDKDARLLLQQLG |
| UniRef90-F6BD87 | P G Y R V K R R KVK R A |
| UniRef90-D7E8S2 | PGYRIKDRKVESRKI |
| UniRef90-B5XGS0 | PGHRVARRKR |
| UniRef90-B9WC54 | Q T D NHAKTLLS CYGFPFSK |
| UniRef90-D2RUD9 | P G Y R V S K R |
| UniRef90-L2G6N4 | TSNRQARLLLLQALGLPFH |
| UniRef90-G1XUJ2 | TS DRDARMLLTAFGVP |
| UniRef90-A0A058ZB13 | PGFRVARRCKSRVGAPQR |
| UniRef90-M0CIS2 | PGYRVSKRDKASRQ |
| UniRef90-16N5U5 |  |
| UniRef90-U1PPI0 | P G Y R V A K R |
| UniRef90_D9IXF3 |  |
| UniRef90-H1YWQ3 |  |
| UniRef90-P50557 | PGYRVKKRDKRSRQIP |
| UniRef90-V4XWL6 | P GYRVAKR |
| UniRef90-W2RVY8 | D T DKDARLLLLQQLGVPF |
| UniRef90-R4WA18 | P G Y R V ${ }^{\text {a }}$ K R |
| UniRef90_X1ACX3 |  |
| UniRef90-11GH87 | R G Y R V A ERKRKRGKVGFR |
| UniRef90-F1VY49 | KTDDEAKSLLAAFKFPFR |
| UniRef90-D7FN46 | P G Y R V A K R |
| UniRef90_C6A173 | PGHRIA $\dagger$ RKRRRHH $\mathrm{P}^{\text {P }}$ P |
| UniRef90-T2MEY1 | PGYNI A YRKTSTVGFPHR |
| UniRef90-A9UNZ1 | K GFRVARRKRSRVGAPHR |
| UniRef90-G5NIW2 | K T DRAAR |
| UniRef90-C5K6X7 | P GRRVGERKR |
| UniRef90_UPI000474EED6 | P G Y R V A K R R $\square$ M A K T VP |
| UniRef90-X1PBR5 | TKDKEGR |
| UniRef90-A3CT10 | K GARIARRSVERRKL |
| UniRef90-MOMI71 | PGARVKRRNKATRQLPSR |
| UniRef90-M7T2C6 |  |
| UniRef90-T4P8A4 |  |
| UniRef90-E1RKD6 | K G $\square$ R $\$ ARRNDERKKLPSKQ  \hline UniRef90-P16168 & PGFRVAHKKRAGAKVGFQ  \hline UniRef90-R9PEV0 & A GARVARRKVARVGAPHR  \hline UniRef90_LOKYJ7 & PGYRISKRRISERR】P  \hline UniRef90_UPI00045457EC & PGFSIA  \hline UniRef90-A6UQ57 & P GYRVKSRKLKRSH!P  \hline UniRef90-P46749 & RYKKDG L L Y S AFQMP  \hline UniRef90_F4BZV0 & A GYR $\square$ A R R R V S K K K L P S R Q |
| UniRef90_Q9YF87 | P G H R |
| UniRef90-D2RE53 |  |
| UniRef90-E0SPZ0 |  |
| UniRef90_M4YQQ9 | T GTRVERRALQARR】P |
| UniRef90-U1PBV2 | P G Y R I S K R |
| UniRef90-I3TDC6 | P G Y |
| UniRef90-R9AEB3 | P G Y R V A K R K R N NK $\square$ G F Q |
| UniRef90_Q975J3 | P G |
| UniRef90-A8E675 | A G Y NVNQR |
| UniRef90_S5TRT1 | K Y Y NHLY I I L N QFNDP |
| UniRef90_Q5CX79 | P G N R \\|V/S L |

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K N P M Q S $\mid$ V|K|L|A K $|V| T|V| N|I| G \mid L$
K N A M R D I HI H K L CVV L L C V N P M K D L R I Q K L V L $N$ N N P M R EVVYI QKL CIINCCV NPKNLPSISKVVVSTMH
 KSYYHNLVSHDF LLKDNYTNGMLAPGGTKVTVNDGV $R$ L Q K Y L R E Y G $\square$ K K $\square$ E R R F GF $\quad \mathrm{L} N \mathrm{~N} \quad \mathrm{~L} E \operatorname{V}$ N P M R R VK

 A NPMMEPRIHKLVLNI CV
S NVMRNDRVVEKLVI N I CV
LY M MAQETK L G P

S A MEVVPR L WK A T L S M Gl
NPMRQIRVEKLVLNISV

MFS S L F HYEDVLRQDLLLK $\square N H$
PMWELLRI

SNPMREI KI EK V V L N I SV
K K DKSANPMRGMVI
M S R L E K L Y K K K $\square \mathrm{F} N \square \mathrm{~K} \square \mathrm{~K}$ R S L N C $\square \mathrm{M}$

## $R \mid$

TSMRDIYID KVVVMMMV

$\square$ I K K N S A NVMRELVKV
ENKEQNVMREI KVVKLVLNICV

VVKKEVKEK ATTASNVVVRLEKKVVGMSMV
EMEKK A GNENPMREVVG DKVVI NI GV
PMREPR E K V V V H M GV
MRK
MQEAKQSNMREI KVQLVLNIV

$M L P L H L H Y E D V L R Q D L L L K Q N H A N D M Q Q V P G L Y E B I R L$
 N P M R K I R
K K K KVP SV

$N \bigvee M R K$ K R $\quad$ E K L I V H T C I P M K R V Y I E K V V V N $\square \mathrm{G} V$ PRLKSHFQNTLSPALLSNDPYTAHRQQPRLDKIVI HTMV $M L P L H A H Y E D V L R Q D L L L K L N H A N A M Q V P G L D E I R L$

NTMKTIRLEVKVLNMGV
FP L N F H Y E D VLR Q D L L LK L N HANVME VPGGLEI RL
STPENVTRLEA I QI H TMA
T T S E NVVQLE K I S I H S M V
A N P M L L S Pr S
TNPMREI K L K K L S I V L N V
T P E L I I P A L E S I T I H H S M V
N N P M R D I R l Q K L C L N DC V
$M \operatorname{V}$ N P K K L E N P M R E L


TPENVVRLEKIVI HTMQ
EKKLLNNPLRDIKVQKLVLNDSV
N NAMRDワHVDKLVINCCV
PMRKIRI E KVVTLNTGV

N R L R F H Y E N V L R Q D L L L K K L H Y T T A W R


QKEVRKE QKDSSKNVMREVR DRK LTCLNDCV MSPLHFHYEDVLREDLLLKLNPKNYFQVPRMSEVKL NPMQELRVRKLCLNDCV

$\square K$ E E R K $\square \mathrm{N}$ | $N$ | $P M$ | $T$ | $Q$ | $V$ | $K$ | $L$ | $R$ | $S$ | $V$ | $T$ | $L$ |
| ---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $M$ | $N$ | $I$ | $S$ | $V$ |  |  |  |  |  |  |  |
| $M$ | $P$ | $R$ | $I$ | $T$ | $K$ | $V$ | $T$ | $V$ | $N$ | $I$ | $G$ |
| $V$ |  |  |  |  |  |  |  |  |  |  |  | MFPLHFHYEDVSRQDPLLKPNHANVMDVPGLCEIRV KKPAP K A S P E NVVK L E K I C L H S MQ NPME EVII D K VVVVNDGV

MFPLS FHYEDVSRQDPLLKLDPANVLEVPGLCKI RVVPK T M Y F L K H F Y $\square$ K T L K Q E L I N K F S Y K H T K QL P P L K K i T L N F G L N P MREIT I D K V VI N $\square \mathrm{G} \mathrm{V}$
$R$ L A D H Y H N T L R D D LMYKFRHNNPENVI QLERI QL H SMV
SRLLK E H Y H T T T L A A R D


## UniRef90 B3FQV3

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UniRef90 Q00PH4 UniRef90_V2XPJ6 UniRef90_F8NYR3 UniRef90-B3V5H5 UniRef90_ROKX99 UniRef90_J4U9J0 UniRef90-U6IE89 UniRef90_M1V5J8 UniRef90_F1DPM3 UniRef90_l2JZ39


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UniRef90 14 Y9002 UniRef90-14Y902
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| :--- |




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UniRef90_E3GZD2 UniRef90_V4BAK3 UniRef90_X1GDJ5
UniRef90_UPI0003829D3F UniRef90_K8ENF7 UniRef90_B3FQV3 UniRef90_V6LTE0 UniRef90-A3MXP8
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UniRef90_M1V5J8
UniRef90_F1DPM3 UniRef90_I2JZ39 UniRef90_UPIO0044174CF UniRef90_G7IVB6
UniRef90 M0EAM8 UniRef90_DONSC8 UniRef90_Q74N79 UniRef90-V4JEC2
UniRef90-H9LR06 UniRef90_C1KR86 UniRef90_C1GQC9 UniRef90_UPI00022C8FA5 UniRef90_Q00PH6 UniRef90_UPI00046B5CC2 UniRef90-UPIO0036EDCFD UniRef90_G2XM14 UniRef90_UPIO004409B66 UniRef90_Q56231 UniRef90_R4QY99 UniRef90_P50881
UniRef90_F1DGP2 UniRef90_T0N3M2 UniRef90_S8E6I2 UniRef90_C1KRI1

S $\square$ D K H G NVS F G $\square \mathrm{KE}$
$N$
S SA GA G GFSFGIT
K E H I L L P
$G$ VK Y D P E VG IF GFDVI IA MER G GFGI NEHIDLLKYDPTTGIYGMDFYIVLKR

NF S
$\mathrm{A} V \mathrm{~V}$
C
C F S
$S$
$Q F$

## 424

 NF$S F$
 S

GF



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






N
S F T D R G F G F G I P P E Y I M I P G M K Y D P E L G L I GlLEA Y VT LER

 H F S G T G N F G F G
F F M D TE F C E F S P E LE D H L E I F E Q F $\quad$ R G F N L T I I S A









UniRef90 W7KXC2 UniRef90－A9J5P8 UniRef90－L8FZG UniRef90－O14337 UniRef90－GOT2D2
UniRef90 14 Y902 UniRef90－B3V566 UniRef90－D3IZY8 UniRef90－A0A010S1S9
UniRef90＿R9YMM
UniRef90－H2C619
UniRef90－F2HHU2
UniRef90 BOEB73
UniRef90－G4RN31 UniRef90 C1MGT2 UniRef90－D8LW32 UniRef90－M1XMN3 UniRef90＿G0HIF9 UniRef90－F8QQG7
UniRet90－P48157 UniRef90－UPIO0042C6424
UniRef90 V9VF67 UniRef90－LIJG94 UniRef90－E4Y2X5 UniRef90 B6JYQ4 UniRef90－EOTJ36
UniRef90－R9SL28
UniRef90＿F4PC68
UniRef90 LOHKQ4
UniRef90－X1HNA7
UniRef90＿S5Z676
UniRef90 R7QN89
UniRef90－Q81BQ6
UniRef90－R1EEO3 UniRef90 C1LMB3
UniRef90－O28367
UniReffo－G2MM75
UniRef90－AORVY6
UniRef90－C5Z485
UniRefgo－P41202
UniRefon
F6D7
UniRef90 ${ }^{-}$K4ABD
UniRef90－K0IFV4
UniRef90－E3GZD2
UniRef90＿V4BAK3
UniRef90 ${ }^{-}$X1GDJ5
UniRef90－UPI0003829D3F
UniRef90－K8ENF7
UniRef90 B3FQV3
UniRef90－V6LTE0
UniRef90－A3MXP8
UniRet90＿R9AAG8
UniRef90 Q00PH7
UniRef90－V6ASE5
UniRef90－Q00PH4
UniRef90 V2XPJ6
UniRef90－F8NYR3
UniRef90－ $\mathrm{B3V5H5} 5$

UniRef90－J4U9．Jo
UniRef90－U61E89
UniRef90 M1V5J8
UniRef90－O26124
UniRef90－F1DPM3
UniRef90＿12JZ39
UniRef90 UPIo0044174CF
UniRef90－G7IVB6
UniRef90－MOEAM8
UniRef90＿DONSC8
UniRef90－Q74N79
UniRef90－V4JEC2
UniRef90＿H9LR06
UniRef90 C1KR86
UniRef90－C1GQC9
UniRef90－UPI00022C8FA5
UniRef90＿000PH6
UniRee90 UPI00046B5CC2
UniRef90－UPIO0036EDCFD
UniRet90＿Q2QAR7
UniRef90 G2XM14
UniRef90－UPI0004409B66
UniRef90－O56231
UniRef90－R4QY99
UniRef90 ${ }^{-}$P50881
UniRef90－F1DGP2
UniRef90＿TON3M2
UniRef90 S8E612
UniRef90－C1KRI1
UniRef90＿UPIOOO4413173

PGYRVVRRKRKKSK】
PGMRVSYR
RGERVAKR
KGQRVSKRI
K DTRLARFFVSSL $\quad$ TPF
 KGYAKTRALMSGLRMPF
PGHRVSRR

 YHQKPVAYLLQNLNFPDTK K G

$P G D R V$
PGYRVAKRCQSK $\square$ GKPHK
$P G G R V S K R$
PGFGINKR
SCGAQSARLLRR $\square$ AFP
PGNRVMYKKMKRGKVGF
RGERVAHRKRK
P G
NTQDETLLLWS GF
A GDRVAKRKLRK
A GYGISKR
NETHLARFLLSSF DPF NNDEISKLLLDNFKFP
 $R G \square R \square T R R R M E Q K K L P A K Q$
$P G Y R V A R R R R K K S K \square P N R$
A GNRVSKR
S G Y
PGERVAKRRRSKNK！
SGENRARALVSGFQUPFVR
PGMRVRYR
PGYRVAKR
P G Y
A GYRVARRC
PGYRTMKRKRKKAS $\mathrm{P}_{\mathrm{P}}$
PGYR\RRRK】QNKKVP
DTKDETSLLWS GF
$P G Y R \square A R$
PGY
AGYNVSRRCKNR $\square G \square K H R$
PGMRVKSRRKARSKIP PGYRVKYR
KADFEKKLLFTSYNFP K SNEEALSLLAAFGMPYR PGLRVSKRKQTRVGAPHR $P G L R V$
K GEAKTRADMSGLR】PF
STKDVTSLLWS GL
P G
NTKDVT SLLWS GF
TGQDRARALVSGFQDPFAR EGQNRARALLSGFQVPFTR PGH
PGSRVSKR
PGDRVSKRLRSRVG
DSQEFARALLSGFRDPFSR A GQRVARRCVSSVG

P G H
REKS LVP LLLWS GLQL
EGQNKARALISGFQDPF
$P G N R V G R R$
PGYRVSKR
PGYRVERRRTKR
PGFRVERRRRARSRDP LR
KTQNETSGLWSGF
HSPRVGEAFWSGLGLP
PGERVAKR
NTKDETLLLWS GF
P G
P G
PGHRVS
NTQDETLLPWS GF
EGQNKARALLSGFQLPFAR
R G
NTQDETLPPWSGF
VDRKET $\square$ F $\quad$ LK S $\square Q L Q L K E$ R G
F GQNRARTLLSGFGVPFTR





 GESGDRL TRAAKXMEXLTGQTPVFSKXRYTXRSFGUX PYDFRRK NGKLAMEILRGQKLITGKSFRSNPFLESN KNKQSILRTIYVWALLTGQRVQCTNAKKSVAVFQLK YNF $\square K N G K L A M E D P R G Q K F I Q T Q R G S T G K S F R S N P F L G S N$



[^1]


[^2]|  |  |
| :---: | :---: |
| UniRef90-T1BIL9 | SF DKQGNAYFG\P DYTEFEGQKYDPDワG |
| UniRef90_T0LVA8 | SFDQQGNAYFGIPDYTEFEGMKYDPEIGI F GL DVAV |
| UniRef90-A4ZHB8 | NFQ $\square$ QNVLHFFELGKTEFLKFRNLPPLDV |
| UniRef90-M7SBY0 | NDGWGFDVQDVM |
| UniRef90-G0QU94 | KF LLK GNFGFGDQEH I DL GMKYDPYTGПFGMDFY V |
| UniRef90_A0N0A4 | NFSDS GNFGFGI E EHI DL GLKYDPSTGIFGMDFYVVLGR |
| UniRef90-A9BKC3 | NFSDTGNFGFGINEHIDL GVNFDTSTGIFGMDFFIVLGR |
| UniRef90-Q05FJ4 |  |
| UniRef90-A0A026VT50 | NFSDTGNFGF G |
| UniRef90-Q0P312 | SF NKNTVNFGLDAFLKCTEDQPNMFDFLEGCSCSFVTSA |
| UniRef90-Q3S292 |  |
| UniRef90-UPI00046B8CD0 |  |
| UniRef90_Q1XG97 | VQKS S $\mathrm{V}^{\text {Q }}$ LSMPTSLLRLFPEIHFEDFEHIQGFDVTIVTSA |
| UniRef90-A0DI11 | NFSESGNFGFGTQEHIDL GLKYDPYTGI F GLLCCVVKTR |
| UniRef90-X0U365 | NWDDDGNFAFGIK H HIDIPPVVKYDPQLGIQGMNDTVCIER |
| UniRef90-M5E5N3 |  |
| UniRef90_UPI0004560B79 | NFSDTGNFGFGD |
| UniRef90_E9P1D4 |  |
| UniRef90-A8MB19 | SF NAGNVSFGIREHILVPGSRYDPADGDFGFDVAVTLAR |
| UniRef90-UPI00046226A6 | SASGVVSFGLPPAALGLFPQIEFDAYPATFGMHIHCMTNA |
| UniRef90_UPI0002235 |  |
| UniRef90-E6ZTU9 |  |
| UniRef90-G0QB89 | SFDGNGNLSFGПDEYI DVPGVEYDGD\GMMGFEVAVS |
| UniRef90_B3T591 | SFDPRGNCSFGIPEHI EI E GTKYNPEVGI |
| UniRef90-A2EA92 | CFS $\square$ E GNF GFGI KEHIDL GLKYDRDIGI HGMDLYVVLER |
| UniRef90-Q8LX03 | AHEN $\square$ YCFVLKDLFSFEEPLFPYFEEVGS $\square$ Q CQFHFT T |
| UniRef90_Q00PH2 | FFMETEFCEFSPELEDHFEDFEH MRGFNVTVVTSA |
| UniRef90-UPI0003331 | NFS D T G NFGLG\QEY |
| UniRef90-H0AA68 | QFDEKGNFAFGI GEYI DVSGID Y DADIGMMGFEVSVNLER |
| UniRef90-D6GWY6 | KFDRNGNLSFGVKEYI HI P GAKYDYTI GIVGITSVNV |
| UniRef90-UPI00036CFB8D | S NFGD GTI S F Gl S EYI DI P NVQYDVDI GII GL DVVSLTLQR |
| UniRef90-T1CGU7 |  |
| UniRef90-D7RMZ5 | QVSLEAEFCEFASELLEDHFEDFEDMPGFNLRILTSA |
| UniRef90-H9M812 |  |
| UniRef90-K4A0Z7 | AE $\square$ RENTI NFFMETEFLF |
| UniRef90-UPI0004560B8D | ATSGVVSLGMRPEAMALFPQTEVNLDQYPLGFQLDCITNR |
| UniRef90-Q2TUG0 | EK L Y CFLLK |
| UniRef90-Q00PH1 | FFMETEFCEFSPEDEDHFE\\|FEH $\square$ L |
| UniRef90-X8JJ81 | AGVAFGL |
| UniRef90-K9ZXD8 |  |
| UniRef90-11KZN9 | NFSDTGLLRLWYSGAYRFGN |
| UniRef90-W5HVA1 | EFCEFSPELEDHFEI |
| UniRef90-L9KGT6 | LD F Y V V L G K |
| UniRef90_UPI0002B4239E |  |
| UniRef90-J7GTF8 | S LD R F G N N F S $\square$ VD C N $\square$ FP D F F GEK |
| UniRef90-UPI00020E2C12 | S FSN |
| UniRef90-G3RXI1 |  |
| UniRef90-C6FGQ3 | NFAELLLSKESFRSLPEI HPFEFFEHKHI GGFDVTIVTSA |
| UniRef90-K4HFL6 |  |
| UniRef90_D2Z230 |  |
| UniRef90-B0BLE0 | QFSMETEFC ESFPELEDHFEIFEHIRGFNVTIATSA |
| UniRef90-H2PYA9 | T GC\GAKHRIS KEEAMRWFQQKYDGI |
| UniRef90-Q9G8W5 | GF N N GVK S LLLLPPQ L TVRGYNLFGFNTTFNLNT |
| UniRef90-G3EIZ3 |  |
| UniRef90-UPI0003ABC091 |  |
| UniRef90-F4RC43 | PYDGTVQLGLPSSGMGLWPGIELENWPRKYGMNLHFVTNA |
| UniRef90-U5YEF6 | NNT】QUALNSSLIRLFPEDQNHFEHFECVQNFH\SIITSA |
| UniRef90-K4HDN6 |  |
| UniRef90-G3EU44 | KFSMETEFFEFFPELHFEIFSKTLGFNVTIVTSA |
| UniRef90-W8VJUS | SFGVTKVTDFPETDYQYHLEQHDFGCNFEFSNYA |
| UniRef90-P49388 |  |
| UniRef90-Q9G4D4 |  |
| UniRef90-G6DIZ0 |  |
| UniRef90-Q4PF66 | AMSGVVS LGMHPEA IPLFPQIE $\square$ QYPNKPLGFQ DDCITNR |

NFDARGNFE $\square$ SAKDHLVIPE $\square$ DYEGFARKRAGGVPVKTKK Y H S
 QF SME MEFCKLSP E L
lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol0
jhmm
jpssm

|  | 170 |
| :---: | :---: |
| UniRef90_TOLVA8 | K GYRVRRRRDESKGLP |
| UniRef90-A4ZHB8 | KNENELFLLL ${ }^{\text {K S }}$ |
| UniRef90_M7SBY0 |  |
| UniRef90-G0QU94 | P G NRVAR |
| UniRef90-A0N0A4 | A GKRVKNRKYRRSNI |
| UniRef90-A9BKC3 | AGERNLKRKRRRSKI |
| UniRef90_Q05FJ4 | N $\square$ K K N F L E F Y K L I N F P $\square$ |
| UniRef90-A0A026VT50 |  |
| UniRef90-Q0P312 | S TVHHTQLYCSGLHFP VLK |
| UniRef90-Q3S292 | K S Q NEDFFLLK SVKF |
| UniRef90_UPI00046B8CD0 | P G F S I A |
| UniRef90_Q1XG97 | KTQDEAF L W W GF |
| UniRef90-A0DI11 |  |
| UniRef90-X0U365 | P GFRVKRKRKARSK\PYR |
| UniRef90-M5E5N3 | RATERARTLLS GLGLPFVR |
| UniRef90_UPI0004560B79 |  |
| UniRef90-E9P1D4 | Y N N Q N I L LY L S S $\square$ Q F P $\square \mathrm{A}$ Q |
| UniRef90_A8MB19 | P GFRVQYR |
| UniRef90_UPI00046226A6 | K GQNRARALLS GF Q 1 P F AR |
| UniRef90_UPIO0022351F4 | P GF S ${ }^{\text {d }}$ A |
| UniRef90-E6ZTU9 | K A T EKA R A L L S G LG $\square$ P F VR |
| UniRef90-G0QB89 | P G Y R V K R R |
| UniRef90-B3T591 | PGFRISRR |
| UniRef90_A2EA92 | PGNRISRR |
| UniRef90_Q8LX03 | K D $\downarrow$ S ES HVLLG H GLLQVIC F |
| UniRef90_Q00PH2 | STKDVTSLL |
| UniRef90-UPI0003331073 | PGFSIA |
| UniRef90-H0AA68 | P G Y R V K R R |
| UniRef90-D6GWY6 | RGFSI S |
| UniRef90-UPI00036CFB8D | A GYS I AKRLTKKRKI |
| UniRef90_T1CGU7 | K G I RVARRKI R N N A VP P K |
| UniRef90-D7RMZ5 | KTEDET L L W W G |
| UniRef90-H9M812 | NTLDETILSWS GF |
| UniRef90-K4A0Z7 | DTKDET S LLLWS GF |
| UniRef90_UPI0004560B8D | K A $T$ E K R QLLS GLGVPFVR |
| UniRef90-Q2TUG0 | K SEAV |
| UniRef90-Q00PH1 | NTKEET |
| UniRef90-X8JJ81 |  |
| UniRef90-K9ZXD8 | K N S K E VSVFL |
| UniRef90-11KZN9 |  |
| UniRef90-W5HVA1 |  |
| UniRef90-L9KGT6 | P G |
| UniRef90-UPI0002B4239E |  |
| UniRef90-J7GTF8 |  |
| UniRef90-UPI00020E2C12 |  |
| UniRef90-G3RXI1 |  |
| UniRef90-C6FGQ3 | NTVGET F $\mathrm{V}^{\text {L L L S S F }}$ |
| UniRef90-K4HFL6 |  |
| UniRef90-D2Z230 | LS Lie E F VF F LT S F K F P |
| UniRef90_B0BLE0 | NA Q DETLPSWS GF |
| UniRef90-H2PYA9 |  |
| UniRef90-Q9G8W5 | K NFD LI LS GFQ■ |
| UniRef90-G3EIZ3 | K TQDETLPPWS GF |
| UniRef90_UPI0003ABC091 | P G |
| UniRef90-F4RC43 |  |
| UniRef90-U5YEF6 | NTENETHLLWAGF FKK |
| UniRef90-K4HDN6 | P G |
| UniRef90-G3EU44 | KTQDETLPPWS GF |
| UniRef90-W8VJU9 | K LDCTS YLILS HLLQL |
| UniRef90-P49388 | NTQDETLPLWS GF |
| UniRef90-Q9G4D4 | NLLFYTKKFFLQQ1 K Y P VK |
| UniRef90_G6DIZ0 | PGFNVAHRRRKKVGFPHR |
| UniRef90_Q4PF66 |  |
| UniRef90-K4CT02 |  |
| UniRef90-S3DJ33 | VD A A E DE D F M R R WE T D F K K |
| UniRef90-L9KUU6 |  |
| UniRef90-Q2TUC2 | N N D |
| UniRef90-U5D9V3 | NT Q A ETLP P WS GF |
| Ref90 Q3LWF5 |  |

[^3]
[^0]:    | $S$ |
    | :---: |
    | $T$ |
    |  |
    |  |

[^1]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    jhmm
    jpssm

[^2]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol5
    Sol0
    jhmm
    jpssm

[^3]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm
    

