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VVADTP PQ
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 LLHDLAPKNRALLAKRDELQATLDAWHQERTGQPHDAAAY I VNDLAPRNRELLAKRDVLQSKI DAWHVQHKGQ FDFAAY I I HDLAPRNRELLAKRDDLQARIDAWHRQHPGABDMAAY IVHDLAPKNRALLARRDVLQETLDNWYRQN GAPVDMAAY I AHDLAPKNRALLQKREDFQAKLDQWYRDN GAPADLEAY LVTELGPRNKALLAKRDELQAKI DHWHLSRQDQPRDPAAY
 $V V T D D A P R N R E L L E R R D D L Q T Q V D R W H R Q R A D E P L D G A A Y$ V I D D L A P K N K ALL L S T R D DLL Q A RII D G WH Q GRA GTVIDD A E Y



 $I V N D L A P V N R Q L L A K R D Q I Q A Q M D Q W Y Q D D P N G F R D L A K Y$ I V H D L A P K N R A L L A K R D D L Q A R DID A WY R E N G A P S D L E A Y LISDLTPENKKLLAFRDELQNKINSWHKDHK EGIDNASEY LVDDLAPKNRALLAERDRLQAELDAWHRAHPGPGADPAAY
 I ANELAP K N R A L LA K R D DLQ A KI D A Y H TEERAGQPHNAAEY

 L I NDLT PKNKALLAKRDEI QHKLNNWHREN QDFDFNSY LI HDLAPKNKALLAERDRLQTEIDQWHRANPGPDRDMAAY IV H DLLTPRNRELLLLFRDEI QEKI DHWHRRN GQPD D LA K Y ,





 $L V H$ L L I N D L A P E N K A L L A E R R D R I Q A K M D E WY R Q H P G N I A D M Q A Y IVSTLAPKNAALLAERDRI QLEMDAWHKANPGPI ADMAAY I V H DLAPKNRALLAERDRLQTALDDWHRSNPGPVRDPRAY
 LVSDLAPKNKALLAERDKDQKQIDAWHKEN ET DEFDKY
 469BE42

L HELAPRNRELLE

V
F94F45



L
2F88F59

## 道

## 8

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$\begin{array}{ll}L & I \\ L & V\end{array}$
L $L$ N G A P R $N$ R R N L L E R R D M L Q K Q il
IV R DLA PRNRALL E V R DAMQA QL
LV H DLA PKNRALLAERDRLQALL


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UniRef90_C0RES0 UniRef90-A0A031MI29 UniRef90-UPI000364FBA2 UniRef90_H1G2R8 UniRef90_UPI0003824C28 UniRef90 A0A011U9P9 UniRef90 K2KSL1 UniRef90_UPI00031346E6 UniRef90_UPI00035CBD0A UniRef90 B1MB69 UniRef90-W8H2Y6 UniRef90_UPI000262CE06 UniRef90_A8TSU2 UniRef90_UPI000380B7BD UniRef90_UPI0003FA5ADE UniRef90_Q5P811 UniRef90_UPI0002FD761C UniRef90-WPIO002 UniRef90-UPI0002D4D8D6 UniRef90_E3HRL2 UniRef90_-V4RU28

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UniRef90_B1VEG: UniRef90_UPI0002F88F59 UniRef90_UPI00029B53F9 UniRef90_H0A904 UniRef90_E5XNU5 UniRef90_F1VV90 UniRef90_UPI0003B37E88 UniRef90_B8CPB6 UniRef90_LODZW2 UniRef90_Q1YEU5 UniRef90-L0GX25 UniRef90_F9DWJ7 UniRef90_IOHY39 UniRef90_C8X008 UniRef90_UPI00036F2076 UniRef90_H3NXV9 UniRef90_S6IDQ6
UniRef90 W2UGC8 UniRef90 V4YUZ9
UniRef90_W3RJV9

130
140
150
160
LN A RFALNAANARWGSLYDALYGTDVIPETDGAEKGPTYN MNARYALNAANARWGSLYDALYGTDAISEENGAEKGKGYN MNARFA L NAANARWGS LYDALYGTDVI SEDGGAEKGKGYN MNARFALNAANARWGSLYDALYGTDVI MNARYALNAANARWGSLYDALYGTDA MNARYALNAANARWGSLYDALYGTNVI MNARYALNAANARWGSLYDALYGTDAI K NARFALNAANARWGSLYDALYGTDVI N NARYALNAANARWGSLYDALYGTDVI M N A R Y A L N A A N A R WG S L Y D A L Y G T D A M NARFAI NAANARWGSLYDALYGTDA MNARFALNAANARWGSLYDALYGTDAI MNARYALNAANARWGSLYDALYGTDAL M N A R Y A L N A A N A R WG S L Y D A L Y G T D A MNARYALNAANARWGSLYDALYGTDVI N N A R Y A L N A A N A R WG S $L$ Y D A L Y G T D A A MNARY A L N A A N A R WG S L Y D A L Y G T D A M L NARFALLNASNARWGSLY DALYGTNAI MNARYALNAANARWGSLYY A L Y Y GT DVI M N A RYA L NA A NARWGSLY D A L Y GT D A
 $\bar{M} N A R Y A L N A A N A R W G S L Y D A L Y G T N A$ DNARYAI NAANARWGSLYDALYGTDAI MNARYAL NAANARWGSLYDALYGTDVI M N A R Y A L N A A N A R WG S L Y D A L Y G T D A N NARYAI NAANSRWGSLYDALYGTDA

 TNARFAINAANARWGSLYDALYGTDAI
 NNGRYAI NAANARWGSLYDALYGTDAI MNARYALNAANARWGSLYDALYGTDAI
 MNARYALNAANARWGSLYDALYGTDVI NNARYCLNAANARWGSLYDALYGSDAI
 MNARYALNAANARWGSLYDALYGTDA N NARFAI NAANARWGSLYDALYGTDA

 NNARYALNAANARWGSLYDALYGTDA | $M N G R Y$ | $A$ | $N$ | $A$ | $A$ | $N$ | $R$ | $W$ | $W$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | M NARYALNAANARWGSLYDALYGTDA MNARYALNAANARWGSLYDALYGTDAI


SNLRYALNAANARWGSLYDALYGTDA
$N N P R Y A L N A A N A R W G S L Y D A L Y G T D V I$

SNARYAI NAANARWGSFYDALYGTDVI
N N P R Y A I N A A N A R WG S L Y D A L Y G T D A
MNARYALNAANARWGSLYDALYGTDAV


RNARYALNATNARWGSLYDALYGTDVI

N NARYALNAANARWGSLYDALYGTDVI
TNARFSLNAANARWGSLYDALYGADII
L N A R Y A L N A A N A R W G S L Y D A L Y G T D A

MNARFAI NA GNARWGSLYDALYGTDAI




MNARYTLNAANARWTSLYDALYGTDAM
SNPRYALNAANARWGSLYDALYGSDVV
MNARYALNAANARWGSLYDALYGTDMI
DNARYALNAANARWGSLYDALYGTDVI
TNARYALNAANARWGSLYDALYGTDAL
NNPRYALNAANSRWGSLYDALYGTDVL
SNARYALNAANARWGSLYDALYGTDAL

MNARFALNAVNARWGSLYDALYGNDVI
$\square$ NARYALNAANARWGSLYDALYGTI
T N A R Y A L N A A N A R WG S L Y D A L Y G T D A
$E N G A E K G K G Y N$
$D G G A E K G K G Y$
$E G G A D K G P G Y$

$N$ E DGGAEKGATYN E A DGADKGKGYN EAGAERGKGFN T D GAE $\square G G G Y N$ EADGAEKGKGYN SEGADAGKAYN E E G CERGSSYN D GGAEKAKGYN DADGAEKGKGYN A DGKEKTKSFN D D D DGAERGTVYN P EA D GAEKTGGYN $P D D G G A E A G A S Y N$ S N N GDASPGLEYN D DGDAERTNGYN ETDGAEKGKGYN | $E T D G A$ | $K G T S Y Y N$ |
| :--- | :--- |
| $S$ | $D G A$ | D D GASKA GSYN $\begin{array}{ll}\text { E } & \text { G A A E K G G } \\ \text { G } & \text { Y } \\ \mathrm{N}\end{array}$ E E D GAERAGSYN A $T P G$ G A G L E $E D G A$

$E N G A$ $D D G A$

$D D G A$ ENGANRDGGYN GA GAAEMGRAYN | $E P G G L$ | $K$ | $T$ | $K$ |
| :--- | :--- | :--- | :--- |
| $V$ | $Y$ | $N$ |  | TV GA EKTK SLLN $\begin{array}{ll}H E E G A & T \\ E & M G Y N \\ G & G \\ L & G S S Y\end{array}$ T D GAE $\stackrel{L}{ }$ A G GY Y EAGADKGNAYN $E D G A E R G K G Y N$

$S E G A E R G T S Y N$
 DGGAEKGTSYN EGGAEKSSAYN E E DGATRDGGYN E G GAERAGGYN E DGAEK GSSFN A D GAE RGSAF N
E G G E KK GAY N

 $D D G A E R G G A Y N$ DEGLERGAEFN SGETARGADYN $D Q D D C A A G S E Y N$ ENGQEAK G GYN | $N D G G A E P G R T Y N$ |  |
| :--- | :--- |
| $E$ | $D$ | E GGSERGKTFN DNGAEKGTSYN ETDGAERGKGYN $\begin{array}{ll}E T D G A E R G K G Y & N \\ E & \text { E } \\ \text { E Q E K G G }\end{array}$ KN GA E $\square G$ S TY N T D GAE PGSSY N

G E L A R GK G F D DGAEKGTSYN ETDGATKGQGYN EADGAEKGKGYN ESNGAELTKTYN P D DDGAERRADYN GDMPE GKGYD EEDGCERRADYN DEADGAQKSGGYN S D E G GAEA GVKY N ES DGATRAGAYN
 S E ED GA VRA GGYN S A N GA DI SA G Y N E EDGAAKVGPYN A E D GGAAKGPGYN

## QUERY

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UniRef90 W2UGC8 UniRef90-W2UGC8
UniRef90-W3RJV9
UniRef90_UPI0003B567F1
$K \mathrm{~V} R \mathrm{GDKVIA} Y$ ARKF LDDSVPDSSGSFGDATGFTVQDGQLV $P A R G A K V I A F G R D F L D E S A P L A G A S H K D S A G Y S I Q N G Q L C$ $P$ V R G A KVI EFA RTF L D Q A A P L A S G S HK D A T GYQ I E G GK L N PVRGAKVI EYARNMLDESAPLASGSHKDAAKYLVEDGKLV PVRGAKVVAFARQFLDDAAPLAESSHVGAKGYAIVDGALQ $P \vee R G A K V I$ A Y A R QF L D S S AP LA S GS HADSTGYRVV N G S L A
 $P$ TR G A R V I A F V R D L L D DVA P L D G G S HK DAA GY T V E N G A L V PKRGEKVI A QVRGDKVI $P \| R G A K V$ RREAKAHFL $P V R G Q K V I A B A R E F L D Q A A P L A R G S H V G S R G Y A V V Q G V L Q$ $P$ KR G A K V i A W G R G F L D T S A P L A A G S WK D V T GF A V T G S N PKRGAAVVAYAANFLDEAAPLATGKHADATKYEVREDALV $P \square R G E R V I A F A K D F L D Q S A P L Q A G S H K D A V Q Y S I V N G Q L S$ EARGAQVI AYARKVLDEAAPLAEGSWSQVTGLAVEGGALV $K V R G D K V I A Y A R E V L$ K V R G D R V KVVRGDRVI A WARTMLD TAAAPLQSGSHADAARYTVVDGTALT
 PARGAKVIAWARGFLEKAAPLATGNYADADKYAVVDGRLS

 P V R G A RV I A F A R N L L D Q A A P L A Q G S H D K T K A Y A V A G G K L $P \vee R G N K V I$ E Y G R E F L D Q A A P L S G A S H K D V T E Y R I N G S L L E PKRGTKVI A WAR DFLLNASAP L E S GS WA DV A S LLKI A S G S L S PVRGAKVI EFAKNFLNQAAPLQDASHEEVTKYAVESGEVV P ERGAAVI ARARAFLDTAAPLAQGSHADARGYTVENGQLRR PKRGEEVVRRAKAFLDGTFPLETGSHADDAAYTVEDGRLI QVRGDKVI AYARDFLNDAAPLATGNHADSTQYAIVDGALQ $R V R G D K V I E W A R N F L D D A V P L I T G S H V G S R A Y K I V D G E L E$ PVRGRKVMSHASAYLDEDAPLARGSHADVAGFSPDAAELV PVRGAKVIA WARDFLD KHFAL ETGSHHDATRYDIR D GALC $P \vee R G E K V I A F A R E F L D Q T V P L$ S R G S HK DAVVQYKVEDDKGLS PARGDKVIKFGRDFLDQSVPLASGSHHQATAYQVANGQLQ AVRCEKVI DWGRNFLDDESVVPLGGASWS DVQK $V$ DA A D G A L A
 $P \vee R G A K V V A Y A K G F L D Q S V P L E S A S H R D V A S Y Q V A S E Q L Q$ PRRAEKKVIVWGRNLLDDQAAPLTAGSHADATAYKVENGQLL
 $P \vee R G D K V I A F A K Q H L D Q L A P L S Q G S H S E A R H Y Q V A G G K L L$ $P \vee R G A R V I A F A R R F L D D S F P L A R G S H A D A T A Y A V V Q G G L R$ $P A R G A K V I A Y A K G F L D D T D P L K Q G S H K D V V H Y S I D D D G A L A$ $P$ VR G E K V I A Y V R E F L D E TVVPM R G Y S H H K D A V V Q Y A V V PARGEKVI AFARDFLDEHFPLNGDSWRHVASFAVEAGRLK

 PHRGAKVIAFARRALDEAAPLAEGSHADTAGYAVVAGQLV AVRGARVI AFARAFLDRAAPLANGSHADATAYAVERGALR PKRGEKVI AFARDFLLDQT@PLQNGSHKDATAYTAEN GAG S $P$ VRGAKVI EFARNFLDQSFPLEGASHKDATGYAIA G GKLQ PKRGAKVI AYARAFLDDNAPLAHGSHADATKYSVEQGKLA PKRGEKVIA YARNVLDQAVPLATGSHREAVKYVLRDGRLV PERAKRVVAWAAAFLDDATPLAAGSHSEVTAYRVDREDLRR PVRGEKVIAFAKNFLDEHAPLQTSSHAEATGYAVANEKLE PI R G N KVI D Y A K K F L D Q A A P L K A A S HK D A I T Y K I A E S K L V
 PARAAAVVERAA IFLDEAVPLNRGSHTDACGYKLENGKLV




 PKRGAKVVEWAAKFLDDTFPLADCSHADATAYRIDNDTLA PARGAKVVAFARQVLDGVAPLASGSHRDATAYRIQDGRLV | $K$ | $R$ | $G$ | $D$ | $K$ | $V$ | $I$ | $E$ | $W$ | $G$ | $R$ | $E$ | $F$ | $D$ | $R$ | $V$ | $V$ | $L$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $S$ | $G$ | $S$ | $H$ | $K$ | $D$ | $V$ | $T$ | $K$ | $Y$ | $A$ | $V$ | $E$ | $S$ | $G$ | $Q$ | $L$ | $T$ |

 A A R G A KVVI A K A R QVLDD GA A P L T S G H WA S V T G L A V R N G T L E
 $P A R G A K V I A Y A R N V L N Q T F P L A A G S H V D A T R Y A V A N G Q L V$ $P$ QR GA K V I A F A K Q HL D T A A P L I Q A S HAADVT K Y WI E G D Q L K $P V R G E R V I$ A YARDLL
 $P T R G A R V V A W A K A F L D$

 PARGAMVI AKARAVLD
 $P V R G Q K V I D Y G R E L L D T A D P L D N G S H H S A S G Y R I V N Q H L V$ EV R GAKVI A F A R NVLD Q S AP LVVGSHANSTGYTVVD GVL H K AR G D K V I A K A K A I L D Q A A P L Q T G S H A DVT A Y T I E S G AL V

## QUERY

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UniRef90- UPI000364FBA2 UniRef90-H1G2R8 UniRef90_UPI0003824C28 UniRef90-A0A011U9P9 UniRef90-K2KSL1 UniRef90_UPI00031346E6 UniRef90_UPIO0035CBDOA UniRef90-B1MB69 UniRef90-W8H2Y6 UniRef90-UPIOO0262CE06 UniRef90-A8TSU2 UniRef90_UPI000380B7BD UniRef90-UPIO003FA5ADE UniRef90_Q5P811 UniRef90_UPI0002FD761C UniRef90_UPIO00255B778 UniRef90-W8ID85 UniRef90-UPIO002D4D8D6 UniRef90_E3HRL2 UniRef90-V4RU28
UniRef90 UniRef90_UPI0004630DD9 UniRef90_UPIO003639DEB UniRef90-B8KJ13 UniRef90-E5WK14 UniRef90_UPIO0035DC403 UniRef90-X5S229 UniRef90_UPI00036AF751 UniRef90_UPI00046E6689 UniRef90-H2FXN4 UniRef90-UPIO0047CEC3C UniRef90-B1KED9 UniRef90-Q5WFZ6 UniRef90-B7GJS2 UniRef90_UPIO0047C6ED6 UniRef90_V4JLR4 UniRef90-A0A031MCV2 UniRef90-F6EMM0 UniRef90_C1DFQ4 UniRef90-W0P6L3 UniRef90-A6GUD0 UniRef90_G8MNP4 UniRef90-W1N6T3 UniRef90-F4PFC8 UniRef90-F2F4A0 UniRef90-NOB1X5 UniRef90_UPIO00469BE42 UniRef90_D3RPC6 UniRef90-G4E4B6
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UniRef90-B1VEG9 UniRef90_UPI0002F88F59 UniRef90_UPIO0029B53F9 UniRef90-H0A904 UniRef90-E5XNU5 UniRef90_F1VV90 UniRef90_UPIO003B37E88 UniRef90-B8CPB6
UniRef90 LODZW2 UniRef90-Q1YEU5 UniRef90_LOGX25 UniRef90-L1LRV8 UniRef90-F9DWJ7 UniRef90_10HY39
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UniRef90 W2UGC8 UniRef90-W2UGC8
UniRef90-W3RJV9
r




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


 I STAAGATTLADAAQFAGFRGDAASPSHLLLKKNNLHTQU
 $\stackrel{V}{\mathrm{~V}}$ $\stackrel{C}{\mathrm{C}}$ $V$ QLGDESTGLQNPDQFVGYTGKLGKPWSVLLINHGLHUEV
 $V$ V
 ASLENGETTGKKDNTKLIGYQGEQDNPSAILLIKNNGLHEB






## 

##  <br> 

## $\stackrel{A}{\mathrm{~A}}$

## $\stackrel{v}{\stackrel{\rightharpoonup}{*}}$

## A

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 V T L H N GK T G L K D A T K F V G Y Q G T E A D P TA A L L K N N GMM I E I T L V $N$ N G E T T L A E P E K L V G Y Q G T T VKLSNGETGLKDPSKLI GYQGQAEEPVALLLKNNRIHLE VRVAGRDLSLKSPERFLGYRGEESAPSAIVFAHNGLHAEL VLLPDNSTLLADPAQFAGFRGNPDQLDAVLLVNHGLHAE VELKEQTATLQHPAQLI AYNGDPSAPSGILCRQHGLHFE:



## QUERY

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 $R V F F I N T G F L D R T G D E M H T S M E A G P M I R K G D M K A A A C I ~ S A$ $R V V F I N T G F L D R T G D E D H T S M E A G P M C R K A D M K S Q P W I L A$ $R V V F I N T G F L D R T G D E I H T S M E A G P M I R K A E M K K Q T W I T A$ $R V V F I N T G F L D R T G D E M H T S M H A G P M I D R K V H M K K A T W I N A$ RVVFI NTGFLDRTGDELHTSMEAGPMIRKADMKASAWI GA RIV F I NTGFLDRTGDEI HTSMEAGPVVPKGEMKQSTWIQA


 $R V V F I N T G F L D R T G D E I H T S M E A G P M I I R K G D M K Q A A W I ~ G A$ RV A F I N T G F L D R T G D E M H T S M E A G P MI R K N D M K S S V W L Q S RVAFI NTGFLDRTGDEMHSSMEAGPMLRKGDMKSTAWITA $R$ V VIF I N T G F L D R T G DEEDHTSNMELGPMIIRKGDMKASTWI QA


 RIVVFINTGFLDRTGDEMHTSMEAGPMDRKNDMKATAWLKG RV AFINTGFLDRTGDEMHTSMEAGPMVRKGDMKKAKWI S S RIV VI NT GF LIDRTGDEDHTSMEAGPMI RKGBMKQAAWI SA RLVVI NTGFLDDRTGDELHTSMEAGAFLPKGDDKGEPWI A A RII FI NTGFLDRTGDDI HTSMEAGAMVPKANMKAQPWI SA $R V V F I N T G F L D R T G D E I H T S M E A G A V V R K G N M R M Q P W I S A$
 $R V V F I N T G F L D R T G D E L H T S M M R A G V M V R K H D M K A Q A W I$ Q A



 RVVFI NTGFLDRTGDEDHTSMEAGPFVPKADQKSQKWFNA $R V A F I N T G F L D R T G D E I H T C M E A G A V L B K G D M K G A P W I A A$ RI AFI NT GFLLDRTGDEMHTTMEAGAMLRRKEDMKSSAWI QA RVAFINTGFLDRTGDEMHTSMEAGPMIIRKGDMKKSSWI DA RVAFINTGFLDRTGDEMHTAMHAGAMIDRKDMKSSAWI TA RVAFINTGFLDRTGDEMHSSMEAGPMMRKGDMKSSKWI GS

 QKGEMKASTWLDG
 $R V A F I N T G F L D R T G D E D H T S M E A G P M L R K G D M K G S A W I Q A$ RIIFINTGFLDRTGDE\|HTDMEAGAVLRKGDMKGAAWLRA $R \mathrm{I} V \mathrm{~V}$ I NT GFGLDRTGDEMHTSMEAGPMI RKNQMKTSTWLQS RVAFI NTGFLDRTGDE $\operatorname{D}$ GHTSMEAGPMIRKNQMKSQRWIAA

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 RI AFINTGFLDRTGDEDHTSMEAGPVIRRNDMKASKWLAS
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## QUERY

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## $Y$ E

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 YEDFNVDTGLAC G L R R GRAQ | $Y$ | $E$ | $D$ | $W$ | $N$ | $V$ | $D$ | $N$ | $G$ | $L$ | $A$ | $C$ | $L$ | $R$ | $G$ | $K$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $Q$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $Y$ | $E$ | $N$ | $H$ | $N$ | $V$ | $D$ | $V$ | $S$ | $L$ | $A$ | $G$ | $L$ | $A$ | $H$ | $H$ | $A$ | $Y E R S N V L V G S C G L R G R A Q$ $Y$ ERRRN V S I G L A C G L Q GRA Q

 $Y E D W N V D V G L A C G L R G K A Q$ $\begin{array}{llllllllllll}Y & E & D & W & N & D & L & G & L & C & C & G \\ Y & E & R & S & N & V & L & V & G & L & H & H \\ A & C & G & L & Q \\ R & G & R & A & Q\end{array}$ $Y E A S N V A V G I K T G L P G H A Q$ Y E R Q NV LV G L E C G L R GK A Q


 $Y$ E D R N V D DV G L A C G L E G K A Q

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 GK GMWP DP DQM TAMMEAKI A $G K G M W A M P D L M A A M L E Q K V A$ GK GM WA M P D L M A E M I K Q K I G GK GMWAMP DLMAA M L E Q K I A
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 I CSEDQVVETLKRMASVVDRQNGDDTYQAMAQDFDNSI AF

 I CTREQVEETMQRMAAVVDRQNADPAYRNMAPNFDSSI AF
$V V T E A Q V V E T M E R M A A V V D G Q N A D D A Y A A M A G N F D G S$ I A A VTKEQVLETLKRMAKLVDEQNADAEYRSMSADYDNSVAF $V V$ S D QV ME TMRRMAKVVDGQNADPGYRPMAADYDGSIAF $V C S E E Q V K E S L K R M A A I V D G Q N A D P T Y D A M A P S F D G G I A F$ IVTTEQIVESLERMAPVVDRQNADPGYKPMAPDFHGSVAF $V V T E E Q V M A T M K R M A E V V D R Q N A D P N Y E P M A P G Y D G V A F$ VCSESQVRETLERMAAVVDQQNADPDYTPMAPNFDSSVAF $V V P A A Q V E E T L K R M A S I V D Q Q N A D P A Y K P M A P D F E H S I A F$ $V$ CTADQVIDTLKRMARVVDQQNADALYRPMAPDFENS


V $\stackrel{r}{1}$

 VVSKEQVIETFERMAKVVDQQNADPEYSAMATDFTNSPAY I TTKDQVMESLKRMAEVVDRQNADPAYTPMAPNFEGNDAF $V V G A E Q V R E A \square R R M A R V V D A Q N A D P A Y R P M A R D F D K S H A F$
 I V S K E Q V M ETMK RMAA VV D QQNADPAYKPMAGNFETSAA F I V T E E QV R ATMERMAAVVDK QNADPTYTPMAPSFDSSFAF
 $V$ CT E E Q V M D T L K RLLA K V V D E Q N A D T A YRPMA P D LD S S V A F

$\qquad$ $V V$ SES QVMESLKRMAAVVDRQNADDAYQPMADDGEGSVAF LCTQAQVLETLKRMAKVVDQQNADPAYRPMAPDYERSKAF I CSKEQVLATLKKMAKVVDRQNADPSYQAMADNFATGDAF $V V S E Q Q V M H T M K R M A K V V D E Q N A D S D Y Q T M A D S F D H S Y A F$ $V I S K D Q V V E I L Q R M A R V V D E Q N A D P D Y T P M A P D F E Q S V A F$ $V \vee T E Q Q V Q S$ VTNEQQV $\checkmark \vee$ S A E QV ${ }^{\circ} \mathrm{D}$ | $V$ | $T$ | $E$ | $E Q Q V$ |  |
| :--- | :--- | :--- | :--- | :--- |
| $I$ | $C$ | $T$ | $E$ | $E Q$ |


v



 $V V$ SKDEVMDAMQEMAAKVDAQNA DPAYEPMAGHFDTSSI AF $V V T E A Q V M E T M R R M A A D V D G Q N A D P F Y R P M A P G F D$ G L L A F $V V D A A Q V R N T L E R M A A V V D G Q N A D P A Y R P M A P G F D A S H A F$ I TTKE QVQETLERMAKVVDEQNADK LYQPMAPNYDDSVAF $V V D K A R V R A T F K R M A K V V D Q Q N A D P A Y R A M A G R A K E S A A F$
 $V I T E D Q F E A S M L K M A A V V D E Q N A D P S Y E P M V S D S Q K G H A F$ $V$ I D E G FT R G I L E Q M A K V V D K Q N A D S H Y T P M A A D F K N S V A F $I$ CS S A Q $\quad$ M E TLK R M A A V V D G Q N A D A D Y $\square$ A M S P N FE Q S I A F




|  |  | D A WHRAHRNKPVDPVAY |
| :---: | :---: | :---: |
| UniRef90 A0A010TFH4 | LIHELAPKNAALLVGRDRLQSEL | D A WHRANPGQ IT DHAAY |
| UniRef90－B6JJA2 | L VKEFAPDNRALL QKRDDLQAK | DEWHRARRGKPFDLAA |
| UniRef90＿UPI000373CE0E | L I HDMTPENKALLVSRDQLQA Q | DEWHRQQGGAG ETEDY |
| UniRef90－A1WID6 | 1 V VDL L A P R NLA L L A E R E RL Q T A L | D A WHQANPGP I G M A Y |
| UniRef90＿C9YBV5 | A DLAPKNIALL A ERD | D T WHKANPGPIT DMPAY |
| UniRef90＿UPI00040D587F | LVHDMGPQNRALLERREKVQ | DEWHTARAGQAHD |
| UniRef90＿UPI00047DB406 | V V S DLT P K NKELLA K R E EL Q A Q | DEWHRNNPG |
| UniRef90＿A4GK41 | I L N EFSPRNKKLL EKRESLQ E Q I | D NWH $\mathrm{D}^{\text {A N K G K D F D K T A Y }}$ |
| UniRef90＿UPI000479708C | I V K DLGPTNRALLAERDRLQQQ | DA WHGERRGQAFDPAEY |
| UniRef90＿Q1QSR | LV HELVPTNRDLLAERERLQD | D A WHKANPGPVRDMAAY |
| Ref90－UPI000468B | L I H D F GPKNRELLA VR A EI Q Q K | DA WHKDRKAQDHDAKAY |
| Ref90＿UPI000372D4D6 | L L D D L P V V R R L L R R S L Q Q Q I | D D WHRSHGNGPDDPVQY |
| UniRef90－Q2L1N7 | I I HELGPRNRELLAERDRLQA | D S WHRSHPGPVRDPAAY |
| UniRef90＿UPI00036E3432 |  | DEWCRQNPGKI Q D Q A Y |
| UniRef90－M1WXD1 |  | D D WHRAHRGGEHDAAAY |
| UniRef90－F3BHK0 | I V QKL TPINKALLEKRELLQQQQ | D D Y H La NK T WDSAKY |
| UniRef90－UPI000417 | L T DLTP P S S ALLAKRERL | DDYCADKDALDD ADDY |
| UniRef90－UPI0002E6D | L I H DLTPENKELLE | HNWHKENKDH FHFDQY |
| UniRef90－A4C3T6 |  | D L Y HQS H LEF D LQQY |
| niRef90－Q3SNX3 | $1 \vee R D L G P R N R E L L A V R D R L Q A$ | D D WHRDHKDTPFD\SAY |
| Ref90－U1K2V3 | FSELGK Q L Q AL L NKRDTLQQQI | DDYHLSHPD WQSAEY |
| UniRef90＿A0A059INS | AV HEMGAENRALLERREEMQQKI | D A WHVARRGQPHDAAAY |
| Ref90－14YTY7 | LVR D F A P R R ELLA VRDKIQQGQI | DEYHRSRAGKAFDQAEY |
| Ref90－G0HG66 | V A K H T P R NRELLA KRVDLQAK | DEWYTQNPG TQDAEKY |
| Ref90－A3JT51 | VVHQMGPRNRALLEKRETI Q A Q | D A WHVQHRNENHDAAAY |
| UniRef90－A0A016XDD6 | ARDLGPKNAALLKKRDRLQE | D A WHKANPGPDTNMKAY |
| UniRef90－U1KIY0 | L 1 H DLS P $\square$ N R DLL N K R L D L Q K K I | DEYHRDNP TWNSSEY |
| UniRef90＿UPI00035 | LVKALAPKNKALLEKKRALQAK | D QWYQQ P P P $\square$ Q DMEAY |
|  | L I E DLS P $\square$ NRQLLA KRDTLQQQI | D D WH LA RKGQPMN $\square$ NE Y |
| UniRef90－UPI000466 | LFTDLAPRNRELLAKRQELADQI | EAFHTAAPGPVDAAEY |
| UniRef90－C7LNS9 | I LHDLSPRNRELLAKRQYLQE | D S WHKRHKDGPHDAVAY |
| UniRef90－D5AQ17 | L I HAFGPQNRALLDKRDQLQA Q | D A WHLQ HRTQGHDATAY |
| iRef90－D5BUG5 | AV HELAPRNRALLAKRESIQTQ | D A WHNTHAGSAlD |
| UniRef90＿UPI0003A8 | LVADFSPLIRAQLQVRDLLQEE | D A Y H HRRAGKPL D |
| UniRef90＿U2Z206 | LAQEFGPRIRDALSDRSKLQ A E I | D A WHLSSRKGQQIDDAEEY |
| UniRef90－B6AZN1 | LAHDLGPKNRALLAERVEMQGKI | DA WHRAHKAGGDTRDAY |
| iRef90＿LOWKY1 | V V LDL T P K K A L A HREKLQAKI | D D WHKNH VYELGA Y |
| UniRef90－UPIO004750E56 | I I TTTFAPQNRTLLEKRDALQAR | DEWHRSRAGSPHDAAAY |
| UniRef90＿U2GR29 | L I R T H T PRNQELLARRDELQK T | DEHFRTNPGQP DPAEH |
| UniRef90－A8LIB5 | LVHEEGPTNRALLAKRTELQRKI | D A WHVARKGQPHDAAAY |
| UniRef90＿UPI0002 | LVNELLGPRNRALLEKRTDI Q G R I | D GWHAARRGLP $\square$ M A GEY |
| UniRef90＿UPI0003B3BB21 | I A A KLG C S NRHLLAKREALQQS | D DWHRTNPGKP DPADY |
| UniRef90＿F3KBR6 | I LTT DLAPVNRALLHKRAEI Q S K I | NLWWHEDKGQQ DPAAY |
| UniRef90－M9RAX9 | L I HDFGPKNKALLAKREELQSQI | D DWHRVR】GQA HDEA GY |
| UniRef90＿A1WZ99 | IVRDLAPRNRELLEQRENLQRQI D | D D WHRNHRGQ F S |
| UniRef90＿A3PHI7 | TVRTLLGPRNRALLDRRAELQAAI | D D WHRTHR |
| UniRef90－C8PXP2 | NKALLAKRDEI Q T Q I D | D D WHAKNPNGQ $\square$ D K A Y |
| UniRef90＿UPI0002558DA6 | L L R K L VP Q NLALLEEKRDRLQA Q I | D D WLVARRGQPWDGAA Y |
| UniRef90＿UPI00036B093D | YFADLTPKNRQLLARRDEL Q A T L | DEYYRANPGRP DPEAH |
| UniRef90＿UPI00036F2EB1 | 1 LAEFGPRNKALLDKREVI Q S Q I | DE WHLLARKNTDHDHEEY |
| UniRef90－B2IEC4 | LVAAKSATNRALLAKRDEL Q A K I | D AYYR S G GSKDPAAT |
| UniRef90＿UPI00034D89CA | LFNDLAPRNRELLARRRDSLQQQL | E A WHRDNPGPVK D M P A Y |
| UniRef90－A0A024K | YVTAFAPRNRAFLA $\mathrm{I}_{\text {P }}$ | D DWHHAHGPVANDPAGY |
| UniRef90－G7QDE5 | IVADLLGPRNRELLAKKR A Y A A A I | DVWHNERRGQPHEAEAY |
| UniRef90－17DZ1 | LVNGMGDENRALLAKRADLQQQI | D A WH $\square$ ERKGQAHDATAY |
| UniRef90－F4AQA5 | 1 L A QLT P V V D A L L A K R D S L Q T K I | DEYCQTHS PLLEPSAY |
| UniRef90＿U4UZY0 | V V T K L G PKNA ALLKKRD L L Q A Q I | D A WH】ERRGSEHKPAQY |
| UniRef90＿UPI000473D102 | L I HEL TPENKALLA K R D EL Q A K L | NRWYRENRD SFDFEAY |
| UniRef90－F2G8N7 | LFEKF F P Q NRALLEKREQLQRAI | DDYHKA GNPVGGSEY |
| UniRef90＿Q2N8W7 | LVHGFTPRNRDLLAKREELQAKI | D A WHRKRRGQSHDHAAY |
| UniRef90＿UPI0000E0F489 | A DF T PRN $\square$ AL L D T R D KLQ AKI D | DAYHQDHKTDSFA A Y |
| UniRef90－A0A031JJT3 | FARFAPRNAELLRKRDDI QARI | D GWHRERAGQPMDADGY |
| UniRef90＿UPI0003728EB2 | LVEEFGERNSDLL N T R E K L Q A S I d | DEWHRKHAGKSHDHQAY |
| UniRef90－K6Z7M0 |  | D A WHLDNLGG A F S QQKY |
| UniRef90＿UPI00037D0F6A | LIHEF GPKNRALLDKRDEI Q S AL | D A WHJAHRGQPA DAEAY |
| UniRef90＿Q1GRS5 | L LGQFAPENTELLAKREALQSSQI | DA WHRAREGQPHDPAAY |
| UniRef90－Q28RA0 | LAHDLAPKNAALLARRDDLQS QI | D Q WH $\square$ A HRDTAHDADAY |
| UniRef90－U2ZPU4 | ERFVPRNRELLQKRDTLQAEI | DA WHGERTGQPHDPVAY |
| UniRef90＿UPI000381629C | MVK D LTPRNRELLARRRDELQT QL | $D D Y Y R A N P G Q P$ DP D |
| UniRef90＿F2BE67 | LVAELAPRNRALLAARDDI Q Q K I | DQWHQA QGGVGDAAA Y |
| UniRef90＿U1KWW2 | R TLT P K N R ALL EKRDSLQK QI D | DDYHDANPG WDAEKY |
| UniRef90－J4V1J5 | I LEEFTPRNKELLDERESI QKQI | D A WHI ERKGQP I NKDEY |
| UniRef90＿UPI0003B37E75 | I L D HFAPLLNKKLLETRGKI K K Q i | D A F Y I D N S GK TID Q N $\quad$ Y |
| UniRef90－H5T883 |  | DEYNLANQGK FEVQSY |
| UniRef90＿UPI0004659EFA | \｜V R D L Q P K R A L L A ERDRLQ T AL | DEWHRAHPGP】ASMAAY |
| UniRef90－G2HUW9 | I E TLLTP $\square$ NKELLK T R D D L Q K K I D | D N WY K T N K Y D S N L |
| UniRef90－UPI0004261FFB | I VEKHTPRNKELLARRREL Q A Q L | D DWYRANPGEQ DQDKY |
| UniRef90－UPI000366407B | L LDDLT P T NQALLEKR S S L Q Q i d | DEYHRT GQPASGEAY |
| UniRef90＿J2YLA9 | LV HDLAPRNRQLLA ERDRLQAEL | D R WHRQHPGP $\square$ A DMAAY |
| UniRef90＿UPI00047s | FI S D FAPENRALLSEREQLQSRII | D DWHKAHPG AFDSSAY |
| UniRef90－C3X4Z9 | DEMTPKNRALLAERERLQEEL |  |
| UniRef90＿G4R6S7 | MVA A Y MPGNRELLEDRDRMQNQI | D D WHRDNGPATANPEAY |
| UniRef90－UPI00035C18B6 | LFARFAPENAVLLAKRDDLQARI | D A WHEARVGQRVDA A A Y |
| UniRef90＿UPI000377 | V LT E F T P R N Q Q L L T K R A S L Q A Q I | D TWWHTDPANQPFNQPSY |
| UniRef90－E0XWJ3 | YAHElAPKNKKLLEFRENLQKKI |  |
| UniRef90＿A9CV31 |  | D A WHREH GAPVDLDVY |
| UniRef90－Q8FNB3 | $V R \mathrm{D}$ T PRNRELLARRDELQA QL | DEYYRENPGKP DPEKY |
| UniRef90－E0XWY1 |  | D D WH ITKNKGNEDN ITE E Y |
| UniRef90－Q4FNA7 |  |  |
| UniRef90＿W5XZG0 | I VRDFSPRNAELLA RRDELQSQL | DEYYRANPGQPD |
|  |  |  |



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UniRef90-Q3SNX3

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| :--- |
| UniRef9O_UP1000479171C | UniRef90-C3X4Z9 UniRef90-G4R6S7 UniRef90-UPIOOO35C18B6 UniRef90_UPIo00377F9B2 UniRef90-E0XWJ3 UniRef90-A9CV31 UniRef90-Q8FNB3

UniRef90 EOXWY UniRef90-Q4FNA7 UniRef90_W5XZG0 UniRef90_W5XZGO
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130
140
150
160
TNARYALLNAANARWGSLYDALLYGTDALLPEANGASRSNGFN MNARYALNAANARWGSLYDALYGTDAISEADGAAKGDRFN SNARYSLNAANARWGSLYDALYGTDAIPY DPNYKKNGYD NNPRYALNAANARWGSLYDALYGTDVL LNARYALNAANARWGSLYDALYGTDV TNARYALNAANARWGSLYDALYGTDVAL rNaryalinannarwgstydatygtdyi MNARFALLAANARWGSLYDALYGTDVI
$M N G R F A L A A N A R W G S L Y A L Y G T D A I ~$
 SNARYALNAANARWGSLYDALYGTDVAL NNPRFALNAANARWGSLYDALYGTDVI SNARYALNAVNARWGSLYDALYGTDAI NNARYAINAANARWGSLYDALYGTNAI AGEGEDAAGKDYN tNARYALNAANARWGSLYDALYGTDVISEDAGATRGGGYN SNARFALNAANARWGSLYDALYGTDVLSEDDGAEKGNTYN NNARYALNAANARWGSLYDAAYGTDVIGEDGGAEMGKGYN NNGRYALNAANARWGSLYDALYGTDAl SEEDGAEKGNSYN SNARFALNAANARWGSLYDALYGTDAISEADGAEKAGDYN TNARYALNAANARWGSLYDALYGTDAI AREAGEAKG YD


 LNARYALNAANARWGSLYDALYGTDALPEDGPGYKGKGYN N NA R F A L N A A N A R WG S L Y D A L Y G T D DV L S Q GE G A E K T L G Y N

 TNARYA L NAANARWGS L Y DAALYGTDVLGSEEGGATREAAYN TNARYALNAANARWGSLYDALYGTDAALGTPPAAP GYD TNARYALNAANARWGSLYDALYGTDVIPHDDKDGITKAYN SNPRYALNAANARWGSLYDALYGTDAIPETEGAERGKKFN




 TIAARYALNAANARWGSLYDAGYGSDVI PESAGAEKGTKYN I NTRFALNAANARWGSLYNALYGSDVIPFSDGAEDTGAYN TNARFALNAANARWGSLYDAFYGTDAM GRLAQGNGYD DNARFALNAANARWGSLFDALYGTDMDPESDGLAKGKTYN MNARYALNAANARWGSLYDALYGTDAL GDLPEGSEFD RNARYALNAANARWGSLYDALYGTDVIDESNGAEKGKGYN MNARFA LNAANARWGS LYDALYGTDALPB GAPE GKGYD T NARFAI NAANARYGSLYDALYGTDSIISEEGGAEPGKGYN MNARFALNAANARWGSLYDALYGTDVI SEDNGATKA GAYN


 NNARFALNAANARWGSLYDAVYGTDVIPEDNGATRTKEYN TNARFALNAVNARWGSLYDCFYGTDAM GTLPPAGGYD NNARYAINAANARWGSLYDALYGTDADSSENGAGDQS QYN
 NNARYALNAANARWGSLYDALYGTDVLDDENGAEKTATYN
 TNARFVLNAANSRWGS LYDAMYGSDAI PETDGAEKGAEYN MNARFALNAANARWGSLYDALYGSDVIVDDPSSEPVAGYN $T N A R Y V L N A A N A R W G S L Y D A L Y G T D A M \quad G D L P R G K G Y D$ LN A R F AL N A ANARWGSSLYDALYGTDADDAPP A AKPGGYD TNARFALNAANARWGSLYDAFYGTDAMM GSRPTKGGYD

 SNARFALNAANARWGSLYDALYGTDV MNARFALNAANARWGSMYDALYGTDV T N A R Y A L N A A N A R WG S L Y D A L Y G T D A ANARFALNAANARWGSLYDALYGTDV SNPRYALNAANARWGSLYDALYGTDAL KNARFA L NAANARWGS L Y DA L Y GTDVI LN A RFAA N A A NARWGS L Y D A L Y GT NA

 SNARYALNAANARWGS LYDAFYGTDVI LNARFLLNAANARWGSLYDALYGTDAL
 MNARFALNAANARWGSLYDALYGTDAL L N A R F A L M NARYALNAANARWVSLYD S L Y GTDDI MNERYALNAANARWMSLYDSLYGTDVI $\square$ L A R F A L N A A N A R WG S L Y D A L Y G T N A




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UniRef90-Q3SNX3
UniRef90_U1K2V3 UniRef90_A0A059INS3 UniRef90_I4YTY7 UniRef90_GOHG66 UniRef90-A3JT51 UniRef90-A0A016XDD6 UniRef90_U1KIY0 UniRef90_UPI00035CBDAE UniRef90-F6CYM8 UniRef90_UPI0004668F54 UniRef90_C7LNS9 UniRef90_D5AQ17 UniRef90-D5BUG5 UniRef90_UPIO003A83DBB UniRef90_U2Z206 UniRef90_B6AZN1 UniRef90_LOWKY1 UniRef90_UPI0004750E56 UniRef90_U2GR29 UniRef90 A8LIB5 UniRef90_UPI000237B29A UniRef90_UPI0003B3BB21 UniRef90_F3KBR6 UniRef90_M9RAX9 UniRef90_A1WZ99 UniRef90_A3PHI7 UniRef90_C8PXP2 UniRef90_UPI0002558DA6 UniRef90_UPI00036B093D UniRef90_UPI00036F2EB1 UniRef90_B2IEC4 UniRef90_UPI00034D89CA UniRef90_A0A024K897 UniRef90_G7QDE5 UniRef90-I7DZ19 UniRef90-F4AQA5 UniRef90_U4UZY0 UniRef90_UPI000473D102 UniRef90_F2G8N7 UniRef90-Q2N8W7 UniRef90_UPI0000E0F489
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UniRef90_E0XWY1 UniRef90_Q4FNA7 UniRef90_W5XZG0
UniRef90_UPI00042768F2


## A



[^0]
##  <br> 

## -

290
300
310
320
E DKVLVVYNWLGLMKGTLSASFRSLAADRHYTAAD GSTLT

EDKVGVYRAWLG
R DKL L GYSNWLGI I Q G T LTE QLR GLNPDRIVTMPRGGTVR








EDKVEVYSNWLGLIRGDLSATFRTLNPDRTYKGVNGEDIT
QDKVVYRNWLGLMQGTLTEKLRKLAPDHHYTNLQGESFS
 EDKVLAYSNWLGLMTGELRESLRELNPDLTFTTPEGDTLV EDKVQVYRTWLGLMKGDLVESFRRLNPDRLYTMPSSGELR

## E


E

## A

 EDKAEVYKNWFGLMKGDLEDSFRTLNEDDTYKTRDGNSKT E D K V $N$ N V Y R N W L G L M K G D L











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| :---: | :---: | :---: |
|  |  |  |
|  | YEKNNVLI GL S C G R GRA Q | GK GMWA MPDLMA A MLEQKVG |
| UniRef90-B6JJA2 | Y E D S NVD T G L L N GLP P H A Q | G K G M W A A P DKMA D ML |
| UniRef90_UPI000373CE0E | YEQNNVHTGLAAGFRGHAQ | GK G M WA MP DLMADMIVQKVG |
| UniRef90_A1WID6 | Y EKNNVLVGLA C G L R G K A Q | GK G M W A M P L M A D ML RQKI A |
| UniRef90_C9YBV5 | Y EKNNVLVGLS S GL R G K A Q | GK G M W A M P D M K A M MEQKI G |
| UniRef90_UPI00040D587F | Y E D R NVDI GLA C GFRGRA Q | GK G M WA MP D R M A D M L E A K |
| UniRef90_UPI00047DB406 | Y ENRNVA 1 GLA C G L Q G K A Q | GK GMWPKPDMMKDMLATK TA |
| UniRef90_A4GK | Y ENWNVDTGLE T GFKGKA | GK G M W A M P E M L A MYE GK TN |
| UniRef90_UPI000479708C | Y E D N NVDQGLSA GLK GRAQ | GK GMWAKPDAMAEMLQAK\G |
| UniRef90-Q1QSR0 | Y EKNNVQTGLA C G L R GRAQ | GK G M W A MPELMAAMLEQKI G |
| UniRef90-UPI000468B6A3 | Y E D R NVD I G L A C GLK GRA Q | GK GMWAMPD RMQEMLEAKI G |
| UniRef90-UPI000372D4D6 | YEDRNVDI GLA C GLR GRAQ | GK GMWAMPDEMK Q M I E A K I A |
| UniRef90-Q2L1N7 | Y ERNNVLVGL N C G L R GRA Q | GKGMWAMPDLMAAMLEQKAA |
| UniRef90_UPI00036E3432 | Y E T R NV HIGLA C GLA GKA Q | GK GMWAMPDLMAEMLEEK $\mathrm{L}^{\text {L }}$ G |
| UniRef90_M1WXD1 | Y E D WNVD TGGAA GFS G $\square$ G Q | GK GMWPKPDMMLDEMVQTKEA |
| UniRef90-F3BHK0 | YEDRNVD】GLAACGLSHKAQ | GK GMWPMPDKMALDMEQKQA |
| UniRef90-UPI0004173 | Y EKANVINGLSTGMSGKA Q |  |
| UniRef90_UPI0002E6DF56 | Y ERSNVFVGLNCGLLGRAQ | GK GMWA MPDLMAAMLEQKI A |
| UniRef90-A4C3T6 | Y E L W NV DI G L K | GK GMWP $\square$ P D Q M A A MLE QKQV |
| UniRef90-Q3SNX3 | YE DWNVDI GL DE GL | GK GMWA APDRMADMLA QK 1 |
| UniRef90_U1K2V3 | Y EDQNVDI GLK T GFRKKA Q | GK GMWPMPDKMADMMEQKQG |
| UniRef90_A0A059INS3 | Y E D R NV DI GLA C GLA GRA Q | GK G M WA A P D L M S A M V E K I G |
| UniRef90-14YTY7 | Y E D N NVDVGLLC GLPGRA Q | GK GMWAAPDKMADMLVQKI G |
| UniRef90-G0HG66 | Y ENNNVDAGLAHGLS GKA Q | GK GMWAKTDLLA EMVEQKI G |
| UniRef90-A3JT51 | Y EDCNVD\GLEC GL S GRA Q | GK GMWAMPDMMAAMLEQKI G |
| UniRef90-A0A016XDD6 | Y EKLLNVLVGLA T GLK G R A Q |  |
| UniRef90-U1KIY0 | Y ENRNVDI GLA C GFS GKA Q | GK GMWPMPDNMALDMMEQKLA |
| UniRef90_UPI00035CBDAE | $Y E A N N V Q V G L A C C L D Q K A Q$ | GK GMWAMPD L MKA M L A QKI A |
| UniRef90-F6CYM8 | Y ENRNVEI GLA C GL P GRA Q | GK GMWAMPDEMAAMMEAKVA |
| UniRef90-UPI0004668F54 | YEDFNV DVGGAT GL P GRAQ | GK GMWAMTELMAEMLEQKIGG |
| UniRef90-C7LNS9 | YEDWNVDTGLACGFSGKA Q | GK GMWAMPD RMK Q MVETK Q A |
| UniRef90-D5AQ17 | YEDRNVD IGLR C G L P GKA Q | GKGMWAAPDNMAEMLA QKIA |
| UniRef90-D5BUG5 | Y ENWNV DI GLA C GL G G R G Q | GK GMWAMPDMMAAMMEQKI G |
| UniRef90_UPI0003A83DBB | Y EKSNVDVGLA C G L P G H A Q | G K G M W A A P D M A D MLA Q K |
| UniRef90_U2Z206 | Y E D R NV DI GLA C GLK K K A Q |  |
| UniRef90-B6AZN1 | Y ENLLVVDI GLE C GL Q G R A Q | GK G M WA MP DL M A A MLE Q K V D |
| UniRef90-LOWKY1 | Y EKRNVLI GL NA GL R G K A Q | GK G M WP K P DELA D MYR T K I E |
| UniRef90_UPIO004750E56 |  | GK G M W A M D L M H A MLEQKL G |
| UniRef90-U2GR29 | Y E D $\square \mathrm{NVV} \mathrm{D}$ T GI A L G L P GK A Q | GK GMWAMTELMADMLDKKI G |
| UniRef90-A8LIB5 | Y E D R NV D $\quad$ GLA C GLK GRA Q | GK GMWAMPDLMADMLEAKI G |
| UniRef90-UPI000237B29A | Y E D R NV DI GL A C GL K G K A Q | GK GMWAMPD RMED MLA AK G G |
| UniRef90_UPI0003B3BB21 | Y E D WNV DVGLA C GLL S GRA Q | GK GMWAKPDRDAE MVETK GT |
| UniRef90_F3KBR6 | Y ESRNVAI GLLKCGMK GKA Q | GK GMWAEPDNMAQMLIDTK\S |
| UniRef90-M9RAX9 | Y E D Q NV DI GLEECGLS GRAQ | GK G M WA MP DA MA A MI E QKIAA |
| UniRef90-A1WZ99 | YEDWNVDVGLA S GFKGKAQ | GK GMWPKPDKMREM F D T K A G |
| UniRef90-A3PHI7 | Y E D R NV DI GLA C G L R GRA Q | GK GMWAMPDRMAEMLVAK $\square \mathrm{L}$ |
| UniRef90-C8PXP2 | YERWNVDMGV K L G L P GKA Q | GK GMWAKPDNMKEM |
| UniRef90_UPI0002558DA6 | Y ENGNVDA GLA CGLQGRAQ | GK GMWAKPDRMAEMLEAKTG |
| UniRef90_UPI00036B093D | Y ENNNVDAGI E H GLLP GRAQ | GK GMWAETEHMAAMLEKK $\mathrm{C}^{\text {L }}$ G |
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| UniRef90_UPI00034D89CA | Y EKSNVQI GLA C GL R GRA Q | GK GMWAMPEDMHDMLEQKI G |
| UniRef90-A0A024K897 | Y EDRNVLVGLRRCGFS GKA Q | GK GMWAKPD DMAEMLEVKI G |
| UniRef90-G7QDE5 | YEDRNVDVGLACGFSGRAQ | GK GMWAKPDRMAEMVAEKI G |
| UniRef90_17DZ19 | $Y E D R N V D I G L A A C G L K G R A Q$ | GK GMWAMPDRMGEMLEAK G G |
| UniRef90-F4AQA5 |  | GK GMWP $\mathrm{C}^{\text {P P D N M A D M M Q SKTN }}$ |
| UniRef90-U4UZY0 | Y E NLL NV DI GLECGLDQ GRA Q |  |
| UniRef90-UPI000473D102 | $Y E K S N V L T G L A S G F Q G K A Q$ |  |
| UniRef90- F2G8N7 | YETANVAVGLRCGLS GKA Q | GK GMWP 1 P D EMQNMMDAKI G |
| UniRef90- Q2N8W7 | YEKRNVGI GMAC GL S GRA Q | GK GMWPAPDLMGKMMLEKI G |
| UniRef90_UPI0000E0F48 | Y ETANVVTGLLRAGMS GKA Q |  |
| UniRef90-A0A031JJT3 | $Y E D R N V Q 1 G L A C G L S G R A Q$ |  |
| UniRef90_UPI0003728EB2 | Y E D WNV DI GLE C GL A G K G Q | GK GMWPKPDRMREMMDTKAA |
| UniRef90-K6Z7M0 | YENRNVLI GLL K A GL K GKA Q | GKGMWATPDEMAAMLKAK\G |
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| UniRef90_Q1GRS5 | Y E D R NVRI GLA C GL S GKA Q | GK GMWAMPDMMRAMLEAKI G |
| UniRef90-Q28RA0 | Y ENQNV DI GLEECGLRGRA Q | GK GMWAKPDAMAEMLEQKI E |
| UniRef90-U2ZPU4 | Y EKRNVA I GL K H GL S GKA Q | GK GMWAAPDRMGEMLE QKI A |
| UniRef90_UPI000381629C | Y EDNNVDAGIAR GL P GKA Q | GK GMWAATELDMSDMVNTK I G |
| UniRef90_F2BE67 | Y EANNVQTGLQ C G L R GRA Q | GK GMWAMPDLMADMLA QKAA |
| UniRef90_U1KWW2 | Y EDRNVD $\square \mathrm{GL}$ A S GFA GKA Q | GK G M WP MP DKMALMMEQK L A |
| UniRef90-J4V1J5 | Y ENWNVDTGLETGFKGKAQI | GK GMWPMPDEMLLGMLQQQKTV |
| UniRef90_UPI0003B37E75 | $Y E N N N V K \ G L D C G L S G K A Q$ | GK GMWAMPDLMDEMLKKQKIN |
| UniRef90-H5T883 | Y E D Y NV Di GLA C GFS GKA Q | GK GMWAMPD M M K D M M K A K I A |
| UniRef90_UPI0004659EFA | Y ERNNVAVGLA C G L R GRA Q | G K G M W A M P D L M A M L EQKI A |
| UniRef90-G2HUW9 | Y ENSNVDIGGLECGLQ GFA Q | GK G M W A M P D EMAK M MVEKI N |
| UniRef90-UPI0004261FFB | YEDNNVDAGLAHGLQGKA Q | GK GMWAMTELMAELLEEQKI G |
| UniRef90-UPI000366407B | Y EKANVMTGLECGLS GKA Q | GK GMWPVPD HMQA MME TKI G |
| UniRef90_J2YLA9 | YERSNVVVGLA C GL R GKA Q | GK G M WA MP D LMA A M L E Q K I A |
| UniRef90_UPI000479171C | Y ELS NVEVGLD C GL H S R A Q | GK GMWAMPD RMAEMMTAKVT |
| UniRef90-C3X4Z9 | YEI N NVQVGL E C GMR GVA Q | GK G M WA A P D L M A D M $\square$ A Q K GD |
| UniRef90_G4R6S7 | Y E DRNVTI GI A C GLTT GRA Q | GK GMWARPDDMAAMMEQK $\square$ G |
| UniRef90_UPI00035C18B6 | Y E K R NVAI GLA C GL S GRA Q | GK GMWA APDRMADMLA QK G G |
| UniRef90_UPI000377F9B2 | Y E NRNVRI GLLKA GL Q G K A Q | GK G M WA $\square$ P DEMANMMQS K 1 A |
| UniRef90-E0XWJ3 | Y E D N NVDVGLA C GFS G $\square$ A Q | GK G M W A A D K M A D MVVQKI N |
| UniRef90-A9CV31 | Y ENWNV DI G L E C G L A G H A Q | GK GMWAMPDMMEAMLEEKI G |
| UniRef90-Q8FNB3 | Y EDNNVDAGI QRGLP GKA Q | GK GMWAMTELMM E M L EKKI G |
| UniRef90-E0XWY1 | YENNNVD\GLK C GFS G $\square$ A A | $V G K G M W A A P D E M K K M L E E K I G G$ |
| UniRef90-Q4FNA7 | Y ENNNVDIGGLQC GLS G K A Q | GK GMWAMPDKMKEMMEQKTS |
| UniRef90 ${ }^{-}$W5XZG0 | YEDNNVDAGLERGLPGKA Q | WA MTELMAEM\EAK\G |
| UniRef90 UPI00042768F2 |  |  |

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 O QLLRE GAN TA W WV P S P P T G A T L L H A T H Y H H R V V D V HL K A G A N C A WVVPS P T A A S L H A A L H Y H Q i HLNAGANCAWVPSPTAAALHALHYHEINI FEKQKEI QKRE




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v


LSAEQVTETEKRMAVVVDTQNEDNTYRPAMAPNFDSSGAF

VCTAEQVMDSLHRMAAKVDAQNADPLYEPMAGNWDSSMAF

t VCTKAQVDAVLARMAAVVDQQNADPHYQPMAPDLDASLAF VVTEEQI DDSLHRMAEIVDRQNEDAEYLPMATDFDKSIGF VVTHTQVEETLARMAKLVDEQNADSAYIPMHPDYNNATGY VVGAEQVEATLQRMANVVDQQNADTAYRPMAGNFAGSHAY $V V S V Q L V G R R A E D A K L V D Q Q N Q D P S Y R S M A D K L E Q S H A Y$
$V T T V P Q V M D T G K M A V V V D Q Q N A D P T Y R K M T D D F C H S G F$ VVTQDEVVATFTRMARVVDQQNADPAYEPMSGDPEHSTAF VASEAEVDAAFRRMAAKVDAQNADPAYRPMAGRETESLAF I DTESQVNESGKRMAVIVDKQNADSGYSPMATNFDHCIAF IVSREQIVETMKRMAEVVDGQNGDPAYRPMAADFDGSVAF VVTEEQVIESLERMAVVVDEQNADPNYLNMAPNFTESVAF $V$ T T K $\square Q V$ V M E $\quad 1$ M K Q M A K
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$P K R G D A V V A Y S K G L L$ PKRGDAVI AYSKGLL
$P \vee R G R Q V V V A A K A F L$ EKRGAQVI EAADQLLDELFPDLERGSHADVTAYRPSTDGFA PQRGREVI A WAMRFLDSALPLESGSHADISAYTVDRASLE LARGDQVI A WCRAFLDEVFPLDGASHKDVSAYQVVGERLV


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A Y A E $\square L T$ P E A $\square E F \square$ AT $\square H R$

VS GEYGE $\square$ LT AEA $L D F \square A M \square Q$

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## GQRR <br> ARQFEGRRQELL

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VSRFTPQRNELL
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VRAFGERREGLL

F GPRRKEL
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K F N S RRKALL
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 PTRRD PGQFVGYTGEPEA VTLADGSTGLQSAAQFAGFTGPRHEPKSVLLINNGLHMEL ITLKDGSSSLKDQEAFAGYRGDKDHPEAVLLKHHGLHEE IVTLDDGTALRDPDOFAGYVEENGALKSLLFVKNGLHGEL IGLQNGETTLKDTSQCVGFNGNAALPTEVILKNNGLHVIV
 AFLSDGESGLKNPCQFVAFDGSKTSPNYLLLKNNGLHVGL AFFPDGQTGLKEPGQFVAASDLDREPTSIVLKNNGLHVE ADDGAGSAGLTGSATFAGFTGDAAAPTALLLRHNGLHIE E
 ATLGDGVT GLAEPARFVGHRGDAGAPEATVDEHHGLHLEI
 V ESDLPLVSPEKFПGYSGNPKAPNSVLLKNNGLFVVL VThADDSVGLKSPEQFVGFQGADEQPDCULIKHNN:HAE ATVAGQPVRLAHPAYVGTRSDGGDTYGLLRNGLHVEL VTLNGGETGLAGADVFAGHSGAANAPSGVLLRHNGLHLE AFGAGGLPLRDPAQFTGYSGGT GDPALADPAQLAGRAGD AVIGDVEHSFADDS FVGYT ADTATGPVALKEPAQYVGHR EPNELTLMLRHHALHVAL ANGA PLKDPSQFVGFSGPPDAPQS L RHG VTVDEGVPALADPTQF1 FRARKDGGLLFRHNGLHIEV ATVGAAVRLADPADFVGFRGEGDEPTAVLQTHHGLHVED AVLDGKRVPFQQHC FVGYEGSPESPDRLLLVHNGLLHAEL GRVNDRWLSLKEKDQFVGYSGDDEKPASLLLVHHRMHDDL

GTPTLADPAQLIGRAGDT
ETADNEPVLRDPTQLVARRGA $\quad$ S DRLEDGSTALADGGKWVGYREDSDTPGALLFRNHGLHIEL A DGHGLCDPAQFAGWSGEPEAPTEILLRNNGLHLI ATGYKGGSTGLLDDTQLVGFQGGALAPFALLKHNGHFA VALGAGEARPADPAAFAGFTGDAASPASVLLVHHGLHAEL ASTTTGSTGLKSPSAFVGYRGNANKGDLVFFVNGLHII AKLKDGESGLQTPEDFIGYNGQAEAPS SLDFLHNGLHIDI ALSLAPDAGLADPRQFVGHAGDPDSPSSVLLRANGLLIEV AVLESGETGLKHAAQFAGYRGEPAAPTAVLLRHHNLHVE
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300 R N $\quad 310$
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 R Y $\square$ APDGKALIT EDKVEAYRNWLGLMRGSLAAPVRTVHPDREYTAADGSSAR EDKI IVYRNWLGLMKGNLKRSFRELNPDRKYLLKNGKMLL
 EDKVLGYTNWLGLMRGDLSESFRTLNPDRAYTAPDGSSFT






A

## R

DDKLS EDKQEVYRNWL H L L MQGTLS
A DKCVVYANWLGGMAGDMA
$E D K V N A Y S T W L G L M K G D L T$ A DKLVY N W E F R L N S DLSFISPS GDNFS

I

A DKVLVY A N WL GL MR G DL Q


 ADKVLGYRNWLQLMQRRLTA ADKVVCYRNWLGLTTGRLTDVFRRLAA


 D D K T G I Y R N W L R L M K G S L D A E F R R L N P D R P WR GP A G E A I S

 E DK S RVY S N WA GLLMR GDLLETS FRRLNSDDTFRMA GGK G DT

 E EKI HAYRNYLGGLMKRELSASFRSLNKDKTYTDTHAA I CK
 A DKVLAYRNWLGLMNGTLTAQFRHLNPDRVYTAPGGKTLT
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EKVI D GQINLRDAVRGTIS
D N MVS GQUNLRDAVNRTI EFSDR
WE GLL E GHI NLRD
$\square$
NRTIS $F$ S
$Y$ I $N L M D A V R G T I \quad T$ A LD K T $\square \mathrm{S}$ YTSM KTGKTYK WRNMVDGQINLMDRW GGR TGTAENGKHYA RRGR GFTD N GKSYA
$D N V L N G Q \square N L R D A \| N G T I S$
SNTIEGQINLRDAI R
T NLLEGQINLRGAI RRDワT FED
$N K V I$ E GQINLRDAVNGTVS
A N T L Q G QV N L R D A I R G TIIE
E A TII Q G QI NLRDAI R
SNMIEGQINLRDANQ
ENTI E GQQNLLDANKKTISLQD
$T N Q L D G Q \square N L \operatorname{FDA} V R K T I D S$
ENIMDGQI NLMDAVRRTITFQ
D K V I E G Q I N L R D A V N G T I S
ENSI G G Qi NL R D A I
SNVLDGQINLRDAVRRTIT FSD
D N N M N G Q I NLRDAI R K NI
E N IVVE GQ I N L R D A V
$S N M V D G Q V N L Y D G V R$
TNVI D GQI NLRDAI RKTISYE
E NTI G GQUI Y L R DANRKTLS
$R N \square Q F T N P A G K K Y Q$
$R N \square Q F Q N P D G K Q Y S$
SK GKSYR
YTSPEGKAYT
 RKIDD TASNGKEYK K R GK N Y E
Q N G K S Y R
$N S G N G K Q Y K$
$Y$ VN D Q GK Q Y Q
NRTDDFTSPQGKKYE EKTGKQYA
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Y V S P E GK P Y Q

## UniRef90 V4PFE6

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UniRef90 UniRef90-N9REW1 UniRefo_UP100037BD299 UniRef90-R9PPC9 UniRef90_UPIO0041108A6 UniRef90-U4K4Q3 UniRef90-B1M717 UniRef90_UPIO003B5C24B UniRef90-TOIQW1 UniRef90-UPI0003B32EC7 UniRef90-W9AIS0

## UniRef90-LONNP7

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340
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 LKGRALMLVRNVGHLMTTPAVLDAEDREDPEGILDALITS


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 LHGRSTMLVRNVGHMFTDAVLDEAGNPDEALIDAAVIV



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





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 $L P$ G R S L L F V R N V G H L M T T P A ll R L P D D GA E A P E G I L

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

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




$L$ K G R S L M L A R N V G L L M S T P L A R L N G Q E V P E G V V D C V V TA


 $V$ K GR S L L L V R N V G H L M T N P A I L D R D G Q E A F E G L M DA MV T L P G R V L M L V R N V G H H I Y T T D T V L D A A G K P I P E T I L D L V V T S L P G T S L T L L V R N V G G H M T T E M V T T N N D G S P I P E G I I L D A M V T S


 $\begin{array}{lllllllllllllllllllllll}L & G & R & S & L & L & V & R & N & V & G & H & L & M & T & N & P & A & L & D & A & D & G \\ L & N & E & V & P & E & G & M & M & D & A & M & F & T & D \\ K & G & R & S & L & M & L & R & N & V & G & H & L & M & T & N & P & A & L & D & A & E & G \\ N & E & V & P & E & G & I & M & D & A & A & F & T & S\end{array}$ L K G R S L A M A R L S G L N P T S P A V L L S G GA E I P E D M L D A M VA $L$ K S R S L M L L R N V G H L M T T P T V L D Q N G D E V F E G L L D A M C T V $L K D K T A V L I V R P R G W H L E E K H V L V D G Q P I S G A L E D F G L F P$

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 LIAALHDDQ GNGRWRNSQTGSVYIVKPKMHGPDEVAFTVQ LI SLQQDGKAG RTNSRAGSTYMVKPKMHGPEEAAFTDE LI AKHDL LDNNSPFKNAKENSDYVVKPKMHGPDEVAFTNR AIA A HDV GPNGRHANSRTGAVYVVKPKMHGPEEVAFADR
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 LIALHDLK GT GPLRNSRTGSVYMVKPKLHGPDEVAFAVE





 LIAKHDLARGTA Q N SVVGGSVYVVKPKMHGPAEVAFABER
 - A B A

L A HHD
AGGRNSRTGSAYVVKPKMHGPDEVGFAVE LGSVHDLKRGDTAGGRNSREGSIUYIVVKPKMHGPEEAAFTND LIARHDAGTNSRAGSAYIVKPKMHGPDEVAFVVD LI ASRHDDAN R R NSRERSDYVVKPKMHGSKEVAFTND LI GKLDID GKGKVQNSLSGS:YYKKKMHGSKEAAFTNA TiAALYDDRRLGAFENSRAGSVYIVKPKMHGPAECAFTNA VAGLYDLGRGLGPHTNSRAGSLYLVKPKQHGPDEVALTVE
LIA A H DV W AIGLHDLKGL GTLRNSRAGSIYVVKPKMHGPEECAFADR LAAMHNLNGNTSRSNSRSGSMYYVKPKMHGPEEAAFTNE TAGLLDLRQVGNKRNSTGSVYLVKPKLHGPEEVAYACR LCALHDLRAPGGPRNTVTGSVYVVKPKMHGPEEVAFACE LCGLHDLRRTAG LIRNSAGSVYMVKPKMHGADEVAYANS
 TI ALHDLRREGPAVRNSRAGSVYVVKPKMHGPEEVAFANR LLSFADIKGENTTIKNSRQGSMYVKKXMHGPEEVAFAVE LAA LIABHDI
LCGAHDLPHDRGERRNSETGS YYGDPKDHAPEECADAAE $\stackrel{\rightharpoonup}{\mathrm{F}}$
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F FHC HAKAQLARGTGPYFYLPKLESHREARLWND F HNAKEQLARGTGPYFYLPKMQSHLEARLWND
HNAKNQ $\square$ K N EGGBNSVGSVIVKPKMHGPDEVAFACR
HNA

HNAVRLVNGTGPYYYPK ESHLEARLWND

HNAQTAADVQGGPYFYLPKMESHLEARLWND
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HNYQQLLAKGSGPYFYLPKTQSWQEATWWND AKTSLAAGSGPYFYLPKMESHLEARLWNE G LGGEQLARGTGPYFYY HNAKELLARGSGPYFYLPKMESHLEARLWNE HNYQALLAKGSGPYFYVPKLQSHLEGRWWSE HNAAALLERGTGPYFYLPKMESHLEARLWNE HNARELLQRGSGPYFYLPKMESHLEARLWND $H N V K V L Q E N G S A P Y F Y L P K L E S H Q E A R L W N D$
$H N T K I L L E N N T A P Y F Y L P K L E H Y L E A R W W N E ~$ HNAKELLSRGSGPYFYLPKMESHLEARLWND
HNA $\square \mathrm{H} L \mathrm{LI}$ A G S G PYFYLPKLESHLEARLWND HNYKQLLAKGSGPYFYLPK QSYHEAQWWSD HNAKTLLAKGSGPYFYLPKLEGHELEARLWND HNAKTLI ENGSGPYFYLPKLESHLEARLWND


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UniRef90_Q022L4


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UniRef90 Q095Y0 UniRef90-B4RAM3 UniRef90_L7UP68 UniRef90-S2JP68 UniRef90_UPIO003B6E21F UniRef90-A0A023SBW3
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UniRef90_UPI000469B533 UniRef90_E8V3B3 UniRef90_UPIO0047BD93C UniRef90_UPIO0047AD9F0 UniRef90-Q6C5R9 UniRef90_UPIO00476868B UniRef90_UPIO0047E4A7D UniRef90_Q022L4

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470
480
 RVVFINTGFLDRTGDEIHTSMHAGPMVRKNDMKATTWIAA RVIV: NTGFELDRTGDE:I HTSMEAGPMVTKSEMKNQDWINA RLIFINTGFLDRTGDEIHTDMQAGPMVRKADMKTQPWMRA RIFFINTGFLDRTGDEMHTSMHAGAMVPKGEMKSSDWDSA RVVFI NTGFLDRTGDEDHTSMLKGAFAPKAEDKTRPWLNA RVFFINTGFLDRTGDEIHTSMLAGPMVRKGDMKSSAWIAA RIVFINTGFLDRTGDEMHTATRAGAMIRKAEMKGADWIKA RIVFINTGFLDRTGDEMHTSMEAGPMIRKAEMKGSSWI DA RTVFINTGFLDRTGDEDHTSMEAGPMMRKAEMASATWLKA RIVFINTGFLDRTGDEIHSSMEAGPMVRKGEMKKSNWLQA RVI FINTGFLDRTGDEI HTAMEAGPMVRKEADKAEPWIAA RVIFINTGFMDRTGDEIHTDMEAGPFVPKAEIKNQVWFEA RLAFI NTGFLDRTGDEI HTSMEAGAMVRKADMQTAPWKQA RLAFINTGFLDRTGDEI HTSMEAGPMIRKGEMKSAPWMQG RVVFINTGFLDRTGDEI HTSMAA GAMVPKGEDKESVWDKA RVVFI NTGFLDRTGDEI HTSMLAGAFYPKSAI KQEPWI SA RVVFI NTGFLDRTGDEI HTSMEAGPFDPKGEIKKQPWI A A RLFFI NTGFLDRTGDEI HTSDEAGPVVRKDAMKATAWIKA RUAF: NTGFGBRTGDE:HTSMQAGAFVRKADMRHQEWLGA RVVFINTGFLDRTGDEMHTSMHAGPFVRKAEMKTQAWI AA
 RVAFINTGFLDRTGDEI HTSMEAGPFSRKDFIKRKSWIVA RVVFI NTGFLDRTGDEI HTSMQLGAFATKASIKTRPWLNA RIFFI NTGFLDRTGDEIHTSMQAGAFVGRDGLKSASWLKS RVVFI NTGFLDRTGDEIHTVMEGGPVVRKEAVRETGWIKA RVAFI NTGFLDRTGDEIHTSMEAGPMLPKGEMKSQPWI QS RIVFINTGFLDRTGDEI HTAMRAGPMVRKAEMKNADWI KA RVVFI NTGFLDRTGDEIHSSMTLGPMRRKGEMKTSPWLAA RVFFINTGFLDRTGDEIHSVMEAGPVVRKADMKKAAWITA RVFFINTGFLDRTGDEI HTSMEAGPVLRKGEDKGADWIKA RVVFI NTGFLDRTGDE:HTAMQAGPVIRKGAMKASAWIAA RVVFINTGFLDRTGDEI HTSMQAGPMVRKAAMREATWI RV RVFFI NTGFLDRTGDEI HTSMAAGPVMRKGDDKGAPWIKA RVVFINTGFLDRTGDEIHTSLTLGPMRRKGEMKTSEWLDA RIFFINTGFLDRTGDEIHTSFKLGPMDRKGDMKHSAWLTG RLMFINTGFLDRTGDEIHTAMHAGAMIPKAEMKSARWIAA RIVFINTGFLDRTGDEMHTAMRAGPMI PKGEMKTSAWIKA RVIFVNTGFLDRTGDEDHTCFAAGPVLRKGDMKSTTWLQT RVCFI NTGFLDRTGDEIHTSMEAGAVIPKTRMKAAKWIGA RVAFINTGFLDRTGDEI HTAMRLGPVLAKPDMKAAAWLQA RLFFINTGFLDRTGDEI HTSMRTGPMVPKAEMKNARWIAA RVVFINTGFLDRTGDEIHTSMEAGPVVRKAQMKAEKWIAA RVAF NTGFLDRTGDEIHTSMHAGPFLPKAADRAEPWLPA RVVFINTGFLDRTGDEMHTSMQAGAMIRKGDMKASKWI AA RVAFINTGFLDRTGDEDHTSMEAGPMVPKGEMKSQPWIRS RIFFINTGFLDRTGDEI HTSDEAGPMIRKNEDRNTPWIKA RIIFINTGFLDRTGDEIHTSMMAGAMRCKNLIKEEAWFSA $R V A F I N T G F L D R T G D E \square H S A M Q A G P V L R K G E M K N T P W \square K A$
 $R T I F I N T G F M D R T G D E E H T F M E A G P F V R K G E V K G Q D W F P A$

$R L A F M S S G L M D R C A A E \square R A S T E A G P V A R L A R L K T L G W R R A$ NLT R LICLTVDYT
 HS A GL N C G R WD Y I F S Y i K K L R N R P DVI R S TVVTMTVP FMRA HSAGLNCGRWDY I F S CI KKFRNDPNFCRALVVMTMHEMRS $H A$
$H$
$H$
 HSAGLNCGRWDY H MA GL NCGRWDY H S A GL N C GRWD Y I
 HSAGLNCGRWDY I H I VAL NC G R WD Y I
 HAAGLNCGRWDY H S S GLL $\underset{L}{N A G R R W D Y}$ HSCGLNCGRWDY I HSAGLNCGRWDY I H S A GL NCGRWDYI H S A GL NCGRWD Y
 H S A GL N C GRWDYI






Y T CHRRKAPA $\square$ GGMAA Q $\square$ PVVKDDEKKNEEAFAKVRADKER YCCHRRGAHAMGGMAAQIPI KNNPQANEEALAKVLADKER Y T CHRRGAPC $\square G G M A A Q I P V K N D P A K N E E A L A K V K A D K E R$ Y TCHRRGAHAMGGMAAQI PI KNDPVANEAALAKVRADKER YTCHRRHAHA IGGMAAQI PIIKNNPAANEEAFAKVRADKGR Y TCHRRNAPA GGMAA QI PVKGNPQKNEEAFQKV RACDER YTCHRRGAFAMGGMAAFIPSK DAKHNQWVQEKVRQDKEM YTCHRRGAFAMGGMAAQIPIKTDPAANEAALAKVKADKER Y T CHRRGAHAMGGMAAQU PI KNDPAANDAAGAKVLADKER
 Y T CHRRHVHAMGGMAAFI PIIKGDAAANEAVLEKVRADKLR

 Y T CHKR GALAMMGGMAAF I PAK D PAVN E QVFAKMVKA DK ER YTCHRRNAHADGGMAAQIPVKNNPDANEEALNKVRDDK DR Y T CHRRNAPAI GGMAAQI Y T CHKRGAFAI GGMAAQI YSCHKRGGLA, GGMAA Q I Y T CHKRSAPAl GGMSALI Y T CHRRNVHAMGGMAAQ Y T CHKRGAFAMGGMAAF Y TCHKREAHAMGGMAAQ Y T CHHRQ $\square$ HAMGGMSAF Y T CHRRNAPAlGGMAAQI YTCHRRKAPA I GGMAAQ I PI R N N P T A NEEAFAKVRADKER
 PVKNNPAANEEAFEKVRKDKER


## UniRef90 V4PFE6

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UniRef90 L1 Q659
UniRef90-E3F4D7
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UniRef90_C4LOF7
UniRef90-F4QLN3
UniRef90-E8RKQ6
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UniRef90-A8L3P3
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560
HPQS GASTA WVVPSPTAATLIHAVVHYHSV\|DVITARQVE\|RQRK HPQAGANCAWVPSPTAATLHATHYHRVDVTARQQELAGQT
 HPQSGANTAWVPSPTAAVLHAMHYHEVDVWAEQERI RQRP
 HPRAGASTAWVPSPTAATLHALHYLEVDVAARQAELASRE HPKTGANCAWVPSPTAATLHADHYHEVDVFARQDEVKAAG HPRAGASTAWVPTPTAAVLHAMHYHLVAVASVQDGLRGKD HPRAGANCAWVPSPTAATLHALHYHQTDVFARQRELAGKM

 HPQSGANTAWVPSPTAATLHALHYHQVDVFEEQKTI INRP HPGSGAT A WVPSPTAATLHSLHYHRINVFDCQQALEDDT Q $\square R A G A T T A W V P S P T A A T L H S G H Y H E V D V A Q T Q R E L A R R E$ QPRAGAGTAWVPSPTAATLHALHYHRVDVPAVQRELARRD HPLSGATTAWVPSPTAADLHALCHYHQVDVVSKVQEQLLAKT HPKSGANCAWVPSPTAATLHALHYHQVDVFAVQENLRNGR HPKSGATTAWVPSPTAATLHAMHYHAVDVAQVQDRMSANA
 HPRTGANTAWVPSPTAATLHATHYHDVDVFARQAERAAEP
 HLNAGASTAWVPSPTAATLHALHYHRVDVAAVQAQLRVRP HPDAGASCAWVPSPTAAALHALHYHEVSVADRQRELAGRR HPQAGASTAWVPSPTAATLHAMHYHLVDVHARQTEIAGRT HVRSGATTAWVPSPTAATLHALHYHQVDASGVQRELLDEP $H L H A G G N T A W V P S P T A A V L H A D H Y H Q A D V D S U Q A S L L E S G$
$H$
$H$ HPQAGANTAWVPSPTAATLHA HYYQIDVVARQAADAKEA
 HPNSGATTAWVPSPTAATLHATHYHQVDVFARQRALATAV HPDAG
HVRAGASTAWVPSPTAATLHAIHYHLVDAFAARTELVVGA HPLSGASTAWIPSPTAATLHALHYHMVDVSAMQKTISVDP HPKAGASCAWVPSPTAATLHATHYHLVDVAARQEEIAAGP

HLEAGASCSWVPSPTAATLHATHYHRFNVFRQQQELLSKH $H P K S G A T T A W V P S P T A A T L H A W H Y H H V D V R Q V Q E Q L E Q Q A$

HPQAGANTAWVPSPTAATLHALHYHTVDVAARQAVLAGHR HPEAGASCAWVPSPTGAVIHAIHYHQI NVADRQQELLSTQ

EAGGGGATAMCFSPRTATLMATQYHRVDSRARQTTLVLGR
EARDGHDGTWVAHPGLVPVAMEVFDREMKEPNQDESKKDE EATDGHDGTWVAHPGLVSVALKAFDKHMPQPNQISKQRED EAYDGHDGSWVAHPGLVPVAMEVFNRLMPEANQIWYKRED EASDGHDGTWVAHPGLVPVAMEVFDRLMPTPNQIN RQRD EATDGHDGTWVAHPGLVPVAKSVFDEHMPQKNQIHRKRED EARDGHDGTWVAHPGLVPVALEAFNREMPEPNQUHSGKQK EARNGHDGTWIAHPGLADTVMP IFDRILGGRKNQL
 EAGDGHDGTWVAHPALVPIAMDVFNKYMPKANQDKLREEV
 EVKNGHDGTWVAHPGLVSLARDIVDANMKGANQLSNKRED EVTAGHDGTWVAHPDLVKKAALDVEFNEHMPQPNQLGFKRRE EATDGHDGTWVAHPGLVPIALEIVNRVMPQPNQLEKKTDY EANNGHDGTWVAHPGLADTAMAVFNAADPA GASNQ EVSDGHDGTWVAHPALVPVAMAAFDEHMPTPNQDHRRRED EATDGHDGTWVAHPGLVPI ALAEFDAAMKSPNQIERKRED EVKDGHDGTWVAHPALVPVALEVFNEHMEGQNQLHIKR
EVKNGHDGTWVAHPDLVPVAMQEFNKYMKTPNQLH DAGDGYDGGWVAHPGLVPI AMEEFVKVLGDRPNQIDKQRD EARAGHDGTWVAHPGLVKIAKEQFDRYMPNPNQUE KKRY EARNGHDGTWI AHPGLADTVMEVFDKVLAERQNQL
EAKNGHDGTWVAHPGLVEVAMKAFNEYMPSSNQVDKKRED EASDGHDGTWVAHPGLVPIA LEVFDRDMPGPNQIKQLDDY EATNGHDGTWVAHPALVPVAKEVFDKYMPTPNQIDKKRED EARDGHDGTWVAHPGLVPVALEVFNREMPMANQIHTSKQD EVTAGHDGTWVAHPQLAIIASEVFNKHMPTPNQIYRRRED
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## UniRef90 V4PFE6

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UniRef90-LONNP
UniRef90-LONNP7


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QPNQDDTYK円PFLKDADLSEEKDKETNNNAQSILGYVVK DELLDDLLT DPVMGKPEWTREQILEELENNAQGLLGYVVR
RAKLEDILTPPLANGANWPEDTQQELDNNAQGILGYVVR PLSLDDLLTPPLAKDTNWSEEEKTKELENNCQGILGYVVR QASVDDOLTHPLAPNTDWTPEEDQNELDNNAQGLLGYVVR

RALLGEMLQPPपAPEDAPSPEEDRAEAEDNAFTLLSYDDG

DVHVTEQDLVEV
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HVTAADLLAVPEGQ
DVQVTAADLLAFGPEKPDTE
VAVAAQDLLVPE QLPQ
DVGREDAPITAA
TITAADLLTVP
NVTAKDLLQVP
KVGEAELLAVP
TVTREDMLQVHDGER
RITESDLLKVP DVSVKQKDLLNDDFEGKTS QVSAADLLAAPEGA GK】TE TATAADLLDPAG GVLREQDAPI TAAELLAPCE QVTAEDLLRVPDG QVGAADLKKPEGT EDVMADPAALVQVPEGTITVADGLIRNNISVSLQYLES KTDKEDLVELPGGTVEAPDTEA V
 DVKVEEGDLMAVPEGT
 TVTAADLLRTPEGT NVSAEDLIEIPEGT KI SAV A Q DLL H:TARDLINPY TEGG DVNVDAADLLE

 TGT:TEEGMRANMRVG|AYLEA ITEEGVRTNDRVGUQYLEA
 TGNLTEKGLRNNVSAALQYMEA GTREAGLRENI RVGVQYDEA GTRTEEGLRHNLRVGIQYTAA HGLRONIAQUGLAYMES
 $R \vee \mathrm{~V} A \mathrm{~V} \mathrm{D} L \mathrm{~L} \mathrm{~A} \| \mathrm{P} \mathrm{D}$ G

UniRef90 V4PFE6 UniRef90-UPIO0038068DD UniReffo-UPIOOO378B311 UniRef90_A0A058ZMO UniRef90 S6BTX5 UniRef90_UPIOO03B31346 UniRef90-G4QK05 UniRef90-UPIO00415077B UniRef90_UPI0003A088A0 UniRef90-EOTHU2 UniRef90-UPI0003A5D870 UniRef90-U5LAPO
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UniRef90-UPIO003B32EC7
UniRef90 W9AISO
UniRef90-LONNP7
UniRef90-UP100035D9A71 UniRef90-K6YYZ4
UniRef90-UPIO003B6909E UniRef90_L1Q659
UniRef90-E3F4D7
UniRef90-UPIOOO248A76A
UniRef90-C4LOF7
UniRet90-F4QLN3
UniRef90-E8RKQ6
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WTDQGVGCSKVPDTHDTGLMEDRATLRTSAQLLANWLLHG WVDLGVGCSKVPDUNNVGLMEDRATLRUSSQH■ANWLFHG WAT SSAG W $\square \mathrm{DQG} \square \mathrm{GCSK} \mathrm{VPD} \mathrm{D}$ HDVA $\square \mathrm{MEDRAT} \square R \square S S Q A \square A N W \square H G$ WHNQGTGCSKVQDTNHMGMEDRAThRTSSQHMANWLHHK WVEQGUGCSKVPDUHNVGLMEDRATLRGSSQHMANWLLHD

WVDQGVGCSKVPDTNNTGMMEDRATLRTSSQHTANWLHHG WVDLGVGCSKVPDI NDVGLMEDRATLRISSQHVANWLRHG


WपREGTAFALRATADHEECFEDLAVQRDCADHLANWAHG

|  | N |  | L |  | w |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| W | N |  | L M |  |  |  |
| W | RGYGAVP NN |  | MEDAATAE |  |  |  |
| W | AGNGCV | N | MEDAA A E |  |  |  |
| WL | RGRGAVP S |  | LMEDAATA | SRA |  |  |
| W1 | SGNGCVPI |  | LMEDAATAE | SRT | w | G |
| WL | AGSGCVP | F N | MEDA |  |  |  |
| W | GNGCVP N N |  | LMEDA | R |  |  |
| WM | GSGCVPLYN |  | LMEDAA | RA |  |  |
| WL | RGRGAVPLYN |  | MEDAA | RT | wa |  |
| WL | GLGCVP |  | MEDAA | R |  |  |
| WL | RGVGCVPi H |  | MED |  |  |  |
| W | RGYGAVP |  | MEDAA | SRAQV |  |  |
| WL | RGIGGCVPL |  | LMEDA | SRAQL | WQ W |  |
| WI | NGNGCVPIY |  | MEDAA | R T S | WQ W |  |
| WL | RGMGAVPI Y N |  | LMEDAA | RTQV | wa |  |
| WL | RGLGCVPINN |  | LMEDA | RAQ | WQ |  |
| WL | GNGAVPIFH |  | LMEDAATA | SRSQV | w |  |
| WL | RGYGAVALYN |  | LMEDAA |  |  |  |
| W L | AGNGCVP1 H N |  | MEDAA | RSQ | wQ |  |
| W1 | SGNGCVPIYH |  |  |  |  |  |
| WI | SGNGCVP |  |  |  | w Q w |  |
|  | GSGAVPIYN |  | LMEDAATAE | RTQ |  |  |
|  | GIGCVP |  | LMEDAA |  |  |  |
|  | HGAAPINN |  | M |  |  |  |
| WL | RGlGAAPIHN |  | M |  |  |  |
|  |  |  | MEDA | SRS | H W |  |
| WL | R |  | M |  | WQ W |  |
|  |  |  |  |  |  |  |
|  | RGR |  |  | A |  |  |



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UniRef90_UPIO0046ACDB3 UniRef90_C5KT26 UniRef90_D4DUS8 UniRef90_A0A017HSM6
UniRef90_FSB03
UniRef90_UPI00036DDA6F UniRef90-F3HZ23 UniRef90-W0YKK3 UniRef90-G1XZW4 UniRef90-K2FRD1
UniRef90-F3DTN5 UniRef90_UPIO003793CD5 UniRef90_N7N815 UniRef90-UPIO0036A35E5 UniRef90_UPI0003749DFA UniRef90_G9QL70 UniRef90-B9XKZ2 UniRef90-M8E3R7
UniRef90-M1Z5R4
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UniRef90-B4RAM3

## UniRef90_L7UP68 UniRef90_S2JP68

## UniRef90-U1WXP5

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UniRef90_UPI000469B533 UniRef90-E8V3B3 UniRef90_UP100047BD93C UniRef90_UPIO0047AD9F0 UniRef90-Q6C5R9 UniRef90_UPIO00476868B UniRef90_UPI00047E4A7D UniRef90_Q022L4


VITEAEVDAALTRCAAVVDRQNADAAYEPGADGSTPGTAF $I V S K A Q V K E S L M K M S A V V D D Q N K D P Q Y T A M K G G \quad G V A F$
$\square V D E P Q V M A A M R R M A L V V D R Q N A D P L Y Q P M A P D F D \quad G W A F$ $\square C T K D Q V N K A F Q E M A L I V D E Q N K H P N Y \square A D A P N Y D S F A Y$ IA GKEDIQNVLERMAKVVDRQNADSHYRPMTKDFKNSAAF

TCTKEQVRATLERMAAVVDQQNADPAYTPMAPHFSHSTAF VSREQVRATMERMAAVVDQQNADPAYTPMAPHFSHSIIAF

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ERRKQ L
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FNPRR】ELL
GK L
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A $\square$ T A E $\square$ T P E F A E $\square L T$ P E A $\square$ A F $\square$ A M $\square$ H R FNPVRKALL
FGARRKELL
RFDAKRRALL
N G Q R K
RSFNATRKQLL
RGFEARRQELL FEPRRRALL
EYADVLSPDAVSFVAGLAREFTG RVDE
RRFGGVRRDLL
RSFEPTRKQLL
FNPRRKELL
RRFGARRSHLL RAFEPRRQELL
RRFEPRRRELM
RRE RRFEPRRRELM
RRF A RRRE
RAL
$\square \mathrm{AE} \square \mathrm{GH} \mathrm{A}$
FSPKVSELL
FSTILTEEALAFLTALHTNFNSKR】E $\sqrt{\text { L }}$

FTRQRRHEL
VRRFRPRVKQLL
FAGRRRELL
$\|$ LTPEALTLVADLR

HAP $\square$ K P A YET $\square \mathrm{L}$ T A D A $\square$ A $L \mathrm{~V}$ A K $\square \mathrm{H}$ R
A Y E GVR Q ELL
RAFESRRQELL RFDARRRELLL L L L

A D LQREFRNH $\quad$ K Y A $R$ RKQL RFDARRRTLL
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$V E K F A P Q V D E L$
$\square A A G R$
$\square$
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$Y$ T CHRRGAHA $\quad 1$ $Y$ TCHRRNAPA GGMAAF Y T CHRRGAFAMGGMSAL Y TCHRRGAFAMGGMAAF $Y$ TCHKRGVHAMGGMAAQ Y VCHSRGAPAMGGMSAL $Y$ TCHRRGAHA
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$Y T C H R R G V H A D G G M A A F$ $Y \square C H R R Q V H A B G G M A A$ $Y$ TCHKR GAPA $\square G G M S A$ L Y TCHQRGALAMGGMSAFI Y CHERGAFAMGGMAAQ Y T CHRRGVHAMGGMAA L Y TCHRRGAMAMGGMAAF Y T CHKRGVHAMGGMAAQ Y T CHS R GVVA A M G G M S A Q YTCHRRGAHAMGGMSAVI
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$\stackrel{\mathrm{Q}}{\mathrm{E}}$ EVDVTADQLLAVDS LEAKPTFEGLRNAVQVGIRYDEA VTREDVLNVEEDLVEWPKGTITEEI RKNI NVGILYY ES DVQAKDLLNFTMAG DI AAQDLLSVP HVTSSDLLNTKDQD HVSARDLLKVAEGPR DVVVTSDDLLDVASAG HITRDVDAPI SASELLSPCD N TENDLLAIPEGT APLVEADDLLAVPKGT RVEAADLLRVPPGAR KIEAKDLLLAEKGD DVTVDAAAL1/PDG $\qquad$ DLTTTPGAPTE EQDAPI TAAELLAPCTGERT $N V M R E D D A P I T A E E L L Q P ~$
$K V S E E D L L E V P K G V T L$ KVSEEDLLEVPKGVRTLP EVTAADFLL DFQPSQPTTEAGLRLNTRVGIQYLAA
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FNARRKQLL
YNPTRDALL
ASAFEPRRRQL

| $Y$ | $A$ | $P$ | $R$ | $V$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $A$ | $L$ |  |  |  |

FAADVPTLL

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T DEALAF $\square$ GELHH
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AARVTRAAEL DAGKPMDFTADT四REGNWKTAPDPKA QRQRDLDAGVFPSFLPETKYVRESDWKVASIPKDL AARKARRDTVARTGRLDEFLPETADVRAGDWTVAPVVPEDL AARVQRQKELKDAGVPDFLPETAYIREGDWKVASIPADL促 KARQRQRQAQFDTGELLPDFRADTQHI RDKTWKVAPI PKDL QRRQERRDQI AN GTDPHFPPETAAI RDDLDSVAPLAPGL QEREEKQEFINNGGEF SFLSETEHIRRCDWEIAPLPKDL AA REMQQKADGKSGAFPEFPKETKNDRESDWTAGEVPNDLD ALRTKRRAEVARTGRL DFLPETKAIREDAWRVALLAPKDL REKVQAELDQGKPLSFLPETRE：RENLWNCAPPGPGL EQRAERQQRLNRGELPMFLKETEALRNDGWTVAETPDDL
 ■QKRREREDLLEKGEपPDFLEETESURRSDWRVSPVPKDL GEMLDFLPETRSVREANWRVADCPEDL ENR $\square N \square Q E K \square D N G E Q L D F L K E T E F I R N D T W K G P P L A K G L$ QA REEQQKQYDAGALDDFRTETAHALRDAQWQVAEAPPAL ARRAERRAEQARTGKDLDFPKTTEDIRNNDWRIAPLPKDL ARRRQAREKLAAGKRSLRFPPETARUREDDWQVAAAPHAL DWQVGSPPDVL AAREAR QARFDAGEDPDFRADTRATRESEWRVAPLPAAL
 AARRER QAYFDGGGLPDFRADTQAIRAGDWRVAPLPAAL KARRDR QARFAAGSSPEFDPETEDREDASWRVAGAGPGL

A A RAKRREEAKRTGRL DF $L$ LPETKEDREGDWRVAEAPPAAL DFLPETAPVRAGDWRVAPTPPALL WQVAPAAPDL
aAra RrQadfdagagldflateanvrddgwrvaepapgl AA RDARQARYDAGELPDFRADTVAIREGHWTVAPDPAAL QARLERERADDEGALPDFLQETTHI RESEWQI ASVPNDL ARLRHERQSRYDAGCLPNFRSDTRALREGDWRVAPIPAAL

ERRKDRQAEDDRGSDPDFDPETKHTRENTWKGAPPAPGL MDRQQRRQDVAD GIDPDFRASTRPVRDDTWRVAGTGAPG AAlRENTEWRVAGAGPGL ARRAERRAETARTARLDFLPETAAIRADEWRVAPAPPAL QNRKDFQAKLDRGDTSLDFLPETANIRNDSWLGPILAPGL RA RDQRQAWINAEGFIGFAPEYSSIRDRSWQVRPAPADL
 ANRKV KQARYDNGAKPDFLPETKSLRENEWKVRGIVPDL AARSARREEVA

RQAFFNSGEL
A A RKTR QARRYNSGAVPGFDPSTKFI RDGEWVCASVP PAV QKRQEQQKLLDAGALLDFREDTRHIRESSYTGAPDADGOL LARRKEQQKSFDLGEKPHFPKETLELR

RQQETANGADLDFLPETKETREDEWQVA EKRNQKQAEIDKGNMPTLLAETKHIRDKTWKVAPПPQDL QRRHDRQRDI DAGVIPGFLVETRGVREGDWRVAPCPPAL ARRRQKVQERLDAGESLHFLEETKYVREDNWKCLPTHPKL KKRMQDQSEDNAGKKTTY PDVSNSKDWKVSAVPHDL
 QERLDRQARLDAGEEDDFPSETQALRNGEWTVPPAPADLC
$K E R R R Q A L L A A G A L D F P A T A G V R A D A S W R V A A P A P G L$ KERRRQA凹RLAAGSALDF

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AKRAERVQQVAD GVDLGFLEETQQAAP A LIADRQRRRIGNGRDPRFREETRSIREDNWRVAGAGPGL AARAE VVARVSAGEDGGF GETEAVRSDSWRVADPAPGG
AQRR\｜DQASTDDSNYFPDFDPTTKNLRDRSWFGAKIPDDM KKRVQKQKELNDGVYFPDFSPDTANLREDLWKGAELPEDLG AQRRERRERFA AGELPGFLAPETSAVRADHWHVAPPAPGL

## UniRef90 R4XA41 UniRef90－R1GYN3 UniRef90 GOWCA7 UniRef90－F5RC78 UniRef90＿T0Q5D4 UniRef90－E9UQU4 UniRef90－DON096 UniRef90－UPI000473901E UniRef90 C1CV92 UniRef90＿UPI00047514ED UniRef90－UPIO0041241D8 UniRef90＿A9E6G8 UniRef90＿A5V0V6 UniRef90－UPIO0037E1953 UniRef90－F5HDP7 UniRef90－G2LZR4 UniRef90－B8GWB6 UniRef90＿D6YVC4 UniRef90－Q6CIU4 UniRef90＿UPIO0036E80F7 UniRet90＿A4FPET UniRef90 L5NAC1 <br>  <br>  <br> 

 UniRef90＿UPI0003B51C02 UniRef90－F2NQM5 UniRef90－K0KSW9 UniRef90－W7T2T1 UniRef90＿C9NSE6 UniRef90－E4TPT4UniRef90－M3A614 UniRef90＿UPILO0038181C1 UniRef90－K1L660 UniRef90－UPI000467200C UniRef90－F6FPF7 UniRef90－W1PZY1 UniRef90－K8ZJD4 UniRef90＿UPI00041CA922 UniRef90－B2AUJ2 UniRef90＿UPIO003741AE5 UniRef90＿UPI000380BF8B UniRef90－IOHBU3 UniRef90＿C5DI56 UniRef90－D3Q9U5 UniRef90＿UPIO003175F5D UniRef90＿I8J1U9 UniRef90＿UP100034C87A9 UniRef90＿UPI00040DAD07 UniRef90＿J8US73 UniRef90－G2WVY8 UniRef90＿UPIO00466CE9D UniRef90－UPI0003B6AE2F UniRef90－F3NPR2 UniRef90－I2GXW6 UniRef90＿UPI000477BCC5 UniRef90＿U4KDV2 UniRef90－E1Z219
UniRef90－B8CKP3 UniRef90＿UPI000413037E UniRef90＿Q9AXL7 UniRef90＿A0A023Y8R9 UniRef90－P13244 UniRef90 M5FQS9 UniRef90＿M7N8X9 UniRef90＿UPI00047ADA93 UniRef90 F8A6T3 UniRet90－GOWCT5
UniRef90-14AJQ7
UniRef90-WORMA4
UniRef90-P21360
UniRef90-V4IG12
UniRef90-A7RM90
UniRef90-W4G8L4
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UniRef90_UPI0003A0CAC1
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| UniRef90－R4XA4 |  |
| UniRef90－GOWCAT | ENMIYGQVNLYDAIRNQI |
| UniRefoto－5RC78 | DNQUQGQUNLRDAVRGTUSVDYK |
|  | WHTLVSGQI NLKD AVRRT】SYTGNNGKKY |
| UniRef90－EgUQU4 UniRef90 DoNo96 |  |
| UniRef90＿UPIOO0473901E | EDKI VYRNWLGLMKGNLKRSFRELNPDRKYLLKNGKMIL |
| UniRef90－C1CV92 | ANCIEGQVNLMDAVRRTIA品E QGGKSYR |
| UniRef90－UPIO0047 |  |
| UniRef90－UP10004 |  |
| UniRef90－UP10001 | ANVIEGQMNMRDAVNGTDS YENQNGKQ |
| UniRef90＿A9E6G8 | KNNIEGQKNLDDANNKSUSLID |
| UniRef90－UPIOOO37E1953 | SNVVGGQVNLADAIRRQTS |
| UniRef90－F5HDP7 | SNMVLGQVNLYDAI RRQIDFED NGKAY |
| UniRet90－G2LZR4 | RNLLAGQRTLAAAVRGDLS |
| UniRef90－B8GWB6 | WANVVEGQI NLKDRWQGELTHVDAKSGKAY |
| UniRef90－D6YVC4 | NLVQGQ |
| UniRef90 Q6CIU | VNVIYGQVNLYDAl｜rDQ |
| UniRef90－A4FPE7 | ANVVGGQVNLYDVIRKQVEL |
| UniRef90－L5NAC1 | SNTINGQINLMDAV NRDTRFTNESGKV |
| UniRet90 UPIOOO3B | ANVIGGQANLYDAlRRRRRIDFTTPEGKEYR |
| UniReefo KOKSW9 | GNVVRAQKNLYDAIRRGKI |
| UniRef90－W7T2T1 | HNVVSGQENLYDAVRGTI VHTSPEGKH |
| UniRef90－C9NSE6 | ENMVEGQUNLRDANAGT：SY FDDKKNKQY |
| UniRef90－E4TPT4 | KNUTDGQQNVYDAlRKQ1 |
| UniRef90－UPIooo38181C1 |  |
| UniRef90－K1L660 | NMI SGQVNLYDAIRGQT DFISEQGKSYT |
| UniRef90－UPIOOO4 |  |
| UniRef90 W1PZ | DNLMKGQVNLKDAVDGSiNFVDSD RKREYKLN |
| UniRef90－K8ZJD4 | RNLVAGQRALAEAVAGTLSFSAPPAR |
| UniRef90－UPI00041CA922 | SNMLGGQ |
|  | VNLYDANRRQVDFK】 GNKEYKLRTD |
| UniRef90＿UPI0003741AE5 |  |
| UniRef90－10HBU3 | ENVVLGQANLRDALDGTL |
| UniRef90＿C5DI56 | DNCVVYGQVNLYDARDQVAFKT PRKEYTLRD |
| UniRef90－D3Q9U5 |  |
| UniRef90-ıJJ1U9 | KNSFLGQVYVKQAIEGTLT |
| UniRef90－UP100034C87A |  |
| UniRef90－UP1000 | VQGQLN【RD A |
| UniRef90 G2W | DamVNGQV |
| UniRef90－UPIO00466CE9D | RNVIEGQLALHDATRGTLTHTVDVPGGEKEYRL |
| UniRef90－UP10003B6AE2F | QNVIEGQ NLFDAIRGQV |
| UniRet90－F3NPR2 | ENVVLGQLNLIDAHRRTIDFTD |
| UniRef90 12 GXW6 UniRef90 UPIO00477BCC5 |  |
| UniRef90－U4KDV2 | DNMIQGQLILRDANDGSUAFEDTVKN KRYR |
| UniRef90 E12 |  |
| UniReego－B8CKP3 | VAGQ |
| UniRef90－Q9AXL7 | ENLMRGQVNLRDAVNGTISFNDQARNR GFTSPEKEYK |
| UniRef90－AOAC |  |
| UniRef90－P13244 | ENLMRGQVNLKDAVDGS |
| UniRef90 M5FQS9 |  |
| UniRef90－UPIO0047ADA93 | SNLLDGQQNLKDAINKTISSIE ALRRQVDFTAEGGKKYQ |
| UniRef90－F8A6T3 | TNVVGGQLNLFDAIRGQV DFTTPEGKEYR |
| UniRef90－GOU | a |
| UniRef90－K9A169 | DSVIGGQ NLLDA |
| UniRef90－14AJO7 | QNAVQGQUNCYDAIRKTITFHDAKKNKD |
| $\begin{aligned} & \text { UniRef90_WOR } \\ & \text { UniRefon_-213 } \end{aligned}$ |  |
| UniRef90－V4IG12 | WENVIQGQLNDTDAYERRDDFTDRTGKSYA |
| UniRef90－A7RM90 | LIE ANKKTQ |
| UniRef90－W4G8L4 | ATVVSGQINLRDAVR RTDTYEQPGGK |
| UniRef90－U2ZC49 | TNQVEGQVNLKDLWAGTLSFDDP KSGKAYR |
| Uniref90－A3 |  |
| UniRef90－A0A02 | SNVMDGQVNLYDAVR RTISYKSPDTKDYT |
| UniRef90 UPIOOO3AOC | ENV GGQLNLRDALDGTLS |
| UniRef90－UPIO00365A862 | GNVVGGOLSLMDAIRGRLA |
| UniRef90－UPIOOO225E3E3E | ENVVEGQINLRDA Llatis |
| UniRef90－UPIO00361DC55 | ENVVGGQLNLDDAVTRKIDFS |
| UniRef90－U5B |  |
| UniRef90 U6PS | RNQLDGQMNLYDAVRNNISYE HPSTKKEY |
| UniRef90－UPIO003B5AE30 | ANVIEGQLTL ADAVRGQL |
| UniRef90－W5W8E1 | WHNII TGLLTLDAAADR DLTTEGGKRYW |
| UniRef90－UP100036D8787 | GQLINLLDAl |
| UniRef90＿UPI000346ABD1 UniRef90－K2JWF9 |  |
| er90－C4 | NVVAGQLNL |
| UiRee90－A4AG97 | PNVIGGQDNLHDARRQUDTMEGKTYA |

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## UniRef90_I2GXW6

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UniRef90_U2ZC49
UniRef90_A3UIY2
UniRef90_Q82LG6 UniRef90_A0A024GTJ3 UniRef90_UPI0003A0CAC1 UniRef90_UPI000262A50B UniRef90_UPI000255E3EF UniRef90_UPI000361DC55 UniRef90_U1NX22 UniRef90_U6PSN3 UniRef90_UPI0003B5AE30 UniRef90_W5W8E1 UniRef90_UPI00036D8787 UniRef90_UPI000346ABD1 UniRef90_K2JWF9 UniRef90_C4RF48
UniRef90_A4AG97

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L N D K T A V V L V V L N N ETAVVLLV R P R GLLHL N E R HL V I N N E E V S G S L V D F G L Y V
 L S EK P AVLLVRPRGWHLPEPRLII DGTPMSGSLVDF GLYF
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## LR S R P A TiVMMRPR GWHLD

L N A N P A L L I A R P R G L H L
L K D K T A V L K V R P R G WH L S E K N F L V N G E Q I S A S L F D F G L Y F
L R A D P A VIVVPR P R G WH L L V D K H

 L K P E Q AVLIVRPRGWHLDE

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L A NDP T L I V R P R G WHM DE




## AVLIVRPRGWHLDEKHVRIDGQAIAGGLFDAAVFA






$L$ N A E R A Till L I R P R G WH L
LK P QA TAVVRPRGWH L DE
L K D K T A CLLLVRTRGWHLDE


L N E KTA T L M V V R P R R G WH L L E E HL E F D G R P V P A S LVV F L Y F F

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UniRef90 B8GWB6 UniRef90 D6YVC4 UniRef90_Q6CIU4 UniRef90_UPI00036E80F7 UniRef90_A4FPE UniRef90_L5NAC1 UniRef90_UPI0003B51C02 UniRef90-F2NQM5 UniRef90_KOKSW9 UniRef90_W7T2T1 UniRef90_C9NSE6 UniRef90_M3A6I4 UniRef90_UPI00038181C1 UniRef90_K1L660 UniRef90_UPI000467200C UniRef90_F6FPF7 UniRef90_W1PZY1 UniRef90_UPI00041CA922 UniRef90_B2AUJ2 UniRef90_UPI0003741AE5 UniRef90_IOHBU3
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## UniRef90_I2GXW6

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UniRef90_I4AJQ7
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UniRef90_A3UIY2
UniRef90_A0A024GTJ3
UniRef90_UPIO003A0CAC1 UniRef90-UPI000262A50B UniRef90-UPI000255E3EF
UniRef90-UPI000361DC55 UniRef90-U5BWX5
UniRef90_U1NX22
UniRef90_U6PSN3 UniRef90_UPIO003B5AE30 UniRef90_W5W8E1 UniRef90_UPI00036D8787
UniRef90_UPI000346ABD1 UniRef90_K2JWF9
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UniRef90_A4AG97


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| $V$ | $T$ |  |  |  |  |  |  |  |  |  |  |  |
| $V$ | $F$ | $A$ | $Y$ | $A$ | $E$ | $E$ | $R$ | $L$ | $G$ | $N$ | $Q$ | $G$ |
| $A$ | $F$ | $C$ | $L$ | $A$ | $T$ | $S$ | $H$ | $L$ | $G$ | $Q$ | $Q$ | $G$ |

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

V$A F V L A A Q V F L G M P R G T$| $V$ | $F$ | $V$ | $A$ | $A$ | $Q$ | $D$ | $Y$ | $L$ | $K$ | $I$ | $P$ | $Q$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $T$ |  |  |  |  |  |  |  |  |  |  |  |  |
| $V$ | $F$ | $T$ | $F$ | $A$ | $E$ | $E$ | $K$ | $I$ | $G$ | $P$ | $H$ | $G$ | $S$ |$\begin{array}{llllllllllllllll}V & F & D & Y & A & E & H & T & L & R & L & P & Q & G & T \\ I & F & S & F & A & E & E & R & L & G & V & A & H & G & T\end{array}$$V F C H A Q D Q L G B P R G T$

|  | 450 | 460 | 480 |
| :---: | :---: | :---: | :---: |
| UniRef90_R4XA41 | H S A GLL N C G R WD Y I F F S L | K K L K M N P Q F VR A DV | M T VT F M K S |
| UniRef90_R1GYN3 | H IVGMNC G R WD Y I F S Y I | K T L K N H T D RIIR H Al | GMDQP F LEA |
| UniRef90_G0WCA7 | H S S GLN C G R WD Y I F S T I | K K L R N K S E HV R D QV | T M T S P F M A |
| UniRef90_F5RC78 | HS A GLN A G R WD Y I F S Cl | K VFRN N R D F CR S K I | T M TVP F M R A |
| UniRef90_T0Q5D4 | HS S GL N C G R WD Y I F S F I | K K F R N H A S F VR S El | GMTTPFMAS |
| UniRef90-E9UQU4 | HA S GL N A GRWDYLFS L | KYFRDAGPSFRATV | GMTSPFMRA |
| UniRef90_D0N096 | HS S GL N C G R WD Y IF S Y I | K K F R N H K F VR S SV | GMT T P F M A A |

HSAGLNCGRWD Y I F S F I K K FR S R H DK I R A VVTMATPMMQN
 H S S GL NA GRWD YI F SVI K NFRERGTRFRGLVVTMTQPFMRA HSAGL NCGRWDYI FS YI K K L R E K E DVVR SLVVSMTVPFMDA $H \| V G L N C G R W D Y I F S Y I K K F R N H P N F I R D Q V T M T T P F M D A$ H S S G L N L G R W D Y I Y S F I K T F S H H R D D WI R A Q V T M T T H F L R S Y A S GL NAGRWDYLF S I K Y F R DAGPDFRNAVTMTAPFMRA HSAGLNCGRWDYIFSFI KKQRAHKNCVRSDVTMTVPFMDA $R I V G G L N C G R W D Y$ I F S Y L K T F R A HR D R V R G QV TM T QP F L K A H IVGGLNCGRWDYI FSSFI KR LGRREEAFLDRSAMVMGKAFLGA H SAGLNAGRWDYI F SVI KKFRRLPGFSRNQITMTVPFMRA HS S GLLNCGRWDYI FSTI KRLRNKPEHVRDQVTMTSPFMNA
 H S A GL N C G R WD Y I F S YL L K K M K S R DVVLLR S T I TMMTVP FMRA HCAGL NA GRWDYI F S II K NFRDRGPEFRAQVTMTVVPMRA

 HASGLNA GRWDY L F SLLIKTFRDAGEEFRNTVVMTAP FMRA H I VAMNCGRWDY I FS Y I K T L K N H P D R I R HVVGMDKE F LINA H M A G L N A GR WD Y I F S FI K K FR D R P D Y I R N QVTM QVP FMK A HASGLNAGRWDYLFSLI KNFRAAGAEFRNAVTMTVPFMRA | $H$ | $V$ | $C$ | $G$ | $L$ | $N$ | $A$ | $G$ | $R$ | $W$ | $D$ | $Y$ | $I$ | $F$ | $S$ | $V$ | $I$ | $K$ | $N$ | $L$ | $G$ | $A$ | $R$ | $G$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $H$ | $D$ | $Y$ | $A$ | $Q$ | $T$ | $M$ | $T$ | $V$ | $P$ | $F$ | $M$ | $R$ | $A$ |  |  |  |  |  |  |  |  |  |  |  |
| $H$ | $V$ | $L$ | $N$ | $A$ | $G$ | $R$ | $W$ | $D$ | $Y$ | $I$ | $F$ | $S$ | $I$ | $I$ | $K$ | $K$ | $F$ | $R$ | $N$ | $H$ | $K$ | $D$ | $F$ | $D$ |
| $R$ | $S$ | $K$ | $V$ | $T$ | $M$ | $Q$ | $V$ | $P$ | $F$ | $M$ | $K$ | $S$ |  |  |  |  |  |  |  |  |  |  |  |  |

 HCA GL NA GRWDY L F SVI KCFRTRGDPDRGQVTMTAP FMRA
 $R$ RVGL NCGRWDY I F S Y L K TFRRRHPDRVVRQVVTMTQPR LK A HCAGLNAGRWDYLFSII KTFRNRGDFIRNQLTMTVPFMRA
 HA A GLLNA GRWD Y L F S IVVKNFRDAGEAFRNAVTMTAPFMRA HS A GLNAGRWDYLFSMIK NRPDVVRSQVTMTAPFMRA HS A GLLNCGRWDYY F S VI KR L R NDPA HVRDHVTMTAPBMDA HSAGL NAGRWDYLFSII KKFRARGAEFRNAVTMTAPFMRA $R V V G L N C G R W D Y$ F F S YL K TFRSHRDRLRSQVLMTVPF LK S H C A G L N C G R W D Y I F S Y I K K L K N H A S Y V R A L V T T M T V P F M R A $R$ A V G L N C G R W D Y I F S Y L K T L R G H R D R L R G Q V Q M T VV P F L K A
 $R \bigvee V F I N T G F L D R T G D E$ I HTAMEAGAML RKGDMKGSAWQQA H SAGL NCGRWD Y IG SVVIKKFRSNPNFVGSAVTMTSPEMDA HCA GL NA GRWDYLF HCA GL NA GRWDY I F HSS GL NCGRWD Y I F HITAL L C GRWD Y I F
 $N \quad 1$ VA L N C GRWD Y I F HASGL NA GRWDY L F S M I HSIGLNCGRWDYIFSYVKYFRDAGDEFRASVSMTAPFMRA $R I V G L N C G R W D Y$ I F S Y I K T F R Q H A D K V R GQQV TMTQP F L K A $H$ SVGLLNCGRWDY I FSYVVKTFQAHPDRLRVLVGMGQHFMRS HSAGLNCGRWDYI FSFIVKFRTNSKFVRSSVTMTVPFMQA H M A GL N A G R WD Y I F S F I K K FK RHAD K V R Q QV S M GV P FM S A
i

## 

A L N A GRWDYI FSHMA GI NA GRWDYI FSAH A A GL N A GR WD Y I F S


HSSGLNCGRWDY
$H I V G L N C$ C GRWD Y i
$N$ IVTAFNA GRWD Y I F S F I
H SAGLNAGRWDYLFSL
H S S GL N C GRWDY I F SY I
HASGLNA GRWDYI F S I I
$H \square A G L N A$ GRWD Y I F S I I
$H S A G L$
$H S A G A G R W D$
$H$
$\begin{array}{ll}H S A G L & \text { N A GR WD F MF S V } \\ H \text { L V A } \\ \text { N A GR WD Y }\end{array}$
Y I I GL N C GR WD Y i F S Y
$\begin{array}{c:ll}Y & V & G \\ H & N & C \\ C & A & R\end{array}$
H CA GL NA GRWDYI F S I
HS S GL N A GRWDY I F SVI
HS A GLLNAGRWDFMFSVI
HMA GLLNA GRWDY I F S L L

UniRef90_R4XA41
UniRef90_R1GYN3
UniRef90_G0WCA7
UniRef90_F5RC78
UniRef90-T0Q5D4
UniRef90_E9UQU4
UniRef90_DON096
UniRef90-UPI000473901E UniRef90- C1CV92 UniRef90_UPI00047514ED UniRef90_UPI00041241D8 UniRef90-UPI000185098C UniRef90_A9E6G8
UniRef90_A5V0V6 UniRef90_UPI00037E1953 UniRef90_F5HDP7 UniRef90_G2LZR4 UniRef90_B8GWB6 UniRef90-D6YVC4 UniRef90-Q6CIU4 UniRef90_UPI00036E80F7 UniRef90_A4FPE7 UniRef90 L5NAC1 UniRef90_UPI0003B51C02 UniRef90_F2NQM5 UniRef90-K0KSW9 UniRef90_W7T2T1 UniRef90_C9NSE6 UniRef90_E4TPT4
UniRef90-M3A6I4 UniRef90_UPI00038181C1 UniRef90-K1L660 UniRef90_UPI000467200C UniRef90_F6FPF7 UniRef90_W1PZY1 UniRef90_K8ZJD4 UniRef90_UPI00041CA922 UniRef90_B2AUJ2 UniRef90_UPIO003741AE5 UniRef90_UPI000380BF8B UniRef90_IOHBU3 UniRef90_C5DI56
UniRef90_D3Q9U5
UniRef90-UPI0003175F5D
UniRef90_I8J1U9
UniRef90_UPI00034C87A9
UniRef90_UPI00040DAD07
UniRef90_J8US73
UniRef90_G2WVY8
UniRef90_UPI000466CE9D
UniRef90_UPI0003B6AE2F
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UniRef90_UPI000477BCC5
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UniRef90_A0A023Y8R9
UniRef90_P13244
UniRef90_M5FQS9
UniRef90-M7N8X9
UniRef90_UPI00047ADA93
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UniRef90_WORMA4
UniRef90-P21360
UniRef90_V4IG12
UniRef90_A7RM90
UniRef90_W4G8L4
UniRef90_U2ZC49
UniRef90-A3UIY2
UniRef90_Q82LG6
UniRef90_A0A024GTJ3
UniRef90_UPI0003A0CAC1
UniRef90_UPI000365A862
UniRef90_UPI000262A50B
UniRef90_UPI000255E3EF
UniRef90-U5BWX5
UniRef90_U1NX22
UniRef90_U6PSN3
UniRef90_UPIO003B5AE30
UniRef90_W5W8E1
UniRef90-UPI00036D8787
UniRef90_UPI000346ABD1
UniRef90_K2JWF9
UniRef90_C4RF48
UniRef90_A4AG97

Y T CHRRGALADGGMSAFIPSK DPDEMARVTQKVDEDKRR

Y T CHKRGAPA $\square G G M S A L I D N K K D P E A N E K A M A G I I R S D K R R$
Y T CHRRGAHAMGGMAAQIPVKNDPALNDKFMAAVREDKLR


Y T CHRRGAPA $\square$ GGMSAF IPVKNDEAANERAFAQVQADKER YTCHARGALAMGGGMSAFIPNS DPAVMEQVLTKVEEDKNR YTCHRRSASADGGMAAFI PNRRDSEANAAALEKVREDKTR Y T CHRRKAPAMGGMAAQI PVKGDTTRNEEAFAKVRADKER

 Y CHRRGAFAGGMAAVPSRRDPEVNEQALAKVRADKER

 YTCHQRGAHADGGMAAFI PNRKDPEVTEKA LRKKVKEDKLR
 YTCHKRGAHADGGMSAFI PVKNDEAANARAFDQVRRDKER Y T CHKRGAFAIGGGMAAFI PNKKDPEANEKAMQKVHDDKKR Y T CHRRK $\square$ HAMGGMAAQIPDRDDANLNALAFEKVRKDKER Y TCHRR GAFADGGMSAR I PSRRRDPA V NERA DA QVAA DKR R YTCHKRGAHAIGGMAAFVPSRKRPEVNAQAFAKVREDKER Y VCHKRGVHAMGGMAAHIP $\quad$ GKNDPAAHEAAMNKVRS DK $\square R$

 YTCHQRGAHAI GGMAAFIPSRRDPEVNEAALDAVVADKER
 YTCHRRGAHAMGGMAAQQ P DAGDAAANEEAMARVRAA K LAR YTCHKRGAHADGGMSAFIPDRRDPEVTRRADEQVRADKTR
 YTCHRRGAHAMGGMAAQIPIGHDEAANEQAMARVRADKLR Y T CHRRGAHA $\square G G M S A F I P N R R D P E D T E Q A F E K V A D D K R R$
 YTCHKRGAFADGGMAAFIPSK DPEVNENASKKVHADKAR Y T CHRRGAHAIGGMAAFI PSRRDPEANARAFEKVRADKDR YTCHKRGAHAIGGMAAVVPSR DPVAAKRALNQVRQDKRR $Y$ VCHRRGVHAMGGMAAQIPDKNDTAANDAAMAKVRAAKER YTCHKRGAHADGGMAAFI PSRRDPQVNATALDKVRABKSR Y T CHRRGAFAMGGMAAQIPDKGDEAANDAALAKVRADKLR
 YTCHRRGAFAMGGMAA Q I PIKGDETANEAAMAKVRAD KLRR YTCHKRGAHAMGGMAAFIPSRNNPAVNENAFKKVKADKAF YERSNVLVGLAC GLRGKAQDGKGMWAMPDLMAAMLEQKVA YTCHRRRGVHAMGGMAA QDPDK D D K A A N D RAM D GVVRA DK L R YTCHRRGAHADGGMSAFI PDRRRPDVTERAFEQVRADKRR Y T CHKRGAHAI GGMSAFIPNRRDPEATADALAKVGEDKRR YTCHRRGAHAIGGMAAFIPSRRDAEVNRVAFEKVRADKDR
 YTCHARGADAMGGMSAF, PAK DPADMMTVTNKVRAEDKER
 YTCHKRGALAMGGMAAFIPSK DANENQQNLDKVRQDKQL Y T CHDRGAFAMGGMAAF Y T CHRRGVHAMGGMAAQI
 Y T CHKRGVVHAMGMAA Q I PI RDDPKANEMALDLVKKDKLLR Y T C HK R GVA A MGGMSATMEDKNDKVANDQAMAKVYEDKGR
 Y VCHKRNVLAI G GMAA QI P DK NDEHANE DAYEKVVKS DK ER YTCHRRGAQA I GGMSAFIPNRRSPEVTSRALQQVRADKQR YTCHRRNDHAMGGMAAQIPDKNDPVKNDAAMNKVKTDK DR YTCHKRGAHADGGMSAFVPAK DPEANEAAFAKVREDKSA Y T CHTRGAHAI G GMSAFIPTRHDEEDNKQAFEKVRKDKER YTCHKRGAHA\|GGMAAFVPNRRDPAVTEAAVAKVREDKLR Y VCHKRGDHAMGGMAATIPDKDDPEKNAAAMEAVRADKGR YTCHKRGAHADGGMAAFIPSRRDAEVNKVAFAKVKDDKDR YTCHQHGAHAMGGMSAFI PSRRNQEVNKVAMEKIRRQKER Y T CHRR GA H A M G GMAA QI P V K N D P A L N D RV M A A V RE DK LR YSCHRRGAFAMGGMAA Q I PVVKNDEAANAAAFAKVRAAKER Y VCHRRGAHAMGGMSAFI PVKGDDAANEAAVEKVKADKTR YTCHRRGAHA $\square G G M S A Q V P G G R P A A G E A A L A K V R L D K E R$ YTCHKRGDHAMGGMAAQIPVRHDPELNKRFLDAVRKDKTE YTCHRRGAHADGGMAAFIPSRRDPSINEAAQALVREDKTR Y T CHKRGASAI GGMAAFI PSK DEAVNKNAYEKLLDADK T R Y T CHRRGAHAI GGMSAFI PNRRDPEVTARAEEKVRADKHR
 YACHARGAHA,GGMAAF Y V CHSRS I A A MGGMAA

 Y T CHRRGAHAIGGMAAF Y CHRRGAHA G GMAAF
 Y T CHRRGALAMGGMAAF
Y T CHRRGAHA $\operatorname{CHG}$ GMAAF
UniRef90_A4AG97


EATNGHDGTWVAHPGMVALATEVFDRDMPGPNQTDSGKQA ESSNGHDGTWVAHPKVVDVAMGVFDEKLGGKVNQVEFDSS EADDGFDGSWVAHPDLVPVAMAVFDEAFGGLPNQIDRDRE EAKNGHDGTWVAHPALVPVAMEVFNQEMPGENQIDSGKQL PVKNGHDGTWVAHPALVSVAMNEFDKHMKTPNQLQVTR
EAKQGFDGAWVAHPDLVPTVLEVFNTAFPGDHQUHYVPEV EANDGFDGSWVAHPDLVPVCREVFDAWLGQRPNQLDRLRE EVTAGHDGTWVAHPALI SIALEI FNQHMPGPNQYHIRRRE EVTAGHDGTWVAHPALIPVAMKLFDEHMPTAHQQHVVRND EAGAGHDGTWVAHPDLVPVAMEVFNRLMPTPNQDDRKL EVGDGCDGTWVAHPDLVPVARAVFEENLEDKANQKDRLRE ELTNGHDGSWVAHPALAAI CNEVFAE MGTPNQIYFVPET EAGDGHDGTWVAHPGMVALATEVFDRLMPTPNQQDSGKQA EAGDGFDGSWVAHPGLVEICFEEFDAVLGDRPNQDDNVRE EVKDGHDGTWVAHPGMVQTAMDVFNKYMPSNNQIDRQDEK EAHDGFDGSWVAHPDLVPVAQAEFDAVLGEKPNQVDRMRD EASQGFDGTWVAHPDLVPVAREAFDQRLGERPHQKDNDRE ELTK GHDGSWIAHPALASICNEVF ANMGTSNQDYNIPEL ESRNGHDGTWVAHPALVDLAMSVFDKNLEGKNQLDFVSPA EALAGYDGSWVAHPALI PAVEAVFDQII GDKPHQK EAGDGFDGSWVAHPDLVPVARAAFDAVLGDRPHQKHRLRE EAGDGFDGSWVAHPGLVPVCREVFDETLGSEPNQLTRLRE EAGDGYDGTWVAHPFLVDI AEKVFTKADPGHCNQKNKPVI EVTAGHDGTWVAHPALI PLARAIFDERMPTPHQQHVGRED EANDGFDGTWVAHPDLI EVAREAFDAVLGERPNQVDRLRD EVRGHDGTWVAHPGLVQVADEVFNSHMANQPNQIQSSKR EVSAGHDGTWVAHPALIDPIARAIFDEHMHAPNQ HDVRRE EVKAGHDGTWVAHPALAGIAVDIFNKHMPTPNQLFVRRED EANDGFDGSWVAHPGMVELCKEEFDKVLGDKPNQLDRLRE EAADGFDGSWVAHPDLVPVARASFDAVLGDRPHQKERLRE EVGDGFDGSWVAHPGLVETCREVFDQWLGDEPHQ\|VRKRE ELAKGHDGSWVAHPALSADCNEVFDK MGTANQUHSIPAA ESGDGFDGSWVAHPDLVPICREEFDKALGENANQLNRLRE EVQAGHDGTWVAHPALVPVAQEVFDKYMPSPNQLNVARND EALDGHDGSWVAHPALVPIVKEVFNNDMPEANQIDKKDHV EVAAGHDGTWVAHPALVPVAKAIFDEHMPTPNQLDRMRED EAEKGFDGTWVAHPDLVAVAREEFDKVLGERPHQKEVRRE QPRAGANTAWVPSPTAATLHALHYHQVDVAAVQQTLEQQR EVRAGHDGTWVAHPALAS AVDVFNKHMPTPNQLFVRRED EAGDGFDGTWVAHPDLGAARGEFDAVGGDRPAQVSRRRD EARDGFDGSWVAHPDLVPlARESFDAVLGDRPHQKDRLRE E LKNGHDGSWIAHPQLATICNLVFKE MGTPNQ EATDGHDGTWVAHPGLVGVAREVFDRLMPTPNQLHVIPEG EANNGHDGTWVAHPALVSI AMDVFNERLKGETNQLKVMP EVTDGHDGTWVAHPGLIDVAKQVFDAHMREPNQDRSKPRH EARNGHDGTWVAHPGLADTAMEIFNEYDG EDHVNQL EANDGFDGSWVAHPDMVPLCKEVFDSVLGDAPNQVARKRD EVRAGHDGTWAAHPGLI PPIMKFFTSNMGGKPNQIQMARK
 EVKAGHDGTWDAHPATVQUA LDVFNEYMPGPNQYNYRADV EASRGYDGTWVAHPFLVETAREAKFAAGQTHQKEQLFEQL EVKNGHDGTWVAHPGLVQLAMKVFNENMPTKNQMHIKREL EAGQGFDGTWVAHPDLVPVAREVFDEALGDRVDQRHRLRE $E L T N G H D G S W I A H P A L A Q I$
$E A G N G F D G S W V$
$A$ EANDGFDGSWVAHPDLVKVAKDVFDAKFGDKPNQKERLRE EAAAGFDGTWVAHPDLVPVAMEVFRDRLGGAPNQKDVLRE EVLAGHDGTWIAHPGLLPTALSVFQEHMPTPNQDHVQKNV EARDGFDGSWVAHPDLVPDALESFDAVLGEKPNQKDRLRE EADGFDGTWVAHPDLVPVAKEIFMKGMNGACNQKHRLRE $E V R A G H D G T W V A H P G L V S V A M D V F D A H M P T P H Q D A K K G E D$
$E A S N G H D G T W V A H P D L V P V A M E V F D R L M P G P N Q D R P L S G Q$
 EAEDGFDGSWVAHPGLVPMCREVFDGVLGERPHQIERTRD EVQAGHDGTWVAHPGLVSLAFEIFDKGMPTPNQGGLMPKN EAGDGFDGSWVAHPDLVPVCRDIFDGVLGERPHQIDVPDP EAGNGFDGSWVAHPGMVQACSDAFTQVLGERPNQIDNKRE EAGDGFDGTWVAHPDLIPVAQAEFDAVLGDRPNQVDRQRD EADDGFDGSWVAHPGMVPTCDEVFDGVLGDRPNQLDRQRD EAGDGFDGSWVAHPGMVDTCKAVFSSVLGDRPNQLDVLRS EAS $\square$ GYDGTWVAHPFLVPIAEEVFTKADQGHVNQKNKPPF EATDGHDGTWVAHPDLVAIAEEVFNLLDPNKNQDNKKLDS EVIDGHDGTWVAHPGLVQUAKR』FDEHMPTPNQUKQLQGF EAGDGFDGTWVAHPDLIPTAQAEFDAVLGGRPNQLERTRD EAADGFDGSWVAHPGLVATCEHAFDPVLGLRPHQLDRQRT EANDGFDGSWVAHPGLVVGVCTEVFTSVLGDRPNQQIRRTRE EASRGYDGTWVAHPFLVDTAAEQRFSEGKTHQKDKRFEQV ERDNGHDGTWIAHPGLAATVREVFVDGLDSDNQLDQQPD

## UniRef90 R4XA41

 UniRef90-R1GYN3 UniRef90_GOWCA7 UniRef90-T0Q5D4 UniRef90-E9UQU4 UniRef90_D0N096 UniRef90-UPI000473901E UniRef90 C1CV92 UniRef90_UPI00047514ED UniRef90-UPI00041241D8 UniRef90-UPI000185098C UniRef90_A9E6G8UniRef90_A5V0V6
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UniRef90-F5HDP7
UniRef90_G2LZR4
UniRef90-B8GWB6
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UniRef90-K0KSW9 UniRef90-W7T2T1
UniRef90_C9NSE6
UniRef90 E4TPT4
UniRef90 ${ }^{-}$M3A6I4
UniRef90_UPI00038181C1 UniRef90-K1L660 UniRef90 UPIO00467200C UniRef90-F6FPF7 UniRef90-W1PZY1 UniRef90-K8ZJD4 UniRef90_UPIO0041CA922 UniRef90_B2AUJ2 UniRef90_UPI0003741AE5 UniRef90_UPI000380BF8B UniRef90_IOHBU3 UniRef90-C5DI56 UniRef90-D3Q9U5 UniRet90_UPIO003175F5D UniRef90_I8J1U9 UniRef90-UPIO0034C87A9 UniRef90_UPI00040DAD07 UniRef90-J8US73 UniRef90-G2WVY8 UniRef90_UPIO00466CE9D UniRef90_UPI0003B6AE2F UniRef90-F3NPR2

## UniRef90-I2GXW6

UniRef90_UPI000477BCC5
UniRef90_U4KDV2
UniRef90-E1Z219
UniRef90-B8CKP3
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D LKTTAADLLTPPEGHDTEGVNTNDDVSTQYワAA YVG EITAEQLLAPCQGPREEGLRKNI RIAALYYI E S DVVPDDRALLDGASTEGDVTERGI RANLEVGI RYI ES DTTAEQLVEVPAGD
 HVTAADDLTIPQGT


 SVAASDLLNTNDEGG EITTAGIKQNLDIGLQYMEA DVTAA DLLQVP
DVQ D T A DQLLDVAST EGEDSE
SITREQLLEEPVGD TSEG
 D L R VP

## DVRVTAQDLLDF

 EVRVTADDQLDDVKS T DTKPEGRITEA HVLRDEFNTTPSATSPNVMYGEVT DV HVT A GQLL $D V R V R E T D L A$

 DVTVGQAELLDVASARRAGATVTEAGLRTNVSVGVRYIES
 DVTAEDLIDLRVEGG SVTNAGDRQNIFVALRYIDS TI GQNDLLNMNV
DVSVTADQLLDVAST
EVRVTAA QLLDVASAG


VKVCRDQDIAPC $P \mathrm{GQDT} E \mathrm{GI}$ RKNLINGLGYMEA


NAEVTAADLTNF S $\quad$ PGGK TTEGLRDNI NVGIMM
AELLHDLLSVPVSPERPWSAAEIQAELDNNCQGILGYVVR

EV HVTAGELVDLSA

LEPRVTDAGVRSNVSVALRYI ES
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 KVKPEELI NPQVPGT■TLG QVNQQDLLNTQUEGG NITEEQLLELPKGT E ITTEG DVHVT EA QLLDIPSAGGAEPGAVENGVRKNINVGILYI E S

 PEGGTODVRMNFNVGIRYI AS DVRNAFGLLRLE EITEADLV
DVSVAA GDLIA ID S DVNVQVEELVTI
 VVQGEDLLEVPTGGRDTV
DI GRERLLEI HQGPR PAVKEDREVLTSACEGTDTED GLYGNADVAIRYDAS DVEVTAADLLSVGRRISGPPSPEGVRTNDAVSLRYFDA $S D G$ TSAQLLSAPGGPDTYGLKENI DVSLVYTEA D DTEEDLLAVDKG DVSVSADQLLD
 $D V Q V T A A C Q L L N V H D T R D D T A B A$
 HSGFETEDLLDV

 EVTTTAEDLLAV EVQVTA A QL L D V A A T QVSQQDLLNTRUEGG S DVDQALLLQPC DVSVA A ADLLARDKT

E Q
GVRENVSI GI RYI ES
$R \square P D G S I T E G L R N N S V A V Q Y L A A$

TEHGFRHNNSVTLGYMD S ITSGD ITTEDGVRDNVTIALRYVES NRTPGRVTEGLRNNISVALHYFHA

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| $S$ | $E$ |
| $P$ | $A$ | S G E VV



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| UniRef90-E9UQ | D L ECNKRSLNAPPGNKWAL |
| UniRef90-DON096 UniRe900-UP10004 | D |
| UniRef90-C1CV92 | QR |
| UniRef90-UP10004 | - |
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| UniRet90-G2LZR4 | QHLDDGTAI DQHLLQATLRALPARLTALPGAA |
| UniRet90-B8GWB6 | AALDDGRVLSSELFVSLFSQEMSDLRREFAS |
| UniRef90-D6YVC4 | LKTVDGKAVTDEWVSIILEDELAKI RAFYGELYQEKLI |
| UniRef90- UPlooo36E80F7 | ANLSGGGQVTEALVERLLNEELDSLGREEHANKFLIA |
| UniRef90-A4FPE7 | VVLAGGQQVTKDLVREVLADTEKQLRSEEG |
| UniRef90-L5NAC1 | GVLMDGREITLALYHSLKEEEMNTIRREV |
| UniRef90_UPIO003B5 | C |
| 2NQM | AVLADGRAVTPALYRQV |
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| UniRef90-W7T27 | TVLSDGQVVTADLVRQVL SEEVKAELSGDHLDEAAELL |
| UniRet90-C9NSE6 | VKLDDGQTFNKELFHTWLYQEDDTIKQEVGEARYAAG RF |
| UniRef90-E4TPT4 | VSFKNGKITFNRALFCVLLEEETEKVKEML |
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| UniRet90-F6F | PI TRRRCEAVLREVMGGLERFRGDRFDDAAA |
| 1 PY 1 | GLELFGRVLDEEMDR EREVGDEAFRKG Y |
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| 2AUJ2 | VTTAEGKKVDKQYALIKLLKEQTQELASKPQGNKYGLIAAQY |
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| IRet90 Jous |  |
| UniRef9-G2 | V |
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| UniRef90 12 CKW 6 | VVLKDTEKVTPQLLKSLLDKQVQDLVAEVNN |
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| 99XL7 |  |
| A0A | Q HLD GTA D ${ }^{\text {V }}$ |
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| UniRef90 ${ }^{\text {- }}$ - ${ }^{\text {W }}$ - ${ }^{\text {E }}$ | EGGTVTEPLVRALVDKEL |
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KFAGTRDELL
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$R$
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E A Q Q A Q A E $\square$ LT E D A $\square K$ F $\square$ A A $\square \mathrm{H} R$
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RFAARRAELL RFDARRRELL

FESTRQNLL
RGRYDAEFAK $\square$ LTKDAAE $\square$ QR
SAFAGRRAE

RRFAARRN A | $L L$ |
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AFAGRRAELL
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 ND R R V E ITGGP T D R K M T $\square$ I A L L N S GA K V WLA D F E E P SAP T W





 Q ER K V E I L G TA S L D FLL K D A V Q S GA N GI II D L E D S L S P T












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Y S A GL N C GRWD Y I F S Y I KVLGSSSEFL R S QV TMKAPMMSS
H S S GLL N C G R WD Y I F S F i K K R R A D R R A V R K D V T M E V P F M D A
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HSAGLLNCGRWDY i F S Y VVMTFRGHPGRLLRALVGMMAQHFMRS
$H \| V G L N C G R W D Y I F S Y I K T L K A F P E K T R Q L I$ TMDKPFDSS
HSAGLNAGRWDYI FSVI KNFGARPEFVRAQVTMTVPFMRA
HSSGL NCGRWDYI FS FI KRRRADKSAI RKDVTMESPFMDA
H I V A L N S GR WD Y I F S A I K L L K N H K D CVVR S QV TM T VP FM K A

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H A A GLL
H A G R WD Y I F S F
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 YTCHKRGVAA $\square$ GGMAAQIPDKDNPQANDAAMEKVRADKLR YTCHRRKVAAMGGMSAQ:PUKDDPKANEAAMAKVRADKLR YTCHKRGAFADGGMAAFI PNKADPAATEVALEKVAADKRR YTCHRRGAHAlGGMSAFI PSK DAAANTKALEQVRDDKDR YTCHKRGVSAMGGMAAQIPVKHDENANEVAFAKVRADKER YTCHRRGVHAMGGMAAQIPIKDDPQANDVAMENVRKDKDR YTCHHRGAFAMGGMAAVI PNRREPEVTAQAFEKVRADKTR
YTCHRRGAHADGGMSAF PDRRDPEVTRQALVMVAEDKQR YTCHRRGAHA GGGMSAF
$Y$ C CHRGAHAMGGMAALI YTCHRRGAHAMGGMAAL YVCHKRGTFAMGGMAAQI YTCHARKVSA $\square G G M A A T I$ YTCARKVSAGGMAAT PI KTDPEANQKAMDAVQADKLRR R R YTCHKRGAAAMGGMSAMI PIKGDEAANEAAMNKVRADKLR YTCHRRGVHAMGGMAAQQI PDKDEPGVNTAAMDKVREDKTR YTCHKRGAHADGGMSAFI PNRRDPEVTERAGAAVSADKRR YVCHKRGTFAMGGMAAQUPDKNDPSANDAAMARIKKDKDR Y T CHRRGAFAMGGMAALI PSRSDAEATARAVAAVREDKER YTCHRRGAHADGGMSAFI PNRRDPEVNNAALEKVRADKHR
 YTCHRRGVFAMGGMAAQQIPNRDDAAANEAAFAKVVRKDKER YTCHRRRVHAMGGMAAQIPIKDDAAANEAALELVRGDKRR YTCHKRGAFGMGGMAAFVPSK DHEENRKDLSKVKKDKDF YTCHRRGAHA $\square$ GGMAVFLPS ADPETNATSLD IVRQDKER YTCHKRRVAAMGGMSAQUPVKNDVQANEAAMNKVRQDKGR YVCHKRGAHADGGMSAF: PTK NKEKNDFAYNKIREDKNR YTCHKRGAHADGGMAAFVPSR DAEANAVALDAVAADKRR YTCHRRGAAAMGGMAAVVPNRNDLEVTRAAFDKVRADKTR Y T CHRRKVAAMGGMSAQ!P DKDDPKANE $\square$ AMNKVRADK $\quad$ R YTCHRRGAHA $\square$ GGMSAFI PDRRRPDVTERAFEQVRADKRR YTCHKRKVAAMGGMAAQIPDKDDPKANDEAMAKVKADK DR YTCHRRGAYA $\square G G P A A V N P A R Q N D E Q Q H R A L Q V V R G E K E R$ YTCHRRGVHAMGGMAAQIPDKEDPVANELALLELVRKDKDR YTCHRRGAFADGGMAAFI PNRHQPETNEIAMGKVRADKQR
 YTCHRRGAHAMGGMSAYIPVKNDESENSTAMSKVADDKTR
YTCHRRGAQA $\quad$ GALSTEVPDDREPAAGRRARAEVAADKRR YTCHNARAAAI GGMAAFIPSR DAEVNKVAFEKVRADKDR FTEHKRGTHAI AAPAANNPTLQDDDMRHRVLNVVHTEKER CTCHRRGAHA GGMSAQVPGRGPDSGAFALAGVRRDKER
 YTCHRRGAHAVGGRAAQVPGADAAAREAAVAAVRDDKER

 YTCHRRGALATGGMAALLPPDPLSDPHSTVLATVTRLLKLL
$Y$ VCHKHGAFGMGGMAPQTP GRTEALRQEQVAKVVEDKEF
 YTCHQRGCHATGGMSALLLPSKKGPEYSTGVEKACRAKLS
 YTCHRRGALATGGMAALLDPEDPSDAYRRVLASVTRLKLL RTCHRRGAHALGAAAVRAVPGHDRQADEAALARURLDAER
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ECH G GF D G T WVV|A H P A|LV|A IAAK G $\square$ FE E I L K D QP H Q IUQK Q S S E A A D GF D G S WV A H P G L V P V V A R E SF D A V L G ERP HQ K DRDRE
 ETYGHD GTWI A HP LI NQUARDVFD QHMLGPNQYHVLRE E EVRAGHDGTWVAHPGMVEACRAQFDKVLGENPNQDGKKRE E A G D G F D G T W W V A H P


 EAGDGFDGSWVAHPDLVPVCREAFDAVLGDRPNQIERTRD EVT A GHD GTWI A HPLI NKI A MEVFNQHMLDGPNQYMVRSED EAQAGHDGTWVAHPALDPIAREVVFAHMPEAHQ
EAGDGFDGSWVAHPDLVPVCQEVFDGVLGENPNQHQRPDV HPKSGANCAWVPSPTAATLHSMHYHKVNVFDEQNK\|KSRS EVVTA GHD GT WIAA H P LI I N K I A M E V F N A N M L G P N Q Y H I A R R E D EVVA GHE GT WA A H P G L I P A I R R E V F E G H L G G R P N Q I A R A G V EVTA GHD GTWUAHPLI EPIARRGIFDQHMLGPNQYHNRRDV EA GAGFD GS WVA HPGLVVSAMAEFDEVVLGDAPNQQSRPRPD E VK G E V R A G H D G T W W V A A H P A A L A S S I A A S E V V F D A K G M P T P P




 E LTKGHDGSWIAHPNLAVICNEVF EASDGFDGTWVAHPDLIETARGEFDAVLGDRPNQVDRLRD
 EAGDGFD GS WV A HPDLVVPVCQEVFDAVLGDRPNQDDRKRD EAGAGFDGTWVAHPGVVAVAEEAFDVVLGARPNQIERRRD

 EVRA GHD GT WAAHPGLIPADREVFEGHLGGRPNQIMGAAAG


 E C S E G F D G S WV EAGDGFDGSWVAHPGLVGVCAAAF PRPDQLDRDR
 EKN GHD GT WI A H P LI NQIA M E IF NEMMVGPNQYHNRRED EVLAA GHD GTWIAAHPLINKIAREAFDSHMLGPNQYHLDREDV EAAEGFDGSWVAHPFLVETAQAAYDSVLDGKTHQRDFRHG E VN A GHD GTWAAHPALI PACMEVFNNKMGNAPNQDHTNKR EAEDGFDGSWVAHPDLVPDCVAEFDKVLGGKHNQVDRQRD


EAEQGFDGTWVAHPGLVEVARSAFDEVLGGATDQVHRLRP EANDGFDGSWVAHPDLVPIAMESFDRCWHRPNQDRLREDV E A E EGF DGS WVAHPAMVDTVLS AFTHVLGNK LDDQIDVVKP EGADGFDGTWAAHPGLVP LCREVFDAALGDRPHQLDRARD EVAD GHD GTWVAHPGLI ALARKVFDAHMPDRPNNI

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

 EI K A GVDGFMVYDLDFI EPMQKLI LE H TQGPNQLH E I K A G V D G F M V Y D L S L I E P M Q K L F K L H T E G D N QL H L R R D V


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



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$D V Q V T A H D L L D F R P E E P \square T E D$
D
D
A

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


 R I T A A D L L V M P TVFPEDLLSMP DV HVTAAADLLAVH ALFTEK LLTLDPRG

 $\mathrm{N} V \mathrm{~T} A \mathrm{Q} D \mathrm{~L} L \mathrm{~L} / \mathrm{I} P$
S


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| :---: | :---: |
| Un | AQLPDGRTVSAELLKQFFEEEQQK\｜DAE AKDKNRPHLI |
| UniRet90 UPlooou74DF79 | VELADGQKVTRDWVRR A ADELUA RDEVGEDAF AADGW |
| S7 | VRLETGEPITPEY゙ DKLVSELGPEVKKLVPGDKDDQ |
| UniRee90 UPI0003030581 | VtLADGEKVTQELVGRLIEEEVAKLPGAET DWATSRDL |
| UniRef90－AOAO24UM57 | AVKDNGTRITKTWVAQILDACVAQ HVGAS |
| UniRef90－UF |  |
| UniRef90－UP10003 | v |
|  | AKTNSGK |
| UniRef90 UPIO0037 | TVTDDQQPVTRERVEALLDDVVASL |
| UniRef90－UPIO002 | VLLSDGEKVTADLVRRLVVEELGAL |
| Ref90 | DS GbPI TAKYVDSLI DELAPG |
| UniRef90－UP100041B1E9F | LHLDDGTAVDFSLLERALPARLGDLARLPGGSRVSEAVGV |
| 9 |  |
| UniRef |  |
| UniRef90－Q7XUG1 | ENADPA ${ }^{\text {a }}$ |
| UniRef90 M9 | EGNAITPAYIDR |
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|  | A |
| UniRef90－X5 | K WQDEELEK |
| UniRef90－A0K0 | V |
| UniRet90－UPIO0026C72A3 | PVTRERVE |
| UniRef90＿A6GIB0 | VDEALLR |
| UniRet90＿UP100035 | AVDREAVTRILNAELERLSAEA |
| UniRef90－B8C | F |
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| UniRet90＿H2 | TV PRQLSGLLHEMVE |
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| Ref90－D3F1R9 | TPLDDGRPVTRELVSAL |
|  | VQMADGETVADLVNRLS |
| UniRei90－UPlooou7A66B4 | VELSDGNTVTPELVTGILAEETERLRGEVGEDAF ARFY |
| UniRef90－P49081 | AALDAGVRATPELLARVVEEEMARVEAEVGPDRFRKGRY |
| UniRef90－111220 | AALDAGVRATPELLARVVEEEMERLRAEVGAQRF RAGRY |
| UniRet90－UPIOOO39F1B5C | NKLDNGKVVDKNLFLSCLEEEFQNVKNEVGNDSFYNGNF |
| UniRef90－M209M | A |
| UniRef90－G0QTP4 | AKTNDGKVINDQYYQQLRDQEVSNLRQ\LKNDNV पNKAD |
| UniRef90 O23H25 | CRTDSGVLINEALYRQL |
| UniRef90 UPIOOO31 |  |
| UniRef90－K5VRR7 | － |
| UniRet90 U1Y |  |
| UniRet90 D8Q9D5 | 咗 |
| UniRef90－VICDS 3 | VGDEVGVKVNREVFGRVVEEEMARIEKEVGREK |
| Un | $V T A A D T G E V T A A R V T A I L E E E V Q R L R D E V D D D D \ F \square R Y$ |
|  |  |
|  |  |
| et90－T1ARF5 | AETEQGVK】 EKTFSKENNR $\square$ RKRQRCQHQAHS $\square$ K |


| $V$ |
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 UniRef90 V9F．52 UniRef90 Q0IG61 UniRef90－G4YUE9 UniRef90－F4Q6D3 UniRef90－DONGD9 UniRef90－M8C272UniRet90－U5EYS5 UniRef90－TOSFM7

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DPESLPGTS $\triangle K V Q D A R D G K F E G A P V P S D L$
AKRK RVLEASHRAELPEHM QPSEATQGNWRDELPKCED AF LDDPEALPGTT $\square R$ VGDAREGNF $\square G A E \square P L D L$

AESSPAFRDPEEQ $\square G S S G \square R G D A R E G N F A G S E D P P D L$ ATERHGTT MOFLEETRS I RQDETWQDDAQVEA

FPAETQTI RDGDWKSETHRPP
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LK D R K VDDV ${ }^{250}$ 260 270 280
 QRQWI QGTGPSSIRNVAYALLSGADGWMFDGEDALGQVST

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

 $R R Q W I Q G T G P A G L R N V A Y A L L S G A D G W M F D G E D A L G Q R G F$
$L M D R R V D D G P A D G D L L L N A L N S G A Q G V Q V D F D D G H C P T$ $\begin{array}{ll}L M D R R V D I G P A D G D L L L & N A L N S G A Q G V Q V D F D D G H C P T\end{array}$


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|  | UniRef90-UPI0003617124 |
|  | UniRef90_Q1IHE3 |
|  | UniRef90-E8RHN6 |
|  | UniRef90-UPI00040E8CF7 |
|  | UniRef90-UPI00037B6301 |
|  | UniRef90-V5WL26 |
|  | UniRef90-M4BDG3 |
|  | UniRef90-W4LUA2 |
|  | UniRef90_K8YYV5 |



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|  | UniRef90_F0Z7H0 |
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|  | UniRef90-Q54RR4 |
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|  | UniRef90-Q1IHE3 |
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|  | UniRef90-UPI00040E8CF7 |
|  | UniRef90-UPI00037B6301 |
|  | UniRef90-V5WL26 |
|  | UniRef90-M4BDG3 |
|  | UniRef90-W4LUA2 |
|  | UniRef90-K8YYV5 |

290 ${ }^{490} 500$
510
520 Y YNHRRGCLA GGMAPQSPS PTGTLSDKEGLVFNGKRD Y NHKRGCLA GGMAPHYPNVGQTLSDKELLSIFNGKKE YEDRVRRALWQGGMEPNIPVGGTEGVNSSMEKALAGAER YEDRVRRALWQGGMEPNIPVG SEAGVSASMAKAVAGAER YEDRVRRALWQGGMEPNIPVVGSEEGVAASMKKAVAGAER E DCHKRGALADGGMTALYPSREDAEGNARADDVLAKDKKN YEDRVRRALWQGGMEPNIPVGSQQGVASSMDKARAGAVR YEDRVRRAMWQGGMEPNIPVGSEAGVTASMKRAVAGAER YE HVVRALWQGGMEPNIPVVGSEEGVSASMKKAVAGAER YEDRVRRALWQGGMEPNIPVGNPQAVTRGMEKALAGARR YTCKRRHAPATTGMVPFVLAEPRSLSRHEATARAIAAKRQ

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UniRef90_FOZ7H0

650

660 VAIKED A GVEEGADFTQELFDKLLEEEYDKLLNANNKDVYEAS AVLTEGDTFSESLFNTLLEQEYDKLLEASNKDVFDAS AVLTEDDAET
TVTDDDVEHTAELVTRLFDEELEKLIAKP GKDLGSPETF A SLTEDDPETAEVFLRLLDEEYAKLLAAGHRDVHEKS AVTAVGDPDTPGLFARLLDEEYAKLRKAGNRDVHDDS AKLTREDTHT
A GVKS GDLIDARLVNR】IQTEFERDQKADPRNVHEKS VVTETSRQVNPSYVFEHFDKM VADSEDH【HDFPFVKQLLLEETDD $\square L A Q L K T Q D E Q D R H A Y$


A Q A
REARR $\square$ AEAMVKNGEF


[^0]:    ## A

[^1]:    Q Q F LK D $\quad$ G Y L LDP E G G A F S V S T T NVD P E $\square$ T H DA G P Q L V VP V
    
    

[^2]:    .

[^3]:    0

[^4]:[^5]:    lupas 21
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[^6]:    lupas_21
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[^7]:    lupas_21
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