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

 K N K M K Y ELI TT D GKARRGRLTFDRGVVETPAFMPVGTYGT MAVRWELLRRDSAARLGRLHTPRGVIVETVVMPVGTQAT RYE LI K T CK KT GARLGGRVVHP H GTFETPAFMPVVGTAA T
 QP P $\square R Y E L I X T C T G A R L G \square V H T P H G S F E T P T F M P V G T Q A T$ MS F ELL L H K D G R A R R G R L S F P R GVVVETMAAFMPVVGTY GT RYELLKRCSRARRGRLYTPHGVI DTPVFMPVGTQAT RYELI HECKQTGARYGKLHTPHGVIETPI FMPVGTQAT


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 M K $R M S Y V$ K D K D GKA R A GVI T $M E F T L S G Q D G L A R R G E L D F P R G K V Q T P A F M P V G T Y G T$ LAHGTVQTPAFMPVGTYGT

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 SF QI HH TD GPARSGELVTAHGVVP $M D F I L H S K D K N A R R G K V I T P R G E I D R T P A F M P V V G T Q G T$

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MK EKL QQE GKARRGRITFPRGVV

K YKFELDKQDGRARRGRLIFKRGVVETPAFMPVGTYGS
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DF MQ WQ GP I LTTDS G GF QVFKL DEKGVVTFRSPSKVVFMMPE E


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$K R C K D A H K K P$
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ERCLKAHKKPD
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ERCKNTLTTTD
ERCKKAHTRK
$K R C K E V H R R E$
$E A C D R A H R R E$
EACLRAHRRE
QRSKDAHGDS PN
ARCKAAHARPD
ERCLRAHER
ARSREAHGDSA
K R CKDANKNPD
KRCKEAHQRPE
RRSKDAHGDNP
K R CKEAHARPE
ERGKNAHKNPDT
$\begin{array}{llllll}D & E & C & A & K & E \\ K & L & H & P & H \\ \text { K K D A H G D S P }\end{array}$
K R SK DAHGDS P
K R CRAA H T R K
ERCDA A H E RK DV
KRCKDYHTDWE
ERCKKAHTR
ERGKNAHKNPDT
ERCCLEAH QK PG Q
ERCQKA HNNDID T
ERCKKAHNR
R R CKEAHKNTD
KRCVEAHQKKD $\square$
ARSKAAHA
ARSKAAHEGNPN
ERSKKEMENSE
LRCKEYHSHPE

$\begin{array}{r}E \mathrm{Q} \\ \mathrm{K} \text { D } \mathrm{Q} \\ \mathrm{A} \\ \hline\end{array}$ | $R$ | $A$ | $L$ | $F$ | $G$ |
| :--- | :--- | :--- | :--- | :--- |$|$

T
E $\stackrel{\text { A }}{Q}$


T E G
K E D

RCKDANKNPET

ARSREAHGDNP
R R S K D A H A GNPN
KRSKDAHEGNP
ARSRRAFDDLKNPN
K R GKAVFNNPN
ERGLKAHTTMD
RRSRDSFDEFGNNN
KRSRDAF
VD R D GY
ERSRRAHE
KRSRQRFNELENPN
ERSKKAHGDNP
$R R S L A A$

 | $A$ | $L$ | $F$ | $G$ |
| :--- | :--- | :--- | :--- |
| $A$ | $L$ | $F$ | $G$ |
| $A$ | $L$ | $F$ | $G$ |

KRGKEAHQRPE
QRSKDAHADNP
ERSRA QFEKMGGPQKGQ
$R R C R E A H$
QRSR D E H D R L Q N T N
E R S K K A F E D
L K N P N
KRSKEAHGDNP
ERSRRAFD DLKN M N
R R SREA H G D N P
KRCREAY PRGAGDAALV F
ERSKKAFQ LYDKGEGDAL F
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$K R C K M T G T R T$
$L R S K E A T K K T E N$
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T R CRAAHAPLDR
ARSRQAHGDNP
KRSKDEHNRLNNNN
QRGLDYHKANSH
ERSKNAHADNP
KRSKEAFVNG
ERSKKARSAQD
ERGLLRAHQHADY
KR S li A A T T
ARSRAAYAGPGQ
ARCQKAHHRK
ARCKARHARDPALPGPQAAL
QRSKAAHGMNP L
KRCREEYPRGTGDN
R R CKDARRR
ARCKAA HSRA
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 $M G V G T P K D L V E A V Y R G V D M F D C V M P S R N A R N G H M F T S E G V$
 $M G V G S P D D L I E G V M C G I D M F D C V L P T R I A R N G T A M T R F G K$ MGVGTPDCLVEGVMYGIDMFDCVFPTRVARNGTVMTSRGK $M G V G S P D A L I E G V D R G I D M F D C V L P T R I A R N G T V F T R Y G K$
 $M G V G S P E D L V E G V W R G V D M F D C V L P T R \| A R H G T V F V P D G K$ $M G V G S P D A L I E G A L R G I D M F D C V L P T R G A R N G T C M T S Q G R$ $M G V G R P E D M V E A V R Q G I D M F D C V M P T R N A R N G H D F V R E G V$ MGAGSPDYLI ELADRGVDMADCVLPTR\|ARNGTALTTRGK $M G V G S P D S L I D G A M R G I D M F D C V L P T R I A R N G T L M T S E G R$
 $M G V G S P D A L L E G S I R G V D M F D C V L P T R I A R H G T A M T S E G R$ $M G V G T P P Q L V E S V A R G V D M F D C V L P T R V A R H G T A Y T S S G Q$ MGVGKPEDLVEGVRRGVDMFDCVMPTRNARNGHDFVTDGV $M G V G S P D C L W E G V E R G V D M F D C V L P T R V A R N G L A F T S H G K$ MGVGSPDSLDDGADRGVDMFDCVLPTRIARNGTCMTSEGR $M G V G T P D Y L F E G V E R G V D M F D C V L P T R A A R H G L A M T S H G R$ MGVGSPDDLI DGAILLGIDMFDCVLPTRIARHGTAMTSVGR $M G V G S P D S L V D G A M R G V D M F D C V L P T R I A R N G T C M T S N G R$ MGVGTPEDLFEGVIRGIDMFDCVLPTRIARHGTVFTKKGK MGVGSPDCI EGVIRGVDMFDCVLPTRIARNGTAMTSGGK
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 $M G V G L P E D L V E G V W R G V D M F D C V L P T R N A R N G W L F T R H G V$ $M G V G S P D C L I E G V \square R G V D M F D C V L P T R \square A R N G A V F T H K G R$ $M G V G T P R D I V Q G V A R G I D M F D C V M P T R N A R N G H L F T S E G V$ $M G V G R P E D L I E A V R L G V D M F D C V M P T R N A R N G H L F V H D G V$ MGI GTPEDLVEAVWRGFDMFDCVMPTRNARNGMLFTSFGR $M G V G H P A N L I E G I A R G V D M F D C V L P T R N G R T G T A F T C E G K$ $M G V G R P Q D L V A A V R R G I D M F D C V M P T R S G R T G Q A F T R R G P$ MGVGTPDCLVEGVARGVDMFDCVFPTRVARNGMAMTHNGR

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V I I K


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 VVIK NKVYERDFSPLDHECGCYTCKNY TRAYLRHLHKANE

 VVI R N A E H ARRFERLDPECSCYTCRHYSRAYLRHLYKAE E L V V R N A K F A R D F S P L D P N C E C H V C K N Y T R A Y I R H L V K A N E
 VVI KNKTYERDFTPGDPNCDCYACKNYTKAYIRHLI KANE

 VVIRNAVYARDFTPLDHECDCYTCRNYSRAYIRHLEKAEE V V V R N A TYE K D WG P V D P E C D CY A C R N Y T R A Y I R H L I K A N E
 I K I K N A Q Y R L D T R P L D E G C S CY T CR N F S R A Y L H H L Y R L K E L T V $V$ R N A T Y A E D F N P L D D P D C D C Y V C C N Y S R R A Y I R H L I R R N E LV V R N A A Y A R D F V P L E E G C A C Y T C R H Y T VVVRNATYQEDFTPLDE ECDCHVCRNYSRAYIRHLI KANE


V
$\begin{array}{lll}\text { L } & \text { R } & R \\ \text { R N S Q } \\ \text { R } & \text { R } & \text { R N A }\end{array}$
I NL R NAKYK F TA
VVIK NK $\quad$ KYEKDFGP DESCDCKCCKNYT
I RI R N A KF RND E S P L D A T C S CY TCK N F S RA Y L L H H L D D R S K E
V NI R N A R H R E DPRPLLEAECRCPDCKNYSRAYIHHLLQKCNE V RVR NAKYEHDLRPI E E GCDCACAGGFTRAYLRHLDRCNE $V K I R N A K H R E D T S T L D S D C D C Y T C G N Y S R S Y G Y H L D C K G E$
 V NI KRKEYERDFTPLDPECDCPTCRNYTKAYLRHLNKCNE


 I K K $\quad$ I
 V NLK NARHANDPRPLDEECDCPAAS QYSRAYLHHLVRCGE

 $\checkmark N$ I K R A E F R E D D A P L D P A C D C Y T C R N F S R A Y L R H L Y T A R E I T V V R N A LDY A A D F A S P L D A R C S C Y V



 V KL R NASNKTDTRPLDETCDCYTCRNFSRAYLHHLDKCKE II R I | $I$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $S$ | $I$ | $K$ | $Q$ | $A$ | $R$ | $Y$ | $A$ | $D$ | $D$ | $D$ | $G$ | $P$ | $I$ | $D$ | $P$ | $D$ | $C$ | $G$ | $C$ | $Y$ | $V$ | $C$ |
| $I$ | $R$ | $H$ | $Y$ | $S$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $R$ | $N$ | $A$ | $V$ | $N$ | $K$ | $T$ | $S$ | $L$ | $E$ | $P$ | $L$ | $D$ | $A$ | $K$ | $C$ | $D$ | $C$ | $Y$ | $T$ | $C$ | $Q$ | $N$ | $Y$ | K $V$ R A A $V N K$ K


 LTVRNAEYAKDFRPDDEQCDCYTCRNYSRAYIRHLIRADE
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|  | $L$ | $V$ | $R$ | $L$ | $T$ | $S$ | $Y$ | $H$ | $N$ | $L$ |
| $i$ | $L$ | $G$ | $V$ | $R$ | $L$ | $T$ | $T$ | $\square$ | $H$ | $N$ | $\begin{array}{lllllllllll} & F & L & L & R & L & M & E & H & L & R \\ Y & F & L & T & K & L & M & R & R & V & R \\ Y & F & L & 1 & K & L & M & K & D & A & R\end{array}$

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 QF RF DLHAT DGAAR LGVVHTAHGPMDTPAFMPVGTAGT H F N L L A R D S Q A R L G Q L D L P H G S V Q T P D F M P V G T Y G T
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 $M M F E F R V Q A V C T G A R A G E L V T P H G V I$ ETPVVMPVGTTRAT
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SA
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220
230
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 AMD F P G Y S I G G L S V GE S H DEMYRIILDLLLP P I L P P Q E K P R Y L DIG I F D GYAI G GILSVGEPKEDMQRILAHTGPKLPEGAPHYL


 E L D F P GY S I G GIL SVVGE S K E E M Y R I L D L L L K P V M P T D K P R Y L




 EFDFDGFAI GGILSVGEPHEVT LKMVEFIGPKMPPDKPRYP SKEA D GNA I G GILAV GE PA E V M Y E M I E V V N G IL P K D K P R Y L





 D M D F P P G Y A L G G F S V G G E G P E E V M H A L L P P P C A A L L L P E E H K P R





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

 $M G V G K P G D L V G A V Q R G V D M F D C V L P S R S G R T G Q A D T R R G A$ $M G V G A P D S L I D G V D R G V D M F D C V L P T R D A R N G T L M T H F G R$ MGVGTPEDILECVERGVDMFDCVMPTRNARNGLLFTSYGK MGVGKPEDI I NAVAVGVDMFDCVVPTRNARTGTLYTSLGV $M G V G S A D S L I D G V I R G I D M F D C V L P T R \square A R N G S C M T S H G R$ $M G \operatorname{GMPDDDLDAVSMGMDMFDCVNPTRYGRNGSAFTRHGR}$ $M G V G A P D D I I E A V A R G D D M F D C V M P T R A G R H G L A Y T R R G R$ $M G V G S A D A L I D G A L R G I D M F D C V L P T R \square A R N G T C M T S R G R$ $\begin{array}{lllllll}M G V G T P D D & I & E S V A R G V D M F D C V M P T R A G R H G L A F T R F G K \\ M G V G N P D D L I & E G A M R G I & D M F D C V L P T R V A R H G A L M T H Y G R\end{array}$
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 $M G V G T P \square N L E N I A D G I D M F D C V M P T R N A R N G M L F T R N G \|$ MGVGNPEDLLMDWENGIDMSDCIDPTKFARGGTLFTNRGK $M G V G K P D D V G A V Q R G I D M M D C V L P S R S G R T G Q A F T R H G V$ $M G V G T P R D L V E A V A A G V D Q F D C V L P T R N G R K G Y V F T S Q G T$ MGVGLPEDLLEAI DRGVDMFD $M G V G K P S D V V G A V L R G I D M F D C V M P T R S G R T A Q G F T R R G T$ $M G V G T P E D L I L G V S L G I D M F D C V M P T R N A R N G W L F T R F G D$ $M G V G T P D D M L K S V A E G I D M F D C V M P T R S G R H G L A F T R R G K$ | $M G V G T P E D M L L S V A E G I V M F D C V M P T R A G R H G Q A Y T R F G R$ |
| :--- |
| $M G V G R P G D I I$ | $M G V G F P T N L V E G V A R G V D M F D C V L P T R N G R N G T L L T S R G K$ MGVGTPEDIVHAIAHGIDMFDCVMPTRNARNGWLFTRYGD $M G V G T P D D L V G S V A R G V D M F D C V M P T R A G R H G V A Y T R H G K$ $M G V G T P D D I L Q A V W R G I D M F D C V M P T R A G R H G Q A F T R F G R$ $M G V G H P E D L V A S V A L G V D M F D C V Y P T R T G R F G Y A L V T E G R$ $M G V G N P E D V V R G V Q C G V D M F D C V L P T R N A R N G Y L F V A N G V$ $M G V G K P E D I V E G V R R G V D M F D C V M P T R N A R N A Y L F T R F G T$ $M G V G K P E D I V E A V F Y G \mathcal{D M F D C V L P T R N A R H G T A F T T E G K}$ $M G V G K P V D L V E A V W R G V D M F D C V L P T R A G R H G Q A W T W D G P$ $M G V G K P E D I V E A V R R G V D M F D C V M P T R N A R N G H Y F T T F G A$ $M G V G K P E D L V E G V R R G I D M F D C V D P T R N A R N G H D F V S N G \|$

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 MG $M G V G K P D D V V E V A R G V D M F D C V L P T R S G R H G Q V W T W E G P$ MGVGTPEDLVEGVSQGVDMFDCVMPTRNARNGWLFTRYGD MGVGKPDDLVGGVKRGIDMFDCVLPSRSGRTGQVFTRRGA



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## K T

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 FRFDLQHESNGARRGVFRTPRGDVQTPGFMPVGTVGT MEFTVDATSKNARAGTITTAHST:KTPVFMPVGTVGS MTFELQYTDSNARAGLITTTHGQIETPIEMPVGTVGS LKFELLQTDSHARRGRMTLNHGVVETPVFMPVGTYGT MDFKVLAKQTKARCGEVRIANHRYPTPVFMPVGTQGT MEFKDDGTCGNARACIIKTDHSEDKTPIFMPVGTAAA MAVKFTLQKEVGKTRVGFIETAHGVINTPAFMPVGTLAA FKFDCQARCTQARAGVFHTPHGIIETPRFMPVGTLAN FELKCTEDRARRGVLHTVHGDIETPVEMVGTCAA MPCSFKLLNENSGARLGKIDTSRGEIDTPAFMPVGTAAT AFAYQLQARCSKARAGVFHTPHGPVHTPRFMPVGTLAN MNFSYTSIASCSKARAGIFHTPHGIVETPKFMPVGTVGT MTFSYKLIKKEGNARRGEFHTVHGTVQTPAFMNVATCAA MVFRVLQTDGDARVGKLTCHHGTI ETPAFIPVGTYGV MKFKIDKDDGNARACTIQTAHSVIQTPVFMPVGTVGA FELLQTDCKARRGRLTTPHGVIETPIFMPVGTQGS MEFQDDKDDGDARACTIKTAHSTIQTPVFMPVGTVGS FSFEVQACCSKARVGLFHTPHGWVETPRFMPVGTLAN FYFEIIKATSGHARLGE\|SMPRGII K TPAFMPVGTAGT

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 $V$ K G V M P A S L E A M G A Q I L G N T F H L W W R P GLLDV L R Q F G G L H I K G V S A H DLLK D $\square$ G C Q I ELL S N T Y H L H L R P G D K V V K E L G G L H $V$ K G V $V$ Y M D Q V
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 $V$ K S L T P A D L D D $\square$ D
 V KAMYPE QVRETGADILLGNTYHLMLRPGAERVAS LGGGLH V $\operatorname{K}$ K A V V $\operatorname{K}$ A $A$


 $V$ K S LIS P D E L A A D L G A H



 $V$ K A V H F H E L N D I K A Q I I L G N T Y H L Y $V$ K A M S P L L L N E I D A Q I L G N T F H L W W R P GN TV ME K F G G L H
 V $\operatorname{K}$ A $A$
 I



 $V$ K TLITPA QLE TA GA QMVLANTYHLLHLQP GEGIVVNQA G GLLH $V$ K GVVMP R S L E EMGA Q I I L G N T F H L WM R P GLDDV MA S F G G L H $V$ K TMMHP Q DLE M L G A E I I L G N T Y H L S S R R P G S A L 1 R Q M G G L H $V$ K A MTPDELE EI GF GLI L GNVYHLHL RPGEQLI A RA G G L L H
 $V$ K A V S K E S L E E IG G E II L A N T Y HLL F L R P G S D L I K E A G G L H
 $V$ K A M T M D A V R S T G A G V V L G N T Y H L M L R P G A E L V H E L G G L H
 MK GVLPD QL DD L N C Q L L L S N TY H L GMM P G DD DL K K A G G L H

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

 $V$ K A I $\operatorname{S}$ H A A V D N M G Y R L I L G N T Y H L $V$ K A V H Q R E L Y DVVK A Q I L G N T Y H L Y L R P G L E V L E K A G G L H
 V K CM WQ E DL YE MN A Q I L G NT Y HLLY L R P G HE LI K V G G G L H V K S Lid A H DV L E L G A EII L A NTYYHMY L R P GD K TVVA K M G K L H $V$ K A V H H E L



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



 $V$ K GLD A V D M S E DE A KI I LA NTYHMYLRPGADVVKKFGGL H $V$ K T L L H P E E L L H L M E A Q I I L G N T Y H LLWL R P G T D V I G K L G G L H V K $\quad$ A V S O D M L K VK SLD A F DMSEMGAK』ILGNTYHLYLRPNDEVVKHFGGLH


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 RF T G W G GP ML T D S G G F Q V M K L T E Q G V T F R S H D
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## G R A K

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## G

 KFMNWQKPIL T D S G GF QVMMKVTEEGGVMFRSHUKYNNLTPE Y


##  <br> <br> <br> G

 <br> <br> <br> G} <br> <br> <br> G} K F N G W S H P 1 L T D S G G Y Q QV F K K K F M N WM GP II T D S G GF QVF K I T E S GVYFK DPSTDF LTPEK SF MK WD R P ILTTDS G GY Q I F S L D E E GAA F F K S H I I K H S F T P E N



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DRCFTHFN

S K W 180
FII T Q GG|I F K D|LIRRECLMRLL $\frac{200}{1}$
A ALEGUVQGGVYEALRLRCLEELL


GQM | $A$ | $F$ | F |
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| F |  |  |

QREA
YGFD
YGHS
QPRYG

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ERCDQAHQRP $\qquad$ G
NCHPE
ECYGY
AQNLIF
DQNLF
SQAF
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TEC
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KEAL EYHQKEKG $\square G V N Q N L$
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 $K L D C D G Y A, G G L A V G E P T Q V M Y D I D D A V E P H M P K D K P R Y L$ QA E Y G GF A I G GLLAV GE GHEAMCNVLDDYTVP H LDPK DRPR Y L


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 S LDCD GYA I G GLA AVGEPAETMYEI I EAVVEPYMPAEMPRYG SIGGFDGYAVGGLAVGEPQAVMFEVLSGVCPLLPEDRPRYL GMERE GNAI G GLLSVGEPPEDMYEMTE LVVCNILPADDKPRYL



## A

 $A$





 D L D L K G Y A I G G L A V G E P Q A


 A MD F D G Y A I G G V $\operatorname{G}$ G V G E P E D E M L









 EMDFP G L A L G G L S V GEK NE E MVD F L N D F V H T M P D Q K P R Y L






 E L D L D G Y A I G G L A $\operatorname{L}$ G G E E T E E E M Y R $\quad$ I I I D A V
 Q L




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 $M G V G T P D D L I E G I D R G I D M F D C V M P S R N A R N G T L F T D D G K$ $M G V G K P E D L V E A V R R G V D M F D C V M P T R N A R N G A L T T D T G R$ M GVVGPVNILEGVARGVDMFDCVVPARNARHGKLYTWNGA M GVGKPDDIL G GI ERGI DMFDCVHPTRAGRHGHIYTRFGV $M G V G T P E N I L E S I A L G G D M F D C V M P T R N A R H G I L Y T T E G V$ MGI GTPDIILMSVENGMDMFDCVLPT RMGRHGTAMTVEGK $M G V G T P A N L L E C I A D G V D M F D C V M P T R N A R H G L I F T R K G K$ MGVGTYREMAMAIASGVDLFDCVIPTRFGRHGTALIDRGER
 $M G V G S P D C L V E G A M R G I D M F D C V L Q T R D A R N G L A L D T S T G K$


 $M G V G T P D C D L L E S V V K R G V D M F D C V L P T R N G R H G V A Y T R R G B$ $M G V G S P D D D L E E S A R G I D M F D C V M P T R A G R H G L A Y T R A G K$ $M G V G K P E D I V E S V R R G I D M F D C V M P T R N A R N G H L F T H H G D$ MGVGTPANILEAI ERGVDMMDCVMPTRNGRNGMLFTKNG』 $M G V G T P C D L V A G V S N G I D M F D C V M P T R N A R N G W L F T R F G D$ MGIIGTPDMI I MAVENGIDMFDCVLPTRMGRHGTALTWSGK MGVGTPLDI AHGINAGIDMFDCVLPTRNARNGTLYTSLGK $M G V G A P E D V L W A I M C G V D M F D C V M P T R N A R N G C L F T S S H K$ $M G V G T H R E M S Q A V A A G V D L F D C V D P T R D A R H G A A I V G S E R$ $M G V G T P E D L V E N V S R G V D M F D C V M P T R N A R N G T L F T S F G K$
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 $M G L G T P P Q L L E M V A R G V D M F D C V M P T R L A R H G V A L T P D G P$ MGVGTPVDILEAVRRGVDMFDCVLPTRNARNAQAFISEGV $M G V G T P W N I L D E C I G M G I D M F D C V M P T R N G R N A M L F T T E G V$

 $M G V G T P V N L L E A, ~ S R G V D M F D C V M P T R N G R N G M L F T S E G U$ $M G V G T P D D D M L G A, ~ E R G I D D M F D C V V M P T$ | $M$ | $G$ | $V$ | $G$ | $T$ | $P$ | $D$ | $D$ | $I$ | $L$ | $K$ | $S$ | $I$ | $A$ | $R$ | $G$ | $I$ | $D$ | $M$ | $F$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
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| $V$ | $F$ | $P$ | $T$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |




 | $M$ | $G$ | $G$ | $T$ | $P$ | $E$ | $Y$ | $L$ | $A$ | $A$ | $V$ | $A$ | $N$ | $G$ | $I$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $M$ | $M$ | $D$ | $C$ | $V$ | $L$ | $P$ | $T$ |  |  |  |  |  |  |  |  |
| $I$ | $G$ | $T$ | $P$ | $D$ | $Y$ | $I$ | $F$ | $A$ | $A$ | $V$ | $E$ | $N$ | $G$ | $I$ | $D$ |
| $L$ | $F$ | $D$ | $C$ | $V$ | $F$ | $A$ | $T$ |  |  |  |  |  |  |  |  |

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

 $M G V G T P C D L I A G V E N G I D M F D C V M P T R N A R N G T L D T R F G D$
 $M G V G T P E D I I D E A I D R G V D M F D C V M P T R N A R N G Y L F T S F G T$ $M G V G H P C D L V A B G A L G V D M F D C V Y P T R T G R F G Y A L T D D G R$ $M G V G K P S D V V G A V E R G V D M F D C V I P T R S G R N G Q A F V R N G T$ $M G V G T Y R E M A Q A I A A G I D L F D C V I P T R D A R H G C A L V Q G E R$ $M G V G T P D V N L E A V M R G V D F F D C V M P S R N A R H G N V F T W K G K$
 M GVGTYKEMVIAI A S GI DLFDCVIPTRVGRHGAALVQGER $M G V G T P G N I I$ EAVYRGVVDLDDCVMPSRNARHGHLFTNQ G I $M$ GV G T P A N I L E A I A L G G

 M GLGTP T QLLEMI GQGVDMFDCVHPTRCARHGQAFTPDGP
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 | $I$ | $N$ | $K$ | $K$ | $A$ | $Q$ | $Y$ | $R$ | $E$ | $D$ | $F$ | $T$ | $P$ | $L$ | $D$ | $P$ | $T$ | $C$ | $P$ | $C$ | $Y$ | $T$ | $C$ | $Q$ | $N$ | $F$ | $S$ | $R$ | $A$ | $Y$ | $L$ |
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| $L$ | $N$ | $H$ | $L$ | $V$ | $R$ | $S$ | $R$ | $E$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $V \operatorname{N}$ I $\operatorname{R}$ D Q K Y E E D F T P L N MR N K K WA T D F S P P D D P G T S F V D T L Y S K A Y L R H L F V V N E I S LRRNAE YKEDSNPLDVECDCYTCRNYSRAYMRHLLWARE


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 DQLIK N S R Y A D D D R P I E E G C S C Y T C R R F S R A Y L R H L F L A R E
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 I NLK N A K Y T R D D G P I DLLQC DCPDVCRRYSRA Y L H H L FKA E E





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 I N I T N A Q WA N D H S A I D P GLD N Y A S QYF S K A Y L R HLLK S N E

 II NLKK A GHA LD K GPI E E GCTCQACTRYS
 I K L R N A K V H R E D T R P
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 L R I K N A R Y K LDD DN P V D S S CE CYTCKNFS RA Y L N H L F K A K E L NMNSSAPRRQLEPI DPECDCYACRHYTRAYYLAHLLRAEE
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 IL A M T L N T L H N I R Y Y M R L M E Q I R S A I G R GQY A A F K T R F L K MLAPMLAT I HNLHYY LQLLMQEVRDALAAGRFAAFAQEFKQ
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QFSFQCLACCSKARAGVFYTPHGAVVITPNFMPVIGTLAN YQVLKTDGRAKRGRLKTVHGVIETPVEMNVGTVAA FTLLATSSAARRGELRTLHGT QTPVFMPVGTQAT MTFELQASGSEARAGKiRTDHGEIDTPIFMPVGTVGS MKFTLLANDTEARAATLTTDHGTIIETPI FMPVGTAAT FELKKTQGRARRGAFTTPHGTAQTPVFMNVGTQGA SNFSFQLVANCSQARAGVFSTPHGDVETPRFMPVGTLAN MNFTVTHKDSASRSGILSTDHGDI PTPVFMPVGTRAS MKFELDNTDGYGRRGRLDFNCGDVDTPVFDAVATYGS MPLQFSVTCTDTAARCGVLHTDHGTIPTPVFMPVGTRAS MKFS TDKKDEFSKARAGVVETDHGKI QTPDFMPVGTVGT FDFTGEAQSGHARAGLFETAHGTVRTPLFMPVGTSAT FDLESKCSTTKARASTLHLPHGSVKLPGFMPVATQAS SQFSFSLLAHDSAARRSVFCTPHGEVQMPAFMPVGTLGT MQYTLLAKDSEARCGVLTTAHGEIHTPVFMPVGTVGS SYEVLCKQSGARLGKLTTSHGVFETPIFMPVGTLAT R $\ddagger$ EGRDGEARAGTLRTPHGSVPTPTFMPVGTKGT MKFQDKTDGNARACTITTAHSVIKTPDFMPVGTVGA KFD ${ }^{\text {HKKTCTKTAARAGRI ETDHGEIPTPIFMPVGTVGS }}$ MPYRLIKQEGAARRGEFVTVHGTVQTPAFQNVATAAA MDFQLLQTDGSARFGKLICNHGIINTPTFDPVGTYGV MFFKLDSKDSAARAGTLTLAHSVVQTPVFMPVGTQAC RSQFEFECLATCSGARAGRFFTPHGDVDTPRFMPVGTAGT

FKVIKKEGYARRGELDTVHGTVQTPVFMNVATCGA
YRLLCKDGSAKRGEFTTVHGVIQTPVFMNVGTAAA FSFQCVCSQTQARAGVFMTPHGPVETPCFMPVGTVAT MQFKCLKTSDNARLSLLLWLKDGEVEDPAFMPVGTQG\| PPDQYRVTARCSKARVGVMSDRHADVDTPVFMPVGTQGT SQFKFKVEKEDSNGRTGVTTTPHGEIKTPAFDPVGTKAT FAFHNLGQDGAARRGRLVTAHGTAETPAFMAVGTAGT
 RLRYQQTARSGRARAGLLHTRRGAVRTPAFMPVGTQAT FTECHKDAHARTGVIADPHGDLRTPAFMPVGTAGT AFRWRAQARSGQARAGYLETAHGTVPTPTFMPVGTVGT FTDTAKDSRARAGVVRTPHGDVPTPVFMPVGTRGT MPFAYHPGPKDGRARRGAITTPRGRIETPAFMPVGTRAS PDFSFTHTQERGAARLGRLVTPHGTIDTPAFVAVGTQAA MSMKFTLQYKDSKARAGELTTDHGVVRTPDFMPVGTAAT AATFEGTCPNTQARAGYFITPHGEIPTPCFMPVGTLAN SALTFDLHGRCSKARASTLHLPHGAVE YKVIHECRQTGARVGELTTPHGKI ITPAFMPVGTQAS LINFKLLTTSGNARSGVIRTPHGDVIHTPAFVPVGTQAT MNFEVLYQDNNARCGVFNFNQEDIETPVFMPVGTYGA RFELKKTSKKSKARLGVLHTDHGDIQTPIFMPVGTEAT ALKFVVHKTCNKARASTLTLPHGEVLTPVYMPVGTKGT RMKMKFDLLQTDSQARAGVVHTDHGAIETPIFMPVGTVGT PALKKLDVLAKNCGARYGYLVTPHGTVELPMFMPVGTLAT FKFDLIAEDTHARAGVLHTPHGDIETPIFMPVGTKAN KDFFNYEVIAECTRARVARMSTPHGDI ETPCFMPVGTQAT YK LCKDGSAKRGQLETVHGTVQTPVFMNVGTVGA YQIVATDGRAKSAHMETVHGVIETPVFMNVGTIAA MRLVAECSRSRARAGELRLPHGTVATPVFMPVGTQAT FTYDVLAEDTHARAGVFHTPHGDDPTPDFMPVGTKAT MKFNLIKTDSKARAGILETDHGKMETPIFMPVASKGS PALTTEVLAAQGRARASRMTLPHFAAETPMFMPVGTKGT MDFQLQAVDKHARAGILNLVHSQV
MS LP F Q L LA TADAGRRAVMDLPHRQV MEFECLATDGAARDGQLDLPRGQVQTPVFMPVGTVGS YKLLKQEGRARRGEFKTVHGTVQTPAFMNVGTSAA MTGAFD EARDSRARAGRTTABGVIETPVFMPVGTRGS MKFELHHASGPARTGTVHTPHGSFPTPAFMTVGTQGT FDVTVEASCGAARALSFETAHGTVRTPMFMPVGTHAT SRFEPTADLEGGAGRAGVLQTPHGEI QTPAFIPVATKAT RHSFEFETFGEHVQARSGLIFHLPHCDLRTPIFMPVATQGA AFHYKKISQDGYARQGEMITGRGRI RTPAFMPVGTAGT YK IJK K GSAKRAEFTTVHGVIQTPVFMNVATVAA
 SADTFELRARCSKARASVLRDPHGPIETPDFMPVATQAS


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UniRef90 Q1NY98 UniRef90_UPI00047912A6 UniRef90 COBJTO UniRef90_UPIOOO3B4B755 UniRef90-D4TLL9 UniRef90-B3EPX6 UniRef90-U3U8F6
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UniRefo-UPOOO3ABA57C UniRef90-W8K7F2 UniRef90-S2ZN78 UniRef90_DOJ954
UniRef90 IOYTE6


V|KTLTT P A QLL QET GA QM|ILSNTY H|L|HLLQPGEATV|AAA G G|L|H
 VKGVYPEDLRGLGAQLLGNTYHLFLRPGHELIRKLGGLH VKAVTKQQLKDDQAQUIGGTYHLYLRPGTGVLEAAGGLH VKGVHQRELNDDPDILGNTYHLYLRPGTKILEQAGGLH VKGLDAGDLEGLECQUELSNTYHLHVRPGDELVRDMGGLH VKTVTPAQLADTGAQMILSNTYHLHLQPGEKIVAGGGGL VKS SSPEELENSGTKIILGNTFHLWLRPGEKTIKLHGGLH VKSVVPTGELAGLNVHILLANTYHLYLKPGNTVIAKAGGVH VKAVHQRELEEDIAQQILGNTYHLYLRPGTDILHKAGGLH VKGIRPQMLKELGAQVLSNTYHLSLRPGADLIAEAGGLH LKGLTPDQLAQTGCKLCLNNTYHLGLKPGQAVLDEAGGAH VKGLTIDDVVRAGAQMVLSNTYHLALRPGDEVVRHHGGLH VKAVHMRELKEDRAEIILGNTYHLYLRPGTEILQAAGGLH VKTLTVEEIKEVSEGLILANTYHLWQQPGEDIVKDHGGIR VKSLTPEEVRATGSEIVLANTYHLFLRPGLEVLETVGGLH VKGLDRGELREMGAGVVLGNTYHLYFRPGAQVREAGGLH
 VKAVHPELSDDUHAQULGNTYHLYLRPGLDTLYKAGGLH VKAMTPEAVSETGTQVILGNTYHLMLRPGADRIENFGGLH IKTVTPQETKESGAQIILSNTFHLWLRLGQNIIKDHNNLH VKGVHFEELRRQKAQAKGNTYHLYLRPGLEVLRAAGGLH
 $V K G V T P A Q L A D C Q A Q M V L A N T Y H L H L Q P G E A I V E Q A G G L H$
 VKTLTPEQLRATGAMVLGNTYHLHLQPGEGVVAAAGGLH VKALLPDTLIDVGYKLMLSNTYHLYLRPGVEDIEAAGGLH VKSVLPESMSDLGAQALLA VKAMTADAVRATGTEVVLGNTYHLMLRPGAERVRABGGLH VKAMHQRELQEADAPLLGGNYHLYLRPGLNDIEQAGGLH VKTLMPEEVAQAGADMILANTYHLSLRPGAEEVAALGGLEH
 LKGITAGQLEALDCQ CLGNTYHLGNRPGPELITKAKGLH VKSLSPRELREHGAT ILGNTYHLYLQPGHELIARHGGLH VTGMTPDDLHALGAEDILGNTYHLLLRPGPGLVREMGGLH VKGLFHRDVRDEHAQUIGANTYHLYLRPGMESIABAGGVH VKTLTPAQLKETGAP LLCNTYHLHLQPGESVQQEAGGLH LKGLTPEQLEETGCRLCLNNTYHLGLKPGQAVLDTDGGAH VKSLTPDEVRASGTDIILANTYHLMLRPGLAVLEAAGGVQ VKSLSPEELKSVDATILSNTYHLYMRPGHKLVEKAGGLH VKAVLPETMKELGAQALLANAYHLYDQPGPDVVAEAGGLG VKSISTEEIKNTGSRIILSNAFHLYFRPGLELIKLHGNLH VKAVTPAQLKEDIAQQUANTYHEYLRPTTPKIAAAGGI H VKGVFPRDLLDLGAQVILCNTYHLLLRPGDEVLRDLGGLH IKGLTSQEMENLGCRLLLGNTYHLAYQPGGDYLEKVGGLH VKGVHQRELKEDNPDVLANTYHLYMRPGMEVLEKAGGLH VKTLSPEEKKDMGAGVLLANTYHLELRPGPDVVAKAGGVQ VKGIPTETVKQLGAQVLANTYHLSMRPGEDTIAELGGLH VKAMAPFELEMLGARI LLSNAYHLYLRPGVDIIEKAGGLH MKGVATTDLGNLKTQVLSNTYHLHVRPGDDVVKKMGG1 R VKGMTPAQ1 DEVGAQILGNTYHLNIRPGSKLVEEMGGLH IKGVATTDLKELGTQVELSNTYHLHVRPGDQVVQLGGLH MK GUTVEQLDALGCRUCLGNTYHLGLRPGPELIQKANGLH VKGLLPGVVESLGTKLLLANTYHLSQRPGDELIAELGGGH
 VKAVDPEVVKDLGAQAVLSNAYHLYERPGSELVSELLGGLH MK VKAVPQHLLEALGAQLLGNTYHLYLRPGLEVVRRMGGLH VKGLDCADILTSGSRMILGNTLHLALRPGVEVISRFGGLH IKGUSSDDLVDLKCQVELCNTYHLHVRPGDDVIRAMGGLH IK K STMPDEVRNHGAQULGNTYHLYLQPGHELIARMGGLH VKGITPDQLHALNSQVVLANTYHLYMRPGVDVVEEAGGI V LKGVTVAQLEELDVEILLGN KAMYMDQLRALGTD ILG VKGVSTEDLEGUGTQVVLS LKGLTPEQLEAAGCRLCLNNTYHLGLKPGQAVLNKVGGAH VKGVHQRELREDTNDIILGNTYHLYLRPKMDIMQKAGGLH




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UniRef90 B3EDL UniRef90-UPI00036A7C38 UniRef90-UPIO0035CE6E0 UniRef90-R5FY72 UniRet90-F2ST56 UniRef90-E6U6Z2 UniRef90-D2R233
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UniRef90 A7HDO UniRef90-D7CQA0 UniRef90-R6VP54 UniRef90_O2JR27

UniRef90 VgD8W4 UniRef90-D1C314 UniRef90_R6H139 | UniRef90-K5B9N2 |
| :--- |
| UniRef90 $\mathrm{S5R3Y}$ | UniRef90-B8D8T4 UniRef90-C9RLO3 UniRef90-UPIO00467C1B3 UniRef90_17M3D8 UniRef90-W8VMY

UniRef90
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UniRef90-10YTE6 UniRef90_UP10003B37CD7 UniRef90-Q17YB5 UniRef90-G1LXB8 UniRef90-UPIO0036FB31A UniRef90_T1A6F6 UniRef90-BOPB293 UniRef90_10IGY6 UniRef90_J4XJT7 UniRef90-AOJSH8 UniRef90_UPIO00420B84D UniRef90 U3LN93 UniRef90-E6YHK UniRef90-UPIO0047DOE94 UniRef90_W2BUF2 UniRef90-UPIO0036646DD UniRef90-U4KYA2 UniRet90_F4B2V3 UniRef90-F5XMH3 UniRef90_UPI00020028DB

170
180 DQA 180 viog ${ }^{19}$
ERCMTAHQR
L N R M N KRCQEEMGRL
ARCRAAKED
DRCIORLDT
 E R C K S HQRRL
E R A K K H L LA T K P
K R S R E H F D
E R A R S H F V S P
ERARSHFVR
QR S R A H F
R

K R CLA A H TRE
NPY
D R C D D A H K
ERCKKEMAAPGT $\square$ N P
KRCQEAATR
ERCDVARFDETPLYGY
G Y
KRGKEALKT
QRSLHRFQEL
E R C R E TH H R R S
$K K A D N Y H R E S ~ G V G L$ $K R Q A L$

RRCVK RVNETPH
ERS S F E
LRCKAEMARLKHENP DQLLL
ERSRLYFDKLHNSNM

KRSLNA
ERCMTAHERT

| $K$ | $R$ | $C$ | $K$ | $D$ | $E$ | $M$ | $D$ | $R$ | $E$ | $D$ | $T$ | $I$ | $N$ | $K$ | $Q$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $Q$ | $M$ | $L$ | $F$ | $G$ |  |  |  |  |  |  |  |  |  |  |
| $L$ | $C$ | $K$ | $N$ | $E$ | $L$ | $N$ | $R$ | $P$ | $D$ | $T$ | $I$ | $N$ | $K$ | $H$ | $Q$ |
| $L$ | $L$ | $F$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |



$\begin{array}{llllll}V \\ V & C K A A L S R E D \\ D R S D A A A A R E D\end{array}$
K R CLLVEHGRDTRERSSQALWGVL
ERSRAAFE

ERCRTAFVARP
D R C I A A N R N L E
AR CLT T A HREEQLD NP
K A Q Y G

DRCFNRYRQTPKYGHYQAAL
K R CVEAHRRS
DRCIVAHK YPETQNNL F

VR C M A E H R R L
Q R S K D E K Y P P Q A
K K S R $\square \mathrm{Y} F \mathrm{~F}$ S
AEAMEW $\begin{aligned} & \text { AK HPP } D H G Y D Q Q Q F F G \\ & A R G K D A W E R D R E S H P R F P T\end{aligned}$
ARGKDAWERLRESHP
DRNIQAHERKEV

$\begin{array}{llll}K & R & G & \text { D } \\ \text { D } & \text { H } & K & T \\ C & R \\ \text { A } & A & H & K \\ R & P & E\end{array}$
ERCYKAHTR
$M$ L C K Q S H S R P


ERCKKEMAREDTLNPNQLL
GEFLDHAKSEGFI ERGHHVF

K



D R C I A A H R R P D
A R S K Y F E S H K H E GR
ERSCRAHGEG

RRCLMFHRATQPPNPYQALL
DRCVAFH RGRGRDGRQAL F
KRCCDAHSR


QRCKKVFGDQP EK $\quad$ Q A MF G




190 R S R A A A Q|LIS 200
L|R S R A A A Q|L|S
I R I E HAK A I A

$\left.\begin{array}{llllllllllll}V & Q & G & S & T & Y & S & D & L & R & K & I \\ S & A & E & F & I & A \\ N & Q & G & G & Y & P & D & L & R & I & W & H\end{array}\right)$

 VQQ G N D F K D L R Q E S A K Y la A
 $V$ Q G G L D P E M R V W C A G E L A A


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


$V$
$V$
$V$
$V$
$\begin{array}{ll}V & Q \\ I & Q \\ V & Q \\ N \\ N & Q \\ V & Q\end{array}$




UniRef90_UPI0003820837 UniRef90-F7V5X1 UniRef90-Q1NY98 UniRef90_UPIO0047912A6 UniRef90 COBJTO UniRef90_UPIO003B4B755 UniRef90-D4TL90 UniRef90-B3EPX6 UniRef90_U3U8F6 UniRef90-B3EDL1 UniRef90_UPIO0036A7C38 UniRef90-UPIO0035CE6EO UniRef90-R5FY72 UniRef90-F2ST56 UniRef90-E6U6Z2 UniRef90-D2R233 UniRef90-F9Z9Q8 UniRef90-A9NG43 UniRef90-B9KZ93
UniRef90-A0AO23X3N6 UniRef90-A71216 UniRef90_UPI0003B63A95 UniRet90-J5TVW2 UniRef90-E7C7P3 UniRef90-E8Q613 UniRet90-R6EG58 Uniinef90-T1CXW2 UniRef90-K1ZS50
UniRef90 - U5DPM6 UniRef90-R6UDV4 UniRef90-V2Y945 UniRef90-UPI00036CDC6D UniRef90-WOJFP8 UniRef90-R61373 UniRef90-UPIOO04679879 UniRef90-A5FY69 UniRef90-Q11VU4 UniRef90-UPIO003794BEB UniRef90_E1QIL6 UniReffo-ETNWI7 UniRef90-V9L1Q4 UniRef90-E1IDU5 UniRef90-A7HDO7 UniRef90-D7CQAO UniRef90ROVP54 UniRef90-V9D8W4 UniRef90-D1C314 UniRef90-R6H139
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UniRef90-R6Y2A5 UniRef90 ${ }^{-}$м3B8F8 UniRef90-R5ZGA0 UniRef90-14BV11 UniRef90-R6DMD2 UniRef90-D5EJJ4 UniRef90_D4J9W6 UniRef90-UPIOOO3ABA57C UniRef90_W8K7F2 UniRet90_S2ZN78 UniRef90_DOJ954
UniRef90-10YTE6 UniRef90_UP10003B37CD7 UniRef90-_17YB5 UniRef90-G1LXB8 UniRef90-UPIO0036FB31A UniRef90_T1A6F6 UniRef90 BopB29
UniRef90 A5USV3 UniRef90_10IGY6 UniRef90_J4XJT7 UniRef90-AOJSH8 UniRef90-UPIO00420B84D UniRef90 U3LN93 UniRef90_E9GFM3 UniRef90-UPIO0047DOE94 UniRef90-W2BUF2 UniRef90-UPIO0036646DD UniRef90-U4KYA2 UniRef90-F4B2V3 UniRef90-F5XMH3

## 

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220 220

240
QLLD|L|PGYA|I G G|V|S|V|GEPPE|LDHHTVQATAPLLLPHHKPRY|L
 SKNAVGNAI GGLLVGEPEDMMYEFTESCASRDPFNKPRYL K Q DLP GNAI G GLLSVGEPAEEMYAMTSEVCSVLPKDKPRYL

 | $K$ | $L$ | $D$ | $M$ | $P$ | $G$ | $Y$ | $A$ | $I$ | $G$ | $G$ | $V$ | $S$ | $V$ | $G$ | $E$ | $P$ | $P$ | $E$ | $L$ | $M$ | $A$ | $Q$ | $I$ | $V$ | $R$ | $T$ | $T$ | $A$ | $P$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $R$ | $R$ | $N$ | $K$ | $P$ | $R$ | $Y$ | $L$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $L$ | $D$ | $F$ | $E$ | $G$ | $Y$ | $S$ | $I$ | $G$ | $G$ | $L$ | $A$ | $V$ | $G$ | $E$ | $P$ | $A$ | $E$ | $K$ | $M$ | $Y$ | $R$ | $I$ | $L$ | $E$ | $L$ | $S$ | $H$ | $T$ | 1 | $L$ | $P$ |
| $I$ | $E$ | $N$ | $K$ | $P$ | $R$ | $Y$ | $L$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


 HK DF K GFGIIGGYSVGED HEVMMETVGGDVARTCPENKPRYYV A R N TP G DA $I \quad G G G L S$ G G E A K D E F C K K V V K L N FP GYAI G GL S V GETPPEAMYAVLDAVMPAMPVDKPRY L



 $\left.\begin{array}{l|lllllllllllllllllllllllllllllllll}S & G & A & E & G & N & A & I & G & G & L & A & V & G & E & P & T & E & K & M & Y & E & M & V & E & L & T & N & S & I & L & P & K & D\end{array}\right)$
 DK GAD GNAI G GLA AVGEPTEVMYEMI EVVNEILPMDKPRYL
 EII E F A G H A L G GL SVGGEPDDEMYRRVGGEMAPLMPQDKPRYY


E
 KRNTRGFAV G GLL S GGES


 | $D$ | $E D G H G F$ | $D G Y G$ | $G G A$ |
| :--- | :--- | :--- | :--- |
| $E$ | $G$ | $L$ | $G$ |

 D GF E GY A I G G L A V G E G Q EL M F S T L D A T V G L I P TLGGFD GF C $\quad G G G S D G G G D K P Q M Y D V V D D M T V P H M P$ QHAFDGFAI GGLAVGDTRTERFDVVGRTAELLPEDRPRYL




 E I G F D GF A I G G L S V GEPP K K K M M I K I L Q Y

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



 E M D F D G L A A I G G L S V G E E N A L M Y E T V E N L L N P F L in E N R P R Y L




 PMGFA GYAI GGLLAVGEPPAERLAVLDDVKTVLPPDRPRYL

 S L GHRGFA GYGワGGALEKENLGTIVGWCTDELP K R D CKGYAIGGLSGGESKADFWRVVAQCCHVLPRNKPRYC DRDVAGFAI GGGLSGGEGKDQFWKMVHLSTDLLPNDKPRYL E M DLLK G Y A I G G L A V G E P Q D D V M T T V D M GL D GY A V G G L A V GE S H E EMY HVL E TVVVP YL P E D K P T Y L A T E S D GWD GF G L G G A L E K H N L A K IV V T WMA Q E L P P N K P R H L




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M GIV 250
270
280
 MGVGTPENILEAVDRGVDFFDCVYPSRNGRHGHVYTNHGK




 MGI GY $\square K D I L E A V E K G V D L F D C V L P T R N G R N G T L F T S K G K$ $M G V G T P W N I \quad I \quad C I A L G V D M F D C V M P T R N A R N A M L F T W N G V$ $M G V G N P T T L V R A V H E G V D M F D C V L P T R T A R M G T A F S S Q G R$


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



 $M G V G T Y R E M A I D A$ A A GVDLFDCVDPT RDGRHGTALVRSER

## M <br> M

$M G V G T Y R E M V R A V A A G V D M F D C V I P T$
 LGGI GEPD DL FVVGVENGADTFDCVAPSRQARTSAVFTNAGR


 $M G V G Y A T D L V V C V A L G C D M F D C V F P T R T A R F G S A L V P W G S$ L G V G D DD DLL E GVA R G I DMF D CVVSPTRDGRHATALVRRWK $M G V G T P P D L L D A D G H G V D M F D C V L P T T M A W Q G T A F T S T G R$ $L G I G E V E D V F G A V E R G C D T F D C V S P T R N A R N G G V L A R F F R$

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

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


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





 $M G V G T P A N V L D A V E R G V D F F D C V Y P S R N G R H G H L Y T N K C H$ LGI S E P D DLEAACEVGADTFDCVNPSRDVRNAAI Y TAD GR
 $M G V G Y P E D L I V S I A A G A D M F D C V V G T R T A R F G N A D T S G G G V$


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330
340
350
ILLAYT|LL|STHN|ITEDIRRTQK|I|RNA|I|MRGTFATEFAHWL MLGMRLCVLHNLYFYNTMMQEIRDAI EAGRFQEYKNE

 $M$ A M R L A V TH N L WF Y N H L M T A I R NA I DT D S F D DFRTE Y S G IL L A Y T L L L S I H N I T E L I R R T T Q A I R R E S I L Q N R F
\%

 $M \operatorname{L}$ G S V $L$


 L L GHRLVTLHNVRFVVRMMETMRRA
 $I L G L Q I A S \square H N L A F Y L R L V R E A R E H I$


A A S H L RFFQRLMENLRQAI
I TY F R L A T L H N L A W W Y 1 L S S L L NTIH NL 1 L A A TLLLSIHNIT ELI R FTRSIIRAA I
 M LLS Y T L L S I H NV T
 $P \vee A M R F A V M H N L Y F Y N K L M E K I R M S L D N D N F E Q F R S K Y$
 $M L G P M L L T T H N L S Y Y Q T V M R G A R E A B E A G R F$










 E
M
T



TL G L R L MVTHNG YFYNTMMEE DRDAI E L L A S T L L S I H N V H F F $\operatorname{L}$ LD LM A Q A R S H I E A G D Y L K WS Q D W
 MLA GEELSSMHNI Y F LLLDLMRRARESI LAA GNYGEFVVTKWLE NL A K Q I A S LLHNLS F YL N L DK KARTHLLLQETFYS WKK



 $M L A M R L G V Q H N L Y F Y N T L M E K I R E A L D T G T Y E A F Y R T W$ $L L G \square R L V S L H N V A F L L K L M R T I R Q S I D E G R F A H L R A E W L G$ L L G GVL L T L H N L R L Y Q R L M A DL RA Ti PGGRWDAFF S R W


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FEVTATDGQARTGLLRFANCTVPTPMFMPVGTRAT PPDSFELVATCSKARAATLTDPHGSVS $\square$ PDFMPVATQAS
 MAFDFTVTARCTRARCGCFTTPHGPVHTPRFMPVGTAAT MDFTLNGTDKKARAGALKLAHGVVPTPDFMPVGTQAT MK LDEFKI EKK IEGGRAGDI STPHGKILTPSFVVVGTKAT KFKILSKDTKARCGILKTSHYEVKTPNFMPVATQGS FTYD甘VAEDTHARAGVLHTPHGDVPTPDVMPVGTKAT RESFSFEVESRDEGARTGVIHTPHGDIATPAF PVVGTAT SFDV DNSAGKARAGVI HTPHGDI PTPAFIDVATKAT P MRF QI QAKVGKARACSFTLTHGKVETPIFMPVGTQGV


F S Y NVVA E D T H A R A GVLHT P H G DVV T P
YK L LS TDNMAKAAEFTTPYGVI QTPCFMNVATVAA M $\square$ FREETRDPQSFARTGT $\square A D N G \square E I P T P V F M P V G T R G A$ HGRTGVIHTPHGDワATPAF $\square$ PVVATKAT PA L K LDDVLHTYGRARACDLHDPHGTVHTPDFMPVGTQGT MTFTKVAEGRRGRAGDIHTPHGDIPTPAFDPVGTKAT MS LIEFEVSRTEGGGRRGRLADPHGVVETPVFMPVGTAAT
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TLEIVVA EDSDARSCRLWT GHGPVETPCFMPVGTYGA

 R $\square$ NFHVEAHATGSSARAGTFRTAHSHVLTP LDFMPVGTQAT


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T F E L G T R V G H G R T G V I H T P H G D
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$L K \square C A T D G R A R T G \square L L D H G E V R T P D F M P V G T K A A$
 PALDFEI LAE EGRARRCHLWLPHGPVETPVFMPVGTQGA

MK F K



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

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UniRef90_S3BVW8 UniRef90_UPI0003C7FF9A UniRef90_Q7VHX2 UniRef90_D3PGB1
UniRef90_Q6C2C9 UniRef90_UPI000422A08D UniRef90_UPI00044107D9 UniRef90-V2XX01 UniRef90-R6VWL2 UniRef90_E2SAF5 UniRef90_S6BYH7
UniRef90_H2CF09 UniRef90-LOHKX6 UniRef90-N1J6D2
UniRef90_K7SIX8 UniRef90_K9P909 UniRef90-A4RR97 UniRef90-U2TGB2 UniRef90-K4RJGO UniRef90_V7PYC3 UniRef90 X1JY95
UniRef90-E1QZN2 UniRef90-G6D733 UniRef90-K9EFC4 UniRef90-A0A010Q0Z8 UniRef90-C4LGK8 UniRef90-C3XEW1 UniRef90-T1GLA8 UniRef90-16X272 UniRef90_G5F5T0 UniRef90_UPIO0016C0603 UniRef90-T0GIU4 UniRef90_Q04EGO
UniRef90_R9SMD5 UniRef90-W4FV40 UniRef90-W1TVC3 UniRef90-E8X5L2 UniRef90-F1T402 UniRef90-UPI0002192A46 UniRef90-M7MQQ9 UniRef90-A2BUQ2 UniRef90_UPIO004408070
UniRef90-N6X2E3
UniRef90_U3Q570 UniRef90-A6G9V6
UniRef90_U5EEJ5 UniRef90-M2VK20 UniRef90-A0A022KU18 UniRef90_B4D4C4 UniRef90-JOX095 UniRef90-H5SRG2 UniRef90_S8A8H0 UniRef90_UPI0002C3E452 UniRef90-H8MKW8 UniRef90-R5DEU8 UniRef90-Q16EK7
UniRef90-D8M6F4 UniRef90_UPI00037F177A UniRef90_UPIO00367EA94 UniRef90_C0R3J8
UniRef90 X1RCJ4 UniRef90-C9ZQY4 UniRef90_UPIO0021940BE UniRef90-M2XXA4
UniRef90 B0SCA8 UniRef90-K2A212 UniRef90-M3UV49 UniRef90_Q04UC6 UniRef90-D8TIX3 UniRef90_COVZ99
UniRef90-X5DQH7 UniRef90-D6ZAQ1 UniRef90_K2AFD3 UniRef90-L1LGH3 UniRef90_UPIO00361D014 UniRef90-A2CCL1 UniRef90-G7YRX9 UniRef90-N0BB25 UniRef90-K1Y7L9 UniRef90-J2ABB3 UniRef90_UPI0003D05A28 UniRef90_L7KI35 UniRef90-A0E0J0
UniRef90_V4BB49 UniRef90_Q7VDR5 UniRef90_UPIO001D615EA UniRef90-J9D369
UniRef90-D2V4WW5






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| $|K G| V|S T D D| L|K G \square K T Q V E L I S N T Y H| L|H| V|R P G D F| L I|K K M G G| L \mid H$ VKAI TPEQI KEYGGQAVLANTYHLMLRPGTAII KQAGGLS


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## 2




 VK GLTPEQVKGVGAQAVLANAYHLYLQPGPEVVDRAGGLA IVKVRPEEMLEUGAQAALANAYHLNLQPGTDVIDAAGGLGG I K G L N S S L D I K
 $V$ V $K$

 VKTGTPEQRETGAQALLSNAYHLYLQPGPDVVDEAGGVS VKGGTAEQLPPDDCKILLANTYHEALRPGTDDLKDVVGGLH VKTVLPETMKELGAAALAANYHEYLQPGPEVIDQAGGLA

 VKGGSQQLKSTGSEMLSNNTYHLNLUPGGKDVLKAAGGGAH
v
v VKAVLPETDREAGAQAVLANAYHLYLQPGPDVVDEAGGLG VKAVLPESMADLGAQALLANAYHLYLQPGHDLVDEAGGLG VKGQLTQSLEDAGSQULLANTYHLLLRPGPEVFRRIGGLH

 VKGVHMTELKEDNAQLILGNTYHLYGRPGLELIGEQAGGL

 VKAMTPRELEDLDRQULSNSYHLFLRPGHNLIAQAGGL VKGVNTRTLKEGGSQFLLANTYHLWVRPGDELIAQAGGLH VKSVSPDELKDLGSEGILGNTYHLYLRPNDKFIKEFGGLH VKTVVPEQVAALGAQAVLSNAYHLYLQPGADVVDEAGGLG VKTVSADDLEELEYSLILGNTYHLYLRPGTAVLERFGGLK
 VKTLTPEQVRSTGAEAMLSNAYHLYLQPGEDVVDTAGGVA LK SLDSKMVDEVGLQLMFCNTYHLMLQPGAEVIKKAGGLH VKGMYYPKLEESECVLSLANTYHLACRPGKEVELEANGIH VKT TVPDQLEATGAQMVLSNTYHLHLQPGEDVVERAGGVH MKGUSVAQLEAGDCRILLGNTYHLGHRPGPDVIRTAGGLH VRGLDNRDLKEMGAEVLLANTYHLHLRPGDEVIKKLGGLH VKNMTPEDVREIGAQIVLGNTYHLWLRPGDELISRAGGLH IRGLTAGQVREAGAGLLEVNLFHLWLRPGEKIUREAGG|S VKGVLPEAVEALGAQAVLANAYHLYLQPGPELVDAAGGLG MKGVTYQEMDDLGCKLLLANTYHLAYKPGGDLLEKVGGLH VKGUTATQLKDTNAQMILANTFHLHLQPGEACLIKESGGLH




UniRef90_N2AB22
UniRef90_R4PX68
UniRef90_S3BVW8
UniRef90_UPI0003C7FF9A
UniRef90_Q7VHX2
UniRef90_D3PGB1
UniRef90_Q6C2C9


 DMFD A GGAVGETSEQMYKTI SFTTPLMPVNKPRYL ERPVPGFAVGGLLSGGEAKDDFWKMVNASTDVLDPKEKPRYLC

 EFDLPGYAI GGLAVGEEADVMYDVI EAVEPYMYKDRPRYLL PLGFDGFGI G GAMEKENLGTI I GWVTEELDPDDRPRHL EI EFGGYGI GGYSVGEDHEVMFETLGEVARACPDDRPRYL
 KRDTPGDAIGGLSGGEAKSDYCRVVDTCTTLLPANKPRYV AMESEGQGGFGUGGADEKKNDGRIVGWCAEELPEDRPRHL
AMDDPGDAVGGVSVGEPVEEMHRVVRQVGPLLPQERPHYL ARGLPGMAVGGLAGGESKEDFVRVVSHCTAAKLPDHKPRYV
 EMEVDGFDGFGI GGSFAKEDMSTACKWVNEILPEGKPRHL

## UniRef90_N2AB22 UniRef90 N2AB22 UniRefor R4P $\times 88$ UniRef90 S3 UniRef90_UPI0003C7FF9A

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UniRef90 H 2 CF 09 UniRef90-LOHKX6 UniRet90-N1J6D2 UniRef90-K7SIX8
UniRef90
U9P909 UniRef90-A4RR97 UniRef90-U2TGB2 Uniinef90-K4RJGO UniRet90_V7PYC3 UniRef90- 1 1JY95
UniRef90 E1OZN2 UniRef90-G6D733 UniRef90-K9EFC4 UniRef90-AOAO10OOZ8 UniRef90-C4LGK8 UniRef90-C3XEW1 UniRef90-T1GLAB UniRef90-16X272
UniRef90 G5F5T0 UniRef90-S2VP63 UniRef90-UPVOOO16C0603 UniRef90-TOGIU4 UniRef90-O04EGO
UniRef90-R9SMD5 UniRef90-W4FV40 UniRef90-WTIVC3 UniRef90-E8X5L2 UniRef90-F1T402 UniRef90-UPIO002192A46 UniRef90-M7MQQ9
UniRef90 A2BUQ2 UniRef90 UPIOOO4408070 UniRef90-N6X2E3 UniRef90-U3Q570 UniRef90-A6G9V6 UniRef90_U5EEJ5
UniRef90 M2VK20 UniRef90-A0A022KU18 UniRef90-B4D4C4 UniRef90-JOX095 UniRef90-H5SRG2 UniRef90-S8A8HO UniRefgo_U8A8HO
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UniRef90 D8M6F4 UniRef90-UPIO0037F177A UniRef90-UPIO00367EA94 UniRef90_COR3J8
UniRef90

- $1 R C J 4$ UniRef90-C9ZQY4 UniRef90-UPIOOO21940BE UniRef90-M2XXA4
UniRef90 B0SCA8 UniRef90-K2A212 UniRef90-M3UV49 UniRef90-Q04UC6 UniRef90-D8TIX3 UniRef90_-COVZ99
UniRef90-X5DOH UniRef90-D6ZAQ1 UniRef90_K2AFD3 UniRet90 LILGH3 UniRef90-UP1000361D014 UniRef90-A2CCL1 UniRef90 G7YRX9 UniRef90-NOBB25 UniRef90_K2AB32 UniRef90--j9ZB81 UniRef90-UP10003D05A28 UniRef90-L7K135 UniRef90 AOEOJO
UniRef90 V4BB49 UniRef90-Q7VDR5 UniRef90-UPIOOOODD615EA

UnRefo_D2V4W5

MGIVIGTPENILEGVIERGVDFFDCIVYPTRNGRHGHVYTNNGK LGMGQPADLFLGVEYGVDTFDCVAPTRQARNGALYTYDGR LGMGQPADLVGGVEYGVDTFDCVAPTRQARNGALYTYDGR LGIGEPGDLFAAIEAGCDTFDCVDPSRVARSSRMYAADGH MGVGTPENIEESALGVDMFDCVMPTRNARNATLFTHFGK MGVGFAVDLVVCSALGIDMYDCVYPTRTARFGTALVFDSP


 MGlGFAEDLLVCVALGIDMADCVFPTRTARFGVALTHKGA | $M G V G T P V N D E A V A R G V D F F D C V M P S R N A R H G N L F T S V G F$ |
| :--- |
| $L \backslash G U E D$ | MGVGNPTTLVRAVREGVDMFDCVLPTRTARMGTAFSSAGR MGVGTTPDFLEALRNGIDMFDCVLPTRNARNGQA TSNGA MGVGSPLDIVEAVMEGVDIDFDSVFPTRNGRHGTALTSKGM MGVGYPVDLVVSVALGADMFDCVWPTRTARFGNAITRHGV LGU| SEPDDLFAACRAGADTFDCVNPSRVARNAADYTADGR MGVGSLREMADAVANGFDLEDCVLPTRLGRHGTALVGGER MGVGTPDCLVEGVARGDDMFDCVFPTRVARNGMAMTHDGR MGVGTPQDVLNAVELGVDMFDCVMPTRNARNGTLFTSLGK MGCGYPEDVEAVSLGVDLFDCVLPTRNGRTGMAFTSGGK


 LGISEPEDFFTAIENGADTFDCVSPSRVARTGRVYHPDGR LGGISEPDDREAIEAGADTFDCVSPTRLGRRGGVYTGDGR MGVGFAEDLVVCVSLGIDMFDCVFPTRTARFGCAL
 LGIGEPDDFFAAIEAGADTFDCVINPSRVARNAADYSPDGR MGVGTPENDLEAVDRGVDLIFDCVLPARNGRHGHVYTNDGK MGVGAPDSLFDSVIRGIDMFDCVLPTRNARKGSLMTRFGR LG| SEPDDLFVAVEAGADTFDCVAPTRLGRRGGVYTLDGR
 MGVGNPTTLVRAVACGVDMFDCVLPTRTARMGTAFSHEGR

$\square$



## \section*{\section*{\section*{r} <br> <br> <br> $12 \geq 1$ <br> <br> <br> $12 \geq 1$ <br> <br> <br> $12 \geq 1$ <br> <br> <br> } <br> <br> <br> } <br> <br> <br> 

## \section*{,}

LGGSEPDDFRAMEVGADTFDCVNPSRVARNAAYYTPDGR | L GVGEPDDLFAAVESGGDTFDCVAPT |
| :--- |
| LGI | MGVGYVLDVIISVSLGCDMFDCVHPT


2MGLGKPEELVRAVEAGMDMF LG MGVGYPDDVFTAIENGADTFDCVSPT $M G V G F A V D L V V C V A L G C D M F D C V E P T R T A R F G T A L V P T G D$
$M G I G T I R E M A V A V A N G V D F F D C L P T R L G R H G A L V R D E R ~$





| UniRef90_N2AB22 |  |
| :---: | :---: |
| UniRef90-R4PX68 | R Y Y G |
| UniRef90-S3BVW8 | DL |
| UniRef90_UPI0003C7FF9A | $R \mathrm{Y}$ Y A |
| UniRef90-Q7VHX2 |  |
| UniRef90-D3PGB1 | R Y Y |
| UniRef90-Q6C2C9 | D L H G |
| UniRef90-UPI000422A08D | R F Y A |
| UniRef90-UPI00044107D9 | N Y F G |
| UniRef90_V2XX01 | E Y F G |
| UniRef90-R6VWL2 |  |
| UniRef90-E2SAF5 | R Y Y |
| UniRef90-S6BYH7 |  |
| UniRef90-H2CF09 |  |
| UniRef90-LOHKX6 | K F |
| UniRef90-N1J6D2 | D Q Y A |
| UniRef90-K7SIX8 | R WNA |
| UniRef90_K9P909 |  |
| UniRef90_A4RR97 | K Q Y |
| UniRef90-U2TGB2 |  |
| UniRef90-K4RJG0 | F Y |
| UniRef90-V7PYC3 | N Y |
| UniRef90-X1JY95 | N F |
| UniRef90-E1QZN2 |  |
| UniRef90-G6D733 | E V $Y$ |
| UniRef90-K9EFC4 | R F Y A |
| UniRef90-A0A010Q0Z8 | R Y Q A |
| UniRef90-C4LGK8 | R Y Y A |
| UniRef90_C3XEW1 |  |
| UniRef90-T1GLA8 | T L |
| UniRef90-16X272 | R Y NA |
| UniRef90 G5F5T0 |  |
| UniRef90-S2VP63 | R F |
| UniRef90-UPI00016C0603 |  |
| UniRef90-T0GIU4 | LY E |
| UniRef90-Q04EG0 |  |
| UniRef90-R9SMD5 | R Y Y A |
| UniRef90-W4FV40 | E W |
| UniRef90-W1TVC3 | D F Y G |
| UniRef90-E8X5L2 |  |
| UniRef90_F1T402 |  |
| UniRef90-UPI0002192A46 | R Y Y A |
| UniRef90-M7MQQ9 | E Y Y A |
| UniRef90-A2BUQ2 |  |
| UniRef90-UPI0004408070 | T Y F |
| UniRef90-N6X2E3 | R Y T S |
| UniRef90_U3Q570 |  |
| UniRef90-A6G9V6 |  |
| UniRef90_U5EEJ5 | N WK G |
| UniRef90-M2VK20 | S F Y A |
| UniRef90-A0A022KU18 | D Y Y G |
| UniRef90-B4D4C4 |  |
| UniRef90-J0X095 | R F Y A |
| UniRef90-H5SRG2 |  |
| UniRef90-S8A8H0 | K |
| UniRef90_UPI0002C3E452 | R F Y G |
| UniRef90-H8MKW8 |  |
| UniRef90-R5DEU8 | Q |
| UniRef90-Q16EK7 |  |
| UniRef90-D8M6F4 | K Y F |
| UniRef90-UPI00037F177A |  |
| UniRef90_UPI000367EA94 | R Q Y G |
| UniRef90-C0R3J8 |  |
| UniRef90-X1RCJ4 |  |
| UniRef90-C9ZQY4 | G Y Y |
| UniRef90_UPI00021940BE | E Y |
| UniRef90-M2XXA4 | D Y Y S |
| UniRef90-B0SCA8 |  |
| UniRef90-K2A212 |  |
| UniRef90-M3UV49 | R Y Y A |
| UniRef90-Q04UC6 | LY E |
| UniRef90-D8TIX3 | TMF |
| UniRef90-COVZ99 | R F Y S |
| UniRef90-X5DQH7 | R Y Y A |
| UniRef90-D6ZAQ1 | R Y Y A |
| UniRef90-K2AFD3 |  |
| UniRef90-L1LGH3 | K M Y |
| UniRef90-UPI000361D014 |  |
| UniRef90-A2CCL1 |  |
| UniRef90-G7YRX9 | R |
| UniRef90-N0BB25 |  |
| UniRef90-K1Y7L9 |  |
| UniRef90-K2AB32 |  |
| UniRef90-J9ZB81 |  |
| UniRef90_UPI0003D05A28 | K |
| UniRef90-L7KI35 | R Y Y A |
| UniRef90-A0E0J0 | NWY |
| UniRef90_V4BB49 | T M F |
| UniRef90-Q7VDR5 |  |
| UniRef90_UPI0001D615EA | T M Y G |
| UniRef90-J9D369 |  |
| UniRef90-D2V4W5 | N Y F |

UniRef90 F8L752 UniRef90 W1NJI2 UniRef90-UPI00042C00DD UniRef90_A8BW19 UniRet90_A0B5F5 UniRef90-K2EKU6 UniRef90-A0AO23HXT4 UniRef90-C3ZCJO UniRef90-L2GEU9 UniRef90-T1KY57 UniRef90-B5IQGO UniRet90_C1FEC5 UniRef90-E9BLS3 UniRef90-U6IBG6 UniRef90_K2FB84 UniRef90 R5Z404 UniRef90_W7TYF1 UniRef90-J9FIF2 UniRef90- B4FSA6 UniRef90-UPI0004411F07 UniRef90-A0A024TAP9 UniRef90-R9LPC8 UniRef90-UPI0003C1032C UniRef90-B7PT12 UniRef90-K2A2L2 UniRef90 A0A023DXJ9 UniRef90-M7CF63 UniRefono-R1GXP1 UniRef90-R7G8W1 UniRef90-G7DZU2 UniRef90-B8CAM0 UniRef90_C7LYS5 UniRef90 A4S1B5 UniRef90-R6FUC7 UniRef90_W6L3R0 UniRef90 R7QDY1 UniRef90-C1MTM1 UniRef90-A2FMJ1 UniRef90_x1LE22 UniRef90-K2B0C9 UniRef90-Q013L4 UniRef90-F4DJ28 UniRef90_W4M9Z4 UniRet90_O2CG47 UniRef90-R1CUX0 UniRef90-W8JGE2 UniRef90-B8BQH2 UniRef90-W0BCC8 UniRef90 F2JE54 UniRet90-G3H6B4 UniRef90-EEYFT1 UniRef90 ${ }^{-}$W1 JKS 7 UniRef90-R7LIG5 UniRef90-UPIO00299D522 UniRef90 B9IQC4 UniRef90-K2BUI1 UniRef90-AOAO22R8N0 UniRef90-UPIO0042B140F UniRef90 K2B8Q5 UniRef90-G2QL68 UniRef90-A6USA4 UniRef90-X1CGY0 UniRef90-F4HL26 UniRef90-W4XQV4 UniRef90-M7T144 UniRef90 X1IS35 UniRef90-K6U954 UniRef90-M5Y1Y6 UniRef90 W7ACU2 UniRef90-C4UEK8 UniRef90-Q869B9 UniRef90-F4BZS7 UniRef90-Q7DH22 UniRet90 H3BAY6 UniRef90-D7DTK1 UniRef90-K6V205 UniRef90_K4ME41 UniRef90-W1F4V0 UniRef90- СО UniRef90-Q12XE3 UniRef90-UPI0003500ACF UniRef90_T1C819 UniRef90-TOLJW8 UniRef90-K2F2E2 UniRef90-Y2Y737 UniRef90 D1YXTO UniRef90-G9BAN8 UniRef90_X1UJG5
$M K L V A E C S R S R A R A G E L R L P H G P G A T P V F M P V G G T Q Q A T$
 FS F EVVLKRSTLAR LGGVI RTRRGDI ETPQFDPVATVAS
 K H A
 $M P \vee A T Q A S$ A L N FR R I I K K T R A R S SH LTTLPYGTVKTPVFMPVVGTNGT MTFQFELIATDGRARAARLSLHPRESRTPMFMPVGTQGS

 FSFEKVKTNGLGRAGIIHTPHGDIVTPAFMCVGTGGK K DFFRFELLHRSSRARVGRLHTPHGNVNTPGFVAVATNGA
 K DFFRFE VVHQSSKARVGRJHTPHGVIDTPGFVVPVVGTNAAA QFSFEIVKKGQLGRAGII HTPHGDIVTPAFMCVGTRGQ MQF TL L Q Q D GLARRRGTVHLAHGDVQTPAFMPVVGTYGT ME F S F E LI S K D S K A R C G VI H T L H G D I Q T P A F S P V A T K A T K F E V K K T T S Y GRLGT L LTAHGKIS T P S F F F CS T K A T
SALTFELVAKCSRARASTLQLPHGPVQLPVFMAVGTQAS FEI FKETDKGRTGQLSLNHGIVTTPVYMPVATRGA FSFEITKRGK LGRAG I H TPHGDIKTPAFMCVGTRGE MPVATQAC
R DFFEFE LLSKKS LARVGRDHTPHGVIDTPGYVAVATNAA MRPS FRRDAT DGTARAGTLTDRHGLVPTPVFMPVATRGM PRFRFEVLSTRSNARAGMIHTPRGTIATPGYVAVGTNAA $M P \vee A T Q A A$ PFFRYELIHRSSRARVGRDHTPHGVVDTPGFVAVATNAA R DFFRYELIHKK S NARVGRIHTPHGVIDDTPGYVAVGTMGA
 FKTELLIKKHRSARVTKKITTPHGDVLTPTFMPVGTRAB


PGFRFEVLHESSRARVGRDHTPHGVIDTPGFVPVGTNAA DFKIVVKKCSTARVSIFELNDTCLEDP IGMPVGTYGA MALKFHVLHKKS QARVC QIE TAH GTIDTPAFVPVATNGA K A Y F R F E I L H K K S L A R V G R I T T P H G V I D T P G F V A V G T N A A


RFN $\square$ S TECK $\square$ T K A R S A VMK L P H Y D VK T T VF MP VGT Q G T

 $\square K$ F E $\square$ K A R D GAGR L G K $\square E \square N G K K \square E T P A \square M P V V N P K Q$


$$
\mathrm{K} L S L P \text { Y G E V Q L P A F F P D A T Y G T }
$$

 PGFSF TVLKESNHSRIGGI KTVRGEIVTPNFLFCATKGC



FEDTNKDLLGRTGKLYTPHGVVDTPTVMPVINPN $M S F E \| L D R D L L G R \square G K F K T K Q G V I D T P L F L P V V N P L K$


UniRef90-R1GXP1 UniRef90-B5Y8Y3 UniRet90-R7G8W1 UniRef90-G7DZU2
UniRef90
B8CAMO UniRef90-C7LYS5 UniRef90-A4S1B5
UniRef90_R6FUC7 UniRef90-W6L3R0 UniRef90-R7QDY1 UniRef90-C1MTM1 101
UniRef90 A2FMJ1 UniRef90-A2FMJ1 UniRef90-K2B0C9 UniRef90-ODO13L4 UniRef90-F4DJ28
UniRef90 UniRef90-Q2CG47 UniRef90-R1CUX0 UniRet90 EOSTF2 UniRef90-B8BQH2 UniRef90-W0BCC8 UniRef90 F2JE54 UniRef90-G3H6B4 UniRef90-E1YFT1 UniRef90 ${ }^{-}$W1 JKS5 UniRef90-R7LIG5 UniRef90-UPIO00299D522 UniRef90 B9IQC4 UniRef90 ${ }^{-}$K2BU1 1 UniRef90-A0A022R8N0 UniRef90-UPI00042B140F UniRef90_K2B8Q5 UniRef90-G2QL68 UniRef90-AGUSA4 UniRet90-X1CGY0 UniRef90-F4HL26
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UniRef90-F4B7S UniRet90 07 DH 22 UniRef90-H3BAY6 UniRef90-D7DTK1 UniRef90-K6V205 UniRef90 K4ME41
UniRef90-W1F4VO UniRef90-X0XGG7 UniRef90-COHA69 UniRet90-Q12XE3 UniRef90-UPIO003500ACF UniRef90_T1C819 UniRet90-TOLJW8 UniRef90-K2F2E2
UniRef90 Y2Y737 UniRef90-D1YXTO UniRef90-G9BAN8

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UniRef90-W7TYF1 UniRef90-W7TYF
UniRef90_J9FIF2 UniRef90_B4FSA6 UniRef90_UPIO004411F07 UniRef90_A0A024TAP9 UniRef90-R9LPC8 UniRef90_UPI0003C1032C UniRef90-B7PT12 UniRef90-K2A2L2 UniRef90-A0A023DXJ9 UniRef90-M7CF63 UniRef90-R1GXP1 UniRef90-B5Y8Y3 UniRef90-R7G8W1
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 K LM GWPNNI LTDSGGYQMVSVTEDGVSFDSPKRVLLTPEE RFMSFDGPI FTDSGGFQAFRITDEGVAFKSGGWHFIDPRS $R F M N W D G P I L T D S G G Y Q V F K L S E K G V K F D D P N R H F M T P E K$
$K M M G W N G P M L T D S G G Y Q I F K I D E S G A R F R S Y I T Y H L T E ~$


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## R

 NFMSWPRGULITM QWSGWN GPTLTTDS K FVNRNRPIITMDSGGFQQVFKIGSEEGVYF S F IN WP Y S IL T D S G GF Q M M NVE E E GV N F


K F M S WK NA L L T D S PFMGWTGPTVTDS

R F M GWDKNVLTD S KWS GWNGPTLTDSGGFQVMSLGSGlGKVV
RFQGWQRNMLTD
AF $\square$ T R P N P LI I
AFTGFGGPMLT

FFE GWK GNI LT DS GGF QLVSI T E E GVVR




RFMNWDRPILTDSGGF VMAR

RFMK Y N R GML T D S G GF QI G S L P DVVVVTEE GVVK FELDFTPE D


ML L S P
$M T N E G Y S$ F Q S H $\square D H V G$
$\square T E$ E GVK F K S P Y D T M $L$
KFMGWNRALLTDSGGFQMVS DTEEGVKFKSPYDTML

$R$ LMA WQGPMLT DSGGYQVFSLSKNSK■CKAHFKHHLTPQS $K M \square G L H D F G L A A D A R D S I Q C L P E S S A T N T P C G R L L I X P A E$ NMMGWHKPMLT DSGGFQI CKIIKEE GAYFKHPDTIML N SRT

 HLT GFKNVVVT DS GSFQL MTDSGGFQVFK IDD GVEFKVYGNVNVEPME $R L L N Y D G \square I E V D S G S F Q L M R$

K LID F S GPVVT DSGSFQLSE

 DFMQWHGPDLTDS GGF QMRKI KEEGVVTFQNPDKVFLSPEK




RFMGWERAILTDSGGFQVFKVDDGGVTFRSHSQHRFTPEL GFMNWKRNLLTDSGGFQMVSVTEEGVKFKSPYDILLSPEQ SLLD F D GPI MT D S G S F QL
GYTGFNGSYFTDSGGFQ UVKVDNEGDIFKDRKSVRVTPEV K F MN NW G Y V I S D S G G F Q Q V G S V $V$ N D K G A TF K P V

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240 DRNLPGYAI GGLAGGEDKDSFWRVVAQCTAALPEDKPRYV


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 SLPF D GFAI G GLLSVGEPEELMYELTYEVLDALPKQAPKYM
 S LP F D G Y A I G G S L G K D S G ELLM ELL L E WMMP F L R R S K P R H L


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SLPF DGYG, GGLS GGESKDQFW
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$R R N V S G Y W V G G F G L G E S M N E R P A L L N A V D E T L P$



 D
QANLP GNAIGGLSVGEPAEEMYAMIEVVNNILPESKPRYL

 D I GF D G
SLP F D G $\$ A LGGG S LGK D R NEMKE L L K T IIP F IP K N K P N H L SQPF D GIA I G G S L GNSK QDMHQVLD WTIPRLD DRPRHLL EGFDGYGFGGWPLDRDGSDRLDVLKMAADAMPDTKPRYA Q R DVVP GF A DG GLS GGEEKDHFWRMV T L S T DHLLPREKPRY L


 K R DVP GF AI G G L S G GEEKD DFWRMV T L S T D HLL PREKPR Y L E H K FDDVY P L G AVVP LDMESY R Y A E L V V DV I V S S L D P T V P V V H L

 ELDFP GYAIGGGLSVGEPKPVMYKMVEHTEQFMPKDKPRYG AMDFDDYPLGAVVPLMEAYRYRDLVDRSKMGLGPAAPVHL
K MP F H I Y A L G QVVMER Y L F N F L V D M M M T A KR N L

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 $M G V G F A D V D L V V C D S A L G C D M F D C V V F P T R R T A R F G S A L V E L G G Q$


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 MGVGDPYLIA HAVELGVDAFDCVAP TRLARHGIALTSQGR $L G I A D M E N I$ EHAVANGVDTFDSCYPTQVARHGTLFTRSRR $\bar{M} G V G T P S N D L E A V E R G V D F F D C V Y P A R N G R H G H V Y T N K G K$ $M G V G Y P E D I M V C I A M G V D M F D C V F A C R T A R F G S A L T S T G K$


 $M G V G S P Q D L I D V V A K G I D L F D C V A P T R N A R H G S L Y C N K G K$
 $M G V G R P R D L L Q S V R L G V D M F D C V M P T R N A R N G F L F T S E G R$
 M G V G Y P E D D V V C V A L G S D M S D CVVY P T RTAR F GR GF S D S G D L GI G D L P S I R A A V K F G I D S F D S S Y P T K liA R H G L I L S S P P K P
 $M G V G T P E N L L D A I S L G V D M F D C V M P T R N A R N A T L A T H E G K$ $M G V G Y A T D M V V C V A L G C D M F D C V Y P T R T A R F G S A L V P T G N$ $M G V G T P E N D V D L V A C L G A D M F D C V V M P T R N A R N G Q M F T N K C T$
 $M G V G T P D D D L E A V K R G V D M F D C V M P T R N G R H G V A F T R F G Q$




 $M$ GUGGY P E D DL I V V S V A LiG A D M F D C $F G C G H P M L D F A L S V$ A L G C D LIF DSAA YA L Y A K N GRY L T E N G T M G L G D P V GI V EA I GS G I DMF DCAMP T RIDSRNGSAAFTS G G R $F G A G H P M V F A L D A V A M G V D L F D S A S Y$ A L Y Y A R D D R Y LTTP H G T
 $M G V G T P A N I L E S I A L G V D M F D C V I P T R N G R N G M L F T N N G I$ $M G A G H P M D F A L A V A M G C D L F D S A A Y Y L Y A E A D R L L M P G G T$


 $\bar{M} G L G R P E E I V A C T Q M G Y T D F D C V D P T R E A R H Q R L Y T Y T E P$ $M G V G Y A V D L V V C V A L G C D M F D C V F P T R T A R F G S A D V P W G S$ $F G C G H P M L F A L D S A L G C D L F D S A A Y A D Y A K Q G R Y L T T V D G T$
 FGAGHPMMFALAVADGCDLFDSAAYADVAKDRRYI TS R GT $M G V G K P E D L V E G V R R G \square D M F D C V M P T R N A R N G H L F V T D G V$ M GVGS P D G L
M GVGYGCHLPYVITAHF
$F G A G H P M M F A L A V A L G C D L F D S A A Y A L Y A K D R R Y \square T S K G T$ $M G V G Y V E G R R P C \quad L W G A D F W$
$M G V G R P E D D V A A V R R G V D L F D C V M P T R N A R N G F L F T A Q G T$ $M G V G D P D S I V E Y S E L G V G I F D S T Y P T R N A R H G F A L T N D G P$

 F GAG H P M M L A LDA V A L G C D D L F D S A A Y A L Y Y A K D G R Y M T V D G T F GA GHP F M L A S F A V A A L G C D I F F D S A A Y A I F A R E G K Y L T D Y G T




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TPAAHAMSQHNUFQARLMGGARDA MNGTFPDY LRSFFR PTAMMLATLHNLHYMVRLMTTFRQHILDNR KEYFRLATQHNLRF \ILRTEE $\square R Q A 乌 E D R F E Q Y K D E F M A$
TVACHL MRTMKSTRDNTKAGTFVDFVKGFMG ILAQRLASTHNVTFDNNLMTQ：RDA：HNNDFLVLKAHW ITAGSALTIHNIFFMNTMMEERRG｜DDNDMPEVRSKWLG TVAMHLLTVHNIVYQLLNLMRSIRESIVEQRFPQFVRDFMR PLGLFVATVENLSYMADLTRKLRAAIEGGSVDSLKEEIRY NQYYNLASI HNLRFIIRLTEDARAAILNGTFPEFKAEFLK TVGAHVVTLHNLMYQRRLLLQAREAIIKGRYPEY LRTFFR PVFMQLATIHNLQYMNDLMKEQRKLI LEGK
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MLAHILLE HNAHYYLGFFRMMREAINRGKFNEFRQKFVA MLAQILLEI HNTHHFLGFFRSIIREAIKAGRFEEFRKKFVQ PLFNQLASIHNVQVMQKTCEVMRETIYNGD
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 RSKLGAHUNLRVSFAEVRMIRQAVVEGSGWELVEQ MGAQTLLETHNTHHYGGFFCSVREAUKSGNFEQFRQKFVE
Q TYFTLATQHNLRAMSRLMENYRNKLQNE
LSYFRLATLHNLHFMLRLMESTRESURCGSFMEDRDRWLK SVAYRLATIHNLRFYSRLMEMLR
TAALHHLTIHNI AYQLNLMRSVRES LEQRFPQFVQHFMK KEAERLLAEHNLYMTFEELDR｜MKA：KEGNLWELVEEWV NLLGTLLTGHNVCYMNRLMEDI REGIRCGCLDEVERRWVR ILGARLNTGHNLRYYQRLMAGLRKALEEGKLESFVTDFYQ

$\Pi L G S \prod L A T Q H N \Pi R Y Y Q R \square M A G \square R D A \prod A A A R \square D D F C$
PSFQYLVTVHNLDFMQRFMEMVR
STVGRLVTIHNLRFYSTLMEKL
TFGURLTT DHNLHFLLKLMEDi RQATREDRLDDFKEEFFE
$K T R T R L L A E H N L Y A T F A E L K L I K Q S U V D G D L$
1

UniRef90 F8L752
UniRef90 ${ }^{-}$W1NJI2
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UniRef90-A8BW19
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UniRef90-A0A023HXT4
UniRef90 C3ZCJO
UniRef90_L2GEU9
UniRef90-T1KY57
TMY
GLY
QHY
R R F
A Y Y
R
D Y Y G
E Q F
G Y F G
R Y Y
$\square \mathrm{Y} F$
R
TMYG
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RYY

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## T M Y G

K
D W
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UniRef90 нзвас8 UniRef90-W1NYA1 UniRef90-A9TIJ0 UniRef90-I1G317 UniRef90-A3Z2H5 UniRef90-D3RZP1 UniRef90-K9SHT2 UniRef90- J9D2Z5 UniRef90_UPI00025561A5 UniRef90-F8Al71 UniRef90 WOK193 UniRef90_X1LAM6 UniRef90-W5L5X2 UniRef90_UPI000258EE35 UniRef90 U1NBE9 UniRef90- X1N467 UniRef90-V4J028 UniRef90 S4PTG4 UniRef90-K2ESP8 UniRef90_Q2MFY3 UniRef90-A9WEM6 UniRef90-C0PRC2 UniRef90-FOZXU2 UniRef90-G7WKT4 UniRef90_A2BK22 UniRef90-B3L067 UniRef90_UPI0004418F2D UniRef90_UPIO0036E8F12 UniRef90 C6SLP7 UniRef90-K2DX49 UniRef90-U3ABR2 UniRef90 M7T9T3 UniRef90-F7XNL3 UniRef90-G6ES04 UniRef90-M0RRP6 UniRef90 R6YQR2 UniRef90_Q7ZVJ6 UniRef90-L9ZS84 UniRef90 K7F3D9 UniRef90-17LON2 UniRef90-R4W5H6 UniRef90-M1XTL9 UniRef90 UPIO003F0E586 UniRef90_UPI0003D77FC7 UniRef90 ${ }^{-}$M5RE53 UniRef90-F7FLB4 UniRef90-E6ZIT6 UniRef90_O29667 UniRef90_F7CCC8 UniRef90 G5AL37 UniRef90-W9RC06 UniRet90_LOHDB7 UniRef90 A3DN00 UniRef90_UPI0001CBA294 UniRef90-W5M5Q4 UniRef90-H3D5B1 UniRef90_Q8TYV3 UniRef90-E5S5Y3 UniRef90 Q7PDU9 UniRef90 A0RY47 UniRef90_UPI00037A9292 UniRef90_V4J811 UniRef90-TONDF4 UniRef90-I3D1P5 UniRef90_K3X8H4 UniRef90_V4Y3Z2 UniRef90 K7IW16 UniRef90-U1PIA8 UniRef90-XOVEN7 UniRef90_X0XRX3 UniRef90-X1GQS5 UniRef90-B4N549 UniRef90-Q8ZYH2 UniRef90-H2C6Q0 UniRef90-T1ABU8 UniRef90-LOHHZ6 UniRef90_E8R779 UniRef90-Q29EE9 UniRef90-D6WEE4 UniRef90_EOSPS8 UniRef90-TOLQ22 UniRef90-MOMMU9 UniRef90-UPI0002653E22 UniRef90 W5J666 UniRef90-W4UEL5 UniRef90-C3ZCJ7 UniRef90_A8A9Q9 UniRef90_Q7RPH1

1
 MTEMVRASRNGARTGVFTVGSSPIETPSLLLSTRKGL MEFTVRACSGHGRVGSLRLASGEFETPSLLMDTRRGL
RFSIVANCSVSKARAATMSLPHAVVDTPVFMPVGTQGT


MEFKDHATCGKSRDGELHFERGVVRTPAFMPVGTYGT FRFEI KARDAAGRI GRLEVNGKRIETPADMPVVNPKQ MRAVFEVGAQDGAGR』GELEIPRATVETPTLMPVVNPNL
$M K \square E \square S K V V Q G C R L G L L T T A Q H S D D V P G C L L F T H C A T$ $M K F N$ SHSTKSCSARI GTLRNPDLTFETPGALVYTKGGS MRDHFE $\square$ RDADAAGR $\ G R L E \square P R R T V E T P A L M P V I N P N R$


M R D VF E DR A Q D A G G R VG D L H VP R A T V MTFEI KSRDAAGRI GIFRTKHGTVTTPNLMPVINPNK MSSSFE LLKRCASGRIGKLTTPHGVVETPTVMPVINPN

P DE T P S LLIS TRKGL
MKLELSRVVQGCRLGVLTSGQHSLEVPGCLLHTRCAT

$K \square E L S R Q Q G R R D G V L K A G Q H S D E V P G C L L Y T H D G T$ RFEI LDKDAMGRI CRIETPHGRIETPTQLPVINPN MKLSLSRVVQGCRLGTLKKGDRCMEFPGCLLYTRTGS MKLNLTKVVNGCRLGKIKTGDHTMDDPGCLLYTKTGS MKFAVKASNGKARAGVL QLGNGPDETPALLLSTRKGL MA $\square$ AF E SLY S DLA GRTARLKTRHGVI ETPYLLFPVVNGR $M K L D V S R V V Q G C R L G V L R N G R R S V E V P G C L M Y T R G A S$ $M K L E L S V Q G G A R L G V L K G G Q H S L D V P G C L L Y T H F G T$ MNVAFEVKDRDVAGRLGRLEVNGRRLKTPALLPVVNPN

$$
\begin{aligned}
& \text { MTFEDFKCDLGGR\GS\QTSRGTVETPAFVPVIHPVR }
\end{aligned}
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MSFEVTESCTGARAGMLTTPHGVVPTPAFIPVGSQAT
MKFLVENLNKNS GRLGLLDDKAAQLKTPLLMQTTKGGS
MKFVLETVSKCS GRLGSLSASSAKFQTPTLVLHTKGGS
MSFEIIAKD LA GRVGKLYTKSGVIETPALVPVVDP
DFEVKEEDLAGRI GUI ETRHGKIETPVFFPVINPDK
MTLKFEVDARDSNARLGRVHTPHGSFDTPAFMAVGTRGT
MFFEPREYDLAGRLARLTTRHGVIETPYLFPVVDPDK
$M K F V I E S L T K N S G R L G R L H D K D G A Q R T P L L M Q T T K G G S$
$M K F Y V E S V S K C A Q R L G T L S E P S V S I K T P A V M L H T Q G G Q$
MCFE K KEQDLAGRI GRLKKTKYGVIETPYLFPVIDPLR
FEQRTADAAGRIGELLAVPRSTVVTPALMPVVNPHV
MRFILESITKEGS RCGLI KHANLAI ETPTCLMYTRAGA
$M K F T L N T V T K C S G R L G L W R D P N V A L Q T P G L I F H T K G G S$




VP HLT QDTLHTLSNDPAVTQVTLNCLAEHHEVLEEFKEGV V PHLTK KVGQMLTTDPQLLSVSGTSTLSMLESGKYCNGMK LTIEPARLEAEFGVEMLITNSYI DRETDALREQADESGLH


ITVDPARFAEFGAQMLITNSY! TKRDEALASRAREEGDH
 $】 R L V S P S K M K D M G A E \| L I T N S Y I I Y R S K K L A D H A L T R G L H$
PTFVSRDH LIA APDSLLLHVSP $\square$ HF $\square \mathrm{DCPSSKT} \mathrm{\square SN} \mathrm{\square GGLH}$


#### Abstract




VP H TT QDT $\square H T \square S N \square P S V T Q V T \square S N D A E H Q E V L E E F K D G F$ I PFI RAEEMKKFGAQAVITNSYI IVYSMREE ABEKGVH A P H L T H D






LC S DEA GEMKKYGAEMLIANAY IVYRKGNDREEAVKKGDH I P Y L S A D DLFENYVQNVLLQLT LSTMQQMAESLDALWPASSLS



 IP H THEVFKLVSRDPQILQDPLAGMHTFKEAMQYYEGTD NQYISLEEILNMGFNAII TNAYILKKNRNDD M DDIH
 VPHLT WDLVEN $V P H V S K E V L Q Q L S S Q M S I S N T \square H M Q E A V Q G C Q K T \square G E F V A$

| UniRef90_H3RQC8 <br> UniRef90 W1NYA1 <br> UniRef90-A9TIJ0 <br> UniRef90_V9ZP20 <br> UniRef90-\|1G317 <br> UniRef90-A3Z2H5 <br> UniRef90-D3RZP1 <br> UniRef90_K9SHT2 <br> UniRef90_J9D2Z5 <br> UniRef90_UPIO0025561A5 <br> UniRef90-F8A171 <br> WiRol90 WOK193 |
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RFMAWDGLVI AK P GDFRKNHLTKDG|V|RFHDVKTR|LIMTPQT
 GFSGYRGVILTDSGGFQLYSRDKE ILIFRPDGGREKLTPEK NFMRWDRALLTDSGGFQMVNVTEEGVHFQSPSPMLLSPEA RFMGWDGPMLTDSGGFQVFKIDERGVVFRNPRDVDMTPEH RMS GWQRPIFTDSGGFQAYS DKNY I PP PGSI MMSPED DFMQWKRP!LTDSGGFQVFKDKEEGVYFQNP DKIFDSPEV RLLDYNGII EVDSGSFQLMR EMLGFDGAUMTDSGSFQLAEYGE
RKFAGLHDTALYCS LHDSATTNPAGHDWGSGGRMELTVAK EYLNFLTFHDPCYAIPSGYHQTDFGPLWTRNGKYMLTPNK EMLEFDGADMTDSGSFQLSEYSD

VDVTTEE
EMLGFDGATMTDSGSFQLAEYGE
TSVTTRE
KFMGWNRALLTDSGGFQMVS ITEEGVKFRSPYDIMLTPEK NFMNFKGGVI SDSGGFQVMSVIKSGNIPTRKTKKILTPEK RFMAWDGVIVSDSGGFQVRKQGKTGAIRSSAKKIVLTPEK QMTAWS GPIVTDSGGFQAYRITDQGLTFQPEGRFQLTPEK GMLSMPEYGF $\quad$ A $\square P R D S V M C I P N A E S F E T P Y G H R M V K P V Q$ VFSMGHPELNNNNNDDSIDSITDEGVTFRSYKKDSLGPVS RLLGFEGPIMTDSGAFQL
 NFI RFPNAMLTDSGGFQMIKDLEEGDLFDNDYDEVKEAKD GKF $\ G M P E S I L Y C S L Q D P A V C S P H G Y I W N N R G R K E F T A S K$

RKFA G LHDTVIF CS LHDSASPSPAGHVWGSGGRDEDTAAR DLLDFPGA IMTDSGSFQLAE YGDI DVTTEE GKF $\square G M P D S V L Y C S \square H D P G T P C P F G Y \square W G Y G G R V E M T T S K$ SVLDFDGTIMTDSGSFQLSVYGE VEVSNRE
 DYVGYPGYRDPCETTPTGGNDRDVVPLFTRHGKESLTAAR GKF $\square G M P E S L L Y C S L H D P V N P C P A G Y V W G V G G R V E M T A S K$ GFMNWPHNLLTDSGGFQMVSVTEEGVHFRSPYDTLLSPER

RKFSGGHDTVLYCS $\square H D P A T P C P T G Y T W G S G G R D E D T V A K$ GULETDMPVMTDSGSYQLMV GKFIGMPESVFYCSLHDPVNPCPAGFVWGVGGRLEMTVAK GNFI GMPESLLYCSLHDPVSPCPSGYVWGGGGRVEMTVSK KMLGLPDYGFAAVARDSMQSDPEYSSTNTRVGRLLDKPVD KVLDFDGVIMTDSGSFQLSVYGEVS ITNT EALGWNHVIMTDSGGYQILV YGSVEDDNKT GSFTSQQDSLPGTTMPSGYNEKQFVSDWTTGGRMRLSTAT RKFAGLHDTVLYCSLHDPAAPCPAGYVWGSGGRDELTPSR RFAAGLHDTVVYCSLHDPATPCPAGHTWGSGGRIELTAAK GLLGFDGFVMTDSGSFQLAE KFMNWNSCILTDSGGFQMMNDSEEGVHF DSPHEMLLSPER

$S$ SLGCEMPDMTDSGSYQ DSEYKD VEVSNSE HYLGFPGQRDPCESTPSGGNDRDVAPDFTRQGKESLTPER QKESVSLLVLRDPAEPCQPGYHEKDVVPVRSGRKNFTAES KVLSWNAVLMTDSGAYQDLR
QKFGDDLIIMTDSGAYQILEYGDDNETNRA
KFSGFNGPMLTDSGGFQVFSLSDLRQFDRDHVTDRLGPVE RMLDFPGLIMTDSGTFQQHVVIYGDVEVKNKE WDKTIMTDSGGYQVLV
$V L L L R D P C E T T P A G G N D R D Q P D F T R R G V E E V D N R T$
$V$ $G H L N V L L L R D P C E T T P A G G N D R D \square Q P D L F T R R G K E S L S A Q R$
$S N F I G S K D S L T C L T L Q D P C N D T K Q G H I W T K N G K V Y Y D A K S$
 DLMGFNGPIMTDSGTFQSYVYGDDEYGNT DLLDFSGAIMTDSGSFQLAEYGE DGVIYASVQDPAHPTRTGYNDKKGVSVFTCAGRTKKITTPE QNDAVSMLVLRDPSEVPVSGVPERDPIYTRCGRRTVKVDA
GKFTGMEDFF LYCSVQDPYNFNKGVSVWGPGGRПKDEVAD ERLGWEGLLYTDSGTFQAYSRG

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UniRef90 W5L5x UniRef90-UPI000258EE35 UniRet90-U1NBE9 UniRef90-X1N467 UniRef90-V4J028 UniRef90-S4PTG4 UniRef90-K2ESP8
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UniRef90-A9WEM6 UniRef90-COPRC2 UniRef90-FOZXU2 UniRef90-G7WKT4 UniRef90-A2BK22
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UniRef90- UPI0001CBA294 UniRef90_W5M5Q4 UniRef90-H3D5B1 UniRet90_-Q8TYV3 UniRef90-E5S5Y3 UniRef90-Q7PDU9 UniRef90-A0RY47 UniRef90-UPIO0037A9292 UniRef90-V4J811 UniRef90-TONDF4 UniRef90-13D1P5 UniRef90-K3X8H4 UniRef90-V4Y3Z2 UniRef90-K7IW16 UniRef90-U1PIA8
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UniRef90-MOMMU9 UniRee90-UPI0002653E22 UniRet90-W5J666 UniRef90_W4UEL5 UniRef90-C3ZCJ7 UniRef90-A8A9Q9 UniRef90-Q7RPH1
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 AMDRTHQWA乌LEFQREVGSDTGTPVDTPTPPDAGRERAEADLETTAE SIEDQNCUGAD IMQLDDVVQTFQDYDRDKEATERTSRWL SIAFQMKLGTDMVVVLDDFTSPKATYDEAKESVERTMLWA VMEWQFGLRSDVVVALDDCTGPEDSPAEQFASTERTVRWF YMENICALKPNLWSSLPDEVPSWVSDKRNUISSVDRTTRWL SVQYQKKLGAD IIPFDELPPYHMDEQKLLESLQRTHHWE




FMSDQAAVQPDCYMADGETWQANTSRKRVRKAVDRTDAHD ILEFQHADGSDIGGPVDDPTPPDVPRERAE
FMNMQRAFKPDWIQCDGDTTSGETSRKRAKKSVDRSEELT TLEFQQA GSD IVQPDDPTPPDAGRERAARELATTMDRI LLQFQREVGSDVGTPVDLPTPPDVAREEAERQLETTLDRL YMDMVANFAPDVYQLCDADTNPESTKKRVQKSVDRTERFM FMEVQEALQPDWFQCLSDGEASYASTKRARKSVDRSLLFL SVEIQNALGSDUIMQLDHVVSSTVTGPLVEEAMHRSVRWL

GSD DIMQLDDVVSSTVTGPRVEEAMYRSi RWL



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UniRef90_X1LAM6
UniRef90_W5L5X2

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240

 E $\square$ GFD GY GFG GWP L G S D GA $\square R M D V L K M A A D A M P D H K \amalg K Y A$ KLDLPGYAIGGLS GGEKKEEFWRIVALCSDLLPSHKPRYC

 K HK K N G I A $\square G G G L C G G E N K E D F C K T V D F S \square K N L P K E L P K Y V$ K NWFRWLCNRWLSCW
EMNFEIHPD I GAVVPLMESYRFRELVDVVIAGLRPDRPVHL

 DK PVIGGYI ID GLLHNNGPDDDQDKQVVA HTANLLPPPEKLLKVS

 | $A$ | $T$ | $D$ | $L$ | $D$ | $V$ | $F$ | $P$ | $V$ |
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| $T$ | $G$ | $A$ | $V$ |  |  |  |  |  |
|  | $K$ | $D$ |  |  |  |  |  |  |
| $N$ | $G$ | $F$ | $A$ | $I$ | $G$ | $G$ | $L$ |  |

$K \square G F D G G G Y G G W P D D E E G N F D F E S A K T D A E N T P K D Y F L Y G$ ESGAQGFGFGGWPL SAE GKLEREMFA LLAR DTPQDAPDFA $D \square G F D G F G F G G W P L D A Q G Q L L D E D V A F T R D Q D P A R F P M H A$






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




 K R PVGGF L L
R D D D R CA
SMNFEGFAVGGLSVGEAPSEMYRDTEATCPHLPEHKPRYL K R D V P G F A I G G L S G G E S K S Q F W R MV A L S T S R R L P K D K P R Y L

 K R P V S GF L L D GF Q GNP T T E T R L Q L L S L V T A E L P E D K P R L V



 E LDPAA V
 GYGFRMMALGSPVVEMESYEYGPMIAAARESIPDSVPDHL
 E A S Y P DGGGVVVP L L E E S Y R Y S D L V V N I I I N S K I




 QQP E G KYS GY IL E GF H N N S Q L L P V V E H CVVK QL E E N K I K M M KLGFH DFAVGTLLEEYRFDLLLEVI LHVKANI LDREAPLHL KANDYGMYPTVLVEKYRYS ELIVEMHVAKSNVSRGKPMCL




 | $G$ | $T$ | $G A$ | $G$ | $Y$ | $L$ | $P$ | $I$ | $G$ | $G$ | $V$ | $V$ | $P$ | $L$ | $L$ | $E$ | $Q$ | $Y$ | $R$ | $Y$ | $C$ | $E$ | $V$ | $I$ | $I$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



 E A G A R L L A V G G V V P L M E E Y K F K E L V V N A V L P V L P P P E A A V H A UniRef90_Q7RPH1
UniRef90_IOA229


$M G L G D P E G \| I K A V S L G V D M F D C V L V T R D A R N G V A D T Y E G K$ F GAGHPMLFPLAVALGCDLFDSAAYALYAKGKRYMTSDGT
 F GA GHPLVLPFAVALGVDLFDSASY ILYARDRRDMLRDRT F GGGTPQVMPFAVALGVDSFDSASY\|IFARDERYLTRERT

F GAGHPMFFPLAALLGVDFFDSAAY IKYARDDRLLFPHGT

 Q G C WN P V NVI NL V EMG IDLLD S S Y CHJILTERSAAMT FTYE F GA GHP I I I PLVVALGVD FMDSAS Y LLVAE DFRYMTRRST F G G GHPMFMGMAV L L GVDDV D S A S YVVKYAR D GR L L F Q E G T F G A G H P M M F A L A V A A G C D L F D S A A Y A L Y A R D D R Y L TVVR G T $P G V G K P T D V L Q A V E A G D D I F D S S Y P Y Q V T Q R G W A L V F P C E$
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 $\square$ NL RAT $\quad$ MYRKD L S P I MNLRSATYGDDETPLVTGCKCYTCKRHTKVY NQLLNSNE

EK LSEDLNYF PCSCPDCLEYTPEEMRRMEKSE
 $L C M L R T \square Y A T D L R P \square D \square D C G C Y T C L N Y T R A Y L F N I K F T$
KHLNELEYF PCSCPVCSRYTPQELREMPKEER EHLDDLHYF $\quad$ CCDCPVCADHTPPEVQGMSAVD LRRISNRFENDNNPVDKNCDCYTCQNFSRAYLHHLYSVKE MNLNDKRYREDLRPLVEGCSCYCCKNHTRAYIHHLLVTNE HNVCNNRYREDFSPICSQCECDACKNHTRAYLHHLCHTRE QQLEDLDYF



VK TRNAKYREETRPLDEHCPCLAC RHS LGY D RHLFVAKE LQLRRKVFEKDFGPINPECTCPTCQKHSRAFLHALLHSDN L L K DK RY QGDFRPLVEGCGCYCCKNHQRAYLH HLLVTNE KKLSELNYF PCKCPDCSNHDP PEELRRMEK YEPKEKMYRDDFGPLVGGCSCYCCKNHSRAYVHHLLVTNE ■NLKEKKYREDFSPLVKECSCYCCKNHTRAYI HHLLVTNE

K RLE E ELA Q Y

KRLEELQYL PCNCPVCSRYSVKELLEMPRYKR
 FCPKETRYREDFGALVEGCGCYCCRNHTRAYLHHLLVTNE

L NLGKKAKYSTDFK S|QQE
 NCSCYVCSNYSKSFLHLLLDTKKN
 VRLQEALEYF PCSCPVCSRYTPKDLLEMPPAER RYLK D DHLREKRFERDFRPLLHGCDCFACKHYTRAYDHHLQNVRE
 KHLDELDEHL PCSCAVCAGHTPAEFQSLRTS
$\square N T K N F K Y R M D F N P L \square H D C N C Y C C K N Y S R A Y \Pi R H \square Y \square S N E$
KKVVK TSDSNACWAEDFTGFVDGCQCLACTKHTKAYTHHLYNTRE LRRLEDVKTDYLPCSTKLCHKP VKELREMPH

VHLLRDLKYPPYFSPVLE RYDLGEVKSMPK RSI RDLHYL PCNCPVCSRYTVRELLELPRRER
 YRLEELKYF RDLKE M MEFPMWSP $\square$ EQLGELDY L VPPAHSQFAEDFSPVLPCECPDCVAHTPDDLRDLGGD V

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 PNAMRLATAHNDRFYGRDMEYLRDA

RE LLLGKHNDYVSFEEMRRVKQATKNNELFELVER T LYY Y L ATIHNLRFMARLMELLRKNLRRDQ T NFCSLMTVHNLFFMENLTKRARNA I DEGTFENF $\square 1$ SFFN
M RLLADHNLWMLREELNRVKQADREGELWKLVDE
REQLLAEHNLYVSFGEIRRVKQALKSGNLMELVE $P$ PLYRLAS M HNLRFMMRLIETLR
LL A GVLLML HNTAHYLRTFRAL REALANDRDQDFKRRVLQ ML SMVLLMI HNVHQYLEFFKLI RESI KNDTLQQFRKKINL


FTAGRLAT $\quad$ HNLRFYS LVDK LD Q
GLADRLATMHNLRFYTRLLEMIK
TLVLRLATIHNLHFMAQLMELIR
MLAQTLDEIHNTHHYDQFFEAVRHADNVNNFNMFSSWFVK QUYFTLSSQHNLRVMNK DMENYRNKI LADE
$\left.\begin{array}{lllllllllllll}P & E R T E \\ D & L\end{array}\right)$
 $L L A Y V L L M T H N F Q H Y F N F F S S V R N A L K E D K D D Q L R K$
$S L G G T L S S A H N V W F ~$
$S$



PV TLLAEHNLYTTFEEIRRVKQAVYDGNLLELVE
MLAHILLETHNTHHY LGFFRAMREATKGGKFDLFRQRFVE ML GLRLLVLHNLYFYNTMMSEDRDAI EENRFQEYKKKKLD LLA GVLLMLHNMAHYDGFFKALRDAITSDRGQDFKNTVLH KEREKELAAHNLHVTFAEDRRIKQAIRAGTLLEVVEQ





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

 TAA LHHLTVMNDAYQVLLA GVLLMMHNTAHYHGFFSA LREALANDKLDLLKRRVLR NERERLI AEHNLYVSFQEDETIKQAI KENSLFELVEK LLA GVLLMMHNFQHYFGFFHADREALRKDRLGQLKEKIYR

 lle




KERIDGIA L HNLHAIKSEVDRVKEAI HEGRLWEY



$\begin{array}{cc}\square L G G D L L & L\end{array}$

$\square \mathrm{L} A \operatorname{SRLLT} T H N \square H F M \square N \square M K D \prod R R G \prod K D G T F S E \prod K R K Y$
KESEDLLASHNLWVTFAEMRMVKQSIAEGSDWELCERRCR LLLGPILLMDHNLHHFMGFFETIRSSIAQDKLPKLDD


KERTRVLSEHNLY TSVEETKRTKQA THEERTWEYAE V RLLALHNLYMLAKELRSI RQAI MEGRLWEMLEH
 LLGPILVMI HNVYHYLRFFEKURKCVKSNTLQALQVSITE I RMLALHNLYTVAREDRETKQAI REGRLWEY I E E EERTRVLAHHNLFTIFMELREDRERIYEQTLWQYVEE
DERERHLAEHNLYVSFGELRRIKQAIRRGNLLELVE
LLLARVLL MD HNCHHYFEFFHSI RTSLIKDGTLQKLKEAIVN
 LLANTLATIHNERWTVRLVDQIIRGAMCSGDLDAFETEF



Q
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niRef90 11G3I7
UniRef90-A3Z2H5
UniRef90-D3RZ1
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UniRef90-U1NBE9
UniRef90-X1N467
UniRef90 V4J028
UniRef90 S4PTG4
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UniRef90_Q2MFY3
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UniRef90-UPI00037A9292
UniRef90-V4J811
SMES
$R R Q G$
Q

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R Y

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$\stackrel{Q}{Q}_{\mathrm{Q}}^{\mathrm{F}}$
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1
MRFAVTKVCASGKARAGLLIQUGSSGIVIETPALLLLSTRPAF E $\square$ RERDGLAR $\square$ ARFDTPHGTIETPTVLPVINPN

## KFETPF पMロHTKGGS

MKFKLLRESGGPRVGSM【LGREECPTPGMDTSTPGGC MRFSVSHMCKGRSGRCGEMLAVKGPFDTPTCLLYTQAGS MKFAVSLVVESS ARLGSLTIPEAVFETPLLLLHTRGAS MKFVIKSISKNS GRLGQLRIGSNELQTPLLMQTTKGGS MAFKVLQQGSAARLGSLALPRKVIDTPHFDADSSRGT

AARSGLFRDPHGPLRTPTFMPVATQGA EDGRENAARMARFKTPHGEEETPTVMPVINPNAL MKFVVEHISKNSGRLGCLVHNGKRYKTPLLLQVTKGGS

FSFKLLTTSTGAR $\square G Q L \square T R A G K \square Q T P N F \square A P S S R G V$
EFT LLKTTGAPRDGR DSLGRKTDQTPAFDGNTSRGV MKYTVEVLA S GGRLGKLTSTAGTI ETPMCTLFTKGGS
 ASECAARLGQLTLGRKPISTPHYVVPTSRGV $M K D S L T K V V N G C R L G K I K A E D R T M D D P G C L L Y T R T G S$ EFTVLK SIVGAPRLGRVVMPRRTILTPDFI ANTSRGII
 APRLGRLCLGRKP IQTPHYVP $\quad$ T SRGA
KF Q $\square E K K T L L G R \square G K \square D T \quad W G S V E T P S F Q P Y G T Q A T H$
$F Q \square L H R D G \square A R \square G E \square E \square K N K K \square L P V L L P V L H P F R$ PEMTFSVLASTAAPRVGKLAIPRKTLATPHHVPLTSRGT PAMEFTLLRASTGARLGRLSLPRNPVDTPNFFSGTSRGV MKNPFTTVHTSLAARVGKFILPRKPI QTPHY TTVTSRGA TAGNTAARLGRLALPRRDVDTPHYLANTSRGV


MKNQFK LLASRSQLRRGELITDHGSDQTPAVIPFAKREA MKFE』LDVDALARLGQIKLNNKEMDTPNLFPVIHPS S
$T A A R T G V L N L S K G T V Q T P N E L A P T S R G V$
$S A R T G R F A N A R G S F D T P S F V A Q T S R G A$
AMRFEVFKKDGAARVGR $\square A F G R L P \square D T P N F I G \square T S R G T$
 MGRVGKLSTPHGDVTTPTLMPVDDPSD

 RSEFSFTTKGKDGAGRTGVIRTPHGDI CTPAFVPVATQGA AMRFEVVSTAAA ARVGRLALPRRPIDTPNFIUMVTRGT

IIQTATREDETPAFFPVHNGKS


 KPDFSFETTNKEEKYRAGTDKVGNKTYETPSLILYYTKE GS DGQAPF LVIPTKRGAVPT
$\square P C L T P D Q$
PKMTFALDAPANSPRSGGLSFTRSEDSTPAVMAYTRKGA

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UniRef90 U6D8Y1 UniRef90_U4L2D7 UniRef90_FOVA07 UniRef90-Q0UBI2 UniRef90-UPI000359FE64 UniRef90_N1JEP1 UniRef90-V9DF75 UniRef90_UPI0003331A5F UniRef90-E5A9A4 UniRef90-W3XJ04 UniRef90-E5SIL5 UniRef90_E9DBA8
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UniRef90_U5HOV1
 MD DTPEEMKKYGVHGVITNSY IILRNDRDREEAEKYGVH QYSFMLS DKAE DHDVLEEYKEGAAKFMGMP





SH DAEHQEVLEEFKDGFRKFAGDHDTV $\square K G V T V Q Q L E E M D V E\|I L G N T Y H L G L R P G E T\| L R N M D G D H$





$\square S H D S P D N F R K V H V N G V Y V P D E D F V E K H P K Q D P P D F K Y \square R$ APHLSAAMLQRISQVPEVACMSDGSIASHHENVREFGKGM APHUTPDVMASHQVGGVHIALDEDGI KREDLSTSNEDSSGH IP HLSHDNVQKHTKIGAVYVPLEDFIGEKSNAPVYNTPCTGG




TDP WDSVIKQLKLNGVITNSY\|LKKGGFQE GKDVH V P HVAHDLMRDHTEDNSLYVGLEDSADMGPRRFPPDPCPP VPHLTPDNLRRHFEDFIERNQVAPLLQTTDKMKTVRAPDH



$A P H L T P D V L H E \square E G V P S V V Q \square T \square S T L A E H H E V L Q D Y K E G I$ IP HLS QDLFRKHTNDFVEKAPQHTPPVYEDDLPDAESPGR



 V P H V A H DVMAREQTASVVIEK QGQPGPHRKGAPPVIYNVPTAPB VPHIAHDVMRDQTADFIERKAHTGPLRNGRPPIPHESALR
VSPLTTTELASLECQALVIPALPFFVQLGEKAMQKLGSLQ




STINTLEAWHGEPEDEACMVNAFLLYKDKEKRRMFEEG

 V
 FKHLTEDTVKDFQVPMDEYGQTFEATCSAAEDFCLPPKSS
 HP HLLMPDDLLPAEARAFQVSLGHFLDRLGPDHVGNHPNGG
 EYFSRHEGKKSKSYLLHSFS


QPH W WNHFD DET $\square$ MVS A Y E $\square$ I R N R R VYEE $\square$ CEK G $\square H$ LR AI LQ P E E R Y $\operatorname{L}$ GIS MFDANEF S SL CTES QLLS S S QLLA A M G
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UniRef90_E9GAK2
UniRef90_B4IXD3
UniRef90_G2WU32
UniRef90_USMA

100
110
120 NQNCLT FLLTVKVDTGEPSGYNTNKKGVSLWMGSSGVVMEVNAKT KLLNEKGAEYKSYYDGLLSPES

DFMGLPEYILILHEGSEFFSKDSVSVWSTSGNRHTVRVED YCSUHDAASPCPSGYNTNKTVSVWGGGGRIELTVSK KFTGMPMHADPMKSTPSGFNDKAGVSVWDQGGRVLLNAQS AEFAGLKEYDNYVSVQDSGTTTPEGYHWTRGGRKLIDPQT E YVGLPGHRDPCETTPAGGNDRDVVPLFTRRGKESLTATR AFTGFPRDMVT $\square$ MGPRRCTNGSQSLS IWTSTGASTLPDDT

LYCSLHDPATPSPTGYTTNKT
VSVWGS GGR IELTTVAK FLEGWKKNVLTDSGGFQMVKDTEEGVRFQSTHGGLLRPED SLIKFSGPIMTDSGTFQSHV TYIGFKDYLDPCEDTPSRLNDKNMVPLFTRRGKIALTAQK $K F L S F D D D Y L L F L G P R R I P P V A T A G T I L T S V G Y Q Q L Q V E Q$ RFFQWDGLLLVPPRGDVIVKISEQGALYKSYHDGMLTPES KFAGLPEHVVNNFYETVPPGHFEPGKDWTKHGKKMDTADK TFACLPDGVATVLAPRRCPNGAKFMAIFTSTGFRNLTTDE EMLDFDGAIVTDSGSFQLAEYGE GKF $\operatorname{LGMPELLLYCSLHDPVSPCPAGYVWGLGGRVEMTASK~}$ AFTSHPTTSFQLLAPRRCPNTDHSGGILTSVGFRTMEVND KF $\quad$ ALLPEDTDTGEPDSQLLRLDETGAI FRSYHRVELTPER KDKVI FTT LTHDATAAVASGKNDKGGVVWGKGGKMKLDPQL EFAAVPRRAATLLAPRRTPAVTPNGNSNSSNGFQEI SNKN KESRLRRYTRVPYIPCPAHNTNSSDADSTSVGFRFLDVDK

 NFLCHQDDILLI LGPRRIPNSSNS DT $\square$ FTSVGFRQLEDGE KLLDYNGGI EVDSGSFQLMR

YGNVDVSNKE GFMNWPHNLLTDSGGFQMVSVTEEGVRFRSPYDTLLSPER KFCGMPAGAAVHDTPFDPLGKLPGGYDWTANGKVSLDVVM

## DLLGFRGIVMTDSGTFQEHMYGELNATNL $A N T S T S V A L L T S V G F T Q$

## 

LS A HE (

 RNLQSFTAFPSDRATTRVGNGAHHVSDFTSTGFRNLTDPE SFMGWDGP DMTDSGGFQVFSLAHTGVTFRSHSEHLFTPEK






 $K F\|S V P E D F L L I L G P C P P N N T P N S\| S I L T S V G F R Q L E A G E$
 EYLNYDG\|I ATDSGAFQQYMYNDDSLD I NADS



$M D L R Q Y$ VGGFEGLLCTDSGAFQGFRGSVYLNNKE GVLDYDGPIATDSGGYQILR YGDVDVNDEE




CETSSGRRWMTCEA
KKFSENGVFFVDSGGFQQKSRN RAYFGVRPTCVVLSPRDPNANDDGVFVAGPDGTKPLTVAE DFQT GMVNRSSFHGLHPSALSTASGISECEKGRDTVTVEK DFDNSYRYMNVRNGLTNNFNKEGUALYCDNGNQRVISKDE RFVDYETTLLTFNELFNKYSRDEGNQFHVDSDKYLLNEHT
DFQTILVN RSSFHGLHQSAPSTTAGISECEKGRYT TVGM
$K Y$ LGFDG LVIMDSGGFSFQKKD
$V V T S T G F Q K L D T M A B A$
DFKSVLTCRSTFQGPHCSAPSTDKCASNHERGRVVVSVDT EF L S L LQEHLLRDSSYFNEQEFGEDSUVTTRKGKTKVTUDE MSGYRTVLTLRSSFHGPHASAFSTDSTVKGRAVVSFEK

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UniRef90_A0A024JBY8 UniRef90_UPI0003EAC54B UniRef90_S4GMP4 UniRef90_B2B4Z4 UniRef90_H2XJI9 UniRef90_X1DLP4 UniRef90_G9KJN8 UniRef90_Q01DK3 UniRef90_J1AMU0 UniRef90_C1MW99 UniRef90-W6L521 UniRef90-A2EUU9 UniRef90_Q4MZD7 UniRef90_W6KDQ4 UniRef90_F0XM99 UniRef90_D9PW90 UniRef90_S9UX04 UniRef90_F0ZSC0 UniRef90_A4HFC2 UniRef90_U5H0V1





#### Abstract

$Y \square R V V K A S Q P D A F V A L S D S T P Q D S T K K R L Q K S V T K S L R F D$    Y A A H I E A L S P D I A IAAPA E H T S V VR P P A K K L V R M A D R T E E WV


## UniRef90 M7ZE98 <br> UniRef90_Q977Z3 UniRef90_K2BYW4 UniRef90_U5ETL9 UniRef90- Q81507

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UniRef90 U5H0V1

170
DACワA|L|DAAS
$\stackrel{180}{ } \quad 190$
LEVND A
L L SKE THERSPTS LY
 VR CLA E F Y K S Q N DKNN QA I Y G I I Q G G I Y P D L R L K S CD F V Y A
 $\begin{array}{lll}\text { A R F } & L K P S \text { R R E K L L R E S }\end{array}$


## $\begin{array}{lll}K & E D \\ N & C & C E R Q Q Q S P D L K \\ N S\end{array}$

GRNSLGVVVGGSSIEQRKLCATEVS G GMIA GPI Q G G $\square$ Y P D LR K R SAELMN QS A I DVLLYKP S N RLLT GT S FF A P I L P G L E K E L Q T L Y S R D C A 1 R CLL E F K K A M T M P N K Q A LY GII Q G GI Y T D L R L K S C QV V C SVI K NTC|lDRYKASKE
 T GACLR LQE ESEVLLRRS AII GVI EGGDVMEERLRSARETA
 SETIH H RDFVEDNDGRDHA Q D L V A A K G G M A K E D K
E A F F K T L D D T E L
R A CA E Y A K Q S N R A CAE Y AK Q S NEQ R D T IDDR LG N T S GVSNK
$\qquad$
E QL

K E ALLSE



D


 DECLLVH QKSKELLEGVEVFGVVEGGDILEERVRSARETA

 S H A LE QLYY GPE GSR S QK SVI IGGVIVEGGDVVME ERLDRSARETAA
K Q $\square$ N S E W
K DNISRRTRSDC
D E LL L N T D E K D T

| D E L |  |  |
| :--- | :--- | :--- | :--- |
| G E L | I | N |



Q E A L L K L V V K S
K Q AV E L R S N P K VM WC
DWMDKVHRDGPVQGGLIFSLVVQSAREIG

DECLLQLHHRSEELLS KAEILGVVEGGDDLLE ERVRSARETA
A DWF SSPPLSTSTSTFAPVLP DPYP


I NAAKSYAENYENTINYA H DLGQTY Y E T L S R R Y P N S T K L V K P P I H P
DKIIEASHSELDCVLIDK
D QFLLSRTTNTAD GPHVVFAPTLPVPYATQWQY LNGLADWMT
 K R R SELLWNEACDVK QQNGNCLVVQPYTND
$S D V S N Y T N T F G V V Q G G K Y D D L R N K S \square E$
AKTEEASDLGCTMLPS DSVAGTHDSGYDDAVPRGENSYEF
T S A D S L Q G NGNC KL M K PLCAA A ENN G E F I F L E E L C Q N E T L

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UniRef90 $\mathrm{N} 4 \times \mathrm{H} 72$ UniRef90-N1REM9 UniRef90-X0ZEP8 UniRef90-H91ZE7 UniRef90-H3A115 UniRef90-R7YM84 UniRef90-M2YPX9 UniReffo-S8BHB4 UniRef90-E9DS80 UniRef90-UPIOOO3945753 UniRef90-V5HRX5
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UniRef9o_ U5HOV
 DGGY ADL
KLDFGVY
VENVEKLSGLVF RDAE GYLKEHISSLSGLALLYDARLAVDLP SDLEGLPRLL ERDDDGVVLHGTESAETIEEKARQIALTMEYGGEHKYTVY FTHGSGVVLDGFFCESLNGDRATHLENVCEKVIPPGLPRFM KLDDYLLHAI GSPVELLEEYRY
EAGGSGSASVSGLAVYDIDLLVDLHADYADTLGHLPRLSL TLWTDRGNAAQKAHPALPESWDNTLKFVEAAEFSHLPRYN
KRPVAGFVLDGFQPCMSAGVRHALLLAVTAELPDDKPRLL

ПQWEYLSRGAEDYDPSSQSSGAVHDPDUDPDGATHQ R E Q HCRAARLSSVTAELPEDKPRLI REVVAGYALSGFYAGEDPSTRERCVKASLAHVESDKVRYL
 PFSVRGA LGGGFLDGDCKNENGDEGALCLKEQQQNDKTTSF DTLIGGFMLSGDGYDESNEERTSHLNTVLAVLPKEKLKL! $M G D F E V I E F P G F G F G E S L D E R Y E W I K E M G K N L T G K E V R I I$
$P F S V R G A S G G F L D M I G R N E N A L E L A L S G K D V H N T K V T S F$
$M$ GQGDRSPQKALAGLAVYDVDLLPDLRADYDNSLALLPRLL


|  |  |
| :---: | :---: |
| UniRef90 M M 7 E988 | GV ${ }^{\text {a }}$ |
| UniRef90-Q97723 | FGGGHPMFFAFAVYLGVDLFDS |
| UniRef90-UPI00039437A1 | HGVGKPDEVLECIERGVDTF |
| UniRef90-U5ETL9 | LGAYTPLVTLEMIKLGI DiFd SSFPYLKT |
| UniRef90-O81507 | LG\\|GQ\|KDII YGVKQGIDTFDCV |
| UniRet90-G7KFH7 | MGVGYPLDDVVCSALGADMYDCVYPTRTARFGTALVPEGV |
| UniRef90-C1BMD9 | VGAFDPWKTLCLVESGVDVFESSYPHDSAERGEALSFDPS |
| UniRef90 - V9L-5H | GTGKPDEVLECVTRGVDLFEGFFPYKMTEQGRALSFNFK |
| UniRef90_G3MHY8 | HGlLRPEFILEAAINGVDIFDTAFANAATDDGLA |
| UniRef90 E9GAK2 | HGPIITPIVLLKLVSKGI DIFDATFPWLVAERGGA |
| UniRef90-B41XD3 | PGAYTPLLMLELIRQGIDIFDTSYAYCAAVNYKA |
| UniRef90-G2WU32 | HTVTSPQQILEQ\\|AAGVDICAVPFDNTTSDAGDALDFTFP |
| UniRet90-U6LNM4 | MGVGYPDDLVAVAADGCDLADSVFPARTGRFGTALTGG |
| UniRef90 UP10003EC3FA5 | HGVGRPDEVLACVEAGVDLFESFFPFLATRHDQT |
| UniRef90-S9339 | GGHPMFFAFAVMLGVD |
| UniRef90-D3TNW9 | PGAYTPLVMLELL NLGVDMFDSSY |
| UniRef90-C5F144 | LGPSTPQDVLKGVSLGLDLSATSFTGTASDAGLA |
| UniRef90_A5K8S5 |  |
|  | PAALSFDQMI GAVLAGVDLIDSNLLAAKKAANGIALVNQTV |
| G6 | C WNPAMTLSAI EHGWDI FDGT YAVK |
| UniRef90-E3QG47 | PPTPQAILRQISLGVDVCTIPFMNTISDAGVA |
| UniRefo-U1R113 | FGAGHPMMLALATAAGCDLFDSAAYALYARDG |
| UniRef90-U6D8Y1 | RDCGTPQKVLEAVERGTDLFFAFFPNEATDAGIALSDFCFW |
| UniRef90-FOVA07 | EGDGAVGVPPSACWDHDDMSSPSTAFLTGRPKRAQTPKEY |
| UniRef90-Q0UE | MDLFTVPFLADATDAGIVL DFAFPPPAKDETSSTRCTLG |
| UniRef90 UPIO00359FE64 UniRef90-N1JP1 | DAVWSPLQVIRAFRLGUDVFSSAYPHTLTEKGFALTSGFY |
| UniRef90-V9D | GVDMLTVPFVTQLSEHGIAFSFTFPGVPERPNNDMHTHTH |
| UniRef90-UPI0003331A5F |  |
| UniRef90-E5A9A4 | GLIGVDILTVPFLAEATDVLDFTFPPPPKNQSTSNRRSLIG |
| UniRef90-W3XJ04 | TQAG\\|DLFATPYMY GASYQLMRMNDPWY |
| Uni |  |
| UniRef90-I3RET4 | DLEDSASYALYAKDDRYMTPNGT |
| UniRef90-UPIIO0044391A3 | NIAYQLRLMNADRTS L EQRFPAFVRDFVATMYGHPA |
| UniRef9-UPIO00333B33D | CGVSRPEEVLECVERGVDVFESFFPYLVTERGCALTFNFD |
| UniRef90-ToLQ19 | FGAGHPMFFPLLFLAGVDVTDSSAYTKYARDSR\\|LTETGT |
| UniRef90-K9GC | ADLLTTPLLGAASDGGIAM EFVFPAPATLQEGSEPLPLG |
| UniRet90-G4N197 | SLGADVILLPFINAFSEAGVAFTFPSPPAKPSTLLPLGVD |
| UniRet90-B60FH7 | ADLFTIPFI GQLSNAGIALDFAFTPSTTAEQQNEKTTASA |
| UniRef90_N1QGV1 | VPFVGAATDAGUALDFSFKPTTNGNHLLHTEPLPL G |
| UniRef90 ${ }^{\text {N1REM9 }}$ | GPSKSPQDILRQIADGDDI宜TVPFANTASDAGDALS |
| 俍et90-XOZE |  |
| UniRef90-H91 |  |
| UniRe | R |
| UniRet90_R7YM84 | TDLLTIPFINAATDAGIAL DFIIPPANASSSTR R PLG |
| UniRet90_M2YPX9 | a |
| UniRei90_S8BHB4 |  |
| UniRef90 E9DS80 |  |
| UniRet90_UP10003945753 | HGVGRPDEVLACVEA |
| UniRef90-V5 | ADLVTIPFLSAASDGGIALLDFTFPAPASSSGSSTSSCTS |
|  |  |
| UniRef90_A1C | A |
| EL8 |  |
| UniRet90_Z4YJE9 | GVSRPDEVLECIERGVDLFESFFPYQVTERGCALTFTFD |
|  | S WQIFAALRLGVD\VITASPMETAHRGELYTATGS |

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

P S L L S L P L L S LSNPSNPHPHPPSHSPR NRPRLPPRVDKR



 T G V S T P LDDV IRLV E L GVD DMD GAFA HQCT ENGYGLCF F E P





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UniRef90_A0A024JBY8 UniRef90_UPI0003EAC54B UniRef90_S4GMP4 UniRef90-B2B4Z4 UniRef90-H2XJI9 UniRef90_G9KJN8 UniRef90_Q01DK3 UniRef90_J1AMU0 UniRef90_C1MW99 UniRef90_W6L521
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UniRef90-S9UX04 UniRef90_F0ZSC0 UniRef90_A4HFC2 UniRef90_K4DKF4 UniRef90_U5H0V1


RA $\square$ ND $\square$ REFPEWSP I KQKQDECLKEEFVPLLEDCSCLACQQHTRAYYIHHLLYKTSE LSTSSQSNHSTDTSPLVVDCQCYTCKTYHRAYLRHLLNAKE I R I K S K $\square$ H E L E S GP L E E H C P C Y T C A N Y S R A Y L H H L Y K $\square$ N D
 V T K E N E T Y K E D F N P L L K G C E C L T C K K H T R A Y II R H L L N T R E RA L D G I E T F P C S C GVVA D H T P A L D L R GRD D
 NFWDNERYQTDLKPLAEGCECYACKKHHRAFVAHLLNAKE VDLR NAAFKFD DRPI LHDCGCYTCRTASRAYLHYLLKAGE





 KRLEELEYF PCSCPVCSRYTPQELREMPKEE
RCPQWA
VDFNNEKFADDFTALFDGCACYTCTKYTKGYLQHLLNTRE YQPKEKKYKDDFRPLVSKCSCYCCKNHTRAY LHHLLVTNE A D L S SFAEEL PPSPY LDRYNAKELLSMS Q


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

 $\square D M W S$ GD HA Q SVTTPLSAKCTCYACTNHHRAFLQHLLAAKE FDLWSSSHKTDTSPLKAACDCYTCTHHHRAYIHHLLSAKE


TD M WDVK F A T D L S P L E E GCD C Y T C K T H H K A Y I R H C L E A K E VDLWKK E Y GTSSIEPLAAVCKCYTCRKHHRAYVQHLLTA KE



S K E S E MEHK A A VK P L S R D CT CPACKA H HRA Y IH HLLDARE R DA QDA QLGFNLREDKYKVDMTSFGVHTPAFVHHLLLDAHE F Q P D

LD LS LP SFS T S VT P L S K S C S LY A CK S H H K S Y DH HL L QARE

 Y QPKEKKYQED FDP LVRGCSCYCCKN HTRAY I H H L L VTN E
 T I E F S D DP E T L Y L P C V C P V C S K H T A Y Y Y EVVRSER MHAMNEHFK LDARPILPGCDCFTCANHHRAY HHLL QCHE
 NDIRRDRKFEHDHTP VIEGCTCSCCRNYKKSYYIHHLLLNVRE
 SEEFENY E P E Y V L N L L N E R C D E K S VVR K E S R A Y I N H L L N C K E I D L N D E C F S LDD R P L C P N C K C Y T C Q R H H R A Y I I H H L L L T V Q E


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 MLAWTLLQIHNHATMDRFFAAI RTSIENGTFEEGVKTFER NLLGTLLTIHNVCYMNRLMEDIRGGI RGGCLDEVEKRWVR FYGEQLLLQNLFTLNKLMGGLRQALKNHQTKKFVQELLQ MLASVLLSUHNLHHFDQMFIHAREHLNAGTFNTYKNHITK ETRKRLLAEHNLHVTFAEVRRIRDAI RRGRLLELVEER LLAGVLLMMHNFEHYFGFFHSIREALKSDRLAQLKELDRR QLGGVLVTVHNDYVMNRLMGGI
MLGWVLI QI HNHADLSAFFAGVRTSDEAGTFDTDVAAFEA LLAYVLLTI HNFEQYFKFFARLRETGRQDKLSELDESLA MLGWVLLQVHNHETLFEFFRSVRKSISSGCFLEENCEKFAE MLAWTLLQUHNFSVIDTFFAA1/RASUERGTFSADVHTFAQ LLAGVLLMMHNFEHYFGFFCSIREALKRDTLVQLKELILR


MLA WTLLQI HNHHVMDQFFAAVRGSI WNGTFAQDVETFER RARLLA $\backslash H N W V \square K E E \square N R \| K Q A \backslash R E G E \square W R L V D E$
LLAS LLLVIHNMTEYDKMFKLIRSSLEN
$L L A G V L L M M H N F E H Y F G F F Y S I R E A L K S D K \square A Q L K E L I R R$ DERTNVLGMHNLYVSVKEDENI RQQI RSENMWNYAE
MTAWALLGQVHNFHVMDKFFAGVRKSVQRGGSFEQDVETFA MLA WSLLQI HNHHVMDQFFEAVRLSITNNTYEADVASFER


M $\square$ A S VLLS $\square$ HN L H HFNEFF VQAR $\square H \square$ SASTFN $\square$ YKKH $\square$ T MLGWTLLQVHNHAVMDQFFAGVRASTGKDKFEEDRVAFEA MLG GTLLQUHNHHTTDLLFFEGI RHSITTTDTFSNDVHTFAK MAA WALLQMHNHHVMERLFAGARAS I ARGTFDQDMQNFNR

MLA WTLLQ THNFHTMDLFFAG TRNS DEKGTFDED TATFAR MLGWVLI QI HNHEILSAFFTGVRSSIDAGTFDADVAAFEA MLA WTLLQI HNHHTMDTFFAAIRESI QRGTFEADIETFTR MLA WTLLQUHNHH $\square$ MDKFFSAI RTSIIERETFDTDADMFH


MTAWVLLQDHNDKVVERFFGGVRRSTEEGWWEKGRSGFEV MTA WVLLQI HNAKIISNFFTAVRESIARCTFEEDCKDFAE $M \square G W T L L Q V H N H A V M A S F F A G V R A V L G E E K F A E A V R A F$


M LA WTLLQFHNHHVMTEFFAGTRKTLAEEGVEAFAKHFQA MTAMVLLEMHNDNALANFFAGVRAA乌ADGTFEEEKARFEQ

MLGWTLLQDHNHATMSAFFGG\QRS $\square$ KDATFEDERLSFSR MLAPVLLMLHNLHHHLTFFKALHNA
NLRVELLAKHNLY LSSFEDRTIRQADREGNDWELVEQ
LLA GVLLMMHNFEHYFGFFHSUREALKSDRLAQLVELIRR MTADVLLEAHNLYRLCAFFAAARNAMRDSRWDEFAARFHR K
 MNSTILLSDHNFHRLVEVFRRVR
LTANVI LSYHNLYMYSMFFQEIRTQDRSGNFLSYDSWFVQ
 MNSTILLADHNLYRLVEVVRYVRSLSLEKR REFLVALI K MLA WTLLQUHNHHVVDRLFAAVRATLADDAFERTRRRFH


| UniRef90_M7ZE98 | N |
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| UniRef90-C97733 |  |
| UniRet90-K2BYW4 |  |
| UniRef90-UP100039437A1 | Q |
| UniRef90-U5ETL9 |  |
| UniRet90-Q8150 |  |
| UniRef90-G7KFH7 |  |
| UniRef90-C1BMD9 |  |
| UniRef90 V9L-5H |  |
| UniRef90-G3MHY8 |  |
| UniRef90-E9GAK2 |  |
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| UniRef90-S9V319 |  |
| UniRet90-06L1W3 |  |
| UniRef90-D3TNW9 |  |
| UniRef90-C5F144 | T Y |
| UniRef90-A5K885 |  |
| UniRet90-R9W139 | N |
| UniRef90 G6D2Q7 | $\stackrel{\text { Q }}{\text { V }}$ YEA |
| UniRef90-U1R113 |  |
| UniRef90-U6D8Y1 |  |
| UniRef90-U4L2D7 | VYE |
| UniRef90-FOVAO7 |  |
| UniRef90-Q0UB12 | Y |
| UniRef90-UP1000359FE64 | RQEG |
| UniRef90 N1JEP1 |  |
| UniRet90-V9DF75 |  |
| UniRef90-UP10003331A |  |
| UniRef90-E5A9A4 | $\stackrel{\text { c }}{\text { V }}$ Y |
| UniRef90-E5SILL5 |  |
| UniRef90-E9DBA8 | A Y |
| UniRef90-I3RET4 |  |
| UniRef90-UPIO0044391A3 |  |
| UniRef90-Q9NEU3 |  |
| UniRef90-UP1000333B33D | Q |
| UniRef90-TOLQ19 |  |
| UniRef90-K9GCC0 | RFYA |
| UniRef90-G4N197 |  |
| UniRef90 B6QFH7 |  |
| UniRef90-N1QGV1 UniRef90 N4XH72 |  |
| UniRet90-N4XH72 |  |
| UniRef90-N1REM9 UniRef90 |  |
| UniRef90-H91ZE7 | Q Y E |
| UniRef90-H3AII5 |  |
| UniRef90-R7YM84 | VYe ${ }^{\text {a }}$ |
| UniRet90-M2YPX9 |  |
| UniRet90-S8BHB4 |  |
| UniRef90-E9DS80 | A Y |
| UniRef90-UP10003945753 |  |
| UniRef90-V5HRX5 | VYES |
| UniRet90_B2WM11 |  |
| UniRet90-A1C4Z2 |  |
| UniRef90-Q4WEL8 | RFYA |
| UniRef90-Z4YJE9 |  |
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| UniRef90-X0YU36 |  |
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| UniRef90-D5G912 | T Y |
| UniRef90 O2HAV7 |  |
| UniRef90-17LUJ3 |  |
| UniRef90-U6IGT8 | H H F |
| UniRef90-E6ULP5 |  |
| UniRef90-X0Z106 |  |
| UniRef90-S3D7L4 |  |
| UniRef90-A0A024JBY8 | VYQG |
| UniRef90 UP10003EAC54B |  |
| UniRef90-S4GMP4 |  |
| UniRef90-82B4Z4 | A Y |
| UniRef90-H2XJI9 |  |
| UniRef90-X1DLP4 |  |
| UniRef90-G9KJN8 |  |
| UniRef90-C01DK3 | E Y |
| UniRef90 J1AMM0 |  |
| UniRef90 C1MW99 |  |
| UniRef90-W6L521 UniRef90 A2EUU9 | Q Y |
| UniRef90 A2EUU9 UniRef90 ${ }^{\text {B3LBF3 }}$ - |  |
| UniRef90_B3LBF3 UniRef90_Q4MZD7 | R H |
| UniRef90-W6KDQ4 | Q Y |
| UniRef90_FOXM99 |  |
| UniRef90-D9PW90 | K HF |
| UniRef90_S9UX04 UniRef90 Fozsco |  |
| UniRef90-FOZSCO |  |
| UniRef90 A4HFC2 |  |
| UniRef90_K4DKF4 |  |
| UniRef90 u5H0V1 | T Y E |

TFK $\square$ SDKDEKCRVGT $\square$ E $\square G E K S Y S T P S F L L Y T K E G S$
SDFGPRपGK LS $\square \mathrm{NRDE} \mathrm{\| LTPG} \mathrm{\|}$ HGR】GN【HLSQT\|ISTPCLFPVVCLVT

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lupas 21
```

lupas 21
lupas_14
lupas_14
lupas_28
lupas_28
jnet
jnet
conf
conf
sol25
sol25
SO
SO
solO
solO
jhmm

```
jhmm
```



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




MQTDTPHGWQKTQP ${ }^{100}$ Q Y WRAVMSV 110 KF L A LQDHLLRDSSSFVEAEFNDDS VVTTRKGKTK DT $\square Q D$

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


150
EKMLKRTNDWS ${ }^{160}$
 MFQAIVDGDTTQSSSAKRVRKSVDVTVKFA WRKYVLACDPDVVIALPDFTPGPHSQKRVMKSIERSTAWL

lupas_21
lupas_14
lupas_28
jnet conf sol25 sol5 solo
SOlO
jhmm
jpssm

170
 EKFLDSNTTTA $\quad$ TFGVIQGGKFDDLRMKSLQ
 D SDARTDKSESHPAPRDNVFVHMAGGTATTAREYGNETSS



lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm
 $S \square N G S P \prod E T L Q A F W L G \Pi D \| V E C P Y \square Y K S S Q S G \square A L V F N V D$ HGP $\square T P V L L K L V S K G I D I F D A T F P W L V A E R G G A L V F P N S$ HSAGSPHEMLVLI RVGIDL FDAHWAQRAAD DGVALDFVFP

lupas_21
lupas_14
lupas_14
lupas_28
lupas
jnet conf conf
sol25 sol5 solo jhmm
jpssm

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lupas 21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
```

 EFWNNEEFENDKKF LLEEDKCEMDFPYSRAY LUHHLINSRE ELSKENVPVT ETLDPSVVKAPAVVATDQKVAKADDNSSDEAVD HN LY DTRYAKDFSPVLPSCPCDACAPFTRAYVHHLLHTHE



UniRef90_K0S8Y6
UniRef90-Q54R13
lupas_14
lupas_28
inet
jnet
sol25
sol5 sol0
jhmm
jpssm


[^0]:    VMEVQERLGSDVAMVLDECVEPF DYDVSAAAARRTRDWA
    
    

    MUFDECTPYPASARAVSDSMELSLLWWA
    

[^1]: