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AVDSTYLLFSAYLVFSMQLGGAMLCAGSVRAKNTM AVPQPVDLVWILDCSALVMLMQ GGFCLLETGFARAKNSI TGFTRAKNAG $\square E D A S W \square M T S A F!\square F T M Q T G F G M L E S G C V S T K N E M$ NQEDSNWI ITNSFI I FTMQTGFGMLESGCVSLKNEV DDATWULTSAFI I F TMQSGFGLLESGSVTRKNEV RRKSAL
ETGFTRAKNAG FFYSGMARSKNAL
A 1 D S TYLLFSAYLVFSMQL GFAMLCAGSVRAKNTM AVDNTYLLFSSYLVFAMQL GFAMLCAGSVRAKNTM ETGFTRAKNAG
ESGCVSQKNEV
ETGFTRAKNAG
A $\square$ D NTYLLFSAY LVFAMQ GFAMLCAGGVRAKNTM
SKNVL
APYDKGD $\square$ A W L LVCT $\square L C W Q \square T \quad$ PA $\square$ GF $\square Y$ AGMHRRKAA $\square$ EAGFTRAKNAG DDATW■LTSAF I IF TMQSGFGLLESGSVSRKNEV DDAVWIITSSF\|IFTMHSGFGLLESGSVRAKSALV DDATWILTSAFIIFTMQSGFGLLEAGNVSPKNEV

RRKSAL
A VDNTYLLFSAYLVFAMQL GFAMLCAGSVRAKNTM
D D A T W L LT S AF $\square \mathrm{IF}$ T MQSGF GLLEAGMVSKKNET
FYSGLLRRKNAL
AVDNTYLLFSAYLVFAMQL GFAMLCAGSVRAKNTM
EAGFTRAKNAG
WLI LCAVIVLLMQ AGFMCLESGLVREKNSI
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A GFTRAKNTG
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TGFTRAKNAG
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A G F T R A K N T G
A 1 DNTYLLFSAYLVFSMQL GFAMLCAGSVRAKNTM AGFTRAKNTG AVDNTYLLFSAYLVFSMQL GFAMLCAGSVRAKNTM AVDNTYLLFSAYLVFAMQL GFAMLCAGSVRAKNTM ANVA WMLGAAALVMLMQ GGFCFLESGLSRAKNSI

ETGFSRKKNAV

ETGFTRAKNAG
$D \| V W L V C A C L V F \square M Q$ A GF LDCLESGLTVRAKNAG VEDSNWVLTSSFIIFTMQTGFGMLESGYVSAKNEV $N D S F V L A S A Y Q V F V M Q L G F A L F A A G V V R P K N T V$

RRKSAL

R R K S AL
RKKHALL
$\square D \| L W \square L V C S G L V F S M Q \quad A G F M C \square E S G L T R S K N S L i$
EAGFTRAKNTG
ETGFTRAKNAG
DDATWlLTSAFLIFTMQSGFGLLESGSVTMKNEV $A \square D T T Y L L F S A Y L V F A M Q L \quad G F A M L C A G S V R A K N T M$

## QUERY

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 $\begin{array}{lll}N & M M K N I I D D V L G G F T Y W L F G Y A M S F G R G A D N N P F V A L G D \\ N & M V K N A S D V L Y G G L A Y W M F G Y A F S F G E S N A F C G L G Q F F D V\end{array}$
 N MMKNVID VLGGFTYWLFGYGMSFGRGSNPFMA G G G $N V A D K N L L D Y V V G T D C F F L L G Y G F M Y G T S W N G W D G K D D F L$ ALIMLSVVSMCISFFQWYFWGYSLAFSTTSGFIGNWWHFC YTMFQSISA IAMVTCLWTFVGFSLAYGETGHVIGNPSTFF $N Q L W \square C M V T V G V V S F Q W Y \prod W G Y S \square A F S E G N A F I G D L K K Y A$ $S V M M Q C I F L M G M M T V L W A L Y G Y S F A F G G S G G W F G N T D Y D F$ NIMLTNVLDAAAGALFYYLEGFAFAFGSSKNPFIGGHYFA

 N MMKNIADDFLGGVTYWAVGFGFSFGT NI MMKNVVDIVLGGLTYWAFGFAMSF NIMVKNAVDVI FGGISYWAFGYGLSFGEDKLNNPFIGMGE SLI WAVSASNAVCIFQWYFWGYSLAFSPSNGFI GNLANFG N 1 MKNLMDFCI GTPVFWLVGFGLMFGKGNGF GS GDAT SLILLCVLCGAVVTVQWFI GGYSLTFSTGNGFUGNVDHAF SMIYLSMMTSAEVVSFQWVFWGYSLTYYSSTNAFLGNLKNFG NMMLTNVLDAATGGMFFYIFGFAFAFGTPSAFLGNGKNFG $N T M M M S F V S D A M V S I Q F F V F G Y S V S F G S D G L F Q W A G Y N D$

 N IMLT NVLDAAAGGLFYY DFGYAFAF AFSH GT $\square \mathrm{MQSF} \square \mathrm{M} \square \mathrm{S} \square \mathrm{V} \square \mathrm{S} \square \mathrm{E} \square \mathrm{Y} \square \mathrm{GY} \mathrm{T}$ MS F $T M V L Q S Q F C A C A C G \square Q Y W D Y G Y S L Y Q S$ G N M KNA
 $N \mathrm{~N} M \mathrm{MK} N V V \mathrm{DVV} \mathrm{F}$ GGLLT YWMFGFGLLS SLIWLSMMAT GVTS FQWFFWGYSLAFSHTAGYDGNLDNLG NIMLTNVLDAAAGGLSYYLFGFAFAFGGPSNGFIGRHFFG $N \square M \nabla K N A V D V I Y G G \square S Y W \square F G F A F S F G$ $M V L A L S M M V M A V A S L E W F F W G Y S L T F S$ NIMLTNVLDAATGGLFYYLFGFALAFGTPSNGLGDLRHFG NTIMMSFVSMALVSI QFWAFGYSVAFGSNGMFE WAAYFG $N$ NIMKNLMDFCDGTVMWF GCGASLMLGENV $\mathrm{NVAVKNLADLMISVAS} F$ WIIGF


EGEGTNAFCGVGY
TNNKFIGGNLDSFG NGMFE WAAYDN


NTIMKNDMDFCDGTVVFVLIGFSLLMGEDDGLIGKPGFDL NI I MKNLMDYAFGSIVFWI I GYSLMFGGDGPIVGSFDDFA
 $N 1 \square M K N L L D F C L G T V A F L L L G Y S L L C G T D H G G F D G W S N F P$ NI I MKNLMDFCI GTPMFMLLGFGLMMSENYFFGFDGKPN NIIMKNLMDFCIGTVVFILIGFGLFLGEDNSMVGLIGKPG
 $N \prod M L T N V L D A A A G G L F Y Y L F G Y A L A F G S G S A F G G D G K H Y F A$ $N I I M K N L M D F C \square G T V V F I L I G F G L L M G E D \quad$ LIMFGD NIMLTNVLDAATGGLFYYLFGFAFAFGSPSNGFDGRHNFG N MLLTNVLDAAAGGLISYLEGFAFAFGAPSNGFI GRHFFG $N V A M K N G L D F C \square S A!V F W V V G F G \square M F G M D W N G W I G T S \square F D$ $G P F \mid l G D L A N F G$
$L L V G F G F G S P F$
$N \square L M K N \square S D F L V G S \square G Y W L I G F S \square M F G P H L L V G F G F G S P F$

AFSPTATNGFTGNDHHFG $N \square I M K N L M D F C D G T V V F I L V G F G L L F G E D V G D G G K P G F D \square$ $N T I M K N L M D F C I G T P D Y W I I G F G I M F G S T S P L F G S L D L F T$ $N V A I K N I L D L C V A G F A F W V L G Y A L M F G E T W G G W \square G T D G F C$ $N I M I K N I D D I V L G G F T Y W L F G H A V S S A R G E K N N A Y V A L E D$
 SLIVVCMMSSSVVMFQWYFWGYSLALSATNGFI GNLRHFG HT GSAY: GDELSNFG SMDWACMASSSVVTFQWYFWGYSLAFSPTNGYGGNGRHFG S LLWASLMAACLSAFQWFFWGYSLVFSHSGSFLGNLDFFS NVAVKNLADFGLSVTLFTSVGYALMFGASHGGWWGNSYWF $N \square L M K N \square M D F C \square G T P C F W \square F G F G \square M F G A G S A V V G W L D P G \square$
 $N I M V K N A V D V L F G G I S F W M F G Y G L S F G V D K G S N A F I G I G D$


QUERY
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## QUERY

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UniRef90 S2KBB45

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220
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240
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$L G T F M L W F G W Y G F N P G S Y Y G Q W S A l G R T A V T T Y L A G C T A A$
$F G A L L L W F G W F G F N G S T L A V T D N I P R I L V N T N A A A G G$ LGCFILWFGWYGFNGAACTSGSQLASAVFLTTTVAPAVAT NALMGLFVLWWGWLAGVSGQRWQYAARAAISTMLASMGGG FGMFMLWWGWLGFNCGSTYGDWKLAARSAVAT SSSTAGG LGTFLWFGWLGFNGGSAFGANLRAVMAIWNSMLAAACGG LGVF LGFCWFGFNGCSTVSMEGLAGKIFVTTNLAAAVAT LGTFMLWFGWYGFNSGSKYGQWSAVGRTAVTTTLAGSTAA LGTVFLWFGWFGFNGGSALSANLRAAQACLSTNVAASVGG MGTFLLWFGWYGFNPGSYYGQWSADGRTAVTTTLAGCTAA GCTLLWFGWFGFNAGSSGAADGUAADAGINTHLAACAGF LGMFTLWWGWLVFNCGSSFGKWKYASRAAVTTDNASLGGG GGVLLWFGWLGFNGGSAFGSNLRAIIVACWNTNLAAASSA LGTFLL WFGWYGFNSGSNYGQWSGMGRTAVTTTLSGCTAA 1 GTVFLWVGWFGFNAGSALGANLRAIMAAVVTNLAAGVGG LGTVFLWFGWFGFNGGSALAGANLRAVGAMMVTQVAAMVGA LGTVFIWFGWFAFNGASTANLSLRSIVYVVNTNLAACGGG FGMFMLWWGWLGFNCGSTYGDWKLAARSAVNTIVSSVSGG VGTVFL WVGWFGFNAGSALLAANMRADMAAVVTNLAACVGG VGTVFLWVGWFGFNAGSALDANMRAIMAAVVTNLAACVGG VLWWGWFGINAGSVWGDTSGRWRLGARAAVATLMSSDGGG 1 GTVFL WVGWFGFNAGSALSANMBAVMAAVVTNLAASVGG GSFLL WF GWYGFNPGSFLGQWSADGRTAVTTTLAGSTAA LGTVFLWFGWFGFNGGSSGNASLRGFYACLNTNLAASCGG LGGTTVLWFGWLGFNAASATSPNGRSRYAFLNTNTSAGTGG LGTVLI WVGWFGFNGGSGUGANLRAVQAMMASHISSCVGG LGTFLLWFGWYGFNSGSYYGQWSAIGRTAVTTTMAGCSAA $+$
 FPGHNLPDGCLGVF ILDWLGWYGFNGAAAFLTTTVSPAVAT






 L GTFLL WFGWYGFNPGSYNGQWSAVGRTAVTTTMAGCTAA

 $T G T V F L W V G W F G F N A G S A L S A N L R G V M A A V V T N L A A C V G G$ LGMFIL WF GWF GFNPGSTAVVKDGTFAIIIAI TTNLAAACAGG

 $R$ GRVVLPCVVFMFVVWATVVYDPNMRSDMAAVVTNLAACVGG


 MGTVLL WF GWYGFNPGSKLA DSTTVVSRTAVVTTTLAAACS GA

 $L G T V F L W F G W L G F N G G S S F G A N L D A D M A C W N T N L T A M F A A$
 I GTVFLWVGWFGFNAGSALSANMRAILAAATVTNLABCLLGG

 NT L L G L F ML WC G S T Y GVA G Q K W L LT DR S AVS T IL S S I S G G


$S A V L I G A D G S L M C L L S M K L M D K F K D D D P L Y A C T V H G V G G$ GATVVGLVSGFLVVLVIEFDDLGHVDDPVGAVGVHGANG AAII CGAI SALFYEAGEQLLEKLKVDDPVSAFPLHAMCG ASII LGVVTGVVCNFGT KI KFMIGI DDALDDFAEHALGG SAVIFGUVSGIVCNLAT,KLKFLLGIDDALDIFAEHAIGG PAVAI GFLGAVACNMAVH LKHWLKYDDVADVEAVHGVGG GSIILGILTGGVCNWATKIKYWVKIDDSMDVFAEHGVAG
 AAVPYGVLGAAFANYAT KLKF LLRI DDSLDIFAVHGVGG GAA IMGAVFGIVIVLSVEFFDKVAKIDDPVGAVSVHGVCG Y WTWNANGWLMKLNFAT KLKKLIGGVDDALDDGAVVGIGGG GALIIGAVAGVLVVFGVWFCDNVVHVDDPVGAVAVHCLNG EAII I GAVGGVI GCASTPFIEWLKIDDP

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| UniRef90-C3YB73 | $V W A \\| L A V G I F A D E G D S R Y D G L L K G G G F Y L L G V Q A L C G A V T V$ |
| UniRef90_UPI00034F8CE1 | I WGVI AVGLFADNPIN GRS L L F K G G G WY L L GVQ |
| UniRef90-B4JGC0 | I WGVI AV GLFADNPVPGRSGLFK G G G WYLLGILQTLSAFCL |
| UniRef90-S3UPF3 | 1 WGTI AVCIFA A D |
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| UniRef90_E0VUA6 |  |
| UniRef90_I2CRA2 | TIGVIMT GMLADKNINGDGWGLFYGGGVELFLKNTAAAVGV |
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| UniRef90 ${ }^{-} \mathrm{K} 0 \mathrm{H} 4 \mathrm{H} 9$ | A WGVVFTALFASKKYVNEV |
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| UniRef90_UPI00029B3561 | TWWGTLVVALVASPSVTGR |
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| UniRef90-B0DY50 | LVGNILTALFAQASVAGS DGYT I I R G G WQLA |
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| UniRef90-R9J5N9 | VWG T L AVGLLANPNAPAGLEGL |
| UniRef90_K3WDU0 | FA G GL LT GLFFA TS DVNGVTGGAFYGNAEQLLHQFVVSQCVA |
| UniRef90-B7QKQ6 | WGLLAVGVFID A D TIS GNSGLLKKGGGVYLLGVQA |
| UniRef90_UPI0001C36FD6 | WGTI AVGLLANPEVPGYALLADQD G |
| UniRef90_U4LG44 |  |
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| UniRef90-F9X110 |  |
| UniRef90_L0R7J7 |  |
| UniRef90-I2FXK9 | $V V G N I L T A F F A D N R V A S F D G S A L D P G G W Q L G Y Q L A D S A S ~ G ~$ |
| UniRef90-B2AME0 | $V V G D I L T G F F A A P A L D G V S G A S Y E G G W W Q M G L Q L A G A T T C$ |
| UniRef90_E2NVS9 | L L G T I CVGLIF A |
| UniRef90_UPI0001CBAEB3 |  |
| UniRef90-G0SDX9 | LVGNLCTAFFADKSVNP\GGGWLNQHW\QLP\QLADSCA G |
| UniRef90-A0A016S1G5 | I WGMTAVG\FCS GATNGLA GVLYS G H F T L L GV Q |
| UniRef90_UPI00035A2094 |  |
| UniRef90_R4TPR4 |  |
| UniRef90-I1LBS5 |  |
| UniRef90-I2JZ29 | $F V G S A L T G L F A A D Y I V A T D G G W L N H H W V Q L G Y Q L A A N V S \\|$ |
| UniRef90 A7SQ16 | V WGLIV VGL L VEE K |
| UniRef90_Q6FVW9 | MI GLL F N GFFA A D WV $\square$ G M D G H T T H G G G WQMY K Q |
| UniRef90_A8PXT8 | $\square A \mathrm{GNLLT}$ ALFADGRISTFDGGWDNHHYVQLGYQLADSCA G |
| UniRef90-M5VLY7 | SWGII F T AL F A K K A Y V G V V |
| UniRef90_G4YS73 | $F \vee G G L M T G L F A T S D V N P N \ G G A F Y G N G E Q F V H Q L V S Q C V A$ |
| UniRef90_UPI0003FC435D |  |
| UniRef90-M5RWN9 | AWGTI AFAL F |
| UniRef90-S9RHY7 | $M \mathrm{~V}$ G NI LT A L F S A D Y $\square$ Q S LD G S T G N K G G WQLGY Q |
| UniRef90-U2D0A4 | 1 WG T I AVGLFAT D TAPAFSRGFGDG |
| UniRef90-F4RG35 | FVGG I LTA I F A D S RVA A F D G S TVIA G G WH H Y VQL |
| UniRef90-W0FNN1 | 1 WG T L SVGLFA T S A APGYS $\square$ A N |
| UniRef90_R6PKN7 | LFGT\CVGLFGRD |
| UniRef90-R5TDP7 | $\square W G T F A T G L E A T K S A P G F Q \square A L D N G$ |
| UniRef90-J3P9G2 |  |
| UniRef90_R5LEH5 | 1 T GTILVGFFATGK GEYTAKGLFYGGG |
| UniRef90_UPI0003B73C74 | I WGTL SDGLFNVEA GVVYGGGFHHLGVQFVGEAA |
| UniRef90_D4LA49 | I WG TV AVGL F A NPKVPGYSLANAAD |
| UniRef90_U9T4D2 |  |
| UniRef90-R5PI42 | \\| WG T I AVGL F A T D S |
| UniRef90_L8X5P2 | MVG NIM TALLFAQSSVAAFDGFSE】P G G WF |
| UniRef90-P54144 | AWGLI F T A L F A QEK Y L N Q $\quad$ Y G NKPGRPHGL |
| UniRef90-N2A3D2 | $\square \mathrm{D}$ GTLAVGGLFATEKAPGYGIA N |
| UniRef90-UPI00042B6A54 | A WGVLF T GLFATKKYVREVYP |
| UniRef90-Q7Y1B9 | A WGVLF TGGLFAKGEYVAEVYGSAGGGGKLLAAQVIEILVV |
| UniRef90-F0SQ35 | A WGTL LLA V L A D PERFGTGLL N N WEQFKVQLLGVVVC |
| UniRef90-F9FQ31 | LIG NI CTAFFATPS |
| UniRef90-14B1B0 |  |
| UniRef90-M2QZL3 | $\square V G N I L T G L F A Q K S V A G F D A \square T V \square G G G W Q L G Y Q L A D S V S G$ |
| UniRef90_V2Y0F9 |  |
| UniRef90_R7GWD7 | $L W G G L A V G L F A T T S A P D N S D Y T G L F Y G G G F$ |
| UniRef90-G2R4Q3 | $L \mathrm{VGNACTGLE}$ F A A D Y VARLD G A T A I R G G WQLPVQLAGSVAG |
| UniRef90_R7AMH0 | V WG T $\square$ A V G L F A T D G GL F Y G G G F |
| UniRef90-D3RS70 |  |
| UniRef90-Q1L727 | A WS LIS IGLFAM |
| UniRef90_R7K8S3 |  |
| UniRef90-A8J1H0 | V WGLL F T GLLA NEGYDT QVY NVPP G G H |
| UniRef90-F8N343 |  |
| UniRef90_G2QWS6 | 1 A G NLLT GLFA A D Y I A HLD GFTS IP G G WQL G Y QLA D SVVS G |
| UniRef90-I1CHI1 | YVGSLLT GIFAESYIAAALD GSTVI A G G WQLG Y QLA D C T S G |
| UniRef90-U1HY83 | I L G L M A N GFLG S D AVVGLD GVN |
| UniRef90_G8YE72 |  |
| UniRef90_UPI00030A0812 | FWGTL AVGLF G N P E D $\quad$ G T G |
| UniRef90-M4FSQ3 | $F V G N L L T G F F A A D Y \\| A K L D G \square S S \square P G G W Q L A Y Q L A D S M A A$ |
| UniRef90_R5EIE5 | ALGTILTGLFA T G |
| UniRef90_G3JT32 | $M V G N I L T G I F G A S Y \square A N L D G S S H A P \square G W Q L G Y Q L A B G T C A A$ |
| UniRef90_D4M2L1 | $\square W \mathrm{~W}$ T $\triangle$ V $\mathrm{V}^{\text {L }}$ F A T |
| UniRef90-W4Y0G6 |  |
| UniRef90-V4L4I4 | A WGLIFVGLF A NEKY\NEVYG |
|  |  |


| QUERY | $1 \mathrm{~V} \text { WS GVVA F }{ }^{370} \mathrm{G} \text { Y K LA D LT V } \mathrm{G}^{380} \mathrm{~L} \mathrm{R} \mathrm{~V}$ |
| :---: | :---: |
| UniRef90_X1YMR6 | ACWGVCVT F L L L WLI N K I V P I R M |
| UniRef90_C3YB73 | $\square$ S WA C A M S F I L L K Gl D K I I G L R V |
| UniRef90_UPI00034F8CE1 |  |
| UniRef90_B4JGC0 |  |
| UniRef90_S3UPF3 |  |
| UniRef90_B6K7L5 | C C Y D F V VT F I I I V I D H $\square$ P C L NV |
| UniRef90_E0VUA6 |  |
| UniRef90_I2CRA2 | AVY T F V V S Y L I F R F L G S VM DLHI |
| UniRef90_UPI0004417EC0 | LS Y S FVVLT TI I L W L M H Y I P GMRL |
| UniRef90_G4TA20 | F GYS LV M T T L I L WVMHFI P G L R L |
| UniRef90_Q7UYZ3 | Y VF A GVG S L I L L K L I D $\quad$ C $\square \mathrm{GL} \mathrm{L} \mathrm{R}$ V |
| UniRef90_K0H4H9 |  |
| UniRef90_Q09J80 |  |
| UniRef90-UPI00029B3561 |  |
| UniRef90_R5V7C5 |  |
| UniRef90_T1IDW3 |  |
| UniRef90_H9K063 |  |
| UniRef90_UPI0001CBAEB4 |  |
| UniRef90_F8NKT2 | C A Y A V VT A L LA K A LD SVPGMK L |
| UniRef90_R5P5I7 |  |
| UniRef90_U9SVC9 | $\square \mathrm{A}$ Y S F C VT Y M L F $\square$ M D K $\square \mathrm{P}$ G L H L |
| UniRef90_E2CWJ2 |  |
| UniRef90_B0DY50 | M S Y S F VM T T L I L WVM R $\square$ V G L Q L |
| UniRef90_G7KYH5 |  |
| UniRef90_R9J5N9 |  |
| UniRef90_K3WDU0 |  |
| UniRef90_B7QKQ6 | T A WSVVVS YVLLK A I D Y V I P I R M |
| UniRef90_UPI0001C36FD6 |  |
| UniRef90_U4LG44 |  |
| UniRef90_R0G2X4 |  |
| UniRef90_F9X1I0 |  |
| UniRef90-L0R7J7 | G G Y T L L I S Y L L L K A I N AVSP P R M |
| UniRef90_I2FXK9 | F G WS FVVVTMIL L F All D RIIP G C H |
| UniRef90_B2AME0 | A A WS F V S CLL L F VIN K I P G LH |
| UniRef90_E2NVS9 |  |
| UniRef90_UPI0001CBAEB3 |  |
| UniRef90_G0SDX9 | G A Y S F VM T C L L L L M N L I P G L L L |
| UniRef90_A0A016S1G5 |  |
| UniRef90_UPI00035A2094 |  |
| UniRef90_R4TPR4 | F A Y S F G G S T I LFF L L I P G L |
| UniRef90_I1LBS5 | C G WVTA TMAPL F Y GL H K M K L L R I |
| UniRef90_12JZ29 | D A WS F VVT S 1 L L L L M N Q $\square$ P F L K I |
| UniRef90_A7SQ16 |  |
| UniRef90_Q6FVW9 | T G Y C A A V S A L C F I I M I P G LQ L |
| UniRef90_A8PXT8 | F G WS F V L T M L L L L I D H \\| P G |
| UniRef90_M5VLY7 |  |
| UniRef90_G4YS73 | A A Y S F V V T L V L L Y I K $\square$ T I G L R V |
| UniRef90_UPI0003FC435D | $\square \mathrm{L}$ WTVVT】TLT F TV I K K TVGGLRV |
| UniRef90_M5RWN9 |  |
| UniRef90_S9RHY7 | A A Y S F V V C A L L Y $\square \mathrm{MNY}$ Y $\square \mathrm{P}$ GL |
| UniRef90_U2D0A4 |  |
| UniRef90_F4RG35 |  |
| UniRef90_W0FNN1 |  |
| UniRef90_R6PKN7 |  |
| UniRef90_R5TDP7 |  |
| UniRef90_J3P9G2 | M A Y S F F M C L I LF LM NL I P G L Q L |
| UniRef90_R5LEH5 |  |
| UniRef90_UPI0003B73C74 | L V W T T VCMLIT F T L I K K L H G LR |
| UniRef90-D4LA49 | GG F |
| UniRef90_U9T4D2 | VA Y S F V VT Y L I LF $\square$ M D K $\square$ P G L |
| UniRef90_R5PI42 |  |
| UniRef90_L8X5P2 |  |
| UniRef90_P54144 |  |
| UniRef90_N2A3D2 |  |
| UniRef90_UPI00042B6A54 |  |
| UniRef90_Q7Y1B9 | C G WVT A T M G P LF Y G L H K T K L L R I |
| UniRef90_F0SQ35 | A SWSCATA A LALLGVMRLFTPLRV |
| UniRef90_F9FQ31 | GL L S F V V T Cl I L F L M NLIPPGLRLL |
| UniRef90-14B1B0 |  |
| UniRef90-M2QZL3 |  |
| UniRef90_V2Y0F9 | S A Y CFVVT TLIAAK G V L L V P L K L |
| UniRef90_R7GWD7 |  |
| UniRef90_G2R4Q3 | GC Y S F A LT C L L L L I N L VP G L R L |

 AVNNSYLLFSAYLVFAMQL GFAMLCAGSVRAKNTM

ETGMTRSKNAG
ETGFTRAKNAG S G LARRKSAL GYS T R F N S L L

R R K N A M
T G F T R A K N S G
$G M \square R R K N A L$
E TGLTRAKNAG

T GFTRAKNAG
 FAG $\square R$ K $N$ EV D D G $\square$ WM T A S SF T $\square$ F T M T A GF G L L E
 A GLAGEDMAS WKEY $\square$ MN $\square$ F L V I NGCTVLFMQC GFALLEA GAVRS KNVT $M H S G F G L L E S G S V A A K D E V$ RTKNVL
 E TGFTRAKNAG A P Y DKGD LCWVLVCT $\square$ F CWQ $\square$ T PA $\square G F L Y A G M H R R K S S L$

A VD NTYLLFSAYLVFAMQL GFAMLCAGSVRAKNTM
EAGFTRAKNSG CCHVKNTK
ETGFTRAKNAG
$S \square N F \boxtimes W T L V C G F L V M F M Q \quad A G F A \square A E T G F T R A K N A G$

R S K NVL

WMNKGDNAWQLTAATLVALQSMPGLVILYGGMVKQKWAV $A V D N T Y L L F S T Y L V F A M Q L G F A M L C A G S V R A K N T M$ ETGFTRAKSAG A S
EAGFTRAKNTG GYSTARKS GG
ETGFTRAKNAG
DTMFVLVSGYMVF LMQC GFAMLTAGSVRTKNTK ATYDKGDMAWMLVCT LICWQDT PA $\square G F L Y A G M H R K K A A L$

R R K S S L L
E T GFTRAKNAG
QPYTYSSSDFVLLNGFLIFFMQ G F V V A ES GQGRAKNVR
E A GFCRSRETV
E S GFSRSKNAC
EAGFARQKETV
$N \square$ NHVW $\square$ MTAACMVFFMQL GFTSYEAGFSQSKNALI A VD D S WVLSATFLVFFTQ AGYCMLEAGVVRAKNAK ESGFCRQKNVV $\square \mathrm{NNV}$ WMMVCTALVFFMHL GFAFLEDGLTRQKNTL $K S L N Q F F L V V M G S F V M F M Q C \quad G F A F L E A G A V R S K N V V$

S GYTWKRNAL
EAGFTRAKSAG
E S GRVS SKDE
E TGFTRAKNS G
$R A K N S G$
$R V Q N V L$

RRKSA L

EAGFTRSKNTA
EAGLTRAKNTG

UniRef90 R5QuYo

## UniRef90 E1GF13

 UniRef90－R7R7M8 UniRef90－H2YE19 UniRef90＿C4QYB6 UniRef90 R7U8S8UniRef90 R6NE29 UniRef90－R4TS78 UniRef90－B9S7P3 UniRef90＿R5GVC5 UniRef90－R5TYG9 UniRef90－L8FRF5 UniRef90－H6BVK9 UniRef90－Q5BG34 UniRef90－G1XF08 UniRef90－R9ADL1 UniRef90－UPIOOO440E253 UniRef90 C4Z544 UniRef90－12KOF5 UniRef90－Q6CEQ8 UniRef90－R6A4Z9 UniRef90－J7S774 UniRef90 GoW471 UniRef90－R6BW10 UniRef90－UPIO003F0A52B UniRef90－BoX562 UniRef90－K4EE46 UniRef90－A0A016UML5 UniRef90－DONEU9 UniRef90－E4XKN4 UniRef90－R2RPW4 UniRef90－A0A044R5B3 UniRef90＿LoGz89 UniRef90－E9FWC4 UniRef90－A7RNC3 UniRef90－FORVD2 UniRef90 L2FQM2 UniRef90－C9SJH5
UniRef90－AOAO16PKA3 UniRef90－UP10002B4AF4A UniRef90－G7XJX9 UniRef90－COC2M5 UniRef90－A0AO24UCR2 UniRef90＿D4L4P1 UniRef90－E1JVY6 UniRef90＿R8BST1 UniRef90－U5GYI7 UniRef90－E8RJR3 UniRef90－L8FP85 UniRef90－U1GEW7
UniRef90 A0A022Q5z6 UniRef90－B9RSH5 UniRef90－R7NKT6 UniRef90＿W2HgL4 UniRef90－UPIO003B3C329 UniRef90－K2RB12
UniRef90
U5JTTO UniRef90－R5JTT0 UniRef90－JgNAC2 UniRef90－BoU9T9 UniRef90－K2RV63 UniRef90＿E3GQ97 UniRef90－G3JJK6 UniRef90－Q6QBS6 UniRef90－Q11154 UniRef90－G7WDB5 UniRef90－L1IUV5
UniRef90 G3BD77 UniRef90－W5X4F7 UniRef90－131L94 UniReftol－K5X6Y2 UniRef90－Dзввн9 UniRef90－B7K6YO
UniRef90－T2KGT3 UniRef90－E4X199 UniRef90－G8LPW2 UniRef90－F7W2A7
 NI MVKNVVDVVFGGLAYWAFGYGLSFGNGNADTGWGKFFY
 GRPGNSFIGGNNFF NTMDKNVVDVVFGGDSYWMFGYGLSYGTDNPFCGDGHWFV NITMKNLMDFCIGTVAFYLLGYNILCGDGK SMIFACMASFSUITFQWYFWGYSLAFSDTSGFПGDLKHFG N MLT NVLDAAAGGGSYYLFGYAFAFGSPSNGFQGRHFFG $N 1 J M K N L M D F C D G T V V F D L G F G L L L G E D T D F G G L V G$ NICMKNMMDFVLGSLFFFILGFPLMFGKNDAGIDGGSGFF SMIWACMGSFSVIVFQWYFWGYSLAFSQSNGFI GDLKHFG AMLYQSFGVIGVICFQWMFWGYSLAYSTAGPFIGDMANFG
$A S F Y P G L L A V A V C S V Q W M I G Y S L A Y S E G N A F I G G L S K A F$

N $\square$ MK K $\square M D F C \square G T V M F V L I G F S F L L G E D \square G F \square G K P G F D \square$
T VAQSVLTTCVICLQWWDWGYSLGNVPNGKMLGNLSDAF NIVMKNFMDFALGTIVFWVLGFGLMFGEDIGG｜DGTPDFF
NTLMKNLMDFCDGTVMFILDGFGLF DGEDLLGDTGKPGF NIMVKNAIDVIFGGLSYWMFGYGISFGNGSNAFIGIGYFF DVMLRNIVDKFLGGFSYWLFGFAFMDGKSKLQNPF GLGR SVFAQDFSGCAVLSVLWVCAGYSLTMGGGKGIIGTFRRAF NTMMMSFVSMAMVSIQFFAFGYSACFSSDGDFAGWAGYNN NDLKNFLDLLIGIVVYWACGFAFAYGKVKRKDDYGNYTG NI MKNLIDRCFGTLLYWLIGGFGMMGGGSADFGGTHFFA NI MVKNVVDVVFGGLAYWAFGYGLSFGNGNAITGWGKFFY SVLMQCFADTCLVSLLWFAYAYSLTFVGGGDWLGSLEKAF NVLFLNYMDTSIGSLEYLLCGYALAFGEGNGFCGTRYFAL $N 1$ MKNLMDFCLGSVAFWVVGFGLMFGLGKDGQTHPLFGM TMILQSLFCACACGLQYWLYGASLYQSRSNPILGDLSVGV

TGNAFFGDDTQFG
 N LMKNMLDFVLGSDFFFDFGFADMHGTDWNGD GGMKGFG HILFRNLMDLCITGITFYAVGYGLAFSDGDGFIGHSRFFL NIIMKNLMDFC｜GTVVFSLLGFGLMMSEDY HTMAMNMMVYG』GMLGYW』CGFALQMGGVGGHDGGHEFGL

GEGSMFIGNLKHFG
GTDMQSLVLISLVS LE WVYपGYSMSFGPDGGVIGDLSWVG
NSS LMAVYAFAATLCWVGWGYQMSFGDKVDFWGKPAVAL NTMLTNVLDAATGGLFYYIFGFAFAFGSPSNGFVGGHSFG
 NTI MMSFVSMAMVTIQFWAFGYSAAFGT HGLFGWAGYNH NTIMKNLMDFCDGTVVFDLIGFGLLGEDGMGDIGRPG ASFYPSILAVACCSI QWYVLGYTLAYGEGGGVFGDFKYAF NITMKNFVDFCIGSIAFVLLGFYLMKSKAY FSGWVGVPE NVLLKNLLDACVGAIAYYLFGWAFAYGGDSK円NGFIGSGN
 SLLFQSFMVMAVTTFQWMFWGYSLAYSTAGPFI GDLANFG NIIMKNFVDFMVGSVLFLCVGFAVMFGGDGAFIGTSGFFN NILLKNSVNTMLCATCWWAVGYAFAYGNSSGGFGGTSRFF NVLMECIVDTCLCGLLFYAFGFAFMFSHGNGFIGY HWFF $N L W L K N L C D F L V G A L V Y Y F D G F G L M Y G D S W H G U G G D N G F F$
$S T V M Q S A D T G V S V W I V A G Y S C F D A G N F: G G A N K F W$ NVLMECTFDTCLCGFLFWAFGYAFMFAEGNAFIGNLQLFG SASURNLVVFLISSLVFYAVGFGFMFGVSCMGWIIGVSHFF STITKSITDTAFGSLIFWAVGFAFAPSASNGFIGNLRNFG N LAKNLVFTAA AFWSVGFGMMFGDGTPFLGLNGFFG N LEKNVFITCGGLLGYCLVGFNLMYPGEFNGFIGFAGFG HAAMPSTLTTATCSTQWFTVGYT LAYGEGNAFFGNFDWVM HAAMPS DLT DATCS DQWF VGYT DAYGEGGWFFGSGKHFF NDMMKNFLDFSAGTVIFFLVGFALMFGTDMGGFTGTSGFS NI MVKNVVDVIFGGLSYWMFGFGFTFGHGNAFIGLGDFFF
 STVMQSFS $\square$ ACLVT LIWAAFGYSLCFDTGSPVFGGAKKFW

NNKFIGNLDSFG SMLFQSFAVMGVVTFQWMFWGYSLAYSTGNAFIGNLDNFG NØMMKNA DDVIFGGLLYWAFGYGUSFGTSKGSNGFTGWGS
NILFKNFVDFMFGSLLFWLVGFGFMFGSDG
NILMKNMMDFCDGTPAFWLVGFGMMFGGSGAFIGKKLDMPH
STCMHSYAS $\square G M V S T L W A L F G Y S \prod A F G D T S G L I G N \square D H V F$ SVAFRKF\｜NTTUSSLTYFLTGFALLSFGDGNGFCGF／̄YFALD

UniRef90_R5QuYo UniRef90-E1GF13 UniRef90-R7R7M8 UniRef90-H2YE19
UniRef90-C4QYB6 UniRef90-R7U8S8 UniRef90-R6NE29 UniRef90-R4TS78 UniRef90-B9S7P3
UniRef90_R5GVC5 UniRef90-R5TYG9 UniRef90-L8FRF5 UniRef9O-H6BVK9
UniRef90 Q5BG34 UniRef90_Q5BG34
UniRef90_G1XF08 UniRef90-R9ADL1 UniRef90_UPIO00440E253 UniRef90-C4Z544 UniRef90-I2K0F5 UniRef90-Q6CEQ8 UniRef90_R6A4Z9 UniRef90-J7S774 UniRef90_G0W471 UniRef90-R6BW10 UniRef90_UPIO003F0A52B UniRef90_B0X562 UniRef90-K4EE46 UniRef90-A0A016UML5 UniRef90-DONEU9 UniRef90-E4XKN4 UniRef90-R2RPW4 UniRef90_A0A044R5B3 UniRef90_LOGZ89 UniRef90_E9FWC4 UniRef90-A7RNC3 UniRef90-FORVD2 UniRef90_C9SJH5 UniRef90_A0A016PKA3 UniRef90-UPI0002B4AF4A UniRef90_G7XJX9 UniRef90-C0C2M5 UniRef90-A0A024UCR2 UniRef90_D4L4P1 UniRef90_E1JVY6 UniRef90_R8BST1 UniRef90-U5GYI7 UniRef90-E8RJR3 UniRef90-L8FP85 UniRef90-A0A022Q5Z6 UniRef90-B9RSH5 UniRef90-R7NKT6 UniRef90-W2HGL4 UniRef90_UPI0003B3C329 UniRef90_K2RB12
UniRef90 R5JTT0 UniRef90-R5JTT0
UniRef90-R7QP87 UniRef90-J9NAC2 UniRef90-B0U9T9 UniRef90-K2RV63 UniRef90_E3GQ97
UniRef90_G3JJK6 UniRef90-Q6QBS6 UniRef90-Q1II54 UniRef90_G7WDB5 UniRef90-L1UVV5
UniRef90 G3BD77 UniRef90-W5X4F7 UniRef90-l3IL94 UniRef90-K5X6Y2 UniRef90-B7K6Y0 UniRef90-T2KGT3 UniRef90-E4X199 UniRef90-F7W2A7 UniRef90_UPI00037B27C9 UniRef90_R5T7Y3 UniRef90-L11XR4 UniRef90-P40260 UniRef90_B2WFE2 UniRef90_V3ZBD8 UniRef90-G9NI84 UniRef90-R5PNP3 UniRef90-R6CGI3
UniRef90 W6MW93 UniRef90-097418 UniRef90-B6WRF2 UniRef90_E9H9L8


FTAYKDFDFSS FVFNLVFCATTATVVSGAMAER MMGSPTSHPREAFANFQGMFASITICLLIGICERG MMGSPTSHDELS LDQLHFDFSAFFVVCTVQUFAGAIAERG $\begin{array}{ll}V T H Y D & T \\ V & \text { V A G Y P P }\end{array}$
 VDDTDENMMGTLFSSFFFHT FAVDVSVQDSLMGQVLVVFLFELTFSTIVTSIVGGAMAER $M M N V D Y N T C Y G G \square P E A L F A F F Q M M F A T I T P L L M T G A Y A E R$ DPEREDGSTPDAGTSYALFDFQMSFATTTSTGVSAGMAER $V$ VAVASGTYGGS DPHDLAFFQTQFATDTPALISGGIVGR YSFMGHKHFFLMDDFYGEFFYNFVFAATATTITSGALAER GNS $\square A F D L P T P T F L L F Q T V F C A T A A T V V S G A M E R$ NPERNGDSPRDEGWAYANFLFQLSFATTSSTVVSGAVAER MGSVTVDS LS GD DPETVFAMFQLTFADITPALVVGGFAER


 FHNLSPSFANPDLYAAFGFTFVTATAMULAGAMLERG | L |
| :--- |
| L |
| L |
| N |
| G |
| G |
| L |
| L | S DFPNPNYDYSFFLYQWAFAIAAAAGITSGSIART LMDVLVAPSPGSLPEVVFCLFQLLFCACTVMVVVGGFERG

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

GDF $M$ MAF $\square G Y F P T A T M$ WF R LSKFPSPS FDYGYFLYQWAFAIDAAAGITSGSIART


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









 SIVYHE EYENYRAN WF F QFVFAATASTIVSGAVAER LK N IELT A LM GSFYQY YHVAF QGSFACDTVGLIVGALAER



 LMHTLGTPSSPGS IPEELLYSFYQMQFCAVTAAIVMGAVARG





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## UniRef90 R5QuYo

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UniRef90-Q11154
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 AKLKSYILLGCVVILIQALPSHWVWDSQGVFFKLGVVDFA ADFACYVIYSFTVTGFYYPVSAHWWSPDGWLYTMRMQDFA A A LLARKKHALSLLWASLMAAGVVSNANGWLADLGALDFA TKLTSY ITFSFFNTLVYVFPAHWVWADAGFLRQLGCVDVA TKFIDYCI YSFVISLIVYPVAA WWVWGGPWLTDLGFTDFA
 TKFLSYCIYSGVISATVYPIVEHWIWGGGWLAQMGFVDFA GRLDPAMVFTFCWATLVYCPICWIWNSNGWAFKYGVLDYA RTIPSLFFGFWWATVVYCPDACWTWNSNGWLYNLPSLDYA RLLLPLIPFIFLWSTFIYAPLAHMVWSDNGFLAQLGALDFA
GRLLPAMVGCFFFMTIVYPVACWVWNVNGWAFKWGVLDYA GRLLPSMLFILCWTIIVYNPIAHWWNSDGWMAVLGSLDFA NGWSFVMGGLDFA TKFLSYCVYSAVISA TYPDEAHWTWGGGWDAQLGFHDFA RILPIIPFTFIWLTLVYCPVACWVWNSNGWAYKWGVLDYA RLI S SQIVGFIFATVVYCPLSYWFWAEDGWLNAMGVLDFA TKFSSYCVYSVLDSLLIYPISGHWDWGGGWLSELGFHDFA TRFLSYCVYSAVISAVIYPDEAHWTWGGGFAYQWGVLDWA TKLESYILFSFLNTFVYALPTRWVWATSGWLNKLGAVDIA CNFKAYCLFSFLNT VYCDPAGWVWGEHGFLNKLGVVDDA IHLQS HCFVSFFITLVHSVAGHWVWHRTGVFRTMGVQDSA MKFGSYLLFILLWTSIVYDPLARWMWSMGWEGKMGALDFA CKMSAYFIYGLLTGFLQPVTVHWTWSNGFLLYPYFRDYA TNFIAYC FSAVISGLIYPISGHWDWGGGFLAEMGFHDFA AKLKSYILDGCIVILI QALPSHWVWDRQGIFFKLGVVDFA MRFSAMMLFTALWVTLVYVPVAHWVWGGGWLGQMGLLDFA SSMTAYFTSIMLLSGITYPIVSHWWSPVGWLAQLGYRDFA TKFVSYCVYSLI ISALIYPVSGHWIWGGGWLAQLGFHDFA RLWPSMLFLLCWTTFVYYVLAHWEWNPSGWLYNLGLYDFA RLARRKSADTLLLSMVSVAVISFQNANGWLFNLPSYDFA QFVAYLIYSSILTGFVYPIVSHWFWSSDGWLFNSGATDFA GSRRKSALALLFQAFMVLAVSRWTWSSNGWLYNLPA DDA DTMQAYFLYSFLMGAFFYPVAAHWIWSPGWLFGVGAMDFA TKFSAYCVYSALISVVYPIEAWVWNGQGWLAKLGCIDFA

 VRFPAFVAFSLLWAVLVYNPVCHWWGSGGWLAKLGVLDFA GRLLPCVVFMFVWTTVIYP AACWTWNPHGWSFRTGVLDFA QFVAYLLYSSFLTGLVYPIVAHWFWSVDGWASPGRSDNLL TKFSAYCIYSAVISAVVYPLEAWVWNSAGWDHQLQF DVD TKFGSYCVYSAVWSAAVYPRLVWHWTWGGGFLGAMGALHDFA
 TSFYAY SSYAFFLTAFVYPVVSHWVWGGGFLFGHGMIDFA GRLWPSMVFLLCWTTFVYYPLAYWWNPAGWLYALGLYDFA RIVPSLIFSFLWATIVYCPTACWTWNANGWLYNLPSLDFA TKFTAYCICSAFVSLIVYPVSGHWVWGGGWLSQMGFIDFA THLFVYPVYTAVVSIAVHPVIAHWVWAPDWLNSMTFLDDA TGFVGLIYSVGVSGFIYPVVGHWAWGPDGFLATMGFHDFA MRFAPYLI FVGVWHGVVYCPIAHWEWGGGFMSQWHVLDFA R GRFCVFLFFWATVVYCPVVYWDWGGGWASSWRGGALDYA TSFRGDILYSTAVTGFПYPI LGHWCWGPGGLIGTGFLDFA SCFDPNVAGTVFMVADIYP:1FGHHSEQYGWLEKLGFIDCA IKFLGFFLFSLVLVGFCYPITGHWIWGGGWLQRLEFYDFA MKIVPFMIFAIVYVGFVYPVAGSWKWGGGFLDELGFYDFA ПPGDALFYGGLIRGKNVLSMLTQVAVTFALVASHGALDFA RLLPVIPFIFLWATFYCPLAHMVWGGGFLGEGGGVLDFA TKFGTYVVVSALVTGLIYPISGHWAWGSGWLEGLGFNDFA VRLKAYIIISFVMTLI HSDPAHWVWSDNGDLFKFGVIDSA TKFSAYCVVYSAVDSMVIYPVSGHWIWGGGWLANGGFHDFA
$M R F G P T L V F I T A H D L V Y C P I A H S M W M D G F L H E A G G L D F A$ GRLLPHMVFLFILATGYCPVTYWIWSGGWAYQWGVLDWA RLIPALVFIFCWATLVYCPVACWVWNVVG GAFNYGVLDYA R LPSMVFAFLWATVYYPLANWTWNANGWLFNLPSLDFA TKLHAYUIFCLTNTLVYSFPAHWVWADNGWLKQLHVVDVA TKFSMYCVYSVFISLEDYPISGHWTWGGGWLCNGSFMMDT R LGPMMVFLF LWMTVVYCP IAMWTWNADGWLYTLGALDFA
$\square R F S A M L V F S A L W T V F V Y$ CPMAHWVWGGGWMAKLGAVDFA


## UniRef90 R5QuYo

 UniRef90-E1GF13 UniRef90-R7R7M8 UniRef90-H2YE19 UniRef90-C4QYB6 UniRef90-R7U8S8UniRef90 R6NE29 UniRef90-R4TS78 UniRef90-B9S7P3 UniRef90-R5GVC5 UniRef90-R5TYG9 UniRef90-L8FRF5 UniRef90-H6BVK9 UniRef90-Q5BG34
UniRef90 G1XEOS UniRef90-R9ADL1 UniRef90_UPIOOO440E253 UniRef90-C4Z544 UniRef90-12KOF5 UniRef90-Q6CEQ8 UniRef90-R6A479 UniRef90-J7S774 UniRef90-GOW471 UniRef90-R6BW10 UniRef90-UPI0003FOA52B UniRef90-B0X562 UniRef90-K4EE46 UniRef90-A0A016UML5 UniRef90-DONEU9 UniRef90-E4XKN4 UniRef90-R2RPW4
UniRef90 A0A044R5B3 UniRef90-LoGz89 UniRef90-E9FWC4 UniRef90-A7RNC3 UniRef90-FORVD2 UniRef90 L2FQM2 UniRef90-C9SHB
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UniRent UniRef90-L1IUV5 UniRef90-G3BD77 UniRef90-W5X4F7 UniRef90-131L94 UniRef90-K5X6Y2 UniRef90-B7K6Y0 UniReffo-T2KGT3 UniReffo-E4X199 UniRef90-F7W2A UniRef90-UP100037B27C9 UniRef90-A0A016TOW8 UniRef90-R5T7Y3 UniRef90-L11XR4 UniReffo-P40260 UniRef90-B2WFE2 UniReffo-V3ZBD8 UniRef90-G9N184 UniRef90-R5CNP3 UniRef90-W6MW93 UniRef90-Q974J8 UniRef90-B6WRF2
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GGGPVEVGSGLSALAYSMVGGRQERMMINFRPHNVSLIT FAGSGVVHMVGGAAGLWGALIEGPRMGRFDRSGRSVALRG GSTCVHMVGGLCALIGAKMVGPRDGKFGKDGKPNA:LGHS GGGPVETASGCSALAYSMVLGKRQEKMMLNFRPHNVSLHT GGGPVHVASGCSALAYALVLGKRKLHGHKSMRPHNLSMVF GGTPVHICSGATATAMSIYLSYPLFRHLRLHKPHNTLCQL GGGPVEVVGGAGAAYSLVLGRRQERMLVNFRPHNVSLIT GGTPVHISSGTAALAISYGGKRRGYGTDRYKPHNTTYVV GSCCI HMVGGDSALIGAKILGPRDGKFEKDANGKVIKVNA GGGPVETLSGFSGFVMSYFLGKRRKHDMVNFRPHNVSMIT GGGPVHIASGTGALAYALYLGKRDDDNGEASMLARAKPHN GGVVHQTAGHGALMYALLLGRRDKRKIPKYKPHSVTSVV GGGPVEDLSAVAGFVYSUFLGRRKENLLDNFRPHNVSMVT GSNCIMMVGGICALIGAAMVGPRDGKFVKDKSGKDTKVNA GSGPVHVDGGSSAFASAVMLGPRLGRYAHGTDPDPMGNAC GGVVIHVTAGVSSLVCAVVLGRRRDFHDHRGEAPYDPDTC GCSAVHLVGGMSGLVATLYLKPRQHRFKDKRARQISDPTK GGVNVHAVGGLAGLVGCIFMGPRLGRFDTTRKYHIPGHST GSTAVHMVGGAAAFTGAAIVGPRUGKYTKDKKSNAIPGHN GGTVVHITAGVAALVAALVIGRREGFQQTAMPPHNMTMVV GSGVVHAMGGSAGLAAALMTGPRTGRFEKNGNCHSMPQVT GSTAVHMVGGVAAFWGAKRIGARIGKYDSEKRAQADPGHS GSGPVHIASGFGSLAWSMMLGPRKKKYAPHFKPHNPLLMV GGTPVHVASGAAALAYSMMLGKRRGHGTHNYRPHNVTHIV GS GVVHMVGGDAGLWGAL LEGPRDGRFDRSGRSVALRGHS GGGPVHDASGCAALAYALVLGKRRDHGDPSTRKPHNTTVF GSTAVHMVGGLCALVGAKILGPRDGKYTKDGKARADPGHN GSVVIHMVGGDSALVGALILGPRDGKYGKNGKVNHSDTGG GGGPVEDGSGLSALAYSWILGRRNEKMMLNFRPYQMQFAG GGLVVHATCGAAALASVLVGGPRRGYGQTNFMPHNLPMTM GGTPVHPSSGAAALAYSVMLGKRSGYSATPYRPHNVTHVV GGFVIHLSSGVAGFTAAYWVGPRSDEDRKNFKPNNILMML FGSGVIDDFGSGVVHLVGAIAGLWGALIEGPRIHSGTLVV GSAVI HTVGGTTAL GAALVVGPRUGKYSKTKSGK GSTCHMVGGDSALIGAAFLGPRDGKFERNARGEVVKVNA GGTPVHGCSGASASALSAYGSYPLFRSRKSHRPHNSMCQLE GSCAIHMVGGDTALIGAYFVGPRIDKYHKDDPGHSDPMAA GSGPVHMASGFGALAWSFMLGPRLPKRAVHYKPHNPLLMV GGTVVH:NAGGAGLVGCLLIGKRIGYGRDLLAPHSLTMTM GGGPVHIASGWSALAYAFVLGKRKHAGEQSHAKPHNTLVF GSTAVHSVGGWVALMGAVMVGPRDGKYNKDDPGHSLTLGA GGVPVEDGSGVSAFAYSWILGRRNERMMMNFRPHNVSLIT GSTVVHTIGGFIALAGSIVLGPRLGRKFKPMLPHDLTIAA GSTAVHSVGAYAAFAGAFMVGPRVGKYKNGKSNADPGHND G GSTVVHTLGGVISLAGAIALLGPRIVGRIFGMPPPHNLTVAA GSTLVHSIGGWFALAGAVAVGPRNGKYNPDMGLHNIPLVT GGAPVEIGSGVGGLAYAWVLGRRQEKELQNFRPHNVSLVS GSTVVHSVGGWAALVGAVILGPR GKYEGGKSFHNLTLST GSTLVHSVGGWAAVIAVCLLGPRIGKFQDGKPQADPGHNI GGTVVHTNAAVAGLVGAYLIGKRVGFGKEAFKPHNDPMVF GGTPVHVCSGATATAISTYLSYPLFRSRKSDDRTPTHIRI GSSVVHSVGGWLALAGAMVLGPRVGKYTEDIPGHNDPLAG GSAAVHMVGGTAAAVGAYLLGPRDGKYGEDGKDKADPGHN GGGNIEILSAVSGFVYSWFLGKRNEKLLINFRPHNVSLVT GGGPVEIVSGASALAYSMVLGRRQEKMMLNFRPHNVSLIT GGGPVHI ASGWSALAYAMVLGKRLHKGDKIHGKAHNPTLV GVGPVHLVGGVTALDAAVMLKRYGRFDSKQQVNSLLGLF FGYAFHDFAGSAIVHSVGGVGKSRAIPGHNLMAASLGVFI GSTAVHMVGGVTACIGAKILGPRBGKYDRDGKPKADPGHN GGGPVHMSSGUGALAYALICGKRHDPDTDKYRPHSVTSVV

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UniRef90-L11UV5
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UniRef90-D3BBH9

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UniRet90 E4X199
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33C329

220
 LGTFML WWGWFGINSGSTNGRWRLAARASVATDMSSIGGG VVAALGVFWLWFGWYGFNGAAAADGDAFATTTIAPAFAT LGTVFLWFGWFGFNGGSTGNASMRSWYACVSTNLAAGTGA TNWWGWLAFNAGSTYGDSDGKWKLASKSATVTMIASDAGG ALGVFILWFGWYGFNGAAATDTLQLSQIFATTTIAPAAAT LGT GLL WFG WLGFNGGSAFGANLRAVYASWNSNLTAMFGS HSASLVVLGSFYGDSGGYYGAWSAVGRTAVTTTLAGCTAA
$M T L G A L G V I L W F G W Y G F N G A A G Y L A N I F L T T M A P A V A T$ TGVFLLWFCWFGFNCGSTTAASLNLGDIALTTNLAAAAST LGTVLLWFGWLGFNGGSAFGANLRAVMACWNSCLTAMVAA LIMMI WNA WLAFDAGTTLALNFKSDMAACVTNLCAASGA LGTVLLWFGWLGFNGGSAFGANLRAVMACWNSNLTACFSG LGTVFWWGWFGFNGGSAFGANLRAAQACNVTNTAASMGG FPGHNLPGGALGVFGLWFGWYGFNGGSTFLTTTVAPAVAT PTLVLLGTLLIWYGWLFFNSGSSRTGYMMLNTQLSACTGG LGMFLLWMGWFGFNGGSTVSMTGDVASUMVTTNMAAAAGA LGTTFLWFGWQFFNPGSAGNATMRAWYAAMNTNLAAAGGG LGTSILWFGWLLFNSATSLTPDMRSVYAFMNTNISAATGG FPGHNLPDGCLGVF ILWLGWYGFNGAAATSDEEMAPSVAT NADFGMFMLWCGSTYGITGGKWKLAARSAVTTVTCSIGGG
$M G L F V L W W G W L A F N S G S T Y G V S G A R A A V M T M M G S F G G G S$ $\square G A T M L W T G W F G F N G G S A D Q S G K G A V Y A V I N S Q V A A A V C S$ AILGFLMDWWGWLAFSVSRYQWTEGMRSAVGTDMASAGGG IGATLLWFGWFGNAGSQGAADGVAADAAINTHLAPCAGF PLTGLGAFILMTGFLGMVLGHGQNIELSATNDVLGGATSA LGTFMLWWGWFGDNSGSTNGRWRLAAARASVATNMSSAGGG TGAGMLWVGWFGFNAGSALAANGSAGMAMMVTHLSAAAGS AlLGLFVLWWGWLGFGITGGKWQLLAARAAVNTLSASIGGG LGVFi LWFCWFGFNGGSTDGMSSDASA DFFNTNLAAAMAA LGTVLI WFGWFAFNGASTANDSLRSTYVVVNTNFAACGGG LGTVFLWVGWFGFNAGSALSANLRAVMAACVTNLSACVGGG



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LGTVLI WF GWFAFNGGSTANLSLRS IVYVVANTNFSACAGG
I GASLLWVGWF GFNAGSNLEANGSAALAMLDTFVATAAAG

 LG S L ML WF GWY GFN C G STYY Y S SAA V S RVA LNMTLCA SVA G
 LGA S L L WW GWF GFN A GS A LGTALLYVG WLLF F NGFSCANASVKVDYSMMNTHLTAAFGA $V G G F L L W F G W Y G F N P G S T L S A M D A Q G D A A N T T L A A C A G G M$ L G T FF F WF GWF GFNGGN LL R ASAEDSLVITNTNLAAATA G
 L GCFIL WLG WF GFNA GSTLKADGVIDSHILLTTNMAAAVGG

 HRPGNSFFSWLAFDAGTTQSLNFQSVMALCVTNLCAASGA $L G V F D L W F G W F G F N P G S T T T A D N T I G M M A M N T S L A A A A G G V$ I T LGA L GVVF IL WF CWF GFNGCSTVVAGLIDFMNTNLAAAALAG
 L GT LL L WF G WL GFNGGSA F GA NLLRAVMACWNS CLL TAMF GA

 ALA DGAVAADRGRMLPA VLGMNLRADMACFVTNLAAASVGG LWF GWF GF NPGS QLA A S GEVVNRVA DS HVF LTTNNLAAAAGG






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UniRet90 G3BD77 UniRef90 W5X4F7 UniRef90-131L94 UniRef90-K5×6Y2 UniRef90-D3BBH9 UniRef90-B7K6Y0 UniRef90-T2KGT3 UniRef90-G8LPW2 UniRef90-F7W2A7 UniRef90_UPIooo37B27C9 Uniref90 A0A016TOW8 UniRef90-R5T7Y3 UniRef90-L11XR4
UniRef90-P40260 UniRef90-S3DRR4 UniRet90-B2WFEE2 UniReffo-V3ZBD8 UniRet90-G9N184 UniRef90-R5PNP3
UniRet90 R6CGI3 UniRef90-W6MW93 UniRef90-Q974J8 UniRef90-B6WRF2 UniRef90_E9H9L8

TWGTIIAVGLIFA TTS
IWGMCAVGIFAEDD
LWGTLAVGLFGVVEDGNTTKGLFYGGG
TlGTISAPIFA
FiGSVMTGLFAADYVAADDGTE DDGGWVQLGYQLAACCAT
$\square F G T \square M V G L F D Y T D G L F Y G G G V H H$
$M V G L F F N G I F A A D Y V I G L D G V N T G L Y P G A W \square K H H W$
A WGLLFTGLEAAKNYVNEVYPN
$\prod W G T A V G L F S N A G Q N G G V A A V N G T G$
LVGTLLTGVFG
VVGLLFNALFATPTITGLDGVNTGHNYRQLY DQVAYILAC $\operatorname{MVGAFLTGGFASSSVSLLDGATEAPGGVQVARQLADAAC}$ LLGTVATGLFAQREVAAYDGVTIIAGGRQLGVQLVEALIG VVGLVFNGFFATENVVGLDGINLGVGPQGWI
1 CGNVTADFAQSSVASFDGSDPIDGGWQLGYQLAD
VIGLIFFNATFGSATVLGYDGYtEHEGGW
IMGSTCTAFFADPAWAQEDGGWDKHNWVQLGHELAAVT TC ALGTLLTGVFSVKD
C GGVLTGIFAADYVNATAGGWLNHHYRQVGYQLAAMCS VVGLIFNALFAADWVIGMDGKTRHRGGWQMYKQUAYIAAT IWGTUAVGLFATDS

## LVGAVF $\square \mathrm{GF}$ SGSSAVGGADGLLYGGGDRLLGपQ

FMGGLLTGLFATSEDNPTEGGAFYGHGMQFVHQLVSQCVA VVGCTMTPFFMVKEHAGLNGDFFWDLPGW $A L G T M L T G L L A L D G G L F Y G G$
$\square L G T L A A G T F A S T Q L G L F S G N G F A D G G Q Q L G V Q F V G V V A T$ YFGVIGAAIFGSDGI
TWGLVSVGFF
ALGTLLVGLFAVD
YVGDILTGLFAHKMVNTYDGGWWNGNFRQLGLQLAGGTTC LVGNILTAFFAADYIAALDNVSSDEGGWQIAYQVADSFAG MAGN LTGMFGTKSLAALDGGEYDPGGWQLGYQUAGTLAC AWGLLFTGLFARKEYVAEVY $M V G A F L T G L F A$
$A$
TLGAVAPGFFASSKGVAMYVGT
MWGGLAVGLFATGNGQNGITGLFYGGG
AFGLLSVGLFADGSYGGTVRGLFYGDGGQLVAQVVGTCTN
 FTGAILTGFFADSRVAGFDGYTVIDGGW
VSGTLLDGVFASKSVNPAGVGLLAGNGAQLGTQLDGVGVV $L V G N L L T G L F A A D Y I A A L D G A T V 1 P G G W Q L A Y Q L A D S V A G$ LVGNLLTGLFAADYIAGLDGTTDIRGGWQULYQLADSAAG ALGGVLTGVLAVPKLSRLFYMVPDW
AWGII FTALFAKEAYVNEVYPGHPGRPYGL
$\square W G T L A V G L F A T G K G E G$
FMGGLLTGGFATPEVNPT TGGAFYGHGMQFVYQ
WWGTUAVGLFATNAAPGYSDADAAGNGKQGGDQVLEA】UG
VIGDTLTGDFATGYVPADDGVSGDAYAGGWW
NPALGGTGAPDYATKPGEMVAAAYEFGPAFLSQAKAVGFT $M \square G S F L T G \prod F A Q T W V A S L D G G A M D G N G K Q V G L Q L A E I C A \square$ VMGTLLVGLDANYAPG
MVGLIFNAFFATKHVIGLDGVNAGATGGFL
1 LGVLVSGFLARPSYNCGGVVYATAGGMQLGMQLLGLSCS
1 WGTLSLGLFACGKYGSTG
I GTLLAGFLSRDAGLFYGHG
MLGGLTGCFADAA GGQNGAFYGN
$M V G G L V N G F A D A A V G G Q N G A F Y G N \quad G G Q \square Y V Q \rrbracket V Y \square L A T$ IWGT S GLLFACGKYG
AIGTLCVASFAEKSM

VCG LLSPMFAEYGMASVPG
$1 V G C M T G F A A K S L G G V G Y A E G V T M V H Q G K P S L L G A C S G$ VAAT MTGLFAKKEVAAYGGVFFDGNVRQLWVQMVEA VGG AWGTLACGLF
AFGAAAVGDFAKE $\quad$ G
$\square V G L V F N G L F A A D Y \| G \square D G V N N G \Pi T G G Q L Y \Pi Q \prod A Y \prod V A C$ MVGSFLTGUFGQAWLYDLDGGGMDGVGVQLGRQLAE:TAD WWGLLCCGLFARQMFSAYTGLFDGGGFELLGDQCLAVASUG MFGTLMTGLLAVD
AMGTLCVGLFATD GGDFYGGGDHYFLIQLLGVASV FTGSVLTGLFAADYVAHDDGSSILDGGWQHYKQL
FTGSGLLTGVFAADYVA


GTYAF L MSAILAAYTDNFVPGLK $\square$ S S Y S F TVS L CL LYMMKFI F T WSFVGSYVLYA LVDCVPGLEV
 CLWTCVVTSTILLVMDRTPWLKT VGYCAVVTALICFILDKIPGLQL

AA YSAVVTFLI LMALKYTVGLRV

VGYTAVMTFFADKLVDLLVGDRV
 GAYSFVGTCMILFLMNMIPGLRL S S Y S F VVS Y $\square \mathrm{MLLIL} \mathrm{L}$ Y $\square \mathrm{P}$ M M Q $\square$


C A Y A F TVSWLILKGVQAVIGLR $\square$ FTYSFCGTCLILEGMNLVPGL $\square A$ Y S F VGGTCLI LLLD D FIPGL

F T WS F VGS F A L Y A V IDC C $\square$ PG $\square \mathrm{E}$ V
$\square L W S G \square G S A l L Y K V V D L I V G R V$ SGYSFVVSCILLYA\|K FiPGMHL

MVWTAMWALLTFG【LKKLQLLRV

AAYSGGMTF VLCFT $\square \mathrm{NK} \square \mathrm{PG} \square \mathrm{C} \square$
$A \square A G L V G \square T P G Y K L A D M T V G \square R V$
FTWAFCGSYM—IDLDDCVPGLEV

A V WS CA $\square$ S F LLLK $L V D Y T \square G \square R \nabla$





WSFDYLVSRILLKLTDALVGLRV

M Q A GF A MLCAG S V R K K N VT


R S K N ML

MVP GLAF LYY G L S R RKSAL
Y S GYS T R R S GLL
E TGFTRAKNS G
DT LWWVLCCG VLIFFMQV GFAS
 S GLARRKNAL $D G \square D \square A W L L L C S F L V$ FMMQAGF LCLETGLVRTKNSSIV E S G R $V$ S S K D EV E S G M V R A K N S Y $G L \vee R S K N T T$
ETGFCRQKNAV
NNVWMMLCTALVFFMHL GFSF LE $\square$ G $\square$ T RQKNT

ESGFTRAKNTV
S GYSHRRNGM
ESGLTRTKNSI

EVGFTRAKNAC
TTSAVDSTYLLFSAYLVFAMQL GFAMLCAGSVRAKNTM
$M T L P G L A L F Y G G L V R S K N V L$
SDGD DTAVLLCSFIVFF QNDGFAALENGNVRAKNAR
AVDSTFLLFSAYLVFAMQLGFAMLCAGSVRAKNTM

MDS GN $\square$ GFVMDCAALVFFMT PGDSCFYGGLVRRKNAV VDNTMLLLVSAMVVMFMAAGFCCDEGGLVRQKNVA

GFTRAKNVG
CAGAVRTKNVQ
S GlSRPQTTL
D DA $V$ W $\square$ S S SF $\square 1$ T TMHSGFGLLESGS VSAKDEV
EAGFTRSKNTG
$\square C A G C V Q L K N V Q$
$\square K Y A V N F T W T L L G A F L V F S M Q \quad A G F T F L \quad G G F \square R Q K N M L$

VGFTRSKNS G
ESGCVSPRNEV
$S \square D T T W V L L S G C L V F F M Q C \quad G F A L L E A G L V R Q T S V V$
A $\square \mathrm{NMVWT} L L C G F L V M F M Q A G F A D A E T G F T R A K N A G$ MQPGFALVEAGFTRSKNTA

ANNVWMMVCTALVFFMH TGFAFDE LGGLTREKNTI.
S GVLKRKNV V

EAGFTRAKSAG
E T G F T R A K N A G

NVLAKNLIVFCLATVAFWAVGYSFMFGKSYDFIGGLQGFFL GTUMQSFLLISVTFEWVYLGYSMSFGPDSHGLIGSGLGG
$D S H G L I G S G L G G$
$G G S F F G N V D W L$ TMDFQS $\square F C S C A C G \square Q Y W V Y G Y S \square Y Q A T G G P F D G D L S A G$ SLIWACMFSASVITFQWYFWGYSLAFGPSNGFIGNLDRFG N LLMKNMFDFAAGS $\square$ AFFLDGYALMFGDD $\square G G F \square G F S N F G$

## 

STMLQSF■c回GVSLVWVVVGFGTYYGLIGNPFDFAFFNN NSKFIGDLDSFG NTMLKNLLDACGAALGFYSVGYAFAYGGGKKTFIGMSNFF STLTLSYVFMALDGVQWVLYGYSLAFGPDDGGDIGLGLAG NDVKNILDGCUSAVCFYFVGYAFGFVKGDGFUGNSGFVF EGNNFFGNTNWLM
GNGF $\quad$ GG L $\quad$ S RAF SVLA QVFYTVC■AC\｜IWADYGYSLAFTGGNDFIGGLSKAF SLAFSHTAGFI GDLKNFA mVAADTTFQWMFWGYSLAYSTANAF GDLENFG SLIWVVSASNVVVIFQWFLCGYSLGFSPTNGII GNLRNDG ASFIPSVYVVCVCTIQWWLIGYTLAYGEGSGVI GDFKYAF NILMKNMMDLVIGSIFFFLIGFALMFGSDNAVIGTKGLFN
NIIMKNLMDFCTGTVVFS\｜LGYALMMGEDTLFKPNLDLAL SILEKNVLDDCVGGICWWATGFALAYSDQETQHAFFGQGL NILLQTLMDACASALMWYLIGFGFAFDKPNPFTGDAMFAL」 HLLLLTLAALAVVSFQWFFWGYSTAFSTSGAFLGNLRNFG NVAI KNIVDLCLSGLVFWLFGYGLMFGASHAGWIGTDDFL NCMVKNVFDVDFGGLAYWMFGYGLTFGDSKHQLGRYVGFG NVALKNVSDLCAATVTFWVLGFAMMFGSSSAGWFGTDGFF EILTKNFVLYA ACTMFLLVGYNIMYVDNSA GGWLPSF NILSKNLIVFGUATLAYWAlGFALMYGTDFGFTGTAGFFR $N \square L F K N \nabla F \square I C V G L L L Y C \square A G F N L M Y G F A E G S S G F F A F A G$ GS L N SFVGGFSKAF
$N \square V M K N \square M D F S \square G S V V Y F \square F G Y W \Pi M F G T$
$E \square Q A W \square G G G K R \square F$ SAF TPSLLVIGCCTПQWFFVGYSLVFGPSGGYDGDLQSFG


TNGFIGNLEFGG NILMKNMMDFSAGA $\quad$ GF WAVGFG $\square M F G T T N G F F G T T D F F F$ $N \| M L T N V L D A A G A L F Y Y L F G F A F A Y G T P S N G F D G R H F F G$ SVLMQCFS $\square$ A GMAT $\square \square W F V F G Y S \square A F G E G N A W \square G D F S K V M$
A LLK NCDDKLVGGLCYWAVGFAFAYGSSSNGFDGTSHFF $N I M L T N V L D A A T G G I F F Y V F G F A F A F G T P S N G F I G K H F F G$ $N$ N LMKNLMDFS $\square G T \| M W F F \square G F G L M F G G G E S G F F G D S H F M$

EGNAFFGGTDRDF NTMFTSVVTIATGIVMWMLFGYSLSFPDHGGVIGDFSWFG $A D C L K N \square S L F S L A C D A Y Y L V G Y R L M Y G D D G G F I G T L G \quad V$ N I MK NFMDFSFGSLLFWII GYS M M G GE $N A M L K N L L D A C G A S L A F F S L G Y A L G F G G M E P E S S K K T F V G$ $T L V R L P L I T T A V V G C \square W Y T W G Y S L A F S P S N D T F A G V S W Y G$
$N \prod M V K N V V D V V F G G L S Y W S C G F G F S Y G D W R N P Y T G F G K F F$ $N$ I IMKNLMDF CIGGSI AF WVIGYS LDMYGDSDGGLIGTPSLL $N S M L K N L L D A C G A A L G F Y S I G Y A F A Y G G S D F F I G T S N F F L$ GYMAHCF $\square$ DST $\square G A V I F Y \square F G F A \square M F G G S K L V P G G N S F \square G$

$$
\text { DVHG【IGS【NK } \square \mathrm{G}
$$

$N \square I M K N \square M D L C V G S L M F W A V G Y G \square M Y G S D T V L G G \quad F F R$ SMMLRNVVDIVLGGI SFWFFGYAFMDGRSGNPFDGDGDFF NTLMENFIDAAVTGLAWWAVGFGLAFGTSAGGFFGTDNFF ATLIQSFADCCIASLVWMVAGYSLAFSNGTPWIGDLSRFT


NAY $\square$ G D $\square$ K H F G
QVLF QTYMT TSNVVIMWYLIGYSLSPTSTSKLIGNLDNAA NI LFKNVFIICVGLLLYYI GGFNLMYPGDFNGFLGFGGFG $N$ NMVKNVVDVVLGGFTYWLFGYGLSFGKG $N$ I 1 MKNFLDFGAGQVTFLFLGFALMFGTDAFGLFGTSGFG $D V K G V I G G L D W S F$ $N \square I M K N \square M D F A \square G T P \square F W \square T G F G \square M F G G T G A L V G G L D P L V$

UniRef90_C8W3D8 UniRef90-G0V8D6 UniRef90-T2JON1 UniRef90-G7Q5R2
UniRef90-A7MFK3 UniRef90-K1WTI3 UniRef90-F3X1K9 UniRef90-M2V4Z7 UniRef90_E1JS28
UniRef90_A1KC00 UniRef90 TOPZ24 UniRef90-Q6CGH6 UniRef90_F0T2R5 UniRef90_UPIO00426A866 UniRef90-C5DQZ9 UniRef90-B8BTZ7 UniRef90-E1QFA8 UniRef90-W4G3J5 UniRef90-B3X002 UniRef90_UPI0003B488A7 UniRef90_Q39CM8 UniRef90-B3Q889 UniRef90_U4LK89 UniRef90-M3AN34 UniRef90-B6K610 UniRef90-BODQF4 UniRef90-W2RZ06
UniRef90 UPIO003 UniRef90_UPI0003B6FA58 UniRef90-B6QCY6 UniRef90-W0FHC4 UniRef90-C5KTM7 UniRef90-D8TVU6 UniRef90-E6ZNZO UniRef90-G2DZW8 UniRef90_Q20605 UniRef90-E3BK81 UniRef90-U3AEX9 UniRef90-U5DEY6
UniRef90-M2VDQ5
UniRef90-M2VDQ5
UniRef90-UPI0002888D63
UniRef90_B5ZTJ5
UniRef90-F3KZ41
UniRef90_Q60BI2
UniRef90-B9KBP7
UniRef90-14Y6Z9
UniRef90-S3D948
UniRef90-S3V4N8
UniRef90- Q9ZPM8
UniRef90_I7BUP0
UniRef90_G4TGJ1
UniRef90-Q3A5T5
UniRef90-K3YRY2
UniRef90-R4KD86
UniRef90-G2FBF1
UniRef90-A8P8Z2
UniRef90-I1TOD9
UniRef90_V7CZ00
UniRef90_UPIO003B59B33
UniRef90-A1CQ21
UniRef90_U3QCP7
UniRef90-U2KWV9
UniRef90-UPI0003A21324
UniRef90_W7XUL3
UniRef90-B7FSA7
UniRef90-V9DFU9
UniRef90_S9RBJO
UniRef90_A8WN92
UniRef90_UPI00047C25BE
UniRef90_KOTEV1
UniRef90-F0Y9X3
UniRef90-I3IGN8
UniRef90-B0DFJ4
UniRef90-J4RND0
UniRef90_UPIO0035E2A3E
UniRef90_U5GEX6
UniRef90-FORHSO
UniRef90-B0W431
UniRef90-B8HM43
UniRef90-K7SLF9
UniRef90-B8DJ83
UniRef90-R7A8N0
UniRef90_R7A8N0
UniRef90_UPI00046CA6F7
UniRef90-C5P5J1
UniRef90-J6ERW7
UniRef90_UPI0003474A53
UniRef90-A5DQX7
UniRef90-A4AVL6
UniRef90-T1JOP5
UniRef90-S7T8P8
UniRef90-A6LRS5
UniRef90_G5HMB9
UniRef90_A7FLA9



LH GMTYVHLATTDPESVYFVYQMTFA I ITPALICGAFARM LAGVTTFSVDANI SELVYVCFQMTFCAITPALIVGAFAER

 HRSVLAEPV GTVI PALLFSMFQLVFEATVCA I AVGGACER
 HFKEFA

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



GEGMS SSKDLLFFAFQATFVGTAATIVAGAVAER
GSLIGSQAEGADHSLESDFFFQVVFVATSMSVVSGAVAER


LLGLKKADSNGNLPEVVYCMYHLTFADFAPADMLGA!VER HPLTFDPSMKEGLWEFAMWMFQMAFAGTAATI VSGAMAER GFTNLDDQDMSNLPDLVHAWYQGTFACDTVVIAMGADAER
 VFRQWAFA $\square A A A G U T S G S I A E R$
HHNA LGDPSPGS $\square$ PT LLYS $\square$ FQMEFCC $V T V A \square L M G A \prod A R G$ $S G A T G D$

AEAWNYAFWMFQTVFAATAATIISGAVAER LKRDPQAGFDYDFFDFQWAFA

$\square S Q \square N G P V A A D W V L S A T F D M$ TATTVVSGCDAER

MKGDTVEAMAATDPELGFFAFQCAFACDTCGLIDGAFAER LS L T E PY $\square E G Q G I P N M V F C L F Q M M F A V I T P A L I T G S V A G R$ WS PGPMDEANGDMAASADWIFQTVFVATAASVVSGTLAER AFFGAFDFFYNDEGDYHNLFFQTVFAATAATVEVSGAMAER
$H$ SQFF $L$ M $H S Q F F D M$
$G D M K A N A Y L D D T V D D Y A F W L F Q Y A F S A A S A T V V A G T L A E R$
$I$ GDMKANAYLD 1 PEMVYVFYQGMFACFTASLVAGGAAGK YDPTRDYDSRES $\square W S Y A S F D F Q \square S D A T T A S T V V S G A V A E R$ FD SAADMHSLFFQTVFAATAATIVSGAIAER 1 GVDNDMFWLFQFAFAASSA LGNRDT TYDGK LADQASWFFA LISFANTSATVVSGAI AER WDGFF $\square S G R S Y D V Q T \square M F W D F Q M V F A T K T V S I I A G A V A E R$
$\square$ M G TENS $\square$ ME GN $\square$ PEMAF $\square$ AF QCMFA $\square$ I PA $\square$ MS GS $\square$ TGR
$\square S P A E Q G Y F F F S A D D W Y N L F F Q T V F C A T A A T V V S G A T A G R$ ADASPGDPLLGAPDMVIYLFQMTFSACCTTVVGGAVAER LAQTGAGGSSVPDDTFALFFYQFCFAATASTMTTGALAER TVGFFDSGDAYDAVDFSVFDFQMVFAVTTPAGITGAYARM DLDAMDR\|IQNGLPIEGFLIFQTVFCATSAT\|VSGAMAER $\square M N V L E A P S M G S L P A \square L F C A Y$ Q S CFAMDT $\square G \square T$ A G GF A E E R R R LHDEQAKPLGGNLPST\|NFCFNVFFPVATVQDFVGADGER LD D TP E Y A D G GYTYWTD F LDF Q GMFAATAATVVSGAVA ER




UniRef90 C8W3D8 UniRef90-GOV8D6 UniRef90-T2JON1 UniRef90_G7Q5R2 UniRef90_A7MFK3 UniRef90-K1WTIS UniRef90-F3X1K9 UniRef90_M2V4Z UniRef90-E1JS28
UniRef90 A1KC00 UniRef90-A1KC00 UniRef90-Q6CGH6 UniRef90-FOT2R5 UniRef90-UPIO00426A866 UniRef90 C5DQZ9 UniRef90- B8BTZ7 UniRef90-E1QFA8 UniRef90-W4G3J5 UniRef90 B3X002 UniRef90_UPI0003B488A7 UniRef90-Q39CM8 UniRef90-B3Q889 UniRef90_U4LK89 UniRef90-M3AN34 UniRef90-B6K610
UniRef90-BoDQF4 UniRef90-W2RZ06 UniRef90-UPI0003B6FA58 UniRef90-B6QCY6 UniRef90-W0FHC4 UniRef90-C5KTM7 UniRef90-D8TVU6 UniRet90-E6ZNZO UniRef90_G2DZW8 UniRef90-Q20605 UniRef90-E3BK81 UniRef90_U3AEX9 UniRef90-U5DEY6 UniRef90_M2VDQ5 UniRef90-UPI0002888D63 UniRef90-B5ZTJ5 UniRef90-F3KZ41 UniRef90-C60B12 UniRef90-B9KBP7 UniRef90-14Y6Z9 Uniinefoo-S3D948 UniRet90-S3V4N8 UniRef90_O9ZPM8
UniRef90 $17 B U P 0$ UniRef90-17BUPO
UniRef90 G4TGJ1 UniRef90 ${ }^{-}$Q3A5T5 UniRef90-K3YRY2 UniRef90-R4KD86 UniRef90-G2FBF1 UniRef90_A8P8Z2 UniRef90-11TOD9 UniRef90_-V7CZOO UniRef90-UPI0003B59B33 UniRef90-A1CQ21 UniRef90 U3QCP7 7 UniRef90'UPI0003A21324 UniRef90-W7XUL3 UniRef90-B7FSA7 UniRef90-V9DFU9 UniRet90_S9RBJO UniRef90-A8WN92 UniRef90-UPIO0047C25BE UniRef90_KOTEV1 UniRef90-FOY9X3
UniRef90 $131 G N 8$ UniRef90_BODFJ4 UniRef90-J4RNDO UniRef90-UP100035E2A3E UniRef90-U5GEX6 UniRef90-FORHSO UniRef90-BoW431 UniRef90-B8HM43 UniRef90-K7SLF9 UniRef90-B8DJ83
UniRef90 R7A8N0 UniRef90-UPI00046CA6F7 UniRef90-C5P5J1 UniRef90-J6ERW7 UniRef90_UPIOOO3474A53 UniRef90-A5DQX7 UniRef90-A4AVL6 UniRef90-T1 JOP5
UniRef90 S7T8P8 UniRef90-S7T8P8 UniRet90_-G5HMB9 UniRef90_A7FLA9


MKFSVTLWFTGПWTLLVYVPVCHWVWGEGWLARПGA TDFA TKFSAYLAYTGFITG|। I YSVVGRWIWGGGWLAQRGFIDFA GRLLPSMLFMGCWTIIVYNPIAHWWNENGWLAVLGSLDFA RVVSLIPFIFLWATFIYCPLAHMVWSENGYLGKIGVLDFA MKVISSLIYPIFGHWAWGRTLGNWE EMTGWLGKLGFVDFA TQFVAYLIYSSFLTGFVYP $\mathbb{V}$ SHWFWSSNLLLGSGVTDFA RVMPAMদFVFVWVTLVYAPVACWVWNDNGWAFKWGVADYA TKFSAYLVYSVLVSAFVYPIFGSWANGSGWLEGLGFIDFA QFVAYLI YSAFLTGFVYPVVSHWVWSADGWLFGSG\|I DFA MRFPAFLLFLVLWTTLVYDPICHWVWGGGWLMELGALDFA MKFSAMMUFSAVWLVLVY伊VTHWVWGGGWLGEMGLYDFA
AQFEAYLAYTPLMAVLVYPLVVHWVTQGWFATHCTYYDFA QFVAY LI YSSVLTGLVYPVVAHWFWCSDGWGSAARGEGLL TKFSAYLTYSAFITCAVIYPVSGHWAWGNGWLAEMNFIDFA GRMLPCMVFSF\|WST\|IYPIACWTWNSSGWVFQLGGLDFA ARAAPAAAAPAAAPAEAAAAPAAAAPKSGWLFQKGALDYA MKFKSLFTFLVLWSFVVYYPMAHMVWDGGFLAKIGSVDFA DK LWPFLFFVLILTAIIYPTTGAWKWGEGWLAVRGFQDFA TKFSTY DYTVVITAAGYP SGHWVWGGGWLATMPFHDFA MRVGRFLLFITLWVTLVYCPVAWTWHPQGWSKLRGAMDFA GRLVPSLVIAFLYITFVYCPQAYWWSSKGWLIFTMGALDFA AKLKSY LLGC VI LIQALPA GWVWDKEGVFYKKGVVDFA CQMAAYLCYSMTLTGFVYPVVGHSVWNGGWLAGMGFTDFA CKLSAYFLISCAVTSLI YPVAAHVAWDDNGRMSCGLLDFA MKFVPYLIYSCLMCGLIYPUYGHWVWGGGWLGSLGVKDFA MREFMLIGYTLIFGDDVHG【GSTNSNGWSFVGGLDFA MREFMLIGYTLIFGDDVHG\| GGS TKFSTYSATLTTTTYPTSGSWYWPFDDDAWLNVAGFVDFA FNLKAYCLYSFLNTIVYS TSAGWVWGEHGFLYQLGVADTA TDFVGLIYTTIMGAIVYP I A HWAWNTGGWLYKLGYHDFA KFSSMCVFTILWLLVVYAPIAHWVWSPTGWVAGLGAVDFA WTFKSFVVYGFFISMFVYPLFANWVWGGNFGLGHGMADFA TKFSMYLVYT $\square A \square S V L I Y P V S G H W T W G G G W \square T N A S F M M S F$ QMGLLDFA GRMAPCTVFMFПWTT IYYDPACWTWNSSGWDYKMGGLDFA GKMAPCVMFMF WTTV VYCCACACWTWNNGWTVKMLGGLDFA IGKYDAFLIFSLLLTGISYPISGHWVWGGGMLSSFGFADFA VKLGAFMIFVLFYVGLVYPIVGSWQWGGGFLSTLGFYDFA CNFGAYMUYSLENTLVYCVPAGWLUWGEHGFLSKMGAVDFAA MNDFIGYTLAFGPDVKGVIGGLDWSGANGWLKNLGVLDFA TKFISCVYSAVISAVVYPVSGHWIWGGGWLAQMGFHDFA
IRFSAVLIFAALWFTFSYLPIAHMVWGGGFLAMDGALDFA

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LGASLLIWFGWFGFNAGSAVSANGLLACSAFVVTNTAAAAAA LGTSVLWF GWLLF NSASSLSPNLRSVYAFMNTNDSAATGG







 LGTVVLLWF GWLLFNSATSSLSPNDKSVYAFMNTNMASAATMGG
 IG T LLL WF G WY GF NCMSTGNGA DVAAKVVVNLTLAAAAAA
 $\begin{array}{ll}1 \\ I & G S M \\ I & W A S V \\ I & W \\ \text { G }\end{array}$
 FLGTILIWWF GWF GFNGGSADNS I R A MY A A F NT N NVAA STGV


 ALGVFILDWL GWYGFNGAAATSPSELSSDF LTTTDAPSVAT
 AVLVVL GTVVLLWFGWDDTAAAACDVAS RSAVVTTTLAAGAAGG

 LGVLIL WF GWF GFNA GS TVLSADENVVP KDIVVNTMLAA GS S G G


 VGA SLL WV GWF GF NAGSNLEANGYASNDFI NT F VATAAAA
 GTF IL WF GWF GFNGGSTLAGTNGA $\square G M \square I L N T N L A A A A G A$




 LGAA L L WF GWF GFNSGSAALAAN GLAAASVVFI NTQQLAT GAAA $\stackrel{\rightharpoonup}{V}$
 $L G T F L L W F G W Y G F N S G S Y Y G Q W S A V G R T A V T T T L A B C S A A$ LGVF L W WF GWF GFNS GS T TA GNSDI GY $\square$ A MT TN LA A A A GA I GTVFLWWVGWF GFNA GSAASA NLDRAVMAAVVTNIAAABVGG
 L P F A Th L

 $\square M L G A L G V F V L W M G W F G F N P G S Q L A D S \square F \| T T N L A G A \square G A$
 V G T LTL W W $\square$ G WF YFNADS TLLS S D GLLAA HCCFN T ILAA GAA S A
 LGGAMLWF GWF GFNAGSAMGAGPDLAANAVLTTQMSAA G I $V G A S L L W W V G W F G F N A G G A A L G A N A Q A S L A F F I N T I V A T A A A A T$


 L GTMM L WF G WY GF N S G S T LVSMGGLA S LVVSVNTTTLA G GA GA IGASLLWVGWFGFNAGSALGANGRAGMAMLTTQLAAAAGG


## 46CA6F7

J1
3474A53

 GVLI L WLG WF GFN GGSSVLSADPAALTSSLVLVVTTSLAAAAA G G $I L W W G W L S F N G G S V F G I T R Y K W K Y V G R A A V V T I C G S F G G G$ $L G V F I L W F$ GWF GFNAGSTTTADNTI GLIDANTSSAAAA GVV WSTFVYDP $\quad$ Y SHWVWGAAMNYVAVNAFFTTNTSAAAA A



MT WMF WD Y R MEKK WSAV G F CS GA F C DY Q LM MA A DTAA LA V






 LT WMV CE WRKF GKP S I L GVV T G MV A G L GT I T P A S G F V G P M V T WC L L D Y R L N GK F S A V G F S S G V I S G L V A I T T P G S G Y VV P P W




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UniRef90 D8TVU6
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UniRef90_Q20605
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UniRef90-K3YRY2
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UniRef90_S9RBJ0
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UniRef90_UPIO0047C25BE
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UniRef90-F0Y9X3
UniRef90-I3IGN8
UniRef90_BODFJ4
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UniRef90-FORHSO
UniRef90-B0W431
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UniRef90_R7A8NO
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UniRef90_A5DQX7
UniRef90-A4AVL6
UniRef90-T1JOP5
UniRef90-S7T8P8
UniRef90-A6LRS5
UniRef90-G5HMB9
UniRef90_A7FLA9



GS LIVGDAAGDAGLWGVT LLKRWLRVDDPCDVFGVHGVCG VAAI GAMTAVCSFFATRY KNYISIDDGLDIFALHGVGG GAVVLGADASVVCFYAVSVLKPKLGYDDALDAFGVHGIGG


 AAFTGGIMTALVCRLTINVNK WLRVDDAI Y SFNLHAIGGG A A V G GLVSTGLCY IGVA YLK EKLGYDDSLDAF GUHGIGG
 WAAIVVGLFAGLLYYLFTSKVLVRVRIDDAVEAIPVHMTNG

 GGLLLGLLGGGLCFGATQFLKRVLKIDDSSLDVAPVMGVGG GALVI GVAAGVCFWSATWLK K KLGYDDSSDAFGVH GVGG $G A V V L G L V V G V V C D F F C T V V K N A L K Y D D S L D V F G V H A V G G$

 TS FFFGGVFGAVV CRIDKFTKKAA RWRWVDNGDTFA THCCVGG
 $G A G I V G I V S G L L V V V V V E V L D L K L H V D D P V G A V G V H C A N G$
 AA LICGSGAGVIVDLAC VLLIKLRIDDPDLGAAPMHGGCG
 MAMIAGGI GGAVCYFADEFVLKVLKLDDP ASVAI GAVAGVIVVFSIVGFDKIKIDDPVGATSVHGVCG


GS IVLGLIVSPVCYFFVDVVKNKFNYDDSLDVFGVHCVGG

 SAFAIGFIGAVAANFGT KVKDLLHLDESLDDFASHGIAG TSFCFGVAGAII CRDKSTKFAARLRWVDNGDTFATHCVGG ESVFIGFVAGILM FETRVLLDKVRLDD
 ASVALGFVASAICNYGT,KIKHLIRIDDALDLFAEHALAG SAVII GGIAGVLVLFSVLFFDKIKVDDPVGAVSVHGVCG AAVIC GFVSAWVLIGLNALAARLRFDDPLEAAQLHGGCG
 AAVLFGVMGGTICNFATQ LKFLLGYDDALDIFATHGVGG



 AA A I I G GT TS P ICFFMDSWVKEKFGYDDALDAFGCHGVGG

GAA $\square G A D A G L L V V F S \square E L F D R K \square K D D D P V G A D S V H G V C G$ AAVVTGAVAGVI YLLGSRGLVSMRLDDAVDAIPVHLCGG Y A SII F GVVGAVVCKILRMIFNTFLLREDRLSVFAVHAGGG GAAVAGMFTAVVCNLLHD GGNWLS DDEPLRVFNLHGDGG
 SAVVI GFVAGILYLVSSQTLIQIRIDDAVDAVPVHMANG GAFITGVVAGPLYLASVFVVESVLKVDDVCNAVSVHFTNG

GA $\square$ VF GVLGGTACNFATQ $\square K F V L G F D D T \square D \square F A S H A V G G$ GFNAGSALGAGPLAANAVLTKSKFGYDDSLDAFGIHGVGG
 A ALLMGVMSGSIPWYTMMVLHRRFSVDDTLAVFHTHAVAG GALAI GLVCGIAVVLSIEGIDKKLKIDDPVGA】SVHGVCG EAIVI GVI GAALCCLSVLRLDKLRVDD
A AVVI GLIA GVLVIVVVDVVEGWKIDDPVGAVAVHGSCG GAVVI GLIAGAVCFWSATWLKHALGYDDSLDAFGVHGTGG AAVGI GAVAG LLLCVSVLFVEQTLKDDDPVGADSVHGVNG
 GA LVIGGLAGLICFNATMLVKQRFQIDDSSLDVFPVMGVGG

 A A AVTSSI NAVI CRLLVP VNNITGGVDDYSK S GII HGVGG EA $\square$ A $\square L \square A G V I I V L G V S F \square D K L K L D D P V G A V T V H L I C G$
$G S L A \square G L V A G V L V V L S \square E F \square D K V L R V D D P V G A V S V H G V C G$ GFNAGSALAMNYVAVNAFFTTRKLGYDDALDAFGCHGVAG


UniRef90 C8W3D8 UniRef90_G0V8D6 UniRef90-T2JON1 UniRef90_G7Q5R2 UniRef90_A7MFK3 UniRef90-K1WTI3 UniRef90-F3X1K9 UniRef90-M2V4Z7 UniRef90-E1JS28 UniRef90-A1KC00 UniRef90_TOPZ24 UniRef90 FOT2R5 UniRef90-UOTRLD UniRef90 C5DQZ9 UniRef90- B8BTZ7 UniRef90-E1QFA8 UniRef90-W4G3J5
UniRef90 B3X002 UniRee90-UPI0003B488A7 UniRef90-O39CM8 UniRef90- ${ }^{-1} 3 \mathrm{Q} 889$ UniRef90 U4LK89 UniRef90-M3AN34 UniRef90-B6K610 UniRef90-BoDQF4 UniRef90 W2RZ06 UniRef90-UPIOOO3B6FA58 UniRef90-B6QCY6 UniRef90_WOFHC4 UniRef90-C5KTM7 UniRef90-D8TVU6 UniRef90-E6ZNZO UniRef90-G2DZW8 UniRef90-Q20605 UniRef90-E3BK81 UniRef90 U3AEX9 UniRef90-U5DEY6
UniRef90 M2VDC5 UniRef90 UPI0002888D63 UniRef90-B5ZTJ5 UniRef90-F3KZ41 UniRef90-Q60BI2 UniRef90 - B9KBP7 UniRef90-14Y6Z9 UniRef90-S3D9L8 UniRef90 Q9ZPM8 UniRef90-17BUP0 UniRef90_G4TGJ1 UniRef90 Q3A5T5 UniRef90-K3YRY2 UniRef90-R4KD86 UniRef90- G2FBF1 UniRef90 A8P8Z2 UniRef90-11TOD9 UniRef90-V7CZOO UniRe990 UPI0003B59B33 UniRef90-A1CQ21 UniRef90-U3QCP7 UniRef90 U2KWV9 UniRef90 UPI0003A21324 UniRef90-W7XUL3 UniRef90-B7FSA7 UniRef90 V9DFU9 UniRef90-S9RBJo UniRef90-A8WN92 UniRef90_UPI00047C25BE UniRef90 KOTEV1 UniRef90-FOY9X3 UniRef90-13IGN8 UniRef90 BoDFJ4 UniRef90 J4RNDO UniRef90-UP100035E2A3E UniRet90_U5GEX6 UniRef90 FORHSO UniRet90_BOW431 UniRef 90 - B8HM43 URe90-KSLF UniRef9_B8DJ83
UniRef90-_7A A8NO UniRef90 UPI00046CA6F7 UniRef90 C5P5J1 UniRef90- J6ERW7 UniRef90_UPIOOO3474A53 UniRef90_A5DQX7 UniRet90_A4AVL6 UniRef90-T1JOP5 UniRef90-S7T8P8 UniRef90 A6LRS5 UniRef90-G5HMB9

T WGAVVATGLLFASKAVVNSAGNGLFYGNAAQLVTQD
$F W G T L A V G F F S A \quad G P G V V D W Y P G$


FFGLMVVPL
1 WGTFAVVF
VLAAT $\square$ S T GCFARKE VA GYD G VTE E VGGDF F
$1 L G A L G T G I L V N D Y S T A D F A A S Y A G T A T Q V L A Q A K G V L T T$
 $A W G T L A V G L F A A S S G M G D V Q G L F F G G G V H Q L G V Q F L G V I D S$ IC G N I LT A L F A E Q G VV N L D GL N S DA E GG WL G Y QLDA D TV IVGTVAT GLFARKEVAA YDGATF DDGGDFF

MWGLIF T GLFATKKYVSEVYGGSPDRPHGL

 AWGTLAAGLFDSAGFS $\quad L K T V G V Q L T G I G A C$
A WGVI F T GL F A R R E Y VE Q $\square Y$ G G G A P G
MWGALATGLF
$I L G T L L A G V F S A T S L G V L S G Y G F A D G \square E T M G E Q$
$I V G N L L T G I F A Q A S V A G F D G A T E \square P G G W Q L G Y Q \ A D S V A G$ $L V G L L G V G V F G E P T Y Y A Q N H E G Y D R G G E Q L G V Q L L G I I T I$ T WGLI F TA L F A K K E Y V N EVVY P
AFGTLMAGVFNTPGTPGYIEG
$M V G N I L T A F F A A D Y D A H L D G F S E D P G G W Q L G Y Q L A D S V T G$ $\square V G A L L T G V F A S P S L G G T G V A D D Y S \square A G Q L W W Q Q F E G V L T T$

$A L G T L L V G F F A T E$
A WG GL AVGLFAAPERLLSVYGRNNHPG
ATGMLLTAFFAKYAL
$\triangle M$ GS $\backslash V L G V V A H P N V A A S D G A T V I Q G G W \square V$
$A L G T I L V G V F A T D G G L L Y G G G F$
VFGTIATGLFASERRMALAYPHANDVGDFMG
A WGLL A A SLFATPWYYDAAFAT
$\square V G N D L T A F F A Q A S V A G A D G V T V I P G G W Q L G Y Q V A D S V S G$



$T W G V L A L G L F G Q P G L V R V D E A T K L P F$
 $A W G V L S L G L F A D G T Y G G A D A K G L Y G D V S Q F M A Q L A G V I T N$ S L G TI L T G L F A VD
$M L G T L L A G V F A S P S L G V F S G L G F A Q G G G Q L G V Q A V G V V A T$ II $G N L L T G L F A A D Y$ I A RLD GATYYDGGWQLAYQLADSVTG
 A WG T L
$\square I G A T L T G \square F A S K T V A S Y D G \square T E \square D G G W$
1 WG T LAVGVFGDKA

## VWGTLACGLFTDPGLN

1 WG S I A T A I F A SKA I N S A G S GL I Y GNF A L L K A H L I S T CA T A A G T L LT GVVA A E

 A A WS FTlSClLLF I I N R I PGCHI

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UniRef90-T1J0P5
UniRef90-S7T8P8
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UniRef90 A7FLA9



FS WS FVGSYT\YALIDCVPGFEV

TAWCGGVT FATMFVVDHTP


T A YCF $\square$ AS W I I LR VLKAVVGLR
CAYVFAITALI AKVECLI PFL
FVIFAFGVGLI MFKL IDDVVGGRV.

F GYS F VVT T LI LDVMHYDPGDRL
SAFTAACSLALIFGTLRYFNKLRVG

FAYSFFGTCLILFLINLVPGL
$V \vee W S G V V A F V A Y K L V D M L D G L R D$

A S Y S F VVT T $\|$ I L WVLH F $\square$ P G C R L
$\square V W S G V V S L I A Y K \| V D L V I G L R V$ TAWNGGATSLDClLISSIVDLGRM

1 V WCVIMTFVILKILDRVMGLRV. $\lfloor V F V F V V M Y V F F K L L D K V V P L R V$
FAYTAVATFVILKVIDADCGLRV


E T G F T R A K N A G
ECGLVRSKNVV
EAGFTRAKNAS
ETGLCRQKNAV NFWLLICAALVFF QQCGFALLEAGSVRQKNVR
$\square \mathrm{KRKN}$ V
CAGS $\square$ RSKNCM S G I SRPQKTL

SGLSRAKNSL
WMNKGDNA WQLTAATLVGLQSVPGLVILYGS VVKKKWAV A GLTRQKNCN

RRKSAL
$\square W L L G C T C \prod A L F M Q$ ETGSVRAKNSV

EAGFARAKETV
$P G L S F F Y G G M T R A K N A G$

EAGFDRSKNSL
ETGFCRQKNAV
TGFCRHKNAV
EAGFTQAKNSG
EVGAVQAKNAK
GLVRSKNVT
EAGFTRAKNTV

QLTRGQNT $\square$ WLLTGS VFFMNO
$\square$ TRGQNT $\square$ WVLLT GS LVFFMNC GFAMLETGFCQSKNA
\RKADAVF LNVCAMLVFAAQD GFAMLEVGSVRDKNTK
CVHKKNTK
ETGFTRAKNAG
A GAVRKKNVQ
EAGFVQRKNVV

WLN K G D N A WQLT AS T LVGLQSMPGLVILYGS IVKKK WAV


ES GFCRAKNTV
ETGLTRAKNAG
ETGFCRQKNAV
$N \square F L V I N G C T V L F M Q C \quad G F A L L E A G A V R S K N V T$
RKKHAL WMSKADNA WQLTAATFVGLQSVPGLI ILYGGAVKKKWAVV MQAGFACLESGAVRTKNSL

CAGSVRAKNAM

D TLYYMFSCTLLLFSVVFGLSLDFSGLIQRRSSF MDTGSSAFILICSAMVCLMTPALAFFYGGLGRRKNVI

EAGFCRSKNTT
EAGFSQSKNTV

UniRef90 F3Z2P6 UniRef90 FOK7Q0 UniRef90-Q6ARH0 UniRef90_A2SS52 UniRef90 E4Q7T7 UniRef90-R7CTM8 UniRef90-E0UKB2 UniRef90-E1ZLV9 UniRef90 G3ASA3 UniRef90_UPI00047126C7 UniRef90-C4YBL2 UniRef90 U8HVD5 UniRef90-Q8RUT6 UniRef90-W9VXC9 UniRef90-E8XPU9 UniRef90-B5YBJ2 UniRef90-B3GLZ1 UniRef90-QOVPH4 UniRef90-12FNY0 UniRef90-B9H8E7 UniRef90-R5RUE8 UniRef90-C5CX78 UniRef90-D8PK86 UniRef90-C0EAH3 UniRef90-F9T7D0 UniRef90 LORAW4 UniRef90-UPI000181692F UniRef90-W1QHN3 UniRef90-Q0FEC0 UniRef90-E1QIU3 UniRef90-E6QTY8 UniRef90-J2JYV7 UniRef90 UPI0003B523D8 UniRef90-TOGN20 UniRef90_G7LYC3 UniRef90-Q47K18 UniRef90 W7WDQ5 UniRef90_UPIO0046EB3B6 UniRef90-E8LEM6 UniRef90-A5FK92 UniRef90 F4KY49 UniRef90_G3IYW0 UniRef90-TOJQS4 UniRef90-UPI00036EE15D UniRef90-D4ZN27 UniRef90-UPI0003700B78 UniRef90_D7TUJ0 UniRef90-D7G3S7 UniRef90_A3JRR3 UniRef90-M6DR91 UniRef90-H9BMM9 UniRef90-I1T0D8 UniRef90_UPIO00468373A UniRef90- UPIO0039E5848 UniRef90 G8BRX6 UniRef90_L7UNH5 UniRef90-E5CF51 UniRef90 Q00YC3 UniRef90-TOR7Y9 UniRef90-A8U5C8 UniRef90-S3NPS7 UniRef90 B5Y3C5 UniRef90_UPI00037FF4FE UniRef90-A9BQZ4 UniRef90_W3XNM4 UniRef90 A9RLB1 UniRef90-B3SC87 UniRef90_C5DCW5 UniRef90 D4LJ61 UniRef90_-Q9R6T8 UniRef90_C1MHX0 UniRef90_UPI00047803D4 UniRef90 ${ }^{-}$K8GGR7 UniRef90_UPI00037061D1 UniRef90-C3X831 UniRef90 H0Q0A2 UniRef90_L2G2A4 UniRef90-E4YQE3 UniRef90-A5DE35 UniRef90 UPI00032A9AD2 UniRef90_UPIO0037A4ECA UniRef90-T1HQR9 UniRef90 R1CB00 UniRef90-K0GXF0 UniRef90-M0RIL9 UniRef90- X0CA17 UniRef90_C4YC30 UniRef90-D3H7U0 UniRef90-S6EELO UniRef90 UPI00036C8D4E UniRef90_L8JUH3
UniRef90 W6M4A1

 $N \square \mathrm{~V}$ M K N $\square$ MDFA $\square \mathrm{GS} \mathrm{VI} \mathrm{F}$ W $\square \mathrm{FGFAFMFGKDAGGF} \mathrm{\square GTSGFF}$
$N W L A K N L I V A A D S \square A Y W M \square G Y S L M F G Q G N P F D G A G G W F L$ NILLKNTLDASVAVAMWFAVGAAFEGSGGNAFIGTTGFFL

QLLFQTYMTTNC\|VI $\square W Y$ YFGYS $\square$ SPSSGSKLIGDFKHAA
$N$ NLKKNMDACVGA DGFYVFGYAFAYGNSNGFDGNWNFAL $T L V R L P L I T T A A V G C I D Y T W G Y S \square A F S P A S T T F G G V S W Y G$ EGNAFFGGFSNVM
MF GDGTPFVGLKGLFF
NVVMKNYMD $\square C V G T L V F W A V G F G L M F G T S S N G W F G Q D Q F M$ TSGAFLGNDRNFG NSAFMALYAFAAVLVCWVGWGYHMSFGDKMPFLGRPD $\square$ G $N V L M K N I M D F A \square G S \| I L V V G F G L M F G E S \square G G \square V G \square T G F \square$
HLMWCVAASNATT DF QWYFWGYSLAFSPTNGFTGNLRSFA $N I D M K N L M D F A I G T I V F W V L G F G L M F A G N G S F I G G I D F L I$ $N \vee A M K N L A D F\|V V T V A Y\| V F G Y H L S Q G D S$

> G G LD F F G
$M Q L T K N M G L F G F A C F A Y Y L V G Y N \square M Y P L G T W \square S G \square W G P A V$ $N \square L A K N F M D F A L A S \square L F F L V G Y G F M F G E G N S F \square G L S G F A L$

$$
\text { Y G } \square \mathrm{I} \text { G N P } \square \text { S Y P F F S R }
$$

$N V L M E C D F D T C L C G Q L F W A D G Y F M F S H G N G F D G T$ HWFF $N I V M K N V M D M C L G S I V F W V L G F G L M F G T D \square G G F I G A P D F F$ $S \| C L G V V T L L W V V V A F S L A F G E P V G F G S G D H F Y S F F G N P Y$ F VGNPLTHFMFNGVG
$N \| M M V I M D C T V G M L G Y F A V G F A D M Y G L D K A G V I G W S G F F$ $N V L A K N L I V F A L A T V A F W A G G F G L M F G D G N G F I G L N G F F L$ $N \operatorname{NLAKNLIVFA} A A T L I Y W F F G F S V M F G G E N P F I G G G G F F L$ NIIMKNLMDFSVGSLI Y WCLGFSIMFGVGNKFISFNGFFL
$N D L D K N D F D A S \square G G \square M W Y T T G Y G \square A D G S G N N G F D G T D G F L$ $M Q L T K N M G D F S L A C M A Y Y L V G Y N M Y P D G T W A D D G V F S G V$ $N D L M K N F M D F S L G S L A F W L I G F A M M F G P Q V V S G F G F G S I S$

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

FFMFSG
$G 1 L L K N V M D L C A S A V S F F L I G Y G \square A L G K S V G G G V F G G R V G$ HI MI RILCDCCLTGLTFYATGYSFAFTHGNGFIGSSGFFM $N I I M K N L L D F V L G S L M Y W \square I \quad G F G V M F G P S I A G L I G T$
NTMLKNLLDACGAAVAFF VGYADAFGGMEPESPNKTFDG $N \square L F K N S M \square I S G G L L T Y Y I V G Y N L M Y G D E Q L I A G W L G R F A$

GPFDGDLANFG


NGFFGK $\square$ GG $\square A$ $N \square L A K N L I V F A \square S S L A F W A \square G F A D M F G D G N A V L G W N G F F L$ $N T V M K N V M D F A L G T V V F W V I G F G L M F G D D \square S G \| I G A P D F F$ $N V L A K N L I V F G L S T I A F W A L G F G L M F S D G N P F M G M G G F F L$


AFSETATNGF DGDDRHFG $N W L L K N F D D L L I G Q V V Y W A C G F A F A Y G K V K L K D D Y G N Y T G$ SLMWASIMACCVTTFQWFFWGYSLVFSEGGSVFLGTNFALC NSAFMSLYAFACVFFCWVVWGYRMSFGDQFPFLGKPAVS | F |
| :--- | $N \square I M K N L L D L L I C A V F Y Y \square T G Y T L A Y E D G N S F L G Y S R W A G$ $N \square M \square T N V V D A V G S \square S Y Y \square F G F A F A F G S S S D S N P F \square G T C F$

GPF $\square$ GD D $A N F G$ TMMA $\square P M F \square A A D V F V D W Y \square W G Y S L C Y G S S S N H F D G S L K F A$ $N T M M M S V L P L A \backslash A S L D W I V A G Y S L S F G G H G N F F G N F S H L F$
$N L L S K N L I D F V V A T L V F F A V G Y G F D K G K D V G G F \square G S G H W F$ $N G L F K N T L T P V I G U L T Y Y \| I G F N L M Y P G W F S F G G F F L D V P$

UniRef90 F3Z2P6 UniRef90 FOK7Q0 UniRef90_Q6ARH0 UniRef90_A2SS52 UniRef90 E4Q7T7 UniRef90-R7CTM8 UniRef90-EOUKB2 UniRef90 E1ZLV9 UniRef90 G3ASA3 UniRef90-UPI00047126C7 UniRef90-C4YBL2 UniRef90 U8HVD5 UniRef90-Q8RUT6 UniRef90-W9VXC9 UniRef90-E8XPU9 UniRef90-B5YBJ2 UniRef90-B3GLZ1 UniRef90-QOVPH4 UniRet90_I2FNY0 UniRef90-B9H8E7 UniRef90-R5RUE8 UniRef90 C5CX78 UniRef90-D8PK86 UniRef90-C0EAH3 UniRef90-F9T7D0 UniRef90_LORAW4 UniRef90-UPIO00181692F UniRef90-W1QHN3 UniRef90-Q0FECO UniRef90 E1QIU3 UniRef90-E6QTY8 UniRef90-J2JYV7 UniRef90 UPI0003B523D8 UniRef90-TOGN20 UniRef90_G7LYC3 UniRef90-Q47K18 UniRef90 W7WDQ5 UniRef90_UPIO0046EB3B6 UniRef90-E8LEM6 UniRef90-A5FK92 UniRef90 F4KY49 UniRef90-G3IYW0 UniRef90-TOJQS4 UniRef90 UPI00036EE15D UniRef90-D4ZN27 UniRef90_UPI0003700B78 UniRef90_D7TUJ0 UniRef90-D7G3S7 UniRef90-A3JRR3 UniRef90-M6DR91 UniRef90 H9BMM9 UniRef90-I1T0D8 UniRef90_UPIO00468373A UniRef90-UPI00039E5848 UniRef90- G8BRX6 UniRef90_L7UNH5 UniRef90-E5CF51 UniRef90 Q00YC3 UniRef90-TOR7Y9 UniRef90-A8U5C8 UniRef90-S3NPS7 UniRef90 B5Y3C5 UniRef90_UPI00037FF4FE UniRef90-A9BQZ4 UniRef90_W3XNM4 UniRef90 A9RLB1 UniRef90-B3SC87 UniRef90_C5DCW5 UniRef90 D4LJ61 UniRef90-Q9R6T8 UniRef90_C1MHX0 UniRef90_UPI00047803D4 UniRef90-K8GGR7 UniRef90_UPI00037061D1 UniRef90_C3X831 UniRef90_H0Q0A2 UniRef90-L2G2A4 UniRef90-E4YQE3 UniRef90-A5DE35 UniRef90_UPI00032A9AD2 UniRef90-UPI00037A4ECA UniRef90-T1HQR9 UniRef90_R1CB00 UniRef90-KOGXFO
UniRef90-M0RIL9 UniRef90- Х0СА17 UniRef90_C4YC30 UniRef90-D3H7U0 UniRef90-S6EEL0 UniRef90-UPI00036C8D4E UniRef90_L8JUH3
 GGDHSPAD $\square$ S NHYSR $\square A D F F F Q V V F V A T A M S V V S G A \square A E R$ $\square$ NDSFKH LG $\square \mathrm{S} \square \mathrm{P} \square \mathrm{T}$ S F $\square \mathrm{MF}$ QTVFAATAAT VSGAMAER S GTYGLKPFPEGLPVPVHFLFQVAFAGTAAT\|VSGAVAER AGDVTSRPGYLS RWFFGWAFSATASTTVSGAVAER MF A A T T A $\square$ MVGGCERA
 SYQTSMSGTEFTTFGWHQFFFQWSFCAATTTVVSGAVAER GDMKANAYDDVT DPEMVYVFYQGMFACFTASLVAGGAAGK $M K G \square G L D S V T G T F S Q M I H V A F Q C S F A C D T V A L I V G G I A E R$ LSSGPDNSPATGGVPLLAKFFFQLVFCGTAATVVSGAVAER $\square N H A D S S T W A M L L F Q D M F A A Q G M F A A D T P A D A D G A V A R G$ YMGVLENPVSQAYPE\|VYSVYQCMFANLVPAIADGACERG
 DMEVLI PELFAAFQATFAGDTCCLIVGAFAER



LEAVGVDAAGADDYSYSDFFFQLMFCAATAS VSGALAER EGM SDGNLPLLASWFFQAVFCGTAAT VVSGGMAER
VSVLPHKTMAST $\square$ PF $\square L$ FA $\square$ F QMKFAVIT PA LITGSFAER $\square$ PE Y VF VCF QMTFAA $\square$ T $\square$ A $L V L G V V E R \square$
$\square S$ GAPSTYEAT G $\square P \square A H W D F Q F A F A D T C S T \square V S G A M \square G R$ $V$ K GDYGASYPSTAYFIFQTMFCATAATIVSGAMAER $V G V L P H K Q L A S T I P F M L F A L F Q M K F A D I C P A D I T G S F A E R$ TAPAANPGINQGlPFVLFAAFQLKFAlITPALITGSFARVD
$\square K G D M E Y \square G L K \square P V Y A F W L F Q A A F A D A M A T \| V S G A V A E R M$


$\square T T G A F R G S G D D V G \square N W A G W \square F Q W A F A A T T A T I V S G A V V E$ WGVASAVDDAAYASTASDYFFQLMFCAATASTVSGALAER LA DS LLVVDGKPDPKFTFF $\square F Q L V F A G T A A T I V S G A M A E R$ LMNTLGTPSPGS DPELLYSFYQLQFCATTAAIVVGAVARG

 FRYGGDPETYTTYPE AFASFQMMFAGCVTCASIVGGATAER VGEQTHPD LAPT $\square$ PLLLFA $\square$ FQ QKFA IITPALITGAFAER
DGFSGSEATGDVVVSYTQAFFTMCFSATSATVVSGAVAER QGADFTGASATQAFHYADWFFQWADASVAVNI CHGAVAER $P D \square F V Q G N Y D T T \square P G Y V F L M F Q T V F A A T A A T I V S G A M A E R$
NTNFF $\square$ M G GVDD DAF WLFQYAFSAASAT VAGTLAER PMDWAAGASGATYTGYSDFIFQGMFAATCATVVSGAVAER
FKNVLARPSVGS $\square P D L L F A V Y Q G M F S A \square T V A \square A T G A V A E R$ NNTIEMPASEGFYGMADMVLYQFFFAADTLVLLAGSVLGR $\square N L P G \quad P G Y S F W W C N Y V Y A A T A A S I V S G A V A E R$
SANYGNAMLPDGVPFWAFLIFQTVFCATSATVVSGAMAER TGADNSPLSWAGUPLYTKFFFQLAFAGTAATVVSGAVAER
$\square$ QNWQ $V A D D A G Y P T M A Y V I F Q T V F C A T S A T V V S G A M A E R$ AGPDNSPATGDGYPLLAKFFFQLVFAGTAATIVSGAVAER LA GVGLNVLTGTDPELAFVAFQCMFAVITPALITGAFAER
$\square M K V L A T P S Q G S V P A L L Y S F Y Q M M F C A V T A A D V A G A T A R G$ YSFMGHKHFFLMDDFYGEFFYNFVFAATATTITSGALAER MDVFGAPAVVTSVPA LLFCFYQGMFAAVTAILMVGGCERA
 YGFEESKLAYWFFQFIFAATTAATIISGAVAERC
FALKD VPDGKYDYSYF $\quad V Y Q W S F A \square A V A G \square T S G S \prod A R T$ FRDVLARPSVGSDPDMDFAVFQCSFAA TVVLLAGSLLGR VGQDIYSTPRGDI LAVVHFLFNGMMKVITVVITFClAERG $L N G V S E T A S S R T I P D M L F A A F Q M M F S I I C V A I L T G S V V G R$

UniRef90 F3Z2P6 UniRef90-FOK7Q0 UniRef90_Q6ARH0 UniRef90_A2SS52
UniRef90 E4Q7T7 UniRef90-R7CTM8 UniRef90-EOUKB2 UniRef90-E1ZLV9 UniRef90_G3ASA3 UniRef90_UPI00047126C7 UniRef90-C4YBL2 UniRef90_U8HVD5 UniRef90-Q8RUT6 UniRef90-W9VXC9 UniRef90-E8XPU9 UniRef90-B5YBJ2 UniRef90-B3GLZ1 UniRef90-QOVPH4 UniRef90-I2FNY0 UniRef90-B9H8E7 UniRef90-R5RUE8 UniRef90-C5CX78 UniRef90-D8PK86 UniRef90-COEAH3 UniRef90-F9T7D0 UniRef90 LORAW4 UniRef90_UPI000181692F UniRef90-W1QHN3 UniRef90-Q0FEC0 UniRef90-E1QIU3 UniRef90-E6QTY8 UniRef90-J2JYV7 UniRef90_UPI0003B523D8 UniRef90-TOGN20 UniRef90-G7LYC3 UniRef90 Q47K18 UniRef90-W7WDQ5 UniRef90_UPIO0046EB3B6 UniRef90-E8LEM6 UniRef90-A5FK92 UniRef90-F4KY49 UniRef90-G3IYW0 UniRef90-TOJQS4 UniRef90-UPI00036EE15D UniRef90-D4ZN27 UniRef90_UPIO003700B78 UniRef90-D7TUJO UniRef90-D7G3S7 UniRef90-A3JRR3 UniRef90-M6DR91 UniRef90-H9BMM9 UniRef90-I1T0D8 UniRef90_UPIO00468373A UniRef90_UPI00039E5848 UniRef90_G8BRX6 UniRef90_L7UNH5 UniRef90-E5CF51 UniRef90-Q00YC3 UniRef90-TOR7Y9 UniRef90-A8U5C8 UniRef90-S3NPS7 UniRef90-B5Y3C5 UniRef90_UPIO0037FF4FE UniRef90-A9BQZ4 UniRef90_W3XNM4 UniRef90-A9RLB1 UniRef90_B3SC87 UniRef90_C5DCW5 UniRef90_D4LJ61 UniRef90-Q9R6T8 UniRef90-C1MHX0 UniRef90_UPI00047803D4 UniRef90-K8GGR7 UniRef90_UPI00037061D1 UniRef90_C3X831 UniRef90-H0Q0A2 UniRef90-L2G2A4 UniRef90-E4YQE3 UniRef90-A5DE35 UniRef90_UPI00032A9AD2 UniRef90-UPIO0037A4ECA UniRef90-T1HQR9 UniRef90-R1CB00 UniRef90-KOGXF0 UniRef90-M0RIL9 UniRef90- X0CA17 UniRef90-C4YC30 UniRef90-D3H7U0 UniRef90_S6EELO UniRef90-UPI00036C8D4E UniRef90-L8JUH3
 NGGWIKNLGALDFA

隹 $\prod K F D D F D V S W V L T G S Y P D T G H W A W G G G W \square G T M G F K D F A$ $L R F R S Y V M Y T L A L T G L V R V D C A T G E R V Y T F S N A V G L I D F S$ RLGPMMVFLFLWLTVVYCPDAYWTWGGNGWLVKLGALDEAA $R F T A Y A L F M L L$
$G R F P S U V V G C\|W V V V C Y A P L A H W T W H P D G\| L V K M G V L D F A A$
$V$ CTFMAYMTYAFFLSSFVYPVI VHWVW $M R V G R F L L F D T W W V T L V Y C P I A W T W H P Q G W S K D R G A M D F A$ VRYGGLLRSKNVLSMLTQVIVTFALVCVLWDAADGALDFA
 TRYAGYLCGAVFDTGVDYPLFGWAWNDNGWLAQMGFDDFA RWDMDPGLGYLYSGLARRKNALHLLNPTGWAFKWGVLDYA MNFHAWMLG VPDWLTFSYTFTAYSWCPGGWLAKLGUIDYA
 RVLPA MLLFAFLWLT IFVYCPLTCWIDWNPNGWAFKYGVLDFAA
 GGWLF QKGALDFA
$N G W L H R K L D V L D F A$ \K LDWPFLVFTVILTGGIYPLQASWKWGGGFLDAMGFLDFA TKFTSYILSTAVITTLVYPG1GHWTWGGGWLSQMGFFDFA
 HAGFLNAKGALDFA KFSAVMVFALLWDT \VYFP $\square$ AHMVWAA GGGFFEMGALDFA VDAMNGKAGLFQKGALDFA TSFRGD L
 RFWSYI IFIVLDSILIYAPLDAHWAWHPEGFLFKMGVLDFA
KFMPYLVFSLIATAVIYP\AGHWVWGNGGWLNKLGMLDFA $\square K F V D F L \square F S L L L V G \| A Y A D T G H W I D W G G G W L A Q R G F F D F A$ EFVAF LLFSLLLVGISYPITGHWVWTDNGWLASMDFHDFA GRTKFSAYLICSVVISGFIYPVVGYWDWGGGWLSNVVDFA RCLLGF TYPVVVHWGWSAGGWASAWRETEWLAKLGVV DFA
 TKFVDYVIFSVLITAFVYPVFGSLAWSNGYLVEAGFI DFA $R L V P M M V F I F F W A T I V Y C P V A C W V W N V N G W G F K Y G V L D Y A$ VRFMAYGMYALFLTAWVYPVASTTRADGPLLFGSGAYDTV
 GRLWPHVGMLQWYFWGYSLAFSSSAKDNKLICY WGVLD WA VRFKMTPGLSFFYGGMVRLKNVVSTLHPGFLRQWGVLDFA CSFRAYFVAATLVSGLIFPVLAPVRSQHKLLSSVGVLDYA $\square S \square S A Y A V Y S F C A S L F I Y P V C A H W A W E G N L L F D I G V M D F A$ TKFSAYLVYTLVISTVVYPISGHWDWGGGWLSQLGFVDFAA CQMVAY LCYSVMLTGWVYP I $D A H \square W S P N G W L W G V G M V D F A$ $\square K L V P F L I F A M \square F V A \square S Y P I T G M W K W G G G W L D A M G F Y D F A$ GALDFA
GRMDPCVIFMFПWAT\|VYDP DACWTWNPGWSNKMGGLDFA MSFRAWMLFCP WWLTFSYTVGAFSVWGGGFLWQWGVIDYA
 TKFПSYC\YS LLIS LVVYPVSGHWDWGGGFLAALGALDYA $\square K F A S F V I F S L F L V G F S Y G I T G H W V W G G G W L A T L G F Y D F A$ TKFSAYCTYSTLISMIIYPVTGHWTWGGGWI GKEGVFDFAA $\square K F V D F D I$ S SLL VGGISYPITGHWI WGGGWLGTMGFWDFA MRAFFYGGMVRSKNVLGTIMQSFFIVALISVASLGADDFA F DIFQKGA L DFA RVIPCMVFDFFWAT LVYSPVACWAWNANGWAFKYGVLDYA CKMSAYFIYG I L T GFLQPVTVHWTWSNGFLLYPYFRDYA $R L G P M M V F L F I W L T V V Y C P I A Y W T W G A N G W L F N L G A L D F A$ NFYAWMLFVPLWLTFSYTFTAFS $\square W S T N G F L T K L G \| I D Y S$
保 QFSAY LIFSFF L S GFVYP VIAHWVWSSS GWLSTSGAIDFA MNDK GRMNDKAWMAFVP LWLTFSYTVGGGFLFQWGVIDYS RMLIPCIIFI FVWATVVYDPI ACWTWNPNGWSNKMGGLDFA

 $\square K \square S S Y L T F T L L F V G I V Y P \| \square G S W K W G G G A L D A A G F Y D F A$

## UniRef90 F3Z2P6 UniRef90-F0K7Q0 UniRef90_Q6ARH0 UniRef90-A2SS52 UniRef90_E4Q7T7 UniRef90_R7CTM8 UniRef90_E0UKB2 UniRef90_E1ZLV9

 UniRef90_G3ASA3 UniRef90_UPIO0047126C7 UniRef90-C4YBL2 UniRef90_U8HVD5 UniRef90_Q8RUT6UniRef90_W9VXC9
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 GGTVVHTNAAVAGLVGAFLFGKRIGFGREALKPHSLTMTM GGNAVHVVSGTTALVYSWFLGYRNEASLVEYRSSNLGMVI GSTVVHSTGGWDALVGTMFLGPRYGKYTADGKSRVLAGHS GGSVVHINSGIAALMGADVLGKRIGYGKEPMAPHSAAPAA GGTVVHMNAGIAGLVMCILLGKRIGYGTEPMPPHSLTMTM GGTVVH:NAGVSALVACIVLGKRMGYPKEPMPPHSMTLTV GGTVVHI NAAI AGLVGAYMVGKRSGLGNVSMAPHSLTLTM GGTVVHINAAVAGLVGAYMVGKRMGYGKEAFTPHSLTLTM GSTVVHTVGGIASLAGGMVLGPRLGRMFARDDKEKGGMPA GGTVVHMSSGFAALAGVIVLGKRKNSQHDPTNIPFVLLGT

| $G S A V V$ | H S | $G G W A S$ | A $A \vee L V L$ | $G P R T G K F G K D G S V$ | V L P G H N |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $G S T V$ V | H S V | G GWA A | $L M G A A F L$ | $G P R \square G K Y$ Q D G Q V | N M S $\square$ A T |
| $G S T V$ V | H S V | $G G W S A$ | $L M G A A F L$ | $G P R$ M GKY GP S GEP | $R \mathrm{~A} \square \mathrm{P}$ G H N |
| G S T V V | H S V | $G G W A A$ | $L A G A M V L$ | $G P R \square G K Y$ V E D G S A | NKIA GHN |
| G G Y V | H L S | $S G V A G$ | $F$ T A A Y WV | $G P R A S G D R D S F P P$ | N NMI L M L |
| G S G V V | H M | G G TA A | VGA VLL | G P R S G R F $\square$ D G $\square^{\text {P }}$ | LP Q Y Q T |
| G S T V V | H S V | G GWA A | $L A G A L V L$ | GA R I G K Y K D GRV | MLP M A |
| G S TVV | H S V | G G WA G | LA G T 1 V L | $G P R L G K Y Y Q D \\| L$ | N M T I A A L |
| $G G G P V$ | V | S G M S A | A Y S MV L |  | H V S L I T | $G S G A V H M V G G D A G L A G A D V A G P R D G R F T A D G K P D D M P G H M$ GSTVVV H S V V G GWA A L M GA WL L G P RA GK Y DP WT F G GNP S LA T G G TVV H I NA G IAA GLVVGSYVI GKRDGYGRESMQPHNLVMTY





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




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


 GGTVVMINAAMAGLVGAFMIGKRVGYGRESMAPHSSLTMTM


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

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


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

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UniRef90_B5Y3C5 UniRef90_B5Y3C5
UniRef90_UPIO0037FF4FE UniRef90_A9BQZ4 UniRef90_W3XNM4 UniRef90_A9RLB1 UniRef90_B3SC87 UniRef90_C5DCW5 UniRef90_D4LJ61 UniRef90_Q9R6T8 UniRef90_C1MHX0 UniRef90_UPI00047803D4 UniRef90_K8GGR7 UniRef90_UPI00037061D1 UniRef90_C3X831 UniRef90_H0Q0A2 UniRef90_L2G2A4 UniRef90_E4YQE3 UniRef90_UPI00032A9AD2 UniRef90_UPI00037A4ECA UniRef90_T1HQR9 UniRef90_R1CB00 UniRef90_K0GXF0
UniRef90_M0RIL9 UniRef90_X0CA17 UniRef90_C4YC30 UniRef90_D3H7U0 UniRef90_S6EEL0 UniRef90_UPI00036C8D4E UniRef90_-8JUH3
UniRef90_W6M4A1

210
220
230
 I G GTLLWF GWF GFNAGS A LAIDNDVAMNAFITTNNTAAAAAA
 GTF ILWFGWFGFNPGSTLSGMNEKIGD』AVNTNLAAAMGA $M G T A F L W L G W F G F N A G S G L A A A D G I A A N A F L V T H L A T C A A A$

 SGTVVFWWF GWF GF NGGSTGNASDRSWYAAVNTNIAAAS GG

 MGTVLL WF GWF GFNPGSN LVVASSAA RVAVTTAALA G GA G G
 LGTFVLWWL GWF GFNPGSTMSADPQASHIVITTNTAAASA I
 VYSVYQCMFANLVPA GSTFAANLDRAMAI STTNIAAASSAG A GA GLLLWMGWSGFNGGGPFAANTDASLAI LNTHVCTAT SLL
 V GA S L L WV G WF GFNAGSAGLEAGTSAVLAFMNTFTATAAA V

 L GA GI LWW GWF GFNAGSALAAD GLLAVNAFVTTHLAAAAAV



 IGASLLWWVGWF GFNAGSNNLDAA GVVSVAFMNTMVATAAAAG $V G T G L L W V G W F G F N A G S A L E A N G S A A L A M D N T F V A T A S A A$ GLLLWF GWF GFNA GSALS MNYVA DNAFFTTNTSAAAGA I GAS LLWWFGWF GFNAGSALEAS GGAALAMVNTWVATACAA VGASLLWVGWF GFNAGSALEAGNSAALAFLNTFSATACAV P H NLWF GWY GFNPGST LSAMD GDGDGRVAANTTLAACAGG LWF GWF GFNGASTVCATGDDVLVSMGADFDTTNMAAAAAA GMLDWGGWFGFN A GSALAANGTAAMAFATTTTTSSAAAM
 LP LAA A GAF LLLWF GWF GFNP GSTLLS GRDAVNTNLISAAA G G

 GGA GLL WM GWS GFNGGAPAVASLLDAS LAVLNTHVMAAA T S L LGTMCLWMGWY GFNGVSTMADGEVAARAMVNTTIA G GVAC
 LGT L LWF GWLGGNGGGSAFGANLRAVMACWNSCLAAAMGS $M G V L L L W W G F Y G F N P G T M G Q F A L V V A R C A D S T Y M A A C F G G$ $L G C F L W L G W F G F N A G S T W A A N A D A S H D L L T T T L A C A F G A$ I GAMLLWVGWFGFNAGSAVASNEDATVAFFNTMIATAAAS

 | $L$ |  |  |
| :--- | :--- | :--- |
| $L$ | $G$ | $G M$ |
| $M$ | $W$ | $W$ |

 LWF A WF GFNGASTVVSAT GDESLLTLIGTVLLNNTNLSAMVTAT

 VGAS L L WV G WF GFNA GSA GA A N GVVI L M V I I P GILA L A Y G G L V

 LGTVVFLWF GWF GFNGGSAGNSTIRAWYSCV STNLAA SCAG LGVFIL WF C WF GF N GASTVSME GDA VVSAVTTNLAAAVAT

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

 LG T ILL WF GWLGGFNGGSAFGANLDAAMACDNS CLLAAABAA
 $G L L W M G W T G F N$ GGDPYSAGIDASLAVLNTHACTATSLL TGCF L LAF GWF GFNPGSTLGAS GRDGSDAVNTMLA GMA GS $P L V G V G A L L L I S L G H \square T Q P G D S E T V A R S M F S T V V G G S G G A$ IGTFLLWWF GWYGFNPGSTLALHNAAARAADTTTLSAAAAA
 $N V L L V L A G A G L L W M G W A P Y A A N D D A S M A V L N T H V C A A T S G L$ TGTVVFLWVGWF GFNA GSALSANLDRGVMAAVVTNLAACVGG
 L T VFLWF GWQFFNPGSAGNATIRAWYSAMSTNLAAAVGG GTFILLWFGWFGFNPGSTFSAHHLRDAVVAVNTNLAAASGA $G \square F L W W G W F G F N G G S V L S G K P G A V S V V L V T T S S A A A C T G A$

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UniRef90_R5RUE8 UniRef90_C5CX78 UniRef90_D8PK86 UniRef90_C0EAH3 UniRef90_F9T7D0 UniRef90-LORAW4
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UniRef90 G3IYW0 UniRef90-T0JQS4 UniRef90_UPI00036EE15D UniRef90_D4ZN27 UniRef90_UPIO003700B78 UniRef90_D7TUJ0 UniRef90_D7G3S7
UniRef90_A3JRR3 UniRef90_M6DR91 UniRef90_H9BMM9 UniRef90_-11T0D8 UniRef90_UPI000468373A UniRef90_UPI00039E5848 UniRef90_G8BRX6 UniRef90_L7UNH5 UniRef90_E5CF51 UniRef90_T0R7Y9 UniRef90-A8U5C8 UniRef90_B5Y3C5 UniRef90_UPIO0037FF4FE UniRef90_A9BQZ4 UniRef90_W3XNM4 UniRef90_A9RLB1 UniRef90_B3SC87 UniRef90_C5DCW5 UniRef90_D4LJ61 UniRef90_Q9R6T8 UniRef90_C1MHX0 UniRef90_UPI00047803D4 UniRef90_K8GGR7 UniRef90_UPI00037061D1 UniRef90_C3X831 UniRef90-H0Q0A2 UniRef90_L2G2A4
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UniRef90_W6M4A1


 L T WM V I D W I C N R K P T T V G I C C G A V A G L V A A A TVVTS WL K D G K P D L S M I I N G I L A G L V A I T A G C N L V S S Y W

 FTYAAMDRLDT GKYSVQQAACEGVVVGLVNITPSCGYYWPW
 I S M L F Y K F L T VK A W DVV A T C N G I L A G L V A V T A S


 L T W WM F L D F R L E R K WS V V G F CVV L D Y A G G G P V E
 LAWCIGEALMRGKASMLGAAS GAVAGLVAITPAA GNVGLM AVWCLMDYRASRSWSMVGFCS GTIIA GLVAATPASGFI HPW $V$ T V M I I T W I R Y K K P DV S M T L N G S L A G L V A I T A G C D M V D P V



 L A A MCTVVWMMY GKP DLLTMCMNGAALAGLVVADTAPCAVVSPG
 L S WL L V E Q A V K G K P S L L G A A S GVV V A G L V A V T P A C C G F A G T M L A WMV A E R V A G H K A S A L G F C S GVI A GLV V A V T P A A G N S G P F
 LA WCVGESLVKGKFSVI SVLWF IVYGYSLAFTEGNAY G G GF







 $I T W C L L D W R L A R K W S M V G W C S G C I S G L V A A T P T S G F \square P P W$



 LVTTSIL
$L V A M M M T W M K Y G K P D \square S M T L N G S D A G L V G \square T A G C A T V S P F$ MTID G L E R I I R G K VR KK NVLSTMAAHSFVAAGVVSIVVDVS

 V T WC L L D Y RLE R K WS AV G F C S GVI A G L V A I T P G S G F V P V W

 V TVMMI T W I R Y K K P DV S M S L N G S L A GLV A I T A G C D T V S P T

 $V$ A A T I T A WL


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UniRef90_E0UKB2
UniRef90_E1ZLV9
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UniRef90_UPIO0047126C7
UniRef90_C4YBL2
UniRef90_U8HVD5
 SSLVIGIIGG\|ICFFSVSFLKKKFNYDDALDAFGCHGIGG
$A L L!G T V A G \square L C Y Y A L I W R V K \quad K G F D E S \square D A W S T H G V G G$ GAAI GGLA GILVVVAVEFIDKKLKDDDPVGADSVHGVCG GAFCI GII TSAACFYMVAVI KPKLGYDDTLDAFGVHGMGG GAVA G GIDAGIIVVYAVSLFDNLKMDDPVGAVSVMGVNG

 $G A L A D G L L S G V L C Y L A V V T L K Q R L G Y O D S L D V F G L H G V G G$


#### Abstract

YASVFGVVAAVVCK LLRTIFSTFDLREDRDFVFAVHAGGG KEAFKPHNLPMVFTGASILYKKWLRVDDTCDVFGVHGVCG SSUVI GLI AGFLVVVSVIFFDRIKIDDPVGALSVHGVNG  $\square S Y Y L G P R T G Y G T N F A T V L K G P M R V D D V M D D F S V H A L A G$ AA LMG LS GS DPWYSMMVLHKKDQVDDTMAVFHTHAVAG  GALI LGVLSGADCNLST KLKFLFRMDDALDLFAEH   


AS $\| V \square G \square L A G M L V V M G V M L L D K \square H \square D D P V G A \square P V H A F N G$ A S RVFMHGLNPQDVLAANSLKRMLGYDDALDAFGVHAVGG
 GSVILGLLVSPICFFFVTTVKNKFGYDDSLDVFGVHCIGG GAIVLGAVASVVCFFAVTVLKPKLGYDDSLDAFGIHGUGG
 DRLFLKGVFDPATGAFAMGAKKLLGADDSALDVFGVMGVGG







SSAVIIGLVAGVLVVFSVLFFDKПKVDDPVGAVSVHGVCG ASVI LGIVTGIVCNYSTMIIKFWIRIDDSMDVLAEHGMAG
 SAALI GFIGGGVIVLPCSDWLE KGEIDDPVVAVPVMGGCGB GAFVLGILVGII CVWGVNGLKR LLRADDALDVEGVHGVGG $G S V I Q G I V A G V V C N F A T \quad K I K Y Y L K V D D A L D L L A E H$


$G A V A \square G A \square S A S A L V Y G \square E F D E K K A K \square D D P V G A F G V H G V S G$ GALFMGLIGGVLCFWGTTALKRILKADDSLDTDPEILFVI A A AVTGVGAGILYMVGSRGL VMLRLDDAVDADPVHFVNG GA 1 CVGA 1 AGVI DPLS LVFFDKTLKIDDPVGATSVHGVCG GFGKIFLKGIAPDTLSGALPKKLLKVDDVCDVFGVHGVGG A SVLYGU LGASCANYAT K KLK FLVVGVDDALDVIVAVHAVGG
 AALLIGAIAGLTFMVWSWAILKFRIDDPRLDAISVHLNAG SAAI GULSGFIVVFGUEFIDKVLKUDDPVGAVGVHGLNG




 AS II LGVVAGVACNFGTGK乌KFLLK
Y T APVFGVIPADVCNFAVDLKSLLQDDDGLDVFALHGVGG AALIMGVFSGSIPWFTMMVIKLLQKVDDTMAVLHTHAIAG SSVIDGLVAGVLVCLSVEFVERKMKVDDPVGADVVHGANG A A FLCGAIGCLLIVFALHRLVLFLKVDDPLDTVAVHFGAG ASLLDGCAGAWIYH AASCCMRRLRIDDPLDAFAVMGACG $A A 11 C$ GF VAA WVLIGLNMVALKLHFDDPGLEAVQLHGGCG
$G L V Q G W A A M V M G I L S G S I P W H R R W S D D D T L G V F T H A V A G$ $K S \square V C G L V G G D T G N M A T R V K Y W L G \square D D A L D V F A V H G \square C G$ SA ALIGLMVSPICFYADSVLKKHFAYDDALDAFACHGVGGG WS S V I I GUVVCGVGCNLAA DLLKNLLDHDD D GMDVWADH GVVGG



UniRef90 F3Z2P6 UniRef90-FOK7Q0 UniRef90-Q6ARH0 UniRef90_A2SS52 UniRef90 E4Q7T7 UniRef90-R7CTM8 UniRef90-E0UKB2 UniRef90 E1ZLV9 UniRef90_G3ASA3 UniRef90_UPI00047126C7 UniRef90-C4YBL2 UniRef90 U8HVD5 UniRef90-Q8RUT6 UniRef90-W9VXC9 UniRef90-E8XPU9 UniRef90-B5YBJ2 UniRef90-B3GLZ1 UniRef90-QOVPH4 UniRef90-I2FNY0 UniRef90-B9H8E7 UniRef90-R5RUE8 UniRef90-C5CX78 UniRef90-D8PK86 UniRef90-C0EAH3 UniRef90-F9T7D0 UniRef90-LORAW4 UniRef90_UPIO00181692F UniRef90-W1QHN3 UniRef90-Q0FEC0 UniRef90-E1QIU3 UniRef90-E6QTY8 UniRef90_J2JYV7 UniRef90-UPI0003B523D8 UniRef90-TOGN20 UniRef90_G7LYC3 UniRef90_Q47K18 UniRef90 W7WDQ5 UniRef90_UPIO0046EB3B6 UniRef90-E8LEM6 UniRef90-A5FK92 UniRef90_F4KY49 UniRef90-G3IYW0 UniRef90-T0JQS4 UniRef90-UPI00036EE15D UniRef90-D4ZN27 UniRef90_UPI0003700B78 UniRef90-D7TUJ0 UniRef90-D7G3S7 UniRef90_A3JRR3 UniRef90-M6DR91 UniRef90-H9BMM9 UniRef90-I1T0D8 UniRef90_UPIO00468373A UniRef90-UPI00039E5848 UniRef90 ${ }^{-}$G8BRX6 UniRef90-L7UNH5 UniRef90-E5CF51 UniRef90 Q00YC3 UniRef90-TOR7Y9 UniRef90-A8U5C8 UniRef90-S3NPS7 UniRef90-B5Y3C5 UniRef90_UPI00037FF4FE UniRef90-A9BQZ4 UniRef90-W3XNM4 UniRef90-A9RLB1 UniRef90_B3SC87 UniRef90_C5DCW5 UniRef90 D4LJ61 UniRef90_Q9R6T8 UniRef90_C1MHX0 UniRef90_UPI00047803D4 UniRef90 ${ }^{-}$K8GGR7 UniRef90_UPIO0037061D1 UniRef90-C3X831 UniRef90-H0Q0A2 UniRef90-L2G2A4 UniRef90-EYYQE3 UniRef90-A5DE35 UniRef90-UPI00032A9AD2 UniRef90_UPIO0037A4ECA UniRef90-T1HQR9 UniRef90-R1CB00 UniRef90-KOGXFO UniRef90-M0RIL9 UniRef90- X0CA17 UniRef90-C4YC30 UniRef90-D3H7U0 UniRef90_S6EELO UniRef90-UPI00036C8D4E UniRef90-L8JUH3 UniRet90-8JM3
UniRef90 W6M4A

A WG T|I A A G|LIFATDVGLFMGGG $\begin{aligned} & 330 \\ & \text { F }\end{aligned}$
350
360
TWGAIATGUFATKAVNSAGNGLLYGNASLVLKQLEATAAT
$F W G T \prod A C G \prod F A T A A V G G V S G \quad L D E G N A Y L L G \square Q \square L D A C V T$ $A F G T L M V G L F A D D$
$\square I G S I L T G V F A T Q S D T G E G G G A L Y G D W H Q L W V Q \square A A T V V S$

FVGSFMTGLFAADYVGMDDGGWDNHHWKQLGYQ
TTGMULTGVFASKKINPAGNDGLIYGGTSFFLHLLGCLIV
IVADTLTGIFASKTVAALDGVTEIKGGW
$V \vee G A \square L T G V F C V P A L G G Y V E G S E \| D P G Q V W Q L K S V L F T$
ATGMLLTAFFAEYALDG
$1 V G C L L T G V F T S S S L G G V G Y A E G V T M G H Q \square G A S S G A \square A G L$ $V$ F G T L SVGI FAKE GV T S FS TVN
$M V G N I L T G I F G T S S I A D L D G S S Y P P \square G W Q \square G N Q L V G V C A V$ AWGTLAAGLFYDGDL
$\triangle V G T L L T G U F T Q A S V A N N D G N T V I A G G W Q D A Y Q L A Y C L A V$ SLGGULAGFFANPKLNRDFYMVKD WQHY $G G L A Y$
VWGTLAVGLFACNTPASEG
$I V G A L L T G V F N T Q A \square G G P G L V G D W G \square G A Q V W \square Q L K G V L L T$
$A T G T D L T V F S V D Q G \square A Y G H$
VVGTLYAGF


$A F G T L A V G V W G Q K A L G L A N D G L L H G G G$
1 VGSI GTGILVNPALGGTGVFDYGANHDQLIS QF WD $\square G V T$
I MGMILTAMFAHGEKASLLHGGFEVFAHHMM QFALVV I FGAMLMTGILVDPALGGQGTADYAT
MVGAI GTGUVYAPSLGGPGGADYA GGG
WWGIATGIFASKAINPAGAGLIYGNFALIKAHLISDCAT
I LGA MLT GVFADPALGGTGVYDYYDMTAQL 1 S S A AWGVGTV
$1 V G A L L T G V F N S P A L G G P G Y V T D Y S \square A S Q V W D Q A K A V L L T$
$1 W G T L S L G F F A C G L Y G A T G$

 $1 V G M L M T A I F A T E A F G G \quad V I A T G N P K L L I S H L I A L A I V$ $V T G S L L T G V F A A S S L G G L G L A E G V S \square M E Q V S V Q A L A G V V T$ TFGTVAVGIFAEK
$\square W G T L A V G L F S D G P G V A K F P W Y T D G L G$
$\square L G T L M V G V F S R E G G L L Y G G G T N$
SLGGILTGFFAMPKLCRLFYMVPDW
$M W G V L A A G L L A E K D N Y G E S Y$
A WGT\AAGLFAEEAFGGVNGLFFGGGDDQ
$V V G L V F N A F F A A D Y \| I G L D G V N T G I I T G G W L N H$
AL GVWWYSLAAKEGFVHELYGATNPDG
WWGTLAVGI FC
$\square C G A L L T G V L S A K A \square G G T T L D S \square G A \square G G Q L V \square Q L E A \square V T T$
VVGMVLTGVLAK DVGLIHGETRTFDMHDAALVLV 1 VGSI LTGVVFATQY $\operatorname{ITGEGGVEGALYGDWH}$
$A D G T \quad$ GVGFFATD $\quad$ G $D F Y G G G F N L I G Q Q L G V G S V$
$F$ QMTFAIITVASELIMMDKVPTH MGHQLWIQLDEGVLAT
AWGLMSVGLFASPARLLAAYDNDAHPGWF
1 W GTLAVGIVFST

CLGGLCVGLFAEPRLCEYM
IWGMI A QSL FNFKT
A $\square$ G S V L LT GI F A A D YVNA $\square \mathrm{D}$ G G W $\square \mathrm{NHHWKQVGYQ}$
AFGTLAVGLFSDGAGTG

YLGT LVGGCLARSSVGAPHYS AKLFGKQLIAASGC ALGTILTGLFADKD
A WGTL AVGLFA
AWGA A TGG
TWGA ATGLWATTKVNPAG
IVGAFAERI RFAAVMLFMVLGGDYSMGWQVWDQVKSVLVT
1 LGAMATGVFVDPDLGGTGVYDYVANAAQPDAYIDAAAGE
IVIFNAFFASGS IGGLGLTGGWVDGNWKLMYDQ\|AY IVAC
$\square C G S \| L T G F A A D Y V G A S D G S V A N D P S G A S D Y Q G W$
SLGGULTGLFAEPKLNK LFYGNYNKYVGLFY
1 WGVISVGLFADGKSNYGGSWNGVTG
VWGVFARALLSQEGL
FWGCVSVGLFAS
A WGLIFTGLLFAKEE
VGS LVVVFADDLYNSKGGWVT HHWVQMGY
IF F GL A T A I F T T P D L A
C IGCVVFTGI FAADYVNSTAGSYTAPDEGGWDNHHW
LWGLLSVGLFADGTYG
VWGTLAVGV F GVDTEG
br

UniRef90 F3Z2P6 UniRef90-FOK7Q0 UniRef90-Q6ARH0 UniRef90-A2SS52 UniRef90 E4Q7T7 UniRef90-R7CTM8 UniRef90-EOUKB2 UniRef90 E1ZLV9 UniRef90 G3ASA3 UniRef90_UPIO0047126C7 UniRef90 C4YBL2 UniRef90 U8HVD5 UniRef90-Q8RUT6 UniRef90-W9VXC9 UniRef90 E8XPU9 UniRef90-B5YBJ2 UniRef90-B3GLZ1 UniRef90-Q0VPH4 UniRef90-12FNY0 UniRef90-B9H8E7 UniRef90-R5RUE8 UniRef90_C5CX78 UniRef90-D8PK86 UniRef90-C0EAH3 UniRef90-F9T7D0 UniRef90_LORAW4 UniRef90-UPI000181692F UniRef90-W1QHN3 UniRef90 Q0FEC0 UniRef90 E1QIU3 UniRef90_E6QTY8 UniRef90-J2JYV7 UniRef90 UPI0003B523D8 UniRef90-TOGN20 UniRef90_G7LYC3
UniRef90-Q47K18 UniRef90 W7WDQ5 UniRef90_UPIO0046EB3B6 UniRef90_E8LEM6 UniRef90 A5FK92 UniRef90-F4KY49 UniRef90-G3IYW0 UniRef90-TOJQS4 UniRef90 UPIO0036EE15D UniRef90-D4ZN27 UniRef90_UPI0003700B78 UniRef90_D7TUJ0 UniRef90-D7G3S7 UniRef90_A3JRR3
UniRef90_M6DR91 UniRef90 H9BMM9 UniRef90-11T0D8
UniRef90-UPI000468373A UniRef90_UPI00039E5848 UniRef90 G8BRX6 UniRef90-L7UNH5 UniRef90_E5CF51 UniRef90 Q00YC3 UniRef90_T0R7Y9
UniRef90-A8U5C8
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UniRef90 W6M4A1

YAYS 1 IGTGI I IKVVS LIFK $\quad$ RR
A VF AF GVTY L L A WVVDKTVG V VF S A VMT F L LIF K F T DK TVG VR V
 F VYCFAVSWVLLK LVDK LVGLRV

VA 1 T PACGTVGYKVADM\|VGDRV F GYSFT $\square$ S C I I LI $\square$ MN $L$ I P G $L$

T A WCGGVT F A $\square$ M F V VD H T P
$\square \mathrm{V}$ WS G VVS F $\square \mathrm{A}$ Y K $\square \mathrm{AD} \mathrm{DT} \square \mathrm{G} \square \mathrm{R} \nabla$

WVYCFAVSWILFKADDKFYGLR $\square V$ WS SVVAFIAYK $\backslash V D A V I G L R D$
$\square V W S G V V S V L F K D I D M T M G L R V$ SAFTFFGSLLLYKKITDC凹ITGRV
$A \square Y A A V A T F V I L K V I G F V M K L R$ IVVSGVVSIVAYKLVDIVIGLRV $\because V W S G V V S V V A Y K I T D L V I G L R V$

SVFTFFGAYFLFKVTNF\| $\quad$ PR $L R$ V VAYTGVGSWLVYKLTNMISPLRV AA WS GLFSFLI L KKCLDKW $\quad$ G L R V
$L V W S G V V A W \square A Y K \square A D K \square C G \square R V$ STFSFVGSYLLYKLVDRVVP LR V F V
 $\square V W S G V V A G \square S Y K \square C D L V V G \square R V$

A VY S F V VG F G L I K G $\square$ GA VMP
$\square A$ WS G VVSF $\square$ A YK AA GATAGFLFQKKIVDLLDGLRV CA Y TFVMSALI AKAIDMVPGLRL

UniRef90 D8R302 UniRef90_G8JUJ2 UniRef90-H1LVL1 UniRef90-M3XJM0 UniRef90 R5LBW8 UniRef90-V5BVZ4 UniRef90-K9B8P1 UniRef90 F3ZYD6 UniRef90_Q8S230 UniRef90-H8X370 UniRef90_UPI0002B4A343 UniRef90 IOZAD4 UniRef90-B2AA58 UniRef90-UPI00046F5D19 UniRef90 K2Q0X9 UniRef90-UPI0004177096 UniRef90-E9C1J5
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UniRef90 B6JAH3
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UniRef90-H6LKH9
UniRef90-A7HCU8
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UniRef90-W0JK37
UniRef90_I1IAE7
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UniRef90-D8LEG5
UniRef90-R6R7N2
UniRef90_G4T2R8
UniRef90_UPI00044137DB
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UniRef90_W1EJ57
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UniRef90-FOZWG6
UniRef90_UPI00036F7E10

NNGDTAFMMLATAMVCDMT PGLAFFYGGLARKRNVL DSAEDMFA $L L C G \square W V I F F K F G F A L F A F G S T S V R S S A$

ETGFTRAKNAG

E A GMTRAKNAA A W $\square$ NK G D T A WQ $L V A$ ATF $V G \square Q S M P G L V V I Y G S \square V K K K W A V$ MQTGFALLESGLVSMKSKT $W \square P N \square N A A F V L T D G Y F V F \square M Q L G F A M L T A G S V R A K S A K$

EAGMVRSKNS】
EAGAVRAANAT RKKNVL
$G L V R S K T T$
$R R K N V L$
EAGLTRAKNTV
GLVRSKNTT
EAGFTRSKNTA

W $\square$ N K G D N A WQ $\square$ T A ATLVGLQSMPGLVILYAS $\quad$ VKKK WAV ETGFCRQKNAV $\square N F T W T \square I C G F L V M F M Q \quad A G F A M V E A G L C R V K N A N$ RGKNVL R M K S V K

MNTGNTAFMMDCTALVFFMT PGLAFFYGGLVRSKNNVLC GAVRAKNVQ $\square D$ A GHTA WM $\square$ MSCGLVNLMT PGLAFFYGGLVRQQNVL RKKHAL


RKKNVL
S $\square$ D T T WVLLTGFLVFFMQC GFAMLEAGLVRQTSVV

NTAFMLLCTSLVMLMT PGLAFFYGGLVSRKS\|I MQVGFAMLEVGSVSSKNTK EAGEARSKNTVKNTT

EAGLVRSKNAA

TVSTMGVLLMVPALGLFEAGLLRAKNSV
RTKNVS
EAGFTRAKNAG
ETGFTRAKNAG
TTSAVDSTYLLFSAY LVFAMQL GFAMLCAGSVRAKNTM
ETGMSRSKNAVV GGLVQSKNVL

ECGSVRSKNAT
EAGLVRTKNTT
AANT $\square$ WVLFTAC LVFFMN AGFCMDETGFCRPKNAV ESGLVRAKNTA ESGLVRAKNTT

PY $\square \mathrm{DTNTQYLLSSAYLVFFMHC} \mathrm{\quad GFAM} \mathrm{\square S} \mathrm{\square GCVRARFAR}$
SGLARKKHALL AGMCRQKNAV

A GFARTKNCV
AGLLRSKNTL

UniRef90 D8R302 UniRef90_G8JUJ2 UniRef90-H1LVL1 UniRef90-R5LBW8 UniRef90-V5BVZ4 UniRef90-K9B8P1 UniRef90 F3ZYD6 UniRef90-Q8S230 UniRef90-H8X370 UniRef90 UPI0002B4A343 UniRef90 IOZAD4 UniRef90 B2AA58 UniRef90_UPIO0046F5D19 UniRef90 K2Q0X9 UniRef90-UPI0004177096 UniRef90-E9C1J5 UniRef90-A9H9C4 UniRef90 B6JAH3 UniRef90-UPI0002F2F77D UniRef90_H6LKH9 UniRef90-A7HCU8 UniRef90 IOICG0 UniRef90-UPI0003B315FE UniRef90-S2KCX2 UniRef90 D5EUE8 UniRef90 C3X1J1 UniRef90-R6B364 UniRef90 TOIPT2 UniRef90 D7LLH1 UniRef90_UPI000347EBCC UniRef90_UPI00047DC1D7 UniRef90_UPI00036CB3A0 UniRef90-L8WUZ4 UniRef90_A1VEI2 UniRef90-R1FT59 UniRef90 UPI0003801A63 UniRef90-M1E9H5 UniRef90-K4ALNO UniRef90 K4B0C4 UniRef90_AOYBZ1 UniRef90-D4M1P7 UniRef90_B7FTM9 UniRef90 C1EAA1 UniRef90_UPI000375A620 UniRef90_C4Y3T9 UniRef90 K4MB10 UniRef90_R7YGV0 UniRef90-F3ZVV4 UniRef90_UPI00041C5E36 UniRef90 W5YCB4 UniRef90-L8N5J9 UniRef90_W0JK33 UniRef90_I1IAE7 UniRef90 UPI000422978C UniRef90-D8LEG5 UniRef90-R6R7N2 UniRef90-G4T2R8 UniRef90_UPI00044137DB UniRef90-Q0BWDO UniRef90-UPI00037A1A3E UniRef90-T2GEF0 UniRef90-A0A015L6D6 UniRef90 R1FVV1 UniRef90-UPI00035C5266 UniRef90_UPI000427D257 UniRef90-B1KHZ7 UniRef90 M5DY80 UniRef90-F2JHP2 UniRef90-J3LEV7 UniRef90-UPI00035D6146 UniRef90 A0A033UY08 UniRef90-14EJT8 UniRef90-T1JHB7 UniRef90 B2B3C9 UniRef90-W6KCP9 UniRef90-K9RSC0 UniRef90-13CIQ1 UniRef90-B3PF77 UniRef90-B4D7W2 UniRef90_UPI0003B36B5D UniRef90 A0L6B9 UniRef90_G1UN90 UniRef90-IOYXR0 UniRef90_UPI000475B8EE UniRef90 GOWCX5 UniRef90_G7V4T8 UniRef90-R6VP21 UniRef90-G8M363 UniRef90-FOZWG6 UniRef90_UPI00036F7E10
 NVLLLS LADTFI SLIAYWMHGYAFAFGAHNDFI GTKYF NIVMKNI DD DCIGAPVFFF■GFGDMFGKNCGFUGNDDLFD EGNAFFGGFQTLM $N \| V M K N L M D F A \square G T P \square Y W L V G F G \square M F G A D A A G D F G T N L F G$ NSAFMALMAFGDRLLPFWAAGPALTQDQRAVFPATAHYGS
$N \square M V K S V L D V C F G S V A Y W F \square G Y G \square S F G S D T S T G N S F S G N$ $S V C I K N V M D V M F G G V A Y Y L L G W A F A Y G D A D A V C S S V G N P F$ $M D F C \square G S L I Y$ WAVGFAALSPTATNGF $\quad$ MGNLDRFG $N V A Q K N L L D F V F G V V G F A V V G F M L A F G R S G F L P V G L D P D Y$
$N \square T \square K N T \square N A A L G M V C Y W V S G F G L S Y G G G N K F \square G S S A F F L$ ATLMQSFADCCUITVLWMVAGYSLTFGTGSPYIGDLSRFM $E \quad \square L T K N F V L F A V A C T M F D F V G Y N D M Y V$ GNDEGGFDPSF NTMMSVLFCCGLTTVMWFAFGYSLSFGPDMGGFGDFFHGD $N \mathrm{~N} T \mathrm{~K} N \mathrm{TM} \mathrm{VLTGVLTYG} \mathrm{\square CGFNLMYPGFGFAGMFPWGAG}$ E ILTKN LLYA\|ACTMFLLVGYNIMYVDNNDEGGWLPSF
$N \square L M K N F V D F M F G S L L F F F \quad \square G F G F M F G G D V L G G F \square G M$ $G A \square I \quad G N F D K \underset{F}{L} \mid$

NSAFMALYAFAAVLLCWVLLCYKMAFGDELPFWGKGGPAF
 SVLMHCFVLTATMTILWLICGYSLGMGGSAGNGGSMDLAM
$N \square L L K S V M D A C A G G \square I W Y \square F G F G V A F H G G N G F \square G T S G F Y A$ DFFG $\square$ IGSFTD

S $\square$ LM QCFAlT CDASVLWFVVGYSПAFGEGNPYFGGMGKAL NTMMACVAIMGLSVLLWTMFGYSLSFGGNHGUIGDFRWAF NTMLLKNLLDACGAAI AFFTVGYAFAFGGTDFPTDTDTDTG TM MMQNYVSMGLMT VVW VWGYS LCFGENKTSYDWGNPAT SLLWAS DMAACLTSFQWFFWGYSLVFSTSSHFLGTLDNFC S QA W $\square P \square M T$ T A VVG $\square E W Y \square W G Y S \square V F S N G H T F W G G T D G \square A$ ATDMQSFS $\square$ CC $\square M T V V W M V L G Y S \square A F T S G N A F \square G G \square D V V L$ NTLAENFVDAATTLLAWWVTGFA』AFGTTSNGLWGTDGFF

T TM S Q SFFSMGWVATLWFAVGYSLSFAPSANG\|IGFYYAF AVLLKNDGDAS GAI CWWLVGFGLAFGEDAHGFIGTSVFA NILSKNFIVFAVSSi GYLLLGWGLMFGGDNPFIGTKSLFI E ILTKNVALFALACUMYMLVGYNDMYPDENSVWPGDSFLL MQSMKNVT LIFSVAGLMFWDTGYNLAYPGDATLFNGLLPTN

N NFSGGLDKFL GVIGSLNFAF

$M Q C \square K N \square S \square Y S \nabla A G L M F W V G Y N \square M Y G G G T F F$
NIIMKNMMDFASGSLVFWAVGFAFMFGSGNSFDGTTGYFD NIIMKNLMDFAVGSIIYWI $N 1 M L T N V L D A A A G A L F Y Y L F G F A F A F G A P S N G F D G K H F F G$ $N$ MMMKNYMDLCVGTVLFWLVGYGLMFGTNVTGWIGTDHFA NTSMHS $\square$ SA 1 VVVTFTWVLIGFS ISFGGNNLWDGDFSHAL
$N \square L I K N M L D A F L A G V A F W L V G Y A F A F G K G N C F L G T H Y F A T$ PGNGWFFGSWTAHL $M Q L T K N D G L F S D A G D M F Y D M G Y N V M Y G V D G G F M G G D S D W G$ NLLAKNLIVFALSSISFWAIGFAIMFGDGNEFMGNSGFFL E I L T K N I TLL Y A I A Cll M Y ML V G Y N L M Y P S G E GII I A GII P P L


F T G GSPYVGGFS

SLLWASLMASAVCMFQWFFWGYSLAFSHGNGFIGTLEFFG

$N T L S K N F \| V F A V S S L G F L F \square G W G \square M F G G D N P F \prod G T K G L F \square$


UniRef90 D8R302 UniRef90-G8JUJ2 UniRef90-H1LVL1
UniRef90 UniRef90-R5LBW8 UniRef90-V5BVZ4 UniRef90-K9B8P1 UniRef90_F3ZYD6 UniRef90_O8S230 UniRef90-H8×370 UniRef90-UPIO002B4A343 UniRef90 IOZAD4 UniRef90-B2AA58 UniRef90_UP100046F5D19 UniRef90-K2Q0X9 UniRef90-UPI0004177096 UniRef90-E9C1J5 UniRef90-A9H9C4 UniRef90 B6JAH3 UniRef90-UPI0002F2F77D UniRef90-H6LKH9 UniRef90-A7HCU8 UniRef90 - 10 ICG0 UniRef90_UPI0003B315FE UniRef90-S2KCX2 UniRef90-D5EUE8 UniRef90-C3X1J1 UniRef90-R6B364 UniRef90-TOIPT2 UniRef90-UPIO00347EBCC UniRef90-UP100047DC1D7 UniRef90-UPIO0036CB3AO UniRef90-L8WUZ4 UniRef90-A1VEI2 UniRef90_R1FT59 UniRef90_UPI0003801A63 UniRef90-M1E9H5 UniRef90-K4ALNO UniRef90-K4B0C4 UniRef90-AOYBZ1
UniRef90_D4M1P7 UniRef90-B7FTM9 UniRef90 C1EAA1 UniRef90_UPIo00375A620 UniRef90-C4Y3T9 UniRef90-K4MB10 UniRef90-R7YGVO
UniRef90_F3ZVV4 UniRef90_UPIO0041C5E36 UniRef90 W5YCB4 UniRef90-L8N5J9 UniRef90-W0JK37 UniRef90_11IAE7 UniRef90_UPI000422978C UniRef90-D8LEG5 UniRef90-G4T2R8 UniRef90-UPI00044137DB UniRef90_QOBWDC UniRef90 UPI00037A1A3E UniRef90-T2GEFO UniRef90-A0A015L6D6 UniRef90 R1FVV1 UniRef90-UPIO0035C5266 UniRef90_UPIo00427D257 UniRef90_B1KHZ7 UniRet90-M5DY80 UniRef90-F2JHP2
UniRef90 J3LEV7 UniRef90-UPI00035D6146 UniRef90-A0A033UY08 UniRef90-14EJT8 UniRef90-T1JHB7 UniRef90_B2B3C9 UniRef90-W6KCP9 UniRef90-K9RSC0 UniRef90-I3CIQ1 UniRef90-B3PF77 UniRef90-B4D7W2 UniRef90-UPI0003B36B5D UniRef90 AOL6B9 UniRet90-G1UN90 UniRef90-10YXR0 UniRef90-UPI000475B8EE UniRef90_GowCX5 UniRef90-Q7V4T8 UniRef90-R6VP21 UniRef90-G8M363 UniRef90-FOZWG6 UniRe90_UPI00036F7E10

【DF VPS GVYAAS $\square P$ FA $D F F A Y Q M M F C V I T V P D M S G A F A E R$ VSLDGVRIAHFFFNYARCAVTTTLVSGAVVER RDDYTSD LPDGVSLCSFVFYQDTFCATAATIVSGAMAER LRGVGLDSVTGTFSQLLHVAFQASFACVTVAVVVGGFAER LNDVNHKDFSETVPFSLIMLFQLTFCTVAVSVLTGSVAER DGTLETPRTEPFYAEAALVLFEFEFAA $\square$ TVLLAGSLLGR
GQFMTDVDVSTDAKVY $\square K Y F F Q L S F A S A S T T \ I S G A V A R \square$ 1 GTEQFAMAGTPSTSFHTFYFQYVFADSTATIVSGAIAER LRNA LIGDESPGSPFDPE LYSWKMQFAAVTAALVDGATARG FMLDSFEHLEGGDPLESFLIFQTVFAVTAATVVSGAMAER

 LNGUGAQDSKGTIPESVFMMFQMTFAIITPALDAGSFARM GVTKDTVNDGGTIPEYVFFAFQMTFAADTPTLAIGAVERV $G A L I G T Q A D D A S H S L G S D F F F Q V V F V A T A M S V V S G A V A E R$
$N E T Q A G P Y A S N D P G U L F A L F Q L V F C M V T P A D V V G S L V G R M$

PAAADQTAAYADYTYYADFLFQAMFAATAATVVSGAVAGR GALIGTQASGADHSLESDFFFQVVFVATAMSIVSGVVAER

PNWGDLSFYESDLPVEGFLIFETVFCATAATVVSGAMAER MNG TTPDTLSPTIPEYVFSAFQGSFACDTAVLIVGAFAER HG IGLDS $\square$ MP TGUPELTFAMFQCMFALITPALILGAFAER
DQGY LKEQAAPYFPMATLVYFQFTFAA $\square T T \square L V A G S V L G R$ NGPYGNDPYPAAVPEADSFLFQVAFAATAATVVSGAVAER QTGMF LAGHSYDVGVMVIFLFQMVFMATAADTVVTGACAER

MEPSEAAKT $\square$ PH $\square$ AFMVFQCMFAVITPA L $\square$ S GAYAER LS GVDDTSGASYGAEWAFFFFQYAFAAAAATITSGAVAER H LAP TlPE ESVYMMYQLTFA IITPALICGAFARM VFFSH $\square$ TSVSGS IDPT ILFAVYQMTFAAITVSLISGALVER

LS GVTSSSLAGDTPETVFVMFQMTFATTTPALIGGFAER LNDWEAGPYADTIPHLIFAAFQMMFAMITTPALITGAVVGR NNQTTFDGTSNNVDDYSFWLFQYAFSAASATIVAGTLAER HAMSGIENDDGD:PGTVFAAFQGMFAVITPALMTGAFADR LAGVDATTVAATIPELSFVAFQMTFACITPALIVGSLAER $\square H N V L D R P V P S D P E L V Y A \square F Q G M F A S F T A S \square V S G A A \square W K$ DRGПDHT\|LPAGVPEYAFAMFQGKFA\ITPALTAGAVAER MAAGTPAATTMTIPESVWMTFQMTFAIITPALITGAFAER LNNMGAGGSSAPI STLTLFFFQFAFAATSSTITTGSMAER LNNDTDNSVTQTIPTYLYCTFELSFAAVTLALTSGSVIER LNHTGPHSMSGGLPLLVHVGYQMMFAIITPALITGAFANR LHGGESRFGTSGLKEAEWVFDWXXXXXXXXXXXXXXXXX



MFGVLPESVNGTLSEFTFFSFQGAFAGПTSCLILGSFAER LYGVGAEPVAPTVPHSTFMMFQCMFAVITPALISGAYAER F R G V G L E V K
 VMSFTPEDAATGYSSYSDWFFQMVFCATTASVVVGAFAER
QDSFAN $\square G \square D T \square A A F F \prod F Q T V F A A T A T \| S G A M A E R$ I GAPYLLDGWSGNSNFVWIIDFQTVFCATAATIVSGAMAER K QVPQVGFDYSFFLF QWAFA DAA LG LNGVGFTPFSETDPFALFMLFQLTFCTDAVSILTGSVAER YELKE TNFAQWFFQYVFAATAATVVSGSMAER FHRDVLSS SPVGTIPA ILFSEFQLVFEATVCAIAVGGFVER A D D S D GAK IEGGYAASSDWFFQMVFVATAASIVSGT LAER $M G A D N S P A T G D A Y P L L A K F F F Q L V V A G T A A T V V S G A V A E R$ SFMLGNGTASKGYALDADFFFQVVFVATAMSVVSGAVAER SKVLGEYAERE DYSTAA DFFF QVVFVVATAVSI TS GAVAER


L N EGTAAPAASNDPHTVFVAFQCMFAVLTVALISGAYAER HGLDGPTYFATAVRPYAFWVFEWAFAATACTIVSGADAER FMRHAP WT LAP T P LLI FALF QMKFA IITPALVVGATAR D
 PAVVTP E L I S E A G L L V P P S V
 LSYRNCNQNAPTIPSAAYAFFMMMFANDTPLLMTGAYAER

UniRef90 D8R302 UniRef90-G8JUJ2 UniRef90-H1LVL1 UniRef90-R5LBW8 UniRef90-V5BVZ4 UniRef90-K9B8P1 UniRef90_F3ZYD6 UniRef90_Q8S230 UniRef90-H8 H 370 UniRef90-UPI0002B4A343 UniRef90_10ZAD4 UniRef90-B2AA58 UniRef90-UPIO0046F5D19 UniRef90 K2Q0X9 UniRef90-UPI0004177096 UniRef90-E9C1J5 UniRef90-A9H9C4 UniRef90-B6JAH3 UniRef90-UPI0002F2F77D UniRef90-H6LKH9 UniRef90-A7HCU8 UniRef90 -10ICG0 UniRef90-UPI0003B315FE UniRef90-S2KCX2 UniRef90-D5EUE8 UniRef90-C3X1J1 UniRef90-R6B364 UniRef90_TOIPT2 UniRef90-D7LLH1 UniRef90-UPIO00347EBCC UniRef90-UP100047DC1D7 UniRef90-UPIO0036CB3AO UniRef90_L8WUZ4 UniRef90-A1VEI2 UniRef90-R1FT59 UniRef90_UPI0003801A63 UniRef90-M1E9H5 UniRet90-K4ALNO UniRef90 K4BOC4 UniRef90-AOYBZ1
UniRef90-D4M1P7 UniRef90-B7FTM9 UniRef90 C1EAA1 UniRef90-UPIIOOO375A620 UniRef90-C4Y3T9 UniRef90-K4MB10 UniRef90-R7YGV0
UniRef90 F3ZVV4 UniRef90-UPIOOO41C5E36 UniRef90 W5YCB4 UniRef90-L8N5J9 UniRef90-WOJK37 UniRef90_11IAE7 UniRef90_UPIO00422978C UniRef90-D8LEG5 UniRef90-R6R7N2 UniRef90-G4T2R8 UniRef90-UPIO0044137DB UniRef90_QOBWDC UniRef90-W1EJ57 UniRef90_UPIO0037A1A3E UniRef90-T2GEFO UniRef90-A0A015L6D6 UniRef90 R1FVV1 UniRef90 UPIOOO35C5266 UniRef90-UPIo00427D257 UniRef90_B1KHZ7 UniRef90-M5DY80 UniRef90-F2JHP2 UniRef90-J3LEV7 UniRef90-UPI00035D6146 UniRef90-A0A033UY08 UniRef90-14EJT8 UniRef90-T1JHB7 UniRef90-B2B3C9 UniRef90-W6KCP9 UniRef90-K9RSC0 UniRef90-I3CIQ1 UniRef90- B3PF77 UniRef90-B4D7W2 UniRef90-UPI0003B36B5D UniRet90_AOL6B9 UniRet90-G1UN90 UniRef90-10YXRO UniRef90-UPIo00475B8EE UniRef90_GOWCX5 UniRet90-Q7V4T8 UniRef90-R6VP21 UniRef90-G8M363 UniRef90-FOZWG6 UniRef90_UPIooo36F7E10
 HLFAYMIVVILNTGIIYVFPAHWLWDKNGWLLKKGAHDFA QLADAYAFYAFCWTASGFASPTRLASLGPLLLGSGVYDTV RVIPGMVFTFFWATLVYCPRAYWAWGAEGWAFKWGVFDYA
$T K F I A Y C I V S A I I S L I V Y P V G H W A W G G W L S K L G F I D F A$ LGSALLSTLIMPIFVHWVWGTADGPNSGAFLANLGFVDFA TRFAAWLVFVPVWTLLVYAPVAHWVWGPGGWIKKLGALDFA NLVSYCFAVIMLILFVYPVVVHWCWSDWGWLSQMGY|DHA KFSALCVFTILWSLLVYAPLAHWVWSPDGWVAGFGAVDFA KVSTVLVLLMIVPGLALFYGGLIRTKSDGYLFKLGALDFA MKLSTFLIFAIVLTGFIYPGEGYWTWGGGFLSAAGFSDFA KFSALF DFVAAWLMFVYYPMAHMVWGQGGLIAGFGAVDFA VKПGPFLIFSTLFVGLAYPПAGSWKWGGGWDDAMGFYDFA MKLWSFLIFTVFLTAF DYPIEGYWTWGGGFLSAAGFSDFA WGSGGLLAGWGLLDFA
TKFSMYLVYSAVISLIIYPVEGHWTWGGGWLCNDSFMMTT TKFGAVMAFMALWFTFSYVPMAHWVWGGGFLGEDGALDFA VKFNGYVLFT L WVITAYLPMAHWVWGGGFLQEMGADDFA MRFGAYVLLMI AWITLVYEPDCHMWADGGFIGKMGALDFA MNDKAWMAFVPLWLDFSYTVGAYSTWGGGFLYQWGVIDYS DHFGAFLIFSTL LVAFSYAVTGHWVWDGGWLSEMGFSDFA WKFGTFAVSSVLMGATTYPLFANWAWGGGWLAQLGNLGGG
$M K F S A V L L F T M W N L I V Y P T C H M V W G G W F A D M G V Q F A$ DSFRAMLLFSVLWLVLVYAPMAHWVWGGGWMFKMGALNVN CTGTGYLAYVMLTVGLGFLSAFNPEPPGPFKKLPGMIDFA KFSAMLVFMALWSLLVYAPIAHMVWEPSGWLAAAGTLDFA $\square K F K S W\|I T F T V W V T F V Y\| P L A H W V W G D G W L A K L G V L D F A$ PNGFLAKAGGVMDFA
$P D G W L N K L G V I D F A$ TKFSAVVIFTALWLLVVYA PITA WVWGGGWLGEMGLLDFA MRFKALFAFDALWSFLVYYPMAHMVWGGGFLAADGSVDFA VMFAPYLGYSALLTGWVYPUVAHAVWNVHGLWGVGMVDFA VKVLMQVLAITCMVSAGEPKLSEVLNDAGLLFKWGAIDFA RLGPMMVFAFIWLTVVYCPVAYWTWGGDGWLFNWGGLDFA DKLSSFLVLGLLWTTLVYDPLAHWSWGGGWAHSLGALDFA MRFPAFIGFTVLWSFLVYDPLAHWWGAGGWLRNLGALDFA $M K A L C V F T\|L W S L I V Y V P\| A H W V W G P D G W V A S K V G A I D F A$ TDFKGLTYTTIMGAVMYPLVVHWAWNSGGWLNKLNYHDFA DKFSSWIVFGSLWVLLVYAPIAHWVWGGGFLQKMGVLDFA VNFPAY XXXXXXXXXXXXXXXXXXVVHWAWHPDGWAS LYYRTAD
 RLGPAPVGIAVWTTVVYCPMACWNWNPNGWAAVLGTVDWA

TKFSALIFVLVFWFVLSYVPDCHMVWGGGYDDSAWHLDFA KWVAVGYSLAFGDD AGVDGSGNFAFGYGVGQMGALDFA IRFSVWIVFSALWVTLVYAPMAHWVWNGGWLSKLGGLDFA ARFAAVMDFVVLWALTDAASLATVTENAGYLWQHGALDFA $\square K F W P F I I F T V F L T G\|I Y P\| V G S W E W G G G Y L D K W G F S D F A$
TNFSGY LIAYSVVTTAFTYPVVGHWTWGGGWLAEMGLDDA
TKFSAYLDYSFCISAFIYPVVVGHWVWGGGWLANMPFHDYA QFVAYLIYSAFLTGFVVYPVVSHWIWSTDGWASASRT TNLSYLFGADGITAVIYPVLGSWIWNDHGWLKQMGFTDFA MKFGPFLIFMSLWVILVYSPVAHWVWGGGWI HKLGAIDFA KRFKAFVIFSLVWSTLVYDPVAHWWGTGGWLRQLGALDFA
CDAIAYFVYSTVITGFI YPVVVHWTWTDEGWLRLGYRDFA CDAUAYFVVYSTVWTGFIYPVVVHWTWTDEGWLRLGYRDFA 1 KLWPFMUFVVVLAGLIYPDQGSWEWGGGWLNTDSFKDFA IKFYAFFAFSLLLVGGSYITGHWIWGGGWLAKLGFWDFA MKLWAFLLFAIVMTAFIYPIQGYWKWGAGWLDAIPFLNFA MKLWPFLLFTVVMTGFIYPMEGSWTWGGNNLGDLGFSDFA MRFSAYVAFTALWTIVVYFPLABMVWGKGGFFNWPVLDFA
$V K F T P L M D T V L W L T L V Y D G S S T S D A G L I G G W G G L D F A$ GGFMAEDGVLDFA DRFSAMLLFSGLWLIFAYAPMAHWVWGGGWMAKMGAVDFA ARVEAYAIYSFFMAGWASMFRTAPNFLGYFAKGSGAIDFA RFTSYVLFMLLFSDFDYAPLAHWTWHPDGDLFKMGVLDFA RLEPMMVFLFLWMTIVYCP|ACWAWNASGWLAKLGALDYA VKFGEFVVFSLVLTGFIYPIAGSWEWNGGWLNTAFFIDFA 1 KY DSFIVESFWLTLLIYPVVGHWTWGGGFLSQLGFMDFA VKFKAFIVLT DFWEILVFYPVAHWIWGGGWLSKFPVLDFA

## UniRef90_D8R302

 UniRef90-G8JUJ2 UniRef90-H1LVLLUniRef90
M3XIMO UniRef90-R5LBW8 UniRef90-V5BVZ4 UniRef90-K9B8P 1 UniRef90-F3ZYD6 UniRef90_Q8S230 UniRef90-H88370 UniRef90-UPIO002B4A343 UniRef90-IOZAD4 UniRef90-B2AA58 UniRef90_UP100046F5D19 UniRef90-K2Q0X9 UniRef90_UPIO004177096 UniRef90-E9C1J5 UniRef90-A9H9C4 UniRef90-B6JAH3 UniRef90_UPI0002F2F77D UniRef90-H6LKHY UniRef90-A7HCU8 UniRef90-10ICG0 UniRef90_UPI0003B315FE UniRef90-S2KCX2 UniRef90-D5EUE8 UniRef90-C3X1J1 UniRef90-R63364 UniRef90-TOIPT2
UniRef90
U7LLH1 UniRef90-UPLOOO347EBCC UniRef90-UP100047DC1D7 UniRef90-UPIOOO36CB3AO UniRef90 L8WUZ4 UniRef90-A1VEI2 2
UniRef90-R1FT59 UniRef90-UPI0003801A63 UniRef90-M1E9H5 UniRef90-K4ALNO UniRef90-K4BOC4 UniRef90-AOYBZ1
UniRef90-D4M1P7 UniRef90-B7FTM9 UniRef90 C1EAA1 UniRef90_UPIO00375A620 UniRef90-C4Y3T9 UniRet90-K4MB10 UniRef90-R7YGV0
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UniRef90 J3LEV7 UniRef90_UPI00035D6146 UniRef90-A0A033UY08 UniRefofo-14EJT8 UniRef90-T1JHB7 UniRef90- ${ }^{2} 2 \mathrm{~B} 3 \mathrm{C} 9$ UniRef90 ${ }^{-}$W6KCP9
UniRef90 UniRef90-I3CIQ1 UniRef90-B3PF77 UniRef90-B4D7W2 UniRef90-UPIO003B36B5D UniRef90 AOL6B9 UniRet90_IOYXR0 UniRef90-UPIO00475B8EE UniRef90-GOWCX5 UniRef90-Q7V4T8 UniRef90_R6VP21 UniRef90_G8M363 UniRef90-FOZWG6 UniRef90_UPI00036F7E10

G G Y VI H L S S GVVA GF TAA Y WVGGPRDTK DRERFPPNNVLLMLL
 GS GVVFVVGGTAALTACVII GARTVYTGAPARCHSVPF $\quad$ TA G GTVVHTVGGMAALMGAKIVGPR】DKYDKNGRGKAIPGHN



 GS GAVHMMGGVAGLAGAWVAGPRLGRFNPTTGKPQPDHGH






 GS SIV HAF G G G GALMMALLLLGPRLLGKYAEDGSVHPIP GHN G S G V V H M A G A A A A L A A V V L L G A R K G K Y G K D G S




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





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G G G TVV H DNA G VA GLVGALLMIGKRVGYGREQMAPHSLT LTA






 GS TLV H S S G G WA A L A GA I I I GA R S G K Y S G K T V $M H D N A A V A G L V G A Y M M G K R V G F G K E A F K P H N D P M V F$



 G G TVVV H DTA GVAA L V A A KV L GPRKGF L N
 GSTVVVHSDGGWCAM A GVILLGPRDGRFSESGKVHSDPGHN

G
GGTPVHVCSGATATA GSLYLSYP』FRSKKSPLRTPTHIRLL GS T LVVHSVGG WA A LTGA I IL GA RKGKYGA DGAVHP IP GS N
 GS G IV V H L A G A S A A L A GV L L L $G$ G A R K G K Y G P N G E I

 | $G$ |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $T$ | $V$ | $V$ | $H$ | $I$ | $G G A V \vee$ NA $G V A G L V A A L V L G K R R G Y P T$

 G GTVVHISAGCAALAGADVLKRRVHDRREDTKPARVPYVL
 $G G Q V V H A S S G V A A L A G A V F L G R R A A Q T R Q S Q P A N I P F V L L$


GGAGLL WMGWAGFNGGDPYAANDDASDAVLINTN|I CAAAS L K HALLSLLWASVMAVAGSAGNASVRAWYSCVSTNLAASCGG

 TGASILY GWF GFNA GSAGAANGIWF TVSYLPIAHMVWGG G LIWF GWFGFNAGSSLLSLANE SLLSSVVNTVIASNCGV GTFILWF GWF GFNP GSTLSGTNPAIGHIALTTNLAGAMGA

 $N G Y L L L A L G F F C F N S G T M A Q F S G V V A R C T D S T T M G L C F G G$



 $D G A S L L W$
$I$
$T$

 1 P LDA $F$ GVVVLWWLGWF GFNGGSVLSADAMTNTADAA S S G G MGTA IL WMGWF GFNGGSDAENATAVGLIVVNTNAAAATGA LGTAILWWLGWY GFNAFGMNQTALLTACLTSTVAAAASM I L W L GWF GF NP GS QLAA S GEVNRDASHVFLT TNLAAVAGG $V$ GA SLLDWIG WF GFNAGSAGAANGLA G LAFVVNTVAT GAAT MGMSFL WL GWFGFNA GSGLAA DGLLAANAFLVTHIA TAAAA SVQWVLFGYS】AFGCATVA NGFSSVVIMNTNTAAGAGM A GAGLLWMGWS GFNGGAPYAANLTSSIVALNTNLSAATSL


 L GT F L L WF GWY GFNPGSTMLADTPAGYARDAARAAVTTTTLA I GASMLWVGWF GFNAGSAVAADGRAGFAMAVTQIATAAAA GLLDWF GWF GFNA GSALSSGGQ LDVDAFINTNIAA S S GL A GA GLLWMMGWTGFNGGAPYAANDDASVAVVNTHFCTATS L
 MGAGMLWVGWFGFNAGSALAANGDAGMAMLVTHLSAAAGT



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41C5E36
$L L W G W L G F N G G S A L G A$

I GAGLLWVGWF GFNAGSSIASNLETARALTVTQVAAAAAGA I GASLLWVGWFGFNAGSAVGANGRAGMAMATTQIAAAAAG |I GAM L WF GWY GFNP GSALLTMSGLVS LVVVNTSLAAAAA GA



 L GTVLL WW GWF GFNGGSSSLLAADMS GT QAFFNTHDAAACAGGG





 $L L M A A L G V G D L D F G W F G F N P G S T V A G T D A V T T N L A A A A G A$
 $L G S F L L W F G W Y G F N P G S F L G Q W S A V G R T A V T T T L A G S T A A$ L G GFIL WF GWF GFNA GSTLEAS TNI G LIVLNTVQLS GAAGA

 HRPGNSFFSWLAFDAGTALALLNFQSVMALCVTNLCAASGA L P LA T L GT F LL WLG WL G F N G G S QLLA M G SAVVNT TMA SA A GV
 L L A TL GMF LLWMGWF GFNGGSNAVAMVFLNTNTAAA GGLL
 TGAAMLWVGWFGFNAGSELAADGTAGMAMLVTQLAAATAA LGGGLLWFGWFGFNAGSALSAGPLAGQALLTTHLASACGU
 TGTVFLWF GWQFFNEGSAGNATIRAWYSGMSTNLAAGCGG
 $G A A M L W L G W F G F N A G S S$ L HADGQAVKAFLNTNTASATAM



## UniRef90 D8R302

 UniRef90－G8JUJ2 UniRef90－H1LVL1UniRef90 M3XJMO UniRef90－R5LBW8 UniRef90－V5BVZ4 UniRef90－K9B8P1 1 UniRef90－F3ZYD6 UniRef90－O8S230 UniRef90－UPIO002B4A343 UniRef90－IOZAD4 UniRef90－B2AA58 UniRef90＿UP100046F5D19 UniRef90－K2Q0X9 UniRef90－UPI0004177096 UniRef90－E9C1J5 UniRef90－A9H9C4 UniRef90－B6JAH3 UniRef90－UPI0002F2F77D UniRef90－H6LKHY UniRef90－A7HCU8 UniRef90－IOICG0 UniRef90－UPIO003B315FE UniRef90－S2KCX2 UniRef90－D5EUE8 UniRef90－C3X1J1 UniRef90－R63364 UniRef90－TOIPT2
UniRef90
U7LLH1 UniRef90－UPIOOO347EBCC UniRef90－UP100047DC1D7 UniRef90－UPIO0036CB3AO UniRef90＿L8WUZ4 UniRef90－A1VEI2 2
UniRef90－R1FT59 UniRef90－UPI0003801A63 UniRef90－M1E9H5 UniRef90－K4ALNO UniRef90－K4BOC4 UniRef90＿AOYBZ1
UniRef90－D4M1P7 UniRef90－B7FTM9 UniRef90 C1EAA1 UniRef90＿UPIo00375A620 UniRef90－C4Y3T9 UniRef90－K4MB10 UniRef90－R7YGV0
UniRef90 F3ZVV4 UniRef90－UPIOOO41C5E36 UniRef90 W5YCB4 UniRef90－L8N5J9 UniRef90＿W0JK37 UniRef90－111AE7 UniRef90－UPIO00422978C UniRef90－D8LEG5 UniRef90－R6R7N2 UniRef90－G4T2R8 UniRef90－UPIOOO44137DB UniRef90 QoBWDO UniRef90－W1EJ57 UniRet90＿UPIO0037A1A3E UniRef90－T2GEFO UniRef90－A0A015L6D6 UniRef90 R1FVV1 UniRef90－UPIOOO35C5266 UniRef90＿UPIO00427D257 UniRef90－B1KHZ7 UniRef90 M5DY80 UniRef90－F2JHP2
UniRef90 J3LEV7 UniRef90－UPI00035D6146 UniRef90＿A0A033UY08 UniRef90－14EJT8 UniRef90－T1JHB7 UniRef90－B2B3C9 UniRef90－WGKCP9 UniRef90－K9RSC0 UniRef90－I3CIQ1 UniRef90－B3PF77 UniRef90－B4D7W2 UniRef90－UPIo003B36B5D UniRet90＿AOL6B9 UniRef90＿G1UN90
UniRef90＿IOYXRO UniRef90－UPI000475B8EE UniRef90＿GOWCX5 UniRef90－Q7V4T8 UniRef90－R6VP21 UniRef90－G8M363 UniRef90＿FOZWG6 UniRef90－UPI00036F7E10

290
300
310
320
AAIICMGTLISGS\｜PWYTMMVV｜HKRQKIVDDTLIAVVFHTHAVIAG ACERARLLPMMVFLNVAVDIKR\LKLDDGLDVYA品HGVGG SAIVIGLLAGIICNIALSFQEKKGWDD
MSVLCGVTSSLI YLALKSLASRKIDDPVSVTVMY LGGG TACLDGIFAGVFSIIAI QFVDKALKI DDPVGAIGVHGFCG EAFKPHNLPMVFTGASILYVKKWLKVDDTCDVFGVHGVCG GAAV GSLGGMLVVSSVEFFDKKIVRDDPVGAIGSVHGVGG SAMLMGMFAGSVPWFTMKKSTFLMKVDDTLAVFHTHAVAG LA LAGGCDGERGRFDPQ $\square K Y$ LCHVDDSLDVWAEHGVAG EGLFIGFCGGLIAN
A SAVGGIVGGLMYLPSSLFTDHVMKПDDPVD
ASVLLGVVTGVACNFGT，KKKYLRI DDALDVFAEHATGG SAAI IGTAAGILMVISVEFFEKKAKI DDPVGAISVHAVCG GALLTGALGGIVAVVGNHYVEEKLKVDDAVGAVGV GGAAVGLTAGVVCSYAVGWKFRFEYDDSLDVVGVHFVGG AAVII GAFAGLQLLLT SHLMVRFKDDD PLDALAVHLGGG GALVIGLITGAVCYFAATSLKHMLGYDDSLDAFGVHGIGG AGIAGLVGALIAGKRVGTTVKNALGYDDSADVFGVHGVAG MSVVIGAIAGVLVIFSILFFDKVKDDDPVGADSVHGVCG AALFIGALVSPICFFFLTKVKVKFGYDDSLDAFGCHG1SG SSLA GALAALASFGAVRLRPKLGLDDSLDVFAVHGVAA SASIV GLIAGVIVVFSVYFFDKVKIDDPVGAISVHGVCG SAAGVGAVAGVVVVYSIUAFDKLKLDDPVGACLSVHGVCG GALFTGLLCSLASYFF：SHVKGRLSFDDPLDAFGCHGISGG GSLVMGLIAGPVCLWGVTGLKRMLKVDDAFDAFGVHGVGG LLMIIAWI TLVYEPDCHMVWAKKK回GYDDALDAFGLHGVGG AAIIVGIVSGTVPWASMMIDHKKQKVDDTLAVFYTHAVAG
 GALVI GALSGFIICWWASTVLKLKLGYDDSLDVFGVH DSPRLTNTQADSCNYAT KIKYLIGDDDALDLFAEHADGG PAMIIGFGGGMLCYGGV KMKKVFKYDDALDVVGVHGVGG GSLVIGVAVGVLCFWAATGLKHMLLGYDSLDAFAVHGACG SALVIGIASSCLLCYFADTFIKPKFNYDDTLD
A AMLMGVASGSV PWCTMMVLHRRKRVDDTEAVLHTHGVAG HTFSYT GAFSVCPDGKKVKLLRHVDDTLSVFHTHALAG GALVIGLSAGIVCFYATLY：KGVLKIDDSLDVFPVHGVGG AAVVI GFVAGLLYNDGSRGL DYLRLDDAVDADPVHLCNG AAMVIGILAAPWCYFLDEVVKNKFDLDDALDVFAVHGMGG MAPHSLTLTMVGAALLCTGVKNLLRYDDSLDNATAAMAMI
 YA PAFFGVIGAGLFC
SAD TGLVGGVVCYFA TSVVKAKDGYDDADDAFGПHGDGG GAI ALGAIAS CTCYGMILLKNRLGYDDSLDAFGIHGTGG GALMI GLAAGLVCFWGATGLKHMMGYDDSLDAFGVHGDGG AAALI GLVAGVLVLIVVD DE WFEDDDPVGAFAVHGSCG SSLLIGI AGGI SWIGVSYVKYKFSYDDSLDVF GVHGLNG AAVVMGILSGSIPWYTMKKWSFMQRDDDTLGVFHTHAVAG
 GAFVI GVISAFFYYASANLLLKLKDDDVVDAAPVHMFCG LLATVTGAVGGVIVVVSILTWDKGK｜DDPVGATSVHGVVG A ALLFGVVAGIACNLA SGGKLLLGIDDCLDAFAVHGI GG $G M S V L I G A V G G V L V V V S V P L L D K F K I D D V V G A I P A H L I C G$ GGALIVGIAGGLAGIVWGTAKRWLRVDDPCDVFGVHGVCG SALIIGLVAGAVCLWGVHGLKKLLRVDDSLDVFGVHGTGG GFNAGSASGGAI CYGGIFLKHKLGFDDALDVVGUHGVGG SALVIGGLASVFCYWGLHVLKARLQYDDSLDVFGLHGLGG GGLVIGLLAGIICLWGVNGLKRMLGADDSLDVFGVHGVGG
GALIIGLLGGMVCFYATVYПKQKLRTDDSLDVFPVHGVGG
 AA IICGFVSAWVLIGLNALSARLKFDDPLEAAQLHGGCG
SAMLLGLLGGFVCYYVITH KKLLNYDDADDAFG品GFGG AA LL GFGAGVLCFLAVQLKSRLHDDDALDVFAVHGVGG GAFFFGVFGAVVCRIKFTKLAHKWRWVDNGDTFATHCVGG
ESA\｜LIG\｜VAG\｜IIVFSVVYVDK\R\｜DDPGAVSVHLVNG
GAT\I GA $\mathbb{T} G G V L V V F S I L G \square D K \square K \square D D P G A D S V H G S A G$ SAVLI GLAGGFVCYLCVTHVKTMFGYDDSLDVFGVHCCGS GAIVLGLVVSPICFFFVTTVKNALKYDDTLDVFGVHCVGG GGILI GLAAGFFAFDGATSIKRALGYDDSLDAFGVHGIAG PAMLIGGFMGGMVCYGGVLLKNRFGYDDALDVVGIHGLGG PAMLGGFIGGMVCYGGVLLKNRFGYDDALDVVGIHGLGG

GAWVA G LIGGFIVVFSVSA DDSGGDDDPVGAFSVHGDCG QSTEIAFVITLICNIAVYW RSHSRI DDALDVFPTHGTGG



UniRef90- G8JUJ2 UniRef90-H1LVL1 UniRef90-M3XJM0 UniRef90 R5LBW8 UniRef90-V5BVZ4 UniRef90-K9B8P1 UniRef90 F3ZYD6 UniRef90_Q8S230 UniRef90-H8X370 UniRef90_UPI0002B4A343 UniRef90 IOZAD4 UniRef90-B2AA58 UniRef90-UPI00046F5D19 UniRef90 K2Q0X9 UniRef90-UPI0004177096 UniRef90-E9C1J5 UniRef90_A9H9C4 UniRef90-B6JAH3 UniRef90_H6LKH9 UniRef90-A7HCU8 UniRef90 IOICGO UniRef90-UPI0003B315FE UniRef90-S2KCX2 UniRef90 D5EUE8 UniRef90 C3X1J1 UniRef90-R6B364 UniRef90_TOIPT2 UniRef90 D7LLH1 UniRef90_UPI000347EBCC UniRef90_UPIO0047DC1D7 UniRef90 L8WUZ4 UniRef90-A1VEI2 UniRef90_R1FT59 UniRef90 UPI0003801A63 UniRef90-M1E9H5 UniRef90-K4ALN0 UniRef90 K4B0C4 UniRef90_A0YBZ1 UniRef90-D4M1P7 UniRef90_B7FTM9 UniRef90 C1EAA1 UniRef90_UPI000375A620 UniRef90_C4Y3T9 UniRef90-K4MB10 UniRef90-R7YGV0
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330
340

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MWGMTFAGFFSEEGN $\square$ G
ILGTLLA GLF
1 V GCLLT GVFTASSLGGTGYAPGVTMGHLGACSGCDAGLV 1 I GA GTGLFQQHSVNG
TFGTIMVGLFATDGGLFYGGGDH
LLGGVLT GLLATPELCADDGVFYGSGDGQLGKQ
VIGLLFNALEGSKTVIGYDGVSDHDGGWQLYDQFAY VVAC
$\square V G L I F N A F F A A D Y \square I G \square D G G F \square N G N W A Q L Y K Q \square V Y \square A G$ SFGTIMVGLFATE
HAFAGVAGTLA LAALLAPVDRDPDGGRFDQFYDQLFGSALN $1 V G T L L D G L F A T T T M G G P Q G L L Y G G G A A Q L G R Q S V A V L A V$ $1 V G G T V G S G L F A R E E$ F
1 LGALLTGVLAYGPLSATDANPAGVVGSQFVTQAKAVGVT
$I V G S I G T G I F V S T S L G G \quad V G V E N Y D M A A Q L W T Q C V A V A I A$ 1 FGLLMVPV
W WGV ATGLFAQSA DNPVAKWNGLFFG
$T L G A L L T G A F A S T A V N P A G A B N D G S L A L I G K A V G V V V T$
LWGTI AVGПFGVADYLG
LFGLLVVPL
IVGSLTVGLFASQKVIS TS GLFYGGSWELLGKQAAGS
I L GTLMTGLLSTS
$I L G A 1 L T G I A V S P A D G G T G \square S G E Y S M \square A Q L W \square Q F K S V M V T$
ILGSILTGVFATHCVTGTDGVQGALYG
I WGALLTGVFCTTTVN
L LGGiMTGLFAHPELCVLILPLPETNGAFYG
1 WGT
LWGVISVGLFADGTSNYGGAWNGVNG
$\square L G L L A N G L F A D T A L D A D D G V N T A V P G G Q L Y D Q F A Y V C A C$ $T W G A L A T G L F A S E A V N G V V N G L F Y G N G Q L W T Q F L S V V A T$ LWGCI AVGLIFCTEEY
$\square \square G A V L T G V F A V K E \square G G A D G N \quad V V L Q L K G V A T T$
$S L G G V L T G V L A E P R L C R L F F G D D P R Y V G Q V G V Q V A G \square A F V$
ILGGLLT GFFAVVPKLCRLFYLVPEWGLRQMGAQLAGVGFL
$I L G T F L A G T F A S A E L G G Q G L P E G V T I L Q Q L G$
VWGGIATGLFAKTSINSVARWDGLVFG

Y LGGTLLIGULADERLGGPDAS GGKQFGKQLWGATFC NTFVATAAAGLSPELGGSGGADYYDMVTQVIIQAKAVGFT $F C G S F L T G L F A A D Y V A A T D G A T V I E G G W H H W K Q L$
$L W G A I A T G U F A S A A I G G V D G A D Y G N V N Q F F I Q I L D A S V A$

MWGAVATGLFASKAVNPAG
$1 V G A L G L T F F D R G S W W A E A A A \quad K S P G W G L L S Q L K$
$I V G A L L T G V F A Y G P L S A T D A N P A G \square S G S Q F V A Q A E S V G \square T$
MMGTI AVGLFGHPAL
$\square F G \square L A V G L L A T K S V S P K N G$
FLGGATTGGLFAEPTLCS

$V \mathrm{~F}$ GT CVGLLFAKEGVTSLSTVNGDFYGG
MWGLI AVCF
LVGNILTG FA AGT $\square$ QA $\square R G P \square N G T A P A Q G W$
I WGTM। VPL
IVGCILTGIFAATS LGGVGYAEGVTMGHQLLLVQLES $\square$ A $\square$
IVGALLTGVFCSPDFGGTGF
TWGAI ATGIIFANAAVNGKSGLLQGDV HQFLVQVASVVAT MWGAIATGIFATTGVNSAGNGLLYGNPMQVVTQTIDVAVA VVGSLLLGVYASSEVNPAG
$1 L G A L L T G V F A S P Q L G G Q G \square W D Y$
$\square L G T L L A G V F S S T Q L G V F S G Y G F A E G N E T M L D Q$
AFGTLAVGI FATD

VVGATGTGLFQNSSVNS

$V V A T V M T G L F A R R E V A A Y G G L D F D G N V R Q L W V Q$
T WGT TSVGLFAAEGLGPARGLLLGGGADQLWH
$1 \mathrm{~L} G \mathrm{LL} \mathrm{A} \mathrm{V}$ P F TNS D
$1 V G M L L L G F L A S A E A N P$
IVGAI GTATVADPSLGGQGWIDY
IVGAILTGVFADASLGGSGLLAEGKTDMSQVAVQTTSVGYT
TWGAL ATGLFASAA NNVDG LIFYGNPHQLWVQFVSVLGT
$T W G V L A V G F F A S E T L D T N S Y G L N Q D G$
$I V G M I M G V F A N K K I N A A G N D G L I Y G G T E F F \square H$
$\square W G T L V \square G L F D \square Q G D G S A \square G \square F V G G G A S Q L W A Q$
I FGTVLTGGIF
VFGTI CVGLFAKEGV
IVGALAIGFCAEDSINAKG

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W $\square$ NKGDNAWQMTAATLVGLQSMPGLVILYAS $\square V K K K W A V$
ETGFTRSKNAG KRKNML EAGVVRKNAA ESGRVSSKDEV

E V G T VR QK NQV
EAGLVRTKSTV

N $\square$ MMKNMMDFAVGS $\square$ AF WAVGF G $\square$ MF GKTNGLFGTTDFF $\square$
MYGASAGGFFGTNQFA
$N \prod I M K N F D T\left\|S \prod G P\right\| L F Y L I G Y G V M F G S S A G S F \| G S D S F L$ E L T K NIALYAIACTMFLLI GYNIMYV GNTEGGVVPAF ATVTQSVAVSCVA GLLWYVVGYSVSFGVGNKFDGGFDTFEL $N I L V K N L M D V F I G A V[S F W A I G Y A L A F G K G T P F F G T E Y F F L$ NSAFMALYAYASTLIVWVLLGFRMAFGDRADFWGKAGPALL $N V L A K N L I V F A \square A T V A F W V I G F G L M F G D G N D F i G L N G F F L$

$N \square A A K N \square M D \square I L V T S A Y V L V G F R \square Q Y G A F D T F F S S D P \square 1 D$

N $V$ MMKNYMDVC $\square$ AS $L \square$ F W $L$ VGF G $\square$ MF GNNSSGF $\square G E D N F A$

S LLK NLINTADCADSYYCVGHSFAYGKPNSFVGFGNFFL $N V A V K N F A D F G I S V A L F W A F G Y A D M F S R A A M G G I D P Q A L F$ NILLQTVLDASCSALMWYFVGFAFAFGIGNKFIGNAMFAL $M Q C L K N I G L Y S T A G U M Y$ WACGYSLMYGVDGGYIGTMAPYS GGNAFLAGFGKAF
$S V L M Q V M T V F S \square N A L L F A D Y G Y S \square A F T E G N A F \square G S \square D K V F$ NSAFMALYAYASSLLVWVLVGFRMAFGERDPFWGKAGVAL FGHTFGLFGTTGFFL NY LA MSFADFCDGS VF WLF GFALMFGGSKLAPGGNQF G $M Q M T K N V A D F S L A T I A Y W A F G Y N L M Y P L G T W L S G V F G P G V$ NSTLHSYSALAVISIQW\LIGYTLCFGNNDGGFIGAGDKG NIIMKNFMDFSI GSLVFWFVGFSIMFGPSIGGFIGGINFL
 $M Q L T K N M G L F S L A A, A Y Y D V G Y N L M Y P D G S W T M G S D D A G G$

GGDNSFVGGFSKAF SMAGMNLAALSMAVLQWVVWGYSLALPTGGKFMGNLRHAG NSAFMALYAMAFGDQLLPFWGKAGVADTGNAFFGGLDKAF $S \| I S Q A F A G N A L L S V M W L L F G Y T G C F G P T M N G L I G L L W P N$ EGNGYWGGLGK】F

$N \square L F K N L M D V C V G V L I Y F A V G Y G \square M Y P G D A G N G Y F G Y A G F$ GGNDFVSGLGKAF $N \prod L M K N F M T M S \prod A A V L Y F \prod V G Y G \prod M F G G S G N G I D G / I D S F /$
 STA $\square$ KNFSDF $L \square A F T V F T \prod T G A S \square M \square G T S H D G W F G W S P \square F$ MQCMKNDALFSLAATFYYLLGTWSMDGVISGVWGGVLEAV $N D I M K N L M D F A L G S L V F W F, ~ D G F G I M F G T S K F G D F G$ E ILTKN VLVAVACTMYMLVGYE $I M Y P D$

G N G F LG T L H Y A G
GGAGLIGNLDHAF

GNGY $\square G D \square R S F A$
EGNRFWGGLNQVM

```
F GLS A D T LN LIF F GGF D N\squareM
```

NSAFMALYAFAAVLLCWVLLCYRMAFGDKFPFWGSTHYFN
 SVLMQCFSLTCLMT LLWYTVGYSLSFSEGNS IIGGLDKAF


## NALVK ILVDFALSTVAYFFVGYAVAYGTTYFVAA

EGGVFFGSLDKAF


YGTFEK $\quad$ F
EGDWFFGNFRHVL
A T LM QS FA AT C L VTVLWM $\square$ GYS $\square A F T P G N G F \square G G \square S R F F$

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UnZ UniRef90＿UPIOOO37CE245 UniRef90－F0JGZ1 UniRef90－R9GM11 UniRef90－C2ESK6 UniR Ref90－R2YTT4 UniRef90－E2S092 UniRef90 W6N3M2 UniRef90－O8MXY0
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 SGAVGNDAPWNYAFWMF QVVFAATAAT $\square$ SGAVAERTKFS पDSYDNPS $\square$

LAYFLFQMMFCGTAATLSGAVAER LS GVEDIGFFVFQAMFVATCATIISGAVARM GALIGMASTDATHADEADFFFQVVFVATAMSVVSGAVAER LKKETAFSLAPGLPEMLWISYQMTFAIITPALITGAFAER 1 GLDPL TGYSYWWYHYVYAATASTIVSGAVAER AEGFLPRTEPPYYPEASLVLFEFELAATTLVLLAGSLLGR


KACA $\square P A A \square G V A D D D H V F F Q W A F A A T A A T T V S G C M A R$ MAGTTDQTLVAGVPEYVLCIFGLTFAMDTPC\｜ATGGFAER FRNVGAPSVVSSVPDVLFAFFQGMFACVTGCLMIGGCERA
$K S \square M Q Q G F T E D I D F Q A D F A A T A T D V A G A D A E R C G L V G Y$ VGMTNAGSPAENLPHDTFMDFQCMFAVDTPALITGAFAER
$\square S F A L I D T A P W D Y T L \quad \square F Q T M F A A T A \nabla T \square C S G A M A E R$
MDTTSNPGQAADTHYAYWMDQWAYAATATT円ATGAMAER
 WDPVGGDADSTGYSTASDWFFQMVFVATAASIVSGTLAER LDNGNPAPMAPQLPHTVFMGFQCMFAVLTVALSGAYAER
 पS GVTDTS SADTFPEFAF贝AFQATFAGTTGADVGAFAER SQSYLI GRASLSYPEATLVLFQFEFAALTLVLLAGSVLGR SGGVYDVAV FALFLFEMVFMDTTAT PTGSMAER YSGFLLI GDSYDVSASVLWIF QMMFAASACTIVTGAVAER LEAVGVDLAGADDGEYSDFFFQLMFCAATASVVSGALAER VGFAPNADYAATIPQQVFMMFQLMFA\ITPALISGSIAER


MAGVTTSTTVESTPEVFFCFQMTFAA TPALIVGAFAER FHHVALEPHPGRLPGLAVAMFEGMFLCITAVIMTG\｜VGRG H $\square G V L S Q P M$ GTUPEILFSEFQLIFCCAVCAIIGGACERG TAHGADPRTEPFYPEATLVLFQFEFAADTLVLLAGSVLGR LIFGDDANTVKGTLPEYGGLVRARNVLSVFMHVYAGACLER

FNNTKVTDLQGSTPK\LFASFQMTFAGTTDALTSGS VER LGTATHPTLSPTIPLVLFFAFQLKFAIITPALITGSFAER GIGEAGDAGPGVLHPQVDFLFQVAFAATAATIVSGAVAGR LSGVTSETTAATVPEYVFVCFQMTFAA
 VGLDANPDFAGTVPFLVFAMFQLKFAIITPALITGSFAER GVTADAADDYGYASTGSDFFFQLMFCATTVASVVGGTLARER LPFATGDGVNQALPGSVFLDFQTVFCATAATIVSGAMAER LDGDTAENLDNGYAPSADFFFQVVFVATAMSVVSGAVAER MYGVLDAAPKRALPTAADVLFQGMFAMVAGTLMDGGSGGH
$\square R D \square E \square N T \square T G A D P T Y V Y S T F Q M G F A \| T V A L I S G S \Pi A D K$ PSTSAYAADANFFFQMVFVATAMSUVSGAVAER
LRKVLGDSSPGS $\square P E L L Y S F Y Q M E F A C V T V A L L M G A L A R G$ LKNISITDLNGSFYQLIHVVFQGAFACITVALVVGALCER

E R
पKAVTPTTAYMAVPEFTW】SYQMTFA $\square$ TTPA LDTGAFAER NGS $\square E T Q T Q R P F Y P M A T L V Y F Q F N F A A \square T M \square L A G S V L G R$

LSSGSFEHLGLDTPKEAFLTFQTVFCATAAT\｜VSGAMAER MAGDTKASI WETIPEADWALYQMTFAIITPALMVGSFVER AP WETADDLGTGYSSGSDHFFQMVFVAATASIVSGTVAER

TSIX X X X H WVD SLDSE』FSSIQKEFMIPLMSQLSAGMSER

TLSGGGEGFELQGLTWVKFFFDTTFAAADPA\IDGGDAER LA GVT PD STAATIPELIYVAFQLTFACITPALIVGAFAER GGDNSVEDVMGSGGDVYYSNMSVVFVATAMSVVSGAVAER LK WDDSLPYAPT MPGVLFAKFQLMFACDTPLLLTGVIAER $L G G \square K P D T L S G T I P E Y V F V A F Q S T F A A U T C A L I V G A F A R M$

## UniRef90 C3ZNA4 UniRef90-UPI00036D02D1 UniRef90-A3LUG7

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UniRef90-R4YTT4
UniRef90_E2S092
UniRef90_W6N3M2 UniRef90-Q8MXY0 UniRef90_UPI00047E66B1
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UniRef90_M1Z1Y7
 $A Y L V Y S V L V S A L I Y P \| F G G W A W G S L Y H G G W L E G L G F D D F A$
MRFSGYlICSF LTATALFPIVGHWDWHGGWLIELGFIDFA KLGMYVLIVIAMTGVIYPVVGHWIWSDDGWLVNMGFSDFA MKLWAFLAFTVALTGFIYPVEGFWTWGGGFLSQLGFVDFA DKLSGLILFMALWSVFVYAPICHQVWGGGYMGGMGVLDFA TAFGGYLI Y S S ITAFIYP VVVHWAWDPGWLLYGVGKDFA $\begin{array}{ll}M N D R A W M A F T P L W L L L S Y T & C A F S L W G G G F L Y H W G V I D Y S \\ M K F S A W F L F S I L W V T F V Y S P I A H W V W G G G F L A K L G A L D F A\end{array}$ $\square K F V D F L I F S G L V G \square A Y P \| T G H W I W G A G W L A D K G F W D F A$ TQFAGYLIYSFFVTAF $\square Y A V P \square H W \square W A D G W L C A W G M L D A$ $M K A V V L F G A L W L V L V Y G P L A H M V W G G P G A I M H N W G V L D F A$ $R L G P M M F F L F I W \backsim T I V Y C P \square A C W T W N P E G W L A S L G G L D Y A$
 $M K F G G F M V F S A L W L I G V Y A P M C H W V W G G G W M G Q M G A L D F A$
 NTNHLLFGSGVI DFA
LQLHCY LLFTLVQT ILIYPFVAHWDWQNGWLV DLGGVDFA $M K F G A Y L L V A A L T S G I I Y P V F G H W A W N G G W L G K I G F V D F A$ NFNAY LGYSMFIGGWVYPII A H WVWCDEGWLGYAGMIDFA $\square K L G S F M V F V I I L T G F I Y P D A G S W Q W G A G W L S E M G F S D F A$
$M R V G Y T A F G D D M G G L V G N F R F A L L D G V N G N P R M G A L D F A$ $K G L A L F Y G G L A R T K N M L S V M T Q V G A A A N G L F F T K G A L D F A$ $V K L G A F I V F G L L W T T L V Y D P L A H W A W G G G W A S Q L G A L D F A$
 WKFSSFADYGUIVGGLIYPIGFGNWVWGGGWLSQLGSMDFA IKFHDHII YSAFLCGVI YPLFGHWMWGKGWLELLIPFGAGA IKLWPFLIFFVVLTGGIYPLQASWKWGGGFLDEMGFLDFA

 KLWPFLIFTAILTGF
$\square K F S A L L L F T V L W V T F D T N P A D A T V A G A G L I W S F G A D D F A$ RVVPFVVFIF CWATVVYCPDACWVWGPNGWSGNLGALDFA RAFH IGVLSQPMGTI PEILFSEFQLSDNGFLANLGALDFA MNDKAWMAFTPLWLLLSYTVGAFSLWGGGFLYRWGVIDYS LRWDCFLAFTVLWELFVYYPVCHWI WGGGFLGTWGVKDFA ISFGFVLTFS GLWMLLCYAPVAHWIWGGGFMSDGGIIFDFA PGGGL LA SLGAVDFA VKTPAGLALFYGGMTRSKNILNTDGMSFMSYASMGALDFA VRFKGYLAFIILFCLFIYCPLAHWWHPEGFLRKWGVLDFA LKFSSYLDYSVILTGIIYPISGYWKWGGGWLDAMGFYDFA $K L P G L A L F Y G G L T R T K N M L S T M T Q Q G A D A C L F K M G A L D F A$ $\square K L G S Y L L L T V V M T G F D Y P V V G H W V W G G G W L A E L G F V D F A$ MKLWAFLLFAVILTGVLYPVVGYWTWGGGFLDELGYADYA


 $\square R I V A T A L V F I V M T P G L G F F Y G G G H M W H E D G I F F K M G G V L D F A$ ARLLPMLVFLLFWWVTLVYCPVACWTWNDGWLARMGVLDYA M K Y SAMMWFS G L W W L L V Y VP T C H WVW G G GF MA E G GVVLD Y A MSFAALAFGTLI WWAV GYTLAFGPDVDGWDVKHGGALDFA $M K L M S F L L F C V V L S A V I Y P V Q G L W T W G G G M L T E W G F V D F A$ $M K F P A F V V F T L I W A T V V Y D P V A H W W G V G G W M R E L G V L D F A$
 PNGLLLGKDGMLDFA GRLLPCVVFMFVWATLVYDPVACWTWNGGWAYEMGVLDWA MH T WGGVLD FA


 MKFNSVMWYCALWMFAVYFPACHMWGPGGFMAAKGDMDFA

 G GFLYY H WGV D D F S
$M K F \square P Q C \square A T V A L V G \square A Y P \square F E G L I W N G N F G F Q A M L E S T B$ $M K L V T L M V I P G L A L F Y G Y T D A A A G T A T A G F L F Q K G A L D F A$ MK L WA F L A FA VF MT G I I YPM Q GF WS WGGGWLSE DGYS D YA $M K V F G F S L V F G P D E T G G L A G N L D Y V F G K N V P W D D S D P Y A P$ K F SAALIVVAAWSLLVYAPDAHWVWS PAGWLYRLGIADYA K FAAVIAFSVLWFTFSY DP IAHMVWATGGLLAVEGALDFA Y G G L L R A K NVLS MLS QVLVT FSV VTVLWUVYDDEGAALD FA A $\begin{array}{llll}G A & D & F & A \\ G A & D & \\ \text { G } & A\end{array}$
MK F S A LLLWFMG $\ W W L A V Y A P \square A H M V W G G G F D G G D G D V D Y A$


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UniRef90_C6XKC2 UniRef90_E3NRD6 UniRef90_W1P639 UniRef90_L0GT49 UniRef90_Q605Y6 UniRef90_B8GQ42 UniRef90_V6AV10 UniRef90_A5G216 UniRef90_A4G1J2 UniRef90_G0JRH4 UniRef90_UPI000466E82B UniRef90_A0A011JIS2 UniRef90_D5X711
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170
GAGPVVHVIAGTHSLVLATLMLRTRKEKSNPENQPAPRESP GSTVV HSVGGGWLALAGAIVVGPRLGKFGKDGKVRPDPGHN





 GS GlVVHMLG GAA GLVVGSYVVGPRAGRFTDKGPVQDEGHTT G GTAVHVNSGVAALVGAVVI GKRLGGWPTTPMPPHNLVFTM





 1 = $G G N V V H I S S G V S G L V A A L M L G K R R$ GSTVVHSVGGWAALTGAAILGPRDGKYNGKTNADPGHNMV





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

 GS IVVV H A V G G F A G L A G A I V L G P R l


 GSTVV HS SVGGWSALAGALILGPRIGKYRDGMTDPMPTDAT
 GGTVVHMSAGWAALAGAIFLGKRKGQKPNPARKGVKSTTA GGGPVHLTSGHAALVYALILDSRRGRRARRPRKFRPHMVV
 GS S IV H L T G A S A AL A AV L LL GPRSGKY LIS DGSINADP GSN
 GGTVVHINAAAA GLVGAYLLGKRSGFGREAFKPHNAFACI



 G GYVI H L S S G I A GFTAA Y WV GPRRDK S D R E R FPP N N V V L L L M M GSTTVV H SLL G G WA A L M GA MI I GP R IG K Y T K D GK S K A I K G H S $G G \square V V H D T \quad A G I G A L V G A S V L G P R K E N K M \square A G N L V L T V$ GSTLVVHST G G WA A L V GA A I L G P R L L G K Y V D G K T V G G Y V I H L S S G TA GLVAA Y WV GPRRDV GGTVVHINAGVAGLMAA LVLGKRRGYPTTAMPPHNLTGTV GAGFGWIA LAAAVLLLGARKGRYNKQGQPDGDPPSSSLPWLA G GTVVHINAG I A GLVGCLLVGKR】GYKKESMAPHSLTBAC
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UniRef90 A0A022I UniRef90-V4P8E8 UniRef90-T1DUM8 UniRef90-Q93X02 UniReffo-COZN31 UniRef90_C1EG53 UniRef90-C6XKC2 UniRef90-E3NRD6 UniRef90_W1P639
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QK M L I
1P DAALGVFLLWF GWYGFNPGSTTTGDSAVTTTLAGAAGA


 IGGCS L L F VGGWIGGFNA G S A WA P D G I GAA A A L L N T L LAA A LA A G
 WAGFNGWFGFNAGSAGAPYAPNTTASVAVLNTNVSAATSLE LGCLILWLGWFGFNPGSVMAADGNAGVALLNTNTAASFGA TGTAVLYUGWFGFNAGSAGSANGDAALAFLNTVVATAGAV LGVYCL WFGWF GFNAGTTGGMWKTAALICVNTTI SPSASI MGAALLWAGWYGFNVGSALAANTTAGLVLMTTTIATCGGI TSVVLGTVFLWFGWFGFNGNASTRAWYSAVSTNLAAAVGA VGASLLWVGWFGFNAGSAGAANGLAGLAFUNTILATGAAA LGVLLL WLGWYGFNVGSLLTMGPLLSNVFTNTSLGACTGG LGAAlL WF GWFGFNAGSALAADGAAANAFVTTHMATAAAA IGTGLLWFGWFGFNAGSALGANSLAVSAFMTTNVAAGAAG GKDPLGLYSLF QMMFAIINDVAMQAMITTTIATAASM GGGF LWLGWFGFNGGSTLKADSSIGLIVLNTQLAASAGA LGAALLWFGWYGFNAGSADGVNGIAVNAFITTNTAAAASA SVVLMSLIGMILWYSGMTRSRVLPASRVSVVVTLSGATGLL
 LVLVYAPMAHWVWGGGWMGRMGALAGQALVTTHMAAACS LGGALLWFGWFGFNAGSELAADGIDANAFVVTNIAAATGA VGAALLWVGWFGFNAGSNLEANAGAALAFINTLLATAAAV AGGGLLWMGWAGFNGGAPYAANLAASVAVLNTNVSAATSL QGHNMVYIVIGTLILIFGWFGFNRIAVVSVNTFLSAVAGA ALATLGMFLLWLGWFGFNGGSQLAMGRIFANTNAAAAGGA LGAALLWFGWYGFNAGSGGGVNSVAVNAFVTTNTSAAASA LGALGVFILWLGWFGGASGDNVKDIAAHIFVTTNLSAAAGA
 AGAGLLWLGWNGFNGGDPYFANADAAAAVLNTNLATAAAL DGAGLLWVGWFGFNAGSNLEANGYAGLAMANTFLCTAAAA
PHSAMLVMIGTGLLWTGAFGANLMALMASSNTMIGGAFGG CSGATATAMSVYLSYPLFRSRNFKSVMAACVTNLCAASGA AGGGLLWMGWAGFNGGAPYAANDAASVAVLNTNVCAATSL VAHWIWGGGFM SDSQLAADGGAAMAITVTHISAAAAS TGGCLLFVGWLAFCGGCNYSVNGLTILLMLNTLIGGAGGG A LLWIGWYGFN AGSALAVDDTAVQAMLTTTLACSTAM ASFQMTFAGDTLALISGQLAADGDAANAFIVTNTSAAFGA LGTGLLWFGWFGFNAGSALGANEMASLSFVNTNLASAAAL GVFL WVGWYGFNPGSQLAFAGAVMLIJTNTTLAAAAGG IGTGLLWVGWFGFNAGSALEANGSAGIKFSAVMVFAADWD PLGALGVFILWFGWFGFNGGSTDAAPTVIATTLLSASAGI MGTFILWMGWFGFNGGSELKVSDAVAMVFANTNLAAASGL VFALFQLKFALGWITPALAANADAADAFANTNIASATAM FSALGVFLIWLGWDGFNGGSVLADTGSVITNTLIAGSTGG LTDGA WGTIPFMLYALGFFGSALAANGLAVQALATTTVAAAGAG LGTVFMWFGWFGFNGGTAGSPTALAFYGCVSSNLAAGCGA MGTAMLWVGWFGFNAGSAVAANASAGMAMAVTQUAATFGA RGWLVFVVLWLLIVY TPALTDQGTAAAAFINTQLGAAGAM MPLAALGTFILWFGALSTVDDANATARAMVNTNTSAAAGT LGASLLWFGWFGFNAGSALSANGLAASAFTVTNTAAAAAT TVALVVGALCERDRFGSAGAVNAVSMTASYDPMAHMVWGG LGTSILWI GWYGFNVGSALGIDKVAIQAFLTTTVSTGASLL 1 GTVFL WVGWFGFNAGAALAPNLKAVVSVATTNLAACVGG GAAFLWVGWFGFNVGSAFAVNASATIAMMTTMVATCGGI LGAIILLFIGWLGFNAGSAGEVNDIAVNAFVVTILSAASGF AGAGLLWMGWSGFNGGAPYAANDDASIAVLNTNICAATSLC LTLGALGVFDLWFGWFGFNGGSTLSGHDFITTNLSAAVGA LGTGMLWVGWYGFNGGSALAAGADAAFACVATQIAAAAAA PLAALGTFILWFGWFGFNGGSQLAAGTDFLNTNLAAAAGT AGAGLLWMGWSGFNGGAPYAANDASSMAVLNTNICAATSL MGASML WVGWFGFNAGSEDAADGTAAMAMTVTQIATATAA MGS WMLCVGWFGFNVMTAASLESASGLVA NSLMAMVGGD MTPALIVGAFAERMKGSNLEATGTAALAFVNTMLATAAAT LGTELLWMGWFGFNGGSELKVSDAVAQVFTNTNLAAAGGV MGASLLWVGWLGFNSGGAGGANPNAGMAVLVTQMAAAGAT VGASLLWVGWFGFNAGSALGANGVAGLAFINTILATGAAT STALVLLMTVPGLALDYAGMASDRAGMAMATTQUATAVAA CCLILGAFAERVRFSAVAGHADQWFTFAY PMAHMVWGGG MTFAI TTVA ILSGS $\square A D R M G A G A R M A F \square A \square W V L V V Y A P \square T$

|  |  |
| :---: | :---: |
| UniRef90_C3ZNA4 |  |
| Reef90 UPIIOOO36D02D1 |  |
| UniRef90 A3LUG7 UniRef90 V 4 HRBE | VA WCLLDFRLLENKWSMVAVCSGCL SPDSDYPEDAFALFQL |
| UniRee90-UPI0002F181A9 | I STALYSQFRFKQDDASMALNGVLAGLVGITAGTAEVSIV |
| iRef90-U1K | WGKADLTML NGALAGLVVITAEP |
| UniRef90-V4N | L S WKL VEwTlR R K P SLLGILSGll |
| UniRef90 B3SC | LTALLIKRLHPNSWSLLVCL NGSLLAGIVSICASCNAV |
| UniRef90 K3x | LTWTCLDVIFFGKPSVI GAVQGMMTGLVCVTAGAGPV |
| UniRef90-UP10003B3 | VVWMVIE WGHRKKPTMLGAMSGLLAGLVGITPAAGFVN |
|  |  |
|  | LAWTFAE WLVRRKPSMLGSCSGCI AGLVAITPAAGTVGPI |
| UniRef90 R1DI |  |
| UniRef90_N9BL40 | VGWMMVEKIMTKHVTSLGLASGV |
|  | LTWMF |
| UniRef90 UPIO0037CE245 | LVASVWSYCYYKQANLKVIANGVLAGLVGITAGAHVVN |
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| UniRef90-R9C | MFFDVIRGKKPSVLGF CDGAV |
| Uni | V A WQL Liv |
| UniRet90 ${ }^{\text {2 }}$ | GA Sbs |
| UniRef90 W6N3M2 | EYIYRKKITSLGVASGIVAGLVAl TPGA |
| UniRef90-Q8MXY0 | TVIGTGKIFNGHYDVKGINGLAGL |
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| UniRef90- UP1000248 | VYFPIAERLKGHKASALGFCSGVI |
| UniRef90-E1RE62 | , |
| UniRet90-TOAWY4 |  |
| 5YZE2 |  |
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| UniRef90 A3JYB5 |  |
| Ree900-K9 |  |
| UniRef90-M9R | MAAMILTQLLYKKVDLTMVLNGALAGLV |
| UniRef90-UPIO003A05121 | LA WMFVE WIVKGHPSMLGLASGAlIAGLVAVTPAAGFAGPM |
| UniRef90-Q6C129 | A WA |
| UniRef90-Q0CMT4 | LTWAGL |
| UniRefgo- $11 \mathrm{H}^{2} \mathrm{~K} 1$ | ${ }^{\text {L }}$ |
|  | MT WAFWERIKYGKASLLVGIVTGTIAGLASITPASGHVTPV |
|  |  |
| UniRef90-D4YVM5 | V' W W |
| UniRet90-E4TJ50 | $\checkmark$ V ${ }^{\text {S W }}$ |
| niRef90 A6C9D8 | SVT |
| UniRef90-UPI | RVNGHKGSALGFCSGVVAGLVAVTPAAGNSVAS |
|  | YAKFRRDDASLTLNGALAGLVGI TAGTANV |
| UniRet90-D6S | VVALIVSKLWFGKADLTMALNGALAGLVALTA |
| UniRef90-UPI0004676101 |  |
| UniRef90-11AU67 | 1 AALILTQIMYKKPDLTMVLNGALAGLVSITA |
| UniRef90-H2JF35 |  |
| UniRet90 H3 | I A ALVAKLMFGKFDLTMALNGCLAGLVALTA |
| UniRef90 Q754 | WL |
| UniRef90-U4S990 |  |
| UniRef90-GOQ443 | WPLVEKWRTGRVTTMGVVSSAVAGMVAITPACGE!N |
| UniRef90-05Q | I ATLLETKLLWKKADLTMLLNGALAGLVALTAAAGFVGTI |
| UniRef90 R7SR | WCLLDF RIERKWSMV |
|  | GWFAKDEWLFREKPSLLGACSGCAGLVGAYLLGKRSGFGR |
| Ref90-Q1WV67 | T |
| UniRef90-AOAO2213C1 | LGWMVIEKMHTHHVTALGLAS GAIIGG |
| UniRef90-V4P | VSWKIVE WIFRGKPSLIGLLSGMVAG |
| IiRef90_T1DU | G VA |
| Q93 | LVWTSLDVAFFGKPSVI GAVQGMMTGLVCITPGAGLVQSW |
| UniR | LGWLIVVERNRDGHPTTFGAASGVVAGLVAITPSCGTVNMF |
| UniRef90- 11 | SVWA QDIKETGKASMLGIATGSIAGLATVTPCAGFVGPL |
| UniRef90-C6XKC2 | A |
|  |  |
| Ref90_W1 | WT CMDVAYFGKPSVIGAVQGMI TGLVCITPGAGVVQGW |
| UniRef90_LOGT49 | WMF |
| UniRet90-E2 | DA WSAVAA VVGKNDPGFVANGA |
|  | MAALITTRLMYGKTDLTMGLNGALAGLVSITA |
| UniRef90-V6AV10 | GKPSVVAAINGAIAGL |
| UniRef90_A5G216 | TVLGAIS SAVAGL |
| iRef90-A4G1J2 | A SML GAA |
|  |  |
|  |  |
| UniRef90 A0A011JIS2 |  |
| iRefo- M1Z1Y |  |



 QF LLV TA A L A AGGCVSTK $\square K Y L C R V D D S L D V L A E H G \perp A G$ SAIVI GA SGCI SVL
 LLMACLLGSLGGSLVVFSIIFLDKAKVDDPVGADSVHGTCG GALI GLLAGPFCYIFASWVKK LLGGYDDSLDAFGI HGAGG AALLIGAIAATAYVCWSEIFLRCKIDDPLDAAAVHMGAG SAMLMGVCAGSVPWFTMMILHKRQKVDDTLAVFHTHAVAG GALEIGFACAVLSYDAVVFVKKFFPWDDALDVFGDHGVSG $P S A V I I G L I A G V L V V F A V T L F D K L G D D D P V G A T S V H C V C G$ GALVIGI AGUI GLWGVVVLKRWLKADDVCDVFGIHGTCG A A A I GIV $\operatorname{S} G A V Y C$
GA IAAVGLITS ICCFFAVTGLKRKFGFDDADDVFSLHG $\square G G$ WSAVIF GVAGGVACNFAVDLKNLIHDDDGLDVWALHGVGG GS VVMGLIAGPLCLWGVSGLKKMLKVDDTCDVFGVHGVGG

 NAGUTALVLSUMVGPRSHPEDPKDHLDDTLDAFGCHGVSG
$A A V I C G L V A A L V L D G C N K V A E R V K F D D P D E A A Q \square H G G C G$ ASILIGFI GGII CYSSVTFMKSKLGYDDALDAFGCHGVGG



AGSALAAGTLAGQALVTTHKSRFGYDDADDVVGDHGLGG ACIILGKR IGYPREAMMPHSKPKLGYDDALDT
A IALIVAGLLCYGALLFRVKKGLGDESLDAWADHGVGG GAII IGALS GFICLWGVNGLKHALGADDAVDVFGVH AAVI MGVFAGSVPWFTMKKSALLMKVDDTLAVFHTHAVAG SAAI IGLVAGVLVIEASFFFERKLKIDDPVGAISVHGVNG AA II IGVIASLITRTSLYF DESKLKIDDPVGAISVHGANG


GA ILVGПFGAA DP WYTMNRDG MFAKVDDTLGVFHTHAVAG GSIVLGLVVGVICFVACTSIKNALGYDDSLDVFGVHGIGG AAIVCAIVGSIIACNLATQ LKFFIIHVEDPLD
TAVVGGVLGAVLGR』KFTKRAARWRWVDNGDTFATHCLGG A AVVMGIFAGSVPWFTMMILHKKMKVDDTLAVFHTHAVA ATI FIGGICGFVSYYGDRLSKARLHIDDALDVHMVHGATG EALLI GAIIAGILCQEMVNLIRGKLRIDDTLD A AFTVGVI TSGACLWSVNNLKKRFGFDDAFDVFSDHGDGA
 QSVLIGGVASSISFMGVHWKNSRTGIDDTLDVVFPCH
EALI,GGVVAGLLVVFGILADEKLKIDDPVGAFPVHGLCG

 $S S M A G G F A G T \square A Y M\|G K Y V L V K F R\| D D A U E A V$

GAVA $\square \mathrm{G} \square \mathrm{I}$ A A F VVVFG $\square \mathrm{EF} \square \mathrm{DK} \mathrm{VA}$ K $\square \mathrm{DDPVGA} \mathrm{\square GVHG} \mathrm{\square CG}$
HMSAGWAFSS IVSNDMVGKFHKRDK DDDALDVFACHGVGG
 GA IFIGIITAAVCYFAVSVLKHKLGYDDSLDAFGIHGFGG
 AAVIMGGIVGAVANYST,KLKFFLRIDDALDLLAEHAIGG EAFKPHNLPMTFIGTAILYGGRWLRVDDVCDVFGVHGVCG

 GAMI CGVLA GPVCYA SATWVKK LL GYDD SL D

 GALVIGLDAGVVSYAVGWKHKLGYDDSLDVVGVHLVGG GAVVI GAIGGVVVVFA EFDDNVLKDDDPVGAVSVHGVCG GALMLGVAAGVVCRFFSLVVKEKYGYDDSLDVFGVHGVGG $V A \operatorname{LI} G A V G G V L V V L T I P L L D K F K D D D V V G A \square P V H L V C G$ QA TLVGAIIGSSLA LIAAYPVTEWLKI DD AAMVMGDLSGSIPWFTMMVLHKNWKVDDTLGAFHTHAVAG
 A GI A GLVGCLLVGKRSVTTLKNALGYDDSLDVFGVH
$H S F \square I G \square A \square G L A S Y C G V L L I K D R \square K \square D D A L D$
 G S I V L G L L A G M C C L W G V S GL K R M L G V D D A F DV F G V

 K RI G L G RESMAPHNLTLTVI K RLLLKAD DA L DAF G L H A V G G


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 UniRef90- A6C9D8 UniRef90-UPIO00370AB24 UniRef90-A0A024PILO UniRef90 D6SPD1 UniRef90-L7WIA4 UniRef90-UPIO004676101 UniRef90 I1AU67 UniRef90-H2JF35 UniRef90-H3NST9 UniRet90 UPI00047A658A UniRef90_Q754N5 UniRef90-U4S990 UniRef90-G0Q443 UniRef90 Q5QVH2 UniRef90-A1HNS2 UniRef90-R7SR38 UniRef90-D3VL80 UniRef90 Q1WV67 UniRef90-F7VUI9 UniRef90-AоА02213C1 UniRef90 V4P8E8 UniRef90-T1DUM8 UniRef90-O93X02 UniRef90-COZN31 UniRef90-A6TTK2 UniRef90-C1EG53 UniRet90-C6XKC2 UniRef90-E3NRD6 UniRef90 W1P639 UniRef90-LOGT49 UniRef90-E2CGZ2 UniRef90 Q605Y6 UniRet90-B8GQ42 UniRef90-V6AV10 UniRef90 A5G216 UniRef90-A4G1J2 UniRef90-GOJRH4 UniRef90-UPIO00466E82B UniRef90 A0A011 JIS2 UniRef90_D5X711
UniRef90-M1Z1Y7
 AWGTLAAGLFDHG AVGLLFNALFGSSTVIGYDNVTDHEGGW

$M V G C \prod L T M F C \prod P A L G G N Q D V N \square F \quad K Q F \square A Q \square A S \square G \square T$ SVGSVLTGIFAADYVTALDGATIIDGGW
ILGAI LTGVFASQSLGGTGGLTPDTMGAQVWVQFKSVIVT GI WGTI AVGVLGNLDMLGTGHDRGTQULIQALGSMSI TYGALATGLLATV NAEGLIDAGNAHQLWVQFVSVVAT MVGMLDTGIIFATKTVNSAGAGLFYGNPEFFITQLKAMTVA $\square$ WGSUATGLFASHA!NSHVTSDGLFVGGGW
AWGVIFTALFASEKYVNEVYP
$\square W G G I A T G I F A W K A \square N S G G A N G L I H G$
CWSLI SVAFFATH
VWGTLAVGLF GNDDL
$M W G V F F T G L F A R Q Q Y \square Q E Y Y V$
TWGA $\square A T G \square F A S A A V N G V D G \square F Y G N P G \quad Q V W \square Q \square A S \square A G T$

$L\llcorner G G V L T G L L A T P E D P G D R G A F Y G G G A R Q L G$
AWGVLALGLFADGSYGNGWNGVKGTVTGLFY
$\square W G L L S V G I F S D G T Y G G V R G L I T G S \quad G W Q L L A Q$
AFGTDAVGDFADEEG[FYGG

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


I IGGLDTVIFATSFLGGTGYPHERNMWEQMSVQILGISFS 1 WGSIATGI FASHQISDQVGLLFGGGFHLLIIQTAVTLLT VLGALLTGIFANPEINSIGKGLLYGN
$\square W G G V A T G \square F G$
$\square W G T \square A \square G F F$
\VGMLLTAFADE

ATGTLMVGVFATD
MTGMLLTGVFASKETNP

TWGATATGLEASKAVNPAG
1 LGLLENGIFADSEI IALDGVNTSTTGGWLWKQL
IVGCLLTSIFTARTLGGTGFTGGMTMDRQLECSGCTSGLV
I LGSILTGVFANKAINSN
LVGNILTGIFGSKA: AHLDGTTNDHGGW
MVGCMLTGUFC\|PQLGGK VADUSLLNQLAAQAGS\|VLT
VWGGTATGLEADSRTNPLTKGENSAG
LLGGLLTGLLAEPELCRLVLPVSNSRGAFYG
IVGSLLGGLATAVMTGGPGLFFGGGFAQLGKQFVGVVVV AVGTIAVGIFATD
FLGTCMLGIVASPVFGGFN TDTTMMTQT】IQCTAAFAT $\square W G T M \square V \mathrm{PL}$

F LGGALTGLFAEPTLCNLVLPVTHSRGAFYG $M A L W G T L V Y V P D A S L G G A G L A D G M T \square A S Q F A G G T V V H \square N A$ A WGA $\square \mathrm{AAGVFGQEAMGG}$
$\prod L G T L A T G V L A \quad F G P \square S G G A V E P G L H Q L A D Q$ IFGAI MTGVLAAPSLGGTGAAD YAMAHQLMVQVKGVLIT GLWSLLVYAP $M V G C L L T G V F T A D S L G G \square G Y A N G \square T M \square N Q A V S G V D A G L V G$ $1 V G A L L T G V F Y S D E I I A A N V A L A P T F A G Q L W V Q V E G V L A T$ $I V G A M L T G V F A V K A I G G T A G A L E G N M A \quad Q V L I Q A K G V G F T$


UniRef90 C3ZNA4 UniRef90-UPI00036D02D1 UniRef90-A3LUG7
UniRef90 V4HRB6
UniRef90 UPI0002F181A9 UniRef90-U1KWH9 UniRef90-V4NPL5 UniRef90 ${ }^{-}$B3SC46 UniRef90 ${ }^{\text {K3XS }} 24$
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UniRef90 K9QQA8
UniRef90 S5UMW7
UniRef90-R1DI78
UniRef90-N9BL40
UniRef90 K0KX8
UniRef90-A0A014NZF6
UniRef90_UPI00037CE245
UniRef90-F0JGZ1
UniRef90-R9GM11
UniRef90_C2ESK6
UniRef90_R4YTT4
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UniRef90 A8IUV9
UniRef90_Q0G0A3
UniRef90-B8IZX4
UniRef90 UPI000248A360
UniRef90 E1RE62
UniRef90-T0AWY4
UniRef90-C5YZE2
UniRef90 UPI0003A6B2D1
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UniRef90_C0ZN31
UniRef90 A6TTK2
UniRef90_C1EG53
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UniRef90-W1P639
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UniRef90_D5X711
UniRef90 $^{-}$M1Z1Y $^{-}$

\LWT G LT S GLMFY LLNKF GMFRD
$L I W S S V V A Y \square A F K \square A D K L V G \square R \square$


MVWCGVVSFICFKVADVLVGDRV VI G S F SVV S Y AL L S L 1 N CY 1 PLRV WAFCFAMTFVI FKAVDATIGMR


WAF VY VATR IIVRLVGAMVGLRV
$\overline{L L Y} D G L M T W G I L K V I G L V V p / R R M$ $L \operatorname{V}$ WS GVGSF ILYKIVDIIVGLRV

FTWAFVGSYVL
 ITF $\ T$ I MD I L L I K T
$\mathrm{G} \| \mathrm{L}$ S F G $\square \mathrm{T}$ Y $\square \mathrm{S} \square \mathrm{K}$ T F N H F Y K $\square \mathrm{R} \mathrm{V}$



VIYCGVLT WLIM KF VDKT $\square$ G $\square$ RV

A $L$ Y AF GVTYGLGK L DDKTFGFR $\square$ A A Y T A $V$ A S Y A C $\square \mathrm{M} \square \mathrm{T}$ K A $\square \mathrm{T}$ G $\square \mathrm{R} \square$


[^1]GGLVQSKNVL S $\square$ D T T WVLLT GF L VF F MQ T GF SMLE A G LLR R R GVV
M H A GFAMLEVGSVQ GMCRQKNALV
EAGLVRKKNAA
R Y P S F Q
ES GFTRAKSAV
ESGFCRQKNAV

S $\square$ N H L W I I VS A C F VFF MQ A G F VC Y E VG F $\square$ Q S K NVI

N $\square$ MMKNFMDYS $\square$ GT $\square \square F F \square V G F S \square M F H G S V A G \square F G \square P D D C$ $S \square A A K N \square G \square Y S \prod A G \square M F W L C G Y N V A Y G \square S E G G G F \square G S F S$ N L M K N FLT IS SGSILYFFVGYAFMFGDSAGGLIGTSGFA $N$ N MKNFVDFMFGSLL YWF $\square G F G L M F G A G G F \square G M$ MQ $\square$ T K N M G $\square$ FA $\square$ A A $\square$ MY WS $\square$ GT DETGGY $\square$ GAFGVAVLEAV
 SGDGNLI G D L G G HAF $E \square L T K N V A \square F A \square S C T M Y \square V C G Y A \square M Y G G N \square F L S G \square A D V D F$



Y LF GFAFAFGSPSNAF $\square \mathrm{GLGGRF}$ N $\square$ LIFKNFVDFMDGSVLFWFVGFGFMFGSDGA GF GMPN

$N \square L F K N F V V F A V S S \square A F L V I G F G \square E F G D G N P \square F G T S G L F F$ FF G GF D YVW N I IMKNFLDFAAGAPDFFLFGFGLMFGKSVSGF\GGSDFA


## 

GVDGGYLGSFTWFA

NTVMQSMAAMVIVTFTWVVLGFSLSFGTGNALIGNFDLIG $D A G G F V G G D D F L G$ NALLENF $\square D A A V T \square L V W W G V G F G \square A F G T S A G G F F G T D T F F$ GS G L SY DGGFSKDF K ILMKNDFDASVAGLFWWDTGYGLAFGSDAFDETGKNGFA NILAKNLFVFALAVTAYWF $\square G Y S L M Y G D N G W F Y F A G L F F D$

```
MQS MKNVA LIF S VA G \(\square M \quad F W L V G Y S M A Y P G E T D A G W \square G M P D\) \(N N L V G G L D R D F\)
``` FMAFYAFACVLICWVVWAYKMGFGSQWGSFPLLGTPG
\(G G L G L F G\)
GFVGNPMTHFMFKG

DVHVMDFVGFGFLMTFLQRYGYSVGFNFLLAAFGDQWALL D S K Y F M
\(N \square I M K N L V D F S V G A L G F W A \square G F A \square M F G A T S T G F F G T E G F F\) N LLAKNF IVFA L STVAF WAVGFGVMFGDGNP I IGTSGFF L MA LYAFAAVLVFWVGWCYKMSFGER \(\square P F \square G Q P N T A L\)

STKFQSFACMGVVGLIWAVCGYS LVFSEGNDF DGGFDY \(\square M\) \(N V I M K I T L G T C F I G V G G L V G Y G V A F G P S V G G L\)
\(S \square A \square E N \square I T F V I T\) T \(L V Y C F \square G F A \square M F G K S H W G L F G G N F W F\) \(E \square L T K N \square L L Y A \square A C \nabla M Y L L V \quad G Y N \square M Y V D N G A G G W L P S F\)
\(N \nabla A \square K N \square A D F G V A T L L F Y \square F G F G \square M F G S S F Y G L L G T D L F L\)

VSGDDYTSLGLIVPLLAFVFFQSVFCSTSVTVVSGAVAER LA GVTMMSVAATIPEYVFICFQMTFACDTPALIVGAFAER S WS
L
L PHFFNLSFLDSDLPKEGFLVFQTVFCATAATVVSGAMAER
GVTRDTADDYGYASTGSDFFFQLMFCAATAS VVGTLAER
\(\square A N \square P D T Y A A T G D P L L A H W\|F Q Y A F A D T C S T\| V S G A M D G R\) FQGVSDSESTRTIPDSLFAVFQMMFSIITVGILTGSVAGR FRHVLDEPSASTVPQAAGVLLMMPGMGLLYSGLSRGANER AGREDGFEGGS YSGASDFFFQVVFVATAMSVVSGAVAER SOSATGDAAGTYPEFMFVAFQATFAADTCALIVGAFAER


VGGETHPDLAPTDP LMLFADFQMKFADITPADITGAFAER WS ADDSAPLDVGYSASSDWFFQMVFVATAASVVSGTLAER

VF A E R
FA L SGMPDFS LS Y DYNYF \(\square F Q Y C F A \square A A A G \square T S G S \square A E R\) FGDLSFYTNAAGLPTEGFLMFETVFCATSATIVSGAMAER LKGITPDSTGATUPEYVFVAFQATFAADTCGLIVGAFAER \(M G L A D \quad W D W T F F \emptyset F Q G V F A A T A A T G V S G A M A E R\)

> AHNGRPAVEPFYPMATLVYFHFQFAA TMMLLAGSVLGR WTSRSASTPTVPDVVCYFYQGMFACVTAALMDGGGERV ASGVDNSPAMGDVP LWAKFFFQLVFAGTAATVVSGAVAER

 \(A A R E D G F N G G S D Y S G A S D F F F Q V V F V A T A M S V V S G A V A E R\)
\(V G P N T A W S L A P S I P F L L F A L F Q A K F A I I T P A L I D T G A F A E R\)
 HPEHGAEDLTYAAGT SDWFFQMVFCATTAS \(\square V\) SGTVAER
 LN NVSISDSTRGIPDMLFCKNVINTMMASVEVTGTAVLMR \(\stackrel{L}{F} \operatorname{MGTVPGDPSQLNAYTLFFFQFAFAATASTITTGSMAGR}\)
 GGSGFLYAGIGSGDDAS PLTNTPFAKTAATIVSGAVAER \(P A V T P E M \square T E A S L V P T V D F L F Q A A F A G T A A T I V S G L V A E R\)

FFWKPEDSMENSYAASSDWFFQMVFVATAAS VSGTVAEAR


TGFF DT TGGTYDVGVYADFFFQMVFMDTTCTDPTGGLAER VLDGKPWSLAPTIPLVVFAFFQLKFAVITPALVTGSLAER

MQ G WF HS Y Y Q G Y \(\square\) H VGGVENLINADFCVGSVCVAFGAVLGK \(\square Q G \square D E S \square L P S H \square P E Y V F A M F Q G K F A \square I T P A L I A G A F A E R\)

LS S WD
 S GSDNSP \(\square\) A WA G \(\square P \square Q A K F F F H \square G F A G \square A T T \square V S G A V A \underset{R}{E} \quad R\) DREFFRQAFAGEFPNATMVYFQLAFAA \(\square\) S
\(\square S N V G V D P N A S Y G P T \square P H V L F M D F Q A T F A D I T P A L I T E R V\) FGGAGYAPMELPATQAMSLLYQMMFATTAVTIVSGAVARM
\(\square N N L S\) Q A H N S LGG V VF VF FE L M F A G T A VT VVSGSMTER GS \(\square M G S Q A D D A G H S \square H A D F F F Q V V F V A T A T S \square I S G A V A E R\)
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PAFPKDNAWPPT FFLGQLMFCGTAST|VSGAVAER

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    F DPGDYSDT \(\square\) PHS \(\square F M M F Q M T F A V L T T A \square I S G A F A E R\)

MKFSSYLIFSSLMTA \(\square\) YP \(\square\) SGHWVWGGGWLA QLGVHDF MRFTAVVLFVILWVTFVYFPIAHMVWDDGMLFA WGALDFA IK 1 WPFF FVALLTGVYP EMGWQWGGGWLAAKGFSDFA MKLGSYMI LTA FMTGII YPVVGHWTWGEGWLYDLGFDDFA TKFSMYLVYTIF \(\square S V L I Y P I S G H W T W G G G W L M N G S F M M N D\) \(\square K \square W P F L \square F\) TA ALT GLIYP \(\square\) QAS WK WGGGYFLDGQYGA LDFA \(W G G G F L D Q Y G F L D F A\)
\(P D G W L A K L G V L D F A\) TSFRGDILYSTGПTGFDYPFDADMGSKGGFFESLGTGDFA MRFKPLLIFII GWLLLVYYPFAHMVWDEGLLA QWGTIDFA ARLFPMMVFLFIWMTLVYPCACWSWNSTGWLEELGELDFA MKLWAFLAFAVVMTGFIYPLEGSWTWGGQEVFGLFSLGDF AKFTAVLLVVVI WFTFDAATLATETAKAGYLFQHGALDTA SK WWS FLLEVVLWTT TVYPDTGSWVWGGGWLSEMGFVDFA

HGKQDFA
VRFKMTPGLSFFYGGMVRDKNVVSTDHPGFDRKWGVLDFA \(\square R V W P F F \square F T A V L T G F I Y P \square Q A S W Q W G G G W L S E L G F S D F A\)

LGALDFA
TQFVSYLAYSSFDTGFVYPVVAHWWSNDGWLFGSGVIDFA TKFSMYCVYSFFISLI I YPVEGHWTWGGGWLCNGSFMMNT ØKAATASEPAPAAAAPDAAAAEKATAAAGWLFQKGADDFA TKFGSYLVSSFLITAFVYPDFGHWAQSTGWLENMGFIDFA
\(M N \square K A L Y A S \| V R K K W A V N S A F M A D Y A G G G F L Y Q W G A I D Y S\) RLGPLAVFLFIWQTIVYCPDAYWTWNPNGWAARLGSLDFA IK FK SFLLFTVFLVGVVYPI A GHLDWGGGWDATQGFLDFA MNFTAWLLF IS LWVLLVYTFVAHWVWGGGF DDEK \(\square\) GA KF GAY ILMSMVVTGLIYPVTGHWAWNEGGWLAAMGFADFA TKFSTYLIFS VVITLF \(\square Y\) PVSGHWVWGGGWL SELGFHDFA
MSFRAWMLFVPDWLTFSYCDGAYSLWGGGFVNKLGAVDFA \(M K\) LIWAFLAFAVVMTGF DYPMEGSWTWGGQSVFGMYSLGDD VATALVLDMTPGLGFFYGGMVGHMWHPEGLFFKMGVLDFA I RF WA YML F MVLFILFVYTPLCHMWHEDGVFYKMGVLDFA

\(\square K \square W P F L I F V A \square L T G F \square Y P \square Q A S W Q W G G G W \square S E A G F S D F A\) WL A A L L G A I D D
MKFFPF! DF \(\square\) F WWVLIYSPVAHWVWGGGWIQQLGALDYA MKFKALVPFICLWSLLVYYPLAHMVWGGGFMGYLNSVDFA TDFVGDLIYSAVMGG\|SYP』IVHWVWNANWLAKMSFHDFA MKFSSMLVF LT L LWLF UVYVPVAHWVWGGGFMASDGGVLDFA CAMLSYFIYSCCITGFIYPIVVHMVWSEDLFGGCGMIDWA VKFGEFVVFALVLTAFIYPISGSWQWNGGWLSELGFIDFA
 I K LDWPFLIFTAVLTAFI YPIVASWEWGGGALDSQFAFDFA I K FSALLI FILLWVTFLQTKLAAVQANAGYFNKLGALDFA MNFFAWMLFCPLWLTFSYTVGAFS IWGGGFDF
VKYSAVVVSSFFVSMDYYPLFGNWLWGGGWLVSQLVLDEA INFKSYVLF IILLFS IVVYAPLAHWTWHPGFLFKMGVLDFA QGGFLAE \(\square G S V D F A\)

VSPVQLLIMTLFQVTLF
\(N G L L A G L G G V L D F A\) SVNEYGLLALLEVKDAG WI HRMGALDFA VNFRGLAMFYGGLVRTKNVIGTMMHSFDGFLFNLGAADAA GFDEOQGALDFA ANFKSLIMSVLIYPVFGSWAWGS \(\square\) FHGNGWLEGLGFIDFA NLGVMDFA \(\square K F \square A F F V F S W F \square A G \square G Y P \square A G H W \square W G N G W \square H R L G F W D F A\) MKFSAY ILLFTLLWATFVYDPVCHWWSPNGWIKGLGALDFA

GSVDFA
RFKAWLI DMALWSLCVYVPVAHWVWGPGGWDAKMGGLDFA RYGAYL FFAVLMSLLI YPVYAHWSWNADGWLKQLGFVDFA HRMGALDFA \(G W L V K \square G S\)
\(G Q L I V L W G G I D\)
\(D\) \(T R L L P L L D A D V F D A G F D Y P D Y G H W V W A D M F T N Q S A W L D F A\) LQFEAYLCYSVMLTGFVYPVVVYSIWNDNPTFGCGMHDFA MK LWSFLLFCVVMTGFIYPVEGYWSWGGGFGKEAGFSDFA PDGFLFAKGA
\(\square K F P S Y L L A T A L I S G \square I Y P \| V G H W V W G G G W L E Q L G F H D F A\) WVWNPNGWLVNFNFLDFA

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 GS GVV HLVGAVAGFWGA Y VE GPR DGRFDNSGKKE GM K GHS
 G S S V GGWA A LAA A A V V L GP R G K F K D K E \(\square\) GSAMP G H S
 GSTVV H S VGGWA A LA G IIVVLGPRRGKY GKGGKVNVI P GHN

 G GTAV H I N S GAAAL AVI LVLLGKRIIGWKKE GERPHNLDPLVM G GYVIHLSSGTA GFVGAWWUGPRLKQDRENFQPNNAYKVA FGFSDFA GSG VVH LAGATAAKYGKNGE DNADPGANLPMAT



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GS GVV HLTGGIAALIACIFVGPRTYRFGRHARHLQQQS QV

 G

 G G T V V G G TVVV HIN A GVVA GLVVTA LVVGKRQGYGQDDMSMAADPAPP GS GVVV H MV G G F C GLV GA I I A GA R R GRF GPD GF E GNNT LQA G GTVVVHDNA G \(\quad\) T A L MLL I FLLGK R LDD Y GKEEE H Y N DP WV L L GSMTIHTFGAYFGLTVTWILYRHQSKERQSAVYHSDEAAM




 \(G G F V I \quad H L S S G V A G F V G P R A V K D R E R F\)
G GYVI HL S S GTA GFVGGAWWI GPRLLASDRENSKPSNDTLML


 G G N A V V


 G S G I V H L A G GTVVHIN A GVA GVVGGAYFVGKRVGY GREADKPHNVTATM
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\(G S\) & \(T\) & \(V\) \\
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210
220 230
V|GAG|ILWVCWNGFNGGDPYAASPDAG|V|AVNTNIICTAMS I GASLLWF GWF GFNAGSSLEANGVAGLAFINTWVATAAAA
 LTMAALGVF LDWDGWFGFNAGSWA DA HVVMTTNLAPAAAA VGASIL WVGWFGFNAGSNLEATGGAALAMINTFTATAGAL
 PLGALGVF ILWFGWFGFNGGSTLAADPAAVTTLLAASGGV VGASMLWMGWFGFNAGSNLEANATTALVALNTMIAAAAAT LGTFMLWMGWFGFNGASQLAMGSVGSRIFANTNMAAAGAGA
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\(A R L F P M M V F L G W M T L V Y C N S T I R A W Y A I E N T V L A A S F G G\) \\
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 LMLFAL WQMKFAIITGGALSASSLATQAFATTNTASAAAM \(L G T F D L W D G W F G F N G G S Q L A M G S A V S D D F V H T N M A A A A G V\)
\(S T A P A A T T T P V A A P A A S A G A A N D R A G M A M A A T Q D A T A A A A\) SLAATLAWTGWFAGPAASAGAANDRAGMAMAATGDATAAAA LGAVLLWF GWFGFNAGSELAADGGAANAFLVTNTAAAAGA AGTFMLWFGWYGFNRGSFLTDANAYGQSGSAYGQWSAVG
 VGAS LLWVGWFGFNAGSALEAGGTAALAFVNTLLATATAT

 MGTVMLWF GWLGFN GGSAGGASVVRGVAAMVNTNLAAASACGG

 LGA GLLL WF GWF GFNGGSALTTSSNTASVVVLNTFTATCSAM FGEYMLPFAGRPGPVGDPYAASPAAGVAVLNTNVCTAFSM
 GLLWFGWFGFN LGTGLLLWF G WLGFNAAGSALLAANGIAAADSLLNTNAAAAAAAAL




 I GAALL WVGWF GFNAGSAAGANALLAGVAMLNTQVATA GAA F Q T
\(A \square A T L G A D I \quad L W \square G W Y G F N D A M D Q Y V P Y D A V T T T L A A A B G A\)
 \(A G G L V V H V N A G G D T A L I L V N D T A V Q A M L T T T D S C S S A M\) \(P\) L A A L GTFILLWF GWF GF NGAS QLAA GTDIFANTNMAAC GGV VGAALL WVGWFGFNAGSNLEANGTTADAFVNTFVATSAAT \(V\) GAGILWVGWNGFNGGDPYSASPDAGAAVLNTNIDCAMSLD GA GLL WF GWF GF NA GS WLGND DG DGAVAFVNTMVATAAAM 1 P MAV AGT ILLFF GWFA FNGTD F RIA IVATNTMIA GA IGG
 AI NTGDTA WMLVSTALVLMGANGRAGMAMATTXQAASAAA G LGVVFI L WF G WY GF N C GS T L M I S GVVA GKVVAVNMTI A A A S A A


 SMAALGVFILWF GWFGTTSVNGGNFAVIAVTTNMAAVSGA
 F GGGLLWFGWF GFNAGGAMGANGVAVL ALATTQQAAGAAGM TTA AL WLLGWF GFNA GST LAAVEPHVI THVL LTTNMAAATGG DGT GI LWF GWF GFNAGSALAAANASAVAAFVNTNTAAAAAT
 MS MA ALGVF ILWF GWFTTS DEGGSFAR』AVVTHMAA CA GA LMMGLSSSIL WVLVVGFSDSFSSANEDADHAFMTTNTSAAAAM


 L GTVFL WF G WMFFNGGSAGNATDRAWYS IMSTNLAAAACGG II GATLL WVGWF GFNAGSALEAS GSAALAMTNTALATAAAAA

 GA SLLWVGWF GFNAGSNLEATAGAALAAFLNTLLATAAAA
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 FSWLLLEYIKNGKPSLVGASTGLVAGLVADTPGAGFVSTW MTWLFIDYFKYDGKWTTVGTSRRDPTRNSTGGPKYKPHSV 1 AALITARILFKKADLTMALNGALLAGLVAITA VSWVFAEWI FKGKPSMLGGASGAVAGLVAITP VAAMILSQLLYKKVDLTLALLNGALAGLVSITAGPD VTAALVTRLI GGKTDI IMMLNGALAGLVAITAEPDNPSPI VGAMLMVWVITGKADVPTTLNGALAGLVAITASCAFVEPD LGWMAFDWMRGRKPNAMLRKWGVLDFAGGTVVHMSAGFAA VTVLILSTLLLGKDNDPMVLNGAIGGLVSDTAAPLLGTP


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SSALVIS QMDFKKADTGMTDNGSWAGLVGDTAGCANVDPW LIWTSLDVVFFGKPSVIGAVQGMVTGLAIDYSGGYVI HLS
 TLSAMLTAWMLFKKPDLGLTLNGCLAGLVAITAPCAFVSV GGAMITIWLKYGKPDVSMSMNGALAGLVAITAGCFEVSPI LSMMVSWGRYKFPSLSLTGNGALAGLVAVAGCDTVTPG L TWTMMDLVFYGKPSIAGAYLARMSFRAWMLFVPGWLTFS IGALLFARILFKKADLTMALNGALAGLVALTA
MAWVFLDK LGHKLSAMMTWHPEGLFFKMGVLDFAGGTVV MAWVFFDKVLGHKVSAMGACDGTVVGLVANTPAAGFVSIP TVWV WDMFAGPSRRPNFLGAVNGMIAGLVAATPAAGFVN VVAMVLT QVIYKKVDLTMALNGALAGLVSITA MGWMFAEWIFKGHPS LGALSGAVAGLVAVTPAAGFAGPM LIGYFHCFUFQKKDGLEELLGSVLGGLVAVTASPHVQSPF


\(\prod A A T \| V T \square T S G K P D L T M \Pi I T G L L A G L V S T T A G C G N M T L V\) LGWLFVVEQKDGHPTTLGAASGAVAGLVAGTPSCGSVSL VTWMLLDRYHFNHVTLAGVCNGAITAVQAMLTTTMSCSSA LGAMLTSLLYKGKVDATMAFNGAIGGLVSMTAEPLAPSMG
 AAMFYMWFRYGKPDPSMTCNGALAGLVAITAPCAYVSGU LA WVLLDVANGKKVSALGFCDGVVVGLVAITPGAGFVT:P VA WMLAE WARTGKIVWMVAGYSLAFGTGSPYGGDLSRFML 1 TATFLAKALQGHYNLSMGLNGVLAGLVGTTANGLKDVYN SVALSSALHKKGKLDMVHIQNATLAGGVAVTAAEMMLMPY LTWLCLEWKISGKMDPSSVAFTALGAALLWFGWFGFNAGS

 VSWSLLEYLHKGKATVLGTCTGAVAGLVAITPAAGFVTPGL
 SSWMLLTELKSGKPFQMMFANITPALIVGAITAERMKFSST TIWMICDWVIGGKPTAVGAAVGAVAGLVADTPAAGYVSLQ
A
\(\frac{L}{M}\)
-
LSWMFAEWITKGKKSLLGGALSGCAAGLVAVTPAAGFAGPM VGAVLTTSVFDKNHSYMEAVFSGLGGLVAITAGSNYMYPF VGALLVSKLTWGKADLTMLLNGALGGLVAITADPASPSPG
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UniRef90 SOFIB1 UniRef90_M4VEJ9 UniRef90-B1XZU2 UniRef90-UPIO00462BDFA UniRef90-UPI0003AA7D6B UniRef90-E7NM84 UniRef90_J6LJ63 UniRef90-I4D6Z9
UniRef90-K0QYW6 UniRef90-A0A023RQFO UniRef90-A0A021VY52 UniRef90-G8NUT5 UniRef90-N1 W5T6 UniRef90_UPI000477606C UniRef90_Q07429
UniRef90_UPIOOO3EC0372


GS LI GLIAGVILVISVQFDDQVLKLDDPVGADAVHGVCG GAVVI GAICGVVMI LAVDFIDKVLKIDDPVGASSVHGVCG \(G S L V I G L L A G V I C L W G V N G L K H M L G A D D S L D V F G V H G V G G\)
\(G S V A \square G A L A T L A S F G F V T Y L K P R \square G V D D A L D A F G C H G \square S G\) GAILL GLVA GVLT YVFMNVVEWFRVDDPVGAVTVHGING SAVII GLLVSPVCFYADAIVKHKDGYDDALDAFGCHGVGG \(\square N V V L G T I F \square A T C C N F A \square D V R N L M K \square D E G F E V W A D H A V G G\)
\(\square A M V I G S F G S \square I M Y F G T K F \square E S K H L D D V\) AAVVI GLIGGAFVFFSMRFFDKR RIDDPDFADSVHGTVG QS LVVGLVASGVSNAAAHF KSRTALDDTLDVFPCHGLGG

 \(G S \| V I G V \square S G I L G F \square G V F W L K K K F G Y D D S L D T F G V H A D N G\)

ASVII G LVAGVLVVLSVLFDDKMHDDDPVGAVSVHGVNG GAIVIGIVAGVVCFWSATWLKHKFNYDDSLDAFGVHGVGG SGIVSGTAAYWVGPRLKKKSSLFQKVDDTLGVFHTHAVAG WSAVVIGDVSGVAANLGDGDKGVVYIDDGLDVFADHGIGG A S S V I I GLVVSGVIVVAAVVFFDRI RIDDDPVGATAVHLANG GAMCIGLLTAAGCYWA A AYLKPRLGYDDALDAFGLHGIGG GS LI GF GA GILVVLSVLF DQVLKDDDPVGAVSVHGVCG
 Y CI G A Y S LW G G GFLFKLKWTLF THHVDDALGITHTHMVAG
HMSAGWAFSS VVSNLVVGSF PKGKVDDALDVFACHGVGG NALFIGDFSSUVSNIVVSKF HKGKIDDALDVFACHGVGG AALLI GAVASTVSYFLVAN KHRGFPDDALDVFACHGVAG SFGAMVIGLVASTLVWLSWNKDFRKVDDTLGVVHTHGVAG

GAVVLGLVAGVVCLFFCTVVKNALGYDDSLDVFGVHGVGG ASII G GLA GLVHNYGYDFLLKKMK DDDAVGADPI HGFCG SAYII S II GGGVCYLVINVI KVKYKYNDTLDAFGIHGAGG A GSALAANGTAVHAFIMHLIKKVLKDDDALDAFGCHGDGG



GS WVA GAVGGDIVVFAVSALDASGDDDPVGAFSVHGVCG LGALVIGLAAGVVCSYAVGWKFRLNYDDSLDVVGVHLVGG MVT WML LDDRYHFNHVTLAKMKPHLPYDDSVDAGGCHGVGG LSILI GADGGCLVVVTVPLDDKLKIDDVVGADPAHLVCG GSUVLGFAAAIVCYFFVAYVKKWVGYDDALDVFGVHCIGGG MGALSGSDPWVSMMDVGKKVSFFQYVDDTLGVFHTHAVAG

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

 GAFALGGALASSV CYCAILIKNKMGYDDSLLD
ASLLFGILSGGVGFLGVFVIKNRFKYDDSLDAFGVHGLCG
 \(S S L L I G F I A G G V C Y L A V S V L K A K L G Y D D A L D V F G I H G I G G\)

GALII GLLVCGVCYSA!LLKSKDGYDDSDDVFGVHGVGG AAI MGMMSGSVPWYTMMVLKLLKQVDDTSAVFHTHAVAG GA LLGGLGSGVVPWITMNIVGKTWQVDDTLEVFHTHFVGA
 VIFTTIWSIAVYYPLAHMVWKPKLGYDDALDVFACHGMGG AALI I GVVAAVGCYFAARLVKHTLKTDDTVDVFACHGVGG TATLVGMI GGALLCTWGAEKI RSW R DDDAVD GSLIIGGVSGAVGFYGVVFLKKKDGYDDSLDAFGTHGLCG


 WAAFIDGDIGGWTYI FWSSLLVKLKIDDAVDAIPVHFGCG FASLI GALAGALVVYAVVAFDRLKIDDPVGAISVHGVCG
 QA A I G M MA G GL T I PAEKLLEKLK
V

UniRef90 B6Q9M0 UniRef90_E1VJL5 UniRef90-I1T0E2 UniRef90-D4W8Y2 UniRef90_13TTD9 UniRef90- F213T2 UniRef90-UPI0004177886 UniRef90 R6UXG1 UniRef90 UPI00037E110E UniRef90-X6L2Z1 UniRef90_M5ADC8 UniRef90 H1YF74 UniRef90-UPI00046252DE UniRef90-H2AP69 UniRef90 UPI000366D35B UniRef90-UPI0003A83C49 UniRef90-I3TQD9 UniRef90-UPI0003C7F5C9 UniRef90 L5N398 UniRef90 Q091Y2 UniRef90_E0TGPg UniRef90 TOZ5F9 UniRef90- H8I6C6 UniRef90-C1DVJ1 UniRef90-K4GMT5 UniRef90 K1RVP9 UniRef90-UPI0003049867 UniRef90-E3H8C9 UniRef90_R4WVL4 UniRef90 A0A059DCR5 UniRef90-Q6C1W2 UniRef90-A7HGH0 UniRef90 W7CDR2 UniRef90- G2H9D3 UniRef90_UPI000471B9D4 UniRef90 UPI0003663E70 UniRef90 M2NJL6 UniRef90 R4YRQ3 UniRef90-UPI00030111D7 UniRef90 H7FT58 UniRef90-C1CVS3 UniRef90-W8AB39 UniRef90_X5MD09 UniRef90-Q2J376
UniRef90-UPI000367B066 UniRef90-Q4L7S7 UniRef90 R6U9Z5 UniRef90 \({ }^{-}\)K9WSX4 UniRef90-A0A023DOY1 UniRef90_A9M8N1 UniRef90 G4VV24 UniRef90-A5GWG4 UniRef90_M3FST6 UniRef90-R9WIG5 UniRef90 UPI000477E4CE UniRef90-UPIO0040210EA UniRef90_I1T0E8 UniRef90 UPI0003676AC1 UniRef90-UPI00047B5CE6 UniRef90-I2EZW4 UniRef90-R5UN67 UniRef90 B5ZDQ6 UniRef90-L1INN6 UniRef90-XOPQ78 UniRef90 G1M380 UniRef90-S0G2E4 UniRef90_Q3B6Q2 UniRef90-D3PAH1 UniRef90 V6HIL7 UniRef90-UPI0003B74C3E UniRef90-G2FMB8 UniRef90 K9T8E5 UniRef90 LODJK0 UniRef90-K7LH41 UniRef90-R4TZB0 UniRef90 N1W6L5 UniRef90-S0FIB1 UniRef90-M4VEJ9 UniRef90 BIXZU2 UniRef90 UPI000462BDFA UniRef90_UPI0003AA7D6B UniRef90_E7NM84
UniRef90 J6LJ63 UniRef90-14D6Z9 UniRef90-K0QYW6 UniRef90_A0A023RQF0 UniRef90-A0A021VY52 UniRef90-G8NUT5 UniRef90-N1W5T6 UniRef90_UPI000477606C UniRef90-Q07429

350
360

VFA A P SLGGTGVWDYVSNGVAPEYS IAS QLWDQAQGULIT \(1 V G G V G T G L W A T P K G C A A F G \square T N P G G\) VVGTI LTGLIFSTS
I I G AVGTGVF T S A S \(\square G G \square G Y\) A D GVT MA D QVWT Q \(\|\) LDAVLVT
\(\square W G T L A V G L F N T S S G L F Y G G G\)
FLGTILTGLFSTSE GLFYGHGAGFDGAQ \(\square F G A L V V\) \(\square L G A \| L T V F T A P S L G G T \quad G A E D F A M G A Q V G \square Q A L G V V I T\)
\(1 V G S L L T G V F A T K A V N Q T \square A A N G \square A Y G G\)
1 WGTLSLGLFACGKYGATG
I F GGUVTGLFTTPELA
\(V T G S \| L T A F F A A K Y V N N T A G V Y A S D \square G G G W \square D H H W\)
 VWGTLSNGLFATPELAGRPGLFYGGGFEQLGVQLLGVVSC AVGMVLTGLLAKD \(\triangle\) WGTLIVP F
 VWGALATGDFATTAVNGYSGLLEYGNPSQFIYQADAVCAS \(\square\) WGAIATGUFANPSVNPAGKGLLYGNATQVLIQ

A WG T LAAAGTFNAEKL
 LLGGLLTGLLAEPHLCDLVLPIPNTRGAFYG FTGSVMTAFFASDWVTKTDGVTVIQGGW VFGTI AVGLFADPTVAP
T \(\square G A L L T G V F A T S S V G G T D G L F\)
A YGTLMVGLFAAPGYGT \(\square T G L F Y G G G V D Q L\)

VTGGTLLVGVLGTDAPNGVDGLLYGGGLS LLGKQAVGAFADV
MTGMLLTGVFASKTVNS
MTGMLLTGVFASKAINP
\(1 V G T L T T G I L A T P L V N P L G N G \square D A G N P H Q V I V Q M \square G \square L G A\) \(L A G G M L V G\|L A D P N\| L G T G G A P D S T Y G G W L Y\)
\(\square I G A L G T G D L V N P A D G G T G V Y D Y Y D F G T Q M D A Q C W G V G T T\) AFGT: ALVFFAPEE \(Q\) VA HS R WVQLGVQCLA GLYL VVGAI LTGVF QSHYVNNDVSNGLIVTG

IVGS LTGAFASKAANSS DAENGLFGGGGW
FVGGAVLTGFFADATDNPASEGATIG
VWGTLVIGLWGVDGMDPGAAGLGLFNGG
\(V V G T V L I G V F A V E S M G G P E G L L H G G G L A Q L G R Q S V A V A A V\) I WGSI ATGI FTSHQI
I WGTMIVPLSYANDI GLNEAGNPSYFG
IIGAIGTGIVVAPVLGGSAAPGDYDMQTQVLIQAKVVLFT FLGGFMTGILATKEGCAAFALTNPGG
\(V A G S L L V G L F A T G G V Q S K A K G L F Y G G G F Q L G R Q A V G V V C V\)
1 WGIVALGLFADGTYGAGTNGVFGGGFGQLGAQLIDVITL MVGMLLTAVEANKGDNA
VWGGI ATGLFAKHSINPVARWDGLFFG
FAIITPALLTGAFAERMTDANPAGVVGSQLVTQAKAVGVT MWGIWATGI FCTDKNVQYAG
\(1 V G S I A V G L F A T K S V N S V V T T N G L F Y G G\)
II GA 1 VGAVTASCANADVYGV
MWGALATGLIAAPSVTEGARGLFYGN
\(\square L G A L L T G \square F A N P E \square N N L G K G F \square Y G N P S Q\)
A WGTLAAGLFAQENYGGINGLFFGG
A WGTLAAGL
TWGT \(\square\) ATG \(\| F A D \square S L N P Q G K N G L I N G G G \square H\)
 SLGGILAGFFADPNLCYLFYGVQDSLHYTGLV
IVGGI GTGGLWATEYGCLAFGITNPGG
AWGTLSVGLFSLDT GLFSGAGFGQFAAQA \(\square\) GVATA


MWGA LATGLFAAPSVTEGARGLFYGN
FSAVMVFAAVWSPSLGGPGAAD YDMGAKLIVQ
CIGCVLTGIFAADYVNADDGGWDNHHYKQVGYQ
\(I V G A I L T G V L V N P A L G G T G A V A D Y N M Q T Q L M A Q \square K A V A L T\)
AAGTILLALF
I WGCI AV GLLFAKPSLVGEAYGEHGHYG
L F G L MVVP F
I I GALLTGVFSSPSLGGFGLG
TLGA ILTGLFANSVINPDFGAGKATG

UniRef90 B6Q9M0
UniRef90_E1VJL5
UniRef90_I1T0E2
UniRef90 \({ }^{-}\)D4W8Y2 UniRef90 I3TTD9 UniRef90-F213T2 UniRef90_UPIO004177886 UniRef90 R6UXG1
UniRef90-UPI00037E110E
UniRef90_X6L2Z1
UniRef90 M5ADC8
UniRef90 H1YF74
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UniRef90-H2AP69
UniRef90 UPI000366D35B
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UniRef90-I3TQD9
UniRef90-UPI0003C7F5Cs
UniRef90 L5N398
UniRef90-Q091Y2
UniRef90_E0TGPG
UniRef90 T0Z5Fs
UniRef90 - H8I6C6
UniRef90-C1DVJ1
UniRef90-K4GMT5
UniRef90 K1RVP9
UniRef90-UPI0003049867
UniRef90_E3H8C9
UniRef90_R4WVL4
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UniRef90_Q6C1W2
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UniRef90-R4YRQ3
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UniRef90 H7FT58
UniRef90 \({ }^{-}\)C1CVS3
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UniRef90 R6U9Z5
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UniRef90 G4VV24
UniRef90_A5GWG4
UniRef90_M3FST6
UniRef90 R9WIG5
UniRef90 UPI000477E4CE
UniRef90_UPI00040210EA
UniRef90_11T0E8
UniRef90 UPI0003676AC
UniRef90-UPI00047B5CE6
UniRef90_I2EZW4
UniRef90-R5UN67
UniRef90 B5ZDQ6
UniRef90_L1INN6
UniRef90-X0PQ78
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UniRef90-S0G2E4
UniRef90_Q3B6Q2
UniRef90 D3PAH
UniRef90 V6HIL7
UniRef90_UPI0003B74C3E
UniRef90_G2FMB8
UniRef90_K9T8E5
UniRef90-LODJK0
UniRef90_K7LH41
UniRef90 R4TZB0
UniRef90 N1W6L5
UniRef90-S0FIB1
UniRef90-M4VEJ9
UniRef90_B1XZU
UniRef90-UPI000462BDFA
UniRef90_UPI0003AA7D6B
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UniRef90_-14D6Z9
UniRef90_K0QYW6
UniRef90 A0A023RQF
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UniRef90_G8NUT5
UniRef90-N1W5T6
UniRef90 UPI000477606C
UniRef90 Q07429
UniRef90_UPIOо03EC037?



GA WA A S M GF T \(\quad\) FKVLD K VHGLRV【VWSGVVSFVAYKVVD \(\square F \square L R V\)

CVFSFVFSY VFRADKQF \(\square G \operatorname{L} R \square\) GLYAFIVSYI I LKVMDKMGGLRV

VVYDAVVSFIILKLLDMTDGLRV \(I\) AYAFVVTFVLVK!LDSTIGMTV
\(L V Y S G V V S F V L L K V I D M V M G L R V\)
\(\square A Y S F C L T W V I A K A D D K T M G L R V\)

A A \(\square\) A A G G T F \(\square \mathrm{S} \square \mathrm{K} \| \mathrm{V} G \mathrm{LV} \mathrm{M} P \square \mathrm{R}\) M
 LGPRLGRFDRKGNPKKKTVGLGRV
\(L L W S G \square G S A!L Y K F V D \square F V G \square R \square\)
LLYS LVVSYVLAKVIDLVMGFRV I I WGF GTSYLFFKILDKT \(\square G \square R V\)
\(\square \mathrm{V}\) WCGVVT F \(\triangle \mathrm{LL} \mathrm{K} \| \mathrm{V} \mathrm{D} \square \mathrm{A} \square \mathrm{G} \square \mathrm{R} \mathrm{V}\)

F L WA F P T S F A A F Y L I K K T \(\square \mathrm{G} \square \mathrm{R} \square\)
\(L V W S G V G S A V L Y K \| V D V V G L R\)
\(E V G \operatorname{L} N S S K N T V\)
\(G S T R M K N A G\)
EAGFSQTKNTV

R R T N T L

EAGLVRGKNTV
\(G M V R K K N V\)

EAGFTRVKNTA

R K K N I L
EAGLVQKKDVS

A GFVQKKNTL
EAGLVRSKNTV

GMVRRKNIL
GMVRRKNVI EAGTVRTGQMD ETGLCRAKNSIV

RKKNVL
E A GLVVRAKTT ESGMTRAKNAV

EAGLTRAKNAG
EAGAVRVYNVQ
GTVRQKNQV
A GMCRQKNAV EAGTVRKKNTA

EAGLTRAKNTV
GLSRQKNIL
AGLVRSKNAA
E \(\square\) G T VR K K N Q V

A G \(\square\) CQTRNAV
GAVKKKWAV

R S K N V L
E S GLT R R K N TA

R Y P S F Q
GSTRMKNAG ESGLVRSKNTA
\(N \square L S N D M D \square V G A L D F F V G F G M Y P G S Y G G G \| L G Y K G\)

\(N \square L F K N A \square T P V L G \square L M Y A \square M G F N \square M Y P G F G D T P G W F G F A G\)
TGNAFDGNLDNFG SVLIQCFA \(\square\) TAHMSA \(\square\) WF \(\square C G Y S \square S F S T V G S F \square G G L D K V A\)

\author{
FSGNLDKAF
}

F GKGF G \(\square\) Y GQHGMF L

\(E \square L T K N V A L Y A \square A C L M Y L I V G Y N \square M Y G D A N S F \square P G L S F F L\) \(S D V D G V I G N D D K \square G\)


EGNAF \(\square \mathrm{GGFDR} \square \mathrm{F}\)
\(N \square L M K N F D D F M F G S L L\)
Y WF \(\square\) GF G \(\square\) MF GA G G \(\square \square G M\) GDGWS \({ }^{\text {D }}\) GLGAFS ATMMQSFTTVAMVSVLWMIIGYSDAFTNGNPFDGGFDRDF E IVTKNLGLYSIACVMYLACGFILMYPGSALIDGULPGUG

GNDFF GGFD Q \(\square \mathrm{M}\) NYGTMSFMDFCAGA \(\square \square F W \square F G F A \square M F G G S Q \square A P G L T N G N K\)
 NT \(\square\) MS S \(\square F \square C G \square S S V M W V I I G Y S \square S F G E D \square H G V I G G M T F W\) \(N T D M S V L F C C G L A T V M W F A V G Y S D S F G E D V G G \square G V V G N \square S\) \(F V F T K N F T I V C F T F F C Y W I I G H A L A F G K D E G G G F F G T T D\) \(N I L A K N V I T V A \square G L L T F A V L G F N L M Y P G D N W \square L G H F L G F G\)
ATMMQAFA \(\square C C \square M S \square V W M V A G Y S \square A F S N G T P W \square G G F S R \square F\)
E L LT K NVALYA \(\square\) A CTMYMLIGYNDMYGGGNGFFPS \(\square G F M \square\) NVMMKNYMDLAVGALLFWLVGYGLMFGSNPSGWDGTDHFA \(H \square A V K N \square V I Y S \square S S L V F W A V G F A \square C F G T G N S \square I G T S G W G L\)

\(N D L A K V F A L A V T A Y W F D G Y S L M Y G G S V V D G W L Y F K G L F F D\) NVAAKNLIDLAVVLI LYWLVGYGVMF GESMDGYLGTSHFL
\(N \square L F K N T \| I P A \square G L L T Y A F V G F N L M Y P G G D F A G S V F G F A G\) \(N T M M M S I C T L G L A S I D W V L V G Y S L S F S G D G L F I G N L D K D F\) \(M Q S T K N V A L Y S G A G L M F W V V G Y N M A Y P S \square G G L L G T T P G P W\)

GS LGLIFGTGAAPYS \(N \square L F K N D F\|T V G L L L Y C L V G F N L M Y G F E S G D\| G L F G F A G\) \(N A L G K\|L G D F C\| S T\|A Y Y F\| G Y P L A Y G \square N F F H S T N V L L L D\) \(N V L A K N L I V F C V S \square L A F W W L G F G \square M F G D G N G \square L G Q E G F F F\) NSAFMVLYAFACVLLCWVCWGYRMSFGEK LP \(\square W G K \square D V A \square\)

F GHTFGLFGTKGFFL


STMMHSFVAM VMT DQ WT DFGYSFAFSGENPY DGNFD LAF


NNSW \(\square\) GNFDH \(\quad\) F



UniRef90 B1QVV7 UniRef90-Q7UGU7 UniRef90-V6M766 UniRef90-F1Z947 UniRef90 UPI00047D1F12 UniRef90-X2D7T7 UniRef90-F9X7M3 UniRef90 Q015H9 UniRef90_W9RQW0 UniRef90-E8LKC3 UniRef90'UPI0002491CD9 UniRet90_UPIO00475B423 UniRef90-F4RLA6 UniRef90 R6TEB2 UniRef90-UPI0003820B88 UniRef90-O26759 UniRef90-O01V36 UniRef90 Q05QS5 UniRef90 R9U2S 1 UniRef90-M1NZT5 UniRef90-F7D6M2 UniRef90 R5BM40 UniRef90-WOPFI6 UniRef90-U2PQP8 UniRef90-UPIO0036DDCBF UniRef90-M5GE10 UniRef90-A1VIG8 UniRef90 \({ }^{-}\)W7WVQ4 UniRef90-Q8AAC1 UniRef90-Q9PCD7 UniRef90-S9QCS2 UniRef90 AoRNF6 UniRef90-A4GK33 UniRef90-A0A059СРT6 UniRef90_D8GLUO UniRet90 K8VZC6 UniRef90-Q1PX06 UniRet90_UPIo0042B80E5 UniRef90 B8KSV7 UniRef90-F5A8B0 UniRef90-E4YBQ4 UniRef90-M1MN59 UniRef90 A5C3C1 UniRef90_UPIO00413A05B UniRefofo-L1JGM2 UniRef90-R7L9R0 UniRef90 C1DJ63 UniRef90_UPIOO047085C9 UniRef90-UPIO00473ACDD UniRef90 UPI000368863C UniRef90-Q1H0G2 UniRef90-K8W1E2 UniRef90-101LH5 UniRef90 M3B146 UniRef90-C5KTM6 UniRef90-UPIO0041D1F4D UniRef90 UPI0003192B2C UniRef90-A4CT09 UniRef90-F9TAH7 UniRef90_UPI0003B4CDAB UniRef90 UPIO0047A4DF3 UniRef90-S1P317
UniRef90-A0A059EA41
UniRef90 X0Y053 UniRef90 C1D697 UniRef90-A5AQE6 UniRef90-A3WEV3 UniRef90 A0A024FHX6 UniRef90-C8PX95 UniRef90-14VJG1 UniRef90_L8M2R8 UniRef90-MOQBH3 UniRef90-K4CLT4 UniRef90_UPI00047A515D UniRef90 QOYNX5 UniRef90-UPIO0047AAB3F UniRef90-14C9L2
 GTGIIYDSSPDQTFSPQVDWFFQAVFAATAATIVSGAVAGR DGSAEQAAASFSNF DT LFLFQLAFAAVSLAUAWGGFAER WGNTSAYAASGGYTYYTDFपFQAMFAATTAT凹VSGAVAER LMGVRVAPSPGNLPE\|IFCFYQLLFCAVTVQLVIGGFERM LA GVSMSSVAGTUPEALWVLYQMTFA\|ITPALMUGSLVER LLSVNSDSLSGALSEYTFFDFQAAFCADASCLIVGAVERV YQMQFATITVALLVYGSVVER

\section*{TQGGTYDVAVMVDF LFQMVFMDTADT VTGSAAER} VGFEPNADYSET \(\square\) PHTLYMMFQLTFAGLTTAAISGGSFAER GPDNGVDEVLKSYSNMSDFFFQVVFVATAMS VSGAVAER LTGTQNNTMDGNTPEMAFVAFQCMFAVITPACAFGAMTGK LSPTDTYALSGTIPELTFVAFQATFAGIITCALIVGGFAER LNGVGFEPYAAT P HQGFMLFQMMFAMITPALI SGSFARM GKDAMDESAR MKG \(\square\) WDNAAGTF \(\square\) PE VFAAFQATFAG \(\square\) TCT \(L\) VIGAFAER PHFFDLSF LDSDLPREGFLVFQTVFCATAAT VSGAMAER TASLEPVGLDGAAPDUTYFFQLMFCATTAS VSGTपAER LQTLTVHPNASSDPESVF VVFQMTFAIISCAIITGSFAER TSWWLGIPYGMDYSQQADFFFQVVFVATAMSIVSGAVAGR

LHGMS \(\square A S L S A T D P Q F T H V A F Q G A A C \square T V A V V G A \square G E R\) FIGYSGFLLIGDSYDVHIWLF QVMFASTASTLVTGAUAER AGADEPATYAPSADFFFQVVF VATAMSVSGAVAER WFHS LDHTTGK \(\square\) S \(\square\) GESLITNADFCCAGSLI AYGALLGK GM \(\square\) NTTSTYAPT \(\square\) PA LLFSSFQMMFA \(\square\) SAPA \(\square M T G A V E R M\) NAFFSGDSATEAGPYAANDPGA DFA \(\square F Q \square M F C D T P A G R M\) FADSDMYYYSAK DTGAHRWFFQSSFSA ITAAVLLFTSLQER GFGVNAPEGSAAYGYWTDF■FQGMFAATSVTIVSGAVAER
\(\square N G \square G E H \square H N G A D D P\) DTDGEGTPNASTMTDPGAYAERM GAEHTLDEVLSSGGDIYYSAFQVVFVATAMSUVSGAVAER LAHGDDWGASMLFFQVMFAATAATIVSGAMA VGGGEERT LKG SS DESLSATVPQFVHVAFQGAFACLTVAVVVGADGER
GRGLTSWPADGSNYALKDWFFQWAFSATAAT VSGGVAER GAQQLAQHNGYGLTRFFFMLTFAA AVPA VSGGUAER
PAVSAETDSEAGLVPTVDF LFQAAFAGTAATVSGLVAER LGHFE GLDDGAFFVFQMVFCATSVTIISGAIIAER
FGLSLPEGWDTSNYNAGYTYFQAMFAATAAT\|VSGAVAER \(F Q N V S M T K G D G D P E G L F A A F Q M M F A L I T S A I L T G S V A G R\) DGGDLSVESDAGYAPASDWFFQMVFVATAASVVSGTVAER HGYELVRFFFLLTFAAA
MQGVGEADTGTGYSVASDWFFQMVFCATTASIVSGTVAER FGLDAPMAYNEGYTYWTDFLFQGMFAATAATIVSGAVAER NGYELMKFFFLLTFAAA \(\square\) PA \(\square\)

VSGGVAER
 EQDY■FQKAFGGFATMVFFQFVFAADTVLDAGALLGRM \(S G V Y\) DVSVFALFRFMVMDTATDTGSMAER YSGAQAEGASYSTAVFFVFQCAFACDSDT ADGGFAER GAGVTAAVKEGT\PHTVFMTFQGMFA\|ITPALISGAFAER \(\square D G \square D \square N S T K G S \square P T Y V H F \square F Q G M F A L D T P A L I S G A D A E R\) G】EYDSHSV YADFFFQMVFVATAASVISGTVAER R
MNGVDMAKNSNH \(\square\) PDG DFSGFQMMFS \(\square\) ITVA VITGSVVGR
MQGWFHSYQDGY\|LVGVENLINADFCVGSVCVAFGA\|LGK FNPA DAAGPDDAYPATNFFVFQLAFAAVSLSI AWGGFAER NTSEAEDALLGGYSVMSDWFFQMVFVATAASUVSGTLAER

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 GGDVVHINAAVAGLVGAYMLGKRSDGGKDNDAPHNLTLTY GGTVIHINAGITAMILAMTVRKPYQYNNENVKGNPMWILV GGTVVHINAGISALVGALTLGKRLGYQKDVMAPHSDTMTL GGGPVHMSSGSAALAYSLVLGHRAGYKTARYRAHNASYVF GGLVVEVNSGIAGLALAVALGPSLGFRKEGPPEPKNVPFV GGTVVGVNSGVAALALVYLLGKRKDTRLLPHNLGYSVIGA GSSIVHSVGAWAGLVGAMLLGPRIGKFVDGRPQADPGHNM GGNVVHDSSGVAGLVVAVVLGKRKNDSDTAPHNERMRFPA GSGLVHLCGASAALAGVLVLGARKGKYSGGKDNADPGCNL GGLVI HILSGVSGLVLCLLLGRRRGYGRMPMLPHHLPMTV GGTVVHINAGVAALVAAYVVGPRDGYGKEAMOPHNLPMTM GGNVVHISSGlSAAVVALLI GKRKNDKDDTAHHIPMTV GGYVIHVSSGTAGFVAAFWVGPRLPQDREDFRPNNVLLAL GGTVVHINAAVAGLVGAFMVGKRVGYGKEAMAPHSLTLTM GGTVVHDNAAVAGLVGAYMVGKRMGYGKESMAPHSLTLTM GGTVVHDNAGUAGLVGAYFVGKRFGFGQVAVKPHNEPMTF GSTVVHSVGGWAALAGALLLGPREGKYKDGRTVPFMGSNT GSGTVHLCGAAAALAVVTVLGPRKGKYNADGSVNPMPGSN GGYVIHLSSGVAGFTAAFWVGPRLSKDRERFPPNNDLMLD GGTVVHINAAVAGLVGAYLLGKRTGYGKEAIKPHNLPMVF GDFAGSGVVHGVGGLIAFVAAWRVGPRYGKYNPDGSSNVI GGFVIHLSAGVAGFTAAFWVGPRAQKDRDSFPPNNDLLML
 GGYVVHLASGAAGFTAAYWVGPRMQVDREQFPPNNLLLALD GGNVIH1SSGVSGLIACVILGKRKGYGLQAYHPHNDAMMF GSTFVHSVGGWAALVGAFLLGPRDGKYVNGKTHAIPGSNLI GGTVVH|NAGVAGLVACLVLGKRKGYPGVAMTPHNLGYTL GGTVVH:NAGVAGLVCALVLGRRKGYGQDDLLAPFNLTYAV

\section*{G \\ \(\cap \cap\)}

GSTVVHLC

\section*{F}
 GGTAVHDNAGVGALAAVLVVGKRIGFKKDPMRPHSLPDVM GSSIVHSVGAWAGLVGAMLLGPRIGKYVDGRTQHNMAIAT

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\section*{ค}

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UniRef90_A0L135



 VAFA ALGVFILWVGWYGFNPGSQLAFQSAVNTTLAAAAGV QVLFLLWIGWFGFNGGSTLGASDGFFGYVAVTSTNLATAAGA
\(A G T G L V W G L L A L S A A G A L A A T D D A A T A L L N S Q V G A A S G A\) ALGTI GVFILLWLGWFGFNGGSVGMTSLVLVNTTLGACAGA A GA GLLWMGWSGFNGGDPYSANIDSSMAVLNTNUCAATSLL CFY QLL F CAVTVVQLVIDGGAFERNASVYVVFNTNTAA STGV \(L G T A M L W V G W F G F N G G S A G A A S A G A A F A C L A T Q L S A S V A A\) A GA G LLLWMGWTGFNGGDPFVASDNAS LAVLNTHVCAA T SL \(\square G G G M L W Q G W F G F N A G S E L T A D A D S A\) L A A FI N T A I A P A A A A \(T N V F I G A A L L W F G W F G F N G G S A D R A A M A V T V T T I S A A T G S\) GTMGYG
 AI LWI GWYG F NAGSADAA DKLALLQAFI TTTVATGSAM LL GLGLLDWF GWF GFNGGSALDTDGLLAANAVANTMMCGCAAM
 IGCCFILAFGWFGFNPGSTGGASGRIGSDAVNTMLAGMAGG AI A T L GA L I L WI G WY GF NLLAMD QYVA Y V A V T T S L A A A G GA FI LF SVVLWAV FVV YSPVAHWDEVAMTAFINTNTAAAA GL \(\begin{array}{llll}P L A T L G T & T & L & W L G W F D S N D A E A N A V S M V F V N T N T A A A A G G L\end{array}\) LGGAILWFGWF GFNAGSALGAGPLAANALVTTQIAAA GGV II A A ML WVGWF GFNGGSS L GANNQAADAVVNTLLATAAA I


 ILWF GWF GFNPGSSQLAA STEA DAMADSHVFLT TNLAACGG
 I GVAMLWF GWFGFNAGSALLAA DARAAMAMLVTAVATABGA I P LAA L G A W I L WW L G WVS S E A S A IDA VS QVF L NTNMAAA G GV \(\begin{array}{ll}A G A G L L & W M G W T \\ A & F \\ \square & \text { G G G D P Y A V }\end{array}\) M G T Al L F I GWF GFNA GS A GSAD EIIA ALLA FI NTVAAAAAGS I
 \(\begin{array}{ll}A G A G L L W M G W S G F N G G A T V A A S T V V A & L \\ L & L \\ L\end{array}\)

 V GT GLI WF GWF GFNAGSALSAGDLAVHAFVVTNI SAASAM A GAGILWMGWTGFNGGDPFAANVDSSLAVLVNTHICATTSLL TGGAILWVGWFAFNGASALAANGLAVQAMGNTMIASAAAM
 VGAAMLWVGWFGFNAGSAIAANGTAGMAMLVTQIATAAAAA I GAS LL WWVGWF GFNAGSALGAA GRAGMAMVTAQIAAAAA G I GASLLWVGWF GFNAGSALEA GDVAADLAVNTGLATAAAT LGTFILWLGWMGFNGGS DLGSANAVAQVFANTNAAAS GGV L S V A M G GF LLWF GWGSTLAA GVEIGP LL NTHMA GAA GA TVVALVVGA L GE R DK FS S A GS A D F DWT T FA Y LDPMAA MVVWG G GLDWF GWYGFN LWF GWF GFNA GSTLTMS DAATAHTAAALAA V NTVVLS GAS GG \(L G A W I L I V G W F G F N V M S A Q Q L D R \square T G L V A M N S L M A M V G G T\) LGAALL WFGWF GFNAGSETAADGTAANMALNTQLATAAAM

 TAIAAAAQTSGDNAWMGSALSAGTLATSAFVATHFGAAAAA MGVF LLWWF GWF GFNGGSVLSADGLVSKVFVTTSLAAAAGA \(G L L W L G W F G\) \(F N A G S A L A A D G L A D A L L T T N T A A A A A M\) PLAALGTF I LDWQLAA GTAAD DNSVS QDFANTNLAAAGGVM I GASLLDWVGWFGFNAGSAVAADGAAGMAMAVTQDCTATAA






 IPMAVI GTF I LAAFGGSTLAGTDLDM SIVAVNTMMASATGA QVFTAL GVLILLWVGWF GFNA GSGFF GFVAMNTNLAAA GA GA TFVYA PI CHWVWGEGGSRLAAADGVA GNAFDT THLAAAAA GA \(M V Y S V L G V I I L W F G W F G F N A G S T L A A N G A F F P Y V A D T T N L D\) LG S GLL WF GWF GF NA G S G LAAVNGLAARAF LVTVIAPAAA G L GT F L L WF GWF GFNGGSALAMHSAE EDGLVVASTNTAAAT LGTALLWFGWFGFNAGSALGANFVSANAFMTTNTATAAAA
 \(V L M M S D P G L A L F Y G G G S N L E C N G T T D T Q T F A D V S L V G V L W\) \(L G A G L L W F G W F G F N A G S A L A A N G V A D N A F M T T N T A A A A A M\) AGA GLL WLGGWAGFNGGDPFAANDDS SMAVLNTNDCAAA S L IGASSLL WA GWFGFNVVGSELDA A G G A G L L V M I NT QVATAAA A V

 \(L G V G L L W W G W F G F N A G S A L L G A N G T A A A A V F V N T L V A G C T G M\)

\footnotetext{
\(L\) P M A T L G M F I L W M G WVVS D A A N A S S V A K V \(V\) V V N T N T A A A F G A
}



\section*{UniRef90 B10VV7 UniRef90-Q7UGU7 UniRef90_V6M766 UniRef90-F1Z947 UniRef90_UPI00047D1F12 UniRef90-X2D7T7 UniRef90_F9X7M3 UniRef90_Q015H9 UniRef90-W9RQWC
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GA WVA G LVVGG\|IVVFAVSALDSAGDDDPVGAFSVHGVCG
GS LIVGFDCGIVFTYCSPFLSNKLRDHDTCGDHNDHAMPG AAI FVGGI GAI CCYVAVAILKNKLGYDDSLDAFGIHGVGG
 ASLAIGA GGGADCYGAVTFLKEKLGYDDALDAFGCHG

VILA GAVLGRMNFNYLGKKFAPWTYVDDTLGVYHTHLAAG GKEVVVDAMTGKAGYIWQTGLKKILGADDSLDVFGVHGVGG GALII GFIAGFACLWGVNGLKKMLGADDSLDVFGVHGVGG GAVLI GAI CGVVMI FAVDFIDKVLKIDDPVGASSVHGVCG GAIII GAVAAVCCIWGITGLKRLLKVDDTLDVFGVHGUGG
GALADG\|ISSGVCYYVITVIKRKFNYDDSDDAFGDHGDGG EAVFI GAAGGVLVYFSILFFDKSDKVDDPVGADSAHGTVG \(A A I I M G L C S G S I P W F S M K K L E M L Q K V D D T M A V F H T H A V A G\)
\(L L W T T L V Y D P I A H W T ~ T V T F V K K F G Y D D A L D A F G C H G V G G\) GALIIGLISGAAGLWGVVILKKWLKVDDVCDVFGVHGVCG


GS LIVGFCSGDISTFVTPFDEKY LKDQDTCGVHNDHAVPG WALFIGSFGALFMMFCKNFLERLEIDDPLTASPIHLGGG

AA \(L \square M G \square A S G S V P W Y T M M C D S K K \square K \square D D T L G V F H T H A V A G\) \(A A L F I G A L V S P M C L F F M T K V K Q K F G Y D D S L D A F G C H G U G G\)
\(S A P P L L C S S P P L L A F P S P L G N F C L S L D D P R E A C I V H G F G G\)

 GALVI GLLA GVLCLWGVNGLKRLLGADDSLDVFGVHGVGG

FAVLT GFDGGDVTMLGVWALEKDRDDDVVGAVAVHGFSG EAIVPHNLPMVFMGTAILFIGRWLKVDDVCDVFGVHGVCG ASVVI GAIA GVIAVVGVLAIDRIHIDDPVGAVSVHGMAG SAALI GIIAGFVCYYCALFVKKY VDDALDVFGVHGMGG

 SSVLI GS GALISS LSVGRLLVMKKUDDVVD
QNVFLHGVGLTPDPKYAAKVKALFGYDDSLDAFGVHGAGG
SA LLIGLLVSPVCYYGDSFVKEKDGFDDADDAFGCHGDGG \(\square A S V L I G G V G G V L V V I F V P L D D K L K D D D V V G A D P A H L V C G\) GALFI GIAA GLVCFFASVKLKHMLGYDDSLDVF


GALVVGGDAGGLFVWLFTFTQNRLK DDDVLGVWPLHGVCG GALVLGAVAGMUCFFCATRDKHYFGYDDSLDVFG VHAV
T LVHVAFQGSFA 1 ITVALVVGQWDRVDDACDVFGVHGVCG
QS IF \(\quad\) GF \(\square A A I I S N L A V Y Y K S K S S L D D T L D V F P C H G \| G G\) AAALI GLIAGVLVDEAAFFDEKVLKIDDPVGAIAVHGVNG AAVVI GFIA GILVFYSARFFEKRGIDDDPIFALSVHGVAG NAGSRLAADGVAGNAFLTTHKERLGYDDSLDVVGIHGVGG AAVVIGADAGUVMVFSVLFFERVLKDDDPVGAFSVHGVAG GALIMGVLVSPVVYLAILLKGKLKYDDTLDAFGIGGAGG
 GAIVIGLLGGAI CYFASTFMKQKLGYDDALDAFGGHGIGG FVMFQ GMFA I TAALIS GAKHKLGYDDSLDAFGVHGIGG PGVVIPEYAYMVFQMTFSKVKNFFGYDDSLDRDKFSAAFV SSIII GLLVSPLSYFMDSVVKKKFGYDDALDAFGCH MGVLSGSIPWFTMMVLHKKSKLLQMVDDTLGVFHTHAVAG GA V V LGVI AS I A Y WAVTS LKIALGYDDALDVFGIHGVAG GSLIVGFICGUVFVYLTPYLESNLRIQDTCGIHNLH
AAVVI GL DAGLLVFFSMAFFEKIRVDDP DAAMSVHGAAG
VGAAVVGLLA GVVCSFAVGWKFRFGYDDSLDVGVHLVGGD \(M A G \mid V I G V A G G L V \vee F S \square V G \square D R \square K I D D P V G A I I S V H G V A G\)


\(\begin{array}{lll}V W G C M A L G & L \\ I W G T L S T G L F A T P A L A E K V G V\end{array}\)
MTGA LTALFSAQKLGG】GYAAGMDAPRQ
1 WWA LLATGIFG
\(V L G G A L T G L F A E P T L N S K G A F Y R G P G G V Q F L K Q\)
MVGSFLTGIFADAPIGADDYEDEDAG
\(F L G T V M L G L L C H P F F G G F \quad N D V P M M K Q T A V Q M F A A V A T\)
VLGGILTTGFFAVPKLCRLFYMVPD WQKYLGLAYGLQT
11 GALLTGVFCAPSLGGAGFGEWTS DGGQ
I LGSLLTGVFAQKKIAALDGASDDGGW
I 1 GSLCVGLFANNTVDNQVPLNGLGYGGGF
\(1 V G S\) GTAVTMDPALGGPGAEDYD
LTGSLLTGIFADANTASFDGKTNDKGGW
1 A GSVLTGVFATKAANS GUVENGLFYGGGV
\(M V G\|A A D G F F A T G R F G S S T A G L F Y G G G A L L G K Q\| V A I A V\) \(\square W G S V A T G \square F A A P F \square N E L G T G L D Y G N P G Q L T A Q V I A V A V V\)

\(\square I G G \square V G A V T A A C A T E A V Y T A D T R T P S M Q G G Y Q A A G L C V S\) MWGAI ATGLFATVSVNPDG
\(\square V G G \| L T G F F N A K A M G G P G L D S A G M \square P G Q L\)

VVGGMATGLFATAEGCAAFALTNPGG
\(1 V G A L L T G V F N S P A L G G P G Y V A D Y S D M S Q V W D Q A K G F A A L\) \(I V G A L L T G V F N S P S L G G M \square A P D A Y T I A G Q V W I Q A K A V L I L T\) FLGTVLTGLESTSE
\(\square V G A \| L T G V F T D K A \square G G Q G Y A E G M T M\)
\(\|I G A\| L T A V F C D E S \square S A A T S S \square K \square Q \| \square G V A \square T V V Y S G \square A S\) 1 L G VMVVP F
SLGGILTGLFAEPRLNR DFYPPPTDMY \(\square G L F Y\)
IWGGIA A GI FA WKAINSAGASGLIHG
\(V V G C L L T G V F T S A A V G G \square G Y A E G V T M M K Q\)
1 WGLLAVGVFADGTYCEVVGLITGSGWQLL
\(G L G G \| L T G F F A D P K L C R L F Y M V P D W\)
MLGGF T
\(L V G \square L L T P V F K N D G V I E L A Y\)
T L GGALTGLFAHPDLSALF \(\square V V P N S R G A F Y G\)
1 WG GIATGLFAQSA INPIAQWDGDFFG
LWGSWSTGI FCTDS
V WGT L A VGIIF
GG \(\square V G A V L T G L F A A P A L G G F G E \square D S \square A S Q L W \square Q \square K G V L F T\)
\(\square L G A L L T G \square F \quad D Y \nabla T N K M S A D P Y S \square A G Q V W \square Q A Q A \nabla G T T\)
VWGTVAA GLIF
\(V V G C L L T G V F T S A T L G G M G Y A E G V T M \square K Q\)
\(I W G T L S N G L F A T P D A V G T P G L F Y G G G F H Q L L V Q A E G V S A S\)
ITGS L L GVFASQAWNSKGPSGLLEGGGUL
TWGVLAVPFFDAKGMSSMSFAPNVGAGYQ
TWGGIACGLFGNQALGG

VWGTLVVGLWG
T \(\square\) GA \(\square L T\) G \(\square\) FANSS \(\square\) NP \(\square\) F GAGKATGM
\(\prod \mathrm{FGG} \square \mathrm{MTG} \square \mathrm{L} A \mathrm{DPA} \square \mathrm{GGQTG}\)
1 WGTMUVPFSYTNAlVANEAGDP
VWG GLACGDFGQTALGGLGGVSF
SLGGGILTGLFASPKLNRLFYG
\(\square W G G \square A V G \square F G Q H W L G G H G G V S F W\)
\(A G \square V G A L L T G P F A A A A L G G F G S V E H P W A Q L W \square Q C K G V G F T\)
\(\square V G C \square A T G V L S A D A L G G T G Y A S G V T M G H T V V H \square N A A V A G L\)
\(M V G M L L T G V F A S K S V N G \square G D G L L Y G N G H F F D T Q L K\)
\(A W G C I A L G L F A D G T Y G G P V T G L F Y G N P G Q L Y A E L D G \square S A N\) AWGTLSTGFFATPEDA
V WGTLATGLFASKLI NESG
I WGTLSTGFFAAPDLVEKVGVGQPGLFYGGGDH
ALGA LTGlFA
DWGTLAVAIFNAE
TWGALATGLIFAT TVNSAGNGLFAGHPYQLLLQLDGVVAT AFGAVATGIFAT
\(F V I L W V T I Y F S P D \square G G T G V V D Y Y D M A Q Q M \square S Q A T A V G A T\)
VLGGALTGLFAEPVLCDLY LSSPGTKGAFYG
\(I V G A L G L A V L M A P Q F G G A G F D D G V T M M S Q F I V Q A K S \square G \square T\)
\(\square W G T \square A N G F F A T P E L V E V G V G K A G\)
VGTLADGLLAA QDMTNGAEGLLYGGGDAQLGK QALcVVVV

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UniRef90-M2X1R5
UniRef90 A0L135
\(R \square A V V A T N T M \square A G A D D K V W G L R D\)

A \(V\) Y T A G A S WA C \(\square\) K A T D \(\square \mathrm{IT}\) G \(\square \mathrm{R} \mathrm{V}\)

SCYCFVVTFlLGK\|VDRLLKMR AAYSFVVTLI IGKLLDFTVGLRV

AF \(\square \mathrm{NT}\) TGATAAAVLADLTDGLRV
1 V WS GVVSVI AF KI VDLLI GLRV
 1 LWS A VVIS LAAYKLVDLLIGMRV

MAFSFVVSWLLAKLVHATMGFR

\(\square G A Y L L G P R S G Y K V A D R C V G \square R V\)

 \(\square L Y S G \square G S A \square L Y K L V D V I \quad G G L R D\)


G G Y A F G VT Y G L G K L DD R T VGFR V

GLVRSKNAA
E V G T VR A K N Q V

ETGLTRSKNTA
EAGLVQKKDVAS
RRKNVL

R S R N VL
E S G MVT S K S V S
GMVRVENVL
EAGQVRSKNVA

N A \(\square\) A K \(\square\) M A D F A \(V\) S T \(\square\) A Y F F \(\square\) G Y S \(\square\) A Y G
\(N V L A K N L I V F C \square S A L A Y W \square L G F G L M F G N T N S L S G Q T G F F F\)
\[
\text { G P } \square \mathrm{A} \text { G } \square \mathrm{F} \text { G G F S R } \bigvee \mathrm{M}
\]

MQSMKNVVLYAVAGFMFWLVGYNMAYPGSGGLLGTTPVIW \(N D L M K N F M T V V L G \square L V Y\) WAVGWGVMYGADAAGLIGTDQFF E I V T K N L GLF Si A CVVMYVCGFALMYPADAVFAIGLSTDM SMIMQNFFCMGUVSVLWVLVTYSLAFGGANGFVGGFDHVG
NTMMSSFF \(\square\) MGVAS \(V M W \square L V G Y S \square S F S G D H G \square I G S \square K N F C\)
\(S V F M H T Y G V A C D M S V L W F F A G Y S \square A F G D T S G D W G G \square G K \square G\) VICAKNDGLYA S GIVMFWLA VGYNGAYGUPEGGYIGTF GMLMQNFFCMG \(\square V S L W V T C T Y S \square A F G G Q N A Y F G G \square H F A G\) NQLTKNMLT WAVGVAVFFVDGTGFESDMTGAG

\footnotetext{
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MQGWFHSFQGGY ILLGVENLINADFCVGSVCVAFGAVLGK GAEVLQEK NGYELMRFFFLLTFAAA DPA

 FFFGDATTMGEGLAGSTDFFFQMAFACIAMTIAFGGFAER HGYGLVKFFFLLTFAAA \(\square P A\) FMLS GTG \(\square\) YDPG \(\square\) YA \(\square \quad\) FFFQM \(V\) FMDTTVT \(\square\) PTGA \(\square\) AER \(D \square\) TNNNGFSELLEAWPGFFFQLTFAGTAAT VVGAVAER \(\square\) Q G T G \(\square\) NG G S G T \(\square\) P E T VFAFF QCTFA \(\square\) TPA \(\square M \square G G P A D R\) SGGDLEAMSDAGYAPASDWFFQMVFVATAAS\|VSGTVAER LLEAGAGADNATWNSWFFQMVFAATGATVVSGAMAER PLE EDGMAYGMDYSQQADFFFQVVFVATAMSVVSGAVAGR LA HMDVQAA GQT \(\square P P V V F V C\) QLMFAVITPALITGASADR FMNNSSSAYAPT \(\square\) PSFTYAAFQMMFA L \(\square\) T PA \(L \square T G S \boxtimes A G R\)
 TPWSDSSSLEAGYSAGSDWFFQMVFCATTVASICSGAMAER
 FAPAAGAGGY \(\square G W \square Y G A V F A M T A A T \| V S G A V A G R A K \square R A Y\)


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210
220 \(\qquad\)
TGAGLLLWMGWT GFNGGDPYVVSVDASDAVLNTHVCTATS 230

240
1 GTLEL WMYWPSFNSAVSNHGDAQHRAAI NTYCSLAACVL L GA WTLTVGWFGFNVMSAQSVEAVSGLVAVNSLMAMVG
1 GASLLWFGWFGFNAGSADSASGLAVSAFVVTHVAAAAAT \(\| G T L F L W M Y W P S F N S A V S Y H G D A Q H\) RAAIVTYCSLAASV NGVLEGKPWPLA AGSAMGANTLAASALATTAVASGAAA QVFTALSVLLLWVGWFGFNAGSTLSGFVAVNTNLAAAAGT QGTVLLWUGWYGFNAGSALALSAQGLEAFFTTTMAPAAAM GTFANGATFSKGVVDPEIVEANFQATFAGDTCALIVGAFA GVLILWDGWF GFNAGSTLGVADAFFGYVALNTQLAAGAGA IPFLAL GS WLLIVGWFGFNVMSAQTLTAVSGLVAVNS LMA VGA GMLWVGWFGFNAGSAVAADGRAGLAMAVTHVAAAAGA GLTSMLSIPGLGGDGSTLNASDFRLSVVAFFFQMVFMDTT \(G T T U L W I G W G Y G F A G S A L A M N S V A L Q A A L T T S T V A T A T S M\)
\(F T P H N L G F A T L G C L V L W L G W F G F N G G S V L F L I S I P S V I V T\) LGAGLLWFGWFGFNAGSALAANNDAALAFI NTNTSAVMAA VGAALLWVGWFGFNAGSALTAGGQAGMAAI NTQLATAAAV QVYTALGVLILWVGWFGFNAGSTGGGFVALNTQLAAGAGT PLAGLGTFILWFGWFGFNGASQLAAGTIFANTNMGAVGGT VGAAMLWFGWFGFNAGSNLEASGGAVLATVNTFVATAAAD TIAAF LGT LI LALLGWLGFNGGSTLNANDPYMNTFLAGAVGA \(I I P L A A L G V L I L W L G W I S D E A S A I A V S Q V F D N T N M A A A G G V\) L GAGLLWFGWFGFNA GSALHANELAGSAFVNTNTAAACAM II GAGILWDGWNGFNGGDPYAASADAGVAVLNTNDCTAVSL LGASLLWFGWFGFNAGSALSAGVLASHAFITTNTSCAAAM CS \(\square \mathrm{P} V \mathrm{~V} \square W \mathrm{~V}\) I GGYSDALSMNSVAMQAMLTTTVATATAM NSMFMVFYAFAAVLFGDPYAASPDAGSAVLNTNLCTAVSL A MLWVGWFGFN GGSQLAAADGGAAMAITVTHI SAATAS
 I G TLYL WMYWPSFNSADSDHGDAQHRSADNTYCSLAACVL| LGAGLLWFGWFGFNAGSADKANEDAGYAFMNTNTATACAL


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\(G A V V G L I V S P D C F F V A V V K N K F G Y D D T A D V F G V H G V G G\) GA \(\backslash A\|G\| I A G \square I D Y A G V M F N E N K L K \square D D P V G A \square A V H G Y C G\)
 FKF LIS F VI LWS TFVYYPLVKPLLK DDDTDDAFGCHGVSG \(R M N L T A W M L F L G V I D S M N F L L F T V H L D D V L G V T H T H M V A G\)

GS L IVGS \(\square\) S G \(\square\) VYVYF T P F \(\square E S R \square H \square Q D T C G \square H\)



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MVGMLLTGVFANKAINPAG
VWGTLSTGFFATKELA GKPGLFYGGGLEQLGVQ

1 LGAL LT GVFNSPAL GGPSFPDAYTDAGQVWDQAKALAF

\(1 V G S L L T G V L A S K A V G G V A G\)
LWGILSLGLLADGSYG
IMGSIVTGLFATKTVNKT\PENGLFYGGGF
FWGTIAVGLFSNK
1 WG AVATGIFATKAVNPAG
I LGALLT GVFAVAAVGGTGHGLIDGNPKQ\|LIQAEG\|IVT \(V\) WGTL ST GFFATPELGGRAGLFYGGGFDQLGVQ

WGIATGLFATHHVNSAVT TDGLF Y G G
F \(\square\) G A \(\square G T G \square\) F T A P S \(\square G G T G G A D F \quad S \square A S Q F M T Q L T A V V I T\)

\(\square V G S \prod M T G L F A S K S \prod N A A V G L F A G G G W H Q L G\)
FLGGFLVGIFADSTACAAFGLSNPGG

VWGTLSNGLFATEELVARGGLFYGGGGEQLWVQF \(V L G T L L M P F V A V P\)
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[^1]:    
    
     $\square \mathrm{V}$ Y D A

