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RKSKMR|VGRG\|GSGKGKTA RHSRKRVGRGTGSGHGKT GRGQKGQKSRAGFEGGQM SNKRKKRVGRGPGS GHGKT S T K N R M R V GRGVGG GK GK T A S KEVKRIGRGHGSGNGKTA GKGHKGQNARS GFEGGQM KHRRKRVGCGESSGHGKTSSGRGHKGQKARSGFEGGQM $R K T R K R V G R G T S S$ GTGKTA GRGQKGQQARSGFEGGQT $R K A R T R V G R G \square G S G K G K T \quad S G A G Q K G Q T S R S G F E G G Q M$ S K RVAVRVGRGLGSGLGKT SGKGQKGQKSRSGFEGGQR TSKKKRQRGSRTHGGGTHKNRRGAGHRGGRGNAGSRKHEM SRQKRNRVGRGMASGNGKT SGRGHKGQK■RPGFEGGQM STKGRMRVGRGPGSGKGKTA GRGVKGQKARSGFEGGQM TSKKRRQRGSRTHGGGTHKNRRGAGHRGGRGRAGRAKHER KNRKRVGRG $\square$ GS GTGKT S GKGHK GQKSRS GFE G GQM SRKPKKRLGRGPGSGQGKTA GRGHKGYKARSGFEGGQM $R K K R M R V G R G \square G S G K G K T G \quad G R G V K G Q T S R T G F E G G Q M$
RKERKRIGRGTSSGTGKTA
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$R K G K R L G R G I G S G K G K T C$ SKHKKKRVGRGTGSGHGKTAC
K K N R K R V GRGTGSGRGYT S G $S T K N R K R V G R G \square G S G K G K T \quad S G A G Q K G Q K S R S G F E G G Q M$
$V T$ TKS TKRLGRGPGTGQGCT K S R K R V GRG $\square$ G S G S G K T G STKNRMRVGRGPGSGKGKTA K R K K RVGRGIA S GHGK T A SRSERKRKGRGl GS GNGKT SKKKATRVGRGMASGKGKTAT NKKRVGRGMGS GMGKT K R R K R $\downarrow$ G R GVG S GM GK T G $S K K A P K R V G R G T G S G N G R N A$ K EKKRI GRG $\square$ G S GTGK T
$R K S P K R V G R G T G S G L G T T$

SRHRKLRVGRGHSAGQGKT
K R V GRG $I$ G $S G L G K T$
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$M R V G R G \square G S G K G K T G$
K T A K $\square R V G R G E G S$ K G K T
K K R K KRVGCGESS GHGK T
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$N T P A Y R K G R G A G S G N G K T$ SNTPAYRKGRGAGS GNGKT RRDSFRVGRGHASGNGKTA TPAKRLGRGTGSGLGKT $R A K V K R L G R G T A S G Q G G T$ RKNRKRI GRGNSSGWGKSA K NRKRVGRG』GS GS GK T G STRKT $\dagger$ RKGRGTATGRGKTAA KNRKRIGRGEGS GQGVTA S WHRKKRVGRGQGSGLGKTA
K S A P K RVGRG $\square G S G L G K T A$
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 $K D R K R V G R G T G S G H G K T A$
S NKKPKRKGRG\|GSGHGKTA SKT SK T II GRGMAS GK GK T $S \square K E R K R V G R G N A S G H G G T$ K EVKRI GRGHGSGHGKTA K K D R K R L GRGI G S GNGKTA SKSASHRVGRGVGSGWGKTA K ERKRVGRGKS S GHGRTC $R R K P T R K G Q G \square G S G L G K T A$
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RHAKKR
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$S G R G H K G Q K A R T G F E G G Q T$ $G R G T K G N K A R P N F E G G Q T$ GFGHKGGXK GRGIKGQKSRSGYEGGQM $G R G V K G Q T S R T G F E G G Q M$ S GRGTKGTKARAGFEGGQT S GKGHK GQKARSGFEGGQM GHK GQWARSGFEGGQM G G G $\square K G Q K S R S G Y E G G Q M$
 S GK GHK GQKARS GFEGGQM RGHKGAKSRSGFEGGQM $G R G V K G Q K A R T G F E G G Q M$ $\begin{array}{ll}G R G V K G Q K S R S G F E G G Q M \\ G R G Q K G G K & R\end{array}$ G GRG $\square K G Q K S R S G Y E G G Q M$ $S G K G Q K G Q N S R S G F E G G Q N$
$S G R G H K G Q K A R S G F E G G Q M$ GKGHKGQKARSGFEGGQT S GKGHK GQWARSGFEGGTM $S G K G H K G Q N A R A G F E G G Q M$ GK GSNGQNSRAGFEGGQM GRGVKGQKSRSGFEGGQM GRGQDGQKSRSGFEGGQM GRGNKGYRSRSGFEGGQM GRGHK GQKSRSGFFGGQM K GHK GLKARSGFEGGQM GK GHK GQKARAGFEGGQQ GRGGKGQTARSGFEGGQM GRGTKGQKARTGFEGGQN GRGHK GQKARS GFEGGQM $S T R G H K G Q N S R S G F E G G Q T$
$S G R G T K G A G A R S G S E G G Q M$ GK GHK GQWARSGFEGGQT GKGHKGQNARSGFEGGQT GRGHK GQKSRAGFEGGQM GRGHKGQKARSGFEGGQM SARGQKGQKARSGFEGGQM T S GK GNK GQNARS GFEGGQT SGRGHNGQNSRSGFEGGQT

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 PLTRRIPKRGFNNDFAKEYAIVNVSDLNQFTE GKG PLHRRLPKKGFNNTQFRDDTEVVNV PLFMRLPKRGFTNFN KLEYAIVNLDQLNTF PI YRRLPKRGFKNPFRKLFGVVNGTLQTAVDNGVLEEGAN PLYGRLPKRGFYNKFGKDYVEINVSVDNRFEDGTVVEPVM HNHGPWDKHGFKRPDDVQDDVAEVDVREDDEDAALLAADG PLFQRVPKRGFTNDHRTEYTVVNLETLNRFEEGTEVTPEL PLHMRMPKRGFNNPFRLEFAEVNLWRLEQAVEAGKIKK G HNYEPLGKHGFSRPEDAQETVLTVSVQKDDEDAALYAAEG P THRRLPKRGFTNDNRTPFIVLNFNRIENLINENKTDPK PLQRRIPKRGFRNPFRKQYAVVNVKELNRFEAGTLIDRAA PIHRRLPKRGFTNDFALDWNEVSLGRVQTADDAGKLDASA

 PIYRRLPKRGFTNIFAKNFNVVIERIEAAIEAKKLDAKNT
 PLAMRLPKLP GFRNPRRDEYSPDNISALDARFEDGAVVD PLYRRLPKRGFNDIKKHSYDQMIINLNDIQHEIEKKKLDUG
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RVEFRPINLHTHAEFVEAGKLNE PLYMRLPKKGFELVNPSSYTIVNLKQLRDLPADSE PLRMRVPGRGFRNPHTRFYRPINLDTVQQWAQEGRDPTDR PLHRRLPKRGFKPVNKKDYSVVNLYVL PLQRRLPKRGFTNIFKKSYELVN
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 SLARRMPKRGFNNIFATEYTVVNVA LVALIARLQL PLYRRLPKRGFTNRNSKNYTEVTLTMDNKSKATDVTAESL
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 $L L E T G T V S K V$ K $\quad$ K A GVVKILGKGNI DRKLTVKAHKF
 VAEETD DARDVVDDGWDVDAVVVLGDGQVRNSLDDITADAF


 LLLEK G I I K KT L L $A A T D D G A A D N A G V I R R L K D G V R V L S G G E I$ TAKVVTVDVAA






 GED A A ALIAAGVI RRAKDGVRLLSDGELKAKVTLEIAGA

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## S

## 

## A

E

| SK V T |  |
| :---: | :---: |
| S 1 |  |
|  |  |
|  | TM |
| A EVT |  |
| D G P |  |
| A L L |  |
| S A E |  |
| E VT |  |
| GQP |  |
| V T V |  |
| E V I |  |
| A L V |  |
| K A D |  |
| K D 1 |  |
| D V | V |
| A T |  | PEVLKQEGVIKN





|  | 130 |
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| UniRef90-F6B5R2 | SKSAAEKI A A A G GKAEV |
| UniRef90-UPI0002DABE80 |  |
| UniRef90_R4U2T5 | SVSAKDAI EKA G GKVEVV |
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$S Q K R P R R D G R G \square S A G Q G A$
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SRQERRRVGRGVG
SRKKRKRI GRGAGSGSGKTA H S K K R V GRGS G S G L G K T KKRMRVGRGPGSGKGK M $K N R \square R V G R G \square G S \quad G K G K T A$
 YRKKRLGRGLGS GKGKT K DRKRI GRGTGSGHGKTAT

STRNKKRLGRGIGSKTGKTG
K S S K K R V G R G I G S G L G K T G
$R K N R K R L G R G Q A T G T G C T$
K Q N A K RVGRGI G S GTGK T G
RK S P T R K G R G $!$ G S G L G K T A
$R K A R T R V G R G \perp G S G K G K T A$
SRSLRRTRKGRGRSAGKGKTA
S K K A P K R K GR GT G S G L G K T A


SRHSKKRIARGPSSGQGNTTA
SRRKAKR L GR G $!$ G S GL G K T
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T K HRKRKRIGRGPGS GTGK T
TRKEPKRKGRGTATGQQGKTA
K H K K Q R G Q GMGS GRGK Y S
$S R K K S K R V G R G I G S T L G K T C$


S
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$G R G H K G Q K A R G G F E G G Q T$ GRGHK GQKSRSGFEGGQM $G R G V K G Q K A R T G F E G G Q M$ GRGTK GQKS $\dagger$ S GFEGGQM GRGQK GQNARSGFEGGQN
 $S G K G M R G Q K S R A G F E G G Q N$ GRGRDGQNSRSGFEGGQM $G R G H K G Q K S R A G F E G G Q M$
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$G K G Q K G Q K A R S G F E G G Q L$ GGRGIK GQKSRS GYE G GQM GRGVKKGQK SREGFEGGQM GKGHK GQK SRAGFEGGQM K GHKGQKARA GFEGGQMM GRGTKGQLSRSGFEGGQM $G R G M N G Q K S R A G G G K G Q T$ GRGHKGQKSRSGFEGGQM GK GNK GQRSRAGFEGGQM GRGHK GQKSRSGFEGGQM GRGHKGQNARSGFEGGQM GSGHK GQKARS GFEGGQM GRGQKGQKARSGFEGGQM GRGQKGAKARSGFEGGQM $S G S G H K G Q K A R A G F E G G Q Q$ A GRGEHGQKSRSGFEGGQT G RGVVKGQKSRTAFEGGQM S GRGHK GHKSRS GFQGGAM SGRGAK GQTSRS GFE G GQM $G R G V K G Q K S R S G F E G G Q M$ TAGRGRHK GQKARSGFEGGQM KRGKRL GRGI GS GKGKI S GRRGHK GLQKRRSGFE G GQM
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$S K P N A K R V G R G \square G S G L G K T G$ K S R K R I AR G Q GS GRGGT

SKHAEKRVGRGMGSGLGKTG


S T K P A K R V G K R G G G S GH GK T
$R K T R R R \vee G R G S G S G L G C T A$
$K T N K K R V G R G D G S G L G K T$ TRK $\square R K L R G S R T V A K G C S K K N R$

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K Q S A K RVGRG $\square$ G S G L G K T G
KNRKRLGRGESS GLLGKT
HRKKRLGRGYSAGQGG
$S R K P K K R L G R G \square G S G L G K T A$
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K H S S KRVGRG $\square G S G S G K T G$
STKTFKRVGRGPSSGKGKT
K T R K LR GHVSHGHGR $\square$ GK HR K
$S R K K K L R K G R G \square A A G Q G A B$ $R R G R G T G S G N G K T A$
$R K K G V R V G R G \square A S G C G K T$ RAR S RRGMNGQNKRSGFEGGQM $T S K K R R Q R G S R T H G G G S H K N R R G A G H R G G R G R A G R D K H E F$ $K R V G R G \square G S G L G K T A \quad G R G H K G Q K S R S G F E G G Q M$ $R Q L R G H V S H G H G R V G K H R K \quad H P G G R G N A G G Q H H H F$
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PI YRRLPKRGFKSLNKGDFQVLNDGRLQQADDAKK LDAKK PLYRRIPKRGFNNINRKEYAVVNVVKLESFDNGTEVTPEL PLARRLPKRGFSNARFKKTYAIVNVGDLNVFEADTVITPE

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| UniRef90-R6RBP2 2 |
| :--- |
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L

D

## $\square$

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LQQSGLVKNA
L L L E Y G F V R K L
K SGMKLLGEGELTKKLTVKANKF GGEDHAALKAAGLARGGKDGVRLLAKGELTSKVAFKVAGAA LQEVGMIKKVV SMGKSGVKI GRGKLEKKLEVKAAKA
 DVVDLN TLK SANVIAKNDRFVKIFLSGSLTKGVTVKSLRV TLSDKNLAKGTF TVVVPELLLEKKIIRKLMDGVKVLGNGNLEKALTVKAHKF LTVDAVVLKSAGIIRRCNDGIR1LSDGSLNTKVMLQVCGA DVVDLKLLIDANIVPAFTKTAKVIKSGEVKKAITIKGIKV ELIDLEALKQADIIGTNTKRAKIMLSGELTKAVTVKGLAV
 TEVTQAMLEEAGMLKQVKDGIKVLGQGTLNVALTVKADKF SIVTLEALIAANVI DARSLIAKLLDSGTVDKAYTIQGVGV VINEDALVASGGVRRKRDGIRVLAKGDVTSKVNDDVTGA DVVDLDALKAAGLITRNDKKAKVVLSGEVKAPVTLRGLRV SSLDKTKLKALGLIKKEDKPVKLLGKGKLSKKLNIEVDMT GVVDHAVLQAAGLARGGKDGVRLAKGELTEKVEFNVAGA GEVTLETLKQANVLKDAKRYAKVILSGELNKAVTVRGLKV
 AVVDAAALGEKGIVSDCKYGLKVLARGELTKKLTVKAAAF TLVEKGLVRKGSC KSEITLDDIYARGLARLGAPVKVLSRGEVKSAIKVEAHKF DVVDLASLKAAGLVKKHIEAVKVLKSGAVARALTVKGLGV
D $\frac{1}{D}$
 VDFPALRDARVMTDTKKERDHKVLGSGELTTQLTVRAHAV
 GVMDLDALKRADLVGTHWERAKVFLSGDVTKAFT:QGLAV YLLAKPSEKADVIDVVQAGYYKVLGKGHDPKPVIVKAKFF VNLDSLVKKGLIFKPGKFPLKILGNGKLNVKLKVQAHAF TVVTPELLAENRLISGQYDVKKVLGDGDLTKKFT:SAHRF VTPELLKETGMIRKI EKDGVKILGNGSVEKKLTVKANKF VAEETDGGYRIDVVDEDADAVKVLGAGQVRNELELVADAF DVVDПAAGKSADLGHEDKVVRII DSGEINKAVNVKGDKV EKYAAETAKAPVIDVVKAGYFKVLGKGLLPKPVIVKAKYF KDEVTEADMYERGVVKNGAAVKVGATGEVDKAVTVEAHRF LEDVYSKKLA AGMKKNPVKVLGDGEVNFAAQVTABKF FEDDVATLKSANLIGEKDRFVKVINSGEITRAMKLNGDKA


UniRef90_E4TEP0

| UniRef90_A3UD91 | $\text { SKPA } \square \text { E A\|V\|EK A G G K\|V\|TVLAK }{ }^{130} \text { S A K D Q }$ |
| :---: | :---: |
| UniRef90-E5Y757 | SQSAADK\| RAAGGEVKELEVV |
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| UniRef90-S8E8W6 | TVRAKAAVEAAGGSV |
| UniRef90-W0E0P2 | TKGARAAI EAAGGKVE |
| UniRef90-B8ELE4 | SKSAVAA EAAGGSIELLKRAPEA |
| UniRef90-UPIO0036BDDE6 | SKSAQKKI ENAGGKT |
| UniRef90_UPI0003B73C6B | SASAVQAI EAAGGKTEVV |
| UniRef90-D3HPM2 | T K GARATI E G $\mathrm{L}^{\text {G G S }}$ |
| UniRef90-D9QGM1 | SAGA $\mathrm{S}^{\text {K A I E A A GGSVV }}$ |
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| UniRef90-B0RZS8 | TKSAEEKI TKAGGKVEVI |
| UniRef90-R7KNU8 | TKGAKAAI EAAGGSVE |
| UniRef90-D1C2M4 | SKSAREKI EAAGGTVEAI |
| UniRef90-R7F198 | T A SALDEKI EKSGSKAEVI |
| UniRef90-XOVAA9 | SQAAKEKI ESAGGKVE |
| UniRef90-R6SQB6 | SKSAlIEKINESGSKI |
| UniRef90-A3VFB3 | SKSAVEAVEKAGGKLTTTAAAAE |
| UniRef90_Q2RQX9 | S A T A REGVEKAGGTLTVT |
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| UniRef90-UPI000472C3DA | SASAKVAI EKAGGSVKLLAAA |
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| UniRef90-R7ALF4 | S A S A R AKI E AVGGGKVE |
| UniRef90-T0F7Q5 | SKSAKEKIEKAGGSVK LSELDAKEA |
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| UniRef90-H6LGT2 | SKSAEEKILAGGGKV |
| UniRef90-Q2G8W1 | SKGAFAAVEKAGGSIALPEAQPSEQ |
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| UniRef90-E1V5M6 | TKGARAAI EAAGGKVE |
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| UniRef90-K0C5I4 | T A GAVK AI EAAGGS |
| UniRef90-C1DX56 | S S SAEEKIKSVGG\\|VEK |
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| UniRef90-A0A010PPJ2 | SASAEEKI KAAGGSTE |
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| UniRef90-K2A3D3 | SKTAVEKI EKAGGKVVVLS |
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| UniRef90-E3PTU5 | TKSAAEKI EAAGGKAEV |
| UniRef90-C7P4E2 | S D GAREKVEAAGGSVELTELGEKR |
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| UniRef90-E4TEP0 | S S A A E E K\|I K T A G G E|V| |

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UniRef90-H1YF91 UniRef90-UPI00034DCAC4 UniRet90_X0ZD25 UniRef90_M1ХMTO UniRef90-B7J486 UniRef90-10HL07 UniRef90-UPIO004417231 UniRef90-X5E721
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UniRet90

- 5 JYC3 UniRef90 ${ }^{\text {K1YSF2 }}$ UniRef90-L1PIY4 UniRef90-R9A950 UniRet90_G8PPF1 UniRef90 U2TJ26 UniRef90-UPIOOO37CBB28 UniRef90_N9VCKO UniRef90-O9ZCS4 UniRef90-DOMGX3
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UniRef90-X0WU34
UniRet90_-F7XY58 UniRef90-UPIOO04409FA8 UniRef90-U2VSD5 UniRef90-K9T9B2 UniRef90-G7Q9V7 UniRef90-D9SCT1 UniRef90-A0AO24HWE9 UniRet90_L1JWK2 UniRet90_A5UL66 UniRef90-UPIO00377E5B6 UniRef90-UPI000367E1B5 UniRef90-U1QQV3 UniRef90-S3BKC8 UniRef90-B6BV59 UniRef90-LOICI5 UniRef90-X2HEI6 UniRef90-N9VBL4 UniRef90-E1YG70 UniRef90-R5J7X4 UniRef90-UPIOOO3B61160 UniRet90_U7JR55 UniRef90_G4QFM2
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RRKRRLLCRGTSAGQGATG GKGMRGQKSRSGFEGGQM NRKRVGRGMGSGNGKTA GRGHKGQKSRSGFEGGQM AGRGQDGQNSRSGFEGGQM
KRПRRGRGPSSGKGK RHSKKRLGRGTSSGLGKTA GKGHKGQNARPGFEGGQT TRRKRVGRGMGSGLGKTG GRGHKGQTSRSGFEGGQM
$H A A K R V G R I G S G L K T A G R G H K G K S A G F E G Q M$ SKHAAKRVGRGI GSGLGKTA GRGHKGQKSRAGFEGGQM KKRKR1 GRGPGSGHGKT STKGHKGAKARSGFEGGQM SKPSAKRVGRGRGSGYGKTCSGRGHKGGKVRPGFEGGQM
STVVRSVGRGLGSGMGKQCTRGAKGQNARPGFEGGQM STRVRRSVGRGLGSGMGKQSTRGAKGQNARPGFEGGQM KHTDKRVGRGDGSGMGKT SGRGHKGQKSRSGFEGGQD SKNRKARGHVSAGHGRIGKHRC HPSGRGKAGGLHHLR KTAKTRVGRGEGS KGKTAGRGTKGTKARAGFEGGQM KTRKDRGHVSHGHGRIGKHRK HPGGRGNAGGMHHHF TKTRKHRGHVSAGYGR GKHRK HPGGRGMAGGQHHHK KRRRRVGRGISAGQGASA GLGMRGQKSRSGFEGGQM SKKNVRRVGRGIGSGFGKTA GRGHKGQHSRAGFEGGQM RKTRRRVGRGSGSGLGCTA GKGHKGQNARAGFEGGQM KTAPKRLGRGDGSGLGKT SGRGHKGQHARAGFEGGQS SRKPRKRVGRGHGSGTGKT SGRGHKGAGSRSGFEGGQT TKTRKDRGHVSAGHGRIGGHRK HPGGRGMAGGQHHHM KTAKTRVGRGEGS KGKTAGRGTKGTKARARFEGGQT SRKPKKRLGRGIGSGLGKTA GRGHKGQHSRSGFEGGQM KTRKLRGHVSSGNGRDGKHRK HPGGRGNAGGQHHHF RKTTKRLGRGPGSGTGKT SGKGHKGQLARSGFEGGQ KTAKTRVGRGEGSGKGKTAGRGTKGTKARATFEGGQM KR】RVGRGPSSGKGKT SGRGHKGQKVKPWFQGGQT SKKRRKRVGRGDSAGQGASA GLGMRGQKSRSGFEGGQQ SRKARKRVARGLGSGTGKTA GRGVKGQKSRSGFEGGQM SNKAKTRVGRGEGS KGKTAGRGTKGTGARAGFEGGQM HREKRLGRGEASGKGGT STKGNKGGQSRAGYEGGQM KTRK】RGHVSHGHGRDGKHRK HPGGRGNAGGMHHHF
KQSKKRLGRGVGSGLGKTA GRGHKGQHARAGFEGGQM SNKRRKRVGRGEGS QGKTSGRGTKGTGARPRFEGGQM
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KNRRSRGHVSAGHGRDGKHRK HPGGRGLLAGGQHHHR
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 SKPAAKRVGRGDGSGSGKTC GRGHKGQKARSGFEGGQM KKSKTRVGRGEGS KGKTSGRGMKGTHARPGFEGGQL
KTAKTRVGRGEAS KGKTAGRGTKGTKARYRFEGGQM SNPSAKRVGRGDGSGFGKTA GRGHKGQKSRAGFEGGQM TSKKKRQRGSRTHSGGTHKNRRGAGHRGGRGRAGRSKHEF KHAARRVGRGDGSGDGKTC GRGHKGQKSRVGFEGGQM SRKEKHRVGRGHAAGKGKQA GKGQSGQNKRPGFEGGQT KKSRKRVGRGDGSG ITGKTCGSGHKGQKSRSGFEGGQM SKKSPKR| GRGPGSGTGKT SGKGHKGYKARSGFEGGQM KAKRRLGRGTATGQGKT SGRGQKGQWSRSGFEGGQM
$K K Q K R K A R P G S G K G K T A S G G K G O S R G G E G G Q M$ KKQKRKARGPGSGKGKTAGRGDKGQKSRSGYEGGQM KASKRAGRGDGSGDGKTG GRGHKGQKSRSGFEGGQM
$K T A K T R V G R G E G S$

UniRef90 UPIO00345227C UniRef90-UPIOOO377ED76 UniRef90-C7REG3 UniRef90-G2XTC7 UniRef90 ${ }^{-}$Q6XYXO UniRef90_UPIO0035EE46F UniRef90-WOSC42 UniRef90-D6GQ53 UniRef90-TOLI99 | UniRef90-M4U4V1 1 |
| :--- |
| UniRet90 | UniRef90_R6BOZ9

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UniRet90_A0P86 UniRef90-B8IYL0 UniRef90-UPIO0029AF7C5 UniRef90-UPIO0047A0C62 UniRef90_A0A024JKE4 UniRef90-E3BBHO UniRef90-L8XZ33 UniRef90-V4C1T7 UniRef90-U6E1L7 UniRef90-UPIO0047E34DF UniRef90-I4BER9 UniRef90 U7PP72 UniRef90-K9PMA4 UniRef90-E4UDX2 UniRef90-C2GGM1 UniRef90-G8TMD8
UniRef90-Q7PVB9 UniRef90 ${ }^{-}$K2C8E0 UniRet90-W1TRF8 UniRef90-O2S3P6
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UniRef90
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IA S VT S QVT
PLQRRLPKRGF
PLMRRLPK
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ASRNVEV

$Y S V I N D R R$ | R |
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FEDGTV PLGRRLPKRGFTNDFKKHFQ\|VNLLVSKCEVRLSLEKCGSA PLYRRLPKRGFKNIFAKEYSEVNVEQLINRFEDNAVVDPVA PMHMRLPKRGFKNPFRVEYQVVNLE KKMEALFPKGGD PLYRRLPKFGFTSRKSI ILFDYFGKVGMRHFHLKRNTEYCPTINVDELWHLLPEEAQ PLHMRLPKRGFKNPFRVEFQVVN LDKLSELFPEGGSVT
 YHPGYFGKVGMRYFHKTQNQFPVINLDKLWSLVPSETRDA PI QRRLPKRGFNSLTKVYNATIRTS PLQRRLPKHGFKNAPFKVTY














































 DKYHPFGKVGMRHFHYTRNMHHNPTINVDKLWTLVPEEHK PLAMRLPKLPGFRNDNRVEYAAVNVSRLDGLFSD G PLYRRVPKLK KNHFPIVNPSYYTIVNVGKLASDPAKTE PLARRLPKRGFKNYPKKVVYQPLNLDRLLEALAGQDA
 PLMKKLPKFGHKNVHAYTSLLEGLNTDRLWSWDQQGRDDS TWPDHYGKHGFKRPQKMIKKVNPVNLSYLEEQADNLIESG PLQRRLPKFGFTSKKSLYVJAEI RLDELNNIEA PLARRLPKRGFKNTFRAEYEVVNVGQLLAMFDGKEEITLV PLYMRLPKRGFKSPFKVEYQVVNLA $\quad$ PLGMDVATAFPQGGD PIQRRLPKRGFKSSQKDYKDQIRTS HNYEPKHKHGFKRPQDAQPTVEEVDVRTLDEDLPLLVADG PLQRRLPKRGFKSL PWFRRIGKRGFTNVNHVEYQVVNLVDLEQRFNAN PLQRRLPKVGFSSRISIITSQVT
PI QRRLPKVGFTN历FKKEDAVINTRDL
pLARRLPKRGFTNIFKKEYTEVNVETLNKFEAGTKFESG PLYRRLPKRGFTKPNAKHYAVVNLGLI QKFGDLGKLDGKA PLHMQMPKFRFKNPFRTEYQVVNLD PLQRRLPKFGFTSRK

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UniRef90 UPIo00345227C UniRef90_UPIO00377ED76 UniRef90-C7REG3 UniRef90-G2XTC7

UniRef90 O6XYX0 UniRef90-UPIOOO35EE46F UniRef90-WOSC42 UniRef90-D6GQ53 UniRef90-TOLI99 | UniRef90-M4U4V1 1 |
| :--- |
| UniRef90 | UniRef90-S2VU54 UniRef90-R411×0 UniRef90-D8M7P3 UniRef90-UPIOO03792681 UniRef90-C4WRW3 UniRef90-F2SHM5 UniRef90-EOUJB6 UniRef90-A0P861 UniRef90-B8IYLO UniRee90-UPI00029AF7C5 UniRef90-UPIO0047A0C62 UniRef90_A0A024JKE4 UniRef90-EЗBBHO UniRef90-L8XZ33 UniRef90-V4C1T7 UniRef90-U6E1L7 UniRef90-UPI00047E34DF UniRef90-_4BER9 UniRef90-U7PP72 UniRef90-K9PMA4 UniRef90-E4UDX2 UniRef90-C2GGM1 UniRef90-G8TMD8

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UniRef90- D9SCT1 UniRef90-D9SCT1
UniRef90- AOAO24HWE9 UniRef90 L1JWK2 UniRet90_A5UL66 UniRef90-UPLIOOO377E5B6 UniRef90-UPI000367E1B5 UniRef90 U1QQV3 UniRef90-S3BKC8 UniRef90-B6BV59 UniRef90-LOICI5 UniRef90 - X2HEIG
UniRef90
N $9 V B L 4$ UniRef90-A5CXM3 UniRef90-E1YG70 UniRef90-R5J7X4 UniRef90_UPIOOO3B61160 UniRef90-U7JR55 UniRef90-G4QFM2

Vsles 90
GI 100

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120
LTA S N G P L K I L L G D G D L S V E L A V V A A A A FA N K F L L N K N K A K K A G V $\operatorname{V}$ K N E L L K E A D S R C L H GVVK G GV K L L G K G E L K T P I N L L V S R A KVV, $N$ N E EVV D L L V L K Q A GVI VDAQLLKDRKVIKKI EKDGLKVLGNGEFNKKI T I K K A SKA
 LVVE

 Q Q A M K D T TKAPVIVDLKA HGVFK L L GRGRI ERPIVVKA KFV $V$ E DLVAK GAVRKGQPVKVLGNGDVTVKLEIAVDRV QKYENDKEKAVVIDVVSKGYYKVLGKGNLPQPLIVKAKFF
 GVVVDLL T L K A A NLI S E DS LTTA K V F L L S G EV T K K F S L E GVA F


 V A




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LTEISSHDSLREWGLAGQTDKIKILGNGELKSKVAFKVNKF




D LLESGLIKAV KDGVKILATGELT
 YADAKADSKVPVIDVVRAGYYKVLGKGFLP GVVDLEGLLLRRIVRGSPDAVKVIDTGE:T KPVTARELLLSGCIHDVHDGVKLLGDGNLR VVDEKALVKAGVVRRSKDGVRLGKGTLK AEATKNTATAPVLDRTQHGYFKLLGKGFL KALTVKIDKV
 RPПT TRELTHSRCDHQPKDGVKVLGAAALKOPVVRAKFV VAVADIVSAGLVR ANDPVKVLGDGDVDVKVNVTAEKA A VVGAA VA AGMKKEFIPVKILGDGEISKKFTVRADKV DVVSLDTLKAAGLVKKEMQNVKVILSGSISRAVTISGLGV DVVDLPALKSAGVVSARAVQAKVFASGEVTKAVTVKGVAV V SQTEKSSDLVPVVDTLHHGYGKVLGKGRLSQPVVVKARFV SAPVTVEALAAGVVRRVLDGVRLLSDGELKTAVTFEDAGA VDAESLMAKGVGIKHDYVPVKVLGDGELTKSLTVKVDKV  TLAAKNLIKG IITKEKLLEVGLINNKNLVKLLSICSDDFA EAPNEPETLVAAGLARKRDRLKLLGDGELSS

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EVVDTPARLKRASGLVKGRGKIKVLG

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 SKLINMKVLRGCVGSNDKKGIKLLAKGK: DRPLQI EVSDA
 DIYDRGLAK
VTVEALINAGLVR KNQPVKVLGDGEVSAAYTFKGVKS VA DLVAKGAVRKNELVKVLGSGDISVALTVTVDKV GKIDLLTLKKENLVSELALSVKIFLSGEVKNKYTISGLGV VAEETDDGYAIDARDVADDGVKVLGSGQVHDALSVTADAF DEDDVLVLKQAGLVPATALNVKILASGSIDKAVTMEGDKA TYITIDVFKAHNLITKNDKRVKVIANGTESTRAVTVTVAKA SVVDVDLLVSSGIVKGKHDG|KLLAGGI NYSLTVKGDRV LKQNKTIAK A I DEKDGLKLLGNG D 1 EDAITAAGDTK QKLDGIRVLSKGELKAKVTLKVTGA TVTTVDDDLAKGAVRDNELVKVLGTGELTVALDVKVDAW



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 STK TRKRIGRGPGSGLGGT, STRGHKGAKSRSGFEGGQM $\begin{array}{ll}R \square R K G R G E A S & K G K T A G R G T K G S K A R P G F E G G Q Q L \\ K T R V G R G E G S & K G K T A G R G T K G T S A R A G F E G G Q M\end{array}$ $K T A K T R V G R G E G S$
$K N R K K R G H V$
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$G Q G A S G G F G M R G Q K S R S G R P R P G F E G G Q N$ $S R K T R K R V G R G \square G S G L G K T \quad S G R G M K G Q K S R S G F E G G Q M$ K T QK LRGHMSHGHGCIGKH REHPGGRG
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SRPDKHRKGRGHAAGKGKQA
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KARGGF GF
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G Q M TSTRGHKGAKSRSGFEGGQM KGRKKRGHVQMGHGRTGKHRK HPGGRGNAGGQHHHR SRQRHKRKGRGMAAGQGA SCGFGMRGQKSRAGFEGGQQ KRDNLRLGRGIGSGVGKTG GRGVKGQNSRPGFEGGQT TKTRKHRGNVSAGHGRIGKHRKMHPGGRGLAGGFHHH
$N R K Q K K R \square C R G D G S G F K T G G R H K G Q K S R A G F E G G Q T$ TTRKRHKRVGRGNASGRGTYSGAGMKGGRSKVGFEGGQM TSTRGHKGAKSRSGFEGGQM
rk■mtrvargnas KGK TCGRGGKGQSARTSF
StkQk
SKHAKRRVGRGपGSGपGKT TAGRG T SKSNK $\square R$ VGRGEGGKRGKTA RRGKKRVGRGTSSGHGKT GRGTKGTKARVGFEGGQM ASTRGSKGAKARVGFEGGQM SVKKGKRIARGEGSGKGGT A TSTRGHKGAKARSGFEGGQM SRKVRNRVGRGESSGNGKTA GRGQKGQKARGGFEGGQM KTRRLRGGRHMGWGQVGQHRASGHKGGLGVTGMKKHHM KHRKERGGMHCGNGR】GKHRK HPSGRGNAGGQHMHF SKKAKTRVGRGEGS KGKTAGRGTKGTKARPGFEGGQM TRKHRGHVSAGYGRVGKHRK HPGGRGLAGGMHHHM KNKKRVGRGDAAGQGKTA GRGTKGQNARTGFQGGQR TSTRGHNGAQSRSGFEGGQM SRKLAKRVGRGVGSGLGKTC GNGHKGQHARSGFEGGQM KTAKTRVGRGEGS KGKTAGRGTKGTGARAAFEGGQM SRTNKFRGRRTHGRGK KSGRGAGKMGGHGNAGLLKHKF KQRKRVGRGPGSGHGKTA GRGHKGQKSRSGFEGGRS TSTRGHKGAKSRSGFEGGQM
A GRGTKGTKARAAFEGGQM


KTARTRVGRGEAS KGKTAGRGTKGTKARAGFEGGQL
VSHGHGRVGKHRK HPGGRGNAGGQHHHF RKFRVRTGRGMGSGVGKTGGRQTARTGVADGGFEGGQM SKKRKRRLARGUSAGQGASASGKMRGQKARAGFEGGQQ TNRKRKGKGVGSGDGKTA GRGHKGQKSRSGFEGGQM KNRKRVGRGPSSGHGKT SGRGHKGQKVKPWFQGGQT KTQKLRGPVSHGHSHISKHWK HPGGRGNAGGMHHHR
RKPRKRVGRGDGS KHGKTCGRGEKGAGARSGYEGGQM VKKTRKLRGHVSHGHGRVGKHRK HSGGRGПCGGLKHQK RGRSSRRGKTA GRGHKGGTVRLGFEGGQT HKAKVVGRGHGSGLGKT SGRGQKGQKARPGFEGGQT KKRKRRVGRGDAAGQGA SCGFGMRGQKSRSGFEGGQM KNSKRVGRGPASGKGKTHKGSGQRGRRDKPGFEGGQT KRRRLKVGRGDGCGKGKT SGRGHKGQKARSGFEGGQQ SKRDKIRVGRGEGS KGKTAGRGTKGTKARPRFEGGQM SAGQGASCGFGMRGQNSRSGRPRPGFEGGQQ SVKNRKRIGRGPGSGKGGT SARGHKGAKSRSGFEGGQM SRTRKHRGHVSAGHGRVGKHRK HPGGRGLAGGQHHHK STRTNTRLGRGPGSTKGGT SGRGHKGQNARSGFAGGQT RKSKRRL GRGNGSGRGTYSGRGGKGQTARAGGKGGQT SVKKGKRIARGEGSGHGGT STRGHKGAKSRSGFEGGQM KTRKMRGHRTMGWGTKGQHRDRGAEGGRGHIGMHKEKW TRKDRKDRGSRSDGGGCTKKRRGAGHRGGRGKAGGHKHMW KYDKVRVGRGNGSGKGKTA GRGHGGQNSRSGFEGGQT RRVGRGASSGRGKT SGRGHKGQKARGWMEGGQT GQTCGKGQKGQKSRAGFEGGQM
SGRGKGOKSSGFEGGQM $K H Y K R R V G R G D G S G L G K T$
$K T R K L R G H V S H G H G R I G K H R K$
KTRKLRGHVSHGHGR』GKHRK
HRKKRVGCGEGGGHGKT SGRGGKGARSRSGFEGGQM KHRKKRVGCGEGGGHGKTHSGRGGKGQTARSGFEGGQM VKKTRKLRGHVSHGYGRVGKHRK HSGGRGLAGGFSHMK KNSKRVGRGPASGKGKTHKGSGQRGRRIKPGFEGGQT KNRKKRGHVAGHGRUGKHRK HPGGRGACGGLTHKM
RRKAKK $\square$ GRG $\square G S G K G K T A G K G T N G H N S R G F E G G Q T$ IGKTCGRGHNGQGSRSGFEGGQM KHAKRRVGRGПGSGLGKTA GRGHKGQKSRAGFEGGQM KTGKLQGYVSHGHGLIGKDRK HPGGLGNAGGVHHHF SRKKRMRTGRGDGSGKGKTGGRQTARSGVR $\square K G F E G G Q M$ SKKRVGRGPASGLGKT SGRGHKGSGQRPGFEGGQT RNKFKRVGRGIGSGKGKT ${ }^{\top}$ STGRGHKGAKSRSGFEGGQM KHAKRRVGRGLGSGLGKTA GRGHKGQKSRAGFEGGQM KKDRMRVGRGEGS HPGGRGNAG HPGGRGNAGGMHHHF


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| E0 | NYRRVPKIGFNNVNSTKYQTIGULL SLS |
| RiRef90－UP100046F4F51 |  |
|  | E |
| UniRe990－D7F | T |
| UniRef90－N8QD | ALYRRLPK FGFTSQLALKTAEV |
| UniRef90－M5E5L8 | DKYHPFGKVGMRHYHLLRNPQHKP\｜IDNDKLWTLVPADLR |
| UniRef90－F7WZN1 | PLYRRTPKFGFDSKKQR\｜TAEVRTSEL |
| UniRef90－C6YOT2 | PLQRRVPKVGFKP䍖 RVEYVGVNLDVLQGLAEKF N |
| UniRef90－K2 |  |
| UniRef90－UPIo00237D171 | PLQRRVPKYGFKNTN KKKEYKSUNVRTIQYLVDKLNVTD |
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| UniRef90－R5W4 | PLQRRLPKYGFT NLKRTEYKPINLSVIDALVTKGNLTE |
| UniRef90－C0ZW45 | PLHMRLPKKGFTNPF RTEYQVVNVGDIARLFPEGGAIJT |
|  |  |
| UniRet90 J9HOP | PLQRRVPKFGFTNTN |
| iR | PLQRRVPKFGFKNINHKEYQAVNLS |
|  | FRRKPKRGFTNI |
|  | DIPKTPHPNDIKKWTSLRDLDDLFTKFGKEEG |
| UniRet90 LLIIM75 |  |
|  |  |
|  | RLPKRGFNFHARFAKAYQYNVALEGRFEPGST |
| UniRefol－UPIO001 | PKAQAVPKRGFKSLRTPAQVVYLDHLNEKLWL NAFDG |
| 14AL | PLQRRVPKFGFKNPGRVAYKPINLD |
| UniRef90＿A8DR63 |  |
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| UniRef90－D3PN23 | TL $\square$ MRLPKRGMKGASHGELKRVEYQVVNVGAIAKHFASGE |
| 5G | PLQRRLPKFGFKNINRVEYKAINLSV |
|  | HMRLPKLK |
| UniRef90＿G8Y8 | E |
| UniRe990－16Wx26 |  |
| 析 | KLKFKNPFRTEYOVVNVGOL VEKLANLAPNGE |
| UniRef90－K9XBT2 |  |
|  |  |
| UniRet90＿UP10003811783 | PLHRRLPKRGFNKFDRKSWNEDVGTLQKAVDEGKLKA G |
| UniRef90 K KTHL8 |  |
|  | P YRKTPKRGFNSTKKDRSNNGS SLVSFNKFODDST |
| iRef90 G9NR | PLIVKHGRKGFNFRAPKISEVNLDQI QNWIDQGRLDPSKQ |
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| A9UQM9 |  |
| O52350 | YRRLPKFGF QTVGFKKQTLSVSLDITAKLNETT |
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| P1 | PLYRRVPKLK R HFPIVNPKKFTIINDDQLSQLPANTE |
|  | YHQ |
| UniF |  |
| UniR | PLMMRMPKLGFKNTNRVEYAVINVGLDGENYKEGEIVVDRS |
| UniRet90－A2U3A8 | PLQRRVPKFGFTNIN RKEYQGINLDKLQSLVD AGKI |
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| iRe | PYFKRFPMTGFNRAHRKI |
| UniRef90－UPIO002627BBO UniRef90 A0A031GPI8 | A SRRLPKFGFKPLNATKKLISRPLNLDFLESSEREVSG |
| UniRef90＿A0A031GP | N |
| UniRef90－Q27021 | RNWAPAINLDKLWTLVSEQTRSK |
| UniRef90－F3YW | PLARRLPKHGFKNPF RVEYAPVNLSR｜AEVFA |
|  |  |
| UniRef90 ${ }^{-662581}$ | GKRGMRVYHRKENSDYARPISSARLWGMIPKEQR |
| UniRef90－S9W4S6 | KLFPKDGRST SEDK Y VPLGL GRVRAWDMNGRLDS |
| 隹et90＿B6AIM6 | DKYHPFGKVGMRYFHMRKNQTFRPITNVEKLIWSLLSRQTE |
| R7 | RLPKRGFTNRNSLEVVGINVSALERFENGAEVSVET |
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| UniRef90－UPI00001C6DA1 | R |
| UniRef90－O6N4V2 | G |
| Q9Y7M5 |  |
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| O－G9ZVC3 | GTLEAALESGRLQGTE |
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| UniRef90-N8QDH0 | TKGAKAAVEAAGGKVE |
| UniRef90-M5E5L8 | S A LAA EKKI K EVGG GVVK LV |
| UniRef90-F7WZN1 | T K GARIII E S A G G Cli |
| UniRef90_C6Y0T2 | S A T A Q K A E A VGG S I E |
| UniRef90-K2C099 | S A S AK TKI EAA G G K AVL |
| UniRef90-X8ISP7 | SKSAAEKI EKA GGKAEVI |
| UniRef90_UPI000237D171 | SKKAREVI EAAQGTAE |
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| UniRef90-Q26D41 | TGSAKAAIENAGGQALTV |
| UniRef90-S5DMC9 | SEDAK N KIIESAGGTVEII E E |
| UniRef90-R7IYB1 | S Q A A Q K A I E A A G G AVV |
| UniRef90_V8G9L9 | T |
| UniRef90_R5W4F9 | SKSAVA A DE A K E G SVV |
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| UniRef90-M7P896 | SQTAERKI K EVGG $\$ V V L L  \hline UniRef90_UPI00016B20C8 & S A SVVK AI EKA G G SFE  \hline UniRef90_I4ALV6 & SASAKESIEK A G G K Vit TL  \hline UniRef90-A8DR63 & T S GVRRSVI E K A G G K I EV  \hline UniRef90-10GYK5 & SESAKEKI A A A G G SVV  \hline UniRef90_R9T865 & SALDAREKI EAA G G Silv  \hline UniRef90_E4T7B4 & S K S A EEAIV VA A G G TVV  \hline UniRef90_D3PN23 & S QAAVEKLKAAGGEAIVIEGA  \hline UniRef90_G5GE83 & SKTAEAAI Q A VGGGTATKI  \hline UniRef90_UPI0004641E9D & S GA A K E KI E A A G G T $\square$ T V L |
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| UniRef90-U1L9X6 | S SAAEQKIVVAA GGSV |
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| UniRef90_A7RLF6 | SRRAEDKIIKAVGGACVL |
| UniRef90-UPI0003811783 | SATAKAAIEKAGGSVSLDEK |
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| UniRef90_F3Y0G7 | T A G A K A AI EAVGGEAVT L |
| UniRef90-J9Z1B1 | T P GAKKRIE DLLGGSA |
| UniRef90-G9NRP6 | S |
| UniRef90_J9NXP9 | SRRAEEK ${ }^{\text {R }}$ K M G GVCVLV |
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| UniRef90_C4V9S6 | T T DAKEQI EKVGG GKWII |
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| UniRef90-O52350 | SEGAKKA I Q S A G G Sil L L |
| UniRef90-P31160 | T A TAQQKI EAA G GSI A L V |
| UniRef90_S9Q1K9 | TKEA $\square \mathrm{ECVVEKAGGTV} \mathrm{V}$ K TVV |
| UniRef90_B9KJ52 | S K A A WE |
| UniRef90_A4FPK6 | T GSAQEKDT A A G G S VT K LD R |
| UniRef90-K9SGR7 | S S GAK Q Kil EAA GGTCl |
| UniRef90_UPI00037D46CE | S S SAK TAI ENAGGNANTL |
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| UniRef90_K2D6N6 | SEAAKAK\\| N A K G TVVE |
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| UniRef90-H2C611 | T NKAKEKDEKS G G Q VI LT P Q |
| UniRef90_U6ED30 | SAGA $\square$ RKI E GNGGEA |
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| UniRef90-B1ZND0 | SESAKAKIEKAGGQAD |
| UniRef90_L9L2Z4 | SKRAEE I K GVGGACVLV |
| UniRef90-O62581 | TPSAKEEI TKVGGKWI I T |
| UniRef90-S9W4S6 |  |
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| UniRef90_Q9Y7M5 | TVQAl Q Q I K N A G G Sil TV |
| UniRef90-A3YUK2 | TASARAKI EAAGGTCELID |
| UniRef90-G8ULN5 | SKKAEEAIVAA G G TVKL GDDAEKAE |
| UniRef90-G9ZVC3 | $S A A A \square A A V Q A A G G S V T V T P \square A A E E E$ |
| UniRef90_A0A059KH98 | T |
| UniRef90_S7XBP0 | S G S A E Q K VA A G G SV |
| UniRef90-J3EQ47 | S A A A K A V E A A G G K I E V I |

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 KHAKRRVGRGIGSGLGKTA GRGHKGQKSRSGFEGGQM KKNTKRLGRGNASGKG TYSARGMKGQRARSGGKGGKA HNKKRVGRGPSSGHGKT SGRGHKGQKVNAWFQGGQT KNRKKRGHVSAGHGR\GKHRKGGARGGRGMAGGMHHHR KKAKMRVGRGNGSGKG TFCGRGGKGQTARAGGKGGQT TSKKTNFRGSRTCGGGTTKNRRGAGNRGGRGRSGENKHHF SNTAKTRVGRGEGS KGKTAGRGTKGTKARAFDEGGGV
 RTDKKRVGRGVGSGWGKTC GRGHKGQKSRAGFEGGQM $K K R L G R G \square G S G L G G S A S G R G H K G Q K S R S G F E G G Q M$ RKSRKRIGRGEGSGHGGT STRGHKGHQSRGNFEGGQM HKGERQRGTRPRLGFEGGQT SGRGHKGQRGRLGFEGGQT SRTKKFRGKRTHGRGK KS GRGAGMDGGRGQSGDCKMLK KSRRRVGRGDGSGVGKTC GRGEKGAGSRSGYEGGQF STKTDTRYGRGPGSQKGGT SGRGHKGQKARNGFEGGQT SRHKKKRGRGQHGGDKHGGNKGSGQRQNFMRTGYETGNT
SRKSRRRVGRG $\square$ GS G $\prod$ GKTAGRGHKGQKSRAGFEGGQM KMQKLQSHMSHSHGRIGKH QEHPGGRGNTGGMYHHF RRRKMRVSRGDGSGKGKTGGRQTARTGVS\|NGFEGGQM GHVCMGYGRIGKHRKE RGGRGNAGGLNHRR SKPAAKRVGRGIGSGLGKTGGRGHKGQKSRSGFEGGQM RQRSKKVGRGIGSGKGKTC GRGHKGGRPHLGFEGGQT KSRKMRGSRTMGWGDRGQHRDRGSQGGR QIGMHKEKW KTQK LRGHMSHGHGHIGKHRK HPGGRGNASGMHHHF KHAKRRVGRGDGSGDGKTA GRGHKGQKSRSGFEGGQM SKSTK $\square R V$ GRGEGGKRGKTA GRGTKGTGARARFEGGQM RYKFKRIGRG】GSGKGKTSGRGVKGQGSRTGFEGGQM KKYRGSRTHGGGSHKNRRGAGNRGGRGMAGSHKHKW KRRKRVGRG GKRGTYSGRGQKGQKSRAGFKPADR

KRVGRGPGSNKGKT SCRGHKGDKSRSGYEGGQ
$S R K T R \square R V G R G \square G S G \square G K T A \quad G R G H K G Q H A R A G F E G G Q M$ K VRKYRGSRTHGWGKRGQHRDRGSQGKRA VGQHKEKW TSTKGNKGGQSRAGYEGGQM Q GMRGTKPRVGFE GGQT KCRHQRGSTFCGYGRVGKHRK HESGRGNAGGMHHHR SRKNRKRVGRGPGG TDKTAGRGHKGQKSRSGFEGGRS $R T Q R T R V G R G \square G S G L G K T A \quad G R G H K G G K \square K A G F E G G Q T$ K TAKTRVGRGEGS K GKTA GRGTKGSKAREAFEGGQM K K N R K R $\lfloor$ GRG GKRGTYSGKG NKGQKARSGFQGGST
$H K G Q K A R A G F E G G Q T$ $M G R G E G S K G K T A G R G T K G S G A R A R F E G G Q T$ $T C G R G H K G A K S R S G F E G G Q M$ K S K K R V G R G GKRGDNSGTGHKGQKSRAG K $K R \square R R G R G P A S G K G K T \quad S G R G H K G Q K Q H A R F N G G Q T$

## UniRef90 UIQUNO

 UniRef90-G4RC20 UniRef90-FORJV7UniRef90
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UniRef90 $\times 1$ LK75
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HNHPPLGEEGOSPPEKVQDEVVLTVDDRTDDEDAPLLAVEG ${ }^{60}$ PLHMRMPKRGFNNPFAKKWNAVRLDRIQAY自DSGKLDAKG TLISRLPKRGFNNVGTYYEVVNLSQLS AMDDGKLAGEG DKYHPFGKLGMRNYHVRRNYNPTINIDKTWSLTPEEQRDG PLQRRVPKRGFRSPVNAPAEVRLDNLNRLEGDVDLAA PLYQRLPKRGFNKPNRKAYAVVNLGLDQKFDDAGKLDAAS S SML K KDPGHFGHDSTHPPHSNAAKKWASVRDLDDFH PMHRRLPKRGFKS PLHRRLPKRGFKNLLAKS LLIVN LSDLDRFEDKAVIDV PGTKLFPKRGFVNQNDKTWAVNLDRVQHWDNQGRKTVSDV SWIVKYGKGWYGKHGFVNPTTKVVSSUS DQQLA QMLESG PLYRRLPKRGFKNVNRKEYAVVNVG PI YRRLPKRGFTNIFAKSFNVVSLGRDQAADDAGKLDAKA PLHRRLPKRGFNNIF RLEFAEINLDRLQDADDAKTDDA PLQRRLPKFGFNNVNKVEYKATNLS PLYRKLPKFRFNRYDYELITSNLINLAYSRSGGKKYLEVD PYFKQMPMVGFRNAHNQYHEVNLSKIQDFWNTGRIPLKEG PLYRRVPKVGFNNRFANKYNVVTLISLVKYETKELTVEFM PLQRRLPKVGFTSKMALTTTEI INLDKYHPGYFGKFWRPAVNDEKDWTLVSERLAELAEERE
 MRGYSYGKHGFKRPDEVSRDVSIVNVGELDELASYLVEEG SWVLRFGKHGFNNPNPRLP VTIDLLELSHLAEKLISED NFVMRSPKLR GFKNPFRVEYQVVNLEKLAELYPKGGDVT TWFQKYHPDYFYHDRKNTSWAKPI SASRLWSLDPKETRYN PLQMRLPKRGFKNPFKVEFQVVNLDKDSEH B FPAGGD PLHRRLPKRGFTSLSKEFTAEV PLQRRLPKFGFKPLN K门EFKPПNDDELELIEKTGASV PLQMRLPKLR GFKNPSRVEYQGLNVGKLAQAFPQGGTVG PLAMRLPKLG GFRNDNRVEYAPVNVSR DDDKFAG PLQRRLPKVGFRSKMAAAAQEVFLYQ\AAMKLD INFDKYGKVGMRHYHLLKRNQCPAVNLDKLWTLVSEQTWVN PLQKRLPKYGFTSRM PLRLTLPKRGFVNPKRMVFTPLNLWKLQKWIDDGRLDVSK PMQRRLPKDGFRSRLLASTVEVLSY LQK KLDNLEP PMQRRLPKRGFKSQSLKFNAEITTMSALNALDQ QLQKVPKLRGFKSPALKPETVTLAMLQDWIDQEKFAVEG PLVKHGRKGFTNDRAPVMEVNLDKLQDWDDQGRDDTLRQ TLPGYFGKVGMRYFNAGADKNATPCINDDKLWTLIPPAEK PLTRQMPKKGFKNPTKVRYQITNVFQLEVFKDGTK SRAVLLGQRGFTRPLKVLNDASIVNVGELDELADQLVEDG PLQRRVPKFGFKNP TRVEYKPINLDTLQULFEKTNAAV PLHMRLPK LK GFKNRFKVTYQVVNLDKLAELFPQGGTVG PLYRRVPKKHFTVINPRRYTTVVS KKLASDPANAE PI QRRVPKRGFNNARHSVTYEVVNLKS PLQRRLPKRGFKSLTGARNVEV PLYRKLPKFVGRPLHQEKYRKYPFQLIRLPQLSEMERLDPV PLRQRAPKRGFHNPHAVVWEPLNGQTLQEAVEKGRLLQPGA PLSRRDPKFGFVNPF RIUEYQVNVGRLQELAEQGRTAG PFYLVIPKYGYNEGHSFRHQYPPLSLQKLQYLIDLGRVDP PFYLVIPKYGYNEGHSFRRQYQPLSLNRLQYLIDLGRIDP YDRDHWGRRGFKRPQSMVKANTTVNVAELKKSMDRFVTSG PLYRKIPKRGFDNFTSKTYAPSDATLQSWI AQSRTSPDEP PLYRRIARRGFSN AAFREEYETINICDFVGRFDDG
 PLQRRLPKRGFKS GTLKYNGEVSHAALELLGV DKYHPFRKVGMRHYHDKRNQCPTVNLDKLWALVSEQTRVN PLYRRLPKRGFTNDFALRFMEVNLS SLQNALKAGKLDGK TWFTSFGKKGMRVFHAKPNYCPSUNVEGLWALVGAKVQEQ

 DKYHPFGKVGMRHYHRNQSFCPTVNLDKLWT VVSEQTQVN
 PIYRRLPKRGFKNDNAKEFAVINLGKLQAAIDAGKLNA YMPDHFGKRGFNRPPKVVREPNTI NVGELDALLADKLLEDG GLIKRYPKLRGYKFKPLKLKPADINDEALGKKDKGGEDDN PI QRRLPKFGFKNDNRISYKA INLS TREDAESKN PLFKKLPGRGFPNTRFQKPVFAIN PLQRRVPKFGFKNVNRVAYKPVN PLQRRLPKVGFRSLKKKESQEV SWVVKYAPDWYGKHGFHNP TTKOTNADTGKYELAALKA P TQRRTPKRGFKNPDKTVYKVINGQVDQWALNDMEAGQ PFYLRVPKYPYYKDHHLRRQYVPVTLTKLQHLIDMGRDDP TNFDKYHPGYFMDHYHRKKNPMWKPTINLNNLLSRLIAAEE TLISRLPKRGFNNVGTTYEVVKLSHLEATGMDVLDREALE PLQRRVPKFGFKNLN RVEYKALNLDTGQKLAEAKN LSK PLHMRVPKLR GFKNPFRVEYQIVNVARTGELFPEGGVVG
 $P L H M R L P K L S$ GFTNNNKVVFQVVNLDRIASLFPQGG PLQRRIPKFGFKSRNUITKKIIGNLDTIQNCIDKINQKQ PLSRRFPKRGFMFNQTGKTWAPVNLERIQSWIDQGRLVS
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|  | SESAEFNIDGAGGEAVRSERA |
| :---: | :---: |
| UniRef90＿U1QUN0 |  |
| UniRef90－FoRJV7 | SASAVRAVEAAGGRVELTQAQ |
| UniRef90－A8BZ78 | SSDAEKKLREVGGVPLLVP |
| UniRe90 |  |
|  |  |
| UniRef90 AORUE5 | TASAEEK】KRAGGEV |
| UniRer90－UPIOOO34BF922 | SKTARQKTEAAGGSTET |
| UniRef90－B0D2 | SKNADEAIEKHGGKVV |
| UniRe990－A0A031LMD6 | T DKAKGKIEKNGGEVILT |
| UniRef90 R7FPG3 | SAEAKNKVKAGGEA |
| UniRef90－Q11P1 | tksa Deavekaggs VkTLapkkde |
| UniRet90－U5QAEO | SKSAIAQ ESQQGKATKI |
| UniRef90＿881L－H3 | A A R |
| UniRet90－H8WYJ7 | DQAIE K |
| UniRef90＿B1AIN8 | SKGALESUSNSKAKAQLLE |
| UniRef90－LOPB81 | SKTAEKKПKEVGGVVELI |
| UniRef90－V41XW8 |  |
| UniRef90 R1EDW4 UniRef90－Q8TRS5 | T S S ARAEDEALGGSC！ SASAREKIENAGGSCll |
| UniRef90＿UPIOOO366AC01 | SKKAEEY |
| UniRet90－A4AFC5 | SGSAEQKIVAAGGS |
| UniRef90－ROMBE2 | TEGAKKEI ESVGGK WII |
| UniRef90 UPIO00255F289 | S S SATEKUSAAGGSTETL |
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| UniRef90－Q110D1 | SASASEATINAG |
| UniRef90－UP100037C4ECE UniRef90－C71P6 |  |
| UniRef90＿C7N1P6 UniRef90－T1136GO | SASAAKAKEAAGGK |
| UniRef90－F7HZR2 | SRRGEEKЏKGAGGACVL |
| UniRefo－C10819 |  |
| UniRef90－C1N819 | S |
| UniRef90－Z9JK9 | TAGARVLVETAGGS |
| UniRet90－E8TUF8 | TKKAVEADEKAGGKDT |
| UniRef90－T5 |  |
| UniRef90－Q60765 | SKTAEKRTKAAGGVCVLT |
| UniRet90－K2ANSO |  |
| UniRef90－W9DSB1 | SASAKEK EGAGGS |
| UniRef90－UP100037DCOAE | SASAKEA EKAGGKA |
|  | SKTAKDE LAAGGNAVVLGKKK |
| UniRef90－UPIO003B5EF29 | SAKAAEKЏAAAGGKAEVI |
| UniRef90－ADAO1PMP8 |  |
| UniRefabSMr |  |
| UniRef90＿10YMG9 | SASAQAKIEGAGGRC |
| UniRef90－H9GPX6 | SELAMAAVEKNGGVIT |
| UniRef90－O6AZN4 4 | SQLAIAAAIEKNGGL |
| UniRef90－M4YM70 ${ }^{\text {U }}$ | SAKAKEKIEAAGGS\｜ |
| UniRef90－J9VR53 | SKSAAQTI DNAGGEVK |
| UniRef90－E1RCM8 | SAGAKAKIEKAGGKVTGIEEGND |
| UniRef90 K7IR15 | SEPVIAA ERNGGV |
| UniRef90－UPIO0047E21BC |  |
| UniRef90－UPIOOO333A556 | SRRAEEKMKGVGGSL |
| UniRef90－K2ETS8 | TK SAIA AVEKAGGSVK1 |
| UniRef90－UPIOOO40BCE46 |  |
| UniRef90－UPI0003B5F09D | SQAA $\mathrm{S}^{\text {AK }}$－QAAGGTAE |
| UniRef90－09UX85 | T NKALQKVKEMGGEVILSP |
| UniRef90－L9KW57 UniRef90－A0A014MDW5 | SR |
| UniRef90－－8DK88 | tGSAKEKTA |
| UniRef90－V6EW25 | SEAAVAAVEKAGG |
| UniRet90－Q8TZA8 | TERAVEKLEEAGGEA |
| UniRef90－X1LK75 | SKGAKEK EKAGGT |
| UniRet90－W2C3T8 | SKKAEDAIDT ${ }^{\text {L }}$ GG |
| UniRef90－F8L3V9 | SKAAVRKLEEKG TV |
| UniRef90－R7ZMMZ1 UniRef90 A0A023 | SASAEEA】QT】GGTV |
| UniRef90－UPI0003713AAE | SkGAQEAVKGAGGETVLIPGA |
| UniRef90－WOEWP8 | SEKAKTAlEAAGGTVELLK |
| UniRef90 W4YMW5 | S |
| UniRe990－E9BSQ2 | SKLADKKIRKAGGAVV |
| UniRef90－UPIOOO3701AOC UniRef90－R6DOS5 | SAAA AAVEAAGGKVILPEVKGSDN |
| UniRer90－R6DGW5 | sksava ale avganalv |
| UniRef90－F5XNL7 |  |
| UniRef90－K2FSS0 | S K |
| UniRef90－S8EP76 | SQSADRAVEKLGGTV |
| UniRef90＿14F3R8 | SQSAQEKI GAAGGSTTQU |
| UniRef90－U3QCY9 |  |
| UniRet90－K1YFB3 | SKTAKEKVEAKGGTVECV |
| UniRef90－1112R8 | TARAKAAVEAAGGTVRLV |
| UniRef90＿B8NII2 | SATAIAAVEAAGGSVT |
| UiRef90＿K5W9Y2 | S K S Allir AlVE K LIG G TV］ |

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UniRef90-J9JST4
UniRef90 P43415
UniRef90-UPI0001 DEB857
UniRef90-Q21QP2 UniRef90 UPI00035ED56A UniRef90-17G9Y0 UniRef90-FOX501 UniRef90_F9ZAZ5 UniRef90 A1BQ83 UniRef90-K2F3V5 UniRef90-C7LKI7 UniRef90 E6WYL7 UniRef90 E6PDL1 UniRef90-A0АО23HV93 UniRet90_H5SGN4 UniRef90_D8PKU4 UniRef90-D3TMK5 UniRef90_Q9V1V7 UniRef90 F4WIJ6 UniRef90-A4WM07 UniRef90-M4ZT68 UniRef90_A0A034VKE3 UniRef90_M4ZWW3 UniRet90_D4DYE2 UniRef90-Q8UVF4 UniRef90 D1JHV2 UniRef90-UPI000258D6C4 UniRef90-GOHIF3 UniRef90_EOSQ71 UniRet90 A0AO23Y684 UniRef90-K1Z0K2 UniRef90 B3EUK4 UniRef90-U5ERUO
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UniRef90 W7ABF3 UniRef90-UPI000464317D UniRef90_W5B1L6
UniRef90ㄴ1L9W6

KRDRRGRGPASGKGK ${ }^{10}$ S GRGHKGQKVPAGFNGGQT TSTRGHKGAKSRSGFEGGQM MRGQKSRSGFEGGQM
KCHSYRGSRTCGGGTHKNRRGGGSRGGRGHAGACKHNM SRVKRVGRGNSSGRGTYSSRGGKGQKARSGGKKGQK KNRKKRGHVSAGHGRIGKHRK HPGGRGNAGGMHHHR RSNKRLGRGVGSGKGKTA GRGTKGQKARGKDPATFT RPGFEGGQM
RVGFEGGQT
SVQRRTRVGRGASSGHGKT SGRGSKGGKVKAWFQGGQT
KNRKKRGHVSAGHGRTGKHRK HPGGRGNAGVMHHHR HKRTRRGRGPSSGYGKTA GRGHKGQHSRPWFQGGQT KAKRLGRGNGSGKGNYSGKGLKGQKARSGFEGGQT SKKTRRGRGPASGKGKTGSGRHKGQKQHGGFNGGQT KTRKDRGHVSHGHGRTAKHRKGHPRGQGNAGGDHHNF GKARSGFEGGQN
SRK $\square$ TK $\square$ RGSRTCGYGAAKKHRGAGHRGGRGLAGGHKHK KKNKRGRAQHGGDKH GHGNKGSKARPGYETGNT
KNRKDQGHVSHGHSLISKHQK HDGGWGNAGGTHHQF KHYKRRVGRGDGSG IGKTAGRGHKGQKSRAGFEGGQM SRKKKFRLGKGDGSGKGKT SGHGMNGQKCRSGFEGGQT
KNRKKRGHVSAGHGRVGKHRK HPGGRGACGGGHHKF TSTRGHKGAKSRSGFEGGQM GRGNAGGAHHHF
RKAKKT $\square$ GRG GKRGTYSGRGNKGQKARSGFEGGRS TCTKGHKGAKSRSGFEGGQM STHSKKRVGRGQGSGTGKTA SRPK KGRKVLGRGLGCGKGK GR GGKGQTVRSGFEGGQT
GHKGQKARSGFEGGQQ

FEGGQT SKKNPQRGRAQHGGDKHGGNKGSGQRQNYMRDGYETGNN GSHTHGWGCKKKHRGGGSKGGRGMAGTGKRNK SRKDPKRGRGQHGGNKHGGNKGSGQRQNYMRLGYETGNT KYRRGSRTHGWGRVGQHRKSGGSGGKGMVGFHKHKW SKKGKLRLGRGQGSGKGGTC GRGHKGAKSRSGFEGGQM SKKNTKRGRAQHSGDKHGGNKGSGQRQNYMRDGYETGNN TKGQRARNGFEGGQM

RVKRDRGTRTCGGGSHKKRRGSGSRGGVGNAGAHSHHV RRPSQRGRGHGGDKHGGNKGSGQRQNFMRIGYETGNT $R R T R V G R G \square G S G H G K T C$ GRGHKGQLSRSGFEGGQT KSRKMHGYRNRGWGS $\square$ GQ QHRKSGSRGGRGAAGMHKHKW SKQNVKRGRGQHGGDKHGGNKGSGQRQNYMRLGYETGNT RKERTRVGRG $\square$ GS GLGKTC GRGHKGGK $\square \mathrm{KA}$ G GE GGQT SRHTAKKLGRGNASGHGNYSGHGGKGQTARSGGSRGK L SKKQNKRGRGQHGGDKHGGNKGSGQRQNYMRVGYETGNA KKDGHKHGWARLGYEGGQT SKQNDKRGRAQHGGDKHGGNKGSGQRQNFMRDGYETGNQ
TSRKCNFRGSRTCGGGTTKNRRGAGNRGGRGRSGENKHHF MHHHF
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G G GPPVWFEGGQL
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$R K S G S R G G R G A A G L G K H K K$ $K S R K D R G T R T M G W G R \square G Q H R K S G S R G G R G A A G L G K H K K$
$K D G K R V G R G Q G S G K G G T A T$
$R G H K G A K S R S G F E G G Q M$ GGSQHGKHRK HPGGRGNAGGMHHHF KKDGHKHGWARLGYEGGQT $R Q R \square R V G R G D G S$ RRGNYGGRGMKGQKSR GRGLHML
 RRKTKLLGRGPSSGHGKT S GRGHKGDGSRSGYEGGGV SRNSLKRGRGQHGGDFHG EGQRSRHNYMRLGYETGNN RVGRG GKRGTYSGRGLKGQRSRAGRKRGLI STANRKRVGRGCGSGMGKT STRGGKGQTARSGFEGGQT
 ISAGQGNSCGFGMRGQKSRSGFEGGQM HRGGQGNAGARHHHS KKKRGRGDKGPGKG $\square$ REKHKHR KSGRPNSTFESGRT STHKTKRVGRGPASGYGKTSTRGQKGQKSRTGFEGGQQ

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GSLAFFKKLPGKRGKGNDNDSEKDKVINDSQLTGFKAKED | PLQRRLPKRGFKNAPFKATYEVVNLDRLVASF |
| :--- |
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 SK P $\square \mathrm{DLS}$ VLCNTGLYN $\quad$ NN PEDKHFG VA DLVAKGAVRKNSLVKVLGQGEDSVALQVTVDAV $V$ S A A K N K T R A P P N V DVVR S S Y Y E V L G K E K L P K P V L V K S K L F
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A KVD
A A K SKTGVAP I IDV
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## $\stackrel{Q}{\mathrm{Q}} \mathrm{R}$

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