

## QUERY

UniRef90_A7T7W5 UniRef90-LODFS UniRef90 UPI00047A382D UniRef90 UPI00037A007F UniRef90-UPIO0041C04BE UniRef90-UPIO0036E6C90 UniRef90 D7C642 UniRef90_UPIO0036E78E9 UniRef90-U5W6T0 UniRef90-S5VCQ2 UniRef90_A6C5Y8 UniRef90-B4V1L1
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UniRef90 F4L802 UniRef90-L1Q8PO UniRef90 UPIIO0034A56AF UniRef90-D7WW57 UniRef90-V5X5U2 UniRef90-A7BVO7 UniRef90-UP10003A98CD7 UniRef90-D6SPZ4 UniRef90-UPIOO03705E09 UniRef90-C3Y134 UniRef90-UPIOOO478AB42 UniRef90_L7CE66 UniRef90_A5UQ26

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DSKKWKMPEEAYRQWYKS 60
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SKRWKAPEKQYREWFKSKENFALGQVQFVRVEEELWIAN SKKWAGPEAEYRAWHKSQNDFGLGALQLVQVEPHVWVAN VSRRWDAPERAYREWHRKRNDFGLGAVQFVQVEPYVHI AN I SRRWPEPERDYRAWHRAGNGFGLGATRLVQVQPDLWVAN VSRRWKEPEARYREWHRAKNDFALGAVQYVQVERYVWVAN LSRRWPEPEADYRWHREHNDFGLGAVRLVRVDTYLWVAN
VSRRWPEPEAAYRRWHRERNDFGLGAVQIVQVSRYVWVAN LSRRWPEPEAAYRSWHRARNDFGLGAVQFVRVSPFVQVAN
LSRRWPEPEAAYRAWHRAGNDFALGAVQLVEVGARGWVAN
ISKRWPEPEAEYRHWHRAQNNFALGEIQLINVEKYI WVAN
VSKRWPEPEAQYREWHRSGNDFGLGAVQLVRVQPDVWVAN
LSARWPEPEKEYRAWHRGRPGFRLGAVQVVRVDRYVHVAN
LSKKWKEPEKAYKKWYKDNNNFERGEVQLIPPVTEYMSVCN
I SKRWKDPEAKYREWFKAKENFNLGEVQFVQVEQDLWI AN
I SRHWPEP
LSKRWKYP

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## V

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 $V$ S R K W S E P E LIA Y R S W Y R E E N D F G L G A T Q L I
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I $\begin{aligned} & \text { S R R WP E P } \\ & \text { S K K WT E }\end{aligned}$


LSRRWWKT P
L S K R WK A P
L S A R WMAP

## QUERY <br> UniRef90_A7T7W5 UniRef90-LODFS4

 UniRet90_UPI00047A382D UniRef90_UPI00037A007F UniRef90_UPIO0041C04BE UniRef90-D7C642 UniRef90_UPIO0036E78E9 UniRef90-U5W6T0 UniRef90-S5VCQ2 UniRef90-B4V1L1 UniRef90-E8WAF2 UniRef90-UPIO003790E35 UniRef90-B8DDJ6 UniRef90_UPIO0034851FB UniRef90_UPI0004019E50 UniRef90_L7EV00 UniRef90-C7M3K9 UniRef90-D9UN45 UniRef90_UPI0004635E1E UniRef90_G8M249 UniRef90_Q9X7P1 UniRef90_UPIO00376BF6A UniRef90-G8SAD7 UniRef90_W4T4T6 UniRef90-L8K813 UniRef90-I6B1D6 UniRef90_UPIO0028A17F2 UniRef90_UPIO003B4B94CUniRef90_UPI00036D00B0 UniRef90_UPIO004713970 UniRef90-UPIO00479431E UniRef90-H8H2X4 UniRef90-M3CBW8 UniRef90_J7L1Q9 UniRef90_A0AO23BT92 UniRef9-C7Q2UU7 UniRef90-W9E4V7 UniRef90-FOIFP2 UniRef90-J6IGQ6 UniRef90-H1PYD6
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UniRef90-G3WYL1
UniRef90-M4ANA1
UniRef90_V9KCL3
UniRef90-B5H4R3
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UniRef90_L7CE66
UniRef90_A5UQ26
UniRef90_I3Z1X6



 MVGQRGTRTGSAGPPVRYEAI GKCLAALAGHASALGASV $M V A Q R G D R$ PSSNGPPIRYEALDRALDSLGAKALDLSASV MI GQHGMRTGSKGPPPVRYEAIDRALTELGHRALELDASV MVGQRGMRPGSKGV PVRYEAI GAALGEVAASAAELGASV LVGQHGMRRGSKGV PVRYEAI DTGLATVADHADELGASL
 $M \operatorname{MiQRGMKTGSKG} P P V R Y P A, ~ E Q S L Q S V A D K A R E L S A S V$ MI GQRGTRTGSSG_PPIRYDAVERCLATLADHAVELGASV VVGQRGMRRGSKGV PVVYEAI DEGLRKVAEQAAVLGASV $M V A Q H G T R T G S K G P P I R Y D A L D E C L A E V G A R A L D L R A T V$


 LI GQHNDYKDENGDPP I RYEAVEKGLQQI A D FAYEDNAKV M GRHGTRRGGTGVPVVYEAI DEAALHRLAPEAGRLGATV


| M |
| :---: |
| M |
| L |

## N



$\bar{M} I$ GQ H KIN K S P H G I PP P I R Y E A V E K C L E K L A E E A L L L L N A V V
LI GQHGTGHRNGVPPI RYEAI SEGLSKLAVHARHHGASV
MI GQRDIKRGKS G PPI RYEAVDKCLVKVGEKAVELDATI

I

| LI | $G$ |
| :---: | :---: |
| $M V$ | $G$ |
| $M$ | $G$ | GQHG| KD

mПGQQGПK GK K
MVAQHGTRGRDNPEVP:RYEAVKQCLEQIADKAKQLNASI
MVGQHGDRTGSNG



$\overline{M V} V Q R G M R T G S Q G V P V R Y E A I D K A L A R V A D K A L A L G A S V$

| F PF P |  |
| :---: | :---: |
|  |  |

 ALIVA Q R R D K T N QL S GIJH L N A L D E GL K K I Y R A A K Q K K A S V
K V I K T H WR
F P T K K H WRNP S K
FPTKGHWRSDSR
FPTKEHWRN
FPTKRHWRGASK
F P T K Q H WK AK S K
F P T K K D WK HR S K
F P T K K D WK H R S K
F P T K A H WR S K S K
$M \perp A Q K G Y G P S K T P R$
FPTKKHWRNK
$\frac{F P T K Q H W R G D S R}{}$

| $V V A Q$ | $Q R D R S N T$ | $L$ |
| :--- | :--- | :--- |
| $F$ | R T K R H WK GK S K |  |

F P T K R H WK GK S K
$F P T K R H W K G K S ~ R$
$\begin{array}{llll}F & P & T & R H W K G K S \\ F & \text { R } & \text { K R H WR }\end{array}$
F P TKKHWRN
F P T K R H WRNK S R
F P T K T E WR L K S K
F P T K G H WK AK S R
FPTKRHWR GAS R
$M \mathrm{~L} A \mathrm{Q}$ H GVR K D K D R T T Y M D
$F P T K Q H W R$


F P TKRHWRDKSR



F P T K R H WR GK
K T I I N F P



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UniRef90 ${ }^{-}$W1JUG5
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UniRet90-C80112
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UniRef90-UPIOOO24928C4
UniRet90_X6KLD2
UniRef90-J2MAW4
UniRef90-UP100035CA7BE
UniRef90_U2SFB7
UniRef90_K7G427
UniRef90-ToSODO
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UniRef90-D3G2G0
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UniRef90-UP100046D 14C3
UniRef90-J5PHV1
UniRef90-B3QBM1
UniRef90-Y1D4F6
UniRef90-LOHTFO
UniRef90-UPIOOOO174440
$1 \square^{10}{ }^{20}{ }^{20} 40$

ALNYVKGNLVTHPVDAQVDALVNTVNTVGVMGKG|ALMM MT AKYTKGNLL K K K ADVDALVNTVNTVGVMGKGIALM
$\qquad$ KALIGDL IEYTSGNLH FT m S EAVDALVNTVNCVGVMGKGVADE FTSQARVLVNTVNCVGVMGKGI AQE ADAEALVNTVNCVGVMGRGI ALQ ADAEAAVNTVNCVGVMGKGVALE DTQDUKYVSGDVAMPTQDGDSVVVHCVDDSGRWGKGVFA MTTESSTGDLDKQQ LEFTSTGDLLKQQ TTYTQGNLLETVN

 QDDVDALVNTVCVGVMGKG AL DSHAQALVNTVNTQGVMGKGIALQ SEAEALVNTVNLVGVMGKG:ALQ PGTDALAHCISEDCRMGAGI AVL ASEDALVNQVNCQGVMGSGA$A$ DYDADIRVNTVNCVGVMGAGVALA SSATITAHIVNNKGKWGKGFVLS OADVEALVNTVNTVGVMGKGMALM ADAEALVNTVNCVGIMGKGI AL ERGDDADAHCCNCFCTMGSG1 APK TEPSQTLVNTVNCVGVMGKGLAQA THFKQGNLL MTISHHEGDLLS LRYVIGDVTHPVD VTEVDGDALVPRG IRYTTGNLL A | 1 YYVTGNLLE A WQUTYVKGDLFAC ASDVDAVVNTVNCVGVMGKGAALQ DTPTNVVVHCADDSGRWGRGLFSA
GSGPKLVAHVIDTSSTWGNGFASQ A ADTQALVNTVNCVGVMGKGMALQ DAPVEALVNTVNTVGVMGKGI ALM APAEVLVNTVNTVGVMGKGIALM PKTDSLVAHCI SEDCRMGAGIIAVQ SDAQTLVNTVVDLGGGGKGFVLA ADAEALVNTVNTVGVMGKGIALM FTSNAKVLVNTVNTVGVMGKG!AAE AADAEALVNTVNCVGVMGKGAALQ KDDSEAIVNTVNCVGVMGRGI ALQ FASQCQTLVNTVNCVGVMGAGI ALE
 Q
$\qquad$
FN
$R \mathrm{VLDGD} \mathrm{FQ}$
T YTQGNLL IHYDQGNL $M V V E Q A S G D L L$
$M S V K I G Q G N E A T$ I FTSGD MEA
N LEYRHGDILQ YKVGNLLEATGGA

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5CA7BE$T K$ LSKNLL
F
FESPAQTLVNTVNTVGVMGKG|ADDTAPAEALVNTVNTEGVMGKGIALQDAPVEALVNTVNTVGVMGKGI ALLMQM MPTLFVSGDLLMELAYRTGNAATV DKLQ,

DSWTLKYVTGDLESC TKAQALAHGVAPDDHFDHDLABA SEAEALVNTVNTVGVMGKGI ALQ PRDESLAHCISEDIRMGAGI AEI TAEVDALVNTVNTEGVMGKGLALQ EPSVI FSCVDESGNWGHGGMFDDDSKAQTLVNTVNCVGIMGKGIALE
KDEAEALVNTVNCVGVMGRGI ALQ



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NTKAQTLVNTVNCVGVMGKG: ALV
TADVDALVNTVNCVGMMGRGIALQ


TGADALV


EKAEALVNTVNCVGVMGKGIALQ
DSGADALVNTVNTVGVMGKGSALQ
SGAKAVVQGVAPNDDFHQGLABCQ
SAPIVEALVNTVNTVGVMGKGIALM

DEAEALVNTVNCVGVMGKGI ALQ
NAKELII GHQVNCQGVMGSGI AKA
DKAQLVAHGVAPNDHFNQGLAKA
ADAQALVNTVNTVGVMGKGIALQ

NAPVEVLVNTVNUEGVMGKGAALC


TAPAEALVNTVNTEGVMGKGI ALQ
DAPVEALVNTVNTVGVMGKGI ALM
QDGLQALAHGCNCAGAMGKGIAVE
S
REAVIVHCVDDYGFWGQGLFSA
SETEA INCVNOVGMGRGLFA
TQALVNTVNTVGVMGKGI ALQ
TARTDALVNTVNTVGVMGKGI ALM
EAEALVNTVNCVGVMGRGIALA
RIKYLSGDAVEPLK
RRVDAIVNTVNTVGVMGKGlALQ
KSTDAVNHVNNKKGKGGKGFVLQ
$N D S A D A L V N A V N T V G V M G K G L A Y Q$


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UniRef90-F7P1EO
UniRef90
W1JUG5
UniRef90_UPIOOO37E11E2
UniRef90-C8Q112
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UniRef90-D1W1W2
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UniRef90-HOYUB7
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UniRef90-H1XUN2

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UniRef90-LOHTFO

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FKRRWPDNYKAYKKACDA KVLRPGTMLIYEKSEPKFIVN
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FKNKWPDNFDAYAAACKA GQVRPGRMFVFDSGKPNFIVN
FKERYPNNYKSYRQACKDQKVV GKMFI TEEREMDGN FKKMFPNNFKKYAQVCKN KELRLGQ LLVTKDKSLLSGE FKKKFGGVQELLDQ
FKKKWPENFKAYAAACKQ LRDRYPSLYPEYKKYCQYTPDGLLGHCQLVQTGAK YTAN FKNAFPENFHAYELACQK GEVQPGRMFVFDTHNPKFIDN LSKKYPAAKKVYGDKYSNTSDLTGGDDQFISVDDRDFVAN FKERFPQNFAAYAAVCKDKKLVPGGDFVTERSDGPRWV N FKNRWPANFRAYKDLCDTKG LKPGQMFVFDTEGPRYLI N
FKKAFPEAYFSAYQKACRKGELRPGRVQVWSTGSFVYI ■KSKWPGAFKADC ATKRGDYKK■GTFTKY TENNLTVYN FKTREPKMFEAYKRGC DQQMLEPGKGWLWR GSDSWVGN FKQAFPENFRAYKTACDA KR1HPGQMFVVATDFPKY1 N LAARSPTPEKQYK LASKCQDLALGDCHLINDDDDEGRGL VRKKFPHVWEQFRETCADDKTPKLGQVFVARMGEGISVAH FKRRFPENFRAYEKACKQ GEVAI GAMFVTETDGPTYIVN
 FKQAFPENFKQYKKACDA KQVQPGQMFITSTGFPKYIIN FKKKFGGVQELLSQQKK PGEVAVLKRDERYVYYL VSRRWPEPERAYRRWHRARNDFALGAVQMVQVRADTWVAN FKKRWPRMMQDYAERCKE KRVKPGEPYLYSDIFGTSIVN FKERFPDNMAAYAEACKKQ QI QTGKMFVTETKEPRWI I N YKKПYPKMFEEYKRLC EDGTLDTGEDHLYKTSNK WI LN FKRRFPSVFKEYEAACRERGDVQUGRMFVSPDDGARWVIN ПKRDYPEVFMQYKQSCSNKGELGGHCQI DSTQSEKYIAN FKNAWPENFKAYEAACK REEVQPGRMFVFDTGQUT WI IN FRLRYPEMYTRYVELCKQKQMGEMGKLWLYKSDRCDWVLN

FKKRFSSVEELIKAQQKKT
FKRAYPENFREYEKACKA

## FKNTFPENYKRYKAACQS

KQVQPGKMFTSKTGNPKYYYN K KELDVGQLLIVRNEKTLLGE RHPKSGELWTWMSADGRHLVN

 FKQAFPQNFLEYQKACRK GEVQPGKMFIHETGNHKY HN LRENWSGMYKDFRHYCSQHNDELLGKCHWVWGEGSRHAN FKRAWPQMFEDYVAAC ERGEVQLGSMHVWTPDPPRYIIN FKQAFPDNFKAYQKACK DNQVQPGKMFIYKTGSPEY:
FKERFGHNFEDYAAACK RKEVKVGQMFVTETDGPRWI
RKM FKQAFPAMYKEYERACK
FKEAYPENYKRYEAACRA DHEKYPAMHKDFHHWCHQHKEVRVGKMFVTHRDAFIWI I N LHEKYPAMHKDFHHWCHQHHP KPGEAWMWGGSDGVRIVN FKSRYPRMFREYRDDCEARA LRIGNLHLWRSDTRRWV N
 FRARFPEMYVEYKQRC ADGRFKDGDVFTWTAANVTVFN FKKKFGGDQDLLDQQKKS
LSSRSSAPETVYA AAKKCQDLKL LREKWPVMVKDFRHYCRQCHPQPGELWEWGGVGGVRVFN FKEAFPENFRAYQAACKNREVV PGRMFVHERSGPRWI IN


FKKAFPENFVSYERACKA
FKERFSENYRLYSAACKA
$\qquad$
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FKKRFPDMHKDYVQRCK
FKNAWPDNFKAYTAAC $\quad$ R
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FKGRYPGMFDUYKGFCKS
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Cancs smpory $L$ S K R Y P V V K K M Y Q D WV N D D K S F A L G N V Q F V V V D E NV F V A N








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 YR H R F P E M F K S Y A R L C E E N K Q L L H P G L L Q L W

 F R A F P K M Y A E Y K Q R C A A D G R F G L G D



 FK K L Y P E M F R N Y Q H F C E S G A LTVVGK LA LY K A A G K W IK EA F P K MYSA D L K TEKG DKAKLGTYTMAFKDGEAAGFN
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F PTKDHWRGKS QUVF
K I I NFPTKT TW KKP

| $K$ |  |  |
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| F P T K N H WK Y |  |  |

LIINF PTKVHWRYPS
LI GQLTYGR SSTVYT
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FPTKRHWRGKSR
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130
140
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 A P S L GVGHGGLDWSKVRKMIFAALGNLDCTVYLY
 A L PY G GCGLANGSWEIVVQKLEETFEDYEVTLY
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 AVPPLGAGNGGLD WPEVR AI PPLGSGNGGLDWKSVKPV
 $\begin{array}{ll}G L P K I & G C G L A G E D W S N V \\ H M P R V G Y G S D R S E W Y T V & E\end{array}$ AVPPLGAGNGGLEWMAVREQIEAVLGDLHAEVLVFE HMPRI A SGRAVGSWFIVEEQI S SAVTDRGVPVVVYDG TLPALGCGHGGLDWMKV AI PALGAGNGGLDWASVKQLI L A V P P L G C G H G G L A WT T V AIPPLGAGLGGLDWMQVRERIEAALGGLDVQIVVFE HMPRI GYGSGRSQWYTVERLLRKYASITYGI KI FVY


 AFPPLGCGNGGLDWDVVGPIMYHKLKNLPDEIEIY HMPRI GYGSDRSEWYTI ERLLRKYAALHGINNIVVYYF AVPPLGCGNGGLAWSEVRPI IVDSLSTLDVDVRLY ALPPRGCGYGGLA WTEVKRLI EEKLSENDVEVIVVE
 A L PRLAT GVGGLDEWEQVYPLLQQALKDLNI PVYVV A PALGSGLGGLDWNLVRSRIEATLGSLELKIVVYE AVPPL GAGNGGLKWADVRPLVERHLGSLGVDVLLYE



 AVVP P GCGNGQLEWSVVGPTLYRHLSTFGGPVELY




 HLPRI GHSTPHFNWYGTERLI RKHLSSKGIPTFI YYF A DPPLGAGLGGLDWKQVRPRIEAALQGVGLRVVIFE AFPELGTSSGGLDWAEVSNLMYKYLEPLNLDI EI YHF HMPRI GYGSDRSQWYTVERLLRKYSSIFAVEI FVY A $\square$ PPL GAGNGGLDWARVKHLIAESLAGHDCEI IVFE AFPKLGTNAGRLPWSQVKAVMVEYLKKVDIPVYIC
 AI PALGCGNGGLNWEEVRSLI YESLGDLGVRVLLYP



 SFPQLGTGNGGLDDEEVQPLMEKYLRKLPIVVYVH GFPKI GA GLAGGDWNVI EAMIKSIFFDCDVTI YI
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60 70 70 HDपNRपYA ${ }^{80}$ FRKAYPENFKAYESACK RKEVRLGEVFVHDLHNPRYIIN


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 I S H R A P Y V EAA A Y R Q M K V N H D L K L G Q A H C I P L D N H T F V C L
 VK K LLF PEVEKSYKEEARGK
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Y EK E $K \vee T S G L P S$ A $L$ FRNKF GQID RLK Q Q
LRNRYPMAYD DYKA LIRNR Y P MAA Y D D Y K A Y E K E M G F L R D DG Q I A Y S A DN D N LI I A N

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 $\square K$ QRFPEAYAAD $\square$ ATVVKG DRSKL

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$\qquad$
LS KL S T S I G DAY QWASEHGDLDHJGDLDL R R L D DCCMMVAL

 A L A K L S E HV V HA Y E R A Y E CD D L H L G D L H L I S T D R H Q CVV A
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FKQKYPAAYEVVYRSHCESRSNPLLGTT|LLI|EPQGKHWIJAC FKEKFGGVKDLQAQ GVKPGGVAVLKRGPRFIYYM ISSRFPAALKADSETA EGDRSKDGSYTSATVAMALTVVN LAKAYP P ULADDKTTYLGDDAKGGTYTQATGNNGQICYN





 VRERWP ENFWELDALATKNGDRSKLGTISATSYPYAGLAFN


$F R E R F G L$ E NLQEQAKQEPL E I GRCYPVGR




 $\square A K E F P$ Q A L E I D K Q T S R G K V E K LGGG S $\quad$ GWT H Q V N G Y N WC G N



$\square K R A F P Y A Y A A D L D$ TMAGDQSKLGCFSLGVPDEQPLVYN


$F R N K F G K V A E L Q K Q$

| $N V$ | $P G G V A$ | $L R D N G R Y$ | $Y Y$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |










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 LIVGEAQLTPVKSKKYIVN



| $K$ | $G$ | $V$ | $G$ | $G$ | $V$ | $A$ | $V$ | $H$ | $D$ | $P$ | $P$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $H$ | $V$ | $V$ | $Y$ |  |  |  |  |  |  |  |  |  |
| $E$ | $P$ | $G L$ | $H$ | $D$ | $W$ | $W$ | $E$ | $D$ | $G$ | $R$ | $R$ | $I$ |
| $V$ | $H$ |  |  |  |  |  |  |  |  |  |  |  |


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






UniRef90_S8AGR4 UniRef90_W4YUH7 UniRef90_A8BMJ3 UniRef90_C4MZJ7 UniRef90_Q19CS3 UniRef90_A0A034W9I7 UniRef90_U6RVP8 UniRef90_W1UDG8 UniRef90_K0EHN4 UniRef90_UPI000441102D UniRef90_U3ANX8 UniRef90_H1CC57 UniRef90_V6MT76 UniRef90-I6ZRD4 UniRef90_UPI0003C37ABA UniRef90_S2Z4Y6 UniRef90_G4THL9 UniRef90_A5E287 UniRef90_H9K8S5 UniRef90_R7PKX1 UniRef90_V9KT55 UniRef90-R6CW52
UniRef90-W4ANJ1 UniRef90-V4NTZ9 UniRef90_W6AUF0 UniRef90_UPI0002EF71BC UniRef90_L7WAA2 UniRef90_UPI00036AEEB5 UniRef90_L1NIV1
UniRef90_UPIO0032AB4C2
UniRef90_M9UXP1
UniRef90_17LH66 UniRef90-M4B6W5 UniRef90_N6UT60 UniRef90_A7XF44 UniRef90_UPIO004636D53 UniRef90_UPI000444042A UniRef90_C4GIU8 UniRef90_H8KUP2 UniRef90_U5ET22 UniRef90_K7QLT0
UniRef90_C8X8M1 UniRef90_-I6WHL1 UniRef90_Q3ST30 UniRef90-UPI000346FDE5 UniRef90_K0XJF6 UniRef90_K0NXU8 UniRef90_C8W0M8 UniRef90_A0A023MI55 UniRef90_Q503C5 UniRef90_R6ZWW3 UniRef90-E1F2T4
UniRef90-R9MG68 UniRef90-M5DV84 UniRef90-Q16MT6 UniRef90-W7T4H9 UniRef90_UPI0003EDE74C UniRef90_Q2SJU4 UniRef90_A8JNW5
UniRef90 A9TQZ8 UniRef90_F9ERA7 UniRef90_R1GLP6 UniRef90-A1BH56
UniRef90-A6ZKW8 UniRef90-X1XU34 UniRef90_D3TRI6 UniRef90_G8XZ93 UniRef90_D2V921 UniRef90_UPI000372150D UniRef90-H3FC23 UniRef90_Q7QCF5 UniRef90_A9AYL7 UniRef90_B4ML62
UniRef90_T1DQZ8 UniRef90_UPI00036F52F1 UniRef90_H8X892 UniRef90_G4YFB2 UniRef90_U1HJG3 UniRef90_B4J140 UniRef90_IOAFW7 UniRef90-X1UVD6 UniRef90-H3E9W1 UniRef90-A0A024J7A6 UniRef90-U2CYP8 UniRef90_C7PX96 UniRef90_M1EAM4 $7 A 6$

LF A S ARYGKRVDT PDMILEATDAAFEHMVNQVVRE\|GA|L| $V$ TKEKYWNKP TYKCLQDSGQSMANHCKRNGKTL
 LP SK $\begin{array}{ll}M Y T \\ L V A T & T\end{array}$


LGT QK T WRTHAD
FPTK K K WR
F P T K R HWK
F P TK K H WK G
AYT QYDF WTP T P GPRVD $\begin{array}{lll}E P S & K \\ S & S & E \\ R & V \\ Q & D\end{array}$ $L F T S R R Y G A R K D$
$F P T K A H W R G K S K$ $K P Q$ F FYTGRHWRNAS


I TKEKASYKP
FAVK D D WK D P S K
V $Y$

A VTQE YGRDP SNKPT L Y T Q Y EPG
$F P$ T K R D WK HPSKK
FPTKRDWKHPSKK PNL
GYTQFNWRG TGRKVDY LITTQETVDCPEHHFGKATDSNVMHALDA VK


LYTQYEPG $P N V$
$S N F$
LVVQACVGRKK QK S S N F

$L \quad F \quad T \quad S V R \quad F$
$G A R V D$
P N A
L Y G Q D D Y G K
K K K A S S Q $\stackrel{L}{L} P \mathrm{~T}$ T
AY T Q N H WR GKG G L A
LGT QT SWKTKAD
LVTKNGTYDKP
L YGQYRYGYNAKGRQ L

$L Y T Q F S M G T R E R$
$F P T H D H W R N P S K$
LA GQYTF GT $\quad$ E Q K R Y T
L P TK K K WREK S K
IT K L S S WGK P
AYTQYKFWGE
$G P Q \square$
$R Y \square A N D C G Q N R Y P F P Q T N$
$L Y T Q F Y P G$
L Y T Q F YPG
VTKKYYYQK PTS
L GTEAAWWTHAK
AY T Q Y M Y R P T R E V L VP C D Y D A 1
LFGEDDP T GTGDDD T D Y D A L E K C L R R K V R D TAAS E A G K C T V LL T M H EA R S Q G N G S GRA R IVE Y V D E A L


## AYTQFHWRGEGDLAA

ATKKSSWGKP
DYEAI R S VMRKI K $\frac{L}{T}$

FPTKKTWKENSK
VF T S VHYGRKRDSPTA L LE
FPTRNHWRYPSKP
CLFTSSFGGSSHGEKQSILNYTKL
I T K L H S WQK P
$V T K D E S W Q K P$
L FT S D Y F G A K K L G P K K D I V Y M E N D L R S S L K K A M Q Q H M L
VIAQHY EKSKGHGP I N S ALL E I
$\bar{M}$ I G Q H G M R R G S G GP P
ITKKRYFHKP
K K T Y N $\quad$ LK P T
$T^{T}$

T Y D T I E R
$S \square K D$


 RAMVS $\square M T K K K E \square K C$ LITT K K K TYNLK P T Y D D L T K FPTKQHWKQESK
VTK Q S S WGKP TY QLMHSSLTAMRQ I I DH QI RKL LVTK NSSY QKP SP TYADLRK S FPTKTLWR P P L V E F VR L N I E S I



UniRef90 EOS2X5 UniRef90-W9VPE1
UniRef90-G0W4Z1 UniRef90-X1D507 UniRef90-UPI0003C3AA2D UniRef90_G0V7Y2 UniRef90-A0A016VKU1 UniRef90-S4TR99 UniRef90_V4JI97 UniRef90-E8NDP3 UniRef90-A0A011T918 UniRef90 A5DR03 UniRef90_UPIO0037D4668 UniRef90-E2NKW5 UniRef90-J7SA85 UniRef90-B5DQB2 UniRef90_L8H6E7 UniRef90-G1X7B1 UniRef90_R42991
UniRef90_H2AWT7 UniRef90-G0X504 UniRef90-U2SX82 UniRef90-C4N157 UniRef90-X5ZB44
UniRef90 Q6U9J8 UniRef90_L1NTU1 UniRef90_Q8IPU1 UniRef90-K4IFX1 UniRef90-W8EID7 UniRef90-A9A5P9 UniRef9O-J1QGF9
UniRef90 D7MZT7 UniRef90-C5B4G4 UniRef90-G2QP81 UniRef90-KONQG1 UniRef90-A0A021W1X3 UniRef90_H0RS50 UniRef90-X7EDZ3 UniRef90_UPI00036C6046 UniRef90_S6EFP6 UniRef90-WOVI42 UniRef90-R7CSC8
UniRef90 H6X3J2 UniRef90-R7YH05 UniRef90-A9GTN3
UniRef90 C5MH18 UniRef90_UPI00035DE038 UniRef90-K9UMH5 UniRef90-N9K514
UniRef90 K3WBB7 UniRef90-Q6J2P1 UniRef90-F4BMU9 UniRef90-XOYDG2 UniRef90_A3LZD1 UniRef90_A6WGB8 UniRef90_A0A024QH87 UniRef90-D5YAQ1 UniRef90-E9CDE4 UniRef90_G2RH08 UniRef90_UPIO0029B1E7F UniRef90-K4F7E3 UniRef90_B6QUQ6 UniRef90-D4CXS6 UniRef90_B4J138
UniRef90_B4J138 UniRef90-B4KUL2 UniRef90-B4KUL2
UniRef90- W9XTV9 UniRef90-J9M441 UniRef90-C2M810 UniRef90_QOUHC0 UniRef90-A0A021 W5F7 UniRef90_Q6FXN3 UniRef90-B8MRZ3
UniRef9- U6ZWJ2 UniRef90_U6ZWJ2
UniRef90_I6WMT9 UniRef90-M3HGI9 UniRef90-I3WVS9 UniRef90-W9YYU4 UniRef90_V8P3E6 UniRef90_11ESG5
UniRef90 C5DPK4 UniRef90-A1CNH7 UniRef90-A0A011WKKU9 UniRef90_A0A015L9B9 UniRef90_Q4WRE8 UniRef90_Q12KG1 UniRef90-K0KS90 UniRef90-M3AM92 UniRef90_UPIO0017458DA UniRef90 A6WGD1
UniRef90_T5JG27

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$\square K K$ QTSDAYEKYKS $\square$ CKEQGS DLL L GK T QLL LIEAPD GR■I A N




 $F R Q R F D L N A L Q E Q A R S Q P L E I G D C Y A V G R$


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

 FK P L Y G QVD QLK S Q GVK T G GVAVL NDNKRFI YY






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




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 F R D R Y P A A Y AVV R A HCRSTPDALL GTALLIDPGGQGHYVGC




 FRRKFGQVDQLLQQNKQ
LF K R WK A P E E QYRK WY QEK D GFA L G A VQF V QVEE ELIVWVVN

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

 FKKKF G GVQQELLNQHKK T
IS TRSMMQETYYYKKA

FKNKYPAAFTGYRAHCQNKVRLPEGTALVI $\square$ RKK F P WA Y S DYMSALEQHGDFMFGKSQI I NQNGHT I A FKKKYE GLNE LKKA QQCK FKDKYPAAFAIGYRSHCQNDVRLPEGTALIIPPGKKHWIDC
 FK SHYPSAYT $\square Y H D H C H M H G G E L W Q K A L L I P P Q P D D E N E H$ I K S L F P E A Y E A D CQ T K K G D R E K L G T I SVV R R D G K K LT V V


| UniRef90_E0S2X5 |  |
| :---: | :---: |
| UniRef90-W9VPE1 |  |
| UniRef90_G0W4Z1 |  |
| UniRef90_X1D507 |  |
| UniRef90_UPI0003C3AA2D |  |
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| UniRef90_S4TR99 |  |
| UniRef90_V4JI97 |  |
| UniRef90 E8NDP3 |  |
| UniRef90_A0A011T918 |  |
| UniRef90 A5DR03 |  |




UniRef90_bofıJ9 UniRef90-B4ML60 UniRef90-B4ML60 UniRef90- W2SEL9 UniRef90-F6GV79 UniRef90-JOWLL2 UniRef90-UPI000477FBF6 UniRef90_C4QZJ7 UniRef90-Q2S351 UniRef90-UPI00046B927D UniRef90-X1WV32 UniRef90_UPI00038195EB UniRef90_U4TVH3 UniRef90-E5DRZ0 UniRef90-N1JR72 UniRef90-12H8Y3 UniRef90-N9N9I6 UniRef90-X1WLD0 UniRef90_UPI0004715F72 UniRef90-C5DBE3 UniRef90-X8HDD4 UniRef90-K9YIR0
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UniRef90 E5EPG1 UniRef90-A0A023NGM7 UniRef90 ${ }^{-}$V8NGN4 UniRef90-W8CZK3 UniRef90-DOGNP9 UniRef90_Q5ULS8 UniRef90_I1FTN6
UniRef90-J9JXT1
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UniRef90-B2VX81
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UniRef90_J9JUE7 UniRef90-J9M772
UniRef90-B4QJP1
UniRef90-A4IT89
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UniRef90-J9K5M9
UniRef90_X1X304
UniRef90 F1KTD2 UniRef90-A0A034VZ19
UniRef90 A0A034VZI9 UniRef90-UPIOO03838859 UniRef90-X1XU37 UniRef90_D4J979 UniRef90-UPI000362E932 UniRef90-I1EPH8 UniRef90_Q2.JPL5 UniRef90-E4VVC8 UniRef90_W6R818
UniRef90_G4VLM2

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 I Y Y K G NI L N A


D A C V
 K H P R I I
S E Q G V l $\begin{array}{r}\text { S } \\ \text { S } \\ \text { A } \\ \hline\end{array}$ A P

 \begin{tabular}{c|ccccc|ccccc}
$M \|$ \& $V$ \& $Y$ \& $Q$ \& $K$ \& $S$ \& $V$ \& $F$ \& $A$ \& $A$ \& $F$ <br>
\hline \& $I$ \& $R$ \& $Y$ \& $V$ \& $K$ \& $G$ \& $N$ \& $L$ \& $N$ \& $K$ <br>
$I$ \& $T$ \& $G$ \& $D$ \& $L$ \& $I$ \& $A$ \& $L$ \& $A$

 

$\square$ \& $K$ \& $E$ \& $V$ \& $A$ \& $G$ \& $N$ \& $L$ <br>
$M$ \& $F$ \& $E$ \& $A$ \& $A$ <br>
$M$ \& $T$ \& $V$ \& $Y$ \& $G$ \& $D$ \& $F$ \& $D$ <br>
$V$ \& $D$ \& $\square$ \& $V$ \& $R$ \& $G$ \& $N$ \& $C$ <br>
\hline
\end{tabular} $Q K$

$Q A$
$A P$
$E N$
$\square S$


 $\begin{array}{lll}\mathrm{T} & 1 \\ \mathrm{I} & \mathrm{V} & 1\end{array}$ \begin{tabular}{ll}
V <br>
I \& F <br>
F <br>
A <br>
A <br>
\hline

 HAC 

$Q$ \& $D$ \& $A$ <br>
$G$ \& $F$ \& $D$ \& $L$ <br>
$K$ \& $P$ \& $V$ \& 1 <br>
\hline \& $V$ \& $A$ \& $L$
\end{tabular}

( L I
S HAQT $T \square \mathrm{~S}$ V M G $H G \vee N C M D G F G S G L$

NGTR $\square$ Q V K G D LF F
 Q I Y Y I Y G D F M K P M N K E E K L I S H C V D D S S R WD K G S M G N


N NF \IFKE】QGD\FVD
APENSSLAHCVSADFKMGKG\|AT\| S R M Q TLTVSVNTVGVMGKGLAS R APD GAALIHACNClGSWGGGIA K A A P NGAALI HACNCQG $\square W G S G I A R A$ APPNTLIIHACNTKGSWGGGIAKA SKMQTLTISVNTVGVMMKGLAB R


$E G D \square F$
QA T A DYA LGHCVSKDFKMSKG $\square \mathrm{A}$ K $\quad \mathrm{K}$



D T D K E C IMM TTVNCVGAMGAGDA K D SETQALINPVNTQG】MGKGLAYQ $S P K Q Y V L A H C I D V D A E M G A G I A K E$ $M P$
$\qquad$ SLA A H CVVSEDMHMGKGIAVA
 A PANTLLI HACNTVVGSWGGGGI A L A A T A P P D T L L L HACNTHGVVWGS Gl A A A A A P P R TLLI HACNA LGGWGAGI A V E K T N I I V H T I GA DAAF GK Gl A Y T A P Q T H S L A H A V E S S F T A E R GL A WQ APQTHSLAHAVESSFTAERGLAWQ

 M K S Glill A P
 $M H$ YE ETKK DL F TLLPT
 TAPPKTLLLHACNTHGAWGSGIALA $M G V E V I N G N I \quad F N S K C N Y L V N P V N C D G D M G A G L A A L A B$
 DLKSK GEDA G IVLAHCVSADFKARKGIAF G
 $K L T E M K T N L L \quad Y A P E S Y A L A H A V S A D N T M K G T L A W Q$



UniRef90_bofıJ9 UniRef90-B4ML60 UniRef90-B4ML60 UniRef90- W2SEL9 UniRef90-F6GV79 UniRef90-JOWLL2 UniRef90 X1WUD2 UniRef90_UPI000477FBF6 UniRef90-C4QZJ7 UniRef90-Q2S351 UniRef90-UPI00046B927D UniRef90-X1WV32 UniRef90_UPI00038195EB UniRef90_U4TVH3 UniRef90-E5DRZ0 UniRef90_N1JR72 UniRef90-12H8Y3 UniRef90-N9N9I6 UniRef90-X1WLD0 UniRef90_UPI0004715F72 UniRef90-C5DBE3 UniRef90_X8HDD4 UniRef90-K9YIR0 UniRef90-X0VX97 UniRef90-W6ARQ3 UniRef90_G3ANG7 UniRef90-D2W3T0 UniRef90_T5JF89 UniRef90_W9W9Q5 UniRef90_K9WNU5
UniRef90_UPI00034ABBB UniRef90-A0A015JVI8 UniRef90-K2PFJ6 UniRef90-Q2UQY2 UniRef90-B6GVY0 UniRef90_N1QDQ8 UniRef90-A9WE21 UniRef90-A7NFI8 UniRef90-K9FX87 UniRef90-UPI0004637A20 UniRef90-UPIO0020622C7 UniRef90-E0S312 UniRef90-M2MK67 UniRef90-B5Y5Y4 UniRef90-N1PGJ4 UniRef90-M2T5D9 UniRef90-L5K682
UniRef90 ROKFC2 UniRef90-A7TJY9 UniRef90-W6XRR2 UniRef90-E5EPG1 UniRef90-A0A023NGM7 UniRef90_V8NGN4 UniRef90-W8CZK3 UniRef90-D0GNP9 UniRef90 Q5ULS8 UniRef90-I1FTN6 UniRef90-J9JXT1 UniRef90-UPI0002D69774 UniRef90-Q2GV19 UniRef90-B2VX81 UniRef90-E4ZQW4 UniRef90-Q9YVL7 UniRef90_Q961L8 UniRef90_Q961L8 UniRef90_J9JUE7 UniRef90-J9M772 UniRef90-B4QJP1 UniRef90-A4IT89 UniRef90-G3MAH8 UniRef90_UPI0003B72D9C UniRef90_E3RZE6 UniRef90-UPIOOO40B4038 UniRef90_F2U0X9 UniRef90_J9K5M9 UniRef90-X1X304
UniRef90-F1KTD2 UniRef90-A0A034VZI9 UniRef90-A0A034VZI9 UniRef90-UPIO003838859 UniRef90-X1XU37 UniRef90-D4J979 UniRef90-UPIO00362E932 UniRef90-I1EPH8 UniRef90_Q2JPL5 UniRef90-E4VVC8 UniRef90_W6R818

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YKRRYPEAF ${ }^{50}$ RYKVACNSG ${ }^{60}$

LA THYPRAEDMYVRDCSQYN LKQQF PAAYKVYEQHCKRDNNALLGKCVLI PSDENQLI AC LARLSSSVPDAY QRASEFKDLEGTCLLIPANKAVWIAC LSKRWKYPEKQYKQWYKEGGNFALGEVQFVSVEEKDWVAN FNRRFG HTDVLKGQQKGVTEI A QLEHEGQ
 LKQKFPSSYTGYSDYCSRF
FKTRFPDNYEQYEAACDA

GALAPGDVLVHDRGHPRYVLN FKNDFGGVGKLVDQ $F K N D F G G V G K L V D Q$
$F C Q H F D L N$
$S L D E Q A D K$ KLK $\operatorname{K}$ GDVGUVKRHDQYAFYL
FCQHFDLN SLDREQAS $\square K$ FRRKYPEMPGAVLDA YKYEPAIGDAVRYTAPDGRVIVN $\square$
FK K M FL1 KKEFPEAYHADLNTUSGDKFRRKFGQVEELKRQ

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LRKC DPGLYERYKHDCS



FKRKYYGVKELLDQ $N K K \square G Q V A T \square K R D N R Y \square F Y \square$ VKYQFPDVYVVFQDACKK KELEFGKPYLYKREHQTWFLL FKQKYPAAYNIYHSHCQKYKQLPEGTALI DP PQEKHWDI C FKGKYPAAFEVYKTHCQRNGGELVGQALLLIPPHKEAGEEH AKYQFPDVYVIYYDVCKN GTLQMGKPYLYKREGSLWF LL

FRRKFGQVDQLFQQ
NKQVME $\square$ AA $\square E F N E R N$ RVEPYVWVAN
IRTQTPAEYSKYVQACKTKGKELLGQTQLLKTVDGRLVAN FKDSYGDAYHDYVDHCNENKESLIGGTALLIPPERKHFVGC TKKAGGKVIEDEADRVCSQLDPRPGDVYVTTAGGLKAKY FKKHFPRAFEAYEQHCKSNNDMLVGIALLIAPEEPPWIGC

 FKKQYPNAYT I YHAFCTKEHSPKTGNIPPVDGDKGHWIGC
 CRDNYPEDYEKYRKWCRAMKDLALGGTLLFCIDDKESRAL FK $\square K Y P N N F Q N Y E Q K C Q A \square K E V D V G K D L D Y T E E K D K I I D$ FSKRLGGRRKYDDKY LRPYTSNS KCVPSILKDGRVIVN FKKKFKRVDQLLEQ G VKTGGVAVLEDNKRYI YY L
 F N K R F D M L Q R K Y P E Y A K H F M D C K I G D C I L
 FKQRYPDAYKI YNTFC DSTHHPTTGTALLLI PRDHGHWVGC FKRRYPRAFAlJYNRYCTKAKHVPSGSALLIPPPSQGHWI GC


FKRIIFGGVGTLVDQ
MRRKFGHVDQLRKEQ
FKKVFGRLDELQAQQAGS
IAKAFPEAWAADRMTVKG DGDI AVLKDDQRYI YYY IRRAGGRVIEEEADRICQAQRPQPGDLYSAFSTNGLLVYN FAKRYGGLRPKD
AKYQFPDVYVAYQDACRS KRITATKPYLYKTDLATPNAV FKQRYPVAYKIYNSFCLNTHHPKTGTALLIPPEHGHWIGC FKLDRYPDMFIKYEADCDA KKDDDG LLWUYKSELKSVLN

YRNQF GKVVNELRRQ LRAKSARVMDAYRQAF EMN
FAVIFGNFEELSKQ

$\qquad$ I RDKYG VEELDTTVAQ PGGDCIKTTHGPRQI Y

 K S WP GNFKAY A A A CR R GE VQPGKMF V FETGNPRYMI N


UniRef90_boFIJ9 UniRef90-B4ML60 UniRef90-B4ML60 UniRef90-W2SEL9 UniRef90_F6GV79 UniRef90-JOWLL2 UniRef90 UPIO00477FBF6 UniRef90_C4QZJ7 UniRef90-Q2S351 UniRef90 UPI00046B927D UniRef90-X1WV32 UniRef90_UPI00038195EB UniRef90_U4TVH3 UniRef90-E5DRZ0 UniRef90_N1JR72 UniRef90-12H8Y3 UniRef90-N9N9I6 UniRef90-X1WLD0 UniRef90_UPI0004715F72 UniRef90-C5DBE3 UniRef90_X8HDD4 UniRef90-K9YIR0 UniRef90-X0VX97 UniRef90-W6ARQ3 UniRef90_G3ANG7 UniRef90-D2W3T0 UniRef90-T5JF89 UniRef90-W9W9Q5 UniRef90_K9WNU5
UniRef90_UPIO0034ABBB4 UniRef90-A0A015JVI8 UniRef90-K2PFJ6 UniRef90-Q2UQY2 UniRef90-B6GVY0 UniRef90_N1QDQ8 UniRef90_A9WE21
UniRef90-A7NF18 UniRef90-A7NFI8
UniRef90-K9FX87 UniRef90-UPI0004637A20 UniRef90_UPI00020622C7 UniRef90-UPI000380AF0E UniRef90-EOS3I2 UniRef90-M2MK67 UniRef90-B5Y5Y4 UniRef90-N1PGJ4 UniRef90_M2T5D9
UniRef90_L5K682 UniRef90_ROKFC2 UniRef90_A7TJY9 UniRef90-W6XRR2 UniRef90-E5EPG1 UniRef90-A0A023NGM7 UniRef90_V8NGN4 UniRef90-W8CZK3 UniRef90-D0GNP9 UniRef90_Q5ULS8 UniRef90_11FTN6
UniRef90_J9JXT1 UniRef90-N1ZQV1 UniRef90 UPI0002D69774 UniRef90_Q2GV19 UniRef90-B2VX81 UniRef90-E4ZQW4 UniRef90_Q9YVL7 UniRef90-Q961L8 UniRef90_Q961L8 UniRef90-J9M772 UniRef90-B4QJP1 UniRef90-K9L4U3 UniRef90_A4IT89
UniRef90_G3MAH8 UniRef90_UPI0003B72D9C UniRef90 E3RZE6 UniRef90-UPIOOO40B4038 UniRef90-F2U0X9 UniRef90-J9K5M9 UniRef90-X1X304
UniRef90 F1KTD2 UniRef90_A0A034VZI9 UniRef90-A0A034VZI9 UniRef90_UPI0003838859 UniRef90-X1XU37 UniRef90-D4J979 UniRef90-UPI000362E932 UniRef90-I1EPH8 UniRef90-Q2JPL5 UniRef90-E4VVC8 UniRef90_W6R818

FPTKKHWRNG ${ }^{90}$
100
100 WL 110
110
120
LVTK SNTYD

YE WI EQGLLQKLLDTMKDKGDS | $L$ | $V T K S N G Y D$ |
| :--- | :--- |
| $L$ | $T$ | SHDTSS

 FTSVGYGKPNKQRGNDGLKYTKLALLQLNKMDRTSKYSL AVVQSYNPRRKVPRSNDSVPDLECCLSKASFLAAAKSASLI LI GQHNDYRDEK
$K L G Y$ LITKEKSFHKPT YENMYKTLQNDRSKAEELISH AYTQYHY FTGASGGKAEDLKYTDVS SSHLGKUIQEVLQSDNTDDVPD VATKDHWRDASS
 KKTSNGKPTMITTHMEKGMAALVDEATAHDIS L VTKKTSNGKPTMD LITKGSSYQK LYTQYFPGAD LFVKEDWK CLFTSAYGGGNCD $\square$ P ES FIILNAYTQFNWRGQGIKYHANRNVFKRVKQ
 $\qquad$ V
A
A
G
T
Q
 ITKENYYTQFNWRGQGIKYHANRNVFKRVKQ CNPTAKI

 FPTKNQWRKPSK FPTKYHWRNNSS CATQQFYGK SGKKYCS Q ILCFPTKDKTWEDSK Y ATLTALL WMREY
 LFTSDFSQTPT MVCLQFVKKGS AYTQYHF $\square A R R N N E P K V D Y R A L I R E C L K K C A T Y$ AFTSTGYGKRNKDSPSQDVRADRAALESKGKKI VAGQDGYGTDKR MVAQNGVRHGS
1 TTKQKCYHKPT FPTKRHWKNMS FPTSRNYGKR
VS $P$

YTDYD LFTSDKYGSRADSEDMU FVGCDFTKGREAD
$F$ PTKRHWKERSDR FPTKRHWKERSD
$K W F L L F A T K R N W$

## 



## FHAVTM

LETSRSHGKN
FTSRRYGKNKDAETSDTYS

LITTSVYGGSSHDTKNEI
AYTQYRPGK


LVTKNRYYQKPS
VTKKKYFHRPT
VTKEFSNGKPS
LITKERYFHKP
VAGQDRYGTDRR

L F T S Q G Y G K K R D G A DVVI T L LVTKPSSYKKPTLK


VTKKYSNGKP
LTKEHHW
QNS $\square Y Q A$

$\square$
T T
YK S LT
E
期
A L L R
$\square$
LYS QY T F T GRKEGKMDLDYWALRSALSAMALDMSTHDLKI 1 HLVTM KQPAGQTSYAIVRQCLERLITYCREHGIKV QV L N L I T K K Y S T G K P T R D S F N Q T I L N L K K V V L E N N I K K I
 AHLVTM M EQPAEASNYDSVRRCLATLLDFCEEEGNSV ALI I A QSRDSSGGLS G $\square \mathrm{KLDPSLSDGLQRISSLALRLN}$
 LFTSQKYGSHVDSEDMQVLQDLSEQLQVLSRQASERPLSLC


UniRef90 A8P1Z6 UniRef90-D5ACY7 UniRef90-CCDDG59 UniRef90 ${ }^{-}$B8QTR2 UniRef90-E5E409 UniRef90-R9ZYH8 UniRef90-UPIO004141D06 UniRef90-J9LR17 UniRef90-X1WM57 UniRef90-X5XSE9 UniRet90 V9CYC8 UniRef90-D4ZX18 UniRef90-×1M359 UniRef90 UPI00036F61E5 UniRef90_R9TJ73 UniRef90-J9LEC1 UniRef90-E9C0Q8 UniRet90 B4H5X9 UniRef90-B4H5X9 UniRef90-S6CFC8 UniRef90-UPI0003C36210 UniRef90 UPIO003C36210 UniRef90-C9RW41 UniRef90-H6C0B3 UniRef90 A2FIL1 UniRef90-C3WDV1 UniRef90-GOYPT3 UniRef90- UPI000334770E UniRef90 B3FJ30 UniRef90-E6UK16 UniRef90-W7QLL9 UniRef90 ${ }^{-}$x1E7A0 UniRef90- ${ }^{\text {F9XJ79 }}$ UniRef90--J9LEC2 UniRef90_D4JT43 UniRe990-V7HXB6
UniRei90-UPIOOO46COC67 UniRef90-D4J905 UniRef90- J9L6A7
UniRef90-T1C2Q6
UniRef90-K9XS99 UniRef90-WOYMV4 UniRet90 UPI0003C4687A UniRef90-X1WJL3 UniRef90-A0A023DDI8 UniRef90-G0RYI2 UniRef90 ${ }^{-}$W8A029 UniRef90-A0A044RGV7 UniRef90_F8SJY4 UniRef90 C8XUC3 UniRef90 UPIOOO3B4FOE2 UniRef90-UPIO003889E26 UniRef90 G5HE65 UniRef90-J9KUJ7 UniRef90-M4QSQ6 UniRef90-_JgKKY1 UniRet90-EIA2G7 UniRef90-UPIOOO472EFA3 UniRet90_H3SNE2 UniRef90 E4UA39 UniRef90-J5JWK0 UniRef90_K9F9T0 UniRef90-G7Xk91 UniRef90-E5DQK2 UniRef90-SoEMWs UniRef90_N2A9Z2 UniRet90-
UniRef90- AOAO16Q201 UniRef90- UPIOOO3BBD977C UniRef90_FoVC94 UniRef90-E7NER7 UniRef90-X4Y783 UniRef90-X1XQT5 UniRef90 UPI000467F2BF UniRef90-10HDW4 UniR Ref90-R1EZ17 UniRef90 L9WRW9 UniRef90 B5Y6U5 UniRef90-V7B5D2 UniRet90_J9KHV9 UniRet90_F8MNW3 UniRef90_A9BEU6
UniRef90 $\mathrm{N} 1 \mathrm{RJB1}$ UniRef90-C7ZHE9 UniRef90-R4IG21 UniRef90-L9ZHQ9 UniRef90-E4NPY5 UniRef90 Q8SD58 UniRef90-X1Q0C5
UniRef90-x1WQ24 $M K Q \square N G N L I T M A K A G F D V I I H G A N C F H T M G A G \square A E K$ KGDILR S DCDVVMHQANARSTMGSGIAKQ $M V V D \square F T G D L F T E F R K G N D V I A Q G C N C H N M M G A G I A D Y$
 KVIEVE GDLI EMALNGDDVI GHGCNCHCVMGAGIAP Q
 IQ F KQ GNLL L TET TEALVVNTVVNCVGVVMGKGMABLD $V N T V S V M G K G L A S R$

K P K A D K R VF $\quad$ G Q GCNCF $\quad$ R Q G S G $\square A G Q$ CKYHE $\square$ G N $\square F T E$ Q $\square$ N D S LTI SASVKEVSGDLLNPSGRSMVVIAHCVDDSGKWGRGLF GK
 $N V \operatorname{Kil}$


 LIS I V E E DI TE $\quad$ A KEKYLVIHAVNCL GVWG NGIA A Q


 I Q Y L S GNAA KPVT D G V VRVI AH I CNDIGK WGA GF S GA $G D \square F S$ A S SRT

MRE【IGD ITKVQAG




 $\square K$ A VH G D T KLQQ GVV Y CNAAN G DGPMGGGVAAA TGSLIP P TAPPNTLLIHACNTLGSWGGGIAAQ LHFVYGSVT DTQNSDHALIVYVVDNSGVFGSGGVFA F QEP GDLYV ITVNTVGVMGAGVAKA TYVIGDLLKAACSFNDIFAHGANCWSTMGAGIALLH NWTLKYVTGDLESCCPRDESLAHCDSEDCRMGAG\|AVM
 LQEE A GSLAVAHCVSQDFQMSRGVAVL $M G R G I A P L$ $N T \square I E E \square N \quad A \square T S A G T F A V A H C D S E D F L M S R G V A D V Q$ I DVI K GMI ARKTTDTNKIIAHGCNCFAAMGAGFAAQ $T V T E \| E G D L F D \quad A P D G A A L \square H A C N S Q G S W G A G \square A E A$

F\| Y C|VVCR PG\|AVE
 $E D Q G S D F D$ APEGAVHQTNCQGVMGAGLAKK

 $\square A E R T G D L G S$ ADAEDSLPHCVSADFKARKRIAFE
 H Y RTGDASLPRENPPGAVVHFVDAAGTWGRGFFKA


GDLL FA Q GFPALAHGVTCDGVMDHG
$L R F A V G D A M R G G G G G G E R A V L V A D A S G R W G K G F F R S$ $M Q F D V I Q G D D A A Q S A D V L V N A A G T S L R M G S G V A G A$
 TGSVHFVVGDCTAPSNSEPVMMVFSCVDTSGHWGHGGMFAA GSFAVAHCVSEDFQMSRGワAVQ

 F N S D Y Y H

GMEFDVVI Q G D L
MEFRVVHGDI

FNAPETYKVVTVNQVGAMGRGIALA A A QSADALV NA A GTSLRMGS GVA GA AQQSADVLVNAAGTSLRMGSGVAGA $T V N V V G V M G A G L A K S$


## UniRef90＿A8P1Z6

 UniRef90＿D5ACY7 UniRef90＿C9DG59 UniRef90＿B8QTR2 UniRef90＿E5E409 UniRef90＿－R9ZYH8 UniRef90＿UPI0004141D06 UniRef90＿J9LRI7 UniRef90＿X1WM57 UniRef90 X5XSE9 UniRef90＿V9CYC8 UniRef90＿D4ZX18 UniRef90＿X1M359 UniRef90＿UPI00036F61E5 UniRef90＿R9TJ73UniRef90 J9LEC1
UniRef90 E9C0Q8
UniRef90＿B4H5X9 UniRef90＿B4H5X9
UniRef90＿S6CFC8
UniRef90＿UPI0003C36210 UniRef90＿UPI0003C36210
UniRef90＿C9RW41

## UniRef90＿H6C0B3

UniRef90＿A2FIL1 UniRef90＿C3WDV1 UniRef90＿G0YPT3 UniRef90＿UPIO00334770E UniRef90＿B3FJ30 UniRef90＿E6UK16 UniRef90－W7QLL9 UniRef90－X1E7A0 UniRef90＿F9XJ79
UniRef90＿J9LEC2
UniRef90＿D4JT43
UniRef90＿V7HXB6
UniRef90－UPIO0046C0C67
UniRef90＿D4J905
UniRef90＿J9L6A7
UniRef90－T1C2Q6
UniRef90－K9XS99
UniRef90－W0YMV4
UniRef90＿UPI0003C4687A
UniRef90－X1WJL3 UniRef90＿A0A023DDI8 UniRef90＿GORYI2 UniRef90＿W8A029 UniRef90－A0A044RGV7 UniRef90＿F8SJY4 UniRef90＿C8XUC3 UniRef90＿UPI0003B4F0E2 UniRef90＿UPI0003889E26 UniRef90＿G5HE65 UniRef90＿J9KUJ7 UniRef90＿M4QSQ6 UniRef90－J9KKY1 UniRef90＿E1A2G7 UniRef90－A0A017SRE7 UniRef90＿UPIO00472EFA3 UniRef90＿H3SNE2 UniRef90＿E4UA39 UniRef90－J5JWK0 UniRef90＿K9F9T0 UniRef90＿G7XK91 UniRef90－E5DQK2
UniRef90－S0EMW9 UniRef90－N2A9Z2 UniRef90＿X1WY45
UniRef90＿A0A016Q2Q1 UniRef90＿UPI0003BD977C UniRef90－F0VC94 UniRef90－E7NER7 UniRef90－X4Y783 UniRef90－X1XQT5
UniRef90_UPI000467F2BF
UniRef90_IOHDW4
UniRef90_R1EZI7
UniRef90_L9WRW9
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UniRef90_V7B5D2
UniRef90_J9KHV9
UniRef90_F8MNW3
UniRef90-A9BEU6
UniRef90_A9BEU6
UniRef90_N1RJ81
UniRef90_C7ZHE9
UniRef90-R4IG21
UniRef90_L9ZHQ9
UniRef90_L9ZHQ9
UniRef90_E4NPY5
UniRef90_Q8SD58
UniRef90-X1Q0C5

UniRef90＿X1WQ24

VLRRKSQK｜I VIDRYE｜L｜AGKMDD｜L｜H｜V｜GDAH｜LV｜KHEYDRSRNN





 $\begin{array}{ll}\square \\ L & K \\ L & K\end{array}$ FK QAFP ENFRA YKTACDA KKIHPGQMFVVATHFPKY DN AKYQFPGVYVA YQDLCRN KVLKMGDYQLADEPERELNTN LR QFPEDFQADEDYGRFGDPMKLGGAFSVPCAGGPRVAB

 $F S L I V G B V E E L D R Q R R V A R \quad G N C A V L E H N A \quad R F V Y Y$


 FK K A F P A A Y A V V R R S H C Q Q A N K P L I G T C L L I P P Q P R H WI A C
$\square \mathrm{I}$ D K F P Y S N FDKRYDMRNRLLK LAAEEKPETLDEKCIVEVENV
 FK E M H P D L Y E RY R H D CK A M K M I T i G N PV I Y Q A D N G K R Y M M
 FKKAFPDNFKVYKKACDE K LLLTTGQVLSVEINPPBYIDN VSKRHKDAEDYYK A QWRYKKVVQLGDI QWVFVDPDVAVVN FRKHYPQVFKDYADHCKGRMGELVGTSLLIPPADKHWI GC
 I Y T K F PVVK T A Y HKYF T R F DE Y L F GK CQLI RVS D NLAVVN FREXFQKKVGL $\quad$ R S Q N K F T G S VA F K K D Q N R F I Y Y L
 ARERFPAAQEDFRRWAAEKKNLSLGSIRVTTVGDGTHLAS

 FK S $\square Y K R V G E L M D Q$ $R$ Q NVGSVA YLQ ENNRFIYY $\square R K A G G K E D E T E A D K V C K E Q N P M P G D L Y V T H A G P F Q Q G D H$ FA RLLYPSAYKVYK SHCKHNRGELVGRALLIPPPLDSHYI GC
 FRER H P D L F Q R Y K H DCK MK II Q I I GHPVIIYKGD DNKH YMM $\square G N N F P A L R E A D A N D P R G P E Q R L G G M S Y A F D H S K G V W G A N$ FKKKFGRVSELKEQ FKKKFGGUQE L LD QQKK S
 FKLKYGQVGVLLDQKVTVGGVAEL


 FKKRFK L A

SLLQ E TA K H S P L K K G G C C Y K V

 FRSNYPAAYEVYRSHCRQFSQLPEGTALI DPPQKRHWI DC VA R NY P E N Y A KY F VT P E D K E K N Q L G T Y S V A H $⿴ 囗 十 ⺝ ⿱ G M G G V V M F N$
 $F R N Q$



 MGKVVCIMSKIVRPDLYVAN $F R V R W P A M Y D R Y R A R C R A G M L R G G G L M S W K A P D G L I V Y N$ A A Y E A A H ENGDLL S L G DA H LVVEC GS GLLAVCN LRRRA A GAEDNE EAMENGPDELGAVAVTDA YDAD YV I H

FRTHYPGAYKTYQAHCSKHQRS LVGTAL LVPDDKKHF GC

 CKERYP IVYREYRWACREK LYF P D DVVMVFEEKVILLA




UniRef90_A8P1Z6 UniRef90_D5ACY7 UniRef90_C9DG59 UniRef90_B8QTR2 UniRef90_E5E409 UniRef90_-R9ZYH8 UniRef90_UPI0004141D06 UniRef90_J9LRI7 UniRef90_- X1WM57 UniRef90- X5XSE9 UniRef90_D4ZX18 UniRef90-X1M359 UniRef90_UPI00036F61E5 UniRef90_R9TJ73
UniRef90_J9LEC1
UniRef90 E9C0Q8
UniRef90-B4H5X9 UniRef90_B4H5X9
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UniRef90-W0YMV4
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UniRef90_A0A044RGV7
UniRef90_F8SJY4
UniRef90_C8XUC3
UniRef90_UPI0003B4F0E2
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UniRef90_UPIO00472EFA3
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UniRef90_K9F9T0
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UniRef90-S0EMW9
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UniRef90_X1WY45
UniRef90-A0A016Q2Q1
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UniRef90_E7NER7
UniRef90- X 4 Y783
UniRef90- 1 XQT5
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UniRef90_X1WQ24
$\bar{\square} \mathrm{P}$ KLGCALDGMNWNEVCGMLQSTFVDPKVQDTV
RMPKI NAGKSAVEWEMTKEVLEK
A $\square P A \square S A G \square Y G Y P \square E K A V L V Y K K A V Y D K E \square R F V I Y D$
Y SPMFNSGAFKVPWESTSRLDEEEFKGFESRWLI
YSPKFNSGAFSVPWESTAEVI EKEFVDWD
ALP P L GMVNGWLKKSEVFSLLVELFYKQDCTVRMY
$V 1 P A L G C G V A G F D L A D G A A 1$ GDEDAASD


## UniRef90 E3GXJ5 UniRef90_M0MGR6 UniRef90-E4V2E5 UniRef90 B4LHAO UniRef90-J3PFU8 UniRef90-J9LCP8

 UniRef90_UPI00006CB007 UniRef90 V5IPQ6 UniRef90-UPI0003B63F7F UniRef90-LOL2S6 UniRef90_17CLD8 UniRef90-J9LRA5 UniRef90-W9RGA0 UniRef90-E7QQ20 UniRef90-M0BQT2 UniRef90-FOZSY6 UniRef90-G3MBI4 UniRef90-X0S2V2 UniRef90-J9LX68UniRef90-G3JBR8 UniRef90-UPI0003A33DA6 UniRef90 G5DET9 UniRef90-X1WVC7 UniRef90-MODCF2 UniRef90_R4W8S1 UniRef90-D5U1E5 UniRef90_U1Q8N4 UniRef90_D3BJT1 UniRef90 UPI0002B4CBEE UniRef90-D6WDE9 UniRef90-D7BG78 UniRef90_L9WX20 UniRef90_W7Z8V3
UniRef90_Q9WYX8 UniRef90-UPI00036AF595 UniRef90-UPI0003732586 UniRef90-F4PQP4 UniRef90-EOSS39 UniRef90-E8R8K9 UniRef90 D3PEI5 UniRef90-GOHXN7 UniRef90_UPI00006CF8F6 UniRef90 X1WN68 UniRef90_UPIO0046BB3D0 UniRef90_L5NWJ2 UniRef90 L9X8B0 UniRef90-H9UAI3 UniRef90-COSEJO UniRef90_Q76YF6 UniRef90 R5CQL5 UniRef90_B1LS25
UniRef90_C3SAD3 UniRef90- XOTRU6 UniRef90_G7V7J1 UniRef90-X1XJG3
UniRef90 ${ }^{-154 Q M 4}$ UniRef90 G8NAL0 UniRef90 LOIDS0 UniRef90-D3ZRU3 UniRef90_F6CQR6 UniRef90 I4EFF1
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UniRef90-T0LFU9 UniRef90-UPI00045DF53B UniRef90-X8DMP0 UniRef90-G0EEG4 UniRef90_X5L7A4 UniRef90-XU1BW5 UniRef90_UPI0003B537C5 UniRef90-O67112 UniRef90 B11450 UniRef90_L8HJG2 UniRef90_S3XDF2
UniRef90_A1AMX4 UniRef90_D3L4T9
UniRef90_B9L9M5 UniRef90-I1EUS9 UniRef90_M0BSN4 UniRef90-A5D049
UniRef90 J9KTX9 UniRef90-10GJR4 UniRef90_UPIOO0368DB3B UniRef90_H2J519
 $\square K E V S G D \square F S \quad A G P D Y A M C H C V A A D L R M G K G D A V M$ AVVVHAANGLGTWGSGVAAA GQVFEVKGDLLNFQA DVIVQQCNEDFQMGSGIVAVN TVEKGLSQS K R G D
$\square K \prod A Q G D \square T E F T G \quad D A \square V N A A N N Y L Q L G A G V A G A$ MEFDVVRGDI AERSADALVNAAGTSLEMGSGVAGA $K \prod R \ V K G D \prod T R$ EEVDATVNAANEYLKHGAGGVAKLL R IHVAQGDITDFVG DAIVNAANNHLLLGSGVAGA KGDLIDKAKAGEDVI I HGCNCFCTMGAGIAKT V L GS NNTVEVVAGDITLFQG, DALVNPANTYGYMGGGVALA
 K PEEYSLGGQQCNCITKKEKGLSQS PEEYSLGHCDAKDMRMSAGIADY $M N F T V V Q G D \square A A Q S A D A L V N A A G T S L R M G S G V A A Q$


MS $\square$ T Y VEANLIEVINNGKVYVAQGCNCFAAMGAGFAAQ VLGD\TEV ESDAlVNPANVF $\operatorname{VIMMGGGVAGA}$ DSGSVQLVYGDCTNPSKGKPADI FSCVDNSGTWGHGGMFA $M E 1 L L T R G D 1$ AQQDADA VNAANNHLWMGAGVAGA

K L K FVS DDLLDPFNDKSDF ILNYVDNSG\|WNKGLSGA $R 1$ RVAE GDITEFQG DAIVNAANNWLKLGSGVAGA

 MGAGLAKN


DADVIVNPANSRGLMGGGVAVV EADVLVNAANGLGIMGGGVAGA EDSDVIVNAANRHLRHGGGVAGA DEKADILVNPSNTLMLLGSGVSRA SA\|VAI TTQVVRSGKMGRGVAAQ DGDAIVNAANNHLWMGSGVAGA EKEADFIVNPSNTDLFLGSGVSAA DRADVNAANGQLVHGTGIAAA ADSADALVNAAGTSLRMGSGVAGA VDAIVNAANNHLWMGAGVAGA GSFAVARCVSEDLQMSGGVAVQ ENVDAIVNAANSYLSHGGGVALA QPDAQAIVNSANANLRFGSGVAGA

UniRef90 E3GXJ5 UniRef90-MOMGRE UniRef90-E4V2E5 UniRef90-B4LHAO
UniRef90_-J3PFU8 UniRef90-J9LCP8 UniRef90_UPIO0006CB007 UniRef90-V5IPQ6 UniRef90-UPIo003B63F7F UniRef90-LOL2S66 UniRef90_17CLD8 UniRef90-J9LRA5 UniRef90_W9RGA0 UniRef90-E7QQ20 UniRef90-MOBQT2 UniRef90-FOZSY 6 UniRef90-G3MBI4
UniRef90- $\mathrm{XOS2V} 2$ UniRef90-9LX68 UniRef90-G3JBR8 UniRef90-UPI0003A33DA6 UniRef90-G5DET9 UniRef90- ${ }^{-1 W V C 7}$
UniRef90
MODCF2 UniRef90 R4W8S1 UniRef90-D5U1E5 UniRef90-U1Q8N4 UniRef90-D3BJT1 UniRef90-UPIO002B4CBEE UniRef90-D6WDE9
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UniRef90 GOHXN UniRei90-UPI00006CF8F6 UniRef90-X1WN68 UniRef90-UPIIO0046BB3D0 UniRet90-L5NWJ2 UniRef90-L9X8B0 UniRef90-H9UAI3
UniRef90_C0SEJO UniRef90-Q76YF6 UniRef90-R5CQL5 UniRef90-B1L625 UniRef90-C3SAD3 UniRef90-X0TRU6 UniRet90-X1XJG3 UniRef90-Q54QM4 UniRef90-G8NALO UniRef90-LOIDSO
UniRef90 D3ZRU3 UniRet90-F6CQR6 UniRef90-14EFF1 UniRef90_UPI0003627A6A UniR Refo-LOAKM1 UniRef90-A8M8Q1 UniRef90-10A1L1 UniRef90-E4TJ88 UniRet90_K7Z9988 8 UniRef9-JKE18 UniRef90-UPI00045DF53B UniRef90-X8DMP0 UniRef90-GOEEEG4 UniRef90-xovBW5 UniRef90-U1DAD2 UniRef90-UP10003B537C5 UniRef90_O67112 UniRef90_B11450 UniRef90-L8HJG22 UniRef90-S3XDF2
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GAGGE EKEAMSKAPIDIGDAISTTAGKLKARYV LRR GAGGELNEEAVSQGPLDLGTVAVTDAYDAEWVL C CR
FRNKFGQVATLQKQ
NVQPGGVAVLEHHGRYTYYL LRASFPAAYRVYADFCAAAKDAVAGRCLLIPPGPAVTIAC FKLKYGAGGALMDQKVRVGGVAELPRSLODEGGKLCVFY ILKKFGSAYETRVKGKGNIADVSPGTCLFQKPKQUQYVAN
 ASLRYPGLPRDLAEHVRKNGNDPGGEVAVTDVPEYRIVS FNKKFKGMMN

FLSNMNPNVGECILYQKNENSQKVLU FRRRFGNWESNQNKKVTD AKLSASLPGAYNRA SEFKDLQLGDLHLDRVDTPQWVAV LRRGANGPNNEEAMERGPVELGSVAVTDAYDAEFVVH SKRFPKVVESFEKIKGESKSEKVLEENVDKEKKKDFVCN I R DNGGTELQDAAMLTCSKGNYQPGDDYVTHAGRFKKITH MRRKFGNDARSLNRSVTEDASLDTGKISVF
LAK FPPDACVYKAFCRWPPRSLAGQCLVIPPQPRVHIVC CKNVGGSMEEEATNGCKKDGPFKPGSVYVTPGGKKWKYV CRERFPSLYNDYRQKCRK EQIVIGEVYCYPEEG

RRGGANGP NEEAVSKGPVDLGGVAITDAYDADYVIH
 SKKWKNVEDDFVK NKHSKQPKEQYELAFK MKDLHL RRHTRDFKRVDELLNQRQQA GGLAVLNHDGRFGYYL
TRRKGG PQUQEECNRDGKПKVGEAAVTGAG LRR GAGAEDNEEATEQGPIDGEAAVTGAGDDDEYN

$\qquad$ VKQVFPSAYQADL ATVAGDKAKLGTYSSAQVEVNHVIIN IGKKWKVVESEFEKESLKMGQFNGTKVEKAQGDKKVFVCN | $\begin{aligned} & \text { KMRGGRA! } \\ & \text { RKKGGDVI } \\ & \text { RKK }\end{aligned}$
1 RRAGGE LKR AAGSGLLKDEDKIKG IFKKFGSAFETRVKVSLHLGRMDL FKRNYGRVGELMDQ RPN NTKXIAY AV TKNNFGDASAQLDKL RPNVGSVAFLQHNDRFIYYL LKNNFGDASAQLDKLAMAKPMVGEAIPINDGNRTIYYL LRRGGAGEELNEATEKGPIDLGEAVATDAYDLDADYV VARNYPDAAAVDHKYAEEKEKNQDGTDSAAHTGKKHWIIC AA AVDHKYAEEKEKNQLLGTLSAAHIGGGVVMFN

 GKKWPSDPKSFSQ GDSNDKSGEVRVEKVKQRASVSYN LRKGGASIQ EACDR\GPI RVGEAAVTEAGR LRR GAGGDDNDAAMEKGPIDLGAVAVTDAYDDDATYV FKKRFGGVQEDLSQRLDAVWIVCSGKMYLQFAKKRCQQTSR TKR AAGEDVEREAMAQGPDRVGEAVATGPGRDPI KA KRKGAAGRDSEEWAKAYGPVPTGKAVATGAGNAKVVAH FSQHCGGYQKELYK
 IVKKGGEKODQDECDKDGHCPVGEAVITSGGNLKAKYV CKERFPDLYQHYRKRCYA GEVVVGKVYLYSDEG DRDKGG PGADQEECTQKAPDPVGGAVETTAGNLKAKFV MADRYPDAMTQYVILAQQ GRDTPGS AVFTRNRGREAGL
IRR
 IM MK YPVVRK K Y Y INGAK KEKGN

## ПKRLGGE

EПEREAVEKAPDPVGSAVLTTAGKDKFKGVV LRRRGGETEEEAVRVCRETKP QTGQVYVTGAGPARFVYH ISRKGPALQAESNDWVARHGADNDGNVAVTSAGNDPARYV FFCRCGGGEECLMQEKLKNSPLKPGEVKTISNNENFTHU AASLIFPDMAQ DKKKGGDADE
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 DAAMEQGP: DLGAVAVTDAYDLDYVIH 1 VK K G G E IVQE E SN E I I I R K N G P A I P


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UniRef90 MODCF2 UniRef90-R4W8S1 UniRef90-D5U1E5 UniRef90-U1Q8N4 UniRef90-D3BJT1 UniRef90_UPIO002B4CBEE UniRef90-D6WDE9
UniRef90 D7BG78 UniRef90-L9W $\times 20$ UniRef90_W7Z8V3
UniRet90_O9WYK8 UniRef90 UPIOOO36AF595
 AAAMPHYGDGQATAK LIFTAWHYAAGKRNPSSE 1 TKQNSWGKP VFTSFGYGRPDAGPAGVILDQTSQALADLRQQLDEEPVAV
 LFSQFTPGKNGFKYQNTREKWFEVCLQQLADFAKEKQFKVIV





LDTKEHCWQKPS VHAVTMTYPAELDAYDSTKQ ITKDLHYHKPK AAAMPHYGDGEATARSTR EATREATRNTLEKADE IHAPTVIQPGGKSSVEYVLKAVEASLGKAEQLGLK VSCVKAPESKADSH TFEVEEFGETLTQVLSDAKHKD\SV VLNKFF
VTKRLSSGKP TYET TFASDQKLRAHMGENNRKL |LPVRYILHAAVLGDEPAT四ETVRQATRSALLLAQAKGDTL I HAAAM PHYEDGRATAESI REATRNALETADELDNCSL LYGQFRYGRDKR GEYTDYEKLASAMEEMLNEKKGFRIKK AYTQYQWRGAGRKA DYEA
ПACDKAPSKKDGSYDFKMDSFTEGLQQVVGAAKDKKAS


IHAAAMPPGGQSTAAFKRESURTATRNALAEADALNCSL
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LYSQLHGGTDFRLDAFERAR
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I HAAVM GQDLKTSEAITREATQNSLYKCDELGI E LTTEHHWPKSTN

LLPCTHSEQVKMLGGEPKADYEA
FPVKHRWYEKADP IV HAAAMGFEGSRPVPASAETVRSATERALILCDRLGESV
 AAAMPHYGDGEATEESTASIRDATQNALETADE
1 HTV
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IHAAAM GMDFKTSPK QIAKATDNSLQKAVELKLK
GRPIIHCASQNQPGPDATEQWDRASDTQGDD DAKQGDGSV HVI HAPTMERPAMRTTVEKVKKATRAATEVALDKGDSI CASQDHPG DHAATM GMDFATDA TEEWS S SFTQLNFGNKKTGDCYTNESLLVKNIMEFDRDCKERNIEG FPTKRHWK AVTMLHAPTMEASSP AVAVGPVAERSSP FHAAVLNYTFKNLPKYPNLNVIKNILNNDDNEILRYGTRL N VVSPVEHSPYQVPDRRLSAERSARELVALADEQGWSV LHAVVMDQDLKTNERSIRYEATQSALMRCDELKKIEEHPCKV IVHAVGWNRFGDNARETALKAVRQSLEKSTSYA AAAMPHYGDGRATK
AAAMPHYGDGRATK ESIRSATRNALERADDLGC
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UniRef90 E3GXJ5 UniRef90-M0MGR6 UniRef90-E4V2E5
UniRef90 B4LHA UniRef90-J3PFU8 UniRef90-J9LCP8 UniRef90_UPIO0006CB007 UniRef90 V5IPQ6 UniRef90- UPI0003B63F7F UniRef90-LOL2S6 UniRef90_17CLD8 UniRet90 U1DNR7 UniRef90-_9LLRA5
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UniRef90 GOHXT UniRef90 UPlo0006CF8F6 UniRef90 X1WN68 UniRef90-UPIO0046BB3DO UniRef90-L5NWJ2 UniRef90-L9X8B0 UniRef90-H9UA13 UniRef90_COSEJO UniRef90-Q76YF6 UniRef90-R5CQL5 UniRef90-B1L625 UniRef90-C3SAD3 UniRef90- Xotrub UniRef90 G7V7J1 UniRef90-X1XJG3 UniRef90-O54QM4 UniRef90-G8NALO UniRef90-LOIDSO UniRef90-D3ZRU3 UniRef90 ${ }^{-14 E F F} 1$ UniRef90_UPI0003627A6A UniR Refo-LOAKM1 UniRet90_B6BMK6 UniRef90-A8M8Q1 UniRef90-10A1L1 UniRef90-E4TJ88 UniRef90_K7Z9T8 UniRef90-J7KE18 UniRef90-TOLFU9 UniRef90-UPI00045DF53B UniRet90-X8DMP0 UniRef90-GOEEG44 UniRef90-XoVBW5 UniRef90-U1DAD2 UniRef90_UPI0003B537C5 UniRef90 O67112 UniRef90 B11450 UniRef90-L8HJG2 UniRef90_S3XDF2 UniRet90 A1AMX4 UniRef90-D3L4T9 UniRef90-B9L9M5 UniRefo-IIEUS9 UniRef90-A5D049 UniRef90-J9KTX9 UniRef90- IOG.JR4 UniRef90-UPIO00368DB3B UniRef90 H2J519

AFPGMGTGVGGGILPKEKAAEVMKKFLERKGKK\|KI
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VLPALGCG\AGFDLREGGR\|ICEEDHRFD VLPALGCGVAGFDFAEGAALIAEEI RNYEPET HI AKPSFSKP SWSETEEVLDDELYDSGIKVFVHSTI

 ACPRLECGPIG|LNWETIRSMLCYIDFRNSSITIVK YSPMFNSGAFRVPWQRTLEVIEEEFAGAKATWTV EAF AIPPLGMANGWL
AI PTLASRIDKLNWS IIKQLIYTEFQNTNTKTHTY VIPILGTGAAGFDFETGAQLICEEVSLTDVRVIIAYS VMPALGCGVAGFEYEEGVGI AEVLDS
 HSVKPNY PGLLK WATLEELYYKKLYDKAVSIVFIHT
A DPRTGCGLDRLQWDNKKMVEFTFKDVDVEVVVCNL AFPLLGTGVGGLPDEAVAKMLEEIKAAPDLTVTLYGF VIPALGCGVAGFDLEDGAAII GEEIDAYD GIPKMGCYNAGGDWNQVSEIVNELGGRYGRVIYSYE SMPAMSTGMFGFPKERAVGIFSKADRD AFPLLGTGVAGLPRDEVIRVMDEELRAADLETGY
 AFPLMGAGI GGVVPKESAKAMVKAFEDREVEVYLY AFPLMGAGVGGVPPAESARAMARALREHGLHVYVRD ALPAISTGI FGYPLDEASEII
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AFPKI GCDITGGKWENYKKMIQE
A TPRIGCDLDKLDWS
A PTAAAGLDKRNWSMIKQLTYNEFQNCDTELLDC VIPALGCGVAGFDLVDGARLICEETSDRDVRFVAY VLPALGCGVAGFDLEDGAGVIGEEIGGYD AlIPFVGTGIFG
WGCRFNAGLFGVPWERTKRMDEKA
ПMPRTGAGI GGGKWEETVKVVEQYQEDADFMTYDYK AMPAIGAGLGGLKWDDVKRCI ERVASSYPVDLYVVE AFPAMGAGVGGVPVEESVR\|ILEE\KASPIE
AFPADGTGVGGFSDEECAR $\square$ M
AFPAFGTGIGGFP
ACPRDGSESDGLQWEDTQNMFRNTFGNSNTKVCVYT HLIAKPQFTSP SWSELDEVLTKELYNSGIKVFVHSD AFPLLGTGVGGLPVEAVARVMLEELKQAPLEVTLY VIPALGCGVAGYDLADGATLI
YMPRPGCGNGRLS WEEVRPLLRGVLDDR AFPALGAGVGGLDMATCAQVMVETITRY ALPAI SAGIFGFPKERCAAI L VLPALGCGVAGFDLLEGAEI I GE
$A M P L L G C G V G G L S K E K \square F L I I K S \square F S E L D L E V L I Y$ AFPAI STGVFGCPYDEAARIMAKA

GIPALGCGUGGLNPSLILTLLEDEEQEADDDLLLF
AVPPLGMAHGWLSFNE
AFPALGTGLGGFPVEECAK $\square \mathrm{M}$

ALPAMGAGVGGLSDEESLDAI EEVLREKG
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AFPALGAGVGRFPDSQVAQLMRHVSEATSLDTVIF



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ITPKLGCTLDGLLNWYQVHGLLKNTFDGSD
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## UniRef90 T1A7Q3

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LTVG
TELLIV GWFLC
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पKKAGG KEDEAEAVKKGP TPVGEAVVTGAGKLKAKY ALRRVSQQTVDQYELAGEMGDLHLGKGLTFPFWRKISVVL 1 FSGAGAN ELDAACDEDGSCPVGQA VMTDAFRLPAN IRAAGPGLEE KPGEGAVI

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$\qquad$ D R A ETKSLIAPVRVGE AVVSGGHNLPN

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& \text { ISRKGPTVQKESDEYVKKYGPVEPGGVAVTGAGGNLSAKYV} \\
& \text { RRKGGKVDED }
\end{aligned}
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UniRef90
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UniRef90 $\cup P 10003 B 5 F 2 B 6$ UniRef90-D3SPK1 UniRef90 D7GXPO UniRef90_-Q0CMD3 UniRet90-C6A047 UniRef90-HOURE6 UniRei90_UPI0004792A75 UniRef90-W5KZS5 UniRef90_L8Y5Z2 UniRef90-X1RPU6 UniRef90-E1FTR2
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120

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TKKTVSQKPT Y VSLRQSUE
HTVGPVWGEGNEHEKLYKAVKNVLSKAQEDGDK T T I HAPTMER PAQRUGVENVREATEAALRKAEELGESV VHAVGPKFGDPEGDVK M 1 I HAPTMEKPAMRDNPENAYKATFAADTKAFDDS $\square$ N
 LVTQTSWGKPTYQLLHSSLTAMRQ
 IVHAVGPRWNRFGDNSREKALLKKAVCQSLEKSKGY TS KM】VHACGP DWKGGTNQEKDRLMDCDQAALEVTEKKGYS $ل$


 KYIUASGPWWEGGDKGFDA RSAB TIFVINTVGPKNDNPNKARGMLHSIHSSLRSATALNCSU I KYITHTVGPKSKNRQUTTYENLYTALMNLKYFSEKHSGKK | KYUGVSGPVWKDGRSNEGATLRQCYDKALYMAVENNCS |
| :--- |
| $I$ |

UniRef90 T1A7Q3 UniRef90-M8B1Z8 UniRef90-G4RKJ1 UniRef90- ${ }^{-15 Y \text { YАF }}$ UniRef90-I1FIN8 UniRef90-K7RFJ4 UniRef90- MOLVM7 UniRef90-B9L2D9 UniRef90-F6SYT5 UniRet90 UPI0002B4A22B
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AFPA $\square G T G V G G F P D E C A R \square M$
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A $P_{P P L G S G L G G L Y W P D V R A L I E E A F H E G D V R V L V F E ~}^{\text {G }}$
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ll
 FKADFKKSGREPYKELKRKGLLKLGEAVITSPGTLKCKA
$1 V R K G G A V I K E S D A L V E R N G O V P V G S A V Y T S A G N L K A K Y V ~$ FKA GPEVQKECRALVKQWGKVPTGRVVSTTGGNLNCKSL \|FHAGGSIIEKEAMLKAKDSPSVGSAIFTSAGRLKFKGV I ADAAGVEFRKMCDFVKKNGPVPTGKAMATSAGGRLDFKAG IFRAAGVSRMAAACDRFAPIHTGEAVITPGFNLPSRYV

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I HTIVGPTWED
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HTVGPTWEDGDSNEK
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I HASGPWWTDGSKGEEAC
I HAVGPKWKKDDAR CCM I QHAVEQSLILAEH LHAVGPVGGKSGGRERILLEAVIDSALINSAESM LLDHVAGปNTFWKATDYSURKSTSNTLK KFVVHTAGPVYRGGKNGE LLTKNKNYDTPA $\qquad$


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EKLY K
H $\square$ H Y S H P$\begin{array}{lllll}N E A T & R & I & T & M \\ G P D & V & G & G A & E\end{array}$

17 HCLGPVYGSDEPAN
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 1 HT
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1 A B V G V W D
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I YKAAGKSQLLRARW K $\quad$ GKI RRGE IAV TDA YNLSA
LKAAGPE LQQECDELVKKNGSLQPGGCAVDTGPGKLACKN




R
I HR A A AGPKLAEACAQLKGCPTGQAKVTPGFNDQA
 DSKKWPNVQAAFKKYARTGRFDGGHDWTLEPDGNQPGFDY

 LQQAGNEDELEFNEKVTEDQDSQLVLVTKGFKLSCQYVYH


 IHRRGG PA ALEACRKLRASHYGKGLRTGQAVATTAGE L Q A GPE L
1
$H R R G G A G R G D A E E C K P L V P I$
$I$
$R$ I HR
 I SHAGGKNEDAQKQLPATDGNVVVGELSQKH@FHCLTMDD I HR R AAGPGLDQECREFAPI EPGEAVITSGQQLPNRFV
 1 SVA G GE QRESTEY DQQNGELRVGGUCHTTGGRLKCRHI $\begin{array}{lll}L & K K A G P G L Q K A G E R Y A & P \\ H & R & A \\ H\end{array}$
 VRRR AGREPFRQLGRMGP R R GEAVATTAGRLPFRAH

I LQQAGVEMKSEFLATKA KQFQRSQLVLVTKGGNLLFCKY
I AKAGGRADKQECDAYRKYGDLQTGKYIVKTSGGNLRCKHV


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 VA GI NLLWRASE R Q SI R D SVA NALARARERGWS L

 AVG PRRKGKDAESLLDNTVYTNDI.







 v


## V



I HAVAP $\square W$ WVN $I$ HAVAP $\quad$ VWD SKKVVSVCQ $\begin{array}{llllllll}V & 1 & H & C & L & G & P & V \\ V & 1 & H & A & V & G & P & R\end{array}$ $V H$ AVGPRWTSANKEN C $\square Q L L$

 I HAVGP $\square W N Q G S T K A A M H L E A V C N S L K A A D$ AVGPNFNKVSELDGDKQLAEAYESVAKDIDD IHAV GPRFGEE GEDKLAASADRRSLEKGEELGL $\mid V \square H C N G P S W N T D K \quad C Q D N M E K T V K N C L A L A D D E D T$ I H T LGPVYGQDKPEAD $\quad$ L LA RCYENSLT LCEKHQDE
 1 H TVGPIWHGGNKGEP KYIIHASGPWWDGGKNNEVEL CQHVVHTVSPQSSRDQTDHQQQL K Y I I H T A GPVWY G G GA GEAK LL L H AV GPVA GKA A GKERVVLLE $\square Y H V L W W$ S E Y S E Q K L P L K KY I H TVGPVWK GGKSHEFEAMKKCLEKCLELL $\begin{array}{ll}1 \quad 1 & H A V G \\ V & R\end{array}$
V

## NFSRVVST

 VIHAAVGPKWKGDEALKCVAE
 IV VHCLG
I HAVGP


 L A TQPDMYH

CERLLKKVVEES $\square$
 $F V \vee L P G W D R G K G K S L K I L E D T I N Y C L R K T E E L G L N$
 WHS A DLI F P Q I LLRDLA V K K C L E K K C L S E L A D E T V R T M

 FPVEHCFYDNPDPK

$V$ I HAVGPKWNSS DV
VI HAVVGPRMGE GDEEKKMAGATRGS LKKVALSSREDKCQ
 LDAVGPVWGEGNEHVKL YNTVKNVLLKANELREK




 $\square H C L G P V Y G R D E P S D R L L A A C Y R N A L R$ L A D Q A D


 |V A G| NLLWRS S E
I H AVGP I WH G GAENEELL
L R Q CVWK S L K K TEE ELLGF S I
II Y HVLWWH SEFPKPQULKHAMKECLEKC
I H A V P DWWNA D D M G D Q R H C $\quad$ DD L L Y N



UniRef90_A5NOY6
UniRef90_W6JVA7 UniRef90_K1R612



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lupas_14
lupas_28
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conf
sol25
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jpssm

UniRef90_A5N0Y6 UniRef90-W6JVA7 UniRef90_K1R612



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UniRef90_A5NOY6 UniRef90-W6JVA7 UniRef90_K1R612

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jhmm


UniRef90_A5NOY6 UniRef90-W6JVA7 UniRef90_K1R612

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jnet conf sol25
sol5 sol0 j̣hmm
jpssm


