## QUERY

UniRef90_B8CWP4 UniRef90-C6CWF9
UniRef90 SoEW00 UniRef90 L1 QNV8 UniRef90-1014U2 UniRef90_UPI00036D8FFB UniRef90-UPI00036E4EF6 UniRef90- D3EM02 UniRef90-B5YC67 UniRef90-R9H2V6 UniRef90-UPI00037F1581 UniRef90-G5H5K9 UniRef90-W4BVC5 UniRef90_UPIO00475DA1A UniRef90- UPIO00362A153 UniRef90-UPI0002EF8BD9 UniRef90 UPI000366EB93 UniRef90 C6JJZ1 UniRef90-S6EG66 UniRef90-GOGEM3 UniRef90-UPI00036261F7 UniRef90 M5RU47 UniRef90-R7EMR5 UniRef90_UPI000477E198
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1
AKDPRYDGN10 KTGRPT ${ }^{20}$
20
GRRKGM 30
30
40
 QHRLRGNLPK: GI RPA:DGRRKGIRESLEGQTMGMAKA THRLRSAPPKIGIRPTIDGRYGGVRESLEEQVMALARS TN LNGKYPKIGIRPTIDGRRRGVRESLEEQTMNMAKQ ENRLIGAMPRVGI RPII DGRRRGGVRESLEEQTMRMAER

RMQQNYPKI GIRPVIDGRRGGIRESLEDTTMNLAKS EKRFIEEYPKVGI RPTVDGRYGGVRESLEEQTMNLAKA
NRLKGSNPKI GI RPTI DGRRKGVRESLEAQTMQMALIN RPI DGRLIGGVRESLEETMKMAQN
$\qquad$
$E N$

Q N $\square R \mathrm{~F}$

QDYRYKQAF

MGRLPK
MKKKYPKIGI
MFTQLPKI GI RPT

ED RFGAA $\square P K V G 1$ RLFGDMPKI GI WOGEMPKI RNSRLIGGKPKIGIRPI DGRLGGVRESLEEQTQALIAQR

EQRYRGELPK G R R
NRLRGELPKVGI
S R RI ${ }^{\text {B. }}$
 NRY(IGDLPKIGI MTNHPKIGIRA MTNYPTIGI NPPRIG1 NRMIGAYPIIGIRPV


LRKKHVRVGI RPT SRLTGEYPIIGI TNRYVGEYPVIG| MKNYPK RPVI
KLIGEMPKVG| NKLIGA


ADQRKLVGGHPVIGI
 RPVI NYPKIG1
G S NDPKLG|
$\qquad$ $N L P R$
D
F
K
NRYQ $\| \mathrm{D}$

RFADSYPK $\begin{aligned} & R P T \\ & R\end{aligned}$
RFADSYPKI GIRPT
MDNRIR G
KYPK
NRYTG

RLAG TWPKIG SLDPK EERRYAGGFPKVGi MVHHPKIGI RPT YGKI G1 | K | $\mathrm{G} \mid$ |
| :--- | :--- |
| R | G | H

 YPKIGI KI Gl RP NHPRIGIRPT
 NYPKIGI RPA
 ס
 DGRRGKVRESLEEQTMNMAR
 DGRLGGVRESLEEQTQALAQR
 DGRDGGVRESLEEVTMGMAKA DGRQMGVRESLEVQTMNMAKN DGRRGAVRGSEEDQTMNMAKS
DGRRQGVRESHEDGNMAKS DGRRQGVRESLEVQTMNMAKS DGrRRGVRESLEETTMGMAKA DGRRRGVRESLEDQTMNMARR DGRYGGVRESLEEQMKQAER DARRGDVRGSLEEQTMGMAEA DGRRRGVRESLEEQTMGMAEA DGRQGGlRESLEDVTMGMAQS DGRRKGVRESLEAQTMQMAKK DARRGQVRQSLEETMGMAHA DGRQGG|RESLEDKTMMLANA DGRRRGVRESLEEQMTMAQS DGRRMGVRESLEDQTMTMARM DGRQGGVRESLEDKTMALAQA DGRWGGVRESLEEKTMNMALA DGRRGGIVESSEDMTMKMANL DGRRNGVRESLEDQTMGMAKA DGRRLGVRESLEEQTMNMAKA DGRWGGI REGLEEQMGMAKA DGREGSVRASLEEQMNMAKR DGRRGGVRESLEEQTMSMAKA DGRVGNVRESLEDQTMNMAKA DGRWGGVRESLEDQTMGMAKA dgrragvreate otmamars DGRRMGVRESLEEQTMNMAKA DGRERGVRESLEAQCMEMAKN DGRRRGVRESLEDKTMWMAHA DGRWGGVRESLEAQCRAMAES DGRQFGIRESLEVQTMNMAKA DGRQGGVRESLEKTMQMALA DGRWGGVRESLEEKTAMANA dgratglrestedotmamaks DGRWGGIREGLEDKTMAMAKA DGRQGGVRESLEQQTLDMARR DGRQGGVRESLEGQTMAMAQA DPRRAVYQALYGQTMEMARQ
 RMQFNLYKGGRPVVDGRFGGLRESLEPGTMQMAHR

S LPKTGПRPVIDGRRMGVRESLEETMNMAKA KKP II AI RPI I DGRRRGVRESLEEQTMQMAKT $P K \downarrow G \perp R V V V D G R C N G V R E K 亡 E A P T F A L A Q K$

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| :---: | :---: | :---: |
|  |  |  |
| UniRef90 C6CWF9 |  | GGVAEAAACADKFA |
| UniRef90-S0EW00 | QFLQENLRHPSGLPVECII ADTCI G | GGVSEAAKCAEKFA |
| UniRef90-L1QNV8 | VAVLYS STLKYPNGLPVECVISDTTI | GGVAESA |
| UniRef90-1014U2 | VARFLSENLRHYNGLPVECVI A D T T I G | GGVAEAAATAEKFR |
| UniRef90-UPI000361 | A A QLIS T NLRHTNGLPVECVI ADTTI G | GGAAEAA |
| UniRef90-UPI00036E4EF6 | VEKLYRENLRYPDGSPVECVI A D S CI | G GVKEAA |
| UniRef90-D3EM02 | TARLLTERLRHSNGLPVECVI A D T CI | GGVAEAARTEEKFA |
| UniRef90-B5YC67 | VAEFI ENNVY LP N GEKVKCVI P Q R CI | G GVAEARM |
| UniRef90-R9H2V6 | A AKYLTENLKHADGTSVECII A D S CI | GGVAEAAM |
| UniRef90_UPI00037F1581 | VAALYQNELRYPNGEPVQCVI A DQCI | GGVHEANL |
| UniRef90-G5H5K9 | VAELITSTLKYTDGTPVQCVIADSTI G | GRVPEAAACA |
| UniRef90-W4BVC5 | VAELLAAELRYPDGSAVECVVAETCI | GGVAEAAA |
| UniRef90_UPI000475DA1A | AAKLI EENLRFPNGQKVECVI ADTTI G | GGVAEAAMCADKFQ |
| UniRef90-UPI000362A153 | VAELI RTNLKNGDGSPVECVI A D GTI G | GRVGESAA |
| UniRef90_UPI0002EF8BD9 | $V A Q L I S E T L K Y P N G E A V Q C V I A D T T I ~ G ~$ | G GVT EANK |
| UniRef90_UPI000366EB93 | AFLQDNLRYPDGSPVQCVI A D T T | GGI A EASAADAKFK |
| UniRef90-C6JJZ1 | A AKLFTDNLRYSDGTPVEVVI ADTTI G | GRVPEAAA |
| UniRef90-S6EG66 | VAQLLESHI RHSDGSFVECVI A D S CI | GGVTEAAAC |
| UniRef90-G0GEM3 | AARLISENLRHPNGAPVECVIADTTI | GGVAEAAAC |
| UniRef90-UPI0003626 | VAQLLSENMNYNNGAPI ETVI A D T CI | G GVAEAA Q |
| UniRef90-M5RU47 | VKTLLTENVRYPNGDPVQCVVANPCI G | GGI A E A T A |
| UniRef90-R7EMR5 | VAELYSSVLRHSDGTSVECVI ADTTI | GGVAEAAMA |
| UniRef90_UPI000477 | A K RLFEETLRYPNGLPVEVVI S D T I G | GRVSEAAR |
| UniRef90-S0FMN6 | A A RLLEENLVYPDGTPVKCII I S D S TI G | GGGLEAAKCAEKFS |
| UniRef90-F8F285 | AAALI QSKLRHPNGMPVQCVI ADTTI | GGVAEAAACA |
| UniRef90_U2UMD9 | LAELI S S TLKHPSGEPVECVISDTTI | GGFSEAAK |
| UniRef90-A6D1C2 | LAAFIEENIKHVCGTAVECVIADSTI | G GVAEAAAC |
| UniRef90-D4LJR3 | A AKLFEENLKY SNGEPVKVVIADTTI G | GRVGESAAC |
| UniRef90-A5M8L7 | VA DLIS S T L K Y P GEPVECVI S P S T I G | GRVPEAAA |
| UniRef90-D5U660 | AAKLIEENIKHPSGEKVECVISDTTI | GGVAEAARCQKKFD |
| UniRef90-W4EQ32 | VAKLLSENLSYYNGQPVECVIADSCI | G GVAEA |
| UniRef90-I6XVT6 | $\checkmark$ A ALYEAELRY $\square$ DGNPVECVI A DS | GGVAEAQA |
| UniRef90-R6P417 | AKELIESEI RYPDGTPMKCVI S D CTI | GGGEEAARCAQQFA |
| UniRef90-B5JDH6 | VAAFLS DSLRYPDGSAVECVIAPSCI | G GVAEAQASVEHFR |
| UniRef90-UPI00046F3C1E | ARELLASNI RYSNGDPVQVVI ADGT | GRVAEAAA |
| UniRef90-G8UJM8 | VVKLLTKTLQYPDGTPVACVI A D S T I G | GRVAESAACTEKFR |
| UniRef90-K0YXW1 | VAKLFSENLRYTDGTPVECVI ADTTI G | GV ${ }^{\text {b }}$ AMACA |
| UniRef90-W4Q184 | VLTFLQEQLHYPNGAPVECVI ADTTI | GGVLEAAQTS |
| UniRef90_UPI0003F91734 | TADLLTANLRRANGKPVECVI ADTTI | GGFAEAAACADKFR |
| UniRef90-16YW57 | TADLI Q T T L RYSDGMPVECVI A D $\square$ CI G | GGAAEAA |
| UniRef90-U1GNA5 | AKELLEQNVFYTNGEPVKVLI ADSTI | GRVAESAA |
| UniRef90_E8LLY8 | A AKLISENLRYSNGEPVKVII A D T TI G | GRGAEAAKCADKFK |
| UniRef90-R5C7T1 | VANLISANVKNGDGSPVECVI A D S TI G | GRVAEA |
| UniRef90-UPIO004728209 | VAKLI ESKLKYPNGEPVQCVI ADAT | GRVNESALCEEKFR |
| UniRef90-G2Z8W1 | VAVLLEK T L K Y P W K PVRCVI A D Q T I G | GGIHEATLAKAKFH |
| UniRef90-A0A023S640 | TADFLSEHLRHPSGERVSCVIADSTI G | G GMAESAA |
| UniRef90-C7T7P3 | VAKLLESTLKYPDGSPVQTVISDSTI | GGVKEAAMSKEKFD |
| UniRef90-R6X0A5 | VADLISTNLKNGDGSPVECVI A DSTI G | GRVAESAACAEKFE |
| UniRef90- X8GRE7 | AKKLFEDKLFYADGSKVKVVISDCTI G |  |
| UniRef90-R6HXF8 | AKKLDEENVFYSDGTPFECII SPCTI G | GGAAEAAKCADFFS |
| UniRef90-R6EEG7 | VAMLYSERLRYSDGTPAQCVIADTTI G | G GVAEAAAVAEKFR |
| UniRef90-G8QUN0 | AAKLIS DNVRYSNGNKVECVLADTTI |  |
| UniRef90-UPI000418D35B | VAELVTATLRHPTGDPVECVIADTTI | GGVAEAAACAEKFA |
| UniRef90-B6VMR0 | TANLLTQHICHTCGTPVECVI ADSCI A | A GLAESAACDEKFS |
| UniRef90-R5C412 |  |  |
| UniRef90-B9Y914 | AKALI EANLTYSDGTPVQVVIADSTI G | GGGREAALCADKFG |
| UniRef90-H3NGE4 | A AELIRSEVKYSNGDPVEVVVFDSTI A | A RVPESARCEEEFR |
| UniRef90-R6TJG3 | AKSLFESELRCSNGEPVKV |  |
| UniRef90-UPI00037EBCCD | VARLLSEQLHYSDGSPVECVI A S C I I S | SSIKEARQADEQFR |
| UniRef90-B2UN39 | AAALIEANI RHASGEPVKCVIADTCI G | GGPAEAAACADKFK |
| UniRef90-R6QHV4 | A AKLISENVC |  |
| UniRef90-R5ICG7 | AKKLFEENLYYSNGEPVKVVMADTSI G | GRVPESAACAE |
| UniRef90-F4GKI0 | A A ALLTENLRYNDGTPVQCVIADSTI G | G GVAEASRCAD |
| UniRef90-N1HH01 | TAALITEKI RHACGAQVECVI ADTCI | A GMaEs a ceekfs |
| UniRef90-UPI00036AF779 |  | S GMQEAAECADRFA |
| UniRef90-UPI000479F4BC | A AKLIEENLRFPSGEKVECJVADTNI | GGVAEAALCADKFE |
| UniRef90-UPI00037AE05A | A ADLI TKNLRYLDGEPVEVVIAETTI | A |
| UniRef90-U2TCE4 | AKRLI ESELFYLDGSPVQCVLSSPCII G | GGGAEAARCEEYFS |
| UniRef90-R5GXL0 | A AELISSKVRHASGEPMECVIADTTI G | GG】AESAACADKFA |
| UniRef90_UPI0002FAEA5F | AKELI ESNLRYADGEPVECVI SNTTI | KQCADQFS |
| UniRef90-G7RZW4 | AKDLI ESNLRYADGTPVQCLLASRTI | GGQGDAG\VYDEFA |
| UniRef90-R6MLV4 | AKELIESNVHYQDGTPVECVISPCTI G | GSGAEAAKCNDYFS |
| UniRef90-U2KD09 | AQKLI ESRLRYPDGTKVQCVI APKTI | GGGAEAYECETFFQ |
| UniRef90-U1QFV9 | VAELLQSHI RHTDGTFVECVI A D T CI | GGVAEAAACAEKFK |
| UniRef90-C0EDQ6 | AADLI SSELRYADGSPVECVISDSTI G | GGGAEAGRCAEKFA |
| UniRef90'I6R | AKELVESSLYYMDGTPVQCVLPEQTIG | GGYadas FVDDDFA |
| UniRef90-A9HPK3 | TAAFLTSELRHAGGEAVECVIADTCI A | A GYaEAAACEEKFA |
| UniRef90-G1WHZ1 | AKELI ESSLRYADGQPVECVVASRTI G | GGRADAEAARC |
| UniRef90-R6N7M6 | A ADLI SSSICYPDGSPVECIVNPVCIS | S DVTEAQHCTHFFA |
| UniRef90-Q2NWL9 | TAALISTRLRHACGTPVECVIAEQCI A | A GMAEAAACDAQFE |
| UniRef90-UPI0004249842 | VAELISSRLTYPDGSPVRCVIAQTSI | G GVS EAV |
| UniRef90-F8IDY5 | VGELLRTHVRKPDGSPVECLVPDFCI | GGVAEAVKAD |
| UniRef90-F3P146 | VAKLI ESTVVYPDGSPVRTVISKT TIG | GGI AESNAC |
| UniRef90-K1SF10 |  | GRVAEAA |
| UniRef90-M9DAY0 |  | A GMaEAAACEEKFS |
| UniRef90-DOYS06 | AAALISENLKYTDGTPVQTIVADRTI G | GRAGESQKVHEQF |
| UniRef90_E2ZFZ0 |  | GGVREAALVAQ |
| UniRef90-UPI0002D509DD |  |  |
| UniRef90-T0CTP9 |  |  |
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## QUERY UniRef90_B8CWP4 UniRef90_C6CWF9 UniRef90_L1QNV8 UniRef90-1014U2

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UniRef90-R5ICG7 UniRef90_F4GK10 UniRef90-N1HH01 UniRef90_UPI00036AF779 UniRef90_UPI000479F4BC UniRef90_UPI00037AE05A UniRef90_U2TCE4 UniRef90-R5GXL0 UniRef90_UPIO002FAEA5F UniRef90_G7RZW4 UniRef90-R6MLV4 UniRef90_U1QFV9 UniRef90-C0EDQ6 UniRef90-16RYL4 UniRef90_A9HPK3 UniRef90_G1WHZ1 UniRef90-R6N7M6
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UniRef90 E2ZFZ0 UniRef90-UPI0002D509DD UniRef90-TOCTP9
UniRef90-X4R8Q5

EK LIRFAKAGLAVAMMKGKSY $\operatorname{LI} \square G S V S M G I A G S V V Q E D F$ EKMLRFAKAGLAVADMRGKSYLSMGSVSMGIAGSMVNEDF GKLLSFARAGLAVAYMRGKSYLSMGSVSMGIA GSDVSDSF QKMLCFARAGLAVATMRGASYLAMGGVSMGIAGSIVDHDF SKLLTFAKAGLAAS $\square M K G K S Y L S \square G S V S M G I A G S V V D Q K F$ EKLLRFARAGLAVANMRGKSYLGMGGVSMGIAGSIVNHDF



E EKLLNFAKAGLAAVATMKGK
 EKLLRFSRAGLAAATLKGQAYLSIGSVSMGIAGSIVNTDF EK L RFAKAGIAVAYMKGKSYLSLGYSSMGIAGSMVDDHF
 TKLLQFAKSALAA A I IK GKA YLSMGSVSMGI A GSMVIDESEF

 HKLLSFARCGLAVALMRGKAYLSMGGTSMGI A GSVVDQGF EKLLRFARAGIAVATMKGKSYLS $\square$ GSVSMGIA GSIPNPDF
 EKILRFARAGIAAAWMRGKSYLSIGSVSMGIAGSIVNPDF
 EKLLRFGRAAVAAASMRGKSYLQ $\square G S V T M G I G G S I I D S D F$
 QKLLKFTKAAIVVATLKGKSYLAMGSVSMGIAGSIVKDDF QRLLDYAVCGLAVAQMKGRSYLSMGAVSMGI A GSVVKDEF
 EKILRFARAAVAASTMRGKSYLQMGSDCMGl A GS SIIDTDF DKLLRFARAAMAVADMRGKSYGSVGAVCMGIAGGSVVDTDF
 DKLLRFARAGLLAVAEMRGKAYLSLGGVSMGI A GS I VD QP F
 EK L RFARAAVAAATMRGKSYLQQGATCMGIAGSMVNDDF EKILRWARAAQAVATMRGKSYLSVGNVAMGIAGSDANADF

 TK 11 RFAKGALVAGLMRNKSYLSGGGVAMGUC EKILRFARAAQAVATMRGKSYLSMGNTCMGI EKILRFARCAAAVGQLRGKSYVGIGAVAMGU HKLLLFGRAALALMQMKGKSYLS:GSVSMGI
 EKLLRFARAGLAVASMKGKTYLAVGGVSMGI KK L L F AKAAVAAKAMRGNSYLQL G SVVMGI
 EKLLRFARAAVAVKTMQGKSYMQ GSMSMG:

 EKLLRFGRAAVAAATMRGKSYLQR GSVTMMG EKLLRFARAGLAVASMKGKSYLSVGGVSMG EK L L R F TRAA A LAAA LLR R R T Y L S L G S V S M G DKILTFSRAAVAAGQMRGKGYLQMGSTCMG

 EKILLFAKGAI A AGQMKGKSYVNi GASSMG
 EKLLRFARAGLAVAT $\square R G K S Y L S \geqq G S V S M G$ GKI LRFARCAVVVGEMKNKAYVNFGSIAMGI EKILLFARASVAAGEMKNKSYVNDGASSMGI EKLLRFARAGLAVATMRGRTYLSIGGVSMGI KKI I SFARAAVAAGQMRGKAYVNLGASAMG EKKILLFARCALGGVSDMKDRTYLSSLGTMSMG EQILRYARCALGVALMKGRSYLS GTVSMG RKLIQFAKAATSVAAMKDKSYLSVGYVSMGI

 KKLVLFAQCALAVSTMRNKAYLSVGNVCMGI EKLLQFTKAALAVTllRGKSYLSMGSVSMGI


## QUERY <br> UniRef90_B8CWP4 UniRef90-C6CWF9 UniRef90-L1 QNV8 UniRef90-1014U2

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UniRef90_R6TJG3 UniRef90-UP100037EBCCD UniRef90-B2UN39 UniRef90 R6QHV4 UniRef90-F4GKIO UniRef90-N1HHO1 UniRef90_UPI00036AF779 UniRef90-UPIO00479F4BC UniRef90-UPI00037AE05A UniRef90-U2TCE4 UniRef90-R5GXLO UniRef90-UPIO002FAEA5F UniRef90-G7RZW4 UniRef90 RGMLV44 UniRef90-U1QFV9 UniRef90-COEDQ6 UniRef90-16RYL4 UniRef90-G1WHZ1 UniRef90-R6N7M6 UniRef90-Q2NWL9 UniRef90_UPIOOO4249842 UniRet90-F8IDY5 UniRef90-K1SF10 UniRef90-M9DAYO UniRef90-DoYSO6
UniRef90 E2ZFZO UniRef90-UPI0002D509DD UniRef90-ToCTP9
UniRef90_X4R8Q5




210
220
230
240
F Q N Y L GMRNEYVDMSEFVRRDELGTY DKEEYERALKWVKE
F QEYL GMRNEYVDMSEFI RRMEEEI YDKAEFKRAMKWVKE


L E R WL G M R V E T I D M V E F V R R I
L K D Y L G M R TE F V D M S E L V R R M E E GI Y D QE E Y K K A L A WV K E
LQ E Y L G M RTEFFVDASEELRRRDQLGI YNHDEFAKAMQWTK E




$\stackrel{F}{F}$
F QE Y L GMMRVE S V D E V VE II I R RMT E GVV Y

WEK WL GMRVEAI DMSEFVGRMQKEQYDPQEYERADAWVKE


L LD Y L G I R P E F K D M S E I T R R I Q N E I Y D K E E Y E K A L T W WV K E
F Q R Y L G M R NE Y V D M T E I K R RLD R EVVY D K DE F E L A L A WT K E


## L L

WTKY GMRNEYI DMSEFARRVNEEI Y
WEK S L G M R R VEA A I D M S E V F S G R M K V G M
FEEY GMRVVSV DEVEDLRRMEEG DYDPDEYERAL S WVK E
FENYL GMRCE GVVDVVEI I RRMENDI Y DKEEYKKKALLA WAKK


1
F
QEYGGRAEQVDMTEILRRMEEGI


LESYGGMRVESVDEVEVVRRMDEGI

fisw empedy

## $\stackrel{L}{\text { L }}$

## $\stackrel{L}{\text { L }}$

 WE Y G GMRNEYVDMSEINRRDQLG|
## .

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## F <br> F


F R S WL D M R V Q A V D M T E L R R R L


## L

FRCY L GMRTETV DMSEVQRRLQLNL
 DEA E F E K A K L L WVV $K$ DKA E F E K A K S WVV K E D P Q E LD F A MEWA G Q $\begin{array}{llllllllll}D & Q & E & F & K & \text { A MA WA E K } \\ \text { D P E E } & \text { Y K K A M A WT E K }\end{array}$ DHEEFERALAWTKA DHE E YER A L K WVVK E
 $Y D P V E Y E K A L A B T L$
 D D $\operatorname{H}$ E E E Y F DEAEFDDAMQWADS Y D HE A Y E K A LA WTK E
$\qquad$
 $Y$


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 HC I EGFDKNPENMQNPRE $\quad$ K DEQWEFVVKMMI $V$ VRDLMKG YCKEGVDVNHPDQQDSPEQKAKLWETVVKMTLI TRDLMVG



 NCKEGPDDNPPEKQHNRKKKDEVWSTSVKMAMIVRDLMVG HCKEGDDINK VSRTEEVKNKEWETVVKMTMIIRDMMIGG NCKEGKDYNGEAL LEEQKQQDWETVVKMTMIMRDLMIG TCKDGWDKNPEELQFSPEKKEEQFEFVVKMAVIIKELMNG NVKEGFDHNREDLVLSREEKDRQWEFVIKMFMI GRDLMVG CKFGSDNNK VKATDEQKEKEWATSIKMAMIMRDLMVG K F $\square F$ GQDNNKEEFKRTDEQLAKDLDETSIKMTLITKDLMVG NFRQGEDFNPPHNQK PERHDDWWAYSVKMTLIARDLMAG HCPEGFDKNPPEKKHTDAQKEEEWAFVVKMTGACRDLMGG YCKEGFDYNETGKKRKSSGQRDEEWETSVKMAL ARDLMVG NCKQGED DNRKDLAKTKAEHEKDWEFTVKMTVIVRDLMVG NFKQGKDWNPEDWQF PEKHEDWWKFVTKMTLI GRDLMNG NLKVGRNVNPPELKRSDKQQEDDWETVVKMTLIIDRDLMVG

 KCK $\square G F D K N P E F V R K S E K E M E E A F E F V V K S M V I I K D G Y O G$ YCNEGEDDNRDVKKKDRAGKDADWEFVTKMTMI I RDLMTG NCKQGLDLNKRENQRNADEKEGDWERSILLTMIVRDLMVG NLEQGADNNPVHDQSKPEKAREEWDTS I KMALIVGRDLMVG HFNEGPDLNPQERQSSPQQKKGVLRESLLMAICMRDMMQG NTPDGPDNEKDPNKFTDEEKHEQLANCDKMTIDARDLMDG YCNEGHDYNEEGKAKTREQKDKDWEFTVKNMLI INDLMHG NCKEGFDKNPDWIQKDRKTKDEQWEFTVKMYLI IKDLMRG NCPEGFDKNPENI RHTPEQKEKEWEFVVKMTLI CRDIMDG NCNEGTDDNPAHLRYSREKKDEVWEFVVKMTMI FRDLMQG
 YFQYGEDLDNAEQYRRSPENHRQULRESLLMA CIDRDMMQG NCTQGWDKNPEELDRPNKEGYEAWWEFVVKNMLIVRDLMVG NCPEGFDKNA KPYSAEDKEKQWQFVTKMTMII RDIMLG NCKEGPDQTPEGHRFSEEEKDEQWEFSVKTAMIIRDLMQG NCPEGFDKNPEFVRRSAGQKEKDWEFVVKMAVI I K DLMSG
$H C L E G T D Y N E A A T Q F S R E R K D E V W A F V V K M T L I M R D L M A G$ VFKFAEDKNRAA VGKFAEDKNRPDVKLDEAGRRKTFRESVLMAM FRDMMQG
 NFRYGEDQNASQYKRNEAQNRAVLKESLLMAMCIRDMMQG
 $N V Q \square G K D F N P E$ NCREGFDCNPE I IRRSSRFDPEEQWSFCVKHALVVVRDIMKG KCPEGVDDNPTPPVLSAKEKDENWEFIAKMTCIIRDILKG

 NCPEGYDVNRDKKPRTAEEKAKEWEFIVVKFTAIVQDIVFGG

 KCPEGVD DNREDPR】ITDSKDEDWDFIARQVVIIRDULFG NLKDGEDHNPSANQKSAEEKEKDWDECIKMAIIMKDMMEG
$N$ KRFGQDTNAAEHRRSPEGYRGVLRESLQMTLCIRDMMQG NFRFGQDTNAAEHRRSPEGYRGVLRESLQMTLCIRDMMQG YCKEGDDRNPPAERRSKAQKDRDWEFVVKMTLI MKDLGDEG N LTTDGENRNPKKNQVSQQDYDEQFEYCIKMUL:ARDLMHG NFRYGEDENNKQYQRNAEQSRAVLRESLLMAMCIRDMMQG K LHKGEDNHKPEYALSPEETEAQWDYVTKMVLIGRDLMEG NCTEMEDPNPPE QQQSRQQKDEVWSTIVKMTLI LRDLMVG KLKEGQNVNPPELQRTKEQKEEDWKTVVKMTLI ARDLMVG $K C D E G F D K N P E H V Q K T R E Q K D K D W E F V V K M M C I D K D L M N G$
$R L R K G D D I N L E E D Y L S E E Q A E A Q W D Y V T K M V I I A R D L M H G$

## QUERY UniRef90_B8CWP4 UniRef90-C6CWF9 UniRef90-L1 QNV8 UniRef90-1014U2

 UniRef90_UPI00036D8FFB UniRee90-UPI00036E4EF6 UniRef90-D3EM02 UniRef90-B5YC67 UniRef90-R9H2V6 UniRef90-UPI00037F1581 UniRef90-G5H5K9 UniRef90-W4BVC5 UniRef90-UPI000475DA1A UniRef90_UPIOOO362A153 UniRef90-UPIOOO2EF8BD9UniRef90-UPIO00366EB93 UniRef90 C6JJZ1 UniRef90-S6EG66 UniRef90-GoGEM3 UniRef90-UPI00036261F7 UniRef90_M5RU47 UniRef90-R7EMR5 UniRef90-UPIOOO477E198 UniRef90-S0FMN6 UniRef90-F8F285 UniRef90-U2UMD9 UniRef90 A6D1C2 UniRef90-D4LJR3 UniRef90-D5U660 UniRef90-W4EQ32 UniRef90-16XVT6 UniRef90-R6P417 UniRef90-UPIO0046F3C1E UniRef90-G8UJM8 UniRet90-KOYXW1 UniRef90-W4Q184 UniRef90-UPIOOO3F91734 UniRef90_-16YW57 UniRef90 U1GNA5 UniRef90-E8LLY8 UniRef90-85C7T1 UniRef90_UPIO004728209 UniRef90_G2Z8W1 UniRet90-A0AO23S640 UniRef90_C7T7P3 UniRef90-R6X0A5 UniRef90-X8GRE7 UniRef90-R6HXF8
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290
300

320 NPKLAEMGYGEEAMGHNAIAAGFQGQRQWTDHFPNGDFME NPRAAELGFGEEAMGHNAVVSGFQGQRQWTDHFPNGDFME NPKLASLGFAEESEGHNAIVAGFQGQRHWTDYMPNGDFME NPKLREMGFGEEALGHNAIAAGFQGQRQWTDFLPNGDFME NKKLADMGYQEEAEGHNAIGGGFQGQRQWTDHEPNGDFTE
NPVLDTMGYGEEALGHNAI
AGGFQGQRQWTDFLPDGDFSE NPKLAAMGYGEEALGRHALAAGFQGQRAWTDYFPTGDFME NKKLEERGYPEESLGHNAIVAGFQGQRQWTDHFPNGDFTE NPVLDDLGFGEEALGHNAIISGFQGQRQWTDHFPNGDFDE NPKLRELGFKEEALGHNAI AAGFQGQRQWTDHLPNGDFAE

## N

 NPKLAABMGKK NPVLDEMGFHE NSDLKRKGTYEAMGRNAILGGFQGQRMWTDWLPNGDFTE $N P K L A Q L G F G E E A M G H N A V V G G F Q G Q R H W T D H L P N G D F S E$

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 NPRLAEDGFVG NPKLAEMGYIGESSWSPCFSSWFPRSTSVDRPFPNGDFME NDKIAAKGWEEEALGRNALIAGFQGQRQWTDHFPNGDFME NPRLEKGWGEEALGRGA1AAGFQGQRQWTDGFPNGDGME NPKAEMGWEEESMGRNGULGGFQGQRMWSDWQPNGDFTE NPKLKSLGFGEEALGHAAAGGFQGQRQWTDYYPNTDFAE NPVLAEMGYHEESKGHNAIIAAGFQGQRHWTDFMPNGDFME
 NPNLPEGREEEAVGFNAIAGGFQGQRQWTDHFPNTDFAE NEKL $\square D A G F K E E S L G H N A \| A S G F Q G Q R Q W T D F K P N G D F E$ NEALADKGFLEEAGGHNALDSGFQGQRQWTDFMTNGDFME
NKKLABAGEEEAAGHHAILSGFQGQRQWTDYFPNGDFME NSKLAELGFGEEALGYNAIVGGF NEKLADLGFKE NPRLEELGFK NEKLADK FP NDKLNDDGWHE NKELKKTGFGE NPRLAELGYVEESLGHNALI NPTAELGYVEESCGHHAIAAGFQGQRQWTDHWPNGDFME
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N
 NKNLPA GFDEEALVGNAVAAGFQGQRNWTDWDPNADFTE NLKLAEMGFEEEAEGHNAIASGFQGQRQWTDHWPNGDFME NKTLADKGLVEESLGYNAI AAGFQGQRHWTDQYPNGDTAE NPKLKEMGYGE
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 NKNLPA GCEEESVGHNAIAAGFQGQRQWTDFYPNCDFPE
 NPELEKLGWKE NSKLAKKGFPE



40 $M K K Y P K I G I X R T I D G R Q G G V R E S L E E E K T M N L A K A$


$S \square P K \square G \square R P V I D G R R M G \square R E S \square E E Q T M N M A K A$
D Y P K $\square \mathrm{G} \square \mathrm{R} P \square \mathrm{D}$ D GRRGG $\square$ RE S $L E E M T M G M A R R$
MNKKPKIGVIGFSDGEPGVHEELKGIVQEQMDA MAR $\square G V I S \square S$ D GRDYVHE G $\square$ A E F $\square R T N E D Q L$

MAKVGVITFSDGRPHVHRELL SMNLA
MKQKYRVGLISFSDGRE YVHKELEG IVKKFEDE
 MARI GVLTISDGRD FVVRDIA DWARSSEDA KVGLMTFSDGRE YVHKDLINDNKAFEQK K K R KVVGVITFS DGRD FVVHNDLIEMNKGFQDR
 MARI GLL TMSDGRD Y VANDI REFVQNAEKA
 $R \square M A R I G V I S$ I S D GRDHVHARN AR






I GIV MMNDARPH VYNLNNAENMAVVH G

$G L P K V G M D T$ FSDAREHEYKVLVYEKT
GKPVI GVVAPCCDPR

$T \mathrm{~V} A D S R D D Y Y Q Q$
R
$\mathrm{K} V \mathrm{P} \square \mathrm{V} \square \square \mathrm{F}$ A T S D P R $\quad \square \mathrm{D}$ Q A S R A R C K N $\square \mathrm{V}$ K $\square G V A S F T D P R E T A L S S E R E E A \square K E K H E K$
 $\square G F \square T$ T C S GRWP REVPE QRN R E

NLEVFDVNEALG



NEK PK L G $\square \mathrm{L}$ P $\square \mathrm{T} N \mathrm{Q}$ Y Q G N $\square R \mathrm{~K}$ Y $\square \mathrm{E}$

MK QK LD $\square$ GF VVTYS GRWP KELPEKRN RE

$K$

AK $\square \mathrm{G} \square \mathrm{F}$ WP GDYRSK $\square$ A R P NAEEATVQLERA

UniRef90 D6PCIO UniRef90 E2NKZ2 UniRef90－X0V7T4 UniRef90－X0TRU2 UniRef90 H7PVV7 UniRef90－R7G547 UniRef90－W1GNE1 UniRef90 R5YBH0 UniRef90 K1SX58 UniRef90－T1B4T8 UniRef90－RENEA5 UniRet90 W5ICC5 UniRef90－X1D611 UniRef90－S1ACS5 UniRef90－UPIO0037DE34E UniRef90－A51KA8 UniRef90－X0T5X4 UniRef90－UPI00047EC598 UniRe990 A8F356 UniRef90－12F686 UniRef90－D4LYN2 UniRef90＿A0A010ZQ40 UniRef90 COCOY7 UniRef90－UPI00037FA337 UniRef90－UPIO0035C283B UniRef90 UPIO0026255E9 UniRef90 F5SB51 UniRef90－D3F3N7 UniRef90＿O1AXS8 UniRef90 D3QAL4 UniRef90－UPI00036F405A UniRef90＿UPI0003B3D5CF UniRef90 D9V2N6 UniRef90＇UPIO003613BE4 UniRef90－X1QV97 UniRef90 UPI00036A4C23 UniRef90 F3ZY71 UniRef90 Z 5 EP J9 UniRef90－R5FFU
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UniRef90 $\times 1$ RDT2
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UniRef90－E3GEC
UniRef90 XoYod
UniRef90－R6LHU1
UniRef90
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UniRef90－$\times 1$ EVR5 UniRee90 ${ }^{\circ}$ UPI0003B3EC27 UniRef90－D9WV27 UniRef90－UPIO003B52064 UniRef90＿BOPG86 UniRef90 W1V5K2 UniRef90－UPI00036BC224 UniRef90－B5H4D6 UniRef90 N9XQF8
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UniRef90 G8TIXO
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UniRef90＿UP1000479C94
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 TAALLTEKपRHACGAAVECVISDTCDAGMAEAAACEEKFS
 VVKADRASGEVDVVEAYLVHSPEEAKLQGQKMV VAELTSAGH

EVVRGSAPVSTNTLAVSVAREVA


#### Abstract

FQERLLVRRLLRESGHEVVTAPEPPWNNETAVQAGKLLLQ IIAKTLEET GEVEVI RAKEIVWKPS IDAKKEAKRLAA AASTLITENLRHSNGLPVKCVIDSDTVGGVAEAARCADKFS LVEALEST LVKALEAT I AEALKKDGR LVAALEADGH IVNALKAS LAAALAEAGH LAAMLGDAGH I QSKQDELVRSLTAAGHEVVAGRDLVATNTLATSVAREVA $V A T F L T E S L R Y P N G Q P V Q C I L A D T C I G G V T E A A Q T A E K F S$ 1 VAALQARGHVVIAAPDAVWTNDGAVVT， LASALREAGH EVVRAREVVWTNRDAVSEARRVA LVASLEAAGH VASLRS VGHEVV IAEELEKQ GEILVLKADRLVCSVESAKEEAEKLKK TAA LTAAGDVVTGG VVRALVATNTTATAAARSVA AADCIVSGSVVMPDKTSVEVVYSGVSLISSNADATGRAREVAA LVEALERT GQVQVI A GEKVI QTPQEAKTEVEQLD WADVI RQRFKNVDGSSPEVITASETI TGVRVAQKDGEELR TAALI SEKDRHACGARVECVIDADTCIAGMAESAACEEKFS A A R K RTVVYFADYEME LHTFDTVARSPQDDDRQTDEDK TAESLAGKIKDPDGTAAEVVYSDVLDDAESQADQVASQFK KKDVVRTGERVGGMEDADPAKSDKMVWRVK DARKQAK ILA VASEI EKVKKAFGDKYDVY A GLLQEELESTAFVDELGAVIRSEVIRTPQAADDFGRQAA


 CGWKANLLNPDKPVSSVAEGLR！$\square R$ A A DC $\square$ S GSVVLPDKTPVPVVYSTVLIDGEAQAD\｜VAQQFR LVKELSKEFEVLD $\square$ YSKDVFG $\quad \square N S V D E A \prod K A G R \| A K$ REEADKQKHNYLIDEEFEVVINAEL NVAK SAELRKAGFEVLDVGKYEALNAGKNFGSMDESFKAGEII A YGEWLEAQM PEVKVVRAPELGSGDESVEEAVREFK GWKVQVLNPEKPVASVAEGLQVINNAK
KYEALERGENFGVDDKEEVLKASRLIGS
LIEA ALEEFEILDVNAKLKKYEAFEKIDSKEEVLEAARUVN YGDWLEANLPKLH VVRADVLGCGKAEVAA ITTRQFK YGNWLQENLIPMDNI I KAERLGDSPQALEAVVEQFK VVETLEKTGEMD IDDPSESFRFDKMVWRPEDARKQTRMDA
 D VFA TAKEVYGADPA $\square E C \nabla I P D E P L F E \square D G \square M R A C T Q M E$ EVFK RAGDEEVE YGDWDEANDKEAS VIRASVMGCSRETVEQVTKEFK EVFK
VAEA $\square V A \square F E K \square N \square T$ P $\square L L T D A D T K \square G G V E E A Q R C A D L F K$ PVDAAKGHGFDS RAG EVFR
$S K A A D E A K G$


चSEARAEVLKM【NEQGПKP【IKDTK【GGVADARKCADLFK $P \vee S T D A E A L S L A E S V S$ VNETTGHGF $\square$ DS QRAGEVFK

UniRef90 D6PCIO UniRef90-E2NKZ2 UniRef90-X0V7T4 UniRef90-XOTRU2 UniRef90_H7PVV7 UniRef90-R7G547 UniRef90-W1GNE1 UniRef90 ${ }^{-}$R5YBH0 UniRef90_K1SX58 UniRef90-T1B4T8
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UniRef90- X1LAP2 UniRef90_UPIO0035FF548 UniRef90-X1NCZ7 UniRef90-X1M0E1 UniRef90-O59131 UniRef90-16U868 UniRef90-I3RF52
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 REGVGSTITVTSCWCYGAETMDMNPYYPKAVWGFNGTERP


K S NVCAT $\square$ TVT PCWCYGSETMDMSPD DPHADWGFNGTERP MT $\square K A V W G F N G T E R P$ SQNVGLT ITVTPCWCYGSET IDMDPTRPKAIWGFNGTERP

A MNVGAVLSVT PCWCYGSET $\square$ DMDP $\square$ MP KA $\square$ WGFNGTERP
A E DVDGT IV S Y GVFSFPNFS A IAAAKF GPF LLAA N L N P D WP SA GVDLLTVLHYAVWAFPHFTMLVQGATPGALLSNDDPVQP

REDVDCTDFNYA TWS WPHFTVLAAQFAPRPYDCNDNPGYP EEGAEVTIFNYAVWAFPHFTVLASKFAPGPFLLFSNPQYP KEGVGVSLTVTPCWCYGMETIDMDPLDPKAIWGFNGTERP
 K GEVEATVI FNYAVWCWPHDSVMASKLYAPGPFLTYGNPKYP

 A A GV DVTVVLHYCVWAFPHFTMLAAGSGPLVLVANPDPVQP






 $R M G V D G V I$ F HFAGWSFPHLATVAAKNSPVLLVASFNPRYP RANCRQVI MCYNVWDFPYLVNSLGRDVPILSLSNNNGQYP



 CGNSGPKP
 RATGDRFDNFMAGWAYPDFSVQLPHEVPKLLLGSSDPDFP K A GVD L L V CVP D T WA F P QLTTIIFPSNTPDNITCGNS GPKP


 SEEVS GI I VGGLWHWTESNLVTGLVVKETPLLLYADDDPAWA





 RA GUD GVI FHYSVVWASPRENKKKNKS TP VVVLTNLAPEQP DDQMDCVVLFS GTWVWAAHLIAADVRDALLI WTHPGS Q G W T LPA A A PVVVVEAVWQYSHHVLLDTHRGPVLVVANWAGDFP S
 Q I P S DAPLIVTANWQYSHHVLLRTHRGPILTVGNFDPTWP T I P A D A P L I V A A V WQ Y S H HVVLLARTHENPI LITVANFA GD WP


 K H A A D I Q GI L V V L P N F G D E I $V$ K L A N L

DVVLNWAYSHHVSLQTHRGPVLLLANFDGTWP NQRMGMDV FATAA WQYTHHVLMRSHRGPILTVANWS GQWP S DPADVPLVVVAVWQYSHHVLLRABRGPDLLVANWS GEYP
 VVVEAVWQYSHHVLLRD HTGP ILLVANFAGDFP $\left.G L \begin{array}{llll|lllllllllllll}L & K & E & A & N & V & P & L & L & L & Y & D & G & D & P & N & W\end{array}\right)$ $K N D \square A G V L V V L P \quad N F G D E R G L A D L Q V P V L I Q G Y P D N R R D$ HQDLHGLIVVQGTFCDASLILNLASNIDI MI WATKEQPTG $H \square P A E A P \square V V E A V W Q Y S H B V L L A R T H K G P G L V V A N W A G D F P$
 $N$ IPAD A PLVFTAAWQYTHHVLMRFHRGPILTVANWS GQWP $N \mathrm{I}$ PADAPLVVVA IWQQYSHHAGLRSHRGPVLIVGNFAGDFP

VVVVDAVWQYSHHVLLRAHRGPILIVANWAGEFP
$R \square P K D A P V I V A A V W Q Y S H H V L L R A H R G P I L T V A N W S G Q W P$


## UniRef90 D6PCIO

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DFTDDWAREKLIA GLVGLLNLNGSLVKAGVEFSSIWSESFEDSEDGTI RHDVS GLVGLLNLTASLTKAAVGHSILWSKDFTDAWTGSIKHDVS GLVGLLNLTASLTKAGI EHSULWSEDFTDEWTGAปEHDTS GLVGMLN NASMTKAGLNYSTH WSEDFTDLDGEAVRHDTV

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 EKLLRFARAAQAVATMRGKSYLSMGSVSMGI A GS VVNPDF QKLLQFTKAGLAVATMRGKSYLSDGGVSMGIAGSQVDPGF QKLLQFTKAGLAVATMKGKSYLSIGSVSMGIVGSQIDPSF EKLL RYARAALATGDMRDTAYLSMGSVSMGI GGSIVNPDF

 EKLLRFGRAAVAVMQMRGKSYLSIGSVSMGI A GSTPNPDF QKLLQFARAALAVAAMRGRSYCS GGVSMGIAGSAVDSAF AKI GVQAVAASAVSNLRGSTFGRFGGRPMGMNTAVANTDQ QKLLQFTKAGLAVATMRGKSYLSTGGVSMGDAGSQVDPSF EKLLRFARAGLAVASMKGKSYLSLGGVSMGIAGSDVDHNF RKIETFDRAASCVKSLRGETFGCFGGRPMGMYTATVGADV RKVMAFIRAGSTYKKLRGQRYGVFGGRSMGMYTAVPNVDL QKLLQFTKAGLAVATMRGKSYGS GGVSMGDAGS
ERLLVHVRAAQAVGGLRGSTFGRFGGRPMGMYTAVANTDQ RKVLAFVRAATARNMLRGQRYGLFGGRSMGMYTAVPNVDL ERVMHFVRAASAAARLKGERYGMFGGRPMGMYTASANGDQ
EKIVTFAKCAKVVSSLSGQKYGLI
 KKYRFARCARVVTRLNGQKYGL AA GPRGNAAAAVAKLRGSTFGRIGGRPMGMNTAVANTDQ DRILTHVRAGAAVQQLRGSTFGRIGGRPMGMYTATANTDQ EKLVAKARAAAAVASGRVGUSVGRDGRPMGMNT
ARLAALIGAAEAVQRLSGTTFGRIGGRPMGMYTAVSPADE ARLEAHARAARAANGLRG VRASA $\square G A D A$ A A AVSSLRG
$R I L R F G R A A R A V R R L R G Q T C G L L G G R S M G M Y V G T A D T A Q$ LD WLRASEAYTTMHNEVYGIVGGPSMGMDTGYFHLVP EKLLRFARAGLAVASGRWRPLCSALPTAVG

 KKMMPYIKAASAAGRLKGKTFGLFGGRSMGIDTGTFDPMQ KNLIDWCYAAVTTVALRGRRVVIFGHDSMGMETADAHDLP ETVLQF LRAAYAKKALAGSTMLRFGERSLGVVTADPVEAL AFARFARADEVIERLHGQDYGEDGGRSIQUVTAEADPLQQ EAFLHRERARSVI NQLKGSUYGAVGPRSMQMWNKDSEADF
 ELVKSWDRASEAVKVLSEGSLLLFGGTYTLGMEHDMDDLP ELVKA WARASEAIKALSERALLLFGGTYTLGMEHLMDDLP ELVKAWVRAAEAVKRISEGSLLLLGGTYTLGMEHLMDDLP EKVK A WV R A VEA A S K KLS R K S EKVK A WARAVEAVSKLSKASSLLLWGAPYTLGMEHLMDDLPB
 $\square$ A V E D R E K A KQLGE
E KVVKA WA R A A EA V S K L GKVKA WVRAVEAVSKLSKKSLLKWGAPYTLGMEHLMDDLPD S L L M
SKVINLVT QMVARFARADEVI ERLL
KIVSFCRAAYMKHWLNMS
 KAD
$V K L G R$ A $L A E Q L R T D$
 $H R L P G D A R A T L A A R L Q H$
$A T P E T E L G E Q L A A R L L E D$
EKDEQFGK TRLKEWDRQGSVTHDMR

## VELG

EKVACFSRA
$K K L G E$

KKVTSFARAAGAVKWLKNVRI

RILRFGRAARAVRRLRGQTCGLLGGRSMGMYVGTADTAQ
$\square$ I KEA HAHSR LVVEEI RKRR ILALGGDTSMGMINGYFGPRR




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210
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230
240
FESFLGMRVVEFDMSEFNRR|IDADLIFDSEELIRAKEYVVST FQEYLGDRCESVDLTE\|IRRMTEGIYDKEEFAKAMVWTEK

FQEYLGMRNESVDMTEFTRRMDRGIYDPEEFERALKWVKE

FQEYLGMRNES
FQEYLGMRNEFVDCSEI ERRIELG




WLSTFGVDVEEDDQWE\|VRRSEL



WMRRFGVDVEEDDQYELVRRAEQ

 WMRQFGVDVEEI DQYELVRRAESGGI

VDPARARDGRAWLER GVEAGKVRRAREWLEE ADASEKKHAREWLET ADQGEVGTAREWLER WMRQFGI DVEEI DQYELV LLRAERADAAEAVHGRKWLEQ WR N TF GLL WQS LF GVDLEHVDQFEIVRRSQE DPEDQVQKALDDWFKE NVKTFGTNVFFVDQLLLLKKMEKE VDEAEVEKGFKWF

WKK LIF Q $\square D S D H \square D H E E V V R R A E A D D E S R V E A V F R W L V D$
 WAK IF AVDTQPIDQLEIIRRASQMIIRDKRINKAFNFLTE
 $\square R N T F G L E D T R L D M K L L A D M L N K K A Y N E K E L K S L R A W I N R$ WR QDF SVVSVRQLPQEQQVELAE ADPEAEVVRQLQWLLT


 GLLKSFVGGD IMMLDQYTIINK GESVNEEQVNEFYEWLDK RLKKFVGDFIILDQYVVIK EGESIEDEKVEEFYNWLMK $M L K R F V G D F I$ MLLDQYVIIM EGEATSEEEVVRFYSWLLE
 I R R T F GVKI E E T DLKVVVFDKM
L

 I R K NF GI RI E ETDLKVVF D QMDN $\square$ PKDVVEADMADVTS WS R $\square F G V D I Q P \square G Q A E$ WMRTF GVVDIDTRDTAELLRTAQE DTEEE LAALKP $M L N P L G I$ Y K E RLLS QSALLLAEMARVSDAEADAAFA WLED

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 $L M N P T G M Y K E R Q S Q S G L V$ AEMRLVTDEEATTALDWLTS

 L L N P L GVVFKERLLS QSALVARMRLDVDDDEASADRQWLNA

 KLLKK F VGDF DMM D QY A I I K E GE E LQKN GISVVTCDLSEI L GHAN K L G P D H P R V K A HLDE K I H N L R K QF GI TVVEY L S L S E V F S LLA QKM







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UniRef90 X 1 EVR55 UniRef90 UPI0003B3EC27 UniRef90-D9WV27 UniRef90_UPI0003B52064 UniRef90_B0PG86 UniRef90 W1V5K2 UniRef90-UPI00036BC224 UniRef90-B5H4D6 UniRef90_N9XQF8 UniRef90 LOA0C2 UniRef90-H5XNX4 UniRef90_G8TIX0 UniRef90 UPIO0036D3825 UniRef90_UPI00036E5ECE UniRef90-E8SCC8 UniRef90-A8RJP6 UniRef90-UPI00036C1A54 UniRef90_Q9V0T8 UniRef90_UPI00036D7439 UniRef90 B8FVES UniRef90_UPI0003B5C18F UniRef90_UPI00037AF636 UniRef90_14C1B2 UniRef90 UPI00047C0105 UniRef90_UPI00040F7EC3 UniRef90_UPI000478ADB1 UniRef90_C1D435



280 YCNEGKDFNPPRKDQDP
NCPEGKD
NCQEGEDRNKKE $\square K H S R T Q K D V E W E M V V K M T L I A R D L M V G$
KCRPDFDKNPVEMQKTPAQKEKDWEFTAKMAC』IKDLFNG K
Y C NE GWDKNRPEKQKDRPAKDADWEFVVKMTLI IRDLM $\square G$
NGPEGLDANSASRRRNRAQKNKEWEHCDKMALIVRDLMDG $N V G R \| E \quad Y D D K K L T P E K L K Q Q \quad I \quad R H Y E A T$ TTA G GVHYDGDKLTPELLERQ $\quad$ TRSYLAVREL NCKEREDRNDEDLKHSRPQKDTEWEMVVKMTLIVRDLMVG NFRYGEDENNKQYQRNAEQSRAVLRESLLMAMCIRDMMQG
 KAKA FHYDGKYLTTPEKL ELQUKSYHAVREI




RMES L F GVLP ETS QVN
E R S M R L Y L A $\square K K L V E K$ A GLT FHF GTDEATELTRAQVQSQL KMYIAA







 $K \quad G T W F D W G T N K F T D L V Y D Q V L \quad S Q M K M Y$ K GMMRFNTGQDEKT ALTTDRQIHEQCKM Y IA A LQ D A GMTFHTGTDEATELTYAQLLSQQCRMYVAA
$N \quad \square \quad \square K P Y$ F QEMP PD D GCTERS $\square R L Y$ L A VK A GMTFH DN DGDWK ECDTDEQVHSQMKMYVAA


 $K$ VGG





UniRef90-E2NKZ2 UniRef90-X0V7T4 UniRef90-XOTRU2 UniRef90 H7PVV UniRef90-R7G547 UniRef90-W1GNE1 UniRef90 R5YBH0 UniRef90-K1SX58 UniRef90-T1B4T8 UniRef90_R6NEA5 UniRef90_W5TCC5 UniRef90-X1D611 UniRef90_S1ACS5 UniRef90 UPI00037DE34E UniRef90-A5IKA8 UniRef90-X0T5X4 UniRef90_UPIO0047EC598 UniRef90 A8F356 UniRef90 ${ }^{-12 F 686}$ UniRef90-D4LYN2 UniRef90-A0A010ZQ40 UniRef90 C0C0Y7 UniRef90_UPI00037FA337 UniRef90-UPIO0035C283B UniRef90 UPI00026255E9 UniRef90-F5SB51 UniRef90-D3F3N7 UniRef90_Q1AXS8 UniRef90 D3QAL4 UniRef90_UPI00036F405A UniRef90_UPI0003B3D5CF UniRef90 D9V2N6 UniRef90-UPIO003613BE4 UniRef90-X1QV97 UniRef90-UPI00036A4C23 UniRef90 F3ZY71 UniRef90-Z5EPJ9 UniRef90-R5FFU1 UniRef90 ${ }^{-}$X1RDT2 UniRef90_R5IW24 UniRef90-E3GEC1 UniRef90_X0Y0D7 UniRef90-R6LHU1
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 NKR $\square$ P KGREEEMVGHNA $\backslash V G G F Q G Q R Q W T D F Y P N C D F P E$ NPR $\square K E L G F K E E A \square G Y N A \square A A G F Q G Q R Q W T D W K P N G D F S E$
 KKIIE DR RLDF GGVKCHYEMSRHYCTQCLSA NKRLDNLGYTEEAEGHNALVAGFQGQRQWTDHFPNG NSKLTDIGRVEESLGYNAIAAGFQGQRHWTDQYPNGDTAE CEE LHLDFCGTKGQPELTNNFCTMDVAE VEEM ELDFVGIKGQLELTEHFVTMDVTE


R K


## E E

$K R \ V Q E N$

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KDVIGKEKG
E E E GF
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DERHLDFVGTKGQPELTDHYCTMDVAE WNLDFSGUK K A P EL T T H F C TMMDV E ERGLDFSGVKAQPELTENFATMDVAE HYDFVGVKCHYEMSRHYCTECLSA VAAERHLDFSGIKAQPELTEHFATADVAE
 $D L N A L G G G F M S Q L E W G S P L P V A D V M E$
$L D F V A V K C Q P E L S D A F V T Q C L S Q$ DF CGLKGQRELTENVCLGDIAE
DRHLDFGA $\square K C M P D M T N F R A P Q C D S T$ K D $\square \mathrm{DADGGGFMSQLEWGSQLPVADIME}$
N E
EKKYN

ND
SDRS LDFAAIKCMPDMTNFRIPQCIST SDRSLDFAAI KCMPDMSNHFRIDQCCIGV $D \square N A \square G G G F M S Q L E W G S P L P V A D V M E$
 KRQF GLDF $\square$ GIIQDQLDWDDHYPATDLS DF VGTK CMPEVA DNYAS C C LADV ESRKENIIGVSIKCQPELSEVYVTACTIP
K $\|$ SEDSY
AKK VEERKERVS
AKRVWERYKDKV

SWSEQK
SWKEFKD
GVSAV
E VMAVS
V K
WSDHENETAAVSA

WEQYKSEVA
VA V S
GVVI KCQPE
AEQGY
GW $W$ R

K QQAYDFATIKCWPEMGNLHTTPC
VRDS DD YGLD AVGI QYQQGLKDMVPASDLAE

YKRFQQLY $\operatorname{DVV}$ V $F A T K C M P E L V N K C Y G A C L A T$

 $K D Q Q Y D F G T L K C W P E M G N L H T T P C$
 SSAVRADDATADQCWTSLQQNYCNVCTNMSMMS
N

K I DEKEKF
 K AALDAVAVECWPEMAGFGGAVCYALL


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 A A QF GCDA


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T $\square \square D T S F D W N G \square R E A F \square F A T E N D S \square N G \square S M \square F N H L D T$
 A पMCSTFDWNGDRESYVLATENDACNGVAMDFGKLLTG
$T \square L N S S F D W N G \square R Q P F \| V A T E N D A L N G A T M \square F G H L L T G S$ AFCNDPYDWDGPKEPVVCACEADSDAALTMQLHLLTN

A LLNSSFDWNGVREPFVVATENDSLNGVAMLMGHQLTGT AFLNDPYDFDGPKEPIVCATEADMDAAI TMEI LKKLART AFLNDPYDWEGEHEPIVCATEADSDGALTMQIFKLIAKT


AFLNDPYDWEGPKEPTVCATEADMDAALTMQLLKPLGG AFLNDPYDWDGEKEVHVCATEADMDAALTMQILKGISET AFLNDPYDWNGPKAPHVCATEADMDGALTMQLLKGITGT ALLNDPYDWNGPKTPHVCATEADMDGAGTMKGGGHVSGT A FMNDPYDWDGEKEPVVFACEADSDAALTMQLDHLLTG ALLNDPYDWNGPKAVHVATEADMDGALTMQLMHRTG $A F L N D P Y D W N G P K A P H I T A T E A D M D G A L T M Q L M H E I S G$
$S F F N S T F D H N G R K A P L P Y A T E A D A Q G L L T M L I M M T Y G G G$ AFDNDPYDMDGPKEPTVCACEADDDGALTMQLLKLMT MLMNDPYDWNGSKEPMVCATEGDSYAAMTMQLLKY

A LL L G GYDADGEFDPFP $\square$ S CEADADGALTMEMDKLIS G SLFNSTFDHNGPKAVQPFATEADVQALLTQLFMTWLSG AFSNDSRGPAGEKKKIVCACEDDKDAALTQQIMYLLTG ALLNNPYDADGEKTPDIPTSCECDCDGAMTMRILNNLDTM SFFNSTFDHNGRKAPLPYATEADVQGLLTMLFMTYLS
 GLLNN K LDRPESDGNTIVAATEADDGAAVTMQVLKFLSG

SLIND EGVTSCECDVNAADTMQपLNT ALFPFDQDAFGKKPVIPTTCEGDIKGTITSALLYYLSG AFFPFNQDAFGEKPIIPATCEGDIKGTISSALLYYLSG AFFPFNMDAFGKKPVVPATCEGDIKGTISSSLLYYKSG
 AVLGRLAD DGIT T $\quad$ GCEGDVDAELAQMTEYYLT G ALFPFNRDVRGEKP IIPATCEGDIKGTISSALLFYLSG GLLNNRLRPESDGET!VAATEAD
GLLNNS RDWDGQAFPHF NEADEGVAV DALVTN ALFPFNADAKGEKPVVPATCEGDVKGTI S SALLFYLSG
 AVLGRLAD

SMMDD
DGYGASTLGDFNTALTVLLLTKLS GLLNNVERPDDERELYPGAALNEVDEGVAV DALVTN GLLNNSRDWEDRPLPHFD NEVDEGVAV DALLSN
 GLLNTSRDWEGQALP TFNEVDEGVAV DALV GILNSTERPDGSRELFAFPHFNEADEGVAV DALVTN GLLNNVQRPDGARELYAGAPDNEVDEGVAV DSVVTN AVLGRLAD DGUNDGCEGDVDAELTTMMA $G L L N N P$
$G L L N T S R D W D G Q P P P H P D T G E N E V V D E G A G M$
$N$
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GLLNSVCRPESNGDVI DTSTEGDQGNLIPMELMKRL GLLNNPYSEEGDGNALPHFNEVDEGAAV DALVTN GLLNNVFSRDGSRELYAGTSLNEVDEGVAV DTLIT GLLNNSRDWPGAPLPHF NEVDEGVAV GLLNNP

ERPP蒗
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NEVDEGVAV

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MRER $\square K$ VGVFS PNDPRPWVRS QNLGLI LK QEFS L

MGKK $\square \mathrm{K} \square \mathrm{GF} \square \mathrm{L} \square \mathrm{L} \quad \mathrm{K} \square \mathrm{V}$ WT NEAMQK QRRDA

K M P Q $\square \mathrm{T} \quad \mathrm{L}$ A S G D LR D S A N QVC WEA Q K D MESR

GDLRESANLQCWPTQKA
$R$ L
A MEAK

ES
$R \boxed{L}$
$R L$

N M E S R

Q Q FEGR
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 KEVEQHGF $\quad 1 \mathrm{GSQKEGMEV} \quad \mathrm{F}_{\mathrm{R}}^{\mathrm{K}}$ PWDVH $\quad$ PS DNIADEAELGRGVDSCR D V F A $E$ VFR $\square R V L Q S E N \square R G G D G F S K E$ D Q $\square \mathrm{A}$ WNTELVRKH I I N $\square \mathrm{A}$ F Q K $\square$ N LTTPVVLENTETK KGGVEEAHKCAQLFK


S G $\square$ D NAE VVGGDEM【DVEPKAMEVLEQFE $\begin{array}{rl}K R G \square E & V \\ D & F \\ \mathrm{E} & \mathrm{V} \\ \mathrm{V} & \mathrm{F} \\ \mathrm{F} & \mathrm{R} \\ \mathrm{A}\end{array}$
$\square V A A \square E S \square G H V V R G H E F D E A R G H G F \square R S Q R Q G M D V \quad F R$ $\square E E D \square A \quad R V L A G \square G H E L V R G P E G H G F \square A S Q R E G M \underset{E}{D} \underset{V}{\square} \underset{F}{P} A$ VAEARTE $\square F K Q \square \cap R G \square F \square A D A D T K \square G G V A D A R G R D V F A$ VADAR RKG $\square E V$ FR
 $\square A N A \square H Q L G Y E V R G H P \square D P V K Q H G F \square D S Q \quad K M G \square E V F R$ E VFR D MFA
$E L L E K \backslash H \backslash H P F \| L D D Q$
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 VETFKDAQRCAELFR

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REGADVFA
EDMKK】AEKFE
AD $\square T R K R \square R E \square S V E F V D \square \square A E D G L L H S E E D R \square K \square A E K F K$ $L I A A \square E K L G R K A R G H G \| D$ PKTGHGIATQKQG\|EVFA NDTKLGGVEEAQKCANLFK $\square Q S A L E Q \square G R M T R A H A V D S A R G H G F I G S$ QREGSDVG
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TGSSSTETREDGDKCAELFR YAN $\square$ TRTK $\quad$ TK K $\square \square D F V D \square I N A D G L I$ YDDAGVEAAAAK

EVFR
A R DVRK QLLKTLDAEGYDYVIGSSSDETREDGLKCAELFR AAEGRAEMIAVLEAAGVKVVAGDSKFGAVEEARKCAQLFR K 1 TEKFK KI EEKFR K $\begin{array}{llll}\text { K A E K K }\end{array}$
 Al VEKFK



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UniRef90_UPIO004636202 UniRef90_UPI0004655EF2 UniRef90-LOFX13 UniRef90_UPI00036F814A UniRef90-H1YHP8 UniRef90_UPI00047DE37C UniRef90-W6W9P8 UniRef90-UPIO0037DA8F3 UniRef90_UPIO003B42864 UniRef90-F4CFL2 UniRef90-I3ZBW1 UniRef90_UPI0003A82481 UniRef90-B6R4F6 UniRef90-H1YEQ5 UniRef90_U2J462 UniRef90-DOMESO UniRef90_UPI00046597A7 UniRef90_UPIO00463AEC0 UniRef90-B5JCW5 UniRef90_C0C110 UniRef90-N2AX75 UniRef90_C6VXK8 UniRef90_V3TML2 UniRef90-R7JRY9 UniRef90_B9KA18 UniRef90_R6FZX9
UniRef90- X0NC2? UniRef90-XONC22
UniRef90-SOFGE2 UniRef90-L4M2V9 UniRef90_G5IEV1 UniRef90-M3HYW9 UniRef90_J9Z094 UniRef90-UPIO00410830E UniRef90-EOSEP7 UniRef90-A0A023CZ64 UniRef90-1017N5 UniRef90-H9UFE0 UniRef90-A8F6D0 UniRef90M1MKX4 UniRef90-R5N7G5
UniRef90-S6ER19 UniRef90_W0HT76 UniRef90-B9XQ13
UniRef90-R6W1W7 UniRef90_UPIO0036A2422 UniRef90_Q74J46 UniRef90-C0D796 UniRef90-UPIO004017F32 UniRef90-S5KBA3 UniRef90_D4JQT6 UniRef90-IO16H4 UniRef90_G8NYMO UniRef90-E1RCT6 UniRef90_R5C953
UniRef90_E6QNA2

K
 SI DPTAPLIVASVWQYSHHVLLITTHQGPILTVANWSGEWP SUDPDAPLIVAAVWWYSHHVLLSTHRGPMLTVANWSGTWP ERGVTVLVVVQPTISDGRLAPLLSRDWEKPILLWATTEKP IVAESVWQFSHHVLMTTHKGPILTIANWSGQWP Q $\square P$ AEAPVVVEAVWQYSHHVLLISHRGPILTVANWSGEWP KENPDALIINEGAWTFPYDSVDAVKAFMRII FTCKDPKDP DPMVGVYVHWTYAPHTVDVGKDNPLLLASNFSGTWP KHRED DAGVLVLDPNFGDEKGVADTNVPVLI QAYPDDRRD NEHADCLILQCGTFCGGEEILALAQRLPVVLWGFPEPEA AHRDE IDGILVTDPNFGEEKAIANTNVPVLIMAFPDDRRD A A GVDGLLL A HCDNFGTERLAKDLGVPVLLWGPDDPEPD IVAESVWQYSHHVLLTTHKGPILTLANWSGQWP K S R P DM V VALFATFSLGTIV[SLFAKNVPVVLWSDPEPDPA E 1 DPTAPLIVAAVWQYSHHVLLISSHRGPILLTVANWSGQWP TI PPGAPLVVAAVWQYSHHVLLRDHRGPVLTVANWSGQWP RMDPTAPVIVASVWQYSHHVLLVGRKGPILTVANWSGTWP VAESVWQYSHHVLLVSHKGPILVVANWDGTYP
$V A E S V W Q Y S H H V L L T T H K G P I L I V A N W S G Q F P ~$ E $\square D P$ D A P L I V A A V WQ Y S H H IV AESVWQYSHHVGLTTHSGPILTTVANWSGQWP GLDPDAPLI VAAVWQYTHHVLLYSHOGPILLTLANWNGKSS TLDPHQPLIVASVWQYSHHVLLTTHKGPILTVANWSGQWP

S I H P DAPVVVAAVWQYSSHVLLCQHRGPVLVLANWSGTWP RETDEGV1 NF GDEVKGLA GLDVPVVLVQAYPDDRRD $E \square P A D A P L I V A A V W Q Y S H H V L L S T H R G P I L V T L A N W S$ G Q WP
 TPREVPLVVI GNWQYSSHVLLRTHSGPILTVANFLPGWP NLDPHAPIIVASVWQYSHHVLLTTQKGPILTLANFDGASS
 AIDDPDAPVIVLLTWQYSHHSSLAHHRGPILLLANFD GTWP
 K HRDD IMGVLVVLPNFGDERGLANLNVPVLVQGYPDDRRD K NADKI DGI LVVCLPNFGDEKGVADAIIRPI LI QGYPDRRRD
 TIDP HVPVIV A SVWQYSHHVLL TSHKGPI LTVANWS GQWP $K$ HADDMM GVLVVLDNF GDEKGLLARLDVVPVLI QA YPD DRRD
 RHASEIVGI LVVLPNFGDERGLAGLDVPVLVQAYPDRRRD TIPPDAPLVETAAWQYTHHVLMRSHRGPILITVANWS GQWP



$E Q G V D \quad G L F V P H G N F G T E R L A K E L N V P V L L W G P R D E R P$


 A DDPDAPVIVVLLTWQYSHH LSSLVHHRGPVLLLANFDGTWP $R E N V K$ GI FFPHGNFGTERLAKEMGLPVLLWGLRDPDEN EKAGEDDGI IVT LDPNFGDEKGVAQANVPVLVHAFPD DRRD DAKVD
A 1 A P PAP GL FVPBCNF

T A A D PD A P GLELPHCNF

A AKVD
 AEQDEGIVVILPVNFGDEKGVADTNVPVLIQATPDDRPD AHRDDIDGLVISLANFGDEVMAAGLNVPILLQACNDSRRD A LDPDAPVIVLLTWQYSHHVSLVHHRGPVLLQANFDGTWP AENDD GLFLPHCNFGTERLAKDLNVPVLLWGPDGPNRD RNRDRIDDGGLVTLPNFGDEKGIADANVPVLVHARPDTRRD







K A K I D

| $K$ | $A$ | $K$ | $D$ |  |
| :--- | :--- | :--- | :--- | :--- |
| $R$ | $E$ | $G$ | $I$ | $D$ |

R E K $K$
K A $\mathrm{G} \mid \mathrm{I}$

A EKV D | $G$ | $V$ | $V$ | $T$ | $L$ | $P$ | $N$ | $F$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $L$ | $F$ | $I$ | $A$ | $N$ | $E$ | $N$ |


$\begin{array}{lllllll}G H R & G & D & D & G & V & V \\ A & N & D & D & N & F \\ & D & G & V & S L & P & N F\end{array}$

$\square I \quad A$ E $S V W$ WQ Y T


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UniRef90 D7CsI2
UniRef90-UPI00047995AC UniRef90_D2R0S1 UniRef90_UPI00036B582E UniRef90-UPI0004789055 UniRef90_GOIVG8 UniRef90_UPI00037149B5 UniRef90-X1TLU1 UniRef90-LODKL8 UniRef90_UPIO00471180A UniRef90-B0M9Y1 UniRef90-E8N4N3 UniRef90-D1PI96 UniRef90_UPIO00413F89D UniRef90-R7ZMZ5 UniRef90-R7LC26
UniRef90_B1ZTE3
UniRef90-A3ZUS2
UniRef90-UPIOO0372675A UniRef90-WOIVJ2 UniRef90_UPI00047818BE UniRef90_UPI00036D0E08 UniRef90-M5SBA1 UniRef90_C6Y1L9 UniRef90_UPIOO041BE8C9 UniRef90_UPI0002558A0E UniRef90_UPI0003B66B87 UniRef90-SOFGZ4 UniRef90-IOIE19 UniRef90-W0F4Z0 UniRef90_UPIO0029A6F1C UniRef90_C6Y170 UniRef90_UPI0003B76EA7 UniRef90_UPI0003FC2FA7 UniRef90-L0G577 UniRef90_UPIO001744E39 UniRef90-B4EZP2
UniRef90_UPI0004636202 UniRef90_UPI0004655EF2 UniRef90-LOFX13 UniRef90_UPI00036F814A UniRef90-H1YHP8 UniRef90_UPI00047DE37C UniRef90-W6W9P8 UniRef90_UPI00037DA8F3 UniRef90_UPIO003B42864 UniRef90-F4CFL2 UniRef90-I3ZBW1 UniRef90_UPI0003A82481 UniRef90-B6R4F6 UniRef90-H1YEQ5 UniRef90_U2J462 UniRef90-DOMES0 UniRef90-UPIO0046597A7 UniRef90_UPIO00463AEC0 UniRef90-B5JCW5 UniRef90_C0C110 UniRef90-N2AX75 UniRef90-C6VXK8 UniRef90_V3TML2 UniRef90-R7JRY9 UniRef90_B9KA18 UniRef90-R6FZX9 UniRef90-XONC22 UniRef90-S0FGE2 UniRef90-L4M2V9 UniRef90-G5IEV1 UniRef90-M3HYW9 UniRef90_J9Z094 UniRef90-UPIO00410830E UniRef90_EOSEP7 UniRef90_A0A023CZ64 UniRef90-1017N5 UniRef90-H9UFE0 UniRef90-A8F6D0 UniRef90_M1MKX4 UniRef90-R5N7G5
UniRef90- 6 ER19 UniRef90_W0HT76 UniRef90-B9XQ13
UniRef90-R6W1W7 UniRef90_UPIO0036A2422 UniRef90_Q74J46 UniRef90_C0D796 UniRef90_UPIO004017F32 UniRef90-S5KBA3 UniRef90-D4JQT6 UniRef90-1016H4 UniRef90-G8NYMO UniRef90-E1RCT6 UniRef90_R5C953 , UniRef90_E6QNA2
 GLVGMLNLNGSLTKAGVEYSTLWSVDFSDMQTATI QPDLS GLVGMLN N NGSLTKAGVKYSSLWSEDFRHATDHVVALSDVG SLVGTHAMAATLRHLGHD DSFAYGH GLVGLLNLNGSLVKAGKPFSTLWSERFEDPWFNKLHEDVE GLVGMLNLNGSLTKAGVSYSTVWSKEFNDDETGKITHADS GLVGMLNLNGSLTKAEVNYSTLWSEDFTDHDASHVRSLST GLVAGMAASGGLKRDGUPFKLCYG DIDKDSEVLKELMD

 SFCGKMSVCNNLTQYGIP FSLTSLHTVNPESESFRAD GTCGLFATGKVLRRFGVPFT Y LTNCRLSD GLVGMLN LNGSLTKAEVEYSTLWSHDFKDHDDSKINGDIK GGRLQANSFCAANRFHVPYFHVHADDGSAAAIGGUGKAV GLVGMLN N NGSATKA GV AYSTLWSEDFTDVVHPTTHVRPL
 GLVGMLNLNGGLTKAGVKYSTLWSENFDDSY GLVGALNLTGSLTKAGVNYSFLWSKDFTDADTGKVTHDLS GLVGALNLTGSLTKANVKYSFLWSEDFTDMSAVSIPSKDE


 GLVGMLNLNGCLTKAGVAYSTLWSEDFTDAGAATLPATDE SLVAA TMNAAAMHRDEHKFHFVYGSNTD ERAA GLVGALNLRGSLTKAGRPHSFLWGEDFQWCDTGTDEHAMP

 GLVGLLGLNGGLTKMGKPYSTLWTVDGTDPWFTELPETDE GLVGLLNLNGSLTKAGVAYSTLWSVNFDDHDESHVVSLES

 GLVGLL NLANGSLTKAGQAYSSLWSETFEDLESGAVAHDLS

AFCGKISVCNNLKQYGIPYS

 A WCGKI SVCNNLYQFGINYS GTGAYSAAGANKAFKKEPF YLTTKHVVHPSDPS



 $G L V G A M N L T G S L T K A E V A Y S F L W S K D F T D S F F M E K L E E W T$
 MWY Wix

 SFCGKDSVSNNLKQYGIEEFSDTELHTEDPESEVFKRDDE

 SQCGLFATGKVLRRFRVPFT YMSNCRLND | PEFE |
| :--- |
| EF |

 GLVGLLNDNGSLTKAGVEYASDWSEDFTDQWTGKDASHDT
 AFCGKFSVTNNLYQYGIK FYIKSDVNSA GLVGTHVMAATLRQLGGHPDESLTGNHTVDPDDHEVKEEFK



 SFCGKMSACNNLRQYGIPYS
 GMCGLFATGKVLRRFGVPFTYMYNCRMDDPE SOCGLA GK RRFQVPF


UniRef90 D7CSI2 UniRef90＿UPIO0047995AC UniRef90－D2R0S1 UniRef90＿UPI00036B582E UniRef90－UPI0004789055 UniRef90－GOIVG8 UniRef90＿UPIO0037149B5 UniRef90－X1TLU1 UniRef90－LODKL8
UniRef90＿UPIO00471180A UniRef90－B0M9Y1 UniRef90－E8N4N3
UniRef90－D1PI96
UniRef90＿UPI000413F89D UniRef90－R7ZMZ5 UniRef90－R7LC26
UniRef90－B1ZTE3
UniRef90＿A3ZUS2
UniRef90＿UPIO00372675A UniRef90＿WOIVJ2 UniRef90－UPIO0047818BE UniRef90＿UPI00036D0E08 UniRef90－M5SBA1 UniRef90－C6Y1L9
UniRef90＿UPI00041BE8C9 UniRef90＿UPIO002558A0E UniRef90＿UPI0003B66B87 UniRef90－SOFGZ4
UniRef90－10IE19
UniRef90－W0F4Z0
UniRef90－UPIO0029A6F1C

## UniRef90＿C6Y170

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UniRef90＿UPIO004636202 UniRef90－UPIO004655EF2 UniRef90－LOFX13 UniRef90＿UPIO0036F814A UniRef90－H1YHP8
UniRef90＿UPIO0047DE37C UniRef90－W6W9P8 UniRef90＿UPIO0037DA8F3 UniRef90＿UPIO003B42864 UniRef90－F4CFL2 UniRef90－I3ZBW1 UniRef90＿UPIO003A82481 UniRef90－B6R4F6 UniRef90－H1YEQ5 UniRef90－U2J462 UniRef90＿DOMESO UniRef90＿UPI00046597A7 UniRef90－UPIO00463AECO UniRef90－B5JCW5 UniRef90－C0C110 UniRef90－N2AX75 UniRef90－C6VXK8
UniRef90－V3TML2 UniRef90－R7JRY9 UniRef90＿B9KA18 UniRef90－R6FZX9
UniRef90－X0NC2？ UniRef90－XONC22
UniRef90－SOFGE2 UniRef90－L4M2V9 UniRef90＿G5IEV1 UniRef90－M3HYW9 UniRef90＿J9Z094 UniRef90＿UPIO00410830E UniRef90－EOSEP7 UniRef90＿A0A023CZ64 UniRef90－1017N5 UniRef90－H9UFEO UniRef90－A8F6D0 UniRef90－M1MKX4 UniRef90＿R5N7G5
UniRef90＿S6ER19 UniRef90－WOHT76 UniRef90＿B9XQ13
UniRef90＿R6W1W7 UniRef90＿UPIO0036A2422 UniRef90＿Q74J46 UniRef90＿COD796 UniRef90－UPIO004017F32 UniRef90－S5KBA3 UniRef90－D4JQT6 UniRef90－1016H4 UniRef90－G8NYMO UniRef90－E1RCT6 UniRef90＿R5C953
UniRef90＿E6QNA2
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200 H V K A F DKAAFAKAFRKEKA I GVVDEGCMGMFNAIV PD H $K D P S R E R K Q A L A K E L L D R K A I G V F D E G C M G M F N A D I P D B H$ REILT V VHAAQSTRGKDFGLDGYHAPGF $\square D F H A D P D F$ KLPAGPAALGLAEELLKRKVIGVFDEGCMGMYNAIIDD DE

 ERLDEWCTTGRVLAE\｜RRKRDLALGDTSMGMDNGYFGPRLL
 SLLLNHLKALNV CLILKQSKFMTIGGRAPGFYFSSADE L K


 AKCTVPAKAATVARRMRKADLGVFDEGCMGMFNAIIPDELD
 $H L P L R E L G E A L A G Q L R R D K A I G V F D E G C M G M Y N A I I D D D E$ EWLKS A R A AV $\square$ A DELRTKKMGIF
 E I GRAFGK
DKLK S WLLDTGSVAHEMREKA


$Q T G R A F G K$
$K E V R Q Y V R$ $\qquad$ RFQ QAAERELGGEALAAAELQQHRPA L


H WLVLS

Q FTAVCRIVKGLRNARIIGAIGARPGGFNTVRYSEM
 SEAGKV GAAVGAWSLRHKEILGGVDTGCMGMMNGVFPQKA


 HALSADAK GQLAASDLLARK】I GVFDEGCMGMYNAIIDDDEP
 MEGRAFAR QLKSEKAIGVFDEGCMGMYNAIV PDE E K G D R H $\quad$ IA K D L L A Q R I L ATPAAELGHTLAERLLKDKAI GVFDVGGMGMYNAIIDDDE RG $\square R N F L A V C N V V K T F R K T R I L L Q I G P R P F D F W S T M C N E G E$
 E D I R D F AKVCRIT A GLLK GLRVAQMGTRPAAFQTVRYSEKL

 K

ARPSAFNTVRFSEK■
TRPFDFWSTMCNEGE
S Y C M G M $\square N G V F P Q K S$
R G M R D F L A V C N V V






$R G M Q D F V R V C N V V K T F R N T R D L Q Q V G P R P F D F W T T M V N E G E$


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



R GIIKDFLAVCNIVRTFRHTRILQIISTRPFDFWSTMCNEGE

W
FAAVCRUVRGLRNVRFGAI


GARPA GF QTVVRFSEKLL

UniRef90 D7CSI2 UniRef90_UPIO0047995AC UniRef90-D2R0S1 UniRef90_UPIO0036B582E UniRef90-UPIO004789055 UniRef90-GOIVG8 UniRef90_UPI00037149B5 UniRef90-X1TLU1 UniRef90-LODKL8 UniRef90_UPIO00471180A UniRef90-B0M9Y1 UniRef90-E8N4N3 UniRef90-D1PI96
UniRef90 UPI000 UniRef90_UPIO00413F89D UniRef90-R7ZMZ5 UniRef90-B1ZTE3 UniRef90_A3ZUS2 UniRef90-UPIO00372675A UniRef90_WOIVJ2 UniRef90_UPIO0047818BE UniRef90_UPI00036D0E08 UniRef90-M5SBA1 UniRef90_C6Y1L9 UniRef90_UPI00041BE8C9 UniRef90_UPIO002558AOE UniRef90_UPI0003B
UniRef90_SOFGZ4
UniRef90-10IE19 UniRef90_W0F4Z0 UniRef90-UPIO0029A6F1C
UniRef90 C6Y170 UniRef90-C6Y170 UniRef90_UPI0003B76EA7
UniRef90 UPl0003FC2FA7 UniRef90_UPIO003FC2FA7
UniRef90_LOG577 UniRef90_UPIO001744E39 UniRef90-B4EZP2
UniRef90_UPI0004636202 UniRef90_UPI0004655EF2 UniRef90-LOFX13 UniRef90-UPIO0036F814A UniRef90-H1YHP8 UniRef90_UPIO0047DE37C UniRef90-W6W9P8 UniRef90-UPIO0037DA8F3 UniRef90_UPIO003B42864 UniRef90-F4CFL2 UniRef90-I3ZBW1 UniRef90_UPI0003A82481 UniRef90-B6R4F6 UniRef90-H1YEQ5 UniRef90-U2J462
UniRef90-DOMES0 UniRef90_UPI00046597A7 UniRef90_UPI000463AEC0 UniRef90-B5JCW5 UniRef90-C0C110 UniRef90-N2AX75 UniRef90_C6VXK8
UniRef90_V3TML2 UniRef90-R7JRY9 UniRef90_B9KA18 UniRef90-R6FZX9
UniRef90-X0NC22 UniRef90-SOFGE2 UniRef90-L4M2V9 UniRef90-G5IEV1 UniRef90-M3HYW9 UniRef90_J9Z094 UniRef90-UPIO00410830E UniRef90-EOSEP7 UniRef90_A0A023CZ64 UniRef90_1017N5 UniRef90-H9UFEO UniRef90-A8F6D0 UniRef90_M1MKX4 UniRef90_R5N7G5
UniRef90_S6ER19 UniRef90-WOHT76 UniRef90_B9XQ13
UniRef90_R6W1W7 UniRef90_UPIO0036A2422 UniRef90_Q74J46 UniRef90_COD796 UniRef90_UPIO004017F32 UniRef90-S5KBA3 UniRef90_D4JQT6 UniRef90-1016H4 UniRef90-G8NYMO UniRef90-E1RCT6 UniRef90_R5C953
UniRef90_E6QNA2

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Unef90_E6QNA2


240 LL NPLLG|V|YKER|LSQSALV V AEMRLVVRGEARSVDDWLRR
 LLNPCGFFKERLSQSALV AKMRTVGDNEASAVRKWLDD
 WQKDFGITYETLDQSEIKDRA VSQQRVDKMVKWTGK FQKTFG SQUCR SSVEDLVKRCKSWDSQ LLERFGVELAPVPLPELTAEVKKAIDADTEVEKTMAYCRE
 L RAKLGPELLKYIMMLEVVMNDAKNI SQDEELERALITIVK




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| UniRef90_D7CSI2 |  | 350 |
| :---: | :---: | :---: |
|  |  |  |
| UniRef90-UPIOOO47995AC UniRet9O-DRRSS | GLL NNQYDEAGKGEALP |  |
| UniRef90 UPI00036B582F | GV NNGSPDGQ SQGLP | ${ }^{\text {a }}$ |
| UniRef90-UP | GLNNAFDESGRED |  |
| UniRef90-GOIV | GLL NNSDRPDGSRPPDVP |  |
| $\begin{aligned} & \text { UniRef90-UPIO003 } \\ & \text { UniRef90-X1TLU1 } \end{aligned}$ |  |  |
|  | G LNSHARPEGNGHVV |  |
| UniRef90-UPIO004UniRef90-B0M9Y1 |  |  |
|  | AVLGMLGD EGVVCSC | LMTMYIGHLLS G S |
| UniRefogo |  |  |
|  | GLLNNVFDSANKKNS | G\| ${ }^{\text {d }}$ |
| UniRef90-R7ZMZ5 | GLL NNTYSSDGPGKALP P | - |
| UniRef90 B1ZTE3 |  |  |
|  | GTL NS T | CAGLDALMIQRL |
| UniRef90-UPIO003 |  |  |
| UniRef90 <br> UniRefg | GTL NSSDRPDGEGEP/ P |  |
| UniRef9 UniRef90 | GLLNNQYSVSGKGEALP | A G ${ }^{\text {a }}$ D ALLT Y K L |
| UniRef90-M5SBA1UniRef90 C6Y19 | GML NDSFSRDGSREPL | CAGL |
|  | GLL N NPVYSEGGKELY |  |
| UniRef90 UPI | GLL NNVDRPNGKGKS |  |
|  | GMLNNRADGSVIREA |  |
| $\begin{aligned} & \text { UnRef90_UPIOO } \\ & \text { UniRef90- SOFG } \end{aligned}$ | AVLSRMAD | AMLIQNYLTD T |
|  | GTLNCSVRPPVEREA |  |
| UniRet90-101E19 |  |  |
| UniRef90_UPIO00 | GMLN | VTGTLTMYAMQLASGS |
| UniRef90 | GL | VDEGVAV DALTT H |
| UniRef | GLL N |  |
| UniRef90 <br> UniRef9 | GLL N NVVRPNGEGKS P | cag |
| $\begin{aligned} & \text { UniRef90_UPIO00 } \\ & \text { UniRef90-B4EZP } \end{aligned}$ | GAI GSTARENGPNTP |  |
| UniRef90-UPI000 | GMLNNDERPPVTRQAV V |  |
| UniRef90-UPIOOO4UniRef90_LOFX13 |  |  |
|  |  |  |
| UniRef90-UPI00036 | QLMP | S |
|  |  | G ${ }^{\text {a }}$ |
|  | G L NDDGRPDVKGQA |  |
| UniRef90_W6W9P8 |  |  |
|  | AMLNSEM GLASSCEA | A S S S |
| UniRef90-F4CFL2 | GLLNNP |  |
| UniRef90-UP10003A82481 | A GNAERDENGEGKA |  |
|  | GAl GSTERWEGK P P PCINEV | A P Q M M WR L |
| $\begin{aligned} & \text { UniRef90-H1YEQ5 } \\ & \text { UniRef90-U2J462 } \end{aligned}$ | GL NNQFSETGEGEALPHFNEV |  |
| UniRef90-DOMES0 | S | ПP GVLS MYLLQQAS G |
| UniRef90-UPI0004 |  |  |
|  |  |  |
| UniRet90-COC110 | $\begin{aligned} & \mathrm{s} \\ & \mathrm{~s} \end{aligned}$ | $\begin{aligned} & T \\ & s \end{aligned}$ |
|  |  |  |
| UniRef90-N2AX75 | SI M | VTGTLS MYALQLAS GS |
| UniRef90-V3TML2 |  | M |
|  |  |  |
|  | ${ }_{\text {S }}$ | G A |
| UniRef90-XONC22 | A GNAERDENGEGKATP | MGSal |
| UiRef90-SOFGE2 UniRef90-L4M2V9 | SLLND |  |
| UniRee90-L4M2V9 | A G GNSERDEQGEDAP |  |
| UniRef90-M3HYW9 | SMMSENM |  |
| UniRef90-M3HYW9 |  |  |
| P1000410830E | GA GNAERPDEQGEPDPCDNEVDMGSADPQ |  |
| UniRef90-A0A023CZ64 |  |  |
| UniRef90-A017N5 |  |  |
| UniRef90 H9UFE0 | F | - |
|  | SMLSESL | A |
| UniRef90 A8F6D0 UniRef90-M1MKX4 |  | AGAVSMYALTLASG |
| UniRef90-S6ER19 |  | G |
|  |  | MGSAIPQAMLW |
|  | GTL NSVERPPVKREAL |  |
| 隹 |  | C GVVGM ${ }^{\text {a }}$ AL |
|  | MMSN |  |
|  | SLL NE | H GA |
| UniRet90-COD796 |  | HGAI ${ }^{\text {T }}$ |
| UniRef90-S5KA3 | SLL FD | HGA |
| UniRef90-I016 H4 | Silms d GL |  |
| Ref90-G8NYM0 | SMMSE QLI |  |
| UniRef90-E1RCT6 | MM GEKQK |  |
|  | MS N D L |  |
| Ref90_E6QNA2 |  |  |

UniRef90 D7CSI2
UniRef90-UPI00047995AC
UniRef90_D2R0S1
UniRef90-UPI00036B582E
UniRef90-UPI0004789055
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UniRef90_X1TLU1
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UniRef90-B0M9Y1
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UniRef90 C6Y170
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UniRef90-XONC2?
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UniRef90 E6QNA2

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UniRef90_C0C1I5
UniRef90 C1F39
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UniRef90_L0EB02
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UniRef90_D5AN96
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UniRef90_UPI0004078EF3
UniRef90 R6E8X0
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UniRef90_R5CQE1
LGVLPT RRGML
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LVSVIED EMIA A $\square$ E R Q C G WT A HVLNPDSPDASVAEGMRV GYKAlVVTPEQTVESYSEAKICAELFK GHKA LCVTPEETVETYEEAKRCTALEQ LAKALSAQGK $\square$ QRAHPVDRAAGHGF IVDSQKMGMAVAELFR

## $\nabla Q S \square S D A K \square Y A D H F A$ $V I D K F S$ $V$

EKDVEATVDFDK A GAGQVI ERFR
LISERLKE LGGDEFVD VVNDEGLLYDDAGLLKIVEKFK TANGAVVQSIDAAELYAKHFK VRSYLEE GPLEAFPPPATVTDDASLRRGVARCR AAAGRERMDRVLEEEGFEVVCPDTKLGTVEDAKKCAALFH VET RAEAK IDCA A WLR

K DVDK V VEKK AKEGREEM $\square$ K VLDGYKS VLSPEQTLHGPDDARKCAEKGRK VAEARQQA $\square$ T $\square$ F D R $\square G \square N T V M V D E N L G G V E E A K T C A A L F R$ GDTYLGGVEDAKVCAELFR $V$ QSFEDARKCAALFK GYGVVTVGSEET DESRAEAARCADLFK DGVVESYSDAKKCAKL GREATLEKMKEMGFGY I L S P TETPLGVVEDAKKCAELE GYETVCLGGSETVETFSDAKKCADELYR YK QLVSKKLKSMNGYETVCLGPSETVETFSDAKKCANLFK YKELILEKLKSWNTDUVDIIDEEGLLFDPAEDVPAMVAKFK YANLTRARLRELGVEFVDIVNEDGLFYDEGDRERIQEKFR GYKAIVVSPEETAHGYKEAEICAALFK FANYTREKMDE DG $\square$ NYVDIVNSDGLLYDDEGLEKVYKKFR

Y A NLTREKMKELSVEYVD\|INDDGLLYDDAGVEKDAAKFK $T P L G G V E D A K V C A E L F R$ VETYDESVRCAELFK TVETFEDAEKCARLFD DTPLGAVEDAKKCAELFK

WRTEETPA VEKFK
ANLTRDKDHALDVEFVD\INEDGLLYDDEGVES DAEKFT $T N L G G D E E A K T C A A K F R$
 QKERFMAVVRNTLSDSVEIVDDDDUSWNMDETRRIIDEKFR QVIEP PAAVQSMADADLYAAHFR D A D K I M R F K
DS DRAAKKF

K $\square$ A E K F K
AAlVDRFQ ARLCAD L F K DVDKIID KFR $A \vee A D F \square G$ QKDCFMEETRKTKAS LVETVDTDDTVCEMDKVNAIVDKMK NA CYQKSVAMLEKMGHEMLVPTGVLTSPEEMLEFMDSDD YKNLDREKIE SFGLDDEIVINDELLHERDEEPADIKRFR WQALLNGMDIELVGEPVLQFDAASADQALPALK QKDKFMAVIRD DKPDAVEVVGVDDIMWDTAKVPGVVEKLKR $\square A K \square D S M G F G Y V I L P E D E \quad$ TPTGNDEGYADAVAAVKEDA D GVVETYADAKKCAELFK A AEKF RRELIQAVEKYGY $\square$ AMDEK $\operatorname{LIT}$ RFGAVETREEGRKYAAF LR PADVEKAVKVFK QKNKFMS V $\square R$ RVKPELVE $\square V \square A E Q G \square L Y E A D V P A V V D K$
 SEEKQI DKKFQ

MAVIREDKPEVVTLVDVDDTCTNG\|IENEAYSPAVVEKFR WKEFKSKEAELVKIVNVDWVIIDEPVIEVEEAKKAADKLS

## UniRef90 L7VJ04 UniRef90-F8FHW8 UniRef90-D8DVY0 UniRef90-G0GEK2 UniRef90-W0FLW5 UniRef90-X0Y6L1 UniRef90_UPI00047B46CF UniRef90 E8V694 UniRef90_UPI00037464DC UniRef90_B4D5G7 <br> UniRef90_N9XF07 <br> UniRef90-A9CVE3 <br> UniRef90-C0C115 <br> UniRef90_H2IFW3 <br> UniRef90_R9LSR2 <br> UniRef90-LOEB02 <br> UniRef90_UPI00037D34B6 <br> UniRef90-D5AN96 <br> UniRef90_C4LFS1 <br> UniRef90-Q1ASX4 <br> UniRef90_UPI000370EA9F <br> UniRef90-G7UDD4 UniRef90-S7V9E6 <br> UniRef90 A7B420 <br> UniRef90-U2THR4

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UniRef90_UPIO00463BFE6
UniRef90-H5V255
UniRef90-M4Z527
UniRef90 W6T4N5
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UniRef90-IOR7U9
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UniRef90-U3W6D2
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UniRef90-C0D7N6
UniRef90-F3ZZ52
UniRef90_UPIO004709A0B
UniRef90-J1H1H5
UniRef90-X0Z619
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UniRef90 F5YFA7
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UniRef90-W4Q9L6
UniRef90-FORSH0
UniRef90_R4D3G1
URDP
UniRef90-R5CQE1
UniRef90_D8ID98

KNADRDEG\| $\frac{90}{1}$ V 1 LPNFGDE ${ }^{100}$

110
120
(1)AVATANVLIQACDDDRD QENVDA V FFPHCNFGTERVGRALLGKPVLLWGPRDPLED
 FFNTRCYSPEFAKLDVMILVMAFNDERRD REKVD G LDF LPHANFGTERLAKAMNVPVLLWGPRDPDEN K A E G S R F I N F M G G WA Y P D F S V Q L P R E V P KL M L G S A DP D F P RHAREDDGI I ITTLPNF GEERGLADARVD IL VQATPDDRRD
 D $\underbrace{}_{D}$ PDAPLIVAAVWQYSHHVLLTTHRGPILIVANWSGQWP E E A GVDGL FLP HCNF GTERLAKRLNVPVLLWGPRDERP ANRDK\|DGIVI CLPNFGDE\|AVAELDVPILLQACNDSRRD

 Q E K V D A
K E DVV A K E K I D A G L F F F P H C N F

 EA GCEVLLVLQPTMGDGRLAPLLDARLWDGPVVLWATPARP A HADRIDDGVIVTLPNFGDEKGVANTRVPVLVMAFPDGRGD ARRDDIHGVVVLLPNFGDEKALSGLNVPVLIQAQPDSRRD KEGVD GLMLAESPHCNF GTERL AKKLDVPVLLWGPDPGPQ P E P N TA GVVD GLFLPBCNF GTERLAKDLGRPVLLWGPLDPEPN KHREE $\square D G V I V V T L P N F G E E R A I V D A L R P V L V Q A T P D N R R D$
 QHRDSDHGIVVLLPNFGDEKAVAEANVPVLVQAQEDTRRD

 KNRDSDDGI IVVTLPNF GDERADADTDVVPVLVQQATPDTRRAD
 REEIVDGI I I VLPNFAAVTEA IVRSGRVPVLVQACDDERRD
 QEKVDA LFFPHCNFGTEKVAHKLHLPVLLWGPRDGARD AAGVDG $\square$ FV PHCNFGTEELARELNLPVLVWGPRDPDRD


 $A D L D V P V L V Q A F P D D R R D$ A AEVD GLFLANVNFGTERLAKKLVVPVLLWGMKDETP


 TAG G $\quad$ LI A LPFCDFGEEQAAASFHLDVLIWWGARDPERP
AEKVD GLFLPHCNFGTERLAKRLNVPVLLWGPRATRRD
 K D R V VA SIVQSVVTFAD GVEVLI K QVQAPVVMVW $\square R E P S \square N$ RHRDRDD GLVVVCLPNF GDEIAAARLLNVPI LLQQASND ERRD
 ANADR DDGLVICLPNFGDEVAVAELGVPVLLQASNDERRD











EHKEK I IGGIIVLPNFGDEKG\|VDLNVPILIQQASSDERRD



 DAEVDALMAFPDCNF GTARVAKAVGKPVLLWGPRDPBLPN
 A NE D K I K G G I I S


|  |  |
| :---: | :---: |
|  |  |
| UniRef90-D8DVY0 | AFCGKISVCNNLYQYGIPFSLTSL |
| UniRef90 ${ }^{\text {Foz }}$ | GTCGLFATGKVLRRFQI |
| UniRef90-GOGEK2 | AFCGKISVCNNLYQYG\|PPFTDTRLHTCDVESK |
| UniRef90 WoFLW5 | GMCGLFATGKVLRRFR |
| UniRef90-X0Y6L1 | GAVGLLASVAGTEQVGI QTGRLFDENFDDHDDFPLPQDVE |
| UniRef90 UPIOO047846CF UniRef90 E8V694 | SFCGKMS CNNLRQYGIPYGTLTTLHTEAPDSAESEQFS |
| UniRef90-E8V694 | SFCGKMSACNNLTQYGIPYSSITSLHTSAPNSAEFAKDLICR |
| UniRef90-B4D5 | GLVGLLNDNASLTKAGVRYSTLWSETFTDGWDTTDPAEDE |
| UniRef90-N9XF | SQCGLFATGKVLRRFGV |
| UniRe990 A9CVE3 | A |
| - |  |
| UniRef90_C1F394 | SFCGKMSACNNLMQYGIPYSITAKKTVQPDSDE F F |
| UniRef90-R9LSR2 | SQCGLFATGKILRRFKVPFSYM CAMCRLTDPY ERGE |
|  | GMCGIFATGKVLRRFNVPFT |
| UniRef90-UP100037D34B6 | GVCGLFATGKVLRRFRVPFT |
| 90-D5ANS |  |
|  | GGM Sl |
|  |  |
| UniRet90_UP1000: |  |
| G7 | CGK S C CNL Q PiP FTLTTQHVSDLA |
| UniRef90-S7V UniRef90 A U7B | GLVGMLLNLNGSLTKAGVPYSTLWSQDFKDSESGKDTHDLS |
| iRef90-U2THR4 | GVCGLFATGKVLRRFQVPFTYLTNCRVD |
| UniRef90-UP100047CAC4B | SFCGKMSACNNLMQYGIPYSLTALHTV |
| UniRef90_S2U3R9 | CGLIFA GKVLRRFQVPFTYLVNVD |
| UniRef90-H5V255 |  |
| UniRef90-M4Z5 | CNNLRQYGIRYSLTKSHC |
| UniRet90-W6T4N5 | AACGLIFAlDGKVLRRFQIPFTYLVNVDVDD |
| UniRef90-Q02900 | SFCGKMSACNNLKQYGIPYSLTTLHTESPGDSED |
| UniRet90-F2N936 | CGLFATGKVRRFQVPFT YMTNCRLG |
| UniRef90- IOR7U9 | SFCGKLSVCNNLYQSRIPFTTTYHTCSIDSQ |
| UniRef90-UPIO00367B56B | SFCGKISVCSNLNQYRIPFTLTTFH |
| UniRef90-A8F6V5 | SFCGKISVCNNLKQSGl RFSLTTHHTEQ\\| |
|  | Still |
| UniRef90-E7GFP3 | SQCGLFATGKVLRRFSVKFT YLTMCRLKD K K K |
| UniRe990_U2B7S7 | GVCGLFATGKVLRRFRVPFTYMTNCRLIED |
| UniRef90_UPIO00413: |  |
|  | CGLFA GKVLRHFNVPFTYIRNSD |
| UniRef90-X1TG84 |  |
| UniRef90-R2QEV0 | AACGLFAIGKVLRRFKV |
| UniRef90_A4TQ45 | SFCGKISLCNNLRQYG\| PFTLTKQHVCSLNS |
| UniRet90_UPIOOO47C | MQYG |
| UniRef90-UP100036273DD | CGKLSVCNNLKQFG\|P FSLTTYH |
| UniRef90-×1A | AFCGKISVTSVLYQYGIPFTLTKYHTC |
| UniRet90- N9X750 | NTCGMFAATKVLRRHGVKYSYIY NCETESDT EA |
| UniRef90-A6VKO1 | S |
| 002 |  |
|  |  |
| iRet90_UPIO003 | GRLRLNSLTGGLKCANHPYSFLIGNPEEA AQUK |
|  | AFCGKISVSNNFWQYGIPFTTTW HTVDAGGPEFAAD |
|  | NSCGMFAATKVLRRHGVTYSYIV |
| UniRef90-V7ELL7 | AFCGKISVTNNFWQYGVPF |
| (100037 |  |
| UniRef90-FITA71 |  |
| UniRef90_SOFN18 | GLFATSK |
| UniRef90-F7Y | RLNSLVGAH LDFSNLYRAGRNDANDP |
| UniRef90 R2Pt |  |
| UniRet90 W7RGA0 | GMCG |
| UniRef90-UP100338510E3 | SFCGKISVCANLRQRNFDFTLTQDH |
| UniRef90 F3ZY45 |  |
| UniRef90- V2XJ68 | NTCGMFAATKVLQRYGLKYSYTY |
| UniRef90-F6DQQ6 | FSNGCGAGVLGHKTSFLFGNPGEE |
| UniRef90 UP100047E69A1 | SQCGUFATGKVLRRFNVKFTY TNCRVDD |
| UniRef90-W0L915 | GRLRGMSAFCGALSREA KVQY HGLPSD |
| $\begin{aligned} & \text { UniRef90_C0D7N6 } \\ & \text { UniRef90_F3ZZ52 } \end{aligned}$ | NSCGMFAATKVLRRHGVKYSYVY |
| UniRef90-UPIO004709AOB | AFCGKLSVCNNFYQYGDKFTTTYHT |
| UniRef90-J1H1H5 | GLINSLTGAYSAANAMD |
| UniRef90-XOZ619 | AFCGKISVCSVLYQNGIPFTLTETHT |
| UniRef90 H3NL86 | SQCGIFAIGGKVLRRFNLKFT |
| UniRef90-FSYEA7 | SMCGKFAMCNALRRY |
| UniRef90-F7KK $\times 0$ | TQCGMFAATKVMRRYGVTYSYIF |
| UniRef9-UP10004078EF3 | SQCGLFATGKILRRFRVKFSYL TMCDVEDK |
| UniRef90_R6E8X0 | CGLFATGKVLRRF |
| UniRef90_W4 | GMCGMFATGKVLRRFNVKFTYMTNCRVDDLTM |
| iRef90-E4Q3G1 | $V C N N L Y Q M G I K F T T T T$ LHTCDVEDSV |
| UniRef90-R7DPD5 | AFCGKFSLTDVFSQYHVPFTVLKPHVVH PLSKEFR |
| ef90_R5CQE1 | AT |
| Ref90-D8ID98 | CGVHLNKSNLFKAGVKFVHVVAPDP |

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UniRef90_D8ID98

170
180 180 - 190

190
200
ED\|JKREKLLCKTVINN|LIRRAR|ILAVVGRPGPFQTVRFSEK|L RGFTNFDGAANAVRHFRS LIRLQI GPRPSSFWTMMCNEGE
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 $R G V Q D F D K V C N V V K T F K A T R I L Q V G P R P F D F W S T M V N E G E$ NDLRRFEQLCRVVTAMRGVRVGAI GARPAGFNTVRYSEKL

 NDLSWFAQVCRVVRGLRRDRIGAIGARPSAFNTVRYSEKLL


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 S RLLLKF LDKVQYVI HEMRKQFK VGA
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 K GLKNFI SAAAVVK SMTNLRI GQI
 $R$
$R$ $K$
$R G L S N C G V C R V V N K L R N A R F G A$ REIEATIFAARVKKDLTGLKMSA STRPADFWTMMCNEGE
 QK LG R IMGVLAVVKKLKNLNVGIVGNTPPGYSFGDFDEDQ RGFKNFIGAANVVKHFSSLRILQUSTRPSDFWSVICNEGE NELQQLAQAAAIVKRFKQAKVMVI GEHPDGFEACNYNQQQ $N G Y E N F L R V A M V L K A L K N D R V A K G G E R P V P F M S V M T N E A N$

 ADI IKFERVCKIVKKLKNARFGQI GTRPNAFETVRYSEK $R G L L D F D K V C N V V K T F K N T R V L Q V G P R P F D F W S V I C N E G E$
$E H L Q K F A G I C R M V K T M R R M N L G S F G A R T T A F K T V R V D E G G$
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A HREPFEEWA $\square$ DMRRR VRPMFRGAHMGLQER

PRVGLLG $\square$ MQP $\square$ Y D D M $\square \mathrm{P}$ G $\square$ TE E Q A A Y A A R
 MNPKPK GGLF TTSGRDVGLQES LSEEVDVIAKE $A K \downharpoonright G\rfloor \sqrt{F} \| G$ LIE A YWPQFSGMKER

$$
A \square G A Y \square P Q F P Q L
$$

RAK LDEDGVNYVD
IK DVNDD GLLY D D A G L A K $\quad$ TT K K FK
 AETKKKVEERLTAMQVDYVNDDGLLYRSRDAEKVAE YLN

KKCAA $\square$ FD
SPEEAARLVE
HEAGKAAK $\square$ F $\square$
D L A RARKAMTAAGMEVVVYPE LIWDAAAAGEACDTFK WKNLQTLDAEFV GEPKLLFDADAV

K E VIMP K $\frac{\mathrm{L}}{\mathrm{M} \text { Q }}$
AQEMLQQAWHS LS $\square M D L E L V G E P E L Q F D A E S A D K A \square P A L K$


$C L A A M E K V G V A E \| I V P G K E L T Q G G L V A S V E D G A K A A E D F D$ FKKTLPGTVELVDGGFV TTKEESQAAGEKFR
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 VVKRFRELAE E LDFEGVEDINEEGLLMTYHDVKAAYKKLT TGDQFVSAPAEA
FESQYEE FKKG $\square$ PDTVELVDGGMI TITKEEAMNAGDK $\frac{1}{F} R$
 $G L L A A G H E L V G G \quad V E L V E L I D D T V W D L R D A D R V V E L F R$

VE T P A E GELYANWLH
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L K


## K M R

FQKALPNTVEIVDGGFV
TTKEESQAAGEKFR ■AQQUSTHGEVCNAG QULEPEG【LDSESGARAAAEKFN
EHE $\square$ IGSRELLLDGEAT LTA $\square R D$
DARNVVK $\operatorname{Li}_{\mathrm{A}}^{\mathrm{F}} \mathrm{K}$ VLKALEP $\square$ CKDLD MEVVVPDK LVRDDKDAEKVERLEK PVEIVRADEPVTTKEQAQAAGDAFR
$I D A V V D G G M \square W D \square R D V G K V V D L F R$

K VIEPNG K K DAEKVERDFK
$K$ VIEPNGDLTSDEELEAFLQEAK
T पK VLES $\square$ SKENNMEPEESLTPKGLVRDDSDAEKVIELGK
TEAVLRDL ANQYGFELHVC APDAETGETQATCDVLL
 VAERLSGVAEWTVAPPVR

FKKLIPESVELIDGG

! IDRLS S S TE
LIYHG $\square I Y$ TSNDALAAAED $\square Y$ LMEHHQRLLEKFSPRDVVAAGMVDNPARAREAGLRFQ
 VPEAQYEDFKKT $\square$ PDTVE $\quad \square 1$ DGGMVTTKEQAMAAGDKFR SAAYVAERFRGMDAE

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UniRef90

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DGVIFSMP ПFADGADTALQDAGVP LMQAYPDERRD KENDDA LVIGNMNFGMEVAVMRKDLPILHFCTKSGPTD GDHPDLIVL QFANAAYACEVLKRF TGPVVLWTLREPVID AADVDLVILQLLTYAYNMLPAVKDDDVPVILVNVQKPTWL ADCIDGVLVTLP NFGDERGIADADVPVLI QAYADDRRD EDNPDLIVLQFANAAYATEV LRRFSCPILLWTLREPVID TTPSDLLILDQASFADSSAEIAAARHMPVLLWAVPDARTG KAGVDALI FQSVACADGVETLTREIEAPVVVNSVREPSIN EKKVDA GV VPHANFGNEKLCREFSVPILVWGPRDEAPP KEPVSUVYVASGGTA GAFKNALPKEPIVIITSGSDNSRS

 AKKVDALAF PRHCNFGQEKVAAEDGKPVLLWGSPETDKS DG\|ILCMPDF DDGA TTALAKAGVPVLSWSHTETTGG AYASEVLKRFAGPIVLWTLREPVID QNRGRYDGI LLSTPNFGDETGLKDCGVPILIQAYPDPERD


AHRGEYDGLVVCDPNFGDENGTKAADVPVLIQAYPDERRD QANLDLLLILQVTFTDASLTVVRDFPVPTAMWSFPEARTG EGLAGIVLFHYTAGEDGSHLGLLDHKMPLLSWAWPEEGTG QEELLDALVIVEATWDSMQYIGINELQLPTVFWAVPYTETF

GCVADVVTRNFSTFPYPITALSDGQNN KED $\square \mathrm{DG} \square V L M S A T F H L G D \| A L L L A Q D V P$ CWAVPEPPYS VVFVGGGGTEGRF पK पEPFLKEPVFLLTSGENN A A DVDVILQLLTYAYNMLPAVKDLDVPVLLVNYQNTDIP AANVDIIFCHAATYAMSHISAARHCQRPVVVLNLQPTEWL PHHVSVVIYQSПTFADGEFTVLDKLSASIIVWSIREPAVG DANPDRLLILQTFTDAAMTVEAARDSPMAI WAVPEPRTG DEDVDGIILTTLTFGDGALIAEEFRGKP II FATKEPPTP DKEVAGU G EGNKGLAGUVFFHAAYGSHLGLGDHKVPLESWAWPEPEAN AEKVDAD VFPHCNFGQEEVVAKTAAPVLLWGSPETDQS VIITWSFDNLTLNDFRRRPVALLAVPGIRSG DKEVAGMLYQGTMTFGDEISAITPGDPVLLFGTKEGTFD TK DLAGILIGTMTFGDEVTIAEKMPELPVLLFEDGNRD QTPPDLLLTQHVTFATGDLVTLLE DDLPSVVWALPEAPQN SNPCDKIFLFQTTFTDAKFLLNFAQEIPICIVSFPEPRTG ATNTDGVILFHAAYTCGETRWLLDHPAPLLSWSWPDPVTN AAGLDGVLVVMLTYGPSLRVLARTHLPLALANTQSPSWD KERFDALVLCIIAGWDPTHAVVKITEHYPMVLWGLCGADQA A ADVDLVILQLLTYAYNMLPAVRDLDVPVVLVNYAATDTP
 AEDVDII FCHLTTYASSTLVLLNVQSVPALDLLTLTDDDWL KQQLDVVLLLQVTFTDASLTLEDGRRGLLVMWSFPEPRTG
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130
140 140 N N LVJP HVVJHP ${ }^{150}$

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                        D
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FD
$E D$
 G R L R AQCGVFASSKVLSREDIDPFTMYGTNCYTED



AEFA ${ }^{160}$
A EFA
60
$S \square K$ NE
S
E Q
P
E K
$R D$
VK

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 S P PLTAAFR
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P VF E

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

 GTLYACGAAADLNRYGKRHAVITG VVEGGDPETSPEVQ



ASMEMMTY $\square$ ANHK $H K G R$ L TWLGTLYACGALERAGKRYAVVTGGVSEGGDEEVTDRDE


 GRLRLNANLAAHA L G L N A F GWV H A D P A T A DVDALA G DL Q
 GT LDR L NS LTGAYSANADTAFRGEGKFEYDF GAPGEAE VE



R NKGMKARI I HG S P M H
LNRNGYP GEI I HGSPE\|IDAD R DRE MV



EA $\square$ T A A A A



 | $S$ | $L$ | $A$ | $A$ | $S$ | $E$ | $G$ | $L$ | $Y$ | $L$ | $R$ | $Q$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |














 G S V C G A N L N A S




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UniRef90 EOSRG6 UniRef90- XOW4V4 UniRef90-R5FJZ3 UniRef90-M5U5Y0 UniRef90-N9X7S4 UniRef90_G5HH13 UniRef90-X118K2
UniRef90-X1UWB4 UniRef90_UPI0001E89B8F UniRef90_X1HL77 UniRef90-D4KF99 UniRef90_LOA7B5 UniRef90_UPIO00365B477 UniRef90-WOJON3
UniRef90 D7AYL1 UniRef90-R7EP50 UniRef90-WOFSC6 UniRef9O-F8EZH5 UniRef90_UPI0003B4C9FE UniRef90_M9WC15 UniRef90_V4J7Y9
UniRef90_H9UCS5 UniRef90-R6ENU3 UniRef90 R2XKF3 UniRef90-S4MWL5
UniRef90 K2LLH5 UniRef90_K2LLH5 UniRef90_R5MM45
UniReff90_A9D841

170 , 180
190
200
ENLINEFAAVCRVVKRMKRLTMGA\|IGARTSAFKTVVFDE|L|A AEI GAAVRAAKVKYQLNHLKMAAIGHTPQGFGFGRALDAE AKM LANFASVCKIVKKLKNVRFGQIGTRPNAFETVRYSEKE NGFETFLRASMVKTMRTLRVAQIGNRPEPFMSVMTNEAE $R G V I D F I R V C N V V K T F K H T R L L Q V G P R P F D F W S V I V N E G E$


 Q I GVTFAKEFRVV
 K LIRSAVAGLGAAKLRSARI GLI GETPSQGFGFGRAMDAD RGFKTFLAAARAANSFHNARIGQVSTRPGDFYTVRTNEGK EGDESYAKVGAAVDNAKDMVI GLMGPRQTWRVCGPQDMSK
 RNLDDFAA ICRVVKGMRRFSI GCI GARTTAFKTVRFDE $\square A$ QLALL A AAAVRRFKQTKVMVI GEHPLGFDACNYNQQQ LEVAKAAA IIKALKKMK $1 M V \operatorname{G} D H P T$ G F D A C N Y N P L L $R G I$ HDFEAVCNVVRTFRHDRILQMGPRPFDFWTTMCNEGE
 E NLIRDFAA C CRVVNGMKRFNLGCI GARTTAFKTVRFDEVA EEYANFVRAMYTLKCFKQAKGGQLGVRPLLFESQYFSEEN

 KAAAA IKAARV KADLKGLKLVSIGHTPQGFGFGRALDAD


 E

## 

E K E GFLLR V V A L RVVKVALLQNAKV GLV

 ENLRDFAAVCRVVAGMKSFNVGCI GARTTAFKTVRFDELT REVGAA DRAAKVKYDLRRLKMISIGHTPQGFGFGRALDAE ENVDYFDRMCRAVNGMKNMVVGAI GARTTAFKTVRDDEDA A LLA A DRADAERVVERLSTMRI ARIGEHPDGFHTCAYNADA RELLDA WCRAA A QV R R R L R R T N I A Q I GR P Y P GMM D L Y
 A QLLKR F A A T C R VVVK AL T G M R VVGVI GARTSSAFKSDVRYD E TV GEL Q Q LA QAAAlVVRFKRAKVMVIGEHPLGFDACNYNQQQ $P$ VLETFCRVVHAKDTFKHAKLLHAGGRVTGFYDGEVDELE HKVKTVAEAGQDMKAVKGMRLALVGPRQTWGPQDMSNEEE

 E K F I E W W A RLADLVQQVFKVVRELQGGRLGSVGEPSDWLISSHVDAQA K QVLLHHKAFAAKRSLLKGKRI GVI GTPASWLVASHVDY LL QEI ADWCRAA QVRRRFRSTNIAQVGRPYPGMMDLYIDESN

 KQLID H HKAFAA QREVRGKRIGVVGYSSPWLVASNVDYLL P IA APTAPKA EGRSPLEGRRIARI GAHPD GFDTAA YD D DA R A M D VF I R V T N I V K N F I G A R I G l V G P R P E R F E T V T Y N E A K A QIE D WCR A A QV R R RFRDTNIA QIGRPYPGMMDLY I DETN K R G F E E F LDRVAS VVKAFQGMRIGQDGVRPRQFLSVKINESE A AKI A Y A KA ATH K QL R CLLKMASI GHTPQGFGFGRALDAE
 $K L T K G L K V S R V L A Q L N E L T I G V V G E H P P G F F F S D T N E Q E$
 TSLRARASVARELKDARILQLGGSAPGFYR S S FL L F ITS G K N EVVD QL S WK T I GII G T R P E GF D T CD Y D S NE RFLLRSARARSRFRHGKLLHVGGRRVEAFYDGETDEES A RVDRWARAARAVTA LRGLRVGVFGYPMNGMGDARVDETA SFCSAAVAA GELLLSEKI GMAGYRDMNLYGTLYDGLS REDAD WCKAAQVRRRFRDTNIAQDGRPYPGMMDLYIDETN
 E K L C E HCLLAF SIVVQRLRKTRCGVLPFRCEHMSTTFVDEFT EKI S QWCDAANACRRLKSGNDGILGRPYPGMMDLNVDETQ E R L G D L A G GVAVRR S L L A T R I GVI GTHPD GF D S CM F S H K E


 AEPAAPPRTRVALDALRGARDGRIGAHPAGF DTCAYEPAR ENHQAFA
NRF V T T VGA
VHP MQPAAAGTALD QLIKSKSIA R|IGEHPDGFDTCAYKPDR
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UniRef90_R7PGH5
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UniRef90_G9Y8G3
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UniRef90_E9SLX9
UniRef90_C4V1L4
UniRef90_X0Y3S6
UniRef90_W3ANA4
UniRef90_I0I8B2


## L LS KF Gli El VPI WPEEVKRMDEK

L ES LDAGVSVDPI A LDAL FAAARGAGEGAVGEARAEAGATL
 AQRYGGINLESFDLSELIEKVQNKANDDAAVVAKRNVLYT LQRAADITMETLDLSDIFARMAALKDSDRKVRAKAKRLQE L R CLT GU EVDRLDDLD DLFARAERVLDDDDVARTRSDAACEM

 $V M K T L G C R F D R M D L E T V F Q H A K K K F S D A D V R R L K D V L V A$ FSRKFGVT LIHDEMGEILYLADNDRDDAEEVLKCLS



UniRef90 R7LDI6 UniRef90-R7PGH5 UniRef90-X0W412 UniRef90_R6M1K0 UniRef90_V7YVA0 UniRef90-A5ZM40
UniRef90- X1RGQ0 UniRef90 F7KFC6 UniRef90-UPI000429B4BA UniRef90-R6R9G8 UniRef90_XOVAY7 UniRef90-X0WCl3 UniRef90-C4ZGB5
UniRef90 A2BMLO UniRef90-XOWZL4 UniRef90 G5HPY7 UniRef90_G8PLG3 UniRef90-R5QZM3 UniRef90 UPI000419598F UniRef90-G9Y8G3 UniRef90-D3G282 UniRef90-R5EFZ7 UniRef90-B8D566 UniRef90-R5IUB88 UniRef90-A9SLX9 UniRef90-C4V1L4 UniRef90-X0Y3S6 UniRef90 W3ANA4 UniRef90-I018B2 UniRef90_UPIO0040D0349 UniRef90 U2C8F5 UniRef90-UPI000471D234 UniRef90-G5HQ90 UniRef90_V2XZ40 UniRef90 H2JHZ7 UniRef90-R5EWN8 UniRef90-D3AH64 UniRef90 UPI0004635D11 UniRef90 UPIO004026D1F UniRef90_UPI00016C04A6 UniRef90_R6QGJO UniRef90 X1FM43 UniRef90-UPI00046E8342 UniRef90_UPI00034A1A66 UniRef90-R7NUD0 UniRef90 R5RVF2 UniRef90-R6TYR1 UniRef90_C4SNF3 UniRef90- UPIO0047178F6 UniRef90_UPI0003640ED1 UniRef90-R5TUQ2 UniRef90-B9K9U2 UniRef90-XOTX25 UniRef90-B9Y505 UniRef90 R6C127 UniRef90_U2TB19 UniRef90-M5T160 UniRef90-UPI0003F7A1AF UniRef90 R7P1D3 UniRef90-EOMRC2 UniRef90-EOSRG6 UniRef90-R5FJZ3 UniRef90-M5U5Y0 UniRef90-N9X7S4 UniRef90_G5HH13 UniRef90- $1118 K 2$
UniRef90 UniRef90 UPI0001E89B8F UniRef90-X1HL77 UniRef90-D4KF99 UniRef90-L0A7B5 UniRef90 UPI000365B477 UniRef90-W0JON3 UniRef90-D7AYL1 UniRef90_R7EP50 UniRef90-F8EZH5 UniRef90-UPI0003B4C9FE UniRef90 M9WC15 UniRef90-V4J7Y9 UniRef90-H9UCS5 UniRef90-R6ENU3 UniRef90_R2XKF3 UniRef90-S4MWL5 UniRef90_K2LLH5 UniRef90 J9H8LO UniRef90_R5MM45

Y A DCSKAPVSS 260
MA GL

DKNVIKDFAKLYKAYTDYVT
Y $\mathrm{T} \mathrm{P}_{\mathrm{P}} \mathrm{AGLDKTP}$
RCSEMENF ALGGMDTTSFPEEGVLKLAKLAVVVENWVLE
R

ECV
KAMMG S LDETPEKN
YTNFSCVPND
YAPPMEPI PAKHQMT
RGMKFNLGSDEETELTT
KCTVGLDKTPDNN
HGAAAVDV

R S GKSVADKKALVYMAKVYMATKEIIA YERRAKDF PNLDAELDEATCKTLKVYSKLRT

YARRAKDF PNLGEMDQDATRKTLK VYSALLQAK
 DAMVGH PDCAKVS
NTVI KIAKPKVATVAALAHAMKNLV

GVVCEMNVPASNALTLAKVSVVLDEY
WMA $G \square E N T P D K N V K D F A$ $N \square A G G A T V D T V W D M A R G K A Y R Y V R E$ VWDMAKYVVAFEQWAQEERLGLVASHY
Q IV G GENTPEKNVKDFA K LYKAYKDYVTE
 LVDAGDD SSADGEKRYP
 $F E!E G$ EFI CKEVND QVKKVAQLCVSASKFVEK ELAE GVAKLYEIDDLSEPVLDKVYAFVLL
DDLESVD

## DQ D QLD R S LRLRAALED

SPSVAGNG NCHNVPEENLNNLAKTGVVLDE YTEEELADELAEARKT IVGLEADPENNVRLYKAYKSYVGE Y T R W $V$ VGLD DLDQDE $\square D K$

 NAL NKP KFGRA $\quad$ KTEADFGKAGDUYCAMKS I $R R D G N A$ DFPNDADMDQTATCKT LK VY S A L R HPSCG
$N V A \backslash P E E Q \| L Q T Y R F G \mid L G M L D L$ $K R T G A V K \quad A N G T T M Q Y M A K I Y M A T$ VASS $\square$ SVSNDDSFNK
RAQACQDTTPEDLLRE

 GT MQYMAK YMAT
$V A R \square Y F A L K K M K E D$
$M R G Y Y A T$
 (ATAEDLLKAMRLYKA $K$ QL
FDIEG GATVETVWDM AKYVTAF $M F V I S E D \quad S P A D P D A R K P K P E Q L D \square A C R V A V A V R D F D L D$ QVA GLQRSDEQRFAQFSSYVR
RAIACREGTPE
YA GGMDGDVDAGELDK NDPRVIDVVNDMSKSVDGSKDS DLLKAMRLYQAVK I DCE S $L$ R L K L A L D S L REE SA

## NCK W HDT F

HCAAV PSGEGMLPDPR\ANTVK HKA ALLEVLK
$\qquad$
MMVGLDQTPENNVRD
FARLYKAYKDYVAD NAQKNE 1 QSFTDKISSSEDS LYDSARLHLALR $N C K W V$ V


GLINRSDETKFAQFSTYVK
RA NCEEI REES【GKAARDE LDAKDFV
 NAAAASTPHEPSD YTPAA LEQALK $\square E T A L A D A A$

```
Y LQGTED
\(\mathrm{S} \square \mathrm{Y}\) H G
``` LCTMQEAGFDKSLD

KWNFLEDGADEVDGRLSEEERED
VF VFR F DT R \(\square \mathrm{NKEE}\) \begin{tabular}{l}
\(F D \| E G G G\) \\
\(V\) \\
\(V\) \\
\hline
\end{tabular}
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                                    T\EK\WDM
    ```

 VD K K N

FDVEGGA ADDDED IMDMAKHEVQWAKDEDLSMIASHY A G Q I IGLLNRTDHTVKR FAQFVKVMAKDYI
VSGDGE LDPDQLLRS \(\square R \quad L K G A L\)

 UniRef90-R7PGH5 UniRef90-X0W412 UniRef90_R6M1K0 UniRef90 V7YVA0 UniRef90-A5ZM40
UniRef90- \(\times 1\) RGQ0 UniRef90-F7KFC6 UniRef90 UPI000429B4BA UniRef90-R6R9G8 UniRef90_XOVAY7 UniRef90 XOWCl3 UniRef90-C4ZGB5
UniRef90 A2BMLO UniRef90-XOWZL4 UniRef90- G5HPY7 UniRef90-G8PLG3 UniRef90-R5QZM3 UniRef90 UPI000419598F UniRef90_G9Y8G3 UniRef90_D3G282 UniRef90_M5TCF5 UniRef90_R5EFZ7 UniRef90-B8D566 UniRef90-R5IUB8 UniRef90-A9SLX9 UniRef90-C4V1L4 UniRef90-X0Y3S6 UniRef90 W3ANA4 UniRef90-1018B2 UniRef90-UPI00040D0349 UniRef90 U2C8F5 UniRef90-UPI000471D234 UniRef90_G5HQ90 UniRef90_V2XZ40 UniRef90 H2JHZ7 UniRef90-R5EWN8 UniRef90-D3AH64 UniRef90 UPI0004635D11 UniRef90-UPI0004026D1F UniRef90_UPI00016C04A6 UniRef90_R6QGJO UniRef90 X1FM43 UniRef90_UPIO0046E8342 UniRef90-UPI00034A1A66 UniRef90_R7NUD0 UniRef90 R5RVF2 UniRef90-R6TYR1 UniRef90_C4SNF3 UniRef90-UPI00047178F6 UniRef90-UPI0003640ED1 UniRef90 R5TUQ2 UniRef90 B9K9U2 UniRef90-X0TX25 UniRef90_B9Y505 UniRef90 R6C127 UniRef90 U2TB19 UniRef90-M5T160 UniRef90-UPI0003F7A1AF UniRef90_R7P1D3 UniRef90-EOMRC2
UniRef90 EOSRG6 UniRef90 XOW 4 V 4 UniRef90-R5FJZ3 UniRef90-M5U5Y0 UniRef90_N9X7S4 UniRef90 G5HH13 UniRef90- \(1118 K 2\)
UniRef90 UniRef90 UPI0001E89B8F UniRef90-X1HL77 UniRef90-D4KF99 UniRef90 UPI000365B477 UniRef90-W0JON3 UniRef90-D7AYL1 UniRef9o_R7EP50 UniRef90-W0FSC6 UniRef90 UPI0003B4C9FE UniRef90 M9WC15 UniRef90-V4J7Y9 UniRef90-H9UCS5 UniRef90-R6ENU3 UniRef90 R2XKF3 UniRef90-S4MWL5 UniRef90_K2LLH5 UniRef90 J9H8L0 UniRef90-R5MM45

290
300 310 320
GKLDA SI R C WMELEKVFI APCILL EGGIGAVSS RCWPDFTDFGTPVCSVL LDGFAFQCWP
RA \(\square L E K D C T C A S M D C W P S A A V L K G \square P C V A L\)
DEYVEEYHLDALADRCWNEMT\LRVCPCVLL
F NWAEEE

 NR \(\square\) ND \(\square\)

 NND


EADEKDYAGVAVRCWPDFTEYGCAACGAL AKRYNCKAAAVQCWNAMQGVLGIPCAAN DEYHLDTVAI RCWTEMQELGI APCVLL
 DGYAQGAAGK \(\square D S\) MLIPAFSML

NH \(\square \quad G A \| S\) S RCWPDFTDFGTPVCAVL
NEQLT
RCVEADG LSGVAVRCWPEFTEEGGAACGAM AEANDCNALS C E C WN L F R KKYVS PCF I L
NPLIYE FKRLVER ERWVQKEDLAMVASHY
 NGLTAVAVRCWPEFAANYISPCAAM
YEE \(\square\) FEEYNVTAVSAECWTAMQLMVGAMCAAY

N E
\(\mathrm{NH} \square\)
VRSKGGYSAFA VRCWPEMTQYGGAVCGPV
YVGVALKNWPE LDFDNY\A GDGAG
YKLDALTLRCWNEMEDVLHDCCVLL
DEVVKEYKMDAVADRCWIEMQRGD
H TQG



EKAQREGYSGlAVRCWPDFTDYGCAACGAL
AAEHGY IGATVKSWPDLFDCYCA IDDGV
```

K

```
N Q QVCEK
```

N Q QVCEK
K Q MC E K

```
```

K Q MC E K

```
```



EVIKKYSLDAMAAECYPMFS
NWDSLAVQCWSQMQELYVAPCLA
Y QLD AVTLSSFSMYQDLK STGCLAV

E Q WVRDEHLGMVASHYDGLA QQGKGVLDSMLIPAFSM AAEHGYIGATVKSWPELFDCYCADDGSV DLA SVNRCQAVAVDCWGFSQDSY【PSCF
GLIALSALSSRCWPDFFTPVCSVLC EFAQEKDLSAMGVQCWTAMQEDC

NK $\quad 1$

LE S L K D K
T GYD A VA L R C WP E VP E E L G S MC L A C
H NLDAFAI RCWPEFTEYGCASCGPM
 AS I AKERNYHA IS $\square$ KD E QWCRDEQLGFVASHYDGFAQG\|AGK DD
 HRLI A LSNHFEVQYMHQ\ISASNPVFSML

VVEHGYH GLAAVRCWPEFFTHYGAAACGA AQKGNYDGLAI SCWPRFSELGMVPCGAY
K
$A Q G V A G K L D S M L I D A F S M L$
MRCWPDFFVAPCGAF
C ${ }^{D}$
$\square K E R G R$
 VLK RYFEENNYAGMAVACWTRFQERLDDVP CMAY

## 340 <br> 350 <br> $G \square P$ A A CE LDDVGNG\|\|M

## A A GVVASCEADVYGALSMY $\square G K E \square T G$

EG $\square \mathrm{P} \nabla \mathrm{V}$ CEGD V N GAVT $\square \mathrm{A} \square \mathrm{MN}$
$G \square A T S C E D D \backslash T$ S A DSMRAMQLAS $M G \operatorname{P} S A C E G D L N S T I L M Y A L H N L S G$ DGFPDACENDI HGALTMALGA $A D G T A A S C E S D V Y G A L S M Y G M Q L T G$ G VA S C E DDLC CAA TMRALSLAS

 EGVVA GCEADVPSTVTMLLLHTVS ALGIPVACETDINGALT

EKFPVACEEDMMGVVTSSTLQHASG
ALLNEDRTPSG
ALLTD
SELNDR
A L M N E
ALMNE
SMMNDY
GVVSSCE $\square \mathrm{D}$ ICSAVTMRALN $\square$ AS G

A L L N D GFCVAEEGEMNGLLSSMALWLLSN
$M G \prod P V V C E T D \prod H G A I T A L L$
GIVA SCE GDVPLLI SMAL GEWDT
$Q G Y L T A C E V D V L G$
SELND
ARLND




\section*{| $G V S$ | $A$ |
| ---: | :--- |
| G | $C$ |}

QE G $\square Y S G C E G D L P S L I S M A D L G Q \square S G$ KQGTACAVEGDIKVAMAMSILKTISGT K G\|ILS CEGDVEGALSMLAGAAL $M G Y I \quad G G E S D M H A T L T Q V V L K S L T$

GMM
$A L V$
$G E E L$
$N$
GELND R
SEMNDR
A MM
L 1
SLLND
A L N S
GLLN
ALMNE
GERR VPCACEADVHGALTNLFLQEMTG


A N G $G V$ VTA C E VDVGN

GLMNLTS SWLAD EGFVVVDTEGEDVGGTMVMHMLNLITS


| LI |  |
| :---: | :---: |
| SMMNDY | GFCVA EEGEMNG |
| VLA ELIF D R | GLPPAACETDDHA A VGAVL |
| A ML ${ }^{\text {N }}$ | A LGGAASCESDVYGALSMY GTQMTD |
| SLLGN | EGIIPCGCEGDLNSALLAMFLLQSFSN |

AACSSQFTEDG VVSS CESD $\square$ H GSVSMFVLQQLS G
GR

SMLNDNN
ARLADR
AMMNE
SMMNDY
T L M
L L S E


B4C9FE
 GLCTAEEGEMNGLISSLALWEDSN AQGYGFAGE GDVLAASIVYAGHQLA G ■K QGTACAVEGDIKVAMAMGILKVIAGT Q A

GVVVSME
RQGIACPVEA A A GIAMY LRLFTG $\stackrel{L}{A} A L \frac{L}{L} G D E N D \square A G$

S QLT E
$\qquad$

GMMGEKR
S LLND
G Y L C D

TPCACEADVYGALTSLMLQALSD
EG $\square P A G C E G D L Q S I F S M L V A Q T L T G$
HGYPVACEGDLDGLDSMIMLSGAT

UniRef90 R7LDI6
UniRef90-R7PGH5 UniRef90-XOW412
UniRef90-R6M1K0 UniRef90 V7YVA0 UniRef90-A5ZM40 UniRef90-X1RGQ0 UniRef90_F7KFC6 UniRef90 UPI000429B4BA
UniRef90-R6R9G8
UniRef90-X0VAY7
UniRef90 XOWCl3
UniRef90-C4ZGB5
UniRef90-A2BML0
UniRef90 X0WZL4
UniRef90- G5HPY7
UniRef90_G8PLG3
UniRef90-R5QZM3
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UniRef90-G9Y8G3
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UniRef90 W3ANA4
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UniRef90-D3AH64
UniRef90_UPI0004635D11
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UniRef90-R6QGJ0
UniRef90 X1FM43
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UniRef90_R7NUD0
UniRef90-R5RVF2
UniRef90-R6TYR1
UniRef90_C4SNF3
UniRef90 D5EMH8 UniRef90-UPI00047178F6
UniRef90-UPI0003640ED1
UniRef90 R5TUQ2
UniRef90 B9K9U2
UniRef90-X0TX25
UniRef90-B9Y50
UniRef90 R6C127
UniRef90-U2TB1s
UniRef90-M5T160
UniRef90 UPI0003F7A1AF
UniRef90_R7P1D3
UniRef90-EOMRC2
UniRef90-EOSRG6
UniRef90 X0W4V4
UniRef90-R5FJZ3
UniRef90-M5U5Y0
UniRef90 N9X7S4
UniRef90 G5HH13
UniRef90- X118K2
UniRef90-X1UWB4
UniRef90_UPI0001E89B8F
UniRef90 $\mathrm{X1HL77}$
UniRef90-D4KF99
UniRef90_L0A7B5
UniRef90 UPI000365B477
UniRef90-WOJON3
UniRef90-D7AYL1
UniRef90 R7EP50
UniRef90 W0FSC6
UniRef90-F8EZH5
UniRef90-UPI0003B4C9FE
UniRef90 M9WC15
UniRef90 V4J7Y9
UniRef90-H9UCS5
UniRef90 R6ENU3
UniRef90 R2XKF3
UniRef90-S4MWL5
UniRef90-K2LLH5
UniRef90 J9H8LO
UniRef90_R5MM45
UniRef90-A9D84
$M N N \square P K \prod G \| V A D S \quad R D C F P A S \square A E N R R K A L V K A$ KKARI GLYSAGLNTYWGQFEGLYDCLMGYNRF PR $\square G L G G \square M Q P \square Y$ D A M $\square P G \square T E H Q A A Y A Q R$

NMESR

LLP QLQESARR
 ER

MNSNAK GLFGTGDTYWGQFDGLLDELDKG K NYPKLGLIAVS RDCFVRSLSENRRKALAEA VARKPK $\square G L V A G G \square G A Y W P Q F P D L L P Q \square R R S A A R$ LLPQ QQASARR GKKAR $\square G L Y S \square \quad G L R E G L R E R L V E Y G K W D E R K$ MNNTPK LG $\square V A$ VS RDCFPME LSENRRKAVVDA
$R V G L L G V G L G A Y W S Q F S G L E E R L R G Q V R T$ ALLPQLQASARR MNNTPK $\square G \square V A V S \quad R D C F P M E \square S \nabla N R R \quad K A$


MNNTPK $\square G \square V A V S \quad$ RDCFPES $\square \quad S V N R R K A$
 NMPKVGIVAVS RDCFPESLSVTRRGNLVKA


MNNDPKVGTVAVS RDCFPAS LLPQLKRSAER
$M N N \square P K V G \| V A V S \quad R D C F P S L A Q N R R E A L V K A$ $K L G \| I A V S$
$M Y N \nabla P K \nabla G \square V A D S$ RDCFVISLSEKRRAA $\downarrow$ VKA

RDCFPAELSTERRKAVVKA
 $\square E A R L R G Y V H V$

MNNMPK $\square G \square V A V S \quad R D C F P E S L \quad S V T R R E A$

IDFRKPKi GVLLI EAERF R R ALGEGTVRGTYA KKPR』GIYTMGKAYWNGDRERLLHYGQF $\square A E K$




LLPQLQRSAER
RDCFPESLSVTRRENLMKA RDCFPVELSERRRRAVVQA

MNNDPK\G\|VAVS
MENMPKI GLVAVS
$M \square N \square P K 』 G \square V A V S$

MNNMPK $\operatorname{ll}$ GVAVS
MENMPKI GIVAVS
$M \square N \square P K V G I V A V S$
MMNKKAKVGVLAL
MS NMPKLGVVAVS

RDCFPMELSTNRRKAVIKA


RDCFPESLSVNRRKALVEA RDCFPESLSVTRRENLVKA RDCFPESLSVNRRKALVDA

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UniRef90 C0CRX6 UniRef90-D5E1S9 UniRef90-R6Z9A5 UniRef90-R6UVN8 UniRef90_UPIO0035CB97B UniRef90_UPI0003B30B08 UniRef90-A5ZYS9 UniRef90_UPIO00347D04B UniRef90-D1CGS1 UniRef90-X1NI66 UniRef90_UPIOOO2490382 UniRef90_UPI00037C4DDB UniRef90_UPI0003F93089 UniRef90- G5IK04 UniRef90_UPI00034C87D1 UniRef90-R6SRW2 UniRef90-F7K2Z4 UniRef90-U2CSL4 UniRef90-XOUMV6 UniRef90-R5CH66 UniRef90_E4QDA7 UniRef90-D4J110 UniRef90-B515B1 UniRef90-UPI0002E11C1A UniRef90-UPI0002555789 UniRef90-R5BIZ4 UniRef90-D7BV12 UniRef90_A0A015KP29 UniRef90_UPI000262699B UniRef90_UPI00047C550D UniRef90_UPI00016C0C52 UniRef90-FOKDK6 UniRef90-G8QU46 UniRef90-UPI0002F8E5EC UniRef90 R6T8U2 UniRef90_UPI0004760D09 UniRef90_UPI0003783CEB UniRef90 ${ }^{-}$G8QTE5 UniRef90-M1LSY4 UniRef90-R5W7H2 UniRef90_J9FB81 UniRef90_UPLO0046F0D2E UniRef90-R6F399 UniRef90 W7SKG1 UniRef90-B8E206 UniRef90-R7PD99 UniRef90-D4JQN0 UniRef90 UPIO00425D4B6 UniRef90-UPI000464F203 UniRef90-R6N2T7 UniRef90 R6NMF7 UniRef90 G4KW82 UniRef90_UPI0003693F5F UniRef90-UPI00040F744A UniRef90-I0XAI6 UniRef90-R5J500 UniRef90-B8I294 UniRef90-W0FQ19 UniRef90_X1QXG3 UniRef90_WOIC96 UniRef90-J9CYJ1 UniRef90-D4MZB7 UniRef90-F8N9C7 UniRef90-D4MOK3 UniRef90- U2BLA4 UniRef90-U2CAB6 UniRef90-E7GU45 UniRef90-UPI00036A4FD5 UniRef90 BONG78 UniRef90_UPI00047CACE9 UniRef90-UPI0003B34F26 UniRef90 C6VYI9 UniRef90_UPI00035D530B UniRef90-E1QV51 UniRef90_B1R1H2 UniRef90 G8LWB4 UniRef90-R6XP35 UniRef90_R7JAE3 UniRef90_R6FGI6 UniRef90-C6LF82 UniRef90_R6VTR4 UniRef90-F7M3Y9 UniRef90_-7M10Y9
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UniRef90 UPIO003B4358F


VYNYGLVDDEKVARQAGEWFN EDFKAS $\square$ PDTVE $\quad \square D G G V V T T K E Q S Q A A G D \square F R$ YQAR $\square R D R M E R D A G \quad V Q V A D A G M V D S P A R A L E A A S L F A$ CAK QGVSVYEAKTTVENEKDALKAVDEVK



SAEYVSER $\square$ AGYDAD I IDVVGFDSAQEGAVAAERDR
 L VEAYKA KYDAAE $\quad$ YYEC


## LIKAKEKYDPED $\square Y$ YEC PVCDVESEDHMVQAED $\quad$ K

 RKA LIDATKKYGEGTVYECPTC DVESEDHMVQALDEDVK VRKDAEAAAY $\square N K D Q E F A D V V Y P G P V W E R D G A E R A A R L F Y$IAEMDAEVFFYG

LA D C
EEAESCGEFFN

VA ERMR
YQEKYGEEG $\square$ Y CSQK
YKEKFDAKD $\square$ Y


F D GEDFEC

| $\mathrm{V} V$ | $E A Y R K$ |
| :--- | :--- |
| $L$ | V A Y Q A | KYGEGEDI YE C ETTVENETHMRKALDEVR KYGEGDIYECPDC IVESEI HMVQALEDIK



YKAKYDEKN $\square$ Y YAA KYDAED DYECPDC I VESEDHMVQALEDVK YAKKYDSK DIYECPVCIVESEVESEVMMVALEDIK QEKIKAGDEKMD VEVV NVGMVDSLQKANEAAED K WKTLLRESVRYVTGRFQELVVDAGFISDAQEAAAAGEKGLR Y

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UniRef90 - J9CYJ1 UniRef90-D4MZB7 UniRef90-F8N9C7 UniReffo-D4MOK3 UniRet90_R7EU61 UniRef90-U2CAB6 UniRef90-E7GU45 UniRef90-UPI00036A4FD5 UniRef90-BoNG78 UniRef90-UP100047CACE9 UniRef90-UPIO003B34F26 UniRef90 C6VYI9 UniRef90-UPIoo035D530B UniRef90-E1QV51 UniRet90-B1R1H2 UniRef90-G8LWB4 UniRef90 R6XP355 UniRef90-R6FGI6 UniRef90-C6LF82 UniRef90-R6VTR4 UniRef90 R7BL74 UniRef90-UPIoo036FDA67 UniRef90-C4U771 UniRef90-D4JAL4 UniRef90_R5WZZ9 UniRef90_UP10003B4358F
 GNKIDTVLYQSVTFADGEFMVKILEYFPVIVWSVREPSVG AADVDLVILQLLTYAYNMDPAVRDLDVPVVLVNYENTDTA AAGVDALVVFLGNGETPETMIADMDGPLMYTCAAEGD LP HADLHILFMASFSDASPAVELLGKVKGPVLGWSMREDP KNGCEALCVFLLGNFGEDSETLLAKHDGPKMFCALMDGRGD KNNVDIVFSHAATY YASATVLPVHQIPVIILNLQGTDRW GQGLDGVLVVMLTYGPSLRVLTETRLPVALANTPDP REMVDLLVCYTATYATSSQVIVQERRVPVVVLNLDTGEWL

AADCDLIVGFLTTYMTATLVPDAQRSGAPVLLINLQPTEA ERNVDLVLCHAATYCTSSAVLPVHQDNPVVFLNLQPTDR】
 PKLVVVQNVTFANAAYITEVLKKF DCPVLLWTLREPVID SAGVNALVVYLGNFGPETIAKEFDGPVMFANLVNGRGD

$A Q D V D M L V Y Y A T Y A \square P V L V L N D Q P A P A V D Y S A F N A P D R T$
 EAGVNALVVYL GNFGPETLAKEFDGPVMFANLIGGRGD

FVIQQFELLPRPTILLADGQQN AAGCDGLVVYLGNFGPETEETLIAKYFDGPVMYVAAAEET QADVEVVFLF $\square$ STYALSST LLPVA QVVGKPIVMLNTGEWLL $\square A G C D L I V G F \square T T Y M T A T M L M P T A Q R T G S P V L L I N L Q P S P$ DK TDFLLLEQTTTFAGGFLEI LAKSDGPVIFWAIPELEDK KAGCNALCVY LGGFGPELLAKHFDGPKMFVAAAEGRGD GAGCNALVVYLGNFGESAETLDAKYDGPVMFVAAAEETQD KAGCNA CLVY LGNFGPEALAKHFDGPKMFCALAQDGGD KAGCNA LCVY LGNFGPE LAKHFDGPKMFVAAAEGRGD EAGCNAQIVY GNFGPETLVKAFHGPSMVVNLVQGRGD THGVNALCVFLGNFGETPETMLADLFAGPMMYTLHDGRGD
 KAGCNALVVFLGNFGPETIAQNFDGPCMFVALDNGRGD

RLVIQHFESGPRPALLLADGMQN DADANALVVYRGNFGEGPETMLAQKDGPVMFVNLKGGRGD A ADVDLVVLQLLTYAYNMLPAVRDLDVPVVLVNLQNTDTA TANVDGIVVAPLMWCEDRAALKVLPNFPVVVCTFFPSEGS VYLGFGESS AAGCNALVVFL GNFGPETABKFDGPCMFVAAAEGDGD KAGCNALVVYLGNFGEMSETLLAKHDGPKMFVNGTQGRGD AKNVDLIFAHAGTYVNSSSVLPDHQKAPVIILNLQPTARD KAGCNALVVYGGNFGETPETLLAKYFTEGPVLCNDRGD AAGCDIV VGFLTTYMTATMLI AQRADAPVLLINLQPTEYC KAGCNALAVYL GNFGPEILAKHFDGPKMFLSLDDGRGD QANVNALVIYLGNFGEGPETMLAQRFDGPAMYNLIDGRGD REDVDLLFLYVTTYALPVIVLNLAPEPAVDYQRFNAGEWL NADLDGVMVVL LTYGRVARLFNENRLPVLLANDQPEP
QAGVNALVVYG GNFGPETTLLAKEFGGPVMFVSAAEEA KAGCNALCVYLGNFGEDSETLLAKHFGPKMFIALSDGRGD
 STVLPLVQRLKVPVLLLNDQPTP AAGCNALVVYDGNFGEDSETLLAKHFGPKMFI ALVGGRGD KAGCNA CVY LGNFGPEDLAKHFDGPKMFVGLIQGRGD KAGCNA CVY LGNFGPELLAKHFDGPKMIATLSSNRGD QADVELLFLFISTYALSSTVLPVAQQVGKPVVMLNMQPVP VADCDLVMVLPTAQTPVLVIDLQPTEAMDHANFDTGKWL
 KAGCNALCVY LGNFGPEILAKHFDGPKMFIN LDDGRGD

## UniRef90 CoCrx6 UniRef90-D5E1S9 UniRef90-R6Z9A5 UniRef90 R6PXC8 UniRef90-R6UVN8

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UniRef90-D7BV12
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UniRef90-F7M3Y9 UniRef90-UPI00036FDA67 UniRef90-C4U771 UniRef90_D4JAL4 UniRef90-R5WZZ9 Unire90_UPIO003B4358F -
 GRLRLNSLTGGLRNHQHPFAFVFGNPDEKA KWLGELYACGALERAGKRHAVI GG VVEGGDPV VAES V

GDLMNGRGDAYCGMNASYNLGDRGKKVYDPETAEEVAB GAVGMCGVNAAHALMGQSIRHIHGNADEPQVRTAGKDAGAA LA QCVGCSSNAFNRAGDTFRAVNGLDFAKADEVTCPEAVR AVSASWDMDDMTYNGIHGRAGVDFDVITGS ANCSACCVSCAFERSGDDFNVVSGMLFDD

GLHNSLAALKOKGKKVEIIHGS DEEAW GLVGLLNLNGSLTKAGVEYASLWSEDFTDQWTGKDAS Y GWLRL NALTGILVSQHHDFEHIYGNPEE Q GRCGLNLAMHSLIKNNTPQFIIMEDDSKKLSFSQFDESNN

 KWLGEDYACGALERAGKRHAVITGGVEGGDPY NLVAYCGVLNASYNLKLRNLKAYGTASECAD
 AHCGACPVANAFNRANDRFKVVNGLLGQSATDENTAHRPE GAYACGAVGADLNRYGKRSAVITGWLVVEGGD AAVA IDDYERLNALGDRGRMM TGMWLANCQACSAPEDASVAA GKD LANGRGDAYCGMNCSYNLGLRKLKAVIPETADDIA GACPLPEMANAFERVGVPFRSVSGLEDQRAWD GACPVPEFANAFNRAAIPFRVVNGLLGMDTYDRKEA DRAW GACPLPEMANAFRRVGVEFRSVSGYLED
AHCGACPVSNAFNRSGIVRRVVNGDETSGRPAKRAWK AHCGACPVSNAFNRSGIPFRVVNGADEQTSGRPEAKRAWK
GTGAYSAGNALLNFREGNFEYIFGSPEE AYCGMLNASYNLALRNLNAYIVLGGPEYPVGTASDVA GRLRLNSLTGGLRSENHSYSFVVGNAPE DDVRKGAQVQ AMTGMANVFA RCGDPFHQVNGS DE GDEACWREDD GACPLPEMANAFRRAGVEFRSVSGYLEDERAWTRIS GLVGSLEASGDNTRYNRPMFTVLGTWSE A YCGMLNASYNLALRNDKAY SLASALEDATWLRVRGLKSEVLQSRDMKVKIHAGVPNMV GKCGMLNASYNLKLRNLKAYI TTGYПSDEYPVGTANEVA AHCQACSVASVFNRAGIKYDVVTGYDSD EETVESVW LTSGKSNSLAALNRNGYPGEISHGNGRDGEIVGKLEW G NLKWNSLCSSLNFFNKASLIKKFNPKKKFDYTFPEEEN AYCGMLNASYNLALLRNTKAYIKAYPEYYVGDAEDCADMII AYCGMLNASYNLKLRGVKAYU PEYPREYPVGTADEC
 A YCGMLNAS Y NLGLRGR RVY GACPLPEMVNAFRRCGVEARCVSGYLEEDPDYPGTAEDVA AYCGMLNASYNLARLRNTKAYI SYEEPVGTADECADAW SLAAALETSSWLRNRGMKSEDLHGELIPEYPVGIAERI Q AYCGMLNASYNLALRKLNPYV TWLGELYACGALERAGKRHAVTTG VVEGGDPE GLVGNLQMSGLLKREGYLYQSVSGYHR DPEVYEEDK GAIDYASFNALGNRTAM TGEWLGACAACPVPEI ANVVD SLAAABEDSSWLRTRGMKSEILHG AYCGMLNASYNLKLRNDKAYISY PEYPVGTAEECADMI GDAYCGMLLNCSYNLGMRHLKKSY PEYPAYPVGTADDDA ALVGFQEASGSFRRFDRP GACPVPELSNAFHRSGISCHIINGDTSLTNENTAARPEAV SLLAAALE S S WLRMRGMRSEILHGAP
 AYCGMLNASYNLKLRNDKAY AYCGMLNASYNLGLRKLPYDPEY PEYPVGVGTADEDA AYCSACPVANVFRRAGIPFYQITGTLNSD PEDW QVTAAWDMADMTYNGIHGRAFEVITDDWRAPAFA GLNSLASALALLSEVGI
GYCGMLNASYNLALRNIKAYT
DSGVLHAK DA
 C Dí D A Y MNGLGDRGLM TGEWLANCQACSVPEFSNVFN AYCGMLNASYNLQLRNVEGYYIGELEYPVGDAEDCADML AYCGMLNASYNLKLRNVKAYYPVGTAEECADM DHE AYCGMLNASYNLKLRNIKAYTVWPEYPVGNAEECADMI AINYQLNSMGDRGKM GRLRLNSFCGALSRENIKLQTIHGL AYCGMLNASYNLQLRNIKAYI

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 ERVD RWARAA HTVSALGRLDRVGVFGYPMNGMGDARVDETA REI Q E WCEAAMAVANLRGARFGFLGGHTYPGMLDMYSDFTM K RI KELRKDF QVKNKLFSTKLAVIGKPSDWLI ASDVDYKE SHVKPFNHATVAKDLVENRSI GI FDEGCMGMYNA II

DKVASFVKSVQVKDDLA HDNIGVVGTYPPGFFFSDADAAE
NSVKTVWKKATTVQSSFGQKIGVIGTRPEGFDTCDYDSTE
ERWIQAAKIRAADRHARHGLMGHDYPGMLDVSTDDTL
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MIAEFAP IARAVVGLKNLKI ISFGPRPKDFMACNAP DKQ
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VMYNNF

NEl IE WT RAA
GVKRVLQHARFGFL
R R D Q WCRAA
ERWVRAAHVRAALRHARHGLMGHVYPGMLDVQTDPTL
RQIGEWI AAAGVCAGMRRNRLGVLGHYYGGMLDVYTDLTR








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UniRef90- WOFQ19 UniRef90-X1QXG3 UniRef90-WOIC96 UniRef90-J9CYJ1 UniRef90-F8N9C7 UniRef90-D4MOK3 UniRef90_R7EU61 UniRef90_U2BLA4 UniRef90-U2CAB6
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## -


 LK SALGVTLHKMDLKECVKLPEQEWI GEVERAEKQV




 $V K E A L G \backslash S L I D V E M D E L V K E I D R$
 LPATFGSHVEVLELDDLRHRVEQVTDADAAAEMSRNVNNS
 $L R R H L G P E V V H D A Q G E L H R T M$
$L$ L F N L GVEDEENSELDLFEAFNNHAGDEPEVVKDMEE

AKRRWGDEYTD D LDERVTEYFN Q S TSDDEVGNACAELAE

LSATFGSHVEVLEFDDLRHRVEKEAETRERVELAR
QSAVFGTHVELLEMCELHALLRERVTDAEAEFRAAFE
 AKERLGVEIVDIDINELVGLAE

EPDRKWL
VTGNLGGHVEVLEFDDLRVRVQQVKDDEVAAKDA

 VAKYFGSTLECI EARELIDKA KTFADAECAENLVEFEK LYN LGVEDEENSELDLFASFNEH L LKTFSVRLGES DEVVRELMEKARFKQGES DQYKTLMEESTCC


 LYN LGGUEDEENSELDDLFEAFKKHDGDPAEVAKDMA
LSATFGTHVEMDEMCELGKAKRDEVTMMEMNEKDKEFHE





 LYHRMWLYTKQFDWEKMWA $\square$ AD D D $\square$ T DEDA $\square$ RAK A I R K LLY GI E L K Y
 LY D L GI E I E E N S E L D L F EAA F N Q HE G D E R I PA I I K E M E E

LY E LGGVEDEENS E LDDLFASFNNAHAED ERDDAVAEEMAK E VSANFGGHVEVLEFDDLRDRVEQ


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RTGRVLAGEETMLHMT
I GL NRNDETVTKF
260
A QFSTY $\square$ K
270 $\mathrm{K} \backslash \mathrm{V}$ M A V K

280

S R RYELDDLTAPVLKKVYAFV LLFRDI
 N
$K A L A C \quad R E A \square P E D M L K A M K \square Y K A D K R \square V E$
 TFEIVGGVDDEEK【HEMAKYVVAFEQWVKD

A G N RYPDMLPR RAQ FE $\square T L L D W$ $E G L K L N P P N K P K F G K \stackrel{L}{S} \| S K F S G S M D \square Y C A M K T L V$

MFE $\square$ CGD SPSDP $\square$ ARKPTDEQ $\square E W S C K V A A A Q E R L V R E$
MFE $\square$ SEDTDP $\square A K K P T P E Q \square E W$ S CRVA $\square A$ QEKMVR SC CNHEADD■ KNMTDFAKLLKAY KEYVI E NDSRDPDVVKDMMEEEDGEGNKMPGDLPKLAQY NCVEC PRERMEDSAHLMHAYMDYVQE QVI
KPKFGHD $\square$ G $\square$ NRSDEKKFAQFSTYVKEMD

TETDFGKALD $\square$ Y CA $\square$ K S M

$V F T L D E S V A D E D$
$T$
TYVME EDV
ELLGEGNKMPGILPK KAQYE
$\square T$ L LD WM
EASLFANRAKGUQEATPEELLR AMRLYKI R
QALACREGTP KD $\quad$ LKAMKLYRALRQVI
A ELGDGNLKPE\|LPKLAQYE

TFR $\square D \mathrm{DGSVKPEDLR}$

Y C ALKT I V

YAAFNEHKNDAR\PEVVADMEKELGGDNKMPG\LPRLAQL ELGKGNKKPEILKKLAQYE
L GAGNKKPE ILPKLAQYEKDW $\quad \square R D$
RFRISANV
D REKLDA A S VRAS $\square$ A $\square$
AELGEGNMKPE\LPK\AQYE
MAGEAGNGESKFSGILPRLAQYE $\square$ T $\square$ E D WMR
VFTVDESVAGEDLR
EMNYADGKQPEMLK K K M K K L A QYE $\square$ T L
QADACREGTPED
$M E E E L K D G N Y P G Q L P K \square A Q Y E$
D 1 LDTFD T E GGGT


EFDVQPDCDPDELARAA RTAVA LRK LVDA
KALACRERTPED
$M L K A M R \square Y V A L$


$\square V K E L T A N H E V Y P N D D M E K L D A S V R A S Y A M R \square A D K D L L V L$
FFLISDDKAADPLRPTEEQLDW

VVREMEEEDGEGNKK PE LLAKQYEDT पK
E GGEGNNYPG■LPKLAQYE
SGNKIPEVLP



EA LAC R REASADDMLKAMK $\square Y R A D K$
AELGEGNMKPEVLPKLAQYE MEEE
LGAG
AELGAGNKKPEVLSKLAQYE
L F
MEEELGTGN KKPE $\square \mathrm{L} A \mathrm{~K}$ KYELT L K


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UniRef90 UPIO00347D04B UniRef90-D1CGS1 UniRef90-X1NI66 UniRef90 U1XLH8 UniRef90-UPI0002490382 UniRef90_UPIO0037C4DDE UniRef90_UPI0003F93089 UniRef90-G5IK04 UniRef90_UPI00034C87D1 UniRef90-R6SRW2 UniRef90 F7K2Z4 UniRef90-U2CSL4 UniRef90-XOUMV6 UniRef90-R5CH66 UniRef90 E4QDA7 UniRef90-D4J110 UniRef90-B5I5B1 UniRef90 UPI0002E11C1A UniRef90-UPI0002555789 UniRef90-R5BIZ4 UniRef90-D7BV12 UniRef90 A0A015KP29 UniRef90_UPIOOO262699B UniRef90-UPI00047C550D UniRef90 UPI00016C0C52 UniRef90 FOKDK6 UniRef90-G8QU46 UniRef90_UPI0002F8E5EC UniRef90 R6T8U2 UniRef90_UPIO004760D09 UniRef90_UPI0003783CEB UniRef90 G8QTE5 UniRef90 M1LSY4 UniRef90-R5W7H2 UniRef90_J9FB81 UniRef90 F2JLH0 UniRef90_UPI00046F0D2E UniRef90_R6F399 UniRef90 W7SKG1 UniRef90-B8E206 UniRef90-R7PD99 UniRef90-D4JQN0 UniRef90 UPIO00425D4B6 UniRef90-UPI000464F203 UniRef90-R6N2T7 UniRef90-R6NMF7 UniRef90 G4KW82 UniRef90-UPI0003693F5F UniRef90-UPI00040F744A UniRef90 IOXAI6 UniRef90-R5J500 UniRef90-B8I294 UniRef90-W0FQ19 UniRef90_X1QXG3 UniRef90_WOIC96 UniRef90-J9CYJ1 UniRef90_D4MZB7 UniRef90-F8N9C7 UniRef90-D4MOK3 UniRef90- U2BLA4 UniRef90-U2CAB6 UniRef90-E7GU45 UniRef90-UPI00036A4FD5 UniRef90-B0NG78 UniRef90_UPI00047CACE9 UniRef90-UPI0003B34F26 UniRef90 C6VYI9 UniRef90-UPI00035D530B UniRef90-E1QV51 UniRef90-B1R1H2 UniRef90 G8LWB4 UniRef90-R6XP35 UniRef90_R7JAE3 UniRef90 R6FGI6 UniRef90-C6LF82 UniRef90-R6VTR4 UniRef90_R7BL74 UniRef90 F7M3Y9 UniRef90_UPI00036FDA67 UniRef90_C4U771 UniRef90_D4JAL4 UniRef90-R5WZZ9

290
ETVKRYS VD A $\quad 300$ A A C Y P F Y 310 EAWVKEEKLGFIASHYDGFA QGKAGVLDSMLIPAFSM N KGCWPAFTEFGFVPCYVM

VSERGYDAVSLKD VDGMKKLLGYPPAPVFM
LDEWRKEEV $\quad$ W ERNLDSVSYYYHGRDDY LVQSGF $\square$ LE LEESGCGAYSTHFDAIG EDGRFRDPMAAAS LDEKLVE DF DLDALAYYYRGTRGDLYERDGAGM NGFKA IVNKYKLDGUTVRCFDLLE IVYKNSGCLG【

पd s पK EK

ERVLERHGFE Y YRVDAVSAECWTAMQLGVGAMCTAY
 $L T$ L LD WIE EHK GS REFA VA GKCWPAF T Q F GCVVP C Y VN

E EK LLA Y Y Y HGAEGNYYEQVQ DGLAAYYYHGAEGNYYEQVQSAF EKLGFVASHYDGFA KGQAGVVDSLLIPAFSM

## AEEHRGSRSYVSFANKCWPAFTEFGFEPCYV ERYGLAGVS LDRCFDLLTADGNTGCMAL

NDA LCYYYHGAPGGEYEK $\square$ QGGF $\square$ VGH AYNLDSLTYYYHGAPGNALQSGF $\square \quad L G H$ NNV R RVIAS RPDFFVPVCAVL ELTLLDW AEEHKGSREYVVFANKCWPAFTQFGCVPCYV N EQEGПN I K A L A SRCWPDFTSYGTPVCSVL TEKYDLDGVS $\square R C F D L L T A L G S T G C M A L$

EEHKGSREYTVFANKCWPSFTQFGFDPCYVN
 $D E Y G L D G V S \square R C F D L L T A L G N T G C L A \boxed{L}$

LE E LA KK ENAK ARCWPDFRETPCFSF
D WVQE HK GYRYVADA GKCWPAFT QF GF VP C Y V N E $\square T$ TLDW MEAHKGSRKYVVFANKCWPSFTQFGCVPCYV LTLLDDWVE EHKGYRYVTVA GKCWPAFTQFGFVPCYVVN
 DT LLD WVEAHKGSRYVTLTTKCWPAFTQFGFVPCYVN D HLG LS RYAAFAN KCWPAFTEFGFVPCYVN
$\square D W V E E H R G Y R Y \nabla A L T$ T K C WP AF QDMFKDPCYVN NK GSKKYVVLAD K CWPAFPKEFGEPCYVN




K R LGS L A Y Y Y E SVS G H
EYEDVIT SVIVGC KRI IEEDK $\quad$ QQALT LSCFRLIKHTDTTGCLAL DWIRDHKGYRKYVTDAGKCWPAFQTQFGFVPCYVNSRLA

$N D \quad D T V L F R E \operatorname{V} G \square R$
CHEEK D DA $\square$ T L S CFK V I EE $\square$ NTTGY L A L EDWDEGHKGHNYVAMANKCWPAFTEFKFVPCYVN
 N HKGCRE $\frac{L}{F}$ LGASEYAVFANKCWPAFQTQFGFVPCYVNSRFA EK LLVDRGYRAYSTHFDA $\quad$ GEDGRFRR LPDAA AS K EFHKGSREYDAFADNCFPYLIKHGVTPCLADL D W $\square$ E A HKGYRK

Y V A A A
 DWVEEHKGYRYVT $\mathbb{Z} A G K C W P A F T Q F G F V P C Y V N$

RDAEEERLSALTLSCFKLIELTGSTGCMAL
 AHQLGAMAYYYE KGYRYVAGAKGNNDYENIVTSVIAGN

D W $\square$ E E H R GYRYVT LT GKCWPAFT QF GF VPCYVN



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lupas_14
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jnet
conf
sol5
sol0
jhmmm
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[^7]


[^8]

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lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm

NHKGQRKY
VA $\square$ A S K C WP A F T QF GF $V$ P C Y VN

D WVEDHRGYRYVA IAGKCWPAFTQFGFVPCYVN HKGYRKYVADAGKCWPAFTQFGFVPCYVN $N \quad \square G A S E Y A G F A N K C W P A F Q T Q F G M V P C Y V N S R L A S$ DWTDKHRG SRKYVATAG KCWPAFTQFGFVPCYVN KEHKGSREFVVFANKCWPSFTQFGFVPCYVN WVEQHK GYRYVA $\square A G K C W P A F T Q F G F V P C Y V N$

lupas 21
lupas_14
lupas_28
jnet conf sol25
sol5 solo sol
jhmm
jpssm

SRLTD
S RLT

| $S$ | $R$ | $T$ |
| :--- | :--- | :--- | :--- |
| $S$ | $R$ | $L$ |
| $S$ | $T$ |  |


| $S$ | $R$ |  |
| :--- | :--- | :--- | :--- |
| $S$ | $R$ | $T$ |

$S R L$
SRLAS R

A Q GYPVSCEVD $\square$ YGA $\square$ S E Y $\square$ GTC $\square$ S

$A K G D P V S C E V D D Y G A D S E F D G T A V S G$

A G R G
lupas_21
lupas_14
lupas_28
jnet
conf
conf
sol25
sol25
sol5
sol
j̣hmm
jpssm


[^0]:    

[^1]:    

[^2]:    

[^3]:    

[^4]:    

[^5]:[^6]:    

[^7]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
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    sol0
    jhmm
    jpssm

[^8]:    lupas_21
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    jpssm

