QUERY
UniRef90 W3AB37
UniRef90-F8AZ18

| UniRef90-W5WGC |
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| UniRef90 |

UniRef90 UPILOOO36C3633 UniRef90_UPIOOO35D7775 UniRef90-A0A017SXY5 UniRef90-хомYW0 UniRef90-UPIO0036AA87B UniRef90-G8SOF2 UniRef90-s9QJJ9 UniRef90-J5QIE0 UniRef90-M4JUH9 UniRef90 17CH52 UniRef90-UPIOOO4667826 UniRef90-11D7E1 UniRef90-H2JPQ4 UniRef90-UPIO003080A50 UniRef90_UPIO00373FEE8 UniRef90_UPIO0036B7A08 UniRef90-B31X49
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FTEKFDQNPYPAYAKLREMDPVHQVRFPDGQKGWL
FTPEFRLDPYPTYARLRENAPVCRVRTPDRETWM A DQEP LVRECPFSPPAEYRQQREEAPVTKVRTPEGKQMWV AAELPVADELYQNTHEWLARQREAGPVCPVATRHGMPSYL PTGPUSRTCPYGPRPEHRQLREEAPIAKVIRPNGRTGWA


D $P L F K A N P H D F Y A G L R E S G P A H M V H L P G Y G D V W L$
$D E F L Q D P H V K Y E R M R E H E P T R R V T U T G G P V W L$ SPPDFSSAVFQADPHPVYERWRTSGPVRQVRMPSGLTVWL SPKFPFNRASGMEPPAEFATLRATNPVSQVQLYDGSGAWL EFPL LRTCPFAPPPAYGELREAGPVHRVTLQSGQEAWA PEFPMRRACPYEPPEEHRRLQREAPVSRVMGPSGDTAWV

LGDDFTRDPYPVFAALRARGPVHRVRIPEGSHAWL
FSPAFLADPYPTYAHLRRTTPVHRIATPQGFDMWL
 APARPFSPDFYRDPQSAYGALRTRGPVNRVTFPDGSTGWL APGCPF
 PELVDTAPMIGNPHADARLREAGPVHRGAGTGAEAWL

FTWEFATDPYPAYAWLREAGPVHRTAGTDGRPAWL APAL FSREFRANPHPVYAALREAAPVCPDSPPHGVDTYL

Y
R G P D
Y
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Y
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Y
R G P D
Y
R G P D
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$G$| $W$ | $P$ | $F$ |
| :--- | :--- | :--- |
| $G$ | $P$ |  |
| $L$ | $P$ | $M$ |
| $Y$ | $P$ | $F$ |
| $Y$ | $P$ |  |







FEKPNVLD LA P L Y E VL R R E A P $V$ T $P$ P $T$ T P A G D P A WL

 WPRDVEAPLQPPSQYAAVREKGPMAKVQLWDGSSAWI
 YPFAEMQRLEVHPEYARLRDAGELGGRVQMPYGGETWLL



 APFFPAPRECPYDTPPSYTAFREA GGPHKVITIWD GSRHWL
 AFPKDRTCPYHPPAAYDPLRGGAPLERVRFFDGRSVWA PEYPMPRACPFAPPPAMTRLQAEKPVSKVRLWDGSSPWL
 A P A Y P LT A P G A L E A P A E WR E L R T T C P V VA P V T L P S G D R A A L S S D F K H E A Y D DY K E L R E F H P A Y P L S S L G E Q N Q G W L




PGPELVVERARTGRPTRTDAPS GVVSAWL
P A F P F P D D G R L A I IP E Q F A D L R A R C P V Q R V E E L P P F G G Q G W L T P E F K A H A H E R Y A R L R S L LA P I I H R V R R L A D S S V S W L


## QUERY <br> UniRef90_W3AB37 UniRef90-F8AZ18 UniRef90_W5WGC UniRef90_UPIO0036C3633 UniRef90_UPI00035D7775 UniRef90 A0A017SXY5

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UniRef90-UPI000344A01F UniRef90-D2BBN4 UniRef90-W7Z1M2 UniRef90_UPI000369483B UniRef90_UPI0003830273 UniRef90_F8F5H3 UniRef90_UPI0002893D66 UniRef90_A0A023WB15 UniRef90-A8LZN1 UniRef90_UPI0002378892 UniRef90_D3Q8D4 UniRef90_L7F554 UniRef90-W6WP61 UniRef90_L8P4T8 UniRef90_UPI00047204E4 UniRef90_UPI00034DED52 UniRef90_UPI00035D902F UniRef90_R4LDM2 UniRef90_C9ZED8 UniRef90_S5VPC3 UniRef90_UPI0004662863 UniRef90_D2BFJ6 UniRef90_J7LTK0
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UniRef90_F3ZFS1 UniRef90_C2W8G6 UniRef90_M2PZS6 UniRef90-IOHB88 UniRef90_UPI0003831072 UniRef90_L8ESY4 UniRef90_K0K240 UniRef90_UPI00036B7022

VTKHKDVCFVATSEKWSKVRTRQGFPELSASGKQAAKAKP I T D Y E DAAAVLKDQRFIKDYSKL FGGTMDQMSVFTQ $\mid V T R Y A B A R A V L S D P R E S K D D D R A G D L Y L Q V F G E K S V V A L N R$ VTRHEDVRQVLNDRRFSANRFHPDFPVLVEGGRNRPESER |LTRLEDIDREMLSSPHFSSDRQSPSFPLMRQIRREDKPFRP

 VVTSHKHIRALLSDPRFSSSRRNPGFP TARPNAPPSALKP $V$ T GYADARAALADPGLSKAPANVPAAMVEA GERDGFQLMA I T R Y G E A K A A A L T D Q R L S K K D Y Q D R K T E E G A D S A N V G E S I A A $V T R Y E D V S Q V L K H A S L S K D A G A E R R A R M P W L L K D F E P D S Q$ $V$ TK Y E DVIGKVAT DERLLSKDRTRPGFPEDSAGGKAAA QA QP V S GHE E GRA I LAADRRFSSDKRKDGFPLVNVDARQLRSQPP V T R L E DVR QLLLTDPRFSSDRFNPGFPILTKTGRPRRRFTA $V T G Y E A A K Q V F T D P S D S K E D G S A G A R A A A T A H G A G G M F A A$

 LTRYEDVRAGLTDP GFSRDLDHLAPPEATALTGDPDSAMNR
 IT GHAEAKAAF GHPGLSKRLLGSAGARAAAGHQLQA GP FEH V T R H D D M R A VLGGDPRFSADPSRPGFPSPSAGFKLGAAEVQ V T S Y A EARSLLNDPRLKKNNVTASGLFPPGSTTIGSDVGD V T R Y E DVRRLLA DPRLALDKRHA A PGNYSGFSLDP ALDA I T R Y A D AR QAL A D S RLL SKNPAHHAEDKT GIPGERSAN L MT
 VTSYELVRAVMS GPQFSSKFSTITNPRVIPQEMRQDAQPG


 V T G Y D E V $V$ R A V L A D T R F S A D A R T P G F P F L S A G QR E LAA T A K P | $V$ | $S$ | $R$ | $Y$ | $E$ | $D$ | $A$ | $V$ | $D$ | $L$ | $Q$ | $D$ | $K$ | $R$ | $V$ | $T$ | $S$ | $H$ | $H$ | $H$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $T$ | $R$ | $Y$ | $A$ | $D$ | $V$ | $R$ | $E$ | $A$ | $F$ | $V$ | $D$ | $P$ | $R$ | $L$ | $S$ | $K$ | $D$ | $W$ |

P E D QRADMPATPTP


 VT GYE A V R QL MA D T R F S S R HVP Y E T P GMP VP T EPSPPQ DP G $V$ T R F E E E V R R D L L G D R R F G R S H P E P E R A S R L T S A A V L D GP T G LTRHADVRAVLGGPRFS MEAGAGRDVPRPTEYPDPAG IV F D Y E HVVK QVLIF D HAQFSSE HRPKFEEGT E QESREGGF

 $V$ T S H A L V R A V L A D P R F S H R A D L L T H S P S GA RTGAA R P A P P G
 I VGHEEARAALTDPRMSNDDRHSS SWQDDGGNAI GL I TR Y D DAVVEALKNERFTKNNRS LQAP GEPGLDPDKKVFGNN

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

 $V$ CRYHAAVEFLKDNRFAKSKQKRESQRRYFRVVALKHLDQ


 VT R WE E GRA L LAD A R L S K NVIA D RHQSDMSRQRDYS HVDN R $V T R H A D V R Q V L N D N R F S A D D Q K P G F P \square R D Q L P P E P G V M$ I DGHAE GRAALADDRRLHKSSARERRTSAVVENDAAE SLAQ V S GYEEARQAFADPRLGRSAPDPERAARISGSVLLGGPRG VV T R Y A E QRTLLS D PRRISA DVKRP GYPDPANS GSTS S P F $V T G Y E A H R E A M A S L Q V$ SADPMRPGSPRLSAGEAAMADAGM

 I T G Y D D VR QAMND PRRLSSD D DKMGRARTQLDSDRNJL V T GHAAARALLGDARLSSDSENEAFPVPSERYVGLLRRRRT V A R H A DQRGLLGBPRISSSDGSLPGFPHQSPGAREVIMMRQR $V$ T R F E E V R QV L R D Q R FVVNNPAADPA L GVAP E DSP QL RA LA N

 LTSYEDCRRAFLLDSDSYSKDMAGTWTRVVIITGDVVI GMGD VTRYEHQRALLADPRVSTMPRNAGFPDDERTQHEPIDHGLL $V$ TRHDDDKTVLSDPERFSNEHPPGFAPEMSEEEQRAA QS G

 V TRHEDVRAVLGDANRFSSAGGARREDLASSRTDAAPSGE V SRHADVVKAVLGDPRFSRAATVDADVVRTTPWRTAA $V$ VGY DLAAR EALAA H P KLLSKNPEPYAEAMRAA GRE LLLDAGGG | $A T G H A A A R A$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | V L |


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UniRef90_W3AB37 UniRef90_F8AZ18 UniRef90_W5WGC4 UniRef90_R4SL58 UniRef90-UPIO0036C3633 UniRef90_UPI00035D7775 UniRef90_A0A017SXY5 UniRef90_X0MYW0 UniRef90_UPIO0036AA87B UniRef90-G8S0F2 UniRef90_S9QJJ9 UniRef90_J5QIE0
UniRef90_M4JUH9
UniRef90_I7CH52 UniRef90_UPIO004667826 UniRef90-11D7E1
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TFVDMDPPEHMHQRSMVEPTFTPEAVKNLQPYTQRTVDDL NMLFSDPPDHKRLRGLAQKAFTPKMISGMRDRVQEVADEE NML NADPPEHSRLRRLVSQAFTPRRIDALAPRVQQVVDD
SMI AMDAPEHGPARRAVLGEFTVRRMEQLRPRUQQVVDEL SLIAMDPPEHSKARRDVVGEFTVKRMKALQPRIQQUVDEH
 LMLELDAPDHGPVRRTVIGEFTVQRMNALGPRIQEIVDQH
 HMLAVDPPDHTRLRRLVAAFTARRI EALRPRIERUTADL NMLSKDPPDHTRLRSLVKAFTPRLIEQLRSR TFVDMDAPDHMRQRGLVESFFTPEYVESLKPYDQRVI
 MMI FHDPPEHTRARALVVRAFGSRAVRELEPRVTEVADGL SMLTSDTPDHTRLRRMVAREFTPRRMEQLTPRIQEMTDEL NLLTLDPPDHTRVRKLVQSAFSTRRVNLLAERVEGM NILSLDPPDHSRLRRVIKAFTVRRVERLRPHVQGIADRL ALLGVDDPEHNAQRRKLDPSFSVKRIAALRPRIQETV
 NMLFRDPPDHTLRRFVSAAFTARSVRRLRPTIAGIADEL NLLNMDPPDHTRVRRLVVKAFTPGRVQRMREPVRRIADE HLLNDDPDHTRLRRLVKAFTPRTIAAFGPRVQELADR
 MFI GQDPPDHGRYRKLLTGQFTVRRMRSLEPRIQQMVIDH NLLVVDPPDHTRLKLVASEFTARRVAGLERIQRLTDE

 NLI SVGPEDHRRLRRLIGKAFTPRMLERLRGRIEEESSDDL ELI GVDDPEHNAQRRMLGPSFTVRRAAALEPRIQETVDR NMLATDPPEHTRLRRLVTGSFTTRAVEELRPFIARTTDA
 VFIAMDPPDHTRLRRRLTGAFTVKRMKQLEEMDHVVEVT GLISMDPPGHTRLRRLAGKAFTARRVEELRPRVSRFTDEL SLI TMDPPRHTQLRTLVSKAFTPKAVAALESRIAADTHE
 QLLAHDPPEHTRLRHMLTPEFTARRMRRLEPRIDEVVGQH GFLLMDAPQHTRYRKPLAGKFTARRMRMLTERVEQUTAEH




 GDFF T E EA DHARMRRLL TPAFSAKRMGGL SDYMRGLLVEGY
 $H M L S A D P P M H T R L R S L V A Q A F T A R R V E A L R P R I T A A B E Q$



 HMLNS DPPDHTRLRKLVTKAFTTRRVAALRPRIEEIT DIETEKAEHERMRRMLAPAFSARRMSALGPHVQQLVDEL

 MAASVPDEGHRRWRREV GTWFTAKRMTALRR GI RDMAEGL

 TFVNMDDPEHARDRRMVTAPFALKRVEAMRSALQKITDDL S I L N Y D A P D H T R L R R R L V V S R A F T A A R K MAASLNGAGQQRWRRMLTKWFTAKRMNALRPAI EAMAEQL
 SFDLMDDPEHARLRRMVTGAFTVKRVEALRPSVQKTVDDL
 HMLNSDPPDHNRLRALVQKAFTPKM LSQLDEQIQHIADD SMVGGQDP P E H T R L L R R LL L T P E F T M R R M R V L E P P RV R A V V D





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UniRef90-G2NZG2 UniRef90_UPIO00464E8BE UniRef90_D9XHB5 UniRef90_B5G8Y0 UniRef90_W7SN18 UniRef90_V6KH10 UniRef90_UPI0003ACF32C UniRef90_UPI00036C11D8 UniRef90_UPI000363104C UniRef90_V5WVD6 UniRef90_C4B644 UniRef90_UPI000377D275 UniRef90_F8K4L4 UniRef90-M3BWE1 UniRef90_UPI000237AAFB UniRef90_X0P3H2 UniRef90-D9XDM0 UniRef90_Q5SFD5 UniRef90_UPI000361804F UniRef90_UPI000255F75D UniRef90_UPI000344A01F UniRef90_D2BBN4 UniRef90-W7Z1M2 UniRef90_UPI000369483B UniRef90_UPI0003830273 UniRef90_F8F5H3 UniRef90_UPI0002893D66 UniRef90_A0A023WB15 UniRef90-A8LZN1 UniRef90_UPI0002378892 UniRef90_D3Q8D4 UniRef90_L7F554 UniRef90-W6WP61 UniRef90_L8P4T8 UniRef90_Q09DE5 UniRef90_UPI00047204E4 UniRef90_UPI00034DED52 UniRef90_UPI00035D902F UniRef90_R4LDM2 UniRef90_C9ZED8 UniRef90_S5VPC3 UniRef90_UPI0004662863 UniRef90_D2BFJ6 UniRef90_J7LTKO
UniRef90_G2P4Y2 UniRef90_L1L1W9 UniRef90_UPI0004773B1E UniRef90_UPI000476A165 UniRef90_D6AAN0 UniRef90_D9W454 UniRef90_A0A014MBL6 UniRef90_Q595T9 UniRef90_UPI00047CBAF0 UniRef90_S0GX15 UniRef90_UPI0004693EDB UniRef90_UPI00036BD354 UniRef90_UPI000360E268 UniRef90_- U3ZFS1 UniRef90_C2W8G6 UniRef90_M2PZS6 UniRef90_IOHB88 UniRef90_UPI0003831072 UniRef90_L8ESY4 UniRef90_KOK240

E Y $\square T$ Q 170
180
190
200
OKRQQNATRTNGSTAREASAANQELLDYLA LVEQRLV

EFF QEHTS RLDIKRTTSAEGRREAFETVVRAYMGDLLAKKKEA
EFFQSCSSRMLSREVTAEERMTAFESLENYLDELVTTKKEA
GEFSGWSHTLLSSASP DEASRSAAENNMAYGLQRLVAGKRA
D R F H GWS D A A M G N WE R D Q D V M G A F D
DF F Q T R S S T L


DEFREWSDTVVAAGSQAGPRLAPALEAMVGYIRBDLADRRR
RKFQHWSNRLISNTNLDDVIVPSVVMFTRYLRQLI ARRRS




 D DF RAWT D GMVSSARPDSQRRQAQED LLA YF LDDLIRRRKA





 DFRHRTGRMLDTSRPFEFARAAGEAVREYVGDLVARKRT
 GRFREWTTVVPALTAEARAHRREVARAFTGY LGEVDAERRA HEFQRWTD DMLAEMPDPAVVDAAWQRMRAYLTGLIADKRA DLFQSLSRTLLDNRTTRPEAERAHAQLMGYLAELAARKRS
 D DFSAWSSVVLVDDSPAD DKNAAMGKLHGYLSDLLERKRTGE KRR



 H LIF R DFS EAAVSSSSLGPAEVVQRATEDFSAYMADLVADRRA E QFKHWSDEVVASADTNSESQQAHEEMNAYFRKI I A LRRE
 A E F Q H R T E R E L

 A DFRGWSSEVVFPS GPEAAGAAVAAMTGYLARLI ETKREA
 D WS N $\square R L D D$ L $P Q \quad W H E W G A V L T T M D R E R T G P A L R A A A D A H V H A L V D A R R A$ EFFERRSTLMFRRSTPADERARCAREIRDFLDVVVTDKER P DF R S WT D GMMLA P ETPPD QAREALDRA L Y R Y L L D L I A A K R A
 A R LQ M L S S N RMN LDDS PE L LTT Q S A QEMEQY DD R L L R EKE Q
 AK LQ K WS A DRMNLS DAPEALTRSAKEMTDYQDQLLRRKKEQ DRFS Y WS E T M L S E T KY D Q D EII LAA A Q A E F A E YMLLGHMDA D K R GS F Q E Q DD T F M G G E T S E E G L
 ATETE QSSRVILLSQDATPEETYGAFVEMTGYLDRLAAARTA ADFQEWT RISVVGAVGGVEERNAASVVMAEYLVRKVAVKRG GHFRKLAEAMTDLSD PRRAEAAMTELADYTRAILIDDKAA NFFQRNSNALINREASPEQRRQAVEELVGYLHGLLEAKKN


 AFFE EQSRRLLRG PE LSSDVEDARDRLEDYLRALI EAKQA QFFQHHSK LLVNRTSSAEDVGKAVTA L LD Y L D N L L L T A K L A
 EFFQDATERTMNSTDADGLQRAAVE LQQYMVRQAVEQER D RF S RWS DMLLNLLTRYRDEIDDTAQRD FHAY LTEHLEAKRA

 D DF Q H R T S R QL D LS DP DEERF E LQQRA GRA YMHALV G GARR


 A DLQ A WTRTAMGNPSAPQRS S L L A A L N A Y L G D L L E VKR Q DRFQEHVATLFDQAADAEARGAAFAAVGRFMGELVAAKRA

QUERY
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UniRef90_M4JUH9
UniRef90 I7CH52 UniRef90_UPI0004667826 UniRef90-I1D7E1
UniRef90_H2JPQ4
UniRef90_UPI0003080A50 UniRef90-UPI000373FEE8 UniRef90_UPI00036B7A08 UniRef90_B3IX49
UniRef90 K0F045 UniRef90_A0A022MGD3 UniRef90_K0VP03 UniRef90-G2NZG2 UniRef90_UPI000464E8BE UniRef90_D9XHB5 UniRef90_B5G8Y0 UniRef90_W7SN18 UniRef90_V6KH10 UniRef90_UPI0003ACF32C UniRef90_UPI00036C11D8 UniRef90_UPI000363104C UniRef90_V5WVD6 UniRef90_C4B644 UniRef90_UPI000377D275 UniRef90_F8K4L4 UniRef90-M3BWE1 UniRef90_UPI000237AAFB UniRef90_X0P3H2 UniRef90-D9XDM0 UniRef90_Q5SFD5 UniRef90_UPI000361804F UniRef90_UPI000255F75D UniRef90_D2BBN4 UniRef90_W7Z1M2 UniRef90_UPI000369483B UniRef90_UPI0003830273 UniRef90_F8F5H3 UniRef90-UPI0002893D66 UniRef90_A0A023WB15 UniRef90_A8LZN1 UniRef90_UPI0002378892 UniRef90_D3Q8D4 UniRef90_L7F554 UniRef90-W6WP61 UniRef90_L8P4T8 UniRef90_UPI00047204E4 UniRef90_UPI00034DED52
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UniRef90-C2W8G6 UniRef90_M2PZS6 UniRef90_IOHB88 UniRef90_UPI0003831072 UniRef90_L8ESY4 UniRef90_KOK240


E P T D D D L $L$ G R Q








 PGDD LLSALI HTADEDGDRLSADELMGMAWLLLVAGHETT $R P G T H D L S A L V E A R D G G E G L S E A E L V G M A F M L L V A G H E T T$




## D

## A

R RPGD DLLS GLIAA A DEE QR | $E$ | $D K$ | $E$ | $D$ | $L$ | 1 | $S$ | $D$ | $L$ | 1 | $N$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $E$ | $A$ | $G$ | $D$ | $K$ | $L$ |  |  |  |  |  |
| $P$ | $D$ | $A$ | $L$ | $L$ | $S$ | $S$ | $L$ | $L$ | $A$ | $V$ | $S$ |

 RPGQAL DSLIAAR DGDDRLSEEEVVSLGVLL VA GHE

GEDLVS R L $V$ V N H L L L T G E



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  ARPDGSDSRLAVE WVNPGKLI NPTDDVL SELLTDSDLTDQUERY
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UniRef90_R4SL58 UniRef90_UPIO0036C3633 UniRef90_UPI00035D7775 UniRef90_A0A017SXY UniRef90-X0MYW0 UniRef90_UPI00036AA87B UniRef90_G8S0F2 UniRef90-S9QJJ9 UniRef90_J5QIE0 UniRef90_M4JUH9 UniRef90_I7CH52 UniRef90_UPI0004667826 UniRef90_I1D7E1
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UniRef90 UPI00035D902F UniRef90_UPI00035I
UniRef90_R4LDM2 UniRef90_C9ZED8 UniRef90_S5VPC3 UniRef90_UPI0004662863 UniRef90_J7LTK0 UniRef90_G2P4Y2 UniRef90_L1L1W9 UniRef90_UPI0004773B1E UniRef90_UPI000476A165 UniRef90_D6AAN0 UniRef90_D9W454 UniRef90-A0A014MBL6 UniRef90_Q595T9 UniRef90_UPIO0047CBAF0 UniRef90_S0GX15 UniRef90_UPI0004693EDB UniRef90_UPI00036BD354 UniRef90_UPI000465707D UniRef90_F3ZFS1 UniRef90_C2W8G6 UniRef90_M2PZS6 UniRef90-IOHB88 UniRef90_UPI0003831072 UniRef90_L8ESY4 UniRef90_K0K240

## E

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250
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270
280


 A N M I
$\mathrm{V} N \mathrm{~L}$ $\mathrm{A} N \mathrm{Q}$
$\mathrm{A} N \mathrm{M}$
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## V

 S SGATATLLE


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## V $V$ $V$

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VNLI
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A
6
$\begin{array}{lll}\mathrm{T} & \mathrm{N} & \mathrm{L} \\ \mathrm{V} & \mathrm{N} & \mathrm{L} \\ \mathrm{S} & \mathrm{N} & \mathrm{M} \\ \mathrm{A} & \mathrm{N} & \mathrm{T} \\ \mathrm{A} & \mathrm{N} & \mathrm{M} \\ \mathrm{V} & \mathrm{N} & \mathrm{L} \\ \mathrm{Y} & \mathrm{N} & \mathrm{L} \\ \mathrm{V} & \mathrm{N} & \mathrm{L} \\ \mathrm{V} & \mathrm{N} & \mathrm{L} \\ \mathrm{V} & \mathrm{N} & \mathrm{L} \\ \mathrm{A} & \mathrm{H} & \mathrm{L} \\ \mathrm{S} & \mathrm{N} & \mathrm{M} \\ \mathrm{T} & \mathrm{V} \\ \mathrm{V} & \mathrm{N} & \mathrm{R} \\ \mathrm{V} & \mathrm{Q} & \mathrm{L} \\ \mathrm{A} & \mathrm{N} & \mathrm{Q}\end{array}$$\begin{array}{ll}\mathrm{V} & \mathrm{N} \\ \mathrm{V} & \mathrm{Q} \\ \mathrm{A}\end{array}$
순
AN
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$A N M$
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| $\mathrm{V} N$ |
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| V N |
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N L I $\begin{array}{ll:lllllllll}V & N & L & A & T & G & K & L & L & L & T \\ A & T & Q & H & N & F & V & Y & V & L & L \\ A \\ A & N & M & S & L & G & T & F & T & L & L \\ A & H & N & L & G & N & A & V & V & T & L \\ A & L & S\end{array}$ $N$ M T $\begin{array}{lllllll}M & M & F & L & L & T & L \\ S & L & E \\ S & L & S & T & L & M & L \\ G & N & G & M & L & A & L \\ A & L & S\end{array}$

$\begin{array}{lll}A & Q & Q \\ V & L & l \\ A & M & L\end{array}$

| V | N | L | 1 |
| :--- | :--- | :--- | :--- |
| V | N | L | I |
| V | N | L | I |


A S Q
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## -

## A <br> A

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QUERY
UniRef90 W3AB37 UniRef90-F8AZ18 UniRef90-W5WGC4 UniRef90_UPIOOO36C3633 UniRef90_UPIO0035D7775 UniRef90-A0A017SXY5 UniRef90-хомYW0 UniRef90_UPI00036AA87B UniRef90-G8SOF2 UniRef90-S9QJJ9 UniRef90-J5QIE0
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UniRef90-H2JPQ4
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UniRef90- Kof045
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UniRef90-G2NZG2
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UniRef90_UPI000377D275 UniRef90-F8K4L4
UniRef90
M3BWE1 UniRef90-UPI000237AAFB UniRef90- ХоР3 ${ }^{2}$ UniRef90-D9XDMO UniRef90-Q5SFD5
UniRef90 F5LL78 UniRef90_UPL000361804F UniRef90_UPIOOOO255F75D UniRef90-UPIO00344A01F UniRet90-D2BBN4 UniRef90-W7Z1M2 UniRef90-UPIOOO369483B UniRef90-UP10003830273 UniRef90--F8F5H3 UniRef90-UPIOOO22893D66 UniRef90 A8LZN1 UniRef90_UPIOOO2378892 UniRef90-D3Q8D4
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UniRef90_C2W8G6 UniRef90-M2PZS6 UniRef90-10HB88 UniRef90 UPIOOO3831072 UniRef90-L8ESY4 UniRe90_Kok240

330
340
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360
FENPDEFNMNRKWPPQDPDGFGFGDHRCDAEHLAKAELTT


FENPDAFDI E RGARHHVAFGFGVHQCLGQNLARDELQI
 RPPGGHLAFGHGIHYCVGAPLARMEAEV


FK D P D T L D I G R R
F P

FADAHRFDPD
FDRPDEFDVE
FPDPDR LDV
YPDAARFDIT
FEHPETFDLLS

$F T D P D R F D P A R T E$
$F R N A D D F D D$




\section*{| F G E T D | D | L |
| :--- | :--- | :--- | :--- |
| F D E P | D T |  |}

$R \stackrel{R}{R}$ RDARSHLAF GYGVHQC GQNLARMELDV RTERSHLGF GH
 R K DPLAFGWGPHRCIAEHLAKAELTA
 RPDNHHVAF GHG $\square H$ HCVGAP A ARMEGAV RGARHHLAF GF GAHQCLGQNLARME LRI DRSARHHLAFGF GVVQCLGQNLARTELDD NNTEHLAFGHGIHFCVGAPLARMQGCI TE VR R HLAA F GY GlV H Q C L G Q N L A R T E L L L L
, $R$
$R$
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A
$R$
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## $R 1$ $R$ $R$

R GAS G GVVFF GH GII
$R$ VA A GHL S F GHG

## F

 R R DAR GHLAF GYGVHQ
## F E H P D T L D D $Y$ R D A E T F D P D $F$ P GA A S L

HRKARGHLSFGHGVHQ

## FADADKFDI ARAQNP <br> FADADKFD ARESNP






HRPTAG
GH L A A
EKS P
$\mathrm{H}_{\mathrm{H}}^{\mathrm{H}}$
HRDARGHLGF
RKKNRHIAFGSGI H C

FEQPERFDI A RKRNP
$Y$ R R P D K LD
Y D R P D E LDV V A R E T G R E G
F E H P D E F D P D R A R A
Y A E P D H L D L GRE
R $N$ A
R H L A F A A G l H Y C L

$R P E R A$
$R D A G$
RDA G GHLA
L $L$ QV

FPNPERFDI HRENNGSSHVAFSFGUHQCLGQPLARLELQV

F A D P H V L D L S R Q
$\begin{array}{llllllll}\text { F } & D & H & P & E & E & & \\ F & P & E & P & D & R & L & D \\ Y & P & D & A & G & R & L & D \\ T\end{array}$
Y P D A G R L D I
FPEPDRFDI GRP

| $F$ | $P$ | $D$ | $P$ | $D$ | $N$ | $L$ | $D$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ |  |  |  |  |  |  |  |  |
| $F$ | $A$ | $D$ | $P$ | $D$ | $R$ | $L$ | $D$ | $G$ |
| $F$ | $G$ | $T$ | $A$ | $D$ | $G$ | $E$ | $C$ | $P$ |

 YPHPDVLD WQ



 R D A R R H V T F G Y G I H Q C L G Q P L A R M E L Q


RSARHHV GFGFGDHQCAGASLARREV
HR QARR HVAAF GF GVVHQCLGQP L A RVVELQV

RSPNPHLAFGAGPHSCLGQALARTELQQV

R D A R R HV T F GF GVVHQCL G Q P L A R M E LQV
R R GAMGHLAF GHGVMHCLGAPLARMEMKI
$R$ D A R R HVAF GF GV H Q C L G Q P L A R ME LQV


HRKAT GHVVSFGHGPHQCLGQQLARVVMTV

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UniRef90_J5QIE0
UniRef90_M4JUH9
UniRef90 I7CH52
UniRef90_UPI0004667826
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UniRef90-K0F045
UniRef90_A0A022MGD3
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 A I S S L L E R F P KM R L AV N E S E L V WR P G M IV R GV K E I P L A

 A I G A L L K R FP P K L S L A V V P E E E L A Y R P S S L L V H G L L S L P P V





 ALLT RLLA E YP A L E L A D G A T L E WR K S L V V I R G L T A L P V R L


 A L D T L L

 A LD R L L S R F N H I E L


 AFRELFDRFPNLRLAVEPEEVKLRTTSVVYGTATLPVAW
 AI G GLLDRFPGLALAVPAADLRHRTGSIVRGLVSLPVR

 AL P A L F H R F P G L R L A V P P P E E P P F K P G D TVV Q G L L E L P P V T W

 GF A G L L R R R F P T
 $\bar{A} L \operatorname{Q} A \operatorname{l}$



 AL RALLERCPDLALDTDPDTLAWRPSMMMGLLRLPVRF AI S TLI RELD NLLRFAVPREEIHWRRGRDMRGLQSLDV A I H A L L Q R R F P G GL S LT $\quad$ D A K P E WH P L V V V F R S










 A Y S T L
 V L E V L L D R L P T L E L L A V P A G D L E R V V D G L A V G G L A T


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


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UniRefo- VGL313
UniRef90_V6L313
UniRef90 M3AVF5
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UniRef90_K4RE09 PRHKANPYPEYARLRAEAPAVRV1FGDKRPAWL PEYPMERDCPFAPPPKMLEMNTAKP SRVRIWDGSTPWL
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PYDYAVHEDPYFYARLRAEAPVYHNPDLDDGAFWA
PD
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FRPRGRAEPHSDYARMRAAGRMHRLDHPRNVPVWT DYANRADPYPVYAGLR HTPVVRDEE TGIFIL
$R \square P \square D P$ FVTD DDGESAKLRAAGPLAAVEDPGGVPVWA ARHCPFGHLEALEFDPLLRQLRDEEPVTRISMSHGQGAWL LPPLKRD GLDPVPEMAAQRSEAPIGKLDLPFGMNAWL TFPVKRERAFDPPDLLRRWQEEAPMRRMTYADGHEGWV APVLPFDPAFRADPYPFYAVMRERAPVHRVR GAWL FYPFSDRADLTVDPTYGELRSKEPVARVRMPGGGDAWL ARSYPLGEAHELEFDPGYAELRREEPLARDRMPYGEEGRL PSYPMRRACPLHPPPELAAMRNGRPARRMHCPDGRNGWU DPSGA PYKANPYPLYERMRASGPVHRVLFPSGVRAWL PAFPMRRPNPFDLPAEYRALREECPVGRATLRDGRPVRL PT LPSFPAADENLDDTCDRLREDAPVVEVEFPGGVPAYL
 A $\square A L P L H Q R D R Y D P P S R M A E L R E R P G L E P V T T P L G L R A W L$ PDFKPDSPARFAELRALGPI HRARFTNGARGWV FDDFVSGDVRDPYTELARDRGEEPVQKIEIPGGKPDFM FPFKREHPFDLPSDLTRRREEEPVSRVPI WDGSTPWL AFPQDRTCPYHPPTAYDPLRDGRALARATLFDGRQVWM ( APPYPRAAGCPFAPPPTVLELNSAEQLSRVRIWDGSTPWL


AWPVARTCPFTLPDQYAEKRKNEPICRAQVWDGSRTWL APELPHMRRVAFDPTPALRDTRETDGVRTMVNSFGMKVYL PRFPFARPSGTEPAGEYAQLRASGPVTRQVELEDGVAWT PGADDFHERAHTVYDRLRAHSPVAFVELPPGRGFWL
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 SQETMMNP पKFYKNLQQERFFHIDDFYGMGGAWV

PFSAAVQADPYPYYTTLRDQGPVYFNEQFGW Y RTDPYPRYRRLREISPLVRA DYASRPDPYPLYAELRESK VAPQDDGSYL
EYPGARACPFDPAPEYRSWLQSPGPRRVRLEDGTPAWV PEFPMPRACPFAPPPEMMRLHAERPVARVRLWDGSTPWL

FPMARTCPYQPPPEYAVLREAGPITKAQLFDGRMVWV
FDP
 FDPDPAFLADPYPAYAEFRAKGRVHY QLEEANTNQWL
DPWSPAFVADPYPVFERLRAERPVF FHETGQWV PLLPFEQPHPLRPAPALADLQATGPVHRVRT

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 $V$ VGHEA GRAALDADPSDSKEWRNAA PDLGARQLSSGD

 |VTSYEVGRALLTDERLSNTD $V$ T RYD EVVRELFADPRLGRSHPNPQ EAARTTNSVLVGGA $V$ S GYEEVVRAVLGDARFSSDRDRQAQPGGQCPAAPQERKD G $V$ TH H Q T I R DLV T DER $\square G R T H P D P E S A A R \square F A A A D G G P \square G S$

 VVTRHAEAKALLTDPRLVKD $\quad$ TNVWGAWQRGEDPPDWPLPGR
 V T R H E DVRAVLTNPA $\square$ S S NP Q HP GFPNVG $\square$ GDPRQD Q $\square P G$ VTGYDEAKAVLGKATGFSSDFGNLV GNAGVTADQNPG
 $V$ TGYDETKAVLGKAKGFSSDFTNLAERNVGVAPQQNPGG V S R C A D V E A A L A D P R M S S D R D R M T A P V V R E L

 VT GHALV REVLVVDPRFGSRGDLQRFPMPVDANLQVPPGMF $V$ TA Y E HI RA V LVGDRRFTAAVTS APGFPMMTRTSSKRAAP QSA V T D H L L L VK E L L T D P R V S K S A HR H WP K W I NGE I S P E WS LIF S
 VTRYADVRAVLTEPGLSADRCAPGFPFILTAESEYLRRIIK


 VVGHEELARSAL NHPRQLLK DP S I TR H E D A RVVLAD PRFSADATRDGFP V Y R Y E EAQQML R D NETESSS

 V T G H A T A R A L L A D P RLSTRDRTRPGFPAPTERFAAVRDRRV V T R H D DVRTVLT D P RFVVTSMREAMFE KLGVPDDLA G Y L L R R I S S Y WDI E S L L H D PR I S S D A A N LAA A A GAD ELLAA ET T GLLPP I T GYD A I R ML FA D PRVVVD DRKPGYPHWNE GMQSTVVQRP

 $V$ F R Y E D V $Q Y$ Y V L K N P K L
I T K H E H V R V L L A D P R I T DD P A K A L P K L S A S D G D G G G F R $V$ TRHEDIVKDVLADHERFSNSRPP GFA LIPGAPEEIPEEARAG II TEHSLARQLLVDPRWVKD $\square G A W S L D Q S G V V T R Q W P L A G R$



 $V T G H E T A R Q V L L D A A T F S S D R Q H P A F P A L A A R F E A A R A V R$ V GHE ARQVLLDAATFSSDRQHPAFPALAARFEAARAVR
 MA DPRLSSAFSVGSSATANRQSSPAA!LSR VS R Y E DVVA I DK NPAVGSSVRAVVSPDKFDAAEQVAPQRG ATRHA DCVA VTRHPK L GHSHMFD FVLDPGWS EHPAALHQLRT VGTYHE ITA ALLHDPRI SSDRRHRSDPE EARLAAAELAP
 V T R HAD QRA LYGDQRLS VDPTRPGFPHMSAAFQEALDSNP P V T G H A E A R QLES DA R L S V D R S NP DYP R LAHSPDVDPAAMKQ

 $V$ SRYEDIVRAALVDPRLLSA ETMPEAMLPM DSENNTPD ILS YRDCDEVLRRPSSSSDNVNSTVAKRAAGTAPVRQGPP $V$ P H HA DVVALLRRRRRLGTYQHRFTHEEFGRTAPPAEHEP I S R Y E D V N A L L R D R R L G R S Y L H D A S H E E F G Q A P EA D F L K P V T GYEEVRGLLADDRLGRSHPDPANAARTGDSALGGGGPQG $V$ P H H A DV S ALLLRDRRLETHKEFGRTPPPPEHEPFTTLNGQ IV T H H A E A R R R LL L T D Q R L V K D D N R WN L F R T G V V T R E WP L A G R I T R Y D D A R A LL LAA D P T L Q R D L V V K H R H A D D


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STTAADPPE 90
100
110
 TLLIRMDPPEHTKHRRMFSREFMVKTVEAMKPYLNDLVDRL
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 NLLSWDPPEHTRLRRMLTGEFTVRRMRRLEPRIREIV HLLNDDPPDHTRLRRLVAKAFTPRRVAAFEPRVQELTDR

 SLFTIDGEEHSRYRRMLTKPFTFKRVEALRPAlQQUTDEH QLIMDPPEHDRMRRLVSKAFTPRAVKAWADLVTETIHGF SVFTSDAEEHTRYRRMLSKPFTFKRVEGLRPAVQKDVDER TMLSADPPGHTRLRKLVAREFTMRRVERLAPRVQEIT HMLNTDAPRHTRLRSLVSKAFTDKRMENFRDRIEELVGQY NLLGADAPDHTRLRRSLAAAFTPRALAAHQPGIDRVCAEA VEDDNEDENHAMMRAMLMPAFSPRRMRAMRPHVQEIVDTV MFDFMDAPQHPRLRRLLSGQFTVKRMKHLEDHVRDVAVQL NLLCMDPPDHSRMRSLVAKMFSPGRMRALYPMIEARTSTL HMLEADPPDHTRLRGVVQRAFSTRAMEGLRPRVHAlVGE SFIRLDPPDHDRLRRLAMRPFGPPHSPRRIHDMRGELSR\| SMLTVDGADHRRMRGLVAQALTPRRVEAMRER TELT
 WFVGMDSPEHDRFRKALIPEFTVRRVRAMKPAI ERTV GLGFADPPVHTRLRKLLTPEFTMRRLSRLAPRIDE\|VAGQ GlMGMDPPDHTRLRRLVGKAFTARRVEAMRADVRNRARRL FFlRMDPPDHTRYRKLLTGQFTVRRMKLLEPRVEEDANAR VMGFSDPTHTRLRRLLTPETMRRLSRLTPLYH VEER VMSNTDAPEHSRLRRLVSRGFTARRVERLRGDVQRVVDGL WALGMPPEAHARLRRLVATAFTPKRVRDLAPRVAEAADRL STINI DPPEHGRLRRLVAAAFTARRVERMRPHVAGIADDL SV LDPPEHTWYRRKLAGGFSPRRMRADEPQI ERVVTAH SFIRMDDPEHSRLRSMLARDFLPRAVEEWRPRIRRLVEEM

 HLSTMDRGDHRRLRGLVGRAFTPARVQALEPRIQQII TILTSDPPDHTRLRRLVSRAFTARRIQDLRPRVEQUTDAL FMFLKDPPEHTRLRRSVSRAFTARRVTVLRERAQAVADGL NLLALDPPDHTRLRRLLTGEFTVRRURRLQPRMEQUVTEH

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 NFIGMDPPEHTAQRRMLISGFTAKRVATLRPATTEIVDSL GMFNLDAPEHNRLRRMTRPFTVKRLQALRPSLQHMTDEL NMLTVDPPDHTRLRRLVSKSFTPRMLEELRPR1QQSDE VLI GEDPPTHTKNRGLVSKAFTPKRTAEMEPRI ROLV SLL NLNPPDHTRLRRLVSSSFTARRVQALRPRIERMVEDL SFI GLDDPEHDRLRRTTMRPFGPPHTPGRVDAMHGEIVRIV SF RLDDPEHAQHRRMVTGDFTIKRAEKLRPRMQQMADEF TFVDMDEPEHATHRRMVVGSFTVRRTRALRPAIDADVEKL NMLGHDDPEHRRLRGLVDQAFQRKGTAAMKPMI ADVADR VLI ATDPPEHQVFRRAVAKAFSPGSVGALKQRIAEVARDR
SMIGQDPPQHTRLRNLVNRAFGPAALARLEGGVRHYAEAD MFARVDDPEHHRIRRMLTRDFTFRRVDAMRPQIQEIVDRY GFLIFLDPPDHTRLRRLVSAFAPRVVAALEPDIRSLVDG
 DFAT EREDHRRMRALLQPHFSPGRMRVLRDRVETLTAGL GLLDDEGPDHTRMRRLVAKAFTPRTVERLEPVVRRUAAEL
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I DGMLADG
I DVMRADGTQA D

## L D NLEAAG

LDRMITAAGPPGDLIHA

$\mathrm{V} T$

D A Q DAMLAAGNT
LAMAATDGP VD A MVAKGP
 LDEMERQGP LA QA GP

VGDVIPE GP LTAMRRAGGPADLVASFAAPVSGRVI LTEDAASTPPVDLVATFALPLDSSQVI MDSLEGRT



 VADLDAEGP | $V$ | $A D$ |
| :--- | :--- |
| $P$ | $D$ | $\frac{\mathrm{L}}{\mathrm{G}} \mathrm{D}$

 GSA L D R F
DDLLDAMLAGPKPVDFVESFARPDPMLV
 I DAILAGPR
 L

D
L
L
L LD DLDAAAAGGEGVDLKAVFAYPLPMRVV LDDADKAARDGDSVDLLHAYAYPLS


## G N Q

 DDQADRGHADLRSEFTFPYPTQI $\square D A M L A G A T$PADLVTALALPLPSMM


 ADELVAGLRGKQRVDVVDDFAYPLPVTVICRLLGVPPEDE VT
 - V VLGP VGAL

$\nabla$ R
VDRLVDAGGGDLELE VGALTDKGGGD LDDLVQREP $V D G L V A D G G G D L D A D L$ DGAABPLPVAVI LDDLAAQGADGRTTDLKAVFAEPLPVAVIAEMLGVPASDR LDGLPVGEPVDIIDQYARPLSAT VDQMYERGGECDFVQEVAVNFPLYVIMSLLGMDEVSDEQRM

150 H|L L G VV|PAED Q
SNMLGVPYEDQ

 SELLLGVP GYED H DLLGVPYDDR CALLGVPYADH $\begin{array}{llllllllll}G & V & P & Q & A & D & R & P & D & V\end{array} Q$ | $C$ | $D$ | $L$ | $L$ | $G$ | $V$ | $P$ | $P$ | $E$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $C$ | $E$ | $L$ | $L$ | $G$ | $V$ | $P$ | $Y$ | $E$ | $D$ | $\begin{array}{lllll}S & E & M & G & D \\ D & D & A & H\end{array}$ $\begin{array}{lllllll}S & E & L & M & G & D & D \\ S & A & H & H \\ P & L & G & A & D & R\end{array}$ $\begin{array}{llllllll}S & E & M & G & V & P & E & A \\ S & D & R \\ G & V & P & Y & G & D & H\end{array}$ $S E M L G V P Y G D H$

$G V P A D R R Q D R B$
$S E M L G V Y E D A$ CEMLGVPYEDA CELLGVFLIR

 C ELLGVVPYADR CDELGGVPDDED SEELLGLAPREDR ADLMGIVEESRL C EAMAVPD G G OQ CEALLGVSYEDR CDLGGPFADH C ELLGVVPYDDR CELGVPYEDR CELFDVPEADR CEMMGVATEEQ GEVLGGVPAEDR GELLGVRIARE AFLDDIDDAH AELMGAPPQDS CELCGVPDHQR GLPSELAARFD C
 CEELGGVPYADR SELLGVPEERR AGLLGLPQED CELLGRYEDR cDLLGVPYDH CEEVGVPDGER CRLLGVPREDE SEMLGVPYEDA CELLGVPFADR GLILGVPDTDH CELLGVPYEDH VDELLQDEP

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190
200
P LF R WS EVVYSMDMAEKDEVERSYDADDAYVTALVAERRR
 EFFQHHANDGLA RYATAEDGQKGAMNLAKYLSNLVRAKME EEFQRHAVARFDLFGGAGASLGADSESLEYLRGVVRRERE EFFEEQSRR LL RGPAAADVEDARDRLDAYLGALI DRKRE RW SAQLFAAGEPDVVDAASHAMADYMTGLLATKRR DGFQHRTRRMLDLSVPDDERRAVQLESRAYMEELVARKRA
 PR LLELYDSFFSSLTRPELVQQVIGELRTFYTGVVDRKRN PRLRGWSEAMVSTTALPWEEMERNKELFAYMGTLVAERRR EFFQRHATVNVDRFATKEQAEESRSGLARYLVELVKKKMD $L W D D T Y L A R E A G N M M M S Q A G A E A S M A M G Q Y F E S L L A E R K A$
$D F F Q E Q A Q R G T G R Y A T E E D T A Q G A A S L A K Y L A K L I R A K M E ~$ DSFRAWSGTALSS PDRAERESAAAQLTQYLAGLLAEKRD D L R RVMHREEGGQDVPEDSMVAAAQDLDTYYQGMVSERRR
ERFQQWAVELVGAGHPPEVVENASKNVQEYGHADI EMKRK RPPEVVMDELVGAGHPGBVDEDAVGNVQEYGVASLI EHKRK DDFRAWSDAVGDTVD GARSAAGWESLNAYMKGLI HRKRS TEFHHSTAVALDLSRPSEERRQASGELRQFMAKLVVAKRS ETFSELSEAALDM ANWAGAASAWQELTDYMAGLVDRKRG DRRCTET VVAVGKDVTPADVTGARDQLVGCDTTLIDRRKA
 PRLKALFEKFFSTQTPPAEVVATLVELGGIMAETVAAKRA A AFRAMSNAAVAPPTTEVWQSALADITAYLDELIETKRAA RRLRDLVVTLMSTGAGPGPTREAKAALRAYFLELTARRRA EFFESRTRVLVSFRAYSDEDRLAAKDLMRYI NRLIE I KKKN EDFQRLSTARFD LDGGAGASLGAMSESLTYLLDIVKKQRE Q DFREWTEGLTDDTAKREVFFELGDALGDYMAGLVAQRRR AKFQRDSAVMLNDDSTDDEVTA AMADLLLTY L H DLVMMKTA PRVHGWFAVLRDLLADVGRSERVVGEFHEYLSWLAARQRE P IFRAFSDALMSSTRYDDEVDKAVQEFDAYLGGLLAHRRA HRLKGWSNALSGFLGAGRPTLEAVAELEDYFRGVIAARRQ DTFRAAADAALSTSAVPEERRQAMTDLHTYDASLVAERRD AGFRKATEQVLADGDDEERVSAGWREVCAVLGEFVRDKRQ EKLFDWSNRMIGGDDPEFQTTEAAEDIGFSYANEMAEQR RS PGLRRVVDSIFHTSAGPEEVAANYQEMYADFGELIEDKRK RGWGKVVQPVGPTDPGRPLYEARLHGLQGYIADVVAHKRE ASFEELTVRVITHGGAAP FEALVDYVKQLVRGKHG LRLRNWTGALLAHTTPPDVAFTTQNNLQAFLHELVERKQR T LWRRFGADLASLNPKRIGATMPEMIAHDHEVIDERRAA GRFRGWAD VVLRSVEDPAETATAFTDLQRFVLDLVAAKPD GDFHRRAAIQLDLTRPDSERGAVAAESRAYMGTLVDRATA AEFQDWSNRAMGVTGGDRVE GG $\square M \square N R Y L G E L L E E K R R$ DFFQRQANAFSSFSSGPEEMMAARTALHTYLGDLLARRGR A QFQKWS $\square$ S LLSFTVNPERGREASQALAEYFAPILAARRE EMFKESAERMMMTSTTEAESMELITKVHAYFGELAELRKR EFF EERSRRLLRGPTADD DQRARAELEGY LGDLIDRRQR EQWHEWGRVLTSMDPQR VPAVLRAAVDHVHALVDARRA PRFRAWVDPLVASLDPDTRQQEARMQLGMYLAGLVEERTK EFFQAQANRGMNRYATAEDAAKGAGALARYLAGLVRAKAD A EFSAWSEGLSRLDDREHAQASAAR LAAYMRELLDRKAA A Y L R E LYVKFFS V DT GPEEFMEVYTTLERYYDDMVAARRA ADMRRCADTLINTGASREAQGAAQLELRSMDAALVHDKRE
 DDFQQRSARQLDLLSDP DPERLELQRQSRAYMGSLVERSRR
 PGLRDAERAATVSTPLSGPDPVLRDRLDRYTRDLIDDKRE ETFAGWSNDLVRGLDPLLMQDPARTEFNAYFRHLAAERRR RAFQRWVDHLLPWGAEPQDPERAWRQMRAY LTGLLATKRV PQFQRWSVALLS ILFNRERGLAASEALRGYFIPILAARRE EFFEHQSRRIAAGTSTAAESADAFGQLKRYLLGLIETKGR QFFQHHSSVGVDRSSTAEQNAAATGALLDYLDRLVAAKTS
 HDFKRWSDDAVATAYDLSRGEDSAREMNAYMVQSLDARRR TR DWSQVLEVIDEDVLATADPAARQDRDYLAGLVAERRR PKFRGWSDAIVDPTERTQAATEARRAMGVYL GGLAEGRRG EFFQAKSQQMFD LNLDPPEENAEANNQLLAYLEELMDRKER AFFQDKSAVGVRLDASPEESRAASGALMTYL DEQQGAKGA GWFKSWLGGLADTANDWAVLRAAVWRMVSYLRRVSRPGGA ERFRGWI TTDLDQVDGLPDGVGRGMDMFRYFSNQLRNAGA RWADDSUSANPQDEKRREEDRAAVREAEAEMAKVLADRRR ELIFHHHTTVGLDVRTSDEEKAKAFGEMFAYDAELVERKEH PQFDPFSTITGVPAEVASERQRAGTWLRDYFHQLIEARRS SADDCGMYELNPPEETARKAVRASVEFSEYLRELI AERRK H LLRPWSADICGMYELNPPEERAAVEFSDYLRALARTRRD DRFRAWTLAAADVRDRARSEQGLGELFAYGRHLVRRRRD $P L L R P W S A A D C G M F E L N P D E E T A R R E F S A Y G R E L I A R R R K$



UniRef90_UPIO00429733E UniRef90-UPIO0036FD309 UniRef90-DOLZN6 UniRef90-K5B9L1 UniRef90-H5WYY6 UniRef90-F3NES9 UniRef90-UPIO00465A455 UniRef90-W2EKJ2 UniRef90-12MZK6 UniRef90-L8ELO8 UniRef90-V6L313
UniRef90 M3AVF5 UniRef90-UPIO00464CA2C UniRef90-G7GMD4 UniRef90_A0A024JYS6 UniRef90_UPI000371E3D9 UniRef90-A0A022LRJ6 UniRef90_UPIO0037D07F1 UniRef90_UPIO0037041F5 UniRef90_W7SZF3 UniRef90_UPIO00383042D UniRef90-UP100047D7EDA UniRef90_UPIO0036129A5 UniRef90-S4Y4Z6

## UniRef90-F8JIV7

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UniRef90 L8EH41
UniRef90_GOFPQ4
UniRef90_C4RJK5
UniRef90-W2ESV2
UniRef90-G2P9L1 UniRef90-C6WBS2
UniRef90-17GVG4
UniRef90-A9EN90 UniRef90_UPIO001FFEC24 UniRef90-UPIO0023795AB UniReffo-C7NOBO UniRef90-UPIO0036367DE UniRef90-A0A014MLI5 UniRef90-K0EMX3 UniRef90-M4JU15 UniRef90-Q595U4 UniRef90-I0V8G0 UniRef90_UPIO003746557 UniRef90-UPIOOO33AA6341 UniRef90_C9ZGE5 UniRef90-LoISZ7 UniRef90_UPI00047E6B46 UniRef90-S5VRF8 UniRef90_UPIO001FFEFO2 UniRef90-UPIOOO37442C9 UniRef90 UPIO000465912F UniRef90_UPIOOO1FFF2DB
UniRef90-UPIOOO3656BD9 UniRef90_UPIO00376FC34 UniRef90_UPIO0037D84DF UniRef90-Q331Q9
UniRef90-LoISB7
UniRet90_UPIO00466EA91 UniRef90-K1X8T1
UniRef90-W5TKL8 8
UniRef90-K9ZJ24
UniRef90-D7C4A9
UniRef90_10RS49
UniRef90-F4F605 UniRef90-UPIO004755E66 UniRef90-C3HA2O
UniRef90-_10GZL8
UniRef90_S9Q147
UniRef90-R4L442
UniRef90-UPI00037BC43C UniRef90-UPIo003736572 UniRef90 DgWQJ1 UniRef90-UPIIOOO36286D0 UniRef90-HOHTP5 UniRef90-UPIOOO373216C UniRef90_S9QT26 UniRef90-G8RUB5 UniRet90-Q744J7 UniRef90-K4R7A0 UniRef90-UPIO0041BD27F UniRef90-W2FOR9 UniRef90-UPI0003C742FB UniRef90-V6KZY1 UniRef90-UP10002378C89 UniRef90_A1T6N8 UniRef90_Q00441

APSGALD 210
220
220
230
 EGGDEDLITRMLHNYMLIPGHTREEALATAELLLMGGHETT
 RPGDGLLGMLVT EHGDEVSDTELAGLADGVLTGG EPGEGILDELVAERLESGEI DREDLVSLSVLLLIAGHETT

N

$\begin{array}{lllllll}E & G & D & D & L & I & S \\ S & D & L & V & A \\ H & A \\ S & D & D & L & L & L & H\end{array}$

## A



|  | GETGQYRVAAEDVVVAGV |  |
| :---: | :---: | :---: |
| UniRef90－UPI00036FD309 | IVGYNGPRVALEDVEVGGTLI | $\begin{aligned} & R A G D G V \\ & R K G D G V A L I \end{aligned}$ |
| UniRef90－D0LZN6 | PVDVATERYASTELQVGGQVi | ， |
| UniRef90－K5BS | II Q NGQRRVAVEDI El A GETI R | RAGEGI I I DL |
| UniRef90－H5WYY6 | $V V Q V A F P R F A R E D V E V G G V R I G$ | GKGAMVLCS |
| UniRef90－F3NES9 | 1 V DGLT RVATEDVEAA | RAGEGVVFSNAVVNRDADA |
| UniRef90－UPI000465 | AVSTATFRFTTEAVELGGAGI P | PA GVPVLVALGAANRDPER |
| UniRef90－W2EKJ2 | H S G T | GPGEVVVCALPAANRDPSL |
| UniRef90－I2MZK6 | PVEMATWRYATEALTI G | LA A A DRDPER |
| UniRef90－L8E | VVQVAFPRFARED MEIA | AKGDVVLCSLS GAD |
| UniRef90－V6L313 | PTSHVLI RFATEDVPVGDA | QGDAVI MS |
| UniRef90－M3AVF5 | NYSAMFARYALEDI EFGDVTVK | K A GEPVVGSV |
| UniRef90－UPI00046 |  | RAGEGLIFDLAPANWD |
| UniRef90－G7C | PLQYNF RV | DSPVMLITGAANRDDRV |
| UniRef90－A0A024JYS6 | QT GQRRIAVEDI EVGG | EGI I L DVAPANWDDRQ |
| UniRef90－UPI000371E3 | RTTTPYEVGGTTVPG | G |
| UniRef90－A0A022LRJ6 | S SQLVL RTTMQDVTVRGV | ADQKVLLLI GAANRDEEV |
| UniRef90－UPI00037D07F1 | GVGVATFRFSLEDI EI G D TVV | ENSLA SI A PDEEQ |
| UniRef90－UPI00037041F5 | PIGQSVHRYAVDRVEVGGA | EPGD |
| UniRef90－W | GGGLLRYAREDIEVGGTTIK | K A G D A |
| UniRef90－UPI000383 | VF HNGPTRFATEDLTVGDVTI P | P A TV ${ }^{\text {M }}$ |
| UniRef90－UPI00047D7EDA | PGGGALPRYAQADI EII GGV | ARGDAVVEDA |
| UniRef90－UPI00036129A5 | VTVTDLARDATENLEI GGQEI R | RAGDAVLVQLDDSANCDEQV |
| UniRef90－S4Y4Z6 | PAEVSVVRWPLEDVDLLGARVP | PA GEGVVAGLLAANRDPEH |
| UniRef90－F8JIV7 | PVHVLPQRTTLAEI ELAGTVI P | PKGAAVWLLLASANRDAER |
| UniRef90－UPI00036B9FEE | SHVLI RFATEDVPVGDRVI P | PAGDALIVSYGA $\square$ G |
| UniRef90－S3ZG53 | PVENATYRFAAEPVEI G GTVI P | PAGSAVIVGLAA AD |
| UniRef90－E3J2J7 | FRRGVIARDATEDVELGGVTI | A d AV HVSYLA A N |
| UniRef90＿L8EH41 | $R \mathrm{~V} A \mathrm{~V} E \mathrm{DVE}$ E A GQHI K | A GEG |
| UniRef90－G0FPQ4 | V VQMAFPRFAKEDMEIGG |  |
| UniRef90－C4RJX5 | NTAAMFARYALADVAFGDVVVR | A GDPVLPALAAGNRDPEV |
| UniRef90－W2ESV2 | HLGP $\mathrm{P}^{\text {a A A L E DVEID GHLI R }}$ | R A GESVTLAI A A A NRDPVR |
| UniRef90－G2 | $V \mathrm{~V}$ QVAFPRFAREDMEIA GTRIS |  |
| UniRef90－C6WBS2 |  | REGDLAYLGLASANRD |
| UniRef90－17GVG4 | WATVGPTRI ATEDLELNGATI R | R A GDAVIFSLSSANLD |
| UniRef90－A9EN90 | PVQWMS RVALDDIELD G | D R A |
| UniRef90－UPI0001FFEC24 | GRQAGLPRIIA TADVELT G | EAVLVSTNAAN |
| UniRef90－UPI00023795AB | DFEFHGESI | LMTLSLSAANRDPAQ |
| UniRef90－C7N0B0 | IVQNGLARAATEDVQLGDTLI | G V |
| UniRef90－H5XA02 | PVMDFR RTATRDTEI G GQPV | KRGDKVVIFYPSANRDEAV |
| UniRef90－UPI00036367 |  | NKGDAIVAGYAAAGRDPAV |
| UniRef90－A0A0 | A FELTTWRFLDQDGDLHGTRI |  |
| UniRef90－K0EMX3 | VAELATCRAATRDIDVAGTTI P | PAGTGVIPLAAAAN |
| UniRef90－M4JUI5 | SVMMTSFRFTAEDVTI A GVHI | AVGVVYQAS GVDPaE |
| UniRef90＿Q595U4 | P IQATQLRYAMEDTEVAGVQVR | M |
| UniRef90－IOV8G0 |  | SKGDVVTAS RVGANRDPAE |
| UniRef90－UPI00037 | VVHSGMPRQVTRDTEVAGTTLR | RAGEFVVVSLPAADRDRALL |
| UniRef90－UPI00034 | PVELLTPARFAAQDMEL GGRRVA |  |
| UniRef90－C9ZGE5 | VTHAGLRRIATEDVVVSGVRI R | RAGEGVIVALQAANRD |
| UniRef90－LOISZ7 | PLMMIT RVASRDTELGGVQIP | PEGCSVMPVLGAANRQD |
| UniRef90－UPI00047E | LTHIGRRRAIIEDDEI D GKVMP |  |
| UniRef90－S5VRF8 | 1 AD GLLRVALEDI EVAGTTI R | RAGEGVLFSTSVINRDTSQ |
| UniRef90－UPI0001FFEF02 | PVQFTQFRYPTEDVELGGVAI P | PVIAGLLPANHDPRA |
| UniRef90－UPI00037442C9 |  | PAGSRIWLMLAAGNRDPER |
| UniRef90－UPI000465912F | QTGQRR】ADEDIEVAGRVI R | RAGEGI ILDVAPANWDPRR |
| UniRef90－UPI0001FFF2DB | PGSSGlPRYAHADI EI A GVRI |  |
| UniRef90－UPI0003656BD9 | PTSNMVFRFATEDVEVDGKTI R | A $L$ |
| UniRef90＿UPI000376FC34 |  | AKGDPI IAVFGAPGRDAAV |
| UniRef90－UPI00037D84DF | PIV AI GRVAKEDI ELR GQHI | REGEQVI SWVGAANRDEQK |
| UniRef90－Q331Q9 | 1 A D GLRRAVTEDIELGGITL R | RAGDGLILSLASANRDESA |
| UniRef90－L0ISB7 | 1 VHSAl | PA GELVFVVSLPSGNRDPDF |
| UniRef90－UPI000466EA91 | PVIHLLMRFATEDIVVGDTVI E | EQGE GVVMS YRT $\square$ GRDTSV |
| UniRef90－K1X8T1 | A SALAATKRVAKEDVVYGGKLI K | KAGEGI I A ATQSGNRDEEV |
| UniRef90－W5TKL8 | ESATMRHATAPFDLGGRRIG | GTGDRVLVFPAAANRDPAH |
| UniRef90－M9QRA5 | $P G Q L A A R \square A R E D V E V G G D A M Q$ | QRGDTALTFLGAANRDPAV |
| UniRef90－K9ZJ24 | F SVVRRA DA DIEI NGQLIT | TNGQKIYCVLHAANHDPAK |
| UniRef90－D7C4A9 | $P \mathrm{~V}$ NPGVARFASEDVSIA GVDI P | PRGATVLVGSALADRDPER |
| UniRef90－I0RS49 |  | AVMPVLGAANRQEDR |
| UniRef90－F4F6Q5 | AVADGVARFATRDTEVAGVRI A | A A G D VVVAL |
| UniRef90－UPI0004755E66 | VGQRR】ATED $\square \mathrm{E}$（I G GQTI H | HAGEGII I DLLPAANWDPRV |
| UniRef90－C3HA20 | PVMFSS RFAGEDMTI HGKRI R | RKGELILLSLTAANDDPKE |
| UniRef90－IOGZL8 | PVETSTFRVATEDLEI GGVTVR | R A GDPVVVVLLSANRDGDR |
| UniRef90－S9Q147 | SAAQALLFRKTTREVEVAGTRIP | PAEASVLVLVGSANRDPRK |
| UniRef90－R4L442 | $P \vee Q$ LIS RVA WEDVEVAGVPI A | AGGERIVAYLGAGNRDPQR |
| UniRef90＿UPI00037BC43C | $P V Q M L P Q R T P L V D V E V A G V T V P$ | PKGAPLI LVLASGSRDPQR |
| UniRef90－UPI0003736572 | AENVLVRVATQDI T I G G HLVVR | RAGEGLI MNPLAGNRDSSF |
| UniRef90－D9W | V ${ }^{\text {N }}$ GQRRLALLEDI EVGGQLI | GVI IPGAT GNWDHGV |
| UniRef90－UPI00036286D0 | SIIADTVPRLAI A EI EIIAGERI Q | QPGDGVILPVAAANRDAGA |
| UniRef90－H0HTP5 | PVQMTKPRFAKWDI E W | DMFAAFLAAAN |
| UniRef90－UPI000373216C | $P \vee Q \quad A L W R G T T G P$ | PADARVLVVWGSANRDERK |
| UniRef90－S9QT26 | PPVQAMGRLTTAEAELSGVRI P | PAGAKVMLLTGSANHDDAR |
| UniRef90－G8RUB5 | LVHSQVDRIATEDLIL G GQQ | HAGDWLVMNIPAGNWDP |
| niRef90＿Q74 | PVQ LAGRI A L D D MV | VMM |
| UniRef90－K4R7A0 | PLQ LIFERWVLDEl EII DGTTI P | PRGAEIAMLFGSANHDPEV |
| UniRef90－UPI00041BD27F | TPAPMFERWVLEDI TVAGVGI P | PRGAEVALHFASANRD |
| UniRef90－W2F0R9 | RSGGG】PRYAREDLEVA | V |
| UniRef90－UPI0003C742FB | MFERWVLDDI EI G GV | R |
| UniRef90－V6KZY1 | L L M R F ATEDi VVGDQVI | R |
| UniRef90－UPI0002378C89 | VDHPLELD GVTI | PAGELLLI STGSANRDPSR |
| UniRef90＿A1T6N8 | MRTAQQDAEVRGVKI | V |
| UniRef90－Q00441 |  | TVLVANGAANRDPKQ |
|  |  |  |

UniRef90_UPI000429733E UniRef90-UPIO0036FD309 UniRef90-DOLZN6 UniRef90-K5BgL1 UniRet90-H5WYY6 UniRef90-F3NES9
UniRef90 UPIOOO4 UniRef90-W2EKJ2 UniRef90-I2MZK6 UniRef90-L8ELO8 UniRef90-V6L313
UniRef90 M3AVF5 UniRef90_UP1000464CA2C UniRef90-G7GMD4 UniRef90_A0A024JYS6 UniRef90-UPIO00371 E3D9 UniRef90-A0A022LRJ6 UniRef90_UPIO0037D07F1 UniRef90-UPIO0037041F5 UniRef90_W7SZF3 UniRef90-UPIOOO383042D UniRef90-UPI00047D7EDA UniRef90-UPIO0036129A5 UniRef90-S4Y4Z6

## UniRef90-F8JIV7

UniRef90_UPIO0036B9FEE UniRef90-s3ZG53
UniRef90-E3J2J7
UniRef90 L8EH41
UniRef90-C4RJX5
UniRef90-W2ESV2
UniRef90-G2P9L1
UniRef90-C6WBS2
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UniRef90-A9EN90
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UniRef90-H5ХА02
UniRef90 UPIOOO36367DE
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UniRef90-K0EMX3
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UniRef90 W5TKL8 UniRef90-M9QRA5 UniRef90_K9ZJ24 UniRef90-D7C4A9 UniRef90-F4F605 UniRef90-UPIOOO4755E66 UniRef90-C3HA2O UniRef90_10GZL8 UniRef9_SSQ147
UniRef90_R4L442 UniRee90-UPI00037BC43C UniRef90_UPIo003736572 UniRef90 DgWQJ1 UniRef90_UPIOOO36286D0 nire90 HOHTP5 UniRef90-UPIOOO373216C
UniRef90- s90T26 UniRet90 G8RUB5 UniRef90_O744J7 UniRef90 K4R7AO UniRef90-UPIO0041BD27F UniRef90-W2FOR9 UniRef90 UPIOOO3C742FB UniRef90-VGKZY1 UniRef90-UP10002378C89 UniRef90_A1T6N8 UniRef90_Q00441
UniRef90_K4REO9

GGG NPHLAF
GHGTHHC
350
360


| FDHPDALMLD |
| :--- |
| YPEPDKLD | RSPNRHVAFGHGPHYCLGGPLARGEGED GAGMEEFDSG FPGGDSDD FH

REPTSHLAFGYGVHRCVGAELARMELRA RSARGHLAFGFGI HQCLGQNLARAELEI
 RNAAAHLAFGHGlHRC
GPRPDVRLD RRDNQ HPDADRFDVTRRPNR NRH

FDDPDVFD NRKRPF
FPDPSRFDLG
FEDPETFRLG

RRDRGVGFGYGRHQCVGQQLARMELQU YTNANKLDLD
FGDPDAFFPDE FADAVHFDDS
WS APDRLDLI
FPDPDRFDI

 RHPKGVLGFGHGPHFC
RSDGGHLGGGHGAHSC
RPSNQHLTMGHGARYC
RPRTSHLAFGHGAHLCC RAPNGQQRVELT

 GPSAGDFDITRE
 YQNPDQLDLQR
FACPHAFDPS
GADMETFDAT
FADPERTDLTRR R P D N Q R PATHLLTFGHGTHYCLGAPLARLEGKV RSARGHVAFGYGVHQCLGQNLVRVEMEV RDPTSHLAFSYGLHRCI GAELARMELRT
NNP
A H G

GPDMERVDPHRQAP
 RSGRGHLAF GYGUHRC

F


## 


$R R$
$R D$

| $H$ | $Q$ | $D$ | $A$ | $D$ | $R$ | $F$ | $D$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $P$ | $D$ | $P$ | $D$ | $A$ | $L$ | $D$ | $L$ |
| $F$ | $P$ | $N$ | $P$ | $E$ | $V$ | $L$ | $D$ | $D$ |

NPH DA F

HRDAQRH
$Y \operatorname{SAD} Q F D \| T R E Q A G R \quad L G G G H P R Y C$

FDAPETLLRVGGRRSP HLAFGHGIHHCLGAALARMELAAV





 F D D P GA F D A GRR R HP HP DTF DLTRTRG

$\begin{array}{lllll}F & A & D & D & F \\ F & F & P & P & D \\ F & D & L\end{array}$

H G S A R Q H V A F G Y G P H Q C L

 $\begin{array}{llllllllllll}V & D & P & H & R & F & D & H \\ F & D & P & D & R & \square & D & N\end{array}$

 NRHEARH RKENRHLGL $\begin{array}{lll}F P D P D R F D P & R \\ F S E P B Q L D\end{array}$ F TYPEALKN
$\qquad$ RQPRAHI GFGHGVHVC

FPEPDRFDVTRD\|,
$\begin{array}{lll}F A D P D R L D D \\ F R D P D R B & R & R\end{array}$
AADPYTFD D
AADPYTFD|D


RDARRHMAFGFGVHQCLGQPLARLELQU RPARHHLAFGHGVHQCLGQHLVREVLEA
FPRPDFDA RSPNEHVGFGAGPHYCLGARLADAEVTA

IDNPEVFDGD RNTRG
FANPDRLDLTRQE
FAEPDRLDLGRDPNP
FPDPDRFDVRYS
FARPDRLDLARTENP
HLGFGRGVHYCL
HISFSAGIHYCI GAPLARIAAG
ARPDRDLATSGDAHLAFGHGPRYCLGAPLAR EALAE
HP D A O R L
$F A D P D R F D V T R$
F T D P F R F DV $G$
$F P D P H R$
$F P$ F P E T

R D TK GH LGGF SH G S H R C M G A E L G R
$R D P N K H V A F G Y G V H F C L G A A L A R M E D N S$


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370
380
390
 VFSKLFQRFPNLKLAVPVEELEFRYDAFVYGUEKLPVTW AFAACNERGALDVPRDSLRWKRPVLRGLRSLPVR VFPTLLRRDPTLRLAVPFEEVPFKHDRLAYGVYELPVAW AYPALVRRFPGMRLAVPPQELTFRKASLVYGVESLPVTG A RSLLERFPGLRLAAPPEEDPKPGDTIQGMVELPVAW ALRALLTRFSGRLAVPADQLEWRHRLVRGLASLPV AFPALLRRFPTLRTTG ADPDFRSFTVVYGLAALPVEW A VATLLRRLPDLRLAVDHHDLRWRGGLIMRGLRTLPVEF
 VLT ALV TRFPGGDEADGADGVVWKQGMLVRGPKLLRVTW VFHTLVRRDPTLRGADPFDDVEFKHDRLAYGDYELPVAW ALNLLLDKLPRYEI DRSKLSRVSMTNVAGWKSVPVR TLPTLLRRVPTLQLAVPVEELPFKHDTLAYGVYELPVTW AITTLLTRCPELRLDAHPAALPWRGGMLIRGVERLPVRW ALDQUSSDTGYEIDPGAERV HSSNVRGFAHLPMR
 VFDALLRRIPTLRLAVPVEEIKLRVNQLGGGLVAVPVTW GLAELITRLPGLRETTPASE:PLREQMVVYGVHSLPVAW VLETLIRRLPSLRLAVAAEEVEWSADRLIGGVKALPVVAW VLSALFQRLPRLELDTSPDEIDWGEWAVLRGPAAVPVAF ALSELVRRLENPRLAEDPSPPYRPSPVLRGPRHLRVAF ALGSLLERCPRLALDGAP PKWQPGMLMRGMRHLGVRW SLEALLARFPALRLAVPPEEVPWHAGSIWRYPERLPITW AYRKLFERDPNLRLDVPEDGLNDKYDGVLYGLHELPVRW AYPALIRRFPNLRLAVPEEDLSFRQVSIVYGLDALPV ALTELLTRDPGLRLAEGRAGVRWKYGVIVRGPARLPVTW AYAALLRRLPGLRLAVPPAEVPMRSNMAIYGVHRLPVAW AYPALI RRFPEMRLAVPAEKLSFRKLSVVYVDELPV AlGSLVRASPGLRLRGDG LEWHRNPLQRKLVALPVV

 MLYGMLRLLPQARLAVPFEELEFRHEVSSYGLAALPVTW ALPALFQRFPEMSLAVPAEELVPVDSFISNGHRSLPVRL ALDTLLARLPGLRLATDDADIEWIPAVLGRGTNHLPV VFSTVLARLPELRLNGELPDAAVKYDSVLIFGLHELPVTW AYGKLLTRYPDLELALTPEQLERLRQPGTWRDRRLPLKD ALTTLNTGDPGLRQADPPHEVLWRAEGMDVSVEREPVTW GLRQVLDRMPDMASADPGAEPRRBPQGGMRGPLSLPVRF GLPALFDRLPGGLRTAGEPEDFTPATSAVVHGVRSLPVSW AFSTLHRRIPTLQFAGSSDSLPYKDEFIVYGVDSFPVTW ALGTLLRRLPGLRLAAPADEIPFKPGDTIQGMLELPVTW ALRMLFDRFSLALDAP
alaklarrhegprL vedp ppyrpnavLrgprhls Vt f VLPTLFRRIPALRLAAPVEELAFKHDALAYGVHELPVTW VFRALPARLPSLRTADPRELQLRSDVLTGGLRALPVTW ALPMLFERYPDLRLAVPDEELRNHPSIIVNSLQELPV ALRALEERFPGLRGVEPDGDHGQVPGFVANGPVRLPAVL VLNTLLRHMDRAALAEGAQLEPVQSAFVFGVKEYPGTF AFPALLRRFSLALAEDFADVPFRSFHFIYGLKSLEVTW ALPALFDRFPDLRLAAPAEELGNLPVVTQNDLAAFPVR ALTALVAKWPQLKLGADPA ALRALVRRAPGLRLA GELRYKDNVALRGLEELRVA AINTILQRLQN:RL DTEQLTWIDNLAMRGLEELPIVF AI GTVLRRLPQLALSVAPGELRWRPTGDRGPERLPVTF ALNLLFDRLPNLRLDPDGTDPDR GQVFRSPTSLPVLF ALSRLFTRLPTLALAVPVEELGGKEAGGVQGVQRLPVTW VYRTLFRRVPTLRLATTVDRLEFKHDHLAYGVHTLPITW ALGTLLQRFPNLRLADEPDQLDYSHS K!RSLANLPVDF AFTQLMARHPGLRLAVEPEALRWRPGLLLRGLHELPV VLEELLTPDRQLSLVPDQQKNVEHFLLRGLKSLRVR ALPALVRRDPGLTA A
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 GLGRLEDRFPATALAVAPQDVQWRPGMFMRRLDSLPVVL FFTELLPRLKSVELA
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 VT RHADVKYV STHPELYSSNGNTAVIDRNSSRDQDEIQKM LAGHAECAAVLRRDQRFGWGD GASVAEHFSQAPDGTVVRP
 $V$ STYWEIH GLLHEDPRLSSDPRNAAAALAVTE EADDPTDPP

 $V$ T GH S H S R R L L A D P R V S A D R S R P DFP PVVLPR F EA DV F K P L




 V F D Y A T S K MVLE NK DLLF S S DR S QK KADS EKT P L E


 LTRFDDVQA GL T D HE TF S SARGNLI EMUQAPEPPPE $V$ T TYQPALEVYRNTSAFTSELGGMRVDS DPAAVKAAA GK VT R HE DVV H V S R HPEVVFSS WRR LALLFDEP PEDHLVLQRM
 VT GHEEARTVLAAEPRMSARRDNSPRPEDHARMFPPERQA G



 A A RYE DVR QVLMD QRF QCNPRNGVFRHDDMPEELDPWLKN



 V T D S A HAR A V L S D Y R R V S I K P Y H G N Y P L L N E EFE D S G Y A D

 V Y GHP EL QE L L DPA TFS S DTMRLI PKDLMPGDEEFSMA G

 $V$ S K HAD I K E VSRRSDVFSNFENTADPRFND DREQI E LQR $\square$ $L T V R H D D V V A V L R D H R F G V H S M G R F L G P G Q K D D A Q A A D T V G Q$ $V$ S R H E D I K S I S R N S A L WS T N A K G A V M RLLP D G A E QLLDLT K A

 VVFRYD DV A A L L R H P RVVS D DRTSALLHRSLLKQDRLDSLD D Q



 I T R Y D D V K L A M T K P E L S S S D RLLRP F Y E S L K DEERRE I L S G VM LLRHAEVLAALRDPQTFSS

| $N$ | $V$ | $T$ | $D$ | $K$ | $R$ | $R$ | $V$ | $L$ | $P$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |




 $V$ T R Y K E I H E V L R D P E T F S S Y P N N L VT G P G G M G K F DP
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 V F R Y Q DVKRVLS D Y DHFSNVRMRTTVSVGADNDEGKHMGK UniRef90_Q89RB6



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 QQ Q R H WVHREPGQ $\square E M G E A N W E A V T Q I G S Y Y F N L V Q E R R K$ D QFRNWSTT LIQSNPTRGEFGPAAAALYEYFSAFLTERRA R S WE LA DAR GTDPDED DARRNEAGANVVAY LQDLVARRRA S KVF DWSNKMVAYDDPEYA DT EAAMEIVVYAMNLAADRKQ ERFHGLDPSFFLTPEEVARRDSARAELGEYFAGLAA ERRA D R L H HL S N Q IVAAT DDG PAEAMAANREMVEVLSAVAAAARAA
 P L F H A WAD T ML DVA QRRRAVRQARVELGMYLSELIEDRRR
 QELFG S DDSEFK RGSTSED QL PALLLDMFGYFNAVTATARRA SAA ACGMYELNPSEETARAAVVASVDFSAY LRELIAARRRG
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 D RL HE LSSALVVVATVDGPDRAVAVNRELLELLLTAGAAAAAA


 EKFK E WS D WVVA GP K DME QQERVNKE LFHY FKEMM A LKKRE $P$ LFREWASRLTTPSPAVVYA QAE EATWGLDTYFKRAI A ECH Q

 HL F K K WV D A L L Q R D Q Q F S L V D E S V K H L T D Y L G E HAAAERRR
 QAFGASVGASSGCPMDQLQKTEAHSEIFLYYADLVEDRRR EKDFHWSNDDPEFQRTPEEGQAAATEEYAYANVLAAADRRE D R WRARSAT LVVA GVCGDELLGDALLAGMVD DA ITLVVDH HTA E QFLGWGDRMTPSWPVWRDAIGA\|GEMDRYADEHLARLRR D E F QRRT A A LLHRDAPVEEQIGNSSELNRFMQSLVRAKKR PQFHVWAEAIVANKEQRRQLEQAQSDLNQYMAELVERHRE $N L F K G W V D K M F E S A N Q V S L V K K G Q K A L A G Y$ LGGGHVDERRK K K $\square F E W S N K M L G Y D D P E Y A E S Q A A A E L M L Y S M G M A E E R K A$ R H MRMRSVVEPTTEPVVMRAVVEAADAELFELVGDAVAWKRN ERTRFAWGSTAADDREEVEKVAAHTEIMAYFDDLAADRRK A R F H GWYTAVIAF QEVT A A GERTRVEFAEYMIDPI DRARRE PQ WRAWSDAMATLDGKRLPEEVRKTLAAARGMI ERRRAE $P$ QWREWGAAVAG GFGPAF DEVIPKVVAGARAAVARCTA AK LVHWTNVFTAFEDQWQDTMAVVGEITEYTQNRIARRDD A PLRAWS LAILLGTPAQHERGNRAVTEFVAYLEDLVARRRA $D R F G G W T Q D$ A A NVGDPVRSKQGLGELFGYCRQLVADKRR QQVRVWMDVS LHREPGQMEMTEAGMRADDFYYELVQKRRA
 E E F E T P A H K L SQDFDWSNTMASYDDPEFAVIDRASMDFDSYAMNLAAARKE A LFKQWADALF QRDAK DS LAKPA WKEMSAY LAGHAA ERRR
 A DFRRWSEGAVQII NFTPTPGRATMALRRYLLSQLGRGHL MKVFNWSNQMTGYDDPDNDPVTASAEVLGYAYQMAAARKA A RVLA WTE GLLSH IVD P Y LA MEQVA E EFMEYFRALFRERRR EKLIFHWSNAIMNTDDPDFDPT IAANAELMGYAYTMAEQRRR A P A A DVLD L WY R A K F Q Q P R D EVVK LA E L L G Y VR K LVA Y K R S
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 D R F H R WY T S I I A F LGNLS Q D P R V R E EFA A YMLLP I I R ERRA LWS D G L R T FI GTA R GVPN K Y Q R A R D H L S A Y L R G H I E Q R R L
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10 y 20 20 20 M A S G P|LIT R|V|R
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HHRVP AP AFVPMPG DWA

PFAPATR



WS PAADENPYP IYYYWRAT QP IRWT G G DWQ
$\square P F A A R C P F T P A P E L Y$ AMQKE E ELLSRVDVPDTFEAVA A P H C R H D P Y R S Y A T
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D G S L L PTLPFDNPSVLGVAPRMRTLQQEGPITPVRAA GEDA WL
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LS P EF HD DP Y S A Y ALLLREHAPLLDWHEPTS G GVVF YV
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P LE P A F A A D P Y A A Y A QLRAREGL T W
D F P F A T E H P L Li P P K E WA A L R A E G P I P E L R L


DPFD PVVDVD PYPVWRRMRDEQPLYRNDEYD RNVFA



P F V $V$ S P Q L


EPPAEYARLRATDPVSRVELFDGSLAWW DPAGRDLH GEAARLRALGBAVLVVELPA G IARA WS
 A A ALLMSPPGRLDPYPTYEQLRAHGPVVPTAABGFGV





PTYKEEPFEWYREMRQNSPVFR E GNMDH PTANYMLRTHCDPHEDMFALRAHGSLFR DDQMGADY LWQ
 RDTVRDPYPAYAYLRDHHPVYWCDCF KAWF

 P Y D F A VHADPY P Y Y A R L R T E A P V V Y R N N T D D D
 AS FDP F DEPYQLDPASALRWFRDQEPVFYSDKMGH PLDTS DPALIPDPWPTFTTLRERDPFHWSKY HAVFNALRAQPGLPHFASPEGRGYYA D PVVRADPT TVAD QMRKQGPVVR


S DAFSYQRPAD $\square$ D AK LAAELRATDG\AYVEPEGDRPYWA PFFEDSLAYGSDPYPRDAELREKGTVYRVLMGGDVAHYC DPFDFG $\quad$ DD DP YPVWARMRDEAPLYYNEKYN A P D D L S P E FAAADP Y S A Y R V L R D D F P L L L H H EA SKEDEFSPHHWYRHMLK QDPVVYNEAS DS ENPYEP F A WYKEMREKEPI CFNPQAD WH AVVDP K A Y A D WD R S H E A F A W W R K N A P L D VA E

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UniRef90_G8NRC7 UniRef90_V9VUS6 UniRef90- C6WAZ7 UniRef90_UPI00030E0967 UniRef90_H3NVW9 UniRef90_V6KZ30 UniRef90-A0ACI5 UniRef90_UPI000368D69D UniRef90_F2LRH UniRef90_J7LC62 UniRef90_S4XQE0 UniRef90_UPI00047BEE79 UniRef90_UPI00034911C3 UniRef90_A0A010Z6J1 UniRef90_E7QY69 UniRef90_UPI00037108E8 UniRef90_V9XKY1 UniRef90-W5TDP8 UniRef90_UPI00036A2E1C UniRef90_D9SZA8 UniRef90_UPI00036D6AD5 UniRef90_A0A014PAZ9 UniRef90_D5UYQ3 UniRef90_D7F1N0 UniRef90_A8L634 UniRef90_UPI00031DD50F UniRef90_E3IZS0 UniRef90_W7SHI2 UniRef90_M3V047
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 LT QHEDVVAV SRRPE DF GS GDGTQ\|FDQPQKLRE YRG
 TGGSYATTEMMLLREKRWGKEYLAYVHMRHGEERTKDAAFQR



 MFRYVDVQFFLRDPRLGADQFQVDPQWLADTGLAPLFEAR
 $V$ PRHAQAQAIL SDPRWSHAEEPELL HGDSEVVELPG
 $V$ T GHA QLVGALREPAASADRVGPLRDAVPE GARDF GT LS R

 L T R Y D D DV $V$ E A L L R S P H S S S A F P K D P G WA M S R G GP T C P A M R K L S R H A DVVA A A L R D S E R F S N E N GP P L M E R D F WK P D S A R M Q H L S R Y A DVVR RVVFQDREFGANDDPAQLRKPDNLDALIANSEN




 $V$ S R HE EVR EVVSRRSDVFSNWENTAAPR FNDD DPREADLQRH
 IV TR R A EAR QLLTTDAREVKDDRA WRLDWQS GWPLIGMVDPGR $V L G Y E D C C T V L A D P R F S R L P L G A T A T P D G G G P R E L$ ASRFEDVSALVMDKRMVRSLDGLASPEWHDMPHHSRFVQF LT R Y E DVVHAMLS DPRFPRDASEAGPDGTGTGE $L$ S R H A DV A A A L R E P A T F S S A T G L T T VY GE LIERTGLQD NP V V R Y D E A V QV LTT D A S T F S A QLD R V M P
 $V$ T R Y E D A C R V L LGDHRK F T S E G G S L L N QL L H G D A A A G LARHEDVADAFRDNRLLSNSWGVSMDPASYNPNAEYAM
 V F L Y Q D VK R V ME D K N Y F S S

 FTGFK DVN L L L R D K R F G R REE LGWA ERKP HVAD VDLLA EK Y
 $V T K Y K D V T K V A T D N R L S K D R T R P G F P E D S A G G K E A A K A K P$ IV T T H D L L K T L L T D D R V S K D P R R H WP A E H H D T W I R T WV G V H
 ITTGYA EVVDTV L R N S R F GVMMD GR D G V F P H WQ D S P A MMS I A Q
 $V T$ GYDEVRA ALAD HGRFSS ARPVENEAERAQLPG V T GYDEELAA AKNHEDS S DRFEGPFADQMRTSALITTFLSN IV T R H A D I ME GGRANRRFRNGPRPVLMPAAMERRAAAPGLR
 LA GYDDVNRLLRDRRFGREKPEGAPDDQGYTGDRDAI EAN


 L T R Y S DVVFA A Q GDVVKRYS SNRMQQQLVDARVPA EKRGLLA S E I T GYE LAARTALVDPA $\operatorname{L}$ AAKNPDTMMGGTARPDSVAARLRRAA IVTRYEDVVAASRRVTD FSSAAKGAF LT DPRTPADLQQARQ
 LLSRHADVKAALRDSDRFSSANGLRMEPAFWGPQAEQFF VTSDVLGRELLVDRRFVKDVNTWHAWRRGWPDRPVVDTPR I C R R H A D L L N A I Y R D T T L Y Y S D K K L L A F A P R F G P G S A L F E H H T T $V$ S R Y E DVVKA I FR DNRDYSPANALDEVVTPFAQEAQDVLMGH $V$ SRHEHVRDVLMNRKDFGTGDFAANLRLFYGPDFDVLANP L T R M D DVVLAVVSRNP SVVF I S G K G NVVA M E V TVDAVSKPLRWMADKTN GLLHPIEPP


VS R Y E D $\$ R Y IDESHPE LIF S A EPMEALDE T N $\square A R F G D A Q G \backslash K$ V F G Y D EVV HVLGGDPATF S N K
L F G Y D G V F Q AFR D D R $\square F$ T S A G Y D K T $S Y E R N L G D S F G R$
 I S R H E DVVERAFKDPVFTTDD NYDWQLEPVVGR $V$ S R Y A DIVVEAA Q D T E R F S S A D G D G DP P D M M G M
$V$ V GY DLV KT VLN DHEHFSSERRQRT I VNV GYE GE H H DP D R L V F L Y D DV K IV V E D K E HF S K

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VIFGVDPPE 90
90
100
110
120

SIIDMDNPEHSRLRRIVSRGFTSRNLGALRGEVENTVLET PYLEMDEPDHSRLRKFLRDGFNPQKIRALRGDIQRDADELD SVLMLNPPEHTYMKGLLMKTFNAERIAGERSNLRATVTEH ILLNMDPPEHTRVRQVQRGFTPRALRALEERLRDRAHAD

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








 S L L R A A D P P D H T R L L R R R L V VLLNKDAPEHTKLRKLVARGFTPRAINGLRDELDRR







 ALLGED DPVHNTQRRMLDPSFSVKRAAALRPRIQETV SVI GMDQPMHTDDRS VVMHSFTPKMMKSWAPRI E E ITTKE DLVN S D G E Q H K R L R A P F M K V F A P E R L Q G L E D S I R T L A N R
 SLL A L L E P P S H T R L R M L V N R A F V S R QV E Q L R P R I A V L A N E



## 

,
V VMLN M D A P H H T R L R K I I S R GFTPRRAI GR L EAELLA QRA Q N


## 

 S L E L E P PVVTRLRTLVNRAFVSRQVERLRPRVEALANE


 HMLGTDPPGHSRLRGSVAEAFTPRAVEALEPWLDNRAAH

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



 $T \mathrm{LV}$ V M D GEQHRALRQI TRDWFMPANVAKLRGHVNELASEF SI STMDAPEHPRYRRI FQKAF LPHTVAAWGD TV D D P V






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UniRef90_J7L633

 LFLLTEGAAMVRPMDQDEAANAATKSLDEFFTRKDRKDRQ $V K$ FEWSNKMI AYDDPEYADTESAAELDAYAMGMAAERKQ GEFQTMTAKLLRLDTPLEEVLAASDKLRAFMRGLVLAKRA
 ERFAYWSGALYGEDRYGEREDAAAEDLMAYLGDHVARKRR DKAVLMVQTDPKTRKKGPEHVEAYEWMANYAADLVAERKK ADFQRRAQVGLDVNATREEHIANLVEMDAYMGELVAAHRR A HVRE $\square$ SAHIARGLDPDTARTTAVHAFTDFFGDLI AQRRR QWSKAMNQLFNPRPTPEQSQKWGSASFHAYLKQQVDQRRE APDRDWSGAILGKADQLAAGHRAVEAFKAYLQDLI ARRRA A SFWYWNAKVAQEEREYRTSLQSLVNLEEYLADLVGKRRA ERFGQWARGTFDQSDDGRHSAHTFQQVVEYTTELVARKRT AARTNAFFAKFDPPDVQERTRNAGAAMEDYFRALI AERKK NDFRAVVDGVFDTTLDAEAAAENAVRLYATMDRLIAAKRA ARCRDWTDKVGY DPRRRDAMNKAEPEFRAY LLDLMASRRG
 $P Q C V A W A N V I S R \square F D P Y A R D N Q C S D E F M D Y \square R G L I A R R R A$ DRFHEWYTSI IAFLGNLSQDPRTHDELAAYMLPI I RERRN
 A MRFK
DR W D D D R LAADLLVQREDGLRDVPPAGUEASFQLLEYYRDLVAARHR DQFKSWSDALVASPTEMEKNERQRQRARREMAEYFGDLLD ELFGGWDPAYLLTAADKAACNTATAAFDAYFRDLIARRRR AK KIFEWSNQMTGYDDPDNTADPAAASMEVYAYQMAAARKE MKVFQWSNEMTGYDDPESDADPAMSSMEVYAWQMAEARKA PRQMRDWKAFFSMLTPQDERDAVMAELDRVFTDMVRQKTA PRFYAWUEGLNSVTAYGSAAVTAQAELRDYLAGQLARKRA PQLRQWSENIVQFFD $\square D R S D E T A T T E F Y T Y L T A L K A E R Q K$
 ALDFHKWAQARVTDVLKDEKVMGALREQTEYFSEHARARRK D HAQRGLRNERGKPLTVTKDKYF DGDFYADYVAWREKNPS A AFVAHLSTQTPMAEDGALGTNPDEFLDSKFSAYDEDRRK RTDDLCFHDEEGKGTDNEDSGGASARLRAYFADQUQERRA WTGMAAAPEEPEFMVGDGATTLA IAHCQLIEYLAEQYVTR
$K Q S D L L D H R E E G V T D V P P A A I H A Y L D L H G F Y T S L L A E R R K$ HEFFEAQSRRLLRGPAPADVDDARKRLQDYDRDLILRKRA PKFKEWSD VVVSSPDTDDPDHQADEELTSFFTEIVDQKRR A D $\square K K W C H D M T A L L S S Q D T P E K Q \square E C A R S F V M Q Q F V A G L D$ PFFRKAAVAMISYADKVPRALDQANDLKEYFLGHDEQRRS $M Q L V A W S N R M V T M Y M F E R D A N Q A S A D F D A Y D R T L I A E R R V$
$S V F G E W I P D M T L T P E D L R V R A E S T R S V Q G Y F R D L I A D V R A$ EHANQVLRNTPGKPMDVKKDRYFTGEMFGDYVEWREKNPS PGLRRQAVDGVFNTAATPEEALANGQEMYR LLGELVAEKRA QFLTEQNAIRTNGSASAREASAASKGLLEYLEKLVDLRAA
 HLLRPWSQAIVKMYEQENQAREACRDFAAYVSDLAAHRDN A QFRRWASDLTGVLEPEDTPQELADELRAYFTELDAQRRR DKLFRWSNEMTGGTDPEYAHVDPAQELITYAMAMAEERGK TEELSRMD RDSRESRDARQRATAGGLVVVNYTERRAARKRR RRILEELTRRLRGSDPDAFLA A AAGLERHFQAVATDRVS RRWAT DLTGVLEPEDTADELAVADRELRGYFTELVAARRR PQLLSWSHDMVAMYMHGRTRNASSQAFSDFLRSYVAERRK DPLGELIDTVLDSSLDEADSLAADTRLYERLAELLAYKRA $A K L G H W T S V I M G A G D D E V S T E E F G D Y L R V Y G V A L A Q Q R R E$
$V$
$V$
$V$ NQFMRRDRQNVDLSRGYKARAADSAAFNRYDNSLDTRQRK NLMDPHAYGNTTPLRLLPFNSPAAHALTEYARKLGEERRA RASDLLVHREEGVFDVPPEAVTAYLELNTYYRELLDADRKR TSDTLIFLGSSLDPDYGPEQALNGVEEMYAYFADITEQRR DRDGRASSVLSDVLVADPDELRVAADDFTRFILPRLDGRA ALLYGWSNHLVGFDDPDFGYRTAMAEAFQYALNLGVERRA $Q M L T Q Q L F E N M S P E Q V V Q L V A G A V T T F E D Y F A R L A E E R R A$
$K L G M E M Y T D A E S T D L R P E A V Q A I G A L I G Y Y T E L T D A K S R$
 SLALLGAALEPTLSSAELDAGHTAVREFKAYLQDLVARRRA
QQVRHWIDESLTREPQGMQANDNTAMLYYDLVKQRRDDPR KYAHTVNTWGRPSPEEQVAVAEAVGQFWRYAGQVLEKMRK LIAAADPEAFTVFEARDLSPEEDALANLEAFFQAQFENRDA $Q F V F E Q T N V M L G V Q D P E Y V M S V A S Q E L A D D M H E L A T L R A K$
$L R Y G E L G A P S L D I W S Q Y Q Q V N E G I I G F E T W L N R H L R T L R R$ EQFLQWGEDMGLSYAMFRRSEKD DALAE WMSGHFDHLRA
 KMFRKWSNTDVEASNFPS MMKDARPEFQDY LDQFLDMKRKE K I FHKLA DLFRRLSFDLISLPTDIVAGFNAATELHGYFAKDQVEQRRR DRFHRWYTAI DGF LGNLAQDPDVRDEFAAYLLPDIRERRT KATDDVTRARGTETPRVAEAGMEMFQTATKLVMARREQAS $H \square F K E W V N Q L F L P S T H N E M K K K A G E E Y F K Y L Y P V V V A K R D$



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UniRef90_U5E5T9 UniRef90_E4N5Y5 UniRef90_A9E267 UniRef90-B2HG25 UniRef90-M5QCY9 UniRef90_Q2G5I6
UniRef90_ S4WI49 UniRef90-S4WI49
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260
270
TNVISLGTLALLDTPGQWEALRSD DDLIPGA|V|EETL|R YV RNVITHGLLTLTLFPDQRDKWLDYEAHSRTAS EELLRWAS
 I N M MVANILIVSLYRNPDQLELLVRQNHSL
RNAITHGMHAFLTHPEQWELGKRER
ANMLALGAFALLEHPDQLAALRDDPERMSTAA THLI S GSAYELLRNS GLLRDWLEQDWS RMPGAAVVEE
SSA

## 

I

R R N $A$ KHLI GNSIVVALLQHP TK GA YHLRDDTGGADPGLIPGWI E RNA

## R


$V N L I G S G G V A L L R D$
$G R L E G W M G K V L A E$
VNLIGNAVHALLTHPDQLRLVLDGTVSWHDAI E ETLRWAP
YRSSGNLLYLLLTHPEQLAAVQRDRDLVPAAVEEGURFET

RNS THGMIAMANNPDQWELFKKERPVTMTADEEGRWAT
AAQLAVAVLLLVTHPDQMALLRERPELDDGADDEMLRYAS

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## V

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 VR D Y A L L GRLLV LAA D P R F S R A A A VGGP DA P T Y N D A Q P V
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V WMVFNDPPQHRRLRGVFQDQFSARAINRYAGL WWLDAPKHTTLRKLVSRAFTVRRVTMLEERIHEICAQL SMISLDDPRH配LRSIVNRAFTPKMLTRIEQSVRDRARRL NMTTATAGDHTRLRAPLARAFTARRVAGLRPRVEELAGEL TLVNEDEPAHMPRRRVLMAPFTPEELKHHEPMVRKLAREY $M F I A M D P P R H D E Q R A A V Q G V V A P Q N L E E M Q G L I R S R V Q E V$ VLLNQDAPHHTHLRKDISRAFTPRA DERLRDELDRR AMI NDDGAEHMQLRREHMAYFTPAYLRGVTEAVRAEVGRL FMI FTDAPAHHLLRSLVSRAFTPRRIAALEEHI RVLCAEM TMLFLDGPKHAKLRRESRGFTPRVVAGMRDSLDRQAREII SMLGLDAPDHTRLRRLVSKAFTPSAl AALLPMLEERVDAA TLIMEDPPSHDUHRKLLARMFTPRRIAALEPQERGVREY NFIDAMDPPKHDVQRATVSPVVQPSNLALMESTIGERVCNLL SDPPQHADYRALVAPFFRGSRIAAFEPELVR A AEC SPLENEPPAHTRLRRLVSSAFARGHVERLRPTVEALAERM LILEADPPAHTRTRAVLSKVLSPAAMKRIRDHFAAVADAK TLALTDPPRHRDLRAVVAEWFGARSVRALVGLMRETT S LELDGVRHRAMRSLLQRQFGQGVINEYADFLRGLTART SLVFTDDPAHARLRALVNRVFTRQRI EGLRPVVAQRVDDM GF TMDPPEHTKHRKAVTPAVAPSSLSKMAPVMRERAGMII MFIAMDPPKHDAQRAAVQGVVAPKNLREMEALIRSRVAEV SMFTAYGPEHRRLRRLIAPVFTARTVNALAPDIERFAREL SILSAEGDEHVRLRRLVAPAFNPRAADRLRPFMREVA
 SLVDEDPPVHTRHRQALRRPFTPERVKTLEPMDREFVADK AMLTMDGPKHRTQRGVMSKAFTPGMVKKLEDKFREYAVNI LLINHDPPEHTRLRKLVAKGFTPKAVGALEDALRSRANK SLHNMDDPEHAKLRRTTAPDLRPSKVRGWQGVVDDVVSEL DPPEHAKFRKLTAPLTSSAAAKQMEPALQATVNR T DLAMEGKTHWEHRNLVSAAFKTRSLARWEPE R DVRPV MFI AMDPPRHDKQRAAVQGVVAPKNLREMEGLTRSRVREV MLVNTDQPLHSAHRKVVNTVFTRSRVEAMRPWLVERVGQL TSLASDPPVHTQLRATLTENLSPRALRGLKGKIETKADAL SLVQLDPPEHTAYRNVLQGEFMPGGI AKMKENVAKTAQE F SMLETDGSDHTALRKMLMREFTPKAVAAYESFLRGLTTRT SMIAMDDPRHTRLRNVVRSAFTKSAVRRLEPAGRGTAAF LLTDDPPRHTQLRAVVNKAFTSRTLKKME TVGVEVAEL SI LCMEGDEHRRLRSLVSRAFTPRATAKMD $\square \mathrm{S}$ EV TVVDPV SLVFSDPPLHTRVRRIMSSALTPRAIARMEPGLIATVDHL TTLTTDPPDHQKLRAVLTENLAPRALRTLKGDLEGKADTM TLLMEDPPIHDIYRRLLARVFTPRRVLALEPEIREYCVRC

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D QLLKWSNDMVMMYQARRTKKHASKEFSAFMRNY|V|ERRRS $T R L R E L V S V P L P D P A L Q A R D R A A D A E V L E L V A E M I A W K R A$
 S DVAA A GTAFGDEETEKARRNEDRDCAAYFTELWNQRVNA
 WR RWS HTLLTSFA LDDPA LLDNRTIGA LVVEARRRLIVVGRER HWS DTVER LGGDPEYFETPEEGFKELDWNCWEYFDGGVWKDREL
 HQQIFA WIN AVLD YA D RQQTSAQAMQQFMAYGHRFVEARRQ ERFRGWVEVL FD DSASTPQEKGRKREGSAYMADLLAAAKRGG
 A MFKGWADNIIESFS GMQF GTERMQPMLRYIREHLDERRR P QLLNWSHAMVAMYQANRTRQKATQEFTAFLTDYIEKRRN
 L K DF DWSN QMI GYDDPEY DVEPAASAELVVGYAWNMAEQRRQ PSFWYWNARVGDEEREYRTSLQSGAKGYDY LAGLVRLRRE H I D N VF HME E GVGMNNETS LAALGELGQRLGAHFADRRT EKVVHWTS II L G V VAP DHET IV GAVLGGLGEY GLLALAE DRRA PRLQS LCQ ALLFAAPAGPADALATHRELDAALADLLRAKRE KYAHTVNTWGRPRPE EQVEVAHAVGNFWQLAGKILDKMRQ AAATGGDVDMDEMYKGAAEMAKSFSALWHDKAARLKAGEK MK LIF HWSNQMVGDMDPEFAANDADAELIDAYGMKLAA ERAD



 HWSD DA TAGPDS D DDYRVRQQEDMKCLLYF TRRLWNERVNE F K S WHE GMVSANA S GD QEALLGVTM MDLMGYVQAWME KT K A
 P YA GVVF NAFGPPNELRQTADERSAPHQAYVAEQCQRHNL ESVFEWSSEAFHRGTSLTTHH ELDARYFVDLMERKVA



 K K LIF DWSNQMVSDDDPHYDNRNAATEEDMYAMQLAALLRAE QLFS RLAASDVLDEDF DK LDDLVMAA QDELDDQYTRDLDIA ERRS QF I K R L A V F GF GFP DEE E QV E Q A Q A D Y WG Y A WV DTFAPFDTRDTPS FEYVMQA IFALLGYAVELGE DKRN
 H WTN Q $\square$ MA Y D D P DL S G GVDP DEANA Q I LGYAYQLAADARS K DWANRMQSADPDHLADETAMQQARDEAMDYFRALTDKRRE ND DREYS LAEFLEHASDPRGQAVVSR VCDYWMKVFDERRQ P WF R K R A V E LI S Y A V V Y Y K K A F EA S A A L K D Y F L G Q DD K R R S ATSMEQANGGPSDNDKVFREMVAMAQGLSADVRDKAARTA RWANAFMLSADLTGEERNASNLELGGYFVALCQARAEALAA DLMLLKLT MIAF GADENP QR@A EA HTE LLVYYDNLLLARRRRR RWGQAAMQVLGPMNRRTAENFPVAAGELVAWCSQVKATADA
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HPGADRFDV
FADADLFDI R

## $R$ $R$ $R$

$\qquad$ RPTR

LRDR

\section*{} | $\frac{V}{F}$ |
| :--- |
| $\frac{1}{F}$ |

## F

F

WADPDRYDIT
FAEPDRFDVS
FGNPYDOVT

## $\stackrel{F}{1}$

SNADK
GHVAFGYGPH

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 FDDPAF R RTPNEHLTFGWGSHFCLGAHLARAEI RA
 FDRPDELI DR SNARNHLAFGFGVHRCMGNRLAELQLRM FPDPEREDR
FAGPDRFDiA
YENPDAFLVE
FDDPFAFKMDRT
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DNARNHVAF

FEDPDVFDIA GHGPHF FDDPEAFDAER DNARNHVAFGRGPHS
FPDP

YPHPDTFD D
RNPTDHLAFGGGAHYCLGTHLTRDEVSR
 FADPDRFD A FADPDRFDPD $\qquad$ $R A N N Q H F G F G G S L H Y C V G A P L A R A D E A E V$

$P N L N K Q L T F G V G U H C L G S A L A R M E G R A$ FPSPDAFDD A $R \quad \mathrm{R}$ RAPNRHLSFGAGPHRCLGSHLARAEMK PDANRNLGFGRGAHACVGGYMARLETAA FPDPDTFRLRRR AKPRQHLAGGAGVHRCVGDRLAEQQLRIV | FPDPDRFDPS |
| :--- |
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 LLSALARRVAAGEDTGP $\qquad$ VKRRYNNTLRGLESLPTTL
MFEELIPRLA ALERVWR
$\frac{1}{A}$
 A
 $\stackrel{\rightharpoonup}{2}$

## N

L AVATMLRRNPRGEVGGDPDRL AAETLLSRLSABELGTDGD P $L V E E L E D R F E R M E R$
MVFELFLGRVGQV FFEEFLGRVGQV APREAV

## VIDALARRVE RLAVGPE

IWQTLLPRLTEVELTGP
LFEELLSRVRAVELVGGVQRVR SNFVNGDREMRVR

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 APSFPFSRAFGPEPPAEFAKLRATNPVSQVKDFDGSLAWL
 DPSLAAPVDRVQE ELAALAAKRGPILYSSKHGGH WU APVFDLAPPVLTDPHEAFALMREKAPVMWHPEQAAAGFWA


A
 DGEN A A A GP S REVASFAALLRAERPVVSWHRPPDDTGFWA DLIADPYPVYRRYREAGSVHPGRPTDGPTTWY ADYFAQWRRARRDHPVVRLESPRFGAFWS
TPATGRD S LDD FWAQSFDDREKSFK LIRDERPVSWHRPDEGDGVWV FDHHSDEFTRNEEELNANGRSRCPVAWNEKYGG A FWY A YPFNAFTDLELAEPYRHAQQAPGLLR $\square$ QMP $\square$ GAPAWL


$$
R P A A E R D A Y F A S V R A S G E R P Y F P E L D G R G F Y A
$$

 AAPIDRFQELAALAAKGPVVYSTAHGGH WI $P Y R V F D V L R R E A P V W W H P T P G G E G F W V$
$F A K Y D E L R A Q F P W Y R N E F ~ G P G F W T$ PRFQTDPAAKYREMREHGSVAPVLEDGBPGFWT






## LT Y D MVAT PAEVVWPS L R DA QNCAP DA DGPMGPEIV



F WARPHEERDAAFAVLRRENPVDWSRPADS DGFWS

FDHTDYAWTKDPYPI WALMRAAAPIVHTDRFDG CYM

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 LSKHAD ICEVSRRPQDFSSEGATA! DPPEMDEFYR
 $V T Q M D D I K E T S K T P E V Y S S E E N T A V D R F Y D D R E E D E V Q R F$

 VFGYAEVARVLTDRGFGRASPSAASAAP $\square P E G T L R R \| V E N$ VTAHAAARQVLERPETFTS TRGMRLGGEPAAVSAASGR $L$
$L$ LTRHEDIKAVYRDPQTFSSEQGVLLRRPARQGDDPMGDAGQ

 T RYDAVREVVTHPDVKKNPVHWRAWREGRDRPDWWVAAE LTSYNDIKHVSMNPKIFSSQYSTGGTEENRHPKDFKSTDD VT GYEEAVEVFHDSEAFSSCVSVTGPFPGFPHRHEDPMND VGSHRDVSQI SRRPEDFCSGQGT QQFDQTAEMREYRG LF RHSDVNRVLRNPDTFTTSVQNTVPKFAFTGRRPPGH FFAHDEVNQLLRDRRFGSREQLGWPSPAPHTRDFDALDAH
IFRHADVKDVEARSEHFVNS DL
 VSRYADVRGVLSDPRFGRSRLYYAADAPALSDVPDLVVNNPD $V T R H A D I V E V S R T N E V F D S G K G V Q F E N D$ P AEMLET TQ V SRFRDL NEVLHDAKAFSSWPADTPPTPGHSRALIPEL VTRYNDVVQULDNPETFSSQPTVPVPPDFMVSRLQSPLRG


 LSRYADIVAAAADAAAFSSETGGDREGGGTTDEDMPMVGA
 TADHGVVRDVLRSTDFGVPRPMRALDRATDPRLPNPIEPP $V S R Y A E I K G L L R D D R D G R S H P D P G R K P Q Y A G N P T Y D L A T A$
$V$
 VFRYDDVARAFK R V LGGYREVVNHVTSNPRDFARDCRRWLVPDDWPLMPYVGWTP ITRHADIDRMI RDTETFSSAQGDRMEDQTH GEEYMARR SYE MARAV L R D T R F T I P P G I N L L M A M G IT S G P L F A K V M A




VTS Y D AVHRVLREHETFSSYPNNLVVANFRH EKAGQGKF PTTYEAVREIAYDTDHFSSRRILVQDERPEDKHPAPP
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UniRef90 H0SSM UniRef90-S4AYU9 UniRef90_UPIO003819991 UniRef90_UPI00038
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 S L ESDPPTHTVMRRGLAGVISPSTMRRLREQFAPFAEELD T V N T TSLASSDPPTHTQLRATLSENFTPRALARGLKVGUEDAAAER TLIAMDGSDHRAVRADGAKLFLPRAVDRLHARMGELAARY H TSSQDPPLHTRTRGLMNKLITPKRLKENEDFMWRLADQQ $S L L D S D G P G H D R L R K Q V F K L F T P V M I G G L R P Q D E A H V D E L$
 SLLGLDAPDHTRLRRLAAPTFAPRRLERYRE D DETV PMVMQDPPAHTEFRKLVSRGFTPRQVEAVEPKVRDFVVER FVM QDPPVHTEFRKLVSRGFTPRQVEAVEPKVREFVVER TTLNSDADDHATKRSVLAHRMTPKALRKMTTTVEEAADG
 $\triangle I L E V D P P E H E R T R R V L M R L G T P G A L Q K M R T V F L Q E A$ NMLTADGDRHRRLRTLVSQAFTPRRVEELRPRDTEDTAEL

 WMYSQDGDTHKASRHLLGNAFTPRSIEAALRADIQDDTDRE S $\square G S M D N P R H D Q V R Q V V Q P F F V P R R V A H L E E G V R G V V R E L$ RLI TRRFTMRGVAELTPMITRLTTEEH
 SLINLDRPYHTPLRMEHMHFFRPGFVAELVKRVDAYMTEL SMLELEPPVHTRLRTLVNRAFVSRQVERLRPRIEKLANEL



 WLVFLDPPRHTRLRRAQVAPPLSAPAVRALRPRVREUAE EL


 ALFNNDPPGHTRARALLSSKAFTPARVASLEPT DAEAAEAL


 SIIDMDDPEHMRLRKIVSRGFTPRILSEMRA LDGET

 A I GLD NPLHNKRRKLV SKWFTPRGVREWEEH VRET








 A DHGA G DK F H H D L R K KV L Q P H FA A R H M L H L L R P K V E E L T A G L




 T LLCLE GAEHQRLRRLVSKAFTPRATDRLHDTIVDVI SMINMDDPDHQAQRNLVASSFTPRAVRR HEQHVRDV




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130
140
150
160 AERVKDAAAKGTGDFVDDIVJAVNLIPLMA\| A DLLGVPEDDR
 IVAAMAAAGPPAD LLMADLAAPLSLDAVIGDLLGVPAAAR VAELVAEGNFEA IDSSLARAFPDEIVADLI GFQGHVKDNML $V D R M L E D G G A C D F V$ A

 le RLRAQGGGDlVTELFK LEGLRANGGGDIVTELFK P L P TVVARLLADPEVDA LERIDA AQQFDATFSAT DQFDLI DEFAYALPVIVIAELLGVPVEDR STLMDGVLENREIEAISQLVQPFPMKVFPDAVGMPPLDR DDGLAAAGP GPVDLKAALSLPLPMTVISELFGVGAEHR EDLLGKLIDDDGPTADLIAD FCAPLTATAQAELLGGVPRSRR

 VSSWAGRDWPMPFDVFFHLMGFPGRAEATDADRAHRAQLE LDAMARTPREERPVDLVSAFSEPLPVRVMCEMLGVPDSVR



VDAA AKGECDFLIDVSAE


## A

$L A A L G T R Q$
$V E A F A A R P$
 VEAFAARPR PADLHAGLSAPLTLLVICELLGVPVGER V RGLAEAGRRTELMESYARRLPGAVVGRLVGLDPEDVPAA IDEMLAGR GQVNFMRAFAQQLPLRVI GDLVGDPPHHR ARELI DRFRDTGSADVVQDFARHFPINVIVDMLGLDRGDH



 VDQVLRDATEFDAFVALAE AFPGLRAFPDAVGLGBDGREN IDGFIAKGECDAAlQF
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170


200 PYGAMAFNAFGADNEDRAEAFTEGEKVAAWDMDSCAREND DWTNRVVSDDPEYMTRPDEKERARAEMFAYFEELSEQRRR RWGQAAMQVGGPLNHRTQESFPDAGELYGWCSSVTAEDDA RRILDDLTRDV HGSDPDRFVAAQQELFDYFRRVVGDRRA EEFKAAFALETVGEKEAPTTHNPLQWLNDKFYAYI EDRRR PQLRDWSENIVQFFDDDRSDETNTTEFYHYDTDLKRLREK GQFKDWVDILFQPYDKEQQKQKAAKEYFEYLYPIVVQKRS RKLVYWSDLAGGGAEMMRDMAKHFSQLWRVKEEKI AA GGE DRFAAWGRALGGALDGVRSVAHAHEEARALFESLVSRRRV TQFDGWTQAIVAANTAEGGIAGALATMMAYFTSLI ERRRA DQFDGWTEAIVABTAAMGTAGAAVASMMAYFSELIERRRN EELDRWAGATFDAMGPVNCRSVGAAKAVAEMMAFARRVVK ELFREWSEKMLSKEFDDPVSMQFMQQMRAYLGGHDSDRRT ERLLHGVAGMMDSAANAAAAYADLVAVVAGLVAERRVRPG DMMLIVGGGMVFGAFGPRTAWYDKLLERADEVSAWVDAKCE GT LHTLMHRVFDATTTPEVAARTNADMQAFLAELAERKSR EA RKRANGRLGEPGSPRSAVYQGELLLHDEVTAMLLADTE
 TRDDVMF LGGGSQDADQGPDQALEGDKEMYACFAELADERRR HWTHELKDRVPGTPHLGPKAKVATPKVQQYFVDVLESRRR
 $L Q G G E L A A P S L D P W R Q Y R T V Q R G I A G F N A W L V D H L Q Q L R R$
$G K L F D W S N N M M N Y D D P E F D P Q M A S A E I L G Y G Y T M A E E R R K$
 PQLLKWSHAYVRMYMFEDAAEQAAREFSDYVKTVIAERRA DRVNHASENIGVERRMPGRGLRALARMQRMVAGI GRERRR TDTMFEWTRPFLTAEQTSDYUSAQRDFSAHLQDVIDAWKRN EY YTQQNADRTNGSSTAREASAANQELLDYLATLVEERLV SAALGRAFTPFLPEADRAAADEALAWLRGYVRDLLADRHA PLFTEATNTYMLGKPGATEREDAMFRMWSYFGDLVTERRS QYRAQQEG $\square$ GNVTPEEMMEF DNE $\square Q A M F D F G R H L L A E R R K$ ERFRGWYFSIMAHRNNLDAGDPRAHEELQDYMLP LIRRERRS RTNTDMGGADPELAADPEKMAAADRDLGDY G GRLREDRDA DS I RTWAHDLFMFPFNRDAAMRASKEFTEFVTPPIDAERRR GKIF DWTNQMISYDDPDFDHKVATAEVMGYSWNLAEEKRK KWGGDASPLLD $\operatorname{LGDFGTYKRASDSLLAFDEFLGEHDAQL}$
 EEQRSGGTRGDRSPAALARADRAAAHLDAYFRAELAARRS E ELALLLAAAAFDETETSTASARRAASVFAYFAELLEKRRA
 DRL $R L Y A D L F H G V M D A G D A D R Y H K V D A E V M D D G L D E F A A T R R A$
$R A C Q D D R L K L Y D P A L D K A R Q V E A A R R C E R Y L A D L I E R R R G$ DRFKVWNDSLLSTRAEDAATQQHLGELAEYIKGLVAERRR DELHRRIGMMFDQTITPEQALENHEGTQRFLADLVARKRA KEQNEGKTDSTPDPAMVDMFNAMVEEMFEYGRF RLKNKRE DEFLDKLQRQPAQTGGETLAHSPLEFLYGKFTGYIEDRRR
 PQLLQWSHAMVAMYGVGRTFNEAAAEFGDFIRATVAARRLD PKLRDWSERTIADGGGPRYGRAAAGEF IRSALGLYETKKA LLPYGDHAFNAFGPANSLVEKGAPRVAELSGWVNEQCARE
 A QVA H NDPVF LA GRDP LAVMGENDMY L H QVAGALAA QRRE



 PLFTEATDVVLFGKPGGTEEEDAGMQMLGYFQKMVDERRA
 A WEHD LLHAGGGSDEEK LRTQMTAMMSVMGRFTTVI A ERRE $P G L V T A L N D M \square D G R D R A I A \quad G Q T H L A T S M A Q L L A D R K A$ R R MLLAA GEAGAALLDTGIS WRAYRRAQAALLREFLDEHLD $E Q C A A L V S R M G G V A D E Q G D G T A A$ VHGSHRAE QLLLF RPDP EAEQDAAAQD LQHLLDDRYARARRA QSFFRDSRRMVATAPAARGVVAAMAEMTVMFHEDIAERRA
 PA LVQQDVADSLDVAEKAVA ABQRMVARMQDLVRTKAR A WGEAAFNLLGPMNERAVESVPLAGELFEWAHHVRAGDLA
 QLFSA WTETVFK A F E DQ G DVT R A WA E L D H YVA D MVAR R R D ERVRRWSE QI MS PD GPP HVTHPEDPGLIKDFYEGTLDEVVK D RLVVF GDS GIF DGVEA EKANEVVLTEALVRELVALKRRS PGD F WSDET FS YFGRLAR NAPGT GTADEQSAKAFFA Y L K E A M E R RTLGWT DPEVRGDLTAVELFVGAVMDLHETVTTLDPERRAA


 $V$ WFRDMSTD GFGDPAALERADRAMDEMTAYFTEGVDRRRR


CPADDTVIT
210
220


 $P G S \square G R G I F D A E K R G D \| P E G S A G H I I H Q \quad Y L G A G V D T$ EPRRDDLA SAVVUHARGD GGRLSEERDTAAYCVTVIATAGTHDTL A PRDDVLT GLLAQAKED GSTPDDEDVMNLSTFLFAA GT ETT





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 DAPAGLMAELVEAHRSGVLDESSELTGLAASLFFDGHALIA SLTDDLLSDLIRAEDDGDRMNAAELRMLAGGLLLAGNDTT RGRDDLMTTMVHAEDDGEPFVPGEI TPVMMILFLGGVEST DPGDDLLSDLAA CPGDDLVSQLVRTAESGVSETRTELTALAALVLAAGFETT QAPEDDLVSRVIAAGEAAAGTKGNLLAQLAFVLVAGNTTS EPRDDLLTHMIHTEHKGQYLTEDELVSTTVVLLNAGHEAT



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 E GLDVPSRLIAH EGSMGHAIIFAAAERGE\|EPEHCGMIVDHQ IV A A GM D RGDTD GILHLLIQPDENGETVSETEFRNFFCLLVAAANDTT
 A RRAE PRDDLI S LLWANRPDWST DVT S WLT QHP S GL S D

NPGDDLLS WMVQAEFDGEKMTDDELKAFFTLLAVAANDTT APAD QVMQAMVAADGAQRPLDDDELRRVFLLLLIGGLHTV




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## A

A
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 A S L I G S L V L R L L E T P A L W D A l $\operatorname{G}$ G G D P A L L L H A A M E E T L R D D A




 VNGLAAVLYAFARYPGQWARLRENATLARTARERRMS MTMLGNALY LLGGERPESWPRIGADEEAAGWVADRMHLIPD SSALLANAVQTLLTHPDQLAHLRSGSIAWEDAIEEVLRQS S

T NLLLSMGGSHLLLHNN LDWT A TAEN DQSTEAAAIEEELVVRYE
$R N A L A B G G L V L L T D D P G Q R A L L A E D F D R Y A D G A V E E E V R H S$


SVTLGWMFLHLARNDDDRHRIVNEPAVVPTAVEEFVRAY

GNWLGNTVRNMLAHPEQLRAVQRDRSLIPQAFAETLRYYT

 QNIVTSALLLLLSDERYAGDHNTAGLLVDDAVNDVLWNSA
$T V L V A N A F R M F A E Q P N L L R R L R E N P A D A E R Y V E E V A R ~ Y R ~$ RHASAHA LAFSQFPDQRDLLVADVEGRVDTAVEEVLRWA RGSLCWAL MHLSAHPQERKLLVDDPGRIPNAVEEVLVYE




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 PLANMGAHYPRHDTEFHGVPLRAGQLVLVSFAAANTQS L

 P I A HMR R NATA DI I MGGKQIRRRGDKVVMWY I SGNRDD EV


 $P \vee Q \quad L T V R K A V N D V E L A G R P V N R G D V V L L Y L A A A N R D P S V$ $P V N$ CF QRTAKNDTQVGGVDIKAGERVGMFYGSANYAEEV $P S G Q F S H R V L R E D D E L K G R M M R K G E L V F L V R A A A N R D A A B$ PTA F LDPRMASADVAFGGVHDAKGDWMLFGITAAANS DPAV

 ASALAIKKTAKE DVMI
$P \square Q \quad Y$ TARLADAP I PVGDRVIRPGRSVFLLLGCANHDEDV
 PLHMF TRYAYNETEIAE GVTLKAGEQLGLLLGSGNRDYQA GPVHMDMRQTEEDVQDDDTVIPSGATCIMMLAAANRDNRH TPINWMRRTAT GDCEMNGHRFRKGDE IFGFYWSANHDEKV


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


ASAAA M F V H Y A LA A

 $P V K G D F \quad R L S R V P V T V G G V Q L P A G T A V M V V N G A A N A D P R R$
 GP Y R GMA R T A R E D V V V F D G R LI K A G E P I A L V Y T S A N R D G R V P P L H L F K R Y A L Q D L E V Q G $\quad \mathrm{L}$ $T P \mid H N M C R V A V G D Q R V G D T V I P D G H Q V V L M Y G S A N R D P A V$ $P V Q Q T F F R T A T R D T E I G G T V I P D G K K I L M F L G A A N R D P R R$
 $T P V M T F R R T A A T A Y E L G G Q T I R A G D K V A M F Y A S G N W D A Q V$














 S PVLNMRRTATE DHELHGQHIDRRGDQLLLLYPAANADPRV








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RDLLDDPYPDFRRLREMAPAVFVE
PR $\square P Y T E N F A A D P H G A Y R Q M R R Y G P L V P I E M W P G V P A T L$ DPHDPETIETYPAVWRALRESHPVAWSDNWGG PREFFDVDA QDPYPLYDRLRSDGPVHQV GDSGFYV APSDPMSEQSFRDPASI CQRAREETPVF FYAPGGVWM


YDPEAEADPMGVYDKLREHGAVAPVLLHDDLPAWL PRFPYTDEFAADPHRSYRELRRRGAFAPVELAPGVPATL SLPDDYRFRDEPLDLYRELRRHGPVVPVLLDGKDPVWA PLDITSHEFWSQPFAAFARLRAADGLSWHQPLSEPGFWA APRLPFAATVRTEPDPVRAALRAAGPLVEVVAPAGGPAWI

TPDYRDRFEDTMTEELHGQCPDAWTEAHGGHYWVV

 APRCPYSADFQADPHAVNQRMEEHGPVFPAEIFPGUKAWV DPYEDNVLLDPWPMYDRLRDMGPAVWL DKHNMFA

FDPDDPETFDSPNADYAVLRATCPVAHSDAWGG FWA
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DPFDADVMANPDPYYRTLRDHYPVYYMPQWD

| UniRef90_P77977UniRef90_UPIO00468D8C5UniRef90_A0A059MLG9UniRef90_S4TS92UniRef90_E7QVF6UniRef90_G8MMG5UniRef90_UPIO002F1190FUniRef90_UPI0002628536UniRefo_G43T7UniRef90_J3AA56UniRef90_U1HBW1UniRef90_UPIO00289AA20UniRef90_X6L244UniRef90_K5BCM2UniRef90_I5C243UniRef90_A0Z5X9 |  |
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$\mathrm{V}|\mathrm{A} A \mathrm{~A} E \mathrm{D}| \mathrm{V} \mid \mathrm{K} \mathrm{L} V \mathrm{~T}$ NDPRFSSAAPSEMDPDRR
80 AFDAATVQALLRDRRLGRAKPAGLLHPSPDHLDRVWGVEAG


 LLARYEHVHAALTNWQDFSSAAGVGLANF HVEEPWRPPS AFKYQDVVEVVMNRDDWTARY QAHFRKGKGDGQASPQFQHG
 VSRYKDIKEVNGLPKDFSSAQGIRGEEQSKEEYEA RRK
 LIDHDGVNRALRDRRLGRQQPDGRRPDPTHDANFDAVEAN VTRFEDIVEVEKNWEAFSSE PS I A ILDPEPDMSVQ GGFGDVNRLLRDRRFGRPDSRGVGRHRTHLEAFDGDEAN

 VTRAEDIRAI SPRADVFSNARGMFLNEDNFSEGFWPEGGE VSGYQEVLTVLMNPGTHVDPTTVGLPRAGNTAGLKVVNR
 VLGYRELHQVTGDPALESRDQWDD LLTRRADLQFASQHPELFTSTLGVALDPMPADVQRFASF VTRWEDQREVFQRPEDFSSSPVGUPGGPGYGGLKMLP V VVRNADVVTVSRHAEVVSSATGGVTMFEDMPSEVLEMAT $V V G H E T A L R V L Q N P N L F A R D G R R W T A P L D S P V L P M M A Y R P$
 LTRFADCSYVMKNPAGFPAPDAETFARFMPRYDAFKVLVT ATHFTEVSALLRDARLFPADPRWVERHGGEDSVMVADGRR
CGQYETTRTVFSDHENFVSSRGVGLNDFHDLGEPMWRPPS $\begin{array}{ll}C G Q Y E T T R T V F S D H E N F V S S R G V G L N D F H L G E P & W R P P S \\ V L G H S E N L H M T R T P S Q F S R D S R R W S A P P D H P L A P D F T W Q P ~\end{array}$ VTSYAAVHETELDQEVYSADEEGSL $L$ Q $V L G Y P E V T Y V T R H D E L F R R W N Q W A N I P P D W P L L P F V G Y Q P$ $M A R Y E Q V Y E A L R D W Q G L E S G A G V G L S N F R V V R P M W R A R S$
$V V G G E T A L R V L Q N T E L F A R D A R R W K A S M D S P V L P M M A Y R P ~$ ITTRHADVKAVFDDWKTFSSENAQAPMRPMCDAGKQDMKDG $V A R Y Q P V K E T L E N W Q D F S S A A G V G L A N F R Y$
$L$
SRYD DV
V $V$ QRYADVAA ALVDPRFSAARAARWVPMRDEGREFKRULSR
$\square T R A S D Q R R V L Q D T A T F S S H R S \square F A S A D G E N W P M \square P L$ VVTKYDDDWVVDKDSETFTSEQ FVNLEDVDDDLMDFRR VTRYDDVRAGLLDDRDATN $\square$ RHARGDD YKGFAVPAPMD VVRHADIRQVSHDNRTF $\square$ S GQGVMFDRDPPDFDEMAL

VLGDRRFSRAMAVAADVPRMTPGKLDS
VSSHDQCLEVLKDPGTFTTRGTSFEE
VLGYRELLHQI SSDPVLFSRWNQWPN IDPDDWPLLPMVGKQP VIGGYRTAVQULNDPDHFPADPRMWQRDDPADCPVLPMMRP ATRMEDVREVYQDPSVFSNH LTRYDEVRHALGDWQTFSSAQ GDGMSTADNEAWKD
V $\begin{array}{ll}V \\ V & G Y R E V H H V T A N P Q L F A R D C R R W N A P D D W P L M P Y V G W T P \\ V & R \\ V & \text { R }\end{array}$
 VTRFDDIVRIERDPATYSADNPASLVNKVM MP VTKYRTAVRILNDPEHFPADPRAWQKTVPGDMPPMVEWRP
 VTRREDAERVLSEWETFSSANSPNVPEEFRSRFAPSVMAD

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WFSGMDVP E 90 HSRYR 100

100
110
120
FTLRAARRQEEFVFEAADAC
 SMIR A D P P A H GRLLRNFVNSRFQPGSIAEHRARFEQUAD DL

 LLLEADPPRHDAPRRVLSGILGPRALRKLREDWFAAAEDL
 $T \mathrm{~T} L A \operatorname{SAAPDHDRLRADIGAPLSPRALEEDGPQIRAEARRL}$

 S ML L E LE P P V H T R L R T L V V N R A F V S R QV E R L R P R V EALLA N E
 SLVFNDAPRHTRVRRLIMGALTRRADEAMEPGLVQLVDGL A ML A VDP P E H T R F R K L V S K A FTPRAV S K L E DR V R EVVTTEL


 SILLYTVGERHSLRAGMDGEALEABANPFELKKSTEEF


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 I L L $\mathrm{S}_{\mathrm{N}} \mathrm{M}$ LR NCLFTD GAQHLRLRKAVTESL $W M L$ LRE DT GHQEVVRRRVVGRYFTPAAVERRAERMTETVDAV IILLEVDPPEHTRTRRVVMSRALSPKVVKTVVAMFAETAERL
 SVLIF TE GEEHRRRAGVITHALEGVDQFGLARDCRLIADR




ALLF GE GNSHGRVRRALAAGFHGVSLQQHAPTITGUAD A
 AFARSDPDQLSRLRRAVTAELHPGRLSTWADRADGLT SFLAMMDPPRHDK L R R LVNKKAFTPRRQITRDEDKVDLVAKEV G I I V R D P P E H T R L R K L V A K A F T H R R V E Q L R V R I R L Q A E Q L $T L V G A E G G S H A R V R E V V R E L F T A R R L Q E L E$ SILYTVGERHQRRSALVSEALAAVDQFELHAH AEQF


 S IMFAE GAEHQRRAGAVGDALDAFDRTELGMMVGQVADR



 S


 Y P L T A D L P E H T A Y R A L L S P TFS P R GV Q QL S E L A R A V A DR L TMLFSEGAEHQRRAEAI WDGLASVDQFELRTQCERVADR F F L M M D P P R H TVVYRKLI S S A FTP R HV R E I E E Q I H R NAVAV TFQETDGREHRKVRMKVAKAFSAPVVAGFEGQIRDLD S LT T LDD GPEHTA L R RA HAP LLLNA QRI RA QSERVVHT AREL
 N E G D L H D Q $\square R$ R VE G CP P K K GP L E E L K P R L A S F S D D L

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


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 E A I A R R LD DI D S GAN VDI DDKFSHPYPVTI I A DLLGLPRDD Y




 CDRMTGAGADLLLPAFCQPQPVVVICRLLGVPEAMAPQLAW
 LDGLPLGGETFNWVDRVSIDLTTKMLATLFDFPQEQR $L$ I D R F E P GK A V D L L P A FA S P L P DT DI A E M L G V P V E M G VENLVAAERDGGQTDFVAECAEELPMHNDNDVMGVPDGQR













 LT KI A A A G E C D F F R D V A Y D V P A L V L F F A L M GIIP D A DVVP K V K
 K A TLLD QN GNASVVT F D F VV $\square D R \square L A S S T S C D$


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 WVLGERPGTRVGGALDHEAVGGDNPLEFLDGGRFEKYLADRRR KELSS S LMMVEGMNSTDTSGFHRAVAELEEYGWSGQDAPRKA
 EWLVSRGDSMIANSDPDFTDYPAGKEDYDYGEKQKRLRED SNAMVAMYQARRDRAVEDAAARAAADFAGF DRGYVEDRRR
$V$ VWVHSMVHDRTHDPETSGAAVAELFGEIDKKHAERRESG VQWVHSMVHDRTHDPETSGAAVAEDFGEDFKHMAERRESG
SHRMVAMYMHGSDEETQRMADAAARDFAAF QLLTHWSDAATSDA RDTDERRTDMGEMLQQSFTQLWHDHKA PRLDDWSHQMVAMYDHGRTRNRAAGEFSDFDRGYVTERRK QEAAHQMKVGTSWNDPELVGETAMSYMHELASSLTSERRE GWS LAADPALTPEQEAHGNRSVNEFLAYDRELVAHRRQHPG PFLLEWGNHIGMTWSAYRDAI QALIEDDRYFDAHLVRLRG KLFGLSDDEYSSDEERAQDTUNE MLLNTTGQELAKFRRA SEFHRLADDLLGFHADMDTAMAASAKLKEYFRTVVDDRRR
 PALVTAMNDMDNGGASALAA GQKHDATSMYQLLAERQA

 QTVLA WYDTIVR SVSEDTAGRDAGTEGPAAYAQLRTAVEG

 RWSQTLIDD GVGGNYSD DPVVWAKAERSVNEVDLALDDEMLDH DRVTS AMADMFDGKDALK ASDELTACFMELVS LKRR KLLDD ILLMTKAPNS GVKPEDEPAYMQI FEYAMALTADKRA
 ERYA GWTS D I S RLLTDP DVPGHRVRERAETAMREFREMDE D YGACVFNAMGPDNALRRAALARNAQDAPWIMAACAR ERLVQQAA R DMDKGTETAVE SNEVYVMGAL NRLVARRRAA QRWSQTMIDDATGNYAD DPDVWAA GLASYEEVDTALDEMLR $D T Q Q L V D D L R D S L D A A E G D D P V A A Y G R V G E R L R Q L V K D K R$

 D WA A S RALLLTWGNLSDEDQLPLAHKMYWSYCRALVAARKE LLPY GNFAFNAF GPRNR LVVTEDEERDGPVVDWVSQQCPR D


 GQLI Q WGNEMVANTDPDYTEHPTVQDVWDYGRDLRDKRVG S GL RRWAESALLRPDAGLLRARDTLATMHDLVDAAVEY E R TVVEHVIGSVVSWSDE EDMQLES DGGLHQVAQEIDEMRRQ
 HD LVPS $\square N D L V D G G E G A L A G R D T V K A A M S T L L A S R R T N P A$ GRVVATGMA QMFEGGDTAVVRGAQMLLETAALYDLVADKRAAPG
 $R L Y A D V V H A L A Y T H P G T D E F D R G F A Q L D Q T V R E L I P B R R R A$ ERMRRVVDS I FHTSATPEEVTATYTEMYAVLGELVATKRE
 AOMSFWADVLGMVMSDDVRKHLAMNEVTDYVLARRA ODR L L L E WTVVRVI GYQDPEDTPAPLLLGPD GKPRNPRSPA L L G E
 A WSQA LIDDGAGNYAADAEVVRKAMRASADVDAADDAVLD D

 KVL A SVYEPMQEPEKSRVWNEYVSGYEYFYQLVEQRRNSD $L H I R E V L N D P P E V I R M L A P D V A A R R$ Q WV RKNREATVVRDAN ALA S IA LIFD GY DRSQLE DRQQAGA $R R Y S N A H F Q V L V A G D P G T P E H T R A V E V D F P Y$ LIAGRIERRRR PRLAE ACRDLMKGTETS GASYVHILESLTRLVAEKHN


 PWLHVVDRRMDTDAYRMMPFNSPAGAELYEYARDLMDRKNA DRAAD GCRQMF GDEPGAQGRADAALSELLAAC G $A Q L V G G M R K V W D G G E E A E A A M G G L F G Y A Q S V T L Q R R E$ $T \square Y N E P A H A S Q Y T P P N S P D \square Q R V L R K M G M D L M A Q L A A E D R K$ A QFFEWGKAGFDS $\quad$ GPAPRTGDALQTMGGYFQYAAENFPN FWSD WA GD I E LVKNEELRK QRDGYMYECGYF QNLWNAKVG D R L Q DLDDDADTE HVP K PLEA LDPEFFELAGY LGELVAARMA D RVMF GlA GMF D GIN AEKAA QVMF GAI GEELAALKRS ERVLNSLS DLWWDGDDAAKANGEYERALSDAISSAKHAAPGD
 GRLLRHWEHAFSDGSHDGEDVASVMAEFTAFGADLLARRRRR $R V G K R Y N D A \square Q A N D D D A T K E S S A L L Y M A R G V V A D R K A N P M$


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 A S L L T N L V WR $\square$
D A T A N L I L L L F G R H P D Q Mat man mak
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 $K Q T T T H T L R A L T E F P D Q R R L L M E D F D G R D D G A V E E F V R W A$
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 A 1 ELLLNALPDLVLSVPAQEDQWRPGPFHRALATLPVQF VLATLLQEWR VKAP VLMAIVEGLPELRFA
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A $L$ AVETLLEQLPDLVLAVEP LLRALVDRVETIGA AI ERLLNALPDLMLAVPE MLRELTARFPNMTLK MVRALLPAVERDEFTA ALEEVLKRFPEWEAD AFRAVMQRLPNLQLA PHTPEWQDNAAYRGVASLPV ALGTLLQRLPNLRLADKPDQLNYNHSGKDRSLVNLPVVF GLEEWLSRIPDFRiKEGTAPITY GGHVFG|VNLILDW VLSRIATTWPDLRLVTDPGDIQWRNGFRHRGPLELKV ELLRELLLRMTEFETDAP GKVMLATNFIHGLKRLPFRF

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1 PRY 10 20 30
PRYHFDREYRSQFNQTTEEMHAKCPMAWTDTYGGH WV YGPD $\square A R D P V S$ S ADPLNLLEKAQTFGDPFMLEFRKGRPFVF
FVFDANYDKRYQQYGADFRTNGDGKPTVVMM DPAYLANPYPTYARLRAGAPVAAALAPYPGVW
LSDHYVQEAHALWRDI RSSGPVAHSEKWGGS WL
 APQDFFAPDALDDPYPLYDMLRDR PVQQVGDSDFFV DPYSDEAMRDPRDLYRRMREAGCPHHMEKY RRAWA


APENNSNPYEYMRWLREHDPVHRSALHESGIFL
$P V R \square W E D G F A D D P Y R Y Y D A L R A Q G P V G W A E L A P G V P A Y V$
PASPTFSQDLYQ $\square Y R H M Q Q H Q P I L R D G H T W V$ FGSEATQDPYGYMEAVAENADIFST $\qquad$ DPYDYDFHEDPYPYYRRMRDEAPGYRNEE R R N K W WA
 PRSDLVLSNQ $L K A Y D A M R Q R C P V A Y S D Y L G$

$P A P V D V L P S L V A A G R V A P V V K V D Y Y G G T$ A $W A$


DALDRDPFPI YRRLRAEAPVVRVKAAGRT

PNSPEYMTDPITQCLALAERGPLVWYEPW

PSFQDEPQAVYRAMRRHGPVVPVEDPGGFPAWL
APEYRDRFDPI TQEMHDKCPMAWSDTHGGH WV W
D P L NPYAI YKRLRAEAPVVRIP SMRRIL QNPHAVYSELRARGQVAPVE $\square M P G V N G W L$ WDAVRELASLGPLTWVSSSGG YWA
$P H E V F R A L R D G E P V A W Q P W P A G P G F W A$
$W$ DPDAPEVIAAPHAAYRRLREHRRVYWHAQLD SWV

 APEFDSRMSETGARLRATCPLARGSRFGG FWV
 DPRAADALNDQQSAYDEMRHRCPVAFSDYLQ WS

HEWMHGMREKAPVHFDRESN VYAQ DPRSADVQRGP\RAYDEVAQRCPVAFSDMLQ WS EYKLSEDFFQNPYPYDTEKRESSPI YMDEEHKGQKTWL WDSEDIUAHPYPVYRRYREAAPVHRVSGAGEPDTFY YGP LLQRDPKELYREMREHGPVAPILLEGDDPAWL


DPYP LMMKAAQERGAVQF LREVLGDPFWC RDPVHYFASLRRRGPVFRMKLI GFPPQVV AVDDPDFPVPSHDPRAVSDAD R
 PPWDQLRRHGGLVSVEVVPGVPGWL


 | $R F L R D P D T G V R A L H H E Y G D V A V L C A E K P A M V C$ |
| ---: | :--- | PEGLVDPYPHYAKLRENTPVF FYEPGNS WM

YGPVFTLY Y $\quad$ GMKPTVV RAPSPIVQVS DGNRPAWL

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ANTDDVVRAVFDDTGNF ILVRYDDVNEAS RNGLA VSSYALCTQVLEDRRFS VLGHAENLQMVRSPSQYTRDSRATAAPGAPRLNALTVPPE LSRHADIYWALKATDTFRGPSAGDLARLFPRARSLNLLAS VTDRRAALDLLHDTDTFSHDPRPWESTVADDSPGMMRWRP
VLDYQEVTELKKHPSLNQGSAKWPDHHGVHSGIDHEWWAK VLRYQEVSERLLKHPKLRQGSAKWPDHAGVHSGIDFHEWWAK LTRYQDIVYAMKEPRLGNTDILQHFQQIMMNQPGQQDLLQR V C G WD A V H EAI E R VED F S SNFHED GTVTP F DMGAPGAP M V T S Y A A CHE DE Q DEDRFSADEKNSLMKRSM M G VSRHHDVLQGFRDSTALSNAYGVSLDPSSRTSEAYRVM VLGHRELLRLTREEQDFSHDPRRWRVPADSPILPMVGWRP |L F R HEDVV RVLDDHETFSSVVSSHLSVPS VASWEEVQRI GSDWETFTSVNDLTGTENGGKGQLIPPMPY VTRYEDCRTVGANDRVFGPSGAPDRPE VTDMELARAAFTDRRLSKDEWMRRVTGVMDGSQPRADVAR VGNPQAILQEIF SLLDSKFDVGRANELLAKPLIGQN VTRYEDCRTVGSNDRDFGPSGSPDRPE V F S Y R Y TK EVVLN N F S KF S S DLT GY HERLE DLRRG DI PTR Y V T R WK DVETVAKSPDDFS AVVGTSPVERSFGKP LTKAADTKYVKDNPELFSSDD PNTPMKRAFWAH FLKYSDVVEGYRNHEDFSTYQTPDPPDEPFPVMQPA MTQMEDI MGCWKTEPLSSDFYDWEFAPQRPPEDEWSNFER AAGNREVFELARCPYVSNDRDVKGERRGYQGGEAAMPDRN LHGYEAVKEALVDHEFSGRGSFPLFERINKG $V D G Y R E L H Q V T S D G E L F P R D Q W E H I P Q D W P L L P M V G R P L P$
$A A G S D Q V F E L A R C P E V S N D H D D H G K R G Y K G A Q R A S G V R G$ LT RYD DCKEVLDRNHEVVFTTDRRR VGGVEDPDVR H LTKAADTKHVKENWELFSSDDPRT

 LTGHAECRRVLGDTAAFGSDFRRLDPAGWTVGEAVPDAQL VLPYAECAAGLKDPQFTADRGTEVLAAKFPGQPDPPWTKN VGPKAVEFVLGT SSHMENFSWREGWPENFKVLLGE
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VFGYAEAFTALTEYKDFSSDLSDLPEK PEFELFREG VFRHADVMRVLLDPATFSNAVSRHVAVP LTKYKDIDYILTNPKKYSSDTRKFMSPFFTSKETDLLYGN LSGVDAVRFVLLNENQYFVISWPPSVKTLLGSASVPVQQG
 LTKKAADTKYVKDNPILFSS AAHPDHAEHML STHQERYAKPDVF凹KPMSLIQGQ
VLT FAKAEEAFRDNAR LSNK $\square Y$ K MTPGDEKF $\square$ VSTAELAAQQ
LLRHADVVAAARDPEVFSSAVSRFLQLP $V$ SHPQA 1 QK ILTDDD $V$ LGHSENMHMVRTPSHFSRDTRDWGPMPDHPMMPHLAWQP VSRFDDVRTVLRDHRHFSSCVLGQDSFEDRSPADGSILPN I VGYEQARRILGDPMRFPADPHVWTVPDTCPVLDMMEWRP

 LHGYEAVKEALIDHEEFAGRGSFPMAERDNEGLGDVFSNG V LGYRELHFVLSSPE DFTCDPRHRARRGPWAPLPGAGRRP VNHPQA QQLLT S DRRQFAASGKENGLLKPLLGEY V R S HALVDEVLT THDLLS S S DEIRYSASEVPHRDNPVL H I S GYDLVVTRLDTHPGFPMAAPVFQENVRRDNPQFVRFFS G $L L G Y R E N L E V A R T P S R F S R D S R H W G D W R D S P$ LLLPVVGWQP


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UniRef90－D7BZW5 UniRef90－H8JDDO UniRef90－UP10003D74656 UniRef90＿Tor9F2

G I L E MDDPEHRTYRNVL｜NPYLLSPAAVVRWEPF｜I｜HDVTRAC MFIAMDRPKHTEQRRVVAPAFTPSEMVRMTENIRSRTSE』




 V L A TA A D E P R H A A H R K P V L L K L A A A K R L




 WI L NKEGEEHHRLRRLMNPAFSPKLDGGLVPRFQALAAEL



A LL
GMDP
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TMVMS E GPE HARIRRRHARVFTPRNTERWGARLAALAEEL



 T SEGEKHMRQRRLLQPPSFRKDRI GKYAEAMIEYGEKM A M I G H DQSHHRVVRRVTAPAFSRNVVDNDQAKIEPEIKKL

 S I Y F S A GDEHRRHARMVGPALEGADPDEI RRHCEQLADR
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 MMLNQDPPAHNRLRTLVSRAFTRRRVERFEA QVRQRARRL SFMRKD DEEHMVERKIVVAPSFSPAAAKKVWSDTFREDAAD
 VVMYTDPPLHDALRRSVHAGFTRSAHQHYDQVIQKAAHDLD


 NGMD P P L H TA YR QVI EPYFSA QRVDAFEPACHAIIADVL NMLEVDPPD HGRLRKLVHKAFTPK』IKQMDSR】KEVS
 SVLVSEGEEHRRRAGAISDALAAVDQFELWDHCARIA T L M R K D H E E HR S E R MA M M P A L M P K T I E S V WA A L Y A D L A E G GLG TSE GEF WLK QR RLDMPAFHQKQLVNLYDVMLS CVQS L

G L L E M D N P E H F A H R K A A Q S L F $\square$ K P R A VG L WR D R W $\square \mathrm{NG} \square$
 $N G L D G K E H A A F R R L I G P Y F T A E R M A A L E P G V R E A A R Q V$ $N R D G D D H Q R L R Q P I V D A L A S V G T Q Q L V P V V Q R A A V H$ S $\square$ F MLLE G D RHKRER K L L M P SFH GERMR DYGELI T D DT QKV $\begin{array}{llll}L \\ L & C & S & A \\ T\end{array}$


 S LI L L D G D R HK R QR QL L S P P FH G DRMRA Y G Q D I S E I T Q Q I
 S I TMMLD G D R HK K R R K L L L P P F H R ERRMPA Y G QLI I C DLLT T K I
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VEA $\square V E K L K S Q D R A E L N M D L C A R V P V H T D S V A V G L R G E E A$ $\lfloor$ I T WPL G RPFP LQEHMQA ITLLE ITLLRLVFGURFLMPARRLR CAEVA GA GA GAVGCDAVGEFGS RFAVRAMMRWLGWPA GLE



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NTYSEPVHA 170
180
190
200
( FWSDWA GDVEKFRTKEGRDERLMHMYEMGTYFQKLWNERLD PAMVRDNLASLDVTSEAAQAHTRLLERMRLLVAQRRAHPR FPIFQQDFPGSPWRNFLNRQQGDNKLLQGE EERRNNQQT SQLA TINPDKDPFTMYGKADAARNQDVGRVAGEEPYD
 ERFMDWA $\square R V L K Y G P F D Q E R K A A F D E A F A D L E Q L L K E R E Q$
 AYASTQLLDGPLADEDLAASAVAAMQLGAYLDDKFTAAAA SLIDDMI MHRDAGQKGMPRNQQAAQELGGYLAAYVARLRA HELLRALDALFGSADDSQAGNRQFEEILLDTLRERRARPA PKLLRSLSFAFMSSADPDPAAK NNWDRDIEYMAGLLDNPN DRMVQAARDALKGTETALQSHTYVMEALSRDALRRRARPE FELAASTDTILEGLNPHASDEQASLEVERYFEGLIEKKRR DRLAEAALGKMMESGAEAAEGEAEFGGYVLDLIAARTK EFIAASRANTVVSDKDDDEEVDVAVQELYDFVERLIAERRE EATNIGLAMGVTIQSELPTIEGALERLYAYADALIDDRRA ALLFFHSLDQKDLGAWSPWGKFMKAMAKLDDLENQLL NMAFA DKLIR LGYATIVAPEQLEQAGMAADELSGYVLEHFEKASE ALADAVLHREDGVADVPPPAMAASDELMRYYADLDAEFRE RELVEAVGGLVSATSGAADASRRMGALLLSLIEEKRRVRG QWVRKNHEATLARDVEAMAAVALEDGYITALLDARRQAGA DAAYAAHEGVYLLDPDPRYPHEAQARLRVRFRDMDAARGQ $D N L V E W F H A M S N D Q A V W D R D D A A L A D I D N Q L G A D Y D A A D S$
$A V M R R A T D A I I Y S P K Q E E R A G G V G A L A G A V A G W A A D$
$P$ RFLQQDWGA WTP WGRMKQRQRHI HDLLQAEIEERRTKENE VEWF HAMAAGLQNVSSDQAVWDRLDQALADV DAQMGALGYE EWFYGLAQGA $\square N F E N D P K R Q E \square A D A D G A E V G A A I L D T L E R$ RWSQALDDGAGNFGWRDEPFERADRANEEMHALFDRLQDR PEFLALSSVFFRSTDPDARAQNLDDDYAVLEELFREKDRN KATSVIDDPESDPTKSNLEFKQAAATLDKVDFGIDEERRK PEFTETWNPTISDEQREAARQDSNKAIDII KEVITERRQA S IY NEPAHASVYTPPDSPDMQQLHLTMGMDLIANLNEDRE EPAHASVYTPADSPDFPRVADLA IASAMGMMH HVAE IRQ NFlHFLKLLT EAFTILDGSPWDQEKHNEQS ASIARVLKDLADGGPGAQEAAHRFGEHMARLVAAKRA EPVHA AVYTPPD S P D DPRDAEDHRAMGDDLLTNNLFE DRQ SEMI RWSQAFGNAPELYERSDTANAEMNALFDRCVQRAKA GTLLAGDESYF EPAARALSFESDPYRTAAGAGVLRQWVAGLFASRGTEPTR GLLLE WTERI IGGYDPDQARTVLGPDGRPADPRSPAMLQE QALMDAVQNYARDPELDALGQEASDGDDAADDAMDPVRRA PGFEEMSNA VVRSMDAGLDPARATRARAELSRLVGEWLET DTAVDACRRMSDPEPGAQGKADAADADLAAAGLTPNRTGL ETIMTYHSGPKDQPVTQGTVMEQLTDLHTYAFELLRGMRG
 AVFADTVAAMSAGDPAA LAEVLPRFAGFLGERLQA NEPAHASVYTAPDSPDAPRVLELYMAMGMDLFANLAEIRD QRMLEWAAASFDLLGVGNKRAAGAAQVIGEMDAYVQNECR AELLEATHLLFSSGERAQEGNARFEALLFGLLAAKTAAPG SEPTHASVYTPEHSPDREK DNEQHREMG!DI INNMME I RE QKWDSWGTHVFRSEGEALDGDKAM VLYDYIDEEQ QERAVL MVMMAWRQLDAYVDEMVAGRRR PLFRKWADTLLSQNDAADDVVPTMHEMNEYLLDHDRSRRR
 ELFEIWVKFSVPGKLDGTKFSQALTSRQLLLDEEVRVVKA $R W L R A H A L A E F A R Y F R R E D R R R R G E T V R R P G T G G P G S G S W$
$R N L I G D L S T T D D A A E G A G A A H N R V V D R M R A L L A V K R E R P G$ QRWSQMLIDGAGNFGWTPGPFQATDIANAEMDRC】RANAE DRLGQAFRTALAYVYYRMNTPGALPVWlPDIRSHRQDPTN LIF RKALISTLSSRGGPESQMAAAATVARMVTEQI ELRRK AWAEKS PLAMRVPVLPTTRTMKASAAVDEDLFAEI ARRRD PTLVEWVADNQAATRSGRLDATADVARRYDEIIRSVLAPR HLLADLSAR LLWSGDQKGAATAAPAVRAYFRGLVARKRA $K R L Q Q N L G S W S P W G Y F L K Q R Q E \square D E \square L Y T E \square R E R R E N L D E$ DRLVHAARDDPKGTETADESNAYDMDVLTRLTVRRRAAPE QWL QVSGQCNARSRP HRI ADGMAKDFGGVNAT $\square G N Q \| L T Q A V A D L V T L R Q H Q P G N$ GRLGLQFE P GLLPYRRFMQRCAQLEARDSALIQRKRSSGE KCANTMTGFFGGSVEYTNECNEATDADREYFRGLLEDRRR TSRVGR VAAGMDAGLWPERGAQLRDAHEELADLVDGWMA GF LQKDLGVWSPWGKIMYLLQQIDQLIYTLIAERRLESNQ LI DYCPGSHHTDTKNVNY IRNYLTTEKIKE HQESRDVANSR
 VRWTDAITMFFGQPEARPAFESAVSELRDYLRTVPSSEGG NQLAAGFLAETHPEAGPPDTAAEFAELREYVAGQLARRRA PRLVEAATRDLMKGTETALSSNAYVTETLENLVARKRA DRLIA WKDSVIALAESPTLEGADDTPAMELLAYVSEADNE K Y I R S Y L L E KVK EHQESLDVTNPRDFID Y FL I KQKQANHA K K F S D WSNTMTGFFEDGIRVNKAAQSLREYFKELLTKRRE

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210
220
240

 EAPEAPDLLSRMDHSDMRDMDQMTFMGNLILLIVGGNDTT | $E D D P S R L L T H P A G L T D$ |
| :--- |
| $T$ | DGLIATYRH RAGQPEFAAVDDAELGAGTVMGIVEGGAENTV NPTKDALSLLIQQADDGNSLTEQELVAQAVLLLEAGHETT




 DTTGLMGELSRGRKDPSYSHVSDEGFATVVVMFGAGVEST




4484 DDIVSALLHHPARLTD

TPAGDVLSALATGTVQGEPLGLEVAESMVNALVFGGFDTT
KPNHTLMSHVMHGGMEGKARSLKKIISPTMRVIILGGLQEP
$P$ PAEGL $\quad$ TGLLDDAVDGEEADTPDEVVTWTVGLVMAGYEST
GRTDILSLMMAARDENGQAMSDSELRDELLTILFAGHETT


HRAEPNNSALSVMLNADNPDEEKQIYANIKI AIGGGINEP




A $A P G D E D N L K D A A F D L F D G G G T$
$N$ NPRPGLINA IAADVEVLGEKPTDEEYMLDDLMAI TAAAGHEL APDASALSAMVNAED Q P R D D L T S VLVRH
$D D V V T A V Q R L V Q D E G S$

| $P$ | $P$ | $I$ | $E$ |
| :--- | :--- | :--- | :--- |
| $S$ | $L$ | $R$ | $G$ |
| $D$ | $E$ | $F$ | $V$ |

NPDRS ILLSMLLAGD

ATELRDSLPPGTSEKD

QPTKDALSLLVQAQDEDGNSLLEELIDARAVLLLFAGHETT
NPDPNRTDMMSARDENGEQMTYEELDRDELLTTLLFAGHETT


,

 S LT D DLLS DLDRAEDEGDRLDAA ELRMLLAGGLLLA GT DT T




 K Y D L L S M L LA A Q D E D S GEKM S D R Q L Q NEVITTLI NAGHETT


 SRKDMLHLMMAARDEEGNPMTDQELRDELLTLLLFAGHETT DDFTSHLI NHPAKLT D
 ET Q D L L S I L L R THHD E D G GA LTT T E MI H Q I I T L Y G A G I E P L
 NRQD I LSLLMMSARYDD GQPMSDVEL RDELMTLLVAGHETT
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R R ANPGPDILSQVLTGE


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$P$ VGGGF REVIQECEFDGYK IPKGSQVLYEDGQTHQDSTL $P V Q A V T$ R WAYED $\quad R$ R G DHEVPRGSRVVALLGSANRDPAR PVSNLLGRWAARDTQLGGRAI RKGDLLLLGYNAANSDPQV

 PNNPMFSRLAVEDTEVGGVAMPKGSVVDICLASANRDPSR PVITGSGRLLDKPLRLDGYEIPAGWVAIPMFSLIHQDSEA
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 A APLLFLRNSSEKAKLDGCTLPPDTTVILSPIISHHAPEI
 IVMNGVARDVKSPDEMMGYNLPTGTIIIPSIMDAHHREEV

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



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 RPEDELTEPG NRAHMAFSAGPHVCPAQVPARLITRT FANPQNDELDRPNPTAHLAFGRGQHTCPGSALGRRHAQ FPDPDRFDPSRFHGTHVLLSFGHGDHFCLGAQLARVQLAE PAAGREAPGGRHPDDASHLSWSAGPHACPVRQHTLLIATE YPDPEDN QSEARKQHHTFGGGVHHCLGHYDARADMSV FGEAG FDLTAERKP HFGFGGGAHHCLGHFVARSDMSE FNDAGRFDMGRK NGQRHLGFGVGIHQC GQLLAQFQAES
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FPDPDRLDLE RDPEQNLAYGRGPHTCPAQDPARLITRT ERDNARDHVSFSTGHHRCLGSPLAKAELDA HERTGEFDPEAGRKKKQHVSFGFRPHFCSGHFLSRAMGEM YPNAQEFLPERFLERQEYLPFGGGDRRCLGYPLAQLEMKL FEDADRFD MFRKKRPHVSFGFRPHFCSGHFLSRAMGEI
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$\qquad$

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YFDPERFNPEQKDEPFSHVPFGGGTRECLGKEFARLEMR\| FADPDVLDV RRAPDRQLGFGLGLHYCLGATLARAEAEL WPDGTN AHMAGNHAHMAFGHGEHGCPFPALAEVIAKS FQDGENYN ALREPNPHQAFGNGPHHCAGAHLSRTVGD WENPDQFDPDNQRPKFAYFPFGGGQHDCLGKSFALMEST


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UniRef90-UPIO003D74656


 VIATILKQY IVLETLVARFPD\RLAVAPEETEWDGGTGRRPTRDPVAD I AAHLLRNY DWE1L PNQSLEVVRVPTTRPKDGFKVKF A| GRLVGELPNVRVD GGLVWQTDPYGRAPANVPLA
 VLRRLLDRTTWLEEAPQRPAWLRSVLVRRPARL MVEETLTATGDYELDEDQCERAYGENLA GFTRVPDRF AVKTVLHRLPGLRLTVPAEEGWRPSPWTRVPTALPVAF AIETLLQKMPTFDLAVPDEQLVWRTRFARRIPERLPVLW
 A ERLTQWLPD QPMVLPRERLTWRPGPFHRSLTALPVMF ALPLLARRLRDPR PAGESTWLPDSGNTGPMTLPIAF TCEAMLRULPPFVMAAPGQEKWQQNNRMRADDVLPLT VLRRLLERTSWI DATDVGD WLPSILVRRRERL AMPALFERDPDLRL DPSAVSVDAGWVFRGMTKMPVTW IMMEELRATETMAFI EAELKWVNSPWSKGLGTRPVRF AL ALTAFFRRFPHARLSEDREQEVKAKGWRFRGVNVLPAKW VLATILSKY QLTLAED ALAEVFHQLDNLRLDDNREM Q AVRLLLERLPNLGL VPGKEPVFRPNEVNGYKRLVVRL $M L P L L F D R F P N M S L P D P P A V I W R G G G F R G P D Q L P V$
$S L Q E W L R Q M P D E L A E D Q E Q G S I F G G S V M G F T S K L A$ SLLQEWLRQDPDFELAEDQEQGSDFGGSVMR TVSELHRRFPNIELAEEPERDPTDHNATV
MLTAVLDRMPDYVVCDAGTVHYDTDGVIQGMRNDPATF MLTAVLDRMPDFQCDA AGAVHYETUGVIQGMQHLPAAF LLTTLLQNFKKKPLVEPKDISDTPGVFGGMSSVP

 AVRRLLERLGPFHI AVPMLFERLKNLELD DSGEPARCGGWAFRGLLTLPARW VLSALHTAGDGFRAQGPAQ YEPTATLRGLRALPVA
 VAAHLLRKY HWEIL PNQSLDTVRDPTNRPKDGLRVRF VLATVMLNY
$V$ LDAFCDRMPHHSVIGT
MLCAVLDRMPDYRC VP
LLK SLLKRARHMEV
NTVSLQMGTTYGPTQL FMDALLDATVDIALL PARPNFQMNNVLRGFTSLPTRL AVAAAGHLLRDARTVDPDATGSEPSPWTRDPRGLPVAF MLTAVLDRMPDYGVCDPEGTVHYDTDGVIQGMRNLPARF
 ALTVLTARLRNPR AGPA PWKPMGTLSGPLSपPLEF ALNRLLDKYSGLAVAGEPQ ALQALLAATTQWQAAPGGGAVP

FAALLVRNY EWELVPGQNLDLQMDPTPQPKDGLQVKF GLRALLDGVPGLGRGG HRVDYADDMVFHGPSRLLLR Ti EVLLDRLPDLRLAVEPEALRWRQSTTDRGLVDLPVEF LLPLLFDRFPKMTLPDPVS VRWHGFGFRGPLNLPV
 ALEELHRRDPDYDLD SEEPPLLHATQVRGCMRLPIRF AL REVLRRVELTAADPAPEAQRMWHVTLVPGKRAVAVA AVEEVVAAFADVTLDPVLRPERSDTPNGGGSSVPVVL VLAT
GVDALLTRLPDAELACDEDDDQWQETDSNRHLVDDPVKF IVQALMTRLPAFRLVPENAREVELVALDGFDRMDAEF AI HHILDALPEMDLACRPGDLVWRPGPL
ALALLLQR RRFTLSPDAVVSHHMRS LMGPRKGLRMVW LFRAMVRRFPKGRFTPGTTPVRDHYSLAFSGFTSI
VMRMLSQRFPE AHATGEPSY保NTLRSDDRFPVSL VLAKILSHF
FLTTLQNF KLKSLVHPKDTDTTPALNGFASLPPPF AIEVLLDRLPNIRLAVPAEALVWRRTAWNRALTALPVRF AI ATILSRY DLLALAENNEEKPQRRGVTL
ALRALLARMPG PWTVEGLVTRDSPVGTDVLALRLVW
 V L D E WL K R I P E F S V


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F D P F S VE T $\square$ S A GP TAFDEMRE $\square$ A P|I VW|LNKYE VYA YSEEGRQNPYPWYAE LHRGGPVVTVADYFGMKPTVI DDAHPQ RHYHDKAKDIRAERAPDGVLWL LS A EFVNDPYPTFSNLRENYPVWWNAAAS WM APSHPLPPQFLLDPNFADKREKQYGSIYKTQQLGRKTVGM $L P R D P G S L A D P$ Y P L L E QL R TA GPVVRVRLVERF DVWW

RTDPDELYRKLREHGPVVPVLLEPD


E Y GP TF R F EFPGAVGVF YGPVFTL YFGMNPLVV
SPEF LINPYPFYEEVRS $\square$ GAVVPISPH APR $\square D \square D P A F W A D P Y P M L A K L R Q E A P I$ AFVPQLGST
 YGPVFTD YFGMKPTVV F LRDRDFQKKRREKYGTVYKTH LFGQPTVVL YGPVFTV YLGRKPAVV RRYGSVVRLKATPHRDIVM AYGPVFTL YFGMKPTVV AYGPVFTV Y LGGMMPAVV D DLHRDPFPDYARLR PS LDDETFGSAHRDYAALA

A D P F Q A LD WQR
E Y GPVFTVHLLGTEPVVV
$Y G P \vee V S F R L A T A R H Y L$
K Y G P V F TVV Y F GLLK P IVV
A D P YP $\square Y$ A QLRREMPVAYIPA

A Y D Q M L K HFPVVKNK
D A N S Y M
APQLQRNPLAFMRSTHAQGHLVRLSLA
A DPFCDEADA A GPQY L DD LCA T A P LV W W L E K Y
GSDPVVV

$P D L H E D P F P \square Y R R M R E E S P D H W V P A \quad$ V $\quad$ N R Y M FRGGPDYVLD $\square Y$ R K H GPLYYAQTPALPAVM VWGF YD G R QP V L E Y GPVFTVHLLGFDPVVV E F G P I Y R L T L P G N S S L V F V L D P $\square G Y$ M E S Y K Q F G E 1 F HA P $R K Y G A V F S L R V P P Y$ A D HLV | $Y$ | $G P$ | $V$ | $F$ | $T$ | $L$ | $Y$ | $F$ | $G M K$ | $M$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $T$ | $V$ | $I$ |  |  |  |  |  |  |
| $K$ | $G$ | $P$ | $F$ | $T$ | $V$ | $H$ | $G P C Q$ | $V$ | $V$ | $\square P R \square R E \square Q Q G P \square E F L L E \quad L Q R Y G P F D R \square P \square P \quad G L A V F S$ GAYF

 P P G VEED Y F A A WQA LAARPGGPG VWT $\square$ ANGGHW $\square$

Y G PVFTV YFGLK P IVV
NPHPLMDWARQYGPIVKLTVPGTTR\| $\quad$ TVV RYGD I F T R FLDNYPPTVL A Y GPVFTLYFGMKPTVV
$R T Y G R V Y G L Y L F G S P T I V$
$Y G P$ VF T L Y L G R K P S V V

Y GPVFTLS YFGLLK PTVVV $Y G P$ VF T L $\quad Y F G L K P$ TIV
MT R D F E $\square R$ P A S VYAR L R A R GPVAPV D L H
ECRKKYGKMWGLV D GRQP L M M
HRFGPVSGLT HGDRQHFF WGF Y E GRQPVLA
$P \vee V A R L A R Y G S A F S M Q L P V F G P T V \frac{1}{1}$
FFTKQKRYGE\FK TK】L GCPCVM
$D$ DPKSFTRLKRYGPVFTG YLGSRRTVI
 QRYG D I F T L R R $\quad$ R T
A AYDK $\square R S R C P V A R$ D
A A Y DKLRSRCPVAR

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UniRef90 I0G172
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UniRef90 XoPL34
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UniRef90
O1EDA8

TCRHELAQKK ${ }^{50}$ VRDWKTFTSTVKAF
70 GEREHUPN LHGYEAVKEALLDQG AVGYDLIDGLLRDPQWTKQPGRGGT PPGWEDHETLRTFQT VTRYDDFVNITKNEEGFSSAVGSTAPSEDRNEVVRSFQGS

80













































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 G L ML LD F D E H M F HR R IM Q E A F T R S R L T G Y V S H I D SVA T K V A I S Q A K D E Q WK R I R T L L SP A F T S GKLLK EM M P II G Q Y G D V L







 A L L L L T S D P L W W R R A H N I L M M A P F S S Q S S M R G Y L P P R M M




 RWKEMM R R R F S L MT LIRNFGMGKRSIE DHV QE EARCL




$A L F F H$ Q GE Y H M R LR K L $Q$ Q R S L S LHS LR N LVP H $\square Q A \square A \square S T$


 $T E P N$ WSKAHNILLLQPFGGRAMQSYHPMMVDIABQQL

[^6]


VRD L A P LGQCE FTEQFAE LLP LH DF LT LIDDVPLED R $F$ VE QVSCELPLQAIA GLLMGVPQEDR WS S Y G GWRFEAESQGRFCAPMLVVFVHNDYAYGVCNNFPA

 MS KLLQ QA A E K GEP F N M YRMG Q S L T MD F I L RIV F G DE S S V Q ID GFEA EGKA DLLQA YCAPLTMMHTVLDGLLGLDDNDA DRVR VEELRKTNGSPCDPTF ILGCAPCNVIDSSVFQNRFDYKDQ

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


$\square$ K S WTHDGTIID TFKEMKKFSFEVGILTIFGNLESHLREE REAQF LVQEL RNTQGRPFDPTFLLGCAPCNVISDILFHRR



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UniRef90_UPI000365DE90 UniRef90_UPI0003C8862A UniRef90_A0A014LDE6 UniRef90_P11707 UniRef90_C7PX80 UniRef90_S9TZH1
 KAKS GDILEWF RQCLREAV DFLKMMEK FNENVHDMSSPWDQEKHNKQT
 E IVSDLSALSGTSEDKVDKYRRG\|LNFGKYLKPLLDSK S QWF F A I F P L R T G WS K Y G K A L A A R D R L L E Y I D Q Q I E E R I S
 FNSED GKRYLRAVAKSHDFTGKADMNKVLELKEHPERMEA $E$ EVQETVDLVS GNGGPEA HQNLLVRMVA L LE NA R S NF L L L QK

F NENFKILNSPWMQEKHSQHS $G R L V L P P W V P T P G R R R L K A A V R V I D A E V A R V T D A R R R G G E$ RETPSPR INS MVRA LDNEAMLQQGSRLKVQNLLMVRTRQQFN EWFHVDENGEFLDDHTRFEDGDRAKAEM RAAVDPDLDDKWT T VWED KILH TLLGSGDEVNATRDDGMMAVMGYFS GLI E QRRA K F WK K DLG VWSPWGRIMHLLEKVVELI YSHDQETKKNFDE QRLS LQDKLMVKAK QQF QHD DEVMNALVDRIIAERKENPD $\square \mathrm{F} L$
 DA WSQGMIE G I ANYG GDPAVEARCHAATSGUDAAIDD L LAADWMATIFHHGHSDGSVSQED IMNRFADYLRPIIAAARDD

 NFLNIMKV N F DENFK LLSSPWMQEKQNQQS



 $L R W S Q T M D N G T G N Y A D D P Q V W E A A R R S Y D E V D Q A L D E M L T$
 $K$ F L A L M N NMNNIFEMMNS IWGQEKDRPNS NPLRMPLFDPTTANREFNAASAVVDDVIYGITEQRRAQPA NF LK LMHMIF RLMS S GWGQLYN AFPNLMYYLPGPHADSCR VF L S L M Q M F DYS DQKFHS LIE HFHENFDDIS GPWLQEKHNKKSAFTMM RWF F GLDA QGA INF ECDPERQAVADADSTEDTGGVTPDMQK ASRSLDTVMTAFNEQMTNVFRHVLHMIYSIDEERRKHPGD

 EPV HA AVYTPE DSPDVQRVADMHREMGLDLLNNLIEETKA

 PALQRRDF GP INFWGK QMRRQQAADKLIDYEEDRERQE QPDP S DV A A LTTP K I GHVVID N WEKRRAVVLSECCSDYFTRRLWN ERVN D WTLLN NLRATLLHDDKK QN IAANANEWNHLIIYTQQLNARAA QN
 K F LIA L M N N M N N IF EMMN S R WG QL Y Q M FL D Y L P GP H N N Y S H Q LA ETRRQ A D M Q R WS Q T M M DGT GNYAD DPDVWA LSDQSFNEVD DA $\square$ DE
 Y G DVLVRNLRRKEAEKGYLFPKSVINFFTRRSKRIKESRDK K F LAALMNNMNNDFEMMNSLWGQL YQMFPK LIDHLPGPHNQ


 K F L T LI D WI E ENS QLQ S S I Q T TESATIGLAAGVT I LDDDLPRIIEAALAHLYEYCDEELGADRDS NPFGP PA WLP TARNRRFRQALGVLDRAVYRLIEERRARGQ A H ILDDFAHRQA YAQE LFPTKEQMRAFFFGERLIRERRARPM N

$P R L R A L G A Q L T R P D G S M T V E Q L R D A A D A Y \square A P Y \square A E R M A$ K KLLFHWSNQMVGDMDPEFADNDAIAEDIMYGMQMAAEKAK LIDDYLPGSHNKVAENFAY IK S Y VLERIIKEHQESLDMNNAR YRDTP HP F VAAMVRNLLDEAQKEAKE LPPLQRKGLRVQARRQA
 HNYDDPAFVGMMPKP DKKMFS R VFFS HTKELVEMTE KVIA $R$ LGDAA DR HVP LDEPE L S EVWE EY DE GQEYF R R IA DE RAT D FL L L M N N L N E NVK IM S S P WM QVCNNFPVIIDRRLPGS HTK Y LV T R V R K P Y R L P L L M A D




 R I DP P WVTLGS R CATLPTPKR DYGRWHPWSRLLAEYRRRYD

 E Q L R R D L GP WS P WG K F L R L R Q Q L D E L i Y A E DQERREK P D P
 WMQDNHAATRSRDRSRTTEVAAQRFDAAIIRS LRTMVRREAGD

## UniRef90 K6XXzo

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220
230
$\qquad$ FSGGFDT EFTTENLIMTISDLGESLNSAQLLRALLLMKHPEMT EFTTENLIMTVSDLEAAGTETTSTTLRYGLLLLMKHPEVT HAEHDVIASLIKSEVDGEPLSDLQLINDLFLLMFAGLDTV GPDNDLLATLAKAKHHNLYSEEEVLSNAAIALTAGRGTS NPGDDALGLMIDTRDEEGHLSKEEIVVQALLLLFFAGHETT
 NPGANNIASVLABHPAGLTV NPGANNASVLAFHPAGGTDT
 DPEDVWIS WLHDGMPEGQTRD

## N

RGDLLSMLISTYDEDDGS
EKNPDRVDMLQATOEQGE

DVTTRLI QHRAALSD
Prab
NTDCFLI KMEQEKHNHQVAFTFMEVLGMLGLI IGGGFDTT

| L |
| :---: |


SRTDILSLLMAARDEAGQPMTDEKLRDELMTLLVAGHEVT
AEPRVDLISMMAHSPATRNMQPREFLGNLMLLIVGGNDTT
AQADNQTSDLTDDQDDGKPMPDAEISSLLRNLNMGLVSSM
GDRGDILDMLLTAQEEGQGMSDSQVHDQVMTLVAAGHETT

D
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APGEDLES
NPGDDLVTTLIGADVDGHKLSEDEFGFFVILLAVAGNET DFDDCFLIKMEQEKHNQQEFTVENLIATVTDMFGAGTETT RGEDVLSLMMSARNEQGELLNDVELRDDCMLLLLGGHETT AKKTQENSTMIDDDETKKKRMTEAEIIAQCLIFMIDAGYEG APGDDVISLLATATDDRAPADRERVALIVTELLAFTGHDTT
 NFAEIKSY LRRVKEHQETLDMDNLVATVTDVFVAGSETT KPSDDVVSGFLEVEVDDRPLTTEEMLDMCFTLLVGGLDTV KRQNPGDDLTTRLLADEPPGTVEQUGLELYAL VIDMSELV

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 G WA A WAL F QL GHLD E VQAK L R E D L K Y F D RVLLKECMR R Y P


 A S Q L S Y A ML H L A T HP A D RER I VA DPTII P KA V E E L L R A Y

 S N MI S N ALL ISLYK QPE QLNLLRRNDSSLMPKAVTECLRTDDS

 AK V Q E E I D D R I G R H R S P C M Q DK S H M P Y T D A V V H E I QR Y I D


 R DALLAT TVVWALLERPDQLTAVREKGCWKD AFE ESVRWV



 ANTLS WAFYLLSSQHPHVEEKDMPKLSYAEHVIVETLRVQP






 TSTTLTTMAYHLAANPQWQDRLREKLETYDLVINESLRLQT S NS L S F VMYELATHPDVQQKLQEQMEY LDMVVNE

 STTLLR YGLLLL MKHPE PCMKD RSNMPYMDAVVHEDQRFDD
 R N QLG L A M Q TFMA HP D Q WR LL A E R P E L G G N A V E E V M RVNP
 ASTI MWLL HMLAE HPEHADKVREEVEHTNNVVVEAMRLRP STTLR Y S F L L L M K Y P Q V Q EK DR R K M P Y T E AV L H E VQR F S D
 STTL R F G L L L L L K D P E P CMQD R S HMP Y T D A V V H E I QR Y I D


 S T T L R Y GL L L L LLK H T E P CMMQDRTMRMP Y T DA MV H E DQR Y I N K ATGLTAFMAFLGRNPSYRDQLVADPTTDPQATEEMLRWET


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FERAETFDPS
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FKSPESF D PSN

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 FPNP HE F NPE HF L N K NGFMPFSAGKR FTQPDDFDINRDKKP HLLAFGGGNHFCAGAWVARAVADV WT DPMRFDPERFAEPRAFAPFGGGAHKCDGMVFGQLEDKT WP EPEEFRPERFNNPYTYLPFGTGPRNCIGMRFAMMNMKL

 HPDP TEFRPSRFLDPNTWLPFGGGVRRCLGSGFALTEGAA FHNPEKFDPSHFLDEKGFMPFSAGKRDCVGEGLARMEGAL
 WPEPESFRPERERPRYAYDPFGGGPRDCIGNTAA VGGOV NP D P H V F F D $\quad$ U R F WKFPNEFNPDNFLNPEAFMPFSTGPRVCLGEGLARME LG L Y E R NLLE F D P D R WL P D R A M S P F S T GNRKCPS D HFS MA QL T L

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 $Y G P V F T V \quad Y F G M K P T V V$ Q H G P I Y RLTVPGYS G LI $\square$
$L$
$P \bigvee L G N T V A F A R D P F S F \square D A V T T H G D V D R \square S M L G R D$ $E Y D \| L R E A C P V A Y T N Q Y G G G \quad Y W L$
GRKP LQ F L A S LPA Y G DLVELRRGGPRPVFL EFFTDRNFQQKRLDEHGDVEKTNNVNKPTVVM GLYETAAR Q G D V VH LQLLG DGDL YQ
PNSMEYALDPGPQCQALSERGRLVWYAPW
DLFTS LMALREYGGPVFTVHLGGRRVVV P I Y WCA WVD G S G GWV WLKELREHGPVFR\ WFGKDLMVM
 A P EPLLT RDYETRPELVYERLREHGPVAPVVLLGGVPA WL LD P A $\square R$ A N P Y P VCA QLREHGP L Q L L EAN F V L $R R Y G D V F T L R V A A M G T M V Y$


HK DPEEVLRWAK Q Y GPVF GHYDGDVPVLN



PRFPQGGAVLAFRYGSVAALRRYGSTFTLQLPVFGETVV Y GP VFT L YF GMKPAVV $Y G P V$ Y T L Y L G GHRLI V H GPVVTLY $\quad$ I GMKP TVV

$R T L A D P H A F T S Y M V E Y G K V Y K T H A F G G W N V A L$
A M RED M I GY LE H LAA GQDN F L R DP LGGF GSAYF A P LPP P MP P G H WLD P L G L Y L R G R A L G DVVR FRMMGP DYVEQ

F LD WAK K Y GP VVRVNVFHK TSVV I
K Y G GVVMWTAAF GTKVVWV
ADPPAFTKAMVEYGRVYRNNAFGGTTVALL ANPFPLYAELRSGGGVVAAPWGGH
$P L L G H V P A L W R Y P L E F L A S S L P A H G D L V E L R L G B P N R A Y L$
DFSADPFTTMDRDYRENGADSELGAGPMRCRV Q DPSVF FAAKQRYGEVFKTHULGGCPCVM K Y GPVVTVV YF GSHPVLV
 TLREARALGPLFNLRFFD TDCWM
 $P L L G H V P A L W R R P L E F L A S L P A H G D L V E V R L G P A R A Y L$ YGP IVF L Y F GPRPVVV

DHDY $\quad$ PR $\square$ VP H Y VK WK D Q Y G GP F L Y X F GP QPR $\square \mathrm{C}$
$R R Y G D V F T V R V A S F G T M V Y$
$P L F K W M N Q Y G P I Y R L A A B G R N F V V$

$E \mathrm{Y}$ G P VFTVV Y L G M K P TVV $P L L G H G L R L A R D P L A F L G G L R D H G E V V R L R L L G P K T V Y A$ $P \vee L G H G L K L A R D P L A F M A Q L R D H G E V V R L K L G B K T V Y A$ PAFVQLLTRWDFSPMSFMDEVRRFGDMYTVNLGKNNPLVF

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 LYGHEAVVKEALTDEEFSGR

S H E EVVRR
L T N P P D H V
LNDPALVRCVLVEHADS
$K$ SVS VFRERPPVP LSQYPVDQ
QQAQKFGRGR $\bar{F} D R L R P M F G N$
$\square E R D G F F K Q A R D H G D$ WVGP


VT S PESVKKFLMSTKYNKDSKMYHA DQTVFGER $\square \mathrm{DFGQG}$ I GPDA QQVLANKD KVYSQSGWEYF $\square A N F F T R$
 AAHPELVREVLLNPRVY DKGGVFDKARQLLGN

A $\square$ G A E A S AF I L A N S D LLF S
LASPEAARFVLVTQA
KAEEF $\stackrel{H}{S} \stackrel{L}{G}$
WEAAFTALAPLTGPS $\begin{array}{lll}L \\ V & G H Q A M K E A L I D D \\ C D P A S T R R V L R D D R T F\end{array}$ DKGGPLFDRAREVLGN V S GPELVAELCDETRFRKSVQP $L N G Y T A V K D A L V D R E L G A S R P$ R L L R HELLVVAALSDDRFSSAVSS QLHVP
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RADEFAAKGGVFDKARQLLGN $\square$ F D Y E L VK QV LA N K

LAADPAD\KTV
FAGDPA $\square Y$ HAGEANSVLSTLLGDT YGTKYGKGLVAEVSEFLFGS VSDPSIARHVLRN L H GYEAVKEALIDEDFAGRGRFPVLEKVNNGLGLIF SNAK IV S GADLVAEVADEDRFAKHVAPSLAR RADAGDGLFTA VNHPDYVQRVLVENR ENYNKNSLIYKTVRPALRDG I CYDPDVIKKVILAEPPKISNLYRFLSDWGH LHGYEADKEGLIDEEFSGRGSFPVIDRNFHG VTAPDLTGAGALSPDY I I A GP LWESDESLLGKE VTAPALTGALALSPDYKDDGP VWESLEGLLGKQ $V$ SNPQALQQMLTQD TRADFHAPGDRNGLLKTLLGDN
ITSSQELVNEVCDESRFGKVLGVS L RQVRDF $\quad$ GGDGLF TAR $V \square D Y H E V L E V L R D D S Q W R R D I R Y W R A R A Q G Q L P R D W P L L A$ I SSYELVADACDESRFDKRVWAPLQKVRAFAGDGLFT
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GEQFAARGPMPIFELVSNGF
 $V N G \square A A M R E A L V D H S E D T A D R P P M P D F E H L G F E P G A E G R P$



UniRef90-12N8S7 UniRef90_UPIO000E225C8 UniRef90_UPI0003315DEC UniRef90 W4C989 UniRef90_UPI000372F49C UniRef90_UPI0002FFEB3B UniRef90_B4VZ60 UniRef90_E4NLN6 UniRef90_Q2GU74 UniRef90_L7N3N3 UniRef90 G2P5W3 UniRef90_K9Q4L1
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UniRef90-L2G0Q1 UniRef90-UPI0003B427B8 UniRef90_UPI00038918DF UniRef90-T0GCG2 UniRef90-Q29JD3 UniRef90-K9WZ87 UniRef90_UPIOO03F0CA86 UniRef90_S2YYA1 UniRef90-X0XV41 UniRef90-X7YA59 UniRef90-A0A024M069 UniRef90_D6WKD5 UniRef90-W5WFX8 UniRef90-D2HY65 UniRef90_UPI0003797B2E UniRef90-UPI0002656F48 UniRef90-B4VBI9
UniRef90_UPI00036A516A
UniRef90_B3S5F2 UniRef90-B2ITS2 UniRef90_A4TAA8
UniRef90_S2KEB8
UniRef90_M3X823 UniRef90-B1WAQ9
UniRef90_G3TF23
UniRef90_S4Y0C0 UniRef90_A3WGM9 UniRef90_UPIO00347BAB7 UniRef90-S9P4A2 UniRef90 UPI0003BCCAC7 UniRef90-UPI0003C0351A UniRef90-LOIVW2 UniRef90-UPIO00225EA74 UniRef90-S5UWY3 UniRef90-D6KBC1 UniRef90_A3IZ13
UniRef90_H6R5M7 UniRef90-M9Q2P3 UniRef90_UPI00020399DA UniRef90-UPI0004670D41
UniRef90_E2PUP3
UniRef90_C3ZCL0
UniRef90-C4ZLT3
UniRef90 H015Z6
UniRef90-S5VPM9
UniRef90-L7MZT3
UniRef90_C3YLJ8
UniRef90_UPIO00234EA0B UniRef90-W5MRH6 UniRef90-X5KGG2 UniRef90-S8DXD4 UniRef90_UPIO0032B0E59 UniRef90-W7STP7 UniRef90-W5TDM1 UniRef90-B3RXL7 UniRef90_L9KW63 UniRef90_A0A022MQ30 UniRef90_UPI000360F9E9 UniRef90-K9UFK6 UniRef90_UPIO0038BFE72 UniRef90_UPI0003A4CEA3 UniRef90 Q82JE9 UniRef90_UPIO003A768D8 UniRef90_S3BVB3 UniRef90_C3XZU1 UniRef90_V8D2M6 UniRef90_UPI0003AF8747 UniRef90_Q7NCB6 UniRef90_F7G5J4 UniRef90_S4T2N5 UniRef90-W9SJA3 UniRef90_UPIO002C62A6F UniRef90_J2ZXP2 UniRef90_UPIO0020D91FE UniRef90_Q9ATU1
 GVGTCPAAKHRRQRRFIQPAFQRDRLDHYCRLMHDEVTAL SSNGKRWKEDRRFS LTTLRNFGMGK RSDEDRVQEEAHCL DFSNGEMWKQTRRFALTV $\operatorname{DRNMGMGKRTIENRIQEEADCL}$ SEPN WKKAHNILLPTFSKQAMKGYHPMMVDIAEQL S LLLQS GATHQRQRKLLMPPLHGDRLKVYGEKICEI GDRVV S GVVTGAAHQTLRKYLYQAFAPRALADYATTMQNITHRY SI FVLEGNPHRRERKLLMPPFHGEHIQTYGQLICDLTDKV SVLAVDGDEWREQRDLLDPFFFFRQI TDYDPKMRKQADRR NFDAPNHTPYRTALDRTLKPARIKRLAEPLERHAEEL $T L M T L R N F G M G K R S Q S L A E A F E K N G K G G Q P F D P M Y L L V L$
$G L I T S D W A D H R R Q R R L V Q P A F Q A A R T A T Y A E V M E R E C E A E$ SLATQEGGVHSSRRRILFQAFQPRALESYDPTIEKDTQRY GLVLSEGELWERQRERI QPAFYMDRIADYADTMTAEVRTA TSKGVEEENWGVAHRVLMSAFGPDSIRGMFDDMHDIAAQL ALVGHDPDHHRLIRKITSPAFSRNVV DNDNRRDEPD $R W K Q L R Q F S V A T L Q R P V S H A V G N V I S S \square A F G D C F D Y Q D Q T$ LLT N STMRVEGDRHRRQRQLLMPPFHGERMRAYGAQDSSUTERV TWKDI $\qquad$ $R R F S L M T L R N F G M G K R S D E E R V Q Q E A R T L$
$G G P G Y R S R G A W D M A L R P F Q D P R N P Q A K Q L$
$G F L F D D P P D H T R D R K D V K A F A P K V V N A D R P D D G A V D G$ SVLVIDEDEHHERRRQMLPPFHRDAVARQTEIMAEIAAAN K WK K HRK ILTPAFHFQULEQFVDVEDSCSNVL SLVTTN NGTE WERRRAAVEPAFRREPLLGYGQVVTERSTAM VFSNGEKWKQTRRFSLTILRNMGMGKKTIEDRI QEEALCL NGLDGEEHRRVRALLDPLIFSPAMERLRPVLERVAADL TLLLVPHQRWKRVRVMLSPAFSASKLKFMMNLMNQSAETL GUVTTDGDFHRKQRRMIQPAFHRSHIAEYAEVMGRAAEEM GLAASDGPLHRSQRRDLQPAFQRSRI GGYVELDRRRAEQA GILQANGPQWSRNRRLLTPAFHFDVLKSYMKVFNECADUL
 SMVFLS GADWKRHKKI ANPAFQRSMPVK IFGNLT IDKMFET RWKEMRRFCLTTLRNL GMGKSDLESRVQEEAYYLMEE DMSNGERWKTMRRFTLTTRNFGMDPVNLLGPAVSND CSU TWKEMWRF S GLMLDFRRKRKLLQPAFNHRRLEGHMADMTRQADLL $G L M L L D F D H H R \| D R R A L S I A F K P G P M R H Y S G I S R E V A K W E$
$N L F T S D G E L W Q A L R A T I Q P A F H A Q R I N A Y A D T M V N Y T K A M$
$G$ GLVTSEGDFWKRQRRLAQPSFHRERLAGLTGVMTETAAEV

LVSECDYERWHKQRRDMD LIAFSRSS LVGLMGTFNEKAEQL GLMLLDGQEHLLHRRIMQEAFTRSRLEAYLTQDNG\|IEQA GLMLMDFDHHRADRKALS DAFKPEPMRHYVGSLNRGIADR TLPALNPPDHTWVRRSAGMFDRASLEDLRGTVGRITGRL SLSVSRGEEHRFQRRLIQPAFRPAKI A AYTTAVAADTRRV HKQRRQI L YEVFKPRMLDSYFNTMVKDTEKY ALLVTDGERHRRLRRLVTPALTARRVERHLGTVTRHIEDA ALFFHQGDYHNRLRKLVQGSLSPEAIRNLVADIEALAVHV ILFNGECWKQMRRFSLI LRGFGMRKMKEKPFDPTYRFSCA GLASCPYDMHRRQRRLVQPAFRPARLARYADAMTARDAELD $\square A A A R W G T Q F K Q R K K F A T T A F K N L G M K E Y E G E P F D I A H N D$ NGMDSTEHTAYREALDRFLTPEALTPFRERFRRVAADL

SLSVSRGEEHRFQRRLIQPAFHPARDAAYTTAVAADTRTV GI I FSNGETWKQLRRFALTTDRNFGMKS DEERIQEEAQYL
G $\square G T V D G S E W A R H R K V V T P A F A M D K \square K M M T E T M V S S A E C L$
SVLVVDGDVHRDRRRLMLPPFHRDAVARQAAVMAEVAADN GFAl AEDSLWTVRRRAVVPSDHKKFLSVIVERFCRCAERL SWKEM RRFSLMTLRNFGMGKRSIEDRVQEEARCL FNDEPNWQKAHD LLPAFSLQSMRGYHPAML EVANRL LIGADGGELWQRHRRLMQPSFHRPKIAKFTTGMVEETATM GLLTSNGNHWARNRRLLTPAFHFD\|LKTY

 SVIDCLSGSQHQRQRQLMMPPFHSDRMRTYSQVDNQVTTET

[^8]
## UniRef90 M4CC11

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UniRef90-D8J6N2 UniRef90 L2G0Q1 UniRef90-UPI0003B427B8 UniRef90_UPI00038918DF UniRef90_T0GCG2 UniRef90 Q29JD3 UniRef90_K9WZ87 UniRef90_UPI0003F0CA86 UniRef90_S2YYA1 UniRef90_X0XV41 UniRef90-X7YA59 UniRef90_A0A024M069 UniRef90_D6WKD5 UniRef90_W5WFX8 UniRef90_D2HY65 UniRef90_UPI0003797B2E UniRef90-UPI0002656F48 UniRef90_B4VBI9 UniRef90_UPI00036A516A UniRef90_B3S5F2 UniRef90_B2ITS2 UniRef90_A4TAA8
UniRef90_S2KEB8
UniRef90_M3X823 UniRef90_B1WAQ9 UniRef90_G3TF23 UniRef90_S4Y0C0 UniRef90_A3WGM9 UniRef90_UPI000347BAB7 UniRef90_S9P4A2 UniRef90 UPI0003BCCAC7 UniRef90_UPI0003C0351A UniRef90_LOIVW2 UniRef90_UPI000225EA74 UniRef90_S5UWY3 UniRef90_D6KBC1 UniRef90_A3IZ13 UniRef90-M9Q2P3 UniRef90_UPI00020399DA UniRef90_UPI0004670D41 UniRef90_E2PUP3 UniRef90_C3ZCL0 UniRef90_C4ZLT3 UniRef90_H0I5Z6 UniRef90_S5VPM9 UniRef90-L7MZT3 UniRef90_C3YLJ8 UniRef90_UPI000234EA0B UniRef90_W5MRH6 UniRef90-X5KGG2 UniRef90_S8DXD4 UniRef90_UPI00032B0E59 UniRef90-W7STP7 UniRef90_W5TDM1 UniRef90_B3RXL7 UniRef90_L9KW63 UniRef90_A0A022MQ30 UniRef90 K9UFK6 UniRef90_K9UFK6
UniRef90_UPI00038BFE72 UniRef90_UPI0003A4CEA3 UniRef90 Q82JE9 UniRef90_UPI0003A768D8 UniRef90_S3BVB3 UniRef90_C3XZU1 UniRef90_V8D2M6 UniRef90_UPI0003AF8747 UniRef90_Q7NCB6 UniRef90_F7G5J4 UniRef90_S4T2N5
UniRef90 W9SJA3 UniRef90_UPI0002C62A6F UniRef90_J2ZXP2 UniRef90_UPI00020D91FE UniRef90_Q9ATU1

130
140
150
160
VSTYQEMKKFAFDVGIVA\|FGHLL|ECSYRDM|L|KHNYNIVDK A GS WR P TARMMFSAD\|AADAVTAVQRNFPVVWKGVYRRMV
 $V$ EALLKKTNASACDPTFLLGGSAPCNVICCSVIFGNRYEYSNK

 L K R WE KMETLT WYP ELLK K YTLLDIAACQLLFIGGVETESEEEALDE $M Q Q V R P$ GQ $\square F V I H D P E R F G Q L K G L I A S M M D Q F K S P F T S G L$ A ES STP G Q TY SAVE EMK GLT FD LL GS T L L G Q D P GK R S G D D





 VS QL K I C E T A M G $\square$ K K HA QLQ S E S E Y V K AVQT I CRVMMHK Q S




 L D RWQ A A R GPF D R SLGFDA EWS E QAPELAEAVRVGMEY LDNQ
 L G V I A K Y A R T R E A V C F F D R C A L A A T K








VETLEAQAOTPVSMODMTCATMDTAKAAFGMETMB
 MEEWGAGPMKFYPADLLAADSFIGIPFGEEADKVNQAFVDM LDTLAARLDE GEADFNALVSEELPVAT IGHWLGLPT ADF TD S WR S GET QDDIS DTMHALLLMRVVAR CLLRTVSH GIGYK RTMAA
 MAGWAPGD IVDLLYPPLRRATRAATLESLVGAAAVDRSEGL
 TE S WC G GQTVVDVVPEMQA LTTARVVTVETMFA DS LDEPA E G WY

 LE QLQ GTKEEPFDPTFLLNCATSNDIDSVVFAKHYDYDDK

## 

VA R WPVGTPFAAAPKMAE $\quad$ TT LE VI LRTVVIGASDPARLDGS V E K L K S D A M A G D SVNMEEKFS QLTLDVI GLALLFNYNFDSL $V$ E ELLRKTNASPCDPTFILDSLAPCNVICSSII FHNRFDYK DK
 IV E R WS D R H T D G E V T D L L P D L T R V VL R IVVMRTVF G L D DR D T


 | $\square A$ |  |
| ---: | :--- |
| $L D V Q D G Q T$ | $F$ | L L K WERCS F S Y R F N S L Y R E E M H P F VGA MVR S L VESGERA R DEL DA LLAA ES GSAGYADLGAQYTRPDLL MVTGKDFGCPD










## UniRef90 M4CC11 UniRef90-12N8S7 UniRef90_UPIO000E225C8 UniRef90-UPI0003315DEC UniRef90- W4C989

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UniRef90_L2G0Q1 UniRef90_UPI0003B427B8 UniRef90_UPIO0038918DF UniRef90-T0GCG2 UniRef90-Q29JD3 UniRef90-K9WZ87 UniRef90_UPIO003FOCA86 UniRef90-S2YYA1 UniRef90-X0XV41 UniRef90-X7YA59 UniRef90-A0A024M069 UniRef90_D6WKD5 UniRef90-W5WFX8 UniRef90-D2HY65 UniRef90_UPI0003797B2E UniRef90-UPI0002656F48 UniRef90-B4VBI9 UniRef90_UPI00036A516A UniRef90_B3S5F2 UniRef90_B2ITS2 UniRef90_A4TAA8 UniRef90-S2KEB8 UniRef90_M3X823 UniRef90-B1WAQ9
UniRef90 G3TF23 UniRef90_S4YOC0 UniRef90-A3WGM9 UniRef90_UPI000347BAB7 UniRef90-S9P4A2
UniRef90_UPI0003BCCAC7
UniRef90_UPIOO03C0351A
UniRef90_LOIVW2
UniRef90_UPIO00225EA74
UniRef90-S5UWY3
UniRef90_D6KBC1
UniRef90-A3IZ13
UniRef90-H6R5M7
UniRef90-M9Q2P3
UniRef90_UPI00020399DA
UniRef90_UPIO004670D41
UniRef90-E2PUP3
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UniRef90_C4ZLT3
UniRef90 ${ }^{\text {H0I5Z6 }}$
UniRef90-S5VPM9
UniRef90_L7MZT3
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UniRef90-W5MRH6
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UniRef90_UPI00020D91FE
UniRef90_Q9ATU1
 $\square P L P L D H A L P T P A N \square R F T R A D R R L D D V I D R M L D T Y R R D T A$ NFLTLM

## E Y

 FDENDRTSSTSWDQEKHRKK S RQDHSPFDESMVRALNEAMQKSSRLKIQNLLMVKTKRQFQ GF LQQQ WGS WSPWGRMVDTRQK DDDLLYAEIRERRQNPEG KVYETWSDPVRFPGNKFDKADHAREQL LARFDKLIDQRLQQLFFPALQKDWTPWGAFRRLKQQVSQLIVAEDRERRQQKDS

 GQLLNFFPNVLQY PPGPHQNDFTYFDKLKEFVREEANAHK ПQHCLP VVEGAYRQANRRFDDAGTRLNQLIDRMDDDYKA NLF E EWVQFS DP DNDP WT TFGKAMKC RTQLLKEANQKSDD ARMVPK WVPIPMWRRYKHGDREMEAVIQEFVAARRGDGVE YREETHPFITAMYAVLKEAGDKGLRVLPQVFYKKQDKKFK PQDKQTVLTFTETWNPQEDSNRAIDILLEVIAERRASPGG
 FSFWQRLDDFFKYTQAGQERDGALRVLHDETNRQDDVGSK KQ LLNA WLDAMPWGY DQNRNKALSELLYAE DRERRQKYDP
 GTFTEWVRDVLEFAHDPERRRRGIVGII QYLDGAINEREE PQFDPFLTFTGQHSEDFSDRLAAGTWLREYLRGLI ARRRS

 EWMRDNHEA TRSGELARTAEVASRFEGIVRRQDRAARQS RGFLANSDHLAYHFTSSYALDMTGLMENDHEVVKSRRDRGV
 HQFLIACRENTYLGESRDFNLFHHSSFDYKLSQNGRKFHR

 GFLEKFNENMKILLSSSWVQICNSFPALID YLPGSHHKDFK LSQQHDPGPHQN| FTYFNKIKQFVKDEAKSHKDTLDANCPR GAMVVPDWLPI RHKREMKRAI RILLDSVARQMIDARRRERGG VQASVAPVRSPLPFTKMKKGVDGRKFMVEFLTAETDRRRK
 D DRE HI E NF NPASPR $N T \square A K V P G D M A C D R Q T R E S V R F \square R Q V G K E W V Q R R R E A D Q R$ TRAFIDTVRHPGLPNRWSKGLAGRKVLEDYFRPLVAQKRA VQASVAPIRHSLPFTKMKKGTDGRKYLVEYFTRETERRRA ARLRDLTHDQVFTQEQLAKSDAATAQLRAYFTELVRERRA P LGDMEKDPTPANRAYARANGRLRQDVADMDARRGRSETG PLYEQWQKPWTKFGKAWKARNLLKKELKEDI DKRQKEQEA D D WLH DIU RADDTRVWRRALLA RSSVHRWVVAEDRRRGER $G Y N S F P T N I P G T P Y K K A L W A R K R L S K I L S E L I G G Q R K E K R L L$
$Q F Y N D Y V S F L K Y F P G P Q T K V Y D L M L G M R V F I C K R I K E N Q E ~$ RRMF QPSALRRLPSRGSRRYRRANARLRGLVDRLVADRRA ERTTPHPFITAMVSALDHAQRKDTFIPGLDFLRRGAEARQ PLLREVPVASVSVSRQUAKDQNVLKEEMARHREHLDRENP
DWVAENHAATRSGDRSWTRQVESFDDLI RSVLEPRRGARE V VAPMGVMEKLPTPANRAYDHANARLRQ\|VADMDAARRRSD KF L A IMAGMHENFE ILNSPWGQLANLFPSFMDLIPGPH HR KEVFHAQKFNYLPTKSNRFKWMLQKKLQNMLSEMIQCRLA
WDLLATDASPGLLRRRPWQA LRRDMAEADWLLYAEDAERRA TSNSPVIDAINALCK\|IPRQIKAERAVSLIVRTVEGLIAK $D F D E L M C N D F P F L D D C F P G U C S D L L K N S N Y T R K F D M E K V R$
$Q R P D P H P F V Q A L V R G L A H A Q A K A R E W I G P I M N K G A D E Q Y A$ EQMENYFRFPFPPLNFPTPRNRRLMRLIVGVQDFVARQDE NLLHHNPWIYFNFTSAGKQFQQQVNVSHEFTEGIIRKRQA



 GLGQPHPFITSMVRALGEAMNQLQRLGMQDKLMFLTKRQFR QRLGLQDKLMVITKRQFNHDIQAMFALVDKLIAERRAQGT DFFYNIVDQVMGMRRNEHGRVDFMQLMMNAHKDDRADNDA QA GVAVI RKPVPGTRWWKGLRSRK LLEEFFYKH DPAKRAT

 YELSRMF RESRESRDPRQRNLSGLGUVNYARKLTARNRV CYFILEKGYNSMP DNFPGTMFHKAMKARKE LSQULAKIIS



UniRef90_M4CC11 UniRef90-I2N8S7 UniRef90_UPI0000E225C8 UniRef90_UPI0003315DEC UniRef90_W4C989 UniRef90_UPI000372F49C UniRef90_UPI0002FFEB3B UniRef90_B4VZ60 UniRef90_E4NLN6 UniRef90_Q2GU74 UniRef90_L7N3N3 UniRef90_G2P5W3 UniRef90-K9Q4L1
UniRef90-D8J6N2
UniRef90_D8J6N2
UniRef90_L2G0Q1 UniRef90-UPI0003B427B8 UniRef90_UPI00038918DF UniRef90_T0GCG2 UniRef90_Q29JD3 UniRef90_K9WZ87 UniRef90_UPI0003F0CA86 UniRef90_S2YYA1 UniRef90 X0XV41 UniRef90-X7YA59 UniRef90_A0A024M069 UniRef90_D6WKD5 UniRef90_W5WFX8 UniRef90_D2HY65 UniRef90_UPIO003797B2E UniRef90_UPI0002656F48 UniRef90_B4VBI9 UniRef90_UPI00036A516A UniRef90_B3S5F2 UniRef90_B2ITS2 UniRef90_A4TAA8 UniRef90_S2KEB8 UniRef90_M3X823 UniRef90_B1WAQ9
UniRef90-G3TF23 UniRef90_S4Y0C0 UniRef90_A3WGM9 UniRef90_UPI000347BAB7 UniRef90_S9P4A2 UniRef90_UPI0003BCCAC7 UniRef90_UPIO003C0351A UniRef90_LOIVW2 UniRef90_UPI000225EA74 UniRef90_S5UWY3 UniRef90_D6KBC1 UniRef90_A3IZ13 UniRef90_M9Q2P3 UniRef90_UPI00020399DA UniRef90_UPI0004670D41 UniRef90_E2PUP3 UniRef90_C3ZCL0 UniRef90_C4ZLT3 UniRef90 H0I5Z6 UniRef90_S5VPM9 UniRef90_L7MZT3 UniRef90_C3YLJ8 UniRef90_UPI000234EA0B UniRef90_W5MRH6 UniRef90-X5KGG2 UniRef90_S8DXD4 UniRef90_UPI00032B0E59 UniRef90-W7STP7 UniRef90_W5TDM1 UniRef90_B3RXL7 UniRef90_L9KW6: UniRef90_A0A022MQ30 UniRef90_UPI000360F9E9 UniRef90_K9UFK6 UniRef90_UPI00038BFE72 UniRef90_UPI0003A4CEA3 UniRef90 Q82JE9 UniRef90_UPI0003A768D8 UniRef90_S3BVB3 UniRef90_C3XZU1 UniRef90_V8D2M6 UniRef90_UPI0003AF8747 UniRef90_Q7NCB6 UniRef90_F7G5J4 UniRef90_-W9SJA3 UniRef90_UPIO002C62A6F UniRef90_J2ZXP2 UniRef90_UPI00020D91FE UniRef90_Q9ATU1


UniRef90_M4CC11
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UniRef90-D8J6N2
UniRef90 L2G0Q1 UniRef90-UPI0003B427B8 UniRef90-UPI00038918DF UniRef90-T0GCG2 UniRef90-Q29JD3 UniRef90-K9WZ87 UniRef90_UPI0003F0CA86 UniRef90_S2YYA1 UniRef90_X0XV41 UniRef90- X7YA59 UniRef90_A0A024M069 UniRef90_D6WKD5 UniRef90-W5WFX8 UniRef90-D2HY65 UniRef90_UPI0003797B2E UniRef90-UPI0002656F48 UniRef90-B4VBI9 UniRef90_UPIO0036A516A UniRef90-B3S5F2 UniRef90-B2ITS2 UniRef90_A4TAA8 UniRef90-M3X823 UniRef90-B1WAQ9 UniRef90-G3TF23 UniRef90_S4Y0C0 UniRef90-A3WGM9 UniRef90_UPI000347BAB7 UniRef90-S9P4A2 UniRef90_UPI0003BCCAC7 UniRef90-UPIO003C0351A UniRef90_LOIVW2 UniRef90_UPIO00225EA74 UniRef90 S5UWY3 UniRef90-D6KBC1 UniRef90_A31Z13 UniRef90_H6R5M7 UniRef90-M9Q2P3
UniRef90-UPI00020399DA UniRef90_UPI0004670D41 UniRef90-E2PUP3 UniRef90-C3ZCL0 UniRef90_C4ZLT3 UniRef90-H015Z6 UniRef90-S5VPM9 UniRef90-L7MZT3 UniRef90_C3YLJ8 UniRef90_UPI000234EA0B UniRef90_W5MRH6 UniRef90-X5KGG2 UniRef90-S8DXD4 UniRef90_UPIO0032B0E59 UniRef90-W7STP7 UniRef90-W5TDM1 UniRef90-B3RXL7 UniRef90_L9KW63 UniRef90_A0A022MQ30 UniRef90_UPI000360F9E9 UniRef90-K9UFK6 UniRef90_UPI00038BFE72 UniRef90_UPI0003A4CEA3 UniRef90 Q82JE9 UniRef90_UPIO003A768D8 UniRef90-S3BVB3 UniRef90-C3XZU1 UniRef90_V8D2M6 UniRef90_UPIO003AF8747 UniRef90-Q7NCB6 UniRef90_F7G5J4 UniRef90_S4T2N5 UniRef90-W9SJA3 UniRef90_UPI0002C62A6F UniRef90_J2ZXP2 UniRef90-UPIOOO20D91FE UniRef90_Q9ATU1

A S C|LTTWLKYLHDDQSLLTWGQTRNMPDTHKVILESLIRMAS AS GLTWAFHLLAENPDVERKLLAEVPYTQRVVAEALRLYP STGLLRYGLLLLAMMPEPCMQDRSHMPYTDAVVHE IQRYSD AKAQKE IERVIGKHRSPCMQDRSNMPYMDALVHEVQRFDD S GLLS F ALDYFLLKNPDPQYEEDLQLSYDRMILSESLRLWP ASALA WAFYWI YQNPK IVYKVMAEGPYLTAVCNETGRIAP


 ASALTWAWFLLGRNPRAEAALHAEVDEYTQRVFSEALRLF TSSSLVSFCLFVGQNRNVFEKICAQMTY LDDQVFKEVLRIVP A TALTFTWFLLAQHPAVERRLVAELEYTEQVIREAMRLYP LVAQQWSAYALLTNPDQVPLALESTAAFSNAFSEIMRWAA EKVHQEDDGVI GRHRGPAAEDRSRMPYTYAVIHEIQQRFN ATNLGLQYHHLATHANHQATDRADPSRDPLAVEELLRAY

 WS Sil GSTMWHLATHPDDRRRLIAEPELMPTADEEFLRAY VNL GNA L LAMMLRDRRHW
ATALSWALERLTRHPA ILDDKASGDDDYLDAVVAKETLRDR



ST T L L R Y A L L L L L K H P E P C M Q D R S R M P YMMN A V L H E I Q R Y I D






 T S T L A S F C R L M A Q E G E I L G K I R E E Q Q R F P K Q L T DM M L
 S S ThL R Y G C L L L $\quad$ M K Y P P E V Q V







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


 GS MI M S L L L V L T E R P D L G D K I R D E V R Y TA N V V T E T L R L Y P










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





## UniRef90 M4CC11

UniRef90-I2N8S7 UniRef90_UPIO000E225C8 UniRef90_UPI0003315DEC UniRef90 W4C989 UniRef90-UPI000372F49C UniRef90_UPI0002FFEB3B UniRef90-B4VZ60 UniRef90_E4NLN6 UniRef90_Q2GU74 UniRef90_L7N3N3 UniRef90_G2P5L3
UniRef90_K9Q4L1 UniRef90-D8J6N2 UniRef90-L2G0Q1 UniRef90 UPI0003B427B8 UniRef90_UPI00038918DF UniRef90-T0GCG2
UniRef90 Q29JD3 UniRef90-K9WZ87 UniRef90_UPIOO03F0CA86 UniRef90- S2YYA1 UniRef90 X0XV41 UniRef90-X7YA59 UniRef90-A0A024M069 UniRef90_D6WKD5 UniRef90-W5WFX8 UniRef90-D2HY65 UniRef90_UPIO003797B2E UniRef90-UPI0002656F48 UniRef90-B4VBI9 UniRef90_UPI00036A516A
UniRet90 B3S5F2
UniRef90_B2ITS2
UniRef90_A4TAA8
UniRef90_S2KEB8
UniRef90_M3X823 UniRef90-B1WAQ9
UniRef90 G3TF23
UniRef90-G3TF23
UniRef90 A3WGM9 UniRef90_UPIO00347BAB7 UniRef90 S9P4A2
UniRef90 UPI0003BCCAC7 UniRef90_UPI0003C0351A UniRef90-LOIVW2 UniRef90 UPIOO0225EA74 UniRef90- S5UWY3 UniRef90-D6KBC1 UniRef90_A3IZ13 UniRef90 H6R5M7 UniRef90-M9Q2P3 UniRef90_UPI00020399DA UniRef90 UPI0004670D41 UniRef90-E2PUP3 UniRef90_C3ZCL0
UniRef90_C4ZLT3
UniRef90 H015Z6 UniRef90-S5VPM9 UniRef90-L7MZT3 UniRef90-C3YLJ8 UniRef90 UPI000234EA0B UniRef90-W5MRH6 UniRef90-X5KGG2 UniRef90 S8DXD4 UniRef90-UPI00032B0E59 UniRef90_W7STP7 UniRef90-W5TDM1 UniRef90 B3RXL7 UniRef90_L9KW63 UniRef90-A0A022MQ30 UniRef90 UPI000360F9E9 UniRef90-K9UFK6 UniRef90_UPI00038BFE72 UniRef90_UPI0003A4CEA3 UniRef90 Q82JEs UniRef90_UPI0003A768D8 UniRef90_S3BVB3 UniRef90_C3XZU UniRef90_V8D2M6
UniRef90 UPIO003AF8747 UniRef90_Q7NCB6 UniRef90 F7G5J4 UniRef90-S4T2N5 UniRef90-W9SJA3 UniRef90_UPI0002C62A6F UniRef90 J2ZXP2 UniRef90_UPIO0020D91FE UniRef90_Q9ATU1


ALASITAAW RLRPLPGHRIRPVA

VLGMVLKHFENYELDVK QTLTLKPGDF
EWELTPGQNLER VLPFSRPRDGLKVSF $Q L T L A Q Q Q P E R P Q R R S V T L$
RLEWAG NGELDLSPQMT TQPRGDVPM
F LT T I LQKF $\quad$ LKPTVD
 I LATLAGQY HLLELDSDPD LDLSVSUT TRSGDPIRMR
ALAVLFQNF
SMSELFKRFPNASLAEEPER
 S L S SLLRSFQFMHQP DPLAELVMKSGNGVR

 A V E E WL A RVPE FE
VLRETLRRVDLFTTTAPDEVQRVKHVTLV
VLSKI LRKF ELQPAVPQHNL
VLAAVLQRFS VDVPGPVRPSPDVVL
LLTNILQRFS
LLRALLERFA
TLAHILKHF E L KLATPGQEVPKR

I AA AKILQRF
VLATVLSRW QMELA DSKPVRPVRKGLLFSPA
TLLRTMLREF RLEPTDEPDEKPHSRGVTVV

FLTSSLQKF TLKPTVPAETIMOTPQPKTN

VLARI AQSY TVRLSRDGDITPRAPVTL
LMAQLLQRY RIEAPEGAPDWQPWPIPQPKDGLKVTF
NLATILQNY $\quad R L S V A P G K F E T L Y R F N T R P K N G L P M T$
ILAMVAQRF RLRGTGAPVTADAHVTLRPHGTMPM
FFASLLQRFSFSAPAGERPSLQFQLGGT
VMAKLLQRL

MMAHLLTRYR
LLHQLVRRFPRDT L VRRPSWAPRVAFRRLLNDDVAL I V ATV AARW RLRP VPGTRLRLEPKATL
FSSLLVRKCQWDLLPNQNLEIIEFTPV
AFTTIAGRIDAQPLTTDARP
MTHHLVTKF RWEVAGFQSGIQYGPFPVP VNGLPARL FFTTILQNF QLKPLVPPQDLDINP LESGFANIP
TLATIAGRWRLEPISGTHVRPAIGTFMSPRGDR

FFSTMLQSF
$A V Q E L L A A T S S T A L E P Q Q P A E R A V S P V G G W A K V A V V L$
MFNA ADHMPNLAPAGDPKRLQ SGWLNGDKHWQVDF LVATVAARW RLRP VPGSAL RPEPKATL
FLASILQNF KLKPDTDPQDID LIKPHLS S $\mathrm{L}_{\mathrm{L}}$
FFSTLLQSFTFKTPEGAPPPITWTPNPF
VMAMILQKF
FFTSFLQNFTFKAPEGEEPSVEFQLGGDL
VLRETLCRADDFTTETAGERQRVKHVTLV
GLAVVLQRLDFEDVPDQUIGMTTGATIH

 AlAKKVHRFDF【T
LTAATATAYRFEQAPGSDPRPR
IVAAI SAKYRFRQVEDSDATTRDG DT LRPHR LLVEPVEW ALAKILSRWELDELVDKRDDHPKRRGLVTAPER
FFTVLLQNF
F L A KLLQRF EVTAADPGYELQDKHTLTM
AVGRIIFDHFTKAELT LDPADQLPWRSGPVVRGLRLLPVRY VLGMVLKHF
VLGMVLKHF
GLARVLMKYRF VTGPDTDDPL
IMHQLLRNF EWSVPDSEI PMNYASLPDPKDSFPVTL

VIATVLLERDLRLVQPRLLRPVRRGVTLAPPEGL
FFTTILQNF TLKSLIDPKD 1 DTTP
$A L P A L V R R F P T L R R P S P$
$L L H H L T T K Y Y R W S V V G A Q N G D Q Y G P$
FFTCLLQRF SWFVPAGQPRPSDYGVFGSLVT
A I NGLLDRFPNMTLDPSKPKPEYR GLEHRGMTAVTVKL
$\stackrel{A}{L} A$
$A L S T$ L $\mathrm{L} R \mathrm{R}$





lupas_21
lupas_14


[^0]:    

[^1]:    
    $\square$

[^2]:    

[^3]:    

[^4]:    $\square$

[^5]:    

[^6]:    

[^7]:    $R Y G P I V R I Q F F N \quad R S V I A$
    LT S E F D A D P A GVY ERLR
    $R Y G P \vee A P V G L M G Q P V W L$
    
    AMRHDPFKQSDERHAKYGRVYGVFNGRTP LV P Y K T L L E L S K K Y G S V F T V Y L GP K K V V V $R Y$ G D P F T M RVGVFP P LV $M$ E Y GPVF T LQL GVQRIVV

    Q N P NDFFAKQRRYGS DFKTH $L$ G GCPCVM
    F T R L R R R F GDVF S L QLA WT P AVV ALRDAAPVHKHSMGPPREAMT
    

[^8]:    TEE P NWQKAHR LLMPAFGPAALKRMFTGMDDDAEQL GYMF LD GDEHRLTHHSALRPFQDGHSPQGWELRAAVARYA SETEEPNWRKAHNILLPSFSQSAMRGYHDKMVDLAVQL HTDEPNWQKAHHLLLDTFS QRAMKGYHNMMVDIAVQL $M L T Q L V D D D W K N V R S T I S P A F S G G K L K Q R N P E D P F V V Y S K$ GVMLLDFDEHRHHRLILLQQAFNAKVLRGYMDAMQPIIRER SWREMRRFADTRDFGMGKRACEDKII E ECFDTTGQSI NCA V S LLLLD GERHQQQRRLLTPPFHGERMRAYGELIRQVTEEV
    
     F SPNALLNK
    R AVGNVIA SLTYGRRYEYNDACFLRILDL LI LTN MV G K A S H K R R L R R SA A Q P L L F K R P K V V I D W W N K R WI E E T V D
    

