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$T T P W L I A G L G N P G P D Y S G N R H N V G F M V A D L L A G R T G$ MYI I A GL GNPTREYEKTRHNVGFEVIDVLADRLG S D A A QP WLVVGLGNPGPGYAGNRHNVGFMVADLLAERVG
 $1 \mathrm{~K} L$ I A GL GNP G G DYAETRHNA GFWFV E QL A R R Y N I K L I A GLGNP GEKYR GTRHNDGF DVI DELAHRLQ MKLIVGLGNPGPRYEKTRHNIGFEVIDELASRNG TDEASPWLVVGGLGPGPEYAANRHNVGFMVADLLAADRMR MKLIVGGGNNPGDKYAQTRHNI GFWVIDRLSEEWG MKCIIGLGNPGKKYEATRHNIGFMVI DELLSRHN MKLIAGLGNPGEGYKETRHNIGFAVIDLLSRKFQQ $\square K L I V G G G N P G P E Y E A T R H N A G F W W V D E A A R L L K$ MYLVAGLGNPGKQYERTRHNMGFDTIDELVDRHR
GSPAVRPTLIVGLGNPGEKYYRTRHNIGFMVVDALADRWH
 $M K Y \operatorname{V} G L G N P G K N Y E K T R H N V G F M V I D E L C R R W G$ MYII A GLGNPGRQYAHTRHNVGFDTIDVLAEKYN ATHTDSPWLVVGLGNPGPQYETTRHNVGFMVLDELADRMP MA D $!R L I V G L G N P G P E Y Q Y T R H N A G A W F V Q A L A D T Y R$ TTQSAIQLIVGLGNPGPEYSQTRHNAGVWFVQQLAHAFN MILVVGLGNPGNQYENTRHNVGFLTVDILAKKLN

 MKLIVGLGNPGAKYAGTRHNVGFDIIDRCAENLQ
GADENAPWLVAGLGNPGPEYAGNRHNVGFMVADLLAARLG MKVIIGLGNPGKQFDQTRHNIGFEVVDELSSKWG
MSADLWLVVGLGNPGPSYAKNRHNAGFMVLDVLAARAG MK L: A GLGNPGKKYERTRHNVGFMVVDELSFRHQ $M K L I V G L G N P G A K Y N L T R H N A G F M V I D S S L A K E Y V$ $L V V G L G N P G P Q Y E K T R H N V G C M V A D T L A A R V G$ $M K V F V G L G N P G R Q Y E E T R H N I G F M V I D E L A D K W N$ MY I A GLL GNPGKEYA GSRHNVGFMTLDEELADRYN $M K C I V G L G N P G K Q Y E Q T R H N I G F E V I D T L S N Q F S$
AGPRLIVGLGNPGPRYAGTRHNLGFMVADILAGRMG MY I A GLG GNPTKEYEGTRHNVGFDVIDRRLSRYN
 MKCII GL GNPGKKYNGTRHNVGFMVI DELLHRHS MWLIVGLGNPGERYARTRHNIGFRSVETLAERHG
 MAD DIRLIVGLGNPGPEYDNTRHNAGEWFLNQLADTEN

WLVVCLGNPGDKYENTRHNVGFMVADELAERKN $M Y L V V G L G N \square G K E Y K K T R H N I G F D V V D D I A E K Y N$ $D Q L W L I A G L G N P G P G Y A G N R H N A G F M V V D L L A A R V G$ MKVIVGLGNPGPQYAETRHNDGFLFI DGLAEALG MADLKMIVGLGNPGPQYSRNRHNIGFQCIELCAQRWG $M F I V G G L G N P G K K Y E N T R H N V G F D A D V C M V K E Y R$ MHI IVGLGNPGKKYDATRHNI GFEAI DMLAKRNN MLVFAGL GNPGKTYENTRHNVGFMTIDELSKEWN MADPWLVVGLGNPGPKYAGNRHNVGQMVVDLLAER VG $M K L F V G L G N P G K E Y E Q T R H N A G F M V I$ DELAKRWN MKMIVGLGNPGKKYENTKHNVGFMAVDDLANRHG $\square R L V G G G N P G P E H A Q Q R H N A G F W W V D R L A R R E R$ MK MIV GL G NP G S K Y E K T K H N VGG M V V D H L A S R H Q $M K L I V G L G N P G T K Y A G T R H N V G F S V I V G L A D K Y N$
$D G P W L V A G L G N P G P T Y A G N R H N A G F M V V D L L A E R T G$
$M L V C L G N P G D Q Y E N T R H N V G F M V A D Q L G E R Y R$ MRWIVGLGNPGPAYQSTRHNVGFMVIDELARRWN MFLI I GLGNDGEKYDSTRHNI GFDAIDKIAEVYN PWLIVGLGNPGKKYQGTRHNVGFEMVDALADAEG $M K L I V G L G N P G E K Y A G T R H N I G G E D I D D S A K T G L G$

 $\square R L I V G L G N P G A K Y E G T R H N D G F M A D D Q Q L A R Y W G$ MKLIVGLGNPGEKYRGTRHNVGFDCID Y CAKELG MKLIVGLGNPGGKYAKTKHNVGFMTIDRLAEKYS MKVIVGGGNPGGKYEGTRHNVGFEVLYELARKWQ
 $M K M V V G L G N P G K K Y E K T K H N V G F M V V D A L A Q K Y Q$


 $M K V I \quad G G L G N P G A K Y A M T K H N V G F W V V D G L S K R W N$ MKLIVGGLGNPGREYSETRHNIGWLVLDELAKRWE MKVI AGLGNPGRNYEKTRHNVGFQAVDKLSESLR IQLLVGGLGNPGPEHALDRHNAGFWLVD QIA TAA G
M S T MY LI I GLLGNPGREYALTRHNDGFEAVDYIA GQKN

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 A A A D Y Y K VV
 A L S A F Y K I P A E RVVVAIH D E LLDI GY GVL RLLKRGGGDN GHN G AL A D Y Y K I GPEN I VVI H DELLDD P F GAL RAK T G G G DN GHN G AVLD WY KL DPASVLVVYDDMDLPLGRLRLRGSGSAGGHNG
 A A A D F Y K V DPE HI I I V Y D DI S L DVGQLIRIRKKGSAGGHNG ALAGFYKVPLERLVVVHDELDLEYGTLRLKLGGGDNGHNG GII V N Y Y K I I D P E D L L V I Y D D I S L D V G Q L R I R K K G S A G G H N G S L A A S Y F K I A P E E E V $V$ M R Y Y K A L L R D F Y K K V $P A M D W L K A D L D E L V V V Y D D L D L P P G Q I R L R L K K G S S$ G GHN G $P$ LLME Y Y D I N V E DV L V I Y D D L D I P T G K V R L R R K G G H G G H N G PLLD Y Y RI P P E NLLV I Y D E L D L P V G K I R L R F K G S D G G H R G
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 A L A D F Y K I D T S Q L
 A MA Q F Y KL S P E QI L VA A DEELALEP GVAKFK LIGGGHA GHNG EWVNF Y KVVPPENLIVDQDDIDIPFATLRLRQKGSAGTHNG S LA A N Y QI KPE EMLV AAHDELLDLDPGVAKFK FA GSH G GHN G E I A R WY K L A A E D DI V V F D D L D L P V G R L R L R M K G S S G G H R G
 P F M D Y Y Q I P P E D L L V I Y D D L D L P V

 P L L M D Y Y $N$ N 1 A L A D Y Y N I D T Q D I M V I Y D D L D L E V G R I R V RP K G G H G G H N G GLARFFSVVEADVVVLHDELDLDFGTIRRLKGGGENGHNG P LL LD F Y K L D V E D L V V I Y D D L D L P A G K L R L R Q K G S A G G H N G


 P L A A F Y K I A P G D L L V A H D E L D L P V GTMMK L KRA G G H G GHN G PLMD Y Y DI K L E DI LI I Y D D L D L P V G K I R L R Q K G G H G G H N G ALR QWYKI DPARLLVIYDDLDLPFAKLRLRERGSAGTHNG A L A N F Y R I K P A E L L V A H D E L D L M P GT A K I K L G G S N G G H N G ALLANFYRIIEPE QILVVAFDELDDPPGVAKYKIGGGSS S QNG QAADFYKVSPDHVLVVSDDVSLPVGRLRIRKSGSAGGHNG EA A N F Y K I D D K E NI I V I Y D D M S I D I G K L R V R S K G S A G G H N G A LLRD F Y K I E P A QI I A AV H D E L DVVD Y GVL R L K L G G G D N G H N G ELVNFYKI APEDILIVHDDMDLPLGKLRLRDHGSAGGHNG PLARFHRIDPSSILVIHDDLDLPAGKLRLRPGGSSGGQNG A L V D Y Y K V $V$ D P E Q L L V DIVVQF Y K V D P K N I V V L Y D D I Dil P V G T L R I R E K G S S G T H N G PLLD Y Y E I P VD NL KV I Y D DL DL PTGRIIRLRTKGSAGGHNG GLRSYYRVPPE QTIVVHDELDIPFDSVRLKRGGGDNGHNG
 AMARFYKI TPEEEILVVMDELDDLPPGQVKLKCGGGHACHNG

 PAA D F Y K I P P E H I I VI S D DTA L D V G K L R I R K S G S A G G H N G
 QIV V F Y KI P L K QVLVVY D DL DLP F GK L R L L P K G GH G GHN G P L M M D Y F Q i P L E D L V V I Y D D L D L P A G K il R L R K K G S A G G H N G
 QAAS F Y K I P P E RI LVVMFD DI S L P C GR L R I R R K G S D G G H N G A V LD W W K L E P Q S V L V I Y D D M D L P D L G K I R L R H S G S A G G H N G M R D Y Y K L S I E D D L V V I Y D D M D L P P G K I R L R R Q K G S A G G H N G S L V K F Y K V V DLE DLL L V I S D D L N L $R$ L L D K L G V E E P D R L V V V H D D L D L P F G T I R I R V K G G H G G H N G P L M T Y F G I Y Q E ELLVVV Y D D L D L A LiGK I R L R QK G S A G G H N G

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 PLMDFYQI PAENLLVIYDDLDLEPGSLLRIR\|KGGHGGHNG
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RLIMN WDEMQSVIQTCADACEEWLEKPFREVMNRFNS RKELDYFVDRAADAVETLIVDGLERAQSTYNS QVAVQESI QKAADACEKWLNKQFEEVMNEFNA KPVIDEMVQKAADACEMWLEKPFLDEVMNVYN RDAVEQTVDRSLRALPHCI AGEMDKATALIHT GPIVAEVLELATKAIETSLRDGVEKAMNLYNAR RKELAYFVDLCADAVESLAKEGLEAAQNRFH QPEVEGAVKQAADACEKWLSHTFLEAVMNEFNQK FEGLDLICEHAAEGAELI DNQGLELAQNRMHA QQQMDEADDEALRCTELLIKEDLVKAMNRLHAFKA QKA/EEAI LLAADAVDDIVRDGLVKAQSRLHSFKAS QQKI DAVI DEAVRSTYTLMKQDMNAAMNQLHAFK APLIEQA VRAADAVET DKDGDNKAMNAFN
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$R$
A

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QEELDHTFQTGLEA




Q K I L P Q V L D LAA Q D T I I S I GK Q G I D K TMMS L Y N S R
K E DVVSNAVK QAAK AVEAWTE\|P FIIQVMNRFN
$L A L I E T S V D Q A V A A L E E Y F K D D F I D T M N K F N$
R E T M D LTVVAR D A V D A V E L W L R E G V TAA M N K V N T K S P







Q E E L K A VL EKKA A D A V E G ILLKLGMSNAMN R F N R
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 $M \mathrm{M}$ K L V L G N P G R K Y E Q T R H N V G F M V A E QL C R E F S
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 $M Y L V V G L G N P G K E Y E G T R H N I G F E A D D Y L D S K Y N$

YLIV G L G NPGPKYEMTRHNAGFLAVDLLALQEH
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 MMS WLVVGLGNPGPQYANTRHNI GFRTVDELARRAG $M Y I \quad V G L G N P G K K Y E R T R H N I G F L T I D E L S R R T G$
 $M K L I V G L G N P G L Q Y A A T R H N D G F E V I D D S A E A Y N$ $M Q L F V G L G N P G A K Y E N N R H N I G F M A L D R I A D E H G$ MYI IV GL G NPERKYA GTRHNI GFSAI TA I S DA Y G
MAEP LLVVGGLGNPGPNYAKTRRNVGFVVADDLABRDG
WIV A GL GNPGLE Y EHTRHNAGFLAVEELAK QCG $M Y I \quad A \quad A G G N P D A R Y Q N T R H N A G F D A I D D I A E K N H$ $M A G L R L I V G L G N P G A E Y L R T R H N A G F W L V D A L A S A A Q$
 $P Q L V V G L G N P E P K Y N R T R H N I G F A A V D A L A N S W Q$ T T P LLLVV GGLGNP G P K Y E L T R H N V G H L V L D E L A A S R M P $M K L I V G L G N P G R E Y E G T R H N C G F M V I D K L A E K N D$ MKLVI GLGNPGRQYENTRHNVGFKVI DKLSEELAA MK L WV GL GNPGRKYA GNRHNI GWMADVERIA E DH G $W L V V G L G N P G P K Y A G N R H N V G F M V V D E L A A Q R G$ $R M K V I V G L G N P T D Q Y K G T R H N V G Y M A I D R R I A E A N R$

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$L$ I V $G L G N P G K N Y E F T R H N A G F L T L D H I A C S E D$
$M S G L K L I V G L G N P G N E H A R Q R H N A G F W F A D E L A R K Y G$ D AMRLIV GL GNPGAKYAGHRHNVGFMAVDRIAADHC AR $\cap R C I V G L G N P G P R Y E R T R H N A G F W F V D E L A R R H G$


 $M K C D V G L G N P G R K Y Q K T R H N V G G M V I D E L L D N R H G$ $K L I V G L G N P G D K Y V E T K H N V G F M L V D Q L A K S L N$ $M Q V I V G L G N P G E E Y A H T R H N A G F E V I D L L A Q R W G$ $M L L F V G L G N P G S K Y A G N R H N I G F M A V D A I A R R Q R$ $M L V F A G L G N P G A K Y A N N R H N V G F M R A D A B A R R H S$ MS IVKLFVGLGNPGTEYQATRHNAGFWWVDALARELK DAPQVVVGLGNPGPQYAGNRHNDGFLVADELAARVG
 $M Y M V A G L G N P G R Q Y E G T R H N C G F E A L D V L M K K Y S$ $M Y$ II A GLG GPGKEYENTR HNDGF DVI D RLLAEEEN $M K M V V G L G N \square G K K Y E A T R H N V G F M V V D E L A A Q A Y G$
$M A G L R L I V G L G N P G S E H A R T R H N A G F H F V E A L A E K A G$ $M K I \quad V G L G N P G N E Y A K T R H N V G F M L V D A L A E H L D$ MYI I I GLGNPTREYEATRHNIGFDAITRLAADDNN MAK $\square \mathrm{K}$ LIV V GLGNPGSKYEDTRHNAGEWMIARLARRFS
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60

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 TSCRRQK WRACI A ECRRIGDEKVILDCKPQTYMNAS GESVVR

 CS WY DHK RF Q GWF GE GL LMA GQKTCCLLKPRTYMNRS GQA V R R
 FGPWRSKFQ GMVSEGDLGDDKVILLDKPMTFMNLS GQSVG $\square S M D D K K H K A V C G K G M I A G N K V L L A M P Q T Y M N L S G E S V G$
 $\square P L D T D K Y N$ ALLS GS GF I G GQKVLLVK P LTTYMNLS GEA I I ERFA F D GK L H GESCRVVRLGGEPDVWL LKPATFMNKS G IAVV
 I SLS EN RKF QA EFGEMGPQREKI RRLL KPLTYMNLSGQA




 F NL S V V S K F S GKTARAVI SGQEMRTLVPTTMMNLLSGKA V S
 I A V
 $G Q L R A A R R F H G E H A R V F V D G V D V H L L K P T T Y M N H S G R A V Q$ ASTTLEKGFSAWVAKARVNGEAVLLAKPTTFMNRSGQAAG

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 F S P WK N CGE F




 I S L T K K HK A $\square$ C GK GMI G GEKVIL AKP QTYMNLS GESVR



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 G L V D Y Y K K I D E E E E L L V V I Y D D V

 E I L L D F Y Y E L D P E DLL L L I Y Y D D L D A $V$ V A R A MA R F Y K I P V E H L L VA H D E L D L D P GVAR L K RA G GH G G H N G KAFDFYKL NLEDDLIVICDDLNLATGRIRIRRGGSAGGQKG A VVDDWY K L D P Q SVL V V Y D D M D L P L G R L R L R Q T G S A G G H N G
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 EFVD F YKIISKEEILVIVDDMDIVPGKIIKIRKKGSAGGGHNG GLVVN WY K I D P P S E L L V V Y D D L D L P F G T I K L R N Q G S S G G QR G $N L M K A Y G V S P D E V I V I H D D L D L P S G S I D R V K R G G G H A G H N G$ LLSDFYRIIPVASILVVHDEIDDPPGAARIKRGGGHGGHNG P L L D N F Y K L D A E DLL L V I Y D D L D L P C G K I R R L R T K G S S G G H N G QL A D Y Y E E A L E D D V V I Y D DLDD P D I G Q L R L R Q K G S A G G H N G ELSRFYKLSQEDLLVVQDDMDLPLGK』RLRDHGSSGGHNG




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UniRef90 A1AXW5 UniRef90_B8EK40 UniRef90-A8ZXZ5
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YI G GLGNPGEKYANTRHNVGFMVLDRLSKSW
MSPSWLVIGGGNPGPRYDGTRHNVGARVITELLCRRVG MRLVVGLGNPGAGYAKNRHNIGFMAADEIVRRHG MYII AGLGNPGKEYMGTRHNAGFSVIDELADKYN MENDRLIVGLGNPGSKYALTRHNVGFRLVECLAERWK MTDAWLVVGLGNPGARYERTRHNVGAMAADRLVATAG MKLWVGLGNPGTKYAGNRHNDGFMALDAI AAAHG MKITVGLGNPGTKYENTRHNAGFMVMDALAKECS NEPLLGLGNGGKYGNRHNGFMALDRADHG NEPWL:VVGLGNGKKFNGTRHNVGFEMVDAJAEAEG
 MSSVQLVVGLGNPGRKYEQSRHNAGFWFVDEVARQYG EETDPMKLIVGLGNDGSEYENTRHNDGFKIVDFFAKKEE MK!। IG MGNPGPEYESTRHNAGFWWVDALARELK
AQM TKLFAGLGNPGPDYAATRHNAGFWWIDALARELK MKMIVGLGNDGPQYNGTRHNTGFMVVDEFAKQHG YVI AGLGNPGLQYENTRHNAGFMTIDKLAESLG
 YII VGLGNPGAQYENTRHNAGFMTVDTLAAKYK LLAGLGNPGPRYAGNRHNDGFLVLDELAARMG MYIIVGLGNPGTKYONTKHNVGFMCLDLLSEKLN EETGKMYII AGLGNPEKKYFGTRHNVGFATI DALSDKYG

 VKAVVGLGNPGLQYARTRHNIGFMVVDRLAEAWG MRLFVGLGNPGSKYEGNRHNIGFMVVDEVARRGG $P Q L I G G G N P E Q K Y E K T R H N I G F E A V D V L A K S W Q$ MKCFIGLGNPGPKYDKTRHNIGFMAI DRLSSDTN MYIVAGLGNPGKNYEYTRHNVGFLAIIDKLAEKLN MKMLVGLGNPGKKYSHTRHNI GFKVLEELARRHQ AHMWLI AGLGNPGLQYQNNRHNIGFMAlDA YYQRFS EHMSDVWLVVGLGNPGPAYAGHRHNVGYLVTDELAARMG MKVI AGLGNPGEKYARTRHNI GFMITAELAKKY PQLIVGLGNPTKYNRTRHNI GFAALDALSSSWQ MKLIVGLGNPGEKYAGNRHNI GFMAVDEMARGYG WLLVCLGNYGKQYENTRHNI GFMAAERLDDKQG MKVIVGLGNPGNEYNQTRHNVGFMLTDALAEHGN MKLFVGLGNPGSEYARNRHNVGFMAVDLIAEAHR
MS TRLIVGLGNPGDEYEQTRHNAGFWLVDNLANDIG MKLIVGLGNPGSRYQGTRHNVGFEVVSTVARRVQ WLIVGLGNPGQRYAATRHNIGFMVVDHLARKLE MSEDKLIVGLGNPGDKYADTRHNAGEWLIARLARRFN MKWFVGLGNPGKQYEHTRHNIGFMALDREAQKHG MFIIAGLGNPTSQYEGTRHNIGFDVMDALAEKYN KPWLFVGLGNPGKIYQSTRHNVGFEMIDVIAEAEG MKVIVGLGNPGKQYENTRHNVGFNVI DLLSQTLS
EEQDPMKLIVGLGNDGEKYENTRHNI GFKVLDYFAKQED MKLIVGLGNPGQKYEQTRHNVGFMAADKTAGLIS YCI VGLGNPGREYAETKHNVGFCVIDKLAEKYE MHLIVGLGNPGPKYERNRHNIGFMVVDRLIDRELK TERWLVVGLGNPGPKYAGNRHNIGFMVVEALAERRR $\prod K L I V G L A N P G A E Y A A T R H N A G A W F V D L L A Q R L R$ IKAI IGLGNPGEKYKNTRHNVGFMVADLVAKSLN MKLIVGLGNDGKEYDGTRHNVGFMVLDELAKREG MKLVGGLGNGKQYQYTHHNVGFLFLDHYAKTKG Y TIVGLGNPGDQYDGSRHNAGFDTVDALEKKLG MFLLVGLGNPGKEYEKTRHNDGFEAVDKISYEYN MKW VGLGNPGPEYAKIRHNVGFMALDRLAERHG MSD■RAIVGLGNPGSRYARTRHNAGYWLLDALAERFQ MTTTKLIVGLANGPQYHDTRHNAGAWFVSEARABH MYLIVGLGNPGRQYEKTRHNVGFDVIDKLADHFG MKW|VGLGNPGKNYEHTRHNVGFMALDHLAEKHG
 MNREFLIVGLGNPGKEYEHTRHNI GFLVVDELARRYK MKLIVGLGNPGKQYENTRHNIGFMI LDELAKAWN T $\mathrm{TK}_{\mathrm{K}} \mathrm{I} V G \mathrm{G}$ GNPGKDYQSNRHNAGFWLCEALAHLYA MLLLVGLGNPGKAYAGNRHNTGFMALDQIARDYS
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UniRef90-JOZ153
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UniRef90 A1AXW5 UniRef90-B8EK40 UniRef90-A8ZXZ5
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PFVRRYRLTPDQVLVVHDDLDLPLGRIRIRAHGSSGGHNG AVTSWYKLPPDSVLVI YDDMDLPLGKTRLRLS GSAGGHNG EILKFYKLTPEDVVVI YDDLDLPPGQLRLREKGSAGGHNG PVADYFKI DTKTLIVISDDVELDPGRIRVRPGGSAGGHNG HLAGFYKIKPQEILVCFDDVSUNGGAVRIRKDGSAGGQNG $A F M D Y Y K V D V Q D I V I V Y D D R D T D F G K I G R L R Y K G S A G G H N G$
$G F M D Y F K A D L E D G L I V Y D D M D T E V G K V R L R Y Q G S A G G H N G$ P LMRWYKLAEPQVYIVYDDMDLPVGRLRIRKSGSDGGHNG Y YWLQKENIPDENLLVVVDDLALPFGTLRLKPKGSDAGHNG KVADFSGITPDHLIVVHDEIDLDPGRLRIKKGGGDNGHNG DACRFFKULPRDVIVLYDEIELAPGKI RVKQGGGHAGHNG EVMDYYKCDIDDFLVIFDDGSLDVGKLRLRAKGSAGGHNG AMASFYRRDLD QLVVAVDDADLPFGQQRMRANGSS GGHHG PLAKFYSVPTPNVVVLHDELDIDFGAVRLKRDGGEGGHNG
 EAMRYLKLEPAEVII LHDELDLPPGKVRLKTAGGHAGHNG A V V S Y Y K P LK QVLVIFDDLDLPFAKLRLDPKGGHGGHNG ELANFYKLEDDEVIVVYDDGSLDDGRLRIREKGSAGGHNG PLMRWYKI A EEDVYVIYDDMDLPVGKLRIRENGSDGGHNG A A A F Y K YWMTKEKIPVENILIITDDLNLEFGTIRVKTKGSDGGHNG QCMDFYKVSAEDILVLYDDMDMPVGKLRLRQKGSAGGHNG ALAARFKIAAPEE:LVVVHDELDFAPGQVKLKRGGSHGGHNG SLARFFKLQPEEI LVVHDELDDAPGQVKLKRGGGHAGHNG PLMDYFK D D D D: FIVMDDMDLPVGHI RLRDHGSAGGHNG
 KLLDYFNI ESENLLVIDHDDLDLDLGKIKFKQNGSSGGHNG EAMNFYKI P DENVIVEYDDISLEPGKLRDRRKGSDGGHNG GTARFFKLDPSGIVVVHDELDLPYGALKLKFGGGDNGHNG
 PI CDYFKVDKEELIVISDDVELDVGNIRVRPKGSAGGHNG

 ALADFYKLLPEDILVIYDDMDLKLGRLRARAKGGSGGHNG EAAKFFKLGESEVVVFHDEDELPPAKMRVKVGGGDAGHNG A 1 MDFYDMDVENLVVIYDDLDMPTGRDRLRQKGSAGGHNG AVLDWYKLPPESILVIYDDMDLPLGRIRLRLSGSAGGHNG
 DAMNFYK L E PEDVIVLVVDDVDIAPGRMKKVKKSGSAGTHNG

 KL LR YY DI E DEDLLVI HDDLDLDLGKIRFKRNGSSGGHNG ALTSWYNLIPPESVLVI YDDMDLPDGGTRWRLSGSAGGHNG


## P <br> Tm

\section*{-} |  | $M$ | $N$ | $F$ | $F$ |
| :--- | :--- | :--- | :--- | :--- |
|  | $Q$ |  |  |  |
| $E$ | $L$ | $L$ | $D$ | $Y$ |
|  | $F$ | $K$ |  |  | $\begin{array}{lllll}P & L & L & D & Y \\ F & K \\ E & A & M & D & F \\ Y & K\end{array}$

 A Y M D Y Y K V A L E D L I V V Y D D M D T E T G K I R L L R F Q G SA G G H N G


 A Y M D $\quad$ Y $Y$ Y $K$








UniRef90_E4RT15 UniRef90-B3EQK4 UniRef90-R7G711 UniRef90-UPI00046527BA UniRef90-D2ZW15 | UniRef90-BOTR35 |
| :--- |
| UniRef90 $13 V T B 7$ | UniRef90-13VTB7 UniRef90-R9JI73 UniRef90-F3ZNI8

UniRef90-D1Y8J8 UniRef90-Q839C0 UniRef90 C3X6B2 UniRef90-A0JU94 UniRef $90-\mathrm{H} 2 \mathrm{FY} 46$ UniRef90-FORBH3 UniRet90-B7K2R5 UniRef90-FOGUE4 UniRef90-A0KN04 UniRef90-R6MLGO UniRef90-F2KOU9 UniRef90-R7FAI2 UniRef90-L1QQJ1 UniRef90-QOABZ7 UniRef90 L8DKX4 UniRef90_UPIO0037657E7 UniRef90-R6T3SO UniRef90-UPI0003128F08 UniRef90-H5T8×2 UniRef90-K4KQJ6 UniRef90-UPIOO04769097 UniRef90-D2RL51 UniRef90-10H183 UniRef90-DSAQI6 UniRef90-R7LJ36
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QNMYVIAGLGNPKKEYDNTRHNDGFSVIDMLADKTG LIVGLGNPGPQYEKTRHNVGFMVADALAGRDG
 YLVVGLGNDGSEYAGTRHNVGFMVLDAWAKASN SARMV VGLGNPGDKYEQTKHNMGFMAVDLLAKDYG MRAVIGLGNPGVKYSETKHNAGFMLLDRIAAQEG MAN LRLLVGLGNPGSEHLRTRHNAGFWLIDALAQAHG MKLVVALGNDGREYAGTRHNDGFMTADLLAERWG PWLVVGLGNPGKEYAGNRHNVGFMVADLLASRDG MQLWVGLGNPGTKYAANRHNIGFMAVDRUAADHG MKLIGLGNVGDKYCFTRHNAGFMVLDKWAMDEG MKI I VGLGNPGKKYKDTRHNVGFMVLDEYTRRNN VVVGLGNGTQYAHTRHNAGFDTLEMLCRKWG TKLIVGLGNPGQQYMFTRHNAGFWFVHHLAQQFN IKLI AGLGNPGREYEDTRHNAGFWWVDQLARRAS WLVVGLGNPGPTYAGHRHNVGHMVADELARRAT YLIVGLGNDGPEYHETRHNIGFMAVDALAKANN MQLWVGLGNPGPQYAMHRHNVGFMTVDVIAEDHN MTTDRLTVGLGNPGREYEATRHNAGFWWVEAVAAGKS MRLVVGLGNPGPEYAWTRHNDGWLALDQVDQRFS PWLIVGLGNPGSKFVGTRHNIGFELIDAI AEAEN MKCIVGLGNPGKKYAKTRHNIGFMILDELVKQNH RLIVGI GNPGPEYAKTRHNVGFRVLDALJKRDK YLIVGLGNPGDDYSGTRHNTGFMLDAFAKASN MSNNDRLIVGLANPGPEYAHTRHNAGEWLVKELARAHN QSSDSWLIVGLGNPGREYEKTRHNTGFRAMDILAEKLN MLLMFVGLNPGNKYANNRHNTGFADDQIASDSG
TPWLIVGLGNPGTKYYGTRHNIGFEMIDHIARTTD MS MLLLVGLGNPGPKYEKNRHNDGFMAVDRIAARHG YLIVGLGNDGREYEATRHNI GFRIADALSERMG TRLIVGLGNPGKEYALTRHNIGWWVLDRVAERFN MSS $\downarrow K L I V G L G N P G P Q Y A D T R H N A G V W Y L E A L A R K H N$ GEKDDPMKLIVGLGNПGPKYENTRHNTGFKDLDELAREKE MQI WAGLGNPGPKYAGHRHNI GFMAVDAIAARHG WLVIGLGNPGPEYAATRHNIGYMAIIDELDERHG MKLLVGLGNPGAKYAQNRHNI GYMALDRIAADHG GDTDRKPWLLVGLGNPGKDYQGTRHNVGFEMI DVI AEAEG MKVIVGLGNPGKDYEKTRHNVGFMVIDEIANKGG
 MKCIVGLGNPGKKYEDTRHN:GFRVIDELABRNH MYLIVGLGNPGHEYKNSRHNVGFDVMDLISSKYN I CGLGNPGQYDGTRHNI GFMTVDTLCEKYK MNEKKLIIGLGNPEKKYEQTRHNIGFEVVDFLADKWG MKLVVGLGNVGDKYCFTRHNVGFMVVDKWA $\mathrm{T}_{\mathrm{MND}}$ NDKLIVGLGNPTAEYEHTRHNAGFWFI DELAWQWK MHLVVGLGNPGKEYASHRHNDGFMAIDALAEEMR DMSKDKLIVGLGNPGKEYEHTRHNVGFWFADELAWQWK YII AGLGNPGAKYEMTRHNAGFLAIDMLAMKQN YLIAGLGNDGPDYEQTRHNDGFMVLDAFAKASN MKLVVGLGNPGKKYEKTRHNVGFMAI DLFLEKYA DKFLICGLGNPGDEYAGTRHNTGFMILDAFAKASN MSDTWLVVGLGNPGPGYSHNRHNVGHMVVDETAGRDG YLVVGLGNDGQEYTDTRHNDGFMIADALAKKAS M TGUN MYLIVGLGNPGREYQNTRHNDGFRYLDFFCEEHQ MSNNTRLLVGLANPGAEYAKTRHNAGAWVVQELARVHN IKLLVGLGNPGNEYEDTRHNAGFWWIDAVARELKK YLI AGLGNDGPEYAFTRNVGFMVLDRLAAQHD
DMKLIVGLGNIGSEYVGTRHNAGFMIADTLVQEDP KLIVGLGNPGSKYHETKHNVGFMALDRIVKPDN $M K L V G L G N P G R E Y A G T R H N A G F E W V D R L A Q T L Q$
$M Y M I A G G N P G E K Y R H R H N A G F D T I D R L A D Q Y G$

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UniRef90_FORBH3 UniRef90-B7K2R5 UniRef90-FOGUE4 UniRef90-K2K5E1 UniRef90-AOKN04 UniRef90-R6MLGO
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UniRef9O_I8S952 LLKFTGQRH
TGMTGKK ALVVTEFSFK ${ }^{60} H Q \mid I T L I K P T T^{70} Y M N L L S G K A L L A$ TGMTTGKGNFHHAKKITHRGKGVIVLKPMTYMNLSGHAVV VEDNQKKFK ALVAQTRIGKESVLLMKPQTYMNLSGEALI ATLKEEKKFFGSVARVSUSGSDLWLLKPATFMNRSGQAVA ATLTLDSKYFGMTARVTLHGKDVRLLIPTTFMNLSGKSVG I SVMDCKHK ALI GKGVIGGTKVVLVKPGTYMNLSGEAIR VVFSDKRYGGAVATTSVKGRQLVLLKPSTYMNLSGNAVR VSF NNSNFEADIAEFFIGTEKVLLVKPDTFMNESGRSVG VRWQKESKFSALVAKTKINGADVWLMKPQTFMNRSGLAVG GSFKVHKARAHVLERVGIGGPRVVLAKPMSYMNVSGGPVS AQLKEEGKFFGWTGRVRUGNRDVRLLVPATFMNRSGKAVA LSKKNRRFQGLFAEMARGNHKIYLLKPGTYMNRSGQSVR 1 DVKKSKFK SLYGQGVISGQKVMLVKPQTYMNNSGEAVR LTLTPDSKFFGASVRLQQGSSDVRLLPDTFMNLSGKAVA GADKEKQRHQALCASAVWHGQKLLLVRPQTFMNASGLAVQ CSDRSEKKFFGEFAKAYIGGEECYLLDPTTYMNLSGKSVQ FGPTRAKFQ SIVADGEVDGTKVLLMKPQTYMNESGRAVG GA RRPERRYHADLATGHLGPHQCRLMRPQTYMNRSGQAVG DSVNTAKHK GLLGGAGYLNGKIILVKPLTYMNLSGECIVR FGPWRSKFS GHFSEGLLGNKKTLLLKPSTFMNLSGQSVG VVFRTERYMGDVAEVSFKGRNDTLLKPSTYMNLSGNAVR VNFSMEKTFMAEVASTFVNGEKVFLVKPQTFMNESGRAVQ LSFRNDSKRGKVAEMRNKDERIFFLKPDTYMNLSGGAVG DTEAWRKADNAFYGEKRMPEKCWVIKPTTYMNNSGVAVA GKFGRAKRAQGEMAEGRLGGPKLILLKPLTYMNLSGAPVV FAPWKKAFQGHVSEGRFGSTRVLLLKPETFMNLSGQSVR VVFEHKSKYKAECVQTLINNEKVILLKPGTYMNLSGESVK VTLNKSKCK GLLLTETYVDGKRVVLCAPQTFMNLSGECVS GQFRLEGKFFGEVCRVRLDGEEVWLQKPMTYMNKSGQAVG
 FGSVQKKFA GWVQEGRIGNEKVILLKPATFMNESGRAVS


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HSMNTVQSK
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## UniRef90 E4RTI5 UniRef90-B3EQK4 UniRef90-R7G711 UniRef90_UPI00046527BA

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UniRef90_I8S95
 AAMNFYKIPVEEILVICDDLNPLGIRLRAKGSAGGQNG AAVNFYH| DVKDLLVIYDDEDLPVGKIRLREKGSAGGQNG TLARFYKIKPEETLVVHDELDIPCGRIKFKGGGGNGGHNG ALANFFRIAPEELLVAHDELDMPPGVAKFKLGGGHGGHNG DVVDFYKLPGSNLIVVYDDKDLDVGKARVRKKGSAGGHNG YWMOQEKDPAENLL VDD ARGOLRGKGGAGHNG ETARFYKIERDVVVVDDANPGGRMRIRSKGSAGGHNG PLDTYFGVDEEDLIVIYDDLDEEVGKDRLRQKGSAGGHNG ALARFYKDASDEVVVVHDELDVPGNAKLKRSGSTGGHNG AMANFYQ PPEGLLVAHDELDLSPGTARFKQGGGHGGHNG AVSDWYKLYPNSMLVIYDDMDLPVGRMRMRDEGSAGGHNG EIDNFYKFDDDKLIVIYDDDDIEFGTDRDRKKGSAGTHNG AMANFYKDAPEQLLVAYDELDLPPGVARFKRGGGAGGHNG QAASYYKLPPERIVVLFDDISLPVGKIRVRPSGSAGGHNG AVCQFYK DPEQVLVIHDELDVPPGTVKLKKGGGHGGHNG EAARFYKVKPEHVIVFHDEDDLPGRFRMKKGGGAAGQNG PYAQFFRLPPESLLVVHDE: DAPPGQVKLKQGGGHGGHNG ELLDRFFSVDPANLVVVHDDESLEPGIIRVRKKGSAGGHNG
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 ELLLNWKVPGENLLIIYDD:DLPASRLRVRKSGSAGTHNG PMVNFYGUKNDELLI AHDELDVAPGSIKLKTDGGHGGHNG KVAAFYRTTPDHLIVIHDELDLDFGAVRLKSGGGDNGHNG KWAMKENDPRDNVLIVVDELDALDFGAVRLKSGGGDNGHNG EAMRFYKLEPDALTVVHDELDLAPFKVKVKQGGGTAGHNG QVCRYYHIVPDEVLVVSDDVALPFGRLRLKDKGGAGGHNG PISTYYKIPRERVLAIYDDLELEFAMLRLLPRGGHGGHNG
QFMNFFDLEADDILVVYDDLDLPRGKILRKKGGHGHNG QFMNFFDLEADDULVVYDDLDLPPGKIRLRKKGGHGGHNG Y WLDKEH QDSHLLVVVDDARLPLGMLRLKATGSNGGHNG AMANFYGLEPEQLVAHDELDLPPGVARVKQGGGHGGHNG EAMRFYKLTPSDITVFHDELDIAPGKCRVKMGGGHAGHNG PLAAYYQVPDRHLLMIYDDMGLPNGVLRLQPKGGHSHHNG EAARFFK ADGDVVAFHDELDLSPGKLRVKTGGGNAGHNG Y AAAKFYKLKPEEVVVSDDLDMPVGKVRMRLKGKHGGHRG ALCMKKEK NDENLVVVTDEDDLLPGQLKMKKGGGFAGHNG EAMRFFKLAPEDIAVFYDEDAPGRFRMKTGGGAAGHNG A LADSAGATPEHISVDHDELDLSAGTVRVKKGGGENGHNG EAMRYLKLASDD RIMDFYSLDPGDIVVYODVDIDGGKLR1RKNGSAGTHNG YWLEKENAPLENLLVITDDLNLPFGTIRIKAKGSDGGHNG ALCNFYKMKPEEVLVCHDDLDLPAGHMKFKFGGGLAGHNG

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 EACNFYK AVLDWYKVPPEKTLIIFDDUSLEPGKLRIRRKGSDGGHNG AVMNYYKIDRESVVVVYDDMDLEFGRIRLRLSGSAGGHNG A LASFYKIKPEELEVVHDELDACGR1KFKDGGGNGGHNG

 ALVKFYGI SPENVI AVVHEIIDIPFNTVKLKRGGGEGGHNG YWMNDLKIVPVENLLILVDDLAAPFGKVKIVRKGSNAGHNG YWLQKENIPVENLLIVVDDLALPFGTLRLKPKGSDAGHNG
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 ML L F V $G$ L GNPGS QYEKHRHNVGFMALDRVVERHN YL $V$ V GL G NPGKEY D G S R H NVGGFEAADDLI DEFH I K L V V GL GNPGRQYENTRHNAGF LAFLDDLAAA WG $L R L L V G L G N P G D R Y H G T R H N V G F M A L E A L A R R N A$ MK L I I GL G N P G K K Y E G T K H N I G F IT I D E L A H Q L G $M Y$ II AGLGNPSREYEKTRHNVGFEAD DDLADKLGG MV VGL GNPGDKYRNTRHNAGFMAID YI LKEKN WLVVGLGNPGDEYAATRHNVGQMVIDHLAKRHN
 MSS I QL I A GLANLGGKEYVDTRHNAGAWLI EN LIEFTH MKLVVGLGNPGTQYAQTRHNVGWLVVNEVARRWG IAAL I V G L G NV GA E Y E A T R HN A GF WF V N N L A K Q T N MS IJKLIVGGLSPGKEYATTRHNAGAWYV ELLAEHYH MSDTWLIVGLGNPGPNYAKTRHNDGQMVLDELAKEVG M S G L K L I VGGL G N P G S E Y T LTTR H N A G F WF V D A L A R A H G $M S S V H L V A G L G N P G P A Y A P T R H N V G F W A V D D L A S R L G$ WLVVGLGNPGPAYRGHRHNVGYLVAEALAARIG $M K L I V G L G N P G R K Y Q H T R H N T G F M I I D M L S E K L D N$ $L V V G L G N P G S K Y D G T R H N D G F M A L E R L A R R E G$ MKCIVGLGNDGKRFEHTRHNIGFEVVDYLLDKYN Y LIVGLGNI GPEYAFTRHNVGFMVLDRLAAQHG
T $\square K L I$ A GLGNPGPEYSKTRHNAGVWFVEELARSHN

M P A $\begin{array}{lll}\square R & L & V \\ M K & C & I\end{array}$



 $M K L L V G L G N P G E N Y Q Q T R H N V G F M L A A B E A G R F G$ MFLVVGLGN P GA QYAKNRHNIGFMFIDR LVES GS
 YLIVGGLGNIGAEYADTRHNDGFDVLDALAEASN
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 $M R L I V G L G N P G P Q Y V W T R H N V G W L A A D H L A Q S L G$
$M M N K Y L I V G L G N P G G E Y E L T R H N I G F L V L D Q L A D K L G$ DKAV I GL G N P G K Q Y E D T R H N N G F M M A A D V V A S L

NDMK LI V GLL G NDG DEYYD GTR H N I G F R V V D A LA A K S A G STDDTMKLIVGGLNPGAKYSETRHNIGGKILDQLAADKG YI I VGG GNPGDAYENTRHNAGF LADVAMEKKYG
SKKYLIVGLGN $\quad$ GGAEYVNTRHNDGFKVLDFLARKES
 YLIVGLGNDGPEYQDTRHNI GFNVLDAFAKASN
 MY L V V GL G N PG S KY S L N R H N I G F MACD Y WLK S L N
 VKLIVGLG L V PGPKYEKTRHNVGAMVVDGLASSAG VK MIV GL G N P G S K H Q Q T K H NVGGFMAVDR LVK D LD MKLFVGLGNPGPKYENNRHNIGFMAADEI HRRHS MS QVTAI GLG I I P GAEYDATRHNAGFWLVDAIARSAA MSNIK LIVGGANPTAEYSQTRHNAGAWYVK QLSERHN $R P W L$ FI G L G N P G Q K Y Q G T R H N V G F D M I
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## M A N

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$F G P W R S R F Q G E T A E G S I G E K V L A L K P A T F M N L S G Q V A$而SGKKKGYQGLYGVGRVAGVEATVLLPQTFMNLSGASVN TSFTTDRY GAVATLRSKGHTLVLLKPSTYMNLSGKAVR TAMFEPKRYGAVARIKVKNKELVVVKPSTFMNLSGNAVR VSFVWQPRFGGWAAKLHCRGEVVHLLKPGQYMNRSGGPVA VSFALDDRFRGCARMVQSTDDWLLKPQTYMNASGMSVG TQLKPDTKYHGLTGKLLIDNVEFKLLDPTTYMNLSGKSVG VNFEQQRH GEVAEAKYKGRTLVLLKPNTYMNLSGKAVN LKCNKKYDERCFSHDYVCEDHYLLIVKPQTFMNNSGVAVK SSTEKKHKAEFGKGIIEGEKVILAMPQTYMNLSGESVR MQFEDKRY GFVGTMRVKNQMLVLLKPSTYMNASGDAVR
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$\stackrel{1}{1}$ SAP STVHCK AFFGQGMVGNTPIFLAKP FS APKKQFQGWVQEGRLGDEKVLLLKPATFMNESGRSG LTWKSDRLAFKTEYKFKGRSIHLIKPTTYMNLSGKAVN VHFANHKDLGKGVMALNGSNVKMFLCKPLTYMNDSGNAVA FSPWR KRFRGEIAEGTIEGEKILLLKPMTYMNLSGESVQ SSFSRHRKALAEVAETRLGYPRLVLAKPLTYMNLSGGPVA AS RPKVRFEANLSEVNYNGEKVLLAAPQTFMNVSGRSVQR FSPWSKKFQ GLLIVSEGMLDGEKILLLKPQTFMNLSGQSVG俍 LS FKTESRFHGQLIQYTNPEHKVWLIKPQTFMNRSGQSVA VSVSRLKHQ GTCGQGLVDGKKVLFVKPQTFMNRSGLCV H FTPWRNRFKGEVAEGRIGGQKVLLLLPMTYMNKSGESVQ VNFRVHKSRALVAEREGPGGPKLVLVKPQTYMNLSGGPVA
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 ERSSYYKIPCEN:IUVVDDUSLPAGKLRIRRKGSAGGHNG ALLAFYNIDRQDL VIYDDLDMEVGKIRFRSKGSAGGHNG YWMQKENI SDENILVITDDLNLEFGTIRVKSKGSDGGHNG ACMAYHKLTPANILIAHDDVDLPVGTIKLKLDGGDGGHNG PRLSFFKLDPGALLVVQDDLDSPFGLMKVRLGGRHGGQNG ALANFYKISPEQLLVVHDELDRPVGTARLKQGGGHGGHNG AMAKFYH|APEEVLVAHDELNLLPGSARLKMDGGHGGHNG SALRYYKVPAEACLVAHDELDLDAGAVKLKFDGGHGGQNG AVARFHKIPPADVIVIHDELDLEPTRLRLKLGGGDNGHNG KVQSWF GVPTSHLIAIHDELDIDGKIRVKFGGGDNGHNG AMMNYFKLDPDDLLVIYDDLDMLPGSI RLREKGGSGGHNG AADDWYGFQPEEVVLLVDDMDLPLGRLRLRAQGSAGGHNG PLMDYYNVARDELIVLYDDLDLNQGQVRLRQKGSAGGHNG YYMDAWKIPVENILVITDEIQLPQGKIRIKPKGSNGGHNG P ANFYK SVDEVLVAHDELDMLPGVCKIKKGGGHGGHNG KVAAFYKIPPENILVIHDDKDLALGKLKAKDGGSAGGHNG
A
$P$ L A A $Y$ Y $F$ F $K$
A L L H WY K
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$\begin{array}{llllll}\text { T } & V & A & N & F & Y \\ H & H \\ A & A & R & F & L & K\end{array}$
A A Y Q S L GVV E A A S F Y K V K P D H L

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

 N L L
 $P$ L A R E Y G L L K P D R I LVVVA D D L D





 F WMKKEN S L M N F F Y $\begin{array}{llllll}S & L & R & F & Y & K \\ P & L & L \\ A & K & F & Y & S & D\end{array}$ PAD I V V H D E L I D F G L V R L K K G G GEGGHN G







 $P A I D A F Y K$




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 S V S S Y Y D A L A K F F

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



## 4

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$|$| $L$ | $K$ |
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 MS DA WLVVGGLGNPGPTYAGT R HNVGAMV IDLLAAARAG $M$ LI A GLGNPTDKYRGTRHNVGFDAIDRIAEDND $M K L, V G L G N P G R G H A N N R H N V G F V C V N H F A R T Q G$ YLIVGLGNDGSEYADTRHNI GFMVLDAMAKEAG
 DKYLI CGGLGNPGDEYQETRHNTGFMVLDAFAKASN $Y L$ I V GLG $\operatorname{G}$ P TEEYR GTRHNDGFRMVSHLADKQG MT DPWLVVGLGNPGARYAANRHNVGAHVIAELAGRQR $M K M V G L G N \square G K E Y D Q T R H N T G F M V V D A B A K K Y G$ $M L L L V G L G N P G N E Y A R N R H N D G F M A V E T$ I ARRRHR
$T Q P A R L Q L V V G L G N P G S R Y A G T R H N V G F M A L E Q L V R S A G$
 $M K L I V G L G N P G K Q Y V Q T R H N I G F \| A I D K L L S Y L N$ MSDSWLIVGGLGNPGPKYETTRHNVGQMALDVLADRIG $M Y L I V G L G N D G S E Y N L T R H N I G G E T V D D Y I S D E Y N$ AEETGPWLVVGLGNPGRQYAGNRHNVGFLVADLLVGRDGB $M K I I C G L G N P G R E Y E R H R H N V G F M V V E T L L P R A R$ $M L L M V G L G N P G P Q Y E G N R H N I G F M A V D E E A R A D S$ $M K M I V G L G N P G S K Y A Q T K H N$ I $G F M V I D D Q L A A B N$
A DLSAE WLI VGGLGNGAKYAATRHNVGYMAVDDLLAK S G
 $T Q P W L F I G L G N P G E K Y Q S T R H N V G F D M I D A F A E S Q N$ MKLIVGLGNPGKEYENTRHNIGFMVLDYYADNNN $M Q L W V G L G N P G T Q Y A D H R H N V G F M V L D V M A E D H G$ $M L L L V G L G N P G D Q Y K G N R H N I G F M A I D A D A D M H G$ KMIVGLGNPGSKYHETRHNIGFMLVDKMAQAAN $\square K L I V G L G N P G D R Y Q K T R H N A G F W L L D Q L V A N E H$ Y L L V G L G N $\quad$ G S S E Y A G T R H N I G F R I L D A F A E A S N MKLI I GL GNPGKTYEHTHHNVGFDTIDDLAAKWG $T 1 K L I V G L G N P G T E Y A N T R H N A G A W Y V E L L V E R Y Q$
 MSTPWLVVGLGNPGPTYAGNRHNLGHMVVDELARRTG QKPWLFVGLGNPGRMYKGTRHNVGFEMIDAIAEAEG MRLGVGGGNPGSRYAGNRHNIGGMMALDAIARRRH WLVV F L GNPGTKFNGTRHNAGFMAADAMAKE LN MKLIVALGNPGLKYEKTKHNTGFMALDYYLKNHN TPWLI AGLGNPG GKYHGTRHNVGFEMVDRIAQVEG $M K M I V G L G N D G R E Y S R T R H N D G F D C M D A L A D C K Y D$ WI A GL GNPGREYEDTRHNAGFLCMDVLADRFG $M T P L R L I V G L A N P G P Q Y A E T R H N A G A W Y V A T L A D Q L G$ MKLIVGLGNPELRHAATRHNIGFDVIDHLAGSST $M R L I V G L G N P G G K Y A R N R H N$ G G F M A L D E E I HRRNN D KYL I VGG GNVGDEYDGTRHNTGFMVLDAFAKASN MFIVAGLGNPGNEYSENRHNDGFMCVDR\|HSFHS MYLI V GLG $\operatorname{L}$ NPERKY D GTRHNVGFEAI DAI SKKF G MP A P RLIVGGLGNPGSEYEETRHNVGFWFLDHLARR LQQ MWL FCCGLGNP GEKYK DTRHNFGFLVI DNFAKKHS WLLA GLGNPGAEYARTRHNAGFWALQTFAEKAG MASDFWLIA GLLGNPGSKYE GTRHNMGFMAADVLAERWS $M$ QIWA GLGNPGPQYAMHRHNVGFMADDLIADMHG Y LIA GLGNDGDEYD GTRHNIGFRIL DALAKASN $\square Q L I V G L G N P G N E Y E H T R H N A G Q D F V E E L A R D L G$
 MKLIVGLGNDGREYENTRHNIGFMVVDELARRLG MTALRLIVGLGNPGPEHAQTRHNAGFRFVDALIERSG
 ET DAMKLIVGGLGNDGDEYAATRHNIGGKILDALAAEKED

 $M L L$ WT GL GNPEPGMRRQRHNI GFMAVERI AEYYR EEKDPMKLIVGLGNDGDEYAETRHNIGFKILDEVAKTND GAPGDGPFLVVGLGNPGKQYAGNRHNVGAMVADVLAGRDG $\square K L I V G L G N P G V Q Y Q Q T R H N A G F W F V E Q L A D K F G$ Y V A GL GNPGAKYEKTR HNAGF LAA DHMA GK L G TETDPMKLVVGLGNDGTEYD DTRHNDGFKILDALAEEEQ

 $M K I \quad A \quad A L G N P G T K Y E N T R H N A G F M T M D K I A D E L H$
 A A PSRPLRLVVGLGNPGAEYAETRHNAGFWFCERLAD KDG
 $M Y$ L A ALG NPERKYEGTRHNAGFAAI DA LLDRMG MHLIVGLGNPGAEYAAHRHNIGFLAVDEI ARQHS $\square K A L V G L G N P G P K Y K D T K H N I G F K V I D E V A F K L H$ WLL A GL GNPGAEYAHTRHNVGFWCVRDDAATVGG MTSPFLIVGLLGNPGPQYATTRHNVGYMAIDEELASPMP $M F L I V G Q G N P G L Q Y A R T K H N V G F W V L D R L G S D F R$ $M S Q V M A L I G L G N P G P K Y A A T R H N A G A W L V D A V A R D M H$

 D G P Y L V V G L G N P GP GY A GNR H NVGA MV L D E L A R R A G
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MF Al I GLL GNPGEEYA HTRHNAGFETV DLLLAEEGG
W VI GL GNPGAKYADTRHNDGYWPI DRLVERYE

## M N G


 S DLWLVVGLGNPGPGYAANRHNVGQMVLDELAGRMR E DMAE MERVVGGLGNGPKYA GNRHNAGFMVVDALAADKG
 MAETWLVVGLGNPGVRYENTRHNVGQMVI GELASRRG YLIVGL GN $\square$ GPEYELTRHNVGFLTVDRLADKH G $M \square L L V G L G N P G K G Y A E N R H N F G F M A V D E D I R R H S$ $M K L V I G L G N P E S K Y S G T R H N V G F D V I D R L S E S F Q$ MF L F V GLGNPDPKHKNNRHNI GFII I DSLNKRFN IVVGGGNPGARYRFTRHNAGALTVDDLARRDD DFYLIVGLGNPGKKYEGTRHNMGFMVADVLAQRWN TPLLVVGLGNPGPKYAGTRHNDGFDVADELAGEDM $M K L I V G L G N P G A Q Y R N H R H N I G F M V V E R I A Q K L G$
 A GRDTGPRDLAGGLNPGNRYRNTRHNMGFLVEDHAMDSAR M Y A V F GLG NPDKEYDKTRHNLGFDVI DELAS QMG MKMIVGLGNDGTRYDETRHNAGFMVVEQLARDFH

## M N A

MKLVVGLGNPGKEYDKTRHNIGFMVIDNYL
MRLIVGGLGNPGKAYARNRHNVGFHCLNYFAKLHS YL I A GLGNPGPEYELTRHNI GFLVLDRLADREG $M K Y$ F G L G N $\square$ GKKYENTRHNI GFMAI DALAEKYN DRLI VGLGNPGPRYAETRHNAGFWFVDALARRYS MK L I V GLG GNPGRKFKKTRHNDGFFVI DELLQRHK $M K I L V G L G N P G D K Y A R N R H N V G F M A L D V I A D H Y R$ $M H I L A G Q G N P G A K Y A G N R H N F G F M V L D R I A S D H G$
$K L I V G L G N P G A E Y R N T R H N D A W E T F D N L S F A Q N$
 $M L A \square Q L I V G L G N P G K S Y E G T R H N A G A F F V E E L A R Q C S$ NMKYVI GL GN $\$ GTKYEKTRHNDGFMAVVNFAEAAH $L V V G L G N P G P Q Y A G T R H N V G Q M A L D V L A D R M R$ MP Q IKAII GLGNPGDNYAATRHNAGAWLVEILARAAG M S H V K AL I GLG N P G S E Y D A T R H N A G A WAV E S L A R D S L MSRVRLI AGLGNPGSAYAKTRHNAGFMVI DELADAFS

WL:VGLGNPGAKYEATRHNVGQMALDVLADRIG MKCIVGGGNDGKNYEHTRHNIGFEVI DHLLERHQ
 M D T LVG GNPGK L G GNPGAYA GNRHNVGAMVVDELASRAR
 MARDKALI GLLANPGAEYEATRHNAGAWLI E EVVRQAS MS ITTLVAGLGNPGRDYESTRHNDGWIVVEALARQTG WLV IGGLGNPG GKYA GTRHNI GY LVVTDRLVERT D M S K FLVLCLGNDGPEYADTRHNVGFMVGDYLARKHE L V G GNPGQKYAATRHNVGYMVVDDLLAAS G LI TGLGNPGKKYENTRHNFGFMVVKAFAEKQG $Y L I A G L G N \square G E D Y A E T R H N D G F K I L D A L A G A S N$ MSSEALLVVGLGNPGPKYERTRHNIGGDAAEELAKSHG TPWLIVGLGNPGNKYHGTRHNVGFEMDDKIAKAEA

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

## A P



 S S K YL L V GIG GNPGPEYRDTRHNAGFRVL SALAEEGG
 $M K L I V G L G N D G D E Y R D T R H N D G F R D L D A W A Q A S N$



L I VGLGN $\quad$ GGDAYKNTRHNI GFKILDAVAAA HA M Y L I I GLG NPGPRYELARHNI GF LVQDNLAEKQR $M K L V V G L G N P E P R Y A G T R H N V G F D V L D T L A A T F Q$ MKL I V GL G NP GNEYRFTRHNAGFLADDK CEKLN R P WL FVVGLGNPGDKF $\quad$ GGTRHNDGFEMIDAFAECLG M Y L IV G L G N P G D E Y T S T R H N A G F Q T I D K L C K K F N $M K L F V G L G N P G P K Y A R T R H N D G F M A V D Q U A S D H G$ M K L I V G L G N P G S K Y K N T R H N L G F M I I I D Y F L E K N N $M K L I V G L G N P G N E Y S K T R H N V G F M C M D E D C K Y F N$

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 GSLQADRAYHGLVARVNRPAGPVWLLQPMTYMNLSGKSVAA
 L S WESNRLLAFTCDFKHKGRQLHLIK PTTYMNLSGKAVN LGAFSHTKYEAVAATGMMDGEKVMLVKPTTFMNDSGRAVVK


 ERWKVHK A HAEVVVQTRI DGAAVVLAKPRTFMNLSGGPVA DSLRPHKKSNTLIAETRLGGKKAILAQPRCFMNLSGTPVR ETLRAHKANARVAESWRPGGAKLVLATPNSYMNVSGGPVS ATWKSGRL AFTADFKFKGRQFFLIKPTTYMNLSGKSVN
 LSKQKPKFKGLLTNGEINNQKLILVKPLTFMNNSGTCI R V R LT G GHRSVVGSGRLGDHRAVLAVPQTYMNDSGAAVG
 VPSFRQKFS GLLGEGTFAQQKI LLLMPQTYMNLSGDSVS VQFKEEKKFFGDVARVSUPESEVWLLKPNTFMNLSGKAVG WEPGEHVRCLDEKNEFTLWE WTMYLLKPMTYMNRSGKAVA

 GSVNWSTKFNGMYNEKIINGEKVIFVKPQTYMNNSGLCVG
 ATFDPSKQFAAYTAKDNDDGVAVMLVKPTTYMNESGQAVR

 | $L G P W R A R F Q C E G A$ |
| :--- |
| $F$ |

 RKTVQKRDYEAHLLE
 VAFSPSK QFAVVGKTSTNGEQVLIVKPTTYMNDSGKAVVR
ATFRSHRSNAQVAERAVPGGPKLILAKPSSFMNLSGGPV A TELRQEKKFLGLYAKVLLNDQELHLLEPTTFMNRSGGAVA


 FTQHKE EHQADIVYFTQINGEKVLLAKPLTFMNNSGVATR LGSFKTHRSRARVVEFRVPGPKVVLAVPLTYMNVSGGPVA FSFETAKL GDIVMFKVKGRSVL CLKPSTYMNVSGKALK
 LSWEKRRSAEAEVARWDVPGRTVLLAMPDTYMNDSGRAVAQ ADLRGVPGTKAQVARVEIDGHGVLEVRSTTYMNDSGEAVAA
 WTFKADSNLQGEDASGTVSESKVILLDPKTYMNLSGQSVR
 VAM NT DQSKALIGGGCIKEVPI LLVKPQAYMNFSGESVG


 TVLRPEAKFHGLLASRLNTGLGNAHLLDPTTFMNRSGLLAVK GSFSAHRSRAQVIETRRPGGPRLVLAKPLTYMNTSGGPVS




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100
110
120
A A L R F WK|L G|LD D|LVVVVD D|L|E|DPYR|V|Q|LVGGGHGGHNG ALANFFKIAPEAILVAHDELDLPPGSARFKQGGGHGGHNG
 PLARFFKDAPE EI LVVVHDELDLPPGQMKLKQGGGNGBHNG EALR F YKLLSLS DLIVIHDDLDIPFGKVRLKEGGGHGGHNG Y WM K T L L KV P K E N V L V V V D D L A L P F G K L R L K P K G S S A G H N G P L M D Y Y Q V D L A D L VVV $\operatorname{A}$ A D D L D M P V G R V R L K T H GA S G G H N G
 PLAS ALLSLPAERIIVCHDELDIAAAGQVRIKDKGGE G GHNG ALARFYKIAPEAVLVIDDELDDLPPGTARLKQGGGHGGGHNG AIVVEYY DVLIDDDI I VVYD DMD TEEGKVVIIRQS G S S G G H N G
 GL A K F Y K V P M E R I I V V H D E L D I D Y G A L K L K K G G G S G G H N G A L A A D F F K $V$ V $P$ P P A A Q V V V L
 Y WMKEHNI PKENILVVVDDVALPFGKI RLRGKGSAA GHNG
 A A MNFYK I Q R Q D I L V I C D D L N L P SGT L RLRAK G S A G G Q N G EIQDYYKIIP K NVEVFHDDLDLEIGKI RCKVGGSSGGHNG

 ALLSQ Y F H L S P T D I I VVVHDE L ELLD F GTVVK L RKGGGDH GHN G QVLGWHKLSPVDMIVI QDDLDMAYGRFKLKMGGSPGGHNG A L A Q F Y K I K P D E I L V V H D E L D DA C G R I R FK LGG G GN G G H N G $R V A D R L N D L A E S I L V V H D E V D L P L G R V K L K F G G G L A G H N G$ AL MQY Y DI SVVEDLIVVYDDMDLIIGGKAVI RQKGSSGGHNG
 PLME Y Y D I A LDD DLIVV S D DL DMPDVGK I K L K QR GA S G G H N G ALANFYKI PADEILVI HDELDLDP G GIIRLKQGGGNGGHNG EFVR Y Y N I D Y K N I LII I Q D DLLDESVGGKYKLK LIH S S S G G H N G
 A LLDYYNGN GEDVLVLVDDMDMPFGKLRFRDKGSAGGHNG





A
 AL A N F Y R I A P E A I L I I A H D Ell D I T P GTAR A F K Q G G G H G G H N G
 ALCQ F Y K I A P E E L LV A H D E L D I P P GAA R Y K Q G G G H G G HN G


 ALME Y Y K IIN K N DLIII H D DK D FP I GK I QFK F Q G S A A G H N G $G L L S Y F G V P L E R L V V V H D E L D D D A G L V R L K V G G G E G G H N G$

 A L A
 H WLLS T L K L T K E N M V V V T D D L A L P F G K L R L L K A K G S A G G Q N G


 $P L A A B Y Q V P L R H I L L I V D E M S L P N G V M R L Q P K G G B G H B N G$

 EAA S F Y K I P P E R I V V L C D $P$ V A R A L G I E P D H I I V I C H D A Y S H F Y K IIP P E HI L I V H D E L D D L P P G TARR LA Q G G G H G G H N G $A L L R Y Y D A T A E Q L I V V H D E L D D P F D T L R L K R G G G E G G H N G$







 SIIA S F Y K I N P S D I V V Y D Dll S F S I G A A A I K I G G S SA G H K G







| UniRef90 B8J804 |  |  |
| :---: | :---: | :---: |
| UniRef90_B3PJN5 | QELI DNAI DRAIACLPDAI NGDWDKAMKNLHT |  |
| UniRef90-A7H088 | KEHLAETLEYGTQAVNELI K S D DESVAQKFTDKK |  |
| UniRef90_UPIO003495855 | RLSSINHTVDES L R CLDLMLDGAMDKAMMK |  |
| UniRef90-E8WRF5 | MNELLEVLDTSLDAVEMTIKEGMPKAMSIFNAK |  |
| UniRef90-G0J555 | \D TLPIYMDKTIEMI TAFST |  |
| UniRef90-H3RN15 | RPVFDQAVAVAEKALID WVGHEFDQLMNQYN |  |
| UniRef90-R7BMQ8 | K D DF DAVCYKASKAVLSLMEVGLEKTQAKFN |  |
| UniRef90-Q4JU38 | NGWMENTLRDSVDSVTLIVNNGTD\ARND\HTRK |  |
| UniRef90-UPI00046F4FED | MQQ\ESAMDASTLVLPQLLQGEFSAAMLKL |  |
| UniRef90-N9VDS9 | SKII EKVVDAASDALIQFIGNDDRYVMNNYSGK |  |
| UniRef90-UPI0003B56076 | RQTLPNLIVDAADAVELI A S E GLT T A QLKVHTAPSA |  |
| UniRef90-UPI00034C8A73 | RAELDLNVERAADAVRTVLT DGLGRAQNLFHT |  |
| UniRef90-W5Y7B0 | MKELPIALADAADEVARF |  |
| UniRef90-A0A011TAV2 | RTSLALLIS DAADAVELLVGEGLLAAQQKHHAPRA |  |
| UniRef90-U5C3C1 | \EELPI FMDKADEMI E GFCT\GINNMTMTQFN |  |
| UniRef90-UPI0004704E6E | KKQVEQITDSVARHIELI I R G D S G |  |
| UniRef90-B3ECG5 | KKTMEKILPVCADAALDFSVNGTEHAMNHYN KPA |  |
| UniRef90-F21018 | TEVIDISVQKLLDNVHLLI ERDLDNFSSKSN |  |
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| UniRef90-U1R710 | KKELDEFLMDGADAVESLI T DGVQRTQEKFNGR |  |
| UniRef90-E2S4U6 | KAEIPIL CADAVEEILRVG |  |
| UniRef90-E6W5J7 | QSLD SFLNHAAEAVLHSAAHGLESAMNDYNG |  |
| UniRef90-G4CRX4 | K QLID EAVHKSIKGGLPLIMS G NLEEAVRFLHS |  |
| UniRef90-D6SUB0 | QNDLKDSLDRSVA ALRLLFTHGKQPALQHINS |  |
| UniRef90-B3PNH1 | YQIIDKILDGVADALVSCIYNDVRFVMNKFNG |  |
| UniRef90-A5Z5K4 | RVLAEQGIKDAASAVEVMILEDINTAMNKFN |  |
| UniRef90-B2GA68 | RPVFEGAVLQAEQALIKWVQGSFDQLMNEYN |  |
| UniRef90-Q479M0 | LPDIEHALIARCLLA WPKLAAGDFAGAQQQL |  |
| UniRef90-R7P545 | SII EDEYNNFNDITDSFINQGDDKTMNCYNSKR |  |
| UniRef90-X0YMF1 | EELI KPVIASVAEAI D C F L NQGMEVAMSR |  |
| UniRef90-M7NLZ9 | LDGLLPVLDKASDMIMGFCTIGTARTMSQFN |  |
| UniRef90-UPI00020D99FC | Q $\square$ TV NEMFDRSTSAMESWLH GNIETLSNQFNG |  |
| UniRef90-D3SDP2 | ARAIEDAlDa ALDDQVPALI A GRWDEAVRNLHG |  |
| UniRef90-Q8CXP8 | T TAVT DSVVEKAADAI EAWI K GKFDEVMND |  |
| UniRef90_UPI00039CC26D |  |  |
| UniRef90-UPI00037FD61A | K WVVEGLMDACSRALPLLFEDNEERFQSEVMRLAPA |  |
| UniRef90-E1X179 | AEFLESYLKGAAKAVEAYIEKGFQSAARTYSKKK |  |
| UniRef90-12F434 |  |  |
| UniRef90-UPI0004222A1D | AKELPFLI GDAADATELLI T D SLVAAQQKFHG |  |
| UniRef90-A0Z9C4 | RQAI DAIVDEAVASLPLLLEGDAVKAMTRLHS |  |
| UniRef90-B1MVJ8 | QPEI DQMLDRSTQAI DMWLS GEVSQLSNQFNG |  |
| UniRef90-A5CTB4 | RQVLPNVLEDAADAI EMIASDGLIA A Q L R F H T |  |
| UniRef90-UPI0002889B3C | LEA A GGAL NECLATLPLVVS G D WAKAMSRLHSF |  |
| UniRef90- A0A024PS55 | RTAI DAAI EECLRTLPDVVAGDWASAMNRLHSF |  |
| UniRef90-E1YM32 |  |  |
| UniRef90-UPI00046A9448 | RANLAVLLEESADAAEALVDDGLLAAQQRFHG |  |
| UniRef90-S2X682 | MQVMDPVIA HVADAVEAFISDEFENVMNQYNG |  |
| UniRef90-Q1Q7H0 | DVEIAK SLLQEACKALKT WVYKGDESCMNENN |  |
| UniRef90-UPI0004650834 | ENLKQAFALS LDDFI DD WTKGEFNK】MSKYN |  |
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| UniRef90-R6YJC2 | RKVLDEAI KTSVNII DDYFNMNFDKLMN |  |
| UniRef90 ${ }^{-}$W1ND79 | REAI DASI EECMATLPLALGGDWAKAMNRLHSF |  |
| UniRef90-W0J548 | TTLLEQNLERYVSGLRLLIDEGPDRAMNILNRR |  |
| UniRef90- X5E7Q3 | T DWDVATDTAADAVDITVTTRGLSAAQNEI HSR |  |
| UniRef90-W8EX11 | N\DLEGRLDEKAEAVLAFGAMGVERAMNVVNVK |  |
| UniRef90-U21520 | AGFDEFIA T GAEAARLIVARGLGAAQNELHSR |  |
| UniRef90-F8L348 |  |  |
| UniRef90-G8QZK3 | 1 T DLKPRIEDS CGAI ET F ALLA G L |  |
| UniRef90-D5NVV6 | LEELPII CADAADLIEQM |  |
| UniRef90-B9RSL9 | REQI D A A L G Q GlD A VR T LVLS GFNQNDT R F N |  |
| UniRef90-R5Q2G1 | EEAI RTCALAALETAPLWAEGEMEKA |  |
| UniRef90-T1A543 | ESKLLESVERALGAFPLLVEKGLEAAMHSLHAPRP |  |
| UniRef90-R6SH33 | GDAVASCFPFAWDGLRRLLAGDIDGAMQICNSKR |  |
| UniRef90-UPI0004759421 | GPEFDQQIADAAEAVTLIVEEGLAKAQNKVHSR |  |
| UniRef90-B9KDP1 | QESLNKVLEQAKKALFELLK S NiJe QVas K Y |  |
| UniRef90-U4TFR3 | HALILQSLDASFEVLAELLAGHTAKAMNALHSR |  |
| UniRef90-M2YER5 | AK DLPLHLDRAADAVERII D D G L T A A Q AFHS |  |
| UniRef90-UPI00047BF8DB |  |  |
| UniRef90-D6YVM1 | MEQLPSLLNQGVKALELLLKDSLQNAMNVVNSKKP |  |
| UniRef90-A0A024K843 | A A WLDPLLEAVADSAGLLVKKDDNGFMNKV |  |
| UniRef90-UPI0003794001 | EAQWPNLAILAAEVIRSFALLQGDERTMNTYNARTK |  |
| UniRef90- 4 XKZ9 | RES $\$ LAGPVHTAADAVE\IAERGVPAAQNE  \hline UniRef90-A0P5W7 & SNLIEDSIYSSYQDFSLLTSGEFDKAMLSLH T  \hline UniRef90-R7IZ75 & EDALSARVNTAVEAAQDAVLAGLQHAMCNYNNK  \hline UniRef90-C0BI29 & QKVLPERFELCSKAlLLSFGLEGLNSAMNHFNGK  \hline UniRef90-N6XC14 & RPEWEVTFEETADLVESIVTCGFAHTQQEDHSKNAS  \hline UniRef90-R6H3S9 & LTILLSNSFSVVDKI I E DFSKLSTQELMS K  \hline UniRef90-A4BXT2 &   \hline UniRef90-UPI00037903E9 & TRLLNEVIEEA  \hline UniRef90-A1BGB1 & RTVMEKVIPVCREAALDVVVNGTEHAMNNYN  \hline UniRef90 ${ }^{-}$A5IZI8 | MIVVEEVLEKVADAAISLVYNDVNFVMNKFN |
| UniRef90-S8CLU1 | RERI DA ALVEGVDALKAVISEGFTESAKCFNKQQK |  |
| UniRef90-R6R8F8 | QVLISSSQDRAVLII ENYLKHGFDYADSRYN |  |
| UniRef90 Q2CFN4 | EGWLDDVLR G I G D GAVALAEGDGARFSN |  |
| UniRef90 ${ }^{-}$W8GRS3 | EILKEKFSLYLKKIIEDYLKID FKELQEKYNGKK |  |
| UniRef90 ${ }^{\text {R } 5 H H W 2 ~}$ | F NKLNEVILKTPKIVEDFISI DFDKLM |  |
| UniRef90-E8RJH6 | MS LTFEQRKTLVAEAVAVFI QEGVDRCMNR $\square$ N GR |  |
| UniRef90-R5WPB2 | KKIADVADDNAADALLQFVEGDIDUVMQKHNVKASA |  |
| UniRef90-T1DW57 |  |  |
| UniRef90 JoZLB0 |  |  |

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MSTPRLVVGLANPGPDYEGTRHNDGWDVLVELASRVP IK L I I GGL R N P G S A Y E H T R H N T G G WL V S A A A A R R H N
$M A Q S V V M V V G L G N P G S D Y E N T R H N A G A L F V E A L A R D A G$ MSTPSLLI GLGNPGAEYEDTRHNVGHQVI DGLSGRDD
 $M W A V V G L G N P G K Q Y A Q T K H N A G F V F M R K L S K N W G$ $M K L I A G L G N P G K K Y D K T K H N T G F M C L D N Y M A K N N$
S D A WLV VGGLGNP G S E Y M ET R H NVIG F WV I D R V A QLT N
 MTAPRRLVGGLGNPGRDYEETRHNAGFWFCASSLAQAWG $M D L K G G L V G G L G N P G P E Y E X T R H N D G F M L V D A V L E E D A$

TPWLIVGLGNPGNKYHGTRHNVGFEMIDRVSQEEG
T P WL L I G G L G N P G K K Y E G T R H N V VG F E M I $M K L V V G L G N P G S K Y E R T R H N D G A M V A D H L V T T A G$ YLI AGLGNDGAEYELTRHNIGFLVLDHLADKQ G $M M T G D K L L V G L G N P G E K Y T T T R H N A G F W W I D E V A A Q T N$ $D S L Y A G G G N P G P E Y A R T R H N T G F W F A D D A A D R Y G$ DDPWLV AGLGNPGPRYAGNRHNVGAMVVAEMAAGAG $L V V G L G N P G P K Y E T N R H N I G Q M V L D E L A S R M E$ $M L L V I$ GL GNP GKE Y QYTRHNVGFDAB E K I A N Q Y N $M K L V V G L G N P G P E Y V W S R H N A G W Q A L D G Q L Q R G G$
 $M K S E K F I G G G N P G K T Y K N N R H N I G F L F I E E V A H K Y G$ TRFKLVVGLGNPTAQYEKTRHNAGFWFVDEIAETYG

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L L VGGL GNPTATYAHTRHNVGFDILDDLA QS FH MKLIFGLGNPGDKYRSTK HNIGFITLDEIAFQMG PKLIVGGLGNPGSNYKSTRHNAGF』AI DVLLEKYG MRLIVGGGNPGRNY DQTRHNAGYRWLEQCAVTLG

WLVI GLGNPGAKYHNTRHNVGYGSLDTILDA H
WLVVGLGNPGGKYASTRHNVGYLGVDKLLEGEK $M W A V V G L G N P G K R Y S R T R H N A G F L G L K R V A K E W Q$ $M Y V V A G L G N P G L I Y R K S R H N A G F Q A L D A L A G R L H$ $M F L V V G Q G N P G E A Y A R T R H N V G F M V L D R L$

M V G L G N P GPKY Q R T R H N A G A D FVVRELAHSVS $M T D S P W L V V G L G N P G P R Y A G N R H N V G Q M V L D L L A A E R A G$ $M N V A G L I V G L G N P G K E Y E R T R H N L G F M A V D A L M E A C D$ WLVVGLGNPGVKYEATRHNVGYMCVDTLLGTHD MLLVI GLGNPGSGYAANRHNIGFMAADELVRRHS

KL I V GLGNPGEEHDEDRHNAGFWFVDALAKQLD AELLSADWLIVGLGNPGPKYAATRHNVGYMAADDLLAADG $M N D \square K V I I G L G N P G P R F S F T R H N A G F L V V D A L A D R Y Y$ WL VI GLG NP GNQY VATRHNVGYRVVDRLLKDTP MKKL A GLGNPGKKYQYNKHNIGGMVI DYFAKQHG $M K L I \quad L G G G N \square G E K Y E L T R H N V G F \square V L D E D A N L Y A$ $M K L I I G L G N P G T E Y D G T R H N I G F A V A D A L A A H H N$ MY I A GLG NPGKKY E D T R H NVGGFSTDDVLACDKLN S DNSVKYLI TGGLGDGREYEHTRHNIGFDVLDELAKQEN MYLIVGGGNPEPEYSKTRHNMGFDVI NKLSTKYE MKMVVGLGNPGKEYENTRHNVGFMVLDNWMNKHN MAADTWLVVGLGNPGSRYEATRHNIGYLVVDELLQRTS $M L L I A G G G N P G P T Y A K N R H N D G F M A V D E D A R R W G$ $M \mathrm{~F}$ AV G G N P G A R F E K T R H N A G F R V V D D MADPKLIVGLANPGAQYADTAHNAGAWYVNALARSRA $M L L I A G G G N P G S Q Y A S N R H N D G F M A A D E E H R R H N$ $M S N P E D V V G L G N P G N Q Y A G T R H N C G F A F V E S L L D H G Q Q$ MS K Y L I VGLG N $\quad$ G M E Y A H T R H N I G F DVV TAFA L K H G $M S T P T L I A G G L G N P G S Q Y E K T R H N I G F M V A D V L A G R L G$ MADNVFVVVGLGNPGPGYAGNRHNVGQMVLDELAARMG MAETKMVVGLGNPGDEYVDTRHNIGFKVIDSLAGVLK
 $M L L R V G L G N P G S G Y V K N R H N I G G M A A D E E V R R H S$
$M \vee V G L G N P G P T Y$ A GNRHNVGAMVIDELASRTK MKLIVVWG NPGKEYASTRHNVGFRFVDFLREQYG M E QP WLV I GL G N P GE K Y A G T R H N A G H L A I D Y L A A T Q G IVVGLG NS GRQYAETRHNDGYLVVADEMAGREV

 $M W L L V G L G N P G R K Y E R T R H N I G G R A A I D E L A R R N D$ MHLIV GLGNPGSQYE LTYHNIGFIIVDAICKHWN $M R L I V G L G N P G \square E Y Q F T P H N A G F L A B D R L A E V V F$ L L V GL G NPTPAYAHTRHNVGFDIL D L L A Q D L G MRLIVGLGNPGSKYAGTRHNAGFWLVERAADRLG P WL FV GLG NPGEKY Q S TR H N VGGEDM DAFA Q S Q G

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 QAYRNQS LARAGVVAYGVDAPKIIVAHTGSYMNESGPGVK QAMDRAHKARAAAAEARGLDPGPKVVLAHVPSTYMNESGGPVVS ASFSTHKRTNCEVAQTRLADDSVILARPRSYMNLSGGPVA AFFKDEKKMQAELADDELNQHPGKLVLPTTFMNHSGQPTR QS LRPEKKYLGGYARVQWQGFDLHLLNPSTFMNRSGQSVK 1 S L QHQSDALVGWGRYVDQKI GLLAVPLTYMNRSGDAVA
 $L S L N Q N K$ K E G L F TKKE K DA GK DV I L L E P Q T Y M N E S G R S I R





 APDFST HK LAMMKTEFKHKGRTFHLIGPTTYMNLSGKAIIN





 FPAWR KNFGQAEVSEGTIDGERVLLMKPQTYMNESGRSVG








 V R F A R H G R A Q A V V A E GAR L G G P R V V L A K P T T Y M N T S G G P V









 $G R L A R T K A R A Q A A T V R M P G G A R A V L V R P A T Y M N E S G Q P G V G$
 M M S Q T GF D A LIWGK GV I A G Q SV L L A K P Q T F M NL S G K S V R

 GAFSTARLL
 IV VR K R K F G A RF GEGEF S DK K L I L L K P WQ R M N R S G Q A V A $V$ T L R Q D H A V K A L V A V K $\quad$ V F GPWRNNK F QA E I C D G M I A G T K A Y V L L K P L T F M N E S G R A V G

 A S F S V H K K S G T QL V E V R H G Q R K V I V A K P L C L M N V S G RP V Q
 A S LS S H K R TN T E VA E IVRLGG R R K V I L AR T R E F M N L S G G P V K $M G S F R S K F G G S G M D N A R G R R H K A V L L K P M E F M N L S G Y A V Q$ F Q SF S K K A D C $\quad$ L I T S S V I N D N K I M L M K P Y S F M N N S G I P V A
 $V H F\|H K A Q Y C G D Y A R\| D L \quad I \quad H L L K P T T Y M N L S G Q A L E$

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 ELLDYYRLGSDRLLVVHDELDLEMGYAKLKVGGSDGGHNG

 AVAKYFSVVAPTEVIVVVDEVIDDFGQVRLKRGGGEGGHNG



 Q A A NYA I K DEKLLVVYDDFDIPDGEIPRDRKEGSAGSHKG QVANFFKIVDPSDILII QDDMDMPIGKIARIRANGKSGGHNG SACKS LDVVTSGDVVIMDEDDDPFGEVRIKQGGGHGGHNG KVAQFYKLSADDIVVLHDEDDLALGGRLRILKQGGSAAGHHG $P A L Q F Y K L K P D Q L I V V H D E I D L A D G A A R L K Q G G G H G G Q N G$ ALARFHRLAPAELLVVHDELDIPPGQLRLKGGGGMGGHNG R C CRENGUQPRNTLIAHDE DLPDGRMKFKVGGGAAGHNG PLAAYYQ

VYDEMSLPNGlLRLQPKGGHGHHNG SLAVYYRDPFQHDLLMFDMMELPSGILRRIQAKGGHGLHNG A ALDWFHLGPEHLLVVVDDMDLP LGRLARLRGEGSDGGHKG PLAKFYSINPSDLIALHDELDIDFGAVRLKLGGGEGGHNG YWLQELKI PRENLLVIVDDIALDHAKLRLRGKGSDGGHNG A LAA NYYK TPAAELLVIVHDELDLPAGGLKLKVGGGHGGHNG ALANFYKLTPNQLLVAHDELDLPAGTMRLKLGGGHGGHNG LLAK LY S VTPADI I IVVDDLDLDFGRIRLKLGGGEGGHNG

 S AKTVYYN Y


 EAMRFYK GPEDVVAYDELDLDPGKARIKTGGGHGGHNG





 KLLHEYKVVP PE HLLVVMYDDVDLPTGSLRIRANGSAGTHNG PLARFYKI PPERILVVHDEMDLPDGRLRFRAGGSAAGNRG AMAKFYQIEPQNILVAHDELDHSPGSSRLKLGGGHGGHNG
 PLAQTLGGIPPERIIVI HDELDLPAGKVRVKKGGNENGHNG
 ALCRFHKITPKDVLVVQDELDLKPGTARIK LGGGGGGHNG PLAGALGLPPEKVIAI HDELDLPAGKVRVKLGGNENGHNG PLLSKQGIKSENI LVVHDELEKPFGTLALKEGGSHRGHNG PLADAFAMDLDHIIVIHDELDLPLGTVRIKRGGNENGHNG LWKDYFKDENQDLLI YDDLDLELGDLRMRPKGGTGGHNG K IDMKYYKIAAKEDVLVIMYD

 KFAKFYKI EAKDI I TII FDDIDI ETGTMKIRKKGGAGTHNG R DCGRHADEPGDLVVVHDELDLPVGRMKFKRGGSDNGHNG AFMNYYKI DVNDLLVI YDDKDIALGSVKLKKNGSSAGHNG QLARFHSVGAETVIAIHDDVDLDYDTIRLKRGGGEGGHNG EAMKFFKLQPSDVVVFYDEIDLAPGRFRMKTGGGAAGNNG AFFAHHGCAFEELIVVHDELDFPPGVVRDKVGGGVAGHRG A ANFFR PVTDMVVAHDD EAMRFHK A A LGDMAVIVYDELDLASGKVVRVKTGGGSGGHNG PLLAWHKI R PDQL VVVHDELDIPA GELRFKKGGGNAGHNG
 YWMDKEKI S L E NTLTVDEELALPLSKVRDRPGGSDGGHNG A A A Q F F S TAVGFYKGVAEDLLVVTDDMALSPGRIVRIRAKGSAGGHNG PLAARLDNVPAERVIVLHDELDLPPGRVRLRARGGSENGHNG ACAQFYKIPVSQIIVLHDELDLPAGKLRVKTGGGHGGHNG ALMGFFSVEPDRLVVIHDELDIPAGDVRLKLGGGEGGHNG ALMNFYKI NREDILVMSDDIDMDFGRVRFRDKGSSGWQNG KLVKFFGIDPQNLLIVHDELDLAAYDLRDKRGGGEGGHNG ALARFYSVNPSNIVVVHDDMELDFGQVAHKDGGGDAGHNG DLIRDFGLSQDRLIVI YDDVWI PDGRLRDRERGSDGGHNG A AVNFYKLQSTQVLVVHDELDLSPGQARFKDGGGHGGHNG ALASYFGVSVKDIVVLHDELELDFAAVRLRQGGGDHGHNG RAVQFHDIEPSSILVLHDELDIDFGRLKLKAGGGHGGHNG RIRNFYKFSLDNVIVI HDDADLEPGRIKIKKGGGSAGHNG
 ALTRFHRTAPEAVLVAHDEVDLP PLAAYYKLPDNRVLVAFDDMDLPCGVLRLQPKGGFGRHNG


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| UniRef90 D6ZJ75 UniRef | QRSLL |
| UniRei90-DoY PE3 | KAN |
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|  | A |
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| UniReforo-AOAO59E7J4 | HDWFDPLVKALSDALPFLAGGNDERFOTEVMRLAPA |
| UniRefiol upiooos6F2613 | A |
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|  | RMOVPT CKRADATELLVGLGLLEPAQNHVEA |
| UniRefolo-UPl | AKDLPFI QDAADAVETLGGGLSVANQVH |
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| Uniretio- | K |
| Unifer90-UP1000300 |  |
| UniRei90-UP100041F55D1 | RDWL VKLLDAIIA NAGELVKGADATFANRVHA |
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| Unirefi9-UP100047EDA95 | K |
| UniRef90-K9EUP9 | H |
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| Unirefi90-B7AAN1 |  |
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| Unifer90- ${ }_{\text {Uli }}$ UniRei90-C0 |  |
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$M K V I L G L G N P G K E Y E A T R H N V G W W V L D H L A D V W R$ MTA $A R R L$

MKL I V GL GNPGKEYNNTRHNDGFIALDNYDK
WLVVGLGNPGQKYERTRHSVGHMVI NAAAEKFG MA QLKLLVGGLGNPGRQYEKNRHNVGFLLLDDLAKDWD

 MDYNGVLVGLGNPGARYEGTRHNCGFADIDAFVDFGY
 MS DPWLVVGLGGNPGPQYAGNRHNVGQMMVLDEDLSRRTD
 $K I V V G L G N \square G A K Y A H N R H N V G F M A V D E L A A R L Q$

 WLIV GLGNPGKKYARNRHNIGHMVVQAVVAEAN
 $M K L L V G L G N P G S K Y K E T R H N D G F R F D D Q L A E S E G$ MKLIVGLGNPGKEYDKTRHNVGFMVVDNYDEHDN MKLI I GLGNPGDQYENTRHNAGFIVLDEVRKVWN WLVVGLGNPGSQYAATRHNIGFEVANVLAARWQ TRMKLIVGGLGNPGREYELTRHNDGFMADDELAKRWN $W L L V G L G N P G S R F E G T R H N A G F D V L D D L A R T E G$


 $M L I L A G L G N P E P K Y E K N R H N V G F M A V D A L A R K W G$ $M N D P W L I V G L G N P G A R Y A R N R H N V G R M V I D D V L A G R T G$ MTLVVGLGNDGREYENTRHNVGFMLI DMISEENQ MAT $\square R L I V G L A N P G K E Y T K T R H N A G A W L V E S L A Q Q S T$
 LIVGLGNPGPSYSKNRHNIGFMVIDDEVRRNS WLIVGLGNPGARYAATRHNVGYMAVDDLLAETG $M L L L V G L G N P G S N Y T N T R H N I G G F K I I D A A I N N H F K$
$M K I V V G L G N P G N E Y E Y T R H N A G W L F L S F L E S K Y E$ S S T WLVVGG GNPGEQYAATHHNVGQLTEDVLLQRTG

 R N R H NVGG M A V D R I A E R H G
 $M P G P A L V V G L G N P G P E Y A E T R H N V G F R V V E L L A A R A G$ $\square R M V A G L G N P G D E Y A D T R H N A G F K A V D V L A S Q A G$ MSTLRLI I GL GNPGAEY LRRHRHNAGFWFIDDSLA LA E G $M N A T F L V V G L G N P G A T Y E L T R H N D G F D A A D E V A D A B G$ $M M N M D S F V V G L G N P G K E Y E R T R H N A G W M A A S L I$ G D A A G D WV GL GNPGSAYKHTRHNLGFMALDAVAAAKS $M S T T Y$ TVVGLLGNPGSRYELTRHNIGFMAADDVAAEGG MFLLAGLGNPDQKYQNNRHNVGFAFDDFLVSAEN L LAGLGNPGTQYTLTRHNAGFMVIDAILDKFH MRLI LGG GNPGAKYEHSRHNVGFDVVDTCAAFFQ
 MKLIVGG G N P GFEYEHTRRNIGGFKDI DKLLDVLN MSAPQLLIGLGNPGARYEDTRHNAGVWLLDRVAERSE

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



WLVVGLGNPGAGYARTRHNAGRRALERLAAEEG MKLI I GLGNPGKQYENTRHNAGFIVLDEITGSFS $S Q \square K A \operatorname{I} G L G N P G N P Y K N T R H N D G F R I V D A I A Q E Y N$ MKVIVGG GNPGEKYS Q NRHNVGFRVVEELVKMLQ MDYKSVIVGLGNPGPKYEKTRHNIGFMLVGSLLRKSM WLIVGLGNPGAKYETTRHNVGYMATDLLLSKRG ASTSRRKKLVVGLGNPG MTGSRHSVGMAVIAALAERLG MSEPWLVVGLGNPGPRYAGHRHNIGAMVVAAMAASAG $\square S L I$ A F L G N T GREYERTRHNAAWDAADRDN $\square C R G$ $M \vee A G L G N Y$ T F P GTRHSVGMAVLNHLA S QL N
LI $V$ G L G N P G P Q Y Q N T R H N

## UniRef90 K2CU69 UniRef90-S2VS08 UniRef90 Q8NRV3 UniRef90-UPIO003B3641D UniRet90 - X1KMU4 UniRef90 K1MY94 UniRef90 UPIOOO4 UniRef90-A712W3 UniRef90-Q6MS28 UniRef90-UPI00037B0EF6 UniRef90-UPIO0047ABD6D UniRet90-WORJ95 UniRef90-B8KRB3

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GS WKFEKKFKAELLDFTLLFASPLTTVKPQ ${ }^{60}$
70
80 ASFSKHR AGAYVANARIGGPAAILAYPDSYMNLSGHAVS
 ADFAVHKKTNAEVAE GRLLPRRVVLAKPRTYMNLSGGAVK FPFKFSKKFNALISEKNIGKEKIILAKPKTFMNNSGQSVK AKFNS A NFGWTAEGKYKGRKVLLLKPDTYMNLSGKAI K
 YSSVKQ EFNSLIYTTVINNQKVLLVKPGTFMNNSGLAVR LS WRS LWF RPLSLA ASPAIVLVKPRTYMNRSGQVFP VVVQNRR CRAMTAADRMSGREIILAKPETYMNDSGASVA FDGWR KDGEALVSTGLVGPHKVRLVKPQTYYNLSGSVLR CRLSPESKFFGDTASGTDNGDPLRFLDPTTFMNRSGKAVA

 VSYS S STKESKG K I D R N G $\quad$ T F F H F L K P L E Y M NL S GRAVA
 D L LQPVKGHRAHAA LYDAHILAVRADTYMNTTAEAI G RHGTVVEMNGGKFSCQLWRDGCWLAAKPQTFMNLSGQCVQ
 SKFTLKKNKLK S WYSEFKINNFTYRLGMPNTFMNNS GNAVR APFVSRRRPQAATADARLGGPRVVLAKPSTYMNVSGGPVA GRWKKAF L R P F LFCEDRRRG LVLVKPCTYMNRSGVVLP ANFSLK QNLHAFVASTHDEEEKVYLVVKPTTMMNDS GI AVVK


 SSLLSWSKK FKGESSAT LDNAGGRK I QLLKKPHTFMNDSGESSIA

L LRAKRKFTD GRTPGPTHPRPRVAVLLDPTYMNES GRAVG
 L N WQR KFK GLY A A A D DL GPERVYFLKPETYMNLS GESVG



 $L P L N P E A K F Q G Y V G K V$ V A GCWLLVPTTYMNHS GRALA




 $F A P W R K R F R G E V S E G Q I G R H K V M L L K P L T Y M N L S G E S V Q$ SRKSMRFKEMGISGDFNLAGNNVLATMPLTYMNLSGKAVA
 ARFTREARLRGGAAARDT LAAGQDVRLVKPMTFMNES GRAVQQ S N WKVVS K MR AVLA E ES R G GAKVVVAK PQTMMNLS GEAVGG P $\square$ S WPKK F H GRWTTGLDGNHPV RLLQP LTYMNES GRSVAA
 Y FPNFKKKKNNNALL

 LELNKSQFNGLYV K K D DFII AKPLTYMNLS GNFI R


 ARD $\square$ S KNSFQGKL YRA A AMKQSSKNFQGGELYKSST LALRRQEK QFF GLLTGRLTTID GQDVLRLLKPSTFMNLS GESVVQ IE L NKY S CQA WI GEGEI GKQEVVLVKP LTFVNNAA GVS L L APWRS D R K V S G E V V V T QL Q DVQ L V L L R P KL L M N V N GV S V A | $L$ | $S$ | $F$ | $F S S K H N A Y$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $C$ | $C V Y K$ |  |

 A A F H Q VS G $\square$ P A E VA Q V V G L G E E E A A L L V V R P T T Y Y M N T S S G E A V FPFESNKKFNAQI SEGTIGNEKVI LAKPETFMNLSGKSVQ

 L RLLE PVPGRKALAAAV G DGLAFARSTTYMNV S GEGI A V S WK S DRHLSSGEVIVSVYQDTQLVLLRPKLLMNVNGVSVA
 1 S WQ HKR GLYGRFPAAVTGGQAVMALKPETYMNLSGESVGG




|  |  |
| :---: | :---: |
| Ref90_K2CU69 | KDEWAVTVRLAADAVEDVVTLGFEQAQQKLH |
| UniRef90 O8NRV3 UniRef90 UPIO003B3641D | LA ${ }_{\text {L }}$ |
| UniRef90- Oplooo3B3641D UniRef90 X1KM | DV ${ }^{\text {a }}$ |
| UniRef90-K1MY94 | KLNERINQFADAALSFVFAGI QNTMSAFNGK |
| UniRet90-UPIOO047CF224 |  |
| UniRef90-A712W3 | KL VElLSTAKKAVEFLITKNINLTSQKFSR |
| UniRef90-Q6N | LNLLKQSFld |
|  | RALVEAA |
| Wo | LT MDemL |
| UniRet90-B8KRB3 | RDA A A S D A AlDEALPKLLAGDMVKAMTQLHSFQ |
| UniRet90-R6B1Q8 | LDKL NSSQEIINNIS DFIDGTNDKLMNKYN |
| UniRef90-K0YR06 | TELEVTVARAVDVIEDIVTTDFLGAQMRLHS |
| S3U | MEQMPELFLAAKQKISSWVRE |
| UniRef90-D74 | ALTEQ |
| UniRef90-E4UA12 | D |
| UniRef90_UPI0003B36E0F UniRef90-B8J0S9 | GAGLDEQIESAAEGARLITRDGLGKAQSVITHAR |
| UniRef90-S5THE3 | QAELPIICADAADE |
| UniRef90-Q7V342 | SLTL DRVYKKLIESLTELNDKNEDY\ITSELNS F |
| UniRef90 D5UK51 | RKDLPWLVD |
| UniRef90-H9UK87 | SREVQPA VAAAEALCWAESGTAAAGDHYANAPA |
| UniRef90-EOTKX | A KKVIDDCADILLYYLYNDFRKAIEKFNVKQ |
| UniRef90-171TJ1 | TFlVEDAKN HLV RGNNMAF |
| UniRef90_COVZL7 | GVELDITIREAVDVIEDIVTTSFADAQQKLHSR |
| UniRef90_E7C6R0 UniRet90 3 K27 | KEGLNNAFIKANESLDQLL |
| UniRef90-UPIO0037D30EF | RADEARTFHVLEEELSGILAGKTDTAANKDHNK |
| UniRef90-R5LQE3 | LDTLNGLFKELNNVIDDYFVLP |
|  | LADVEDLTARAADTAERपVLGEDE |
| UniRef90-C2RX12 |  |
| UniRef90-C1ECF0 | ATELESTWAKACDAVRGVLVDGDDKTMSAV |
| UniRet90-F4LP | RIILSQUFPQSAAMLAQA |
| UniRef90-R7D5 | OF |
| UniRef90-V8C9k | R |
| UniRef90-B8GZL | HQWLDPILDADADALPFAAVGDDERYQAEV |
| UniF | RDSLAVTLERAADTVEDVVTRGFEDARQRLYSER |
| UniRef90-UPIOOO299D3C1 |  |
| UniF | RLAVEDALILASQAVAVWVTQGQAAAMNRFNG |
| UniRef90-N9SILO | ( KLVIDQAADILIFYLSNSFMTTVEKFNANK |
| UniRef90-Tok | A SGW A A CEAIEEHLEASSLEDVSSKFSVKQ |
| UniRef90- UPIOOO3B4D4CD |  |
| UniRef90-R5 | LEVLENVFSEAFEKFTEFLDN |
|  | EWDVTFENAADVVESIVT |
|  | EDSFRDLDGYL NIMLGDWS A |
| UniRef90 - V8CHU3 | EQLLELVDESVRGLLFFIS ERDFAALQSHETUSKP |
| R7403 |  |
| D |  |
|  | E |
| UniRet90-F4C | VMTSQAAEAAALALTRGVV |
|  |  |
|  | ELPFT |
| UniRef90-F4GLY5 | CIMKACT |
| UniRef90-F2TZG4 | QDALERVVAHARDALLLLTENNDDKCMTA $\square$ NDK |
| UniRef90-S2Z2H22 | AEELPFLCSDATREV |
| iRef90_DORRN7 | VKLIESFASTKKNLQLVLLKKFDEFSSK |
| UniRef90_Q3 UniRef90-FO |  |
| UniRef90-UPI0003B733C8 | MDPLADLLGVLAAELPTLLA |
| UniRet90-E8Q6Z4 | KKKI DFIMNQAILCIEDII FDKFVKVMNQLHPK |
| UniRet90 O8RLD7 | K |
|  | L D OkA D |
| iRef90_UP1000381144B | TVD ETVK A TL |
| UniRef90_Q03Z52 UniRef90 12 K 789 |  |
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| UniRef90-АОАОЗ1M9А2 | QQALDACCl DEALREVPGMVAGDWTRVMQRDHSFKA |
| X1R | KKVIEETS GASQAVEMV |
| UniRet90_A2BDR2 | VLD |
| UniRef90-B6JNZ5 <br> UniRef90-U2HUM8 |  |
| UniRef90-M9LH | KLGEAUDKTCDAVEFALTHSFD |
| UniRef90-171W | LAARLVVAE GLARAQHRDHCRR |
| UniRef90_K2G9F9 |  |
| UniRef90-V6DH27 |  |
| UniRef90-K2CG12 | R EHMDS |
| UniRef90- UPI0003A476C4 | Fedol |
| UniRef90-W5UEH3 | QTiLSSVMEQSVELLLAQ1TE |
| UniRet90-UPIO003B310A7 | AVI DLA Q R Gleat Q Q F HVR |
|  |  |
| UniRet90_UPIO004420 | QEVLP |
| UniRef90_D3UHU UniRef90-M4ZU39 |  |

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UniRef90 U4LRN1

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 M T FVVGGGNHETMKYHNTKKHNVGYWVL D S FA K R Y G L L V GL GNP GEKYRETRHNLGWDAMDAICYTYG

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




LVAGLGNYGLQ GTRHNVGMAVLNQLAQKLN MKLIVGLGNPGKKYEKTRHNVGFIVLEELHKQGI $\vee V G L G N$ HSMPNTRHSVGMAVVNHALAEKGAG
IE LI IF LGNHGKEYQKNRHNAGWLLWEASQMASY MKIV FGGGNVGREYENTRHNMGFMFLDYL
 MVVDALAGQFS LIVGLGNADARYANTRHNDGFAVIDALYERLQ $\square K L V A F L G N Y G K E Y E K T R H N V S W Y F E D S L B F A N Q$ $L \mathrm{~V} G \mathrm{~L}$ GNPGPKYEKTRHNAGFLAADAVARAYR MVLDELASR I G
 MKLI VGLGNPGQNYQFTLHNDGFMMIDYLLNTII LVVGLGNY TMPDTRHSVGMTTVNRI ANQMG M QLVVGLGNPGTRYTKTRHNVGFMVLDSICSRWE $M K L I V G L G N P G D E Y D K T R H N L G F M V I D C I A E K L N$

MKLIVGLGNPGKKFLNTRHNDGFVVVDSFLSQNK $L \vee S F L G N P G S E Y A G N R H N A G B W L A A B L D P F B$
 MRYDWVWVGI GNPGSEYDTTRHNAGF LALDA LKERFQ L I L GLG NPGLE F S LT R H NVGFSLL D K I V V K N G
 LVVGLGNPGKEYANSRHNAGY IVLEQIA FYNN $\square S N L K L V I G G G N P G D R Y M N N R K N D G F K V V D V L A N N T G$ $L V A G L G N Y S L R \quad G T R H S V G M A V L G H L A H R L G$



 TRHNAGFLVAEELARRHG $M Y L I V G L G N P G K S Y S N N R H N D G Y K I V D N D K N K Y G$ L I VGLGNPGSNFLHTRHNVGFGFIDKLVLKNA MS MKVI I ALGNPGKEYENTRHNVGFHDLDKFHSLHN KLIVGGGNPGLNFNFTPHNVGFMLIDVLLKRKY DE L I A F L G N Y G K K Y E N T R H N A A W I F S G L L D D I S C G

M G Y L V I K S LA N K LG
$R \square V \operatorname{VA} \square G N P G S R Y A W T R H N \square G F L L V D Q L V V E F Q$ MAVDRIVKDLD $\square$ A S $\square$ GNPEPQYANTRHNDGHRMMNQLIKTY LI T GLG NP G S L Y R N T R H NLGF LIIINRI AEKY L
 VK L L VF LG NPGKAYARTRHNIGWMVAEHL $\stackrel{Y}{\mathrm{P}} \mathrm{G}$ I I GLGNKGLSYKNTYHNMGFDVVSKLAKELG

 CF $\square$ GLG N P G S K Y D N T R H N $\square$ G K D W L I K $\square$ S E T Y C C G G P GS QY THTRHNIGFLAVDELARRWQ LVGLGNPGTKYNGTRHN』GKEWLLKLSESHC
 $W L V A G L G N P G \quad L P G T R H S V G M A V L G H L A R R L R$ TPWLIVGLGNPGTKYHGTRHNVGFEMIDRIAQAEG

$\square A S \square G N P E P Q Y$ A N T R H N A G H R $\quad \square M N Q L I D$

M ALE QLA K R Q N
 $\square Q L I V F L G N P G A E Y E E T R H N A A W L L L T Y$ L F P S S V V $S R R L L V C S L G N P G S Q Y A L T R H S A G H \| L L R L A S S R M$


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UniRef90- T2MAR7 UniRef90-X8C3G1 UniRef90-UPIOO03665F44 UniRef90-L1IDP5 UniRef90_UPIo0036FC8E9 UniRef90_OIMRO
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UniRef90_U4LRN1
$P G P R V V L A K P T T Y M N V S G G P V A$
WS FKEDKRFNALISKGMV ENKSVHLILDLTYMNLS GTAVK ASFKDTPKCFSLSAKLDLP

 LSFSRKKFGYVSEFTYK





 MLAKPQTFMNASGESVGG
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UniRef90 E8ZKB5 UniRef90-M1NHF4 UniRef90-Q73Q01 UniRef90-V5WI49 UniRef90 UPIo00479DB4A UniRef90_U3GWD7 UniRet90-K1S9W4 UniRef90-K7G5A3 UniRef90-K2ECA9 UniRefigo-A7RWB1 UniRef90-D3L2F4 UniRef90-8F4E77 UniRef90-A0A017PKH9 UniRef90-UPIO001745812 UniRef90-E1L2X6 UniRef90_UPIo003B6FC01 UniRet90_M1VKE6 UniRef90-N1V0L8 UniRef90-A8PMR3 UniRef90-B3QZM3 UniRet90_UPI0001CBA016 UniRef90-K2B720 UniRef90-Q98PE2 UniRef90_UPIo003710FCA UniRe99_Q2NIQ9 UniRef90-F5YFB7
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UniRef90-T2MAR7
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UniRef90_U4LRN1
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 EAARYYQDEPKNVIVFHDDMDLALGKI KMKVGGGHGGHNG EVIKKHQVKVENIIVVHDDLDNAFGKVKTKEGGSAEGHNG KFVDYYNLQPSDVLLVSDDLSWPVGTVRLKRGTGSGGHNG EDKSFYKLQNSDFLVIYDDLYLETGRIKLSLNKGPAGHNG RFVEYFKISADHILVVHDDIDMHPGRVKLVSGGGPGGHNG AAASFFRLKPENILIVHDELELKPGDLSFKWSGGLGGHNG HLFRQFGKPMQFLVAV DNMDLNPGTIRMKKRGGTAGHNG PLAAYYKLPLNRVLVFHDDMGLPCGVLRDRHNGGHGGHNG PARGTLKLPLDHVI AVHDELDLRFGDLRTRMGGGLAGHNG NVASFFKVPPADIIVVHDELDLDLGQVVHKVGGGGNGHNG EAMNFYKDPPQN LVMYDDISDVGRTRIRRKGSDGGHNG SAAEDYKFRVEDI YLVHDDLDKPLGKMA:KLGGSARGHNG NGGHYYKMHQKDIVVVHDDKDULLGELIK QENRGPAGHNG RVVSAYNMQPSHVILVHDELDKALGKFSLKYGGSAGGHKG EAVTFYKIKPENILVVHDELELPLGKVSCKFSGGLGGHNG SAVNYYKVDLNDVFVIHDDLDMNLGTFKLTYNHSSGGHGII
 KLAAKLG|iNARSVLAVHDELDKASGVVRLKWAGGLAAHNG SFLLRRETEWSTRLLVLVDELELLAPGFVSLKWSGGLGGHNG AMAKFYGVQPDHVI AVHDETDIPFNTVKLKIGGGEGGHNG A A A F Y Hl PVSAl AVHDDLDLDPGIARYKHGGGDGGHNG KILNEYKI TLNDLLVLSDDYYLEGNYKLKLKGGHGGHNG KCAKKYELQPSDIYLI HDDLDRSFGKYSLKLNGSARGHNG
 S:MDYFSLAPQDFLI: LDDVELPLGSRRLRPQGSSGGHKG KI INKYR:KDENLLVVVDDYLDEGKLKLKMQGGHGGHNG AAASFFKIPPGADLVVHDELELALGTASLKFSGGLGGHNG RAAGKYGVKPEDVVVVHDELDKPLGKLAWKHGGSARGHNG SIFSDFYMCIKNLLVVLDNVDLPLGKCRLKERGGMSTHNG YiNPK MOGDIVVYDDVSLPLGKIRIRKKGSHGGHKG YL KNKEDFSDVGVVYDDVNEPGGKRIRKSGSSGGHNG LIKDFYKMQNYDVVVVHDD:DLPLGDVKLKVGGGSGGHNG AAVELYNLALENVYLVHDDLDKALGKVALKPGGSARGHNG QAVKDLGISLQNLYVFHDDMQRDLGKVNLKGNGSANGHNG EFKNFYNFD NKYYVDHDEMDLDQGRIKTKGGGGHNGHNG
 QLMLKYNIPKDDVLVLVDDINLEPGAFKLKYKGGHGGHNG KVMDFFKLPMNAAIVLVDEVALDFGQLRLKGKGGAGGHNG Q1KDFYKINDNOYVIHDEDDLDQGRKIKNGGGHNGHNG SVFAKFYMKI ANLLVVVDNI DLPLGKCKLRKVGGTSTHNG KLFHFLKLDINNVLLIYDELDVPLGSYTTKRKEKK』SHNG KVINKYDVRLSKI FI H HEEVNLDVGKFKDKQNGNDGGHNG AAASFFRLKPENILIVMDELELKMGULSFKWAGGGGHNG AVKGYYN|ATDRILVIADDVNQPFGNVRLRQSAGGGGHKG GMATFYR NPDEVVVAHDELDLPPGVAKFKLGGGHGGHNG RYLDFFKFPMTNLFVVTDDISLSFGKLKLKTMGSAGGHNG SLAAHYQVPLRHILLIYDEMALPNGVLRLQPKGGQGYHNG SAKDYYGVSLDQLLVLADDVNRKFGDVRLRESAGSGGHNG ALLT YYNISIKDMIII YDDLDMEVGKIRFRQKGSAGGHNG KHFNHVRKQYPHLVILHDELQVDVGKYQRKPGTSARGHNG YWMNKEK PRKNLLISDDYLNFGNRRLRGKGGDGGHNG TWVSYYKLPVKQVLVIVDDLDLPFAKLQRLPKGGHGGHNG ELMGKYKETADGIIVIYDDADAlIGTIRARNAGSAGTHNG AMASFYRDQPDEILVAHDELDLPPGVAKFKLIGGGHG Y ASFLRIRPRDIIVIMDDITLTLGKIVVNQGGTEHTHPG Al VK PLAKFYG KIIKNTNLPKNKMI LHDDLDRGRIRLKLGGGEGGHNG AALSLLDINERLLVIDDDIYPVGGLRARPKGSPGGHNG KLLKNINLPNNKI। IFHDDLDLNPGEVRLKEGGGHGGHNG WLKQKNVGLPDRVLI LSDDINLSGTLRYREGGSAGGQKG QLVSYFKIPLSQVVVMYDDLDLPFAKLRLLPKGGHGGHNG RATELFGLAAEEVCLVHDELHKPLGKLALKLKGSARGHNG PLAAHYKLPLRHILLIYDEMNLPNGILRVQPKGGHGHHNG AFMQSHRWRQDELLVVTDDVSLPFGECRFKAKGGPGGQNG WLRLHGVESPSDWLILSDDLDTPFGMVRFREKGGSGGQRG PLAAYYQVPLRHILVIYDDMSLPNGVLRLQRKGGHGRHNG YFKDPLSQVLVIYDDDDIPFAKLRLLPKGGHGGHNG KHFGKHDQGKSALVVLHDELQVDGGKYQRKPGTSSRGHNG QLVSYFK TPLNQVVVMYDDLDLPFAKLRLLPKGGHGGHNG QLVSYFKIPLNQVVVMYDDLDLPFAKLRLLPKGGHGGHNG AALDWFGFEPNQMLILVDDMDLPLGRLRLRLSGGAGGHNG KLMRWLKQTKAQLLI LHDELDLPVGKiKYRPESKVSGHNG AACAFLQTDAKQLLVVHDELELPFGVVSLKQGGGLGGHNG


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UniRet90 $\mathrm{S5ZO20}$ UniRef90-O5L564 UniRef90-UPIOOO2B47440
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UniRef90 Q6MAT2
UniRef90-M4CWP5
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UniRef90-O83975
UniRef90-L7L901

UniRef90 U4LRN1




A

130

140
150
160 KDLINKLSKNFKRIQVG| GR DQQDDLKDWVLGKFTKQQ LRHA IESIISCLSQNF円RIRVGI GRPDKNE
VRSCMSCLNNAMPRLQVGUGRPTHRDAVQAYVLGRFSPAE

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## $V$ $L$ $L$

$\begin{array}{llll}\mathrm{L} & \mathrm{K} \\ \mathrm{L} & \mathrm{K} \\ \mathrm{L} & \mathrm{R} \\ \mathrm{L} & \mathrm{K} \\ \mathrm{L} & \mathrm{K} \\ \mathrm{L} & \mathrm{R} \\ \mathrm{L} & \mathrm{K} \\ \mathrm{L} & \mathrm{K} \\ \mathrm{L} & \mathrm{R} \\ \mathrm{V} & \mathrm{R}\end{array}$

## L


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




 R R S C $\square$ S CLLD S NMPR LDRVG $\square$ GRP T HPDTVQGCVLGHFAPAE $Y$ V D I I K C A G T RFA R LTR $\square G V G A P P S$ GT AMD KYVL G R F N G D E







UniRef90 HoR5LO UniRef90-WoGKB4 UniRef90-Q8K9V3 UniRef90 ${ }^{-}$X1PLP2 UniRef90-E1BK88 UniRef90-UPIO003A07E59 UniRef90 A0L5U8 UniRef90-17M4F9 UniRef90-H4F843 UniRef90-E8ZKBS UniRet90 M1NHF4 UniRef90-Q73Q01
UniRef90 - V5WI49 UniRef90 V4VZA2 UniRef90 UPI000479DB4A UniRef90-U3GWD7 UniRef90-K1S9W4 UniRef90 K7G5A3 UniRef90-K2ЕСА9 UniRef90-A7RWB1 UniRef90_D3L2F4 UniRef90 F8F4E7 UniRef90-R5SUG7 UniRef90-A0A017PKH9 UniRef90-UP10001745812 UniRef90 ${ }^{-E 1 L 2 \times 6}$ UniRef90-UPIOO03B6FC01 UniRet90_M1VKE6 UniRef90 ${ }^{-}$N1VOL8 UniRef90-A8PMR3 UniRef90_B3QZM3 UniRef90 UPI0001CBA016 UniRef90-K2B720 UniRef90-O98PE2 UniRef90-UPIo003710FCA UniRef90_Q2NIQ9 UniRef90-F5YFB7 UniRef90-M4A478 UniRef90_W6TDD8 UniRef90-Q0SM65 UniRef90-A6LJD9 UniRef90_B7IFM7 UniRef90 A5CF35 UniRef90-14B7U1 UniRef90-UPIO00462AA6A UniRet90_S2JP98 UniRef90-UP100035EC7AC UniRef90-।4B8T8 UniRef90-L8UIR1 UniRef90 Q83V99 UniRef90-D8LSW9 UniRet90-UPI00037EEAA9 UniRef90 W5SWD7 UniRef90 FoQQU5 UniRef90-M7P003 UniRef90_S5ZQ20 UniRef90 Q5L564 UniRef90-UPIO002B47440 UniRef90-U1YXN6 UniRef90-Q6MAT2 UniRef90 M4CWP5 UniRef90-S7KFA1 UniRef90-UPI000405837C UniRef90-G3AUA4 UniRef90- G7SQN8 UniRef90-K7L4V2 UniRef90-FORX26 UniRef90 R6WXFO UniRef90-X2N9F7 UniReffo-H2CEL8 8 UniRef90 ${ }^{-}$X8C3G1 UniRef90-UP10003665F44 UniRef90_L1IDP5 UniRef90 UPIO0036FC8E9 UniRef90-101MR0 UniRef90-C0PB2 UniRef90'UPI00042C397D UniRef90-U7DTF5 UniRef90-V9F2G1 UniRef90_C6HX88 UniRef90 W5CLAO UniRef90-Q0DG74 UniRef90-Q5APM6 UniRet90_K3XMS7 UniRef90 MOXSEO UniRef90-UPI00020028F3 UniRef90_A0A024JG81 UniRef90 083975 UniRef90 - L7L901
UniRef90 U4LRN


QELLPPVLERAVDLL
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QTRLNELFEKG $\square E \square L K$
LEKDRLCFPKMQELLMSFLKGSPDQLMNEFN EMLLAERMTSLDADGVREFVTTGSQQAMNVLNVIK LDVVK SQVPQADSFFKELLEAD
MERYRR $\ T R D \backslash P E \square L F T L F T S P V E Q T \square E R \square N T$
R ERV
AEVRDLVDRAADAVERIIDG

GEDLVQHVLEKAADLLEHI LHRNSSKA
KKKLNASISEA SEE MGIIS
KPILTCVLEECSQTILNYL
MKALPDVLERAAKAI LA WVTMDDEHADS YVNS
MPVLEQVLAVTSLALEYALVFGPEVLLPAWNKRR
CNII NNTFSKLDDI I SDFVNLDRDKLMNKYNS
QLGGVQSLLTEITTLFVQWCS GEED
QPLVQTAVSRAVEAVRSALNTGLENAMNLYNRK
LEAFTNTANSAADLLESCIAQGFQKTLN
QE LMQNVF
WRTMEEVLDDCVQVARHWDEDDLAKVVQFCNAAR

$K \square M V Q K S F P \square I S N \square I K N F \square Q D$


KP IVDTMI QEASFAVESWI LNGDEDTMNRFNKK
QKNI LKNI D IIDNK】IFNFIQDDFNILMNGYNSK
MP ILEPALEAAA
QKVLEAVLVQSVDLLISLSQQDAQSASSPAGGRRAA
LEILNFVFPCMHRALPYLFQGKFDK
1 D RLEKLYDFLSDELDDI SESNFKDKVQKDNS
L E VVNKALNLSYEALKTVVNEGDDKAMSLFNAK
LK K L D KVLDLS SDDALYTIFKDGIDDKAMSLYNS

$N M K!E E V D D A E A A L R S L L T Q D \square K D V L A R \bar{F}$
$Q S L L P L V Y E K A A E T L L G H I Q Q N$
MSKLEDVV
$K K W V D D T I N K \square S K N \square S L L I N N$
$R \square T A D K L L$
$R D A D E A L D E A T D C V D L L F K D G M V K A T H R L N S F K$
QQQI THNFPLFKKLISNFIQGPFANLMNTL
KKELDNVIADACDAVEHWVE EDMAKVMTRFNSAR
KEE LDENVFNF LS EE I $\square$ S DDEFNFDHKVAT DNS

DD L
QI GI QSVF DEASALFSQWCS G
QKLI DEAVDEAARCTE $\square W \square Q D G \square T K A T N R D H A F K A$
AKELPFLLDDAADAVEMVLTEGLLAAQGKYHAR
L Q V L A T FV D R GVEVLLDRLIKESVSQVMNAVNT
RKQUDEALEQGSEAVJKTLVLSGFSEGDSRFN
KVQMSTMFAEATERLFSSWC S GFSEGUSRFN

| $K V Q M S T M$ |
| :--- |
| $E$ |

LEII DDVI PKCVVAELEKLI EDDDKK
LKNUF DKLE
E $\square \mathrm{S}$ LP LVINLDAEKMLTD Y
KTLVDASTDFVANELLSFDKGDFDKFMRNVNGFKP
SFR $\square$ D $\ \square$ NDAESA $\square R E \square A S R D \square R D V M E K F$
KTNLEMVHKHALDEI
RAEVPTICEQAADATELL EELGLEAAQNVVHAW KKYLKKAFDLFASNFNLICDQKFSQAQKALHTK
$K K Y$ VDEA YD DFSMNFNT DCAQDFSK LQKQLHTK RESLVLAWKPFRE IVDRWL
QELLPPLLS ATDLLLDH $\square R E$
QEAMPDLLRYTNELLRLYLHRGVAQATTYANS

RIQI DTALE QGVDAVRTLVLKGFSGSDERFN

LDVI DEVLPKCVKDLENMVIKDLE
QEEVFTI I
QEELDFTFHRG\DA TR TMT LEGFNKSATFVNT
QPVLEEVIDEVLAGLDLDQRLGFERAGNRLNGF $K S L L D T A Y F Q A V G I I Q D I R E N G$
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UniRef90 M2YMI1 UniRef90-UPIO004412EFF UniRef90-R7TUG5 UniRef90_HOYZMO UniRef90 X8J614 UniRef90-C5DP72
UniRef90-O22K97
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UniRef90-C4Y3V9 UniRe990 xot851 UniRef90-W3WYM8 UniRef90_M7TC36 UniRef90-A0A024GGL6 UniRef90-R4XL94 UniRef90-M4B2E2 UniRet90-11BQP5 UniRef90 ${ }^{-}$K1PW65 UniRef90-Q3V206 UniRet90_J5J5J3 UniRef90 C5FVK6 UniRef90-UPI000289ADE2 UniRef90_18TG47 UniRef90-G8BDN0 UniRef90 ${ }^{-}$M5E6B6 UniRef90-17C5D6 UniRet90_N1RKW8 UniRef90 S7ZFB9 UniRef90-A1C9T3 UniRef90-B9WAN2 UniRef90-D3BJK6 UniRef90_G7XSK9

P|LLI|CSV|GNPGTTYANTLHSAGHTVL|NK|L|ASHLG $M$ VNPHFLVVGLGND TFPTTRHSDGHFMIDVLANRLG
 MAR FLIAGLGNY PYPHTRHSVGQVVLDSLAGKWN

$N T \prod K \prod L Y$
V L N
$R L L V G L G N P G E K F K M T R H N V G K M A A T H F L Q Q H T$ LLAGLGN SPYPLTRHSVGHLIVDSLATRLG MLTLFCLGNPTLKHKYNRHNAGLLLGEFLDEKMD
 GLGNPEPQYRNTRHNAGLILLDLLKAHYD
 $L I C S V G N P G A Q Y A N T L H S A G H T V V N Q L A A H L G$
$C \prod T G \square G N M E P Q Y A M T R H N V G \square C F V D Y Y L L R G Q$ CI DGLGNPSPKYDNSRHNIGKDWIDNVSKKFF



RLIVGLGNMGSEYHRTRHNVGFGVCKTFASEYL


DMAS L R LVVSLGNPGEYRDTYHSAGHMVLESFQKKLP

$M L I V L S G G N P G$

$I L T G I G N P E P Q Y A G T R H N V G L Y M L E L L R K R L G$ LV VSLGNPLPKYE S LHSAGHFVLNGLTKALQ SYPLLVVASIGNPGATYSNTLHSAGHVVTSAVSRPPPD MSDSQVIFS I GNPG A $\square$ AR R S CGHLVLKAAMEHFG

## L V DS L G N P LPA Y A TLH S A G H F V I R G L A QVL R I L FGI G N P VKYK G T R H NVGK YI I E QL R RELC $L \vee V S L G N P G E L D R N T Y H S A G H M V L E A L Q R L G R$

MFSPRFLVVSLGNPLPQYE SLHSAGHFALNGLAKVLR I FS I GNPGS T N R H S T GH IVMK A L DE YFG LVASI GNP PPYHTTRHSAGHILLKSLQQRLH L L F S L GNPSP Y L N T L H SA GHHALAAL DP LL P L I A S L G N P PP Y H S T R H S A GH ILL K HL A S HL L MQIVFSIGNPGR MNRHSTGHYVLQHLVSDFG MGNPGTHYANTRHNVGFQTLDRLAAALE

$M N Q A K L L V G L G N \quad A T L P N T R H N V G M M \quad N H N$
 $\square A S G G N P G Q T Y Y N T L H S A G H L L L R S F A E L M N$

$L V V S L G N P L P R Y E \quad S L H S A G H F A L N G L A Q V L R$ I A SI GNPAP YRTTEHSAGHILLD S L T P P HL R I A S I GNPRP YRQTRHSAGHIL L D A L
$I$ F F S I GN P G P $\square S S R N S$ VGA RTV D Y L A K N L K Y RT T R H S A GH H L L E A L L

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UniRef90-B9WAN2 UniRef90-B6QGEO UniRef90 D3BJK6 UniRef90_G7XSK9


YAPFSKEKSWGNGLVSRPPSRDWTLWQSTAYMNESGKAYQ TS $\square$ SADKRLDGLVGRGSVNDVSLTLYDPKADMNDTGRPTV GYPQFSKDKSLGNGLVSKGPEDWTLWQSTSYMNESGKAWM QPKEFKKCRSAPYVKYCDSNQLVLLRYDGNFMNLSGKYVV KEFKEKSKLEALIGES HDNKVLWVVPTNYMNDSGKTI S YTFQKARDGSVAI GTEYLLWQSNVYMNVSGPAVA PGKPWMPCTVPRVAASYCHASRHLLRSDGAFMNRSGQNVV VGWARDRHCAADLADASLGDAQLVLDRPRRDMNLNGRSVA FPPFRKSASYGGNVSMGGFDSTYTLFQSPSLMNVSGKSVK LQWNSNTKHGVSYTHITSHTD LTYSHQLMNVCGKSLA FPAFEASKPLGKSQNLANPDNPWCLWQSPSLMNTSGVALA PNMNSDKWRVAKSCKCSLLQTTIHFSQNSTYMNNSGQSVV TKLSSQKGGYIGGGETHVGETLVTLFKSKSLMNISGPSIA ISMSSERGGFRGRSDVLIGDTPVTLYKSKSFMNISGPSUA

GQPSFTSERYGKKAVRTSAGSKYTLLQSPTDMNDTGPWDA S SMLHDPSVHGDVIQAA $\mathrm{S}_{\mathrm{G}} \mathrm{GT}$ TLTLLAPTTYMNASGKSVR YNLPLNEQLDGYVTNDNNKPTRLALEKPRPAMNVLGNAIG $L P Q P T K N S T Y S A T T N G E L$
$S P S R R H P T A T G P A L E T E S L S Y T T T L V K S N T Y M N E S S K A W L$
$S T$ YTPFQKGTGFRRVPSDRDIYEDWTFWQSASLMNVSGNGVK
पQDRTYSPHTGGKVHYTEGEHCTLLRSDGQYMNLSGEQVC QPSFRE VTLGRQSYLVSQGPKYILVQSPTYMNVSGSFWQ THLAFSFTGFRHVPTEHDATQDWTFWQSTSLMNVSGTGVK LLKPRTFMNRSGLAAG QPEWRERRLGRSRTCLVSQGTKYTLVQSPSLMNRSGDAWK PNDEYKKGKRYEYVECDGGDTRVLCRSVDTFMNHSGDSDK YPSFREVTLGKKACLVSQGPKYTLKKSSFMNECGGNVA AKQUFKPSSNSMYSMTEVDN APPLSKTKTLGSGSVSRVGRPEYTLWQSASGMNVSGTGTM SQPALAKTRHAAKAPLASLSPAYALLQSPSLMNVSGKYAA ATQLVKKGKYSMTSLDNV ORGMFVSNAYMNESGESLR LPALKKSKPYANSMGADVGRPEYTLWQSPSYMNVSGKDLD CGPSPESQPPGKQKCKGSSGNKYTLLQSPTLMNVSGRFVEA
FSFPEFPKFSGLLSSGRVSSSLLYLEKPVAFMNNGGRPV FSFPEFPKFSGLLSSGRVSSSLLYLFKPVAFMNNSGRPLV HPTVRLTLDAPTTFMNASGKSVG WKSDTTHTTVLVHSNKEVKEYQVTVLLPTTYMNCSGTAVR
 QSSDQS GKLGKLSCLVSQGPKYTLVQSPTLMNISGPAWQ AGPFNPDPSLSNGLTTETYLPKTTLWQSPSYMNTSGPSLV
STVPNRFPLISTKHQPSTGPDFYRTWYSPSYMNESGPKLV
 QPSFRE VTFGNQTCLVCKPCEYMNNSGQTLS ARMNPTTSPLYTT VPLLPTRMPLVSARQPSAGPDFYKTWYSPSYMNESGTKLV
 YSTWK S P SLM NV SGPPVLRQLK SWLSDRKKYLNN SSYS ST MDWUD R FQDCSTKDTYSPENHLLLVKPDTYLVKDNHEVL


## UniRef90 M2YMI1

 UniRef90-UPlooo4412EFF UniRef90-R7TUG5 UniRef90-HoYZMO UniRef90 ${ }^{-} 88 \mathrm{~J} 614$ UniRef90-C5DP72 UniRef90-Q22K97 UniRef90 M7BQX2 UniRef90-UPIOOO3946484 UniRef90-W4GK36 UniRef90-B8PK40 UniRef90_-9Z2124 UniRef90-WOT4E9UniRef90 M7NQ UniRef90-R9XBT6 UniRef90-G4QCJO UniRef90-A7C7R2 UniRef90-N1QHU3 UniRef90-K5W5H1 UniRef90-M3AWRS
UniRef90 F7LOU4 UniRef90- $\mathrm{H} 2 \mathrm{~B} 2 \mathrm{F9}$ UniRef90_UPI0004736C84 UniRef90-N1JQU2 UniRef90-Q752X8 UniRef90-K6W879 UniRef90-UPIO00343F333 UniRef90-D5GAF2 UniRef90-R9ARV6 UniRet90 R7YXJ4 UniRef90_O54V95
UniRef90 D8LZE7
UniRef90-K5WYH7 UniRef90-B0D164 UniRef90-X11HG4 UniRet90_F7VU38 UniRe99O-UPIOOO4407C4B
UniRef90_O UniRef90-G3ALL1 UniRef90-W7HZ16 UniRef90-N4X7J6 UniRef90-LLLM84 UniRef90-G9N185 UniRef90-E3S1F5 UniRef90-G3BCD1 UniRef90-C5LRVO UniRef90-TSAQW2
UniRef90 A7TTK2 UniRef90-G2QA24 UniRef90-E9CIQ2 UniRef90-C7Z293
UniRef90 $\mathrm{O} 6 \mathrm{BXC9}$ UniRef90-W9YP99 UniRef90_C9SXL9 UniRef90-W9WD62
UniRef90_C4Y3V9
UniRef90-х0T851 UniRef90-W3WYM8 UniRef90_M7TC36 UniRef90-A0A024GGL6 UniRef90_R4XL94 UniRef90-M4B2E2 UniRef90-11BQP5 UniRet90-K1PW65 UniRef90-Q3V206 UniRef90_J5J5J3 UniRef90-UFI000289ADE2 UniRef90_-18TG47 UniRef90-G8BDNO UniRef90_M5E6B6 UniRef90-17C5D6
UniRef90 N1RKW8 UniRef90-S7ZFB9 UniRef90-A1C9T3 UniRef90-B9WAN2 UniRef90-D3BJK6 UniRef90_G7XSK9

A AFMAWSKT\|SKLVVVHDELEKPLGAVSVKEQGSPKGHNG D MLR K T A I N P A SLIVI H D SLLDHKPCVVSPK F G G S A N GHNG P I A A Q A H G I H T E N I Y L L Q D D L D A K l T K F R l K E S G S A N G H K G SAAEDYSLGPK DI YLV H D DLLDKALGKVA I K L G G G SAR GHN G SVLKTFHRTPRNLIILQDSLAHGPLTVSPKFGGSANGHNG PMWNR LHRDHVTHVVLHEELSSPLGKVQRKPGTSLRGHNG




 RAWSKFCENLRFLVVIMDDDVEKFGGLKVKNCGKGRGHNG $P L W Q \quad R I G S A T H V V V H D D L M L P L G K V Q L R P G R S P R G H N G$ AV CHF YKIAVDEIIVAHDELDLDIVEIVKLKKGGGHAGHNG
 NAMKSLGFQPSSMVVIHDSLSHRPGVASPKSGGSAE GHNG NWTKSLSLAEGRLVIVHDELEKPLGAVSLRQGLSAKGHNG E I I N F Y K L D P K D I I V I Y D D M D L P F G D I R I R E R G S S G G H N G

 $P L W Q R \square G G A T R V V V H D E L S L P L G K V Q L R P G R S P R G H N G$ ALAAFFSVVAASVIVVHDDLETPFGQVRLRRGGSEAGHNG R A A E L F G L T A E E V Y L V H D E L D K P L G K L A L K L G G S S R G H N G KA WK AFMAELLSELVVLHDELEAAPGRVKVKKGGSAK GHNG RYCE HVNARRVLVLHDDLQREWGKLSIKHGGSANGHNG A A WRHWQL QRERLVVLHDELEKGVGEVKVRTGGSARGHNG
 LFSKQNKNNMDEILIVVDDDIDDPFGEI RFSPKGGS GGQNG A A Y R N TS SRDPK SLIVI S D SVVQHIPTK LAVR LIGGSANGHNG AEYRKSVNSPSSMVVITVDLSHRVEAGSVKLGGSANGHNG RAYKDFMVDPE EVVLVHDDLEVELVGVVVRWKASHRGHNG GFLSHHRWRQDEMLVLSDEVSLPFGTIRLKSRGSS GGQNG $K A C R A T V Q D P R S V I V I Q D T M Y G E P G R M K V K Y G G Q P E$ G H R G $K F V D K N R D P A D A I V L I M Y D F E S D D G V V R I S K F K K N E S H N G$ KAWKTFKTSPS LLVILHDELEVAVGRAKYKKGGSAGGHNG RAYNE WLRE DR RLVVVVDELE SALGKVVTIRDGASAK GHNG
 D T $\square K K Y G A E S L G L V I V H D E L E K D M G V V K I P W D R S P R G H N G$
 RYFEANKKRPDDVIVLYDDFELDLGRVRISQFKKNESHNG PALSDLRLRADDVLVVCDDLT IDPGQLRMKPGGSSGGQNG DMCDKHDPSSLGLVILHDELEKSLGNVGLVPWRSARGHNG E Y L R GRHGS LQQRMVVV H DEEL E L S I GK I K MRDGGSSN GHNG E HLLSERGGLAS EVVLVHDDLEEELGVVKIRWKRSHR GHNG SAAKHFA I KPHQMLLAHDCLE LNLA EFKLKA G GSAK GHN G D MVK QHDPSSLSSLVIVVHDELVEKDLGDVRTAWDRSHK GHNG Q Y I E Q E K DG L R Q L I V V Y D E F D L D L G K V K I
 A A Y R AFEDPTLS LLVVMDDLEEDLGVVRRKWNSSHR GHNG A WK QF S N I Y P P S L V I L H DEELESSSPGAI K LRRGSSPK GHNG AF LGNEKIRQCDLVVLFDDFELVMPKVRLQRLKQNESHNG $A \quad I L R R T G V A L E G I V V V C D T L D L P P G V C R L R R K$
K A YK QFDFGLPGLVVLHDEMETAPGQLRRPRNGNSAKGHNG NWADALKKNKECLVVVVDDLEEDFGAVVRKWKASHRGHNG QLVNFYYKVEPENVIVEHDDDDDDFAKVKDKRGGGS G GHNG RFFS QHRWRQDELLVISDEVSLPYGTIRRFKSRGSSGGQNG RAYQEFKVSPEAL CVV I H DEMESKLGGAVKVRLLT GK GK GHN G AFMQSHHWHDDELLVVTDDVALPFGECRFKARGGPGGQNG QAVHDLSIPMSNLYIFHDDMQRELGK
 RAA E L F GLLTAEE I Y L V H D E L D K P L G K L A L K L G G EMLK QHDAASLSLVVLHDELEKALGEAAVAWDRSPR GHNG RAYKSWHTRATNLI LLHDELERSYGNLHIRYGGSSRGHNG MI L L H D DL D L N P G E V R L K E G G G H G G H N G $R Q L K N W K I L A P T$ LVI L H DELLEAP LGGKVRVKRGGPER GHRG

 KTMQK WDA GPATDVIVHDELEKDLGUVRTAWDRSHKGHNG





$\prod K S V Q Q S L Q S K F \square K V G \Pi G \square G R P A G G S R V S A Y V L G N F T G S E$ I K SI NSALNMNWSRIWVGIDRPESRREVSNYVLSRLDAHQ LK SLDANLGRDYWRFRFGVGR GVGEPAEHVLSCFTSLE V K D I I K C I G T R F A R L K I G V G A P P S Q F P L D K Y V L S R F N S N E

 VK NLIE F F M D D F VK C GVGGUGPLPS TVNE E D Y YLLS D F N G G E

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
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sol0


| UniRef90_M2YM11 | $\text { RAVIJE G S\|V\|E E } 170 \text { V/R RLLJRKLL」 } 180$ |
| :---: | :---: |
| UniRef90-UPI0004412EFF | RE |
| UniRef90-R7TUG5 | K D L V L R F F P A L E L L |
| UniRef90-H0YZM0 |  |
| UniRef90-X8J614 | LDWWAE G L N K V VAELEATIIKKS L |
| UniRef90-C5DP72 | LEILQKSFKTAWERIGHLVNN |
| UniRef90_Q22K97 |  |
| UniRef90-M7BQX2 | HEVLQRVLEQAADLLLEHT |
| UniRef90-UPI0003946484 | REKLEQI LA QAVT CLLEHI Q |
| UniRef90-W4GK36 | QDDMAKL MA Y C TALL HVYVHRGLNDAMMVANS |
| UniRef90_B8PK40 | R E |
| UniRef90-J9Z124 | K K D L Y A La E |
| UniRef90-W0T4E9 | IL $\backslash \mathrm{QLEEAFPRSLEHTRKLL}$ |
| UniRef90-M7NQX0 | L NYVERTDPEVVKEI Y K L I EK |
| UniRef90-R9XBT6 | LEQLEDALPA AVGHLD GLLR |
| UniRef90-G4QCJ0 |  |
| UniRef90_A7C7R2 |  |
| UniRef90-N1QHU3 | RLALD G SVE E |
| UniRef90-K5W5H1 | K Q |
| UniRef90-M3AWR5 | K E A V E |
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| UniRef90-H2B2F9 | VEVLQESFPSACNLLEKML |
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| UniRef90-N1JQU2 | RTK\EECTS QVLKELQAMAA G |
| UniRef90_Q752X8 | LS QLE Q |
| UniRef90_K6W879 | R K ELP F VLG D A V DVIEE ELVLH G F |
| UniRef90-UPI000343F333 |  |
| UniRef90-D5GAF2 | K D T LK E S LP EVLA A LE K L |
| UniRef90-R9ARV6 | L H Di T DGL |
| UniRef90-R7YXJ4 |  |
| UniRef90-Q54V95 | EHLLKESI D KASRYSIMWWLEK GSDF T M NLIN |
| UniRef90-D8LZE7 | LNILPPYVI HFACEGLRVYLHRGDNAAASCCN |
| UniRef90-K5WYH7 | KQWTQEGL DLVITEI E |
| UniRef90-B0D164 | RWWTEDGLDLILTE I EKVARKN |
| UniRef90-X1IHG4 | E ELVKE I I K K T A E A E F S LKVGLA K T M S R Y N |
| UniRef90_F7VU38 | K G L Q Q |
| UniRef90-F0W5M8 |  |
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| UniRef90_G3ALL1 |  |
| UniRef90-W7HZI6 | VERMETALPQVLEFLRRL GTGKL |
| UniRef90-N4X7J6 | RDQVEKSAVSVFKALEDIAAG |
| UniRef90-L5LM84 | QELLLPVLERATDLLLDHIRE |
| UniRef90-J5PBA1 | QALLTQSEPAAWRALNQYL |
| UniRef90-G9NI85 | RTTLEE DTPWDVAKCLIE |
| UniRef90-E3S1F5 | RGALEKCTVPVYRALEEI AEG |
| UniRef90-G3BCD1 | K EVLEKGIPLLAID Y L E Y I VEAEGEVACNKVNA |
| UniRef90-C5LRV0 | QALIFYEVSKYAAQVI RVWLFRGFDLAVNLANTDK |
| UniRef90_T5AQW2 | R GVLEDV |
| UniRef90_A7TTK2 | RRII R E |
| UniRef90-G2QA24 | RGVVE |
| UniRef90-E9CIQ2 | L A R L N D |
| UniRef90_C7Z293 | RRILEE EAPWKVAERLVELEDE |
| UniRef90-Q6BXC9 | RQUI D NLI P L A I D Y ID HV I D |
| UniRef90-W9YP99 | RAKI EAATDSLI AVLES |
| UniRef90-C9SXL9 | RSVLEKAGEGVLRCLREW |
| UniRef90-W9WD62 | K S KII EAATESLA |
| UniRef90_C4Y3V9 | K QLLS T S L Q T Y K Y VE H\\| I S S D G $\ddagger$ G C N K L N S R |
| UniRef90-X0T851 |  |
| UniRef90-W3WYM8 | HANL |
| UniRef90-M7TC36 | KGIID |
| UniRef90-C6V4G9 | LER R L N L F G F I G T NLPLLLS D |
| UniRef90-A0A024GGL6 | Q R R L C L L K Y I E EVLRVYVHR G L Q Q A T TVANG |
| UniRef90_R4XL94 | KRTLEQ |
| UniRef90-M4B2E2 |  |
| UniRef90-11BQP5 | \EQLEESLV |
| UniRef90-K1PW65 | LS ILR SVFEK VELLVN |
| UniRef90_Q3V206 |  |
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| UniRef90_C5FVK6 |  |
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| UniRef90_18TG47 | LAA AVRAAAGPVLDI $\square$ A DE $\square$ |
| UniRef90-G8BDN0 | K I I M S Q S FDLCLIF Y L Q Q I A E A G |
| UniRef90-M5E6B6 | RAACEAQVN |
| UniRef90-17C5D6 |  |
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| UniRef90_S7ZFB9 | L DAVARAAESVVDVLEEEM |
| UniRef90_A1C9T3 |  |
| UniRef90-B9WAN2 | K $\square$ K L E ESFKLLQLY |
| UniRef90-B6QGE0 | MQALRETVPEVVEVL |
| UniRef90-D3BJK6 |  |
| UniRef90_G7XSK9 | LKAVRAA A G P VLEVL |

[^1]

|  | 1 | 10 | 20 |  | 30 | 40 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| jhmm |  |  |  |  |  |  |


[^0]:    

[^1]:    lupas_21
    lupas_14
    lupas_28
    jnet
    sol25
    sol5
    sol0

