
$\square$ GHFCKRWAKQGCAHFVCSSSGNAGMAAAYAARQLGVPAT A Y N FMA HIDPK D D R WRVI TCS A GNHA Q GVVALA G S H L D I P C T A Y N R I Q L S E E Q K A K GVI C A S A G N H A Q GV A L A A K K L G I K A V A Y NKINLLSRDECARGVLCASAGNHAQGVALSAHKRGCAA T A Y NKMAKLSPQAKRGVI CASAGNHAQGVALSAAKDGVRAV LG H L C K T L A E R GYERRFVCCS GGNA GMAAA YSAR K L G V P A T



 A Y N M A H L T E E E R W WR G V V A V S A G N H A Q G V A Y S A Q H L G DP A T A Y N K M A HLS T K E LLERVI TSSAGNHAQGVALSARKLGCKA I AFNAMRKLVRPGAPHFVCASAGNHAQGVAYACRHFGAKGT A Y NLI QLGPADRQRGVVCASAGNHAQGFAYACAA LGLLTG

 A Y NKMTR SAA QRAR GVI TASAGNHAQGLAMAAQRMGV SAT A Y N $\square S N L D T E A E K K N G V V A A S A G N H A Q G V A D A A T Q M G I$ K S T AFNAMRKVLENEK GLVVVASAGNHAQGVVAMCRHFGVVGV A Y NLA HLS DEEKKR GVI ACSAGNHAQGVADSAQKLGI K A K
 A Y NMAHLSPERMWKGVI ACSAGNHAQGVAYSARTLII PAT SYFK $\square S Q L T$ D E E K H GVVI A A S A G N H A Q GVVA LAA T K S G I K S L
 A $\square N K I T L$ T E E QK K K GVVVAASA GNHAQ GVVAFASRNA GUSAT

 A Y NMNCLSDE QRAK GVVAASAGNHAQGLAMAADKMKVKA I A Y NKIS RSEAERAAGVVCASAGNHAQGVALSATRLGI KA T A Y NLI QLDAEERAKGVVTASAGNHAQGFAFACAQLGLHGR A Y N MAHLDATESWKGVVCCSAGNHAQGVAYSARRLKIPAT A Y NK I A ALGREAANGVVAASA GNHAQGVAFAASRAGI PA T A Y N I H Y P A N D L V R G V C A S A G N H A Q GV A Y S C K N L G I G K A Y N MAHDPA DALARGVI TASAGNHAQGVAFSAARMNVRAV A Y NMANLSAE ILARGVI AASAGNHAQGVALSAQKLGCRAV A Y N M M S S L P A E KLDE CVVVCAS A GNHA Q GFA YS CK K L A Y NKMAKLTAE QLEKVI TASAGNHAQGVALSAQKIGCEAII AFNAMRKVLAQEKRKFVCASAGNHAQGVAFVCAHFGVEGT A Y N M I S QL S D E E K WKVI A C S A G N H A Q GVVA F SA N Y L N I P A T MVMAVAKAK E E GA E A V I CA S T GNTSAAAAA YATRAGL K A Y
 A Y N A M S LT ESE LLRKGVVVASAGNHAQGVAYSCHRLGVKGV AFNAMRKVIPEH QVVFVASAGNHAQGVAFMCSHFKVRGV A Y NKMAYSAD QLD K GVI CASAGNHAQGVALAAKRLGCKAV A Y N K VMMLDEKDRGRGVI AASAGNHAQGVAYAAARAGLPCT A Y NM Q SLT EEEMKK GVVCASA GNHAQGVAYSCKAMKVVGM A Y N KIA T L G R S P G GVVAA SAGNHAQGVAFASSRAGLSST

 $M V V A V A K A M E E G A R A V I$ CASTGGNTSAAAAAYAAAAGGLKCV A YNMIA K DETQKNAGVIACSA GNHAQGVAFSSNHMNMPAT $M V M A V A K A V E E G A Q A I M C A S T G N T S A A A A A Y A A R C G I A C D$

 A Y NLI SA SKE QA K K G V V CA S A G N H A Q GlV A Y S C Q H L G I K G V
 MVLAVAKAKE E GSEAVI CASSTGNTSASAA AYAARAK LRCVV A ANAVFSLKESERQKGVAHSSGNHAQALALAARLAGVPAY

 A LSMDRQAE HRPGDTVI EATS GNTG DALAMVAALKGYRLK A L N L L S L T E A E R A A G GV L A F S T G N H GQ A V A A S A R M T G A T A T
 AYVRMSRSEEEKARGVVAASAGNHAQGVALAAKKLGISAT




 AYNRISRLTDEEKRGVVAASAGNHAQGVAFAARELGGIRAT A Y N IV N LTEE QK K C GVV I A S SA GNHAQGVA YAATA FGV K S T A Y NKI S GLLS QE EARGVVCASAGNHAQGVALACNKLDIQGT AKFLI E DAEAR GK LGKPVVATGGNTGVGGLAMVAAAKGYRTV AYFAMHKY $\square$ QE GYREFITASSGNHAQGVA YAAQLHGVKA T




## QUERY <br> UniRef90_14YCW8 UniRef90-UZNJ36 UniRef90-UPI0003771920 UniRef90_S9ZRR7 UniRef90 $13 \mathrm{JJX25}$ UniRef90_A6W2V2 UniRef90_UPIO002624CA5 UniRef90-M9MA27

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पSVGGGGLLCGVVQGLQEVGWGDVPVTAMETFGAHSFHAA CSVGGGGLISGMSEYMKRUAPEDVKMIGAETFDGDALDRS




 CPIGGGGLVSGMAMYKALYPHDKVIGGVQTEDSAAMKTS I PVGGGGMLAGCSTWLRGRHPQTRIVGAEPAGAACMAAAD VPVGGGGLLAGVGAYMK YLRPETRLIGVEPEDAASLKAA VPVGGGGLIAGMACYLKA LDPHDKVI GVEPYDSDAMYHS ASI GGGGLMSGITSTYK NLSPHTRMI GAEPAGALSMKTS DPVGGGGLLAGMAAYIR YVWPNTKVIGVEPEDACCLKAA LPVGGGGL SAGVRSYFEDGCDYTFVEPAGGASLAAA FIPIGGGGLVAGTGSYVKRПAPHTK\| IGVETHDACAMNQS FVPVGGGGLIAGIAAYIKYLRPQVRIVGVESEHSACLQAA VPVGGGGLVAGIAAFVK YLRPEVKVIGVEPDDSNCLQAA FCCVGGGGLIAGVGVYIKRIAPHVKI IGVETHDANAMARS VP GGGGLCAGVAFAIKQINP KCRVYGVQAQGAPSMLHS LSVGGGGLLAGVVAGLKEVGWQDVPIDAMETRGADCFNQA IVQVGGGGLAAGVAAYVKYLRPQTMRIAVESDESACLQAA $V G A I G G G G L L S G \| A Y V A K T F K P S \square R V I G V Q A E T C P S M A V T$ GPGNAGNISAYWKGFKELRDNKQIAPPEDAGFEAEGSAA VPVGGGGLIAGVAAYIKAFWPEIGKIIAVEPADAASGKAA VPVGGGGLLAGVAAFVKYVWPQT RVI GVEPEDAACLKLDA VPIGGGGLAAGLASYVKF LRPDVKVIGVEPADAASMKAA VPVGGAGMLAGCTTWLAA RHPRTRVVGAEPTGAPCLAAA FCCVGGGGLIAGVGVYVKRTAPHVKII GVETYDADAMTQS PTGGGGGLISGVGCAIKEQKPNVQIIGVQAAAAPSMLEA

 FVPVGGGGLAAGIGSYMKTVSPKTKIIGVEPEGAPSMLAA VAIGGGGLAAGVASYKRLKPEIKIIGVQPVDSDAMKQS LPVGGGGLSAGMLSYFKAVGAETKVTLVEPVGGPSLTAA
 PVGGG GLSAGVGSYMKTYSPKTKIIGCEPEGAPSMFEA LAVGGGGGLAGVAAGLLEVGWQHVPI IAMETRGAHSFHAA LPNGGGGLCAGVSTY:K SVSPSTKVTGVEPEGAPSMTLA IVPVGGGGLIAG|AAYVKQLRPEDRRVGVETVDSCAMKQS MSVGGGGLUGVGSYMKEDPETVKVVGVEPAGAASMQAA VPI GGGGLISGVACAIKEQRPGVQIIGVQAAGAPSMLEA VP GGGGLI AGVATAVKE QTDARVVGVQAEGAASAADS LLPVGNAGNITAYWKGYTEYRGDGVIDSLPRMLGGVQAAGAA MSI GGGGLSSGVGSYFKEDSPSTKIIGVEPAGAPSMKTS $\square P V G N A G N I T A Y W R G F K Q Y Y E L G K T K K L P K M M G F E A E A A A$
$F C A V G G G G L T S G G G S Y L K A D H D K V I G V E T Y D A A T L D V S ~$ DPVGNAGNTTAYWKGFVEWKQAGKVDKTPKMDGFEAEAAA CSTGTGGTFAGVTNYLKSMNKDDGCYUADPPGSVDASYVQ AS IGGGGLISGUGTYIKSVSPQTRRTVGVEPAGAPSMHEA ASPIGGGGLITGISLYLKKNKPQDFIAGIEPAGAASMKAA IPVGNAGNITAYWKGFKEYHEEKGTGLPEMRGFEASGAAA TPVGGGGLIAGTATAVKGYNPGTRVIGVEPEAGDDTKRS TPVGGGGLLSGTVLAARCFSPATKVWAGEPAGADDAYQS TPVGNAGNVSAYWKGFKEYYERGKSTSLPRMVGFEAEAMA CATGTGGTLAGVARFLKEQNPPNVRTVLADPHGSGLYSF SCMGTTGTVTGVSRYLKKDTPE VAPFVVERDGYPKMARS VPCSGGGLSSGVITAVRDTHPETVAPFVVERDGYPKMARS VPVGGGSLLCGGAVAVK HLKKDTEVYGIDTEKAYSMVEA GI GGGGLLAGNAVKQEAARRGRHLRIIGVQAENAAAYPPS GPVGNAGNDTAYWKGFKEYHEAKGTGLPQMRGFEAEGSAS AATGTGGTYAGVALYLKE QSSKVRCVVADPMGSGLYSW APVGGGGLTAIVAHHHSQATDHQCLTFGAEPTGADDAARS PVGGGGGLAAGVSVLVKQLMPNVKVDAVEPEDSACLKAA VPIGGGGLISGVAFAAKSMKPS|KIVGVQAENAASMYNS VPVGGGGLISGAGYLKEKMKDVEIIGVQPENSAVMYYS
 LPDGGGGLMAGVGSVFKSLSPET CVVGVESTGTASMKAA VASGTGGTIGGVSRFLKEQNQSTQVWHIDPMEGGASSDYV
 CASGTAGTVAGVTRYLK TMSEGRVQCYVADPPGSVIYTY






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UniRef90 LOF583 UniRef90-I0DQ43 UniRef90-K9VJQ5 UniRef90-R6FCBO UniRef90-C3WB15
UniRef90 S2KRH7 UniRef90-A0A024LV73 UniRef90-KMY9G7 UniRef90-U5F9F1 UniRef90-K6V9U9 UniRef90-X0RM66 UniRef90-H1GY98 UniRef90-14VXX3 UniRef90-UPIO003F53FAC UniRef90-W6EF92 UniRef90-L5KWD6 UniRef90-VORW16 UniRef90-G2PC26 UniRef90-UPI000477E4F8 UniRef90-W3RH68 UniRef90-UPIO0037B28CF UniRef90- A8LRI3 UniRef90_UPIo00424D278 UniRef90-S0JMD6 UniRef90-D3PAU5 UniRef90-UP10003B5CB5F UniRef90-H8GGK8 UniRef90-REEFX1 UniRef90-XOPU11
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UniRef90
U5N8 UniRef90 C5ZYZ6 UniRef90-R9NFG9 UniRef90-QOSTQ4 UniRef90-HODHR2 UniRef90-C6VV60 UniRef90-UPIOOO4714601 UniRef90-G8ZRC7 UniRef90-B9JX06 UniRef90-S2EIU8 UniRefe90-ROJTZ6
UniRef90 D3SPV UniRef90-G7ZGRO UniRef90-14A1A8 UniRef90-R7J222 UniRef90-F7NIJ5 UniRef90-F4DV70 UniRef90_K7RR80 UniRef90-W9WW51 UniRef90-UPIOOOC4624218 UniReffo-D8KOY UniRef90_UPIo003644E04 UniRef90-LOWAF7 UniRef90-G6Y5D8 UniRef90-G8MEJ8 UniRef90-UPIO003B4AA4B UniReffo-Q22B57 UniRef90_UPIO004717A03 UniRef90-D2TXD3 UniRef90-V5CSV2 UniRef90-C70628 UniRet90-TORM49 UniRef90-H2GOZ22 UniRef90-KOCAR5 UniRef90-K41JJ7 UniRef90_UPI0001850F7B UniRef90-F8GUJ9 UniRef90_E312LO
UniRef90_K1WP56

MVMAVJAKAK 50 EGSDATICA ${ }^{60}$ TGNTSAAAAA 70 YAARAGMRC 80 AKDAEERGLIRPGGTVVEGTAGNTGDGLAHVCRAKGYKCV AYNADSVLSNEEKNKITCASAGNHAQGVAYTAKKLNLKAV AYNKISQDVDRGVDSFIAASAGNHAQGVALAATKCGAKST
 AYNMVQSIPQERLSSVVCASAGNHAQGVAYSCKALGLKGS A YNMAQLSPDLLAQGVI AASAGNHAQGVALAARHLGTRAL AYYVSTMTEEERARGLI TASAGNHAQGVAYAAKAFGCKAT ALNRINLTEEEKKKGVIASSAGNHAQGLALGATAQGIKST ALYNMQASPEELAAGVVCSSAGNHAQGFAMACRSMRYHGR AFNLAKDKEEGKTNEVIASSAGNHAQGVSYASSKLLGMHAT AYNMIMQAERRGQIKPIEATSGNTGIALLAMVAAMRGYKMK AYNKTTLTPD AYNRMVQLDAAQRGRVVA AFNKIFS AYNKISLTKEERAQGVIAASAGNHAQGVAYSARSGGUSAT MGHLCQMWAEQGCEHFVCSSAGNAGMAAAYAARTGG| PAT MVMAVAKAKEGGSDTVICASTGNTSASAAAYAARAGLRCII MTMAI SEAKEAGAKAVICASTGNTSASAAAYAVRAGMVCA ATHALAVLAEQGCTRVVTASTGNHGRAVAYAAQALGMQAT AFNKISSLPPEARPAGVVASSGNHAQGVAAAAQLFGMPAV AFNFMRKRLARGEARFTCASAGNHAQGFAFACRHFGVQGR ACNAVFGLSDALAERGVAHSSGNHALSLSYAAGRRGIPCN AFNMISALTFEEAFKVVCASAGNHAQGVAYSCQKLGIKGT AYYA: KKRSQSEAAGVVCASAGNHAQGVAYTCRETGVQAV GYSMIMDALFNKKMTIIEPTSGNTGDALAMMGASLGFKVM MTMAVSKAMEDGAKAVI CASTGNTSAAAAAYAAKAGПKAV MTMAVTKAVEEDSRAIICASTGNTSASAAAYAARAGIKAF AYH K K LDD ENQLKAGIVTASAGNHAQGVALSAKKLGIKAV AYYAISKTPETRKRGVVCASAGNHAQGVAWTSAKMNIPAT ALYAEERGLLRPGGTVVEGTAGNTGIGLAHVCRSKGYKLV
 MTMATSKAKEDGAKAVICASTGNTSAAAAAYARRGGMSAF MVMA AKALEVGSKNIMCASTGNTSASAAAYGSRYGLKTD AYYAISRTEDEKQRGVVCASAGNHAQGVAYTCNEMQIPAT
 ALNFQMLDKDPQDAAFVCASAGNHAQGVAFACRHFKRKGI AFNKIFNLSNDKKSNIIAASAGNHAQGVALACKKLKIKCL AYY ISTLSEEERAKGLITASAGNHAQGVAYAAKAFGAKAV AYNKIASLSQDEDRGIITASAGNHAQGVAYAARERGAHAT
$A S Y K V C L T E E A S C G I A A S A G N H A Q G V A Y A A K R G R A V$ AFNKISLTTEERKKGVIASSAGNHAQGVAYSAKHYGIKAV AYYKISTMSDEARQKGITASAGNHAQGVAYAAQKFGCKVV ALNKIRSLSDEEKSKVVCSSAGNHAQGVAFAASQANVKST MCMAMTKAKEAGKKVVICASTGNTSASAAAYAARAGLKA AYNMASLTPEALAGWIVCASAGNHAQGVAYACRKMQVKGA A YYKISNLSYEERHKVVCASAGNHAQGVAYTCNQLDVYAK A YNMUAKLDDSQKNQVIACSAGNHAQGVAFAAKHMSIPAT AYNFFRKVDGQDDKDFVCASAGNHAQGFAFACRHFGVHGV AYYK KKLSSEEKKYGVVAASAGNHAQGVAFASSLEKIPCT MTVAISKALEEGKRAVIGASTGNTSASAAAYAARAGLKAY A YNAVSRFTPLQRALGVVASSGNHAQALALAASMLRVRST AYNKIVQLSPEEKKGVVCASAGNHAQGVALSCAKLKIKGK AYYKI SQLSDEEKRGVIACSAGNHAQGVALGATHNGIKSLL MTTAISAAAGRGAKAVVCASTGNTSASAAAYATRAGMTCA AYNKIQSLSQAEREKVIAASAGNHAQGVAYAATQAGDKST ASNAVQLDAEQKRLGVVTASTGNHGRALAFAASQQGVKAT AYNRMRQSEAERHAGVVTASAGNHAQGVALSGARDGIRAV ALYAEERGLLKPGGTVVEGTAGNTGIIGLAHVCRARGYKLV ALGAEERGLLKPGGTVVEGTAGNTGUGLAHVCRARGYRCV MVMAVAKALEDGFKAVACASTGNTSASATAYASAAGVES
 ALNMISQAEKRGDDRPIEATSGNTGIALAMAAAMKGYRMR ATNALAQDAEAGCTRVVTASTGNHGRAVAHAARADGIEAA AFNFFRKAEGGGERLFI CASAGNHAQGFAYVCRHFGVQGV ALNKFNLTTEEKAKGVVCASAGNHAQGVAYCCNYMKTKGT ASNKIAAMENGGVSSVVASSAGNHAQGVACAAKKFGIPAT
 ASHACSYYAEHGAKGFISSSGGNAGIAVAHSCRKLGGPVT ALDRLEKLSDKEKENVIASSAGNHAQGVALAAKKLGIKAT A YNK QLTPEQQQRGVIAASAGNHAQGVALSAAKLGGUAT ALNMIETALNEGKDNANEPTSGNTGDGLASICAAKGUGLI MTMAVTKAVEEGSNA\|CASTGNTSAAAAAYAARAGLSAF



UniRef90 E5WFD2 UniRef90-UPIOOM4560767 UniRef90-Q5HMF5 UniRef90-M0DAV8 UniRef90_A7RWI2 UniRef90-R7KWC0
UniRef90 LOF583 UniRef90-LOF583 UniRef90_K9VJQ5 UniRef90-R6FCB0 UniRef90-C3WB15 UniRef90_S2KRH7 UniRef90-A0A024LV73 UniRef90-K9Y9G7 UniRef90-U5F9F1 UniRef90-K6V9U9 UniRef90- XORM66 UniRef90_H1GY98 UniRef90-14VXX3 UniRef90-UPIO003F53FAC UniRef90-W6EF92 UniRef90-L5KWD6
UniRef90_TORW16 UniRef90-V6T3I6 UniRef90_G2PC26 UniRef90_UPIO00477E4F8 UniRef90-W3RH68 UniRef90_UPI00037B28CF UniRef90-A8LRI3 UniRef90_UPI000424D278 UniRef90-S0JMD6 UniRef90-D3PAU5 UniRef90_UPI0003B5CB5F UniRef90-H8GGK8 UniRef90-R5EFX1 UniRef90-XOPU11 UniRef90-C4JMC2 UniRef90-A3LW23
UniRef90 Q0A7X3
UniRef90-K9PGD3 UniRef90-R5J014 UniRef90_UPIO00347787F UniRef90-R6YXK2 UniRef90-M1N452 UniRef90_UPI00035C94F8 UniRef90-J4KRR7 UniRef90_K0BB52 UniRef90-R6N7Y3 UniRef90-U1SI72
UniRef90 L5N8X7 UniRef90 C5ZYZ6 UniRef90-R9NFG9 UniRef90-QOSTQ4
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UniRef90-F4DV70 UniRef90 K7RR80 UniRef90-W9WW51 UniRef90-UPIOOO4624218 UniRef90-D8K0Y5 UniRef90-A1SHH3 UniRef90_UPIO003644E04 UniRef90-LOWAF7 UniRef90-G6Y5D8 UniRef90_G8MEJ8 UniRef90_UPI0003B4AA4B UniRef90-Q22B57 UniRef90-R5D3T2 UniRef90_UPI0004717A03 UniRef90-D2TXD3 UniRef90-V5CSV2 UniRef90_C7Q628 UniRef90-TORM49
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SETE PTTLLVNSVNPYR|LIE G Q 140
150
ESDDNAVWTNQFDNTANRRAHDAAFEDCDQLGGAPDLAA NYTKQHKMNF DDPFNNVYTDAGQGTLNQDQTNGGQLDGFI EGTDAEFVHAYDDTDVI AGQGTLGAEMY HDCPDVDTVI VPPFNHPDI WEGVASVIHESSEQDKNKPDVVV

 EAQKGLTFIHPFDDPHVIAGQGTDGMEILRQHQKPDHADF $\begin{array}{lll}E K H G Y T F & V H P F D D L D V A T G Q G T I A M E I V Q E L P T V D Y I C \\ K A T G A V F L H P F D D E Y V I A G Q G T I G I E I L E D M A D I D T V L V\end{array}$ ARMANDWANQFDNDANRQAHYETTGPEI WTQTGGHDDAFI
 KEKK ATF SEKEAVTLVNSVN PYRIVGQKTAAFEVCDAGGQAPDVLVC

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ETEP

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





 $S \mathrm{SLLN} N \mathrm{~L} T \mathrm{D} \mathrm{V} P \mathrm{P}$ F D H P Y V I A G Q G T I A L E I T R Q L R L D K L N A L






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


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$E T R P$ V $\quad$ VA LV N S V N P Y R I E G
LA WD Y P V A L V N S V N P VR L E G

 R E E GY A FV P P F EA A G G V MVV P P F D







 GPR R M L VV PP F D D Y D II A G Q G TA G LEE QLDE QG DR P D A F V


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UniRef90 S2KRH7 UniRef90-A0A024LV73 UniRef90-K9Y9G7 UniRef90-U5F9F1 UniRef90-K6V9U9 UniRef90-X0RM66 UniRef90-H1GY98 UniRef90-14VXX3 UniRef90-UPIO003F53FAC UniRef90-W6EF92 UniRef90-L5KWD6
UniRef90-TORW16 UniRef90-V6T316 UniRef90-G2PC26 UniRef90-UPI000477E4F8 UniRef90-W3RH68 UniRef90-UPIO0037B28CF UniRef90- A8LRI3 UniRef90_UPIo00424D278 UniRef90-S0JMD6 UniRef90_D3PAU5 UniRef90-UPI0003B5CB5F UniRef90-H8GGK8 UniRef90-REEFX1 UniRef90-XOPU11
UniRef90_C4JMC2 UniRef90-A3LW23 UniRef90-QOA7X3 UniRef90-K9PGD3 UniRef90-R5J014 UniRef90_UPIooo347787F UniRef90-R6YXK2 UniRef90-M1N452 UniRef90-UPIO0035C94F8 UniRet90 - J4KRR7 UniRef90-Kовв52 UniRef90-R6N7Y3 UniRef90-U1SI72 UniRef90 C5ZYZ6 UniRef90-R9NFG9 UniRef90-OOSTQ4 UniRef90-HODHR2 UniRef90_C6VV60 UniRef90-UPIOOO4714601 UniRef90-G8ZRC7 UniRef90-B9JX06 UniRef90-S2EIU8 UniRefe90-ROJTZ6
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 AATGTGGTLAGVARYLKE QRENIRCVLADPTGSALYR
 PAGGG GLLAGTSYYAKQINPRIKIVGVQAEGADAIVQS SSMGTTGTI MGVSKYLLKEQNPDIQUVGLQ
IP VGNAGNITAYWKGFKEYHESKGTGLPEMRGFEAEGAAA VPIGGGGLAAGVSTVFK HLSPHTQTVGVEPVGAASMQTS VPVGGGGLLAGVAACIKALRPEVKVIGVQAADSDAMARS VA: GGGGLASGLCGVFGQQLSPNTKIVGVEPEGAASMKTS LSVGGGGLLCGVVQGLQE VPIGGGGLSGLATAIKSLINPNITKVGVEAEQMAAMKAS IPVGNAGN SAYWKGFKEYDASKRTGLPRMFGFEAEGAAA LPVGNAGN| TAYWKGYKEYPFADSEPRASRTPRMWGFQAS VPASGGGLMAGVAIGIDTAFADCRMITVEPEGFDDHAHSF LPVGGGGLASGMALYFDGQRKPAFRLTEP GGAPSLKTS APVGGGGMLSGCCLTLSNDAPEVQUIAAEPEQADDAYRS AAVGGGGLISGVSTYVKDVSPVTKKIGGVEPKGAPSMQEA 1 PVGNAGNOTAYWMGYKEYYEAGKVLSKPKMCGWQAAGAA LPVGNAGNITAYWKGYKEYSADSDTHRPVMCGYQAAGAAP QIGGGGLAAGDAVYDKSLLPHVKVIGVEAEGSACMKAA CATGTGGTLAGVTRYLKEVSDGRVKCFLADPPGSVLFK FVPVGGGGLDAGVAVYLKKDAPHVKDIGVETNDADALYQS
 | PVGNAGN|SAYWMGFCQYHQAGKCDRLPKMMGFQAAGAA LVPVGGGGLIAGVATYLGEAAPQUEVGGVENGARSMKAA VPVGGGGLASGVSNFLRE YSWKTKLRFVEPQGAASLSAC

 PV GGGGLISGTAFAAKQLKPEIRIVGVQAAKAPSTYNA PIGGG GLISGIAAAYKQMLPSVRVIGVVAQGAPGMYHS VPVGGGGLITGVAT LIAKMLNPKIQIIGVEPAQAASMTAA LCPIGGGGLISGVTLAAKALNPNVKVIGVQGEGANAMVKS MAI GGGGLASGTSTVFKQ DSPKTQLIGVEPEGSPTMHKS

 DGGGGLAAGVLIADKEKSDNPKDKVIGVQSKSFPSMYES LPVGNAGNITAYWKGYKEYYQMGKIRKLPRMMGWQAEGAA VVPTGGGGLLSGCVVAAKTLNPGCRVI GVEPEAGNDAQQS LPVGGGGLASGVSSYFK LLSPNTKVIAVEPGGAPSLTKS LPVGNAGNITAYRKGFVEYAESGAASKAPAMWGFQAAGAA PVGGG GLDAGDALAVKERAPHVKVYGVQAQGAPAMYMS PV GGGGLAAGISVLIKQLMPEIQVIGVEPEESACLAAA CSTGTGGTLAGVTRYLKDVSNHSVKCFLADPPGSVLFSYI CATGTGGTLAGUGRALKEKSDGKTQIWLADPPGSVLQYIS LPVGNAGN:TAYWKGFKEYHDKGDTDRTPMMMGFQAAGAA LPVGNAGN TAYWRGYREYLAQPVTDAPAGPATHDPRMWG SSMGTTGTVMGCSMYGKEQNPDVQVVGQQPEHFDDTRSG DPCGGGGLSSGDSTAVKDASPGTAVWGVEPEHFDDTRRSG VLPVGGGGLAAGIAGYAKGSVPNSAFVEAEPAGAPSLKRS II CIGGGGLCAGVGSYFK HMSPDTVIVGCEPEGCPSMKLA
$V P A G G G G L A G V A A C V K Q N P R I V E I G V Q A G A D A D A Q S$ SAMGTTGT MGCSRYLKEQNPADEVVGLQ SAMGTTGTVTGVSQYLKSKSNKUEVGGLQ
SSMGTTGTLTGGSQYLKSKSNKHEGGLQETEGTASLNAS ILPVGNAGNI SAYWLGYQEYAKEGQASRTPRMFGFQAAGAA IPIGGGGLISGCALALK TLKPTVRIVGVEATQMPAMKTS PVGGGGGGLAAGVAVYTKQLDPQVKVIGVEAEGSACLKAA LPVGNAGNISAYWMGYSEYHKAGI AGSVPRMVGYQATGAA SSMGTAGNTMGTSRFLKEKNKDIQL LPVGNAGNITAYWKGFKEYHFEKETGLPKMFGFQAAGAAP APASGGG|LAGVALAVKDRVPEAETYSVEPKGFDDYARSL
CSVGGGGLFCGMMGLEHORAGVRVLAVETKGADSLNLS

## UniRef90 E5WFD2

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UniRef90
USNBX UniRef90 C5ZYZ6 UniRef90-R9NFG9 UniRef90-QOSTQ4 UniRef90-HODHR2 UniRef90_C6VV60 UniRef90-UPIOOO4714601 UniRef90-G8ZRC7 UniRef90-B9JX06 UniRef90_S2EIU8 UniRef90-ROJTZ6
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UniRef90-R7J222
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UniRef90 F4DV70 UniRef90-K7RR80 UniRef90-w9ww51 UniRef90_UPIO004624218 UniRef90-D8KOY5 UniRef90-A1SHH3 UniRef90 UPIOOO3644E04 UniRef90-LOWAF7 UniRef90-GGY5D8 UniRef90-G8MEJ8 UniRef9O-UPIIOOO3B4AA4B UniReffo-Q22B57 UniRef90-R5D3T2 UniRef90 UPIIO004717A03 UniRef90-D2TXD3 UniRef90-V5CSV2 UniRef90-C7Q628 UniRet90_TORM49 UniRef90-H2GOZZ2 UniRef90-K0CAR5 UniRef90-K41JJ7 UniRef90_UPI0001850F7B UniRef90-F8GUJ9 UniRef90-E312LO
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210
220
230
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 IVTKGKLMDRQGGSTTEGIGQGRVTDNLKQEV SVLDDSV VDNHSTVTRENDDKFVDGASVARVGDDTFDVAKDKVDDYV VKAGELVTLDGI RSUAKTLGATRVAERALEWTKEHNVISC LADGKVEKLHSVSTLADGUKVMEPGEHTFQLCKEYVDGIV LQRREVVTLDKIDSFVDGTAVKRVGDFTFDICQEVLDDVI
 YVTTGQPEVVGGNSITEGIGSSRV

TANLADSPLDDAL LAAGKPVTLDHVDQFVDGAAVARAGAQPYAALAAAGDMVT VKTGEDHTEGGSITEGIGNAVMNSRDTANMQGAPADDAVIV VVQNQVIKEPSEGSSTAGURRWPEQYLPTIFDRSRIDRTI I QENVNTALNTVDIFVDGAAVKRVGDLNFATCKESLHDVT LEAGRRDTLDEVGGFADGTAVKQVGALTFALCRQHVDMML IVEGMNTELAHVDKFVDGAAVKKVGNLTFELCKKYLNKVI VDEKKLAVVEKKKTTADGIAVTTVKENTENIVKKYVDEIV IVKGQPIEQPETDATADRIGNPASWDLAVAARDESEGKID GSAPIVRGEPVKEPSTIATAMRMGNPASWTYAEQARDEI D LAAGRPVIVEEVESLADGGGIGLDNRYTFSLTRDLIDEALL
 FKAGHIIADDAPVTIADGLKV PLKDLTWHFVSNHVSDILI FLADKPVLLKQI DRFIDGAAVKRAGTFTFPDCKEVLDKMI FDYGAPUALEQLDKFVDGAAVKEVGQLTYQHAKEYVDQQM IVLGHPVKNPETIATAIR円GNPASWEGAVNAAEESGGLID FLAGHPIEHPETIATAIRIGNPQSWDYAWAAQKESGGWFD LKAGKPVDVGYVSHFADGVAVSKAGTETFRVLSKYLDDIV TS SGGQL 1 ERGGSSDTEGDGQGRVTDNLQPDV ELLDGAL
 LVNGHPVAHPETLATAIRIGNPASWDKAVAAQSASQGHFH IVEGHPFENPETIATALR| GNPASWDKAVSARDESGGSMQ
YEAGRPDRLPEDDKFADGLAVQKVGQLTFDATRKYVKRLL
 LEKNRIVEISNGFTIADG|AVKKPGNITGEVLRKYMDDVGG
 FYKKSDQTTKSVRTAADGIAVVRDVNEKNFNYULECVVDEVV LIAKGETAALDAVDTVADGMAVKRPGDLTFKFAKEYVDDVI
 LKNGKRTPLASVGTFADGTSVRMUGEETFRVAQDVVDEVV KNGSLTSCGGARTDADGMSVKDPGQKTFSDIKELIDEVV
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LRSGEVVRDDAPKTVADGAQSRAVGQLTFPVIQRLVDDID
LEKGEVVELDKIDKFVDGAAVKKLGDLTFSVMKETVDQVL
LQKGFPIDEPETIATADRI GKPASWDQA DAARDESGGVI E
KRAQSLKATVEASTHADGLAVKMPGDDTWSLVEKYVDDVV
LDAGRPVDLDHVSLFAEGVAVARIGDETFRVLQTCLDDVV SSGGKLKDRTGSSITEGIGQGRVTDNLKQEVNELVDGAV VVLGAPVTRPETVATAMRIGNPASWKQAEAARDESGGVAD FQAGHPVDHPETGATAUR| GNPASWEQAVAARDESGGRFA AKGARVTNEPGHQSDCDALLVAEPGAITFEDNRKNLSGVV LAAGKPVFVDEDETLADGGGIGLDNRHTFTMTRDLIDDVV


VNAGKLVRDEKVSGDATTLAASQVCENAFNVASRLEVRSQ LVHGAPVPDPDTIATA\RIGNPASWDLADAAREDSSGVIE IENGKTTTDSKAKTDADGIAVTTDKENTFEMVQKYVDEIV LNAGELVTLDRVSMFADGVAVKRMGVETFRLCREYLDGVI FLRGAAVENPETVATADR\|, GNPQSWDKAWTAQKDSEGWFD IVNNGPVSHPETDATADR\|GNPASWEGAKSADEQSKGEIH





UniRef90_B5YF95 UniRef90-O5QVH4
UniRef90 C8PJJ1 UniRef90-UPIOOO35E3A68 UniRef90-V9EPB7 UniRef90-Q31JX7 UniRefefo-L7ZG32 UniRef90_B8KRH2 UniRef90_UPI0002E685E2 UniRef90-A0JY81 UniRef90-G2TK89 UniRef90-Q2RGZ5 UniRef90_UPIOOO3768995 UniRef90-U3H1K1 UniRef90-JoNP77
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25XTK1 UniRef90-D6z834 UniRef90-A1WFB1 UniRet90_W9RGL2 UniRef90-F4CTC9 UniRef90-F7Z2H8
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UniRef90-D8MVG3 UniRef90-F4H8R2 UniRef90-T1EDV2
UniRef90 UniRef90-D4ZZH1 UniRef90-UPIO0037C7CDF UniRef90-UPI00037BAB5E UniRef90-V9ERM7 UniRef90-UPIO0047E7C77 UniRef90-UPIo004044CA4 UniRef90_U5FCD6 UniRef90-S2DPP8 UniRef90_Q3SK73 UniRef90-19WREO UniRefofo-D5U069 UniRef90-A8JFA4 UniRef90-UPIO0047CD7C6 UniRef90-A8MA47 UniRef90-B4RBA9 UniRef90_UPIO003B57587 UniRef90-LOFXT1 UniRef90-D5C219 UniRef90-B1BZ03 UniRef90-O58860 UniRef90-X1J882 UniRef90-C6WUL6
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UniRef90-G4R838 UniRef90-S3D5W0 UniRef90-UPIOOO3683832 UniRe90_AOAO22QRK7
UniRef9O_UP1000474835A UniRef90_I6ZUG8 UniRef90-A0AO24QA80 UniRef90-W8GW08 UniRef90-B8HKM3 UniRef90-W7YY87 UniRef90-Q3M511
UniRef90-M2XPD2

 A YNKI H LTTDEERAHGVI A ASAGNHAQGVAMSAQKF GV H A V A WAMI RRAEEQPGKILI EATS GNTGDGLAMVAAVK GYP DR AK S LI LDDAEERGLIMKPI EATGGSTGISLALLGASRGYKTL MTMA TK K A KA GAKAVI CASTGNTSAAAAAYARRGGRRAF AMNALLQQFSPAQRKA GVVASS GNHAQADDALAARDLDDPAT AMSMI AEAEDRGD $\square$ N P I EAT S GNT G $\square A$ LA A A A A I RGY R ML AF NALSRFDAQQRKAGVVASS GNHAQGIALAANLLGMPAT MTMAMTAAVAS GAEAVV CASTGNTSASAAAYATAA GLKCA
 SAVAVARALAEGAKVVACSSTGNAASSLAGAAASVGLKAV MTAAI TAAAKAAGAKAVICASTGNTSASAGAYATKAGMTCA A Y N R I Q L P K S Q L E R GV I T A S A G N H A Q GVA L S G QK L G R A D
 A Y VR M H L D A E E R S R GVVVA A S A GNHA Q GVVA L G A S L L GI P A T
 AFA MI N L S K A QK E A GVV A A S A G N H A Q GVVA L S A K HL A Y N MAT LPK D QLSK GVVVASAGNHAQGLAYACRKMQVNGT A Y Y K $\square$ S TM E EA RQK GIL T A SA G NHA Q GVVAFAAAKKYGV KA T AFNMRQLTPS QLLTNGVI TSSAGNHAQGVALSALKLDNCSAT

 | $K$ | $L$ | $S$ | $L$ | $P$ | $K$ | $G$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | AFNALSRFDAAQRQAGVIASSGNHAQAIALAARLLGLPA T A Y NMMAKTKED LERGVI CSSA GNHAQGVALAAKKLGCDAV A Y N L I A Q L S P E QR E R V V CA S A G N HA Q GV A FA CA RLGGVRA R MVMAVAKAIDESGSRSVI CASTGNTSASAAAYAAKAGI RAI



 AYNMAT LSSAAELAHGVVCASAGNHAQGVALACNKMQSHGT

 $M V L A V A K A K E A G K D T V I$ CASTTGNTSASAAAFAARADMQAVV $A F S M D D R A E R R G E D Q P I$ EATSGNTGDALAMDAAMKGYA L K A Y VRMSRS P Q ERA RGVVVA A S A GNHAQGVA LAAARMLGIDAV


 AK S LI LD A E E R P GGTVI EATGGGSTGVS LA LLGAASRGYK T L A 1 N A M Q T E E E R K V GVV T H S S G N F G Q A L A L A A N N L GVT A H
 AYNMI K CALERRGTDRPI EATS GNTGQALAMVANDLVGVDMT ALSMM ERGERRPGDTLEATSGNTGUALAMAAAMRGYKMV
 MT DAV S KAKEA GA QAVL CASTGNTSAAAAAYAA RA GLRAY $A L Q L V S E A L A D G R L R P T E G T A G S T G V S D A M V A A A Y G C R C S$ A ANAVLDKAPSQMAKGVATHSSGNHAAAA ARAAKVAGIPA F

 AMNMI ARGE $\square Q P$ GDTLI IEATSGNTG $\square$ ALAAMAAAVRGYRMV A LVLLS LDPPEERKVGVI AMSAGNHAQAVAYHAQRLGDPAT A YNK I KLDDDDAKMK GIA S S A GNHAQQGVA YA A K K L G V K A T $M T V G V T R A N E L G V E V V G C A S T G N T S A S L A A Y S A R S G K K C D$

 GEVLIDDDALQQQGKGTII EATA GNTGQGLAMAARKHGDTAD A Y YI S T L S DEERKKGLI TA SA GNHAQGVAYAAKIYGAKAV A Y NL M QL T P EEELAVGVVVTASA GNHAQGVAFACRAMQVRGR
 A L WM N K A EKTP GCTI L E P T S GNTGGIS LA MV A RLR GY RMV

 $A D N K D S$ LTEE E L S R GVV T A S A G N H A Q GVVA YA A S L K G A S A L $A$ Y N M A N L P L E S L K R G V I A A S A G N H A Q GV A L S A K R L G C R A V MTMADTKVLSS GQKMVACASTGNTSASAAAYSAKA GLECA SAVLTSRALA GDESVLTCASTGNAAASDAGYAARTGLDCC $\begin{array}{llllllllllll}A & L & Y & I & R & D & A & A & R \\ A & Y & A & E & E & K & G & L\end{array}$ A YNLI QLTATERAA GVVVTASAGNNHAQGVVAFACARAMGGDQGR


 A F K L M Q L T K A Q L K K G V I T A S A G N H A Q G V A Y A A A K L G A K A T



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| :---: | :---: |
|  |  |
| UniRei90 C8PJJ1 |  |
| UniRef90- UPI00035E3A68 | IMPETASEERKMIMRAYGAEIIELTP |
| UniRef90-V9EPB7 | MPD DTAKEKПQMMKTMGPTTSMD |
| UniRef90_Q31JX7 |  |
| UniRef90-L7ZG32 | VMPHDAPAAKVAATRGYGGKVVEYNRYHEDREQUGRDL |
| UniRef90-B8KRH2 | LIMPSHMSDERKQAMAAYGAELIEVTSDEGMEGARDLA |
| UniRef90_UPIO002E685E2 | 1 VMPTDAPAAKVAATRGYGASVVLYDRFTEDREQ |
| UniRef90-AOJ |  |
|  | YMPEKTPLAKVLATKAYGAEVVLTGESFQEA |
| UniRef90-O2RGZ5 | 1 FVPGRAPQGKVAQLLAFGATVISVQGSYEDAF |
| UniRef90-UPIOOO3768995 | V |
| UniRef90_U3H1K1 | VMPKTPDIKVQAVKRLGGEVV |
| UniRef90-JONP77 | IVMPTVTPRIKVDAVRSLGGEVRLVGENFDAAKAEA |
| UniRef90-W7ST52 | VFMPRRAPLPKLAATRGYGADVKLTGESFD |
| UniRef90-UPIO0036 |  |
| UniRef90-TOLH |  |
| UniRet90-12NE | VMPQNTPSTKVDAVRGFGGEVLLYGANFDEAKA |
| UniRef90-12ETD9 | 1 FMPTTTPAQK1KQVGMFGKEFVIKIEEVVGDTYDY |
| UniRef90 C4Z0E4 UniRef90 ${ }^{-}$A2BWN | VVMPTTTPLIKVNRTKGYGAEVVLYGNVYDEACEYAMKL |
| UniRef90-C9P215 | LIMPDNATQERKDSMRAYGCELILVSKEQGMEGARDLALQ |
| UniRef90- $2 \times$ TK1 1 | IVMPVTTPEDKVSAVRADGGEVVLHGHHFDAAKAHAL |
| UniRef90_D62834 | VFMPGGASLPKVAATKAYGAQVRLIGASVDEA |
| UniRef90-AMFB1 | AMPQ |
| UniRef90-F4CTC9 | IVYLPRTTPROKRDRVAKLGGKDVIVVGNAYDDAAAAAA |
| UniRef90-F7Z2H8 | VIPSGKDALGKLAQAMYGAETVEIDGNFDQAL |
| UniRef90-R7R8P7 | VMPTTTPLMKVNRTKSYGAEVILKGDVYD |
| UniRef90 B3T6W7 | IVMPKNASPAKVAATRGYGATVILEGKNYD |
| UniRef90 UPIO003707644 | 1 LMPHDAPAAKVAATRGYGGKVVVYDRYREDREQUGRA |
| UniRef90- UPIOOO410C11A | IFMPTPTPNQKLDQVKMFGGEFAEVVLIAGDTFDEAKEAAY |
| UniRef90-H1XYH5 | 1 |
| UniRef90-L8DFF4 | VVMPVGV |
| UniRef90-W4K500 |  |
|  | IP HGYVALGKLAQAVQYGARIVAIRGNFD |
| UniRee90-D8MVG3 | 㑑 |
| UniRer90-F4H8R2 | $V$ MPA |
| UniRer90-TIEDV2 |  |
| UniRef90-N1JJG4 | VMP |
| UniRef90- UPIOOO37C7CDF | IVVPTCNSPEKNALMRALGAELVAEGRDVQESSEIADRMA |
| UniRef90-uplooo3 | VPR |
| UniRef90_V9ER | DITAKEKVQMMKTMGAQVHIMSDKENHFFHVARR! A |
|  | MPSSAPAVKIEAVKAYGGKVVSEPTLKKAREREANK V |
|  | VMP |
| UniRef90-S2DPP8 | LVVMPDNSTKERVLSMEAYGARVILTPKTDEYSRADAEKMA |
| UniRet90-O3SK73 | R A |
|  | MPGDAPA |
| UniRef90 D5U069 | PEEMSAERFMLMRL |
| UniRef90-Q7NKL4 | VLIPEGYVALGKLAQALVYGAEVIADRGNFDQALAIVRTD |
| UniRet90-A8JF | 1 |
| UniRef90-UP100047CD7C6 | 1 VMPSNAPEIKKKAVKGYGGQVVECEPNLKA |
| UniRef90 A8MA47 |  |
| Ref90 B4RBA9 | MPKGTPFVKVQQTRAHGAEVV |
| UniRef90_UPIOOO3 | FVVPEKFSEEKQELMRALGAEVV |
| UniRef90 LOFXT1 | IVVMPSAAAIKKAAVRTYGGELIECEPNLKARETTLEKVV |
| UniRef90-D5C219 | IVMPRFTPNVKVEHTRAFGAEVILYGSGLSEASTYALKLA |
| UniRef90-B1BZ03 | I CMPAHTPLIKVEATKAHGAKVVLHGEVYDEAYAKA |
| UniRef90--258860 | $V L L P E G K V A L G K L A Q A M F Y G A K V I Q V K G N F D D A L D M V K Q L ~$ |
|  | IPKGKIALGKLAQAlVYGA |
| UniRef90_C64 | MPDNQ |
|  | P |
| UniRef90-UPIO00429B824 | FCVPEHFSMEKRSTMKALGAKIVHTPRKKGMKGA |
| UniRe990-A9KLQ8 | VMPPA |
| UniRef90- H1YEZ5 | LVMPDNSTRERTDTMEAFGAKVTLLD GIDERCRDYAEEKG |
| UniRef90-A9D5V6 | VFMPVTTPQQKIDKTRMFGGE |
| UniRef90-D1AD9 | CVMPENT |
| UniRef90 AOAO24UX19 | VFMPNTQSREKIDALQFLGADVRPVPAVAFNYNHQARDYA |
| UniRef90-C5D3D4 | K ED |
| UniRe990_S5SBR5 |  |
| UniRef90_J2G11 |  |
| UniRef90 M1M4S3 | MPTTSPQLKUDAVKRLGGEVV |
| UniRef90-W1TR52 UniRef90 C7NY41 | VIVPAGKVAAGKLAQAVVHGARLVAVDGNFDQCLTVTRQL |
| UniRef90- G4R83 | I VIPETQSQEKKDAlVLAGAELTEVPAKPYKNPNNYVKVS |
| UniRef90-S3D5W0 | 1 YMPNTQSQGKVDLLRLLGAEVYPVPDNPENYNHQAKRHA |
| UniRet90_UP10003683832 | 1 Y V PTTTPKQKRD |
| UniRef90 A0A022QRK7 | IVVPKNAPKCKVENVVRYGGQVIWSEATLQS |
| UniRef90 UPIO00474835 |  |
| UniRef90 I6Z |  |
|  |  |
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| UniRet90_881 |  |
|  |  |
|  | DKMSQDKINLLKAYGTPTSVPPDSPESYNGVAERLA |
|  |  |

NEERLEFVVPAFDDER\ISS GQGT IALE ILEDLKDIEA ERDDCWWANQFENTSNARAHYLHTGPEIWEQTEGRIDALV
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UniRef90-D6z834
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UniRef90-N1JJG4 UniRef90-D4ZZH1 UniRef90-UPIO0037C7CDF UniRef90-UPIo0037BAB5E UniRef90-V9ERM7 UniRef90-UPIOOO47E7C77 UniRef90 UPIOOO4044CA4 UniRef90-U5FCD6
UniRet90 S2DP8 UniRef90 Q3SK73 UniRef90--19WREO UniRef90-D5U069 UniRef90 A8JFA4 UniRef90-UPIO0047CD7C6 UniRef90-A8MA47 UniRef90-B4RBA9 UniRef90_UPIOO03B57587 UniRef90-LOFXT1 UniRef90-D5C219 UniRef90-B1BZ03 UniRef90-Q58860 UniRef90-X1J882 UniRe990-D8HMO UniRef90_UPIOOO429B824 UniRef90 A9KLQ8 UniRef90_UPIOOO36DFA41 UniRef90-H1YEZ5 UniRef90-A9D5V6 UniRef90 D1AD91 UniRef90-A0AO24UX19 UniRef90-C5D3D4 UniRef90-B5SBR5 UniRef90- J2G111
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 SVAGTGGTIGGNSRFLKEQNPDELDVWVVDPDGSG\|YEF VPVGGGGLATGVCSCAKQ DNPDUKIVAVAAKGAPAMHDS SSAGTSGTTAGMSTFLKEKNPDVKVWVIDPMFTNNDRTSG IPMGNAGNI SAYWMGFQEYHAKGLSQKLPRMMGFQAAGSA CLGGGG LLAGSALAGRRLSPGCRVYGVEPLAGNDGQQS SSMGTTGTIMGVSAYLKTKNPDIDQIGGQQ GLGGGGMLSGTALSTRRALAPDCQLFGVEPEAGNDGQRS LPVGNAGNITAYWKGYKEYSAPFETRTPQMWGFQAAGAAP 1 PVGGGGLIAGMA CLLKNYDPKDRVIGVQSEGAPAAYNR LSVGDGCTMAGAWKAWVDLKKAGWIDKLPRMCCPDTRAFR LPVGNAGNTTAYWKGYTEYAQKGLADSTPRMWGFQAAGAA FVAVGGGGLTAGVAAYLGDVAPHVKVIPVEYDESACLKAA PVGGGGLAAGIAV LI KQLMPDVAVIGVEHEESACLATA AA GGGGLVGGVAVAlKALRPDVKIVAVQAENAAALPES LDPVGNAGN SAYWMGYKEYAAGSVASRTPRMLGFQASGAA AGIGTGGTLSGAAKY KKKNP KVKIIAVDPIGSVFYQY PVGGGGLIAGIAV LVKQLLPE TQVI GVESKDSACLYHA FAMGGGGLASGVSTVFKQQLSKTKLVAVEPKGSPTMKTA VPIGGGGLEATGVSTAAKLLNPNVKVIGVEPSGANCLQES SSMGTTGTIMGTSRYLKKQNSQUQIIGLQ
PVGGGGLLAGMAV Y DKSLRPDIKVIGVEADESACLKAA PLGGGGLAGMALAV KTLQPDMRVIGVQAEGAAAWPES VPVGGGGIIAGDAAYVKRVTPE VKI DGVEPSDANAMADS VPVGGGGGLAGMTTYLRERHPGVGIAGVEPAGAASMTAA VVPIGAGNGSAYWKGFKEFNEKFETGLPEMHGFEAEGAAA PVGGGGLAAGVLIAVLKDKNPNVKIVGVESKSAPSMKNS PLGGGGLLSGSA LVRAALAPDCQLYGVEPEAGDDGQRS SAMGTTGTIMGVSKYLKEKNPEDQIVGTO VPVGGGGLAAGLSSVF QQLLSPNTKI IGVEPTGAPSMKRA
 CATGTGGTLAGVGKFLHEKSEGKTQI WLADPPGSVLQYVS DPVGNAGNI SAYWMGFEAYAKAGKVLKTPNMFGFEAEAAA SSMGTTGTITGVGRYLKEQCDSVQIVGLQ
$P$ PGGGGLAAGTVAALAEA RPDVRVIGVQAARAAAYPAS LSVGGGGLLLGVSRGMEAVGWNDVPILAMETVGADCLHQA CATGTGGT AGTTRYLKTVSQGRVKCYLADPPGSVLHSYI $V P V G M G S G V C G V L A G A R D A L G V K A E V Y G V V A D G A P A Y G L S$ UPVGNAGNISAYWMGYQEYFDDGLATRKPRMFGFQASGAA TSAGTSGTIAGMSRFFKEKKPDVKVWLIDPEFINNERSTS CAVGSGGLLGAGARAA

VACLGGGGQLAGCALAAAALSPGCRVIGVEPEAGNDGQQS AE GTGGTLMGDAKRLKEECRDVIVAGAEPAECPVAAGWF SGAGTGGTVAGVSTALKARNPRVRVFVVDPRVKRGVMMTS IPLGGGALPAGVSYLVRHVKPSTKVYGVQPENAPFYVLS
 VPVGGGGLI SGVADAAKG DKPEMEVVGVESARFPSMF LVPDGGGGLDAGIACAAKQDNPNVKDYGVEPEGAASADAA VPVGNAGNI SADWKGFKEFEDTGIIDDELPKMTGDQAFRKR IIPVGNAGNI TAYWKGFVEYYQAGRAKSKPKMMGFQAEGAA SSMGTTGTIMGTSRFLKEQNPNDQIVGVQ ATGGGGLVGGVASAVKADRPDVRVVGVQAEEAAAYPPS AGAGSGGTFAGTARFLKE LCPVGGGGLLAGVSTLVKLLNPNTKVIGVEPSGANAVKTV MPVGGGGCI AGISTYYRERAPGTALVGVEPSGAASMTAA SAMGTTGTIMGCSRFLKE DPVGGGGLSAGVSRYLEGEVAPCN
 ACVGGGSNAIGMFYPFLEDNHHAATITKGTKGVIHGSLTY CLGGGGLLSGCATA ARALSPACRITGVEPEAGNDGQQS LVPAGGGGLICGVALAAKAINPDVQVIGIQTHASPPWYYS I AVGGGGLI AGVSAYIKEDRP DIKUIGVQTEDSNAMYTS LPVGNAGNI SAYWMGYNEYAGRRTSKVPQMWGDQAKGAAP YPMGNGCGLAATWKGFREFAEDGDVEECVQAEGATAMHDR CAVGSGGTLGGVAMALKERNKDIQDGLADPEGAALYNY VPVGGGGCLAGMGTYLRERSPRTAIVGVEPAGAASMTAA VPISGGGLI SGLALAAK SLINPARIFAAEPKGADDAARS $P V G G G$ GLDAGMALAAKEQNCRUKVDGVQTDSVPAFAGS GAFGTGGTI SGTGRFLKE KNPEVKVIGVDPVGSVFY VPVGGGGLI SGIA VAAKYVNRNLRII GVQASGAAAMHS $V V P T G G G G L I A G I A A A V K A T R P D V R I V G V Q A E Q A A A W P R S$ AATGTGGTYAGVALYLKE KNPALKVVLADPMGSALY A $\square E S D G G T D D A F V A G G T G G T D S G A G E V L K N K Y P N V K A V A$

UniRef90_M2XPD2



|  | $\text { PE } \quad 290 \quad \mathrm{KK} \text { I V L I L }{ }^{30}$ | $300 \text { G NIDD V } \mid \text { S LL L }{ }^{310} \text { T K } \square \text { E E G }$ |  |
| :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { UniRef90BESYF95 } \\ & \text { UniRef90Q5QVH4 } \end{aligned}$ | GPGHRIVTFSCD | LGERSVSKL |  |
| UniRef90-C8PJJ1 | NAKFAFPAGAKI Gl 1 LS | G GN $\square$ DV Q MLNI I I E K |  |
| UniRef90-UPI00035E3A68 | MEQGTIVVL | GERYLS |  |
| UniRef90-V9EPB7 | REDGPGHTIVTIILAD | d GVRYGSKLDEK WLEDNGL |  |
| UniRef90_Q31JX7 | K E EIPDGATIVVVLTG | G G GLKDPS |  |
| UniRef90-L7ZG32 | K S M L R G K R V GVI IS | GGNVD\RRYGELL |  |
| UniRef90-B8KRH2 | SKEVENATIVAIVCD | R G D RYL S |  |
| UniRef90_UPI0002E685E2 | K GQRVGII VT | GGNVD L L Y A ALLS EA |  |
| UniRef90-A0JY81 | QVPAGK TIVITVTG | G G GLK P P |  |
| UniRef90-G2TK89 | V V G K HV GI V V S | GGNADLDK ${ }^{\text {G }}$ HFK |  |
| UniRef90-Q2RGZ5 | DKVVVLVTG | G GLL D VA |  |
| UniRef90-UPIO003768995 | QGAVI V CTV T G | G G |  |
| UniRef90-U3H1K1 | ENKNLVSVVC | GANMNFDRLRY |  |
| UniRef90-JONP77 | EGERLA C V L S | GANLNFHQLRYISERSEI |  |
| UniRef90_W7ST52 | P - V VAV | G G NVDPLL |  |
| UniRef90-UPI000367ECA5 | V VERG | G GLKDPD |  |
| UniRef90-TOLHY5 | GKDKIIVVILPD | S G S R M L K 1 |  |
| UniRef90-I2NEY3 | G I E G ENL ACVLS | GANLDNFH L R F VSERCEI |  |
| UniRef90-I2ETD9 |  | G G ${ }^{\text {N }}$ NDTR |  |
| UniRef90_C4Z0E4 | DVK K K I V SiL | G NMDVI |  |
| UniRef90-A2BWN7 | NKNM1AIAC | GANMNFERLRFVAERAAL |  |
| UniRef90-C9P215 | GSVVVA $\mathrm{S}^{\text {V }} \mathrm{C}$ D | RGDRY L S |  |
| UniRef90_Z5XTK1 | S GVK GLNVA Al L S | GANLNFDRLRYVAERTAL |  |
| UniRef90_D6Z834 | $\square \mathrm{L}$ LA GE V CGVLT | GGNVDPLLLTRV |  |
| UniRef90-A1WFB1 | A GQRVGVLIS | G GNIDMARFCAL |  |
| UniRef90-W9RGL2 | A EA Y CRYYGDK GENVVAI SS | GANMNFDK $\square$ RVVTEEDANV |  |
| UniRef90-F4CTC9 | D A LP I Pr GSVTVCI LS | GGNNDVSRYAEIIVERA |  |
| UniRef90-F7Z2H8 | QVKK G Q | N G L K D PQT |  |
| UniRef90-R7R8P7 |  | GGNMD I TMS SVVQQ |  |
| UniRef90-B3T6W7 | S PGKKVVP | G GNID MYLLGQIVAK |  |
| UniRef90-UPI0003707644 | R G K R V G V L L S | G GNVDMARFAELL |  |
| UniRef90-M7X016 | LEHGLIVCITCD | R GD R |  |
| UniRef90-UPIO00410C11A | KGKNVVCII | GSNNDI T RMEE $\mathrm{I}_{\text {K E G A }}$ |  |
| UniRef90-H1XYH5 | $\square \mathrm{D}$ R V N 1 VTI FPD | S GFRYL S S |  |
| UniRef90_L8DFF4 | T G S | G G N D P L L T T V I T H |  |
| UniRef90-W4K500 | LGPGKTIATIL CD | GAYRYQSRL |  |
| UniRef90-T0DF64 | GLLGRGQTLVCVLTG | G NGLK D P D |  |
| UniRef90-D8MVG3 |  | G D R Y LS |  |
| UniRef90-F4H8R2 | P GA WD GPVVAL $\mathrm{L}^{\text {S }}$ | GGNDDPQVLLHVV RHGL |  |
| UniRef90-T1EDV2 | FKSNARKKNILVIVCG | GVNIINDNQL NMWKT QF SL |  |
| UniRef90-N1JJG4 | LGP G H TVVTILCD | GAYRYADRLRKWLE |  |
| UniRef90_D4ZZH1 | GATVVCVLTG | G G GLIK P P D |  |
| UniRef90_UPI00037C7CDF | FRGKKI GLI L S | G GNADS S LIF R QVLQ |  |
| UniRef90_UPI00037BAB5E | QGLVEPGRRIVCTVTG | G G L K P P |  |
| UniRef90-V9ERM7 | ELGPPGHTIVTILAD | GGVRYGSKL |  |
| UniRef90-UPI00047E7C77 | FKNKHI Gl I L | G GNVDLLKLSFFK |  |
| UniRef90_UPI0004044CA4 | $\square G P G K T \\| V T I L A D$ | GGQRYQS |  |
| UniRef90-U5FCD6 | NCKSQHLVTIA S | GANMNFDRLGYVTERTE $\square$ |  |
| UniRef90-S2DPP8 | EKGVIVCI TCD | RGDRYLS |  |
| UniRef90-Q3SK73 | SKEVENATIVSIVC | 兂 |  |
| UniRef90-19WRE0 |  | GGNVDLA T F A QL |  |
| UniRef90-D5U069 | KKG DKVVTILPD | YAARYFST |  |
| UniRef90-Q7NKL4 | GHEAPA G G Q VVCVLT G | G G L |  |
| UniRef90-A8JFA4 | RAMGPGHTIVTLLCD | G GHRHLSKFKEYLESMDL |  |
| UniRef90_UPI00047CD7C6 | NREQFKGKRVAIIL | G GNVDLA |  |
| UniRef90-A8MA47 | GGV V N | GSHI DVERLRK\LE |  |
| UniRef90-B4RBA9 | PERFRGKKCGLVI T | GGNID TRLLASVLT R |  |
| UniRef90_UPI0003B57587 | GTRIVTVFPD | S SERYLS |  |
| UniRef90-LOFXT1 | LF Q KRVGI VI | G G NVDVSK |  |
| UniRef90-R4VMS8 | ENATIVSIVCD | RGDRYLS |  |
| UniRef90-D5C219 | K GRQVGLI L S | G G N IDLLVLSS $\square 1 \mathrm{QR}$ |  |
| UniRef90-B1BZ03 | K K KVVSLV | G GNIDVVLTIS S MIN K |  |
| UniRef90-Q58860 | GlIDR R ERIV CITTG | G G LK ${ }^{\text {P }}$ D |  |
| UniRef90-X1J882 | QK RVVCVVT G | GTGLKDTD T |  |
| UniRef90-C6WUL6 | SKRVENAVIVSIVCD | RGDRYLST |  |
| UniRef90-D8HM05 | PGEFEPPVVAIL ${ }^{\text {G }}$ | G GNVDPVLLLQ $\$ U Q H  \hline UniRef90_UPI000429B824 & E PGTNUVTIFPD & G S D R L SK  \hline UniRef90-A9KLQ8 & $\square \mathrm{D}$ VT GKKVVSILS | G GNMDVITMSS V V H |
| UniRef90-UPI00036DFA41 | PGSTVVCLIS | G GNNDVSRYGEILER |  |
| UniRef90-H1YEZ5 | S Gl IVEIA CD | R G D Y |  |
| UniRef90-A9D5V6 | ALEALGPEALAGKSVVAVVS | GGNFDFERDPDVKE |  |
| UniRef90-D1AD91 | GERADIVFIVAD | GGWKY LS TL EEAEER |  |
| UniRef90_A0A024UX19 | S L G R G S T V VTI L C D | S A T R Y Q S RLRTWLESKEL |  |
| UniRef90-C5D3D4 | L R S Q TVLVCL S G | G G DKDVQTMMNV |  |
| UniRef90-B5SBR5 | A LQQRVDVRGKRVGVIVS | G GNVDLQHFARLVQAAA |  |
| UniRef90-J2G111 | GTVPDLA GKKVLTIVS | GSNVDARKLAEII GKHA |  |
| UniRef90-M1M4S3 | KKTGlK DKNI I Sis C | GSNINFDRLRFVAERA |  |
| UniRef90-W1TR52 | VPEGA TIVCTVTG | G GLK ${ }^{\text {d }}$ AT |  |
| UniRef90-C7NY41 | DAGTVAPGDSATLVVTG | GTGLKDTASARDLVD |  |
| UniRef90-G4R838 | RELLGPGKTVVTVLCD | Y GNRYQSKL |  |
| UniRef90-S3D5W0 | GKGHTVVTMLCD | GAYRYADRL |  |
| UniRef90-UPI0003683832 | VDPGSTVVCLVS | SGNNDVSRYGE\IER |  |
| UniRef90-A0A022C | NPVWKDCKNVGIVLS | G G NLDL D ML |  |
| UniRef90-UPI000474835A | GLGTVGVVVS G G |  |  |
| UniRef90-I6ZUG8 |  | S GYKYFSTI DWLAEH |  |
| UniRef90 A0A024QA80 | A A LFAHNKQIKSRHCGVIVS | GGNMD\GTMPQI |  |
| UniRef90-W8GW08 | GLT GK | G G N ID PLLLT HVVNH |  |
| UniRef90-B8HKM3 | K QLGPGHTIVTVLCD | S GSRYQSRL |  |
| UniRef90-W7Y187 | K ELGGKGKRVVVVIPS | N GER |  |
| UniRef90-Q3M5I1 | SQPKY IVVLLPD | T GRNYI NKI |  |
| UniRef90_M2XPD2 | $\square \mathrm{GL} \quad \mathrm{NKV} \mathrm{G} / \mathrm{V}$ I I s |  |  |


niRef90 G1QH24 UniRef90_D6B250 UniRef90_A0RPF8 UniRef90_Q9HHA5 UniRef90_A8I9S1 UniRef90_K2DJS5 UniRef90_M0M5B0 UniRef90_A9NZE1 UniRef90 ${ }^{-15 C 933}$ UniRef90-UPI00041BB8C4 UniRef90_C5LC28 UniRef90-K1P5D4 UniRef90-A0E1N6 UniRef90_X4Z8U5 UniRef90_R6FMX4 UniRef90_UPIO003702747 UniRef90_UPI0003B79FEC UniRef90_W7HME6 UniRef90_D3FXN5 UniRef90-C1AEM2 UniRef90_H8L2M8 UniRef90_U7P7G8 UniRef90_D8GTC4 UniRef90-Q83G80 UniRef90_D0CXM9
UniRef90_W8VZ78 UniRef90_J0SA02 UniRef90_D3NUA1 UniRef90_D9RYW0
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UniRef90_E6TSE9 UniRef90_UPI000375B07B UniRef90_A5FIN1
UniRef90_E5WT28
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#### Abstract

AFNLSQFTPEQRRHGVLAFSAGNHAQAI ALLAARLLIDMPAL AYNMASLSAEALDANGVCASAGNHAQGVAYACNKMQVRGR A  A VA M I D A A E K A G K $\quad$ IGP N E P T S G N T G $\quad$ G G L A MV C A A R G Y K L L         IGYACEEYLKRGAKRFI ASSGG GKQMVLDAEKNPGSVIVEATSGNTGDGLSMAAADRGYRMV AFNKI AAGDEKRKGVIVASAGNHAQGVYSASYFNVPSV AYNKI AT LSDEEAERVVACSAGNHAQGVAKSASERGI KSV  A LY MIIK DAEDKKGSTII I EPT S  A Y V R M G L S E E E R A R GVVVAA S A G N H A Q GVVA LAAA K L G I S A R  




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


 A M S M I R R A E E R G E IVKPI E A T S GN T GI A L A M A A A I K GY R MV $A Y N R I A Q D E A G E T D R V V A A S A G N H A Q G V A L A A T K L G \square D S T$

 A A N A I A R LTT P E Q R R L G V V A S S G N H A Q A I A L A A R C A D V P A V





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




 A WS A I S A D DA A R K R GVIDA Y S S G N H A Q G V A H A A T L H G TGGSV


 A Y N Kil H L T E E E K K R GVI A S S A GN H A Q G V A LGA T S Y G I K S T
 A R S L F L Y A L C N G W G G E H E A S S G S T A V S E A Y F A R M L G L P F V
 $A Y N M A Q L S A E E L A R G V V A A S A G N H A Q G V A F A C R S M G V H G R$ $G L T F C R Y K S V D V N R G I I S A T R G N H G Q S L A H A A S R F G M P A T$
 A L S M I E D A E D K P G D TII V E P T S G N T G I G L A M V A A A K G Y R T L A MN L L S LTS R E E K E R GVVVTA S S GNH GTA F S Y L L K E F S I K G K



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UniRef90_A1A3R8 UniRef90_A1A3R8
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UniRef90_UPI0003B3DA49 UniRef90_UPIO003622574 UniRef90_Q7TUI3 UniRef90_G2IXL2 UniRef90_I2EYK0 UniRef90_B9WIY6 UniRef90_UPI00036A548B UniRef90_UPI00036FED59 UniRef90_C1AEA5 UniRef90_IOJX76 UniRef90-11E0Q1 UniRef90_L8G1N1 UniRef90-D7FHM2 UniRef90-D5CR24 UniRef90_F6GH77
UniRef90_K0N646 UniRef90_W0E611 UniRet90-UPIO0031BC986 UniRef90-UPIo00469B5EC UniRef90-W5X2D4 UniRef90-Q9NG81 UniRef9OOPIIOOO46477EC UniRet90-E4KZF3 UniRef90-E8Q6J6
UniRef90 S5ZDW UniRef90-S5ZDW0
UniRef90_M1YVB6 UniRef90_A4AH35 UniRef90-U1P8V4 UniRef90-UPI0004448FAF UniRef90-UPIO00317050E UniRef90_E3D084 UniRef90-F5XQ72 UniRef90-UPIOOO369B222 UniRef90-0162E6 UniRef90-T2KM65 UniRef90-u9U387 UniRef90-D6B250 UniRef90-AORPF8 UniRef90-Q9HHA5 UniRef90-A819S1 UniRef90-K2DJS5 UniRef90-MOM5BO UniRef90-A9NZE1 UniRef90-15C933 UniRef90-UPOOOO41BB8C4 UniRef90-C5LC28 UniRef90-K1P5D4 UniRef90-AOE1N6 UniRet90- $-4788{ }^{-1}$ UniRef90-R6FMX4 UniRef90-UPIOOO3702747 UniRef90-UP10003B79FEC UniRef90 W7HME6 UniRef90-D3FXN5
UniRef90
C1AEM2 UniRef90-H8L2M8 UniRef90-U7P7G8 UniRef90_D8GTC4 UniRef90-Q83G80 UniRef90-DOCXM9 UniRef90_W8VZ78
UniRef90 JoSA02 UniRef90_D3NUA1 UniRet90 D9RYW0 UniRef90-F5SHY8 UniRef90-Q987A3
UniRef90-UPIOOO37BE49F UniRef90-E1R536 UniRef90-J9SAA99 UniRef90-K2M6M6 UniRef90-Q2JA98
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I V M P E D A P A S K M A A T RE Y GA QVVVTYNRYTEDREA $\square$ S QR|IA




## I <br> 

1


##  <br> V




 $L V M P E N Q S V E R R Q T M R A F G A E L V L D P K A G S M E M A R D T A T M M$ $L$ AVSS K S S A D K DD M L K N M G A K V Y V C P DP R S Y Y Q VA K R L H D


 I VMP EATP LTTKV S GVVK E Y G GEEVVLAAGNNYDEAYEYAV NLA I CMPYHAPLSKVKAATNYGAEVEEVVKDSFDDAAAFAKKL
 IVMPDTMS DERRK LMEAYGAELILLTE GKYGMA GSVEKE LA AVVSSD A Y A S A K L N TM R A F G A E L T I V H S P N G Q E M I SVVS A T I
 I




AVMPRTTSPEKCRLIEFHGGRCHFVDDPRTMYEESARLAA LTMPSSMS LER QKLLKKAFGANVVLTDPKY GMQGAVNEADK $L V M P E T M T V E R R K L L K A D L G A E L V L T S G A E G M R G A V N K A E Q$ I V DP ETQSQQEKK DML R LAAGATV VEVPAVAYANPNNYVAKT




 I FMPDDQAKEKSELI ET LGGEVVHLCRPPEHMCKLAEAKAE


 LIMSESMSEERRASMKAYGAE I I SSVSAA E GDE GARDLAALK CMPSDQSAEKAS LLLLKLGDKRQFVNLAKSRAHELTADSS

 LI MPENASEERKQCMAAYGAELIVVSQAGGMEEARDVAEA
 $V L D P E G F D S H G K L C Q A V A B G A R V L Q D R G N F D S C C L R D A R E$




 I CMS RLVPQNK LDEI R R LGA EVVHIVGNS Q D D A Q Q E VE R L





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UniRef90 U1P8V4 UniRet90-UPIO004448FAF UniRef9O-UPIO00317050E UniRef90_E3D084
UniRef90-F5XQ72 UniRef90_UPIo00369B222 UniRef90-T2KM65 UniRef90-U9U387 UniRef90-G1QH24 UniRef90-D6B250 UniRef90-AORPF8 8 UniRef90-A819S1 UniRef90-K2DJS5 UniRef90-MOM5B0 UniRef90-A9NZE1 UniRef90-15C933 UniRef90-UPIOOO41BB8C4 UniRef90_C5LC28 UniRef90-K1P5D4 UniRef90-AOE1N6 UniRef90- $-4788{ }^{-1}$ UniRef90-R6FMX4 UniRef90-UPIIO003702747 UniRef90-UP10003B79FEC UniRef90-W7HME6 UniRef90-D3FXN5 UniRef90-C1AEM2 UniRef90-H8L2M8 UniRef90-U7P7G88
UniRef90-D8GTC4 UniRef90-Q83G80 UniRef90-D0CXM9 UniRef90_W8VZ78
UniRef90 JoSA02 UniRef90-D3NUA1 UniRef90_D9RYW0 UniRef90-F5SHY8 UniRef90-Q987A3
UniRef90_UPIOOO37BE49F UniRef90-E1R536 UniRef90-J9SAQ9 UniRef90-K2M6M6 UniRef90_Q2JA98 UniRef90-E6TSE9 UniRef90-UP1000375B07B UniRef90_A5FIN1 UniRef90-E5WT28 UniRef90_UPI0003730394
$\qquad$


CESNEATFIHPFDDVVMEGQGTVGLERDADK

IAAPNFFVPQQFENPAN
ETMPHAYMLQQFNPAN
DNEGM YVPPFDD
ERNGAI WANQFDN

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[^1]ETGGHYMDQFTYDWRGNNN $\square$ AES $\square Y$ YQMMRRERHPEPAWVV NETENSFDPSQFDNPANPAMHKNTA DE $\square$ LNDTNGKVD ILV MAADDSALYF $\square P Q Q F Q N P A N P E \square H R R T T A E E \square W R D$ APHGA $\square W A N Q F D N V A N R Q A H D D T T G P E D W D Q T D G K V D G F V$ MAHEGKGRVQFANQDNPRIHVETTGPEIWADTKGKITHFV $D D G G D V E F V H A Y D D P A D V G Q G T L G L E M Y E D L P E V D T V V V$
$E E T G$
$A$ A D $\square P N S F Y P N Q Y D N D S N Q A H Y E T T G P E D W K D S E G K I T H Y A$







## K

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 DLGGHFMD Q F TYDWRGNNNVI ES S I H D QL RLLERHPEPA WIV

 KNDERYLI P Q Q FENPANPAIIHRATTAEEI WRDTD GQIDDVL




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UniRef90- $55 Z D W 0$ UniRef90_M1YVB6 UniRef90-A4AH35 UniRef90-U1P8V4 UniRef90-UPIO004448FAF UniRef90-UPIO00317050E UniRef90-E3D084 UniRef90-F5XQ72 UniRef90_UPIO00369B222 UniRef90-Q162E6 UniRef90-T2KM65 UniRef90-U9U387 UniRef90-G1QH24 UniRet90-D6B250 UniRef90-AORPF8 8 UniRef90 Q9HHA5 UniRef90-A819S1
UniRef90
K2DJS5 UniRef90-K2DJS5
UniRef90
MOM5B0 UniRef90-A9NZE1 UniRef90-15C933 UniRef90-UPIO0041BB8C4 UniRef90-UPI00046FOAFD UniRef90_C5LC28 UniRef90-K1P5D4
UniRef90 AOE1N6 UniRef90 X4Z8U5 UniRef90-R6FMX4 UniRef90-UPIO003702747 UniRef90-UP10003B79FEC UniRef90 ${ }^{-}$W7HME6 UniRef90-D3FXN5 UniRef90-C1AEM2 UniRef90-H8L2M8 UniRef90-U7P7G8 UniRef90-D8GTC4 UniRef90-083G80 UniRef90_DocXM9 UniRef90_W8VZ78
UniRef90 JoSA02 UniRef90_D3NUA1 UniRef90_D9RYW0 UniRef90-F5SHY8 UniRef90-Q987A3
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 LP VGNAGNISAYWMGYGEDADAGRSTKRPRMLGUQAAGAA VAGIGTGGTITGAGQVLKQRKPSFRCVAVEPDASAlLSGG
 CAVGTGGTLAGVALALKE
 CLGGGGLLSGCALAARARASPNCKVYGVEPAAGNDAQQS VFATGTGGTLAGTSMYGKDKNPK円QTFLADPQGSVLYKYF VVPVGGGGLLAGCLTWLRERHPQVRVVGVEPAGAASMDEA FVPVGGGGILAGVSSWIAQHNKKIKIIGVEVEDSACFTEA TPMGNAGNITAYWMGFQEYKQAGKCQLLPQMMGFQASGSA
$V A G V G T G T I T G V E V L K A R K G V K I V A V E P E G P V L G G$ VAGVGTGGTITGVGEVLKARKPGVKIVAVEEPGSPVLSGG NGSGTGGTIAGVGRCLKEYNPDPQGSGLANRDNYGVMYDS SSMGTTGTIMGTSTYLKQQNPADQIDGVQ
APDGGGGMI SGTCDTLSSDKQVQVYAAEPDRADDACR S SAMGTTGTI MGVTRFLKEQRNDITIVGAQ
LPVGNAGNITAYWKGYKEYHESKLSSKLPQMLGFQAEGAA PVGGGGLMAGMAV Y TKADQPNVKVIGVEPEDAACLKAA SGAGTGGTISGVACYLKQEVGLKDVSIVYNKVKFGVMYSS VTDGGGGLI SGVTTAVKALCPNARIIGAQPEKAADAFKSK SSMGTTGTIMGCSRYFKEMNPAMQVIGAQ ACSGTGGTI SGTAKYLKEQNPNI KVIGVDAFGSVIKKY AT DGTSGTLMGLSRSLKEFNKDI Q VCAEPYLGHKLQ ASGSTGGTVSGGRYLKERLPDLKVIMPDPVGSDYHDYFN MSPGTGGTSATVGRF R YQQHNTKLCVVDPENSVFHDY LSVGGGGLLCGVIEGLKRNGGADVPVIAVETEGADSYGKS GGAGTGGTLSGCAKYLKELTQNKDVKVVCADPVGSVYD VSAGTGGTITGAAKKQKELIPEKTKVIVVVAGGAPAMRLV VPVGGGGLISGGASAAKQ
 PVGGGGGGISGIATALKKLKPDAKVIGVQPKGAPATYLS GAVGTGGMLMGVAGVLKEHAQDTRI VA PV GGGSSAAGYALTVGRLTDATVVGVQSEAAPAAHRA VPVGGGGMAAG\|ADAVKTLRPSVKVYAAEPVNADDCYQSK GIGGGGLIAGTAVKEAARRRGRTVRVIGVQAATAAAFPGS MPAGGGGLMNGVSLAASTLRPRIELWGVQSEASNPYVVS AGLGTTGTLMGIGRYFRETKPGVKIIAA VPLSGGGLLAGVALAMKSASRDURVVGVTMERGCAMHAS MSAGTGGTSATLGRYDRYKGYDT ELLTVVDPENSVFYQS ACVGGGSNADGUFSALEDDECQTHMKFGSPGVIHGFKCY LSVGGGGLLCGVVQGLQEVGWGDVPVIAMETFGAHSFHAA ATAGTGGTSATIARYVHYMQYDTRVCVADPENSCFFDGWR AGFGTGGTVSGl AEVLRAKNPNVKI SAMGTTGTITGVSQYLKKKNPAVRUIGVQ PDGGGGLISGDATAFAELSPETR $\square V V G V Q A S D A A T V P D$ $V P I S G G G L I S G V A V A A K A G K P N V L I F A A E P K G A D D A A R S$
$A G V G T G G S M C G T A R Y L K E Q N P A D V T V G D D T Y G S V F K K Y K E$ AGVGGGGGLLAGAALAKELLSADCRVGGVEPGAGDDGKRS SALGTSGTAMGDSKRLKEYNPDDRIIGVEPYILRHKDQ
 AGAGTGGTDSGVVRFLKRQLPDDTAVLADPQKYGVMFNEE SAFVAASGTGGTITGTGE ELIKRFYPEASDHVVEPAGSPV ASAGTGGTDTGVAYLKSKNPNDKDIAADPMGSVLAELWR P LGGG GLLAGSALASRAMAPACRVYGVEPEAGNDGQQS SSMGTTGTIMGVSQALKERNPEVETIGLQ PDGGG GLISGIAVAAKSDNPNITVVGVQAEGANPMKVS PPVGNAGNYTAYYLGYSEEKVRGNSTHIPRDFGFQASGAA VCCGGGGLTAGVALALDDRHAPGLRTRPCE
LSVGNAGNISAVYKGLRELLETVGFIDRLQMMTGDQATQGS IPIGGGGLI AGMATAAK VLRPELEDIGVQCSLYPAVRGA PVGGGGGGDSGVADAAKS K K AGVGTGGTITGAGRVLKEQUPGIHIVIGVSMARGAMMAS VGAGTGGTSATIGRYLRYHRYCT KLAVVDPENSAFYQA ACVGGGSNSMGIFTAFLQKGEHAATMCYGKPGLIHGFKCY ACVGGGSNSMGMFAFLQKGEHAATMCYGKPGLIAGFKCY VAGVGTGGTITGVAQVIKERRPEARFVAVEPSASPVLSGG SGIGTGGTI TGAGQLLKE KFPELHVVA VPVGGGGLIAGDAGYLKAEDKNDEDIGCQPENSAVMYESD VPGGGGGLASGLSEVFRGKLSMNTKGGVEPKGAPSMKTS

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UniRef90 UPIO004044DF9 UniRef90－UPIIOOO3B5DA76 UniRef90－R6WA28 UniRef90－B1C5R6 UniRet90－B6XHP9 UniRef90 R7TSH3 UniRef90－L8EDX4
UniRef90－UPIO003B3DA49 UniRef90＿UPIOOO3622574 UniRef90－Q7TUI3 UniRef90－G2IXL2 UniRef90－＿12EYKO UniRef90－B9WIY6 UniRef90－UP100036A548B UniRef90－UPIO0036FED59 UniRef90＿C1AEA5 UniRef90－10JX76 UniRef90－l1E0Q1
UniRef90＿L8G1N1 UniRef90＿D7FHM2 UniRef90－D5CR24 UniRef90－F6GH77 UniRef90－KN646
UniRef90 W0E611
UniRef90＿WOE611
UniRef90－UPIOOO31BC986 UniRef90－UPIOOO469B5EC UniRef90－W5X2D4 UniRef90－Q9NG81 UniRef90－UPIO0046477EC UniRef90－E4KZF3 UniRef90－E8Q6J6
UniRet90＿S5ZDW0 UniRef90＿M1YVB6 UniRef90－A4AH35 UniRef90－U1P8V4 UniRee90＿UPIo004448FAF UniRef90－UPIO00317050E UniRef90＿E3D084
UniRef90－F5XQ72 UniRef90＿UPIO00369B222 UniRef90－Q162E6 UniRef90－U9U387 UniRef90－G1QH24 UniRet90－D6B250 UniRef90－AORPF8 8 UniRef90－A819S1 UniRef90－K2DJS5 UniRef90－MOM5BO UniRef90－A9NZE1 UniRef90－15C933 UniRef90－UPOOOO41BB8C4 UniRef90－C5LC28 UniRef90－K1P5D4 UniRef90－AOE1N6 UniRet90－X4Z8U5 UniRet90＿R6FMX4 UniRef90＿UPIO003702747 UniRef90－UP10003B79FEC UniRef90－W7HME6 UniRef90－D3FXN5 UniRef90＿C1AEM2 UniRef90－H8L2M8 UniRef90－U7P7G8 UniRef90 D8GTC4 UniRef90－083G80 UniRef90＿DOCXM9
UniRef90＿W8VZ78 UniRet90＿W8VZ78 UniRef90＿D3NUA1 UniRet90 D9RYW0 UniRef90－F5SHY8 UniRef90－Q987A3
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TEGKLERTDGSSDTEGDGQQALSEPRMTKNLEGAPDDQGL
TWKGGPTTLATIDSFVDGAAVRRAGDRTYAVVARHAPELL

FQTGKVEKAPY ${ }^{2} K T \prod A D G \square M T$
VEkEGTRRRHQVDTLVEGI GLNRL
FRAGR】】AD PQPGSQl PG｜RKWEDE
VKGKIIENPAEGSQIAGIRKWSPAYQPKIYEASRVDRIE
LDAGAPVTLSRVGASAIRIGNPASWKKAVEAARESSGKID HEREGTRRRQQVDTMVEGUGVNRLTNNFEKGMKEFCDEVV QSGTLCSPAEGEPDTIADGLRTSLGNKAWPVVRDSVDEIV HETREFDDKE円YPYRGE

GLKNMKES
TGTVDHGKDGTYQVEGVGED
GFVPSIANTSAYDEVV

FKTGDATIKGDCGSKIEGTGRPRVEPSFIDGVFGVDEMR
LNAGFLVEDANTSSTATTLGARMVCAOALAYSKNHRDESV
LYY YKKIVDPPGSYKVEGIGEDMLCGQALHYSKNHRDESV
 VKEGKI LTVKGGSTIADGI AVKTPGEITYEMVKEYVDDIV LLAGVPVSLNTVGSFAEGVAVRCVGNETFRGCKNYLDDVII

$\sum \square$
DQAGRPD
IQAGRPVQVPRYGELVYGLRN <br> \section*{ <br> \section*{ <br> }



YT T GE LKA A
$G G S P$
$S S \square$

ПNTGVLFNERDKEGYRVRHPFDTVT
KNGKLERTPGDSDTEGIGQ
QEAEGHRLKNPFDTVIEGCGLNRL
LRAGKVVHIDTPKTIADGAQTQHLGQYT INRGER $\downarrow$

$D V Q \| V G V Q P A T D S D S P G L R W P A A Y L P$
TEREGTRRRAQVDTIVEGVGDNRVTANFEAGEASRVDKTI $\frac{\square}{S}$ SGGKPGPHKLVGT
SKGEGHPTGAPYKVEGVGQDCV
$\square R R G S G V H \square D T P V T L A D G A D T$
PEDGASIAGDRRWPAEY T T


 VEPTASPVLSGGEPSPHK』QGIGAGFVP
$L D A G R P V L V E E L P T L A D G G G Q G L D N R L T F A M C R D L L D$
$W K T L D F T A R T G K G S R I D G I G R P S V E P S F L P S V$

 KA GK IIEKKLIPT I S DGSAGGIEKGAITFDICKNLVDDFI MEENKNTA LKTDDKFVDGAAVKQVGDKTFEICRYNLEDII





## UniRef90 U1RGLO UniRef90-H8GF39 UniRefofo-E2SN62

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UniRef90 E8SIP9 UniRef90-UPIOOO37F4142 UniRef90_Q0K3S3 UniRef90-R4Z2Z6 UniRef90-R7YJD8 UniRef90-G80IK2 UniRef90-UPIO0035CEF35 UniRef90-W0RBF9 UniRef90-R5MLF1 Uniinef90-H2YR96 UniRef90-UPIOOO2B48798 UniRef90-G2LI86 UniRef90-W9GSH5 UniRefolo-D8F1Y2 UniRef90-W8S4E5 nirefan-D4GP06
UniRef90-H8FRX4 UniRef90-L1MFU2 UniRef90-UPI000372963C UniRef90_R6S126 UniRef90-UPIOOO37CEE51 UniRef90-A0A026WL31 UniRef90 R6WGM2 UniRef90-F4LDG9 UniRef90-UPIOOO362DC69 UniRef90-COBGGO UniRef90-E4TRH5 UniReffo-W2ECT1 1 UniReffo-TOC9B9 UniRet90-F4LOL6 UniRef90_M5W0Y9 UniRef90-MOLWCO UniRef90-UPLOOO475B075 UniRef90-A4J492 UniRef90-W9BXU0 UniRef90-A9TXJ4 UniRef90-UPIo00372B3CC UniRef90-B1KGV8 UniRef90-A4RXL8 UniRef90-C7MAL6 UniRef90-R5CLL4 UniRef90-G2LER0 UniRef90-D8DZL UniRef90-UPIOOO35E969E UniRef90-Q6CST5 UniRef90-S5YSE3 UniRef90-X7EIF5
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UniRet90-R6PSS5 UniRef90-D2SBE5 UniRef90-J3N176 UniRef90-UPIO0035F4626 UniRef90-Q11BX4 UniRef90-I2FDK8 UniRef90-UPIOOO45EB4C3 UniRef90-L7EXU7 UniRef90_Q9YGB0 UniRef9-AOAO24PV03 UniRef90-Q2FRF7 UniRef90-C1EEG66 UniRef90-UP10004011B1A UniRef90-QORSK9 UniRef90-R5AH77 UniRef90-UPIO0037ADF63 UniRef90-E9BVX8
UniRef90 FiA425

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GYNA L A R F T A Y M A V T K A V E E G S K A II C
AYSMIKHAE
A L A M I E A A E
ARSLELYAL
AYNAIAQFT
VLGQALLAR
ALS NMAEPHSGDTIYEGTVGSTGI SLAAICRARGYLAH ARSMI DAAEKEGLIKRVEATAGNTGLALTVVGAQRGYKVV AYLRUARLSDERARGVVAASAGNHAQGVALAASMLGAGAT ALLAMIVEAAEQHPGAVIIEPTSGNTGVGLADVASVKGYKA, ALFLQEKGLISPGGTVVEGTAGNTGIGGAHICNALGYKCV A YNMI QLS KDDLKNGVI CASAGNHAQGVALSAQRLKDKAQ A LGLI TDAEQRPGATIIEPTAGNTGDGLALDGRTRGYRVI AANLLSLDPERRARGVVAASTGNFGRALAFAASQAGVPAV ARDAMDKGLLRPGGT\|VEGTAGNTG■GLALVGASMGFKTV AYNK\|RQDTDRGDDEFVAASAGNHAQGVALAATECGADST
 AKYMI EKAEKD GRDKP GATSSGNTA LGLAMVCAVK GYKRD







 A Y V R I A G L R QEERA GVV A A S A GN HA Q GVA L A A S L L GVR S T


 AVAMLEDAEKS GMMVPIEPTS GNTGGGLAFACAAKGYRLM A R N L M A L D A E Q R K R GVI A A S A G N H A L A L A Y H G R E L G I P V T

 TVGQI LMAKKM GKTRIIAAETGGQHGVATATVCADMNMQCE $T I G Q U V A Q R L G K K R D I A E T G A G Q H G V A T A T V C A L V G V E C D$


 AYFRMT LSEEERRRGVVCASA GNHAQGLAYA CAQLRVRGT A MS MI E R A Q QR G D D TI I EA T S GNT G DA L A MAAAA Y G Y K MV

## A

 GAM A A A E K E GKI IPDIEPTS GNTGUALAFVAASKGYRCD


 AI S M I EAA A E K E G K D T I L E ALSMILDAEERRGDTIVE
 V G H A C E T H H A R GA R HFVVS S S G G N A GL A V A Y A G R K L G V P P V T

 $G I G Q A L L A K F M G K E R L I A E T G G Q H G V A T A M A G A L L G M K V D$
 M TVGGV S M A L Q L G M K S V A C A S T G N T S A S L A V Y G A K A GI P V I A MNILLQLSKA DLLQKGVVTHSSGNHAGALALAAKTKGI P S Y TSVAVTKARHAGRNVVTCASTGNAAASLAGYAARADLDCR A L N MI Q E A E $\square K E D T I I V E P T S G N Q G \square G L A L V G A V K G Y K \square R$ A L A M V A A A E E R P G G TI I E P T S G N T G V G L A L V A A R R G Y H CVV



UniRef90_U1RGLO UniRef90_H8GF39
UniRef90-E2SN62 UniRef90-E2SN62
UniRef90-B6AZG2 UniRef90-UPIO004672821 UniRef90_K9HM24 UniRef90-UPIO001FFF383 UniRef90-M1P9P9 UniRef90-W9V3R1 UniRef90-F5XZ47 UniRef90_S3NT58 UniRef90-D3EG93 UniRef90-AOP7L8
UniRef90 UniRef90-N4WBI1
UniRef90-E8SIP9 UniRef90_UPI00037F4142 UniRef90-Q0K3S3 UniRef90-R4Z2Z6 UniRef90-R7YJD8 UniRef90_G8QIK2 UniRef90_UPIO0035CEF35 UniRef90-W0RBF9 UniRef90_R5MLF1 UniRef90-H2YR96 UniRef90_UPIO002B48798 UniRef90_G2LI86 UniRef90-W9GSH5 UniRef90-D8F1Y2 UniRef90-W8S4E5 UniRef90-D4GP06 UniRef90-H8FRX4 UniRef90_UPIO00372963C UniRef90_R6S126 UniRef90_UPI00037CEE51 UniRef90_A0A026WL31 UniRef90_R6WGM2 UniRef90-F4LDG9 UniRef90_UPI000362DC69 UniRef90-COBGG0 UniRef90-E4T8H5 UniRef90-W2ECT1
UniRef90 T0C9B9 UniRef90-TOC9B9 UniRef90_UPIO00479AA6F UniRef90-F4LOL6
UniRef90 M5W0Y9 UniRef90-MOLWC0 UniRef90-UPIO00475B075 UniRef90-A4J492 UniRef90-W9BXU0 UniRef90-A9TXJ4 UniRef90-UPIO00372B3CC UniRef90-B1KGV8 UniRef90-A4RXL8 UniRef90_C7MAL6 UniRef90-R5CLI4 UniRef90-G2LER0 UniRef90-D8DZL1 UniRef90_UPIO0035E969E UniRef90-Q6CST5 UniRef90-S5YSE3 UniRef90-X7EIF5
UniRef90-J3JUJ6
UniRef90-L1PFB4 UniRef90-S6HKG3 UniRef90-D5BIN7 UniRef90-W9YUA7 UniRef90-A0A011NUP6
UniRef90 A8WRN7 UniRef90-A8WRN7 UniRef90-W5WQY8 UniRef90_UPIO0018507E3 UniRef90_G8SJW4 UniRef90-R6PSS5 UniRef90-D2SBE5 UniRef90-J3NI76 UniRef90_UPIO0035F4626 UniRef90-Q1IBX4 UniRef90-UPI00045EB4C3 UniRef90_L7EXU7 UniRef90_Q9YGB0 UniRef90-A0A024PV03 UniRef90-Q2FRF7 UniRef90-C1EEG6
UniRef90 MOA3H? UniRef90-MОАЗН2 UniRef90_UPIO004011B1A UniRef90-Q0RSK9 UniRef90-R5AH77 UniRef90_UPI00037ADF63 UniRef90_E9BVX8

90
100
110
120



 TVMPESMSVERRTLDRGFGAELVVTPAAKGMTGAVERARE
 LVMPESASLERRQIMQAYGAEILLTPAKRSTDGAIEKAYA LIMPANMSSERKAAMTAYGAELI EVSKEEGMERARDDEMQ

 LIMPDNMSKER MNULKAYGAEVVLTPSSERMPGSGAKELXR LIMPENQSLERRQTMKAFGAELILTSVEGSMEDARDKAKK | $L V M P D T M S L E R R N L L K A Y G A E L V L T P G A D G M K G A D K K E L Q Q$ |
| :--- |
| $F T M P E T M S M E R R N L L K A Y G A E V L T P G A E A M K G A D K K A K E L D$ | AVMPATTSPAKDGLIGERQGGRCHFVERSYEVYGAAQQLAD

 I CMP DDQAKEKSDLLEKKGGVDQNQFVNRARNRAAEHTAD $L V V P D K M S Q E K D F A L K A L G A R V V M T G H P E Y Y Q D M A Q R L A S$

$V F M P E G A P L P K V A A T R G Y G A E V R F P G G D V E S C L T A A E E F A$ | $V F M P E G A P D P K V A A T R G Y G A E V R F P G G D V E S C D T A A E E F A$ |
| :--- |
| $V$ | LTMPETMSQLERQNLLKAMGAQLVDTPGNEGMSDRKAEEALR


 IVIPETQSQEKKDMLRDAGAELI QVPAVPYANPNNYVRYS

 NLSPEKDKLLRTMNVDUVMVDHNLLHPESPDSYNNAAREYAA VYMGKTDVERQRVNV RMKMLGARVEAVTSGNMTLKDATA
 FVVPTKFSVEKQTLMRALGAELINTPREALGMKGATAKANE II MPQDAPAAKRAATEGYGGRVVTYDRYSEDREA DARRLH
 VFMGKT DVERQFQKMRMLGATVVEPVTSGNMTLKKDATNEAF $L V M P D T M S M E R R N L L R A Y G A D L V L T P G A E G M K G A D S R A E E ~$
$V$ $I V M P E G A S L A K D A A T Q A Y G A N V V L H G A S Y D D A Y A H A V A L R$
$V Y M G E T D M E R Q A P N V A R M R M G N R T L K D A T N E A D R D W U A N P ~$
 $I V M P L T T P K D K R E S Y$
$V V G P A D T P P E R L A D I D A R D P H V F R V E G D Y G A E A E A Y A Q Q R$
$V$ $V F M P S G A P D P K V A A T R D Y G A E V R L H G H V F D E T L R A A Q E Y A$ AVMSEGNSPERRQLLQAMGARVELVPQVEGGKPKRAEALT AVVPATTAPAKDDAI RFQGGEI HKVDDPRTVYDVAHRLAT IVIPKTQSQEKKDMLRDAGATLVEVPAVPYKNPNNYVKYT FVCPDKVSEDKRNVLRAYGPTSVPPDHPDSYYSVSDRLAA
$A V M P K S T A K R K \square Q Q U E F Y G G T C H F V N H S S E D Y A S E Q L A T Q$ $A V M P K S T A K R K D Q Q I E F Y G G T C H F V N H S S E D Y A S E Q L A T Q$
$L V M P D T M S T E R R K L M Q F L G A E L V L T E G S G G M N R A D A E A E R$
 I YVPGTTPRQKRERDTAI GGDLVELVLIGDTFDDAAEAAA $L I V P C C Y S K E K Q I V M R A L G A E V V T V E D G L P G A R K M A E K L Q$

 IS SLPDDTSQEKLSLLTALGAIVNKDPNQYVNAAKSCSEEY


 FVMPETMSRERRLLLKKAGAELVLTPGPDGMGGADSRAEA
 $V Y T A D S A N P A K V A R M Q T L G A E I V Q V G A D F D V A K D A A R E L S$
$L V M P D T M S M E R R N L L Q A Y G A E V L T P G S E G M G G A D R K A E E L$ VFMPEGAPLPKVSATKGYGAAVEYAGTSVDDALAA AGDE VYMDMKRQSLNVMRMEMLGAKVVPVTSGSNTAKDATNEAD $C V M P E N T S I E R R Q L L G M Y G A Q I I S S P A A G G S N Q A V A V A K G$
$I C M P D D Q S H E K S D L L L H L G A T V E R V P V A P I A D K R H F A A A P$ CMMPENSTPERVGTMKAYGAKVERVTPSAKTADKRARAAAP VVVPETTTERAKALLRLEDATVVVQGGSWQEANAHABQT FVVPDKVSQDKRDVLTA CGARVVVTPTHPESYYSVSDRLV AVMPRTTSAEKCRLIEAHGGQCHFVDDSRKMYEASAAGAA
 $V L L P S G K V A L G K V A Q A L M H G A K V I S D N G N F D R A L E M V R D L$

 LTMPETMSKERRDLLKAYGAEDVLTEGAKGMADAKAEELA


UniRef90_U1RGLO UniRef90_H8GF39 UniRef90-E2SN62 UniRef90-B6AZG2 UniRef90_UPIOO04672821 UniRef90_K9HM24 UniRef90-UPIO001FFF383 UniRef90-M1P9P9 UniRef90-W9V3R1 UniRef90-F5XZ47 UniRef90_S3NT58 UniRef90-D3EG93 UniRef90-A0P7L8
UniRef90-N4WBI1 UniRef90-N4WBI1
UniRef90-E8SIP9 UniRef90_UPI00037F4142 UniRef90-Q0K3S3 UniRef90-R4Z2Z6 UniRef90-R7YJD8 UniRef90-G8QIK2 UniRef90_UPIO0035CEF35 UniRef90-W0RBF9 UniRef90_R5MLF1 UniRef90-H2YR96 UniRef90_UPIO002B48798 UniRef90_G2LI86 UniRef90-W9GSH5 UniRef90-D8F1Y2 UniRef90-W8S4E5 UniRef90_D4GP06 UniRef90_H8FRX4
UniRef90 L1MFU2 UniRef90_UPIO00372963C UniRef90_R6S126 UniRef90_UPIO0037CEE51 UniRef90_A0A026WL31 UniRef90_R6WGM2 UniRef90-F4LDG9 UniRef90_UPI000362DC69 UniRef90-COBGG0 UniRef90-E4T8H5 UniRef90- W2ECT1
UniRef90 ${ }^{\text {TOC9B9 }}$ UniRef90-TOC9B9 UniRef90_UPIO00479AA6F UniRef90-F4LOL6
UniRef90 M5W0Y9 UniRef90_MOLWC0 UniRef90_UPIO00475B075 UniRef90-A4J492 UniRef90-W9BXU0 UniRef90-A9TXJ4 UniRef90-UPIO00372B3CC UniRef90-B1KGV8 UniRef90_B3EGT7 UniRef90-A4RXL8
UniRef90-C7MAL6 UniRef90_R5CLI4 UniRef90-G2LER0 UniRef90-D8DZL1 UniRef90_UPIO0035E969E UniRef90-Q6CST5 UniRef90-S5YSE3 UniRef90-X7EIF5
UniRef90-J3JUJ6
UniRef90-L1PFB4 UniRef90-S6HKG3 UniRef90_D5BIN7 UniRef90_W9YUA7 UniRef90-A0A011NUP6 UniRef90-A8WRN7 UniRef90_W5WQY8 UniRef90_UPIO0018507E3 UniRef90_G8SJW4 UniRef90-R6PSS5 UniRef90-D2SBE5 UniRef90_J3NI76 UniRef90_UPIO0035F4626 UniRef90-Q1IBX4 UniRef90-_12FDK8 UniRef90-UPIO0045EB4C3 UniRef90-L7EXU7 UniRef90_Q9YGB0 UniRef90_A0A024PV03 UniRef90_Q2FRF7 UniRef90-C1EEG6 UniRef90-MОАЗН2 UniRef90-UPIO004011B1A UniRef90-Q0RSK9 UniRef90-R5AH77 UniRef90_UPIO0037ADF63 UniRef90_E9BVX8
UniRef90 F1A425

F

ETHP VIALVNSVNPYRLQGQKTAAFEVVDQLGDAPDUHV EHAGGAVLVPAFDDPSTIAGQGTVAKEIVEQLGYAPDAVV LUHKEIPNSVQFENENNPKAHQLHTGEE: WRDTEGTVDVFV EDM GATVVKPFDEPAVIAGQGTMAVQAAEAGAHRDDRLT AEHTDWVMLYQYGNPANTDAHYRGTGPEALARDLPSVTHFV AAGEGKVLDQFSNDDNPQAHYDTTGPEDWQQTHGQUTHFVV EER GMTLVPPYDHADVIAGQGTAALELFQEVGELDHDFV
 MEQEGRGLVQFGNADNPRAHYEGTGPEWKATGRKVTHFV EEHGYFMPQQFNNEANPDПHARTTGKEIVEQMGDQLDAFV KETHGYFEPQQFENPANPKVHELTTGPELVEQFETIDAFL AERGMTLIPPYDHPHVMAGQGTAAKELFEETGPLDMLVV ESTHYCLGSVMGPHPYPWMVREFHRVIGEEAYAQDPDVVT
PNRRGIFADQFETQANWQAHFNGTGPITYGQGGRDDAFV EDPGAWYVNQFGNPNNPKAHETGTGPELWSQLKGRIDAVV A ETGAVFIHPFDHSDVVQATIGGEGLDQLPGVRTITGAVG


 AEH GMAMLPPFDHADVGAGQGTVGLELLEDLPDLETVVV GRNGAIWANQFDNVANRQAHIETTGPEDWDQTAGTVHGFT AEESDAEFVHAYDDCD\|VAGQGTDGVEMYRDGPEMDTVVV HENGAFFADQFNNPANPAAHETTTGPEDWEQMGGQDDAVV
 EADRDWCCHPSDTYYVIGSTVGPHPYPMEHEGRDYPDYEM EPNGADWANQFDNVINRQAHDETTGPEVRRDLDGKXDGFV

A

## K

LLAENPHYFMP
$\qquad$
 T D T F Y L I G S V VGGP HP Y P D MVA R LQ S V I S S E DK Q E L P D YV V


RESD
 VVKG EMLKY KNGFDDFEIISGAGSVGIEMLEDRDADAV DDADGATQVPPFDHPVDMAGQGTVALEAAEQHGRELGTMV REDSGSYFVDQFDNPDNPETYYETGPEDYDQLDGKLDWFVV EAMRDWCCHPEDTFY IVGSTMGPHPYPQEKDGRDYPDYLL
SVVGPHPYPDMVARFQSVISEEMKWQLQEKI GRDYPDALV
TEGVGVFADQFENEANWKCHYETTGPEIYLQLNGEVDAFI
 KTDPNSVILDQYSNPGNTAHYDTTAEEVEDQCDQQVAMVV
 GEDP IYVSPFDNEADWDGAATMVEEDHRQMPDGEAPDATV MADSRYYIPQQFENPANPAIHRATTAEEVWNDTHGQVDIF EKVPASYILAQFDNPNNPLIHYQTTGPELWNQTHGKVDAV
RQDPSWVFVEDGHEPAVAEGAGTITGLELLAATMDLDAVV
 ARRTGAVLYHPFDHPDVIAGQGTLALEELEECPEASTVITM AEHDDWVMLYQYGNPANAEAHYTGTGPEI LADDPSITTHFV GGSVGFYAGQFESPANYRAHMATTGPETVQQTGGRIDAFV MEDGYDQLNQFANPDNWKAHYRTTGPEIWRDTDGEITHFV LLGPDDAFIHPFDDPLLWQGHASMIDEVAAAGF KPDAVV

 ETTGATLIPPYNYGPQVIC
ESYGWDNRNAADNPFQIDEG
 ASTPGSFVPGQFDNPANPQAHYDTTGPEIWEQTEGALDLF ERHNDY LGITAHEFNPEGMRGADTDGYELAEQAPSMSHLY KRERDRMNAQFENLANEAHRATTGPE WRQTSGKVNAFV
CRERNWTLVRYNDVDVEGQGTMGCDYDKVD

## UniRef90 U1RGL0

 UniRef90-H8GF39 UniRefe90-E2SN62 UniRef90-UPIOOO4672821 UniRef90-K9HM24 UniRef90-UP10001FFF383 UniRef90-M1P9P9 UniRef90 WoV3R1 UniRef90-F5XZ47 UniRef90-S3NT58 UniRef90-D3EG93 UniRef90-AOP7L8UniRef90 N4WB11 UniRef90-N4WB11
UniRef90 E8SIP9 UniRef90-UPIOOO37F4142 UniRef90_Q0K3S3 UniRef90-R4Z2Z6 UniRef90-R7YJD8 UniRet90_G8QIK2 UniRef90-UPIO0035CEF35 UniRef90-W0RBF9 UniRet90_R5MLF1 UniRef90-H2YR96 UniRef90-UPIO002B48798 UniRef90-G2LI86 UniRef90-W9GSH5 UniRef90-D8F1Y2 UniRef90-D4GP06 UniRef90-H8FRX4 UniRef90-L1MFU2 UniRef90-UPI000372963C UniRef90_R6S126 UniRef90-UPIO0037CEE51 UniRef90-A0A026WL31 UniRef90 R6WGM2 UniRef90-F4LDG9 UniRef90-UPIO00362DC69 UniRef90_C0BGGO UniRef90-E4T8H5 UniRef90-W2ECT1 UniRef90-TOC9B9 UniRef90-UPIIO00479AA6F UniRef90-4LOL6
UniRef90 M5W0Y9 UniRef90-MOLWC0 UniRef90-UPIO00475B075 UniRef90-A4J492 UniRef90-W9BXU0 UniRef90-A9TXJ4 UniRef90-UP1000372B3CC UniRef90-B1KGV8 UniRef90-B3EGT7 UniRef90-A4RXL8
UniRef90-C7MAL6 UniRef90-R5CLL4 UniRef90-G2LER0 UniRef90-D8DZL1 UniRef90-UPIOOO35E969E UniRef90-Q6CST5 UniRet90-S5YSE3 UniRef90-X7EIF5
UniRef90-J3JUJ6
UniRef90-L1PFB4 UniRef90-S6HKG3 UniRef90-D5BIN7 UniRef90_W9YUA7 UniRef90-AOAO1 1NUP6 UniRef90-A8WRN7 UniRef90-W5WQY8 UniRef90-UP100018507E3 UniRef90 G8SJW4 UniRef90-R6PSS5 UniRef90-J3N176 UniRef90-UPIO0035F4626 UniRef90-Q11BX4 UniRef90-I2FDK8 UniRef90-UPIO0045EB4C3 UniRef90-L7EXU7 UniRef90-Q9YGBO UniRef90-A0A024PV03 UniRef90-Q2FRF7 UniRef90-C1EEG66 UniRef90-UPIOOO4011B1A UniRef90-QORSK9 UniRef90-R5AH77 UniRef90-UPIO0037ADF63 UniRef90-E9BVX8

TPVGNAGNTTA ${ }^{170}$ YWMGYSEYAGRTTTKLLPEMWGVQAWGAAP ${ }^{180}$ VPVGGGGLLGGVLT WLHE RHPGVKVVGAEPQGATSMALA
 TC GGGGLTSGIALALEADAPDFRVRPAEPEGFDDVARSG
VAGVGTGGTVTGVARALKGIKPGVRAVAVEPAASPVLSGG APGSGGGMAGLSAALLERSPHTVISSAEPEGFDDMARSLA AGGGTTGTLVGAGRYLREQKP DVQVVAAEPRYGELV SSMGTTGTMMGVSRYLKEQNSAVQUVGLQ
CLVGGGGLDGGCALAARAMSPRCKVYGVEPEAGNDGQRS VPVGNAGNITAHWMGYSEATATDPTVRVVYDAQTDAFTPS SSMGTTGTVVGTSQFLKEQNPNQUGVQ
SGMGTGGTMTGAGKVLKENYDDVKLYAUEPADAAVLSGGS AGVGTGGTVSGAGKVLKEKYPDIVQLCVVDPENSAFFPAYR $V G A G T G G T S A T I G R F I R Y R R H H T W L C V V D P E N S A F F P A Y R$
$C L G G G G L L S G C A V A G A R A M S G C A V Y G V E P E A G N D G Q R S$ CLGGGGLLSGCAVAGARAMSPGCAVYGVEPEAGNDGQRS TGAGTGGTHSGVARFLKPRDPDPQGSGLFNRVKYGVMFDP $C G V G S G G T L T G L T R F F R Q K S P R V K M V L A D P A G S V L A D Y V A$
$G G G L M A G V A A V S A H R A E T G A D V K I V G V A K R A A A F P D S$ GGGLMAGVAAAVSAHRAETGGADVKIVGVQAKRAAAFPPS AGVGTGGTLSGVGEGLKSYNPQUEIVVLDDPQGSVLYKWF VPITGGGGLDAAGVSFYK LVYPEVKVFGVEPNDENSMAQA MGCGTAGTFSGVARYVRERNPNAVC PLSGGGLLAGIALAVAKSANPRARLDGVTMERGAAMHAS
 P GGGGLISGDATADKHHDPERRVGVQAEGAETVHES AGVGSGGTLTGLSRFFSRVSPATDIVLADPKGSDLAEY IVPVGGGGLISGVASYLADMAPRTAVVGVEPSSAASMKAA AG|GTGGTICGAAEFLKEKDPRDKVI AVDPMGSIFFDYFH

 CLGGGG LTLASALAARALSPACRVYGVEPAAGNDGQQS VGVGTGGTDSGVGKFLKEKNPNTKIWGUDTYGSVFKKYHE ACVGGGSNAMGTYYHYLINDDRVKIVSAEATTGIIHGAKTL A QAHDGKLDAF AGVGTGGTITGTGEVLKKHFPGQRVYA PMGGGGGLAAGIALAVK SLKKDQRVIGVEATAVPSVRES ACVGGGSNAAGSFYHFLDNPSVKLIIACGDLGUVHGSMTY CCAGTGGTLSGTARYVKEKNPDVK
VPVGGGGLIAGVAAYVKRVHPKD LIVETVPQLYFVQAGPCD VVGMGGGGLAAGVAVAVKSVRPEVRVVGVQAAGAAAYPPS DVGMGGGGLAAGVAVAVKSVR EVGRVGVQAAGAAAYPPS CGAGTGGTSATVGRYLR YQRYATRLCVADPVHSVFHRHY CA GTGGTVAGVGKYLKEKNPNDK GVVADMGACMYNFYE AGIGTGGTVTGTGRYLREVSAERDGGRVQVVGADPEGSVY MSPGTGGTSATVGRYURYQQLDTVAQLCVVDPEHSVEYDY V PPVGGGGLIAGIALAVKHDKPGCQVIGVEPERCASMTGA VPVGGGGLLGGCGAWLRERSPATR\|IGVEPAGAVSMSAA IVAGSGGFSGTAKYLKEAWSPDVAVYGVEAELANGURTV ACVGGGSNAAGTDYHYDDDERVKIVLAEAGGQGIDTDHTA ACVGGGSNAAGAFYHYLNDDRVRLVAVEATEGIIHGARTL

 DGAGTGGTVCGUGRKFKEDSPQTKGVAADPEGSVLAGPDD SSMGTTGTIVGGSAYLKEQNKDIQIVGLQ
 VSGGGGGLLAGLANGMERVGWGSEVQLAVETKGADSLYQS VFGVGTGGTITGVGRYLTEQNPAVRVFAVEPEESALLSGN LPVGNGALITGVGRLLKERSPSTKVVGVCARGAVAMLEA AGIGTGGTIGAGEVLK AVVGGGGLISGLAVAAKALRPDGRVIGVQASGAAAFPPS ACVGGGSNSIGMFADFDEEKDHASAMALGEPGVLHGMRSY AGLGTTGTLMGVSRYLREKKPEVRV AGAGTGGTVSGVALHHKEEAGLSATHIVLADPQGSGLYNK SSMGTTGTI TGTGRYLREQSDTVQIIGVQ
LSVGGGGLLSGVVEGLERNGWHDVPVLAVETEGAASLHAA VVPGGGGGLSGGIGGUVKKTLKPSVRVIGVVASGADAMKRS VAGVGTGGTVTGTGRFLK HYTQRDTASADRSPDAGGRVR ATAGTGGTSATLARYVLHYTQRDTRDCVADPENSCFFEG ACVGGGSNAMGIFYPFLETGLHAASLNAGELGVFHGMLSY LVVGNAGNISAVYKGLVELSEDGFIDKMPMMTGAQAAEGSQ PISGGGSGIATAVKGUKKDCVVDAAEPVGAGAYAADTFES
$F$ SMGDGCTIGGCWKGFREAELDYVDTMKMLGVQPEGAS CSMGDGCTVGGWKGFREFAELDYVDDTPKMLLVVQPEGAS CSGIGTGGTITGIGQALKEHYPS EVMWAEPENAAVLAGG VAGTGTGGTLTGTGRFLKEKKPEVRIVGVEPAGSPVLTGG CASGTGGTI SGVSSYLKE QDSRVRIVLADCHGSGLAS

## UniRef90 U1RGL0

 UniRef90-H8GF39 UniRefofo-E2SN62 UniRef90-UPIO004672821 UniRef90-K9НМ24 UniRef90-UP10001FFF383 UniRef90- M1P9P9 UniRef90 WoV3R1 UniRef90-F5XZ47 UniRef90-S3NT58 UniRef90-D3EG93 UniRef90-AOP7L8 UniRef90-N4WBBI UniRef90-E8SIP9 UniRef90-UPIOOO37F4142 UniRef90_Q0K3S3 UniRef90-R4Z2Z6 UniRef90-R7YJD8 UniRef90_G8QIK2 UniRef90-UPIO0035CEF35 UniRef90-W0RBF9 UniRet90_R5MLF1 UniRef90-H2YR96 UniRef90-UPIO002B48798 UniRef90-G2LI86 UniRef90-W9GSH5 UniRef90-D8F1Y2 UniRef90-D4GP06 UniRef90-H8FRX4 UniRef90-L1MFU2 UniRef90_UPI000372963C UniRef90-R6S126 UniRef90_UPIOOO37CEE51 UniRef90-A0A026WL31 UniRef90-R6WGM2 UniRef90-F4LDG9 UniRef90-UPIOOO362DC69 UniRef90_C0BGGO UniRef90-E4T8H5 UniReffo-W2ECT1 1 UniRef90-TOC9B9 UniRef90-UPIO00479AA6F UniRef90-4LOL6UniRef90 M5W0Y9 UniRef90_MOLWC0 UniRef90-UPIOOO475B075 UniRef90-A4J492 UniRef90-W9BXU0 UniRef90-A9TXJ4 UniRef90-UPIO00372B3CC UniRef90-B1KGV8 UniRef90-B3EGT7 UniRef90-A4RXL8
UniRef90_C7MAL6 UniRef90-R5CLL4 UniRef90-G2LER0 UniRef90-D8DZL1 UniRef90-UPIOOO35E969E UniRef90-Q6CST5 UniRef90-S5YSE3 UniRef90-X7EIF5 UniRef90-JЗJUJ6 UniRef90-L1PFB4 UniRef90 S6HKG3 UniRef90-D5BIN7
UniRet90 W9YUA7 UniRef90-A0A011NUP6 UniRef90-A8WRN7 UniRef90_W5WQY8 UniRef90-UPIOOO18507E3 UniRef90 G8SJW4 UniRef90-R6PSS55 UniRef90-D2SBE
UniRef90 - 3 NII76 UniRef90-UPIOOO35F4626 UniRef90-Q11BX4 UniRef90-I2FDK8 UniRef90-UPIO0045EB4C3 UniRef90-L7EXU7 UniRef90-Q9YGBO UniRef90-A0A024PV03 UniRef90-Q2FRF7 UniRef90-C1EEG6 UniRef90-ММАЗН2 UniRef90-UPI0004011B1A UniRef90-QORSK9 UniRef90-R5AH77 UniRef90-UP100037ADF63 UniRef90-E9BVX8 UniRef90_F1A425
.
$\angle \bar{V}$ GEPVVDEPETVATADR\|JGNPASWKYAEAARDDSHGWIID LERGEPTALDALDPFVDGAAVRMVGEYTYALAARHTPRLV AGPHKDQGIGA SAGA $\square Q R N N A M T G S \square C D A \square I T P Q P G D L T P P \prod M H R C G A G 1$ KPGPHA $\square Q G \square G A$ TGERLRNQDPAARSLCDALMAPMPGELTFPIDRPRADRGF TGERLRNQDPAARSLCDALMAPMPGEL

PAFGAGGLNMKESYRPGTFDKSLPTRTV
 EAASPRPTMPETVATADRDGNPQSWNHAKAVVRDSNGWFD
QPGPHKVVGTS QPGPHKLVGTS S DGAQ $\square P G \square R K W P E$ PGPHKTQGTGA ПEPEDSPVLSGGEPGPHKDQGDGAGFIP DGDPDAPFGPVPGSRIEGIGRPRVEPSF ISQVIDRMV LRSGEVVRVDTPRT:ADGAQTPFLGNHTFAVIRELVTDVV LK QDDVGQVVEAQSVSAGADYPGVGPEHSHLAAEGRARYVV HGYDKEAGSWLVEGIGEDFDPPDCDLVREAY DAAGAPVRVEGRPTMADGDAVGRPGDDTLGLFDDLVDAVV VEPDTSAVLSGDKPGMHKIUGIGAGFIPKTYHPEVVDKVI SEGKLERSDGSSDTEGDGQ GUGAGRVTANMKGAPIDEAI
T LEAGMPVLVEEVESLADGGGVGLANRHSFTLVRDLVDDVV LKNGPPQWAK CSEAEGDAVKEPGSDTDPLVKEQVDDIL LDKGVPVTLDDTNTDADGATGGISELTARTDEEHVDEVV
 VMQDEDGQULEPYSUSAGLDYPG\|GPMHANLASSHRATVL


 LELGRPTTVTAQATLADGLAVQRPGDLSYALDKQYVDDVVV
 LAAGRPVALDSVATMADGMKVGRPGDVPFSIVRDLVDEVR KEVLESSGTSTSEGGGQGRVTGNLGWGLPERDGGCIDRWC
 LEAGEPVKAPTTATLADGDAVPTVGPRSFQTVKNLIDDIV VRAGRPVTLHEMDRFVDGAAVRRVGAAPLRMVKA APELV LADPKGSI GGGEPGHFRDEGIGNDFVAETMDLSLVDQVE VMQTEDGQIQEAFTVSAGMDYPGMGPMHADLASKGREQVL LMQTDDGQVIEPYSUSAGLDYPGUGPGHAFLIDSKRAEAG YTTGEFDSPGSSDTEGDGQ YYK LNKTDVTFYEVEGGGYD QGRMTANLLEGFKPDFNC MEADQIVSLPSVDPFVDGTAVGRAGEL
TGEFDENETYPYVTEGDGEDVI

AKGPHP! Q
WRTGRVEPTTSVDTDADG|
TEPTDSPVLSGGQPGPHKI
LAAGAPRKLESCATMAD

ПAAGHTVEDPADTSVATSLGAKRVAEQAMTCADTHPLHSH FVSGKDEKVESVRSIADGUAVRDVNADNFALLQQCVDESV
 FLQNEEGQITPTHSVSAGLDYPGVGPEHAYLKDSGRAEYV WAQGGPARLSEVQSCAKSLAAAVVGEHTYPLSRRHVAELV
 ATHDAFHGHDEIDEVADAVGRPRNT $N I G T H L Q M G I I G D T$
GRPYLVEGVGEDI
GRPYL
$K S G P H$
 FVQTGELVSDGLKTVTEGUGSMRLTANFKSAA






 UniRef90-E8RE85 UniRef90_K1EU87 UniRef90-E2CQS5
UniRef90-C1A7S4 UniRef90_H0R1V3 UniRef90_UPI00036EA316 UniRef90_UPI00042A4BB4 UniRef90_G4KTP1 UniRef90_S2KM19 UniRef90-E6WYQ5
UniRef90 F7XL04
UniRef90-F7XL04
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析

1
10
20
20 G P V WW| $K$ CEN ${ }^{30}$
$\frac{30}{L Q R T G S F K P R G}$

$V$ GNTPLVHLRHDS

V M E | $T$ | $P$ | $L$ | $V$ | $R$ | $L$ | $S$ | $S$ | $V$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $T$ | $P$ | $L$ | $L$ | $P$ | $S$ | $R$ | $F$ | $L$ | $S$ |
| $T$ | $P$ | $L$ | $L$ | $E$ | $S$ | $P$ | $A$ | $L$ | $D$ |

R P
E G H A
A
Y G K
I
Y

Y P L Y E A Y I Y | $P$ | $V$ | $T$ |  |
| :--- | :--- | :--- | :--- |
| $D$ | $L$ | $L$ | $R$ |
| $P$ | $L$ | $E$ | $Y$ |

$\square \mathrm{G} Q$

$\qquad$ G V E
 A K E

 P L L ELLTHI D H MVV D TLI GH
 T P L V Q L R H L L N

\section*{| $P$ | $L$ | $L$ | $K$ | $L$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $L$ | $V$ | $R$ | $L$ | $N$ |} THLLKKLD

$\qquad$

R P

D Q
V ${ }^{R}$
$\begin{array}{rl} \\ V & Q \\ V \mid A\end{array}$ $V A G$
VAIG $\begin{array}{ll}1 & G R \\ \\ & G N\end{array}$


L H DQ \begin{tabular}{c|c}
L <br>
LI \& GE <br>
\hline

 

Q <br>
E <br>
\hline P <br>
\hline
\end{tabular} $P$ P PLET

R
LIGNTPLIQLK
V RHTPTELSS $\qquad$ S A LS $\stackrel{\mathrm{E}}{\mathrm{L}} \mathrm{V}$ Y
$\qquad$ RGHARRT $R P Q V R V$

MVGNTPEHSP KGHAVRT KGHAVRTPLLEAPLLNAKLGGRLLVKPEMLQKTGSFKFRG RPHIHRTPVLTSSVLNRLTGAELFFKCENFQKAGAFKVRG
$P$ VAVRTPLLSSPALDTATGARVFLKPEVLQRTGSFKFRG

 RPSPLTEVPRFAEHAGARVFLKREDLNHTGSHKDNN RPSPGYYAEKFSADDGADVWLKREDLNHTGSHKINNGKTPLVR【NRIT
VVRTPLYPATW
$R G V V R Q T P V E S S R V L A D$

## 

GNTPLVRLSR EQLDCDLVAKVEYFNPAGSVKDRP RPSPLWFARRLTEQLGAKIYMKREELNHTGSHKLNN GNTPLVRSHNLARRLGLRLYFKLEGSNPTGSFKDRQ
VGNTPLI GLERLPARMGUDILIKAEWFNPGGSVKDRA $P$ LAALATPLI Y SRSLSNLFSAQIYLKCEQFQPTGAFKDRG $K P G I I R T P C N Y S K M S R T L G L D L Y L K K D Y L Q V T G S F K E R G$ $G N T P G V K D N R L P K A G G A E V L A K L E F Y N P G A S V K D R L$
 $\square G D T P M\|K\| N R L V P$

$\square G N T P L R Q D$ TPLLPAQRLAAFLGLELWVKDESRDPTGSFKARG R P T $P$ L $\frac{\mathrm{R}}{\mathrm{R}} \mathrm{P}$ VAHRTPYI RSQUASRRLGTNIRLKLDALQPSGSFKLRG RKTDLVHTKKVN TRCEVY KKPECLQRTGSFKDRG THLLQFP LIPDRGVRLYLKDESTHPTGSLKHRLL VGGTPLI RLDNMAPENAAEVLVKFEGLNVGGSVKTRT


 A Y N TI S QVLD ESRERGI DA S S GNHARAV A WLA KRLLDL H AVV



 AFNALSSKFSAA QRNAGVVTSSGNHAQADALSAKLLGGIPAT
 A L N WV R TA S HE EA R G L GA V S A G N HA L G L A WA A R DA GV E VT ADGAMERGELDAETVVIEPTSGNTGIGLADVCADRGLRLI $M T V G V S K A D E L G M K T V A C A S T G N T S A S L A B Y G A K A G I P A I$


 AKAMDDDAEAHPDSVI I EPTSGNTGIGLASVAAARGYR LI ARAAERSGMLRPGGVIVEEGTAGNTGIGLALVANALGYRTV A A N A V LK S K K D R E N GV ATHSS GNHAAA A A RAA QVA K $\square P A$ Y A LGLLVQDAERS GRGTVVEPTS GNTGQGLAQVAAAR GYRLI



## A

G G Q
A K A MI E D A E A K G Q A T I I
 ALKMI AEAEARGQIKPIEATSGNTGIALLAMAAAIRGYKMI GV A ML E A A E Q N K D SVVIV E P T S G N T G I A L A F A S A A K G Y K L I A ANALRQL A L GMIR DAEARPGGTIV E A Y N M M T K S K E QLER GVI
 A FARMA A S A DERRRGVVV A ARMDAASAGNHAQGVARSA GAMGIAAR
 $\square$ GAACEAHA A S HM I R VA $\begin{array}{cc:c}A F N L & L A \\ T \square G Q & L & M A K\end{array}$ A RS L F L Y A L A N GWT TVV I $A D A M L E G A E R D G R C V I V E P T S G N T G I G D T L V G R L L K G Y R V C$ $A F K M N S L D P A K R A K G V V T A S S G N H A Q G V A M A A S A L G D K G \|$ CLGALLAKKMGKKKLIAETGAGQHGVALATAAALVGMECD A YALI ADAEARGLIVIIEPTSGNTGIGLAMNAAAKGYRLI

 AFNRDMDPEAQRAAGVVAYSSGNHAQGVACAAAMLGLKAT ASNAVF GLLSDAEAARGVAHSSGNHAGLLSYAAGRRGIPCH
 A AVQASNTHSTRKPHFYCSSGGNAGGACVHGADTLGCEAT



 GA A MI WD A E K S G K M E IV E P T S G N T G I A L A F VA A A R G Y R L T
 A Y TRIMHTAREERARGVVAASAGNHAQGVALAASLLDTEAT

 $V M G Q \mid L L A R R M G R S R E V A E T G G Q H G V A T A T V C A L F G M K C V$ VAIAI SKARELGRRRFATVVS GNVGNALAAYAAHTGARAD
 ARYAL DK L S QEKRK GVI STS A GNHAQALA YHGRDQLIP VT
 AK SMVEEAEAS GRIM PIEPTS GNTGDGLALDGAIGGYRTI
 1
3 UniRef90-D7B322 UniRef90_UPI0003AB1D93 UniRef90_UPIO0035D6429 UniRef90_F5SBJ5 UniRef90_B1YWA3 UniRef90_UPI00035F4007 UniRef90_D3I9C7 UniRef90_UPI00035C3AE2 UniRef90_UPIO003B381EE UniRef90_J3IW91
UniRef90_A0A037Y013 UniRef90_B0UP66
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## UniRef90 A1SFB6

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UniRef90＿S7VFC2 UniRef90＿C1D1D8 UniRef90＿V6JX86 UniRef90－K1ZXS4
UniRef90－E8VMY9 UniRef90＿E8VMY9
UniRef90 M5GB75 UniRef90＿U2RT22 UniRef90＿E6MGQ2 UniRef90＿UPI0003F96E2F UniRef90＿UPI0003774A91 UniRef90＿UPI0003B52B30 UniRef90＿A9WK26 UniRef90＿W0REJ3 UniRef90＿Q9AXU4 UniRef90＿A5G891 UniRef90＿C6XT87 UniRef90＿Q0AQJ8 UniRef90＿D3Q945
UniRef90 Q914R3 UniRef90－Q914R3 UniRef90＿Q8EQJ5 UniRef90＿UPIO0037D4863 UniRef90＿UPIO003608934 UniRef90＿UPI0003B5B493 UniRef90＿UPIO003622D9D UniRef90＿H0UR51 UniRef90＿Q1N0H3 UniRef90－UPIO00364D172 UniRef90－W6RCZ6 UniRef90＿Q8CZG4 UniRef90＿H5TDQ6 UniRef90＿K2JTE3 UniRef90＿A0A017HIV3 UniRef90＿B3QJ29 UniRef90＿E9E7M7 UniRef90－KOI4R6 UniRef90＿Q1QDU0 UniRef90＿A5GBL3 UniRef90＿UPI0003B5E942 UniRef90＿E2MVK6 UniRef90＿A0A059MLE5 UniRef90＿H2CDW3 UniRef90＿Q60179 UniRef90－H5X119 UniRef90－W5W0C3 UniRef90＿E8SIA6
UniRef90＿F8GP78 UniRef90＿K6YWN9 UniRef90＿UPI000478CA31 UniRef90＿A0A024KDY7 UniRef90－I4ENI3 UniRef90＿Z5CR77 UniRef90＿E4XL09 UniRef90＿A0A022LQY6 UniRef90＿J7IR96 UniRef90＿P32582 UniRef90－A8H530
UniRef90－A3ZLT9 UniRef90＿UPIO00374EF41 UniRef90＿D7B322 UniRef90＿UPI0003AB1D93 UniRef90＿UPI00035D6429 UniRef90＿F5SBJ5 UniRef90－B1YWA3 UniRef90＿UPI00035F4007 UniRef90＿D3I9C7 UniRef90－UPIO0035C3AE2 UniRef90＿UPI0003B381EE UniRef90＿J3IW91
UniRef90＿A0A037Y013 UniRef90＿B0UP66


VVMPEGAP $V$ PKKKATRGYGAEVLIFHGRYLE DALAEATVF IV YVPR TTPRQKRDRIAALGGAQVEVIVTGDTYDDAAALAE

 IV VMPKDAPSLKK ERTRAFGAEVVLYDRYTEDRVA DGRA I A IVMPHDAPAAKVAATKGYGGNVII YDRYKEDREQDGR S L TVMPSGQTPEKEKMDTLHGVKPCPFKDPNHFYHTARRLGE
$V C L P R A A D E S K V N A L L E S Y G A V I S Y F D S D E E A R L S A D I E A S K$ IVMPENASPVKIEGSRALGAEVILHGDINDAWVLMHR V $V L L P E G K V A M G K V A Q A L M H G A K V L S D R G N F D E A L A L V R T Q$
$L T M P D T M S M E R R K I V R A L G A Q I V L T Q G R A G M R G A I E K A A Q ~$ IVMPKTTPTVKVMQTESVGGNVVLHGETFDEANAHARELE

 I VMPDTMSVERRQLMKAYGAELVLSDGTRGMK DEKAAELA VVIPDTQAKEKKDMLRDAGAELI EVPAVPYADPDNYVAEV | $\\| V M P S N A P E V K K Q A V K G Y G G V V I E C E P N L Q A R E Q G L K D V V$ |
| :--- |
| $L C M P A Q M S E E R K R T L T A Y G A Q L V L T D P E R R M L A A T E E A E K$ | FVCPDKVSTDK INVLRAYGCPTAVDPDHPDSYYNVSDRLV AVMPKCTARKKIVQIEFYGGKAHLVDRSDQIYAESHRLAK VYMGAEDVRRQVFRMRMLGAKVIPVNSGSKTLKDAIDNEAM LTMPETMSVERRNLLKDYGAELVLTDGAAGMKGAIAKADE VYMGEVDI ERQKPNVARMKMTNEAMRHWINHPTDTHY I IGG LTMPETMTMERRQLLRDFGAELILTEGAKGMKGADDKAQE


 FTTTDKQSKEKVDALRAFGCPTNVEPEDPRSYYSVVSSRDE FVCPDKVSEDKRNVLKAYGARVEVCPTDPRSYYNVSDRLV AVMPASTSKEK $⿴ 囗 十 ⺝ 刂$ A Q A FYGGQSHLVEDPTQ DYAESER LAR MIMPDNSTMERRNI LKAYGAEVVLTPSEEKMPGSDRKELQQ
 AVMPRSTSANK DALI QRQGGRCHLVDDATMDYAEAARLAD
 II YMGEVD DAKEHPNVVRMKDLGANVIAATHGRKTLKEAVD
 V VMPKGQIIEKERLIRLHGAQLMLVDPCPFKNPAHFYHTA
 VVPD LSTTPYMDGKDREAGTEVIVQKGASWQEADNYLTETL $I V M P R F T P G V K V E R T R G F G A E V V L H G D T L E E A R A H A Y A$
$V F M P S N S T Q E R K D A M T A Y G A T L I D V E E G L E A A R D M A L Q M Q$ VVMPACVSMERRSVLEAYGAEVVLSPADEATDGADRLAHQ IYMGKVDADRQRLNDARMRDAINEAMRFWVSHADDTYYCF AVMPRNTSPAKVALI EAQGGRCHY DDRPPE LTMPESMSLERRKILKALGANLVLTEAAKGMKGADEKARE $I$
$Y$
$V$ V FMPERVP LPKLDATRGYGADV HLTGEVFDDTLAAAVEFA






 I FMPQDAPPFNRNTCQLAGANVTLDDGDITDAGKVVAERK VVVPETASARARELI RVEGAEV VVHGASWVEANAFALAAV
 AVMPRTTSPEKVEELIVERGGRCHFVDEPGRDYAESHRLAA $V V V P E T T S D R A K E E L Z R L E D A K V V V H G G O S S$

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UniRef90_R5YRI3 UniRef90_A3WAC5 UniRef90_UPI00037D69D2 UniRef90_R4XJU9 UniRef90_R6SGD6 UniRef90_Q1NE89 UniRef90_S7VFC2 UniRef90_C1D1D8 UniRef90_V6JX86 UniRef90_K1ZXS4 UniRef90-E8VMY9 UniRef90_M5GB75 UniRef90_U2RT22 UniRef90_E6MGQ2 UniRef90_UPI0003F96E2F UniRef90_UPI0003774A91 UniRef90_UPI0003B52B30 UniRef90_A9WK26 UniRef90_W0REJ3 UniRef90_Q9AXU4 UniRef90_A5G891 UniRef90_C6XT87 UniRef90_Q0AQJ8 UniRef90_D3Q945 UniRef90_Q914R3 UniRef90_U3H5N4 UniRef90_Q8EQJ5 UniRef90_UPI00037D4863 UniRef90_UPI0003608934 UniRef90_UPI0003B5B493 UniRef90_UPIO003622D9D
UniRef90 H0UR51 UniRef90_HOUR51 UniRef90-UPI000364D172 UniRef90_W6RCZ6 UniRef90_Q8CZG4 UniRef90_H5TDQ6 UniRef90_K2JTE3 UniRef90_A0A017HIV3 UniRef90_B3QJ29 UniRef90_E9E7M7 UniRef90_KOI4R6 UniRef90_Q1QDU0 UniRef90_A5GBL3 UniRef90_UPI0003B5E942 UniRef90_E2MVK6 UniRef90_A0A059MLE5 UniRef90_H2CDW3 UniRef90_Q60179 UniRef90_H5X1I9 UniRef90-W5W0C3 UniRef90_E8SIA6 UniRef90_F8GP78 UniRef90_K6YWN9 UniRef90_UPI000478CA31 UniRef90-A0A024KDY7 UniRef90-I4ENI3 UniRef90_Z5CR77 UniRef90_E4XL09 UniRef90_A0A022LQY6 UniRef90_J7IR96 UniRef90_P32582 UniRef90_A8H530 UniRef90_A3ZLT9 UniRef90_UPI000374EF41 UniRef90_D7B322 UniRef90_UPI0003AB1D93 UniRef90_UPIO0035D6429 UniRef90_F5SBJ5 UniRef90_B1YWA3 UniRef90_UPI00035F4007 UniRef90-D3I9C7 UniRef90_UPI00035C3AE2 UniRef90_UPI0003B381EE UniRef90_J3IW91 UniRef90-A0A037Y013 UniRef90_B0UP66

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 E DD GA WKPNQFFNLNGPQAHYESTGPEIWEQTGGEVTHLV CESEGCVEDSP FDDPFVIA GQGTDGGEMDE HQPDLDT VLI AKTDATVVVPPFEDPHVVAGQGTDEAGQQATARGATPDRLY RDWVTNAHNTYYCFGTAAGPHPFPTMQDQEQSGRDPDAVV A ERHGLLTLIP PY DHP DVLS GQGTAAKELFE EVGALDALFV ENES

## EN


 EE Y GNAF IPPQQFENEANPA IHKKTTTAQEDWEDTMDGNDVDI F



 AKK LINKE DPNS HNQSNPNVHYRTTAA E DLDDD DGDNLLAMVV
 $\square S D N A \square W A Q Q F A N E A N P A \square H R A T T A E E \square W A D T A G E V D V F V$



RDTTGAWMPNQFTNPANPRDHYETTGPELWAQMGERVDAF
A EDEGGTF DPPFDHPDVII GQGTDGTE』NRQLKD DHAVFV
A QTPNSFVPQQFKNPANPADHRDTTAEEDWADTD
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AETSGAVFDHPFDDPVVLAGQGTVAMEMLEDQPDLDVLVF




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 ELGGHFMDQF TH DWRGNNNIA ES DF TQLQQLEEHPMPEWIV $\square D T$ SK Y F MP QQF ENP ANPA』HEETT GPEIWNDTDGSDDI F
 ERTGAVVI HPFDHPDVIAGQGTLGLEVLDQVPTAGTVLV
 A D TYFLVGGTVAGPHPYPAMVRDFQTVIGEETKMQMPDVVI



 QLD GHYMDQR TYDWRGNNNNDNSDFNQMEKEQYSDPTWUV
 E T G G H Y M D Q F T Y D W W G N N N I A E S I F E Q|LA M E R H P C P E W I V
 F Y L I G S VVGP HP YPEMVRNF QRVI GDQVLEKEGRLPDEVV GA QDAFV HPFD DPMLW Q $\quad$ Q GHATMMDDEMA LT GPKPDVVV
 E LDGHFMDQFTHDWRGNNNDAESVVFDQMAKEPHPVPEWVV A ADPRVF $\square$ PQQQFENEANSEAQREGTAKEVLEQAGKK DDGF TLVGADDAFDHPFDDP L LWTGHASLVDEVAAAGDKPDAVV


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FKGESHDCGGD TLAEGTAVKNP LLADKVNNAPEKTPGSWLVEGIVGEDFVPDNCDLSLADQAF $V / \mathrm{VG} \mathrm{VMPQGQYT} \square A E G \| A V K S P$ TAGPHKIQGTGA
YTSGELRAEGTSDTEGDGQ
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L
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 APGKHR QQGlGA
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UniRef90 - $5 \times 119$ UniRef90-W5WOC3 UniRef90-E8SIA6 UniRef90-F8GP78 UniRef90-K6YWN9 UniRef90_UPIO00478CA31 UniRef90-A0AO24KDY7 UniRef90-14ENI3 UniRef90-Z5CR77 UniRef90-E4XL09 UniRef90-A0AO22LQY6 UniRef90-J7IR96 UniRef90_P32582 UniRef90-A8H530 UniRef90-A3ZLT9 UniRef90_UPI000374EF41 UniRef90_D7B322 UniRef90-UP10003AB1D93 UniRef90-UPIO0035D6429 UniRef90-F5SBJ5 UniRef90-B1YWA3 UniRef90-UPIO0035F4007 UniRef90-D319C7 UniRef90-UPIO0035C3AE2 UniRef90-UPIo003B381EE UniRef90-J31W91
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250
260 K ML VEP

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 TVTDEEAVAFAREAARKAGLVVGDSSGANLAAAYRGA KVDNDVAFSTAREVAKTVGLLLVGIDSSGAALYAA LVDEPSLEKAVISLLLQTEKTVVE TISDQDAFSHTRALENRELTLAGTSTGVLLAAALRYCQQQ PVSNEDAFATGRLI GRAEGVLVGIDSGAAVHAAV LVPDAEALRTVFDLLEHEGLCLGPSSGVNVAGAVRLAQQ TVVSDA QUSAMRLIYERMKVVIEPSCAVPLAVVLK QVWEEDAYPLARQLAREEGI FVGMSSGAMAWAALEVA AVSDKDSFQMTRRLAKEEGLLVGGSCGMAVVAALRVAER KVHDKDAFLTARRLIREEGLLIGGSSGAAMWAALQTA KIPDAASVACTHWVSKLIGRKVGASTGTNLYGVLQLAC VATDEEALRGFRMCTQLEGIIPALESAHAI WGAVQUA VSFDDALEVAKKLASQEGLLAGUSGAIVWAALEQA
 PIEQAEAEQMARDLAAREG FGGI SSAGALVAAIRTAKR QVGHEDSAYDAKQLAQKEGLLAGLSCGAALWAAL
$L V E E A A D A R A M R W L D D E H L V E G S A V T V A A L L$
 LVSNDADSAAVKDVYDEGRNLLETSGALADAGAEAYC KVTDKDAALMTRDIARKEGIFVGNSAGSATAGLLQL LVDERQDEHALNLFIAQMRVLPEGAGAVGLAAVLAHKQR EVSDAASFEMTRRLAREEGLLVGGSCGMAVEAALDVARRA KVPDAWSLAAMHYLARRLGRRVGGSSGTNLIGALVAARQM QVKDEQAVTLLKDLAQKEGIVLGPSGAAAVYAAMEVA QVSDKDALHTAQQLARFEGLVGPSSGAAVW SVPDAASMAAMRYLTEPLGKRVGASTGTNFAGALTDAMQ EVTDEDAIETTRALGRDYGLLVGDSSGANVWAARIMAQK EVTDEDAIETTRALGRDYGLLVGGSSGANVWAARIMAQK

 VVSDAEAQIGMAHAFRYLKLVAEPSSADP GGAVALA TASEQE VDAMRLT WARLKIVMEPSSAVP पAT LLK AASDAEVGTAVGFAFRELKLVVEPACGVCPALCYNGAVAL LVDEGD EQAVLMLLEEEKTLVEGAGAAGLAALVRYQLE DVDRVAEVYMRKLAKTEGMFAGVSSGAAAWAATQVAK

 QVTNDEALEMARRLGRE
TVSEEQURSAMAVLARKARLVAEPSGAVSLAAYLSRADQ

T
 SI SEDWIA SIAILLRLEKEKAVVE DVEDDALRVARALATEEGVLSGDSSGADIHAAGEGAA KTDDKPSFKYARQLISNEGVLVGGSSGSAFTAVVKYCEDH KTPDPASVATTNWLENTIGRKTGASTGTNLYGALQLASEM KVDDEDAFEWGRQLAKQEG VAG\|SSGATMWAAAQLAA RVPDAASHAAMRWAADVTGLAVGGSTGTNLWGAALALL PVPDAASI AAMRHLHDRTGLSAGGSTGTNLWGVWHLVARM PVDGHAAIATARQLMRVGGVCAGISTGANVLAALDVAA AVTDDEDQEAMATLATHEGILACPEGAATVAGVAKLVAAG TAEDGEALEAVRLLSRTEGLPALESAHAVAEAIKLA
 KVPDAASIAVIRRVERLLGRRVGGSTGTNDWGAFQIVAEL KITDDEAISTAKDLAKLEGMMCGIDSGTNTAGATRLVA LVTDRAALEACERFLSDHRVLVEPACGAALALAYAP TVSNQTAFETARLLGRLEGUGGGAGAVGFAAVLS

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AALGHGVELKPGETVVCLLSGGNNDVSRYGEILER PRGATVAAVVSGGSVDPALMARVL
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GKDPKSNGPI GTI TGGRNVDMTQFTKVM
ALLSGRLDTRGRTTLVVVTGGNVDPKILAR
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TTPKTVVTLACDTGNRYLSK
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KRPENAGKTIVAIVCDTGERYI ST
KRPENAGKTVVALLPDTGDRYLSML
LTSGTVVFIVCDRGDRYLSD
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DFEQKTFKPDDVVVVSLSGRGDKDLQNYDEY MHASGRRGSI VTLICDGGERYSDTY

RRLGAGKRVLCIAPDTGERYLS
AAALFHGDQLEEDNVVVVTSGGNVDADDFAGADARHG AAALKLAPQWQGKKVAVVLCGKNUVLEKY ALRAAAASGPGKTIVTFACDAGERSYSKL AAVTGKDDMKGKTUAVVVCGGNVDQAAFLEALTTAG
AALLAGKDDVRGKTVADVLSGGNVDADDFSRLI LV PGFNENSVVVLVVCGGSNMTFEMMDQYSEQAG PERFKGKRVGLVLCGGNDDPLLLAA IDER NPDAVIAFIVCDRGDRYLST
पTEENPDPERPPVVVVNLSGRGDKDVDTAARW NEELGRKPLDIVVNSGRGDKDVDTAAKW $\square \mathrm{D}_{\mathrm{A}} \mathrm{DGRRGSVVTLLCDGGERYAGTY}$

KKPENDGKVIVVVFPDAAERYLST DKLDKDDIMVINLSGRGDKDVQTVAKALGR PGPSGSTVAVIGGGNVDPRLLADVAERAGM EQ GTVVAIFPDGSDRYMSK ERSA RPPRILTLFPDRGERYLDTVDAWDERVA PNYKGKRIVTLFADTAERYFST MSPDTLVVVNISGRGDKDПFT VAEHLGV
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A A
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LISEMRERGERGSVVTLICDGAERYAHTY
LR EGRRGSVVTLICDGGERYQHSYAWVAER RPEMRDRNIVTFACDTGERYMSTV
$E \square Q$
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 ADDAWTKGQDRSGGVIVEGTAGNTGI GLTMIGNVMGCRTV ALSMLEDAEEKGGITPIVETSGNLGLGLVLVALQKGYRFL ALNKI SLLAEEDARGVITASAGNHAQGVAYAAALRGVSAL AVNMI AALIERHGRNVVTASTGNHGRAVAYAASKLGLAAT ALQMIEDAEADGRGTIIEGTSGNTGMGLALAAIVKGYKCD GDAAEASGELPPGGTVVEATSGNTGDALAMVGAARGYQVV AYYRISRLLNPAERERVVAASAGNHAQGVAWSASRLGIVSSR TLGQALLCKRMGKRRVI AETGGQHGVSVATVAALMGLECV A GQGLLALRTGKRRIIAETGGQHGVASATIAARFGLECT GKRMVEDAEISGRHTVI EPTSGNTGI GLA ACADKGYRA ALFTI RDVIARPGGTIVEGTAGNTGUGLALVGASMGFRTV AYNLI QLDAAERAAGVVTASAGNHAQGVAFACRAMGIKGR ALGQLLLAKRMGKKRIIAETGGQHGVATATVAAMFGMDCE ALAMFNDAEKKGLITPIEPTSGNMGISMAFMAAMKGYKMV A AAQGVAKRMGKKKVIAETGGQHGVATATVAALDGMECK QTVAVTAATQHGADTVALASAGNAGQAGAAYAGRADDDE ARRALESGELVEGGVVCEGTAGSTGVSLAMVCRALGVECF ALSMIRRAEQRGDIHPIEATSGNTGIALAMVAAIRGYKML VLGQALLAKRMGKPRVIAETGGQHGVASATAAALLDLECV ADSMIRHAKARGTQRPI EASSGNTGIAAACAAASGGMSATV ALSMLRHAEARGTMRPVEATSGNTG\|ALAMAAAMMGYRMV ALGQVLLAKRMGKKKVIAETGGQHGVATATAAALLGLECN AIGQI LLARRMGKHRIIAETGGQHGVATATVCADMDMECI GANMI WDAEKRGVLTSNEPTSGNTGUALAFVTAARGYKLT
 AVRMVDAAEASGAGTIVEPTSGNTGMGLALVAQQRGYRCB ALAVINDAEEKPGGVIVETTSGNTGYSLAMIAARRGYRCII ARAAERRGILKPWMTVVEATGGSTGSSLALVCAVKGYKFR AI GQIL LAKRMGKTKIIAETGGQHGVATATVAAKFGMECK VIAQGLLAKKLGKTKVIAETGGQHGVASATVAALLGLECT ARSLFLYALCNGWDPVIEASSGSTAVSEAYFARMLGLPFIG A WALSALAPGLRAKGVIAFSSGNHAQGVALAAKLHDAPAV AHALFLHADCNGDDDQVEASSGSTADSEAWFARELGLEFV AVKMIEDAEKRPGGTVVEPTSGNTGVGLAVVAQQRGYKC ALSMLEDAERKRKTTLVE
 ALSMLERAEKEGKATVI E ARQMLDEAEQRPAGR VI E AFNLLALSEDERQRGVVAHS AYNAI ARIDAATRARGVVASSGNHAQAVAYAAKVFGIPAW ATRMVEEAEKSGRLKPIEPTSGNTGTGLALVAAVKGYRCI GVSMI RDAEDNKDTVI EPTSGNTGI ALAFVCAARGYRLV VKYMIEQAERTKDKTVLEPTSGNTGIALAMIVRRKGYKVK AKAMIDDAEQKGLSVIIEPTSGNTGIGLASVAAARGYRII

$T$

AMNLLALDEDARRRGVVGGAGNTGLGLAVVAKSLGYDLL ARSLFLYALSNSWDKEGTPSSGSTAVSEAYFARLLGLPFDV GKYMIADAEKKPGGT\|IEGTAGNTGLGIAFAALNKGYRVI GETAMHSGKLKPGGTLIEPTAGNTGUGLALAAVGKGIDV MSAAVTMAKKLGATRLAAPSAGNAGGALAAYAAAAGVEVH
 ALNAI RQAEKPAMFQVVT LGGACQKALDDGKKTFVS CLGQ1 LDARRMGKTRIVA


GVSMI LTAESPGKT ILVE

IGNFILSQLSDPKLHFYN
ALGQGLLAKYTGKKRVIAESGGQHGVATATVAADLGCPCT AVRMIEAAEKSGADRPVEPTSGNTGVGLATVAQQRGYRCL ALAMIKKGELKPGATVIEPTSGNTGIGLAAVAVAKGYRALV ARSLIEDAEARGADRPGEPTSGNTGISLAMICKRKGYRLK



## UniRef90_R5C9z3

 UniRef90_NOBIC6 UniRef90-11 Q340 UniRet90_M9RRN1 UniRet90-L5MWY1 UniRef90-UPIO00288F2A1 UniRef90-UPIOOOO47BE685 UniRef90-A0A021VTR1 UniRef90-H6MSH3 UniRef90-UPIO002F23A22 UniRef90-UPIO0037CBEF9 UniRet90-J9HS71 UniRef90-E9CHG4 UniRef90-F9Y6T2 UniRef90-W5TD64 UniRef90-UPI00037ADB8D UniRef90-UP10002C33887 UniRef90-W7YDU7 UniRef90-WOJREO UniRef90-OO16B2UniRef90 W6RF25 UniRef90-G8SBD5 UniRef90-UPIIOOO3459AAO UniRef90-UPIo00373DB59 UniRef90-A8H8S7 UniRef90-L1PAF6 UniRef90-A8WLY8 UniRef90-UP1000472AB3A UniRef90-R7D4K5 UniRef90_R411D9 UniRef90-MOMBR3 UniRef90-UP1000479FD8B UniRef90-M8D4F9 UniRet90 J5VDN9 UniRef90-C7ZCI8
UniRef90
R5Q3C7 UniRef90-D5DJX7 UniRef90-D5V324 UniRef90-UPI00047C2768 UniRef90-D8J3Q3 UniRef90 UPIO003B52A95 UniRef90-W1S6E3 UniRef90-G7CC94 UniRef90-_J3LVL4 UniRef90_E3KJG9
UniRef90 UP10003 UniRef90-R2PZD5 UniRef90 UPIIOOO35C6535 UniRef90-G8PRN4 UniRef90-C1D3X3 UniRee90-UPI0003A54880 UniRef90-T1G9L5 UniRet90-O39VD2 UniRef90-D5MMY9 UniRef90-E9F991 UniRef90-R7FP42 UniRef90-A0AO24PCC6 UniRef90-12EU73 UniRef90-UPIOOOB706223 UniRef90-F7RYB1 UniRef90-UPI0002376C27 UniRef90_O7NOM1 UniRef90-J4T6K1 UniRef90-R7MSF4
UniRef90-UPIOOO255C05D UniRef90_UPIO00477F167 UniRef90-W6R9B0 UniRef90-X0P152 UniRef90-B7G3F1 1 UniRef90-W7YP48
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UniRef90 A9JT04 UniRef90-D1BPE9 UniRef90-D7E2X9 UniRef90-C5FZ17 UniRef90-E3PT95 UniRef90-B8M831 UniRef90-UPIIOOO360A782 UniRef9O-UP1000380C2A5 UniRef90-R5E956 UniRef90-B9XCN1 UniRet90-D3F297 UniRef90-E2ZBIT UniRef90-H2C172 UniRef90-C6WCC8 UniRef90_G2Q0H9



120 IVIPDNQS AVMPARYSPDKQMLLRFLGAETDPAGGYKGAMDKVEDLMK IVMPSTAPETKKAGURRYGAELVEHGNSYDEAESYAYELA VCLSRLVPANKVAALEALGAEVRRVGESQD EAFGEVERL FVMADKQSKEKIDALRAVGCPTNVEPTDPRSYYSVSKRGG VYMPVGAADPKDAATRAYGAEVELVGATDDESLVAAREFA IVMPETMSMERRNLLRAYGAELVLTPGPEGMGGADRKAQE
$V Y Q G A E D V R Q V F R M R L L G A E V R S V E G T K T L K D A T N E A D I$ VYQGAEDVRRQVFRMRLLGAEVRSVESGTKTLKDATNEAD I TLPEKMSQEKVNVLRALGAEIVRTPTEAAWHDGVAMRLN I VMPETQSQEKKDMIRLAGAQLVLVPAAPYSNPNNYVRYS I YVPTTTPKQKRDRIRAHGGDFVEL DAVGDTFDAAAAAAA i FMGAEDVERQRLNVRSVTSGSSTLKDAVNEADKDWAAND LTMPSYTSLERRVCMRAFGAELILTDPTKGMGGTVKKAYD VFMGEEDTKRQALNVFRMQRTLKDAGNEALRYWVSNVEDT VFVPSRSGFTNKAMINVHGGEMNVVGGRIGDAGAAFEEAD VAMPDDAAMEKSALVEAYGARVVRVRPVSIAHRDHFRASH L $M P E D S S V E R D Q T M K A F G A D V L L T P K E G G M E Y A R D A A T R$
$V Y M G E T D T E R Q V A R M R M L G A T V V P V T N G S T I K D A L N E A L$
$V$ VVVPASTPRVKLAQDRAYGAKVCEVEGSYDDAFDIAERMA LIMPRNSSLERVQTMKAYGAEVILVD GMEDARDLADSMV VVMPRGQAREKELMITLFDVDACPFADPDHFYHTAKRLGE II YMGATDDERQKLNVFRMELLGTKVVADTDGLQTLKEATT LVMPETMSVERRAMLRAYGAEVILSDPMEGHPGVIKKVEM IVMPETMSLERRSLLRAYGAQVLTPGSEGIKGSVKKAEEL 1 YMGKTDVDRQHVNVERMKMGNMTLKDATNEAIRDWCRHP LTMPDTMSMERRKLLKALGANLILTDGAKGMKGADTKAEE IFVPGDAPEGKLAQPLVYGADVLAVNGSYDEAYDLSMEAT
FVCPDKVGQEKINVLRAYGAEVAVCPTAVDYYSVSDLLAR LVMPETMSMERRNLLRAYGAELVLTPEGMGGADRKAEELV LAVTDKSSQDKDDMLRALGAEVHVCPDDPRSYYEVAKRIU IFMGKTDVERQHTNVERMRMLGAEVHPVTTGNMTLSDACS VFMGEEDIERQALNVFRMKKTLKDATNEA VFMGAKDVERQELNVFRMKSGSKTLKDAMNDADRYWVTNA AVMPRTTSPEKDALLERQGGRCHFVDEPTRDYAASRDLAA TYMGEKDVARQEMNVVRMGLMGAEVNEDTREDFAGNVEDT ITMPMDAPRDKDENTRALGAEVVLYDRETEDRDADGDRDS AVVPTSTALAKIEAMQALGGEVQTAPGGEDDCEAARRDAC FVCPDKVSEDKQNVLRAYGCPTAVPPEHPDSYYSVSDRLT IVMPSDTAVEKSVLMRAFGAKLVLTDPTKGMGGTVRKAYE IV VLPDDTAVEKSQLIENMGATIVKVRPVSTSNRSHYVNVA LVMPETMS ERRKLMQAYGAELILTPGPDGMKGARDLALDQ AVVDCHASKDKLRAMQAFGAELVYVSEGDADATADRERMA AI APKATATGK REDEADGGEVHLVEPYQDYSEAARDAKE IVMPDNAPQLKLDMRAFGADVIVVGPASEERAARAKELT UVVPEDTPTVKVEATRAHGAEVVLVAVGQREAVAYE IVLPEKMSKEKVDVLKALGAEVIRTPDSPDSNMRVAARLL LTMPDTMSVERRNLLKAYGAELVLTRGAEGMKDNKAEELAK VLCSDAVAVEKLRSMTALGADLDITHSPSGPAMNKRAAED IVMPETMSVERRQTMKAYGAELVLTEGAKGMKGADAKADE LVMPDTMTQERDNLLKAYGAELVLTPGDEKMP IAKAKELV VYMGEDDDQRQAPNVARMKMTNEAMRHWDNNPVDTHYDIG LTMPETMSTERRVVLRALGAE TVLTPGAAGMKGAVEKANE VVMPNDQTPEKTKMIELHGVPPVPFKNPEHFYHTARRDAE VCMSALVPA KKVDAVRALGAEVRIVGRSQDDAQAEVERLV AVMPSYTAKRKIQEIEFYGGKCHFVNHSAQDYDESERLAK FVVPTKFSEEKQAEMRALGAEVINTPREDGMLGGASAKAKE FCVPEKFSVEKQTLMKALGARVIKTPSDQEMAGA KKAKE VAMPADVPQANYLECEAAGAHVTLVNGLIGDCGRIVAERS IVMPETMSIERRKLMQGYGAKI LTPGADGMPGAIKHAESL CVMPKNAPMVKKRAVTDFGGNVETENNNEARDAVAARGQ VVVPETTPEFDRDRLESYEAKVDVHGKQWSEANKVVAEED VYMGATDVERQKPNVFRMGAKVHPVTAGNGTLKDAMNEAL
 VYMGAVDVERQKPNVFRMKPEVSGNGTPKDARNEGMRDWV LTMPETMSAERRAMLRAYGAELDLTPGTEGMSGADRREA V VMPEKMSMEKVDVLRALGAELVRTPDSPESHVGVAWRLK
 VFMGEEDDRRQELNVFRMKHTLKDATNEADRHWVEHVEDT FVVPDKVAQDKDAVLRAYGCPTAVPPDHPDSYYSVSDRDA I YMGEVDCERQMLNVFRMKMTLKEAVNEAMRDWVTNVRNT VVMPDNVTPERTQLLQMYGAEIVYSDGTKGSNGAVELEMA 1 FMGEEDTQRQALNVYRMTSGTRVLKDAVNEAMREWVSRV VYMGAEDVRRQKLNVYRMTSGTGTLKDATNEAMRDWAKTV I YMGEVDTERQALNVARMGTGSRTLKDATNEGLRDWVASV

## UniRef90 R5C9Z3 UniRef90-NOB1C6 UniRef90-11Q340 UniRef90-L5MWY1

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UniRef90_C7ZCI8 UniRef90 R5Q3C7 UniRef90-D5DJX7
UniRef90-D5V324
UniRef90_UPI00047C2768 UniRef90-D8J3Q3 UniRef90-UPIO003B52A95 UniRef90-W1S6E3 UniRef90-G7CC94 UniRef90_J3LVL4 UniRef90_E3KJG9 UniRef90_UPI00037C4A96 UniRef90-R2PZD5 UniRef90_UPIO0035C6535 UniRef90-G8PRN4 UniRef90_C1D3X3 UniRef90_UPI0003A54880 UniRef90-T1G9L5 UniRef90-Q39VD2 UniRef90-D5MMY9 UniRef90_E9F991 UniRef90-R7FP42 UniRef90-A0A024PCC6 UniRef90-I2EU73 UniRef90_UPIOOO3706223 UniRef90-F7RYB1 UniRef90-UPIO002376C27 UniRef90_Q7N0M1 UniRef90-J4T6K1
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UniRef90_K8ECQ7 UniRef90_R4T6F5 UniRef90-UPI0004183556 UniRef90_Q3B6A9 UniRef90-B0RD32 UniRef90-W7DUC3 UniRef90_Q8DLI7
UniRef90 A9JT04 UniRef90-D1BPE9 UniRef90-D7E2X9 UniRef90_C5FZ17 UniRef90-E3PT95 UniRef90-B8M831 UniRef90_UPI000360A782 UniRef90_UPIO00380C2A5 UniRef90-R5E956 UniRef90-B9XCN1 UniRef90-D3F297 UniRef90_E2ZBI9 UniRef90-H2CI72 UniRef90-C6WCC8
UniRef90_G2Q0H9


 KATGRTFVHAFEDDHDI AGQGTAGLEAMLA LEPDFDALL $\square R E R S M T L I P P F D D P L I A A G Q G T Q G L E L M E D A P D D D R V I V V$ EETTNSWYVNQYDNPSNCAHFGSTGPEVWEQTEGKVTHFV IERPGAVLARQFANEANPADHRRTTAEEIWADTDGQVDIV EENPQYFVPQQFNNPANPKIHEETTGQELLGQAEEDGRID RDWVTNVRDSFY IIGSVVGPHPYPAMARAKEGRATPDAVI

 ADVEGATMVPPFDDARTAAGQGTVAVELLEQDPAAPDLVI NDTFY LIGSAVGPYPYPLMVREFQRKQLI EKENRLPDYVV
 AENDEWYSLQTFSTPYRHEGKKTMFYEIVEQEWAVPDAVV GAGAGFFADQFENLANYRAHKEGTGVEIYDELGDALDAFV LQQEGRGRVQFGNTDNPLIHYETTGPEUWRQSQGRITHFV DDASVCCRNTGUNPFTREGKKTCAFEMAEAFDWRVPDWVI AEGKGIVLDQFANPDNPLAHYQTTGPEDWRDTAGSITHFFV
 VNENGYFMPQQFQNPANPEIHRLTTGKEIIDEQVGELDAFV ADTYYVIGSTVGPHPYPDMVARLQSVISREDKRDYPDYLM

 | $E K Y G W Y N R N A A V N P F Q V K R T V G L E L A E Q S A V R G E V P D W F V V$ |
| :--- |
| $E T P G G W K P D Q Y S N P A N P Q S H Y E T T G P E D W A Q T D G R V T T F V$ | KENPSYFDPQQFKNPANPKVHRETTGQELLEQGKE KETPNS YY $\square$ NQYFNPLNTEAHYSTGREDWEQTAGEITHLV REKAKEFSKEEGFSNTNVLVGYQTGHELIVQQFPDGIDAFC

$E A D R D W C T M G P H P Y P D I V A R M Q S V I S E E E R W Q R D Y P D Y L I$ FYLIGGADGPHPYPKMVRDFQKIIGEEAKEQFTAVPNAVV RDTFY II GTVAGPHPYPMMVRDFQAVIGWEARRQAPDYVL EDGGHFIDQFTHDWRGNNNIAQSUFDQMALEPDPEPAWVV HYLVGSVVGPDPFPRMVRDFQSVI GEEAREQFRERPDATVV TERGGLTLITKFDDEMVIAGQGTTGLEDAEQAAETKADVV ERGGHFMDQFRRDWRGSNNDAESVFAQLRDEPHPMPDWVI
 MQADGKGRVQFGNHDNPLMHYQTTGPE WRDTAGRVTHFV AKENGWFVPSQFENPANPDDHEKTTAKEILDTTGGSLDAFV ADDPDSIWTEQHNNPANGNGYRGLARELRDVLGERIDYLV



## S

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TETGATMVHPSENPKVDAGQGTDGQELVGQMQEHLQVII
S M D A A A Y WI N Q Y A N P L N WQ A H Y H GA GE E I Q Q M E G Q I D V L V



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










## UniRef90_R5C9Z3

 UniRef90_NoB1C6 UniRef90-110340UniRef90 M9RRN 1 UniRef90-L5MWY1 UniRef90-UPIOOO288F2A1 UniRef90_UPIO0047BE685 UniRef90-A0A021VTR1 UniRef90-H6MSH3 UniRef90_UP10002F23A22 UniRef90-UPIO0037CBEF9 UniRef90-J9HS71 UniRef90-E9CHG4 UniRef90-F9Y6T2 UniRef90 ${ }^{-}$W5TD64 UniRef90-UPI00037ADB8D UniRef90-UPIO002C33887 UniRef90-W7YDU7 UniRef90-WOJRE0 UniRef90-Q016B2 UniRef90-W6RF25 UniRef90- G8SBD5 UniRef90_UPIO003459AAO UniRef90-UPIo00373DB59 UniRef90-A8H8S7
UniRef90_L1PAF6 UniRef90-A8WLY8 UniRef90-UP1000472AB3A UniRef90-R7D4K5 UniRef90-R411D9 UniRef90-MOMBR3 UniRef90-UP1000479FD8B UniRef90 M8D4F9 UniRef90_SVVN9 UniRef90-R503C7 UniRef90-D5DJX7
UniRef90-D5V324
UniRef90-UPIOO047C2768 UniRef90_D8J3Q3 UniRef90-UPIIOOO3B52A95 UniRef90-W1S6E3 UniRef90-G7CC94 UniRef90--JJLVL4 UniRef90_E3KJG9 UniRef90-UPIO0037C4A96 UniRef90-R2PZD5 UniRef90 UPIIOOO35C6535 UniRef90-G8PRN4 UniRef90-C1D3X3 UniRee90-UPI0003A54880 UniRet90-T1G9L5 UniRef90-Q39VD2 UniRef90_D5MMY9 UniRef90-E9F991
UniRef90 R7FP42 UniRef90-R7FP42
UniRef90-A0A024PCC6 UniRef90-12EU73 UniRef90-UPIOOO3706223 UniRef90-F7RYB1
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UniRef90 UPIOOOC4183556
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UniRef90-O8DL17
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UniRef90-E2ZBIT
UniRef90-H2C172
UniRef90-C6WCC8
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200
 QLS G G GLI S G VAA A L K A RIP G DRVVI GVSMER GAAMYQCQQ VPA G G G GL DC GVVALAAAKA I N P Q V QVI GVVQHAASPP WY Y S



 A CVVGGGSNADGVFAPFA YQEMHADLSGGAGRKGVLHABAMMY A CVVGGGSNAMGMFFPFVEDTQVQLVGTEAAGHGIHTEHHA $M G A G T G G T V T G \square A R K L K E R \square P N V K V V G V D P V G S I D A E P E S$ A AVGS G GTLA GTGLAL $\square P \vee G G G G C L A G Q G T Y L R E R S P G T E D L G V E P T N A A S M T A A$ ACVGGGSNAIGUFYPFLDTNMHAATFNRGTVGIIHGMKTY




$A C V G G G S N A D G I$ F HAFVVTGRHAASITGGSVGVLHGNRTY VPTGDGN ILSGI A A GFLDDYS LG ITTSAMPRDWRACD DAMA S SMGTT GTI M GTGRY L K E T N P A I Q Q V G V Q SVA GT G GT I A GNSRYL SEQNP AQLQTVLVDPDGS GIYA Y A CVGGGGSNADGDISAFLDNDPSDVKLYGVEAKE GIIHGMKTY
 ACVGGGSNAAGTIFHYLDDDRVHITIRLGRPG\|IHGARTL

 $G G I D A F I S G V G T G G T \square T G V G Q V L R E N F P G V Q I I A$ ACSGT G GTI S G A A RYLKEQNP KVQVI GVDADGSLIKKY GAVGGGGMVMGVSK LVKEKYPQTRII ACVVGGGSNSAGTMYHYADDMRVRMUVHCGTEGRLHGARTL ACVGGGSNAlGMFYDFIKEENHAAKMAKGTKGVIHGTGTY


 M G $\square$ G S G G T VT GVGK Y L K EKNPNAK I Y GVVEPA
A GAGTGGTIA GV GRFLVSVASDVQLIDPPGSGLFNKVKHG



 C A A GTGGGTDA GLLARKMIGEK
 A GLGTGGTLMGVGRRLKEHDP
GAVGTAGMAMGVGRVLRSKSPSTR\|VI.
$V A G V G T G G T D T G V G G Y G L K S K N P D V K V I A D E P A T S A D V S T G$

 $P L S G G G L A G G \square A V A V R A L D P C A R V V G V V M E R G A A M A A A A D A$ $M S A G T G G T S A T L G R Y \square R \quad Y Q G H N T K L I V V D P E N S \square F Y$ D Y $L V P L S G G G L A A G V A A A D K G V S P K T K V I$ GLDTMERGAAMKAS SGA GS G GTYS GDMRYLKEKNPK川NGILAADV A GA GS GGTFTGGADYLKKRNPKINTVVVEPVGSILDGGAP
 GGKAPDAFVAAGVGTGGTVTGVGHALVRVVDDVVQFA CAVGGGGLASGNClALRALLGDDIKVVLAEPAALDDAKRS

 A AVGGGSSNADGDFHSFLDDRDVRIVGVEAGGHGMHGNRTY





 A CVGGGGSNADGLEAP F LDDTNEHAAS DSK GSVVGVIDHGFKC Y CSVGGGGGLFNGGIQ GLHEYNKSHTSNSSTETKGADS LA Y S

 ACVGGGSNAIGGLYP FLEDSSVKMVGVEAGGLGDEPEKHY A GLGTGGGTLMGNARRFKEESLGAVVKIVAAEPMQGEPVQ A CVVGGGS NADGMF YHFDVEXEHAATMTK GSVGDFHGMK S L A CVVGGGSNALGLDFH GF L E P GE HA A S V F A GRP GYFH GT H S L

## UniRef90 R5C9z3 UniRef90-N0B1C6 UniRef90-11Q340 UniRef90 M9RRN1 UniRef90-L5MWY1 UniRef90-UPI000288F2A1 UniRef90-UPI00047BE685 UniRef90-A0A021VTR1

UniRef90-H6MSH3 UniRef90_UPIO002F23A22 UniRef90_UPI00037CBEF9 UniRef90-J9HS71 UniRef90-E9CHG4 UniRef90-F9Y6T2 UniRef90-W5TD64 UniRef90-UPI00037ADB8D UniRef90_UPI0002C33887 UniRef90-W7YDU7 UniRef90-WOJRE0 UniRef90_Q016B2 UniRef90-W6RF25 UniRef90-G8SBD5 UniRef90_UPI0003459AA0 UniRef90_UPI000373DB59 UniRef90-A8H8S7
UniRef90-L1PAF6 UniRef90-A8WLY8 UniRef90_UPIO00472AB3A UniRef90-R7D4K5 UniRef90-R411D9 UniRef90_MOMBR3 UniRef90_UP1000479FD8B UniRef90-M8D4F9 UniRef90-J5VDNN UniRef90-C7ZCI8 UniRef90-R5Q3C7 UniRef90_D5DJX7 UniRef90_D5V324
UniRef90_UPI0004
UniRef90_UPI00047C2768 UniRef90_D8J3Q3 UniRef90_UPIO003B52A95 UniRef90-W1S6E3 UniRef90-G7CC94 UniRef90_J3LVL4 UniRef90-E3KJG9 UniRef90_UPI00037C4A96 UniRef90-R2PZD5 UniRef90_UPIO0035C6535 UniRef90-G8PRN4 UniRef90_C1D3X3 UniRef90_UPI0003A54880 UniRef90_T1G9L5 UniRef90-Q39VD2 UniRef90_D5MMY9 UniRef90_E9F991 UniRef90-R7FP42 UniRef90-A0A024PCC6 UniRef90_I2EU73 UniRef90_UPI0003706223 UniRef90-F7RYB1




UniRef90 J9SFE3 UniRef90-W8EV17 Unirefofo-DOCZZ2 UniRef90-G8NBH3 UniRef90-A8NGQ4 UniRet90-D7CF39 UniRef90_M7EWC1 UniRef90-K8EM42
UniRef90-DOL4D UniRef90-L9U8A5 UniRef90-UPIO0029AE3A0 UniRef90-A4G4G2 UniRef90-W7CL34 UniRef90-K9QGE7 UniRef90-UPIOOO4679E82 UniRef90-G1KAYO UniRef90-W1N8N5 UniRef90-D5EQF7 UniRef90-R1HMT6 UniRef90-E6SMS2 UniRef90-E11AL2
UniRef90 O8WW8 UniRei90_UPIOO04089CE7 UniRef90-S7TLL3 UniRef90-E4T4V7 UniRef90-F2K3X9 UniRef90-E4U8U5 UniRef90-G4L5U7 UniRefofo-D1AT15 UniRef90-UPIOOO35C3DC8 UniRef90-A3TLL6 UniRef90-K6DY80 UniRet90-W2T6P3 UniRef90-N4VTHO UniRef90-D3RTM5 UniRef90-S7ZBN4 UniRef90-COZA89
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UniRef90-D5D985 UniRef90_UPIo00373D610 UniRef90-G9NTT3 UniRef90-F5T1A7 UniRef90-D4JWZ1 UniRef90_Q2CC71 UniRef90-UPIOO047AEC74 UniRef90 R6NZD8 UniRef90 UPIOOO2E131D0 UniRef90-UPIo003B6C92F UniRef90-E1VK69 UniRef90-G7UUU6 UniRef90-C7QCC0 UniRef90-W8RYO5 UniRef90-R5BXLO UniRef90_UPIO0036DA3D4 UniRef90_UPIOOO369A382 UniRef90-UPIO00255A179 UniRef90-UP1000373EC8E UniRef90-UPIO00477F444 UniRef90-H2WBH3 UniRet90 W4EKE4 UniRef90-R9PS50
UniRef90
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UniRef90 UPIOOO475EE00 UniRef90_UPIOOO3727C25 UniRef90_UPIOOO36B7338 UniRef90-I4BQD9 UniRef90_UPIo0036809BA UniRef90-O7M958 UniRef90 E1VWK4 UniRef90-G8BUZ3 UniRef90-UP10003C14D1B UniRef90_U2SD08 UniRef90-UPIO00368E586 UniRef90-10QY43

保 IUGNPLLRLNKLAHRPDVEVWVKLERANPGGSIVKDRIG
$\square \mathrm{G}$ PLLSSPFLDEDAGRRVLVKAECLQHTGSFKFRG PYTHRTPLLTSHLLDELLGKKLLLKAEHLQKTGSFKARG KPLWAETPLIYSSDLSDNVGASVYLKLENLQPSHSFKYRG
 LIGQTPLLEUQGFT DPQGTKI FAKLELCNPGGSVKDRG RPSPLYFAERLTEYFGASIYLKREELNHTGAHKDNN
 GUVGHTPIVKLNRLVTEGSADVYVKGEYQNPGGSUKDRNG
 VGHTPMVRDNK SKAYGCELLAKCEYFNAGGSVKDRD S
$\qquad$ TPLQQl $\checkmark 1 /$ RPTPLYRADRLAAACGVRVYLKREDLNHTGAHKDNN RPTPLTLARRLSEKGGAIYLKREDLAHTGAHKINN EPDHVKTP RDSMALSKMAGTSVYLKMDSAQPSGSFKIRG
 LIGNTPG1KANHVTDGAGAKYAGVKVEYFNPGGSSKDRI

隹 PLYFAENDTKHAGANIFLKKRE
DLNTGAHKNN
$\qquad$

NTPLVESTTLSKHAGCRVFLKLE

GNTPLVRGAGPSEAAGAELYGKCE
 VPPTPQYAWPLLAERLGCDVWLKHENHTPAGAFKVRG F $\downarrow$

VL LETPVWRWQTGA
EQHI

 RPTPLTLCRNLKAPNKTKMYAKRE RGLIHRTPLLRSESLSRSLSGDVYLKLEALQKTGSFKDRG LIG R

## EGKV


$\downarrow$ TPLLKLUNK ${ }^{R}$
$\qquad$ PTSLYYAERL
THLHRFE SOHWGDELGKCE
DELIGNTPMVLIKSLSEATGMNIYAKDELNNPAGSAKDRV RPNPLYFAERLTAHFGGKI YFKREELNHTGAHKDNN
VGWSPLYEEPRLAEQDGGRLWVKDDGQNPTASLKDRA

UniRef90_J9SFE3 UniRef90_W8EV17
UniRef90_D0CZZ2 UniRef90 A0LLQ7 UniRef90_G8NBH3 UniRef90_A8NGQ4
UniRef90_D7CF39 UniRef90-M7EWC1 UniRef90_K8EM42 UniRef90_D0L4D0 UniRef90_L9U8A5 UniRef90 UPI00029AE3A0 UniRef90_A4G4G2 UniRef90-W7CL34 UniRef90_K9QGE7 UniRef90-I7ZD88 UniRef90_UPI0004679E82 UniRef90_G1KAY0 UniRef90-W1N8N5 UniRef90_D5EQF7 UniRef90-R1HMT6 UniRef90_E6SMS2 UniRef90_E1IAL2
UniRef90 Q8WW81 UniRef90_UPI0004089CE7 UniRef90_S7TLL3 UniRef90_E4T4V7 UniRef90_F2K3X9 UniRef90 E4U8U5 UniRef90_G4L5U7 UniRef90_D1A715 UniRef90_WPIO0035C3DC8 UniRef90_A3TLL6 UniRef90_K6DY80 UniRef90_W2T6P3 UniRef90_N4VTH0 UniRef90-D3RTM5 UniRef90_S7ZBN4 UniRef90_C0ZA89
UniRef90_A9GUB7 UniRef90_UPI00047EECB6 UniRef90_UPI0003C7F7FA UniRef90_F1KY30 UniRef90-D5D985 UniRef90_UPI000373D610 UniRef90_G9NTT3 UniRef90_F5T1A7 UniRef90_D4JWZ1 UniRef90_Q2CC71 UniRef90_UPI00047AEC74 UniRef90_R6NZD8 UniRef90_UPI0002E131D0 UniRef90_UPI0003B6C92F UniRef90-E1VK69 UniRef90_G7UUU6 UniRef90_C7QCC0 UniRef90-W8RY05 UniRef90_M5A4B5 UniRef90_R5BXLO UniRef90_UPI00036DA3D4 UniRef90_UPI000369A382 UniRef90_UPI000255A179 UniRef90_UPIO00373EC8E
UniRef90_UPIO00477F444 UniRef90- H2WBH3 UniRef90-W4EKE4 UniRef90_R9PS50 UniRef90-M0M8H4 UniRef90_R6BN65 UniRef90_M1LY65 UniRef90-K1W4Y8 UniRef90-L0MHV7 UniRef90_G4RPT1 UniRef90_UPI0004759B39 UniRef90_UPI000468DF5A UniRef90_UPI00037039EC UniRef90_UPI000475EE00
UniRef90 UPI0003727C25 UniRef90_UPI00036B7338 UniRef90_I4BQD9 UniRef90_UPI00036809BA UniRef90_Q7M958 UniRef90_E1VWK4 UniRef90_G8BUZ3 UniRef90_UPIO003C14D1B UniRef90_U2SD08 UniRef90_UPI000368E586
UniRef90-IOQY43

A Y L R|I S R S A E ER A R G|V VA A S A G N H A Q GlV A WA A S DLGTP A R A L S MI E Q A E K D P D S T I V E P T S G N T G VGGLA MVA A VK G Y K I I
 $A L S K A L T L E D P$ K GLLADVSSGNHAQGVAYAARVLGVKAL ISHQKKWKEY GDKVHFFVISS GGNAGQAAACAARRYN L RCT $V L G Q A L L A K R M G K T R V V A E T G G Q H G V A T A T A C A L F A L E C V$ $A$ A A L S S P K E K N I V T C S A G N H GL A VA EMA K T L G R S V T



 A Y N L V Q LS E $\square Q K Q Q G V I$ T F S S G N H A Q A I A LA G K L L H $\square P T$ T
 T LRAMI EDAERKP GDTVI EPTS GNTGDGG ALASADVKGYRCV A NHLLMLNEAQRQRGVI AMSAGNHAQAVAYHAARLGDQAT A Y NRMA QLSDDELSKVVTASAGNHAQGVALAAKHLGTTAT
 ALGQGLLAKRMGKRR』I AETGGQHGVATATVCALLGMECV I GHFCKRWAKQGCAHFVCSSAGNAGMAAAYAARQLGVPAT
I

GEAMLRAAERDGRGTVVER
 ADAAEKSGELKPGGVIVEPTSGNTGVGLAMVAQQRGYRAD MTMAVSKAAEHGAAAVAAASTGNTAASAAAYAARAGMKA
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AL N A V Q KL K D E N A L GVVTTHS S GNH GQGLA WAA A QA ELD CR AL R M E E A E K S GRIV PI E P T S GNTGGIGLA LVGA IKGYK T I


 M T T A I S V A V A Q G A K A V V C

 A L S MV E E A E R R G D M TVVV E A
AKAMID DAEAKGALKPIEPT GYAALSALLSEAARRGVMAYSSGNHAQGVALAARMHGAAAT
 VLL GQALLLTVVRMGGKTRVVAAETGGQQHGVVAAATAAAAABGGLEACT



 AK SMQRR GVLK A GSVI I E P T S G N T G I GLA S $\square$ A A V L G Y R M I
 CLGEALLAKYMGKTKVI AETGGQHGVALATACALVGI PCE $V L G Q A L L T R R M G K T R V I A E T G G Q H G V A S A T A A A Y F G L D C T$
 $G \cap S L L E D A E N R G V I R Q I E A T A G N T G I G L A D A A D G K N Y H V K$
 ALAMIE DAE QK P GATII EPT

 $A L A M \square Q Q A E R R G E \square A P I$ EATS GNT G $\square A L A M D A A M K G Y R L K$ A YY A MYK Y $\mathcal{A} A E G Y$ K R F I T A S A G N H A Q GV A Y A A Q L H GVEAT
 A L G Q V L L A R R M G K Q R II IA E T G G M H G V A TA TVVA A R F G LDD C V $T \vee V G Q i \quad L \quad L A A K H M G K T N N I A A E$


 ALGMIN A GKIT P ETIVI E P T S G N TGGIGLASVCAAK GIK LI
 CMGQIL LAAKRMGRTRIIAET


## UniRef90_J9SFE3 UniRef90_W8EV17 UniRef90-D0CZZ2 UniRef90-G8NBH3 UniRef90_A8NGQ4 UniRef90_D7CF39 UniRef90 M7EWC1 UniRef90 K8EM42 UniRef90_D0L4D0 UniRef90_L9U8A5 UniRef90 UPI00029AE3A0 UniRef90_A4G4G2

 UniRef90 W7CL34 UniRef90-I7ZD88 UniRef90_G1KAY0 UniRef90_W1N8N5 UniRef90_D5EQF7 UniRef90_R1HMT6 UniRef90-E6SMS2 UniRef90 E1IAL2 UniRef90_Q8WW81 UniRef90_UPI0004089CE7 UniRef90_S7TLL3 UniRef90 E4T4V7 UniRef90_F2K3X9 UniRef90_C4FDW0 UniRef90_E4U8U5 UniRef90_G4L5U7 UniRef90-D1A715 UniRef90_UPIO0035C3DC8 UniRef90_A3TLL6 UniRef90-K6DY80 UniRef90 W2T6P3 UniRef90_N4VTH0 UniRef90-D3RTM5 UniRef90_S7ZBN4 UniRef90-C0ZA89
UniRef90-A9GUB7 UniRef90_UPI00047EECB6 UniRef90_UPI0003C7F7FA UniRef90_F1KY30 UniRef90_D5D985 UniRef90_W8HI42 UniRef90-UPI000373D610 UniRef90_G9NTT3 UniRef90_F5T1A7 UniRef90_D4JWZ1 UniRef90_Q2CC71 UniRef90_UPI00047AEC74 UniRef90_R6NZD8 UniRef90-UPI0002E131D0 UniRef90_UPI0003B6C92F UniRef90_E1VK69 UniRef90_G7UUU6 UniRef90_C7QCC0 UniRef90-W8RY05 UniRef90_R5BXL0 UniRef90_UPI00036DA3D4 UniRef90_UPIO00369A382 UniRef90-UPIO00255A179 UniRef90_UPIO00373EC8E UniRef90_UPI000477F444 UniRef90_H2WBH3 UniRef90 W4EKE4 UniRef90_R9PS50 UniRef90-MOM8H4 UniRef90_R6BN65 UniRef90_M1LY65 UniRef90-K1W4Y8 UniRef90_Q1GS18 UniRef90_LOMHV7 UniRef90_G4RPT1 UniRef90_UPIO004759B39 UniRef90_UPI000468DF5A UniRef90_UPI00037039EC UniRef90_UPIO00475EE00 UniRef90-UPI0003727C25 UniRef90_UPI00036B7338 UniRef90_-I4BQD9 UniRef90_UPIO0036809BA UniRef90_Q7M958 UniRef90-E1VWK4 UniRef90-G8BUZ3 UniRef90_UPIO003C14D1B UniRef90_U2SD08 UniRef90-UPIO00368E586
UniRef90_I0QY43

V Y M P T
100
110
120
VYMPTGAALDK $\square$ AATKAYGAEVVLAGSTVDEALVEARRH LVMPESMSIERRRLMAAYGANLELTPREKGMKGAIEKAHQ
 I VMPEDAS PLLKKAAARA YGAEVVDQGVTVANREADARALLQ
 $V Y M G E D D T E R Q V A R M R D L G G E V V V S K T G S R T D K D A D N E A F$ F V V P E K F S LDE K QV L MQ A L G A T L V H T P T E A G DT DIE K A R E L A $A V M T A S T S P A K T A L D E R E G G H C H F V Q R P G E V Y A E A D R D A D$




 IVMPRHTPNLKVRNTRALGADVVLVGEGVDDAGAHARQLA I FMP L A T P R M K QVAVK R H G G D SVVEIV LVGD TY DA A S A A A C
 $V Y M G V D D M A R Q R P N V F R M G S R T L K D A D N E A M R D W V T N P E S$


 FVVQDKVSESKRAVLRAYGAPTNVEPDDPRSYYRVSDRLA $V \vee L P A G Y V A G K V A Q S L V H G A R \| V Q V S G N F D D A L R L V R E L T$
 L TMP M TMS V ERRRNIL KA Y GAE IVLTE GA K GMK IA KA E E LA
 I F MG E E D $\square \mathrm{K}$ R Q A L $N$ V V R M T S G SA T L K D A V N E A L R Y WV A N V



 ITMPNNATE ERGK ILLKAYGAEVHLTSSSEHGMRGAI E EA YR $V L V P H G R \square A A G K M A Q A V M H G A D I D Q V R G N F D D C L D L S R G$ IVMPEKMSKEKESTMRMLGAD IVRTPTMADHDNTAFRLHK $L T M P E T M S D E R R N L L R A Y G A E L V L T P G P E G M K G A V N K A T E$ AVVDNHAAAEKLRSMRAMGTND HFVTEDTSAREDDAEAMA

 LTMPETMSVERRNLLKA YGAEVVLTDGAKGMKGAIAAKAEQQ I LMPS DAP QLLKLDNTRALGAEVVTYDRASEDRDALGAALDA
 $V$ Y M GEED T QR QVVPVVRTGTRTLVDAMNEAMRDWVANVETT


 $V V V P E$ GNS LEEKNATMRACGAEVI E Y GRDFDTAR QRAGE LAA
 LTMPETMSQERDNDLKAYGAEIVLTDGKKGMQVDKAEELA AVMPATTSAAKIAMDEREGGTCHLVTDPVTDYQESAR LAD $L V M P A G A S P A R V A A C R E W G A Q V L L L P D V H A A F A H A B Q Q L$ I HMGQVD DEKEHPNVVKMK LGCKLVPVTFEEYLKDPKNF
 $\begin{array}{ll}I \\ V & V \\ V & P \\ T\end{array}$ FVVPEKFS QEKQTLMKALGAE I I NTPTAFGMHDKKVNELL VYMGADDCERQKPNVFRMKLMGAEVIPVHSGSSTLDKDACN


 L L MPENMSMERQAAMRAYGAELILVSREQGMEGARDEALE $V V M P S$ GTPWLLKVKKTMDYGAKVILWWG ES YYEAEAKAMA $L V 1 P D K M S V E K I N H L K A M G V E I I V E K G H P E Y Y Q D Y A Q R \square A E$ I YMGSTDDHRQQPNVQRMKDAMNEALDRWVTNDVDTF Y I I $L T M P E S M S M E R R K L L K G F G A E V V L T P A D K G M K G A D D K A H V$ $V$ Y M G E K D DIE R QV Q R M K M L G A E VVRR A T S G S K T DLK DAT N E A I
 AVMPASTTSTTK IVLI R S QGGGRCHFVVTAAAGMVYAEAAQRAAE
 AVVVP K T T S I E E K I E L L I E F Y A G R C H L V V D A A G QV D E A A R A L A A




UniRef90_J9SFE3 UniRef90_W8EV17
UniRef90_D0CZZ2 UniRef90-A0LLQ7 UniRef90_G8NBH3 UniRef90_A8NGQ4
UniRef90-D7CF39 UniRef90 ${ }^{-}$M7EWC 1 UniRef90-K8EM42 UniRef90-D0L4D0 UniRef90-L9U8A5 UniRef90-UPI00029AE3A0 UniRef90-A4G4G2 UniRef90-W7CL34 UniRef90-K9QGE7 UniRef90-17ZD88 UniRef90_UPIO004679E82 UniRef90-G1KAY0 UniRef90-W1N8N5 UniRef90-D5EQF7 UniRef90-R1HMT6 UniRef90-E6SMS2 UniRef90-E1IAL2
UniRef90-Q8WW81 UniRef90_UPI0004089CE7 UniRef90-S7TLL3 UniRef90-E4T4V7 UniRef90-F2K3X9 UniRef90-C4FDW0 UniRef90-E4U8U5 UniRef90-G4L5U7 UniRef90-D1A715 UniRef90-W0FQ96 UniRef90-UPIO0035C3DC8 UniRef90-A3TLL6 UniRef90-K6DY80 UniRef90-W2T6P3 UniRef90-N4VTH0 UniRef90-D3RTM5 UniRef90-S7ZBN4 UniRef90_C0ZA89
UniRef90_A9GUB7 UniRef90-UPI00047EECB6 UniRef90-UPI0003C7F7FA UniRef90-F1KY30 UniRef90-D5D985 UniRef90_UPI000373D610 UniRef90-G9NTT3 UniRef90-F5T1A7 UniRef90-D4JWZ1 UniRef90-Q2CC71 UniRef90_UPI00047AEC74 UniRef90-R6NZD8 UniRef90_UPIO002E131D0 UniRef90_UPIO003B6C92F UniRef90-E1VK69 UniRef90_G7UUU6 UniRef90-C7QCC0 UniRef90-W8RY05 UniRef90-M5A4B5 UniRef90-R5BXLO UniRef90_UPI00036DA3D4 UniRef90_UPI000369A382 UniRef90_UPI000255A179 UniRef90_UPI000373EC8E UniRef90_UPIO00477F444 UniRef90-H2WBH3 UniRef90-W4EKE4 UniRef90-R9PS50 UniRef90_M0M8H4 UniRef90-R6BN65 UniRef90-M1LY65 UniRef90_K1W4Y8 UniRef90-Q1GS18 UniRef90-LOMHV7 UniRef90-G4RPT1 UniRef90_UPIO004759B39 UniRef90_UPI000468DF5A UniRef90_UPI00037039EC UniRef90_UPI000475EE00 UniRef90_UPIO003727C25 UniRef90_14BQD9 UniRef90_UPI00036809BA UniRef90-Q7M958 UniRef90-E1VWK4 UniRef90-G8BUZ3 UniRef90_UPI0003C14D1B UniRef90_U2SD08 UniRef90_UPIO00368E586
l UniRef90_I0QY43

A
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H $\square$

 | 1 | $L$ | $E$ | $Q$ | $P$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $A$ | $D$ | $V$ | $P$ |
| 1 | $A$ | $E$ | $Q$ | $A$ | $A$ | D


 AER ENTPYAYMPDQFANPANPEGQRLTGAEELWKDTGGRVDIL ASDPNAVVVQAYNDPILWEGHASMVKEMKEQLPRKPDAIF
 QTDPNSFVPMQFENPNNPLTYYETGPELLQDHPEPFTSFV ERGGHFIDQFTMDWRGNNNIAESIFAQMADEEHPDPTWIV SKQDGWYMPQQFKNPANPADHFKTTGPELNDTEGKVDFFV
FYIIGGVAGPHPYPMVRDFSSIUNECLTQMPEMPDYVI AATDGYFMPQQFSNPSNPAIIHEATTGPEDQEVGQLDYLLV REDPGSFYVNQFANPANPAHETTTGPEDWEQMQQRLDAVV QARHGLTHIKPYDEPQVIAGQGTTGDEDAEQAAQEQADVL SEHGMVFVHPYDDPYVMAGQGTMALEVELEDAPQLDVLVV
 YYLLGSALGPHPYPTMVRDFQSVIGHEAREQMLNQPDVIV KNNPGWVYIPPFDDPLIWEGHASVVKELKETLWEKPGAVA
VDTHYUIGSVVGPHPYPDMVARFQAIIUEEMRWETPDYVV TAELGAFMPMQFANPANPEVHRRTTAEE WRDTDGKVDFF
 STIPGAFKPNQYDNPNGPLSHYHTTPEDWEATDHKVTHFV
 DDTHYCIGSVMGPHPFPMMVRDFHRNQVLELTGRDPDAVA ELDGHYMDQFTFDWRGNNNVAESDFRQMANEPFPVPDHIV $R D W V T N V D N T H Y L I G T V T G P H P F P E M Q V L E D T G R L P D A V V$
$D D T H Y L L G S V M G P H P F P V M V D F Q S V I G K E T K E Q F P D A V V$ DDTHYLLGSVMGPHPFPVMVRDFQSVIGKETKEQFPDAVV
FREDTCNRLAKELGYCTIEPFDNQDVICGQGTLGAEEIIEQ $K E D P N A H L D Q Y N L D N P L A H E Y G T A E E I W T Q T N G K I S A V V$
$R D W V T N D D D T Y Y I G T V A G P H P Y P M M Q M L E R T G R L P D A L V$
 LQKEIPRSFIPQQFENQANPDIHRATTAKEGFAQMNGRLD





## j

 HYMIGTVAGPHPFPAMVRSFQRVMSDEAREQDQQKPDAVC
ETEGAWANQADNTANRRAHIDETAPEDWAQMDGRVDGFI RDWVTNVDTTFYDIGTVAGPHPYPRQQCLEQDGHLPDALV RDWAGPHPFPAMVRDFARVIGVEARRQTLELTGALPDAVA EANGWHFVPS LLHPDLIRGVATYALELLEAVSD LLRRVY A A HG L E AVVP P F H R D D L V L GV A T Y A R E L F D AVV G D P I D T I EEIPDSFDPGQFENPANARAHVETTGPEIWEDTQGNVDFF AAQEGRTVVHPFDGPGIAQGTGTVGLELMRQVAGLEAVVV GTAAGPHPFPSLVRDLTRGIGDEARAQCLEQYGVLPHA| A
 EALLR D WA A S Y H P F P T I V R E F Q K M I G Q Q I L E T E G R L P D A V I



 ETPHAFF INQFNNSANPAAHERTTAPEI WEQTDHQLDALV GTVAGPHPYP QLVRDFQSVIGKEVRTGQLEKEGRLPDSLV

 AEDPSAFGPSQFDNPANPQAHRETTAEEIWTALDGDVDYL

 ES G GYY LDQFTY D WR GNNN



## UniRef90 J9SFE3

 UniRef90-W8EV17 UniRef90-DOCZZ2UniRef90 AOLLO UniRef90-G8NBH3 UniRef90-A8NGQ4 UniRet90-D7CF39 UniRef90-M7EWC1 UniRef90-K8EM42 UniRef90-DOL4DO

UniRef90 L9U8A5 UniRef90-UPIO0029AE3AO UniRef90-A4G4G2 UniRef90-W7CL34 UniRet90-K9QGE7 UniRef90-17ZD88 UniRef90-UPIo004679E82 UniRef90-G1KAYO UniRef90-W1N8N5 UniRef90-D5EQF7 UniRef90-R1HMT6 UniRef90-E6SMS2 | UniRef90- E1IAL2 |
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| UniRef90 O8WW |
| 1 | UniRef90-UPIOO04089CE7 UniRef90-S7TLL3 UniRef90-E4T4V7 UniRef90-F2K3X9 UniRef90 E4U8U5 UniRef90-G4L5U7 UniRef90-D1A715 UniRef90-W0FQ96 UniRef90-UP100035C3DC8 UniRef90-A3TLL6 UniRef90-K6DY80 UniRef90-W2T6P3 UniRef90-N4VTHO UniRef90-D3RTM5 UniRef90_S7ZBN4 UniRef90-COZA89

UniRef90-A9GUB7 UniRef90-UPI00047EECB6 UniRef90-UPI0003C7F7FA UniRef90-F1KY30 UniRef90-D5D985 UniRef90-UPI000373D610 UniRef90-G9NTT3 UniRef90-F5T1A7 UniRef90-D4JWZ1 UniRef90-Q2CC71 UniRef90-UPIO0047AEC74 UniRef90-R6NZD8 UniRef90_UPIO002E131D0 UniRef90-UPIO003B6C92F UniRef90-E1VK69 UniRef90-G7UUU6 UniRef90-C7QCCO UniRef90-W8RYO5 UniRet90-M5A4B5 UniRef90-R5BXLO UniRef90-UPIO0036DA3D4 UniRef90-UPIOOO369A382 UniRef90_UPIOOO255A179 UniRef90-UP1000373EC8E UniRef90_UPIo00477F444 UniRef90-H2WBH3 UniRef90 W4EKE4 UniRef90-R9PS50 UniRef90-MOM8H4 UniRef90-R6BN65 UniRef90-M1LY65 UniRef90-K1W4Y8 UniRef90-LOMHV7 UniRef90-G4RPT1 UniRef90-UPIO004759B39 UniRef90_UPI000468DF5A UniRef90_UPI00037039EC UniRef90-UPIO00475EE00 UniRef90-UPIIOOO3727C25 UniRef90-UPIO0036B7338 UniRef90-14BQD9 UniRef90_UPIo0036809BA UniRef90-Q7M958 UniRet90_E1VWK4 UniRef90-G8BUZ3 UniRef90-UP10003C14D1B UniRef90_U2SD08 UniRef9OOUPIOOO368E586
UniRefo-

TGVGGGGHLTGVAEVLKPKFPAMKV RPAEPEGFDDVTRSAL VAGVGTGGTDTGVAEADKGKKRSFKAVAVEPTASPVLSGG VPVGGGGLAAGVATAVKALAPTTLVLGVEPEGADDARRSL CSVGGGGLLGGVLVGCKEVGWEDVPIVALETNGCDCFYHS SVG GGGLAAGDAMAFSERTGCKTDGVEALNSAPMRDA AGAGSGGTFAGTARYLKEQQPTDRTC
VGAGTGGTSATLGRYLR YRRHPTWLCVVDPENSVFDPA AGVGTGGTDTGVSRYLKNEKKLPDKSIAVEPSASPVLSGG ACLGGGSNAMGIFYPYDEHKNHSASLMAGSPGVLHGNRTY ADFGETGLDAFI AGV GTGGTVTGVGHVLKQANPNDRDYA CCGGGGLI SGCAIIAT KALLPTCQVIGVEPELDADATRS VGVGSGGTLTGGSRYFAR A VAPELQMVLADPKGSILAD AGAGTGGTITGARKLKEKCPECKVVGVDPDGSDVALPS LQVGGGGMAAATATWAKLLHYPNIYIVGVEGTEQASMAAA AV GGGAMLAGDATVLKSRNPHIRIWGVETEGANSMYQA ACVGGGSNAMEAAGEGLETGRHAASLTAGRPGILHGALSY ACVGGGSNADGTFHPFATLGDHAARFFAASPGVLQGTYSY LLSVGGGGLLCGVVQGLQEVGWGDVPVIAMETFGAHSFHAA ACVGGGSNAAGAFYHFLDDEHSAATTALGKPGVLHGSRTII VAGVGTGGTVSGIGEVLKKYNPNDQIVAVEPAESPLLSGG ACVGGGSNAIGMFHPFINDTEVRMYGVEPGGYVLHGNRTY LIPVGNAGNITAHWMGYSELYEDGTLETRPRMLGFQAAGAA ACVGGGSNAIGIFHAFIPDAQVRLYGFEAGGDVIDGMRTF $\square A G V G T G G T V T G T G E Y L K E Q N P D I K V$ MSAGTGGTSATIGRWLR LQGHDTQLTVVDPENSVFMDY ACVGGGSNAMGLFHRFDEDERHAARFATAVPGVLHGAMSY ACIGGGSNAMGMFYPFIEDDFHAASDTKGRPGVLHGADMY VPEADADFVA GGGGGLASGVAAYVSEVRPDDKVFLVEPEG AGAGTGGTITGLARGLKKHNKEIKVVAADPHGSILALPEA ACVGGGSNALGLFHPFIETGRHAAPLCAGRPGVLHGNRTY AFVATAGTGGTVTGTGEADREKLPELVMVVEPKGSPVLS AGMGTGGTVSGLGKFLKERKPELKMVGVDPVGSLYYDY CTAGTGGTVTGTGEVLKEKDPNLK IGAGTGGTVTGAGRRVKEECPNAKVIAVDPVGSVLADPNS
 GAVGTAGMFTGVASALREGGTLTGAGE! IK SKYPSAKTVV AGVGTGGTVSGVGKYLK
 VCCGGGGLTSGVALALEAEAPGLRVRPVEPEGFDDVTRSL VPVGGAGCMAGUVTYLREAGPDVAVIGVEPDGAVSLSAA VAGVGTGGTDTGVGKYLKKQKKSVHVVAVEPATSPVLSQG ACVGGGSNAMGITAAFIGDENVRLYGFEAGGHGVDTGRHY CAAGTGGTAAGTGMGLKAFDEKIMTVGLADPHGAALYNY CSPGTGGTAATLGRYVRYRRHRTRYLCADPEGSVFFHYYC ACVGGGSNADGVFHAFVPDASVKLYGFEAGGSGVHGTRTF VPIGLGSGLCGMIRT RDLLGLDTELGGVSSAADAYAQS YVPGMGSGINAITEVRDLLGLDTAVVGVVSENAPASKLS VAGVGTGGTLTGTGEFLKSRNSKDRVIAVEPADSPLLSEG TGAGTGGTSATDGRFLRKYHRRTRLCVVDPENSAFFPG PVGGGGDCAGDAAAVKQDNPACKVYGAEPAGADAMTRS ACVGGGSNA GMFTAFLDTDKHSATMTLGKPGEAHGMKCY ACVGGGSNALGLFTAFLEDPSVRIYGFEAGGDGVDTGRHA
 AGAGSGGTFMGTARYLKSQKATLKTVIVEPVGSILNGGKA ACVGGGSNADGMFADFIKTDQHGAPLKHGRKGMFFGMHSL LINPVGGGSSAAAYALTGKLLSADVDGVQASGADAVYRA AGVGTGGTTSGDAKYLKEQNPNVKV FVGLGGGGLLAGSSLSKRALAKNCKUYGVEPULANDGQQS SSQATGEDVHGPDSRLHRHNVDSKPRGFFADQFENESNFQ P DGGGGLLAGMGTA ARGDKNDMRLVGVQAELYPSMYAE SSMGTTGTITGVGEYDKQQNAAVQ\|IGLQ PTGGGGLISGIAYADKRARPRARIYGVQAKGAPSVYDS VGVGSAGTLKGLTNYFKRVKPD ACIGGGSNAMGLFHPFLDDPRHAASLKGGKPGVLHGNRTF VAGVGTGGTDTGVGEVLKQRKPDVKIVAVEPAASAVLSGG ACVGGGSNAAGAFYQFYDNPKVELVAVEAAGLGDDSGKSA VAGGGGGLLSGTFLTTRAMLPDAQVIGAEPANANDAAMSL VGAGTGGTSATIGRYUR YRRHATRLCVVDPENSAFYPS AAVGGGSNATGMFYPFLDTKEHAATMTKGSHGVFQGSMSY VAGVGTGGTITGVGEVLKAKNPNLKDYAVEPIDSPVLSGG IGAGTGGTSATFGRYAR YKRHETKICVGDPEGSSFYEG AGCGTGGTISGVSKYLKEKDGLINLHVVLADPQGSGFYNA ACVGGGSNAIGMFHPFLADEGVRLYGVEAAGHVLHGNKTY
$\| S V G D G C T I A G L W K G L K D L Y A U G F I D R L P Q A E G C C P I N R A$ IPVGGGGGIAGNAVAAKA IN PDVEVVGVQTERFPAVRQA
ASVGGTLSGAGKYLRQLKPDVKIVAVEPGVHSDPDRDN


UniRef90-JSSFE3 UniRef90_D0CZZ2 UniRef90-A0LLQ7 UniRef90_G8NBH3 UniRef90_A8NGQ4
UniRef90_D7CF39 UniRef90-M7EWC1 UniRef90-K8EM42 UniRef90-D0L4D0 UniRef90-L9U8A5 UniRef90_UPI00029AE3A0 UniRef90-A4G4G2 UniRef90-W7CL34 UniRef90-K9QGE7 UniRef90-17ZD88 UniRef90_UPIO004679E82 UniRef90-G1KAY0 UniRef90-W1N8N5 UniRef90-D5EQF7 UniRef9O-R1HMT6 UniRef90-E6SMS2 UniRef90-E1IAL2
UniRef90 Q8WW81 UniRef90_UPIO004089CE7 UniRef90_S7TLL3 UniRef90-E4T4V7 UniRef90-F2K3X9 UniRef90-C4FDW0 UniRef90-E4U8U5 UniRef90-G4L5U7 UniRef90-D1A715 UniRef90-W0FQ96 UniRef90-UPIO0035C3DC8 UniRef90-A3TLL6 UniRef90_K6DY80 UniRef90-W2T6P3 UniRef90-N4VTH0 UniRef90-D3RTM5 UniRef90-S7ZBN4 UniRef90_C0ZA89
UniRef90_A9GUB7 UniRef90-UPI00047EECB6 UniRef90 UPI0003C7F7FA UniRef90-F1KY30
UniRef90-D5D985 UniRef90_UPIO00373D610 UniRef90-G9NTT3 UniRef90-F5T1A7 UniRef90-D4JWZ1 UniRef90-Q2CC71 UniRef90_UPI00047AEC74 UniRef90-R6NZD8 UniRef90_UPI0002E131D0 UniRef90-UPIO003B6C92F UniRef90-E1VK69 UniRef90_G7UUU6 UniRef90-C7QCC0 UniRef90-W8RY05 UniRef90-M5A4B5 UniRef90-R5BXLO UniRef90_UPI00036DA3D4 UniRef90_UPIO00369A382 UniRef90_UPI000255A179 UniRef90_UPI000373EC8E UniRef90_UPI000477F444 UniRef90-H2WBH3 UniRef90- W4EKE4 UniRef90-R9PS50 UniRef90-MOM8H4 UniRef90-R6BN65 UniRef90_M1LY65 UniRef90-K1W4Y8 UniRef90 LOMHV7 UniRef90-G4RPT1 UniRef90_UPI0004759B39 UniRef90_UPI000468DF5A UniRef90_UPI00037039EC UniRef90-UPIO00475EE00 UniRef90_UPI0003727C25 UniRef90-UPI00036B7338 UniRef90-I4BQD9 UniRef90_UPIO0036809BA UniRef90-Q7M958 UniRef90-E1VWK4 UniRef90-G8BUZ3 UniRef90_UPI0003C14D1B UniRef90_U2SD08 UniRef90-UPIO00368E586
 $V E P E L S P V I S G G A P G P H P I Q G D G A G F I P A N L H Q D V L D G T$
 KPGPHK 1 Q
EAGR\LRLAEAPRTRADGVRTLSLGAYTFPILKAKVDGIL MSMNNGRFNSERKELPKGIDKVYDPVHNVHMAWKGGVKSI VLQDEDGQULEPYS SAGLDYPGVGPEHSYLKDTGRAEYR

 LPGKHKDQGIGA

 $I V Q T G A P R K E A G S W L V E G I G E D F V P P \quad N C D L A R V K H A Y$
 GETVHC GHASTAEGDAVKQPGELTRRLVAEHVNE IL ID A GHPVALDKVD IDCDGTAVRKVGELTHPVCAEMVDEWM
 VLQD DNGQUASTHSISAGLDYASVGPEHAWLHDTGRATYT TTA
$\square M Q T E D G Q V V E P F S \square S A G \square D Y P G \square G P Q H A Y \square Y D S G R G \square F M$

DVHQYKIE GVGEDFYPKAFD
VRGEPVAEPKTVATADR DGRPASWE LEA A EAALIKEGUKGKHKIGQGDSAGEGATRTLRDESGGAI E L LQ DE EGQTLETHSVSAGLDYPGVGPEHAWLHDTGRAVYQ


 LNSDHENEP
LMEDDNGQIDETH


GGKPGPHKLVG
 KVLGRVVPDPDTVATADRПGNPGPGFDPK LINQSIYDKIL K EVQPAEPDHGDEGLKRMDEADRPS YYAEDFADERI

## पE

VEPAASMLAGNAWAPHKI QGWT

LVVGEPHTLPTVDSFVDGAAVKR $\square G V V D H P A L H G L V D Q P R$ KVGPHKDQGIGA

GFI P D T L D T S S VVY ILQDEDGQTLPSHSVSAGLDYPSVG YAHGEDKAEGSSVAEGDGQ GREH LMQDADGQUPTHSVSAGLDYPGVGRITANLEGAPDDTQF LALA FEQGRIVCTETADTFADGMACRMPSPDALEIVREGAARIV FEAGEVRTTETAATFVDGVATRSPDADSIAGVVGAARVI RAGSHGIQ
 FEAGRPQVLERVDTVADSLGAPYAMDYSFGVCSRFVDDMV

 LMQDQNGQDEESYS $\square$ S A GLD F P S VGPQHAYLNS $\square$ GRAD YE


 DEGPAEGSNDPGI RRWSPAYDPGDFRPELVDRVL

 DPGPHP $\square Q G 1$ GA
 QS GVIESLPGPAQTLADGAATPSVG SPGPHK I QGIGA YVNGDPDVVTGLSSRDEGDGRPRVEPSFLPGV GVVDRMV $L L Q D E Y G Q V Q E A H S \square S A G L D Y P G V G P E H A Y G K D T G R A E Y V$
$K P G P H K I Q G I G A$
WRTGNMGYATGKGSRDEGDGRPSVEPSFVPGV
GGKGRIEGDGRPSVEPSFVPGVIIDHMV TNYGVMYDTVEKEGTRRRHQVDTIVENNFSKGEHLIDDESI $L L Q D D D G Q D Q E A H S D S A G L D Y P G I G P E H A W L H D D G R A S Y L$



UniRef90 J9SFE3 UniRef90-W8EV17 UniRef90-DOCZZ22 UniRef90 G8NBH3 UniRef90-A8NGQ4 UniRef90-D7CF39 UniRef90 M7EWC1 UniRef90-K8EM42 UniRef90-DOL4DO UniRef90-L9U8A5 UniRet90 UPI00029AE3AO UniRet90-A4G4G2
UniRef90-W7CL34
UniRef90-17ZD88 UniRef90-UPIO004679E82 UniRef90 G1KAYO
UniRet90 W1N8N5 UniRef90-D5EQF7 UniRef90-R1HMT6 UniRef90-E6SMS2 UniRef90 E11AL2 UniRef90-Q8WW8 UniRef90-UPIO004089CE7 UniRef90_S7TLL3 UniRef90 E4T4V7 UniRef90-F2K3X9 UniRef90_C4FDW0 UniRef90-E4U8U5 UniRef90-G4L5U7
UniRefofo-D1A715
UniRef90-UP100035C3DC8 UniRef90-A3TLL6 UniRet90_K6DY80 UniRet90_W2T6P3 UniRef90-N4VTHO UniRef90-D3RTM5 UniRef90-S7ZBN4 UniRef90_COZAB9
UniRef90_A9GUB7 UniRef90-UPI00047EECB6 UniRef90-UPI0003C7F7FA UniRef90-F1KY30 UniRef90-D5D985 UniRef90- UPIOOO373D610 UniRef90-G9NTT3 UniRef90-G5T1A7
UniRef90 D4JWZ
UniRef90- Q2CC71
UniRef90_UPIO0047AEC74 UniRet90_R6NZD8 UniRef90 UPI0002E131D0 UniRef90_UPIooo3B6C92F UniRef90-E1VK69 UniRef90 G7UUU6 UniRef90-C7QCC0 UniRef90 W8RYO5 UniRet90_M5A4B5 UniRe990-R5BXLO
UniRei90 UPIO0036DA3D4 UniRef90-UPIO00369A382 UniRef90 UPIO00255A179 UniRef90 UPI000373EC8E UniRef90-UPIO00477F444 UniRef90_H2WBH3 UniRef90 W4EKE4 UniRef90-R9PS50 UniRef90-MOM8H4 UniRef90-R6BN65 UniRef90_M1LY65 UniRef90-K1W4Y8 UniRet90_Q1GS18 UniRef90 LOMHV7 UniRef90-G4RPT1 UniRef90-UPIO004759B39 UniRef90-UPI000468DF5A UniRef90 UPIO0037039EC UniRef90_UPIO00475EE00 UniRef90-UPIOOO3727C25 UniRef90_UPIO0036B7338 UniRef90-14BQD9 UniRef90-UPIO0036809BA UniRet90_Q7M958 UniRef90-E1VWK4 UniRef90-G8BUZ3 UniRef90-UPI0003C14D1B UniRef90 U2SD08 UniRef90-UPIO00368E586

A AVS GRLALS ${ }^{290}$
G T 300 TVICVVDSGGNTDPLLLRHV
PQ
AAADYHGSEDEGDAVICTVSGGNVDPDVFRR

KLVPPQASGEDRVVAFIVCGGFKDSVDEVAEY GRELGGDGLVLINLSGRGDKDMDTAARY GK SLTNENPVVVVSGRNDQMEKWHR\|I
VRDR RAGSVVTLLCDPGDRYGTTY
■KDAARPGPREGKMVVNLSGRGDKDMMSVAHDGEKFGV
TLPKEQVVLVNLSGRGDKDMHT VAQRMGL
 REQTTPKRVVTFVCDSGNKYLTKM DEGEAVIVAVATGGNVDAAMFSRAMSQA KELKEGQRCVVLLPDSVRNYMSKY
A A VLS EPERFRGRNVGLVLSGGNDDMQALSSVIQR RKDEDKGKRILSVLCGANMDFEQLATWAK PGMPDNAVVGLILCGGNDTQREMNEWAK TMRPDQIILVNLSGRGDKD

SENENVILNLSGRGDKDMATYMKY $\square \mathrm{D}$
RPENEGKLVVFVVCDTGERY LST
TVLARRPENKGKRIVTVLPDTGERYLSTV
KTMSKDQFIVVNI SGRGDKDIHTVASL
ELGADQTVIVLLPDSGRSYMEKI
$R \square E D G A$
KK LGKGKTVVTVVPDNGERY乌ST
AA ELDEEPVIVVCLSGRGDKDMHTAARW
KRPENKSKVIVALLPDSGDRYYST
MREEGRTGAVTLLCDSGERYLESYQWVASNVG
VLGRELGPEGTILVNLSGRGDKDMHTAAEW VI CLSGRGDKDVDTVKSRLE
पG LK K VVLI LCGGNVDI
KDLGGGKDTVVVVLPDSDRSYLSKA
TLRPDQSILVNLSGRGDKDMHTVAR
$\square K E A \square P D L K P E T R V V V T V C G G S N V T P E M L A D Y R A K \square$ KRLGVGKRVVCI APDTGERYLSM KKSGKKENVLVLLPDGASKYUS
AAAEAGQVEPGLTITITVTGHGLKDIDT KELKKGQNCVVIPDGDRNYMSKFAWMVER
A DRAAKQLGKGKKVLA PSNGERYLST LPANSTVVTII CDGGEKYLDTVDDWMMRHGL KELGPGKKVVTVAVDTGLKYLS
TQLAKRPENKGKNIVVLLPDTGDRYLST
AAALFRPEAVQGDAVIVVCTGGNVDAALFARALETL E पS LPAGANVVALDSGGNNDVSRYGE\|VER
E $\square A K R K E N K G K N T V V \frac{L L D D S G D R Y L S T}{L}$
GRELGEDAVILVSLSGRGDKDMTTAARW KQLGPGARVATILCDTGFRYLSSLPEWDRAKGL KTLGKGKDIIVNLSGRGDKDIHTIARD
MQAAGR
SGS VSILCDSGERYAHSYA
AAELLGREPV
AAMQERDSNRGERUAVVLSGGNDDRQLLAHMAEQA RGNHSAFVLCGGNVDTDQFAEVL EDAKKPENEGKTIVALLPDSGDRYYST
LICEMRAENTRGSIVALLCDPGDRYTDTY
LE
GRKVALVLCGANDDAARFAELL
REEYGTLTPDQSILVNLSGRGDKDAD YYAEKLGL
REEYGKTHDATLLNLSGRGDKDMGTAMEW
ALLQGKTHDRAEKTVALVCGGNDDVTVLSRUVER
पEAQVAKPRSNIVTIFADSSERYLSQ
KDKEQTL AAAFQLRDKLAGKTVVLPISGSNLSMSKLRTI TEDAKRPENKGKKIVAL LPDTGERYLSTV NNKN

AAMLAKPDEKAGRKVGLVLTGGNDDTRLLANVLLR PGSVVVAII
ALLAGR】EERGGRGVAVV SGGNDDATVLVRVLNK TTPKNIVTFVCDSGNKYLSKM
LPKDHLMVVNLSGRGDKDMATVHHLDDELGL
$\square E \square A A R E E N R G K L V V F V C D T G E R Y L S T$
NETPKTALVMLSGGNDSASSMQKDWQQ
RPEAKGKKIVTIGCSSTERYLST
AA QGRSGSVVTLLADGGDRYAETYEEWLTSHGL
T LNKDQDVVVSLSGRGDKDVEADMKYLGGAG SKEDGKKYPGKTVVTILCDTGERYLS
LE ILSKNMKPNSNIVIIACDSGSRHLSKF LGEVAKDVGKDGVVVLCLSGRGDKDIFTVADADGR VI GKDDTVVSVVTGNGLKDVA

UniRef90_UPIO002F67211 UniRef90_A71331 UniRef90-W6RUE3 UniRef90-S0L7Y5 UniRef90_UPIO0046A76A5 UniRef90-B2URP0
UniRef90-V9AYG1 UniRef90-B9MKC7 UniRef90-B7KXY4 UniRef90-R6NR38 UniRef90-E6PW93 UniRef90-E3HDJ0 UniRef90-C1D701 UniRef90-F2CS76 UniRef90_G9XVF1
UniRef90_E4WI18 UniRef90_D1YYW5 UniRef90-C0XS30 UniRef90_UPIO00381B55B UniRef90-D4IQQ2 UniRef90_V3TZB3 UniRef90_AOLD59 UniRef90-B9QUS2 UniRef90_A712T4 UniRef90_U5KL50 UniRef90_UPI000478CA2C UniRef90-UPI0003B593F7 UniRef90-L7LDW4 UniRef90-Q5FRN4 UniRef90-D3S073 UniRef90_UPI0003B40009 UniRef90-B2TQP7 UniRef90_UPIO00472F042 UniRef90_UPIO0044179DC UniRef90-TOK243 UniRef90-A7MFJ3
UniRef90-R4T755 UniRef90-R4T755
UniRef90 A7H067 UniRef90-DOLXL6
UniRef90-14F2M3
UniRef90-E9E5C7
UniRef90-R5DEW5 UniRef90-G2MNF7 UniRef90-N6YLZ6 UniRef90-G5HSQ6 UniRef90-G7V770
UniRef90-Q8RE94 UniRef90-K9RL76 UniRef90-D6TZU2 UniRef90-A9V2F2
UniRef90 Q2G8S7 UniRef90_UPI000050F741 UniRef90-J1GZ14 UniRef90_UPIOOO4654503 UniRef90-D0ZE08 UniRef90_UPI0003787AB4 UniRef90-X6GJF3 UniRef90-D2Z698 UniRef90-K9F0C1
UniRef90-T5K3T0 UniRef90_T5K3T0
UniRef90_UPI000304FB48 UniRef90_B8DM42
UniRef90-F21142 UniRef90_19MA35 UniRef90-D9VVX2 UniRef90-UPIO004636C65 UniRef90_D7L832 UniRef90_B9WGQ5 UniRef90_UPIOOO4670775 UniRef90-UPIO004057290 UniRef90-R5T2S0 UniRef90-F5XEU6 UniRef90-Q3KK59 UniRef90-BOKOL2 UniRef90_UPIO003FBD882 UniRef90-COBXJ6 UniRef90_V4HCB0 UniRef90-IOYVZO UniRef90_UPIO0047EOAA5 UniRef90_A3V882 UniRef90_LOKVE2
UniRef90-14ADI5 UniRef90-C2GEP0 UniRef90_D5X912 UniRef90_A9E1P1 UniRef90 J4UWF3 UniRef90-C5BV84 UniRef90_E4RIR9

1
 GFI AETSCDLAPKLSE YGAKIYLKKENLQTTGAYKIRG LVGKTP LLELGKYSKKLNSRII AK LDEEYNPTGSVKDRD
 $L V G K T P L L E P R N Y A Q R L N A R L L L K L D H L N P A G S M K D R I ~$
$V G N T P L V R L Q R D P G A A G N V I L A K L E G N N P A G S V K D R P$ RPSPLYFAKNLSEHLGVKIYLKREDLNHTGAHKDNN
GGTPLVRAFGKA
RPSPAYHAERLDS $\square G N$ TPMIS L L K RETPLYYAASDTESGCNL
 RPSPVYHARRLSEACGAQUWLKREDLNHTGAHKINN
 RPSPI FEATRGREHAGARULLKREDDNHTGSHKDNN

## VIEP

TPIYHMKKI GAE $\square G G E A Y A K H E$ TPLQYCPRLS RPSPLYPAKRLTQRWGAEI WLKREDLNHTGAHKIRG
 $\checkmark$
 RETPLYFAERLTEHYGPQUYLKREDLNHTGAHKGNN $\square V G H T P L \square Q L N K M V G P N S A R V L V K M E A L N V G G S D K T R T$ $\square V T R T P L Q S W A R V S A A T G A R V H I K R E D L E P V R S Y K V R G$ LVGNTPLVKLNSVVKPGSGLVAAK DEYLNPGGSSKDRD RPSPLWFAQHLTEELGAKVYFKREELNHTGSHKLNN RPTPLYYARNLSKKIGAKIYGKREDLDHSGAHKINN RPSLLTEAPRFADDLGVRVFLKREDLNHTGSHKINN
RSHDGNTPIMKLNNMGDKAGVNVFAKLEFLNPGGSVKDRI
 VRTPTLSQTLSEMAGCRVFLKFENLFTAA
 R P S P L Y H A K R L S A HYG H E I Y L K R E DLLNHTGABHMNN
 RGHDYQTPVIPSRKNSDSSGTKLFFKAENFQYTGSFKLRG
 $R P T P L Q H A E H L S D R Y D R A V Y L K R E D L L H G G A B K L N N$

 $L V G R T P L V Q L N R I P Q T E G C K I V M K L E S M N P S A S V V D R \|$ GMTPLIPLKKRLGA QLEMNLVVKDEGVIPTGSFKARG GPTPLWKCERLSQACGGEIWLKREDLHTGABKINN
 R P S L L L Y F A E N M T K R L G A K lim
 LI G K T P L V E I T S I IVQK P G V R V F G K L E G Q N P G G S V K D R A
 RPS SLLY FA Q RMT E DLGGAK I Y L KR E D L NH T GA H K I N N RPSAIITEVVPRFAEHAGARIVLKREDLNHTGSHKINN




 RPSSLHRAERLSEHAGAQUWLKREDGNHTGSHKDNN

 R P S P L Y F A E R L T E F C GA K l Y L K R E E L N H T G A H K $\square$ N N

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

 R S TP L Y H A R N L S K K Y G T K l Y L K R E D L V H G G A H K L N N

$\qquad$ GNTPMVKLSSIV
$\qquad$ GNTPLTKDSLSEATGRTVLAKAEF RPSPLTEVPRFAEAVGRTVLAKAEFLNGAGSPKDRV

UniRef90_UPI0004680990

UniRef90_UPIo002F67211 UniRef90-A71331 Uninef90_W6RUE3 UniRef90-SOLTY5 UniRef90_UPIO0046A76A5 UniRef90-B2URP0 UniRef90-V9AYG1 UniRef90-B9MKC7 UniRef90_B7KXY4
UniRef90_R6NR38 UniRef90-E6PW93 UniRet90-R6WFY1 UniRef90-E3HDJO
UniRet90 C1D701 UniRef90-C1D701
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AYNGALA EEKAAGVVAASAGNHAQGVAYACRAMG|RGK ALRMIEAAERDGRKTVIEPTSGNTGI GLADVGAVKGYPVE
ALQUEDAERKGDIEPVE GVAMIDAMERDGKIEAVE ALGQALLAKKMGKTKVIAETGGQHGVATAFAAALLGLECN AVAQALLAKRLGKTRIIAETGGQHGVATATVCARFGLECI GLNAMCLSKEVAQRGLIAASAGNHAQALAFHGGQLGVKVT ALNMIMEAEKAGKIDKDEPTSGNQGIGGALVGAVRGYKTID
 VLGQALLAKRMSKSRLIAETGGQHGVATAIAGALFGMKVD GIVYMDEDAENKGGYTI AEATAGNTGLGALAADNKGYRVI AVALEASGK DQADS IILEATSGNTGIGLAMVCAARGTKCA AIGQLLLAKRDGKKRIIAETGGQHGVATATVCARFGLECT
 VLGQALDTKRMGKKRVIAETGGQHGVATATACALLDLECL GVRMIEDAEAAGRIKPIEPTSGNTGLGLAMAAAVKGYRVI
ARSLFLYALCSGQLIEVEASSGSTAVEAYFARMLGLPFV ARSLFLYALLCSGQLHEVEEASSGSTAVSEAYFARMLGLDFVV ALAMMEDAEEKPGATVIEPTSGNTGVGLIFVSAAKGYKLV ALGQVLLAKYMGKERIIAETGGQHGTATAMAAAHDDPPCE
 A WGMLHMAEKEGKLQEQE ADKMIEEAEDDKDTVII EA G NMI DAAETPGKTLLVEPTS AAVGVSRAKELGVKTLAMPTNGNAGGAWATYAABAGME V ALGQVLLAKRLNKERLDAETGGQHGVAMATACALMGI KCV C GQULLAMRMGKTRIAAETGGQHGVATATVCARFGLPCV ALGQALLAKRMGKTRVIAETGGQHGVATATAAALLDMECE VLGQVLLAKKMGKKKVIAETGGQHGVATATAAAELEGMECD
 ALFIIRDAEQRGLLRPVEGTAGNTGGGLTLVAKALGYRTV SAVATAMAKELGRDVVACASTGNAASSLGFAAVSGLKSV VLGQALLAKKMGKTRLIAETGGQHGVATATAAALFGMDCVV VLGQALLTKRLGKTRVIAETGGQHGVATATAAALFGLECT C GQVLLARRMGKRRIVAETGGMHGVATATVAAREGMECV ALYALNKNELEKGGTIVEGTAGNTGUGAAAAAAKLGMECVV AGYMLRAAEDRGDLMRIVATSGNTGUSGAALCAARGYRCV AKSMVEAAEKEGKIVPVEGTSGNDGLALAHIGKIKGYKVI CMAEALLAKHMGKTKLIAETGGQHGVALATAAAYFGMECE ALAMLVDAEKKNKTYGUEPTSGNMGISLAFMAAMKGYKII AMAMIDDAEKTGRLKPGAPTSGNTGISLAMVAKVRGYNLI CLLGEALLAKKMGKTKLIAETGGQHGVALATAAALVGLECD AKAMIDEAEKSGKSVIVEPTSGNTGIGLASUAAAKGYRII C $A_{G}$ QLLARRMGKKRI A AFSMIEKAEKEGKSVIIEPTSGNTGIGLAMVGAAKGYKVI AVKMAKAGLIGPGGTVVEPTSGNTGVAMAMVAQQRGYNCVV ALGQVLLAKYMGKERIIAETGGQHGTATAMAAAHLDMPCE
 ALALLTLDAAARKAGVIACSAGNHAQGVAYHATRLGMPST TTGQALLAKYMGKKRLIAETGGQHATATAMAGANMGFETVV GKADI DAAEKKPGGTIVE AMHMVEKAEEKPGGVIVEATSGNTGIGLAMVAAAKGYRLI ThGQL LMAKRLGKTRIAAETGGQHGVATATVCALMGMECL ALS IVRAAEPRRGDTVYEGTVGSTGIVSLATLARALGYRAH $V L G Q A L L V K R M G K T R V I A E T G G Q H G V A T A T A A A L M G L E C V$
$A F N M I K T A Q K N G R G T I M A T S G N T V G L A M V A A B E G Y N C$

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UniRef90_R6NR38 UniRef90-E6PW93 UniRef90-R6WFY1 UniRef90-E3HDJ0 UniRef90_C1D701 UniRef90-F2CS76 UniRef90-G9XVF1 UniRef90_E4WI18 UniRef90-D1YYW5 UniRef90-COXS30 UniRef90-UPIO00381B55B UniRef90-D4IQQ2 UniRef90-V3TZB3 UniRef90_AOLD59 UniRef90-B9QUS2 UniRef90-A712T4 UniRef90_Q5KT13 UniRef90_U5KL50 UniRef90_UPI000478CA2C UniRef90_UPI0003B593F7 UniRef90-L7LDW4 UniRef90_Q5FRN4 UniRef90-D3S073 UniRef90_UPIO003B40009 UniRef90-B2TQP7 UniRef90_UPIO00472F042 UniRef90_UPI00044179DC UniRef90-TOK243 UniRef90-A7MFJ3 UniRef90-R4T755 UniRef90-A7H067 UniRef90-DOLXL6
UniRef90-14F2M3 UniRef90 E9E5C7 UniRef90-R5DEW5 UniRef90-G2MNF7 UniRef90-N6YLZ6 UniRef90-G5HSQ6 UniRef90-G7V770
UniRef90-Q8RE94 UniRef90-K9RL76 UniRef90-D6TZU2 UniRef90_A9V2F2 UniRef90_Q2G8S7 UniRef90_UPI000050F741 UniRef90-J1GZ14 UniRef90-UPIOOO4654503 UniRef90-D0ZE08 UniRef90-UPI0003787AB4 UniRef90-X6GJF3 UniRef90-D2Z698 UniRef90-K9F0C1 UniRef90-T5K3T0 UniRef90_UPI000304FB48 UniRef90-B8DM42 UniRef90-F21142 UniRef90-I9MA35 UniRef90-D9VVX2 UniRef90-UPI0004636C65 UniRef90-D7L832 UniRef90_B9WGQ5 UniRef90_UPIO004670775 UniRef90-UPI0004057290 UniRef90-R5T2SO UniRef90-F5XEU6 UniRef90_Q3KK59 UniRef90-BOKOL2 UniRef90_UPIO003FBD882 UniRef90_C0BXJ6 UniRef90-10YVZ0 UniRef90_UPIO0047E0AA5 UniRef90-A3V882 UniRef90_LOKVE2 UniRef90_14ADI5 UniRef90-C2GEP0 UniRef90_D5X912 UniRef90_A9E1P1 UniRef90-J4UWF3 UniRef90_C5BV84 UniRet90_E4RIR9

V VMPDTAPK ${ }^{90}$ KFERTRSFGA
100
110
120
IVMPEATPLLKVAGTKSLGAEVQTYNAARDHEGERERR\| UVMPEATMLLKVAGTKLLGAEVVLKGDNEDAYAYALKYT IF M GE V D V Q R Q E L N V F R M E H T L K DA V N E A L R Y WV A H V E D T



 IVMM E T M S L E R R K LI A A Y G A K L V L T D G S K G M A G S I E K A N E $V$ YM G S E D V K R Q S P NV Y R M H K T L K D A M N E A M R D WV A N V E N T












 $\mid V$ VMP R SAP L V K V Q S CR D F GA N V VL F G SN F S E S K A E A E R L



 $F$ V VP E K F S V E K Q T L M K A L G A E i V N T P R E D G M L G A V E K A N E
 I YM GA E DVR R Q A L NVVF R DE M L GA K V I P V H S G S C T L K D A V N













 $V$ F M G E K D V K R Q E L N V F R M K S G S R T L K D A M N E A I R Y W V S N A $V$ V M P T C A P K S K K V $A$ A A T C D $\quad$ Y S A E LVMP E N S T V E RVVQ TM M A Y G A E V I L T P K T IDE Y S R E Y A E E L A

 II Y M G E V D T E R Q A L N V A R R M R R T $\quad \mathrm{L}$ I K D A
 IV IDP K T Q A Q E K K D A I $R$ R Q L G A K L I E V V D A V P Y S D P N N Y V K Y S

 II H M GE IDD I A K E A P N V T R M K L L G A T V V P V S F G G R S L K E A V D I T M P S Y T S L E R R V T M R S F GA E L V L T DP T K GM G GA V K K A Y E
 II YM G E V D I R R K E H P N M R I L G A N V I

 IVMPD TMSSME R R M L LT A Y G A E V V L T P G K L G M E G A I M K A E R









 II C M P D D Q S R E K S D L L L H L G A T V E R V P VA P IT S P D H F V N L A


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UniRef90 I 4 IF2M UniRef90-E9E5C7 UniRef90-R5DEW5 UniRef90-G2MNF7 UniRef90-N6YLZ6 UniRef90-G5HSQ6 UniRef90-G7V770
UniRef90_O8RE94 UniRef90-K9RL76 UniRef90-D6TZU2 UniRef90-A9V2F2 UniRef90_Q2G8S7 UniRef90-UPI000050F741 UniRef90- J1GZ14 UniRef90_UPIOOO4654503 UniRef90-D0ZE08 UniRef90-UPI0003787AB4 UniRef90-X6GJF3 UniRef90-D2Z698 UniRef90-KMFOC1 UniRef90_T5КЗT0 UniRef90-UP1000304FB48 UniRef90-B8DM42 UniRef90-F21142 UniRef90-19MA35 UniRef90-DgVVX2 UniRef90-UPI0004636C65 UniRef90-D7L832 UniRef90_B9WGQ5 UniRef90-UPIOOO4670775 UniRef90-UPIO004057290 UniRef90-R5T2SO UniRef90-F5XEU6 UniRef90-Q3KK59 UniRef90-BOKOL2 UniRef90-UPIO003FBD882 UniRet90 COBXJ6 UniRef90_V4HCB0 UniRef90-1OYVZO UniRef90-UPI00047EOAA5 UniRef90_A3V882 UniRef90-LOKVE2 UniRef90-C2GEPO UniRef90-D5x912 UniRef90-A9E1P1 UniRef90 J4UWF3 UniRef90-C5BV84 UniRef90_E4RIR9 UniRef90_UPIO00468099C

130
AEEENAVQASPYDDPHVIAGNGVGADEIVVRREGRVISHFF KEH DKIFVHPFDDEFVQAGQGTIDALEMLESVPDVLYVV KEPPNAFVPQQFTNSSNPEYHKKTTAVEDWEDTEGKVDVV HYULGSVLGPHPFPESVRDYQSVIGNEARAQLLKSEQVLP ARSIAEQMPDAFYTDQFNNRANAWAHESGTGPEDWQQLEQ

 AANPGSFDPAQFDNPDNCAAHYKTTGPEDWEDTDGTVDIVF俍 RQWVARDDDTFYVIGSVVGPHPYPTMQLMEKEGRLPDAIV
$R D W A G P H P P M L V R D F V S V I G Q E A L V Q M P E V I G R Q P D A V V$ KELPNVHVLDQFSNPANPAHIRWTGPEDWKDTAGKDDIFV EQISKSFIPDQFSNPVNPSFHRETTAKELLEDTEGKVDVF CDENGTYLLNSDNPYRLEGQKTIGFEUVDYGGEVPDRUI EALRDWVTNVDDTAYVIGTVAGPHPYPMLEKFGCPPDALV
 ETDKGFMPNQFDNGANPAVHETNTAEEDWRDTDGQLDAFL
GEIDGAVMPQQFENPANPEITHNTTAEEIWNDTSGAVDVF VFYVIGSVVGPYPYPEVVKHFQKETKAQLKKMGITKADYV AKEKGYTYGNGYDHPDIIDSGAGTCGKETMDQVPDVLVKVQ AKEKGYTYVNGYDNPDNTMAGNGLEMMDQVPDVLVKVQ AETDGAVMVHPFDDPRTIIGQGTVAKEVHDQLDGAPPDVV ETDGAWKPNQYQNQAGPRSHYETTGPEVWADTDGKVTHFVV


 EKEQGLTFVHPFDEPDIDAGQGTVALEMLEDAPEDDTLI
I
 R D A V ADQ MYVVGSVVAPAPFPAMQEAHDTDGKVD F RDWATNV ADTHYVVGSVVGPAPFPAMQSEAKFGEQPDSVV
RERPGTVVWINQYANERNWQSHYHEGEEILRRDLDDRPVDYLV

 TT T P H A Y M LQQQF R NP ANA K $\square H$ R DT T A E E I WQ DT D G K V D M RTTHYCLGGSAVGPHPFPLIVVRDLQCVI GREARTEFPDAVI H NTFY II GTAA GPHPYPELVRDDQSVI GKEARAQMPDLLV

 QGSEY LMLLNQFANNDNWWAHYRSTGPEEDWRDTAGQVTHFV

 N Y IFGTAA GPHPFPAMVRDFQK I G E EARA QLLDEPADAV M


 SAFQGPHPFP LMMVRNF QSVVGFEAREQYLEMTGELPDBVG ETTPDAFMLDQQFNNPANTQQVHYDTTMPEEWEDTHGNVDIMG H Y V VGS A I GP HP YP T L VR TF Q S V I GQ E TKE Q F K K L P N A V V

 RDWVTNVDSTMYLIGTVAGPHPYPAMVRQAQEGRLPDSLV
 LAKETEHADQFVNKANAKAHME TTGPE I WE DT DGEEVDVGV
 R D WVT NVDNTYYVIGTVAGPHPYPQQQULDMTGKDPDALV AAQKGMTFDHPFDDPVVAAGQGTVALEMLEQMPD LDCIV

 $A$
$A$
$V$
$V$ RRRRGFFADQFETSANWQAHADTTGPEDWRQTGGLVDAFV RD WT GPHPFPEMVRDFHRDIGGAEAREQLLERVGRLDDADA



UniRef90 A7133 UniRef90-W6RUE3 UniRef90-SOL7Y5 UniRef90_UPI00046A76A5 UniRef90-B2URP0 UniRef90-V9AYG1 UniRef90-B9MKC7 UniRef90_B7KXY4
UniRef90_R6NR38 UniRef90-E6PW93 UniRef90-R6WFY1 UniRef90-E3HDJO
UniRef90 C1D701 UniRef90_C1D701
UniRef90_F2CS76 UniRef90-G9XVF1 UniRef90-E4WI18 UniRef90-D1YYW5 UniRef90-C0XS30 UniRef90-UPIO00381B55B UniRef90-D4IQQ2 UniRef90-V3TZB3 UniRef90_AOLD59 UniRef90_B9QUS2
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CP\||SGGGLMSGQALA\||ADGFPQAK\|।|G VEPAGADDFSQS LPVGGGGLISGVASYIKQVNPECKVIAVGAKGAPAMHDS
 $R V D A V V V G V G S G G T L G G L T H F F Q R V A P Q V E M V L A D P Q G S V$ A GVGT GGTI TGGGRLLKERKPGGDTVDAVEPADSPVLSAG SAMGTTGTIMGVSTYLKSRNAAVQVVGAQ
ACVGGGSNA GGIFSAFLEDHEVKLI GCSGSVGDLHGAKTY
 $V A G \| G T G G T I T G T G R F L K E M N P N V K I V A V E P A D S P L L S ~ Q ~ G ~$ A GLG SA GTLQGI GRYLKDHNPEVKV DA A A GGGSNAMG』FYPFEATDKHALAMDKGSKGVIHGMKTY ACVGGGSNADGMFHPYVETGRHAAPLSAGRPGVLHGARMY AGSGSGGTVCGVGKYLK VA GVGT G G TVTGVGEALKAVNPG $\square K V V A V E P Y N S P V L S G G$ ACVGGGSNAIGIFHAFIETGRHAATFAGGTPGAFQGAYSY LPVGNA GNDTA YKGLNEMKKDG\IDRIPKMTGDQAEGSA AVPVGGGGLLAGVTSYLADMSPLTSII AVEPKGAASLHAA A CVGGGSNAI GLFHPFIGYENVAMYGVEARPGILHGNRTY CAIGTSGT LMGLSRFLKVMKPD L KVVCA C
 $V S G 1 \operatorname{GTGGT} T T G V S Q V L K D R K P D L H V V A V E P E D S P L L S G G$ ACVGGGSNAMGIFSAFLKDKNVNLCGVEAKAGIIHGMKTI ACVGGGSNAMEAAGFGLDSGKHAATLTKGEVGVLHGAMSY

 $V V P V G G G G L V A G M A A Y F A E A C P S T R V V G V E P A G A A S M A A A$ A GVGTGGTITGTGRYLKEVSEGRVKVVGVDPEGSVYSGGS AA GGGGNAMGDFHPFLDDASVRLII SRGRPGVLHGNRTY ACVGGGSNADGIFHEFLNEKKHSASLCAGKKGVLHGMLSY | ACIGGGSNGCEAAGDGMETGRHAASITAQETGVLHGARTF |
| :--- |
| $C G A G S G G T Y T G U L K Y L K E K N S N Q$ |

 VPIGGGGGLISGMAT AARAMKPDIRIVGVQAEGYPSMYDY MSAGTGGTSATDGRYLRYQGHATRLMVVDPENSVFYDYWQ ACVGGGSNADGIGHGFIEGNRHGATLTKGTPGNLHGAMTY MTAGTGGTDSGVARALKAADPTDAEVGVDPEGSILAGPGE VGAGTGGTSATIGRYLRYRRLPTRLAVVDPEGSAFFPGWR I SMGGGGLISGIGSVCKAFHPQTKIYGVSADNSMADAESM VA GVGTGGTVSGVGKGLKAHNPDVKIVAVEPADSAVLSGG
 $V$ ASVGTGGTITGTGTYLKRKNPDLKVIAVEPAASAVLSGR A GIGTGGTISGVGKALK
 YPTGGGVGII GIYKALRELQQMGWIGERVQATGCAPIVQA ACVGGGSNAI GMFHPFVGDEGVRLI GVEAGGEHGHGTLTY A AIGGGSNAIGLFHPFLDDPSVRMLGVEAAGHLLHGNKTY ACVGGGSNAMGUFAAFLESGRHAARFSGGRPGVLHGSATY

 SSMGTTGTIMGTSRYLKEQDENIKIVGVQ
SAVGSGGTLAGVAFGLKARSKDVKIALADPDGAADYXAFG TSVGDGCDISSLYKGFLDLKRDGLI DRIPADCPVHDAVRS ACVGGGSNAAGSFYHFI ECSDTAATLATGREGIFHGMKSY ACVGGGSNADEAAGDGVDTEKHAASIERGRPGVLHGAKTY


 F GVGSSGTVTGVGRFLKEKKADVGIV $A C V G G G S N A M G L F A G F M D D D K H S A T M T Y G K P G M I H G F K C M$
$V M G I G T G G T V T G V G R Y L K S K N P N V K I Y G V E P A E S N I L N G G$
 A GLGTTGTLMGAGKYLREKNPDDADIAA ACVGGGSNAMPAGRTLDELGEHAATLTLGEPGVMHGFKSY VAGVGTGGTVTGGGEYLKEQNPDVKVVAVEPATSPGVLSKG ACDGGGSNAMGLFHPFDETGKHAASLNGGVPGVLHGNRTF A GVGTGGTDT GVGK ILKNKFSNDK I A GVGTGGTITGTGRFLREVSAARPEADGGEVQUIGADP A GVGTGGTVTGTGTYLKEKNPDDRD ACAGGGSNTMGTFHEFVGDDDVDLYAVEASEGVLHGARTK A $1 F V A D G G G G L I A G \square A A K A D R P G V K D I G V E P T G A N A M A D S$ ACVGGGSNAM GLFYPFLNDADVKMYGVEASGFGVHGNRTY VPVGGGGLIAGMAVAAKSVKSAITII GAQAHDFDAAKAQ ACAGGGSNAMGDFHPFVEDTDVKLLPVEAGGCGMQVQGKT ACVGGGSNADGFFHPFLGDGEHAATLSLGRPGILHGAYSY A GFGTAGTVSGVGEVLKENNADTQ

 ACVGGGSNAMGIFNAFLDDDRHAARFSGGSPGVLHGARSY
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UniRef90 E6PW93 UniRef90-R6WFY1 UniRef90-E3HDJ0 UniRef90_C1D701 UniRef90-F2CS76 UniRef90_G9XVF1
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UniRef90 A7I2T4 UniRef90_Q5KT13 UniRef90_U5KL50 UniRef90_UPIO00478CA2C UniRef90_UPI0003B593F7 UniRef90-L7LDW4 UniRef90_Q5FRN4 UniRef90-D3S073 UniRef90_UPI0003B40009 UniRef90-B2TQP7 UniRef90_UPI000472F042 UniRef90_UPI00044179DC UniRef90-TOK243 UniRef90-A7MFJ3 UniRef90-R4T755 UniRef90_A7H067 UniRef90-DOLXL6
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UniRef90_UPIOOO4670775
UniRef90-UPI0004057290
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UniRef90_UPI00047EOAA5
UniRef90_A3V882
UniRef90_LOKVE2
UniRef90_I4ADI5
UniRef90-C2GEP0
UniRef90_D5X912
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UniRef90_UPIO00468099C

FLA KKVINSKSVRTIADGIVAVRDASEDTLKIILETVDEFV $K P G A H K I Q G \square G A$ LAD Y YVET GHF GEA GS WLLVE GI
 PA E GS Q $\square P$ G $\square R$ K WPEA $\square L Q D E E G Q \square L N T H S \| S A G L D Y P G V G P E H A Y L K E$ DPSVTARSGTASVVEGDGRARLEPSFLP $R A G A H G L Q$

 LLQDDMGNI TPAHSISAGLDYPGVGPEHAYLYDTKRAEYA


 $V$ M A D E N GQQIL GTH S I S A GGLD Y P GV G TV K S H VCGG D F N P S P CK I E G I G S QP GP H K $\quad$ Q G G G A
$V L Q D K Y G R I L P V H S \square S A G L D Y P G V$
 $T \vee G T H D Q M G I G D$ $\mathrm{L} A$
$\mathrm{G} R$ GR $D$
 $V L Q E R D G Q T K A S H S U S A G G L D Y P G V G P E H A W L A R S G R A T Y M$
PE G S T M G G

ER G P H P L Q $\qquad$ | $G$ | $G$ | $N$ |
| :--- | :--- | :--- |
| $G$ | $N$ | $F$ |
| $G$ | $A$ | $G$ |
| $G$ |  |  |
|  | $Y$ | $P$ |





 K P G P H K $\square Q G \square G A$ VLQ D S WGQ IMM S S H S VS A G L D Y A GV G A A G S VLF G APPYPRELP GI GA SRVVP

## A A GPHKIQ

 $\square$ GPHK $\square$ Q GMG $R P G P H K \ Q G \square G A$ WQE GK P D S QLWP NSRT $\square$ AF G $\square$ NVP K
 $1 L$ Q D E D G QTR G SH S I S A GLL


## 

 F CQD GD GQ QAP VYS IS A GLD YP G I GPEHAYWHDS GRAS YV $V L Q D A D G Q T V E S H S I S A G L D Y P G V G P E H S W L A D I G R A E Y I$
 $V$ K N K D L K S E G S S $\square$ T E G $\square G T$ G G Q P GP H K I Q G I G A
V $E P P$ E N S P V L T Q GQ G G L L H R IP G L N G G F
VPF ES SVLS GFPRGPHKIQGIGAGIVPGNVDRSLFSEIL L L E DE E GNPAPVHS DAS GLD YP GVGPEHSFLKTAGKVNYH
 MLKDSQGEE
EAGPHKIQ
WVA GDRSVT TGVPS RワE GI G G Q R VV



## 

V
LA A S P VLS G GK P GP H GL Q GIGA G

$L M$ S D DE GQU DE TH S IS A GL D YP G V G P







D LS ${ }^{290}$ GDGD\|VLVLS ${ }^{300}$ GRNVDDDAFRKWD
$\square$
GKN VVILPDTGLRY LST
TLSKEQRIIVCLSGRGDKDVHQVKQYME REQTTPKRVLTFI CDSGNKYLSKM

ENTGKNVVVILPDSADRYYST
ERVENATIVFIVCDRGDRYLST
KMGLFKTSDIVVVNLSGRGDKDINTVLEL LISEMAAQGRSGSVVTLLCDSGERY
TELAKRPENSGKRIVVLLPDGGERYLST
MGRSQTLLVNLSGRGDKDIGNDADL
GKDKVIATVLADRMERYFST
KEMSKDEILVINLSGRGDKDTNTVLEVYQKGEL
GMSPEQVI LVNLSGRGDKDINTVARLA
REENKGKMIVTIFPSGGERYMDLFAAVRE
ELEGKKIVVLLPDTGERYLST
GRELGEGAIIVVSLSGRGDKDMDTAAKW
RNMGVIGDDERVVCVVTGHLLKDPETV
$S G V K F E P G S T V V C I V S G G N N D V L R Y A E D M E R$
M Y
IERGNVVVVFPDRAEKYLS
LQ $\square$ ARTPRYAGKRFVLVLASFAERYLST
GQRDEMAGKTIVVIIPSFAERYLST
LKGHKTIVVNVSGRGDKDIDS I INYKK
GKKVVTVITG

EGPDSLVVVLLPDGGRGYLSK
TMAKDQIIVLNVSGRGDKDIFT VAHHLGV
MSRDEIIVVNLSGRGDKDLE
AEAEGSFEPGQEPIVIVVSGRGDKDIDTASKW
A A LDK L A S K $\square \mathrm{DSGNIVTLLPDRGERYFSK}$
QRPENHGKLIVVIIPSFGERYLSTV

MREEGRCGAIVTLLCDSGERYDETY
VLGRELGPEGLIIVNLSGRGDKDMDTAAKY
TLSGKKTIVVNVSGRGDKDMNTV


PENEGKTVVALLPDTGERYLSTV
A E A D E A V E E G
P H S A
KRPENEGKTI
A D
$W \square K A$
KGAVIVA APDRGDYY

## E N Q

KTMKP $\mathrm{T}_{\mathrm{R}} \mathrm{R} V \mathrm{~L}$ NTGGLKYPDTVQ
ANLGROD GQS LG S D AVIL VNLLSGRGDKDMT TAAK W
A R
$K \square E N T K D K I V I I N L S G G D K D M$
$L L S G K L D Q Y$ K $G R K S V S I L S G G N D D L S R V S Q \square$ AAAKLAETLEEGLIVCII CDRGDRYLS

REMGPGHTIVTVLCDYGTRYQSKL
TMGSDEVVAVVVTGNGLKDAASARKAVE
GRE DKNK VVVTVGRGDKDVAA AR YR
R
NNRDKLPAGGHVVVNLSGRGDKDMEUVREVLFREG
KEMGPGNTIVTILCDVGSRSASKIFNV
ENQGKLIVAVLPDTGERYIST

PGCTMLLNLSGRGDKDワD
Y VA D N F G
KMPENKGKLIVTIHPSFGERYLS $K T M S K D Q H V V I N V S G R G D K D V Q S V A E V L P K \square G$
$T \square L A N R P E N A G K N V V V L L D D T G B R Y L S T$
EMHSQGRNGSVVALLCDPGDRYLNRY
GKGKKVLLPKDHLMVVNLSGRGDKDMQTVMHHME
E LAK K RELENPDAVVVVLLPD SGRGYLAK
ELAKREENKGKTIVALLPDTGERYLS T

TMS
A V I K
$D T G E L G G D L V V V L L S$
TLLS PEKHI I V N L S G R G DK D M E T FA Q Y I
K K P ENKGKTIVTVITTDYGERYVSTV RELGGPGKKVVTIFPDTGERYLSM
$\square F D T R K F K E D E V I V L N L S G R G D K D L N T Y$
VT A RTLP P GSVVVVTVLCDSGTRHLSSKFWKHDEEMG
LA EARPAGAEAPVLLVNLSGRGDKDMDTAARW $K E L G K G K N V L A I A A A D N G E R Y L S Q$

GNAMIVAAEADEGGVIIEPTSGNTG\|ALAFIVARKGYRCIL

jnet
sol25
sol5
sol0
jhmm
UniRef90-J9ZAD8
UniRef90 UPI0003B59A62
UniRef90-R7DEQ0
UniRef90-E7S0U6
UniRef90_B0U426
lupas_21
lupas_14
lupas_28
jnet
conf
sol25


UniRef90_UP10003B4DBDA UniRef90-C7DAQ6 UniRef90 A9B1I1 UniRef90_U6NF68 UniRef90-UPI0003127FF4 UniRef90-X1JND7
UniRef90_S6HAV7
UniRef90-D9PMY6
UniRef90_UPI0003B69B64
UniRef90 H2AJT2
UniRef90-D0L098
UniRef90-E6X1E6
UniRef90-K9PAJ0
UniRef90-A8UW08 UniRef90_UPIO003608A61 UniRef90-E8T565 UniRef90 UPI000462F899
UniRef90_Q750D4
UniRef90-K8E237
UniRef90-J9ZAD8
UniRef90 ${ }^{-}$UPI0003B59A62
UniRef90-R7DEQ0
UniRef90-E7S0U6
UniRef90_BOU426
 $\square Y E A D R G R Y F K P D Q Y N N P A N P G S Q G S L G L E V F K D C P E A V L$ AADRGLTMIRPFDEPQVIAGQGTVGLDEITQDAAATKADVL QNRNIIYDRGANS IPAREAMKTISYEICEQDGWQAPDWYI EKDPNSF ILAQFDNPSNPQVHYMTTGPEDWKQTQGKVDAC KEIPDSFSPQQFANPANPNTYYKTGPEIWDQLDGQIDDFV RENPGKYWVQYTNQNNVVAHYDTTGPEIWEQTEGKVDAFL DNTFY ILGTAAGPHPYPKLVRDFQSVIGREARAQCPDTLI

 ARGEGIVLDQFSNADNPAAHFATTGPEIWRDTAGKDTHFVV GTVAGPHPYPMMDRDDQSII GWEAKRQULEAEGRLPDKVI RDWVTNVESTHYPHPYPMLVRDFHAVQCLEAFGRLPDVLI K NPDRYVY LD QYNNPANWRAHFYSTGIEVWNQTEGRVTHF EKTDGGFMPQQFENPANPEDHRQTTAEEVWADCDGKVDVL
REPERFFPARQFENPVNPKVHYEQTALEVLTQLGRJPALDF L

FADQFENEANWTIHYQNTGPE YQQLGGRINA

 | AQPGYFMPMQFENLANPAVHEVTTGPE LEAFDGKGPDAF |
| :--- |
| GEYPWAFVNDNDRPYYAEGSKTMAFETAEQLGWR $\square P D Q V V$ | AADGTAYLVPSYDHADIIVGNRNVFLEILEDLEPDNDSMF




[^2]

| UniRef90_UPI0003B4DBDA |  |
| :---: | :---: |
| UniRef90-UPI00035E2778 | ASLGTS GTLVGT |
| UniRef90-C7DAQ6 | VCCGGGGLTTSG |
| UniRef90-A9B1I1 | QAVSGGLGPLGVYHGFAEDHAMGL |
| UniRef90-U6NF68 | VF GIIGT G G Ti T GVGQYLREQKPNVKM Y |
| UniRef90-UPI000312 |  |
| UniRef90-X1JND7 | VTQGTGGTISGVGKYLRERNPKI |
| UniRef90-S6HAV7 |  |
| UniRef90_D9PMY6 | CGVGTGGTATGVGTYLKQQDPS |
| UniRef90-UPI0003B69B64 | VPI GGGGLIS GMATVARA A GRPIEVVGVEAELYPSMY |
| UniRef90-H2AJT2 |  |
| UniRef90-D0L098 | S A MGT TG |
| UniRef90-E6X1E6 | AClGGGG NA\G\FNHFLEEEQTECIGIEAGPGVLHGQMSY |
| UniRef90-K9PAJ0 | ACVGGGSNAMGLFHPFVEDGRHAATITEGRVGVLHGAMSL |
| UniRef90-A8UW08 |  |
| UniRef90-UPI0003608A61 | VA GVGT G GTIT G $\square$ S EVLKSRNADFKAFAVEPMDSPULSGG |
| UniRef90-E8T | VA GLGT G GTFTGMARRFKEVNPNCLCVAVEPDTCAPLS GG |
| UniRef90_UP1000462 | GGS $\square$ T Gl GEVLKQYNSNDKVIA |
| UniRef90-Q750D4 | AGCGTGGTIGGVSRYLKERLLGDSVHT\FYNR\NYGVMYDH |
| UniRef90_K8E237 | VAGVGTGGTLTGVGHVLK Q ANPDVLIYAVEPAESPVLA G G |
| UniRef90_J9ZAD8 | VPIA S GSLLTKIWKGFQEMSHPGLRVNGAQAQGCSPVYQA |
| UniRef90_UPI0003B59A62 | VPIGGGGLFSGAVQACEGRGDPII GVELSPYERVTRIAWN |
| UniRef90-R7DEQ0 | PVGGG GLIS GVAFAlIKSLKPNVKVYGVQASGAPSMLNS |
| UniRef90-E7S0U6 | A CVIGGGSNAl GMF TAFLDPGRHA ATLTWGKPGEDHGMSCY |
| UniRef90_B0U426 | LGCDSAGT\\|TGLSRAF DSVASDVELILADPVGSI |





[^3]

|  | 290 300 |
| :---: | :---: |
| UniRef90_UPI0003B4DBDA |  |
| UniRef90-UPI00035E2778 | AE E GKAGEIVAIFPDGGEKYLT TAVFASDR |
| UniRef90-C7DAQ6 | LAAALYHHNSDDTDVIAVASGGNVDTNMFSR |
| UniRef90-A9B111 | GQVNPEELIVVNCT G |
| UniRef90_U6NF68 | RPEMAGKLI V TVVPS F GERYLS T Y A N $\square$ R DEA |
| UniRef90-UPI0003127FF4 | K $\square$ AP K G T HIVVI FP D G S ERYL |
| UniRef90-X1JND7 | PELKK VIVTLINDTGQRYFST |
| UniRef90-S6HAV7 | GMGKEQIIVVNLS GRGDKD\HTVA |
| UniRef90-D9PMY6 | RELLGEGKRVLCLLPDSGRGYLSKVEWLLEK |
| UniRef90-UPI0003B69B64 | A ALLAHPERFRGKTVGIVLCGGN】DTRLLANVLLR |
| UniRef90_H2AJT2 |  |
| UniRef90_D0L098 UniRef90 E6X1E6 |  |
| UniRef90_K9PAJ0 | $\square \mathrm{LP}$ PTEVVLNLSGRGDKDVNT VAEKLG |
| UniRef90-A8UW08 | E RGEKGVIVTVFPDGGEKYLT T |
| UniRef90-UPI0003608A61 | LNVA EKPEMKGKRIVVI LP S M A ERYMST |
| UniRef90-E8T565 | K DVKPNGPVVTVAPDTGERYDST |
| UniRef90_UPI000462F899 | SQ |
| UniRef90-Q750D4 | AVRVAQEMPA GSTLVLI ACDS GSRHLSKF |
| UniRef90-K8E237 | KKLLGKGKSVLAVVPDNGERY |
| UniRef90-J9ZAD8 | $\square \mathrm{R}$ PDELTVA YI T G G GLKTMEA |
| UniRef90-UPI0003B59A62 | TPPGGISACVISGSNIDADLHAD\VA |
| UniRef90-R7DEQ0 | MFNKVPVKGKKVICLVSGGNIDVTILSRVIN |
| UniRef90-E7S0U6 | S SDEHILVNLSGRGDKDAD YVASKLGL |
| UniRef90_B0U426 | $\square \mathrm{L}$ R K RVLVFVCDTGNKYL |




[^0]:    

[^1]:    

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf sol25
    sol5
    sol0
    jhmm
    jpssm

[^3]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

