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 I T T T D L P G R T S A Y R R V A E V $V$ R P Q V TLTTDLPGRTSPFRTAEVRPQVSGVILKRLFVEGDVVQAG VTNELPGRMES $\quad$ R RVAEVVRARVPGIVLKRVFREGSDVKA G
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 ELPGR DAATRVSEVRARVSGILQERVFEQGTLVKQG S VE $\square T$ A E FP GRTVVAYE T S DVVRPQVNGLI QSRLFTEGBFVRAG
 TSELP GRTSPFQDAEVRPQVSGIVLTREFVEGSDVKTR T DYVEIT GTAASTNIVKLDARVEGYLEKDHFADGASVVED LWDEFNGRVEAVESVAL RPRVSGYIDRVNYEEGQVVKRG $L F \square E L P G R T A A F E T S E V R P Q V T G V L K A R L F E E G G \| V R A G$
 TEWDEFTGRLQAPQTVTVTPRVSGYI EQVFFTEGAMVKAG WDEFS GRIVADVESVELRPRVVSGYIESVNFREGQEVKK G $T$ L $T$
 VELPGRTTPSLI A LT TELPGRTSPYKIAFIRPQVSGII LKRYFTVEGSNVMAG T DWDEYT GHLVVSPETANINARISGII EAAPFKEGAMVKK G
 LTTELAGRTQAFMVAEIRPQVGGIVQQRLFVEGAEVKAG TLQTELDGRVEPVRVAQVRARVNGVVLKRLFTEGSEVKAG
 $T L Q S D G S F N A V E$ GANLSA QVQGVVQKIGFEDGQDVKK G
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QQLTYQTDPA ${ }^{50} Y E A D Y Q S A Q A N L A S T Q E Q A Q R Y K L L V A D Q A$ QQLYQI DPSVYEATLKSAEANLQSTRSVSDRYKQLVNEQA
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$R \square R R E \square A S G O \stackrel{170}{\square}$
180
190 P LDE GRLE
200 QLRRELESGRLQKAGDNAATVKLILEDGSSYPQEGKLKFS
 KLRRALESGQLQKTADKAAKVSLTLQDGSQYPLQGSLEFS RLRHQI AS GQLRTLNSHEAPI RLMLEDGTPYQLEGRLDFS RLKSALAAGQLKATDSR LVELILENGQPYPYKGRLFFS RLRQA R R SGKYKHAES A RVELILEDGTVYPNTGKI FFT RLQRDLASGQLRQNAGKALVSVVLGDGSVYPHKGTLAFS RLRSAMESGRLQSAGPDQAEVGLTLEDGSAYPLTGTLKFS RLQDELAAGSLKRSGDRQAEVRLLLDNGMEYPYAGRLKFS KLKSLIQQQVVTDSEDKMDVTLFLEDGSQYPYTGTLSFS RLKQELANGTLKQ ENGKAKVDLVTNDGTKYPQSGTLEFS RLRRDHAEGKLQRAGQGQAKVQLVLEDGRPYGDDGTLQFA
 KLKRAMDEGKLKSAGNGQAPVKGLDDGSSYDHAGVLQFS RLKKAMARGDLARAGKGAAKVVSVVLEDGQEYGRAGKLLES QLKQAMARGDLQKSGANAARVRLLLEDGSAYSIEGKLEFS RLKSALESGLLRREGKDAARVSLTLADGSQYGQEGMLQFS KLKNEI ESGI 1 RQEQGKPVVHLTLTNGQSYAQKGHLEFS RLRKAFANGSLTA GSNEARVGLRLDDGTEYPHPGRLLFS ALRRSLAEGKLQRAGDNAARVQLVMEDGSDYPAEGKLEFS KLRRQQAS LLQQNKDGVPVTVKLED RLQRS LAAQGQLKRRGTQAASVRIVLPDGS KLKQAI ASGTITHNGGKVP VSLILNN
 KLKRALASGQLESAGAQAAKVNLLFDDGSRYTETGKLEFS RLKREMAQGRIERQPNGEVPVTLTLEDGSTYEHVGRMALS KLRKRLA GVKTSQTVPVKVQLEDGTAYAQQGKLALT RLKQAVTQGSL EKSAQQAEVTLVMENGQAYPLKGKLQFS RLQRALEAGKLKSAGAGQARVTLVTEDGQTYPHDGKLLFA KLRRQIAEGQMS AVNGAVEVTIILEDGSEYPQKGRLLFT SLRRAFASGQLQQVGKDTARATIVLEDGSEYGQPGKLLFT
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 KLKRGMAN K KDDNGKLPVTVKLEDGSVYGHKGKLAFS DLRKRIAARGITKAPKVTITLEDGTAYSETGTLQFA SLRQRLAAGGVTPGS TEVHLMLDGGARYPQAGTVQFS SLREALAEGRLAQDEGKGARISVTVEGTGQRRDGHLDFS RLKQTLASGVLKKDTAT QARVKLVLEDGSPYPLPGTLKFS NLLQAI DSGRLKVSGPH VAVKLKLENGADYPQAGKLEFS RLREALKGGNLSAGQSQALSI RVL RLKREIDSGTLKANNGQAKVSLLLAD RMKEEVASGQIKQVQGSTPVQLNLENGKKYSESGKLGFA RLRAAAAEGRIAVQEDGAARVRISLGQDGFSQEGRLLFS RLKGDLAAGRFKREGKGDARVAVKLDDGSTYAQEAVLRFS RLRQQLSKGSIDD RSNNTKVRLKLDDGSYYPDEGNDAFS
 K L R R Q I M D GKLTKDGK SLRRKLMQGGVAPTR AKVQLIL RFKRSLARGELHKAGVDSAEVKLEEDGS RFKRSLARGELHKAGVDSAKVRLRLEDGSDYPLEGKLEFA
 A L R R QLAA EMRHQVASGELESLPDDELVPVQLVLEDEGREHKQEGYLNFA RYAELARSGKRASEREGTLPVQVALADEEGFPHEGKVDFV RLRQQLSKGSLNN SNNTKVKLKLEDGSTYPDEGQLAFS $R-R R R D A M K E G R D L A D D D P T V T L L T L A D G S T Y E H T G T L L A A$
$R L R R E V E S G R V Q R G A G G A V E V R L L L E D G S E Y A A A G R L A L D S$ ELEKRLEQGRLKYAGKEQNKVKLILEDGTDYPLEGTLQFK
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220
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 DLTVDEST
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 $D V T V D Q A T G S Q V L R A D V F N P R S L L L P G M F V R A R L V Q Q$ EALVN QETGTVVTMRA RFPNA QGLLLLPGMFVRARMAQ
 DNRVDAATGTIRARATLVNPDGLLTPGLYARVRLP



 DVTVVPTTGSVTLRADFPNPKGDLLPGMFVRAVIREG D NSVDP GTGTI QLRGVIPNPKGELTPGGFAQMRI,
 $D V T V D P T S G Q V T L R A E V A N P D N L L L P G Q Y V R V R V S Q$

 E P HVVD E Q T G VI V L R D DEFPNP D M L L L P G M Y V Q V EMP T


 NPAFSTETGTFLVRAVFANAKGTVRPGQFVKARV DNALDP QTGTVRAHAVVANPNHFLTPGMFGRARL A $\square S V T$ P T T GTVLLLRARFPNADGAI LPG LFARVRV E PQVSADTRAVVKQATMDNRERQLRPGMFANVRVVL

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

## UniRef90 wopdc9 UniRef90-X7GEV5 UniRef90-A1B681

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UniRef90 E1JSX6 UniRef90_UPIo004630CB6 UniRef90-K0Q314 UniRef90-J1KSQ6 UniRef90_UPIo0026C77E9 UniRef90_K7A093 UniRef90-B5WS13 UniRefot E1JU05 UniRef90-S6ASC5 UniRef90-A3 UniRef90_UPIO00380A417 UniRet90_-_3HG94 UniRef90-E8LM18
UniRef90-H1SEM2 UniRef90-B1FGC3 UniRef90-×5L3R8 UniRef90_O7M9Q0
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UniRef90-HOTWT5 UniRef90-W1LD20 UniRef90-Q316E3 UniRef90 O7MQHO UniRef90-K9ETN1 UniRef90 UPIIO0047A2ED3 UniRef90-D6V576 UniRef90-B3ED68 UniRef90_V8DK35 UniRef90-UPIOOO4438291 UniRef90-E6WT72 UniRef90_13YH85 UniRef90-UP10003622292 UniRef90-D8IW4 UniRef90-R5T2V4 UniRef90_D1R168
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 TLDSDYPATIDGIQNIDIRPKVDGFIVKIFVDEGAVVKKG
YLELTGNTASINTVDLNARVQGFLTSINYKDGAMAKKG
TPSTKAVGTLRAVQGVTLTAEVSGTVSAVQFVSGDKVKVG
TPS KAVGSUEAVNGVQVANEVPGVIQSUEFESGDTVKEG
TPYVEFTGSLEARKEVVERRPRVEGYVQDVSVEPGRLVEKG
TEWDEYTGRLEAVEAVEVRARVSGYLDKVNFKDGEKVRKG
VTLDAVGSLDAVRQVTLAPEVAGRVVALQFDAGSAVRKG

TYATATGTVTALSTVTVNPGGGQLHSLNFREGEVKG

TEWD


TLWESFTGGVVAVRGADLSNEVAGVVEDVHFQSGQEVKAG
VVPAVGTLQAVNGVDiSGAMSGLVKSIAFESGQDVRKG
LYVEYGQLAGTDEVKIQSRVSGNVVEKYDTGGQFVAAG
SEWDEFSGRLEAVDRVDRARVSGA KAVHFREGALVKAG

SEYMRFTGNTQAVNSVDLRARIEGFLVKQAYVDGATVKKG
NDEFIGRFEPVEQVSVRSRI GGYLQEIHFSDGALVKQG
LESEYTGQTFGQSDLQUNPRVDGITESMNFKEGSFVKKG
TLRAVGNMRARLGVNVTTELAGMVQTMYFTPGTPVKKG
$\square S M D L P G R M T P F K Q S Q V R P Q V D G V I D K R F F E E G A Q V K Q G$
HVELPGRIEAVRTAEVRARVDGVVERTLYQEGTDLPAN
LHMAYMGQTAGSREVQVRARVGGLL亡RRNYEEGHPVRQG
HMAYMGQTAGSREVQVRARVGGILLRRNYEEGHPVRQG
SYDETYPTTIEGKVNSEVRAKVSGYI QRVAFVEGGEQVKKG
TEWKQYSGHLEAVEHVDVRPQVSGMLTAVHFKDGSLVRKG
TDWQSYTGRLEAVEKVVIRPLVSGTIVAVHFKDGAVVKQG
SFSLNGRVYAYERADVRPLVSGVVVAVAFKDGAVVKGG
DTFEFVGQTQSDQAVDVRGRVSGFLVKRGYKEGAMVKAG
TEWQSYSGRVEADEQVEVRPLVSGTVIAVHFRDGALVRKG
TVYEEFPARLQGKQNIEIRPKIDGFIEDIYVDEGAYVKQG
IPREEYPAKIKSIDQVEVRAKVSGTLDKKHYTEGALVKKEG
LSDEYNGRINAVETVKLRPRVSGYVERVAYTEGSQVHKG
$V$ WSSFSGRLRAVDLAEIRPEVGGRLTEVRFRDGQTVAVG
TLTTTRPGRVTASAEAEVRPQVNGDVTERLFEEGSHVKVG
VTLSALGTVVANASVTVTSRVDGQL DKVYFTEGQKVEQG
ITKSYVCQUHADNHVELRAQERGYLQKVYVDEGQFVKKG
LTYEYVGOTAGSEVEVRABVGGTLMRAYTEGRPVKG
TVNATGSLCOASKGMVSSEVPGTVAETVESGOEVOOG
SDEFVGRFQPVDEVSVRSRVGGYLQEVHFEDGALVKQG
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TDYDEYVGRFVALDYVEVRARVSGYLDKIHFTDGQMVKVG
ISAVGTARAVNGTQLTAQAAGIVTEI RFNSGDMVKKG
VYLDGVGAVRALNTVTVRSQVDGKLDAVNFVEGQDVKKG
EFI GRFQAANEVQIRARVGGYLQAINFRDGQLVKEG
YVGRVEATQAVDLQPRVEGYLTAVNVTEGGMVNAG
DEALGFIEPNQGVTIANETSGVIKQIVFESGTQVKEG
TLTKEYPGYLSSEKTVDLVARVNGTLQTI AYAPGSRVKKG
T ALTTYPASIEGIINSEVRGKISGYI TDVLVDEGQKVRKG
TVTRDYVCQI HAYQHDEVRALEKGYLQKI FVDEGKYIHKG
ITTTVGDLAAVHQVDVSADVSGRVTQUFTAGATVKKG
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AVGTVRAVQGVDLNNEVAGQVKQILFDSGAKVKQG
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WQSYSGRTEAVDRVEVRPLVGGTLTAVHFKDGALVKKG
VSAESTGRVEAQYSIVDVITRVSGFLGKKYFKEGDFVKKG
TLKAVGSLRAVLGVNVTTELAGMVQKDYFKPGSAVQKG
TLTKDYPGYLEAESTVDLVGRVNGTLQSKNFAPGSRVRQG
TDVDTFTGRFEALDNVDVRARVSGYLEKVAFADGALVRKG
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UniRef90-E1JSX6 UniRef90_UPIO004630CB6 UniRef90-K0Q314 UniRef90-J1KSQ6 UniRef90_UPI00026C77E9 UniRef90_K7A093 UniRef90-B5WS13 UniRef90-E1JU05 UniRef90-E1 V8G7 UniRef90_A3U986 UniRef90_UPIO00380A417 UniRef90_F3HG94 UniRef90-E8LM18 UniRef90-H1SEM2 UniRef90-B1FGC3 UniRef90-X5L3R8 UniRef90-Q7M9Q0 UniRef90-13U6V6 UniRef90_G2TCV7 UniRef90_UPIO0046541BC UniRef90_B1M828 UniRef90_Q2NR57 UniRef90-UPIO00478683A UniRef90_G2H9E3 UniRef90_B5JKX9 UniRef90_B3PY29 UniRef90_U4TCD3 UniRef90_G2IKJ2 UniRef90-K2HJR0 UniRef90-HOTWT5 UniRef90-W1LD20 Uniref90_Q316E3
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 QV L F VI E P T L Y E N S V K Q A E A E L K T A K A N Y QR M K E A I K S D A





LLSAKPKARTRRLLSAMDA DPRPFQAALNEAQADYVRAKTLFNKNVIARDRFD
PAPYDVRVASAEGALARAEAQEKRARALRERKV
 DARSYRAEDARAEADLARARTQAKRAKTLSEQQA NAPQYEQQVRSAEADVNAAQLUTVNKTRPLVEKDI DQRPFVTAFNEATAALEVAKSTLDYAEAQFKRAD
$Q S N T Y T A Q R D A Q A S Q V G R Q Q E Q R Q L A L T K Q Q A$

 DSSTYKAADLQSABGALEVSAKANAAREFEKLVAQNA DVLIRLESVEEATLRTAEADLGLAQVEYERGKSLVGRQA DLLFNVDAKPFEADVAKAEADLKTREARLKLAEATLKRKE DLLFVIDPRPFKAQLDYAKAELERVKSRKELAQNDLDRAE QLLVQL
 QLL
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 DPRSLQASYDQAAASKRQNQAPAYRQYVAKTDDD DPATYQASYDQAEAAVVSARPKAQRYDNLVK DA
$A D D S Y R A D L N K A E A V L E N A R M T A S R A R L L A N A ~$ EPAPYQASAQKTEASLTTLKLKADRYKELVKDNA DQRQYRAKADKARAQLKKDEAQADRDKPLYEQNA DPKLYQARANKARAQLNKDKAMAKRIRPLYEQNA
 DPRPYQARVQAARAQLEQASRLTQARSLESRA

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P D PR D DA M A A V Q A Q A L A A AKSRGLYTQRLGSFNA D H KP F Q A Q LD A A K A QL A Q E R A RLDEVVAK P L A ER NA R N P Q Y E Q Q I R S A Q A DV A T A QM QVT K T K P LVD K D D P A K F Q A A F N E A S A QL
D A R S Y R T V L A Q A Q A QL F D GPER A DRDAARARAAFARMQVVRSEELRAPSGA DPAPYEAAMAKAEANAAFARTELVRAVSLVKTQT


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UniRef90 E1JUO5 UniRef90-E1V8G7 UniRef90_S6ASC5 UniRef90_A3U986 UniRef90-UPIO00380A417 UniRef90_F3HG94 UniRef90_E8LM18 UniRef90-H1SEM2 UniRef90 ${ }^{-}$X5L3R8 UniRef90_Q7M9Q0 UniRef90_I3U6V6 UniRef90_M4S6P3 UniRef90_G2TCV7 UniRef90-UPI00046541BC UniRef90_B1M828 UniRef90_Q2NR57 UniRef90-UPIO00478683A UniRef90-G2H9E3 UniRef90_B5JKX9 UniRef90_B3PY29 UniRef90-U4TCD3 UniRef90_G2IKJ2
UniRef90_F8JGR0 UniRef90_K2HJR0 UniRef90-HOTWT5 UniRef90 W1LD20 UniRef90-Q316E3
UniRef90_Q7MQH0 UniRef90_K9ETN1 UniRef90_UPI00047A2ED3 UniRef90_UPI000476AD9C UniRef90-D6V576 UniRef90_B3ED68 UniRef90_V8DK35 UniRef90-UPIO004138291 UniRef90_E6WT72 UniRef90_13YH85 UniRef90_UPIO003622292 UniRef90_D8IW44 UniRef90_R5T2V4 UniRef90_D1RI68
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 $\bar{V} S R K D Y D D A D A N Y E A S V A S Y Q S A E I N L G Y T K V T A P D G G M A$ $V$ S H Q V Y D D A V $A$ A Q R D Q A A A
 I S E Q D Y D A A LAA R V TVVA EA A I N T A K I N L E Y T E V R A P I A G R V QLA K Q DFA S QA DV QNA QA S L D LA Ki N L G Y T E V RA P F D G V



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





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 Q SLTAWRNKTAPPDIRVSVALLADKTYSRHGRVDFQ ALRRALAAGQLAMDSADAAAVRLIFDDGSEYAHPGKLLFS RYAQMARDGQRPSERDGSLPVQVGLVGEDGYPHAGKVDFL DFSKTYKGNTLAQQMKNIPAVSLVLADGTGYAQNGKIESUG NFAQTARARSDLQQGGGGVEVQVSBTDANEKPFTGKLDFA NFEKSVKSGKDETKGATDWRTHI QLADGSTYPEAGKLNFS RVRDEARRRGITTTDLDRQPIEVGLOTETGYPHKGKLDYD SLRGVFAAANTAD SHGLPVAL LNNGDAYPVNGR1LFS AFSRQSRGGTNSSANGETNEVVLRLTDERLEPRKGHLDFV RLK SKLKQGQLKAADNAG VQLILEDGTTYKHDGVLQFA LL YVDYTLSEKNLPNVATGYPVVATVAAVPDMAFNGKVSAAD

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ALQRA $\square K N G A V Q G K A K D$ EVRQAQAAGPLSITAALDRTDAHVITGD ALRKQLDSGALKS VDGKAQVKVVLEDGSTFDQTGVLEFI QFRKALASGTLEKMKS VPVTLVLEDGTPYEHTGKUAFN KNNKLWFEGKRPSSRDTPNPVEVALTGETKPSHEGHMDFL K LK RDIASGKDSSTSQKEDPVRVVLEDGSTYAHAGKLKFN KSKRNVNDGQKDQNRSWQPTVTUTLPDNTTYPFKGLVDFA KYARLAQDGKRADTRERANPVYLALADDKDFSHDGHIDFV KSKRNVNLGQRDSSRKWDPYITITLADNTQYPLRGLVDFA
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 YLQFTGPARELATVSVQQPVSVRVDAYSNDTFTGEVTAD NFQATAQKRGVDLQASGGVDVIATIGDNSGREFKGKLNFA E
ELRREMQQQEALP
GONVRVVADDGS VNILVNGTSNELYSQQGKLTKFS DI QQQTQSGARQPTKMKHVEVQLILANGQVYDERGFLDFA RLRKDLAAGKVVIGAGGDYVVRLVLPDGSVYKEPGR1NFT KYVEARAKAGSDREAASPVYMGLSNETGYPHAGEDF
 QVI NAAQGKDL RYLNHDLS TFRQQDLNGDLVSNADDVPVMLGLSNE TFRQQULNGDLVSNHKQNEEVILFFDDGSQYPDKGKLSLT EFRAEQANKQLVPPPDQHYEVTVVLADGSEYPQKGRITFA RF
EF पKHAKGGSITEKLKNAPNVSLVLSDGSEYKEKGRIESM KQAYSLREGTWKEAAQGALKATVLSKEGVVYSDKGRVDFT RYAQMARNGRRGSDLDGKLPVQVGLSDE

## S

RFRREMAAQ SAEGQPDRKVTLRLADGTEYAQEGRLTAA LVKQHLLATQRTLGDLSK円PVEIGLQTETGYPHTGKLDYL TLLQAL HHDQTLTATALDQDG RD RRMREEGRITKDKKKYDVVVRMANNE A
NFADTARKMGTDQLG
AAKGYPIEVAIDSYP
$\mathrm{K} \square$
ALr RLLARGGAS
K LGQKISAHVDTF
RYLDAASVKRDSVDRGLS ELALDLE
RVNAAAAKGELA
NYAETARKNEVLQSGGGGLK AMSRQVSPLIPSGEVSFSDVV R
AMLMQQGATQQKDTLPRQ
DF
NFKDKTKSENLT
QFRRQYEGATLEEKIRNVPPVTLLAD KQVRRDPGEKALAHSR DFIQDAEGTT QDK RV
SLKANLQA KYVNPARA KLLK
R
Themtqea ask
RYTRQEASAAAG
KYKRQLS


TRTVRIALPG
ADSPMPVTLLLHNAKPYPHQGEILLS
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 G $\square N V D A S T G D V L L R I L V D N P Q R L L L P G M F V R A R V P H G$ DNRLDSASGTIRVRAVFENKDRFLTPGLFGRDTI NPVFSAETGTFLVRAVFANEKGTLRPGQFVRARV


 D SQVDLSTGTILTRAKFDNKDLYIDPGLFAKI RDPT
 EPQQGTDTRNVAVQATLPNPDHLLRPGMYDQARLELG DMAVDSNTDTVAMRALFANPGHELLPGAYVQ\RLEQ DNQI NADTGTFKVRAQFPNTDRNLWPGQFVNVRLTL GTSVDTGNGNVNLRAVVPNPKGMLLPGMYVRAVLP EMTVDPSTGSFSLRVEVPNPERLLMPGMYVRGEFGMG DNRLDVSTGTLRSRAVIPNHDLSVLDPGQFGRVRL G $\square \mathrm{D} V \mathrm{~V}$ TTSGAVT LRAVVPNPEGILLPGMYVHALIDV EPQVDPRTGTFSVRAEMPNPDHVLLPGQFTKVK DNRIDAQTGTDRLRASFANNDNQLI PGLYAKLRL

 DNRLDRSTGTLQFRAELANPDGIFKPGQFARVEMPV EPLVDAKTGMVSVQARFPNADGNLRPGMFARIEDE


 ENHVDSASGTMRVR
 EVTIDQSTGA TLRAVMPNPNS LLLPGDFVTARVH $\square G$
DLVVDPSTGTQTVRAQFANPDRTLLPGQFVRGRI
DTQVDSTTGVVKVRAEFKNPDGAVLPGQFVRVRLE DNSLDATTGTMMVRAVLDNDEGRFTPGMFARVQL

DNHLDSTSGTI K LLRAVLDNRNGRLVPGLYVRVKL
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DATYNQQTGTFLVRAEMPNQEGVLRPGQFVRV
DNQLDARSGTDRVRARFDNPNGTLVPGLFARVRT

D SVI DETTGSVKARADFSNSDRILLPGQFVRVRIE
 DNRIDSATGTIRARALLANEDGALMPGMFVSVKVASG
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N
NPELLDT
NSEVDSSGTVR RARLANPDLVLQPGLFGRVQV

 D NQVDPTTGTLKLKAEFPNGKFQLWPGQFVNVRLKV ENRVDPQTGTLRARARFANPDFALQPGLFGRVELE DNEIDARTGTI AVRAVFDNPGQLLDPGGYVTVEL
 NS QVDEAT GAI TFRAKFDNPSRLLTNGNSAKI QIP EADFNNETGNIAFRATFPNPNGLLRHGETGNIQM EPQDSSDTRNVRVQATDDNPEHLLKPGMFATVSVVL GGQFDESTAAI AVRAVFPNENGLLRTGNTGRVRLE DNQVNPRTGTLQARAVVDNGANELTPGLYVRLQLIM DTTVDPATGAVSVRALVPNPDQALLPGSFVTLKANLG SPGI DQGTRNVLI RARFENPDLALRPGMFARV EFEVDPTTDSVVIRAQFANPDHHLLPGMF DHGRVENG D NRLDTASGTVRVRADFDNANSQLVPGDYARVRLGGG DNKI DKDSGSVQMRATFDNEKGWLVPGAYMKVKL





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UniRef90-M4ULW2 UniRef90 $\times 4$ 4Z4D UniRef90 UPIIOOO47A8615 UniRef90-K9DGC5 UniRef90-14N6H0 UniRef90-UPIIOOO477D9E9 UniRef90 K2QHS6
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TLWDDFSGRLEAVNRVELRPRVAGAI DTTHFTEGALVKAG
TPYHTFDGRTEAVNDVDIMPRVGGELTADHFKDGDMVKKG
TAYREFTASMEGSRDVEIRPQVDGYLDK SVDEGAYVRKG STSYPATIKGTQDI EVRPQVSGFIVKLCVDEGATVRKG SREYAANLEGKENVDVRTQVEGYLEKVFVEEGSFVTAG $\square Y L E A V S T L R A A Q G V E L S S E V A G L V S E Q Q F K Q G D N V A A H$ GTVTAANTVTVRSRVDGQLMALHFEEGQQVKAG WDEYTGRFEPLQQVEVRPRVSGAVDTINFVDGQ\|VNTG LTEDLPGRVTAVRTAEVRPQVGGIVQRRLEEQGAEVKAG LTLDADGTVQALNSVTLRSRVSGQLDEVLFQEGQDVEQG TLWESFTGRVEAPETVDLRPRVSGYI HEVAFEEGELVQAG TVESVGSTRALESVTVTPEVSGRIATHHFAEGRVGEG ThDRDYAGNLEAVQNEVRARVAGYLDKILVDEGKAVHKG VTKDYVSQUQASRHIERALERGYLQKIFVDEGQFVKQG SSEFTGVI AAVKTVELRPRIGGTLESVTVPEGGLVERG

## TET

 T Q LQ AVGRLEAVEQVQURPRVAGFVTADNKPGSQVKKG PG GLRAVR DEQELSGRVKPKFISEVRPQVTGDVQEQLFKEGSFVKKG ASLKGQQDIE:RPRIDGFIDALYIDEGSLVKKG EYVAQLQSVNHI ELRSQERGYLQKIFVDEGQFVKKG LTEDLPGRVAAVR\|AEIRPQVSGIVQRRLFEQGAEIRAG TDWDEFSGRLEAVERVEVRPLVGGTITAVHFKDGSVVRKG
TV VSADGTMNARATAVVRAKVSGEL TQEFSGRLEADDVVEVRSRVSGYVTVNFKPGAEVKKG TQEFSGRMEADQRVEIRSRVSGQI DAVAFTEGSLVKKG DDNDFLGTVEGKYDVEIRPQVEGVLQQAYVDEGDHVEKG TEWDEVTGRLEAPESVIGRPRVSGYIDRVVFQEGTLVKKG
 GTVVPITNVTVQARVSGYIMNVAFKEGQHVKAG TMYSDYPASLKALQGVDLSLEETDGTVTKLMFESGQQVKQG TVTKEYVCQUKSDRNDIKAQEKGYLQKIYVDEGQHVKAG KTAPGTVKPLNSATIKARVDGLLKKVLFVEGQLVHAG TPGVEAMGTVRAVRGVDLTVETAGIVKE:SFHANEKVASN SVKEEYSALLEGKVNVE:RPQLDGTLQKIYVDEGASVKAG


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80 DVLIFVI|DPRPYQAEVVDRAQSDWERAQRLIGDSATARRDYD
 QLLFKLETKSLNQDAQAAKANVNAAQVEVDKDKPLVEKEI QKLLF QVMPMLVNAQYEKAKAEYESTSIEFENTEKLFKENV

 A $Q \mathrm{~V} L \mathrm{~F}$ V A PLVQL D P L F Q L APLYRI EPDLFEAAVKQAHAAETLLAADQLQRAQELLDDRNA

000 | $Q$ | $L$ | F |
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RLLIAS
E L L V T DVLVVI DPEPF QAELDRAEAQSAFTKNELDRGQKLVDSRV
 QVAYEAAVTTARASVTSAEAALKDAERRVQRNQELRRTQA DLLAAVIDPQPYKVGLA QAE GTVQQTAACQLKSAEEDDLRLYE $T P L V Y L N D D E L R A Q Y Q R L E Y T K K L F E S Q E N R Q K Q L L E K E A$

 D L F K I D P A P Y A A E V D R A Q A Q L E A A K A RVV F N IV T K R D F D Q
Q P D L $\vee R$ F LMFEI DPAPFQATLAQAKRDAARMETQYKGDVVAKKDFD QP F RI E P DPYQAIVA QREADLHRAQAEHTNSQAQLRRGE

 Q Q
QVLLF F V:

## Q

 A PLV Q L \begin{tabular}{l|ll|lll}
$Q$ \& $L$ \& $L$ \& $A$ \& $R$ \& $L$ <br>
$Q$ \& $V$ \& $L$ \& $A$ \& $R$ \& $I$

 D L L F Q I $\begin{array}{llll}D & V & L & D \\ \text { Q } & L & L & R\end{array}$ 

$Q$ \& $L$ \& $L$ \& $F$ \& $Q$ \& 1 <br>
$Q$ \& $L$ \& $L$ \& $F$ \& $Q$ \& 1 <br>
$D$ \& $L$ \& $L$ \& $Y$ \& $V$ \& $I$

 

$D$ \& $V$ \& $L$ \& $F$ <br>
$A$ \& $V$ <br>
\hline
\end{tabular} QALVEQ QALF K

 QLMF Q I | $\mathrm{D} P$ | L | F | T |
| :--- | :--- | :--- | :--- |
| Q | I | L | D |
| R | L |  |  |



\section*{} DVLF V I | Q | I | V | A | E |
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| D | I |  |  |  | | $D$ |  |
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UniRef90 H1HMM4 UniRef90-R1H545 UniRef90-D7A356 UniRef90-S2KFU8 UniRef90-J3AVM1 UniRef90-B3PI34 UniRef90-S2D077 UniRef90-UPI0004764830 UniRef90-F2LY59 UniRef90-14YNYO UniRef90-W2CKM7 UniRef90-U2Z819 UniRef90-M5UPD0 UniRef90_D8JE60
UniRef90_B4ULK8 UniRef90_B4ULK8
UniRef90_UPIOO036516BA UniRef90-G7QDA1 UniRef90-W0DIS6 UniRef90-UPI000346F360 UniRef90-F8TUH5 UniRef90-K6YD98 UniRef90_Q217H7
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UniRef90 E1QKYY8 UniRef90-N2IRD5 UniRef90-UPIO003B78152 UniRef90-A0A024HHG2 UniRef90-V8A623 UniRef90-L1M6S0 UniRef90-UPI00042021F6 UniRef90-G8T7S5 UniRef90_UPI00037EE5E8 UniRef90_UPI0004075668 UniRef90_A0A011RBZ0 UniRef90-B4SG85 UniRef90-XOP7N8 UniRef90-E8TXL7 UniRef90_UPIOOO347021D

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 VSPNELALAKAKLDKANAEVRLMESRLSFTDVNAPFDGMM

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UniRef90-F4C8T6 UniRef90-K4IX76 UniRef90_G4F7J0 UniRef90_B5EJA2
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UniRef90 W 2 CKM 7 UniRef90-U2Z819 UniRef90-M5UPD0
UniRef90-D8JE60 UniRef90 B4ULK8 UniRef90_UPIO0036516BA UniRef90_G7QDA1 UniRef90-W0DIS6 UniRef90-UPIO00346F360 UniRef90-F8TUH5 UniRef90-K6YD98 UniRef90_Q217H7 UniRef90-A6AQKO UniRef90_UPI00047A43C6 UniRef90_R7DGS8 UniRef90_J9GE84 UniRef90_C7PGW4 UniRef90-AOKVS2 UniRef90_UPI00036997C7 UniRef90-A0A011R256 UniRef90_UPIOOO4678919 UniRef90_B8EKM3 UniRef90_L9PBK7 UniRef90-I8TC87 UniRef90-D5RML7 UniRef90-R8AZW7 UniRef90-Q0A9F2 UniRef90_UPI0003713A77 UniRef90-UPI0003FAD5B6 UniRef90-Q138E6 UniRef90_G7ZAV3 UniRef90_UPI00037348E7 UniRef90_A0A031J087 UniRef90_R7D188 UniRef90-F3ZUA0 UniRef90-UPI0002E0950B UniRef90_UPI000479EC8B UniRef90-AOKHS7 UniRef90_A6LC35 UniRef90_UPI00047B8F24 UniRef90_S9SCC4
UniRef90-M4ULW2 UniRef90- X4Z4D6 UniRef90_UPI00047A8615 UniRef90-K9DGC5 UniRef90-14N6H0 UniRef90_UPI000477D9E9 UniRef90-K2QHS6 UniRef90-E1QKY8 UniRef90-N2IRD5 UniRef90_UPI0003B78152 UniRef90-A0A024HHG2 UniRef90-V8A623 UniRef90-L1M6S0 UniRef90_UPI00042021F6 UniRef90-G8T7S5 UniRef90_UPI00037EE5E8 UniRef90_UPI0004075668 UniRef90_A0A011RBZ0 UniRef90-B4SG85 UniRef90-X0P7N8 UniRef90-E8TXL7

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180 D SKVPVVELGLANET

190
SRKGT\|QS RALKTLADEKMPGADDRVPVQMTLLS D S SKMPVKGKMQF DFMSDAEGKTTSEK $\mathrm{D}_{\mathrm{G}} \mathrm{G}$ TPGI QLIMANSR NFTSDRKS

SDKPDKVKFLMANNQFF DYK\HKQDNEPTKVKLRMANGQDFNOGGAD $R Y T E L L G K G Q R P G Q S N T V R V G L A N D V G T$ KYLRQAKAGERGSSRNTANPVEVQLADEKGFRWRGRVD TMVRQYGTKDNA N
 RLREE $\square Q A G Q \square G G A S A E P K V R F T L E T G T P Y A P E G R I S L T$ $R V Q Q G \quad$ GDRPDPSR円AVR $\operatorname{li}$ RSDGSTYGQVGRVNFV ELKEKLEGAAQDNPHGQAVPVRIGLSGQQDFPYRGQLDFV
 R T H V

GLTKT A G S VGEA $\square \mathrm{K}$ E KILGQTIKI SVDAYPQTEFSGKI SAII
 R $\square$ GARVATGAVLPVTALDRTRTVTLD

DMREENNNRGKQEIAARKYVPMLRLSNGSDYP $A \backslash R Q$
$R \mathrm{Y} \mathrm{V}$ S $R \square K$ Q Q LI
 RALNS IADASGKRGNLDQIPVDMVTS GG A LLKYQRDAR KY IRLAK SGQRESSRG A
QVRAATA $\qquad$ HRKQLSEGRVVIGQS G SGGDASAAVVHLGRLADGTRYEHS EVVGVA QRAGPVMVGALDRDQIAFTRSE KVHKDQKA V V RADNSVGGASGKDDRDPVEMSTST RVRNAIDVARGSNDEKINVDVTMSLSDGASETAKGHI QLI EFKNQFPGNTVEQK $\quad$ K Q $\| P A V E L L L A D N S V Y P Q K G K V E V V$ DLVQQYGS LQKTMEQMPEVELMLSNGKVYQYSGKI DAI SLTK AGGTLKEQLGKMPAVKLQLADGSIYQHEGKI DAV RFSKGAAGSTLQQQLQRMRPVTLVLSNGDDFSEKGRIEMV
K K VAAAAAA $\quad$ GGKKTEGQS
TITQARKNGTDS
VEAWDRTNTRKDATGTL LSL
RYARLATAKERPSSREFKNPVMVRLADETDWTHSGVMDFV
T L R G D A A
KL
RLLRAMQAGPV
NOPR PVETVPVR
NDQPRRVRIALGDNGEAERGTLLTV RLDFSVPERFLPTLQVGMPVVLAYSDGYGGAFEGEVRFV
 DFRQNQKS DSKPVVKLLMANNQYFENSGIVETI GF LGQTRPETVGRQGTPFPVVEVGLATENGYPHSGALDFL AFQRRFDVSRPAQAAEKYVP TLILPDGSEYAEQ R VGA AAHKGQPAVVRIGLA $R \quad R G S S V T V T S D A F P D R T F T A R V N A L$ NMTK AGGTDKEQLEKMPAVKLQLSDGTMYDAEGKI DAVV TFLSELEGNTQAEKIKNAPQVRLTLANGTEYPYVGKI GTI AVVAAARANPQLTVEAWDREERTALGD KLKKVLPTNDFRN TVGTLILDDNTIYSKKGVLSSLD
 RARRNVKFGEQDTTRSWQPTVTVTDADDSEYPVKGIVDFA NY円QKNK R/VNS TVREALASSQAAKTS RFSANTAQGARTP

GLIP K V
K L A QRLA
RVSRR
$K Y T Q L A R$

## RVARAAQQ

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KV

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210
220
230
D NR|L|DTSSGT|I|R|V|RARFDNADGS|LVPGLYARVK|V| $D N Q V D P S S G T V R V R A V F D N A D G R L M P G Q F A R L T M$ EADFNNETGNI PFRATFPNPMGLLRHGETGS I
 EGEFDSETGTI PFRATFSNPERLLRHGETGNVVVHE
 D N QVVDP A T G T $\quad$ I R V R A V L P N N P E R R D NAI DPNSGTI RAHAVIANPDGFLTPGLFGRARL S GVI D K E T G A V G L R A V F P N K S R L L Y S G S S G NVLI P



T G Q I N Q N T GT I K I R A A F N N P N E I L T N G N S G K ll R D N H L N P N T GT L Q FRAV L A N P D G R I R P G E F A R V E M P

 DNQVDTATGTFRLRAVFDNPDGRLVPGQFARVRM


 D N QL D T R T G T L R V R A L L A N P D G R L V P G L Q A R V R M QV D S K I D P K T Q TVVKAR A VF ENKK G ELLMP N QFAR I K V
 SGVI DPATGTVSLRAEFPNAGRLLHSGATGNIVMP D NA DASS GTIDRLRAVVNNADGFLTP GMFGHARV
$D N R F D V D T A S M R A R C I L S N D D Q V L L P G M F A R V R I P$
$D \square A V D E A T G S V T L R A A F S N S N N A L L P G D Y V R A E L G T G$
$N P E V V P V T R N V R V R A T F P N K D G R L R P G M F V N V A V$

DVTVVPGTDTVLI R SRFENPD GLLLVAGQYVGVLVESG


$D N Q V N G Q S G T \square R V R A A F D N A D G R L D P G Q F A R L R M$
GNKIDDLET GSI QA EA QF DNPTYSLMP GEYGNDLTMKL
EGQFDKTMGAINFRATEPNVNGLLRSGNTGRVRIP SGTVDSGTGAVSLRASFKNPDKLLRNGGSGKVIVPT
 DSRVNPTTRAVIVRAEDPNPDLRLLPGMLMKVKL D PKVVDRNTRNVLVRATLKNPGHRLIPGMYAKAHVVTG



GNTVDATTGTI QVKASFPNA QRRLWPGAFVTDRLPV





 D N R | $M L$ | $L$ | $N$ | $E$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $T$ | $K$ | $V$ | $K$ | $L$ |

 $G \square N V D S G T G D V L L R V L V D N P K R D L L P G M F V R A R V P$




AFKADPATRTFKARVVLDNADGADRPGMDCRA
 DNDI DPTTGTLRARAEFANPEAELLPGQFVRVFMK D N Qi D T T T G T



 $S G Q F D Q A T G S V R I R A V F R N P E G V L R S G N T G K V V I E$ D S RVQTDSLDI KVRVVFDNKDNALKPGMLLAADI


 TK D Y V G T I I E E K M G S T L S F E I A G NI T S IVRV E E G D R V S K G





WS DF S GRI TAVERVDVRPLVSGRI EQVMFSDGELVEKG $T L K S G Y T A T L R G R Q F V E V R P Q V S G D I T E I X D N E G D A V H K G$ TE W WE F T G R L L D A S A S V V TEKVEVVGNARATRAVVLSAEVEGRVMQVHFQEGQAVDAD $V A A L G S M A A S N T A V V R A Q V S G V L Q S L N F R E G Q Q V E A C$ GTVTAANTVTVRARVDGQLMALHFNEGQEVKAG TETATGSLVALQGAALSAQVAGIVNTIDFRSGQDVNKG Q I Q AVGSI RAA Q GVDVT TEVAGLI RQVRFKSGDEVKAG
 DYTGFVQAQQEMELKAQVSGQITAKYFKGGDNVSAG
WDTYVGRFEPSRAVEIRPRVSGQITAVHFADGATVRRG

T EWD LVILE YVGQTA GLK QV EVVRARVGGULLRRCYVEGRPVRKG

 GTITAANTVTVRSRVDGQLMTINFQEGQQVKAG
 SKSYI GRI EAIEDTNITARVTGYLKARHFQEGQMVEKG VSLVG SVVKVQGTVINTEIDGTVKEDKFSAGADVKA G

 $T L S S G T V Q A Y N T V Q V R T R V D G E I Q Q V A F R E G Q T V R K G$
 LTKD YPGYLT TEQTVNLVARVNGALQSASFTPGTRVKQG

 T P HL


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S D
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D Y V G LI I K A A S R V
$T \mathrm{Y}_{\mathrm{Y}}^{\mathrm{T}} \mathrm{D}$

| S L |
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| L |

    VTY
    T T WE D FVGRVEAPERVEVRARVKGMLEAVLFKEGETVKEG
T WEDFSGRLEAIERVEIRPRVGGAILQAHFREGAILVKKG
VY LT G LG TVVQAFNTVQVRTRVDGQI TKDAFKE GQFVKA G

SLSFEYAARLKSI QSVGVYARVQGVLLSKNFKEGDUVQEG
TYYEEFPATVTALREVEI QPQVSGNVTGDFFQDGQHVSKG

T P S DTY TGRVEAVDTVVI RARVEGFI EKRLFDDGA DVKA G
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80
DVL|F VI D QR P Y Q A EA N RTEAAAAELAK DE L N R S VK L FA EKA

 SVLIQLDNQKQKNDLAAAKADVELSELQYQRDALALLKKGL



 DLLVVELD DRQAE GERDRLLRAEYQRALSSYQRASRLI NSRA $Q P$ A Q D P R Q A D G A L A R DKA QLA GA QVD L L R Y R DL F S K DA
 QV L L E L N DT D D $\square A L L Q Q S H K A A A E L A K T A Y D R D R T Q Y E D K A$


##  <br> T

## D


 $A L L A E E D P S Q F K V A L A Q A Q A T L A N A R R D L A R Y Q Q L V K T N L$
 DVLVLFDDEDERAELREAEVAADRAQLSLTRAKELSKTRN ELL A T I D P R Q F E M A L M Q A E A Q L D S A R V Q L Q R Y K T L L E E Q D S



## D

## A

 ELV A AE I EVI AEMDRRSFRAASLAQVQQGSDARDQAQLKNAQLDARQRYK A TVQUDDKQYRSA N S A RADVERYQKLASVNGIAQQTVD SLLLALDDAATQAAAELDQAKANDQLTSENERRAKLLLEKEA D
## D

QLLFKI QPLFHIDAHPYQEVVNNTRASLQAAKAAMESAAINVEKLT | $D L L V E I D P R P Y E V Q L T Q A Q A T L A N A K R D L A R Y Q Q L A K T N L$ |
| :--- |
| $D V L A E L N A P G L D A Q Y A Q A K A D L Q V A Q A K Y D R W R S M G K S Q A$ | ELLLVA QDTSSEKAQ LAGALA QAELARSTDLRTERLLPERI



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UniRef90_J2XSY4
UniRef90_R6C413
UniRef90_C1DLW6
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UniRef90_I3I795
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 VSEADLSTAKAQLAQVKAQEVNARNNLSYTVVKSPADGVV



 ISRQELDTQQSLVSETEGTIKSAQLDQLD VSTSELDMARRNVNAAAAQLRAVQSRQRDRVLVAPFDGVL ISQLEFDNAENDVKQAQARLNYNRAVIAKKTLRAPFDGKL

CC C
$\stackrel{1}{V}$ VSRDQVLQATAAVSNAEATLNTAHTNLGYCYIRAPFNGTV VSDFDRQTARNQLLQAEAALDNARNNLSYTEVKSPVDGVA VSAQDMDTTAAGVVQAEAAVQGAELQLSYTKVYAPUSGRIC ATASSLDQQLALANAARASADQARASUGDRVIRAPFAGWA TASNELDKDVTDIDDARAQLAQYQAELDARYVRAPFSGVL





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UniRef90_M4SJ32



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| UniRef90 RoELX6 |  |
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| UniRef90-UPIOOO4772878 | EVARNFKQNVSDDNPKNKENTTLILADGTTYEEKGSVQFL |
| UniRef90-A8H1P6 | RLDLQTPENYLS QLSVGMSVTASSRAWPQKQF ${ }_{\text {IGK }}$ |
|  | HegTVPVAVYDRANTVQL |
| UniRef90 G1UC | VARALREREENPSLIPPLP VQAWDREQKHL |
| UniRef90 STTZ16 | RV AAMQRAMUEDKCMTVRVTSNALAGLILDGT TAT |
| UniRef90-UPIO003B3FC87 | AIQKRTAQGASTPADADDSTRTQTLDT |
| UniRet90-Q2YB72 | QLGGPLNEKKVK |
| UniRef90_G2IUD | RGGK |
| UniRef90_UPIO0029A2CBA |  |
| UniRef90-UP1000463D8EF | TVLARYRS GAKLPVEAWDRGDVKLI |
| UniRef90 - 5 XUG1 | SYRQQHQTPDRDP RDVPIDLSLRLPNNSVFPGKGVLDFA |
| UniRef90-UPI00037D5736 | LSKGQTAPVMFDAYPNEKWSGVVDFV |
| UniRef90-F6DLL8 | R $\square_{\text {K }}$ KAGQEVQVKVTAVSEKPLTGKI |
| UniRef90_UPIO00366DE4A | ALREALHAGPVA VTAMPNDGSKTPV |
|  | R\\|QTQMA KGSLPVIAYTQDGRTRLDEGKL |
| UniRef90-AGUB37 |  |
| UniRet90 E1QEK9 | KVHVQVAAEGDRLFDGE |
| UniRef90-H1Z979 | YFTKDTKSTRDTSSGQILPEVTLILADGHEYGEKGKVDMV |
| UniRef90_D5WFI9 | R YVDVPQDDASLVGA GTAVSVTTQQYPGRRFEASVARS |
| UniRef90-A8ZXR4 |  |
| UniRef90-S6JE | GNTLQLELDALP |
| UniRef90-S7TL80 | RLPEVLTALDRGKAEGQPLAVEAWNRENTQKVADGVL |
| UniRef90 U1KJJ0 |  |
| UniRef90-UPIOOO289C4EE | QTKPGTKLSFTV GKARAKQVEMAGQQATFQGSVYAT |
| UniRef90-G8MW38 | RL ${ }^{\text {L }}$ GQKVTATADARLGETFAAKVTA |
| UniRet90-R4WP | K VELATGAGEG |
| 5z | NVAV GQPATLIVAALGNKSLTASVERI |
| UniRef90-D4ZJP1 | HTR NGESDSTAYDRSNHPLVGSLKTM |
| UniRef90-D5W6S9 |  |
| UniRef90 G7ZFW7 | AVV LAAQAQGPVKVEVQDREGRRVLDTGSLAVV |
| UniRef90-L9PE64 | GVMKQVNDGASLTA ${ }^{\text {a }}$ ADRTRTNALDN |
| UniRef90-UP100038094FC | ELRRQLNEAGDASNITARLRVPGGLSGSDSELEGRLEFL |
| UniRef90_UPI00047AE177 | R P PGEACRDKISALDEAEFEGKIMEK |
| UniRef90-A7K4 | Sold |
| UniRef90-I4AP83 | EYKEHEKKDSLLS |
| UniRef90-UPIO002E466115 | GLQDAMASYPAL EGGMPITLLGRDGAPYDVAAHLLFS |
| Unif | LVDFRLPERFVG QLRPGLGLRAAPLARSGTDL |
| UniRef90_U4ZYU8 | RYFSRTTV |
| UniRef90_AON | GTVRQV |
| UniRet90 Oplooo380045B | RTN HALQTSGTPLAVAMERESGKPLGRGS |
| UniRef90-12GJA0 | SVQPGSAVSFLI DGSNQPGQGAVYAI |
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| ef90 A8ET05 |  |
| UniRef90-F8GE69 |  |
| UniRet90-V5SIF3 |  |
| UniRe990_F5IU83 | PDDE |
| UniRef90_G9PS85 | QLEYFKSQGAVYKTK LVLSNGTEGAAGSRDFE |
| UniRef90 UPI00045EBD5C |  |



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1
 QAVGSLRAAQTVVLRPEVAGRIAGFGFRNGERVRRG LE L G R EAWSRAPI YARVSGYLKSWSVDVGQPVKAG TEYLQLDGTVEAVRQSTVSAQTSGTVKADYFDVDDAVPAG 1 MREYTGSIMALQEVPVRAKVSGTVMEKYDTGGQQVTEG
 $\square P G T L R G F V E S P I Y A R A T G Y L L H W Y D D \square G A H V K Q G$ WREFPGTVDAAQKAELGFRVSGKLHSLNANEGQVVKEG TEWQSYSGRLEATEHDQLRPLVGGTIVSVHDKDGGVVKQG MSAEAVAQTEGAKEVEIRPRVGGILLKKLFEEGAPIKAG YVSGI GSVLSLHSVVI RPQVDGLLTRLLVKEGQLVKAG
 $\square T L Q G E V Q A D Q R V T V R A E T A G R I A A L P V E L G Q R V R A G$ $A V G T V T P S T T V I V R A Q V Q G T L A S I N F R E G Q V V A R G$
 TSELNLPGELESYYETDVYPRVSSYVKALHVDIGDQVKKG

 VEA】

 $T V T A T G T 1 E P D T K V D V G T Q V S G T V S R I Y V D Y N S V V T K G$ TYPATIKGIQDVEVRPKVSGFITHLNVHEGQYVKAG VR LT A NGTVSAQQMVAVRPQLSAMI RAVHIKK GQFVQKG S RNFPATAVALEEVELRADVVGYITGIHIKEGQQVKKG R SGSLRALNQASVKAKVSGEVLQVLVREGEAVRAG


T DELKKALGTAQARESVTワTASVTQADASVEFESGQYVGKG TLPGNTQAFTDTPIYARTNGYIKAWYADIGARVKAG VALIJGKLEADRSVFVAPEVAGKIKADKVTANQEVTAGG RSFDSQI NSDNEVVVEPRVSGFLVARHYKKGMPVRKG TTS SGNIEGSRTVRLGFMVAGKLNF AADEGQPVRKG VEALGTAKAWEFVSIRAGVTEHISRVNFESGQRVKAG UATVEPVQEVMVRSEVSGYIDDVHFTEGSFVKEG VTLYGRTEASREVMVKAETPGLVVALGPQEGDRVGAG I DLPGTLEAAHQVAVVAQASGSVLRQHVQEGDSVRAG YLELQGNVATKENILINAEHSGTLQQVFVTEGQKVRKG VESLGEVRGRYEAALGGRVPGKVVARHVETGTRVKAG TVTNSYVGYAEATNQVQITPYINGYLQEISVKAGQFVREG VGKINAI DSAALTFSAGEKITAI HFRDGDTVGKG SYVADVQALQFVEVKPKVEGFVQQULVDEGEKVQKG YVEMDGQTFGYYDIQI RARVEGFLESRHFQEGSRVKKN LERSYPALLRSDNEVTLVARVTGFLEQRHFEPGEMVKEG EFDGYLASNFDAVIQPRVNGYLDTKQFANGMPVKRG $\square Y K E W V G T T E G L V N A Q I R A Q A N G Y L D K Q A Y Q E G Q R V S Q G$

SYSGTVEEGNGTYLSFPVMGTVKTLHFHLGQHISKG SVTATGKI GPVDTVTVGSQVSGII KYLYVDFNSKVKKG TDGLSVSGNLLPDEEVQLSFETSGKITGIHFKEGATVQEG TRSUSLYGRTAPDREATISSEADGRIVSVSVKKGATVKKG LPGAVAPFADAAI YARTSGYIESWRTDDGTRVKTG

 WH T Y T T T R L E S P Q E V A L M P R R V

 TRE $\underset{S}{\text { N }} \underset{\sim}{A} Y$
 $V P$ VR A S G R G $\quad$ V

 LTVEATGQRLESVRTADVGAQVSGQLESLTVEIGDKVKKG



 $E F S G D V R P R V E S R L G F R V G G K I A A R L V D V G A V V K G$
 TKTYVGTVEESYGS QLSFATMGTVSQVFADEGKFVKKG

 S F T A TVVEA K A V N HI T P A M G G R I R VI H V D I G S R V S K G

 GTVTASSATSVVKA QVS GPLVEVRYKEGQUVKA G

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UniRef90_D1XX23
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UniRef90_B5XQM3
UniRef90-I4N0L5


QPLVT LVQGQQAA GVA EAEA QLRNEE QLYERSRQLAAER QLL QLL AT T ETPEDD Q QL Q QA LA DLATAAQANYERWEFLLTKTDS
 QLI F E I D D S E Y Y T AL L SA QA A L E S S RA NF DRAVPPLA K DN A QL L A S L D P T N Y G DA K E L S D V QV A QVS DEYNRMKMMH D R N S


 Q V L A DL L M Q V D P K D I Q E A V T A A K A QV D A A T S Q Y N LAA A DL L N R F N


 QLL $\quad Y$ T I D A QP F Q A K V A Q A Q T N L V







 Q I V A Q L D A T D F K N T L E D R E A V F E N T E R N F R R A G E L I G S G S


 DVLIE I E P D S Y Q G Q IQ A A QA GKK I A D DE LDD R QQ K LVY A K G D , QLLVRLD






 Q L L A Q A E V D R N R G A L A N A Q S QLL I Y Q Q A Q Y K R Q D Q L $T V L A T L N P D E Y D L L A Q Q A Q A Q F R L A D V Q Y Q R Y K K L R Q D C K$ QTLVTMDAANYSQQETQQLATARRDYERYSELYKVGG QVLV E LDDNSVEK A N LL LA A E A K L P A A K L T Y N R Y L A L M K T N S QV L V E L K A D Q E T A G I A E A Q A Q L A Q A E R E Y A R WK T L A D R GV DI L A R I D P R P F D L A V A Q A Q A QL L K K D E A L L Q N A E R D L Q Q L D UniRef90_I4NOL5



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 V S Q V Y D N QK A A A D A Y K G A M D A A Q T N L S D T IV T A P F N G KL


 A S R QQLD T QE T AVQQDSGSVDNLRVQL
 VSRADLETRRAALEAARARVATARATV $V$ SKQE TDE K $\square A T V D A S Q A N V R R D E Q T Q G F Q V V Y$







## I

## UniRef90 F0JK45

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UniRef90_R5YLY9
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UniRef90_UPIO002F0BFE1
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UniRef90_A4WUU5
UniRef90_F2BYA8
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T

## D

G




LEKKVVFVGGQYTMAPGNED PGSPGQTGELA



 $G L R Q V S E G A Y V N A G T V I T$



 GEVYI EK F Q DVVKAT QPVISFI DID RLRMEI YVTQD
A N R S V T T G Q MV S P Q G S S L M S V E D L S S V Y V V V N I E Q K D



 SQRSVVMGNNV DPGQS CFK LVVKLDNDKVKVSIPEKEDA



 $G L R L V D P G N I V Q T N D Q N G \square A V V T R L S P D T V I D T L D P$ T E V


|  |  |
| :---: | :---: |
| UniR |  |
| iRef90 F3L |  |
| UniRef90-C4SPA9 | SKALDTNSGSMLVQLAVDNTTGELLPGAYANVRFE |
| UniRef90-E6W526 | YPYADPSTHTFRVRIDIENPAASLFPGMLVRVEVPV |
|  | NP NMNG |
| UniRef90-B6J | DNTVNSRTGTVLLKASMPNKNELL |
| UniRef90 E1V4S3 UniRef90 | GSRUDEGTSTVQAQATFSNPDGQA |
| UniRef90-Q2SAR4 | SSRADEATRLFNVTFSMP |
| UniRef90-S6AQC4 | DNQLNTGTSTLRVRARFDNADGA |
| UniRef90-UP100037 | ASGIDPQLGTQLLRATFDNEDKRLLPGQFARIRVITG |
| UniRef90-14XP41 | DNQ DTNTGTIRAKAEFNN |
|  | SPEVDSRT |
| UniRef90 W7W | DSAVDANSGTVQVKAQFANPQQQL WPGAYADV KLA VG |
| UniRef90-B8GI | SARADTT RTFRVEDTVPNEERSL |
|  | DNRVDAATGTVMLRAQ |
| UniRef90 UPIOOO35F | SNSVRPETRSEMILEIDFQNKGGRLKPGMFASV |
| UniRef90-UP | DSRIDPTSRTFTVRAE |
|  | D R V ${ }^{\text {N }}$ |
| UniR | DNQ DLLNTGTVKLKGQFAND |
| UniRef90-A5PAU4 |  |
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|  | SQAVDVGSGTSRMQLTLDNASGELRPGSMY |
| UniRef90_UPIO003AA622F <br> UniRef90- D1XX23 |  |
| UniRef9c | DNVVDTASGTIGLKAEFSNADR |
| UniRef | DRAVNRNTGTVQ1RGKFDNNES |
| UniRef90-Q474 | NPAVSQGTRSLMVYV |
|  | G |
| 24 | GTR DPVSRSVS R |
| W1 |  |
|  | D |
| UP10003 | SNSMPPTSRTLLTEVDVNNPTGELLPGS |
|  |  |
| UniRef90 R7 | RTAVSSATGTIVLIVRFPNPSYRLKTGQFARVEANIG |
| UniRef90-UPIO0036D | GSVAD |
|  |  |
|  | D |
| UniRef90 UPI0003715592 | EAKADPATRTFRVEMNVPNDDLKLKAGVTATVTLSAG |
| $0{ }^{\text {- }}$ | DAQVDAATGAVPVKVRLATPPPALLSGQGVRVRLLLG |
| UniRef90-K2Q7M1 | SNYINPSNRTFKUEVD |
| UniRef90_UP100037 | SPVAD |
| UniRet90_UPIO003AA2155 |  |
|  |  |
| Q17 | A |
|  | , |
| UniRef9 |  |
| UniRef90_U7P891 | GSRVEESTSTVQASATFANPEHRVLPGQFVRVSLE |
|  |  |
| A5 |  |
|  | D |
| UniRef90-R5 | G |
| UniRei90-R5 | D |
| UniRef90-UPIO002F0E | SSTASQTTNTFTIELETPNPEQAIPAGПSAEV |
|  | S |
|  |  |
| UniRef90-UP10002D3FEA7 | DNTVSASTATVSLQVTVPNTDHKLWPGQYVLVQMPV |
|  | ${ }_{\text {d }}$ |
| UniRef90-A4V | DNRVDEASR |
| UniRef | S |
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| 0379E |  |
| UniRef90 I1D | DTRLDPVTR |
| UniRef90 UPI000237A9BC | DTQVQSGTDTVLVRGSFPNADGSLIDNQL |
| UniRef90-D7JCS8 |  |
| UniRef90-Lo | QPTPEKVNNAYYARFEVPNPQGLLRLQMTAQ |
| UniRef90-R0YB86 | ADPNEST |
| UniRef90-A811E0 | D |
| Unip | SKGTTRNNLSYLLTALCNEK |
| UPI000360B322 | SN R ${ }^{\text {a }}$ |
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| UniRef90_B3R4V4 | A A A AD |
| UiRef90 E1TBQ3 |  |
| Ref90_W6Z |  |
| UniRet90 UP | G |
|  | S |
|  | R |
| UniRef90 UPIO003AB342E | HPTINPTSRTFPVEIEVNNTEQRLRPGMFSRVILNFG |
| UniRef90-F4HC08 | EPANKSTG |
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|  | D |
| UniRef90_B5XQM3 | S |
|  |  |



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UniRef90_uPIOO03B3B18C

QVLVKJLDAEVVASLLRAAEAALEVAKAGARAAQANQAQLR

 $Q S V G R I D D R E V K A M L E A A R A Q M D Q A R R N R E M N E A L L A K N F$ E LLLA EMD R V T L Q S T Y D GTKKA E Y E Y Q K K N Y E R S K A L L H D K S L $D V I V R L D D R B E Q V L A R N L A E V A L E S A A R Q A E D N R K D S S S$ $D V I$ A R L N N VQ QLLA RVAE LS A VL T D QR R QLD RLLQNLAT T Q A QAL A YLDAPQARADLLTARAESTRKAREMARSHMLEDGGA S L L A K L D D R D A H N N L M T R E A E H E W L A A D F K R K V E L L

 DLLLVEMTNA E EHA L L E EAARVRA GEA ERRQYQRVVKALVA QR S


 DLLERI EPDLYQAVLEARRADLDKAEANLERKEELLRREA



 QLI A RLDDRRDQAQLDNAREDLARYVELARHGADDRKTLD $D L L V Q D D P R P Y K A T L A N A E R D L A R S Q A A L A N A Y A S K C Q T V D$ QLI AEMDRVT LQQSELASSAKAEYEYQQKNYERNKGLHEK QL
 $K P L F Q I D P R P F Q A E L E M A A A S L Q R A E A A L A R A Q L Q E Q R L A$
 QLLVQMDP AQLFQTKVQLNNLEKEYARLDTLYK $D P L F E D Y S P D L V S A Q E E Y L T A Y R S L S E T E G G S D L L A$ QLLFRID A R Q A R A A VA Q A I A A ERRAT LD YERAEKLVEKGF



 EVIVGKFTDAKAESNYDAAKANDLSTKNNFEKANKLUYEK Q M
 QLLVQMDPS
 QLL F QL S N K E F I N DLLN KAKAANMQSAAKAAAAR DA E LIEME R V D

 DLL F E L D D A E H Q A T L R Q A Q QV L N R Y Q SLLK S S DA I SR N DVD QVLVELKA EAEDA GIA EARARLA QAERDYKRWKTLA D QGI QVL MVL EAPE DQAQVVNAQAKWKAQEAMYDSTKATYDRTL




 QV L A Y L D D R D DR N ELQQDRQA NYELLA K V E F E RAN S L L K K K V
 QPLVRLDPDRARLAVAQSEAQMHKLENSVQRAQKLVGQQM
 KV L L Q V D DA L L Q S QL DA A KA S YENSKTNYYERFKNSSSSSEG

 D LLE TLDD DA QPRASLRRQSQQLLTRYERLIDNNHSDSRNDVD DVLFSLDDRKDQAALAKDQAMLASSQSDLQRAKDLVAKQA E L L A T L D P TAD Y Q VA L D A RQA E F DLLA Q S QL K R A E Q L FA K K L


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|  | ASARLRLDEKARVDSLEAQKAVVDAQLSELQVRAPFAGRL |
| UniRef90-UPIo003783C6D 1 SRNAADQNEANLRAAEAQLDLARKSLSDAVL |  |
| UniRef90-UPIO0037B2FAA US NLEVYNAEDA EKSAQLDLETAELNLARRQUVAPUSGVA |  |
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| flo A0A031JYM9 SRRLEGAQADAAGAGAELERARLILRNLGLTSSVSGYV |  |
|  | ISQSEFDNTQAQLKSAKAALAAARDQLSYTRLTAPFSGTI |
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| ef90-B4U8L7 | M |
| I3YC | ASESLLDERKRDLDTAHALLVALESRLADRVI LAPFDGVL |
| UniRef90-UPIO0041A6EE4 IVSRQEADEKAGDLAARRALSNAAQALQGFTRLSAPFSGVV |  |
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| UniRef90-Q5LTL6 TPASEVDITARANVKSAKAAIRQAELDLSYTEIDAPFAGRLD |  |
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| UniRef90-UP10002EF8D52 S T DSFDQTETSYQAALVSLEQAKTDLSYTTI SAPFDGVV |  |
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| ETLQRLQQREAELAAAEATVAQTDAKLA |  |
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| Ref90-V8BPD7 ${ }^{\text {a }}$ (LYKTYKQAKEQVASAQETVRKAQTNLGYATITSPDDGI |  |
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| UnRef90 Lom699 NARMQRDVASAAVAQASARVEARKVTLGYTRITASPVNGR1 |  |
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| A $\mathrm{N} V$ |  |
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| UniRef90-F6CO93 V V ${ }^{\text {V }}$ |  |
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| UniRef90-D3RP36 ASESLLDERKRDLDTARALLTADESRVADRFIKAPFDGVL |  |
|  |  |
| UniRef90 UPI00035EBB45 ESNDEMDRDNSGLAEAEVAYDRAKLNLSYTTIKAPFSGRL |  |
|  | VSQSSFDTASAKLKSAEAALKLSRDKLAYTTLTAPFSG |
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| UniRef90-E4T813 VTKMQLDASYLQMK SAESQLRQQEDSIGGKCKLIAPFSGTI |  |
| UniRef90 UPIo004785984 1 AESDLS |  |
|  | GSHADFEMSHAQIKVAQVNVDTARVTLGYTR VAPSDGE |
| UniRef90-WOBEL6 QAA QRLLLWG\TEEDIDEQLKRTGKITRTMTIHSPTQGTV |  |
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| UniRef90_TOJRK2 |  |
| UniRef90_R5C04 |  |
| UniRef90-J3C8V |  |
| iRef90-G31ZD6 |  |
| UniRef90 - UPI00039D8C48 |  |
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| Ref90-UP10003B3B13D K S R ERLELLDVPRHQ R L EQTGEDMKSLHVHTPLS GYV |  |
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| UniRef90 X6GNM |  |
| UniRef90-K7ACTO |  |
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## UniRef90 K4LC22 UniRef90_UPIO0029B1EF0 UniRef90_I4EAN6 UniRef90_G4QMH2

 UniRef90-UPI0003783C6D UniRef90_W4UVD7 UniRef90_UPI00037B2FAA UniRef90_UPI000476A5E4 UniRef90_A0A031JYM9 UniRef90_F7RS15 UniRef90_B6EL02 UniRef90_UPI00047627AB UniRef90_B4U8L7UniRef90_I3YCG7
UniRef90_UPI00037328FE UniRef90_UPI00041A6EE4 UniRef90_UPI00046E9242 UniRef90_W1YVY5
UniRef90_Q5LTL6 UniRef90_I9KXW0 UniRef90_UPI0002EF8D52 UniRef90_I3ZGR6 UniRef90_U6ZZT0 UniRef90-F4ARN5 UniRef90_UPI0002DB37EE UniRef90_W8X0C5 UniRef90_UPIO0036C8595 UniRef90_F3PWF2
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UniRef90-UPI0003E
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 DDRQINPGQQVGAGQ TPLYTVSNPRTLWLIDDVPDEASSS

 TK Y I T S PA D GVVAA K L N I H P GE K
$\begin{array}{lllllllll}G & F & R D & V & R & G & A & L & V \\ N & R & I & P & L & K & G & S & V\end{array}$ $T S R S A Q \square G A L V V A G N A A$





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## A










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TARNYDVGDMYSMSS P
SARNVQPGEKVAVD
 SARNVQPGEKVAVD GKLLDVVDLSSMELDAPVP T



 $T V P T V V V G A L V T T E N Q T D A L T T V T R L D P D Y \quad V D V A E S S R R$
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UniRef90_UPIO0029B1EF0 UniRef90-l4EAN6 UniRef90-G4QMH2 UniRet90_UPI0003783C6D UniRef90 W4UVD7 UniRef90-UPI00037B2FAA UniRef90-UPIOOO476A5E4 UniRef90-A0A031JYM9
UniRef90-F7RS15 UniRef90-B6EL02
UniRef90-UPI00047627AB
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UniRef90-13YCG7
UniRee90 UPI00037328FE
UniRef90 UPIO0041A6EE4
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MAASLNEYTKQ
QLNVNQKTRVSFINDS
 LPEANLPTFKKLLDAGEAPTVKADRSASTDVLATGVMDF MVEADAFSKDI RF MVEADAFPSVHLRSLVPGQRVEARTSAHGERVFTGVVRGV RIVYVRVPQGYSA YFAQYL RNKSNLTVFPWQ
DVLQQLGETETLD DTLTPSVSFD ViN AESQRSPEVHTLPNGT ALQQALRSGPVD GLSADKK
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EVQAAVRAARAVHHAKGA
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KRVEVGRGRPERLGGTLVLV GVEEGQRATFTVDAYPNDVFEGVVSA

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AALPPAAAE
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VPVGSPLTAVTQ $\quad$ IRRLGDATSSSSS
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KARRAQAAG $\quad$ LLHASVAESA $\square$ S VRK LLLHA

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APDAFDVVASFP
$-Q P G L G G E A T S$
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YF F EGMEA
LLATGNEDQGQSITAEADALPGKSFPGTVDRLD
RLRPGDPAYFTPSHRYETTQKFTVDAFPDEIFHAKVHQV ${ }^{\mathrm{K}} \mathrm{S} \mathrm{K}$ TGQHADTHADK LLHKALA
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HTAVGQEAFFT\|LGDAGRRYSSRLRDIAPAPENGHNAFI पPQAEVGELLRQLAAGRRAQVQAWDASDTRMLAQGELLAA $R$ VYVQv RV
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, RIYVRVPQVY SSOVHAGPAEIR AVPGRVFRGKVVY VGEDRNRFDTGSLQRGDRLEDNLELETGDTYSGEGEMVSP KIGDKAKVRLV RFSTGD
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 QLLASLDDADLKQAVKSASAQVRSAESQLKLITESNLQRYR QVLAVIDQRTAQANVSAAQAKVETARDELRGKQALFDEKV
 DVL DQLDDALLKSNYKSQLSKLELARVELVRNKKLLRNNS DLLAKIDPQEQQASLKQATATFERQKTLLEGGYTTRRDYD
 QLLAVLESRELADAKSSYLAADEREQANFKREERLWQKKV ALVAAVDSTDTKLSGERARASLQRNAEELVRGRALHASGS D PI AT QVLA DiA APELRRQKEQQAKEKGAAARVAQTQAVADERRAA QLLAKIDDGGLSQQLAQLQQQANLAKTTFERQKRLWDQNLL ELLAEI DTPEVDQQRQQATASLELAKSSAERWEALRKKDA SVLLELDSPNAEADFAKAQADLMFANHAFNRQQELYAGKA QVLAVI DPSDMEQTDQELRTNLELTNTDYEKQKRLWDQKD KVIARI DPRVFEAKVDQCRSALELDRAQFKRYESLWRQRL QVLAVIDSPDLDQQLAQTRAHMLQEQANARRWQNLLASHS

DVLMELDSEMAAAMLLASRTQLQFDQQNYNRपKALVEKGY QLLAEI DTPELDQRVSELRSTLAQARADFERWRTLREERA QVLAVI RSSE I A DLQNQA DARKNLSVLDDQYKLGLASERD DLLAQLDTRDFNDALDNARASYAAINSQYKRSKPLVAKGL DLLVKLAVKDRAARVEKARALVAQREDENSAAKSLAEKNY ELI ARMNGTSARNTYQDALLEQQKAQDAYNRLKPMYENGT QLLVRLASAEEFAEQREAQVALAEQRRELNRIRGLAADGI DLLALIDPRDAETEQARHYQLNKKEATTKKD EEAENKRU




 QPLMEDYSAA I S SAAAEY IST TDNS KMPDVASPERYG


 QKLASI Y SAELLSAQQELLEASK\KNDFPEПYQ ALLAAEI DPRDVQNRLNTTEAQRQRMESDRQSGYVTQQEFE
 QLLAQLESQNEQGQLTQARNHYERQETLLAQGWTTRANFE QLVALLDPTDLQNNLVNARAQLDAAEHRLVFAKQQLDRDE QPLALMDDMELQANVQSAESEQRRSDSELVRNEPLGRQGA
 QLLAEIETPEVDAQLLQARATYSGGAGSKQERDEAEASFK SPLADLLIPE WAAAQEEYLALRDVGEPQLLAAARQRLRLA


 QVLARLDTDRLEAEVIQARASLDSAKARFERCQKLAQRQL ELLFTLDSRQIDAQI EQATAQLAGARRDAKRFAELIGKGA QVLLELDNE I ARASVELASANEARTRSDFNQEYASRLELDD $M D V Y S P E L D T A Q H E Y L I A R R G L Q S V E D G G P E V L S S M Q H L A$ QVLAETNSDT $\square$ RASYAEAQAVLADAVTNNKRIQQLRNTGA QLLGVI DPEQAENQ GKEVEATLMELRAQYSRQQRLAQTQAA QKLALLDQTD LK LQQAEQAEAEHSAAKGVLAQA DASENRAK QLIVQLEDSEQQAALVDARQRFKRDEAVHERGLVSRQEFD $Q V L A S L E S E T G K N Q L A S A R A D V E R M Q A L M P S G A D A R T Q L D$
$Q T L V V L N D I L R A Q L A Q A E A R H A T D N A T T A Q R R A A L I K A D$ QEIVRLDAAI AEAQLLQAQTQLEQANATTAQRRAALIKAD TVLARLQQDVPKLKVEQAHGRLARIDRDTTSGTASDVALT EKLDQLDNALLKLQLQTVEDQUEGLETDVKRFTDLDAADA L ARLNPDEYALLEQQASANFQLADVQFQRAQRLRQDKV DLLVQLDDAKAEAALDEAQAYLNDEKRKYKEFERLVKRGA UniRef90_F9ZCK5
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TSRSELESAFANYKTAQAD\|IT TAKEDL\|Y T Q\| VAAPMDGT\|I EGGRRRRLENLA IPPEVIDDEI ERTHKVPPS VVWSSPRD GVV A A LLLS K RTAADA KVVVA A Q A A L Q T S R D R






 I S D Y QLAAVACAEELE QAKA QES DARNNDLSYTE I K S P S N GVV V
 $V$ S Q N S V D KL T A QF N S E S A KLL D Y DA T QI E Y M K V K A P F S G N V


- ELRAKGWTAQARFRRAERAVRELARNALD RATLRAGADGVV GSEEQFLDAKSTYESQEESVNQDKAQMSKTNVKAPFSGMVIV VTQQELNERSSAYAQAQANLAAADANVRFKRVVAPFSGVI VSRKELEQAQDDLSRASSEVRRAQDRLKNLHVAAGQDGHF
 VSRQEADEKTSNAAAARASAQAAEADYAYKTVRAPFAGTI GARKSLQTAEAKLAASHAEVIRNERLLNDRKVVAPFDGVI VSQQDVDERQSAYRAQMAAVEAQRANLNFKQVRAPFSGLV VS LaRQELRKAQSNVGKSRKQLSVYGVSTYYLRAPDSGFV RSKTGVAETKALGNEAKANTALARKNWQETNNGAPSGGVVI VPRQQVDQQRSRVEESEARLAAVEARLSDRVIRAPFAGVL VTAQQLEQARLQLKNAQANYNSASTQSGNTEVRSKISGIVVI NIENTYRAGAARVKQDRAEYDVARNQAGYAVLRAPQDGVI QELARQRRMHAQURQDQSQLDSRRTKLGYTRIQAPMDGEVV


## 1

$\qquad$ 31MJE5 IR5 was aictac

## C

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S S VVD A F A T A R R A A K V R A E T N L Q L035E80C4
AV S T
GMPADVIAQLQRSGTARPVW
VT QA R $\square D M Y Q A Q Q L Q A Q A S L R S D Q A E L G Y T R I I Y A P M D C T V$

CS QEELLDTTRAAYARAQAAEDTHETDDAKAVIRS$T T Q V N L D N A N T$ QADVLAGTIQADQSALDFTEIRAPFAGR।

I S A Q E LT Q Y Q A RLD A S R A QI E S N QL R L A Q T QV I S

QARNNLAAAEARVERARAGVDEAQKQLGYTRIVAPYSGIL
S A RAD WQ S A S S KL K S S T A A L R NAE Q NL S WT QLVAPA D GI I
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V S E Q DFDD QA QAAN HNSAA KA TVWE QAAK A N L

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UniRef90-W0H516 UniRef90-G7GA66 UniRef90-TOI7U0 UniRef90_V5FB62 UniRef90-B7B9Sg
UniRef90 UPI000 UniRef90_UPI0003473402 UniRef90-A0A059DXQ8 UniRef90_UPIO002DE399E UniRef90-W3RES3 UniRef90-A9BBD2 UniRef90-K6ZMU3 UniRef90-K2BP91 UniRef90-WORTT6 UniRef90-X5MER3 UniRef90_J7Q4B2 UniRef90_IOIRH0 UniRef90-G2ECT5 UniRef90-D7NCA9 UniRef90-UPI000382DDF2 UniRef90_UPI0003669C38 UniRef90_UPI00047B81CD UniRef90-A1VVV7 UniRef90-F2NFD1 UniRef90-M5QQ60 UniRef90-F0G384 UniRef90_K7YHI2 UniRef90-Q7NM92 UniRef90_UPIO00368998F UniRef90-U3B1R3 UniRef90-K2L3D0 UniRef90_UPI000365758F UniRef90-WODLU0 UniRef90_G7SRQ7 UniRef90-L1P4H3 UniRef90-M4XJS8 UniRef90_UPI000375DF06 UniRef90_C9LT55 UniRef90-Q39PW1 UniRef90-R6WUC2 UniRef90-Q1QM80 UniRef90-A0A031MJE5 UniRef90-W7YIR5 UniRef90_F3ZR17 UniRef90-c9KM66 UniRef90-UPI00016A4E5C UniRef90_UPI00045EC4DE UniRef90-L7UBU5 UniRef90-H7FS37 UniRef90-K6Y9T3 UniRef90_I2QQ15 UniRef90-D5WM25
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UniRef90_UPI00035E80C4 UniRef90_UPI00016C532A UniRef90-UPI00031E4FE9 UniRef90_U5VGX3 UniRef90-E3FQP0 UniRef90_UPI00042A5A70 UniRef90_G4SVN5 UniRef90-K1XTV7 UniRef90_U5T320 UniRef90-D5BUZ6 UniRef90-Q07NC3 UniRef90-D9SGX4 UniRef90_M5DJ49 UniRef90-N8UI86
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UniRef90_F9ZCK5
 VERNVSDGMKAKSGDVLFRIVDHTRVWVL ADVPERDLA TATGPDPGQQVVDGEMMVVRVAQPEEREAA $S Q P L F T V S D V K R L$
 L ERTAD

 $T Q R N I S V G A L A G A G S N I P L F M D A Q S N K D R L T L S L P E K H A S$ VGUVTQEGQTVIAQQAPVLLKLADDDTMTVKAQVSEADVI
 SMRHSNAHQVVAPLQPI IVNI DDNSSY GTLPYR\GALVGPNMAQPFTVVSDNAEMYAYFSUSENMLR ERVSVDPGELVGPGEQWGRLIDDATAKGDGQVPQQDVASLC
V


 GLRRI SVGALVTPGDVITRIH DDGVMKLDFSVPST $T Q T L V D P G Q V V A A G Q P A V R \| A H A G$ TQRFVDPGKMI S $\square$ GTS
 LSK SVEEGQTVAASFSTPELFTIAQDNMQVVANVDEADIG
 DDFDPKVGEAVSPASPQPDGRDVNQDGDKVVAEVSEAYAG VELMAREGMTVMAGTTQFRLN GLSTVWANAEVPESQAA ISRNVEVGRTVVASFQTPTLFTDAQDLTQMQVE
 RRALVTEGALVGQDQATPLTTVEQLDPIYVNFSQPAADVD
 TEKNVTDHMQFNADNVGSLFTTSNDDDVWDMANVFESDIS SRVSADRFENVQVGQQI VNIHSTDEVEVLIQVPDR ENRPAEDGDLLSVNDPV ATBLDADPM
 ISVVAQSGQTLAASQQTPVLMKAVI DTMKVNARVSEADVG

 AARHVEVGETVTPGKPLMTGFDPK VGKPKTAGTMATAGTPTVIMRDADDSKKQDMAKVDETDDGG TEKHA VVGELADPSKSLYTVA ADLSSVWVMVDINEKDLV

 QSVEDEKHQDVRPSQTVVTFIDIT KLKAETY
SEIVAEEGQVVAAGQTVMTLVQTDELEVEDAVPENRTDDV V


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| :--- |
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| UCR | UniRef90- C9P4Y8 UniRef90-13BNW7 UniRefofo-D6CTP9 UniRef90-D7VSE3

UniRef90 WOH5I6 UniRef90-G7GA66
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UniRef90-X5MER3
UniRef90-J7Q4B2
UniRef90- 101 RH0
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 AV GVQSAPKGQKATVRVRAFPERTFSGTVTRIV $R$ RYVRVPQAYAARMHDGFVAQFTVPDYRDRKFEARLLHS RVYVSVPQNEAA A DHPGMNATLTVPEHPGETFHAKLVDT A V $K$
$K$
$V$ $\operatorname{TPGDP\square YFT\| LGQP}$ RV RV QPGQKARDRPDGGPSVEGEVRSV WVNVALYDYQMPWVR LGDGVQLQLPAYPGRNWDGRLNFL SVQQEMNA
H
KVEK
ELR $N V S V S V P V L V A H R M G$
$R Y S A R Y G S ~$
NDSMMA
sVQKGQAAW DVQV
LQVIAKVPESELTREPGDPTIELTLVSDPSVRASGTVRE
GIDKISQS
TVWVNINDYQKDLIK
$F \square S S L K P G \square A \square R A K A R A$
EDEAAVADPEAFAAAAGKGQATLTLWSKPGVVYRAKLSELL RAYVWVPA QVAPLVKRGQPVEVAFSA DVTRGKKVTVEFPVLGKSDETKDRQAGD
GV K K GERVTFTVDAYPDETFQGTVKQV RVYVYVPQTY AQRIKEGDRVTVTQAELAGQKFGGTVVRT TVVMEVFETVGGK UK LGQRLSITVPAYPDERFPATVQYI LVRP

GAKVQASSPA
AAVDGAEVGDVKVGQAATFTVDAYTDKVFSGKIDQVV RLYVPVPQNYASVIRPGMPVQLSVPEHPGQTFSAKLIGN ALRRAVKSGRATGLAQQDVAVTLLRADGTAYPLKGRLLFS
 $R V Q Q G Y A A D \quad$ PR LVVAHVPEHSTG SVQTGQLAHITLFDG K1KKGVKASVS\PA】PDHA AVRA GKPVKARSVAFRDRVFVGDVKEAV DL QMGAPVHFTLLGAPHAQFHAKLAAI KVGET $\mathrm{K}_{\mathrm{k}} \mathrm{V}$ R R V RIKSGEAVSVE KS RVIANDPQYKDAEDKTAGLVADPGAPDKRYGKLRA NI KVDQQATFTVDAHSGKTFTKISQTDTANTWQTVSSSST KI HR EYKRTQLSGVEQPEYNN A VRA

GQTAAVTVSAFPDLKLKGRTTY
GQPVTVRASSOPGYPYKGTVETVV
FAALSVPDGPEDQAEGQLVLADDVRDPLTYREHST Q $\square$ NKGDTTTVYFPA位

PEQLATDLGKAAKNS $\quad$ EVSLAFDK LPEKKMTTREDTV AVGTPVKVSFWAL
RVGRHATVN
QI
Ql RSGLKA
SIKKGMPVS LVKS
VVLVTDAQQDIANVEKEMT M $\square$ RSTPADVQVMVSSLTADA
RV $E V V A K V P E S D \square G$ R $\square R V G \square P$ RVGEKVVVRATAFDAK KYFEMDANDKDABADISFV KT
 RVFADVPQTFATAVRAGQP APVSRREVPGREFAGAVART HL KVKPGMSAYFTTLAGGKRRWTSTVI LP $\| P P K P L E Q S S Q G G$ KI Y A QLRQQDAEGKAQAGMNS GQPARVTL EAYPGRTFTGNVVKV RLIGLADAMSAQAGMNS VELVLEDGSVYPVRGKLALS
 QV
DLREAMAADSTR
KEGQRATFTVDAYPGRDFSAQITQV MVHR AD $\quad$ GK $\square R$ VGQTVRFTVDAYPNRNFQGSVRLI

KVAPRQ
$T V V V Q V P Q Q A L S R$ LETGQTAEVSFDTGEEKT EF RQMKESGASTADEFLQ TVRL $K \mathrm{FTVNVPENKMAQFSFQQVC}$
$K V Q F L L P D H L L N R F S R D G V E$



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UniRef90 V9VWD1 UniRef90-14WLA6 UniRef90-UPLO00378339E UniRef90-X7ECQ5 UniRef90-B4CWM4 UniRef90_13UC37 UniRef90 NoLNC3 UniRef90-UPIO003623DOD UniRef90_13YA49 UniRef90_K21P16 UniRef90_B4SI75

 TQTEQFIGRIEAKQRVDIVARVTAFIEKRFFVEGSDVEEG NVRLTGTVEPVPDARASRVEGKIAAVFVNVGDRVAKG LNGRVDAEQVAQVYPIFGGTVTQVEVEAGDYVEKG VVLSGDIQARKVTDQSFQVSGKLVKRFVDVGDRVKAN SLRLYGRTEADQRTRLAARTGGIVEEABVQKGNRVEG | GSGQALAETELKPWSSGVVDKIFVAAGTKVKIG |
| :--- |
| $\square S A T G V I N Q R D V A D V Q R A G G F V Q R Y A R A P D D I R A G$ | TVGTVGVAFPNV STIGTVAIREADIFSETGGLVKRVSAEPGAQKK门G SLDFSVNGIFEPLQELNFSAEKPGRVVRVLVDEGSKVRIG LT $\square$ ALTGSVEAGRIAQLASPAEGPVLGVRVREGDLVKAG VR V

TSS S
S
V
L
T
T THLGGEVQP LPGRLN STVRAVAEVVQ VASIQAKKQYTVVTKFEGWI QRLYVVTGQAMVRKG TKSYPARVERRQYT SKLDGWVDKLYNAGMIKAG KFPATVEADHTANVVAPLAGRITELKVGEGDHVEHN RRFVARVDADSTVDLSFQVAGRI NQLVERQGDVVPEG EARGVLRARDQAMLASELSGRIVELPFSEGESFKKG VSQAFPGEDRARHEPELAFRTGGKVIRRLVEVGERVKKD SISASGLVTTENQANYGFKIGGVVSRIYVEEGQFFKKG STTAVGTLQAVLQSVNVGAQVSGQLQSVKVEGGQYVKKG TASGEAAQRQVNLSPKQAGQLEELLVQEGDAVRKG NV VALGTLQPRRYVDVGAQASGQIRKLHVEVGDQVKEG TVNLRVTGELKGDHEALVASNAAGKVVEAAVERGMAVKKG TVNLPLSGSLTPDTQATIKSKVSGEVHETTLQEGMQVSAG TV'ATGWADADDNTTVAAQEQGVIVSVNADDGATVKDG VNAEFSGEVRARVESRLGFRVGGKIVARKVDAGAVVKQG GNFAAWQDLSLLAENSGRVTQLVDEGSHVSRG VTVRATGYUEYDESFTVNSKVSGWVEKLYADTGKLVRKG YTGTVRGRYETRLAFQVGGQVLSRNVNVGAHVRAG
YVTATGKUEPEDEVNLSPDVSGELTEGPVSEGEHVEKG
VS■SSAGKVAPKDTVAVGAQVSGQLTELLVEAGDLVEEG LDGVI EAVQQSTVSAQTSGKVLQLPFDVDDSVRPG VSGKI QAASSADVSSRMMGYVTKVHVNVGDKVQKG LTLSGTI EERNVKSVSANFDGRI DDLYVATGQEVKQG GTITAANTATVRSRVDGQLDA1HFQEGQQVKAG VGEVRARYETDQGFRIGGKVVERKVDGGAVVKKG FAGSI QARYESTLGFRVSGRIIARRHVDVGSEVAQG TTATGTVEPRRYVDVGAQVSGQVKRDHVQVGDDVKRG TRALDYSGAVKARVEMNLGFRVAGKITERRVNIGDRVQPG QVTMPGQLRARDESTLFRVSGPVAARPVAGERVASG NVTADGTLQPRSYVDVGAQVSGQI LALHVQPGDVVEKG TRSYTGTI KPRYQSDLGFRVSGKIVERFI NVGDRVTPG VDVMGRVQSDQNLLVSPESAGNVVELVKEGDRVTKG ISGNLQARTAAAVRAEVGGTILDI NAQQGQVVKKG ATGVLQPDKQVEVGSQANGQLRSLKVVLGDRVTKG TVRASGEVRARFETALAFRVGGKIAKRHVEVGSLVKAG STTVTFPGEI REDRTAHVVPRVSGVVESVKVDLGQAVKKG ANGNVAAWQEASI GAEVSGRLAEVRVNVGDAVRAG VELDFTGELAAYREVNLVPEVSGVVREIKFEENDQVNKG SAPANIEAEKMVKITPPVAGRLVHLHRQLGDPVKVG $V S S T G P$ AP $V$ NTVEVGSQLSGLVLSLHADFNSEVSAG


> SFSVNGTFAP DQS TVSATGETSAAQLVDVGAQASGQI KHLYVKLGQHVEKG DYAGVVKGRYESNLSFQVSGRUTSRNVQGGSVVHSG LUGQLEPWHSVALSAQVSGTI ESLNVGLGEQVTRG ANGTVTPMKTVNLHPQTVTTI REVHIREGQFVKEG GTVATDERSVIAARANGII EQLYVRANQQVTKN TLVLRTVGSAVSDRRTEVTATDAGEVVETALQANQMVEKG STTLHVPGTVNPREADTVSARVDAVVSRLHVRAPTRVAAG TFTTLPGSAQAYMDTAIYARTNGYLKSFKVDDGAHVKQG TFTTELPGRTVAPVIAQIRPQVNGIIQKQLFTEGSQVKAG TVNTDRQAHVSPSFAGRVESVYVELGQQVKRG GRVDYDETAHLHPRADGFI QGLVVREGEPVRQG GETEAAREVNVTAETSGRVVNAPLRKGAYVQVD



QLLARIDAT $\quad$ IA ETNVE QQQAT LELLAKANADRAKMLFENDA DLIVQLEDSEQRARVSQAKQRFARDESVHKRGLVSGQEFD QL L V S I DNDARLAKKA QAKTAFNNAEKNYNRFKNLLLASAS

 ALLASLDP T DQQNQLRAAQA QWINAQANARRQQELFDQLDD QL L LEI DPEVQQQAVVE GARAS LAS LQQA QEKRRRRLLK QDA

 $M$ T A K L D A T D Y R L A L E S A D A E L K A A E S S L A Q T D A DE K R Y A

 UniRef90 R6J5K3 UniRef90 Q0C1N9 UniRef90_A3JAM3 UniRef90_UPI0004758545 UniRef90 LOFXP6 UniRef90_UPI0003C7B910 UniRef90-G8QP24 UniRef90_UPI000288E51E UniRef90_E7RV42 UniRef90_UPI00035EBDF1 UniRef90-Q0AAQ3 UniRef90_UPI00046689D3 UniRef90_UPI00047A6FF5 UniRef90_UPI0004790CBF UniRef90_U2SHR0
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GQPAIMTV TGLPGETFEGELSTVIV
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$\square$ RAYEQHT P LIR PG $\checkmark R N T P K G M S A L T V G$ KVKPGTAYFTTLSGGKR RVGYAVFADRPEKLLPVTLKSF WVKPGMTAYFTTLSGGKRRWHSTVRQ@LP DP PKPLAHASQ
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MDH DFMQSGGGMEGKTSGES A V
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 $H V Q A G A P V A F T L \quad L G E P D K E Y Y A V L D S D K L V P T H D K S V E T$
$K$
$K$ QVKAKVPES D $\square G R \square K V G Q R A K \square R V D A Y P E R S F T A R V S A \emptyset$ HVKPGMTAYFTTLAGGKRRWVPPKPLDQTSQGGGSPASAS $R V K P G M P V Y F T T E Q R R W Q G K V R Q V L P A P P T A A G Q G Q S S E T$
 K V ELKKALATGPVA WI R
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WI QVS $\square Y$ DND $\quad \mathrm{P}$ WVK P
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$D Y R T R M D E G E V K D A R Q A$
$S$
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GDSVIVVSLWANSAAYTGTL
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 QI KKGTSVAVLVKSMG WVMLDAYEQGLG Q $\square$ SAGDQ $\square$ QFSVNA $\square P G E E F S$ AKVAF TVMQAQKAGKGWWW GRMKG $\square E P G T S A V I R \square W A N Q D Q S Y A A R V R E V$ R | $G V T A G M P V W F R R W H G K V R Q V L P A P D L P A G G S Q G D G G Q D G S$ |
| :--- |
| $E F$ |

 $Y V K P G M P V Y F K T L G G D W A G T V R Q V L P A P P K P E S T S N T A A T$ $\mathrm{Q}_{\mathrm{R}} \mathrm{V}_{\mathrm{E}}$
RI RE
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LVR $R \perp D S D R N A D S S V T L W A A P D H V Y A S K D R E V$

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WLSASVPERDLAH

RHGD TPVEFHVT galdy yritilag TGARAKIRINAPGKMYRGKVREI

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( 7
``` WLSASVPERDLAH VDVGQSQAHVAVDAYPERTFTGEVNKV PGA VSAPDLINARVEGKI GYV RLVVKVPEDYAA NGKNGQSVNFQVDAYPERHFEGKQVRL


WLEFVLPTMVNDNVQPNQQ IRFKSLQTGNQ FNAQVQSL WVEAEVFERQAAL VKKGDRVTMNLDYLPGTTWDGNVDYI WVLADIFEHQDDW LAPGLTAE DRLDACPGQTWTGKVDY L UniRef90-B4SI75
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\hline & MKSSTQATGSVALT \\
\hline UniRet90-F9ZUF & YP TLDPKSRTVTARLSE \\
\hline UniR & APSLGEANRTARLRVVLPNADGLLKPEMFATISVIVG \\
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\hline UniRef90-EOXPN5 & SRDASAQTRTFRVEVA \\
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\hline UniRef90-UPIO00315CF32 & DNVVDPDSRTLHVQVETKNK \\
\hline UniRef90-F6IN
UniRef90-B2UL & LPKADDQSRTLTVRIEELPNPGLKLRPGMFAQVNF \\
\hline UniRef90_101JF &  \\
\hline UniRef90-QOYS & S \\
\hline UniRef90-UPIOOO30 & APMAD S SLNFPVEIETVPSND \\
\hline  & YPYMDDİRTR \\
\hline UniRef90_D5V & SPAGLDETGRTLPVRMSVSNDDGALPRPGMFGTLNTVGG \\
\hline Rei & SSDSDSQTQTYE \\
\hline UniRef90-J31W & GGGSPDSAGSYTVLLDVDNPDGALMADMTTQVFFVAG \\
\hline & \\
\hline & A \\
\hline & PNKE \\
\hline & \\
\hline UniRer90-C4L23 & YADMNAETRSVQvRIETDNOQ \\
\hline Unie90- U4L000255 & V \\
\hline UniRet90_UP1000 & \\
\hline UniRef90-UPIO004 & R \\
\hline & \\
\hline & \\
\hline & \\
\hline Jos & SQAADAALGSFQUELKLLHMKNQKPAVG \\
\hline \[
\begin{aligned}
& \text { UniRet90_Q7MGGO } \\
& \text { UniRef90 }
\end{aligned}
\] & KPTPQTDNNVVLYYADVPNPTGELMI \\
\hline ef90-A5GRV9 & SPRANNDVTTFEVKLELDPPAGLLRIGMTTDVDFDSG \\
\hline 0029 & S \\
\hline & KPAASSVGKTYTVLFDVA \\
\hline UP10001745331 & GASVRESARDLIIEEAEVANEDQQLKPG \\
\hline UniR & DNTVDTASGTILAKAKFENASGALWPG \\
\hline UniRef90-UP100029AEFBA & D \\
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\hline &  \\
\hline  & YPYMDKKARDVKVRLEFQNTDFELKPG \\
\hline & S \\
\hline & S \\
\hline iRet90-M5R8D6 & \\
\hline & \\
\hline &  \\
\hline & YPYANAKTHTFRLRMALTEPNGS \\
\hline & DPVVSADSRSAKVRAEVNNFSGKLKPGMFVTAKL \\
\hline UP1 & \\
\hline  & \\
\hline UniRer90 - UniRet90 \(^{\text {a }}\) & A \\
\hline UniRef90-UPI00035EBDF1 & SGSADAQSRTFAVRVSLPHDDRVLL GMTA \\
\hline & - \\
\hline & \\
\hline UniRef90-UP1000047, & SPQADP \\
\hline &  \\
\hline & \\
\hline  & QPSPEKMNNATFFNADVPNPTGELRPDMTA \\
\hline & YPTLKSDTRTVPV \\
\hline & GEQ \\
\hline UniRef90-UPIO0039CBB19 & APTVDPQTRNALVYVDLP AHPDIRAGMFARGEFLLG \\
\hline  & APTVNPSNRGLKV \\
\hline  & \\
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\hline & EPRADAATRTRRARLTLEETPPGLRLGTAVAI \\
\hline & EPAVNVQSGL \\
\hline UniRef90 M7NV36 & G \\
\hline UniRef90 - \(771 \mathrm{B21}\) & D P GLLT T \\
\hline UniRef90 U7UGB7 & APMADSVTRTYTVTVSLPSPPQGMRLGMTAT \\
\hline UniRef90 K9DLW1 & ANAVDPQAG \\
\hline C4U & LPNMDLATRT \\
\hline & D \\
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\hline  & GNVVGDQTA \\
\hline UniRef90-B4CWM4 & \\
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\hline Ref90 B4SI75 & \\
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\section*{VDVD} LTGKIINQDQVVkVVFPLVGGHIIET TKADLGDYVVKG LPASLKGYTETQVFARTNGYLKAWHKNI GDTVKKG TGETVAHEENSLAFRLDGRVITRTTDIGQHVNAG VPGTVTLDERSIISMRTDSFIDNVAVTTGDRIAKG TVRFSGTVQEENGSSLSFPLMGRVKSVKVDLGSRVRQG ITGGLQARRLASVRAEVGGSILDVLADQGQTVKEG VSAVGAVEAFERVQITARVAGAVDRVAFTEGQEVKKG SRTLTGEVQARFRADLSFRISGRVVARIVDVGAHVSKG RSFVGTVKPRIESDLGFRVAGKVAKRLVEVGQTVEDG S LDVSADVGFNERDVAVVQARTPGFVERVYHAPGDVLKAN ASGTVESDDRVQLVARASGTIRAPDLYDGQPVRG NLSASGYVVARRKATVAAEDTGKVVGVYIDEGMSVTEG SI DEDRSTQVFSPYTGRVTKLLVRAGEHVEQG S四EQNYGTINQEKIKTISSRAMGRIEKLYFKVGDYVAKN ATGKLEAEKDVVLRPEVNGRVLELYVDEGSYVKRG
EANGRIEAIRSAEILAPVAGRVLRLVASRGQARRG SRTVSATGEISPSNLVSVGAQASGQIKKLYVKLGQQVKKG LSI IYPGKVKAASEVKLAFRVAGPIKEVLPEVGAFVKKG TVLVTATGSVQPTEQVDISSELSGTVRDVNVDYNSTIKAG ATVEAVKQSTVAAQVSGRVAAVNFDAGDYVKAG DRRTFSGTLESNAEFLVAPKVSGRVEHLAVDMGDPVFRK \(\square A A V G N F V A M N G V D V N E A S G N V V A D H F D S G Q F V A K D\) DDVAGQLTADREVTLRANVGGFVVEKPDAQGSPVETG TVTVSATGNLRPTNQVDVGFELPGRTIESVLVREGDRVVHKG VNATGEVKAAQLVTVGAQVSGQIVKUHVRVGQMVNKG
 VETTGTVRPVQRATLAAKVMGAIVELPVSLGQKVQAG QVSFNGTVVPQRQATVADTMGGDVRNTSLLPGQYVQKG YPGTVKASKTAKLAFRVAGPLDRVNIKPGDAVKRG \(T V P L Y G T L T S P R D A D V M P R I A G L V E T V A V D A G D R V S A G\) TIS EAVG T■SVDAPGIVVPAEQTPMAFRRAGEQHVLVKAGDVVKQG VRFPGEVKADWTARVVPRVSGVVQEVSADLGQAVKKG -VTVSASGTLAPTKSVDVGSELSGTLESVLVQENEQVKKG TQSVEAVGEVFAENLVDVGAQVSGQIKELYVKVGDKVKKG YNGYLNTTESVEVRSKIRGFLTEVLFKEGTEVAED VRLYGKIAPDERSSQTAHVGGRIESLAVDTGETVRAG VTLPAEALVEAVTQATLAAQVSGRVVEVLVDAGQVVRKG FAGSiQPQHEVALGFRIAGRLATRHAEMGDRVRKG SRSTVLATGGLLKPSVQVNVGAQVNGQLKKLYVRVGERVRGQG TNSVVLTGED QARKVTEQAFRVSGKLVKRYVDVGDRVAKG STTLTGEVESDKTVPFVSLVDGVVMDTYFSLGDYVKKG \(S\) SSANGNVAAWQEAVIGAEVAGRI AEVLVDVGAQVRKG ATGYIVARRQATVSAEITGRISELLVEEGARVEEG SLSLVGRLAADQSKTISAWTSGRIEQLYVREGDPM LSTELPAELVGFQQVDLYAKVTSFVKELKVDDGSEVKKG LEAPGNVAINERGVI QARTTGFVEHAYAKTTDPVKRG SSVSLTGTVVSDGQKMI GSRYMGYVKKVYVKLGDKVKRE隹 SARKYPFILSEPYRTAELAFRVGGHIAQLDVQEGQFFRRG VT SYTGKAAPAKEVSVVPTVPGKVLSFNYDVGDKVGQG VT LLADGKLEASEQVEVGAQVSGQLKKDHVKLGDVVTKG VKLKLAGTLEADQETELYAKVNGYVQKVNVNEGEAVRKG VQAVGRVRPKELVAVGAQVSGRVERLHVGLGQRVAKG TVPALASGLI EKLYVNASQQVKKN DQLSGSFSAERQAMLSPRMDGLVKSVRVDAGDAVKQG
\(T V L T G Q V Q P R N E A S M A F R D G G R M I A R P V N V G D V E A G\)
\(V\) GWAVAADITTNMAPLQAGLVTETEAKDGQHIKAG TVNPEQSSYISSRIAGRIEQLYVREGAKIGKG QVTVPAEVVAPDAVVLTNELAGTVRALNLKNGNLVTKG LTGDI QARKVTEQSFRVSGKLVERYVDVGDRVRAH VDVVGRLEASKRAEVSAQVAGNLVEVPVEAGTAVAAH T LWVKTIGTVEYNENTTGTRVSGWLETLMVTVGQRVKKG SVTADGTVQPRNYIH1HPRVEGWIEKSFIKSGDSVEKG ETSGNVKPAQLI RSGFKVAGVI DHI HVEEGDTVKEG RIFSGUAKAGDEVELSFRSNGIITALNVKVGQKVNKG QTQAPGS EAEKLVKI TPPLAGRITRLQRSLGDSVKAG TLSRDLDGTVNDDDRGVIPARAGGLVDKLYVREQQRVTAN TVSATGKVQPEDEVKISSEVSGEVDALNVKEGQVVKKG RRFTGSI EGADRDEITPRVGGRVAEVFVNLGDRVEPG
TAVLDATGYVTARREATVSSKITGKLVAVPVEEGDRVSEG

\section*{UniRef90_UPI000377A163} UniRef90-UPIooou5E8E5E UniRef90-H3RK96 UniRef90-K8PCJ1 UniRef90_N6UXI3 UniRef90_R5VFY5
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 QLLYELYSPELVNAQDDYMQAMDYLKQDKVRGAGLLRKA QPLFDLYSPTLVNAQEEFVFALARK QLLVELDPSTQQAKLDAGRFSLENLKAQLQEQRAQHELAR DLI AKLDNVQANLAYEQAKSAMNTAKSSLDRDKSLYEKGS AP:ADDLLPEWGGAQTEYLSVRRDGK QPLARLWIPEWNAAQQEYGAILQLGDRALTA DLLVKINPDLYTSGYNQSEASFKEAKANYDRNKSDYDKGI QALVTLYSPDWVAAQEEYLAVSRMAAGEP DPLLQLDTEEFEQDLAEALASRDATRRELQRTRELRDQGD
 APLADLLVPEWAAVQEEYLDRALNEPALLAAARQRMRLA
 UniRef90_UPI00045E8E5E UniRef90_H3RK96 UniRef90_K8PCJ1 UniRef90_N6UXI3 UniRef90_R5VFY5 UniRef90-H8N170 UniRef90_Q08MP6 UniRef90_UPI00046AB956 UniRef90-H5YFE3 UniRef90-G2D8Y6
UniRef90 UPI00046A49DF UniRef90_A0A013VFX6 UniRef90_W3RFU9 UniRef90_K8NDU6 UniRef90 Q3B5X3 UniRef90_UPIO0047DB416 UniRef90_D3SNK5 UniRef90_C7BQY8 UniRef90_Q7NJ02 UniRef90_B4RP41 UniRef90_UPIO004779F00 UniRef90 B3PZL6 UniRef90_UPIO003631395 UniRef90_S0FY17 UniRef90_W0BDS7 UniRef90_UPI00036A0FC4 UniRef90_UPI0002ECFBE9 UniRef90_S6AAA3 UniRef90_G1UN38 UniRef90_M4Z92 UniRef90_UPI00039BA63F UniRef90_B1ZSP0 UniRef90_K9ENI5 UniRef90_C0QMG4 UniRef90_U2ELW9 UniRef90_H6SQ17 UniRef90-A7K2P2 UniRef90_UPIO0047E2E65 UniRef90_G8QIP8 UniRef90 U5XYI8 UniRef90_UPIO0016C3AE1 UniRef90_K5ZSP9 UniRef90 B1FE88 UniRef90_A0A011QPR3 UniRef90_A0A038G9L7 UniRef90_H5SCJ4 UniRef90²5URA7 UniRef90_W8KP73 UniRef90_A9ATV8 UniRef90_B8FLR2 UniRef90_D7VW10 UniRef90_UPI0003FE8097 UniRef90_Q0ARH4 UniRef90_H3ZGB4
UniRef90 A6E7H2 UniRef90-UPIO0046A19DC UniRef90_A6Q7R3 UniRef90_UPIO0037C1570 UniRef90_B3DW67 UniRef90-R5CUB3 UniRef90_UPIO003728B06 UniRef90_R5AAV0 UniRef90_L8XXE6 UniRef90_G2PKD0 UniRef90_H8KSR8 UniRef90_UPIO0035D340D UniRef90_16WH96 UniRef90_I1YJK4 UniRef90_UPIO00476C4B9 UniRef90_A0A037XUW1 UniRef90_W6TVJ0 UniRef90_Q12NV6 UniRef90-A9HN17 UniRef90_F2ZNW0 UniRef90_IOIFE9 UniRef90-W2UIE6 UniRef90_B8CUW1 UniRef90_F2JUB0 UniRef90-K9NG59 UniRef90_A6TJZ6 UniRef90_UPI0004641B15 UniRef90_D4YYC6 UniRef90_A0A031GZ95 UniRef90_WOHJP0 UniRef90_UPI00046AF400 UniRef90_A0A022H0G8 UniRef90_UPI0003662D46 UniRef90_A4BMN5 UniRef90_I3YRC6

ASKEQLEAAKGEVNRVNERRRTVGGNGSVYVVKAPVSGF\| APKQEVDEKRAAFAAATANVRRLENDENYRRVDAPFDGVI
 \(G V P Q E V D D G 1]\) LIAEMKWVEVQSKLQQAQSMEAVARKNLTDCKLYAPFSGV RTQLARTQAEGQLAQAQAQLLKLAQDQLARTKVAAPFTGVV SVNEQRPGALGAEVGAAKAQLKLAQDQLARTKVAAPFTGVV

 RAARQRLRLT GMPDMLI A RVERQGKVAP Y LT LTSPRAGVL \(P\) LA QS GALAMDAYRKEQLRDSAAQVDLAYTSVASPFDGFV
 S S DLL L L S T A R A E R GK M A A E Q K IAA A A A V R K C T V L A P F S G G V

 S A R K D F Q V A Q S E Y E Q A A A D L E A V R A R R L R R V T V A S A A V S G F V









 A S Q K K F Q Q S K A D Y L S M Q S R L E A A A A Q L P L
\(H\)
\(H\)
 \(L A Q V S L D D A Q A R A Q A A Q A G V E R A R K A L A B R D I\) RAPARAGVV




\section*{A AREKLQLWKMTDAQ ITT}





SAAE Q D Y Q Q A Q V Q L




 N V K K K Y G M T G F G M D D L E G Q I






 A A R D RL R L Q F MPEAV I R SVVERSGQPQTRMTVRAPBDGYV



 T S L S E H Q K A H S N L E S A RA D LA A LQQ A Q L A Y T E L FA A A D G V I




 A ARK E Y EAA QA A Y D QA GS DARA SAD K LAA QYGAGAR GTRRRD A A R Q K LQ L L LM P EEEVIDR T VER S GQPQQTA DT LARAPA S GF I





UniRef90 UPIo00377A163 UniRef90_UPI00045E8E5E UniRef90-H3RK96 UniRef90-K8PCJ1 UniRef90_N6UXI3 UniRef90_R5VFY5
UniRef90-H8N170 UniRef90-Q08MP6 UniRef90_UPIO0046AB956 UniRef90-H5YFE3 UniRef90-G2D8Y6 UniRef90-UPI00046A49DF UniRef90-A0A013VFX6 UniRef90-W3RFU9 UniRef90-K8NDU6 UniRef90- Q3B5X3 UniRef90_UPI00047DB416 UniRef90-D3SNK5 UniRef90-C7BQY8 UniRef90_Q7NJ02 UniRef90-B4RP41 UniRef90-UPI0004779F00 UniRef90 B3PZL6 UniRef90_UPIOOO3631395 UniRef90-SOFY17 UniRef90-W0BDS7 UniRef90_UPI00036A0FC4 UniRef90_UPI0002ECFBE9 UniRef90_S6AAA3 UniRef90-G1UN38 UniRef90-M4Z920 UniRef90_UPI00039BA63F UniRef90-B1ZSP0 UniRef90-K9EN15 UniRef90_C0QMG4 UniRef90-U2ELW9 UniRef90-H6SQ17 UniRef90-A7K2P2 UniRef90_UPI00047E2E65 UniRef90_G8QIP8 UniRef90-U5XYI8 UniRef90_UPI00016C3AE1 UniRef90_K5ZSP9 UniRef90 B1FE88 UniRef90-A0A011QPR3 UniRef90-A0A038G9L7 UniRef90-H5SCJ4 UniRef90 \({ }^{-}\)Z5URA7 UniRef90_W8KP73 UniRef90-A9ATV8 UniRet90-F3HGM7 UniRef90_B8FLR2
UniRef90_D7VW10 UniRef90_UPI0003FE8097 UniRef90_Q0ARH4 UniRef90-H3ZGB4 UniRef90_UPI00046A19DC UniRef90-A6Q7R3 UniRef90_UPI00037C1570 UniRef90-B3DW67 UniRef90 R5CUB3 UniRef90_UPI0003728B06 UniRef90-R5AAV0 UniRef90-L8XXE6 UniRef90-G2PKD0 UniRef90-H8KSR8 UniRef90_UPIO0035D340D UniRef90-I6WH96 UniRef90-I1YJK4 UniRef90_UPIO00476C4B9 UniRef90_A0A037XUW1 UniRef90_W6TVJ0 UniRef90-Q12NV6 UniRef90-A9HN17 UniRef90-F2ZNW0 UniRef90-IOIFE9 UniRef90-W2UIE6 UniRef90-B8CUW1 UniRef90_F2JUB0 UniRef90-K9NG59 UniRef90-UPI0004641B15 UniRef90-D4YYC6 UniRef90_A0A031GZ95 UniRef90 W0HJPO UniRef90_UPIO0046AF400 UniRef90_A0A022H0G8 UniRef90_UPIO003662D46 UniRef90-A4BMN5 UniRef90-I3YRC6 UniRef90_N2IPG7

NV \(170 \quad\) KEGDQAT\|TTTLSYPDK|V|FHGR|I DK|i 180 \(R L S V W V P Q A Y\) ADD DEAGQTASVRPLGTQGQA SARIDHV RDAVFDLAEPSLAEYASSTPFSITGLSNPADATAGHFRDID D L R D A M
A V
KDGKSSVTATIPGNDKSETGTVAMV
R V A R
RLEASVPAAQLGQ VKVGQKAVI EAPVLNGTKAEGVVVGEK RLKPGMGARFTVRTDG

GQTESRSVA LT T L S D P S VTMAMGERE
RAKSGAAS VTLWSEPGKKYTARLREI
RVTVDVPQSLIPT T R KFGKAWVEQPEGGF
SV GQAVEARLPAFPGATLKGRIDAI LVFRFAAPQASLGMFVPGAATPVLLDGREDRPVTGKVRGV EIVVDVNEAF DGRVVPGGA VNAVLDAYPGWTIPASVIAI D \(\vee\) A \(V\) K PGRRFTVHV K \(\square\)

\section*{
}

Y L K P G L K A
QVRV
 R QDQFKEFSC
K I A V
KAAPRVAVE \(\square\) PS S \(\quad\) NKW \(\mathrm{K}^{\mathrm{G}} \mathrm{A}\)
\({ }_{R}^{R} L \operatorname{L} H \square N Q K\)
S V HLN QK
F V MR LP \(\square\) A DRDAAR VRQ \(G \quad \frac{L}{L} P\) \(A\)
1
V
A
QVHAGQSATF
AVRPGMAVSYT\|LGEPDVSAHNVDAYAGRKYPANIIRVGY
\(R V Q V\) R
 A

A GNEVQFRVNGMGKTV

\(R\) DDVSAPQQYFGRG
LLRVDQR
M V D P N
KVGESARVSSTSFASDEAM
\(S V Q V G Q Q A S F T\)

K ISIGDRVEYS\|LSD\|NKKYワGFTLSDGKYKT TS SSSSSS

\(R\) VYVSVPQSEAA TVKPGMTATLSVPBEHPGMRFSARLVDT

\(R 1 R \mathrm{P}\)
KVHPGQPDWF YVVAEPKGQLVSITVAAFADQHFTGRVTYI
EVGQS L P
RVGRDATVSATAFESRSS
REAVFSAYESLLRSDQTGGS \(T\) TVPDGOPAYV RSGVI
 ALRPGMPAQ
EI EVDVNEGQTGR VTPGQRVEARLDAYPDWRIRAHVEAI
 ASVAK \(\operatorname{PGQQPATATASALPGKDFSAKIARK}\)

 QLQQN
TVGQTVS
GGRTCLISFDRMSGRTFRPAETYI
\(K \square T P G M K A Y F L N T \square Q V G D K V S V L M T A A S E T P L T G T V A T I\) K
EGQTA
G
\(R \square D \square N V P Q E R F T Y \square N K D S Q I T \square Y P D A L P N Q S L T G K V D A\)

 \(T \|\) Q

\(R \square R A G A T A A V T V E A A G E G\) K

LVAV
\(\frac{L}{H} V \mathrm{~K}\) GMHAWFTTLSGRWTSTVRQULPVPPK RI GKNVDVF \(\square \mathrm{Y}\) KV


QLGMNPEDSFSAGT WLVAYFPQAQAGAVAAGGQTASTVDAWP \begin{tabular}{c|l}
K & A \\
A & \(\mathrm{A} P \mathrm{G} \square \mathrm{A}\) VK
\end{tabular} \(\stackrel{R}{\mathrm{R}} \mathrm{L}\) \(R\) V S



SATASGKLVAKNSIVNISTRMMGYITAMKAEVGQNVTAG T TTKEFPGKLLPTEOSKLAFETSGKIKNDYVDVGDSVEKG TLVLSGKIMENEELN AVVQVSGRI EKLYVNTGEQVNRG FAGSI QPQYEVALGFRVAGRIATRHAETGQLVRKG VSTSGSVRALITVSVGSQLSGQI TEDYADFNSEVKKD \(\square S G E W V G T L D G Y V N A T I Q P Q A N G Y L I K Q D Y R E G T Q V S K G\) \(F P A S T L A G D K A V L A F R V S G Q V I N L P D K T G Q K V N K G\) QVRLYGKIVPDERSSQTAHVSGRI ESLNVDTGETVRAG VSVTLTGDVQARVQTELSFRVGGKI IQRMVDVGDRVSAK \(S F Q A E G Q A Q P D R D T S I R A E A S G D V V D V L V M E G E E V E G G\) SVQATGIVKAMVEVKVGARTPGKVVNLPIVVGDRVEQG I R L F GKI DADRIAEVNS IVSGVVKSI NVGLGDYVKQG
\(S V L A T G R I D A D E R V N V G A Q V S G Q V K S L K V K Q G D Y V T K G\) VTFVGGVEPKEAAIVASKVTSTVLDVVVDVGDQVKQG NHTVRISSPVTGRVVSISAQLGDTVKSG


QLLVSTNATDTQAQTSQAQANYNTAKKDYERFQNTYKSQS DILAKLDDREALARLNQAKASFDLSKQULERFQDLKSQGH QLLATIYSPELVSAQQELLTAASLRESQPELYKAVRNKGK DLLATLEPSDQQNRLRAAQASWQQTRDEQLRYQQLFERGV QVIARLDDSTYTRVNQAKANAANTEREYQRNKSLQAKGS QVLFEIDPRPFQAALDQAKGQLEQAQINVNRDTPLAQARA QVLFELDPRPFQAALDQAKGQLEQAQLNVNRDTPLAQARA QTLATLYSPELFTAQQELLEADRMGQS LTMA QLI QVLARLDPKDLQTNVDSAQAQVVAEQARFVRQQKLLPKGY AVIARRSAKGAQADLARAREEFARADREFKNATELLNRGV QVIATLEQDDQEADLAEAKAEHSRADKDFERDKQLHETKS QVLAVIQSSEFQKEKLDAVNDVALAEKNLQVAQDLFEGKLL QLLARLDDSLTRRQDEEARAAVQTTEKDYVRYKNLYQEQV

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm

lupas 21
lupas_14
lupas_28
jnet
conf
sol25
sol0
jhmm
jpssm

UniRef90_R6YFW4
UniRef90 J2T2F6
UniRef90_J5K661
UniRef90_A0M109
UniRef90 \({ }^{-}\)W0H3Y5
UniRef90-I3CJ20
UniRef90-E8WVA7
UniRef90-UPI00035C0E84
UniRef90 K6AF13
UniRef90-U7DBR8
UniRef90_A3SDV4
UniRef90-14C0V5
UniRef90 F0S6R9
UniRef90-V8RQH7
UniRef90-14BYE2
UniRef90_C6XD07

UniRef90_R6YFW4 UniRef90_J2T2F6 UniRef90-J5K661 UniRef90-A0M109 UniRef90- W0H3Y5 UniRef90-I3CJ20 UniRef90-E8WVA7 UniRef90_UPIO0035C0E84 UniRef90-K6AF13 UniRef90-U7DBR8 UniRef90_A3SDV4 UniRef90-14COV5 UniRef90 FOS6R9 UniRef90-V8RQH7 UniRef90-14BYE2 UniRef90_C6XD07
 K VGKKYK

\(R\) V SKMQ KVSQLNEQVFVSAQVRQL VQRTKAGGGDLLKNASAVPLTLTLSNGEAYAQKGHI AYVV \(R V V F Q L P N S M V N R V K G A D A E F S M Q F D S Y S G E T A P G V F Q E I\)
 Q IK SGQTA

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lupas }2
lupas_14
lupas_28
jnet
jnenf
sol25
sol5
sol0
jhmm

```


lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm```

