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 GASQVGINKWRFLLQSLEDLDSRLRKLNSRLEVVRGQPTDD LSAAVGDKRLHAHFSAIAALDDALVQLGGRLLIRRGEPQQ APREMGGASRWWLNKSLASLGASLEAI GGKLTLRTGPAEK GSTNVGDNKWRFLLQCLEDLDCSLRKLNSRLEVIRGQPAD DKLENKDARVTFTYNTLDELHRKLEAQGSTLLVRHGKPLE GSSNVGDNRWRFLLQCLEDLDANLRKLNSRLFVIRGQPAD NKDDVAPARVTYLIGCLQELQQQYQQAGSQLLILRGEPSQ DQLDRDDRRVEFIHREIQQLQAQLHQMGSTII ARYGRPID GCWKLGGASRWWLAKSLEALSHDLAQRGARLLLRRGDTES ELRAPGASRWWLHHSLASLTESLERLGAGLVLLRGRSET GTRPLGGAVRWWLDGALRSLDAKLAAQGGGLVVLEGDERE A L
NELDADDARVTFIHKTISADNLTLKEYNSGVLCLHTTPEL SKLDRDDARVSFI HRELRAANKQLEQQSSGIAFYHDEPNK SSGPLGGAQEWWLHHSLASLTVALLEEGGRLLLRSGDAEE TQSVYQTQKTQFTIESVTDLRLSLQKLGGDLLVYTGDPE KVRPLGGARQWWLHHSLVSLTRSLAKLDQKLILRKGATQA N $\downarrow$ GPLGAAQAWWLHHSLAALKASLKSLSGDLIFISGKAED GQWQVGSASRWWLHHSLTAFAQQWQEKQGQLFCFQGESLS DALDRTDRRVEFI VQEVNRLQNELTAMGSTLVVRYGHPVA EKLNKNDARVQFIHNQVKKLHSALKDYDSSILVKDGKPLA AHAWTGPNRQHFLCGNLESLAKNLEA $\square G S R L I I R S G E T V S$ ESLPKNDARVNFIYDSLEKINMELNAEESSILIKKGNTKN EDLNRQDARVDFIHQELQRLQKELRELGSDLLVLYGRPQA GVRPLGGAAKWWLHHSLVSLAGGLEAAGSRLVLRRGSAAG KEWQLGGASQWWLYYSLISLKNDLSELGLSLIIRKEDPLK TVDDLGAAPKWRLGLGVGHFAETLAAKGSRLVLRAGPARE GLWKRGAASRWWLYHSLSSLNKSL NGTLALERGDATK GKMNISMTYCRFLLQCLEDLDASLRKDNSRLFVDRGQPAN ALRPLGGASRWWLAQSLRALQDELDALGVKLVIRRGPSAK NQLDREDARVTFIYQTIEALNNELREQQSSILIKYNSTGQ QEHDWSPARVQFVVAHANALAEELAKDGDPLSFIQAKRFD APWAPGAASRWWLHGSLASMDQALQTFGTGLLIARGDALA NKLPDYDRRVDYIHQALTKMQQELQVFGADLKVYVGEPLD DPLPRADRRVEFIRESLVQLDASLRHRHGGLIVRHGVAAE $N E L L A E D R R V E F I H A S V S E L D A A L R A L G G G L I V R H G R A R G$
$P D T Q P Q D R R I G E L I G A L G E L D E A L R A N G G G L V L Y G D P A D$
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110



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L L P $\operatorname{P}$ K L A A T

AI P QL A VA LQQVT GV FWHKD GEPYARERD GKVVE QELLK Q GI

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AIAKLAKALNSKAVFWNWDVEPYSQQRDADVIDALQEQGLV
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G L






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TAMRL A A R L N A G A V Y WN R RY D P P

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



V L C QL A Q ETGA E K L F F N R D Y T P D A R K R D E L V A E V L S R H G V
II P A L V E E T G A A A V F WN R R Y G L L P E R E T D A A I M K T L K D N G V

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$V$ V L E L











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 TV $V$ H S F S S G H L L L H E P S R L $\quad$ Q T K S G G G P Y R EV A S F A A SLL F E P WT I T T GA GTHFSVVYSPFWRACLAAPAP TLVLCK D QVI F ECDEELLT GQNKPYTVVFTPYMRTWRKRFHA $D F L D F K D Q V I F E K D E I L N E S G D F Y K V Y T P Y K N A W L K K F K A$ EAHSFAAALLWEPWTVLTGQGEPYKVFTPFWRAAQAMPEP
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 DFDT FK D QVLLER S EVVTKENGEPYVVFTPYSKQWLKVISS AVETVHDRIV HEPGSITPNSGEHYSVFSYFWKKWRDREKP
 RLHPYK D IAL HERNEVLTGGGGSPFKV FTPYAKA WLK LDDKP $M V E S F N G S L L H E P W T V$ KT Q S G GPFKVVFPFYRNAA QHDDR DAHSHAGHILEEPWTVETGTGGFYKVYTPFWKAVRGRDPG $\square$ WF TFK D Q AV F E R D E I L N GQ GKP F S V F TP Y K NA WL KA LQP
 $T V R T F K D H V V F E A E E V R G L S G D P F Q R Y S A Y R D R W W T K W R A$ TVESSNGSLLNEPWEVLTGSGGPYQVFTAYWRAARRRTVA ALHTCKDHTIF ERREELTTQS GSPYTVVFTPYRKAWFAR LGA IAAESFNAALLHEPGAVVNRAGBPYRVVTPFWKACRDAGLP EVKYFWGSTLYHLDDLPFRLEDMPSNYGGFREAVKGLDVR SMQGYNGDLLYE PWEINSENGKPFTSFSPYWKKCLDMSVE

 $T$ LCLH H GNYLAPP G S V T TGGSGGLYK I Y T P F WRAL RERMP P
 NFHHYKD QVIFEKDEVLTMAHKPYSVFTPYKNMWLKNVND SYESVHDAI FHPPGSITTTNAGDPYSVYTYFWKKWRDRDKP NLKK F $\quad$ RGH TLLYNK E D L P F P DK D DP DAF N Q F K K K I E R D S I I RCES H R S T L L F E P WE A S K T G Q P Y R V F S A F WR A CRE L S Gl DF HQ Y K D QV I FE Q S E M L T G G G T P Y S VV F T P Y K N A WL K K L D D



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 NHE Q Y H DAVI HEPGS ITTTTDGDPYSVVFTYFGKKWLDDRDKP E LKKHFWGSTLFHVDDLPFKDEDMPMTHVDFNKRVQGVEVR D ARSFGGH L MF E P WTVEETK TGGFYKVYSPFWKSVKTRDVE
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 SHG A A APKFRLGEGVRVFGAALAVVGSRLVLRRGDALA DPLPADDRRVAFI HAALVELANALAQHGSALVVAHERAQA K HHAYGGASRWWLHHS L A S L A K S L E A K G S K L V L R R G E A VA Q Q H DVVS G R Q L S F I R D S L Q H L S E D L S S G L G DRP H G GAA R WW L H H S L T A L DKLDKKDARVEFI HNQVTKI SRELEAFDSSILVKYGKPEE GFPKT GALLRAQFLLECLADLRKNLMKRGLDLLVQHGKPEE GDWAPGGASNAWLHRSLAALDADLRARGSALLLCQGDSHA
 P QHP $\square G S A S R W W L A Q S L R S L Q G S L T A R G Q S L T L R R G R P A R$ RQWAMGGASRWWLHHSLTRLDESLRAKGSRLILRRGKSAE DALDRQDRRVEFI HQQI E ELLQNELARMGS GMVVRYGTPLS G G R A L G G A A R WWL H G S L R A L D A A L A G L G G R LV L L R G D E A D GQF YP GRVVSRWWLK Q S L A HLLD Q S L K S L G SRRLLI KTHS TAV


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 D A L P R C D R R V E F: H A S V C A L D E D L R A L G G G L V R H G T A V Q
 GKFA A GGASRWWL GHS LTSSLARSGLGGHLSIYK GNPCE DKLPENDARVTFI FETLQEMRKELQDYDSSLAMFHDTPEK
 $D N H K D G Q A G R V W L H Q S$
$D$
$D$ DHAGP ARVAFLLDSLDALLREDYRDRGGGLVVAHGDPAE $G L G A A P K W R L G L G I G A F D D A L R E K S S R L I L R K G D A L E$ R NHDDADCKVD F WL R N L V E L E K A L G K L N V P L L I R E A D T WD
 QAHDDAPCKVDFWLRNLQHLSQALDNLNDPLLIRHAATWD K N M Q V S V N R WR F L V E S L K D L D E S L K K L K S R L V F V V R G H P A E GFPKTGP F R A Q F L L E S V A N L R Q S L Q N L G S NLII K DG KP EV APPPE LPPMAWFLVES LVELQQQRWRDAGSRLLVVAGPPVQQ $G \square R P L G G A A R W W L H G S L R S L G E E L A A D G \square P L V L R R A A A A E$
 GHYY Y P G R V S R WWL K Q S L A H L D S S L K S LiG T S L I TMK R S D S I S GFPKTGNFRAKFLLESVADLRTSLLQNLGSDLVIRQAAPEE GRWRAGAASRWWL HHSLAALDRAFRERGSRLLIARGDSLT

 QKSNNKVNRYQFLLES L S D LN S SGLTS LGSQLLVLRRGTPEE D E L P R Q D R R VE F I H A S L LEELH Q G L Q Q L G G GL IVVR H G P A L E RMHHMAPK QAEFI WQS L Q DV Q Q S L A A K G V V L HV A QCDD F S HLLP MAPARLWFLIDSSLI ELLQQRWRDAGSRLLVVEGDPVR

 VGPK T GPFRLRF LLEGI RDL R NTLIDNKGSNLVVRRGKPEE


 D T L P K A D R R V E F I WE SVVREL K LAA L K K G GDL L VA Y D F A E Q D APDLSPARLWFLSESLRELQGRWREAGSRLLLLRGDPAE
 R L A P GS A A R WWL H G A L T A L E D DL R A R G GR L CIIMA GPA WQ
 $H \square R P D G G A A R W W L A Q S L R A L R A D L S H H G \square P L I L R Q G P A T A R$ GTTEYGFKRTQFLLESLKDLDKSLRALGSGLLILLKGKPE RHRAMGSASRWWLHYSLASLDATLREKGSRLILRKGKCED D A LPRRRDR RVEFI H G S L A E L D A A L N GA G A G L I V R H G R A Q D AKHDMAPRQAAFLLQNLQLL RDALSAREDAFYYHQCDDFQ K R R S L G A A S R WWL DK S L A AL D S DL QRLGGR LILRRRGDPRR EHFVPGSASKWWLHQS L S S L N D SL EAADLAPARLWFLAESLRELAERWRAAGSRLLVLRGDPAV QKHDDAP ITKIDFYLRQI EVLQHADAKLNIPLIIDQTDPLWE
 LT GRAS RNRNAY L A E A L E D L R SA L R GRGGDLIVRRQGESAD
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 AI P R L A R QY Q A VA V HANHDD D P A A RRR DEAVVARTLAD E GR ELTKLAEETGATTVHANCHYEPWWLNAERKLAA
 A SVVEVKK QVCAENSVTHYNY QYEVNERRAR DVQVERALLRNV



 I V A QVAK QVGAS SV HALR H Y EPWWRNA E K A V $V W Q E L L Q E Y P D E E V F T N H D Y E V Y A K E R D A Q I A G L L A G B A L$








 I L V K I C Q L E S I N K I Y WN R V Y E P WV I S R D K K I K T N L K K L E I
 E LP R L A D E H G A E A V FWN W DY T GLLA R E R D R R V E S A L D D A D I

 QAP QL C R E L S V E S V HVN E E Y G DH E S R R D S A V A Q AL LEA D GV


 $R$ R P ELLA A ESGA D RVVVWNRRF GA GRA LDDA AVA DRLREAGR








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 WLD DFCQQQQVDALFYNQQYELNEQLRDEALVARLSRRAB


 TLLQELDKATGAT QVFYN HLY D P DS L V R D H H V K Q GLLT Q S G I QV HAL A QETGAT DVHLSAGVSRFARRRMERIAA ILPSSLAKTFEAHTVYAHKETCSEELNVERLVRNGLRQNHP V F P R L F R E WG $V \mathrm{~V}$

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h可kellpfa ${ }^{140}$
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 $K V L V D W D Q L L V A P E L L K T G G G D P Y R V Y G P F D R N W R E D S E P$ RVSSFRGSLLFEPGSVTGGGTPYRVYSAFWRACLSAPAP
AFEDFRDQVIFERDELTGAGAPYSVFTPYKNAWLARFDS SLRLDPGTTLPPGGVQPGGGGGHYKVFSPYYRAWESAKWR SVRSFNADLLYEPWEVNDDEGRPFTTFSAFWEKCLSMPPE RCDSVEGNLLFEPWDLATEANGPYRVFSAYWRRAVTRLTL EARSFGGHLMFEPWTVETKTGGYYKVYTPFWNSVKNSGVA DIVSCHDALLHEPGTVLTNEGKTYSVFSQFFKKASQKGIS EVKKHWSHTLYDTDMVRENGGGFYKVYSPFWKAVRGRDVG AFSDYKDQVLLDRDEVLTQQGRPYSVFTPYKRAWLQQLKP VSQGFDDSLLLPPGSVLTGNREMYKVFTPFSKAFLQQGLP KFSAFDDACHIEPGKVQTKNGDPYKVFTPFRKEWLRLF KVVVDWDQLLIAPELLKTGGGDPYRVYGPFGRNWRGQVQP TFHSYMDQVVFEYPD ATRQGEPFKVFTPYKNAWLGALRP KVHTCWGSTLYHRDDLPFPHSRDPDVYTQFRKAVESEGRV SWATFDDKCLDPPGCVRTKQGEHFKVFTPFKRAWLSLEQP NAESFNASLLQEPWETKNGSGNPFQVFTPYWRKSRP ITYR QVNYYSDRTLFSPGSVRTGSGDPYRVFTPFKRALIERCTD ETHFFDDFTLLAPGSVRTGQGDPYKVFTPFKKQCFKQLQE AFHQYKDQVIFEQDEVLSQAGKPYGVFTPYRNAHDKKLND KLLADWDQLLVPPDALATGAGDPYRVYGPFFRSWRRREAC EREAHHDAVLHEPDSI RTNAGDPYSVYTYYWKKWTDRETD AAHSYPGALWQEPWTLATDAGQPYRVFTPFWRKLRT SLS QARSHRGNMLHEPWQVRTRQGAPFRVYTPWWRAVRAMGAP RLYVHDATTVVPPGDVTPQGADHYAVFTPYLRRWSAEPLR EFHQFHDATLQVPGSVKTQQGKMYQVFTQFFRAASKLQVE RVLCFCAHLLHPPGTVLGGSGRMPRTFSSFHRALRERDLS EFETDSTSTLYHAEDLPFSDKD DPDVFTNFRKKTEKAVIR T LHLHHGNYLAPPGTVTTGSGSPYKIYTPFWRALNERMPP
 TCHRFHDSVLDPPGSVDTGNHEMYKVFTPFRRAFDQRLLC SVSSHAAWLLFEPGAI QTKTGGPFRVFTPFWKAHRPYLGP NVQSFNSHLLWEPWQVLKKDETPYKVFTPYYRRLSKASPR RVLVDWDQLLIAPEALRTGQGDPYRVYGPFWRNWRGQVAA DLILYHDRTLFPVGSIRNKSNQPYQVFGAFKKYCYEQLVP $Q V Q S F N G D L L Y E P W E V L N D D G K P F Q S F E S Y W Q K C L N M P P D$
$R A R T H P G I T V P P G E T P S G G D H Y K F T P Y W R A W G T G R R$ KLQLIWGSTMYHTEDLPFSTSSLPDVYTQFRKSVESKCDR EVASHRSHTLYHLQG DDNGGTPPLTYKKFLSVIEGMAPP EVKYFWGSTLYHLDDLPFKDEDLPSNYGAFKDKVQKLEDR AFSDYKDQVLLECDEVLTGQGQPYSVFTPYKHAWLQQLKP


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SCGK LIPPSLGPAPGSGLDEDGGGWGSDPTLESLGL
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SVFQKPAHDKSPAMPQL
TPDPAPASVP APDVWPTSDRDDDWALL
FMLSSYPVARYLDRLAPLPPQPLPTLPGLGFAEDTLALPG
 ECYPAPDKRAHP AD
ECVAAPKVRSSGS $\square E P A P S \square$ I
LDKEKNTFFPTPPLHI DGLEEMGFDWS G

PAPTPPPATLPAHAVQGVALDALQLAPPLPWDAQFWDHWQP $\square \mathrm{N} \square \mathrm{K}$

PAPSEDHLDNTYKNSRLPNLSLSDMGFETS
QP LIPAPKA LTA GPK $\square$ ATDD DASWN $\square$ EP TRPD WAS PAPRPAPDHIPAPPTWPETDSLDDWKLLPSSPDFGQDWTP F YLKSYPTETYFN HFVKVPNRMPVPSLADMNF
 TDL
A GGDFY LK K Y P VEKKALARPPARRDHTLPTHAQLGFE
KPVGSVTLEQMENCTTDVEANHSEKYGLPSLDELGFNTS VPLAVPTSVQP
ECVPAPKPRQGAPDSKTPEDKPFDYP
R P
YPVERHAQHLAVPPAG ERLPTLADLGF
T I Q L P Y YPSEKLIHK\| I P HNYPFLSLKDIS F
APLAAPRRLKGCELPPRLAQRQVELDAL GLAPARPDWAG
RLPLSPPEQATYIGDSGSPHACKPQELLP
HTLK $\square H Y T S Q H L D N T V K N T R D P N V$ SVLSEMGF
$F Q C K A Y P$ VACYAGHLLAALPKGE ADPSLADMGF

S SYPPPN GDALRAGDDDLPTSDDLGFD
AP LSAPKNDTAPD
RTVHTPEAQQPLS
KPAPK LSAEH DKDCKTP DGSDHEEKYGVPS LAEL
RRVPT PKAQAEPGVKSDPVPTAVEGFPTPS ETLRADWPA


GTVEAPTGLIDLDAACLDAL
$P V P L P R P A G L R A A T R Q P A S D A L D E W R L L P Q R P \quad D W A G$
ARMEA FPDAEAAAGDAPKADGERIPELAEDGF
DEVATPRTDTLPPDVTVGDLPEAPAGDSPAAA LGGETEG APLLPPKR DSGDASRCPSDNLVFEDESESNALLARAWSP
 EARSAPGE $\square \square A P D S W P D S D A L D H W Q M$
F P
PALSAPSD DP APDAWPDSEALADWQL
TALPAPTARLPPVDVSLPGDKDAEVGQVPTWQEMGF
YPVDRYAHHLAPPP A A DERLPTLSDLSF
ECLPAPA
$R \square A M P K \nabla Q S V P Q V K K E S E T S V S S \square S E$
VTVPAPAGLVDLDPAAVPSGEPL


PPVDYDPSRLRFHSSPTPKLSLDDLNLLP

A D A A PSHFAQSPPES $\square A D F A P H D D T K$ T $\square$ EHL WPA EPYPTPED FYVKPYPVDAYRHHYAVASDEDAQQYVLRELAQMGF


LPPLPVPAALGFAALPPAVEDGLVSLSALGLGPTRPDWAQ $V P$ LAAPRAVRVPS GLRSEKLP
$\stackrel{V}{P} \mathrm{P} V \mathrm{P}_{\mathrm{P}}$
PPLPAPKRL KGVTRAPEGDTDESFALEPEKPDWAG NAFEAPKE IPQ PPTLELPSFEALDLEFIP DDKRAA DHFKG PDPQRRPQNDALPDSWPASDALDDWRLLPT

$R S V P A P N P R T T P A V A T S P L L A P F D Y P Q Q P V D N Q L$
$R N Q L C R R P E A M S F F E G A V A C E A L A S F D$
$M$
LH PTQPDWSA MPVEVPKNLQ
$R P V A A P T G L R D L G E P E L Q A L H R S T A S P L P L V E \quad P D A A T$
 $S P L D P P R R L T$ $\square$ ClRTPTLLGPPPNUE DP PVPHIDPSAQELGHTPHDELYGVPTMEELGLETS KTIAALDQLKS
YPVERYARHLAALPAGERLPPLAELGFVPT
$F Q L T P Y$ T $P$ PASHARHLAAPPAGECLPTLQEDGF


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 NLLH SRNQS S
C PAGSASRWWLHHAL RALDRDLRDAGAAL HLRRGELLD A N A R VG P N R WR F L H E S L T D L D N S L K A DG S R L F I L K G K P E E QD H A MAPR Q A A F L WQ N L Q A L Q T A L A E R G D P L H V R E A E S V E

 RQWAMGGASSWWLHHSLVSLDKALRDKGSRLILRRGKCAD RE H D D A A C K V D F WL R N L A A L H T Q L A A L NVP L L V R Q A P H WR RHRAMGGASRWWLHHSLARLDESLRARGSRLILRRGKCED DWMQVGGNRWRFLQQTLHDLDQQLQKLGSRLEVVRGKPAE AARPMGAASRWWLNRSLTSLEAALRDHGSRLII RQGDTKD DHASDVRVRR
, <br> \section*{} <br> \section*{}

N
GQF AKKK K C G $A K K R G L V R Q R F L \frac{L}{1}$

## R

 A A KWWL HHAI I DV
 GQFYP GRVS RWWLKQS L VHLD Q S L R S L GAP L LI KTEDDTLS



 K T T WR F Q Y R A K F L LE S V T D L R S T L Q UH G S N LI I R Q C Q P L E R D WK L GAAS R WWL H H S L K S L D K S L R D K G S R L I L R R G D CA A VSP $\quad \square R R D F L T R C L A G L R G S L R A L G G D L I \quad R Y G D P V A$
 GSSNVGINRWSWKYE DVEPFKHLMMA QNSTVTLEVVLFVPA

 ARAARNRRAHLLAEALADLRSGLRERGGDLLLRRGDTAS
 G L R P L G GAASWWL GK S L A S L A Q S L D A V GI D L Q I E T GDP H K HV R P L G A A A R WWL H H S L V S L R N S L E R H G I E L V L R R GVA E T


 HQHGMAPRQAAFIVRHLRSLQSALAERGDALQVVEAEDFS A R R P L GAAAKWWL ANS L RTLLDRELRKRGQRM I L RRGDTA T EA H LTA P VR VD F L LR T L D LL K K DLA K LDDP L YVET DDKRK DWMQVGANRWRFLQQSLSDLDQQLRALNTRLFVVRGKPVD


 K K NK F GF KKT QF LI E T I A DLL K E N L T K L
 Q R H D D A A D K I D F Y L R Q L Q T L E Q Q L N A L N I P L I I K N I D F WD QAHDMAPRQAAF I S A QL N A L Q T A L A E K GIV P L L F HEVVAD F E



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KFS $\square$ FDDNYI $\square$ QPEMIVLTTRDGE $\quad$ FKIVIFTPFRNAWIIKR QVQSFNGDLLYEPWEVLDDHGKPFTFFDSYWTKCLSMPPD PLHLDFAGETVYPPSLVLKPDGSPYTVFTPFSRAWKALPFA EAHSSNGSLLWEPMKVLKKDGTPYRVFTPYYRKDNVEPPR DVETVRDELFFEPGDI TTTNKGEPYSVYTYFWKKWRDRPKE KLQLI WGTTMYH TDDLPFDTSSDPDVYTQFRKSVEAKCTV GVTSFPGNLLLEPWELKTASDTPYQVFTPFAKALRHH HIP QLHRFDYKCIFAPGTVTNGAGNTYRVFTPFKKAWIAKARD AVHTYQDHYLHGSQEI DNQSGQPYKVFTPYYRDWQNYPKE
 KV I I KHGHTLYEAERI FKANGKVPLTYQAMQKSMSNLGPP VCQGFDDSVL $\square P$ PGSSVT TGNGEMYKVFTPFSRAFDR RLQE EIRFFRGKMLYYTQDLPFPDAHTPDIFTQFRKEVEKLPVR KLELVWGSTMYH DDDLPFDCESLPDVYTQFRKSVEYKSK】
 DLCLDHDGMLLLPPGAVRTGSGGMYKIYTPFARAMMEQMPP NLRSCDDQLFFAPGSVLTQAGNYFQVYSQFRKACYADPPL DLDCHDGNYLAPPGSVKTGSGGLYKIYTPFWRALRDHMPP KVETHCSHTI YNPELVDKNLGKAP ITYQKFDGUVEKLKLP EFKGFNTHLLADPADI RTGSDGPYKVFTPFFRALQAHLEG DREAHHDAVLHTPDSIRTNAGDPYSVYTYYWKKWTGRETD DFIGAKDNVIFEKSEITKADGDPYTIYTPYSRKWKEKMSE LHVHDAVVTAVPAGEVVPKGGDHYAVFTPYFRRWRSAHRR ALFTFKDQAlFFRDELLNGQGKPFSVFTPYKNAWDRAAEP HVQTFPSHTLHDPEAYVAQGKDVPTVYQSFVKLFASMGPV DVEEAESFTLFNQCNLPFSLSDMPDTFSPFRHKVEKFCTP DVHSYNSALLFEPWQLATQQGGPYKVFTPFWRSALSHWQV $D C Q G F D D S L L L D P P G S V Q T G S N T M F K V F T P F S K A F L H Q G L P$
$D E F H D F K D Q V I F E K T E V E K N D G G M Y L V F T P Y M R Q W K K E F E N$ QCFVESGHTLYD LDMLVAKGNSPPTQMTSFMKFDEQDPPP PFELHRGNTLFTEDQLPTGLDAFPATFTPFRKQVEPLTDT
 VKTFWGS SVVHVDDLGFEDDHDPQVYTKFREVCGRVPVR KAHGYFDHHMHASGEIKTNSGTPYQKFTPYFRKWKELQKP P LY S FK DQLIFAKNEVCKPDGSPYVVYTPFMKKWENYATQ NLKHFDGHTMFHKQDLDFPDKS DPNDFGVFKKK IDERES IVV RLRSHLDQLLFKPGSVLTK SDSYFQVFSQFRKACSALPHS EVHRYLDQLLFKPGSVLTRTGTYFQVFSQFRKVCDHHADP TVESFNDQIVYEAGSI RTGQDNAYSVFTPFKRKW

 ERAAVHDAVLHEPGTIRTNDGDPYQVFTYFWKKWRDREK

 TTHRYLDQTLFAPGTVLTKSGGYFKVFGQFRKTCLARLEP EFKDHYQQFLEHPEDVPYDSERDPKVETEFRKKCEKYSEV SLNPQHDDCVVPPGSLKTGGGRQYAVYTPWYRSWVAHLHA SVQSFNGDLLYEPWEI YDESGLAFTTFDAYWSKCMSLPIE
 AVRLFDGVTVVPPGALPSGGGSHYKVFTPYWRTWQEYPRR RCQGFDDSVILPPGAVMTGNHEMYKVFTPFKKAWLTRGMP
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 VCEHPGLLTVVPPGDLTPASGDHYKVFTPYWRAWEGARWR SFEVVHDTCVVPPGQLRS GS GNQYAVYSPWYRSWVAHDHA KADSFPGNVLAEPWNIKTGSGGAFQVYTPFARVVRQWPDA EAHSTPGDLLFEPWRIANGEGNPYRVYSAFWRACTSGLPP A LVETGSPYAVGPGRVLNRTGEPYKVFTPFSRAWHDHGWP
 DADSTNGSLLWEPMQVLKKDETPYKVFTPYYKNCLNAPDP VCHGFDDALL $\square$ SPGSVLTGNHEMYKVFTPFKNAFLRRLRE ETHDSRSDLLASPSMIRNKEGHGLRVFTPFWKRVRALGDP CMDVIHDTCVVVR GELKSGQGKQYAVYTPWFKSWVAHVHE AMDVVHDTCVVNPGELTSGTGNQYAVYSPWYRAWMAYIHK


 EVVTHVAHTLYDDDRVERNGGTPPLTYRKF LKKVYNEMGK EFHLFHDRTLFPDASIRNQSDTPYQVFGAFKKTCLEHGLP VLVQFDTQCIMPPGSIRTQQGD $\quad$ Y K V FTPFKRSWLARLHQ VCEGFDDSVMLAPGSVMTGSHEMYKVFTPFKNAFI KTPER



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80 GSTYYFGFPKQF|L|MEC|LDD|L|QKN|L|MKRGLN|LLI|QHGKPEE SFKKTEKFRTQFLDETVTQLKLNLAKYNIPLFVYSATPET
 RAHDDAPCK $\square$ D F WLR NLAELSTRLSELNVPLLI RTLDDWR ESYFMSSRQQSLI QS RVDALQKDLNSLGIPLHCIIDDNHEQ
 A A GFAAPNRLALLAD CLLRDLD S GLLRDRGGRVVVRS GDLVE
 RQHDMAPRQAAYLRAHLNGLQQGLAERGIPLIMEEVSDFA GK S P Q GYYRA QF L A E A V A D L R A A L R A A G S E L V V R V GAP E E K D N D Y K D N A V Q F M I A C L K E L N D QL H QL N A R L Y F F E G L T A K I G G A S KLDWLH H SLNSLNKSLDN R L HFFRGNPLK A A H NVS PR Q I A F L H Q N L V E L Q H T L A K R G DP L DCHFA D SVV E PDPKAFNRI RFLLES LVDLDTSSLKKLGSRLLILRGEPGQ CR P A G P V R L A F L Y R C L R D L D R R L A G G R C V R A G D P E Q K Q K
K G KG HGLT
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 TGRASRNRNAYLADALADLRGALRARGGELGVVRQGETAA EFKK T EKFRAKFLLETLRELKNNLALKNDPFYVFHDLPEN SV A GQPRVRFMFRCLRALDAKL GGRLDVVSGDPVD
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 H DFNASSSRA W F L G N S L Q E L GNNWK K M G S R LV L E E G D PVE
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 K K N PVSDKKLNFLWQSVLDLK QNI EAKGGQLVMLKGDAED ALG A APKWRLGLAI ECFKKKLERMGSNLILRRGNACE K PA GEPRRRE L F DC L R A LD H D L G G G L HIA H G DPER K MHHMSARQAYFI HVRLTELQQKELAE LDNDQLLYQSCDSDD R Q H DMAPRQAALLRAY LNDLQHSLAGKGIPLLYKEVSDFQ GEWRLGGASRWWLRESLAALSRDLEKRGAPLTLRRGDAQA Q A H D D A A C K V D F WL R N L R D L R Q S L E G L N DP L L I R K I D T W D D MLP EK D P RLQ F VVN QL HE N Q HFN QF Q S GVQSYHNS P L N

 E WHGTSPARSDFMLETI KLLQRQLTDLLHIPLVIKRGDKGS ASAGAP RLLRYLYRALRALSESLLDGRLLVTRGRPEE L L R T S A R RRA WFYRNVAALRREAYARRGGNL LVRFGMPWE $K$ T A GS K R L A Y LGQ S L R L L DE S L $\quad$ GNNL HV DA G D Q DT Q $\square$ GDFGFKKTQFL DE TVQNLKKNLNDLN
 QTAGPVRRA A $A S R V R A A A$




 $E G G \quad G G A W R W G L Q Q A L A A L N A D L Q \quad G K L C C Y V G D P A R$ Q $\ E E A$ G A K L L A Y M GQ S L R A L D E S L QT THYFGFPKQF I IECLADLKKNLMKRGLNLLI RHGKPEE
 ETGQPRSRR LITSLRALADSL DGHLVVRTGNPVD

 Q NL L K K D D K R V T F I Y K S V Y K L K E D L K S i G L D L A I F F B T P K GVRPLGGAVK WWL H H S L L A L S E Q L A Q R GVVR L

 E P H A Y Q Q P G L Q F ML E A L Q D L Q Q Q FR TH Q WQ L GL Y Q GQPE Q Q Q H H MAPR QAA LLLNA HL NAL QQALA EK G DP L LYRE VD D FA UniRef90_J1QAX4 UniRef90_E4YMW4
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W4VH UniRef90- $22 \mathrm{Kl25}$ UniRef90-UPIIOOO26530B3 UniReffolWOBIV3 UniRef90-KoC4V9 UniRef90 WOP4T9 UniRef90-Q4PCL99 UniRef90_UPIo004645699 UniRef90-Q12KA9 UniRef90-UPIo00344F7E8 UniRef90-UPIO0047ED611 UniRef90-KOJOH3 UniRef90-A3WL53
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UniRef90-MOHAU3 UniRef90_UPI0002F1CF30 UniRef90-A0A034W8G7 UniRef90 X0QAR1 UniRef90-UP100026282F3 UniRef90-UPIO0039D8BDD UniRef90-Q7NJT3 UniRef90-E8W8B5 UniRef90-O7V310
UniRef90 A9DMU9 UniRef90-P12768 UniRef90-S3AP64 UniRef90-W8VXC3 UniRef90-S3NXP3 UniRef90-N8S9Q7 UniRef90-E4TPL3 UniRef90-QOFFF3 UniRef90-W7SJ39
UniRef90 W7DRD5 UniRef90-UPIO00237CECE UniRef90-UPIOOO4651F38 UniRef90-T2HD62 UniRef90-COBN32 UniRef90-M1V6L5 UniRef90-Z9JZJ8 UniRef90-UPIOOO467A249 UniRet90-W3X2T2 UniRef90_K0V681 UniRef90-UP100037BC00D UniRef90-UP100038024FE UniRef90-F4B1A7 UniRef90-G4QHJ44
UniRef90 S8EJB4 UniRef90-UPIOOO2EDDBA5 UniRef90-UP10003C7E638 UniRet90-F2Q1Q2 UniRef90-UPI0003FC1E87 UniRef90-H5V327 UniRef90-UPIO0030A6F16 UniRef90_IODTQ6 UniRef90-UPIO0036E4D54 UniRef90-A0L6R4 UniRef90-UPIO0037F4B80 UniRef90-B9SPQ77 UniRef90-V6MFG4 UniRef90_E6SFH1
UniRef90_B7l4R3 UniRef90-E4N615 UniRef90-U11EC8 UniRef90-H2G3Z4 UniRef90_R1HBM0 UniRef90-J2DKG9
UniRef90-G7HVZ9 UniRef90-G0A1Q7 UniRef90-J1QAX4 UniRef90_E4YMW4
UniRef9O_A9TL17
 MLPEIVTTHNCTHIYCQKEWTAEELQVTTAVKKALIPKLI VFVRLISRTHMNAIFFNKDEVGRGKERDEYVRTLLQKYGI EMVELCRTHRGDALHANDEYGVNEQRRDQAVAEALRQDAV ALYEKCLSHKVRHLFLNFQYELNEWQRDERLGLKTAALGLL ALEKWLSNTQFEHLHYSCDYELNERRRDEQLKVLAHRYQV EVCAVAGEAEADEVHLAADVSAHAHRREELLRSALSARGC
 VVGELVRRTGAGAVYCHTEVAYEDLRAEAAVRAAAEAGGA
 WLLNFAQQQNATGLYFNHQYELNERLRDEQLRQMAAQHL VVPAVAGETGADVVHIAADHGPYGRRRDERVARALLAGGR EVVRVARSVGAAAVHVSTDCGPYGRRRDASVAKALADNND WLKYYCNKEQVKELFYNCQYEDNEHKRDQKLKKVLMGHV ILPKLDQEAGANALYFNLSYEPEQV R QLDQYIYDNTLV IFKEMFLEWGVRYLTFESDPEPIWTERDRRVKALCKEMKV
 YLMYFCFKHKINNLFYHYQYEFDERNRDFLVKKKLSQQGV LLPELWKRWSITHHVVFEKDPSAYGRRRDQLILEAAEKSNV Vi PALAREWGVKAVYAHEEVGTEEEAVARALQQALQPLGL EVCAVVRAVDADDVHMAAGCSGFAQRREDRLRRALEADGR
$D T A A L L V D Y V N E H Q 1 G A D F A G K E P E D N E Q R R D N A L T V S G L$ EVHALAQETGSTVVHLSAGVSRTAQRRLDRTDALSATGG VIPDLVSKHQDDSVFLQKEWTPDEVKINTNLQELQNLKSV
 LLKARTNEQNIHEVVYSEQFGLYEQRQDNLLKAHCQRSIG VLPELAATVDADFVTVHTRPTPEESSVESAVERELGGDGV QAPAVCQHLGQQDVHVNQEYGDHETRRDQAVAAALHDHGV
 VIAELAEHYQVDGVFAHREHAPEEKREEDKLRET KKKLKV VLERVLSRWQUGRLCFERDTEPYARRRDEALRSMAERVGV IIPQLAKKDDAKFVFWNRSUEPYEGNRDGEVKNNLKEQNG EVRRVAEETGAARVHIAAGVSRYAARREQRIREALADSGR ETARVVHESGAHQVHVAADVSGYAQRREERLRTALEGTGC VIPDLVTEYSAKNIYLQKEWTRDELDQENAVGDAL ESAGL SHPEKILHWQIQTVHANDEYELNENQRDRRVDQHLANAQK S SA SKKATQAKAVYASQEVGTEEDATVKQLQKRLNKNQV VLQELVNETGALDDVYWSRAYDPVSIDHRDKVVKSLLNG VLPELAAKIKAGSVHVTADTAPYGRERDDRVQKALGD

## > -wog <br> <br> 

 <br> <br> }ELDRLAAETGAAAVYCNRDYEPWADARDAQLQAKLHEKGV
 DCQDFCQQYEDKHI TANKEYELNEFNRDKA QQACDQQQU
 $R I P A L A R A D S A T S V H D S Q D Y S P F G R R R D D T V Q A A L G E G T$
$V$
$V$ VLNDLIKRYQVSSVHDSAEYEPYGAKRDAAI R EEAGG
 EVCAVVSRTGAGEVHLSGGVSGFARHREERLRRELERERC RIVELCKTWGANQLFANDEYEVDELRREANLVRLCAKQGI VLPKLVNEYQ STVFLQKEWTQEEVNVNNNVKINLNGNVN ALAAFCGQQRVDALFYNYQYELNERQRDAAVEKR LLADVV AQSQCLLEYCQQHSIDQVFANQEVEDNEQVRDHALSEQDI
WVLDFAQQQQVDHLYFNHQYELNEHRRDEWLIHHPQRAF LLPELAYSLGVQAVFANHDEEPATMARDNQVRGGLIDRGI VLPEVAHAVGATGVYWNRDYTPQADKRDRAIKGSLIERGL VLKDLIARYNVKEVHIDDEYERYGAARDARV KVAEYCQQHHVTALYFNHQYALNEQRREDKKVTALLKNKT VIPQVAREVGAESVHVTRETTPFGRTRDAAVEVALQSEGR QTAKLAAETGATAVHVAAGVSTYARRREQRLRRALGE VIATLARETNAGAVFWNDIAQAPHQADAGDVESALASDGV NVFTKLKKENFDEVVVSVDFDNYAKKRDEEVVADASEKGVV ALARLGQELGVTRLYANQAVETDELRRDSAVSERLAQEG|l VLAQVAAETGAKSVYALTHYAPWWRNAEKAV

ALPQLANDLINATVAWSERYHEPQRSIDSAVKERLETSGGL
ACAQADAQDCASESHLFYNYQYEFNERQRDAAVEKADPNV
VIKKFCKENEDT QMTWMKDAETFYRERDEETVKVVHRME
UniRef90_W9RSE2 UniRef90 UPIooo287A8FE UniRef90-B7GJFO UniRef90-U3HWT0 UniRef90_UPIO003624D87 UniRef90-UP10003644519 UniRef90-S1SRF9 UniRef90-UPI0004046ADA UniRef90-A4W863 UniRef90-E1Z506 UniRef90-A9BJX3 UniRef90-F8G765 UniRef90-K8WU58 UniRef90-B9GWN1 UniRef90-D3D2J3 UniRef90_UPIO003703169 UniRef90_C5WCP4 UniRef90_W4VH46 UniRef90-S2K125 UniRef90-UPIO0026530B3 UniRef90-Wobiv3 UniRef90-Koc4V9 UniRef90-WOP4T9 UniRef90-Q4PCL9 UniRef90-Q2JXG1 UniRef90-UPIOOO4645699 UniRef90_Q12KA9 UniRef90-UPIO00344F7E8 UniRef90-UPIO0047ED611 UniRef90-KOJOH3 UniRef90-A3WL53 UniRef90-G7G8S2 UniRef90-B9SPQ6 UniRef90-MOHAU3 UniRef90_UPI0002F1CF30 UniRef90-A0A034W8G7 UniRef90 ${ }^{-}$XOQAR1 UniRef90-UPIO0026282F3 UniRef90-UPIO0039D8BDD UniRef90-Q7NJT3 UniRef90-E8W8B5 UniRef90-O7V310 UniRef90-A9DMU9 UniRef90-P12768
UniRef90 S3AP64 UniRef90-W8VXC3 UniRef90-S3NXP3 UniRef90-N8S9Q7
UniRef90_A1ZPZ8 UniRef90-E4TPL3 UniRef90-QOFFF3 UniRef90_W7SJ39
UniRef90-W7DRD5 UniRef90-UPIO00237CECE UniRef90-UP10004651F38 UniRef90-T2HD62 UniRef90-COBN32 UniRef90-M1V6L5 UniRef90-Z9JZJ8 UniRef90-UPIOOO467A249 UniRef90-W3X2T2 UniRef90_K0V681 UniRef90-UP100037BC00D UniRef90-UP100038024FE UniRef90-F4B1A7 UniRef90-G4QHJ44
UniRef90 S8EJB4 UniRef90-UPIOOO2EDDBA5 UniRef90-UP10003C7E638 UniRet90-F2Q1Q2 UniRef90-UPI0003FC1E87 UniRef90-H5V327 UniRef9O-UPIIOOO30A6F16 UniRef90-IODTQ6 UniRef90-UPIO0036E4D54 UniRef90-A0L6R4 UniRef90_UPIO0037F4B80 UniRef90-B9SPQ7 UniRef90-V6MFG4 UniRef90-E6SFH1 UniRef90-B714R3 UniRef90-E4N615 UniRef90-A8ET25 UniRef90-H2G3Z UniRef90-R1HBM0 UniRef90-J2DKG9
UniRef90-G7HVZ9 UniRef90-G0A1Q7 UniRef90-J1QAX4 UniRef90_E4YMW4
 A WVESYDQFLFHPDSIPFSVEKTPQIFTHFRKSDEKQTLV AWYYYDDAHEHGAFEVEKADGTPYKVYTPYYRAWRKRPKR PFHRHDDQLLEAPGSITTDAGECFKVFSQFRKVCLSHSDP Q $D H G Y H D Q L D P P S S V T A Q G E M Y K V F T P F R Q K W L S C L P Q$ VPHEHHDSVIFAPDEVVKADGDMYQVFTPFKKQWLKQLWP
RLHVHDATTVGAPGSVTPASSDHFAVFTPYFRRSERAVR RLHVHDATTVLAPGSVTPASSDHFAVFTPYFRRWSERAVR EFIRWHDQCILPPKSTTTNDSMYQVFTPFYKKWR VCQGFDDSVMLPPGSVMTGNHEMYKVFTPFKNAYDKEGDP RLRAYWANTLCHCDDLPFSLDQLPQNFDKFREQUGGVAVR NTSSFNGSLLTEPWQCKKDDGTHYKVYTPFYKELIK NIFTYDDALLLPPGSVTTQKGDMYQVYTPFRRAFLSQL EVFSPVSHTLFPADDIQRNGGKPPLTYQSFLK LAGQPSW ELRRTGSAYAVEPGRLVKPDGSPYRVFTPFYRAWKAHGWP DWVETGSPYAVTPGRVTKPDGDPYRVFTPFYRAWTAHGWR VCKSFHDYTLLEPGSILNNNSEMYKIYTPFRKKVLKKSNV EVKAHTDAVAFAPGEL TSQGOYYKVFTSFWKSLSSFPIQ ECIIERVSHTLWNPDUI KNGGTPPITYSMFMECVTEIGHP KVHSSNGSLLHEPWTIRNENGDFFKVFTHYWKRCRQULDD RI RGFDDGVLVPPRALNTGKGTPYTVFTAYKRRWDAWMEE FVQGFHDNLLVSHELIKNKNNKAYKVFSFFKKKlTQYLYK $K V V A V Q G H H L Y D P E Q V V N K N G K P T M S M S T L Q K \| V A D M G V P$ PLHLEWGHTLYHPADLPFALLADLPEVFTRFRQQVEAKAAD RLYVHDGVTAVPAGAVTPSGSDHYAVFTPYFRRWSHERLR NLTLLQQDCLLAPGAVLNDSGDMYKVFTPFSKKWKQQTLP NWIETFDQFLFHPSDIPYQDNKDPKIFTPYWRTWEG ER ELVRAGSPYAVTPGRVVKPDGTPYRVFTPFSKVWREHGWR EFQLFDGNLLVPPEAVETKQGGYYKVFTPFNRAWRTEVAK EFTGVLQDTLFKQSDLPFDLNEDPKSFTPFRKKSEAANDP KLQLVWGSTMYHIDDLPFNANNIPDVYTQFPKCV I R DLRRFWGHTLTHLDDLPMALSEVPDTYTTFRKAVESAVED
GFHSYLDQLLFAPGSSLTQSGSYFQVFSQFRKVCLHMALP KVDAFCSHTI YNPDLVIRNGGNAPQTYQKFLSVIEK DNVP EFVRWHDQCI LPPQSITTNDGDMYKVFTPFYKKWR PLRLYDGNSLLKETELPFSLVDLDPKFSNFRKQVEKEVIS KVSTFNSSLLWEPWELKKDNSPYKVFSPFYKKLKNHPGP RLSVHDAVVVAPGSVVPSGAGDHFAVFTPYFRRWSGEGLR QVIETWDHLLDEPLK FSGNNNPYSVYGPFYKNLKSK NWVESYDQFLFHPEDIPMTDDKDPQVFTVFRKKCEKYAQ\| ELHVHDAVVLAPGRVVPTGGKDHFAVFTPYFRRWEAEGVR ALHVHDATVLAPGAVTPSGGRDHFAVFTPYYRRWRDRHGR KTYRVFDQFLYHPDDIPFTDKEDPKVYTGFRKKLEKEARD SLKLYHDRCIFNVGTL LNKNQQPYKVFGAFKKSAYEQLH ELELFHDRTLEPLRSTRNKSEQPYQVFSAFKKVCYSKLDT KVDFYAQTTLFHEDDIPWPIGKLPDIFTQFRKENEKQGVR TSFKGHVLFEPWVPKTKSGENFKVYTPFWRHVSSQL
 KCDEDDGNLFTDPLTVRNGKGEMYKVFTPFRNTFLDQFDQ TAQSFPGALLAEPGSVCNAQGKPFRVFTPFWRALAELLQP DFHSFKDQVVFEKDQVTKEDGKPYVVYTPYKNKWLS ELVSFKSELLVEPWELAQDNGEPFNEFHPFMEKWLAFPKP TFTLYEGDI APVGSVRTQNNEMYKVFTPFKRAWLKQYQD PLRRFLDSYLINPKDILKSDKTPYKVFTPFYNSLE QFVLHHDQTVIEPGKLRTGSGGPLQVFTPYHKAWLAELSS ELCATGSGYLVSPGRITKSDGAPYRVFTPFYRAWREHGWR RVAWFHGQYVQEPGEIVKPGGGPYTVFTPYARRWWAAPEV KLTRTGSPYAVAPGRVRKPSDDPYRVYTPFYKAWCLHGWR YTHYDQFLFHPEDNPFNSGDDPQVFTQFRKKCEKESTV NAKSLNGSLLWEPMSVLKKDETPYKVFTPYYRKLTRQAPR RLRVHDGVTVVPPGAVVPDQRDHFAVFTPYFRRWRESARR PLARTGSGYAVSPGRVTKADGTPYKVFTPFYRAWQDHGWR RFYTEDDTCVVTPGELTTQQGKQYAVYTPWYRSWVAYGKQ EFVETYDQFLFHPSDVPYADSKDPEVFTEFRKKCEKECKV
 RVHAFDDALLLPPKSVTNQKGEMYQVYTPFRRAFISQLVT SLRTCKDHVI FGRDELLTANQTPFTSFAPYLEHWLARLTP QLVRTGSPYAVKPGRVVKPSDTPYRVYTPFYRAWRTHGYR KLQLIWGSTMYHDDDLPFNDTSLPDDFFDFRKALLMLQUV TVYTYHDNVFDPPGHVVTQQGEMYKVFTPFRNAFLRLFVS $R L V A T G T P Y A A G P G L V V T Q S G A P Y R V F T P F A R A W R A H G S$
$E L E L G H D R T I F P G R S I V N S Q Q P Y Q V F S A F K K A C Y T K L$ RLHVHDGSTAVPPGAVRPDGRDHYAVFTPYDRAWQQTPRR VSKIFPGDLLVDPQAI RNKDNRGLRVFTPFWRRVQGLGDP PLRRFDDSYLIDPKII LK SDQKPYKVFTPFYNYLE
EVYDFPCHLLAEPGETTTTGGSYKVFTPFSRNLRDADGD GCHWYNGCCVLPPGRVLTGSGDMFKVFTPFSRAWLKHRAP DLCLHDGTLLLPAGAVRTGGGTPYRIYTPFARALMEHMPP PAHEFPGHLLLEPWNITNGQGNPYKVFTPFGRKLMELLDE AFYSCADTLLNEPEHGLKSDGSAYQVFTAFYNRARLHPVA SCQGFDDSVMLAPGSVMTGNHEMYKVFTPFKNAFLRRLKP

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E C VA A P A K LPP P AE $\square E F N Y P Q Q D F D A E L$
A ALPAPQEL
EPQK NKFKNYFTEEISSS $\square$ ALQVDKFPQNENL

A S S P LLTTS DS SLPPP VGDVGSCETSEVPTTKDLGY
EPVAPAPTEPDWLDPASLSGGSEEIPPDPVLD
APADTGPSLVDPPRSLKIPRPPRADAELP
FSLPSPQR

H HLAALHDAPRPQTRLTILSDPLPPPPRLDTSPVDACLWPA
$P R P M P D P \| L T K V M K I P S D F E$ ERCALPSLEVMG
QPSLADTNRPN
K GPPLPETPRWP
NK1P
$K P I D A P E D L P \square P T D K D S K S K S L Q D \quad T D P E D$ $R \| P S L P P D P P G L D P G P L P T L A E L G L S L P P P D P R A R F V Y A G$ EPLPAPRHVR VPDR】RSEEPPAPSGVP
VPVPAP
PVLPAPDRVSVPS GPEPGS TP DHLSEE
RSCUS IDEQIPSENFFETSNII LPSLEDLGLE
KPADTDESTVDW LEPAESEELPDVEPLADFYPEWE
IS DWTPE S W
GCLK IDPVTLAPSPPVVDDWCVPSLDQLGL
EGGDAGRSGESAGDGDPAGRDPLSEPDVPPLP

LDPVANPERLS DKPPKDTMEQENTNCYAYPTLDELL

## $R P \prod A V P K \ L P A Q P Q N C \backslash P G \square$ R <br> $R K V V K K \square E N I V L N D N V V E S L D \square K S \square D L L P W W K D K M G Q H W N \square$ APVASPSHLPPPG ELDADYGIPTLAELGYP <br> SPFGAPRKVRVPEGPGSAALPSRARGLSPGLAEGGETEG

RELET T $\operatorname{SKMPEKNRVT}$
GTQTAPRTVRVPDGVASDPLPDRD
T P L A A PRSVPVPE AVVSARL P
RDCVSDDESPKVPETTDPTGEDQGDEEFEKDSRSAFPWQG

$\stackrel{R}{\mathrm{R}} \mathrm{L}$

K PAKS GVDSASWMTLKGSKKVPAAKSELPAGEAAALE
TDYH
ECVAAPAARGEP
APPLPAPKK $\quad$ HAAPAPASDRDDDWR $\square Q P K K P D W A Q$
$S \square P A L A H R V K R Q A P L H \square P A D P H V D G F E T P T$ RA $\square R E Y W P A$
$P P P V A A P L R L Q T L P G L R Q R V S H V E \square H E L E L V S D L S P E W$
THFSLVPWPLSSNPILIESCELLSSDD
PLHQSNY LKEFEVSKNINKVDFDYSFFPSLDELGFE
DPLPLPQANDKSASSDLKKLFDQPLPKVP
APADSGPGSARWDDPEDTAENVSARVEVPSATE
TLYYEAPERFPS LPP GYADGSVPDEPSDVP
QRLQ


$D P L P A P R R V R V P D G V G G A A L P Q$
DPAPAPDSVPWLRPEGRTPLPDDPAPDGMTLPPLG
HPLELVDAPAVNAGDARNHFKDLDFSAVPTAP

ECVSAPAVRASGPLDDPEPFAPFHYP
TYQAPLSSV
$R S$ RPAPQPRGEA $\square A \square D D \square S \square P \square F A H H A V V D D A P H P A$

QPMDAPPTVTWAT
GPVAAPKEIKAPTPPAEYRKFPDFPFP
EPKCAVRSCDKDPKS

PPAAPPLR $\square P W F D G D$
AP L P A PRA $\square R T P D D L P S A P \square P$
PKPLP APKKLTSVSGDASEADDEWKDEPT QPDWAG P LHQSNH EEEFKTATNDKKDNFDYDFFPTLQDLGF
$\square P L D T A D A P P K S A Q P D D D R E T Q A A G A D L G W D W A A$
QPRGEPCAWPSLVASGLAKPWDNPHWPV
AVPQPVPA Q V A APLRWPRSDADDDWPLLPRSPDFHADWTP SADLAVATQVGPNFPLSGTGSSLDDSDALNLVPSGSQWPD L P
QCVAAPHAREGARPDAKP
APCPTVTA
STGEALQED

UniRef90 W9RSE2
UniRef90-UPI000287A8FE
UniRef90-B7GJF0
UniRef90 U3HWT0
UniRef90 UPIO003624D87
UniRef90-UPIOO03644519
UniRef90-S1SRF9
UniRef90 UPI0004046ADA
UniRef90 A4W863
UniRef90_E1Z506
UniRef90 A9BJX3
UniRef90 F8G765
UniRef90-K8WU58
UniRef90-B9GWN1
UniRef90 D3D2J3
UniRef90-UPI0003703169
UniRef90_C5WCP4
UniRef90-W4VH46
UniRef90 S2KI25
UniRef90-UPI00026530B3
UniRef90-WOBIV3
UniRef90_K0C4V9
UniRef90 W0P4T9
UniRef90-Q4PCL9
UniRef90-Q2JXG1
UniRef90 UPI0004645699
UniRef90-Q12KA9
UniRef90_UPIO00344F7E8
UniRef90 UPI00047ED611
UniRef90-KOJQH3
UniRef90-A3WL53
UniRef90_G7G8S2
UniRef90_B9SPQ6
UniRef90 ${ }^{-}$MOHAU3
UniRef90-UPI0002F1CF30
UniRef90-A0A034W8G7
UniRef90 X0QAR
UniRef90-UPI00026282F3
UniRef90_UPI00039D8BDD G
UniRef90_Q7NJT3
UniRef90 E8W8B5
UniRef90_-Q7V310
UniRef90 A9DMU9
UniRef90 P12768
UniRef90-S3AP64
UniRef90-W8VXC3
UniRef90 S3NXP3
UniRef90- N8S9Q7
UniRef90-A1ZPZ8
UniRef90-E4TPL3
UniRef90 Q0FFF3
UniRef90-W7SJ39
UniRef90-W7DRD5
UniRef90-UPI000237CECE
UniRef90 UPI0004651F38
UniRef90-T2HD62
UniRef90-COBN32
UniRef90 M1V6L5
UniRef90-Z9JZJ8
UniRef90-UPI000467A249
UniRef90 W3X2T2
UniRef90 K0V681
UniRef90_UPI00037BC00D
UniRef90-UPI00038024FE
UniRef90 F4B1A7
UniRef90 G4QHJ4
UniRef90-S8EJB4
UniRef90 UPI0002EDDBA5
UniRef90 UPI0003C7E638
UniRef90-F2Q1Q2
UniRef90-UPI0003FC1E87
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UniRef90 A0L6R4
UniRef90-UPI00037F4B80
UniRef90-B9SPQ7
UniRef90-V6MFG4
UniRef90 E6SFH1
UniRef90-B714R3
UniRef90_E4N615
UniRef90 U1IEC8
UniRef90-A8ET25
UniRef90-H2G3Z4
UniRef90_R1HBM0
UniRef90 J2DKG9
UniRef90_G7HVZ9
UniRef90-G0A1Q7
UniRef90 J1QAX4
UniRef90-E4YMW4
UniRef90_A9TL17



## UniRef90 F9RK27 UniRef90-Q1G0Y2 UniRefe90-O2COV8 UniRef90-Q9HQ46

 UniRef90_UPIO00478E5FF UniRef90_UPI0003747067 UniRef90-U7KAH4 UniRef90-Q7UJB1 UniRef90-UPIO0035DF7C6 UniRef90-Q26F23 UniRet90-U5VN15 UniRef90-G2LPGO UniRef90-E6NUD8 UniRef90-R2VLR9 UniRef90-UPIOOO31501C5 UniRef90-A0A024G981 UniRef90-Fow1D7 UniRef90-M1RUA6 UniRef90-X5LJK7 UniRef90-F1NOJ9 UniRef90-U1ZRS2 UniRef90 ${ }^{-}$X4Z637 UniRef90_W9WPA5 UniRef90-Q2BJV5 UniRei90_UPI000366B595 UniRef90-T2RT54 UniRef90-A819R8 UniRef90_U7JWM8 UniRef90 KODOS5UniRef90 M5BMN4 UniRef90-M5BMN4
UniRef90-W9YLK5 UniRef90-E2SOF6 UniRef90-D7C6U5 UniRef90-Q0V6S3 UniRef90-L2GFXO UniRef90-Q6YXC2 UniRef90-G4SXM1
UniRet90 UPIooos8 UniRef90-E7F1Z7 UniRef90-UPIOOO4752A7A UniRef90-MOYZ41 UniRef90-W5W0A9 UniRef90 F4AQA0 UniRef90-UPIO002E65BFA UniRef90-K7UWC9 UniRef90-R7YNN7 UniRef90-N2JJ19 UniRef90-N8ZQRO
UniRef90 E4PKV8 UniRef90- F2Y9G7 UniRef90-E6J940 UniRef90_UPIO002E3973F UniRef90-V4HAD4 UniRef90-G7G4D9 UniRef90-12K8L3
UniRef90-B3ESI6 UniRef90-H9JC95 UniRef90-M2Y3R8 UniRef90-V8NV15 UniRef90-W1Z3Z3 UniRef90_F6SWA3 UniRef90-Q4FL16 UniRef90-A0A010P618 UniRef90-U7LR522 UniRef90-G2GHX7
UniRef90 $\mathrm{X1YE45}$ UniRef90-D2S8x0 UniRef90 UPIOOO1B44A82 UniRef90-UPIOOO3623F58
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QVISDCA $\square$ r 90 GAERVVFNREYEVNEQDRDD

110 VIADL CASASAIYVTQGICSEETQDEARVESKMKAPA SMPVLIEQYGINLIYRSRHCGWYEQQQWCYLKQCYPHL VLPAVANDLDATRVVWNHDYSGLATDRDAGVRDALDAAGV VFDKLLQQFDIGAVFTNHDYEPYAIERDALVERQLSGAGV
 VLQHLLPSLADDAVHFHHEPRTEEADTAESVQQLCDQHGU VLTELINETNADKVVWGRTYLPPLNDRDAKIKSLLKQKGV QAPEVCKQLQVEAVHWNEEYGMHEHRRDEATRRKLEQSGD YLLYFCQKYKVNNVFYNYQYEDNERKRDCLVKKKLSQKGY LFKRLKETMPWGRIYFNEDTSGYGAERDEQAKKFFKENDI
 FLTVLMQAWKITDLIFEKFQLPYAIKRD QIIPAVAEAVGAASVHVSHDHTPFGRRRDDAVRAALGG SDSLPQQEWGVTRLTFEYDSEPFGKERDTADMKALGGEAV QAPQFCAARAIEQVHINAEWGINERRRDQACTDRLARDGV
 EVVAVAREADAGEIHMAAGVSGYAGAREERLRLAMLED DGR EVCRIAEEVDAAEVHDCADVSGYAMRRQARLAEALSAQRR TVPDVARAAGADLVAFNWRAGKAEQAVDEAVARHLSAAGV I I P A V V E E F G V V S A V GWS R R Y H K P L R E L D A QL K R L L Q E K G V CLLANLLQAGQYTHIGVSQHCGYDETAQLNAVKRFSNSL EVIKLARKWNARRIYANDEYQVDELRRDIRLVHLATMASM TIVKFIRGNNISHVFANYEYEVDELRRDIRIDSDSHCAGF EPRLAAELGATTVTWTRRYHGPLREVDATVKETLTSQGT ETCRVAARVGAGAVHMAGGASGYAARREARLRVALARERR
$K I V P T V I E W G K V S H V G G N Y E Y E I D E L R R D I K L V K Q V G G G I T$ RI AELMGQWGASHLFANMEYEVDELRREAKMVRMFADKGL ALIELVRSIGATHLFFNHLYDPLSLVRDHRVKALLTAEGI IVKDWVLACGDEAVFVNRDYTPFSRHRDYRLQQVCDELD QVCAVAAGVDADQVHVAAGVSGYARRREERLRAALEAERR IIPQVAKQAGADSVYADHHYEPWWRNAEKAVGRQVDLHLH AVCAALKDWNDGKLCFESDTEPYALARDKRVTDFAAASG VVPEVAAEDGAGSVHVSADTAPYGRARDERVRKALGD KAPDLAQEHGVKQLHENYEYPLNEQRRDQAVLKAFKHAGI ALIDLVRSTGATHLFFNRLYDPDSVVRDHRVKEQLSAEGU LFPKLFKAWRDSHLVFEKDTDAYARERDEKIMELAKEAGV NVAELCDKYEI ANVHANDELGQNEDKRDSEVQNQLNTSGK VIPQLAHAHSIERVVRSRLPGTQEAGQWQAIKDRLPKA AL DDCIETDGATRVVFNHLYDPVSLVRDHNIKEKLVELGD VIPGLAALTGAREVHVSRESTPYGRRRDGRVRAALEADGR QFNEFDTLHGFTHVYANREYEINELNRDAQCQSFKKSA ELINFCKANDVKHVIANTEYELNEVNRDKALDHECDELSM VLQQLLQETNANKIYGGKRYTKLEREDDERIYEEDNRDGI ELPSVVRETGATVIFWNRAYEPIYLKAEERVISMFSGSTV VFPRLFKEWGVTHLTFEYDSEPFGKERDAAVVKLAKEAGV VLREHVEKWNITQVTFDLEDEPYYKGDDRIRAMGQELGF
 VIPRTAREIGADTVTWTRYYHGPLREVDASVKAFLADSGU QVGKVAAEADADEVHMASDVSAHARRREEGLRRALEAEGV VLRRLFEELNDKKLCFEQDCEPDWRERDERVTKLCETMDV CLLKQLKETPSWDKVYFNRDETGYGAERDEAAKTFFDEQEI ETMTVARQAGATMLGLGADVTPYAKRRESHRRDRCGGERI
QVCAVAAEADADEVHMATDASAYARSRERRLRRALEAEGR TLRAIAAHAGAAAI FWHRSHEPTRAARDAEVRRALRADGL VLPRLARAVNADVVHVSAEYGWEGLQLIDSLQNKVGGVKV EVAKAVAETGAGEVHLASGVSGYAARREERLRRALEPEGC EVCRVVAEVDAVEVHLASDVTAYAHERQDALAAALRANGA QIPELCEKWGVSHIFCNTEYEVDEDRREAALTRNCLQRGD EVCRLVSETGAGDVHLDAGASAYARRREERLRAVLESGGA ETARLAREAGATTVHLDADVSAYSARRARRLRAELTECRLL
 VLPGLMAQRGQTCVLAQSEVTSEELALEKKVKSAVVAAGG FFSRLDQKLNTKNIYANTELGDNELKRDQTVQQELNQYKK ALLKI FKSLTKVTLILQTEVTKEETDVEKRLQKDCQETKA Q SLLSVGAHK YANTEYEVDERRDIQVCEDAKDTVN VIKNLLSLKGAHKAVYLNEDYTPFSKMRDERIGKYCEDTGK ALVRLFEASGAVALVCEEDAAPYER RI PLLLCK Q $\square N A T D V$ HIIS A DFTPF GVRR DA A V A A A L A D S GV $E V R S L V D E Y G D R D V H V A D D V S G H A Q R R D R R L C A A L D G T A A$

## UniRef90 F9RK27 UniRef90-Q1GOY2 UniReforo-a2COV8 UniRef90-Q9HQ46

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130
140
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160
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 PCLSFDSDVVLPAGTVLNQQGLPFKVFT ALRVHDAVTALAPGAVVPSGSDHFAVFTPYHRRWSQEDDR ELRCHDEVTVLAPGRVTPGDKDHFTVFTPYDRRWLETGKR AAKSFPGHLLTEPWEVQTQQGKQYKVYTPFAKTARGVAED TVVETPTFGLFDVSTLPFSVEDMPDVFSPFRRKVEKHSEP RAEYFSDRCVVEPGALATKEGRQYAVYSPWLKNWVATLDK HVSLHHDQTVMEPGTMLTGAGKPMKIFTPYHKAWLAEVKA TATSLPGFTLVEPWEVTNGQGQPYKVFTPFSKAAASQVAG ELRVHEGAVTVVAPGVLVPSGDHFAVFTPYYRRWRSEPWR QVSLHHDQTVIEPGTMLVGAGKPMKVFTPYHKQWLALLKE AVQSFNADLLYEPWEVVDDDGCPFTMFAPFWDRCLCMPDP AWHSCADVLLNEPEQALKSDGSVYKVFTAFYNNARRDPVG RLCVHDAVTAVAPGETPGGGDHFAVFTPY RHWLGVPMR QTYTCVSHTLYDVKRIVKNGGSPPLTYKKFLHVLSVLGEP
 DFVRTGSPYAVTPGRVRKGDGTPYRVFTPFRKAWLEHGWR AFATFHDTCLVKPTEIMNGKNEPYKVFTPYFKRWLEMTLR TAQGHHDA AFAPGSLDTGKGDYYGVFTPFAKAWHKQDTQ TVQSFNADLLYEPWEVLDDDGFPFTMFAPFWNRCLCM KVIVRTGRTLYDPDEVRANGGKPTMSDTQVQQAGKKLGTP GFQRHLDQLFFEPGSVLTKSGGYFKVFGQFRKTCDNLLQ VFQQFETLSLFTEGSLPMALEELPDTFSQFRKQVEKTGDR SVQSYNGDLLYEPWEI YDERGYAFTTEEAYWDKCLDHMEP RLVETGSPYAVGPGRVLNGSGRPYQVFTPFSRAWREHGWP ELKIFHCDTVLPVGTVLNKQETMFKVFTPFKNAWLKR EFHLYDGDVLCQPGSVVTKSGEMFKVFTPFKKAWLAGFSQ TFTLYEGDLIAPAGSVKNQSNEMYKVFTPFKRAWLKQ TTKFFNTHLLFEPANVKNQQGNSFQIFTPFWKTCLTKTDE KLVSFKSELFVEPWELQNDHSPFFPDFHSYMRAWMQLPPP KVTTENSHTLYDLDRRLAQTKD
TFTLYEGDVIAPVGSVKNQSNEMYKVFTPFKKQWLKQ EVVSMVAHTLYDIKTULANCGKPPLTYKNF GRVLSMDGNP QYKYFKGNDLVEFQEMTKDDGTPYKVFTPFWKKTEQH DETSTFG GDAQTRPFSDEEMPDVFSPFRRKVEKYCKP NATSYPGFTLVEPWEVTNGQGKPYKVFTPFGAAARSQLEP RLHVHDTTTAVAPGAVTPAGSDHFAVFTPYFRRWSKERLR KCVENVSHT LWNPNEVDQTNGDPPLTYQMFDHTVDDIGPP PLVRTGSPYAVTPGRVTKSDGTPFRVFSPFARAWREHGWR EVQAFHDSYLHSAEEVKKSPTEYYKIFTPYYKKWREEDKE ALRLFPGVTIVDPGELPSGGGDAYRIFTPYYRAWSGAKWR RLHVHEATTVVPPGEVTPASSDHFAVFTPYFRQWSRQRPR
RADAFNGSLLFEPWQLGTQAGDPFRVFTPFWKAALAHWPP EFKFYWGKTLYHKDD PFTDKEDPGTSKTYR AALAHWP EWVATGSPYAVAPGRVRKSNGERYAVFTPFYRGWTDHGWR RLHVHEALTAVEPGAVTPSGGDHFAVFTPYFRRWSGERLR ELHLHDQHT QQPPGELRPNDRDHFSVFTPYWRRWAEMPLR AFATVPDTCVVSPGELSKGTGSQFAVYSPWFRAWCAYLNS
 HLHGETITAVDPAALRPSGGGDHFAVFTPYFRRWTETGRR EFHWFDGDVIAPPGSVCTKSGDMFRVFTPFKRQWLKQYEQ GTRAFEGHVLFPPESVATKTGGYYKVYTPFWKSVRDRDVG KLDLYWGSTMYHLEDLPFREGDMPDVFTPFKQKCEDRCVR ELILFHDRTLFPVASIRNQSNSPYQVFGAFKKTCLQHGLP SYINCWGSTLYHKGDLPFQDNHVPDSYTGFRKDVEEKLRD FVEDY DQFLYHPETVSNNFSNIPNVFTQFRKKLEKYVK KATFVHDKCIVEPGVAVKKDGSYYAVYSPFQRLWLIATLND ПMKSFEDYLLTSKNDFKN YRNFTTFYNVVKNKQ1 R VVHSVWQGTLFKAEDVPFSVTDDPGVFTRFRNEVERAKVP TLQATGSPYLVTPGRVTKDDGTPYKVFTPFLARWRDVGWR RVHAHPESTIAPARLSPSGRKDHFAVFTPYLARWLETPLR

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N LTP P V V K T T A

EPLAELTKLPSLPGAVCEPDLSQALRFMPTLAELGFE | $S P P V P D Y$ |  |
| :--- | :--- | :--- | :--- |
| $P$ | $L$ | $P$ PA A PEPEPA DLLAADTALDADTSPDPSVQELGF FY L R S YPDSVLYDR FYRQEAMALPRLAQUGFEWSG KPAQTPTEIKTVSADKSARQFPDWKPP EPLPVPELLA

$R P L E E P \square R \| H G T \square P E E V N A \quad G D \square P T \square E S \square G \square S T P P$
RTLDYQQE $\square P S V V S T T \square P Q D E D L G L E S F E K D H R S A F P W K G$ A LAAGRVQCQAPLNDPSDPVPERIEGFDTPT
 T PV
TPAPRPRSVPWASPSDGPPEEPSTDVRपPPAGE K PLDDPSSIP RPLLTPSQLPSF
QP I NAPKKIPSLPA
APAGTSAR SASWDAPSKS $\square G H \square E D P H A P D V G$
RPVGSVTS QQMEGCRAE DQESHDETYGVPSLEELGFPTEG
APPAAQRAPRPQGPVSSPPSDPD DWPDV
NPFPPPDKNAR $\square$ ARSKYSELFDTE $\square$ PAAPASKQ $L T E D$
GVLAAPRTVRVPDGLRSEPVPSRED
PPAAKPRRLRLPSRLS IGPRPAGGSAD
$R T L P V P R L N G A A P L P C D D L E E W A \quad \square E P T Q P D W A G$ NVASYLNNGNDQSPSPTSHDELGPDGDLPSAHPDPDWD LPVDALASLPDFTPPLDESFHLTLDDDLPAPSETSF
DPSRLEESPVPKANDDKPKVGDLFDCEVMPESVEGGFE
DEPEGVPEMGASASSASAWPKPTEPAWAASLAEHWTP AP LPAPRRVPS $\square R S$ A A $L P$ TAAS $\square$ A PGA
QPELLDTSPAPAANPSSMKKELKDDFDTPAPK
DLLELYDPPAKNPASARKKFGELFDTE $\square P$
AAPLAPGEDPARRCPSDELVFEDESER GSNALLARAWSP $\square P Q T L A E G R F C V P P E C P$
GP L GAPRR\RVPDGVRSEPLP
EK PARDVSUEDFQRRQQQSMMDVDVYAVPSDADLGDQWPG PAPCPAPDDIPAPSSWPTSDSLDDWALLPT SADSDWAT

RPADTPDTAKWVDPRSLDQVKIPEL
QLPGVPEK
$E Q L A L R D T P Q A Q S P \square D L P S D P \square P A L P E L E D S P V D G R Q W P A$
$R P \square P A P T S \square P D P G D T S L D L A G P N G D F A V P S \square S E L G \square$
$K C Y A K P E V Q Q P V$
ERLR
V S HLPPWRLVPAA
EPGRRPRDDPWAAMPA
RTEPSYKP $\square$ K WYSPDVLNSDGQSEKWPV

A DLPAPDHI FNGYNQPI NSDDDSDW
PRPVVNAKLRGDKFGTLPDCFYEEYDKVPNPEDGG
EPLS $\quad$ S K Q

K P A R Q $\square$ TSEDF $\square K C \square T$ P T K $\square$ A A E E Y Y R $\square$ P K P E D $\square G$
$\square A V P A T Q R \square P T P F \square P T \square D A S F L L T \square E D \square P E P S E$
LPVPELLSRREMGASASSSWPDPSADEPQWAAS LAQYWTP
DPLRAPRTVRVPEGVGSDPLP
RPVGAPDEFGRDPAILASELKLYQQQHMPGPEEFGDTYDG
DPAPRPDAVPWSTGVRSEDPPEVP
${ }^{\mathrm{D}} \mathrm{P}$
$D E V A T P R R L P D \square P V G R \square P A L P A G E S P G$
$D V L G A P R S V P V P P G D G S E E L P S R A P G T S P G L A E G G$
RTRPAPERLPGUAAPGETSSEALGLAPAP
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SPDGAPRTI RVPGGVGSEELP
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DP DPAPRK LGTFPVPTDPLPDAADLCDGPGSPHL
SHFSDPS
TPDPPPKRLTAP
KPFPAPAPGALPLPAGLEAA

QEEILTDKHDDSNLI HNPTEIPSLKELGFN
SQGRFLDPSPEPAANSKSVRKHEKLGDL
K PV
TPLPAP
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P LLP P P DRVRLPGHLSPGDLPGPEAFS


## UniRef90_U5H816 UniRef90-G7XDAO UniRef90-H8XSA6 UniRef90-F4H796 UniRef90_V5HIH6 UniRef90-E4PN99 UniRef90 UYZS25 UniRef90-L8PFG4 UniRef90-H6BZT5 UniRef90-F4FZY9 UniRef90 M7D97 UniRef90-D6XYK2 UniRef90-W3WNS UniRef90 D8TIN9 UniRef90-V9FJE2 | UniRef90-A3JVS8 |
| :--- |
| UniRef90 -A1CJL8 | UniRef90-U1LNK3 UniRef90_V8CY93 UniRee90-J6EEC3 UniRef90- AOAO59FPY7 UniRef90-UPI00035A1C37 UniRef90-UPI0003B34141 UniRef90-Q4T4M6 UniRef90-K9HQX5 <br> UniRef90-B0U051 <br> UniRef90-UPIOOO4643101 UniRef90-UPIO002D7C210 UniRef90-K9AYL7 UniRef90-UPI000255AD81 UniRef90-H6BMC5 UniRef90 F9S9N3 <br> UniRef90-CON1K3 UniRef90-A3TJ93 UniRef90-C6W145 UniRef90-IIY1R6 UniRef90-G4FAA4 UniRef90-U1M610 UniRef90-UPI00029A5DFD

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QQPDVARRHWHFTHDCLVDLNKDLTDLGQPLIIAVGVAVD YRTRVGPNRWKFLLECQSDLSAAYTTLNQRLWVVREAPQS DQTNYHCRQATFI ADSLLTLSSQLDSCGHSLLVVEGEPHQ ASS GDRRLAFLFESLRDLHNQL DGRLLVVRGAPEQ KAHMDSGWKLKFIVEALKSLQKSLAEDHDPLFVWFVEYFK AQPEHSGRQFDFLVECLQSLDDALKARGSALCI RTGKAED GFAPRGRHRQVF ADTLADLDASLRRLGNGLEIVTGTPET感GPATGGACKYWLHQALSCLCASLERNGSHLVFLRGSSEQ QQPDMSHRQYLFLSECLEELNTELTRLGQPLILMDGDAVE GTAGGSRRAGYLARSAALDE ATGGRLVVRHGDPRE KERRDGPARDGFLWQSLDELRGRLLARGSDLLVRDGDPAE KKNKYGFYRAKFLLESLTDLKRQLXTVNISLVAAGRAAE RRHGTSPARMDFVCENLQLMKSELNSGHI PLVFLEADQVP HQHHLAPGKADFIFRHLKQLEAELADLGITLLHDFDDQAK AGAGAVRRA WLAAALEATREEF LLRPSGKPRTDFLHRCLKSLDDRL
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SAQRWWLHKTLVNFQNKLNNIGISFKVYADNEIV SGAFNAPNRAAFLAAALQELDDELRRRGRLVLRRGDVID KSSGE
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Unepugble

## UniRef90 U5H816 UniRef90-G7XDAO UniRet90 H8XSA6 UniRef90-F4H796 UniRef90_V5HIH6 UniRef90-E4PN99 UniRef90 UYZS25 UniRef90-L8PFG4 UniRef90-H6BZT5 UniRef90-F4FZY9 UniRef90-D6XYK2 UniRef90-W3WNS8 UniRef90-D8TIN9 UniRef90-A3JVS8 UniRef90-A1CJL8 UniRef90_U1LNK3 UniRef90_V8CY93

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EVVAFLKD ${ }^{130}$
140
150
160
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 NCHALDADLIVTVPVVTQQNEPFKVFTPYYRRWLQLLQE EWVETGTPYAVGPGLVQNGSGAPYKVFTPFAKAWRGHGWP EVHELDYDLIVAAPVKTQQNEPFKVFTPYYRRWLQLLED TAHGYHDAVAFSPGSLLTGKGDFYGVFTPFSKAWRKQVTV ELLTYOADTVLPYGAVLNKQNEMFKVFTPYKKAWVKTLQP KFNALDDYFLSDP ELRTGSGSFFKNFTAFYNRAMETNVK EFSLLADKCVFTPGTLLNKQGSYFKVFTPFKKTWDQR EVVVRTGRTLWDSDQVKHGGKPTMSHTQLQQAGARLGVR OTVVRNGHSLYDTKRRDNGTPPLTYKRFDH LILLGDP NVSVTRGNTLEDEDDLTFDLADDPKHFTPFRKKMEAQPAA PFHTFWGTLVVPPRSVTTAKGDVSQVFTPFYKRWRDTPWD ECHHFQDSHLHGATENRKQDQTAFKVFTPYYKSWEKLRKP HYR $\square Y P A N Y L T P F Q E V M T Q Q K T P Y H L F T P F R S L L R E Q G D P$ TWTERPQNGVVRRQRNRD
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E
俭 EVREFDDYVLDEPWTVKTTQNGYYTVFTPFWNKLKGHFND

UniRef90 U5H816 UniRef90－G7XDAO UniRef90－H8XSA6 UniRef90－F4H796
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$T D L L R \square R T \square T A \square P P A \quad P G F P D D N R G E C P A \square D E$
GLLA
 EKAPAPGGRRGPACENAPS TDAATTAVPTWQEVGF PKPDPTPEKVPAPA
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EPADTVESADWVDPGD $\square$ AGVES $\square \mathrm{D} \square \mathrm{PDPP}$
PRGKAPDT $\square A A A N V P S E P W \square A E D F R A P$
EVPVRNGTAEDFQRCSAPDADLAESYRVPGPEDL
EPVSLPPRPAACPVPDVPP
APLEPPTADPPAHWPRGAPDEA LGGARMPRRKDTTVDWAA
K $\ E A P N K \square K F \square C E N Q \quad T K \square P T A E S \square G \square E Y D N$
DPVPRPREIP WATLRSDGVPPDPGTDA
GAGAEPVTLPPWPPDASRGLPPGRWDDVWSASSLGFSFAG SPLP円PPTLDSDTAARTEQVRESDSHLVATDDDLALISPA NYLRA TPNTLDKENLIITNAIPELGDLGFD
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VSQESNPRASY LSPSY $\square N A D A D \| L S T K F P P Y S \square Y G F$ KP回

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KP\PAPKH\squarePDP
E
RP隹T TTQEQMARCRTQ \(\square\) SDNHDEHYGVPS \(\square E E \square G F K T Q\) EPLATPKQLPP
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LP MEPPKS IPNPGDTNDDDAGPNGDYSVPTLKELGL
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RPHES $\square$ RS $\square \mathrm{PP}$ PP
$K P \square A P P T R \prod D V P A$
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## UniRef90_M1FCR3

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 QLRDARKWRLGLGLLDALAQALTAAGSRLILRRGPAEA QAGDLSRRHAQFVLESLVELQADVRRRGGELVTMNGDMED DK

AANPRL KHPAANSGAAFLRASAAELHRALAERGDPLEVAQEAET KHPETGSGRVRFMLSCLAALDEDLRSRGGRLILRSGDPVE FGTMGARQRAFFLRHVKRLKERYREFGSDLVVRAGDPEK KWLKVGPNRWRFLQQSLIQLDTNLRKLNTRLYVVRGNPVE RPDPAGVARVRFLLESLGDLDARRLGSRLLLLRARDDVAD AAQDVSNQHYQFLLESLSELDAALARRGGCLHVAVGEVVD KLSDTSRRHWDFVRARLDELDQAVSERGRPLVVREGDAVE YLVRYSQEQSAFLQQSVACLSQSLENMGQKLIVFDDRPLD GFARVGPHRQAFVAAALRDLGARMAALGNPLQVCHAAPAT GAGFMVPNRAAFLADALADLDAGLRERGGRLVIRTGDVVT RPGPRGATDFFLGCLAALNESLRBDGRLLILHGDPEV GDRPTGAHRARFRLESLSDLRASLRDRGSDLVVREGTPES EDTHYDDRHWRFVYESLQDLNKQLSPYGHRLTVTKGEALD GPDPYGPHRLPFLLETLADLQQRYAALGSGI HFVVGRPEE NAPDFSARHWAFI RESLQALREALAARGQPLVVRQGDAVP GFARVGVHRRAVLAAAVRDLRRQLADLGNPLVECCGPPGK EDNPYSPRADEFMLQSLENLDEELQDLGSRLHVVKATPE SEHSLERSAAAKSLTDKYGADG1FRKVSSKPAEQEKSYCR AAHDRGPRRDDFTLRNLDTLKEKLDRDNDPLHSPRKTLPD DDEHYSERHFNFIKESLQDLQSRLENYDTKILVVQGEVDP AFGPVGRRHYGFQMRGVRALKRRYRELGSDLIVRSGDTAE VVASNGLAKQRF LLESLADLDAKLQTLGQSLQU AGEAVS ASPKHDLRHWRFVWQSLMDLTAQLEPFQAKLHVIMPRE KDPHYDERHWRFVWESLRDMHRRLEAHPRSLRVLHGDPRE AQADVDARHLGFLVEALDDLESRLAALGVRLLLKVGDMPQ DNNPYKSEFATFLINSLVELDKEL
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 II PKLIEKLNIIQTI YADEEYDPENVIRDQKITNLLEFNKS ILPALVQNTGAQRI HQSDWPTAGMRAVQDRLRAALAPLGA VLERARRQFGVDGLWSHEETNGWTYQRDKRVGAWARAHGU AFRRLKRDFPDSTVYFNHDETGFGFSRDQNAQEVLKSLGV VLKQLHEQTGFERIVAHQETGNDWTFQRDRRVIDWCAQAG VLRRLLPAWRITHLFFDAASEPFADERDNRAVAGASRLGV VLPALARARGAGSVHVSTETEPAGAARDARVRDALAEVGV GLERIDEQNKDEAVFASRCAGTYENQVWVSLQKRQPNL

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$V V P D F A R E V G A T A V Y W N A D S E R A W R T A T D C Q V V A L L E R S ~$ TI PELVKQYGПTDVYAEEEYASEELNLLRSVTDVLPA T VLEYLKDRFGVFELYSHQETGVQWCNRRNQIVREWCRRNG VI TYADPDRLLFQRADGYNERKREEEVIG WEWEG II DKLVAQAPFDALFAHEETGNDWTYRRDAAVAWCAANH VLERLYQRFQFQRMVSHQETPGWTYQRDLRVKRWCEAHRV
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130
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EPYSVFTP $\begin{array}{r}150 \\ \text { W }\end{array}$
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 $S V V Q Q E A Q S L F C S G Q L P F K T D D L P D T F T K F R K Q V E V L L D H$ KI QTFWASTLYHRDDLPFHDSRLPDVYTQFRKAVEAQAKV PMTWCDDALLAAPGTVRTGQGEMYKVYTPFRRALLAQLDT AFHEVPQFGVVRPLANRDEWAGH TTRMYETQTLHLREDD GSDELKRVFTAFRKRVEYDGRA VSQWNSTLFDEAQ FS $\square$ MGDVFSSFSRFRKRIETAHFL
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PFYPFH S P P PGQLEKPKSKSRFRKLWQESMLE

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 K I DQKKSHTVVDPYVI ISKNGKAPLTYQKYDQLASECKDP EVFTPVSHTLFDPAEI I NKNGRPPLTYQSFI A I A GEPPE $G W H E S A Q F G V V R R L Q D R D K$
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 RWIDF
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D A S Y P T H SQF H GDWE QVPKS $T V V S L N T H R L F E Q A E L P F S D A A D P D S F S V F R K Q V E S L E$ LWREFPQQGVKRGRKDRKN WSQDWYAL M
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PWRQFPSGGVVRALRDRDD WSADWLARMTP E $\square$ QCRHDYTL LPDDTVLKQDGQPYSVFTPFYRRFVSQVPP $K$ FFSYPDVLLSAEEKKIKIGGQRSFTPFYTKARELEVP KCIVKYGRTLWDSDEIVGVHGGPTMTTTQLQKAGEKLPPP DWVET GTPYAVGPGLVRNGSGDPYKVYTPFHRAWRDHGWP VHWQEWPQTGV DR RLLSRDG WAARWLQRMEA $\mathrm{V} C E G F D D S V I L P P G$
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$N L T D T D G S T M V H P G D L P F A P K D C P A V F T S F R K K V E$
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UniRef90 ${ }^{-L 1 J G S}$
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TPYAEPDADA LASVSDGTTVPPDVD $\square \square \mathbf{D}$
ASPQENPDLRKGDFYALSNRFLESLPS
PCHDVDHRLIRGSFACEERLAAFHLRDLP
APLPPPDRATGVDTTGWPAVP
PRLAALEVARWFVPDGQTRFQRVGV LDT T
KPQSVDKSI
RPDQSPKS|PDP
EPAAYPRSLDLVEVDSHQKALDLREDDLPTMPEAG
P QVA MPA
GFRAPPGMQPDPLPTMADGGDPTP
EPK【INESHपNपQLESTFYDA
KPAESKKSARWDDPGDVKGVRAVEDPDL
TPARTDATLDWLDPTALPGRDSVED
PRPTELPAVD
ASKESTPRKTFDIPTNLNAVKQVKTHRFPAYSMYGF
TRYPSPKSLPMLGTSPLKPEAWPE
REL
TSRKATASKREVTFPFPVQEVEQDPRTAFPFKG

E P P E A L S G VGG K P L K S
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B







 G T A I L L W Y K R H D S P VVVV WF K R D L


LR N DLRLHDHPIFHLCAEPTPHVLPVYVWDQRHV





GTA


T
A C
NA C N



$A \square S V V W L K R D L R L S D H A P L L G A A Q S G L P V L L V Y C F E P M L L$
$V$ V WLKR L R L


IVVYSMRK D L R L R R D S R GL L Q A S A LDA Q E L V V L F V I A P G D Y

GTA I LWF KHDLRTDDHPALLA ASAFPSLVP\YVFDHR\L




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UniRef90 F5LCD3 UniRef90_F5LCD3
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UniRef90-UPIOOO440DDC9 UniRef90_M4FQ67 UniRef90-Q3B5H5 UniRef90_A9E3L8 UniRef90-UPIO002E761ED UniRef90 A6DP26 UniRef90-D8RLP2 UniRef90-G7DTG3 UniRef90-A7EIMO UniRef90-10YVL3 UniRef90_A0A011QT04 UniRef90-K7LFK6 UniRef90-UPIOOO471E106 UniRef90-A9SZ36 UniRef90-F7NU14 UniRef90-A0AO24FK89 UniRef90_K6ZP13 $R Q G R D Q E H S G V N F L Q H A V E L G K R Y R E S G R K L H V A Y G K P A E$ GF WK T G GFRTRF ISESVYDL RSRLRDVGSDLMIRFGMPED GFRRMGAHRRRFMADTLQDLQNALQALGQRLVLLHGPVAE K DEP LSMRHLHF I LDESLE EMQNSFNS IGGGK AVFHGEMID K NPHYRRRHWHFI AQSLADLNHQLQPHGTKVWVLEGDPIT H QPD S S A R Q WQF I A E S L R DL R R QL A A DG LP L WVV E G E T L T

 T D P H I S N R H QVFF IV Q S L S CLL S T QLLK QL G H QL Y V F WC DMP D S EK N K S S N S I Q F MI E S L Y DL N S Q I N D K K L K L WT T Y G D E DD A QPDSALQHYQF LRES L RDLA QQL R SCGARLQLALGEVPE A QPDASARQWRFVAES LEGL RADLAALGAPLIVRRGDMMA
 KTTPRRRA


 GFWKT G GFRTRFVVSESVVYDVRS RLVRSVGSDLIFIRFGDPED

 NDAHYSDRHWNFI K QSLEDMNKQLAQFNTKILGVSSEVI K
 RHNFNKYSFEFVISALGYVNFELVNKLGSFLLVERGFNEE $\square L S R F S D E M L E L L L F A L E D L K K S L T E Q G S N L L V R F G S A E N$ HDPHYSERHWRFVVQS LVDL QA QLSEFQTQVLVLQGAVQT

 A QPEMD AR HAGFL REA L D DL T R R L QML G L S L L Q L R G DMPA RLD NTSNRRQWHFVRESLLDDL S DQLVVLGGTLVVHQGRVID
 GAETFS GAHLELL NQS L L S L E A ELLA A R G GRLVFRVGEMPA K FWRCGHHRTKFVAESVVNLKESGLEKVGSGLALRAGARGD N D A H Y S K R H F N F I K Q S L E NM N E K L N AVG S S L L V VE S N A L K

 NYA D S D S R H WRF I Y E S L Q ELL N K K L E A F S T Q il Yi F H S E V EVV
 $K Q Q R C G P F R Y S F V K E S V E Q L Q N N L R G L F S D L L V E V G T A A E$ K F WRCGPHRAVFLAESVWSLKQDLERVGSGLLI RVGDVFD GFARVGTHRRAFAAAALRDLGTRMAGQGNPLVVCHAPPAT D NAHYSERHWRF DWQS L Q CMN LS L S E H GHQVVI L Y GN A DD F NSAPS Q DKQAF DHDCLVDLDHQLGVYQQHILVRNEPP LL EFWRCGKRRAKFTAESVVWDVKK DLLNQLSSDLIVVRVGSVKD RLPDTSAR HWQF I R A S L H E L A S D A R A L G Q S L TVV RVG DVV D $T T L G G C P G G G S A R A S S T W T P R C A G S A P P D S S S T T$ K D R H T D L R H WR F L Y E S VV N CYRRQFRDRRGTRRLYL F HREECE E L P L L F D V P A R L R F L W W S L M E L R G E L L L K R G S D L L V R I G K P S D ASPE GSSA HVAF ALDE GL A Q L R R A L A A R G L P L L V E V G E A C S

 $\square G$
 NDSHTDERHWRFI QQS L S VME K LLAK Q S K QL S I A Y G EAD Q
 Q N P H L S L R H WR F I MK S I S DMN LQ L N R A G C GVALV H G E C DE
 N NAHYRGRHWQFI AQS L A DMQNTLK SYGHQLEIVE GNALD




 $F \operatorname{LE} A K A R H F G F$
$E$
L TH F G E H H WR F K A HDRSARRDDFV
 QF QP GRC S R WWL H Q S L K ALLE K DLQ A L G T S MVYR R S P E S R

SRFSDETLELVLLAVEDLRKSLKDRGSDLVIRFGNAEN N D P H Y D L R H WR F V LQ S L Q D 1
 Q QPD T SVVRQWLFI E Q S L QLL D Q QL T AL G QPL LVLK GPAT Q



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UniRef90 ${ }^{-1}$ MODH54 UniRef90-UPI00037971E5 UniRef90 M5XF58 UniRef90-Q4PFI2 UniRef90-F5LCD3 UniRef90-UPI0003B4404D UniRef90 UPIO004702643 UniRef90_UPI0002E1A39E UniRef90-B5YAY6 UniRef90-A0A022QER2 UniRef90_UPI0000E0FEC6 UniRef90_UPI00037A31FF UniRef90-M0P617 UniRef90-M9LTW3 UniRef90-F5RA28 UniRef90-M1T585 UniRef90-UPI0002B4B7EB UniRef90-D7CSG2 UniRef90-H1W0T8 UniRef90-L7W836
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UniRef90_Q6SFP7
UniRef90_V4SDA8
UniRef90-F3Z2Q3
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UniRef90-B8K6P6
UniRef90-H3NSV1
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UniRef90-M4FQ67
UniRef90_Q3B5H5
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Uninetyonolfls

P WHE TP QNGIVVIR RLLETRND ${ }^{140}$
150
160
PWHELPQNGVVRRLWSKDWEQRMRT DVSTFNGHLLREPWTVATREGDPFQVFSAYWRAARRFFPP I WREFDQFSVFRGNDNRDD WSKKWKKNTER VCKTFHSYCLRDPYSVSTEG
 DARSFNGNLLYEPWTLSTSAKVPFRVFSAFWREAQASGEP
DWHQYKQFGVVR
TFTQLT DHLLLPGFADFTGKSEPYKVFAAFHRRWVEFMNE PVHFVNGKTLI HPADLPFPSSETPDVFTPFRKKVESLGTR TVQTLWQSSLIEPDALPFAAENMPQVFTEFRQRIES
HWTEYQA
CWQEFPTNGVQRGRKHRKGWN
T WREH
WHEVYDQF LFQPDDGLRQLDNK\PKVFTNFRKTLEKECSV
LWQELPQSGVVRRLGSRDKRTKI IVERLFDS SVYTRLSHTLYD
$P \mathrm{WI} \mathrm{E} Y \mathrm{P} Q \mathrm{VAVRRGQNGRKG} \quad$ WKKFADRY $\square K$ ILNTSTDULLTDTLDGADHLKNM A WQEWPQHGVVR
IWTEVPQ L GVQRRLVNRDG WARDRQAVMRQ KVHMYDTKALIDPDDLLPFKVDKTPDVFTPFRKRVEDKMSR KV $\square R$ LLDRHLFAPNAFTKKDGDPYKVYTPFKK LLPA PH LLPPDLTKPYRVYTPFSR
ETESRTDLVLVDPGRLDERYPNHSQFHDDWDAVPKR
APNFVLWRTPFYDVKS $\quad$ K D $\square P D S Y N D F T K D R$
PVQFVNGKTLIHPADLPFESSETPDVFTPFRKKDEALGMV PVTTLIDHTLADFGDFFAERSAPYQVFTPFYKKWNAYM
E W
N W
HTCDPHHST LIFDSHEDPFELSKVPSSFTKFRK LVEHLDV ELRFFEGNFLVSPNLISQTBMFTPFFKKWSAYL PEIVMWSSPFYD VVKSSRDDPSSFDDFQK FK LPIV KWTETP PWHEYRQHGVVRRDRKRDGW
ATDPRTDLVLVDPGRLAAR YENHGRFHDDWVAVPKH PFKLLEGKSLI HSRDLGFPVKQLPDVFTHFRKQVESDMFR PWHESPNGGVVRRLRDRDRWSDLS WLSRMTP
DWHEY

PFYEFPSAGVVRGARLPPPARAPAAVPARFRTPWELGLAP
AFKTWLDEKYFDRDLHFKSPDELADVFTAFRKTLREKPRP PWTESISNGVVRGLKNRTQWKEHWIEF

QAVDCNYAVQPGFDKTSTGGHYKVFTPFYRAWSECGWE
EFELWWKDEKYFDRDTGLESPADLPDVFTTYRKSQEREKPR TWQQSQMHGVIRKLKSRKDWEKRWK
LERVETGQLLTAA ELPFAQSALDTSFSAFRREDERTPQA AA LGVPDLLLLPAPHLLPPDDLDRAHRVYTPFSRNFQGLDPP NACFVWDCTLLSFDELIVNEYQH SFETFYNSVISKGLP EFKLWLDEKYFDRDVPLKKPSDLPDVFTAYRKSAEREAPR PVRAVWHSSLIQPEDMPWPAAELPGVFTTFRQKVERAGDM
 $K F H L Y E S Y T L Y Q Q H Q L T N V L S D F P Q S Y S K F V K Q L A A$
EFKLWTDKYFVVDRDLDTKDRDLPDVFTSFRKTVERDAPR AFHEHRQFAVI RGRLDRDHWHGAWQAF
FVHNFNCDTLHEPWEDYDEQGHAFTTFAGFWNRFDRRFEP TVQSFNSDLLYEPWEVLDDHGCPFTMFTPFWNKCLCMDPP TFVVQHECYTLLAEAEVYERHTSPLGSFSKFRRKV
SWVEFPCNGVQRQRLNRDGWDKQWKS
A LNCDESGRLIDRRALDPFEMEALPGSFSAFRRSVESECAV A WTEFPQTGAVRRLRSRDGM WARRWQARMDA AYQEFPQNGII RGRK HRQGWLKLLEK NWQEYQSNGVKRGRYSRDG WAHDWHRVMSQPLA
HWE E K L K P S EF WFAPDQ $\square H N \square Q G K P Y L V F T P F Y K T \square M K Q \square H R$ QWHEY


NWQEFTTNAVI RGVFNRDGWDRHWQ
QWHESQHGAVLRGAKTRQQWDERWHTF
DWQEFQTNGI QRKRKDRKGWNR
F LQ VDAHNVVPCWE
GFQRWTDEKYFDRDLNFKE DHE $\square P Q V F T D Y R K S V E R Q K P R$ LIF ITEDAHNDVPCLMASPKQEYSARTFRPKVNRLLALPPV TWVENINNGVFRGLQDRTD WE WI EKWENFMNQ


AVHEVDAHNVVPVWDASDKDEYAART D R R DK $\square Q R Q \square P E$ $N L Q E F$ AHNGLIERALLKNREGWRKRWYQKMHQ $D V S F V H D \square C V V P P G T \| R T Q Q G K P Y S V F S P W A R N W T A T V K Q$ DFK LWQDKYFVDDRDLPFEDKDLSDIYTTYRKSVEPRNAP


PWQETKS
S S $\square$ S QWS A P $\square Y$ YTPE SAS $\square P$ DNYQAFQR $\square G R T \square$ P WQQYQQHAVFRNRD LWAGQADAY LSGTLYPK
QWQE
$S F A[L]$
$S F A[L F$

UniRef90 F9UGIO UniRef90-FOFXS3 UniRef90-A8G331 UniRef90 G3PH24 UniRef90 UPI000361AFBA UniRef90-UPI000471ECC5 UniRef90_C9Y9X9 UniRef90 UPI00041FDB82 UniRef90 UPI00045610D3 UniRef90_UPI000360EF47 UniRef90-UPI0001850B61 UniRef90 A0Z3E3 UniRef90-LOWHU7 UniRef90-G2ECG8 UniRef90-I3ICJ8 UniRef90 ${ }^{-}$W5KNL5 UniRef90-W9US40 UniRef90-G5CSY6 UniRef90 F4G5T0 UniRef90-Q28R72 UniRef90-G7DWK7 UniRef90_U1LGC5 UniRef90 W2U2W2 UniRef90-M0DH54 UniRef90-UPI00037971E5 UniRef90 M5XF58 UniRef90-Q4PFI2 UniRef90-F5LCD3 UniRef90_UPIO003B4404D UniRef90 UPI0004702643 UniRef90-UPI0002E1A39E UniRef90-B5YAY6 UniRef90 A0A022QER2 UniRef90-UPIO000E0FEC6 UniRef90_UPI00037A31FF UniRef90-M0P617 UniRef90 M9LTW3 UniRef90-F5RA28 UniRef90-M1T585 UniRef90-UPI0002B4B7EB UniRef90-D7CSG2 UniRef90-H1W0T8 UniRef90_L7W836 UniRef90 UPI00041A3644 UniRef90-E9ECH3 UniRef90_U5A918 UniRef90 UPI000429AB28 UniRef90-UPI00046A0A54 UniRef90-B7AAU9 UniRef90-M2Y6Y9 UniRef90 H6BY47 UniRef90-UPI00046782EC UniRef90_U4ZVS7 UniRef90_UPI000362D027 UniRef90 UPI00037FBA62 UniRef90-N1QA47 UniRef90-K2L8Z5 UniRef90 D8RF17 UniRef90-W5GN04 UniRef90-F7RZU0 UniRef90-UPIO002626EBC UniRef90 T2LBL2 UniRef90-UPI00034D2070 UniRef90-F4L4V2 UniRef90 F3L3D9 UniRef90-UPI000248FB00 UniRef90_UPIO004634934 UniRef90_Q6SFP7 UniRef90 V4SDA8 UniRef90-F3Z2Q3 UniRef90_A3JDX2 UniRef90 B8K6P6 UniRef90 H3NSV1 UniRef90_UPI000440DDC9 UniRef90-M4FQ67 UniRef90 Q3B5H5 UniRef90_A9E3L8 UniRef90-J3MGJ3 UniRef90-UPI0002E761ED UniRef90_A6DP26 UniRef90-D8RLP2 UniRef90_F7RZT8 UniRef90 G7DTG3 UniRef90-A7EIM0 UniRef90_IOYVL3 UniRef90_A0A011QT04 UniRef90 K7LFK6 UniRef90-UPI000471E106 UniRef90-A9SZ36 UniRef90_F7NU14 UniRef90-A0A024FK89 UniRef90_K6ZP13

Q P

HPNPASTTTVADMKVSDQQDEWPETFQVP
RPAKESPSTFKPFPPDLPRTSDYA $\square D$
$P \vee L P K P \square R \square Q A P D K \square P S S F \square K D \square A$

DP $\square$ APVH $\square$ NK $V$ AS $\square$ Q $\square S E D H P \square Q A$

P ILKTPNHFKPYPEP $\square$ PDSDA

GPYAEPGRGA L A D VRDGKTVPPDAD $\square \mathrm{D}$ DP

$R P \square K H P P A K F K S F P P G V P S T P D Y A L D$
$S P \square \quad \square P P K \square P G N V M S L S W G T L P T \square D D L$
DPDLAA $\square P F V S Q T M V E Q L T H Q A L A \square Q D \square$
DPYPEPGVDA $\square$ ATVRDRTPVPQSEAD $\quad \square D \square P D A G Y E$ EPVPAPDKLKPFAEVQVDDAPGGCFGLSSKSAQGLD A PLPPPAHIEAAA

LQLP VT CP LSSPTGPC LEME LDWGTMPTFDAL
SPQNLPTAGEAAARAALESF
$T \square P P P S K G S \square P P Y P D Q D T \square P P Q R S P F D \square P S$
H P
$K \mathrm{~V} L P R P A K S S \square P$ AF PEEES $\square$ PA QAHPFVSS $\square E D \square$


AP LDPAPTS $\square P P$ WS SVAPRGFDD
 $K P V S T P P S L P A L P S F L P S Q P A P F A \| P D$
$P T T P L P P P T S L L P P P M V P P D V M \square A A G A V P A C A G Q G A D T A$ QTKLTTESLHTLDANEL

KAHPAPSG $\square$ PP $\square P D H \square P E Q A A P F A \square P N \quad S \square E E$

APMLPPKR $\square$ NSGD $L$ SRCCSSDHLDESERGSNALLARAWSP
PASRCAP $\square \mathbf{T} \square P$ P WPEAARGFPP $L K A$
PQ QPTPA STFKASATKVDGEK $\square Q T \square S \square D P V L L E K F T T A P$ E P

LEPLDTTQQNNLSKLLLPP

$F L T A \square P T L K P Q T V P W N L D W P A N D W S Q A M D S L K$

KTLPRPAAS $\square P$ AFPEAGS $\square P E Q A E P F A D P$
ERVPASEPWAPTDWERVRARDPVERPA
PLLSLPKKDQLFTKKEVQHLASF FHVPSDE

F LVDFPTLEPFSKPWPGVAQEK $\square$ D WDS $\square$
E QVQA
NQSKY LDESPEPAANDESTYKHDTCADL
$R P D L P K P E M N S$
$V P A P A P P T D V P P Q H S P F V I P T$
$V$
$V$ $D D W Q P H S G H G G R L V A S P M A A G V P A D A D L G F A E A G$ TPLQLSVSKLPGAEDEL DWGVLPSYDDIGFDTSN
AP $\square$ PSPAKFPGL PEGLTDTGS $\square$ PDFK


 GPVLYWMSRDQRVQDNWGLVYSQEHGVPLLVAFTLVPK



GTA L WFKHD LRTDDHPGLLA ASDFRS LVPDYVF DHR VVYWMSRDQRAEDNWAMLYAQE GGVPLVVAFVLGA WQV $V V Y W M S R D Q R V Q D N W A F L Y A L K Q Q L P L B V C F C L V P K$ HPALVA AAQNEQVLACFVLDPRLE LVWLKKDLRLSDHAPWHAATKAAKEVVALYCLEPKLI

$\square Y$ LLRRRDLRDSDNP DFHE $\square D R \square S K Q V L P V Y V F P S E V G$ GSALVWFKNDLRVDDHPGLVAAVAKHETVVPLYVFDHRIC GPIVYWMSRDQRVNDNWAMLYAI E LDANPLVVVFNVVTK


VVY WMS R DQRVQDNWAF $\square Y$ A $\square K L E A P L H V C F C L V P K$

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|  |  | UniRef90-R7Q9J2 |
|  |  | UniRef90-I1FCU4 |
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|  |  | UniRef90-U1L3N3 |
|  |  | UniRef90-B7VP55 |
|  |  | UniRef90-U0F3H8 |
|  |  | UniRef90-V7AH06 |
|  |  | UniRef90-S3D146 |
|  |  | UniRef90-UPI00037D788F |
|  |  | UniRef90-F6W9G4 |
|  |  | UniRef90-UPI00045E9A80 |
|  |  | UniRef90-M4V2B3 |
|  |  | UniRef90-UPI0004049ABC |
|  |  | UniRef90-E3IM85 |
|  |  | UniRef90-L8X515 |
|  |  | UniRef90-C4YAK7 |
|  |  | UniRef90-LOWEG2 |
|  |  | UniRef90-V9D9Z0 |
|  |  | UniRef90-C1MPT6 |
|  |  | UniRef90_IORUJ5 |
|  |  | UniRef90-A5G103 |
|  |  | UniRef90-C6BZW8 |
|  |  | UniRef90-M7Y7E4 |
|  |  | UniRef90-M5WBP5 |
|  |  | UniRef90-H9J281 |
|  |  | UniRef90-D4H6T7 |
|  |  | UniRef90-R1EGA5 |
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|  |  | UniRef90_I1DV02 |


T DPHYDVRHWRFVWQS LTALDQGLQRVELPLLVRHDEVLS F LDAA YRQFHFLLRGMRGTAETLREHGIPFFLLQGDPAD TSHDRSPRRDDFCLRNLAAGKETLGGMDIPDYVTSHTPRD GFDRLGPAKSCFLLESVQALADGLNALGLTLVTACGGPAS RFWRCGRHRVKFLAESI WDMKMELEKAGSGLLIRVGLLGQ AHGTPSDARA LHEAVVALRASLRALGSDLVVRVGDPSM ASAGP RRLRYLYDALRVLRDNL DGRLLVTRGRPQE


 SARNQHFR FMMEGLCEI DLEELEYLKIPFFMISGNPVD EFWRCGPHRAKFTAESVWDLKESLGKI GSDLVIRIGMERG
 $\square$ RKLGGELILAKGKAGE
 F LEATIRHFGFMLKGLQEVAEECQELDIPFHLLDGFAKD ASSGE RRLQYLGDALRRLRSDLDRGRLLVTRGLPHE RQPDSAPQHFEFARESLQELAEQLPEQVPLLLAKANAPVA
 EPFETRHDYFFATMKQFMQELADQEUGLRTIVADSAE KFWRCGPHRVKF LAESVWEMKEELEKVGSGLLVRVGDLLH
 QFPYASSRHFQFMLQGLQDVAENLAKRNIKMVIKRETFP
 MRGDAPR F $\square E A T \square R Q F G F L L K G L A Q V E K E C R E \square N \square A F H L L L G E A S K$
$S Y L A F T P G G P E A L S A A L E R L R A E L R V R G S D L A D R V G S W E Q$ CFLGAT IR HYDFMLRGLEEVAEECEKLCIPFHLLLGLPKD G F L N A T L R H Y K F M L G GL K E V E K E C R D L N I G F H L L L G P A R E



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| UniRef90-R7Q9J2 | D TAP IVSEVARARVFWNKRYKPRAYPVEDAVRSELTAMDV |
| UniRef90-I1FCU4 |  |
| UniRef90-G3WL40 | VFPRLFKLWQAARRCLSFPPCKRVPRQPLRARSLRACGGL |
| UniRef90-U1L3N3 |  |
| UniRef90-B7VP55 |  |
| UniRef90-U0F3H8 | FLEKMAKQFQIEALYSHQETGDVTFQRDKQV |
| UniRef90_V7AH06 | VVQQLA T EVKATCVFAEQEVEYELRLIVVDALKQR |
| UniRef90-S3D146 | VLRHVIDEINQKAVWMTAEEGVEEKREERAI RNLCDETDT |
| UniRef90_UPI00037D788F |  |
| UniRef90-F6W9G4 | LP NFVKKHA I G GVVTD S S P L R VPLQ WVE DV S K RLP P D V |
| UniRef90-UPI00045E9A80 | VIA ALVREVRAAGVQVTGVHISAETRRRDRLVEAHLPDGV |
| UniRef90_M4V | V CWNRRYSATQRETDTAIKSALKERG |
| UniRef90-UPIO00404 |  |
| UniRef90-E3IM85 | EVPRFAATHGTGLVVTDFDVLRLKRAWLGQVR |
| UniRef90-L8X515 |  |
| UniRef90_C4YAK7 |  |
| UniRef90-LOWEG2 | LLA ${ }^{\text {L WQAQAPLQVVTAEADAPEE }}$ |
| UniRef90-V9D9Z0 | VIEDLLRQFQQVWMTEEEGVEEKREERDVRKAAEKFG |
| UniRef90-C1MPT6 | EMPSVAAALGATSLAAARELEWARVAGWRETLAALRAAGV |
| UniRef90-I0RUJ5 | R\PLLLVKTI GAASVHVSADFTPFGRRRDEKVRAALGA V |
| UniRef90-A5G103 | VLEALRRRLGGFALWSHEETGNRWTHARDRAVRRW |
| UniRef90-C6BZW8 | TLPAFVSNIRAGAVVTDFDPL |
| UniRef90-M7Y7E4 | AFSF $\dagger$ HS QYQ $\square$ R NVFFYQES GI GLTYQRDKKDSAFFRKAG |
| UniRef90-M5WBP5 | TIPNFVSECGASLLVTDFSPLREVRK CKEEDCKRVSDF |
| UniRef90-H9J281 | VLP Q WVVDHNDGAVVCDFNPLRVPMGWLDGVKGKLRKDV1 |
| UniRef90-D4H6T7 | ELSKFI R QVGAGAVVTDFSPLKFNRKMKLELAEVI NV |
| UniRef90-R1EGA5 |  |
| UniRef90_Q0N448 | TL NDWVQTNNTS AVVCDFNPLRVVRD WVATVKSQLAP HVV |
| UniRef90_S4R979 | VLPPFVNEKNIGAVVTDFLPLRVPRQWVKDLKKALPKNVV10 |
| UniRef90-UPI000361 | LI PQIAK D HGAEKVFYGRTYDPPGLSTQEKVEDALDRS GII |
| UniRef90_UPI00032A6A1A | VIEQLATEVKATCVFAEQEVEYELRF |
| UniRef90-D8LQK0 | V VPAFAKELGALLAI VTT M C PLRDPTRRAREVAEELNKD G |
| UniRef90-UPI000388B8D3 | VLPAFVTGRGLGGVVTDFSPLRVPMQWVEDVKERLPGDV |
| UniRef90_D5PIS0 | RIPRIVKEDGASSVHVSTDFAPF GRRRDDRVRAALGS V |
| UniRef90_A6GPG1 | LQTMALCCQQISIIYSHQETGNWASFVRDKEVKAWCESHS |
| UniRef90_Q4L4B3 |  |
| UniRef90-S3FHZ6 |  |
| UniRef90_T2FG57 | A IL QVVQAT GAT QL F Y NHLY DPLSLVRDRKLKQDLS R Gil |
| UniRef90-W9XI99 | QFEQKQGQAHVSAVWMTMEEGVEEKREEREVRRAAERAGV |
| UniRef90-M0TF10 | V I LELVNKVKPSHLY A E EEVEYNLRKLATTVESSLSAVPF |
| UniRef90-K8FE60 | PNAEI EKFCNEVNASAVVTDFSPLRLGLKWRDDFAKETKR |
| UniRef90-B2A7J6 | PYGAI E L A K D A M I VVDKGY LK F EKDWKE ULSHQLSC |
| UniRef90-N6XMQ4 | VLDRLHAAAPFTELYAHEETNGASYARDRAVARWCRARGV |
| UniRef90-Q17KA3 | TIPKFVKTHNDGAVVCDFSPDRVPMKWVEDVRKSLPAE V |
| UniRef90-U2H486 | EI ERVVHDTGAQAVYWNRRYAQPQRDADAALKASLKARGV |
| UniRef90-UPI0003592E | VLP Q FVK D N S $~$ G GVVT DF S P L R T P A K WVDELKEALPED V |
| UniRef90-J4WYU0 | I Y SFFKEHNFDTLYFNNTFGEDENSRDVKIKKLFDKRSF |
| UniRef90-D8TQV2 | QLTAVARTVGSRAVVSEAEVELRWRDPAGAALDRARDALG |
| UniRef90-Q28811 | VLPAFVQTHG\GGIVT DFSPLLHHTQWVKDVQDADPRQ V |
| UniRef90_UPIO0031891A3 | EFCESQELDKVVMASDDMSYHKEEYDYPHQ K Q |
| UniRef90-D3TMD1 | S LVEFLK DVDAATVVCDFSPLRLPGQWLEETK EVL |
| UniRef90-B4MQY9 | ELPKFVRDNDIGAVVICDFAPLRVPRQWVEDVTK |
| UniRef90-T1HKC6 | GNILTFVKEHKIGGCVVIDFS PLRLPKDWAKKLKEALPEN |
| UniRef90_D8U3Z0 | TLLPDLVTRLGAGLLVTDYSPLRLGRQWREQV C C S S P V |
| UniRef90-UPI00037FFFDC | NSLSVEYQILNI FSHTETGVRETWRDVRLRNHFKSEH |
| UniRef90-U3JYH0 | V LP T FVAE H GVGGLVTDFSPGRLPRQWVEDVRERLPED V |
| UniRef90-F9L6L7 | FFKEKGINEVVI A GDIMSYHKEEYD |
| UniRef90_UPI00047D9FD2 |  |
| UniRef90-A0A022QT | AVDTIPTFLKECSLLVT DFSPLREVRKWKDEDCNSVNESV |
| UniRef90_Q6AK21 | A HLLVSDFDPLR\KRQWTE QLIA QVVTPIT |
| 90-W8BWG3 | CLPEFVRNHKDA AVVCDFTPLREQLQCVEQVKA ALP VNV |
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PFFEVDAHNVV|PCWEASPKQEYAAHTFRP
VYHDFFSETLLPPNYTGQSRYDDFQTYTRFW
PLVQVDAHNLVPVWLASDKQEYAART ${ }^{\text {P }}$
 1 WHE
CL PHHSTLFDSHEMPFELSKVPSSFTKFRKLVEHLDV S WYEFANGAVVRGCKERKHWDKN PGDELWQTPFYEVKDVQN LDASYDEFKKR MRAPIE DFKLLVDKYFIDDRDLPFSDQDAPNVFTEYRNKVE NWKEYQRDGILRGlQHRKGWDE
PLVQVDAHNIVPCWVASNKQEYGARTD RKK DHDQLSQ $P L V A T G S P Y A V T P G R V L N Q A G S P Y R V F T P F A R A W R D H G W R$ SVLTFNGHLLREPWTVATRDGRPFQVFSAYWRAAREYSPE S WH Q
P L HEVDGRNVVPCRMASDKREYAARTLRP
RAEYFSDRCVVEPGALATKEGRDPS RLEESPTP
SFTPCHNSCVVLPGALKTKSGTQYAVFSPWFRAWMAY
PVHEVASRTLLDCGDTRPGASSLCGSFSRFRRRVEADGGP RLWLDEKYFIDDRDDPFDKPTDLPDVFTSYRKSVEP LDRD KCDTWHAPL
PLEESSSPYLVSPGRVTKSDGTPYKVFSPFYRAWHEHGWR

## PLLEVDGHNVPARFDTDK

QWHQSQRDGIVRGIRDRAGWDE
T THEVDAHNVVPLWAASEKLEYSARTDSK DNKKLPEYLIDE
 PLI EVDAHNIVPC
KLWTDEKYFVDDRD $\quad$ PF TNDKDLPDVYTTFR
FFAQVDAHNIVPCWQAS LKQEVYASTFRP KVLNQLDR PLAQVDAHNVVPCWVTSDKQEYGARTD, RRKUHDKLPQ

PLFQVDAHNVVPVWATSDKQETMART\RPK DHALGA पPEL $P F V Q V D A H N I V P C W V A S D K Q E Y G A R T I \quad R R K I H D Q L S E$ P LVATGSPYLVSPGRVTKQDGTPYQVFTPFDRKWREVGWR A WLEFQNNAVVRKLKNRDEWGKL
TVTTVRANHYFKPSATMNKQGEPYKVFTSFYKAHRSKDR
$V \square R L D D R H D F A P N A V T K K D G T P Y K V Y T P F K K A V Y A E T P P$ LVRSFNSDLLYEPWEVNDEEGHAFSTFQDYWNKCLNMPPL DFK K W LD KYFVDDRDLP FKPTDLPDVFTSYRKSVE
SWFI FWRTPFYD FKNLKELSASYHEFTKLKLS $\square$ S $\square P$ SVRVVDAHNIVPCW
P I H QI ETDAVIPVNTASSK EEYAAYT DRKK LLKMLD D RWHELPQFGVVRRLDDRD R WQAAWEAHVAA PLCQVDAHNIVPLWVTSEKQEYAARTD RNKVNNNLNT TVESSNGSLLNEPWEVLTGSGGPYQVFTYWRAARRDRAVA $P L C$ QVDA HN V VP C W
$S Y K T F T D Q \square L F E P G S \square R T \square E N K P Y S V F T P F K R K W \square E N F N \square$ VASYGWRAALWRADH
PFVQVDAHNIVPCWVASDKQE
EVQPI RVQHYFNPKKTFNNQGEPYKVFTSFYKKWRPYVMQ PFIQQ DAHNVVPVWFASQKQEYAARTD RNKDNSQLEE PFTQVDAHNIVPLWVASDKQEYAART
 PVHEVDAHNVVPVWVASDKREVGARTLR
PFAQVDAHNUVPCW
SVT TI RANHYFKPSKTRNNKGEPYKVFTSFYKKWRPY $\square M K$
NLIMI ESDLLVPVKE
SI HEVDAHNVVPLW
QVDTHN
$P$ FTQVDSHNIVPLW


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[^2]F TTEFP
RPVSGVTRQQMERCQAE $\square$ REDHDEAYGDPS $\square \mathrm{DEEGFPTDG}$

F पTEFPPVIKHPYEPK DEAEPVDWDNCYNS
RPAAEPAGLRWFRGPGSEPMPEVVGAPAPALPPVG
ASRPAPPRIEFFPVPKSVAARVKDLSALALQPCAPDWAG
K P
P ViA Q PE
APRKTVPRPPS $\square$ PPMPSP $\square$ PAKTEPFS $\square P$
GPART
NTFSKREP $\square P F S N P F P$ VDE $\square R \square Q L V Q Y P S$ GFQPAG


SPNPQGTK $\square P A A T D W K A A Q T S \square D D R S V P E \square S W \square$
F LTEFPPLIKHPYPSTAPAEP
SPAKSGAESAHW $\square \mathrm{DPDQVA} \mathrm{\square PQCD} \mathrm{\square PDPGAT} \mathrm{\square D} \mathrm{\square AFEWEA}$ PVLPVPD

APYDPPKR【VAGEVSNCPSDDGEDESEKASNALLARAWSP MPAPA $\square P \mathrm{VLSM} E \square K T S A \square P S V D$
F $\square T P L \square S R N P N F N S E T T N D E Q Y D \square D \square Y T \square E E L$
PQAVLPAALVFVTPSALLQPGARA PAEALGD YLTQFPPVI KHPHKASFKADSIDWVKLLDTME
APLPEPERLGFHRWPKALSDRALALDALTLRPSAPDWAG
$D \square L D \square E Y K Y$ VKNKK LNSNDNFDFNSPNDSRL
PAEPLPAPSALPPFPASVEPGR\|PGAAEM
RKDD
YLTTEFPPLTRHKYPNRKPS
Y TTEFPAVKHPHNGELKDEDDDWVGAENS LE
FLTDFPEVPQLPPWSHEVKPEPVNWETL
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