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

MNLDSYERT (LIVSLDLIATPGSRRGTPHTGGCVIED

M
F $\quad$ HH D T E S A A $L$ L MLFAPDTEESLEFVVTLVNTSPGASRSG
 $M \bigvee F \square H D T R S A L L A T V D L V N T H P S T S S E G$ $M N F N S H T D A V V A V S V E L V N L L T S G Y K Q G R P Y$ MPF S H D MVHALGTVVDLI NTVSGDR $M L F A P D T E V A L R S V V N L I N T A A N G E$ $M V F \square H D T Q Q S L R A A A Y L V N T M P$
LFAHDT@EALQLSVGLVNTGRNGK
 M T F S H D T E H A L MDFNSHSDRVVTAAVELVNALTPGERHGRPYTPPS DLCRS
 M IFAPDTEASLGTVVAL 1 NTA $\quad$ TAE $M L \square P H D T R \square A L D T V V D L M N T A P Q G D R P D E$ MLEAPDTEEALEFAVVLANTAAGASRSG $M L D T H D T E C A L S U L V E L D T A P E A C G S E Q L P$





 MLINHDTRCALADVVDLVNTAPPG $M Q P$ H DTRRALLDVVVALVNTAAEPD Q

 $M \mathrm{~L}$ I N H D T G G C A L D A V V D L L N S S P A G A P S A VG D D G L P D V A A L

 MHFAPD TE DAL E F A ALLL GN TV P DASRS G MLFANDTEVSLRSVAALINTLNDDG $M L D P H D T R I A L D T V V D L V N T A P E G G R G E A L G$ MTFSHDVEHSLEVVVDLVNTDPTATG
 $M Q D N H D T R C A L D D V V D L L N T A P D$

MDF NSHADA $\square$ VR V

MQIN HD TRCALDQAVVLLNTMADGENP MLIP HDTRIALDVVVDLVNTAPERDGPGVDDR $M L$ FAHDTEVALVSAAALVNA M NFNSHTDGVVASAVKLVNGLT
 $M$ L $M \mathrm{H}$ L P Y G E Y A V T L A A D L A N MLF A H D TEASLLAAVWLVNSA MI FAYDTEVALVSAAALINTAEAT $M L$ DT H D T R CALLDAVVDL L NTAP E G D S P GAP MPFGHDTEDGLLSVAALVNTAT $M E L A$ Y Y S D M AV R L $V$ NTEEPQRG MVFTHDTEVALAAAAALVNTAPNPDTGDAEE MVFTHDTE ESLQAAVVLVNAA $M E L A Y Y$ A D Y A V R L V M IF T H D TE HALATVVDLVNTAPAAGG MHFA GDTESALVVAAS LVNTARGG MLFANDTEDTLQS $\quad$ TA A LVNT LVVNTLVND MELNYYSDFAVR LVNTEQPERG
MVFA H DTESAMRTAVALVNTMT
$M Q F A P D T \square E S$ TDD FA VAA GNS HP LA S R S G S N P Y M MVGGRLLCMD FIN TVVSWR E S A E K R $R$ L A V D V N T K T L D
$M L F T H D T E V A L A S A V G L L N H P D W S G D G$
DF $\lfloor$ N S YWRDWRTGDRR

MDFDAY ME LAA Y Y S D F A VR

LV N S E E P L L R E K D T DFI NSYWRDWRTGDELDRLT SVESVV
MLF GHD DT CGANAAVELVNTAPEDAG
$P L L G D N L A L D B I N T E E Y V D$
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MHLNPYGEDAVDLAADLVNR MPFAHDTESSLIAATAALVNTA

GKRHD
GKE E T D
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 $M E L A$ Y Y S D Y A V R L

 ME L A S Y A D Y A V $\mid$ R $\quad$ L V N T E A P|V|R G

## QUERY

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 VRFLNRWGLAAVEAPDGELESLVQLRHLLRRIVDAVAAGE AA EGLRTGYPHREVTEGEAGELAEIAARLRGVFDAVATGD


 QEFVGTHEISDVGVLTEF DLSAVVRVRARFAAVFAAPD RAFVESHGVQVGALGERDVADMRATREL ERCVDAGUILDFPLAEKDLDETLDDRELFARLGAAESDR DDFFDEFHYTGRR DHDEAELAAVRALRADLRRLLTSD

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 RELLERNESDVSGLAERDLEVVRGLRDRFHAVF LLAADD TRFLDADHWTGRRDTREELTAVRALRPRLRKFWEAAG


 $\begin{array}{ll}K & Q \\ D & L \\ D & D\end{array}$




 R A L F G P M Q QLAA R R A G E A D I TT R L K G V R T R L R A V F TAA A A D G D $K$ S WLTA H G L P A DP A D S A Q L Q E L
 D R F L A E Q DF S GS R A T A N ELLA A V V Q L R A E A R E EVVN SA M N S V ADRCRSAGLVLLERPTTA Q DLDRARYAL ES WEKVVDAA D NDFFTVHSYSGRH EHTEAELRAVRALRPRLRRIWHAD A GLLDLWEFTGRRDGDD A ELEA I REL R GR L R R L WTAT

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RDQAVEAVNRMLREAKALPYLTRHDEWDWHLHATSPDAPL RDQAVEAVNRMLIREAKALPYLTRHDEWDWHLHATSPDAP ARDAAPLINQLVAGAGTTPQLTDHDGYDWHVHYFAPGASV RDEAVAVVNRMLREARADPYLTRHDGSDWHMHATEPDAPL VERAAGLVNALVAEAGTTPRLTNHDDHGWHIHYFAPHAAV EPQVVELVNAMLSEAGAVPRLVDHDGDGWHIHATPDEAPL VAGAVELINGLVGEVRTTPHLTDHDGHDWHVHFFAPGAPV RDDAVPLVNAMLRDGRALPQLVRHDEFDWHIHASEASDHL
 QPTAVRTLNSLLSSTRDTPRLTEHDGHPLHVHYFAADSSL RHTA ELLNTMI AAAGTTPRLTDHDGYDWVHYFAPGASL PADVAHVVNEMLAQSPQQPRLTKHGSWDWHLHFTPDDAPL TAEAAELLNALVAEAGTTPRLTDHDGYDWHVHYFAPGASL TPEAAALINSLVAEAGTTPRLTDHDGYDWHVHYFAPGASL PREASELLNNLVAAAGTTPQLTDHDGYDWHVHYFAPDASM RDEAAVEVNAMLAEAHALPYLMRHDGFDWHLHATAQDAP
EAEAVQIVNKVMAEANALPQLVKHDRWDWHLHATSPEDP EAEAVQIVNKVMAEANALPQLVKHDRWDWHLHATSPEDPLL
 PPAAADLLNRVLQAAPTSRRLVCCGEEGYRLQLTPVCQDW DDAAALQVNGLLEETRARPLLDRHDGEPWHLHFHGPGGTM PVD LTVI NQVLEAGRSTRMLEWNDEGRKFRVADHQRDSS
 EDRUVEVVNSLLDEYRADPQLVKHDHWPYHLHAVPSDSPL ARTAAGLINDLVAAAGTTPRLTDHDGYDWHIHYFAPGASV

EAAELI NAMVAEAGTTPQLTDHDGHDWHVHYFAPGASU EAARAELVNVMLEQASAYPRMTNHANDGWHLHYRDPQQSL RDAAAVLVNRLLADAHAVPLLVRHGGFDWHVHAVSPDAPF EDEAAELVNQLLAQAKALPQLVKHDQWDWHLHATTPAAP RDELVAFVNEVMLQYRALPQLVRHDEWDYHLHATPSDAPL EMRAVDMLNALLIDFPVSPQUSGHDTRDWHLHDAEQSANS RDSAAGLVNEMLDAAGAVPQLVRHPPADWHIHAVPSDAPL EVRAVDLLNSLLEFPVSPQI SGHGDLDWHLHLADHATNA PPAAVALVNEVVGGVRTTPHLTDHDGYHWHMHYFEPGAPL VDDAVEVVNTLLDESGARPRLTRHDDDGWHLHVTADDSPL EVRAVDLLNSLLMEFPTSPQISGHGERGWHMHLADHAATA RDDAVELTNEWLAEAQAVPQLVRHGDVDWHVHGVRGDEPA
RDNAATEUNAMAEANALPFLTRHGDSDWHLHANSPGAPL HPADLERFNESVSHFYQTLQ VIHEKDHYTLKFKHTEKNL PGEAARIVNELLTEYAVRPYLSDHDGSPWHLHVAKPEATW EVELVSETNAMLSEAQAVPQLVRHDEWDWHLHATTHDAPL EQDVVDRLNSLLDQHPVQPQQSGDGERWHMHLTPEGGRM
 RPD LSDLNAFLAAAQSHPQLIWSKARTDEI QTSRSTDT EHDAVDELNSLLEQHPVHPRISGHESGNWHI HVTSRGSMV TVPGLERLNPYMAAGPVMRQAAGLEYEGRMTMTLAEHPSNA TPDGLERLNPYMAAGPVMRQAALDEEGRMTMTLLPMRADW PVDAAAVNRVLEVGRPGSKLEWDGNMQQYRVAVYQNTES
 VDEIVSIVNGLLREHRALPQLITHDDEPYHLHAVPRDAPL EVDVVAEVNDMLEEAHAMPQLVRHDAWDWHLHATSADSAL V

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 ATRVLVEAAMAFVDVI RADEYDRVRVCAADDCESVVVDYS ATRMAVVEAMAVVDLVRAGELGRLGTCGADDCQDVLVDLT
 AEHDAADCGDALA QVLVQDEWERLLRTCGAPGCSNVFVDES




 A D HL L A A D C GMA L A FII VA GEQERLLRRCEAP GCGRAFVVDLS | A E R C | $R$ | $V$ | $E$ | $A$ | $A$ | $M$ | $A$ | $L$ | $D$ | $D$ | $V$ | $I$ | $R$ | $M$ | $D$ | $E$ | $M$ | $D$ | $R$ | $L$ | $R$ | $V$ | $C$ | $E$ | $A$ | $P$ | $D$ | $C$ | $T$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $V$ | $D$ | $F$ | $S$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $S$ | $E$ | $R$ | $M$ | $A$ | $V$ | $E$ | $A$ | $A$ | $M$ | $A$ | $L$ | $V$ | $D$ | $V$ | $L$ | $R$ | $S$ | $A$ | $E$ | $L$ | $S$ | $R$ | $L$ | $R$ | $T$ | $C$ | $A$ | $A$ | $S$ | $D$ |
| $C$ | $E$ | $A$ | $V$ | $L$ | $L$ | $D$ | $L$ | $S$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | A DHLLAADCGMAL AFIVVAGEQERLRRCEAPDCGRAFVDLS


 A ERMADVELAFAMVDVVRAGGGLDRMERVCE GQDCDDVIVVDLD

A Y D R L A V D A A M A LA E V I R A D H A A A D C GVA LA A L L V GE GERRLRTCSAP DCDHVVFVD

 A MRMLVVESAMAFVDVI RSDA WDRVVRVCAAD DCESVVYVDFS A EHLLA A C GMALAFLLVAGERERLRRCGAPGCGRAFVDLS
 A DHLA A DCGMAL AFIVVA GEQERLLRRCEAPDCGHAFVDDS A E R I R V E $\$ I A L A L V V V I

 A R RMMAV E A A M A F I D L I DRA G E T E R R L A D H L A A DGGMALAFLIVAGEQERLRRCEAPDCGRAFIDLS
 A GDWAA S CA T GLLA IVL GSEFHDR L GVVCTAPHCDRVVVDVS A A S LL L G PVA E S L V S L V T D N K F E F V R Q C E A D D C V L L F H D L S

 T T D WGATCAT G L A VVVLGGEMMDRELGVCTAP HCDRVVYVDTS





 A A RMAVVEAAMALVVDLVVRAGELVERELRTCCQADCCQDVVVVDLS AT R I L V V E T A M A MVVDVI R D D E L





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T NRSRRYCSDRCATRANVAAYRAR R N R CRRYCSRTCGNRMHV
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$R G F V E E F V Y T G R R D G D A$
$R$

 GRCVDAGUVVDFPVTDDDLADVLDMLDRWTAA ADATSD FKWLKEYALLETQMPNTEMAQLKKLRSLLWNWVQA GVQGN QAVFREHVIRWSDVDKSDVPALLRRWTTRLRAVF RAVAPD ERWLVRLEWAPAFEEGELLGAARTLREVVRELVAARKAGE RA H HLLSDTGVLDTSDLRALHHVRARFAEVFAAA
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 STFDERWKVTVPPPTAEDLKTLHRLRAKLRSIVEAVAPD HDFFGGRVWWTERATERDLSTLRRAKRKLREVFVKGSSGD EAFLDARTYTGRDRDAAELAELRELLRVRLRQLF GLUNTD KMAGQLPEASDEKAPGGLLTLARELREHARAVIHAAMAGV KNWLQQSGQGTLSDTGELLAEARKLRALILQLLVEEKKNGH

 EAFVRHWRWSG TPDRRFAEVQRVRLVRPRLAQLWELD QVWLA QHPFTGVILGADEVAEVRAVRTQLRRLWQVA DDFWTRYGYTGRHDGADEVASVRGIRAQLRTLLLA HQAGVLND TLAAPPAGLVERARELREDMQTLVVSAREGR R DAFYAEFEYTGRHDRDR GAELDAVRADRPALY EEFFVRHVYTGVRTGDAELAAVRAQRAPLRTLLTS VARCDAAGF VFDSDD $\square G \square D D L R K T V D Y L E H W R D V A R A T D$ DAFLEAEGFTGSRTRDA AELDSVRALRREDTLLWTAD EAVAQA LGRWARRVTAREAGELAQVAVALRGVFEASGRGD EQRTRDVGMTMPF PRH LDDEEQTRRVIDDWLRDVDATS DA WLKAAKQLPENFTDTPAGEALAALRQAMVRTIEAGRSGK DVYLNSFGWTGRRDDDAELRSVHRLRARLGDDWAA TDD REAGVLTEDLDESLPSGLVGLARELRENMRALVNAAKEGQ EQLLREYALHAPPIDEASAVALLRLREYMRSLLERVVRGE
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 QYFSTKWELKVPLPTDPMLQSLRELRQQMRNVTEAVATGQ GEWLEEHKLPAAPMLPEELEQLKGLRGLLWDELQRLVAGE LA WLSHAGFRPPAPRNSLLQAARHLREQIRTAIEDREAGN RDLFVGMTQMSRRLTDTDVGRFRAVRARLRAVFTAADEGD
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 TAFFDGHPWRQSKLADRDLVAMRRAQKRLRGVFEAGTAGD $R E L F G P A Q Q A A R R A T D S D V T R L R T V R A R L R A V$
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$V$
 ENWLQQAGLADASDKAADPGALLQEARRLRDIIREMVADK WSLLTDHDIQTDTPTASQAAELVAWAGELSQ AYGEPD MRWLERHHVTPPGASADLLAQGKQLRNVVHDLIAARKAGQ DEWYAEHRYTGRRDGDA AEDASLRALRPVLRDLLTAD QQA GVLPEYRESPPPGLAHLARELRDNMRELLDSAQQGR QSLLEAHEDRRPAVVDADVDGFRDWRDQLARVF GSTD RDFVARWGWTGPPI RPDELDRVYAVRALLRELWDSAA D
 LDWLDKAGLLSESLGVRCMTAASALREELFKLVRAHSDGE HRCI EGGLVLDAPATDADVTATVAF LREWEAVIDADT K R WLA S S GLVVVPAEGELLREARALRETVRRMVGQKKAG
VAFLTAHGEWFSPLSARETAQVVSTARLVRDVALAQTQQ HDFASRHDFSGPRATKSDVEETRRLRDRFDAAFAAGLDPE GEVFAEHSIRWPDLDDRTLIELRRWTTRLRTVFTAATEKR RAAAGALGPVDGQVDDAVAERLRQVASRLREIDESLSRRD
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90
Alvi 90
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VEHDGYRWHM
120 IDDACGVVNELLTETGAAPVLARHDKEPWHLHFHAVDAEW EVRAVEQVNALLSDTKASPWLTRHPEMPWHLHLASDHDPL TDETVSTVNGLLRENSALPQLDTHDDEPYHLHAVPRDAPL VAVDLDTVNRILEKGHPLTRLQWDEDTQRYRVDSHAVSHS DRVAAERLNAIVAAAGTTPQLTDHDGYEWHVHYFAPGASV VDDAAREVNVMLRESEARPYLARHDGWDWHIVVTEPGAP $\stackrel{R}{R}$ PS LDDELNGWLAQAQSHLRLVVDEQGALQTQRVYLLDTP
$\stackrel{s}{\mathrm{E}}$ PGNPAA NGFILRKAVSHPQLVWPASGTPQLERQRKQQT SASAVRILNELVATAGTTPRLTDHDGYDWHVHYFAPGAS EDRVVETVNELLREAAADPQLVKHDEWDYHLHATPPHAP VSERVDRLNALLATHASYPRVTDHTGTGWHIHYRESGA VAADLTVVNRGLRDGKPETRLQWDEGTQRYRVDVRSGTHS PSSAVQVTNSCSTQGSATPTLTAEGGRKWRL SS RGERIEELNHWMSAGPVLRELHKNEDGGYTLNYSTVHPGUL GYETKCA NSTLKKGSPYPQ AWQENEKKFVINYHHATLT EDATCDALNALLVDGAGQVYLTTHGHFGPHLHFAPDDSD MAGAVEILNTLLQQFPVQPRUSGHSDQDWHMHVTSRGSAV EEGLVAHVNALLRESQALPHVVRHDHFGWHLHATDDDQPL TPS LAQLNDYLAQAQSYL MDRAAVEVNALLLDTNARPQLDRTGSPGWNLHFHGADDTL AEDADDVVNKYLCHAPMQKRLETVDEG
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 EVGAVDLLNALMMEFPVSPQISGHEHRDWHMHIADHAANA $S$ VD LTVVNQLLEAGRPARRLEWDGDAQQFRVDVHQRNNS KAGNAAGINRYLAAATSYQQLVSSDEGGLQLKRUYSSQTP LDRQVAVINHLLERGASRPF SQHGGRAPHLHYFREEPDV RERAASLVNTMLADARALPQLVRHDDQDWHLHAVSSDAPL GADPA VINHVLERGCPLEKI EWQPAEAAFQKKTLRRNLE AAEQCSAVNDLLVAAT RPWVTTHDGLQPHLHFVPDSADV EARAVSLINRMLREAHVLPQLARHDDWPYHLHGWSDETPI
 FADSURF NLFLKEQSLSTKLVLDENGFRRVSHTVLRKP VDSDVAEVNLLLLRETDALPQLVRHDDWDWHLHAARPDAPA RDORCEAINALLVDGVASMYLTTHDGLRPHLHFTPDEDDV RDQAAGLLNQMLADSRARPYLHRHGEQSWHLHFHSPDADF TESQLKELNRWMEGGPLVRRLHAGMDGRMAI GYRPLESGW


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 WQQUCVIISAATALGLTGRGUDRMGACEDDECTHVEADTS

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 A QL LE PI ATLAAASLLSDPHFERVRECEHPECILLWFYDRT
 ADRVA A DVA LVVLDDLI RS G DLDR RLGRCAAEDCRAYLADDS VSRIMAVTAGGLAIFTVEADGRRLGRCARTGCRQVFVDTS V Q QWA A GLA VSVAAAALGDHDPHRVGLCAAPRCDQVYI DAS ATRDAVETAMAMVDVIRADELSRLSICADDGCAGVVVDDS $A E Q F L A P I A E A A A T L L V E G D F G L I A T C E H P E C V L W F Y D R T$
$\square P M W T A D C S E S L A R M V G D G H V D R L G T C E D G A C G R V F$

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 P DEAAVLVNDLLGREHRALPQLVRHD DYGWHFHAVPPDAAAL E E E A V





 E DARAGLLNDLLERWSGHPRLDRHDDQGWHLHYRDDDVT F RDEAVP LVVNAMLRDGRADPQLQRHGDTDWHLLHAVEDERPF
 D A E R AT AVV N A MLL L A D A S A Y P R M T D H A G D G WH L
 T S DMI H L LI N RMMT E G P VT RVLVKEQDGH F TVLGLLRPS KN S W

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 P E QRAALLLNA QMAAVAAAYPRLTNDD GE GWHLLHYRDEN QVLI ADTRCTAVNALLDQGVRRVFLATHDGLLPHMHFADWGDTVV


 P H P RTDNL T ALLIATYVGPPRLTDHGSTDWHLHFRGDNVST
 P A D I D A V N T WAR R A P $\quad$ D P Q L T P D G G





 $P S S A V R L L N H Y S T H G V S A T T L T S D G R R E W W L \quad G S G S$


 SA D P A $\quad \mathrm{V}$ I N Q V L



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RNRSRRYCSTACGNRNAVAAYRAR RNRSKRFCSTTCGNRVAAAAYRER PAKQRRWCSMSCGNREK IRAHRHR KAHKRRWCSMACGNRHKVAEFRKR KSHRRRWCSMACGNRHKVAEFRKR RNRSKRFCDTSCATRTHVAAFRAR RNRSKRFCSTRCTNRVAVAAFRAR KSHRRRWCSMACGNRAKVARFRQ
RAGRRRYCMPECGNRVNVARHRAR GKRKWCSMKCGNRAKVARHEHK
RNGRQKYCSTRCNN
RNRSRRFCSTSCGNRVAAVAYRAR KSHRRRWCSMACGNRMKVAAFRSR KNQSRKFCDT
RGGAQRYCSPGCANRDAVRRHRAR ANRSRRHCSDRCTSRANVALH
KSHRRRWCSMACGNRAKVARFRQ TNRSRRYCSDRCATRANVAAYRAR KNGKRRWCSMTCGNREKAAGHRAR KNRSRRFCESGCGNRAA
QSRTRRWCEMTCGNRQKKARF
KSHRRRWCSMACGNRHKVAEHRKR KNGTRRFCGASCQNRVKNAHHRR KNGTRRYCSARCQSRVKAAAHRAR KAHRRRWCSMACGNRAKVAEFRKR RNSSRRYCDTGCGNRANV
RNGSKRFCSVRCGNRMNMVAFRER RNRSRRYCSTTCANRNAVAAYRAR KAHRRRWCSMACGNRHKVAQFRQR KSHRRRWCSMACGNRHKVAEHRKR K SHRRRWCSMACGNRAKVARFRQ QSRTRKWCDMTCGNRQKKARFKA RNASRRYCSNTCASRSTVAAYRAR KNGLRRWCSMACGNRAKASRHYQR SNCCRRFCSERCATRSHV
KAHKRRWCSMTCGNRYKAAQFRKR RNGRRRFCSTRCGTRVNVADHRAR RNGRQRYCSVRCANRAAVRRHRGR RGGRRAYCSAKCGNADAVHRYRNR RNRSRRFCSTTCANRVAVAAYRAR KNGKRRWCSMVCGNRAKASAHRQR RNGQRRFCSPQCQSRVKAAAHRAR RNGSKRFCDARCANRVHVAAYRAR RNGSKRFCSVRCGNRVNMDAFRAR RGGRQRYCSVRCANRDAVRRHRAK K NASRRFCSTRCGN
TNRSRRYCSDRCATRANVAAYRAR RNRSRRFCEGGC
RNGRQRYCSPACGNRMAVRRYRQ
KNHSRRWCDMRCGNVAKVRRYRRK PARNRQWCSMRCGNREKARKHYGR RNRSRDFCDTGCGNRDHVAAYRER KAHKRRWCSMACGNRYKAAQFRKR PNRSRRYCSERCSSRANVAAFRAR RNNDRRWCTMACGNRDKVAHYRAR KAHKRRWCSMACGNRHKVAEFRKR RNASRRYCSNTCASRSTVAAYRAR RNGSKQYCTRACAHRASVAAYRSR RNRSKRFCSVACGNRNAVAAYRAR RGGRQRYCSARCGNTDAVARHRA RNRSKRYCDDKCGNDMKVRRFRER RSRTRRWCEMTCGNREKKARFDA KAHRRRWCSMACGNRAKVARFRQ RNGRQRYCSSVCGNRDA
KAHKRRWCSMACGNRNKVANFR $\square R$ KAGRRRYCMPECGNRLNVAKHRAR K S HRRRWCSMACGNRMKAAAHRAR TNSSRRYCSDRCATRANVAAYRAR RNRSRMFCDTGCGNRQHVAAYRER KGGNRQFCTTRCANRVNAVRHRAR KNGTRRFCGVTCQNRVKNAQHRAR R N R S K R Y C D D K C G N L M K V VR R R A R

| UniRef90_R4SSZ6 |
| :---: |
| UniRef90-AOB3M6 |
| UniRet90_S6IG |
| UniRef90-F4CMD5 |
| UniRef90 D7C3V4 |
| UniRef90 UPIO0036DF0EF |
| UniRet90- S2YS |
| UniRef90 UPI0003FEA3D |

MQLNPYGEYAVLLAASLAN
MRLNPYGEDPVRLAVDLIGA LALDFLNSDWSDYRGGRAEDRFRDPDELL
PDFRपGTVLATSFITATRTERCGDAVERIPTPQRL
MDFTDDTEEALRSAVWLVNSAEQ RVNPYDEPLLQNVTDLLN MDFDSHMSGVVEAAVRAVNLLVPGERGGRPATGAADCED mLIDHDNRRAGDWSDFLNSEWHDWRRGRSEDRLEKLTWQ MLIDHDNRRADDWVDDVNTAAEP

DTDESLTLWTALVNTRYLHDGHE

> TDRPLTGEPLALDLVNTEWPEQ

DPRPLVGEPLALDLLNTRW
meVNGYRSDGVGAAVAMVNAWTGSDGSP
MHLNPYGEDAVNLAADLVNRRP
ME पASYA DFAVR


HGTLFSQDVIATLLALAPLVNSELGGADVLASQSA MYTNPYGADPVTLAADLANRRPRTTR
MHYNHYGREPVQLGTELLN
mLFAYDTTTALAAAAALVNSAR
FDSHVAVGLEATDGVNTSPRVWV
MDHPPA!FILDALGLDFLNSV
ATP解TP
DPCA

$M H L N P Y G G S A A E L$
MDRPPAMF TADS LG

H WD GY D S I G G S V P L
$M \mid A I D H P$
$M H V N H Y S R E L L D$

NTDDLN
RPPAD
LWADFLNSQW
AAAELAARLVAGP
IGGDLALDFINSEFGV GAAHHDCFADDEAV



$$
\begin{aligned}
& P Y G E Y A V L L A A S L A N \\
& S D Y G A G L A T D \\
& \hline
\end{aligned}
$$

$\square$ F GHDTEDT $\square$ RSACALLANS DRVAG
EO

$$
7 \mathrm{P}
$$

$\begin{array}{ll}\text { A } & \text { L } \\ \text { L } \\ \text { L } \\ \end{array}$

MHFNPYGGAA EQLGA
MYFNHYSDEGAQLAAALV

 MHFNPYGGPAAQVAAGLVNM | V $\downarrow$ A S PGAP |
| :--- |
| $P D A A A P E L$ |

$P \square A D H P V Z A L M N T A P G A S R S G B E E D V T T A Q L$
HFDSHVHAVTDQACRLVNALTSGHDGTRPVEPPARRAEV
DPRPLTGEPLADDLLNTQWMGE GTLQDLLADVDGL
 $M D L^{T} P$ Y A E
$L A \vee L L \vee N$
MHFNPYGGAAAKAAAALVNTGT
DGD DLAALD
GEARTDVLAPAAKLV MKKAPFKLNAEHVALDFVNTLDDRYTAGGPRELLPTYDELL MEFAHDTQVVLAAAASVNTA MLIFAHDTEMALAAA
MHFNAYGGTGARVAADLLNA
MQFNHGNMVGPTLAAELASDAGRSWDSG
MHLNPYGEYAVLLAASLANDWPGDRDG
 MHF $\quad$ YRP $\square P A M F L A L D F N S$

UniRef90_UPI000289E9C8
$M H F$
$M N L$ MHFNPYGGAAAQMAATLVN

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 DAWYLESGMVSASQEADVEQAIAVREATYGLTKARVAGD RKWQEAHGLAVERLPDAQLEALKRLRSLMQSMVKLLAAEE RDLFGGSRQAARRATDADASRLRGVRTRLRAVFEAAGEGD AVWLTANGLDERFAEADATTLRRTLQA RDALKKAVDGS DGFFTRWGYTGRHDRDDEGAEVAHVQAARARVARLWEVD RALLDRHEDRRSALNRESSEQLRQWSSRLRSAFEPA MAN MK WLDKMGEAAPFDNRSALKKVLQFRSVLREHFENUAEGG VD WLAVYGLAVGSCTPAQLGLARELREAVHATAAATGAPL
RDFGMTKEVPATSVDYE SERCARAGVALGPCGQADLDEVRRFLERWRQVVD TR QQFLTRWHLDAAALDESMVRSLDTLRSHLWDYAARLVRGE ADWLAVSGLAVESCTTEQLELARELRES:HAAATALHEPL
 ADALAEAGYARDLPSPGEIEELRGLARRMYRVFAEVEAGD QWFLNHWQLTAPVPMPEEVLAMRHFRERDHALAVKLAGGG RGFAARHRISGDRLDETDLLAVRQVRERFAAVFAALTHG K LATLRDHGMAVTAVSPSDASALAAWRLRLREVFGAATSD LSWCREQAGVPAGLAEACLARALALREALYRLFHAQAEQR RRLLEEHGAAAERVTRRDLNALLELREELSEVFQAAARGE AELLAVDPPSAAHLTDRDTPEFAALANELRLVLDSARTAD TALLDSRSAADDRAVSDVETRLTALAWALRDADTA SEWLVGAGTERLEESESVLETVKSFRETLYDVLVS
 $R D V L R P F S F L V D D L G E E A G E P L L E W T G E L R A F F A D$
$A D R C R E A G L V L R P V T D D L V R V H A V L D A W E K V V D A$ $R G A L D P A V E L P A H A A P G S L A A A R L L R E Q L R A L V M A H K D G G$
$R A L F G G P S R A A A L A D E A D L P R L R T V R R G G V E A A B G E$
 RGYLDEHGWTGRRDGDAELAAMRALRARARVLWELL DQ ARCAAAGLALSCAPTDGDLASVAEAFLRRWRRVVVCVIPA MDWLRKAVYNGNEEEARDVESARLLRHHDFHLI QSANESS RDLLSEHGLSPDALTSGEDADVQGLREEGRSVLDAPTAGE $G A A V S D A G S L P R T F D S A E A E H L A A T A R A M R R G F A M H D G D$
$L D W L E A Q L V P A D A D P G E D D N G D Q A R S R E W F R D F V R A H$ RAALHDEPWWSERCGQSDLVALRETRGALREVLGAVVRGD LUADLDDRQRAALRRWDERLDAIFTAPEDGP MT WFKTMGETAPFLSSLTLQEVRQFRAELRKHFEYGAEGS
 HERMDGVVSTGVHAQPEDARGLARAAGQLRQVFDAVSVDD CA WLDDVGLAAGSLAETAPDK AVQARALREQFRRYMNDG ARYVAVGMPLENEPAHEVDLNMLQHFRTQLHHLADALSQGG RQLLADADYPLGSVTAAQVAELRRWIDELDAMFDHPT LA WLKLAGVLPDDVGVALQALAVRLRDNARSLVHAAKQEE LSWLEQASLVPVDVRPAELDEVAAKARGLREWFRAFVTAR LALGMTQTFPPAPDDHAQVRAV GRFLVEHGLAAPRLTTDDLDEVRFLRKELRALVLA GD RAELHDEPWWSSRLTEQDLNTLREVAANLRQSIEAAVSGE DVLLE RRPSPADVTGLHEWQAPLTEVVDAVTH ARWL RDAALHDPDLSVTQETALLELRETIWSLLDALITRGA DRMMREAGMSLTRLTEAEAAQARAWGRRIRAVFABEPD RALLEEHGWSGRDRDEHELAEVREVRGELRRV WADD SDWL!RAGWLAEPLAGRYPPGLLAVARHLREVVRMLVEAR
 RVWLDSAGLSGDHVADG RMLRHVRQARQALRTAVDGS a DWL AVSGLAVRSCTAAQLERARELDEADHEAATAGARQE AVWLRSAGLDGRATADRATRDALAETRGV LLDLVERRP RKLLEETGEAAARLTRRDVDALCELRDELAEVFQSASGGD VEVMRAAGMSLTRLSADDATEVDAWGGRLRQVFE 1 D WLRQAGALPAGHAGPAPAGLREAALALRDAARQLVEKR LRFCREGGLLTAASQEKGDRSADELRELLARVFYRWVDGR EAWMAEQPYTGDRATGAERAAVRALRERLTALWPAPGEPD AAFLDTWEFTGSRVGD EAELAEVHQLRAVVAGDWDTD SEVLRVHGMARPELTAAHARRLAAWIERVRPVF G GEPD VAVLRAHNVRRPDLDEEGSQRLREWASRLRVPFSA PD
 TRFCEKWDLPEPGTDAATLDVLRGLRGLLAEAAARGLRGLL LDVLRTDDYPVGTLDAGGARELLEWARRLERVFD
UniRef90 C6W9W2
UniRef90_B4EDMO
UniRef90_UPIo00289E9C8
UniRef90_R4SSZ6 UniRef90_AOB3M6
UniRef90_S6lGV9 UniRef90 F4CMD5 UniRef90-D7C3V4 UniRef90-F8FRA6
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## UniRef90-D9V758

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UniRef90_D9UZY1
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UniRef90-UPIOOO36C641A UniRef90-E4NGVO UniRef90-UPIIOOO3ACF964 UniRef90-E5XUF9
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UniRef90_UEEI78

## UniRef90-D3EB62

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UniRef90-UP100036EA1D6 UniRef90-UPIO0036A2F96 UniRef90-K0ERE5 UniRef90-F7SUS2 UniRef90-R4XOV5
UniRef90 V6MHNO UniRef90-UPIO004697BCE UniRef90-UPIO0030EE10FC UniRef90-UP100035FAOC3 UniRef90-G7CKG2 UniRef90-UPIOOO47A7701 UniRef90 G2E784 UniRef90-UPI00026270F9 UniRef90-UPIO0036BFF59 UniRef90 B2UK06 UniRef90-E9V1B4 UniRef90-UPI00029AFEB9 UniRef90-B5HYM4 UniRef9O-UPIIOOO37ED479 UniRef90-UP10000420F46F UniRef90-W2EMB8 UniRef90-UPIOOO37120D8 UniRef90-F2LRA7 UniRef90-UPI000364E88C UniRef90 UPIO001FFEE93 UniRef90_14ERQ5 UniRef90 UP100036D15E1 UniRef90-A0A022LK98 UniRef90-E8NGL8 UniRef90-G1UUZ2
UniRef90 G8MLI UniRef90-G8MLL2
UniRef90_C6W9W2 UniRef90_B4EDMO
UniRef90_UPI000289E9C8

 PDATAVAVNALLADVADGPHLSSHDGQGWHDHYAPPEASLET PVPELEELNQVMEGGPVLRRLVWNGEQ YRVRLEAQRSTW PVRAVDELNALMMEYPVSPQLSGHDRPRWHLHLLAEAAATW VAEGADAVDGVLAHGRIRLTLTADGPGEL PEFDDPSW PLSDKDRLNAMMGEGQVTRRLYS GEEGLKGSVVPVKFHW RDEAAELVNAMLREADATPFLVRHDAVDWHLHATAPGASV
 EPAPVSFLQDQUAAAPFTYELIDDKERRWHLLARDP PATAVRVINDRSVEGRAAAVLTPEGERRWHL HYRDASGS DTERARLLNTLLAESSSYPRLTDHDGDGWHI HYRDDRLGA PLAVADQLQPYLQASAVRRTLCQDQDGHWRIVLEPGQKDW AAPA SERLNAFSARARAVAVLTWEPSKVPTLSPRFCQPTA RDEMAAHVNDALAESRLTPALRRHDGVDWHLHAVADEQPF EHERVRLLNQMLSRHTAKPSTTDHDGSGWHLHYRDPDAGF MDAACEGANALMGDTGAMPVLARHNDEPWHLHFHAVDARW QMEEADMLNEHLVQDPVTRRLSGEPG DVRLQYVPVTEDW PRAAAELLNALVAQAGTTPRLTDHDGYDWHVHYFAPGASL
PRDALKRWNQWLEDLINLKAHVIDNVG

DSDASVVNHVLKAGGAATELAWDGASQSFKAVRPRRLDD VDARVELLNRLLADSASAPYISRHDGRPPHRHYHVSGGS ENGRAAQMNSILDRYACPPRMTNHLGTGWHLHFRDDDVPVJ EEDVVERINGELVRHPVRPQUCRHDGQRWHMHDTESGRA EDHAAVRLNKLLSAHPAHPHLALEDGRWRLHHHPAETAL PSVMAARVNDMIERYRARPYLVDDMDQPFH|HFDGDGETP DPQDVTPLRKPLLAAYRYAELPPALPLKWTVPLTDDGTA DPGAHAALNSVLDHGRLRRALSPEGP LEAAVEHVNGLLARVEVRPRLVDHGGDHDHHAPSGVPF EHERAALVNRMLADSAAYPRMTDHAGG WHLHYRDDRQSL APD LALLNGLLERAPRRLLVREKDGAARLGRRFAGEP DVRAVDLLNSLMVEYPVSPLVSGHDDDDWHLHDADNSPTA DEEAMALLNGLMLEDPMHPHLADHEPHGLHMHYAPPSSRL EEALVAEVNSLLAANRANPWLTRHPEAPWHLHFNQT PRGRADALNALLAEHSAPPRLTDHDGH WHVHYRADDVPF APARAELLNALLVEYASAPRLTDHDGDGWHLHFRDPGVAT TEASLQFVNGLLKEQDMRTVLVAEDSAYSRKSRMLFRKP | $L$ |
| :--- |
| $P D D A D R T H Q L L Q A V P H H V R L T P D S Q N G Y R W N A V P D N T D L$ | PDLAATTVNRLLRDSGARPRLDRDGGAPWQLHFHGADDSF

KGRPLSALNRLLERDDAFSRIDASSGDKPLQFETVRRWKA GDAVLAGVNRLLTEHPPQPRLSGHSG DWHIHVASPDAPP
EPSPASFL
EPSPASFL
PEDMRSLW TTSRPYi STHDGRPPHLHYA ALRELGPLNGALQRHPGCLRQVRTEGGAGGVKRTERVYA PPDVTALRKPLLAAYRAHAGLTPSLPLRWTVPLVADGTA DPADFDQVNSDLAKEHSHDELLQTGEVPQLRRVWRMEKP
 GSADAAVVNQVLQAGRAAEALCWDDASASFKVVRRRRHDD AUSDLDALNQVLALSPSHLRLSLAEQDYRLEQVSASGGW PDARAALLNDQLATAGAYPRLTNHDDEGWHLHYRDDVRSL
 EEKTVELVNALLRDTRATPWLTRHPETEWHLHLTAADAPL
 ADRRI DLVNELLAETACRPFVSRHDGLPAHLHYAGEDDTL RDAMVDAVNAVLDTTELAPHLARHDGKDWHLHASPSDAPL KAGRADAI NVLLRQAPSHPVLVWNDKTPRVELLRPADS VDTAATAVNALLREMGSVPQLDRARGGGWALHFHGREPDL LDEGAPLVDAVLEHGRVRVALTPQG PVERPEDGDPDW PAAAVRVI NDFSVRGRASAVLGPEGDREWRLSAT SA STGAAEALNRLLERGALHPRLGGGPGGPERRPRTDDPAW PDARIDLINALLADSACEPYISRHDGLPPHLHYASERTGR QEGDPAALNRVLASGSHHDELQWKKGGEPELVSRRTDLNA RDGTVALVNALLDETDARPHLARHDGWDWHLHVTPPHAPL EDGVVAVVNRLLRDGHALPQLVRHDDWGYHVHATEPSASV VDSTCAAI NELLESAASRPTLSTHDGHKPHLHFAADGDDV PDARAALLNAQMAAVTAYPRLTNHNGEGWHLHYRDENDALL PLSALAPLNGVLQRDEQHGVIVADANAPGGLAFGQRRWTN PRGTVGLVNELLAETATRPHI STHDGRPPHLHFAPAELPT KLE LRTINRMLASARRTSOI

## UniRef90_R4SSZ6

 UniRef90_A0B3M6UniRef90_S6IGV9 UniRef90_F4CMD5 UniRef90_D7C3V4 UniRef90_F8FRA6 UniRef90_UPI00036DF0EF UniRef90_S2YS83 UniRef90_UPI0003FEA3D7 UniRef90_D5UCJ0 UniRef90_UPIO00378D46F UniRef90_C3K5R6 UniRef90_ROMJM0 UniRef90_D6BA44 UniRef90_UPI0003B70B6D UniRef90_UPI0003674CB3 UniRef90_D6TDZ7

## UniRef90_D9V758

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UniRef90_D2B9M4 UniRef90_D2B9M4
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UniRef90-UPIO0036C641A UniRef90-E4NGV0 UniRef90_UPI0003ACF964 UniRef90_E5XUF9 UniRef90_B1MD14 UniRef90_A0A022LSE1 UniRef90_U5EI78 UniRef90_D3EB62 UniRef90_UPIO0037CE4E9 UniRef90_M2XNU5
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UniRef90_UPI00035FA0C3 UniRef90_G7CKG2 UniRef90_UPI00047A7701 UniRef90_G2E784 UniRef90_UPI00026270F9 UniRef90_UPI00036BFF59 UniRef90_B2UK06 UniRef90_E9V1B4 UniRef90_UPI00029AFEB9 UniRef90_B5HYM4 UniRef90_UPI00037ED479 UniRef90-UPIO00420F46F UniRef90_W2EMB8 UniRef90_UPI00037120D8 UniRef90_F2LRA7 UniRef90_UPI000364E88C UniRef90_UPI0001FFEE93
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UniRef90-UPI00028

130 L 140
150
160
A $\quad$ GVLRAYTAGGLLAHLVVCDAPDRFGVVCSREGCDTVVVDVIS
A GLLSPVLWSAIDLLGGARLVKVKRCANDACQWLFIDDS

PEEVLATVARYAVELL GGPDVPLLKECGNPECTRVYDDRS

GPAWLA
C M GLL A
S

| $V$ | $D$ | $R$ | $L$ | $G$ | $T$ |
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|  |  | $D$ | $R$ | $V$ | $R$ |

K QVMAE
A A D F A V T TV VA
$\bar{V} A R V Q A D V T A A G G L A A D F A B V$



| $L$ | $W V$ | $Q$ | $S$ | $E$ | $T$ | $V$ | $S$ | $F$ | $V$ | $E$ | $L$ | $V$ | $T$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $E$ | $D$ | $A$ | $L$ | $G$ | $V$ | $A$ | $A$ | $D$ | $A$ | $I$ | $S$ | $I$ | $I$ |
| $S$ | $G$ |  |  |  |  |  |  |  |  |  |  |  |  |  |

AERLLIETAMALIDVVIRAD

A VGWA A A MA T GLLAVVLGGSASAERRLGDCSAERCDRVVFADTS


AAGVLEPVARAVVELLTDTPLALVRQCEABDCTLMFHDRT
WRQVATLLGVGTAMHLTGRGMDRAGVCVADTCPRVYADTS




P
GQRIRINTAMGLANLVAD
HDALLAPVVEAAAHLLTE
VE



## 



 L P HF L A L A A E B E L L R S G E L D R I R E C E GP G C G WI F T D H T





 AR QLLAA ITAF GLLA WFLT QRGLHRFA RCAADDCTRTAADVT

AARLRLETAFALVDVI RADET



 V D D A L G VI A A D A I G G L A G E R D G K L


 A D RMGAE $\square A M S V V D L V R G D D L S R L R R C A G E D C D A V L V D L S$


 A
A ES LLMP V VET LAKLVVE

D E F L A P LT T E A V S Q LI C D T D F S L V K K K C E N P DCMM WF L D R T

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| UniRef90-S6IGV9 | K N |
| UniRet90-F4CMD5 | R |
| UniRef90-D7C3V4 | RGMR |
| UniRef90-F8FRA6 | RNRS |
| UniRef90-UPIOOO36DFOEF |  |
| UniRef90-S2 | RNGTRRWCSMACGN |
| UniRef90-UPIO003FEA3D7 | RSRTQRYCDDKCGN |
| UniRei90-UPI000378D46F | RNGLRAFCSARCGNNDAVQRHRE |
| UniRef90-C3K | KNKQRKWCQMSCGSREKLSR |
| UniRef90-ROMJİ | GRRKWCSMKCGNRQKVSRHQKK |
|  |  |
| UniRef90 UPIO003B7086D |  |
| UniRet90 UPI0003674CB3 |  |
| $\begin{aligned} & \text { UniRef90_D6TD } \\ & \text { UniRef90_D9V7 } \end{aligned}$ | KNRTRRWCDMTCGNRQK |
| UniRef90-UPIO0040C | KSHKRRWCSMACGNR |
| UniRef90-T5KEM7 | RNRSKRYCSTTCAN |
| 5 |  |
| UniRef90 UPIOOO346EAB0 | RNGTRRFCSTACQNRTK |
| UniRef90 ${ }^{-1}$ | RNRSRRYCSRTCGNRMHVRRRAR |
| UniRei90-UPIO00312D403 | RGGHRRWCNMTC |
|  |  |
| W |  |
| UniRet90 ${ }^{\text {do }}$ |  |
| UniRef90-Q39BA5 | KNGSRRWCSMSCG |
| UniRet90-D9UZ | RNRITRRFCSTAC |
| UniRef90-UP10003 | RGHTRRWCDMTCG |
|  |  |
|  |  |
| 2B |  |
| UniRef90_UPIO | R |
| UniRef90-UPIO0 | RNGRKRYCSDVCAN |
|  | RTGRQRYCSQRCAN |
| UniRef90 E4NGV | DRCATRA |
| UniRef90-UPIOOO3ACF964 | RAGRRRFCSEACA |
|  | RNRSRMFCDIGCGNRIUHVAAYAR |
| UniRef90 ${ }^{\text {B1MD }}$ | KNGARRWHSMTC |
| UniRef90-U5 | RNGRQRFCSPACAN |
| UniRef90 D3EB62 |  |
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|  |  |
| UniRef90 UPIO00474 |  |
| UniRef90 D6V869 | R |
| UniRef90-UPIOMO360 | RNGRRRFCSTRCSTRV |
| - | C |
| 6NKS2 |  |
|  |  |
|  | RNRSRRWCSSSCGNRARVKRHYDK |
|  | K |
| SiRef90- UPIOOO36EA1D6 | R |
| UniRef90-UPI00036A2F96 | RNRTKRYCDDKCGN |
| UniRef90-K0ER | R |
|  |  |
|  | R |
| UniRet90_V61 | RNRVRRWCDDACGNLIMKVRFRER |
| UniRet90 UPIood | R |
| UniRef90-UPIO0035FAOC3 | tNatrafcsarca |
| UniRef90 G7CK | RNRSRRFCDTGCGNR |
| iRet90 | RNGRQRYCSPRCA |
| UniRef90-G2E784 |  |
|  | R |
| UniRef90-UP100036BFF59 | R |
| Re990-B2U |  |
| UniRei90-UPIO0029AFEB9 | KNA |
| UniRef90-85HYM4 | RNGTRRWCSMTCGN |
| UniRef90-UPI00037 |  |
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| UniRef90-UPIO0037120D8 | RNGKRRFCSTRCATRVHVADHRDR |
|  |  |
|  |  |
|  |  |
|  | RNGSRRFCDSSCA RNGRRKFCSRCA |
| UniRee90-A0, | R |
|  |  |
|  |  |
| UniRef90-C6W9W2 | RGHARRWCSMACGNRAKVAAHRAR |
| UniRef90-B4EDM0 |  |
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MVFTDDTEDADRA VLDFLNTVALSEGKPRD
MNDD D V
DSGARALDFAYTGGMGDNPAW
DPRP
$\stackrel{P}{p}$
PVVSGHLSLLDLVNTEVV
MRYEDYDGNLARLAVELVNADEPSELS
MHLLPYGEDPVNLAADLANRRP
PAPADESLDFLNTRWY LTHK पNKEDLTDPILF MHLNPYGEYAVRLAQSL


VGDNLALDFI NTGVGAAHCECLDDDSSVVNWL
 HFNPYGGTAAQLAAALVNVAPD MDFTDDTVAADEFMAALADTVAEASESGGEDELVTTAQLD MQHSPADFVADALGLDFLNSAPATPVDVPDDWLDDGEGL
 TGTLSEROD
MHLINPYGEYAVLLARSLA ADEPVLDFLNTVALVD MDFSPYGGVGARLAAELAN

MHLINPYGYAVLLAASLAN DWPEDRAG\|VDRT DPRPGVGGARVLDFINTGTNGRRPGTAEERLTSFQFF DPRPLTGEPLAIDLLNTRWDDTEG FHDLLEDVQGL MQFNPYGGAAAELAARLVN

ADYPDFRLEADYUNHDRRMRGDPGVELLKGVNDL MVFAD MVFARDTEANLLAAAELVNTALRRDG HDALTTPAEL PDFRLGSVLATSF TGTLSERCGDPDERTPTPQRF
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UniRef90-A9ALL2
UniRef90_UPIO002629FCF UniRef90-UPIO003A79B71 UniRef90 ${ }^{-}$W8HH36 UniRef90-UP10004728A05 UniRef90-UPIO0037FFB76 UniRef90-B2JX14
UniRef90-Kок3Ү6
UniRef90_UPIOO03B69941 UniRef90_UPIO003674B3D UniRef90-UPIO00479CE05 UniRef90-A7IDW2 UniRef90- F7QLF4 UniRef90-HOQWC7 UniRef90-K9ARA8 UniRef90_Z9.JQ79 UniRef90-E8V515 UniRef90-W5WHU4 UniRef90-A0A023C7Q4 UniRef90_UP100037E63F8 UniRef90_UPIooo3B4B59E UniRef90-DgVog9 UniRef90-A0A014PA00 UniRef90-E1VTV6 UniRef90_UPIo0036C54C8 UniRef90 W4POU7 UniRef90-UPIOOO307102B UniRef90-KoV2X1 UniRef90-UPI00035F44A4 UniRef90-UPIO00465DB6D UniRef90-W4B3J8 UniRef90_UPIO003465EA3 UniRef90-F8A096 UniRef90-WoPFM8 UniRef90-UPI000380D220 UniRef90_UPIOOO3714166 UniRef90-W7S6W3 UniRef90-F5SX11 UniRef90-UPI0002EFB33B UniRef90-UPI0002556EEA UniRef90-UPIOOO3C75832 UniRef90-D6U2W8
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GRWLGEHGLLSGPADAPAPAAVREPLTAARAALLRAADDGD STWLAQAGFGPASLPSAKGGVLLSKLRTLREAVEVLVHAR
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VAV
A QWLADNDLDLPADEP
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ERWLEKAGYGAGGGEARDLAEARRLREAVRALVEORKA PAFLKRWNLTDPSPGEEERAGLIALRSLLRAMVGAADAPL KRFLEVFPYTGRVDRNAELDDLRSLRPRLRAMLLA LHWLMQAGLYFGDDNARFAAGLLHEARHLRDVERSVQRA AA WLERFEASDGTVTERDLIDATGLRKAIASUATALLSVNE NAWYVESGIAVSAGREADVEQAKTVREAIYQLVTALGEGY HVIKEENSFWDDQLAGQVLLCILEMRAVLRDHFELIADGQ GVWLHSAGRADRAVAEATRGALRETREVLRALVDGEAGRD ARSRLPDGLDTIVTEDELERVRTLRDAVFPLLAADRAHGR DHWVETMRRTGSLVSPEALRTLRSVRDFLRGNFEEDADGG AELFAEHGVT RPSEADLAPLLA ELRPAITAVVTG
 FAWCRDQAGVPACVEPAWLAHALALREALYRLFLAQAEQR VDRTREHGMSMPF PAQPGDHARCRDVDQWLLIVNAPS
 AQLLPEDFEPAPPGLLKLALLALRASAKSL LQAARLEGD ACWLTTNELRCR LRWLSQAGMVPPRSTPEQLDAI AA QARGLREWFRGYVKAR VAMLREQRYPVGTLDAFQARQLTAWARRLEPVFAGTV TGLVDAWRYSGRRDGDDGAAELAEVRAARTRLRAVWADP AGW GGY RMDAGGGGMAPLRQTRAALRSAL LILEQARMVPAEALIPGELDKVADQARHLREWFRGFVQER A A AGLKVGSGLLKGAADANLADVHALRAALQRLFDDLETGS ARWLIRMGWQEGADAAAQTRGLLKSARALREAVRVMVSTR
RELGMTVDF RELGMTVDF
LAEGMSMPFPERAGDHA
L DAVVDAH YPAHELTHAEVWQLARWAQRLREVFTG RAWLLDRDLPGAVLQEYCRGRIVALRENLRDLFTAHIGGP VGAMMVEPQVGEEVPPDDLDGAAEHARMLREDFRRVTGLL SRWUSQAELDPGPMDTRGLERVRRLREAIYTLVRSWPPGD
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RSWLLEYGFDLDSVTEVDLTLARELRSSLRAADPYNPHDP VDWLAVSGLAVDSCTTAQLDLARELRESVHAAATAAAHAL DAFYVRWGYSVRHDGDD AELAEVRAARTRLQRDWGVD DD WLAEYGLNVETCTTDQYNRARELREATHAAATAAANGE AT WASLAGYEGGAPSVAALEGARTLREAI WRSLGAAMEGR DAWFLEAGLMDRRATTADLEVAVELREAVYRVVHARMMGA REA YDEPWWADRVRDEDLAALRPVADGLRRVLAAGVAAD VYWLTVAGIKLRSYQSFKQGELLETARELREVIAKLVKAD
RELAGFQSHIVRRVTES DLARLRAVRARLAVFAAASEGD RELAGFQSHIVRRVTESDLARLRAVRARLRAVFAAASEGD ha wVás RLAPGAVGEADLDAVRRLRDALHGLAAARAHTK
 ARWLGRCGMDAGEAGDQALRDARELRSLARELVERRKEGE AVWLSALGDLTSEADDVTRERLLLARTALDGLIATLPDFD RAALLDEPWWADRLHEHDLDVLREVAAGIRRALDAMVAGD

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A A WVA H H
A WAASRLSPTPIRQVEVEAARTFRD
RDFYVEWAWTGRFDGDAELEQVRALRPRLRAVWAAATRDE LD WLALNGLAVKSCTNAQLELAWELREAIHAAASASASGD VA WAERSRLTPPAVSAVEVAALRMLRDALFHVVIIAHTRGE DDHPAAQGSGPRHLTRADLAEVRALRETVRAVLERANT D
RDWLVRTGGYGEGELPPAMPGLLTSARRLRETVRALVVDR EQSRLAPTPPALLRTDDEVAYARRLRDALRTVVSRAVGGA AESRLAPGLRLA VDEGSPEAVRYVRDALWRAAGARAHER LGWLHQARLVPDRAIPGELDRLAAQARALREWFRSFVRPD DAWYRESSIIAGPPAGPADLVDAVALREA:YAGVAARDEER $L R W L D Q A G M V P P R A T P A E L D E V A A K A R E L R E W F R H A L A S S$
$Q A V A T E A E L V R S T L G A R E L A B A S D L D D R A M F R E N V P V A$

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## R

## UniRef90_UPIO0037317ED niRef90 H8L310

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UniRef90-UPIO002629FCF UniRef90-UPI0003A79B71 UniRef90 ${ }^{-}$W8HH36 UniRef90-UPIO004728A05 UniRef90-UPIO0037FFB76 UniRef90-B2JX14
UniRef90-K0К3Ү6 UniRef90-UPIO003B69941 UniRef90_UPIO003674B3D UniRef90-UPIOOO479CE05 UniRef90_A7IDW2 UniRef90- F7QLF4 UniRef90-HOQWC7 UniRef90-K9ARA8 UniRef90_Z9JQ79 UniRef90-E8V515 UniRef90-W5WHU4 UniRef90 A0A023C7Q4 UniRef90 UPIIOOO37E63F8 UniRef90_UPIO003B4B59E UniRef90-D9V0G9 UniRef90-A0A014PA00 UniRef90-E1VTV6 UniRee90-UPI00036C54C8 UniRef90 W4POU7 UniRef90-UPIOOO307102B UniRef90-KoV2X1 UniRef90-UPIO0035F44A4 UniRef90-UPIO00465DB6D UniRef90_W4B3J8 UniRef90-UPIOOO3465EA3 UniRe990_8A096 UniRet90-WOPFM8 UniRef90_UPIOOO380D220 UniRef90-UPIO003714166 UniRef90-W7S6W3
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 EPARVAVLNALLTRYAGPPTVTDHDGSGWHLHYRPDGAGL KGDSADDLNAVLTRGRDRRALTPDGP ABDPEVAN RDDAALLVNELLAEAGAVPRLVRHAGEDWHVHAVPDDAP LD


 DATALTVVNKAARRPAAVPQLTPAGRWT
 AARELNLILERGALRYRL GAAGP PAADLDVVNAAAAGPPLVPRIEPDGTRAWEARGTTDDPAW GSSVPVPBGAT GADDVVNELLAKYPPQLHDSDHDGGTAHLHHAYNGDDG
 E PQAEDLVGAFLLAEASPRVALARVDG RYAWRISPPGATL AEARAALLNEQMAVVTAYPRLTDHDGEGWHLHYRDDDDDL EADALDLVNSTARTPSAVPQLTPEG
EEADVDGANQLLRVARTVPFLGRHDGWTWHDE TARTEAG VDVDVVNQILEAGRSARELEWDSASKTFKLVAHRRHDD TD V A DL NDVLAHGRDRRTLTPAGPAD KGRALAALNQLLARDVQHREIVAGGPGDAGVFLLRAT DRVAHLNALLAETAARPYI STHDDRPPHLHFAPETETT RDELADAVNGILAEANALPRLVRHDGADWHIHATSHDAPD AGDPAPLNDVLSHGRDAPYLTTEGGPPEERVVDDEPEW D L R A L EPLNRLLERDEQFSRITGDPGHAAGLEFRTRRWRS KNGDPGPLNDFLVASPSHSELICEDAGLLLERKRVVKSP PQERARDLNAHMASTSAYPRLTDHDDEGWHLHYRDDDAS L
K
A

## A




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## P


 PGTAVQVI NDRSAQGRAAAVLTPEGRRHWQLGG SASR R DEA A GLVNA L L R E A D AVP F L T R H DA LD WH L HATAP GA P L

 $R$ VAVQRETNALLAAHPLRPQLSSGHGENWHVHVADPGQSP
 ALSDLATLNRLLDRDDKFSQUAASSHSPAQLELQSHRRRT PLRAVAVVNEAAAGPPVAERMTAEGGRAW MASHIDDVFNRLASDAPLTVLLHADG VA EA QA QL NELLARGRLVRRLGAAGP
 EPTDFAVVNR ILLEA GRPVRTLLAQGDGDNVVLWKRRRDDS

 PPAPLATLNEAAAHPPLTPAI TPDGRRRW ATPAT A EATVA LVVNDLLRT GEALP QLVDHDDYGWHIHAT GADAP F PASAVKVINARSVESKAAATLSSEGRRQWWLGPAAR P PGDLAAVINETAARPALAPAIAPDGSRRW A GAPS AVEAAALI NDGLRRSRADPVL R HEDDRWWTEVTSDADRR $K G G G A S P L N D L L A K S P G H S E L V C D E P G L R L T R R R T L K T P$








 GASAERALNEVLARGRLRPELR


UniRef90 UPI00037317ED UniRef90 H8L3I0 UniRef90_A0A022MJR0 UniRef90_W8AIA9 UniRef90 F6FQI1 UniRef90_UPI000381843C UniRef90_U5QMM0 UniRef90_UPI00031D5EDE UniRef90_WOI2T0 UniRef90_A4AFI2 UniRef90_UPI000262D318 UniRef90_UPI00037478DE UniRef90_UPI00026290F5 UniRef90_UPI000262ED76 UniRef90_D5WRT2 UniRef90_UPI00035C3F4B UniRef90_UPI00035EC16C UniRef90_19M7Z1
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UniRef90_UPI0002629FCF UniRef90_UPI0003A79B71 UniRef90-W8HH36 UniRef90_UPI0004728A05 UniRef90_UPI00037FFB76 UniRef90_B2JX14
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UniRef90_UPI00035E1348 UniRef90_UPI000373DC70 UniRef90_UPI00046455EB UniRef90_C9ZAS5 UniRef90_UPI00037DE56B UniRef90-A0A023NS20 UniRef90-W7SG65 UniRef90_G8NNI5 UniRef90_W6XCG5 UniRef90_Q5LXG8 UniRef90_L7ETB4 UniRef90_UPI00035F89AC UniRef90_W8H8N1 UniRef90_UPI00038116C2 UniRef90_UPI000378A0CB UniRef90_UPIO00248CB4C UniRef90_L8EWD0 UniRef90_D1CGF6 UniRef90_R4SV90 UniRef90_UPIO0047BECE3
UniRef90_UPI0002F13D3E

LPA W VAAA DLVVR|L|F EEHPER|V|RGCANPECVLWFYDTS A GRQQLA RLLA YSAAELLAAEGDFRLVRQCESPDCSLMMYDR T

 R A R L A P LA E Q A A E L L V E G D F T L V R RCE H P D C I L WF Y D R T Q WV LS E IA L S F A EVLVVD P QR R R L K V C E NH D C R WV F Y D R S A ERVVLVETAMALIIDVI RTDEGSRLTVGADETCRSIAADDLS



 AD AL A S LVAF DALDRLLA A GD L Q TVLHRCANPDCVLLEI DAS VSWI ARSSAAALAHI ACQDPGVII GGCQADGCPKFFVD Q S
 A ALL LSPVLWSATDLLGGLDRLAKVKRCANDACQWLFVD DS $P V V L R S V I A D V G T A D H L T T R G I T R L G R C G S T P C R R V I V D T S$
 A D DL AVVVI GTGGL GTVVA S L GPNRFRSCCESPS CNGI FV D T S A A SLLEPVA QALVSLLTDSQLGLVKECEAHDCTLLFHDL
 $L V R V R A F T A A G L A H V V C E \quad E P D R L G R C G R E G C G T V Y V D T S$


 P DVLFA VI SVVGTALDHL STRGMHRLRRRCAADPCTNVVADVT

 TAMLMGR\ADEATQLLVSDALSSLRCCSSTDCDWVFLDDS

 VA TAFA VLAA D A V D L A T | $V$ | $D$ | $E$ | $V$ | $L$ | $G$ | $A$ | $V$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $R$ | $D$ | $A$ | $V$ | $D$ | $L$ | $L$ |  |
| $P$ | $V$ | $L$ | $R$ | $S$ | $V$ | $C$ | $C$ | $G T$ | $P H V L E A V I \quad S V G T A L D H L T$

 TEQ
 QPAWAA DERVKA Y T A A GJLAT L L F C A LA R L L I L V V F R L R R N ATVVVLVVETAMGVADVV VDDALGVIAA A AIISILAGERDGKLALCAS $V$ D ALLL S GVVA DA L L RLL QPEARAR L R R C IA E GLS QIA R QTVEIVGGGAEGDVLRECGRPGCCQMYFFDTS ATEVAAAAAWGVAQGIVGYGLERWGRCAAEDCGKYFLDTS

 V A GlLLMS T V
 PRQALGQVAESVAQLLATGQFEYVRQCEHPDCVLWFYDRT A A S LL L E P V A A A L V QL L T Q G E L A Q V R Q C EA H D CTLL R F LDD V T GPAWAA ATEVAA AAAWGLAQGVVDHGTARWGRCGASGCGTYG DTS A K A L V S L I A LDDALLT L F D S D Q L S Y
 GTQLLSTVARDAVDLLTGPLADRIRTCAAADCHLIVVDTS



 GT QLL L S TVVAR DAVDLL T GP Y A Q R I

 A E EVVLA P L A A A A A A E F L L T T A N F E L L V R R A E
 A A Q AL S TV A R T AVA LGGPDADLLKACHPRCVRYF LKEH PGNALLS LL A R D A I A L L G G S P A M A K V K E C C S N P D C T R L
 A DRIISA I CAFT L G GVLVEYGRGRLKMCASPPCEELYVDQS A G I L R A V A S VG TA L H L T G L G M H R L G R C A L A E C P N A Y A D F T YEAL GHMLDA DYAAML E GTWQRMKVCRDEGCQWAFYDHS R P A WLA A YGYLSLLRT
TPA W A A

|  |  |
| :---: | :---: |
| UniRef90_UPI00037317ED |  |
| UniRef90-H8L310 |  |
| A |  |
|  |  |
|  |  |
|  | KSHKRRWCSMACGNRHKVAEFRRR |
| U54 | K |
| UniRef90 ${ }^{-}$W012T0 |  |
| UniRef90-A4A | RSNNRRWCSMRCGNRAKVRSHRAR |
| UniRef90-UP100026223 | RGMRRQW |
| Ref90-UPI00037478DE |  |
|  |  |
| UniRet90_UP1000262ED76 | R |
| UniRet90-D5WRT2 | RFCGNTCA |
|  |  |
| UniRef90-19M7Z1 | KSRTKRWCDDKCASLMKVRKFRAK |
| UniRef90-A9 | KNGSRRW |
| UniRef90 |  |
| UniRee90-UP10003A79B71 |  |
| Un | RAGRRRFCMPVCGNRVNVANFRAR |
| UniRei90-UP0004728A05 |  |
| UniRef90-UP1000 | RGHARRWCSMACGNRAKVAAHRAR |
| UniRef90-K0k | RNGRRR |
| UniRef90 |  |
| UP100 | RGRRWCSMACGN |
| UniRef90-UP1000479CE05 | RGHTRRWCSMACGN |
| UniRef90-F70 | KSHRRRWCSMACGN |
| UniRef90 H0QWC7 |  |
| Uni |  |
| Z9JQ |  |
| 8V5 | KSHQRRWCSMTCGNRHKVAAFRQR |
|  | RNGLLRRFCTTRCANRVYVAAYRAR |
| Uni | KNKQRK |
|  |  |
| UP100 | KNater |
|  | PRRTRQ |
| UniRef90 ${ }^{- \text {E1VTV6 }}$ |  |
|  |  |
| UniRef90-W4P0 | KAHRRRWCNMACG |
| UniRef90-UP1000 |  |
| UniRet9o-Kov2x |  |
|  | KNGNRRWCSMACGNRAKASRHYAR |
| UP1000 N4B3 | GK |
| UniRef90-UPIO003465EA3 | RSRTRK |
|  |  |
| UniRef90-W0PFM8 |  |
| P100 |  |
| UP100 |  |
| W7 |  |
|  |  |
| Un | R ${ }^{\text {WhCsms }}$ |
|  | RRWCSMA |
| UniRef90-D6 |  |
|  |  |
| UniRef90_K9D500 |  |
| UniRef90_A0A031GGZ3 |  |
| UniRef90-IOV876 | KSGRRRWCSMSCGNRAKAQRHYQR |
| UniRef90-UPI000300564C | TNQAKKWCSMKCGNREKVTRYQQ |
| UniRef90-UPI0003660601 | DDHRRD |
| ef90_- 5 |  |
| Ref90 D1ADN2 |  |
| 900-K1 |  |
| UniRef90 E3HER5 | QSRTRRWCDMTCGNRQKKARFQA |
| UniRe90_-UPIC | RNGSKQYCTRTCAHRASVAAYRS |
| UniRef90-UPI00046455EB |  |
| UniRet90_C9zAS5 |  |
| Ref90_UPI00037D | RPGRRRWCAMGCGNRSKVR |
|  |  |
|  |  |
| UniRef90 G81 | RRRWC |
| UniRei90 O5LC | GHARRWC |
| UniRef90 L 7 L | W |
| UniRef90-UPI00035F89AC | RREWCAM |
| iRef90 ${ }^{\text {W }}$ - 888 N 1 |  |
|  |  |
| UniRef90 UP1000378A0CB |  |
| Ref90 UPIO00248CB4C |  |
| UniRef9 | KNRSGTWCTMVCGSRNKARNYRSR |
| Un | R |
| UniRef90_UPI00047BECE3 |  |
|  |  |

UniRef90 G8XE78
UniRef90-UP10002DB5D2C UniRef90-UP100047B93B2 UniRef90-U2YQR2 UniRef90-D1C8K5
 UniRef90-B1W576
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UniRef90-UPI00037B789B UniRef90 - ${ }^{-15 G W H 2}$ UniRef90_UPI000287ED84 UniRef90_E9UZ27 UniRef90_UPI0003681A7A UniRef90-10KGU7 UniRef90- FJH 2929 UniRef90- L7FBA3 UniRef90-D6TC48 UniRef90-UPIOOO35CCD08 UniRef90 W8AJE6 UniRef90-H6R3X3 UniRef90-D6TUX8 UniRef90_11D3P3
UniRef90-UP10002D6DFC9 UniRef90-M3JIA9 UniRef90 ${ }^{-}$K4RB47 UniRef90-UPIO0036338A7 UniRef90-IOG2H7 UniRef90-B2TAG0 UniRef90_JoV1L1 UniRef90-S5VG47 UniRef90_UPIo0037386D1 UniRef90-UPI0002DF65E4 UniRef90-W5TSC4 UniRef90-R1FXQ0 UniRef90 ${ }^{-1}$ 5A0M8 UniRef90-UPIO002D5A317 UniRef90-F5LEE 6 UniRef90-K0F4Y9 UniRef90 L1KY10 UniRef90-T5KNM7 UniRef90-X5M4C6 UniRef90-B5HDB6 UniRef90-UPIO002885CE2 UniRef90-UPIO00474C5B4 UniRef90-UPI0003F866BB UniRef90- UPI000478DDEB UniRef90-D7AVM1 UniRef90-A0A014M7N4 UniRef90-U1MT99 UniRef90-R4SN34 UniRef90_UPIOOO29B0320 UniRef90-UPIO0029B0E31 UniRef90_V9VY36 UniRef90-M3E7N7 UniRef90-K0F462 UniRef90'W5W370 UniRef90_UPIO004134455 UniRef90-UP10003B442BC UniRef90-Q1RR78 UniRef90 V6K717 UniRef90-UPIO0036D3AA9 UniRef90-KOUX44 UniRef90-G8S013 UniRef90 UPI00045E9EE3 UniRef90-UP100039AD4B6 UniRef90-NOD1V4 UniRef90-U5E784 UniRef90_H6RMD8 UniRef90_UPIO0035FA1C5

GGRTSVDFTATLGMRGLADEC ERDRAPADLL LTTDDAQVLAWL
 TGTLSERFGDSVERMPVPRRLD VGDALGLDFLNS DATPLDTPVDWUKDGEGL DPRPHVGEPLALDLLNTRWMSPEGMPRLLADTAGL
 PLDFVGTLR ARRNAAPMEKCAPAEFA DPGALCLDFM LSGGPGPDSHWEALYSTDDL DPRPLLGEPLALDLLNTTW MSAGELRDLLADVDGL MNLDHVFVCGNPALEDFATLRA RASLRFEMFATPSRL

DPGALCLELLLTGGPGPRWESLYTSADLVRWA MHLDPYGEYAVLMAGSLA

LPLDFVGTLR ARRNEAPTEKLATPALL ACLDFVNTERPVERLDTYADLLVLIERL

DPRPLLGEPAVVAALVNTQYGQGRRAHRE GVQDLLSGSRGL
 GDALALAFRNSVGATPDD

VALNLVATVAASKDRAKGTDPEAPRAELL DPRPHLGEPLALDLLNTRW MRDGALQDLLTDTAGL


MH पNPYGEYAVLLAGS DA
DDWPADREGGVSRT
HHTPAMF AGDAPGLDEFLRTLRYRGTPAETEELPDERAW LSLNLVNTE ENRRGKRHD ms पs Vhtrs ILTLTTQLVNSDHDGE LL
HWDGYDSTGGSVPLDFMNSQWYDWRGGRSEDRLDRPGWL NVYRFDPGALCLELVVTGGPGALARFEVLSTPDRL MHDNPYGEYAVLLAASLAN DWPETRAGIEERTLE DPRPHVGEPLABDLLNTRW MSADGPQDLLADVEGL

DSGRVCLDLVATARETDRRADGPEPLAGTGQLL
 NFADYSR GAAVATDLVNTSP\|VRAAG DAVADPAAL HSVRATARRTAALVNALTA LEFAADLCNRRRDE YRFDPGSLSLELMLTGGPGERYETAHTPSALADWF


VSGRASLDLVNTVRNGTRYDLLTKSEDVINWWV DPRPLGEPLALDLNTRWDDGRHDLDDSLDTALWL DPRPLTGEPLALDLLNTRWN REGGVTQDLLVDTGGL
TARPLTGEPLALDVNTEWVD HGRTVDLFDEPGGL
PFLGSRLWLDLVNSAPAAARHEVGDFLATEDGW
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UniRef90
B2TAG0 UniRef90-JoV1L1 UniRef90-S5VG47 UniRef90-UPIO0037386D1 UniRef90-UPI0002DF65E4 UniRef90 W5TSC4 UniRef90 R1FXQ0 UniRef90 ${ }^{-}$5AOM8 UniRef90_UPIOOO2D5A317 UniRef90-F5LEE66 UniRef90-KOF4Y9 UniRef90-1KY1 UniRef90-×5M4C6 UniRef90-B5HDB6 UniRet90_UPIO002885CE2 UniRef90-UPIOOO474C5B4 UniRef90-UP1000478DDEB UniRet90-D7AVM1 UniRef90-A0A014M7N4 UniRef90_U1MT99 UniRef90-R4SN34 UniRef90-UPI00029B0320 UniRef90-UPIooo29BOE31 UniRef90_V9VY36 UniRef90-M3E7N7
UniRef90 K0F462 UniRef90_W5W370 UniRef90-UP10004134455 UniRef90-UP10003B442BC UniRef90-Q1RR78 UniRet90_V6K717 UniRef90-UP100036D3AA9 UniRef90-KOUX44 UniRef90-G8S013 UniRef90-UPIO0045E9EE3 UniRef90-UP100039AD4B6 UniRef90_NoD1V4 UniRef90-U5E784 UniRef90_H6RMD8
UniRef90_UPI00035FA1C5

A A AlLDVP AADRHILLGHEQSRQLADTAARLRVVFEAVQAGR DAFYERWRYSVRHDGDA A EVVAAVRETRDRLARLWSVD
 VA WAERVVGLVRPAEAEAVLTRARVLREAIVGIFSHVSAGK QQ IG V G S AT DV A G G D G HLLLA RLLRKL R D S I E GLLAAARRENR GVWLSSS P P V PVVPAADRA TLLDRLLLAARTALDAALAASTAAGEG

 HAVPETAQGVAAPLDEHGFSALKELRVLLRQGFERDADGN
 $L A B G D$
PSAPD S R WCR EA G L S D GPVTPPRALA QARE LREALHRAFSAPS AP D


 FE WV E E H D QWA P LDA T E P L L D A V K S F R E S L F S L F F S S V S Q G H
 T D WL R HESLLPASASAE DLESAVRLQESLRKAIAANHNGA
 D DWFVVESGMTP P GADEA DLLDTAVAAREVVI YEVVMAALLAGE


 GESRLP DGLLAPVVVTEPEVA DARRLRDALHRI TSARVHGR





 DAFFVKHRYTGAHRTAAELAAVRAQRAPLRRLLTA
$R \square W L A S A G L A D R A D A D A A L E A V R A A R A A I V D T V R H G R R$




 DEWLLR GAPKPP QRATEDEDA QMRELVRRADYGVVQAVRAGH
 LR WLLEQAELVPARALPGELDTVAEQARRLREWFRDFVRAB


 DEWLVVAGLLDRAPGATDFTAAVALREAVYRLAVAALTGE
 LD WL E QA GLVRRERVTPGELDAVAARARQLREWFRGFVDAR Y S WL E H MF SVVP DPFTQESMS DLKELRSLL RKGFENDADGQ RTFA 1 D HSFSPPR $\quad$ G DT D $\square D H L H D L R G R L R A T L A D A P D D P$ EAF LEKWELQAVDPQPPHERAALGELRQAMRAITECACTNS S E WVVLVGAT T ERLAEAVLQAVHDFREALYQVL
 LGMTQTFPPAADDHE

K V R A VI D D WLAAI VD QP D RCWLLANGLADREANEKSRTTLVSAREAILQALQ A RWLVGAGLVPAGVDGAWVARFVELRDCI DRLVRGPGEGR A EVLVR Y GEAEPDLSPGDI E GMREAADRLREVVAA G S
 GAFLAAHDI QRDTNGT ELALLMHALRDEVRAVLEA DT


 $E E S R L P D G L G P G A V S A A E V A D A R A L D R D A L W R I A Q S R V R E E$ AVWLGSPPVRRARADRDTLDRLLQARSALDEVVADVLRPT

 A I WL S S A GLTDDRAQA DAATLAATLAARAIVYVVQHATH RALLRKHGDTGPELTEFGADRLRQAASELVALLGBD NTLLE EN LLLTK KI S DQVLP LLREDRSFLRKGYESLADGE
 $N T P L V R D A L G G A R V G R D T Q E R L R Q A R A A L D E A V A D P A H P T$ AVWLASNGLAGAHPADAE ALDRLREAREALAAAVHGS RHYGLLDG DHQAAEGDLTRARALRAGLRQAMAHHHDG RRWSAHDMPMHCRAMRKDLE QVCEFLLELWTAVVDA R G G T LA WLH E Q H LT GNHTMDVAAP L R Q A R S A L R Q A L E QP DE H




## UniRef90 G8XE78 UniRef90-UP10002DB5D2C UniRef90_UPIo0047B93B2 UniRef90_U2YQR2 UniRef90_D1C8K5 UniRef90_J3DWR4 UniRef90_B1W576 UniRef90-C7QJP2

 UniRef90-D4GE77 UniRef90_UPIOOO3636879 UniRef90-UPIO0037E9A11 UniRef90- D2PSH4 UniRef90_UPI0003714E6C UniRef90-UPIOOO382E31B UniRef90-A3TI96 UniRef90_V6JKH0 UniRef90-W9FNR4 UniRef90 W4BV70 UniRef90-UPI0004098B7F UniRef90-S6VDL5 UniRef90 ${ }^{-}$W9AS75 UniRef90-UPIO00360BBBA UniRet90-Q5YSZ6UniRef90-XONEQ3
UniRef90-D9US49 UniRef90-UPIIOOO349ED77 UniRef90-V5XED1
UniRef90-UPIO0037B789B UniRef90' B 5 GWH 2
UniRet90_UPIO00287ED84 UniRef90-E9UZ27


 $P$ VPSA DLL NLAVTA ALSRARVVARPDGFAWGWAAGPDD
 PAA A A DALNEVVLSSHGRVRRTVGPDGAPASTVVVDDDPSWAP PPEAVH QLLHDYPPEMHLSDHDGGTWHIHFSRNGTPA SA D LTV VLNRLYK DGRPTKRLA WDD DA QRYQ』AVSHEE ES

 VA A S A G E L L N E L L L R V T R A A P R L T T Q Y E G A P WH L L H F A G P E V S M PA D L D T S N WS A R S L P G P R L T L G P K S R P A L A R R P Q L R L
 D E R C V VRVVNALLAAD GA G S V Y
 S LT DI E KL N GVMEAGHVRRTLTTDD QELKLQLVAVEAHW K G R P L A A L N RLLER R A RI A P I L A D K D L P G P L QL L T T R K WRT
 PPHARKVI NAAAEHAQLTVELDEDGGWSLTPHATG
 P ERRAAALLNALLTDASEHPRLTEHADGGWHDHYRPD GLGL PPAGVDAINRHAAGLPVKVQLGPDG EAGDLEVVNRAAARPPLIPRMTPHAEGRDAVHAA IDD D
 RPAALAAVNGAARGTPATPQLTDTGRWT PAADMAVVNEAAALPPPVPCLTPEGERGW VPGAS
 P $D$ R A RLL NELLMA QATAYPRLTD HD DEGWHIHFRDDT D S L $V G Q V A S Q F N K A D Q D A L T A R G F I P N D G Q T L G W \square Q P V P D D K$ $P L K R G A L L N H V L S R D E E F G Q V V V T T V S K G G K Q G R S E L A W L$ $P$ PTAVDVVNEI AALPGPDPHLAGG TTPPPQLAA






 APARVETINAFAREMPPPPQLSSTGDKKRLGSPDRH
 DLRELLA PL N QLL ERRDRYGEVVAAAT GEVPPFEFRANRRW


 PDTDRELVNRTARGSKPVLGLRPDGG $\quad \square D R G G D$

K G R P L T P L N R L L E R D E S F S S Q V V R D H D GAVV L E L T S S R H WR T

A
DPADLRVINEAAARPPLAPALREDGTTGGWAAGAAT
 A D D A L E ILLNARAQNAPPG IAAAVKDGKGTLVRALCAP PRE
 KGRP LAALNQLLAQDHQHGEIVASDGATRFELRASRRWQS








 $P R E A A Q L V D A V L A H G R I R A R L T A D G \quad P A E E P E F A D P S W$ VA A PLP DL DRLAA ALP L RVS F G GPRPA LAA PGGDG ETKRVLVLNE KLLTMRATSPSITNHDGSGWHLHYRDADAGF
KPADLDLVNALLAAGAPQPHLAWRGGALVVEEHPPESAGP





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UniRef90-UL10002D6DFC9 UniRef90-M3JIA9 UniRef90-K4RB47 UniRef90-UPIOOO36338A7 UniRef90_10G2H7
UniRef90
B2TAG0 UniRef90-JoV1L1 UniRef90-S5VG47 UniRef90-UPIO0037386D1 UniRef90-UPIO002DF65E4 UniRef90 W5TSC4 UniRef90 R1FXQ0 UniRef90 ${ }^{-}$5AOM8 UniRef90-UPIo002D5A317 UniRef90-F5LEE66 UniRef90-L1KY10 UniRef90-T5KNM7 UniRef90-×5M4C6 UniRet90_B5HDB6 UniRet90-UPIIO002885CE2 UniRef90-UPIOOO474C5B4 UniRef90_UPIOOO3F866BB
UniRef90-UP1000478DDEB UniRef90-D7AVM1 UniRef90-A0A014M7N4 UniRef90_U1MT99 UniRef90-R4SN34 UniRef90-UPIO0029B0320 UniRef90_UPIOOO29BOE31 UniRef90_V9VY36 UniRet90_M3E7N7 UniRef90-KOF462 UniRef90-W5W370 UniRef90 UPIOOO4134455 UniRef9O-UPIOOO3B442BC UniRef90-Q1RR78 UniRef90-V6K717 UniRef90-UP100036D3AA9 UniRef90-KOUX44 UniRef90-G8S013 UniRef90 UPIOOO45E9EE3 UniRef9-UP100039AD4B6 UniRef90_NoD1V4 UniRet90_U5E784 UniRef90_H6RMD8
 ATVILVESAMAVVDVVRSDEQSRLRTCEAEDCDAVLVDLS
 $P Q V L R A V I A V G T A L H V T T R G M G R L S R C A A D P C R N V V V D V T$
$L D R L W P V A R A A E L L T S D A L S R V R E C A G D H C G W L F L D T S ~$ ASQCLSRLAYAAAELLAEGDFNLVRKCESPDCSLMFYDRT
 $\square A D L D W V V N A L V E L V V S D S F T Y V R Q C E A H D C I L L F H D D S$ GERVATSCVVALLTAI ADGGAGRLRICEGADCANVFVDAS EAALQSLIAYDTLQLLASGELMTLHRCANPDCVLLFLDTMT ATSWLAEFATAVAMLVGSDDLELLRRCGAERCDNLFLDAT
 GDGWAAGCAAALALAVGSERAGRLGVCSAPECDRVYVDBS QSRVRAVTAGSLAVFTLEAEGERLGVCALDTCRTAFVDTS
 PEALLLPLGEALARFVCSEDFSHVKACEGPACTLLEVDHT
 ПAAALGSVVSEVVRAMATKEWSRLKVCVNDTCQQAFYDHS PAWLPAWLAAANLLDLLAAAPDRIRQCAHEECVLFFYDTS AGVVRAVVSVGTALHLTGRGMDRLGRCALLECGRAYGDFT VSQGLSALARETVEIVGGADGALLRECARPECTQVYLDRS AAQVTSHIARNAIDLLTGPWAERIRECEAGDCMLVFVDMS AEWLSAWLAADDLLRMLTRAPDRIKQCAHENCVLWFHDTS PEQALATVARHAVELLSGPDVPLLKECGNPECTRVYDDRS
 PDVLRAVISVGTALHHTTRGDHRLSRCAADPCTAVVVDVT VSQGLSTLARATVEILGGDEGALLRECARPECTQVYLDRS ADWLFSLSAY DLLTTQDQTLIKQCGA CAWFFLDQT PERLLLPAKAFGDVICYEDFRYIKKCESPTCTMLFVDKT A ageqerlrrceapdcriafVDVS GPGWLA PVW A VELAVAMIDLI RADELSRLALCADETCAGIVLDM
VEQALSMVARLAVELLSGPDVPLLKECGNPECTRVYVDRS
ATEVAAAAAWGLAQGURHGLERWGRCADDTCAAFFLDTS
ARVLHAVISVGTALHLTTRGMHRLSRCAADVCRNVVVDVT

PESLLQPIGTALARLVCEEDFTHLKACEGHACTLMFVDRT
AERTAADVAVALADVVLDGETSRFGTCAATGCGALFVDLS
A AVMGQVAVAFARLLAEEDVRRLKMCANEDCRWVFFDES
GAQLMSTVARDAVELLTGPHAARVRMCAGERCHLLYVDTS
PYVLRAIISLGTSLHLVTRGMSRLGRCQATPCTNVVADVT
WLAADDLLRLGLGEAPDRIKQCAHPHCILWFHDTS
CAALLALVARDAVDLLTDPARSRLRQCEGDNCRRVYLDTS
AE WFLASSCMTLAVLLWDRQLPPGGVCASSACENVFVTST
AEAATAQLAARIATAAGEGTWQRLKACEAHDCRWVYYDRS

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

GTALLSTVARDAIDLFAGAYAHRIRTCGAHDCALLFVDTS
LPAWSA AADYLRLLTDRPDRIRHCANAQCVLHFYDVS
DDRFA WLLVDGFI RSPEAAKLRQCE RCSWFFLNSG
PGWLAAWHTAERYLRLDEESPDRURKCAGTECVLRFYDTS
LLPAWLA ADNLRLLA DAPDRLRQCAHADCVLFFFDTS
AEWLLSTAADALGLWMSDRGYPAWGSCAAPDCGRFFVDTG
SNVLISLVALDALKLYTSNKLSSMHRCANPSCVLLFVDTR
PAWLPGWAAVTDFLRLMADRPDRIRACGNPQCVLHFYDVS
GPAWLA ARDYLNLLDRAPERIRTCSGGGCILHFFDTS
VEAALARLLVAVTAAQADGSWARLKLCHADECRWAFYDTS

LPADAADFADFAARH EPARLRHCANPECSLVFYDTA



|  | RNAARQFCGTAC |  |
| :---: | :---: | :---: |
|  | RNAARQFCGTAC RNRSRRFCD |  |
|  | RPGARRWCSMRCGNRHKRAHRAR |  |
| UniRef90-U2YQ |  |  |
| UniRef90-D1C8 |  |  |
|  | KNGTRRWCSMACGNRAKAR |  |
|  |  |  |
|  | RNRTRRFCSNACASRTT |  |
| D4G |  |  |
| UniRef90-UPIO00363 | RPGLRRYCDTRCGNRAHVT |  |
|  | RNGSRRFCSAPCTARAKTAAYRAR |  |
| UniRef90-D2PS |  |  |
|  | RPGRRRWCSMTCGARSKMAGYRSR |  |
|  |  |  |
|  | KNGSRSFCSVTCQNRVKNTRHR |  |
|  |  |  |
| UniRef90_V6JK | GRRAYCRARCANTEAVRRHRA |  |
|  |  |  |
|  |  |  |
|  |  |  |
| UniRef90-W9 |  |  |
| UniRef90-UP1 | RSRSGRWCSMTCGNQSKQKTWRSR |  |
| O5 |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| UniRef90-UPI00037 | KNGTRRWCSMAC |  |
|  | RPGRRRWCAMRCGNRHKVRAHRAR |  |
|  | RNGRQRYCSVRC |  |
|  |  |  |
|  | RGHRREWCAMRCGNRVKAAAYRAR |  |
|  | RAHTRRWCSMACGNRAKQAAHRE |  |
| UniRef90-G7H7S 1 |  |  |
| UniRef90-L7FBA3 | RNRSRRYCSRTCGNRLHVAAYRAR |  |
|  |  |  |
|  |  |  |
|  | RNRSRRYCSTACTNRNAVAAYRA |  |
|  |  |  |
|  |  |  |
|  | RGHRRRWCSMACGNRAKQAAHRDR |  |
| UniRef90 UPIO002D6 |  |  |
|  | RVWCAMSCGDQAS |  |
|  | RRWHSMTCGNRAKASRHYAR |  |
|  |  |  |
| UniRet90_10G |  |  |
|  | RGHARRWCSMACGNRAKVAAHRKR |  |
|  | RGTRRQWCGMSCGNKFK |  |
|  | RRKRFCSPRCANRTHVAAFRAR |  |
| UniRef90-UPI0002DF65E4 |  |  |
|  |  |  |
|  | RPGTRRWCSMECGNQAKKSTYRAK |  |
|  |  |  |
| UniRef90-UP10002 | RNGKRKWCSMKC |  |
|  |  |  |
|  | RPGRRRWCSMECGNRNKVRAHRAR |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| UniRef90 UP1000 | PAGRSRWCSMACGSRAKMRTYRAR |  |
| UniRef90-UP | RGHARRWCSMACGNRAKVAAHRKR |  |
|  |  |  |
|  |  |  |
| UniRef90_AOAO14M7N4 | Storery |  |
|  | RSGNRRWCSMRCGNRAKIRAYRAR |  |
|  |  |  |
|  | KNGTRRWCSMACGNRAKARRHQAR |  |
|  |  |  |
|  | RGRGRRWCNMTCGNRHKVAAHRKR |  |
|  |  |  |
| UniRef90-KOF462 |  |  |
|  | GRRKWCSMRCGNREKVTRFQRR |  |
| UP |  |  |
| niRef90- Q1RR78 | RTRNRRWCGMECGNKAKVQAFRQR |  |
|  | GTRRWCSMACGNRAKASRHYAR |  |
|  | K |  |
| UniRet90_K0 |  |  |
|  | RNGTRRWCSMGCGSRAKAARHYOR |  |
|  |  |  |
|  | GRRRWCAMRCGNRNKVRADRAR |  |
|  |  |  |
|  | RRWCDMTCGNREKKARFHARHWCSTRCGRVRAARSAR |  |
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UniRef90_A4QGL7 UniRef90-A8L2R2 UniRef90_UPI0002486D6D UniRef90_UPI00035F6005 UniRef90-A8TT61
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UniRef90-UPI00040A5D7B UniRef90-E3HPK2
UniRef90_U5EGW0
UniRef90-UPI0003B586A2 UniRef90_S2ZFN4 UniRef90-D4G3X8
UniRef90_Q7NL44
UniRef90_UPI00036C865C UniRef90-S4MUH2 UniRef90_UPI00036D5C2C UniRef90_UPI0003802470 UniRef90-M0QJG7
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UniRef90_L8DKX6
UniRef90_UPIO003692E34
UniRef90-H5XGR9
UniRef90-L7U544 UniRef90-W8H4Q4 UniRef90-A0A023NYY1
UniRef90_UPI0003A73792
UniRef90-UPI00047926BA UniRef90-UPI000382F9A2 UniRef90_D7BS08
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UniRef90-UPI0003739D6A UniRef90-J3F8J6
UniRef90-V6JV64
UniRef90_UPI000373E093
UniRef90_UPI00047E08DE
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UniRef90-UPIOOO4759E75
UniRef90_V9XNN3 UniRef90-A0A024YTZ6 UniRef90-T2GW09 UniRef90_UPI000361D808 UniRef90_E2D2Q5 UniRef90-H5TSV6 UniRef90_UPIO0034BCBA3 UniRef90_D9VH34 UniRef90_K9AWB1
UniRef90-F5XPC7 UniRef90-UPI0003B4ADF3 UniRef90_UPI000475BF84 UniRef90_UPI0003F74986 UniRef90_S3ZFH0 UniRef90_UPI0002626953 UniRef90_H0BDC7 UniRef90-K4QUP3 UniRef90_UPI00036A857C UniRef90-UPI000360DDC1 UniRef90-L7U433 UniRef90_A0A037ZHF5 UniRef90_K4QX90 UniRef90_UPIO003A41752 UniRef90-D9SZC8 UniRef90-A0A024QR13 UniRef90_A91418 UniRef90-K0EY85

G GRPSL

PA!FVADADPG
DPRPLTGEPVSLDDLN NTVWN
 MSLPH RVVGNLALDLANTISWRNTSREVDHLASSFDDV



VA D H LALLDFLNSR AAPSGTP DEWLANGKDLL DPRPLI GEPLALDDLLNTRW MRDGTMQDLLSGPS GL

$R P L G G A R V L D F I N T T N G R R P Y S T L E E R L T S T K F F$
S Y R F D
$\mathrm{MH} L \mathrm{~L}$
A S Y LF
$M Q L N P Y G E$
D P GAL C L E L L P T GGPGRL
$\begin{array}{lll}D & P V R Y V I \\ D P G A L C L \\ L\end{array}$

$G G P L A L \begin{array}{lllll}L & F & L & N & S \\ D & L & A & N\end{array}$
ATPVDTPVDWIDGGHGLL
P L I S G NLLS L






| $Y$ | $K L V G G R P S$ |
| ---: | :--- |
| $L$ | $L$ | $M Q Y \boxtimes A Y \square G N M A R L T V E L V N G D D P S E$




$M S \square D \square L$
$V A E A P$
$T G E$
$\square G L \stackrel{D}{L} \stackrel{L}{L} \stackrel{N}{N}$ S T R
A L DLLNT R MVVE
DSGRVCLDLVATGEPAPKGGQRRDLLDSDADA

G GAAWIN LVNTTY MQFNHYSMHGAHLAADLANLERNTPAHLD

A S Y LIF DPG SLLCF EL LTT G GP GERWES LHEPGDLLA A WLL PR R L E P P S TNFLSSRYYDGRG ITDLFDSPDRA


MHFNHYGQDAVLLAVDLAN
D P PRDAGEGVSRC


VGNAQCFELVNSVPDRIEGGDR

A P H G F
D S G S F AL D FA Y T GP DG G L R A D ELL H A P D D L
RPAEWMI DLANAVRAAPELDR
D A GAVCLDDFA H T G GEGRYAVFETVHKPA DLL
DPRP LTGEP L SLDDLLNTRWMQDGAREDTGGLSAVDGL


ADLVRWAE ES R LDP D GLGGPGGGP GS G S
TFVS GNLAL D YA GTV EART TEYRDR LVVGP DLL $L V G E T M S L D L V N T E W D D$ HGDMVDFLAADGAP
PF VPVA D H P A L D F L
GAGVATDLVNTAPVVRGAGGEALPDAVAL
Y R F DP GALC LLELLTTGGPGARYEVLHRPDDLAGWL
DPRPHVGEPLALLDLLNTNWMSDGGGVQDLLTDVAGL MHANHSSEVGDHAALDMINTDEQSESGGPVDRWQTDADV

UniRef90 BOSWU6

## UniRef90 Q6W1M8

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UniRef90_UPI0003B586A2 UniRef90_S2ZFN4 UniRef90_D4G3X8 UniRef90_Q7NL44 UniRef90_UPI00036C865C UniRef90-S4MUH2 UniRef90_UPI00036D5C2C UniRef90_UPI0003802470 UniRef90 M0QJG7 UniRef90-UPI00036053B3 UniRef90-W2F0P9
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UniRef90_C3DU44 UniRef90_UPI00029B2B9A UniRef90_UPI0003FDAE8D UniRef90_UPI0003754B85 UniRef90_Q7W1F0 UniRef90_L8DKX6 UniRef90_S3AMX1 UniRef90-UPIO003692E34 UniRef90_H5XGR9 UniRef90_L7U544 UniRef90_W8H4Q4 UniRef90_A0A023NYY1 UniRef90_UPI0003A73792 UniRef90_UPI00047926BA UniRef90_UPI000382F9A2 UniRef90_D7BS08 UniRef90_UPI0004650B6D UniRef90_LOJ024 UniRef90_UPI000380F9F9 UniRef90_D5W526 UniRef90_UPI0003739D6A UniRef90_J3F8J6 UniRef90_V6JV64 UniRef90_UPI000373E093 UniRef90_UPI00047E08DE UniRef90_D3D176 UniRef90_UPI0004759E75 UniRef90_V9XNN3 UniRef90-A0A024YTZ6 UniRef90_T2GW09 UniRef90_UPI000361D808 UniRef90_E2D2Q5 UniRef90_H5TSV6 UniRef90_UPIO0034BCBA3 UniRef90_D9VH34 UniRef90_F5XPC7 UniRef90_UPI0003B4ADF3 UniRef90_UPI000475BF84 UniRef90_UPI0003F74986
UniRef90 S3ZFH0 UniRef90_UPI0002626953 UniRef90_H0BDC7 UniRef90_K4QUP3 UniRef90_UPI00036A857C UniRef90_UPI000360DDC1 UniRef90_L7U433 UniRef90-A0A037ZHF5 UniRef90_K4QX90 UniRef90_UPI0003A41752 UniRef90-D9SZC8 UniRef90_A0A024QR13 UniRef90_A91418 UniRef90_K0EY85
 I D WL DVY DL NVDS CTA GQL D LAARELRESI HQTA TAAA Q G D


 R S S G S VDPA L LIA RLEA A WR D QA I V L R E A L Y A VF A T L T A GA LA WLLE QA GMVVA DATPAEFDAVAAQARALREWFRAFVRAR AVWLAA ANALD FPAD DTVLR HVLQARDAL A A AVVDGS $V R N R \| G G A A P L T D A D V A A A R A L R D R F H A D F R A A D A A A$ VA WSK QVGLVGGDVSP QELQQVVLALRKADGAAGSADANDL LRWLA QAKLAPARAKPGELDHVAGQARDLREWFRGFVRPR RA WL DA A GFAPA QAPK GLLDDSARTLRRETVRALVAQRKAGL
 TA WLLRERPVPVGAARSRDLFDAVALRDSLARMADAASRRE EA WCRGVGVSLA QDAA GLLAS LHEL RTAAFD IASSAVDGH

 T L WL Q R A GLL LAP PVDAAVLAS GRR LREAVDRAVLAVVS GR $R$ WLLASNGLDRRF PA DAA A LE HVLLDAREA LAAA V D D P G $\square$ E WA LHASSL L S E Q E Y D A D LDD A V I A F R E R L Y GV F H NL S L R Q
 GRWTAESRRLGLDDRV TA E QLGGAKTVLRAALDRMARAN GRA T
 REVGMT MDFP TAPDDHP R R TREVI DDWLAVVDAS D $D$ L WF VEA GVA D R A P GP D D L A A A L V L R E RI Y D LV R A R L E DE
 ERSVAA GMVLDHPVTD D DLTEVVLAYLDDRFAAVVDAP TDAR M G F A EDIGGPD DLDQTLDYLDEHWRNVMARARVAGED VEALRRPDYATRP SLQDARLIAVCAA QARTVFEALEAGD LD WLA QARLVPARAMPGELDKVADQARALREWFRGFVRAK



 A A WI TEAELSPVRVTARELTAARTLREALYRVLRDAMAGR LA WLEAA GHVPAGLAPAGLAE LARALRRAAARMVRAAAAG
 DA WFRESGLVVDGDVQPS DVVRAVSLR EAVVS LVRSALEGY


 A A

LRREFFFRQH HVVADP D AD A ALAR LRRA $R R W V R Q A G L D P G P V D A R A F E R L R R L R E A V Y T L A T S W P P G D$
 H D WI R D C R L A P GP V T P A E L A A A V R T V R D A L WR R L A L A R A G G E GPWLVDNGLLPPRVTPADLELLRAVREALRTMLVHNAGGP




 $R A V L R G H A V V E T E L D D A A R T D L L R W A D R L D A C F G B A$ A K S RLLRLDPD QVRVSSEELTAARRVRDAIMRMAQAVLRGD HAWMQTFPRSPFTPTEDQLAQLRQLRDTLGSVYRDTLDGD

 $D A$ A GFVFDA D DV

 R A WA Q S LGLPVVRELT GEELADLRSFRESVFAVFAAVAEGN E A WS R SVVGL P T T G G S Q Q E R D DLLI A L R D A l Y R T FA P L A A R Q E $T$ Q WL H E R P V A VGA A R S R D L F D A I A L R D A I S R M A L A A S R D E GEWLS QPPDTAADPVTPRRDLSAAKTLLRQADWDTAHARAA GR $T V W L A A N R L D G R T A D G R T L E H L L R A R D A L A G L V D L P G R G G$
 $R G G P G S G P G P A L V V S E G E V A D A R D L R D A L W R L A E G H V E G P$ N A WY L E S G LTTDT P GDEEVDVRAA T T L R EA L Y R L V R R L GE E F
 ELWFREYGFDPA EQDVDALRASRTAI RSLLDS
 S V L K L A D P A S L S A L GP E A M N K A A A EA R V L R EVV L R A F LE Q D NAWYMES GLLDDAPGTEDDVREATAVREAVYRLVRRLGEEF ERFLAEHELGV TATGADLGQVHALRQEVRAVLEART
 $R C W L D T N G L A E R C V A D E P T R \quad \square A L V R T R D A V L R V V A D G$ Q A WL E L S G L A P A RVVPK G L L D S A R E L R E A V R A L V A Q R K A G Q

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UniRef90_N9STL4
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UniRef90_F5XPC7 UniRef90_UPI0003B4ADF3 UniRef90_UPI000475BF84 UniRef90_UPI0003F74986
UniRef90 S3ZFH0 UniRef90_UPIO002626953 UniRef90_H0BDC7 UniRef90-K4QUP3 UniRef90-UPIO0036A857C UniRef90_UPI000360DDC1 UniRef90_L7U433 UniRef90-A0A037ZHF5 UniRef90_K4QX90 UniRef90-UPI0003A41752 UniRef90-D9SZC8 UniRef90_A0A024QR13 UniRef90_A91418 UniRef90_K0EY85

A D D G
110
Y T V $\mid S R R A V A P$
PAAALEIVNTCSTRGRATAVLSDTRERRWQLSSSSAR

 S P A A L A AL N S VL A W G HV T R S V G Q D GP T T V V R V E D P V
 K GRPLAAALNQLL ERDERYEELVVAD DANGFA LREKRRRWRSP
 $D P S R L D \quad L D V I$ RDVAA LAA LR QAS LS GTP YTWHFEG ALLKELEALNRLLLESDE GTSR VVHHDDGDAFALQRTRRWRS $P L K$ L S A L N QALLA A G GSSHLELLTVVA GAPSLA ARRYDAA T TAADHAALNRVLAHGRVRRELTDEGPRD DPEDD D APRAVDVVNLYAATPDVPPSLAGGSRQAGRSVHTVPQA


 AEGPGE $\square$ AEFGDPRW
 TDEA L QQUNLHYQQGAVWRVLRS DDGMPWGWRTCASAQE L EASAYDAFNSLLLARGHLRERVDADGGVSTVVEVDDP S P D S A A EVNEAARLPTPRHQLDGSG

| $R$ | $V$ | $R$ | $T$ | $G$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $R$ | $L$ | $P$ | $A$ | $T$ |


R T A R $\begin{array}{lllll}\mathrm{L} & \mathrm{A} & \mathrm{P} & \text { A } & T \\ \mathrm{~V} & \mathrm{C} & \mathrm{P} & A & \mathrm{D}\end{array}$
PRERAR LFNEQMAAAAAYPRLTDHDGEGWH

AAGAT PAGALAAVVNEAAERPPLTARLTADGGREWHDHYREDGQHL E Q T RAD LL NDLLLLQHAAAPRLTNHAQTGWHLHFRDAADVAG

 A GRPLTRLNSLLERREAFSRIEPHDGGALAL K S S DL Q I N QFSS K VN T L P QL C E NE F G E L E N D F V T Y L E T Q IE K A P F T Y K I I E

KPAAADRVNEAAARPDLAPQL

| $E$ | $G$ | $G$ | $Q$ |
| :--- | :--- | :--- | :--- |
| $T$ | $Q$ | $L$ |  |
| $T$ | $A$ | $G$ | $P$ |
| $L$ |  |  |  |

$\begin{array}{ll}\mathrm{V} & \mathrm{S} \\ \mathrm{L} & \mathrm{V} \\ \mathrm{S} \\ \mathrm{S} & \mathrm{S} \\ \mathrm{T} & \mathrm{Q}\end{array}$
KPAAADRVNEAAARPDLAPQL GERRWK SAHP
Q G G D A A LV N QVLIEA GRPARRKLA WDDGQQGGYTLLAECPR DHS
 D A D A L A LL L ATAR GPSAVP QL TRE G $R R V E A T$
$P S W G P$
 PASA I HVINDCSDQGRAAAVLTPEGNRQWRL
 P DPS L R QADEAL RALPVVVFVLGADEQPGGF APSPELSS A GAlAP PVNLLERFPPAMTVSTHDGGGPHLHFARDGEDP HPDA DVGGVVAEVNEAARLDPLPKHQLEVSGRLTTRTGG
 A Y D P GDLAAVNEAAA GAPLAAVIRPDGTRAW
 K GRPLT AL NRLLER RERFGAVVVGAGSAFEFRERRRWKSP
 A A D P S A L NAFLLQGA VPQLVWEEAGGPVLDRFRQ GDVN


 PA Q A A A HLRTVLDRTRITTPGIVVGD D RLHVRWTTDSHDP D DSARALVDAVLEHGR』RATLTPEGPGERAEFADPAWGPA
 RDDAVRLVNGILAGHGARLQLVRHDEGDWHPHADEASAPL
 NGGGPE TVVRQDRPAFDLALQVGLDEYGNPTLTSSAYE GA
EADRVRLLNALLAEAAAYPRITEHDGYSWHLHYQDDGMRL $A V P A B G L Q V V T D A H A S G L S R Y G Y G P T T T G V A R E W P D V W D$



 A A LA EHPL
GPDDLATLNDAAGRPPLAARLTVGGDREW APGGT



 E D Q A V E S AT A L V T R A G L GPVVLHRDAA DRWQWY VTS P DA S L TPPA A DLVNNDAAA GLDPLSPQAGPD GSRSWRTPLT VT D A L N A LLD H GR I R R R LT P D GPA D E A DVP E S E W $P L K L A A L D N R A L A A G G S H L E L A E T G A G Q V A V E R R Y A A A T A$


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UniRef90-UPIO0034BCBA3 UniRef90-D9VH34 UniRef90-K9AWB1 UniRef90-F5XPC7 UniRef90_UPI0003B4ADF3 UniRef90_UPIO00475BF84 UniRef90_UPI0003F74986 UniRef90-S3ZFH0 UniRef90_UPI0002626953 UniRef90-H0BDC7 UniRef90-K4QUP3 UniRef90_UPIO0036A857C UniRef90_UPI000360DDC1 UniRef90-L7U433 UniRef90_A0A037ZHF5 UniRef90_K4QX90 UniRef90_UPIOO03A41752 UniRef90-D9SZC8 UniRef90_A0A024QR13 UniRef90-A91418 UniRef90_K0EY85



160 VEDALGVIAADAIAAI A GERDGRLALCASPTCQAAFFDTS



 GPAWLAV RDYLKLL NTAPDRI RHCAHDSCDLHFFDTS

## 

 $\begin{array}{lll}A & A & S \\ L & L & L \\ P & D & Q \\ P & W & L \\ P & A\end{array}$ $A$ G M
A $W$
G E
A E

A A | A $L$ | $A$ | $H$ | $V$ | $V$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $A$ | $L$ | $D$ | $L$ | $L$ |
| $R$ |  |  |  |  |  |
| $A$ | $M$ | $A$ | $R$ | $V$ | $V$ |
| A | C |  |  |  |  |
| A | $E$ | $L$ | $L$ | $V$ |  | R G P A WLP G W


 ARDALDLG
$\qquad$ $A$ E VMA $A$ L V $C$ C PATALA
GAA WTA
T S M L $T S M L I D R L$ A
A
A

## V

A
$P$

P



 VD I AL A L V A A S G V R L L G S G L L N D L

 AS AL GQIATAYHAAAIRGDWSRVRRCPASDCAWVFWDSS

 $L P A L T A R L A A A G V A A A A A D G T W Q R L K A C E A H T C Q W V Y Y D R S$

WKGLGH
(
VEDALSVAADA SI A GERDGRMALCASPTCQAAFFDTS A A D A L A P
 VGGRSCAAALAHVICGDPHVTVGRCQADGCERFYVDDS

 RERLLVDLLLI I RDAQRDGTWALLKACANDECQWAFYDKS

 RQRLGRLAYAAAELL AEGNFELVRKCESPDCSLMFYDRT C G A L L A V V A R D T V DLL A RAALA TVVARDAVLLVVGSLLLERVKECENPNCSLLIFLDDS

 W TAA R D Y L DLLSS TPERIRACASETCLLHFHDTS $L^{T} Q L L V L S A Q A W A H L L V$ LAGTGAEEVRDCAADDCGLRFVDTS ASRIA AVAAAMAMIDLI RADELERLSICTGNLDDGIVVDLS
 $R A V L A R I L A T V V L A E A K G V W F R V K M C S A P D C R V V F Y D G S$ PAVL RAVTSVAAAQYLTSTSLHRLGRCAARECRRAFVDFT A D S VP Q AL S T IA R D A V DL F S P A N A E R I R C C S S D D C DVVVYL D T S GDWFLASSALDALQI LTECGRVPWGECAAS GCDTLYLGTG T A Q A L S T L A R E M I E L L S G P L A A E R D R E C A S D D C P L V F V D S S GPAWLA GPAWLNANVETVAGSVAR


 GWGAAWSAARAFTELLAAHAPDRIRQCAHPDCVLWFYDTS
 TGQALATVARHAVELLSGPDVPLMKECGNPECTRVHIDRS A GELAVLI GTGLLGVVRTLSHDRFRHCASPVCDGMFVDTS
 $A Q W L L P A A E S A A E L L D A H G D F S L L V R K C E S D S C S S L W F Y$ D R T


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170
180
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KNASRRWCDMTCGNRAKK $\square$ AHRAR RARARRWCSMACGNRAKQAAHRSR RSHRRRWCSMSCGNRHKVAAFRQR KNGTRRWHSMTCGNRAKAARHYAR RAATRRWCSMRCGNRAKVRAHRAR GGRPRKWCSMRCGNQAKAASHRRR GRRKWCSMKCGNRHKVSRHQKK KSHSRRWCSMACGNRAKAAAHRSR RNGTRRWCSMACGNRAKASRHYAR PAHNRRWCSMRCGNRTKVRLHQAR RNGTRRWCSMACGNRAKASRHYAK KSKQRKWCQMSCGSREKLSR RSGTRRWCSMACGNRAKVRRHRA RS GARRWCGMACGNRHKAASYRQR RPGRRRWCSMRCGNRDKVRRHRA RPGRRRWCAMRCGNREKVRALRAR RNGRQQYCSVRC
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GKRKWCSMKCGNRKKVAKFQDR ARSRREWCSTGCGNRARVARHYAR KNASRRWCSMRCGNRAKTRAFAER QARRRRWCSMRCGNLAKIAGYRSR K SHRRRWCSMAC GNRMKVAAFRSR RTGRQRYCGTVCSN
PAGRSRWCSMACGSRAKMRTYRAR HGSRREWCAMDCGNRV
K S GRRRWCSMACGNRAKAMRHYQR KNRSGRWCSMACGNRTK LQRFRS QSRTRKWCDMTCGNRQKKARFNA RNGQRRWCDMACGSRDKARRYYHR KNRSRRWCSMRCGNRTKARRYAAK RNRSRRFCSNTCASRTTVAAYRAR HSGARRWCGMACGNRHKAASYRKR PAHNRRWCSMRCGNRTKVRLHQAR RPGRRRWCSMRCGNRHKVRAHRAR RNHGGTWCDMTCGNKLKNRAFRAR RGHRREWCSMTCGSRMKAKAYRER RGHARRWCSMACGNRAKVAAHRKR S RRRWCATRCGNRMRVARYYQR KSHKRRWCSMACGNRHKVAEFRKR RGRRRRWCSSECGN
QARRRRWCSMRCGNDAK $\square A G Y R S R$ KS GKRRWCSMECGNRKKAAEFYAK RNGRRSYCSVRCANTAAVARHRA RPGRRRWCAMRCGNRSKVRALRTR LNARQHWCSDVCGN
RNGTRRWCSMSCGNRAKASRHYAR KAHRRRWCSMACGNRAKVRRHR PRRTRQWCSMRCGNRAKARAHYER RNRTRRFCSTACGNR RNGRQRYCSPTC
KARNSRWCSTGCGNRMKTRAYRTR RSGTQRYCTHACVNRDAVRRHRAR RNRSRRWCSMSCGGRDKALRHYR RNRSRRWCSMTCGNRSKARRHQSR RAASRRWCSMRCGNRAKVRAHRAR PGSARRYCSTACATRERVAAHRRR RPGARRWCSMRCGNRHKVRAHRAR RNGTRRWCSMACGNRAKASRHYAR RNGRGRWCTMECGNRHKTRTYRER RPGKRRWCSMRCGNRHKVRAHRAR RGMRREWCGMSCGNK
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## UniRef90 W8ABI6

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UniRef90 D5DKI6 UniRef90-R4T784 UniRef90-D9X8E3 UniRef90_UPI00036232CD UniRef90-W2ET17 UniRef90- M3BII8 UniRef90-UPI0003B61EA5 UniRef90-X5KVB3 UniRef90_UPI0003714605 UniRef90_UPI000309B312 UniRef90_KOK439 UniRef90-UPI0003128F1D UniRef90 D6A2D5 UniRef90_UPIO00374F2ED UniRef90-S2YH30 UniRef90_V6UDL4 UniRef90_J3HY67 UniRef90-UPIO0047A44DA UniRef90-B5HP03 UniRef90-A0A024JZ46 UniRef90_UPI000368CE61 UniRef90-W2EVX7 UniRef90_T1VV48 UniRef90-A0A010ZTT5 UniRef90_UPI000479BE42 UniRef90_UPIO0036C1174 UniRef90_UPI00037695B3 UniRef90_UPI0003672529 UniRef90_C6R349 UniRef90_UPI00031FE238 UniRef90_W4VN29 UniRef90_UPIO003783060 UniRef90_UP10004028735 UniRef90-D9VWC7 UniRef90_D9VWC7
UniRef90_UPI00037426BD UniRef90_UPI0003676FDA UniRef90_UPI0003AD167D UniRef90-HORKR6 UniRef90-D2PXG4 UniRef90-A7GQ15 UniRef90-W4QKW4 UniRef90_UPI00029AB483 UniRef90_UPIO00366C004 UniRef90-L7ERK3 UniRef90-12Q7W0 UniRef90_B1MJH9 UniRef90_F8JM15 UniRef90_UPIO0029AB8F4 UniRef90-A8U1Q3 UniRef90_L8JNF1

# VLA 20 <br> 20 

 VAFRFTATVIS R R DT 30$R \square G G S L S L D F V N T E M W R G D V P Q R G E R L T G Y G A T$ MHLNPYGEYAVLLAASLAN
 $M D \triangle V A A G \stackrel{L}{P} G D$
 MDRPPAMF DADS LGGLDFDNSVVRATPVDTPDDWLED GEGL

 D PRPPVGEPVSLDLLNTRWVAD


F Q PRDLVGGDLVLDLVNTVT TR $P L T G E P V A L D L L N T L$ $P D G P$
$A Q Y$
$A T D Q$
HSVQAVARRTVALVNALTGNDPATDQARATPSPAVL Y GERPALDFANTLRRRKDPLHPTDLLHDRSDF
 $E W V P D H F I G G H P A L D L S N A V F D R R A P A T D N E L R K S V R D V$ $R P L V G E P V A M D L L N T R W V E G A T P H D L L D G I D G$


## $\square G G S L A I D F A Q T G G E G W R$

$$
\left.\begin{array}{ll}
G S & L \\
L & A \\
T & A
\end{array} \right\rvert\,
$$


R PAG
A P ETAERLVAFINTRHCPDGDDVLTRERA PGWLL



TFWS GNLAALD L L A G V
F D SHVAALLLDQAVALVNTLTDGARETEPVVMMGTPDDL

## FRSRDLVGGHLV

$M P \square A D Y P A \quad G A A L A T D L V T T A S P T V R G$
TNLGD R L V L N F L N T L $R$ VDPRP LTGEP L S L L D L L N T R WTEE
$D L L G F V N T G P W G G N P E T M D G A E G L T A W L$ A QRPVMELVSTVRHDGDGGVLDD LDTVRGT PDKDDGEELAIRLVNTAAWRLR DPSEERLADADAL

D A

 $R$
$R$
P
$\mathrm{V} L$
L
MY LNHNGRSCLNFAGTLKH RNTSREERLVEPAVL
MYLNHNQEAPEKLEVNF LNTWRIPNDTRDPKDELNADDDV
PAELLRDFVNTYDVEQDADE
D P R PLLGEPLPLAFRFNTRWTD DRNGSRFERLTSPQRLL
 D PR P LTGAR PLALVNTF DPRPLTGEP L A L L L L N T R WV
$D G G R P C L D L V N T L$
D G GRPCLDLVNTL R SRYADGVELLTGPDAL
LP A P G S Q E A LCC A A L A N T L L
IN DF TNVGNHPALNFLNTRLI
HSVLTMARRAAALI NALTGDR LD FLNAL A TPVDS QVEWDT
 D P R P L L G G PV S L DL L N T R WML D G E $\square$ A D A S GL S R L E G L


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

GLALVEALVNTRGLESGRD
DALANI YDFANT LDVVRHVEHPQSDEDAGAL
RGAGAVLAFRFTATVIDRAGAATERLIDPDRL

 $S$ L H G G W L C L D F I N TV H D WTVVDP Y D Y L S S Y E A V
$P F V F Y G E R P A L D F A N T L R R R K D P D L L H D R S D F A S W L$

## UniRef90_W8ABI6 UniRef90-L8PEN2

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UniRef90 UPIO003C75529 UniRef90_UPI000466F688 UniRef90-UPI00037FE1B9 UniRef90_W7T7M8 UniRef90_A8M829 UniRef90_D2BB51 UniRef90-UPIO003B6843F UniRef90_UPI000478307A UniRef90_B1VEG4 UniRef90_I2GRC8 UniRef90_D9W3K7 UniRef90_E8TJ58 UniRef90_UPI0003482A94 UniRef90_B8EM95 UniRef90_U5E489 UniRef90_A0A024KDK4 UniRef90_UPIO00255D12D UniRef90_K4ZS23 UniRef90_H6R6Y8 UniRef90 K0F906 UniRef90-W2EJX8 UniRef90-D5DKI6 UniRef90_R4T784 UniRef90_D9X8E3
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UniRef90_M4K7P5

50
60
70
E L W W L D A VG|L|RTPGVSPREFRNALE|L|REA|I|YR|L|A|V|AAAGBP

N A L W A
 $A$ V WLLD S P P VASSPTAD R A T L D R L L T A R T A L D A L A A T A V R R D $R A W L R A H G W S V G D L D E P A L G E L V R V R E A L D R E H D A G E S G E H$


 DD WLLA QAKLVPAEAKPSELDKVAGQARDLRDWFRGFVVAGQ $\bar{M} D W L V A T G L V A Q A L P E D L L V A A R A D R E V V R G A V H K R K H G E$ NQWLADHNLAPADAGLQEAARVRSLREQVRALLAAQVGGH TDELDDAGFSAAEASEASVQRVTQRDAAMTPFLTELPDLD LQFMRNHF

SEELLS
$F$ GT L D E L K QF RD G $\square R F V V E E K G T$
AVWLAS T G L A D R F
PADAATLGHTLRAREALAVAVDSPG A RWLVVEADLTVPHCDDADLRRAVDVREATYRLALATMRHE


 T S WLDS H L L VA E QLLDP Y CQNQL T GL R V HV RAM FEAAVQN R A A L L R A H GE P D P DLLTP T DVVT E L R A V A V L L R A V F A A B E D AS WL N QARRATSWA GELDQECVTTLREAVLLLAEHNLGMN LAA A L E R L A E D D P R QA E RVLLG K A R QVVR Q S ML TVV F SALVVK G N A A WLLTEHDEF GGEVT DADAAVARELRDALVTLLLAAHSGDE A NWFSAS GLADDRAD GRFVE GVREMREASFQVVDPDAA G R Q WLLG E T GLDDTRAVD GRTLERVLTTTRDALAVLVDA PE
 A D WAEASSPDLDRFRPSSVTETEFAAARA LDREA LWWTARA HVVE

 A GWLGGSDGTELS VTPDELLALRELREGL RELAAANNA QD


 A A LIPRTASSLPRDLDDE QAA Y LSGAARRMRDVVQAMQDGR A WAQAT G LITA GEATETAALTRLRRFRESSYT LTGMVEQR A A WVA A S NL G T E F G V P T D I A Q A IP L R G A L R A CY N A LI D E Q $T D L R R L A E T E P G R A K L A B L D R T R E L R E A L H D L I D T A L I B P D$
 VQWME Q N QWLS S Y QRERDLT QVREFRQYGRAFL G G AVWLGAHGLEDRFA ADAATLRHTLRA RDALRRAVDGA
 $T R W L Q Q Q S G L P A T V D E E L R R A V V D V R R A V R A L G A R V V S P A$ LVWLG EN GVGGARLGEAVYREAIVL REAI YDIVVARIHAP
 GS GLVVP Q GTDLAAHADPSWLDGFHELRRCI GQLVRGAPGHG SEWAVQA GLVDA DVSAD DL GTADEVVREAI YRTATALLDRRR LQFMRKHF DE ELSFGGTLDDELK QFRDGI RFAVEE Q
 ELWLLRANDLTPATATEDDLRGAQDLREAIHRIGTAVCEDR A $\square W L$ S S A GL A D TVVPESPETLDAL RATRDALARGD
 A VWLAANGLDGRFAADA R S VELWV S E E HITP E QTQK I I QFRS DL RTWIL A E W L S LA GFTAGPVTAGNVLAAKALREAIDRVLLPPEEPA
 E CWLD A F GVDLT NLS D Q DVTEVLDVRSKLE EMVDHLMVGQ A DVLAA Y GESVVPDLTAA DIAE MRAAAVLL R DVFAA E H
 K Y L A E Q D PQLLNWPS S T A D R K DLQRVRQLRSVLRQVWSRS A L WLE GVGLA GRF RADKS T LVVHLLT AREAI ARAVADPA A R WA E LA G L G T DV A D E A D L E A A RLLL R E A LLY R L V L S T L GR A LA WARDAGLVGVDFSPNARQRARRLRNAIDQVGAADADGD EQWARQCGETPGPLGDGDLLGARELRDALRRIAATAVGDE E $\square W W L R S A D L D E R Y R P E R A D A A D R A A A L C T T R E A I D A D V R R P$
 LRFTKRH WDEEIS FGTVDELKQFRDELRFIVEEKGS
FA WVV A Q A L H D R QFS G EVYEWWADEVVLP LLL K K LL RLLHKLRQ G Y T D ALVVPPGTALDALDGTVVVRFHELDRSDISRLMAARLGGP A DRCRAAGLAVDDATTADLRRTAAALDAWEEVVDAAD NTAEGRAAFG』AEDTERELAAMVKELRESLRAVVCLAHACHP A D WM Q E R G L G G G R I T P A M FA T A L R L R E A L R A Y L E P A E R R R WLWLLRANGLD GARLTVADLVSAKELRES MRAGTAVAD GE

 D A WMA A A G L G VD GA QPA S L D DLLR DL R EA I Y R CG LAAII D D A $L K W L R E K Y E Q D R E A G E Q V L D Q Q N K A R K V L H E E L F L V V I D R S$
$T$
$T$

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90

PHREVTPLGELLTAGPLLVT VDTGDGSAALAAADEGP
 GDD LA VLNALLARAPTRTGLVPARTGFA M WTMSETDP PQERAALLNAQMAAAAAYPRLTDHNGEGWHLHYRDQSDTL PATPEDRLNEVLAHGRDRRTLGPDGVPDSVVEVDEPS
 $R P R S L T L I N D S A G A T L R P R L V P N S G A R G W$ E P A V E S V L D R FM H TA QA N R A L R WS A K K DR MA WPAEA DP A L $P$ VHGDKVV E L LMSGVP F GIVFGEHSDQLIPLVENGRM G $D P D A L T L V N A Y A R K P T P V P Q L T P E G G R Q V D A T$ $P$ LTAL GRRLNSVLERDDS FRQUVPRRGGDGLALQRMRRWRS
 $\square$ D T A A A K V V E E L D

## D

P F R GAAL


ENMDS
E E A
$T \mathrm{~L}$ V

| $V$ |  |
| :--- | :--- |
| $D$ | Y |
| D | P |


 PAPALRALSGADRLAPPYRTLSWEDNRLVVVAGRAGDY $P P S A A D A V N G N M Q K D S S A P A L C F N E S Q G F F R Q H T H P V T Q L$ VDAAASALNRLLDRRGRGVLRLTSHDGRPWHPHDDDDDAPW

## P

## 



## |



 $D E D A V A B A N T$ T L G WF P L R L G L T P G G S IDD N L L S LE R N I E K A P Y V F K I H A
HDEAAGLLNRMLVDSKARPSLQRHGEQSWH
$P$ LRAA DLVNAAAAAGPPLVARIAPDGSRGW

| $Q$ | $Q$ | $L$ | $Q$ | $Q$ | $P$ | $T$ |
| ---: | :--- | ---: | :--- | :--- | :--- | :--- | A I A D L A PL N R L L E R D E A Y D R V V S E R G R LT LE TA R R WR S P


 $\mathrm{V} P \mathrm{P}$ E P A P A V Q D T L R K A H G K A DL WP D G Q R L Q W L V P DK G A GP D







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

 ADRLNETLRHGR $\square$ GRRLGPDGPEN VP DSRRRM NRRAAAAPGWPQL HWD APADTVGVDTVLGHGR $\quad$ VRPTLTAEGPGE $M P$ VREMVETDT DSESRKSSLDALVASEDSFRVNFNAEGBGEDAW GE VRFTSTGDPY
 RPEHVAVVNAAAAEAPLAARIEADGTRGW RRVEDPADGAT LPNHVE YMNDKLRQNAGYDRLIIDEN KVSIVRSYS $V$ D D A A T A L N RLL REHTGPDRLTSHD GGPWHPHLHDDDAP W RGKP L R AL NRVVLVRDE E FGQVVVA GETVRGLVWSPQRRWRS

 E P P A LAVI H DVAA RTFTAALLTGSPATDEFTH
R P A ALVTI EDALATASCVPELRQGDGHGFHRDWRF GSDG A EEESRALLNAVLAHGHRELLSLGADG
EPSDVDQLRELLVAAVARARIVTLSPDRWK
ANEAAVALNRLL RTHTGPLRLTSHGGTPWHPHLDHDDAPW
 P A D A L E RVN SL AS GAPPGPRAVRGADGD LVRALSAAPD DEERAELLNRILAAAAAAYPRMTNHAGSGWHLHYRDAGQPL
 $N K E V L G A L G D A L A A F P L R V E A R V D G C G$
TPEDI RLINTAGRRPTPVFLLGPGGRTR




## UniRef90_W8ABI6 UniRef90-L8PEN2

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UniRef90_M4K7P5

130
140
150
160 VIS DALGVVLAADA\|RVLGGPGRGR\||KACEGPGCAG|LILLDTS LLS RVA A A IAA ALLVE GTWTRLKACEAADCHWAYYDRS LGRALATLAANAADLLTGPDADRLTNCGSAPCNRYLL $L E Q P L W P V V W D A A E L E V S G R A E R V G G S C S D P D C A W V V L D T S$ PHVLRAVISVGTALHLTTRGMHRLGRCAADPCRNVVVDTT WL PA WYA AENWLRLVADRPDRIRHCANDACVLHFHDVS
 GVQVLGAAARDADELIGGPSASRVVRRCEGDGCKLVVEDTS P L WLL L
A RALLAW $\qquad$ D A L R
V P E ALLL LIP I G E A L A A K F VV C E E D F AS GWL APLAEAAAELLASGDFALI RKCESDDCALWWYDRT
 E E NL Y T M L L Q S L L VA I D Q K R WSRLLKAC P DCR WVV Y D Y S W P S A VVL A R V
 RSTLVATLA GAAIDLLSGPDAS VRGCEGPGCRMLFLPA H VEHAMA LIAADDAAGL LAAGDDADLLAQCQSEPCDRFYLRT GE WF LA S S CLAALTVLVVWDRQRPPGGVCAS GTCHHVFTNE G

 GPAWTA AAADYLDLL DAPERARGCANPACVLHFFDT S
 $F A Q V L S T V A R E A I H B F G T D R V E R F R E C A N P T C S L M F V D N S$
 ARDVIADD A HTYFTARAAGDWTRLKSCAARDCRWAYFDTS LA EAL GGGVAAVARAAAR GSWNRMLRMCAAPPDCHWVFYDT S
 $V G Q Q W A A G L A V S V A A A F G E H \square P H R V G D C A A P R C D Q V Y I D A S$  L

 A S HLL P WLLLA DA G A Q L L L C S D R T T
 VEDALSVI AADVIEII A GERDGKLVLACASPACRAAFFDAS

 $V T$ WVGARSCAA ALDA HI ACDVVPDVADGQCGAEACGKYEVD Q S $V L G G F G A A L F A A A A A D L A A A R G G W A R E L K V C K D P S C H R G F F B C T$

 C A A L L

 $\square R D A L S I V A A D A D A V L G G P D H D R V K A C Q G D G C T G L Y V D T S$

 HRAIGGT LI EI IGEGTWDRFKCCALDTCGWAFYDST VA A A F A V L A A D A D D A A T S D A A E V R DCAAADCGMRF C D A S
 A RNLV GYFAD QTL R L L N DVEHSRIIKKCSSTNCIMYFYD S S GQ WLL A S S CMA LTVVLVVWDRQRPP GR DCSSS SCENVFIN Q G
 GPAWTA A R D Y L GLLA T
A S A VLAA A TARD GVVELLTGPEAAA
$\begin{array}{llllll}G & D & R \\ F & D & R & G & P & A \\ A & V & A\end{array}$ T V P W WLA A A L E G Y LDD L L L A A D DLA GELLALAA WRLLED RVPDRIVRQCHPQCVLWYLDTS
 F Y T I L L H I L V AVVE EGKWS RLKAC P D CRWV F Y D Y S
 CAGLLAVVARDAVDLLTDPARAALRRCQGEDCHRLLYDTS $G D V L H A L F A V G T A L H L S G R G M H R L R R C D V A E C T T I F A D T S$


## V

VA D ALSSI A A NAI E T L G G P DRDRVVKTCADEHCHGLVVDTS




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KNGARRWCSMACGNRAKAQRHYAR PGNNS $\square$ WCAMDCGARHKMRTYRSR RPGNRRWCSMRCGNRHKDSAYRTR KNHMRRWCDMKCGNRTKARRFRE KPNTARWCSMACGNRMKARRHYQR RPGTGRWCSMACGNRAKNKTFREK RGARREWCAMDCGNK
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RPGRRRWCAMECGNREKARTHRAR RGHARRWCSMSCGNRAKVAAHRSR RGGSRRWCDMRCGNREK
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RAKNRHWCGMTCGNKVKVQAFRAR RNGSKRWCGMACGTIAKVKNYRAK KNRSRSWCSMRCGNRTKTRAYRAR RGNNRRWCSMNCGNKAKKSAMTAR KAGARRWCSMACGNRAKARSHYAR P RRKWCSDECGNRARVTRHYRK RNGTRRWCSMACGNRAKASRHYAR RSRTKRWCSMTCGSRHKSREHYKR PRRNRQWCSMRCGNRAKARAHYAR HARRRWCSVRCGDRDRAARSYER RPGRRRWCAMECGNREKARAHRAR RNMSRRWCDVSCGNRANASKHYHR SGPERRYCSRRCATRERVAAHRR RGRVRRWCSMSCGNRAKQAAHRER RNRSKLFCDFGCANRAHV
RNGTRRWCSMACGNRAKASRHYAR RSHRRRWCSMVCGARNKMRTDR
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RANNRRWCNMTCGNRAKKAALGRR PS GRRRWCSMRCG
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20
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RT
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PLLGEPLPVELANTRYAVR GVPHEGLAEPEHL
GGPAWINLVNTTYNAQEDDTLDDRSARFREALL
GGRPALDFVNTVDNRARPAKRDYLAGFPELL
GEPLAVDLADT IITSRDPVVDLLADEAAC

## $\square L D D Y$ V

E LL $P L L G E P V A L E F A N T F A V R$ GRPAEGLETPEML YRFDAARLVRDFVNTAEPQVAGEVLTSPERLDAGWF

EDSGSLALDFACTAGLGQPEGERPTVADAASLN
 RPESADEL
पa पEALVNTपDПEAGADEपDT
PLIGEPLPLDLVNTARSA AGEAGDVLASVGGL DLLNTRWVA GTEHHDLLDSLDGL $P \square R R \square Q A L V N T V E R P D G A D R L A D P S D A R P W M$
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A G T LIDEVG T P

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DLVVAFGDSVDPESGRDDLGSPARL DRRPLTGEPLSLDLLNTRWSDEAG


UniRef90_K2MHB2 UniRef90_M2QU15
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UniRef90 $\cup 5 \mathrm{WW} 0 \mathrm{H} 7$ UniRef90-U5W0H7
UniRef90_W7IWQ0 UniRef90-Q6ACX3 UniRef90_UPI00046710DE UniRef90_UPI00035F2EC1 UniRef90-UPI00035DF5BF UniRef90_UPI0003663897 UniRef90-A8LWH9 UniRef90-UPI0003639DD3 UniRef90_UP100035EE1FC UniRef90_K9NIC3
UniRef90-Q5YT22
UniRef90-H2K9Q6 UniRef90-J3HSN7 UniRef90-R1HQ90 UniRef90-D9W3X6 UniRef90-UPI00030CBEBB UniRef90-L1KZA3 UniRef90-R4T0U7 UniRef90-W5WKA3 UniRef90-J7L8K6 UniRef90_UPI000361CB08 UniRef90-C7QK29 UniRef90-I8R029 UniRef90-Q6AGH6 UniRef90_UPIO0035C423D UniRef90_R4LDN4 UniRef90-R1GD35
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UniRef90_UP10003B51B67 UniRef90-C7PAQ4 UniRef90_UPIO00376875F UniRef90_D8GMQ4
UniRef90-U5VWG0 UniRef90-10L388 UniRef90-D2B8K3 UniRef90_JoWCM8 UniRef90_UPI0003708A9F UniRef90_S9SJX4 UniRef90_UPIO004682A27 UniRef90-U1H358 UniRef90-R4Z7C0 UniRef90_UPIO001851E0C UniRef90-UPIO0030616D5 UniRef90_UPI0003774267 UniRef90_S5SR23 UniRef90-G2NP47 UniRef90-A1RDG3 UniRef90-A4X557 UniRef90-A7H8P6
UniRef90-F3NPP5 UniRef90-G2NKH1 UniRef90 S5VNJ8 UniRef90- W9AHX9
UniRef90 TON3N2

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60
70
80
EAFCVDDGMRRRLLSVKDAARULIFAV|AGALLRPVVEADDD TDWLVAQGLTPVDAGEMCAGLVRSLREQVRVLLASRSDPA VE WLVLAGLLPRPVTA PADSLAVADALREAVDRVARGA DA WWKVQAGRLPAGDPPVPAAARRLRGVLRSLFEAHLAGE HLWLVRHQLLPDRLNGRQSGRLRALREALRALFEAYGDGR IA WVRLLGAA PAPTSRTLRAAHETRETVHALLQAAVADC AEWLAVAGLLGAEPGGSARPSSAHLRTALEARARASGARLD A A WLA GHGFGTPD GERAGAALRSARSVMTGLLD
MK WADYTGDSVEEDSGSALAEMDELREVMYRLALHATKRT RLWWVGAGLPLGRLGPDWVEAFRALRHDVRTLVRAELAGT A A WLLRDSEAALLAVDTADLAAAHDLRECIAALLRAAMTDT KENNVVRQSDLDALENKELHALDHELRSLRSLCQIVLSDLD A ELLARHGERPEDLTATAFADAERLRAAVLRVARILTLTD ARLLADHGETPADLAPATDAAADALRGAALRMTAVLTEPD GWCGQTRGFAPAALSAQMHRAA VVLREALYR\|FRSAIEKT
 DSWFVESRMLDSEPGADASDLAAELRESI YALVEARLDGA D A WYLESGlAVVSPARPADVERATTVREAVYQLITARRRGA GR RELIGPGDVAGDDDLALALDLRESLRAALRANHDSR TSWVRARGSWATRFTADDPDQVISLRQATRTALARAVRPG ARFLTEHGADGRSPTADDVAEVHEVRAALREAI EA P PD RSGLVPAATP LA HVDSGWLVGFRELRGQIGQLVRRSSGSD T Q WL WDNGFEVREATRRDVVAARTLRAAIRDVAAA RTGGH A E QRLVDPGT R L GPA DLTAAVS REGLRSVLLGHAGHA GWLTERFPEVAPTAGEREFRDADTLREAIGRLURRASGGP A GWLA GRGLVPDRAGDADLRTADTLREGLREAMSANHGPR RAWLARQGIAAAQPAGGQADGQAESQRAGRKTAEEGSAPL TTWLREHADPLREPDEQLRLDMVALRRAVRTLFAHAVRPG RRQLAEYAEVHSDQAEVTLIARARELREAIVRVFSAVSYDR NHWLTERGLAPAGAGEMCATQLRSLREHVRALFAAHVAGP
SAWVRQCGPCAAGGGADAARA RELREAVYVLITAARAGR
 DA WAEA VGPVAPEQEAELRSWDGELAAVFA
( ARFATAAASFRAPESQSEHSKLIELREAINSLFRTAVA A E WhLA RAGLTPDPVTAGNVLAAKALREAIDRVLLPPEEPS
 TTWVRGHGAVGFTAGEVELTAVRDLRAAVRSLFARAVSPE FAEQHSIPVSTRPGDLRAVHRLRATVRDLIDHPAQAR HA WLAA QSERIDEVTKAVLEAVHHVRQHTVEAVRAARLGP A E WAERS GLAAAEPEPALLEEARGLREAVDRLL IVAREGT RA WLLADEAEAVGPLDGDDLAGLRRVREHIAAALYAARDGE DSQRLSAGVGEGGVGGGDVREFLTLRDAIRALLRATTEGE AS WLVAHGLVGEGTTASDLTLALRLREALR WAAAANRGD GVLVQRDPDSMRGRRDRRELRAVFAAKTL
ALWLEQTGPPAPAADRATLDRLLETRTALDADASAAALDA A A WLA GHRDTAPPVPAQLLREARELRESIYRAARSDAAGG ARVLREHGEPEVQLSPSDLAELRAAAVSLREVFAAPDAAT GSWAVAAGLATPTVDEDALARTIELREALYRLASARDTPE A A WMAERGLAGAKVAPAMLEAALKLRAATREYLQHDPAGR A GLVPE GTPLTHADPSWLDAFRELRADLVPLVRAPGSPS LD WAGLAGLFDPERAAAALDRAKRLREALHRIVSAR IVGV ADRCRAAGLTDRPVTADDLDRARAALNAWERVVDAAGEQ EDGRARFGLTQGEAEAARELRESLRATLDAHAGHP E E WLEADRLPVVTVTARTLDRVRALRGHVQTLVDAARFGD
 I A N GLLAPSAELTAADLALA EVREALRALLI HNAGGP
 AEVLTAYGERAPELSPDDVAAMRAAAVLLREVFAA AD AKWWE $\square Q E V R L P A G P V P D G T A V R R L R T A V R D V L D S H L A G R$ A VWLNSEPVRALPVGRATLDRLLETRDEALAASAARREQA AA WLGERFSADATCAEHELRDALTGREAMANLTYAALGGH RRWAEAAGFTVVVADGGVTEVRELREVAHRVLEPLATGA KDFCAKWNLADTHIPDAMI NKLLELLRDFLSYVTNKLCTKK VRWLD $V$ L GWGDRPATEEHLAGVKRLREADWAGAWATATGS LDQ LAGHGLRLDALADDDVREVHLLRREARGVVE RATET
 $K T L L K K D L F E G V S V S D E D L Q L T R S Y R D Q L K K$ K NEWLVDRPEVAPTAGEREFRDASALRSALGRLARHASRGE LS WSERRGTLPDAATRAAMQQAYDLRRDIVTLI DALDGGR FSRAATASSASLHRVGRRLDAQLTPLLRELHAM

 TAWLVDHGLVPDRLQDYCHAKLTTLRSQLRHLFDAHLAGQ VRWAAESRLPDGVVGDEELERARVLRGALWRMTRARARGE
 VDFALQAGAVDEPLARRLAREALALREALYR FVARANGP
 $S G L V P P G T P L D H A D A S W L P G F R E L R G H V G R L L R G G D A G E$


## UniRef90 К2мнB2 UniRef90_M2QU15 UniRef90_UPI0003667FA9 UniRef90_W7SVY2

 UniRef90_UPI00037ED1AA UniRef90_C7QED7UniRef90 A4FBT2 UniRef90_UPI0001FFED37 UniRef90_W7ZNM6 UniRef90_D9VYD4 UniRef90_UPI0003710276 UniRef90_L5N5W5 UniRef90_UPI00037A1E47 UniRef90_UPIO00364DC5B UniRef90_Q11C57 UniRef90_U5WZZ9 UniRef90-M5EH07 UniRef90_UPI000369632B UniRef90_X0NB83 UniRef90_D2AXV8 UniRef90_D3Q182 UniRef90_A4FHJ2 UniRef90_UPI00036E789F UniRef90_17GG34
UniRef90 U5W0H7 UniRef90_W7IWQ0 UniRef90_Q6ACX3 UniRef90_UPI00046710DE UniRef90_UPI00035F2EC1 UniRef90 UPI00035DF5BF UniRef90_UPI0003663897 UniRef90_A8LWH9 UniRef90_UPI0003639DD3 UniRef90_UPI00035EE1FC UniRef90_K9NIC3
UniRef90_Q5YT22
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UniRef90_J3HSN7
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UniRef90-W5WKA3 UniRef90_J7L8K6
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UniRef90-D7BWF1 UniRef90_D7BWF1 UniRef90_UPIO00368B5DB UniRef90-UPI0003 UniRef90_A1T9M3 UniRef90_A0QYC8 UniRef90_A0A021W3W2 UniRef90_UPI000370B58C UniRef90_UPI0003668382 UniRef90_UPI000381AA3F
UniRef90_UPI0003B51B67 UniRef90_C7PAQ4 UniRef90_UPI000376875F UniRef90_D8GMQ4
UniRef90_U5VWG0 UniRef90_IOL388 UniRef90_D2B8K3 UniRef90-JOWCM8 UniRef90_UPI0003708A9F UniRef90_S9SJX4 UniRef90_UPI0004682A27 UniRef90_U1H358 UniRef90_R4Z7C0 UniRef90_UPI0001851E0C UniRef90_UPI00030616D5 UniRef90_UPI0003774267 UniRef90_G2NP47 UniRef90_A1RDG3 UniRef90_A4X557 UniRef90_A7H8P6 UniRef90-F3NPP5 UniRef90-G2NKH1 UniRef90 S5VNJ8 UniRef90_T0N3N2


UniRef90_K2MHB2 UniRef90_M2QU15
UniRef90_UPI0003667FA9 UniRef90_W7SVY2 UniRef90-UPI00037ED1AA UniRef90_C7QED7 UniRef90-A4FBT2 UniRef90_UPI0001FFED37 UniRef90_W7ZNM6 UniRef90-D9VYD4 UniRef90_UPI0003710276 UniRef90 L5N5W5 UniRef90_UPI00037A1E47 UniRef90_UPI000364DC5B UniRef90_Q11C57 UniRef90_U5WZZ9 UniRef90-M5EH07 UniRef90_UPIO00369632B UniRef90_X0NB83 UniRef90_D2AXV8 UniRef90_D3Q182 UniRef90_A4FHJ2 UniRef90_UPI00036E789F UniRef90_17GG34
UniRef90 U5W0H7 UniRef90_U5W0H7
UniRef90_W7IWQ0 UniRef90_Q6ACX3 UniRef90_UPIO0046710DE UniRef90_UPI00035F2EC1 UniRef90_UPI00035DF5BF UniRef90_UPI0003663897 UniRef90_A8LWH9 UniRef90_UPI0003639DD3 UniRef90_UPIO0035EE1FC UniRef90_K9NIC3
UniRef90_Q5YT22 UniRef90_H2K9Q6 UniRef90_J3HSN7 UniRef90-R1HQ90 UniRef90_D9W3X6
UniRef90_UPI00030CBEBB UniRef90_L1KZA3 UniRef90_R4T0U7 UniRef90_W5WKA3 UniRef90_J7L8K6 UniRef90_UPIO00361CB08 UniRef90_C7QK29 UniRef90_I8R029 UniRef90_Q6AGH6 UniRef90_UPIO0035C423D UniRef90_R4LDN4 UniRef90_R1GD35
UniRef90_UPI0003741561 UniRef90_UPI000463A583 UniRef90_M3EOH3 UniRef90_HOHY14
UniRef90-D7BWF1 UniRef90_D7BWF1 UniRef90_UPIO00368B5DB UniRef90-UPI0003 UniRef90_A1T9M3 UniRef90_A0QYC8 UniRef90_A0A021W3W2 UniRef90_UPI000370B58C UniRef90_UPI0003668382 UniRef90_UPIO00381AA3F
UniRef90_UPI0003B51B67 UniRef90_C7PAQ4 UniRef90_UPI000376875F UniRef90_D8GMQ4
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UniRef90-R4Z7C0 UniRef90_UPIO001851E0C UniRef90_UPI00030616D5
UniRef90 UPI0003774267 UniRef90_UPI0003774267 UniRef90_S5SR23 UniRef90_G2NP47 UniRef90-A1RDG3 UniRef90_A4X557 UniRef90_A7H8P6 UniRef90_F3NPP5 UniRef90-G2NKH1 UniRef90_S5VNJ8 UniRef90_T0N3N2

-

## A

 $V$ EHALLATLAANAADLLTGPDAERDAACGSPPCTRFFL




| L |
| :--- |
| C |
| C |

 $\square T$ A V L A E L A S A TI DLVVTGPD RA EL K P CH GP GC V L H F V K K D HV L Y H I DR S I F H T L E T T S V S R I R N C E HE E C RL Y F V D T S D D WF TA S SALLALA QII SENGRATWGECAAPNCANLYY GT G


 QREALVSTVARHAVVLLSSGPDVPLLLKECCGNPECTRIISIDRS G TPTVTATLARATIDLLTGPHRPDDRACTAPRCVRYFVVK

 FD GACA QLVDADRRCREDGTWGRMVKVCARETCCRWAY YDAS
 A A A GLA R A A A I M DAVS A GTWPR L KVVCQE GT CRWA FVV T S AS LL GPVAEAVAQLLVEGDFTLVVQCEHPDCDLWFYDRT
 L E H A L A A L A A A S T A D L L T G G P H S G C I R A A L A QVV VA GYAA AV A S GHWP R/L R R CA A D DCA WAF WD S S



 | $L D$ | $R$ | $A$ | $L$ | $A$ | $A$ | $A$ | $A$ | $D$ | $A$ | $A$ | $D$ | $L$ | $L$ | $T$ | $S$ | $P$ | $D$ | $A$ | $E$ | $R$ | $L$ | $T$ |
| ---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | A C A S S P P C

VD A A GLLACAATELLVSPADTSVVRECEAADCVLLILPA H
 SAA A R A R 1 A R D A DA
 GPA WHA A DNWLELVAD R P GRVRPCANDACVLDHYDVVS ARSALAVLADDAIVDLGTPGRGQVKVCSGTGCVAVYDDTS GA WLV T SSAL GLA S LLAERQGVPGGLDASPSCGKPFAHTG



 $A D R L A G L L P \vee$




T P L W

,

| $\begin{gathered} \mathrm{D} \\ \mathrm{~V} \\ \hline \mathrm{M} \\ \mathrm{M} \\ \hline \mathrm{~V} \end{gathered}$ |
| :---: |
|  |  |
|  |  | D D QVIV DIVVIAL A QEV CEHGTARFGRCDAEGCDDLF YD A T VARVRAVMAGGLAVLTA WTGGTRLGACERARCGTVFVDTS





 CAGLLALLARDAVELLLTDPERAAVRECEGDNCPLVYLDTS

|  |  |
| :---: | :---: |
| Ref90-M2 |  |
| UniRet90-UPIO003667FA9 | P |
| UniRef90-W7S | NKRRПWCTANCGNRARVARHYER |
| UniRef90-UPIO0037ED1 |  |
| UniRef90-CTQED7 | RPGTRRWCSMR |
| UniRef90-A4FBT2 | PAGNRQW |
| UniRef90-UP10001FF | R |
| UniRef90-W7ZI | K |
| UniRet90_D9VYD4 |  |
| UniRef90-UP100037 | NNPRREWCSAGCGNRARVARHYQR |
|  | GKRR |
|  | AQRYCST |
|  | R |
| UniRef900Q1 | KNASRRWCSMECG |
|  | KPSNRRWCSDRCGNREKTRTYRDR |
| UniRef90-UPIO00369632B | RGRRREWCAMRCG |
| UniRef90-XONE | RGSRRQWCGMSC |
| ef90-D2A |  |
|  |  |
|  | C |
| UniRef90-UPIO0036E789F | R |
| UniRe990-7GG34 | T DGRREWCSKPC |
| UniRef90 WVIWOO | R R G SRRWCSMECGNRHKVRAARAR |
| UniRet90-Q6ACX3 | RSANRRWCSMRCG |
| UniRef90-UPI00046710DE | R |
| UP100 | RRWCSMACG |
| UniRet90 UP | CGNRARVSRHYQR |
| UniRe90_UP10003 |  |
| UniRet90_A8LWH9 |  |
| UniRet90_UPIo003639DD3 | GNRRW |
| UniRet90_UP100035E | GTRRWDVMR |
| O5 | KNGRRRYCSTRCA |
|  |  |
| J3HSN7 |  |
| UniRet90-R1HQ90 | P |
|  |  |
| UniRef90_UP100030 | PAGRGRWCSMRCGARAKMRRYRAK |
|  | P RQEWCKPSCGNRARVA |
| UniRef90 R4T0 | RrRWCsarcgnrarva |
| UniRef90 J7L | RRWCSMRCGNRAKAARHY |
| UniRe990 UPI000361CB08 | RWCSARCGNRARVARYYQR |
|  |  |
| UniRet90_18R029 |  |
|  | RNASRRYCSRTCANRMNAR |
| UniRef90_UP100035C423D | KNGTRRWCSMACGN |
| UniRee99-R4L | RGRIRRWCSMCM |
| UniRef90-UPIO00374 | RHGSRRWCDMRCGNRAKAANFRAR |
| UniRef90-UPI |  |
| М3 |  |
|  | KGGRRIWCDMTCG |
| UniRef90-D7BWF1 | 硣 |
| UniRef90-UP1000368B5DB | AGRGRW |
| UniRef90-UPIOOO34A1BB5 | GTRRW |
| UniRef | RNHGGTWC |
| UniRef90-A0QYC8 | RNHGGSWCTM |
| UniRef90-A0A021 W3W2 | KNGRRRWCDMTCGNVAKARRFQQR |
|  |  |
| UniRef900 UP | K |
|  |  |
| UniRee90-UP10003851867 | K |
| Hib | NNKR |
| UniRet90 UP | RNGSRRWCSSACGNRERARRHYQR |
|  | KPGNRRW |
|  | RNQARRWCSMACGNY页MRRAYA |
| UniRef90-D288 | RGGRRVYCMPDCGNRLNVANHRAR |
| UniRef90 JowCM8 | R L |
| UniReet90 UPIO003708A9F |  |
| iRet90_S9SJX4 | GLQRFCSK |
| UniRef90-UPIO004682A27 | RSGNRR |
|  | R |
| UniRef90-UPIO001851 | RGGRRR |
| UniRef90 UPI00030 | Q |
| iRet90-UP10003774267 | TG QQWCSPACGN |
| ef90 |  |
| niRef90_G2NP47 |  |
| UniRet90_A1RDG3 | HARRQWCSTRCG |
| UniReef90-A4 | KNASKTW |
| A7 |  |
|  | KNGIR |
| UniRef90 S5VNJ8 | RGRRRRWCSSECGN |
|  |  |
|  |  |

UniRef90_UPI00037F4F52 UniRef90_UPI00040AA168 UniRef90_A0A034U442 UniRef90_S3ZMH7 UniRef90_UPI0003651C07 UniRef90_M2ZRU9 UniRef90-A4FK08 UniRef90_V8D0S2
UniRef90 G8RTF6 UniRef90_UPI000477B41A UniRef90_V6K2D2 UniRef90 UPI00034A41D5 UniRef90_H1QC37
UniRef90_Q0RET2
UniRef90 A0A024RL56 UniRef90_UPI000474C1EA UniRef90_UPI000476BCDC UniRef90_UPI00034DDDD5 UniRef90 D6XC53 UniRef90_UPI000360D982 UniRef90_UPI00037CA552 UniRef90_UPI000377E446
UniRef90_IORL80
UniRef90_G8SIS9
UniRef90_B1W4X2
UniRef90-E3GMP5 UniRef90_UPI00047B9648 UniRef90_A0A014M527
UniRef90_J8HVF0
UniRef90_D2PN37
UniRef90-W4A1Q0
UniRef90-R4SQM8
UniRef90_S9UED9
UniRef90-R1IF37
UniRef90_UPI000465E305 UniRef90_X5L7R7 UniRef90 UPI0003084421 UniRef90_UPI0004760033 UniRef90_C8X7A6 UniRef90_UPI00035FD67A UniRef90 U5QN46 UniRef90_UPI00047C4CEC UniRef90_UPI0001FFDBF3 UniRef90 E4WI53
UniRef90_UPI000477264D UniRef90_UPI0003742FFA UniRef90_UPI000382FA4E UniRef90 C6B943
UniRef90_UPI00037B633A UniRef90_UPI00037ECE65 UniRef90 X5LJY2
UniRef90_H1QLR9
UniRef90_UPI000417A8EF UniRef90_UPI00037208AE UniRef90 S4A2P7
UniRef90_UPI00036A1246
UniRef90_UPI00035F57C7
UniRef90_B7IJD1
UniRef90_UPI000379C27A
UniRef90_UPI00047EA601
UniRef90_UPI000478A186
UniRef90_L8ESP3
UniRef90_N1MC65
UniRef90_S2XS38
UniRef90_C7PW14
UniRef90-I2C938
UniRef90_UPI00036A5181
UniRef90_K9EZQ1
UniRef90-UPI000369A3A0
UniRef90_V9GA45
UniRef90_W4POY7
UniRef90_IORCl1
UniRef90_D8HUR9
UniRef90_K4R963
UniRef90_F8K1S2
UniRef90_G2PG98
UniRef90_E7NAZ0
UniRe UPIO00376A9F6
UniRef90_D3Q4T1
UniRef90-D9XQQ6
UniRef90- S2YZB4
UniRef90- X5SGW4
UniRef90_V7FB50
UniRef90-T2GUQ3
UniRef90-D9VGM1
UniRef90_R1G146
UniRef90_UPI000366A517
UniRef90_UPI0003706C7A UniRef90_H5XEC0
UniRef90_D9XZD7

LVGGSPALDFVNTVDMRRDRWGP DLLRTYEDL Q WVP EHFIGGHPALDLANAVFDRRVPGPGNELLGSPRDILI G GHLVLNFVNTA GKERDA DRWVDWNTALDNWA



MALVES LVNTLD TE T GHDSLDT
RAVAERTTDLLNTLA QEDTG
$G \quad P A Q L$
P R P V $\operatorname{V}$ D T G S S L C
F DARDFVGGHPALDDVNTVTGRDPRDWLD DYEAY LA WL


$Y \mathrm{~V} F \mathrm{~V} S \mathrm{G} N \mathrm{~L} A \quad L D L A G T \stackrel{A}{R}$
K WRRRS EHE ELLL H T P S D L
VS GRPCLD FA GTLRAK SRHGPAPGQELLSSRPALL

LC LD F $\square$ N S R WF I THK P Y GDP I D D Y D WL
LP P A P GTVE HV S L E FANSA VSLP G D R V DDVMDTPDVA
AQP L C L Q F T K T VTAARETATPR D S L L R P S D L

D T GAPCLDDLLYTGGEGDR ARWETMHAA G D L
LE I I A D F F N T Q D R R T R G DP Gl E H LT E P S R L
G GRPCLDLTTTL QVRHREHPRELLKTPADV
$P \square A R V Q A L V N T V E \square P D G L D R L A D P A D A V P W L$
FR P ARRAIDLANAVRSTPGISR DAL



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

EDLLLALLNSAP IVDGKKVMNDLPGSAGRE

VGIALLHHEAN TE DRRGRRLLTGHDAEAATRAWL
$\square D D \square S L L G G H P A L D F V N T V D S R G G R W G P D D L V A W A H R L$

P $\square$ L A L D A A T R R H D GHGGVA D GLA T LD E T
HSVLSTARRTAALVVNGGGPPGPGSGTGPBPAPDAV


A GRLCLDDLVRTLRHRGETEELTVEAALLTA WI

F TSRDLVGGHAVLDDVNTVTAAEPVDWLDGHPRLLEWA

D A G R I C L D L A T T HPE ERFD SVVDVL RA WIA
 FL NTWSDELVGIPEDGSTPKST
DAGSPALDLVATV GRRPSTPVERLGMBCRLL
 D PLGTDEDA P A P D P A A V
A L E L VQ S LVN T LD LE S GA D A LD T
$V R A D P R L P R D A M$
DS GR DCDLDLLATTHPEERLDSADRTRAWATG

$P L D G E P L P I E L V N T T F V D G G R G R V V D T L T T P S E L$
D F A N T VD VE D R
T D K L A T R A G L
GEEQDALADPAEG
$M$ VGGHACLDFVNTVD ARRDVWGPDLLQTYADL PEHFLGGHAALDLSNAVYRRNPPLHNELFNSPRDD



A LALVNTWRLSTTGE VDELAEP GDA
$L$ V G E P L A L D L V NT R S AV G G D A LA T P E G L R G WL
T P A P G V A E HP S L A L V D S A GELP G GR RF D DLAATPD S T

 A R WF RA V E MTAAPVS QA ELTE ARLLLREALYRLGTGVAAA P GARLVEKARLHAGLSES DLKELTELREAVHAVFSAIATGA A A FADLLHS L PVVRARPGDPRAVHRLRATVRDLIDBPEQAR A RWLREEHGRSAVGLDDRKRQQLVRLREAIREHVES GQES G VGWLDVEPAPMPRVDEHCLERFRSVRDAALLILHSAVAGE RPWLD DN GLMAAELSDADLQLLRDVREALRAVLVRNSGGP A A WL A GPPLGAEPVT DRELA DAKAL RQAI WDVAHARAATA ADGRARFGVAEKELAEARELRESLRAALLAHAGHR E QVLRAHGESEPHLTQKDTTALHRVAADLRHVLDAAT T RAWARGHGGGGGSDAEVALLVAVRDALQEVVRGRRDP
DAF DLPTPAAGFTSRDLERVQALRAAVDRLVQARLAGA RQSILAAHAAEAPDAAARALHDAKQLREALFGIVDALVHDA $R R W C R L D P T P A L E L G P A D V R A A R T V R D A L W R I G L A R V A G R$
 T A WV R E H A ET LP DVDE TTVLA AVVDLVRAAVRALGARAVRPG RA WLI A NELGSAPASES LLLRDARALARAIHRAGTA IAS G G A A WCGES GQLDPKR LDDRSFHRADELLREA V Y D L A VARMA DA AEVLRRAHGLDPIELTGEDLGELRAAAAELRAVFAAR SDWAR QARLTVIEVTDDDLAAALALLREAIYRTVTARLERR



 T A WL H R T A P QVTELVGHPVDALIDLRVVVRNLFARAIRPA A R WV A TH LLLGRAVAAAE DLIRAKELRREVLWRTANRSAD GD

 TRWLAEAGFGPGAVDEDGLRRTVTLRETVDRLCRKTGR
 AALLVEHGERPADVAPGAFADAAELREAVRRVTDVLTETG $N Q W M T A R G L A P V D A G E M C A A Q L R S L R E Q L R A L F A S R T E G L$ GASRLGLDAGDVAVSPADLGPARLLRDALWRATRAASAGG G R H

 A ERAVAA GVAREW EPVEADLGAVRVLLERWTAVVDAGP TQQFGGTG S Q TEIDAHLQRMRNALHDVIR E QWLTTAHGLT GAGLQE GDAERLDRALRAHIRSVIVVSKVHGH
 ERWLREHDLLVGDAPGGHLTRAHELRTALRAALRQDAEGD
 $R$ L WCL E H T GQASSVDT T A $\quad$ A R E I R D L M R M S I S C D SA N N GLI I A S GA S P T A A E L D L L V R R V A EVLRAHGEDDPDLTSRDVEGMRAGAVLLREVVAAD SADA A S WM A A R GMLLQADITPAMFDTAVGFRRALRDYLQHPPSRR EEGRARDGIGPEDVADARRLRESLRAALLAHAGHR D Q WLA E HGLAPADAGEMCTA QLRSLREQI RS LL ASRVAAL A HCAPRTVVATGTGPAPADVATARQLVRAVVTLLLTAATTGT
 $V$ D WCA ES SLLI GGERDEAGAERERRQVIDEARERVVALLLFED I E WC L R A G A L GP R E R A A WM R QV R T L R D H L H A L L A S R I D G A $R L G Q R$ WA G



 $R S W C Q G V G L T L R E D G H A L L G A L H E L R S A A T D V A T A A V D G R$ RS WLLLRYNFIHDRRVSDEDLVLARRELRSSSLRAAINHNPH D $\square R W F A T V G L Q G D L L D H Q E W V G V A S E A R V L R E V I G T V L K Q R$ RD N GLLAAAGADVVETVDLRFLREVREAFRAVVVHNAGGP ARVLREHGEPEPTLSPEDVAELRATALELREVFAAR
 ARLLAD HGEHPDDLTEHGAADADELRAAVTRRTAVLTETD S GLVPP GTPLPEADASWPVRFRELRGQI GQLVHGELEGR SAVLRPF GQPAAEASP QR I A E DRGLRTTMMDIASAPDSAG D A WLA R H RLA GVSS DVR DLGD WLDL REAIR GYLTALAGGA
 RRWAREHGGDGGSLELTLLREARDALRDVARGKSSP A LA Q CV
V VWLL LA EASARPLLAEAALEKAK』LREAVYAALQAEAAGA GT WL L A A GLDA DE QEAVAVAEEVVRDI RESSYALFDADASEP
 D A WLDDDVGVERRQSSAAELALARRLRDAVRRRAAQVTADD A R WA V E A GLAA A P A A G R D D L D R I R E L R E V T Y Y R L V H A TLLG G S E A WLR RHDLPAVTLGPDDLSRLAALRAAVRELLAALAEER


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SCSEPDLLENHIREALNHANLCVAGREPAHWTVLPEKAGS LLIAGASA PADAVDDNDAVQAASVHRLLTANAREAEHVGAQSD APTEAQCKPDRTVAAGGVARAEVDADGNVGLVAAGDS PPPAVATLNRTAAAEPLAPELSADGTS VRWAAPVR PHREVTPLGELLSRVPLYVAVDERDGSA GFAAPAA EQAAERLNHLLATTAHPPRLTDHGATTWHLHLDSDDAPW ACLGEFLQGVSRVPVIEGGGDRWVLEVPEAHRDA SPDPEDAGHLNTCAAPPTPTFFLRGDAWLRVEVPQPD QPADLETLERAWRRATRGQRLIAAAGRAFDDPPDSANRAD APAPADLAALNAAAPPL!PRLAPD TTTAGWAEPAT PEPAARTLERLFAAAPLVLDVRPDGGAALRPAAGLGGVAY TEEDVRTDNEAAAAGRPVPAWESGQDR WR WRLGPDH APSPADATRAAAARTPTVPVLHWTDDTEPVVHRQPGPPR VPDPADLLNRWTARHRARLVLT GGRARWHLPETDSAR PVADLETVNGLAAGPaVGVELT

ETDSAR
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 APSALQAVNEALTRVPSVSLLRWSDDEGLQRSAEHPATQV EMAEADRINDWAGRNDAFRVLDGAG PPTALQRLNRWADQLGTPQLTWPDDDPAPAVTWSARTSDP
 HDGNVEQVK

LEQLTKN
DTDRAELNAFAARPPLVPHWTG AARRLEPDDRLLGSVA RERLILRDG HVALAEEARDE PPPERALATLRAVAAGGTARAVLDPDAAVRLVAAGDS TDAAAEALNRLLADCGARPRLSRHDGHAWHLHTRGDDAGW PPAALSAVNDALTRVPTAPLLLWDDKDGPYRATTHPTTRW $A V T D G D T$ RA ERIAAAPPLIPLWGSRWH AGRSLAVVNRLLAVGQSYRQI APEAANRLVLHRHQHWQQP AATA DLRERAHTGPLRLTSHGGAPWHPHDHDDDAPW GAERARLLNALLAEGTGPPRLTDHDGH WHLHHRDDGLGL QADAHAALDSLLRDAVLTPEVGPT GTKWELQTSPD PASEADLVNDALTRAPAAPLLRWDPALGLHRKAVRRDSGD APAALERVNLLARAAPPTPCAVRTAEGTLVRSLYAE PG GQGGEAAV GYSFHVTLTAGHGARLTI QDSDLKLVADMARRGLSQQTLGQVGG TVEWRRSDAKD PVAPDTTPHGTAQWPVHVRGEDGVP PPSKADADNLLAADELGTTHLEWPAEGEPAMRWSGRSSEP PPAALAVLRGLADASTARVDLAPDG GVRLAAAGDGV AAH ALNRLLGAHTGALRLTSHQGTPWHPHLRGDDAPW QRSVARALNEAI AAFPLVAEL GGTGKALLRPARNDA PHRTVTPLGDLLAHAPLHLAAVDDDGSARLTPADPAP PADPAALVNDALIKAPAVALLHWDQKDGPYRAAPHPTTQL PPAARTLLNDLAAANPPAPQL DSRGHLHRTAPDPDA PDP GLLTAADRVLAAHPVLVTARGPL ATAPGLPP ENDFDTYLEKQDEKAPFTYKIIEQ WQLVPDPVG ED APEAAAHLAGMFRTATIAAADLVRSGEG WQWRDRETDLRS PADAVQGVDQWLHRAWSSQALGADGRMHWR APGPAEAMSRVEERAAAAARLTVGEDGARF GVGVETSG
 PDDALARVNEDARTAPPAPRAVRNQDGSLIRELAAAP PE QAAEPDRINAAAAHPAPVPMLTRDGTAEFHRPIT EPGEDTFLEKKDESAPFSYK LDAK EAQAVAGATVLAARVGRAPVLVRDADNRWQWVPTALDATL APRPVALLNDLARVEPPVPRLRVDPEGRPG SGTEPLS HHDGFQSMNRAAGQFRFFYRFGEATDVIESVDVQGKGG LDDRQEEKVNHFLRVSSYRVELVEKDETLH SARKFDSGS VASAASVLNALFAAYAGPPRLTDHEEGGWHLHADPADDGP PHREVTPLTDLLTRAPLHLSVDPGDGS WHAATLAAAD TDRAAHALNELLARCGARPRLSRHDGHPWHLHVRGDDAGW AAPGWAQLAEWASAVTDRQDFSESGAVRLRQVGGDP NPAQQDLVRMNDAAVGAAHYDELQQADSLVARRRWHVADP DTDLIAAAEHVLRGVPLYARLGTDP AALGPLLEGVHQTPETTA DGLRWTVVTPPDARLLA DGSAPDAVHRLLRDYPPDMHLSDHDSGGWHVHFSRNGTPG PDDALQUVRDAVALALPKRSLFPSGDRAWQWTDAASLNTI PSQPLGLLCSRAANRLGAQQVAWDGTERGLALASDQWED VPESLDDVAAAAAAPVSTRLDLTATELQRSVRWHVEYGG DGADLRTLNAAAAGSPTSLTLGSRGAQ RTGGLGA TPGGVPANGGEARTGTRPLLGSGAGPHVEFAGDDATA PASAARRVNALLAGARP PRLSDHGGTTWHLHFARDDGP
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130
140
150
160
$A \operatorname{ATA} V M G L A A V V A E L G A D R|L| G R C H P R C G R A F L D T S$
 VTA A L A L L A V V E A F Y T L A LI K D R L A V A A S E L L F M Q P M L L S N



 AE WAASSAGMCLA LLL SDRQRPPGGVCAAHGCARVFDDTG VELVLTWWA HVEETRPGRLKPCGNPECRRFLLDRS

 LA
 A A LA V V AL A Q A A A F
 $G Q W L R T S S G L A D A V L L A E R Q A D P G G D C A A P S C E K S F V D T G$ AP QLL LATLAADVLDL LAAGAD DDNVKRCAHPGCTRLVVDAS
 L N WV I Y QV A R S F S KL ITTE Y P L A Y L K K C E N P E C D WUF Y D D S VEHAMASLAADDADLLTGSDAEDLSACSAPSCNRYMLRT


 GA WLLVTSSALAALAVLLSDRQAPPGGLCAAS GCGKPAAY LG VP L QVNAAKGLA QLL RTKMWHRIRVVTAEDCQWVFVDRS | $L$ | $G Q$ | $A$ | $L$ | $A$ | $T$ | $L$ | $R$ | $D$ | $A$ | $D$ | $L$ | $L$ | $A$ | $G$ | $P$ | $H$ | $A$ | $A$ | $R$ | $R$ | $E$ | $C$ | $A$ | $H$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

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 E QLL LEAVAEADADLLCQGGNFALVRRCEGT GCSLWFYDRT
 E RLA AVRAAMAWSE_V TERMPGRLRPCANAECNLFLIDHS LD H AL A R L A A D A A D L L T GP D A E R L T A C D S A P C S RY L L
 VDTALA HIVVMSALTATVNGTWHRLMRMCPAPDCQWVFYDNS LDA S N RI ALLDA A GLTSRDERRVRACQGRNCGWLF LD Q S

 PE WFLASSSCMALAVLVVWDRQRPPGRVCAS GACRNVFDRQG
 LD HALAALADNTADLLTGPDAERLTACGSSPCNRYLL A T


 $P A A G L A L V A Q D A D A L L P S P E V R R V R V C G A D D C A V R F V D R S$


 SA QLLSVV ARDL DALVTDPRRDRLRTCAAE DCGMVYLDHG

 WGAWLVT SSAL GLAA ALLAERQDPGGLCASPACGKPFAHTG
 AD WF TAAGA HALA QLL SANGRVAWGECAAPGCATLY LGTG CGELLAADIARDTVELLTDPAARALRHCEGDNCPLVYLDTS

 AETALARVARDWAVTVASGEWDRLKQCPDHACLWVFWDGS V E TVLA WAATE
 GHRVAFETAE $\quad$ KLVSRNDRRRVRECTGPNCGWLII DTS
 NPALAATATDADTVVLTDPRYRDQLRRCANPDCSMLGFLAT VVT GLLARVARESIALLGGGEATKLQACYAPGCVLYFMKTH ATAEVARAAVVLLGEMAGETPPRVRECERQACTRLIIIDRS


S E R L T A WL A E A A A D F L A R P DVVA K V R E C E A D D C I L L F F L P P A H

|  |  |
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| UniRef90-A4FK08 | PANNSVW |
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| UniRet90-UP100 | SGSPRRHCSRRC |
| UniRef90-H1QC37 | KPNSARWCSMACG |
| UniRet90-Q0RET2 | PSGARRWCSMRCG |
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| UniRef90-D6XC53 | W |
| UniRef | RGRRRRWCSMTCGNKVKKANLKA |
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| UniRef90 UPIO00377E446 | AGGPRRYCSTRCSTRQRVAAHRA |
|  | RRWCAMACGNRAKKTAYRDR |
| UniRef90-B1W4X2 | W |
| UniRef90-E3GM | KSHTRKWCDNKCAS KMKVRRYRA $^{\text {S }}$ |
| UniRef90_UP100047B9 |  |
| AOAO1 | RGKFRRWCSMTCGNRAKKDAMRMR |
| UniRe990 J8HVFO | RNASKRWCGMSC |
| UniRet90-D2P | RQTWCSPACGNRERVNRHYRK |
| UniRef90- R4SOM8 | atar |
| UniRef90-S9UED9 | RWCSMACGNRAKNKTFRHK |
| UniRef90-R11 |  |
| $\begin{aligned} & \text { UniRef90-UPIOOO465E } \\ & \text { UniRotan X } \times 1 / 7 R 7 \end{aligned}$ | RRWCTMAC |
| UPI | R P |
| UniRef90-UPIOOO4 |  |
| UniRet9 | RSRTWCSMSC |
| UniRef90-UP100035 |  |
| niRet90-U50 |  |
|  | SGPERRY |
| Rer90-E4W ${ }^{\text {a }}$ | RPGSAKWCSMTCGNRMKVRTHAHR |
| Ref90_UP100047726 |  |
| UniRef90_UP1000 |  |
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| Uni et9-C6943 | RGGARRWCSDTC |
| UniRef90-UP100037ECE65 | - wcspsca |
|  |  |
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| UniRef90-UP1000417A8EF | PAGRGRWCSMVCGARAKMRRYRAK |
| $\begin{aligned} & \text { UniRet90_-S4A2P7 } \\ & \hline \end{aligned}$ | - |
| UniRef90 UPI00 |  |
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|  | GKRKWCSMKCGNRKKVAKFQNR |
| UniRef90-UPIO0037 | RWCDTKCGDRNRARAYYAR |
|  | KNQRRRW |
| UniRef90-L8ESP3 | PAHNRRWCSMRCGNRAKARRHVAR |
| UniRef90-N1MC65 |  |
|  |  |
| C7 | Q |
|  | RYCMP C |
| UniRef90-K9EZQ1 | KRWCSMRC |
| Ref9 | NGKPRKWCSMR |
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| UniRef90_W4P0Y7 | R W |
|  | RNHGGTWCSMTCGNKLKNREFRAR |
| UniRef90-D8H | GGSPRRYCSSRCATRERVAAHRAR |
| UniRe990-K4R963 |  |
| niRef90-F8K1S2 |  |
| UniRet90-Q82D62 |  |
| UniRef90-G2PG988 |  |
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| Ref90-D304 | RSRTRRWCTMRCGNRAKT |
| UniRet90-D9XQQ6 | R |
|  |  |
| Ref90 X5SGW4 |  |
| ef90_77FB5 |  |
| T2G | R |
| UniRef90-D9VGM1 | P R REWCSVACGNRARAARHYEK |
| ef90-10H9U9 | R |
| iRef90 | R |
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| UniRef90 H5XEC0 | P RRRWCSARCGNRARVARHYQR |
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LDGGHLSLDFTNTRLVADP! $\qquad$ WDVLDTPEGL D Y Y Lick The ALADRST
$\square P P A P G T D T H V S \square A L A N S A V A L P G Q Q R A D D E E T P E D A$ WTAHRFSGGALALDVANSVVLRFDPTRRDDRFADGAAL WTPHRFTGGMLALDTANTVVLRHHPEKTFDRFDDPAED MNDRSAAPGSLALVESLVNTLDLESGADALDTAEGRARFG DSEPLTGEPLAMDLVNTRPAD GDGRSDLLDTPQRL

SR $\square$ HEDLALIRF $\qquad$
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$\square \mathrm{DD} \square \mathrm{NLLGG}$

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$P \square A R V Q A L V N T V E L P A G P D R \square A H P D D A A P W L$ WTPHRFAGGALALDVANSVILRFDPEHSIDRFAELPQM
$D V L L E L L N T T P V V N$ PGGHYVDLLGTPQTA
MTFSHFSEYPF
D PGA


NTVERG GVVQDQLADPEAA KKQLHDKEDLT Y WL LALELASTGGPGPROEVADDADAMAEA LCLDFLATTHPEEQLDSPDGLRTWITAA ALVNTLDRESGADRLALLAADAEPWL PDTEQD ${ }^{\text {D }}$ LLLAFLNTTDTETGTDVLRDAEQWQQWC DAGTLCLDLVATV GRRPEAPVERMGDAERLL LALVHDLVNTVDLATGADALDTP GLALLQDLVNTLDIGAGTDELDT
YSREAAPGDLARLETFCNSARLLYGEDSFTTPATA WAAGDATDLVNTAPEVWHGEEHLPDLAAFAGL PRPAAPPPLTLVQSLVNTRELLEDRDDLSTPAGL

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 TRWLADRGLVPGDTAAYCQSQLTDLRAHLRTLFAAQAGGE A GWLSARDLVPPGADATDFRIALRRREVLRDCADANRTRE DSFAEERFGRLGPDGPGRREPLIGLREATDRHFRAQVRAE REWLVRHGWG GEPTLEHLI SLRDA REVMRAFLADR ARFAEAAGFRAAEDGGRRLEAVLSIRETTDRLFRRAVSKG ETSGNPGSADAAGDAGGEVARARELRESLRAALLAHAGHP A A WLDLEGAGDPAPAESDLGPVHTVRAHVEAVLHALLRGT ARWLGMAAGTPVEVGPGDVTTALAVRGAVRDLLDAMVDRS LVWLQQNGLA QPDAAAA GYDDALRLREALYALLDAVIKER LDWFHANDLDSRGERTALQRAAIALRELI YNLLI AR GIGGQ A GLLRDHGFAWREFDAAEHAA GLREWGRTLRSFFALTD RDWLRANAANLGTPSEADRTALVELRQHVRAIGAEYVAPQ H NFLD DQEAKANPAAA D DE LEENAKALRETLHRIFBSHEERD ARWLTERNLAPAELRETCALRMRSLREQURAVETSRJDGR
 A R WLA DA RLVVPPALDDTWVARFHELRSAVSRLMAALGGPE TERGLGAPGLP DRVKTVVDALRCVVLAHHNEQ A A WF DLTGGLPVPALTA QDLDAAQALRAAVNAVTRALIAGQ A LLETD RLLSEPDRPLTSADVARVRELRAEVSEALEAARQGR E AFERERFGPLLPARPENRKSLIELREATDRHFRAVVRAE AEWMSSHGVGGATDKARRVLI DARSALQAVVRGKATPD A G WLLA ERGLLDAR QVGAPDHGLDL R LRAGIREELGVNVGD D TAWFEAAGI GPAPVDEPLLAQAVELREAI DAGLLAVVERA

 VA WL R RGS RDDPGGA EAAFGQALRIM DDLDEAFRALATGR
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 HG
$R G L V P A D A A A$ K A P GVVAAREI R NAMRTAVV
 ER WV A S C E GL P D A V D P E GLLA S A L S L R E A I Y R L A L L D R IIA E R
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 G D WL $\square A R G L A P A R L Q E V C A G R L R A L R G A V R E L L D A S V R G G$
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 RERTSEALNSFAERADARPAWTRDGAA HVRTQADAP LADRAHLI AGASALTSTSGHITLLADSARWAVSPRPGATA DPGAVSVLNGELARTGTRPLLQAMPGPPGAEFTGDCTTS TESMIEG|LNQLLVRHAAVPNLHGHPDGPPVLAFHRADASL EPAALDAG NAADTRVPTAEELRWSSARGLHRSAPHPTDQV DPAALTRLRDDEADALLAHAQLMRGKTFAWSWR DVDT DT PPAALDTLNTALLAAAPATPRLAWTADGPHRADVPDTGNP

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UniRef90_J7LC46
 PERLLGALATDAVEFDASPERDRLRTCLAPRCVLYFLKEH
 ARA ILA W $D G L R \square S S$



































































 $R T A L A A V A A D A J E L A T S E$











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$j^{2}$


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SHGRQEWCKPSCGN
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RGGRRRWCSEVCGN
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RGRRRRWCSSECGN
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P RRRWCSPRCGNRVRVARHYQR
RNGTRRWCSMACGNRAKAARHHAR
HGRQQWCAPSCGN
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${ }^{1}$ MSA ${ }^{10} 40$
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ARWLAARGSSV DGEAEQARVL AGWLRQHGLAAAVPGAAELGRLTDLRRAVRELLAALTEHR RAWLLGAGLVPGAVDHRWLDRFRAARDLLHRLVHTEVEGH ADWLRLEAPPPEHLTGSDLAAVHAVRDHTAAALAALLDGR GQWLAERGLAPVDAGEMCAAQLRSLREQRAALAARLDGA AEWLAAAGLTLPEVDEQLLCEARELRESUYAARSVADGR EPWLRSHGLLPADATPQELDEMRAVREALRALLVRNAGGP GLLAVPAGTALVRVDATWLVAFRELRGAVGRLVQASLGQD ASLLHAHGPTRPDVTDEDVTSLGAVADRLWEIFGA QD AWLTQRDLAPIDTGEMCAAQLRSLREQVRALFSARAASL AA WFREHGLPAPAPGAEDHRLALALRAGLREELGVHVGDS LA WLASATLLPAAAADRADRDAKGLREALFGDFDALAHRA DGFARDLFGPLQPVAPENRPAFLDLREATDRHFRAEVLGH VSEMEASGLALVASQQKSLVRLWEFREATFRLVRSITLGA VAVLRQHGPDLIDLTAQDVGEMREAALLLRAVFGA AGLLDRHGERGPTLTEADVAPMRSAALQLREVLAARED EQWLQSAPPAPCPLDARGLSRLRSLRDDIRAALATRHADE VECGLAPEGTL TTEADAANARELRAALVVVMLAHAGGA QAWLLEHGLGTEHVTEADAAGARELRDALIAVLLAHAGDP RPSADDVFPVQLLRREVRGITETETAEQ DA HGLLEHHLHLDPEVHAQYLALRGG|REELGVNVGVS TELHGDRPGSARRGRPADLHAVHALRTTVRGLIDHPDRDR EAFERELFGDMVGPAPQNKGNGELREATDGYFRARVTGE
 VERRMLARGAARSTGPDDLALALDLRSGLRAVLLANNGGN VA NELLAPSSELTAADLETVTRTRESLRALLVNNGGGP LLHWLLESAELVREAVNSSDLDTVADDAKRLGDWFRSFINPS AAFAEAATHLGAERGAEKRPVFLGDREA DDYFRSSUASG
 AA WAVHAGLPVGVVSGKDLRRAI ALREALYRTLLCAARRQ MARLEKTGLHDGEGATAAHREAVAFREALYGLFKALIDNE VE WCARAGALRPDDGVRVPRTARELRRHLHALFAARVDPL A AWCRGVGLTPAPAADALLRALHAVRDAAYDLASAGB AAWCRG ANLTLVPAKSERRNAFDGLREATDRHFRALVGP TAQLTRLAHTGPQTAQHALDSLRAFRETLHDCLMAEQAGS RARLG TTGESAAQARELRESLRATLLAHAGHP TAWLDLHP NLGAVDGDELRELREAIREVFRSAVETR RRWCAERGLGAAP ESTAAREIRYSMRAA!SCSAPAA AWFAAAGAGESSDATDADAATARELRDALLSILRAHVGCD VEFARQTGAVDPAEADRAFADATALREALYRIFLARAQRR RAWMRARGVESSR AGEHGIRGATDAEADARAl DLLRESLRQAL LANHDP L GLIPARGPLPLPQ PHWPAAVREVRGHLGRLVDSILGGRR RDWFATRGLVPAEATADDVAAAHRIREGLRAVLLGHAGHA TEWGRAHAAGLGTATEDLRREVVELRQAVRALFARAVAPG AAWLDDLPTPAGGLTSRDVDRVQVLRAAVDRLVRAAGAGP $R W L Q D Q E E L P A G D L V A D E Q L R L V G L R Q A V R A L F A R A V S P A$ SALKAESPETWSRFGPLDETTLIETANLVRPIFAATSAG REWCDGVGLRDEAVTEELRTELRTDREAAYDVVAAVVHDR KILFMKE YFHEEFPFHTIEELKSFREDTRMTIEGEGS NRWLTERGLAPVDAGEMCATQLRALREQURSLFASHVAAL AA WLRGVQPRLAPADADELRRFRQLRDALRRLAAVTTGDT DAWYVESGLTVAPARRADVERATAVREAVYRLVTDRRLGG DDVPHVGKLAMGKSSTAVIGDLRQLRDALRRLAATATADP GT WLLAAGLADEGEAGAVAEEVREI RESSYAL FNA円AS N HHAGLLTPAGDGEPSEAELAEARVLRRLFWALFDAQSEGR KQFM NKYFHEELPFYTIEELKSFREDIRVAIEGG
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 RRWAREHGGDG SLAELTLLREARDVLQDVVRGNSSP DSWFVESGLLDERPDRADLRAALELREAIYLLVRAVGTPL DRWLADHALAPERAGLAEMSQLRSLREQVRSLLLAARVAGV NNLINNHDLELLNDTDKNDVKLRKLREDCFSTIQSDENEE AAW AGLETATEELRLRVVELRWAVRSLFAHAATAG APLLRAHGDHRPPPTPRGVRELRAWAAASLAPCFAPSGGR

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 GSD GLLAELLEAVAVVLR GDAGPQSLAPFLRDVSQVPTTTS $\quad$ VTLQWQLQAP RPSPAALVNELAALVPPVARLEWGPEG VCPAPDSLLLT
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 P S DLLEHAWRRAVSRQR RHPVKPA EAGAATLI ENSVQKAVLVSRLSNTA पAWEDPAANAGADL VDRAAGLLNRLLLERAGPLRLTSHEGGPWHPHVRDDDGPW TDTAAHALNRLL AQGTGPLRLTSHAGAPWHPHLDDDDAAW P A A A LAAVNEALTRAPA A SLL R RWDPERGLHREVAHPVSR】

 RPAAVATVNALADADARAEVVPADGEP DRAAAVRGSQ A A A GAAVLT PAVDAVEAA R R A GRAPVL RHDPSGRWRWHVTA A

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 $P$ AS P D A TMSS N QA A H R C L A T L S S T S D GPVV E W $L V A P A W Q V Q V E F R A G G P V L T G A D$
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 T G D L L Q Ell N E Y L R S H Q A T L E I D D G

 L E K W L E KYP F HVYYI K E DMK G

D DEALAVVNDAAASAPAAPRLTHSGRWT
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 ESSLQK WL EKYYP FHVVHIVKDDMK G $\quad \square T Y E P V E E N V$
EPAPRD
$R$ VP A P A
PVSPAAVNAAASISPPRLVPALHDLRW
RAAPEAVLNAAAEAPPLVPVLRSGALRW RTLRPPARGS
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ETELLGRTANDA\|GLLGGRDLTR|VIKECAHDRCGVLFEDRS VA $A$ AL ATLATDAADLLTGPAAERLTACGSAPCNRYLL CAALVSLVARDAVELLTDPARGLLRQCEGESCTLLYLDTS $\square A$ ALLEALATIALHAVRLI GSDTA LRQCEDDNCTRIFVDRS CGALLAAVARDAVELLTDPDRALLRACAGDGCTRVYLDTS VAAALSEIAGDALALFASEAGAALSACASPECDRYFAKVD VEAVLAWSA LRETMSGRLRPCANPECRRFLLDRS ANGIDRATAHSVLKLIASPEPERMKDCGN CGWLFLDRS DDSLLAARAVIAWSELEQTRPGRLRSCGNPDCRLFLVDRS FDAYLGECLALVFIGGGLGELDRLKVCRNPDCRWVFYDRS PQALDTATARSALLLLAQPEPERLKDC PNCHWLFLDRS VVTALARLARESIALLGGPDAAKLRACYAPGCVLYFMKTH RVAAAVAEAL VAGTWTRLKACEAADCHWAYYDRS SDNISECVSTAFALLTAPHGA I RPCAHSECTLLFAAT DDAAVAALARDAGEVVSGEGGPLVRPCEAHGCDRYYVRE
 LDHALAALAADAADLLTGPDADRLTACGSPPCNRYLL ARSALAVLAADAVDTLGGARSGTMKVCAGTGCVAVFLDTT VEALLGLVASDCIDLVRSGMAGDVRRCDAPTCGLRFV CPALLATUARDALDLLTDPTRSALRQCEGDNCPGVYLDTS AEWFAASSALALAVLLAERRALPGGVCASASCGRPFVMTG VDHALATLAADAADLLTSDDAERLTSCGSAPCTRFLL ARRALGALAAAWSELAVTGEAARLKRCAEHGCAWVFWDTS
 DYH RLLALHLFGFLGSPDMSRLKECR RCSWLFIIDRG GEWLLGSSCLALAVLVWEHQRPPGAVCASVSCENVFVTQG GEWLLASSCMALAVLLWDRQRPPGAVCASESCQDVFLTQG VEHALAVLIADAAELLTGEDAERLTACGSPPCDRYLL VELLRSYVLIQLLAAATYADTMRRLKVCANPRCRGAFYDRS VAGALGALLAAAADLARQNGWARLKACRNPPCHLGFYDRT
INGGFGTVLANVTELAHAGLWDRLRACRHDPCHFCFFDRT ARLAVGLI ARQAIDFFGGPPRHQLRACLAPRCVLYFVKEH ADQLAA GVALAGVVRALGHERFRACAAPGCRGVFADAS SQQPLATLALTWTRLRLTGDALRLKRCAEHTCELVFWDLSS ADALSLICGMGLGGVHTLGERRFRPCAAPTCRGAFIDTT

GMQGAARAVLA WDGLRVHSPGRLRPCANTDCHLFLIDRS VKAALRLVAAYVTARADGSWQRLRRCPAEDCAWVFWDSS VTSRLAGLLLAVRDAQRDGSWSLLKACGNDECRWAFYDAS ATSLGNATAHSALSLLSAETQERLKICGN CGWLFIDRS WGTWLITSSALALATLLADRQSPGGLCASPSCGKPFAHGG YVRLLAALARAAIDFLSGPERAQLRSCTAPRCVRYFVK PVHAVALSAGAMLDSQDDLGRLKECPGPDCGWLFFDET ARLPLKRVALDALDLLGDPHASRLRRCANTRCGWLFDDTS EDALLSAVARDLDTLVSDESRRRLTMCASEVCRMLYRNPA
 LL SRVAAAVAEAVTAGTWDRLKACEAADCLWAYYDRS GGGALAVIGRSAVEVVAGAS

RGCANHDCVLFFA H ALGDVLVAATHLVHTGYWDRIKMCPAENCLWAFYDRS VDRSFAYLLSAVADLASRGAWARVKVCKNDTCYTAFFDKT DAPLWPVVLSAADVLTSGAEADRVRVCETHECSWLFVDET MDAVIGRVLGATAAALLADGTWARLKVCANDRCRWAFYDHS LISALLSLLARDTLTLLTDPGRALLRRCEGEGCPLIMYDTS
 LAGVLSVLARDAVHLLTTRGPSRLRACEGCCGLAFYDRS RVRLLATLARAAI DFLTGPQRAQLRSCTAPRCVRYFVKT
 YTKVLSIVLIDA UVQENLWGRLKAC PDCRWVFYDN
 QREALAAVARHAVELLAGADVPLLKECGNPECTRVYIDRS AEVTLTKIAEQAATLFSSPQRVDLRACQAPGCVRYFVRDH
 YTKVLSIVLMS IQQEVWGRLKAC PDCRWVFYDHS
 ADDLTALLARDAIDVLLDPRRSRLRACDSPVCRMIFLDSP
 VEavLawagTe ATQALADLAREAVETVAGPM GRLRAR ATGALADLAREAVELVAGPDSALLRECGHPDCTHVYLDRS LDHALAALAANAADLLTGPDAERLTACGSPPCNRFLL NDHELYK VK SMLQTFDTDSDTR RKCKNDECDLHEVDKS GERGVAETAAAALEFVAGGERTDLRACPAPRCLRYFVKAH $V$ VRVLAA ITAAEGVELFGGERRSLLRACYAPGCVLYFVKDH


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170
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K N R S R RWCSMRCGN
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KNRSRDWCDMTCGNRQKASRHYQR GGSPRRYCSTRCATRERVAAHRAR SHGRQEWCKPSCGNRARAARHYSR RNGRRRWCDMACGNRAKAGRHRA
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HARQEWCS $\square$ GCGNRARAARHYR
RNGKRVWCSMECGNRAKVGRWRRK
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HGRQEWCKPSCGN
PGGRRRYCCVTCQNR
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P RREWCSADCGNRAR
RGRRRQWCGMSCGNKDKAAAYRAR P RREWCSASCGNRARVARHYKR RGGKRRWCNMRCGNREKIARHR
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RHGRRHWCSTRCG
KGGKRKWCDMTCGNRVKAASFYKR P QQQWCKPSCGNRARVSRHYHK $R A G R R T Y C T V R C A N N D A V A R H R G R$
$P R E W C S P G C G N R V R A A R H Y R R$

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EPRLVRLMNT $\quad 20$ WADRRG $\quad \frac{30}{V} H D S L S T P G E[40$
 A A L VEA FANTLDVDEV
HGFTPELRLIDLANAVRATPDLPRAALAALL


WA A GVA TVDLVVNTA EVVWRGM D R L



 $T G V A V A N D L V S T S P$ TVRGAAGDALPCPAAL


LRLVRDFVNTVEYQED E EGWESPD DL

PP P $\square$ GEP LAALDDLVNTRPATGDDLAAAPDDDRTWWAL LR V 1 I E D F CN TA I L L H D I D E

$M D L S Q S Q E \square A E Q L V R E F L N T W R D P N D T R K Q V D E L G T I D N V$ RWTEHRFAGGALALDVANSVILRSEAAKSVDRFAVPA QII

APAPRVDEPAPLALANTLWDDRHGDALADKDYVQAWI WT A HRFA G G A L A L L 1





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


 P A P GESABPALA LAN TA $\square$ T LP G GR $P E L G G A D L L V D F L N T L D V E D$


 $P A T$
$T$ TA
$W$ W A LL
$D_{S} L$
QAP Q LAA
$L L L D F L N T V D V E E G T D V L A T E Q T W S E W A$








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A Q WDS A T G ${ }^{50}$
80 TGWMVARGLAAPDADEYCSNRLRTFRGSVREVFDASVTRD VAFTEQHGELARRGRAADDHAVHALRTTVRDLDDHPGRDR AA WLDEYEEAPDATS PEAHRDYLALLRAGLREEMGARVGDV

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 TDLLARHGLDAPPTDDADLREVLLLRRETRGVI E APWLADHEIA ATTGELAALVRARGVLQAVVRG
GGWLRAHGYPEAVSPVELAALAEARETVRAFL
TDWVRARTAVLPAADAGLLTAVRDLRAAVRALFAHA AVRPA RDFPQAAAGDAPVAAENERDFALREAIDLHFRRILDGG $\square T \mathrm{~F}$ REKYWKEELSFHTDDELKQFREDI RRAVEEQV
EQWLVDRGLAPVDTGEMCATLLRSLREQVRALLAAHTAGR AA WLRGRDLLGEAATEDDLALAKTVREGLRSVLAHAGHDA A H WL QTRGLLPAVVTAGQRDRAETVREGLRALIADRPDGLD RA WLADEGERLPAAGPDDAAAVREVRTHAAAAVAAVRRGE TEVLREHGEDGPELSADDLAELRSAALRLREVFAA DD QT ERLPDAAPEQVTAADLAAVQAVREHTARALAHLRRGE A H WL RASGAVPTTVDHNWLLLVRQLRTAVRRLLTAQLGGR RQWAREHGGPDGQPALDWLRRVRDVLQAATHGP APWVQEQGGPGGSAAEVAHLRLLRDTLQAVVRG
$F Q F M R K H F D E E F F F G T L D E L K Q F R D D V R F A V E E K G T$ AAAERHRFPTLIAPEAERRPIFLELREAADDYFRTFVTGG LARAAGWSPSPGAAGPVRDSGEDAARLAEAAAEDRPILGG RRWLAA A GL EKSESEWRGLLELRR ILLQAUVRG
A GWMAERALAPAHATAALFDEALQLRRALRNYLQCDPAER RAVVRPAPGSTDGLRLEAVGRLI EVRDAFRRLAAEATGPD DGFAGAAFGTLLPVAEPNRTRLLTLREATDRHFRAAGAE HAADLPGPVDLGQLRDLRRALRRLAADATEDPRAPVDPMS VR WLRTLATARPQAAQASFTAALTLREADFRVFAGLHAGT AEFCAERALFGAPVAAENEADFIVLREAIDLYFRERILNG
 RAWLREHG AABEGLADLVAARNVLQAVVRG LRFARRTGDRDAQGAREALRRAREVRERLARILGALVAGE AVWLRSAGFADSVPADRELDALLATRRAVVALLD GSAD ARWLVERGLVPADLYELCASRMRALREHIRALFAARVDGA GSWLI GRSLLPEHVGEPCTTRLHALRQALRTLLATSASPP ASGFRAAELGDRRLAVSSPAAI APVVLS RETTERDFRGA SGLVPPGTSLVHADPSWPVAFRELRGCUALLVRGRAGRP AELLA


VEGESAAFELASLDARDAERLRATATALLGDVLALTD G LVPPDTPLAHADASWPPAFRELRRLVHGWLTRHDAGS SDWVNF LGWAKACD $\square P R L L E N D H E L R E T Q Y A A L S C \square V W G K$ RRWLRAHGGTG TAQELRHLLAARDALQRVTRG
DGWLAAELAAAPPAGPEQYQEFLVLRRALRALAGARTEGP S GLVPA GTPLTHADASWLARFLELRDHTARLVRALPGAD ANFCAERALFDDPVRLENRPDF ALRETDDRYFRARVLDR
RD WLA ARELPAEASDADAAAARELREALI DLVRTHS AEVA
ED WLAAHGLAPAGVREQCATQLRALREHVRSLLAARVDGL QRWLTDALGTWARVAGTDMRSLRRLRTTFEGVILAGGRSP R R WAS EHGLEPGD
A D WhT A A GTA DS A DDA A R F S S WVRDRDLGAPGVAE A DWVRERAALLDTVDEALHTAVRELRAALRSLFARAVGPG R DWWDQHDRVPDGAPAPPLAPTVELRHAVRTILDGHLAGT ERFG $\quad \square A E A D L P R A R E L R E S L R A A L L A H A G H A$ GRPHTAARLAGADPEAGDLLLARRLRDELRAEAVTHHRGG RA WLLGTGLVLDTVDTAWLTRFRAARDLLLHRIVHTEVEGR A A RDLPADPLRTAAAARDALRT QQQVAVDDERAAGI RRRAVLQPAAAAATLVDARRVRAALR ARFFRAAELGGRRLEAPFPDK $\square$ APVVLAI RETTDRLFRRA
 RDRFGGTG

TVWLRERGLTGPRATDDDLHTAHADREGLRAALRREP LSWLQGQSAVDDERGSGDRRRLVDARRVRAALRALAERGD RAAGLPVSVTESPPTRAQDAQLVSLREAAHAVLSALAAKR ATARERFPPLAPDEERRPVGRDREADDDYRSSIADG | $A$ |
| :--- |
| $T$ |

 KAWLVERDLAPPRLYNVCAGRLRALRDVVRTLLRDADDPA


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 RPPA $\square D A V N A A M K L A P A V D R L A W S E S G G F R S L P E H P E T Q A$ TDRAAEA LANA L LAA
 F DISSLDRI NELLARAATPA PARAVRTEDGGS FDSLNR NELARAATPAPRAVRTDEGS LARTLDHAPA DPEAAAGLAGMYRAADAEAELARTGD RWQWRDRETGLRL V I D A A TALLTAPARGATLIPDPA HEGRTR WAAPL PEDATA PPGALDRVNAVARNPPPPPRAVRRADGTLGRGLALHRSGD PPAEADIAVINAAAAHAPLVPRLDNGE
 AS A A L A P L N QVLA PEPDDLAAVNEAVR PAARP
$\qquad$ EEQAVA GAMVLAGRAGRSPVLRAADRSGMAGAWWHVPTAAPGAA DESPSALLQPFLDRVGLAPT GTDTGGQWRLH


 DAAALRSLDDALAELPLRLSF GGSESFALAPATDRG D P A A RTS S A DLAR QLP LALDDLTAHPP
 T D RAAETLNRLLLRSTAGTLRLTSHDGAPWHPHLDSD DAP W
 V VPEA P E A P P A ${ }^{\text {P }}{ }^{\text {L }}$
 WR
QWH
$R$ L
$A D R$ $=A V$

 $Q K W F E E Y P$ F GVVCVVT E N M E D D G DGKLA GLLFACGTARRT F

E Q S PRALAPFLEGVGYSPRATPE GLD WALHA RSNRPVLQALTAALAAFPLRVELRAEHGTVLTGTRKDALA VATA VSSLNAASAAETVWPEL RFQRRRGLARQDAWS GDAF AE QRVDLMADLLEADAAVLRGA GNGGDAVALDTAA $P S A D V A R V R R A A A H P P V R L T L Q A V G \quad R D E R R G G$ $R P A A L A V L N V L A E Q A Q A R L D W P D G G P P E R T L H G P A A G$ PPAPADLIQQQGYATALSTARLEQRGDQFVWTLPADH $G D D Q L L A R L L E A L A K A L R D A S$ APEALVRRLNDAAARTPTVPVLRWAEGSGPVARRRPVRGE P PS RAD AL NRCAAR DTVAPQLDWPA DGVPSAR WVSAEKD P
 $P Q Q A A D E L N E I L G H G R I R R R L G E A G P$ PAEALDAVNAALTKVPSAALLA WDSERGLHRSAAHPID QA P A A A I A A V NTALTAAP TA GLL A WDPA QGL HRSAR HP L D Q A AEDAVDLV $\quad$ LAR GRQRLLTLHDGQPGETVEVAPAWAA $V L K G A V A T A D L P E F L R S C A D G L A A G G T E D G A Q G R P F$ G D P A

 T P DAVEAVNTAARADAAAPQLAWREGPERSWHSTRPGS ATAA $A V E V L N R Y A A E P P V T V R L E V A G V G D G V G G G R G R R T G T$ $Y D L A L A R V N D A A R A V P P A P R A V R G E D G G L V R E L A G P B P A$
 D SASA E L Q K LLT GVVARVPR VSAH GVD WVLEAPAARMPA DPEALAVVNAYARTAADWRELAPGPEFRAVVRRAVED
 GADALLLA
 EPDGA
$L P P A D V P V S L V P D A D G W V R M V P S G R G I$




 PAGEQAEI HDDLL P P LAVVTMSPEGVELAPATAVAAVLAA


 $R E D A V V E D N R V L G R S A G T R R L D P L P D G G F L R S F V P T B D A F$ RPGREETL MMLEAA IGSAMADATLDFHREAGATFQPGP GEDDGKLAQFLFACGAALRMF
D P A A T A RVVDTVLGHGR IVRATVTTAGPGE EAE FADPS W
 $P A A S V Q A$ N D ALLTSAPSAALLLYWDEARGPYRAQAHPDDQQ


## UniRef90 U5VW10

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UniRef90 D3Q3R8 UniRef90_UPIO0036880AE UniRef90-R1HUJ2 UniRef90-UPIO003714EC9 UniRef90_UPI00037F148A UniRef90-S6GT16 UniRef90-UPIO00381B0D7 UniRef90-H0B152
 VEYAMSAVATDALGLLTGEDAAMLSRCAAPSCGRFLLRT ADALSLICGMGVLGVVHTLGERRFRPCTAPTCRGAFLDT DRLPLTRLADAWSSLVATGDAARLKRCAEHTCAWVFWDVS VPGALGAVLAAVTEVAQSGDWIRVKACCNPPCHFGFLDRT VAGALGAVLAAVTEVAQSGDWIRVKACCNPPCHFGFLDRT CAALLAVIARDAVELLTDPVAASLRQCAGDNCPIVYVDTS PRD ADALSLICGVGGLGVVHNLI CQAALSDVARSALCLLGEAAAVVKQCQGADCTRLFVDRS VRQALSTLARDAADDLEASPGRALLRRCAGQDCPLVYLDTS A FEAALAVSALSLLRDDTVARLRLC PNCSWLFVDRS TEALLRGVLAAAVVDLLAREDLANLAVCHAPGCGQFFHRAR LA VRAVLAW PAAELAVTGTGTDGLRQTSPGRLRPCANTECRLFLIDRS GDATGAARAVAWDGLRDTSPGRLRPCANTECRLFLLDRS AEVVRTVLEALLRDGLTGRHATRLKACAAPECRWVFYDRA ADDLTAALARAAIGFLAGPDRDRLRACHAPRCVRYFVKDH PGSLAAATAHSVLRLLAMPDPERMKDCGN CGWLFIDRS YTKMLQULKA VEHALAVLAADTADLLTSPDAERLTACASTPCSRYLLRT ARAALAGVLDAVRASREDGSWSRLKVCDRVTCRWAYYDYS VDNALATLLGVVAEAVAAGTWSRLKACREPSCRWAFYDYS GSRVAAALAAEVAGLLADPDVRKVRECEADDCTMLFLPAH GEWFLASSSLSLLVLL WNHARPPGGVCASPACRNVYLTLG GQRLAAWLAEAAAELLADPAVTKDRECEAHDCVLLFLPAH SPAGSAVEALLLNGLTASG RRLKACASDTCRYVFYDAS CRGLLATVARDAVELLTDPALGGLRRCEGDNCRRIYLDTS
 YTVMLQ ILLIA AESLLGNATAHSALSLLADETQERLRICGN ADAWAANAATALAMVIGVGQGVRLRSCEADGCGWLFDRS EGRTTAAKAVLAWDALRISSPGRLRACANTECELVFFDVTS AEAVITVIARQAIEGATSPRWEMLRACEAPACAYFF YDRS VQEVLAT TLAASASDLLGGPD VIATMGDDEGGPDHLLIRHCAGEPCTRLFVDRS DHRAWWPAAVAAAKLLTTGPVTRVKVCASTGCRGLFLDTS PGSAAAATAHSARRLIAMPDPQRMKICGN CGWLFI DRS DDLTVLAQAAL GFLAGPDRQRLRACHAPRCVRYFLKEH $Y V R L V A G L A R A A D D F L S G P Q R A R L C A C T A P R C V R Y F V K$
$V R A V L A W$ VRAVLAWWCRILDALRDSSPGRLRACANPDCRLFLLIDRS PAWLAAWSAAEAYLRLLDEHPDRIRKCANPECVLHFYD VDHALAALADNAAELLTSPEAERLAACGSPPCDRYLVRTH TDHLLARVADDAVDLLTGPGADKLAACGAAPCSRFLVRT TPAFEAALAVSALSLLRDDTDARLRDC PNCTWLFVDRS RAA L AAVARDAVDLLTDPARAGLRQCEGDNCPIVYLDTS DTWLAASGALALAQLLTERGRLAWGECAAEGCRNLFLDDG LTARTAAAVAAASADGTWARLKACEAEDCRWAYYDRS FDAAVAALARDAIEVVSGELGPLVRPCEAHGCVRYYLRE
 PRWVIDVLTLSUEDLLRFEDDTKLKECG RCTWMFLNKG VRAVTAWGA LRLALGA SAAAVELAGEGAERLRACPAPGCDLYFVRT CAALLGSLARDAVELLTDPARAGLRQCEGDNCPLVYVDTS
 LDHALAALLATDAADLLAGPDADRLAACASPPCNRFLLQH RWLASALWAEALLAQQAGWPRLKLCHNDDCRAAFFDTS DAAVASALVLSIQGKLGRVRLCGGEDCRWAFYDAS CAGLLAVVARDAVDLLTDPARGALRRCAGGACHRLYDDTS AHTAI GEILAAASRLSTLGMWDRVKDCPADSCRWAFYDRS ADRVVAALARAALTFLDGPDALLRACPAPRCVRYFVKD HQLALAAAADSLIDLLSSPSQTRLRRCQNPTCSMLFVAA ARAVLSEVLADVV LAVAGPDWRRMKVCPADDCGWAYYDAS CGALLAQVARDAVALLTDPARGQLRRCEGESCSLVYLDTS
 DERIIAARTVLAWSR VMETLPGRLRACANTECNLFLLIDHS A GGVTGGLAALIAAALLGAWDRLKVCAEGTCQRAF DSS
 GPGWAA ARDYLDLLRTAPDRIRACAHEAC SNALDAATAHSVLRLIAMPDPERLKDCRN

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170
P RREWCSTACGNRARAARHYER HARRHWCSTRCG
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KNRSRRWCSMVCGNRNKSRTYAAR PGSPRRYCSTTC
RNRAARYCSPGCGSQVSMRADR $\square R$ RNSSRLWCDMACGNRQKASRHYRR RGRRRRWCSSECGN
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P RRRWCSARCGNRVRVARHYQR RPRTRVWCDMKCGARSKMRDYR $\square$ R RGRRRRWCSSECGN RANTARWCSMACGNRDKARRHQER KPNTARWCSMKCGNRMKARRHYER RNGSKRWCGMACGTDAKDKNYRAK KNRSRDWCDMACGNRQKASRHYHR RNASRRFCGLSCQNRAKATAYRAR KPNSAKWCSMACGNRMKARRHYHR KPATRRWCSELCGNR $\square K T R A Y R E R$ KEHRREWCSALCGNRARVARHAQR RNRSRTWCDMACGNRSKAKRHYRR QAGTRRWCSKRCGSR $\square$ NAAAYRRR T RREWCSPSCGNRARVARHYQR KNNSRRWCSMDCGTEAK
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P RRHWCSTRCG
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UniRef90_UPIooo347B4FA

WT P HRFSGGALALDVANSVILLRHDDERRIDRFEAA GQM


MA L DVANSVILRHEPSLSRDRFSVAVQR
P H R F A G G G I L A A L $V D L L N S R P Y A N L P D K L D D P G T A Q V V L$
GFRPAQRLI DLLNAVRTHPDLPRALAVRLLV
DAGRDCLDLLATTHPCERLGAAEPLRAWUA
THRAAVLLRDFVNTRDVEVGSDE DHFGTPGSA
 MCI RFVNTMAWRLRRPQ EERLPTPEAL G GHPAIDLVNTVAWRGD DARR@DNLVDYS DVV $\square G G H P V L D L A N T V F D R A H P G P G N E L L D E T S S D V$ $L \vee V D \stackrel{L}{L} N T L D V E D D T D V L T N T A S W R A W S$ $M L G G A P A L D L A N T L H$ WRQGAEIDCDTSYQDL


WT P HRFSGGA LALDVANSVILLRHDTARRDDRFEAPEAA GLLALVESLVNTLDLETGADTRDTPESRVR
 $P$ WRFDTGRLCLDLVATGDPAPGAGHRDEPLAGEGR L $L$ L P R T LAA RLSSSVAAFLNTAPGPRGGQEEPERTFAATAQL

VVDFLNTDDERT
$L$ I G G T RV L D F I NT TN GRRPGS SLE ERLT S F Q F F $R I A L D D A L T V R H D G Q G G V A D E L A D D P A G L$ $G L A L V Q E L L N T L A P P Y G D D V L V D D A T G G R W L$


E Y D GAPMLGEPPADELGNTVHATRRGRPRDALRTVPDL
$\bigvee G G H V A L D L V N T V E P R P G A T A F R E H L N T P A E L$
LALEFVST $\quad$ RARRTGVT D S LIE DAE GL LI GEPLA L D L L NTRTRD H DVLD TPGD F Q T WL
 $G L A L I E A L V N T V D F E A G T D A L D T P$
$G L A L V Q E L L N T R A P P Y$ GEDVLAAGERETGBCDQL VVEAFLNTLDERTEAHAPTDELTSEAAL
 EDLLVDFLNTLD TVDATVELAT QA GLL
DAERDVELLLAFLNTVNMTESTDVLSDERSWLQWS

 EELLL ALL NSAPVVVDGHRD DRLAGGASGRGGL LEAI EAFGNSARFLHDEDAFANLPSTRDWL
 A GDAEHDVELLLAFLNTRDLELGTDVLDHTAAWRAWV HRFSGGAL ALDAANTVVLRGDTARTFDRFDDPVEI
 E D S S GL E G A


THTGAEGRYAVFE LLHAPEDV
 $\square P V$ GRKQDLDWADDAVL
$\square P V A L A N T R A V A Q E Q D A D V T P A D D A A C L$


L A L N S SPMVD GQ

 A A E L V A D F A N T L
D A G R C C L D D L GFA L V FMNTADAERGTDLLDSGSAWERWV GFALVQELLNTRTMAYGADLLVSGEDAQWWV


GLRFATDFANTDWAPTGGETEPHGAP
$M N V A A V V G L G D H P A L D F V N T L V A D G P L E L I V D G P G Y L R W L$ GLLAVQELLNTRATMHYGADLLLDPDDA


## UniRef90_A4FHV7

 UniRef90-LOLKS7 UniRef90-UPI0003B4B60B UniRef90-M5FOH8 UniRef90-H4FEP0 UniRef90-AOAC70 UniRef90-UPIOO0464A441 UniRef90-UPI000368F02D UniRef90_E4NJIO UniRef90-L7FFQ6 UniRef90-UPI0003807602 UniRef90-UPIO0026280CD UniRef90-F4F1H2UniRef90-H5X129 UniRef90-UPI00047B5F46 UniRef90-LOJ063 UniRef90-UPIO002DAC221 UniRef90-D3FDG1
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QEFCAERALFGAPVGAQNRANFDALREATDRYFRRRVLEG LGGAP DDGLTAVRELRESLRATLLAHAGHA SAWRRAFERLPAPDSGGEVDELMRLRDDLRA RRWLVGAALVPPGTPPSWVQRFTELRGHLAQVVRAETEGR PALVPEEGEVRDRLAAAAAVRARELRERLTRVWALLAATD TAWLRDLAPAGAELETYCRDRLTRLRTDLRSVFSTRATGA FEWALRHSEHHVASDALEPGDAVTLRTALRQABYALSGGE TEAWAGAHPGVVAEVFEADASTLAAVRDVRAAAADAARLGP AAAWAEAQGWPGPSGEPGADDLRRVRELRDRLAGLVTGE QAFSAAAAEFSAPVAEPNRKDFLALREAIDGYFRRRVEGH AGWLAAHHLASGDRELTAADLTATTTLRTALRQSLLGDR ASALLLMAQAHPEQALRSLEQLRAFRERLHRLFAALASNQ LA WGVRVGLASTAAGSQALHASVEVREATYDVLLAVVRAD AAGTAAGDMAGPMAAELRMLRDALRRLAAEATGDP TA WILAHAGDLGTVTPRMREEVVALRQAIRALFARAVSPG ARQAGRLDPPSGPLTPDGLAAVRRLRGHVEAALDAVRAGE LRWAREHGCLSEGPSADLAAEQQLRDALNLIVGGQV HGRAREGSPAELELLRETRDVLRDVVLGR RAWLTGHGTPLDGVDGRWVGRFRGLRELLDRVHGELRGG RDWAEAHGWPGPEPRPGDLDRVRALRERLPALVTGEAEP AHWLARHGLAPEGVRPSA DDVAVRWSTATGRPAPDGRRADRTFRDERRYRI DARLHAT

RAWWHGAPGPSGSEAPESVAKARSSRDALRAVALAHHGSA AA WLRREHGEPVTEVAADVEAVRSLREALVGAATATVGGE AA WARETGRERPELTERDLDQVRGLREETKTLLTGGEPAH PTWLHEHG VSEVELDALVAARDLLQAVVRGTAAAD LGWVDAEPAWLPALAGDDLAVVVAQRDATSRLLHAAALHA ARGWGGTG RT REWHDVADEDDESAHRELVRAREAIRAHLAGTDSAE ERLLRPREPALPAPSEGDDAQLRRLRDSLVDVVSQPGAEA HHAKLLPPPEAGRGSVDDSAAALAEARHLRQLFWVIFDAQ TERGLGDV GDLGEARAVRTSLRASLGERHDGP ARFFRAEELGGRADAVADPHRDAPTVLAIREATDRLFRGA AA WLRDRAGAPPPADPALLTAVRELRAALRSLCARAVRPA ADWLAAHGLPTGAVRADERLRLRGLRAAVRALFARAVSPG RSWLHEHGQAGCALDSGGLSFLVRVRETVRDHLEG RAWWLQDDRLPAGAGAPPRSETVALRQAVRDDLDTMDAR ARWLRAHGAPKG

GTRLPALAPDWTGAFVELRSSVDQLVTAALEGR
GRWLGLLVRTPVAARDEDVAEVRGVRNADGRVARADAAGD ARWLGRPGDEELRSRALELRAAVRALLAAGERLDAPLAVR A A RRWAREHGGSGGLTAD RAARPEAEAAGASVTDRHVEAARSLREADRSVASASTGGE SRWLAARGLAPEGAPTGETELADALRLRAALRGAAAATPQ SRGAGAEGWLRAQGDPGSVRSAREVRDAAALVGAGAMPG EEFLSAVGRRPDRVREDDLPAARLRDALRSVALSVIDGR A DWLVATGLVPRAVDETWPARFRHLRACVDRLTTAEPAGR AAWLRTHDLTAGTPPPALHEAAVALRAGIRAHLGTHVGD AERGLGE PGDAQAAREVRDALGAAAGABGOER TDALGAWPAPTLLLSAGDLRSLRRLRVAFEQVVLAGANPE RAWARDLPGVAEALDVDSLTWLRRAREAVREHLEG
RRWLHEDLSPLATPGPDDVVRAHELRELLRPLGLAAAAGH RAWLHDHGQAGCA LDSDALAFLVRARETVRDHLEGVAGAR AA WRELCATHGDPELGEREAEAGALAAVAAELLAVFAESD AAAGLVADAEPAELADADAHAAVELREWLRPLIARWVRGD QRWLTEALDGTWSRVSGLPAPTLLRSLRRLRTTFENVILTA PRFAAAATGYRAAELGAALPKVLADREATDRLFRNAVRRG GNWLRAHGYPEAVAPAELAALTEARETVRAFL VERT

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UniRef90-H5X129 UniRef90-UPI00047B5F46 UniRef90-LOJ063
UniRef90_UPIOOO2DAC221 UniRef90-D3FDG1

DPAGLETLN ${ }^{90}$ DAAAGPVPVV $\square^{100}$
dagle mida
110
LHMSGD
120
$S A D L L L A D L D A A D A G V L K R$
RRERATDAGWQWAF
A S
VSkGALA VSOHADAVAAGRLERATDAGWQWAF
VERAA LAELLDAIAMALRV
PPAAVTAVNDAMTRVPTASLLMWDEKTGPYRAAPHPTTPS $V L E G A V N A A Y L A G A C A K G L A G S D A R I G G L E Q P F G N P A T$ GGDWADLTARLSAATFGY DFDDGVRLRQVTGDP PDAAAAALNATLAAHAVAPRLSRHDGHAWHLHVDRADAGW LDHALARRNELARPAPPAPRAVRAEDGTVVRELHGP PD TGGAPAALDGVLAELPVRVAL GGPAPTLTAAGTGARA ELNAFAA $\qquad$ ATVAGPRWPGPALAP

 GSAALATVGVEYRTAVQHRELRPVDGRVAWMDRTRSVFTP
 LDASPDAVPVTIELDAVGGPT LVVTRDAVGAVMAAAARLA GRGVASKRVALRS FHKAIIGHAGGSAGLGDILDLLQSTSTNE
 RADALAE INNRLGGRSAGTRRVEQRTDGTYARTFVSVGDAF NDDRLDAELLEALACTLR PHGPVTPLGTLLAAAPLIVAVSAEDGSAALRPATDPAPLV EERGSERLDSWLQSHPQTVRIEND KLVYRG PAPAAAALNALAVAAPPPVRAVRDAGGS LVRADARAPE $E S A A V D A V N E L L A E A G P L R L L T A G G D V V G L A P A Q V P A D A$
$A P G A L D G V N R A L T S A P S A L L L R H D P H R G F S R S N Q H P V T Q L$


 $D D R V L T A N L L Q A C A R M L K Q$
$D G G A A T A L A D Y$
$D$
 EPDPVAALNKLARRTPWWRELRVDPEPR VVVSCADRP ASPQLDALGVRWSAATARSGLVLRPGEPVYLDVGTNPATL RPPAPEAVATLNALARAWPELVWLGDGKPARRYHPGDA PASAADLVNATAAAVPVAPRLEWPPNGEPAARPVPAGAEE PPPAAALAA DNEAARPAHRVLEWRDGGP ARVRAERDGDA $P D E G W R Q L R P F V V E A D D R A D L V$ D DA TPAWELAELDRSPL

RSPVAFGPLLEGVHRTPEMTS DGLRWLLRTAPH VPGPPSELGVLLAAAPLAVTVTGDGAAALDAPDPSP AAEADLVLLNSAAAAGQPPAVRAVRAPDGT LARALPGPPE VRAPTDVSLRPGLDEAGRVALVPVGSP
A A DRRS S $\square$ A EPVTTPDAFPLRLVPDGEGGLRVAAEPVAPGV PESGPPEPVQAPLAAGATLRLDHPDGNGSVHLDPAGTGA
 VP
P D M S G T Y G LLDG L
 RPAAEDVRLVQEALASDRPLEVRSGDAGLELTQPAD ELSSATL
T L GP
LLRKAALRATATTAGLSWDLDVEDAERGA $D L D A D D V D N D R V A A G V T R L L L G S G T G A G A S R L A A G T G F P A$ ATPAVDELAAVVDGVVRTPRVTPDDGVTWDLHVPADDRLP AKAA WADVNETATATTAFRHVFDGDGRVALLQVSGPPVVG DDGRDMPTDAALGGLFDQACRLVSDVAlGBDGAMTPFT IDDGRDMPT DAALAGLEDQACRLVSDVAVGPDGAMTPF ASEASAALPDFLEACAAG LRGHASFAMSPGKSFGDPAT PPSSADAHRLLPEDVPTAPRLTWQPGVPPVLRHLPVGPPA $P P S P A D A Q R L L A A L E P V T P Q L H W P A G G A P A A G A L P S A A T P$ RQEAHARLSALSEQLLGPPR WDGQGRATLPEAAGDPVH APARAERINLAAAAVAYTRQLTRTEGWAATTVLSTTHQHG ASVLRRYDTDARQLPDUGPDG$\quad$ V $V A S A D E T V N A L A Q G P P P R D R A V P D G H G T$
$Q G G D A A L V N Q V L E A G R P A R K L A W D N G Q G G Y T L A E C S A E P T$
$M$

 VPEA DMRRVFTGVHRLPEVDASGLRWRLTGP SVS PAE DEADNAVGRAASMWVELRGSRVLQVVPVHSGDA $P P P R D A V L G D V A D R L A L R V R V S P D G G D V D L E A G G G E$ $P A D S L Q R Y L A A V R R V P V L T A D G E V E W R T T G G G V G A H L$

 PPDPEAAAAADEALTRFPVRITANGA PRARARAAAADEALGTRFPVRIITANGA VEPP R R PWPVAVTLLDGVPALT
RDSALDP A ADVQVSLVPDADGWVRVVPTGRG DREAAGY LTGLSSELLGAPRWGAEGE APDPA EA L N AVLA HDTP $\quad$ D QLTAD $P Q L A A T R V N A A L R A H P G P S E L A Q D P D G R W V T R P A P R D A S A$ AAHALTRLNVLLAADSRFGELVRDGVGL RVVDRQRWAS GSEG LGGALPPADVPVSLVPDADGWVRMVPTGRGT AVATADMPELLGACAGA LAGHDEHLRLPGQPFGDPAT


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UniRef90_UPI00036AA542 UniRef90_D2Q423
UniRef90_E8W2D3
UniRef90_I2MZ96
UniRef90_UPI00037855D8 UniRef90_M3E9N4
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 V E H A L A A DA A D A A DLL T S P D A A R L T A C A S P P C N R F L L
 GEWLLLASSALALLAQLLTEHGRPVWGECAAPGCRTLHLGPG

 PERML A VVELVLTWW DVQTRRR G LS QVARSGI AALLADPNA

\section*{$\mathrm{V} D R \mathrm{~L}$ <br> | $V$ | $D$ | $L$ |  |
| :--- | :--- | :--- | :--- |
| $V$ | $L$ | $V$ | $L$ |
|  | A WA |  |  |
|  | $A$ |  |  |} AVA A V D L


$\qquad$ | V | K | E |
| :--- | :--- | :--- |
| L | F | R |

A G
$\begin{array}{ll}R & L \\ C & R \\ R & K \\ R & R\end{array}$

GLY LLLRRSAAAAAILVLFPSGNDI RQCEADNCGGFFIDDS






 TA M L I G R L A DE A T Q L L V S G N L R E L K S S C T A T D C D W L F L D S P
 GE WLL EA AVVWSQVLLAQTEGTWQRLKKLCRKPACRSAFYDRS
 $P$ P VALALTALADDAVCLFGGPAGAGVRACHGPGCVLYFVHGA
 SARRIRAALAAAAI DLLAGPRREQIRACPAPRCVLYFVKEH TAALLDALAEAA I DLLADPAAGRVRGCEGPGCRLVFLPAH WP $V \vee A H Q A Y V$

 GEWLLEASVWA QVLLAQT DGTWQRLVKLCREPGCRSAF YDRS DALLDLVVAA E SLV S L V L A E LF T A QL T DVGR R IVK CRNPRCQVAF YDRS A E A L S L V CGVG L L G TVR A ATVVLSI GDAL GAVLAAAARDA VQGR $\square S R V K L C Q A D T C R E A Y Y D \square S$ GDALGAVAAAARLAVGYWDRLKICCSAPDCRLAFYDRS

 VRVV LA W A L L G V L A A A T V D L L A R D D L A A I A A V C E A P G C G Q I F H R S R $V D A \backslash V A$ WS S

V T | $G R V I A$ | $L$ | $L V I D G L$ |
| :--- | :--- | :--- | E $\vee \mathrm{HGG} \mathrm{L} T \mathrm{~V} L A L Q G \square R$ A T GKP G R L

 $P \square A D E A A L A D S A L S L M S$ Q N S L L R R L S I C R N C N W L F L D R S A D R L T A A L A R A A L A L L G G P D R E R L R A C P A P R CVVR Y F V K E E DRLVAELARAAI TFLLTGPERERLRACTAPRCVRYFVVK AVAARVVAALALGRFAG GRSARLKVCRSPECRWVYYDRS HELAALAAVAD SLIDDVL L P A $R \left\lvert\, V V \frac{A}{L} T V G G E\right.$
 A A SLLLEPVAAALADLLAGDALRHVRRCEAHDCTLVVLDVT A GRALASLAREAVELFGGPLADRIRVCGAEDCGLLVVDRS
 A A R L T A L GEWGRVK $\quad \mathrm{C}$ PERMLAVELVLAWFDVQERRPGRLRPCGNDECRLFLLDRS
 V A QALLA RLA A A A VLAATANGTWQRVKMCAAPDCRVVFYDGS V

## $V$ RTAMA WSA

LA WS G L R D RI R P C E N D T C R L F L L D R S $V$ Q E A L G R L A R T A L E D L T G P R M P E I H A CAAEPDCR K L Y L CETLLLAAVARDAVVELTDPARSGLLRRCE GETCGRLLYLDTS
 SEDA GTLLITATTRLVVLGTWDRVKDCPADTCDWAFYDRS VR WF AS AL WAEALQAQQAGVWPRLKLCHNNACRAAFFD T S
 VR A VAA EV L A A LA L A DLAAGRGARLKVCRSPECRWVYYDRS AVAARVLISSALAQWFAERGRCAWGRCAAADCGRAFDDEG
 RWLA S A L WA EA L L A Q Q A G WA R L K LLC H N GD C RAA F F D T S


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UniRef90-J2L4N8
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UniRef90_I2MZO7
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170
180
RGARRSWCGMECGNRV
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PRHNRWCVASCGNRNRVREYYAR RNSSRLWCDMACGNRQKASRHYRR KNKSRYWCDMACGNRAKASRHYHR KQGRRQWCCTRCG
RNSSRLWCDMACGNRRKASRHYHR RSRTRRWHSYECGNKVNVAAHRAR PGSPRRYCSPACASR RGRRRRWCSSECGN
KNRSRTWCSMRCGNRTK
PAGNSVWCSMDCGARHKMRAYRSR RANTARWCSMTCGNRLKARRHQER RGARRNWCGMSCGNRVK RAQNRRWCSMGCGNRAK
HRQNRRWCSAACGNRDRARRHYDR RANTARWCSMTCGNRDKARRHQAR RGGRRRWCSMTCGNREKASRHRR RNRSRTWCSMVCGNREKARSWRQR RSKPRRWCSMSCGNRAKAARYR PAGRGRWCSMVCGARAKMRRYRAR RS GAGRWCSMECGNRHKTRTYRQR KNGRRRWCDMTCGN
KNKSRAWCDMACGNRAKANRHYRR PAGRGRWCSMVCGARAKMRRYRAK RNNSRTWCSMACGS $\begin{aligned} & \text { RAKVKRMRAR }\end{aligned}$ RGSRRRWCS
RNRSKRFCDEACANRTHVRSYRAR HARRRWCSNRCG
RNGRGRWCDMECGNRHKTRTYRER R
P RQEWCKPSCGNRARVARHQDR RNNSGVWHDRRCGNAANLRASRAR RNRSRTWCDMACGNRVKANRHYRR RSGRGRWCSMECGNRHKTRTYRER KNKRRRWCKTTCGNRARAARHYQ P RREYCSAGCGN
KNGSRRWCAMECGVRAK
HARREWCSPACGNRARVARHYQR P RQEWCSVACGNRARAARHYR P RRRWCSPDCGNRVRVARHYRR RNGSRRWCSMECGTSQKISRYVAR RANRARWCSMACGNREKARRHYER PAARGRWCSMACGARAKMR
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RNTSRRWCAMACGNRAKMATFRDR GRRRWCSDRCG
RNNSGVWHATTCGNVENLRAHRAR KPNTARWCSMTCGNRMKARRHYER RN QRWCSPGCGNRARVDRHRH RPGTARWCSMTCGNRMKARAHAQR PGNNS $\square$ WCSMDCGARHKMRAYRTR RSRTQRWHSYECGNRTNV
RSRRRRWCSMTCGNQAKAARYRS
RNRSRMWCSMVCGNREKARNFRER
RNGSRLWCDMACGNRRKARRHYHR HARQEWCTPSCGNRA
SHGRQE WCKPSC
PANNGSWCSMECGARHKMRSYRGR
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K SHRRRWCSMACGNRMKVAAFRSR RPGRRRWCSMRCGNRAKTRGYRAR P QQVWCDPSCGNRARVSRHNRR RNRSRTWCSMRCGNRQKARAFRQR RANTARWCSMTCGNRLKARRHQER P RKEWCSDSCGNRVRAARHYAR KPRTGRWCATACGNRVKTRRYRQR KANARRWCSMTCGNRLKARRHHQR RPGTAKWCSMACGNRAKARAHASR PSGRKKWCSTTCGN RGRRRRWCSDVCGN KNRSKRWCSMGCGN RGRRRRWCSETCGN
RNRSRSWCSMRCGNRAKSRNWRHR RNNSGVWHDVTCGNTANLRAFRER PAGNGGWCSMECGARHKMRTYRER GRRRWCSAACGVRHRVRAHRSR PANNSSWCSMDCGARHKMRAYRDR RRTPQRFCSQSCATRTRVAAHRA RGRQRRWCSMACGN
RNNSGVWHDVTCGNTANDRAFRER RNASRLWCDMACGNRQKAKRHYRR PSSNGLWCDMVCGARHKMRAY

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UniRef90- S2ZZC6
 SAWLRAQEVAVGEVTRKEHELLLRVRETVRDHLGGRHVTD TAAWRER LGNRALAREPLGALRALRAPLRAAVDARARGE RHWLI R D RLRADTPAAARETRDALRAAI
A A WLVGSGVVPGAVDRGWVVRFRMLRELLRRVVHDEDCGR ASRLVPRGTPLENVDETWVARFQRLRAGVDRLIMTALTGGG AGWLAGRGLVPAAASDGDLRTALGLREGLRAAMLGNHGRA ERWVAECDELPDRVTADTFESAIALREAVYHLALDRVLGR RRWARKHGGPDDAPADDWDRTA T DLGLPD DVRNGLTGGADALVAAADALHPVFAAATTD GTWSRTSGLPAPTLSATDLRSLRRLRSAFEQVVLAGANQE REWLVRSGLVPPPVDDRWLRRFRGARELLHRIVHAEAKGA TSWVRDRGARDFAADEACWAEVVAVRAAVRALFARAVRPG GGVVPALAPGAREAAPGDLAEVRALRDRLAPLV LDPD SAWLHSHGAAGSTAEVAD AA WTGDRAAAPPPVDQALLTAVRELRAAARSLFARAVRPG VTWLDRAHLLPAADTAAALQEARALRALLFWTVFDAQKDGH RKWLAAYGADGVSITPADVDEAREIRDALVTVLLTHVDAD A D H ERWVAACDELPDHVTADAAESARALREATYRLARVLDRPF TRWLGERAAGGFEADDALMDEIVELREAVRALLFARAVSPA DALDSEVJGRAFGLGEAEVPAARELREALRAACLAHAGHT DHWLRATGLPLPALDRHWLARFRELRACVATLARAQLGGA
$E R W V A C C D A L P D R V T A D V A E S A L A R R E A V Y R L A R V L K R P F$
 ALLLEYGEQPPVRLTEADVAALRGAAEEVRGVL VVAPD TTPLVPPGTP ERWVAACEGLPDRVTPSAFDAALNLREAVYRLARVLDRRF AAHALAANQAGEARAARDALR GQWAQAHGLEPPELSATDLDAVRELRTAVKGMLEDPPGER
 AALLULSADDFRSRYGAPTTAALVRTARDALYPALPRAVVDGV RAWARQTGRTTPSLTEKDLAALRTLRGRVRGWVTGESEND ARGLAADPLSDAVRARDALRAAAGDHDAHASRFRAPVAAE VT WAE LAGVVRREATGDAVGAEAALTDALREADYETALGA MRWLALHDLTTPEVREVCAQRMRTLRDHVRALFTARVDGP RRWSTARGGTG TPHELRLLRRLREHVSQVVLGRA REVTAAWAEEQGWPGPSGEPRDLERVRALRERLAALVTGE EQWVAECAELPDHVTAGDLASALALREALYRLALDRLRSR RAWLARFARHARRDGADELTALRGFREDAYAAIAYLTSDA RA MAAHLLTVPDGTDLAVDGVRDLRLVRGAVAQVLQGRP LR WAAAAGVVDPGFRQALLATVHRLRGAVISAGTAIADGP EMEADRDPDPPERYTSADLDAVHAVRGCAARALEHARHGT SAWLRSQDVPVEELGRRDHELLRVRECLRDHVEGRDTTR AA WLRDTDADLREVNDSDLRVARELRDAVRTLTVATVDGR RAWWAGDLGPVRLDTPEDLATLRALRAVVRGLALRNGDD VSWCHQTRAALSAADAVTAAREHRAVVALREAVYEAVFQQ REH

DATEAELGDLVAARGVLQAVVRGT
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$G P W F A A N G V P D G E D R R R V R R A R D L L Q A V A L D R L A G R$
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 $H D P S L E V V N A A A A G P D P T V R D G D A G G D R M S G G$ LP G GRVDVGTRISLTADGPTLVADD STGPFDASGVVLPRAQAH LVADERGRVAILDAGTGASW $\begin{array}{ll}P A P A \\ P & P\end{array}$
 GS LAAMAA $\quad D V S V R D G D V V Y$ V EPASLAGFADPVEVAGGVPRLAGAEVTEAVLAAAVRLAA




 P A P A L D A I R E DA A R S L $\quad$ A GA T L E G S P A R L G FI
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$P E H Q A G V V L R L D P D G R V R P E$
$P P S G E D G P G P A A V L H S T A A S L Q L G D D G V V R L E P R G P ~ G ~$

 D R R A LD L VN GL A RDA GLDTVQL S DTGTR R T GN
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A A A A D LALLLNAAAEGAAPPAVRAVRGPDGALAGALAAPPD $P G G P A P V A R L D N A F A A A A P P A V T A V V D G D G E L V R A P D A R P B$
$P P S A L A P$



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A GAVRAWDLPPPELGDADLVKLRAVRA\|VERLVDGPTGGR REWLTAAELTPSPVTHADLRAAHHLREVLRELALGADDGV ARWTVAAGLAAPPVPAGALAAGVGLREAIHRLATAAVAGA ACRAGEA GPGQPRGRTALD LHRLRADLDDLDDARIDGR $\square$ A W

SGWLRAHGILPGTP
DAALESWSAMNDAARERDLEPDRDLRADLHALLATRADPS DEAI A AWAATSGDAAQDLDEQSRAALRGFRDNLHAHDSHS TAWVRAHAAALPRADESALEAVRGVRAAVRALFARAVRPG
 DEWLSDHGATARELQDARPASTAAERTAVAAGLRAGTGRP AEALAEWSRARDSEAPEGPGDLRALRD LRASFVSLVDGD SAWLVEHGLAPARVLEPCTVRLRLFRGAVRELLDARVAGR HAKFWATQALPEGARAPSAEQTRRLRSAVRELGEAVVAKR A D WLELSGLPLDAEPTSADVEAARQLRETLRPVALAVATAT ARWFADAGVAPPPVDET GHREADRLRETVWQLLTT TDPG RDWLARVELTPAPVGPAELHEAHRLREVLRELALGAVDGD VTRLLRRAEERPEEASAALAGAREFRSALYGCLTEERGRG $D R W L A A G P L A V P A A D P P A D A D D L A A A R A L R E A V R A A V E A L C$
$L S L E Q L G P P A P A Q G S A R D L A E V R E L R D R L A P D V L A P D P A M$ AQWSVVAGVMEPELADQALTFAKNLRALMHQLLAAFAAGQ Q A WL DRAGGAGWA A TS G RA WLLDAA RPLLPGATE

A P W RAQAADRELAQLPVGQLTDLRDPVRRALDAAARQA A Q WF A ATPVTPPGPADVERARRLRETDRLLAMATVAGQRP EDWLVAGLLKRARQRPEEAAAVLGEAREFRRLYAALTGPD GDWDERAEDAPRPPEPADVTRAQVLRENLRLLALPVVVEGP AAGDTAQEPGGDPAGDATDAPTEGTAGN AQNAAED LNTDDRFHGVDRLRAGAAGAAPREVREARDADRAFVVDGR TAAMDAWSAGPRGLAEDDVARLRDLRADLRSCMGASTASS LRWSVRVGVLGDADADRVDQAVRDIREALHLVLLATVTDA VDFVNEWGSLPRALDDREPSGDRALADELHAVFAAAA HRWLALMGWAPAAVTETQRERLVALREALRDLAMAAVSRA

 VSRLLEQAEESPDGAAAVLRETRQFRGSLYTCLTRPGDG RLLADGRPA A A GRAA LAVLDRADQLRGSLDRVLRARLAGQ PHAGEARPAGAEPPSSATLRSVRKLRAA VAGUWHAAAED
NA WYVESGTAVSPGQEADVERAKTVREATYLLVTALGQGY
LREQALRQPAEAAAVLDEARRLRTDLYACLT DPR $L L R Q A A E R P A E A G R V L D R A R G F R A R L Y T C L T A R P D$ TAWLQQHGLGDGEVTRAELARFRMLRDAVRGVLHARVEGR VVWARECGLVDEVAAARLRAVLREVRRLRRDVHDLAVGLG RARLDGTWPGGS RLTDEEISAA DAEDIHRVFAAAPGAA ERWLVARGLAAERVASTELSRFLRLRHAVRETLAARIDGV

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UniRef90_J7J741 UniRef90-UPI00036BFE23 UniRef90-UPIO0036AF73A UniRef90-UPI000364FE2F UniRef90-D5PA94 UniRef90-UPI0003457E5E UniRef90-KOF3X5 UniRef90-W5WGL1 UniRef90'UPI0003449A15 UniRef90- D2BCT0 UniRef90-UPIO002000D72 UniRet90-J7UCX7 UniRef90-R1GD67 UniRef90-UPI00036AC12C UniRef90-T1CHU9 UniRef90-UPIO004755E47 UniRef90-UPIo0047566FA UniRef90_K8XMD7 UniRef90-K0ESK8 UniRef90-S3ZSB9 UniRef90-H81K17 UniRef90-UPI0004190663 UniRef90-UP100034C378C UniRef90 R4THU2 UniRef90-E4NOV9 UniRef90-R4SQF6 UniRef90-UPI0003614DD0 UniRef90-UPI00035D74E4 UniRef90-UPIO00366F7B3 UniRef90-D8HYK0 UniRef90 UPI0003AA06B2 UniRef90-D3FB63 UniRef90-UP100034AABCC UniRef90-UPI00036BF928 UniRet90_UPI00030C7F60 UniRef90-K8X192 UniRef90-F3ZK85 UniRef90 D9VZ56 UniRef90-UPI0003624AD9 UniRef90-F8JNX7 UniRef90 D6XA47 UniRef90 XON4C6 UniRef90-M3А505 UniRef90-D6Y7X6 UniRef90 UPI0003603777 UniRef90-F4CTG2 UniRef90-10 KW43 UniRef90-UPI00037B9BA5 UniRef90_A5CNC8 UniRef90-D9VNB9 UniRef90-UPIO0045E7F5A UniRef90-UPI00037726C1 UniRef90- V6L543 UniRef90-H6RRK4 UniRef90_F4CRM2 UniRef90_UPIO00255F3DC UniRef90-UP10003C75CDE UniRef90-S4N1S2 UniRet90_UPIO00262EC9A UniRef90-UPIO0039BBF3E UniRef90-UPIO003B74C26 UniRef90 UPIOOO37DAAE9 UniRet90_UPIo00380A21B UniRef90-K3XUT4 UniRef90-UPIO00479D023 UniRef90_W2EJN2

## 90

## 100

110
120
GGSAGARAADRLLAAADRDA GGRSAFDAVDGRFAWRPDARA PELRTRALDARSAELPITATVEDHDGTPRLHLDADPEAPL GAARVTV PPETAEELIAF $\square$ A GHDDP $\square H L T V D D$ $\qquad$ GRTWVPASLVVSGDGEVRDE AEARRRLTAAAAELLGAPRW DEDGSLAHPVTAQDP
 CATVV HTASASLCMGEDGRVRL APRGTG LAEASRRVNALLAEAAHPPRLTDHHGTAWHLHDARDDAPW DPAARAELTELIARDFPDMLDVTALPPRLVARTRVPVDAAL PEAAVARLNALLARCGGPLRLTSHAGAPWHPHDDSDDAPW $G P G G V A A S F A L S A A G E V R L L$
$P P K A D Q V$
PA
 DAQALDLLNSYTERGNVTVRLDWPDPGAAPLVRLTAADP DEQPAASLQRFLDGVRQVP VAGESGVEWKVE
$\square A A A$ RAMSATMGARVDPDGTVKLE PRAEG HNK S GGSNSQTLAVPGATVELSVRPDGEIAVEPSGSGWRY APSPADARRPLAARVPTVPVLSWPRDGDPVVRDAPTVPSG PPRSRG AHGVVASFGLSDAGEVRLDDPSGSG RDAVVDAL VDRVGLVPRL DSRGAPPRLGWRAAAD APDDID TVNLFAALPDVPPSLRRRAGANRVRLAQALSSVA ETDLGKPVRADLALRDGAVRLFPSGTGRQWL ASALW

 PPDPVAA LEYYLTTEFEPVRLDAAD
 HEYVTSSR $\square W$ DDGAFARVAEVAQEAMRHAVFVRSDDGLGRWRPHPDSGQR

 RATDTDALAALLDGARLRPEVSTAGVSWRLETAPGDELA $R L L E P R V V H D A P A V H V A A A A L R L D R G G H A V L E P R G Q G$ $P V S P A D A L D A T A A R V P V R P V L D W P E G A A P A V R D E P B A P G$ a A NGLLAAAPART PDPVRTRLNALAARAPVTFHVDAAG PERAAREVADFLAAHHDPVRLTVAD DVRAFKAVADVAEDAAKASAFVRGDDGLGRWRLLRESAGDR AAASDLTLLNAAAGAAPPPAVQVVRGPDGALAGTDAGPPD PAGAVEETARFDAEQPDPVRLAVAG AGDAVRDAADLDAVLAALPVRVSLATGAPTLE P R EVLRTLTASVALHRDG DGASAVADHQRWSGAAARARLVLDSSRVRLAYGTVPGMLV PVTQASIVSGLLDRARVRPVLLERDGALAEEWTVDDPSQA EPSPTAAD LI VAAAGHPHPLDSPAAP EDRAAAADNALLEECATRPRLTRHDGHP WH LDHVRGDGADW FASRVPVVLAAGEGPRPAPVTVVEAVLAAGAALVLTGS GAPAE VRDRTSGAVLALRPDGTVDLE WRSSPPRGQG $A A F A A V S R A V E E A S A G A R F G L G P D G L A R W R S S P \quad A Q G$
$G D D D L V Q A Y V T A L T H A T L Q P T D G G$

A GAALAGINHLLSAAGPVQLI LPGGPTPAVLDAGREGDPA
TALDRVNALAAAAAPPAPRAEPGPDGRLVRALGAPPRC
DGTALTLVNDAARKPPAVPQLTPRADG
EGRAFKAVAGAVEDAARLSVFTRGDDGLGRWQPSPAAGLR DVPAFRDVAAVVDEAAAHSRFVRGEDGLGHWQVGPAAGLS APDAVRVI DAAALAAPGTTDGVWDDDGSVTRGWRSTGGDP RRAALARVSTLAVEARQSQSLTATADA VT WRFTRDAG PGAPVDDVLEGARAAPDEVSVVVRTVGESSWRRADDVFEW APDAVR LLEAALAAPGTPVGVWSADGTVTRGWRSTGGDP
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A ARLAVRAVADLLDLAASGDWDRLRLCAARPCQDAFVDRS VSRTAVAAVFAAVARLTAGRWNRIGICPDTACRWAFYDRS VGDALVR I ARQAVDHLTGADRDALKSCPEHDCRGVFTDQP WR WLASAL WAE ILLSSQHADTWRRVKQCHNHRCGSTFYDRS VRALAGSVLAALAAAEPSGRRARLKVCRSPECRWVFYDRS VDFALATMLADVFAAVSAGTWTRMKACREPSCRWAFYDHS WRYLAS $\square A G V T A L E A Q C A E V W C R L K T C R N P R C A D A F Y D R S$ A WLLTSGALAALAQLIADRQRLPGGRCAAPGCPRVF L A S DEWFRAASAVALLAVVWGRQGPPGAVCAARGCARVLIPYG GWRWLASALWGEILLSQAGTWRRIKRCHNHRCGSTFYDRS TTAALSRLAHQAADWLTGPDRHDLRACPEQDCRGVFAD


A DLPA QLA R S AVVEFLA GP QRERL RACPAPYCVRYFVQD GARFAARAVLAWAQV GQRLRPCENDECTLF LIDDR
 RAGAAARLARATLAFLAGPDRQRLRACHAPRCVRYFDKDH WR WILASAL WGEILLSQQHADTWRRIKRCHNHRCGSTFYDRS A P P L L A A MLAATVVLDADLT DPATARSAGGLAAERACADVVYDDTS R D A V AL F T EVVGFDDVAA D GQPTARLSRCSAD DCADVF YDSS TETLL AQQA G $\square W S R L K L C R L D G C R S A F Y D V S$ A DRAMARLAAADAADLLTGPDAERLARCGGTPCSRFYVRT
 $T S V A L A R D A R Q A V D H L T G P E R D D L A D C P E C D C R A D F V N A G$ LS GCLLA AVARAAVDAFRPENARHLLKWCEGTDCTRPALDAS A A A A F A R L A H QA A D WLT GPDRHDLRACPEQDCRGVFAD LPLLYA VA QRAADLLA DPRRLTVVVCPGKGCGWLF LDA
 LT I I M D L L T R D A L D L M M K R L
 WR YFA A V V L L E V F A Q R L A A E



 A D DVA GLL A DVL E E H R S GRLDRRLKACAN P DCQWVYYD A S

 VEAA DRALATQALVTLRGPDRLLLAFCAFSDCRWVAG DAS
 WD R L R LLCPAADDCQQAFFADRS





LPVCA VARSAGELLADTRRFTVRGCPSRDCGWLF LDES $L P L F A, V A R S A A G L L A D P R R L L V R A C P G E G C G W L F S D E S$ L D R A A A T I A A DVVVD V V D H GERLGTEGEGARARLV
 A M L A A V L D A L
LARSGAPAPRAVAVVIGVLGRAR
L D R A A A T I A A DVVDLVCDHG

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UniRef90-J7UCX7 UniRef90-R1GD67
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UniRet90-K8XMD7
UniRef90-K0ESK8
UniRef90 S3ZSB9
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UniRef90-UPI00034C378C
UniRef90 R4THU2
UniRef90-E4NOV9
UniRef90-R4SQF6
UniRef90 UPIOOO3614DD0
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UniRef90-F3ZK85
UniRef90 D9VZ56
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UniRef90_UPIOOO479D023 UniRef90_W2EJN2

RGVGRRWCDMRCGNRAKIVEAFRER RPGRRQFCSTRC
RNRSRTWCSMRCGNRAKARSFRQR GRRRWCSPACAS
KNNSGVWHDVTCGN
PANNASWCSMDCGARHKMRTYRSR RNRGRTWCSMVCGNRVKVRAHRRR RNNSGVWHDVRCGNAANLRAYRAR GAAPRRFCSPRCATRTRVAAHRRR RNRRRTWCSMDCGNRAKARASHHR AGPPRRYCSRRCATRERVAAHRAR KNNSGVWHDVTCGNAVN
PGGRRRWCSPACASRGRVRALRER RKGERRWCDMRCGNRAKAAAFRER RRANQRWCSPGCGNRARVARHY品 HGRQTYCKTSC
KANARRWCSMTCGNRLKARRHQDR RNTSAVWHDARCGNAVNLRASRAR RNNSGVWHDLACG
P RQEWCKPSCGNRARVARHHER KNNSGVWHDVTCGNAVN
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RHGRQEFCKPSCGN
p rRRWCVAACGNRARVARYYAR RRRDQAWCSVGCGN
PGGRRRWCAPACASRGRVRALRAR GRRRWCSDRCGKEMPV
RGRRRRWCSSECGN
PSGRRRWCAPACASR
KNRSRAWCSMRCGNRTK
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KNCSGVWHDVRCGNAVNDRASRAR
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pagrrafcclitconrar
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PGSARRYCTPAC
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## PSGRRRWCTMSCGN

RRGHR $\square$ YCSTRCQTRERVRAHRQR
RNGSRRWCAMACGAQAK
lupas_21
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[^5]:    lupas 21
    lupas_14
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