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UniRef90 $10 H X 84$ UniRef90-A1VWS1 UniRef90-14BYU6 UniRef90-F7XM42 UniRef90-F4XK66 UniRef90-K9WJ07 UniRef90-F6BAL7 UniRef90_UPI0004754831 UniRef90_C9R8B4 UniRef90-19CIL6

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UniRef90_C5BM83
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GPSV ${ }^{10} 30$
30
40 $N L T L K D R A L G A Y L G L A C G D A L G A T V E F M T P E R I R A E Y G V H$ PSLIERALGAYLGFAVGDALGATVEFMTRGEIQAKYRLH

LLNRALGAYLGFACGDAL GATVEFMSPKQUQKRYGVH

P T

$\left.\begin{array}{lllllllllllll}L & R & E & R & A & L & G & A & L & G L & L\end{array}\right)$
DRAEG
L ERARAAFVGMA

P
PSLAERYRGALLGLACGDAVGTTVEFKPRGS
$\qquad$
A ${ }^{-}$

NMADKIKGCLFGVACGDALGAT EFMSRES


L H N R A LGA YL G LA A G DAL GATVVEFMTPRE\|RH

RAQAAYFALACGDA G GATVEFMSRGTDOFTPL LYDKAQGAYLGLAGGDALGATVVEFMRPREUQAQYGVH $P E L L A R Y Q G C L L G L A A G D A V G T T V E F S A K D S$ PS L EERALGAYLGFAVGDAMGASVVEMTPREE NLLER I KGGLLFGLAAGDALGATLEEFMNRDEVQRKYGPL SRFD

RARGALL GLAVGDAI GTTVEFKPRGS

LGAYL GLAAVGDALGAPVESKPPGEDANFDPMI
$L I N$
$M$

ERYRGSGLGLLAVGDAVGTTLEFKPPGS LNKFKGCLVVGV/AI GDAMGMPSEGLTKE


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|  | K S | Y G |
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|  | VR R R | Y G V L |
| T |  | H P |
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|  | F S E |  |
|  |  | F T P i | PSSLEDRARGAFLGLAAVGDALGGATLEF LSQRYRGSLLGLATGDALGTTVEFQPRG

EKYRGCLLGGLAAVGDAVGTTLLEFKRPGT SMVDRTRGSI I GLA VGGALGVPLEFKPPKT
 $R D R A D G A L V G L A D G D A L G A P V E F C Q R G R$
$R K H A R G A M L G L A L G A L G A T V E F M T P R E D R Q Q ~$
 $N$ RTQHYQGCLLGLAAGDALGTSLEFLQPDGS

RNRVIGGLLGLCDGDALGVPVEFESRNSDK PA LRDRARGAFLGLAIGDALGTTLEFSRRDTLPH $M \square D R D K G G L G G V A D G D A L G G T T E F$




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## QUERY

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UniRef90＿IOKH30

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 RDIIGGGWLTLRPGQITDDTEMSIALAQAMIDSGGWDLTR
 REIVGGGWLRLKPGQVTDDTDMSLCVARGVAKAGEWNLTA RDIVGGGWLRLRAGQVTDDTQMSLALGAAILEAGGWDLAN TEMI GGGWL GLEPGQVTDDTQMSLALGEALIDQQGWNLRA K EVVGGGWLRLK P G Q

 R E I T G G G WL R L K A GEII T D D TE M S L A L G D A I L S A G K VVE PV S
 TDMIGGGPFHLKPGQWTDDTSMALCLAESLLNKNGFNAAD KDMHGGGWLKLRKGQVTDDTEMALALGRGILQAGQVEAQA RDVVGGGWLGLRKGRVTDDTEMSLALGRSILATGGVNAGA TDMTGGGPFNLQPGQWTDDTSMALCLAESLLHKGGFDAPD TELTGGGGHWRLKPGEVTDDTKMTVAVARGIVSNPVDPDPC RDVVGGGWLHLKAGAVTDDTAMAIALGNSLVRRNGLDLTD

 IDMVGGGPFSLKMPGQWTDDTSMALCLABESLLARKGGFDAAD RDI I GGGWL RLARGQVTDDTTMGEGALDRGLAAGDTALTEG
 DTDKGGGWLRLKPGQVTDDT KDII GE GWLGLLQPGECTDDT RRIVGGGWLKLKPGEVTDDT KDMTGYGTHNQPPGTWSDDS LDMTGGGSFNLNPGEWTDDT

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## トトயト <br> E P T D

GEWTT D MVGGGPFSLP AA GKWT
$R D M R G G G G V V G G Q P S$ G T W W D D $\quad$ G

 SMALCLAASLLENG FDLHD SLTFCLAESL CNGFDLRD

 | $S$ | $M$ | $A$ | $L$ | $C$ | $L$ | $A$ | $H$ | $S$ | $L$ | $I$ | $E$ | $Q$ | $Q$ | $G$ | $F$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $D$ | $P$ | $V$ | $D$ |  |  |  |  |  |  |  |  |  |  |  |
| $S$ | $M$ | $A$ | $L$ | $C$ | $L$ | $A$ | $Q$ | $S$ | $L$ | $I$ | $E$ | $H$ | $N$ | $E$ | $F$ |
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S M A
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SMAL CLAESLI EKKGFDPVH$T \mathrm{~S}$

TMALAL GNSLASRNAPNEED
 $K D G F D P S D$
$C N G L D L Q D$
$A G P F D$ T T M A
T SS M ART TMQEFGSHHQPKGTWS

TEI TGGGGPFALSSGGQWTDDT

REMRE Y G T H H QA R G V WS D D T S L T L A A V V D S I V K C S GI D Y K D
DDF YPSPDLKAGEWT

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## S

TTMQGHGTHDQPAGTWSDNS
$T \mathrm{~T} M \| G Y G G T Y N Q P P G T W S$
$T T L Q G Y G T H N Q P P G T W S$

## QUERY <br> UniRef90_UPI00036F6AD6 UniRef90_H8FU55

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ICEEF ALWWK S R PVNVGNTCRRGDRRYMHEGTTTAPYSEG

 I A E E F A A WL R S K P VDVG DTCRRGI RNYMLKGLLETPFNQW I A R H W L A WL





 $\square$ A A NFAA WLK S R PVDCGDTCRKGI RAFMLNGTLEAPPNQW QMGRYLNWWQWGCFDDGMTVSQALAQYQQTADPFAGTDPY A A E A F S D WM S A K P V QMERYLNWWTS GCFD, GLTVVRQALVDFQRNGDPFAGTDRY

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QMN RY V R WWR GK P V D CGGHT CR R G L L R Y VN E GT L A GP P N E G VA D A F V A WLQ S R P VDVG NTCRRRGIRRY LQTGTDRGDPAEE VGGERYVH WYR GHCFDIGNATRRAGYRNGKKY DSWAGS T D P N
 QMQRYV RWHD E GYMDD
 $M A E A F S Q W M R D R P V D$ QLQ Q Y LR WS R GQCFD $\begin{array}{lllll}Q & Q R Y & R W Y Y T G R \\ F & K N L I & E W Y K N E\end{array}$
Q
LGEAFLRWRATDPPDV G

## QMQRYCAWRTHGYMDIGMTVVQAA

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 ■MERFS SWLLNYGDYDVVGNATVLAMSRYDDGVNPCGGGYEH QMRRYLRWRDGRCFDIGNTVATALRRFEEQGDPYAGTDP


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## QUERY

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 DAGNGAAMRMLPTALFTMGDDNLLCRCAVEQGHLTHNHPL DAGNGALMRVLPALLFAFRDPDLLSRCVVVEAHVTHNHPL
 DAGNGAAMRVLPVALATLGHPERAAAWTVAQAHATHNHPL SAGNGACMRNLPMIFFCMEDWDRFSEYTLAQCHITHNNEL DGGNGAAMRMLPAALLSSLPDTELMKKYALEQARLTHHQAL DAGNGACMRCLPVII ATLRQSPEVVQASRLQAHITHNNPL
DAGNGACSRDLPLALICLYRDDEFEHWLCEQNHFTHHNSL
SAGNGSLMRLVPVVLFYFPDARQIQSFAADSSRTT

 SAGNGSMMRLAPVVLFYYPDADRリRAFSADSSRTT A A P E SAGNGSMMRLAPVVLYYYPDADRIRAFSADSSRTTHAAQE | HHNRLL |
| :--- |
| HHNAL |

DAGNGAAMRFLPVADANHRNAERARHWAVEQAHTTHNHPDLD DAGNGACMRNLPVVALATMGNAEAFTQWTLEEQCHFT

 TAGNGSLMRLAPVVLWFFPDQAQVLEYAQASSRTT
 SAGNGSLMRTLPVSSAYRHDKDKMCRDSAQDSHMT DGGNGAAMRNLPVALATLGDDADFERVS LA QARVT SNGNGSLMRRLDPLFYVEKMDEEQFEDTHQVSRDT D A GNGACMRV $\square P V V L A T L D Q P D T L L A A C R L Q G R \square T$
 SKTCGAAMRVAPLALYCRDLADEKRNDIEASKDTHNNATE NAGNGSLMRLAPIPLVYANDEIVAMEKSVESSRTTHGTKN
HAGNGALMRTLPLAFVYPGPAELFSR CVEVARMTHWDPE
TAGNGSLMRVAPVALRALDDDARAVQDARDQSRTTHAAAE
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TAGNGALMRLAPVPMFYAANAEATWKQAGESTRTT
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SAGNGS $\begin{array}{ll}\text { M R }\end{array}$



TAGNGSLMRLVPIPLAYRRTPVQAHVAAQESSKTTHGARE
SAGNGSIMRLAPVPLYYANQPALAIDEYCAQSSRTTHATAK

DAGNGACVRNLPVVLATLNAPASFRQDSVEQAHLTHHHPL
AAGNGALMRLAPVPMLWRDDARRTGDCAVESTRTTHGAAE
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EAGNGSLMRLAPAVLFALDDADLADRLAAEQSRTTHRAPR
EAGNGSLMRALAPAVLFALDDADLADRLAAEQSRTTHRAPQ



TA GNGS L M R LAAP I P LIF Y A N SPS A A DE R A A Q MS R T T H GA D E
A A GNGSIMRLAPVVLYHYPDLREVSAAAADSSRTTHGATE
A A GNGCLMRLGPVPCAFKNCHSLALLRYSADSARTTHGPPA
TA GNGS I DRLA P TADIFRRHSLSASWWESVTQSSVTHNADE
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S D A A C LT LGRMVHHLIGGRGMKACREEANRLVHQHRDFHF SDAGTLCLGRMLQALEAGDGDAPCRQQAEDLIDAHPEFQF S D D A T L A L A R M T Q A LV Q G R G M R E A R DVVAR H L V E TH K T F R F S DAAC T L G GRLVVHLSVLGFSKPRLRREADRLTESHPT FS F S D A A TL CFARMLLADLL A G GYWRDKREHAKALVAAHRQFRF
 A
SDAACGYYGGLIHGALLGKSKDELLSSRYSPVPGYWEKEK


 ALASCRLFAQQLMNALQGKSKQETLQENLRHIAEGCYLQK
SDEATVALGRMTVLLAGGTQADCRRMADTLVARNPVFAF AVDACVYLSGLIVGALQGRSKEELLAPGFSPVQDYWSQYE SDAATLALGRLLQGLLLGDRPAQSAER AADVDAHPKFRF CLAACRLLAEVMVRALOGNSKDDLLAPLRQTVARGDYQTK ADDACRYMGAGCYYPLREYWQKNPLCNEVRVIASGSFKDK AVDACRYLGALLVGAVNGVSKEELLSELYCPIPQYWQENP

 AGLTCFLYCRAVQGLLEGEELPAAFDRAAAEMEREAPFSW AVEACDLFVRILREAGQGAGKDAARSRPADETARIMRDAA AI ECCQLLAFILYQALSGKDKATTLDPKVISI ACGNYKHK CLDACRYLGSLIVGAVNGVSKEELLSERYSLISGYWEQHP ACVEFVHVCRALASGIAlQS

ALPHYDTLIT I
TVDACRYMAGLI DGCLIGESKEKILSKRYSPVDGYWFKDK AI ECSRLFALQLRSALRGEEKAALLSTTPAGLARNDHASK $A L Q A C Q L M A H V M C K A L H G V E A K T E L F Q H T S S I A N R S Y L D K$
$T D A T L T V V N M I Q A G L S G V I D R A M Q Q A H L L V E A F P L F R F$ A DACRYLGGLLVGALQGESKETLLSPLYSPPPTSWFKRR CIDACRYFAALLYCALKGDDKAAILSRKIAQLQQQHYLEK AQMACGDYПQUADNLLKGNTPKMAYERMKNTVSDYYSKQP A DAGTEC NRMLHIGALHGGSLADMSTGPVQNEAKTFTYRR AVDACRYLGALI AAAANGAGKEELLSAKLALPEDGSFRRK AVDACRYFAGLIAGADQGTSKEELLGPHYSPVPGYWQNHP AVDGCRFFGALLLAALEGSTRKEILERPWREVAQGSFRHN PIDASEALALLLANAIRGMPLTDLLSQSYGPYTDGSWRGK AINSTQYLSYLLVHMINGSNKDMPLQPRVMIINAGEYKQK SDIDTLTLGEMLRCALRGDGDAAVRRLADTLVAQYPEFDF A DCSRLFAAQLRAALMGAGKEAVLAPSDAA HARAYAGK AIEACAYFVQLLRDA LFRPRTWSGDPAIAAIAAGSWCLK GKAGAALQAFAVADAVRGQKEDMLDKLKEVVKTDMYTEKR CVEACGVYGRLI AAALEGASREQVTSPGLATVLRGSYRVK AVDACRYMGALIVGAVNNFPKEDLLSNLFTPIRGYWDKNK CLQACRLFAVALCRALQGLPRQQVLDPRLRELARGDYRDK SQMACALYCLLVRALVQRVPPDKAWSQAVDAFAAYYERPP CLQACGLLACYLLAGLRGWSKAELLAPDAYREWMGSYRRK
SVFACFVYVLFAIQLMKGKSKAEAYKYMQDIALEYAEKQH CLEACRLLAVALERALAGGTRDAVLDLSNQQUAAGGYRGA ADEACRVYNRAASRMLRGQPLPSALAAEVQGTRYESALYV ATVACVVFARFLRSAILGEPDPKPGDSTI AATIA AGDLLMV SKIACHLYCQUAVKLLNNQSDDDDLKYYKDDKEFDMEFNL SLVGCGIYVLTAKELIREKGTNPETAAYERLRNDNGFSALL AI GGAVAVAVAVACILSDFNEDEMLEDEYSMEIRDEGLDY AVDACRYMAGLI LGALQGVNKEILLAPRFAPDGVDWEAHP GAACCLFYNLLIYHLTDQYCKQVGIQPSKFFWYIDRHDQK AVESCRLLAQVLANALAGQSKDHYSEPADRELAAGSFRHK ATDTCDYFAGLLLGCFEGKSKEELLADKYSPIPDYWYKRK AVNCCQLFAAQLHLADNGADKERSLRPRPMDINAGEYKQK SQVGCGIYVMVAIRLIGGTDPEIEIRSYNRLLKRLDEFDRL


## QUERY

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QPYHGLASAYVADTMQTVFHWFFRGRTFEECLVGTVNQGG SETDIKGSGYSVQSLEAALWCFHHTNSFEAAILQAANGGD ERKRIDNPAYIVDTLKVVFQALFATDSFENALI EAVNRGG RRRMENPGGYLVETLRAVFQALFATDSFESALVEVVNRGG KRADVVGSGYAVASLEAALWCFHHTDSFAEAVLAATNLGD FLQNIDSGGYVVSTLRTSLWCLLRTSNFEEAVVKAVNFGD








 Y IIE E L S H F G Y V V D S L E A C L WC F L N N D S Y R D T V I TA





 TKNEVKKGSSYVVIDSLLEAALWWCFYNSTSYREAVLMAANLGB





 T Y S S Q L Y A T E F Q H F G Y V I D T L E A S L W C C F L L N N N S Y T N T V L TA V N L G G



 T R K E

 R E A E IVVG S G Y S SV E S LIE A A L W C C F L L H T D S F D A A V L R A V N L G D
 $V$ I S E L G N G M E A S K S V P T A I Y S S F Lin S E N F K D S V V Y A I


 EPPAAI K G S G Y V V Q S L E A A L W A F D K S S N F E D GA L L A V N L G D $F S D N$ I K S G GYV L H S L E A S L WC F L N S E S Y S E A V L K A V N L G E A R EQII RGNGYVVDDSVEAALWCFDRHDTFEAVVLEAAN LGE

 D IVN DI K S S G Y V V I D T L E A V L WW T L V V N T N N S Y R E T L L K S V N L G S $P$ D H E I K S S GYVVVM T L E A A I WCCLLNTD S Y K D C V L K K A V N L G D
 R P P A I R G T GY V V Q S L E A A L W A F WT T E S F R D G A L R A V N L G E

 S P P D I $\quad$ K G S G Y I I



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9
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H E
F A TEAAI $\begin{aligned} & R Y \\ & A\end{aligned}$

## QUERY

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[^0]



D A D T T G A LA G M L A G A T Y GVVD
270
280
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D A D T T $\quad$ G A $\quad I \quad L$ DA D T C G A V $V$ T G GlLA $G A Y Y G Y Y G I$









## D

D | $P$ | $P$ |
| :--- | :--- |
| $P$ | $Q$ |
| $P$ |  |
| $P$ |  |
| $P$ |  |
| $P$ |  |
| $P$ | $A$ |
| $P$ |  |
| $P$ | $R$ |
| $P$ |  |
| $P$ |  |





 | $P R R R W L A$ |
| :--- |
| $P$ |
| $P R R W L$ |
| $G P D$ |

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


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 S

 PQEWRARLAQRQL R $E$ D \begin{tabular}{ll|l}
$A$ \& $R$ <br>
1 \& 1 \& $R$ <br>
$D$

 

$P$ <br>
$P$ <br>
$P$ <br>
\hline
\end{tabular}

 ERWRQQL V DA DLI


 P K A WL E RLE EK GRRY I K K P E N WRD RL H D T GM｜

 E E
A R
$K E$
$K$ L
SE
A

 |  | $E$ | $I$ | $A$ | $E$ |
| :--- | :--- | :--- | :--- | :--- |
| $E$ | $D$ | $V$ | $N$ | $N$ |
| T | $D$ | $I$ | $E$ | $D$ |
| $D$ | $D$ |  | $L$ | $N$ |
| $A$ | $D$ | $I$ | $E$ | $N$ |

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| UniRef90_UPI00047D5DAF | QV T A L L Q M |
| UniRef90_UPI00034542D7 | HVR K L L T I A |
| UniRef90-D5AQF5 | QV P K L L A L S G |
| UniRef90_UPI0003B7936D | Q TSALL RL |
| UniRef90_B3E295 | HADRLI |
| UniRef90_G8AJT5 | Q V D GL L A R S P |
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| UniRef90_UPI0003629482 | IA $\square$ K L L |
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| UniRef90-D7E8Q3 | Y A D K L M H |
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| UniRef90-B4CZ88 | F L D R L P A P S A $\square$ |
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| UniRef90-10KM81 | LA DAL HALL |
| UniRef90-UPI00047882FE | L A V G L H R L Y |
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| UniRef90_N9WXM4 |  |
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| UniRef90_UPI00037FD5DA | LT S V L H A Q R |
| UniRef90-14ANF5 | L C E R L Y DL |
| UniRef90-IOKC29 | L A ERL |
| UniRef90-A0YYT7 | L A Q Q L E R Y P L |
| UniRef90-10KH30 | L A Q R L |



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TDMMGYGTHHQPPGTWS
TEMVGHGTWNQPTGTTIT
$K$ GMMGYGTYNQPE

## D

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T RMRGYGTYNQPPG
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T RMLP N DNFD LP P GCFT D DTS MT LCL A Q S F LDC G GQN VD



 T E M L A N G S H GK S A G TVTV D T E M A L C I A R S LVVENERF D G Q D TGYRNGGPHRLAA GEWTDDTSMALALADS LARVGWDLND Q REMK GGGPHRLPP GFWT D D T S Q A L C L A E S L L Q R G F DP K D KE』PMLD DDMHGGGPFALRA $Q D \triangle V G Y G T Y N Q P P G T W S$
 $K G M T A Y G T Y N Q P$ KGMTGYGTYNQPEGTWSDDT

D
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$V$ DMRS F GVVH GQQK GTWSD DS SLL L L C TM E S L L Q

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 D V VRDEYRSRWEPGEWTDDTAAMLCGIDS LLESNEVNLLDD

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MAKKLYHI
$\square A E D L L E L A$ MAGKLFDRAP FAEDLLAAS
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LADDLLEVA
AAGNLIRLGG
LIDEF
AVEGLHALR $\square$ CNKFFD

LA QQLFERAPL
LANRFY
LAEKLC
MVTALLD L R G
MADELYRLY
LGDRLFR
LANRF
VAQK LLEHRN
MLQKLLK
KCEQLF
$\frac{Q A}{L}-A D A Y R M S$

LADRLHAAAQV
L DKK FYEF
LCQRF
LCERFF
LA QQLlFAAAPV.
LAEDLLRL
LANRLAK
LA HR
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VA D DLIEI

L I K R L L E

LAERFAR
LA QRLEA
LA R RLWSAS
LS ERFAQF
LSKKLHHL
VE QL VR
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MADDLLA Y R

L L E K Y FQVVS GM LTDK【VNI

F LIE Y VF K T Y G

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 TEMMGEGPHNRIVKGGWTDDTLQMLAVAESLITCRGFSAED


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 P NRKE G V T D MVV G Y M P A Y G H $\square$ G A $\square$ T


 $\begin{array}{ll} & G \\ P & \\ S \\ S & D \\ T & C \\ M & T \\ T & D \\ T & C \\ G & P \\ T & E\end{array}$ F SLLFNGSSSHFT DRIR G G G WL RLPA G DVT D DTTMTVALAEAL GAGGPPDARA VD MVGH GT HN QLLA GTWS NHKSKDFEDFTDQCRFT MKVKDGHRVRWNQGDWTDDTAMTVAIAKALLECNG DYT D

GKWHQRLFF GYGMDSDDTEHSI FVAQCLLACGDDEQKR
 NYKSKD FP LLFCQRSEFTDDTVMTLAVAKALLDTCGEDDAA D DMRGGGPFALRAGQWTDDTSMALALAHSLLHRQGFDPAD R P Y K G H P NE GL N A G Q Y T D D T Q L M L LV GT L L A D R K Y T E D R PEMTGGGGLGGYEPGEWSDDTTMAVABALAVADGHDLTSEA $\square D R F L D G P F N Y K Y G Q F T D D T G Q A L V L L D S I A S T D Y P D V R D$

KNFNFFDKRCFFTDDTVMTLAVAKLLKFDAVTDIKE



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G
ES LDQ P DA P S L E A G R V T T D D T


$N \square H T T D F E L F T P$ Y G N D WT D D
 D M $\square G G G G L G B P A A P G E W T$ D D T S M A L A A DA E V V SAATGE G A G L D A

 $Q G V T G Y$
 RTARPIAPYHKGDGHVT DDT

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Uniinefoluplooons
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UniRef90-DGYAVO
UniRef90-R9HR23 UniRef90-C9PG18 UniRef90-ㅎ5H8J1 UniRef90-K3WZ12

UIAQNFKVJWA 90 GCPMG| GET 100 K KVLDFGDY 110 FSRRLVNWADWGHFDIGLQTARAI ERLRAGIAPEGPKGEF FATRLIAWHDEGLWTVDGQVFGIGWQTKLALQEMKRGVEP MANRFLEWMEKGEYTPGGTTLRALGKYKTTRRSCGCTSNT VFARFQRWAAGQPKDIGLQTEDVLTNGEPWDALLHEQVNAR LMDRMMRGYRRHPEFYGPTSSLVFDLILAGRSPEAGKRRR VAAEFVAWWDSRPKDDGNQTRQVLEWRDRTGRDMQLRAHD

LAFRLRWWLLGLDAGGUGYATLKSILKLWESAAAMADRARA MRRSYLRWYRTQGYSHGGHMDGWLLTHRDLEAQRAPGNTC QMQRY RWRDGKCFDDGNTVSAALNQYLSTKDANAGSQEY LVRAMMYYGSKYPFPMGGYGAR VIARWAEGFDAFNKNTFGPSSKAAMRADKEGIADSELENN VFRRFQRWAASDPKDIGLQTEDVLTGGDPWDTAAARHFDR VAKKYAEWHDSRPFD GNTCGLAFGDAPDENGAYGERSMA FEEAYRRWGRRYPDAGYGRAFRA WLLSRRPEPYQ VHRAYLRWAATQRDWGPDERKKDDGWLAREEWLYAPKNPD VAAGFLDWFESNPPDVGNQTRKVLGNVHRGTRDFAQTAEH

TALIMAESFRIHRKLFGPTSARVFEAVLAGKSAFRDSKEV PALEMAESFRTHRKLFGPTSARVFEAVLAGKSAFRMSKEV FGERLKRWYEEGAYDVGVATSRADRTMMEGTRPAGETDER SIQYFIEWMTKGHWDVGRSTRTSLRLWVQFGMEEGEFHNE VQLAYQRWLHTQGVDWEAAAGRFLGDYPAPDGWFTEKDND LMHKFAHYRDNGYWTPYGKMFDYRYKQRLPDEEWGGSSEY LLGTMQDYGNRYPSSYGNMFYEWL FAQQLEMYCRVGFPELGDTPHGAASRLCHKVEDQDDVLFE CADAFDAWMRAKPVDVGNTVRRGAVRWRGHGTAQAEPSS LADRFVK ERTFGGGSTIGGAFIRNYKDERKPWYLESGVH LSNHALRCMQEIGGQKYPDAGYGRIFYQWLYKKVPGPSGY | FACRLRTWMNKGFPELGDWGGCGUGPEQASRLIWERSGKM |
| :--- |
| FEQSLLEWCRKYPNKGAYGGS | LA WCLKWWLVSLPAGVGLATLKSTIRDW LGVSPLK SGVY 1 MDNFILWVSNKDFIIGRATFFALGNYHNKRYECGMKGFN

 YAHALREDY DRGALRFPDGSLSAACERMAKENAPQ KGVK VARGFLRWYNGRPPDMGNQTRAVLAATDRRLHTFAADHPR FKKELVSVMHEVGDKYPNCGYGGHFGVWDRENYTEPYN
DESTKLYACKLKEYGRKYPDAGYGRMFKQWLSNDEDEPYN FAEKMRKWAVENRMVIGPSTRRFLLEALVNHTDFMEA GKT IGARRLIA WNOAFSSMLVGPSSLRALAABRAGKPIVESGRV FARRLRDWMLKGFPELGDPGGFGDGMHAAARDVWESSGRY YARQLLA WEEQMRARGSGPSTKAALQLVREGADTAKVGKE AAWYFVDWFEGRDWPGGGATAQGIMAFKAYGDSKSGAGEG QMNRYANWYQHGYWSSTGTCRGAGHTYLVTGEPLAGNDPD LAKRLIDWMNGFEDNLLGPSSKASLLAHSEGRDPSQYLKT TAHAYLRWLQTQWEPGWLITQQRALHDRRAPGNTCAWARNN AARAYWVWWWHGRCFDGGGTTQLALLSYSKLLNPEYPRPTN FKDSLYWCRKYPSPMGGYGAR FARWLHSADPQPYN EEAVVTNMQDRGKRYPYAGYGG KFRHWLRESNPKPYG
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 TARAYDRWFDTQGEHPRHTGHREDHSQRAPGNTCTPADND VADHVVPELMGSPVWIPEDEAEALWIVTRLHYGHVDPREA FARRLRWWILALPAGVGKATARSGVKLW GVSPAKAGVF YARRVALETENR\VGRGRTTEAAVERLALGVPWQEAGSP LATTLLKWEDDMRAKGSGPSTKLALEQVRNGGDDTKTGKT CAKRFLSWLRENAFTANGEVFDVGHATYEALGTSGKPCGGR LAAAYQRWLHTQGVSHPLQHGLLDGWLVTVPALFARRTND I ARHTLSWADHFEKNVLGPSSKAALNADRTGDSVHDUVAN I ARRIKNWMKHGGLGLGRTTATVLRQKKYEDDPHACGQCN LAKVMQYYGKKYPCPMGGYGSS R F FVRWDNEEYPKPYN
 VAVNMKEWGRRYPDAGYGGRFG I DMTWADGFDAFNKNVFGPSSKAAMTATKAGTPDDELENN LYHAY TRWLSTQERLHK 1 MDKYLVNS WVLRRGWFHALKEP (L WLAYLRWLATQPQPRWIDTQGVLRHRRAPGNACRPVNAD A NKLI A WTNAFENDILGPSSKAALLAVKKGEDASDVTAR I GRHILKWFDAFNKNVLGPTSKDALKAIIRQGTPVSELENN LVARLIDWEAGMRAKGSGPSTKRAIDMILAGHTPEESGRY AVCAMQRWGRRYPRVGYGGLDFR VAEAF LDWRREGASDIGMQTSAVLDAMFAAARRAYESGVP QMERYERWKEFGCFDIGNTVAQALNRYQKNGNANAGSSEN
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UniRef90 C9PXW5 UniRef90－UPIOOO3474B28 UniRef90－F81HP2 UniRef90－R7F8G9 UniRef90＿A0AO24YPC8 UniRef90－B8GGP7
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Unireftoo－DGYAVO
UniRef90－R9HR23 UniRef90＿C9PG18 UniRef90 B5H8J1
UniRef90 K3WZ12 UniRef90－UPI0003B5F27A UniRef90－L8ESS3 UniRef90－M3UYG8 UniRef90＿H1YWM2 UniRef90 L8X272 UniRef90－A0A017SWZ7 UniRef90＿UPIO00248D27C UniRef90－K9FE34 UniRef90＿UPIO002378A0E UniRef90＿UPIO00473C43B UniRef90－A5ZIA6 UniRef90－C3Z2N3 UniRef90－A1K2U2 UniRef90－A1ZWC4 UniRef90－F2KS80 UniRef90 H1CCJ2 UniRef90－C3XON5 UniRef90－UPIO00346E2C6 UniRet90－R5IWQ9 UniRef90－R5IN23 UniRef90＿LOHBK4 UniRef90－H6MRF3 UniRef90－N1ZUS2 UniRef90－E6URS5 UniRef90－UPI0003B4E377 UniRef90－UP100036DDOD6 UniRef90－I1G689 UniRef90－UPIO0047E3522 UniRef90－UPIOOO3F5CBA4 UniRef90－B2ACB3 UniRef90 AOAO23YYY2 UniRef90－R7KIK1 UniRef90－R9KWX6 UniRef90－UP100037EF8ED UniRef90－M5BUC4
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Uniref90＿RONWG2



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140
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K A VEECAANDCRLLTHYDPR
A A A NGG｜L｜MRTSVV｜G｜L｜FP K A VEECAANDCR｜LTHYDPR

 A A GNGSLMRAAT SAVVYAGGREATMDAGRRIAALTHGDRAA SRSNGAVMRGPP IGVMY NS GQVQEDS LLCAALLTHADPV
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SKGCGGVMRAAPVA CSTDPAEVFRLAARTAALT
 DAGNGATMRCLIPAALJATVGADTAADAQAARQARAT ENGNGSLMRIMPLLFYIKGDIRTQFNIIWEVSALT
 SAGNGVAMRSSTIGGYFADNDVKLDDFVTLSTRIT YNGNGSLMR LPLAYYCYYNDDEVYHLVKDISSLT SYGNGSAMRVSAAAELYAEDMEQALHLAKLTAEVT STTSGCLAAGVPFVLGFPDMNEACERAVRACNTT SAGNGALMRTAPVVLAHPDDRDTLSQAARAVAGLT SFGNGSAMRVSPVAWY ANSLDECEALAAATAEVT SFGNGSAMRVSPVAWY ANSRDECEALAAATAEVTHSHPE GNTNGGAMRVAPVGMFFHGDLDRTVQADDSARPSHGSRP
 GATNGAAMRICPAGI A YRPGSELISRVQTMTELT RAGNGSLMRCVPTALFQRDEG RMVEESMGLSAVTHDDSC SAGNGSIMRLAPVVLRFAGLPERQA MAVLSSRTTHGAGE ALTNGAAMRIAPVGCLIADKPELLAKTVADISKVTM

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SAGNGSAMRAAPVGLMFYDHPQQLIQVAHQQGLITHQDPR SAGNGSAMRAAPVGLMFYDHPQQLIQVAHQQGLITHQDPR SNGNGSLMRI LPLAFV LECTDEEIRAVSAIT SKGCGGVMRVAPVGLFLHREPAHAFKVATELAALTHGHPT GVTNGAAMRDAPVGCLMATDKMAFIDAVRQASSPT IIAPNGGVMRTSVVGTHRFQDLEEVAKNASDDARVTHHDHR SWGNGSAMRVSPVGWY FNSLEETLAVARETALITHNHPE SQANGALMRVSPLGMFGSQFSTEQVGLWAEQAIITHPNPV SYGNGSAMRVSAAGWL YESVERTRENANATANVTHNHPE GVTNGAAMRVSPLGCLMPTCSDDFDEQVWLASSPTHKSDV SKGCGTVMRSAPFGLIDPHDSREAVYKLSSDAASLTHGHPS AVTNGAAMRDAP GCFTPEDEKDLVDYVWKVSKVTHTSDV GTTNGAAMRDTPVGAADVGDPGRFVQAVIQACQVTHNTS
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UniRef90 UPIooo3B5F27A UniRef90-L8ESS3 UniRef90-M3UYG8 UniRef90-H1YWM2 UniRef90 L8X272 UniRef90-A0A017SWZ7 UniRef90-UPIO00248D27C UniRef90 K9FE34 UniRef90_UPIO002378A0E UniRef90_UPI000473C43B UniRef90-A5ZIA6 UniRef90-C3Z2N3 UniRef90-A1K2U2 UniRef90-A1ZWC4 UniRef90-F2KS80 UniRef90 H1CCJ2 UniRef90-C3XQN5
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UniRef90 D4SKT1 UniRef90-LOHBK4 UniRef90-H6MRF3 UniRef90-N1ZUS2 UniRef90-E6URS5 UniRef90-UPIO003B4E377 UniRef90-UP100036DDOD6 UniRef90-I1G689 UniRef90-UPIO0047E3522 UniRef90-UPI0003F5CBA4 UniRef90-B2ACB3 UniRef90 AOAA23YYYZ UniRef90-R7KIK1 UniRef90-R9KWX6 UniRef90-UP100037EF8ED UniRef90M5BUC4
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170
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54545


 $A \square A G A$ A A V A E A A R L G L Q R G N R WY G A S IMM D R T N I A M K I I S S

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






 CTV A CAAA Y N T I V S K LI D Q V A P Q E A I E A G L Q VAA E M A A K GP V $C \square L H B L L L G E D K S D A L S A A A D Q A W Q S K K I L A L A R G E Y G N K$






 S E EAA C VI VY V H V A K R L L N I L L D I L P S L Q Y D K P F D R L H R IM Q L
 $A D A$ GA FA IIA WA S R A II E GA S WE E IVKA E LIP V L T E E V Q Q Q H I


 GIIK GA EATAS SAIF MARNGSS K D EIIK S Y I E K E F D Y N L D R D E

 $A$ A A GA S MIIA I A V S A A CD GR N W D E II D Y TM N V Y D Y V E E F A H




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 DLLS A YPS W I A E EALA DAVY CNP GP HDVR QALLLAVNHS G WR A GA D $\square$ A A RLL WVRK LVRGMGTRGE EPQQA L CLAA A QLGG




## D

 T T F S A SMASRVVELALMMVASEHCGVVEEDPNRCAVLACANLGG

## 



 IV A DV ETS GYVL H T L E A A L WALLWHS DT F E E GL MLLL P L G S



 WA P H Q N Q M T F CF K T L A A GL V A L R S K Q D F R S A I T DRRCDNPSGFVVDTMRAVCQALAERRNGFQAVLTDVVNRGG
 FSNK I G S GAYLLE T L P F VI Y VLCNY S DPEESIVVKAVTYSK

 TEWK G DS GY DY H TVPMA I Y A WY Q H F DNF QEA L E A V V F N CG G


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 KHDE L K A Q E K E F Q DHI $N$ A K N L L K R T G T D F R K F I M E L I M M A G
 A GATDAARFTTEEQLAALLIAAVHYAERPFEALLEGANLGGG E E LP R GAS GYVLESSLMLAVAAMFDPRSDEDILVDVVRVGR $Q R G Q V R G T G Y V V D S L E A A L W C F H Q H D T F A G A V L E A A N L G B$



1
 EPPPALDRRGHVVGALEAALDWAFHRSGSFRESVLEAASSLGBD P E LGGGRCS G Y V L E S L S L A I A A I LDD T R S L E D IVVVDVVRIG W
 A I S SLLGE G WI A E E A L A I A L Y C T L K A D S F E Q GlV L M A V N H G G
 TLLSAA E H G WV A E E A L A A I S L Y C C A L T TA H S F E E G V T F A A V N H G G $D Y R S P S L G A R R P S R L H A I E M L L V G G G D F R R T V L G A V N Y G R$

 D S S E Gl R S S G Y V V DT LIE A A LDWVI S HV VE E Y D N DVVLA A V N L G E
 $A D R V L G E G W D A E E A D A D G L Y C A L T A P D D E R G G I B R A V T H D G$




 E G WIVA E E A L A V GL Y A V L A T S G S T P A E H F R T A I A V A I N H S G






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260

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L Q D R L K HA
LVESLVR

| 1 | $C$ | $Q$ | $L$ |  |
| :--- | :--- | :--- | :--- | :--- |
| $L$ | $A$ | $R$ | $F$ |  |
|  | $A$ | $L$ |  |  |
| $T$ | $A$ | $D$ | $Q$ | $L$ |

LAD DFAAQSA
LGDR LAEV

QAAD DLATM


| 1 | $L$ | $D$ | $R$ |
| :--- | :--- | :--- | :--- |

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KA CGL LEMA M
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LLEEFEA
Q A K Y L A T F P L
VVTKFKQMYG
I G D K LT E


## VA E DLLT F

## V VR R F

VMEKFYK
ADDLER【
$\square A N A L V L$
$\square A K R L I G M T P$



$\begin{array}{ll}\text { MAD R } \\ \text { Y A D Q } \\ \text { L } & \text { V }\end{array}$
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LANDLY
$V L A A F D E A R Q L$
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DTDTIAADAGGLLGARWGASAVPDGWRRLLHGWSADDLER DSDTVAADCGGVAQAYYG DSDTLTCLAGGIAEAFYG UPVWFETECTARLPEDMLT
 DTDTHGAMATADCGALHGDDAFENVHIQLINTANNDDFAP

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| UniRef90_F0QZ12 | V 290 |
| :---: | :---: |
| UniRef90-H1S4F2 | L A D D L |
| UniRef90-W5TQ94 | VADDL |
| UniRef90-B6HJ73 | LADQLLTAQGV |
| UniRef90-13Z184 |  |
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| UniRef90-K4LEH2 | VAD DL |
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| UniRef90_M0EQY7 <br> UniRef90 UPI0001C377DB | $\square A D Q L V E L A$ |
| UniRef90-D9V1X0 | $\square A R D L L A L R A$ |
| UniRef90-Q2LW57 | 1 l D T |
| UniRef90-S7VBQ9 | L A V D L F |
| UniRef90-W5XH37 | YADKILQF |
| UniRef90-H1HK13 | VITLFHE |
| UniRef90-Q8YSA1 | T TEKFM |
| UniRef90-B3RV10 |  |
| UniRef90-14XPT6 | LVQ G L L A L R |
| UniRef90-UPIO0034493A7 | Q A D GLAELA G |
| UniRef90_V9Z6T8 |  |
| UniRef90-UPI000466A66C | VA EDLERV |
| UniRef90_Q7QCA6 | LAEQLF QVA G |
| UniRef90_UPI00036834BA | 1 A D D |
| UniRef90-J9G3S4 | LVEEFENRYG |
| UniRef90-J4J385 | YADSLLAHRG |
| UniRef90-B9XNA5 | V A 1 R L A |
| UniRef90_G8LV97 | 1 L NTFNDRYE! |
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| UniRef90-A2ST17 |  |
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| UniRef90-F2RHY5 | P A R A L T E Va |
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| UniRef90_UPIO0028A0608 | LA D D F |
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| UniRef90_M5Q0U2 |  |
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| UniRef90-D3A8L4 | la ${ }^{\text {a }}$ TLLT F |
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| UniRef90_14ALL2 |  |
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| UniRef90_UPI0002654018 | K\NALLD M M G L |
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| UniRef90-E1L4C0 | 1 L T A F |
| UniRef90-D4CJ26 | V L NRF |
| UniRef90_B0L8U6 |  |
| UniRef90-A0A015ZIS8 | V I G N F Y H |
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| UniRef90_L8N5Q1 | VVEKFREWRNL |
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| UniRef90-R7CQF9 | VVDRFETLLA |
| UniRef90_U2KH92 | $V \mathrm{~L}$ ERF |
| UniRef90_UPI0003738D39 | R DALVEFS P |
| UniRef90-I0DUG5 | YAK $\square_{\text {L }}$ SALDR |
| UniRef90_R5FLB8 | V L K A F |
| UniRef90_H2JVG2 |  |
| UniRef90_UPI0003725EFE |  |
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| UniRef90_UPI0001E2E2D8 | $V \mathrm{~L}$ D N F |
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RVEGMLLGAA $\square G D S L G N T S E S R \square P V R H Q \square H G E \square$ RDRACGALLGCAAGDALGAGYEFASP LGPDVP QQRMLGCLYGQADGDAFGMPSELWSREKVRAYFGWI

SRAYGALAGALALGDVELGSVYEF GMSPQQDQTVYGHV AAGTLLGLAVGDALGAPLEGLPPPEKK
 MIGAIVGDIVGSRFEFSTKNKISYFGWI ПEKKDLGCLYGQAGGDAMGMPSELWTKNKVISYFGWL MLGAIAGDII GSRFEHAPDQTV $M \mathrm{MGALA}$ GDMVGAPYEFDQGEKIKDFDLFD
DQNTVYGCMIGGAIGDALGAPDEGWT
YRARVRGCLLGGALGDALGYAVEFSSLDQTRAAHGPR MVDK】AGCLFGGALGDALGYPDEFDKVDQLDPKHD

EKFRGAII GASCGDALGYPLQNLSVARIKHRFGPF
DRWLGSLLAGAVGDALGGPVEFLHIDTLRERFGP MLGAll GDNVGSRFEFNNTD
$\square P D R \square M R V L Q A A V V G D A F G V P Y E$
 MLGALIGDVGSVFERAPHKSKE MYGAILGDMI GSPYEFDK
$R \square Q G C L L G Q A Y G D A L G M P S E D W P K S R V E S Y F G W \square$ MI GAVIGDVI GSVFEWN
$\square A A R A A G V L V G T A C G D A L G V P Y E F A P K V Q \prod A P$ MLGA IAGDII GSVFEPHWRRIKRKEFD YRARVRGCLLGGAVGDALGYAIEFTSLDRIRATHGRH LSRAQGCLLGQLAGDALGSLVEFRSAEQIELLYGGV LKNKFRGAMLGVLVGDCLGSPFEGKDRPKKRRSLQKR AAGVLLGAAAGDIUGSDYEKDPVKDMR
 WAAR पPEDRV R N ARRARVRGALLGGAVGDALGNPVEFLSLDGTRRAHGDQ FRSRVRGTLLGVAVGDALGSPVDPLALDAIREAHGPD TLDDR LTGS RRDALAGTLIGTAVGDALGDPMEGLSARRQQKLFPR
$M P D R L L R M L Q A V V G D A G V P Y E F K H R D T$

L AVALGDALGLP FRSRVRGTLLGTAVGDALGAPLDALSRLDEREAHGPL MRDRVRGCLLGGALGDALGAGIEFQSLAEIRQEHGP LPDRRLRGCLLGGALGDMLGNPIEMRSMVTVEAEHGPD

RA MIGAlIGDIVGSRFEFNNAK
PESLDRASGSLEGLAFGDALGADTEFMSVEQTSAKYGPE
TWSDRVLGCVLAGA GDALGASDEGGP DMM RRQMGER LDRAAGALVGTAVGDALGVPYEFECRPRLRSGGES ■KDRAAGII AGNDIGDMLGAPLEVENRARPUTGPEPA
GPA RFRGCMYGAAAGDVGSVYEGRSVKDPELDPD
 MLGAITGDVVGSRFEFNNHRD
FRSRVRGTLLGAIGDALGTPGDGLSADRVREEHGER ATGALTGLALGDALGFPTEFNDVPSILAKCGPW TILGAILGDVIGSVYEFN
DAAFGCFLGACVGDAAGATLEFDGHEPSMTEVKDA MEEK DGTLLGAADGDSLGMMVEELPVDEVIEFYGPV


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G VQUPRHQIQP $\quad$ GYYTDDAA










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A A B A A A WT PA H A H

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VHAAYRRWYAT QRDWGPDERKAEDGWDDRMGTLQQPRNPE Y $\emptyset E Q F K$ S YFRRRYP YA GYGSTFRT W WANSSSS EPYN LSE QA QN SMKNLLVIQQFPWK GY GQNF DQ WA MNPKPE P Y G LA S G L CR WRHG GF CAVGGHVF D DGDQTAAA LDAVAPA GER YK D S L L E WCRKYPNPKGAYGGS FARWIVADDPQPYN $L L D W C H R Y P A P M G G Y G$
 L M T R Y S Q WY H Y GEYTP GKT TE DAllKR F D Q G TKPCGGVDEM V S HY Y S R Y A LIE Y P Y PMGGYGGMFKA WSSKVAR QGDHEPY N I AK MYRK WYFSNPFDDGMTT H SALDSADDNKASSSUYENNTQQ
 V H RA YL R WAA T QRDWGPDERRKDNGWL AREE WLLYSPKNPT


 MA H TF I K N Y E LIEPFR GYGPGPPHI FRLI RAGTA WDEYYS G LARKFAD S G R $\quad$ SYG $\square G R T M K G F L D A F K S G R P W Y E S ~ G P H$ I VERWHS WAQTAPDVGNQTRRRGLTA QSARDASAAERTGH IAAHDMR WDDAFNKNILLGPTSKGALTADQQQGVALA DDQAN FA QRLYQWTVVEGFPELGDKGGCVLNPHYAA LQVWQKSGGT
 LKNTD CMQSLGRQYPYCGYGVNFYFWIFGD DDPMYN
 VVCFMRRHWGRRYPRDGYGNLGRR QWLLMENP QP Y G TPY YES DRRDGRQYPHAGYGG SFFRWLDAENPRPYN LHD WCR RYPNPMGGYGE WF WR LR WVESDDDPQPT G



 YQHTLHRYGNRYPHAGYGASFRA WLDTHDPHPYG VRQA YGRWLET QQRPP GNACLS GLA Q SHVPDPAPGPVNPG
 $V$ GERFLD WLA GGASDVVGQTRAVLAHAAEAGDEFSARTDR I E G $\square Y$ R S Y MR WYYSQTGEEPRRGQK TWMRRQSHEREFCND $V$ QHAYQR WYHT Q GVP WH R A G GS YAMEA EPDGWLVREP GND
 GFKNLSRK I S E EMVEDGNKYP YMSY GTRFR YWLE DP DP Y N LMDKFVA Y MERGAYDIGNTCAKADRTYQAEPTTCGDPSEF
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 NFAKTIWEYGRKYRGRGYGGSFRNWLQEDNLKPYA VA E RMLDRWLKA GAT DVVDETARSSAAHKVAASAA YF H K R T GR YA H T IK DYYRRYPKA GYGKTFRR EWGAS DSMEA YH LREA YERWLE T QSKSAPGAQSYAPDPWLP LD GKPGRVNPD ALDDA YV H WYRSGPFDVGNTAA GAPSPGACPGRARAAAS LT VAKRFARSYQNEPDRGYGAGAASVET DDKEPAKTDFDGLG F EDNVR SYACQYP LA GY G GTFK K WM A G IIT GP Y N
TARAFLRWRREGASD $\quad$ GAATAQVLGGTERALAAMFGS GQR $M R R F Y K W$ Y $\quad$ P GVGYGGSFHKWAKNPGLGPYN FAETDWKYGRKHPYRGYGGF F DEWLQSENRAPYG A A E ALKD WGRRYWDNGGWGSRFG_EWLLSDSMEPYG VRNAYRRWLDTQNHPAPPAQHPWLYARRAPGNACGPVNPQ LHRAYRRWVATQRDWGPDLRRKKDDGWLAHMGTPEAP KNPG MAHRFAQEYKKDPDRGYGAGVITVCHDVYEPARAQFNGKG
 L A R R L R W W W I A L P A GVV G Y A T L R A I L K L W L G L S P A R S GVV $L M D R F V A Y M E D G A Y D I G G N T C A K A I V R K Y R A A P I D M C G D P S$ E F RTYR A ARELGSRYPGARYGARRFSDWLIFSEGGLPYN
 LWGAYRRWLTTYARRAPGNACLSGGRRRDTMGTLAQPANPD LLAAY LR WHDTQRHATPPPPDGHPHRTGRLREEPWPVNPD Y M $\square R E W A K W A V Q A P D V G N Q T R A V L S H A Q R V A S E G G R T E P N$
 LA LARFARWSRGYGPGAAR ILKR DRRGEHWSSASRKVYYTGG
 $V R D A Y G R W L D T Q R Q P P G N A C L S G L A Q Q V H H P D P A P G P D N P D$ EYRKYSNWFFNGEYTPGKAFGYGRTTMRAIVEKSPGNQRT F DAMKKY GRMYPNADYGARFNRWLMTNNREP YN LETLAVEELLHFFNAHPDAAYGGRFDTWARGAEQKPYG

 Y L S L L R M L A I KYMMQE IGRPNCGYGGMF GRWVF S DCPEPY N LHRA YRRWAAT QHD WGPDERRTEDGWLARMGTPAAP KNTA A WHH WLA DLDE GPFRGAGFSERGTLENLRR GAPDTA QHR H MA GPFVAWYHSPDNNPGRTCLDACELLDDGDRPWQEASRTG FAQT ILDYGKRYPNRGYGTS FFKWLAHDTPAPPYN


VQSAWHA WRDE GP F RGAGFSER GTMLN LRRRGAPVTAQHRH

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## \section*{}

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 S L VA S GI L T NVI I R T I Q N P N K Y A ML K A I Q E A L T Y Y G D K P L

 A Y L S A GAFAVVVHGLAR GETLDGSVQRALAQLASRPGHQP A E Q GA DAVALAARHARTSSTVDANLWFNDVARARDFA DS Q A H A A V S T F V T L V Y S A D H G H A D P V E K A L A Q A Q NE D E I E T D T GKE GAALDAAYADGLALVAAFDRDGFLAKLIDDYTQDKVVYIRV STSSSCLAFTAMLWWLL DMKTPPDPAWWPKRYAADAAAL Q G A G D A C V L WC T T I R R A V R T R H DP DEERRE L WASSRLDEA E A S P

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A LR HA AVGC|LLGTAVVDALGLAGEGLSKRR|LARVYPDS TFADRGRAALLAHACGDRFGAP LEFVQDASVR $M L G A M D G D \square A G S K Y E F N$
T T R A R A L S A LQ G LA L G D AL GMP T Q S MS RER $\square F A D H G T L$ MLGT\|I GD\|VGSPYEHSSEPMKSKDF $R K R M K G A L I G A A Y G D A F G M P A E M W T P E K \square K R V Y G H V$

 GMYGA IA GDDI G SIIYEFENHK S
DRF LGGSLLAAAAGDALGAPVEFYPVEQDRSRYGA MTRRAS GCLFGLAFGDALGAATEFMQLEEIXCRRFPPB $R$ Q D R F H A A F V GLA A G DA L G F P L R G DP P A S L A R L P G L A MLG A I I G D L A G S $\square$ Y E Y D E F K S V K R N $\square$ D R R I A G A I A G DI I G S S Y E LIK G
E K V $\quad$ Y M L L G VA V G D S L G Y P FE R F T P D E R L K K F G L I



T Y K D K VM GCWA GKNDG G VLGAPFEGKR
Q V $M \backslash G A \backslash I G D I V G G S H E F R D$
$\square K N K F R G T \| L G V L V G D C L G S P Y E G L K T \square S A Q K K S N L Q$



FRACLEGGA G GAL GAEMEFWSLDRIVRQTFP
 $F R S R V R G T L L G A A V G D A L G A P V D G L G L G A D R E A H G$
 $L D R V$ K G CLLV G GVAGD CLLGAP FE GQTVVSSVVLNS Y L E MF GA I LG D I G QP Y E F DR
$G A T L D D R \square T G A L V G A A V G D A L G G P V E G Y S P E Q \square V E R H G A W$ K S G $\ddagger$ YGLI I G D A M G VPVEFSTRE E REKNP $\square$
 $L A E R D T G A L V G A A V G D A L G G P V E G Y D P E R I A E R H G A W$ K Q A A T GVLTGLLA GDALGFPTEFDDVPA LIAKFGPW $M \square G A M I G B D I G S V Y E F K D N V E$
RAA GTLLAAA CGDALGVPYEFAPR S Y R E R A R G C L L G L A A G D A L GAPA E ENDS PA E DR R R W G R L





 $M I G A D I G D V T G U S Y E F D N N T E$
$M E G A F I G D \| V G S V Y E W S$
 VRERALAALAGLADGDALGDP TE GDSPAEDTPVTG
 E D R MLG A L M G T A V G D A L G M P V V G G L S H T N V R T Y Y R G
$M$
$M$
$M L I E L A \| G D A Y G A G F E F Q D Q Q T \square E L Y N N L$
$Y K D S V Y G T \square Y G A C \square G N A D G T \square T E D M K K R Q V N H K Y P \square R$ $P L L A Q R R R G A L L G M A V G N A L S V P T A F M A V P F P K Q A E G P Y$ $M E D K F D G A F L G A A V G D S L G M M V E E L P I D D V I E F Y G P V$

 ML L E L A A I G D A Y G A G F E Y A D I G M I R Q H N T L A




 | $M$ | $G A$ | $V$ | $G$ | $D$ | $V$ | $G S Y Y$ |
| :---: | :---: | :---: | :---: | :---: | :--- | :--- |
| $M$ | $L$ | $G$ | $A$ | $F$ | $G$ | $D$ |
| $I$ | $I$ | $G S$ | $T$ | $R E$ |  |  |

SFASRVQGS LMGGALGDSLGYLVEFDDVDTDRERFGEA MNKKVLGCLLGAAVGDAMGAATETKSTRQIEKTFGFK





RTARPLAPYHKGDGHVT DDTLMTHALIRVYATRDHLDAYA K D $\square$ T GYGTYNQPEGTWSDDSSMALATLASDKDKGKMDYK D
ERREVL TYT D DTHMM TGVAESLIRTRGFDGEN RTARPFAPYHKGDGHVT D DTLMPHALVRVYARRDHDDAYA $R Q M P L P T P$ A $A V V S D D T Q M T L A V G H A L R T A T D R G V L E$ DKNFK LFVVSYAMTT D D S DMT LA AVGQALVNTYEK IQEE P EMDGGGLGGPYAPGEYS TE M I G G G G
$P K F L D Y H R T L F D R G D F T$

 M DF Q SL H E I A P E E M MV V D DL DVVQLI WL N V L L E K G WE T S D D
 REF QPVPSVRSAPGELADEGQLLLLTLDESI CTQRALDETD
 NVKTTHFYLFTPSSRFTDDTVMTLAM AKWLTDCPNHEFKE TDVKDNVELFTNECSFTDHTICAVAMADAIMNNGSYQEA GPREDAG DPAPVVTDDTQLLTLAV GTALLSAPTPTAAVV DRY R RFF GWGMVSDDTEHAALVVAEALARSAGEVQAA

 H GA LR S R T L LP GP WLWT D D T QMACSVVFAVLSAH GR DDQEV ACTKDYDFPLKRESHFTDDTVMTAAVCRAILNNGENIGRE F A A A R GLDPA
K GVVGGAPD
N GY $\square$ K H P R HD $\square \mathrm{GP}$ G C Y T
 MKLMGGGPHELRRRGQVTEEVQQLMACLSHSLRAMGRYMAAAB K DLMVP HP Y F L R P GENTSEFEI DTVVAKSI DDRKMDDDK D
 RTARPI APYHKGDGHVT D DT LDMTHALVRVYATARHLDAYA $E G \ A D L A P A H G R S G G \| T H F T Q L T L F T V D G L I R G A W H P P T D$ $R Y V Q H P R H N D R P G A Y T D D T Q M T L A D A E A M V S N D P W E P D A$
 F DKL E GPP FKA G G QV W G R G $\square$ T D Y D LD E N G T A R I T A D T Q L M L L L S A N A L R G I M A P V Y Q Y RTARPIAPYHKGDGHITDDT LMTHALVEVYAKRRRHDAYD PTKYA DFELYSKHSFFTDDTVLTVAVADWLLHGGB NVKTEEFELGPPPGSHFTDDTVMTVAVAEKLANSGCNSRKA $G L V D L S Q A A \quad G P V H F S D D T Q M T L Y T V D A L V E A G A D A N A C$ T P P Q D T LAARGRRAGQVT DAFS IPYI LTKHLI KEGGKATRE RELTNRHNSRWDKGDWTDDTDQLIVLMNMLI ENGGVVND D P QTGGD LD QPSPEKWWVSDNTDMHLTTAGALTTDYWCLDD TPQPNSFHATKSLGDFTHYGDQMFVLLESLAAEKGFSLDDD UniRef90 D8F3S7 UniRef90_D3LTH1
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 $\begin{array}{ll}L V K Q L Q K F G R E Y P Y G G Y G L R F K & K W L K E D N P Q P Y N ~ \\ Y A L W F K Q Y Y R R Y P N A G Y G Q M F R ~ K W A L S E N D V Q R ~\end{array}$ YALWFKQYYR RYPNAGYGQMFR K W WALS ENDTVQR VADHFLRWRRSGATDGGNQTRAVLDSVQDTARTHGRNGGR
$V A R A Y R D E R V D G P M R G A G F S E L G T V V A L E R G G P G T G L V H S H$
$Y A Q R L R N W V S Y G P V D I G N T I R T V A N S P N Y V N A P W E S G G K R$ VADHLVPDLITNPRWIPELEAEA DPLHYGHHDPREAGSGN


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 YAKAYSLFGKRYSRVGYGTMFK N WDNSSSQKGYN LASKFVAFGRDRRLGYAGKFYNFLLQVQDGKEFLEKDHSA QMQRYHRWTFTDTGYCGQTFLKALLDSEKHDTPYGNINPR LIDRDRLLDRHGDHKVIDNRLASDDPHLAADEVWKDSGKA AL RRYRAWQPHMTEVFEDCQTSGFPPLGAGRRVWLRAYRK YALRLRHWI EFGFSEFGDTPGWVVKDPVQVSKKMWEESNKS LADHLVPDLMQNPRWDPEDETEADPLHYGHVDPREAGVGN L H RA YL R WA ATQRDWGPDERREDDGWLARMGTPETPKNPG

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130
140
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 SKGCGANMRVAPVGLLQLDAKQRAADAQFQAALTHGHPT
$G T L C P S V S R A L V V G L F E S G Q R A R L P H D A G V L J V I T H K D P V$ SMGNGALMRVSPG GMEFDLESVLEETEKATDPSHDSAL SWGNGSAMRVSPIVLKTPSLKKAMYQVAEETALITHNHSE SKGCGTVMRSAPFG LTGGPADESFGLAARCAQITHGPT SWGNGAAMRVAPLGAWFGGEPDEAARQAALSAEVTHTHPD SYGNGAAMRVSPAGLL ANSVDEALELAKAVTEVTHNHPE DNGNGSLMRIMPLAFA
 NFVDDLINKMDKIEGDTSELYKERLNIVKNLLSEDGDDLDN SCGNGAAMRVAPVGAYFAGEPAKAAVQAALSAKVTHAHPE NNGNGALMR】WPVAFYDFTADLTLEDVIDQLTGLTHGHRR SAGNGSLMRTGPLALAYLDDPWGLAAAARRYSDLTHGDPL
 EQGPEAATRSAPFGLLVGWEPQLVLQLAVECAVQT NAANGAVMRTSVIMMYNDSEDATYRATVDVALVV
SYGNGAAMRVAPVALEFMDDGEKMVEVARNQAKI T SYGNGAAMRVAPVALGFMDDGEKMVEVARNQAKI T
SYGNGAAMRVSPVALLHADP\｜EDMITTAHRQSLITHSNGT
 DNGNGSПMR LDPVCLYLFEQQDEVID VHNCSALTHAHDR ALGNGALMRMAPIPIVSNQDDADAIDLAQQSTVTTHRHPQ $\triangle V N C G A A V Y M A P V G L V N A A D P A A A V A D S V V T A C L Y \amalg A G D G$ SKGCGANMRVAPVGLVPGLSEEQRAGAAQLQSALTHGHPT
SYGNGSGMRVSSVAWL YDNHDDVNKYAEITASVSHNHPE
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SFGNGAAMRVSYIGWHYPTLEEVGDGAVFSALVTHNHPE SDKSGSAMRAGPIGMFP TVEKVIENATIQAAITHNTPD RPGNGSLMRLLAPIPIYFFNDLEQTVEYAGLSSQVTHGHPD SAPNGAVVRTSVVGIHQCNDIQEVIKNTINDCKMTHADPR PADPGSLJARAPLGVYLAGDAHALTQASLEDSALTHFDPR
 IVNCGAAMYMAPVGLVNAANPAGAYAEAVD』AGAHQTHTA ETGPEAAARSAPFGLLVGGWEPQLVVQLAVECAAQSHGHPS

 SFGNGAAMRVAPVALVCYNHYDNLREFAKKQSLITHTHK』
 IVNCGATMYMAPVGLVHIGDPRSAYAEADD\｜AGAHQHDGT SWGNGSAMRVSPVAYAR DTLPEVLSLAEATAAVSHNHPD S Y G NGAAMRVTA I GYA F DDLLK P L L K EVVK A S CYYTH H NRE SKGCGTVMRSAPFGLVPHDPAEAVYK LVSSDAASLTHGHPS
 GS GF GA ATKAMCIGMWKPERLETVVEVSIVEGRMT DELDAGA AR DAPLVYCYSDHLENLVEAVQA QTKMT NDCNGSGVRSAPVGLYFSADPEKAFAVGCRSGELT HSDPL S K G S AVLTR NIPLGILYYWDKPEEAFSVGAE\｜SALTHSHAT

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 A I V S A Q S L N T LI Y M G R K GY S K E S M K P K F Y P F G K S L D K R L GIK GAKAVTAAIFLARHGFTKVNIKDY】ENKFGYNRDINT

 GVA GADAVAVAASLAATPDPPSPRAADRLA GEPSAATAA Q
 S M D
 AI DS P NE QRVA E E L G V NVRALE SV
GVAGA $\quad$ AA YAVAGRMAAAKPKPGPFLDAVVES $\square P D G Q V A K Y$ A RLLASRFFVVYLLRMMPRVKNDERALEMAI RRSNRATIJK W A GEACVLLWCEGV RHAVVDGDLAGVRAGLNLLPEDRRDA WR A LLA A S DLT A HAVRGLL RSYAYDNRTRYHEFWLGDLWT R A Q GRNAARAQAHVLAQLLDGTDDATQAAVERAWTADPDGRPE VIEA AEFFARTAWGVL GGKSPRAASLEAAREAGYASAP DGR


 AVLGAVIQAAAVRDALQTEEGKEDDPKRFTAIDEEEFCE Q

 SKLAC G I Y Y F L I R A VL G E C G
$A D A L S G Y F A E L L V R A L Q G E S K T D L L S G H W Y Q H P D A R G S W Q$ GKEGAAVQAYA
TREADEKVCEAARDHRDFESALRPDRAAVAPYDTVGPDCR ALAA SD LTAAHAVRLLAEGAEPTGLVGQLRSYALENRSRYH

 A GDACVI WCEGI R HAVVVHGTFD GVVRAGV ELLPPPERRAD WN
 TQAA IDESVAEAAARYTAFESAVVPDRAAVAPFDTVGPDYR S I Y A E QY TA A DE CLLAFS FT E LTTV IL E Y GLAA F DPEESRDAR AVAGAAVIA WAVSRA $V E G A D W E L A L S G T A A A T G Y E Q G S E R$ AVAGAVVVAWAVSRARAVNGDTWQWQSIADSVPADAHQAQ $A V Q A A L V L G E V V V Q L V Q F T P E A C D P G D V L P E V R Q A V V S S P$
 AI K G A Q CVVAT LI Y WL R T CRRDRREEIDEKAVKHNFGYREIYA ALAAASELTAYAVRLLRRTDYRDEWLGVLWQQAGAASPADY A EYA A LAAVA LAATYSLLPHHPAATELLTVLDAGAHQHYAAEL G $\square K G A Q V V A E A D F R L R R G E W D K \square Q E L L I S S Y G A D Y E \quad R Q$ S YRAARAVAGAVF LAARQHKTKEQ QRTYLRQYYPLDFR LEE
 G $I R G A Q A V A C A V F L A R N G E T K E S \square R K F \square S D K F R Y D L D H E Q$ SEA DDFAVEAAERAAKRGNWVAAGDVAARDRWSRTMDPAD



 CQLAACAAFNAA GHAVTHYVQEVSFAAS LLDREDLA $\square A Q Q E$



 GVD GA L L Q A A I Q Q S I H IH P D D Q


 A IV G A K TVVATCVF LARK QEDK D S I K R T I E K M Y G Y R FQ P D E





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| :---: | :---: |
|  |  |
| Ref90-R6QAUO | VYPKGKFDETCMDAVPLSFYLLSQASSFEDAI |
| UniRef90-UPI00035C53F9 | WVAGGDПAARDEWAIPYLLGLAPREQDAWDTLCRAAALGG |
| UniRef90-U7UF | RPSYLFTTHTAESVPQAIEAFLESDSFEDAVNGAVSLGG |
| niRef90-R6R | YDFDGTGLAASESDPSALALVQLSKGDPNDCARYAANUGG |
| UniRef90-A0A059MGT2 | PPGDFANNGWTVHALQTAWWAISTTDDLQRALEAAVRAGG |
| UniRef90_R5CJP7 | RDDYRFDVTCQGSVPABMAYLQAPNSAEKALRLALSMGG |
| UniRef90 UPIOOO3039309 | KDQHASNLSENISUENA WCAVQHLDNYTEAL WTTVRGLG |
| UniRef90-A6G3344 | WTYERGVSGFVVHTVPAALYCVMAGADARASLELAVR |
| UniRet90-Q2W6U4 | RPWYEFDETCPVPQALTCALEATSY |
| UPI |  |
|  | A D WL |
| UniRef90-L7ULJ6 | ALT QLR RVGVPPSELKGVDGLPSHPHDFREAVA |
| UniRef90-R5JOA6 | TNRFDSSCLVFDNCLTA FTESNSFEEAV |
| UniRei90-B7BFD2 | VREFAKMVGSSGYLLPTVPNFTKYGND |
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| niRef90-R5H158 | ETYQFNT |
| UniRef90-R4T072 | ELGNGSHTGA |
| UniRef90 N6ZJR4 | DRPTYRFNETCQETVPQALVCALTATDFEDALRSA S S |
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| UniRef90_UPIo | PPHAFGDNGFVVRALQAAWSAITHEPDFTGALRAAVRAGN |
| UniRef90 M3DHB1 | DPSPEHFIUARGWDECLELCCFLLFVDEPLTALRRAACTSG |
| Uninef9-1201A4 | VAQGQTCRVDEAMPGVALHLVVRHERDPAACLTENVMAGG |
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| UniRef90 |  |
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|  |  |

TSTN $\square R A Q G H A L Y A L E A A L W A F G T T T S F A D C L L A A V N L G E$
APS S A A RRPSRLHA $\square E A \square G M L L V S G G D Y R H A V P G A V N Y G R$ EPWLGDDWTRAHDDAPEAFCFLQFVDEPVTAI RRAACSSG
 DPHTFGSNGFVVTALQAAWSADTRTGHLRAALEAAVRAGD VRHYPWTDLAAPEAVALAALAAFLAGGGEVGEAVVTFGVSLGGR RLGGDRMAMGYTYKCLASADWALRQAGEYQKLITDITMAGG TCLAAWYREGCTWKESVTEGLHDTYASNDFEETVLLLAGINGGY
 DPAQLDVSGSALGALGVGLWALKTATGVEDGLVNVVSLGG


 LAR GWDECRHVLDRLELAFCADRHVDDPVSALARAATTSG | $G L H S G V S G Y A Y H T V P A A L H S C F Q H P R D L M T A$ |
| :---: |
| $L P G V G V$ |

 ELGVGHDTSALDTVPFCLWVAAHLGHDFADSCWTAASAGGG
ITREYSFDSSCEYSVPPSUVCFLDSTDYESAVRNAVSLGGG V PALI GTSVATQESVPAAFAVLRHVEDPWQACCTAASLGG
 YRPFGKFDDTAMGSMPLADRCFVESEDWQSCI RNVFSVKC

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$T R E A A N T V G T S G H V I E S V P F S D F A A D S F E E V L A N \square I S C G G$ IHSLGEGWVAEEALADGLLCALRHENDDAGAMTFAANHGG DARLPSRTKS DEELPVALGFVVARDGDLRAAVLDAVNYGR
 B
 KLDDETTIGYTYKCMGSAIWGVRSPHDFRKTIDDLI REGG QEHWFYFEAKWQFYLEAYDALLGAGDDWTELCHRAMCHGG WVNTGQSCHTPEAFPGVIHLISKYESDLKEALIQSVMAGG PV HS LQKLGLGWRALAI AVYCVLKNDSLREAVIMACNHDG

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E

## D



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L|GER|L|ARTR
L A D RLLLL
Y Y Q
$L V D G L L E \square R$
$A V K Q F Q R G Y$
$L T D S \square$
$\square$ N D R F $\square \mathrm{DF}$
$\square A R A \square A S$
LISRMYQVRG
TADRLFR
KLEK
$\square$ HKF $\square \mathrm{D}$
VADD
$T \square T V L Y$ QK A G $\square$
$\square \mathrm{ADK} L \mathrm{~L} D \square \mathrm{~A}$
$\square A$
$\square A G D L C D A R$
LA GR
LAD D
KVESMCIISGV
K A D C
$\checkmark$ V D DL
VMKGFFA
VMKAF
LALGGL

$\square A E K L F N R S$
P A R T L T E V

FEEQF
$\boxed{L V D L A A L D}$
K A D A
पKTEFHT\SEL
Y GAE LLRLR
YAVALASYR
LGARLFELA
$\square \mathrm{V} E$ Q Y Y E Y $\square \mathrm{G}$

DYEEF

TAREF
LADDLLK LDRA
VAEDFV
$\square \mathrm{D} R \mathrm{Q} \square \mathrm{M}$

PATTLTALV
LADD
LDARLLVL
I F N K WY A

TAERLSEDM
LADD
TV DAFRRRFGM
$\mathrm{T} V \mathrm{DAFRRRFGM}$
$\mathrm{V} V$ REFNEVMNV
I GAE LLR V T G
QAEGIEAL
LGEALYRLS
$L \mathrm{~L} N \mathrm{QL}$

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LDDK LGGALATAMI GDALGAPTEQRSTRETREDFGGR RVYGGWLGKNI GGTLGAPVEGKKELLQLDFYPVL AVKGAVVGDVLGAQFEFDRPRNLDWKNVPL YKSKVYACWTGKN GGTUGGPYEGK MKTRVFGVLAGGALGDAMGMPTECWSQEKTRADYPRP
TTKRAATGTLVGLALGDAMGLPTEFIDDRITSWYGPW RVRGMLLCVALGDSLGNRTESMFPTERDLEHGRD PTTPNAASGCLEGLAYGDALGGPAEFMTVPDDHARYGPD MNSKITNASTVGFAl AVIGADLGDAAGSQFEFNRPENLDYKHCE RATGALLGLAI GDAMGFPTE RALASLDGLSVGDAFGNRF DRALGSLYGLALGDALGMPTQTMSRAADAARFGTV MLLATAAGDALGAGYEFDPPMGDDEPVGMI DRARGLLLGAALGDALGAPFEGRS
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## $N$ LS

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LVDKDQGVATGNALGDT TGLYTEF LPKANFRDTEPTT RQDRFQAAFLGLAI GDALGFPLRGVPPSNLMRVSGLA ARRSLEGLALGDAFGERWFPLIRDPRQAY पYNRALGGWLGRSAGCLLGKPVERYQRPSLREMDEAN AVISRGQGALLGQLVGDAFGAQMEFMTPKEVKDRFAGN
 ALLFNKVYGGLLGGNAGGSLGTPYE DRAEGA LGQAVGDMLGVPFEFANHTFTSLEGAEE LEDKATGALAGAAVGDALGGAAEGNTPEATQERYDDW WSALLWGDAL GMPTQSMSPAQIVEYYGHD MLGAIAGDIGSRFEGHAAPR
MLGAIVGDIVGSVYEWN
TTPEQVRGVLYGSAYGDALAAPVEFRDVHRTRAQYADT EKFKAAMVLSAVGDALGYRWERCTSGKI DQEELAS RHDAFSGSFI GQCVGDALGFVVQGQLESVCRGHHDPH STMEKFKAALLLAGVGDALGYRNENNALGAKDQEELKE ML GAlVGD\VGSVYEWN
MSDNKKAAVLASFAADALGAHW DYDVEEDVNRFGRV KFKACMLLAGVGDALGYAYEFCRNGAINREVDEE FKQVLEAFAVGDAMGMPTEFMTLKMI RNRFGLI DKALGSLVGLAVCEALA GSNPASVSENAPLI EKFQAAMLLGSVGDALGYRNENSASGTKIQEDLQK LLDKПKGGWAGQTIGCTYGGPTEFKFNGTMIQEYTPD VKDRAVGSMKGALLGDVVGSRFEAARMQANRESYGFS GAVI GDIIG MLGLAUGDAGGKRTEFSTMADLDWEKCPL DALGAGYEFGEPMAADAPV
TGLLIGTAVGDA! GLAREGTAPKRARRMFGDK LIERYVAAMVLSAAGDALGYQWEFLLRSGE KIDGQL RQMIRASFFGGA GDALGAEMEFWSLNRПRDRFPH MLLELAI ADAYGAGFEYADEMIVRNNDDL MKDRAYASLQALAVGDAMGSQF LLLERYVAAMVLSAVGDSLGYKWEFILLNGE MLLEAAI GDAYGAGFEFRDLDFI SQN NQLL GCLIGGAI GDALGAPVEGLGLDQI LERHGP DESKFVGTLLGGAI GDALGKDVEDLTEEEVRDLYGGR FRSRVRGTLLGAALGDALGAPLAGLGARAVREACG D MTDRAAGALMGAWL GDALGGPHWYYDFEELRRDYGDW

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 I ATNYR DCMD DMCGRSPGGTCMAYAQNLDPDNPSSWUANF
 LA KNFVLLEYFK DPRRGYGAAVGDVF DKLRKTKMDADPVGPA RE Y G L K K Y E DF DK L N IMP YFKKTF S P NF L K WV H GT S E A Q LVKTMVT DGRKYPNSGY GGRFYK WIMGP KQEPY N
A D Y Y L K Y A SRYPNAGYGRMFK
LV V TM R RY Y GNKYTPP K G GYGY ANM LIKSEWLRHPKMKA YN V AN MVLKWSENPPHFAGPSTRRAVEAALRNGADPEGRETTM $E L G Q E W L E H \square F F P F D E Y G Y A L T N L R K G L I A P D T G S F N N P F$ LVETMVDIGRKYPHS GYGGRFYGWINGDNHEBPN P V L G E Y WL S F $\square$ S G Y WNE Y G $\square$ A HENML R G I IP P L C GD F D N A W
 L REEYVA WARSPENNPGRTCLVACGMLAAD GPWQGAS QTG
 VA R RYRA WKP HAF DMTDEEM GS GLLPALLTAGRRLLWLRRHHRK 1 A DNLLLLWYKTAKY D DDFT S K HALLDKYFEDK T DA G GT GY S FTKTMREVGQPYPYSGYGGR
YA K A Y GVVGRKYPNVGYGTMFK
VRAHFLSWYHSPENNPGGTCLRACEALERWGGPWQRARSVVN LAA RFAERMDVGRRYGVGATAVRSGHDWRVAACDSFDGKG
 LAT GFARAWEAEPGRGWGGAVRDVFGEDLAGGHWQF GGAG FCRRMDE E LIF GPGGYTS QS DREAWRRRVVEQ GRP WGETA G H FAHAFANAKYP LWWHANQSARYN LLQGMESPASGHWKNNP H MAGPFVRK $\quad$ GA WEPRWVPE LDREALEKWDF HRLQLAACDPR LLRDEYI A WSRSPENMPGHTCMVACE QLADGRLDPWRAT QDG FID A MKKY GRMYP DA DYGARFNAWLNSDNREPYN
I A AR I RHWATADGFGVDQRDRRFDTDPHAVAQRYWEANGR VACS YVFWS Q SKP P D IGGKATRNALT $\quad$ TGRYLPPNWHHYNVG HANAFAKADYMLDWHANQAGRYN ILNGMEAPESGHWLNNPH


 AFSAYQEWGHSQPFSMMGMATRRSALLGRLADGLPAGAPSNE D AF ADAFAHAGYS LWHANQAARYLNGDKAPESGHWKNNFH
 I A A GF L SWYTD GVFTDDGNQTRVLARMRQAAFDLHARTGR

 YAKDLL RWEAGMKARGSGPSTKAALQALTNGVDPEETGRF | $Y A S A L R A F V R Q H P N R G Y A S M F R$ | $R W A H T D H A P A Y G$ |  |
| :--- | :--- | :--- |
| $F$ | $D$ | WAMKKYGRMYPDAGYGTRFSS | LEPHFDA WRHDPQNNPGITC LTACSHLERGGPWQAA TVPG








 FGETDIK DYALRYPA A GYGGTFR VKA WFEDVVVRQDEYKRGGASELLAAANNLRKGPQSGKN NTV
 L RAEFVDWWRSP DNNPGMTCLRSCFR LST G GPWQDAS D IG I A A G WA E WA R D A T D V G V Q T K KVVLTAAAAAAA GGVVP TA K H S R L A K H Y Q D CMGDMD GRAP G GQNA MLL E E PDKDNGWRDP FNN H V H H A L L R WL G T Q D E A DP D A D HVGLVVR DPRLHYRRAP GMTC







 FCRRMDEEVSGPGGYTS QS IREVVWRRRVQQQKLPWGKT GSH LA N R L L I WWV Q S GVNSPD F LDRDP I R VA REYWERKMAPN GD K L S H A Y A D WL D T Q D G GP A S A H C R G L L A T R P A L R Q R R A P G N D
 MAK LIVVKEYFSEPHRGYGQNRKTKFED VYKPAKEQFNGSG WA YAMA GYWRSHPEPAGWLLKRALVDRFPADPTSGP LRRAA
 LWWDCY Q D WL E T Q WKT DK QS MSHKMMTLAAQQKP GSLLQHP MARRFAKEYSMSPGRGYGSGVIQVLKDVYQPAKDQFNGRG LA A SFA EHHHADRGYGPAVNRIRDGGDWRE LASALFKGQG

## UniRef90＿C6CUL6 UniRef90＿UPIO00203901E UniRef90－W7T1V6 UniRef90＿UPIOOO35EB9E1

 UniRef90＿Q16ZC1 UniRef90－R5SRQ1 UniRef90＿UPIO003B6016A UniRef90＿D3L571 UniRef90＿C9LHG6 UniRef90－A4AF41 UniRef90－UPIO00374D1BE UniRef90－UPI0003B31F51 UniRet90－R7G4PO UniRef90－G2KCDO UniRef90－UPIIO003C757AD UniRef90－UP100004788C34 UniRef90－UPIO00363920F UniRet90－E3FCT8 UniRef90－R5MC48 UniRef90－R6FZE5 UniRef90－R6N2P2 UniRef90－UP10003669C1A UniRef90 UPIO0047DEC5A UniRef90－UPIOOO3718380 UniRef90－G7CH07RDSNGAWDRSEDWACLLTPGHPETAVKYAYEDATVDHSH SKGCGAAMRSMCIGFRHPEQLETLIAVSDESGRMTHHHPT SKGCGANMRVAPMGGMPGLGEVERAAAAQFQAALTHGHPT
 SKGCAAVVRVAPCG F GAGDAERAFE LATEVAAALTH GHRT

RSGPGALTRSAPFGLLVGWDPGLVLQLALECAAQSHGHPA ADTTEAIERTLARALRYAARPGKLAESISRNTVLTQADDV SKGCGANMRVAPLALVPSLTPEQRAGAAQLQSALTHGHPT







ADFSGLMAPGMPNGWYGGAYVGAMYALAFTSSDVNYVVKE SCGNGAMMRIAPVGYYFDTDDEVEKQCRDATVPSHNCKE SWGNGSAMRVSFVGEYYDDFDEMQRMAEATAAVTHNHPE S LGNGSAMRASPI GWAC NEAEDLLREAEKSALPTHSDPE
 GTSNGGAMRVAPAGLVHPGDVEGAVKAAAITCQPSHFTNV SWGNGSAMRGAFVGEFYEDY EEMQKMAEATAAVSHNHPE KHSNGAWDRTEDWATLAPGYPDLAVRFADEDAKVDHGDGE GTTNGASMKDAPIGDANYEDMEDLVSKVHQDCLPTHNAKD SKGCGANMRVAPVGLVPGLTEEQRAGAAQLQAALTHGHPT SAGNGADMRIAPVLPHLRTGGMQLWVDTALSAAVTHNDAL

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200 GYLXXXXXXXXSYFENQWSKYPPSFPEMYGVKERDEFYRS A L A A S E LT A F A DH WL R N G M R P A E L P D A L R E R C F E QR T V Y H
 GI N GA L L A A L A T Q SLLKL NPEE QLNAK QFKENDPDLDANY




 A D G A S AVA A A I S Y A R G G N VV D K I WE LA YE A I EVVASNY GY ALAASDLTAHAVHGLLRSYAYENRSRYHETWLGDLDTRAB AVASSVAWVALLWRLLNGDLDESPAEWLETY TEVLRVLDS
 $C Q L A C A T L A R D A P D I V N E T T S A K W E D L D T A Q Q P D P M L Y G P$


 ALAAS DVTA HTVHLLLA QGTAPQGLLDPLLRAYAEANRAVYR $G V A G A V A I A L D H T P A S G Q Y V R R G L R R A L N L L R H A P K E A A H$
 A GDACVMWCLA I R HAVLTGGFDVRDGLDHDDGSRRDLWAA GFHGAAVQACAAWLAL SGFPWFSLL EQVDSATGAATPERA VLS LTVVAYGAVLA QLVRGET LDDARLS DKLDMHMARAAADPD




 A A WMTMMAADLCRGATRRRAFMHARSRCLNAEVLADVLGS F $C L V S C V A V V G I D R A L L K G E L T S E E M D N G Y L D H A W A W T D A Y$ CAAAAAALAEELRHLPRLLTWDPARAMAQLRKVSVPPSQL




 A A ESCIIDHAEIDR R SVLGRGWAMGDESVSSSRRERFLASPT



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

 GI K GAMATADAIFMCRYYFGPAECKRLVKEHDEKEYGYDD $T L D T A E F F A R V T A A V L K G E S P R A A V E R L A A S E A F E M T P V A$ GYLGA L A VA L FVVSYAYQGKP LKEWDNQDHWSYFKESWEKY

 GVK G A Q A I A S A $\square \mathrm{F} \square \mathrm{L}$ R R G G GKE D $\square R K Y \square T E T F G Y N R T \square E G$
 A L A A S E L L T A F T TV W W W

 GRDAARAFAHVLSLVLCGHSLRAVLRQLREMHFDPATMRA $G I N A A V A A A L M S H Y F G Y R L G E K R K L G E F L Q Q S Y V S G E W A$ AV EA A MA LGFGYHYAALGATYDEDINHDLQGAFQGRKMGP
 GYLGAVASALFTAYAVNGKSWDYFQDQWEKYERDEFYKSV $G I S C A K R D A L A V H Y F K Y N L G D G S N L V S F L N E T L K E N E T Y K$ A HLAA G VFA STVWGLVRGAEVAASLVAARELLEGHTGHAR DY DT S A MLLS A FVVS YL V S Q D S CS LLS WE EA L S L L H E DK S F A R ARLAA GAYALLVHGAARGEPDEEALRAAVHGVRQGPPDPA $V V S L T V A Y G A V L G M L V R G E P L D G A L S M K P S Y M A S A A A D P D$ GFYGGAFVSAMYSAAFYLHSPENYHEKHPDNWKECWFMLQQ
 CVV VA CVIG S A LV R WLV R QEAL G WHEAK GARMA GAVV E P L Y GWA G G GLLAVLI GELHA
$G \square A S A A A V A A A V S R G D E G G D L E D A F G A A V T A A A A G A E R G H$
 GVHGA VLQC I AVV HQALSHDPK
TRAASALHADVLGGLLNGTPLWEAVRSWELHRSHRQPDPR

 GYNGAVLDAL AVHLSLQQGDTEMEEVEDNKETRNDARIL KE


UniRef90_C6CULE UniRef90_-UPIO00203901E UniRef90_W7T1V6 UniRef90_UPIO0035EB9E1 UniRef90 Q16ZC1 UniRef90_R5SRQ1 UniRef90_UPI0003B6016A UniRef90 D3L571 UniRef90_C9LHG6 UniRef90_A4AF4 UniRef90_UPI000374D1BE UniRef90 UPI0003B31F51 UniRef90_R7G4P0 UniRef90_G2KCD0 UniRef90-UPI0003C757AD UniRef90_UPI0004788C34 UniRef90_UPIO00363920F UniRef90_E3FCT8 UniRef90_R5MC48 UniRef90_R6FZE5 UniRef90-R6N2P2 UniRef90-UPI0003669C1A UniRef90 UPI00047DEC5A UniRef90-UPIO003718380 UniRef90-G7CH07 UniRef90-UPI00037C1F6D UniRef90-FOJDF4
UniRef90-R6W243 UniRef90-E2PXD3 UniRef90-W1UKN9 UniRef90_UPIO0016C52EF UniRef90-E1FRHO UniRef90-UPIOOO35E214F UniRef90-A719R2 UniRet90_G1XH16 UniRef90-S9PDH9 UniRef90-UPIOOO36115A5 UniRef90-K6ZCs0 UniRef90_UPIO004292383 UniRet90_UPIIO0041C7A1C UniRef90-G5H700 UniRef90-S3B3355 UniRef90-A8MCN0 UniRef90-s3X7F2 UniRef90-UPIO003B7AE14 UniRef90-W4N8U5 UniRef90-UPIOOO377CA1A UniRef90-D4FSX8 UniRef90-E8U644 UniRef90_UPIo0039449DE UniRef90-W6KCM6 UniRef90-V8PHM5 UniRef90-D1C4A2 UniRef90-UPIO0047C3E65 UniRef90_S7T9T1
UniRef90 11 G417 UniRef90-11G417 UniRef90-C7LNJ7 UniRef90-UPIO003EC0552 UniRef90-R6XPF5 UniRef90_UPIOOO3785365 UniRef90-G8QV19 UniRef90_UPIOOO47BE732 UniRef90-E4NCSO UniRef90-UPIOOO3733EAF UniRef90-X2HE04 UniRef90_L5MDL1 UniRef90-UPIIO00237DF37 UniRef90-B21XU8
UniRef90 A8F869 UniRef90-UPIO003AD6F6C UniRef90-F7B6T3 UniRef90-UPIO0034C6738 UniRef90-UP100034D0987 UniRef90-D3SMM8 UniRef90-V4IBL8 UniRef90-UPIO003B3D344 UniRef90-F8NCA0 UniRef90_SOHL20 UniRef90-F9ZG18
UniRef90 F7WAH8 UniRef90-D3RMS8 UniRet90-G2NTX7 UniRef90-D8FBB4 UniRef90-D6WA32 UniRef90-UP1000363D8CE UniRef90-U5EK16
UniRef90-Q1WTB2 UniRef90-G3PGR7 UniRef90_S3ZMS2
UniRef90_K6AEN8

210
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 LS YS GWGGSS GHDAPMIAYDAFLGSPDWTE LAALRGFFHGG




 IA DSVGS G L H A A E A V P A A IVGCFVAA G G D P WWVVVAA A N I G D

 DEE I GSGMET DETDPCAFA I VELDA K D P SPR HFVERGWDECLLAVVCFLMFPQEPLTALRRAACTS G DPLWHS GAF LLDETMPTVLVUVAQHGHDPREAMLVAVNDTR VASSAA Y LAARGWDECQHVFCADRHADDPDVSAMARAAAT S G ELHLHRRNLGHVRVAFRLAFWEFFHAPSAEAGLVDVVNRGA SLEMINSNNYVVDTLEAFFYCFDNS DNFS QTLIGAVNLGG

 E LGNGSRDSAQDTVPFCLWAVATHLDDYERAVRACASVVGG WV A GAD I A A R DR WAR DTVA GRPEAE GDPKRA CLLAAANLGGG LQQ A WS SIVTTPDPVDDPAAGLFRADHLRLALEAADVGGG GE L L G N DVVAVGGSVPLDALLAFLLHPDSPREAMRFAAIRAG G
 DALHEA LLD WS PM GPMALAF CLLLREGDFRGADEDS DNSGR EHWLGA L WT LIAPDPSPEAFDARGWDEEPVAALRRAACTRG

 GVFVPFNDDAKVNAAY IVLGGLVGQGDYTKTMQDSTARAGQ
 K GVD GLLP PHVVPVLLMALYAT L K A P NDFRQAVELTLLRCGG AS DNGQRRIRADDTVPFAVWSAARHPDDVVAALWATAAGFG HF GHYHWVHTDNNAALTVAALLVGNGDLEKTICNVVMGGW H D WLG DLDWDRPGVPDPAVHCLLLHQGSPVDALARAATTSGG $P E D F M T H Q G W V L I A L Q N A F Y Q L L H A S S G E D A I R T S V L Q G G$ QT WF E DE K K WE E H H F C S A F DA Y Y G Q G D F T R T M D I A I E NALNA YAK GLDLREARRIIIVYGNSFMDAIAKTISLGY
 D A R DP S RTK S I E E LIPAALGMLIAAAR GNYREAVLGSUNYGR QRDCGTS VEANE SVAAAFADA GAFFDEPTKALCFAAS LGG
 HA WLG DLLWTHTHDPSP DA YCYASANGDPHDTLLTRARAT R G K T I RHMAEYQENWFYFEAKWQFYGHDAPMDAYDALLAAGS $D M W L G D P P Y V V G S V L W A L Y S F D R S P D D F R E T L R T A V V V G G$



 SDAPRPAESGAAASLQAAAMSAFRDSDSFAAGSIQCFPHGP


 ES WLLGDLLS SRDHFFASALLDCFLLDMPDDPVAAVRRAAVSSG
 RYSGWGGSSGHDAPMIAYDA ILAAGDSWKELABRAFFHGG
 KP WE G KVIK S K G WM S V R A A I TA A V M R N D S M S E L L Q D CLIA F T G
 IVDNGRHVAAHDTVPFSSLWAAARHLGDYKAAFWTTAAAGG


 $L V E E D A G S G G A E G V L A A A L Y A A L V C E D V S Q G G R D A V R H G G$
 DKWNHDVGCPK GVF LVSVAMAMLYGNGDYTETLDDAARAGQ


 REM $\square G T$ GLLA A YES $\triangle P$ TA A G $\square F V A C G G D P V K C D M A G A N V G F$
$M L D \square E F C P S E G G G E L G \square A V A A V A S A G N F T D A V V T A V N H S A$ TRTTRPGSAP TPEDLET L GQ GWLGPEADRTGGLLLAVVHS G F Q R L G K G WV A E ET LAA DA L Y C S L K Y Q K D P C R A I E I S V N H D G



## UniRef90 C6CUL6 UniRef90-UPI000203901E UniRef90-W7T1V6 UniRef90_UPIO0035EB9E1 UniRef90 Q16ZC1 UniRef90-R5SRQ1 UniRef90_UPIo003B6016A UniRef90_D3L571 UniRef90_C9LHG6

 UniRef90-A4AF41 UniRef90_UPIO00374DIBE UniRet90 UP10003B31F51 UniRef90-R7G4P0UniRef90-G2KCDO
UniRef90-UPI0003C757AD UniRef90-UPIOO04788C34 UniRef90-UPIO00363920F UniRef90-E3FCT8
UniRef90-R5MC48
UniRet90 R6FZEE
UniRef90-R6N2P2
UniRef90-UPIO003669C1A UniRef90-UPIIO0047DEC5A UniRef90-UP10003718380 UniRef90-G7CH07
UniRef90-UPI00037C1F6D UniRef90-FOJDF4
UniRef90-R6W243
UniRef90-E2PXD3
UniRef90-W1UKN9
UniRef90-UPI00016C52EF
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UniRef90-UPIOOO35E214F
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UniRef90-D1C4A2 UniRef90_UPIO0047C3E65 UniRef90_S7T9T1
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DSAVAGALAGQLAGADHGPEATPPRWRAEDDREVLE
DSDATGAI AGSLLGARYGRPALPRRWSDTLDARVLD
DSDSTGSUTGQUVGVQQSNSWLPVSYRNKLELRDVI
DMDTTCAVVGGVVAA GAEGVPPAWLERTEP

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UniRef90 D3L571
UniRef90 C9LHG6
UniRef90-A4AF41
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UniRef90-UPI0003B31F51
UniRef90-R7G4P0
UniRef90-G2KCD0
UniRef90-UPI0003C757AD
UniRef90-UPI0004788C34
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UniRef90 E1FRH0
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UniRef90-W6KCM6
UniRef90_V8PHM5
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UniRef90_K6AEN8

LGDQGLRT
VARELYHLS
TTMSLNDVYAM
MADQLLE
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1 A K N $\square$ T T $\square$ A A

VS E D LY
$L A A R L L S L R$
$L \vee Q$
$\square A \square T \square A Q Q A A$
A A L R F T E T A
$R / \mathrm{Q} Q \mathrm{~L}$
UVNKLLMLS
TTMSLNDVYGD
$\square$ AGALWE
KVEGMC@LS GV
A ADRLF QARQV
$\square A$ A A
TDASLADLY
LT A A L L A L R
LA A R L L K K
$T V R R \square C A \square R$
VVTRF
VIER
LSDQYAAD
L
P S LYRAAQ
L LDRIV
L SK QLLE
Y A
MGNQLIK
LGEALHRLS
$1 \mathrm{~L} N \mathrm{~N}$
QARELAAAS
VARALYSL
LATDLHA LDKQLMSLAN
YAQML
A A R A $\square \mathrm{Y}$ A L
SARA LY QL

| $L A$ | $D$ |
| :--- | :--- |
| $L A$ | $D$ |
| $L$ | $R$ |

$\square \mathrm{L}$ K D L A A
$\frac{K}{K} A K M L A R Q L G L$

VA A G L

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## MF GA $\square$ Y GDV $\square G S Y Y E$

 AVVDRGAACLLGGALGDALGAPVQYLGLPDI QRDHGPD YLDKFTGTLLGVSI GDTLGHPFEGVLRERIYSRFSDF ALADRVAGVLI GSALGDTMGGYTEFLSAADAATAYPTR QDRALATLI GGALGDALGMPTQLLSPARIRSSYGFV RIEAAILASFVADALGAHWEY DQQHILQEYGRM MLGA AGD【I GS IHEFGPPA
PTHDEKCKGAMLATA TGDALGWPNELRSKNKDKNEWTRR DRARGALLGLAVGDALGAPAENLRPSEIRRRWGRD LIEKYVAAMVLSAAGDALGYKWEFLRNGE ETHRQL GE ILLDKVKGGWYGR\|CGCYLGKPVECVKMPDLKKVLTRT
 ERALAA FIGAAVGDALGGPFEGRAAGKLDGREWKG ERVYA GWLGKDIGVRHGGNDEGWTYERINKAFGEV LLDKIKGGWAGQTI GVSFGSHTEFRYQGI FRSRVRGALLGTALGDALGAPDDETAVDGAPPAQGAE MLLVIDAMADAYGAGFEFTENEYDKENHCLL MTTQATAMVLASFAADALGAHWDYDTAERIGRVERLL ARDALAGLSVGDALGSQF FVPGRQ $\square Q E R A A G A M M G A F I G D A L A G P H W Y Y D L K Q Q W Q D Y G T W$

RASGS LIFGLAYGDALGKPTEFDTVAE $\square$ QRRYGPT MLGAIIGDIAGSRFEFN
TPNDRAVGALMGAFI GEALGVPHWYYDLKQLHRTYGNW $P D L A D R V L G G W L G R D A G N M L G K P V E H W T R E R I D R Y L R Q A$

 FKEKLRAGWLAQLVGGAMGTMVEGYTSENLQKAFGDV $S L T G L S V G D A L G A Q Y F V P A N D P V$
RLHASLLAGAYGDSLGAEIEFLSLDAI RRQFP
 RESRVIGALLGVHAGDSLGATVEFSSHKE IARTYPNLD SLVSRFRACLASAVAGDVLGSEFEGDSAVSLKAATQHV NATALARARNCLLGLAA GDALGMPAQTLSRGALARHYGRI
 RAA LDAT GLSVGDALG SRRDK YYGLLFGCAYGDAMGMPSEMMCRK LLDETFPLEP MGGAl GDAL GAPVEGTTLDRTREEHGP
DRAMGA LIGGAGGDALGMPTQLLSPARIAEDYGHV $\square R$ QAATGSLI GLALGDALGFPTEFNDVPQULAKCGPW ARDSLAGLSVGDALGS QFFVPGRQPAD AS GSLLFGLAMGDSLGKPTEFQDYATVVTEYGPG GDAVRDRARGALLGGLAVGDALGAPAENMKPSQI RRRWGRI TAMDRALGAFYGLALGDALGMPTQSLSRGQULSRFGHI

PSVTEKCTGAMLASAI GDALGGWPNLGAKNSIKEWTRRS ER ILGALYGQALGDAMGMPSELWPRTRVKAHFGWD SVRSR DRAGLLAYAAGDCFGAPFEGGATVGEAAD LEA AYT T LVG LAVGDAFGAQ

[^11]$R A M V W A S F M G D A L G P H W E Y D T V D R F G Q D$
$L A S L E G L A V G D A F G$
$L A D$ F VPEN

[^12] LD K WLG A LVGGAAAGDALGWPNEQNSKE DFQKWEKRD
 GTALEDRSVGALLGSAVGDADGGAVEGWTPEATRERHGGW
 LEDRAAGAIVAFI GDALGGPHWYYDLDELRRDF GPW
 LIE RYVAAMVLSAAGDTLGYYWEFLRDGE K





## UniRef90 SOEZ91

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KEFR SNKK■F RFTLCGHRNKKLFNTYTDDTQLTLHTAKALIQGSGFNEDY RYFLCGHRAPKEPGHWTDDTDHALLLLLSFLLTASTDQAD
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 LRAGRPPAPPWEWTDDTEMACSVYAQURGDGRDDRDK QF LDWPRWERDDAGSYSDDTQLILAVARARLAGQPWWEHF TGYLHEFKNFAAD DDTNGPLFFLRSLEDYTHTSEDT PWHEGYQELMDSWPDLYDDTYMDLTFVDVLERVGDAPVDS TDFQLFKPNSAYTDDTILTIATADSVL NKKD TKYHQICLDKKSTGCYTDATQLASIATVDGLINGAWHPPTD APLPDSYHAGKGAGEFTHYGDQALVLLESLARSGTFSLVD PADLAAGWLPPSPWEWTDDTEMACSII VAALGETGWIDDRDA DPRPNRYHAGLKAGQSSQAGMLMRMMTESLVEKGEYRQAD GPRELA NTHTKDFEFFHPDCQUTDDSAMTIALMAATLEGDMQNEMS TPQPGRFHHGGEAGQNSQSGFDELMLRSLVERQGYDEAD GALPLTDYLPEPVGPGAGDEQCVRGRIHGSCRDDDVDYAD TEFVPYGVPFPGYGTTEDGVERQKLMLAALAKKGGRVTAD
TR
TGYLR RFLFGRGMVS MLLDNGVLPDENNYNDDTEELAFLDAFSEKGYEVTAE DGISDLPPHQGLDGATTDDSQMTLFTAEGLIGTHSHPPSV NNGENAFCDTVTHWINNDDTNYTVIGLKTLEDYGKDFTSD
 QSLDVPPDPPWPWTDDTEEACCIVATLGAGDFDRDRFAAL ERFSSN.TDERQLEFTDDTAMARSICVSLIHNKGYNAKH TGFVAPFDGHLSAGQVTDDTEQTLLLSRRLLRDDGFDAQG GTLQPPRPAEEEVLIYSDDTAMTHCVVKSLLAKRDFDEVD EWYDGYПKWWYDNVPLYDDVYMDLTFVDVFDRLGLDAPAD KWKDRVKHYFDTFPGLYDDLYVDITFVNVFERLGLQAPAD AVLEDPRATARGPWPFTDDTAMALSLYEVLNECGRVDQDR AKMGGLDKDNDSDWKVSDDTVMHLATAEALIAAGEQPYSL DGLIAEYASGPVGTGATTDDTQLTMLTAQALVQAGGATTGV EDFVAPVADHPVSGTITDDTEQALLLGRGLIVSGDFDHTR AYVTDDTQMALLAVARALRAAMDRGALID GPQRALGLLPPAPWQWTD

## EGYVEDDPAG

GTLENAPADQPDAGSTTV
A
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 FIDAMKK Y GRMYPDVGY GGRFGMWINSDNREP YN $F A \square R W R K L F A G Y A G Y \square D G A T R M T D K \square F D F G E G P A N S G S N$ LAASFAEHFDVARKYGAATERVRDGEPWAALAAAQFNGS G LA RAFA D RHDDFDRGYGPAVNRMLRRVREGGDWREFDGQG $V$ R LA S Q R WLYT Q GVD WR WA A GE L TVVD HPAP DGWQSAP V D N FANAFANASYNLWHANQAARYN LNG DKAP QS GHWLDNP H

 IA D S L V P K MLLT GRRRWVP ELVEA DA L RL HY G HVVDPREA GVGGN FST QWKAMFED Y S GWVD GATK ETLLA NLEA GK SPQA A GS G MRE WA RKVRPAA H LGGGYGKKFFS WLAAA EVQPPP Y G

 YF DKLKA WA FDETTHRYPDP F ILDKA DYNLSNNUIEGGLRFS
 $\square K R D \square R R W V N R G A F S S T G E C F D \square G T S T Y N A D M R D K P D T D A$ A WH W A D R D E GPFK GAGFSERGT LENLRRGAPDSAQHRH
 $L T D T M V R V G R R Y P N C G Y G G R \quad F Y S W I N D E D H R P Y N$ YARRVAA I F SEGRRVGGYGTK QA A DRLAA GVPWDEA GTP P P VLGD YWLSYM DP NWVEYGTGKANLREGFQPP DS GF LDDNTY II A DF LN WRASGATDDIGAQTSSSVLSSAAQYDARTWWRTGNR GFRRERAKEYAVRYRQYYSRFPDAGFGNMFSEWARSDTFRR MASAFA YASYKLLWHANQAARYN LLNGMKAPE S GHWKNNP H VWNS YRRWLVTGQQAAAPDE GATGGLLAQGRELYASRSPPDNE

 FARRWVE EMSHYKGYMDKATLGALENFRAGRPPSAT GADT




 A HVE LDP F WTC Y E R G G G G A T K R A A N S WLA GVAP WD S T A K E E P E QM GLLT WLN YAPD GHGFYWWGGY DMAPRSGS DEQNGHAVV FA $\square$ AF A H WL FNP HAD D $\square D Y$ Y $\square E A D F A G L M N P G M P N S A S E I I$ YE QTLKD WVRAFPRAGYRPK F G L E WALSDQS TP Y I V H R A Y L R WA A T Q R D WG P D E R R K E D G WL L R E E WL Y S P K N P D








 IARAFA ERCDPYRGYGA GAVQVLHQDRDAVPWQRAAAPA G V H HA LLR WY RTQQGCKP HETVNV GLITTDRRLWARRAP GKND Q WM WL TS L A M G HV STAAERVA Y RNN GN LVPT SK S GWWKNP Y $\begin{array}{llll}A & \text { WH E W } \\ \text { LA D R D E GP F R G A G F S E R G T L }\end{array}$ LGRHFDPYRGYGPGAVVMDRQL RGGTPWPDAAAAAFEGQG MARRFAEEYKRQPHRGYGGNVI SVFEQVYEPSRKQFDGSG WA QD LLDD WEA G G LAA DLLGPSSSKAADA ALLD GVPPE ET GVVN MAKRFAE EYKRDPDRGYGAGLSSKCRDVFEPAREQFNGKG FAMAFATAAEYPLWHANQAARYNILQGIMMPPASGHWMNNPH $F A V S F A N T E F P L W H A N Q V A R Y N I W Q G I M P P L S G H W L N N P H$ LA QRFAARYKA QPWRGYGGGAHRLLQQIGN GLPWRAFPG G YLHKLMRWADENPEQ DGPSTS K A L D DLL R A GKS Y VE S GK Y LAKHYKDCMADMKGRAPGSTCAAMLQPDKPE GWRDPFSKT L QS TY YT WAMTERRGPGRTVISAARKAAARRKPGWPLGND WV N A LL D WERRDGSYDVLGPSTKRADDADNE GVPAE EA GS G A ARFFVSWYHSPDNNP GRTCDDACRRLDDDPGLPWQHAGA D LADAF A E R CEP Y R GY GPGAVRILLR LI RTMTP WPVAF DGQG
 LA QRLI A WEANMQAKGSGPSTKRAI EMILAGHSPEES GRH

 FIPFWLKYERGGGSALKEAAKLLKKGIVPWEARENNKYFM
 LA REFAD T WRA EPWR GYGA GAARLLFARVAE GTPWER GGS G D F LT R L $\quad$ A A A A P H $\square R G \square G P S T R A A V D R F R T R G A D H A E T G$


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 EDGNGVAMRILPHVFRREGAWAEVKHQVFLNGLFTHGHPR QEWDGAQMRCMVHGLLMPGLPEKAAYLAYIDSCISHAGNG SWGNGAAMRVAPLGAYFADDPERAAAQAAASAEVTHAHPE STDLGGASRMVPLALFYGEDRETFMANAETQTAMTHNHPQ SLGNGGAMRVSPVSWLS SSLDESLDAARRVTAVSHDHPE SYGNGAAMRVSPAGWVAASLDEAQELAELTAVVSHDHPQ ADTSEAAERVTLLAARYAMTPGLIAARHAWENTHLSQTDSL QEWIGALIRADIFGWTRPGLPHRAASLARRDAVLSHTGNG S EGGCGAAMRAMCIGLRFPHQRDMLIQVSIESGRMTHHHPT ADDTDYQDEADYAGLMSPGMPNTASEISDKTGHTMNYGDG SCGNGALMRFYPVAFATYGKSKEEEEVVRELTEXTHPGEF SYGNGAAMRVSCTALFTLS DEDCTELAKKASTLTHSNKN ANGNGALMRIAPLALLLQSETDRVKRFARDYTVVTHRHAR SWGNGSAMRVAFVGEYYEGY DEMQRMAEATAVVSHDHPE AAGNGSAMRAGPVGLLHADDPAMLARVAETQGRITHRDPR KDSNGCWMRSEDWACLAPGHPEDATRFAYEDAVVDHADEE
 SYANGAAMRVMP $\square$ AYA YDDEREMDEQVRASCYYTHHHRE ADDDDFQDEADFAGLMSPGMPNSAAEVCDGDGHDMTYGPA SGGNGTTMRVSPDGLFYCKDTKNLKDFALHSSN VAPNGSLMRTHPLGVICFREEREAFALAAEISRVTHVDPR SEKSGAAMRASPIGVI ADERQVIEYSALQAKVTHNTPG NDFAGA SRIAPLLAVHAAAPDVLVEAARAQTLMTHGAPV SFGNGSAMRVSPUALDFQDRQQALEAAAASAAVTHDHPE AWSDGLAMRAAPFGVFAAGRPAEAARLVAVDGRVSHEGEG EGGCGAAMRAMCDGLRFPHRSDTLIQVSUESGRMTHHHPT GTTNGAGMRVAPAGLIWPGKKEKACHLALLITCLPSHMLDE
SWGNGAAMRVAPGGAYFAGDPDRAAQAARSAETHRHP AGGNGAAMRVLPHCVAHADNFSALAQDALADGVTTHGHPR AEQGGGQDFVDWGLDTPGNPTLAAEYAEKDASVSH DGN SKGEGAARRISPIGFA AQSVEEALTEAEKSTRITHNIPE AAGPEAATRSAGFGLLVGWEPQLVLQLAVECAVHTHGAPE SSDLGGAARIAPLVYWYRNDRDALLAAVRQQTALTHNNPA SCGNGAAMRVGPLGAYFADSSTRAAAQARASAEVTHAHPE ADDTESDERTIPLADRYASSPAQLAENDAANTTLTQDDDT SYGNGSAMRVSSVAWLYNDMETVNKYAEMTAAVSHNHEE SKGCGANMRVTPVGLVDAD LDTLAGLAQLQAGLTHGHPT SYGNGACMRISPAAVLDEGIDRERVAKWATEVSSGTHNHPDT ADTTEAMERTLADAVRYAAEPARMSQADANNTALTQSSET A GLNSFARACHPIGUVNAGNVETAAQDAMEVAQLYQTNSR ADTTEGDGRTLALAVRYAFQPREMADAISSNTRLTGSDET
SAGNGPAMRAAILGAAV DDLSLLESLVSVSSRLTHTDPK NE WDGAQMRAGICGMAAPGNPYMAARLAWRDGEVSHANN
 SKGCGTMMRVAPVALMVPR DQVRSDAIETSALT AWSDGLAMRAAPFGVFAAGSPAEAARLVADDGSVSHDGEG SAGNGAAMRAAPGGAWHADSPAHAAEQGARAAEVT
 GTTNGAAMRVAPVGLSVAPEVEPLVARVVETCRVT ACDLDYQLEADYAGLMSPGMPNAASGIADKIGGHMTYNSLD ADDIDYQIEADFAGLMTPGMPNAASEISDKVGHIF TYGD SFGNGSAMRIGPAAGYFADGYDVIAEQARLSAEVTHCHPE
 SKGCAGVVRVAPCGFVGPSQPEHTALGCATAAMTHGHPT GDTNGAAMRIAPVGNMMPEPGDALVAKVAETCRATHNTSTG SCGNGAAMRVAPLGAYFADSTSRAAAQAQASAEVTHAHPE SKGCGANMRVTPVGLIPGLTDEQRSGAAQLQAGLT GTTNGAAMRITPVGI ADVRQPERFIVSVVVACQVTHNDGE GFSSGLPMKITPLGIIYSDTQDKILAMLEEDAYYSHYTDT SAGNGAAMRAAPLGAWHADSLAHAAAQAVRAAEVTHAHPE KESDGAAMRAVPIGLFPGTG DVIRNAI DNSEISHAHQH AGGNGAAMRILPHVIHKQN DDLLILDVIKDCLYTHGHPR GVTNGAAMRVSPLGCLLPNLTAFIAEVALASSPTHKSD SYGNGAAMRVAPAALAARDLGHA AELARRSADPSHAHED DTNGAAMRALP TGWAVADDGLRRTVTTGLSRTTHGAASA SWGNGAAMRVAPLGAWFHGNLPQALRQAELSAVITHAHFE
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 $A V A G A V A V A V A A A L V A G A P G L P D P R A R D M L D H D D P R E V A A$

 G LAGQWL R DVA A HVAPGLVRDGIANAISLLPLEDS QSAAA REAA GVFA A AVAA WREA I PVLDRKAVEPF DTVGPDYRD QS L VI Q S A RFF A S A A DE T A E GRKPLDALE MA QKELSSSNS P I Y Q GL R GA LA TA H A V WL A R H GAEAAAA RA A L E S E Y G Y D L S V G E AI K GAVAVASAI F LARQGKGKAEIAA YL RKYFYDS QTLA Q VVQQSVGYACVLSLLIRGEAFDEDLSGKLMDRVRNGEWKV
 GYLGGALVSARLFTAYAVNGKPPQEWVEENLQHWSYFQDQWV
 GYNGAILQALSVRKAI R
AVVGS YL F LVELL HHLL NHKS LK QA L N IVVRASCEAGWFPQT
 S
GMYGEVFMAALESAAFVESNKFDLDE DALRCWTDHVPFQD A GDACVIDCE GIDRHAVLHADFDGVREGVALLDPEQRRE WWQ A WE GTAVLHELI RVALVDGADPDREEHRPRWATVLAPGWH A VA GA G AVVA LAV Y MA R K GA D K K E

$C V V A C V I G T G L V R G L V N G E V R D W H V E W Y V K E G K Q G G D Q D W$ GVNA ALAAALMTHYFI YDLGPKQDLGEYIA SKVPGDWN AIAASAAAVAAAVSHGIA GCDWREATRHAVDAAALGAKHGH I GDGAAFFARTALYLLDGAGMEDALRKAASEPYGALPAQD G!K GAQATVDADQQARDGRTGDA】LAAVCERYGYETTPSL A I L L T T C Y A Y A L D Y L L R
$\square Y G G Q A V A W T A R S$ LRRAVTAARRPYPDRLTMERAVRSAVV GY LGA LVVSALFTAYAVNSKPPQQWVEQNLQHWSYFQDQWE
 A S L T S L L D A A I WA R CLVA G P S I A M RI QLAAA DIAAR R A N DREM A IV VAMAVAVAASYAAASRTKPCAPEELLRAVEPYAEAA Y





 GI K G A R A DA S A I F LAAREKK S K K E $\square S E$ Y $\square E K N$ K GYEP $\square N E \square$ GLA A SELTAYAVFALRA
S L A WVN L F VT A V S M V K D M P A D D G K Q Y L R N ML Q Y T L S D E H S




 $G Q L A A A A W A E M L A D V A T G A K L E E D A A T \square A G Q Y E Q L K N G H E$
 CPISSCAA YNTI VS KLIDD Q
$G \square A G G V A V T V A A A V A A A A R L D G Q P V D R A A T R \square A T A E E A A H$ GYNGALLQCAAVYY LLHPFDVDNYLD QLHQFMHDLEEETK A $\square$ A A A SAVAMTVVC GVVA GS GFDAALPRALDAARHGQRVGR GYNGA L L Q A L AVVH Y $L$ L
SQFYQCMS DVI RWHQQYPDNWKQTWFECEKKWSTDDGCPE GWYGGVY T G AL Y S M SFVVSDDVECMKD I N WHKQYPNDWKQ
 G Y L G S L A S S A L F T A Y A GHLSAGT LAATVS GLVRGVPVREALDRARAELERHD GHWE A I A S A A A V A A A V S C GVVA G G D WR S A S D S A V A A A R R G A A L G H A L A A A D LTA H A V H L LAARGAEP L G LVVGMLRSYA YENRARYY $G I$ A G A V L A GVA A A L DP A T EVVHR GVVR R A V D L L G R P L A E V VA GLAASELTAFGVRWLADGLAPQDLLARLRDHCADQRKVYH GI Y G GRAVAA GVATAM
GI A S A A AVAAVVSSGLNGTQLEHALNAGTEMAFMAEHHGH ALS A A A GV A GF I A G ALLNARKYE E DLE F SFFKLMEKAEK DA L
 A I LGA S CYA YA LYY Y LR N K K DVLE Y GE

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SEKMDKTSGYVVDTRAAAVWVADTQSTPRQGDIAVNGGG DRSRYVWNESCQGSVPAAMRCFYESSDYESFURNDYSLQC

VRK DHNTAPGTFGTQT TKAWLYGEDDFGKSLCMANSFGE DPHTFTNNGFVVSALQAAWSALTRTDHDRLACLEAAVRAGH ESDRGVHVFNSRYSVGAAMUAFLDQSHDYESALRAALSLGG胃

KEDDWEHLQSYVDEHGATGYVYKTLGSFEELITDLVMHGG SPWKGKVGALGVDSTRAADTAVITENDLLKSLLKCUAYTG WIVGPNVAARIGWACELVRGKEVAEGDPWQAAVISANGGG WARFGQSCGMQGAFCGVVHMAVRHEHEPETGLVENVMGGG DRASSRYNETCQGTVPPADQVACQSASFEACMSTCLTLDA
DAGYPWTDLAPEAVGLAFGAFTAARGDFRTAVLTAVNMGR KYDK DRGWWGHDAPLI AYDA LAAGDSWKELAHRAFFHGG EESSYDWCHTDSNAEIVTAALLYGNKDYGKSICMAVGACF ELGNGAQVSAADTVPFTLWAAATFAGDYPAAVTACVEAGG LPDVSRQWPSWLQAAQTVSMIVGQGDFSKTTNTCNMCGW
 EDWKQRK TPDTSPAEPAFSAFMEASDYEEADRLALLIGG
 KNKRGCNA DVHRGVCRAAPDTVAFTCWVAAAHLDDYPAAVRACVEAGG

AEHPGVFDETVHGTMP TA TKAVLEAEDFEDTVRTATSYGG

 RYHTYNWIHAYPNACCEIDALIYGNGDFRETLHDITMCGID RLGNGARVSAQDTVPFCLWAAATRLTDYPAASKACIVAGG TAHADRKGWTAEEALSIALYACLAGKTFDNALQDAVLHSG EDDSHDWCLTITNAAVVAISSLYGETDFTNALGIAMECGY
E पGNGTRSTAVDSVPFATWVATHHपGDYPAAVQACTAAGG P ETSYCVK PRGDPDMAGRILRAVELARDGEQALVSLWETLCVAANIGD
GVFVPYNTDAT TNSAY LLTGLLYGEGDFYKTMDTSTRCGQ TWFECQKKWSSEVGCPDGVFLPFNTDDFFSTMDIAARCGQ EPVNGSQDSCQDTVPFCLWVAASHLHDYERAVAQTARARG ETVYGVGFETIETIPAVFTMIVLSKGNPMKSAWLSANDAG KAGYFVEENVEHWSYFEEQWRKYGHDAPMDAYDAMLGAGN TSAALDAAVDLAAQVCVALCAEAVADDLERCLRMAVNHSG WVTGGD AARIDWVPAAFAVLEDAGGDPWQAAIISSNLGG DRWLGDLWQRADDRTPQAYIARGWPDEPLTALLRRAACTRG
 HEWLGDLW
w
KTFQPSTFKRCKFLLAAFAVFNDYLDQPQKADKSSMALGG E LGTGSRAMAQDSVPFATWVAAQHLDNYPAAITACVAGGG CSY位KVNELEGFDHET LGEYMHSDNPLEAUQETLSGGG

ARELGNGVAAPESVPSAVYAFLREPDDLAACLRFAVRMAG RPGRNGVSLEAVGAVAAVVDVVRHADSVADALRYAVSLGG TLGTGRE:AAHDTVPLALW:AARHGSYVDALWTVAQLAE

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250
260
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280
D T DCNGATTGS\|LGTLYGRKNLLPTHWTEG\|NDTDHTGVAG
D S
DS DT LAT TT GS TAEAAYG DDWПKNKAYS Y LDEP DKDVLRR DSAARGLLAGMLVGAATGRDGLPEPWLAGLAARERDE
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$D V D T T C A V G G V A A G T G G E P P A D W$

DVDCNAGEAGTVLGVLNGANMDPKKWTDPLENWKRTEDTM
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DADS $\square$ ASMAGAVTGALS GRTGVPGDWAEEDATASRTDLVE DSSARG ILCGFI LG ICN GMNAVPEQWDKEM
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DTDTQAAI AGSI AEAYYG VPQAWQQALPYVDDEEMKG




$D T D T V A T V A A S L L A A G N \square Q T P V D T Q W W H Q T L N H Q \square L D$ DSDTFGAlAAGGVAEEFYGAEGILKEYLDK

D T D C T C G S $\square$ G A VM G $\square \square$ T GARN $\square$ P K K WT D P VN D R $\square$ S T MC $\square$ D DTDT
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DADTNACFAGALLGAYLGYSALPGHWKHGL KHGDWLSG DTDTDATDALAAAACSKEVDNLPQSLYGNLERYGYDYYET DTDTIGAVAAGMAGACAGTAELPEQRIAELRGDDLDEVRA DSCARGLMLGMLMGARHGGEWLPRRWLDALR
DTDTLACIAGGVAEARFG VPDWAVELVQTRLGHEQWA
DADTTAAVAGA $\square$ AGA $\square$ NGECA $\square$ PPDWAGA $\square$
DSDSTAAIAGCWWGVMYGFKG
DTDCNGATVGSVLGTADGYNADPSYWKDRVNDTLESTLAG DTDSDATMAGAI AGAWRGFDALPEDKYAFFRAVNDFDIEA $D V D T T A A \square V G G \square V A A R T G \square G G V P R Q W \square S A R E P L P V W A V S D$

DSDCNPSSAGGILGVMLGYSQIPEYWMQGLRGAEAKKFKY
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$D S D T \square A A \square A G A D A E S V F G \quad \square P Q S \square K R A C D R Y \square P V T M V S$ QNQSRAMLVGALVGAQVGLDGIPQRFLGGLER SRALQE DTDSNGATAGSVAGVLSGAAAIPPQWKDPLEDTVRSRISE
 DADTTAAALGGILGAGLGAGGLPEELLSGGLREWPREWMKR $D V D C N A G M I M P L L A D Q Q G \square Q T I P S E L L H P A F E K D E T Y M R G$ DVDTTAA VVGGVVGAYTGVGGVPTAWL $D S D S T G A A A G N M M G L I D P L S T L K H R W A L V I E G A D \square \quad \square T R$ DTDCNGATVGSIMGGMDGAKNIPESWKNNVTGULRT DADTTAAVAGALAGATRGVSAIPEAWRTPI
DMDT T AAMAGG\VAAYTG\DGПPKEWDAAREP
D RNSNG L RTIIYA TTLGMEQVPDAWSKSCEGV DDADE DTDTDGAITGAMGGAL GMTGLPGDAVAALRAANALDLDG
DSDCNPASAAGTLGTTLGYNRTPDQWKRSLKEVEDRNFA DSDCNAATAAGULGTILGYSNIPESWKESLSEIQDRPFAY D DDTNCA VGGGVALAVGESGVPTDWLADREE

 DSDSTGSICGNLLGARYGTAVLPGRWQSGLEVRS
DTDTDGAVAAGMAGACTGFSRLPQQHIVRLKGLDDEQVRA DSDSIAALTGAFAGAHLGAAAWPSAWADHVEHRGDL D VD T TAA VGGTVAGYTGVGGVPT GWLAAREP


DTDT $\square$ AAMAGALTGARCGPAT LPASWRARLEGAERA VA DTDTAAA A GGGLGGRVGTPDIPAWDDRVDLPDGATLDG $D V D T V G A V V G G V L A A \quad G G T P V P A D W L A A C E P$

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UniRef90 UPI000299DDED
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UniRef90 ${ }^{-}$FOSHX
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$\square \mathrm{A} E \mathrm{~A} T \square \mathrm{~A} \square \mathrm{~S}$


V VARFESVWG

KVEALCRALGL
LDKKLMAL
L A A DLVA AR
L V Q R F Y


TS L S LDD D LY A $\square$

T T E Q
$\square \mathrm{A} H \mathrm{GLAA}$
LK L
$T V A K F H R R Y P$
LASALAR
LA A R T L $A \square A$
LA Q DVASKVGV
LA K A
K
LVRD Y L R L

Y A D QLYK
HAADLLALLR

T D V S L N K L Y D L

$\square A T D L V A A R$

TAQS L L K $\square R N$

LA D R L
$L S$ A A L A E L R A
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UniRef90-W6T8J8
UniRef90-W2ELX1
UniRef90-K1QCL5
UniRef90_X8JQS9
 FYDRLLGCI YGSVLGDAYGLATEDLNKEQQI $P \square T K Q A A T G V L T G L A L G D A L G F P T E F N D V P$
$R \square K T G L T G F \| L G D W L G M P Y R G K G K G T F K P \square W T$


 GDAGGAYEFQAPVVDSEE』
$P D Q D A R A A G A L Y G L A T G D A L G M P T Q M L P R P L V V E R Y G P V$

$E R \square Q G L V V G A A L G D A L G \square P S E G L T R Q R \square A R \square W$
QDRALGALLASAAGDALGAPYEFQPA GSTMADRALGGWLGRMAGNMLGKPVEHWTAERDDRYFEDR $P E A P S R F L G M L L G G A V G E F V G A G Q R G T A T M F A D E G L I R A$ PDRHSRALGAMVGAQVGDVVGSRFEHSPDKS RALAS LLRGLAVGDALGSQF
$F \stackrel{V}{V} P \sqrt{V} N$
 $N M T D R A M G A L V G G A L G D A L G M P T Q L L S P A R D A E D Y A H V$ QHAHASLDGLVTGDALG
 $N Q L D R D R G C$
$N V E A R A R G A$
$T \square D D R \square T G S L L G A A V G D A \square G G P V E G W T P E Q \square S \square R H G E W$ MLGA II GDDI GS DYEPKD $\qquad$ MEQRYRAAMVLAGVGDAI GF RWEF LDKDGPRDHAQLGE GWLGAVAGCLLGNPVEGWTRDRIRGFLKDS PATLEHYKAAMVLSGAGDALGYRWEYNESGPAIHQEVKE PGFPSRVRGCLLGGSLGDQLGHPVTASSREGGRLRYGAE

 SFPSRVRACLMGGALGDSFGYLVETDDLATDQRNFGPA FKNDIYA GVLGKIIGVYLGRDVEGWTYEAIRDTFGED PPLANRCAGVLLTAASGDSLGWMTEFLTPDEVLHKFGQV


 I GDALGMPTQSMPREWLLQDYGRL EKFKAAMLLGSVGDAL GYRNENSTVGMKIQEELQR
 $P T \square Q N R A A G A V M G A F \square G D A L G G P H W Y Y D \square A V L R R D Y G D W$

LDKFRGAWLGRA $\quad$ GCALGKP LEFMSGSDGRPGWENV


EKRA $\square G C M M C S Y 』 G D S \square G T V T E F T K D L T E E Q \square Q K A$

| $Y K T$ | $K$ |
| ---: | :--- |



FMGCDMGGAFGDAL GFPVEFMQLSEIVEHYGR

YRERFLGSFLGRGAGCTLGAGLEFQSVENMRVWAEHF

A LaA NRA NGAAVVGSAVADAAAQPMHW\YDLQAQDPNPEF EQDQHDI YAGDVGDALGVPDEFQERDT


## UniRef90_K9VU89 UniRef90-Q54ZA8 UniRef90 G0Q4Y4 UniRef90-R6W948 UniRef90_R6ILC6 UniRef90 G3PM26 UniRef90_UPIO00369E6A1 UniRef90-C8X2T2 UniRef90-H6LI69 UniRef90-L1JP73 UniRef90_UPI00036CAC9A UniRef90_UPI00026C7318

 UniRef90-K2HHW9 UniRef90-W2EF15 UniRef90-A1ZX79 UniRef90-X6E9R7 UniRef90_L8GP97UniRef90 U1MR46 UniRef90_UPI0001744990 UniRef90_UPI00047A3666 UniRef90_D7C2T1 UniRef90-R6JF48 UniRef90 ${ }^{-}$A4F9R4 UniRef90-D1NSI1 UniRef90_C5C2P4 UniRef90-UPI00047A79CC UniRef90_UPI000360F2F2 UniRef90-R5CCE1 UniRef90-X5PY66 UniRef90_UPI00038101FF UniRef90-F2N8A7 UniRef90-F6IT37 UniRef90-R5RIU2 UniRef90-K2RDX2 UniRef90-U9QK40 UniRef90-F3ZKC2 UniRef90_M7D875 UniRef90-C7HTM0 UniRef90_UPIOO035C7402 UniRef90-F3J9J6 UniRef90_UPIO00413BE66 UniRef90-S7U3U2 UniRef90-E4N1E0 UniRef90_UPI0002F4C6F0 UniRef90-Q67P92 UniRef90-M3CQC2 UniRef90-X1JWG0 UniRef90-D6AVY5 UniRef90_UPI0003B58391 UniRef90_L8GKJ77 UniRef90_V4X4B2 UniRef90-H2T1Y8 UniRef90-W5WG86 UniRef90-N1V3N3 UniRef90-V6LZW8 UniRef90-R9JTL6 UniRef90_U9UNP8
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UniRef90-18R1Z1
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UniRef90-U2ATD8
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UniRef90-H2T3V3
UniRef90-W6T8J8
UniRef90-W2ELX1
UniRef90_K1QCL5
UniRef90_X8JQS9

 TK DYDAVKMFSSRARFTDDTVLTFACAEAFLHGLDMASN K S Y LR GDKCSGNTSMLLCALDS EFDSENPFYRRQTGQQSCYGDQAFVLL ESDSECGGLNVDD RTARP $\square$ APYHKGDGHVTDDTDMTHALIVRYDRRDHLLDSYA EPKPSRYHAGLRAGQNSQTGQVFRFLLDSLVDNDGYNQAD EPGPSTYHKTKKKGDFTHYGDQS LLI LKSVSEMDGFY LDE GMGVVSGMFEDPLGSWSERTATMMCVAESICHDKTHDSND QTARPLSPLHKGDGHVTDDTLMVMALASVYETRAHDSAFD VDGFHPAPPDHRCADWTDDTDQCVLI LDS SLHNNGEVDVDD VDGFHPAPPDHPAGAVTDDTEQAMLVALLLDGHGTADPAE SFVNHTDDQNYHDWEYTDDTEMT GGLIKALDSEQPFDEELLD DYVSTGDGMWFKEGVYT DDTEMTVGLVKALIVDAGGDPSKV


#### Abstract

PGPDTHRF $\square$ A GRGMGSDDTEHLVFTADA ILKSQGDTQTT KP IVTKAGGAWELGEWTDDTAMALPILRALADGRSDDDEA PEWQECTRGRDHGSCRDDDDDYTLLGLQLLETHGFDFTEA GYTKNDDKLQKYNGAFSDDDTDVEYIYLLLLMEKYGVEPT  EGFVSDDPAGTDD YPLLKNRELSPRGHWQWTDDDTEMACSVVAVLAAAHRRVDQDV ПWNKDRKHYYDTFPGLYDDDYVNVIVVNVFERLGLDAPAD EGFDAPFADHDPAGTITDDTEQALLLGRILVESGRFDHTR E ELWAARELRPAPWLWTDDSAMAFVLFAHLVAHGEVQPNA 


$R G \square R D F T P A F G K \square G A V T D D T Q M M L F T A E G L L R A W C H P P S V$ TGYVAERPAG TPEPGRFHHGLTAGQNSQAGF ILILMGRSLV R A AGMAEA KPDEANFALGNEAGQVTDDFSQTYLLCRKI LIENNGVDNEK $K P D E A N F A L G N E A G Q V T D D F S Q T Y L L C R K I L E N N G V I N E K$
$P E W P Q C T R G N D H G S A R D D D V D Y A V L G L D L L E T Y G P D F T T E$
E STLDQPDAPNMPAGADTDDTEQAVLVAQLLVAGGGDDPTA APLADSYHKGFENFANDDLDLQVLWLDVMKKSVHINEKD APGADSYHKGKGRGDFTHYGDQMLVLLESAAAKGGFDAAD WPDGYCKWYYENEGGLYDDDYMDLTFVEVFDKYDDVPVDS REVGGGPFGFPAGDWTDDTAMAVAVGRGILQPDDPVDA DALPLTDYLPGPPSCRDDDVDYA L LGLDHLDTHGFGFSTE

RTARP $\square$ APYHKGDGHVTDDT LMTRLLDEVYEERDHDDAYA RDKTKDFPFFGENCRFTDDSVCTAAVADTLLHDLPP
LGGISSALTVNRRDWRVSDDTVMHTATAEALVDDWESMKDLD GQYPISGYLRSDVSPSDDDVDYLLLNLDVGAEHGSFQPVD LGGLKNDRVELPDWPVSDDTVLHLATAEGLATGGEELLHE GYVQHPTHLGVRPGAYTDDTQMTIAVAELLVFGEPWTAQR GLRSFGQLETARDSGTTQADYTVDALLEALEWANAGTAAD
QEFQDTA
$T Q A L Y T V D A L L E A G L E W A N A G T A A D$
$S D D T M T L F T L L G I K N ~ M D$ YYYKGHDTGAP LIVPDDDDSGTFAFFRALEDNGCSAGDT EFHRDYHRRRWDDGDWTDDTDQQLLIIDSLITNGGFNSRD TGLVDGDASQMPAGSVTDDTEQALLVASLLI RSRGSNAVE
 NYYKNHRTGA PLIVPDDDDSGTFAFFRSLEDNKFDPDDR GGRFQGYEDYDEAGEYSDDTQLTLCVAACI RADGGFDIER LGGDKK NDKVEFPDWPVSDDTVLHAATAEGLATGGEELLHE WYYVHD KIGVPLIVTDDDISGTFTFIRALEDSPGQDGKD


Y LWFKGANAWP DNGMQTDDD DRYTVLA $\square$ MM L EERKGREWWD DPVPA G $\square$ RWDHPD GPVSADDDID WTI LGLFMLERYGRDLA $\square R M E G G G \square H R V I A G Q G T D D S E L A T S L G Y G L I E S D E N D L N L$
RGYVR
KPNTYNDDDTYEDAFDKAFEKKGYNVTSE WDYPVDYGTFAADDDSNGPIFLVRAMEHGRKDGHAQDVAD DPMPEGFVLNACWNETTDDDLDYT LLGLHILESKGDDYTA NGLQDEDRGEG ILQYSDDTAMTRCVVQSLLTRAGFDEQD GRWPLERWFTNDSGMPEDDDLNYPIMALTLLERHGREFED QGUVKPQFGPNQKALVSDDTQMULFGMDGLTEGDRILRRSG EGFVSDDPAG
 DFREMI RPDLPNDDLDLQLLWLEVLQQKKGRRVTAAD RAESANPFYRRQTGQQSCYGDQAFVLLESLSECGGLNVED TAMSVGGYWDQPLGTWSDDSAMTLALMDNLTTDASYDEFD SEDEGGG TDDTEYTI FVAGLLVRHGHEDVER $M G G \square Q A \square H V K P P Y W \square V S D D T V M H L A T S E A M T G C K G E L Y R E$

UniRef90 K9VU89 UniRef90_Q54ZA8 UniRef90-GOQ4Y4 UniRef90-R6ILC6 UniRef90-G3PM26 UniRef90_UPIOOO369E6A1 UniRef90_C8X2T2 UniRef90-H6L169 UniRef90-L1JP73 UniRef90-UPI00036CAC9A UniRef90-UPI00026C7318 UniRef90-K2HHW9 UniRef90-W2EF15 UniRef90-A1ZX79 UniRef90-X6E9R7 UniRef90-L8GP97 UniRef90-U1MR46 UniRef90-UPIO001744990 UniRef90_UPIO0047A3666 UniRef90-D7C2T1 UniRef90-R6JF48 UniRef90-A4F9R4 UniRef90-D1NSI1 UniRef90-C5C2P4 UniRef90-UPI00047A79CC UniRef90_UP1000360F2F2 UniRef90-R5CCE1 UniRef90 ${ }^{-}$X5PY66 UniRef90-UPI00038101FF UniRef90-F2N8A7 UniRef90-F6IT37 UniRef90-R5RIU2 UniRet90_K2RDX2 UniRef90-U9QK40 UniRef90-F3ZKC2 UniRef90 M7D875 UniRef90-C7HTMO UniRef90-UPI00035C7402 UniRef90-F3.j996 UniRef90-UPIO00413BE66 UniRef90-S7U3U2 UniRef90-E4N1EO UniRef90-UPI0002F4C6F0 UniRef90-Q67P92 UniRef90-M3CQC2 UniRef90-×1JWG0 UniRef90-D6AVY5 UniRef90_UPIO003B58391 UniRef90-L8GKJ7 UniRef90-V4X4B2 UniRef90-H2T1Y8 UniRef90-W5WG86 UniRef90-N1V3N3 UniRet90-V6LZW8 UniRef90-R9JTL6 UniRef90-U9UNP8 UniRef90-D4TZ44 UniRef90-UPIo003C82EFB UniRef90-A9WNK9 UniRef90_N9XQM6 UniRef90-U7QJB6 UniRef90-UPIO004442F42 UniRef90-XотTG3 UniRef90-UPI000370F631 UniRef90-S3Y1T3 UniRef90-МЗСзМ2 UniRef90-UPIO0047A221E UniRef90 ${ }^{-}$Q8NDY UniRef90-UP10003C8CD98 UniRef90-UPIOOO3592D13 UniRef90-Q2Y7L6 UniRef90-K4R062 UniRef90-F8FQA6 UniRef90_UPIo00369F98F UniRef90-Q22C47 UniRef90-A0A009EWM4 UniRef90-18R111 UniRef90-FOZ4Y2 UniRef90-UPI0003787F7B UniRef90-C1BJU6 UniRef90_UPI00037F428B UniRef90-R5C9D0 UniRef90-HoBCF4 UniRef90-UP10003ACC564 UniRef90-U2ATD8 UniRef90-N2A4Z2 UniRet90-H2T3V3 UniRef90-WGT8J8 UniRef90-W2ELX1 UniRef90-K1QCL5
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 FAKKLQKWVTSGFPELGDQAGIGSNPFYVSEKNWVTSGRR VRAEFVAWYHAPDNNPGNTCLTACRLDEHTRVWQEASQTH LWMCGNQHDDAGFGSR
YQQNLRNWYFNRKYTGENDEFD DDQVTQKADMKNFRGVS LTQRTLKFFGPGSDYEGPWRHASLKSFLKNVDSGKEETGR VAAHLVPDLMGTPRWIDELEAEALP LDHGHVDPREAGVGN FTARLLDGRPASGRYTDQAMRDVWKARQQEARSWEEAGSF LKNDWLTYMSNYDGYMDKASTESLELLSGQNNLGSSSDEL IMMRLLRYRVGVGSCQPGRCMQFDKFMRQQGQKQARMNAA IAREWYSWSLGTPD GNGHYAPRAVDFRAAAAKAHEDHPT FAKRCYYWDHFGFTELGDLGGLGIGMNFQCEKIWRDGGCQ LVKFWKKEYEEGGNVKGYTRAGHGSIDSVYEVRRFQQKRR WVNALLDWEREGSYDLLGPSTKRAIDADNNGVPAEEAGRS NEDVLVKYWTAEYHDHGRDGHGSDAGYYEGKHSDNEDREW
LarhlRwwLLLLPaGVGLATAHALVKLW LGGWKPGRNGVF TLDHIVDEWAVWRRGAKDLPDHTAGAARTAAAADHQQRGR QVGDLWLLRLPYLQTFTRIAYRNLAAGVKPPATATLDNPY PDGWLVERGRLRSRSTDEPTLLTAGAAHAGGKPRGTFQQP F TDALKKYGRMFPSVGYGARLAFMRWVFSDSRKPDG SMWREHVVSQRGGFHGGGFSEMGADANLRRGPQSGTDNHE YKASULEWVRRFPDAGYRAVNR KDFLKWVENDGNDVY LAQSFAEAHDDFDRGYGPAVNRLLRLVREGGDWREFNGQG FAISFANAGFPLWHANQVAKYNIKQGIMPPMSGHWLINNPH
WVNALLDWERDGSYDLLGPSTKRATDAINNGIVPAEEAGRS LAREFAAEYEREPGRKYGPSMHGVLRRVGEGEDWQFGGQG


DHHALLRWYDTQGGKPWSSRAPGMTCMSALGASQAFGSND AWREWLTDTDEGAFRGAGFSERGTVENLRRGAPASAQHRH FCQRVDNDLFGPGHYTSESTRHAWKRRVAEKRPWHD GGGA IVKLAILEWSDMPQYFDRFAGPTTRSAVKMFKTGAKELIEK
 FAQHWKNFVGFPWNEYGIATRNLN GGM PPESGRGNNYYW FAQRWQALFADGYAGYVDGATRRTL ENLKAGWPAEEAGST LAREFAAEYTAFPDRKYGPSMHRVLRAVQDGADHLEGGQG


VAAHLVPRMDGAPRWDPEDEAEAPVHYGHDDPREAGAGN AETMRKWGKRYPQCG FSQUKTWIYAESDQDAPNC EDKLARKYVACGKDMEGRAAGEKTMETLMMPWNQDPYDPK VANHWLRSLPVGTYTAERVAYRNLVTQVMPPESGRRHNPY VAARYVEGMKDMDGRAPGPWGVSQLKPGEEGGFRVPYNDQ LAENFVRAFHRDPREGYASFHRLLGEVSDGAELLRRMRPD LWLAYLRWYAGQEGGFPDAAPQPLPRWIEMGSRARPI NAD IHEAYKDWYRTQQQQKNFFTGKSQNTCLQSUSSRVHIKNS AEDDGNA WLNY VENETILWWGG/LCRSTEHTAYLRLKNGM FAHRLSKWNNKPPFGDGKTVGTVLSHHRASWEVWVRFNRN FAHALLA WEDSMDERGSGPSTKAALERVRAGEDPLTVGGE YREMVRRYVDALEKLPEHRADPALKPDNYLLA WHTPFNEK LWLGYLRWLRTQPPLRWDDQQEVLQHRRHPGNACRPTNRE AEQUGDSWLNY IIENETILWWGGLLSRSTEHTAYLRIKNGM FCQSEFPLWLDYARGAGGTVKEAARKDQRQSASWNSNYRD VAGRYVEAMKDMKGRKPGPSSILGVSQLKPGEEEGPYNPE IAGKWVAHDPFGWSAEYGTGLENLKRGIYPPLSGRDGNPF I AAGWYQWSRETPDIGHGNSVPSGRDMHEAARADHKAQHH LAAGWYQWSRETPDIGHGNSVPSGRDMHEAARADHKAQHA FASSLMRWEQSMKDRGSGPSTKAAVEIIRQGGDPEDAGRY YREMVRCYVERRPDPATlEGCAQLKPNNYLLAWHTPFNEK YREMVRRYVERRPDPATIDGCAQLKPNNYLLAWHTPFNEK LIKRLMDWSERGYPELGDTAGYGLDKYTKNGCWRNGPKQA
FCQRMDEEDFFLNGMPQSURDTWRKRVQNQPWGQTGQ

## ПGKLWHEDNFAQVTHHYEVDGAPADWGQKQQWVRTY DNPY

 TEDVAREWLDRLPFTQTFTAERAAYRNLLLGKPIPETNPY叚

D TAME WVALIPFGWSAEDVALKNLKQGПFPPESGYFNNPF ALLNYAPYEHGFFWWGGYGNLRNGIKAPLCGSIAKNGAA ADVAGEWLLRLPYHLTYTTYRNLVNGWEPVRTAVVDNPY $M A Y S F A K E Y S L S P G R G Y G S G R V P K L N D V F Q P A R A Q F N G R G$
$V A Q L W L E Q L P A G R F T A E R A A Y R L L D A R P V P E A T H H N P F$ AADAYLD WYA TQQSRARYTHGTGEEYNVQKRGTMEKPFNA VERAWHHWIDEGPFRGAGFSERGTLENLRRGAPDSAQHRH FTKWSCDLARSNYWCDDDDYREMVKCYNYLDAWHTPFNEK QMAQLWNDHGKNGSWGLFWGERKFINNYRSGMDAGRAGYF LAEAWDRQCWYPFNEYGIFLLKNYERGILPPYSGSFNNPLEF KFQAFVMWGDYMPAHHTFDVGKTCMHA RNHFTNGDAADF AWRTEIVDRVDGPMRGAGFSELGTVRALRRGPGTGRWHRH


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A TAASUIVARATQYLLVQKRKQED IIFYCAEF DKDDDSDT AI ASAAAVAAAVSRGVAGGDWYAASDSAVAAAQRGATLGN GRAASALTARAVRYVVLDLSERRKASSKPALLASDSMLET CTEGCALLNLTVAGLLEDADTPLQDARDYVGFDTPDERGD AGDASVAWSVAMAHAVETGEDLEAERQQRWRDLLAAEAETQM VYGAMWAAALALEAALDRDPPRCRLARTVRKAAAGYEAER GHNPAGV GGVAVSALLRDVPLAEADQRGLAAWHALPARRH GVKGGMAVADSIGALARYYFGWTHSIADNPRECKRRMQDFV LWCGMAMAAGVAAAMVADDWRDRRHEDLGEALVELHERCT AVVGAMA VAAAAALAAAPGGPPSPRARDALDYGDATTVAA GWYGGVYVGALYSMAFVTDDVLVTVEEALNTDPEQSDFYK
$A V A G A V A V A V A A A D A A A G D Q P A D P R A E F L R E V A A H V P D G$ AI QGAAAVATTVSYCFEHDR DEWDELLALIAAAADEAARF SIMASLIYCELLHALHQGQQLSKALI EVHQLLAASHFKQT VYGGIYVACEILEHALQYDPNDCHPENWRDCFNYIFENFG AVDACRYMGGLI HGALDGKSKDELLTPRYSPWPGYWEKHK GYLAAGLFADAIRQSLAEHGQKPGMAETREMVEYALRQSE MLSMGVGYGCILACLIQGDTMDAQIYQQPLK WLAAENTWKV AISGACAVASAISTGLKENSDKLAMKDASQSKDKDSDMKD VPDARAALESALRHVPPGCRLARTVRRTMALHEAGLDWAA GHDQ
VEAEQYFSVCASTAFFETD पLQVLRKADGYDPKDGSMYAL VVDAAAFLARVASRVLGGQAVRPAVEEAAKQAEGEDSLAV AAAGAVAVALAAALAVRSRGAAAPGRAAFLTGVADLLPES GWYGGVYVAALYASAFENRDWKTTWQLVEDKWADEVNCPQ


G $K G A R A T T H A \square W \square A Y R G E S A T A D R E V T T E Y G Y D \square T V D D$ GFLGAFASALFTAFAVEGLPLPKWVEHYAEGDDYFEKAWM GLSEVPATSRLADELTDVLGWYANGVEYEQAVTRVHERWD
 GLDPAGTFAAMIFDAVHKDPDTYSNYDQFVPQQYLDQYDQ

GF $\square G S \square C T A L F A S Y A V Q G K R \square E Q W G D M \square K T V P L A E E Y C Y$ A QASAAFSWLIHQLAVVESRADLDSGRVRTGNELNDALG A $\mid$ DAAVYLAVMESLAFVEKDDDRLLDDWRGVRQWIADHHG A 1 GALLYGYALFLLINQDQIPSGRE
GFLGAVASADFASYAVQRRPMTTWVDETERDWGYFCDKWQ IYEPRSIIKESVEYTPEGTEFKEVVSKVIRWCEEDRDWEE AVYGAMVIAAMEALLAFVCDGTECMNSYLIELLHHREPDWRK TIEAAVLWSFADRHADAGDGRLTPERRDYWRGLDAEAHSA AVAGAMAVAAAAAVAAEADGAAVGRERDMLDYDDATTVAA LGIAGAAAVSAAVSAGVAGARVPEALEYALAAAREGSLRG GFLGSLCTALFVSFAAQGKPLVQWGRDMLRAVPRAEEYCR GFLGSLCTALFVSYAVQGRPLECWGRDMLRAVPLAEEYCY CAASCVAVTTAISLMLQQKHVK
VVTLTVAYGSVLSLLVQGHQLNRS DSGKDMR DARAGKDPF AWEGTADLHELIRVTLAGDDPEVHPDHVARYATVLSPDWH MYGEMFVAAMIAAAFVESNPLELGLSEVPANCRLARDDRQ SQGEMYAAALVASRLYEADRGILDLHATGIDHDGAMDWIDD SKGCCALYCLWVRKLLDGCSIQDSWDONGALDEDEHHLLS VIGEVFSVNMLPKDSEYYSVIKYALDMCLKSDSWEKAWRN GYGEMWALAEALSWAVEVRDARTSWDDALTRLLQERYGHYH

GFLGSLCTADFASYADQGKP DEQWGRDMMRTVPLAEEYCY EALETALGDPAESLFAEAVKWAFSDAPSDHSYKDAVEAVT AVWIEQYYAAVESMAFAGGYMETFHEDPCGWKKARARMLR CVAETLAAARFLEHFDLNGPDPTALESVLEQRKQPQDLDK

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DATPQTY $\square Q R G W D E C \square T A H C F L I F P E P V T A R R A A C T R G$ YEETKPAYSFDSTCPGSA<br>SFLASKDYVDCLRLADSLGG NRQNLCNGSFVVDTVESVVNWFMAGNSYKECVFSAINSGK MFYVYFHFSSLPGAFQAALHGVLTAKHYEQAVRDTMSCGG
CRLFGLACTLGFMLPAAYYFVARFAYDFENAVLSAVNGGG KTATKNIDAPAVDFLLKNGQSCHHQDNDRDAMIDNVMAGG
EKCPANLKDAPPDVLCQAMWALKHSQDFVSGMDLLLKEKA EKCPANLKDAAPDVLCQAMWALKHSQDFVSGVDLLLKEKA VGAFQAAWAADAGVGPDPEGKFAQRDALVAALEAAARAGY $\downarrow G Y T F K P M G C A \| S L R E A F K M K E K G \square D F E D L I E R \square A Y E G G$
FNLIFQVPSDAYHTSACVLYLLKHSKSAFEGLKNA\|LMGG WVTGGDIAARIVWAQALVRGKAKRDGDPWQAAVISANLGG KDYGEMVDQLPDHK LDEASYLLKWYTDPLEGLKAAVKMGG TPKTLETSGYVVHSLQTALHNGLIADSAEDAIVTAVNHGG AVSLIQSCHIYHSVPMALYAWLHHRGNYSDTLTEVVRCGG $P$ WELTANNGWVVGAFQAAWSAIVHGATLAEVLELAVRSGK DTSGLHWIHTVPNAAVITAGLLYGEGDFTSTMATVRGGL PAMTKTDWNANLNGLCGILAMLYGEGDFQRTLDLSCAMGF hDSMGEGRSGLGALAVAIRVATACPDDFAAAVRIAADHGG LRHYGYNDASCQGSVPEAVVCFLESVDFEDALRNAVSLGG $\stackrel{\text { W }}{\text { W }}$



#### Abstract

DVRSGTLISAPDTVPFALWSAAGHपDDDPEALWQTVAGWG GAQTPSPELIARVRYAWRLAENADESEFKASVHDAANDGG SRADVRNTGYVVDTLLAACWLALNYETPRETVLAAANFGG YDKYPGNCHIIPNAAVMVLSMLYGREDFSDTLNICNMCGW EPPEDRGRGFVVKSLEAALWAFYKSDTFEEGCLLAVNLGE AGDAPTPEGDAVMGGGWVAWCALMANSLEEGVCWAVNHTG SHLYGMPCAFYHQLPAAYYLAARFSDDFESAVLHAIVGGG SYDLIGSGLHVSEAVPISFGLLKANENPFEAVIDAVNGGY


VIKVLDWCGQHDAEKVMYKTKSFYGDDFTSAPMNDAHMGH IERFGQNCEFQSAFPSVVHLLARYADDPAAGLLQSTLAGG DVRSGLRIAARFPAGMSVRHAATHLDDPVEALWQTLAGWG GTKAPFNDDAKLNSAYVVMGLLYGDGDMDRTLEVSTRCGA SAERDRSGGYVVETLEAALVAFLRTDSMEECVVLAVNLGD LYKEGNGUEALNSVPTA【YCFLKQPKSYKDSVAYALSLGG
DRPDYAFDMTCQGTVPQADTCADESESYEDAVRNVSDGG KYMEERGLFHSDVPAFPARWGVVERDAFYKLLDKAALHAG ETDEFEWVHTLSNAQVLT ${ }^{\text {LGLLWGDGAFEPAVRRAVQAGF }}$ NLRGDSNGRGPVIWPANYWAGRSGHDAPMDALDALLGAGS VPWRGKVGSKGAMSVRAALTALAANTGLTELLRACVAFTG GLAGRLKAALRLGYAVLAGHASDPQEHFRAALALAVNDDG YEKYPGNCPMVTNHLTLLMALIGMGDDFNKACMIACSAGW

QEQWFYFEAKWQFYDEAYDALLGARGNWTELCHRAMFHGG DG WVAEEALSLALYAA VSGSHEAGNSPTAHFLSSDNHRG YEKYPGNCPMVTNHLTLLMAFDMGGDDFNKACMI ACSSGW

WY DDLRGLSNGVGPLLWPPSYGPAERDWEEDMNRAAFHGG VLRKVESHFKEYNWVHLYPNTWFGESNFERSMKIIASFGY AWSEFSSMYNYEKYPGFCHIVPNHDDDFQKSQMIVNTCGW PPSYFARNGWVIHAFQGAVSALCHAGDFTRVVEAAVRSGN VLGCGRRTSAHDTVPFALWSAARHLGDYTGGFWTTASVGG HWIAGADDADRSMWVTCALIALVALDEDPFQTLLEAAGLGG KTIRHTAEYQEHWFYFEAKWQFYLEERAYDALLAAGNSWT QEHWFYFEAKWQFYLEAYDALLAAGDSWTELCHRAMFHGG
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D S D S $\quad$ A C LT G A L A G A H L G A A A WP K E WS E R DEY R S D L DADTLAAI A GPMAYAFY REMPEP LVYQALLKKLPEWMQK S S D AV G AL TGLLLA G $\square Y Y G L E$
$C T C S R G S F \square G A C L G A Q \square G F E G \square P A A W T S K$

N N MARAALTGALSGAQCGLS QIPLRF\|EGLEAGN D S A GRGMI DGMI LGAYLGYEALP KAWLNDLNH E $\quad$| $\square K$ |
| :---: |


 DADTNGAVVGAVLGTYLKGDCMPSNW$L D E D N K K W L E E$
 DTDTI GAI A A GMAGACAGFSRLPQHRVTSLTGDDMAQVQA F V D S L A A V V LG T L G A R Y G L E G L N P N F V R K V E C R E E L Q T L G $D T D T I G A \| A G A I A G A R F G S S A L P D Q W I D T I N E A G E L E L$

DTDT
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D T A S S A M L C G QL L G A L H G P T A I P A E WLA E L E F R L L E R R L A T
D S DTQAAA A GS I A HAA Y G
D A DT IA AMA GALA GALHG■EAVPAAWADAVQE
PTNTIAS TIAGAFAEAYF KHIPKAF $\square$ KRALDARLTPDMEA $D V D T T C A D V G G V$
$D S D C N A A T A A G V L G L L G Y E N \square P E M W K E S L Y A V E E L P F A Y$
DRDTTCA IVGGVVAARTGTGG\|PAAWRNALE
D T D T $\$ GA I C G GI CGARYD DTA AE ER F DTEDTAATIAASLAAA GHPAIPVAT DWWQQILNRSLLE D T D CNVGNVGTIMGVFA GlS GI D D K WVK P I N D
D A D T T GAII Y GQL A GAYYAKS AI P T K WI K GL
 Q NQSRAMLA GALVGA QVGLA GI PERFDLDGLDR SAEI RK D T D T V A I I T G T M A G IVC Y E I N D K I E N M I D I L E E K N K M R I R E $D T D S G G A T A G S V A G V L C G A A A \square P S Q W T A P L E D R V R$

D S DC IV VA T A GA LIG I IKGYENワP TLWKERV
DSAA RNDAVGCVVGAAHGEGAVPAGWLEAMKAAPRDQ
DLDT TCAIA G GVVAARTGLGTAPAAWLEAQEP
D S DCNPA TA G GIL L G T MLGYSRDSEKWLKNDREVEDVNFD


D S D T
D S D S T G S $\square$ A A S LLWGA DH GMRGVPENHYRNLEYRDRUE N
 D S D STAVI A C CLLWGLLY GF Q GVV E GNYS K L E Y R N RLLE




ES GATGADA GCLFGLLHGLDGVPGGLYRELEHK E ELLGR
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 DVDCNA GEVGTVLGVIMGGDGID YRWYKP
 $D V D T M C A M V G G V$
$D$ TD T DAA MAGAMLGAVHGLDGWPAGAVETDRTVNDLHLEP


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 DTDSTA ATTGSVYGA LHGAGAVMSEVRSAVRGFDRDTIDE D T D T A A C V VGGMIGSLVGYQNIPSNYVNIL
D T D T T A ClV A G G I A G LYYY GVVDA I P S S WMN HL R G K EMVE
 $D T D C N V G N V G T V M G V R G G L D E G I D E K W R K P V N D$
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E S G A T GT DA G C L F G L L H G LDD S VPP G L Y Q D L E H K $\quad$ E E L S R

 CTCSRGSF $C$ GACLGA QVGLE GIPASWTSR
D T D T

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T NEEF
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L T N
RLDNRLLH LYE E
LARRFYK
LAADLVAAR
Q A
L A D QLVEMA
$\mathrm{Y} \square \mathrm{N}$
DAAA
$V L E R$
LIN N F
T L N R $\square \mathrm{Y} K$ K S
$\square$ A CRMAEL

1 I E G L F
LA D Q LVR
LTHSLAS
LAREIEKI

LA A G LY
LAAERTLDRLA
LAEKL

LAEELY

MA G $\square \mathrm{F} \square \mathrm{A}$

LGEALYHLS VADALLD

CAEQLYALS
$\square A \square A V L E R F G$
LA N D L L H L R
LGAALYRLS
LGTALYRLS
LAMDL
$V L D A L A A L A$
$\square \mathrm{T}$ D R T $\square \mathrm{A}$ L

M
$\checkmark A$ GRTFALA

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T D N S $\square$ RK L
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 E KFKA AML LA GTG DA LGYK WV F CAS GDVKI QE E L K Q Y LE RVV A GVL GK LI G V Y V G R P F E G WTH QRIV E E L G H I
 PSM DK $\square C G A \square L G A A D G D A L G W P$ Q E R P S M H S F K T WY R R S $R S R C R G C L L G A L L G D C L G G E F E L R P D L P S P P R E G P A A$

$T \prod Y$ GA $\$ A G D IIGGSMYEFRSVK S $E R A L A S L R G L S V G D A L G S Q F$

 $F R S R V R G T$ L L GVAVGDALGAPVDSLALDAIREAHGA T R R D RIL L A L L GVVHA G D S L G A T L E F Q GWWNI H CMFPNL FERRCVGSMLIGKFCGDVLGAAVEGWDVERIREAABCD


 $A L D S L A G L A F G D A F G D R W F G D L R R E G A E A L E A R$


 EKF QA A MLLASSVGDALGYRNETSVSGTRT QGELHK $\square P D R V L G A W L G R A A G C L L G K P V E K\|S L A G\| R A R Y P W N$

 D KVV G GWI GKCL G GAA GAPV E GFK KLI ECKDY K E
 ACGDAFGLP WE GSAPRDV MDGFYVGD I I GNY $V E E H V Q G C L L G M V A G A W L N A D T R E Y S P S E$


T L K D K $\square$ A G GWA G K M $\square$ G $V$ S Y G L P T E F K A L G K M Y E THRGRARGCLLGLLAAGDALGRPAENLSPEQ\|AARWGRLL T $\square$ QD RAS GA $\ M G A F I G D A M G G P H W Y Y D L A E L R R D Y G D W$ EKFQAAAMLLGAVVGDALGHGGRAFASSGPEVQKEPGKV PGFEDRVK GALYGLDIGDALAMPDHWKSADDLHDQSQYV LE RVY A GIVLGKLI GVY $A K \square M E K \bigsqcup G P I$
 Y A A L M GALVVADAAS MGTHWWDYSP E RVSSMLSN L L
 $T \nabla T$ D R M R G CLL WGLLFV G D A L A M P V H WH HP S S DMPRK H L W $P S \square P S R D H$ G C L L G G A L G D A L G S P V E T M N A E Y AR N Y F GP V $M P T$ Q S L S R E A V R E R Y GR I EKFQA A MVLGAVGDA LGSRWQTCSSGGQQQQELRAA $N Y$ L E K V Y A G Y L G M N I G DR L G A P V E DWT Y E R DK N T Y G E RAA GA IVGGSFIADAASLPVEKLAAEVSSKPTPEF



 $L E A R L R G A W T G R A A G C L L G K P V E K \square P R R G U E E \square L R A T$

 LSAA DAL GAATEFKTPEA $\square R$ ARYGE $\square$ ALDS S LYGLAHGDAFGDRWFFTSREE RDKFYGA WLGGRSVGCA LGKP LE YWSRAEAEYGLGLS $P N L K G R Y V A A M V L S$ GAGDAMGFRWEFCYRGRADIDELDQS

 $\square R N F \vee R G V I S G G L I G D C Y G Y V Y E D R P V V K F D V P L K L I$ $P E \square K D R A A G A D I M G A F I$ GDAALADPHWYYDLTELRRDYGDW
 $M D E R Y V A A M V L S A A G D A L G Y K W E F D R D G E \quad K D H Q Q Q$



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 LGYVHEKKVGDPGVVTDDDVSGTFQFVRALEEHGYSPEED
 SKIF S G GGRFFTYEEK $\square$ N REMEDPTP EPGEESGRRVSK GRWP AGEYSDDTQLLA ARAML

0 GRWPGDRWFTNDDGMPEDDDLNYPDLALALEKHGRGFTEDD KDFELFPYGACFTDDTVMTLAI ARWLMEDVTRSEYT YPLLKQRVLPPGPWQWTDDTEMASSVLAVLADHGRDDQDA PFHRDEYRSKFEENDFGDDAEQVLLVMESLFENGGHFPKD RNFHDAEGKSDPPGTWTDDTSMALCLARSMARHG FDEAR
 GLCSFVTGTNRGDGCYTDDTQMA DALARSGVACGGRCDAL TDYTKP YKTFAADDDANGPVFFLRALYKDGELTPDD DGHMGVRKDGMRYGMYTDDTQTALALATSLRKADGQDGAD $D D$ HPVSHGLAAAKVTDDTEQTLLAARLI QGDGLLDETD NPVPGRYHDMLKAGDLTQAGY ILRLTMQSIVEHEGYDEAD


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

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 RAADIPARGRWERGSTSDDTADTLLVAEHLTTHGGAGDPA
 $K A F S S L V W N D P F T W A P D D G D E L A D A L A N S L I K E K M F K P E A$
$R A A F D S R A L P P A P W S W T D D T E M A A S V V R V L A D H G G I D D Q D A$ WPFELCANLTWKKGESTDDSDMALALLQSFHECNSFNPEH


DGHRSKFSCPSDFKSWTDDTDHA LLILLS Y LHHNGQVPSD 11 SDDTQMSDHNVAALQQ VRAYGHKLRSPRLDTGFHNAA RSHDAAEELPAGPWQWTDDTEMACSVVTVLAGEGRDEEDV STYQPGSVFGFAPGEATDDSQMVAATLLGYRKGDGLPG GADAHRDTPEDVPWYWTDDTAQALVLFGHLAENGGSVRQD EWTHASTRET I KYMESDDD IRYTVLGLMLLEQKGNWDSWD LGGGLED DKVKLPGWMVSDDTVMHLATAEALVENDENDFWLT PYYVN EELDLPLIVADDDUSGTFAFFRAMEDHGFPQA T T T YYTFEDAERHGLRMNLNDRRAYDHDMADALGGAWSDDDTD RDYVKP Y TDTLSGADRS QLIYTDDTQMGLATLRSLRSTHEDDPSH FPLLARRELDPTAPWRWTDDTEMAASVVAVLAAHGRVEQDA DPKPGRYHDGVKAGQLSQAGF LLKLMLHSLVENKGYDETD PYYVH EELDNLPLIVADDDLSGTFAFFRAMEDNGYPKNGT AQRGGLEALDVAQWRVSDDTVMHLATAEALLEAGENPYAL DSYDTTPETMN
TPKPGRYHD GLLKA GALS QA GIILVVMLLLHSVVREQGGYDAA D SHFPYY A H D S L T A GEELTA Y GE WL A L L Y I R L L A EP E I S T H Q I $W Y Y V H$
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 VGKTWLNNV DEHRTDFWWGGRGMSTEHTAFLNLKRG\|PAP MAK R FAE E Y QKDPDRGYGAADSSKCRDVFEPARAQFNGKG

 VRE E FVDWYRSPENNPGRTCLVACNLLKDEGRPWQDAS Q $\square$ MAKRFAE EYDKDPDRSYGGGVVTVCRDVFEPARMQFNGKG
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 LHRA Y R R WA AT QRDWGPDLLRRKDDGWLAAHMGTPEAPKNPD GRDWPGRAKGSRPCDVGGATVEGLERYRQTRDPAAA GAGE SAARAYANEYEMGRGYGGTAYKILVLIRRQGDDEEFDPGGG


 WA QDLI A WRDRGLRD LLGGPSTMAALEAMLA GTDPA HTGRN LFP K L NGEPMAGP GGYTS QS DRVVVYQQRKAGDPWTKT GS T
 LVAA FARRHDSARGYGRGTDWLLAQVRWRDLSSVMFKGHG A DLD VR A YKRDARAGYARGFRGVLEEVADGTELLEVLRPE YMDA YYR HFGPGTNYDQPQSRDRLPKQGPWRNEHQRSGTD YREMVKKCYVEHRADPATMDGCSQLKPDNYLLDAWHTPFNE K VA T S WLDN LLP G GRDVFTAETYRNLLLDGWANPGDPVAAASA W MREAF QQWYPYYANFTGPTTRAAMKADFNDNRAIDNKGNA




 $M I T V L K K ~ F Y E E Y P D K I P T D Y G E S F V N W V T N V N$

 YQEALLATAGFRLWHANVQTRKNYFDSDFPP YMAPCREF

 $\begin{array}{ll}F & \text { R R M }\end{array}$ WLT R L A A Y M T T P G N HN D T Y V QMQAYVNWQ】GQCFD】GNTISRAIA IGKA WL NY LI E HR S L L WWGGNGNSTEHTA WLNLKRG DA A P

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 VAT A WLDNLPA GRFTAERAAYRNGLDARPVPETATHLNPF GACDEF
 RRAF L D EYVEHNNRAPGNACMSSI NNYRKNPAKEPAYGND LAHSFARHHDFDRGYGPGANRLLRLVRWRELSTGLFRGQG $V L A G L R D W L S T A P P D V G G L T R A A L R L G T D D G R A W E H S R F Q$ AL A A GLLA Y RKY GPSMHDVLARRDGD GERWTVVVAGGQFGGQG
 IA RYYK E CMK DMN GRAP GRT CDSGANMLLKPGVRNGPMNAK

 LAREYADYFKDGSHRYYGGTVPSVFRENARNNYENPFGSG LA A SFA GRQNAGGPRGYGRAVNR\|LRQVRDGEDWRFDGQG
 LAKHYQDCMEDMDGRAPGGHNAMRLEPSRANGWRDPFNRR
 F CRRLD E D K NGPGGYTS QSIREANKK RVVE GAS WR E T G G Q


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S

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 SWGNGSAMRIAPL GAWYA DDPEQATHQAE SSSYTTHQHRE RGANGALVRAPLLGALLKFWD GTYVIGENTTECCRVTHPDPR N A G N G S L M R L I P V GRAGNGSDMRCDPTGL FQREWGSLWDESVADSAVTHDDLV

 $K$ S G I G GQQ $\square \mathrm{F}$ I D T W G LV L

 SWGNGAAMRVAP LGAWHAADLDTAMEQAARQSAVSHHHPE WAPNGSLMRTHPLGLMCLTKVEETFQVAADFSVVTHVDPR SWGNGAAMRVAPL GAWYAGDAEQATHQAEDSAYPTHQHRE

 R D A RLSHGRNGLYGAJLFAAAACAAAVTASSSVGDVIAAGLS EATNGAAMK DWPAAVLHPGD』DAA DDCALQ』CRFTHNNVL
 CEGEGSPIRSE IWWGMSFPGKPEIAAKYAEMDSSIMDH YGE

 S S GNG GAMRSAVI GWY AK D DE E L K E LVVYKA IMMPTHNEEG

 GVDNGA V R T A L G VVPN F HELLHEVEGNAVRDCRATA A DRK ADDD DDF QI EA D YI GFMCPGMPQTAN KMADYMGHMMMNYGN GWS D GLAMRAAPYGDFAAGDPGEAAR LVEDDGCVSNA GE G

 S S GNGSLMRVLPVAL AYWRDQREARMYARRSSITTHPN GL AS G $\square G A Q \square F I D G W A M V A P G Q P Q L A A R D A R A A G E V S H D G E S$
 D D D Q N P A L C S IP A L V S L K L P S E QLDD L E DE R VVGI T

 GS GF GAAAKAMCVGMWQPERDDNLVEVSIE DGRMTHNHPT


 QEWDGALIDRADVHGWVNPGDPHRAAAMARRDAVLSHTGNG $\square C N C G A A M Y M A P V G V V N A G D P A G A Y A E A A D D A G A H Q H S$
 G $\square$ GNGAAMYIAPIGIVNACNPKAAYDAADNFASGHAADV TAS S GGLVTLP PVIFAALREGDRAAA DTAALMQLRLDT

 WAPN GS L M R T H PL GI ICLAF DEKTFQVATDFSLVTHA DPR

 SYGNGAAMRVAP L GA WLLAA DLEEAAAA QAAVVHHHPEAVAAG REW WGAA DRAD GLA Y GAA GYPE LAAAE LGWRAASFSHVKN G G GCGGAMRSMC G L R YPRPE DQLIDAVSDEA GRMTH H HP I
 A E Q I G GQI FI D S WGLLFPGQAEKAADYAEKAAS V S S Y G NG GAMRISP LALLYGLKVVETEFDLVIDVTRLTHTNPD SWGNGAAMRVAPL GAWYAGDAEEAVRQAEVSSYVTHQHRE
 EGGCGAAMRAMCDGLRFPRPS QLH $\quad$ QQV S IESGRMTH H H P T VD WI G C QM R GMVVCGML A P G WP LIEAARRLA YLDDGVVVSHARN G

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 ALHGAVCQAVATHLALGLDATEPVRVATFVPPDRECVRSA $A L H G A V C Q A V A T H L A L G L D A T E P A R V A T F V P P D R E C V R S A$
$A V H A A V L L A V M E S Q A F V R D W H E E N P R D W N W A F S Q L K T H Y G$ GFLGSLCTALFTSYA IQEKPLEEYCKKTDRHMAEYQEHWF SVYAA QL WA AMEAEAFISKDINHVLDDWMKTRQHDEDSYG $G Y N G A Q L Q A L A V H L A L Q D Q P R E L F M R Q L I R H M E E V E S D E R$
$G I T A G A S M A W V I W A V R Q G I S K D E I S Q E L Y Q R W N Y Y H D L L G$ $G \backslash A G A E S M A W V I W A V R Q$
$A L V G A L L Y G K C V Q L A Y R$
A L A A S DLTAHAVRDLLRAYAHANRTRYHDRWLGDDWTRSQ GYNGA ILQALAVVYALHGESNR
VYGAMAAAIRLGRDAGRDGDASEAGVRAGDDTIHAAYGDL VWGGVYVACAGSLAFVEPDYYKEHPENWRDCFQYDYENFG


CMDS CVIASTLIARRLRGQDLE $\square E \square N H$
$C L E V C E F W T S V V V Q I L Q N T C$
$G C L A A G A Y A V I V V G L A R G E S L D$
CTFSCAVYNTVVAALVEGKSVE
A 1 DGAFA $\square A L A V A Y L$
GVQGAQATAAAMF LAKEKAPKETDSDLLTNDFGYNFSYQD AVAGAVVIAWA S RADDGERWSA VDDSLPSUARHAQQKRT GLYGARFMAACISKAFDTSSHAKYPNDFRACRQYDEEEWG TMRKAAATLPMKKR DKALVLKGDNVLAGKEVHDMVDVFDE A $\backslash A A A C A V A A V V S S G D A G A D F R S S L P L A D D A A K L G Q Q R G Y$ VVSLTVAYNAVLALLVQ
AAAGAVAVAVAAALAVRGRGTP $\square R \square A S R M P A H T S V R H A A E$ CVVSCAI GTALVRGLV
AVVGAMAVAAAAALAAAPAGPPTRRARDMLDYRDAGTVAA GMTSATAAALAVHYCRYDLGPVAELPTWLAPASTDPAVWA VRTAQFFAKLLEHY ILLHGRDPEGFHKVLSHFPNDQYKRDW GFDGSDCTALVASYAGQGKPDEQWGRDMMRTVPDAEEYCK VVPAGSRYAAADRRGAELGAGDLGDEAAVDALHAEFGHLH AMSGAAAMAAATSEALRAQTIELAVDDGKRHRHWETAVVE
 IYGEMF LMAE B P RECLLDYRDLA WALEHCGAVRGHGDARRL RGLQWAVVTGAMYDYCHPDVVLCELDRELKRTAGCKDFRE ALAAASDLTAHAVRGLLRSYAYENRTRYHRRWLGDLWTFSQ A QAAAAVAAACASWAVEGVDGPMLLAVAAAEADALAGPRW

 AI LDPCIVHSIVIHRALESYRNQKPLE
$C V A S C V L V S L L I A T L L Q G Q L V M E T D D Q K R T V N E E L L D K N F$


VVSMTVAYGAVLGQLVQGRPLD
GFLGSLCTA LFASYAI QGKRLEQWGRDMDRTVPDAEEYCK MENGGKMMAHIILDDLQGRELGRAVFDHYQNFDFPDQUVV CQEACEVWDGAISIIMR
VHAAALWACLIAARLI AD DRRWHAEHPDWLTTRQLIQDTYG GYLGSLAAALFTAYAVRGSPVEAWGHGLMEVLEKAKQYVK $G 1 V G G R F D A A C D S A A D I D F Y K K D T K K N W K R C L F F V Q A T F G$ AL ACAKAFASALLNEALRSRRMEPNDEQVRNLSVEQNELSY ALHGAVCQAVAAHLA, Q
VEQSSEYDYEVMEDILNGKDYRKALLDNKDVNDYDDEVVK L ERYA LALGEACAVAERLGFPATAVVEKVERTGLSDVSVI GFLGSMTTALFASYADQGKAVVMWGRELMKVIPRAQEYCR A L HGAEAFSLIVHHLMH
GISGAAADAAGVSAWVAGASVAERYDALLPLARADDDDAF GFLGS LCTALFASFAVQGRPLVSWGRELLKTLPKAEEYCR
 VYGAMWAAAAAVASALDRDPPRCRLARTVRRAASLHDAGVV

AVESACFWAGMEAAAFRERNDEALLEENDSY $\square N V K Q \square K D \square$ LEAAGVLAACATALSLAKDGTKMAI QDMCEKARQLYSPMA GKAAGYALACLACAVAERLGFPATAVVGQUIRNHQSDDDVI L Y GAMWAAALCSAALVCTDVDEEVAAQPQDVADGLDTLHA C AS CVTVSTLIALLLQRKEDDIDEIITEALKHGVQYLKN SAVSAAFFTNLTHGULRGQLVRREQDFWADLICALQGGRN GIAGAVAVAVTAALVAASGTTPPEPAALLDAVLALVPRSA CVFASVFFTALLDGRLAAGQPFQAAAEESLQVMDASDARSV, AVAVALAAAFAARSRGGPAPRDLLTRVADRLPGSDVRSGLJ GIYGEMFNAAMDSAAFAEKDNERILEIGLSE\|PRVRNDWD $G F L G S L A S A L F T S Y A V Q G R P V L S W$ AVDAAGF LGALEAAAFDERDLDTDFRQCTKFDETENAKYG IL YGSMFSAAFFEMAWAEQEEDWKDCRKKDHDAYFEEVEGG AVCGALLQAHAVRLVWS IVSK
VVSMTVAFGAV
AVDAA GF LGAMEAAAFDQRNDEK\FDDWRKVRERDDEKYG GYLGA LASALFTAYAVHGRPPRQWGKGLMEVLPEAKKYIV VYGGMYAAALTALAYVRDDERALLQERSEPNPAAAWRLLD IVAMSTAYCCVLGQLVAGERLDEQL
ALATAKAFASALNEALRSRRMEPVLEKVRLLDGDVNDLTH A 1 YGAQVLAAMESLARLDT DLRE WRARFADWRVAHKRGVA

UniRef90 G4E1M5 UniRef90＿UPIO004677082 UniRef90－A6CVW8 UniRet90＿－66AZR2 UniRet90＿G9NC74 UniRef90－F6ZW18 UniRef90－UPlooo2E94B31 UniRef90 X1BWD1 UniRef90－L8P9T0 UniRef90－V8NW44 UniRef90－UPIO004648DBA UniRef90 R5A2N2 UniRef90－S4RWG9 UniRef90－R61T01 UniRef90－NoCY01 UniRef90＿S2K3H3 UniRef90－A8NEQ5 UniRef90－H1Q9994 UniRet90 Gosgz2 UniRef90－A8．J938 UniRef90－U9W1S6 UniRef90－D2ADY4 UniRef90－UP10001E89D9A UniRef90－L8HOW2 UniRef90－B7RRF6 UniRef90 V9LTR1 UniRef90－UPIOOO381BD1C UniRef90－F9FCYO UniRef90＿D6BB04 UniRef90 UPI00047693E3 UniRef90－Q03443 UniRef90－F7CUX3 UniRef90－Q6ADS8 UniRef90－X3JRU3 UniRef90－D6KAM9 UniRef90＿G9RPIO UniRef90＿UPIOOO4711412
Unirent UniRef90－Q828Z7 UniRef90－A8L2V4 UniRef90－R7M9Y5 UniRef90－G1 Vows UniRef90－UPIo0037CB55D UniRef90 D2W013 UniRef90－UPIOOO3592DE5 UniRef90－R5F628 UniRef90－D2AWZ2 UniRef90 E8WNN4 UniRef90＿UPIOOO42C6070 UniRef90－COOIG1 UniRef90－V2WVJ9 UniRef90－UP10003FAC8C9 UniRef90－C1BK92 UniRef90－G8QQl1 UniRef90－L8JFB8 UniRef90－IOV1R5 UniRef90－E4RNS1 UniRef90 UPI0003A64B9B UniRef90－G3PRJG UniRef90＿UPIo004186D81 UniRef90－D1BFT9 UniRef90 UPIOOO3837576 UniRef90－UPI000248CF2A UniRef90＿UPIooo2653714 UniRef90－G2PCN5 UniRef90－UPIO0037306D1 UniRef90－J2X1C4 UniRef90－R9N161 UniRef90＿K6ZCS5 UniRef90－W6M097 UniRef90＿UPI00045E6188 UniRef90－V4BRD3 UniRef90＿E4UWH7 UniRef90－IOUSS2 UniRet90－B5G766 UniRef90 Q9RT11 UniRef90＿UPI0003615F17 UniRef90－W4C589 UniRef90－UPI00035A18E3 UniRef90 ${ }^{-N 1 Z V 11}$ UniRef90－R7ZTF7 UniRef90－D3E7U8 UniRef90 G7YCT5 UniRee90－UPI000475D98C UniRef90－Q31GW9 UniRef90－UPI00047109EC UniRef90＿UPI000332F8E6 UniRef90－I012V4 UniRef90－B4D602 UniRef90－Q6LPH8 UniRef90－A5UVE2 UniRef90 B6AY22
 LWHDGNDVSAPGSVPLALLSFLRHPGRPDAALRFAIVAGG YFEAKWQFYGHDAPMIAYDALLGAGGDWKE LCNRAMFHGG YDKFHGVCHVIPNHAIMDMAVLYASNDFDEAMHTINTCGW SVADARALGMEEFPVPTADYSFLRCMEPQRTLIYSDSGGG IRMNGGFDSSAVNTVP位MF IAFSATTFVKA乌RSTHY乌GG

DPTPEHF $\square$ ARGWDECTA LLCF $\square W F \nabla D P \square T A R R A A C T A G$
HWVHVLNNAAVIAYALTAGRGPDGRGDFGASVATAVTAGW YDKYPGNCHIIPNAAVMMLSMLYGGGDFERTLCICNMCGW QAAKSATPYCNLESVPTAVYAFLRCDQPEPTLLYAVSLGG IRPRYEFDVSCQGSVPEA\｜TAFLEADSYEDA乌RNAVSLGG

LQQSYQFSCDATDTVEAADIAF LYYSKDFEDADRKA DSQGG YDVGAGTSTIESVPCAI ALVELAQTDPNRCAVLCANLGG
 PEGHSDMVASHESVPAAFGVVLLAGGDPWKAAVDAANDGD
VLGSGYRMSGPDTVPFA乌WCAAGHपDDEEGLWCTVAGRG
VLGCGRRSTAHDTVPFALWSAARGLDDYEATFWRTAQAGG RPWRGKVGSPGMDSTRAAITALAAHTGTAALLQACVAYTG QTAYEERSMCNVDNFQGALNCLTRNEDYVS SVRTTMRSGG KTIDRHLAEYQEHWFYFEAKWQFY WVHSLNNSAL LAFALTRGDGDFARTMTLAVSGGW LADIIGSGLHVSEAVPAAFGFACCPNSAVDAIISGVNIGN HSATYHWVHAVPNTALIAAALTHANGDFTGSVCRAVSGGW VDERFAGMHAVHTNCLIVFGLKLAEGDLMRGLSQTVAMGL ARTRMLQRYGHHEFTNAVTNLGYGENNLDKIINTAFRCGF LRKAFDSVYNGRGMPYAASYFRMVNGNTKDAMIAAVNMGR DPTPEHFILARGWDECLEALGRLQQPEEPLTAMRRAACTSG
 TKPPNVPSQGADCSLQNAFYQLLHAKTLTEGGLSRGVEDTF

DARAAYAVSHTYTP पKAALTALYWPDDYRSFTTVLTKMAG NPGTKYNIDAK LINGAY IVIGLLYGEGD

RTDRHLAEYQEHWFYFEAKWQFY
GRHFSSACYMDQS円PATLYपA पKYCQDPEQALIANTMCGG
YDKFPGNCHVVPNHALMDMA LLYAPHDFQAAQRDVNTAGW DA GHCVE ENLLHWNYFEESWRKY
YDKYPGNCHIIPNAADILSLLYGEEDFGKSQMDCNSCGW VLT IVNQACHLADSLPLAAWILQNSESYTEA DRMNWLASG
MADKRGQGCSTAQGFPIVLDVLLNYSDPVEAFSVNDRAGG GGQLSPACYIDQSFPAVLYLAARYHGDFESALIANAGVGG KT $\mathbb{R} H M S E Y$ QENWFYFEAKWQFYGHDAPMDAYDALLAAGS
ADFLYDVVGTSVQSQESVVSALLLVDRYRHGLCVAASLGG KTDRHMAEYQETWFYFEAKWQFYGHDAPMDAYDALLAAGS YDKYTGVCHDIPNAGVCVDSMDYGQGDFNRTVEDATMCGW SKAEDMKVHPHNVAAKKLGYACSIDPGGFLSMLHCLLNAGG A WADTPWLHVVPNAAVLTAGLLYGAGDFTKTUALTVRGGL

FGElIAFCKDKPDFRTARAYLEKRWDSFRDAMQLCVSAGW DDVSRK 1 EK GGLLSPACYIDQSFPAALYLLAARYPDDFEAALVANTNVGG EYGHLHWVHVINNAAVIAYALARGGGRFGPSVSVAVTAGW

PNAFFGEGWVAEEADFNVLGVFSAFRSPKDGLLALVNTPG VELGMRRAASMLDYDDVAWAAARSLGDFERAFWTTARAGG LLDAGLFQSGYVLDTLQAALAHAQAGTWLGCVEPAVLLGD RTAGRFPEGTSVRHPFALWCAARHLDDLEGGLWEAVAGLG TFSHYDAVHTNNNAALVAASLVYGGNDFEKTVVTSVYGGM
 FKIPFPMMGSMVNGLNGVMALLYGNGDFERTLGIAVSTGY VVHAVMDFHREQPSDFRACRQYYGEGDYARTVEIASMCGW

YH $\square Y P G P C H M V P N H A V L A S \square L C A G D D F A E S V K \square G A S A A W$ ESGYSVEENLQHWSYFQNQWENY
ARFEEYNWЏHAYPNLAADMALWHAHGDपTTAFRWLAHAGL
VFSLISPACHDKDSTPMAAWILQNSSSYTEATMKNTQVSG HYGYDRYGGGCHIIPNHALIHLYGEDDFQRSLMVTVTAGW

UniRef90 G4E1M5 UniRef90 UPI0004677082 UniRef90-A6CVW8 UniRef90 Q6AZR2 UniRef90 G9NC74 UniRef90-F6ZW18 UniRef90-UPIOOO2E94B31 UniRef90- ${ }^{-} 1 \mathrm{BWD} 1$ UniRef90_L8P9T0 UniRef90-V8NW44 UniRef90-UPI0004648DBA UniRef90 R5A2N2 UniRef90-S4RWG9 UniRef90-R61T01 UniRef90- Nocyol UniRef90 S2K3H3 UniRef90-A8NEQ5 UniRef90-H1Q994 UniRef90 G0SG22 UniRef90-A8.A938 UniRef90-U9W1S66 UniRef90 UPI0001E89D9A UniRef90-L8HOW2 UniRef90-B7RRF6 UniRef90 V9LTR1 UniRef90-UPIO00381BD1C UniRef90-F9FCYO UniRef90- D6BB04 UniRef90 UPI00047693E3 UniRef90-003443 UniRef90-F7CUX3 UniRef90 Q6ADS8 UniRef90- X3JRU3 UniRef90-D6KAM9 UniRef90_G9RPIO UniRef90 A9KRK5 UniRef90-UPIO004711412 UniRef90-Q82827 UniRef90-A8L2V4 UniRef90 R7M9Y5 UniRef90-G1Vow9 UniRef90-UPIo0037CB55D UniRef90 D2W013 UniRef90_UPIOOO3592DE5 UniRef90-R5F628 UniRef90-D2AWZ2 UniRef90 E8WNN4 UniRef90_UPIOOO42C6070 UniRef90_COOIG1 RiRef90 V WVJc UniRee90 UPI0003FAC8C9 UniRef90-C1BK92 UniRef90 G8QOI1 UniRef90 L8JFB8 UniRef90-I0V1R5 UniRef90-E4RNS1 UniRef90 UPI0003A64B9B UniRef90-G3PRJ6 UniRef90-UPIOOO41B6D81 UniRef90- D1BFT9 UniRef90- UPIO003837576 UniRef90_UPIO00248CF2A UniRef90-UPIO002653714 UniRef90 G2PCN5 UniRef90-UPI00037306D1 UniRef90-J2X1C4 UniRef90 R9N161 UniRef90 K6ZCS5 UniRef90-W6M097 UniRef90-UPIOOO45E6188 UniRef90 V4BRD3 UniRef90-E4UWH7 UniRef90-IOUSS2 UniRef90_B5G766 UniRet90-Q9RT11 UniRef90_P100036 UniRef90-UPIO0035A18E UniRef90- N1ZVI1 UniRef90-R7ZTF7 UniRef90_D3E7U8 UniRef90 UPIOO0475D980 UniRef90-O31GW9 UniRef90 UPIO0047109EC UniRef90- UPIO00332F8E6 UniRef90-1012V4 UniRef90-B4D602 UniRef90 Q6LPH8 UniRef90-A5UVE2

250
D S D TVVGA\||AGG|L|A VLNGMTP P PELV|SR|L|D

 DTDCNSGNVGCLVATMLLGLSAFPYDWRGPLADR


D S D S $\square$ A C $\square$ A G A F A G A W $L$ G A D A WP T E WA D R $\square E$ Y R G D L
D T D SAGATVGGVVGALQGVEGПGQRWTRPLDGHDATSLPG


D A K T
 DTDCNAGNVGTIVGVMGGIEAIPMHYRKPIND DT DTTAAMVGAIMGAMHGTSWMPKHWYDNLENGDRDYCDR DTET $\square G A \square S G A M A G A C \square G C S G F P V E K V E Q V R R A N P \square A \square E Q$
$D \square D T T C A \square A G G \square I A A R T G \boxtimes A D L P P A W$
$D\|D T T C A\| V G G \square L$
DVDTVATIALDAASSCSAEYQDLPPALLAGLENYGRDHLAG CSAARSCGVGA WVAA QYGSQCLPSNWISRTLDRGREVLE
 DTDTVATMVGAI S GAFHGVEAFPADYLTTLDRMNHFDLAE

DS DCTAASAGSILGAVLGKSAIAPELYECFHDRMDTYLK
DTECTCATAASI YG IMMIGYQAI DEKLKNAI

 D T D T I T T I N S S I AAEA Y Y K L $P \vee D R B A C C G A L L G A T Y G E K A F P E E W K K V L Q$

## D S N S N A CVA GAVLGAVRGYS LLTPLWLTDLRKRQVTWLNK

 DSDCNPSNALAMVLGDIKGFSAFPQEYREAIEK
D T D C N A G N VGCLS G L M L G LD G $\square E P D W R G P \square A D R \square$
D T DCNAGNVGS L LGVFK G $\square E G \square E Q K W L D P \prod R D$ $D S C G R G I L V G A L A G A C Y G F G G I P \square S W V T T L Q D \quad G E A L A E$
D T A A R A M I I G M L L A D Q G L K N LP D NLID GFNRA G EELK E


DTDTVAAVAGALLGACHGARAFPDAEVATLERVNHLSLRT DSSATGLISGCLFGLLHGLSAAPTGLHQDLDRREK LGD



DFDS $\square G \mathrm{~V}$ V S GVI LGAMYGHKYINDEELEVLTETNK\|PFQN DNCHRGAVLGAMLGAALGLRAIPERWIQ GLQAHAALE
$D T D S A G A T V G S V V G G L L G A E A M G Q R W T A P L D G R D A T S D P G$ $D S N S N A C L A G A V L G C K L G F T H L P S T Y \square T E L R Y K Q T A W L N \square$

DSDT $\square A A D G G C L Y$ G A F W G Y E T L
$D \square D$ T T C A V VGGIVAAS P S GVPPRAWHRQTEP
D S D TVACVVGALCGAR
D M D T TCAI A G GVIA S RTG GD G L P P A WR A A L E P
$D T D C N G A T V G S G M G A K L G A S K L P A S W D E P L H D T L Y A D L$
D T DCNAGN\GCFNG\|RLGLEGL
$D C D N Q A A T L G G L L G V I H G G A A D P E R F T H N L P S R G R$
$D T D C N A G N V G T V L G V Y G G L A G I P E H Y R K P I N D$

DTDCNAGNVGC $\square$ NG $\square R \square G \square E G \square$
$D \boxtimes D C N A G L V G T V L G \square L Y G A \quad P E K W A A P L R G K E R \square S \square R A$
$D T C G R G \square L I G A L A G A C Y G F G G \square P \square S W L T T L Q \quad S G E A L A E$ $D T D C N A G N V G C L L G D K N G L A G I D P D W R G P V A D R L Y L$

EA DK【Y A TIA
LGEKLYHLATM

niRef90 G9NC74
UniRef90-F6ZW18
UniRef90-UPIO002E94B31
UniRef90 X1BWD1
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LWA A A GDALGW $\square$ TEGKGR $\square$ T APVDWQRT
 NSDIEKTVINSALWAAAGDALGWDTEGNSRVAQTVSWER


$L I E N Y V A A M V L S A V G D T L G Y Y W E F \square R N G Q E D H R Q V$
REAYRAAMVLSGAGDALGYRWEYCTSGPQIHQELQE
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FTDRDRGGWLAQLVGAAAGTALEGYSAENDAEAFGPD
PSLAERUEASCVLTAVGDADGYRWEFNFSGERDHKELKD
$\begin{gathered}\square Q D R A A G A G M A G A L I G D A \\ \square \\ \square\end{gathered}$

YEETVYAGVLGK\IGVYLGRPVEGWPYQR\|DDEFGED MHDPHLHTLLSLTAADALGAATEFKTPEVIRAHSGEF A RDSLHGLSVGDALGSQF F VPGRQ $\square L G G W T G R V A G C L L G K P L E F W K R E E M V K K Y N V V$ RARAALLGSFVADAATSSLHWIYNRNTLREEPEF $P G L G D R \square H A A W L G R A A G C L L G K P V E K L E L S A I V E L A R A T$
 EFTPVRDNRHQEGLR NRVYA GVLGK LIGVYLGRPFENWRYKD LLEKLGPI ENYVASMVLSALGDTLGYKWEFQLSGPVIHR

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

HAAWLGRAAGCLLGKPVEKLEDPA $\square R A D W F T A$ QDKFHGAWLGRSAGCALGKPLEFEGAGQWPDRHYTP MEECDAGSLVGLAVGDALGAPVEGRSGDEVAEEGGVE $F D E K \square Y A G W L A K I V G D R D G A P V E G W T Y D R D R N D F G E V$ ALLARYGNALTGLAAGDAWGYQVEFTSYTQMPAYPVT QMEKCKGAMLATAIGDALGWPNEPRSKNRAKKSKVMD EQRYKASMVLSGVGDALGYDWEFEKDGMLIHEEVQK ERFEAAWLGRAAGCLLGKPVEKLPDAGIRQ LABRA $S Q \square D$ $R A E G V L L T Q A C G D A L G V P W E L G H R P A D G G C G S R P$
$R V L N A W T G R A A G N L L G K P V E I D R E G D R E R W P W N$ PD DS QRKVCA LIGATVGDAACRPLHWIYNQETLDNGLGD

QNRAMGA MGSLI GDALGVPHWYYDLDQLKKDYGEW G FGA GD GSRYEAN P
$T \square R D R A A G A V M G A F V G E A L G G P H W Y Y D D D E M R R D F G P W$
LE HYKAAMVLS GAGDALGYRNELWEFNMSGPA TRSERAHAVLLACADGDAAGDPTRGMAPDEDESTYGPP

K ENDKPAMLLSAFGDACGYKWEFKSPSRIYEHYEYL SKKERAKGALMGAF IGEALGDPHWYYDLEEMRQEYGEW

RRSLDGTSVGDAFGM
$\square Q D R G L G A F Y G L A L G D A L G M P T Q S L P R A L I L Q R Y G R Q$ TRSERAQAVLLACAIGDAAGLPTRGMSPDEI ERTYGPW

RDYA GVLGKLI GVY LGRPFENWTYA QURDRDGPD $\square E K N A K G \square M M G L A D G D A V G W P A M F Q R R R E D A E K Y N I I$

DHYTTGMMLLSAAGDALGYRWEYNQSGPADHQELQE

 DR $\square Y G C D I G S A L G D T I G D Y T E F L T K A E S A R W Y A S R$ RLHAAWLGRAAGCLLGKPVEKLPLDGVRALARAT MDEKYCACMVLSGVGDAIGYRWEFERNPKQILKEYNH LLRGRLHAAWLGRAAGCVLGKPVEKVTLEGDRADTGNW K DRVQGALWGLLAGDALASPTHWYYRQGIRDYTKPV DKCKGAWLGQMI GVTYGDKYEFRSNG



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UniRef90 $\mathrm{Q2CH}$ UniRef90-Q2CHA7 UniRef90-D5V1W0 UniReffo-F3NNP7 UniRef90-X6NK26 UniRef90_UPI000366385E UniRef90-A0A015MPW2 UniRef90-A0FL48 UniRef90- M7С300 UniRef90_UPIo00442083A UniRef90-D5X755 UniRef90_UPI0004027F05 UniRef90-R7WNB3 UniRef90-W4B3Y4 UniRef90-A0A024KH87 UniRef90-D2VF74 UniRef90-UP100036E9CC8 UniRef90-D7DK12 UniRef90-R6R140 UniRef90-T1L1C1 UniRef90-UPI0003B50B1A UniRef90-A0A016QPW4 UniRef90-C4RGRO UniRef90-J7L9A7 UniRef90_G5IC92 UniRef90-D8U8L1 UniRef90-D6AVY6 UniRef90-UPIOOO3FFBF25 UniRef90-E5SDU6 UniRef90-E1ZLT7 UniRef90-Q11JD1 UniRef90-U3JFM2 UniRef90 EE1Z439 UniRef90-E2Q163 UniRef90-T1ERL9 UniRef90-H3BFH5 UniRef90-D8THJ3 UniRef90-D3EH46 UniRef90_L8GXF3 UniRef90-F9TGO3 UniRef90-COCRK9
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G N WPLA GYFRYPWNRRSDDLNYPLLGLLVLRRHGRFTTAD QDMLEEDKCGEFVMKFSSDSAMTRSVAESLIEKQDLDGVD


AQKGGLGNTSTAGWKVSDDTVMHLATAEALVAAGKQPYSL $M G G L S K I R V A L P D W P V S D D T V L H L A T A E A L A T G G E P L F Q E$ RPKPGRYHEGVEPGQPSQSGILLEMTDRSSVECGGYDEAD KPPADTFGRCNEAGMCTDDFLQAKYIMDALLAHGRQVSDK YPVPAPAGEWUVSDDTQMTLALHDALTDVDDLTDDD $\square E L W F R G A D A W P \square T G Y T D D D R Y T V L G L D L L E Q K G N W D S W D$
$R D Y V R$
 ØPQVLMAKQGWPFGGVSDDTLLS LTMKSLNQETPNLAAA $\begin{array}{ll}\text { TPKPDRYHGGMSAGQLSQAGLIVFVMLLRSSVVEQEDYQEDD } \\ \text { TDYPVDYREFAAD } & \text { DDSNGPLFFLKALEDGRHQDVAE }\end{array}$ MTRAVAQSLVAHKGFNATD SYYKH QECNVPLIVADDDDSGTFSFFRADADTNSENHAD TDYQPGSVFGFAPGEATDDSQMTVATLLG YGRGGGLEG PADLAA GRFPPPPWQWTDDTEMACSVVAELVGAGEDDRDR GGSIPDRDPPWGPWRWSDDTEMAASVYAEVVRGQGVDPDR TGTPLNNQPWDDYAPVDDDTNYTVLNLKVMEFGYDFDPGD
$F D P P S C P F Y T C E V G D L S P Y G Q E L V P L V K F L A A T G S C E P Q A$ GNPPSCPGYTCEVGDLSPYGQELLPLVKFLAATGSCEPQA $\square K T K D F P L F S D G C R F T D D T V M T C A V A E G I M N G G G A D D$ VEECFSVVGPKERLKYTDDTAMARVVAATVVDKNYFDAKA TYYVHD RLGGPLVVTDDDVAGTFTVPRALDDYGDSPDED $A E M G G D G N F S D Q G W R V S D D T V M H L A T A E A L V A A G K N P Y S V$
$T$ $T T Y Q V H Y H E G M A A G E N T L N A L C A R L V T R G M A R R G G Y S Q E G$
$D G L T D L V P V H G R R G A V T A A T Q L T L F T V D G L I R G A W H P P T D$ MGGIA ALDVRKPKWDI SDDTVMHLATAEALVEYWKSGDND TTQELEGAFQTLWGCVPDETLMHMATAEALVSGWES LHTF RGLDPDDAARHPWNRRSDDLNYPLLNVLLLQRYGGFRTAD GDSTAEAEYGDEDARWSDDVRYTVLGLLMLEERGDFNSWD $\begin{array}{ll}\text { CGWDYRPNMYGVQGDYTDDTQYCLCGLQS } \\ \text { DPTFYFAHANKSAGEPSQYGAQLYAMLDS } & \text { FETGHFDPQR } \\ \text { K RKGRFDLN D }\end{array}$ TDYLVDYHEFAAD DDSNGPIFLVRALEDSGH円TADD DF VGWDRPPAGQWWTDSDDT QMTLAL HWALAEDDEAVT DA DGGURSSNNPWWHYSDDTQLTLAVARSII AGDWETF TGGLE $\square S$ KDADDFPVSDDTVMHLATADALVKVGEGEGAS $T G N W P L S T W F T A R G V P G D L A A A H P W N R R S A A T C L A E N D D G$
$G E M Q G G G L G P Y S P G E W S D D T Q M A V I I A R V A A T G A D L D T S D A$ GEMQGGGLGPYSPGEWSDDTQMAVIIARVAATGADLTSDA EKTPEFWPYTI PLGGHRSCYNEEALTTMAAITTKNGVIDDKK KPKKNRYHAGLEAGENSQTGQVVTILLESVFDCGEYRESD $\square K T K H F P D F S N G C R F T D D T V M T C A V A E G I M N G G S A D D$ $D P R P D R Y H A G L K A G Q L S Q A G Y I L K L L L R S L V A C G G Y D E A D$
$K E L L K N D R V E L D D W P V S D D T V L H L A T A E G L A T G G E E L L H E ~$ PTWWDRDHPTKPGVPEGTDTEVTREDLAAAST LLGDEAGA REMDLPG PVALDTDDTQMALAVARAADQGPERFEPP GGYKNLK K $\square$ NKKDWRLSDDT I MHIIATA $\square$ AIITRPTNTDNES EPKSDRYHAGLEAGQUSQAGULLKMMAEHLDENDGYAQDA PELLVSRTLPAATWRWSDDTHMTLSVVENLAMHGRDDQDS
 HHYVH ARGGDPLVVIDDDVSGTFAFVRADDELATWWNHVV RPSVPFSDNRPPQKFPGDDTEWVSFTAKMII E EGKCDRGF WRYMAGGRFELPAGCYSDDTQLRLATSRAIVRDGTFDVEA LGGGLKNDKVELPDWPVSDDTVLHTAEALATAKDGEELLHE GVLEPAGTDGPDTRQLLFHTEGLMRGLPAGFSGPGGLMAM GNWPLSTWFWNRRSAPTS LAENIDGMPEDDDLDYPLLNLL TEMVASDFWKQPAGSWSDDTSMSDGLDENDVSGG DYDD RRMIVGASVELCSGCYSDDTQLRLSTSRAI NKYGFFDVEA RQLTEPDTESHPDGHRDRDGVWDDQGLLALNRHMCGLGA GNWP LAT WFTEHDGMPEDDDLNHPLLTLLLLQRHGRAFTT LGGYQNDKVDHSNWRVSDDTVMHLATAGAITRDNADDFEK PLHTWFTAAGLDPAVAAAHPWNRRSAATSLAENDDGAPED HGGVYGPLISIPCGAYSDDTQLRDSTSRAINHNNYFDVNA AEMQFHYHGTLAAGENTDEAQLSRLLVRTIAARGGVDDAA DS LDEWSSEALERAFAQDDLYVEMTFLESUEKHGDNDSFA $G N W P L S T W F T A R D G M P E D D D L N Y P L L N L L L L Q R H G F T T A D$
$P L T T W F T A R G V P P E L L A A H P W N R R S A A T S L A E N D D G M P E D$


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WREGGCK
FAKDEVTAWQGYADGAGNDSKRGTNWFSNFFRSDRQSYVN IAEKYKACMRDMVGRAPGMTCCNSVHDLUPNRSKWEFNER IGETWRNYLVEERAILWWGGAGNSTEHTAWLNLDKGDKAP FAK\ELTVWLNYALGGGNLTKRSVNWFSNFFVNEKQNYFR FCKKLDEDTHGPGGYTSQSTREVYRQRVEQKLPWDKVGSR LARSFAV HHDFDRGYGPAVNRLLRLVREGGDWREFNGQG VAEEYNTWWQTDPDDQGSTFFKGLNKMRENAYLKNEEDKE VARAWLNYAREGVGMFWWGGYGVSTEHTAYINLPAPQSGS TAKHYKDCMDDMAGRSPGSTCVQNAQPDKPDGWRIDP NKN LLARRYVEAMKDMEGRKPGPTSILGGSQLHPGEPGGPFNPN FCRRLDTEMNGPGGYTSQS TRDAWRNRVQEGLAWGSFGSD AMREFQRWYPFYANFTGPTTRAAMKAIFDDNRTIINGGNA ITSRFLEWQTDPDNDPGTTCMASLSALRSGARWYDANGRE IGKLWHGHLTYSQVCTAETQEKPADWPLRQERVRMHLNPY DIA ERWTSMDPMGWSAEQVALNNARRGVLPPLTGVIDNPF VQEYVACWKDMGDRSPGKKCRDSINYIKQTRKNKWDYDSR FFLERFPQLDNGTPAFGPGGYTNQSGRETYRQNKPWSETGGH ALLNYAPFEHGFFWWGGYGNLRNGIPAPRSGSIEQNGSAT LIAKRFAQDFFENPKRGYGERVTEVFAABHDEEYADPFGPG FGNAWLNY IIEDKTVLWWGGPGRSTEHTAYLNLKRGVQAP
VLAALRDWLDAGPPDVGGLTRSALRSGTLDGRAWAASGFQ LALAFAHRCEPYRGYGPGAVTILRLIRTGTPWPVAFDGQG VLYA WLN WLPAGCCTAERVAYKNAGEGFSAPTTATFQNPF WARLWLDELPGRTFTAERAAYRNLLSGDEGPDTARRRNPF FIDAMKKYGRMYPNAGYGGRFRRWLASDSREPDG
MAKGFVETYFSEKCNRGYGGRDSDFDDVFLPAEFQFDAKG CTQAYVEQRRLVPHTYGRDAKNAFNADERGTADCRARPDG $\Pi$ GKA WLNY IIEERSILWWGGAGNSTEHTAWLNDKRGDPAP LARNYKECMNDMEGRAPGSMGTAKLEPGRPDGWRIPFSPR FLQDYVAFMTTPGSHNDTYAESYHRDFFKNWAAGVPPEKC
VHRAYGRWAATQRDWGPDERRKDNGWLAQEEWLYAPKNPT LKKLYQTVAKYYLRCMNDMNDRAPGNTCMFDGYIDPYDSG YREAAKKYLMALDRYHNRQQDLGKIGEKFWGLFSDKCDGH VARLWLDQLPGRTFTAERVAYRNLLSGDEPPDTARHHNPF VGKLWHRHLSFGQVFTAEAQSY LNFWEKHDHWGRSY LNPY TTEVFSRLRMSKGSVTGGQSGRKADTRMVNGEDWHATGQF VGEALQNYAPFEHGFFWWGGYGVATEHPRSGSISQNGEMM DTRQFLDWQVDPDNTPGRTCMTSAHNDRAGACWYETHEAE GPVLYGALVEKYIVSMTDMGGRAAGDTCMNSVARHPFNKR MADLLARLWLEELPAGRTFTAERVAYRNIDEPPRTARHRNPF VADGFIDWYESAASDDGAQTRAVLGAVAHHRDYHKTSGGR VAQAWLSDDPAGRFTAERVAYRNL LDGVPPERAARVRNPF ICENFKRNAFPGAVEGPWIAGGVVIKFLENYELYAECFSGD
FTNRLLDGTPQSGRYD FTNRLLDGTPQSGRYTDKAMRDVWNARQKKGLGWPEAGS FCRRLDEELCGPGGYTSQSDREDWRQRVELKDPWGRTGGH VAARYIEGMKDMDGRAPGDWGVSQLKPGEEGGYRVPYNVR TIRERADTAPMGWRQLVRAIPVGIATSTADPEAFGQAVWE ICKELAKAYIHSMEDMAGRMTQTGMRSKVYQWNEDDFSDR FCKMMDQDFGEAMAGPGGYTSQSMRHLWRARVEKELP WDQ LIAAFARRYAEDPHRAYGLGVRKLLEQVGSRPWQAVFANG LAHSLIEWKAKGSYDLLGPSTKRALEMLLDGHSPEEAGRF I RDRADTAPMGWRQLVRADPVGIATSTADPEAFSRAVWEA IEKKSVFWWGGNGDSTEHTAFLNLRRPPRSGSASVNGRTV VINKWKNLMENKDMVKGSMSVMGALTNDERGKYPGHDNPH FAKDELTIWPTYSLGGGRGTKQAVNWFTNFFNQRRGNYDK VAFRYVEGMKDMEGRKPGPSSILGISQLRPGTEGGPYNPE ITPQYAPYEHGFFWWGGYGNLRHGITAPRSGSARQNGRTA GALSVQRWQDAQRGEYDG WLSQVPEDRVPGEAGPS LLQRYRLWLDDELPAGRTFTAYRNLLQGVEPPATATRHNPF FAKFELTVWQSYALGAGRGTKAATQSLTQKNRNWFNNFYN

ADLARLWLDELDAGRTFTAERDAYGHVEPPETARRRNPF TCQEMATAYVRCMEDMGGSKMTPGMKSKLLKWNEDPYAPA DDLNYPLLALLLLDRHGHAFYRNLLDGVEPPHTGAYRNPF FSKNE FRDAYVAWMTTPGSHYASTCHRMFFANYAHGKRDPADCPD QAGKAFADSKYPLWHANKAGRENVRKG\|MPPLSGHPFNPH VAGLWLDELPGRAFTAERVAFRNLLGGVEPPLTARHRNPF VALA WLNDLPAGRFTAERVAYRNLLDGVDPLRAALVRNPF

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MKENVVQTAEDVCKLMHYDSR
REWПGALDRADVHGWTNPGDPAAAAAQAHRDATLTHTANG SYGNGGAMKDAPVSLYCYNNYDNLLHYVKEVTQUTHAHELD AAPNGSVMRTSVLAIPYFWDEEKVKENSKKIGSTTHADPR GGGCGAAMRAMCDGLRYPREEDDLLAVSUESGRMTHHHPT ASGIGAQDFTDGWALVSPGNPEQAARLARAAGSVSHDGE SGGNGAAMRIQPHVWCTFNYNDDFILNVLKDSLVTHGHPH ADTTEGDERTLALAVLYADNTKELAKSUSHNTFLTQVDDU SWGNGAAMRIAPLGAWYADDPEQATHQAEDSAYPTHQHRE GTGNGAAMYVAPIGVVNACDPRAAYDEAIAFASGHQ DAQNGKVIAEQDGQIFDDTWPKKAADFGEAAARVSHDGE ANGNGALMRLLAPLADALYTESRFVTRAYRAYTQMTHRHPR EGGCGAAMRSMCI GFCHPEQLDSLIQVSDESGRMTHHHPT ATGCGAAMRSMCI GLRYPHPSDLNIQVSIESGRMTHHHPT VDNTEAAERDDA IAVRYADNPAKLAWAVTANTALTQTNSN
 REWIGAALRADALAYGAAGHPQLAAELGWRDASFSHGDYG DEWUGGQMRGTDCGMVAPGNAREAARLAYLDAQDSAAGNG GENGAIMRTALCGLYLKDNRNEWIKALVEVTVHKSPK ADTTEAAERTIVLAALYAKHPLKLAQSVSSNCULTQCDEA SYGNGAAMRIAPVALYGDNDSDDKFEMVDNCSRITHTNVK ESGDGAQDFMDAIAMACPSDPEKAVDLVRKAASVSH DGD SAGNGGLMR AAVWVAGF TGEALAREAAAVTALTHTDPR SCGNGAAMRVGPLGAWFADSTRHAAAQARACAEITHAHPE SWGNGAAMRVAPLGAYFADDLERVVEQARVSARVTHTHPE REWVGAQDRAEVFGWVNPGNPEAAAEAAYRDACVSHTRNG LDSQANCFVKSPAVVALFGGVGDGGVALRTAVDVQQNNDT SFGNGAAMRVSPCGWMMDCGFMARRQLAERS IAVTHDHPE SYGNGGAMRVAPVALYFSNDLEAALHMS SWGNGSVMRIAPVGLAYRNAPADVLRWAVADAVMCHVHPE ASG\|GAQIFIDGWALISPGNPAQAAKLARAAGSVSH DGE AGGCGAAMRAMCTGFYRPEQLDTLLRVSVESGRMTHHHPT AGEEGHNTASDGLGAMRQGAEASAAAARRHLALTHQSQALD GGGCGAAMRSMCDGMYFPDQZDRVAVAVECGRMTHNHPT SAKFGTAARSMCIGMCYPEQLNDLLQASIECGRMTNSYPT DDFQANCFAKASLLVARYAGKPELREKMEAAVRVQQNNDQ REWIGAQURVDGYAYGAAGQPQLAAEDAWRDASFSHVKNG TAGNGAAMRVGPLGAFYYADTD
SR CGADDQQLPAVSKLPPYIGDHKAHDEQAVRVTNNKDS AEQUGGQ\|FIDTWGLVTPGNPDLAAQYAAAAASVTH DGN SAGCGAVMRLVPTAFA PQQYLLGLTALQAVITHKHPR AGGNGAVMRILPHVIASA
GGGCGAAMRAMCIGLRFPDPEQEHTAVSVESGRLTHHHPT REWIGGLIRADVHGWTNPGDPGAAAEQAYRDAALTHTGSG SAGNGALMRNGVDGLTRDRDPRATALAARAVAALTHADPG RWWDGAQURTDVYGWIHPGDRTAAARLALTDARLSHTGAG SEGNDAFCAALPIVVK LLSDKDNMWEKSLEVVRLFSTHSD SFGNGSAMRISPCAWMMNCGFTARRELAERSITVTHDDPE ADTTEAAERTLALAVRYACEPARLAAAVAGNCVLTQDDDT GGGCGAAMRSMCIGLRYPKPDQSLVAVAVETGRMTHPHPT ACGGECLTRQEFQATAAAGVSDQVDGTQERLSTRYNRLWE AGGCGGSMRSMCIGFKYWSDEDTLIELSIESGRITHNNPV A $V$ GNASGERNDAQADFYADDEESLSLNITANTALTQSDNL SWGNGAAMRATP GGAYFSDDLSCAAAEALLSATVTHAHPE CGGEGLTRQEFQAAALLAAGVSLQVDGSQERLSTRHNHWK AEQTGAQDFDDGWALASPGNPAQARGAAAAASVSHAGA FFDDAACVVSDPFGIAFAGKPELAAEKTVVDAEVTNSEDG CGGNGGAMRIQPHIWADKSKWDSFLLDVVKNTICTHGHPR ATGCGAAMRSMCDGYPHPNQLSSLVGVAVETGRMTHSHPD GGSDVAFLVPGMVAALCGGGPGADADAAARVASL LAAGGG REWIGAAIRADVHGWTHPGDPAAAAEGAHRDAVLTHTANG GGGNGAAMRIQPHVWATLSNAESFLIDVVKNSDTTHGHPR

NGS MM THP DGVIGIGLSEETWDLAANVGFTTHVDPR REWIGAQIDRADAHGWTHPGDPAGAAAQAHRDAVLTHTGNG GGGCGGAMRAMCDGLKYSSSFDQLLRFSDESGRITHNHPV REWIGAQ\|RADVHGWTHPGDPAGAAAAAHRDAVLTHTLAA SGGNGAAMRIQPWASRTPERVESFLLD IIKNSLTTHGHPR NDRHNSVAAVAAAYGGGPGARAEAVDAAVRVARVTRDSKP ADDTDFQ\ESDLFGDITPGLFKEMQQDAEVFGSIMNYGDG REWI GALI RADVHGWTNPGDPAAAAEQAHRDAVLTHTANG
 REWLGAQURTDVYGWVNPGDRSAAARLALADARLSHTGAG FPRGVMQGACLPGRAPWTLWLLRSQSGRTGSHPS

UniRef90＿L1N810 UniRef90－UPI0003007C82 UniRef90－E2AAU1 UniRef90＿BOEIDO UniRef90 J3CIW0 UniRef90－K1R8Q8 UniRef90－Q2CHA7 UniRef90 ${ }^{-}$A0A059IDG0 UniRef90－D5V1w0 UniRef90－F3NNP7 UniRef90－X6NK26 UniRef90－A0A015MPW2 UniRef90－A0FL48 UniRef90－M7C300 UniRef90－UPIO00442083A UniRef90－D5X755 UniRef90－UPI0004027F05 UniRef90 R7WNB3 UniRef90－W4B3Y4 UniRef90－A0A024KH87 UniRef90 D2VF74 UniRef90 UPI00036E9CC8 UniRef90－D7DK12 UniRef90－R6R140 UniRef90 T1L1C1 UniRee90－UPI0003B50B1A UniRef90－A0A016QPW4 UniRef90＿C4RGRO UniRef90－J7L9A7 UniRef90－G5IC92 UniRef90－D8U8L1 UniRef90－UPI0003FFBF25 UniRef90－E5SDU6 UniRef90－E1ZLT7 UniRef90 Q11JD1 UniRef90－U3JFM2 UniRef90－E1Z439 UniRef90－E2Q163 UniRef90－T1ERL9 UniRef90－H3BFH5 UniRef90－D8THJ3 UniRef90 V6JNF9 UniRef90－D3EH46 UniRef90－L8GXF3 UniRef90＿F9TG03 UniRef90 COCRK9 UniRef90－L2T5P2 UniRef90＿R9JLY UniRef90－A0A022MF89 UniRef90－F9EG08 UniRef90 D2PXX9 UniRee90 UPI00019277CE UniRef90－E1Y8T1 UniRef90－I1W9Z1 UniRef90 D7ADG3 UniRef90－H2T3T7 UniRef90－S2ZBM1 UniRef90－UPI0002626D28 UniRef90 $\mathbf{Q} 54 \mathrm{H} 71$ UniRef90－M5DXQ1 UniRef90－U5QHG2 UniRef90 F3GFD8 UniRef90－J3J419 UniRef90－J3P691 UniRef90－13LM34 UniRef90 B8D1Z4 UniRef90＿B8FA53
UniRef90 O6DBR3 UniRef90－U2C710 UniRef90 UPI00038142FE UniRef90＿UPIO00370C5FC UniRef90－R4PQ24 UniRef90 UPIOOO3700473 UniRef90－Q0U4N1 UniRef90－UPIO004762F17 UniRef90－D3BV31 UniRef90＇UPI00036AB768 UniRef90－A1JTG7 UniRef90－FOYD35 UniRef90 UPI000381AD77 UniRef90－S5USz8 UniRef90－UPIOOO30D5C42 UniRef90 UP10004762987 UniRef90＿W5PEM3

GVWGARFFCAATSKAFETSDHQQHPGDFRACRDRDERDWG AVLGS I I Y LE TL WQLLHGKTLAQALMPDYRRUFARDF DS L GYLGSLASALFTAYAVNRKPPHGW GYLGALASALFTAYAVQGLPLELW
VLTTTTTYGAVLGMLVEGHRFD
AMSGAAAMAAA SEALSTRR $\square E \square A V A \square G K R H \square W E T A \square V E$ A IVPA L L L A D AVRHA
EMFNAAMISAAFAGLSNQE VVQПGDSEDPQTSRLAKDVWN ILLGEVFNAVLAARAFVVSDSKSNACKTSKDWQSAWALCDA GFMGALQSALFASFA』KQDEPK LDW
A ПECAQDAAGLFAG EDFPDYSDW IVAMTTAYNCVLSQLVN
GIYGGDFVAVCISYAFVEFYHEHKEEGWRRGFQYDFEHFG GVNGAKLQCHALREALQPFDSLSYLQKLIAQKMEKIEDGCQ ALDAACYLGAMESMAFEEKCLEKLFDLGMRYCGAVTDWRQ CVAASVFLTAFDEALQAGQPYREAAEAGRVMDR
GI A
AVEGAVAVAVAAALMARHEWWGPGRF口DRVAEALEPGPVR IYGEMFVMALAVQSVLEDYDSGMTYEDSLEKLHKLHDENN AVELAWAAARVLERVITSGDVLANKDVDPRSLMYQEGPDV VYGAMFAAAVI AEAAGGRSDVHGCLDSVERDFDAVVDRLH GVKGGMAVADA乌F LARYWFGGCHGEFEHSDADDPAECKQR
ARLLP LAAATAAMRQRDEADERALARLPAGDDTGSERGRVV AVNAAVLWAAMEAEAFVSKDVDHLLDDWEATRQKDEDNYG GYLGALASALFAAYAVNSVPPQAWGKGLMEVLPRAKAYVQ GNYA QVYSQLLVREAVRSAAKDVGVDLDAALRYGYTDQEV GYLGSLASALFTHYAI QARPMVSWGAGLMEAIDLAWGY GFLGSLCVALFTSYAIQGKPVVQWYRENWFYFETKWQLY L AVAYGMAGALLLEKVVLGQSVSEALSWAVGEGGLQPDMGA VYSAMFVAGTI ARLAVAVRDADGTARAHQDFDTVVDRLHA $\square Y$ GAMFCSAM』AAAFVERDMKRN $\square A E E T E D S L E L V S K \rrbracket W E$
AVQWALALATVMQAVLDGSS $\quad$ RREADELVRSNTTEEDSTQD GI YGGI FVAVCDS WAFVEADMRK』IEKWRECFRYVKENFG $A \vee V P A L L L A D A T R H A P E Y C G$

AHDVHACLATGLRVVPPGSRDARAVRHAVRDAGAHADFDT AADSCVIQAEMIRANVAGPAW
$V D G A L W V A A M S A A A M V L D D P R Q V A L S G L E A V A A D S E D A R A$ SLKFVEASACLVQAFI QGVNDPIAEAKKN■HADLDKPF $\square P$ ITGQSAAFGLII SCLIDGSNPEH
GVRGGMAVADAI FLARYYFGPASCRQRDKDH\｜IHEYRYNM VVSMTTAYGAVLGMLVRGHPLD
GFLGAVASALFTAYAVQRRPVTTW
ALHLVVESDKPRGTWSPEPDVVAATRRAMNDAMQVATTPTQ GLAAADLTAHAVHLLLRDYAVQHRETYHERWLGDLDTRAG GFLGA LVSALFASYAI RS DPPKTW
$\frac{\square}{G Q} \mathrm{SLLTVAYSSVLAFLIQQESLD}$
ALHLVES LEPRGTWSPDPDVVAATRRAMNTAMQVATTPTQ AVHA AVLWA A MEAEAVR $\square W N A E L G P R A W E V T R R R \square E K R Y G$ LL LCDQA
LWACDEVLNEA LSSLLPRKSWDRRKVTEALSLVRRRS $\square F A A$ GILGAVFHALSLYSAL
GFLGAVASALFTAYAVQRRPDTTWKTFVQSTRYAVTETER GVYGGI FVAVCDSYAFVEKDWEKEKNGWRLCFQYI FNNFG ADAVAALFGRLFRHGDPLPPHTLLREILRRGPARGPVTDT VYGAMFTAAALAVAAGGAADVHMCLRHGIATAAAHRDFDT SVVAS LIYYLEVLHALHQGQALPAALVSVHEALFSPDFAQT G\｜AGAVFHAAALASLLNGNS
CTVSCCVEVALIRGLLR
$V Y G A M F T A A A L A V A A G G G S D V H G C D A A G L R V V P P R S R Y A R$ GF LIGAYVAALFTSYADQGVAPRQWGRKLMSEGLPAAKQY［L AA GGGAGVHEALRAGLAVVPPRSRLARALRHGMEVDELHA A 1 A GAVFHA LCLLSHLL
LERAAAAVAGVLFDSVHGVGTMADRVDAATDALGMSRVHA LYAGYFIAGMYSACIPPESTYRKCIEDVITSYHQHPDDWL
 $V Y D V H R A L A A G L G V I P P R S R$
$V$
$V$
V EYQEHWFYFEAKWQFYLEERKIIEDTENEASFPDRYDAEE

UniRef90 L1N810 UniRef90 UPI0003007C82 UniRef90－E2AAU1 UniRef90－B0EID0 UniRef90 J3CIW0 UniRef90－K1R8Q8 UniRef90－Q2CHA7 UniRef90－A0A059IDG0 UniRef90－D5V1W0 UniRef90－F3NNP7 UniRef90 X6NK26 UniRef90 UPI000366385E UniRef90 A0A015MPW2 UniRef90－A0FL48 UniRef90－M7C300 UniRef90－UPI000442083A UniRef90－D5X755 UniRef90－UPI0004027F05 UniRef90 R7WNB3 UniRef90－W4B3Y4 UniRef90－A0A024KH87 UniRef90＿D2VF74 UniRef90 UPI00036E9CC8 UniRef90－D7DKI2 UniRef90－R6R140 UniRef90 T1L1C1 UniRef90－UPI0003B50B1A UniRef90－A0A016QPW4 UniRef90＿C4RGR0 UniRef90－J7L9A7 UniRef90－G5IC92 UniRef90－D8U8L1 UniRef90 D6AVY6 UniRef90－UPIO003FFBF25 UniRef90－E5SDU6 UniRef90－E1ZLT7 UniRef90 Q11JD1 UniRef90－U3JFM2 UniRef90－E1Z439 UniRef90 E2Q163 UniRef90 ${ }^{-}$T1ERL9 UniRef90－H3BFH5 UniRef90－D8THJ3 UniRef90 V6JNF9 UniRef90－D3EH46 UniRef90＿L8GXF3 UniRef90－F9TG03 UniRef90 COCRK9 UniRef90＿L2T5P2 UniRef90－R9JLY6 niRef90 B5DG8 UniRef90－A0A022MF89 UniRef90＿F9EG08 UniRef90 D2PXX9 UniRef90 UPIO0019277CE UniRef90－E1Y8T1 UniRef90－I1W9Z1 UniRef90 D7ADG3 UniRef90－H2T3T7 UniRef90－S2ZBM1 UniRef90－UPI0002626D28 UniRef90 Q54H71 UniRef90－M5DXQ1 UniRef90－U5QHG2 UniRef90 F3GFD8 UniRef90－J3J419 UniRef90＿J3P691 UniRef90－I3LM34 UniRef90 B8D1Z4 UniRef90－B8FA53 UniRef90＿Q6DBR3 UniRef90 U2C710 UniRef90－UPI00038142FE UniRef90＿UPI000370C5FC UniRef90 R4PQ24 UniRef90 UPIO003700473 UniRef90－Q0U4N1 UniRef90＿UPI0004762F17 UniRef90 D3BV31 UniRef90 UPI00036AB768 UniRef90－A1JTG7 UniRef90＿FOYD35 UniRef90 UPI000381AD77 UniRef90－S5USZ8 UniRef90＿UPI00030D5C42 UniRef90－UPI0004762987 UniRef90＿W5PEM3
 EHTGFDTVVDRLHALHDATHHWVHDGDFTGSVCRAVSGGW $\square G Y T F K P V G C A \square L S \square R E A F K M K E K G \square D F E E L I E R \square A Y E G G$ EQDFYVKENLEAWDYFEDRW YQHYPGNCHVVPNHA $\square$ M $\square$ MA $L L H A P D D F Q R G Q M \square V N T S G W$

VLGCGRRTTAHDTVPFADWSAARADGDYEAAFWTTAQVGG LDEFREFHSH $\square$ K $\square$ SFQRAFYH $\square$ WK GDSYDVA $\square K E T L I F G G$
 PRSA $\square K$ SSGYVVDTLEAAIWVAGNAPDFKNGMMTAVSLGE
$\square N D \square \square G T G H V S E A \square P A A F G F A C S A A N P V D A \square V S A V N \square G N$ EFSHYDPVHTNNNAA VAASLIYGGDDFEKVVVTSVSAGM E YVEYNWLHVYPNAAAQVVALWFGEGNFDRTLEIICGDGH T P P $\square G G \square S \square D P \square E T \square K A V V W V V K R A N N C A E A F T L A C S \square G G$ YDKYPGNCH\｜IPNDAVM\LALLYGEGDFSDTLNTCNMCGW
 ARAKIDEKYGYDVYPGCCH』VPNHGDNFERSIQUAASAAW

EGVRGASARAVDTVPFALWVVARYRGGFESALWATVAPGG ØFEWCHVIPNEKDIVLSLLYSG GDYSRAI GNCVQFAF QFGPWRAGCGNPGCLVAALLVALQAPDFQAGVRHNLLLGG EEYGAYHWVHVVPNAALVAAALTHSGGFAGAVTRAVSGGW $\square R D Y \square N H E Y G Y N M S L P E A \square C C F L D S D G F E D A \| R N A V S L G G$ SEKMRNGGYWQDRAVDATWAFCRHWGHPPAA VVGAMHQGG Y DKYPG $\quad$ CHVVPNHALMDMALLHAPHDFQRGQMIVNTSGW ESGFFVVKENMEQWYYFEEQWKKY
VHRVYGSACYDTDSFPSVLYAYKHTDSFEEAVLANTNVGG DGDGPAGGSHAGADLAAAVYAALVSEDMRHGLRLAVNHDG
QQRQ DDKKGCNKP DFPANYNDTEKNK DYRRWC DWAMMHEG VWCNGPACGNPAAFTNVAMAAAQYGNSYVDAVRANMLAGG AHGHYHWVHA $\square$ PNAALLAAALTHADGDFTGSI CRAVSGGW AFKHYHPVHTNNNAALCAAALDHSGGDFEKGITTAVLGGW
DDQKTGLHCDLSVAFPVILH LLTSSDYRSAVKTNDYCGG YDRYPGNCHIIPNAAVMVLALLYGEGDFSDTLNDCNMCGW

VVDELHTAHAGYHWVHAAAA $\square$ THADGDFTGS $\square$ CRADS GGW HAEYGH L H WVHAVNNSALTAYALTAPDFATGVGRAVMGGW TVAKFGKACSLPGSFKGAYLCLLSTGSFVDAIRLNITAGG
$\square R$ PDYRFDATCQGS $V$ PEA $\square$ T CF $\square E S T G F E D A \square R N A D S \square G G$
$\square L T E Q F G S S P E P T R M V P \square C F G L S T Y \square A H W L S R Y G \square T R \square G G$ DSSPEQF $\square$ ARGWDECLAALCFLLFPGDPVLALRRAACTSG
$\square L T E Q F G S S P E P T R M V P L C F G \square S T Y \square T H W D S R Y G \square T R \square G G$ YNKHAG】CHVVPNHAVMVLALLAGGHDFSRAMH【VNTCGW $\square \mathrm{P} \quad \mathrm{L} L \mathrm{~A} D \mathrm{R} V \mathrm{~T}$ GS $\square \mathrm{Y}$ S YGTAAPYSKSKEDY $\square K G \square M A A N C \square A R$ DWDYFTEKWKWY LDLRALWAGRSGHDAPMDALDALLGAGS YDKYPGVCHIDPNIAVMILALLYGKGDFSDTINICTMCGW LA A AVRARGELVRADPTMIAVSRRFFDPRWAMQAAVDHSG VVDRLHVAH GAYHWVHAVPNLTHADGDFTGSDCRAVSGGW KAGVIRTSGYVVDTLLAACWLALNYQTPREAVLAAVNFGG

A $\square R F G \square E T A R T V D R \square H A A Y D S T H H W G D F T R S \square G N A V S G G W$ VDSQAQPHRTMELYERGWNYFYTAWESYLRDRQDGVENGG AHEGRHWVHVVPNAALLAAADTHSGGDFTGADCRVVSGGW
GAPDEMDSUYLQQS $\square P S A M A K K Y G G D D V F D A L L V N A N V G G$ ETWKY DEHKWQ\NGAYVVIGLLYGKGDLKKTLEISTRCGQ ARHAATHHWVHPNTALIAAALAHADGDFTGSVCRAVSGGW VVDRLHAELGGYHWVHAAAALTHGDGDFSRSICAAVSGGW HAQYGQLDWVHSVNNSALTA YALTAPDFATGIGGRAVMGGW REKTYRKWSSHDAPM DAYDALLGAKGSWTELCRRAMFHGG

UniRef90 L1N8I0
UniRef90 UPI0003007C82 UniRef90－E2AAU1 UniRef90 BOEIDO UniRef90 J3CIW0 UniRef90－K1R8Q8 UniRef90－Q2CHA7 UniRef90 ${ }^{-}$A0A059IDG0 UniRef90＿D5V1W0 UniRef90－F3NNP7 UniRef90 X6NK26 UniRef90－UPI000366385E UniRef90－A0A015MPW2 UniRef90－A0FL48 UniRef90 M7C300 UniRef90－UPI000442083A UniRef90－D5X755 UniRef90－UPI0004027F05 UniRef90 R7WNB3 UniRef90 ${ }^{-}$W4B3Y4 UniRef90－A0A024KH87 UniRef90 D2VF74 UniRef90 UPI00036E9CC8 UniRef90－D7DKI2 UniRef90－R6R140 UniRef90 T1L1C1 UniRef90－UPI0003B50B1A UniRef90－A0A016QPW4 UniRef90＿C4RGR0 UniRef90 J7L9A7 UniRef90－G5IC92 UniRef90－D8U8L1 UniRef90 D6AVY6 UniRef90－UPI0003FFBF25 UniRef90－E5SDU6 UniRef90－E1ZLT7 UniRef90 Q11JD1 UniRef90－U3JFM2 UniRef90－E1Z439 UniRef90 E2Q163 UniRef90 T1ERL9 UniRef90－H3BFH5 UniRef90－D8THJ3 UniRef90 V6JNF9 UniRef90－D3EH46 UniRef90－L8GXF3 UniRef90－F9TG03 UniRef90 COCRK9 UniRef90＿L2T5P2 UniRef90－R9JLY6 UniRef90 B5DG81 UniRef90－A0A022MF89 UniRef90－F9EG08 UniRef90＿D2PXX9 UniRef90 UPIO0019277CE UniRef90－E1Y8T1 UniRef90－I1W9Z1 UniRef90 D7ADG3 UniRef90－H2T3T7 UniRef90－S2ZBM1 UniRef90－UPI0002626D28 UniRef90 Q54H71 UniRef90－M5DXQ1 UniRef90－U5QHG2 UniRef90 F3GFD8 UniRef90－J3J419 UniRef90＿J3P691 UniRef90－I3LM34 UniRef90 B8D1Z4 UniRef90－B8FA53 UniRef90－Q6DBR3 UniRef90＿U2C710 UniRef90－UPI00038142FE UniRef90＿UPI000370C5FC UniRef90－R4PQ24 UniRef90 UPI0003700473 UniRef90－Q0U4N1 UniRef90－UPIO004762F17 UniRef90 D3BV31
UniRef90 UPI00036AB768 UniRef90－A1JTG7 UniRef90＿F0YD35 UniRef90 UPI000381AD77 UniRef90－S5USZ8 UniRef90＿UPI00030D5C42 UniRef90－UPI0004762987 UniRef90＿W5PEM3

DADTNGAVVGAVLGTY YKG■CMPNDW LDLDNKKWLEE


DVDTTCAVVGGV ASGTRGAPPTAWDDRTEP NADSNCCVVGGLIGAYHGMKPL

D T DCNAGNVGTVLGVACGDDGワADKYRKPワND DTDTVAT $\triangle T A S L L A A A G Q D A V P K S W W Q A I A N R D$

DTETVATMVGA $\square$ SGAFHGAAA $\square$ PADY $\square$ S $\square$ LDRMNHFS $\square E A$
DTDCNGATVGS $\square M G A K L G A A K \square P V K W T A P L N D L L Y A D L$ DVDCNAAQILCVLACQQGSG【IAERWSKPL

DTDCNVGNVAT IMGVRNGLEGTDDKWRKP\｜HD
D T D T $\square$ ASMACAI S GALHGDSKVPP LLDEHCEASDNT $\square K$ DTDCNAGNVGCLNGDRLGDEGIDKK

DMDTTCAVAGVLGAGSSGAPASREWSSRVE
DTDSNAAIVGAVMGTLLGPEGMDEAWTNP
DNCSRALLVGALLAAKGGASSIPTAWASKT RQYDKLALL DTDSNGATAGSVAGLLAGHDALGERWTTPLKNRLSTAVAG DSDTQAAMAASIAQAAYG■DD\｜AKQALSYLPGPLRDVLER
DTDTLASMAGALAGAQHSCWWVP $\square C W W S A L D R S V P E A L A E$ DTDCNAGNLGCLYGDMLGLDGLDPDWRGPVADRLY
 ASTVGAVGALGALHGEALPPALCELGRPG
 DNCSRSLLIGALLAAEGGMSCLPREWTSQQVPKWAQYEV DTDCNGATVGSILGASLGAAALPEKWDSPLNDTLYADV

DSCGRAIIIGA IM AVTDSSDПPAEWVAK
DTDCNVGNIAT\｜MGVRNGLGG\｜DRKWREP $\square$ HD

DTDSNGATAGSVAGLLAGSAADPDRWTAPLKNRLATTVAD DTDSVGATVGAVLGAVLG VPAEWAGPLDNRNQVA TDE CNCSRGNLIGAAFGAKFGDDGIPVEWLNKVDN IEN DS DTQAA $\square$ A AS $\square$ A QAAYG $\square \mathrm{DS} \square$ AEQA $\square S Y \square P M P \square R D V L T R$

DTS SMSA $\square V G A \square C G E A K G H H E \square R R G S W M Q V E E V N D L D L T S$ DSDS $\square$ AA L AGAFAGACHGAGAWPPEWVARLEHRDEL

D T S $\square$ MS A LVGA LCGEAKGHHELRRGSWMQVEEVNDLDLTS DTDCNS GNVGCLVAVMHGLEGLDQDWRGPLADR

T A D S VP A LVGA L S T G L A G GEN $\square$ P D S W $\square$ N S $\square$ NK K $\square$ K T D Y $\square E$
DSDSTAVIACCCWGLDHG\DEVP LYNYKNLEYRDRLE
S
DTDCNVGNVAA TMGVRGGLNVI DSRWRQPVHD
RSA $\square$ T GA $\square$ AGAVVGARAGIPGLPPEWLGRLEAADLVE
DTDSNGATAGSLAGLLAGRDRLPERWTAPLRNRLATTV
DTD

DSD
DTDSNGATAGSVAGLLAGSEA $\square P R R W T A P L R N R L A T T V G G$
ENVHRGAVLGALLGANKGRSRLPPRLVDGL AATSEDAA DADCNPSSAAGILCCMKGFSALEPLWKEHLPKVSD DTDSDGATAGSVAGLLAGPGALPDRWRTPLKNRLATSVAG

ESGATGA IAGCLFGLLDGLDAVPVGLYRALEH QEEWRR

UniRef90 L1N810
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UniRef90-E2AAU1
UniRef90-B0EID0
R L N R L L H L Y Q L
UniRef90_J3CIW0
UniRef90-K1R8Q8
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| sol25 | B B B B B |
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    HFDA RDYVNVT
    H HSD
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    KHCMGSPDRSEVWAMIAPGLPDVAAEYAFKDADVDHGGGE TAGNGALMRNALDGTRGGDPLATASARAVAELTHADPG IVNCGATMYAAPIGAANAGSADSAYAEADDVAGAHOSSYG SWGNGAPMRVSAVGWLAADETEA DDVABAAVTHNHDD SFGNGSAMRVSPCAWLMTGMTPSTRKLARLSAEVTHNHLE SKGCGANMRVQSVALLNAD PDTRAGIAMLQAALTHGHPT GSGFGAASKAMCVGMWQPERLDSLVEVSIEAGRMTHNHPT AAGSGSAMRAGPVGLIFFHDDPETLVRAALEQGLITHADTR
    GSGFGAATKAMCLGMWKPERGETLIEVSLEVGRMTHNHPT DFGNGAAMAVAPVALMHALNAEVFTREVLRAGLITT GDFAGSAMRVSPCAWVMGMWPSNGREEARLSAEVTHNHPE GGGCGAAMRAVP GLLYGDQLNDLAAVSRAQARMTHDDPN GTTCGAAMRVAPALSVEKGNKEKLKEAIRACSDPTHNTND AQGDACLIARVAPVVMYFTDSRETMLDACVNSTATTHSSRQ GSGFGAATKAMCIGMWKPERLETLIEVSIECGRMTHNHPT SWGNGSAMEVDPAGLMSPGMPNAVLAEAKRSAMPTHGHPD HMSDGTAMRIPPVGDICAGDPKRAALMAEVDASTSHSEDG SWGNGSAMRVSYVGEYY YDDFDПMQAKAAETAAVSHNDDE SKGCGANMRVAPLGLVREDTERQVAGAAQLQSGLTHGHPT TAGNGSLMRTAPVALAYLGDAEACAEAAFGLSSLTHADPE
    SKGCGAAMRAMCIGLRFPYPCDTLIQVSIESGRMT
    

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