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 VT LGTGFSNPNGVAVDSSGKIVVSDPGNADKRMD GSEDGQF $\square N P N G I A V D S A G N V Y V S D G G N Y G E F D E$

WF F F P N S VAAD D S G NFYVAD TSSHGVLLE



GDAEDNLCRPWGTACDREGHVVIADRSNNRQVYH GNGDGQFSSPYGLAVGPDGSIVVTDSGNDGVFLA GS GDGQFNQPSGVALDSAGNVYVTDQNNR\｜QKFN GRE $\square$ KTFSGHTDYVK SVA ISPDGRYIVSSWDNTIKLWD

GSEPGSFTWPRGLAVGPDNSIVVADSSNHVQVFD GKFGSNGNK $\square$ GQ Q EHPHYIAVSNTNRVIVSDCNNHGRV $\square$ S $\square$ TRFTPPTAGSAP $\square G \| A A G P D G N V W F T E S G T$ GRIAR

GETDHTDT GHTSPV WGVAYSPDGTR\ATASGNTARワWD



GKFKTKD GAGRDMGPKGVAVDRNGHIIVVDNKSNGKLVT 1 TPI HTDTEELKGPCGVAMSDDNHVIIVTENSSHVTILD GSELRQLSGHGNPVN SVAFSPDGKI LASGSDNTVRLWN GQLLQTLTGHSSSV WGVAFSPDGQTIAASDDKTVKLWN FGKEGSGDGELCRPWGI CVDQRGRVIVADRSNNRQIFD
 GKC【KTCTGHTNEV CSVAFSPDGKTLVTSSGDHLKVWD GQCLK T WY GNTD WALPRSVAFSSDGKLLASGSDRTVRDWT PFRGHKGFV HSVAFSPDGQY $\square V$ SGGGNTVR $\square$ WD GTGEGQFM $\square P T G V A A D S G D N D Y V D F N N R V Q K F N$ GQAVQKTSLKTFLEGPRGGAFDAAGNLYVANASE RKIMK GPDGRLYVSSSGNDワQVDG GNLLDTFRGHEDAVNAVAFNPDGKRIVSSDDNTLKLWD QGTADGRFNYPWGVTTDADGF IYVCDKENHVQVFQ

 GTTGSPGSGNNRFDTPQGVAVDAN Y IVYVADTENHRVVAT SITPVRSDTELEYPWGVAVSDDNHVII TSYGHCVTI LDD GECLQMLS GHEAQVS SIAFSPDDRMLASCSGDRIKLWD $R$ S V A F G S D S S TVLVSASS Q IV R L


QQ LLKMDGHNSAV YSVCFSPDGATLASSDDNSTRLWD


WS 1 AFSPDGEKVVSSSDDHTVKDT $\square T P V R T \square T G G K C P W E V A V T D D N H V V V D E Y G G H V T I M D$ LTLTGHQGWV CSVAFSPDGKYLASGSSDYIKLWD

FDGHGQVSRPWGTTVDKDGQILVADRNNRVQTFY TGKEGNGPGEFLNPRGlA\｜DKDDNUYIVDTGNRIQUS

PWA ${ }^{1}$ DHEDGRMFVSDHGNNRQVFN FHEPAGLACDADGNLYVVDPGTNLIVST

PNSVAVDSKGFIIVADTDNCRTVFD
GQCLLKTLRGHTSWV GAGQFDIP GQCLNTFRGYTNGV GQCWQTLTGHQDWV GKCLLILQGHTNWV QSLAFSPDGQI LAASNDQTVKLWN C GVTASDEGEI FVADRWNRI QVFT WSI AFSPDGTTLASGSDQTVRLWD RCVAFSPDGQTLASGSADHIKLWK RSVAFSPNGTTLASGSGDTVRLWD

TlVTYAGGDVLS S P GELIRSFYGHLYEVS

SFYGHLYY E VV S GLATD GA GNLYVADS GNNVRR\D CVAINPNGKILASSYDGIIKLWN AVAFSPDGQLVAASYDKTVRLWE Y GVAVNPAGTVYVSDKSGSVSVID GQCDHTDRGHSGS $\quad$ WSLTFSSDGLI LASGSDTTVKVWD KFGSPGTRPGQFDRPAGIA NEVVVADKDNHVQVFS PFSGHTFGVN SVVAFSPDGQYIVSGSDDTVRVWD GENLKTLTGHVGKI WSVAFSPVGTMLASGEDKTIKLWD
 $T L E G H S S G V G A V A F S P D G Q L V A A S Y D K T V R L W E$ TKGRNKGEFTNLQGVAASTSGKILIADSNNCVQIFS


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RAFGSQGTADGKFNYPWGVTTDALGFDYVCDKENHRVQVF PDFGCWGSGDGEFKGLEGIAVMSNGNILVCDRENH TGGE $\square A R F P L P R A G F P T G U T G G P D G N V W F A E F D G G R V G R \square$

TTTGETDHTDTGHTSPRGVAYSPDGTRDATASRDNTARDW PSFGGWGSGDGEFKGLEGVAVTSTGNIVVCDRENH DGYLIASVGEKGFNTPCGIAISPTGHVYI ADNGNDRTQVL


FKFGSHGEGNGQFNAPTGVAVDSNGNIIVADWGNSRTQVF DGYR DASVGKK GFNHPAGIA ISPTGQVYIADPGNHRIQVL VATGSELRQLSGHSWESSVAFSPDGKILASGSYDKTVRLW RNGQLLQTLTGHSSSVWGVAFSPDDQTIASASDDKTVKLW EKFGDRGRAVGYFNYPWGVATNSHNADAVSDTRNHRVQUF DENGN
PDGKTH LDTYNNFSSPDG $\square$ A $\square$ DDEGY $\square \quad F$ VSCNNSY $\square H$ RE GKKVKSLGGEGGSGNV
SGTGECLNTGTGHRDCVGVAFTSDGKTLASGSGDHTVKFW REGKKVKSLGGTRGSSNA $V M \square G V Q Q D P D S H L G D V T S M A F S P D G Q L L A S G S T D K S V R V W$ $V N T G R C L Q M \square Q G H D W A Y T V A F H P Q G E M V A S G S A D C T I K L W$ WWFPEGNKCDPQSPGYKRFYF
AVSGDGQFVVSGSRDKTVRVW LHKHCLVDTFRGHDAVNSVADSGDGQFVVSGSRDKTVRVW
 RKWGSEGTGDGQFKSLYGDASDKDGNVYVTDDGNVRVQKF


## V

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## V

VKTGEQQKKL NGHS
$N D F G V R G R S P G Q L Q R P T G V T V D M N G D I I V A D Y D N R W \square T \square F$
 1 IT G N C I QV L E G H G WW W S V Q F S P D G RL L A S A S E D K T I K L W




 $V N G G K C L R V L Q H I N W V L S I A L S P D G Q T L A T G S D G T T V K F W$ QGRVLSKFYLQNAKCVRGVAVDTRRNHI WPDMQGEVLVFR
 YSTGKCLKTYTGHNGVYSVAFSPQDKTLISGSGDHTVKLW
 A 1 AATGTCRSTFAGHSRVSAVAFSPDGQLVASASDDKTVRLW TEKNKVTATVTVGKYPCGVAVNPEGTKVYVTNTDANTVSV VNTSKCCQVLQGHRRVQSVVFHPDGKVLASTSHDQTVRLW





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A A GSKT QTVLPFTGLNDPDGVAVDNSGNVYVTDTDNNRVV.
 TK A GFTFA GWYT DNGAFAHGFTSSTPVTGNIVVVAKWTAV
 E P N G S F L CK F GF GQ M D R P S GI A I T P D G M V V V D F G N N R L






T P S GK VT E F P LD G TESAPYRTT GGPD GNLWF TEP GTSRTG GELCRPWGI CCDS QGHLIVADRSNNRLQ DTTTGETLHTLTGHTNPVRGVAYSPDGTRIATASDPDTAR

 QPNGKLVTKFGDKQFAGPHFAAVNNNNEIIVTDFHNHSVK GQFD HP G GVA V D S A G NVYVA D T E N D R I Q D S S G S F LS Y $\square$ N T D P L Y G P Q G L A A T S D G H V VV A D S G N H C F K
 $N R N G Q Q L L Q T L T$ G H S S S V R G V A F S P D G Q TI A S A S D D K T $T P Q G Q F V R K C F F K N L D S P R G L C Y Q P D G Q Q L D T M D F N N H R L A$

 EVVSTGRCLRTYTGHSSGVVSVAFSPDGKTVASGGGDH\|V$R$
 NWHTGQCLLQTFTGHRDK\|FAIAFSPDGKI FASSSADQT V A YPGSLGDVSKACPTLQPQDVPPVWAPDLWMFHWENTRRY D LHTLSSLVHTFTGHENSVCSVADSEDGQFVVSGSWDKTMR $D K Q G N P R S Q P F R G H Q D Q V F A V A F S P D G K A I A S G S A D N T \square R$ NADGAGEP VVLRGHTAQVDSAAFSPDGRRVVTGAQDRTAR


 DAVT GESLQT LLEGHSHWVSSVAFSPD GTKVAS GSDDRTI R
 $D C A G K A L L A P L T G H K G Y V L S V A F S P D S Q T I V S G G T D G T V R$ NAAGVPQWTDDNAHFGYLRDVAVGPDGRIYTDEAWGSARY
 D I H T G R C L N T L K E E G Y R V C R S L A A F T P D G K I L L A T G S D D Q

 TNSG S GALASYGPGFFQFPS GIAMDSKGNI FIADDSENHRIQQ
 LQFKYPDGIA
S S D GKFKSK $\quad$ GA GRLMMGPKGVAVDKNGHIIAADNKACCV

 SPD GLF LLSRYSFDGVNHSRYG
 STDGTVMSGFDLKKDSYDRGI AVNMRTNHILVTDADRRAV
 VA D S G N N T V R R DIE R F N GP K G I A V V D A N G T V Y V A D D T S N H I I R



 DPATGVLKHILEGHSNLVSSVAFSPDGQLLASSSFDNTIQ N A D G S F S T Y V G 1 S T
 EAAT GTCRSTLEGHSEVVRAVAFSPDGQLVASASDDKTVR $\square D T A K N K A T A T \square K V G N L P T G V A V N P E G T \quad R V Y V T N E Y D I$
 $D T E G N Q V G Q P F F S R P S Q F N S V A F S S D G Q Y I V S G S G D K T V R$

 QPNGK I VTR
S LK N GELIH T LK G H S Y A VT C $\square A F T P D G K T L V S G S G D K T L K$


## QUERY

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RMDADGTNIVTL GTGFSGPAGVAVDSSGKIYVADLGNST
 KLPGGAGSQTVLPFTGLNRPEGLAVDASGSVYVVDTGNDR MFPQGMWGEKGSGEGQFNDPASIDIDSNGDVYVLDSANSR VF
V IHPDCQSARFTHNAQFLRPQGVAVDQEGRLIVADSRNHR LPSHSNTTQTALSFTGLNHPHGVAVGPDG VYVADSGNNR VFKPCGAFHHKFRPGQFDRPAGVACDASRRIVVADKDNHR 1 DEADFMHAKLLECECFDRPQGLVIDDEGNIVIADSRNHR
QFFLAKWGSEGYSTGOSSSSGIAMGDGAVYVVDRGHES QFFLAKWGSEGYSTGQFSSPSGVAMGPDGAVYVVDRGHFS LWD $\begin{aligned} & \text { STGREDRTFKSHTYEVTSVAISPDGRYIVSGSHDKT }\end{aligned}$ GFQPNRFGSRGTAERQFAGPHFVAVNNKNEVVVOFHNHS IFDVNTFGGEGSDDGQFKFPRGVAVDDQGY VFVADSGNNR

## K TTPSGKVTGYPDPRAGSTPFNTAAGPDGNLWFTDPASNA

 1 FNYDGSFHHKFRPGQFDRPAGVTVNKQGQIVVADKDNHR IWDTTTGETLHTLTGHTSPVWGVAYSPDGTR\|ATASWDDTKFFVCQFGTTGSGPGQFDNPFGTTTDATGLVYVSEEVNNR VIEPNGTQARILGSHQFTRPQGIAIDHRDNFVVVDTKNNR VFNQEGEFLLKFGSNQFNAPTGVAVDDNGNIIVADWGNSR KFTSSGTFVTVWGSSQFAHPDGVAVDGAGAVYVADTENDR A YRY
 LWDVATGSELRQLSGRGNQVKSVAFSPDGTILASGSKDET KLWNRNGQLLQTLTGHSSSVRGVAFSPDGQTIASASDDKT VLSPRNMSEMKVYGSMFVRPQGVVIDPEGHILVCDSRNNR $\frac{1}{K Y} N E N G Q F \square R K C F Y K H L D S P R G V C Y L S D G Q L L I T D F N N H R$ K Y
IASVGEKGRLGSRQLQFSTPDGTA
 LWDLTTGALQHTLEGHSESHFSVAFSPDGQLLASGSADKS RLYNCETGGLLRTLEAHDARVYADESPDRQTLAACSTDQT LLYRDLPQPLRLDGREMSVWVRRDLARVGDAPAVAATGSII LWDLRGNAVAQPFTGHEDFVRAVTFSPDGKYVLSGSDDKT YVKKFTSDGVFITKWKFNAPAGMASDSAGNDFVSDKDNRR
 K LWDTSGKLLHTFRGHPGGVTAVAFSPDGKRUVSGSGDGT
TFDVNTFGCEGTEEGQFKFPRGTAVDDQGY\|IVGDSGNNR LWDTATGESLQTLEGHLDAVYSVAFSPDGTKVASGSGDWT LWNRQTGQCCKTLQEHTDLVWSVAFSPDGQLLASGSFDQT APGGNHRLQIFNPNYQFITAPHGI A DDQAGKVYIADRDNHR KFSPDGKFVGQFGTYQLNGSRGITIDTAATGLVVSDCNNC
 FDRNGKFISKFGSKQFMCPSGIGGDGENNDVIADFRNAN LWDVRTRECLVVGKEHANWDFGVAFSONDKIVASGSGDST $K F S P D G K F V G Q L G T E Q L I G P V G \mid A D D A T G L V Y V S E W G N N C$
$K F S P F F V Y M K E W G R K E F F Q P M Q L A V D S K D N I V V V D R I N N R$ LWDAMTGESLQTLEGHSGSVWSVAFSPDGTKVASGSYDKT WWDARTQYQKQKLFDHTSSVLTASGSTDYTTLASGSDNNS
$V T F S H S F G S K G A N G R L N H P R D A A V D S G L V Y V A D C W N H R ~$ FIFQSNGKLVTKFGAKGTSDRQFSD ПWDVQTGECLKTLQGHTDWVWCTVFSPNGQTLASASGDRS KFYMGHFGNKRFGSGMDKEPIGADDATGLVYVSEGGNNR


## LVFRPDRTVRHPRAGEMTHPQYVTVDGEGNILVSDWDTNC

 LFEESGRFNSFFGSKFFNRPSGVVVDKEGYIILGDLYNHR KVTPSGVVTTLAGSPGUSGNSGDAARFNAPTDIAVDDAGT R RDEDGQVTVHPVG GUARPTVIAQGPDGALWFSEYGTHR VINQKGNYNKINNYFKLHHPLGI ADDQSGENITTETDYHR VWDVLTGKCLQTLHEHNNSPLGVAVNPDGKSLLSVSENQT LWDVGTGDCLSTLQGMRNGIKSVVFSGDGRILASGCEDHT LWDAHTGQCWKTWYGNTDWALPVAFSSDGQLLASGSNDKT WDTKSGECLH LQGHSNWVRSVAFSPNGVTLASSSDDQT ПWNपKDKQETAATAAHLDGQAALAFDPAGNLYIADSANNR LWEAATGTCRSTLEGHSSYVGAVAFSPDGQLVASASLGN SVIDTAKNKVTATIKVGKYPWGVAVNPAGTKVYVANYGDG LWDVSTSQCLNLLHGHDTRVWSVAFSPDKQMVASASDDQT VWDKQGNQVGQSFVGHTGPVNSVAFSPDGQYVVSGSRDKT
TWDANTGLCLSTVRGYSNWIVSVAFSPNSKYLASGSEDKI
 SGSGDKTVRLWEAATGTCRSTLEGISSDVNAGSFSLDQNP
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VVKLLAGSTTSTVLPFTGLNTPLAVAVDSDRTVYVADRGN 1 KRMDADGTN VVTLGSGFSSPDGVAVDSNGKIYVADFGN
 $V Q K F Q P D G S F L Q Q W G S G G L S S P R G I A V S S S G S V F V A D T Q N$
$\square G R D T T$ Q G K A R LIF P LDP A G D S R P VGGDA A GP D G N L WF G E S G N

$\prod S V F T S D G T F V R K F G R C G F N H P Y E \prod A F D K D G F L Y V C D D W N$ VI MS P C GQ Q L T K F G S G GFDRP T S V TVLPD GRIAVLDF GN


$\square Q V L N P D L T F S H S F G S G G F R S P R D F A D D S Q G L V Y V T D M N N$ $V$ K LWD C QT GQCLLKTWY GNTD WAMPDAFSSDGHTMAS GSND
 $V$ R L W D M K T G M L Q Q Q A LIK A H S K Y VV Y S V A F S P D G R L L A S S S A D

 L R L W W L K GH Q LGQP LIDGHEY Y L Y S V G F S P D G E T I V S S S S E D




## $\square Q \| F N P D G T F L K A F G S W G F K G L E G V A V S T T G N U L V C D R E N$

 I R LWDAA T GKSLLQTLEGGSNAVYSVAFSPDGTKVAS GSYD $V$ K L WDD $\quad$ K S G QCCL K T L K K H T S A I W W I A C S P D G Q M V A S G S F D $V$ QI Y N S G Q T G VV G G S D N S H F N Y P F D V A A V D R N G I I Y V A D E G N

 $V$ QI F NEE GNLLLKVLGSE GFSKPTGLVVVSSGNILVADRGT


## V

 I R L W W D A VT G E SLLQTLED D S S S WV N SVVA F S P D GTKV A S G S H D K S AP NTPVEQKLSKSGPAFSPBFVAVNNKNEIVVTDFHN AK LLWDANTGVCLIT LIK GHRNGVWSI A FSP D GKLLAATAS D D I SVVF S D GVFVVRKFGGED NDPCGLAFDKDGFFYVCNSTA V K L WN P N T GK CQQTIPPAHQS WVWSVVFSPN GK IVAS G GQD


[^0]| QUERY | $\text { DRVVK TIS S } \mathrm{DEH}^{250} \mathrm{HHHHH}$ |
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|V|AT|L|RGHTETV| | $G$ | $K$ | $E$ | $I$ | $K$ | $P$ | $L$ | $R$ | $G$ | $H$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $N$ | $W$ | $V$ |  |  |  |  |  |  |  |
| $G$ | $R$ | $L$ | $L$ | $R$ | $S$ | $L$ | $E$ | $G$ | $H$ | $T$ |
| $D$ | $G$ | $V$ |  |  |  |  |  |  |  |  | $G Q T L H T L H G H T D W V S$

GECMKTFHGHHDGU KE CTVGGHSDWVS
$R F G \square R G R T P G Q M Q R P T G V A V H P S G D I T I A D Y D N W V S \| F S$
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GHKWKVN
VLHPFEGHTYYV
 GQLLQTLKGHGDAVA
 SVAFSLD GKR\|VSGSDKTVR\|WD TSVAFSPDGKYIVSSSDKTIRLWD QAVADNPDGQLLASSSDNTIKLWQ SVAli SPDGKLLASSWDKRIKKWN

 RSVAFSPDGSRIVASNDRTIRIWE

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 GKCIKTLREHGRRVGTSVGFSPDAHLLASGSDQTVRLWD DPFRGHQVGSGTY TGAVWSPDGKHUATASDNTARLWS

QCDEVLRGHTGWVW RAV WSRDDRLIASSADRTDRDWD
VGQ $\square$ RNPHGVI ITRNRNVLVCDTGNNRQ IFT GKLIQSLEGHLGWVN SVQFSPDGNK\VSGSRNTTPLWN
G
GQEVRTLQGHTSWV TSVVAFSSDSKVLASGSADHTTKLW



## LT R LT GHS GVV $\square G V A F S P D G Q T \square A T S D D K T V K L W Q$ GTLITTMKDHEGGV RGVAFHPDGNLIATASDKTVKLWK QLIHPIKGHDDWVA CVAFSPDGTRIVTSWDTTIRLWD PLEGHASSV HSVAFSSDGKWIVSGSGDRIRVWD  <br> GECDR PLLEGHTSDRIN W WS IUSFSPDGQTLVSGSADTLRLWE

GEELRTLIGHS NSVRAVAVTPDGDRAVASDDSTLRVWD GKHIHTFEGHADTVNCVAISPDGQTLASGSDKTIKIWN K GKGQDQFQQPAGIAISGNTVYVANNGNRIHRFT

GENDHTLTAHTDWV WGVAFSPDGRRLAAAGRRVVVIWD TSVAFSPDGELHVTPRDNTVRIWD GHEEWVN SVVVFSPDGNVASASASYKTVRLWN KQ QQKLEGHTGGIN


GQLLS TLE GHSAST1 GQCLKTLQGHTSWV GKSLLTTHPGDSSTI
$P \frac{R}{\mathrm{~L}}$

 WSVAF DSNGTKLATGTGFWRVMLW

YAVAFSPDGQT【ASTSGDTПK VWN QTQKPDTLIGDGTRDYSVALSPDGKTLASVSDKTUKVWN GQFGAAGRGDGQFVWPRSVDLDSVGNVFASDDDKEGAFLS LNGHSNYIS SVVAYSPDGKLILSGGDNMLRLWN GK LIE Y TLTGHNDSVNAVGVTVSPDGKKVISGEDKKLKVWD QDVITFGGPGNFANPRDVAFSHDGTGASVSADGVLRLWD GSHVFTYQGHTNYVA SVAWSPDGKWIASASGNTVQVWN

LTGHQNLV

FSVAFSSCGKMLASSSDAKVRLWN HTVSVRPQGDVI ATTSDKTI KLWN $G V S F S P N S Q V I A S G E D N T V R L W N$

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 PGGSRGRERGEFTNLQGUSASSNGRVVVADSNNQCIDQLFN ADGSGRILSGADAAVMDVRFSPQGRYVVADASGDASVVRLWK VETGKLVSHPHEDSVQSVAFSRDGTRLASGAWDNTIRIWN KSGKEVRKLEGHSGVRSVAFSPDGSRIVSASDDGTVRIWE ASGQHLIKFQGHLAPWCINFSPDGKILATGADDKVIKLWD
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QSFGGVLA $\square$ AFSPDGQ
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DTGQVI RSSLA
HSSVTACAISP
SHRVIFVFS P
SASVWSVAGSP
FASPAVAYDG QTFADDCAVAYDGSGNLYIADTNNNVIREVS
WDACRSTLEGHSDYVSVVAFSPDGQLVASASWDKTVRLWE RDGSLQKTLIGHNEVWKVAFSPDGHTLVSASGDKTVRLWR LQTQKTLTEHSHLGUAGVADSPDGKTLASTSDNNTVKVWN SWGTAGSGEGELNGPSGIAFDADDNLFVVDSANNRIQKFT ASFKSKTFIEHSGCVYSVAFSSSDGKTFVSASKDRTVRGWN WAGKIEYYLTGHNWVNAVAVTPDGQKLISGSSDNTLKVWD TEGVYLRHFDKHMRPQDVCMDGNGTLWVVGGGGHVVQYST ADGSHVFTYRGHNYVASVAWSPDGKR\|ASGSADNTVQVWN


LERGEEDRTLKGHNSVSAVAVTPDGDRAVSASGDDTLKVW LATGKQTNHLTQNSWVYSLAITSDGQAIASDTFEHTIKLC




 RRSGQEDQKLEGHTRGTTRAFSPDGRILVSSSWDETTRRLW W W W


LATGQQLLSTLE GHSWVTACAVSPAGAQRVVSTSRDRTVKVW
 AATGSVI QN LPDHD FVY SVAAFTPDGKSLVSASKDKTITIV VNDGKLLFSCQHPETDWS ${ }^{\prime}$ AFSPNGQTLASGSFDQTDSWW AATGTCRSTLEGHSYIRAVAFSPDGQLVASASEDKTVRLW LLHNSLLTRWNVSDDEVWGVTWSQDSRTI A TASSRDTVKKLW LQTQKVIAT LTGHNWVWSVAFSPDGKILASASFDNTIKLW
 LNTEKKLIGYTLNHDNVVVNSVVFFTPDGKKLISCODCDKTIMKIW
 $\begin{array}{ll}A T G A A L T G F V G H A N N V S A V A F S P D G H T L A S G G L D S T V & R L W\end{array}$ TNDGSHVFTYKGHDWVYTVAWSPDGKRIASGSADKTVQVW NHPAGVAVDAAGNVFVLDSHYGQVWEM


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UniRet90 G4TX15 UniRef90- $\mathrm{B} 2 \mathrm{~J} 5 \times 0$ UniRef90-I1FCJ1 UniRef90-G7WPS4 UniRef90-K9PRY1 UniRef90_11FAT4 UniRef90-UPI0003478C29 UniRef90-UPIOOO3479FD6 UniRef90-UPIOO035C36FA UniRef90-F2UCYO UniReffo-DOLUT2 2 UniRef90-X6N7D8 UniRef90-UPIO002D3604D UniRef90_UPIOOO3174048 UniRef90-D9VC58 UniRef90-A9GSK2 UniRef90-UPIOOO427EE1A UniRef90-K9VR67 UniRef90-C1F4Q6 UniRef90 BOC3R6 UniRef90 ROKD52 UniRef90-F5UF33 UniRef90_UPIOOO3681271 UniRef90-GOAOR3 UniRef90-K9ZML4 UniRef90_EOUIP1 UniRef90OUP100035D643C UniRef90-C3ZU26 UniRef90 D6TY28 UniRef90-A0A024K115 UniRef90 O3M803 UniRef90-K9XWE4 UniRef90-K9VT27
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NVATHRB1 130
140 150

160
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 NLNGQQLEQFP GHQDYVRSVSFSPDGKYUATASSD RTV
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 INTNTNTVISTISVGYKPSGVA TTPDGNLAYVTNKFSDNV NRLTGFCQQTLADHHGWVLSIVTFQPSTTTNTTPSADSKDK
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 ADNGQSTGQALTGHSDSVNCVAFSPDGKRIVSGSSDNTLR DLATGKEEYTLTGHNYSVNA AVVTPDGKKVISGSWDKTLK DTTSGTERPLRAGHTGAVVSVAFTPDGRTLATGSLDTTHL DRSLVRTVRHPEGEMEHPMYVTVDGEGNTLVSDLISHYVY NASDGSHVFTYKGHSNKVNAVAWSPDGKRTASCSTDKTVQ PAGTSNPKPLPFTGLUGQAVDAAADAAGNLYYTDDDKNRVL NLQGHELATLK GHDEKVTSVSWSPDGQI A AGSENKTIK
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 $F T Q D G Q F G T K G S G P G Q L D M P Y G I T I D T E G T V Y V S E Y G N H R$ KGALFQHQSQATGCRCLM
IF Q SNGKLVTKF G GRGTADMFKFGSHGEG
RLWY L N KQQFPP FRGHQSTVRSDDFSPDGQQVVTASDDRT $L L N P D N S \square A T T W G S P N L P D P V A V A F D N A G N G Y V L D Q R R S R$ V WN A D GS GEP LVLYGHGSRVWSAVFSPDGRRIAS GS WDRT
 SMD GY LIA S VGEE GS QLNTPPCIADSPDTEQYIVDRGNHR $\square$ WDAENVQTVSTHFEHADGDNSVAFSPDGRHIASGSDDGT




 ■WEAKS GKEVRKLEGHSGSVRSVAFSPDGSRIVSAS DDGT


 KKMKS LGGRGGGSGNVKFSSPRGVADTSDQFILVSD$N$ N H K LWDVVKTGSELQTTLQGHSSLVVHVAAFSPD GQTLAAS GSRDET
 IWD G D T G N VVVPGPRA Y T S MI Y A I A A F LIP D G GR I F S A H G D H T RTYGT T G V P YVT DGYHYNTPS SVAVAPD GSIVLTEDK GHR

 I WNMHT GECFKTLQGHTSRIHSVT\|SPDSLILASSSSRDKT NID G DC L L A S V G E E G T Q F K Y P V G I A





 K L A P GASSPSEELFHALRSVIDDAVDAKSAVVVVDGQQNR SVFDPH GVHLFFHGGQFKFPRGIADDSQENLIIADS GNNR KLWNKDGKLL RTF LLGHTSVVSAVAFSPDGQIVAS GSADKT I F T A S GVFLLKF GSYQF QYPWDVAVNSRRQIVVTDSRNHR $V$ K P D Q V P V L L K T LI G H T A QVVY G LAA F S P D G Q TIIA S A S A D N T LWE T D G TVII RI L E G H E D D SVV L D V A A F S P K G D M I A S A S S D K T $V$ WD T A THAALLG GP F E H G G PVVHSVVAFS P D G S R IV V G S D D R T $V Y D E S$ GK F L F Q F G GK Q L D D P R Gl I C T D S S G H I L V A D S G N E R
 TI L DRE GK K V K L L G GK G G S GNVKFPSPRGDKCILVCDNHR
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 L WDD N T G E CLLKT L N G H S S DVVH SV AAFS P D G Q T L A A G S A D R N RIWWDVST GETVLHTFTA HA G PVVRGVVVFSPD GTRALAA A G G RT

 I WDVAS GREVRKLEGHSNVVAVAQFSPDGQNLVSGSWDKT L WS V A T E D C I QVLLR GH R N WV F A VAA F S P D GRRRLAS A A H D H T








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V $V$ D E S GKFLF QF GGEQLTTRPAGI CTDSSGHILVADS GHQR V WN A S N G S HV FTYYK GHSS WV N AVA WS P D GK WI A S G S R D K T KLTP GT T N P TVVLP F T D L N M I A GI A V D N A G NVVV S D S G S K R
 $K$ L WS R Q G T L I K TLI G H G D A V L D V $V$ K F S P N G Q M I V S A S R D K T
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D

V|R|L|WDVGGRRGWAT|L|TGHTNSVVSVVFAPDGRTLASSSTD $V$ K L WDVVS T GEEEDK TLLS GHTD WV Y GVVSFSP D GKLLLA T G S G D



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

NGQFNAPTGVVVDSNGNIVVAWGN VVFD PRS I GSEGSGPGQLQSPTALSDD\GGNIAVADYGN $V R V W N A D G S G T A D L I L S G H E D W V S E A E F S P D G A Y I V$ S A S K D $V L I D E Y N M T E S R I V E T P T F Q R P Q G V I A A D D G S I L V A D S R H$ I QVLNS DLT FS HSFGSYGFDLPHNI ADDS Q GSLYVAD GHN
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| UniRef90_UPI0003712E4D | $G T\|V\| R\|L\| W D L D^{250}$ |
| :---: | :---: |
| UniRef90-UPI00047ECAE6 | $N \mathrm{~T} V \mathrm{R}$ L WRLLD L N Y L |
| UniRef90-B8GB84 | RTVKVVWEA T GRLL |
| UniRef90_D1A9K8 | GTARI WD T T T GQ TL H |
| UniRef90_H8X6D3 | N S VRVWD |
| UniRef90_UPI0002FA04AE | Q TVVRLWD $\square$ N T G Q |
| UniRef90-K9V4W4 | K T V K I W |
| UniRef90_I1F8P5 | N R V VVY |
| UniRef90-UPI000443D162 |  |
| UniRef90-H2SNJ6 |  |
| UniRef90-Q3MBB0 | $R T V R L W D V T G Q M L Q$ |
| UniRef90-UPI00047ED8C8 | A R I A RFSTS GQYL |
| UniRef90-D0LR22 | R TVVVWRADG |
| UniRef90_E9IUU5 | NS I K A F N S L S L L Y S Y |
| UniRef90-I1ERM3 | HRI Q ${ }^{\text {L F S P D E K F }}$ |
| UniRef90_UPI000440996A | N T I R I W D |
| UniRef90-B0DDW2 | K T I R L WD S Q T G K L V H |
| UniRef90_UPI0002E8A238 | Q T I K I W |
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| UniRef90-UPI00047B2877 | R T V R L W V V T G Q |
| UniRef90-UPI0004127753 | K T V K L WDV S T G Q |
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| UniRef90-Q8TPK7 | S TVVAVIDVA T N |
| UniRef90_UPI0002DF116C | R T I R L WDI T T |
| UniRef90-B2WNC1 | S T V R L W |
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| UniRef90_UPI000440E1BA | GTI QL WD T E S G |
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| UniRef90-A0A017TJ16 | K T $\square$ RVWNA D G |
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| UniRef90_K9WGI7 | R T I R $\square \mathrm{W}$ |
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| UniRef90-B8HM86 | CTI R L WD |
| UniRef90_UPI00034D1BEB | S TI RIWWD T S T GELLR |
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| UniRef90_UPI0003705B18 | G TVVRLS D L K G N |
| UniRef90-X6LDC5 | K T I QLWD A T S G |
| UniRef90- M2Z5C4 | D T AVLWDMNG |
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| UniRef90_UPI00036E050D | R R V V K L |
| UniRef90_Q03601 | HR I Q ${ }^{\text {P }}$ |
| UniRef90-K9VIJ8 | Q TVVKLWNVDGTER |
| UniRef90-B4MIN9 | HCLYYL ${ }^{\text {C P P }}$ |
| UniRef90-B0JGM3 | K T I K L WK P D G |
| UniRef90-A0YIY4 | NTV K L W ${ }^{\text {S S D G }}$ |
| UniRef90-M2PL68 | RTI R I WD A $\square$ T G E |
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| UniRef90-C3ZU24 | D I V A I Y |
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| UniRef90_I1FCJ1 | HRI Q V L N P D L T F S H |
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| UniRef90-K9PRY1 | KTINIW |
| UniRef90_I1FAT4 |  |
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| UniRef90_UPI0003479FD6 | R T I K W W |
| UniRef90_UPI00035C36FA | NTTRI WDTSTGQL |
| UniRef90-F2UCY0 | NTVRVWDVETN |
| UniRef90-DOLUT2 | G TI RII WQAD G |
| UniRef90-B4VS12 | GTV R L WNREGELLH |
| UniRef90-X6N7D8 | Q T I R L WD |
| UniRef90-UPI0002D3604D | Q TVVRIWDAA T G |
| UniRef90-UPI0003174048 | F A V R FWSVATGELL |
| UniRef90_D9VC58 | $D R \vee Q L F S P D G R F L$ |
| UniRef90_A9GSK2 | R T L K V WD L A T GQL |
| UniRef90_UPI000427EE1A | Q TVRLWD\A T G Q |
| UniRef90-K9VR67 | NTI K L W |
| UniRef90-C1F4Q6 | N R I R EVS |
| UniRef90_B0C3R6 | Q T I R L W |
| UniRef90-ROKD52 | NTV R L WEAATG |
| UniRef90_U7QRR0 | G IVKLWDVNG |
| UniRef90_F5UF33 | K TIIKVWNLQTQ |
| UniRef90_UPI0003681271 | HRLQVYEKVKDYEEH |
| UniRef90_G0A0R3 | N IL R L WDA A N GR |
| UniRef90-K9ZML4 | NTIK M W |
| UniRef90-E0UIP1 | G Q V H |
| UniRef90_UPI00035D643C | Y T V R L W |
| UniRef90-C3ZU26 | H T V T V Y S |
| UniRef90_D6TY28 | K TVVQVW |
| UniRef90_A0A024K115 | K R V L K L A P |
| UniRef90-Q3M803 | E T I KVWD |
| UniRef90-K9XWE4 | K TVVKL WNRQGKQL |
| UniRef90_K9VT27 | NTVKKLWTA D G |
| UniRef90-Q0W0Y5 | N T V ${ }^{\text {S }} \mathrm{A} \mid$ I D T V T D F E E Q E |

UniRef90 D2VPM5
UniRef90 K9EXL9 UniRef90_UPIo0044096FC UniRef90-K1QS83
UniRef90_O5AY27
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UniRef90 G4T6E8 UniRef90-K9RD44 UniRef90-UP100040CC35C UniRef90_UP100035EB2D5
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UniRef90-M2R882
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UniRet90-BOCDS2
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C $\square$ QT TDGHKHSVN

## VVFS PDDET DASASDSTDKDWT  

 GRELLTLKCHNDWV RSVA WNPDGQALAASYDST I KI WN RTTSVLSGHSDDVN

GRLLR LLTGHGGSV
 GNLLRTLTGHNHSV RAVAVTADGKRVISSDDKTVKVWN TSVQFSPDGNRIVSSSDKTI RLWD YS SVATS PEDRRUVSSRDYTVRVWD

GSELDATLTGHSGVN GKELSNLTGHNGQV


AVA TTPDGKQAVSSSDKTLKLWD WSVS $\downarrow$ SNDSKTIVSGSDSTIKVWN SI GFSPDGRlVVSSTTGAVRLWD


FADPFGLARSGNGTLYLADDNNLIRLIR
$T V L H D R G H N K E V A \quad S I A V S T K E T Y V A S S W D C T V R V W D$ GKLLKTLTGHEGNVN RVRFSPDGKSIVSDGDNNVKLWA GE IIKPLKGHEDFV RSVAFSPDGQHIASSWDKTVGRVWD

DSAKIVPGGVAVDRHNAVYVIDAAANRVLKV GKELLTLNGHTKWV ESVAVTPDGKRII SGSDETIKIWD


 GKELASFTGG

FEK LVV $\square S S$ S AFSPNGKF LATDADGKTHDWQ
GRVIFSFEG
HKGYV ESIAFSLDGVRVVSSDDKTIRIWD $F N V G K G T Y G V A V H T N G E V F A G N D D G F V Q V F S$ KCAHTLTGHSSWV T SVVAISPNGLI LVVGSDDTVKVWN
 GHMDGVSSVAFSTDGTHUVSSYDKSVVRVWD

TSVSFSRDGQTLASSDDNTIKLWN GELIRSLNGHSRLVSFVG FFPDGSKIVSSYDNTIRUWD

TGRKGSGVGEDDAP $\square G V A F D S D G N \square A V V N N N D M T C D$
 GEQTHESTGVRFA
 GQN $\square \mathrm{T} \mathrm{V}$ FRGSDS $\square \mathrm{RR}$
GKE $\square$ T T L R GHTER V
$P L R G H G Y S V$ AI AFTPDGRLLAAHDRAA QLLD




FSPDGNKIVSSSNELI KVWD
 KTRKELAT LINHQDWVIAVAFSPDGTIATASRDKTARLWD VA WSPDGR WDAGSSRDQRVRV
K F GRKGVGNGEFDLPAG\CVDVDNRIIVVDKDNHVQIFT AVK F S PTDSIFASGEDTKIRLWR $K T V T P V S A K N Q \square C N V Y A G A Y S P D G K H \mid V A G Y N N N V R M W D$ AVAFSPDGTRIATGADNADHLWD


GK LLVDFKQVNAAKKPHS $\square A \square H D S G E \square Y V A Y R A S H Y V Y N$ $G N V I H S L T G H S S D V N T V A U S S D D K Y F V S S R D E T U K V W E$

RGVA WAPDGNlATASRDGTARLWD ALAFSPDGKLLVSGSNDHIKI WD


APAGTALSPDRRRYVTRPEGHGA LDD GQVV PGDEPTFFSQPSSVA SPDSQTVAVGADQSVKLWR
 GVAFSPDGKQVVSGSGNTMRVWD
NA $\square A \square S P D G K T L V S A S F G T I R I W N$ FSPDGAY VASEDSTURVWR $T G V S F S P D G G L L$ ASS GNDGVVRL

## UniRef90 D2VPM5 UniRef90-K9EXL9 UniRef90_UPI00044096FC UniRef90_K1QS83 UniRef90_Q5AY27

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UniRef90 $\times 6 \mathrm{MKM4}$ UniRef90-Boc5U5 UniRe990-UPI0003EABEAD UniRef90-UP100037B47A8 UniRef90_UPIOO04409566 UniRef90--11FDU4 UniRef90-UPIO003477D32 UniReffo-X6ML19 UniRef90-B0D541
UniRef90 K9UVD8 UniRef90-F4XK01 UniRef90-×6M7P3 UniRef90-G3AHR1 UniRef90-C3Y3H7
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UniRef90 J1FE75 UniRef90 -J1FE75
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UniRef90 G4TQM7 UniRef90_K9ZFD9 UniRef90-G4U2Z3 UniRef90-UPIO001CBBBCC UniRef90-B1M2A1 UniRef90-K9X730 UniRef90-UPIOOO4758F04 UniRef90-X6LTD2 UniRef90-F8PD52 UniRef90- D2SA17 UniRef90-UPIO0034909FD UniRef90-K9VRF8 UniRef90-DoLUU9 UniRef90-UPIO003677D52
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90
100

120 KDGELLKTFEGHTNKVTSLAFSPDGKT ASASEDTTMKLW SQTGIEVRPPFHEGCLSSVAYSPDGRRIVSGSFDYTVRVW
$N T Q I G T V V R L R G G G F V C V T S S G D L V I M I S D D H T Q A K I V$ AATGAEKHILKGHDWVNAVAFSPDGQRVASASDDWTIRLW WQCIMHTLSRNSGFSAINSLADSPDGNTLVSGDDDK RLIM ASTGKCIATLTGYPTGVDVTUSSNGGTVATGSGDCLIR1胃 LGG PVLTA LKGGDRRRTMEGHESVNTLAFSPDGRTLASGSDDRTIRLW LETGEEQFTLSGHSGWQAVAVTADGTRVISGSNDNTVKVW VSSGKQIVSLEGHSSAVSVQFSPDGEKIVSGSYDYTVRLW
 VKCGRVVKLLNGHDGVTSVSFSPDGQRVVSGSRDCTIRIW SSQGCVLKPLEGHSGPTSVAFSPDGHVVSGSDDRTURVWD LLATGSELATLTGHNSVNAVAITPDGKQAVSASDDKTLKLW W AKTGEHMGKPFHQKGVNSVAFSPDGRRIVSGSQDKTI LLW


GVAGYRDG
RQGVVSThAGT
ARTGEEVVKAGHRGRVYSVAFSLNGTHTASGSADCTVRVW LLEGLFPKTLEGHKYRVMDVAWSPDAQTLATASWDQTVRFW AKTGDPVGKKGHKSLVRTVTFSPDGHIVSGSGDKTLRLWD GGFHEEELLGEEMDWPNSVAVDSQGDVYVSDDWLNRITVF LIEGKELLPDGHSDWVGVAVTPDGKQVISGSYDETVKIW SETGETLATLPADAAPAGLAVSPDGAWLAAAERDADAVRI QQNVISTFSGNDDKVYCGUSLDPTGDVYFADSTNQRLSKI
 SSRDMWVFPSKQVGSPAGIATSSLGYLIVIIAEPEKKQVSV VRTGESFKTLUGHSRFWSVAFSPDGSQUASGSEDQTIKLW VESRQAMKREGHAHDFDVASSPDGRVVSGSADRTVRIWE TGTGTMQADLAGHRDDNTVADSPDGQIVASGSEDRTVKLW
ESSGKQTHSLKGHNSVSARFSPDGTKIISCSWDKTVRLW ESSGKQMHSLKGHNSVTSARFSPDGTKISCSWDKTVRLW VVDGLCFNNLAGHSSIWSLVFSADGQULASGSTDHT1RLW PKTGKVIRTLDGHTEVVSVSFSRDGQTLASGSDDNTVKLW HRHENTRKLI GHSGPVYGVSFSPDNKFLLSASEDKTVRLW SKEGKDTFKPDCMDDPHGLTVLKDGRMVVVNRPEQTSCLD VKTGKLNVKLNGHSKYVSVCFSPDGSSLASSSGDMSVRLW RDRTVTVGRLLGAGTVNAVAFSPDGGVLAAVSNDRSVRLW LEQGRELATLSGHSGVRAVADAPDGKRAVSASSDETLKLW VASGYCTRILQGHGWVWSVSFSPNGS LAAGSDDTSIKL W
 LATNQEVATLTGHNSVKSITFSPDGNTLASASADKT1KLW AKSGAELQCYQAFAEAKAARDSSNGQTVVCFKDVALLDW VRSAQCLKTWSGHT DWALPVACSGDNI ASGSNDKTIRLW DGTVMAGFDTKNSSDYRGI AVDRTNHVLVTDADQGTVLVF TENGKVLATLNHQSRVFAVAFSPDGK TIIATASYDKTARL
 TNGDSCRCFLVDGKCPWGIVDDSNRQVVTFDSTGQALRVY INGTPDKTFKAHDSFDEDIDDSPSGRVIASASRGRDVKLW YDQRHITNEGLEGRSCTGIGISQQG VVVVNWRTRKITEM ASSGQPLLG HTDMVISAEFSDDGQRIIRSGSQDGTARYW AGEGTGYRLPSEQAGPVG\|EAGPDGALWFAEDNGNRMGRIT LIARGQEDRTLEGFKSVNNLADSPDGKTLADSDDNKDQLWN AAGVTTTYAGTG
YAGNGDFLQVWGNYRTQELALDDAGNVYVLDKGHPYVYKK FATGNVIRTLSSHNYVNTVALSSDGKYIVSGSDDKTIKIW TATAAPITVLTCGDHVRSVAWSPDGTALAGTSRDHLAHRW VGTGALLWASEHDDFVRVVRFSPNNEFVVSGSGDRTVRGW VALGSQIRGSGVTNNIYWVAFSPDGRUVSVLGRESUWLWD AETGQPLGERGHSSRVNAVTCSPDGSRDCTDRDWGAESGQ ERDGA LVGE AVGASPSGIAVSPDGATLYVANREADTVSV PDGQLSTYPRPSAGAMPSIAAGPDGGLWFTLNGGNAIGRI VLSGKQLQDLEGHSDTNGVDFFPNEPKILSCSDDGTIRVW PATGRPRGAAGHTDAVNAVAFNPDGTLAGTDRTDRLWDTA LDTGSLIRNDQAHDAVASLATSPNGRILASGSWDNR1KMW LIKTGRRMRTVPAHTAPNAVAFSRDGQTVASGSDDKTVRLW WTTGREVSNLEHRGRVRSVDFAPDGATLATGCDDGQVRIF
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## UniRef90_D2VPM5 <br> <br> UniRef90-K9EXL9

 <br> <br> UniRef90-K9EXL9} UniRef90_UPIOO044096FC UniRef90_K1QS83 UniRef90-05AY27 UniRef90-K9PIT9 UniRef90-UPI00037CFDBA UniRef90_L8M8F0 UniRef90-UP100037D9BC4 UniRef90-U7QH69 UniRef90-K7WTS1 1 UniRef90-UPIo0044092DD UniRef90-K9W2N1 UniRef90_UPIO0044080E2 UniRet90-R7SF62 UniRef90-K9TP09 UniRef90-AOYUL3 UniRef90_G4T6E8 UniRef90-K9RD44UniRef90_UPIOOO40CC35C UniRef90-UP100035EB2D5 UniRef90 A7RMW4 UniRef90-A0A021W4R9 UniRef90-M2R882 UniRef90-UP100034D9C8A UniRet90-BOCDS2 UniRef90_W4LFD3 UniRef90-X8F3NO UniRef90-B4VHM7 UniRef90-DoDC25 UniRef90-D6TPM3 UniRef90-D2VAZ1 UniRef90-A7BVG4 UniRef90-X6MKM4 UniRef90-BOC5U5 UniRe990-UPI0003EABEAD UniRef90-UPIOOO37B47A8
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UniRef90_IIFDU4 UniRef90-UPIo003477D32 UniRef90-X6ML19 UniRef90-BOD541 UniRef90_K9UVD8 UniRef90-F4XK01
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X6M7P3 UniRef90-G3AHR1 UniRef90-C3Y3H7 UniRef90-A0C2z9 UniReffo-B4VJX3 UniRef90-E3JD58
UniRef90_D4ZXP5 UniRef90-UPI00047EAC18 UniRef90-G6FNK1 UniRef90_B0DYW7 UniRef90-A8ZKU8 UniRef90-UP100034CFB37 UniRef90_S7RLI7 UniRef90-X6POR4 UniRef90 U7OHL4 UniRef90_Q10×W6 UniRef90-G2GCV6 UniRef90-C3Z485 UniRef90-B4NS43 UniRef90 L8N723 UniRef90--10X6G7 UniRef90-UPIO002063B0E UniRef90_LOJ8R3 UniRef90-F5LGCO UniRef90-UPIO00476FC40 UniRef90-L8EUF8 UniRef90-H1Y022 UniRef90-UPI00031E329A UniRef9O-UPIOO0041068A5 UniRef90_18TRMO
UniRef90
G4TQM7 UniRef90-K9ZFD9 UniRef90-G4U2Z3 UniRef90-UPIO001CBBBCC UniReffo-B1M2A1 UniRef90-UPIOOO4758F04 UniRef90-X6LTD2 UniRef90-F8PD52 UniRef90- D2SA17 UniRef90-UPIO0034909FD UniRef90-K9VRF8 UniRef90-DoLUU9 UniRef90-UPIO003677D52 UniRef90_G4TSQ0

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$\lfloor$ S D T G N QR $\square R \mathrm{~K} \| \mathrm{S}$ T N G Y $\quad$ S T $\|$ A
SKDGKFLKTFKDHNSAVIH LAFSPDGKTDASAGEDTTGS DTQSRKVYPPGKGHQNWI RSVVYS PDGKRHIVVSGSEDTKTVR CYSGSTEKQTIQYKDKRPKYI SENRNLDVCVADCGANAVV DVATSAEKH\|LEGHKDWVNAVAFSPDGQIVASASNDWTVR

 DVARHRPVTTLRGHRSAVFSVAFAPDGRTLASGGSDGTVR
 DASSGKQQYVLDGHDDTVNSVQFSPDGNRIVSGSSDKTI R AS DGK VPD SSARHTDAVRSVAFSPDGTQUVSGSQDKTVR DLKTGTALSTLTAHSFWVQAVADTADGRTAVSGSDDNTLK D A E G V $V$ C $V$ L
 SATS GRRGPPLKGHTGGINSVAFSPDGLRIVSGSDDKTVR

 RYTREMKTKGSRDPLEKPWGIAVNRSNTKLAVTDCHFHYI $P G A Q A Q F N G P D G V A V S Q A G R V F V A D D T N D R D R$

 NSDGEFKTNWGQGELDGPAGLAFDQNDNLYIVDSRNHRVQ A A GAT QPVDLPFTGLNFPAGVTMDLSGNV

 D ALTGGAERHTFHGHTGPVNGCADISPDGKWIVSASADTTTLK


 YARD GRRLGSLKLNWMKPFGVAVNSKGQITDNCENGSLSV

 Q I S TVK SDTPTYGRSGMVKSVAFSPNGQILASGGLDNKI Y
 HVST GQCLHVLAE HMHWVMSVAFSCQPNDLASASFDDRM1
 DVS S R K LI Q KL E GH S H WV N S V G F S P D G S K V V G S F D K S I R SLLDTYTALVSYK GHNQPIWDVKFSPLGHYFATASHDQTAR

 D L E Q G R E L A T L S G H S S S V R A V A DA P D GK R A V S A S G D K T L K DVVVS G D C M T T I N G H S G G V T S V S S F S P D G K T L A S S A S Q D K S V K $N \| K$ GQ A ll K L K G H H D S V WS I S C S P D N K TVLVTA D Q E G V I

 A QTGDAVGEPLRGHKYSVQSVAFSPDGKHILSGMHDPDAM QVHHPVRKKKME GHLDHWVSDVQFSPDGNMFLSASYDGT IGG
 WDTENGKVLATVNHQSSVNAVAFSPDGKTIATASYDTTAR D A R S GAQRRLVVRGHTD YVWNIA WSPD G QMLAS A S S D Q S VRR

 A ATGMLLLQTLSSDTHTKTVVAAISYSKS
 D ATTGHP GGQPLRVTGPVKWLIPFGDDRLLSRDDSAVRLW
 T PD GTVTE YPLPDVRGAFASVIA T GPD GA L WFTANQANAAI G
 $K$
$E$
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 PLGEPFRGDRLRGHNSWVNSVTFSPDGSR\|VSGSRDCT DR




 DVKT GSRRLRTLS GHAGGVNALAFSRDGQTLAS GSDDRTVR


## UniRef90 D2VPM5 UniRef90_K9EXL9 UniRet90-UPIO0044096FC UniRef90_K1QS83 UniRef90_O5AY27 UniRef90-K9PIT9 UniRef90-UPIO0037CFDBA UniRef90_L8M8F0 UniRef90-UP100037D9BC4 UniRef90-U7QH69 UniRef90-K7WTS1 1 . UniRef90- $\times 6 \mathrm{MT} \times 0$ UniRef90-UP100044092DD UniRef90-K9W2N1 UniRef90-UPIO0044080E2 UniRef90-R7SF62 UniRef90-K9TP09 UniRef90 AOYUL3 UniRef90-G4T6E8 UniRef90-K9RD44 UniRef90-UP100040CC35C UniRef90-UP100035EB2D5 UniRef90_A7RMW4 UniRef90-A0A021 W4R9 UniRef90-M2R882

| WDTATGAEKQTLEGHKGNVKAVAFSPDGQUVASASNDK |
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VWNAATGVCVLGPLEGHNSVKSVAFSPDGKHIVSGSNDQT
VWNLETGEELRTLKGHGSYVRSVSISNDSKTIVSGGDNNT WWEVKTGKCVKTLKGHTYWVNSVVLNPDNKIVISSGSSDRT LWDVQTGGEVRTLSGHSESVYSVAUSSDGRLLASGSYGN VIFNMTGKVLMSTGSQLGNPHGVAFLNDDVIVTADEYNHR VIEPDGTVGTLAGGERFDTPTALADDAQGLVWVADTRNRAA
LWNTRTEEKVAKLTGHNGRVWSVAFSPNGEQLASGSEDWT
 YVADLNNNR
VWNLETSESTFTLKGHTDPVKALAVTPDGKQVISGSWDKT $V L D A P S G E V L A$ VWDVLTGAERHTFHGHTGLVNGCAISPDGTWIVSASYDQT KITPSKIISTIAGTQTTILGDGIILSPTGEIYISDSGHHR LWNDRN RQVMKTFEGHTDKMWSVAFSPDGLTCLSGSEDKT KLWNRQGKELASFKGHGDSVMSVAFNPDGQTLVSGSTDGT LTVDWTNGSVLH LQLIGGGEYPCFVACSKKDDTAVTTKNS WDVRTGECLKTLQGHTGHVRSVAFQEFGDVLASGSDDQT VWDAESGDCISMPFAGHTHVTSVTFSPDGKRVVSGSWDMT VFSPDGKTHLDTYSNGGRSYGVAIDDEGYLELSHHKNDY 1 WNTATGDLLSTLSGHLNSVNSVAISPDGKLLASGSKDRT VWDASTGAELKVLNGHMQS|ISSVTHSTDGTHMVSGLDDNS LWDPKTGEVIRTLWGHTGRVNSVSFSRDGQTLASSESDDT WNVPFRKLTQSLEGHSDAVRSVNFFSDGSKVVSGSQDNT FAFDLDGNLKFDFGRQFQNPEGVTVDRAGNDIVSNAGDGR LWEVNTGQLKSRTTNHDGGVFSVCFSPNGSTLVSCSADES KNQATGRKIGQLTGPGQVVKAVAFAPDGTALATAGWDN LWDLEQGRELATLSGHSDWVYAVAGAPDGKRAVSASNDKT WWDHE HKCVKTLEGHTDQVRPVSFSPNGNILASGSGDCL VWDAL GGKCLKTLGHGDLINSVAFSPDGRFVISGSNDRT LWNLTTNKALALLRGHSDFVKSVSFSPDGKTLA SASADRT 1 WETTTCEKDKELKGHSNYVLKAQFSPDGCFIVSCSWDKT
 L W
IVDAHDAKVVAVLRGHSDTVWGVTWSPSGDRLATSSTDGT LLKPDGSFIIREIGKGQLQYPWFIAVDSRDRFYVTDCRAHK VFNQNLDFMW
KIWDFKGELLKTLQGHKGGVHSTTFNSNGSTMLTGSQDTT DYHAMGGDERNLLTGHNGAVYAVEFSPDEKYUATGSADNS DARTAKP TGDPMHVLNDPMLPSAAWYEKTGRIVVQAEPGA RINTAGELSEYADPREKAEPHGLVVGPDGAVWFAQ VWNVAKGKIIRTWKENSQAATSLAIADDGKTLIGAGSDKR RITPDGDTVLHDLPTPGAGPVGLTAGPDGALWFVEIDAGQ KI SAAGVVTTTGADAVFKSPAGLAVDASGNI YVADQGTNT TLKFNNQGEFLEKYTDYGPNVGWQTFSNGNLYLGDYGQGL
IWEFATGNVICTNAHSSMMNAVALDSDDKYIFSGSNDQT
 WDOTMMOPPQTFEGHSREVSGVTFSPNGELLVSCSADGT LWNATAKKLQSFNRHQALIKNVIASSPDGKTLASVSDDKT EHVPRRVGGLGDGESGLCQPTH:AVNKCGELVVADTHNYR KLWSRDGKLLHTFKGHDSGDWSVAFSPEGQTIATGSNDGM RISTSGADTEFPLPDRAARPHAIVAGPDHALWLTEWGTGQ WWDVQSGKQVQLFEGHSSGVRGVLF LINNGLKIASHSYDNT WDVVTVQLVADPFQHTDEVNNISFSPDGKQLASSSNDKT VWNLSTGQKKFTLRGRNPIVSGAMSPDGQLLATSSNNGQ
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| UniRef90_D2VPM5 | Q R\|| $\mid$ K K V $\mathrm{T}^{\text {T T Y }}{ }^{250}$ |
| :---: | :---: |
| UniRef90-K9EXL9 | H T I K L WT K D G K L |
| UniRef90-UPI00044096FC | RTMCIWDS |
| UniRef90_K1QS83 | G K V K K I |
| UniRef90-Q5AY27 |  |
| UniRef90-K9PIT9 | R T 1 R L W |
| UniRef90-UPI00037CFDBA | T TVVI WNVQT GE |
| UniRef90_L8M8F0 | QT I K I WNPIN G Q |
| UniRef90-UPI00037D9BC4 | LT V R L WDVA G R |
| UniRef90-U7QH69 | DRVII WDLK ${ }^{\text {L G E Q }}$ |
| UniRef90-K7WTS1 | KTVKVWNLETGEEQ |
| UniRef90-X6MTX0 | KTI RLWDASSGKQTY |
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| UniRef90-K9W2N1 | NTLKVVDLLQ G |
| UniRef90-UPI00044080E2 | NTI RI W |
| UniRef90-R7SF62 | K T I K V WD A A |
| UniRef90_K9TP09 | K TLKLWDLA T G |
| UniRef90-A0YUL3 | NTIKVWNLETGEL |
| UniRef90-G4T6E8 | RTVRLWDAETGMQ |
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| UniRef90-UPI00040CC35C | K T I KLWDVQT GREFH |
| UniRef90-UPI00035EB2D5 | GRIVRLGVNG |
| UniRef90-A7RMW4 | NRVQVFTSEGEYL |
| UniRef90-A0A021W4R9 | GLVLQIRAD G |
| UniRef90-M2R882 | KTI RIWNSTTGE |
| UniRef90-UPI00034D9C8A | NTVKL WS REGQ |
| UniRef90-B0CDS2 | K S V RI WN |
| UniRef90-W4LFD3 | NRVRI Y GPE |
| UniRef90-X8F3N0 | DRVLKLPAQSNSRH |
| UniRef90-B4VHM7 | G VI R V W S |
| UniRef90-D0DC25 | NSLSLDD A |
| UniRef90-D6TPM3 | Q T L K V WGA LT GAERH |
| UniRef90-D2VAZ1 | Y RVRKVFT N |
| UniRef90-A7BVG4 | NTI RLWNSETEQE |
| UniRef90-X6MKM4 | NTI R L W |
| UniRef90-B0C5U5 | R T V K L WNMDLE H L R E |
| UniRef90-UPI0003EABEAD | GKIVLLSSEGR |
| UniRef90_UPI00037B47A8 |  |
| UniRef90-UPI0004409566 | S T $\square$ R $\square \mathrm{WD} \mathrm{A}$ |
| UniRef90-I1FDU4 | K GIT KY |
| UniRef90-UPI0003477D32 | Q TVKLWNTATG |
| UniRef90-X6ML19 | NTI RLWGP |
| UniRef90-B0D541 | K S V R V WD S T G E E L R |
| UniRef90-K9UVD8 | RTIRLWDLINTGE |
| UniRef90-F4XK01 | HLI KL WDPK T G E |
| UniRef90-X6M7P3 | KTIRI WD |
| UniRef90-G3AHR1 | DSVVNLWD $\mathrm{S}^{\text {G T GRR }}$ |
| UniRef90-C3Y3H7 | HCI |
| UniRef90-A0C2Z9 | K S I HLW |
| UniRef90-B4VJX3 | K TI K L WNPDG |
| UniRef90_E3JD58 | GAVILWNTATGRR |
| UniRef90-D4ZXP5 | K T L KL WD |
| UniRef90-UPI00047EAC18 | GSI R L WD T |
| UniRef90-G6FNK1 | K TVVKLWS $\square$ D GKEL |
| UniRef90-B0DYW7 | K TVRVWDSSTGQ |
| UniRef90-A8ZKU8 | QTVRLWDVYS G |
| UniRef90-UPI00034CFB37 | KTI KLWNLDTNNQE |
| UniRef90_S7RLI7 | C TVRVWD T LT GQ |
| UniRef90-X6P0R4 | STIRLWDS K S G |
| UniRef90-U7QHL4 | K TVRFWDTQTGN |
| UniRef90-C3ZU14 | H T V A $\square$ Y |
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| UniRef90-G2GCV6 | GTVRVWDAT T |
| UniRef90-C3Z485 | GHLQVFDPDGMYQR |
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| UniRef90-I0X6G7 | G S V VI F D S $\square$ T G |
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| UniRef90-L0J8R3 | SAI QLWVQT GKELLRE |
| UniRef90-F5LGC0 |  |
| UniRef90-UPI000476FC40 | K T 1 K L WNLK T K |
| UniRef90-L8EUF8 | GRIGRIT TS GR |
| UniRef90_H1Y022 | HAI R KVTS A G |
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| UniRef90-UPI00041068A5 | GTI RVWD |
| UniRef90-I8TRM0 | Y K L Q W Wd Ia T G M |
| UniRef90-G4TQM7 | HTVRLWDITDQ |
| UniRef90-K9ZFD9 | K TVKLL WDLK G K Q |
| UniRef90-G4U2Z3 | STI RLWNA Q |
| UniRef90-UPI0001CBBBCC | RRI QMFTYWGRF $\square$ R R |
| UniRef90-B1M2A1 | NTLSLLD S K |
| UniRef90-K9X730 | KTVILWN |
| UniRef90-UPI0004758F04 |  |
| UniRef90-X6LTD2 | NTVRLWD S S G R Q $\square \mathrm{H}$ |
| UniRef90-F8PD52 | K S I K V WD |
| UniRef90-D2SAI7 | A TVRLWNPATGR |
| UniRef90-UPI00034909FD | RNI RI WDSTGKQLH |
| UniRef90-K9VRF8 | 1 IVWDLK T GKER |
| UniRef90-DOLUU9 | GSI RMWPLA |
| UniRef90-UPI0003677D52 | GSVILWDVADR |
| UniRef90_G4TSQ0 | NTI RLWQGVTGR |

UniRef90 M7UBS3
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UniRef90 ${ }^{-15 J K 67}$
UniRef90－F1Q4G4 UniRef90－Z5XQK1 UniRef90－M2P804 UniRef90－K9Z9Q8
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UniRef90－D6U864
UniRef90－G4TUZ7
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UniRef90－।11YIQ3
UniRef90－AODHV3
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UniRef90－Q8YZ23
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UniRef90＿D7DWT9
UniRef90－BoDYZO
UniRef90－AOYWB3
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UniRef90
B2W5L4 UniRef90－UPI0003FC191E UniRef90－B4VP88
UniRef90＿D6TBP7


PSDVALGPQGWIYVLDTNNVVRVYN VSPVGVAITPDGSRAYVTNYGDGKVSV G【TLVNTWQLDSYFSVRSLTFSPEPKILAGGGGGYNSTUK GGLSSPEAIA ADAAGNAWVGNVSSNSVTTV GQCLNT解AGHQDAD WSVAFSREGDVLASSSDQTVRLWN GEC $\square R T \square R A$ YANWAVS $\square A F S A D G \square M A S N N D A S V R \square W N$ GKVIKTGRGHGQFSTPLSLAVTTDGFLVVAEFYNERQUDD NSVCFSPDGTTLASSDDNSTRLWD NAVQFSPDGLKIVSDDDTIPI WDA $P$ VAVRFDRGGVLHVLSRGVEGIVTR QLSYPAG\｜ADSSTGDLYISDNYNHGLISN GSFGTSGDGTGAFAQPAGIVVGSDGVAYIADAGNDGVVTT GNTLTGYTDYTDAFSPSGVTGSADGNIYLWDATSNAQTLT GNLVRTLSGHGDWV LAVSFSPDGKTVASASDKTMKLWN GHDRELN SVVRFSVNGRTIVSSSNDHVRUWD LLQMSGHAGEV YSVTFSPDGTRVVSGSWDEAVRIW GDVIQTLMGHTDRV QTVAWSPDGQTLAAAFDHTDWLWD GQPLQPIRGHEEWV TCVAFSPNGSRIVSSWDKTIRLWD
 $\square A V G K S P V G V A T S A A G R V Y \mid S N D S Q S V S V I D D$ QSVCFSPDGKTLASSDDDSIRLWD

NSVAFSPDGT पMATSWDNTAK $\square W S$
FSPDGKTILTSQDGAARLWD GQQKПK DDGHRDQVN SMCFSSDGTTLASGSGNSTRLWD FVLSFLGADLPNTPLSVAMNSQGLIGVTDSDNSVKVYT GKLIRTDTGNLGAIS SVAMSPNGHFLAVGSCEHVKVWN GQLIRNLKGHS NST GEELRTLKGHSSYV Y GQLDRVIKGHSSWIS SVVISADGKTFASSRDNTIKLWN GQCiMPVKGHDDWVS NVVAFSPDGQTLASSSDQSVVRLWD TSVFSDGTLASASWDKT RLWT GKEDQS四KDTGPV FSVDFSSDGTRVVSSRDTTHRLWT $S P L$ ESVDFSSDGTRVVSSRDTTURLWT
 SVVF $\square P A G D K \| S G S S D R T R \Pi W$
VLDPLQGHGELV TCLAVSPDGSCIASGSADETIHLW $K G S A P G Q F D D P T G I A V V G D E V F V A D S R N R \| Q V F D$ पDTGRNPAGLAVGPNGNVYIAEFDNDVRKIT DVSFSPDSQTLVASRDKTLKLWT

K ILS CSDDYT\R\WD VNFSPDGNMLASCSDKSIRLWD
 GELLYGFPLGKFSTNPYALAVQRDGRVIVTDPGNHSILDF VQGTKNGQFSDPQGIFVDGKDLVYVADTGNHRQVFD YAVAFSPDGKTIATASDKTARLWD

$G G L I N T L L G H S Q P V G T \quad L A \square S G D G R T L V S G S G D T \| L V W D$ GQLQTTLTGHSNGV YDVNFLSENRLVSASADHSLKVWQ

UniRef90 M7UBS3 UniRef90_UPI00034C7E2A UniRef90_A0A014L7T1 UniRef90_UPI0003F713BC UniRef90_K9TH25 UniRef90-K9W7D5 UniRef90-BоС635 UniRef90-B0DYW5 UniRef90-X5JK67 UniRefofo-F1Q4G4 UniRef90-Z5XQK1 UniRef90-K9Z9Q8 UniRef90-UPIO00444A1AE UniRef90-UPIO003B65FOB UniRef90 UPIO0036CD7F8 UniRef90_K9PCE7 UniRef90-G8NPY6 UniRef90-UPI000255DE31 UniRef90-BOCFV1 UniRef90-UPIOOO4408795 UniRef90-E6Q0J3 UniRef90-K9XD32 UniRef90-KgWIW8 UniRef90-C3ZZ84 UniRef90-UPI00034A7A8D UniRet90_R7VKR2 UniRef90-AOEBO1 UniRef90-X6NDZ8 UniRef90-M3D744 UniRef90-D2VFB9 UniRef90-D9W630 UniRef90-Aoszz3 UniRef90-UPI0003B59818 UniRef90-UPIOOO347E106 UniRef90-X6P7S7 UniRef90-A0YR05 UniRef90-M2QHH6 UniRef90-V5MAL8 UniRef90-D6U864 UniRef90-G4TUZ7 UniRef90-AOBEC3 UniRef90-X6LXA5 UniRef90-I1YIQ3 UniRef90-AODHV3 UniRef90-M2P818 UniRef90-M2QHH3 UniRef90-Q8YZ23
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UniRef90 $\mathrm{DgWWF4}$ UniRef90-D9WWF4
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UniRef90_D6TBP7

TTTGПQTQEGHTSTVTSVAFSPDGKQVVSGSYDDTVRTW0 ${ }^{60}$ ADLTGSVFTETMSSLVSVRFSPNGEYFAIGTISGEVRLWR AD DS DRQRTLFGHKNSVYTVADSPDGNVASGSDDQTLKLWD
 LTGQEVSDFSGHSQVNTLAMSPDGETLVSGSNDSTUKLWS FSGKLEKELTGGHSVH VT GDCVQT पe GHS GVY SVAFSPDGKVLASGSDDKDVLWDV PGGPDF GGLHWPALASPKASHLFTGYAGRFPHIPH 1 DTATGTPI TVGSRPWGVAFTPDGTRAYVANQFSTSVSVI LWNNTGKEVRTLSYPYSITFSPDGKTAASGDSSRQWKLGG LSGTNGYTGGGLAAPKAIADDAAGNAWVANTDGNSVTEIS




































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$\square$
 PEGTTLTQAAGFDRPFGLAFGDDGTLYAGDSSGGALWVGN
 TGECVATLDGLSRANCVAVFPDGRRVVSGSGDKTVKVWD
TS DERKLVLTGHVGPQGDAVDTQGTLLISGSWDNTVKDWN VTGOQKAQATELLDVTVAFSPDGSKVSGSLDKTVRLWD ANQSPHVALSHAALPDGLSQGSQVQVLVDNEDSAPGTNMK ANQSPHRALKKADQVWSVSFSPNGKTLASGSVDKTIKLSN
 K REGKVLKSWQAHNDAVSLAWSPDSKTLVSGSLDQTIKLWN






$\square$





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90
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110
120
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 A E T G E R I R N

 LA T G Q E M R T F A G H S S G V


 PGVNKP HY IPVPAPKDGVPSDPTDVVF DTATNTVTPITVGGGAWDVA $\quad$ TAP D GTRAYVTS GGSNKVSV
 SA S GAN GY IGGGLSDPE GIADDGSGNAWVSNFGGSAVTEF VA A R R QR GPTGGEGAVNAVAFSSPDGRVVSAGVDGTVRMWD





 PD GRTREVVRRGFDGPYGVVVDDLGTVHAADH YRDASPAT


 AD G T L R T T L T D H Q D L V V Y A V A F S P P D S Q M M V S A S S D K T VV K ARTGELMMNSGHSDGVLCVVAFSPDGKMISGSMDHTMRLWD
 TEN GQSEQQLQSYA S LYD A WS P D GTRA A SGSS D G V VMIW

 TA LMMQESFRRLKTGSGPVVGIATNSNGHRVVVADWYENVVVKV $F Q K G Y Q K A K L A G H G S V N S V C F S D D G T T L A S G S S D Y S I V R L W$ A Q T G A Q Q L L D Q G H S G L V A C V A

 I E DE Q K V K L D Y H T K TVV H S V

 LA T G E L Q K K T LT G H N S V N N A I T V D T D S E L I Y G S G S V D N S I N I W A T G E E DR T L K G H D S V H SVVAI S A D S K T L V V G S D D K T I K L W





 ARTGGRPVMDKGHSSSTlWSVVAISSPNTQQV


 AATGECVATLAGHSDEWCVAVFPD GRRVVSGSHDKTVKVW


 PR S A P P ES H Q G H R S
LVV V C V
 K S WG GKGP EPGQF DGPMYLADDRSDRLYVGDAFNQRVQVF



 | $L Q$ |
| :--- | :--- |

 VAS GMPR G V L R G H S R T Y G|V|A WS P Y G RLL L A S C G W D H A $\mid$
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UniRef90_M2P804
UniRef90_K9Z9Q8
UniRef90_UPI000444A1AE
UniRef90_UPI0003B65F0B
UniRef90_UPI00036CD7F8
UniRef90_K9PCE7
UniRef90_G8NPY6
UniRef90_UPI000255DE31
UniRef90_B0CFV1
UniRef90_UPI0004408795
UniRef90_E6Q0J3
UniRef90_K9XD32
UniRef90_K9WIW8
UniRel90_K3Z84

 $T V D G D D T E Y P A P G A F \quad P S A M A A G P D G A M W F T L N Q G N A G I G$ DLH Q GKCQTFRGHTDLVTSVAFSPNGRILASSSADKTIIR $N P Y T G K A L R K L R G H S S W V Y S L A F S P D G \square T L A S G S R D T T L M$



 D DD N P K K K R L Y G Q K G Q I R S V A F S D D G Y TVVVTGGSD D S S I F
 $G L M P G V Y Z T V D N D N H R V L A L D F D G N V I W A T G E M G R G$ IDTTNTVTGTPDTVGTEPQGVATTPDGRAYVTNFGSNTVGS
 $T G S G Q A V G E P L S G H G E A V L D V A F S P D G A D L A S G G E D K M V R$

 WD A T TGECLLSTMQHPSQVVRTVADSSDGQVIISGSKDRTII R

 $M L W K V E K Q R N D A G E L W N P C D V A F L D D G N M Y D V L N D K N N K L$ AKT G QQKAK LK GHSTSVVSINFSPDGTTMASGSYDNS I R DVFS GQQQDAFEGHSDAMNGI QLSSDNSKILSYSNDKTIR T DE GEP L GVVRTH L L L P FA H GI T A D GE
 NGSGQGPPVRRTGHAGPVKDVAYSPDGRLVATGGGDKKVI T PAGVV T TLAGTTGVAGDADGR
D A $\square$ S GE QR Q T LT G Y ES P L L SVAF NT D GT $\quad L A S G G \square A N N \square F$
 QLNPP VVLKTLNGFDTEVWDVVLDSDGQTIVASSRGGGIV AKT GKPL LHAFEGHTGDVNTVVMSPDGRRVVSGSDDKTIR
 AFTGKQVGSALRGHQDSVASLAFSPDASHFASGSSDAT R




 $N L K T G K A \| R T M S G H K G G V N A I A \square S R D G Q T L A S G S D D K T V C$ EVATGELAGP LLHHQGPIDVVAFSPDGRLVLTAGQDNTAR DVNTGQQQKAKL QGHSDKVWSLCFSPDGTTLVSGSSDKS IC Q 1 E H HLE G G F S $\square G$ $M N S N G E L I \quad F T D T R N N R \square R K V S T S G Y I S T \square A G N G T V A Y$ NPFTGDPLRSMDGHLGEVTSIAIVSGDGEVLFSGSADKTVK





 HVSNGKCLK I F K GHTQLLRRVNFSPDGEILASGSCDRTIIK $T I Q R D D K G T P L Y S G N E K I K Y I T E N R N H D I C V A D W A A G A V V$ | $D$ | $V$ | $A$ | $G$ | $R$ | $R$ | $K$ | $R$ | $L$ | $T$ | $L$ | $R$ | $G$ | $H$ | $E$ | $S$ | $T$ | $V$ | $S$ | $D$ | $L$ | $A$ | $F$ | $F$ | $P$ | $D$ | $G$ | $R$ | $T$ |
| :---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $A$ | $A$ | $A$ | $D$ | $F$ | $S$ | $R$ | $H$ | $V$ | $K$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $D$ | $A$ | $T$ | $T$ | $G$ | $K$ | $L$ | $L$ | $K$ | $T$ | $L$ | $T$ | $G$ | $H$ | $S$ | $S$ | $A$ | $V$ | $N$ | $G$ | $V$ | $A$ | $W$ | $S$ | $A$ | $D$ | $G$ | $K$ | $T$ |
| $L$ | $A$ | $S$ | $A$ | $S$ | $S$ | $D$ | $T$ | $T$ | $I$ | $K$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

 T T T G D A R V M
 DPEGLPPAPE L LAA GAAEDP




 A Q T G A P V L D P L
 DNE GTMFDAMNP GNLATVSGLNVDNNGYIVISDDDVRRIQ WDTENGKELATLDHQSSVVAVAFSPDGKTIATASSDKTA

 EADWDACRSTLLE GHSDYVRAVAFSPD GQLVVASASND KTVR NWHT GQLLRRTFKA HSEAIWSVAISPDGQSLATGSWDHS I K


UniRef90 M7UBS3 UniRef90_UPI00034C7E2A UniRef90_A0A014L7T1 UniRef90_UPI0003F713BC UniRef90_K9TH25 UniRef90-K9W7D5 UniRef90-BоС635 UniRef90-B0DYW5 UniRef90_X5JK67 UniRef90-F1Q4G4 UniRef90 Z5XOK1 UniRef90_M2P804 UniRef90-K9Z9Q8 UniRef90-UPI000444A1AE UniRef90-UPI0003B65FOB UniRee90 UPI00036CD7F8 UniRef90-K9PCE7 UniRef90-G8NPY6 UniRef90-UPIO00255DE31 UniRef90-BOCFV1 UniRef90-UPIOOO4408795 UniRef90_E6Q0J3 UniRef90-K9XD32 UniRef90-KgWIW8 UniRef90-C3ZZ84 UniRef90-UPI00034A7A8D UniRef90-R7VKR2 UniRef90-AOEBO1 UniRef90-X6NDZ8 UniRef90-M3D744 UniRef90-D2VFB9 UniRef90-D9W630 UniRef90-Aoszz3 UniRef90-UPI0003B59818 UniRef90-UPIOOO347E106 UniRef90-X6P7S7 UniRef90-AOYRO5 UniRef90-M2QHH6 UniRet90-V5MAL8 UniRef90-D6U864 UniRef90-G4TUZ7
UniRef90-AOBEC3 UniRef90 $\times 6 \mathrm{~L}$ ХА UniRef90-Q1GzE6 UniRef90-॥1 YIQ3 UniRef90-AODHV3 UniRef90-M2P818 UniRef90-M2QHH3
UniRef90 $\mathrm{Q} 8 \mathrm{YZ23}$ UniRef90-O8YZ23
UniRef90-D8FVGO UniRef90-LODH44 UniRef90-AOBQM8 UniRef90-F6UML6 UniRef90-D2VZ49 UniRef90_D7DWT9 UniRef90-BODYZO UniRef90-AOYWB3 UniRef90-K9WSI3 UniRef90 UPIOOO2F9F3D5 UniRef90-B0D1W2 UniRef90-K9TGT5 UniRef90-G4TQB9 UniRef90-X6MIE6
UniRef90
D9WWF4 UniRef90-K9PDC1 UniRef90-K1Q8D5 UniRef90-LODR60 UniRef90-K9V3J1 UniRef90-UPIO004410D9D UniRet90-M2PJUO UniRef90_UPIo0036915B4 UniRef90-DOL142 UniRef90-UPIIO0034A77D5 UniRef90-B4W4H3 UniRef90-F0YG01 UniRef90_AOAO26WPE3 UniRef90-K9TPQ2
UniRef90
X6MTJ5 UniRef90- AoCJ90 UniRef90-M20W77 UniRef90-B7K999 UniRef90-C3ZQ23 UniRef90-12F8S3 UniRef90-Q10VX7
UniRef90 D9TEL1 UniRef90-A0YUH5 UniRef90-B8HZ95 UniRef90-K9QC24
UniRef90
B2W5L UniRef90-UP10003FC191E UniRef90_B4VP88
UniRef90_D6TBP7
 LWDVRTGECIKTLNGHEDWVWSVTFSPTDNGILASSSDGK RITMDGRTTAHPLPTEAAAPVGLAQGPDGALWFTEDGAGQQ
$L W D V S H G Y C S Q V L W G H A A T V S K T S F S P D G Y T L I S G S H D G T$ LWNVHTGKQFFTLYGDSGLVNAVAFSPDGQTLVSGNFDGS WHKAKKKERSTLDAHSEAIQTIAVSPNGKWMISGSDDTT L WDWANGSTLKTLEGHTDAVLSLAYNTLDQULVSGGRDKT LWSLVSGEKIRTLKGHLGTVTSLAMTPDGKTLISGSKDSM LWNALTGNFIKFLPLHTSAINSLELSPNGNADASASDNGE WDASTGQALLEPLEGHTKWVTSVAFSPDGTRVVSGSGDST LWDVQTGDCVQTLESHSNSVFSVDWSDDSLTVASGSGDKT VIDTATNTVTGTPIEQFRYPFLMDEDQDGYDYVVEVINTM $L W N V V T G R E F H T L R G H S D D V T S V V F S P D G R T L A S G S Y D K T$
$E F S N A G V S G N Y T G G G L D E P F G I A D D G A G S A W L P N F S G N T$ LWDRSRRQQGPELAGHEAAVRSVAFSPDGRRVASGGDDWQ WDTSSGHCVACFTDHTSWVWSVSFAHSSNLLASGSQDRS VWDVERGEMAFKPLKHTDTVIDSVAYSPDGVRVVSGSFDRT LWHVSTQQCYQTLREHTGHTKAVVLSADGQRLASGSDDGI IWDVETAELIDHTCAHSGWIKSLAISPDAKDLVSASADRT GGKGQGQQQLSSSLRVAVNSSNHIIISDNRNNN KLWDKHGTLLKTWRGHSAEVYDVAINDQT IATVGADKTLK RIFDPTGTSLDTLAKGDIRPLGVADTREGNDAVTDCKGKR
 RTYDTTTGEVRERARGLNRPLGIAVRPDGALVVAETGAGR
 LWDAARRNRTAASGEAGTAVNGVAFSPDGRFLATANQDRK
 KLWDVNGVLLATLEAHQGGVKTVAFSPDGQMLATGSEDQT LWDVTTGEDVIAPSGHSDRVRSVAFSPDGTRIVSGSSDDT SVINTATNTVIATDPVGDRPRIVVFTDDGTRAYVTNQNSN FWDANTAQSLGISQHHQGPVHTVAFSRDGSQIASGSSDGT FWDANTAQSLGKSQHHQGPVHTVAFSRDGSQLASGSSDGT VWDISSGNQWLLLEGHEKRANEIQLSSDGTTUASCSYDKT
 EPLEGHTNWV TWDTRTGRPVTKPDEHSSTTWSVATSPDGTR VSGSYDKT KLWSRTGRPVTKPLEHSSTVWSVAISSPDGTQUVSGSADAT LWNLKTGSRMLTLSGHRAQVNALAFSRDGQTLVSGSDDKT LWEATGKPVGSPLRHQNWVEAAAFSPDGKTVLTGSQDST
 IWHLSTGKLLKTLNGHTDKVKSIAVSPNGEFVEGSVDKT AWDALTGQSIMNPLIGHWCVQSVAFSPDGRYVVSGSDDKT WW WK K GQLIQTLPGHDHDLLDLAVSPDSKFIASGSSDQT
 LLDANTGQLIAMLRGHEGRVVAVGYSPDGSALISGSWDTT AVIDTATNTVSASTLTGDVPILVALTPDGTRAYVSVAGEN AWDVASGKCLYTLQGHTSEVLVALAFSPDGLTAASGSADKT VVNQDGKLRWRYTGHPSATKNGVTTDSQSRLLTADGDNHC LWDETTGKPLKTLTGHSDGVISVAWSADGKTLASASLDNT WDSATGAHLATLERPSGPVESLCFSPDRIHVVSGSRDQT VFGPFADNDFGPFNGWFATVTNVTLDGQGHVFAADFYNHR GFADGNGAEARFDRPLGVAVVD DEIYVADSANHR $K$ WWQDDGTLLETLSGHTDSVNSVCFSPGGEMLLSAGADAT
$I W W R D D T L V K T W E A E G R V T S V N W S Q D G Q A A V G T E D N T A$ WRRLDDTLVKTWEAEEGRVTSVNWSQDGQALAVGTEDNTAA
$V W D V A T G E C V A T L A E H S N Y V W S V A V F P D G R A V V S G S W D N M ~$ RFKFQFGECGKRDGQLLYPNRVAVVKTSGDDIVTERPTHQ TWA IETGDLLHTLTDHRGPVRAIAISPDGQTLISGAADAT RUWIVSSGKQIKLGRHFSITTEAQFLPDGNKIISCSFDRT FWDVRTGQQKAKLDGHSSTVTSVNFSPDGTTLASGSEDNS LWNARTGRQVPDPLRHGSWVQSLVFSPDGTRVISGSSDDT KYRYM
KYDPEGNFVAEWGSGYSGKWGGSTПDSSGNDHY TNKMNNM RLWDTENGNVLATLNHQDWVIAVAFSPDGKTIATASSDKT
 1 WDCKTGECLQTLRANQSSVRSIAFTSDSRYLVSACEDHQ WRWDNVLLRNPESDQADWITSISFSPDSRNIAAASRDST WDANEGLSQYFSNTPAQULLGHAFSPDGQTVASGOFAGT

## UniRef90 M7UBS3 UniRef90_UPI00034C7E2A UniRef90_A0A014L7T1

 UniRef90_UPI0003F713BC UniRef90_K9TH25 UniRef90_K9W7D5 UniRef90_B0C635 UniRef90_B0DYW5 UniRef90 X5JK67 UniRef90_F1Q4G4 UniRef90_Z5XQK1 UniRef90_M2P804 UniRef90_K9Z9Q8 UniRef90_UPI000444A1AE UniRef90_UPI0003B65F0B UniRef90-UPI00036CD7F8 UniRef90_K9PCE7UniRef90_G8NPY6
UniRef90_UPI000255DE31 UniRef90_B0CFV1 UniRef90_UPIO004408795 UniRef90_E6Q0J3 UniRef90_K9XD32 UniRef90_K9WIW8
UniRef90 C3ZZ84 UniRef90_UPI00034A7A8D UniRef90_R7VKR2 UniRef90_A0EB01 UniRef90_X6NDZ8 UniRef90_M3D744 UniRef90_D2VFB9
UniRef90-D9W630 UniRef90-D9W630
UniRef90-A0SZ33 UniRef90-UPIO003B59818 UniRef90_UPIO00347E106 UniRef90_X6P7S7 UniRef90_A0YR05 UniRef90_M2QHH6 UniRef90-V5MAL8 UniRef90_D6U864 UniRef90-G4TUZ7
UniRef90-A0BEC3 UniRef90- X6LXA5 UniRef90_Q1GZE6 UniRef90_I1YIQ3 UniRef90_AODHV3 UniRef90_M2P818 UniRef90-M2QHH3
UniRef90 Q8YZ23 UniRef90_D8FVG0 UniRef90_L0DH44 UniRef90_A0BQM8 UniRef90-F6UML6 UniRef90_D2VZ49 UniRef90_D7DWT9
UniRef90 B0DYZ0 UniRef90_A0YWB3 UniRef90_K9WSI3 UniRef90_UPI0002F9F3D5 UniRef90-B0D1W2 UniRef90-K9TGT5 UniRef90-G4TQB9
UniRef90-X6MIE6 UniRef90_D9WWF4 UniRef90_K9PDC1 UniRef90_K1Q8D5 UniRef90_LODR60 UniRef90_K9V3J1 UniRef90_UPIO004410D9D UniRef90_M2PJU0 UniRef90_UPI00036915B4 UniRef90_DOLI42 UniRef90_UPI00034A77D5 UniRef90_B4W4H3 UniRef90_F0YG01 UniRef90_A0A026WPE3 UniRef90-K9TPQ2 UniRef90_X6MTJ5 UniRef90_A0CJ90 UniRef90_M2QW77 UniRef90-B7K999 UniRef90-C3ZQ23 UniRef90_I2F8S3
UniRef90_Q10VX7 UniRef90_D9TEL1 UniRef90_A0YUH5 UniRef90 B8HZ95 UniRef90_K9QC24
UniRef90 B2W5L4 UniRef90_UPI0003FC191E UniRef90_B4VP88
UniRef90_D6TBP7

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ค$V$ R LWW L L R R CQR S $\square$ SAGS GRVMGVCFSPDQRMLATAGF D

| V | $R$ | $R$ |
| :--- | :--- | :--- |
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I Q I Y N QY G Q F V RK F GA N I LQ H P PR GVVTVV SK GR IVV VE C K V


## VVVLDPKGSFLFEWGGSGFTRPDDLYFSDDGSVFVLEQSG








| UniRef90_M71 | $K T V\|R\| L \mid W D \square A T G G Q Q$ |
| :---: | :---: |
| UniRef90-UPI00034C7E2A | RTVKLWD |
| UniRef90-A0A014L7T1 | G GVGRI |
| UniRee90-UP10003F713BC | KTVKLWDTTGQ |
| UniRef90-K9TH25 | QTVLL WD |
| UniRef90-K9W7D5 | KTLKVWNL |
| UniRefoto-BOC635 | CSI KL WDV |
| UniRef90 BodYw | R I R R WN A |
| UniRet90-X5JK67 | R |
| UniRef90-F1Q4G4 | NTV WK |
| UniRef90_Z5XQK1 | QSIMF |
| UniRef90_M2P804 | KTVR\|VWDASTSQ |
| UniRef90-UPIO00444A1AE | STIR1 WD |
| UniRef90-UPI0003B65F0B UniRef90-UPI00036CD7F8 | GVVQUVEKKDGKFL |
| UniRef90-K9PCE7 | KTIKLWDATGKE $\square$ R |
| UniRet90_G8NPY6 |  |
| UniRef90_UPIO00255DE31 |  |
| UniRef90_BOCFV1 | GWI RFWD |
| UniRef90-UP10004408795 | NDVILWN |
| UniRef90-E6Q0J3 | DR1GR1T P |
| UniRef90-K9xD32 | S RLWD KT |
| UniRet90-C3Z284 | QRVSMFGSD |
| UniRef90-UPIooo34A7A8D | s 1 K 1 WD |
| UniRef90-R7VKP | D V |
| UniRef90-A0EB01 | NSI RLWDVKTGQQ |
| UniRet90 X6NDZ88 | GT R1WD |
| UniRet90-M3D744 |  |
| UniRet90-D2VFB9 |  |
| UniRef90-D9W630 UniRef90 A0SZ33 | QKVMLWDVAERTR |
| UniRef90-UPIO |  |
| UniRef90-UPIOO | KTVKLWDKDGR |
| UniRef90 X6P7S7 | KTVRLWD |
| UniRe90-AOYR05 | GTVKWD |
| UniRef90-M2OHH6 UniRet90 V5MAL S | K ${ }^{\text {K }}$ |
| UniRef90-D6U864 | GLI SLWNPSDGRW |
| UniRef90-G4TUZ7 | GTI RLWDVQTGHQ |
| UniRet90-AOBEC3 | FSILLWDVKTGQQ |
| UniRet90-X6LXA5 | K T 1 R1 WD |
| UniRet90-Q1GZE6 | V |
| UniRet90-1YYQ3 | S |
| UniRef90 AODHV3 | K S:RLW |
| UniRef90 M2P818 | N T 1 R 1 WD |
| UniRef90 M2QHH3 | D T: RLL WD |
| UniRef90-D8FVG0 | NTi R1 |
| UniRef90-LODH44 | GSARLWDVA |
| UniRef90-AOBQM8 | NS Y ${ }^{\text {L }}$ WDVKTGE |
| UniRet90_-6UML6 | H |
| niRef90_D2VZ49 |  |
| UniRef90 D7DWT9 | KTVKI W |
| UniRef90-B0DYZ0 | KTI RLL WDAVTGH |
| UniRef90-AOYWB3 | GV V M C |
| UniRei90 UPIO002F9F3D5 | GYVMLWDLK】GHR |
| UniRef90-B0D1W2 | A TLRI WDAL |
| UniRet90-K9TGT5 |  |
| UniRef90-G4TQB9 | KTLRLWDTATGQ |
| UniRee90-X6MIE6 |  |
| UniRef90-K9PDC1 | SAISLWDTFGGYTRR |
| UniRet90-K108D5 | GNVKKVK |
| UniRef90_LoDR60 | R K |
| UniRef90-K9V3J1 | NTIKLWD |
| UniRef90 UPI0004410D9D |  |
| UniRef90-UPI00036915B4 | NRVQKW |
| UniRef90-DOLI42 | SRVRK |
| UniRef90-UPI00034A77D5 | KTVRLWHRDG |
| UniRef90 B4W4H3 UniRef90 Foycol |  |
| UniRef90 FOYG01 UniRef90 A0A026WPE3 | QTVKVWDAATGE |
| Uneeo-katrocas | RTLKIWSLTTGELQ |
| UniRef90-X6MTJ5 | ETIRVWD |
| UniRef90_A0CJ90 | NS:RLWDVKTGQQ |
| UniRet90_M2QW77 | At ${ }^{\text {a }}$ L |
| UniRef90_B7K999 | W |
| UniRef90_C3ZQ23 |  |
| UniRef90-12F8 UniRef90-Q10 |  |
| UniRef90-D9TEL1 | GTVRLWD |
| UniRef90-AOYUH5 | DTVRIWDVNTGQL |
| UniRef90-B8HZ95 | D Y V V |
| UniRef90 K9QC24 | K ${ }^{\text {V }}$ K |
| UniRef90 B2W5L4 | K |
| UniRef90 UPIOO03FC191E UniRef90 | DTL |
| UniRef90_B4VP888 UniRef90-DTETP7 | NTAKLWTIQGKYI |
| UniRef90 D6TBP7 | GELLVWDANGEYVR |

 UniRef90-X6NWX5 UniRef90-D8FZP7 UniRef90_UPIO003632D26 UniRef90_K7W6N0 UniRef90-A9WFE9
UniRef90-A4YV38 UniRef90-C2ZPN1 UniRef90-UPI0002EB3E06 UniRef90-B4VJJ3 UniRef90-Q01T33 UniRef90_UPI00037FB228 UniRef90-U5QDP9 UniRef90-A0A049B2U8 UniRef90_C1ARD8 UniRef90 E5WKU7 UniRef90-S9QCY4 UniRef90-D1YX27 UniRef90-G8RV33 UniRef90-M2TIE1 UniRef90_UPIO0037C1D07 UniRef90-M2QWJ9 UniRef90-L0J750 UniRef90-X6M3K0 UniRef90-UPI0003716254 UniRef90 X0QB37 UniRef90-T1HT84 UniRef90-11FTT0
UniRef90 K1WFF5 UniRef90- X6MF73 UniRef90-K9UXQ1 UniRef90_UPI0004407EED UniRef90 K9S8L0 UniRef90-UPI0004408667 UniRef90_UPIO0047AF96C UniRef90-UPI000372CC40 UniRef90 X6M212 UniRef90-A0EG03 UniRef90_Q112W9 UniRef90-R7QML9 UniRef90_UPIO003A0EF30 UniRef90-C3YGF3 UniRef90-LODPJ6 UniRef90 UPIO0034AAE28 UniRef90-UPI00021A5460 UniRef90-C3XY68 UniRef90-M2QY89 UniRef90- X6M7R7 UniRef90-E2ATR8 UniRef90_J3S993 UniRef90 K7VZX0 UniRef90-K1PD14 UniRef90-D5U5X0 UniRef90_A0D5I2 UniRef90_G4TM09 UniRef90-D8Q5D2 UniRef90_UPI000346C8FA UniRef90_UPI0003618F68 UniRef90-I1E6U4 UniRef90-G8NNV2 UniRef90-UPI000463B310 UniRef90 D8G7W6 UniRef90-UPIO0034C6B41 UniRef90-X6NUP0 UniRef90_M5C1X7 UniRef90-AOYXM9 UniRef90-X6NE63 UniRef90-X6NU31 UniRef90_D7AJL9 UniRef90_C3YDR0 UniRef90-V6KPF3 UniRef90-X6NIV9 UniRef90 ${ }^{-}$X6MGA8 UniRef90_UPIO0032B2276 UniRet90_W1SAT9 UniRef90_D2BDC6 UniRef90_D7A4L5 UniRef90-UPI0004409C32 UniRef90-X6NDN6 UniRef90_U5WUI5 UniRef90_C3ZU27 UniRef90_A0YTJ7 UniRef90 X7Z2A5 UniRef90-UPI0002F59341 UniRef90-X6M2H0 UniRef90-K1QWE3 UniRef90 X6NSS4 UniRef90-K9TJ67 UniRef90-K1QYA7 UniRef90 X6MRW3 UniRef90-UPI00046A1107 F S P D GNMVVSSNDNTIRLWD ESVNFNPDGKTFASASD GQVKKWR
G H R L A R SVAF S P D G K R $\quad$ DA S G G T D RT L R L
 WAV A WS P N GK I I A S A S D K T I K L L WH


$\square$ N T $\square$ R G H S D R $\square$ S T


S VS F S P D G S L LAA T D LD GK $\square C L W R$
$T \bigvee G S N P S G A V F T G T R T Y V A N Q G S S V S V L D$ GPYGワAVS DK GEVWF THKANKI S Cl G A V A FS P D GRVLSA GEDK TARS WD
 $T G \square S \square L H S \square R G \square A V S P D G S C \square A S G S D K A D R L W D$ S SLAFS P DGRLLASGSDFTVQVSD
 GQSVDPLT GHT DWV T A V K F S P D GT RLLA TSS GDNTVRLDW

$\begin{array}{lll}G Q Q U Q L E \\ G K L I & L & G H E R G L \\ N\end{array}$
Q S V AVSPDGRII ASSRDNTTRLWH G V Q I S A D G S K L L S S T D R T V R L W W AVA $V$ S P D G Q QL V S G S D E T $\square K$ QWE
GQLLNT $\square Q G H S N V V$
$R G V S F S P D G N R W V T S D D R T V K L W R$ SVAA F S S D G K R I V S G S R D E R V I ll W

GHSNAVN
GQQMFKLE GHEHCVN


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\(\mathrm{K} V \mathrm{~V}\) R \(\square \mathrm{FRGHKSRMN}\)
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H G L A A F S P D G T T L A T G G T D R T V

 G G GDFNLFNPRGVADTPDKF ILVSDDHRDGYLNK
VM K P LE G H T G P V
 T GVQF S P D G S KVVSALDEKLRLWD
$T \square L H S T G R N M F Y L P H G L S \square D N N G N Y W V T D V A L H \quad Q V F K$
TCLHD GS $\square$ WT S GETND $\square K C F S$ VS G $\square$ G D G QLLG P S S V F ALDN D G K L Y V S D T GN N R V V F D HSVCFSPDGSKLASSWDRT』।LWN

 $F N V G S S T Y G V A V H T N G E V F A S S W D G F V Q V F S$

DGCAFAPDGSRLVAVDGTATLWEV SVAAAGSHFVSNTDGSISVWN
GE Q $\square \mathrm{K}$ T F K G H S Y W $\square \mathrm{Y}$ VAID A NGHSFV S S DDK T L R L WD V A F S P N E H T VV S S W D N T I R FWD SVA Y S P D G TRV A A GCS NGSVS $\quad$ DR
 GKS S E T LIKGHSKWVS DA QFS PDGSTIVSCSGDTIVRLWN





TEYT $\square$ P TS GSEPAH TT T GPD GA LDWFTEANK $\square G R \square T$ T P A GIA V S P D GRAF VT S D GK A L S L D TS I A Y S P D GRH IVVS GA D R T I R PNAMEVGPDGLLYFPVMGAN EIDWR QRVITFGGPGKF QFPRGVVVSPSNEVFVTDKNNQVQVHS $G V S F S P D G Q I L A A S Q D Q T V K L W S$



G K Q $\square \mathrm{Q} \square \mathrm{L}$ E G H T K D $\square \mathrm{NT}$

FSPDGKVVSSSWDNTVQIWD

 UniRef90-K9S8L0 UniRef90-UPI0004408667 UniRef90_UPI00047AF96C UniRef90_UPI000372CC40 UniRef90_X6M212 UniRef90_A0EG03 UniRef90-Q112W9 UniRef90_UPI0003A0EF30 UniRef90_C3YGF3 UniRef90_L0DPJ6 UniRef90_UPI00034AAE28 UniRef90_UPI00021A5460 UniRef90_C3XY68 UniRef90-M2QY89 UniRef90_X6M7R7
UniRef90_E2ATR8 UniRef90_J3S993 UniRef90_K7VZX0 UniRef90_K1PD14 UniRef90-D5U5X0 UniRef90-A0D5I2
UniRef90_G4TM09
UniRef90 D8Q5D2 UniRef90_UPI000346C8FA UniRef90_UPI0003618F68 UniRef90_I1E6U4 UniRef90_G8NNV2 UniRef90_UPI000463B310 UniRef90_D8G7W6 UniRef90_UPI00034C6B41 UniRef90-X6NUP0 UniRef90_M5C1X7 UniRef90_A0YXM9 UniRef90-X6NE63 UniRef90_D7AJL9 UniRef90-C3YDR0 UniRef90_-V6KPF3 UniRef90_X6NIV9 UniRef90_X6MGA8 UniRef90_UPI00032B2276 UniRef90-W1SAT9 UniRef90_D2BDC6 UniRef90_D7A4L5 UniRef90_UPI0004409C32 UniRef90-X6NDN6 UniRef90_U5WUI5 UniRef90_C3ZU27 UniRef90-A0YTJ7 UniRef90_XZZ2A5
UniRef90_UPIO002F59341 UniRef90-X6M2H0 UniRef90_K1QWE3 UniRef90_X6NSS4 UniRef90-K9TJ67 UniRef90-K1QYA7
UniRef90- X6MRW3 UniRef90_UPIO0046A1107 UniRef90_X6LTP7

RDGTLQK LLSAHTDVTSADFSPDGEMFATAS LDRKVKLWS $D V N S G K M T F G H L D T V T S V A F S P D G T R D V S G S S D R T I I I W N$

 KT GQQMMFK LIE GHEEKCVVDVACFS P D GT T L A S S G S Y D N S I R L W W V $N$ G K F D Q T L K S H D D V

 AKTCRYPKTTLT DPQAVAFHPD GLSSFLANSPGTAQLWDQ TQGELMRNDTGHGAPYSVSFSPGGTKIASAGGNTSVVIWN $P$ LG K Y G S D R Q E F K Y P H G I A DS P T G K V Y Y IA D C N N H R I Q V WN G R E G S G E G E F R Y P S G V A I











 K L L V $V$ L L K F L




S G T IT E Y T IT A D S Y P WG TT A GP D G NLWF VE T G NK I GR TT T A ATRKVHRVDVGGGPVGVAVVHPSGSAYVADWYQHRVIAVD



 NS N $\square$ QVAMS LQ A WK P LISLCTTSSSGDFLVVMDNNH VS G K R I HL L D G H S S V N G A Q F S P D S S R V A S S S W D R T $\square R \square W D$ TSGKKVA TLLDE K K E P E DVVAFSPNGK LLAS GRADGTAS I WE

$M$ E G K I T


|  |  |
| :---: | :---: |
| UniRef90_X6PEA7 <br> UniRef90 $\times 6$ NWX: | ASSGKLIQSLEGHSNGVGYVQFSPD |
|  | NIADGKMLKNITEHSDGITSLAFSSDGKFLASGS |
| UniRef90-UPI0003632D26 | RTGQPVGHSLQGHKDWINHVADSPDGRR |
| UniRef90_K7W6N0 | SNGKMI KNLTGHTRRVNGVA |
| UniRef90-A9WFI | PTRGTTRSWGRSSRYRDV |
| UniRee90-A4YV3 | SDTATRQRLRTIKVGTRPFGVTIDTEGKRAYTANVGSNDV |
| UniRef90-C2ZPI | $N T V V G T\\|N V G \square R P R\\| I V F T L D G T R A Y V T N Q N S N T V$ |
| UniRef90-UPIO002EB3E06 | FDRHGKLLKQWEGQFNLPHAVCLDAKGRVCVGDRENNRVQ |
| UniRef90-B4VJJ3 | (TVVLSSRSSGFNCVAFSPDGQILASGSGYRTIK |
| UniRef90-Q01T33 | 1 |
| et90 UP100037FB228 |  |
| Ref90 U5QDP9 | D GT |
| UniRet90 A0A049B2U8 |  |
| UniRef90-C1AR | NTATNTVVGSPIKVGITTPNAVAVSPDGTRVYVTNRSSNTV |
|  |  |
| UniRef90-S9QC | TATGQPLARPLKHLRRVTAVAFSPDGKL |
| UniRet90-D1YX27 | TSTNTVIGSPIPVGNGPQNI A T P PGTR |
| UniRef90-G8RV33 | DTVTGGLIDTVDVGDFPTMLLLSPDGSLLYVAD |
| UniRef90_M2TIE1 | GQ |
| UniRef90-UP100037 | STA SNTVTASIDAFTAPRGLAVSPDGS |
| UniRef90 M2QWJ9 | AMTGERLGGPLKGHSDWVFSVAFSPNGARIASASRD |
| UniRe90- 6 CM3K0 | KTGRAIHKFDGHSRCVSQAQFFPNGHTIVSCSYDNTIR |
| UniRet90-UPIooo3716254 | TGRTAV LRGHAHWVYGTAFTPDGRLLATASDDETAR |
| UniRef90-X0QB37 | TGQQIGTPLTGHTDTATAVSFNRDGTRLASASADSTVR |
| UniRef90-T1HT84 | NQYGQFVRKFGANULQHPRGVTVDSKGRIVVIECKVMRVI |
| UniRef90-11FTTO |  |
| K1WE | TGLILYNNNQHSTIVYSVAFTPNGRW |
| UniRef90 X6MF | DYSSGRQUQTLDGHTRYVNAAAFSSDGSKVVSCSDD |
| UniRef90-UPIOOO4407EED | GRVIFGPFEGHTGWVQSVAFSPDGARVVSGSND |
| UniRef90-K9S8L0 | ARDGRKLDTWAAHEGQIP SVDFSPDGQ MLVTASND |
| UniRet90_UPIO0044 | NTESGK |
| UniRet90_UPIoo047AF | G K |
| UP10003 | DGTISTVAGGAALAQPTDVTVDAQGN |
| UniRef90 - 6 M212 | DVHSGLELLQSIQAAL RGITFKIRFSPDGS |
| UniRef90-A0EGO3 | , |
| UniRet90-O112W9 | NGAQVGEALVGHTSWVWSVAMSGDGRRVVSGSEDGSV |
| UniRet90-UPIOOO3AOEF30 | EAATWELKRKLAGHTDR\PNVAFSPDGKTL |
| UniRef90-C3) | PDGTCVRTVGRYQGMQDPQYITVDGQGN |
| UniRef90 LoD | DTSTAPPTGRFFRHPGGADVVAFHPGGKVVATGGADRTTR |
|  | NLQGEKLTTLR GHREAVTSVSFSSDG |
| UniRef90 UPIIO0021A5460 | TSDGEFVGKFDDGQFHCPRGLAFDNDGF L |
| C3x ${ }^{\text {d }}$ |  |
| UniRet90-M20Y89 | VITGLTVVGPLEGHEATVESVSFSPDGHQVSGSWDKT R |
| X6M7R7 |  |
| 俍90-E2ATR8 | KRDGQLLYPNRVAVTSGDUIVTERSPTHQLQ |
|  |  |
|  | SLNGQKLATITVGE EVKSIAFSPDGRLLTIGMNNGTLG |
| UniRef90-K1PD14 | V |
|  |  |
| UniRef90 AoD512 | RNEKCKILLRGHUNC NS CFSY |
| G4TM09 | TGQPLGEPFQGHESTVLAVAFSPD |
| UniRef90-D8Q5D2 |  |
| UniRef90-UPIO00346C8FA | GASLLKAFKSEQDIIYAATFSSD |
| UniRef90-1166U4 | GKQKRTL QFSKP |
| UniRef90-G8NN |  |
| UniRef90 UPIO00463B310 |  |
| UniRef90-D8C | KTGALLYTLLGHSALVNSVAlAADGKTLASGS |
| UniRet90-UP100 | SRGKSVLTLRGHTDVVTTVAVSPDGKLI ASAG |
|  | ASGl RLKQLLGHVGFGTRARFSPDGRFIVSC |
| UniRef90-M5C1 | ATDGVLLLGPLHGHTDRVNCVTFSPDGALIASA |
| UniRef90- U6NE63 $^{\text {U }}$ | ATKSGNE CRTGHSEA |
| UniRef90-X6NU31 | SIWDVNFSSDGKYIVSCS |
| UniRef90-D7AJL9 | NVSGRFLGDFPPDDIGGPSHVAVDKDDKVYVTDALNFTVK |
| UniRet90_C3YDR0 |  |
| UniRef90-V6 | GA HVATlTEHFGRVRATAFRPDGAVLATGC |
| UniRet90-X6 | DVLSGKETKIITLNARLGRGIQFSPDGCYAVACLQDETIR |
| UniRef90-X6MGA | D |
| UniRef90 UPIIOOO32B2276 | NLDGSLRKVLFWQ |
|  |  |
| iRef90_D2BDC6 |  |
| UniRet90_D7A4L5 | DTASLTRLASTKVGGRPFGVTIDAEGKRAYTANVASNDV |
| UniRef90 UPI0004409C32 | D A |
|  | DGKQ |
| UniRef90_U5WU | DLTVGTDGDLYıAD |
| UniRef90-C3ZU27 | RPDGVRTVQHPRGEMTHPRYUTVDGEGNIVVSDWVTYCVY |
| UniRef90-AOYTJ7 UniRef90 U7Z2A5 | DQSLLQSEASVFHPLISTVNTWTAHSDSLMSVSFSPNSQFV |
|  | DGTLRATMLFTPGYPGFFRGVAVGPGEFVVT |
| UniRef9 | DVKSGERIKTMKGHFDAVFCATFSPDGQFUASGSDDAT I R |
|  |  |
|  |  |
| UniRef90-K9TJ |  |
| UniRef90 K10YA7 | STESQSIQFNDKGQPKYUSENKNLDICVSDVQARAVV |
| W3 | S |
| UniRef90 UPI00046A1107 | GPVGICSGSD |
|  |  |



VWDVETGKQTAK LDGHRNSVMSVCLSSDGTTLASGSLDHL LWDTDTGQPVGEPLHHEGAVNAVAYSPDGSRVISGSDDRT
 F DVKTGEQKYVLAGHTDSVSDVAFSPDGTMLASEGARDT

 LWS VP D GKASA A V L T G H T D LI N R CT F S P D GT L L A TA G D D R T

 I W D V K S G K E L K K I $\operatorname{E}$ G H S D T I I R E V

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







 8
KLLWTPE GRLLSQTFVGHQGWVNSVSFSPDGRMIASASD DGT
 LWN R E G QP LG E P F K G H Q S F V T S V A I S T D G Q Til V S G S G D N T
 WD L L S G K L L Q V L E GH T D R V E LAAR F S F D D S R V V T C S W D K T I W D L L S G K L L Q V L E G H T D R V




UniRef90_D5U5X0
UniRef90_A0D5I2
UniRef90_G4TM09
UniRef90_D8Q5D2
UniRef90_UPI000346C8FA
UniRef90 UPI0003618F68 UniRef90_I1E6U4
UniRef90_G8NNV2
UniRef90_UPI000463B310
UniRef90_D8G7W6
UniRef90_UPI00034C6B41
UniRef90_X6NUP0
UniRef90_M5C1X7 UniRef90_A0YXM9 UniRef90_X6NE63 UniRef90_X6NU31 UniRef90_D7AJL9 UniRef90-C3YDR0 UniRef90-V6KPF3 UniRef90_X6NIV9 UniRef90-X6MGA8
UniRef90_UPI00032B2276 UniRef90_W1SAT9 UniRef90_D2BDC6 UniRef90_D7A4L5 UniRef90-UPIO004409C32 UniRef90_X6NDN6 UniRef90_U5WUI5 UniRef90_C3ZU27
UniRef90-A0YTJ7 UniRef90_X7Z2A5 UniRef90_UPIO002F59341 UniRef90_X6M2H0 UniRef90_K1QWE3 UniRef90_X6NSS4 UniRef90_K9TJ67 UniRef90_K1QYA7 UniRef90_X6MRW3 UniRef90_UPIO0046A1107
UniRef90_X6LTP7

TY $\square W D T K T E K Q \prod A K F D G H T Y A V N S V C F S P N T T \Pi A S S N \square D$ VRLWDVDTGRMVGDPFRGHKGVNSVAFSPAGLWIVSGSSD VRIWDVASRQQVREALGHGAWPVSIAFSPDGSRVASGALD
 VQVFSPDGKTHLDTYNGNFNDLNGIA ADDDEGYIFVS
VTKASSTGANLSGAGFTGGGLPDGIALDSAGNAWVANDGT I RLWQLPDGREHTVLRAHTGWVDDCAFSPDGSVLATAGGD I SLWNLGTGQLIKRLSGHTDGVWSVADTKDGNTLVSGSWD VRLWDVASGKLVRTFSGGHAQSVTSGAFRADGQLEASGGSTD VRLWDAKLGNEMQRGEGHFDQVTGUDVSPDSSTVASCSYD FRLWNPTQGTRQLTVPGHQDQVTGISFSPDDTMMASASLD IGLWDVATGKRLNQFIGHSDCVASARFSPNGQFIVSSSWD FQl FNQEGQLLLFVGKPGFYMPSGDHIDRNDRIFUSDSYN $\square \mathrm{HV}$ YSEDGQFLFOFGGSGDQGPMGVCVDG
AVIWRDGEDDHRLTGHTGLKLWTAAVHPRRPLLATAGDD MLVLDDKSRQELQKLKGHDNIVLGAQFSPDGYTVVSWSWD HKSNLDGTNRQAVVKGSLPHPFALTLFEDGTLYWTDWNT LFVFNLEGKKLMEUGGAGFITAPNAVAVDKDNHIYVTDSGN
 ICLRDTETGAPVGELLQGNDWHNSLAYSPDGCRIISGS D VARYRPEAGESDVL ASGFDQLYGVVVAPSGAVVVAELGT
VKLWNLQGKLLKTTMM AHNAYVLGVSFSPDGHTDASAGYD $V L S I \quad G R D R V D V L A S G L S E P V G V A I A A D G T C L V S E A G A$ VRLWNRKGQLLSEPFKGHQNYVRSVAISTDGQTIVSGSDD I RUWDARSGNEDQRDEGHSGSITGUDVSPDGSKIVSCSSD LRVWDVSSGKQUQVLEGHSGIVRGMEYFPKSFKVLSYSDD ARI WDTSGNQW AQFDGHQGGVNTVLFSPNGDLLFTSGYD



|  | R |
| :---: | :---: |
| UniRef90 X6PEA7 | R |
| UniRet90-X6NWX | GT: ${ }^{\text {a }}$ WNA |
| UniRee90-D8FLP7 | NTLKMWNATDR |
| UniRef90_K7W6N0 | SHVI |
| UniRet90_A9WFE9 | NQVLQFSADGQY |
| UniRef90_A4YV38 | NILSV |
| UniRef90-C2ZPN1 | NTVSVINTAT |
| UniRef90-UPI0002EB3E06 |  |
| UniRef90-B4VJJ3 | NR |
| UniRef90-Q01T33 | GRVRKD |
| UniRef90-UPIO0037FB228 | ERVLKLD |
| UniRee90-U5QDP9 |  |
| UniRee90-A0A049B2U8 | DRLTVI Dartn |
| UniRef90-E5WKU7 | NKiGR |
| UniRet90-S9QCY4 | KTARL |
| UniRef90-D1YX27 | NTVSVI |
| UniRef90-G8RV33 | DTVSVI |
| UniRef90-M2TIE | MTVKIWD |
| UniRee90-UP100037C1D07 |  |
| UniRef90 M2QWJ9 |  |
| UniRef90_LOJ750 | H. |
| UniRee90 X6M3K0 | QV VR |
| UniRef90-UP10003716254 | RTAR1 W |
| UniRef90-X0Q837 UniRef90-T1 1 P84 | GTVLTLPTPDGQ |
| UniRef90-11FTTO |  |
| UniRef90 K1WEF5 | RTVKIWNLKTGEL |
| UniRet90-X6MF73 | K ${ }^{\text {R }}$ RLW |
| UniRef90_K9UXQ1 | NTIKV |
| UniRef90-UPIO004407EED | T TVR1 WDVESGQTVH |
| UniRef90- UPIOOO44086 | ATVRWSVPGKE |
| UniRef90-UPI00047AF96C |  |
| UniRef90-UPI000372CC40 | VVMKI |
| UniRef90_X6M212 | R |
| UniRet90 A0EG03 | HSI RLWDVKTKQH |
| UniRef90-Q112W9 | R ${ }^{\text {a }}$, K |
| UniRei90-UPIO003AOEF30 | A R VR |
| UniRef90-C3YGF3 | N SV |
| UniRef90-LODPJ6 | GMARL |
| UniRet90_UPIO0034AAE28 | N |
| UniRef90 UPIO0021A5460 | CRLFVYN |
| UniRef90- M20Y89 | K V b wdaghrluh |
| UniRef90-X6M7R7 | KTIRLWDSS |
| UniRef90-E2ATR8 | HCVKVFNYE |
| UniRef90_J3S993 | N |
| UniRef90_K7VZXO |  |
| UniRef90KK1PD14 | SNVKK】K |
| UniRef90-A0D512 | N STSTwd |
| UniRef90-G4TM09 | K T 1 |
| UniRet90-D8Q5D2 | D S |
| UniRet90_UPI000346C8FA | NTVKL |
| UniRef90 UPI0003618F68 | GTlLLW |
| UniRef90-G8N | VTKTSNSG |
| UniRef90-UPIO00463B310 | A TVRIW |
| UniRet90-D8G7W6 | KTVKLWD |
| UniRet90-UPIO0034C6B41 | KQ1 GL WD |
| UniRet90 X6NUP0 | K T R |
| UniRet90 M5C1X7 | CTVRVWR |
| UniRef90 AOYXİ |  |
| UniRef90-X6NU31 | R St Ri |
| UniRef90-D7AJL9 | RRVQVFEY品KENR |
| UniRet90_C3YD |  |
| UniRet90_V6KPF3 | RTVRLWDPDTGEQ |
| UniRef90- 6 NIV9 | Q $T$ |
| UniRef90 X6MGA8 | ETI QL |
| UniRef90-UPIO0032B2276 UniRet90-W1SAT9 | HSILACNKHTGE |
| UniRef90-D2BAC6 |  |
| UniRef90-D7A4L5 | NTLDVILD |
| UniRef90-UPIIO004409C32 | ST1 ClWD |
| UniRef90-X6NDN6 | KTVRLWDTKSG |
| UniRef90 U5WUI5 | GRVLSID |
| UniRef90-A0YTJ7 | NTVKПw |
| UniRef90-x7Z2A5 | GRVLG |
| UniRef90-UPIO002F59341 | DTVRLWNRKGQLLS |
| UniRet90-\6M2H0 | K |
| UniRet90_K1QWE3 |  |
| UniRet90 X6NS | KTIRIWDTTSE |
| UniRef90-K9TJ67 | R S V |
| UniRef90 K1QYA7 | $V$ |
| UniRet90-X6MRW3 | KTLRLW |
| UniRef90_UPIO0046A1107 | KTVRLWD |

UniRef90 I4FN12 UniRef90 Q16BTO UniRef90-UPI0001D2EE2B UniRef90 X6LWI6 UniRef90 UPIO003618800 UniRef90-L0D617 UniRef90_UPI0002FAEF9A UniRef90_F2SID0 UniRef90 K1QQZ8 UniRef90-UPI00036766FA UniRef90 UPI0003816A95 UniRef90 U7QFW5 UniRef90-R7QR87 UniRef90-C3YF29 UniRef90 S2JNS0 UniRef90-G4THC0 UniRef90-W3WT51 UniRef90-W7SB90
UniRef90 A7BZD6 UniRef90_UPI0004416376 UniRef90-K9W0M9 UniRef90_K1Q5U3
UniRef90 F2TXJ2
UniRef90-UPI0003720BF1 UniRef90-S8AWZ1 UniRef90 S8DYK0 UniRef90-R1E165 UniRef90-K9WJD4 UniRef90-A3Q393 UniRef90_G4TJH1 UniRef90_K9PHA9 UniRef90-K1Q6R1 UniRef90-X6PEJO UniRef90_H9KPI1 UniRef90 UPI0002DA0281 UniRef90 D1A2J7 UniRef90_UPI00037E38D2 UniRef90_Q7NH82 UniRef90-A0A024LZH5 UniRef90- D0LZ61 UniRef90-K1WEA3 UniRef90-UPI00047D1230 UniRef90 W4HYW4 UniRef90-UPI00034DF11A UniRef90_X6PCN5 UniRef90 L5K851 UniRef90 LoD9C9 UniRef90-J2N2U3 UniRef90_G4U339 UniRef90 I1F493 UniRef90-T5AHY6
UniRef90-A0DB07 UniRef90- UPI0003154A05 UniRef90-X6MTL5 UniRef90-X6LWZ9 UniRef90 X6NMB8 UniRef90-D8FVV1
UniRef90_G4TRE2
UniRef90_B7JWJ3
UniRef90 UPI00035F4391 UniRef90_UPI000366EAC9 UniRef90-G4TP14 UniRef90 F5UHZ1 UniRef90 ${ }^{-}$X6LVS7 UniRef90-K1PT88 UniRef90-Q2IS76 UniRef90- Х6PBI5 UniRef90-G1XKX9 UniRef90-X6P7D1 UniRef90_B3G4M9 UniRef90_U7QI25
UniRef90_Q4WH21 UniRef90-KOKODO UniRef90 UPI00037B7E03 UniRef90-D2W029 UniRef90-K9PT71 UniRef90-C3YS30 UniRef90 X6M410 UniRef90-R7S181 UniRef90_AOBN36 UniRef90 K8GN12 UniRef90_B4UYY9 UniRef90-E8X218 UniRef90_E8X5V6 UniRef90 L8G6V4 UniRef90_UPI0003693216 UniRef90_D3CX75 UniRef90 A3Q5X7 UniRef90 B2JAS7 UniRefyo-B2JAS
UniRef90- 1 K72

GKKLLT LT GHKT WV EFVAVTADGT I I SADS DSTワKVWD

PAGVAVDTDAAFTVADSKTVRRHDR | $F$ | $V$ | $T$ | $N$ | $Q$ | $G$ | $S$ | $D$ | $V$ | $T$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $V$ | $A$ |  |  |  |  |  |  |  |  |

 Y GVALSP DGRTALTGSDMTARLWD NG $\square \mathrm{NFQN}$ GEYMHTLGSHKDMLN GLCFSSDTHLASASSDRTARDWD

I S L G K S GRLWVS DRSGNLVQT D WDVNFSP D GRMLLAA S S DR SVVRVWA T P $\square$ TVGT A P T WVA VF P N GTA YVT N S G S D NVI D T SPDGEVI AT GGNEKV DK
$T M T G H T S Q V \quad T S L A M N G D G K R V V S G S G D N M R V W D$
TGTEKGQFIAPMGLTDCPRNRDIIADTGNDVQLFD
GQPVGPLQGHEEVV GACLQTLQGHSDSLN

WAVT F S P D G S RIV S G S D S TVRLWD


| $Q$ |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $G Q$ | $P$ |  |  |  |  |
| $L$ | $L$ | $L$ | $H$ | $S$ | $D$ | $T$ |
| $L$ | $T$ |  |  |  |  |  |

$R S V A F S P N G E R \| V S S S D G T L K \square W D$


GQSLLVLPSDGAMV
E SVA WS P D SAYVATAGRERVVRD SVAFS PNGK LIAAS DDS T $\square R L W D$

S V V I T R D G K T I A S G S D K T $\square \mathrm{K}$ L L W

F N QPM GMA A GP DGAMWVAH DGA DAR V GA

IS LGK S G RLLWAS DDRGNLVQUDD

VK F S P D GK L A S A S WD K T VK $\quad$ WWR GDSPLRFTLKGHEKWVESVAFSPDGTLATASWDGTARLWN QFTGHHGPVVEVVCFSPD GRFLATGSDGTVRLWD

$L \vee L S G H G A R \square A$

GK L L Q TLA G H S D A V T S VS F S P D G Q T L A S A S D K T V Q L WR
 I SLDWNS D GTLLATSYDGFARIWT GQFSQPRWTVQNSGP LDLAFSRDGRTLVSVGKDRNI RT


Q AVAFSPDGTLIASEESNVRHVWN T S V A F S P D G T L L A S G S Y D Y R I R I Q T $\square$ K T R S G F WP K DI A VD S N G DLLL Y C D W E I G T V Y K SVTWSRDGKMLAS GSKDHTVKLW
 S I IP LLLKK GHQEWVYSVSFSPDGSTVASASDK TVKLWS


$P$ LR G H A S A V N

GEEQFTLTGHSNSVN AVAVT A D GK IV I S S D D N T L K V WD

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    Q T \squareK T K S G Q T \(\square\) K T K S G
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K WP N DVK FS P D G S KI A S S A D K T I R L WD DGFK $\quad$ PA
 D G F QLS P D G S KVLSYSGD TII RI WD $P P A L F V D T N N S I \quad Y V V N K F K N Q V I I W$ GK T $\square$ A T T S GHGWQS GP T ALE FSPD GQLIVSAAGDRVVLSR
$S \| V E F P$ VGGPGAGPYGDTVAPDGAVWFTEVHHGR\GR P G GLVVGGDGAI WFHETGAN RII GR
 PGREAGKFYYNHGVVVSANNEVFVVDRVNRVQVFS GRQ Q R VFE GHD LFV R GVVTFSPD GRIWSVS S GEQLIVFS
 GQCLDALHGHTGHV RSVAIHPSGKWIAS GSDQTVKFWN $L T T \square P V G A H P T G V A V N A T G E V Y V A N T A G N S V I S T$
$S P S G \square A V G A S G E L L V A D A G T V S Y F A P$


E T V S P K G G D
11 A P $\begin{array}{ll}H \\ D & C A F S P D \\ D & \text { D }\end{array}$ Y GADFTPDGKYLVTVTSDGGRVWD

## UniRef90_I4FN12 UniRef90-Q16BT0 UniRef90-UPI0001D2EE2B UniRef90-X6LWI6

 UniRef90_UPI000361880C UniRef90-LoD617 UniRef90-UPIO002FAEF9A UniRef90-F2SID0 UniRef90-K1QQZ8 UniRef90-UPIo0036766FA UniRef90-UPIO003816A95 UniRef90-U7QFW5 UniRef90-R7QR87 UniRet90-C3YF29 UniRet90_S2JNSO UniRef90-G4THCO UniRef90_W3WT51UniRef90 W7SB90 UniRef90-A7BZD6 UniRef90-UPIOOO4416376 UniRef90-K9W0M9 UniRef90-K1Q5U3 UniRef90_F2TXJ2 UniRef90-UPIoooz720BF1 UniRefefo-S8AWZ1 UniRef90-S8DYK0 UniRef90_R1E165 UniRef90-KgWJD4 UniRef90-A3Q393 UniRef90-G4TJH1
UniRef90 K9PHA9 UniRef90-K106R1 UniRef90-X6PEJO UniRef90-H9KPI1 UniRef90-UPI0002DA0281 UniRef90- D1A2J7 UniRef90-UPI00037E38D2 UniRef90-Q7NH82 UniRef90-A0A024LZH5 UniRef90-DOLZ61 UniRef90-K1WEA3 UniRee90-UPI00047D1230 UniRef90 - W4HYW4 UniRef9O-UPIIOOO34DF11A UniRet90-X6PCN5 UniRef90-L5K851 UniRef90-LOD9C9
UniRef90_J2N2U3 UniRef90-G4U339 UniRef90 -11F493 UniRef90-T5AHY6
UniRef90
AODB07 UniRef90-K1R7S7 UniRef90-UPIIO003154A05 UniRef90 - 6 KMTL5
UniRef90
X6LWZ9 UniRef90-×6NMB8 UniRef90-D8FVV1 UniRef90-G4TRE2
UniRef90 - 77 JWJ 3 UniRef90-UPIOOO35F4391 UniRef90-UPIO00366EAC9 UniRef90-G4TP14 UniRef90-F5UHZ1 UniRef90 X6LVS7 UniRef90-K1PT88 UniRef90-Q21S76 UniRef90-GPB59 UniRef90-X6P7D1 UniRef90-U7Q125 UniRef90-Q4WH21 UniRef90-KOKODO UniRef90 UPIOOO37B7E03 UniRef90-D2WO29
UniRef90 K9PT71 UniRef90-C3YS30 UniRef90-×6M410 UniRef90-R7S181 UniRef90-AOBN36
UniRef90-K8GN12 UniRef90-B4UYY9 UniRef90 $=8 \times 218$ UniRef90-E8X5V6 UniRee90-L8GGV4
UniRef90-UPIOOO3693216 UniRef90-D3CX75 UniRef90-A3Q5X7 UniRef90_B2JAS7
UniRef90_X1K742

 LTGKVLAQVVQDGGPMGVAHDPRNRLFVSDWYNARIWVLD LATRPAATLADGGKPAGVAVSADGRAYVTSPEGKYUTVDD ASGKQLQDFRGHTDSVFTAFSSDGRAVVSCSDDGT RLWN VNGAKLNTFIGHFEAKSVCFSPDGHKIATGGKDETLRLWN ADLSKSIFTETLSSILAVGFSPDGKVLATGGVGGEVQLWQ ITGECKETLEGHDCVNSVDFSPDGSLLVSSSGDHTVRVWE LQGNQLQKIQTRGELEGHTVIQNGDLIYTDKENKVINRIY ASHTVSTTMAVGDEPRGVAVTPNGKAYVVNTVDGTVSVID LWNRNGQFDTNFDDPAGVSFSPDGQTIASASYDTTVKLWS GDTGRQVGETMAHRTWGVAMSGDGKRVASGSEDSTVCVWD ПDGKGKHRTAAPRYPTAVA

GTTCKKLIGHAGPYGVSFSHDNQYLISCSEDQTVRLWS VETGEQVGLGPQDSVWTVRFSPNGSQIVAGFQDSTIQLWD TSGTCVQTFQGLNSVNSVAMSSDR VVGASDDNTVKL WD
DAGTRVATVQVPSAAYGVALSRDGKLLAAGVADGS D WVNSVAVSPDEHULASGSEDNT KL WD VNTRQSDGESTVDSVNSVAFSPDGKHIVSGSDDGKVRI WD LDGSLITTRTGHSRVWNVIFSPDGQTVASASFDRTVKLWK Lival WDAVSGEPVRLLTGPTDIAWSPDGRYVAASSKDCVVRVWE TNGMSLQTLQGHSWVQAVAYSADGKVLISGSRDTTVRMWD ATGAVTTDAAQFYHPYGVATSPDGGLFVTHFHNHKLRRVE LSTGKVVSDGNLDRDRCLAISSNGKLLASGSADKTIK LWD VAGSGLAGWRDFNEPRDVAVAEDGSLYVADALLNHVLRRID DGAVDRFPVADGSRPSLISAGPDGALWFTRNGDDRIGRLT WEADTGQPLGEPLRSHDVAFSPDGSRDASSSHDKSVRLWE LQGEQLRKIYGHNGVLFVAWSPDERLMASCSADTTVRIWD GEYAYLEGHSDIVWGDQFSPDRTKAVSYSYDKT R WD GQLGPSKGQFSSPHGFCLSADEDIIVADTNNHRIQIFE RDGKLLHTLRGHDGVWSVNFSPDGKMLVSASRDKTVKVWR KNGKPVATLEGHRGVISVAFSPDGATLATGSGDGTARLWN KLGNQLTLKGHKDWVTSACFNPNGKFGATGSYDGTVRLWD DNGRQVACFEQPEAVWGLVFTPKGDTEVSAAGRGVDAAIQ
$P D G E P M G E E G V F P G A F S P D S R I V T G G A D K T V R L W D$ SEASPRRLEGHSMAPTMASFSPDGRRVASSAWDQSVRVWD IVNERSALVLGEHNSDRTVAFSPDGNDIASGSWDRSVRLWS KNPRLTAPSPLFGANGLRTGPDGRVYAQVSGSQUSALD EDGNLASTLGQHKGPFALKWNKKGNYILSAGVDKTTII WD WDTDSGRESGAPLKPAE REDRDGRMVVTEGNASFWDLER DA

TPEALGEPLRGHSGVAFSPDGSRIVSGSEDWD OQVWD
 VQTEKVQLYGHTGYVQTVCFSPDGKTLASGSCDTT:RLD LNSEKTRLYKTLDRVPSVSFDPQGQMLASGSYDRTVKLWG
 APNTKQVLRGHSSWITKKAGSPHGDT:VSCSYDADIQLWD ADTGHPLGRGHKRGITGVAFSSDGSRIVSGSHDGTVRQWD AGGSFDRTLKAHSDITSVRFSPDGKLLASASADNTVKLWR
 VTGEEQFTLTGHNSVNAVAVTADGKIVISGSDDETLKVWD VQTEELIVRQG WGPCKACATSSGDLLVTLCSNDVRDVD LSGKQLQVLETPSSVCRAKFSFDGSRIVSGSSDGT|RLWD LSGKQVQVLQGHSAPKSVELSPDGSKFVSCAEDCTVRIWD ADGSGHTGETQLKEVQSVSFSPDSQLEAIGDVDGK|ELWN

|  |
| :---: |


 S D G S K L H I F D GP S WM S GAR F S P D D S K I A Y WS T D K T L R L C D


 GSTTAVVIDASGLTQPTAVALLAS VATGTLQQTGHSDWVSSVAFSHDSKLLASASNDKTVVKIWD



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UniRef90 A7BZD6 UniRef90-UPIoo04416376 UniRef90-K9W0M9 UniRef90 K1 Q5U3 UniRef90 F2TXJ2 UniRef90-UPIO003720BF1 UniRef90-S8AWZ1 UniRef90-S8DYK0 UniRef90-R1E165 UniRef90-K9WJD4 UniRef90-M9LKQ7
UniRef90 A30393 UniRef90-G4TJH1 UniRef90-K9PHA9 UniRef90-K1Q6R1 UniRef90-X6PEJO UniRef90-H9KPI1 UniRef90-UPIO002DA0281 UniRef90- D1A2J7 UniRef90-UPIO0037E38D2 UniRef90-Q7NH82 UniRef90-A0A024LZH5 UniRef90-DOLZ61 UniRef90-K1WEA3 UniRef90-UPI00047D1230 UniRef90 W4HYW4 UniRef9O-UPIIOOO34DF11A UniRef90-×6PCN5 UniRef90-L5K851 UniRef90-LoD9C9 UniRef90-J2N2U3 UniRef90-11F493 UniRef90-T5AHY6 UniRef90-AODBO7 UniRef90_UPI0003154A05 UniRef90-X6MTL5 UniRef90 $\times 6 \mathrm{LWZ9} 9$ UniRef90-X6NMB8 UniRef90-D8FVV1 UniRef90-G4TRE2
UniRef90 - 77 JWJ 3 UniRef90-UPIO0035F4391 UniRef90-UPIOOO366EAC9 UniRef90-G4TP14 UniRef90-F5UHZ1 UniRef90-66LVS7 UniRef90-Q21S76 UniRef90-X6PB15 UniRef90-G1XKX9 UniRef90- X6P7D1
UniRef90 B3G4M9 UniRef90-U7Q125 UniRef90-Q4WH21 UniRef90-KOKODO UniRef90 UPIOOO37B7E03 UniRef90-D2WO29
UniRef90 K9PT71 UniRef90-C3YS30 UniRef90-X6M410 UniRef90-R7S181 UniRef90-AOBN36
UniRef90-K8GNI2 UniRef90-B4UYY UniRef90 $=8 \times 218$ UniRef90-E8X5V6 UniRef90-L8G6V4 UniRef90_UPIOOO3693216 UniRef90-D3CX75 UniRef90-A3Q5X7 UniRef90-B2JAS7
UniRef90_X1K742
TDTKTWNVFNARNNELLSGIVTKTPDGNKTGK■WDDTKKVWD AMDLSEQAQLTVGAAPAGLALSDDGRWLASADRDADQVSV ARERRALRR1ALEGGPLGLAVAPDGGRVYVADMYEGRLFA SKTGKTLKMLNGHDQNAIKFSPDGSQLLSGGSDKTVRIW AATGSSLGPMVHODWVSSVAFSPDGRTVLTGCFDQTAQLW VADGKSLMSWKAHKRWISLAFSSNGLMLATSSDDK SVKVW VDTGMCI QLFEGHTDSVGTAFSTDGQYIASSSRDKSVRIW NT TGYWVP SGHSSH NGDILVGMIKVGEGKVTRYNNTGK FDGTLLKSITGHEAGVLH SASRDGRLLASASDDKTVRLW TATDTVSTTVTVGATPIGVADTPDGAKAYVANDNSDNLSV SDTGRQIGGTRHSASVNSVAMSGDGRVVSGSRYNTARLFD PGDVLVTCPLTGELLQFGLNGNTDTRGLARDHVKSCNGVV ADTREPI GERGHRSAVCAVAFSPDGSLMASGSGDET円RLW AESGACLQTLQGHDSVNSVAMSSDSYRVASASDDNTVKLW RSPAQLAVAKGHTDSVFALAFSPDGKRLASASGDKTVRLW AETHRTIREPPEGHGYPAVAYSPDGRIVSGLLDDSIRVWD $L D G S L I T T L T G H S G S V Y S V I F S P N G Q T L A S A S T D K T V K L W$
$N T Q U Q T V I D L D R W K P L N V C S T S S D D L L V V M D T D D K K Q E K Q$ DETHRCTSTFEGHGSFVCVAPSRDGNF ASGSGDNTVKVW AGTGDLAQDLEGHNDVWGVTWSPDSTRLASASHDQTARMW AQTGRVLLQCDHSGVVHSLAFSPDCRRLVSGSGDHRAIIW VATGAVTLLAGG
LSTRKVTRTLGSQFSGHSTAFSPDRLTLVSGSADQT TK LW ANGNVTTIVEYAPGAVAAGGDYADGKLGESKFNEPSSLAF TAGELTEFPLSEGSAPFG\|CAGADGALWFTEMGSGGIGR\| ASTGRPLGERGHESSVLTIAFSPDGRVASGSDDNMDRMWK VQTGQCLQVLQGHGWVRTVAWGRDENCLI SCADDGTVKLDW
$V D N T I T E F I K T G N W K F S I Y S S H N G D I L V G M I T K Y N K T G E ~$ IASSNQLCGLKGHDNDCGVQFSHDGSKIVSCSRDKTDRIW KTPGKEEGQLWYPRKVAVMRNSGKFVVCDRGNERSRMQLF AKNGELIITLKGHQKAIGVVFSPDGATLATASWDNTVRLW LLS GNPLADREHPEPDTSLCFCRDGRFLATGFDDGTARLW FWDVESGRCLRSHKVHTGLADSADGYLASGGADGQDHLWR AGQRPPVVLRGHEDAVFSVQFSAEGERLVTAAGDSSARIW FKTGQSKRILNGHDGVWSVADCSQSQFVASGSADQTVR1胃 LIAGGHLDVGSMKGAPDDIAFDSDGNLYATEVMDGRVSLR VQSGRQLQUFEGHSDINGILFLPDGSKVVSYSDDKTIRIW


TGVAKQALTPHGKNDMLSTFSPNGKQLASGSDNHAVGLW VKQGQQKGKDDGHNYVTSVCFSKKGNLMGDITQFMSICLW SKVIRYSGSTEKQTVQFDDKGNHLYSGNGCDKYITE


 F D A A T L D L L H RVVDVGTRPMGLRFAPD GR L FVVGNVGSNDVS






 SCDHVNPLVDFAGHLSDVNTVRFHPNSKYVVTGSSDNTAR



 S L G S H K C I Q T L K G H A N P V S S V M F S S T G E A L V S G S LD F T V R DLATGSAAVVLE GHTDFVEGVAWSPD GLLSIATGSGDHTVR D AVT GAPMQLLEGHTNTVTSVAFSDDSKMLASASYDQKI K

 TVSGDLVVSDTGNQLK QK YVVTTLAAGAGSVASSYSCKFPDAQ

















 $N$ K N G K L L R T I I A E G G G E VV N WV T F S P D GR T I A L A A S D D N T
 DLQ GH QLAILKKGHEKS IDHGVVFSPDGQRI ATASRD GT V



 DIS LLEREI QLT GEYLDVIKEVEFSLDGSKIVVSSEDKTVR Di T GN S CNN NP H H H H D RV GVV GLDS K S G T Q i A S G S F D D T I K
 NRDGSFKQTLR DQRAS LLGVVAFSPDKQPDDQUISADGTV



 PNGTRCGRFVWPSSAPGQTHVAVDDKGNFYETSRSHGSVR

 D S K T G N C L N L L K G H T D WI H A l A F S P N G K WL A S G S S D Q T il R $\square$ D A T T N TVVTDT TVVGHQPTGCAVT PN N
YS G S VS E FS Y T GGGVVY Y P LAAVA A G T N G D $\square W V A D Y$ G S S S A S
 $D V A L G T L Q Q T L K G H S S V V S S V A F L D N S K L L A S A S H D N T V K$ $R P D$ GR S RQQ V P R G L S GP F GV TV D L G G GV HVG D H



## UniRef90 I4FN12 UniRef90_Q16BT0 UniRef90-UPI0001D2EE2B UniRef90-X6LWI6 UniRef90_UPIO00361880C

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UniRef90_G1XKX9 UniRef90-X6P7D1 UniRef90-B3G4M9 UniRef90-U7Q125
UniRef90 Q4WH21 UniRef90-KOKODO UniRef90_UPI00037B7E03 UniRef90-D2W029 UniRef90-K9PT71 UniRef90-C3YS30 UniRef90_X6M410 UniRef90_R7S181 UniRef90_A0BN36 UniRef90-B4UYYY UniRef90-E8X218 UniRef90-E8X5V6 UniRef90_L8G6V4 UniRef90_UPIOO03693216 UniRef90-D3CX75 UniRef90-A3Q5X7 UniRef90_B2JAS7
UniRef90_X1K742


LLASNGTT LSGASGYAASQPFTSAVA DDATQNAWFAVQNG KITGTTASVI A A GLTSSPNAVAVDDSGSQYVLSAGSAT VWDAATGTLQQTDQGHSAGVDSVAFSHDSKLLASASYDNT TDTPTGSTTLTTLPGGLDSAQSCAFSPDGLLLLATSASTDGET $R$ RDPRSGAQTLLA QLSPGLDNDTFVVGDRLGVSNFTGE
 LGRIPLDGALQEDDLPG KPHAVVADPSGGVWVSLWGA I RMWKVDSGEPDDEPLRGHASVNAI AFSPDGSRIVSGSDD VQLWDVACGECLKTFLGHMNRIYSVAWSADGNKIASTC CGG

 ARLWRAKDGELITVLKGHQDQVTSVAFSPDGAALATAGWD VRVWDLSGN LIAEELKGHQPWSVCFSPDGRFLATGSRD VRVWDLSGN M A AEVLKGHQGPWSVCFSPDGRFLATGSRD ARVWSADGGGEPLVFTEHDAWVWSASFSPDGERVVTASSD MRLWNMEGELLKVINNAHSMGGNQLAFSPNGEVIVSVGND
 NLWS TTGSLLKTFK GHSDAVASVAFSPDNSLLASASFD IRLWETLSSKQRQUFEGHKNFVDGIQLSSDGSKFVSYSWD



VRLWDAETGELKAIFTGIFGLPMAVAISSPDGKTLASGSVD
LKI WDFTTEQELESDEGHSRYVKAVVVTADGKRAISASDD
UniRef90-E8X218
UniRef90-E8X5V6
UniRef90-L8G6V4
UniRef90_UPlooo3693216
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UniRef90-A3Q5X7
UniRef90-B2JAS7
UniRef90-x1k742

| UniRef90_I4FN12 | GM\|I|K|IWDMETN RE |
| :---: | :---: |
| UniRef90_Q16BT0 | NTV TVVFDAD |
| UniRef90_UPI0001D2EE2B | E AVSVFDLT |
| UniRef90-X6LWI6 | NTIQLWNIES G N R |
| UniRef90_UPI000361880C | DQQLKI |
| UniRef90_L0D617 | K TARLLWDAQT G |
| UniRef90_UPI0002FAEF9A | CK】QLWD |
| UniRef90-F2SID0 |  |
| UniRef90-K1QQZ8 | N T V T V Y K Y L |
| UniRef90-UPI00036766FA | GALKLWKT DGTEI |
| UniRef90-UPI0003816A95 |  |
| UniRef90_U7QFW5 |  |
| UniRef90-R7QR87 |  |
| UniRef90_C3YF29 | NT L E $\square$ F A S D G H H L |
| UniRef90- S2JNS0 | G T V R A W |
| UniRef90-G4THC0 | GTI R L W A |
| UniRef90-W3WT51 | K TIJKLWDAES G |
| UniRef90-W7SB90 | H I TRLWDLAA G G |
| UniRef90_A7BZD6 | D TIIKLWDL S T G K Q R |
| UniRef90_UPI0004416376 | DS I R V WD A Q T G |
| UniRef90-K9W0M9 |  |
| UniRef90-K1Q5U3 | G K V K K I |
| UniRef90-F2TXJ2 | ATIK L W |
| UniRef90-UPI0003720BF1 | GSA A V W ${ }^{\text {d }}$ |
| UniRef90-S8AWZ1 | Q TVVKMWD T VT G |
| UniRef90_S8DYK0 | GS I R $\square$ WD S ES G |
| UniRef90_R1E165 | HKIRRV |
| UniRef90-K9WJD4 | G I I K W WKVD T G Q E |
| UniRef90-M9LKQ7 | NSII RLI |
| UniRef90-A3Q393 | D R L A R V S A D G |
| UniRef90_G4TJH1 | MTI R L WEAET GQL |
| UniRef90-K9PHA9 | K TVRI WN |
| UniRef90-K1Q6R1 | D T V T V Y K Y L |
| UniRef90-X6PEJ0 | K T I RI WDVAS G Q |
| UniRef90-H9KPI1 | NRVAVFS R D G |
| UniRef90_UPI0002DA0281 | Q T IR L WNRQGK QLQ |
| UniRef90-D1A2J7 | GTARLW |
| UniRef90 UPI00037E38D2 | R T A Q V W |
| UniRef90-Q7NH82 | R S I R FWDVA T G R |
| UniRef90_A0A024LZH5 | D T L R V WD A R G |
| UniRef90_D0LZ61 | H S V R I W N A D G |
| UniRef90-K1WEA3 | NKVKLWSRVGEFLRE |
| UniRef90_UPI00047D1230 | G ILQLW |
| UniRef90-W4HYW4 | G Q V L R I D P |
| UniRef90-UPI00034DF11A | K S V WRLD A |
| UniRef90- X6PCN5 | ATI R V W D |
| UniRef90-L5K851 | K CVVHI WNT Q S G S L V H |
| UniRef90_L0D9C9 | G Y L R I WD T T T |
| UniRef90-J2N2U3 | D A V V V D |
| UniRef90_G4U339 | K TI RLLWE N F H Q L F R K |
| UniRef90-I1F493 | HRI QKFSADGKFVGH |
| UniRef90-75AHY6 | S T I WL WD T E T G |
| UniRef90-A0DB07 | NS I RLWN |
| UniRef90_K1R7S7 | G NVKKI |
| UniRef90_UPI0003154A05 | S TVVKlWS H D G K |
| UniRef90-X6MTL5 | K T I R L WD |
| UniRef90-X6LWZ9 | CEIRII W |
| UniRef90-X6NMB8 | R T I R L WD |
| UniRef90- D8FVV1 | G T V K L W |
| UniRef90-G4TRE2 | E T I RVWD A D T G Q I |
| UniRef90-B7JWJ3 | GTARVWNTQGQE |
| UniRef90_UPI00035F4391 |  |
| UniRef90-UPI000366EAC9 | G TVQLWD T E T GEQ |
| UniRef90-G4TP14 | K T I RVWDAVTGQ |
| UniRef90-F5UHZ1 | NTLKVWDLTTREE |
| UniRef90-X6LVS7 |  |
| UniRef90_K1PT88 |  |
| UniRef90-Q2IS76 | G QVT K I D P A T G |
| UniRef90-X6PBI5 | K TIR W W |
| UniRef90-G1XKX9 | G S I K I L N \ N G |
| UniRef90-X6P7D1 | NTPR\\|FIDT T R R E H |
| UniRef90-B3G4M9 | HR $\mathrm{H}^{\text {QKF }}$ ¢ |
| UniRef90_U7Q125 | K TVVKLWNLDD |
| UniRef90-Q4WH21 | E TVVKL WD P T T S F L |
| UniRef90-K0K0D0 | GRVGR】T P D G A V E T H |
| UniRef90_UPI00037B7E03 | HEI GRMTP DGRLT R Y |
| UniRef90-D2W029 | N R I R L VMPNG |
| UniRef90_K9PT71 | G TVVKLWRLD G T E $\square$ R |
| UniRef90-C3YS30 | H Y V S I F |
| UniRef90-X6M410 | R TI R L W T E N K |
| UniRef90-R7S181 | R T I R I W T T |
| UniRef90_A0BN36 | K S I R L Y D l Q T E Q Q |
| UniRef90-K8GNI2 | R T IA I WDL K T G R |
| UniRef90-B4UYY9 |  |
| UniRef90-E8X218 | S S L $\quad \mathrm{L}$ LS P S G Q |
| UniRef90-E8X5V6 | P A V A A I |
| UniRef90_L8G6V4 | K TVKVWD T A |
| UniRef90_UPI0003693216 | $\mathrm{GR} V \mathrm{~V} V \mathrm{~V}$ D |
| UniRef90_D3CX75 | K T ARLWD |
| UniRef90_A3Q5X7 |  |
| UniRef90-B2JAS7 | E T A C $\square$ WD T T GKLLLNE |
| UniRef90-X1K742 | NR\Q K F D S Q G K F L |

UniRef90_A0YQ89 UniRef90-LODEZ6 UniRef90-K9VGV9
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UniRef90 X6NFI9
UniRef90-D2VFG7 UniRef90_UPIO003638397 UniRef90_F4XQD0 UniRef90-A7C479 UniRef90_UPI00031CA480 UniRef90_L8M4F4 UniRef90-S8E7H3 UniRef90-G4TVZ5 UniRef90_UPIO0035C7184 UniRef90 X6MD52 UniRef90 ${ }^{-}$M7NWV1 UniRef90_UPIO003B62432 UniRef90-F9G728 UniRef90_UPI000383B51A UniRef90_UPI00047EE1D9 UniRef90_A9VXV4 UniRef90_V5FZ44 UniRef90_L7VRB2 UniRef90-X6PAP8 UniRef90-UPI000333D371 UniRef90_R6DF25 UniRef90 ${ }^{-}$XOSI48 UniRef90-UPIOOO344631E UniRef90_X8IW22 UniRef90 UPI00033192D9 UniRef90-R7SMC0 UniRef90_UPI0003594E6F UniRef90_B4CYT3 UniRef90_C1B3Z2 UniRef90-J9HI93
UniRef90 C4RND1 UniRef90_UPI00016C46CD UniRef90-B7KMB6 UniRef90_B0EOS1 UniRef90-D6WVP7 UniRef90-K9TNH7 UniRef90_B4VRA6 UniRef90 R7UJB4 UniRef90-E3JBF7 UniRef90_UPI0003C18F9D UniRef90-D8PZQ1 UniRef90_G3QCT9 UniRef90-S4TMC4 UniRef90-B4NPE9 UniRef90 X6PB56 UniRef90-A0DFV6 UniRef90_UPIO00440D225
$\square$ H G H S A QVN
Y GMAFSPDGQVLATGGDDGTARYW A VVI $\mathrm{NPQGNQLAASDDKT} \mathrm{\square K} \mathrm{\square WD}$
 NGFEVGSDGWIYLWFKGQVVKINP



GHSESVQAVAVSPQGNDAVTSDDRTVKTWN GVAFSYDGNLLATGQHGNVRIWD FSSDNKMIVTCSGTRI RLWN

 GSGNGDFNFPRSVDTTRDGDVVVADTMNHVQDFN PLRGHEHLV WSVGYSPDGHRIVSSYDKTIRUWD

VQFSSDGKMDVSSYDQTDRLWD

GDLLHS $\square K G H A R G V N$ $D V A \backslash D R R G Q M L V S G D D A T I K V W N$ GNPVNVLQGHGSYT

TSVAFDPKGKLVTGSDDGTAKI WN
 P LT GHTDFVYS
 LRFDGDGQLAGPGNFADDYKGDVWVINNYQFNADVN EVTSPFRGSGSMSNPVMLDFSDDKTLYITNESGNDRLW

LGTGSHPHGVVMGPDGGLWICDESNADRRFD ALAFSPDGKKLVSGSGDCLAVIW

## GHTQMV HSVSDDPKGEILAASEDKTVKLWR

GTLLGHSASVTAVAFSSDGTTLAASSDGTVRLWD


T DVEFSPDGKl I LSCSDMTVRLWD
 $G K E \| L R F N G H S A P V N$ AVVAVTPDGTRVISGSDNTVKVWN
$K C \square H T L^{T} G V G L L G S \square N S \square A \square S P N N D D L A S H D D K T \square K D W N$ QELDTLAGHSDSVRTVAVSNWQGNIIASGSDNTIKLWN VAYSHDGKLYASAAGDSIVKLIW GQP $\square R P M K G H E K S V \quad R D I R F S P D G S R I V S G S D M \square I R L W D$ QH QQVIRTDDLP IAPVGLAVSKTGRLYVADWYHDLVVAA


 PQFI AF SRDGRRYVSDSDEKGVLDT LPYKGQGF NSPHLAASADGRMEVADWSGNRRLSA


 ESTIYSHDGAH I SGSK R DVVRLVD PEGMAVDWMGNLYWADTGNRDEVAR SALVVSSDGR WVATASHDSTILL TGLVSPDGLACD WLGGRLYWTDSTNRDEVSN

IT FRPDGDRLVSSSNDFT Q K R C C QTDDPTKTSTNVLGATDVAFHPKGNVVASASGNQVHLWH GFRNRDWSVVFNFTNSMIACSSDNQIHLWN SVVRFSQDGSRVVSGYDDTVRIWN $P V T T D R H P R G V Y D V R F S P E A T L A T A S S D G C V R V W S$
 FTFFGQAKEVFAVAlSPQGKMLVAGFDNKISSWQ ALGGEPYLIFANR DD\|RKLAP VGERLSPRGSAVAPDDSVAVPDRDGGVRLWE IS GLVSPDGLACDWDGKLYWTDSTNRI EVAN
$K P L S P A G H T D W V N C V A F S P D G K C I A S G S D C T V R L W D$ WPNGLALDQEGKLYWGDAKT DIEVIN
$K T G T G G D P M E H \square G A V T A V A F A P D G R S D A T G S G D T V A R D W V$ LTGEF DHTFFGHSATVDVADSPDGRMMVSGSFDRKVIEWK

PGWQ $D E R T M T G H N G L I S V E W A P N G K M L A S P S F D R S W K D W D$ VSTGTAAVQGRRWRGHYMGFFPDGCRVLSCSYDDTVRMWE $V S T G T A A V Q G R R W R G H Y M G F F P D G C R V L S C S Y D D T V R M W E$
$A D G E M A V V A D G F G T P A A V N F D S T G K L Y V V D T M H G Q L M R M D D$
$E E R E R V E L A G H R G S V W P F A F R P G G G Q L A T S S N D G T V R L W D$ VENERYSPAGERGSTVWPFAFRPGGGQLATSSNDGTVRLWD
 TTGFNDLSFAAGAMMYDI DMDSQGQIYGANDTGKIMKYNP

 VEGRSARDFEGHSKVTGAARSSDGNHTIVSCSNDRTIVRLWD


## 

 $A \| T$ GVV $\quad$ IG R G H E D S V L S V G Y S P D G H C I V S G S D D S T M R I W D VK R K E IJKK F E G H F D V L G S Q F S P D N K M I V S C S K D K T I R I W D






 P S GE S KVVIGKA H TAAAVR SVVA F S H D G Q R LAA TA S D D K S V K V W S




$\qquad$ T S V V $V$ S G

Ysabt $S P$
$S P$









3 UniRef90_UPIO004416E2E UniRef90_UPI0003AA7A52 niRef90_D2B8D9 UniRef90_UPIO00455FB15 UniRef90-K7ZGR6 UniRef90_UPI0003F0BA41 UniRef90_K9XJR2 UniRef90-K9TI38 UniRef90_X6MU39 UniRef90_A7S2V4
UniRef90 C2FVJ4 UniRef90_X6PDX9 UniRef90_UPIO0016C4BC3
UniRef90_K1PCJ1 UniRef90_UPI0004 UniRef90- X6NN27 UniRef90_K1QWP2 UniRef90_UPIO002DF1384 UniRef90_L1IHC6 UniRef90-C7ZFU4 UniRef90-K1Q0W4 UniRef90_UPIO004410897 UniRef90_M2QY08 UniRef90_UPI0003B5B6A4 UniRef90_H2V3J3 UniRef90-R9HAX3 UniRef90-S8E8U6 UniRef90_Q3MC23 UniRef90_-UPIO003471BCC UniRef90_K9UH13 UniRef90_UPI0004723FE0 UniRef90_A0A023XK31 UniRef90 X6NFI9 UniRef90_D2VFG7 UniRef90_UPIO003638397 UniRef90_F4XQD0 UniRef90_A7C479 UniRef90-UPI00031CA480 UniRef90_L8M4F4 UniRef90_S8E7H3 UniRef90_UPI00035C7184 UniRef90_X6MD52 UniRef90_M7NWV1 UniRef90_UPIO003B62432
UniRef90 F9G728 UniRef90_UPIO00383B51A UniRef90_UPI00047EE1D UniRef90_A9VXV4
UniRef90_V5FZ44 UniRef90_L7VRB2 UniRef90_X6PAP8 UniRef90_UPIO00333D371 UniRef90_R6DF25 UniRef90 ${ }^{-}$X0SI48 UniRef90_UPIO00344631E UniRef90_X8IW22 UniRef90_UPI00033192D9 UniRef90_R7SMC0 UniRef90_UPI0003594E6F UniRef90_B4CYT3 UniRef90_C1B3Z2 UniRef90-J9HI93 UniRef90_UPI00016C46CD UniRef90_B7KMB6 UniRef90-B0E0S1 UniRef90-Q7NF65 UniRef90_D6WVP7 UniRef90_B4VRA6 UniRef90_R7UJB4 UniRef90_E3JBF7 UniRef90-UPIO003C18F9D UniRef90_D8PZQ1 UniRef90_G3QCT9 UniRef90_S4TMC4 UniRef90-B4NPE9 UniRef90_X6PB56 UniRef90_A0DFV6 UniRef90_UPI000440D225

 LD G Q F V L V WK D L $W$ D N P R S L A A L L

 RSGESAAVLRGHGRMRAVAFNRDGSMLATSSNDGVVRLWD












PSWSCLYT LKGHRNAVTS ${ }^{9}$ THFS PTEEMDASGSQDQTDE $\mathrm{T}^{120}$ GPTTRPLMAKQTNGRVLAMAYSPDGWTFVTTDSGRVTRIR L D K K A MIVR E F H R Y G P V V Y S M A F F S C D S G A I A S A S G D K S S I K L W





 VSSEQEKKKWEAHSRWNDVQFS

SKGK F L F Q F GKK GTK D G L
$D G Y \square C A L S P K Q K L K V F R S V S F Y P N G L A F N A D H S K \square Y \square A E T$ DE S GK QI K S LE GHSEVNDAT F S LN G QI IA S A S Y
 QG GQFRSVFETVDEPYSIAS DGS GNVIVSTTRRTVEVYK











 $V$ Q D GQCCLR NL S G H S Y I R SMAFSSSDGR IL AS GS T DRT I R L W





$\stackrel{L}{T}$













WS GP Y A $\square T$ A G P D QA $L W W T L V H A G R \square A R \square$
K N P GK E E GQLLF YPRKVAVMRSSAKFVVGDRGNERSRMQQ F
PGECRQVLESNRMDRLVSVAFGAEPHLLATASNDGRVYLW SDS GKEVFKSNS RNRV ERVAFSPNGKLVALGDNNS QVAVY LETGN Y I L L K G H N N RVVRVVFSPD GKWLA G G GNDRS V I L W $V M T G E V E A E L K G H D W V N S V T F S Q D G S R V V S G S D D K M V R I W$
 VT RKQFLKSFVGHSWVRSLQFAPDGQKIVSCADDQTVRVW
 RYT G DL K RTMN GHSSDT WS V A DS P D C Q T L V S G S A D K T I R V W


 KVKASRDVIIDDQLPDLDGLCADRNGGCSHCFFTPHATRCG



UniRef90_A0YQ89 UniRef90_LODEZ6
UniRef90 K9VGV9 UniRef90-K9VGV9
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UniRef90 D2B8D9 UniRef90-UPIO00455FB15 UniRef90_K9UGJ3 UniRef90_K7ZGR6 UniRef90_UPI0003F0BA41 UniRef90_K9XJR2 UniRef90_UPIO003783A24 UniRef90_K9TI38 UniRef90_X6MU39 UniRef90_A7S2V4 UniRef90-C2FVJ4 UniRef90_X6PDX9 UniRef90-UPIO0016C4BC3 UniRef90_K1PCJ1 UniRef90_UPI0004409A56 UniRef90_K9UGI2 UniRef90-X6NN27 UniRef90_K1QWP2 UniRef90_UPI0002DF1384 UniRef90_L1IHC6 UniRef90-C7ZFU4 UniRef90_UPI000376A76E UniRef90-K1Q0W4 UniRef90_-UPIO004410897 UniRef90_M2QY08 UniRef90_UPIO003B5B6A4 UniRef90_H2V3J3 UniRef90-R9HAX3 UniRef90-L8ASW8 UniRef90_S8E8U6
UniRef90_Q3MC23
UniRef90_UPI0003471BCC UniRef90_UPI0003830945 UniRef90_K9UH13 UniRef90_UPIO004723FE0 UniRef90_A0A023XK31 UniRef90_X6NFI9 UniRef90_D2VFG7 UniRef90_UPIO003638397 UniRef90_F4XQD0 UniRef90_A7C479 UniRef90_UPIO0031CA480 UniRef90_L8M4F4 UniRef90_S8E7H3 UniRef90_G4TVZ5 UniRef90-UPIO0035C7184 UniRef90_X6MD52 UniRef90_M7NWV1 UniRef90-UPIO003B62432 UniRef90_F9G728 UniRef90_UPI000383B51A UniRef90_UPI00047EE1D9 UniRef90_A9VXV4 UniRef90_V5FZ44 UniRef90_L7VRB2 UniRef90_X6PAP8 UniRef90-UPIO00333D371 UniRef90_R6DF25 UniRef90_X0SI48 UniRef90_UPI000344631E UniRef90_X8IW22 UniRef90_UPI00033192D9 UniRef90_R7SMC0 UniRef90_UPIO003594E6F UniRef90_B4CYT3 UniRef90_C1B3Z2 UniRef90_J9HI93 UniRef90_C4RND1 UniRef90_UPI00016C46CD UniRef90_B7KMB6
UniRef90 B0E0S1 UniRef90_Q7NF65 UniRef90_D6WVP7 UniRef90-K9TNH7
UniRef90-B4VRA6 UniRef90_B4VRA6
UniRef90_R7UJB4 UniRef90_E3JBF7 UniRef90_UPIO003C18F9D UniRef90_D8PZQ1 UniRef90-G3QCT9 UniRef90-S4TMC4
UniRef90-B4NPE9 UniRef90_X6PB56 UniRef90_A0DFV6
 DA $\square$ S LEPDGPSRTHESDIRAVAYSPDGDTI DT GASDGTAQ
 HTGTGELRHKFDVHGGTCLNMAWSPDSELIAAGGIGDNWS $\square S T G T L V H T L Q Q H T G E T C A L A F S P D G Q H M A S G A V D G T D R$

 $N T \stackrel{S}{ }$
 D L A T GKF L CTLLA GHS GTVWSTA FSSPDSATVVAT GSDD QT I R Y A R T G Q L L D S F S G H A D Y V R C L A F S P D G K I L A T G S D D K T I K
 GTHNDWTGNWDS QNMEWTNPVCFTNTGGPV
 E P Y GI E L D A D GN L Y I V D RL N F CVVRKV D GKTAVVISTV A G TG


 NVQTAAMVKTAI
 LNS GKLI RTVPDAHLNADTKIVFTPDGSNFVSASRDRTIK NQAGKLRFKYTGPDSFDPVGI STDSQSQULVADYDNNRIH

 DTSSSKHCDNCFT DYGGSATSVVDFNPS GTCDASSGSDS SGR SNYNFQT KGLDDNPT DFAGT D T K T Y LP EVFP $\square P D D N G S R R \square W S D S Q G H \square W \square T T W G N G A L M$ DPSNGNTLWVLEGHQGVIYSLAYAPDNRRLVTGSDDGSAR


 $\begin{array}{llllllllllllllllllllllllllll}A & V & F & H & T & V & T & R & D & Q & A & E & K & G & L & Q & P & Q & G & L & A & L & N & P & G & G & T & R \\ L & Y & T & C & Y & S & S & R & V \\ S & S & S & G & E & I & A & R & F & M & L & D & T & P & I & T & R & L & G & R & L & A & I & A & P & D & G & A \\ V & W & F & A & D & L & T & G & Y & G & V & T\end{array}$


 DVVYT GK CILNTLLLGHKN WVWSDS F S P D G Q S I V V S A S Y N K T I K


 DVSSGTQLQLFEGHSDSVNGVHFTPNGLNIVSYSNDKTQR N GLDE TA GF L A A S P GF P GF VR G V RTDNGECTQKLKGHDDSLLSVTFSPNTRFLASSSYDGTVR GMDGSDRFVII NTEDYWPNGLTLDYEER
ID PK T NKVVVDTIPMPKSPHSIAVHPT RPLA IVACFDANAA ID M GALKA A TVPA GAMPY GVVSVSPDGA
GES GDLLRWFDCSDYMREPSDI AI H GKEFYVCDFKGHNVVV ALAP QRLGRSSLIGHEDEVWSVAFSPDGRSLAS GGKD GKAM
 S DMLLGQERVVI AD DLPHPFGL TQYS DY IYWTD WN NRDGEDTQI CANESSLLLCMGIVVDNAGDIYVSEAANNGVH

 S D M L G Q D R V V I A D D L P P H P F G L T Q Y S D Y $\square$
 GK L LT E WGA G E F DMP H G L T L D R E D NVWLT DVGRQQVF


 NVET GE DF QKHN GH QRR VLS I T F S S D GQF I A S S S R D Q T I R


 $N L D G S M R R V L L A E N L E K P R A I V A H P G E G T L Y W T D W G M Q P E$ GQH GVDSH RGCVVAPDGSWVAVGGGQRD $N L D G S F R Q K V V E G T L T H P F A L T L S G D T L Y W T D W Q$
$D A T T G E T V D E L K G H G G G V A C I G F S P D G K L V A S G S Q D H T \square C$

 NFQG NLRTVI AS NDLD K P R A I VI HPGEAFWSDWGPNPKIE




## VVRTVAGSSLAGYNDANGFSGPEDVAVDKNGLIYVLDRKN

 L RVWDVEHGAELAVLRGHGSNVTSVSYSPDGQRIVSGSWD俍 I LCFGHC
GRVWDTGTRQEPLLCKDDTGGVTDVAFSPDGRLLLSASNN
 VVKFDAAGHYQFEWGGKGFRDPHGVAVDSHGRVFVCDRTN VGVFSEEGTFKRIGGSEKVTCFPNGIVAGDDGDVWFGDNQA VRLHDLAADEVRVLPKAHSGR ILCLAYRPDGRLLASASVD VRVWDVASGKALRSFQGHMTKAIAVAVRGDGQQVASASED VKLWDVANSNVIKTFEGHKKGVLSVAFAPNGQIVASGGHD
VRLWNVTTGEVEAELKGHTYSVNSVAFSQDGGVVASAGDD VNLVD $V M E A R P L Y T F Q G H E G A V M A V K F N Q G G D F F A T G G A D$ VKLWRKDGTLIKTLGTGHTAAVWGIDFSPDGSLIATSSADD VHLWNLHTGQL VRVWWTDGWRAGPVLDGHSHTVRAAAVSADGAFVASAGGD

[^1]| Unir | R 250 |
| :---: | :---: |
| UniRet90－LODEZG6 | NTVRLWD |
| UniRef90－K9VGV9 | GTVKL |
| UniRef90－D2VPP4 | NRIQLLK |
| UniRef90－UPIO003165014 | NTIRLWNPHT |
| UniRee90－UP100044 | CASVVWdartgrpfre |
| UniRef90 D2B8D9 | RLARVW |
| UniRef90－UPI000455FB15 | R RVQl WNAQTGKPH |
| UniRef90－K9UGJ3 | GTVRLWD |
| UniRet90＿K7ZGR6 | S RVQK |
| UniRet90＿UP10003F0BA41 |  |
| UniRef90＿K9X | K T 1 |
| UniRef90－UPIO003783A24 | RT1Kı |
| UniRef90－K9T138 | GTVR |
| UniRef90 A7S2V4 |  |
| UniRef90 C2FVJ4 | FCDKVFSDGEYVR |
| UniRef90－X6PDX9 | GT $\quad$ R |
| UniRef90－UP100016C4BC3 | HCVRVIDLAKGR】E |
| Ref90＿K1PCJ1 |  |
| UniRe990－UP10004409A56 |  |
| UniRef90－K9UGI2 | A ${ }^{\text {a }}$ |
| UniRet90－×6NN27 | ESIQL |
| UniR 90 UPIO002DF1384 |  |
| UniRef90－L 11 HC6 | TTLRVW |
| UniRef90－C7ZFU4 | DNIRVWDAASGE |
| UniRee90－UP1000376A76E | RR N W Qngha |
| UniRef90－UPIO004410897 | GTVRVWD |
| UniRet90－M2QY08 | TTリRリWD |
| UniRef90－UP10003B5B6A4 |  |
| UniRef90－H2V3 | A QVLMWRTN |
| UniRef90－R9HAX3 | HR $\backslash$ R M $\square$ |
| UniRef90－L8ASU8 |  |
| UniRet90－S8E8U6 | NSTRVWDAT |
| UniRet90＿O3MC23 | N |
| UniRef90－UP10003471BCC | GR |
| UniRet90＿UP10003830945 | GVTRVWDTSTGRVSRQ |
| UniRef90 K9UH13 | RTVRLWD |
| UniRef90－AOAO23XK31 | NO GRF KDGQF |
| UniRe990－X6NFI9 | K |
| UniRef90－D2VFG7 | NR |
| UniRef90－UPIO003638397 | G T |
| UniRef90 ${ }^{-} 4 \mathrm{XQL}$ | K |
| UniR |  |
| UniRef90－UPI00031CA480 | NTVKLW |
| UniRe990＿L8M4F4 | NNILLWD |
| UniRet90 S8E7H3 |  |
| UniRet90 G4TVZ5 | N |
| UniRef90－X6MD52 | GTTRLWDSSGKQT |
| UniRef90－M7NWV1 | NSVAVMD |
| UniRef90 UP10003862432 | R |
| UniRet90－9G728 | R |
| UniRee99－UP1000383851A | LAC |
| UniRef90－UP100047EE1D9 | GTLTQLD |
| UniRef90－A9VXV4 UniRef90 V5FZ44 | DTVSVID |
| UniRe90－V5FZ44 | GKVLLWDLAQ |
| UniRef90－X6PA | NTUR\｜WD |
| UniRef90－UPIO00333D371 |  |
| UniRe990＿R6DF25 |  |
| UniRet90－XoSI488 | D VRVWD |
| UniRef90－UP1000344631E | RS HACNKRTGEKRKE |
| UniRef90－X81W22 UniRef90 UP10003319 | KTVCVWDPSTGQL |
| UniRef90－R7SMC0 | KTVKTWDA |
| UniRef90－UP10003594E6F |  |
| UniRef90－B4CYT3 | S R $\mathrm{S}^{\text {Q }} \mathrm{F}$ |
| UniRet90＿C1B3Z3 | N |
| UniRef90－ 9 H193 | NRFHVYSKDGQLIQSEY |
| UniRef90＿C4RND1 | GTAVL WDP |
| UniRef90－E7K0016C46CD | QTIURLWDINGNHEL |
| UniRef90－B0EOS1 |  |
| UniRef90 O7NF65 | RTTRLLWSRDGK |
| UniRef90＿D6WVP7 | K R VMV WN |
| UniRef90 K9TNH7 | ETIKIWTREG |
| UniRef90 B4VRA6 UniRef90 R7UJB4 |  |
| UniRef90－R7UJB4 | GSVRVWETTG |
| UniRef90－UP10003C18F9D |  |
| UniRef90－D8PZQ1 | RT！！ 1 do |
| UniRef90－G30CT9 | NR1EVAR |
| UniRet90＿S4TMC4 | KSVHKCNKFTGKGH |
| UniRee900 B4NPE | KTVSKINGKGFRSVHE |
| UniRef90－X6PE | T R |
| UniRef90－UPI000440D225 | NRII EVRLDGQYRQ |

UniRef90 l1EKV4 UniRef90-K9R860 UniRef90-C3ZOH5 UniRef90 ${ }^{-}$X6M4E6 UniRef90-M5C4F8 UniRef90-D2WOP3 UniRef90 UPIO002C680C1 UniRef90-UPI0001E89C73 UniRef90-JOCVF8 UniRef90-W7TFQ4 UniRef90 Х6M0M8 UniRef90-UPI0003333C9E UniRef90-K6GQP2 UniRef90 X6MNZ9 UniRef90-M5C312 UniRef90-M5BNA9 UniRef90-AOYRJ3 UniRef90 LODKZ8 UniRef90-C6WD50 UniRef90-K9ETC2 UniRef90 UPI0004643DC5 UniRef90- W4m9W9 UniRef90-V5F963 UniRef90 D9PIG1 UniRef90-X6LBN2 UniRef90-W4LT17 UniRef90 C2W4Y4 UniRef90 UPI0004418FFC UniRef90-M5FV24 UniRef90-L11473 UniRef90-UPIO0047CB10E UniRef90-UPIO0034BFD3C UniRef90-B4VPU0 UniRef90_X6LZG4 UniRef90 UPIO002D681BF UniRef90-UPI0003F09189 UniRef90-E8X2JO UniRef90 ${ }^{-}$KOHTK5 UniRef90-F5YCB3 UniRef90-B4MR15 UniRef90-X8JF21 UniRef90 E8R250 UniRef90_F8ABP1 UniRef90-LOHER4 UniRef90_UPIO003450101 UniRef90-UPIO0044142AB UniRef90-UPIO0030AB3EA UniRef90_UPI0003333198 UniRef90 C3ZZ70 UniRef90-UPIO003D26B50 UniRef90-UPIO00346945F UniRef90 UPI00016A720F UniRef90_D8G9J9 UniRef90-C3YNK1 UniRef90-J4GIP7 UniRef90 UPI0003623DFA UniRef90 WOSDY4 UniRef90-H2TT95 UniRef90_B6GY70 UniRef90 M2QVG6 UniRef90-S4XTW7 UniRef90-G1KQ71 UniRef90-A8PG40 UniRef90 Q1IQG7 UniRef90-C3ZSA6 UniRef90-UPIO00455EA96 UniRef90 LoGQS5 UniRef90- $88 \mathrm{JE32}$ UniRef90-UPIOOO374D290 UniRef90 G4TSP5
UniRef90 - T5ANI1
UniRef90-UPIOOO46A8697 UniRef90_K1WG01 UniRef90 UPIO003706C0C UniRef90_UPIO00470FDOF UniRef90-84SH53 UniRef90- ${ }^{-16 N V V 1}$ UniRef90 UPI0003B2ED61 UniRef90-H3BHQ5 UniRef90-G9YVF7 UniRef90 UniRef90_UPIO0045E41D3 UniRef90_ATRGY8 UniRef90_UPIO003722035 UniRef90 L8PLM0 UniRef90-UPIO0044182E8 UniRef90-G4TU22 UniRef90-B0Y7W6 UniRef90_G7VYC8

PATTLNHGDWVDKVSFSPDGELLVTGSDETVKTWH

GKQLQVLEGHSKDV NGVQ F S P D G T KIV S A R D K T I R M W D

| $L$ | $G$ | $V$ | $F$ | $A$ | $S$ | $N$ | $S$ | $Q$ | $L$ | $S$ | $C$ | $S$ | $E$ | $D$ | $K$ | $I$ | $R$ | $V$ | $W$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $S$ | $V$ | $A$ | $Y$ | $S$ | $P$ | $D$ | $G$ | $S$ | $R$ | $V$ | $A$ | $G$ | $D$ | $G$ | $S$ | $V$ | $S$ | $I$ | $\operatorname{R} N A$



GAEFSSDGRLLVTGQDRTVRLWD

VQVFEGHSKRVN DLS S PDSQMLA ASWDNTVRTWT VNGALFSSDDSKIISYSNDKTIRMWD $S M S L T A D G G R L V V P S E N G I D V Y D$ S VA F S P D G R A AL G S LDD G T I S V WD AVA F S R Q G S M I A A S D D G T I K L WK HALLFSRDGKRLAVGAGGSVQVYS
 Y V T N E GNSVTV I D

FTFHNTYDG $\square$ TCLDFSDDNMLVAAGQESYワRVWS $V P L G L S A A L G R P E G I T R D G S G N L Y V C C D A N D V A R V T$ F S P D S S KVV S S $\square \mathrm{DK}$ T $\|$ Q WD G G GPFNLPTDDAFTPS GEMFI T D GY GNARVHK

F D GSIT N N SLA I S P DE QIA IVS D S R S L R I Y D
SNLTWPNGLAI DGSQRLYWADAGKTIEFAG


EGLGGCPDT\AFSPEEK $\ A D G D A D G K V R L W R$


G Q WE VGRNGVNEFNQPVGVT VDKK GNVLVADFGNR】Q LDD
$E G P V F D D A G N L Y V S D \square P W G R V F R$
$\square S \square Y R Q P T A V L A C E D G S A W V A A Y G S N E L V D D$ GQVLYEW GKNFFYMPHGLTVDDPEDNVWVTAVAMHMQVFK GEMVWSHRAVSPE GRPTGPTFLSDGRVAVAGTDNAVRLTE NK L S F P S Y LA Y DP R D E L Y V V D TA K GR I V

$V$ V F S H D C V HL V
TSVVIFTPDGQQAI S G S DRKIIKVWD
HCVASGPQPFILFANS QDI RHVH P E Y I A V D D D G N L L V S A WN S D V Y L Y
 GVRFSPNGKLIAS GVDDTIKFWS
TKKFSLSEYCTNPYGLAVQRDGRVVIDADANSSIGLFE
H GHT QA $\square$ C S L A F S P T HELAASGSRDNMMI WD
GDGPYVP PEPVATDPS GRFLVSDTTRHQLVLE

$R$ S V $V$ C F S P D G K Y L A T G E D K Q I
VS GVRPECVIAEADGTLWTSDARG!ATRDD SLVSPDGACDWUGKLYWTDSTNRIEVAN

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

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

DFCPTPDGMA $\square$ APNGDLI LACPNKDGKI SK $R S V C F S P D G R Y L A T G E D K L I R V W D$ R AVAFS LD GTRLATGGGADVHLDD EGINF DGNGD IWWAVSLFNGAIVVKV SAMAFSRDGSRFVVDSKGFWQVLD K G S T K GRFSKE $\square$ H L A F D S Q N Y YV T D T EN R I QK L S | $A$ | $L$ | $P$ | $E$ | $P$ | $V$ | $L$ | $L$ | $F$ | $A$ | $N$ | $R$ | $\square$ | $D$ | $D$ | $R$ | $V$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $D$ | $R$ | $D$ | $G$ | $N$ | $L$ | $I$ | $V$ | $L$ | $K$ | $I$ | $D$ | $K$ | $D$ | $R$ | $N$ | $I$ | GKE $\square$ HKLKGH LLNWVNDAKFSPD GNMVVASRDN TIRRLWD $\square S G L V S P$ D GLDA C D WVG K LY W T D S T N R I E V A N

$\square R Y T \square T D H K F A V L S L D T S P D G Q T \square A A S R D R T V K L W N$




UniRef90 I1EKV4 UniRef90-K9R860 UniRef90-C3ZOH5 UniRef90-X6M4E6 UniRef90-M5C4F8 UniRef90-D2WOP3 UniRef90 UPIO002C680C1 UniRef90_UP10001E89C73 UniRef90-JoCVF8 UniRef90-W7TFQ4 UniRef90-UPIOOO3333C9E UniRef90-K6GQP2 UniRef90-X6MNZ9 UniRef90-M5C312 UniRef90-M5BNA9 UniRef90-AOYRJ3
UniRef90 LODKZ8 UniRef90 C6WD50 UniRef90-K9ETC2 UniRef90- Q7PZR0 UniRef90-UPIO004643DC5 UniRef90-W4M9W9 UniRef90-V5F963 UniRef90-D9PIG1 UniRef90 X6LBN2 UniRefofo WLLT17 UniRee90-C2W4Y4
UniRef90-UPIOOO4418FFC UniRef90_M5FV24 UniRef90-L1473 UniRef90-UPIO0047CB10E UniRef90-UPIO0034BFD3C UniRef90-B4VPU0 UniRef90-X6LZG4 UniRef90-UPIO002D681BF UniRef90-UPIOOO3F09189 UniRefe90-E8X2J0 UniRef90-K0HTK5 UniRef90-F5YCB3 UniReffo-B4MR15 UniRef90-X8JF21
UniRef90-E8R250 UniRef90-F8ABP1 UniRef90-LOHER4 UniRef90-UPIO003450101 UniRef90-UP100044142AB
UniRef90-UPIOOO30AB3EA UniRef90-UPI0003333198 UniRef90 C3z770
UniRef90-UPIO003D26B50 UniRef90 UPIOOOO346945F UniRef90-UPI00016A720F UniRef90 D8G9999 UniRef90 C3YNK1 UniRef90-J4GIP7 UniRef90_UPIO003623DFA UniRef90_WoSDY4 UniRef90-H2TT95 UniRef90-B6GY70 UniRef90-M2QVG6
UniRef90 S4XTW7 UniRef90-G1KQ71 UniRef90-A8PG40 UniRef90_QIQG7 UniRef90-UPIO00455EA96 UniRef90-LoGQS5 UniRef90-X8JE32 UniRet90_UPIO00374D290 UniRef90-G4TSP5 UniRef90- T5AN11 UniRef90_UPIO0046A8697 UniRef90-K1WG01 UniRef90_UPIOOO3706C0C UniRef90-UPIOO0470FDOF UniRef90-B4SH53 UniRef90-X6NVV1 UniRef90-UPIO003B2ED61 UniRef90-H3BHO5 UniRef90-G9YVF7 UniRef90-UPIO0045E41D3 UniRef90-A7RGY8 UniRef90_UPIOOO3722035 UniRef90-L8PLMO UniRef90_UPLO0044182E8 UniRef90-G4TU22 UniRef90-BOY7W6 UniRef90 G7VYC8
UniRef90_xovSE8

RDGKLLKILRGHGWVNWVTFSPDGQF IASASDDNTVKIWS LRGAFVRQFETMMNPDDVALDGEGNLWVVGKQFLCGEVHV LSGQQVQVLEGHSGINGIQLSADGSTLLSYSWDNTLRI WN YDGTLLVPLQGHSRVLSVVFSGDGRLVASGSSDLTVVVWD FAGTGLAKNAKLSNPRGLNFGPNGDLYMADSDNNVVRRIN LDGGRKRQKVGSLTHPFALTLSGD TVYWTDWQTRS VGACN WDAESGAPIGESDWVQCGAYCPDSMRIVSGADDCTVRLWD VTDPRHAGLATVPGPEGVALSPDGHMLATAGDDRMMRLP VIP DADVRSAVA DDWDSDDHVYWTDVSTDTISRKW WS GWWGATRAVLRGHEGVAFAPDGKNLVSGGWDQAVRLWE LS GKQIQLLS GLL WVMKAELSPDGSKLVSYSSDNTILIWD TTGESVLSLTDDKNVYYVAVSPDGTSVVFSRYQGIAYVWD DTGNLILGKGHTEQAWSVVFALAGGWIVSCSEDCTIRTWD MTTDGEHTPVPLKSPCAPTVATDDALWFTDFRHHRLGRTT ATGEPVRQFSDGSAAYQLAFSPDSRYDAGALTNRTVETWG TNNEQVRFEAHTDVVNDVCWSPDGRVISTVSKDRSVKIVV
 VAGQKLQLLEGGSSVVSVQFSPDGSKIASCSNDNTVRIWD FDENGVHQFGQFNMPHGVHTDRQGRVLVCDRENDRVQVFS LDGSKVLIGSQLPHPFGLTHYGEREYWTDWQTKSGQSADR VATGEGEPFTGHSRATCAAISPNGKRTAYGSEDKTVIVWD LGSMTQKAEGHRSTPWSVALSEDGKTAVSGSDDETLRVWD FDGTRAFEREHTGWVWSLAFSPDGELLASGGDDGIVRLWR GRGKPAHNLTGHSRVTCVAGSPNGQULASGSYDKTVKLWS NEVSSLVFSPDGKTLASASFDQTLKLWD SNGKY $\square Q L L D S E R P T G V A M A P N G N T V V V V F Y T K R V H I Y S$
TNGDWALVAEYDGEPNGTKFLKPGALLTTDYKNGLMQLDV VNGRKRGPLNGFDRPYDIARGPDGRLYVSEFRGGRVSV FPGTAFQPGSGFCKPTSVAVLDNGDFFVADGYCNARILKY俍
 TSTRQHTLVGHSOLVRSVSVSSPSGRYVASGSSSOQTVRTWD LTGNPVWS QEGKFVQKLAVTPDGRLVAAYASENDLSVWD ESGNFLFKFGGLKRPFGICTDSSGHIIVADSGNKRVQTFT LEGNFLVQVGTFNRPQGLAYNAKKNLYVADTENHALRVID LNKKEIRTLKGHKFVYAVALSGDGQTLASGGKDNIIKIWN STGSLLRNLNYGAGLTNVNFSPDGKTlATPSYDNTVQLWN ADGTLVKQVGGFNQPHFVCVDREDNIVVADKNNHCVQVFH PVGTEIKRLEGHGFVNCVTYSPDGKTLASASVDFTVRLWK ADGETV DGDGDFREPQGLALLPSGKVIVADTVNHALRTVD REDRFVKAFGGQFRPVDLAGAGD RLYVADTAHHQVHVLE LNGSTVLGSHDUTSARPLTCDTSMHUDASGQVRLEWPTD
PDGRQATLGPDVGEPNGMAMDRQGNLVAA $\square S G G K V Y K \square H$ LNGTKVLFWQDLDQPRATALDDPGYMYWTDWGERIERAGM PQHGPVKILEHPAPVNTLAFSSHGARLASGSSDRIVRVWD SAKNEVLTIGVHKAPYFISVSADGRGYVANSGSGNLSVLD PSGELINKFSLGKNPYGLAVQRDGRVVVTDFHKHSVFLEE TAHSCELPLKTKSPVLSVCFSPDGSQLSVGCLDNTVQLWN AAGAPL WLARGHGWVWSCAFSPDGARLASAGSDGSLRLWD AYDSLVGPLSGHSSVISVAFSSDGSRIVSASRDGIRVWNA AAGEPLRGHKGLTFVAVAFSLDGLRIVSGSHDQTIRLWD PATGVMVHAFENHSPRSLAFSPDSKAIALHWGDTLVTRDT WLDVPVLEETGWASPMGLAFNEEGDLFISDNQGWSGAEKS LTGTEIAHLAHEGMVDAVAFAPDGARLVTGCTDQHIRLWD VGGQCVTQLSTGGNPNGARFHKDGRLFITDNARGDLTYDP STGGQUNKIKGHEYDNSGAFSLDGRYIASTSQDRTVKDWN ATGEFLFQUNDLRKPGHAAVDSVGNDYVADVTAHHIPENT HRSEYTLLLNNLENAGALDFHHSMELWSDVTLDRDMKAND
WFDVPRNEYTGEARAMGIVFGPDGDLUVDNAGWTGEPHM VSGKQLKKWEGHSNCVTSAFSSDGNTVVSSSWDQTMRLWD LNGTKVLFWQDLDQPRAIVALDPAHTLYWTDWQTRSIHACN LAGQLQVSLNRHDAASSVIFNPNGQQVISGSRDGTNNWD I DTGTLTPGTPVAGPENMAVTPDGRLYVANDHDNTVSPVD KGGSTTRKLVGHSGPYSVAFDPYGYLLSSSADATTRLWSL ANGQPDGELQGHGEVHTVAFSPDGSYIVSGSEDKTDRLWD A AGDLQQTLEGHSGVNSVAFSPDGRLLAAGFDDSTVRLWD ESGTVELGUTVGSEPNSAAFNPNGQVFVTNRTSGTVSVIN


RNGR LITT T P GHQEG $\square$ TVVNFSPDSK VVVK $\square$ WRREQKDGE FRADGTLVGTVGAH
VHSKQQI QVLQQ H $\quad$ APVVAAFALDGSKVVSSSQDETIRTDW LLS GKQI QVLEGHSDNIVTAKSPDCSRVISGSVDKTVRIW

S S GI GRPKRKEILSALYSPMDDQVLSPERQPYFHTRCEEDNGGC ASTGESVGVYGHDEWVWCVAFSPDGACIASGSDDATIRDAW YQPGSVAVLTGHTDALTTSLVFSRDGSALASASADNTARLW

 MKNADTVVQLDDDS GVLCIAFSCDGRVACGDMNGEVYICG
 LLATGKPDGVFTGHDFVYDVAYTPDGHSLLSVSKDRTIKLCI $P A G R T T T V D L P G A G \quad P Y G V T G G P D G A V W C T A A T T G K I G R I D$
$V Q G N V V E K L P G H S L L V K G V S F S P D G S V L A S V S R D T T V K L W$



## 








## VTPY LPRRRNSERFKGVNDLIFDADGNLYFTD Q GQS GLHDP

 $L S N N G D W Q Y Y$$T K$ A GE LI LTT WG Q N SFS G V S Y D P Q N Y F A I P H A L T L V P E L E $L K D G T V$ FCPP P Y H Y G G V T S V A V S S D GTR F I S A F S Y R A I R M W

 P

 D GS Q R E R L I E E G V N M P E G L A A V D WT G R I Y W T D R G K S L I E G S



 HK F G R E G D R P Q D M WA P M G V S A D S R G N I V L A N M G G T T D G V G


 $V$ V F S P D G Q L V A S A S E D T T
RDGRSEVLLDS $\square D G M P L G A V$ DSSVRKI IVDSDDYWPNGLTIDEEQKLYWADAKLSFIHRA VASGEVLNRFEGHNS DNCVVFSPDTTIASASEDET RLLDD LEKHSEIATVAVGSAPGEAAVTPDGKTVVVSNRTANSVSDL ADGTRVKSVRRNFNKPYF DCVDKEDNDIVANKGSHRVQVF NTMGDTAFESFHTQA RTVAYSPDGYI ATGSEDRT RI WE
 AATGKLLDNLDGHNWVLSARYSPNGKQIDTASTDKVVKVW ATTGQTLGEPLQGHGEFAVALSPNGSRIASTSPNTVRVWD A
 IEAGQNVLTLS DEDGVTTVADSPDTKYVAAGSLDKSVRVW VETGAELRRFFAGDSVKAVAFSPDGTRVAWGGLNQAARVW RSRSLLTVFADRVEGKSFDLVFDEQGGDYVTGADNSNYLDY $A V M G V E C S A D M K N S T F S G V V T Y S P D G R E L T$ DPKVYMFAPCVGKFSPVGELLD $N G S N V E E V V S T G D E S P G G L A D D W H D K D Y W T D S G T S R \square E V A$ VFTGRILRGVVKCTVVADNMEHPNGIRIDWGDYMYVTQSCM VKSGRNVKILHGHNVINDAQFSPDCQTIVSSSFDNT $\quad$ G $\square$ W KRTGEKRRILSALYSPMDIQVLSQERQPHFHTQCEEDNGG DGKGVETVASVEVQNPEGI AVDWARNLYWTDTGMDRDEVS WRTGQLLKSFAEQSFPYSVAISPDNRWIASGGFQA IKLWD LT TG G A GKAVPVGPRPFNVVAAPDGKTVYVSNSGGSTVTP DTMTNVVAYRGHQNPVWDVQWSPMGVYFATASRDRTARLW $V I S G Q Q L G N H G H E G S V Q A V V F S P D G R I V S G S W D R K V R L W D$


UniRef90 I1EKV4 UniRef90-K9R860 UniRef90-C3ZOH5 UniRef90-X6M4E6 UniRef90-M5C4F8 UniRef90-D2W0P3 UniRef90 UPI0002C680C1 UniRef90_UP10001E89C73 UniRef90-JoCVF8 UniRef90-W7TFQ4 UniRef90-X6MOM8 UniRef90-UPI0003333C9E UniRef90-K6GQP2 UniRef90-X6MNZ9 UniRet90 M5C312 UniRef90-M5BNA9 UniRef90-AOYRJ3 UniRef90-LODKZ8 UniRef90-C6WD50 Uniinefoo-K9ETC2 UniRef90_O7PZRO
UniRef90 UPIOOO4643DC5 UniRef90-W4M9W9 UniRef90-V5F963 UniRef90-D9PIG1 UniRef90-X6LBN2 UniRef90-W4LT17 UniRef90_C2W4Y4
UniRef9_OPIOOO4418FFC UniRef90-M5FV24 UniRef90-L1473 UniRee90-UPIO0047CB10E UniRef90-UPIO0034BFD30 UniRef90-B4VPU0 UniRef90 ${ }^{-}$X6LZG4 UniRef90-UPI0002D681BF UniRef90_UPI0003F09189 UniRef90-E8×2J0 UniRef90-K0НTK5 UniRef90-F5YCB3 UniRef90-B4MR15 UniRef90-X8JF21 UniRef90-F8ABP1 UniRef90-LOHER4 UniRef90-UPIOOO3450101 UniRef90_UPIO0044142AB UniRef90-UPIO0030AB3EA UniRef90-UPIO003333198 UniRef90 C3ZZ70 UniRef90-UPIO003D26B50 UniRef90-UPIO00346945F UniRef90-UPI00016A720F UniRef90-D8G999 UniRet90-C3YNK1 UniRef90-J4GIP7 UniRef90-UPIO003623DFA UniRef90-WOSDY4 UniRef90-H2TT95 UniRef90-B6GY70 UniRef90_M2QVG6 UniRef90-S4XTW7 UniRef90-G1KQ71 UniRef90-A8PG40 UniRef90_QIQG7 UniRef90-UPIO00455EA96 UniRef90-LoGQS5 UniRef90-X8JE32 UniRef90_UPIOOO374D290 UniRef90-G4TSP5 UniRef90- T5AN11 UniRef90-UPIOO046A8697 UniRef90-K1WG01 UniRef90_UPIO003706C0C UniRef90 UPIOOO470FDOF UniRef90-B4SH53 UniRef90-X6NVV1 UniRef90-UPIO003B2ED61 UniRef90-H3BHQ5 UniRef90-G9YVF7 UniRef90-UPIOOO45E41D3 UniRef90-A7RGY8 UniRef90_UPI0003722035 UniRef90-L8PLM0 UniRef90_UPIO0044182E8 UniRef90-G4TU22 UniRef90-B0Y7W6 UniRef90-G7VYC8

NSF $\square$ YRAYKNDEHHTGT $\square W S L N F D S K G K L A S A G D D N T I N$ NSWWGYLFRRQRLKYPAFLTVDGDGNVFVTDCENHCVF DVSSGRQQQLLEGHLGEVTSVQFSPDGSKVLSSSTDKT:R ATDGALLLGPLHGHTGGVNCVTLSPNGTLI ASASSDMTVR
TNEITISDADNNVIRKVNGNTSTIAGNELGSGFSDGG TNEMFISDADNNVIRKVSNGNISTIAGNELVGSGFSGDGG LTTDQQRSSMFLKVPPAPTNLALDEKGVVYTDTTSFEV1R EVTGPALA NVNSVEEPIICKGHTDAVLAACQFSPNDRTLASSGSWDQTDR NTDGSMRTVLTWENDDRPRDVVEPMGGYMYWTDWSPKIR NTDGSMRTVLI WENLDRPRDVVVEPMGGYMYWTDWSPKIE
$N$ RSSGEPAGTLTGHTESVKVVAFSPDGRLIASGATDGK L
 NPCDAGVREPLTGHTDWVRSVAFSPDGSREVSGSYDMTVC KSDG TLDKPLERHSGKFVGVSFSPDSQVIAAASDDGTVK EEGRATWFD PPAGSF PAMITTGPDGALWCTLNQAGALA Q $\operatorname{VRSPRMKVLEPSTDEHNGVSTNPDGNRIAATRDGQVA}$ KVSRKQFLSSFTGHTNWVRCARFSPNGKLIASCGDDRTLK
 D P VSGAVLDP
DVSSGQQDRR DEGHEFRVMGAKFDPDGSKVVSYASDKT $\square R$ NAEGERLTQWGDPEFRSCHGVAGDSHGDIY IDDLEKRKPTAVITGFSQPRGITVSPNGKYVFVTNFKGDKV SHLCLRSPNPSAFSCTCPTGUNLMPDGKTCSPGMNSFLIF SDV KPANGRTESRTPFTFAALSDDCTRLVSVGEKDTARL TTSGUYSEVKSSPEILA GGLVFDSDEKLFAVGFSSGKI ASVGFEEVTDGHGKNLRGDRLAFCPKQTQRQSNEGNVQLW VRTGKLLRT LAGNSNSARHVAFNPDSHSCAVGSLNGTLE QTGKMRIVLAGHALQANSVAYSPDGKTLASGSGD RS TSDGDFVM

DWS DVLT YKGGGLNAPQA DAADQSGDVWTANSGNSSVS SGRLYRLRPNGQHNVPSPNGVALSPDGRVLYLAVTRGNCV IGSKGLAPGEFVGPQNLTLDEEGYLYVVDYGNRR S LLCAADRENGRVQCFYSSNG SAIDGSRLDKHDKAFRGHEGVAFSPDGTRIVSVSRDRAVR RLEDGK ILRSYEGHTHHVLGVDWKSDGRQLASSGGDSVVK DKEGNY NPDGTEKWNFTTGGGMRGGSPAIGPDGTIYIGTYADKKLW MWNLQGNLLYNLKGHTAPVLNVIFSPDGNKLVSSSKNNVI AETGAS GMPMIGHRGDVNSVAYSPDGQRIVSGADDRNVR DLVSATLLHTLDDHRGKDTGLAVSPDGNLLVSASVDRTLK DLSGKHRQIIIKEDTSQPRGI AVHPMAKRIFWTDINPRIE RPDGSLVRTVRYGEIKRPRYITVDGEGNILVSDYNSNSVY TSDGVTRAFSGNGYERNLNGSSSTSTSFAQPSGMSLSRDL
 SLSKDGTMLKSMDDHLPEATDVTFTKDSKKLVTVGSDGGNV NADTLTPDAVDDSHEAVDYSUAFSPDNKRLVTSSDDGTVR GRVWIAMAGVHQLDWTYDPETGTVEVAAGTTNEGLVDGPAA TAEGKPVRTYGSGSFARPKGTAMDKAGR
GDEYTMGNRAVQTMLEGATALALSYSGTDYDAETDEKKVH DTTTGYRLENPDGHKDSVYSVAFAPNGRDLVSGSDDKTIK ETATGQCRSVLEGHSHAVRAVVESPDGQLVASASWDTVR LTRQLPWWLAVAGNDRDGYDVLVDEKGPRIVADNDSMTNE NLDGSFREKVVEGSLTHPFALTLAGDTLYWTDWQTRSTHA
 IDAAKSSVRTTLSVCKEPQDVVVMKNSAKAFVVCPPTNQVI AETGRRVGEPDEGHENWVRA\AYSPDGQRLVSGSDDKTIR DAASGAPLWLARGHEGSVSSCAFSPDGARLASAGSDGSLR AHDGTPMFEPLPGHDDLVYVIFSPNGAYVAASSSDRTIQ DATTGKLLDNLDGHTQLSNSIQFSPDGNRILTASWDKTAK ADTGQQLGEPLQGYEGLAFSVVFSPDGSRIASAPNSMIQM WEAATGATGHVFDHSFGEHSFAHDRCSQAIAWGSMSTGAD RNGKLYVTQSSLSQUK DPSGLLVSYCFDMNDRDIVVTNTS
DANTGYRLEGPDGHKDSVYSVIFAPNGKMWELLVAPRGQHP NPETGEARYLAHGST VVAVAFSPDGTRLASADDDQSAH FAPGTRSARILADRLPYPNGVALTPDGKFVNIGDYGAKA RTSGWESSQNNIGKVIWPRLVALGYGDGSILVFDAASGKL TYFVDMVDVYPKVVLPASLILDKDGKAAFADQPKGYDR KLDGTQRKVLLWQNLEKPRA ALHPMEGTDYWTDWGNTPR TRQKTDSGKLMSCVYRFP LDAEGDHCTNTDADP DANSGEKVGELRGHLRHVHRAKVSPNDVF IVSCSTDKTDR CSHLCLLSPREPFYTCAPTGVQLQDNGKTCKAGARRTDLR VETGEMTARTLTGHYKDVNSLGFSPDSQFLISGSRDRAVN
 DPTTGDLQQTLRGHSGSVNSVALSPDGQ
DNTATLTVVGTISVLSSPVAMVV VGGQLYGTQAGANKV

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SVVDAATKNlVRETIGFSMTRGTSVTADGQTLYAANSGRD ARPYFADVVVPINITMKNTI A GGVDPQEGKVYWSDSTLHR WDAETGQSIKYLLTGQASNIYRVAFSPDCKRVVSGSRENT VWDLGSMTQKARLEGHSKAVGIVAMSGDGKTAVSGSNDET
VMDKDGTNFSEFATVFSTNSIGMAIDGDDNLYVSDRSNNR

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 AVNPDGTEK WTFTTGGSVYNQPADGADGTIYVTSYTDKK KFWDQKGELIKTLTDHQDSVYGMTFSSDGEKLISSSNDKIT
 SSSLQGSDRLLIASSDLVEPSG』TUDYTDTLYWCDAQQSV K
KEAYVADSESSSTRAVNLRTGGSRSDAGGDPVIA
1 WNVKTGQLLRTLTGHLGDVNAVAISPNQKJIASVSDDRT $V F D P A T H R W R E W R L P G Q D P H Y A I F V D D R D I V W L S E W S A N A$ NLWDDEGNLLQKFRAHSEWПNALMFNSKRNMLATSAGDKK K YRY
VWSA DNGDEFMSDGEHTGSVWAAAFSADGRYVMSVASEGV EAWFAQPSG■AAAGNRDWDADSETSADRWDDTDGVVHTAV
RПRQVSTDGEMTLDAGAPSDCDCKNDANCDCYQS
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$S N A P K G G R C I K T F E G H K D F V S V A L T P D G A W V L S G K D R G$ VWNLADGTRTLRRSGR SWPRALAFAPTGATHLATAGTDR MTMPSVANAQSKRGPY ILAHDGMTMDADGRLYWAEFLAGA AGPLIKGY GLPSDDRFGGHEAMCFDPDGNSIIACHFHGE VWHLKSGKILHKLEGHFNNVVEAKFSFDSLSVVSCSWDKT ALRVMMDNRRTIADTHDFWPNGLTVNAQNEYYVDAERGR DEYANMDNRRIIADTHLFWPNGDTIDYAGHMYWVDAKHHV TWDWSEKAGMEILKGHSSVVRDFQFFSDGQTIVSCSDDLT RISSDTPDFTDVVLEVDDURHATATDYDGYVYWTDDEVRA RADLDGGNR ILVNSSVTWPNGLTAYSDNKIYWADAKLDK






#### Abstract

$S \square S V V D T S L G Q \| V N E V K V G R E P Y G A A L S P D G K L L F A S S A D$ I SRANLDGSQHEDIITTGLQTTDGLAVDADGRVYWTDTGT VR $\operatorname{V}$ WDATGQPDGTPLTGHTGWVSSVAFSGDGKRVVSGSWD MRVWD LVSMK QKACLEGHSGWVTSVVA DSEDGKTAVSGSGM   


$\square T K \square T S G T A G T A F G S S A T \square N T P K G \square A \square D G T G N V W V S N S G G$ VWVLNHRAEPVQVLRGAPGSSTTNLAFGGAGRVYVTDSTH I HIFDGNGSYLGLLTGDVLLSPESLRFLDDGTLLVSDA V LNMRTKQLISKFPNNQQFENPHDVAVTSSDGNVVVAEADNP I RMWG $L N H G K S R G R \square H V G \square G G \square S S V A F S S G G H V L V D A S E N$
$A R L W N A D N G Q V T R G F G G S S E Y L H C L A V G E E G G L I A A G A D D$ GLVYDYDTGKLRGWNPGWFNYPSDVMI DSFGRIVITDDLN LWAVNPDGTEKWNNTTGYSDAAGPAVGSDGTIYISRYAN LKIREKDG MTDKTLTDPDGIYYLASHPKNNLIATSNSG
 VEMANLDGSKRQRLAQNDVGHPFAVAVFED HVWLSDWAD
 TRIWNLNTGRELRPP TGGHSAANAVAFSPDSEKIATGSDD LVRFDQAEQFEVLTLPRPHANVRQMMGRHGEVWLSESGT

VK $\square C D V F G G E L V D T \square E G S D G L V N A A T F S T D G K L V A A G G G D$ GTGLFDFGHRDGDAGQALLQHPLGVTALPDGSVAVSDTYN
 VRVWETATGQCRSVLEGHSYAVRAVVFSPDGQLVASASRD $N G G C \frac{L}{S} H D P E Q F G P D N L G Q G G Y M D G F A F D A E G N I W V A A V C R$ $N G G C S H L C L L S P R D P F Y S C N C P T G V Q L Q E D G K$
$I A V W D A E S L T P F L D D P A H Q D N V K S I S F S P D G R Y D A S G S D D$ I AVWDA ESLTPF LDD PPAHQDNVKSVSSSPDGRYIASGSDD


 $\begin{array}{ll}1 & R V W N P N G S L A T H P F E G H A S S V E S V A V S P D G T R V V S S S \\ A K V W D A A S G N L L L D L K G H K Y W V K S A L F S P D G K R I L T A S E D ~\end{array}$ AKVWDAASGNLLLDLKGHKYWVKSALFSPDGKRILTASED I RLWDTTTYT MMHVLEGHSESVT IATFSQDGRLVASSSPD
 VQFWDPRTGNTQLMLQGHKNSVDSVAPSPSGGSFATGSGD VARLWNDSAWAETVRHTYPEGIASIAFGPEGQL VAD V GVADMDGFTLGYMPKEAGRWTTNLTIHDGYLYVTEAEK MQRWDVKTGKTMDAGENFLFHPVAVAVSNDGKKIITGAEY MR DWDADSGTQLKKLVGHIDYVNNVQFFPDDQTIASCSAD VHKFRADGEKMVTFGRYGASDAADIADDARGNVLDADTGN
 I R LWDVNDRMEDQKDEGHSDCVTGVDI SPDGTLIVSSSYD ,
 I KLWHLKSGK LLKTLEEANGKVTA A A I LSEDGKYLVSASQD L VPVDD T T GTVRPPLTTGAYPLAVALTP




| UniRef90 I1EKV4 | HR｜I QK L S S N Q F |  |
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| UniRef90－K9R860 | R TVVLWQRQRKNNE |  |
| UniRef90－C3Z0H5 | D 1 V T I F |  |
| UniRef90－X6PA77 | K TI R I WD A S G K Q L H |  |
| UniRef90－X6M4E6 | K T I RI WD |  |
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| UniRef90－UPI0002C680C1 | D K I EVINVD G T K R R |  |
| UniRef90＿UPI0001E89C73 | G TV Q V L P T |  |
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| UniRef90＿V5F963 | GTV R V WDVA G |  |
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| UniRef90－X6LBN2 | KTLR L W S $\square$ N N K S N K E K |  |
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| UniRef90－F5YCB3 | NRILLI ${ }^{\text {L }}$ D P T |  |
| UniRef90－B4MRI5 | T R I HKF |  |
| UniRef90－X8JF21 | GRII LYY D Y $\quad$ I H $\square \mathrm{WH}$ |  |
| UniRef90＿E8R250 | G TV MVWK T D D |  |
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| UniRef90－UPI000346945F | T TVVR】WNLS T G Q E |  |
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| UniRef90＿D8G9J9 | G TVR】WNLD G K |  |
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| UniRef90＿UPI0003623DFA | HALRRYDPATGE |  |
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| UniRef90－H2TT95 | R |  |
| UniRef90－B6GY70 | M R I WR Y S A Y T G R |  |
| UniRef90＿M2QVG6 | S TVVRVWE T A T G Q C R |  |
| UniRef90＿S4XTW7 | NGLSV $\mathrm{V}^{\text {G P P G S H Q }}$ |  |
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| UniRef90－A7RGY8 | R NI D SVNKFTGREKR |  |
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| UniRef90＿B0Y7W6 |  |  |
| UniRef90－G7VYC8 | GTV T V $\mathrm{V}^{\text {N T A S N }}$ |  |
| UniRef90 ${ }^{-}$X0VSE8 | $\mathrm{GT} \mathrm{V} \mid \mathrm{K} V \sqrt{\mathrm{~W}} \mathrm{D} A$ |  |



AFSPC GKHVATA D DR LVRVWD | $A$ | $V$ | $A$ | $S$ | $A$ | $D$ | $S$ | $R$ | $Y$ | $Y$ | $S$ | $G$ | $Q$ | $A$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $G$ | $S$ | $V$ | $R$ | $V$ | $W D$ |  |  |  |  |  |  |  |  |
| $I$ | $A$ | $L$ | $H$ | $R$ | $K$ | $Q$ | $L$ | $V$ | $S$ | $D$ | $D$ | $Q$ | $N$ | $W$ | G GFRLTH T F QA HS LADVSGIAALHPRK Q LVSDDQNWKMWS



GPTA $\square$ A VNPTGKVYVANSSGSVTVID K I F $V$ V S N E G N D D T T V L D
 $T P L S P L S T P N G V A V D A A G R V I W T A R A N H G A V R S$
$T \vee Y \vee S$ N E G N T $\square S V I D$
$R S V C F S P D G K L L A T G E D K L I R D W D$
$\square T$ S $\square$ N $\square R S S L V S V S F S \square D N K Y V V A S M Y G S C I V Y D$
 TYLNNPKALEFSS DGTKIVSSSDDNTIVRIVD

UniRef90 ToZR54 UniRef90 Q7NJC7 UniRef90_UPI00042C7AEE UniRef90 V6HYS2 UniRef90 UPI000455F5A9 UniRef90-W4K1B9 UniRef90-W4XIN8 UniRef90-H3BL52 UniRef90 I1FCR2 UniRef90-C6HYR3 UniRef90_LODQ66 UniRet90- XOWFK3 UniRef90_UPI0003711F30 UniRef90_D6U6M9 UniRef90-A7IB93 UniRef90-H3BG23 UniRef90-X6LBI9 UniRef90 POCY34 UniRef90-17M0K7 UniRef90-K5WD29 UniRef90- X6LRV3 UniRef90-X6P8N6 UniRef90-D2VY08 UniRef90 X6ML94 UniRef90_UPI0003D07D12 UniRef90_E3KY25 UniRef90_C1MR80 UniRef90 X6NDI2 UniRef90_UPI0004408959 UniRef90-W1P6K8 UniRef90-S7N0G4 UniRef90-B7QNN3 UniRef90-D6TMV0 UniRef90-UPI0003629FB1 UniRef90-ROGN18 UniRef90-H2Z4K2 UniRef90-M5C8K5 UniRef90 A3PJ35 UniRef90_D9WRD4 UniRef90-B1X0P0 UniRef90 UPI0003B720E3 UniRef90_UPI00016C49CC UniRef90_UPI000455E4B5 UniRef90-UPIO00348765E UniRef90-B5L516 UniRef90-C7QDE8 UniRef90-UPI00029A4DF8 UniRef90-W6UFJ8 UniRef90-K7EUC9 UniRef90_Q54KL5 UniRef90-A0A023GFL9 UniRef90-K1PEM3 UniRef90-Q0RUK6 UniRef90-UPI0003C43CC0 UniRef90_B8LVZ1 UniRef90_C3ZDV4 UniRef90 K9EJZ4 UniRef90-X6MLW2 UniRef90-X1A4N3 UniRef90_Q4WA99 UniRef90-F7CG08 UniRef90_UPI000455CFFD UniRef90_X6ND27 UniRef90 UPI00016C43FA UniRef90-W0REF1 UniRef90_DOMKG0 UniRef90_UPI0003C86C5E UniRef90 A0A022T6F6 UniRef90-B3EGS8 UniRef90-D9VZZ0 UniRef90 B0X5M6 UniRef90-I3ITY4 UniRef90-N1VQP8 UniRef90-L7M257 UniRef90_L8WGY0 UniRef90-D4ZRW6 UniRef90_V2X961 UniRef90 UPI00022C8EB0 UniRef90-UPI00006D0361 UniRef90-H2Y8T1 UniRef90-J2K191 UniRef90 Q3MDH3 UniRef90-A1Z9D7


DKGDRY LAA A Y G GFKPVDVA $\quad$ KA GD R LVYVVD $\square E H H E V Q V L D$ DVYGVR F SVR GQLLASASRDCTVR FWM WD G S I L K S $\square$ N L S R N A V G L S L N V Q Q E L V F F E G W D D T I V F K Y

## 

$L D G T$
$A$
$A T K$


 $D T G T G G Q T L Q G H D D V N S V A F S R D G N L L A S G S R D H T V K I W D$



 F D GTA YGTLDFSQQMGTVFALDHDNKVYFAHTALLKWI ERNM



 DATSGKLLSGPVAGNRGVSFSPDSKLVVSASRDKTIIMME

 L H K Q H V Q T I G E H S G I CQQVA F S P D N K Y L A T V Y Q D D T C K DW D
 V K T G G E H L F F N G L WD P R T R F P V G S SMRGHSI A Y S A D A K F L A S C S V D R T V R V W H TTGND\|HGRGHSKDVNCVRFSVDGSALVSGSLDGTVRMWD


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UniRef90_K9EJZ4
UniRef90- $\times 6 \mathrm{MLW} 2$
UniRef90- X1A4N3
UniRef90-Q4WA99
UniRef90-FFCG08
UniRef90_UPI000455CFFD
UniRef90-X6ND27
UniRef90_UPI00016C43FA
UniRef90-WOREF1
UniRef90-DOMKG0
UniRef90_UPI0003C86C5E
UniRef90_A0A022T6F6
UniRef90-B3EGS8
UniRef90-D9VZZ0
UniRef90-B0X5M6
UniRef90_I3ITY4
UniRef90-N1VQP8
UniRef90-L7M257
UniRef90-L8WGYO
UniRef90-D4ZRW6
UniRef90_V2X961
UniRef90-UPI00022C8EB0
UniRef90-UPIO0006D0361
UniRef90_H2Y8T1
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UniRef90-Q3MDH3
UniRef90-A1Z9D7
UniRef90_UPIO004410FD7
UniRef90-M5C384
UniRef90_M5C3T0
UniRef90_G4YZ95
 DGKNQTVAAKDLQRPSWSVEMDRNGNGLARVQSGQVSRDE
 T GS GQLVKGKGHKLA IT DLAFASDGQLLISASVDRSMCAW TETGRIIDEPFHTDYVRAVAWSPDGRLVASGSDDYSVRMW
 $P D F T D D V L Q V G D Q R H A D A D D Y D P E G Y V Y W T D D E V R A D R R A ~$
$~$
$C$ SSSTAPTFGPGYFSSPVGDAADGSGSTSTGWVTNTSSDEV
 TETYEFI RTLPSGPDPELLVVSASGDRLYAANEDDNLVTV IGSGRTIGRWEAHSGAVDVAVSADRRYGLSRGQDVSVKIW ATRGA IMHTFQAHTQPKALAWSSDGRLASVDGPDGMVRVW PATLKILRKLKSGPDPELFALHPTGNPLYUANEDDNQVTV
 L RTSQCSLTLSDEDGVTTVAVSPDGKVIAAGSLDRTVRVW
 AGTGVCLTTLTHQDRVLSVAVSPNGLWMASSTESLVCLDS VNAGTEIITFKRDGGVRDVNFSPNGKY IVAGLED TVVRLW

 DGSYREKVMREA DD $\square P E G L A V D W N R K L Y W T D R G K S H D E R S$

 V IA GPM K A
 NTADGVTKAFSGDGRERNL NGS SSTSTSFAQPS GI S
NHQVSII A GRPMMCQUV
 PLSGKLTQKYTGHSAVSALSWSPDGQTLASGSKDTTLQLAW

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

 $T D T Y E E Q P T L P S G P D P E L F V L H P S G N P L Y D A N E D D N I V T V$
$\square P T S D M D G R V G$
$D$ PDKDSKVSFFDHYSYVLDVVVTPDSQLVITGALDGLRVWT EGVLRRI PVPTAGAQPFGITTTQADGTAWFTELGRDALGHI

 DGSLRSVIVETEDYWPNGLTGDQQQQLYWADAKFNCIHRS
 KSSGKVDGLLWFPRKVAIIRQSQRYVVCDRGNERSRMQLF
 $K R S G K L Q F K F K S D H Q P T N L A V G R D G D V Y V V E T G N F R V A R F$ NGKDESRVLRAHTAAVRSLDFSPDGLSIATASDDMTVKVW ENNSVMTLLELSNWQPRGLCHTVNGNLLVSMRSVVDARSR RDRVITTVAGAGPDYADGFTAD
DGTHRRVLVQDDLGLPNGLTFDAYSSQLCWVDAGTSRAEC ADTGSLQQTLEGHDWIRAVAFSPDGRLVASGSRDKTVKLW LHTYSNLVVYKGHNYPWDVQFSPTGYYFVSAGHDRVARLW 1 ANDTNVLLSPLQVLDNMVYDPSNGY DYITSSS ILFPVFV
 RSSSTPLWRYQTDHFVSSVADSADGNYLVAGSEDDYUYFF TA T G D C V Q I LE G H N G PVVTSVVSF S A T S E QV A S G S A D E T $\square K \square$ DGSHRKAVISQGLPHPFADTVFEDSLYWTDWHTKSINSAN ILTGREMQKFSYPRYVKDVQFSRDGQLFVASFAGTVIEIW ARLWKPVGLLRGHSAPIGLSFSPNGRSVSVAANRTALLWS $K T V A R T V P L E H G A G K P V G V A V S P D G R R V Y V A N G A A D A V S V$
$P R T G R Y P M P D P A A R D P H T L V F A P D G T I W F T V G G G N F V G H F$
 E GKGK P V R V VVTRSTVAVATLTGHTKSLAFAPDGTLASGCADGTIRLWD NGSQQEALIVK NLISSPAGLAADWTDKIYWTDAGTNRIEAA $L G S F T N T V L Y Q G H V Y P W D V D V S P C S L Y F A S C S H D R T A R L W$
$P G S T T A S R V Y G Q T N F V T G U A A D K M S S P Y G U S D D D S E G G M Y V$
$V$ $N G T G Q E A V V T G E V Q H P D G L A V D V A R N L Y W T D T G T D R I E V A$ VGDGT $\square D L V G \| H D G E V N S A A F S P D G K H V V S G C D D G K I R M W$
 D H NWE TVV GS GERCDP GD E A H C G D G A L A R D A KL A Y P K GVA
 MADPRRPTPFGHKSTVVHSVABSPDDGRTSSDDTDRLDNVAA
 ASTGEPA GRKGHKKRVRAAIAFSPDGTRRIASASGDKMMAV W


## UniRef90＿TOZR54

 UniRef90－Q7NJC7 UniRef90－UPIOOO42C7AEE UniRef90＿V6HYS2 UniRef90＿UPI000455F5A9 UniRef90－W4K1B9 UniRet90＿W4XIN8 UniRef90－H3вL52 UniRef90＿－11FCR2UniRef90＿C6HYR UniRef90－LODQ66 UniRef90－XoWFK3 UniRef90－Q1YEM4 UniRef90－UPIOO03711F30 UniRef90－D6U6M9 UniRef90－A7IB93 UniRef90－H3BG23 UniRef90－X6LB19 UniRef90－P0CY34 UniRef90＿－17MOK7 UniRef90－K5WD29 UniRef90－J2WNA5
UniRef90 $\times 6$ LRV UniRef90－X6P8N6 UniRef90－D2VY08 UniRef90－X6ML94 UniRef90－UP10003D07D12 UniRef90－EЗКY25 UniRef90－C1MR80 UniRef90－X6NDI2 UniRef90＿UP10004408959 UniRef90－W1P6K8 UniRef90－S7NOG4 UniRef90－B7QNN3 UniRef90－D6TMV0 UniRef90－FOSGL4 UniRef90＿UPI0003629FB1 UniRef90－ROGN18
UniRef90
H2Z4K2 UniRef90－M5C8K5 UniRef90－A3PJ35 UniRef90－DgWRD4 UniRef90－B1XOPO
UniRef90 UPIOOO3B720E3 UniRef90－UP100016C49CC UniRef90－UPI000455E4B5 UniRef90＿UPIO00348765E UniRef90－B5L516 UniRef90＿C7QDE8 UniRef90－UPIo0029A4DF8 UniRef90 W6UFJ8 UniRef90－K7EUC9 UniR Refo－＿554KL5 UniRef90－Q222P0 UniRef90－A0AD23GFL9 UniRef90－K1PEM3 UniRef90－QORUK6 UniRef90－UPI0003C43CC0 UniRef90－B8LVZ1 UniRef90－C3ZDV4 UniRef90－Q96ZT6 UniRef90－K9EJL4 UniRef90－X1A4N3
UniRef90－Q4WA99 UniRef90－F7CG08 UniRef90－UP1000455CFFD UniRef90－X6ND27 UniRef90－UPIO0016C43FA UniRef90－WOREF1 UniRef90＿DomkG0 UniRef90－UP10003C86C5E UniRef90 A0A022T6F6 UniRef90－B3EGS8 UniRef90－D9VZZO UniRef90－B0X5M6 UniRef90－I31TY4 UniRef90－N1VQP8 UniRef90－L7M257 UniRef90－L8WGY0 UniRef90－D4ZRW6 UniRef90－V2X961 UniRef90－UPIOOO22C8EB0 UniRef90＿UPIOOOO6D0361
UniRet90－H2Y8T1 UniRef90－J2K191 UniRef90＿Q3MDH3 UniRef90－A1Z9D7 UniRef90－UPI0004410FD7 UniRet90－M5C384 UniRef90－M5СЗт0 UniRef90＿G4YZ95

LLY｜VJMAGQHQПWRMDTAAGRVEVLAGNGHNGПHDGPALLE GKITDPLGVVKDPGRKGSLLVVSHRTGEVSRYAPDGKGTL F $\|$ DGSGSQFVVTA ADAHPDGVAVDWVRNLYWTDTGTDRUE QDLDVDSSGGLYVVDRNAQRVLYFPSGSTTATRVYGQGGS DPTGNPVGQPMTAHTGYVVSVAFDSESNRVLSGSMDCTCR DLNSLRCRFTLRGHADSVNSVMFDPFSNNILTASADKTVS CDSGNHRDQVFDGKLK LTRSLSTDFSKNQKYPHLQLPGQP TCSSSCNTFSGSSHFSSPVG｜VADGSGNIWWVTNETGNSVTT V 10 GGDGNTTPVGVGTSPADVAVNPVTNRI YVANQGSGTV IDDETGARLAELPVGVEPEGMGLSPDGADVVNTSETTNMA DAMSGMQHATFKPQDKDVAALTWSPDGTCVAVASEDGGVQ LDVEANKVIAQVPVGTEPEGMAVSPDGNTLVATSETTNMA NLDGSLRKVVFWEELDQPRADSLDPVRGYMYWTDWGPKDE DVQSGlEDKRLLGHSKAVLSTQFSSDGKMIVSSSSDKTIN DSTTGFLNENGNGHEDSVYSVAFSNNGEQI ASGSDDRTVK DDKGFELVDTDQGHFEHINSVSFSSNGRFIATGSHDKTCK LEAPGEVRQAFAGHTKDVTSVAHSRDGR\｜VSGSLREHSAC 1 D $\square$ AA GHETGRVPVGMRPYAVAL
DVNSGTEKKQLLGHSESVLSTQFSHDGKVIVSSSVDKTTC WDVSSGKEUQVFEGMSDVCATFSPDDSKIVSNENDERUR VNTGKEVKRIIIDFVVSPSTLYIDPDGKTIVLGLADTTIR DLNGLYREVMVKENVFQPRGIAVHPLAKRFFWTDLGARPR DLTGHNHYIMYAEFHPKDDYIVSCSMDQTVRVWDITGRRK DARNGRCAQTFYGHDNSCNHLSFNTKGDKLASCDADGVVK DVKSGSELQKLEGTNSTNDVNFSPDGQCIIAASADIK AESGEAVSGPFEGHTEWVNSIAFSPDRKSVISSSSDHTVR GIDYSLSKLAIHSALESASAIAISHTGVLYITETDEKK円N YLNGSNQEPVVTSEVQHPDGMAVDWIDRLYWTDTGTDRIEE DARTGAELKQYAGKSGDIKRVIFSPDDKQILTASSDRTLR DSTGHCVKTVIDDENP PVSFVKFSPNGKYVLEGSKNDLHL H LDD G YRKVLV WDNDEKPRALALHPLHSLMFWTDWGDSPR GTSGKLLSGPLRVHTAMVWSVSISPDGTRLVSGSEDGTMR
 LDPPHFLYQLEDFGTPGYALAMHPNGFLVASGDDEGTVS NGEGAVESVDLAQHKGGVYSVVFSPDGSRMASAGWDGYVR DARTGKALRVVEAHTDAVRALSVTKDGSKLASGGDDNCVY NLDGSSREVVVKGSLPHVFAKTAYPDTSMWASGSDHNSHS GGFSGDGGPATSAQLNDPQGVAVDGAGDL
SPHG
SRSGHFVRRTQ\｜KF贝D\｜VAGLA贝NQQGQ\｜VAVDSVTPGVF KLDGQHRQVLVWKDLDSPRALALDPEGFMYWTEWGGKPKI GAYDGKFERTLEGHKEGDSDIAWSQDSKLICSASDDKTDK TPEGKFVRHYGPGQFARPKGIAMDRSGRMY SSQRQNLQHMLPLHSNWVHSVRYSPDGRMLASCSDDKTLC VVRYSGSTECQVKPLFSVHSPAVNGNGDICADYTGNVVV VGDATKAHLDDPSAVAVDDDGVLYVAEGYRVRRVJ促PEQPVRRRVLEGLQYPFSVTSFGKNL
GTDQFQPGRMFVGHYSDVTCVQYHPNSNYVATGSSDRTVR DLRDLKQUEELETHKDSVHSVAFSQDGQWLASGSEDQTIC VKSGQELKLLITDDSDEMHCVQFSPDGRLVCGASSENDTIH WDVVAA GK CVVQ V V E V H Y T V H S V A F S N A D A R L A A G L D G G S T I
 D GDRTQKPFVELRDGDHQARSVAWSPDGRTVAVGNHDGTIS LDARTLRPVGRVAVGRRPWGIIAVSRGRW
 DVNGKYREVIIKEDDSQPRGVAVHPMAKFWTDMGDNPRIE
 STDGRQRALLIWERLDKPRDIVVHPSEGFMFWSDWNPLI E TFSRTYPLRLYAGHLSDVDCVKFHPNSNYLATGSTDKTVR ADSGNSRVLYFPAGSTSATRVYGQPDGGPGATGLSGATWV DSHTLSLEFDPFGSQHHDLSVFSPDGRLIASGSNDGALR ETNSLNIRLMFDEHTDTVNNISFSPDSQLIASASNDKT DTRTGQLVERDRGHRDSVYSVAFSPDGKVKQANWNDADRH VSADNVLYFADGTNMVDRDGI ITTVIGNHMHKSHWNVEEV
 SLLTWTNLTVYKGHVWSVWGVKFSPHGHYFASCGGDRVAR DLVTRRTITRKKYYEKPVNSLAFSPDSKFIVSGSDECDVT RLDGTARKVLIYEHELEPRATAVAPSLGWMFWSDWNERKE DWAAGDLLARLKGHEDEVSSVCFAPDGQHLVSGSWDHTVR ASTGALTLGPFIGHTDSVTSMDYSPDGTRVASGSDDKTIR

## UniRef90_T0ZR54

 UniRef90-Q7NJC7 UniRef90-UPIO0042C7AEE UniRet90_V6HYS2 UniRet90_UPI000455F5A9 UniRef90_W4K1B9UniRef90 W4XIN8 UniRef90- H3BL52 UniRef90-11FCR2 UniRef90-C6HYR3 UniRef90-LODQ66 UniRef90- XoWFK3 UniRef90-Q1YEM4 UniRef90-UPIO003711F30 UniRef90_D6U6M9 UniRef90-A7IB93 UniRef90-H3BG23 UniRef90-X6LB19 UniRef90-P0CY34 UniRef90-17MOK7 UniRef90-K5WD29 UniRet90-J2WNA5 UniRef90-X6LRV3 UniRef90-X6P8N6 UniRef90-D2VYO8 UniRef90-X6ML94 UniRef9O-UPIOOO3D07D12 UniRef90-EЗКY25 UniRef90-C1MR80 UniRef90- ${ }^{-} 6$ NDI2 UniRef90_UPIO004408959 UniRef90-W1P6K8 UniRef90-S7NOG4 UniRef90-B7QNN3 UniReffo-DGTMVO UniRef90-FOSGL4 UniRef90_UPI0003629FB1 UniRef90-ROGN18
UniRef90
H2Z4K2 UniRef90-M5C8K5 UniRef90-A3PJ35 UniRef90-D9WRD4
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UniRef90 QORUK UniRef90-UPIO003C43CC0 UniRef90-B8LVZ1 UniRef90-C3ZDV4 UniRef90-C96ZTT6 UniRe90-K9EJL4 UniRef90-X1A4N3 UniRef90-Q4WA99 UniRef90_F7CG08 UniRef90-UP1000455CFFD UniRef90_X6ND27 UniRef90_UPIO0016C43FA UniRef90_WOREF1
UniRef90 DOMKGO UniRef90-UP10003C86C5E UniRef90-A0A022T6F6 UniRef90-B3EGS8 UniRef90-D9VZZo UniRef90 Box5M6 UniRef90-131TY4 UniRef90-N1VQP8 UniRef90-L7M257 UniRef90-L8WGY0 UniRef90-D4ZRW6 UniRef90-V2X961 UniRef90_UPI00022C8EB0 UniRef90-UPIO0006D0361 UniRef90-H2Y8T1 UniRef90-J2K191 UniRef90-Q3MDH3 UniRet90-A1Z9D7 UniRef90-UPI0004410FD7 UniRef90-M5C384 UniRef90_M5C3T0 UniRef90_G4YZ95

170
180

200 KKEEPPVTVNPREATYG WRDTAVAADGTTYVTDQGDKG VT RLNGTMRK LISEDLEEPRAIVLDPMVGYMYWTDWGPK FTTGVQNKGGISANSLSSPECLRWDPFSGGLYDGDYNNSR RDIPDKKLPKGDLMYACWPTTSFAWFADGSRFVSAGEDHA LWDDETCQGACEPLNCVAVVSTAVLSSDGDLAATGETDKLV VTRLNGTSRKILVSEDLDEPRAIVGHPVMMYWTDWGENPK VAVTRNENGALLVSDVANKCDPLEFSSGEKFQRSFWQLRR VWELASGRLRHQLTDQPLPVTALTFSPDSATLASGGGDQT TVVDGATNTVITAIPDVGTDPTALALNPDNKIVVANNSSDN HFDDRESHRLVANVLVDSRPRFAQYKSDGEVWVTAETGGT VWRTADGQCEVMLNGHTDAVVDVLPSQDARBLLSCSVDGT HFIDTKTNKIIGNVLVDARPRFAEFSADGKRWVSAEVGGT RAGMDGTDRSII DDTNUYWPNGLTGDYTERKFWADAKLSF LWNVESGERLKOFKGHSNNVTSVKFSPDDKCYISCSLDNT WN GQGFEVINAIQSHTEKIKCAAFSKDCRYLATSSDNT LWDVATGKLLREFVGHSDDVFSTAFSLDNSRDATGSRDGT
पWNVESGETLKQFKGHSDRVMRAKFSPDDKFTVSCSWDNT WDVLSGTQLLSLEGHKEDVIKAQFMSNGSKIISYSRDKT KINIDGIIQTTCTNSQLULDIDVEVSPDSEVFIVDTNNHR LDVNSNKELKKLMGHSSGUWCVQFSPDGQKIVSSSKDKT KTTTAQPMSFEDQVQHDRGVNWATFHPTDPLUVSCGDDRQ LWDVRMVAELLTVCGPHPANKVVFDRAGETVAVASDDGT VWDKKGDMVRKLFEGHDDWVNSVAFSPDGGKQVVSGESDNCT NLFKFGDHDGVGSEALLQHPLGIFCGEDGVIYVADSYNHK RLRQVTTNGEICLLAGAASDCDCKNDVNCNCY
VARLNGTSRKVLISEDLGEPRAIVLDPPKGYMYWTDWGNK V 1 WEVASKQAVINHOHSDSVLALSWSPHGNYMASGGKDSQ LLWDRETGEEQGDPFRGHRWAVLSAFSSDGSRLVSCSEDNR LDKKSGVVKTFDKESGLAWPDSVATTPDGNDAVLNMLTFK LWNISTAKFVKTYTGHTNSEYCI FSVTSGKRUISGSEDNC LESAAMDGSQRHTSRNLHWPNGITIYTRNQUYWADAKYH\| HFDDTTTFETTTNVLVDQRPRFAQFTDDGRHLVSAEDGGT LLWNVSDPAHPVPAGPPDDFAGALAFSPDGKTVASVYDDRT TRGGDSAVQLFELPTPHAGPVGVTVGADGAAWFCEILAGA 1 WDAVNGTQLQPVKAHDADDAWSVSFGNNGKWVASAGSDGF VWDMQTFERLAGPFKHDGPVCSVSFAPDGSRLISGSDDFT CHKHTGENSREVHSNDFSPMDIHVYSQQRQPM

FVADTFDNA
VVSEEGDLIHWDDCSTFMKEPSDTADRGREYFTCDFKAHC DRAAMDGSERTTLVPNVGRANGLTIDYAKRRILYWTDLDTN $\square$ WDVESGKMVKTLKGHKEYVFGVSFNPQSNLIVSGSFDEN
TWDCTSRTCVQRFTDGGKLLRCAEFHPDGNTVAVAGKGSA VVNSSGDLRFRYGGNKMTRKKNKTFEPKCHDLIHNQFNNN

LWDVLNGNCVRVMTGHKAAVHTLAWSPDGRYLASAGVDKN VINTSTNKVIANISVGQDPSNMVYDPSNGYIYVTDFKSNT LWEDAAVNQKDSRLKHSYGVSAVAFSPDNQLLASSSWDKT WF QKSSSIP DWGYSA SNLIYSVSTSSDGNYIVSGNGDNS
 WDPFTGQQLQKVDTHRHTKEDTADKPDGRLIATASEDAT
WDKKSQSTLQVMNGHGDVITVVKSPDGQTVVSANDKT VDPATMKLEETTLPRAEARPRRLARTSDGATWYVDYAGGY
 SKSGQG QRYSCVVPTGLSNKKQCRKIPNTFITFAHRKDIVR WDVASGKNIDANYQTGDTLSHAVVFSPDDSRIAFCGRDAK LWDPAARTGTSTLPGHNSPVRSVAFSADGQTIASGGGRT RAGMDGTGRVTLVSENLQWPNGLADDADSHKYFVDGGTKL LWSTQQGASVRLFTGHRGPVLSLAFSPNGKYLASAGEDQR ALDQSDNLFVADTGNNRVVMYPRTTQTAGLAALAFNDLNC TFDSRSGKPVLGPLKHQNWVRSVVFLPDGSNVVSGSADRS VKDWNTEGDVLRTVNHDFPVWTVSFSPDGQKVASVSDDQU HDRWP TEQAMLP AGHKDMUDDHMVIODAPDGRVKIVVAG VWNWP ELI NPLDNSLDM DDHMVLQLAAPDGRVKVVAGR
 LLDGKTGKK LKFGEHSEPVNLVIFSPNGQMIASASDDCT RASGKDGSERVVLVSENLGWWN GIVALDEAKAMYWSASGKTDK RASLDGSERVVLVSENLGWPNGIALDEAKADYWCDGKTDK WDGLTGKQAAVCGDDDWSHSGYCVSPNGLYVASGSRDGT

UniRe990 B5L516
UniRef90-C7QDE8 UniRef90-UPIo0029A4DF8 UniRet90 W6UFJ8 UniRet90_K7EUC9 UniR Refo-_554KL5 UniRef90_Q222P0 UniRef90-A0AO23GFL9 UniRef90-K1PEM3
UniRef90 QORUK UniRef90-UPIO003C43CC0 UniRef90-B8LVZ1 UniRef90-C3ZDV4 UniRef90-C96ZTT6 UniRef90-K9EJL4 UniRef90-X1A4N3 UniRef90-Q4WA99 UniRef90_F7CG08 UniRef90-UPI000455CFFD UniRet90_X6ND27
UniRef90-UPIO0016C43FA
UniRef90_WOREF1
UniRef90 DOMKGO
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UniRef90-131TY4
UniRef90-N1VQP8
UniRef90-L7M257
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UniRef90-M5C3T0
UniRef90GGYZ95

 VYRWAPGEKP ThWAKGFTDPSGLAISPAGDIYVTDIGS LERAALDGSDRVVLVNTSLGWPNGLALDYDGKIYWGDAKT V KLWNAKTGDDSLDAFSHHGNVTSIDDSPDGSMLASSSDD VRVWAVESGRCNWTLKGHTEAVHALAFSLDTSKLASGSED VECANLDGRDRHVLVNTSLGWPNGAALDQEGKLYWGDAKT
 VTVIDGATNVPTTVGVG SSPAAVADNPTGKIVVANFGS VSVIDTDTKEDKKKITFEDPGPVGVRITDDGKAYVALGBA VHYWNTNTGRDKLLFSGHTQKLLSLSWSQDGKLLASSSAD I HKSNLDGTYRQVVVEGSLPHPFALTLFRETLYWTDWNT I RDWNIETGREWKILDEHSNHVNDVKYFPDGRAIVSCSSD CI WDVEKDFELI HVIRDHTNTVTSVAFSFDGKYLATGSED VIVWDVGTGASLATFMGHHGWLRSIAFSPNGDRVASGSDN
 I ESANLDGSKRRILAQNDVGEPFDIAVFED HVWFSDWDK VKDWRMSETWEVDTCRGHFNNDSAVLFHPKHELIISDSED 1 QIJWAATGKDVKKLEGHDGTITGVKISSDSRTIVSCSYD IRVWDTKSGEVVSGPFEGHNHVRSVAFLPDRKHVMSGSAN TERAA VHVWSIVSGEKARVYTGHRGNVNAIAWSSTETAIASGGDD AI LWDVATRQPVVELSGHTAAVTSVCFSPDDQRVMTASRD VYMWELNSKQMLQKGEGHTETVTTVASHPTENUYALDAAF I EKANLDGGNRRAVISRGLLHPFGVADFEDGKLYWTDWQS VSVIDPAAGQIEKKDTFEDPGPVGI RVTKDGKAYVAGGPA I QLWDVSDPKRVRPLGAPLGYVNALVFSPDGRMLASGSAD I GRVDRAGRVSEHPLPWHESKPHAI AADPAGGFWVSLWGS VKVWDVETGAEVFSFHGPTAYHVVRFARDGTTVAAGGRD
ARVWKUATGSLAFDPTRVHAGPVGVDWSPDGTVLTAGARD $\square R E V T P D G T \square S T V V N S H \square N T Y A V T V D P S D L Y \square A D T R N$ VVVIQEDGQYاRTПGGESTDFPNGTDVSGQGDVLVGDSHG LIESSNMLGLNREVIADDLPHPFGLTQYQD YIYWTDWSR VR $\square W D V N T G E C T K M \Delta S A H S D P V T G V H F N R D G T L V V S G S Y D$

## VRVYDLRNERLLQEYDAHEGTVNTVHFHPSGEYLVTGASD

 VHIUDSDGNFIRYIGYLCDG VRRIDRSGRDTLVAGRPGLDDPTGLALGPDGSLYLADAGN LLATPGSRTCRCPDNTLGVDCIVLLWDDAYGRLLAEMKGHTDPVYSLCFSREGSLLASGGDD I SVITNS SSNTVITANTSTRQGPLGILYDPNGYIYVTDAKS 1 RWHLYPSKEDSQIIGKHTDNTISVAVSPDGHWLASGSWD WWDLMSTTKKKELKALRSVDVINDVKFFPDDHTVVSCSNT KCWDTATGACLHTLHGGDDTVFYVGFLRDKDRLASGSSD VRLWDSTGQQLQKLYTPSGAEITAVEYSPDGRLTATASED DRFIDAATGEERSRFEGHTNLVSAACLSADGALAVTAGGN
LGRYDPASGNVQEWPVPGGERPYGMAVDDQDRLWFVETGP LEMANLDGSERQRLAQNDVGHPFAVAVFED HVWFSDWTM FISFDTDYRVDVALPTNFLINATGVDVDKTGQIYWTDPGA VKSLDAAYRVDVALPVNFLDNATGVDVDKTGQVYWTDPGA RLWDVPSREHRATLNGHTAAVTSVAFSADGKTLASASED VEYVNFDGTGRNRLITEGLKHPFGLDV HDRKVYWTDWDT VKLWDLASGTLFKDLRGHTDSVTSLSFSPDSSLVASSSMD SVTNNGGTCNAGVLGPKSLSTPTGIFFNQLGQLYIADRGN VRVWRVDGAPACEPLEGHQGWI NSVACSPDGAYIVTGSDD IRLWDLNGVLETTMLGHTDRINDVDFNQPAKDMASVGE PLHCASKNATVQCMLKGHRNS ISSVDLISPSGCTLATGSGD CQIWNVEEKFQDFNGIQVCDDVLSI AFSVDGKYLATGSED VRVWDVLNGNCVRTYTGHKKPVMCLAWSPDGRYLASSGED VRLWSIPASDMIGRMG IKLWDVQEKTEVAELKGHTKAVTSVSFSPDSQTLVSGSKD VEVANMDGSGRRVVISDNLKHLFGLSSLDDDYLYWTDWGN VWVWDGHCEQALAELDDGDGSVWSVNFSPDGKRLVAGHDS


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UniRef90-LODQ66
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NRI LSY
RTI CLLWDTDTK
QTVRVWNAYTGE
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DKIEVINDDGTKR
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SKAVEDTA
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QNVTVIDGVTN
NRIAVIDGNTYE
RKARLWDLTTGRQ
GSVRIWD
NRVAVVNAETFEVEKY
HSIHSCNKYSGLDRRE
NTI RLWN
ARIWKWTK
NTCKDWSTEKGFE
RRLLVWSDEGGEL
NTLDIDDAE
RTIRFWN
KTVIR R WDDLGGK
RRVRKLDPF
GTIRDWDVTTG
PSLRRMDKKTSQNR
KTIRVWD
ATFRLWN
RTIRVWD
HSI R WDA
NAI RClDLK D N
IRIRAVSKN
DRIETASVDG
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GSVRVWD
SVI
NRTAVFTGKG
RSIERANKTSGQNR
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DVIRRVDGHG

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STIRLWNTYQHN
DHVWRVS
NRLVGFDPKT
PSVIRVNKRTGKNR
DII SRASFDGKHDE
ESVRLWD
DSIRVW
HSI QVADKDTGKNR
NSVRVWD
NRVLMY
RSIERLHKRTGER
ATVRVW
NTIKI WD $\square \mathrm{NGSLIR}$
WRARI WS YT
NRVRVIGTDGK
NTCILWNDD
SMVLVWD
ERVRLWS
RTI RLWES

GTI RFWD
ETVYVWDARSQQ



[^2]| R P Y LQ HVQREGLKGLND DFFASNGDLYFTDQNPTGRVFR VPGRKVAFQVVVGVEPEGMAVSPDGRFAVSTSETDNAVHW IKVTKDLVPGTTDKYVESVRVSPDGKY LAAALDMNTVKVF
 ATEEVEKVIPTNQTYSHMIAFSPDEKVAYDPNDGSNNDTV VK SGQEVKKMTGHSQWDNVQFSQDGEMLVSASYDRTVKIV
 TTGEKKLPLTLPCHSSPVIVDVSFSPKAEAIATAEENTVKVWR LTSNTVITLAGNGSKGRDYRGGRGGSAQPLNSPWDVELDA NGSFAGSFGKQEGAQLQYATTDKDGNQLVTD DSRSRVHVY MDTYTALVVYKGHDAPWDVSFGPFGHYFATASYEHTAR ${ }^{\prime}$ W TADPRHPAPIGHTGPLWSVVFSPDGSMLAAGSADSTATLW GASSSTSTVGTGFGLPWALAVNPVTNKVYVANYCGTAGDC PGGRDTEYQLDEGSLPDDVALGGSGDLWFTERAANCVGRDIC AETYEF GWSLPSGPDPELGVVNPDGTRLYGSNEDDNLVTV
 VAAGTCDATLPPQGFKVSVAWSRDGRRGYMDVEDTSVVVW GKNTTGTVQDLAVSPEKDQLLVCTAGALQSFN
 LDSGAVTTLA
 ADDGYLLHTLQADGEVNSVNFSPDGRVAGRNQVVQVWRVA DTGQRQWAPGQRFAGLNDLAFADDGTVFFTDPGHPHGRVF VPDGKPDRTLKGHTRRRIHALVFADSKTLASAGEDGGVRLW RDGKLIHTLUNGRD
TSDGVTEVF WVTDVQF
$S A L A L A P$
$S G N G Y E K$ ADGTLVKTLEGHQGAVFSVLAFLEDGTAWFTELGGNALGRMW ANSQTVSVFAHNFNQPNDIADTASGVLFDPNWAQST GQL NSQGHSQVIKSHSAPVKSVALSSDGSLLDSGSDDKTLKVF HTGQS LLSPFSHDYGAHSIAISPDSTCIAASLGGGTILIGG

 TASDRVVHKDDVGSAPRRVVFAPDGRRAYVATAKGVSVID DGQVVDMWGNDTPFAGTEVVEDPYGNAMPRWKGCRFQRAH
$M E D M S N V V A Y R G H Q S P W D V Q W S P G G V Y F A T G S R D K T A R L W$ $M E D M S N V V A Y R G H Q S P W D V Q W S P G G V Y F A T G S R D K T A R C D W$
 TEDLAALKDEVAVGQGAFGTDVTADGNTMYVNNEAKSTVTV Y N GSNREVVV SGVQGAGEGGAVDADGNRKMYWVNEAKVDCFVK TESHSILLAEVPVGVEPEGMAI SPDTKWVVNTSETTNMAHF RGTHVETVIGNGLHTADGIVIDSTGRIYWTDGGRNS DEVA
 IDDSSQQVTLIDSLHSPEGLAVDWHKNIYWTDSGNKS IVSVAA

[^3] $B B B \quad B B B$

|  |  |
| :---: | :---: |
| UniRef90_E3HJC6 <br> UniRef90-UPI00037D92EA | $R A D G K T V D L L M D G L A A G P N L D M N K A E N V L Y V A D$ |
|  |  |
|  |  |
| UniRet90_UPI0003B34757 |  |
| UniRef90_UPI0004793BE4 |  |
| UniRef90-X6MFI6 | SVK T GE\\|I RSLIGHTAGIECARFSPDGCNVVSCSWDDTA |
| UniRef90_A8LFC1 | DTESGEWMATFAGHTEGVQACVAGPDGTWLASGGDDA |
| UniRef90-UPI00041E07DA | DANSGSELMSLVGHGTWACSLAWSPDSTRAATGSHD RTV |
| UniRef90_K9TF95 | VT DGKLLQT WRGHLDDQVLAVMFSPNGKTLASASGDRRIF |
| UniRef90-UPI00035D4 | WD WT QGNPVCVFSNDAGVTAVAFSPDGEHFATGLDDGSLW |
| UniRef90-D8TQU | RQD Y LY $\square$ ALA GQHQDWDSS GTAALLFSGTGAERNQNGPTPF |
| UniRef90-C3YAV1 | DHNGQYSFSFDRGKLGVASGVAVSADNEIFVAEWNNQRV |
| UniRef90-UPI000382E | \S T QEQRDKMDRFVPI EFNNLALDQEGFIYTTNPS G |
| UniRef90-U4LVS4 | SCDHDYPDR\FAGHLSDVDTVTWHPNSTYLFTGSADKTAR |
| UniRef90_UPIO003610760 | NVSDPEYPSQVGEPLA G GS GVGFSPDGHTLATGSGDGKVR |
| UniRef90-Q1IKL6 | A FNGSVTVID GLT R STTPTAI AVNPVTNK |
| UniRef90-W2EMR9 | T LR GKLTHFAVPTPAGEP L GII AVAA GT T I WFVEGASDKIG |
| UniRef90-X8J2S1 | VTEGGLIS GPFERPVI GFQSVGFSPCGAWFFSGSSDGTVC |
| UniRef90-E2CL70 | V D TVKKTVVAEVPVGVEPE GMAVSPDVRWVINTSETTNMA |
| UniRef90-K1QUN7 | DDNGVPLYSKS S TKYVSENKNLDICVADMGSRSVV |
| UniRef90-B1WR27 | RES GLIEETI I NPl Q P P L A FA NENHILTS W WF S GAVV |
| UniRef90-A8HMF2 | DVAA A Q PA L L V HEMHVDGVAFSPDGAVLASASHD |
| UniRef90-A719F8 |  |
| UniRef90_UPI0002FD6D3A | QEIDQA NAKIUSSLNFSPDGKTLATASADKTVV |
| UniRef90-UPI0003746363 | ESSARETAELPSVAAGWVYAIAFSPDGRTVATAGDADTVQ |
| UniRef90-C6HZH3 |  |
| UniRef90-W5MG75 |  |
| UniRef90-E1ICU5 | D GTPLYRLQGPGGHSGAVFSVSFSPDGVHLVSGSWDHTVC |
| UniRef90-F7T7U3 | A WQEGGAAAPVLQGLPFPNGVVVMPDQAALCVASTRSTRR |
| UniRef90_Q5EUG3 | NWPTGALI GQLPVEKHRVHALTVSADGKVLAAAATGGP |
| UniRef90-UPIO00381C0A8 |  |
| UniRef90-L1J431 | MADGKTSKFVGNGQFNGPRGLTFSPDGTYILVADTGNHVV |
| UniRef90-11H655 | LDP ELQELFVADSESSSTRGVSLKSGGSRLL AGGDPLFPD |
| UniRef90_UPI000468 |  |
| UniRef90-B0CBF6 | KTEGGLLQT LTGHTGSISLLAYSPDGSLLASGGGDKTVR |
| UniRef90_A4CC06 |  |
| UniRef90_J91Y45 | K |
| UniRef90-X8IY48 | DVDGKAVFELPTEDTVEAHVLAYSSDGTRIIS Y T Q N G CLL |
| UniRef90-V4BEE3 | VCLVAPLPTSHTCTCPTGILLKSDNKTCETEMKHFKIS |
| UniRef90-K1QA38 | DIVVSDREEAEVHTT TI TLLD GFVKNKYVGQRDYRMK |
| UniRef90-X6MK42 |  |
| UniRef90-UPI000380B0C3 | AKG R VTARIPK】T T A Q SLA |
| UniRef90_S3Z | DHL WL |
| UniRef90-UPI0004407387 | S SDRIS ALRIY A GHLS DVDCVKFHPNSLYYATGSSDWTCR |
| UniRef90-K5ZIN7 | S LD GKVVDKFRGKKLNSPNDLW\DDKGGIYFTDPRYSNAQ |
| UniRef90-G0GP45 | EYDGSVTDSYQGHRLNSPNDIVVKSDGTIWFTFYEGHKAT |
| UniRef90-S9SV14 | VD\GQHKT T A V IP GFSQPRGI KVSPDGRYVFVTNFKGDKV |
| UniRef90-H2V9M6 | KLAEHCVDANNTYCFENPRAIVLHPKYGFVYWTDWGDKAF |
| UniRef90-DODC30 |  |
| UniRef90-H9IVH6 |  |
| UniRef90-F2U4R0 |  |
| niRef90-UPI000393F7FA | TGDGRKRKMLIT T ELINEPRAI AVDPHQGFMYWSDWGGQAK |
|  | VT T GKLIREFVGHS GDVLSGIAFSLDGRR\\|ATGSRDETVI |

[^4]

170
180
190
200
$Y A D R D E P G G Q M K K A S R F D Q P D G M A \square D S A G N D A \square V H A Q A G T$ QVIDTLHFTVPGDAPEKVMPVQDRFTPDARQAVIADGRGN $\square W G L D F G D C H R S I F G H Q D A I M C V R F F P D S K N F V S C S K D G M$ EHPKPP LPAVDGQFREVTDMAWDSQGNTYISDY DNSR LVIDRETDKVDYKRRDGAVPVRLVFSPDGKYALDPNREST W WDVTS GNEIKKRLQWTTKKMKDAKYSPDGQUIVFGGFDKT
 LRRTSDGKLIHLLEEGHGSRVVAIRRSPDGQLLASASDDGT LWETGVA GSCRVLEGHRDWVTSIAFSPDGAALASGSRDGQ TTSWA QPS GL

SLA GDGS GLLMYVADSESST V
$R \square S D E Y \square A P \square G D Y S R V R S T F D D D D A A M S G V Y R V L D S T R G R$ MWDVNTGNSVRLFSGHSAPVTALAASPDGKYLATAGEDSL LWS I PAADMVGRFA $A F R P D G R V L A T T A R D G R$
$A V N A D T N Q I V V V N S G E D D$ TIIDGVTNSTTFATTGTSPSDDA
RLHVPRHDRRRAAGEAFHNQRG
LWDSSRKTVDEVPRGHDSSVESVHFSPDGTRVASGSEDHT HFISTEDYQDKHNGLVDQRPRYAHFTNDGALFVSSEDGGT VVNQTGCLRFRYTGSPAAFPDGQATDSHSQILTADSHNKR
QRLDRNTGSLLNNYQGFGLPYDAVELGNGSQULVADCLLGQ LWSLPDAQLLTVLHHHSQPVTAVAWSRDGRTLATSSWDKT
 LWD ITRPVEPRRLGAPLADHTATAFSPDGRTLATGSDDGR R KLDVATGTVTTVAGKGALAPGMDDG AHKTLGTNKTMLISTGHRPMDDHIFHSYRQPEVSNHPCQT LDWNDIDKQPDRRFTDHAGAVNSVAFSPTGRLIVAGSHDRN RWWTLADKSERPKVTSAGGTRAVAFDRDGKFLATGHEDGA
1 WEIVGKSGAl RSFNAHRERVTSVSIAPNRQSIILS SGDN
 NLFRFGDHDGTGSDVLLQHPLGVVYASDNQIYVADSYNHK VRGGDAADAVTD LPPGSGPVGITVAEDGAVWAADIRADA LWKTSGTLQQTLTHKGA TALQRNQNSEELVLNTIANHQT WVYDLDAEHQLSNKRLDF EFFDDHGLDGMGNLYIARYGSGT FDAQSKSTPLSPFDGHTDLILAIDVVSDGKRIVSGSQDGT KPFNPF GIVSDKHGHVLVADWSNHA $\square$ WNMKT TKVIHTLKGHSHHVLKAQFSRDEFKLLY LVVHMDK WVVNARKNTVAGTITGGAEPWAVAVTPDGRKVYVTNMNAD LTLGTGHPSGFQSGEPFNRPTDVAISPRTGDVFVSYGNSR L WDVQK GTAMRVF GGHQGP $\square$ T SLAMSPDGRYLASAGEDLA WDWVEKGGCDRQLK DDSLYK

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

[^5]

|  | VVWLIFSPDGEPLYRTRSCAGMRTTNVVAFGGEDTLYTTEAEQ |
| :---: | :---: |
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| UniRef90-I2K3N3 | VKTWD GDKF Q NVQKLAVHESEVWSLAMSHS GEFFVTVSHD |
| UniRef90_UPI0003B34757 | $V A K V A P D G R W L G S W G S F G F N T L H S \\| A V D A R D E V Y V A D R G N$ |
| UniRef90_UPI0004793BE4 |  |
| UniRef90_X6MFI6 | VQIWG VKE EQ D I Q Q E G H S G AVIGGVDIS P N G S K V V S S VD |
| UniRef90_A8LFC1 | $V \mathrm{R} V$ WEVAT GRALAVV H G H A H TV REASFSPDGAWLATVGGD |
| UniRef90_UPI00041E07DA | THVWDLT T GAPVASVDVQEVELSDFAWSPD GSRLAA DS S L |
| UniRef90_K9TF95 | VRLWRTDGKLLSSILHHSHP V T S L S F HPDSQTLAT GTS D |
| UniRef90_UPI00035D4E4D | LKLQALQQ G G A V SLS NHSGTVVTAVCFFSP G GEFLAS GAED |
| UniRef90_D8TQU4 | $\square R V L D L G S G G S G L K V G G D L Q H P L A V L S S A D S S \square Y V A D S Y N$ |
| UniRef90_C3YAV1 |  |
| UniRef90_UPI000382ED92 |  |
| UniRef90_U4LVS4 | I SIWD A G G K RLLKAMR G H GK T S $\square$ Y S L S F S R E S NVLVVSGGA D |
| UniRef90_UPI0003610760 |  |
| UniRef90_Q1IKL6 | $\bigvee \mathrm{SVV}$ V G A T L N VT TVAA S LA H GP |
| UniRef90_W2EMR9 |  |
| UniRef90-X8J2S1 | $C$ VWD Y K G T LA A G P F R G H T A GVIS VA FS P D G T R IV S S A Y D |
| UniRef90_E2CL70 | $V \mathrm{SV}$ V M N G GFEVVSGVQN E W L Q PV GMR IT S D NE L F V A L G P A |
| UniRef90_K1QUN7 |  |
| UniRef90_B1WR27 |  |
| UniRef90_A8HMF2 | L ALV DVA S G QVA A TLE G H M L LP F D CKWSPDNKSL A S C GKS |
| UniRef90_A719F8 |  |
| UniRef90_UPI0002FD6D3A | $V \mathrm{~K} L \mathrm{~W} \mathrm{~L}$ L GKLLUHTFK GHTNEVLDVVRFSGDGKLLASASAD |
| UniRef90_UPI0003746363 | $V L L W D V T$ D Q A A P R R L G P L L S Q S GVAFS P D GHMLVTA G G D |
| UniRef90_C6HZH3 | GGAASFRDPRG\\|ALSSDGSLYVADTRN |
| UniRef90 W5MG75 |  |
| UniRef90_E1ICU5 |  |
| UniRef90_F7T7U3 | $V W W L D P L G E V R G R \square E S C A G \square R N T N L A F D P D D T L Y \ T E S E T$ |
| UniRef90_Q5EUG3 | $V \mathrm{~K}$ L WS AL D G A EVKTLT G H R G AVFGVGFTPD GKTLVSA GSD |
| UniRef90_UPI000381C0A8 |  |
| UniRef90_L1J431 |  |
| UniRef90_I1H655 |  |
| UniRef90_UPI0004687456 | $L A R V A K D G T L R V I Q L D D D G A K \quad P H A V A P D A E G G V W A T L W G A$ |
| UniRef90_B0CBF6 | WQQWNLE GKSLKTEDLNQLHS |
| UniRef90_A4CC06 | V I KVV P D G K I K T F QLK G Q P P T NVALLNA Q D R L Y V T M Q K R |
| UniRef90_J9IY45 |  |
| UniRef90-X8IY48 |  |
| UniRef90-V4BEE3 | I CRSNLD GS QREIVIVEK G L R T A D GLAVV SVGRVYWT DA G H |
| UniRef90-K1QA38 |  |
| UniRef90_X6MK42 | $L R L W D V K S G E Q \\| Q S L E G H S E N D T G V D T A P N G N I I V S C S N D$ |
| UniRef90_UPI000380B0C3 | SVGVVY D A A S R R HLLK DVVRVGRLLPASAAASP D G TVVVVGNTM T |
| UniRef90_S3ZTG3 | VHRFDARGAHLMSWGEPGFSLPHGVTLFGD DAVLVCDREN |
| UniRef90_UPI0004407387 | INLLWDLGS GRRVKKMTGHTASVYSMAFSSESSLLVISGGA D |
| UniRef90_K5ZIN7 | ALYY L SP D K K CLY R VA E GFTN P N GVVGTLD GKLYVS D T E K |
| UniRef90_G0GP45 | $L A W D V E G N N K R V Y L D C G N G T A D G \\| A C D A D G N L W C C M W G S$ |
| UniRef90_S9SV14 |  |
| UniRef90_H2V9M6 | EYSDLD GQ HRHTVYDGNLP HP FALTVVFED TVYWT D WNT |
| UniRef90_D0DC30 | VAVIDD GESLLEVIDDYDMVGQR VWQMAFTPDEK F L V T T N G N |
| UniRef90_H9IVH6 | TIIESSDF D GHDRRTVLSNVP Y P Y GlV I VGQ HIYWT D WK T |
| UniRef90_F2U4R0 | LSFYLLSSGRQDGKERVLDYD P C S L S Y S D G N Y L VMGG S N |
| UniRef90_UPI000393F7FA | LHDFNGDNRKVLLS SHHHLGHPFALTVFED RVYWT DLE D |
|  | $\square H M W S A E E G E L L Q S F E G H T S W V S S V A F S P G G D V V I S S S R D$ |

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm

| UniRef90 E3 |
| :---: |
| iRef90-UPI00037D92EA |
| UniRef90-I2K3N3 |
| UniRef90-UPI0003B34757 |
| UniRef90_UPI0004793BE4 |
| UniRef90-X6MFI6 |
| UniRef90-A8LFC1 |
| UniRef90-UPI00041E07DA |
| UniRef90-K9TF95 |
| UniRef90-UPI00035D4E4D |
| UniRef90-D8TQU4 |
| UniRef90-C3YAV1 |
| UniRef90 UPI000382ED92 |
| UniRef90-U4LVS4 |
| UniRef90-UPIO003610760 |
| UniRef90 Q1IKL6 |
| UniRef90-W2EMR9 |
| UniRef90-X8J2S1 |
| UniRef90 E2CL70 |
| UniRef90-K1QUN7 |
| UniRef90-B1WR27 |
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| UniRef90-UPI0002FD6D3A |
| UniRef90-UPI0003746363 |
| UniRef90-C6HZH3 |
| UniRef90-W5MG75 |
| UniRef90-E1ICU5 |
| UniRef90 F7T7U3 |
| UniRef90-Q5EUG3 |
| UniRef90-UPI000381C0A8 |
| UniRef90-L1J431 |
| UniRef90-11H655 |
| UniRef90-UPI0004687 |
| UniRef90-B0CBF6 |
| UniRef90_A4CC06 |
| UniRef90- J91Y45 |
| UniRef90-X8IY48 |
| UniRef90-V4BEE3 |
| UniRef90-K1QA38 |
| UniRef90-X6MK42 |
| UniRef90_UPI000380B0C3 |
| UniRef90 S3ZTG3 |
| UniRef90-UPIO004407387 |
| UniRef90-K5ZIN7 |
| UniRef90-G0GP45 |
| UniRef90-S9SV14 |
| UniRef90-H2V9M6 |
| UniRef90-D0DC30 |
| UniRef90-H91VH6 |
| UniRef90-F2U4R0 |
| UniRef90-UPI000393F7FA |
| K8 |

$G \nabla \mathrm{~V} I \mathrm{R}$
$\mathrm{D} \mathrm{T} V \mathrm{~T} V \mathrm{~V} \mathrm{D}$
SSIRIW

RRIQVEDTAGTLLR | N | D | S | 1 |
| :---: | :--- | :--- | :--- |
| K | T | I | R |
| R | L | W |  |

GSVRVWDPL
SRVTI LDDASSGQ
GNI NLWNRDGSFL
GTVLLYSPDGG
HRIKKLDN NTNE $\square$
GRVTEFEAT
MTVRCWD
HKVF L WN
NNVTVIDGATN
RTICDWDATDG
NRVAVID $\quad$ PRKREVEKY GEIKMITYT
NRLSMINLVTGE
GKCRIWT
NR $\quad \mathrm{H} V \mathrm{~V}$ Y GQG
$D T V I V W S T Q G E S K Q E$
QL V RLL W
NLI RKIVLATN
G S 1 RL L
GSILR
GTVKLWD
QTI RLWNLEG
NRI RAVATKDN
STIRYI
NALAHVSASGE $\square$ T $\square$ H
KTVRLWSQKDNQ
GAI EVVT
ATLK WWDLRQGH!
ETLRQWDAQTG
KTiEVATLEGKMR
TVWVFKYARRVEH
KTI RLW
GTVSV1
HRVQVFSLDGEFR
WTVRCWDVKG
KNIYVFD I LEN
GNVRI FNPQGKHI
NSINIISTSDN
RTVEK
NDVTVID
K ALHRADKT
RKAGLYTRDGDHL
EA AYSANRDTGH
DTMRLWD【NTG



[^0]:    VYVY DES GK F LIF QF G GE GLK WP LG IC T D S S GHVLVA D S G N I QVFDPE L K Y Y CHF G GE GFRYP S GI A LTTNE GRVVAIV DRYN
     GRITVVDGRATSFAPPTADGGPFGIAAAPD GAMWFTDSAA
     $V E M F D K T G K F$ FK HI AT DMK GPQA V A MAT R GQQLVVDTA A G S $V$ RVWDVGT GECLNTLRGHTHRLRSVAFNPNGKLI AS GSYD
    
    
     $T \square S V I N T A T N K V T$ DTSKVGSCPFGVA
     V R VW DK Q G N Q I G Q P F S G H T S G V N S VVA FSSPD G QYIV S S S M D
     $V$ Q L WEAAT GRYRSTLKGGGSSYAHDVAFSPDGRRVTLDANGG VKVVNQE GEFMLKFGSNGFNAPTGVAVDSNGNIIVADWGN
    

[^1]:    पRVWDVASRTQVGDA位EHDHVSVAFSCDGKRIVSGSSD I SRAFMNGSSVEHVVEFGLDYPEGMAVDWMGNLYWADTGT SRAFMNGSSDRRRYLENGMMHPYGMAAVEEDGNGYWADTGT IECSNGDGSDRIKKLSTHLPHPFALTVFEDGTMYWTDWNT SMCCWDVKTGQQUAKLVHSNCVNSGCYSSDGTTLASGSQD
    ISSAFMNGSGVETVIVFGLDYPEGMAVDWMGNIYWADTGT

[^2]:    lupas_21
    lupas_14
    lupas 28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

[^3]:    lupas_21
    lupas_14
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    sol0
    jhmm
    jpssm

[^4]:    lupas_21
    lupas_14
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    conf
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    SOlO
    jhmm
    jpssm

[^5]:    lupas_21
    lupas_14
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    jnet
    conf
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    sol5
    jhmm
    jpssm

