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S S SLGDIKIAEVNTRGLFVKLVNTSDKELTI GDHILQQ SASAKGNVEIKEIDPEGKFVKLFNKGTDEVAI GGWQLQR SSKGEVRVMECDPDGKFVKLSNTSDKDUHI GTWQLKR QRSAKGNVTISECDPNGKFIKLENSHRNDENVGEHKIRR SSSVGNLKI TEVDLDGHYVKI INNSDKEESIGDHILQQ SRSANGNISI QDASQDGKYVTLENTHSRDEPIGGWKLKR
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 ASOGSOUGKNDSDKDQSLGSWRLKR SSSLGDVETADVHVKGDFVKLDNSSDREAEIGNHVLQQ HSSSVGGVSVDEVDLEGNFVKLRNNSDTDQP GGWILKN SGLVAI KOLIKLQNASDQDQALGGWNLKR ASNDGKIVVENVDTDGKFVKLKNTSKEDQPLHGWDLRN SSAVGNLKVVEVHSGGHYVKI DNTSDDEEEI GNHTLQQ HATAKGNLSI QDASVDGKFIVIENTSPKEENIGEWQIKR GHSRSSGHIKI ADVNFRGLIVVRFINCSDQEMEI GDHILQQ SRSAKGNI AI QEAEPSGKYIVLENDSRRDENIGDWKLRR SASAKGDLEISDHCPDGKYVIVKNKGTKEVPLAGWRIDR ASASGVIAVDETDAGGRFVKLTNDSQQDQAVGGWTVKR SSAKGDVEVVEVDPEGKYVKLHNKSGKEVQUGGWTVLR GQS
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VSIVEVDAQGRFVRLLNAGPRDQALGGWRLAR SNSDCDRETEHDTDGKFiKLVNKGEETMSIGQWA:KS SSAKGDVDIVDVDPEGKYVKLRNKGANEIQI GGWQIKR GQ SGTSKGEI EIVDADPEGKYVKLHNKSQQEVSLGGWII LDR SSRSRGAVSVAEDDVDGKYVRLKNNSEKEQSLGGWVVRR SSTTSGLVSVIETDNDGNYVKLHNHTDSNQSGGGWELQR
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$\qquad$ SAKGDLEVSECDPEGRFVRI QNKSKQEYPLAGWQLVR
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 V ID S $\square$ D A F TY R LDP A H SVI QP H G HL K I Y GRTSSGGDHSPP D S RHSEADDAEYKFHRS LQQKAHTFCTVVWSSGTGQTHSPPSD
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 QV G S G T P IAAF K FP A K F T L K A G Q R V T I WA

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SNGNTEFADQNEMGKCVKTINSSDEETNTGNWVLKQ CYAASGSVCVEETDKRGNFVRLKNNSTEDQPLNGWILRR SPGCSCLKIVAVSARERFVRVLNQSPEETDLGGLTLQQ
 SASAGNVCIEEMDVDGKFMHRKSTSKQDQLLRSWELDR
SFGSPLRIVKMDKRGKFIRVLNESEESVDISGYVLIKQ HRLAVGPGLKIV EEVVEEGKWVRVANSSEEEQLMGGYRLVV SVGPLN:VDHDLHGKQV'LENTSEEDUQLGGWKLTH HRTYSGDTRIKDCDEYGKYVIVENAGHGDHRLSGYRISR SYKGAISIDECSPDGRYIVITNNGATTENLNGWRIVR
 PTGGNISIEEVDLEGKFVQLKNNSEKDQSLGNWRLKR SPTGSCLK MAVSRRQRFVRULNQSLEETDAGGFVLQQ SSCLKVVAVNPREKFIRVLNQSEQTADLGGLVLQQ SSTIGNLEIAEVDPGSHFAKILSCAEKVESTGDFLLKQ

KGDI LEEEVNGHGHYICLRNTSSEDKMMTGWELK SSLRMVKMDKRGKFIQVLNESEESVDIGGFVLQQ GPIRTADHDTSGKFIVLENTTDDDVALGRWRIVQ TRGHLVI NDCAKNGSYI EI LNKGNTEESLFGWCLIR SRLTGSCDKIVAVSRREKFVRVLNQSLEETALGGFVLQQ RSSKGNVCI IECAVDGTSVTVANIGSQREDISGMRLVR TGDITLDEVDRSGDYI CLKNASSENKVMTGWELKL QRNSKGPCGIADAAMNGTFVVLENTGRKEENIGQWTVKR QRSAKGPITVSQVDPNGHFVEVENTSRKNEDI SSWKIKR QRSAQGNVTIGKVASDGSFVIIENTSDQDQHIGEWTLRS

TGNICI EEIDVDGKFIRLKNTSEQDQPMGGWEMIR SSNSSDVRIASIDCKGKVVTI ENSGASTQDLTGWKV QRSAKGNVS IHEASPDGKFIVLQNTHRKDESIGEWKLKR
 QRSSKGVISIAEVDNTGRYVTLRNTSTTRMNLKGWKVKR QRSAKGNVTIAECDPNGKFIMLENSHSKDENLGEHKLRR VDGEFVRLLNHGIDQTVSIGGWMI R SRTAKGPVSMCATGKLGEFVEIENSGRDDFKMDGYSISR HRSCRGNI AFSDAAPDGSQVGIENNTSKTVNLKGWKIRR HARTDGRVAVEEVDEEGKFVRLRNKSEDQSMGNWQKR GQLALSECSPNGTFIEITNTGEVETNLAGWCLIR SSTAGSLGITEVNLNDEYIVFENTGSEGLDLSGW SGTLAIAEINLNDEYVVFENTGDEALDLSGW GPIARAGLNLERDFVVFENQSEKPVALGNWEVR STERSDTNPNGEYVVIKNYGSDTVNLKGWKLKD NVSI TYI DLEGEFVVITNASHQPVDLTGWTL
TSG
GSAPAS VSUTSIDLAG
 RSSKGN\|SiVECAVDGSSVTLVNTGSQKEDISGMRLMR HNLNDEYVVITNKGGAAVNLGGWSLR
SGDTIUEDNLNGEYVIFENTGDEAVDLTGW SSABGNLRUGDVHPGGHFVKILNSSPGEESGGDYDLQQ

## UniRef90 UPI00045E1B3B UniRef90-U6I4Z9 UniRef90-T1E1E3 UniRef90-H2KYU8 UniRef90_UPI00032910D2 UniRef90_UPI0002A448F63 UniRef90_O97339 UniRef90_UPI00038EDDF0 UniRef90_Q5C3Z6

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 $L V R G F P A C L F R F P P$ GTLLPPRHHVTVWGEGTGHTRKHGAS
 $R V R D C P Q R M F R R P R G T V L E P Q H H L T V W G E G T G G V Q Q H Q P R$ EADGH ETRFKFSRTFSLKPGTTCTI WSQDAGNSHNPPS D QAD G E EVVTYK F GRTFNMKPGSTCTII WGSDSSDATHNPPET
 KVDDNKVYTYE』P NLVLKTGTVVKIWSKNHQAQAR GD D
 $T V D G D E R S F T F P H D F V L Y P G Q T A Q V S A H V Q T Q K K N H H H H$ VVDGRDQPEFKLDSRFSLKRGQKVGIYARGAKPKNAGARA $L V R D F P V C M Y R F P P$ GTVLAAPQHHITVWWGEGTSRTKKQLPD
 WVGD T TASCRYSSRYLLKAGQSVTIXAENDEATAMPPNN

 $N \square D N N R S I V Y E \square P S S T V L R P Q K F \square K I W S K G N R P M G S B P N D$
QVF EGDEDAYKFTPKYVLRASQTVTVWAA GAGVQ
 NT DNGR IIVHVIGSPKSILEPNRYYKIWARGNKPQGSNDAE G R R D E IVA Y K F T P K Y V L R A G QVVVTV WA A GA GVVA H S P P A T KADS Y E EV TAF K F P R S L I L Q P GA S C Q V WN S D S GAAAN D P P K D



 LVVR FPK GRYRFPA GTVLEPGHHVTVWGVGASSSKKHQQA




 LE R E F P V CLLY R F P A G T L L A P Q H H V T V WGE GF S N T K K H L P A
 $G V Q S Q T V A V F Q F P P V T R T G T N S T M T V W A A D A T V L H T P P S X$ LI K D RELLFTYKFQENFTLKAGEGLTLHRFSSTRRPYPDTH
 $N$ D D GR Q I I R Y T F P N H T L S P H S T V K

 QVDDRVTNTFA $\square P K$ ST I WSDGCKPTDEEG QI NDNEPDTHKFKENFTMKPGE VVTVRRDGARNPYPTNAD
 TSSS $\square$ R QVVYTFPR GF VL TPQSTVVQVFARGRGGDHNPPRS K $\square G D T S V$ T Y K Y T S R Y V L K A G Q TVVTEVA QR S TV
 $R$ ID G K R E IVVYSLPKD FVL R A G K S VV K V WIGGYPVSIYREPLDT TLPAGHHITVVWAT GADRAHKPPKE
 RTSSSLPEDSY I INRDT QL DAQQNI RIWWAKNFEKDAE DKA D KLD N R R E IVVYI I P S NTVLKAGRTMK SESEGKEAVYRFHPQQQLDS GTADDTVWSASSGKVEMSPGB
 E I G G K TKC T Y E F K N DL QL G P GQK I K L F S G GAA DMK Q S D S D QNGDDP LLLTYRFPPKFTL
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 GKLET QVFRFPSTYVIM P HARVVTVFSKNARADVKPDED $K A G$ HTFTFP D $\square T L$ E P GESVVYVYS EVGDQ $\quad$ TYHFPS GTTVTAGGSGLKVVSENAGAGAD T I DEGEHHTYTFP QFTLAS GAEVVKLWW TKAGTDDANN TVSDEADHTYTVPDGFTLDPDETVTKH TGSGTDTDTD $E K G N Q \quad T Y S F P S G \square T I P A G G T L K V L S \quad G S K A E S S T G A$

 $T V S D E A T H E Y A F P A E F K L G R P G E S V V T Y T G D G T D T N N$ $N V N G Q A V A V F R F P P N \square R M S A N S T V T A V A W C$ TVS DEAIHEYAFPA GFK LIRPGESMT LYY TGD GTDTDNE
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## VVCESDTTFATGDDLDDY LY DNNGQERAR

## DYWKTRTVWN NDGDTARLFDPSGETVSERE

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FEGPYANWGTGTLVHTSLYSPDG
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LYWGNGADWN NDGDTAYLYDANGNLVDTYS
LVWT QSNIWNNNGDPGA L Y DS QGKLVVKR
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L LWTKSDVWN NDGDPGSLYNAQGQVVS
LYWGSGSPDWNNAGDTVTLSDADGDPVSE
CVMHRHETFGTGKVNYTILMDNNGEEIAKHE
LY WCSDSRWGTGTTTRTVLMAPSGEEKAAYTG

MYWNRKDRW KGQEDSEH


RTEPGGLVIAE DDADEER VFENRKETR\|DLGGW
S S SLG DI KI A EVNVKGFFVRLVNSSEKEVEIGNY LLQQ
TAKS TVELSSNIDLLS GE IVVSIINSSNSTVDLTGWKLVS
$T G F \backslash K D T T V N C K G K F V R I L N T S D Q D V D L S G F \| I Q Q$

GERSEPGGLVI A EI DPNGERIVVENRGEDRLVLAGW
 S GSAQH GVKRAR IVWD GNFHRLSQK A DAPGN
$V Y \square^{D}$ $\begin{array}{llll}D & A & N & D \\ D & E \\ L & D & \\ R & N\end{array}$
HYNAKGN




T T GK
DVVI S S I DLL N G E VAALI T N
$\begin{array}{lllllllll}S & Y & S & K & G & D & V & K & S \\ R & D & L \\ R & A & N & G & P & V & S & G & H\end{array}$
HADANGN
$\mathrm{V} K \square \mathrm{D}$ NPEDES H E
$\square$

NLD E YVLFKNTGTSRI QLNGWTISD
NLNDEYVVVENRGADPVDLTGWTL
TNLLNGEYVVLKN $\quad$ KGKTPVNLRGW
HRTYAGD $\square$ R $\square$ K DCDEHGK Y V I I E N A GHSDHR L S G Y R $\square$ S R $N L D G E Y V T L R N G G T E M L D L S G W$
 HADAAGN

! G A T D P Q Q E Y VVLK R VG Q G DLN MD G WVL R D
ILE I HEVD TE GKY I TLVVNSTEHT TDDCLDWTVKQ

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DVYIS DLSLEDEWVKITNPGETSVDLNNW QADAGGN
HADAAGD $N$ N E E
$\mathrm{D}_{\mathrm{N}}^{\mathrm{V}} \mathrm{Y}$
D S I E

TSTGNLAVAEVNADDEYIVFENTGDDTLDVSGW


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UniRef90-D217Z8
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LVWES QKSWGVGEN $\square \mathrm{S}$ VVLLDGDGNETAE $L Y W G A S G A V W N N D G D T V T V R N G A G E T V A E R S$

LVWTQSNDWN NDGDPGALFNAEGQLVSKR FLWKE QNEFTTTPNCTTMLCKPNGEAIAWYTP

LYMDLASPDWNNGGDVATLLDPDGNVIST F
LYWGASGAVWNNDGDTVTVRNEVGKTVAERS
L LWTQSNIWNNSGDPGT LYNSQGQVVSRY 1 VMEKQN WPMGDNTSVRPKDHEGNLRSS RYWGATSAVWNNDGDTVVVANASGAVVARRS LYWGS GNPFWNNDGDTASLYDSNGNLV LYWGRNAPVWNNNGDTAYLYDSKG
L Y WGYNVNI WRDDGDVVRVADANGQVVLEH
LYWGSGSPI WNNAGDTVIVREDTGDLVLE
LKWTGAY $\square$ WNNDSD $\square$ AALYDAEGVLI SR
LYWGSGGAVWNNSGDT\|IVENEDGETVIEYE LQWSKAYLWDNNGD TARLYDPQG LLKWTNANI WN NDADTAELYDNKGKLISLDTI LMWADSNIWN NDGDPAQL FNNLGKLVS S LVAHQ $V$ Y SFDFSKNTKTVLVDDADEV

LYWGSGSA IWNNSGDT\|IVTNADGETVINRE 1 IWTRSNWWNSGD GALLTDSNGE
L Y WGKREPVWDNDGDTVIITNHDGETVTTY LYWGRSSPTLNNDGETVTLRDADGAVVAERST LYWGSEVPVWDNDGDTVYLYNERGNLVDSYS

VY WRSGAVWNNGGDTVTV TDSSGSTVATYT I I WKAVNNWGFGSRTSTSLCTKNGEASFMHVVV $L V A T G I Y S F D F S K K T K S V L L D D A D E E V G W Y$

LH WG $\square$ Q N QVWS QE GDTVIVEDANGDV
FHWDGGGTWNNSKSDPAELYDSSGQLVDTY LYWGRSVPVWNNDGDSATLRDSSG RVFDD
YYWGRNSPVWNNDGDTVTVRDETGTTVAVHR LYWGAGSPIWNNGGDTVIVTTADGDEV LYWGS SWGANDGDTAYLYDASENLV LYWGRGSAVWNNDGDLATLADANGTVVSTMER YYWGRSQPVWNNAGDTATLADDEGTVVAERS LYWGSGSPVWNNGGDTVFVTTDDGELVVE LYWGSDRADWNNDGCVTLLLDAEGQVLSEHQ LYWGSGSP WWNDGDTVYVVT TEGDRVLE SSGQDPDQFHCGRGCVTLLLDTEGQVLSEYQ QVADN FSFGVGT CVVWKLLDEAGNEKAT LYWGSESPVWNNDGDTAYLYDNSGNLIAEDER LHWNRKSPVWNNDHDTAYLYNAEGELVDKYS LKWTSSTIWN N NDGDPAELLTDDKGVLVSS $L$
$Y$ YYWSA GSPVWNNGGDTVTVRTASGELVAEKS LYWGRRTPVWNNDGD\|ATLTDPDGRVASTLER FKKY DH WWNNNGDKAQLYDDQGDLVDEYE
QVAD QFSFGVGT CTWKLLDESSNEKAT FYVIKKAMWNTQADV AQLTNPSGDVVSSY LYWGNTA DWNNGGD TVSVYDDSG YYWNSGENIWNNSGDTAGLYDEDGNLIDSY SSGREPVPLLSSRGCATLLLSPKGEVLSEHQD
VYWRGGAVWNNGGDTVTV RDATGDEVLAYT FYAVKKAI WNPKGDVALVKNAEGEVVCSH FYRGNGPI WN NDGDTATLRAANGTVVA FYWSNRDAIWNNDGDTGTLKDAEGNII STYS LYYWGKDDHVWNDDGDTAYLYDSTGKLI SS L H WD DETPWNASGDDVVVL DGDGTVVLEQSD L Y WRNQAVWNNGDRDTAFLIDRNGNVI STYR LYWGKGGAVWNNGGDTVYLYDASGTLV LVWDDWY 1 WN NDGDGAKLYNSKGELVSKY L YWGSDSAWNNGGD TVVVTRDGETVLRY LFWDRSTSIWNNS GDLAVLLDPEGNMVSQY RYWGRNGAVWNNDGDTVVVRNASGETV


LY WGSGRADWNNDGDNAYLYDSTGELVDSYQ $\begin{array}{ll}R Y W G Q A N V W E N G A D T M T V & R N A S G E V V L Q R S \\ V Y W E R A G A V W N N G G D T V T V R D A T G S E V L T H T\end{array}$
 LK WTGQYVWN NDGDTAYLYDSSGATVTTYS LYWQDAPVWNNGGGDVTV RDDNGNVIVQRS LYWGQSSPVWNNGGDTISLRDATGTTVIEET LYWGSGSPI WNNNGDTVIVTNANGE


UniRef90 момоS0 UniRef90-LOEJW7
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UniRef90-B1HVJ1
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G

SSDGETGПA VDKSAEIVT TNNGKKELHLKGWKLVS
 NDCDAKSHPN YVVLRNCSQVEHSLDDFDFFR HADAAGD DRDNLNDEYVVLENTGNETLELSGW QKRSKGTVAFGEATLDDNFIVMENTTDSDQKMDGWQTRR VETANDNLNDEYV TVVNTGDEPVNLSGWAVSD
QAPSAGN VQUTYVFYDGEYVEVTNLGDTPKDLEGWVLKD QRSSKGPIAFNSVDQSGSNIVIENTTSKTQSLRGWRIDK


DAANLNGEYFLLKNQGRTAVSVAGW NQEYVQVKNVGKTTLNLTGYKVR DLEDEVNALDEYVVIHNYGESSIIMTGFKL I DVASVDVNGESVTVVNRGDTALGLGGWTL QVTTDGNVQITKIFYDGEYVEVTNLGSEPQDLAGWVLKD SDGSVKSTEAD

SQGALLSVEDVQPEG
NLSFSELDREN

HANA

SSDGPVHFASADPSD
DI HVTNLDVLA
ISLLSIDAISECIRLTVSGDFEDSISGYKIVV
SNGTLAIATINADDEYUVFENEGTETLDLSGWTVED
SSPDSKVEVSYUHYRGEYVEIAN QYDSPGKDTRSNASLKA

| $S P V V I N E V D P V G$ |
| :---: |
| $S Q V E U G A L D F K G$ |


$\square \mathrm{AHADLE}$
HYDASGN DNYNLNDEYVTFKNKCSYSIDDTDWTVK VVISEVESDGD

SPVIINEVDAVG
【S\|IKSHPD
Sh G
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UniRef90 xifVP5

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$R V Y$ QFPSGAVVDAGGTLTVMS ASGAKDVAD ANENGSRIFRFPRHYITFAGEETTVWCTPGATAFNPEPY NDDTHTPDT FPAGTTIESGGYLAVYTDTDGG IIGHHKSR PFGSQAVVEPHDQVTI WTAGPKGDEEDAHN KA TKPFKFKDPNGTKIEPKSYLVIYCDSTAGETNT
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