## QUERY

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NP FWVNP SGFYVNPDTAAARWVVA
SPFWV
FYTDP NSGFRDPGSSAVGQWV

WRANPDDPRRPLI ESRIAAQPAAD
GTD
 P YWVNPD GSAARQLAEYHAEGEDAKAI GRIARQPTAE
P Y WV NPDGKAARQAAAYAKDGKNDEAIDDKIAAQPVAE GSPFFVDPNTSAAKWVAGNPNDSRTPMDRDRIAATPQGK PFWVNPEGNAAEQLATYARAGRDAEQIRKIAEQPTGE GEDPYWVNPDGNAARQVAEFEDEGDEAGLVRRIAEQPVAD S GNPLYVNPNS DGRRQAEAWRSSPADAAIMEKLGNVAIGS S S D P FWV N P D S K A A Q AV S D LIE K D G D DA QAV R K I A E QP S GE P Y WVNPEGSAARQVAAYEKDGDRAGLI RKI AEQPMGE SPFWVNPNGNAARQAARLAGKEQEARLIAKIAQQPVAE


FYADPNSKVKQWLAANPNDSRAALI AARI
G A P
LYRHP
$G L W \vee V_{N}$
P Y WV N P D
FYTDPHGSAARQVAAYRRKGEDAEAIERIAAQPVAE
$F W V D P A S P A A E Q L Q M W E R E$ GRDAALLLKRIA DQPTALL PFYVDPDSKAMRAAQASPGNPQLADVANTPQAY
SPFWVVDPDSPAAQQDELWEREGRTAQLLRRIADRPAAL


 DGNP F Y Y V D PN SKAMRALLKGNPSPE
SEAPYWVNPEGKAAQQAAEYRDDGANAKLI ERIAASQPMAE DGNPFYVNPDSKAMRAAKGAGSPE $\quad$ LI DAIASTPTAY
 GGNPFYVNPYYKSEVESDADPSTGSGAEKASAAANVPSFH GDDPYWVNPS GKAATA LAGYRAEGKEAEARER\AREPVGQ
 SGTQFYADPNSQVVKWDAANPGDAREPAIASQIASVSQGI S P F W WV P Y WV DPGGNAARQARTDAADGASARALRKIAGQPVAD P L Y V DPQSTAA $\square$ WWA GNHPSDGRVT D $\square R N R I A N Q P G A R$

 DGQGFYVNPNSAAMRAAQGAGSPE

NGFYVDPNSNPAAWARANSGDSRAASIQSALASKPMAR PYWV NPDGTAAR QVAAYTKDGEAAALDRRIAEQPVAE GFYVDPDSSPAAWAAANPGDGRAAAIRDSIARTPMAR GAPF WADPDSAAVQQREQWRADGADAALLDRIARQPAGK FYVDPSSDAAVAARDRATNPTDADLMARLARGSAAA
S P
 $\begin{array}{rl}P F Y V & D \\ L & R\end{array}$ GLY R H GES QVLDWWVRAHRSDPRRPLI ESRRIAARRPAAV SGFYSNPDSGPAVWVRNNPSDSRAARIQSAI SSQPDAR FYVNPTSTAMRAAQK ADPPSPE LTAI ANTPQAY

G S P


G D P

| $D$ | G F Y |
| :--- | :--- |
| S | l |
| D | D |

PLUYRDP DT A P A N WV R A N S G D S R A A R I Q A S I A N N MTAR
DTSPFWVDPASAAAVQADRWEKQGRDAAVIRRIIAQHPAGM
S GLVYV D P Q S E P VRWVG GHA G D S R R A MIVA G I A DR P IA R PFYV D PASSAAM A A ARNANPPSPRQLDTAVANTPQAY SGFYVDPNSNPADWVRNNSGDGRASR\|NASIASKPMAR GFYVNPQSTAAQWVQQHPDTPATARI RSTIAEVPSALL
 GAPFYVNPGSAAM RAANAAEPPNPQ LRAVADTPQAY NGFYVVDPNSNPADWVRDHPGGSTADKDKA AI STKA GAR
 SPFYADE $\quad$ VA QAA A D $\quad$ S N P S L A T KAA S V A K NGFYA DPDSNPATWVRDHPDDSRASPDRTSIATKPGAR PFWT T P DSRAA LQAADWREDGRTATLMDRIATTRPEAE SGNPFYANPYYSSEVHT LAMPS LDPSLKPAATAVAKVGSFV

## QUERY

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 WFANYNPSTVRAEVDAYVGAAAAAGKDPI MVVYAMPNRDC WlGPDDP
WILPEDP WFTTTNTSTVR E A
E K
R
Wl S PENP$\square$ E A
 WPANYDPSTI WFTDTDQGRVEAQVRQVVRDARAR A WLSQYNPGTVQQEVAGYMSAA A
 WIGADDP ESAVRDLTEQAAAADREALLVLYN WIGVEDP QGEARGFTEAAAKADREALLVLYN WFTTTNTGTVR WlGP E N RAEVDAYVG
EAEARGYTE

 WIGVDDP EESQTRGFTEAAAKADRDALLVLYNI P
 WF A YY SPSTV WFADFTPSTI QADVSAYVSAANAAGKIPLLIPYMVPNRDC WFADFTPSTLTSRVRAVTSGAAAQGRVPVVVPYAIPDRDC
 WL GPAP P WL GVD D P WLTETNESLVEER WPA GEDPGPV WLDQAFPSTVSGTVRAATA WPP GET WLT PPGPSAS
WI DNLVPA $\qquad$ STVAKYTA WLTDPTPATVTSRVAAVASAAWAAGAMPMLAMYSLPNRDC WLAANNPGEVGGDVRSYASAGAAQDQVPVVAYAIPDRDC WMDNVSTFAVDA VKY WVR PEDAKAQTEQLTKAAEKADRSALLVVYNI WMDNVSSLAVD SKYIATAQAAGTMPILALYGIPHRDC

 WLT PEGAQEEARGFTEAAARADRTALLVLYNI WFTHYNPDEVRAEVDALVGAAQAQGQDPILAVYNI WMDHVSNFAYDAKV IIKAAQEAGAMPILALYAI WFSNYRPSTVQSDVSAVTTAAAAAGKTPVLVVYE $\begin{array}{ll}W \square G D Q D P & H A R V S D I T A K A Q E A G Q V P V L V A Y H \\ W P A G H D P G & G D V R A A V R G A A A G G R T A V L V A Y N: ~\end{array}$ GDVRAAVRGAAAGGRTAVLVAYNI $W L G P A D P G R G H A A R V T E A A T A A D R E A L L V L Y N V P H R D C$
$W F G G W S$
$W$
 WFANYSPSTVTADVRRVTAAAAGKNQVPVLVAYMI
 WMDNVSSPSVDA KYI SAAQASGATPVLALYAI WFGNWN SDITAEASSYVGAAAAAGKDPVLVAYNI WVGAENP EAEAKGFTRAAAKADRRALLVLYNIPGRDC WFGSWS GD $\square R S A V N S Y T G A A Q S A N K D P L L V A Y N M Y G R D G$ WDGGDDP EGQAARYTRQAAAAGRRALLVAYDDPHRDC WF GDADPATLTGRVRAQVALVRAAGALPVLVAYGIPHRDC WFGNWS GDITRAVSGYVGAAKAKGKTPILVAYNITDRDC WFTEYAPDTVTSRVRAVTAGAAAQGRVPVLVAYAIPDRDC WPAGDDPVPAVRRATGGAAKAGSTAVLVAYNV WLS NF NLSTVQADVSSYVNGANAAGQIPQLTVYGIPNRDC WFADFAPSTI TARVRAVTSGAAGSGRVPVVVAYAI PQRDC
WFANESAG IGPAVSGYVGAADSHDKLPVLVAYN WFTQYNPSEDQGEVADVVSQAAAEGEAPVMVVYN WPAGDDPVP DI RRAVKGA A GKRTVVLVAYNV WFANFNPSTVQSEVSGFIGAANAAQQDPVLAVYEI WDGPENP GREARGFTEAADRAGRTALLVLYD WFAA WS GNDTTAVSSFVAAADAADKLPVLVAYN WFADFNLGTIGSEVAGYVNAANAAGQIPELVTVGGI WF NGDGADASDARAYTSAASRVHKLPVLVLYHL W口D NGDGADASDARAYTSAASRVHKLP LVLYHLPQRGC WF GNWNPGSVGARVAGYTGAAQAAGSMPIVALYGI PHRDC
 WFA D Y S P DS I T A R V R A V A S G G A A R G QV WFGNWS GDVKKAVDGTYAA WPAGDDPAP K I EKATAGAKADDRTAVLVAYNI PGRDC WMDHLSTPSVD SKYIADAQAAGTTPILALYGI WFDTVAKVP DLGGYLADARSKNQLVQIVVYDLPDRDC

 WF GNWS GD A TAA GSYTGRADSADK LDPVV AYN P

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## QUERY

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UniRef90_UPI00036F67CE UniRef90-L0J5I4 UniRef90-UPI0004149F08 UniRef90_V6KLA6
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## 90

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GAPSHSAYRSWMDEFAAGLKNRPAYIIVEPDLISLMSSCM S GASS G GYR QWV D QVA A GLK K R P A A I I L E P DVLAMLMSTC Q
 GAPNHTAYRAWIDEIAAGLRNRPAVII LEPDALPIMTNCM GAADGNAYRAWVDSVAKGIGDRRATVILEPDAVLHLVDSC GAADGNAYRAWID GVAAKGI GDRAATVILEPDRAVLHMVDQC
 GA A D G D S Y R A W D GV A K GI G D R A A T V V L E P D A I L H L V V G C GAAK D A D A Y R S W W G E F A G A V $\operatorname{Cl}$ GKHSSS GYRNWI S GFAR GI G A S R A V V I L E P D A L A H L T C C K


 GAADGNAYRAWLDGVLKGIGDRPTTVVLEPDALDHIDEKC G GASHEAYRAWVDQVAA GVA GRPAAAVLLEPDVLDPMMTNCS GAAD GDAYRAWIDGVTKGIGDRNTTVVLEPDALLHIVDCGC GAADGNAYRAFVDSVAKGIGDRPATVILEPDAVLHLVDGC
 GAA D G D A Y R T F I D QVVA A GI G D R P A T I L E P D A V Q H MV D N C GAADAGAYRAWVDGVARGIGDRRATVILEPDALLHLVDGC
 GAPD GEAYRRWWDAFAGAVGDARAVVVVEPDAVPHTVDGC GAPTYTAYRTWAQSFANGLGSQTVVVMLEPDSLALQTCLS GGASEAAY D D WDD NFA A GLGGSHEVVVIL E P D S I A QA D CLLD


 GF GS GDS Y R QW D A DS A GLGG GAPAA I L E P DA LAMA A C L S
 $G S G S G A A Y R G W I D$
$\begin{array}{llllllllllll}G & A & S & S & L & D & Y & D & T & W \\ G & A & D & S & A & D & D & Y & R & T & W\end{array}$
SNFAGGLGSGSSIVVLEPDALGHLLTTCS
 GS GS A D A Y K G W I D GVVA A A I G S GP A A V I L E P D A L A MAADCD
 A A LA S N K Y KA Y I D S IVVEKYGSDTAUIL V I E P D S L A N L V T N C
 GAPDDHDS Y R A WV D E V A A A G L E D R P A T I V V L E P D A L P L V V S G C S GAPD DS SYENY GAASADEYRSWI GAPDAAAYERWIG GA E SAAAYRGWL D GSYSGASYRAW GAPDLAAYDAWAR
GADGADAYRQW
RAFARGLRAGPAIVVLEPDALAGLDCLA

GAAD GDAYRA WV EAVARGIGDRGATVILEPDAVVHLVDGC
 GSYSADAYRAWI SAFAAGVRGNPAVVILEPDGLASVDCLS

 GAA D R A A Y G E W CGGESAAYRTWI
 $\begin{array}{llll}G A R D \\ G & G & A & Y \\ G & D & D & W \\ L & Q & Q & T \\ W\end{array}$ GAADGDAYRAWIA

## GA

 GAHSADFYHQWV GSHSSGAYRAWH
 GAPDLAA Y D A WI D G G HS S PEAYR T W W $\begin{array}{ll}G A Q D A & Y \\ G S F & R \\ G & \text { A } \\ G & G \\ G & R\end{array}$ A A LAS NKYKNYV D GAPTAAAYRTWI A A LAASNGET Q
CA GHS A A Y

## QUERY

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UniRef90 G8SAE

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160
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 RRQQTERYAELSYAGRTLRRQAAHARIYYDAGNSGWLPSS AGARAARFASLARAGATLRAANPKARVYFDGGHSGWHPAP QAGRDARHAALREAVTTLKSAGPETHVYLDGGHSAWHSPA TPARQERYDALNYAVTKKKSAGQHTKVYLDAGNAGWGHPD TPEQEERYALLTEAVGKLKA LDPHTKVYLDAGNPGWIDPG ADQQNQTKASMAYAGKKLKSGSAQTKVYFDDGHSAWLSPG TPDHEERYDLLKGA IAKLGA LKNTKVYLDAGNAGWGHPD TPEQEERYDLLKGAI QTLKA LPATKVYLDAGNAGWGKPE EADQAARMELLKYAVGALKA NPKTYVYVDAGNANWVPAG TPEQEERYDLLENGAVEKFKS DKATKVYLEDAGNAGWGTPD T PQHDERYALLGSAVERLK RQPATQVYY DAGNAAWQSPD AQQQEERYFASSLERAVTRIVRAAAPNAKVYLDGGNPSWNTPA TTGARERYGLLAYAVDRLK RQPNTRVYLDAGNPGWLGPG DTQRAERFEALARAGRVLKAADPQARVYYDAGHSDWNPAG

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 CA A R A E E R Y R R L L A A GKSARDELLARYAVA QFAALAPAAYLYLDDGNSAWL TA A GDQRQERF DLI S Y A V D T L G R NPATAVVYVDAGHSRWVNA G
TPAHE ERYDLLLKGAVVRRLKA LRRTKVYLDAGNA GWGEPR SSELLSGRYASLARAASAIHAANPKARVYFDAGHSAWNSAA
 GAQRQERFDLMRYAVDTLT RNPATALYID GGHSRWVSAD DTARQTRLGLLRYATEQLRDRAPNTWAYLDGGNARWIAA D TPRHEERYDLLKGAVERLK KQPGTRVYLDAGNA GWRTPD
 TADRQTRYDLL RYAAVALTGAGAAAVYDAGNAGWHGPA GDAAKNRTALLLKYATQQFKSRAPKAKVYLD GGNA HWVAPA EA GRAARFAALARAGRVLKAANPKARVYYDAGHSAWNAPA TPAHGERSALI S GADERLK RQPGVKVYLDAGNPAWDEPA ASD D $\square$ S ARDQALHTATQTLKAGNANAKVYLDAGHSTWNSAS G G QRADRYA S LAARAGRVMKAANPRARVYYDAGHSDWNAA G SA Q $\square T$ D R LAMMLSYATQMFQQKAPNTWAYLDAGHTNWVAPA A D Q RQERYDLI RYAVETDT RNPAAAVYI DAGHLRWHSAA A DPS Q RNQSLDHAVQALKAASSQA HVYLDDGNSAWLEP G
 SGELDNARNQAI STATRTIKSGNPNAKVYLDGGHSTWNSAG T P A QEERYDLLAGAVATLTSLG RTEVYLDAGNPGWSRPG N D A R Q T R $\square$ S L $\quad$ R Y A T E Q F R D R A P N T WA Y L D A G N A L W W I N A D A D QVT A R D E A L A T A TR T L K A A N P N A K V Y L D A G H S A WN S A G T PA QEERYALISSSADDRLKQQPPNTKVYVDAGNPAWDPAA S SAQTTR LLSLESYAVDRLKRSSAPNTWTYLDAGHDDWTPA G A D Q R Q E R F D L I R Y A V D T L T R D P P A A A V Y V D G G H S R WL S A E K D K R S E R R L
 A GRRADRFTSLARAGRVLKDANPRARVYFDA GHSGWHAPA D D QRQERYDLI RYAVDALT RNPAAAVYVDAGHLRWHSPE
 $P$ GQQQERLELLI GYAVDTMT RNPATAVYVDAGHPRWVAAD ANAQSA YKEGVIYAVQQKLNAVG VTMYIDAGHA GWL G WP GDARQTRVVDLLKYAATQFAQKAPNTWAYLDGGNATWIPAA RVVAT DRYALLAYAVDRLK RQPRTHVYLDAGNS GWI PA W SRAAP YYKELTAYALKTLNFN NVDMYMDGGHAGWLGWD A G Q $\square$ A E R N A ML K N A I A Q F H T K A P N TW W Y L D A G N A G WI G A P
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Q M A S WLQQA D ${ }^{170}$ S N S A H G $\square$ A T ${ }^{180}$
190
200
S NYRWTA EVA Y A K A VLS

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 K Q A A A L R A A GVVTTS GDGI FTNVANFRTTADERAYAR QVLA

 RMVE P L K RA GI EKAD GFALLNI SNFQTTEENKKYGKQLSS
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 YRLVRSLREGGGIEQADGFALNVSNFQPTRRTKAYGHRLSA RMAEP LRRAGL KKADGFALLNIANYQTTEDNKAYGKKLSA



 $K$ QATLLRLLAGSADSSDGVFSNVSNFNSTEAEVAYTREVLD E A A D RAR R A GAAA E Y G D G I A EMANRLN QVGVAK ARGFSLNNTANF
 $A L A D A L R R A G U G Q A D G F A L L N A N F Q T T E A S R E F G H Q L S G$ A NASVYKNASSPAAVRGLATNVANYNTVCDEKTYDNNFAP

 EMANRLNRVGV HKARGFSVNTANFFTTEEEIGYGEAI SG

 ALAEPLDRAGI ERADGFALNVSNFQTTASNIAHGKRLSA EAATRRVVNAGVAG ARGFALLNVSNYRTDAESNPYGVAVAN EMANRLNQAGVAR ARGFALNSTNYFTTEE QDGYGEEI S G Q $\square$ A GPLKRAG AEAADGFSVNVSNFYSTEDSIRYGKELSA TQASRLR SAGVVLTS GDGDYSNVSNYNRTANEVAFAKSVLS EMASRRLERVGVVRRAAGFALNVSNFVSNRENVAYGERI AM VMA A R L N EVVGV S K A A R G F S L TMA QRLQSAGVSN $\square R G F V I N I S N F Y T T A E S \| S Y G N A V S A$ A LF D S L L R A GI GAAD GFAVNVSNF QT TAASKEFGK QL S A
 EMATRLRAAGVEQARGFALNVSNFDDSASEDAYGRQISA TMASRLNAAGAKNVRGFSVVVSNFFTTAESSAYA QKI NA EQAALL RQAASAASSDGDFSNVSNFHRTADEVAYDGRVLDD $K \square A G P L R R A G D D R A D G F S L N V S N Q T D T A T R A Y G K A L G E$ DQAGRLVAAGVAD AD GFYTNVSNFNPTNSEASYGRS I L S
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 Q DQEP L R R A G V E QAD GF A VNV AN F Y S T R Q S L A Y G R QL SA $T M A Q R L E N M G V$ R NVRGFALLNVSNFYTTAQSASYA GNVNA E Q A N R L A A A GVVA N A D GFYSNVVSNFNTPTSAEVVFGKAVDS KLVEPLRRAGVAK ADGFSLNVSNFQTDQESSAYGSRLSQ TMAKRLTSSAGIARARGVALNVSNFQSTARNVSYAAAVNA
 AMAEALNAAGVVKQARGFALNIANFYTLAQVRSYGEAINA
 EMAS RLLSQAGV E HARGFSDNVANFFTTEEEDGYGEAAISG

 AFA $A Y R D A G S P R N L R G \square A T N V A N F N S N Y D E I H Y \square G A L A P$
 $R L V D A L K A S G V A R$ AD GVALLNVSNFQTNKVSSAYGDELSK A F AEVYKAAGSPRGVRGIVTNVSNYNANCDEERYDNALAP EMAQQLLAAAGV DGAHGFALNVSNYFTTDQSTSYGNAVNS

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$\qquad$ HFVIDTSRNGNGPLSGAWCNPPGRGLGTPPTTD ELRLPRLGAVIDTSRNGAGPTHDHFCDPPGRKLGTPPTAR ALGGPNLGAVI DTSRNGNGPPPGQWCDPEGRALGQTPTTR AVGDPDLNLVVDTSRNGNGSNGEWCDPSGRALGADPTDA KT DNKHFVIDTSRNGNGPEDENWCNPPGRSLGETPTTK KVGGKPF VI DTSRNGNGPPRENWCNPPGRALGEVPTTA MVG GKHFVIDTSRNGNGPAPGNWCNPSGRALGATPTTR ALGDSRLRAVIDTSRNGNGPLGSEWCDPAGRAIGTPSTDQ KVG DKHFVIDTSRNGNGPADENWCNPPGRALGETPSTK KVGNKPF VVDTSRNGNGPPAERWCNPPGRALGEVPTTK ETGGGKHFII DTSRNGAGSPGGEWCNPGGRALGQTSTTN
 LVGYK HFVIDTSRNGNGPHEKAWCNPSGRALGEPPTTA ALGNPGLHAVIDTSRNGNGPAGSTWCDPSGRKIGNYPTAA LL DGVHFVV AL GNSALHQVI A L G GPGL
RL G GE
AL DGTHF
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DLGGGS GK
GKHFVI
AVGGPTLGAVI
SLGRG QMVV
LTNGS
$A V G \quad G K P Y V I$
LLG GTHFTV
QLKSAGFHFIVD

 AT GVA G L G A VI ALGSPN ALGSS GLAHYVI D | $\mathrm{K} V \mathrm{G}$ | GAHFV |
| :--- | :--- | :--- |
| G | $\mathrm{GH} H \mathrm{~V} V$ | AL RQRGLTFVV $M T G$ GKHYVI

KVGGKPF QLGGSGLTA QLGGSGLTAVI RLGG NVHFVIDTSRNGLATADGQWCNPRGQSLGTNPTTR ALYGYGKPFVVDTSRNGNGSNSGEWCNPAGRKGGTPSQVG KVGGKPF VI DTSRNGNGPSEETWCNPPGRALGEPPTAD ILGGYTKPFVVDTSRNGNGSNGEWCNPAGRKIGTPSQQG ALG GKHFVIDTSRNGNGPDAGRWCNPPGRALGTPPTTR ALGG DVHFVVDTSRNGQRAPDGAWCNPPGRGLGVLPTTA SLYHYTRGFVI DTSRNGHGGTPGKWCNPAGAKLGTAPQA ALGGPGLGAVIDTSRNGNGPTGGEWCDPDGRSIGRAPTFR RLDGAHYVVDTSRNGNGPLGDAWCNPPGRALGTPPTTR $A L G V N G K H Q V I D T S R N \quad G G A S G D W C D N T D R R I G A Y P T T A A$
$A M G A P G M G A V V D T S R N G N G P A G G E W C D P D G R K L G Q A P T L R$ ALGG TSHFAVDTSRNGNGSNGEWCNPAGRKLGVTPRVG LTNGS HYVVDTSRNGAGPAPDDWCNPSGRALGTPPTTA
 LL DGAHFTVDTSRNGEGPLPGEWCNPPGRSLGTPPTAE STGUSGKRQVIDTSRN GGASGDWCDNTDRRMGPYPTRN SLYGYTKPFVVDTSRNGNGSNGGEWCNPAGRRIGT TNQ ALGDS GKHQIVDTSRN GGASGDWCDNTDRRIGGYPTTS ALGSAKHFVIDDTSRNGNP $L$ NGDDWCNPTGQRVGAAPRT MTN GAHYVI DTSRNGAGPAPDSWCNPGGRALGTPPTTA ALYGYTRQYVI DTSRNGNGSN GEWCNPAGRKLGVTSQTG RLYTYTKAIAVDTSRNGNGATPGDWCNPRGRKI GMTPQVL ALGG HDHFVVDTSRNGDGPAPSDWCNPPGRALGAAPTTE ALGPPGLGAVIDTSRNGNGPSDGEWCDPAGRKLGRAPS DS ALYGYTKPFVIDTSRNGNGPLGSEWCNPAGRKLGATSQTA TVG GKHFVMDSSRNGRGPLAGDWCNPPGRGLGTPPTDR MTNGS HFVIDTSRNGVGPVDSDWCNPPGRALGTPPTTA MLSNAGFHFIVDQGRSGVQNQWGDWCNVKGAGFGQRPTTN ALG YAAPFVVDTSRNGNGPDDQDWCNPPKRKLGASSQDG DL AGKHYVI DTSRNGNGPYAGTWCNPPGRALGTPPTTR ALYGYTKPFVI DTSRNGNGSN GQWCNPAGRRTGTPSRRG

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T G $\square P G I D A Y L W V K Q P G Q A D G C A A T A G L F V P G Y A F R L T R$
TGEDRI DAYLWVKLPGESDGCSAAPGAFSPEYAHGLA
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$T$
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T GDANVDAYLWVKPPGEADGCKYTAGSFQPDLAYSLASSA $T G V T G I D A Y L V K L P G E S D G C K G S P G T F T P D Y A Y E L A$
 $T G V S G I D A Y L W V K L P G E A D G C A G S A G Q F I P D L A Y D M A Q A A$ TGDALVDAFLWIKRPGDSDGPCRGAGTWWPDYADGLARRA TGDGNIDAYLWVKPPGEADGCRFTAGSFQPDLAFSLANGA TADPLADAYLWVKRPGESDGTCKGAGDWWQEYALALAGAA VGVGGAEMTLWIKVPGDSDGQCGPAGTFMPDVALRMI TGDPLVDAYLWVKRPGESDGTCRGAGTWWAEYALGLARNA GGASGLDLQLWVKPPGESDGNCGEAGDFSPTDAMKLL
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GNPFY SPYYAEEVEAAAADDDPVLKAKALKVKEDPTFI DGNPYYANPYYTEK円DAAAAQIADEDKTKALKVKE円PTAL GNPEWANAYYRSEVSSLAVPSSGPLATAAAKVADVPTFQ SGNPFWANNYYASEVTAYAV PTGGAKAAAVADVPSFM APYWVDPRSDAARQAAAYRGDSERAAHMDRIARQPAAT GGNPFYADPSYAAQEDDDVRGSDPDAAQALERIAKGGVALL NPFWANNYYRSEVSTLADPKSGAMATAAAKVANVPSFQ

YTGAKSAHPELTTAIETLENYAIAS STNPFFVNPKWAAKLWNLLKKGD\｜LNALKVPKiATMSTFV FYANEYYAGEVAAAAQMSDSSMAAKAAKVGQVGSFL FYVEPDAPPVGQVAAWTAAGREAAAMRRIAESPSAV GNPFYLSPYYSAEDASAAAVTDSSLKAKAASVANDPTFT GNPFYANPYYKSQVESSADPSASSLVAQASAAADVPSFY NGNPFFVDPEYVAKVQSDDKTTDAALIEKMKKVQEVPTAF

पYVDTENQSYAAWQAASG
GNPFYVNPYYSSEVAFDA乌PSLS
GNPFYANSYYASEVSSLALPSTGAAKAAASVAAKVGSFY NGFYADPQFHPTQWVNANPGDPRAAAIRTAMAGKAGAA APFLIDRNSQAAEEANR BPARAQAIAPGVNTPTAF TGLYVDPKSQPATWVREHPNDPESAMIKSGIADEPLAR GNPFYANSYYASE $\square$ STLADPSTPAQATAAAKVAKVPTFM

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GGPDGTAYRAWI DA|V|ATG|L|GPDPS\|VVL|EPDA|LAR|V|DC|L|D GASSDAEYLDWI REIVSGI GERRAIVVLEPDAIAQVVDGC




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 $G A P D A A A Y R R W V A R A A E G I$
$H A G R R A W V V L$
$H$ CGGASNGAYANWI AQBVAGGIKKYPAVAVVEPDSLANLVTNC GQHSAGGYRAWI GAFADAlI GDGPALVVLEPDAVAHMVAGC GARDGAHYRAWI DAFATGUGTHAAYVVVEPDAVAQ AGCG


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P E A L A E R PVLLDA E A V V R A F K A
ANAKDAY LECTNYALQQQLSAVVP QNAD A YR V V I SYL DAGHA GWL G WP TP PHAERRLELLS GAVVSRLK QHAPNTVVYY DA GNPGWVNAAA
 A NAAAVYKRSVVYAMQQLNTVG VYMYLDAGHAGWLGWP DAAVQARNRMLTYATEQFRDRAPNTWAYLDAGNAGWVAA G
 A A D R Q T RY S L L S N A V DV L A R A G V A V Y L D A GNA T WH S A A
 A D QR SVR G G L Q H A AREFKARAPNALVY HDAGNASWI A A D S NA Q TA Y K A G V TTY A MQ QL


 GRAA QQRLALLSWAVATERTEPGVRVYLDAGHPGWMPAA SSSSDAD RLTMLAFAARMFHEKASNASAYL DAGNAGWVAAD S E A Q A A Y Y E CVVNYALIDNLNLA NVAMY DA GHA GWL GWP A NA QDAY LEECINYAITTQL DDDNVAMYLDAGHAGWLGWQQ S GAADTYKTVVAYAIKQL ALPNVSMYLDGGHGGWLGWP

 K E Q Q S VR L GLL K Y AV DTENSKAPAA QLYLDA GNARWKPAA


 SGAESAYKESVEYADKNLN LDNVAMYLDAGHAGWLGWP S GAKDA YLECI NYALKQLN LPNVAMYIDAGHGGWLGWD S K A K S A Y L E GVVNYALLRQLN A A GKANRLQLLFQYATGQLAT LAPNAQVYIDDGNSDWLAPP ANAASAYRECTNYADTQL DLPHVAQYLDAGHGGWLGWP ANAETTYKACVTYALKQLSSVGGVYQYMDAGHAGWLGWP GCASAGYQDNLVKAVAAALSA NANAEVYVDDGYWMLDSAS $A N A K S T Y L T A V N Y A L M K Q L S S V G B V Y Q Y M A G H A G W L G W P$ AKAAPYYES LTVVYALKTLN LD NVDMYLDGGHGGWLGWD
 K TVHTMMKNALSYAVNVFGA MSNVSVYLDAAHGKWLGTD
 D A QIJE ERE GMLRTAIVAQFAEEAPNAWVYLDAGNSAWVEAE NQQRAERLAALAGLAEAVTDANPEARVYYDVGHSAWHAPA $R G A E A A Y K E G V D Y A L R Q L S A L G$ V $\operatorname{D}$ G S Y VDAGHA GWLGWN Q GQ G DRVGF L QYAAK AFAAK GARVY DA DNSAWL S A S KKAEPVYK $\operatorname{SVVQYAMRQLNTAG} V Y M Y L D A A H A G W L G W P$
 SNA QSAYLECINYALTNLN LPNVAMYLDAGHA GWLGWP CAEQPERYGLLDEAVTRLK RLPRTTVYLDAGNPDWIDAG GQ GD R L A L L R K A V QVLLDEA G A A V Y L D A GNSSSWTGVD
 C GEQAGYRENLIKTAI RVLSS NPNAEDYLDVGYWTLQSAG CGSSAGY LDDNLKVAVAALSA NANAELYVDIGYWMLLANAN GA DLAARNQALHTAVRTLKS GNPSSKMIVDAGHSTWNSAA ANAADVYREGIAHAINAL QYDHVHLYIDAAHGGWLGWD QASKS GYEEGVAYALKTLN LDNVAMYIDA GHGGWLGWD NGPAATERYALLA EAVAALLKTGPGVRVVYDDGGNPSWVDVD
 $A N A E S T Y K E L V S Y A L A Q L Q Q D \quad N V W L Y L D A G H S G W L G W P$ ANAESAYLECTNYALEELN LLPNVAMYLDAGHAGWLGWP $P$ E T E T A Y R E NV A Y A L Q K L N $\quad$ M P H V Y Q Y I D A A H S G W L G WP
 GQGDRVGYLRYAAKSLTAA G GVYI DA GHS GWLSVD A NA Q S A YLE CTNY A LDE QL N LLPNVAMY L DA GHA GWL G WP
 A NA H DAY LECTNYAVT QLN LDNVAMYL DA GHAGWL G WP EAERTTRFGLIAYAI NAFSGR

| $T$ | $W A Y$ | $D$ |
| :--- | :--- | :--- |
| $T$ | G G N A S WV | D A D |
| T G A N C G WTA A P |  |  |





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UniRef90 U5VQU5 UniRef90－E5XNE3 UniRef90－A6G3Z7 UniRef90－UPIOOO466F407 UniRef90 LTVV210 UniRef90－UPI00035EEC92 UniRef90－D2S411 UniRef90－UPIO0037F5105 UniRef90－IODPN7 UniRef90＿C8VSG6 UniRef90－М3вМ53 UniRef90－UPI0004409521 UniRef90－UPIOOO3C74420 UniRef90＿UPIo0036444CD UniRet90－S3ZXS5 UniRef90 V2XNS5 UniRef90－UPIO003753FDB UniRef90－UPIO00378FBC8 UniRef90－G2QA39 UniRef90－F8B3R1 UniRef90－D5UKD4 UniRef90－A0A021W446 UniRef90＿U6NEZ6 UniRef90－E2JAJ2 UniRef90－UPI000375DC63 UniRef90－V2X4U0 UniRef90＿UPIOO0441157C UniRef90－S6DXG7
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170
180
190
200 EMAERLIRAAGADDYGSGISSLINVNFRPTKDEVGGYGKRILD RLVEEPLMKSG1 DQADGFALNVSNFQPTAVTRAYGRRLSLI PMTTALRRSGI ERAYGFALNVANFETTEDNLAYGARLST ETIASRLNQVGI EHARGFSLNTSNFFTTEEEIGYGEEVSA
 ALRGPLREAGIAGEADGFAVNVSNFRTTAASTAYGRRLSA EMARRLQLVEVSK DRGFALNTSNYYTTAQSATKGNAIRA
 TMAEQLIAAGI KDASGFSLNISNYYATEPTDKYGERFLM AFAGVYQDAGAPAADRGLATNVANYNADCDEKGYDNSFAP RLADLDRRSGLDEADGFALNVSNFHTTPVTRAYGDRLSA TMAQRLHEAGLIRQAHGFSLNVSNYYTTAQSSAYGNAVNS GDVARSLRSAGADRADGFALNVSNFQTTESEDRYGRRLSE RLVEPLRLAGIDERADGFALNVSNYRTTAESAEYGHRLAR AFQQLYTDAGSPKFVRGLATNVANYNSNYDELIHYDQALSG TMATRLGNAGVGNIRGFAVNVSNYYPTAQSATYASSVNA AFAGIYNDAGKPAAVRGLATNVANYNTNYDEVHYANNVRS DTAARLRAAGV DRARGFALNVSNFDETADERAYAAAVSA EAANRLNQIGGEDAVGFSINVSNRTTAESKTWGQQVSQ EMARRLNSAGARDLRGFALNVSNYHTTADSNAYGAAVAA AFSQLYTSADRPEFLRGLATNVANYNSNYDEMHYINALAP AFASLYKSAGSPSFVRGLATNVANYNSNYDEDHYINALGP AFQQVWQDAGSPKSVRGLSTNVANFNPNYDEIHYIESLAG AFSQIYQQAGKPGAVRGLATNVANYNPNYDEIHYIEALAP AFVEVWNAAGRPKSTRGFATNVSNYNPNFDEVRYINAFRP VLAERLRADGV ERDRGFALNVSNYYTTEESVAKGDADRQ TMASRLKSADVSD IRGFALLNVSNFYTTASSUTYANAVNA AFAQVYKNASSPASLRGLATNVANYNSNYDEQLY円NALSP AFASVYKNASSPASVRGLATNVANYNANCDEEDYVNALGP AFAQI RKDAGSPPQLRGLATNVANYNPNCDEKRYVEAMVS AFAEIYTSAGKPAAVRGLATNVANYNPNYDESHYVQALAP LLFAQVYKNASSPAAVRGLVTNVANYNANCDEKRYUNALAP VMAEYLDNAGL KNAKGFALNVSNSYSTPESDSYADRIN SMADALHAAGVKKDARGFALNISNFYSLDQSRQYADLINN
ELAANVYKQAGSPKQVRGIATNVAGWNSYDNEKKYVELFSP AFTSLYSNAGSPSGVRGLATNVANYNPNYDEMLYI EALAP ANADLYKAAGKPAAVRGLVTNVANYNANCDEKRYI NALAP AFAEVFKAAGSPAAVRGLATNVANYNSCDEKRYINALAP EAARRIELVGLD DHLDGFALNVSNYHTTEDSVAYGEQVSA ANAKVYKDADAPAALRGLAVNVANYNANCDEKRY円HALYP AFAKVYKDAGSPSSLRGLVTNVANYNADYDEKHYLHALSP EAARRLVDAGVAGAAGFALNVSNYRTDAESNPYGIAVAD AFADIYKAAGKPKSVRGLVTNVSNYNPNYDEKKYIEAFSP AFTQMYQAGGSSPFIRGLATNVANYNPNYDESHYINALAP $K V A T A M K D D G S S G R V K G V T D N T S N Y R S N D E C A G Y C T N F Q T$
$T M A R H L D G A G A R Q A H G F A S N S N Y H N G R N T S Y G N A L S$ AFAQVYSDAGKSPF $\quad$ KGLATNVANYNPNYDEIHY円NALAP ANAKVYKAAGSPRAVRGUVTNVSNYNANCDEERYINSFAP DLAGPLRRAGLDDADGFALNVSGFQPDABVRAYGAKLSR KVAQVIKAAGSNGKIRGVATNVANYANYDELYYDQALSP TMARRLHEAGLIRQAHGFSLNVSNYITTAENTAYGNAVLA TMAERLEAAGLEDAHGFSLNVSNYLSTESNVAYAEAVNE A $\|$ APTLVEAGULDEGAGIATNISNYRTTTDETAYASAVIAA AFAQUYKDAGRSAFGRGLATNVSNYNANYDEDRFINALAP DFQELWEGAGSPKYVRGVVTNVSNYNPNYDEVHYAE AFTDUYKEAGRPKSLRGLATNVSNYNPNYDEKHYVDAFAP AFAQVYSDAGSPAALRGLATNVANYNANYDESHYVAAIAP ALVVEPLRRSGIAS ADGFSLINVSNYQTTASNIIAYGKELSP TIAQRLRKAGV DQARGFATNVSNFNADAAERSYAEALSK ANGQLYKDAGKPSRLRGLVTNVSNYNPNYDEQKYDHALSP AVAGVVKTLVGAGRVKGI ALNTSNYRSNAEDSSLCWNFQS KVATVMEELGASGRVKGVTINTSNYRSTDECATYCTNFQT EQARRLIAAGDADADGFYTNVSNFNPTSGEASYGRSMIS
EFAKVVKLAGGGNKIRGFVTNVSNNSSWDESHYVSSLAP $A \Pi A K V Y K A A G S P K Q V F G F A T N V A G Y N K C Q D E K R Y V N A F A P$ RVAAALTEAGV GQADGFSLNVANFETTEANLEYGTRTSE AFAEMFKSADFVAFVRAFATNVREYNPNYDEFPY IQRVRP AFASVLQGAGNNATVRGLATDVSNYNPNYDEELYINALAP ANASVYKNASSPAAVRGLATNVANFNAVCDEKSYINAIAP DFADVDKAAGSPAGVRGFATNVANYNPCFGEYDYVNAMGT ELASVYRSAGSPSQVRGIATNVAGWQWNQNEKTYVEVFGR A NASVYKDASSPAAVRGLATNVANYNSVCDEQQYINALAP A LA AKAKNAGSPKQLRGFSTNVAGWNSCQNEKDYVSTFGS ANANVYKTANKPASMRGLATNVANYNSNCDEKKYINALGP TMAARLVQAGVAG ARGFAVNVSNFFTTAESSAYADAVNA VIADRLLRAGVKG ARGFAVNVSNYYRTADETARGEVVSA TMAKRLLSAGVAR ARGFAVNVSNYDGTTESRRYAERIIEA TMADRLRQANVAK ARGFSLNVSNYQSAWENVRYGQEIAA ANAKVYKDAGSPKALRGIVTNVANYNSNYDEKHYVEALAP


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GLLGDDGKKTVV ${ }^{210}$
220
230
240
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LLGGKPF
LVGGKPF HYV ATNGSQAQFV DTGRNGVGPAPENWCNPDGRALGVAPTTA ALGSQAQFVIDTSRNGNGSNGEWCNPAGRKLGDTSRNG ALGG GKRVVI DTSRNGNGPYKGTWCNPPGRALGVPPTTR AL DG DKSNMIIDTSRNGHGAPPNQWCNPLGRKIGEGP ELAGWDAHFVVDTGRNGKQPTWGDWCNVKGTGFGVRPTTD LLG GAHYIIDTSRNGNGPLPRQWCNPPGRALGAPPTTV MLQSAGFHFIVDQGRSGQQNQWGDWCNПKGAGFGTRPTTN ELYGYTKPFVIDTSRNGNGSN GEWCNPAGRRIGTPTQLG LLG GTRFVIDTSRNGNGPAADAWCNPPGRALGRPPTTR ALGG DTHFVI DTSRNGNGPYGGPWCNPPGRALGTPPTTR VLGSF PAHFIVDQG A GGGAKWVIDQGRSGQQNQWG GLGTAGKPVIDTSRNGNGSN GQWCNPAGRKLGSTAQLG LLNSAGFRFIVDTGRNGKQPTWGDWCNVKGTGFGVRPTAN ALGG TAHAVIDTSRNGLGPAPGNWCNPPGRALGAAPTGN SLFGYSKAFVVDTSRNGNGSNGEWCNPGGRKLGA GSQ ALSSSGFHFIIDQGRSGVQNQWGDWCNVKGAGFGDHPTTS MLSSQGFHFIVDQGRAGVQNQWGDWCNVAGAGFGTRPTTN AVG GKKFVIDTSRNGNGSEDKNWCNPPGRALGTPPTRN VLSPFPAHFIVDQGRAGQQNEWSDWCNVKGAGFGTRPTDN LLGGFPTHFVVDLGRSGVQNQWGDWCNVKGAGFGTRPTTN LLEARGFYFIVDQGRSGVQPTAGHWCNVIDTGFGTRPTTD ALVGS ARFLVDSSRGNGAPGGEWCNPAGRGLGVPSQVG LLGRHFVIDTSRNGNGPAERRWCNPPGRRLGTPPTLV ALGHVAGFVIDTSRNGNGSN GQWCNPSGRKLGTPPQ LLGWPNAHFIMDTSRNGVQPTWGDWCNVIGTGFGVPPTTN LFQEQGFYFI IDTSRNGVRPTWGDWCNVIGTGFGVRPTTD ALGWADSHHVVDQGRSGKQPTGGDWCNAVGTGFGIRPTSN LLTANGFHF1TDTGRNGKQPTWGDWCNVIGTGFGVRPTTN LLQAEGFHFITDTGRDGVQPTWGDWCNVKGAGFGARPGTN LLG GAHYV KLYGYKKT TLIDTSRNGQAAKAGEWCNAAGPKLGMP TQ KLHAYTRAVVVDTSRNGNGAHPGDWCNPPGRKLGLPPQTL ELTSAGMQA:IDTGRSGVQGEWGNWCNVNGAGFGRRPSSS LLTAAGFHFIVDVSRNGVQPTWGDWCNLKGTGFGVRPTTN LLAGYPAHFIVDQGRSGVQPTWGDWCNVIGTGFGTRPTTT LLG GARYVIDTSRNGNGSNGEWCNPRGRALGERPRLV LLAGWDARFIMDTGRNGVQPTQGDWCNVIGTGFGMRPSSE LLGWAGARFIVDQGRAGRQPTWSHWCNAKGTGFGLRPSAN AL RDKTKSF VNASARNGAGPLGKEWCDPAGRRLGAAPRIN MLASSGFQF VDQGRSGVQNQWGDWCNDKGAGFGTRPTTN AMGSTDMKCIVDTSRNYNGSPTSDWCNVPTAGDGKPPTSE ASYGYTKPFVIDTSRNGNDSN GEWCNPAGRRTGAASQTG ALQSAGFTFIVDQGRSGQQNHWGDWCNTKGAGFGTRPTTN LLEAEGFHFLVDVGRNGKQPTWGDWCNVRGAGFGARPTTE EGRHFVVDTGRNGEGPLPGDRCNPPGRALGTPPTDR AVGISDDHFIVDTGRNGVDDTTETWCNFIGTGFGERPKPN ARYGYTKPFVVDTSRNGNGSNGEWCNPSGRRIGTPTRTG QLAGFTAPFVIDTSRNGKGEEGVDWCNPAGQQLGETSRWG ELGG GLIGAVVDTSRNGNGPLGSEWCDPPGRLVGNNPTVN LLRGWDAKFIVDQGRSGVQNEWGNWCNVYGAGFGMRPTLN LTG GKKFVIDTSRNGNGASGSEWCNPSGRALGDRPTRV SLPPFPAHFLVDQGRSGQQNAWGEWCNVKGAGLGTRPTTD LL NGWDAKF I DQGRSGKQPTWGHWCNALGTGFGLRPTSN QLGGRPGYVIDTSRNGNGSNGEWCNPSGRALGEKPRVV KVGNKPF VIDTSRNGNGPASQAWCNPPGRALGEAPTVR ELGNGAHYVVDTSRNGSGGNGEWCNPEGRTLGKTPAAV LLGWPGAKFIVDQGRSGKQPTWGDWCNAPGTGFGLRPSAN AMGSNDYHCIVDTSRNFVASSSSEWCNVKTAGTGAPPTSN AMGSSDMSCIVDTSRNYNGSPTSDWCNVATAGI GKPPTSE SLGVSGKRQVIDTSRN GGASGDWCDNTDRRIGRYPTVA LLKTAGMHAIVDTGRNGLRDAWGDWCNVIGAGFGVRPTTT RLG GKRFVIDTSRNGNGPAAGHWCNPPGRALGPAPTTR MLKSPGFQFVVDQGRAGQQNQWGDWCN KGAGFGTRPTTS MLDSNGFQFIVDQGRSGVRTAEGDWCNVLGAGLGPRPSTD ELSSAGFHFITDTGRNGKQPTWGDWCNVKDTGFGAQPTTD ALAAEGLHFI 1 DTSRNGRGNDWGYCNNIGAGMGERPRAN YLRDAGMHAIVDTGRNGVQGEWGNWCNTNGAGFGQRFTTN RLGGKG YVIDTSRNGNGSN GEWCN RGRALGDKPRLV LLLSAQGFHF:VDTGRNGKQPTWGDWCNVINTGFGVRPTTN LLAGWDAHFITDTGRNGVQPTWGDWCNVKGTGFGVRPTTE GLAARGLPYVVDTSRNANGGTAGDWCNPEGVKLGVTSRVS LTG GTHFVVDTSRNGQGPADGPWCNPPGRGLGAAPTIE ALHRPAA YVIDTSRNGNGGN GQWCNPRGRKLGRHSTAN LLDQSGDHFVVDTGRSGQPPAGTEWCNPPGQRIGETPGLG LQGWNAQFIVDQGRSGKQPTWGDWCNAVGTGFGMRPSTN
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G EDA 250
260 270
T GDEDVVAFLWVVRPGEADGCAANAGTFVPDLATA|LAE
TGDP A I D A Y L WI K R P GES DGTCNGAGRWWT E Y A L D D L A R N A

$T G V P L A D A F L W I K R P G E S D G A C G P A G Q W W P E Y A L D L A$
TAGEHADAYLWVKRPGESDGACNRAGVFVNQYAI ELLAHNA TADPRVDA Y L WI KVP GESDGECNAAGGWWPEMAA E L L A ARNA T GDPLVAA Y L W WI K RP GESDGECGGAGEWFDA YA L E E L L A R GA


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

T G DE LVVAF AVWVKP GGESDGTCGAA GTWF QA YFEQLLVANA
TGAP L V DA L V V WV K R P GE S D GACR GA GH WWA E YA L G L A
TGSSLLI DS LVVWVKPGGECDGTSNSAGTWFQAYFETLVVSAA
$G G A E M L D W I V D P G E S D G N C G S A G Q F D P E V A Y R M V$

T G DPA I DA HLWWVKRP GESD GTCRGA GA WWP E YA L G GL A S R A
TGSSLIDAAVWAKPGGESDGTSNSAGTWFQAYFEQLVSKA
GGDS GTEMLLWWVKVPGDSDGNCGPAGQFSPDLAVRLI
G GAEML
TGHELVDAFVWV
TGDPIVDAYLWI KPGGESDGTSDTAGQWFQAYFEQLLTNA NDGS GLDALLWWIKLPGESDGACNGAGQWWQSMALLELARNA NSATGAEMLLWVVKVPGDSDGKCGPAGEFSPDDATRLDE
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TGSSLI DSIVWVVK G GESDGTSDSAGTWFQEYFEALVRNA
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$T G N E Y V D S L V W V K P G G E S D G T S D T A G Q W F Q A Y F E Q L L R N A$
G GADLL
V WAK VP G D S
GHPLADAYLWVKRPGESDGACGRAGRWYPAYAMALAR
NGGGADMLLWIKTPGVSDGKCGAAGQFSPDLAVRLI
T
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GNPLEDAFVWVKPGGESDGTSNTAGTWFQAYFEQLLTNA TGHPSVDAFVWVKPGGESDGTSDTAGTWFNAYFEQLLTNA
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T GDALLDAFVWVVK GGESDGTSKAAGEWFHEHFVQLLLRNA
A A GSQPAMTLWIKSPGEADGCAAAAGTFVPDLAHKM।
TGSSLADAFVWVKPGGESDGTSDTAGQWFQAYFEQLLKNA $T G N S Y D D S D V W V K P G G E C D G T S N S A G T W F Q E Y F Q T L V S K A$ $T G \square S N I D P$ F M WI K P P G E S D GE C T S A G S F Y L E G F T L L
TGSSSLI DSTVWWVKPGGESDGTSNSAGTWFQAYFETVVSKA
TGNS LVVDALVWVKPGGGESDGTSDEAGTWFQAYFEMLL K K K K A
T G D P L V D A Y L WV K R P G E S D G T C R G G A G A WWP E Q A L G L A R R A
$P G M P L L D A Y M W L K T P G E A D G S S T G A G Q W F H E Y F V Q Q L L K M A$
GGAEML
EDAELL

N D A V WI K P G GEADGTSDTAGTWFQEYFVNLVKNA
 T G H P DV D A FVVWVK PGGEADGTSDTAGTWFQAYFEQLLRNA
NDSTGLDALLWI K
TGSDLLDAFVWVK $\operatorname{L}$ G GE
CDGTSNTAGTWFEAYFEQLFTNA DD
TGDALVVA FVVWVKPGGESDDGTSSDTAGTWFQAYFEQLLLKNA
TGYWNL DYFMWI KVPGESDGKCNDAGAFFAEHFKMM
TGVSNLDYFMWIKPP GESDGECLGAGSFFAEGFTKLL

$T N N T H V D A V V W V K P G G E S D G Q C G M A G E W F D E Y A Q M L V K N A$
TNDALVDAFVWGKPGGESDGVSDPAGQWNQAYFEQLLANA
$T G Q P L V D A Y L W V K R P G E S D G A C R A A G Q W W P E Y A L E L A T N$
TGNPLI DAII WVVKPGGESDGTSNSAGTWFQAYFETVV
TGNDLIDDSIVWWVKPPGESDGTS DTA GTWF Q S YFE TILI QNA
TGDELADAFVWVVKPGGESDAHCGEAGTWF QAYFEQLL TNA

NDSTGGLDA LLWVKKDPGESSDGTSCKAAGQWNQAYFEMLLLRNA TGDALVDAFVWVKPGGESDGTSDSSAT
T G Li E L A D A FVVWVK P G GE S D G T S D S A GT WN EAYFEMLLLKNA
$T G D A L A D A F V W V K P G G E S D G T S D S A G T W F Q A Y F A Q L V E N A$
TTGPEFLLWIKVPGDSDGDCGPAGTFSPDLA
T GSPHADAFLWW KTPGASDGECGRAGAWWQQQAEEUVRLA PAA LAELWIANPGNS



UniRef90 A0A010YWR7
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UniRef90-U5VQU5
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DPNPFYVDPESEALKAVDAATDAATRDAFL TIADOPTA NE $\square Y$ YAPRF $\square E E \square D S S T P K \square T P E L A A K A E K V K Q V P T A V V$ YGLAKSSYPQLSTALGTLENYADAS FYVEPTTNAGRQADIWAAAGRDADAMRALSKVSQAI NSFYR SEVEQAVKDTSDPSLASAAAKVADVGSFI GNPFYANPYYASEISASAlPSTGAMATKAAAVAKVPTFY GNPFWANDYYASEI SSLAVPSSGAMATAAAAVAKVPSFE GNPFWLSTYYA AEVDSAAQVSDATLKAK LLKVKELPTFT NPFFANPEWAKAEPALAHIGDSANAARVRKVQQTGTFV ENTGYSNFKFQGEVQSSIDKLSGDMAKKAEKVKYVPTAV SGNPFYANSHYGYVRAAANQUSSSLKQKALAVANVGSFL ENELYSNYKFQGEVDQSDQRLSGSLQEKAKKVKYVPTAA DRQLFPNPYYADE【KNLATPKTGDLATKAAKVAEVPSFA YASAVVAYPNLKDQDELVAKQQVAQ

## GLWVDPDNAARRAGGAGGGGAERAVLRWLAGQPVAV

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 DN A ETPQAK SADF LDTDTQAYEAWQAASG SD K

 SGNPFFVDPGYKKVDSSIAQVTDTALKAKMEKVKQDQTAF NAYYSSE $\square Y N$ NAVPSLVAAGKASLTAAAKAVATVPTFV
 GNPFHANSHYSSVEAALGNLSDSSLEEAAAVVKETGTFD


SPLSYATAKTDYPDLAFADSAVEEYSSFY ENEDYSNYKFQGEVDTS $\square$ SK KSGNLRQKAEKVKY VPTAA GDEKDAADYLAAQPTAY
YATAKTDYPDVAFADSAVEEYSワAA
FYVDPDNNAATWVKENGDNPNAEKIKTSIADNVVAK PSVSYANAKQNYPNSAFAISELEKYTIAT YAAAKITYPDAAFALNELEKYSIAT WTQAAASNPK LHGAINELSKYAVAT YSAAAQAVSDARAQGRTAEAFEVIASRPTAT DGKKLFANPAWSKLDQTYDAKGDTQNAQKVRSI QD DGTFV WTQAASTNPKLQGALNELSKYAVAT SGNPFF $\square$ NPYYVADDAA DAQMSNSSLKAKAEKMKTYSNA APASYSGAKTTYPHLATADET\EQYSDTA
 FVAPAESKAARAAAEGGSADEVAAAEYLAAQPTAY LYVDTDTQARAAAKAARAAGRTSVALDVIATAPQAR NPD AYRQAAGLLRDGRYADAAGVLAGTPQAV GNPFWANSYYASEDSAYAVPTTGAMATKAAAVAKVPTFQ
 NRGYGNARIA LENLPMDADATAGTTYLAAQPTAY NR $\square$ Y CNDDRKKRVQSS INQLS GELRAKAEKIKDVPTAL

DTNPFFANPTWATKEQTYDAQGDEANAAKVRATQDVGTFV DWDFY LEPSRLSVV KNERNAELKKLYYQVYGTPCGG $N P Y Y V D E V N G A I A Q$ M S D S S L DA K A E K MK T Y S N A $\square$ AVQTDAKFAPAlNELLKKYPVAT
 GNPFYANAYYSSEVFSLAAAGKASLTAAAKAVATVPSFV GTPLYSDPDLLAVEAARV DPRLD DPIAQTPQAK SGNPFFVNPKYSETRQAF $\square$ SRGDQTNAAALVSEMVETRGDAT
 DF VO Y R QEVEAAAGNLTDPSLQEAALKVADVGTFQ NPYFKNPEYVPGTVAAAQQTAYDASASADEALVEKGMAT
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## WLT QGDPLPRAREVSM

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WLSDRAPESVGGHLS
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WTTDRSNTDAAVASARAAKAATGVDQUVGVLYNLPDRDC WYDGVSPIKNEGWLKNFVEGAEKAQKTPIVVLYGIPNRDC WLDTNMQSWLESNLQGALAQQESTGSDTVFVVYDLPGRDC WYTDRGGDS WYGDGTPDEVRASVRRTVADAARRHALPLLALYNIPGRDC WF GDGSKDEVLDTVLRAVISAKRAAGSIGGIFVVYDLPDRDC WFSDWSSATVLDDVGDYLAAADAAKAVPTIVLYRIPALDC WПSNDALLADIDKAITNARAAKAKGENPVLVLYNIPDRDC WYSNRANGGYYTTAKQLVAGACAKGRNPVVVVIYGLPNKDC
 WLDTISTIESFESYLTETGE NEDFGVVIYDRPGRDC WFTDGTPEGVERKVRALVDRAAARREVPVLVAYNIPYRDC WYSDRTENGDYAKTAADLVSSCSEDSRUSVVVYGLPNKDC WLDQVAKVPLTTYLAAADAEAKSSGSQQLFVVYDLPDRDC $W L G D W T Q G T L T K T I S T A L T G A E Q S G T T P V F V L Y A I P D R D C$

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160
A GA A A Y KEG EV A $N|V| A|Y| V|D V G H A G W| L W E$ ERLRDERLPLLRKAVDALTGHG LTVYDGGNENRVPTA C G EA A G Y L D NL K V A V A A L S A N S NA QLVYVDVGGYWDS TN A A

 QASAA GYREGVAYALVKSL D LDPNVA QYVDA GHGGWLGWD
 K NVHSLLHKSALSYAVNVFGA MSNVSVYLDAAHGKWLGTD CGGPA GY LE NLK $\square$ GAVNALSA NANAQLYLDVGYWMLTNAA G G G GDERFREV NYAI RTL QRLPRTGVYVDSGHSDWQPLN
 ANARAA YL E CTLLYAVKQLN LLPNVAMYLDGGHAGWLGWP SAAAD GYK S STTTYALKKTLAAAG VYMYMDAGHA GWLGWP ARAAPVYEEGDAHAlKSLLQFD HVHDYLDAAHGGWLGWD $M N V Q N L H K Q G L A Y A I S K F G T Q K N V R V Y L D A A H G A W L S A D$ QASAS GYREGVQYALRNLN LPNVAMYIDAGHGGWLGWD R NVHDMHK QALLSYA V S K F GTQQNVVRVY L DAAHGGWLNAE SQAADTYKAATDYAFKTLN




## 21

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D Y A ElLYKKAGSPKSVVRGTCSNVVNFNGNWDESKFHAALAP TMAD WLLRQAG D DEVQQGFFTNVSNFYRVDQERAYA DELAD AVATVI T E L S A S GTLLK GVTDNTSNYRSTDETTTTYCTNTQT $T L A D S L R R A G D G R A A G F A L N V A N F H P T D E V V A Y G R A D S D$ EAATKMAGEGKKVRGFVTNVSNYNPSWDESHYASSLAP


 A LA S V YK S A G SP S QV R G IS T NVA GYNKCQN EK I Y DNTHGA KVA S V L K E DA P N G K I R G L S T N V S N Y Q P L S S E A Q Y H Q G L S S
 E LLAKVYKAAGSPS QFRGIATNVA GWQWNQNEKLYTELLGA AF GQI YK A A GSPAAVRGLATNVANYNSNCNEKLY IN ALAP AFGKLYNDAGKPSQLRGMATNVANYNPNYDERHYVEAFRP AFVTMWTNGGKSPFI RGLATNVANYNANYDETHYIDALAP EFAKVVAMAGGNSTVRGVVTNVSNYNPSYDESHYALSLAP
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 VIA D RLERAGVV QRARGFAVVVSNYYHTQDEVARADMI SA ANADVYKKAGSPKAVRGLVTNVSNFNGNYDESKFHAALTP AVAKVVNTVDPDCRCKGIVSLNTSNYRSNAEMAATCERFVK
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 K VANAMTD DGNSGRVKGワT $\square$ NTSNYRSNDECAGYCTNFQN AFASIYKDAGKPAALRGLATNVANYNSIYDEKSFIHAMGP
 KVATVMQQLGSSGRVKGDTINTSNYRSNEECAGYCDNFQA VMAE RLLQQA G $\square$ E HAA GFSLLNVSNYHTTA DSVAY GQR DS D
 $A \quad I V P R L V R A G V G G A T G F Y L N V S N Y H T D A A N V R Y G K L I S T$ EAAKRLKMVGVNKVA GFSVVNVAAHYTTDSEVVRYAESVRD DFAEVIKKAGSPANVRGFATNVANYNPCFGEFDYVDAMAS DNANIYKNAGSPASFRGLATNVANYNS DCDEKRY IVAFGP

 $K V A A V V K E \square A P N G K \square R G L S T N I S N Y Q P D D S E Y G Y H Q K L A S$ ELAKAYKAAGSPKQFRGFATNVAGWQWNQNEKDYVETFGP AIA ERLRRAGVA HARGFAVNVSNYYRTEDEVARGTVISG A NANVYNAAKKPASLRGLVTNVSNYNANCDEKKYDNALAP $K \bigvee V T I M K D L A T S G T L K G I T D N T S N Y R T T D Q D T K L C T N F Q T$
 K M A D L I R Q TG V DD R V R GFA T NVVSNY Q A S A DE F A Y A A S L S S A I A D A L K D A G V E K I R GF A V NV S N H Y K T D Q S D E K A K Q L L D S A A Q VV K D L A V F G R V K G l TVAN A S N Y R S N A E I S Q L C S S F Q Q

 DFGKVVRMAGNSTKDRGFSTNVSNYNPSWDESHYAS SLAP

 EVATVVTK LVSASGAVKGVTDNTSNYRPTDECTTYCSNFQS QQAS WL R QA GV DRTQGFFTNVSNFYRVDTERAYADEDAD
 DTAA R L RAAGVAK ARGFATNVSNYNATSAEQAYAKKVAQ $S L V P R L V R A G V G G A T G F F T N A S N Y R T E A D S H W Y G T L V S A$ AFASVYKKNANSPKAVRGLATNVANYNWNYDESSVYVQAIAB $D \square A Q R L V R A G V Q R A Q G F F D N V S N Y Q T T E R Q \square K Y G T W D S E$ ALAKVYKNAGSPKQVRRGATNIAGYNSCQNEKTYVSKFSA $\begin{array}{lllllllllllllllllllllllllllllll}E & M & A & Q & L & R & Q & M & G & I & D & R & V & R & G & V & A & T & N & V & S & N & Y & Q & S & T & Y & D & E & F & A \\ E & Y & A & H & A & L & S & D \\ V & A & K & I & I & K & D & M & A & P & Q & G & K & L & R & G & L & S & T & N & V & S & N & Y & Q & S & T & R & D & E & Y \\ A & Y & H & Q & K & L & N & S\end{array}$ D A A DL L N GA D $\square A B S A H G G A T N T S N Y N W T D D E \square A F A E S V D A$ DFAEVVQKAGNNTKDRGFSTNVSNYNPSYDESHYASSLAP
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 $E V A N R L K G V D V G K V A G F S D N V A N Y N T T G S E D R Y A E R V R S$ VVATILQKAGGNNRIRRYASNVSNYNPSPDESRYADNLAA
 DNTTILQQKAGSNARIRGYSSNVSNYNPSADESRYATSTGN LY A ELVKNAGSPKAVRGVVTNVSNFNPNADESKFHDALAP ALAAAYTGAGSPSSVRGFATNVAGWNAVQDEDRYVTLFGA
 A VA A VVK QLVSA GKVK GDTLNTTSNYQSTSTLLSTLCSNNFQT AFAQMYSTTGSSPYFRGLATNDANYNSNYDELLY DEALSP

## UniRef90 H1UZ51

 UniRef90-AOAO22LIZ4 UniRef90-H3GIR1 UniRef90-UPIO00366C9B8 UniRef90_T2B3P4 UniRef90-D1AC46 UniRef90-C4B811 UniRef90_W6ZNK2 UniRef90-D1BIS4 UniRef90-G2QFW6 UniRef90 BoFEV9 UniRef90_G4ZYR4 UniRef90-UPI0003AD219C UniRef90-J3P2B7 UniRef90-G2XV25 UniRef90-M4FX76 UniRef90-G4TC42 UniRef90-L7HXX1 UniRef90-Q9UW10 UniRet90_V2XP74 UniRef90-P78721 UniRef90-F8B3Q9 UniRef90 L2FVL3 UniRef90-H3GSW0 UniRef90-F2R3X7 UniRef90-L8EZ28 UniRef90-D9UC73 UniRef90-H1VDM2 UniRef90-G9NFV6 UniRef90-M4BS04 UniRef90-O9UW11 UniRef90-C7YVK6 UniRef90-G8A561 UniRef90_-Z5X9D6 UniRef90_H3H306 UniRef90-C7ROP5UniRef90 B2AE04 UniRef90-Q0UPA5 UniRef9O-UPIIOOO3C75F2D UniRef90-G8RX49 UniRet90-A9FHT2 UniRef90-G1XDU1 UniRef90-UPIO0037BC790 UniRef90-G4MM92 UniRef90-D8QGE7 UniRet90-E3W3U4 UniRef90-G4MS86
UniRet90 D3D8M0 UniRef90-K9G2R5 UniRef90-H3GIR4 UniRef90-H2BPT6 UniRef90-A0A031FVY7 UniRef90_W2M1Y5 UniRef90-D3Q463 UniRef90-K3WJC8 UniRef90-A0A024TAQ9 UniRef90_U2YV58 UniRef90-R8BLTO UniRef90 W4FUK9 UniRef90_Q96V98
UniRef90 M4C2S9 UniRef90_UPI0003450D87 UniRef90-A8LCS7 UniRef90-U2XB82 UniRef90-UPIo0031A423D UniRef90-R8BXH9 UniReffo-AOLR50 UniRef90-H8E4Y3 UniRef90-Q874E1 UniRee90-UPIo003793F18 UniRet90_W3XB13 UniRef90_-JVFXX
UniRef90_H2BPT2 UniRef90-TOR7Y5 UniRef90_UPI000375A098 UniRef90-S8A9C3 UniRef90-UPIOOO463FOC7 UniRef90-Q2GTW3 UniRef90-K3WJB6
UniRef9O_B2ADA5 UniRef90-C9SYl3 UniRef90 V2YR75 UniRef90-F6IJT5
UniRef90 G4ZXN0 UniRef90-C4B812 UniRef90-TOQBN6
 AVGG DPHFVIDVSRNGQG WRGTWCNPEGAGLGQEPHVT AMGKSDMTCIVDTSRNYNGSPSSDWCNVATAGIGKPPTSE RLG GARFVVDTGRNGRGPDRPTWCNPPGRALGPPPTRS HLEAEGLHFIVDQGRPGAREEWGEWCNVEPAGFGPAPTTN CLGRRDLTFVLDTSRNGRGPWPQEWCNPPGRGLGVRPTTR LLQQQGFQFIVDQGRSGVRNAWGDWCNHKGAGFGIRPTTD QL DGAPFVVDTGRNGNGSDGTWCNPPGAALGAPPLTL ELKSAGMHAIIDTGRNGVTGEWGDWCNVNGAGFGVRPTAN ALGYPGMKFVVDTGRNGVDVSSTTWCNFVGTGFGERPQGN AMGSDDMHCIVDTSRNYNGSPTTDWCNIDTAGIGKPPTSN C RFRQKHFVLDTSRNGQGPWPQVWCNPPGRGLGARPSTR ALKTAGMNAIVDTGRNGVQGEWGHWCNVDGAGFGVRPTAT LLAAKGWHFITDQGRSGKQPTWGHWCNAMGTGFGRRPTAD MLRGWNAQFIVDQGRSGVQNAWGNWCNDKGAGFGLRPTTN HLEAEGLRFLI DQGRPGAREEWGEWCNVEPAGFGUAPGTP ALGVRDLHYI I DTSRNGANNQSGTWCNFKGAGLGARPQAN ALASAGMHAIVDTGRNGLRQEWGHWCNVNGAGFGVRPTTS ALGVRGMKFIVDTSRNGRNPSSATWCNLKGAGLGARPQAN LTGGS HFVVDTSRNGRGPASGAWCNPPGRGLGITPTAD MLIAGYPANYLVDQGRSGKQPTWGDWCNVKDAGFGARPKVK ASG KNYKCIVDTSRNMVDPTSTEWCNSNWAGMGEDPTTN ALG GAHFVIDTSRNGNGPPGEAWCNPPGRALGRLPTAS ALGGPGLGAVVDTSRNGNGPPGGAWCDPAGRALGTPPTLR YLEAEGLRFII DQGRSNSREEWGEWCNVSPAGFGVKPGTP LLKSAGMHA VDTGRNGVRKEWGDWCNVKGAGFGVRPTAD LLGWSNTYFFTDQGRSGKQPTWGDWCNVIGTGFGIRPSAN ALGVKNMRFIVDTSRNGVDAKTKTWCNFVGTGFGERPKGN AMGSTAMTC VDTSRNYNGSPTNDWCNIPTAGIGKPPTSN LLGWPGAHF TDQGRSGKQPTWGDWCNSKGTGFGURPSAN KLGWADAHYVID DSRNGAGGQ DDYCNAPGARDGHAPQLY AMGGSMKGVVDTSRNGNGSN GEWCNPSGRALGEQPSSN RLKAAGMHAIVDTGRNGVQGEWGNWCNVDGAGFGRPPSAD LLVKNGFHFLTDTGRNGVQPTWGDWCNVDGTGFGDRPSST
 LLNGWDAHFIVDQGRSGKQPTWGDWCNADGTGFGDRPDTA KVGW KHYVI DVSRNGNG WTGTWCNPPGAALGQDPKVT LLAAKGWHFI 1 DQGRSGKQPTWGHWCNQQGVGFGRRPSAN ALSAAGFHAIVDTARNGVQGAWGDWCNVIGAGDGVRPTAD ALGYPDMHFVVDTGRDGVADSSGTWCNLIGTGFGERPKPN LLKNAGMHAIVDVGRNGLREEWGHWCNVNGAGFGVRPTTS LTGNS HFVVDTSRNGRGPAEGAWCNPPGRGLGPAPTTA LLAGWDAHFITDTGRNGVQPTWGDWCNVKGTGFGVRPTTD TMGKSDMNCI VDTSRNNIIETTTDWCNVLEAGIGHPPTSE ALGVRGDKYVVDTRNGANNASGTWCNFKGAGLGERPKGN LL G GAHA VDTSRNGVASSGGEWCNPPGQRVGEPSGAF A
ASKKDMAC
GTES
HV TIGSDEYRCIVDTSRNFKAPTTTEWCNSRSAGIGHPPTSD AVGSTAYHCIVDTSRNYNAPSSAEWCNVRSAGI GDPPTSN ATG GLHCAFDTSRNYRGS $G G D E W C N S S A G I G A P P G S D$ LLGGAP HLEEEGLRFII A T G AAGDSSVYFVSDTSRNGDRKHPGEWCNQTGVGUGARPQAN GLHCVFDTSRAGSRKEWGEWCNVSPAGFGDKPGTP AMGSTDMSCI $\quad$ DTSRNHNKLTTTDWCNVKSAGI GKPPTSE R川GD
ALGG RL DPHFV1 QLAAAGMHLVVDSRNGAGAPGGEWCNPPGRTVGDPSGTF CVGSRAKHFVTDTSRNGTASARGQWCNPRGQGLGVRPVTK LLSQNGFHFITDQGRSGKQPTWGDWCNQKGTGFGMRPSTN CIAFPTTHFVIDTSRNGRGPQGGSWCNPPGRGLGLRPTVN ALKTAGMYAIMDTGRNGLRKEWGDWCNVNGAGFGVRPTAD RLG GTHAI DDTSRNGVATAGATWCNPSGQRVGDATGT ALGDRNMKFIVDTARNGVDVATGTWCNVIGTGFGERPKGT ATGVPGLGAVIDTSRNGNGPTPNEWCDPPGRMDGRPSTTD H鸟ANGLRFI DQGRYGARAEWGDWCNVAPSGFGAVPGTT YLGFKDMHYVIDTGRSGNANAPYNSCNNFNAALGPRSTTR AAGTSSVYFVSDTSRNGDRKHPGEWCNQTGVGI GARPKAS QTG GLHCI IDTSRNHNGSPQNEWCNAKSAGIGAPPTDN CLSSAMKHFVTDTSRNGRGPWPQDWCNPPGRGLGARPTDD LLNGWDAHFITDQSRSGKQPTWGDWCNAMGTGFGLRPSSN ALGVPDAHYVIDISRNGAGPQQQYCNAPGARLGKKPQLF
$A F G Q R G L K F I I D Q G R D G A R K E W G E W C N V Y P S G F G Q P F T T N$ VMGYNGMNCIIDTSRNFHGSSSSEWCNLKSAGDGKPPTRD ALRERGDNFIIDQGRDGARKEWGEWCNVSPAGFGQPFTTN HLAGYPAHFIVDQGRSGVQPAWSHWCNINGTGFGPRPTTE ALAAAGMNAIVDTGRDGVTGEWGDWCNVNGAGFGMRPTTS ALVNRGKRAVIDTSRNGRGGWAEVWCNPPGRGLGRRPTDE AVGSDDLUCI FDTSRNYHGPESNEWCNVKSAGUGPDPTSD ALVDNGFQFIVEQARSGVQNAWGDWCNVKGAGFGLRPSTD ATN
ATGGS


UniRef90_H1UZ51
UniRef90 ${ }^{-}$A0A022LIZ4
UniRef90-H3GIR1
UniRef90 UPI000366C9B8
UniRef90 T2B3P4
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UniRef90-G2QFW6
UniRef90_B0FEV9
UniRef90 G4ZYR
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UniRef90-V2XP74
UniRef90-P78721
UniRef90 F8B3Q
UniRef90 L2FVL3
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UniRef90-F2R3X
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UniRef90 G9NFV6
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UniRef90-C7YVK6
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UniRef90_G8RX49
UniRef90 A9FHT?
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UniRef90 R8BLTC
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UniRef90-M4C2Ss
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UniRef90-UPI000375A098
UniRef90-S8A9C3
UniRef90-UPI000463F0C7
UniRef90 Q2GTW3
UniRef90
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UniRef90 V2YR75
UniRef90-F6IJT5
UniRef90-G4ZXNC
UniRef90 C4B812
UniRef90 ${ }^{-}$T0QBN6
UniRef90 A0A022LRJs
$P L A V F P D S Q T E L W L R Q H P S D R R T P A L R G A L G G R P T A L$ $V$ FTDTEAA REAANAPE DSPEQAAAA YLAAAQPTA F NPFFVNPEWSNKDKSF LIKKGDVVKNFRTDQAQKVSTEV P PVNYAAAKEA YPDSATADDHLESMGDAT
$P N P D A L R Q A V D L V R A G R D A A G I A A M V A T P Q A V$
F Y $\square$ N P Y Y E E VV N A I S Q M S D S S L I A K A E K M K TY Y N A I
LHANSFYRKEVEDAAATMSGTLKEKALKVADVGSFV

D GTRFYTRPDP GAVK QI A NAA GQRGLARKKI STMIETP QA V
NSFYR
$P N P G A T E Q U A Q L L R D R A D A K A L K M M V A T P Q A V V$

Y V VN S Y GK K L E Q T $\square$ AA K N D T $\square$ N A A RTRTVA Q I S T F T A P Y S Y T A AVVQA NA QFAP A I D E L K K Y A VA T DNPYFADPASRTAQAAAQAKADGEAERVVLSRLASTPQRG GFYADLES NAAKWVAANPDPDRARKVVAHGLVRRPAACR SPEADAATWLAAQPTTY
S GNPFYANKFYSSEVVSAAAAMTDSALAASATKI
DNELY $\square$ N D A Y VQ K $\square E S T G P D M T P E L Q A K A K E V E K D P T A V$ ASAASSYPRLKPALSTVLAQPLAT Y A A K S T $Y T D A V K T N P Q F A P A B N T M K Q Y P V A N$
NPVSSYSAAVNEY

PELK N A I EKVS QHQUVT
 $S D P$ DRELLGAI ARTPQAT LS Y DL Q QRA Q KV K DVV TA V

 P F Y $L$ L $F$ T E T K A Y E M T K Q S DLLFVDFHSSTVEAAAGLTGQAQADALL LGGSFP GSS D NP F Y V N P D Y A K EVV S IAA RVS DPALKGKMQTVKSYPTAV

D T NPFFANSGYAAK KGAFLAAKNDTLNAARVKTVQKTGTFV

$V$ K P Y S
Y S L A K V Q F P H L K N A I E


DNPFYLNQDYSLVDTSIALTTTDASLAAKMETVKSYPPTAYV NRRGDFLNAARTRTVKD\|PTFA
 DANPFFVNQNYTAKEAFLAAGDDVNAGKVQYVQESVGTFV NPFFANPKWATKLESFTQKGDRANAAVVRKVQKTGSFVV SPYYADEVAAAV
 DTRFYVDPASKAAQQALTKAHDLDGALAMARLLASWPVAQ D NP Y YVNP $V$ WS A A EP G GEAVA DQPTGVVWLDRISADEGND

PPATYTGAKNEYSDDAFALNQLEEF GDAT D NPFYANPDYAKDVSSDAKVK DA DLKAKMRVVVSYPTAV PTNTAAYWAYQKETDPDKKRAYYNI GYT PSVAA
FT T S P N S Q T R Q W L K T H P N D P R T P K LT AVL GN HP D S E
 PE $\square$ A GA $\square \mathrm{E}$ T L S K HP $\square$ A H
 AKATYPALADALTLVEEQPIAV PGVAPVNFAKAKS DYPDLDRYALEAVVESKPVAT

S S NP F L P N PE WT A K R D A F LDA R G DVVENAEKVRADGQVGTFV D NPFFVNPYWAQEVQSAANQTNATMAAKMRVVSTYSTAV Y S VA K T Q Y P H L A S A $\square$ E A V E A Q P $\square A$
 D NPFY V N P VWS A SEP G G G A VA D E S T A V WM D R I G A DV G N D D NP Y Y V N P E WRA S E P G G S RV A N T S T A V W W D R I A A I E G A


 D NPYYVNPDWSAAEPGGEAVADEPTGVWMDQISAIE GNN
 D NPYYVNPEWKAAEPGGSRVSNNPTAVWLDR\AA $\square$ NGTP
 DNPYYVNPEWSALAAASGDRVAD QPTAVWLDRIAT DE
SAAPQYADPSSPAARAAREAQAQGRAAALLNRVAAQGSAR
 DNP YYVNPEWSAAEPGGSAVADQPTGVWMDRIAA $\square E$

A LLKEHPELTEA $\square E T L S K H P \square A H$


UniRef90 W3A6S2 UniRef90_LTKGJ2
UniRef90_WOZ8C2 UniRef90 ${ }^{-}$B2AC20 UniRef90_H3GIR7 UniRef90-UPIOOO37DDADE UniRef90-H2BPT3 UniRef90_V9G331 UniRef90_Q0RFZ3 UniRef90-UPI00037163EC UniRef90-F4H413 UniRef90-W3XNU1 UniRef90-Q1K5V3 UniRef90-E5R555 UniRef90-TOR5A9
UniRef90-A1SMG6 UniRef90-V6K508 UniRef90-TOR.JP9 UniRef90-UPIOOO34A1124 UniRef90_QOTVMO UniRef90-DOET40 UniRef90-TORFL1 UniRef90-W4FX54
UniRef90 ${ }^{-}$V9EQJ5 UniRef90-V9EQJ5
UniRef90 - ToQZF9 UniRef90-A0A024TL11 UniRef90-D1BUN4 UniRef90-A0A010QRK4 UniRef90-F8A4H4 UniRef90-TOPX59 UniRef90-BOFEV4 UniRef90-F3NPZ1 UniRef90_12NBQ3 UniRef90-C7M724 UniRef90-UP100045EB5FC UniRef90-UPI00036682C8 UniRef90-E3EEC5 UniRet90-M7SK46 UniRef90_S3EA57 UniRef90-G5A765 UniReffol-19K9R1 UniRef90-TOQF55
UniRet90_O9PDW2 UniRef90-J3PHZ7 UniRef90_WOFKU8 UniRef90-UPIO0035EE16F UniRef90 A8P8P9 UniRef90-ROJ5H9 UniRef90-G2XC33 UniRef90-Q96TP4 UniRef90-TOPTQ0 UniRef90-E4N4Q4 UniRef90- J7LBAO
UniRef90 K3WJB4 UniRef90-UP100031A2AD3 UniRef90-s3WUR6 UniRef90-H5TKJ7 UniRef90-UPIO0035DBD32 UniRef90-FoWFR8 UniRef90-S6EXB5 UniRef90-UPIO003B47F88 UniRef90-A0A024TMU8 UniRef90-W4G1D1 UniRef90-M2USP9 UniRef90-S8AD60 UniRef90-K1WY16 UniRef90 X X DGJ 6 UniRef90-MALB17 UniRef90-A0A024UMW9 UniRef90_Q7Z7X6 UniRef90-UPIO004765227 UniRef90-D6Y5G2 UniRef90-G4T5S8 UniRef90-FoICV UniRef90-UPIO003B70ECE UniRef90_W2EPP2 UniRef90-UPIOOO34ADF3C UniRef90-F4F7W9 UniRef90-FoW755 UniRef90-10LAX2 UniRef90-A1SQM7
UniRef90- Q8VLR1 UniRef90-F4H667 UniRef90-UP100037BF78E UniRef90-UP100035C1EC7
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UniRef90 A0A024GAE2 UniRef90_D1BZM7

60

WLAGSSGDLGNLRTYVAAARRTSSTPVIVLYNIPGRND WLVPRDPGEVGARVTSLAQEASDQGATSTIVVYGLPGRDC WVSRLSELSRIDEAIATARRVQKTKQIVGLVLYNLPDRDC WYSDRDNGNATQTAVDLVDSCPETSRLSVLVVYGLPNKDC WFGDQSPAQVERLARDVVEDASRADATPVLALYNIPGRDC WLDNNMQSWLEPNLQGALSQQNSGGTMTVEVVYDLPGRDC
WYSDRNNGDYAQTAANLVSSCPDSRISI WLDTDANDAKLEPADADVP CDBHILGAVIYDLPGRDC WFGDPDPATVRTRVADRVRVVRAAGALPVLVAYADPRDC
 a WLDTIAN WVSSRSGLSEI DEAIQAARAEQGQKQIVGLVMYNI WITTRAGLVEUDTAIKQARAQRKGFKKMMLVLYNL IDALLAACP NDTPVIIVYGLPGKDC WLTPEEPGSVAPLVARVVRAADAAGQVPTFVVYGIPDRDC WFGNWNK DIKADVDAYVAAAAAVGRLP LAAYNVHNRDG WYTDRGGDSISELLSK CAGATPVIVVYGLPGKDC WLTPEPVGEVWDRVAHLASEARAQDATMSI AVYGLPDRDC
WLA WEGPDEVAPDLVE WYTDRTEKVATQTMDVCAAGNGGDKTVVFLYMIPTRDC WWTDNN STYRAQVETLMGHCNAS TVPTIVVYGLPGKDC WYTDRVSDVSSLAKSVVLPKCVENASTPTVIVYGLPQKDC WYVDCGSDSDNELM AACPNDTPVIIIYGLPQKDC WWTDNNP DYDKEMQKLLNNCNASTVPTIVVYGLPNKDC WFTGETPKKVRNAVRDVVRSADRARAVPTLVAYNLPFRDC WLDTREKISSLMNSTLAQIRKLDQEGANPTYVIYNFPDRDC WI GDWTSADARTRVEEDTTAARDEGATAVLVVYAMPGRDC WVNDNGHNPVPDVL AKCDNGAVPIFIIYGLPNKDC WLADGATGEVAQHLKA

AGSKTVVFIMYMIPTRDC NGGMGLRDHLDAALEQKGSGEEVVQLVVYDLPGRDC WF GNWSGATVQAAVDSYVTAAAGAGRIPTLVAYNVPGRDC WFEGVEAFDDT TLKRLIEGAKAQQKTPIITLYGIPYRDC WLTQGTPTEVQAEAHELVTAAADQGQVPTLVAYNVPFRDC WLDRIDA IELEQHLDAALAQKKGNTPIFVTYDLPGRDC WLDRGGKLGLEAHLDQVL AQKKGNTPIFIVYDLPGRDC WLDTIENGKFNDAVADLPCEN WVTTVSGLDADDKTIAEARAEQSQEQLVQLVLYDL WYTDRVPALAKAVVLPVCSDTNEATAPPTVVVYGLPQKDC WV WYTDRDPDS KDGEVASRAAAASAAGSTAVFMVY WLDTDAVNDTGHLDAALAQKKGTPITATFVIYD NKDC WLDARDKIPL LNETLAAIREANRAGASPPFVVYNFPDRDC WLTPEQDGEVYDRVAHLATEARAQKASLAVVVYGDPGRDC WI DRMAAGSVEEHLDAALA QKKAGTPDASFVIYNLPGRDC WI SSADISTVKPLIRDALATQRRTRKLVQLVVYNLPDRDC WI SNTASGD DGAI ESARAVQQETGKIVGLVLYNLPDRDC WVTSRSGSEIDDAIRSARNEQRRTGQKQVLVLYNLPDRDC WFDVVAKVPTLGTYLADIQQSTGRNQLVQIVVYDLPDRDC WYADSGGSDAIGALLEACPT WFGTATPQETTDAMAALQAKAAKAHQVPVTVAYNVP SPTTGD MGLRDHLDEAVAQAAGEPLVFQLVVYNLPGRDC WYSDRVNGDARQTITDLVNTCDESTRLSVVVYGLPNKDC WLDS DA DSDQGHLNAALAQKKANTPITVFVIYDMPGRDC WYDGVS SDADARLKKLLDRAKAANQVAQIALYGDPHRDC WDTGGSRG DPNLDDMMNASRATNTMPVVVLYNIPGRDD WYTDRDPFAKKNLDAYLEDCQEANDSVIVVVYGLPGSKDC
WLT S GTPEQVQAEAHKLVGDAAAKGA TPVLVAYNDPFRN WWSDNNPTHRIETDALFDRCNAS TVPTIVVYALPNKDC WYTDRSQ Y LAEAIATLAAACAPRNGRLPTFVVYGLPNKDC


 WMDRNGGPGLTTY YLDAALS QQQGTPEVIEIVIVDLPGRDC WYTDRS D AK TQQVQNVVSKCPAGDR PTVVVYGLPNKDC WLDNMENMNNWLERN LKTALAEQQSGLTVFVVYDLPGRDC $S P$ T T G D M G L R D H L D A A L E Q S S G D R P MVVV Y N L P GRDC $W$ VS DT GKMGL RE HL N EAV E Q DEANGSKPLVVI YNLPNRDC


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

 WYTDRRDPNSAF VVVEK LLLKKCPPTSSRI VLVVVYGMPQK DC NSSSNGAFGVREHLDEALR QGAGYI Q FVI YNLPGRDC WIIPEATSEVRRSVVRAYTRRALAARKTPMLTVYGIPGRDC GVVDGK M G L R E H L D E A LQQQK GS GE LVVVQLVI Y DLIPGRDC WLGPQDAATVGASVRTYTRAAAAAGRTPVLVTYAIPDRDC SPTTGDYG LRDHLDEALAQAAGDP LVIQVVIYNLPGRDC
 WY T D R DP S AKENLLDAYLNTNEDCQETPVVVVYGLIPSKDC WM D R I $\operatorname{SA} A \square T$ G N A D Y H L D D


## UniRef90 W3A6S2 UniRef90-LTKGJ2 UniRef90 WoZ8C2 UniRef90-B2AC20 UniRef90-H3GIR7

 Unineffol-H2BPT3 UniRef90_V9G331 UniRef90-R8BPK7 UniRef90-UP100037163EC UniRef90-F4H413 UniRef90 W3XNU1 UniRef90-Q1K5V3 UniRef90-E5R555 UniRef90-TOR5A9UniRef90-A1SMG6 UniRef90-V6K508 UniRef90-TOR.JP9 UniRef90-UPIOOO34A1124 UniRef90-QOTVMO UniRef90-DOET40 UniRef90-TORFL1 UniRef90-W4FX54
UniRef90 ${ }^{-}$V9EQJ5 UniRef90-V9EQJ5
UniRef90 - ToQZF9 UniRef90-A0A024TL11 UniRef90-D1BUN4 UniRef90-A0A010QRK4 UniRef90-F8A4H4 UniRef90-TOP X59 UniRef90-BOFEV4 UniRef90-F3NPZ1 UniRef90_I2NBQ3
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140
150
160
 $N L A$ A G A V D




 Q Q S A A GYR D GVAAYALK QL N LDPNVI MYI DAGHGGWLLGWQ $P$ A A ATARYAMLGYAVVQLAAVGGAEVVDAGNASWHSVA A T A A S D R F A ML N Y A V D K L A A L P H T S V V Y L D G T H S A WL G S G T TAAADRFAQLSGAVDRLSA LPNVSLYLDGTHSGWLGAG Q A S A S G Y R E GV A Y A L A Q L N
 CAVQN GYA GNL A VA GKN LIAANSNAQLYADVABAGWSTAA

 SLQDRAGY LRTAVEE NIRGVDTWIVLDGGHSAWHP
 $K N V H$ QLHKDALSYAVNVF GNMSNVSAYLDAAHGKWLK WD CAWTHGY LANME DAMSLLTAANPNALMYVDVGWWTFKNAT CGHAA GYLANMQRATSSITARNPNARRYVVDVGYWMLQTVA CGNDKGYAANLGVAMDILSQ NTNAELYLDVGYWTLLANAA GDKCAEYQANLAAAAVSILSSA NSNAQQYADIAGWAFQGPA C GKTA GY LD N MM TVI P MLTA DNVN A S L Y DDVGGYWAFKTEE ATAADERTAMLNHAVDVLAAALPNTDVYLDAGHS GWLNVG TGAADAYKEGTDYAFKTLN LDNVAIVVDAGHAGWLGWE GQGDRAALLAYAAR SLDDAGARVYLDAGHSGWHDAA C A V N L A Y E A N L K T A V E VLSS Q NTANA H I Y V DV A A G WAT E S Q NVRNLHKNALSYGVNVFGS MSNVSVYLDAAHGAWLGTD MKANGNYVK GVGYALAQLGA DPNVYNYVDAGHH GWLGWD $\begin{array}{ll}E \\ D & \text { AR T A R F D }\end{array}$ A T A A A ERFAMLNHAVDVLTA LPNTAVVYDGTHTGWLSVG ND A R C A YVE GVVQ ALLNKLHA I P N TYNYLDDGHS GWL G WD

 CGNDKGYAENLGVAMDVLSQ NPNAEIVLDVGYWALSDED
 STPSCAYEEGDKYALNKLSE DPNVYNYMDDGHSGWLGWD



 A N A A E P Q R D AI A Y A I A A L Q A D N I H L Y D D A S H G G WL G WD KEAVPTYREGIAFAIVSLLDQLNVALVIDAAHGGWLGWA A GAQAAYTEGVTYALQKLNTVG VYSYVDAGHAGWLGWP
 SPANGNY VNGVGYALSRDGA IDNVYNYVDAGHHGWIGWA
 STPAC GYE EG I KYALD KLHA DPNVYNYMDIGGHS GWLGWD AE $\square$ RKERAPLLTY VGQKFQANNPNAALYDHAG SGQLNQE ATNRAERDDLLRYAIDRLS RNPAAHVYLEAGTS GSVTPD
 S GAASTYRELTVVYALKGL DLPHVAMYMDAGHAGWLGWP
 CGQDAGYLDNMQRASAVLTTNNANAMLYVDVGYWMLQTDD SACDNNYLPNMAMAVKL LTQNNPAARLVVDVGWWTFKEDA A NATPDYEQ GDAYALAKLQF PNVGSLMDAAHGGWLGWA

 A EAA A L Y E E GIVVHA I S K L Q F D N N V H L Y L D A A H G G WL GA E
 AKSEKYYMDGHAYLIMKKLGQF PHVAMYLDIGHAFX LGWD $M L A N G N Y V E G V A Y A L D T L G E \quad D P N V V N Y V D A G H H G W L G W D$ REA Q Q A YV Q GVVYAIVKLRA I PNVV IVYVDAAHHGWLGWD A A A A D GQKRSLAYAIANL QLPNVAIVVDGAHAGWLGWA S NERKERAELLLNYVGLLTLKQKNPNVATYI HAGSA GLDPTNA S NA A S DRFS ML N H AVVDAL A A LPS A A V Y L D GTH S G WL G VG S C GA A E R Y R E L G Y A V D R L K R R P P H T A V Y L D G G DE G WP S L V SPANGNYVNGVGYALGQLGA I DNVYNYVDAGHHGWMGWD
 SKANGAYVNGVGYALAKLGAIGNVYNYIDAGHHGWLGWD PTKPD GWQGML RFASRRRLSG SGAWVYLDAGHSNWTPYD
 $M L A N G N Y V E G V G Y A L S T L G A \square G N V Y N Y V D A G H H G W I G W D$
 $M K A N G G Y$ V D G V G Y A L A Q L G A DP NV Y NY I D A GH H GWI G WE GVTK GK Y E K NL RMAI KMLLSCRDSSSEDYI DDGYWCDGSAA
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UniRef90_V9G331
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TVTAVIVLVTAGSKVKGISLNTSNYOSTSKLSTLCSNF ELAKAYKAAGNPSQVRGUATNVAGWQWNQNEKKYVT LFGAA DTAARLRQAGVARARGFALNVSNFDETADETAYGDAVVA DAADRLVKAGVAKTADGFFLNVSNYQLTERQVKYASWVSQ A LASAYTSAGSPSQVRGFSTNVAGWNWDAEEEKYVTLFGA EITATILSMASPAKVRGFSTNVSNYNPSYDESHYASSLAP KVVAMAKATNPAAKIRGYATNVSNYNPSWDESHYATSLAP NAVQALKNLGK LLSGDADNTSNYKSTNEMVQACQSYSS QLARLLEQAGDADQARGFATNVSNYQTDADERAYGEQLSA AAQDVLSDLKSAGRLNGTAINTSNYKDTDTLKSDCASYSG QMADLLRSTGLLGDVRGVALNVSNYQDTANEFAYAHQLSD ELDATVYKDAGSPKQVRGVSTNVAGWNAYDNEKLFVSMFSP TMATMLDKLAKAGRMRGTADNTSNYRGNAELLEYCMNFAA AAMQVVGAASRPGAVRGUVLNTSNYRVAEMATDCSNFVN AVAKIVNAVDPDSRCKGISLNTSNYRSNAEMVATCERFVK MSAEVVQAASKGGTVRGLALGTSNYRKTSEMSDLCAKFVK DNTDRLDKAGVQKADGFYLNASNYQWTADPTALDDRYAQ ANSELYKKAGSPKAVRGLVTNVSNYNWNWDESKFHAALTP ETARRVRLGGTEGLAGGALNTSNYQTNADMRAYGEAMAA KVASVVKEIAPNGKIRGLSTNDSNYQS\|SSEYQYHQKLAS DNAELFKTAATSDDVHGFITNTANYDWNVDELSYAQAFRE EAAQAV PDGG1.RYMRGFVTNVADHRGTPRAEKWSEEFVAQ DVTDRLIKAGVTR ADGFFLNASNYQETEKLQKYGTWVSQ NFTNVVRNTAGLSSDDGFITNTANYEWNPDESDFTAALYS NFTTIFKDTSKGASVDGFITNTANWNPNFDESDFAESFVN
 AVAKIVNAVDPNCKCKGTSHNTSNYRSNAEMAATCERFVK VMARRLAEAGVA HARGFAVNVANYYRTEDEVARAELLSR TLYTKVIDQTTAGFANGFATNTANYEWNFDEMDYSETLYA SNLAPYRRAGSPKAVRGLVTNVSNFNANWDESKFHAALAP QMADLDKSVGVLDKVRGFATNVSNFNTTQNEFSYAHAVAA NNVSLYTNVAGLNSSVDGFITNTANYEWNPDETDFTAALY DFAEVLEGANPKSKVRGLA KVVDMAKKDNPASKIRGYSTNVSNYNPSWDESHYATSLGE QFATVVAKAGPNAKIRGYSTNVSNYNPSFDESHYALSLVP EFATVVSLANANNTIRGFSTNVSNYNPSYDESHYASSLSP AFANLYTNAGSPSFFRGLATNVANYNANYDEDHYDNALAP KAVAILKSLGK VTGLATNTSGYHATTEMNQUCESYSK $T Q A Q L L V D A G V A D A Q G F F L N V S N Y Q T D A A L A R Y G T L V S Q$ ASAALFHEAATPDDVHGFISNTANYDWNVDELSFAQALRV KVAQUVNELSRAGRLKGITLNTSNYRSTQEEATLCTDFQQ SLYTRVVQGTDAGFADGFITNTANYTPDFDESTYAEALYN RMADLLRKASPSSG1 GFAVNVSSFAPTVPITAYAQRVRT NFYEAATTAGTPSDVHGFITNTANYDWNQDELISFAQGFRD KVAKLVHSMDKHRKCKGIALNTSNYRSNEEMNALCERFCR AFAKIYEDAGKPRAVRGLATNVANYNPNYDEKHYDEAFRP ETAARLLMADAGKARGFFLNVSNYESDTRLKRYARWVSD KI ASALQVVSATHSVRGIVLNTANYRPVSEITSLCARLTQ RVVALMKILAKAGAVRGIVLNTSNYRSNDELLQWCKVFID DVVEAAKKINPAAKIRGYSTNVSNYNPSWDESHYATSLGA LIFAEVKKWAGRTNKFRGFDSNVANYNSNWNEWRFFRALTP
 VMAARLNEVGVSK ARGFSLNTANFFTTDEEIGYGDA!SG TFARVVSRSGNNTRMRGFATNVSNYNPSWDEDHYDKFLAV NNAKVLNASDGVNGIDGFVTNTANYQWNPDEADYASRFVA K ${ }^{2} A A V L A K L D P T G R L K G D S U N T S N F R S T D E L V R L C S T F S A$ KVYSKVIKSGSPGKVRGFASNVANYTPCPDEKRYIQAMFK SNLGPAVHGASPDDVHGFVTNTANYDWNRDELTFAQARRS EIVAAAKKLNPKAGIRGVATNVSNYQTGYDEQVYAKALRN AANALIE GGVEHMRGFAFNVSGVGGTKEEQEGAEKLVA D TDRLVKAGVERADGFFLNASNYIETGRLAKYGSWVAD EIAGRLVKAGV KRADGFYLNTADYQETDGLLRYGESLSR DNAALFHEAASPDDVHGFIANTANYDWNQDELSFAQALRV
 KVADFLKRVCGPRNVAGDVDNTSNYRTDPELEEDCTNFQD SRPRFLRNSGD GYARGFSTNVSNFRPTVDEKQYAAFLLR TVQEFYKVATSNDDVAGFAVNTANYSPTVDEQSYAQALRA ASAEVFHEAATPDDVHGFIANTANYDWNADELSFAQALRT DLTGRLLRAGVPERADGWFVNSSNYGSDADEVAYAQTGRT DNFGPSADLATPADVHGFIANTSNYDWNVDELSFAERLVQ KVAKLVNYI DKHNKCKGLALNTSNYRSNAEMDVSCERFCR TNAGPAAQLAGFASDDGFITDTANYEWNPDEAGFTAHMHD
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 AVGSTDIHCIIDSSRNFQNASSSEWCNVRKAGIGAPPTND CIGWPRAHFVTDSSRNGQGPWPQDWCNPPNRGLGARPTLR SAGDQSVYFFSDTSRNGKRKHPGEWCNQTGCGIGARPQAS ELQSAGMHAIVDTGRNGVQGEWGNWCNVNGAGFGIRPSAE ALGG TAHYVVDTSRNGRGPAADNWCNPPGRGLGVAPSGR CI YYGTAHFVVDTSRNGQGPWPQTWCNPPDRGLGLRPTTR CL G G WRLGHVIDTSRNGQGPWTQEWCNPPDRGLGPRPTTS ALSTAGMHAIVDTGRNGVRDAWGDWCNVNGAGFGVRPTAS YLQQHGLHFI I DQGRPGARKDWGDWCNVNPAGFGHIPTTD HLEAEGLNFII DQGRPGARAEWGEWCNVEPSGFGLLPGTR QTG GLHCI I DTSRNFNGSPQNEWCNARSGGDGAPPTDN DLDGAHYIVDTGRNGNGST, DDWCNPTGRAYGPAPAPE ATGGGLHCVFDTSRNFNGSPQSEWCNAKSGGIGAPPGTP LLG GTHAVVDTSRNGAGPAGSQWCNPADRGVGAPSGAY ELKK S A GMQAVI DTARNGVRKE WGDWCNVKGA GFGVRPTGN
 A RPGYTCI FDTSRNYHGPPTGEWCNANMAGIGVPPTSS LT GNPQWRCVVDTSRNYRTPTSNEWCNNKF GAI GVPPTRN
 A SKK K D Y K C V I D T S R N Y LG GPKT GE WCNSQYA A I GVPP T S K ALGGGPTARFVVDTSRNGQGPWAEDWCNPPGRGLGLDRPTLQQ FLAGYPANYLVDQGRSGKQPTWGDWCNDKETGFGTRPNVK
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 CIQAAMAHFVI DTSRNGQGPWPEEWCNPLDRGLGLLRPTTD AGFPS GlGMLI DTGRNGWGGPRGNWCNNSGAGLGTPPTAA A GWPS SLGMLI DTGRNGWGGPRGNWCNSSGAGMGTPPQTA ALEAA GHHAIVDTGRNGLREEWGNWCNVDGAGFGVRPTGD $H L I E N G L H F I I D D Q R S G L Q N T W G E W C N A V A G F G I R P P T T E$ A SGRREYKCIVDTSRNFVSPSSTEWCNANWAGIGELPTTN $Y \square G$ GAHYVVVDSRNGRGPAA GGWCNPPGRGLGEKPTTS
 A GWPS S IGFII DTGRNGWGGPRGNWCNQKDAGIGLPPDAT HLAEEGFRFIVDDQGRSGRQPTWAEWCNDKGAGFGARPSAD ALG TGHAIVDTSRNGAGPTSNQWCNPAGRLVGDKGGTY
 $H$ LA GYPANFIVDQGRAGKGGEWGQWCNDRGAGFGDRPTAD YMAAE GMNFII DQGRPGARKEWGDWCNVSPAGFGLPR GAS $H L E A E G L R F I I D Q G R Q G A R A E W G E W C N V E A G F G Q P A T T Q$ Y L S GLPAHFII DQGRPGAREEWGEWCNVEPAGFGHAPTAD
 CVWAK LPHFVI DSSRNGQGPWPQTWCNPPARGLGTRPTAA


 $R L G V Q N P R Y V V D V S R N G N P V W D N N W C N P P G R K I G P Y P T P R$ RLLFDS D 1 GMLI DTSRNGWGGSEGNWCNQAGA GLGERRPTAG A SKRK YS CIVVDTSRNY LLEARGFQFIVDQGRSGKQPTWGHWCNADGTGFGMRPTAN CMA QA QKHAVLDDTSRNGQGGWAEVWCNPPER GRGRRPTAA VAGNPD WRCVI DTSRNYQTPTTTEWCNNKFGAI GDPPTRN ATPGMNFKCV FDTSRNYHGSPTGEWCNANTAGIGLPPTDQ A MA A E GMNFI ID Q GRP GARKEWGEWCNVSPS GFGLRPGAA YFTNF GLLKFIVMDQSRS GQRSSANSWCNVK GAGLGGIRPTTAD
 MTN GAHYVI DTSRNGAGPTSDAWCNPSGRALGTPPTTA Y LEK K G L R FIV VD Q GRP GARAE WSDWCNVVPS GF GMLD GTS A GFPSSUGMLI DTSRNGWGGPRGLWCNQNGAGLGQPPQTD KTTGGLAATCVLDDSRNFQGPDPNQWCNPKGRGIGRPPADH A A G IV SVYFI DD S S R NGVRFHPGEWCNQTGSGIGARPEAN AGFSADTGMLIDTTSRNGWGGPEGNWCNQSGAGLGQRPTAA ALIAK GFGMLI DTSRNGWGGPAGNWCNQAGAGLGERPRAN LLAAKGAHFIVDDGRSGNQNSGGDWCNNKYAGFGPLPTTN QL G $\square$ K N K H Y VI D T GRSGNPKAPYNSCNNFAAALGPRSTKN CLA AS QA HFVI DTSRNGRGPWAEAWCNPPDRGAGARPTTT CLGAP LTHFVVDTSRNGKGGWPQ $\square$ WWCNPPGRGVGPRPTTD ELFDS G $\square G M L I$ D T S R NGWGGPSGNWCNQS GAGLGERPTAA
 KLFNSN IGMLI DTSRNGWGGHAGNWCNQAGAGLGERPRAN $K L G \square R G K H Y V I D T S R N G A T P S G Y D V I N P T W A R I G R P P R L V$ A GFNS D $\square G V I$ I DTSRNGWGGHVGNWCNQSGAGLGERPTAAA LGGTSF
 A GFDPGUGMLI DTSRNGWGGPNGNWCNQAGAGLGERPTTA A SRRNYSCIVDTSRNYLGPPSGEWCNVKHAGIGFPPTSS LLVSA GFGMLVVDTSRNGWGGPRGAWCNPS GAGGIGERPQAA

## UniRef90 W3A6S2

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260
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280
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TGDPLADAFLWVKTPGQSDGQCDAAGAWFPQQAVELVSLA TGDPYVDAYLWVK $\square P G E S D G Q C P A A G A W F P Q M A L E L V H N A$ TGDELADAFVWGKPGGESDGTSDTAGTWNQAYFEMLLENA QSNSNVDATVWIKPGGESDGQCGDAGAWFGGYAEMLTGNA
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PDYPLLDAYFWLKPP

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TGNPVSYY WAKPRGE
LVDFLK KGESDGQCVGAGLFFPDGFQR L

TGGDTLDAFVWVKPGGEADGTSDSAGTWFQEYFVQLLENA
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TNHELV DYYLWLKKVPGESDGQCTGAGQFFTQVFTSLWNN
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P E S GI DAYVWMK P P GESDGASEA
GDGTAAAYYLWLKNPGDSDGRCEAAGHFSPELALRLI
TS APHADAY L WI KHP G L S D GTCANAGSWYPAVVAKSVVQKA TGDPLIDAYLWIKVPGESDGQCPPAGGWFVEQAAELI AFA PA A HLDAYVWVKPPGESDGSSTGAGAWFHDQFVMLINNA PA G HI DAYVWAKPPGDSDGSEDPS GAWFHDQRVMMLVQNA
TGSELADAFVWGKPGGESDGTSDEAGQWNQAYFEMLLKNA
TNSTLVDSDVWAKPGGESDGACGPAGLWWDEYVQMLVKNA


$P G G H V D A F Q W I K P P G Y S D G S S T G A G D W F H A Q F V K L I N N A$
$T G V E T L D A F V W V K P G G E A D G T S D T A G A W F Q E Y F V M L L D Q A$ GDDVV DTNLWIKPPGESDGTCNGAGVWWPAGAVALTQ
PGPAHLDAYVWVKPPGESDGSSTGAGHWFHDQFVMLVQNA
Q NNTNVDAIVWVKPGGESDGTSDEAGEWFNDFVVNLVKNA
TNNTNI DSIVVWIKPGGESDGACGLAGAWFDEYVQMLVKNA
TENPHVDSIVWIKPGGESDGACGNAGAWFDEYAQLLTRNA
QQNENVDAIVWVKPGGESDGECGKAGAWFGGYVEMLVKNA TGSSLI DAIVWVKPGGESDGTSDT
T G N P L V D Y Y L W
P
T GY D N L L Y F V W W I K P P G D
$P G G H D H A Y V V G K G P G E S D G S C D P A G S W F H N Q F V Q Q V T N A$ TTGAHADAYVWAKPVGESDGVCHPAGKFFPDVALKVVEN PSAPGLDANLWVRAPGTS DGPCGTGGDLLPSVAYAM1 P E P GI D A YV WMK P P GES D G A S E
T GYEYI DYFVWWVKPPGESDGEGTTAGQFFYEHFVILL
TGHQYV DAFVWWVKPGGECDGTSDTAGQWFQAYFVQLLQNA




 VSNSLVVDS VVWI RAS GPSDGE C GMA GEWFA GYVEQMVKNA
FPNAHLDAYVWLKPPGESDGTSAAAGQWFPAQFDQLVANA
PAYPLI DYFLWW KPPGES

PAP GI DAYVWVKPPGESDGA
TGEA IVDALVWVKPGGEADGTSDPAGTWFQAYFEQLLRNA

 P ETGIDAYVWMKPPGESDGSSEEAGHWFSEQFQELLANA $P A \quad T G I D A Y V W W A K P P G E S D G S S S$
$V P D S S L S Y L A Y L K V P G E S D G F C N A A G E F S M D L F T N L W N N$
PA PGIDAYVWVKPPGESDGSS
FDGA FDGTLWVKHPGESDGTKNGGGQWCDFLADRLL
PA S GID A YTWWIKPPGES D GNSAP


T G Y K C I D Y F L WVK P P G E
PGYPH H A FVWVKPP GE WG


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UniRef90 $\times 8 J F B 7$ UniRef90-UPIOOO301307C UniRef90_V6JZ83 UniRef90-V41BM4 UniRef90-A0A041AJR1 UniRef90_UPIOO03798143 UniRef90-UPIO004195658 UniRef90-M5C1J2 UniRef90_W9bSU8 UniRef90-UPIOOO3743698 UniRef90-R7Q6G5 UniRef90-C6W193 UniRef90-A0A024GTA4 UniRef90-D6TQZ3
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DNPYYVNP $\square W S A A E P G G D A V A D E P T G V W \square D R \square S A \square E G N D$ DNPYYISPDYAAVDSS $\square$ AKVTDANDKAKMQTVKTFPTSDV DNPYYVNPEWKAKVAGGNRVSNTPTAVWIDRIAADNGTP DNPYYVNPEWKAKAESGSRVSNNPTAVWIIDRIAAAI NGTP DNPYYVNPEWSAAEPGGDRIADQPTGVWLDR AA EGA DNPYYVNPEWSAAEPGGSRVSNQPTGVWLDRIAA DNGA DNPYYVNPEWSAKAAAEPGGS
 GNPFYLNPDYTKVNFSTSKVSDPALKQKMKVVAGYPTFV DNPFYLNPDYSK DTSUTKVSDVSLKEKMETIKNYPTGV DNPYYVNPEWSANAAAEPGGS DNPYYVNPEWSAAEPGGSRVANQPTAVWLDRIAADN ENTFYVNPGQT DAGAYARKGSQPQAAGMLATVADQPEAK $\square F V D T R S T T V E A A G R \square N G P A K D D A R G R T V A R F P S A S$ DNPYYVNPEWSAAEPGGSA DADQPTGVWLDRIAADEGA
 DNPYYVNPEWSAAEPGGGKVAGQPTGVWLERIASDN DNPYYVNPEWSAAEPGGTAVSHQPTGVWLDRIAAIEGA ENPYYVNPNWSAAEPGGSAVANTSTAVWMDRIAADA DNPFYVNPDYAKVDAS DAKVKGVPLKAKMGVVKNTPTAV DNPFYLNPDYGEKVNQQATQTAGSLGEKMAQVATYPTAV

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DNPYYVNPEWKAAESGGSRVSNNPTADWDDR DAA DAGTT DNPYYVNPTWAASVEGAARASDPALAAKMRAVKTQPTAV DNPFYLNLDYGENVNKQAAQTAGRLGEKMAQVATYPSAV ENPYYVNPDWSGEVSAAAAAKGGTLGAQMAKVANTSTAV AEGETEI AELVAKVARYPTPT DNPYYVNPDWSAAEPGGSADADEPSFVWMDRIAADG DNPYYVNPEWSAAEPGGTRISDRPTGVWLDRTAAI E

 DNPYYVNPEWKAAEPGGNRVSSNPTAVWLDRIAABAGTV
 NGNPFFVDEEWGLAQMA $\square K R R T N P G A A S Q \square R V I A E Q P E T K$ DNPYYVNPDWSAKAAAEPGGS DNPYYVNPEWSAAEPGGDQIADQPTGVWLDR

 D NPYYVNPNWAATVESAATRAESSLAAQDRTVAKQPTAV



D NPFYVNPEWSAAEPGGSR DANTSTSVWDDRDAA DE DNPYYVNPDWSGEVTAAAATTGGTGGGKMAKVATTSTAV DNPYYVNPDWSAKAAAGSK\SNQPTGVWMDRDAADNGTT ENPYYVNPDWAAAEPGGDAVAD【STGVWLDRIAA E A M Q T Y PTLQTALETVAKQP $\square A R$ D NPYYVNPEWSARAAAEPGGS DTNPFYESPHYEAEDARDNAAGKSELAAKAAKVAQVPSFI DATFYRNADYVLAVMKAAD DEGGELGKQMRQVAGHPTFL DNPYYVNPDWSAKAAAEPGGS G DNPYYVNPDWSAAEPGGSA $\quad$ A DEPSFVWMDRIAA

PFYVDPASAAM VAARNANPPNAE LTSVANTPQSY GSQLYVDPWSTTLEAAQSLSGQARDDAQL L GSDASAT DNP YYVNPDWSAAEPGGDADADEPTGVWLDRIVSAMIEGNG DNPYYVNP QWAAKARADGGAA VADQPTAV
 DNPYYVNPQWSAAEPGGSRDANQPTGVWMDRDSADDGNG

N P Y F L $\quad$ N P N Y VA E VK A S A T S V G G T L G A K EA A V A N Y P TA A S DAKLYA PEPAA DVQKAVDAS DAADGRKLQQMIDTP HA V NPFY VND FWSANVEAAADRAGGDLGSRMMADADEPTAMV $D A V L Y T D P D Y K V A Q S L G R V A A G S A D A T V V K A A A A D P T A V$

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$\qquad$
V
R A Q S A R|VAVVV|YG|PGRD ${ }^{80}$ DSQSNGPMGIRRDLDEALS QGADY I Q F F V I YNLPGRDC WL D R lla SLD R A SMGLRAHLDAALVQQQTSGQQVAIVVYDLPNRDC SPTTGS MGLRDHLEEAVRQ
 W LD R $\square$ A A $\square G L \operatorname{LEEHLD}$ QVL DSSSNGAMGVRDHLNAAL DSSSNGAMGV R D H L D A A L NGSMGLRDHLDEALTQK WAPS $\quad$ GGGLGALDVVAISAARAFGSGELVVQVVIYNLPGRDC Q N Q G Q 1 V G L V L Y NL P NRDC WLD R I G A M G L R R A H L D D E A L L R Q R K G S G G D L V V V Q L L V I WLTGNTDADV NHLRTAAQ DADRTNGTI QLVLYNLPGRND WI DTNG IGA G R P LI Q DALAQQARTGQIVQIVVYNLPDRDC
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 WVSNRAS LIPNIDRAIQAARDERGKDQIVGLVLYNLPDRDC WYT DRDPNSD QVLEK L L N K C S L S S Ri VVLVV Y GMPGKDC WLD S $\square$ G A $\square$ G L VA HL WY T S T S R GL R GHLDEAL RQAAGKPLVVQLVIVNLPGRDC



GS S SNGSMGVRAHLDAAV A Q GA GY DQ FVIYDLPGRDC WMDRDSADGLRFHLDNALTQKQSGTPLVVLVI YDLPGRDC WMDR』GA $ل$ T L R E HL D D T L A QLP GQP I TFLMVVYNLPNRDC WLDTTDSRGLRGHLDAALAQASGGTPVTIIVVYDLPNRDC WLANTAASKKVPKVLA QVEQMKKTGKKVLFII YNLPNRDC GTPGARGLRAHLDTAVSQGAD

GTGGKM GL R A H L D EA L K QK G S GELLVV QLV I Y D L P GR D C WF T A GTPTSVKKQEVKDVVVHA HADGEIDVLVAYNLPBRDC W $\square$ S D S AT $\square$ DTIDQPLDA DAVA HQEAS GEQVLVIYNLPDRDC


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 GQGGGRTMGLRDHLDAAVEQAAGHDAVFQVVVYNLPGRDC WID T I A N I A K I E P A VA DV P C T N WLD SI GAI GLRDHLNSALA QK TAGQTMLVLVI YDMPGRDC WMDNADGPGLKFHLDEAVKQK A A GSTPLLVIYNLPGRDC



GVNGGMGLRDHLDEALEQSGGEPDADNDVVYDDPGRDC WLDTANQRGLRAHLDAALA QATGGTPVAQFVI YDLPDRDC
 WYT DRTDDTEK LAAKEVY L NVCDSSFDAKVVVVYGLPNKDC

 WLD D GYP RS LA GHF DEA WLDR $\square$ A A $\square$ G GMGLEAHLNRAVSQGAQTIQLVIYNLPGRDC


 WLA H GTPEIVEA $\square$ ARDDVTERAAAAS QMPVLVAYNIPYRDC WMD R R A A I G GVVGDAR HLDEA LT Q GA D LF QVVVIY NLP GRDC

 WY T D QR GN IP QLLA KEVY L DVCD S VF K DLVI I V Y G L P N K D C WLDSMGGAGYTSS LLDDYLNAAETQAADVTIVVYDLPDRDC WLT GDSRD LDPNLTTSMLATARSTGTTPVVVLYMIPBGRDD WL N G GDESHVVYQQQVH QAVVTAAAA QNAVPVVF AYNVP GR DC WMD R $\square$ S A $\square E G N A D L$ R H H L D A A Q K QP GVV M L V WLD R G G A M G L V D H L


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UniRef90 Q3RGT3 UniRef90-D6A622 UniRef90_H2JNY3 UniRef90-D3FCY4 UniRef90-A8PG31 UniRef90_N9UT68 UniRef90-D3Q9E0 UniRef90-F2RHQ4 UniRef90_L8PK25 UniRef90-L8ENZ7 UniRef90-UPI0004763790 UniRef90_G0CDS6 UniRef90_U9VSC4 UniRef90_J3P289 UniRef90_A0A024GVN4 UniRef90_A3RUA2 UniRef90_M2ZQE9 UniRef90-T0RFE1 UniRef90_UPI00036463F6 UniRef90_UPI00036889A9 UniRef90_UPI0003A34F63 UniRef90_H1V2R6 UniRef90_UPI0003692265 UniRef90_UPI00035C641A UniRef90_K9EMB3 UniRef90_D811M3 UniRef90_O93860 UniRef90_UPI00029AC404 UniRef90_V6KHA8 UniRef90_B5I4T1
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UniRef90_T1WAE8
UniRef90_D9USZ0

N
NK E S E R V V A Q|L|A D A $V \mid$ R A $\mid$ GKQNGAYVNGIGYALATLGA S IIPACA Y V Q GVVQY A I N K L S IPA C A Y V Q G V $V$ Q Y A $M K Q N G G Y V N G V G Y A L R K L G E I P N V Y N Y D D A A H H G W I G W D$ S C GS S A

 E $\quad 1 P N V Y K Y V D \square G H S G W L G W D$
 SKANGA YVN GVGYALAKLGAIG NVYNYI DAAHH GWI GWD MKANGNYVKGVGYALNKLGDAPNVYNYIDAGHHGWI GWD A VA K P DQ E E GI A Y A L K K L $\quad$ Q L P N V N L
 MKSNGNY EK GV GY A L D K L G A I P N V Y N Y I D A A H H G W L G W D


 MK AN GN Y EK G V $V$ S Y A L


 S PANGNYVNGIGYALRQFGA IDNVYNYLDVGHHGWLGWD GPGTATRVADLTYAVRTLKAKA RTTVYLDAGYGTWHTDW MKANGNYQK GVGYALNKLGGDAPNVYNYIDABHHGWDGWD $M L A N G N Y$ M K GVVGYALNKLGAVVNVVNYVDAGHHGWI GWD $M K A N G N Y V K G V G Y A L K Q L G A V P N V Y N Y V D A G H H G W D G W D$ ANGPGGYRDGVRYALDKLHA ITNVYTYIDAAHHAWL GWD


 NDSRCA YED GIVKYALNKK S NISNVYNYMDIAHSA WL G WD MKANGNYVA GVGYALAKFGA IDNVYNYDDAGHH GWLGWD CAKTNGYLDNMAKAIPVLTE NTNSLDYIDDVGYWMLETAT $M L A N G N Y V Q G V G Y A L A E L G A, ~ D D N V Y N Y V D A G H H G W D G W A$
 MKANGNYEKGVGYALUTLGA IPNVYNYVDAAHHGWLGWD


 S MA TCA Y T Q Gl Q Y A L N K L H A I S NV Y NY L D A A H S A WL G WD
 MKANGNYEKGI GYALHTLGA IPNVYNYVDAAHHGWLGWD $M K A N G N Y Q K G V G Y A L N K L G D A P N V Y N Y V D A G H H G W L G W D$
 Q GAATAYKEGIAAYTIASLQK_PNDDLYIDAAHGGWLGWN NKANGGYVQGVGYALNKLGADGNVYNYVDAAHHGWIGWD MKENGNY QK GI A Y A L Q E L G A L S N V Y N Y I D DGHH GW G G WD QGAASTYRELTDYAMQRLN LDNVAMYLDAGHAGWLGWP

 $M K A N G N Y V K G V G Y A L N K L G A \quad I P N V Y N Y V D A G H H G W L G W D$ SPENGNYVEGVAYALDDLGA I PNVYNYVDAGHYGWI GWD
 QK SAPYYREGVKYALDELK TLDNVYTYLDAAHSGWLGWE
 MK A N G N Y IT GVVGY A L K K L G A I G NVV NYV DA GH H GWL G WD QGA GYLANLQTAlKLLSQKNVNAEIYLDVGYWTLEYPA AS DRSARFASLARAGRTLRTANPRARVYFDGGHSGWHAPA MKANGNYVKGVGYALAKL GPDPNVYNYDDAGHH GWLGWD S MA K C A YVVQGIQQYALNKLHAVN NVYNYIDDAHSAWLGWD AKSEKYYMDGHAYLI KKLGQFPBVAMYLDIGHAFWLGWD $M K N N G N Y V K G V G Y A L N K L G A \square G N V Y N Y V D A G H H G W I G W D$


 MKANGNYVKGVGYALAKLGA I PNAYNYVDAGHHGWIGWD $M K E N G N Y E K G V G Y A L D S T L G A$ I PNVYNYVDAAHH GWLGWD
 MKANGNY QEGGSYAVNEDGAALPNTYNYLDAGHHGWG NG G N A A P A H K R L L P E GQDERY E QL R G A V A L L G A L P R ARVVY D GT G S S WL A P G MKQLGNYEKGVGYALSTLADIPNVYNYVDAAHHGWL GWD ENPKCGYMNGIKKAVNSLSEACPHCPDVLDAAHGGWLGWE
 CAAKA QYGKNLATAI DLLVSDHSNV FI DDGFWTLSNA Q
 RADRAGRMQLLQKVVTRRN RNPGTYVYLDAGSSGSVTPE D H P D D S R Y Q A L G E A V R R L E K Q Q H T A V Y L D G T N S N WL P V G



UniRef90_UPI00035C56AC
RMAAlLTE QV ${ }^{170} D^{1}$ A
180
190
200
SRARGFVNSNFMATADEDAYAHDVAA TVALLLKDAATADDVHGFIVNTANYDWNQDELSFAQDFRD
 SFYEAANASGSTDYVHGFISNTANYSATVDELSFVQDLRQ $K D A P \square M K E L G S S G N V K G V T I N T S N Y R S N D E C A T Y C T N F Q A$
$L G F E A A N A A G S P D D V H G F I A N T A N Y D W N Q D E L S F A Q A L R E ~$ NNATVSLYTNVFRNVDGFITNTANYEWNPDELHFHRDFVN SNATILREAATPANVHGFIVNTANYDWNYDELSFAQAYRN SVADQLKAAAVAANVQGFIVNTANYDWNQDELSFAQAFRQ QVAKIVRDAGSGTKIRGYTTNVSNYNPSWDENNYSRSLAP DNATLFKEAATANDVHGFTTNTANYDWNVDELSFAQGFRN SNLDPAVQGASVNDVAGFIVNTANYSPTVDEQSFAQALRG EVYDLARRDNPNAKVRGLAVNVSNYNWNDDESRYVNVLTP NNMTAAlTAAGLDASVDGFVTNTANWNPNFDESHYAEALYA SLYTKLI QSTKAGFANGFATNTANYTWNPDEMDYSETLYA ASAEVFKQAATAADVHGF DANTANYSWNVDELSYAKALRE
 LKLLRKLLVNLVMVRFVVLLLTSNYQSVDNEYRYQQNLNS
 DNFAPAQASGSVDNVHGFITNTANYDWNVDELSYAQAFRA CATQYYSPAAPNDGAPGNAVDPADWRWTD AWFDQNAGT ASATLMKEAATTNDVHGFITNTANYDWNVDELSFAQAFRR ASARLLYQAATADKVHGFITNTANYDWNTDELSFAQAFRE ASAQMMHQAATAGNVHGFIVNTANYDWNTDSLSFAQAFRN SNFGPAVNAAGVDSVDGFIVNTANYNWYVDEQSFALDART $A L Y T R V V Q A A G L S S V D G F V T N T A N Y E W N P D E Q D F T Q A L Y S$
$S A F S P T V T L A G V N T V D G F V S N T S G Y D W N A D E V S Y M S A M Y D$
 QLAQF RDDCGDHKIVGUVLNTSNYRPVAEVVNDCKNFQK
 LVKETLKQFTSTGRINGIALGTSNYRTNAEMTTMCESFGA
 ELDAGRLVEAGLAKTVQGFALNVSNYQPTDQLNRYATWVSK ANAKVFKDAGRPKALRGLVTNVSNYNSNFDEKRYDEALAP ANAKQTAVASGSVNNLAGFVTNTANYDWNQDEKSFAQAFRT
 SNFQPFVNLAGGVNSI DGFUSDTANYTPDTEEVPFATAMYN GNMNLLI PVVGTGVLRGFSSNDSNNQPCQSEYEYSDKVRK SNAQQFKKAATVADVHGFIVNTANYDWNHDELSFAQALRT DNAEDFKTAATTGDVHGFIVNTANYDWNVDELSYAQAMRA DNFKP!KQAATANDVTGFITNTANYDWNVDELSYAQAFRQ D $\square$ TD RLLKAGVERATGFFANSVAYGRWISSCI A YAERYAA D NLDLLA RQIT P NATVRGLALNVSNYNPYYDEWNYVKTLTP $T M Y Q A A V A S G N V K N V H G F I$
$D L N T A N Y D W N Y D E L S F A Q A F R T$ $D L A E V A E M S G S K D N V A G F I T N T A N Y D W N V D E L S Y A Q A F R Q$
$A F A N L Y K D A G R P A A V R G L V T N V S N Y N P N Y D E R R Y V E A F A P$
 ATAAVIKEIAPNGNI RGFSTNVSNYQPDESEYEYHEKLNA
 DNAQILHDAATADDVQGFTTNTANYDWNTDEQSYALALRN ASAELLKTTATADDVHGFIVNTANFDWNDDNQGAQAFRT ALANAYKNGGSPKQLRGFATNTAGWNSCONEKDYVDTFAP $N N M D K T \square P G A G D A S I D G F A M N D T F Y$ Q WN P DENHYVQNFVS SFAEVVAKSTKGFASVDGFVTNTANYEWNPDEHAWTAQLHR SVQEFYKVATTNGDVAGFIVNTANYDWNQDEQSFADKLVA ASAELFKQAATASNVHGFIVNTANYDWNTDEQSYAQAMRA AVADIVKHVSEKSRVKGIMLNTSNYQFTSTLATLCSKFQQ KQAAALRAAGAATNGDGUFTNVANFHRTADERAYARRVLA $D N A D L F A Q A A Q A E Y V H G F I T N T A N Y D W N V D E Q S Y A Q A F R Q$
$S N L Q P A V N L A G V N S V D G F I S D T A N Y Q W N D D E S H Y D T A M Y N$ KVYSKVIKSGSPGKVRGFASNVANYTPCPDEKRYDEAMFK DNAQVIKQAATADKVAGDIVNTANYDWNVDELSFAQAFRQ TNFGPSADLAGFDSVDGFITNTANYDWNFDELSYAQAFRT AVAKIVNSVDRQGKCKGIVLNTANYR TASEMNDCCRRFQ SNFNPSVNLAGVDSVDGFIVNTANYSATTDEQSFASALRS ALGEESKNAKTNATVRGLVTNVSNYNGDGDEQKYDNDLAP
 TNAQQFKKAATTDDVHGFI VNTANYDWNYDEQTFAQGLRE AMAARLNDVGV GRARGFSLNVSNFYTTDEEI GYGEAISA E DSDRLDKAGV QRADGFFLNVSNYQWVSQCIAYVTEVNP MFGTLLGMNGTADDVHGFTTDTANYDWNDGELAFAQDFRD DLGEDLNAKAHNTVRGLTTNVSNYNGLGDELKYDNDLAP ElASRLVRADVGKVAGFFLNVSNFESDARVVPYARWVSD SNLAPFKKAATSSDVHGFIIVNANYDWNQDELLSAQALRD DFVKLLKKLRIVRKLRGFAINVSNYQANPDULYAMSLES DMASILREGATKADVHGFDTNTANYFWTVDELGFATAFRQ AVAKIVKSVDPDOKCTGIEALNTANYRSVEEMHTYCERYRK SNFAPFVNLATSSSLDGFUSNTANYTPTVDEOSYDNAFDA RMAALLRGAGVASERGFAVNVSSFAPTAPIVTIYAQRIRA SNGGVLSTEAGYASVAGFVTNTANYEWNADEADWTAHLYD DFKALVQGATPSGRIRGFASNTANYTPGDDELTEDDRLT

UniRef90_UPI00035C56AC UniRef90_A4XAT4 UniRef90_A9AWC6 UniRef90_A9AWC6 UniRef90_Q9KH72 UniRef90_G4ZXL9
UniRef90_D7AWS2 UniRef90_H6CF70 UniRef90_C4RQ37 UniRef90_D9TBM7 UniRef90_G2NAA6 UniRef90_G2X193 UniRef90_D9X5N7 UniRef90_UPI000367916B UniRef90_M0QL86 UniRef90_A8NW81 UniRef90_K8ZBP8
UniRef90 Q3RGT3 UniRef90_D6A622 UniRef90_H2JNY3 UniRef90_D3FCY4 UniRef90_A8PG31 UniRef90_N9UT68 UniRef90-D3Q9E0 UniRef90_F2RHQ4 UniRef90_L8PK25 UniRef90_L8ENZ7 UniRef90_UPI0004763790 UniRef90_G0CDS6 UniRef90_U9VSC4 UniRef90_J3P289 UniRef90-A0A024GVN4 UniRef90_A3RUA2 UniRef90_M2ZQE9 UniRef90-T0RFE1 UniRef90_UPI00036463F6 UniRef90_UPI00036889A9 UniRef90_UPI0003A34F63 UniRef90_H1V2R6 UniRef90-UPI0003692265 UniRef90_UPI00035C641A UniRef90_K9EMB3 UniRef90-D811M3
UniRef90-O93860 UniRef90-O93860 UniRef90_ UPI00029AC404 UniRef90_V6KHA8
UniRef90 B5I4T1 UniRef90-F6FUL2 UniRef90_A8PG30 UniRef90_U5W712 UniRef90_UPI0003AD3752 UniRef90_S6DXG2 UniRef90_D3D8L6 UniRef90-B0FEW0
UniRef90-D3FCY5 UniRef90_UPI00028A27A7 UniRef90_UPI0002FA0313 UniRef90_R8BR00 UniRef90_D2UB66 UniRef90_D5UEY3 UniRef90_B5HPK9 UniRef90-F2RGG1 UniRef90-M4BS05 UniRef90_D6AKA3
UniRef90_B5HJV8 UniRef90-W7SP49 UniRef90_Q870B2 UniRef90_D7C1F4 UniRef90_D2B768 UniRef90_A0A024FX48 UniRef90_W2EIN9 UniRef90-X8JFB7 UniRef90_UPI000301307C UniRef90_V6JZ83 UniRef90_V4IBM4 UniRef90_A0A041AJR1 UniRef90_UPI0003798143 UniRef90_UPIO004195658 UniRef90_M5C1J2 UniRef90_W9BSU8 UniRef90_UPI0003743698 UniRef90-R7Q6G5 UniRef90_C6WI93 UniRef90_A0A024GTA4 UniRef90_D6TQZ3 UniRef90_D0L4F5 UniRef90_UPI0003B4CB69 UniRef90_E5LP78 UniRef90-T1WAE8
UniRef90_D9USZ0

210
220
230
240
$R L D G L H A|V| D T S R N G A G S D \quad G E W C N P P G R R|V| G E \quad P G G A$ ELVAK GFGMLIDTSRNGWGGHAGNWCNQSGAGLGERPQAA A GFP S G I GMMLI DTSSRN GWGPHRRGGWCNQAGA GI GERRPAA

 AMGKSAMTCCVVDTSRNYNGSPTSDWCNVPTAGGIGKPPACK $E L V G Q G F G M L I D T S R N G W G G P S G N W C N Q S G A G L G E R P Q A A$ A GWPSSLGMLI DTGRNGWGGPRGNWCNNSGAGMGTPPQTA ELISKGFGMLI DTSRNGWGGHTGNWCNQTGAGLGERPKAA K L F D S N $\quad$ G M L I | $E$ | $L$ | $F$ | $N$ | $S$ | $G$ | $G$ | $M$ | $L$ |
| :---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $I$ |  |  |  |  |  |  |  |
| $A$ | $E$ | $E$ | $G$ | $L$ | $N$ | $F$ | $I$ | $I$ |

 | $K$ | $L$ | $F$ | $D$ | $S$ | $G$ | $L$ | $G$ | $M$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $I$ |  |  |  |  |  |  |  |  |
| $A$ | $R$ | $T$ | $S$ | $N$ | $P$ | $R$ | $Y$ | $L$ | $V$ | D S RNGNPRWDYTWCNPAGRQI GSLPRVV


 $K L V S L G F G M L I D T S R N G W G G T T G N W C N Q K G A G L G E R P K A A$ KLVAS GF GMLI DTSRNGWGGHAGNWCNQNGAGLGERPTAA A TG GKHYVV A L G V Y G M K F L V HL AVGFHFIV G HL AVGFHF CI A D R QK H A V I D T S R N G Q GP PA GK WCNPP GR G L GRLD S L E ELFNSDDGMLI DTGRNGWGGSAGNWCNQSGAGLGERPTAA $P$ PNDALHHFVI DTSRNGLGAWTPEWCNAPGRGLGPRPTAD QLF N S GIG MLI DTSRNGWGGTAGNWCNQSGAGLGERPQAN A GFRPDVGMLI DTSRNGWGGSAGNWCNQAGAGLGERPKAA ALLFRS GLGMLI DTSRNGWGGTAGNWCNQSGAGLGARPTAA GFVGAGWGFII DT GRNGWGGPRGNWCNQSNAGIGMPPAAA
 H L E A Q GL R F I I D Q G R P GA RA E WGE WCNVAPA GFGMAP GTP A M H S D T Y R C V V EA $\square R A$ GF GMLI DTSRNGWGGTAGNWCNQA GAGLGERPKAA LTENA YHCVI DTSRNYRGPKTGEWCNSRYAGVGVPSTNN ELL DA G 1 GMMLDDTSRNGWGGPPGNWCNQSGAGLGERPTAA CVGPE EARGRTPTCASNDGQPGGAWDPPAGRGGGARPTAD LLVSEGFGMLID TARNGWGGPAGNWCNQTGAGIGERPTTA L L Q G WD A Q FIV V Q GRS GKQPTWGDWCNA IGTGFGPRPSTN $K L V S E G F G M L I D D T S R N G W G G H A G N W C N Q S G A G M G E R P K A A$
 AFVSAGLGMLI DTSRNGWGGHRGNWCNQS GAGLGDRPTAS
 $K L F D T N L G M L I D D T S R N G W G G A A G N W C N Q S G A G L G E R P Q A A$ EAVNQ GFGMLI DTSRNGWGGTTGNWCNQSGAGLGERPKAS
 HLQAVGFQFIVDQGRSGRRTEWGQWCNDRNAGFGIRPTTD $K L F D A G \square G M L I D D T R N G W G G S G G N W C N Q D G A G L G E R P K A A$ ELVGQGFGMLIDTSRNGWGGSEGNWCNQAGAGLGERPKAA LL Q G WNARF I TRTGRS GKQPTWGNWCNSRGTGFGMRPT S N
 LL GGRPRRFVVNTSSNGQGPEGNSYCNAPGRGLGP KPTSA QLVT A GFGMLI D T S R N GWGGSAGNWCNQAGAGI GERP KAA ELF D P G $\square$ G MLI D T S R S G WGGP D GNWCNQA GA GL GERP T TA
 $L L V A E G F G M L I D T S R N G W G G P R G A W C N P L G A G \square G E L P Q A T$
 AV GS T DLHCI FDTSRSYHGPASNEWCNAKSAGIGADPTKK ALGGPGLGAVVDTSRNGNGPPAGQWCDPAGRALGQTPTTR $R L V Q A G F G M L I \quad D T S R N G W G G T A G N W C N Q A G A G L G E R P K A A$ AFVAA GMGMLIDTSRNGWGGARGNWCNQDGAGLGQRPTAS A A GlESVYFI DDSSRNGVRFHPGEWCNQTGSGIGARPQAN ELVNSNDGALDDTSRNGWGGTAGNWCNQS GAGLGERPKAA
 AL DAK GF GMLI DTSRNGWGGHAGNWCNQSGAGMGTRPTAS
 EAFSPDVGMLI DTSRNGWGGAAGNWCNQKGAGLGARPQAA $E L F D S G L G M L I D D A R N G W G G H A G N W C N Q S G A G V G E R P V T A$ GRFVSQYA DLAHN
GDF G P T T R F V I
D LF NE D I G ML I


D S R N GLGPAHEDWCNP PDRGLGLRPDTT CL GRAPAHALI D T S RAGNQEAGGDWCNFRYAGFGPRPST T
 A D GYE PKFIVVDTSRNGAGDAREDWCNVVRSAALGEP FTTE ELIFDAGVGMLI DTSRNGWGGSGGNWCNQSGAGLGERPKAA A G R DVQ C I I DTSRNNLPPSPPKEWCNYKKA GI GRRDPTKK
 $C L G G Y S T H F V I \quad D T S R N G R P V S A G R W C N P P G A G L G A Q P Q V A$ LLVAE G G GMLI DTSRNGWGGHRGAWCNPAGAGIGERPQAS



UniRef90_A0A041AJR1 UniRef90_UPI0003798143 UniRef90_UPIO004195658 UniRef90_M5C1J2 UniRef90_W9BSU8 UniRef90_UPI0003743698 UniRef90_R7Q6G5 UniRef90-C6W193 UniRef90-A0AO24GTA4 UniRef90_D6TQZ3
UniRef90 DoL4F5 UniRef90-UPI0003B4CB69 UniRet90-E5LP78 UniRef90-TTWAE8
UniRef90-DguSZ

VVDTNLWVKPPGESDGACNGAGQWWPEAAVELTKAA EPGIDAYVWVKPPGESDGSSEGAGAWFPAQFQQLMQNA P A PGVDAYVWVKPPGESDGASE EAGIDAYVWMKPPGESDGSSEGAGAWFHDQFVMLVNNA EPGI DAYVWVKPPGESDGSS S S GA GA WF PA QF QQLMQNA
S GRA GAFFNEYMRMLIENA K A

## $T A G Q F \square P D V A A G M \square A R S$

 SDEAGQWFNEYVVNLVLNA SMSGDWFHAQFVKLINNA AS A

$$
\begin{aligned}
& \text { RAAGSWFHDYFVMLLQNA } \\
& \text { RSAGQWFNDFVVNLVLNA }
\end{aligned}
$$

PAGAWWPAQAHTLARNATASGHWFPAQFQQLMLKNA
AAGIIDP

a A GVWFENYFRLLVENA

AAAGSFQKAF
RA A GA WWP DFAHTLARNANTAGTWFQAYFEQLLKNA
TGAGHWFESQFVELVRNA
PAGHWFSGQFQELLRNAK A
AS
E
 ..... G CS D SAGTWNQAYFEMLIKNA
S RGAGAWFHNQFVMLVQNAS
A A
SGAAGSFTPEYAYALA
T S
SCDPAGRWFQAQFVQLVKNAASGAGHWFPAQFQELMRNA
-
C PP EPEIDAYVWIKPPGESDGSSE
TPSPLVDA IVVWVKPGGESDGTSDT
TREAYVDGFLWIKVPGESDGECPAAGQWFADQARELIEDAP ESGI DAYVWAKPPGESDGSSEPAGHWFPAQFRELVANATANKTVDAYLYDKPPGESDGCTE

PK PNIDAYVWIKPPGESDGSS
VKYKDTYAYSWLK $\square$ AGESDGECTGAGDFFPQAFVNDWNN PA A GFDAYVWIKPPGESDGSS

PAGSHLHAYVWVKPPGESDGASSDAGQWFESQFRMLVENA PDASHLDAYVFVKPPGDSDGTSDSAGQWFHDQFLMLLRNA

UniRef90_UPI00035C56AC
UniRef90 A4XAT4
UniRef90-A9AWC6
UniRef90 A9AWC6 UniRef90 Q9KH72 UniRef90_G4ZXL9 UniRef90-D7AWS2
UniRef90_H6CF70
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UniRef90_K8ZBP8
UniRef90 Q3RGT3
UniRef90 D6A622
UniRef90-H2JNY3
UniRef90-D3FCY4
UniRef90 Q6A4K7
UniRef90 A8PG3
UniRef90-N9UT68
UniRef90-D3Q9E0
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UniRef90-L8PK25
UniRef90-L8ENZ7
UniRef90 S3ZFS
UniRef90 UPI0004763790
UniRef90_G0CDS6
UniRef90-U9VSC4
UniRef90 J3P289
UniRef90-A0A024GVN4
UniRef90-A3RUA2
UniRef90 M2ZQE9
UniRef90 TORFE1
UniRef90-UPI00036463F6
UniRef90-UPI00036889A9
UniRef90 UPI0003A34F63
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UniRef90-UPI0003AD3752
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DNPYYVNPQW AEQAAAEPGG EATADQPTGV


LWVNPKSS $\square$ TEHLRTEHLKGQDRADAEALAGYASAS DNPFYI DPVWSAKAQAENGGS RVANYNTAV DNPFYVNPEWSALAASGSA $\square$ ADQNTGVWDDRIGA $\square E$
DNPYYVNPQW ADQARAEPGG NPYYASPDYAAEVAAADRGTNPALATAEDKVANDPTAV DNPYYVNPLWRA NALAEPGG SRVANTPTFV DNPFYVDPVWSAKAAAEPNGSGESTFVWMDRIGA $\quad$ E

FYVKAPMAAAEKQLAAVGQASDASGLAAMLATPQAV DSNPFYGNPYYQSMVENEKAEGNVDDAAKAAKVARVPVFS


DNPFYVDPDWSNKAQAETNGS K I AHYNTAV DNPFYVNPEWSAAEPGGSAVSNQPTFVWपDRIAA $\square$ N NPFFVNPWFQKEVEASKTLTDDP TQKQRLKDMPAAY NPFYLNPDYVSEVQSQA SADGSSAEA KVGAYQTAI ENPFYVDSVWAAK AAAEPGG EALANVSTAV D NPFY DNPFYVDPVWSAKAAAEPNGSNYNTAVWMDRIGA】EGPE

FYVDPHSKAAKQALVDNGDVGNAVNMAKLASWPQAE DNPFYVDPDWSAKAMAETGGS KVANYNTAV GDNPYYVNPDWSAAATQGGGAADTPTAVWDDSI GADTSGS DTRFAVTPDNEAQRQALTQHHDLAGAAAMAKLASWPEAT

## YTDADKTNPQFAPATNMTKQYPVAN

 S PFWVDPDSDAARQVRAWEKGGRDAK\|LRRISERPVADD NPYYVNPTWASSSVRASKQSDASGAAKMQTVAKQPTAV


PDPGAAQQVIDGGRQSTDAALIAEEVATPQAV
$\square Y$ A NPE WA QK LIESF $\square$ NKGDTTNAGKVRTTQNTGTFV
SVVA QI PVFS
NHYGDYVRAAANR DSDSSLKQKALAVANVGTFL $G Y Y V N P T \square A A L D A S \square A T T D D A A V A A T L E A M K G V A S A Y$ A S GNDRALLGR DALQPRA

D N P F Y V N P M WS A


DVNPFYANSHYSKELQETKAAGDVLNAARVTTVQRTGTFV SKAGFAVDPSSPAAAWVLNNPGSPAAATDKQRDARVPAAH

DWDFY LEPSRLNTV KNEKNAELKKLYYQVYGTPCGG $P P Y S L T N A V Q Q H P P E L Q Q A Y D T V K A N A V A T$ TPYYA GEVAAPLAPD DDTPALSTKAAAVANDPTFN VAPDSKAA $\square A A N D P S A T P E Q A A A A K W L A A Q P T T Y$
 NPAGTSVRFVLGRSSLATRTTMLERSSEIDTAH

NAF
NAF
NAF

[^0]


WFTEGTPDEVRGKVGELVHRARAVGRTPVLVAYNVPGRDC WMDRDGADGSWGLRDHLDAALDQNANVIQVVVYDLPNRDC DGSNNMGLREHMDEALE QGADAI QI $\square V T Y N L P G R C$ WFTSGTPAQVRDQVRATVRTAAAERAVPVLVAYDIPGRDC YGNGSPTTGSYGLADHLDEAVSQGALIQVVIYNLPGRDC WYVDCGSAD DAI DALLASCPSTDTPVIIVYGLPEKDC WPAWDDPAP G $\quad$ RSAVRSAARTKKTVVLVAYN】PHRDC

WMDRDSADTGNAHDDNAVQQQKAAGKPVLVIYNDPGRDC WFTDRQGTDERSTMLSNMLNQCSEDTRLSIVVYGIPNKDC WLGPQPP RERVRSTTESAARAGTIPVLVAYNIPHRDC WFTDGTPREVQRDVRRTVLEAKAAKAVPTLVVYNAPGRDC
WVSNTAMLADTDTATKGARAAQAQKQTVGLVLYNTPDRDC WYDTSSVNDITGYLEDAAADQKKTGKIVQLVIYNLPERDC WLDTISTIPTFESHLTNTSACACEVFGVVIYDLPGRDC WFAANGSTSR

WMDREGPADGMGLRDHLNEALAQGADLFMFVVYDLPNRDC WFTDGNSAHRPTA $\square S S Y \square Q E Q D G D Q L A \square F G \amalg W G F K G E R N$ PGRDC YFGRWGDDEVTTKVRAYVAGAQAGDKपALMTLFRMFPWEG
WVSNVAGLS GПDTATAEARRTRKQQMLQL
RVAVPEK EVADDIRPYLDAAVGSRAQALLFADADRGAGC
WYDGGSPGSGGKELKNFVEGAERARKTP\|VVLYGПPNRDC WYTDRGPSOTPDL WFDTAKGPDLGAYLGMFLGN WLTPEDPDEI WDRIAHLASE ARDQDASLLSVAVGLPDRDC DSSSNGAMGVRDHLDEALAEQQGASQTRLVVYVVYDRDC WLTGDETKDATALRGURLEAC GGKIPTVVIRGUSNWDY

WLGLKDDFYTMQQVKK
W पGRDDDFYT】QQ
W■GVDDDFYT $\square Q Q \square K$

ACEDSSVPVVVFYMAPRLDE SACEDA TI PVVVAFFMHPSQDE ACNEDEIPVIVFFMRPSAGD QSACEEDSVPVVVFFMFPMTDE QSACEEDSVMPVVEFFMHPRLDE

[^1]
## UniRef90_L1PHF8

UniRef90_F8K1X1
UniRef90-R4M8S5
UniRef90_UPI00047E24FA UniRef90_B2VVS8 UniRef90-M5CB17 UniRef90_D5ZTQ0 UniRef90-Q9RQE6 UniRef90 B3PKK5 UniRef90_UPI000393D490 UniRef90_UPI00047A7DE8 UniRef90_W7TF70 UniRef90 UPI00036F294F UniRef90_C5BTS3 UniRef90_UPI0003B49E6A UniRef90_X8JEA9 UniRef90-UPI0004672290 UniRef90_R7QHK0 UniRef90-M5C1N7 UniRef90 D8VN70 UniRef90_E4N239 UniRef90_J9F5Z9 UniRef90_C7Q1L2 UniRef90_D4ZGP3 UniRef90_E2GJC5
UniRef90-A9Q634 UniRef90_A9Q634 UniRef90_D7C4P1 UniRef90-H2JY39 UniRef90_I3I951
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UniRef90 L8WMR6 UniRef90_E2LLA2 UniRef90_F0Y265 UniRef90_UPI00036D98A2 UniRef90 W8A343 UniRef90_UPI0004754937 UniRef90_UPI0003665AEA UniRef90 Q53652 UniRef90-A1SG30 UniRef90_UPI000471647A UniRef90_L8G715 UniRef90 UPI0003629D48 UniRef90_UPI0003633FE1 UniRef90_G7TBH3 UniRef90-I9P9M1 UniRef90_W4G2P2 UniRef90-Q9Y894 UniRef90_E8NEI3 UniRef90-UPI0004768601 UniRef90-H2XMI4 UniRef90_UPI000380D6B7 UniRef90_E4XPM8 UniRef90_E7FJ01 UniRef90_Q76G00 UniRef90 E7FIZ9 UniRef90_E7FJ00 UniRef90-A8Y5V6


 A AKASNGETEYI DPIVAIFKKYPI SLI I E PDSLCNLLVTNC S S KA A A GY Q QL L N S A K S Q $\square E K Y P V A I I L E P D S I G D L V G G C$ PAPGRTEARAPSRRPAGHGGRGGLIVVLEPDSIAQSACLS GAAS QAD Y E E W DDAFAA GDGGERAAVI L E P D G L G VID A DP



A

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## \section*{+}

## S

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## \section*{A}

## A <br> A

GAASSAAYRQWDDAFAAGDGTTDAPLDIV
HALASNRYRTYI DVLAASGIGADPRAVVVVEPDGTALLDEEDC





YA $\square$ ASNGE $\square P Y$ TDP $\ V A L L G K P R \prod A A T \prod E P D S T P N L V T C$ AAGSTDDYKAFLQELTGAI GDRKVLYVVEPDALGLLAEEG GAANGAAYRRWIE QVA LGIGDRKAMVVLEPDAVAQVVDRC GAASQADYEAWADGFARGLTDTQVVVI EPDGLSNLPSDC DRYKNYDDPDAQTLADYRVVTTVEDDSLPNLVTNV SAGESAGEDTFI KPYTEKLADDHFAVILERDALANLEDCD S S K A A A GY Q KLL E S AK SQI QK FPVAIVVLEPDSIGNSVAK C


 TAKERATYRSWI DQASAQI GSSRVAIVLEPDALALAKKQR GSDSPEAYRTWI SAFAAAI GNRPAIVI I EPDAVAQLDCDA EAAEQASYRRYVTNLAQGIGDSRVAVIVQPDGYFVKKAFE

## K Y K T F V D K F A K A V S S A P F A V V L E P D S LG N V ITT N Q PASSGSYRSW SSALAAAVGEQDVIIVLRVSA <br> SEPGGR



QAP T WEEYDAK DEEYGEALSDVP DMLILEPSFDMHTENSE RIGTWEEYDEKLEYYAEHLAEIPSIIVMEPSLLMHFNSKT RIA S WE EYDVKLENYAKQLADVPSLIVMEPSLLMH TFNS A AHSWE EYDEKVLEYGEALAEVPDLLILEPSLLMHFNSKT EAGHWEEYDEKLDYYAEHLSEI PSLIVMEPSLLMHFNSKT EAANWEEYDEKVTEYSENLQEVPUVLI LEPALGMHFNERT


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## UniRef90_LIPHF8

## Une

UniRe99_R4M8S5
UniRef90_UPIOOOO47E24FA UniRef90-B2VVS8 8
UniRet90_M5CB17
UniRef90-D5ZTQ0
UniRef90-Q9RQE6
UniRef90-B3PKK5 UniRef90-UPIO00393D490 UniRef90-UPIIO00047A7DE8 UniRef90-W7TF70 UniRef90'UPI00036F294F UniRef90-C5BTS3 UniRef90-UP10003B49E6A UniRef90 X8JEA9 UniRef90_UPI0004672290 UniRef90-R7QHKO UniRef90-M5C1N7 UniRef90-D8VN70 UniRef90-E4N239
UniRef90-_99F5z9
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UniRef90-H2JY3S
UniRef90-131951
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UniRef90 FOY265 UniRef90-UPI00036D98A2 UniRef90 ${ }^{-}$W8A343 UniRef90_UPIOO04754937 UniRef90-UPIO003665AEA UniRef90_Q53652 UniRef90-A1SG30 UniRef90-UPIO00471647A UniRef90 L8G715 UniRef90_UPIO003629D48 UniRef90_UPIO003633FE1 UniRef90-G7TBH3 UniRef90-19P9M1 UniRef90-W4G2P2 UniRef90-Q9Y894 UniRef90_E8NEI3 UniRef90-UPIOOO4768601 UniRef90-H2XM14 UniRef90-UPI000380D6B7 UniRef90-E4XPM8 UniRef90-E7FJO1 UniRef90_Q76G00 UniRef90-E7FIZ9 UniRef90-E7FJ00 Unir Ref90-A8Y5V6 UniRef90_H2ZF36
 A A ATPYYEQGI E Y ALDKLH P PVPNVYTYLD DAHSAWLGWS PDQRQERFDLVRYAVDTLTRDPAAAVYVDAGHSRWLSAE SPANGNYQDGI SYAAAELGA DPNTYNYIDAGHHGWI GWA QQSASGYRDGVAYALKQLN LPNTAMYIDAGHGGWLGWD KNAAEAHKQLLSLALATL QLPNVSLYLDGANAGWLGAE AGERADRFASPARAGRVLKDADPGARVYFDAGHSGRNAPA ATAAAERFAMFNHAVDAFGA LPNAQVYDDAGHWGLGAAA STPACGYDPNTRYTLNKLSQ ISNVYSYVDDGHSGWLGWD DTPKCAYREGTTYALNKFAPIKNVYSYIDAAHSGWL GWD MKANGNYQNGLSYAAAELGA LPNTYNY:DAGHHGWI GWD MNSNGGYVNGVGYALRKLGA I PNVYNYIDSAHHGWI GWD DVADCGYRDGIRYALDALAEIPNTYAYLDDAHSGWLGWD GPSDSARLYMLKAAVARL EKQPGAAVYLDGTNSNWLKVG KNSAQAHKRLLSLAIATL DEPDCGYQDGIQHALNELSKTLP ENSKNQRLSSLLRETVVLLRKK AAAQDVYKRSTIYAI QKLNQ MKANGNYINGVGYALAKLGA ETTKQSYVNGVGYA KKLSQ AAATPYYEKGIAYALGKLHG\|G GIADCAYRDGIRHTLNEGG SQIMYLDIGHSGWLGWP MKSNGNYEKGVCYALDKLGA IPNVYNYIDAGHHGWLGWD SEPDCGYRDG|RHADTELGKVPNVYSYVDDAHSGWLGWS RARNAARYAELNYAVDKLNEPMPGTKVYLDGGHTDWHPVS GPTTAARVADLAYAVKTLKAKGRRTVVYEDAGNVQWRPVG MKANGNYVKGVGYNLGTL GDNGNVYNYVDIGHHGWI GWD NATTAGR1DADIKYAVSALGEAPQTVVYLDAGYGTWI SWA MLANGGYVDGVSYAAAELGA LDPNYNY DDAGHHGWIGWG TPPHAERYQLLSEAVDTLKA DPNTKVYDDAGNPDWПDPA
 DQEAMKNALSYAVNVFGS MKNVSVYLDAAHGMWGSAD QQAAPYYRQGVKYALDKLYADGNVYNYIDTGHSGWLGWD GCASAGY DDNKVAVEALSS NPNAEDY DVGYWMLAYPD VPRRRPRLALLRDAVAAFAALPHVRVYLDAGHAGWINPA GAADAERIAEIRYAGEADERANPKALVYLDSGHSGWHSVA SPANGNYVEGVGYADAQLGA DDNVYNYVDAGHHGWDGWQ KNSAKAHKQLLSTADATL QLPNVSLYLDGAHAGWLGAA QSSASGYREGVQYALRNLN LPNVAMYIDAGHGGWLGWD DDPRCAYELGIAYAVEALKAAAPSAHDYLDAGHGGWLGWE RTADPARLGLVRYAAHRFAQDPRTTVYLDASDSDWLSVE RAARLALLGFAYGQLLQHNPATAVYYDVGNSTWVDPA QEANGGYRDGIRHADTELEGKPNVYSYVDIAHSGWXGWS
 A WVGKVGRRMLAWTVQTLAAQPRATVYLDMGSEDWADVA
 ECSTDPRPQVTENVVASLHASTRHARVILDVSDLAAQSVP GGYRDGIRHAlTELGKlPNVYSYVDIAHSGWLGWS SMPACGYEAAIKYALDKLHA IPNVYNYMDIGHSGWLAWR GSAKNERAELLTYCARKLKENNP
C GVQKGY DQNLKVAV GL DASNANAHDYVDV AS WADQN SESLQEPDSATRCIWPQLCGRNVYMYLDAGHAGWLGWP PYTPACAYEGHAYLIKKLGQFPHVAMYLDGGWLG LDGT S RWRNAQYEEEFLKRARKVIVRMNKAWVYVDAGNAGYGGSD

NEYHAAYQLSFTQRVDSП!RKFPKAWTYVDAGNA DY DQWA EYHNTEYQLAFAQRVEKVLQKFKRSWVYVDAGNAMYLQWT QNSQHDTAYQVQFAQRVQNAANSKSWIYVDAGNAMYLQWN EYHNTQYQ
 EYHNTEFQVAFATRVQKIIESFPRAWVYVDAGNALYYLQWA
TSHHADAQRVGNAVMF
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## UniRef90_L1PHF8

## UiRe90

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QAVNVLVEDKTAGRLK
AF SQLYRDAGSPQYVRGLATNVANYN
EMASLTSSTGLIGDVQG
EAGGKVKVIYSPGKVRGFASNT YTPWEDPELSRQETCAS


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## UniRef90_LIPHF8

## Unine90-8K1X

UniRef90_R4M8S5
UniRef90 UPIOOO47E24FA UniRef90-B2VVS8 UniRef90 ${ }^{-}$M5CB17 UniRef90-D5ZTQ0 UniRef90-Q9RQE6 UniRef90 B3PKK5 UniRee90 UPI000393D490 UniRef90-UPI00047ATDE8 UniRef90-W7TF70 UniRef90-UPI00036F294F UniRef90 ${ }^{-}$C5BTS3 UniRef90-UPI0003B49E6A UniRef90 X8JEA9 UniRef90- UPI0004672290 UniRef90-R7QHKO UniRef90-M5C1N7 UniRef90 D8VN70 UniRef90-E4N239 UniRef90-J9F5z9 UniRef90-C7Q1L2 UniRet90-D4ZGP3 UniRef90-E2GJC5 UniRef90-A9Q634 UniRef90-Q211E7 UniRef90_D7C4P1 UniRef90-H2JY3S UniRef90_131951

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YLAGYPAHFIVDQGRAGNQGDGEEWCNVPYAGFGDRPMVT ALGGPGDGAVIDTSRDGNGPAGGEWCDPAGRRLGRAPALG QLGDPTTQFVIDTSRNGVGPWAEDWCNPPDRGLGARPTLD AGFPSTDGMLI DTSRNGWGGPRGNWCNQYG GI GERPRVS RMITKGAGMLI DTGRNGWGGPRGNWCNQPS GI GYKPWAD AMVDAGMGVLI DTSRNGWGGDYGNWCNQAGAGLGERPQAS QLVAQGFGILIDTSRNGWGGPRGDWCNQNGAGLGAAPTVQ RLFSPNTGMLIDTSRNGWGNHKGNWCNQAGAGMGERPTAA AMIARGAGML:DTGRNGWGGHRGNWCNQHGAGVGYRPQAN YLVGFPANFIVDQGRAGNQKASDSWCNFKYAGFGLRPGAV QGFPSDDGMLIDTGRNGWGGPRGNWCNQPG GVGERPQAN GI SEEHGDVIDTSRNGAGPPPNAFANPPSNRLGMAPTLR LLQQNNFHFIVDQGRSGVQNEWGNWCNDEGAGFGDRPGPS AMISAGFGMLVDTSRNGWGGPRGNWCNQPGGGVGERPQVA KAKNSNGGMVTDTGRNGWGGMRQNWCNVKGGGLGLRPTSQ EFVISSGFGMIIDTSRNGWGGTRGDWCNVNGAGI GARPQAN LGAPESLGMLIDTSRNGWGGHRGNWCNQAG GVGFKPWAD AGFDSGLGMLI DTSRNGWGGHSGNWCNQSGAGLGQRPTAA AMISKGMGMLIDTARNGWGGPRGNWCNQPG GVGYRPTAA AMIQQGFGMLIDTARNGWGGPRGNWCNQPG GVGFRPQAA CLAEEMKHFVTDTSRNGRGPWPQSWCNPPGRGLGMRPTTK CMWYATAGQYYSAAAPNDGTPGNAWTDAWDQNVGTPPTPE AMDSAGFGMLVDTSRNGWGGHRGNWCNQRGGVGERPQVA AGFPSGMGAII DTSRNGWGGADGNWCNQSGAGLGERPTAS


AAQGFNAHFDTDTARNGVQPTWGDWCNVIGTGFGVRPTTN CLAYADKHFVTDTSRNGQGPWAQSWCNPPARGLGRRPTTR KLGVSDIHFIVDTGRNGVDDTTQTWCNFVGTGFGERPQGN FGGNPDRFEQVFTSGNNELSTRN
AMGKSDMSCV
CL
ELVGQGFGML!DTSRNGWGGPSGNWCNQSGAGDGERPQAA HLEANSDQFIIDQGRSYSRKDWGEWCNVSPAGFGM
YLVGYPAHFIVDRGTAGPGPSWSNRCSLKYAGFGLDRMVT SLASAGMHAlVDTGRN GPGASSACC
A $\square G H P D K H F V T D T A D N G K P F T W Q Q Y C A S A G D S \square G \Pi P P T T N ~$ AYGHQ DFVMI DSVNGAPNTANDWCNPHGQKLGTLPSTR AMIDKGMGMLIDTARNGWGGPRGNWCNQPG GVGYR ALAAKGDHFVI DTADNGRPFTYGQFCKKPTAALGVPPTWK ALYGYTRQFVVDTSRNG
ALARKGLHAVLETSDNGQPFHGSE ПNPQGTADGVPPTTD AGWPSSLGMLI DTSRNGWGGPRGNWCNSSGAGMGTPPQTA YPQNASVHFIIDVGRSGLQNTREE
 AMMSKGMGMLIDTARNGWGGPRGNWCNQPGGGVGYRPTAA
GFVGAGWFLIDTGRNGWGGHRGNCNQSGAG

## C

PDEQTY $\square$ QP
V
$R \square H R T G L N F V V D T S R N$
ELVGQGFGMLIDTSRNGWGGPAGNWCNQSGAGLGERPQAA

ElH QTGYHFLIDTSRNGGEFSSRNSCDPPRVRNGSRPTWR EI HQTGLNFILDTSRNGGLFSERNECDPPYVGKGSAPGWA E HQTGLHYLVDTSRNGGDFSRRNECDPPEVGKGEDPSWA E HQTGLNFILDTSRNG
QTGG YHY I I DTSRNGGEFSTRNSCDPPRVKNGSMPMWK
lupas_21
lupas_14
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sol25
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jhmm
jpssm

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UniRef90-R7QHKO UniRef90-M5C1N7 UniRef90-D8VN70 UniRef90-E4N239
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UniRef90-A9Q634
UniRef90 Q21IE7
UniRef90-D7C4P1
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UniRef90-|31951
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T G N S
TGDALLDAA $L W W V K P G E S D G R C L R A G E W F P E Q A L E L V R Y A$ $P D M P L L D A Y M W L K T P G E A D G S D T G A G Q W F H D Y F V Q L L E N A$

P EAG $\square D A Y V W M K P P G E S D G S S E$
T HPLVDAVVWVKPGGESDGTTDTSSSRF
VNDEYVDGY $\quad$ WWFGRPW
FDRDAMVEPAFVKTPGQSDGRCGPAGEFDRQLLLD
TAAQLVDGY $\square W F G R P W$
VD NK YVDA Y LW WS R P W DP D Q GEGGTKFSPEYAE LL PA SHVDAYVWAKPPGDSDGSCDPSGAWFHDQFAMLVQNA
 $P \quad S P G D D A Y V W V K P Q G E S D G V S D P A G R W F P E A F Q L L V E N A$

S GMDY LDAFYWVKPYGESDGTSSGGGSRMPLLA $\square A$
P EAG】DAYVWMKPPGESDGSSE

D GAATV
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[^4]UniRef90_L1PHF8
UniRef90_F8K1X1
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UniRef90_C5BTS3
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UniRef90_W4G2P2
UniRef90_Q9Y894
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UniRef90_F8TAD0
UniRef90_UPI0004768601
UniRef90_H2XMI4
UniRef90_UPI000380D6B7
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    sol25
    sol5
    sol0
    jhmm

