## QUERY

UniRefi90-W2E9C7
UniReipo
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UniRef90-B2IT99
UniRef90_D9TRM6


A$A \stackrel{E}{Q}$
ADEVPWG$R S Y Q D$
WG L
RERQWA G
REKQWNLGS:AAYDAWDDTTGGP VVVAVIDTGUDDSHPE
N Q Q GNL K KI QAPQAWDAQRSDPGVKIVAI: DTGVQN HPDDKQYHVEQLGLLQAQDQASDSEGVTVAVIDGGVDKHKD
QDVPYGlGRV $\begin{array}{ll}\text { QAPEAHEKGHAGSGV} K & L \\ K A P E A W T I T\end{array}$
Q Q Q

    E Q
            QWGYGMI DAQDP LQAGYTGKGIKVAILDTGUSAHPE
    
Y E WDII G Y TE S N K A WS L VN Q K R EVVKV A V V D T GV D N HVD
QWNLRSTNVEAAWSE TRGEGI TVAVI DTGVSPVPD
A Q

$A Q A \square P Y G Y K M V G T$ Q S L VP A T L T G S G V K I G V L

A E


| $K$ | $E$ | $V$ | $P$ |
| :--- | :--- | :--- | :--- |
| $Q$ | $S$ | $V$ |  |

            Q S Y L R Q T K L D Q A M A A V S P N P \(N\) N L
    
NK Q Y A HP RI NSPAAWDLSFGSSSVKIAI I DTGVDYNHE

DVQWNVKMINAHLVWDQYFFGYGVTVAVLDTGIDYHPQ
WGIRKVKAPEAWQMGYTGEGVIVAVVDTGVDTHPD

GLD RYEA LKKL P S R S

$S \quad R Q Y G P Q Q K$
$E \square P P G V Q L$



| $V$ | $P$ | $Q$ | $G$ | $A$ | $P$ | $Q$ | $A$ | $W$ | $R$ | $G$ | $H$ | $D$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $G$ | $V$ | $T$ | $V$ | $A$ | $V$ | $L$ |  |  |  |  |  |  |
| $L$ | $E$ | $A$ | $I$ | $G$ | $V$ | $T$ | $Q$ | $Q$ | $L$ | $W$ | $E$ | $E$ | $A$ |
| $S$ | $G$ | $T$ | $N$ | $I$ | $I$ | $V$ | $A$ | $V$ | $V$ |  |  |  |  |

            WGLEA I GVTQQLLWEEAS GTNI IVAVVD TADAHPD
            WGL E A I GVT QQLWWE EAS GT NIIV AVVDT GVDTHPD
        QVIP WGINAIN A QKLLWPD VTGKGVKVAILDSGVDFHPD
        R D Q Q WDLDAARVPGAWPVS TGAGVTVAVIDDGVADHPD
            Q WN L K M \(\quad\) G MP Q A WD S S R G K G V V V A \(V\) V \(L\) D T G I A Y H E D
        \(R D Y Q Y G L G T T N T N N A W D V T R G S S N Q E I A V V D T G V D Y N H E\)
            VP WNLK TIMADKAQA EGMNGAGVVVGII DS GVDATHP
    SNEVPPGVVRI DAP LVVWQQGYRGDEVIVAVLDTGCEDHPD

QQASWGLERI ADFA AHR $\mathcal{R}$ G
QQAS WGLERIGASEVVENGSGVDIGILDTGI QTHCS
S P S Y Q Y GIV N T D A D H A W DVA R G S S S Q E I A V L D T G V V D T H P D
A R S LIE WD IP DVMADSAWSN $\square$ S QK K TVVKI AVVDTGVD YNNS
$V P$ QI GAPTAWAA GYT GK GVVKVAVLDT GVDTHPD
WGA D LV K A P E V WA K G Y T G K G V V V V A V L D T


HFDYSQVTKKAWDLGYSPKKKKVVI AVLDS GIDNHPD
WGVERIGADGV DPNGAGVDVGI LD TGI QSHCS

Y A L D M I N V P A V W WD R GY S G E G V V V A V L D T G I D T H R D
DSQYAPQQVNCPEAWEET LGDSDVTI SIVDQGIQQHEN
E S LDP WGVDRIDDADVAHSNGET GQGADIAA I DS GI DS DHP

$V$ D E A WE T Y A P S Y K P T V A A V L D S A GVVA S H E D

IDDI K A R DVWE Q S N K G Q GVVVAI I D T GV D THPD

VP Q D A P E A WD $\square$ Q T G N P NLVI GVI D T GVD N H Q D
VP QI GAP T A WK A GF T GK GVVI AVLD T GTD THPD


## QUERY

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UniRef90_UPI00031191FF UniRef90-D3SV39 UniRef90_UPIO00225AE24 UniRef90-Q8RLP2 UniRef90-W6N776 UniRef90_H2JX93 UniRef90-K9V2Z3 UniRef90_UPI000477ADCA UniRef90-F5L997 UniRef90-A7VM14 UniRef90_UPIO0028A19E3 UniRef90_LOJFG4 UniRef90_UPI00036AFEA1 UniRef90-K9TQT2 UniRef90-L9WBU6 UniRef90_I3R1U4 UniRef90_B1YEX UniRef90_UPIO00185124F UniRef90_UPI0002E9AC27 UniRef90_X2GU21 UniRef90-D5EQJ9 UniRef90-BOJT18 UniRef90-K1VWL7 UniRef90-B2IT99
 LKGVPGTNVVNPDQPPQDDVGHGTHVAGVI SATNNQLGVA
 LKDKISHGYNAFDGDFSDAHGHGTHVAGVAAATNNITGIA
 LAEKIMMDGYNAFENNFEDEHGHGTHVAGIAADTNNHDGVAA LTRRLLPGYNADDRSPNDENGHGTHVAGDI A S PNNGEGVA
 LKGKFVSPYNAVTGGTSFYSGHATHVAGDIAASSNNSGGA LQFVEGYDFVNNKKEANDDHGHGTHVAGTVASTNNRYGVA FAGKLVDGYNEDNNVPQDDNGHGTHVAGVIAATNNADGIAA LNFVKGYDFVNDKDDASDDNGHGTHVAGTVASTNNGYGVAA LKFVKGYDFVNDREEAKDDNGHGTHVAGTIAAATNNKYGVA LRFVSGYDFVNDRNDASDDNGHGTHVAGTVASTNNNYGVAA $D L E V V D G V N T V D G G D Y M D Y N G H G T H V A G T V A A D D N N S G V V$
$D K G R L D P A N A D N P A G A P D D V H G T H V A G I I G A A N N G V G A H$ LKANYGYDFVNKDNDPMDDHSHGTHVAGIVVAASNGIGVL
 LEGRVLGGFNTGSTDVSDDNGHGTAVAGLI AASGNGVGIA
 LKFVEGYDFVNDRTQADDDVGHGTHVAGTIASTNNNYGVA LKNNIVGA NDLDPMKKPVDAHGTHVAG』IAAKNNG GGGI $L N V D G F S A F D S G E D Y S D G S G H G T H V A G T A A A D D N E T G V V$
$N F V N T S L G K S F V G G T T M D V Q G H G T H V S G T I A S Y G$
$V$ LKIAGGASVVNYTSSYADDNGHGTFIAGVI GAQDNGSGLI LAGRVYTGYNNPKASANDDEGHGTMVAGII AATNNGRGVA
 LEFVGGYDFVGDRPEADDDVGHGTHVAGTI ASTNNNYGVA

 LSDA GGVNTTGGGSSYYDDNGHGTHVAGUVAATGDNGMQP
 LKDRIISGRNFTDDDYTDYNGHGTHVAGTIAAHKNEAGVI DLVNQIA EAKSFDPGETDGHGHGTHVASTVDGTGADGKHK LKDRIKGGKNFTGDDYQDYNGHGTHVAGTMAASMNKQGVA $D K V I K G K D F V N N D D D P M D D N G H G T H C S G D A A A T N N G V G V A B$
$L A G R V S E G V D F G D G S S F D D N G H G T H V S G T V A A Y S N N D G V Y ~$ LSGKVVYCIYTNLGNCADRNGHGTHVAGDIAASDDNVGVA LQGQLVEGYRPAASDSSFGGAHGTHVAGTIAASDNSIGVI KNYSGGVNILSPMFTPYDYNGHGTHVAATIAGRATDLNVV VD $\square Q N E K N F V D P N G D A \square D D H G H G T H V A G V I G A R D N G V S M R$ $L K D R I I G G K D F N T G D Y Q D D N G H G T H V C G T I L A S Q N A Q G V V$
$D K V V G G W D F V D N D S T P Q D G N G H G T H C A G U A A A T N N S T G I V A$
 LA GKIADSRSFVPDAVQDGQGHGTHVASTIAGTGAASGGK LEGQV $\square A G Y R P A F D D S S Y G G S H G T H V A G T I A A K K D G K G I V$ FGPNI HKNVINPEQPPVDDNGHGTLVTGII A A QNNHLGIV $L A G Q I L P G A D F T E G P S T D P N G H G T H V A G I I A A A G N G Q G I V A$
$F K F V Q G F D F V N D D V H A N D D H G H G T H V A G T I A A T N N G Q G V A$ DKTI LGGYDFVENDDDP LDDNGHGTHVAGTAAATNNGTGVA A 1 KNAWRGNTPGMEAPTDATGHGTHVAGTILGTDPNKSLL
 FKLLRGFNTLNGSTDVTDYAGHGTHVAGII GAARDGKGTF LSVAGGQNVTGSPDDYEDRHGHGTHVAGVAGAVDNGRGVV LDGKVIYDFVQNDNTPQDQNGHGTHVAGIAAATNNATGIA VDIA QEKNFVD GKGDAQDD NGHGTHVSGVVAAAENSYGI LKDQVIESKNFTSADATDHFGHGTHVASVVAGTGAKSGGK LKGNI WWNFHDKNNKTDDTHGHGTHVAGTIAGVRNNFGVT LQEAYKGGANFVEDGRSDPYSHGTHVSGUISARGSPNGMR SSGVTGASFQGHGNWFSDGNGHGTHVAGTIVALDNNDGVV LKNQIIK P Y NAVVPGPTDNNGHGTHVAGLVGATNNKVGVA LSVAGGRNFTGDGPDYEDRHGHGTHVAGDVGADDNDRGVV RDGNHEYSWDDGYDNPTDGHGHGTHVAGTAVGGGDGEPI LQ GNLWVNDNDGNGFDDDFHGHATHLAGDIGAQRNGDDVT DTGYAVE T C S GCDEPWDD DNSHGTHCAGGIA GAVANTE GVV
 LRGQVKGRVNIVKTGI AGHGTHVAGTIAAAANNRGIV $\left.\begin{array}{ll}L \\ L D K I D G G Y N F S S D D Y T D Y N G H G T H V A G L I & A\end{array}\right)$ LVGNI WWDFAYNDNNPSDVYGHGTHVSGTIA GKNN GVGVT LKGQVLDA EKNFSSADTVDRVGHGTHVAS』AAGTGAAS GFK


## QUERY

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## 

## 

90
100
110
GVAPSAELYAVKVLGASGSGSVSSTAQGLEWAGNNGMHVA GMSWYNCIMPVKVLDSSGAGSTYAVAQGI DWAADHGAKVI GVAPEAQUYAVKALDQNGSGDLQGLLKGADWSNANGMDVV GVSWKSNILPVKVLNDDGEGSSYEVANGIYWAVEHGAQVI GVAPSASLYAVKVLSSSGSGDYSW| ING|IEWAISNNMDVI GVSWHNP:LAVKALDHNAEGSSLSI|AKG|VWAVDQGAKVI GMTWFNPIMAVKALNADGYGTSIDVAKGURWAVDHGAKVI S S G A
$R N G B$ K S
A
G
G
A
G T
$\qquad$ A A K N GVARGANL GVARGANLYSVKVLDKNGQGTYAQLDQG G I A Y K A N I M P L K V L S G S G G G T IIA D I A E A I K F A A D N D A D V I GI A Y E A S L M P L KVLSS SYGGGTVVADI AEAI K FAADK GADVI GVAPNVSLYAI KVLNSSGSGTYSAIVVSGIEWATSNGMDVI GI A Y Q A K I M P I K V L S A Q G G G S V S Dil A D A I R FAAD N G A D I I
 GAAPHAGLYSVKVA $G \vee A P G \square R V \square P \perp K A$ GVA Y D AKI MPI K V L N D GCD K A CLS S GRC
 GI A Y K A KI MPI KVLDDGNGGGTVADI A E GI RFAANN GADVI



## G

## 

 EAGLLVKVLKAGSGKYEWI KGIHYA
 G V A P D D A T L V A $G \vee A P N B K B A B D K$
GVAPRVHI Y GVVAFNRKGSANLSDLLSADNWCIENRMDVV G V A P K A K L L I L K V L N K K G L G K I D A L I N A I E Y A I N WR G K V I


 GVVAPGA K L V V G K V L D D S G S GLDES WI DE GMEWAARS GA K A V
 GVA P K A QWI A A K VVF D S E G E T



 G $\square$ H Q S A K I L P I K V L N A N G E G E T D A

 GI AP A A QLISA K V VLD DY GY GYWS SII IA GMEWSVGA GAKVV GI AP Q S ELLYVYRVLGPS G GT T E WIVNG\|E Q AVK D GMDVI

 GVAPEADWIAAKI FDDNGATTTSAI HEAFEWFLAP GPHVV $G V A Y N A T L M P V R V L D D R Q S F D E D A V A N G \square R Y A V N N G A Q V L$


 GIAPAAHLYDVHVFSPDGTARMSDI IRGINWAVEHRMNV I
 A V GVAWNAKIMPLKFLNDQGSGSTSNADKADNYATAKGVVLT GVAPDAKLLAGKVLDDDGFGEDSGILAGMEWAVAQGADIV


## QUERY

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UniRef90-A7VM14
UniRef90_UPIO0028A19E3 UniRef90-LOJFG4 UniRef90-UPIO0036AFEA1 UniRef90-K9TQT2 UniRef90-L9WBU6 UniRef90 - 13 R1U4 UniRef90-B1YEX UniRef90-UPIO00185124F UniRef90-UPIO002E9AC27 UniRef90 X2GU21 UniRef90-D5EQJ9 UniRet90-BOJT18 UniRef90-K1VWL7 UniRef90-B21T99

130
140
150
 NLSLGNYASSMFLHDAIRYAYDKDVVLIAASGNDNTEQPG NMS G TSSDSQELHDAMDKAYEKGVLLVAASGNDGNGKPN NMSLGDYYHSDALHDAVKYAYDNDVVII AASGNDNVSDPM NMS GGPQGSTALKAVVDKAVSQGIVVVAAAGNSGSSGVG NLSLGDSHDSNIMYEAIKYAYDQDVVLI AASGNDNVDTPM NMSLGGSTGSTTLKGASDNAYNSGIVVIAAAGNSGSNTDG NLSLGNYQPSSVLEEATRYADAHDVVLVAASGNDSTSQAS NLSGGLEVESKA EAALQYAASKGITIIAAAGNKHSNQPT NLSLGNYADSQFLHDAVKYAYDRDVLLVSAAGNDNTERPG NLSLGG SYTYAMDYATQYAKAKDVLIIAAAGNERSYELS NMS GGGGASQMMEDADNYAHEKGVVIVAAAGNEGRSSAS SLSLGGTEYSEALYEAIKKAYEKGILIVAAAGNDGDDTVL NLSVGNYTSSAALKEACRYAFDHNVVLVAASGNDATNQPS NMSLGGGGASHMIEEADKYAHSKGVVIIAAAGNEGRNSSS NMSLGGSGESKLMKEAIEYAHRKGVVIIAAAGNENTNGAS NMSLGGSSGSTALKQAVDNAYARGVVVVAAAGNSGSST $\square G$ NMSLGGGGESQVMKDAIDYAYDKGVVIIAAAGNSNQNAAS NMSLGMSQYSTALEDVCDEAYQEDILVVAAAGNDGPDTDN TMSLGGTSSSSTLQSACDNAYNKGVVLVGAAGNSGGAVI NMSFGSFYNDPAVQEKLLEAYDAGITTLVAASGNEETNVPA NLSLGGGAPNSDYLDALKYAADNGVVVAMASGNSSSSAPL NLSLGGTLASPALHEAVRYATERGVLVVAASGNAEGNAPN NMSLGGAGESNLMAEAIDYAYHKGVVLVAAAGNSNQNAAA S SLGATNGGTALQQAVQYAWNKGAVIVAAAGNDGNTRPN NLSLGGLGDSHIMSEAIKYANEKDVVIVAAAGNSNQNSAA NMSLGGGFPSDILDSAI QYAVESGVVVVAAAGNTGSNQKE NMSLGSPEPSRALQDAVDDAFNHDILVVAAAGNEGNNTVG NMS GGGGYNQSMDEAVQTAVAQGTIVVAASGNDGASSIS NMSLGGRSYNPVMHDAVKKAVAKGUVVVAASGNEYDSVPE NLSFGDVKVSTLFRDVLRFLWEKGITFVAAAGNEGQPQDY NLSLGGAGASQLMQEAIDYAYRKDVVIVAAAGNANKNAA SMSLGGPEDVPAMHEAI QKAVAQNILVICAAGNEGDDEYG NFSVGFDVKDEFRRQAIRYARTKGSFVVVSAGNNNDNCDN NMSFGLMPOSTALQEAIQNAYKKGVVIVASAGNSGAESV NIS GGTGKDDALLKGAVDYAVSKGCILISASGNLGFQGVN SMSLGGSAAPTALQTVCNLAWTRGLLIVAAAGNADPSNVG MSLGGGHSDSQAVNRLSEETGALFVIAAGNDGSEG STG MLSLSDPSYSKDMEDAVRYAEGKGVLLVAAAGNNG ERVS SMSLGGPSDDKDLHDAIK KAVSKNI QVVCAAGNEGDGDDG SMS GG PDSQPEHDAIDAAWNKGIVVVAAAGNSNTNSKS $N M S L G T S S D M Q S L E D A C N A A F A D G L L V V A A A G N S G N D T V E ~$
$S M S G G G P S D S S V L D A S Y W A Y Q Q G A V Q V V A A G N S G D D N V S ~$ SNSWGGKGYSITILAHTITAQDMSYGGIFFASAGNSHTDEI H NMSFGMPKVSDTLHEAI RTAHRQGITMVAAAGNQGNGNVD NLSLGSLKKSDDLRRDKKANKQGIVLVGASGNYGDNDSE ISMSLGGPADEKEHALI KEAVENNILVVCAAGNSGDDELD
 NMSHGGSQGSTTHYNAIKYAYNKGVVIVCAAGNDGRPLVS SMSLGGPPTSQAVNDLTAETGALFVVAAGNLGGNGKETVS NMSFSDERDNPQLKHSTKKADDSGIIVVASSKNSYGGTVG NLSLSSTGEEAAVTNAISYARGKGVVVVAAAGNGSGSPVS NMS GGGGYSQTMASAVEYARKKGVTVVAAAGNAGRPRVE NLSLGCDCDTQAMEDAVNYAWNKGSVVIAAAGNAGVSTQF NSSWGGKSENEFYRD\|LKKWRAVGILPVFSAGNGGEGSDG SMSLGGPQDDPALHKAVQEAVAANILVVCAAGNEGDGNDA NLSLGGEYPNGTLQKALEYASSKNVIVVMAAGNDGKSLPG NMSLGAEARYSS AAMQEAVAAGMLIVAAAGNESAANPN SMSLGGESESEAVAEAMETAHSAGHLLLSAAGNEGNNGMT NLS GCDCSTTTLQNAVNYAWNRGSVIVAAAGNDGVSTTF NMSLGGGGESRTMAYMMKYAADRGVTVVAASGNEYDSTVG
NLSFGGKGLAPEDDSAMOYASKGSFVVAAAGNDADVKD NLS GGY DTDPLEAEVNKLSAEKGVLFAIIAAGNEGPQSIGG NMSLGSNSPSSDILAALQYASSKGVIVVMAAGNDRDTLPG NLSLGGDGNDPVDQAVNRLTAQTGALFVIAAGNDGDGSVS NLSLGSNHSDEPTSRAVNNAMLDGVIVVVANGNSGPEMGT NMSLGGGSSNTTERNAMNNFNNSGMLLVAAAGNAGNTSFS NLSLGGAYSKYVDDADQYAYNKGVIVVAASGNSSTSTRH SMSLGGKAENTSLARAIDEAHSAGHLLLCAAGNEGNDGPT NNSWGNNNYNTEFYEGVEAWVAAGDFPLFSAGNSGPGADG NLSGGGEPPTERTAEALRFARDRGVVAVFASGNEGAARAT NMSLGGGGYTELMDDACAYAQNEGSLLVAAAGNDSGGSVS NLSLGQYEYDPYMEAATKKAEAKNIVVVSAAGNDGRNKL NUGGGPSSSYTEKA VRYAQEKGVLIVSSAGNDNTSYLS NMSFGASQPNRALYHAIKQASQAGIVLVASAGNSG GRLE NLSLGGPTHKDELYTVIKELHTLGVVIVAAAGNEGDGEIS
 NNSWGGGGFSQALYDAINAAGQAGALFIAAAGNSSANADI
$N L S L G G T D T D P L E A A V D K L S A E K G V L F A L A A G N E G D G A V G$
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200 YPAAYPEVLAVSATDSQKLKAAFSNYGDYIDVAAPGVSIA
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 TPGAADAALTVVABDKSDQLAGF
QYPAGYPGVIVVAALDYYGVAGF $Q Y P A G Y P G V I Q V A A D D Y Y G V A G F S S R S D$
$F P A S Y S S V I S V T S V D W D Q K I G K N A P R G$ YPAADPGVIAVAATDGSDAIASYSNAGGYVDVAAP GVAD
 TPASYP EA FA AV G A L D R K D D K I A K F

 YPATHDDVVAVTAMDEDDTLAAYSSVGEGVDLLAPGTDI R EPASYANVIAVGATDSSNRKASFSNWGTWVDVMAPGVDIAA FPASSEYAI SVGATNP LGMVADYSNYGDGLDVVAP GSKIA

 VGA P A T A A L GII S T GA D R A K I A A E F S S R G P K P D DV YP A S Y D A VV S V A A V N S S K NL A S F S Q R N S Q V E I S G P GV NV A






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UniRef90－A7VM14
UniRef90－UPIO0028A19E3
UniRef90＿LOJFG4
UniRef90 UPIOOO36AFEA1 UniRef90 K9TQT2 UniRef90－L9WBU6 UniRef90＿13R1U4 UniRef90＿B1YEX UniRef90＿UPI000185124F UniRef90－UPIO002E9AC27 UniRet90 X2GU21 UniRef90－D5EQJ9 UniRef90－BOJT18 UniRef90－K1VWL7 UniRef90－B21T99

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STYPGSTYASLNGTSMATPHVAGAAALVKQKNPSWSNVQ1 STYPSNQYAALSGTSMATPHVAGLAGLIRATNPKLTNVQV STYMHQYYATGSGTSQATPHAAAMFALLKQRDPGNTNVQL

  $S$ S $\quad$ S S S GY T S Y T G T S M A S P H V A GAAA A L I L S K N P N L T N S QV SNSGATVAGFMGTSMASPHVAGVAALIMSTGVK

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$S T V P G G T Y D Y Y Q Q T S$
$S T E K G G S Y R L S S G N S$ $S T Y P T G \quad Y R A M S G T S M A A$ $Q G D A G G \square Y A S F Q G T$
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RNHLKNTATSLGSTNDYGSGLVNAEAATR MNDMRKTAKDIGTDTYFGYGLI DVGKAVR
 $Y$ DVI T Q TA E DLGGRDSYYGHGEI NVTAALQ


 MDLMTKNAVDLGSDKYYGWGQVD IVKTLQ RQRLENTATPLGDSFYYGKGLINVQAA E K IL T K S S VDDLGWD DFY GY GRRVDAYRALQ RKIL E E S A K EVVENDNYYGS GQL DAEAA I K KEIL F NTATKLGNKREYGHGVVNDVNAL
 $L K V L K Q S A R V I Q D D N Y Y G A G Q L N A E A A D R$
 LAD RMN D TA A D E L G D P F Y Y G N G IVV N T T E A E W L LERTAT DLGEKGYYGNGLVNPVAALQ
 ETLI SASA
$R C I L S V A A D D P G R D G E Y G Y G R L N V L A A D Q$ L NVLK QSTRA IEDDNHYGAGQLDAGAAVQ RQI METTTADKVP GT GTYWNGRVNANKAVQ LSVLK Q S VRKVDPKNHYGVGQLDAGQAVK EYILKNTSKDLGES GYYAHGLVDPGEAL $K E R D D S A A E G I G N P E W Y G S G L L Q L L D A V$ $R Q I R R D T A Q E A G S F T Q Y G Y G G V$
EARLKSTARDAGPDPYYGAGVLDAANAL


LQVLTQSAQKVTEDNHYGAGYLNAGQAV Y A QL VR RT DPLGS PRAEGN GF L
E Y IL D K TA DD I GK DEETGYGGVNAKAADE $R S L L Q K N A V D L G R D A Y F G F G L V Q V D K$ S S KL QA WAKTLS GYNRQGS GL MQLA
 WNLLASTVDNLGWDPLYGYGRVNANAA Y A QLVKRTVPLGNSPKLGNGLV




RK HI A A T A D DI GF DHDS GWGRVNAEMAL
$R R I M V E S T D P V Q E N R S Y G$
Y S Y L L 1 H A I A L G S P N E E G N G Y $\square Q$
RSLLQRTADSIAFSG
Y A QL C $\square$ H T E NL G S K K E Q G N G M 1
RAA A ENTADKI S GTGTYWA GRVNAYKAVQ
Y A QL DKRTVPLGYERTSGNGLI DLLK
R T A L Q S T A K DLG WD K Y Y G Y GL V N A Y G A $\square$
 R K L L E NTAF DFGWD H DTGGYGLV KLDAALQ $R R V L Q T L A E S L G E E T V Y G K G U V$
E Q AI ESSAVDLGRDDDYGHGHVD
EKALYAGAVRVNRTDEYGHGLLNAQK
RSAI ENTANPI S GTGS FEHGLI D S E SAVVK E QII T S TAATPLK P N H A Y GY GKI N A Y N A V K K ERLDSHTVSLGNDRSEGHGLLKMHKTLE
RQIL AETS
ANILFTTATDVGAPGVYGRGLLNVEKALQ RSILTTETAETVLDTCAEGAGLVDAREAV RAAI ENTAVYMS GVGTY QHGLI NVNA SVR E A LL Q T S A E P LIN P N D WY GY G K V NVVAR AV $K$ G $A$ T G S T K G G K Y P F Q Q G S G R I QV D K A REDVTQSA
K A AL M T T A K P NR S LSVYYGAGRVDVGRAV KALIMNTAVKVGSHGEYGAGLVQGHDA
$R N V L N Q T A E R R G T S G R Y G W G I V R A K A A$
R WMME YT SMDYNGSQYHQNGAINAWDAVQ RKI L G E TA A T VLLGT CAE GDGGVVNARAA L K G HL ERT A R V E P P N D $\square \mathrm{Y}$ G S G I I N $\square \mathrm{H}$ Q A V ERILDETANP
R SHLHETAVD IG S GDEQGYGRVDAGNAV
R Q IL Q D T A EDIG S S DA Q GYGLV D
$R S K L Y A A A A K K T G D T H Y G T G R L N A$
$R Y L L E V T S R Q F N G D E Y \square G H G A!D A K D A L$
K Y Y F SKNALKLD F P NL VGNGLIQ
A QLVLDDSTKNPD
$K N T L M N T G D P L A S$
K GALTASA QPPYNPFQQGSGR $\square$ A VDR A $\square K$

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| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $N$ |  |  |  |  |  |  |
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Q WA 10 NA AKAWDKLLVPNRNVIVIAVVDS GIIDYQED LPKGVDLI GASK LDWEQGEKGRGVTIAVIDTGCDTHDE QYAPQQVRADQAWDTTMGSMDVTVAVVDQGVDYTHP

ADWGHAAI GVPDAWKVT KGKGARVAVLDTGCDSHRD EAMSWGVSRI GADARHVKNVTNEGDTVAVVDTGDYEHAF AEETPYGUTMVQAPEVSDANASNK KVCIMDTGYDMNSG QYAPKQVNADTAWDTTLGSSSVTIAVVDQGVKYDHP DK QWYLS R A QVMATNLWNLGYDGSGUTUAVIDTGUDASHP

LINLKDTWKRN KGAGVTVAVIDTGDDTHEE I NASAAWNVETGNRDLVVAVIDTGVDTHAD SAPWGLLDRI DQRDLLYTYTYTGSGVHVYVIDTGIRTHAB
 QGRPWSLQRLVFDQLWQDT KGKGVRVAVIDTGVRTHQE K GTPWSLQRVVLDQLW KDTKGKGVKVAVIDTGVDTVNA E E DE A N L R A I R V N K V W WE K N DT G S GI TVVGLI D Q G V D Y Q H P QYAPQ GAPEVWESGHTGEGVRVAVLDTGIDAHPD
SEDTEWNVPQINAPQAWSDGYTGKGVTVAVLDSGYDDHPD
 $D G V E W N D A Q V H A P E A W D L G Y D G T G T V V A S I D T G V W D H P A$ P WS L Q R V L M D E L WWK Q S T G K G V R RDQQWGLEALHTGRAW QTTKGEGITVAVLDTGGVDSHCD
 $V A Q I G A P T A W K A G Y T G K G V V I A V L D D G V D T H V D$ A Q I GTPEA WEA GLTGKGVTVAVLDS GVDAHPD
 QRDLT $K G T P W S L Q R V L L D Q L W Q D T K G G R P V K V A V I D D T G V D N T N R$ Q Y A L A K MRL P E A HAA L S V GA DV TI A V I D S GI DTHPAE E WNLLSNIHSDKNVGKTFERK VTI AI I DTGI NK T S E

## A D S VP

$A Q Y A L A K L R L P E A H R Q A N G E G V I V A V I$ Q NVP WGLYRIRRAPVWNEGYRGQGVVVAVVVDSADDHPE KQI RADLAWAA GYDGKGTRVAVVDEGVDNHPD K QIRADLA WA A GYDGKGTRVAVLDTGADABPD S QI LLK QAHAYTTGSPEIKIAVLDTGVDKKHQQ WGMYSAHCTHAWLHGEKGREVVVAVI DSGVADHYD WQ F Q K $\square$ G T NK T WD QVKNATTVGVAVLDSGVNTHPD S A GLLT GK DV TIA A V I D T G I HP H H S D RDQQWALDAMHTQEAW RTTKGAGITVAVLDTGVDDEHP

QWAMAKVQAEKAWGRTRGNRNVVVAVI



 Y P WGLDRIID QRERYE YVTP TS GVRVVYVIDTGI LT T H D N N Q WGII D Y N L Y S A WE ITRGG DV NI A IV D Q GI SK H Q D $V R Q Q G A D K A W E S$ G F D G T GVVKIA V L D T G V D T H E D WGLD RI DQD GAYEAPGAGQGVTAYILDTGI SAHSE
 $N$ NV WG LD R I D Q Q DL Y S Y E Y D G S GVVTAAYVI DTGVVRTMNE
 I GAPTAAWK S GITTGK DVVLI A D L D T G I D N H P D $N \square E W N \square S K V G A P Q V W E M G I D G A G T V V A S I D T G V Q W D H N$ SAPWGLARISHREKLNLGSAGKGVTAYVVDTGVNNHKD


Q WH H N NVNS QQAWD I TTGSSSVLVGVCDTGFDVNHN
 D NVE WN】S QVNAPEVWAKG DDGTGIVVANLDSGVDTHPA
 WGNDMVNAPEAWARGYTGQGVTVAVID DGVDDHQD K N A T WG LAARI SHRDRLRLSTAGEGVDVYVI DTGI N NHVE S S EKQWHL Q YLK AT QA HTLNQ GENVIVAVLDTGVSPBPD
 A E A E T WGIF E M F WA G GS QEVT P Q S DV T CV V D D GYDR GH D
$V P Q I G A D K A W A A G Y N G K G V K I A V L D T G V D T H P D$

QSVP Q V QAPAAWQRGLTGKGVTDAVLDTGGDPPGAE
 A A D T P WGLDRIDDLDGSYEPAGTGAGVTAYILDTGIDPHTE


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UniRef90 A4C3J1 UniRef90＿UPI0003683883 UniRef90＿UPI000362F7AC UniRef90＿C9Z1Z9 UniRef90＿UPI0002F2EEE8 UniRef90＿Q6CSH5 UniRef90＿A5E6E6
UniRef90 B5JIB8 UniRef90＿E8LXT0 UniRef90－TORM18 UniRef90＿V6JMS9 UniRef90＿UPIO00248CDAC UniRef90＿I2N655 UniRef90＿B4VA73 UniRef90＿I4GTZ7 UniRef90＿D8QAB1 UniRef90＿E8RZH8 UniRef90＿B1C687 UniRef90＿K0R2V3
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UniRef90＿Q2FLC3
L

 VDRQHGYDFVNNDRETSDDLSHGTAVASVIAAKDNYYS $\quad$ SA DNMVPGWNIYNGNDDAS DVHGHGTKVAGSAAAAANNIGSA $L K I V A A R D F T G S R S G S S D V N G H G S H C A G Q V L A A E N A V G M V$ LA GRY GMDYVDNDM＠P D D Q N GHGTHVA GTIV DCTP GL $\frac{1}{F}$ GDDGYGSHD T G D WF ND GHGHGTHVAGTIAAVNNNKGVV

 DKDVGWKDYVNGRSSPYDDNGHGTHV S S IAA GTGANGKYK
 LKANTWYDFANKD GDPMD GHAHGTHCAGVI GARHN GT GIIM
 $F A G R A D I A F D A V G D G R N D C N G H G T H V S A T V A G A S G G R K$ LK GAVDRSSGTDGDGTAD\｜VGHGTKVAGIIAARPSGTGFV QVVNGK D Y L L H A G G N GK T D K VVG H G T K V A G I I A A R K D GT G F I
 PGYDFA DSDS DPYPDAPSDEYHGTHVSGIAGGVTDN GTGT
 L R DK S GYDLVD H D A LPE D GHGHGTHVAGDAGATNN GLGVA
 L N DHVLY DYAENKRYADDTFGHGTHVTGILAAVNNGKG\A




 LA A NL WQ NPNPNSSQTCP GEHGHGTHVAGTVAAPVNGDGVV
 LNEN IWWNFANDTNAVVDGNGHGTHVAGTI GGVANGRMVV LIGRTTDYD YVTK STMVVVDED GHGTAVS GCIAAAANNGUGI S
 LKIVKGEYNAINVDEP』VDNDGHGTADAGIIAAKDNDKGVV

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 HE F NWFDATSTNASTPYD D $\square$ A H GTHVVTGTMVGSAN GSNQ F D GRAVWGKTIP K D D P D D GNGHGTHCAGTIGSVH
FEGRRAKWGTIPQGDEDEDGNGHGTHCAGTII GSNAY




 $L G G N L L K G A D G S S V G R S D S S G H G T G M A G G L A A C G R ~ G ~ G ~ S ~ A ~ Q ~$
 FTGKPGYDF GSNPSMANDGDGHGSHVAGTVAAATNGKGVA

 FA GRIT R S E NF S E A D T V V D HF GHGGTH V A G G I AA G S GAA S G GK D $\square$ DLA E EN G WA D F P N D YD P D G H G T HVVT GTIDAGGNAS G H S $\square$ $F G G R A S V G F D V T G G D G L D R Q G H G T H V A G T I$

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Y A V V D H G A QV ${ }^{1}$
,
 $G G I S N S S S L L S G R A L S$


GMAP GA K V VGV K V
 GI A P E A E L L V I K V D A E G N F L L R A S D L V F G L A Y A I E A D A D V V KFLDSGSGET DDA SS DYAVANGAK L
 GI A K S A S L HAVVRVLNCEGSGTTAGVVAGVDWVTEHHQSPV



 $G T C P A C R L M P V R V L N N D G S G T Q V E V A D G \square L W A A E H G A Q V I$
G $\mathrm{L} A \mathrm{P}$ G A E W
 GVVA WN C K L L P V K A F GP G GE G DT K A V T D S L L WA VE Q N V D V I $G V A P G A K L L D L K V F G A T N E S D A Q A L R Y C V T W R G P N N E R V V$






 $G V A P E A K L M V L R G L G Y F G G G T N Y M L V R A L K Y A A D C G A K V V$ GVA P GADLL $\operatorname{L}$ V GKVVL NDSGS GDSSWI I A GMQWAVDQKA DVV


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G $V$ A P K A H L FDI SNSSLISSSPTSQMRRANA I MRAWQA GA DII


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UniRef90 UPIO00471AE8E UniRef90_F2JJD4 UniRef90_LOIBA6 UniRef90_UPI00046806BF UniRef90 Q0AHS8 UniRef90_UPI00016C5853 UniRef90_C6LL79 UniRef90_UPI000364C7B7 UniRef90 MOIL69 UniRef90_UPI0003466B6F UniRef90_L1NU12 UniRef90 G0HMR6 UniRef90-V5MIH4 UniRef90-R6VPE2 UniRef90- F2NN22 UniRef90_UPI0003819829 UniRef90_H8MRH1 UniRef90 UPI000362CC6B UniRef90_UPI00035DC442 UniRef90_UPI0003B765BA UniRef90 IOV0P6 UniRef90 J3A1Q9 UniRef90_UPI00036322B7 UniRef90_UPI000409123E UniRef90_UPI000478648C UniRef90_W8QZB2 UniRef90_N0D5C8 UniRef90 R4G015 UniRef90- G2N9I9 UniRef90-X0SMY8 UniRef90_UPI000471B274 UniRef90_UPI00036EEDF6 UniRef90_D6EEK1 UniRef90_IOUFG7 UniRef90_UPI00039DBECE UniRef90_Q9KBJ7 UniRef90_D9WB64 UniRef90_K8PUD8 UniRef90_D3EQS0 UniRef90_UPI000368F8EE UniRef90_B0VIM7 UniRef90_Q3SQE1 UniRef90_E8PKE0 UniRef90_UPI00041B2474 UniRef90-L8JZD9 UniRef90_U6H316 UniRef90_H6LE81 UniRef90_A0A024QEH0 UniRef90_L1KJ12 UniRef90 C3HVI2 UniRef90-W5X7M6 UniRef90_F8RGS6 UniRef90_UPI000377CD4C UniRef90_UPI0003624CE1 UniRef90_B4V525 UniRef90_W5WZA5 UniRef90_L8GLP0 UniRef90_R6DML4 UniRef90_UPI00031C8978 UniRef90_G2NBA7 UniRef90_M4ZX18 UniRef90_S2XTN8 UniRef90_A4C3J1 UniRef90_UPI0003683883 UniRef90_UPI000362F7AC UniRef90_C9Z1Z9 UniRef90_UPI0002F2EEE8 UniRef90_Q6CSH5 UniRef90_A5E6E6 UniRef90-B5JIB8 UniRef90_E8LXT0 UniRef90_TORM18 UniRef90_V6JMS9 UniRef90_UPIO00248CDAC UniRef90_I2N655 UniRef90_B4VA73 UniRef90_I4GTZ7 UniRef90_D8QAB1 UniRef90_E8RZH8 UniRef90_B1C687 UniRef90_K0R2V3 UniRef90_UPI00036C48DD UniRef90_QOILC0 UniRef90_H5X5L0 UniRef90_U1R6A0 UniRef90_S5AS21 UniRef90_D2Q151 UniRef90_LOJKI5 UniRef90_K1EM20 UniRef90_MOPFQ4
UniRef90_Q2FLC3
$N L S L G G T Q Y S Q V V A D A|V| T Y A W E H G V V V V A A A G N D \quad S G P \mid V$ SLS L G GEADNEMLHEAI REA DRHNILVVCAAANENADGLP
 $N$ ISYE GAA GSLTV QSAANYMRSKGGVVVVAAGNSSGY S MS LGGPSEDARI RAAADAARARGVLVI AAAGNEGPGTVG $N L S L G N K G Q S R T V D N A V L Y A D N R G C T V V A A A G N D N W V E D C$ S M S L G G S G S S Q A E G GAF QQ AL DA GULS I A A A GNS GNSNK S
 QLS L L V L LK $N$ N S WG GGGGF S QA L Y Q A V N NA WDAGVVVCVAA GNS GPDTVG
 S NS WGGGEYSEALKES IENARDKGVLFVAAAGNSRMNNDS
 ANMSLLGGGVDA ALDDAVRRSDALGVTYVLAAGNENQDACK $N I S Q D T A K P D S E L G R A V R E A L K N D I V V V A S A G N D G L T A A T$ $N$ I S QDTASKMDPAVDAEFQSADRFV AAAGND GADGKVKET
 NLS L GGGGYTSTMKNAVTYATNQGSLVVAAAGNNGTGSVG VNMSLGGGPADAADNDVSASTGTMFVVAAGNDGEYGTTGVG NNSWG GSPNNDWFRPMVQAWRSAGIVPDFSVGNA GPGTAS

 NLS SAA GQ GETEVVLKAVI E EAVVR GVVVVAAA GNSHPT TND $N L S L G D D S E S A H P E P S E D A A V Q K G V S V V A S A G N S G D D R P S$
 NMSLGGGPEHDPELHKAVQEAVLSDILVVCAAGNEGDFNFS $N L S L G G M D T D A L E A A V N K L S A T K G V L F A I A A G N E G S G A V G$
 $A N M S L G G G A S S A L D S A V N N A \square A A G V T F S D A A G N S N A N A C N$ SMSLGGGQAQEDPMVRDVEEAWNAGITVCVAAGNSGPDAQT $N D S Q D T V K P N N N L Q R A V Q N A L K A N V V V V A S A G N D G L D G K T$ NMSFAGPHDPAMERGLAAAAAKGUVLVAAAGNAGAKSPPD


 NNSWGS GARSKAFLDVLEYGTRKGVVVYVFSSGNSYRTGNR SMS LGGSATPTDCTTDPMSMAAEEFGFVVAAGNA GPA LNTVS
 $N M S Y G G Y T Y$ D P L L E A T A I N Y A K D H G KI LVAA S GNE G DP S D S S LS LGA Q A FESFRRDDPVVEAWHEGVVVCAAAGNSGPEQTT
 SASWGSRTAAAP LVEAVKRADDRGVI FIIAAAANDGKNNDK SLSLGGAEAYDDPLTQATQKA WHSGLVVCAAA GNDGPSRST

 SMSSLGGAWPSAAQRDAVAKADRAGVTVVAAS GNDGTN RVVS SNSWHS GT E Y TA I N E A V V K D A V G K G CVVVIVFA S G N D Y R S S V S
 VNASLGGPSSSAVDDAFDALVKQGTLPVVAAGNENQDACD NMSFA GPKDAVIERRADAAVAAKDVVMVAAAGNAGAKSPPG N NSWGGPGLDEWYRDVVREWRNAGI FPTFAVVGGGPGSVA ANMSLGGGGVSQATDDAVNNAVASGVNFVVAAGNDNSNACN N IIS QDTTTSPN S DLAAAAVVQEARRHKNVVVVASAGND GLDDGD T
 $N N S W G G G A G D E W F R P M V Q T W R A A E I$ FPEFSAGNGGPGSIA ANMSLGGGKSPALDLAVNAAVKAGVHFAVAAGNENQDACN A NMSLGGGGKSPALDLAVNAAVKAGLHFAVAAGNENQDACN SNSWGGGAFS QSLYDA I SEAEANGVAFVAAAGNAAS DDDK $N L S Y G G \square Q Y$ ETINAAAQY LIRDRNGLLDFMSAGNSGQEHAD NNSWGAMK ES LIMMK E FMDNAGKK GVVVVAAAGNSYKD DDV $N L S L G D D S E S A H P E P G E D A A V Q A A V V A S A G N G G E K G D R I S$ N NSWG GA GLDEWFRPMVRAWRDAQI FPEFSA GNGGP GSVA NMSLGGPE LDPVEEAVNRYSAEKGVLFAVAAGNPGHDGI A S M S L G D D S ES A A E D E A V Q Y A L A K GVVVVVA SA GN S G G D P V S NMSLGGWTDSTA LLRDALAYAASRNVIVTVSAAGNSSLDSSPG ANMSLGGGKSRALDDAVNRAVDAGLHFAVAAGNDNRAACS
 S M S L G G S G S T NLME S A CEAAAYD D GV LVVIA A A GN D GPS E S Y NMS L G GCSDLPLWQDAVNKAGAKGSIIVAAAGNENEDASG $N L S L G G D P L E A Q V N K L S K E K G V L G A I A A G N D G D F G E Q T D G$ A NMSLGGS A D D AL DTAVVRGADEAGVTFGVAAGNESTDA GT $N$ L S G GPGDAD DLVAASADAATAS GVAVIVAAGNGGEYGGGL
 ANMSLDGGSK DPA LDDNAAS GLVDDS GVVTVSVAA GNESQDAAN
UniRef90_UPI000471AE8E UniRef90-F2JJD4
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UniRef90 V5MIH4 UniRef90-R6VPE2 UniRef90-TODHW5 UniRef90-F2NN22 UniRef90-UPIOOO3819829 UniRef90-H8MRH1 UniRef90-UPI000362CC6B UniRef90 UPIOOO35DC4B UniRef90-UPIo003B765BA UniRef90_IOVOP6 UniRef90- J3A1Q9 UniRef90_UP100036322B7 UniRef90-UPIO00409123E UniRef90_UPIO00478648C UniRef90_W8QZB2 UniRef90-NoD5C8 UniRef90-R4G015 UniRef90-G2N919 UniRef90-XoSMY8 UniRef90_UPIOOO471B274 UniRef90-UPIOOO36EEDF6 UniRef90-D6EEK1 UniR Ref90-louFG7 UniRef90-UPIO0039DBECE UniRef90_O9KBJ7 UniRef90-D9WB64
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UniRef90 B5JIB8 UniRef90-E8LXT0 UniRef90-TORM18 UniRef90-V6JMS9 UniRef90-UPIOOO248CDAC UniRef90_12N655 UniRef90_B4VA73
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SYAALP SYPADYDECLSVGSVDYGNLNKQMKRERHLDLVAPGVGLL YPAAYDNCMAVSALDENEQUANFSNVGPKLNVAAPGANVL SYAPSDALIVASATGSNDTRASWSSYGPAVDVAAPGASI Y YPGGSPGVICVAADDSARATASFSSRGRQVVVAAPGVNI R SUVNDDKCIVVSSVDSNLQKAWDSNWGSSIDFAAPGVNIV YPASYDAVMSVAAVDSSEKVASFSQYNNQVEVAAPGVSVK
YPAAYSECLAVSALDPDETLASYSNYGSKLDLAABGTNVL
 YPSSNEYVIAVGGIDRNNRRAPFSNYGNNDSVVAPGIDI
SPAAASKVITVGAAVDKYDVITDFSSRGPTADVVAPGNWI T YPAAYSNILSVASUTNKGSLSSFSNYGTSVDVAAPGTDIL YPAADENVIGVGALDSDWELAAYSNYGDNSDVVAPGS VVY KSPARVSEAITVAATDSTDRASFSNYGSCVDLFAPGVNIT TPGAAAAALTVGAVDSDDNDASFSSRGPRLGDGAPGVEIA YPAAYPGVLAVAASDRNDERAPFSQTGDFVGVAAPGVDMV YPAAYPGVLAVAASDRNNARAPFSQSGPFVGVAAPGIDMV NPGSMPGVLSVGAVNNTGDLADFSRRGPSPDLVAPGVQQR YPAAYSECLAVGALDPDESLADYSQYGSEDELAAPGTNVT APALANSALAVGAVDGDDELAAFSSRGPKPD:TAPGVGUV
 NPANYQEAFATGATDHDNKLGSFSLQGPSPD AAPGVNGR
$Y P A S Y E G V L A V A S S D R N N E A Y F S G G G F V G A A P G V D M I ~$ YPASYEGVLAVASSDRNNERAYFSQGGGFVGVAAPGVDMI YPAAYPGVIAVAAVDKYGTHAAFSTRRWYATVSAPGVDIV
YPASSDYTVAVAATD YPGAYPEVVSVGATGGDGKFPCFPNTNDEVDVVAPGVNIL
 YSPARVGSADTVGSTTSSDRSSFSNYGSCLDLEAPGSSIT YPAAYDGVLAVGASDRNNERAPFSQSGDFVDVAAPGVEMV YPAADRNVIAVTAMDQSDKLFAQSNRGSYVALSAPGVDUL
 HPAAAAQVIAVSATDADDRLIFPASNRGSHVAVAAPGVDIF PSYPVPGVIGVGATSNDNRRAGFSNAGPYVTVAAPGAADL SPGCAPGVLTVGAVDRDDSTARFSSRGPALGGAAPGVEIS
$\frac{1}{Y}$
YPAKFANVISVGAIDSNLQRASFSSTG KMDFTAPGVNDL
TSTPGSADDQNTVTRSDAVISKFSSRGPTVDVYAPGSNAD

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YPSSDPDVISVGATNNDNLRASFSNYGVGLELVAPGEHI Y
SPGSADSALTVGAVDKDDKLAPFSSTGPRVDVTAPGVAI T

| PAANPNVIAVSATDTRDQLLTASNRGNYDALAAPGADIF |
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YSPARAANAITVGSTTSNDRSSFSNYGNCLDIYAPGSNIK

NPANYPEAYATGATDDNDKVGSFSLRGPSPDUSAPGVNIR
TSPAAAENAETVGASTSDERAYFSNWGKCVDIFGPGLN:

APAYPANVVSVASVDRRGDLSVFSNYGPNVDVSAPGSSIL SPDYPASFITVAAYSPEDRMTGFSCWGPTVHTAAPGRNI NPANYPEAFATGATDDNKNLADFSLLGPSPYVSAPGVNIR TPASAEAALTIGAVDHGDKLADLSARGPEPDVTAPGVNVT YPAAYPGVIAVAAVDRRGRKAAFSTRNWYATVSAPGVDVV TPARYAYGFSVGAVNSNRTDASFSNNSSMQHVMAPGVNVY YSPAAAEAVTVGASTFSDERAYFSNHGKCVDVFGPGLNIK YPAVEESVIAVGGDDRTGNHAADSVAGPEDDVVAPAVDIY YPNSYSVVALQYDSNGNPTRAKYSDYNEYKDIAAPGSNI N FPASCSGVITVGATETRGYRSPYSNYGARIDVMAPGGDTS

TPGNLYEAMAAGANNEAGEDASFSSGYYVPDYAAPGVAVK SPAAADDALAVGNLKRDGSLNESSCRGPDIVAAKAADAVI SPGNSYDAIAVGATDRYESVTSFSSGYVVPDVVAPGASVT


## UniRef90 UPIO00471AE8E UniRef90－F2JJD4

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K8PUD8 UniRef90－D3EQSO UniRef90＿UPIooo368F8EE UniRef90－BOVIM7 UniRet90－Q3SQE1 UniRet90＿E8PKE0 UniRef90－UPIOO041B2474 UniRef90－L8JZD9 UniRef90－U6H316 UniRef90－H6LE81
UniRef90－AOAO24QEH0 UniRef90－L1KJ12 UniRef90－C3HVI2 UniRef90－W5X7M6 UniRef90－F8RGS6 UniRef90－UP1000377CD4C UniRef90－UPIoo03624CE1 UniRef90 B4V525
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W5WZA5 UniRef90－W5WZA5 UniRef90－R6DML4 UniRet90－UPI00031C8978 UniRef90－G2NBA7 UniRef90＿M4ZX18 UniRet90－S2XTN8 UniRef90－A4C3J1 UniRef90 UPIOOO3683883 UniRef90－UP10003 UniRef90－UPIO002F2EEE8 UniRef90－Q6CSH5 UniRef90－A5E6E6 UniRef90－B5JIB8
UniRefo－ 8 I XTO UniRef90－TORM18 UniRef90－V6JMS9 UniRef90－UPIOOO248CDAC UniRef90＿I2N655 UniRef90－B4VA73 UniReftol－14GTZ7 UniRef90－D8QAB1 UniRef90－E8RZH8 UniRef90－B1C687 UniRef90－UPIO0036C48DD UniRef90－QOILCO UniRef90－H5X5LO UniRef90－U1R6A0 UniRef90－S5AS21 UniRet90－D2Q151 UniRef90－LOJK15 UniRet90－K1EM20 UniRef90－MOPFQ4
UniRef90＿Q2FLCB
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TTDWPGYKTVSGTSMAAPR20
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 STYLDGTYAKMSGTSMAVPHVTGALALLMEFGRKLTESEM
 TTTAGGGYGSVSGTSESSPTVAATAALMFSANPDLAPADV


A STVPKGGOCVDNGT

 A A RAGGSYQGMSGTSMAAPHVAGSAALVAQARPEWKADRL T T E A R G S Y E QLLS GT S MAT PVV S GVVAGL ALA Q W D L N N A E L


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S Y T NPPYAKLSGGT
A A S A PGGY LTI DGTSMA






TTTYDGGYAYANGTSFACPYVAGVAALVISASPELTGEEVV AAAAPGGYDQDDGTSMATPHVAGAAAI LKQRHPDWKSAEL


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UniRef90-G2NKV0 UniRef90_G2NKV0 UniRef90-D7C6D6 UniRef90_G8N8F6 UniRef90_J2IHN7 UniRef90_O13464 UniRef90_W4YIL5 UniRef90_Q647R6 UniRef90-D9SVR0 UniRef90_F8DAS6
UniRef90 S3FGX9 UniRef90_J4KP23 UniRef90_W4F8J2
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 $R A Q Q W A L Q A V H A Q Q A W R T T K G E G V T V A V L D T G V D A N H P$
 LP WGLDRID QRSVYTYTAT GKGVNAYVIDSGIDTHPQ G L $V A Q \quad G A P E V W A G G D T G Q G V D V A V L D T G I D A H P D$
 A P WGL S RI SHREALSLGNAGDGVTAYVI DTGIINNHK K D
$\mathrm{D} \mathrm{A}^{\mathrm{T}} \mathrm{W}$
T V P


NATWG DR
A SWGID DRNLYTYNTTASNVTAYIIDTGIRTHSE
S S E WQFERI GA DKTWNVVDNP QTVVVVAVI DTGGVNTHPD
VS QI GAPTAWSAGLT GTGVTVAVLDTGVDTHPD
$S P T W G \square D R Q G A P T A W Q A G Y T G K G V T V A V L D S G V D T H P D$

 ASAVPWGLDRIDDQDDSYTTQA
$T G K G V T I A V I$
NTTYGLDQTNAPDVWDDHDTGEGAEIAILDTGVMPPDHP $R G A P W G L A R I S T R D R Y D A D T A G E G V K V Y V I D T G I D K H V D$
 H T S E L T G N G V R V $A$ A $V L$ R DK Q WH LDA L D $\square$ GKAHR $\square$ T R GA GVVTVALI DTGVAA HRD K SAP WGLARTSHRAKLTDNQGGEGVDAYVI DTGINQHVE
 A Q S TE WGSNFMVIDN YRRTRGYT GA GVVKVGII DS GCANHED
 $K E T P W S L Q R L L T K Q M W A Y G \quad K G E G V K V A V I D T G V D A Q D K$


$\square$ $N M T$ LT GK GVVTVAVV
WN D D Q S A Y TATDDGSAVHAYVI DTGIRTHSE

QWH LPK IQAP TSWSSS KADNTVI AI LDTGVDSSHS
S S Q Y Y V H QI GT DLA WS K TR GAS DIVVALI DS SADNMMD



A $\square$ S Q A WGL K K S D A A R A WS VT K G S R D V V I A V I D T G I D K H E D
E D T P WGLS R G Q D QL Y Y Y DATSSGNV T A YVL DTGGMS HE Q Q Y Y T WGCQDMGMMDQLA DYHARQQQSATVVAVVDDGGVDPAABA
 RTVVWNLDRLD QD DKYEPA GTGE GAHI Y SI GTGGI R SHKE



 TRKKAIVAAL WGID DI D NS SYTYPNDGKGGVTVSV R S K Q WH L


I K A L D A WQ T T T G D H S V I I G V I D S G M D Y N H P
K NAP WG L A RI SHRRRGSNEYGGK GACVVVIDTGVDDHPE QV T W G L SYPWYFNNLQVPELWKLS TGGSGVTVAII GS GIIDSSHE
 $P W H H V L T Q V D K L H A E G L S G N G I D I A L V D D G V D T H P A$

 LA GSVLDGTDF GADGRTDRSGHGTGMAGLIAAHGNGNNGA LA GVVVGKANFTD DPDNTADVGGHGTHVAATIASRHAKY LK G QV LP GK D GAER GDRP WARHGTAMA GII A GSGH GA GVL L D G NV L P D K D GA GPGDRTWARHGTAMA GII A GHGHGD GVV $L L K R V V A S R S F V E G E V V D R N G H G T H T S S T V A G T G A A S G G K$ $F G V R A Q A G F D A F G G N G E D C N G H G S H V A G T V G G T$ $D Q V E P E R D L V G F G A G P G D W A R H G T G M A S I I A G H G H G D G V L$ LDGKHFMDFVGGKETCYDDNGHGTHVCGILSAAD
1 G ND GYGSNDT GNWYNDGNGHGTHVAGTIAADGGNGQGV FGGR 1 A WA APSF G GD GADCNGHGTHVVSTI G S K L H



$F G G R A T T D T V G G G Q N G Q D C Q G H G T H V A G T V$

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UniRef90 S3FGX9 UniRef90_J4KP23 UniRef90-W4F8J2
UniRef90_A3LY46
 GI A P D A KVLP $\square R V L D R G R \quad R N A E V G P A I D Y A V K K G A K V I$

 GVAPGADLIVGKVLGDDNTGYNSGIIAGMEWAARTEHAKV $G V A K G V S G V A V R V L D C N G S G S W S G V V A G M D W V A S N G S N S V$

 GVAK GVNLRGVRVLDCNGEGSGSDVIAAVNWVRTNAVKPV $G V A P E A E L L H G L V L$ R GTS GS FA QIVAGVEWALDASEADVI GVAPGAA L H G G KV L D N D G S G Q N S WI L A GME WA AR D Q H A KV


 GVASEAN L L I YK V CR NDGTC WA D DV AA GLDYATAAKA DII $G V A P D A D L V V G R V L N S G G Q G Q E S W I L A G M E W A A Q R A P V V N$ $G V A K G V K L V A V R V L D C N G S G T T A G V I A G V D W V T A N A V V P V$
 $G V A P D A T L L D G K V C Q D V G C P E S A I L A G M Q W A A V D K R A D V V$ GI A F R S K L L P L K V F TVVYGSAD DA GYA EAMD YA WQH GA DV I GI ANGATLLDGKI FDDDGMSRDSWIIAGMQWAADQAAKIV $G V A K N V N V G V R V L N C S G S G S N S G V I A G 1 D W V K N N A S P S V$ GI A Y E A EVVFVGKVLTNSGSSTGAGVLAGLNWAIANRCEVI




 GI A K K A KLI A V K VLLGS DGS GSTSDVI A GVQWAARQHK GSV


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


 $G V A K Q A E L V A V K V L G S N G S G T M S D V I A G V L W A A E Q A D V D V$

 GVAK K V Q L V A V RV L G C D G G G S I S DV I D GV D WV T E H A I K P V
 GVAWNAQILPVRI SNSDGAAYFSDIARGLNWAANQGADVA GLAPNVRYHFYNVFYGKNSKYTVSWTVAVDTAVAKGANLI
 GVAAPDA E GVAPKAKWIACK GLDCA QFLLDPHNNDGKKCDTSKAPBVI



 GVAKKVSLLAVRVFTCGGYSQTKHIMAGFDYDAEHGKKGP GI A S G A T L V S L R V LDD E GE G R L S G I I Q A I N Y V A Q N GK DV V


 GVAPEADLLAGGVL $\quad$ GGNATLRTLI EGI SWSIEN GADVI $G V A K N V K M V A V R V L N C S G S G Q W S Q V I G G I D W A R N H S ~ G P S V$
 GVVA K K A
 GFAPDTEI YAFRVFTDAQVSYTSWFLDAFNYAIATNMDVL

 GI A Y D S KLLLSVKVVVK K D S LLEE SVVLAK GVRWAAD N GA KI $G V A P D A T L L H G A V M T D C E G G R S S T G L A G M E W A L E E D A D V I$ GLAPNVRYHFYNVFYGKNSEFTDSWTVAVDLAVTKAANII GVAPNATLAAYRVLNCNSVGEEDDVVAGWLKAFEDGAQLI


UniRef90 Q39WE2 UniRef90-U5WDY2 UniRefefo-KOJPV1 UniRef90-H2JLS2 UniRef90-UPI00037F3FCF UniRef90-U5BPU1 UniRef90-UPI000372FB54 UniRef90-C4ZBE5 UniRef90-U1L4S1 UniRef90-UPIo003827F26 UniRef90 - M0C2D7 UniRef90-UPIO004664273 UniRef90- B81I52
UniRef90_D9X388 UniRef90-W1 QEH5 UniRef90-B9WBX7 UniRef90_UPI00037F0199 UniRef90- H 5 XHX 2 UniRef90-UPIOOO3603844 UniRef90-UPIOOO2654244 UniRef90_H6LD76 UniRef90-A4XB86 UniRef90-H1 XU20 UniRef90-UPIOOO47D7047 UniRef90-Q12OH2 UniRef90-G4F321 UniRef90-UPIO004762135 UniRef90-UPI00034AACDB UniRef90-A6CK80 UniRef90_D3T2A8 UniRef90-D2JB38 UniRef90-A0A024TB7 UniRef90-C1D454 UniRet90_R4LHM4 UniRet90_V5NDN0 UniReffo-UPIOOO34647B6 UniRef90-A0A059EWS5 UniRef90_U1K646 UniRef90_M8D9S0 UniReffo-B2CJ59 UniRef90-U5MVZO UniRef9-LEETYO UniRef90-U9YOLO UniRef90-E6R505 UniRef90-11D5S0
UniRef90
B7G7C6 UniRef90_B7G7C6
UniRef90 UPIO003 UniRef90-G8SAL8 UniRef90-G5SR11 UniRef90-K2EB26 UniRef90-UPIO003452876 UniRef90-UPI000479B26E UniRef90-DOLHY2 UniRef90-V4HUH6 UniRef90-M2YUG5 UniRef90_W4FBD4 UniRef90-A5ZAA6 UniRef90-A0A024F7M4 UniRef90_V8G6F4 UniRef90-H2ARF1 UniRef90-D2B7VO UniRef90-R5BQ15 UniRef90_W5JMA7 UniRef90-UPIOOO34AE337 UniRef90-F1T106 UniRef90_UPIO001CBB281 UniRef90-UPIOOO365AOFE UniRef90 C8VUL6 UniRef90-H1QK40 UniRef90-G3AKH9 UniRef90-FOM452 UniRef90-UPIOOO476D332 UniRef90_K1WDW8 UniRef90_S3BQEO UniRef90-G2NKVO UniRet90-K6AXE9 UniRef90-D7C6D6 UniRef90-G8N8F6 UniRef90-J21HN7 UniRef90-M1BH12 UniRef90-O13464
UniRef90 W4YIL5 UniRef90-Q647R6 UniRet90-D9SVRO UniRef90-F8DAS6
UniRet90 - S3FGX9 UniRef90-S3FGX9 UniRef90_W4F8J2 UniRef90_A3LY46

NNSWGGGGYSRALYDTNQR ATMDTPS NLSLGGSDDPATLSAVEEAKAADVVIIASAGNKPAEFDVI NLSGDDSASAHPEPAEDAAVQYVVVASAGNGGDKGDRVS NLSLGDDSNSPGEDEAVQYALKKGVVVVASAGNGGDDHVS INMSLGTAAWHTQDDPVSQAVNKGALFVIAAGNAGNSPYS ANMSLGGGASQTIDDAVGRMYDAGDPVIVAAGNGDSACNY NMSLGDDSESAHPEPREDAADQYAVVASAGNGGLKGNRVS NFSVGYDPCSDTAERDIDELWDMGVVVVAAAGNYGPAPFS SMSLGGSGQSSAERQAFANSYAQGMLHIAAAGNDGNSSMS ANLSLGGSKSAALNTAVENLSRSKVFTVVSAGNDNVDSCV VSMSLGGEPSEAVNRLSEETGALFVIAAGNSGPEPYSVGA SMSLGSVELTAEVPPPYTRALSRGIPVVTADGNSGSQTTG ANMSLGGGADPALDEAVKKAVAAGVTFGVAAGNDSSDAGQ ANMSLGGGKSPALDMAVNAAVKAGLHFAVAAGNDNADACN
 SVGLGG NDDDF LMK DAID NAAKKNILIVASAGNDGPGS DD MSLGSSWPDSLAVDRLTEETGTLFVVSSSNFGPQ ESSVT ANMSLGGGANASLDDAVKRSTAKGVSYAVAAGNGNNACNY VSMSLGGAESESVDDAIRAMINAGISVSVSGGNDDFSSCR NMSFGGYLVSSALRTAIENAASAGKVLVAAAGNEGANADY NMSWGGWDSDPLEAVGALIAQTGALFVVSAGNAGGDGTV NLSWGMNPDEDAVNTASAQKGTKFVVAAGNDGLGGGGTVG ANMSLGGGASQATDDAVNAAVAAGISFVVAAGNDNSNACN SMSLGSQSPVQAAYTHAGEAALRNGCLIIAAAGNSATNTG ANMSLGGPASQAVDDAVNNLADSGVFVAVAAGNEGQNANN ANLSLGGPASQAVDDAVNALLSDSGVFVAVAAGNESQDANN SMSLGSAAQSDPMVK VEKAWASG』VVCVAAGNEGPDAGT

 A N M SLGGGGK S P S L D A TVVNGAVVAGVV FAVAA GNDNK DACN NNSWG DVVT RSNSYQA SVNA WVRAA GVI PVVVAAGNS G S S V V SMSLGGSSFSARYETIASRLLDRGILLVAAAGNDSARPHY NMSFGGSDDADLHDAIRSAQAADIVLVASSGNDGGRGGD ANMSLGGGKSPSLDLAVNRAADAGLHFAVAAGNDDRDACD NMSLGLSYYEPLFAEVLDDLVNYGU DPVVADGNENHGNTS | VNMSVGGLRSKAMEFTIDYANKLGILFSVAAGNDHDDACE |
| :--- |
| $N N S W G G G G S O A L S D A I T A S E N A D I F V A A G N S A V D N D V$ | NCSFSGDLYDPALEAAFRNAHDHNVLFICSAGNNPNDSVG ANMSLGGGKTSALDAAVNAAVKVGIHFAVAAGNDNADACD NDNGVQDTVADSLLKKCYDANIICVTNGGGWVIGPQHKSI N $\square \mathrm{SQGTAADPPTLRQAVDKAEQAGVLIVASAGNGGADGYP}$ NNSWGGGAYSDALKAAIETAGDAGILFVVAAGNAGSDGDA WGPPDGLIYKAMLKGIKDGRGGKGSLFVFASGNGGANDDN ANMSLGGGKAKTLDDAVNAAVEAGLHFAVAAGNDNKDACN ANMSLGGGVSTAVDDAVRRS 1 AAGVTYAVAAGNDANACNT MNLSLGGGFSPALNSAINSAADSGVVVVVAAGNSNEDACN SMSLLGSDAEEDPVVKAVNAAWDAGIVVCVAAGNSGPDAQT

 NNSWGDRAHSALLEEAI HDAMNEGIVTFASGNHNSDNYPA
 NLSLGGDDYDSRLATSTKRARAKGVIIVASSGNDGQRKTT ANMSLGGGFSQAVNDAVEAAVAAGIPFAVASGNSNADSCG SMSLGGSGSSTAERNAFDQSYQRGMLHIAAAGNGGNSALS NLSLAGHEDFAVIRDAVAYAVARDALVVAAAGNTQRDAPS NGSFGYPTTNFYLED\|ITKWRAAGII PVFADGNHGYKGCT NMSFGSSAHSALIENALQDAFGSCVLVAAAGNESTPTADC NYSGGGTEFSQEEHDALAEAEKKGILFVAAAGNERSNSDQ
 NFSMGQPETDPVEQAVNTLSAETGTLFFVAAGNDGGRRPV NMSLGGPAGHNWEQMLIGEAVQQGITVVVSAGNGDDTAGV NLSIGGPDFDQPFVDKVLELSANRVIMVSADGNDGPGTLN ANLSLGGPESPALDEAVNALADSGVFVAVAAGNEGQDAGN NCSFGASNYNPALSDEMK STGULFVCAAGNNGSAEPI IQMPFLGARSNVTDGGVNDFKLGFLSIAPAGNNQGNGCF NLSLGGESTSSTLDAAITRAANLGILFAIAAGNDGKNADN ANMSLGGGKSKTLEDAVNAGVEAGVHFAVAAGNDNADACS ANMSIGGDPNSSVDQAVQGLINAGVTTVVAAGNNNRDACT LINSIGGGDSQAFDQAVNTAAKAGIHVVVSAGNEHQDACN SMSLGGFSRQRAYSEAVRYATDRNVIVVASAGNSNRDAAG NMSLGMSYYEPLFAQVFDMLTNYDVLPVVAVGNENHGNTS ANMSLGGGASTSVDNAVQGAINSGVTFAVAAGNDSRDACS NTSLGRRNNSQSVTEAVKYALEKGVLIFAAVGNTGDNSVE ISNSWGGSVADAITSAINNARTNGCVVVFAAGNSGS SVS ANMSLGGGVDDALDAAVQKADDSGVTFGVAAGNESTDAGQ NNSWGGGGFSETLRAAIQSGGDAGILFIAAAGNAGRDADV NLSIGGPDYDLPFVEKVWELTANNMIMVSADGNDGPGTLT VNMSLGGGYSKATNQAAARLVRAKYFVAVASGNNNRDARN NSMSLGGGASTSLDNAVKNLVNAGVPTAVAAGNDNKNACN $S M S L G G G D T Q S S L I A D A I D Y A T K E G V L V V A A A G A D G B G S \square D$ NLTILCESMDSILKEAI DYAVSKGCIIVAPS EYNVIKKT SLSLGWDGHSRASVDAI ENAREAGTVVVGAVGNGGEGTSL NLSLSGEDYDKVLADSIARRARAKGVVIVASSGNDGAKT S ASSTGFQGSGWAVAAVASR $\square$ AASGVPC GGNGNNKKAGDF NNSFAKYELEFWMEDTIAAWRAAGI DPVFANGNDGAKGCG

## UniRef90_Q39WE2 UniRef90_U5WDY2 UniRef90_K0JPV1 UniRef90-D9WR35 UniRef90_H2JLS2 UniRef90_UPI00037F3FCF UniRef90_U5BPU1 UniRef90_UPI000372FB54 UniRef90_C4ZBE5 UniRef90_U1L4S1 UniRef90_UPI0003827F26 UniRef90-M0C2D7

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UniRef90_H6LD76
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UniRef90_B7G7C6 UniRef90_UPI0003FE559A UniRef90_G8SAL8 UniRef90_G5SR11 UniRef90_K2EB26 UniRef90_UPI0003452876 UniRef90_UPI000479B26E UniRef90_D0LHY2
UniRef90-V4HUH6 UniRef90_M2YUG5 UniRef90_W4FBD4 UniRef90_A5ZAA6 UniRef90_A0A024F7M4 UniRef90_V8G6F4 UniRef90_H2ARF1 UniRef90-D2B7V0 UniRef90_R5BQI5 UniRef90_W5JMA7
UniRef90_UPI00034AE337 UniRef90_F1TI06 UniRef90_UPI0001CBB281 UniRef90_UPI000365A0FE
UniRef90 C8VUL6 UniRef90-C8VUL6
UniRef90-H1QK40 UniRef90_G3AKH9 UniRef90_F0M452 UniRef90-UPI000476D332 UniRef90_K1WDW8 UniRef90-S3BQE0
UniRef90-G2NKV0 UniRef90_G2NKV0
UniRef90-K6AXE9 UniRef90_D7C6D6 UniRef90_G8N8F6 UniRef90_J2IHN7 UniRef90_M1BHI2 UniRef90_W4YIL5 UniRef90_Q647R6 UniRef90_D9SVR0 UniRef90-F8DAS6
UniRef90 S3FGX9 UniRef90_J4KP23 UniRef90_W4F8J2
UniRef90_A3LY46




UniRef90_UPI00037269EE UniRef90_UPIO00368347E UniRef90-J3PLK0 UniRef90_UPI00046F14C3 UniRef90 E5WTB0 UniRef90_UPIO00051000D UniRef90-D3PQ14 UniRef90_UPI000381B874 UniRef90-J2GMG5 UniRef90_Q6MKV8 UniRef90_UPI00036E0065 UniRef90_G8BCI8 UniRef90-W7IC97
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UniRef90-D7UWH1
UniRef90-D4ALV9
UniRef90_U6MYJ7
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UniRef90_UPIO00180BE40
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UniRef90-W4Z9T1
UniRef90_UPI0003830BA8 UniRef90_UPI00030EA785 UniRef90-X8J9X1 UniRef90_M5EXR3 UniRef90_G3ASS8
UniRef90_L2G8Y5 UniRef90- J5K3B7 UniRef90-B3QY67
UniRef90-B9L4H8
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UniRef90-M0BJS6 UniRef90-H2B109 UniRef90-UPI00047C1A81 UniRef90-I1D358 UniRef90-M2U6M1 UniRef90-E3QJ58 UniRef90_UPI0003693037 UniRef90-D3QA35 UniRef90-C6WHDO
UniRef90_R7D935 UniRef90_V9DC37 UniRef90-MON2Q2 UniRef90-W6MHX9
UniRef90-M0LSF9 UniRef90-K1XRZ6 UniRef90_UPIOOO3732702 UniRef90_E4N439 UniRef90_UPIO0037D8519 UniRef90-E3FJI3 UniRef90-DOMRG0 UniRef90_J1SOH2 UniRef90-R1E530
UniRef90 B2G3W2 UniRef90-D3PSR7 UniRef90_M2SM10 UniRef90-UPI0003693F75 UniRef90_K1E4Z3 UniRef90-A0A023X0H4 UniRef90-TOCEK8 APWGLARDSHRHKLKFSTAGLGVDAYVIDTGVNEHEE QAAKVVGSSLTGAGI RVAVLDTGFDTHQD ANETEHTGAGVTDGMLDSGIVDNHPE Q WY KKKYG $\quad$ D DMWKKS TGKGVKVAVIDSGVNTHED QYALDHLDAKGAWDRGFMGEGVTVAIIDDPADTHPD TWGHATAQAFNFWNAGYTGAGVKVAII DSGVTPHPD QKTPWGDHAVKATQAWNKSGRGAGARVLVLDTGIDAHPS ATWGIDRIDQRNLYTYTPTGAGITAYIIDTGIRYHQQ DNAPRHLARVQYPYI YDNKFMGQGVNAYVI DSGVENHPE KNKPWGQLEMQFDELHQFS RGEGVTVAVI DTGVRKHDY
 KKI K I A V V DTGI DNHPA
WGLARVGSKQAGGTTYAGKGVRAYIIDTGUDTHKD
APWGLARTSHRDK $\square$ NFGTGGEGVDAYVIDTGTNDHVD TAPWGLQRI DQRKVYDYYYSGEGVIVYILDTGARTHND APWGLGRUSHRNAGSTTYAGAGTCAYVIDTGDYTHSQ WHLDADELTELHKDSQ GEGITVAVI DTGVDSHPD WGMTNLGATVVWPTFRETPKVVVAVIDTGVDNMWS WY LKRMNVMGAWEQGVTGKRVVVTILDDGIDPDAS WG DDRDDQTNDYTYNATGAGVNAYDIDTGI ATHPD
QYGFQNI EAEGGWSTRTGDTTVVVSIHDSGITNHPD NAPWGLARVSHRDSLTMGTGGEGVDVYVIDTGTNEHVD DATWGLDRIDQPQYSYPSSAGNGVSVYI I DTGLDSHDE

 SQQWGFNGMRVPGAWDYN TGSGVTVAVLDTGITSHPD


AESVP LAMLGADKMHSKGYKGEGMLIGVLDSGFDNANK AP WG LIQANQVHALGITGSGVRIAILDTGIDTHPD S QEVVPGGIKMVKQRALPLDGLGGQGVHVYVIDTGLNAHTE WGLLDRADQKALYSYDTKAANVTAYVLDTGGITSHED
TWGLL KATKVMKSLLTGSGMKVAVLDTGMDLHPD
PWGLRR $\square$ SHHQAGGSGYGGEGVCVYI TDTGMDNHPQ A QSVPTGVDRAEADLSPTAADDGNDTRVAVIDTGIDDHPD

 $D Q Q Q W V L D A L N V E Q A W T V T A K A G V T V A V V D S G V D D V K E$ G V WG RERQWYLDRMQAESMWKVS TGKGITI AVLDGGVVSANE
 EAPRH
 APWGLGRISHRARGATTYDGAGTCVYVIDTGVDSHPE

ISAEEAWE ITQGSESVVVAVMDSGYDEHPE
KALQADVLWNLGIRGAKVKVAVFDTGLKNHPH
RD DQWFWGDLD LT QAQKVSE GAGVTVAVLDTGVDTHAD ATSTTYGLDSINATSAWNADTRGGGAKVAVLDTGVDVAHP

QTYLSNTNVEPAWKKNSRLDTQYVAVI

TAGAGVRVAV D GLQKNPD RNAPWGLARISSSPEPRSTTYSGAGVDIYVIVDTGVRTHADV I NDFEAWEVETGSPKVKVCIVDGGIDDKHN WGQDRVDQEAAEGDSKAGEGVTSYTIDTGVYDHPD
 KNAP WGLARDSHRDALGFGDGGEGVDAYVIDTGTNDHVD QTLPWGIDRIDADKTIA AEDTGTGAHVAILDSGDDNHPD QWHLDDVNVT GLWYE GDTGKGVVTAAVDDGLDMDRS
 EEQPWSQRLLGFQRAHEQDLLGTGRTIAVI DTGVNEHSR WGLDDRVDQRRPPLTDRGGQGVTVYVVDTGVRSHED V GLEAAWNSS TGRGCLI AVLDTGI LDP HED
 EPDQWDLDA K A DQAAKVNPGSRNVTVGDI DTGVDDTHC WGIDRIDSRDGTDSGVTGSGSLVYI L DTGVIRIHVD WALAHTGAPSLWAAGMRGQGIR】GHLDTGVDAHPD QWHINDINVTGVWLQGITGKGVTACVVDDGLDTSND EGEQWDMQMINVPQAHQITTGSPDVTVGVLDSGUDPDDHP QGRQNNLRAVDALRAWNVTRG KTRVAVLDSGCYAHAE

UniRef90_UPI00037269EE UniRef90_UPI000368347E UniRef90_J3PLK0 UniRef90_UPI00046F14C3 UniRef90-E5WTB0 UniRef90_UPI000051000D UniRef90_D3PQ14 UniRef90_UPI000381B874 UniRef90_J2GMG5 UniRef90_Q6MKV8 UniRef90_UPI00036E0065 UniRef90_G8BCI8 UniRef90_W7IC97 UniRef90_Q16966 UniRef90-D9WDF0 UniRef90_D7UWH1
UniRef90 D4ALV UniRef90_D4ALV9
UniRef90_U6MYJ7 UniRef90_D4AX50 UniRef90_E3KJ50 UniRef90-G2QUE4 UniRef90_B4SCU5 UniRef90_UPI00035D88B4 UniRef90_UPI00029A1078 UniRef90_K1PMN5
UniRef90-R7AV79 UniRef90_UPI00036C89CF UniRef90_D5HBP1 UniRef90_C5P4Z8 UniRef90_W5YMZ7
UniRef90_K0K1J7 UniRef90_UPIOO0180BE40 UniRef90_UPI00036E7404 UniRef90_UPI00036BD223 UniRef90_UPI00047AB31B UniRef90_UPI00035FC2D5 UniRef90_C6XSX3
UniRef90_I2EYU2
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UniRef90_B2G3W2 UniRef90_D3PSR7 UniRef90_M2SM10 UniRef90_UPI0003693F75 UniRef90_K1E4Z3 UniRef90_A0A023X0H4 UniRef90-T0CEK8 UniRef90_P25381

FAGREDHAR 50 $\qquad$
60
70
80
FVGRVTKKLFASRSSEDDVHGHGTHCDGTACGRPTTGPRY
 FSKNDHT GYNA DQPNP DDDYGHGTLMM GDIAAAQHNS DGFQ LR I A F K DF $\square$ N GQEDPYDDNGHGTHVAGCALGNGSDGKYQ L K GVVVSKSKD F S G LDD K DT TDH H GTA VA GVI A GQ GK GA GPT LA A NWA GKAYDPVTDTTYTSSHGTFVASTVSAPKDGRGDA L R GKTHKP Y DLDTRTS QLPQ GHGTPCASVAIAASNGQGIV
 LA A NFEKGKDFNGSDFSDKVGHGTHVAGTIAGVLDNTGFT F GGRAVVGFDADGGSADDCNGHGTHVAGTVGSAT $F E G R A S A G D D F T N E G S G D S N G H G T H V A G L I G S A T$
LTVR G G G DFVAAHNGLEDCDGHGTEVAGIIAAAAGQDGFV YDVNGHDPDPKPRYDYTNENRHGTRCAGVVAAANNHVCSV FDRKASVNCVSGKPNTADGAWHGTHVAGEIAAAKNGVGVT LKAVNGRDFGDNDNDPMDKDSHGTHVAGTIAGAN
F GGRAKWGKNFADDMDQDCNGHGTHVAGTVGGT
 FGGRVVEMAAQFGGYDLNDGNGHGTHCAGDVAGNR

W

 LK N NVLPGYD DESKGHEDRTGHGTAMASLI A GHGHGDGVL $K N G K F G F D F Y D D D D D P M D E Q N H G T H C A G T I A G V G N N G V G V$ FDVNSHDKDPQPHYDYTNENRHGTRCAGEVAAANNNVCGVV FENRVFADFVNERRTRYDDSGHGTHVAGCLCGSGSRGRYK FGGRATNVYDSFGGNGQDCQGHGTHVAGTVGGNN
$L Q P N V W Y G G D P S D G S V D N T N G H G T H V T G T V A A T N N A F G D A$

FGGRATWGTNTVDSNNTDCHGHGTHVAGTVGSRS
LHANYDPGASSDDNSHDDDNRHGTRCAGEVAAANNGDCA】 LVGRVLKGPNQPGDEQTDHTGHGTGMAGLIAAGTGKS GGGD L NVVA GYDF $\quad$ SSSSAAARDGNGHGTHVAGTVAAVTD T QGVV
 FYGNSNLI GDPYFHGTHVAGII GARGNDKGMD $L R$ VIGTWDFVNNETNVYNDHSHGTNVLDCMAA YE $\quad$ G GR V V FSTVTP GDCPSPPNVAEDGNGHGTHVSGGAASDGSVSSV FTGRVATGRNFAPNNTGDCNGHGTHVAGTAVGTT $F$ VDA NVT GTNDP GTGNWWQHGHGTHVA GTMAADNNDK GVV FGGRARYDFDDNDTDANDCQGHGTHVAGTIGGAS FA GRS IVSQSFVPGDVQDGQGHGTHCDGTACGKDLNDRRY FQGRA HQ $\square K S F \| P G V N Y D D H G H G T H C A G T I$ LNVYEAGGKNCWLP PPVDRHGHGTHVAGTIGALDNGTGVV


 F E GRAYHVANFADKHDYDCYGHGTHCAGTVGAKN
$L R G K V L K G E N F K E P G K D D P D G H G T A M A M L I A G N G D G Q G V K$
 LS GVIAADQFDAMPNVP DEKRDHGTSIDDGIAGVGALKGM






 $F E G R A S W G K T D P A G D E D D G N G H G T H C S G T I A G G$
$L Q$
 LE DD GWKDFSADPSEPVD Y D GHGTHVTGVVGAGNESGTHL



 VGGVADTSKGAWRPWNPDDDYHGTHVAGTIAAARNGVGVA FGGRALA GWSAGCPTGSECNGHGTHCASTAGGTT

LKDNFFAEGSHDYNDHEDDDRHGTRCAGEIAAGKNDACG
 DAGRPTTGESAWAPTTSD H GTHVA GT
LNVVA QYDFWYRDARADDQLGHGTH
H $V$ A S I


## UniRef90 UPIO0037269EE UniRef90_UPIOOO368347E

 UniRef90-J3PLK0 UniRef90_UPI00046F14C3 UniRef90 E5WTB0 UniRef90_UPIO00051000D UniRef90-D3PQ14 UniRef90_UPIO00381B874 UniRef90-J2GMG5 UniRef90-Q6MKV8 UniRef90_UPIOOO36E0065 UniRef90-G8BCl8 UniRef90-W7IC97UniRef90- 016966 UniRef90-Q16966
UniRef90-D9WDF0 UniRef90-D7UWH1 UniRef90-D4ALV9 UniRef90-U6MYJ7 UniRef90-D4AX50 UniRef90-E3KJ50 UniRef90-G2QUE4 UniRef90-B4SCU5 UniRef90-UPI00035D88B4 UniRef90-UPIO0029A1078 UniRef90-K1PMN5 UniRef90-R7AV79 UniRef90-UPIO0036C89CF UniRef90-D5HBP1 UniRef90-C5P4Z8 UniRet90_W5YMZ7 UniRef90-K0K1J7 UniRef90_UPIO00180BE40 UniRef90-UPIOO036E7404 UniRef90_UPIO0036BD223 UniRef90-UPIO0047AB31B UniRef90-UPIo0035FC2D5 UniRef90_C6XSX3
UniRef90-12EYU2
UniRef90-H5SG92
UniRef90-UPI0004762F9D UniRef90-UPIO003699672 UniRef90-UPIO0035C7F10 UniRef90_W8DP26
UniRef90-J5JVZ0
UniRef90-UPIO0035E4C6C
UniRef90-N4UHN6
UniRet90-A4X1P0 UniRef90-E9EXM6 UniRef90_UPIO00376E781 UniRef90_D4MXW4 UniRef90-W4Z9T1 UniRef90_UPIO003830BA8 UniRef90_UPIO0030EA785 UniRef90-X8J9x1 UniRef90-M5EXR3 UniRef90-G3ASS8 UniRef90_L2G8Y5 UniRef90-J5K3B7 UniRef90-B3QY67 Uniinefo-B9L448 UniRef90-L7LTW5 UniRef90_R4LVA3 UniRef90-MOBJS66 UniRef90 UPIO0047C1A81 UniRef90-I1D358 UniRef90-M2U6M1 UniRef90-E3QJ58 UniRef90-UPIOOO3693037 UniRef90-D3QA35 UniRef90_C6WHDO UniRef90-R7D935 UniRef90_V9DC37 UniRef90-MON2Q2 UniRef90-W6MHX9 UniRef90-M0LSF9 UniRef90-K1XRZ6 UniRef90-UPIOOO3732702 UniRef90-E4N439 UniRet90_UPIOOO37D8519 UniRef90-E3FJI3 UniRef90_DomRG0 UniRef90 J1SOH2 UniRef90-R1E530 UniRef90-D3PSR7 UniRef90-M2SM10 UniRef90-UPIOOO3693F75 UniRef90-K1E4Z3 UniRef90-A0Aо23XOH4 UniRef90-TOCEK8
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 GVAPDVDILSASMWLGESGSTREQADKAIRWAVDSGAKVI GLAPKSKFLPVADF QPGYVGDFYVARGVVWAVNRGAQVL $G A A P G V R F M P$ I $\quad H \quad G T$ GTAYDSDVHVIDGDTQASYTNLSHTVEALQHAATLDVDVV GVAKGVRLVGVRVLDCNGSGTTAGVIAGIDWVTSNGQPAA







 VGVWKAQ MALRFLGPDGNGNISDAVKAIDWAVANGAHII GVAYNARIGGVRMLDGDVTDSVEANNHDDDYSASWGPDDD
 $G V A K R V N L R G V R V L N C S G S G S F S G I I A G M N W V A T N H V K P V$
$G T A G G N G E F A N G R G T G I R Y M V I P N L P D A Y V Y A A D N G A V V S$ GVAKKANVYAVKVLRSNGSGTMSDVVKGVEWAAGAHKGSAA GVAKNASISAVVRVDCSGAGSNADVIAGVDWVAENHAAPD




GIADAVQLMGI RVVDPNGDEYDKDVALGIRYAVDNGAQII
$G V A P A A Q L V A V K V L R D N G S G Y \square S D T V A A L D W \square Y N N N V K V V$
GI AKRATVHPVRVLGCNGSGSTS GVIAGVDWAANRVLPAV
GVLPGVKLHIIKVFNAAGWGYSSTLATAIDTCVDNGSHVI
GIAKGAKLVGVRVLDCNGRGANSAIIKGIDWVTANAVKPV
GVA Y E A T I Y V GK V L N N A G S G N G G WI L A G M E WA I V N G C QV I


GAAPNATVMAYRVLLDCSAEGTEDDMMA GWLKAYENRAAQI I

 GVVSPC A R I L P I T V F G S S G T N S V P A L A K A I R Y A A D S D A Q I


APGAKI YHARAF EDGKSTMDVI LSAL DWAAS QDVRII

 SVGVNDKVQPIVI GYSNYNGGFQTNDATVSRAASKGVVAV
 $G \| A P E A T I M P I D P I N D$



 GI A K G $\square R L I S$ AQVVYGYS N DK T P P S S $\square G \square K Y G A D H G A V I S$ $G L A K K A T V V G V R V L D D Q G S G T T E Q V A G G I D W V T N H A E N S V$
 $G V A K K A N V H A V K V L K S N G S G T M S D V V K G V E W A A N A H S E S V$


 $G V N W D V K L M P V R V I D S A G T G Q S D K V A K G I R Y A V A N G A D V I$ | $G$ | $A$ | $P$ | $E$ | $S$ | $T$ | $L$ | $L$ | $S$ | $R$ | $Q$ | $S$ | $D$ | $G$ | $S$ | $T$ | $P$ | $G$ | $T$ | $T$ | $E$ | $T$ | $M$ | $A$ | $R$ | $A$ | $I$ | $N$ | $H$ | $A$ | $V$ | $D$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $A$ | $S$ | $V$ | $I$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $A$ | $K$ | $R$ | $A$ | $S$ | $L$ | $V$ | $A$ | $V$ | $R$ | $V$ | $L$ | $D$ | $D$ | $D$ | $G$ | $S$ | $G$ | $T$ | $I$ | $E$ | $Q$ | $V$ | $V$ | $A$ | $G$ | $V$ | $D$ | $W$ | $V$ | $T$ | $A$ | $H$ |$A$ GI T W G G Y A I P I K V GLD N G VF S TA Y I A Q GI R LAR S L GVRVV




 GLA Y E AKVVSGVRIL S GDDT DVDEALADNYEMQKNDIYS CS



 UniRef90-UPI000368347E UniRef90-J3PLK0 UniRef90 UPI00046F14C3 UniRef90 E5WTB0 UniRef90_UPI000051000D UniRef90_D3PQ14 UniRef90 UPI000381B874 UniRef90_J2GMG5 UniRef90_-Q6MKV8 UniRef90_UPI00036E0065 UniRef90_G8BCI8 UniRef90-W7IC97 UniRef90-Q16966 UniRef90_D9WDF0 UniRef90 D7UWH1 UniRef90_D4ALV9 UniRef90_U6MYJ7 UniRef90 D4AX50 UniRef90 E3KJ50 UniRef90_G2QUE4 UniRef90_B4SCU5 UniRef90_UPI00035D88B4 UniRef90-UPI00029A1078 UniRef90_K1PMN5 UniRef90 R7AV79 UniRef90_UPI00036C89CF UniRef90_D5HBP UniRef90_C5P4Z8 UniRef90_W5YMZ7 UniRef90_K0K1J7 UniRef90_UPI000180BE40 UniRef90_UPI00036E7404 UniRef90_UPI00036BD223 UniRef90_UPI00047AB31B UniRef90_UP10 UniRef90_I2EYU2
UniRef90_H5SG92 UniRef90_UPI0004762F9D UniRef90_UPI0003699672 UniRef90_UPI00035C7F10 UniRef90_W8DP26
UniRef90 J5JVZ0
UniRef90_UPI00035E4C6C UniRef90_N4UHN6 UniRef90_A4X1P0 UniRef90_E9EXM6 UniRef90_UPI000376E781 UniRef90_D4MXW4 UniRef90 W4Z9T1 UniRef90_UPI0003830BA8 UniRef90_UPI00030EA785 UniRef90_X8J9X1 UniRef90_M5EXR3 UniRef90_G3ASS8
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UniRef90_J1S0H2 UniRef90_R1E530
UniRef90_B2G3W2 UniRef90_D3PSR7 UniRef90 M2SM10 UniRef90_UPI0003693F75 UniRef90_K1E4Z3 UniRef90_A0A023X0H4 UniRef90_T0CEK8

SMSVGADVRSVSWRYEMRRAlLARGSIIIAAAGNNANGFVG SMSLGGDDQPSDDYEQ】GQACLDAGTLVIAAAGNESG■APV
 $\square G V I S L S L G S Y P V K S Y K E D A W D L G M T V L V A A G N S ~ G P S T I G$ NMSWDDPA WPSSWDESFAYAYKKDVVVIACVGNAGATQAW NNSWGGLGYGNLVKEAFDYALANGVVVVASAGNSYKDEDS SCSWGTTDARYSLNAVKEQAIAKGCVVILYAVGNDDVNYVN LCNNVQLD Y G GA SLLQAACDVLDEAK GVPDVLAAAGNYADD T V R SMSLLGGA WSTPA ERTA VAAAADKA GIVTVVAAS GNNGSNRVS A NMSLGGGASTSDDNAVVNS $\square$ NDGVTVAIAAGNDANACNY ANLSLGGAKNHILNKA IVEHATKTGLIVVVAAGNSNDNACT NMSVVDSCRPADLD DQPSEKNLQADVVLVASAGNYGQDCES $G R T V D G P A T Y$ D GITMKDRNGDGSDFVWASGNGGREDDNCNC NNSYYTDPWYDAVRRASSYAERKGVVNVAAAGNENYDCLD $N L S L I T P F K S Q E M K K T \square D K A K N V L F I A A A G G T N V N L M T P L$ $M N M S L G G P R S E A T N Q A A K A \square S D A G I F L A D A A G N E N M D A Q H$ N N S WGSTESTYSLQLVIERSRGLGILIVNAAGNSSTNND■ ANMSLGGGKSVTLDRVVDQAVAVGMHFAVAAGNDNADACN VS L S L G G DKNSALDRAVQAAI NQGLHFVVAAGNSNTDACS ANMSLGGGYSASLNRAAAALVDAGVFLAVAAGNDNEDAGN $N C S W G V Q V P F D S L A D G A A L A A Q T P P P V I V A A A G N D G D D A D N$ $N V S L G S P H H S \quad A L D Q A V E R A Y Q N D V I V V A S \square G N R Q N A V I S$ SNSWA GPETAPAL SEA ITRAEQRGVLVFVAAAGNNNDKSPY
 $\square L N 1$ S $\quad$ GMGSAPNQDKMDEAWKQGITVVCAAGNMGPKPMS ANMSLGGGFNSSVNSAVNNLASRGVFVAVAAGNENQNACN Q NS WGYTSPGQSLQDAIDYFIDDNGGIVVFSAGNDSDN GDW ANMSLGGGKSFTLDLAVNAAVDAGIHFAVAAGNDNADACN ANMSLGGGNSDALDDAVRGAIEQGVTRVVAAGNSDADACS ANMSLGGGGADTATDTAVRNLVAAGVTTAVASGNDNQNACN GKTVDGPAKMA GVNQGREGKGS VFVWASGNGGRHQDNCNC $N \square S L A V K E G S H Q L T E A V Q Y A L D K G A L V F A G V G N N G G N R D E$ $N M S G G G S G C G T T Y Q N A I N A A V N R G V P V V V A A G N E N Q P A A N$
 $N L S L G G D S P E P R F E A A L A R A V A A G T V V A V S S G N D G A S D P S$ NMSFGKKPERKMVEDAIKYAEKKGVLLINAAGNDGVNVDS NTS LGGYSTFDNPAQNYADWAAQAGILVVASAGNE GSSAWK
 NMSLGSGFPSKLVAYSARRANEKGVLVVAAAGNGGNDSKLL ANMSLGGGGASAALDDAVKRADASGVTFSLAA GNSNTNACN SMSLLGNPMPSTAYETVGRRALQNGCLIVAAAGNNGGGTVGG V S GSLGGPFSPALNQAAGNMANNGIFMAVAAGNDNRDARY NMS LGGAGKSDAMHRADCNSVAKGVTYAVAAGNDAAAAA G
 VSSTG $\square Q G N G W A L A M V A S R \square A A R G V T C I G G L G N M G L F Y A M$
 ASMSIGGGKSRSMDESVEELVKSGVPAAVAAGNENENACH NMS L GF QEYMS QLRRQAVVYAI KRGKLLLLASTGNDGGNYAS A N M S L G G G A D S A L D T A V R NA A A S GVVTFVVA A GNESTN A S T

 WGPPDD GRSMDALKG』QQGRGGKGSIVVFASGNGAANDDN ASMS LGGGYSATVNQAAARLQASGVFVAVAAGNDNRDAAT S N S WG G G TK N E S L E N S Y Q S R D G K G A V I L F S S G N S G T N GVGG $N L S G G A D T P S G A L E R A D E Q A Y A R G V V V V A A A G N T P D S V T G$ $N L S \| G G P D F M D P F V D K V W E L T A N N V I M I M A \square G N D G P G T L N$ $N M S F G V R P S E T L H T A D R N A R A A G V V L V A A A G N E A D K G N D A$ SMSLGGGASYNDEYADAISNAQQAGVLVVAAAGNSGEGTSS
 NMSII A GRSHSDAVQTAINNAYEAGVLVVAAKGNDTTDFPY
 VNMSLGGQSSEVVNQAAAA VVKAGHFLAVAAGNEAADAST QNSWGYRYPGPSIDYF DKYAGMAGGVVIFAAGNDYVGYDA ANMS $D G G P E D Q V L D D A T T K S D E S G V T Y A V A A G N E S S D A C G$
 $N \square S V G T T Y R T D V L V Q G V E K L W D E G L V V V A A A G N Q G P G S V T$
 WGPPDDGKSMQEPEKDVKEAMLKGVL ASGNGGMHNDNCNF
 $N \mathrm{~N}$ S QSSSCQSNQKLHNAVRYAYEQDVVVVAAAGNTGGQCQK $V N M S L G G D P D E V L D A A V R N S D A S G L T Y T V A A G N Q G D D A S Q$ NISSLGGVVGYDA YLDAELAQARANGLVILAAAGNYSAPYTG
 NNSYYVDPWMFNCKNDADQAA $\square K G V L N V A A A G N S G L D C W D$ LS MS LGGGGGANRYDAVIDQAAMAAGVLETVVAAGNNNGDACC A NLSLGAA DRNSDVINQAI KAAYEAAGLIVVVAA GNSNDNSCW SMSSLGLDEGT QNEFVPVI ERMRQMGVLDVVADGNSGGGAPA WGPPDDGKTMQAVQNGRGGKGNDYVFAAGNGAASGDNCNF N NSWGGSGVDPWFVDULNAWRAAGILPVFAAGNPGPGS QQ NNSYY VDPFEFWCGDQPEQATEQGTVHAAAAGNSAYDCKD


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UniRef90-H5SG92 UniRef90-UPI0004762F9D UniRef90_UPI0003699672 UniRef90-UPI00035C7F10 UniRef90-W8DP26 UniRef90- J5JVZO UniRef90_UPIO0035E4C6C UniRef90-N4UHN6 UniRef90-A4X1P0 UniRef90-E9EXM6 UniRef90-UPI000376E781 UniRef90-D4MXW4 UniRef90 W4Z9T1 UniRef90-UPIO003830BA8 UniRef90-UPIO0030EA785 UniRef90-X8J9X1 UniRef90-M5EXR3 UniRef90_G3ASS8
UniRef90_2G8Y5 UniRef90- J5K3B7 UniRef90_B3QY67 UniRef90-B9L4H8 UniRef90_R4LVA3 UniRef90_MOBJS6 UniRef90-H2B109 UniRef90-UPI00047C1A81 UniRef90-I1D358 UniRef90-M2U6M1 UniRef90-E3QJ58 UniRef90_UPI0003693037 UniRef90-D3QA35 UniRef90-C6WHD0 UniRef90-R7D935 UniRef90_V9DC37 UniRef90-MON2Q2 UniRef90-M0LSF9 UniRef90-K1XRZ6 UniRef90_UPI0003732702 UniRef90_E4N439 UniRef90_UPIO0037D8519 UniRef90-E3FJI3 UniRef90-DOMRG0 UniRef90_J1SOH2 UniRet90-R1E53W2 UniRef90-D3PSR7 UniRef90-M2SM10 UniRef90-UPI0003693F75 UniRef90_K1E4Z3 UniRef90-A0A023X0H4 UniRef90-TOCEK8

俍 GSPANAST1MAVAAVDRAFRIASFSCGGMIDVAAPGVADL YPASYEGVISVTSVDRKDDSGETASDGKIDFSAPGEDI SPAVHPKLIAVGAIDDDDSVADFSSRGPTVDVVAPGTNI TPAGYPGVIASAAADGNRNKTDFSTYGRHVSSAAPGEDVN
YYAAHPDVIAVAASTSQDAHASYSNRGREVTICAPSNGDW YPGRYEKVVAVGAVARSSARADYSGTGPYLDVASFTNQVT YPAALSTVIAVGAVDVNDNKADFSQYGPELAVVAPGVAVV

YYPASDPQVICVAATDDNDARADFNWGSVVDVAAPGKDI W
YPAMHDASLAVAGTDRDGESREGSLPAGEVHLAAPAEDLY

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| $A$ |
| $W$ | ARPANCSNVGVGATDKNGKKIKVSQSGPQVDVVAPGDKMV

 LPAYPTPTVGASGATAAALVAPFSNYGDTVDVFAPGVGIY YPADADSUIAVGAVGSTLNVASFSSYGPSFDGSAQGAGTI
 TPAPARTPAATVGATTATVARASFSNYGSCLDEAFAPGQQVV QPANSQSIMAVAATDSCLKVADFSATGAKVDIAAPGVKVY

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CNFDGYTNSVYSITVGADDRKGQHPYYSYSSGSGDADHTT
SPASEPSVCTVGATDSSDRRSTFSNFGKAVDIFAPGTG
YPARADNVIAVGATENNDKRTYFSQYGTDLDVVAPGSDUV


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UniRef90-R7AV79 UniRef90 UPIOOO36C89CF UniRef90-D5HBP1 UniRef90 C5P4Z8 UniRef90_W5MZ UniRef90_UPIO00180BE40 UniRef90_UPIOO036E7404 UniRet90-UPIOOO36BD223 UniRef90 UPIOOO47AB31B UniRef90-C6XSX3
UniRef90-12EYU2
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UniRef90 UPIO004762F9D UniRef90-UPIO003699672 UniRef90-UPIO0035C7F10 UniRef90-W8DP26 UniRef90-J5JVZ0 UniRef9O-UPIOOO35E4C6C UniRef90-N4UHN6 UniRef90-A4X1P0 UniRe99O-E9EXM6
UniRef90_UPIOOO376E781 UniRef90-D4MXW4 UniRef90 W4Z9T1 UniRef90-UPIOOO3830BA8 UniRef90-UPIO0030EA785 UniRef90-X8.J9X1 UniRef90-M5EXR3 UniRef90-G3ASS8 UniRef90-J5K3B7 UniRef90_B3QY67 UniRef90-B9L4H8 UniRef90-R4LVA3 UniRef90-MOBJS6 UniRef90-H2B109 UniRef90_UPI00047C1A81 UniRef90-I1D358 UniReffo-M2U6M1 UniRef90-UPIOOO3693037 UniRef90_D3QA35 UniRef90-C6WHDO UniRef90-R7D935 UniRef90_V9DC37 UniRef90 ${ }^{-}$MON2Q2 22
UniRef9 UniRef90-MOLSF9 UniRef90-K1XRZ6 UniRef90-UPIooo3732702 UniRet90_E4N439 UniRef90-UPIO0037D8519 UniRef90-E3FJI3
UniRef90 DoMR UniRef90-J1SOH2 UniRef90-R1E530 UniRef90 $0^{-}$B2G3W2
UniRef9
O UniRef90-M2SM10 UniRef90-UPIO003693F75 UniRef90-K1E4Z3 UniRef90-A0AO23XOH4 UniRef90-TOCEK8 UniRef90_P25381

210
220
230
240
STWPDRRYRTIISGTSMATPHVISG\|AA 几WAQRTGASGEAL SSLPGNNYDRWDGTSMATPHVTG\|AALIAQSNNAFRGWAL S IWNTGSVNT SGTSMASPHIAGLAAYFLSDYPE
STSKNGKFEYVSGTS TSAPYVTGLDALLMQQYHLPSNNDV ALRAPNSYTTLSGTSMATPVAAGMAALLDEQRNNLKPDEI
 TSKSGGYNSSYGGTSCAAPFATGVMALLKQAYPNHTAQQL SSVPQGT
WHTSDTATNTDSGTSMATPHVTGAAVLYLQGNPSASPSTV SVNARNPYSSSSGTSMASPIVTGMVANLLSE GVAPSKI SLDPTTNDGEDQGTSFAAPYVAGAALIRSYRKELSAKQV NTLPGGKYGYMAGTSMASPHAAGVAALIKSTHPRASAAQV
s

STWIIGSKHNTISGTSMASPHICGLLAYFLSLQPEITPAEM SAWFSADDARMSGTSMATPHVAGLIAAHLSRQGNYTTQQM
 STVRNSQYAQYDGTSMATPHVAGAAAMVWASTFSSSPAVV

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## s



STYPEGNTNT®SGT
STSNGGGGTATMSGTSMAAPHVAGAAALVLADHPGHSPAQV S SVVPQGRYDAFNGTSMATPHVAGIAA LYAESTGKRGAQL SAKPGGGMT QMTGTSMAAPHI A GLAAYIVSSDANKVSPDL




SLG Y R T D Y E I T S G T S M A C P HV A G A IA SA WNS GDTNTDS GTSMASPHVA GAAA LHLAADNPSATPAQV S A G $\square K$ S K D Y M L S GT S M A S P HV A G L I A Y F F L S L A A Q VT P S E M

 STWNNGGTNTDS GTSMATPHDAGLGAYLLAA
TGYNWGDYVSFS GTSAACP IAAAVVGLMASQNPNLTASEL T T S WD G GWDRRT GTSFAAPMVSAAAALVRS IAPDSSVVEWV GSAVVGSCRSLS GTSVASPVVAGAVTLLMSLGSALNPASV GPRPDGGYVSLTGNSASAALVSGAAALILDAKYPDLQPAQV



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## I

 SAAPGGGGEATMSGTSMASPHVAGAAAMVVGANPGAAPADV



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UniRef90 C6XSX3 UniRef90-I2EYU2 UniRef90-H5SG92 UniRef90 UPI0004762F9D UniRef90 UPIOOO3699672 UniRef90-UPIOOO35C7F10 UniRet90_W8DP26
UniRef90 J5JVZo
UniRef90 UPIO0035E4C6C
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 WARLLQUSRRLRPPRDIGKGFVQA

KT पKKYAEDLGKDD $\square Y G W G F L$ K QLMMEGALKKNEDKYYGKGLI N
TAKLTSTAKPVPPDPVVGWGRLDPKAAMK RRALETTTWEGSFTREKGWGHLNA
 RDKLYEGATPFGTKNEYGVGLI

RNALVGNAT
KPTLLKMA
SERIKLTA $\square P G G R D N R \square G Y G M D N P D A A L$ QHTI VETAKPDNVSHFFGFGLMDAEAMV KALLKGQADDTGYNGFYGAGLVDALDAVK KSR\|LKNVHKLSALNMTTGGLLDAYKA
KD I IHATLLD $\square$ PAAKTQWGGAPDAMSAV K D NMISIIASK
SDKLKRDAT
CAY RSTGTS GK LS G
FKRMVETTRDAGKPGDYGWGQLDDRAAL
RDLIYENARPVP
QHIVVNTARKANVSHSFGFGLMDAGAMVR KRKLLHTAHDLGEPNKQGWGM】D $\square$ KKLLE RTWI I NNATP
ES ILEESADDVGATLD $\square G A G R \square N \square A Q A \square Q$ KKDMIA ATK
STRLDELATR
ETALDTAATNGKTTN
QHLVVRTAKPDGVSHAFGYGLMDAYGMV LKVMLNTTTGEKRSDFDGYGALRPDRALK ESTLKSTARPVACSAGCGAGLVDATRAV RSELQNRSKQYD ILGGTGA

## VDIL LRTADDLGADSTYGRGGLDLARA

 KFI EQSVTKIDFPVITTGGIVNAYNALQ RDYLIRSATQINPDNRIGYGIPNFDKAYE
ASALTSAATT
WK LLTSSAMTLPLPRAVGSGLVQA
CQTMARMAT
K EALVA
EALLDRTARDVDDNNVFGEGRDDAYAAV NKLFMSTAKPQRDNGAFGGGLIDAWEA
A QALA R GRPAAGYDDQDGFGVVD

$\square R \square M M D T A G K P T P S R Y \square G Y G T \square R P$
ASALTSAAT
KRVLKE
EKALADTARDGGPDNDFGYGLLDTKAA KKKLIRDSTK QWLAMDTAVP DDESHTYGYGK $\square$ DA YAMDE

ENYLQQTCDKTGWNTEMGYGRVNAYKAV RQTLRETASPLDPPGQAGSGLLSARGAVE KQALMASAGRLQPMFEQGWGKLQLLEAYR EARLDATA $\square D R G R D D Y Y G A G A L N L M A A L$ T S A EESAWKPGKDSRYGLGDVDAHEAV K S TL $\square \mathrm{KMATD}$
EK ILYNTAQNDGSSLYYGHGLLDAGYAVQ WARLGQSARRLPPSTDVGSGLVQA KAKLLLATARKNDDSG
KEM $\square T \mathrm{~T} A \square R P Y D \square N G K \square G A G Y \square D A A R A \square$ AKALTENA
KAALMGAAVDPKGATVYGAGRVD $\square$ ARA KMMLRDSCDDMGPRNQQGWGKFNCKKFL KAN』 $\square$ A $\square$ AT
QY LTTLLTSVEVNYSHKYGYGKDDAYNMVQ
AAALETTAWKPDPDTRYGAGIVDAVAA
$R S G L K L S V D P L N M S D Q M G S G R L N D A N A F E$
$M R R I D E T A Q R T G S D N D V G H G L I N P M A A I T$
STALTSASTT
Y LCLTATAEDLGPDEEYGFGLVRADR ETILKKTARALIPCTGGCGAGIVDAYAAVQ WGALA 1 SAAK MFPNNIFGYGRLDVDRAVQ QWLLKEQADNPGNNSHFGYG\|VDALDAVK T D A ML CMSTK
KDKlVEDSTP
RQALLNSALPLSATGS GKGA\DALAALK QWLTVMTAVPLTTPHQFGYGKLDAYA VVE EKILKETATKLTDNQYYGYGLVNAYDAV $\square R E L R A Q A T D T P C N S Y F G D G L V D A Y A A V R$


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UniRef90 F4PKS4 UniRef90-U4L6X8 UniRef90-A1R9J4 UniRef90-G3WHN1 UniRef90-B4X4M5 UniRef90 ${ }^{-} 1$ QED2 UniRef90-UPIO003F9A4EB UniRef90-BONCZ1 UniRef90-C5KEP7 UniRef90-M7NB07 UniRef90-J3KHH7 UniRef90-I0AFV0 UniRef90_L8TLZ9 UniRef90-L7C921 UniRef90-U7V3A9
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RNAEWGLASTSHRTTGSTEYAGNGMYAYLVDTGIINYHQD QWHLANLNVTGVWDQNVHGEGVTVCLIDDGLDMHPD QWYLSDLNVKEAWAQGYTGRGVVVSILDDGIENHPD
NPTWGLDRLDQRADPDRSYTGQGVTAYI IDTGVRSHSD
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KGAP
 EPLQWSLPAMKADQAHERTLGSKKVTVAV DTGGVDDTHN WYLNRMNVIPAWKMGGTGKGVVVTVLDDGLDPKAS WGLAR】S SSKPGTQDYTGEGITVYSVDTGVDNHED AQSGQWY DEAMKAEEMWEVS TGEGIKVAVIDSGVDPSSP TPTHLQQDGAPAAWAAGFKGQNI RIGHLDSGIDPHPE QWHLHDVNVTGLWYEGTTGTGVSATVDDGLDARAN
 EAYt TGMEA DAVPEAWERGNRGDGARVAVLDTGVNASHP RPLQYWLDEYGVREAWAES TGEGVRI AVI DTGVDSHQD QWY SDLNVKAAWAQGYTGHGLVVSILDDGIENHPD QWDLRAUKADEAHKDNDGSRNVTVGIDTGVDTHPD ADVLWKDGПTGKGVKVA FDTGLQNHPH APRHLARDSRRDIIYDDDFVGKRVNAYVIDSGIADHPE QWYLDELRIDRAHQ\|S TGRGVVVGVVDSGADAHPD DVQWHLHD\NVTGVWMGGDTGQNATVAIVDDGLDMYSD WH L K A THVVKE GWDDTMGEPNFVVAAI I D D GI DN H N M Q WHLLND L N V T G L W W E G I T G K E S I S A I I V D D NAPWGLSRLTSAAALTFTYTGSGVDVFVVDTGIFTHSQ YLGAi GVPAAQSRGRSGKGTTIAVIDDGVNSHPD WGLLGRLNAGRYVY DSTAGAATCVVVI DTGVTTHPE
 RNGQWHLGRTNVEAAWEEKWGDRS VVVVVDSGVDTHED EPLQWSLPADKADKAHDTSMGSSKVTVAVIDTGVDDTHN RSQQWHLDAMKADEVWKISYKGKGVTVAVVDDGVVEMPE QWHYPAINLPQAWDITTGTSTTVAVIDTG\|LYSDT MNVSDAYEASQTGEEVVVAVVDTGVDNHED QPSPWGLDRVDQRSGYSWTAAGAGVTAYVVDTGVASHAD
 DAPWGLGSISHHEPNNTTYAGEGTYAYIVDSGLNTHVE

QWHLNDVNVTGVWSQGITGKNVVVAlLDDGLQDHPD WGLTAI GALEAQKVDVPLEAVTVAVLDTGIDTHED A DGPEWGLTNINAPQVWNLGDRGEGVVVANIDSGVQYDHH ESLQWDTPADKADQAAKVNPGSRKVTVAVI DTGVDDTHC WGLLSRI SQRNFYDDNGSGKGVDCYILDTGI NNHDE NAPWGLQRISQEAAFDFNYRGQGVDIYVIDTGVVNHDD
 NATWGLDRVDQPALPLDNNGGRDVNIYVVDTGVVRHQE

MGITGKGIKVAIFDTGLSTHPH SAPWGLDRIDQHDLPLNRTGGSGVTAYVVDTGVRSHSE GRDVCVAVLDTGLAMHPD T W L E A ISVPEAWDSTPKRTPVTIAVIDDGIAAHPD T WNL DA 1
 AQSTQWGL RQREYWINDYKFPELWNQS TGRGVTVAVIDTGVDTHPD MS IPEAWAAGFTGKGVTVAVLDDGVDAHED Q WGLSSVTEMTYA WERVPDRSSIRI AIVDSGVNNHQD EQQWDMRM】GADRSHGASEGSRDVVVGVLDSGIDPHPE
 QWH HDL NDQEVWDAGULGENVTVAFVDDGI DRHPD

 MNVQAAWRRGYTGKNVVVTILDDGIDSYAS ARDEQWYQKSLRLADAHQVSQGGAGVVVAVVDTGMDQHPD ARDEQWY QKS LRLADA HQVSLGGAGVVVAVIDGGADTHPK WELLPAMSVPAAHALSQ GEGVTVAVIDDGGIRTHPE
 DQQWHLNDVNVT GLWKENDTGYGVVAALVDDGLDYENN
 SEQWHDHDLNLREVWDAGILGENVTVAFVDDGIDRHPD
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## UniRef90_K3Vmv3

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90
100

120 GVAYKAKVSGVRLLSGPDSDVDEAASLNYAYQENDDYSCS
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 GVAYDSKIAGIRILSSPISDADEAEAMIYKYQDNQUYSCS GFAPDALI HTFRVFTNDQNSYTSWFLDGFNYADATGVHVL GVAPGVKVSGIKVSNPDGFFYTESVVCGFVWAAENGAQIT GI AKKAKLVAVKVLGNDGSGPTSGIVAGINWCVEHARQNV GVA DVKLMILKFMGSDGNGPLSGALNALDYAVRMGAAVS GLAPDAKIVPYRVGMKGADTEEDHLGEALRAAADSDAQLI GVAYDSTVAG\|RILSGPDTAAEEAAALIYGLDVNDTYSCS GLAHNANLVGVKVF QGRSTLTTTIMKGVQWCIDNGINVM GVDKKVKLDDVKAVSLLTGSTQLSHLDEALEYTVNDKKACV
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## UniRef90 кзVмv3

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NNSYYVDPWVEAGGRATKYERKGTLVASAGNSNODCLD NNSWGGSSPSATVREALRYAKEAGALIFVASAGNSNQDCLD NLSTGGPDMDSPFVDKVLELLSANNGIMISAAGNDGPDYGN NLSYGHAGADEGEEAAI RYALLERDVVVVAAAGNVRGPDIA WGPPDDGRSMDAPGILI KRAMLKGII YVFASGNGAAKEDN
 NLSIGGPDFDMPFVEKVWELSANGIIMVSADGNDGPGTDN VSMSLGGGASTALDNAVASLTAGGVHVVVAAGNSNVDAGT SCSWGAATVYFPLSLRQRAAGGKGCVIVFAAGNANTNWGS
NLSTGGDTPVSVLEAILKFAVTKNVLVVAAGGNQGPDPRH ANLSVGGGKSEALNSAAANAVSSGMFLAVAAGNSAQDANN VVTLSVGSWSRVLEDAVRSLINHGVTVVVASGNSGVDACY NMSFGGGARSTLQEEALATAFSSAVLIAAAGNDGNYNAPM NMSLGIPGDDVARAEAVKYALSKGKLIFAA VGNYGDCA $N M S L G U P G D D V A R A E A V K Y A L S K G K L I F A A V G N Y G D S A N A$
$D R V V N U S A T N A A V Q L L W K A G I V V V V I G G K G G T D C S V C Y$ ANPGATGSCPTSLQAALDAVNSTGAI SVVAAGNENTDASK NCSFGKSHNEGGMET\|DY\|GREYGVLVVAAAGNESSNDDR ANLSLGGAASTAVDTAIQAVMNDGVSAVVAAGNSAVDACG NLSLGVNGVSGALNDTIKNAAKAGVIIVVAAGNQGKSASL ANMSLGGPVSVALEQAI QAAAQTGVRFMLAAGNEAQDANN GTSVVSGYYSSAFNDAVESAYEAGVTTVVAAGNDGLPALL NMSFGKYSTQKWDEEAMDYAAAHDVLIVRAAGNNSKNDDC WGPTDSGEVAEAPQG\|DDADKNGIIFVFASGNGGAHDDN NNSYYVDPWYEAVRRAVQYSTDNGVVNFGAEGNSDADHDN NNSWGGAGGDPWFQQTIAAWRAAGIFGVFSAGNDGPDCAG IISMSGGFRPEWISAPAFRTVTEGVLPVDADGNDGPGVVR VNLSLGAPKSPSLDDADESAKKDGIVITVAAGNEDEDACT SSSLGYTDWHAPITMAADAAAERGMTVVVSAGNSGEKGIG SMSLGGGGQSNSLDNA DAGATRSGMHFVVAAGNDNKDACV NDSGGGRGQCTSLQDAFDFARSKGVSVVISAGNERDNASE GRTVDGPGFSQGVNTGRSNLGTLFVWASGNGGLHFDNCNC ANMSLGGFTSTALDTAVSNAVTAGVTMVVAAGNDNTNACN SMS GGPDFDHPFVDKVWELTANRVIMVSADGNDGPGTLN ANLSLGGGTNATNDAVAEAVSAGGFTVVAAGNDNANANNF NLSVGAKTGLEEPKENVEQLWDAGIAVVVSAGNYGPGEGT LMTEGSDSSSQLVTDKIQEANAAGMLVVVTAGNNPDFPCS NMSLGGPVLDALEKAAMDYADSQGVIIVASAGNRGTAGMG WGPVDNGATMDAPGLLIRRAMVHGVFAAGNGAASGDNCNF NISLGSPQWPQSWDAAFLYAEQKDVVIVAAAGNRIGGNTQ SMSLGNKTKSTAYERVGRRALDNGCLIVAAAGNHRLIRGNS NLSUGSNKASWSWDDAFKYAEEKGVLVVASAGNRGSGMTG
GRS NDSTGMPQNSQMLKEAVDYALARNVVIVAAAGNESNAWTV NSSFFVNPWSEVLARAVEYSTSAGTLIVAAATNEAVDLTP NISGGQLTDDGEAEDWLKRAVENNVLIVAAAGNDGCECLH WSMSLGGSKSDAENRAVEAAFDQGILTVVAAGNDNDAADF WGPADDGRAMEAPRLATRRALINGVI ASGNGGHYRDNCNF SLSLGGSADPVLDAGVDAAADAGMLVAVAAGNDNGDACKK ANMSLGGGASQAVDDAVNNAASKNLI MAVAAGNENQNACN TNSWGCPPDPGALRPATDALEAAGLLVVAAAGNSGPLCDS WGPDDDGKTVDGPGRLAKQAFEYGIKKGRQGLGS
SMSLGNTTPSTAYETVGRRALQKKCLIVAAAGNHRSTGTV SMSLGSVGHTDAEERAVRYALEHDVVVVASAGNPGDTAVN NNSYGDAAAFEAVRRAVTYSTGRGVLNVAAAGNSGFDPDK SMSLGSRKFFDSYQKAIDYADSKGVTILGAVGNLGDNADS WMPMMPTTYSAlIKGVKEGRNGLGSIYIVFGTGNGGDDCNY ANVSLGGGASTTLDNAVRRSIASGVTYSVAAGNSGALASA WGPSDDGKTMQAPDTLVKKAlIKGVLYVFASGNGGMFGDS GKTVDGQAFENGWRMGRRGLGSVFVWASGNGGRSRDHCSC WGPADDGRAMEAPRDGTRRALVNGVV/FIFASGNGGHYRDN

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UniRef90 Q9RUD0 UniRef90-A3LYR4 UniRef90-UPIOOO2DD7848 UniRef90-12H6C9 UniRef90_Q31N99 UniRef90_UPIO0036BB87A UniRef90-P09958 UniRef90-A0Ао24YH30 UniRef90-A0A059LDN5 UniRef90-B4KXQ6 UniRef90-M3K0W4 UniRef90-W7VLC9 UniRet90-C9SHB4 UniRef90-D2ET26 UniRef90-CONN41 UniRef90-C4PFY6 UniRef90-B4VK48 UniRef90-D7BBB4 UniRef90-E4ZQP9 UniRef90-E1Z4L0
UniRef90
U3NY11 UniRef90-H3NY11
UniRef90 UPIOOO3C74870 UniRef90-A0AO24YM42 UniRef90-A6CKZO UniRef90-K9ZZA8 UniRef90-TORLD7 UniRef90-L8TM82 UniRef90-A0A016PPR6 UniRef90-A2TR32 UniRef90-V5FKY2 UniRef90-UPIOOO35F3E2E UniRef90-S2JER2 UniRef90 UPI0003B4A086 UniRef90-10LCU4 UniRef90-ATNP74 UniRef90-D7CIA4 UniRef90-GOWG86 UniRef90-F4PKS4
UniRef90 U4L6X8 UniRef90-A1R9J4 UniRef90-G3WHN1 UniRefofo-B4X4M5 UniRef90-V5G5D8
UniRef90-N1QED2 UniRef90-UPIODO3F9A4EB UniRef90-BONCZ1 UniRef90-C5KEP7 UniRef90_M7NB07 UniRefofo- 33 KHH 7 UniRef90_-10AFV0 UniRef90-L8TLZ9 UniRef90-LI7C921
UniRef90 U7V3A9 UniRef90-U7VVA9
UniRef90- AOAO16W3S4 UniRef90-UPI000248CB19 UniRef90-17E578 UniRef90_UPI00034B5426 UniRef90_M7TY81 UniRef90_S9PUJ9 UniRef90-A1YEB3 UniRef90-UP10003FOBOA5 UniRef90-UP10003B5FAF6 UniRef90-F4FFQ6 UniRef90-UPIOOO3C8DE55 UniRef90-A0A011Q2L0 UniRet90-D3D686 UniRef90-R4STH5 UniRef90-UP100036B7B18 UniRef90-P87105 UniRef90-E8WE14 UniRef90-P09231 UniRef90-A0A059KLT7 UniRef90-UPIOOO3596DDE UniRef90 S9 9 G 31


## UniRef90 K3Vmv3

 UniRef90_M9LS29UniRef90-L5LHU4 UniRef90-F8EBE6 UniRef90_UPIO00299EEA6 UniRef90-W74771
UniRef90- E9FBI7 UniRef90-UPIO003736CA1 UniRef90-I2FVM6 UniRef90-C6WAX3 UniRef90-G9PBIO
UniRef90 A4S80 UniRef90-12MW56 UniRef90-P26016 UniRef90- C5L122 UniRef90_S3BZF1 UniRef90-Q9RUD0 UniRef90-A3LYR4 UniRef90-UPIOOO2DD7848 UniRef90-12H6C9 UniRef90-Q31N99 UniRef90_UPIo0036BB87A UniRef90-P09958 UniRef90-A0AO24YH30 UniRef90-A0A059LDN5 UniRef90-B4KXQ6 UniRef90-M3K0W4 UniRef90-W7VLC9 UniRef90-C9SHB4 UniRef90-D2ET26 UniRef90-CONN41 UniRef90-C4PFY6 UniRef90-B4VK48 UniRef90-D7BBB4 UniRef90-E4ZQP9 UniRef90-E1Z4LO
UniRef90
H3NY11 UniRef90-UPI0003C7487C UniRef90-A0A024YM42 UniRef90-A6CKZO UniRef90-K9ZZA8 UniRef90-TORLD7 UniRef90-L8TM82
UniRet90- A0A016P UniRef90_L8TM82
UniRef90_A0A016PPR6 UniRef90-A2TR32 UniRef90_V5FKY2 UniRef90-UPIOOO35F3E2E UniRef90-S2JER2 Unireete- Upiooos3440086 UniRef90-10LCU4 UniRef9-ATNP74 UniRef90-D7CIA4 UniRef90-GOWG86
UniRef90 F4PKS4 UniRef90-U4L6X8 UniRef90-A1R9J4 UniRef90-G3WHN1 1 -
UniRef90
B4X4M5 UniRef90-V5G5D8 UniRef90-N1QED2 UniRef90-UPIOOO3F9A4EB UniRef90-BONCZ1 UniRef90-M7NB07 UniRef90-J3KHH7 UniRef90_-10AFV0 UniRef90-L8TLZ9 UniRef90-LI7C921
UniRef90 U7V3A9
UniRef90-U7VVA9
UniRef90- AOAO16W3S4
UniRef90-UPIO00248CB19
UniRef90-17E578
UniRef90-UPIOOO34B5426
UniRef90_M7TY81
UniRef90-S9PUJ9
UniRef90-A1YEB3
UniRef90-UPIOOO3FOBOA5
UniRef90-UPIO003B5FAF6
UniRef90-F4FFQ6
UniRef90-UPIO003C8DE55
UniRef90-A0A011Q2LO
UniRet90-D3D686
UniRef90-R4STH5
UniRef90-UPI00036B7B18
UniRef90-P87105
UniRef90-E8WE14
UniRef90-P09231
UniRef90-A0A059KLT7

UniRef90_S9XG31


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## .

 5F3E2E-9ate
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${ }^{2}{ }^{2} 38$ 19

4B5426
$\qquad$
0B0A5



## 


 TDLRQKCTESHTGTSASAPLAAGUIALTLEANKNLTWRDM
 STW WQ GG $\square K T I S G T S M A S P H V A G \square G A Y F L G K$
QATPGGEYATI GGNSGATALVSGAVALVKSKYPNLSSADL STWNTGPTNTISGTSMASPHIVGLLAYLLS DYGT
STLNTGGNGLMSGTSMATPHVAGVAALYKATYGDAPSATV DVGENACYSAHGGTSAAAPLAAGIFALVMQVRPDLTWRDM GSKVGDGCRADSGTSVASPVAAGAAVLLSSIDPELNPAVM STMPGGKYGYKAGTSMASPHVAGVAALIVSKYPWAPPSVV SARPGGGSQSMSGTSMAAPHVAGLAAYLMADEGUSGGAV
 STVRNGGYQAMSGSSQASPITAGAVAVLLSAKPGASVDAII


$T$ T D L R Q R C T D G H T G SSTK P TRYAAS WNGT SMMA

## S

 ADNGGYGAKCGADSNGRTSGGG ADGKTNCTTSGGSGS
DNTSDSATYTGNGT
SGSGNYCSNTHGGT
STGNAGSYASYNGT
TMDRARCTDSHTGT

|  |  |
| :---: | :---: |
| UniRef90 K3VMV3 | Q D R $\$ K Q L A T K NVVA N A G T G S P NLLA  \hline UniRef90_M9LS29 & Q HIAVVRSAVK F N P N H K Y G Y GLID A Y Q F V E  \hline UniRef90_L5LHU4 & Q HLVVQTSKPRKVSHSYGYGLLDA G A MV  \hline UniRef90_F8EBE6 &  \hline UniRef90_UPI000299EEA6 & S S A LT S A A  \hline UniRef90_W7J471 & A D GLT G A A T P D K $\square$ T N A |
| UniRef90_E9FBI7 |  |
| UniRef90_UPI0003736CA1 | F K R M VE T T R D P GR D R E Y G W A L D L R A A L |
| UniRef90_I2FVM6 |  |
| UniRef90_C6WAX3 | H D WL ${ }^{\text {N S K A T }}$ |
| UniRef90_G9PBIO |  |
| UniRef90_A4S8Q6 |  |
| UniRef90_I2MW56 |  |
| UniRef90_P26016 | QHIVVRTAKPANVSHSFGYGLVDAAEMVR |
| UniRef90_E4UPZ4 | C D R L K Q |
| UniRef90-C5LI22 | TDS S T R T A S L R N A L S L Q N L G E L D A L N A V |
| UniRef90_S3BZF1 | LRVLMQLGDHHNDPSKY G Y G A V R P |
| UniRef90_Q9RUD0 | K NAL F T SASNASANNNVGFGQI S $\square$ P G A L |
| UniRef90_A3LYR4 | Q SVLQ T T A L NREYS HKYGY GKI D A Y Q M V |
| UniRef90_UPI0002DD7848 | KRA E E GA D D M P P D A GK G Y V N L K K A L E |
| UniRef90-I2H6C9 | QEEMVKLS TKGDFTRR |
| UniRef90_Q3IN99 | $R \mathrm{D}$ V A E T T D D L E P T R Q G A G R I N A S A AV |
| UniRef90_UPI00036BB87A | A NRIVSTARDTGSDPLYGYGVLDVEAAL |
| UniRef90_P09958 | Q HLVVVQTSKPRKVSHSYGYGLLDAGA MV |
| UniRef90_A0A024YH30 | $R \mathrm{~T} M \mathrm{~L}$ KA Q A A K WGQT GYYGYGVVDALLKAVK |
| UniRef90_A0A059LDN5 | KRAILATARKLAEDNETG GILDDVEAALLK |
| UniRef90-B4KXQ6 | K Q VLVEGAEKLANYN】FGQGKLNLLKS MQ |
| UniRef90-M3K0W4 | K D QL I A DC T K |
| UniRef90-W7VLC9 | $\square \mathrm{NRII} \mathrm{I}$ T A R D P GR D P Q F G F GR I D P VA A L |
| UniRef90_C9SHB4 | QWLAMMDTAVPPINFSHTEGYGKIDAYAMVE |
| UniRef90_D2ET26 | $\square \mathrm{A} V$ DQK T G K K L D |
| UniRef90_C0NN41 |  |
| UniRef90_E9CD05 | K Q AL I ESANVVP DAN】FGYG S L N L L G A |
| UniRef90_C4PFY6 | S T T K K |
| UniRef90_B4VK48 | K R L L Q D T A D K I G Y S Q WF G Y G K VN A F K A VQ |
| UniRef90_D7BBB4 | E A KL K S Q A T ALPPATNEVGKGML |
| UniRef90_E4ZQP9 | A Q R I L |
| UniRef90_E1Z4L0 | A A ALVAGAT |
| UniRef90_H3NY11 |  |
| UniRef90_UPI0003C7487C | $K G L L Y A Q A D D R A C T N F Y G A G L V D A L D A V R$ |
| UniRef90_A0A024YM42 |  |
| UniRef90_A6CKZ0 | K WVLKNTTREYAYQPSGTGGMVRADAAV |
| UniRef90_K9ZZA8 | EEVLRATATNRPSGSDCGAGLVDAAKAL |
| UniRef90_T0RLD7 | K A RIM M N S T TVK Y S N K VG S GLVNLLD S M R |
| UniRef90_L8TM82 | A G SLV $\mathrm{V}^{\text {S A T }}$ |
| UniRef90_A0A016PPR6 |  |
| UniRef90-A2TR32 |  |
| UniRef90_V5FKY2 | A A R L VALAT P |
| UniRef90_UPI00035F3E2E | K D L M K TVTP CNS D M S $\square$ S G G M L N G Y E A M K |
| UniRef90_S2JER2 |  |
| UniRef90_UPI0003B4A086 | A NLMKKQA GELA GKEYRGAGLVNALAA AV |
| UniRef90-I0LCU4 | EELLDRTARDVDDNNVFGE GRLDA Y A A V R |
| UniRef90_A7NP74 | $R Q R L L E T A L P L S A P E R V G A G L$ |
| UniRef90_D7CIA4 | QWLLKA QA DNPGCPSFYGYGIVDALDAV |
| UniRef90_G0WG86 | K R KI DD F S T N |
| UniRef90_F4PKS4 | YEAI TQ T A SHPEADVQQGFG V V T WA A $\square$ |
| UniRef90_U4L6X8 | K QLI M D T A VP $\$ S $\square \mathrm{D}$ |
| UniRef90_A1R9J4 | $E Q K L K A T A R P V D C P G G C G G G L V D$ |
| UniRef90_G3WHN1 | QHLVVRASKP |
| UniRef90-B4X4M5 | $N L A L V N D A T$ |
| UniRef90_V5G5D8 | K Q AL M A S A R R LP GVNMFGHGKLNLMKA Y Q |
| UniRef90-N1QED2 | G E RI K S LS T K NVVT S P G S G S V N |
| UniRef90_UPI0003F9A4EB | R D A V V A A A T K |
| UniRef90_B0NCZ1 |  |
| UniRef90_C5KEP7 | K SII K D T A T D S K GVE T LT F G RVNA A A AV |
| UniRef90_M7NB07 | ERILLEAVALDPMATP EAA G H GFi T A D A AL |
| UniRef90_J3KHH7 | Q Y L I VETAIPVNFSHDFGYGKVDA Y S L V Q |
| UniRef90-IOAFV0 | RKVI NQTA l Y TP DP TKFGNGLLQANRAI |
| UniRef90-L8TLZ9 | $\square \mathrm{NRIV}$ V T A R D PGKDP LYGYGIL NAEAALLK |
| UniRef90_L7C921 | WQLLVS RA QPLPA THLVGGSGLVQA |
| UniRef90_U7V3A9 | DQRI I T S A D D A G P D PLLYGF GI I N P T A A L |
| UniRef90_A0A016W3S4 | QHLIVRTSES LPFSRYF GF GVLNAEKLTK |
| UniRef90_UPI000248CB19 | H HILLDDS S QKLDVP P $\square$ A G Y |
| UniRef90_17E578 | $R R T L E A E A L P M P C P A D Y G D G L Q D A Y C A$ |
| UniRef90_UPI00034B5426 |  |
| UniRef90_M7TY81 | T EKL K S L A V |
| UniRef90_S9PUJ9 | Q H \TVHS A V P F DVS HR F GF G K LD A K R |
|  |  |

UniRef90 W5NKH4
UniRef90-G8JPK9
UniRef90
T1HSD7
UniRef90 ${ }^{-}$K3WEZ4
UniRef90_S2JRT9
UniRef90-W4Z530 UniRef90-UPIOOO3B5F8FE UniRef90-A4F9K1 UniRef90-TOR680
UniRef90-G8JUS4
UniRef90 B4M1S6 UniRef90-UPI00035COEF4 UniRef90-S3C8E1
UniRef90-E4RXF7 UniRef90_K9TDZ6 UniRef90_UP10003B3F078 UniRef90-R5LFU6 UniRef90-KOKIC5 UniRef90-C6XUT1 UniRef90-A7RME4
UniRef90-E3BN12 UniRef90-W7ZN27 UniRef90-A0A024UC08 UniRef90-A4FFI6 UniRef90-UPI00035C3168
UniRef90 R7U5W6 UniRef90-A1Z144 UniRef90-F4H1C7 UniRef90-K7WG32 UniRet90-R9AEQ4 UniRef90-K9QWN3 UniRef90-UPI00037CADFD UniRef90-UPIO002EF79DA UniRef90-A3IYBO UniRef90-B4S6S6 UniRef90-UPI00036A0DCA UniRef90- UPI00035E4EDD UniRef90_-12GWG0 UniRef90-A0A024F1NO UniRef90-Q1DFT5 UniRef90-A2TVH4 UniRef90-T1JNR2 UniRef90- C9QDQ3 UniRef90_L8JWJo
UniRef90-E4RZUO
UniRef90-F7W807 UniRef90_WOAGN5 UniRef90-Q93CG1 UniRef90-UPI000388D5E1 UniRef90 D7CEB8 UniRef90-UP10003648EDA UniRef90-W714H6 UniRef90-E8U7J7 UniRef90_Q26352 UniRef90-K8G139 UniRef90-DOLZJ3 UniRef90-12MT19 UniRef90-F9G471 UniRef90-UP10003FCDBC0 UniRet90-E6WRI4 UniRet90 M7SK22 UniRef90-X0GFB8
UniRef90 UPIO004686342 UniRef90- W3X8T2 UniRef90-UPI00036F2E4A UniRef90-H6ROS3 UniRef90-UPI0003B580CA UniRef90_H8KWU5 UniRef90-W1J7R1 1
UniRet90 D3SVV3 UniRef90-D3SVV3
UniRet90 UPIO003F12809 UniRef90-X81XJ8 UniRef90-UPIOOO4235494 UniRef90-H3EFR4 UniRef90 UPI00020627C5 UniRef90-UP100037B1F57 UniRef90-R7TUZ6 UniRef90-Q829F9 UniRef90-UPIO003475CFD UniRef90-Q26489 UniRef90-UP10002C66CDB UniRef90-L8EFV7 UniRef90 UPIOOO36422F2 UniRef90-D9XRF3 UniRef90-A8M5Z9 UniRet90-R9ML83 UniRef90 R5GH51
UniRef90 Q5Z1L8 UniRef90 C7PA29 UniRef90_UPIOOO3654087 UniRef90_D7CT26

EWN QRTGANKVWADGNIGQNVIVASI GSGVYTHEA SPQWNLARISERKALTKPYAGSGTYVYVI DDGMNDHKD


WNAAA
 GLDMNI GPAWQKGYTGKGVVVSILDDGUQTHPD TP WOTQL GVDKMHQQGYHGEGMLI GVLDAGFQNANK SSQWHDNNI KAPGAWTVTTGSSSIKIIALDDGVDDHED AGTPGDDEAKAWDITRGIRSVVVAIADDAIDNHPD


PKGLD $\quad$ NVLPVWRKNDTGKNVVVT LDDGDDKEAS SETTPWGFSAVNAQILSDSAAGNR TUCIIDSGYDTHND

QANEWGVETIGAPKVWAKGNKGKGTVVGGПDTGVRTHEA SLT WGLQAVGVNGS $S R Q W D M D L I G A P A A H Q V T G G D R K V V V G V L D S G V D N H P E ~$

QTPPALATLGAQEAWTMATGEGVLVAVLDSGVDTRNE SQQWYLNHISVEQAWDTTRGLRSIVVAVVDDSFDKHPD DATWNLQRVNQRNAHAQDYTGAGVDVYVIDTGTRTHTE AGGLEWGVANI NADDVWA QGRSGEGVVIANVDTGFQFDHP NQQWNLHMMDVQKAWRFTTGSNQVLVGDEDTGVNGNDH

WG $\square Q A \square G A D V S P \square P S F D G \quad \square K \nabla G \square D T G \square D S H P G$ WA पDR DDQDQKYHYDSDGSGVTVYVIDSGVDAKHP YPRDYQGANVTVYVLDSGIRDHPE

$G V P L A H A Q G \square R G A G V M \square G I L D T G V D A D H Q$
VPWTFDRHNIASAWGRS RGAGI TIGI IDTGLSPNQP LDNVEAAWAQGFTGKNVTTAIMDDGVDYMHN RDRQWHLDAMHAEDMWKTS TGSGITVAVIDSGVDKNVD

TKLLSAWD DQKGSSDVVISTHDGGDDDHTD KSAPWGLLKMLGGMDMLNAGFNGKGVLVAVMDGGFKVFEH $G L V L A N A \square P A Y Q A G A T G R G V L A G V I D S G \square D P E F A$
QWYMNNLNVLTAWSKGYTGLGVVLSILDDGLRDHPD WGLDRIDQPDTLDASYTGRGTTIYVLDTGVRTHRD NLKLI GADQAHAKGLTGTGQAVAVLDTGIDDHPW SATWGLSRISSTEPDQDRSGGAGVDVYVLDTGLNAHVD QWYLDNRMNVLAA WDVGYGGKSPVVAV DTGKTA AP D QAEQAWD $\square T R G V R S V V V A I M D D S V D N H P D$ VP WNFVEMN DPQAWQQS TGSGVTVALDDSGTDRFDE WGLDRIDQPRLPNQRYTGAGVSAYIIDTGVRSHSD A PWGLGTISHRTSGSTSYAGQGSYAYVVDSGVQSHTN WVRASLNGQYLHEKGYKGKGMD\AIIDDAGYQNDKD


$T \square P E P Q R A \square D L P H A W Q F S T G A G Q T D A V I D T G V T P H P R$ RDYEYWLGDYGFTTAWN TTKGKGVTVAIIDTGVNNVAE RVVGDDPDDINDR EDEQWDKDLI NAFDAHDHA TGADTR I GUL D EA GVTQBSE AQS\|PWNपDR\|
 K
 QWH
Q

## UniRef90_W5NKH4 UniRef90-G8JPK9 UniRef90-T1HSD7 UniRef90-K3WEZ4 UniRef90_S2JRT9 UniRef90_W4Z530 UniRef90_UPIO003B5F8FE UniRef90-A4F9K1

 UniRef90-T0R680UniRef90-G8JUS4
UniRef90-B4M1S6
UniRef90_UPI00035C0EF4
UniRef90-S3C8E1
UniRef90-E4RXF7
UniRef90 ${ }^{-}$K9TDZ6
UniRef90_UPIDO03B3F078
UniRef90-R5LFU6
UniRef90_KOKIC5
UniRef90-C6XUT1
UniRef90-A7RME4
UniRef90-E3BN12
UniRef90-W7ZN27
UniRef90_A0A024UC08
UniRef90-A4FFI6
UniRef90_UPIOOO35C3168
UniRef90-R7U5W6
UniRef90-A1Z144
UniRef90-F4H1C7
UniRef90-K7WG32
UniRef90-R9AEQ4
UniRef90_K9QWN3
UniRef90_UPI00037CADFD
UniRet90_UP100037CADFD
UniRef90_UPI0002EF79DA
UniRef90-A3IYB0
UniRef90_B4S6S6
UniRef90_UPIO0036A0DCA
UniRef90-UPI00035E4EDD
UniRef90-I2GWG0
UniRef90-A0A024F1NO
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UniRef90-T1JNR2
UniRef90-W9FU47
UniRef90-C9QDQ3
UniRef90_L8JWJJO
UniRef90-E4RZUU0
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UniRef90_12MT19
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UniRef90-E6WRI4
UniRef90-M7SK22
UniRef90-XOGFB8
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UniRef90-W3X8T2
UniRef90_UPIO0036F2E4A
UniRef90_H6R0S3
UniRef90_UPI0003B580CA
UniRef90-H8KWU5
UniRef90-W1J7R1
UniRef90-D3SVV3
UniRef90_UPIO003F12809
UniRef90-X8IXJ8
UniRef90_UPIO004235494
UniRef90-H3EFR4
UniRef90_UPIO0020627C5
UniRef90_UPIO0037B1F57
UniRef90-R7TUZ6
UniRef90_Q829F9
UniRef90_UPIO003475CFD
UniRef90_Q26489
UniRef90_UPI0002C66CDB
UniRef90-L8EFV7
UniRef90-UPIO0036422F2
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UniRef90_A8M5Z9
UniRef90 R9ML83
UniRef90-R5GH51
UniRef90-Q5Z1L8
UniRef90_Q5Z1L8
UniRef90-C7PA29
UniRef90_C7PA29
UniRef90_UPIO003654087


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

FGGRAKWGWSAYKGASRLGEGHGTHVAGIIAGKDGSKTY
FEDRGTFAYDDDEGSGTDCNSHGTHCAGTAAGKD NGKDYK

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


 LTDNMGYDATGGSSNGDDWYFHGTAVAGVAAARGNSKGVR
FQGRDFKRKNFLPLPEEDSDNHGTACAGVAVAEENGIGIV

 YDYNHYDSDPGNNDVTGPDARHGSHVAGIIAAARTNNLGDMM YDYNHYDSDPFPRYSPDNDNKHGTRCAGEVAAMIKNTHCGV

LIK A N F WY DA Y H N N T T P VD TVGHGSHTMGTSVGTT
FAGRDDTGSFVPGEDVHDGHGHGTHVIGTACGTPAQGPGI LSAAIDAGDSAGCA WQPT TSVHGTHVAGlIAAAADGKGVT YAGRVSHGFTAPSEGDDD $\square$ NGHGTHCAGTVGGTT HGTHVAGDI GARKNK ${ }^{\text {GMK }}$
HSGDDLVGVDVETTGRTDPDGHGTAVAGQIAARETGSGVV
FQGRDLKENDFLPDPGEKETSHGTACAGLAVAEENGSGIV
F GGRASYGYNGTSGDGTDQVHHGTHVAALIGGAT
FQGSGRDNDF DPDPDGSKANSHGTACAGLAVAEENGTGDV
AGVRQYRGNNGDGTGPCDKNGHGTHTMGTMAGDDGAGNQI
PDLRFTNSISSNFDEYSSSSSHGTLVQGTIAATNNNG
(HGTHVAGIAGAVDSPEGII


FEGRILEAYDFTDSGVGDNYGHGTSVAGII $\quad$ M FRYVSLFPNSPHNPARDDPDGHGTHVCGIAAGVH $L L G N S F W W W S N N L D G P N D R C G H G T S M A G V A A G P R N N D G P S$
$Y N A K A S Y D F S S N D P T D D W F N S H G T R C A G V A A A R D N D V C G V$ YNAKASYDFSSNDPTDDWFNSHGTRCAGVAAARDNDVCGV
$L H G Q V L D G M D Y S S D E H T D Q E G H G T G D A A L I D A T G A R G G S Y$
$\square A D N M W \square N D D D G N G Y D D D \square Y G H G T H V A G T V A A V N N N A G G S$ LDIIHTYNYVHKTSEVDRDDTHGTNVLSDIA GK LGQVFS GRDSPLSRDTAGNAS DQDAGGHGTAVSTVLAAAKNDSQVH FA GRARWDFVDNDAVVEDGNGHGTHIAATAAGSA
FSGR\|VAEACFCLAGGTNLCDHGSHVAGIAAGTG



$F$ GGRNGYDADVDNDNVA QDGNGHGTHVAGTVA GTA


 YQGRAT LIEFNAVNNVDTDENGHGSHVAGTDG
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UniRef90-D7CT26
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 SAG $\square$ N S D Y T S K S G T S M S T P HVA G

 T D L H H E C T S N H T G T S A S A P L A A G I V A L T L E A N N K L T WR D M





 STMMP NGGQYA W L Q G T S M A S P H A A A G V A A L L K K S K H P R A T P A Q L




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K DII MK SVVKVDQSDEAGGGVVNAYDALK
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KE II LKSSVKYTDKEDVTGGIVNVYQAV A HRLMVTASRGERDDLVGWGVVRADQAL KRILQDTADKIGHSQWFGYGKVNAAKAVR QSRLLALATD
KRDL ETTADK DGHSQWFGYGKVNAARAVQ RDLLDLSADDTDNNNVYGEGRLDALALV RSII STTAYDLGTPGYYGYGVVNADAAVR RHILEESCDEVDTSNKLGKGRINADKALI RALLRTNADPLG $\square T G S$ GAGL
K QI L MQS
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Y AR L V LGARPLKSN
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CNLI AS
$\square E L V R H S G D R A D P D N \square Y G Y G \square P D \square W K A Y Q$ SDRIIKELANLT GAS
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$\square K R L Q A T A H A P G W N P Y D G Y G A V D P V A A L$
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QYLVVMTSRPQPVSHKFGYGLMDASEMV $R Q R L I R$
ANRLVKTAKNDKPDAHYGYGF $\square$ QPAAAL HDALVNNA
QA LLKAQANNPGCPGFYGFGIVDA LRAVK VR R LVS TDPAPGGGYGAGVLNPYRAGL VRALEVTADSRDDDTDQSHGA DAKEALK KQQLLTAADNPGFEGVLGKGYLDAARAAL
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 1 D L P E V R A K Y S G G K E V I V A I I D T
 A P K H L A R $\square$ S QRQK Y V K N F T D E I N N Y I L D T G V F A H S D $\square P$ VIR A N K A WES GY T GA G Q T V A I L D T GI D S H P F





 SK QWYMNKL N ILK A WNQ GLTGRGVVVISILDDDGI E D HP D $Q G A T W G L G T L S H R E P G F T T Y T G A N S Y A Y V V D S G V Q N H S E$ QAAEAWANGNTGASVVVGIIDEGVQNHPD $L G F T G A G V T V A V V D S G L D T H P E$ RGAD WNVRLIGAD RVWELGVTGAGVTVGSSDSGVDAAFR NAPRHLARISSREGYKYKETGDGITVYVLDSGVATNSE

L D A I N AR A L WR LIGYT GY GRKV LI I D S GQYN N P A
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$\square E M S R A H L L H E A G F K G Q G M T \ G V I D A G \square E A M K N$ VS A LD A WDLSVGSHDVIVGVIDDTGVENGF
 $\square S H$ GVLDPVWERGFTGKGVVVSILDD GLDTHPD D Q Q WD M R M i G A P E A HE VGGR G S GATVVGVL D S G $\square$ D P H P D
 T Q Q WH L H D $\square \mathrm{NV}$ V G L W L E G $\square$ T G K G A $\square \mathrm{SA}$ I VD D G L D M Y N D WGVD RMNQRMLRDHE GFGS VVHVFILDTGVRTHVE WNMP M HVLPVWRKG $\square$ GKGIVVAVLDDGIEDHPD




$\square S V E P A W D \square T R G T R S T V A T T D D A \prod D N H P D$ SKQWYMNNLNLLQVWSQGLSGQGIVVSVLDDGIEDHPD GLRKVQANEVWDLDPTGAGVRVCVIDD GLLDEHPE
 WN $\square K Q V T N D R S Y H \square N K G S H N T K V G I I D S G I D N H P D$ $I N Q L G L R N A W K T S E G G G G T V A V I D S G V Q S T N A$


EPDQWDLPAMKADQAHKVSDGSPKVTVGVLDSGVDDTHN R DKE Y WL K E S GVTN A WQVS K GA GVVKVAI I D S GVVDTHPD NVPD DVAR LIKADRVHATGDTGRGVRVVMVDSGWFRHPY AETTPWGQTFVGATQLADNLSGNRTICIIDSGYDRHAD GLD L NVMA A WEMGYS GA GVT TAA MD D GDDYHE D A P WGL G SI SHK TKGSTQYAGANTYAYVVDSGISTHTQ WNL R K I K WDEARNLS GDASRVKVAVLDTGIDDDHP V G D H P Y

$\square N L A P D H N M G Y T$ GA G $!T!A V I D A G F K N V D L$ WGLDRIN QRLLPSDYLTPRCVVI YLI DTGDYTHEE WGLDRVD Q D DV Y E P I G D GNGVDVVVI DTGINAHVD Q WGVD TVGAP DI WKY TN GS GIVI GSI DTGARHTHW

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FENRGKPGRDTGEGMGDQNGHGTHVAGGASKT LAGKVVSEACYNCATTIDDCNHGTHVAGIAAGKGPN FS LKKNFDNDYDPQETPNGDPRGHGTHVAGTIAA GPNGQIK FEGRATWGFNAVSGSPDDDDGHGTHVAGTDGGKTYGVAKK FNGRARIVFVNPAEGTDDHAGHGTHCAGTTASSH
LKVIGWYDAVRGRTTPYDDNGHGTHVASTAAGTGEGNAAY LGGNERMHPKQPDNDPMDYQGHGTHVAGLIAAKNEWLT T FGGRATLGYNAAGGAHTDTGGHGTHVAGTIGSTT FSGRADETRSFVEGSVQDGNGHGTHCAGDAAGPAAPAARY QVTGRATFGWSAFTSRTDDNGHGTHVSGTSAGKTMEV LWANYDYDFNDYDPDPQDENRHGTRCAGEVATANNGFCGA
FEGRADAGYSVSPAAHVDTVGHTHVAATAGKTYGVAKK GEGGQVWWDFDGNNNTIYDGDDHGTHVAGTUGAKSNGTGVV FTGRIVPGYDFAFNDPVQDNSHGTHVAGMIAAARNGTEMQ NDTNYGNNKVSGPDPKMEDAKHGTHVAGIIAARNNSIGLIK
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 $N \mathrm{GI}$ S R A RII H A WK I F D D D G T A E F A Y FVVDP VM Y CAA A G IDDVI $G$ G A N NVA M S I R A V P NGDE Y DK D I A L G I R Y A VD N G A K V I GTAP D A S Y Y L F I T T E N D E E N P V $G$ VAR GVRLMSVRAV PNGDERDKDVANADRYADDNGADVI GTAPDASYY LFRVVASETPK E EA Y WIA A A EKA D S L G V D I I $G V S K N A N D W S V R I F N K D G V A T S K G V W H G L L S V F N D G Q L P A$ $G V A K A A N V Y G V R V L S C D G S G S W A G V V E G C E W A N N Q N G D S V$ $G \backslash A P E A K V L A D G R S T S D R G M A S E Q V P A A D D Q A \square Q G G A K V I$


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 $\bar{N} N S W G G G G Y S Q A L Y D A \| A R A K S K E I L A V A A A G N G G S D G V N$ SNSLGGLNDCYPTMLA SMRATAAAGTLMMVAT GNEAQSSSPD NTSFGKY QNPE WVIDDA IKYAA DNDVLIVNAA GNEGDDDDK E LEGCDPGA LRPATAA LAAAGDLVVVAAGNTGPRCRSDED



 SVS IGGNEFMEPREKEAVKYAQSKGKLVVAAMVGSGDNKPE

 NNSYYVVDPWLYN CKDRPDYA QKKGTLDNLASA GNSN H DCCLD NMS L GGPDLKSRTEDDRAFA DAETALGVLVSVAAA GNDGAN ARHS | $\square N M$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | $N$ LSIIGSP DMDQPFVDKVVWEVTANGIIMMVSAAGGNDGPNAGN $V N A S S L G D S Y S S A L N L A A A D A L A E S G V L V M V V S A G N D A K D A C T$

 NMGWPQSSSDSELLMRKVIA EA QSRGI I IVVAAA GNDSTAALL NTSLGYYKFDDVMSRQASRAADKGIVMVCSAGNSGA GPWT
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GK TFGRP GKED GAKK GRGGK GS $\square$ Y

 NMSFGYSPFKSAVDAAI KYADAHGVLMIAASGND GANLD T WGPVDD GTTMDAPGDLVQRADVNGIVYVFAAGNGALHEDN S L A L G VKA WS GA LGERIVVRELT DRGVLVVTAS GNQNTDACT WGPNDDGKTVVE PEKLARAAFEKGVWASGNGGSNGDNCDC N NS Y Y LD P WWQAVQRAIIRYSQSKGVLTVASAGNANHDCLV Q N S WGFT SYDQSVVLDAADYFVAKGGIVI FAAGNYNDDD R W $N M S D G G P S S S A V N R A A A E \square T S A G L F L A V A A G N E A T A D A S S S$
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 $D N L S L G G P Q S D A V D S A D A A A Y S A G I L D V V A A G N D G D N G W G$ S H S Y G G G S S D D V R I A F E N A A A A G H $N G S F G K Y F N S Q W V R D A D Q Y A E S K D V L I V V A A G N D N D N D K M$ $V E E E V G \square W V K T Q Q D A G N T V K L K V S T S D Q$ NSSYYTDPWLFNCRTDDDQKALVDAVGRATRYAETA DCFD $N \square S L G S T S P D Q S W D A A F D Y A E Q K D V V I V A A A G N R V G G N \square Q$ S CSWGF DERERT LDSAAVANAVSQGVTVVFSAGNGHFGFPG SMS LGGGASSSTTERNALAAHYNNGVLLIAAAGNDGDNTHS GKTVVDGPRNVNGVNNGRN GLGNVVVWASGDGGPNDDCNCD $N L S G G G G A P D P T E S A A F E A L L A N G T T I V A A M G N E R G S P D S$ $N$ GSFGKSPNAQWVYDADKYAAEKEVLVFHAAGNDGANDDD T T S LG YFE Y DNAlS R GAEDA FSSKGI I VVASAGNE GTTTSEP
 $N M S F G Y S P H K G V V D A A V Q Y A D S M G V L V M$ HAA GNDGASVDD NTS LGYSQFDNPKYNYSNNAFNKGMIIVNSAGNSGNSPWT

 $T L A M G G V A S T A L E R A \square Q R A Q A A G V V V V A G N T T E P G L G G V E$

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| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Y$ | $P$ | $A$ | $A$ | $Y$ | $E$ | $S$ | $V$ | $L$ |
| $Y$ | $A$ | $A$ |  |  |  |  |  |  |
| $Y$ | $P$ | $A$ | $S$ | $Y$ | $G$ | $Y$ | $D$ | $N$ |$|$

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G T D R N A D R A WY SNYGPRLD[LVAPGGVM|

$\qquad$ A SFSNWG $R C$ | $C$ |
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F A S $G V$
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$V$ $\vee \mathrm{A}$
 $V$ G S P GTS
D P G F VGGVPANSPS IIANFSARSSSVEGGQVDDAAPGVEVY RSPARSPEVICVGNVRDDNQRGGSNYGDAVD』FAA GTNVL
 Y S S S GAVGGRGVLAVAAANVTTKPNANRTMPDDTAPM YMMM



 YPANYANVISVASITSAGNKSSFSNFGATVDLGAPGSGIV



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 GYA A S M WT TI S I N S A R N D G Q T A GY D E S C S S T L A A S T D A G V A T SPANVPNALTVAADDSNWAPA

 A P A D GK GVVLS IGGSVNGNLDRSGFSSQGPTSDGTTNGEQVW

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$\square T$ N F Q N T G VP $\square$ T D P
WS T L VRAA QRLEPAADVGAGL
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RKLI MNMATK
 RDR A S SGTTTLPSPFQVGTGLVDAWKVL $\square A R I K A B G T P$
GERLA QSA Q A LS D PRDVGA GLAR A P A
K R I I L Q S VVVKVEHEVEFGNGVVNAYKAFQ K A YV KK LAV
QHLVVRASRP
T K R I K A L G T P
Q QA L L T T A T D L G A D DVV G WG LVN A A K A V

$R R I L T A T A S P V P V S H V V G A G L V D A Y A A D R$ K DELIK L S TK
A LAALYNSAK D LGGPDNDYGKGMDNVGAA QWLTVVLNSVK I DFSHQFGYGKADAWA YVE H QIMA ETAFDLGPA GYSGFGFVNADAA V R AEK】YETCD LLDNDEYYGSGLANAYNALE

LRVMFESAGRGDASHYLGHGVVRPNA $L Q R L Q S S A R P F P S T S T C G A G L L D A G N A V$
 C G V L K D M S T P

VAR $\square K A$
SSALVSNAEAV
K QALINSARRLPSMFEQGAGKLDLLRA
E GA L LA GSRSTPEGR LLEAFAA LK $R$ A A L L K S A T P LE D K A R C L VG KL N L LGA I E HARL MLGSRDLKAN
$\square E L V R R S$ G DRAD P DN $\square Y G Y G V P D \square W K A$
K DLLMNTGDP $\square A S$
K A MLMGDAK
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QHLVVHSAEKTSPNHKFGFGRLHATRLV RTILEQTADKIVDTNWFGHGKVNAGRAVK $V$ S AL G GQA D T I PCPGFYGAGVVNAPEAVR RD DLK K TAR DVGHDVAT GF GLVNASKAVE E QYI KETARPFPNTAIDCGTGII DTEAVLE K QII LDSATRYNRTSLVTGGIVNAYNALK QY LL L E TA $\square P \square N F$ S HE Y G Y G KV D A Y S A V KRHLI ATAT $R D V V R G S L L P N T P N A L$
QHLIVWTS DPDSSNSRFGYGLLNAEAMV A A L L ERTAVP QPRNGFHGA GLVNAYRAVK $K N K L L T G \boxtimes V N \square D V F N L L G T G A I D A E L A \| R$

RER L L
T A R V L N L T $\square P$
$K D I L R R T A H P \square N C P G G C G P G \square V D A A E A V K$ Q WLSVVVTAVP FNESHTFGYGKIDSYALVE K ALLLDSARRYP
$R R 1$ EQTAD K $\square G Y S Q W F G Y G R V N A E K A D K$ QHLVVRASRPRQVSHHYGYGLLDA
$R Q \square L T E T A T A V Q V S G D C G A G L V D A Y A A V R$ $T E R L V G G A E R L D N A P Y L G G G L V N A T R$ EENLYQNTDHVENKNEVGSGIVNAYESL
 $V G A L R A T A V S \square D S V D Q L G R G R L D L D A$

TNADVAS RK $\quad$ KGVP N Q F N $\square G E L D A L N A$ Q GML KA QADDPRCPSFYGHGDVDALDAV KK I I MD S GVAVNDNVIVG
$V R K L V S T A T D L A P L I \quad Q Q G A G L V N A$
KA LLYRQA DAMPCTDPYGBGKV DA
$\square N R \quad V S T A K D P G K D P D Y G Y G \quad L D A E A A L K$


TARI K A
RS ALASSADKVDFTPDFGYGRLNLE K K V I L Q S G L P I K A K V V L G
RQML L E DS DRYNPNNNYGYGワPN
LEAL YR SASNFDP DNF LGGYGIPNFTKA
RTII L E T A T P
VKLVMSSNQATDPNTSLGYG $\square P$ DFFKAYK

Y A Y $L T$ Q T A D RTWPN N RYGY GRVNVA K L L $\overline{\mathrm{V}} \mathrm{K} R|\mathrm{~L}| \mathrm{T}$ A T A T D K G P D D Q Y G H G $|\mathrm{V} \mathrm{L}| \mathrm{D}|\mathrm{L} \mathrm{G} \mathrm{A}| \mathrm{L}$

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AQSVPWNLGRTQPDGAYSPPNKGELVETYLLDTSVQSHR LDLGAPEAWSKGFTGKGLKVGVIDTGVDNHPD

YQWD【KRVTNDKSYDपSTGNHNVVVATVDSGVADHPD QWDKHLINAFDAHDHA TGEGTRIGI DTGVYHDHP WY IDNYDFNFTWSYEPINAGTVAII DTGISEERK WNLDRDDQDRGYHYDATGTGVNVYLLDTGIRSHQE ENNQWYLNSAN

EWGVKDTGADQVWSYDNRGEGVVANDDSGVQYHPA QWHLNDVNVKDVWYRGVRGRNVTVAVIDDGVDCDSN I NLFRAWEVTSGAPEVVVAVVDGGI DRHED WGLDRVDQDNSYTPSATGGDVVVYVIDTGVNDHVD RAQQWHLDAMHADEMWKTSTGKGVVI GLVDSGVQEGVQ YLEATSDPEAWDSTPKRTPVTI AVIDNGI ATHPD

 WGLFRVSHKQNSRDQTTLNPTVAYVVDSGIRTHRM WGLARIHQRQRGDDS $\square G G A G D E V Y V L D G Y Y D H D D$

RTSQEK【Y VSVGVIDTGIDDHPD
NAEWGLGAIHADQAYAAGYTGKGIKKGIVDDGPVYTDPY ASSPQANIKNLHADEAWADGFTGKGVTVASIDSGVRYSHR NLSGVRTPGAWDYNH GEGVVVAVVDTGITNHPE WGDEAMQAHHLPNDGQGQGVTVAVLDTGIVNHPA
 DAWRKNLGSAEAVIAVI DDGFDPHDF $\square K Q \square G A D A A W A K G Y T G K G L K V G V I D T G D D Y H P D$ PDAWQFS KGAGQLVAVIDTGVSPHPR
WHLSQVQAPVAWHASTGSNQVRVCVIDTGADHEDLD VEAAWALS DGTGAIIAVVDDGFDDHEE MNVQAAWKRGYTGKNVVVTILDDGDDSYAS

LPFSHAMTQVDKVHNQ FKGNGVLVGIIDSGПDYRHP NQRLTGKGVTVGVI DTGVDTHPD
SDPAQYAQTQपHLPAAHKDARGMNG TVAVIDSGVDAAHP MTQVDKLRADGDTGKGDKVAVIDTGADYHPA A Q TQADFLHQEGFLGKDVTVAVIDTGLDAHPA WGLKRUNAATAYALGVTGKGVTLGVMDSGATEHGN DMQFALLAMTGADTAQNLGLTGRGVKVGVDDSGVANHPE $\square G 1 P E L Q E A G Y T G Q G K I I A V F D G G F T A T N R$ GVEKLHQEGFTGKGVKVGILDTGПDNHPD QVP WAFYKHALPSAWNLS SGAGVTVGVVDTGLSPQQT WGLGRDSKOFQGEGTTAKHSTVAVVDSGVRTHEM INADLIA WDLL TTGDGVIGGAENVNTYQED DGAGVRVCVVDTGVECGHP
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FGHRVIHSINTMHEDENDMGGHGTHVAAKIAGTE F MVGPVDRSWRVVKDDEGDFCGHGTACAGMIART MRLTDNEDASQRFGDKSHGTIIASVIGAREENLNFN LARSYRGYVDGHPDNADEVGHGTHTLGTAVGAD
 FEGRAQKGPSDNVSNDEDVHGHGTHCAGTIASRAGGGUV LKGAYKGGYDSFEQDADDPYGHGTHVSGTIVGRAANIVQK LPGLIPGGDYAGGDGTEDCDAHGTVVAGLI AATQDGQGFA QQGRLVKGWNRACPTCSDHSGHGTHTSGIIGAANNLLGVA Y

MWDAHGHGTHVSGTVAGVGDPGGVY YQVRFGYDQVGNQFNCEDGNGHGTHVAGAIASADNGLGVN LKKNYAGGHDLVDNDRDPMETHGTHVAGAI AA ANGKMK



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 DFGRRATHLWKAESSWEDKCGHGTHVAGTIDGKTYGVAKH LQKNYKGGFDTVDFDNDPMTMHGSHVAGVIAA VHPDEENGNHHTRCAGEIAAVNSGMK FNSVPEEDGTRFHRQASKCDSHGTHLAGVVSGRD WSSRNVIRESFVRGESADEGGQGTHYLGTAFSSPVSAPRY

 NLNGGTGKRCGGSSTADDNGHGTHVAGTVAATNNGNRVL LAGRVTERVDTHPENGTDESGHGTFVAGVLGGSGANGDHA

## UniRef90 Q2S2Q6 UniRef90-UPIooo29A38AF UniRef90-R7JPN1 UniRet90-U7PSH8

 UniRef90-A0Z7Q5 UniRef90-UPIOOO4782715 UniRef90-UPIO0029B4E80 UniRef90_UPI000398F76D UniRef90_UPIO0046EAFF8 UniRef90-R6A7Z1 UniRef90-G8XBJ4 UniRef90-K6TUR3 UniRef90-LOKOB6 UniRef90-F2F3V8 UniRef90-E1ZHU6UniRef90 B7ABQ1 UniRef90-ToSQZ5 UniRef90-A0KV58 UniRef90-UPIOOO46539C1 UniRef90-C4YOY7 UniRef90-UP100031CD6DE UniRet90_UPIO0026516C3 UniRef90-E8NAU6 UniRef90-E4NBM3 UniRef90-C5KQ96 UniRef90_K9RNJ3 UniRefofo-L9PCO2 UniRef90-FoZFV4 UniRef90-J8JQN5
UniRef90 06 CH 18 UniRef90-11BY88 UniRef90-F2R7C6 UniRef90-JLRF1 UniRef90-A0A031RAM3 UniRef90-TORW18 UniRef90-UPIO0036B3108 UniRef90-A9S838 UniRef90_UPIO002260222 UniRef90-N4V1J6 UniRef90-B0YCK2 UniRef90-U2Z8W2 UniRef90_10BAE7
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UniRef90-UPIOOO38BC5DE UniRef90-L7CAL7 UniRef90-Q0TM39 UniRef90-W1Z3F1 UniRef90-H2SBT4 UniRef90-KOKID1
UniRef90-G6AGB7 UniRef90-UP1000380D69D UniRef90 M1 XTB9


GTTWEARSCSDSSLLKSGQWDLAPTDHNGENPRPDLAPDV GVAWEAKVAGDRDLSGTDTAEDEAAAMVYGLDANDUYSCS GVAGGVRLISCQMFTENKSDNGDEVAALKYGADAGAVIS GVATEVQ KGVKVLNCYGSGSYSNMIAGALAQDSVGRAAV GVAPEAELLSISI GASASVPFTEQIANAMRWAVDHGATVI GLAPGAKVLPIKVDTGGTSQHAGQLAQGIIYAADHGIKII GI DDRVRILPVVGATSTFRTLTDAFTYLINEKKDDVKVI GI APRCKGLIVPVFDDRLKASQLDRARGIEQAVEAGANI I GVAPQARGMGLRACDDATRCNSFTLSKALNYALLNGAQVI GVGPDLKVRSYRVFPESGSAPTAWIVDALVAAANDNVDVI GVSPSTKLDAVKVFSGKGGSSSQLMQGVSWADDDYVKNV APDCELSSI RVLGERFSGSGDVLLEGIRWAVRQRFDVV | $G V A P D T T L V S U K A A N S$ |
| :--- |
| $G I L P G T T L Y T Y D D H S D$ | RFS GVAFNAQUTSAENGDPGPGNDGAVYKKGIDDAVSHIGGVDVI GVAPGATWI AARPFNADGSAKQSDILLAAQWDCHRGADVV GVAPGARDLPVRALGVCGGYSSDDADSLIWAAGGVVADAP GFAPDAEVYAFRVFTDAQVSYTSWFLDAFNYAVATKMNVL GVAPDATLYSYKVFGPGDGTDQATVIDAFLRAFDDGMDVV GVAKKANVVGVKVFGDTGTAQTSDIIKALEWAKGMGGRAV GVAYEADLYVYKVLGRNASGSSAQVIDGПERAVKDGMNVI GVAPEAR MTVRQTSADGYGKDSALASAVRRAADAGARVI

 GVAPGARLDPIRLASGLGSQAEADAFVWAARNGADVISCS GIA ANAKIGGIRMLDGDVTDVVEAKSLGDIYSASWGPDDD GVAPNAQLMEVKVLGEFGFGRTSWMIGGMIYATLNGADVI GVAPEAQUVARALGPGGGGTTEQVLAAAEQADKDKVDVV G
 GITPRARVVSRRGIVFERQDEEDWWVEGLEWLEEMGADVV GVAFDSKLIVGNTGGTDGMTYGPNQDYNFFLAAKGGARAI GVAPEVSLGAYRVFGCEGSTTADVILDAERALADGMDVV GVAPKADVYAYRVLGPYGSGSTSADLAGDDKAVSDGMDV: GVAYNAN VSYRASSDNGYHEQNGVKNAFTALGNRDVKII SVGYKSYLKCGSGYGQ RVAPECSLYSVRVLGQGFTGTGDALLTGLRWAVDQGFDVV $G L C W T A Q L M P V R A L D D W G S G Y T A D L V K G L N F A V R N G A K V V$
$G V A K K A S V Y A L R T L S C S G S G Y K D S I S A L D W V R D G O K P V$ GVNPTLSVAAINVQSQTGMHYPEYVVCGFVWAADHGISVT SGVAGGNGSPIMVCDAFGRKNGQAFERAFVYAANHGAVIA GVAYNAQUHF AI NAEDYSGLDQAYASFYKDFTSRYVTAV GVAPGASWIGCVNLDRNGDPFTDGRPERAPQVLTNSWGCP
 GVAYNAH GGIRMLDGDVTDLVEAKSDGI DYSASWGPKDD GMAPYAHLATYRVCGLD CAEAD LAAMDAAVEDGVDVL GTAPGASFLLLRSEDGENLVEEDYWAQAAEYADSVGADII GVAYSAS YAYRIFGCSGDSTDDIIVDALLRGVADGQDIL
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UniRef90 Q2S2Q6 UniRef90_UPIooo29A38AF UniRef90-R7JPN1 UniRef90-A0A021 W0G1 UniRet90_U7PSH8 UniRef90_A0Z7Q5 UniRef90-UPIOOO4782715 UniRef90-UPIO0029B4E80 UniRef90-UPI000398F76D UniRef90-UPI00046EAFF8 UniRef90-R6A7Z1 UniRef90-G8XBJ4 UniRef90-K6TUR3 UniRef90-LOKOD6 UniRef90-F2F3V8 UniRef90-E1ZHU6
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UniRef90

F9DOFO UniRei90-V2WYS4 UniRef90-D5GKK3 UniRef90-10JS22 UniRefto_U3JTB5 UniRef90-UPCAI7 UniRef90-Q0TM39 UniRef90-W1Z3F1 UniRef90-H2SBT4 | UniRef90-KOKID1 |
| :--- |
| UniRef90 | UniRef90-UPIO00380D69D UniRef90_M1 XTB9

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 NMSLGGGFSAAVNSAAAALVSAGVFLAVAAGNSADDASYY NLSLAGPPNRLLEVALKKIAEQDVMVLAAAGNGGPMAMPQ VMNSLGGPASPTVNAALDRVAAGGVVPVVAAGNDDDDACE NMSFGYSWDKAVVNEAMKYAASKDVLIVQAAGNENKDIDK VLLPFAGAYSRVLNAGCRRVAQMGVVMVAAAGNYKDDACL SSSLGYYQFDHKYMNHHYYAASRGILLVNSAGNSGSGVWG NGSFGKSPNKEWVYDAlKYAASKDVLFVHAAGNDAENIDVV NLSMSGMAEYELYKRAIKYADKHNVTVVTAAGNDGDDCGN NMSMGSPPQTSARQQVVRSVTQRGTSVVVSAGNDCANWDS NLSFGAKSPHDLERRALQKAVDSGTTVI SSVGNSGBEEYY SMSVAGDMSPAVNEAARRLVEDHLIVMVVAAGNSQENACM
$N L S G A G A G P S A P L Q E A T D E A R A R G V L V V A A G N Q G E D Y R G$ NFSARLNVTSSDFKNLLKELNDQGIILFASAGNTGSVSST GNQGTSYPEDNAVKACKNAGASAVIVYSNSALPGLQNPFIL VNNSWGGGNTTFYQDIIRSWNAAGIVEAFAAGNSGDGTSC WGPTDNGQTVAAPDVLVRKALIKGVVYVFASGNGGRVGDQ QNSWGYTNVYEATEYFIKYAGMKGGIVIFAAGNEERDYMS ASMSVGGGASTSLDTAIRELVSSGVPVVVAAGNSNADACN NLSLTTNTWDPSWDDAFMYAFDHDVVVVVAAGNSGTDRVG NVSQGYYGGTLTPADLDKLKAAAAVFASAGNDGAKGNPIN NISGGQDTDFGEAEGWLENAVNNNVLLVAAAGNDGCDCLH NLS AG PPDRLLDKLLDVALERGIGVVGAV DAKAAGPA TTSVGGYYGNYYETNYVEIMVSKGVIFVNSAGNNGEFNMG NMSLGGFDSMKDWKRAIQYAVQKNVTVVAASGNESLNTPG INFSGGGDTSEAEDALFRKAVEMGMVVAVAAGNENSDACY NLSLSTSRDREELRRLADEAYFQQTVIVASAHNTHVES NNSYSMDPWMYWSPRSIAYAQSKGLAVIASAGNEGADNDH NDSLSTYKDTSSLKNSVEKAVNSG1TVVASVGNDSSKQYS $N N S W G G T K P G G A Y Q G A I D A A R S G V V T I F A A G N D G N L N N P D$ SNSFGGNSSIDDWMDKVVDAWTHAHILPVFASGNVNGFECG
 NLSGGGPDYDLPFVEKVWEMTANNGIMVSADGNDGPGTLN TASIGGRGGFAAWAVVASRTASEGVVVA\GAGNSGNGGAY VNLSLGGPPSDALDAAVASTVHKGVVVC
SCSWNAEAKVFPLPTRIAQAGGKGAVVVFAAGNSGKDVND NLSLGSDAENSPDVVA INNAVLGGVI AVDANGNAADDGPY NISLVACPTSEPGNAEMYAAEAKDAVIVASAGNTDTCKAS NMSFGKPYSPDAVWDAFKYASDKGVLIVKAAGNSNEDTDV SNSYGSPGYSQLEYEADQALGQAGALFVAAAGNGANNNDF WGPPDGA WWDPNDPAHRQGRGGKGCVVLFAAGNGNESVDN GKTVDGPGRMAGTKKGRQGDGSTFVWASGNGGREGDYCSC NGSFGKYHSSEFVWDATKYAESKDVLFVNAAGNEGTDTDF NLSLGSSSNWADDPTAINRVAERGSVVIAAAGNDGSEGAF
 NMSFAGPRDALVGRAVAAAAARDVVLVAAAGNAGATSPPL TAS GGPWTDEPWAATVSR VEAGVPCTVSAGNSGDQGIF NVSVVADKDSDUSKA IIEYAALRGVYVVMAAGNQGDNPVQ SSSLGYFDWYRFVTVAANDAVQKGMSVVISAGNDGPGRDT NNSWGSNDGKNFIDAAYEVAKKYGIIQVFTAGNRNGMKES NMS GAAYQWPQYPQAADNLVDAGVVVVASDGNSGATGVY TSSLGYSITFDDSTMNHTYEATQKGILVVSSAGNSGNDPWR NMSLGANYNDPLYPTSTNNAVLAGVTAIVAAGNSGDRMYS SMSMGHDFSVGKIEDGVRYANNKGKLIFCAGGTSTSFTNF NNYSGGGSVLASQDVILARAVKEGLVVVTSAGNDAKDACT NMSWGSCQVNPVIYENVEVWEDYNVVLVAAAGNGSFSCPS NLSLSTTRPQETLRSLADQAFFTGTTLVASAHNTPVES NLSLGGPSYDPALRSAMALAGNQDVLFVVAAGNASKNSFP
 ASSWA GKFMS SMMRALDYASKDVVNVFAAGNGGIDLDN QNSWGGKFMSPSLKAAIDYFIDKGGVVLFAAGNESSDDMS
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PIEGCDPGALRPATAALDAAGIDVVAAGNTGPYCRSTVKD WGSSEDFDPNHPINVASKAAYDRGI TVLFAAGNEGPGEDT NLSGGNNVGPDLPISMNKAVEKGITAVTSSGNSGPNIWT GKTVDGPGFEQGIKKGRKGLGSDFVWASGNGGRQGDHCSC SLSLGGPSYGDVI AVGAFGATQKGIFVSCAAGNSGPYHGS NSSLGYHGHTALISRTASMLARKGMLLVNSAGNEGMRSWG TSGQPDGWTEGTTSVVASAANGTVVTVAAGNDGASGPW INLSLGGGFNAATNNAVQKAVAGGLTVVVSAGNAGENACN NLSLLGNGPDWPTTHAVNRAVEGGVTVIVAAGNSGPDTWT WGPDDDGKTVDGPHQLGKAALQHGVVASGNGGQHNDNCNY MMPGGSSTNDGDMESTTKRAMASGALLISGAGNNARGHVV LMP SHNSTKNSGYMNETLFKLAVASNALVVVGAGNNARGHVV GKTVDGQAFENGMRLGRKGRGSDFVWASGNGGRSRDHCSC
 NMSLGGDGGNAALHDATCRATGKGVTFVVAAGNSGSDFQT VLLSLLSVGSAVVEERVEWANDRGALVVASAGNAGPRSVT
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## UniRef90 Q2S2Q6 UniRef90-UPI00029A38AF UniRef90_R7JPN1 UniRef90_U7PSH8

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UniRef90 L5MMA2 UniRef90-A0A031RAM3 UniRef90 T0RWI8 UniRef90-UPIO0036B3108 UniRef90_A9S838 UniRef90-UPI0002260222 UniRef90-N4V1J6 UniRef90-BOYCK2
UniRef90 U2Z8W2 UniRef90_U2Z8W2
UniRef90-W7ZXP3
UniRef90_UPI00035E6E12
UniRef90_E1ZT27
UniRef90-K9P7D0
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UniRef90_Q26H74
UniRef90-S2JQL9
UniRef90-W1SJY7
UniRef90-W5WY18
UniRef90_UPIO0036050E0
UniRef90_N4VTK0
UniRef90 C1D268
UniRef90-C1D268
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YPACYEKVVAVSALAPDYKKSWYSNFSSWIDVAAPGGTVY




$V \square P G V I N V S S S N Q W S T D K D A F Y S N Y G N S F I D V A A P G G D P Y$
$V S P A R A G A G D V G A S S A D D S L A F S N W G R C D D V D A P G T E ~ L ~$
VSPARAGAGDTVGASSADDS LAFSNWGRCIDV I
FPWRFSSVISVGSHQEDDPDLHLYNPEPPVEFFAPGQRVQ



SVLCPGCVQNAVAVWGGSGKGPGKGGAVKPDFVAPGVAIR
ASPANCNVVAVAASDKAGARAVYSNYGPTVDVTAPGGDMT




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




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FISSPGTGTGPVAVASM
$V G S P G T A S K A D S V G A S T$
$F G Y Y P A G Y I S V A M M D E N E N L L D V S N Y G S S V D I V A P G K Q \prod F$
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YPAADPAVIAVSGTDAGDRLMAASNRGSHIALAAPGADLL
FA STAASGKHVTADASGDNVVTPAVLIDENSTMDGGEEKN
FASTAASGKHVTADASFDNVVTPAVLIENSYTDDGGEEKN
FPAAKSAQTNTPGLYSNNRKSSYSNYGAGLEVMTPASDVV


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SAGAPGVGHKVIGVASYDNAA
LGAPGNAPLA ITVGASDTSVS DPTYSGS
V GAPGFA AWMP ETV GAVT GTIVEASTYYQKCDVCHS GAEDDFT

DGPANNGADTVASLNEHNVNAYDSNWGTCVDVWAPGSKIPB


PPSKDSSSPTDAWAPYERDSWSANWGKQTDAFAAPGENVY





LSNEAPWILTVGASTTERKVATESSRGPNTASPGIIGPDN


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VGSPATSSKAITVGASA
DGYANSDYTVTIGAVDETGSMPFYSGGDKMMRS VTTDWD
QVITVGGATNVQDQPVVETGSMPFYSGGDKMMRS VVTTDWD


DGYTASWVITVAAGDKDGQLAD FSSRGDRPTITAPGVDVITI


QAPAAYPEVLTVTAMSDSNVAAFSNYATTVAAPGVCIVSL


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| UniRef90 Q2S2Q6 |  |

UniRef90-11BYS8
UniRef90-F2R7C6
UniRef90-J1LRF1
UniRef90 L5MMA2 UniRef90-A0А031RAM3 UniRef90 TORWI8 UniRef90-UPIO0036B3108 UniRef90-A9S838 UniRef90-UPI0002260222 UniRef90_N4V1J6 UniRefifo-BOYCK2 UniRef90-U2Z8W2 UniRef90_W7ZXP3 UniRef90-UPI00035E6E12 UniRef90_E1ZT27 UniRef90_K9P7D0 UniRef90-P29122-3 UniRef90_B6YTA6 UniRef90_Q26H74 UniRef90-S2JQL9 UniRef90 W1SJY7 UniRef90-UPIO0036050E0 UniRef90-N4VTKO UniRef90 C1D268 UniRef90_UPIO00376D9CE UniRef90-U2GDS7 UniRef90_D7CY28 UniRef90_UPI00034B711D UniRef90 UP1000470627F UniRef90-UPIOO0411CDOD UniRef90-Q6CAG3

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SLDPRNTGVPYSGTSFAAPQVSGVAALVRSRFPDMRASEV ATYPGDQYRF $\begin{aligned} & \text { NGTSMASPAVAGVAALVWSHYPKLTAEDI }\end{aligned}$ STDSPSSYKYLSGTSMSCPGVAGAVALLLALKPSAGPLDLI



SSTPQKKFGYMTGTSQATAWVTGLVAQTMSEGKKVAPPEV VPVPDGKYQLMSGTSFSAAFVSGUAALVLERNPALKPVEV FTYTPGEPDAWAGVS
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VADQAGGFTTGNGTSFAAPQ
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 VAWTGGKTVRTTGNSFAT

TS $\square P S D A G S P G D D S S M A A P V A G V L A T L R Q V H P E M S A S Q \|$ STAAQSYYEFMQGTSMACPHASGVTGLIVSKYPGFTNADC GAYENDNYGTGSGTSFAAPFVSGAVALLTEKFGQLTGQED SAMPGGGYATDDGTSMAAPQVAGVVALMWSANPALDDDRT

VLAPGGGYQRSAGTSEAAPLVSGVAALMRAANPALTAAQT TDLDRQLCTDGHTGTSVSAPIVAGIVALALEANLLLTWRDV ATKSNATFNIISGTSMSTPHLSGUAALLKSSHPDWSPAAI VIDGSGVITQANGTSFATPTLCGMVACLWQALDPGKTASQU SLLSPVDGIKKPVWATSNDTTITDDACNPLLPASTPNLT STW $\square$ ANATTTFSGTSMAAPH $\square$ SGLI
LQKGTGCTEGHTGTSAAAPLAAGMTADMDQVRPCLTWRDV SSDCSTCFTSQSGTSQAAAHVAGIVARMLTLEPELTLAEL
 PHKLDSSYTVFQGTSLACAYVSGVCALLLEAKPELNYKDLV

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UniRef90-G8XBJ4 UniRef90-K6TUR3
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UniRef90-E8NAU6 UniRef90-E4NBM3 UniRef90 C5KQ96 UniRef90-K9RNJ3 UniRef90-L9PC02 UniRef90_FOZFV4 UniRef90-J8JQN5 UniRef90_Q6CHI8 UniRef90-I1BYS8 UniRef90_F2R7C6 UniRef90 J1LRF1 UniRef90_L5MMA2 UniRef90_A0A031RAM3 UniRef90 TORWI8 UniRef90-UPI00036B3108 UniRef90-A9S838 UniRef90 UPI0002260222 UniRef90_N4V1J6 UniRef90-BOYCK2 UniRef90_U2Z8W2
UniRef90 IOBAE7 UniRef90-W7ZXP3 UniRef90_UPI00035E6E12 UniRef90_E1ZT27 UniRef90-K9P7D0 UniRef90_P29122-3 UniRef90_B6YTA6 UniRef90 Q26H74 UniRef90-S2JQL9 UniRef90-W1SJY7 UniRef90 UPIO0036050E0
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UniRef90_A0A023Y1J3

RRLLRQTASQAAPDTTRGWG\|V\|DAEAA|V|R
 $R Q A L D G N A K D L G A D P V F G Q G L L D V G A A V R$ CAYI QSTAQK NVLTGVPSGTI NALA
$\square A R L Y A E A T D \square G P D D \square Y G Y G L L$
EAQLLETALP
KE\IVKK VTKVNHNVSYSGG\|VNAYEALK RQRLLHFATK
$\square K A D Q Q S A D N A A P D N V N G Y G \Pi P N V V K A$ KQ\|L DESGDSLTNTFALAGIVNAYNALK AKLI YKTSEKLDGNEYYGSGLVNAYNALK ENVI ERGAEGDGRDPKTGAGRINALDTVE K Q LLKTLAT DLGYDKEYGNGFI
 RNALKQTAEDLGRDDYYGYGLVNAVAA

 | QYVCAKAAVPVNE DHKYGYGKL DADKGV |
| :--- |
| $R T Y L E R G V H E V D S Y N R L G A G L I D A Y L A V$ |

$\square N R L I S T A K P P G L D L L Y G Y G L V D A S R A V$ LRVMINTASNPSRSDFLGYGVIRPR』AL KSII RDTATAVSRT
RKI L LQ Q A L P CNRDRRC $\square$ A GR $\square N \square S$ GA L RRLL Q
HEALLSTAS LSSSPNKMGFGVVDAFAA ENLTQTAKDPGHDALLFGSGEANDYNAL E E Q I DN

K N A L Y L S A
$\square D L M R K Q A P A D G K E Y R G Y G F \square N A \square T T M R$ ESIIQETARR
AEVLKT TATDMGAPGLYGWGMDNLGKAD LT ALANTSYDEYPNNNYGHGLPNVARALR EQQLKESARPLPCSAGCGAGLVDATAALK
RDELFSNANSTLITGESGS
AMRIISTGSSLPPSQQVGGGLVDASKVV MSKILILADK
RD IIRTSARR】GSDPEYGHGCVDAEAAV
$\square K R D E A T A H A P G W N P Y D G Y G T V D P V A A D$ $R I L L M T V D Q L K D \square S V T G G V V D S Y K A V Q$ K QALL LS SVDPV
RELRRTCVR\|GRSPFYGYGRVSARRAVE QHLLVKTSRP
KRAL ELLSAKPVNGT $\square \mathrm{D} Q \mathrm{QFGGLQQDKA} \mathrm{\square E}$ $K H \| M D$
$\mathrm{KK} \mathrm{Q} \square \mathrm{L} A \mathrm{~A} \square \mathrm{~A} \square \mathrm{~K}$
$R R I L T S T A R D L G T P G R$
TEK KK $\square$ SEQNVD DENA $\square G F G L L N A E A F \square K$ $V N T L R M T A S R A D P D N \| A G Y G U I R A R A A$ RDVLLTTARQVKPDERWGWGALDMSKAM
REVILESSQARNPDESAGYGVPN
$\square T K M K Q S S Q F Y P T K N Q F G H G \square I N A \square T A \square Q$ EDLITKSNTDV
ESILKLTALNMPYNGLIGAGVLDTYKAVK $K H A L Y L S A V R \square G D P G T R G$

LA LARKQAAPEGEREYRGAGMPSADDAV
 LQRI YVTANKEGNSDVYGQGLLDDKKA IV KQVLQETATNMPGYETWGTGYLNAYAAL

RERLLASVDRSGGDLDRDAEAMR QHLLVKTSRPLRVSHLYGFGLVDAEAMV K SAIMTSANNLADVYA $\operatorname{MAAGHVNPTKA}$ MDLVRKAGSRADPDNVFGHGDPDFWKAYQ

QHVIVFTATKYEDSHQHGFGLLNAWRLV RQRLI HFSTK
WQALTSTAQK LEYPTDMGAGLVKA

KSILQKTATNMPGKEAWGAGYVNAYAAVQ QHII VKTAAGYNVSHLYGFGLMDAEAMVK KQKI I D L S T K
\D DVRRSSSNVKPDN $\square M G Y G \square P D F W K A Y Q$ ITKI RADA
ERRLTGTARPVNGTAAAGSGVVDADAAL

UniRef90 C5FGP4 UniRef90_S0AND2 UniRef90-R6S8U9 UniRef90-B2CJ52 UniRet90_G6AGN2 UniRef90_UPIO00367A0EC UniRef90 A3VZX3 UniRef90 W7INM1 UniRef90-J8QEIO UniRef90_R7NTA2 UniRef90 W6Y8S9 UniRef90-D0LSK8 UniRef90-K9WFX9 UniRef90_C9MQG1 UniRet90_A4FKY6 UniRef90-D8J199 UniRef90-LOSRQ2 UniRef90_UPI0003487C7C UniRef90-F7RXE5 UniRef90-UPI0004777E8C UniRef90_A1ZJL4 UniRef90_WOPIP8 UniRef90-UPI00047A6D1B UniRef90 R7IMQ2 UniRef90-R5JS43 UniRef90-M3A090 UniRef90-G8AGR3 UniRef90-A9SKB4 UniRef90_Q5YY66 UniRef90-X6JAT6
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UniRef90-F2PT77 UniRef90_UPIO004798729 UniRef90_C2MG36 UniRef90_G2RQNO UniRef90_A8SUR9 UniRef90_UPIO0030D48EB UniRef90-UPI000262B391 UniRef90_C5KBM9 UniRef90-K9V1J5
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UniRef90-FORIV1
UniRef90-K4ZRF3
UniRef90-KOUTQ6
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UniRef90-E7RXP4
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UniRef90-K6CDC3
UniRef90-R7BEG3
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UniRef90-H2L850
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UniRef90-S2ZQ41
UniRef90-I3E1D9
UniRef90_IOYN58 66DD65
$\square A A N A F V N N G V G D P F P Y D N D A H G T H V S G T V G A A G N N G V G V$ HGTMVAGVVTARPEESGVV LMDNLY INFVDD IYGYNDDEGHGTHVAGTVAARNNNGGVA ARVLPGQDVLGSGPANNDCAGRGTFMAGIAAGQTTGVGFA TNSRLEVI RLDEVEGKSSGTQHGTAVAALLVGASDSR VP FARRNVKALAVTGAYANDNDKHGSHVSGTI AAAKNGDGIM LQGREVRDLVGADPTAFNRDHHGTEVAGDIAASNNHDGIV
 LTGNSANMDSGTGNWFTDENHHGTHVAGTVAAVNNGVGVV
$F A P S V W F W K R K I D G P N D D C G H G T S M S G V M A A R T T D G T P T$
 LKDAYKWDFVNNDADPMEYTSHGTHVAGTI AA DKQNYAVK LKNNMDESETGDPAD $\mathrm{I}_{\mathrm{K}} \mathrm{K}$ DRNGHGTHVAGDI GA NGKVK FEGRDDKTDSDNIGDYSDSDGHGSHVAGII ADATPD DLRRNYKGGSDLVDGDDDPMSHGTHVAGUIAAANNGKDK LNGRVAGGWDTGDWTTDDKYWHGTHVAGTIAATNNGDGMA IASYRWNFVDDSSNLTSTRQHGQACARIVIAARNNSNDMA
$\square Y G R H G Y D F V N H D A D P S D D Y G H G T H C A G I I A A A G N G R G V A$
 FNGLNHWDFTSDNPDPADVAGHGTHVAGVIAGRTHKGVIF DDSVK GWDFVENDADPMEYTSHGTHVSGTVAGNDVDYAVK


 LKDAFKWDFVDNDNDPMEHTTHGTHVSGTIVGRGDNGWVR
 HGGVDGYSFVGTEGYTANFDGHGNMVASLIGANPQGDGVK LQGQGDGSWV GMDGAAQPADSHGTHVSGDAAAADNGLGVA LRANLLPGYSF ISSASTSNNWHGTRVMGVVAAANNGTGDA
 FKVVSEACFSTHRSSGCDFSGHGTHVAGIVAGGSENL



 EGGGRAAQIKSFVSTNTDGNGHGT


FAGRLEVERLAPGDLPESQALHGTADAALEVGAP GTRSP FR LLGGYDFVHRANNPYTGFHHGTQVLSNMGGFVDNQLV. FS GAFRYDGAPTLDSGGK LGNHGTHVGGDAGGSRDGGPMH EFTGRVDSGAGWISSPWDGAFHGYAVAGVIGAAKNDNGDH NKSILLNNNDTINNYDDDKNGHGTYVASTI
$\square W G N I T G D N D S G T G N W F D N G G H G T H V A G T V G A D N N D G V V$ FNNVPEEDGVRVHKQASQCDSHGTHLAGVVIGSD LDDAMWVNPNEVAGDGDDNDGHGTHVAGIIAAAEDNGEGNT LTGKVVSEACYSTSGSCGSCGHGTHVAGVAGRNGGGTMH LNVVPGYFISDAARARDGGGHGTHVAGTI GAANNTKGVV VSCTWNGMPNQEYGAWKDYDSHGTMVAGDIAANHNGYGID $D L R R S Y G G G H D F V D G D K D P M E H G T H V V A G I I A A A$
$E F Q A W N G G H G K N D G D A S D C D G H G T H V$
$A$


VGVN WNK I A CKAFTNTATLVDIIECLDYF LDAMKTRTSSS GVAPKAKLLPVRVLGLNGSFSVTAYLEGMGYAASRGADVI GI AS GVRLMSCQI FRKKN EQGDAAAADKYAADNGAVIC GIAPRARILPIRVAQNPNEVDPGR\AAGIRAAVDGGAKVI GLLPGAELIAVDAFQRSGGATDVASDYDLVRALDQRDVRV
 GMAPGADI WNVQVLTSGGSGTDAGITAGVDYVTANADQVA GVVPNGQ HVVKVFAESGWAYSSNLDAAADQCANYGSNVI GANPNHKLHFVKVFGAAGWAYSSTLASAANQCGAAGANVI GVAYESNLYAVRGTDDNSGDEQDGVSDALVLLANKNTHII


MNMSLGGAYSASFNQATEKVIIKAGTF|V|AASVGAGNVDYPP
 $N T S L G Y Y A F D D S T F N Y R Y R A A D K G M L V V C S A G N S G A G T W T$ TMSSGGGSNGWK E N A WAVA A S VD K GVIVVTDSAGNDGK Q G $\square F$ SWGYSSTAGVTEMPEMLKEAIDDYFIVVIFAAGNENKDFSA $N L S L G G A D Q A S P L C E A D E D A R K A G A L V V A A G G N N G D S A L F$ TNSWGYNANSSRVVDEYTFGNKDFTVLVAA GNDGSSNNTVS $N L S L T G P A N A V L E Q T L A E L E S A E G I V V V A A A G N G G P N A P P$ SMSLGGQPFSRTFERVATRAMAQGTLIVAAAGNESDAPVG $N L S G M T V N G P D W P T S I D K A V E A G V V A V T S N G N S G P K M W T$ Q N S WG D PAD
 $N \square S D G G R D P T Q Q G A E L I D E V L Q A N L V I V A S A G N E N L N E D G$ Q NSWGYSSNTIAVDYFIKNAGMKGGVVIFAAGNENKEFSA AVSMGTPSPAADLRAAVDYAAGRDALVIAASMNVQDGQTS
 NSSWGGGGKKS WL DA A A DVAQASN TVLLVWAA GNASKA NVN $V A N M S N G C T D Q A L S Q A D T N A V D A G V A W A V A A G N D G V D G R N$ NMSLGGGTFSSTTERRNAFQRLNDNGVLSDAAAGNS GNTQLS SMSLGGGARANKTEQRAFDALAAKGVLSDAAAGNDGNTTIS SMSLLGNLDWSVGQIADAVRYAYGKGMIVSAAGTSFSWANNI.
 $N \square S L G A E Y D N S S L L D C V E H A W D L G L I V C A A A G N N G P K Q G S$ NTSLGGYYSFD DLMSRQAS RDA DK GMVLVCSAGNS GMGS WT
 SMSLGAMAS I S I DQA TN LMMNTKGIFVVAGGNFHEDACRY
 $N L S L G N N V N G P D Y P T S V N R A A A L G V A V V I A N G N N G D W T V G$ $M N M S F G G S Y S A T M N Q A T E N V I K A G I F V A A S V G A G N R D A S Q$
 NMSLRFYNNNKMWKRAI QYAVKNGVTVVAGSGNESLNLDN NMSVCFYGDNAT ID GFIA EAKKR R SIV MCVAA GNA GRNGNS
 $N \mathrm{MS} L \mathrm{G} G \mathrm{G}$ GDSVTSSA $\square S S A \square A R G S V V V V A A G N D N A D A A G Y$
 NNSWGIDEADEQMKY LI ELVGKKGAVTVCAAGNDGNASIP $N L S L G S G G Y N S S Y A S A V S K L N D A G \square A V V \| A S G N N G S N K I S$ AI MS L G GP LDSPPLDRAVKNAIDGGMHFSIAA GNSNMPADL $L$ NLSLGGYPFNPVWFAEVVRLVRSGVCVVVAAGNAGYGTVT $N L S L G N D P L S P A A V A V N N A M L S D V V T V V A A G N A G P R A N T I$
 TASLGDGWSEDPWAMTASRIVKSGVPITISAGNDGDS GLIF NMSI GS S Y Q WA EYPKAADRLVKRGVVVTVSAGNSGANGQF $N L S G G G T F N N A Y T A D S V N N A V L A G V T V V L A A G N D G P G T D G$
 NMS LTN TMCGGDVQDADRVAQDKGITTVAAQGNRGVNYET $N T S G G Y T Y$ S N P NYS YTQADMDGNVTSAGNSGNTSWGIVS $N L S L G A V P G D T A V T E A D A Y A A A Q G V L V V A A A G N E S F P V C D$ $N L S E A A C A D D T A V G Q A V R Y A F E R N V V V V A A A G N L A S T V A S$ $N N P G G V G A C S T T F Q Q A I D D V T A K G V T V V V A A G N D G L S T G Q$
 $\square S L G A G G Y L S Q S A C D S A N R S Y A S A V V V I A S G N N G Y S N K \square S$ GK S L D T P G R ER G I R E GR D GR GS I Y V WASGN G G SKN D D C G C
 $N L S L G T P T E Y S S I K N A I S Y G \square S K N I I F V V A A G N E G S A N P Q$ $N N S W G G T K P G G A Y Q G A I D A A R S G D V T I F A A G N D Y N D N N P D$ TSSLGGYFGYDNPNYSHANDAFSKGIVVIASAGNSGATADP NMSLGGDPSAGALKDEVVWLLKQFGVTVVVAAGNEGADGVS $T L S L W S E G Y T G V I$ A S R IVVDKGRVVI GSAGNQGLVGA WYAA
 LL A E GSTTSTS QAVT DKILAATAA GMLVVITA GNYGLDLDD
 NS S L G Y T S R RYF P E E MA ELLA ARKGI L VVNAA GND GDNED W NNSWGGSSKNTWFYPAA QAWDKA GI I PVVFSNGNS GPACDT $N L S G A G P E N A T L G D D V T R L V D E R D I V L V A A A G N A G P R A D P$ PEPDWSSYNDTLRNGLKTGRNGLGAIVVFSGGNGADQTDY NTSLGYFEYDNPAYSYTYNDLNGCVTSAGNSGNSANPHDG NNSWGGTRPGGAYQGADDAARSGVVTDFAAGNDYNDNNPD NCSWNFNDDSKELGELIGNHE LLFVCAAGNSNLNLDNQSL
 NASFGNEYRDAASVKRWTDAVQKDILLVAATANGYGSNLN NMSLGGGAYTAVCDTD $\quad$ TDNLLRNVG\|ATVISSGNNGTNMTG
 NMSLGGASSCSSVYQNA $\quad$ GDGAVVARGTSVVVSAGNSNKNAAL


## UniRef90 C5FGP4 UniRef90-S0AND2 UniRef90-R6S8U9 UniRef90 B2CJ52 UniRef90-G6AGN2 UniRef90-LOA0A7

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UniRef90-IOYN55

180

200 AMAGLAYFVNNSGDYS DSTESSRCGYTASFCVAAPGSKVY PPADAENVITVGADDRKGMNATFSSLGYTADVMAVGLRSS YASSGSS GENVAAIAAYQNVV
YPACYSKVVSVAAMAWDFSKASYSNYAKWVTDTAPGGDQD YPAACAGVVGVGSVSDSVSRAYYSNANSSIDLAAPGGNWN

 VGSPGTSSKAI SVGASA

$$
\text { SPA DY D A VVS V A A DA P D Y T K A S Y S N Y G S Y } \square D \square S \text { A P G G NVY }
$$ EQPPNNSTGGHVSSYTSWGPSTEAE $\quad$ KKPSFGAPGGK\|I ST GAHYPSSYISVLASDHNDQRASFSNYGATVDVGAPGAAIL FPAAFPGVVAVGATNLAGNRAPYSNYGATVTLVAPGGDMS YPACYPPAVSVASMAWDFTKASYSNYAKWVTITAPGGDVP YPAAFPSVLPVSGDDESGSPANRGGSNAPAQAPASSNVVS

 DATPGVIVVRSSSATPS PPGVLSAPGEDIL

 VGVIFPATMSEILLAVTGVTDRNGYKECHNCHYGRKVDFVL
 VP A D A E H T L A 1
 WP A RYDACIAVA GVNKD DLRWKGSCRGYGVDVSAPAENVY S P A RVLSTLAAVGSSTNKNVLSWFSNYGPCISI DAPCITSA
 SPATASKAI SVGATSPAK QNPYLYARWED
 SPSAAALDITVGASDAAMNIP TFSADA GDVVHV
VPA QMPGVI NV SASWSTQQLAFYSNY GSAI DVAAPG GDTW YPA D RE DVITVVSANTTVKFAS GYSYYGDKVDFSAPGSAVR VGSPGTSSKA I S V GA ST
SPA S CPGVINVAANGDTGGRAYYSNYGNT\|TLSAPGGGVY
 A G DD S D YVI SVAA A S NEK D GLLA S Y S N Y G E S V H M A A P G N QI L A P GCVSHALSVGATTDNDGVAWFTNKADFLTMLAPGTSI Q
 QFSGAPERAAHSGTDMDYGVSYFSSKGPTADGVAPGERII GTPGAAA LP $\square T V G A S D V S Q T I P T Y$
 $F V N G G A T$ GK GVVTGVAS Y D S I E AP LLL S Y H S S Y N $\square$ N G GRK $\square D$ ATGAPSLAEKVISVAAVDNA
TPGGAHLPDSVGASTPPMDTSFFKANG】QPLLYA







## ,

A YPGEATHVLAD GAVKSDETYATFSS SGPSPDVMAQGQA SVV SPACVSAAVAVGATDDQDAVAGFSNRGALLDLAFPGVQIN


## 


 TPADADSVLAVGGLNPETGHLDFSAYGPSADPNVAAF GTV

 S S V S A M GIV NVCATNAMGKRAPYSERGANLTVCAPPEVTT VP A D A A T NL A V G A V N S E E V K T G F S S $\square$ G P T P D L M A M G $\quad$ NV T
 F P CS Y D NIITVVMAVDN K GLP Y N S S G Y G N GVVDIA A P GV V V K YPA GYPSVMMVGANDA DNQ VA DFSQFPSCSSGKGRRVVTD Y SPA A S E P E VI TVVGAVN S A D GA G G S N Y G R C V D DVVFA P G D D V V


 $V$ GSPGTAS KAlSVGAST

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TAASVKGARWKTGTSFAAPYVTAAVALWQQTPGSSPAEI SWPMPLRHNRDSGTSMATPHVAGVAALIAQATGARSWA L
STTHNSSYGDMSGTSMACPMVSGVAALVIQKYGGFTPERL WPVALGSYADLSGTSMACPLAAAIIYALLSNVRNTFEPDEL STTPGNSYASFSGTSMATPHVTGLAALLKAADPTRSAQQi SPGLIGGYRWTQGTSFSSPAVAGADALMKGEDSTDTREQL KSKASSGYAYMQGTSMACPHVSGIAALVASYFGGFTNEELV TAASVTGARQKTGTSFAAPFVTAAVSLLDSNNPGLSLEGL SLNDTSDTANASGTSMAAPHVTGALGVLMQRYPDLDNACLI STWPGGAYDFTSGSSMATAHVSGVVALLLALIAPQLDARSV STWPGGGYNT】SGTSMASPHAAGGLALL
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S $\square H P D G E G T P \square S G T S Y A A P V V A G \prod A A L V R S R F P H \square S A R E V$
 SAVPGGGYRVLGGTS
TTSAGRKMPYFLGT SMACPHVAGVAALWWQKNDPNRASSV SAWRNGTTQTLSGTSMAAAHITGLGAYIAGLEGFPGSEAL T
TTDPNSYFHSGDGTSYSSPMVSGVIADMLEANANLGYRDV LAASPGGYSR $\mathrm{D}_{\mathrm{D}} \mathrm{GTSFASPLVAGFAACAWQQQRTLTAMAL}$ SVDISNAYTKMAGTSMAAPHVAGVVGLLKSAKADLTYEEV TAASISGARWKTGTSFAVPFVTAAAARLRADAPDLDARAV VATENGTDASAAGTSFAGPVLAGAVTSFWSAFPSKSNAE SSVINGNWANKNGTSMAAPHVAGSIAVLMERFPYMTGAQV TTGPDDEETLISGTSVVSAYVSGTAALLLSQNPKLTPVDU ETVCVEVTAGGVDT
SASSDTCFTSRSGTSQAAAHAAG $\square A A V I L S S N Q N V S P V Q V$ STVPGGGWEEMSGTSMATPTVAGAAALMFAENPNLTAAQV SSVNGTGYGFASGTSMAAPHVTGAWALMKSKNGVASVTAV PIANAGPGGTFW
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| UniRef90_C5FGP4 | CETIIKK $\square$ A $L^{250}$ |
| :---: | :---: |
| UniRef90-S0AND2 | A SVLK T T TVDMGAPGLFGWGM\D\GKAI |
| UniRef90-R6S8U9 | $\square E V I H Q S G D R A Y P D N \square F G Y G V S D V W K A$ |
| UniRef90-B2CJ52 |  |
| UniRef90 G6AGN2 |  |
| UniRef90-L0A0A7 | LT RLQQTATDLGPDDATGAGLIDD |
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| UniRef90-A3VZX3 |  |
| UniRef90-W7INM1 | WARLA Q A A R QPPSTDVGAGLVQA |
| UniRef90-J8QEIO |  |
| UniRef90_R7NTA2 UniRef90 W6Y8S9 | KEIL FKSAYDVDNYNQLGYGCVDATAALL QNLLASTAKPIAPPAQQGAGLIQAYDA |
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| UniRef90-LOSRQ2 | HELLHRTSRQRDG |
| UniRef90-UPI0003487C7C |  |
| UniRef90-F7RXE5 |  |
| UniRef90-UPI0004777E8C |  |
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| UniRef90-W0PIP8 | \\| ETL T T T T T L GEKE\YGMGLLNLGNA |
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| UniRef90_R7IMQ2 | KKAVKL |
| UniRef90_R5JS43 |  |
| UniRef90_M3A090 |  |
| UniRef90-G8AGR3 | S R LLLKATARRPPDWDAFGAG\VDAEALLK |
| UniRef90-A9SKB4 |  |
| UniRef90_Q5YY66 | QAK LIGEATPGTDPTDTGAGLVRA |
| UniRef90-X6JAT6 <br> UniRef90 W9Alo | KATVQRSAHVPPDTDEYGAGIVNAEALLR |
| UniRef90-F2PT77 |  |
| UniRef90_UPI0004798729 | K K $\square$ I M Q S |
| UniRef90_C2MG36 |  |
| UniRef90-G2RQNO | T A R TKQ A A P Y H D A DFGS GEANAYRALK |
| UniRef90_A8SUR9 | KARLIE Y SVDLG D D I Y C G Y G |
| UniRef90_UPI00030D4 |  |
| UniRef90-UPI000262B391 |  |
| UniRef90-C5KBM9 |  |
| UniRef90-K9V1J5 | VSILLKK T A T Y G |
| UniRef90-R6QQA2 |  |
| UniRef90-F4AMT9 | $\square S A L D N T A K A \square D S G S \square T \quad F G R \square A L G A A$ |
| UniRef90-L8WJ20 | SQELRKHAV |
| UniRef90_UPI000373ED10 | KE】FVSAATDLKRPEFQGAGLLDLMRTLQ |
| UniRef90-A0A024PM42 UniRef90-K1VPY5 |  |
| UniRef90-K1VPY5 UniRef90 UPI0004791BEA | K R $\\|$ L K S A $\square$ D VGF S N Y Y G Y G LVD A G N A $\square$ |
| UniRef90_UPIO004791BEA UniRef90 ${ }^{\text {M1WE88 }}$ ( |  |
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| UniRef90-K4ZRF3 |  |
| UniRef90-K0UTQ6 |  |
| UniRef90_K0KN17 |  |
| UniRef90-UPI00041C42EA | TIL KQS T G K P M N G Y C G Y GVLNAYEAM |
| UniRef90-UPI00036B8322 | MQLVRESGSQYTSPDYFGYGI PNDEWAL |
| UniRef90-A1SLZ0 | HDALVDTARTPGFTSSYGHGIVDAQAAV |
| UniRef90_K0UZL3 | MERI KRTARTAGADAAVGYGVVDPVAAL |
| UniRef90-FOGJY5 | QQKLQTRAAKLAAGTACGSGILDAGSAV |
| UniRef90-G7YQH7 | QYVTLLAAN |
| UniRef90-E9FB74 | ASLLTTY A APYYSVARQGGGLVQAWEACR |
| UniRef90-Q15Y71 |  |
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| UniRef90_Q6H8Q3 |  |
| UniRef90-M4VQT8 | K T L L K A S |
| UniRef90-K8DJN1 |  |
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| UniRef90-X8JJ |  |
| UniRef90-A0A011V0T4 | A A HLT A HARPGFDASDFGHGLV |
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| UniRef90_IOYN58 | $\square \mathrm{K} \mathrm{A}\\|\mathrm{I} \mathrm{S}\\| \mathrm{A}$ |

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A D SVP
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$A \square N \square S G A W Q Y S$ RGEGQTVAVIDTGVQPGPR YESSAAGSGVDIYMLDTGITTTHTD QVTPYAVYQSQADQLTFNANAGMKVCI DSGLDNGDF LAMGNVQKLHDQGDKGRGVQVAII DSGVDYRHP APTTQADHEKGNVEGAWDQGYRGQGMVVAVIDSGADTTHK A WRKGYTGKGVVVSVLGDGMDQLAS
MTGVDKDHAAGVTGKGAKVAVVDTGI WYTHE VNLPRAWDRTRGSSGVVI AVVDTGVLPHPD I GQPEAETATYDGAGAC|AILDTGIDYTHN D TPRSQQDLGFDSVWS DT RGAGQRIAVIDTGVSRHPR QLTPYAVVQSQADQV SFNASAGMKVCVIDSGLDSNQD SQFPTWNHNDTNVR乌AHANGYLGKDVVVAVVDTGADP MTGVDKLHAAGITGKGAVVAVIDTGIYYPHP GGUNKLWEEGIEGQGDKVAVLDTGIDSHPD YEWGVSKIGAPQVWSSGATGQGVVVASGSGVRNHKA GLDDMLNLQNLHQQDHTGNGMIIAVMDSGFPNVHS
 Y Lea $\square S \square P E A W D S T P K T P V T D A V D D D G D A A B P D$ MTRLLANGVPGAGVTIAVLDTGVDDTWY KMNLAAWRLRGEGQLVAI DIGVRPGPR WAVDRDDQVSLDNRPYTGNGVDVYVLDTGIRNHYV SYGLYGQGQTVAVADTGLDTHEA APPNWNQGTTNAADVVAVVDTGVDNHPD NYQWDDQRDTHNGDSYALETGGVVIVGII DTGIDNHPD QPHFAYYHLDQARAKGYTGKGVT ALI DGKVDTTPE GGEMTNAREATSATATDSSVTVAVVDTGVSANGY WYGDTVNIPAAWEKYQTGEGGTVAVIDNGFYVDAT


## ADSVP

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VNCDEAWK■CTGDPRVIVAVVDNCVQDHPD I NADLAQQAGARGQGVKLAVLDDNLVPSYA I NAADAWAVDTTGNTPVVAVLDSGVDYHHP

俍 LP WSHKTTNVDKLHKRGUKGAGVVIAVI DSGLDTHPV
LRTDKADARTFGSDGLGIWAVIDSGUDGHPH

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$G R D D P A S A D M A G T R G L V D S S G H G T F M A S V A A A A R D G S G D H$
$F G G R G H S P Y T L S D S P L D D T D G H G T H V A G L V G A S$
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$T G V L N Y V D P A T N N L N V E D V R G H G T S V A Q T L A G R T A R L F S G$
$\square N V E P G G D Y \square E S T D G L T D C D G H G T A \square A G L I A G Q P G A D G F S$
FGGRARWGGSFGVGGGID
LPARPGGDYVSTGGGTEDCDAHGTLVAGLIAARTAAGARW
$L P A R P G G D Y V S T G D G T E D C D A H G T L V A G L I A A R T P G S G F A$
$E W N N D S G D N D S G T G N W N D H G G H G T H V A G T V A A A D N G F G V V$
FVGDDYTGDNAPAPDQDPDGGHGTHTAGIVGMKNQGFGLV
FVGDDYTGDNAPAPDQDPDGGHGTHTAGIVGMKNQGFGLV
$F$ PFVYNYASKSNDWDKDDGPGHGQHVAGUI GANGDEKYAV
FNLNGHSGDASNSAPDFFLSSHGTRCAGTVAAAANASCTV
$F N L N G H S G D A S N S A P D F F Q S S H G T R C A G T V A A A A N A S C T V$
$F E S V A D Q Q V D V T G S G G D A V G H G T A V L G Q$



$\begin{array}{ll}L A L E G G G D Y V G T S D G T D D C D S H G T V V A G L I & A \\ \text { F }\end{array}$


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


DFADGDADPMDDGTFGQDASGHGTEVAGLALI
LNVDPGGDYVETTDGLTDCDGHGTLVAGLVAGQPGDDGFS



LAGATIVDKSPCTHSSPYSQSHGTAMASLLVSKE
LGGCF GPGCVPDSDPMDTCNGHGSHVSGVISGTNNPYG11
LEDVEDGDPSGVGETRDGNGHGDWVAACYAANTDDR LR
CIVSFGRDFVGDAFTGDDCGGHGTHLAAGIVAANKNALGFT
DFSTNGWDDGSGNHGWNTANGHGSNVAGIIAGMASNGSNFTV
FEWNNISGDNDSGTGNWDENGHGTHVAGTI GAADNNVGVI
LHDNCDRVDGDDGPDGMDNHGHGTFIAGUI AGNRENHGUK
FDFNDNDPDPFPRYDPTNENRHGTRCAGEIAMANNNKCGV
MANNNKCGVV
GIIDVNGVAA


DK LLPGY DF DS DAN $\quad$ LAN D GNGHGTQMAGVGAATHNGSGMA





LAA NMWTNDDDSNGYADD】HGHGTHVAGTVAAVNNNGGVA
PDA GKVDGFTDYTA SP GTPRGHGTDVSAAVLGSAQDGFAG

LRNNYDAA $\quad$ NSYD $\square$ NE GDDMNGHGTRCA GE AMANNQKCGV
GTAGSQC

LPGIPGGDYVSTGDGTGDCDAHGTIVAGIAAAPTPTSGFA



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UniRef90_Q6CBA4
UniRef90_X4ZLT2
UniRef90_UPI0003FC41CF
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UniRef90_UPI000414A40C
UniRef90_C7RVN6
UniRef90_M0SXM3
UniRef90_UPI000361AD11
UniRef90_K3VH79
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UniRef90_U1M0V5
UniRef90_UPI0002C42568
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UniRef90_T0LBL0
UniRef90_UPI0004678FE5
UniRef90_M7T8S1

## UniRef90-M7T8S1

UniRef90_UPI000371505D UniRef90_A8NP24 UniRef90_V9XH68 UniRef90_G9N4L8 UniRef90_R0GE08 UniRef90_H3CQ33
UniRef90-M0MC08 UniRef90-H1W5P2 UniRef90-U3QJM2 UniRef90-X1FMZ5 UniRef90_UPI00036CFAB0 UniRef90_H0YRG5 UniRef90_-T0KX53 UniRef90_R8BDF0 UniRef90_UPI00046E7B75 UniRef90_K3WRQ1 UniRef90_UPI0004644099 UniRef90_UPI0004039923
UniRef90_UPI000298B93C UniRef90_K2BZ89 UniRef90_R6GLW7 UniRef90_C5KLH3 UniRef90-I1V1M9 UniRef90_URF83
UniRef90_UPI00037091D2 UniRef90_-I1EL28 UniRef90_UPI0001E89289 UniRef90_C8WNU0 UniRef90_G2FYX9 UniRef90_Z4X7I9
UniRef90_G4UQ61 UniRef90_M0B5C4
UniRef90_C0KZ97
UniRef90_R6DPG1
UniRef90_A9D2L5
UniRef90_B3L6J7
UniRef90 V9L5N2
UniRef90_B1HNW3 UniRef90_F6FYR6 UniRef90_UPI0003B6EB27 UniRef90_F0B7W7
UniRef90_B1XZ21
UniRef90_UPI00037FE01D UniRef90_UPI0004785DFB UniRef90_E7RCS1 UniRef90_I8DVB7 UniRef90-E7RXP3 UniRef90_W9B431 UniRef90_UPI0003F05A14 UniRef90-J3P6F0 UniRef90_D4IPG5 UniRef90_F0BBS8
UniRef90_E3GKY2 UniRef90_UPI0002632107 UniRef90 E91JS2 UniRef90-X1HEY6 UniRef90_14BF03 UniRef90_E9T2Q6 UniRef90_E6KS24 UniRef90-A0A024JJV7 UniRef90_D6ZZD7 UniRef90_S2XPS1 UniRef90_J3Q221

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 G APD A QL FITEDDS SENPVE ESNWVEALEMADSDGVDVV

 GV A P D V T L N S Y Q T M S S G S T A D S S C K D S A V I Y A I N D GA Q I I
 GVAPKARVATYKTSSRSRLVGATAMPRTPSPSAPMAPSPG
 GI A S G A S L I I G L G IV GVAFNARVGGVRLLAKKRVLDVQELHEVDIYSASWGPPDD
 GVAPDVKLLSIRSTGSPKTGTLTGVADAINRSVDAHARVI
 GAAPDVTI GA YRAWGCNSLT TNDILLDAFNAAFEDGSDI I
 $G V A K N A S L I A V R V L S N S G Q G P V S G I V A G L D W A A A S G R P S V$
 GVAAP E A T I A A Y R V F G C E G S T S T E IL V
 R L A P E A D L I A L R I F G E E G R T K N N VI M R A Y E WL H D N A Y D V V

 GAAPDAQLI SIRRQSNSSGYGNVDTMALAVRHAADLGASVI

 GVA P DAT L L S Y K V F S NAA DVIT A S: GGPS GWS H NAADA GVV $\left.\begin{array}{ll|lllllllllllllllllllllllllll}G & I & A & K & V & D & Y & S & Y & R & V & L & G & A & Y & G & S & G & A & T & S & G & I & I & K & A & D & D & T\end{array}\right)$ GVAP GARRLWSVKVLDKEGSGSTSEDVA GDDYVTAHADEVA


GV


UniRef90_B3MDE1
 UniRef90_Q6CBA4 UniRef90-X4ZLT2 UniRef90_UPI0003FC41CF UniRef90_Z9JJ83 UniRef90_UPI0003B42327 UniRef90_F9XA84 UniRef90_E6KS23 UniRef90_UPI00042941AD UniRef90_UPI000414A40C UniRef90_C7RVN6 UniRef90_M0SXM3 UniRef90_UPI000361AD11 UniRef90_K3VH79 UniRef90_G6EA97 UniRef90_E9H9G1 UniRef90_UPI0004703822 UniRef90-Q21P16 UniRef90_C4LKX8 UniRef90-U1M0V5 UniRef90_UPI0002C42568 UniRef90_R7TP14 UniRef90-TOLBL0 UniRef90_UPI0004678FE5 UniRef90_M7T8S1 UniRef90_UPI000371505D UniRef90_A8NP24 UniRef90_V9XH68 UniRef90_A8FYH1 UniRef90_G9N4L8 UniRef90_R0GE08
UniRef90 H3CQ33 UniRef90_M0MC08 UniRef90-H1 W5P2 UniRef90-U3QJM2
UniRef90- X1FMZ5 UniRef90-T1VMQ5 UniRef90_UPIO0036CFAB0 UniRef90-H0YRG5 UniRef90_TOKX53 UniRef90_R8BDF0 UniRef90_UPI00046E7B75 UniRef90_K3WRQ1 UniRef90_UPI0004644099 UniRef90_UPI0004039923 UniRef90_UPI000298B93C UniRef90_K2BZ89 UniRef90_R6GLW7 UniRef90_C5KLH3 UniRef90-I1V1M9 UniRef90_I0RF83 UniRef90_UPI00037091D2 UniRef90_I1EL28 UniRef90_UPI0001E89289 UniRef90_C8WNU0 UniRef90_G2FYX9 UniRef90_Z4X719 UniRef90_G4UQ61 UniRef90_M0B5C4 UniRef90_C0KZ97 UniRef90_R6DPG1 UniRef90_A9D2L5 UniRef90_B3L6J7 UniRef90_V9L5N2 UniRef90-B1HNW3 UniRef90_F6FYR6 UniRef90_UPIO003B6EB27 UniRef90_F0B7W7 UniRef90_B1 XZ21 UniRef90_UPI00037FE01D UniRef90_UPIO0034785DFB UniRef90_E7RCS1 UniRef90_I8DVB7 UniRef90-E7RXP3 UniRef90_S3C5P0
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130
140
 INYSATGPVSKAMNQAFVKAVEAGI TVVVVSAGNFMKAACN N M S IIG G Y A D M L L WK R A L Q Y A A V NTSLG YFTYDNPNYSY EYA DL N GQVA FA GNS GA S S DP YVVS $N L S G G G P A D P L L Y K M L S Q L L S E N R I V L A A M P P N G H M D G F P$

 SI SI S S NDRNAS LK WAMARAMS SGTIIV A G $\square G N S A S D N D S$


 NLS F VF DESSYDLFLDADVRAAAAGVVVVISAGNNDAGAPG
 GK H I G G HA L E R GVVE L G R R GRRGA I Y
 NI SVVAACTDPRMLRGSLDRAESAGVTVVAAAGNSCHDGMN $N L S G G G G C D D R V L A D P D E D L R T M G I A T V I S A G N D Y F D A B V$ GRTV DGP GF QR GV TK GRGGLGT LGVWASGNGGGYYDNCNC SCSAGMYTGWANDPWGIAASAAKGVSVIVAPGNSGBRSGMF NNSWE DPNWDTTNSATTNYYVNAGGLVVFASGNSSAANPS VEAP GD QP GV NV A QLDRTAAA DQVRA GL EA Q GA D Y TVVSF E D NI S VVT CLLPAD KPIDD Q TNAADVEKDAVIVVAAA GNNR G GV S T V SMS L G GSVS QA LDD
 SMS LGGGGSNSTESNAFQAFTDAGGLVVAAAGNDGNNVRS

 $N M S W G S Q E T S Q A M N R V M N G L V E K G V R D V V S A G N S G G E K S G$ TSSDGGLSSDNAWAVVASRLVDQGVVIITISAGNDGQAGGF
 N $\square$ S A G D G $\square$ N D QRLLGAA I E Y A T $\square$ A K N AVV A D P WN SVT T I A S SMS LGGGGANSTEENAFQAFTDNGGLVLAAAGNDGNDVRS

 $N L S L G G G A N S E T D G A S D N N A M L A G T I S V D A T G N A G P N R G T$ SNSWS GPS GDD WF QPVI DA WVAA DII PVVFLGNDG $N L S L G F D G E E P S V R E A!N R A I A K G V V V V V S A G N D H R D V S A$ NTSLGYT QYDSTI SK GATMAMEKGMLVVGNRGNEDNFKI I
 NSSSQQGFAKSS $\square L D K T M A A A T A A G V N V I A A A G N S G R A S K N$ LMTEGM $\overline{N L S L G G S D E P V E A V K Q A D G Y A N D A G V V V V A S A G N A G T E G D R}$ $N V S T V T C D P A D R G I D Q A E A A V D K D A V I V A A N W S G V T S V V I I$ $N \mathrm{~L}$ S L G S P TP D G I V Q D A V S Y A L S K G S L PV A A A G N D G T D GL M
 NNSWA GRTMSKAFSLAATKLGEKGAVTVDGS GNDAADVDK
 SISTGSEEDLDESTKWA TRAD A LIGVIVVSPMGNDAKDTDA


 SMSLGGGGGANSTESNAFQSFVDAGGLVVAAAGNDGNNVRS NASFASTTKNYLSSLFEALLKTLEEKKNVLVVVSSSGNCCPTSES WGPNDD GKTVEGPGRLAQRAFEYGVWASGNGGRHGDNCDC $S G T F D G D A F E Y L P T F D M S Q T D G N A \| R A A L A G G K G K D V F S K$
 $M S L G G G G A C D S A T Q V A / N G A V S R G T T V V V A A G N D G E D A A N$ NMSLGGGEGACSATYQSAVDDVIAARAVVVSSGGNE GLAVD NMSFYVDPWVEAVQRAA DYAR GHGVTLVGALGNESTDDGK


 SMS LGS WQLD DPFANDTSVLESSKGIAVIAAA GNNGGPALT $N D S T V A C L A A G D A L D D R A L G A A L G G A V V A A T G P A P D W V A S$ $V A S S L G G G A S T A M D S A D E R M D D A G Y T V V V A A G N D N A N A C Y$ STVGWS QS DKAMITNTAGKA ID TILAGGGNVTADFS LDA S QCSY GYPA GSDYF $\mathrm{C} A \mathrm{~K}$ K QNCAAVSGGLAGIAANNDMTGMS S


 SMSLL WQPNRQQWRNMCNAVLA GGI DMSVAAGNE GDEQGT $N D S S D D R A L G A A L A Y A V D V K N V V V V T A A G N V G G P G Q C P Q D$ $N$ I S S D G DA D Q S L GAA AVHYAA TVVKNAVVVAAAGNFRS G GCT TNATSTTDHSDALKWAVARAMSQGIIIVTAADGNEGRDETQQ
 NES GVG L G DS F GF IPP T F DLLS Q T D G DA I R A A L K N GA GTVVS


## UniRef90 K9P4L5 UniRef90-Q6CBA4 UniRef90- 4 ULTT2 UniRef90_UPI0003FC41CF UniRef90_Z9JJ83 UniRef90_UPIO003B42327 UniRef90_F9XA84 UniRef90 E6KS23 UniRef90-UPIO0042941AD

 UniRef90_UPIO00414A40C UniRef90_C7RVN6 UniRef90-M0SXM3 UniRef90-UPIO00361AD11 UniRef90-K3VH79 UniRef90_G6EA97 UniRef90_E9H9G1UniRef90_UPIO004703822 UniRef90-Q21P16 UniRef90-C4LKX8 UniRef90-U1M0V5 UniRef90_UPI0002C42568 UniRef90_R7TP14 UniRef90-TOLBLO UniRef90-UPI0004678FE5 UniRef90-M7T8S1 UniRef90-UPI000371505D UniRef90-A8NP24 UniRef90_V9XH68 UniRef90-A8FYH1 UniRef90_G9N4L8 UniRef90-R0GE08 UniRef90-H3CQ33 UniRef90-MOMC08 UniRef90_H1W5P2
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UniRef90_E3GKY2 UniRef90_UPIOOO2632107 UniRef90_E9IJS2 UniRef90-X1HEY6 UniRef90-I4BF03 UniRef90-E6KS24 UniRef90_A0A024JJV7 UniRef90-D6ZZD7 UniRef90-S2XPS1 UniRef90-J3Q221
UniRef90_B3MDE1

 VPADAATALT DGAVSSSEVKAGFSS DGPTADLMAMGVGAT SNTPGVIVV RSSNSTPAPPGVISAPGND\L SPSDADSLLTVGAVDSDRNYASFSSKGPSADLATQGAQAA SPASAPSACTVGATDTTDTKASFSNYGSMVDIWAPGVSIK GSATWSGVVGVSAVD INGARADYSSWGRGVTTAAVGGPIA GAPGTAALAITVGASDVSQTDPTFTATAD
SPGAAALPISVGASDVSQAVPTFDATAGDVV
YHGF QNNII AAAATDSAGNVTWFSTPGAALVVAPGQSVP ASNGEGLVGDAHPDLIAPGVNILAAAWTGSSGPTGLE WVI I A GGHDAAGNFDYTYANRAGSGPSSVWY LAADSRDVN TLCESQNTDCVGGVDKDYNKGWFSRDGKFIDI WAPGSEIV DSYASSVYTLSVSALTPQGLSPYYAEPCPAVLTSAGYVGGQ
 YPAAQAGVVAVTAVDAAGRLYDQANHGSYIEFAAPGVDVMW GHPGCVSDAITVGWNANGEVIWGTNMSEQVDVLAPGRSIA $D G Y T N S D H T L S V G S A T Q Q G R V P W Y S E A C A S T L T T M Y S S G V$
$V G A P G G T T S S I I G V G A Y G N L Y T W S S R G P T V C I S A P G G A G A$ LSASPATGFKVTAAGSVDN

T IA S DPVVS GVTATNNLNADASYANRCGYNCDAAPGNVYV REVHDMAQATPGAVSDFSTFGPTMEMSMKPQLGAPGGNIL | $G S A C E P Y V L S V G S L T A G G Q P S G F T M A G P W V G V A A P G E N V V$ |
| :---: |
| $S P A R V P S A D V G A A N D F D A K A A F S N F G P V V T V Y A P G Q N V V T$ | GNPRSADPADVGAVEDDGTPAGYSDPGPWVDVAAPGSGLV YPAGYPSVMMI GANDADNNIIADFSQF STSAPGISTNSLSVGSDENEVYPTVYSAHDD EAPDAHYAAANSGQGADANMADFSSWGPMPDDSAPGGQIV DGYGSS $Y$ T ISVSSGPPRGHRPDHQERCAS ILTTSSTVVT AASSGSRAFSVVACVASDGADAEFSSYNPDRDN

APADCSGVDAVTAHANDGENATYANDGAQVADSAPGGGCG PAWYDDYVLTVGSVDPNGTASSFSDGGPWVDVAAPGTGII
 WYTSSGGNGIGSTTVGSV
TEFVGVPNTHPSWPSVFTSFGGTYD $V G \square K P D \square A A P G T N \square F$ MGTPATSRDG■AVGNTTNPEVHY

 UniRef90_UPIOOO42941AD
UniRet90-UPIO00414A40C UniRef90_C7RVN6 UniRef90-MOSXM3 UniRef90_UPIo00361AD11 UniRef90-K3VH79 UniRef90-G6EA97 UniRef90- E9H9G1 UniRef90_UPIOOO4703822 UniRef90_Q21P16 UniRef90-C4LKX8 UniRef90-U1MOV5 UniRet90-UPIOOO2C42568 UniRef90-R7TP14 UniRef90 ${ }^{-10 L B L O}$ UniRef90-UPI0004678FE5 UniRef90-M7T8S1

UniRef90 K9P4L5

## UniRef90_Q6CBA4

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UniRef90_K 3 HH79 UniRef90- G6EA97 UniRef90-E9H9G1 UniRef90_UPIO004703822 UniRef90-Q21P16 UniRef90-C4LKX8 UniRef90-U1M0V5 UniRef90_UPI0002C42568 UniRef90_R7TP14 UniRef90-TOLBLO UniRef90_UPI0004678FE5 UniRef90-M7T8S1 UniRef90 UPI000371505D UniRef90-A8NP24 UniRef90_V9XH68 UniRef90_A8FYH1 UniRef90 G9N4L8 UniRef90-R0GE08 UniRef90-H3CQ33 UniRef90-M0MC08 UniRef90-H1W5P2 UniRef90-U3QJM2 UniRef90_X1FMZ5 UniRef90 T1VMQ5 UniRef90_UPIO0036CFAB0 UniRef90-HOYRG5 UniRef90_TOKX53 UniRef90 ${ }^{-}$R8BDF0 UniRef90_UPIO0046E7B75 UniRef90-K3WRQ1 UniRef90 UPI0004644099 UniRef90-UPI0004039923 UniRef90_UPI000298B93C UniRef90-K2BZ89 UniRef90 R6GLW7 UniRef90_C5KLH3 UniRef90-I1V1M9 UniRef90-IORF83 UniRef90-UPI00037091D2 UniRef90-I1EL28 UniRef90 UPI0001E89289 UniRef90 C8WNU0 UniRef90-G2FYX9 UniRef90-Z4X719 UniRef90_G4UQ61 UniRef90-M0B5C4 UniRef90-C0KZ97 UniRef90-R6DPG1 UniRef90 A9D2L5 UniRef90-B3L6J7 UniRef90-V9L5N2 UniRef90 B1HNW3 UniRef90- F6FYR6 UniRef90_UPI0003B6EB27 UniRef90_F0B7W7 UniRef90 B1XZ21 UniRef90_UPI00037FE01D UniRef90_UPI0004785DFB UniRef90 E7RCS1 UniRef90_I8DVB7 UniRef90_E7RXP3 UniRef90-S3C5P0 UniRef90 W9B431 UniRef90-UPI0003F05A14 UniRef90-J3P6F0 UniRef90-D4IPG5 UniRef90 FOBBS8 UniRef90-E3GKY2 UniRef90_UPIOOO2632107 UniRef90 E91JS2 UniRef90-X1HEY6 UniRef90-14BF03 UniRef90-E9T2Q6 UniRef90 E6KS24 UniRef90-A0A024JJV7 UniRef90-D6ZZD7 UniRef90_S2XPS1 UniRef90-J3Q221
 SDKI IN S
QSLUKQSAKD LGKDPDFGSGEASDYYAL VQMVKASADKYNPDNNYGYGUPD QDLLDRTSR
$\square S Y L Q R S S Q Y T T P D N L L G Y G V P N F V L A$ $\square Q L L V H T T T D G G W N Q Y T G Y G L A S P A T M \square$

QE ILAATAVQTGATTDYGFGLVDAFAAVR RSAMMTTASRPATPFDFGAGHLNLDRAM VS LLLDNATDPGRDPVFGNGDLNLSK
QQILAYSAHRDHFNDAFGFGFLNVHDAVR QHLVVLSSSPPKQD
KKLLNETAKD■GWNATTGWGVIQPKKAYE QQ $\mathrm{L}_{\mathrm{L}} \mathrm{QNQAQDKGPDPQYGHGLL}$ $R Q I L A A T A T P G A G S Q$ AGMVHPARAV E QVLESTGVNVDARNG】TRPRIDVHAA
R Q A LE N T A LK V V S LD H F G H G L VQVEK A
$R Q T L L G T A A D L G A D E V Y G Y G M L D V G K A \square K$
AHRLQUTSTQLTSTAQQGAGMINALRA VHRLTATAQARSPSNLTGAGGVDPVAAL QAKI QNDADK
MTR I E TAHSPGWNPQVGHGVVDPLAAV

K A LLMNTSQPLVSPRRQGAGQDNVGAAV QHIIVRASRAFKVSHDYGFGLLDAEAMV MRDFEAAARNDPDQPRDGAGLADYTAAVE

TTALKASARPHPNPGVCGAGLLD ESLLARSGLQ DDPDTNVATPRI DLVEAM $M Q R I E A T A H A P G W N P Y V G H G V I D P L A A V$
QHLI IRASRPAHVSHYYGYGLLDAGLLVQ
SAR $\square$ LS SGDA VPWGSETGSG

MELTKE $\square G H S N S P N N L L G H G \square P D$ QYLIARTAK

NELLMCTATVCGSPRVQGAGFAN $\square R Q A \square R$ KKIIKDTATKGVKDSKGFGRVNAAAAVK $R \quad R \quad Q A T A T G V D A A G K L G A G R L N L D A L T R$ VQRI TATAHNRAPSNVVGAGTVDPVAAL RLCLEQTASNNGYVSQTGYGIVQADR LDTLKDNCLKFS INF LIF
KAAL I A GATDVGPNGNQGWGRVTLDKSL
TA DQQKTADD DGTDE DF GAGEANDYTAD LQLMTKTALNNEWNKYTGYGVADLGAMM

RDELTATAEP $\square$ PNSEE $\square$ GAGMPNAENLL
Y N S L R N C S T K
$\square R L L R E S$
QHLIVWTSESDMVNNRFGFGLLNAKTLV KVALSNTAQVLDKTKYQGAGRVNAYAA $K T I L Q Q S S R P F P P D T Y C G A G M L D A G S A \square$
$L A A Q K T$
RQMLRASARAFPP
$R E L L Y M T A S P \square D S$
ПERDKRTAHKPSQSSLVGAGVVDPMQAL PLILARSARQVDAKHDYGFGVVNADAAVK
MKR DEDTA LIPAGWNPQTGHG VVD $\square R$ NA $L$ KNKITGEAT QARIMNSGRSVEYTDQVGTGLIDAVAVL TTLLLTSVNDIN QQTLLTTATDLGDPGVYGWGLVNAAKA $\square K$
$K Q L V L A Q C L D \square Q R D R Y Q G S G L P S \square M R M L$ QHLVAKNAAGFWFNSRFGFGLMNAYALV DSVLEVTAVE LGGNNTYGSGRIDCYEAV $M Q R$ T DTAAPA GWDPVVGHGVVDPDAAV I ARI EATAHAPGWNPFVGRGVVDPVAAV $L Q L L V H T T T D G G W N Q Y T G Y G L A S P A S M \|$
$K E D F V S S A T D L K R K D F Q G A G L L D \square M R A \square Q$ K VALSNTAK ILNDVFAQGAGRVDAYAA

```
lupas_21
lupas_14
lupas_28
jnet
conf
l
soly
jhmm
jpssm
```




```
lupas_21
lupas_14
lupas_28
jnet
conf
```



```
solo
jpssm
```

UniRef90_S2ZAE4 UniRef90_A0A037ZFC5


[^1]


```
lupas_21
lupas_14
lupas_28
jnet
jnet
sol25
sol5
solO
jhmm
```



lupas_21 lupas_14 lupas_28 jnet conf cont
sol2 sol5 sol0 solo
jhmm


```
lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
```




[^0]:    $\qquad$

[^1]:    lupas_21 lupas_14 lupas_28 jnet conf sol25
    sol5 sol5 solo
    jhmm
    jpssm

