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GGNTVLIQRMDEAFVSSCDVISNKAWSACSLKQGTHETT S


 GGNLIA AHRMDNS ILDSI KV SFNKAYTALALLKMSTERENE
 E G N L V $\operatorname{L}$ A Q H R M D D G A W W L P S
 EGNLI A QHRMDGAWLPSVNISRNKAYTAAGLEMPTHELAE EGNLVAAQHRMDDAWLASVNI SRNKAYTAAALEMPTHELAE GANLL GF HR DD DA L L A S I S I A Q N K A Y S A V T L K M P T D E I G D G G N L V S H V R M D G A WL G S I D I S I N K A F T S R A F D DQ T K D L G D
 S GHLLKAFRRMD GAPLLSI GI SQRKAYSAAAFGMATGEWLD GGNLIAVHRMDDAWLASI EI AQNKAWTSVALLKMPSANLAD

 GGNLL Y F QRME GTLLDSTKVSQDKAYTACALKCPTCDLAAD D GHLKKAFFRMDEAWMGSDDIADRKAK TSRYFNLPT GEI G S G G N L I M L Q R M D D S L L G S I EVV S M G K A Y T A A A F K M A T N E L K D G GNLLKAFTRMD GAFLGGI DDSIGKARTARLDNMPTSALGA SCHLLAFARMEGAKIITSINTAI DKAFTAAGHRVPTSVYKE




 GGNLKAFTRMDGAWLGS DI ADKKARTARYFDMPT GD DGS



 G GNLL AF ERMANAWLGS $\square D I A D K K A W T S R A F D \square E T Q E L A K$


 GGNLKAFTRMDGAWLGSLDIADKKARTARLFDMPS GDLGP GANQVA F VRMD GA WL G S A DI S L K K A K T A R FF DMP T G D I G K GGYLLAFERMENAWLGSVDIAQKKAWTSRAFD】ETGTLGT S A NL K A F K R M D G A F L G S I DI A I K K A R T S T L F P F A T G V L G G
 GGNLMLLTRMENAFI S SIDDIAANKAFTALALLKQGTHEVTP S GTLLAFERMDGAKVTSVTIAQNKAFTAAGARKATSAINE



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



 GANLLAFARMDGAWLGS LDI SIKKAKTARFFDMNTGS $\quad$ GGE
 TGHPVVVLHKMD H A QYA S L DL A QA K A R T A T H F K R P T K V F E E

 S GHLLSFVVRQDGAMAGSAELAVDKAFTAYDFNNRTDTLGA GGHLLAFARQDGA 1 RAS S IDI SQRKAVTSVLMEAPT GALTP EGNLIA QHRMDDA WLAASVNI SRNKAYTAAALLQMPTHELAE G G NLAA F L R M P E A F L H S I DIIADDKA Y T A A S F G F P T S D WE A S GTLDAFERMDGGKVHSVQVATDKAFTAASARKGTHEYNA
 E GNLIA QHRMD GAWLASVVDI S RNKAFTAAALDDMPTHDLAE GANPVLVHCMDDSFIAS YDVAFNKAYTVVGLKMPT■KLKE D A NLI SINRMA GA LVVSERIS QGKAYTAVALKMPTSTMLAT G A N L K A F V R M D D A WV G S I D I A F K K A K T A C F FA M P T G Q I G K GGNLI A QHRMDDALFASVDI S LINKAYTSVSTKMPSHVIGE A GHTLA Y L R M N GAFLLHSEGIAVDKAYTAASFGFPTRDWLQ GANLI AFAHMDGAWLGS GDIAAQKKARTARYFNMDS GE I GK TGSLLVSFYRMS GALLVVSESLA QKKAYSAVAMKTDTHELKA A GHPKLVR S MD GA Y G S L DV A V N K A Y T S I A F Q M S T A A L G E


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 EVMQLTSRQAQA ILLDGGEAKANELGLPVVVAVLDA $M K \square A \square A Q S T L S W E A A H T A V E A A V Q E A S R L D V R I N V A V A D S$ MTE NADAG LMLAGARAKASD GVPMC A TDE


KQVLK TDEDAKKMMDGA DNKADE GVDMDIAAVVDD SATFNIPSLTPELATKAVEVAVDACRDRNAQVTAAVVDR SI ShKTAELVLKAAVEKAKQLGVPMNLAVLDE MSSSIVTKNISTEAAFTAVQAAVEKAKEIGINVCVSVVDR QAADPLSCVAQRALDTALQHAEKNGWLVSVAVLDG
 $S \square T Y D T A R R V D E A G \Pi A R A E E G Q P M N I A V V D D$ KTKHYLT ADAEFLLNQAHQYADENSFNVSIAVTDE MEDQRTM LVEAKRMIA 1 AEQKAQEDGVPMVI AVVDD KTKPCDTQEDVNK LDAAEKEARAHQWAVTI AVVDD VPTLTTEDAKMADACEKYGQAQGWPLNIAIVDA TIETVSLDARRVITAAETEALMDGQPVNIAVVDA SKPVLTVEEANRMI AAGEAEADQNEWKVTVAVVDD MGALSLSTAQKVVDAADEKANEDGQPMNIAVVDD
MNT\|VEK TTSRQAAFTACLSATEKAEELNTATNVSVTDN STPKSQPQLTLQGAHDALAAAQSHAKIIGVPMNIADVDA STPTQRHYZNASQALTVINAA $\square Q Y S N G G V P N D I T V L D P$

KTKPVLT DDDARKMAFAAEKEAVKNGLIVSI AVVDD AARARMTLEEALSIMKRGEEMARSLHVPMVFTVVDD (
QTKHYLTLSDAEFLLNKAQQYAVEHQFNVSIAIVDE LPLASAWTAVEAAVAHASREELQVSVAVLDA NAFDSAPVLNLETAQKIAAGCQAKAVKEGWKMSVTVVDA KTSHELTLEMALKMANVAERKAAETGVPVFTAVDA STPSQRHYI NHTQALQVINAGDQRAQAI GVPQNIAVLDP STPSDRHY: NETQAQAVITAAIAKSYE GVPNN:AVADP
 MGRLTLETAKRLIAVAEQKSRQMGLSSNIAIVDD MDVTRTSLRLTAAAAHKAVGAAVEKADELGVAVNACVVDA
 KPITLADAKKI VAAAQAEA $\square K N G W H M A I A I Y D S$ NMDLKSAELLADFAKNTANDMNLPUVITVVDK SVPQQRHYDNATQAWTADDAAVQQSMADGVPNNIAlVDP QTKPYLSLADIKKIAAGAEAEAVANNWPVVIAIVDD MNKTHVQVSLTLDAALVIAQAADSKGNEGGVKLNAVVVDS MSAYRQQPQ T TLK LAMQALQAALEQAESRGLRTSITVVDA MNFLNLELSKKVIEEVENLAKNEGIPVVIAICNE TVNDKRLSLDTADRIGKAADDKCRKEGVQITVTVVDR QTKAVLVQADITKI LEAAQKEANNNSWPVTIAITDD HSKPVIGQAEVHRLLSAARQHAQANQWNVTI AVVDD T पR DESVSQEDAQRVIAAAQAKAEEDGSPSNIAVVDA

RS AKAKELAGAAETEAAKRHWKMA S VDP ALETVPVLDMDTALKIAGGCQEFAEAEGWRMNIAIVDR KHKMTLKDAEKLITAKKKKAKA A LERKPVLSLEAARKI AAGCIAKADEMGWKMNI AIVDG KTKYFLTAEDVKLIIKSSESYSLDKRLNVSI SVVDD PTSSKPSLTLDGARRVIAAAEQYARQNHTTGVIAVVDD KTRQVLTLDDARKI AATAEAEADRNGWAVTI AI CDE KTKPVLGLTDNLI DDAAQKEADANGWPVTI AVADD
 MNK QRTTLNLAAVKQI AQAAEDKARAQGLSVSIA:IVDD
$\qquad$ ROVRNSLELANKLASEADQSCKSSNYNVTVSVVDK
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 S S QL V A F L L R M D N A Y L G S V D $\left.\begin{array}{lllllllllllll}G & G & L & K & A & H & R & M & G & A & V & G & S \\ G & I & L & L & H & F & L & R & M & D & N & A & A \\ P & L & S & A & H \\ G & N & M & A & M & H & R & M & D & N & L & L & A\end{array}\right]$ $A$
$A$
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$V$ $\begin{array}{llllllll}A & L & G R & R & S & K & Y & E \\ A & D & R & G & F & T & R & A \\ G & G\end{array}$



 TG G L LA M K RMD GA SAMMSANFCQEKAKCSA LASRAPS SAAY N G G H L L A F A R V G G T P WH S I N L A D D K A R T S V S S A A L P S S T L G D GANPI Y F E R M N G A Y I A S A E L S R L K A V N S A G M Q L P T S L L E E S GN V V L L H R M K G A L L A S L D







 G G N L L A Q V R M D D A L L V S I D

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 GA N L L L A F A R M D G A W L G $\operatorname{S}$ L L D A GRVVAAVVHCMD GA Y I A S Y D D I A V N K T F T S A S L K M S T A K L S K






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 ASQPGAPAYGIASA $\square$ S GRLMVVGGGLPVVVDGDVVGGIGV AVQPGGELFGINTTNNGKIVVFGGGIPIVSGDRII GGI GV
 LSQPGGP FNIDEVSNGGGLITFPGGLPIVKDGGKVIGAIGV ALQEHSPGVQDGUPRRPRFVAFGGGLPIMHNGERIGAIGV AVRNHGPAFGDQTSHQGRFCVVGGGLPLFVDSQIVGGIGC $S T D P G E D S Y G V Q H L D P N V T I L G G G V Q I T D D G R I I G G I G V$
 VL Q GKTQLQA G DSRPGGQFWGMALSDGGRVLVFAGGFPVVVDGEVIGAVGV



 1 IN NGRTSFLSAPMLQGMMLEGGVPILVEGVCAGAVGV
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 RSQPGGDLYGI EETNGGGLVVFGGGQPIFDTGYFIGAVGV LS SQPGGSLYGIVHSNQGLITFPGGIPIVDADGEMSGAIGV $M \cap N G G R T A F L S A P A D D G M M E G G I P V I V N G V C D G A V G V$ $T V L P G Q P L Y G L Q Q T H P G K F C V F G G G V P L T S G G R F L G G L G V$ $A A G P G G P F A G L A H G S E R G L I T F G G G F P L M V D G E V A G A V G A$ MIKNGQFGF LISMNAGLGMLEGGEPILYQDHVVGAVGI
 $F S K K G G P A P G L \quad A N L P G F V T L A G G D P F S A G K D F L G A V G V$ LI QP GRELYGI QVSNQNKIVTFGGGYPDK DNDEDIGGIGV RSEPGGDLWGI QETNGGTVVFGGGQPIFDPNGYFi GAVGV RSQPGGDLWSIVETNGGGLIAFGGGVPIDHQGYWI GAVGV Y L K PEAGTYGMTATNGGLVGFAGGLPIDKNKEILGYI GV ASQPGKPAYGDNSADGGRLMVVAGGLPVTADGMVVGA$G I G$ $M D N G G R V S F G D S A P E \| S G M L E G G V P V I V E G Q V I G A V G V$ SALPGGPAFGVNTTNYGRIVILGGGIPLVVRGRIVGGIGVV SAQPGGPTFGINTTNQGRLVILGGGIPLVREGRIVGGIGV


A VE $\qquad$ GINTTD

SMS
VKNDEII GAI GV
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 A GTLA A FLLRTP CAFLHSSVDI A I DKA YTAASSGGATS QWP Q
 GGHLL GLVR LDDNCAA $\square G S Y$ I A A EKARSAALGRRETKNFED




 A G A L L L M K R M D G A T P L T A H L S L E K K A K C S A M S R R P S K F Y E D



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 KTDKALTHDDVKRUAASEAEAANNKWAVS\|AVCDA MAD SLNQAQAVVDAALKKSAEGGLMDIAVVDA EAVSMTTLNFELAVQLAVATLHQARALNLDMAAAVLDS KNTTRSTHLTDEAATKAAQATLDAAEKENQRVSVAVVDR
 KPVINLQTAQQLTQAALNTARKLQDDVVICIVDA KTKAVLEQADDKLIAAAAEAEADSNNWAVTIAIVDD
MN $T V T V T P L T M A D E T L V A A A B A A A D A A G V P V S V T V L D A$ QTLTPEDADTMAQQAMVSCEERGFQVGVTVVDR PVTLETARRLIEAAKEKALSLGVPMVVAVVDA
 MDFEVVEAVRRGVERATVMGITKVAIAVVDG HDQPSVSLAEAREIIAGGERKSREVGQPANIAVVDA ITNDQAHAIAAGEAQARSMGVPVNIAVLDA
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T TRTESVSLEDARRVVAAGEVKAME MGSPSNIAVVDAV MNKSQQVQTITLAAAQQMAAAVEKKAAEINVAVVFSVVDH TADUKRLSLEMANRIALLATLEACRAEGVNVAVTVVDR PLGLKDAQRLAALAAIKAAEGAVPVVIAVADV NKTVNVANUASQTAFQLALESVNQCHSQGYRVSTTVVDT

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$T E K S L S T Q V A L E A Q S A Y E S C A K Q G Y H V S V H V V G R$ MQKEMFVTDVAMRADASAVTAAETFAAEKGWKVSVAIVDA


$T V S L V L A E A L \square A G V K T A V E A H R F P V S V V V L D S$ HMRPHLNEIDIILMCEAARRCAEANSWSVTI AIVDE QSKAVLTQQEVTRILAAARAEAQANQWAVAIVVVDD ERNMSQKLAAQUSAGECTAKGYNVATAVDR
MSRLTLAQANSIIDTALAEGDRLDFPLCVAVLD A MRKLTLSTAETI ISAAYEKAAELSLPLTVVVLDA MT TI SLETADGI TRQADAVGRELSAPLTI AVLDA
 HAMNEDDASNVLNTADKANQLNVAVTVAVVDT $S V P S S V I T A S A A S L A C Q A A V A H A E A L G I R L N V A V T D A$ PTRPAARLTHAAADTVLQAADAHAEA GGVPENVAVVDA QQKY MKLSQATMLDAAHAEARRRGVSVCIS LDA
 $S N V L Q Q Q N I P L S L A L D Q A Q E A V Q A C A Q E Q Y S V S A A V V D R$ TVPY SLDLATAKAI GEGCEKYAASKGWRMII AV HDT $K P C T$ LGVPCVFAGVDA $M T L L S L A Q A N L I A D K A L E K A E S L D F P Q T V A V L D A$ A A H A MLIN A ALAEAHRMNVSVCI A IVDA MGTLNLDKAQSTI EFALNWRKENGLPLTVTVLDS KNKSVLELADVKLILAAAEAEAVKNGWGVAI AVVDD
$M N T \square S L E Q A D S$ TITEGALQQRAREMSAPLTVAVLD S

MTKLTTAEVDLIVAETVKRGAALGKALSIAVVDA
MPATVTLASKITDAADAAARMQKFPMAVVVVDA MTHICNDLARVLARDARKKADEI QVPMVI AFADA MADLTLDTARKILDAAFAKSTELKLPLVVTILDA
 $K L L T R P Q L S N A G A K S L L N A A E E E A R Q K G M Q V S A V V D A$ MTKLTLEVANSTINRACSTASGKGLPLSVAVLDA $\square T R V P V I T H D Q A N E L V K K A E E T \Pi K S H H I G G A V A I V D A$ QKALLNATAQQLLNAAQETATAKGWPCAVAIVDD MTALTLDVARKISDAALAKCREMKLPMAIAILDA MSALTLNIAVNLAGHALATGRELNAPLAVAVLDS MKK【NDVKELSLEIVKEMAKAAEAKACEMNVPVIFAAVDA TQTHEQLTLAGARLALAAAERRAQELGLGMNVAVVDG


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 AGLLRHFVRMDDAVPGAI DVSLKKARTAALFRTDSAELGM GGNLVAQHRMDGSLLASLSLALDKAYTAAALKMSTEEVAQ GGNLVAHDRMDAAW GSVDISSI SKAFTSRAFDDSTADLAA GGHPQVVMRDTLAMDLTTLESRQKAYTAMSFNAPLSQMED SGGLILVHRMDGTLPASIDIADKAFTAAAFRTATHDLGA HGALVYYEKADNTEVASAQIALDKATSAAVYKRPTRDFFD AGRVVAQLRADNAGTHTLESSRKKAFTAVSMKQPTANLMK GGHLLVLQRLDDAPTGSVTVSQEKARTAFLEKRTTKSLEE GGHLIAFAREDGATIFRHHADAKARGVVGMGDDTRVLAD VA WPVAFVRMDGAPLGVIDVSSKKAKTAVLFHMDSEAFAK GGHLLYLERMDGTFAQAAEVSYQKARSAALFKKETKGFED EGQLLVAlRGDDSSPHTLENSLRKAYTARTFRTSSGEIGA KCTP LVKRSDGAYASSFD AB GKAKTSAKFSRSSCDLED
GGHPLAFERLDGCAPDSAYUALEKARTAALGRRESKAYED SGVLLAMVRADGAGPHTVEASRAKAFTSASSRNPTSGDAK GGNLVAQQRMDGALLASISLSLDKAYSALALLKMSTEEAAA GGHLTAFARMDGTFLATDDIAIRKARTAVLFQANSEDVGA GGALLRMERMDGTGSATSE:AUGKAKMAALSRRKSKDMEE AGSVRAV LRANNAGPHTVDASRRKAYTSASTKAATSAIVE GGHLLWLQRLDGAAAVSSHAASKARTAALGRRESKVYED GGHLLALKRDERASLLRPQIATGKAFGVLGMGFGGRELAR GGHAI ALKRQDGSSIMRPQIATGKAVGALAVGTGTRWLNA GGHLVVALQREDGASMLRPQUADGKAWGAVALGKSSRLLAA AGQTI AFIKMNGSPLMSESAAKGKAYTAVGMGRPTSRWED AGLLRGFLRMDDAVPGAIDVSIKKARTAALFRTDSLELGV SGTLAAFLRMPNAFLHSIDIAIDKAYTAASFGFPTSQWGG DGNLLAFLRMDGAKLLSRESALAKAVTAASNGAATGRL AAWPVAFIRMDGAPLGVIDVANRKARTAVLFQMDSAEFAK GGHLLWLQRLDGAAPISAHIAPAKAHAAALGRRESKVYED GAHLLYLHRMDGAAPSTVEMADGKGRTAALGRRESKVYEE GGVLRALLRADNAAMHTPEAARRKAYTAASSRTATSTMVE AGNUVTLMRDDNDGPHNTQAAWRKAFTAGSTKTPTRQFAK GANLLYLERLDGAQIGSADVALGKARTAMRYRRASKMLED GGHKVIKRSDGASLLRPEIAFGKAWGVLGMGFGGRDLAK A AWPVAFLRMDNTILGADDIANKKARTAVLFQMDSAEFAE AGVLI ALSREDGASNLRPEIAQGKARGAISMGDGSRALFN GGNMLGFSRLDNVAPVSAHIAASKAHTSAMGCRESGVYEK GGWPI LTARMDSAPVVADDLAQGKARTSALFKRPSDDLEK AGVLVSLQREDTASLMRPDAAMAWGSDADGRSSGLAE GAHPI LFQRMDAAFLGSGDIAISKAKASANTPFPTRVFEE GGYVLQVRTDGARVLTPGAASKAHSAAVMERPTRQLHG GGHLLAFARMDGARPASGYTSITKATTAATFRQETGPSPR RGELVHFQRMDKADPVSSDTAVNKAFTAAADRMSTHKVGR RGVLKIAAAQDGTSLMRAEIAHGKAYGADAMGMGSRALYQ GGYPIALERMNGARITGPQ:AWNKAFTAAGHKRSTHLFNG AGLPLALVRMDNAAPAGVEUAPGKARTAALFKRPSGALED SGRLLAFTRMDDSQTGTDETADKKARTAALYHSPGKVLAQ GGHLVAFQKQDGASMLRFEAFGKAYGALAVGFGSRWLDK GGWP TFDRLDGSTPANDALAPEKAKTSAYFGQPTEAYQD RGTLKTFVAEDNTSLLRGDVAHGKAYGALALGMGSRALFK GGHLTALQREDGASLLRPHIATGKAWGAIALGKGSRLLAQ GANLMLMHRMEDAFLTSDDAI NKAYTAACLKQGSHEIAE ATHLLCFARMPGAKI TSUGAIDKAFTAAGHRLGTHLYKE GGHMI AMEREDGAGVVRQQVAAGKAWGALGDGVGSRTVGA



| UniRef90 UPI0004153628 | $\text { S GAP GEADDACARA G\|I } \begin{array}{r} 130 \\ \text { A A } \\| \\ \hline 140 \\ \hline \end{array}$ |
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| UniRef90-E6W8R9 | S GAHGAND |
| UniRef90-UPI000465C208 | S G D T S D N E L VA K VG\E A |
| UniRef90_H0Q048 | S GVKK A P E D A Q I A R A Gl A A La |
| UniRef90_UPI000382A4E8 | S GDT S D D E $\square$ A A VA GIDD |
| UniRef90_19KFJ7 |  |
| UniRef90-Q88I09 | S GD T S D N ERCALLLA I E A L |
| UniRef90_UPI0004677BA3 | A GASGDLDEKFA Q A GVA SL |
| UniRef90-A0A023XQS2 | S GAPGDADEACAKAGI D A |
| UniRef90-M5IYF8 | GGAPGGHDEACAVAALETLKA |
| UniRef90-N8VDQ0 | S G GS $\square$ S Q DVE ${ }^{\text {VA Q S ALL }}$ |
| UniRef90-A1VQE7 | S GVK S T E D A Q I A R A Gl A A I |
| UniRef90_UPI0003C752EB | GGGAPEQDHGFATAALEELS |
| UniRef90_U4V254 | S GAP GE LD E V C A Q D G D A $\ddagger$ E |
| UniRef90_E1K0B5 | S G G SVAED T ACATA GQKA |
| UniRef90-X0Q504 |  |
| UniRef90_UPI0003675B83 | SGSANPNEDA I A K A A S D S FK |
| UniRef90-H6Q9E5 | S G G T G D Q E EVA KVVAEALQ |
| UniRef90_G8PPW4 | S GASPK】DEECA Q S GLLEEIS D L |
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| UniRef90_UPI00029AA358 | S G G S G Q D Q |
| UniRef90_J2RV53 |  |
| UniRef90_B8GN12 | S GAS GE LD E K CAA A G L A |
| UniRef90-G2TCY3 | S G G TVEE D M Q $\square$ A S Y AL R M F L E |
| UniRef90_G6YGA9 | S G GT GA Q DEQCAKAGLA GF |
| UniRef90_U4KG63 | G GAPGGHDVACAEAAIKKV |
| UniRef90-B8EKK1 | S GVQ S S Q A I IA Q A GVDVAAKL |
| UniRef90-H3N785 | GGLS A QEDHDAALLAVAENLLE |
| UniRef90_UPI0003B5BE63 | S GDT G DVDEECALAGL |
| UniRef90_UPI000226017F | S GAS T E D D $\square$ A I G R $\square$ A A R VLT |
| UniRef90-I2GIF9 | S GA T A DQD TEI AKA G A |
| UniRef90-J3IHK2 | S GA TVVEA D QVI A VGA A |
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| UniRef90-B7X221 | A G A P G G H D EA CA Q K A $\square$ T A L K |
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| UniRef90_A4SWA7 | S G D T S N D I CAVA GVVA |
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| UniRef90_K1XM56 | STGTPA QDQLVVQA GVD A L R EV |
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 L T D A S T I I D T A I A E A R A R S L P L A A V A V L D A
$M S L S K A K R Q L T Y E G A A A A V M A A V A K S K E D G A P E C I A V V D P$
TEQGTS LGQEGALEEAKQABIEARKLGKKVVSVAVLNN AVARGVSKAEQMGIKVSIAVVDE
MPELTDERADRIVARGRAAARDAGLDAVFAILDT
KQVLSMDS\NILTSRIVEMALSDGKPVSMAVCDN $T K T L P D M T L N Q A Q A A V Q A A V E K A R V M K V P V N V A V V D A$

S SKNLSLELADK LASQTISACNAKGYQVSVTVLDR $M Q V A V A Q S V I$ GWEAATTAVHAAAQHADSLGDRVNI AVVDT MPELTLEYAHRLIARGANSAKSKGMQAVFAVLDK SPLTLA QANEI ADAALAAGHQLQYAMAVVVLDD
 1 SEATARAVVSRAVAVAERQGSPMAIAVCDT EQQTLGLAEAEKAVVAGSARAHDLGDAANDAVLDA QSRITLKKAKALIEKDEEESDRRGMNSVIAI CGP
 MTAITLAAANRLVEHALATGREGNAPLTVAVLDA
 MTNTRPATALSHKGVMTALTAAIAKAEEDSVPQNVVIVDQ DP VVTVNVISEA GAKQALEAA EQTAQKLHAPCAI AVVDR A GSQDRA DQQNAPSAl AVVDP
$1 T$ TAEAE Q LLQASKAHATQMGLIVAIA VVDP
KLEVEEARHMIAAAVRKAAEIGVLETVCIVDD TASVPQPVIDAPAALRAVEAAVRHATALGLRVNVAVVDA TQRFMTLELAANDIAMGAVEACREMGHRATAVVVDR A VNVSRDTMDVANRIAVASI EACRKEGDPDSVTVVDR SKETTPVALSFHDLHQLTRAAVERAQQLQVPVVVSVVDT

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 RVLTHDQALSLLQAAREESTKLGVPMSFAVMDV



MSTTLTT Q D A WE LVVTARAR R K A E E L G L A V V I TVVV D P


$P$ VR S E K V L TVVDA A V R A A QV


PLS YE $\square$ A HRAALDA A LDEAGRAEGHKVCAVVVNR

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 AVTQNRVLTADAAMKVADAAQKEAAEQHQRVAVVIVDR




$M \square I S T L E T N L D W Q A A L R A V Q A A S D H A S A L G I R R I M V A V V D R$ TKPILTLEDAKRVAAAADTEAQANAWKVVIAVVDD
 DATVATKSLTPEDALDAAKAAMAECRK RGYQVAVAVVDR



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UniRef90 E8XQT2 UniRef90-E8XQT2
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$R G D V V A D R M D G L W R T A P A R G K F A S V Y G V P A D L M A$ GGYPIVMERMNGARITGPQIAWNKAFTAAGHKRSTHLFNQ AGLPAAFARMAGAPLHSTDIANDKAYTAASFGLPTGAWHA
 KQVVQMSYHMPNGNLVGTFLAPKKAWSAI AMKEPTKDISK
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$G G N L V C D K M D G T Q L A S T E I A E A K A R A S V R F R R Q T K D M Q N$ HGNQRVADRDDFASKFTLQUAEEKANATIMSGLKSGDF GGHLLAMQRTEACAPVGSYVAGEKKARTAALGRRETKVYED AGTPMAFLRMPGAPLHSHTHAEDKAYTAAGFGLSTADWD GANLLAFARADDCFLGADDLAQRKALTAVRFRASTGALGA AGVTRAVLRADRAGPHTLDSAVRKAFTAASMRTPTQKIAE GGNVVLSMKEDNAAVHTMKTAQKKAFTALSFGMTTTEFAS NGVLRSAMRDDLLAPRFTLQQAQEKANMVVMSGLKSGEFRQ GGHVKLAHSQDGCSDARYE:ADGKAYAALAMGFNSREFYN AGHLLALIRMDGAPWI STDVAQGKAWTAAAYGAPSAAQKA AGVMKAFRRMDGAP LLSVE AKDKAYTAAAYKDPTHAWFD GGH KALKRDDGASIMRPEDCMGKAWGALADGFGGRELAR SGKLKAFVQMDDAAPVSVQVALDKATSAVLLQDDSGVFES SGQLMGMLSHENAAPICRQLISDKAYTACVTGRRTALWRD
AAQVVMTYRMENALLVSNDMAYKKYTAVGMRMQSKDLAP GGHLLAFRRDDRALLISGETSTRKAYTALQLNSATADLVD AGHLLAFLRSAQAPLHSTDTA DDKAYTAVSFSRATHLWEP QGNP AVHVMDGAFLVSFDVAMKKAYTAVAVKMSTMELSA
$S G S L L A F Q R L D G S A G C V D A S M K A R T S A L Y H T P S L K F M Q$ SGSLLAFQRLDGSPAGCVDASDGKARTSALYHTPSDKFMQ
$G G D V V L L H G D G A P G T E D S A R K K F T A A S F N A P T S A L A G$ GGHVVAAKREDGAGDMRFEVAFGKAWGALGMGFGSREYLE

## 

## V

 S GDLKLVVKGDGAGPQTVESAKRKAYTAVAWGQPTSKKLTQ A GHLVASARMDGAPFVTVEVARGKAFCAATGGQPGDNLDQ Q GF L LA FARMD GAKLLTTIELT QRKA YTSCQQLGATTATTGLQ G GHVLAFEREDGASPGRFGIA QGKAYGADMLGMPSAQMAR A GLNLVFLSMNGAFLHSADIARDKAYTAAGFGFPTGQWLQ GGHLL L LQRSHDTQRGSVETA $\quad$ RAKAHAAVAFQRPTKASED
 $S G M P Q V M L R D R F A G A H T P P T A T G K A W T A V S F K S N T T D D V A$ GGHPLAFERLDGASPASAYDATEKARTSALGRRESRLYEE

 $G G K L I \quad S L Q R Q D G A S M M R P E I M A S A K A W G A L A M G C S A R K L A T$

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K A A S N
S L K D G
RAA QNDPFYNLAMLVV
 $P$ LQVGQP YPRFD HIHA G GLLLDMGGGVVPLEND GQLIGGALGV $R L S E E Q L N D N Y F C D S C L T A M P G G T P V V L N N G L I G A V G I$ A S Q P GQP L Y GI E T T N G GLVI FA G GE L L DK T G TI I G GI G V
 $P L Q L G V P Q L H F D H I H H G G L L L V G G G I P L F D G G E L I G G L G V$ $M V R D H P D L M A D A P L S E E P V I A A A A G G I V V R H K G R I V G A B I G V$
 $R \vee Q T G R$
$\mathrm{M} \operatorname{I} \mathrm{N}$ GGRTAF
$F L D S A P L Q G L L E G G V P V V V D G Q V I G A V G V$


 $M V N S G R Y A \quad A D A M P V V P L E G G E P D V I D G N V I G A B G V$ $\square V A G A E M G Y G M D N S N D G L L T I A G G V V I X D Y D G K I M G A I A S$


 NVNEGRTAF
A 1 NKGRTAF
R A $D T P$ VMRSLIMM

 RAK S P L Q T M G


 WNAPMAP $A V Q P G A A L Y G L E R S C A R P F V V F G G G F P V F D G N S V I G G G V G V$ $M A Q P G G P U Y S L E S S S N$ G GII S F G G GVVVI Y H D D DL I G A I G V $A \square N N G A T \quad G N L S \square P G I L A G E G G I P B V V G G Q L I$

R S QR S D $\square R$ P E L N H V K GI L M L VGG GV PI I S G GRRRI G A I G V






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



 V S QP GE S L Y G L G N TN D GRI I T F G G GF P L D D D G N V I G GI G V D A D A R P A F I A S VLA H G N MV P V P G G VLI Q N E R QV L G A V GIV
 H R Y V A N P K VA

 NASGAAP S DKD DP GTLF LAAGGVPVVASGGSPIA GI GV R Y R E N P MVVWGNASALGYGAPMLPGSLPI R DDGRVI GA I GA
 RLLQN E QLDD I S YFG DARFTA LPGGDPL LAN KQCI GA V A V $A E Q Q A Y F M A A V N G V Y G G Q V V P V P G G Q L V C D D G A V L G A V G V$ VLGDNERLLRI GIPARERLVVFGGGLPVLLDRQCI G GI GIV AVLSGR $L I H L A L P G V I P A E G G V P L M R D G L I V G G L G I$ RANANPVFFAI APAA GGKFIP QTGAVVIVAS GQVLGAIGA HATRDPAFFALAADSDGRVASSKGGVLI REDGELLGGI GV ATQA PAMQGLRQL PNVVLIGGGVMIEAGGSMLGGIGV $M V N G G R T A F \quad L S A P L L V C L E G A V P I I V E G Q V V G A V G V$ A ARPA GAVYTLENTNGGLINFGGGVVLRDKAGFVTGAVGV $L$ S A A D GP I R S I E H S N G GLVTF G G GVVPLVDARGRCVGAVGV


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| UniRef90－J6UEE2 | S GDT S D R DEACA $\mathrm{DPA}^{\text {P }}$ |
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| UniRef90－M3FWL6 | GGADDTTDDRIA HQARD |
| UniRef90－M0NQ26 | SGGSAKEDMEVAQAGVDAFDSL |
| UniRef90－UPI00030D7EDB | S GDLS DLDEKCALE GI |
| UniRef90＿UPI000318251D | S GVLPVQDDQVARAGVEAMRA |
| UniRef90－UPI000476F811 | GS GTGEQD $\square$ EV |
| UniRef90＿UPI000463E3E8 | A G GRHEQD |
| UniRef90－14MVZ4 | S GAPGDKDEGCALAAVKKF Q |
| UniRef90－K0CMA8 | S GMAEFDDEALAQN\I A QF |
| UniRef90－UPI00047D1B2C |  |
| UniRef90－UPI0003639014 | SGAPSAVDVAVITAALDAV |
| UniRef90－X1HVK0 | CGGTPEQDVVVGKVAI A A |
| UniRef90－D2QHG4 | AGGNFEQDQAI GAAA |
| UniRef90＿C4SJE2 | GGLDS A K D HEAAVKVAQFMHEL |
| UniRef90－A0A037ZJA4 | T GDT S D NDLK A GEAGIT A |
| UniRef90－Q9Z430 | SGGSEEQDEACAEAGLR |
| UniRef90－D5CRL1 | S GVVR S F Q GQl A Q A GANA |
| UniRef90－A0K334 | S GGTGEEDEAICIE GLRRA |
| UniRef90－S2YS49 | S GDRPDNDEAVAVF GV |
| UniRef90－K8PIR8 | S GAPGDADEACAKAGVAA |
| UniRef90－S6IQV8 | S GVKKSEQDA QVARRGAQSL |
| UniRef90－UPI00035E8BD5 | A GATVEADED |
| UniRef90－Q2SVZ0 | S GGTVDDDVAVA Q A CVDAFAT |
| UniRef90－B1JAG5 | S GATPEDDAQFAQAALDS |
| UniRef90－E1QSJ5 | SGGSAEEDEADAQAGLSA |
| UniRef90＿A6FD62 |  |


UniRef90_G4CEN8
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UniRef90_A0QA33

## A

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70
80
位
 $R G C D K V S L A Q D G T S L M R H E I A H G K A W G A L A L G M G T R A I F K$ GGHLVTLQREDGASLLRPQIAIGKAWGAVALGKGSRLLALL GGHLVAFQRQDGASFLLPQMSAGKAYGALAIGMGSRKVEA A GHVVSAQRQDGASMFRDDVARGKAWGAVAFGSSSRDLAD GELLFSRMDEAPART NAABAKATAARMSMST@SFKE $H G E L L G F A R M D D V S L Q A G L L A Q N K A Y T S A R D R Q P S G N L G A$
$W G W P V L I Y R M D G A S Y G Y L E V S R D R A W T A A A F K L P S D E V$ GGTLVSFARMDGAPTFTVDSAKRKADLAVALGFDTVHMSA GGHAQVLLRDRFAGPHTIDTAMGKAWTANSFRESTGNLAA AGRLVAFASEDGSSLLRGRDARAKARGALNMGVGSRSLAA $G G H V I$ AAARQDGASNNRFEIAQGKAYGALALGMGSRAIME
$G G H L L W L Q R L D G A A P A S A H I$
$A P A K A H A A A L G R K E S R L Y E E ~$ SGHQQAVVKGDTVPDQSLSVSYRKAYTAFSYGQATSELIN GGHLIYLERTAGVPSAMVEAS DMKAKTAAGYGVTTKALEQ $G G F P L A M E R M D G G R V T G P Q D A W N K A F T A A G H K R S T H L F N T$
$S G Y L V A F D R M D T A K I T S V S I D A D K A F T A A G A R N H T S F Y G K$ SGLPLVVLRDRYAGWHTLSAAEGKARTAASWRQSTATVAA GGHLLMLERMEGGRFHTVHSSTTKAATAASNKRPATSKGAA TGHQQAVIKGDTVPLQSDSVSYRKAYTAYSYGMSTSELVA
 HGNTRFNYRMEHALLVSAELATKKAYSAVAMKTSTENLTE QGELVYCARMDGAYPLFMHMADNKAYTASRMLRDTATFAE
$H G E L L A L W R T D G C S L P P V V I D Q N K A Y T A A R V R G K S G D L G R$
 S GTLLA F ERLDDGAP L GCVDAS DGKARTSALLYRAPSVVFME
 $G G H V V V A R R E D G S G \| A R F E D A F G K A W G A L G M G \square S T R G L A A$

 DGELVAFRKEDGSSLLREKIARGKARGALNMGVGSRALAA G GHPLA F ERED GAAP GRYA AA E GKAY GAVMLGGMP GSA QMA A GT LRALLRRADKATPHTVSASQRKAYTSASTRTPTSTRAE GGHLKKALVRMDGAPFHGVTDSTDKARTAAGFGKPTA QWKD S GVALAALARSEQAGPHTVGAS LGKAFTSASGRNLTSEMAK
 GGNLLAFLRVDDAALSTVQDAQNKAWTSLAGRSPS GEWME S L G L V A Y GRAD GMTPHSVETSKRKAQTAASTRKPSAAAL
 $R G C D R A A V T Q D G A S D M R H E V A H G K A Y G A D A M G L G S R A L A K$ E GNVVIVVI R S D GA GVVHTVQTS F NKAYSAANVLDTTS GULAAS NANQIVQKRMDGPVHAAFEFSRAKAFTCVTMKTSSREFRD A GVERAF LVRGDHSTIHT RETAYKKAYT IAS LG GSTGQLTE
 A R QLV SLTTMMD GSDKVVNDLACKKAYTSSSLMRKTTLLKWQE
 GGFPILVVERMEGSQLASLALAERKARSAVLVYRPSASFEQ GGHLVAMEREDGSGYGRPDVASGKAAGALAMGVSSRKLGD GGHLI AF QRGDGASFARAQIATGKAAGALSFGVSSRKVGD


 GGHLLLHFARHDAAQF LTIDDA INKAWTASSFALPSHAWNE G GKL I S L Q R Q D G S S M M R P D I A I A K A WE A L A L G C S S R K LA Q $\begin{array}{ll}S G L & G V Q L K A D G A G P\end{array}$ EGLVQVVIRRGDNATPHTDENSFYKAFTVITLRDSTEEIAK SGTPLLMKRMDNAGPHTVEASRMKAFTALTTKNATSNVMK S GHQQAVVK GDTVP LQ S L SVVAYRKAY TA YSYGQATSEDDA A GTPVA FLRMGGAPLHSSGIA EDKAYTAASFGLDTA GWDA GGHVI AFEREDGAAPGRFAIAAHGKAYGSVMLGMAGTAQMQ G GHVVAVEREDGASTKRFEIAFGKAHGAVAFGLGSRALMA
 A GVI KALLRADGAGAHTVDSSQRKAYTAASLRESTQKLAL A GLVVKLTYREDGATALRIDDAHGKAAAAWGMGVASRTLLD GGHPQAI LRDSLLAAPFTIQUAHDKARAVILSNVASSAF
 AGLPI HSAHMDGAPGPSRA $\square$ A L L N K AVTAAGFG GATNAWQE
 D GVVQAVIDRGTNATPHTIQMSHDKAYTVI TIGPSTAAI TA G GHLLAFRRRDRAVLIAGETSTRKAYTALQLGAPTADLVD G GHVVVAERSDFSPI GRFEDARGKAYGALALGGMNSRAAME GGNVLALHRLPGARLTGVDI S $\quad$ GAKAFTAAGHERATHLFNE HANVL L F CK M D K A LI A S S S L S P A K A K T S DA F R T D T H T L S Q

 UniRef90_B4VGF7
UniRef90_W6I7L9

## UniRef90 G4CEN8

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UniRef90-UPIO00262CABE UniRef90-D3UM60 UniRef90-X1R042 UniRef90-V4PSG2
UniRef90 $\mathrm{S} 6 \mathrm{JGR7}$ UniRef90-I4N566 UniRef90-U2ZYG4 UniRef90-S4YW55 UniRef90-D7A1U9 UniRef90-F8GQ42
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UniRef90-S3IIZ3
UniRef90-UPIOOO2D2D03C UniRef90_S5SGX2 UniRef90-D4YMD1
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UniRef90-K9ssk7
UniRef90-LoIRK9
UniRef90-KOSL25 UniRef90_Q12G57 UniRef90-UPIO00464CE38 UniRef90-E3HTF3 UniRef90-L8TTQ6
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UniRefololioo UniRef90-W7Q9M4 UniRef90-K9RSR4 UniRef90-D6X662 UniRef90-R7Y1V3 UniRef90-V5X8F5
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UniRef9o_WWI7L9
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 LLAEGVLPARIAPDVPGLLLIPGGRIVEAAGATVGAVGV RAESHPAFVALVADAGGDLVPVPGGVLIRDNDDLIGAVGV RAEQQAYFIAAATATGGRLIPVPGGVLVRDDGAIKGAVGI MDNGGRTAYLSVPALQGLL EGGVPITSEGHCLGAVGV AKLAGPENGALNTIPEVLFVPGGVTLRKADHRVIGGLGV QLLEGHPGF SNLPGSLPMEGGVPVMINGQLAGALGV AALPGNEAFGTQWSFDGKFAVFVGGFPIVVDNQVV VSQPDGPAWGIVNTNDGHFNVIAGGIP IVDGNVIGGTGT
 QGQDLDVLHARGLSGPGNWTPMEGGYPVMMENCIGGIVV AKDTGPADGSLATVPEVLFIAGGVTLRKADKTVIGGIGV RAATQPVFYGLSDLSGGNVVPDPGGVLVRAQGLLLGS: GV AVQPGAALYQLETLTNGDTVTFGGGVPLYADGTIUGGOG
NAQED DREL
R VAPQLLANL
RLQKGENTV DEDPGAVALAGGYPLTVNEVVGAVGV YLKSDPASELKIIDTMPDYI AADGGYPI 1 ENGLVLGAI GV GIADGTDPSDIRYLDENDLDDGGVPI YIDNVVVGGIGV RYAKMGVFGQMSSDGMVPSGGRDGNRIGAVG1 YMAEPAVA GQPLAHHPRLTPVGGGVPDFHEGRRLVGGMG MAAERPTFVSLAPLDPHGAVPAAGGVIVVDDGSVLGAVGI RATTHPQFVNLVALAAGELVPVPGGVLVRDDGMIVGAVGV RAEAQHYFMAANGAFGGKVVPVPGGVILRDDGEILGGVGV
 GLASNPGLADT PGYLLLAGGVPVRAGTTVVGAIGV EARPGGNIVSLESTNGGLISFGGGIVLRGDNGQIGGLGV EVQPNAPLYGLESVGARPFVVFGGGLP DRDGKVVGAVGV PELATKLELGSGGILTSIAGGVPLSFDGVHVGGLGV RNEDRPAFLAVAAASDGHFIPVPGGVLIDDEDQVI GAVGV RAGEQPFFIAVNTMARGALIPVPGGVLIKASGETIGAVGI MQAKGANGVGI WPMPARGITLFPGGVRLMSQGKLVGGLGV DNPVSQKLNQLNHDQMVFVQGAVPLFVDGVPI GAVGA KTA RISKTPTGPALSTVSMNILLLAGGVAIRHNDETIAAAGV

I NNGRYS
LSAPHLEGMLE
RINGTGP
ALAGGRMAV
MAADRPQFAALSAAWNGRLIPAAGGVLVKDDGNLLGALGV MAVERPWFTGAASSAPHPVIPAAGGVIVVDGGAFI GAVGV ALAAGG LNLRLLATEGACPLEGGLPLMHEGRLVGAI GV FIASKPANNGMRDMD SRFVIQAGGLPIKMGALVGGIGV LAAPGGDLFGLHTSGGGRFVIGGGGVPVTIDGVVVGGVGV DVQPSLA GQRLS QTPRFTPVAG
DADNRPAF TSAINVLANGTVSGGLLIKDDNYVMGAVGV LVTQKPELQSLMRLNESLLLLGGGFP KDGGEVVGGIGV
 GSQSNAGAANLR DDPGFLLLAGGVPVKMGNQVIGAVGV AHQDGPANGALNTV PEVLFLPGGVTIRAKGEVIGGLGV VVGDNAEL RAGLAQRDRLVMFGGGLPVRVDGECVGGIGV
 ALQSGEPAVLNGDAGQPGVALFRGGLPIAVGGEVIGG|GGV LIARKPEDQADRDMNESKLILGGGLPIKDEGEVIGGIGV RAKENPAFFALAATSGGKFIVPQTGAIVITANGTVLGAMGA RTNRNDTRMEMNHVDGILVLDGGLPVEVAGSMVGAVGV
ESR
RLDSCSAAVROGLPLOPGMALFGGGEPFHHOGRVMA ESV VMSRIREMEGNNLIYAKGAVPLFRDGMLIGAGGV RTQGREAFVGVASASRGTFVPVPGGVLLDEQREIIAAVGA KMTPTPLPMGLPPNPLYGINFSTGGVAKVGDELI GALGV AVQPGGLFHSLPTALDRPLLFTAGGIPVFRDGRLVG
$R G E L Q P Q F V A S A T A A E G R V I P V P G G V L V D D S G Q L V G A V G V$ $P A L P G N E A F G D S Q M L P G K F A V F V G G F P L V F E G Q I V G G V G 1$ GVLKSLINQFEAENTS RAEAQPYFVAAHVAGPAALVPVPGGVLIRREGRLLGAVGIV AVKPDGPFHSDPTALDRPLLFIAGGVPLRRDGVLVGAI GV AVQPGGPFHTLPTALDRPLLFAGGLPVHRDGRLIGAGGV

| UniRef90_G4CEN8 | $\text { S GVA K E Q D A Q }{ }^{130} \text { I A K A GlV\|A A } V A^{140}$ |
| :---: | :---: |
| UniRef90-C7PHT6 | S GGAVPQDLLIATA G |
| UniRef90-UPI00036670B8 | SGAPGDLDRACAEEGMEA $\square$ RE |
| UniRef90-UPI00034D4689 | S GDT S D ${ }^{\text {NDED }}$ C |
| UniRef90_S6INK9 | S GD T S D LD E Q C A $\square$ T A $\square \mathrm{EA}$ A |
| UniRef90-E8T7C9 | S GDTSDND |
| UniRef90-UPI00047C1A8F | S GDAGPRD |
| UniRef90_UPI000361F26E | S GLS LIE N D H AL |
| UniRef90-U3ADD5 | SGLAEQDDEALAMEVLNA |
| UniRef90-F0QXJ2 | A GNKPQEDKEI A $\square$ SVLK S |
| UniRef90-UPI00046536D0 | S GAESDTDHQIGTAAVERL |
| UniRef90-W6K690 | SGAPRGEDGACAQAGIDA |
| UniRef90-A0QA33 | S GHDPDHDEACA $\square \mathrm{Q}$ GVA A |
| UniRef90_UPI00047B6ED8 | SGDSSDNDESAASTAI EA |
| UniRef90-A9C257 | S GVIK P A E D A EVARAGI A A L Q V |
| UniRef90-B2IG01 | SGAPGDKDEACAKDAVAELQ |
| UniRef90-S6H7R5 | AGGLSPDDGAFAQKAAAVLS |
| UniRef90-121S65 |  |
| UniRef90-K6X9J4 | S G G S A Q D DVA A H AV |
| UniRef90-UPI0004781CE8 | S GAPGDNDEICANAALQA $\mathrm{C}^{\text {S }}$ |
| UniRef90-X0WQ16 | S GGD WK Q D |
| UniRef90-A0A059KHX3 | S GAPGDDDEA $\square \mathrm{CL}$ L GVV |
| UniRef90_A0A023DAG7 | S GAPGDKDEACAQEAVNKFKA |
| UniRef90_UPI000378E9EC | T GDTADNDELLAVAAVR |
| UniRef90-UPI000262CABE | SGAPGDLDEACAADGL |
| UniRef90-D3UM60 |  |
| UniRef90-X1R042 | S GRVPEEDEEIALAGLKAMK |
| UniRef90-V4PSG2 | S GLT GVEDVEIA EL G V A |
| UniRef90-S6JGR7 | GGAPGRIDAQCANYAID K Y K |
| UniRef90-14N566 | STPVQALDNQASETAAQALKK |
| UniRef90-U2ZYG4 | S GVSQEVDGDVAEAALL |
| UniRef90-S4YW55 | GGAHGSQDVQVAKAGLKVLE |
| UniRef90-D7A1U9 | S GDTS DVDEACA |
| UniRef90-F8GQ42 | S GGPSDVDEE $\square$ GRRGVVA $\square$ G A |
| UniRef90_K0DMM1 | SGGSSVQDHEAAEEALVR |
| UniRef90_G6EGS0 | SGDTS DNDE |
| UniRef90_UPI0003B63E7D | S GHQPDEDEACA $\square$ A G $\square \mathrm{EA}$ A |
| UniRef90-A0A017HBU6 | TGDTSDND |
| UniRef90_UPI0004718CBA | GGAPGGHDEACALKA $\square$ EK V Q A |
| UniRef90-Q2W958 | SGATEDED |
| UniRef90-H8GY06 |  |
| UniRef90-S3IIZ3 | A GATVDDD |
| UniRef90-UPI0002D2D03C |  |
| UniRef90-S5SGX2 | S GGPVDDDLATA E A ML A |
| UniRef90-D4YMD1 | A G GKPaED A QVA QAVLARLGA |
| UniRef90-W9TFJ3 | S GASSDEDEHVAMVGI |
| UniRef90-A1B136 | GGASGD $\square$ D A C C A A AGLTA $\square \mathrm{GA}$ |
| UniRef90-B6JGC4 | SGDTSDNDEACCIA G |
| UniRef90-K9SSX7 | S GTPGM $\dagger$ DEGCALK G R D A $\square$ |
| UniRef90-LOIRK9 | S G G $\square$ P A M |
| UniRef90-K0SL25 | S GAAGDEDEYCA |
| UniRef90-Q12G57 | GGAPGALDEVCAHAGVVRIQE |
| UniRef90-D2Z8H7 | SGGSVEEDVEVAEAVVSLWKE |
| UniRef90-UPI000464CE38 | SGRTMKEDQELADAAVELLK |
| UniRef90-E3HTF3 | S GVKS TEDALIA QA GIIAAL |
| UniRef90-L8TTQ6 | GGAPGA LDEACATAGADAVA |
| UniRef90-A9HBD2 | SGGSNPQDEQAAEAGMAVWT |
| UniRef90_J2GQK0 | S GDLLS K D E |
| UniRef90-G2IJM5 | T GETSDNDE |
| UniRef90-UPIO003690123 | S G |
| UniRef90-A6X6H3 | GGASGATDAECALAGLQAIIEA |
| UniRef90_I4BG52 | SGASAAEDEACALAAL |
| UniRef90-UPIO003670552 | SGSSGEVDHQCAMDA $\mathrm{V}^{\text {G }}$ A $\downarrow$ Q |
| UniRef90-B2VB78 |  |
| UniRef90-Q6LPW3 | S GDHSDLDESCA ${ }^{\text {de G }}$ |
| UniRef90-F9ZGE0 | GGAPG I EDEVCASAALKVLK A |
| UniRef90-I3YRK8 | GGGSAENDDI ${ }^{\text {a }}$ AKAA |
| UniRef90-UPI00040CCA82 | SGAPGS LDQACAQKGLDK\K |
| UniRef90-G0E715 | GGAPGGNDEACA $\square$ A GLLQS |
| UniRef90-H8L6N7 | SGAPGDKDEACAASA |
| UniRef90_UPI000364970D | S GGSEEEDG $\square$ CARAGLAA $\downarrow$ G |
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| UniRef90-C6KWJ5 | S GASAEQDEICA |
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| UniRef90-UPI0004662509 | S GGT GDEDE Q $\square$ C $\square$ D GVLI |
| UniRef90-L0DZ63 | S GAPGGHDEQC |
| UniRef90-R6M808 | S G GTK EQD T T L A MVA DA Y F |
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| UniRef90-W7Q9M4 | S GDSPGNDQTCVLAGT |
| UniRef90-K9RSR4 | $S$ GGPGGNDQACALK G L EKIT |
| UniRef90-D6X662 |  |
| UniRef90-R7Y1V3 | S G T S D N |
| UniRef90-V5X8F5 | S GGNGAQDKAVGGAlLAEFEAL |
| UniRef90-J5H5R8 | S GGTVEQDIEIANEAVTA |
| UniRef90-19LJU1 | S GDT SDNDEICAVAGI |
| UniRef90-UPI00037E8F5C | SGAPGDKDAACAAAALQKVEE |
| UniRef90-W7SBH8 | GGGAPEQDHK |
| UniRef90-B4VGF7 | GGGAPEQD |
| UniRef90 W6I7L9 | S G D T S D N E A A V V A G $\square$ E A |



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UniRef90
UniRef90－R4T3K6
UniRef90－R9PJQ9
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 LS LDLAMDAANEAVRVCRETKGWVSVAVVD TLTLAQARMIDDTALAQPRGDNAPLAVVVLDA VPDQRLSMDSAVKI AQGATEECREKGDQI AVTVVDR MTRLTLEQASHIVDAALAEAATLAKPLAVVVLDA MAGISLSRARTIIRKTLDAGKEMELPLSVIVLDA MPDLTLPAAQTVVATALRTARERSLPLAVVVYDA KTKPILGQEDVQQ I DAAAAHANKNNWAVTI AVTDD RMTLELSKKLI QKIEEEAKRRGKRAVI AVCGP EQEMGLNLANTNAADEADAKASGEDAVC AVCDA MSE【V DEQUTLEKADLIVKNAISKAREVKVPGMVVLVDH AAVAACGKKGYKVSAAVVDR
tFDTPTLLPELAVKAADAAVEACRERDTQVTAAVVDR DLDTALMLCATALATARDDGAFVSVIAVVDG MPKDWTTAAHLAMEAVAACAGQGYSVTATVVDT SKT四YPVLTGDAAMKMAQKAFNEANKSGHRISVTVVDQ GFAVSVAlvTR QKTSLGMAEDKKVADAAQAYASAKQWIVTIAAIVDD MTDLPLSAAQTLDATRTEARRDNLPLALVVLDG THLTIDAATEAAQAALDAARKENQVSVAVVDR

TTFELASALNVQALRLADEKQVSIAVAVVDA
 QKYALTQSLALKKLEAVTNKAKEFGIKINAAIVDE


$P R \square D W R G G A V A A Q A A L D C A E R D G D R V H V A D V D R$ MHLSTALSYDDTALALARKRNVRVAVAVVDH QKAVLGQEDVARILEAAVAEAKTQEWPVTI AVADD SA $\square T \mathrm{~T} V \mathrm{~V} V \mathrm{~L}$ QDSDVQKIVVAAKKSMEQNHTKGCIAVADA QRKAVLEQAEVARILAAAREEAQRNQWAVCI AVVDAD KSQSAPTITRSAASALIEAVLATADEDSFPVAVAVTDT MNSLTSEQALKICQGALSAARSAQFPMGVVVLDA
 VTLEQARTMDAETFKKGHELGLPLSAVVLDA $M K N L T L E E A N R A A Q G A L K A Q A L N D R I N V A V C D A$ TQSTHLTMEAATKAARAAVEEAEKDGRHVSVAVVDR

RAAHHPVVISIVDA $D \| V K \square E R M S M G \square A M E V A K R S V E A C R E K G Y W V S A V V V D R$ QM\｜PCLDLADSEAlVFSALQTAERSGSQVS AVVDG AADKGWPCALAIVDD SMTGKQARLDLETARRAADAA DAAAREGGNRVSVAVVDT QE $\square G \square A A T I A 乌 V D D$ PLTVAVLDA
$T$ LLFSDARTLVNDARERADE LGKALSIAAVVDY QERNLPLADAQELAQATVEACAAKNFNVTATVVDR
 DAVLNMPRLLVVEAATEAAEAALLAQCQSDDLVPVSVAVVDG $T L P L D V A D D A A K E A 乌 R V C E T K H Y W V T A T V L D M$ LT LEGAQVALAAGLARAEELQGRFNVAVTDA
TI GLLDEAQKALAASFAKAEELGIAVCVSVCDA QS QTKAYLS GDMAMKIAQKAYEEAQKSNHHVTVTVVDA HSKPVLGREEVARV $\square G A A R E E A Q R Q G W A V S I A V V D D$ NDFESSNGLTFQAAQKI GSAAMEYANLKKGYKVCIVTVVD MSKLHATECREFIAAVTEKAVNMGVPIVVAVVGP

$K N L S L E L A D K L A Q R A D Q S C S A D R Y N V A V T V V D R$
 DAQRLQQAKDELSALGAKVTIQEVDA TRPYLSLDAAGKGVSACVAMAKENGWNMSIVIIDR KTKPMLSADDVQAILTAARAEAEANSWAVTVAVADD DEAHARGLAMAVAVTGP
$R \prod T L E L A K E \square C E A G E A F A A G K Q W N A T I A A$ I CDD
$R N$ S
MS TLTLDAAEKIVAAAHERARTVGKAVSVAVVDA

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 SGQTLAVLRHHNAGVHTDRASYKKAFTANSQKRETAEIAQ QGTTTALVRADAAGPHTTASATGKAFTAASLGRDSGTLAS GGA VAFARMSGAFDHS DDADDKAYTAASFGFPTAQWGA GGHLQWLQRADGAPPATAYIAAAKARTAAMGQRESKFYED RGAVKAAVAEDGTSDKRFEVAHGKAYGALADGDGSRADGK NGNTIVTLRGDGAGPQSYESAEKKAYTAVSWNAATSKLAE SGDVRVLLKGDGAGPQTEESAKRKAFTAVSFGQPTSALAK AGVLRALVRADNAGPHTVEAARAKAFTSASSRTPTSKMAE HGLPRVYRRYGDALVLSITLVPGKAYTAAVTQCKTKEVAA GANLKAFDRMDEAALLSSDIAQNKAYTAAAFGKPTHEWYP SGNLDAFERMDGGKISSVIVAQDKAYTAAAARKATHDYNA GGHLVADGRADGSGFLRPDVADAKAHGVIGLMMDSRADAQ SGNTLAYDRMAEAFLHSESVAVDKAYTAASFGFPTGQWLE AGHLVAFKKDDGTQLGSIELALMKARSSAPFVRPTEDLET GGHLLGMVRDDGCAPVGAYUAVEKARSAADGRRETKDYEA DGQLLFMQRQEGSAPDCDESAEAKVRTAARFQETTNTFYK
 SGQLMAFVREDGASMFRFDI ARGKAWGAVGMGASSRALAE GANTVLFERMDRSFVGSSDUAVRKAKTSANFPFPTRTAAE
SGLVKATLKADHATVHODTAFRKAYTVATLGPRSSAFAE GGHVQAFEREDGAAPGRFGTAHGKAYGAVMLGMAGRAQMA GGALVALARQDGSGNLRPDLAVAKAYGVLALGMTNRATAA
 NGNTLVTLRGDGAGPQSYVSAERKAFTAVSWNAPTSELTG GGHLVAFQRMDGSEDAGPALAPGKAYTAVAHRMSTADLAP NGTESVTWRMPDALLVSSELAPKKAWTAVAMKTATHKLAD SANVQVILRDTHAARFTMDIANQKANLVIMSGLNT AGLLIRFSRDDGASAASVEAAMAKARTAALTGKDSAAAEQ SGLLVAFQRFDHAPPGCVNASDGKARTSALYHAPSLKFMQ GGWPLTLRMDGAPVVALELAQGKARTSALFKRPSADLEN RGHDLLVVRDDGAAWFTAGVARAKAATSALDGDPTTAYSG GGYPFRLERCDGAGAMTPAVATAKARTAALMRAPSGVLTS HANLLAFVRMDDSVPGADDLAQRKARSAALFRLPSGELGR GGHTVALARQDGSSILRPQATGKADGALSVGTGTRWLQA GGFTVLVERMDGARPMTPALADSKAYSAAVMQRPTEMLEN GGQLVTARREDGCG\|VRFDVAFAKAWGSVGMGLPARTLGE SGDLLAFVRMDGAPERLVPVVIAKAYTAVRMRATTEAFRK

FGQVQAMLRGANAAEHTMESARLKAYTSASFGSNTSELTE | FGQVQAMLRGANAAEHTMESARLKAYTSASFGSNTSELTE |
| :--- |
| $D G V P Q V V L G B R S T V H T A E S S M K A F T V F G F D R S S G F F E L$ | GGTLAAFLRMPGAFLHSVDVADDKAYTAASFGFPTSQWMS AGDLLAFARMDDAFAESGLIAIDKCRTVVRFGGAPTDGLY

GGRVVTFARMDQSNWASIYGSQGKALTAAATRCRSGVIPP SGQTLAVLRDDRAGVHTLRASYKKAYTANSQKRETAEIAK GGHPLALERDDGCAPIGAYGATEKARSAADGRRETKRYED
 EGHLIALERMDDAGFTPDDARAKAFTAAAFRSMSPRFSD $C G Q Q R F F F S M D N A L L V S H T L A P Q K A W T A V A L K M P T H E L A T$
$D G N T I V T L R G D G A G P Q S S S A E E K A F T A V S W N A K T S E L T G$ AGTPLVIKRMDNAGPHTVEASRMKAFTALTTKNATDDVMK GAHVILSYRMEDSLLVSYDMAYKKAYTAVGMKMQSKDLALL GGNVLVAMRPEGVGPHNLLASQRKAYTALSTKTPTRQFAE HNHLVALEKVDGAIGDSAVAQAKARTAALLQSPSKDFED GEDVVASARMDQALPASYKGATLKANTSLSWGMPTEQVNE SGDPILLEVMDGTQYASTALAPAKARSAARFRKPTKVL
$G G H L V L L H M S N G Q G S V D L A P K A R G A A A F R R P T Q U F H D ~$


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UniRef90_S2YHM0
$R G A G G \quad L A H V P G|L L| F E A G A|V| P|I| S A A G T|L| Y G A|I G| V$ DSEPGGQFWGMALSGLGRVLVFAGGVPL
RAE A QAY FVAAN GALGGGGMVPVPGGVLVKDKGRTMGAVGV YCKPGAPAPGLERSNGGLMTFPGGVPLRDPE GRLLGAVGV RYKDDPSEYSSGAGYHAPFDPGRGVFPVFQNGHLLGAI GA A V N K G A

 ALKTNP FASTYATLPNDFLLPGAVAI KDGDEVIAA I GVV RAANNPAFFQSVVAVTGGQLALPGGVLI REEGAVI GAVGI R A
 RAEAQAYFAAANGALGGQLVPVPGGVLVKAKGRVLGAVGV RAEEQAYFVAAVSHLVGPLVPVPGGVLI RDGEGVVGAVGII M $\quad$ DN G R F A F RAENQAYFMGAMN
 E S V
 RAEQQAYFINVNALTNGALVPVPGGVLIRKNNNIVGCLGI
 $M T D P S A A G Y G I Q H L \quad P R V T I L G G G K Q I T A G G R I V G G I G I$
 AKVTGPANGALNT
RAQPYF!AAATAADGGS 1 D G K V V G GI GV
 $M V N A G R Q A F \quad L T A P G L D C L L E G G V P I T V N G S C A G A I G V$ $R A V E Q P T A V A V S H V V G G A L V P D V P G G V L A R A D G Q V V A A B I G V$ RLD S A P HLLADI NAQGDGP T $\square R$ WAK ETGKDMGYW NVAKNPAAA G Y W AAAE GAP LMG $\square$

 RASDSPEFFSVAA LAGGGKVFSVPGGVVIVADGEVI GAAGAA

 AL HA GKAM $M \vee N G G R T A F$ MLNQNK $M V N G G R T A F$
$Y$
$V$

 RAKDNPNFFALAATAEGKFLAQPGAVLI KASGQILGAAGA LSK D GKP GVVPGFA WTP GVVVY G G G L P P MA G GA HI G G I G A
 RAQQAYFMAAVNGVYGGAVVPVPGGLLLRDDGVVIGALGV R A A DSPEFFSVVATLAGGRILDVPGGVVVRDDGRLLGAVGV RA DHPTMRGIVAAE GAHAIL GQ GAVDIDRNGVVEEGACGV $R L R \quad R E D D P I \quad A Y F C D P L L T A L P G G A V L B G G G N V I G G V G V$

 AVQP GAPLY GLESHMMQGKVVTVGGGGFPL WRDGKLL G G L G

 RLQQGETTV A AD A H P A L A D L ID A A A A RLLKDEPELLRL LA GP GQPL WSI E QS NG GDYLPMPGGLDPVRWD GMCI G GI G V NAETRPHFVALNGASGGAIIPVPGVVVRADGETVGAVGV
 NADKNPAARHLLAA DEGFLLLGGGGVPVKA GDEVI GAVGV RLGKNPAFLGIVAASDGRMAPNAGGVLILDNGTVI GAVGI $R L L D G G G L T L N D F C D P D L T S D P G G V D P L A D D G C V A A V A V$
 $M K T S P$ Y A P QLATV H NVMALP GAVAFKVNGEMVGALGI
 E A LA GE DAVVRGI ANRPGIAAFGGGVADVVDGHVVGAVGA


 G I K Q G T IP Q E L K DLDD P N I L V L P G GII P I I Y K D E V I G G I G V HMRP HLELLATQLGVTGLPGGLPI AFGGDVIGGIGV GLRNP QMLANASAFTNGQVVASGGCTPVFKGNDMVGAYGII
 SAQANAGAANLR D $\square P G F L L L A G G V P V K V G E Q$
 RARNNPEAANLDSSDA E L L L L G G G V V P L F A D S E L V G S L G V F 1 N S GRPS F VLENAPVYK Q V I N N GRTAF
 Q D A A A A GAVA Y S GA D GA LA L E G GLLPV SI D GK IVVGGLGGL DLT DGK F T SFWHLRQEAAI PLE G GFPI LL H GK


| UniRef90＿UPI00037619AD | $\text { S GA S G VT DE G C A R A GAES L }{ }^{130}$ |
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| UniRef90＿N0BA48 | GGAPGDKDEMCAEAGLAKIK |
| UniRef90＿N1MFJ0 | S GD T GDCDEEACAIIAGI LA |
| UniRef90－F9UI64 | S GAS GETDEECALA GI A E 1 Q |
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| UniRef90＿S9RTN1 | T GDS S D NDAAAAKAGI E AV |
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| UniRef90＿UPI0003B44404 | G G A S A D LD E |
| UniRef90＿UPI000361FE4E | G S G T G D Q D $\square$ V VGKA A LT A IG A |
| UniRef90＿UPI0003B3BA7D | S GD TS DNDEIAAVS GIIESV |
| UniRef90＿UPI000374C76D | GAPGAHLDEACARAGLKALGA |
| UniRef90＿UPI00035FDD86 | T G D T S D D E |
| UniRef90＿UPI0003FDA6FC |  |
| UniRef90－A0A011ADP3 | S G GTVE Q DVA CVKA A ADK W |
| UniRef90＿UPI000237F32D | S GAPGEKDEACAQAAVTK |
| UniRef90－W8HDL4 | S G D T S D NDEAVAVA Gl E A |
| UniRef90＿F0TP87 | G G A H G SEDVR】A KA Gl S A |
| UniRef90＿K2P0C5 | G G A P S A D R Q CA $\square$ A GLLQAI G A |
| UniRef90＿B2UJF7 | SGGSAEQDEACARAGLHA |
| UniRef90－F8GW25 | S GVR S NEDVE $\mathrm{V}^{\text {V }}$ A R A GI A A L A |
| UniRef90－H012H5 | S GDTS DNDEA CAKAGIE A |
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| UniRef90＿UPI00037846BE | S GGSYEQDRQAAEAALD |
| UniRef90－UPI000474B0B3 |  |
| UniRef90＿A2SG61 | SGGSPEEDEQCAKAGLDAI R DL |
| UniRef90＿UPI00045E8E6B | GGAPGDKDEACASVGLAAIA |
| UniRef90＿A3SX14 | T G D T S D D |
| UniRef90－F4CXN9 | T G D A S L N D E |
| UniRef90－W4L6A8 | GGGTGQQDEDCARAGVEQL |
| UniRef90－F4GPH9 | S GLA P D E D Q A $\square$ A |
| UniRef90－H2K2M5 | A GASGDLDERYARAGAAAL |
| UniRef90＿D2AWY6 | S GGTV A Q DVACAEAAA |
| UniRef90－D8GQ24 | S G G SVDQDMQVA Q A A M DVYNA |
| UniRef90－I2WIG1 | S G G SVEEQDMD\｜A Q S A M A A I N |
| UniRef90＿B6BGB0 | SGAPGD\DADCAKKALKSLEE |
| UniRef90－A5GJN5 | S GMTPDQDLA $\square$ A R A G A D CFA |
| UniRef90＿D8MMH9 | STPKQELD NQASESAATALLN |
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| UniRef90＿V4XJR6 | S G A S A A Q D Q $\square$ ¢ E A A V A |
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| UniRef90－A2FBE1 | G GA H L S LD S DVA K A G L I AV |
| UniRef90－Q0G7N5 | GSGTGEQDLQ V GRA GLAA I G A |
| UniRef90＿Q12EW4 | S GATSAQDEEI GQYAREKL |
| UniRef90＿Q8FC33 | S G G SVEE D MLI A R Q A M A Q FSVL |
| UniRef90＿D9VDL4 | A GAS GAQDETFAQAGVDAL |
| UniRef90－D4DXU1 |  |
| UniRef90＿UPI00040E18A3 | S G G N A $\square \mathrm{ED}$ D T $\square \mathrm{AE}$ Y A $\square \mathrm{EE}$ E $\square \mathrm{N}$ |
| UniRef90＿UPI000375B0DB | AGGGAEQDEGCAMSAAQQI |
| UniRef90＿G7LLD0 | S GAHGANDS QV |
| UniRef90 G8PR10 | A GSSMEND |
| UniRef90－A6GMS9 | S GVKK S D Q D A Q VA R A G $\square$ A A L K |
| UniRef90＿A0A031JQV1 | SGGTSAQDGEVATAALGRFK |
| UniRef90 UPI00036B21BF |  |
| UniRef90＿UPI000463195B UniRef90 ${ }^{-}$S2YHM0 | GGAPGGNDEECAVAALDKVK AGGTADEDQQ $\quad$ ADDVLQSL |

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UniRef90-A0A024H1V0
UniRef90-B6WX57 UniRef90- V4NXJ8 UniRef90_N6Y877 UniRef90-Q07M19 UniRef90-W8FIW4 UniRef90-UPIO00361769A UniRef90-X6KXW3 UniRef90-T1VVM3 UniRef90-W8UBZ2 UniRef90-A5V723 UniRef90-Q2J7E UniRef90_UPIo0029A63AA UniRef90 U1ICA5 UniRef90-Q5YWE9 UniRef90-M2VUB4 UniRef90-UPI00037AF98C UniRef90-Q5FSF2 UniRef90-UPIOOO30010A6 UniRef90_B8HBF7 UniRef90-A8LJ49 UniRef90-A0A022G985 UniRef90-W2RKE5 UniRef90 E5Y8C3 UniRef90-UPIOOO365F475 UniRef90-HOP4B4 UniRef90-A0A024IAP8 UniRef90 G9Z844 UniRef90-W1KDX7 UniRef90-HOTML6 UniRef90 QOS3L9 UniRef90_UPIOOO36E1897 UniRef90-N8VFB7 UniRef90-UPI00037E2FEA UniRef90 D3PYN6 UniRef90-L8XCP2 UniRef90-V4PHP1 UniRef90- J1KY31 UniRef90-UPIooo35C3990 UniRef90-M2V821 UniRef90_Q0FJH5 UniRef90-V4R4S1 UniRef90-Q8ZUP1 UniRef90-19LOY5 UniRef90-A6V8NO UniRef90_F7SMQ1 UniRef90 A0A021XGU4 UniRef90-UPIO003656389 UniRef90_UPIO0036E3C6E UniRef90-R7FVN6 UniRef90 M5F099 UniRef90-UPIo00411E6AA UniRef90-K6VHD2 UniRet90_R7X5M8 UniRet90_J3ADP2 UniRef90-G5ZXL1 1
UniRet90 B0UD47 UniRef90_UPIO004630A98 UniRef90-F7VH62 UniRef90-B2SZX4 UniRef90-B9JL76 UniRef90_UPIO00366F6E5 UniRef90-S4Z3L18 UniRef90 M3HZ61 UniRef90_UPIO0030F7216 UniRef90OUPIOOO47ED7C2
UniRef9O-UPIOOO375F79E UniRef90-UPIOOO375E79E UniRef90-F3NAQ3
UniRef90_-_3NAQ3
UniRef90- xop
plavivLoa
 LD YAQSIGVPIVVSIVDA $R Q V P S \prod S S T A A Q H V V A A A I A A A Q D S G Q A S A V A V V D A$ QTKPVLGAAEAHRILEAALTAEAERNGWAVAVAVVDD MDLADADAVLASAFAAAEQAAARVSI AVVDG

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

TERNVSQALATDDLASRTLATCQADGYNVSVTVVDR MTFLSLDHANRI IAAALTRGQELGLPLTVAVLDP TRQQTKLNEKGAELI LASAAQAKATDMKVAMNDAVVDD MTSISLTAAVTIAEHAVAFGVEHGYPLTVAVLDP
EQQPILTGSMAAKIVQAAFAEAEKDGYYITVVTVDK MENMTDELAKKLGAYAENLAKEYGKPFSVAI CDK $S H \square V T S Q K D D W S A A A A L A S E A V R I C A A Q G Y S V T A T V V D T$

TKKTLA RADVQA LDDAAERHARDNSWAVTAAVVDD SAFVEFKVLKPEDAMAAATAAMEHCRAGGYQVGVTVVDR SNANSLALISYKQASQALDAAVRLAEEHGTALSFVIVDS

KTYYQLPTSLADEAAMEAVNTCQQLNVPNVTVCVVADD AVLSERNVSLALANQ1AAATVAACSAGGYNVTATVVDR AALSQKNLSLTQANALASAAIGACTAKNYQVTVTVVDR TAPYLPLEMAEKAAKAALQACSTKGNAVTVAVVR MWSAVVDR MTAVHPV DVSLAEARALVRRAVDKAEQLGLRGAVAVVG $K T A Y D M D L N T A N Q L A E N V M Q A C Q K A S K P A A V T V L D Q$ A VTETKTLSSEAALKAAKAADKEAEEQNQRVTVADVGDR

THHDLTKALKSVVATTSNEENGGLELNMWGTI VAR FTKS $\square$ STAS NRQAAAALDEAAGAAARD IGDEAAVAVTDA SPPSTDSGMADTQAMELAQAAIADCQARGYPASASVVDD


TSHSTTHQAAAR TIAEATAASERVGPLSAVVLDA
 $S \square T \square A Q A D A \square V A A T \square A Q G R E G Q R$ R THLSLQQAERCI A A A I A E ARRQGQAVCVAVVDA $T G P \square Q Q Q T L S L D L A N R L V N A T L E A C H A D G R T A V V A A V D R$ MQKYRSSIVVTADAADQALAAAVDKAKADNVPQCIFVVDP RTAVKLELAEARAMI EAAKAAAEEAQVLETVCIVDD TSNAQDLNQEGALRLAEQAKLEAQKLNKNVSVAVLNS MAMFRET\SLTHDGALKAVAAGATRAVEMGVPQCLMVVDA

EP PQQYNLS DK $\square$ A EHLADHTIT EACDPQSAGGLAVAVVGD MSNFVERDKLTHAGAQAIVTAAVAHAQAMGQPQCI AVVDD RAVTLAEAKTVVAAAEAEARKQGWLMVITVVEP MTTLSYDVSLSLAQAALQKGADLGLPLAVVVLDH


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UniRef90_UPI00035C8275 UniRef90_UPI00037DB03E UniRef90_UPI000344CF4E UniRef90-A3Z599 UniRef90-B7QVX6 UniRef90_UPI00035E5928 UniRef90-S2JUH9 UniRef90-A7IEK7 UniRef90-A0A024H1V0 UniRef90-B6WX57 UniRef90_V4NXJ8 UniRef90_N6Y877 UniRef90-Q07M19
UniRef90-W8FIW4 UniRef90_UPIOOO361769A UniRef90-X6KXW3 UniRef90-T1VVM3 UniRef90-W8UBZ2 UniRef90-A5V723 UniRef90_Q2J7E5 UniRef90_UPI00029A63AA UniRef90-U1ICA5 UniRef90-Q5YWE9
UniRef90- M2VUB4 UniRef90-M2VUB4
UniRef90_G2EBZ7 UniRef90_UPIO0037AF98C UniRef90_Q5FSF2 UniRef90_UPIO0030010A6 UniRef90-B8HBF7 UniRef90-A8LJ49 UniRef90_A0A022G985 UniRef90-W2RKE5 UniRef90-E5Y8C3 UniRef90_UPIO00365F475 UniRef90-H0P4B4 UniRef90-A0A024IAP8 UniRef90_G9Z844 UniRef90-W1KDX7 UniRef90-HOTML6 UniRef90_Q0S3L9 UniRef90_UPI00036E1897 UniRef90-N8VFB7 UniRef90-UPI00037E2FEA UniRef90_D3PYN6 UniRef90_L8XCP2
UniRef90 Q2JZD8 UniRef90_V4PHP1 UniRef90-J1KY31 UniRef90_UPI00035C3990 UniRef90-M2V821 UniRef90-Q0FJH5 UniRef90_V4R4S1
UniRef90 Q8ZUP1 UniRef90_Q8ZUP1
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 GGSLLVTLRGDGVGPHNTAASQRKAYTALSTKTPTRLFAE HGNLRAFARMDDASAGVSDASAMWKGKSAGKYGYATAMSAD GGYPIVLERMDGARVTGPQUAWNKAFTAAGHKRATHDFNQ GGHFVSGVRMDGAPFGTFDVRGKAAATAATGGASGADLVK AGGLI CFARTDGAADLDASGPAYAKARVAAERQHPSGAL GGHPIAFAREDGATFARLE $\square A R A K A K G A L G M G A D T R A L A E$ NGNTVVTLRGDGAGPQSYESAERKGFTAVSWNAPTSQLVK SGETITSIRMDGAKYLSMHTARAKARTAASSNAPTGTM KGVLMYFHRMSDALLISNDDAQAKAYTAVADKAATHEVHQ GGNLLAFRRMDDAALQATQIAQDKAYTAAGFGMPSAQWHE GGHPVVVEREDGAGTVRFEVARGKASAALGTGVASGADGA GGHPLAFARLDGAAPISAYIAQEKARTAALGRRETKAYEE GGHVLAFEREDGAAPGRFADAQGKAYGSVMLGMAGSAQMA GAHPLADHRMTGARDTGVEDADAKAFTAAGHQRATHLFNE SGETRVLVKGDHSTTHTRTSSFRKAYTVATFGFDTSAFVE

 AGIVRAVQRADNAGPHTLAASQQKAFTSASARNATQAMME
 GGHLLAFRRDDRAVLISGETSTRKAYTALQLNAATADLVD F GVLAAFGKTDGALASVGTFAQDKAYTAGLQGKSTKAFGE A GNVDAMVRGDNAAQHTVEASREKAYTSAAFGADTSDLSQ A GII KTVLRGDNAGPHTVKASEQKAFTALSTKTPSGQVME G GHL 1 ALQRQDS S SNLRPG\|ATGKASGALALGVSSRK】GE A G LLVAHVRMDNARLETADVSVDKACAARAWAPPAHGEAP GGHLITFARMDGARPASVPTALTKATAAATFRQPTGPEPAA GGHPVVLHRQDGSGILRPDIATAKAWGVLGLGVPNREDAR RGHDVFAVRGDGAPWFTVGVARAKAATAALMGAASGDLAG SGQULAVQRHHNAGVHTLRASYKKAFTACSQKRDTATIAK D GFMVLFNKLDGAKLLTIKDTPNKAYTAVRMGVSTADFLK SGHEQAVIKGDTVPLQSLSVAYRKAYTAYSYKNTTSELIA $\begin{array}{ll}G G H A L G L I & R L D G A A P M S A K I A Q A K A H T A A V S R R E T K A F E D \\ F G T V Q A L L & G D N A A E H T D E A K Q K A Y T A A A F G T P T S E A K\end{array}$ $F$ GVPQAFVRDRFAGAHVWETATRKAWTAVSFRSGTTELDA A GHLVVAAARMDGAPFDTMEVARGKAFACVTGGQSGRALRQ TGKLAAFLSLDGTPERAGAIAQSKAYTAMRMELTTQAFHD GGYPIA LERMNGARVTGPQ A WNKAFTAAGHKRSTHAFNG EGLVQAVIRGDDATPHTDENSFYKAFTLITGGPSTGAlAQ A GHVRAMQRADNAGPHTLEASRLKAYTSASARNTTLAMME A GVVKAVQRTDNAGPHTVKASEMKAFTADSTKNASGKVME $D G A T K M V L K A D G S G P H T V S S A T G K A F A A A S D G R D T G E L A E S$
$K G L L C S V V R S D D A W P G S R S I D A D A K A S T A N N F S N S T A M L Y S$ A GNVQAMLRGDNAAQHTVEAARQKAYTAAAFGANTSDLSE SGALVTASRLDHGGPGGMARARSKAWDSATQQDPSAEHLH GGNVLAS QRYESVGGHNDTAS QRKAFTAAYTKKTSTMDFMR

 TGNLRAFERTDGAPF LDTVDVADDKAWTASSFGFATHVWND K GVVVKTTVLRAD GAMKPPVVAAPDKAFTAFVVFDQPGAEMED

 GGBHVIAA F E R Q D GA S P GRRF QI A Q GKA Y GA V MLGMP G S A QMA
 $S G V L A A F L R M P$ GAF LAHSVDIA IVDKAYTSAGFGFATAQWAG

 GGNLLIA L LQRDDN IGPHNTLAARQRKAFTSLSTGSTSRALSE

 K A R P V L T E V M D D A F L V S Y D V A N R K A Y T S

 GCRLLMA F L R M D GAK VLS E QSA DRKA MTAA S NAAP TAN NGAALVMSEKMD GA QYGSNDVARRKAETSANFRRPTSYFQA R A S L R I C L N Q D G T A I H R H RV A H GK A N A A M S L G M G S R A LGA F GA P L V L L R D R F A GLLP A A T TA S S KA Y TA A L S F R S S TAA E FA K









 RARSNPETANLNTLDELLLLGGG$I D L F A G S E L V G A M G V$ W
$V A L P G N E A F G \square Q W S F E G R F A V F V G G F P$
FAASPAMAVA PVVHVDA GLLAVPGGMPIVDDGEVIGAVGV
$R Y Q A N P \quad V F G Q M S S L V G P L F P S Q G S D G V F V A G R L E G A V G V$

$R$
$N$
E

$P G T L F D A G G \vee P \vee R A G D A P \vee A G l G V$
$F$ L Q Q D A P L A M GA P D Gll E R F V P F G G G Y P
$G G G L P L D D G V I G G I G V$

A I A GGRALLSLQGVMHQPCALMAGGLV

PA LP GNEAF G I QHMHPGRFAAFVGGFPIVVE
DTLQKQPF IVANDRDSDHLIFLPGGVPIVKDGRTLGA\GV $K T R G G P S T Q A L A S L \quad P D I L L L A G G V G V K A K G E \| V A A I G V$ RATS P IMSGIAAQAEGGHIVYARGAVPIFSKGILVGAMV
 A A QKNPGAANL TDDPGFLLLGGGVPVRVGDEV
 $D K A L L L A E A T S G R M T N L L G G L P L D A N G H V V G G I G V$

 NSQKNPAANNLK DIPGFLLLGGGVPVKAGDEVVGAVGV MAADRPSGALGT $\square$ APAGIVPSAGGVIVVDADGRVI GAVGV ATGGDGRVGRERPSPA EPVVTAGLPGALPLWRNGVIVGAVGV


 $R L Q T D N$ L $N$ I S Y FA DENFV GMPGGVVPLNAQQQI I GAMVGI
 $M I N Q G R N A F \quad L S A P G \| E$ GLME G GVVPVIAD



 $P A L P G N E A F G Q Q L S F E G R F A A F V G G F P V V V D G E V I$
 AS QKNPAAANVLK DVD GYLLL G G GVVPVVA GNEVI GAVVGV AAQSNAGAQNMR DVVPGFL L LAAGGLPVKEGDEVI GAI GI
 RAK AGN


GATAGRPA

YVTGDPKVAPL
REK S DAAFKAQDDAHK D 1 Y Y D HA GS VP
T $\square$ T P $\square$ P L S Y G L A Q S S E G GLVVSFS A G L P I Y R N E N
A DE
$\square K L S L D A A G Q R L T N L E G G L P D$
AVQPGGPILYSAENSN GGLIVFGGGLPIVLNGRLIGGVGV RAEAQAYFAAANGAFGGQMIPVPGGVLVKDKGRVMGALGV
 RAA Q NLPFY IGGTVHAGLIIFGKGGD YVAKREFSGGVGV

 HAR QDP ESAN PASPTGEAFGDHVMMPGKFADFVGGFPIVVDGEVVGGVGIl

 $E$ VAA


 $R A E A Q A Y F V A V G R M M D G D F D P V P G G V V D R A N G D L L G A V G D$ G $\square E T K R L D A G L G R L D V V A M A G G L P I E A G G G I V G A V G V$ STQGGEPAS GVRHL P P R R V VA I G G GI PI E S A G S I V G A I GV
 H A K
HAK LLLAAATQ

| $F$ | $L$ | $K$ | $E$ | $H$ | $R$ | $E$ | $L$ | $D$ | $G$ | $L$ | $R$ | $D$ | $M$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $D$ | $A$ | $D$ | $G$ | $S$ | $I$ | $A$ | $A$ | $D$ | $I$ | $R$ | $Y$ | $L$ |


| $G$ | $V$ | $D$ | $G$ |
| :--- | :--- | :--- | :--- |
| $N$ | $V$ | $Q$ | $K$ |

$R A R S T P D A E N L N T L D E L L L L G G G \quad V P L K V G D Q \prod G A \| G V A$

 VGQKFPALQASFNAN PEI SGLPGGFPVLWEGVVVGGLGV UniRef90_F3NAQ3
UniRef90_X0PW85

|  | 130140 |
| :---: | :---: |
| UniRef90_A811Z9 | S G |
| UniRef90_V8RE31 | A GGGGEQDENCARAAAD |
| UniRef90-A0A059EEY9 | S GAPSVFDEECGNVG |
| UniRef90-A0A038FRM9 | SGGNGEQDTQCGVAAL |
| UniRef90-UPI00036B2780 | GGADAETDERLA SRALEGLKDL |
| UniRef90-H1RZG7 | S GGP S DADEEAARRGII A A |
| UniRef90-D5BMC7 | S GGS GDDDLAVAK A GLDAIQAV |
| UniRef90_UPI0003B50DB5 | S GDT GDCDEEC |
| UniRef90-S3BSR2 | A GASGA LDEEFARAGAKALGE |
| UniRef90-B9JJG7 | GS GTGDQDFEV |
| UniRef90-W1YKX8 | S GGTVAEDMDI |
| UniRef90-UPI00035C8275 | SGGHWSADERIATAGANAL |
| UniRef90-UPI00037DB03E | S GDAS DADEAVAVA G DEA |
| UniRef90-UPI000344CF4E | S GVK S DQDA QVA SA GAK SVA A |
| UniRef90-A3Z599 | S GMT P DVDA AVARAGVEAFA |
| UniRef90-B7QVX6 | TGDTSDND |
| UniRef90_UPI00035E5928 |  |
| UniRef90_S2JUH9 | G G A P G H D A A |
| UniRef90-A7IEK7 | GGAPGEKDEACAAAGL |
| UniRef90-A0A024H1 | GGGTGEQDEECATAGVTVLGE |
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| UniRef90-V4NXJ8 | ALNS V |
| UniRef90_N6Y877 |  |
| UniRef90_Q07M19 | S GAPGDADE |
| UniRef90-W8FIW4 | GS GTGEQDLEDAKAAVA |
| UniRef90-UPI000361769A | GGGAPDQDHGFATEAVRALDA |
| UniRef90-X6KXW3 | S GAQDHED |
| UniRef90-T1VVM3 | GGAPGMQDQTCAAAGRDATA S |
| UniRef90_W8UBZ2 | A GAPGGHDAQCATKALEQIS A |
| UniRef90-A5V723 | T G DVA ${ }^{\text {d }}$ NDEL |
| UniRef90-Q2J7E5 | SGGPAPLD |
| UniRef90-UPI00029A63AA | GGGS GE QDAEVA QA G $\square \mathrm{NM}$ M |
| UniRef90_U1ICA5 | S GGT GS Q D NVISLA GQAALK |
| UniRef90_Q5YWE9 | TGATSAED |
| UniRef90-M2VUB4 | S GADPDEDVSFARAGWA ALA S V |
| UniRef90_G2EBZ7 | GGAHGSADVKVAKAGL |
| UniRef90_UPI00037AF98C | GGLLK EDGEVALKVAAAA |
| UniRef90-Q5FSF2 | S GAPGDKDEACALHAV |
| UniRef90-UPI00030010A6 |  |
| UniRef90_B8HBF7 | G G A P |
| UniRef90-A8LJ49 | S GAPGDワDDECAQAG |
| UniRef90-A0A022G985 | SGGAAElEEEML |
| UniRef90-W2RKE5 | STGTPAQDEEVAKAGVEAV |
| UniRef90-E5Y8C3 | S GRKPQEDAELAERLVQKL |
| UniRef90_UPI000365F475 |  |
| UniRef90-H0P4B4 |  |
| UniRef90-A0A024IAP8 | GGAPGGHDEQCAMAALEQVKA |
| UniRef90_G9Z844 | GGAPGGHDEAC |
| UniRef90_W1KDX7 |  |
| UniRef90-HOTML6 | SGDTACADHA |
| UniRef90_Q0S3L9 | GGAPGMRDQACAAAGLDA $\square$ A |
| UniRef90_UPI00036E1897 |  |
| UniRef90-N8VFB7 | GS G G S ED HQCAVQG\Q |
| UniRef90-UPI00037E2FEA | S GGSPDEDEA!A Q A AVD |
| UniRef90-D3PYN6 | GGAS GD\DEKI A EAGL |
| UniRef90-L8XCP2 | SGDTSCADHNIA WK T RN |
| UniRef90-Q2JZD8 | SGGNYQQDQDAAVAA |
| UniRef90_V4PHP1 | A DVP HEVADACARAAV |
| UniRef90-J1KY31 | A GGSASQDF 1 IA A S GAS |
| UniRef90_UPI00035C3990 |  |
| UniRef90-M2V821 | S G G SVEQdLS A A F A GVEGLGA |
| UniRef90_Q0FJH5 | TGDSSDNDATAAKAGVEA |
| UniRef90_V4R4S1 | S GGS WS QDQEAGEAA |
| UniRef90-Q8ZUP1 | S GGT GDQDEEVARAVAQAL |
| UniRef90-A1W2J8 | S GGSAEQDEIC |
| UniRef90-19L0Y5 | TGDSSDNDE |
| UniRef90_A6V8N0 |  |
| UniRef90_F7SMQ1 | GAGGSA ${ }^{\text {a }}$ E GCALLA A $\square$ D |
| UniRef90_A0A021XGU4 | GSGTGDQDF |
| UniRef90_UPI000365638 | S GGNGEQDT $\backslash$ VGTAALRALQ |
| UniRef90-UPI00036E3C6E | G G G G EENDHNIAKKAV |
| UniRef90-R7FVN6 | S GGTAKEDTVYAETAVK ITFNE! |
| UniRef90-M5F099 | GSGTGEQDFDVARAALTA $\mathrm{C}_{\text {G }}$ |
| UniRef90_UPI000411E6AA | S GLIP P E Q A A L A |
| UniRef90-K6VHD2 | GGGGAAQDEACAEQGVQK |
| UniRef90-R7X5M8 | GSGTGEQDVEVAKHALKCLL |
| UniRef90_J3ADP2 | S GGS A Q ${ }^{\text {GLI }}$ ARAGAAAVK |
| UniRef90-G5ZXL1 | SGDTSDND |
| UniRef90-B0UD47 | S GAPGDKDDACAAAGПEAV |
| UniRef90-UPI0004630A98 | SGAPGDADDVCAKAGI |
| UniRef90-F7VH62 | SGAPGDKDEACALDA AVKKFQA |
| UniRef90-B2SZX4 | S GAPGDKDEACAQAAVDKY |
| UniRef90-B9JL76 | GS GS GEQDEAVALLVALKAI GA |
| UniRef90-UPIO00366F6E5 | GAPGGDKDEVCAKAGLASIGA |
| UniRef90-S4Z3L8 | GGAHGNEDVS $\mathrm{I}^{\text {A R A GLS VLE }}$ |
| UniRef90_M3HZ61 |  |
| UniRef90-UPIO0030F7216 | GAGGAANDEACALK A I E |
| UniRef90-UPI00047ED7C2 | GSPGGDKDEVCAQAGVAKI |
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| UniRef90-UPI0003632693 | A GGNFEQDQAVGAAAI A |
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S $\ N Q K G A \square E \square A E Q A N D E A E K D K K V S D A V L N$ SKT DYEPVLTGDAAMKMAQKAFNEANKSGHRISVVVVDD RS $\|$ RSLTLDDARA\｜IAAGEQFATSSGLGVAIAVVDQ AVVIVDR
LSHKDAHQLLNKAEQTATQKEVT TAVSVCDT HAINATQAGTVVQAAALEPAN【SIPVNIAITDP MSNLSLTAAQTILATALDHCRKGNFPMAVVVLDA PDVTLKESDDLATAAADICQAKGFAASVSVVDT QQLTSALKSSVATTSDEKNGGLEGNMWGTLVGR KTKVILSQQMASAI $\square A A G Q E E A Q K N N W S S T A V A D D$ SQKNLSVELANKIAQSTLQACAKDGYNVAVTLVDR
 HQFTNDQALQUGTAIINEAKSKGKAVTVNIVKR

A Dethelt Leat AVRTEKNISLALANQLAAEAVAACAANGYSVAATVVDR $P V T Y D Q L K A A L D A A V Q D N G G L G F D M W G T V V N A$ KTKPELELGDAERMLAAARAEAERHGRAVSIATVDD QRNEVSLAMANDLLNAALTACHADGRTSVAAIVDR $R M W S A I V D R$ QFSSFNTDTAWETGSELKAEAERRGVAVS ПDI QL LT LLERVEQCLQQGKAEAQRLGVEAAIVVVDA QVYSLDSQTAQTLIDAAVAVCQKVQHNDAVVVVDR SPTVALKRMTLEVAQQIAQGALHECRSRGDQUGVTVVDR
 AANGGGLAVPMWACDVDE QTGVLSADAADK DADAVQKEAVKQGQRVTVVIVDR PMLTLEAADEMSSVALREATAYGFPISVCVLDA RSMNDVSLASASKLADAAMAACQAQGRHLVVTVVDR MANDLLTAALTACHADGRTAVAAVVDR MNGVAT TRSVGHDLAAKAVQVAVAKGGEAGCPLVAAVVGA SENFSKHIFSSEQLKNIIDTVLAEAWQQSAMVVITLCDE PALDFATADAlRDHCLAAADRAGYTVAVAVFDA SAMT पEAAST UVAAGAAGRAAGCPLVVAVVDA $R L G V R V S U A V V A R$ $\square$ IMWATIVDR
AEHRDPQFDFDDAWQTGQSTQQRGREENAPTADEVYA MADADRLVDAALTAGAERGFPLAVAVLDV LANTTPSAQLSVAEVERILSQAIAYATRAGMRVNVAVVDA LANITPSAQLSVAEVERILSQAIAYATRAGIRVNVAVVDA

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 ELREALTRARRADNGGFDLDMWGTVVSR KSSPAPS $\square$ TQAAASA $\square \square A A V H A A S R \square G F T A A V A V T D P$ QFTSFTNETAKKGDADYEAAKHKGKVADDVR QFTHFTNADAWELGTMILMEARRRGAQVGIMI RRS PSFGYHDAWALGTAMVSAATARTDPVADAIVDN －TETAYKVGTSMIEKALLENKSIVVDIR K QHFTFDDAWELGSLLVELARESQAPVAVDIR R KTMGLGLDADLAEASVEVCRQDGYQVSAVVVDR
MTTTPT目E SLTYDDAWALGSLLVELARERRAPVALDI HER R PHFDADTAWQLGAYLREVAKARGLALAI EI R T V VPRFDADDAWRLGNLLREMAVERRAPMVIDVRAR TFDEDAAFAVGSAMRERADSDKLGVVCSVEDR

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 $M M K E G R D \| A \quad W F G D P D R Q A P V P G G I L I R S D G T I A G A V G T$
 A $\square$ QSNPDAAGM LP GE IVD S $\square Q H$

 K AESSETAKNLNTLDE LL L L G G G A AP IWSNGELVVS DGUS $\mathrm{G} \square \mathrm{K} N \mathrm{G}$
$N A N G D Q \square G V M S \square P L V S T V A G G \square P V L \quad V D G Q L V G A V G V$ $R T L P A G A L F G I E N T N R G G I A T V P G G F P L F R N G D V I G G I G V$

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GS Q S
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YCEKDRSYA QFY A A NP QEFEAVGGSFP $T$ S VK NVVI G S $T T V$ AT QP G GS LF GLQF SNP G GVNVFGGGLALYKK GKLI GALGV
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$G A Q K N P G A A N L V Y L P G F L L L G G G \quad V P V K S G N E V I G A V G V$ AVLE G GP LY GL QHSNPGGI NVFGGGLLFDANDQVVGAVGV $A \vee Q P G G S L Y G L Q H S N P G G V N V F G G G L G L Y K G N V V K G A V G V$ Y D Q R R P
RARSTPDA
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RARQNPDAAN

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 $Q L M G G R$


 $Y$ Y A S P R $\square A P L A G H P T$

## LKK N Q

F AP QLATVKNVIALPGAVAFKAHGEVVGALGD
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 M
RHRAGTTFEASS R LDP DTYAA HGGSFPDTLEGTVIGADTVV $E V K N G G G D Y A D P T L D P R E F A A H G G S F P D V I$ K GAPI GTI T V




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UniRef90-A8GDA9
UniRef90-UPI00036065FF UniRet90_C7Q9A3
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UniRef90 G6EA67 UniRef90 - J2IPR8 UniRef90-M5UDD7

10 20
पPHFDEDDAWQLLGVALIRTQA ${ }^{30}$ Qa PlV|Al| |Al| ETLTLRQFTNHDALRAGQYVIDRALQDKLSVAl|ELKR SYVTSIDNLTQKAAFELVNRVNHFASTLNKEVSVATLDA $K A A T M Q P V L D D A D V A K V V Q V A K Q A L A E R H A K G C I V I T D A$ $M D G V V S V R T V G H E L A L K A A A A A V A T G A A A G C P V V A A V V G A$



KELQFAEFTNETALEDGLK LDERAKVENKRTA DD D SR SRFSPDDAWALGNRVRETALARGAGVAIDISDR QFSQFTHNTAVLIGTK VEKALKDNSPMVI SI QK ATAWDLGTRLKTACEEQGVSATI EVRLA
TNEDALQLGDELINYAKENGKSVAVIVEKN TFTCEDAWELGKVFVADAMDNDLKIAI AI KSL TFTCEDAWELGKVFVADAMDNDLKVA, A VKG K
QSLSDPEVNDI VARAVQAS
AVAFEVGSAl R DRALKKKNLPRIVDIVR
PSFDQHDAWRLGSLI ANHALAENHGVAI
 S F


NEDALLTLGLTLINNAK
LIPHFLEEAFTVLTRARAQDRRSRMQASISVVER
 THQDALQLGLFIVQUAEEVGQGIAVHIEND GERVCVAVTNR
PRFGANDA $\square \mathrm{N} \square \mathrm{G} \square \mathrm{ILLDRGRKDNDPILINIRTP}$
 LPRFTYEDAWQLGTTLRRMAAERKLGVVIDVGLF A WE GSAIRQRALDESDAPVSIEVFA VPQPALTLAAASRLATAAGGACRQLDRTIAVAVLDG

PRFDAARAWQTGAFLHERSRABGAPEC|AVVDA

MSHEED DRR $\square A \square Q E Q R L V E E R G Q E E A W A L G V W L R Q A G L E R$


AEQERRLTLEDAWKLGSLLVEMARLREAPVAAD R R THDDAWTLGSLLVDLLARERDLPVAIDI R R SHDDGWALGMDLRRLADENKAPVAMEVFAA $\begin{array}{rl}P V V I D \\ W A & S D A \\ V N R\end{array}$
QFSHFTNADAWEVGNCTVAEA TKRKDPVAVSIRLN PVFNEALAWELGCTLQLAASLNQAAVHIE: REA LTSGTNTEAUGMGHELIGRAMKENLSUAVEIRKR TFPTFTANTAWTLGSLLRTRLLA FSKPVVI DITLA

dtawa TGSKLVGVAQAQNAPVATNTRTP ELPTYTHRDAWDLGSTLVRLAREADAPVAIDDRR TLKAALD DAVSAEESGLNLHMWATLVNR QFTHFTNDDAVALGLQAVEVIREWKLNLAVDIV呙 DSFTDSSFTYEDAFELGHLLHARALVNKKP1 SIALANN
 OKKALVSADEADSSGLNNHYWAVVTDR
पs SFGVD VAWE GTGARKKALEESKAVVIDISDP QFTSFTS LPHFDEQNALDLGLMLIENAKPFKKPVVI DI $M E K Q L V V D$


## 

H K L
ATLRFAALSSANVGKIVAQAAAQANQSGHPSVIAVVDR
UniRef90_UPI0003B48706

## UniRef90 UPIo003753847

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UniRef90-S0G062 UniRef90-A0A021X276 UniRef90-X5X184 UniRef90_UPIOOO4772645 UniRef90- J2WJ29 UniRef90-UPIO00479BAAE UniRef90-FORW21 UniRef90-UP100036D31EE UniRef90-G2POT9 UniRef90-A6GS37 UniRef90-C1F3M3 UniRef90-X50HA2 UniRef90-B8H987 UniRef90-AOAO24JOU4 UniRef90-C1DM14 UniRef90-V6IYL2 UniRef90-UPI00031CF73E UniRet90-V6K3V5 UniRef90-YOKHQ7 UniRef90-UPIOOO36D7160 UniRet90_EOIG12 UniRef90_UPIO002F9440B UniRef90-UPI00037D83EC UniRef90-UPI0003B66253 UniRef90-H2ILT8 UniRef90-B9JML8 UniRef90-W8IC41 UniRef90-F2R4P4 UniRef90-UPIO00360BC83 UniRef90_UPIO003789080 UniRef90-UPI00041D5807 UniRef90 UPIOOO370FC44 UniRef90-LLLLYY UniRefofo-I2MYR1 1 UniRe990_G1XZD7
UniRet90_G8SBQ2 UniRef90-C4T5X9 UniRef90-W0L8W3 UniRet90-A8GDA9 UniRef90_UPI00036065FF UniRef90-C7Q9A3 UniRef90-UPIOOO225F12F UniRef90-UPIOOO46EC261 UniRef90-Q6BJQ9 UniRef90 UPIOOO4625C17 UniRet90_R6BKE8 UniRef90-UPIO00462FF84 UniRef90_UPI000360895F UniRet90-U6BD43 UniRef90-Q602U8 UniRef90-Q08MA9 UniRef90-G8M810 UniRef90-S2WVG5 UniRef90-UPI0003B2FAED UniRet90-B5GDP6 UniRef90-UPIO0037E99B7 UniRef90-A4AKR1 UniRef90-UPIOOO47EEBOF UniRef90_N2V7U3 UniRef90_10H8O6
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70
80 SGKVCEVVNSRDDWLGSRVISARKANTANAFSTSTANLGK NGQRLFYAALDGTAPDQEEWIRRKSNVVLRHGHSSMYMRL SGSUIVLTSGDSVGPHNTEASRRKAYTSLSTKTATLQLLR GGDLVAFVRASGSPSPSAKDAQDKAYSAASFRVPTPDLYA AGQQLFHAALAGTSADNDQWVIRKNAVVMRFGHSSYYMGR VGNVLGVFRMNGARATNDDAAIAKAITAFSTRTASQUVQE NRVPL THLMDGTSEENVHWLYRKKRVVDHYNKSSAYIAA HGHQLFHAALPGTSPDNDSWIQRKTRVVHRFGHSSLFVRQ
 FGHQLFHYSFTGTTPENDQWIDRKNRVVNRFGKSSLHLGT D RPLFHCADPGTSTDNVEWIRRKRNTVLRLWHSSYLVGR SGEVLASLRMDGARFLSMRTAQAKARTAASINAATGGMA NGQQLFYSKLDGATMDNDLWAKRKNKVVEHFNHSSYYMNV H DPLFTHLMDGTSEENDKWLYRKKNVVDHYNHSTQFIGA SGKTLFHYALEGTNLGNDGWIDRKFRTVQYFEMSTLRYSL
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 NGTVLFAHGMNGTTRDHGDWIRRKSNLVNRTGHSSFYIHT E HPLFTHYMAGTSKDNAYWVNTKKNVVNHFGHSSGYVGE TGAVCAVAFSGSAWLLSRQUAAAKAFTANGLQLSTQQLYD N HTLFHAALPGATPLNDLWAQRKSNAVLHYHMSSAHLGK FEQVLFSYAMEGSTKDKQDWAKRKRQSVLRFGHSSHYLGH GGHLLVLKRMEQVGPAGPVTATAKARTAALFRRTTAQLAE GAQQLFHCALPGSSADNDAWIDRKRRVVERYGVSSFLVGA FGQPLFLTALPGSSADNDEWMKRKRNTVLRLAHSSLYAGLD GGNLLAYGRVEGAAVLALKPSDAKAQTAASGGDATGPF FGQPLFFSALEGATPDNAAWVRRKRNVVAHER RSSYATGL
HSMPVFYITALPGSTPDNSNWIRRKRNMVLRYFRSSYASTL GGQQLFHAALPGSSPDDDAWI DRKRRVVARYGESSLLVAA GGVLVVLURQQLIATPDHDDWVRRKRATALHFARSSYAVGG AGRTLFYYAMQGTTPDSADWVRRKRNVVNHFHKSSYAVGG AGQTLFYYAMPGTTPDIUDWVRRKRNVVNHFHKSSYAIGGL RGRQQLFHALSGASADNDAWIDRKRRVVERYGVSSYLVGA
RGDQQLFHHAPGTVPDNATWDDRKVVVRRFGHSSLLI GQ DATLFHAA LPGSAPIDNDWARRKSNVTLRCHRAA SGQVLHSVTNDGTSGDNDQWISRKKRTVLRFGKS
QGIVCAIVKVDDQWPGSRALAEKANTANAFSMA
 FGRMLFVCAMPGSAPSNADWARRKRNVVQLLQRSSLATGLL GDHULFRAMLPGTTVDQQDWDRKKAAVVHRFEASSALVAL NGQRLYYAALDGTAPDQEEWIRRKSNVVLRHGYSSGYMRR NNNHCLFHATVGTAPDNDSWVARKRNTVLRFGASSWYMHN GRKLFYFA LDGTTPDNARWVERKSRTVEHFHRSSYALGL
D R
GLQ

## UniRef90 UPI0003753847 UniRef90-D5MIC7 <br> UniRef90_UPI00047AD671 UniRef90_UPI0003F62C9B UniRef90_H8KZD2 UniRef90-A4XDU0 UniRef90_UPI00041E60D0 UniRef90_N9W090 UniRef90_UPI00047148EA UniRef90_D2SGX7 UniRef90_UPI0003B797AB UniRef90_D2QFK5 <br> UniRef90_I7BRX2 <br> UniRef90_S0G062

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UniRef90_M5UDD7
UniRef90 UPI0003B
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 NAEQNSDTKNLNSLPELLLLS GGSPI YYKG


 HFPPAPPLFGVQFSQLPGLAADPGGLPLYKNGVLVGGIGV

 SLLKK K Q T L T D QA G L P L R D NA A A G G G F P i R L R G A C I GA I T I
 RALSS GRDQMEAHNLPHADFAVHGGSVPLFVADGCVGAVTV

 $M S A G A G G A$
$R F R A G S T F E D S S R L D P D R Y A A H G G S F P D T L E G A V V G S V T V$




TMRARGKTFANDGLPDADYAAHGGSFPI RAGGPVIAAVTV NASKQRD F DSQPHIDAREYCA HGGAFPVVRDKGSLVGVI TV

 NYETGERMEHHAFINQAEYCDHGGSFPLTRAGAVVGAVVV RAARDA

PFEFGVD L A $\square$ A S K G G $\square T N L G G G G L P \square I V D G V V L G A \square G V$ $R L Q A G A T L A D K H G L P V E D Y A A H G G A F P L T V A G V V I G B V T V$







## 



## 







K MK P E EK F F
VDS K E Y A FH G GAVP DY L K DYPDGCLTV KMGGDEAAFAAKFMSAGEYADHGGGVPVRVTGVIVAVIVV

 R V

|  | （ 130 |
| :---: | :---: |
| UniRef90＿UP10003753847 | SGLIA QRADHELVV |
| UniRef90－UPI00047AD671 | SGLS QEADHQLAMDALAFLK |
| Ref90－UPI0003F62C9B |  |
| UniRef90－H8KZD2 |  |
| UniRef90－A4XDU0 | SGGSEAMDVEYANAGLA |
| UniRef90－UP100041E60D0 | SGLDPQAEDHALAVEA |
|  |  |
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| UniRef90－UPIO003B797AB | SGLPQRDDHNLVVEALS |
| UniRef90－D20Fl | SGVPMREDHGIIVEVLATWLND |
| UniRef90－172 | SGDTSDNDER |
| UniRef90＿SoG062 | SGLPKNEDHELVI |
| UniRef90－AOA021X276 | SGVPQR】DHA\VADA！AGF |
|  |  |
| Ref90 UPIOOO4 |  |
| UniRef90 J2WJ29 <br> UniRe | SGLPQREDHA |
| UniRef90－FORW | SGLRDVEDHEVLIRCISKYLSV |
| UniRef90－UPIOOO36D31EE | SGLPQREDHNMVVEALAA |
| UniRef90－A6GS37 | ITASTVD的E |
| UniRef90－C1F3M3 | SGLPQRADHELVVEALCALTGL |
| Ret90－×50 |  |
| iRet90＿B8H | S |
| UniRef90 AOAO24JOU4 | SGGLPDVEDH |
| UniRef90－V6IYL | AGLTPQMDHDYVVEGUKRF |
| VGK3V5 | $\boxed{\square}$ |
| $\begin{aligned} & \text { UniRetgo_VKKVb } \\ & \text { UniRef90_YOKHQ7 } \end{aligned}$ | GVGGGRTDEPCAI AGLNKIQ |
| UniRef90－uplooo36 | S⿴囗 GVED |
|  | SGLTGEEDHA |
| UniRee900－UPIO002F | SGDTACQDDK |
| UniRef90－UPIO003B66253 | S GL |
| UniRef90－H21LT8 | S |
| UniRef90－B9JMLI |  |
| UniRet90＿W81C | S |
| UniP | SGLPQAEDHALVV |
| UniRef90－UP1000360BC83 | SGLPSQDDHALVVY |
| UniRef90－UPI00041D58 | GSGTTEQDVEV |
| UniRef90＿UPI000370FC44 | D HEL |
| UniRef90＿LoLLYO | GLP QREDH |
| UniRef90＿I2MYR1 | SGLS SHLDDHALAVEALERFO |
| UniRe | SGLPQADDHALVLEALETF |
| UniRet90－C4T5 ${ }^{\text {a }}$ | SGAPHLDDH |
| UniRef90－W0L8W3 | SGS QRED |
| UniRet90－UP1000360 | SGGPQLED HALVVDALAREAGAL |
| UniRef90－C7Q9A3 | SGLPQVDDHNLVV |
| UP10002 | SGLPQEDDHDMVVKAMESV |
| UniRef90－UPI00046EC261 | SGLPEQDDHALVVRAJQAL |
| UniRef90－UPIo004625C17 | 矿SCADHEVA |
| UniRef90－R6BKE8 | EG Q ${ }^{\text {G }}$ |
| UniRef90 UPIIOO0462FF | GMPEFDDH |
| UniRef90＿UPIO0036089 |  |
|  | S |
| UniRef90－N1PX |  |
| UniRef90－Q08 | S GLA A |
| UniRef90－G8N | SGLPQRDDHQMVVEA |
| UniRef90 S2WVG5 | GS WGQ |
| UniRef90－UP10003B2FAED UniRef90－ $55 \mathrm{GDP6}$ | SGLAASAEDHA |
| UP100037 | D |
| UniRef90－A4AKR1 | SGEPDTDDHQTAAEA |
| UniRef90－UPIO0047EEB0F | SGLPQREDHR |
| UniRet90－N4V7U3 | GLKQDEDH |
| UniRef90 10 HzO | S GLP PADDH |
| UniRgo－UPI00047842FA | SGDT |
| UniRef90－G8Y | S GLA QEEDHLFA |
| UniRet90－H4F5 | SGLKSQEDH |
| UniRef90－I13XE1 UniRef90 F8EYC8 | SGLA MEEDHNLVANALQEFLIL |
| UniRef90－Q11AN6 | SGLTQYEDHRLAA |
| UniRef90－R6N7Y1 | SNQSHFTNHDIIVKAVSRY |
| 06 |  |
| UniRef90－UP10004712FB6 | TGLQDTDDHQLIVDALAA |
| UniRef90 G8ZT |  |
| UniRet90－W2SF06 | D H |
| Ret90＿G88AD5 |  |
| UniRef90 G6EA67 | EEQUALAGTVGFE |
| J2 |  |
| UP10003B | DELVRWGVEQLIA |

# 20 <br> لSTTHE $\downarrow$ R 






 ETEAHFTCEHAWVI GNILRNALRTADCPCLIHISIA NEVQTVMT EALAVANSARAQIRQPQARVTVSVVDT

TRETRPLTPDGAAAMRNKAAETVREMELSAGYFVVDR PSLDENDAFSGGQRIRDIADKGGUADDVSLWDR $\square P H L D N D D A W A L G C L L V E L A A E R D L P V V V D V R R A$

## $G \prod A V S \prod A L F N$


 KEHGKPAVI YA $\square$ A

QFS QFDNETA WK LGCFARRTS $\square E K$ FPSSAVVDD D NSD A WQ GTLARELAQDLPKPDMIDVTLA RFTLDDAWELGGRLRAAAAEARLPVA $\square A \square W$

DAFELGS $\square$ ARS $L A Q E A G K P V V I D \square S Q P$


DECDSHGNLAVCI!DD
QTAWKLGCQLKK】AEDNSTLVAI EVY A TFTADAAFEI GCRLRAHIRSNSKPAIIAVADD

LEEALLAVANRARAQI RRSQARVTITVVDT RFGHAEAWDL GQRVVALATERDLGVTVAIVLG
 RFDLT T A WDLGSLLRHMAVERGLSVVVVDV

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| UniRef90_UPI0002E0F6A3 |
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| UniRef90_L7EJF2 |
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| UniRef90_M3HJS6 |
| UniRef90_G8NXK8 |
| UniRef90_UPI000464FFBB |
| UniRef90_X6D9L5 |
| UniRef90_V8A6K8 |
| UniRef90_A3LYU2 |
| UniRef90_C9SCU7 |
| UniRef90_E5AB67 |
| UniRef90_M5DWW3 |
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| UniRef90_UPI0003165FD2 |
| UniRef90_A6WZS8 |
| UniRef90_UPI0004412D06 |
| UniRef90_UPI00036BCE59 |
| UniRef90_UPI000380D44B |
| UniRef90_H6RKU5 |
| UniRef90_UPI000455EDC9 |
| UniRef90_Q0G2J6 |
| UniRef90_M5T518 |
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| UniRef90_S6EYW2 |
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| UniRef90_M7WZV1 |
| UniRef90_UPI00036C7F0B |
| UniRef90_D1BE99 |
| UniRef90_N6TTN1 |
| UniRef90_UPI00035FBEE0 |
| UniRef90_W6VZC3 |



[^0]



[^1]



SGGTE $\square Q D E E V C / R A \square T A$ $S G \square P Q R E D H N L V V R A V A$

SGLPQREDHNLVIRAVA
S GLP PEDDHQLVVDACRKVLS $\square$
G GLP QR QD H Q
S GMTQEDDHSVIVQG\Q
GGASGD $\square D A T$ CARA GLLDE $\square G A$
S GDGVDQDDVV TA FAG
SGLPQDQDHLLA LETLREFN
S GLA QEEDHMFALKVL



 SGGRGTTDDELIMVKA LIAA S GLR QRED HQM VI DALT D L
S GLTTDEEDHVLMVEALTA





[^0]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

[^1]:    lupas_21
    lupas_14
    lupas_28
    jnet conf
    sol25 sol5 sol0 jhmm
    jpssm

