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QUERY
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 Y E R Y V P P Q D A V R K L F Q Y C V E H D L H L Q T Y IDD D K LiY A R E E N Q K


 Y K $\quad$ T L N K N DL K S L CN Y L E N H S L P C S I M T D I Y T N T HE TIIE M YENPLNQTELEKLLIETEQNGHPLIVMNEQTMKATVVQHP



 Y K SELKKTEDAERVIETARKYKDFYI LYRDF LEEKDMY DDQ S Q H A


 YECTILTKE QAHELYEVSKKHNVIVVHTYVENDII TEK GNQY
 HQATID GRQAKQVAKLA ESLGGLDCHAFSVEHGLITPMENE
 HK SVLSSSEDVHDDS GFAELDHGHGI SYFTEDFDVNGMAS DN FERQLEQKSLMELVQFSKEYGHSLVFMNESHMRANESSQA EQHLL DA DTMEKMWT LGGEEDGLSMWWVSTE GVVFRETPPRRS
 Y K N PLL HL E S LLRKLA E YS S KK Q HP L V Y LS HE EMK SNDEYHP
 YRNTL P T D A L R RLTEHAGSNDHTLVYLGQHRGGATKANDH YENVLPNDDI PRLYEAARTY HDTULTYYDGAEIVTENSHDP

 Y K Q P L N K N AL L K L T QE GLLEK GHPAVFFLTPE GMHSNVEHHS
 Y D K S LTTPE DCHELLYDLLAREMNVNDMAYEDEA IT EDDD QY F NNPLHPAALHKFTQFAKQEGYPLVYLDHQEMRATVEYHD S CLPI PA GEARA LVEKSDEMKFAMMLIGECDLTVCNPTPD





 | $S$ | $H$ | $L$ | $T$ | $L$ | $D$ | $Y$ | $N$ | $D$ | $L$ | $C$ | $D$ | $L$ | $Y$ | $N$ | $L$ | $S$ | $L$ | $K$ | $I$ | $G$ | $S$ | $R$ | $S$ | $H$ | $F$ | $Y$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |




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 Y EKTME Y E KT DK I I N L L K E Y K L R P HF NTHNK I L T E S L E F S







 $F S R T M N N Q F Y R E F V D F D K R N Q L H Y N V V D D K G N T Y T S H D E K$ HQELMTPEEVQTVI DWGKKQKII GIILVEGEKYGYYDPENTD



 Y Q R P LIP R E S V $V$ E K L L V

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UniRef90 M5J788 UniRef90-M5J788
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$K Y T H E A S L V N M P L K Y R T V D E M T P E M N I I K M M M I D E E E V L$ PYSGNFSLYLNQNRWRDNIVDDVLKYLKNKDTVAEVALVG VYEDFAKGLGVDCEDFTDVNELGDEQVLQVTPFCSVEQEA AYLVNMDLCYRTPEEMTEDDKIVKMMMI DDAEVLDQGDAQ VDEIFRQHLAVENLDKKPVEEVLQQRIMQDTPFFSKDYEA KFTVHEAFMNDVSLNYKNIEDVNKDIVISKVMMIDYPEILL AEKYSDEPILYENVEELDEKGINKILWYDEVEKINTFLKE TDIEGQLTGMDIKEVSSFTEHVQNDVVKLLMLEDPEKLAQ YTVMERDTNGUPLTLDDFNELAEDHQ1 KVMMLVDEPEDEQ SKYTVRDAFNTNMQIKYRPADLISPDIEINKIMFVDDPTR VSKSUNLPIPAVDNYYEFLLENCDDULQUNLFVDEKKEKE ERVIQALNET पN LUGKYPEKSRSLSEEVYCLCLYADEDEAQ F $\backslash A E S L A S D D F P Y P L I D A D F Y K H Q A I Y Q T L L F C E E K D E V$ F QDYK WLK FGCDSYDKEKLDKMVKELSYDESLELTNSDP YTDVEAKINGDDVTEMNFESLSDDHASLKAMMVAEPSKLT H DQESDETLKFSH PSYDPEYFEDREIYQSLLFCVEGEEK
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| HFM8 |
| EW1 |
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| 98S6 |
| HK3 |
| UN7 |
| UM2 |
| 3X7 |
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| N76 |
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| 00047E1E9A |
| 377 |
| EW7 |
| HAl1 |
| MYJ9 |
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EVLP S TP T 170 R WYPAF 180
190
200 (IIRHFG KLMKVLPNCEATRWSPAFTDVVAKGIRKQKGIIDEVIDRHFG


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 NEER DMIVKNNTDNEETFYEVFGPNASKELSIKYLFEYFN LLMPTLRNCTSGRWHPAFTDIAADADKGKGLHAMADYDG I PKEYFERYTMVK SSPYFFEIDNKQADKGAALKHLA H HLGG DRVVTVPGCTSGRWHPAFTDVTALGADKGEGLLAMAKHLGG
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$R L Q E L L P D C S F Q R S N P Y S V D I V P K N G S K Y R G L L D E T E A S G$ EVLPSLSCCEMGRWHPAFVDVTARGNTKQRGMDEFIRHFG
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$\prod K L E E T M S F G D G G N D \square S M L R H A A D G V A M G Q A K E D V K A A A D$ I RLE E TMAF GDGGNDISMLRHAAVGVAMGNANDEVKAAA D



 $V$ SENETMFDGDSYND』GIMKLVGFPVAMENAFEEVKKVAK

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 I R L E D T L A F G D G G N D I P M L R H A G I G I A M G N A R D E V K A A A R I A Q K N V VM A L G D Q G N D I A M I KPEHVYAFGDGLNDDQMLKTVHNSVAMGNGEPVVKEVAK I TPE K K M C DG D Q D N DL A ML Q Y A G L G V A M G N A P E E I K K V A K
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 I T A K Q T MVF G D Y L N D L E ML E K A H Y S Y A M A N A H P D I K K I A R
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 MI KLI ATDMDGTLVNNKGNINENIFELI HDFHDKNVKFV MKLADDDDGTLLNNDRAVAPAVKQAL LAAKAQGVHDL M, KELSDMDGTLNSSKKEVSQKTSQALKFAKTMGVDFT MGKLIALDLDGTLLDSRKRLSPRNKEALDKCARMGIQLVJ MKLIALDLDGTLLTLDKKSASARNALDRLKKNGHDVF

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N
YK VVFFDVDGTVINDD


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| UniRef90-UP10004 | ELVKNRFDLI KDDLVYLVE NGN |
| UniRe | K |
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| UniRef90-S6EQ27 | 仡 |
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| UniRef90-F3BCS2 | N |
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| iRef90 ${ }^{\text {A5ISL3 }}$ | N |
| 矿 | IATGRPDTDLKEDSEV PYDAVIALNGSDUSLRNGKR |
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| 11R |  |
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| UniRef90-C2 | N |
|  |  |
| L7BNV5 | $E N$ |
| UniRee9-AbLW | TGRGIGHALASLDEANTHVPMILLNGAL |
|  | D |
| UniF | arple |
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| UniRef90_R6U3B0 | R |
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| UP1000 |  |
| UniRef90-G2K |  |
|  | GRALDELR |
|  | GRPKMASPMYYEQMGLDTPL CSNGAY |
| UniRef90-E4KNL | GRAYHSALPLLEANGITCSFITLNGA |
|  |  |
|  |  |
| UniRef90-17K1D | LCSGRPFAGLTTYLDELIHGDDQYVITLNGAISRTASGTV |
| R5 | ICTGRSRAEVYPE WDIDLDDGMIGGNGSYVEYHNEVI |
| UniRef90-UPIO0034CE9D6 |  |
| efto |  |
| UniRef90-H3NMIO | M |
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| $0{ }^{-} \mathrm{C} 9 \mathrm{~L}$ | D |
| 10 C | ISTGRSRAEVY OHI WDIGDDGMIGGNGSYVEDNGQAI |
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FEEF83

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 HCDVI IVNSLEKNIAKELI E $\square$ GRTIPNSYVILCGKNSAYIESHDE

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UniRef90-I0GMB5
UniRef90_R6A2R8

## UniRef90_A8ST52 UniRef90_F8DYP5

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UniRef90_R6A2R8

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 SWAKMVERSFKSLIRRFKPQSMMREPVYQVVMVATVGETQ PYTIGESYLVRLPVKYRAPEDISKDLVISKVMMIDDPKLI HVKEEAELNGLEIIEESEFSTAIDFAPCKCMLVSDDADALL Kl VEHEWLKFGFDIPDDS $\quad$ RETVLGE
PAEFQHFVTFYCHAVDFEQEKYVKFADGVPVERTEEDARA RRLWYYNETNYNQPLAKDKQRKVVKIEFIYLPDPDYQEDF TLHLDPGDFNIIEYESRGGNFKLCEI DAAQPDYLQENADA FDDPFGNVLRRDVGKKDYYGDWVINKMSCATEVEADKRVE DEFAAELNKYYTHSAVVDSWEDVDDEMIKASFFDATGKAG DGKVEVLTGPKGDMDSSFKQVVNPDKILLIDQEEQEDKRA EAKYQKYRTQKPQYLGEAFYHPPMTVTRVVFADSSEAERG MEKFQQWVMSCPANVRPNVRKDEDFNTLIDNPAENDWKFV TKYPY IRFSEGNVKDLUAFLRTSGVKVMKMGAFVLKDGLA
 DEYDRKYWGASFRNFKNPEKLFDMDTGTLAYVGEDSGAYD T TYHKGAPKNTVKYERDACGLRTHEVHSLLDWCTTPHHEA YVKEEARDNKLPITLYPNFLKQIVYPINKCLIVGDPTPLH VMRTENWAKSLPEHQRPVFRQVPSLREAAREVESDWKFAL VGEKTMKKYVSGKGRKDVSNVTVRTSFPEMDFGASPYRND RFLEEVDKFYYKKETVNNIEDIENDTVKTTFCDFNNVRQL RLIKQTAKYYERYKIVEDLTSIDDDILKVTICDFNGSENN LVAYFNVGGFKIVNVADNFDELVRDHVVYQIMMSGTKDDYP
 FTELLESRINQMPIVQTDDFLSEITFPVDKL LGTGNKEI TA DTQALQETLSLATNPPDRQKDTLLPVHLLCLFGDERIEQ RARETLKTYAIQKGQSAESVEGKEPEDFLHGLKYGGELYR QLIHDGLRTCNLEHPPVCATGYREAAVYQGVLFCNDEATA TYTVGESFLVEMGLRYRAVNEMDPNAVMPKVMFIDDPRDQ SVPDMFQQGKENVFIGDLRNTDTTDPTSQEMLQEDSSHMD PEF TSRVR REAEMQRWGQCGRQFKDAWALLDKK RTVNFDGTEEEARA DEIARHYPAHTRVTDFAADDDDIFKITVCDRGMSRLNSYQ ERICKATRRDSDFAELKEGKAPVYKVFIFTEDUPLLKRDQ LLGAYNFITHDALADCRODDTIDSKLMFTDDAHLIDQAIDED TAEHARHDRVQPRLLPFGQWPRQPAKKLLLGVNLEREPDF VDVHDKEEGVVPKARETLEQNLINDLFNLKQVEMDKVVTD LLVKKYFGDEVNKRCCFWEDEKPKFQKLSIWLGSDSNFAS MNKEAEPMKRVDDUKAY QGDVPKVMGVDYVANTTEARID LTYGYRNKFTLVDDVLEEGAEIDKIAVYQKDSDRELGESV VKSYTYGKFIDYTVCNFDDLELKNVNIDLTDPEKVTGWVN TIRKAYGFDHEEPPAVDAELDEKEDLLMMLVLNEEPANDH HLQEMVFQTRDVHPNIDEFVEKNHKPVEKINLFFPDMEER KEFLI DMYRKMHPEKPVDNI IEQDEERFEAKDIHEDTDAN HFISLLEQEYYSFQMVDDLMETAKTDPVFKDAVYHFESSE KVMHAFEENKHALEVSLEELERMTEKQKKANLITDFKKIE SIYRTVLKNDEFQALPMSDVPEITYSKAVMATTLSPDIKE MEETWLKKMRHYCHRLKPLHHLNEVQDDRLIKKFALNLSDD KEVLR IKERH $\quad$ REGFYKGKTFDDTEINFDKFVIWTNENSD 1 IEHEKRDFGDGDREYDDESNLLTHPFYGLAYFGDPKGTDL PYTILLESYLVNMPLFYRTPEEIAEDVLAVKMMMIDDPFKK DDYYEISNKYYYRLKKDHDFSEDDDKILKFSDSCPDEKTA VEKSFAYFGMEVPEVVDPRTGPKDNVMQMNFFVDEEQEKY TEDLVNAIRSNHPELSEAEVQQRVNQRFQEESFLFVDSFS

 NMDKYQMS IY QPMFK R VATTVVDDII DYAK NHPIVEKIVLYH






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 LLA DHHASGFAYRDTDFAQ SSHRH DDKFYFNASPDP LQAR


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KIERFGD ${ }^{170}$ RERSYF 180
190
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 RNKDESEKYTI ARTGYNHVEVVRKDIDKGTALKGI ADKYN LFAPYYDSMQVVLASAYWVDVTNKGANKGMAVKALQKRLG KALHFHSQLNIYLSEPFFLEMMPQRDDKAHSLQKLGNSUG LYKTAFPLLQFKRWHPYILNVLETDISKARAMESVLHYFH DDLNKVHTWGGRGETALFGDLGVKDUNKAHALDVLLEHLG PFAERFQNMQFYRWHSLATDFLQKDGSKAVGGRKFLERTG DFAKFQDNFSVVQSEPYFTELMPQNVKGNAVTELARGLN SYVQAMQAKLQQNFGPKYIELDARGVDKGHAVRSLCNAYK EMQAKINHDTAVSSGYGNMDLIVSGLHKATGLKADMKKHG MERAFPTLQLRMFSVNYGADIIEKGUSKAEGLKKLCAYYG QQLKEMGDLAVSSSANNNLETTNKAAQKGLALLDFAAHAN Y K KY SNEFNVVVSGEDWLDTAKDVNKGDA A ALGQSQK SVLGENNKVAVASSFDTNLEUTDVHAQKGPMLKRYDESLGO YYTSRFPQLNFYRNTPFSLDTVKKTVSKGNAVKLLQEKLQ PAFHFAYAHLPSRPQWQFASVVSRFVDKTDLFHRLVNHLG पKEEFASSLSDAQTADNYDDIMACGVSKGSALEKLEPKYQ LLNGVFNDNVDATTSKPFFLEFMAKDVSKGNALUKALCHKLG KVMRNLPMLNASRWNPMFADDNDRGIDKATGMDEVCSYYG LIPQWGDKVKACMSGDEWVDFMDLSVDKGKAMAFIQDYFH LLREKYPDLYGVKSTPYFCEDGSKDAKKSKGVQFLCHMWG ARLRKREDLVVTSSDPNNLENADGATKGEAADRLASHLG R FENEEMEI LKFISFDNIEETNRSAQKGISLQYYVEHLG
 HVLQKDTEDMVTASAPTNLEDMDKHGHKGNGLQEMASYFN HIEALMADIERLHQGHGSVDLIVPGNHKAHGLKALLDHFG FESFHNEFFEFIURGEGFYEVVPLGFSKASGGEYLINYWD EQLDTLGEDADAASDSSNDEVNHENAQKGDALAKYADAKG VPAEYFEKYTVVRSTPFFLEVLNSNSSKGLALKELSEHLG YYVDFGDYCNVTSSGHGDIDLLLPGMHKAHGLTELGKVLD FSEKYKGVIGVERSEEFFLELVPGGUNKARGAEVLLDRDK S LLNDPTUEIITSSGFDNLEFNHPNAQKGLALEKFAQKRK SDVNKVCFCTVPMFGQNSGELAVPGVHKAVAGADVLVHLG MPKSISENYHIVRSQDRILEFLPANSDKAAGLEKLLHHFG QNEAARAETSFAFAETTSLESTSSNVTKGQGLIGLCHFLD
 DLNPDHSPMKDMDFSPDNLEITHKKAQKG\AIQAYLKEKG MGDRFPEDNVHMFAEKRGADVVEKTASKAMGLIRLCDYFQ VAFPDPQELREFFPSEYNMEIFPNGCNKDVG RILAEKYH VRAKFGDSLYVVRADKNFLELLNPHVNKGNGLRELYEKLN VDTRNQFKDLQNGTWGGFGDIGVRDITKAHAUDVLLKHVG SALEQDPMIKTASSGCGNVEVTAAGVEKGAALWELAQQLG GHKKFSDRVHLTTFTSDNSVEAMPVGVEKGTSMKKLADGYG



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UniRef90 H1HRA3 UniRef90 ${ }^{-18 A J 38}$ UniRef90－E2MZP0 UniRef90 R6PKL9
UniRef90
S1N8X0 UniRef90－H4GIQO UniRet90－K4KEG2 UniRef90－LOKBI3 UniRet90＿R7HS88 UniRef90＿A5ISL3 UniRef90－R5BO37
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UniRef90 F4D9F5 UniRef90－C4L3T6 UniRef90－E4KNL1 UniRef90－R5TEA5 UniRef90－RGG1J7 UniRef90＿17K1D9 UniRee90－R5NFK7
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UniRef90 WODTN3 UniRef90－C9LN92 UniRef90＿10GMB5
UniRef90＿R6A2R8

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TPAEMMAGGDANDGSMITYAGMGVAMENATDGVKSAAN I DPQNVIAL GDNHNDTSMLKSVGMGVAMGNADDTVKSQAK I SMENVLAI GDNENDDSMLQAAGISVAMENAEDDVKQAAK I DRANVMAIGDQENDLTMLQYAGTSVAMGNADDAVKAVAR

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－ーロ WHSSEIMAFGDGQNDMTMLELAGESYAMANGDPRVDKLAK LEMRDVYAFGDSFNDSEMLEEAGVGIAMGNAKEELKAI AD SLIENTMADGDNYNDVSMLEMAGTSVAMGNAEAETKAIAS YTMDEVMVFGDSMNDYSMLSMDFKAVAMENAEPEIKEVAK I QADEMMALGNAQNDESMIEFAGLGVAMENSIPSTLADAD LVPGQVAAFGDGGSDQAFLQAAGHGVAMGNASAQVKACAR LDTAKLISFGNNYNDLSMLELDDCGVAMANAPKALKDKAD VEKKNTVALGDSANDLSMLTYAGVGVAMGNSASQVKKKVD
 ISKEETMAFGDNNND GMMRAAAESYAVGNAREEVKTAAK MT DEDLVAGGDQNND DVLVQCGGLGVAMGNGTPELKECAD LSGNQTMATGDGENDFSMI QKAG\｜GVAMKNGSKELHAAAD V SLEETFAIGDNMND SMIKMAGYSVAMGNAEPEVKKRAK VSKTETIVFGDYHNDIEMMQEADFSFAMKNAHKDITELAK DPDQDTVAGGDNFNDVEMDEVAGGSVAMGNAEEDVKKLCD DDFSNLMTFGDADNDLEMLKAAAQGIVMENGLPNVKAVAT I HHENTYATGDSTNDLSMLKYVKNSTAMGNSTPRLKOLVS ITADEVMSVGDNFNDVSMLKYAGTSFAMGNAEPAVKAHAK TQQSEVMADGDAENDLSMI DFAGTGIAMGNASEAVKAAAD PLSEMTAFGDGGNDLEMI KEFGDGVAMSNANPVLFKVAD
$r$
－ RSLSETIAL GDNFNDVGMLREAGASAAVANAVPEVKEMCD WDFSNLMAFGDAENDAGMLEHAEVGVAMENADPAIKKIAN DEGSKTIAVGDADNDDDVKTAGLAVAMKNANDNVKKUCD AMEQVVAFGDNNNDLSMFEQVGLAVAMGNAAPQ｜QSHAH INMDQVAADGDSLNDRSMLRMARYSFAMENGVEPVKKIAK TPGSDTVAFGDSMNDYDVVKTAGMGMAMGNAMEELKEAAD ISADEVIAFGDQVNDUPMFEFAKTAVCMANGSDEAKAKAT AKKEQTIAFGDAKIDUPMDEYCSYGVAMGNGGDEVKKVAD I GRREILAFGDNENDDGMFAAAGTAVAMGNARERVRQAAG IKLSEIVVAGDSQNDFEMLRDAGTGVAMGNGQTVVKEVAD LDP K E VMAF G D GLN DVVDMLQL A GHPVVMMANA HA GL K Q A C C $V$ S D DR VVFG DGGNDCSMFRPEWMTVAMGNAKPVLKKKAK




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UniRef90_FOVEB7
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UniRef90_R7FNN2 UniRef90-Q9KEK6 UniRef90_B7CE37 UniRef90_E3CIG8 UniRef90_UPI0003F8FA37 UniRef90_UPI00035ECD61
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 Y D QA I S A DLAAREVVLVHMKKF DVIPPMLVDDGYNCTI Y S G GEP









 ER H T LTP TEEDVA WL LHE LAARTY GERI GFWSAY T GGGLAD WDE F

 YE QHLSRERQYLDI ID HLSKS PYMENNEYAY LLSDANP DY D A HE K C LT LD K K Y L L D MVK R T E D DQ F Y DT T P NEEDA D P K L F


 Y N K T I P D D VA L P L F H I A K K Y G A D I L A Y T E D T L L S G DR P N Q HK GMDK DNARKII SF I E E R NF D LT WCDY S F DE WV V K D R T D
 MHQQI S E E D S RAA V DWL HE R GL EFY L ESNN GLLFA S E HF K E




 F H A S F T R GE YE K L L E L L S K Y K L V VA H F Y T M D R V I A Y S A I G S
 Y L K N F T P K Q L D H L

 S S S P Y N K T I P K E E I R P V W E Y V K K T F G L SHHDFTKADVDRLNQFCTDNEAGLI WKF LDAMY IGQYPEK




 F S A T I P P H E R G I E


 HAEYLDDKDAQKAVESLLLEEERNLVNRVCGYQEQGIGCNEKN



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 Y
LTN NE S D


 EFITHYYDNDQKVSHFEDVDDDVFKVTANFTEETVRQAEE GVENFRPENQFKPERVTKDPNCLLLQTRAEDKYALADEMN

 Y G HT R P Y ES I DVI H E D S WDI R DVVA Y A F DI I Y K D A A H L K T

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


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180
180 K K 190
200
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 MMEPFKDTLNCMFTGPFYFEFTAKGDDKAKALDTVLDPMG





 MAAPFS DRLS CMFTAE WYFEFTDRGI DKGRALLSFALBRCG QF $\square$ QDFPEMTFYRNSHYTFDVVNRG IVKGT GMNILL NQPA A Y Y S E L F R K E P T G S G H G S V D L I V V P N C H K A S G G L A R L V E R WG H NKEF L N D Y Y FVVRT@P I S I E L L N K N A S K G NG L K A F M E E L N


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



 F G S Q I S Q R F S GVVR S Q P V I Y E A M P K G T T K A T A L K Q L A Q H L E

 RFY Q H QLA $\quad$ N T WG GPLN ILECTPKGVNKAFALEYLLNVMN HF Y A E N
 $\square K Q N F D G K Y$ II NDHFDGSADVVSVSFNK GHAVAYTTSABLG



























 A KLA ES GSSLAVSSSSSRGNDEDTHADAQKGDALATDAE KLAH RTYSRLVAHRYWSTPYHVIEVVKAGVSKATGLKILADTEG


 KELMMKDAFIVTH S S N T LIE TA ENVDK SKGVEAMAA HWG S FPAF QE GL KIT $\square$ S G A Y WI D IT N E GV N K G VAVVTA L Q E F L G


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 L E K N E L A A F G D G Q N D I PM F E SVVGHIVVVMENATDDDVK K Y A D L E R R R T IA F G DMPND P P MFQ WAA H GV AMA GA HPE L K A VA D FS E D E A L A F G D G G N DVVDMLQVVVGTGVVAMGNATMNVVKA AA N
 $\square S$ LDE CVVAFGD G GNDKEMMDEKVKY GFAMDNGSQA I K E VA Y
 IDPSEMAAFGD GQNDRAMI ELA GVGVAMGNADDELM SVA D $L$ R D $\square P$ T Y A F G D GY N D D P L L Q TA D T G I A M G N A Y P K V A A A A A D

 MDK T H T I A I G D GMNDYE M L Q FVVHYGVAMRNAKPELK EVAD LR A A D T I A F G D M P N D D P M F G WA A H G V A M A N A H D E L A
－
$-\square$

## ーー

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 FSQDDSAFGDGDNDVHMFEAAGTAVAMENATRAAKKAAD


 KDKAD TI AFGDAKVDIPMLDYCQVGVAMGNGGPEILDAMAD I S L H E MV A VG S F V N D K E MI S QV GLGGV A M G Q A P E E V R R A A D
 LTPEDACAFGDGNNDVEMLA YVGTGIAMGNAVNAAKKSAK I AREEVVAFGDMPNDLPMLRWAGHGVAMGNAHPEVQAAAD LT K D QI MVLGGDENNDLTMFEVAGFGVAMGNANDQIM DLAS
 I N NEEVVMAFGDE E NDMEMLKS SVKYGY DMK NARKTLK N KLLK


 LD F D D A Y A F G D S S N DLL P M L R Y V K N S V A M G N S D P A L K D E V A I K E K N V M A VG D S P N D E A M I K A A G V G V A M G N A E E E V K K A C A D I DMKDVMAI GDNYNDVVMLKMMAGRGVAMGNANDEI KKLAD









## $\pi-$ <br> F

 IK QA DVIA C G D G N N D L S M I E WA GLL GV A MA NAAD T VV K K A Q






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| UniRef90-E1L2 | YVTATNDEGGVA |
| UniRet90-G5 | VVTRTNEESGVA |
| UniRef90-E5V1 | FITKSNNDDGVAYA |
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| V2Y043 | EVCGSVEEDGIFHYLKGKRLI |
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| Ref90 - 66 FYD7 |  |
| UniRef90-E7G | V VP S N N |
| UniRe990-E7M | $V T \mathrm{TDLDDDGI} \mathrm{Y}$ HAFKHFELT |
| UniRef90 G1WFN6 | MVCGTNNEDG\|AGAL |
| UniRef90-S4ZZZ75 | YQTDDYRSHGIPNALTHFNLI |
| UniRet90-T2NN15 | AVCPSNDEDGVLVTLDQLFPL |
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| UniRet90-D1AVW9 | YVTDSUDDDGFVKMLEMFKLI |
| UniRef90-M3IG31 | Y I TGSPDEDGLLHFFTQ |
| UniRef90-R5QWK4 | Yi T ${ }^{\text {d S S }}$, |
| UniRef90-UPIO003B4DFBE | YVTDDVDKNG |
| UniRef90 SoL980 | ETY S S |
| UniRet90_UP10003 | YVRSNDE |
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| UniR | WQTSAVDKDGI Y HAL |
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| UniRet90-D4YT29 | T DDNNHNG |
| UniRet90-R7ECYO | T ${ }^{\text {a }}$ |
| UniRet90_UPIO0047A | WVTARCDEEGV |
| Uni | YVTDTNDANGVATA A EKFl |
| UniRet90-L7EII | FVTLSNDEDGIACHLEN |
| niRef90-Q93D | GHHNDQAV |
| UniRef90-A0AO24DCT7 | NEEDGVA |
| UniRet90-U5UNM1 | d |
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| UniRef90_W4B295 | EN G |
| UniRet90_R6RN | VTRHYKEDGI F HALK HLILVI |
| UniRef90 R6R91 | F T S SNDEDGVA |
| UniRef90-R7F | LHTDSNDNDGIVNALKS |
| UniRef90-Q9KEK6 | EVTDSNYEHGV |
| UniRet90_B7CE37 |  |
| -3C |  |
|  |  |
| UniR | YI AKSNEEDGVA |
| UniRet90-UP1000255B | LVTTPVDQDGIYNGLK |
| UniRee90 ${ }^{\text {Q7 }}$ | ETAANNDDGVGRVLERWWL |
| (iRef90-N1ZSE0 | - A N A G GVA |
| UniRet90_7JGB5 | VTHSNNDG GRYL |
| UniRef90_UTUC15 | ETAFTNNEGGVIKTI |
| UniRef90_UPI00040A625C | YVTDTNDNSG |
|  | FITDDNNHDGIA |
| UniRee90 UPIOOO42897F8 | F |
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| Ret90-R6EZN4 |  |
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|  | R SND |
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| UniRef90_W4BVB3 | T SNDEDGV |
| UniRef90_C6JK34 |  |
| niRef90_R9MJ01 |  |
| UniRef90-A0A024E | A |
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| UniRef90 ${ }^{\text {CoCl }}$ | R |
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| UniRef90-UP1000386B59E | D ${ }^{\text {G }}$ |
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| UniRef90-BONFEO | E GV |
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| UniRef90 D8FVD6 6 | VAPTVEEGVAAA EEFVVL |
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| UniRef90-R5S0E2 | FVTLSNEENGV |
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| UniRef90-UPI00036C33AF |  |
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I KAVFFDMDGTLLN
 IKMAAIDLDGTLL HDDMSLSDFSKDIVRKAKHRGIRFV

 IKMITTDI DGTLLN NNKQITTHTKEIGLQACRKEGVYFS $K A V A L D L D G T L L N S N K K R L S S R S M A S L R A C L S R S I L V I ~$
 KKYFFFDDDGTLTDRSTGEVVPSALATLKKLEAAGHFVS


 TKII F FDDLDGTLLN NERSEI STENRLLLLLLLDDGNY LLLV
 KVVAVDMDGTFMRDNQTFDHKRFDRDLNQLRDQGGHFI
$\square K L I$ 1 RAL F DDIDGTLVGADNQQ SAAVQAVTKAQERGLWI G




VK V I VT DMD GTF LDD AK QYDRTRFMA QFE QLRQRNEI EFVV YRUVFSDDDGTFLTPENGVTAATADAVRQLDARGIPFV MTKAVATDMDGTFLKDDKSYDKPRVVKALLKAREQGVKVT IKLLALDLDGTLFNS KKUVTRENKLALRAARNKGVKVV YRVL ALDDLDGTLLTPKKTLLPSSLEALARAKAAGHQLI KMI AVDLDGTLLNSESK ISKKNTDAIKKAREHGDEVV MFDVIALDLDGTLLKNDK TVSEETIRTLKKHEKDGRQIV
 RLVASDIDGTFIRSDERVSPRLRDVINKMTAQGTVLC KLIF FDVDATLYSKEQRLVPESTIKAIHEAQENGHKVL MKKAVFSDLDGTLLNSDNHRSRLTKKTVNSDQKKGDPFV YKIVFFDMDGT YQTEND\|QESSLQAIQALRDQGYUVC MFKIIFFDMDGTLLNAERD
M $\square \mathrm{KLI}$ A LDDI DTLLD DR
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 PRVQQAVIEALKKG\|IVT KE: PQSALDALKKTAEKGNLTF HTVSPRTKEALMNAQERGVKVV
R S E LLALDLDGTLLNTSN
 UniRef90_R6F0N2
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者 A T GRLLLSAQKY A R Q\| GP HCKDICYNGCLVTESD GTQU




 FVVTGRHHTADVR YYK E IDDLDTPVVDCNGTYVYDFKNEKAI


 AASGNQYAKL $\qquad$ K SIIF GDKAMFFVAENGAVIVYENTYY $P A T G R G Y M Q Q L P E L R Q L Q K D E Y V L S F N G G A L T E N K D$ VVTGRAAP WTRHVLDDLGYR GLAVCGQGAQVYHAGEHRLL

 I A S GRHYGTLAEMADKLGVD I S T GRSPDEI EAATS TTGUDTY VA S GNQYYQLKSFFPDDA SEDAF

 AASGNQYAKL RSI FGDKEMYFIAENGAVVYQGNSVY VSTGRAYFDVVSIFEPLGDKTVVISANGAVIHDPD GRIV PT S G R D Y D G I P W W D Q L K N V D I N Y Y V: T T N G S A V V Y E A K A K K C




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UniRef90 D2AXL8 UniReegood2AXL8
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 I KKSIPQEWGREMWRQFSKKGVEGVLDTATEMYCPFEGTS YQNNIKPELVKQVIEQAKEFGDSVSMHSPTESFLSEASPF

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

 Y VA K MKK D MVK T L L H T A E K H GHE A V L Y T K E K N V L T S F S S P
 $Y S V P$ D D A D F R Q L E A E L E T L P R L S L N Y Y Q G T H WY SP EP D N IH S P L P L R K A R E I I HM A N E M G V K N I LA E V K D H V H L H Y Y D E
 Y H Q P V P G E L A L T I Y R R V K G HF HL S A LTT L D R E TAAA K E EA ETGAALY A A V D Q D GT D G H T L I E P G Y R




 ST T A L P A D P V C H A 1

 GG D P L R D W Q WD R LI L L I E S S K L D A I C H F S E G I G Y L P D N E H




 $S Y$ E Q L D R S L V E E L V D K S E LTRS QL K L L Y S H L E P L A L P F D V L S D G I V Y S L A C R G N SA D P L P V L Q A Q Q L I T L L D E H A V H G L M Y V D N A M L Y E K P T G H
 Y S EN I S LAA S A K N I K D LI LIQ D Y S E C K I G F E I N N K L Y T Y S LIP MP A D D V L A MVVHE A E K K G V R I L L S G E N C A Y V A D S D K D $K \operatorname{F} V \mathrm{~S} L \mathrm{Y}$ S L P V E R L D A L L H C A D V S I S V Y S D E H W Y V E A L D R W NSHVLNPDALNTLVDAATTHDIQGCGYATGTGGPRDKQPV Y H K TVVP E T VV E QI K RIICE EN NIVY GTF E GE K C S Y F R D H N




 CAN P L Q P R Q A R Q V L D M L E H F A I M G L M Y A D D A M M Y Q H T T G H

 K H Y L G G K K A L K A A Y E A C L A D P N L S A H F F T T D TA A Y Y T Q E $\quad$ I P K


## UniRef90 R6FON2

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UniRef90-W4QTA5 UniRef90-E5V2W5 UniRef90-Q9KC28 UniRef90-W0Q7N7 UniRef90-D2AXL8 UniRef90-UP10004695BCB UniRef90-B0TIL9 UniRef90-UPI000415BF16 UniRef90-UPIO002FDA359 UniRef90_M2P7Y5 UniRef90-A0A022MBR5 UniRef90_UPIo002626C47 UniRef90_Q1WS49 UniRef90-R5GDP5 UniRef90-S0RV81 UniRef90-UPIOOO21979E6 UniRef90-U3TU23 UniRef90-D3QHA6 UniRef90-UPIO00466ED40 UniRef90 R6S492
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 VHEDVKMLDGFRSYDRNQAGQVFKF ISFSFDQELMKKDWQ DKFVSTLSKYDDMPY SITNFDSYEKEPKPKLMUATKETNM EAKYKKYRTKAVAYLGDAFYHPKKKPTRLIFADGSEAVVR RRSEYYLASPLLDFVETADFDQLPKG\|VYNADFLDEALAG VKKYFVSYTVCPFDSLKUENVNKLLAGVDYGNAERVTGWVK VAEHRKLGNRFKQLLDFHAVDWKEQKFVKTMFMDEHRTGK SPVSVMDSYFTKMPLHVRPNATSAGDSCLAKYMWADAPQ促 QTGQFGY TYKEEHEELYTDKQLVYNI NVFSFDNEKRLAVL QEESVVRQQLFHLSECRDQUMIHKIFLFTGDLEMLDKIK FREQMGERLEPTEYIIDETLDYDALNALYKGYUSUPKEEE VAFDTEPGYTHPWDGERPRRNAPATELTAQLSSAEMAGVV
 LRGHFAYFHGPLPRDDKDYFKEEDVNMLLVGGADKNNDH YWTAQEGDITRASAKPAAPLTAVHKILVMGDAADILALEN DMMKDFDTNEHNHLKTDPTSLLI QPKEGDMEKVKYIREEL LKKSFESRVFLSMVADELTYETVERFKFDTEDFLLNGET DLAKYHKDSGFSFKEFDVENPPVDDVAK FF RHBDHDYLMM RDYSKMAGVPFRVVSNDEELLGKKAPTKLLALELDQLWEE TKKRYKLDNADLPQDDETYFLDEEIFMLYGFNETPEYDEL M $\square R E W T R E G G R P P V Y A G P D V L N G P S R I L K Y S L R S D A F I H L$ $K Q K M S F Y Y P E C V E V N D L Q S T V S P N G Q V T K D T L S Y K K D F R E$
$H Y F Y R K D M E R C D S W D I V R T K N V E F N V S H P D E C D E P G M$ HYFYRKDMERCDSPWDIIRTKNVEKFNVSHDPDECUEPGM EIDKYYHSTVETSDLHDVVTDDVVKVAVYTPGDAEAEVFP AEVGRYYVRHRVVEDVTAVDDDIIKVALLFAFGSAERTTAP AEVQRYPETLIKPEDITEDPHSLLMQTRAKDKYAEAEEMK
 FREVEQTRAYFAAVAETAETKGIDYDKFCIVTDAQSDIER TEVEAYDTGMPVIDVNNFVSAVKEPVVKVLMMKAPERLAE RVQHEEEDTVVPFARVLGRAEQPHKL LLMGEEAEMAAAEQ ARDNQMPI 1 HVEDFPSHVPESMNKILLTGSPEIINLAKNE
SQEYARUARVNIEEADLANLLSQEPEGVEKILDLDQLRPL
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VSHYPEANPTLDFVTVNSFAEVIPENVIVYNVVFLDQQLCK
 S Q N GYA Y $\square$ S S Y T DLIFLAGK DVNVYNL LAFS F HKEKLETGW


 VD F HPH
 F Y Y F CRDHHVLNYLFYDEQRSYHKRHNAYNAVLMTKEQRS
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 FTKFLKKWVVSCPENVVRPNVYQAENF QTFIVDGTITDWKVLI
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F V A R D A G N L L L N A D $\quad$ DD N Q P V T D L E M L L


## UniRef90 R6FON2

 UniRef90 R6FON2UniRef90-UPIOOO2B4D17E
UniRef90 R5IU5 UniRef90-R5RIU5

UniRef90 D1AIM0 UniRef90-W4QTA5 | UniRef90-E5V2W5 |
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| UniRef90 |
| Q $9 \mathrm{KC2}$ | UniRef90-WOQ7N7 UniRef90-D2AXL8 UniRef90-UP10004695BCB UniRef90-B0TIL9 UniRef90_UPIO00415BF16 UniRef90-UPIOOO2FDA359 UniRef90_M2P7Y5 UniRef90-A0A022MBR5 UniRet90_UPIo002626C47 UniRef90_Q1WS49 UniRef90-R5GDP5 UniRef90-S0RV81 UniRef90-UP100021979E6 UniRef90-U3TU23 UniRef90-D3QHA6 UniRef90-UPIO00466ED40 UniRef90 R6S492 Uninefe90-UGBBB2 UniRef90_G4EMMO UniRef90-UPI00047B9663 UniRef90-R5SMA6 UniRef90-AOAO23VQX9 UniRet90-R5DW34 UniRef90-D3AEM8 UniRef90-UPIO002491AFE UniRef90-UPIO0028A0057 UniRef90-E7GTG3 UniRef90_UPIo004057461 UniRef90-D4MOT3 UniRef90-U5F730 UniRef90-UPIOOO35D2448 UniRef90-AOROM1 UniRef90-W4Q396 UniRef90-R5HQG5

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UniRef90_E8JP14
UniRef90-R9VWG6
UniRef90 U5F5U9
UniRef90-Q65E39 UniRef90-L7EEV8 UniRef90-R7KUJ9 UniRef90-R2P3GO UniRef90 U3GZG2 UniRef90-AOAO37USV2 UniRef90-R2NII1 UniRef90-R6UWQ8 UniRef90-F5T3V3 UniRef90-AOM3X3 UniRef90_-M2YBDO UniRef90-C6CCU3 UniRef90-×0P967 UniRef90-R9XQQ0 UniRet90_UPIO0036EA770 UniRef90-G6CG69 UniRef90-H3NDX9 UniRef90-UPIO0047AA154 UniRef90_A0A024UPQ4
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 CELVGDLVTPTHSSGRALVEMSAHGVTKASALLATLAEGHA胃
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 EKFKNANDLTVVQSDDFNFELEHVNASKGKAATYYAKVLG ERLTLRN TLGHLRFAGNYL MFQYDEKDKGUQEMMERGH
 TGEFRDASVNVEGFRNHAYDVTRNQVNKGDAVETVLEADR
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 FNKHHTEKVHCTSSGFGLLDEVPYQVNKWTAVQYMMQCYG KDLSEDPDLVYSAGYKGNMEVTAVGADKGNGLKWLADFLG QEMQDFSVIQSGTHALWGVEIFAAGVNKRSGAEMVARRLG VVDAAAPDANVVVSGANWVDVMHPEADKGVALRALADALG ALAPFADTHQVVVSGEHWVDVMNRTANKGAALRALQRELG DYFRNELETNTWGGPLNTLETCAKGVTKASALTYLLDHYQ AVLPDDLEVCDRTAPNGLEVNAGNSKGNRLAEWVSTKG
 MYREFEQEFDIMDRRGGVYEIVPHGCSKGTAVDYALKQFQ MYREFEQEFDIMDRRGGVYEVVPHGCSKGTAVDYALKQFQ VEKKLQQEFEVMRSKPFFLEFTEYGVTKGTSLHHLLQKLG ALAARLPACNVVRSSPILLEMSREVTKAAGUEAMLRAFS LAQRYGNKVHVTKSKPHFLEVGERSVNKGVALAYLAKGFG LPKELHQHFEDFKSRDIIVEMMPKGVHKAAGGNQLVEYLG QHVEQTLGLECEWSWHDQVDMARAGNSKGKRLSEWVASQG GKQYHNAQCVCFKTAADLFEFVNPQVNKSSGQQKLCEDDG RQFEDAQDITLVTSAEHNFETEHLQASKGLALEKLSHKLG RDKDPLDCNLIITDNGKLGQUMAHGVNKLNALRYLDNKLS VYPAMKRFSDDFNVNTCWVDVVGKTVNKGTAVTKLMERLG
 YGFMDTAFDLAPYMAHEFTWDHVENPDKGTGLTYVADHLN KAANELMTKDDTQYNNRVFEDAKGDSKGSALQFLSHHUG LEEFLAKHPTEVAQDHFCFDVFNANNDKFVGUNQVLQKEG
 TDCNDILYYASDNKEYGFLEVLSNNASKEKALDQFMNFKN解DRDFADRAECTFSSPDYFEATARGVDKSSALTDYCAAKG SHADSAALNECEWSWIDQDDVAQTGNSKGNLLQRWAASQG SDPNDEKMQKFEWSWVDRVDITKAGNSKGACLAELDKREQ DA PVI QDYT AVS SKHWLDVMAPGVNKGVALHDLAKVLG
 ELSVENRGKQEYPHACYLEVMNGAVMKSKGVEFLCNYYG

## UniRef90 R6FON2

 UniRef90 UPIOOO2B4D17EUniRef90 R5RIU5 UniRef90-R5RIU5 UniRef90-D1AIMO UniRef90-W4QTA5
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UniRef90_C6CCU3 UniRef90-XoP967 UniRef90-R9XQQ0 UniRef90-UPIOOO36EA770 UniRef90-G6CG69 UniRef90-H3NDX9 UniRef90_UPI00047AA154

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 VSKDEAMAFGDHWNDKEMLQYVKYGY $\square$ MGNAPENLKEVFD I DKESAMAFGDGMNDKEMLKLVGNGFAMGNAQEELFQYAD I PLDNDLAMGDNLNDEPMLKLVKYSVAMENAVPELKKMSR I NSDVMAIGDNLNDVSMLKYAGTAVAMENGEAEVKQLAD LTSADVIAFGDMPNDLPMLRWAGTSYAVANAHAEVLAAVD DRSEVLADGDNRNDLMI HWAGQGVFVANAPEVLHQAD 1 PVENTYAAGDEQNDISMIEAAGCGIAMDNGTDLVKKSAD
 CSDEETMAVGDNYNDLTMLDMAGLSVAAGNAVEDVKKACD VPLEDTVA GGDNLNDDSMFKTAATGI AMENAEQEVQKCAN K PEETVA GDNSND SMMKEAAGGGVAVENAEQEVQKKAN LEDKPVYAFGDGTNDPPMDKYADYGUAMGNAAPALKEKAA S SDEGLAFGDGGNDLEMLVQLRFSFAMQNAPQRVKEAAR

 MTMDEVMAVGDSENDIEMLREAGLGI AMGNAADDVKSIAD VPDEQVAVI GDNLNDLPMFKVAGKAI AMGNGHDEAKAIAH FELSEVMAFGDSDNDLEMLSGVGVGVAMGNAEAVVKSGAH LKMENVLAFGDAENDVEMIDKSGLGVAMGNACKNTKDVSN DLKEVVADGDQDNDREMICNAGCGVAMGNADDDLKACAK SLSEVIAFGNTENDVSMLKMAGTSYAVKNADEYARSAAG FSAENVMAMGDEANDFTMLEWAGLGVAMANAVADAKQDAD h SKDEVDT DGDQNNDDELLKAGGVKVAMGNATQELKECAT GMEEVMACGDFNDLEMLREAGGGVAVANANELKKSSAD ISMSEVMAFGDDTNDLALFHTCGVPVAMDNADERVKQSAS EDLSDSVAFGDSMNDMEVITKAGUGVAMGNAVKELKEAAD MDVERSMADGDSGNDVSMLGVVSDSFAMGNANDLVKAHAK GRIDEDVVVFGDDTNDLVMFDKRWCSIAMGNGSEDIKQKAD VTPERVLAFGDMPNDVEMLSWAGNGUAMGNAHDSVLEVAD IATESVATIGDMANDVAMFRKSGLSIVMGNAGDEVVRAAR IP HTSTVA GGDEQNDDPMIQSAHDGIAMKNGDDDVKTAD VSADEVIAFGDNYNDLDMLRYAGYSVAMGNAPDDIKAOVR IPRERII AFGDEDNDFEMIDYAGTGVAMGNADDGLKS DAD VHPREILALGDSENDLSMLSDPDYTVAMGNASDAVKRSAR FSLINECI AFGDGMNDVEMLSAAKKGLIMETAHPRVKATLN TSLETVAVGDSYNDLEMLEAAGLGVAMGNADPEVKRRAD LGPADTLAFGDMPNDVPMLQWAAHGVAMANSHPELLAVAD DVIKNSFAFGDGMNDISMLQSVTHSIAMGNASDSVKKIAD GQKHNVMT TGDNFNDVEMLDYAALGVAMGNAPTEVQAIAQ FRRSQTAAFGDGPNDVEMLRGVGIGTAMENASVDVKQAAD VKPSKLIAFGDGMNDVEMLKLAGYSYAMANGDPEIKKDAK INSENDMAFGDSENDATMLEYAGCSYALLKTGNDLAKEKAK SAHSETVAFGDYLNDYALLQAAGTAWAMDNAHPELKALAD ITPAQTMVFGDYLNDLEMLDAADWSFAMANAHPEVVRRAR $\square A D E Q V I A F G D N H N D V S M F Q V G F G V A M G N A T A E I Q Q H A D$ FSMEQTMAMGDNLNDSMLERAGYPFAMGNADKEVLALCR LTVEQCAVIGDHLNDLPMVEVAGDSAAVANAHPKLVQAAR LEKEDAYVFGDSSNDLTMFRCGAHTIALGKHDEVLDPYTE | L S |
| :--- |
| LT |
| 1 L |
| 1 | TLIDDVAFGDGGNDLEMLKAAGLSYAMENGSDEVKKVAD SSKNVMAVGDEENDLSMLKWAGLGVAMANGIVAIAKETAD LSMKDVVAFGDNYNDISMLEAAGVGVAMGNADDAVKAHAN ITMQEVLAFGDTSNDNEMLRDAGLGVWLCNGSEDTKAMAD TSIVETAAVGDSLNDFSMLKDAGKSFAMGNARGDIKEMAD AGYDEAMVFGDYLNDYEMMSCCKYSFAMENAHQQLKSAAH VDLK E MLA GDNYNDLPMLVKAGDGIAMGNAPEVVKRSSD 1 DAHETIAFGDMPNDIEMLRWAGTGVAMGNAQDNVKQAAN

 $I$ SWEECICFGDSTNDKMLEMAGMGVAMGSATDYVKSFAD FELKEALAFGDNFNDLSMLKAVGDPI LMGNAPEELKKQFR RIPSQSMAFGDNYNDVEMIRGVGMGI AVGNAKPEVLEDAH SSEELISIGDNFNDVGMFKISG\|SVAVANAPEEVKKAAK I PLEAVMAFGDNGNDITMLSAAGLGVAMGNGDPEAKEAAD A MTEI VAFGDNFNDDSMLSSVGLGVAMGNSADDVKARAD LQKDIIAFGDEANDTTMMTFAGTGVAMKNABAPIKQAAD | DPENVIAFGDNFNDIVSMLKLVGMGIAMGESELEVQQSAK

$V P M E E T V A F G D G A N D L E F V E A A G M G V A M Q N A D P S V G L A A N$








| UniRef90_R6HG63 | FVIT T N C D D D G\|I M N A C K HY G W |
| :---: | :---: |
| UniRef90-UPI00046AA612 | HFTDSNNDEGVLN L L S K I |
| UniRef90-Q3K320 | QQDQ T NEED GV |
| UniRef90-R9K563 | Y VT D S VED |
| UniRef90_UPI000287F3AC | YVCS Q S Y GQGVA EATI |
| UniRef90-M4K7J2 | VVTTSNDDDGVAEVLQRW |
| UniRef90-H3RMH9 | DVTPDNDHDGLAKYLQDY |
| UniRef90-A0A023CJ39 | MIT DTNDENGVAKAIY |
| UniRef90-R5ZAW7 | VVSPTNQEDAVARYLEEHVL |
| UniRef90-R3W3V3 | YET DTNLENGVGKA |
| UniRef90-D6DGY1 | FVTKTVEEDGI A Y A METLGL |
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| UniRef90-C7RFM2 | FVIGSNEEPSIA K |
| UniRef90_UPI0003B4CA5B | EVTVSNLDD GVA Q |
| UniRef90-G5IIQ2 | DI CGCAAEDGIYDYCKK |
| UniRef90-R2RLK2 | EVTLNHDEGGI A Y VLD KL |
| UniRef90-D6KLV3 | EVCGHHNEDGVAHWI |
| UniRef90_R2T6R4 | YVTDSNLDDGIA NFLQHFQ L |
| UniRef90-UPI00047E20B8 | VVVASNNNHGVAEVIQ |
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| UniRef90-E2ZE05 | FVTESNNEDGVAVALERFVL |
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| UniRef90-G7DC07 | HVTATNEQDGFAEA |
| UniRef90-C5ES19 | FVTAPFDEDGVA VA I E K $^{\text {V }}$ |
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| UniRef90-S6EX93 | Y I T DTNDNS GVAKVI R K F V L |
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| UniRef90-D3LT33 | VI TDDNNEGAVGEA |
| UniRef90-Q8K639 | QQLISNEEDGVA |
| UniRef90-G2NXN1 | EITASNAED G I A V VL |
| UniRef90-C9LVP6 | TVVPTVLE D GAA WGI |
| UniRef90-Q5FL47 | IVTKKNNDDGVAHILN |
| UniRef90-F2QEA2 | ALAPANSQAGVYQVLEKW |
| UniRef90_D4E9F5 | LV ${ }^{\text {L A D }}$ HLQP GI A EVI R T R VL |
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| UniRef90-I6STT7 | KMTQDNDHDGVAKELKKLFL |
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| UniRef90_E1R6F6 | IVAPSNTEDGVGK!L |
| UniRef90-B7CBX1 | FI CKSNDMNGVSDFIQ |
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| UniRef90-S5KKT1 | HVAPSNKEAGVLQV |
| UniRef90-UPI00046600F4 | FLTKSNDEDGAAYAME |
| UniRef90-U2MCA2 | RIITLSHTEDGVAKTl |
| UniRef90-A6CL58 | YKTSSNEEDGVAKAI |
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| UniRef90-M2P757 | Y I T D T P $\square$ Q N GI QKA CLK Y G L $\square$ |
| UniRef90-UPI0003B6BC1C | EETSHNDDHGVAQAVYDYVL |
| UniRef90-C2EMA7 | Fla P A T ENGVFRVLQE |
| UniRef90-R5D5P5 | VLAPDCNNDPVAQII DEYLL |
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| UniRef90-F9HH94 | EV $\square$ GSHADQSVINYMEKL |
| UniRef90-R5Z4K7 |  |
| UniRef90_UPI00036D9C47 | VVSETNDEDAI A HYI NEVIL |
| UniRef90-C6K3T0 | HVIESNANDGVAKKL |
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| UniRef90-V2XMM6 | YVAPPLLEDGI Y K A MEHFGLV |
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| UniRef90-C8KX61 | KTIGSHDQDSIAQEL |
| UniRef90-S5E1F0 | HVTLDNNHDGIAEALAKF |
| UniRef90-W7AJG6 | YVGPSNNDDAVHHILRTF |
| UniRef90-A0A015U215 | $Y \\| A P S N D V G G V L S V I R E$ |


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UniRef90_SOIZ55
UniRef90_R9LZA7
UniRef90_UPI00037682AF UniRef90_L7EUI7
$\prod A T G R M Y R S A L L R F H Q D V G S S D P L I \| A Y Q G A W D Q D P D T Q N V H$ LAT GRRWVATMPFAQELGLKAPCIVHNGAVAVDPLTDPMV



 | $P C T G K Q C E R V E A$ | $L$ |
| :--- | :--- |
| $I$ | $G$ |

I T GR S L D E AK P F L A

WATARARHSVVTMANSCGFR

AVTGRHHTA AKPYY Q E L L G
$L V S S R G P V G M Q P F L G P L G$


$V A T G R S Y A E A R F A D E$
 LLSTGRPKYTLL

 $\mathcal{V}$ C S G R P S Y N M I F D VASGNQHRALSRCFDHHPDVFHDAENGALVAAGDEVLYT T

 $P \vee T A R Q P R G V R F D A Q A A G F D G W A L C G N G A H G V D L G T G E V L$



## 

## V <br> 



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- II A S G R L L S S A R S Y S E M L I $A$ IT S S R CVD S IVYKI I E E Y H L P S Y V I A F G G

 PA S G R Q L A T L Q H M F S R N E P D T F $\quad$ I A E N G A







## PA S GR QLA T LT T M F

MF QPA





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120
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 Y ANDLLEKKYI R K I L E M D Y K K Y GE E DF LDNLY S DNVWWYIT E E
 K HNA DT K H DAL T FLAALAKEFQMM L VMYYVT DAMTYSKRSP K VDTMPDE TWKGMLSMVHES LPSCDYYI ATPDRGFAEDGG SRHSLAPETTREAVEELLSRDVDPWLFIDYDWLVRDGDTA
 E GLT KKQTIDLINFVHHTYGSMATMAYGRETAYDGTEAPA YKNPLNGHDVATVVGQVRQGGYPALFQEAERCYASDHSS


 H K N VL S P N L L N N V L D H L Q E R E I D C L I I E T P H N L Y C F E S N K T
 FEA HVA GEVQRRAV AQALAERVPGVLFVSVRQGGEVVFAQQ

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$D H H R H L H E M V L A D T L P L D E P M V K V A R H A E V P S A D L Y R T$ DHHRHLHEMVLADTLPLDVEPMVK VARHAEVPSADLYRT SHLDSDDSKVVDDFPSFLKRGYAKMLISADPKDIDDFIDF AYMQALEKWANQYPPTAQPK DEQTDSFRHRVEQETF TWKF SRMFHWLRDSYGYDTQETSDPH\|LEDQQ\|IKFSVYHPNAC QVRHEATVVKTPDLSHHYDGVGKI MGVSTDVAQLRTVERE QTEFYAKRSKVDVTVVGDLREFLIKQCQEHPPVTEMLRVL KDKELLQYFAKESVEISDWQELPDDTFIELTFHHDEIEKK RVRDMEHFANQSYPEGDLQWA DDGDVYQLNAYVYPGEEQ GERVRHGWDVTADRELLWSAPDDKLILHHPDVDEDRLAAV DFTHHDRDVLHNELAVIEDLLGQQEPFLKLACDFNGDPF KEVLARFHVQDPNQ1 RPWKPE EVARKDRQKAKFKDIDEKEFEAKMDYQNKNDKYDKMDEDE MTALGRYYANLELVDDWGRVEEPVLKLALGCPGEETAGLL
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 A YPL WG DD PQLLS I PL N PNVFNQTVK ILI YFENLVDS VTDC IQAEVDKYY LANVCASSNDPDDTVKVALYVETEAERAALP SINSLLHAEGASLYVGDFKETLWDDPNGFIILAVENYDED
 V K H Y C S R T G M E Y Q V S D D L L K T I G H A P C K L L A I D M E N H G R L I E N F M E L M D IVN Y V D D Y Y E L V N D P H I Q I F K I V A F S P H G Q V R



 TR F Y Y H Q L K E I D S L Q Q LiP E D D Y V K I A F N I N R E T H P N V D E E




 D RVVFKR F Y T KVVE Y VP H L E DVVTA RVVDK F T I Y F P E G D A Q K G Y P S FP M DP GA S FA P V D D L L T D S S E GHYAA QP V V K L LAA H H P T M
 E Y L E F I S S H Y Y E N V Q R V D N LAA N V T D N I L K K V T A N F A E D T V R K


 TRRHDVVEK E L V Y K Y F P L N S Q V T N I S M I G S A D T I K Q I WWL K L N
 S R F Y E D S Q K I T G K A V G R D G M L A Y V T G N C K L L L V T E G R A V S A H D GP LP Y VALLT D V E Q L W A E P L N K I Y
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 HYMEA L L K K WA K TA P K H H Q P K I Y K DD S F S D Q V R D T E Y V WK F IT N R G S E K M L E A Y A G S G F R Y K E M D L N M C P H D G I H A V F F T G

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 H LLQDERQQVYKFDAFENLEDTNKHAQKGDALTNFAERLG
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$R L A M G D A T V T R S P S A L L E S G P G V K A S T L A L S C A E R G$ LLKAQLGDELYITFTTENYLEVMNKGVSKGQTLALSCAERG
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 YYKERVPELNFFMNSPSSI DVVNSTTNKGTGANHVKEVLN DGKGRERFYDVLESSEGNLEFVLPHTTKGTAVEALANHWG LKAQYGEEMKPVTSGNDSLDLLEPKVNKGVALKTLLDKWE LQKQLDGQLSVMRSKPYFLEFTEVGVTKGTSLDFLDQKLG QLLTQVPHFAVSHQSPYRLDITAVNALKGAAVHFYTEKYQ ENPWVSAKFNGERSWSNRi DFAAKGNSKGLRLAEYVSELG KHERFQGKAEHTMSNPRVLDTVRWGVNKGNAMCEVVQLL G LDPDAFLTLARLDAGDRATE SGPDVSKASTLALCCAERG

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210
220

240 $\square P V E R V V A V G D W D N D I E M L Q F A G L G V A M A N G S P A A R A A A R$
 I D QA DI IA F G DESNDLD MLA Y A GT GVAMQNAIA PVVAIA D

 I KPKE T I A F G D GMNDYAVLVRSVGUGAAMKNGHPYLLRELE $V$ D MK DVVVIG DNDNDDSMFEVAGHADAMDNAVEEIVKSKAH
 I D ASEVVAA AGDAFNDVAMLT WAGTALAPANARTEVIDEAD I K M S EVVA F G D GFND Y E MLLK MVGK GYVM GNALY QL KE ALDN $\square A R S E T M A F G D S M N D E S M L R M T A H G V A M S N G L P Q I I R E A A A$
 I E DHEVACIGDMNNDIPMLDVAGVADAMGNAPAEVQKHAH GADRS QV L A M G D N F N D L L LS MND ALA A G DN Y N DL SMLLEKVEYSYAMGNAHENIIKRACR LTGEDLI AFGDSGNDIPMLDFAKYSYAMENGMAIAKEHAK L R P E E T I CF GD GENDL GMFGVCGTSVAMGNAYDLVVKRHAD
 I P P E N GUA F G D Q H N D I E M L
$L$
$H$
 $V$ S Lin D MV A F I STE QALA F GDEENDFTMFDVVGFPVAMGNAVSALKEKAA V GRQETMAFGDGYNDDE LLAAEAEYSFAMRNAFEETKAAAN V LAA ET TA F G D Y L N D Y E L L E VA GT S Y A M A N A H P D L LA $\square$ A D $V G Q A E V V A F G D A P N D A E M L A W A G R G V A M R N A E P E A L E A A D$

 LT P DNLMAFGDEANDYSMLSLARVSVAMDNADPSIKKV T




 I CPS EVVMAF GDGFNDI DMLQLVGEPVVMQNAHSDI KQLLK
 VDLA HTAA $\quad$ GGDGGNDVAMFHKAGVSIVMGQGEASVLGQAD



 $Y$ Y 1

 $V$ E P DH TVVA C G D Q R N D L E M L H WA A W GVA M G NAPD QV K A VA D


 MSPSELMAFGDANND KDMLLAFAKHSYVMENSHDELIFNIAS





 I A R E N S VVA M G D S F N D M S M I R Y A G L G I A M G N A C D E L
 V GAD QTAAA F G D Y L N DVV E M L $A$ A A A G H T Y A V A N A H P D IA LDE EVVAF G D GL N DVEMLS LVGGSPFVMSNGSPRLLAEAS ATAAETIAFGDMPNDVPMFRWAGYGVAMGNAHEQLRAVAD




 IQ P Q E L LAA F G D A N N D I E MLL A L T P Y S Y A M A E C S P G V A D VA N





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| UniRet90 OPIooo37682AF | GRTAPNNEDGV |
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| UniRef90-G2SM | VVTKSNNEDGIYAFL |
| E6A |  |
|  | HVTGSNVEDGVA |
| R6R1 | NHTLSNDEDG\| |
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| Uni | EVVGTNDEHGA |
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| UniR | AP S HLDESGVERV |
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|  | TKENNEAG |
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| UniRef90-UP1000477 | HLTADHNHDGI ALVLEEL |
|  | FLAPPNTSSG |
|  | A |
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| UniRef90-12N1V1 | VSNDDDG |
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 MCKII AVVLLDGTLLSSENK ITTYTQKII KLLIDEKNEYFV
 METLYYVSDLDGTLLN KKKEI TSKTAE ILLNRCI REGMKFS MYRYIATDVDGTMLDSRHQLNSAALNTALSQLQQQNVSWD


 VIVDIDGTLLNSRRSVDEDTWVAI QRAMEKGHFVT
 QAVCLDLDGTLFGKDSHTVSARTLRVLEAVRAKGDHVV IKLLALDLDGTLFTTDK QVSPENKLALQ $M \square K L I C L D V D G T L V N H Q$ GQMSQRVRDAARAVVERGHEVV FFDLDGTLLPEDE


## Y

 RDLSPYVSQAI REFVANGNMAF

 RVVASDCDGTLLRTD GTVSAYTRDVLARCAAAGVTVV KKLI A IDDDDGTLNQDS LI TSKTENTLKKSVAAGHHVS
 MDO A ASDMDGTFDN DQMTI SKVNAEAVKRAQAQGVKFG MA A ALDVDGTILEHGAH MAPGTPDAIRAARAAGHLVY MRKLVFLDVDGTLI DS TQEVPESTKDACLHAAAAGHRLV






MYMLIFDDDDGTFV SAM
M Y P

$\square K M I I C D M D G T L L D N Q K N$ I

MGKYLVYDI DGTLMGPSGRKITEKTKWALNRAAAAGARVV
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KI FAFDLDGTLL EDSGEI HPGTKKVLDLAVKKGHKLI
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LI CSDID GTLMINHT TLTPTTQQVLQAVMAQGHQFY
$R$ R A T DLD GTLLRDDK TLSARTVAALAAAGEAGDEVF

K WF DT DMDGTFLN DKKEIAPNAKEDMNKLQAKDDKFI
MIKY Y I S DLDGTLLN QAGQLSEKDTATVK

UniRef90 UPI000364BE8D
Un

UniRef90 UPI000364BE8D UniRef90-UPIO004761811 UniRef90_G1WIA9 UniRef90-B8IK88 UniRef90_G2LMB2 UniRef90_UP10003B3A31B UniRef90-R5BVH2 UniRef90-H3RSF0 UniRef90-K6TXH0 UniRef90_Q04AP9 UniRef90_UPIO00248FB14 UniRef90_LZZBR5
UniRef90_S6BR58 UniRef90-101089 UniRef90_UPI00040ADE68
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130


160
 $F D K A G R T L F D C S M E E L M M T Q T G P V C R L N D F Y H T K E D C D L V W$
$P Y T D L E R R T D Q A G P R V V P D L A P F L G R V S R D E A G L A A C E A A$ NNFCSAEYQFFHPDNFIFQNISKIFFTSKNFQKLSMLKRK AERETANTGVTPNPEPAVVYRTPPHKDMCMGDPAADDRVE QKMESQVQYYSERALESCSEVKRVDDLFEVLDEGKVVYLA

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 E EMLISANTKTTPEILLINDQVASRWKAEQKGAHKDMCMGNV TDQEAA DT D IMPTTAPDRDMQRDNDSVQKMLCMGDPSMVD A A GATAEEEALLHHNEDAHPPDKVISFNHGLPDAVDLLHE$P$ PKHWQLQRHHVVSPKHLQAYPVLKVTVGGFDPHRVDEVY FSSYVYFYRMVNHEADDTHNVLKMTFFTDHDGALLKALQY QDASFGVEAVGVDFQTMLDATAVRVVVFSTENTPEEFNEA
$V$ V
V $V K$ KPQFPYTKSYPNLSWEELKDKSKDIVKI LIV DTDKVLL
 GDASFGAETKVVDFDELLENKAVRVVVFSTDNTAEEFGHA DAPGYARTLGDAVTQLQHYSVYKILMSTSLANHIAQDKAL DA FAGLERQMSHMEVMPSLAELQQVCGDVYKVLVSSSDKQAL
$P V M K D Y E H K L A A F M P P R A S G A N F S G L G S Q E A G D A I V A Q U A$
 HRADDRADGQWLVGGLEDLAQEPAGKGLVRHLDWSTEQQUS
 SLIPRLDSHY KKSLQKTKFETDVVLNEALYDKVCFVGYQUD RMANFAELLDRVTPDTPFKLABVTLASARMEEMMNIKYGDNY PY LK KVEPY LRTGTPSSCAKCTFTLPPTASASLA DVVISHF
EKHSKKEGFKPVVISVDEMPKNFYKIILTANPDRLPEVE ITPRRFTRMRPDWGLVGSREELWAQPIVEKVLMRHRELPDG VVVQKF IETFQLVKNDTYHDGVSSD LGGATVI NVSEGQAQN $V E Q S H T V Y H E P K A E D M P S V E H L D A D A E D Q K V L F L D T A E G V$ $P Q L L A F H Q D S G F R Y E V A N L A T H D G Q G V A K V L Y I G D A A D L G$
$V K T F Y P T V H Q V E K F M D V D D N D F R F S L V W D P S V D V G E H V Q Q$ R DLF VQRCVNFFHQPYGEYDKGGKFENSTCNFLQAEGNVVD
$K Y Y N E M K K Y F E K L T V V K S L S E I K D K I F K I S L V D V M P E L L$ LVGGRTVCTPVSSLELUVRLAPTRILCHGELATVEEILGR

 $E E R F F F R Y K D F D P D T G G T D G V G K V F F T C E D H D K L L P L E E A A$
$V K A A A A F F N E A$
$V$ KILVVHGSFQNVIY DNSYDEDEEDDLKISVHDATGKCKETA









 P PF HRDPSAGIAAAAEK LLDEDGECGGTPVLLKLAAH HPA VA

 $A \operatorname{S} Q S$


 NNFCPTRYKYFCPDVFNFKKVSKVFFTSHNLKKLHTLQKD $Y$ VP HE LH T L GYGP LVVDSFD GY L GRVDK VVAADADP GLLA SFF A L WMKKRVKRVV KVY DPKKELDVVMAKY IGF GNRKDM $\square D D E A Q L T G M P L V K V T D F K K A V Q K P A V K C D M L A E P T Y G Q E$

 DDQYF IA NPYELWRGPASNMALYDKDEKDKDTMFRALENY A QANVIDDMPDLNAMPLI GPEFLPNLA GHVTNAAAYGDADR
 RHLES SKGKT WNRGEFARFWHLLDDEVEVPPDVSFENTQMEDLD



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UniRef90_Q04AP9 UniRef90_UPI000248FB14 UniRef90 L7ZJV5 UniRef90_S6BR58 UniRef90_101089 UniRef90 UPI00040ADE68 UniRef90 UPI0003B468C3 UniRef90_B8H9R5 UniRef90 U7UJN2 UniRef90_R7G8S7 UniRef90_UPIO00376D38C UniRef90_E1VRR0 UniRef90_UPI000288D257 UniRef90 A4EBW5
UniRef90_UPI000476E24B UniRef90_C9QH36
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UniRef90_C6PVB1
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WKEKF GERATVVTS GFAWL|DMMPKGANKGNAMGTL|QQSLN QLKKKYPDVSIVQSAPYFIVVMAKGDRKGPAVKLLADSSLG

 I I N C Y G N K I H I N F S V P G CL EI V S G T T S K G H GLLKLI S NLL G RMLLA D R P G L V GY R S K D T Y L E M A N A T C S K G D G L A A V V A A E L G VT D C Q Y A Y Y L N D Y N G L Y C L E V F S D Q A S K K E A L L K L K E M T G R GF A Q Q M I E R Y P Y S G F G C M D V L P L G VN K A A G L K E I I N D D H












 CQLRRTNDILQA DLSTPNKLDD TVCLGVNKGQSAATWLSQHN

 A RVAEVVGERAEVANS GMGEVVGRGVTKALALSTWCRPEP

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

 RVAAAAALASVTHSEKGMIEVVDPAGVDKAVGLGRAAERMG Y E I EPD D R P V NVVD GA Q N S Y D I I R N QV NK GEA V K K L L D R L E
 VVE R N L A WH Y V T Y S L P P D C L

 $N S Q L K$ QFRYLLRST GEVVYSAVIISHAEATKERALLEHLLCQAWS





 EEFFNVVI F SKEEDDFVNGEI ILLKHCTKADGIIKRVVEYFH E QVE Q QV G L E CEWSWVDQVD A KK GNSKGRRRLQRWVVEA G QVREF GETLY VT Y S L P DCLEVMMANVSKGRALEFVLARLGG LREAAKPELRPASLSGAHWVDVMMPSVDKGKSLRKLAEHRG KLLA K E R K I NL L N IV D LDD R H I E I T T K P GI S K G S G I K WI C Q N V L


 KIMMMIAK DHDKVVVNFFNFFFDIMMPKGCNK GTAAIEKLDAEYYN P DAFLEELGRAVAGAHGDFTEISSGLGVSKASTLARCCARRG
 K D A I L A N S S E HL H H A F T CLL E FMD K SVVDK A VA I E QV L E K E G YREKYGDKYS IV DTNKVYLD DNPDNASKYNALIVALLKNMN PA V G H L V S V T HS SP GQA L L E MA L P E V N KAA A L QRAA T G L G
 $C$ QLLR D T L L S S L Q A D A P N K L L D

 K KLLY S I Y S F S Y F T N S K E NVVEIN P K K S VN K G Y G|L E Y V A K E L Q V G E K Q I T H K S $\quad$ DT T S K K P F F L




 APWFE LVHGSYDK ISPNNGELLIDNGIDKGTAVRDVASLLGG

 L $\operatorname{N}$ D A


|  | AETR 250260 |
| :---: | :---: |
| UniRef90-UPIooou761811 | NVTTADHNHDGTAQVL |
| UniRef90-G1 WIA9 | HLCASCTESGVSRYL |
| UniRef90-881K88 | MVTAANDADGFAQA |
| UniRe990-G2L | HVIESNDNDGVAK |
| UniRef90-UP10003B3A31B | TVTTRHHDDGVAA |
| UniRef90 R5BV | GVLDDCDHDGVA |
| UniRef90-H3RS | RITSDND |
| UniRef90_K6TXH0 | IVVSSCDDN |
| UniRef90-Q04AP9 | H\APSNNDEGVMQ |
| UniRef90-UPIOOO228FB14 | YTTLAGTNDG |
| UniRef90-L7Z | GH |
|  | TVVPDNDHDGAAVA |
| UniRef90-10108 | WVAPS |
| UniRef90-UP100040ADE68 | LWTASNDQCGVA |
| UniRef90- B8H9R5 | EVTHSVYDDGAAHV |
| UniRef90-U7UJN2 | YVTVSNNEDGVAAALER |
| UniRef90-R7G | EVALSNEDDGV |
|  | LVTRTNDQSGVAEALYRYI |
| UniRef90-UPI000288D257 | FV的 SVA |
| UniRef90-A4EBW5 | YVTDTVDHDGVVAAL |
| UniRef90_UP1000476E: | FVTGTIEDKG |
| UniRet90_C9QH36 | C |
| UniRet90_F3L238 |  |
| UniRef90 A3XR33 | YVSSTNKEHAVAKA |
| UniRef90-W5SU32 | EFVKSNEEDGA |
| UniRet90 UPIO00255E79B | EVVPSNDEDGVAR |
| UniRef90- UPIOOO3B5EF11 | DITKTNDEEGVMDYL LHHD |
| UniRet90-87C9 | YISDANNEQGVL |
| UniRef90-V710E9 | RLAAKTNVENGVGGLAI |
| UniRef90-UPIO00425DOF0 | WTSTSIYENGIKNAFRYLGLI |
| UniRef90_A3DJZ1 |  |
| UniRet90 D7CD00 | EVAPDHDEDG |
| UniRef90 A0A024PKVE | HQTPAVIDSGVYNGLRKLGLV |
| UniRef90-E5Al | GNNFEAGVA |
| UniRef90 UPI000219385E | G |
| UniRef90-E7G947 | Q A A C E |
|  | WVAPSARFGGVAVA |
| UniRef90-R5LDH1 | KI I ESADNDGVAHWL |
| UniRef90-17LBH4 | ELIGSSNDSAVQK |
| UniRef90-R9J016 | VVCGNVWEDGI YYEFQRMGLL |
| UniRef90-D2BY96 | EVIGGTNIEQA |
| UniRe90-17k79 | N A |
| D4XV1 | T NA |
| UniRer90- UniRer9 $^{\text {R } 7 \text { CMX }}$ | VTEDNDHDGVMK |
| UniRef90 UPI00046539BD | DITLSNDEDGVARWL |
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| UniRef90-S5UNR7 | LVTKNNNQPGIA |
| UniRef90_UPP00036CA63F | Q $\square_{\text {d }}$ |
| UniRef90_UP100047BACC3 |  |
| UniRef90-LORUG2 | S |
| UniRef90_C6P | YKCSSNDEHA1 E |
| UniRef90-G5K 1/1 | HTVP A EDRDGVAYG |
| UniRef90- UPIOOO478CD4F |  |
| UniRef90_C5NX92 | EVIGNNNDFSVIKYV |
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| UniRef90_UPIO00301B77A | PVALPNSRNGVADYL |
| UniRet90-S6EVB8 | EQl GLNRHEAVASYL |
| UniRef90-UPIO0040C7A8F | EVIKTNAEDGVA |
| UniRet90-Q6KI | EVIGTNNSDTIGKKLLELI |
| UniRee90-UP1000047A105D | AP |
| UniRet90_R6P8 | A P |
| UniRef90 R9MEC4 | Gl LGNDADGVAAWLKE |
| UniRet90_-F9RPY8 | LIVTDNNGCGlGQYLR |
| UniRef90-UP100037E71ED |  |
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| UniRef90_UPIO003602AE6 | HVTASNADDGVAQAl |
| UniRef90-G2RYR1 | D TEELVADGGVGDYLY |
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| UniRef90_UP10003777843 | $V \mathrm{GFCDDDAV}$ |
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| UniRef90_R4U4 | GMT TNEEGGV |
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| UniRef90-UPIO004116F76 |  |
|  | GNNNDFSVIKYMEKYV |
| UniRef90 R9GGY2 | FITKTNHHSGFSYG1 |
|  | HVTA SVYRDAAAKYNAW |


$M L G L I C V D V D G T L I G S D N$ TVREDVWAALADARARGVRDA $M V K L I V S D I D G T L L P Y G Q \square N L R S S L F Q V I E Q L R E R G V I F C$ MLGLI CIDVDGTLVGS GGVIPEVVWRAAEDARERGVHLA



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UniRef90-UPIOOO479C4CE UniRef90-UP1000479153F UniRef90_AоА011TZK6
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UniRef90 17K1J4 UniRef90-Q6AH62 UniRef90-17LSG2 UniRef90-UPIO00369AFE8 UniRef90-R6UF78 UniRef90-FH33P4
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TATGRHYRDVAGTRDVLGVDAYLTTSNGARVHAPGDERTY IVTARGDTGTYPLLDQ NGIRCDVTTYSGGVILDEHRNVI AASGSQFQRLQGQFAPFANEDDYISQNGSLVHCGSQDSNP LATGRPGHELSWLMDELEDESADGY CNGTLAVYRGKNL VASGNDLIHLHDVFEAKSPLO IATGRSIVATMPILALLGIETGYAVCSNGAVTLRLDPGYE PASGRQLANLRATLAGAT AASGRPLYTLETMFPNL L LEEIILIGDNGAAARWGKDL FCTGRPRAMGNGFTERTGYQGYPGIYNDGSGVYDKDGNLI

 I ATGRPPMTTVDFEELLPADA PRVYLNGAFVRDGAGKT LNTGNPPLPKILKMANELNAKYLVAANGSAVIDVEKNEYG TATGRHYKDARYFFNQDETGKYUASGNGSFVHNELGEVI VCTGRARFDVRGII
 VATGR FDYHILEIEGYIESQNYRI GLNNGGAIVALEPDG LCTGRADGDVHPDVKAVGFD GAISNGGAYATRGGELV FATGRHWLEMQPLDADFKLKAYLITGNGT
 LASGRPTAGMVKHAEALDYGGYIVSYNGAFVIKAEDQSIV ISTGRALPGALELVAALGTEGYVVCSNGSVVVRDDPSWE I ATGRSLSGALDVANRLGLTEGFVVVSNGAVNPNTATGYE I ATGRSVISTLPVMEALRMTPERPAVCSNGAVPEQAEGFE
 I ATGVHQERTNULFKDFLNEPLNFVTNNGARVVKSDGTVL ATGRNYLGAKEAMDELGVKVPLITSHGSVAFDENGNEIF PASGRQYKTLADMFSAHVEGMPIINVRRGGMPLATTTLPQ

 LASGRHYADMRVFRDQLDVPDHGISSNGAYTHDPEDQLL LCSGRPADGNALDYARRLDADGWHVFQNGASVVNAQTGKS
FATGRHHADVSSIUGFDDPVHLITSNGARLTSACKNLDID IATGRVYKHSVNLLEYLDCENGSYIYDPEGKCIDQKSLTD VASARSVVSMQVMLKGLNLRLPVIEFNGAFIDSDLDSGRHE
 LASGRSPFGMQPYLAQLELHQREGYFNGAIVMRSDTGQQL LATGRNHTDVQSILQKIGSEKALMITSNGARVRDLQGNLI IIATGRAIVAANQYFGMVEVNCPIIMCNGGMVYDIKSGEH LSTGRSESMTVPLLETLGI HPKYLVTANGALTDRRREDGS ATARSYDASKGILQPLKLKLPVILNNGA

LCSGRPAFGNALRYAERLDPDGWHVFQNGASVVNVGSGL PASGRQYHSLRGLFAPVQDELAYLCENGAGAGREEDAPVL LCSGRPALAKARAYAQRLDPHGWHVFQNGASVVHVGTGES INTGNDPFEMKSSVESDCPNKYDIASNGNAMHNYLEGEFE

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 Y H DGLLTRDRAADVVDF I E S N NL DMVWCAFSFEDWDD PR I L
 S QACMQA DL GREDI RAMQRTGGLVVVMVSGTETCYDQPTSS A Q S LIK P A L LE PLI DRLES DP LFHI HLSGKQGAYARKDDP

 FVVSEMPA E GWR QL A R STK QC G LQQAA Y A EK QD EKY DKV F K N Y S K S L P K E F L S T F LKK C DE D GA L P DCT F H TK K A V Y S LI K A E DNHPDVKN IV ANVLDE HYDKA I CWK K DEADENYFHD DVA D RA YP LDRAV ALDAVV DT LREAA PGVSFAVELATGDHYEPA Y S GYEI LEADPRPALE LLRGA WSDAVVAVEDLLGVGFKVSAP

 $T V I D P Q L A A E V I A A S R R A T A D R D L G L V V C G V G G G Y A E R D D$


 RENAFTYEEAEKLKNDIEKNYMKELNYLVLQTVEAKRYDK



 VM G Y L P K K E S F K K I A S Y LiN E N K I D F L T Y H K N S M Y G F N Y N N P

 FNQTI S QKDAHDI I DYCRSHNFFYLTYLNDQIIHDTTHDY


 RSHGLSPELVAWLVRRADETGRVLELYTDEEVVAVERDADR
 $F K H Q L P M E T V R K L V D L A E Q H Q D Y Y E L F P Y Y K N R D R N E W K S$ ATSTRVVEIVREL ARAGQDVGTVLCGEKAYAERTDRAFL



 LSEAFPEDVLPRLIEHAHATDRLLEIYTDTEFAITMPGDY R Q H L P S H IV V K RVI E E T QVV N D L V I N M Y C G S Q WL T N E VN H N


 Y

 $S$ Q N V

 S A D QL D P E CAARTLALLEHPAVTPWLFTGGLWYARAAD DV

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 MMME Y V R A R L A H R E DID R D S V VA K A V





## A

## A



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 TH DD S S LT GMKQQVVAEPGDLQP DKY VFPGEPE LLQQQYQNE











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 $\square T$ T A QTLCFGDFNND\PMFEHADFSFAMANA QPDVLECAR


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UniRef90_Q1QY75
UniRef90_UPI00034CFBF3
UniRef90_U2U3Y1
UniRef90_A4S216
UniRef90_D4JE13
UniRef90_S9VZR6
UniRef90_D5T1Y6
UniRef90_UPI000420B30A
UniRef90_S3JG34
UniRef90_UPI00036011EE
UniRef90_G0VM41
UniRef90_B9VQ20
UniRef90_H1X872
UniRef90_E1QQYL7
UniRef90_E2ZKM2
UniRef90_M6D5B5
UniRef90_UPI00041A831D
UniRef90_UPI000382CBF2
UniRef90_R6SRW5
UniRef90_E0NZD4
UniRef90_U5NCV8
UniRef90_V8D5G4
UniRef90_T0N9L9
UniRef90_C1CV24
UniRef90_B1CC04
UniRef90_B9Y489
UniRef90_R7DTC7
UniRef90_A5IYW7
UniRef90_N9TRD5
UniRef90_Q5HM770
UniRef90_U6LF01
UniRef90_F9I4M1
UniRef90_I0GU19
UniRef90_U1PT01
UniRef90_W7ZLZ4
UniRef90_UPI0004676F00
UniRef90_Q8EVR4
UniRef90_UPI0003787059


AATGNDRATVDRFLAP FVGRFDYVVQNGGQVITKDNKEV










 I S GRS R Q GTP A H R E L M K Y N G FP G V V
 L AT GR G $\square P G A R E V V L D A A G M$ REGAAVCSNGAI TDDDER DA LVTNHSFSYAKKIARNVKCDATIIAHGGGSFISSTDCNEW



|  | UniRef90_A4FQU4 |
| :---: | :---: |
|  | UniRef90-C1D3N1 |
|  | UniRef90-W8GMH3 |
|  | UniRef90-F2NWB6 |
|  | UniRef90-UPI0003481F34 |
|  | UniRef90-A0A023B239 |
|  | UniRef90-B5EXJ7 |
|  | UniRef90-L0B085 |
|  | UniRef90-J2UI80 |
|  | UniRef90-F5YDX4 |
|  | UniRef90-Q384S8 |
|  | UniRef90-E2NQT6 |
|  | UniRef90-B9Q5X0 |
|  | UniRef90-UPI000365BCD4 |
|  | UniRef90-H8DT21 |
|  | UniRef90-E1L2D7 |
|  | UniRef90-F8AEU1 |
|  | UniRef90-K1SIM2 |
|  | UniRef90-R5KZ62 |
|  | UniRef90-F8L180 |
|  | UniRef90-Q1QY75 |
|  | UniRef90-UPI00034CFBF3 |
|  | UniRef90-U2U3Y1 |
|  | UniRef90-A4S216 |
|  | UniRef90-D4JE13 |
|  | UniRef90-S9VZR6 |
|  | UniRef90-D5T1Y6 |
|  | UniRef90-UPI000420B30A |
|  | UniRef90-S3JG34 |
|  | UniRef90_UPI00036011EE |
|  | UniRef90-G0VM41 |
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|  | UniRef90-H1X872 |
|  | UniRef90-E1QYL7 |
|  | UniRef90-E2ZKM2 |
|  | UniRef90-M6D5B5 |
|  | UniRef90-UPI00041A831D |
|  | UniRef90_UPI000382CBF2 |
|  | UniRef90-R6SRW5 |
|  | UniRef90-EONZD4 |
|  | UniRef90_U5NCV8 |
|  | UniRef90-V8D5G4 |
|  | UniRef90-TON9L9 |
|  | UniRef90-C1CV24 |
|  | UniRef90-B1CC04 |
|  | UniRef90-B9Y489 |
|  | UniRef90-R7DTC7 |
|  | UniRef90_A5IYW7 |
|  | UniRef90-N9TRD5 |
|  | UniRef90_Q5HM70 |
|  | UniRef90_U6LF01 |
|  | UniRef90-F914M1 |
|  | UniRef90-IOGUI9 |
|  | UniRef90_U1PT01 |
|  | UniRef90-W7ZLZ4 |
|  | UniRef90-UPI0004676F00 |
|  | UniRef90-Q8EVR4 |
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| :---: | :---: |
| UniRef90 A4FQU4 UniRef90 C1D3N1 | LAERFPENAYYLWEGRYLEVMAPGGHKGNALLARIAHEYG |
|  | EEKFPQFK\VISGFGDYIELTAEGVTKGSAAIVLADYLK |
| iRet90-F2NWB6 | 尤 |
| UniRef90-UPIO003481F34 | GVNKGSTLAMLCERWG |
| UniRef90-A0Ао23в239 | VRTAFPRCPAFVGGTSNVLI LSNGCTKAQGVRALCNLLK |
| UniRef90-B5EXJ7 | LIEEERAHLCFSAVDCLEVLPLGCNKGSALAVLSNHLG |
| UniRef90-LOB085 | FEQGKDYVAKFDLPGAWDVIPGGVSKAVGITKLMEHYG |
|  | Qageranllcrsawdclevtphochkgatlg |
| iRef90-F5YDX4 | FGKGPGSAVYMART㑑TFLEVMNDTVSKGSG |
| UniRef90-Q384S8 | DTKYEHYUTTVMTSDHCLDIMPKGVSKASALRMV |
| UniRet90-E2NQT6 | M1KKRTEEKYCHPNDHFLDVVPNNCSKGTGVNY |
| ef90-B905X0 | LIRATLEPQCVRPLTWNLEVIPAGISKATGMQ |
| f90_UP1000 | QLIDAFEFDVPMRGFLNLMPAGWNKGS |
| H8DT2 | CLEVLPANC |
| 1L2D7 | - |
| UniRef90-F8AEU1 | A I I RELGLLNLVAVDSGFA HVKKP WIVNKGEGIKKACEILG |
| UniRef90-K1SIM2 |  |
| UniRef90-R5KZ62 | R V |
| UniRef90-F8L180 | CFLUAPLIKDPFQNGYYVVQATHASVNKGSALRDLKQRLR |
| UniRef90_Q1QY75 |  |
| UniRef90_UPIOOO3 |  |
| Uni |  |
| UniRef90 | GASKGAAV |
| UniRef90 _ DUJE13 |  |
|  | DRLKDHVDFCFSLPFIDISPHGN |
| 5T | Qry |
| Ref90_UP1000420 | STSWLD APDGVTK |
| UniRef90_S3JG34 |  |
| UniR | G |
| UniRef90 GoVM41 | D |
| UniRef90 BgVQ20 | LikNK |
| UniRef90-H1 ${ }^{\text {a }}$ | Gramid |
| UniRef90-E1QYL7 | G DK |
| UniRef90-E2ZKM2 | PKFQAIPGVAVVQGSPDN ETAAGVDGSALLALADLLG |
|  | E |
| UniRef90-UP1000382C |  |
|  | LNAPGCSKANAV |
| UniRef90-EONZD4 |  |
| UniRef90-U5NCV8 |  |
| UniRet90_V8D5G4 | EMARRDLADVTFSTDNGLIELSAPGVSKASGLRMLAELKD |
| UniRef90-TON9L9 | GF |
|  |  |
|  | FDIIKKYDINTTQSEKNWIEIFPKGVNKYNALKII AD |
| UniRef90-B9Y489 | EQLDHSCFIAQSGERLLEIGSGSAHKGVFI DYLKQTYS |
|  | KYQEFSFYSWGNFDHIYSFEVIKKGVSKGAALSLLKDILI |
| UniRet90_A5IYW7 | KKKLHTMQTHSNFLDIGIVACSKASALNNI SNEHK |
| iRef90_N9TRD5 |  |
| UniRef90_Q5HM70 |  |
| UniRef90-U6L | GEHLRCVRPLNWNLEFDNPSVSKAVGAQVLLTQLN |
| UniRef90_F914M1 |  |
| UniRe990_10GU19 |  |
| UniRet9o UPT01 | VRGAGLDGVEY |
| UniRef90-UPIO004676F00 |  |
| iRef90-O8EVR4 | WGKYFDFVVCGPCYLEICMKNINKGYATQYLLDN |
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 VDPRATVAVGDGGNDVEMLGWAGLGVAMGGAPEPVAAAAD $L S L D Q V I V V G V G E E D S E M I A M A G L G V A M G D A T E S V K E K A N$ KDIRDVI AF GDQLNDFAMLQKVGIGIAMRNGNESLKFVSN


[^4]

| UniRef90 A4FQU4 | $E\|V\| T G P\|V\| S E \quad \begin{gathered} 250 \\ G\|L\| A A\|V L\| N R \\ \hline \end{gathered}$ |
| :---: | :---: |
| UniRef90-C1D3N1 | EHVS GPDE L G V A R WL T QE |
| UniRef90-W8GMH3 | FTTKTAKKNGVAKVIN |
| UniRef90-F2NWB6 | FITTKDNDSSGVGDFIEKYVL |
| UniRef90-UPI0003481F34 | RVAPSSFEDGVGRVVE |
| UniRef90-A0A023B239 | VVAPNVDDDGWALSVLQ |
| UniRef90_B5EXJ7 | HVIGHCGNQAVSHFLTHW |
| UniRef90-L0B085 | WVMDTCDEGAVSEA |
| UniRef90-J2UI80 | HI IGHCETQAVSHYL N |
| UniRef90_F5YDX4 | LVI GTNAEDGVAVFLEEAF |
| UniRef90-Q384S8 | HVVGCNEEDGVAHKL |
| UniRef90-E2NQT6 | HVYSYV |
| UniRef90-B9Q5X0 | Y QTVSNDESAFA QVVNELLL |
| UniRef90_UPI000365B | WHI GRCEDDAVA QAI EALA |
| UniRef90-H8DT21 | HVLGHCGTQAVSHYLNHW |
| UniRef90_E1L2D7 | WHI G A CED D AVA CAVEMLDA |
| UniRef90-F8AEU1 | Y I T K ESYAEGIY HILEK F G |
| UniRef90-K1SIM2 | Y I TT DVDKDGU |
| UniRef90-R5KZ62 | GCVK SVSE |
| UniRef90-F8L180 | II APPAREK G I D G L Q K L |
| UniRef90_Q1QY75 | AI $\square$ GHHHPNGVA WQ |
| UniRef90_UPI00034CFBF3 |  |
| UniRef90_U2U3Y1 | CIVD S MWE D GVAK WL |
| UniRef90-A4S216 | ■VLDTNDDDAVAVAI |
| UniRef90-D4JE13 | QI I GPYEDYSVIEHI |
| UniRef90-S9VZR6 | EVI GHHDEDGVAKKVVEL |
| UniRef90-D5T1Y6 | PVIADNDHAGVLK |
| UniRef90_UPIO00420B30A | RVTGTVDEGGLLSALR |
| UniRef90_S3JG34 |  |
| UniRef90_UPI00036011EE | YEYDSVAD |
| UniRef90-G0VM41 | KVY D S V |
| UniRef90-B9VQ20 | WITAPNTEHGVAKATQHWVL |
| UniRef90-H1X872 | PTVSDNNHDGVLD TI |
| UniRef90-E1QYL7 | ALVSAHDKGGVAEAVRR |
| UniRef90-E2ZKM2 | S A D C D H G VAELFRKL |
| UniRef90-M6D5B5 | YITKSNNEDGLAMTLLELSL |
| UniRef90-UPI00041A831D | N HID Y V |
| UniRef90-UPI000382CBF2 | WVTRPVSQDGDPYMI |
| UniRef90-R6SRW5 | LCLCPHTEGLI A DLLPRL |
| UniRef90-EONZD4 | AVFPS ${ }^{\text {P }}$, GAMLDHF |
| UniRef90-U5NCV8 | Y I SKSNDEDGLDKELD |
| UniRef90-V8D5G4 | EI APDNNSGGVGQVLA R W |
| UniRef90-T0N9L9 | YIARSGHGAGSAEI |
| UniRef90-C1CV24 | HTVGHVDEGGLREAV |
| UniRef90-B1CC04 | MIISPSNNQNAVYH\\|ILKE |
| UniRef90_B9Y489 | HIVEESAAD |
| UniRef90-R7DTC7 | LFTS TS S Q G LLD Y LKEHH |
| UniRef90-A5IYW7 | YVSKDNNENWI SWLI DNL |
| UniRef90-N9TRD5 | FFTSDVIQNGLGEAI |
| UniRef90_Q5HM70 | $\square$ T EYT NEEDGAAHYLKK S HL |
| UniRef90_U6LF01 | YTTVSNNESA |
| UniRef90-F914M1 |  |
| UniRef90-IOGUI9 | A V Y P S V |
| UniRef90_U1PT01 | AQT GSVEE |
| UniRef90-W7ZLZ4 | WVTRTMNQGGLA Y MV |
| UniRef90_UPI0004676F00 | GI THTNDEGGVGEYLDAL |
| UniRef90-Q8EVR4 | YI IDNEPST FVLEAI D K |
| UniRef90_UPIO003787059 | HLIALA E Y L N GLla D RVE |

[^5]EVTGPVSEDG|L|AAVL|NR
EHVS GPDELGVARWLTREIL
 RVAPSSFEDGVGRVVEE

WVMDTCDEGAVSEALQ
HI I GHCETQAVSHYLNHW

HVYSYVY
YQTVSNDESAFAQVVNELLL
HVLGHCGTQAVSHYLNHW
WHI GACEDDAVACAVEMLA
Y T TKESYAEGIYH【LEKFGYL
Y
II APPAREKGIIQGLQK LDLI
A 1 GHHHPNGVAWQLRDF
,
CIVDSMWED GVAK WLE H
Q।
EVIGHHDEDGVAKKVVELFE
PVIADNDHAGVLKTILK
HVIGHCRNQAVSHYLTHW
Y EYDSVAD
K VY D S V
MVWL
ALVSAHDKGGVAEAVRRY

NHID Y V HE
WVTRPVSQDGLPYM\RE
LCLCP H TE GLI AD L L P R L
YISKSNDEDGLIDELDLF
E:APDNNSGGVGQVLARW
HARSGHGAGSAE
MISPSNNQNAVYH\|IKE
HIVESAAD
YVKDNNEWI SWLI KNH
FFTSDVDQNGLGEAI DDY
$\square T E Y T N E E D G A A H Y L K S H L L$
A VY P S V
A QT GSVEE
WVTRTMNQGGLAYMVHE
Y I DDNEPSTFVLEAIDK
H L A L A E Y L N GL A D RVE



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

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

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    jhmm

[^3]:    lupas_21
    lupas_14
    lupas_28
    jnet
    cont
    sol2
    sol5
    jhmm
    jpssm

[^4]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

[^5]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

