

## QUERY

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60
70
EQLLGAKQPLMQQLERNGRARAEILREAGVSLDREGLARY
 EGILARRKQSLIVLLEQQGDRRHNLLTSLGLSADRAGVQAV EKLLADKQPLLAQLDQHGQQRSQLLASLQLSTDRAGLQRL E QI LAR K Q S L I L L E QHGQRRRSQLL GS L GL SADRA GV QA L Q GI L T D K Q P L L A L L D Q H G QVR S Q F L L GL QL S A D R L G L E T L E HVLA QKQALVILLEQHGRRRSQVLTGLGLPSNRQGLEQL
 E SLLNDKQPLLALLQQHAGERSRVLQNAGLNADRDGLKAL EDILA QKQALVILLEQHGRKRTQILASLNLPTNREGLEQL E NILARRK Q S LI I L L E Q H G R R R S E LLA S L G L T T N R R G L E S L ESILAAKK QPL L ALL GQHSSQRS QWLDGQQLSADRA GL E A L EVLLGEKQPLLALLSEHGQQRSRQMQELQLSADRAGLEAL
 EDI LARKGSSLI I L L E Q H G Q K R S Q I L L S L G L P A D H S G L E QL V L K K QPL LALL GQHGAQRSQWLRDQQLSADRSGLEQA
 E NI L A R K Q S L V I Q L D Q Q GRRRRSELLL A S L G L S Q DRE GV A QL EHILARQKQALVI LLEQHGRRRSQLLAGLGLPANRKGLQEL Q DLLAAQK QP YL R QL E Q H SKERS QLL T Q A L L S A D Q Q GI E QL Q , Q

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 QA AV QRK QE L L HA L A A T E EAVME EK SVLLUQSI SLLTANSRYAALLAA GGFAPNESGMMTMW A ELTP KKNALLQQELVALSKGRHAALAAAGCEGSEA GMEPW
 P A L L H D K N E L A A R L T A $\square$ A G Q R R L T L A R E G L N A E R S GV A T W NDIL S K K A P L LD QLK H H A N $\square R R Q W L A S L G K M T T E T H W K A$
 PDI AKEK A ALVGGQLNQLETRRDTLLLVKNGFAKGRSGDEAW D A L T R E K N DLL L G A V R E RA K Q K DR TL V QM GYR P E S GEP S R LA V N D E DTHHYE QLH GHS QQRHNLL KMLGVS INRDGLQQV

 $N S V T P L L K N D L I D E Q L G L L S Q Q Q R H Q A L A A A G A A P S E A G M E A W$
 L D L V R Q K N K VA A EL A T L A A R R S R L L A A S GVVA S D G A G DA A W AKLTGEKKAQAVARMAELAAARRYDLLEAA GFE GKEA GMEA W

 E Q AVVRQKNDCLAQLEHSVRAREQMLQQVGLPGGLGGAERF Q AVTE QK N A AL M D R E R AK Q K $\square$ H H L L VA M G Y S P D Q G E P S R F
 EALLEEKSLLLNNLSHCSKQRYQVL ADNGYEASES GMKNW
 EHAVA EKHVCLDDL RGLIAHRLHDLQALGFSADAQGLAA Y
 E GL L N D K A R VL Q DI N A S T Q AR Y Q AI T G L G F G P D E R G L A A W

 HDADA QKRQHV ATLEQASQAQNALLRSHGYETNA GGMEAF





 E P L A A E K T R L L E QL A A Q A R E R A GLLM Q E A G L T D


 ASQSHDGPQLLQQLDVLGNLLNECKAVNERNGESIQQATT $A S H S A V G E E L V K A G D E L S A L I M Q C Q A A N E N N G G S V Q Q U T T$
$A A Q S P N G E V I M Q Q L N V L T E L M E T C Q K V N E T N G R I V Q Q H V T$ AAQSPNGEVIMQQLNVLTELMETCQKVNETNGRTVQQHVT
 A A R S A H G A E L L A R S D A L

 A ARSEKGAAALLEQAQLLEATLEACRSANERNGRLI NQSAVV
f

A

 ASNS PVGGSQLLAENSASSLNSLLEAEC
 CATSPSGTDILEQAGKLEKLLADCCRANERNGQLI


## I A ASGN


$\frac{A}{L}$
 FA A HP TA S R A HA A WT LLLLS I A S QAR D L N R M N G E L I Q L Q Y N FARLE E GQ Q L N D R WQALLRATVERCNELNQGNARLINQRRQ
 FA A HP GEHDARAAWAELLPDLATHARELNELNGEVI LA VA GTPALRAQWEALLDLTREAKELNRVNGMLI


 $V$ Q A H D Q A D Q L G T R WS T L L L D H T R R C D R L N S D N A R L I D Q R R V

$F \| R$ SA GF S DLLF E L WQ E A D Q K L R T C Q T L N Q T N G R V I S Q K R L
$F N W L P P A P K A A A E W Q R L E Q K A E R C K A Y N D K N G E L G I R Q Y$




 $F A A H P E E T G T R D A W S S L L A D A T Q A R E L N R D N G E L D Q Q Q S N$ $L E \square A A S G E A A R N A W A D L L A V A R S A K E L N R T N G L M I G Q Q R N$
 I Q T E D D A L A L T L L L I K N N L K A V A $V$ SQ H F AP DELLA ETWHELLTLLSREVAELNDHNGKLAGERHA
 $A S Q S S I G D Q L L A Q S D V L T N L L A Q Q Q A I N A N T G Q$

FSKMDDGVVLNDLWQALRQSI ERCDTLNHGNARLIDRQRV LSKNPNTQLHTSWQSFQNTLSLSKEANRVNGVLVTKQRN | $L$ | $T$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | P | G R Q G L | LE TVLPVP E R A E A L W A A L T Q AT E Q V H Q Q N E V N GT V I S R H HV


 $F$ S WL P Q K T A A E G WW Q S LGEQKA K R C K M Y N E K N G D L L I R Q

 $L R D W D Q E G Q L R S V W E R L A E V M Q N C R R L N Q I N G G V V R B R M V$










| QUER | G |
| :---: | :---: |
| UniRef90 LLLLWN5 | A NOI |
| UniRef9 - S6HFK? |  |
| UniRef90-B1JCD7 |  |
| UniRef90_S6BKL | G GMLG |
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| UniRef90-K6B161 | A HQL |
| UniRef90-F2N036 | GS ML |
| UniRef90-U3HAR6 | GStJ |
| UniRet90-A4×W94 | GSVL |
| UniRef90 Q4K860 | A NQLK |
| UniRef90 M50KS7 | A ${ }^{\text {a }}$ Q |
| UniRef90 w9tb90 | GDML Gl |
| UniRef90-UPIoo036B66F3 | R SVL |
| UniRef90-I4JYQ5 | A N QL |
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| UniRet90-W2DDT9 | A NQLR1 |
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| UPI00037A6D56 | Q |
| UniRef90_Q21/K1 | G |
| UniRei90-R8B1F7 | SML |
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| UniR |  |
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| UniRef90-UP1000369FBEC | Q NA |
| UniRef90-UPIO00472C0 | N |
| UniRef90_W5IVJ7 | GRLLD\\|LR |
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| UniRef90-M7CUB5 |  |
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| UniRef90-UPIO0036311BB | ELSMQLLR |
| UniRet90-UPIo003703A35 | Q Q MLINALQ |
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| UniRet90-W6MDJ3 |  |
| UniRet90_UP10004761DE1 | QGA |
| UniRef90 UPIO0040EA48E |  |
| UniRef90-Q1GZW9 | QQVLDTL |
| UniRef90-A0A023V8T0 |  |
| UniRef90-W0V1X8 |  |
| UniRet90-M7PTG3 | M |
| UniRef90_G4E4S4 | EQAlQ |
|  | R N Q |
| UniRef90-A1TZU5 | SRLTDUFR |
| UniReef90-wo |  |
| UniRe90-G22361 |  |
| UniRef90_13Y640 |  |
| UniRe990_3CUC4 | Q |
|  | R |
| UniRet90 UPI00023 |  |
| UniRef90 U2ZEZ1 | Heml Sol |
| UniRei90 UPI00036E5EAF | R R AlL DVLK |
| UniRef90 S3JGAO | ENLVN |



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UniRef90_F2PDM0
UniRef90-I3IAA9
UniRef90_A1WUF0
 LAHNERQTALCNKKALRAKQRSENLATLGFNSDNSGMRRLL
 DD LARQKNELAAQITADGSGRTEALAAAGDPADRRGDDAW

 NQNLAEQKPLLRKLDLHATERSQTMKAMRRTSDQAGMSKR
 NEHNK LQSSLCNSLMVKASDRGLLLQDL GFAGDASGMQALL KTLLAD KNSLVKNLKQHAHTRMHALLQAAGLADETATLDAA

 EQILDEKAHLLSELGSTVQKRHDALVKLGFEGSEKGMADW DVLNAQDMACYQHLSQHSQQRYRLLERLGDNANAQGMQTL DQHNRD LLRLVDDIAARAERRTKVLAAFGFEPGLAGMAALL EQMVDKRVELLQAL GAAANARYDALAAAGFEPNEQGMSAW QTNI RKQLPI IEQVKCTADERSQCLANDGVTADDAGTKKL
 KYHNGHQTTL CEHLQQRAKLRSEGLDS LGFAGDASGMAQL LN NLSLQEPLLESLGKHASLRESVMGKGGLPNSRVGVEALC LTHNVQLQKLMQRLSDNAKKRCEYLETLGVSADDAGMKRL
 $G L L L D E K Q P L L V Q L D Q H N H D R S A Q L Q R L G L P L S R E G L L A Y$ EQAASKKQKLAARLNDLVARQNGCLQAYGSPPDGRGLDTF A GIDEAKGKLVEELTSLGQQRHECLVEDGVAENGEAVERW TALTPRKSSLVNDMAVLASQRHNALGAAGYKAEEAGMEAW TALTTKKSALVTQMTLLSAQRHRALGKAGYPAEEAGMDWA ERRNA QDDNRIEVLAARAQRRSKVLTAFRGEATGPGMQRAL

 PA IVEKKTELIGVLARLEAARDAQLTELGFPTGWSGMEDA SNNLHNQLPVLKQLGSNASKRSHTLQQLQDPCSENGAKKAL

 GQIIEQKSQLLVALEQAGGKRKALLDANQLPPNDVGWRNL ERDNRQDSRHVDNLRGRAQRRSKDLAAFRLGDDGAGMQRL PDLVARKTELYRQLTDLGRQRTSWFVAGSLS GMQAL A QL NTAK LTQLQAVSGHARKRHAELLAAGHAADRAGMDAW EQULNPKKQLLLQLEQHATLRQQLLQQQAGFTDESTTLDTQ

 ESATAQKNLAVTAHREQQEQRLSWMHGLGLGADSSLAELG ALLVADKDRLIDQFARLDMRRNRFLNAAGLPEGTQGMNAW HEI TERKRGVAQQLVDLSQTRDNLLAEDGLPAGHAGTEQ
 HLLNERDQLLLGSAQDRARRRVKVLKAVGLAFDEAGMQAF $N T N V Q Q Q T P I L N K L S R S S N E R S Q C M R E L G L P C N D S S V T R D$ EALNPQLTELYNMI DKTATERRLLMQQLQLPANKEGIHQL
 EELLAEKAPLVSALSQQDRAIIAYCQQAGIQPGESLEQHLL NHCLKQKQPLVVRQLEALGRQRELILKKQAGFPADRQGMAAF DRLNLQUTTAVVALAVRAQRRAKVLGAFRLQADAEGMQREL SRGNRRIVELVASVRERAERRTKVLQAFGLHDDRAGMQRL EANDRLQAPLLQQLRRTSKERMECLISDGLPANEDGVAQL ATHNQQQNRLMAQVQLQAQQRCQHLLALGLKPDEKGMAKL
 AATGHA IVALADALIDDNHRARGRCARALTEPAEPKSMADV PADSERKAQI ADRLALLDSERERQQVALGFPPDHD GAN ERATVAKNAAVAAHRAQQEQRLGWMQGLGLSPD SPLGDLL A DLVNAKSEHISVLREASSERSALLQQSLS
 $K L L$
$E$
$E$
 TEHNRQQTRLMADLQQQAQQRCQHLLALGGKPDEQGMATL
 $P \mathrm{P} L \mathrm{~V} A \mathrm{DKDRVVSQLSRLDAQLNQLLAAAGLPGDAQG} \mathrm{\square SAW}$ P ELLTERKARAVAELATLGRERDAQLQVLGYSPDE APLNASKDAQLQTLSNDARERYVELQAAGYTPDLAGMGTW EAAVNKKQDAMIRLEAVFQDHEERLRMSGLPSTPEGDSAY LA HNT QQTLLCDKLAQRASVRSQHLSQLGFDNSPGGMTKL


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| :---: | :---: |
| UniRef90 C5AEH6 UniRef90 A3D9Ms |  |
|  | QALPKGAKVSQQWQLLQQSLVAEC |
| UniRef90- ${ }^{\text {B0T }}$ | TARLPQASQVSILWQNLLLLVKESQQVN |
| UniRef90_C7RLC8 | LAVHPSETRARDAWNLLMSLAGQAHEVNRANGELIQMQHN |
| UniRef90-UPIO00369A013 |  |
| UniRef90-G8QG41 | GNPKDFAVQQL WN SLKVIAVVEARELNLLNGKLIN |
| UniRet90-W5YNB2 | QSAG㑑 ELVDLWKRADEQLRQCQALNQHNGRVMGQKRL |
| UniRet90-U0EYQ9 | VLPPSGKVHVQWRELESLVKQC |
| UniRef90-U3ABE4 | FDALPKADQARKQWTVLHTLIKQCKQENTNNGSTAAQElV |
| UniRef90-A8G | ПARLPKAEQVANDWDNLDGLVRESKQDNEDNGKLLQQEVI |
| UniRef90-UP10003016BE5 | DARLSGRWQLLQQAAERARQANANNGMLI RMDYN |
| UniRef90-UP100036EFA4C | EQESP PTVAKAWRQLAQQWDECQHLNAVNER LQRTRV |
| UniRet90-U1/S |  |
| UniRef90-J2KVW3 UniRef90 C6XBV5 |  |
| UniRef90-A8A | 1 ARLPAAPSVSALWQSLQQQVAQCQATNEYNAMLMNQElL |
|  | LTHFPGGEQLQQAWQRLGQLASQCKRLNERNGKLMHHDIL |
| UniRef90 UPIOO | L KKQSSTV LLEQA WVSFQQKLVQAKELNRLNGILINNKQRN |
|  |  |
| UniRef90 ${ }^{-}$YOKI66 |  |
| UniRef90-A8FPB2 | 1 AKLPAQAQMKLLWENLLILVKESQRVNEANGKLLQQEVI |
| UniRet90_E3BPG3 | LGALPDAVEVRSQWO |
| UniRet90-L8JFN5 |  |
|  | LAALDSGPQVA\\|LWDKLKQLTHHCHNQNEVNGQLLALQS |
| UniRe | V |
| N2J4A8 | AERFEQDDQLIEAADQLTTVIEQCKEANNRNGQIINQYTV |
| P100047E |  |
| UPI0004188DAD | Q |
| UniRet90_UPIOOO47298CD | SGD AEAAPLWTQVLEQTRQAKE |
| UniRet90_L9PF | GADAAEATALWQALQQHAREAKELNRUNGML |
| UniRef90-17A887 | LAASCPGGGALQRHWQQLGDLARQCQQLNERNG |
|  | QLADVWQALLAKSASANETNMRNGALIDVHYT |
| UniRef90-UPIO0046F55DD | WNSLLEDTREAKELNRVNGMIVNRQQT |
| UniRet90-D5W6F6 | AST DARTATQWTLLQKAADRARRVNTNNGELIRVDYN |
| UniRet90_A6D2 |  |
| B8CVP1 | I ERLPEPEQVSMLWNNLVSLVKESKQMNEANGKLLQQEVI |
| P1 | QHGSAED KQV |
| UniRef90-K5ZON5 | AAKTPLGPRILEQADSLEAALNACRAANERNGRLINRAAV |
| UniRet90-K4KHL9 ${ }^{\text {a }}$ | DQA MQNWAKLEKLKQCKAANETGK |
| UniRe990-W9U | PSPEALIGNWTQLT |
| UniRe990_K5Z | S ${ }^{\text {SPERAVLQQFWQQLGRLAAECQQLNERNGKLL }}$ |
| UniRef90_UPIO00464EA35 | EPAVHAEDAEKWETLLGLARTARASNETNGRVRIRMV |
| UniRef90-UPIOOO3649 | ALEQEVQAANQRIGSLIELINST |
|  | ARACPVM |
| UniRef90 W6LQA | 7 |
| UniRef90-02C8H8 | I HALPHA历QLQQQWQTLETLVKQCHDLNQRN |
| UniRef90 UPI0003A8FADA |  |
|  | VEHCGGSPQDAELQDTLAALAAECQENNRRNGGLILQDRT |
|  | EESTVARDWEELLGLAD |
|  | MRNGAL!DVHYT |
| UniRef90-UPIOOO382A527 |  |
|  | QSNGQLSQHET |
| $\begin{aligned} & \text { UniRef90-F6AKK } \\ & \text { UniRef90-LOI3B8 } \end{aligned}$ | QCQQYNQSNGQSLS |
| UniRef90-W8G4U9 | RLPPNEHAGALWADLRLRANACHQQNHHNGMLLTQQDT |
|  |  |
| UniRef90-UPIO003A07E19 |  |
| UniRe | MSEH GTEADREVWAALFELLAQDAKELINVNGVLIGKATN |
| UniRef90_11Y | ACQNNQLNGGI VNRQYL |
| C5 | LGPEDQATRLRTLWQKLGAMASQCQQINERNGKLL |
|  | GDP S R RWQELCDLLEGQARAMNERIUGAL |
|  |  |
| UniRet90_UP10002EC9E57 | M R E |
|  |  |
| UniRef90-UP10003B39D09 | MQWLSDKETLLKAWCQLETLCARAQSINRVNGQLIARHLT |
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| UniRef90-UPI000 |  |
| UniRef90- B8KP21 | VSHCGDHQADIELQNQLIGLATQCQESNRRNGGLILQDRT |
| UniRef90- UPIO0036F76B4 | NSNPQLKPLIPAWEDFQRLLARCKERNETNGKLISQQTL |
| Uni | ALLGPQSRVTSLWNHLQQLVRDCQAENEVNGKLL |
| UniRef90-S6ABX9 | SRLPA |
| UniRef90-UPIO002DE | ELQQA WLQ |
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| UniRef90 WoA4G1 | W0 |
| UniRef90-K2K9H9 | DVAA LTWALGQRLSQCKS |
|  | RYPQAQHLEHTWEQLGQLAGQCKRLNERNGKLL |
| UniRef90-Q0A | LAAANHSSAVARDWEELLNLTR RLARQRNQTNANLVSLOYT |
| UniRet90-R70L3 | AAASADDAR DIAAWKALLDAALDAKRANENGML HLC |
| ei90 UPI00036260 | T |
| UniRef90-D5BW49 | VQASTSQEQLSTLWEQRQERLQQCRDQNQLNGSLI NRHQV |
| UniRef90-D8 |  |
|  | T |
|  | QKQVQQQWSQLESLIKQCHALNLRNGVL |
|  | RNFEECQTMNGINGKLTSQQTL |
| UniRef90 A1WUFO | LRTAP ESLRTAWGELEQLLRTMQARNEANGRL |


| UniRef90_C5AEH6 | $\mathrm{L} \mid \mathrm{Q} V \mathrm{~L} R$ |
| :---: | :---: |
| UniRef90-A3D9M9 | NR\\|L ${ }^{\text {N }}$ |
| UniRef90_E8LS05 |  |
| UniRef90-B0TPI3 | S QLL |
| UniRef90-C7RLC8 | A Q ALLEAL |
| UniRef90-UPI000369A013 | R N Q |
| UniRef90-G8QG41 | S AL |
| UniRef90-W5YNB2 | S RLTTD $\square \mathrm{FR}$ |
| UniRef90-U0EYQ9 |  |
| UniRef90-U3ABE4 | T QLLQ |
| UniRef90-A8GYM0 | NQLL N |
| UniRef90-UPI0003016BE5 | E R A L A V L R |
| UniRef90_UPI00036EFA4C | N Q TLDLLR |
| UniRef90-U1FS08 |  |
| UniRef90-J2KVW3 | Q N A L K I Q |
| UniRef90-C6XBV5 | EQFLNALH |
| UniRef90-A8AKI0 | T NLL Nl |
| UniRef90-S6BKW9 | A QLL G |
| UniRef90_UPIOO03765228 | QEKLDAL |
| UniRef90-UPI0002E2D6D4 | HEML N |
| UniRef90-UPI000467E403 | G T L L D L R |
| UniRef90-Y0KI66 | R N Q |
| UniRef90-A8FPB2 | T N L L N |
| UniRef90-E3BPG3 |  |
| UniRef90-L8JFN5 |  |
| UniRef90 A6F9Q6 |  |
| UniRef90-Q2SD54 | T K M M Q I R |
| UniRef90_N2J4A8 | A S MLLEILQ |
| UniRef90_UPI00047EE615 |  |
| UniRef90-UPI0004188DAD |  |
| UniRef90_UPI00047298CD | Q G A L Q A L R |
| UniRef90-L9PF74 | HA QLQALR |
| UniRef90-17A8R7 |  |
| UniRef90-B2JJ13 |  |
| UniRef90-F7T680 | QQS LDALR |
| UniRef90_UPI00046F55DD | QAALSELR |
| UniRef90_D5W6F6 | QRALK AL Q |
| UniRef90-A6D281 |  |
| UniRef90-B8CVP1 | NQ L Q |
| UniRef90_UPI00037A0FD9 | QNAMNI |
| UniRef90_K5ZON5 | G S MLLE I |
| UniRef90-K4KHL9 | S QLTQLL |
| UniRef90-W9UR09 | EQLLNLLQ |
| UniRef90_K5ZBY6 |  |
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| UniRef90-UPI0003649742 | RQAL NV |
| UniRef90_AOYG92 | GQ\\|LD A I R |
| UniRef90-N9V805 |  |
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| UniRef90_Q2C8H8 |  |
| UniRef90-UPI0003A8FADA |  |
| UniRef90-A4A621 | $R G A \backslash D V L R$ |
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| UniRef90-F0LR30 |  |
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| UniRef90-J2UQK5 | QSALTILQ |
| UniRef90-IIYI58 | QRAMS IL R |
| UniRef90-F2MWC5 |  |
| UniRef90-Q3SID5 | RQA L N V L |
| UniRef90_A0A024HHD6 |  |
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| UniRef90_UPI0003B39D09 | QEALD |
| UniRef90-A0A031GMX5 | HTQLNAMR |
| UniRef90-UPI00016A780F |  |
| UniRef90-UPI00047333D0 | R Q S 1 NFLR |
| UniRef90-B8KP21 | R GALLDVLR |
| UniRef90-UPI00036F76B4 | KRLVNLI K |
| UniRef90-E1SLF8 |  |
| UniRef90-S6ABX9 | QQA $\square$ A $!$ L Q |
| UniRef90-C4UZH4 | MQMD!L |
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| UniRef90-UPI000477F5CB | QQALDVL |
| UniRef90_W0A4G1 |  |
| UniRef90-K2K9H9 |  |
| UniRef90_A4Y0P2 |  |
| UniRef90-Q0ADD5 | R Q T L Y A L |
| UniRef90_R7X0L3 | QQAL NVL |
| UniRef90-A0A031MGH3 | S RLLDLLR |
| UniRef90-UPI00036260D3 | RQAL NVL |
| UniRef90-D5BW49 | LRALTI |
| UniRef90-D8ISX1 | Q S ALTILQ |
| UniRef90-Q12HZ7 | S |
| UniRef90-F2PDM0 |  |
| UniRef90-131АА9 | NHM M NLI R |
| UniRef90_A1WUF0 | $\mathrm{R} R / \mathrm{L} \underline{L} \mathrm{D} \mid \mathrm{L}$ |

UniRef90 W5YQ72 UniRef90_UPIO0047BE05A UniRef90_UPIO00374B3FE UniRef90-J3D906 UniRef90 M M QV91 UniRef90-F8H3J1
UniRef90-ROE158 UniRef90 ${ }^{-}$O7NZC1 UniRef90_UPIO00360D283 UniRef90-LOGV30 UniRef90-C4TUB4 UniRef90-UPI0004778C45 UniRef90-G4T3Y0 UniRet90-U1ZWM1 UniRef90-F9ZV24 UniRet90_Q2Y9F2 UniRef90-M5DGX2 UniRef90-S6HLW6 UniRet90_U4TGP2 UniRef90-Q47129 UniRef90_10HQNO UniRef90-K0C286 UniRef90-W8KIJ4
UniRef90-TOALS3 UniRef90-UPI00047B6689 UniRef90-F5REB9 UniRef90-UPIO0046A6FBB UniRef90 N6Y099 UniRef90-R7X6N7 UniRef90_10QMQ9 UniRef90-A9IKP3 UniRef90-M1FEU2 UniRef90-G8UT82
UniRef90-B8GQA3 UniRef90- ${ }^{-} 6$ Y879 UniRef90 F4GPG8 UniRef90-R4XOL1
UniRet90 O1N310 UniRef90-Q1N310
UniRef90-Q46PG7 UniRef90-T8SVI8
UniRef90 - T1XH27 UniRef90-A6FHZ8 UniRef90-R8AS58 UniRef90-C4KAV0 UniRef90-S2K157 UniRef90-F4LHW6 UniRet90-A1K954 UniRef90-D5CMW6 UniRef90-UPI00035F725A UniRef90-A0A052JDN6 UniRef90-UPIO0030CED55 UniRef90- F1VUD9 UniRef90_13ICD7 UniRef90_UPIO00475C907 UniRet90-F9T9X4 UniRef90-F8GCQ7 UniRef90-UPI00045EAD24 UniRef90_UPIO003662B09 UniRef90-UPI0003B3C656 UniRef90_UPI0004789C91 UniRef90-W0V3U8 UniRef90_-V5PYS7 UniRef90-A3NFX0 UniRef90_UPIO0030AC241 UniRef90-UPIOOO3661214 UniRef90_S611T0
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UniRef90 E6RNS9 UniRef90- A3NQD7 UniRef90-H2FTK4 UniRef90-Q6LW34 UniRef90-C1DCU2 UniRef90-D9SEX0 UniRef90_UPIO00362A459 UniRef90 Q2BQU6 UniRef90_UPIO00255A676 UniRef90_UPI000371DF67 UniRef90-UPIO0037DD480 UniRef90_UPIo003791FBF UniRef90-l9BWE4 UniRef90-Q1QW25 UniRef90-H1SEP5 UniRef90-UPIo00367F9B4 UniRet90-M5DUT7 UniRef90-H8GNE7 UniRef90-TONEIO
UniRef90_B5SA72

DSLLDCLVRETALVSEFSVLLEAETQALVNREADQL

 QHIQQFVVRSLAEDDKLYQQLLELIQQQKTLYLKFDGESL

## MSADE Q

FVSYCRDEDE IVV
 LS GLLNCKUELLEGLEKVLIAAEATAVVCSANYDEVV

MHDT
MLA A HL
$V^{1}$

MTDSDQLR A LTQ TGQECAHTVMAVL

 SDQLIELI QQLEHISGQLNSTLKKEQAVLKLKDSQQL ITDELALLIEAEAMQLGEFLJALERE AARLSALMTEEAATLRVALGHLRAE ADQQRLALLIEAESMQLGEFLSLLDREE IVADVDADLGDYRQLIETLDVLEGLLVKGETDAL MAA SLLDCLARENALVQEFSATLDSETHALVDRTAQQL AKTLITQLEQEINWVEELNTLLSEEKEILSTSQFNQL MHASAQRLDLLNQAVREACLLESALERESNALAERDLQAL

## $\| T$ $A$ D MSDADALLATVT E

SQPLTQSLQKEA पQQVKALLQGIRDD R TTLPELL
 ADRQRLALI AEALQQQLQPELQREEALQQRDSRGL MSRREQLLRVI EEDFQAYNRLVELMNRLGHLLLLVRDAVQL SLV D A AQLLESSLLA AVD
$\qquad$
FATLLVTETQLLEGLGQALQEEYLALCOKQALAL
$\square Q A L A S C L E D E T A L D L Q F Q A A L Q A$
RDDEQDCTDYQCLQGПMQS【YE
A पLS LIEFQLKNAQELTEVLEQERA
(
MSDYA QLLGDMRSDLADYQQLETLLEQQFRGALSHDAANL

QA TRVLRGVSDDAAYGALLELQEQQFQAALRHQPARL
IDALLNALSVETNATGAFAALLGEEQQALVSGTLDTL MTQA ALI QTLLADTNACAAFGRALADEREAAKRQDYQAL MKDV LLNTLDEEHATLEAFASLLAYEQKALAESPLEKL MSQREQLLKVIEQDVHDFTRLHGCMSHLQVALLMARECDA

SNALVGLLHREHAATGLFLELLGLEAHAMTEGLDTEL ERFSRILQRESEATEQLLALLKQEYALLKSAPAEQL
 QLWQTLQQERQGYEHDHRLLQHQARLLT

QHDARHLGEETAEYEDMQALLADEQRALI QQHATMOMCOEV ADHTTLMTAFSDERDAVRGFVDLLLQEQSLLTENSIDPD QFSLARHDARQRSHLETLIELEAERECLAHGHVDGL

A D AK AL
LLDLLRKNLDTLIQLDDLLAQERASLERNQMEEL
QLLMVLRDENSTVRLLEATLREEAEALLAGERARI
SLAETLDRQDDAMQRFVTLLREERQSLTQGEDDEL

ITKDLKSVLKQEIVNVNNLYRQLNQEAENLKQTPQAELL


UniRef90_W5YQ72 UniRef90_UPIO0047BE05A UniRef90_UPIO00374B3FE UniRef90-J3D906 UniRet90-M7QV91 UniRef90-F8H3J1
UniRef90
ROEI 158 UniRef90-ROEI58 UniRef90_UPI000360D283 UniRef90-LOGV30 UniRef90-C4TUB4 UniRef90-UPI0004778C45 UniRef90-G4T3Y0 UniRet90-U1ZWM1 UniRef90-F9ZV24 UniRef90-O2Y9F2 UniRef90 Q0AA95 UniRef90-S6HLW6 UniRef90-U4TGP2 UniRef90-Q47129 UniRef90-IOHQNO UniRef90-KOC286
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UniRef90-Q46PG7 UniRef90
UniRef90
T1XV18
T1 UniRef90-T1XH27
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 $\begin{array}{ll}D E & T R Q K Q P L A Q E L N L F A K Q L A Q L E E T E K L P N T P A G L E R A \\ D S L D D K Q P L L A L L Q Q H G G E R S R L L A A G L S A D R D G G G A L\end{array}$ ASLAAHKKDVVAQLEQFSKQLGQVLATEKLLVSQEGIHSY LP AVEKASHAQQLAGLTEAREQWLGMSGSLJKDQGDMER LTLAREKAQQARQLDHLADVRNRWLTTRGCTRDRNGMEQG
 QQ AKAKETCLTQLSPLALAHENLLDEKNYDCTHEGMLDY TGGGQQKVELVGQLNALEFARSKVLPRQSGETAKAAMTRW LELLSDEKKALVTHLENHTKTTHIFLRNMNDNKGLYGFSDA NAAVADKQSRVQALEALTRQQTELLQREGYETNAHGMDCV

## $\stackrel{\mathrm{Q}}{\mathrm{P}}$

VA ANEKAHQAQQLAQLSDARNYWLRKLGYTQDHIGMERG
 MAMNDRDMEYYGQLNDRAQRRLQLFSLLGLPASSDGFEGV PELTRHKESLALRLAALSDHRDALLEQMGLPEGHEGTEHA ETLAEKKQELSTKLEASAKQRVDLIKESNPGDKPHGLSDF
 AVSTAKKDAYARQLAQAAETRQTLLATLGHGADRTGLDAA PGIIENKTALTERIAALEQTRDAQLNALGFPGGLVGME
DETAKNKRQLLLTFEKQVGSRQDYLSTHSVTADEDGLK SL LA PSLTERKAGLLDRMAADDQARESAQVARGFEPGRAGADAA EKLSPEKQQQI T Q TAELDVK
TDSNHQLQPLLHTLQQRATERCQHLQALGLPADDNGMQAL VVLCQDKNERYRRLQRLSDDRSLLLGRFGQAVSDTVIRDW DISNQQDTALLDAAVVRVQRRRKVMEAFRLPVDEQAMEKL QAAVQRKETLADDLAQLGAERDALLSGAGLASGPAGTDAA LPLAEAKVQLTNKIAALAEARQRFL RMGPPGTNDMAGW FDLAKKKSDIAFQLQRLADSRDTVLAQAGKPHSRAGUQAL KEAAEHKEMLADKLVAASQERDRLLAAMGLAPGHAGTEAA
 ELLNQQULVLIDFISTRATRRRKLEADPAAAGNQGDIDNL GHLAGNKNRLVNRTEQLSKQLEDLLSMEQLPCHQEGURTL EAIAKKKVVLIEQLQSTDERLRRHPEVDNLSSD
DYLASDKSRLIEELDQFDDHRNEDRKQGLSLEKNSTNAW
 LNVCERKGTATMRLDQLDRARRAVLEQQGFTPDRTGSDLYY SALATHKKDLVAQLEQFTKQLGQVLATEQLVVSNDGDEAL SALAESTNAAVDGMEQRRRQRVSLVR GGLSGAGGTMNQL MAAGSADRALVQALGTSHEARRQCARVLAAPKRPASMSEL AELIGKKMELAQALTRATAAREAQMILALLNLRLGPGG TTANEQTSALMDAAGARARRRSRVLEVFHLGTDTHAMQSL EALNQQKEQQALNVAQAVEAHNRLLRELGLNNNGEETRKL ETHNKKMLGFLESLNESHNQRDGFLVSLGLQGGKEGLAQL LSHNPQQTTLTGQLAELAARRDTLLAELGVASPEQLCHKL LTHNAELQQLMQQLNNHAQHRGEHLIALGMTADDAGMKCL ARLTERKAAQAKTLEQLDGQRRALDHERGYSTDRDGASQLD LOLAROKQETFVLLEQLESQRVTAQRKLGYGEGRLIG QS SDNTQEKTGLLNRFHNFTLERVELLKSFSTETSKEDYSSA EPLADKKHELSSKLEESARQRMELLHHSDTNTSSASLNEF DELLEKKKPLLLQLQNNARERTDWIKNTKLPKKR LIFK/L EETAGRKQHQLNHLAGLDRERRQWWATYYPMDDPYGLPRF ERLAEAKSQVAAELETLDAQRRDVMREDGHGESRQSAERA
 DGUASNNQLVEQMERVNRQLGELLALGKLPHNREGMSLC ERLTETKQQQLGRLTEADRERRLWWAQHG GADPYGLVKY

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UniRef90-TONEIO
UniRef90-B5SA72
UniRef90_UPIO0036F6DF9
 AAQ ADARLSETWQVLLARAAKARELNDRNSALVSLRYT FQRTEAAVELTGNWAKLMSLCAECRALNEQNGASIELLAT
 Y DWLADKPSACKEWTRLEDAVNRAQS INQLNAAFVDEAQV FASGPEWTACRKPFADLLELAREAHDANLANGLMI QMKSS VDASADDELTAAKDAARRAALNCAAHNNVNGSLV AAAAAGPQVQKAWEELLELAGQARGHNLRNGSMVHLDFT $\frac{\square}{\mathrm{A}}$ A LAKAASGTNTADSWLDTATLTKTCRTLNEKNGASTDLLST RILADHPTAAMAWQELLQLTETAHRINEDNGILVNQRYN L QSHGSDGAADDWRELLQLAEKASQLNKLNGLLI GQRYN LRERSDAGLEAEWQALTRQLQALQRSNEANGRLI HRSQT TQQEVSGAQAKQLWDDITLALRKCKQINEANGLVINQAQU LASEPSDQEAVANWKKLMELARRAKQLHELNAQLI NLHQT LEPLPAAEAALQAWRTLETRLQACRRKNTRNCELL LLSLAPGTLLEKAWSNI QALAEDNKELNQTNGSIINRRHT LRDWDEEGVLRPVWDRLVEVMSHCHRLNQVNGGVVSRRRV CTGLP R RVLARWDEVLELARSARARNELNGKLI ASLGVRKQDLLTLQDKLKSAVENVSQQNRLNGKLVKKAYD FASGPEWAACRQPFADLLALAREAHDANQSNGEMIQMKSS CAGLP RVLARWDEVVSRARQARDRNALNGQLI LQWLDAPARFSARWQVLQACAARCKASNARN

 LKNCADGITINHLNNTLAERLNLCRELNTINGQVIANNMY LRAWDEQGLMSPLWDRLQTVMGRCKRLNQINGGVVQRQQV FGNLP

RVLVRWDELVSAARQARDRNALNGKLI
ANEYP ALLAASDRLLEQTRKASEGNASNGAII DLEHN

 FA
AAADGEAS LAAWTALVELAQAKACNRRNGSMVQLDFT
ADAAALLTTYLAQKQQIETELSQCQELNDVNGKLI
FRALPLSASAQQQWQQLHQLIQACQQQNSRNGKLLAQQ
LLAGLP ARVLARWDEVLGLARTTRERNALNGKLITERMA
a

LA G
E


A A
 AAAHPF
VAAHQPSD ELAPLWQALQNHAAQAREANQRNALLVNLRYT LCTHQPSD TRWTALLALGAEAREMNRDNGMLI GRHMM FRRAESASDLLARWSQLEGFVSETKALNERNGKLL
 LA QLPTAP RQAALWATLRERVAHCKTLNERNGRLL AREHDLDDS A WQRLRELTETASQRNRLNGFTIER LIRHPGGDALVRAWRRLTALARHLADANRVNGALLERQQV I EALLQGAPQLETDWAALEQMVLECKRLNQRNSHELLTEQY AA ADARVDAAWKALLAAAAEAK R RANDTNGVLI LIGGPALEPGVAEAWRKVVFFAHKARDANELNGALVNAHDT AGAGDARVANQWKLLQGVVQRARHANLTNGMMI RVNYN DDGYPPDATLVRAWKTL VSVERCRDLNERNGKLLAMHS AAAAAGDAVLKSAWQQLLARAAEAQAMNHRNGVMVHTHLT
$I D E Q D G S G L L Q Q Q W Q A F L E Q V A S Q K Q N G I N G G L L S Q R Q A$ IEQLDGSGLLQQQWQAFLEQVDASQKQNG\|NGGLLSQRQA AE NDARLANGWQLLQHSAERARRANA DNGMLIRMDYN PAPLSGQLGELWQALLQQARLCRADNDGNGRLLASQ
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| UniRef90_W5YQ72 | S |
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| UniRef90-UPI00047BE05A <br> UniRef90-UPI000374B3FE | RQSSLLDAL |
| iR |  |
| M7 |  |
| UniRef90-F8H3J1 | Gsm\HTLQ |
| UniRef90-R0E158 | QSALT |
| UniRef90-Q7NZ | ESSLDV |
| UniRef90-UPI000360D283 | QQAL |
| UniRef90-LOC | L |
| UniRef90 C4TUB4 |  |
| UniRef90-UP10004778C45 | QQALHFLQ |
| UniRet90_G4T3Y0 | RQSLN\\|LK |
|  |  |
| UniRet90_F9ZV24 |  |
| UniRef90-M5DGX2 | QQAL |
| UniRef90-Q0AA95 | A Gl |
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| UniRei90-UPIO0004789C91 | Q $\square \mathrm{R}$ |
| UniRei90-WOV348 |  |
| UniRet90-V5PYS7 | QQA $\mathrm{SS}_{\text {VL }}$ |
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| UniRef90-A3NQD7 | ERTLSVLR |
| UniRef90-H2 |  |
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| UniRet90-C1DCU2 |  |
| UniRef90-U2E1M3 | NRTLSFLDQ |
| UniRef90_D9SEX0 | HNQ |
| UniRef90_UPIO00362A459 | Q N |
| UniRef90-Q23QU6 | NQLLS V/R |
| UniRef90-UP1000255 | DQLLALLQ |
| UniRet90-UP1000371067 | QR VNAL |
| UniRee90-UP100037DD480 |  |
| UniRei90-I9BWE4 |  |
| UniRei90 Q1QW25 | ARMGNFTK |
| UniRer90-O1QW25 ${ }^{\text {UniRet90 }}$ | Q R MLIN F Lk |
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| UniRef90 Uplooo367F9B4 |  |
| UniRef90-H8GNE7 | HRSLQLik |
| UniRef90-TONEIO | NSML |
| niRef90-B5SA72 | QNALAVL |
| UniRef90_UPI00036F6DF: | L |

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$\mathrm{N} N \square \mathrm{~N}$

 K A CLI SA ALLIA
PEVQRTAQLIDTEAT LLQGFVALLEREESLLIAGDADALL
DIK QLISILQGETEVYDQMLELCREETKVLVAGNVARL MS QHQAFALAL EQA DDLTSQLETLLLEETAAVDGRDPEHL MSPTAPLMTLVVQQRECVQALQTLLEQEASIIASRVSDDICl VNALCSHLEQEDNWVASLNALLAEEKGLLETRQFKQL MRDMHADLGDYDALREALQRQFAAALKHDSERL ALLAG $\square$ AADMQAYAGLAALLEEQFDAALRHQGPRL TRLLRGVADDVPAYQALLLLLDEQFDAALRHQSARL
 AKQLIEEVENNGKLHKGLEELANKKTEVLKKGDTEAL D EL I A V L G
 MS SQSLIQNLARETELSKEFAAVLGE

VTHLT S LT QIIM

 LQRHI AQQQGQLETLSALLQQEKVAlIANRVSKDI | $T$ |
| :--- | :--- | :--- | :--- |
| $N$ | $A Q Q L R G N L E A Q R D C A Q R L L G L L Q E E$ MESLNKL QQTLEEMTDAHSRLLVLAEEK


 SLL QELEAAETRH MSSFEQLLDVMHSLDAAHHSMLDLAEQKKHALIRGDVEEL $M D S \square Q K G V D I L D K E C E L Y S G L L D L S K K K T Q V I V D A$
$S L A R L L S D Q Q K R L D E L V A L L S R E Q T L L T P G D$
EEL 1 TVLGQEKE IVEKLIPISERKTAILIREDLPE
A L Q GLV E FQLKNAD DLSELLKKKEQGAI AQRDSKE I TEDLKKVFKALITTLHELDQKAQEKEAVVKKNDI EGL $R V K Q L 1 \quad$ GVGQDCGRYAELQQQLLRQHSLLAAHDVNGLL
$F H R T U V S D F Q V A C A L T$
$M$

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UniRef90 H1G2X3 UniRef90_U1ATQ4
UniRef90-A6GSX3 UniRef90-V2IRV3 UniRef90-UPIOOO2376046 UniRef90-WOTKY2 UniRef90-C9QLN2 UniRef90_K0CJI6 UniRef90-F2LY23 UniRef90-UPIO004743CC2 UniRef90-D5WVS3 UniRef90 F9ZH31 UniRef90_UPI000470B041 UniRef90-H0Q125 UniRef90-F3ZWA7 UniRef90-H8YZN6 UniRef90-FOG8C3 UniRef90_UPIO003958E3C UniRef90-G9EKX9 UniRef90_UPIOOO35C1B22 UniRef90_G3ISW1 UniRef90_UPI0003671C47 UniRef90_UPI000373AF35 UniRef90-G8Q798 UniRef90-F8CXT7 UniRef90_UPI0002D91E72 UniRef90_A1HT58 UniRef90-S6HI21 UniRef90_U3C8Y1 UniRef90_B7VKL4 UniRef90-A3Y8T3
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 E QL AKEKLTLI NQLQQTADQRDSQHPDVATLTND

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 QQVTENKTSLL ATMQYLENRRHE TES L ERIMKEETPLISRRLEKLELARRQWLQQQGIVAEDATMMQL A EHNQR Q T QLMAAVQQQAQQRCQHL LALGGLKDEKGMATV
S C T N D K I I A S D D A L R K N H L K R R L K V V A A E K L F S N N R D G F K V T A L A D QV I A A V E P L D A R R R Q RVVSLVVTA L L GP Q GDMA QL F T

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A ATAK QK LTL LUQRIQLLCDA QISKCPEST SSPSNDATTQKG


A EVA QR K Q A L L A R L E A S E K LLR Q GVVQHRLLGYA D GAA G
$K E A A E R K E A L A D Q L V A A S Q E R D Q V L A G L G L E A G H A G T Q T A$
HRVTE QK T F L L S A L DHAERKRQQLVETLKVNA


E S IA K Q K LT L V N QL Q Q T D QR I A K H
DKFLLKDEQKYVK A E QVERERQHTVASLGNQSQSTSLT DV $H L A G Q D K Q A Q L D R L E Q L D A E R Q Q L A R A V$

 SETTEEKEQRLADA L A S V E HRRRRETMMNLLGKRP D DVVKVMDV S A LLAA DEQKHIFAI RQLEERRRRWLLKE


| UniRef90_H1G2X3 | EQA\|LH\|LIR |
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| UniRef90-K0CJI6 | $N R L L N A L R$ |
| UniRef90-F2LY23 | GSLLN |
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| UniRef90-D5WVS3 | R Q M $\square_{\text {d }}$ |
| UniRef90-F9ZH31 | Q N LR |
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| UniRef90-H0Q125 | A VLL ${ }^{\text {a T Q }}$ |
| UniRef90-F3ZWA7 |  |
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| UniRef90-W8X529 |  |
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| UniRef90_UPI0002FE946D |  |
| UniRef90-UPI00037816C2 | A R L S D V V |
| UniRef90-A4BQE4 | $S A E L G L L Q$ |
| UniRef90-K2EFG6 | H N Q |
| UniRef90-B8KBZ8 | S |
| UniRef90-11DWP8 |  |
| UniRef90-FOLUM9 |  |
| UniRef90-V6MKG8 | R N S |
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| UniRef90-Q2L1C3 | T Q T $\square \mathrm{E}$ A $\square$ R |
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UniRef90-U1LMP7
UniRef90-EOSIL5
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UniRef90-B4BNA5
UniRef90-W1N7E0 UniRef90_UPI000463833F

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FSTLPKA LQEQFETLDQQI TCNDKNTVNGLSVQNSLN A ERFP ELLTDVKTELENVVMNGKEVNELNNQLLKQA AETIFPGAECALQRAEIDALI RACKARVARNGNLLAMQS EKHVDQAEKDREYKKHMTSIIEEDKNINEVNSRLI ISYLEEQPQLMEVKERLLQTGKEMAA NEQNE LLLNQA LA S NLS DD PDDWQTWNQARQSQQLNEQNGKLI EQQFQ LS QRPQS RRLAEVHDRLKSVTGSMQRVNEQNKELI PQSTFSDEEVVP LTEQVKALLYHCKKQNDVNAQAAHQATV KAPYSNHAALEQTWQQ】TALSESLRDKNQHNGLLLGYH

MANGEERQQLRECGDRLRAAVNALSEANEDNRQLIEQS AYRAACDAGCEDLWEQLRQRAEDTAHANRRSGEILQ VQQTTTTDEYK IWRNNFHDVLRSCREKNEVNGKLIEMNLV
lupas_21
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| lupas_28 |  |
| jnet |  |
| conf sol25 | $\begin{array}{lllllllll}  & 9 & 9 & 8 & 8 & 5 & 1 & 8 \\ B & B & B & B \end{array}$ |
| sol5 |  |
| sol0 |  |
| jhmm |  |
| jpssm |  |

