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K Q P E P
 H M SVKRLRRWEQVENSEGTワWGQLGEDSDYDKLSDM
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 KLK QUH WD KLE DVVSETVWS QE GERQDAAR L E S S K K K RMRNFFWKTI P EE QVRGKTNDWT DAARQQHQ $P \square T P S K K L K Q L Q W D K L P Q Q Q H T V F N D G E P D K W I Q R L R D D$
 K P IVK T K F RMP V F F N WVA K L K ALLH WEKV DSPQT THWA A HEREEKY LDEL S R K HMSVKRLRWE QVENSE GTDWGQLGDDPDYHKLSDM
 K E Y K P V VP L L R R A N WS Q I R PKENSFWANTNEEKFEN PAPKAKMKTLNWGKI PPHKQNLW TIVAHNHQDTTMED
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 $R$ VN P P T L R M K K L N WQ K L P S N Q N S M W A T L S GP G

 K P $\square$ Q T K Y R M P L F N WD A L K L

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## G

## G

GVWEIFEEQFKTKAQGPKMKVVQKAPSKVSLLIESNRAKNGL



 GVM S DFE E Q F K T K S Q GP K G R A T Q K G P S Q A T L I E A N R A K N L



 V K Y LDDL D L Y F GT QRRNSISSLPEPPTKK K DVVVEI L SHKKA Y NA

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QUERY
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 RSI DKAVQAI QASNSLRHVFDVILAVGNYMNDSSKQAQGF RSI DEAVDSIKQSKHLKGVFEI I LTVGNYMNDSTKQAQGF

 R


## L <br> $\stackrel{\rightharpoonup}{\mathrm{Q}}$ <br> 

 R A I A A SMSIKSSTKDKKILEIILAFGNYMNSSKKGAYGF DCLAEAGNSLLNAKSFKELLSLILLVGNYMNGTKGGAFGF NAIIAASASVKSSQKLKHMLEI I LALGNYMNSSKRGAVYF $R Q V V T V S E S L R D S V S L M N V L G L I L D G G N Y M N D A N K Q A R G F$
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 RKLDEACESLKNAPMFKELMGLILLI GNFMNGGAFGFKVS KYLRDASKELRASERFKRTLKAVLAIGNALNMSTFRGHGF DSLIDAASMSIKSSEKLKGILELVLAFGNYMNSSKRGAYGF KALSLASREVVQSGTLRQLLEVVLAFGNYMNKGQRNAYGF RKLSDAGKSLLGASNFKELLNLILLIGNYMNGTKGGAFGF NVVNAASEEI RNSVKLKRIMQTILSLGNALNQGTARGSGF

 DALIAASMSVKSSGKLKKILEIVLAFGNYMNSSKRGASGF NAMLFAGDNLLNNKLLQEVLYMVVVAGNFDNAGGYAGKAV NAVIAASVSVKSSPKLKQMLEVILALGNYMNSSKRGSVYF KKLFEAGKALLDAKNFKELLSLILLI GNYMNGSKGGAFGF QLVLNACERLLTSHRDPIFCQLI LKGGNFDNYGSHNADGF E L L QRVCKTL QS SEAVLQVLGLVLAFGNFMNGGNRQADGF NA A A A SVV V K S S QKLKKI LEVILALGGNMNSSKRGAVYF
 VS IKDSKKLRSVLEMVLLVGNYMNSGSRNAGAR DVVHEASESLMSAPRF DEMLKLVLLIGNYMNAQKGGAFGF D AI MAACRTLKASKHFGTLLELILVFGNFMNTGTGNAKGF A $V$ V SNVKDLDQCKHLRDIMGLVLAFGNYMNGGNRTRDGF ASVI AASMSI KSSGMLKKVLEIILAFGNYMNSAKRGAVYF NSIIAASMSIKSSTKLKKILEVVLAFGNYMNSSKRGAYGF Q AVASACEELRGSEKLKVIMKNILLIGNTDNEGTPRGQGF MAVSAACEEIRKSKSFSKLLELVLLMGNYMNAGSRNAQTY KALSLASQEVVQSRALRQLLEVILAFGNYMNKGQRNASGF

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 $N$ VVNDASEQURNSVKLKRI MQTILLSLGNALNHGTAR GVGF

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 ELQPVLDVVKVSI EQLVRDCKEFQGILNVGRSVELGKLS
 DLQPVVAASRI AA EQLLOTDARKYIDNVKNVOMSLDNGNLS
 DLSGVVG|AKLNVDQLRTVAKKYUDNINNVGSSLDAGNLS ELYECNSLEKVDVDNMMOAKRFARNINNLGASVDSGSLS DLEFLTETQNVSIEQLEDDCKAMNKEVETINNSLQQGKLS DLNVLSTVHNISUEQLETDCEEMSRSVKNITDSLERGKLS


 $D L P T V P L A A K V N Q R T L T T D L N D L H T T I S E I X E A C H S M P A A$
 E L R F V D K A A A V S L D SI L L D D L R T L Q K GME V TAR K E F M V Q D D N ELAKPA EA Y R V N L Q D L R K GILG DL R E G L K KI R T E LA D H Y

 ENI QMSTDSGNLS


DI AKVEDLGKVTLEHVELECEEFAEKVGSVVYSLTQGKDS DLSRVLDLGNLMVGQIEQDFHEYTQRISGVVQSLEQGRLS KLHHVQDAARLSLDNTEAELHSLSARTRCLRENIQR ELAKPAEAYRVNLQDVRKGLSELRTGLERIRQELQADHFS ELSKPAEAYRVNI QDTRKDMGELREGLRRIRQELNDYYTD ELHYDEKAAAVSLENVLLDVRELQRGMDLTKREYSMHGHN DI SGVMTAAKI NLEQVQSDAKRYIDNDTNVQKALDSGSLS DL $\quad$ TVVPLA AKVNQRTITADLSDVHSTIQDI RTACVKIPAT CVYPLPEASQMKFEDFTKDLLKLRKDLRACTVEVESVC ELDHLEKASKVSAETLRKNLKQMDRQVQQLENDI MTFPPP ELSNLESASKTNLEQUGDDIKNLDSQLQKI KRQIEMPNTD DL R KVEN L G NVT L D HL QL E Y D DLLS S KI NTV HR SI QK G QL S

 D L H F MDKA ATVS LDGLLADVKSLQTGMEQAQKEFTKQDD ELPNVP EAAKVNMTELLEDFGNLRSGLNSVEAELQYQRGQ
 DLTHLEASTKI QLKFLAEEMQAISKGLEKVVQELAASEND DLPTVPDAAKVNQRALTNDLDADLHGTVSEI QAACQSMSPS DLSSLEPCAKI QLKFLAEEMQALSKGL EKVVAELSMSEND ELS TL QS SAKL SVE QL SLDDIESYVKTIKNVESSMENGNDS ELHFLDKAALVSLDSSVLQDLRALQRGMELTRREFAAERES QLSNLEDASKTTTEQI NSEITTLENRDRKITKQDELPTTD ELHFVEKAAAVSLENVLLDVKELGKGMDLI RKE
ELEKPAEAYRVNLQDVRKGVTELRNGLKRIRAELKDHY DLEQPSQAA GUNVEDI RTEASANLKKLLDTERKVSASVPE EPQDLFQASQMKFEDFERDLDRKLKKDLNACLGETEKVCKV ELHYVDKAAAVSDENVLCDVKELQRGMELTWREFSVSHNA
 ELHFLDKAALVSFDSI LDRNRALERGMELTRSEFSAEEEN ELRDLERAARMSLATI GADFNDLRKGDEAVKKELELSVNA ELSKPAEAYRVNLTDVRKGLGDLREGLKHLLLELENHHFN DLQACEAPTRITYSSLQADUAEVRGGLRLLENQLKGVTDK DPQDFFQAAQVKFDDLIKDTRKLKRDLTACEKDVQKVCAN ELRYVDRASKVSFENI LSDVGSI RRGMNLTQDELETHHHP EI HFVDKAALVSLDGLLQDIDSSLERGMEMTQKEFAEQDDS DLGSLEAASKLQLKALAEEQQAVVKGLEKVEQEL DLQHVDKASKVSAENLEKNLKQMEKQLQQLEKDLETFPPA ELQNIPEAAKVNMTELEKDIGSLKSGLKCVEAELLYQRAQ ELAKPAEAYRVNLQDVRRGLTELREGHKRIKTELEEHF DLVSLEATSKI QLKMLAEEMQAVSKGLEKVEHEFKASESD ELHFLDKAVLVSLDQLLADVGALERGMELTKQEL E I A A I TRSAKVDFDELAESLSSQLERRCKASWDSLKAD TFPSLEAASRCQWKEMVA QUTFLQDGDANLQKEVEMQ CVFPLPEPQDLFMKFEDFQKDLRKLKKDLKACEVEAGKVY DFAHLDKASRVSVEMLEKNLKKMGRQLQQLEKNLETFPPP E L D H L D P H V R E A S KV S L G E M D K D Q Q M L R T GL A DV A REI E F H R S S
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## QUERY

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A
RFAVVMSGFLENSHPAVQSLESLQQRAMEEF
QVSSKEHDQPFKENMEQFI DQAKDDQEAEENSLTETHKCF EEDK FAIVMNSFLESAHPTRQSLDDLQHKAMEEF DASVFHPEDK\|LNI 1LPFLPEAKKKVGYIQDHFNSMETTF A

AEIDQDEEFGKQMWS A E D DSSKFHPKDKFLLVMENFLENSHPAVQ DPKQFHPQDRVSQIARGFLGGSEGQLERLQRDARTAEDAY QOSNLHPKDFURKVYKDNRAKTKSODDWDYKDISKTY E E D

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ASESDGPVSEVFRKTLE E DPQ GMDKFVTKMSSFAAYAKEVYLKLAKMYENMEKLY ADDDPGDRYAKQMWTFVGRAGAQ円ADLTDDVNAADTRF GPVSEI FREKLKEFTDNAGADVQSLSSLFSEVGKKA

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AEEEERLY ПK DE A ARRNEEN L EEEAQRRNEEN

REEE $\square R \square Y \mathrm{E}$
LEETRKRNEA YEETRRRNEA REVENRAYEA

LEDQWRRNE
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$\qquad$
REESM R RIYE A
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## WKKAAAAQEA

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$V A E E R A A R E K$ AA DEKRAVEK RKRQEQLMME

LI L Q E R L K
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A E

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Y A EEKAS $\square E K$
RAAR
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 K K Y S P E V $V$ S M K R Il K P $\square$ K T K F RMPVFN WVAL K P N Q KKRMRSFFWKTI P E E QV RGKTND DWT DA ARPQYQ
 K P S T K M K QLL NWTKIIPNNK S S Y W K K DV TE VG DE K P NVDMRALFWTRI PVNQSTVWS S L S D T S V SLLEPF D


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 $K P \square Q T$



## VID

 P S CPMK P L Y WS R I Q $\quad$ DS S K R I WE A$\begin{array}{ccccc}R & P & L & K & P \\ K & P & L & L & L \\ K & A & L & L\end{array}$
K P NVEL R P L F WT RVV R $\quad$ RNS S T V WM K
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K Q Y K P EVVQLKRPNWSKI TASEKSFWTKVKETKFEDD





P A K KL K P Y H WL K L R A VNGSSLWAETQMS SEASKYABD K P K L K A LLH WD K V R A T S D TVVWD QLLK S S S F QL N E DMM



K K WE V K NPMKRANWKAI K M S D K S FWVGKCEE DKLLA S D DLLLA
K P $\square$ K T K F R LDPVFNWTALKPNQGTVFNEDDDEKPEKRRARE

K K R K T V K L F WK E L K H P D S S R S C K FGGR G T V WA S LD KV
$K P \square K$
P K P K L K T $\quad$ L H W D K V R A S S D MVVWD QLLK S S S F K L D E E M I


## K P

 IP T P K T K
 K P P R P S R P M R P L Y W N R I D K N N D T L WN N L E E P K IL L A A N E F E P $\square E P S K$ P MK P L Y WT R I E L H G K R V WE A V S E P K
$P$ S V K L K Q L Q WD K L


P S C P M K P L Y WT R I Q $\square$ N N D K T L W D S L E E P H DR D T S E F E
 $K L Y K P E V Q L R R P N W S K L D L S Q D C F W T K V K E D R F E N N$

P P P S K K L K PFF WD KV STA G GTVVWGQLGMM GGQVDLLTD L
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UniRef90—13J5A5
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 NAVHMAAKELKGSMKFKRVLQAVLTGGNALAGSTFRGRGF QTLEAASKELKNSRDFLKLLEAVLRTGNRMNVGTNRGKAF RKLEEAGEALDHAKHFKEVLNLILIVGNYMNGTKGGAFGF NILRNASRELRSSLKFKKLLQIVLTLGNVLNGSSFRGGGF
 ETLEAACEELRSSRLFIKFLLEAVLKTGNRMNVGSHDADGF NAVIAASMSIKASTRLRQILEIVLAFGNYLNSSKRGAYGF ETLEAACEDLRGSRLFLKLLEAVLRTGNRMNVGTNRGKAF
 QTMEAASDELKNSRLFLKLIEAVLRTGNRMNVGTNRGKAF DTLVAATDQVAESDKFRRVLEHILADGNYLNGSTPRGYGF NALYAGDNLDSNTDLHEVLYMIVYAGNFLNSGGYAKKGV QTLEEASLELKASRLFLKLLEAVLMTGNRMNVGTNRGKAF GSAKLKRIMQTILSLGNALNHGTARGSGF VSVTAACEETRNSETFAKLLELILLVGNFMNAGSRNAFGF KLLRSATKEMMCCKELHAVLHLVLQAGNGLNAGAGNAVGF QDLKEGMEQLEKNKTLRYILSTLLSFGNFLNSSS AAGGF TILRSATKELMSCEALHSLLHLVLQAGNIMNAGGYNAVGF KVVYETASLLMEDKQLAYFMQVLLHIGNFLNDAPRRADGF EALLKASKEIMNSKRLRKVLEMILALGNYMNKGQRGNAYG GVVNSAAEQVKNSEKFKRIMQTILSLGNALNQGTARGVGF QTLEAASEELKSSRLFLKLLEAVLRTGNRMNVGTNRGKSF MAVSAACEEIKKSKSFSKLLELVLLIGNYMNAGSRNAQTF QLALTACESLLTSQRLPVFCQLILKLGNFLNYGSHDADGF ETLQKVCSSLQSSAGVMKILGLVLAFGNFMNGGNRTRDGF VAVLEASKEVQRSKRLKKLLEVVLAFGNYMNRGQRNAVGF FDLKLGMEQLAKNDTFKHVLATVGALGNFLNSSSRGAGF VAGTAACEEVRNSQKFSKILELILLMGNYMNSGSKNEYGF NAl DAASASVKSSPKLKRMLEIILALGNYMNSSKRGCVYF ETLQSVCKTFQSSPSVLRVLGLVLAFGNFMNGGNRQADGF EDLQSVCKTFQSSPSVLRVLGLVLAFGNFMNGGNRQADGF ETLEAACEELRSNRMFLKLLEAVLKTGNRMNVGTNRGHAF NAIDAASGSIKSAPKLKRMLEDILALGNYMNSSKRGCVYF AMLEDACRELMSSKLFLKLLEAVLKTGNRMNVGTARGMAF MAVNAACDEVRKSKSFSRLLELILLTGNFMNAGSRNAQSF DTLEVACEELRNSRMFMKILEAVLRTGNRMNVGTNRGQAF NSMILAGEDLMTNKSLQEVLYMVLVAGNFLNSGGYAGNGV ELFTNACKQTTKSTNFLKVIEVVLVIGNFLNGGSARGDCF HAVISASSSVKSSKKILRAVLEIILAFGNYLNSSKRGPYGF KLVEEACQALRNSTLLPVFCRLILDVGNFLNYGSHNAVGF
 RKLSEAGTALLNAKYFKELLSLILAFGNYMNGTKGGAFGF KKLSAAGRSLLDAQHFKELLNLILLIGNYMNGTKGGAFGF EDISSVCKDLLECNALQDVMGLVLAFGNYMNGGNRTRDGF SMLEEACKELRSSRLFLKLLEAVLKTGNRMNVGTDRGRAF EIVTRASKGLLHMKSVKDILALILAFGNYMNGGNRTRDGY NAMLYAGDDLLNNKTLQEVLYMVVVAGNFLNSGGYAGNGV VSVTAACEELRKSESFSSLLETLLVGNYMNAGSRNAFGF AHLQKAGEEVKGSRLLKLLLAMVLKLGNTLNGSGEENKGF ETLEAACDELRSSRLFLKLLEAVLRTGNRMNVGTNRGEAF HAITAASRAIKSSKRLRKLLEVILAFGNYMNSSKRGPYGF AAVSSVSLALKQSERFRAVLEVLAFGNYMNSSRRGDYGF VSVTAACEELSQSQAFTKLLEIILLVGNYMNAGSRNGKGF EAVLEASKEVQSRRLKRLLELVLAFGNYMNKGHRGNAFF NVVNSAAEQVRNSAKLRRLMQTVLSLGNALNQGTARGEGF RCI RKAAQELQQSHKLAKVLEIVLAMGNYMNKGNTQAAGF QVVLKATSSIQQNKRFRQLLTHLAVGNYLNFGKRNGYGF VSVTAACEELRKSESFSSLLETTLLVGNYMNAGSRNAFGF QVVSKASASMQGNKRFRQILTIVLAVGNYLNCGKRNGYGF EALSKASKELLHSRNDKQLLEVVLAFGNFMNKGQRNAYGF LLRVYEAAKMLLNAPRFFDLLELIRILGNHLNGGGHKGGAF NAVNSACEEVRSSQKLKEIMKKILYLGNTLNQGTARGVGF

Unequghe

|  |  |
| :---: | :---: |
| UniRef90_G3NKE2 |  |
| UniRef90- UPI00044122E1 | ELAAPADASRVNLLDVRKRFAELKEGLAGI |
| UniRef90- ${ }^{\text {S7P }}$ | ELRDTPQAA |
| H2T | ELHVEAASRVSAEILKSSLTME |
| H9GK | ELQHVESASKVSAQILKSSLDSMKQQUERLESDIKKFPK |
| UniRef90-Q4RQM1 | ELHYVEKAAAVSLENVLLDVKELNRGMELTKREYSM |
| UniRef90-FINBT1 | K RDVHEAARLSIDNVEAELHSLSFKTRSVKDSIR |
| UniRet90-M5VSU3 | ELTSVKKAAAMDSEVLSKEVAKIAGGVKKI VEVIKLIEES |
| UniRef90-TOR727 | EVPHIVEAKRMS |
|  |  |
|  | VTEAKRLS |
| UniRef90-K7KKL7 | VNLEAATK Q |
| G1TGW4 |  |
| UniRef90 UPIO00350CEAE | A ${ }^{\text {a }}$ |
| UniRef90-R7T218 | EMPHVEAAARVSVQTILASVQSLVGGMKQV |
| UniRef90-U5G | NVRKAagMDSDVL |
| Unil | EAYRVNLQDIRKELAEMRNGLKR |
| UniRef90-K5WW | NLEAAARVSVQPL |
| UniRef90-UP100032A748C |  |
| -5JR49 |  |
| UniRef90_M01835 |  |
| UniRet90_UPIO00462C0 | ELHFLDKAATVSLDSVLQDVRGLQRGMELTRKEFMRQDDS |
| UniRef90_Q10Qs | ELGNVKKAATMDFDVLHGYVNKLETGLEKIKSVLQL |
| UniRef90_M5WXW5 | HLEAASK】QLK ALLAEEMQAV |
| UniRef90-UP100045753D8 | QDLFQASQ |
| COPGP7 | GNVKKAAAMDSDVLSSYVAKLAGGEKVTVLRLNEEV |
| UniRet90_V7CHA2 | SNVKKAAGMD S |
| UniRef90- B4IZ14 |  |
| UniRef90 ${ }^{-145}$ | NVKKSAG |
| UniRef90-M4C | T |
| UniRet90_UP10003C17B47 | ELTHIEKASKV |
| UniRer9o M4A5X | KLSHIQAASRISMETLDAELQLLTS RTRSMEES QK |
| F6TXY8 |  |
| UniRet90_H3CV14 | ElGATRSAKVDFDQLQENLCQMERRCKASWDHLKVI |
| UniRet90-How5x0 |  |
| UniRef90_B6K7JO |  |
|  | D |
| UniRef90_UP10001A7B186 | ELSSLEPATKIQLKFLAEEMQAINKGLEKVVQEL |
| UniRef90_UP1000 |  |
| UP10002C30FB1 |  |
| UniRef90-UP10003C43360 |  |
| UniRet90_G3H393 | DLEPPSQAAGINLEIIRSEASGNLKKLLEIERKVSASIPE |
| W5NIN5 |  |
|  | DIPHVKRAAKVNLGELLEREI KDLKTGLNEVQKELDFLRGQ |
| UniRet90 W5MNV7 | A A M S A M |
| UniRef90 B4GRZZ8 | QCidka lival |
|  |  |
| UniRef90 Q4RW30 | EVY V KAA |
| UniRef90 - UPI0003C11A | EVPAITRSSKVDFDOLAENLVQLE |
|  | $V \mathrm{VNVKKAAA}$ |
| UniRef90-13K2Jo | ELHFVDKAAAVSLENVLLDVRELGKGMDLI RRECSL |
| 10a | RKTATVDLDVLT S SVS Lishg |
|  |  |
| UP100032 | ANVKKA AMMSNMLSNDVALAKG |
| UP100022468 | MNALDSATKT TVEQLTNEFNA |
| UniRet90-F4C | ELD DVPAAGKISLSMV |
| UniRef90-H9KR13 | SL EN |
| UniRef90-Q4RLP | Elil |
|  | d dil |
|  | Q |
| Ret90_K5VOB0 | A PAEAYRVNQDVKS TELREG |
| Ref90_BOCT66 |  |
| UniRef90-H2M | EPQNFFQAAQVKFDDLAKDVRKLKRDLTACEKN |
| UniRef90-Q167 |  |
| UniRet90-614 | SVFPLPKPADVDMDVLASKFEDLL |
| UniRef90-B4M |  |
| UniRef90 ${ }^{\text {G/R }}$ | ELAHVEKASRVSAENLQKNLDQMKKQISDVERDV |
| UniRef90-UPI00029DC34D | ELAHVEKASRVSMLETEEGLLLLVRAMDPAVPNVQNFPAA |
| UniRef90-D0F | ELRSVPLIAARESFETVDGEFKNLERGLTSLNTELGLL |
|  | PHLESAARVSVQTVMSGVNSIEAGLKKTTSEI DSCRKS |
|  | SNVKKAA |
| UniRef90-L7LPN0 | RFVERACTVTLENL LT DSHELEKGMDLCKRELALRRDS |
| UniRef90_G7Y9F6 | GDIATAAKVPMEALTSDVNALVSG |
| UniRet90_G30199 |  |
| UniRef90_R7TJ79 | KVNLTELENDMKTLRU |
| UniRef90_UP10003D76448 | ASKIQLKFLAEEMQA |
| UniRef90-F4NSE ${ }^{\text {d }}$ | VSFNSLEDS RQLRSGWQSI QLELETYKSQ |
| UniRef90-R7UWX2 | ELPTVAEAAKVCKMVIAQELGELRKVLQEVSSTVNKLG S |
| UniRef90-F6V4W1 |  |
| UniRef90-K7GY89 | Elatv |
| UniRef90-H2TX71 | DLKTIPEAAKVNMTELEKDINNLRSGLKSVELDYQKKRPQ |
| UniRef90 U5GZD |  |
| CEF | D |
| Un | D |
| Ret90_K3 | SVKKAAAMDSDALASCIL |
| niRef90_13J5A5 |  |




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R M K
$\square A E$

RKRQEQLLME REDQE

K E
MKEEKA $\square$ KMA
K E

QEKKKADKEA R N K Q

M Q
A AEER $\square$ A $\square E K$
A QAKKAA
RQEQAAKAEA

MQQDR
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MHDK
K E
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MQEM
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REAKETARRQ
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REVQESRQQQ
READEK
QRKKKE ${ }^{\text {RKRKQ }}$ QLEAEAKK

LILQERLREA
QKRKRAAYRE
RRRLEAA
RKKQEQAMRE
L M L Q ERVK
QKQKRAAYRE

A NER
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RLVQEKKLLQQ
RKEQAAKAEK A $\square$ SKER $\square$ KEA Q

LIF E EKVAAEK AAEEKSAFEK

Q $\square \mathrm{EKK}$ K
A K
N $\square$ S K ER $\square$ KMA Q

A DEAER $\square K \square R$
■QD T K
RKKMEVAAQE RHRMDALQMLQ

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H K R

VEEEEK $\quad$ KRQ

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 $V P$ QPS HP L K S F N WV K K L K Y KL P TL L W W A L K P NPTLVWIALKPNQ VGTIFNELDEERPRRR
 SKKMK QLQ WEKV S K A QK TVVWGKNE E E EVA EKL KMF
 PRPKLKPLHWDKVRASSDMVWDQLKSSSFQNEEMIE $P \square K P R V K M R P F H W V K V P T N P Q S F W N K L$
 KV V K P T L K M K K L N WQ K L P P NT HS MWASASSSSNDTP KVETPTVKLRSLYWTPLPAVEGSIWLNLDETK LDDKEFGP

 K KKK T $\square R$ L F WNEVVR VE G T F WS K L E T
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 $K I P K P G N P M K S F N W T K$ L $P$
 KKRK TVVKLFWREMKEPENTSRGKFGK GTLDWDS LD KVV P T L R MK KL N WQK LP S QVLT D S H S L W S S VQQQQN S P L E
K K TS S L K P Y H WVKV R A M Q G S L WA ESQQK QEEQS R QPE
K P E T S MRRLLNWLKI RPTENCFWDKDNENKYEN

$P$ LT K L K P L H WD K V R A A K S MV WD K I R S S SF E
$\mathrm{K} \mathrm{P} \square \mathrm{K}$

$K \square P K K N K K T V K D F W K E V R E D P V C \quad S S K D K T G F D W D E D P D C$ Q T K Y K L P T L N WVAL K P N Q VR G TI F NE LDD DEKL HRQ H M S V K RLL R WE QV E N S E G T I W W G Q L
K D Y K P E VQLK RAN WS KFDLS E D SFWTHSKE DKFENN
P K P KLK A L H WD K VK A S S D MVWD QL N E D M DE TLFMVN




## 1 I K

K N K K TVVK LIF WK EVV D DF GTMMLK TVVGG S $\square$ WD E L S S P V K RMSVKRINWEKI EPVDNTVWGQLGED
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K K V K K T $\quad \square \mathrm{K}$ L L H WK T V $V$ Q
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$P$ QVKLKNNLQWQKLLDADKTVIGKHNDWTDKTEGEYE
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SSNP KSFNWSKLPDSK
K PKKKMKRANWNGLDA
$\square P Q$
$\qquad$


## $P$ \Q

L R G T I FVGMNDEAVLDA
P QVKLK NL Q WQKL DAAEK TI WEDQDHDSMEE ILSDK L Q WT K L P P V K K E S L F D K L G P M D DVVN
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K P P VP E T P M K P L Y WT R $\square$ S P VK G S $L$ WW L $\square$ E E E P N V N F K E






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I D|I S E LE S LF S VMMPNMEAKRQRQHPSVATLI|DLQRSKNC $\square D T K T I D E F F G Q P D G K A P L D S K S K T K Q E I D N L D A K R S M N D$





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UniRef90-F2U8B9 UniRef90-W5NWP6 UniRef90-Q01HV1 UniRef90-W4GH50 UniRef90-O22824

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| :--- |
| UniRef90 |

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UniRef90 UniRef90_EOVIP0 UniRef90_Q7Q1T1 UniRef90-F7EOS9 UniRef90_S2JVT0 UniRef90-FOZR10
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## D


170
170 HLLI P R V I S K 180
 QVVA D|LKNSLL




## \section*{} <br> A

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UniRef90 UP10003C12427 UniRef90-UPIo002A4B929 UniRef90-JoDMT7 UniRef90-UPIO00359E439 UniRef90_T1JFN2 UniRef90-H2MTZ3 UniRef90-V4ANV3 UniRef90-R9RZN1 UniRef90-F7EIS8 UniRet90-W5N4W1 UniRef90-D8SKU3 UniRef90-UPI0003F09DFF UniRef90_UPI00032A7F3A UniRef90-M4ASU3 UniRef90-U5G9R9 UniRef90-UPIO0038332DD UniRef90-E2EZUU6 UniRef90-V5GJX6 UniRef90-UPIO0046C01EB UniRef90 U5EVYO UniRef90-F6UP58 UniRef90-UPIO003C4D209 UniRet90_H2TAT5 UniRef90-11KLT8 UniRef90-UPI0002A4A9BF UniRef90-W5LQP5 UniRef90-E9FWU4 UniRef90-W1PEW2 UniRef90-O54NOO UniRef90-UPIO002B8DA30 UniRef90_U3JXR6 UniRef90-UPIO003F1A5AE UniRef90-A0A059BM83 UniRef90_-Q9BL72 UniRef90-G3NYO5 UniRef90_F617A3 UniRef90_Q5TJ56 UniRef90-AOAO22RNV2 UniRef90-D2VDU4 UniRef90-Q16U10 UniRef90-UPIOOO3C3AЗE6 UniRef90-K1QXS9 UniRef90-UP100022AF9DD UniRef90_S2JKC8 UniRef90-F7AYX7
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210


240 TIVRMAKELMCCEELHSLLHLVLQAGNDMNAGGYNAVGF TSVMEASREVSRSRRLRRLLEVVLALGNYMNRGARNASGF HAIISGSSSVKSSQKLRNVLEIILAFGNYLNSSKRGPYGF AVLEVACKELRNSRLFLKLLEAVLKTGNRMNDGTYRGQAF HAI AASVSIKSSQKLKKILETILALGNYMNSSKRGAVYF TLLIEACDALMNAKQFQALLSIITMGNYDNGTNYAGFGF TTLEAACTELKNSRMFLKLLEAVLKTGNRMNVGTDRGHAF ESLEVACEELRSSRLELKLLEAVLKTGNRMNVGTNRGRAF EVTLNACKELHKCPKFDEVMHYVLSTGNYVNGGTNKCHGF IKAVTLACEELKKSESFNRLLELVLLVGNYMNSGSRNAQSF KLLDQAYGDLKRSTKLLSLLQVVLAVGNYLNGGTPRVYGF DTLEAATGELKNTRMFLKLLEAVLKTGNRMNIIGTNRGHAF QVVLKATSSLQQNKRFRQLLTLLAVGNYLNYGKRNGYGF KLLDEACHSIRTSTLIPSFCRLILDVGNFLNYGSHNAEGF VNLTAASKCVREATKFHRLLELLLAYGNYMNSGKGGVYGF DALMEASKEVFRSRKLKKLLELVLALGNFMNKGQRGSAGF DAVLEASKQVHRSKRLKKLLEVVLAFGNYMNRGQRNASGF EAILDASMEVVRSKRLTQILEVVLAFGNFMNKGQRNAYGF SAVFDASKQLFRCRRLKKLLEVVLAGGNYMNRGQRNASGF VMGTKACEELRDSKKFKRLLELLLLFGNYMNTGSRNAQSG EVLHTACESLLTSTRLPNFCRLILDVGNFLNYGTHNAEGF MAVSTACEEIKKSKSFSRLLELVLLMGNYMNAGSRNAQTF QTLEAACEELRNCRMFLKLLEAVLKTGNRMNVGTNRGEAF AVMLKAANELLDCDDLHSVIRLVLKAGNYMNAGSANAVGF
SMLEEACKELRSSRLFLKLLEAVLKTGNRMNVGTDRGKAF NAI IAASASVKSSQKLKKMLEAVLKIGNRMNVGTIRGKAF NTVNAATKEVKESAKLRQMMOTVLALGNALNQGTARGVGF MDLKAGVDELNGSAKFKSVLHTVLTVGNVLNSSTFRGEGF NAI ISASSSVKSSKKFRSLLEVILAFGNYLNSSKRGPYGF DCLLKASSELKNSKKLAKILEFVLAMGNYLNDGTNRTTGF VSVUAACEEVRQSQSFSSLLETVLLVGNYMNAGSRNAFGF E
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N
 MDLKAGMEELKTNKTFRGILSTLLSIGNFLNGGYDVKGF
 QLVLAACDSLLTSHQLPVFCRLILKDGNFLNYGSHDADGF ATLEVACKELRNSRLFLKLLEAVLKTGNRMNTGTFRGQAF NTVSASKALLESDGVMDVMGLVLAFGNHMNGGNRTRDGF
$N V V N S A E E I K N S L K K K I M Q T I L Q L G N A L N Q G T S R G G F$ ELFTKTIVKDVKNSKNFLKVMEVVLQLGNFLNGGTARGDCF A LEEACKELRSSRLFLKLLEAVLKTGNRMNGGTDRGKAF NAMLYAGEDLMNNKALQEVVYMVVVAGNFLNSGGYAGNGV CDLKKGVDEGKKNKTFKCLLSVIGTVGNFMNGGAQARGF TVVLQVSDALKNSKSLKSLLCLILVLGNFMQGGAFGMRGS KAVIVASKSIVNSRKMRKLLELILAFGNYMNSAKRGGVYF VAGTAACEEVKTSKKFAKVLELILLLGNYMNSGKDPAYGF EAMRDASKEVLQSKCLKQLLEVVLAFGNYMNKGQRNAYGF SVVLSASDALRNSDAFRDLLHVILLLGNYMNASSDQGFGM GAVSLACDEVFKSKKLLRIIEIILVLGNFINYGTPRGDGF VAAKEALEELKTSSKFANVLELILLMGNDLNTGSRNAQSF
 AVLEAACSELRKSRLFLKLLEAVLKTGNRMNDGTFHAHAF TNLRSVCEFMLRSSSLKRVMALILTLGNYMNGGNRMRDGF GTLEAACEDLTSSRLFLKLLEAVLRTGNRMNVGTNQAKAF K VMEASREVASRRLRKLEEVLALGNYMNKGARNAWGF ELLQKLCETLKNGPGVMQVLGLVLAFGNYMNGGNKTRDGF ILAVTLACEELKKSESFNRLLELVLLVGNYMNSGSRNAQSF EAILLASKELIRSKRLRQLLEVVLAFGNYMNKGQRSAYGF HSLDAASDSHKSSQKLKKLLELGLALGNYMNSSKRGAVYV GTLEAACSDLRSSNLFLKLLDAVLKTGNRMNDGTNRGKAF SMLEEACKELRSSRLFLKLLEAVLKTGNRMNVGTDRGRAF NTVNSACDEVRNSLKLKEI MKKILYLGNALNQGTARGSGF DIVEHVSKSLMKQESLKIVLGLILAFGNYMNGGNRTRDGF TNVTRACDDVKGSRLLKLLLGMVLKLGNTMNGGEETEHAL VRIRDGSEGLVKAESFARLESLILMMGNFLNSTGVQGFGF


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UniRet90
F2U8B9 UniRef90-W5NWP6 UniRef90_-oliHV1 UniRef90-W4GH50 UniRef90-O22824
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UniRef90-R9RZN1
UniRef90-W5N4W1 UniRef90-D8SkU3 UniRef90-UPI0003F09DFF UniRef90-UPI00032A7F3A UniRef90-M4ASU3 UniRef90-U5G9R9 UniRef90-UPI00038332DD UniRef90-E2EZU6 UniRef90-V5GJX6 UniRef90-UPIO0046C01EB UniRef90 U5EVYO UniRef90-F6UP58 UniRef90-UP10003C4D209 UniRef90_H2TAT5 UniRef90 -11KLT8 UniRef90-UP10002A4A9BF UniRef90-W5LQP5 UniRef90_E9FWU4 UniRef90-W1PEW2 UniRef90-054N00 UniRef90-UPIO002B8DA30 UniRef90_U3JXR6 UniRef90-UPI0003F1A5AE UniRef90-A0A059BM83 UniRef90-Q9BL72 UniRef90-G3NY05 UniRef90_F617A3 UniRef90_-25TJ56 UniRef90-A0AO22RNV2 UniRef90-D2VDU4 UniRef90-Q16U10 UniRef90-UPIO003C3AЗЕ6 UniRef90-K1QXS9 UniRef90-UP100022AF9DD UniRef90 S2JKC8 UniRef90-F7AYX7
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290
300

320 KLP HV HEAARI SLESIVEAE
 ELQHLPEAAKVNLSELEKEDNNIRKGLRAVEAELEYQKHQ ELLYI DKAAQVSLENVVSDVCELERGMEAARRESEA
ELLENV K K G S ILLDAD SLESATAT K L GHGGLVKAK D L L L N K
EL H Y I E K A A AV S LENV LLDDVKEL QRGG DLTTKREYNMH GHN ELE I PS A A ARVNYSDLQSTSKQMLDDI YRISESSLTTAFD T ELSNVKKAALMDADVLIHDDGKLAGGITTKITEVI RLNE

 ELEHVESASK
DLENV STAA G $\operatorname{L}$ N $\square E N M Y S E T S G N \square K K L R D L Q N K \square S T A A T D$ SLLNSLDEVSAIS FTLLQNDVHMIEASLVQI

 E I Q I C QKAA GV NLD SV Q S E CSVL LK QLT EATK KV S QLKFADKASTIMWEAVLADMKELDANFASAKKERELKGGD
 D L S N N V P A A A K V V N L L T E L E K K E V D $\operatorname{C}$ C A I I K D A A K E I S H A E K A A R V P V D T V S G N L R N M L K Q i K Q L E T D I K S F VP S EI A A I T R S S KV D FDELLAD TLDQLDEKRCRESWESLLKVI

 E L S N V K R A S T M D S E V L S S D V L K L I S K G I T N I A A E I V Q V N DM M QLD HI GMASRDCKDDI DK DL K E E I D K M E E V K L F S S I H P
 ELHFVEK A A A V S L E NVLLDVVK ELGRGME L L R RECGLDHEHS
 E L F F I D K A A Q V S LLE N V

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


 DLE QPS QAAGI NLELI RSESSTNLKKKLLEMERKVSSCIPE





Q










 E LG N I R K A A GMD S DVL S S YV LVRLDVGLQK I K SVLQQL
 ELEHVESASK
 DLESVY QAARHS RKEMEQELCALIRKSIKIATEALKDTETD EL H Y V E K A A A V S L E NVL L DVVKELQRGMDLTKREYTMHDHN
 E L Y N V K K T
 S ATCL EA A A TVVSLDPQLLLDATAALER SVDLVVRQEV
 $E L S S V V K A A A M D P D A L A S C A A K L S S G V R K V G E V L R L N R$


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UniRef90 Q54N00 UniRef90_E0W1N6 UniRef90_UPI0002B8DA30 UniRef90_U3JXR6 UniRef90_UPI0003F1A5AE UniRef90 A0A059BM83 UniRef90_Q9BL72 UniRef90_G3NY05 UniRef90_F6I7A3 UniRef90 Q5TJ56 UniRef90_A0A022RNV2 UniRef90_D2VDU4 UniRef90 Q16U10 UniRef90-UPIO003C3A3E6 UniRef90_K1QXS9 UniRef90_UPI00022AF9DD UniRef90_S2JKC8 UniRef90R7VKZ UniRef90_E0VIP0 UniRef90_Q7Q1T UniRef90_F7E0S9 UniRef90- S2JVT0 UniRef90_F0ZR10 UniRef90_K1PNS7 UniRef90_UPI000388B71B UniRef90_B7FZU7 UniRef90_S8CP68 UniRef90_UPIO00462D760 UniRef90 UPI00046D3A1 UniRef90_MOSLS6 UniRef90_X1WIG7 UniRef90 UPI00045D6700 UniRef90_UPI0002C35393 UniRef90_E1BS28 UniRef90_A8PHB5 UniRef90 S7MJB6 UniRef90_11GSV1 UniRef90-E9JDE4 UniRef90_G7I8P1 UniRef90_UPIO004573EFA UniRef90_T0S1H7 UniRef90_T0R4U7 UniRef90_UPIO004561891 UniRef90_B7ZXY9


D S L S H Y F GED P A R CP FE QVT K I LT LIF MK T F
 H K F L L W L G $\square P Q L S D T K P N E F C R I V S E F A L E Y R T T R E R V L Q Q$ KECLVEYFGESSRNADA NAFFSLLVRFVRAFKVTDAENEQ

K EMGQ Y F LLF D P K K V S VEE E F V VD L H N F R N M F L Q A V K E N Q K


 N E CVV E Y F G E R Q S D A M L N A F F GLL F A R F D A LTL T F G E DPA R CP FE QVM S TVLSN FVRM F
E E ITT S Y F G E P K K S T Q P D V F F F S TII N N F NK F A Y W L G V N R $\square$ S T T R P H E $\square F K$ K V
 LAASYLCED A QQLSSLEDTFSTMKAFRNLF
KSTGDYFHGNAGKDEGL R LIFVIVRDF LIMLDKACKEVRK K DCCEFY GENEKST S PTVVF QKLA HFVQNYQKCRGENEA Q D LVLFF GLLKPKTEVTT GHLDFMLDWFEFCADFKTRWKRENK DALILYFGEDPAR
QEL AVLF GEESK $\square P$ SEEFFVT\NRF VVMFDKC




 $\begin{array}{llllllllllllllllllllll}\text { E E T I } & \text { G Y F G C K P K }\end{array}$
 GS LSE YYCFDPA KYTMEEFFTVDVTTFKDAFVQA HADN MKSAKHFGEE TNKMQPDEFFGQEDQF LQA ARTDEWFGE AQAKPSPEQFFGLIVRFIVQFKNADVANEA K DAMVYYGENPRNK RPDEFFNI FARFLSSWKTSAIIE EAN KK L C I F F A E DP T K VQ P E E LF D I F G R F I T L F EN A
 A S LL L Y F GEDD K E MQP HQQL FSSIIVS FSRDFEKAKEEKRK

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


AKALKHFGENEG KMQPDEFFGDFDTF


 K A VMK F Y Q F VP K E T A E P Y D F F N L WL S F C R D F K D I WK RERQ K E I T E Y F H G DVVSKE D N P L R IV VIVVRDFMGMLD NVCKE LRR
 A A LCTR F GFK QP DATG F F F GL WS DFGRQQVAAARAELQ A AVLE YF GEDPAKK PADFF QTVSS FCQAFEKAKA EVQT N E AL K Y F G E D P K K R M R T E D F F G IVF
R E T T G F F G D S A K E E G H P

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UniRef90-H2MTZ3
UniRef90-V4ANV3
UniRef90-R9RZN1
UniRef90 F7EIS8
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UniRef90 U5EVYO
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REAHE

R R R L L A A H
AQKKPAKPLKQ
RRKQERALME
RAEEQAALE

K D K S Q K
RKEQAVKAEK AKKQEAAKAKQ

E E K $\square K R$
QKQKRA
R R

FRQ
QK QKRAAYRE

REKADEHRHKR

ADRKAELEAQ
QLEKKA
R RK【LEAAT

## R DLLKEAA <br> $R R R L Q Q A$

H
LIK SKQA QHKKRAAHRE

RPAKTQRKE KAALEKRRQE $N \square S T E R D K E A Q$

L K
K R
R R V Q E E VRRKQ
Q LAKKA
RETAEVKR
MQLKQERDEK VLSTER R L R QA Q

RRRAEALQ
YTRQQELAEK

NIS K ERLKEAQ
QREERKRQAK
EEHHRKR
QRKKRAAHRE 1LKKED】REK LQER

## LLLQERVKEA

RENLERLKKQ R
$\stackrel{R}{\mathrm{R}} \prod_{K} \mathrm{RK}$ K R $\square \mathrm{E}$ E
S K
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ADDAKQR
$\square$ GEQR

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 KKTIKDHWKEANASSDTFWTSVVKELG PVK VPPSSVPLKCFNWTK\PDTK MVAGTVWTESLDEAKLYKV $K T Y Q T K N K D P Q L W T A M K P N Q A K$ NTVFEKLNDELVITEK IPQPSHPLKSFNWAKLRAENKMTGTVWHDVDDERAFKV $\square P A P K S K M K V N W K I P S N K N I W T Q V A V R H Q N S P L A D$ $K P K K K T K R U N W E K I P T N E D S F W V K A E E A R F E D D F I F Q$
$P K A K L K P F F W D K V M A N S D M V W H E T S A G S F Q F N E E M M$ KPRLKPRHWDKVRATSETVWDQLKSSSFQUNENMM QAKQKLKFVEWEKMNNDQQTDWDEFERDIEEYQLAKA KPKKKLKRANWKA MMPTEKSFWTKVQEDKLARPEILD KDYKPEVQLKRANWSKISPSEKSFWITKAQEDQFENNELFA KKKKRIRSFFWKTIPAEKVKGRANVWSQ DQVQQNFQ PLPKLKPLHWDKVRATPDMVWDKLRTSSFE
PKPKLKPFFWDKVNANKSMVWDHLKSGSF DDDDQD VINPSTKMKPLYWKRVILDPSSSLWDQVLEPTFNSQDFEE

KTKLKPFFWDKVNANQSMVWDHLKAGSFQFSENAD RTPQPSHPLKSFNWVKLNEVSGTVWNEIDDSQVFR\｜LDLE IPQPTNPLKSFNWSKLP ETRVDGTVWTELDDMKMYKD

RK LKTFQWDKVSPHSSTПWGDEDAQA TAERपRQQ KPVNPAVPMKPLYWSRIHSPEGTLWEK母EEAKIE

PCPS LRRMKKLN WQKLPSRVVTDHQSLLWTSSSSESVVE
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PPKSSVQLKSLNWSK】PLPK LRDTDWADVHESEDYDV
QFPQPSMSVKSFNWVKQTQVKNTTFETMEPE EDQVRGKTNDWTLAAKALKC KKKRLRSFFWKTDP EDQVRGKTNDWTLAARKQHQ QP円TPKTAMKPLFWSRIQIIEDKAKSDSNDESFWKKLEED PKTKKKPFFWDKVNPDHSMVWHEDKAGSFQNEEMMD

QP $\square K T K Y R M P L L N W Q A L M E E Q A G T V F T E D D D Q V L Q E$ SLKPLHWDKLRADSGTVWDQVKN SDSFRVDEA PRP MKLKPFFWNKIHPHEKTAWNS SGVDPARIDDK K YKPEVSMKRDNWSKUEPSESCFWLKAKEDKFENDLFAK
$V F K D T G K N R R F F W D P U D D A K G T M F E D M K F D Q D H D K S V V$

PPKPMKP【YWTRILAPKSSLKPTPSNEKVDGNDTNV RVNPPT YYEPKNQLKRVHWERVEPPSGSVKFPIDDETDGRTLLNS KTPDPNCKMKHFTWNKVPADQTSIWGDVNTMDDSDKVE $\square P K S \square G Q \square K T \square N W \square M \square P K E R \| V G T \square W E N \square D E K K \square Y Q Q$ PLPK LKP LHWDKVRAASNTVWDK RSSSFE FDE HWDKLRAISGTVWDQVNNSDSFRVNEAA VQRPTQRMKKLNWQKLSSKKNSLWSA PKYKMRRLNWNKLSTHQRNI WTQLANSKENG G YS RKYVRLFWQEIKPAGTLQQGMDKTWWASTAPVE VYKPKVPMKKANWDRVDLAEDSVWVKMQENELASD

PQPSHPLKSFNWVKLN EERVSGTVWNEIDDMQVFRI PKPKLRNLYWEAVKSEEGTI WECFAREEDKDKFVDQ PSCPMKPLYWTRLQDNDKTLWDSGEEPHDRDTSEFE KAPKP

## RVKLRPFHWTKIPTNSKTIWKQAQDRSADDSVEV

KQPEPCRPMKP YYTR DDSSAS LTWEK
TRLKPLHWDKVVANHSTVWDQI NDGSFDDELMES PPKPMKPLYWTRIDAVDSAAPKEI WQEIIEETKLDNII KPKLKPFFWEKVNPDQSMVWHEI NAGSFVFDEEMM PKAKLKPFFWDKVQANQTMVWNQLKAGSFQFNEEMM

VKLKPLHWDKVTADHSTVWDEINDGSFDDELMEN
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 SLVVENFSVVKKPVK QVEVANEKKGKKVVKDRVLDPK SAMNL




 L S E D A I E TLEFGYNADKK S GDA K K EAA QVIDRILLDPK KA QNL I K Y LLEL E NHF SVVQNKK T T $\square$
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$\square N M D V F E E L F K T K A Q S A P V D V G T \square K V K V A Q K A S S K D S L L D$ AMENLFPQNSATAAAGNSGQAAARGGQHSRLLDPKRLQNV K LF S D F A VEP P A G S D S K N K D K T D S H N G K ■T T L L E DN R A N H I

 PD FS S I E QL F S FP A A KP K EPPAARK EP K E I T F L D A K K S L N N L GWLQQ L L D E K F

 MESLFLNNSGGAGNSDQAARRGSAGKQESRLLDPKRLQNV






DCHEFE E LTF S K K P $\square$ S D T DT K T K A K Q QVVK L L S N K R S Q A V

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 NIFLKQFKCSNEVAAMDQAGDTT
EIVLRSVSDFTPEQLVRM
F T D D NFLDPADQFF NYYLKQFRKN NAALVDLIRKGEARSIGVEKLKGL THMLMKAVSATAEQUFAALLHGNGYGSAQQLEAL

T\【SKAlNLTTDQVCFALTRGDGLSDQDLEALS AIMLKVLNVTSADVIGALMHGNGDL


SILLGSLKKMPYDELRRRUVEVDEALLTPNVVEA VLRMDE

G| LISSLLKLEMKDIQQAIVTVDDSVVDLETLAALYENRA
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${ }_{A}^{G} \prod_{i} \mathbb{V}$ M S SLL


LLRAL
VOCEIEHAIYHVDTSVVSLETLQQIINVKA LLKAL NVTLAEVVDALKLEGNE

㕶P TE
VLRSL ATSAREIIDDAL VDGQELSLETLEKL

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UniRef90_UPIoo03314D25

210
DTITRVSKALDNMTSKEL 220 220

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DTIRVSKALLNMTSVEILGLILAFGNYMNGGNRTRDGF MAVTLACEELKKSESFNRLLELVLLVGNYMNSGSRNAQSF VATTKACEEMKNSKKFGEMLELILLLGNYMNAGSRNAQSF ATLEVASNNLRNSRLFLKLLEAVLKTGNRMNDGTYRGQAF VAGTAACEEVKSGVKFNKMLELVLLLGNYMNSGSRNGQAY ATLEAASUELRNSRLFLKLLEAVLKTGNRMNDGTFRGQAF ENMADACDAIDDSQNLKIVLFAILELGNALNEGDPQRGGF

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EAIVLISASRLVRSKRLTGILEVVLAFGNFMNKGQRNAYGF AMIEGACTELKSSKLFLRLLEAVLKTGNRMNVGTLRGSAF HSMIIAAQELMTNKALQEVLYMVLDAGNFLGGYAGNAAGV MAATVALDE KKTNTKFARILELILLVGNYLNSGSRNAQSF
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## R

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 RIS S L N KLLVLTK S NDPKVSLL HVLVE QTEKK DKEVLDNGVE
 KI NF LTELNSTKTVDGKSTFLHULAKSLSQHFPELLGFAQ KLDALLKLADVKGTDGKTTLLHFVVQYRRMGLDIVISSLS K L D T L L K L A D I K S T D G K T TVVLHFVVVQE I IR S EKVLA G L S S
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 RVASLNKIADTKSSDRNISLLHYLIDMILEKHFPDILLNMPS
 K L L D T L S K L

NL AL

| $T$ | $S$ | $A$ | $L$ | $K$ | $L$ | $S$ | $D$ | $V$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



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

 K L Q S L D T L V D T K S N D R R I C L L H F I V D T I R S K M P E I M N F D S

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 KSTVDYFHGNSGKEEGL RLFTVVRDFLIVLDKTCKQV DDLAEYYVFD KSKYTLEEFFTDLKAFKDSFYEAQRENHK L L

## K

 EETGDYFHGNAGKNEGLRLEVIVRDF SKFLDY DGYDGAREVKVTPFCKVISEFALEYRTMRDKDML RSTVDYFHGHSGKDEGLRRFAIVRDFLKILDKVCNEVRK EKVIGT回GDD HHL EYLGYPPSRSMPVGOFCRTAGF KDCVEYGENEKSTAPNVFFQKLAHFALEYRTKTREKUE MKAKHFGEOGR MOPEF RELTEYYGEVSKDESNLLQTFIIVKDFLGLLDKVCREMR QQLAEFFCEDLSS FKIEECFRIFHAFTCKFKQAVIENER EDMSKYYCFDKKKYNMEDFFGDUKDFQDSFKQALKDNAK KSTADYFHGQAGKNEGLRLFATVRDFLIMDDACKEVRD KEVTEYFGDAAKEEAHPLRIFLIVRDFLCILDSVCKDV DETMAFYHFSPKAQCTPDQFFEYWTNFTNDFKDUWKKEDT DQAVRFYGEDPK KMQPDEFFGMFKEFTDSWEKCSADSRE
N
GEDAEYFHGDVRDEKNPL KSTVDYFHGSTGKDEGL RLFVVVRDFLAMLDKVCKEVKE HTLI EFFGYSAASTVTCQQFFGAIFAFACQFSKVFQKIER TVAVNYLGEKDKKKIKPDEFYKQISTF VRSVEAVFK

K T T V D Y F H G S T
AKALAHFGEQTGKDEGL RLFGVVRDF
 NQALTFYGEDAKS $\square A S T D E F F S V F K T F V S S$
KATMNFYQFKSKTDDEVKEFFSI WAPFSNDFKDTWKKEQQ
 D ECVRLFGEE RLADYLCEDVA TFSLDDLFGIIKTFRGLFL
 K K TVEFFAYEAK HSFLLY LGHPSVREDSVR
$S Q T L I S F G D$
HTLI DFFCE K K GALAQYLCEDAA LD IEVLIVF QWKGNNETQPNDFFSVWISFCNDFKE\|WKKEQ K S TGDYFHGNS GKDEGL R L F S V V S D F LI MLD KAC
K S TADYFHGNAGKEEGI RLLVVII RDFLVILNKVCTEVR

 EDLVRYFGQES NRLKPEPLFGTLARFKAEFEHADAE



 SRLAQHYCENE NSFNLEEFLAAFMEFCDRVKACQQELET

 RE IVSEYFHGDVKDEYNP LRTFVIVRDFLSMLESVCKE KETTEYFHGDAKEEPHPLRIFMVVSDFLATVDRVCRDV K K LAA E Y F C D H V S H L S L E E L F G TIIK DF R D L F L K A DK E KKLAE FFCEDEGD FK I E E CFSVFHQFTQRFKKA

 SKALTHFGEQE SKMQPDEFFGIVDTELQAFLEARQDLEA EETASFYGEDPSSDCGPDAFFSIVYSFAKVLQQSADRDNER
 $L D L C H W W L A E E V$
$N$
$K K T N D Y Y G A S K D N M V N P F Q L F V I \quad I K N F D D M V G Q A C \square E L K R$
 KSTADYFHGNAGKDEGL KLDVIVSDFDIILDKVGKEVKE





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$\square P$ P K K T P L K P L H W VK VR A M Q G S L WA D S QK QE S QARAPE
VK LK P L H WD K VN T N H S MVWDKVDRGSF D QDLMEA
 PRVNLPMLNWTPLHSVKGSIIFEAIN
$R$ VLAP P L R M K KL L WQ KLP S N Q S S M WA S L S S AEHSSMWASLL $\qquad$ SC GA EVVE
PKAGSQMKQDQWTK冋PVEKHNVWMSSARLSENE LVLU
VK LK PLHWDKVNTNHSMVWDKDDSFRFDGDLMEA
 P $\square K$ T K P K L R NL Y WE T L S N T A G T I W D T LQ S EKC S Q NEN IA


PKTK $\square$ K P F F WD K $V$ S P D H S M VWHE $\square K$ A GSF Q NEEMMA
$R K \square R T K Y R L P A L N W V A F K P N Q \quad \square G G T V F S E L D D E K V M G D$ KLK K L H WD K VN P SHSMVWHRID G G SFNF D GD LDM K VKLK PLHWDKLNANHSMVWDKLDSFKFDGDLMEA

K T K L K PFF WDKVT A S QAMVWDQDKAGSF
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KLRNFNWDA\P RHSVMGKRNDWTSEKKLDDE
K T K L K P F F WD KVTAT QAMVWD Q ITAGS F
$R$ VQP P T L R M K K L N W Q K L P S S R S S M WA S L S S P $\quad$ D T EMVE K K Y K P EVVSMKRIN WSKI EPPENCFWDKVREDKFENDLFAK K P $\square Q T K$ F R MP LL N WVAL K P S Q $\square$ T GTVFTELLNDEKVLQE

QPKKS LK P Y H WL K L R AMQGSLWAEAQKNDEASNAPE K VK M P T L R R M K R R L D W W $V \square N P A N K M K P L Y W K R I T N R N E S \square W D Q V L E P T F D S K D F E N$ PA K K K K T V K L F WK E L K D DD G P A WE S G Q A T L WA S L E K V K K TYKPEVGKK P L H WD K V T T N H S MVWWDKMDRGSFD D D L M E A

 $R V N P P T$ LDRMK K L N W Q K L P S N R G S V W D K SR S K S GE D S P A S Q
 $K L H W K P A N V E D Q S I P S$ L $L$ Q Q K G S F WN TVVDPS PNCKMKSY QWTRTRN $\operatorname{CNNTFWKKVNLTKYNDVLP~}$ VIN P S S K M K P L Y WK R $\square$ S N R NE S $\square$ WD QVLDE TF D S K DFEN PHRNSMWA SLSS P GSE VVVE


K A K T R S F Y WQQ LEA $\square$ K G T $\square$ WEE LIE KE HCNQSNVDL
 R P K P K LK P P LP WD KV R P S S T T T WD RLP YNPSNANSKQR P K A KLK P F F WD KV NPGQAMVWHDIRAGSF
KGPAPKKRMKPLHWDK $\square P F S D E S V W S L I N A G T L H D T T F$
K VNQPT LRMKK LNWQK LPSNSHSMWASVQKE REPPPHE K VK T P T LR M K K L N WQ K LP S N S R S M WA S V T S S S E E T I E P D Y K L K P L H WD KVRQAPN

R R HTKLLK P L H WD KVVA D H S VVVWDE I N N G S F D D D L

$R P T V Q L K K L N W Q K V$ A S NTVPNKPSLWVLAQTESME
 VK LK P L H WD K VN P D H S MVWWD K I D R G S F S F D A D LM

VP MRKFP WT A $\square$ NP HRDCFWAT TSED S LAN DLLEQ
 SKRMKAFHWDVVPQ $\quad$ KHKS $\square W A S C S L H K$

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पDWTEIUEGLIFCQQCDSSGERKPRKEPSE\|TLLDGKRSLINVIV $\square D \square S E L E S \square F S D A S T S D A A S K K \square N K P E K V Q L V D M R R A N N C$ DVEETFAKLAPKAKTEVKKPKVLQLQLPDSKRSHTM LIFGYVATNRRSPKGKSHSADPSKQSAKTNFLLDPRKSQND V T THKLEHLTFESRAKDFDTKEKQQENKTKEVIVLDPKRSN VDTHKLEHLFESSRAKDFDTKEKQQENKTKEVVVLDPKRSN




 V D T S R L E H L F E S K S K E L SVVS K K T A A K R Q E

K K R $\square K E E L K F L D P K D A Q N L$ $I$ N T A K WT QLF GA A DKEAKA D D S QAK PRKGIVVLDGKRSNAV

 DDFDNFEETFKAQTQGGGQTVTDKKEKTTTGMDSNRMQND $\begin{array}{ll}E A L F G Y V & A R K P S T A N T V P H Q P T V V T\end{array}$
F NEEMTE T LF GCNPVDKKGNDGKKEPQFVRILDPKKAQNL PEFANLE ELG CQQEKKAKDAAD GAKKKKKSLLD GKRS L N V


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LF CAKKK A VD S S T NP S S T T G K E GEKVK LVV LVDD $\quad$ K K S N S $\square$ P D F S S li E R L F C F P V A K P K E P P A R R E P K E I T F L D S K K S L N L



 $\begin{array}{lllllll}L & E & K & E & S & V & E\end{array}$









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LK EKFS T S K P GPK G G D T L M K P A K K VK Q P Q V V K D E K L L A L

$\square$ DE $\square$ F CQKPRAKSSPAVLSPNG $\square$ SKANVVN $\square L D N N R S \square A \square$

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|  | UniRef90 UPI0003AE42DB |
|  | UniRet90_JoXN |
|  | UniRer9o-M5Y2B2 |
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|  | UniRet90_A0A022RVX9 |
|  | UniRef90 MOSEE |
|  | UniR |
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|  | UniRef90 ${ }^{-} 1{ }^{\text {C C2G2 }}$ |
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 AIVLKSGAVSQGEILDALDDDGKGLNADTLEK


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 A I ILSR YKMSYEDVVKH|KQVDVDEFTEDQINAMKTN A TVLLQLLNLSTKDVCQALLDGDCDVLGAELLESGMEGND A LLRALGNTDDEVCEALLEGNSDTGGTELLESL
$G \prod F W K Q \square K K$ SNES TEDTR LGSSK DYGSEKLKELLKYDK
 A A LQQGSVKLSHKQWRKGLLKVDDSLCSANTLQQLRTALP


UniRef90 G6DI82 UniRef90-J3NOM UniRef90-S8EO60 UniRef90- 11 KXL9 UniRef90-UPIOOO2060DF6 UniRef90-LLKYY68 UniRef90 R7U788 UniRef90-UPIO00344005E UniRef90-UPI0003AE42DB UniRef90-JoXN68
UniRef90_UPIooo2C3E9E5 UniRef90-B4LU87 UniRef90 FoWZA2 UniRef90 ${ }^{-}$X1XYM4 UniRef90-H2R2U6 UniRef90_G3H710 UniRef90 E9CGK7 UniRef90-V4KMJ7 UniRef90-H3C7S3 UniRef90 ${ }^{-}$A0A022RVX9 UniRef90 MOSEBO UniRef90-W4XYP8 UniRef90-M4DN02 UniRef90 M1C2G2 UniRef90 - T2MIT5 UniRef90-UPI000234EE8F UniRef90-UPIO002652ED2 UniRet90 AgURA4 UniRef90-D3в3W3 UniRef90-X1Y6K8 UniRef90 W5MQ58 UniRef90- M8ABV7 UniRef90-UPIOOO2C34175 UniRef90_K7GA38 UniRef90_G1QYR8 UniRef90-W9RED7 UniRef90-V9KXZ1 UniRef90 UPI0003D0D592 UniRef90-F0ZPS2 UniRef90-V8NKH5 UniRet90_11J5F7 UniRef90 UPIO0044398D7 UniRef90-A9UWS2 UniRef90-L7LVR1 UniRef90 UPIo0045E2A18 UniRef90- UP10000222115 UniRef90_UPI0003DOE56C UniRef90-F2U8H0 UniRef90 H3F7X9 UniRef90- E3MX78 UniRef90-FoZGV8 UniRef90 ${ }^{-}$W5M916 UniRef90 Q1ZXK2 UniRef90-L9.L9D9 UniRef90-H3ANL9 UniRet90 UPI0003F19BC2 UniRef90 ${ }^{-17 C X N 1}$ UniRef90- 04 N 22 C UniRef90-UPI000034F2D2 UniRef90_DON387 UniRef90-A5K953 UniRef90-ROG3D2 UniRef90_G7IKM UniRef90-Q4D3C2
UniRef90 S9XN27 UniRef90 UPI0003B334F3 UniRef90 F6YG12 UniRef90-UPI0003D07639 UniRef90-UPI0003C4BF23 UniRef90 M8A2U8 UniRef90-F1KPW0 UniRef90-B9IEK7 UniRef90-A0A016UMD3 UniRef90 UPI000359B5AE UniRef90-G1NGC9 UniRef90-UPIO00034F2D7 UniRef90-S4RB48 UniRef90-A2DC30 UniRef90_Q8GX37 UniRef90_M4E785 UniRef90 B9T836 UniRef90-UPIo0021A4A37 UniRet90_W5MPP8 UniRef90 U6DTI5 UniRef90-A0A016VT87 UniRef90-F2UF81 UniRef90-UPI0003C4583B UniRef90_V919S4 UniRef90_J9JTY5


RKLLPEDGEVKKLRAF

PTSDEELRLRLYT EFDVEVLKQRKLLPEKHEVEHLRSFTE PWSRNLVPL LRWRKLSPEQKGGCPTSQLKQ EYDDLCE PWSRNLVPI LRWRKLSPCLIKLGCPTSSLPLCDAQRTKLGV OKFCPTKEEMDLL KKGYSDKENLGK QKLLPDKEEVKKLKGSKKGGFRGDRVGLSE CEADYQLIK DSGil

MVPTEEEKQKTQEAQLANPND AKLUGS LGRVAPTEEEQSLI LJA
 LLKFLPSPEEKVLLEEHSX OESGMA
 LKLLPEKHEDENLRAFTEAQFEEMPEGEQFALS PKDMDEQMRATQEELDMSMHLDSEKAKKVPS L AK MMPDSKEGEEMENKQAENPE MGT
 पKKLPEK K EVANLRTFQLIVKGSEDHESKLDK

LMPMEKEVEKIREAQLKDPYL R PLGT
NLIKHLPDQEQLSSSLSQKKS DYNNLCE
ULLLLPNTEEMSVVVSEFVKSGGDUSAVDK RFCPTKEEMELLKNYTGDKATLGKCEQLAK
 TPVELIDTVLKMAPTSDEELKL RLDTGEVSQLG
 SFQGEKDKLAN LLKLLPEKHE:IENLKSFGDGK QLLKLLPERHELGENLKTFKEEKAKLAS PVEMLKKLKELAEKKLSEM

TR|SPTQEEAVKDTQYR GNPSKDAD QLLTYTPNKHEIAQY KLYSGSKLLLTK DSDTDTKTKTKQRAQSDEDEKIEKHSKASKEKENAKSLDK VRFCPTKEEMKLLKNYT $V K L L P D S S E V S M V M F K E E G K P L G N A E R$ GEVKGYTGDPALLGK
CLSR APSKEEERKLKSFS DGGSEGAP FHPDTLERLARAATQEEQSALLQFKDESPFGDTTKLAD YWRLIDRMLLKYVPTKEEDETL EAKKपKENLSEFDSFSR MMPTEEERQK胃EAQQANPDV PLDVITKKLSEAEPSMILEEMPEGEQFLAS
FTLEHDMPTKEERDLLNKQHDSGKAMAETD FTDEQDTALRRYLPTPQDLEMYQSFK $\square P \square E K \square K G \square Q R V L P T D E E \square K L I$ ■PLEKLKGLQRVLPTDEEVKLLEEHQDKKKDANQTIGGS


UniRef90 G6DI82 UniRef90-J3NOM7 UniRef90-S8E060 UniRef90-U6N5L4 UniRef90_11KXL9 UniRef90-UPIO002060DF6 UniRef90-LLKYY68 UniRef90_R7U788 UniRef90_UPIO00344005E UniRef90-UPIO003AE42DB UniRef90- JoXN68 UniRef90-M5Y2B2 UniRef90-UPIO002C3E9E5 UniRef90-B4LU87 UniRef90-FOWZA2 UniRef90-X1XYM4 UniRef90-H2R2U6 UniRef90-G3H710 UniRef90-V4KMJ7 UniRef90-H3C7S3 UniRef90-A0A022RVX9 UniRet90_MOSEBO UniRef90-W4XYP8 UniRef90-M4DNO2
UniRef90 UniRef90-T2MIT5 UniRef90-UPIOOO234EE8F UniRef90-UPI0002652ED2 UniRef90 A9URA4 UniRef90-D3B3W3 UniRef90-×1Y6K8 UniRef90-W5MQ58 UniRe90_M8ABV7
UniRef90_UPIOOO2C34175 UniRef90-K7GA38 UniRef90 G1QYR8 UniRef90-W9RED7 UniRef90-V9KXZ1 UniRef90-UPI0003D0D592 UniRef90_FOZPS2 2 UniRefofo-V8NKH5 UniRef90-11J5F7 UniRef90_UPIO0044398D7 UniRef90-A9UWS2 UniRef90-L7LVR1 UniRef90_UPIO0045E2A18 UniRef90-UP10000222115 UniRef90OUPIOOO3DOE56C UniRef90-F2U8H0 UniRef90-E3MX78 UniRef90-FOZGV8 UniRef90-W5M916 UniRef90_-1ZXXK2 UniRef90-L9.J9D9
UniRef90 H3ANL9 UniRef90 UPI0003F19BC2 UniRef90-F7CXN1 UniRef90-Q4N220 UniRef90-DON387 UniRef90-A5K953 UniRef90-ROG3D2 UniRef90_G7IKM7 UniRef90-S9XN27 UniRee90-UPI0003B334F3 UniRef90-F6YG12 UniRef90-UPIO003D07639 UniRef90-UP10003C4BF23 UniRef90-M8А2U8 UniRef90-F1KPW0 UniRef90-B9IEK7 UniRef90-A0A016UMD3 UniRef90_UPIO00359B5AE UniRef90-G1NGC9 UniRef90-UPIO00034F2D7 UniRef90-S4RB48 UniRef90-A2DC30 UniRef90-O8GX37 UniRef90-M4E785 UniRef90-UPIOOO21A4A37 UniRef90-W5MPP8 UniRef90-U6DTI5 UniRef90_A0A016VT87 UniRef90-F2UF81 UniRef90_UPI0003C4583B UniRef90_V919S4 UniRef90-J9JTY5
UniRef90_S4PUR8

## B

AE DFLLH LVDMPSYAERLEAMVVREEFQPRLRSLRFCL ADQFYLLLLSV PSYSMRIQCMLLCEETRTLLDMLRPKA A
AEQFLL
AESFLHHLL AERFMLETVMSSVKL
ADRFLY
PEQFAV
T EQFAVUQG
$A D Q F$
$P D A F L W E$
PDAF LWE

| AEQFLLK |
| :--- |
| AEQF |

EDRFML
PERWILETYG

PEQFAV
PEQA
PEDM VMSNVKRLRPR RLWA SNV
PEQFV ASLIGIPLMRQRLECHQLALQFRDNYNDIKYDL
AKAPLKEHFVMKVPGVESKLRAFSFKiQFGTQTAELNKGL
AELVLKE A A L LTGVP
P E QYV KEA SADETKHQ


## $\stackrel{A}{A}$ <br> A

 PEGEQFAATLASINALPA$\qquad$ ${ }^{2}$ TLLNIP
$Y \square^{Y}$ LLLGVPCYQLR R
ADQFYL LLLGIP CYQLRTEC
$P D Q F A Y Q M$
$P E Q F L Y E$ SFV PD

CEQFF YELLLVALP

AERF LKKELLLHVPFVFKRVDALLFVANFHSEMKRLRKSF


VDQFMLEMC

 UniRef90_J3NOM7 UniRef90_S8E060 UniRef90-U6N5L4 UniRef90_I1KXL9 UniRef90-UPIO002060DF6 UniRef90-L9KY68 UniRef90_R7U788 UniRef90_UPI000344005E UniRef90_UPI0003AE42DB UniRef90-J0XN68 UniRef90-M5Y2B2 UniRef90-UPI0002C3E9E5 UniRef90-B4LU87 UniRef90-FOWZA2 UniRef90-X1XYM4 UniRef90-H2R2U6 UniRef90-G3H710 UniRef90-E9CGK7 UniRef90-V4KMJ7
UniRef90 H3C7S3 UniRef90_H3C7S3
UniRef90_A0A022RVX9 UniRef90-MOSEB0 UniRef90-W4XYP8 UniRef90-M4DNO2 UniRef90-M1C2G2 UniRef90-T2MIT5 UniRef90-UPI000234EE8F UniRef90_UPI0002652ED2 UniRef90-A9URA4 UniRef90-D3B3W3 UniRef90- X1Y6K8 UniRef90-W5MQ58 UniRef90-M8ABV7 UniRef90_UPIO002C34175 UniRef90-K7GA38 UniRef90-G1QYR8 UniRef90-W9RED7 UniRef90_V9KXZ1 UniRef90_UPI0003D0D592 UniRef90-FOZPS2 UniRef90_V8NKH5 UniRef90-I1J5F7 UniRef90_UPI00044398D7 UniRef90-A9UWS2 UniRef90_L7LVR1 UniRef90_UPIO0045E2A18 UniRef90_UP10000222115
UniRef90_UP10003D0E56C UniRef90-F2U8H0 UniRef90-H3F7X9 UniRef90-E3MX78 UniRef90-FOZGV8 UniRef90-W5M916 UniRef90-Q1ZXK2 UniRef90_L9J9D9
UniRef90-H3ANL9 UniRef90_UPIO003F19BC2 UniRef90-F7CXN1 UniRef90-Q4N220 UniRef90_UPI000034F2D2 UniRef90_D0N387 UniRef90_A5K953
UniRef90-R0G3D2 UniRef90_G7IKM7 UniRef90-Q4D3C2 UniRef90-S9XN27 UniRef90_UPI0003B334F3 UniRef90_F6YG12 UniRef90_UPIO003D07639 UniRef90_UPI0003C4BF23 UniRef90-M8A2U8 UniRef90-F1KPW0 UniRef90-B9IEK7 UniRef90-A0A016UMD3 UniRef90_UPI000359B5AE UniRef90-G1NGC9 UniRef90_UPI000034F2D7 UniRef90_S4RB48 UniRef90_A2DC30 UniRef90_Q8GX37 UniRef90-M4E785 UniRef90_UPI00021A4A37 UniRef90-W5MPP8 UniRef90_U6DTI5 UniRef90_A0A016VT87 UniRef90-F2UF81 UniRef90-UPIOO03C4583B UniRef90_V919S4 UniRef90_J9JTY5
UniRef90_S4PUUR8

210
220
230
240 NALLVAGDD|LMSSRA\| QEVLY\|LLVAGNFILNGYAGGAAGV TTINDATKEVKESLKLRQIMQTVTLGNALNQGTARGVGF
 D HLAAAAAAASSSKRLKSLLFAVLQLGNLLNEGDPQREGF QT EAGCNELKSKGLFLKKLEAVLKAGNRMNAGTGNAQAF MDLMQGDE LKTNRTFKAILGTLLSVGDFDN GGAEVKGF EA LLLA SRELDRSKRLK QMLEVVLAIGNFMNKGQPDAYGF




 YSIUSASSSIKSSKKFRAVLEVILAGGNYLNSGKARGKAF

TEKAKAF
MAVVTACEEDKKSKSFSK LLE LVLLMGNYMNAGSRNAQTF LSI K L A V V ELH D S NALLK TVMSLVLAIGNHLNAGSARGKGF GVI QAA C E ELSSNNRMFS GLLVAAI L S L GNKMNVVGTS QR HC F
 A T L





 R A V R H A S M E V K Q S K K L Q E I M R YL L G V GN Y DN G S T T R GF G F ASVVMEASREVARSRKLRKLLEVVLALLGNYMNRGARNASGF STMTKASTELMECENLLHTVI RLVLKTGNYMNAGGYSAVGF
 MA V T L A A C E ELLKKSEESFNRRLLELLVLLVVGNYMNSSGSRNA QSF


 $M N V T H A C E E V K K S E G F R R L L E F V L L K V G N Y M N A G S R N A Q T F$ EAVLAAS QAL QHSTAFKKKLLEIVLAFGNYMNSAKRGPYGF



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



 MAVSTACEQIKKSKSFSKLLELVLLMGNYMNAGSRNAQTF MAVVSAACEEVI KKSKSFSKLLLELVLLMGNYMNAGSRNA T F
 $N K I R \operatorname{VASSNEI} G Q S S E L K K T I L V V V L Q V G N K M N Q G T A R G K G F$
 T TL E V S CNKLRKSRLFQKLLEAVLKTGNRLNNGTYRGHAF
 $K L V E E A C Q S L Q M S T L L D P S F C R L I L D D V G N F D N Y G S H N A E G F$

 A SAVIEACDEVRTSAGFAMFLEMVLLVGNYMGHSSKTYKAF
 E H I K V A S Q E L R R S K K L









 $N Q \operatorname{QKI} R A C K Q L Q A S Q K F V A V L E Y I L A D G N Y L N E G R K D A K G F$
 D S K K M C N DLDTN QPFK QFL S LV L F G NY L NA GSYN AS GF


SLNDLTKDRDVKSQDNSSNLLNYVVKEMASQPEETTCPDP KLDTLNKLRDAKSNDGRMSLI HYMAKLIQDKNADLWNYTS RLA SLNRLADTKSSAKGTTLLHYLVQIIEKKFKDILTLEE RMTSLLKLVDTKANKPGMNLMHYVVMQAKEDDATLLKFPE K LD TLLKK ADVKGLDGKTTLLHFVVHYKQLGLEMVSGLSD
 RLQSLDALLDMKSTDRKQTLLHYLVKVIAEKYPQLTGFHS RLDSLPKLTDTRARNNKMTLMHYLCKVLAEKLPDLLDFPK RMSSLLKLADTRANKPGMNLMHFVVMEVEKNDKKLLEFPT KMSTLLKLTDTKANQNSDTLLHHILEEIEKNHTDLLQLPS NLDDLDSLSTNKDDENKTSLLDY I AKLSMDKYPKTKNVAE


 K I I S T L L

## \section*{}


  RLNDLTKLA OTC KLDTKLA QLKSVDKSVTLLHYVARMVRMKKGNGVRFMK
 RLDTLLKLADVKGTDGKTTLLHFVVHYRSLGLQVISGLST
R

## $$
1
$$

$$
1
$$



## 

 K DILPKLKDVKSSDNSRSLLSYIVSYYLRNFDEDAGKEQ KLDSLLNLSEKCSANTNMTLMHYLCKVLASKASDLLDEHK KI DTLDKVREVRSSKSNITLLHFIVQTMQEFYPKDWDITE KLDTLLKLVDVKGMDGRSSLLHFVVQEMMKSEGSVRNLNT NLTALLKLSDVKSVDGRTTLLNFVVEEVVRSEGKVGGLSS KLSSLNRIDDTKSTDNEMTLLHYLVQMLEAKFPDVLTLET KLSSLLKLADTRANKPGMNLLHFVALEAQKKDETLLKFPE ELSYLEKVSEVKDTVRRQSLLHHLCSLVLQTRPDSSDLYS EMNVLTKLMDTKDVDNKFTLLHYMVDSMRKFDAKNARFQE KLSAFDRLLDLRSRDRSQNLMNFVADVVMHKFPDVRNFQN RLE

D A SIVF A A A Q QVTT F E DL E G DVVT RLLERELQACSRRVDRII I S
 DLPHVKEASKVSLGEMDKDDTMLRAGLTEVNREDEFHRSS QLQHI GPASRI LKQEVVAEFQKEKKKVAB
 DLEP PS RAA GI NLE I I Q S E CS S NLLK KL L E MERKVVSSSLP E ELQHVESASKV
DLHFLDKAGSVSLDSVLADVRSLQRGLELTQREFVRQDD E L A S L E A S T K V Q L K Y L A E E M Q A I S K G L E K V VQ E L K L K N I K EAASRMF T QE V M S E L E T L K R K L E S L
D L D CVVAK DA G I NFEVVVKA EAGANDK KL LEETEHNDASS

 ELEHVESASK
DLEAVGDAARVS IVT LSSTDVQGLRKGDDLVLYEREKQQNN D I P HVVKRAAKVN
DLEHLDKAGKVPVEMLEKNLKQMGRQLQQLEKDLETPPPP DFHHCDES S RVN ADEE R K TVVQLTENNN KKL E N C L K V V K K L Q
 E LGPLLQEAARFNKTEVLLAELVRSLERAVSTVRAAMEAEI AS T
 ELHFI DKAAAVSLENVLLDVREQGRGMDLVRRECSLHDHA ELDSLKLVQQLSISDMSTDINDLEKQFNIVSNNCKKV
 QI T A V T K A A K V D Y V QV H N N L I E L E A N Y K A S C D Y V K V I F
DLEHLDKASK
DLEHL DKASKVSAENLEKNLKQMERQLQQLEKDLETPPPP
 DLE S L E S A S KI QLK S L A E E I Q A ITTKGLEKL NKQLTA S E S D



 DI E I CQKAAGANVESMQSETGALQ
D L ELVSKA
DLLECVAKA A G I N L E I I R TESSSSHK
 ELTNVKK TATVDLDVLTTSVSSLSQGI SRIKELVG
DFMHIAKASRVNPDEMAKGVAALKNGVVKVENQLRGYKK EF S N V K R A A A I E F D S F F V N T C S S L T A R V T E T Q QL V V VN F G N S
 ELQAVEKAAKVS LEVLNQDAQDLVKALKETSEVLER GGNR
 D L E N L ESATVETSTTKADLDDTANNDKAVQLNFNKCQSYMEQAEKG E L S N VKK S A D ITE Y GVL R S NV S R I C Q G L K N DE A L L L L S E E S EFSNVKKAASIDD DTVSATCLALTSRAKEARRVL
E LT NVKK A A A MDSDILSSSEVAKLADGIMKVKEVLKLDE D L P H I N N A C K V V L V V L K L Q Q H V Q S A A A R I S V V E N I E PA L T R C A KVVDPALTRC AKVDFEQLTENLGQLLR DFHCDAASRVNGDELEKGVAALRQNVTKLDNCLKTYQKQ
 E L T $\quad$ E F E A V P G A S I


## UniRef90 G6D182

 UniRef90-J3N0M7 UniRef90-S8E060 UniRef90-I1KXL9 UniRef90-UPIL002060DF6 UniRef90-L9KY68 UniRef90 R7U788 UniRef90-UPI000344005E UniRef90_UPI0003AE42DB UniRef90-J0XN68 UniRef90_UPIOOO2C3E9E5 UniRef90_B4LU87 UniRef90-FOWZA2 UniRef90-X1XYM4 UniRef90-H2R2U6 UniRef90-E9CGK7 UniRef90-V4KMJ7 UniRef90-H3C7S3 UniRef90-A0A022RVX9 UniRef90_MOSEB0 UniRef90-W4XYP8 UniRef90-M4DNO2 UniRef90-M1C2G2 UniRef90 T2MIT5 UniRef90_UPI000234EE8F UniRef90_UPIO002652ED2 UniRef90 A9URA4 UniRef90-D3B3W3 UniRef90-X1Y6K8 UniRef90 W5MQ58 UniRef90_M8ABV7UniRef90_UPIO002C34175 UniRef90-K7GA38 UniRef90_G1QYR8 UniRef90-W9RED7 UniRef90-V9KXZ1 UniRef90-UPI0003D0D592 UniRef90-FOZPS2 UniRef90_V8NKH5 UniRef90-I1J5F7 UniRef90 UPI00044398D7 UniRef90-A9UWS2
UniRef90 L7LVR1 UniRef90-UPI00045E2A18 UniRef90_UPIOO00222115 UniRef90_UPI0003D0E56C UniRef90-F2U8H0 UniRef90-H3F7X9 UniRef90-E3MX78 UniRef90-FOZGV88 UniRef90_W5M916 UniRef90_Q1ZXK2
UniRef90_L9J9D9 UniRef90-H3ANL9 UniRef90-UPI0003F19BC2 UniRef90_F7CXN1 UniRef90-Q4N220 UniRef90_UPI000034F2D2 UniRef90_D0N387 UniRef90_A5K953 UniRef90-R0G3D2 UniRef90_G7IKM7 UniRef90-S9XN27 UniRef90 UPIO003B334F3 UniRef90 F6YG12 UniRef90-UPIO003D07639 UniRef90_UPI0003C4BF23 UniRef90-M8A2U8 UniRef90-F1KPW0 UniRef90-B9IEK7 UniRef90-A0A016UMD3 UniRef90 UPI000359B5AE UniRef90-G1NGC9 UniRef90_UPI000034F2D7 UniRef90_S4RB48 UniRef90_A2DC30 UniRef90_Q8GX37
UniRef90-M4E785 UniRef90-M4E785 UniRef90_UPI00021A4A37 UniRef90-W5MPP8 UniRef90_U6DTI5 UniRef90-A0A016VT87 UniRef90-F2UF81 UniRef90_UPI0003C4583B UniRef90_V919S4 UniRef90-J9JTY5

1A4A37
C458
C45B
 GAISVG FREALKSFLDAAEAEVRSLISLYSEVGRNA

NEAS $\square G E K D P \square A T \square M D E F V E E A E P K V A E L E K F \square K E A M E D F$ GEGGNFVKEMDHFLGNAEEELKLVREKQTSVFQLI TDSKHDGATA K KKMSEFLADCAERUVVLGKVHRRVMNRF VREPNEPNDKFVPVMSDFITVSSFSFSELEDQLNEARDKF D VQEQYAGR LQASDDEASRALLDEVFFQADE EKK VQEQYSQRLQT ITKASRALDEVFQADEQKKL

RTDIHFFENTNHHFDNSRQHMANMQEQDEQMDQLI GG GRFVREMKAFLEAAEEELTVVREQQKSVMELV ASASSEHREPFKSKMEEFTASAEKSVAKLHQLIDECRDLDF PD $\square$ SENDGFQAIIGPFADHADR SQELRQNLDEMKQMF VQSH VLRDFLGNSEEKLKKIKSECKTAQTC AKHEMKPVLKQRMSEFELYKCAERIIILKKUVHRRUINRF A S TS LAAESPYKA IIPKFLADAGHQCEVMEAAHYRINNRF GS S G D Q WL K KFRA RMT R F EEDENNNNNEFRDSLASFVEQSEKDI EWLDEEEKRISTLV ASENDGPVSQ $\quad$ F CK TLLEFLGVAEAEVRSLTSLYSNVGRNA
EDG CLTTKLTSFFESAEEELRVITEEQLRTMDLV A QRDNVKGLFGKEMKKFLDAAEKEMKTVREEQDRVMELV AS LDEESG FQCKLVQFIE QT QVQVTHLLEEEKK DRALV
DVQEEELVHPFQEQMERF LDNAKGLLKKAREDLGHASTAF G AFEQS IVSFQATAKQECAKLESALEDMNKQY GSSQ PGDRFDPVMREFHAQASVRFAELEDQFQDMKTRF VKTNVTKQDDLREQMESFLQDAEAQLAEVETSLQTLNSVS LEEESG

F QRKLA QFVENS QA QVT RLLEEEKKLRLMV VQEQYSQ

CMVLKEFLRANSPTMDKLLADSKTAQEAF ASENDGRVSGDFCKTLEFLTDAEAEVRSLASDYSNVGRNA GATLSCQPDLWQQVQDFVQEAGTQLAEMGGAVATFETAR QDADQGSNKFVSSFSSFIVKCEQDDKSIEDLQKKIVDSF AKHDCKPALKSKLLGFLQASTEKLGLLKDVHRR

## K G G N

FVREMNNFLENAEEELLRVREEQTRDMQLV
F $\square \quad \square H$ S F Y $\square H A D Q K \square A R \square A E R F N S M S E Q Y R R \nabla C V L Y$
EDSHDKFVTKMS $\square$ S F W $\square$ ASEFK $\square K Q L K E$ GD
VQKQYAFRDKFEEKMHPF L EKARKEFATVSTMSAKMKNDW TVDEDVVQPFKNEMEAFVATSTATVHDLQKQDAACQDDF PSAADTPGDQFTAVARAFVESAHEEFTTLERAFFKMQAEF DS SN MKQKlNDYLSDVAQRワHQLKA ITYVTKNRW DDEK $\square$ AEDDP $\square R V K L S E F L V S S K T E L D D A E K L M V D T E Q E Y$ LEAN DPSSSKFQSTLKAFVVSSSEAQLEKMLQRDAKTAEEAF


EDAYDKFVTKMSTFDYSFNKNHDKTDSKNNNNDSNVFQVL QNVKCDFQDNFTSIMREFLVDAEPKVNSLSKHFEEVMTTF GPVS QVFRKVLKDFISMAETQVATVSSGYSSVGKNA NRIEEKEENDFVESMTVFVDDASKEVATLKTDLDETLRLM
 GHSEEHHWWKFRESMTQF LETVAEEIKKI EREEASTLI AV


$\square S H R \square P \square F C Q L I L K Y E A P \square E D S \square N A S Q K \square K E T F N T \square D R K K$ VKA QYETP DQDSINALKK L E E EFETIERKKMEDANY GLS GDERNGCFVAFMAPFVSQAEEVI REVLEDGERVLGHV SEENDMFVEKLGPFLEKAKAEYDVVEKMHQTMSSKW

| N |
| :---: |
| Q |
| A |
| I | QLSQEEHGQPFKDSMEQFI SQAKDDQENEEKSLTEAHKSF ASESDGPVSEVFRKLLKFISVAETQVATVSSLYSSVGGNT $\square S Q M Y T P S \square Q N K K N A H S R M N N D Y C A V Q K Q E S L E N R$

UniRef90 G6DI82 UniRef90-J3NOM7 UniRef90-S8E060 UniRef90-11KXL9 UniRef90-UPIo002060DF6 UniRef90-LLKYY68 UniRef90- R7U788 UniRef90-UPIO00344005E UniRef90_UPIo003AE42DE UniRef90-JOXN68
UniRef90 M5Y2B2 UniRef90-UPI0002C3E9E5 UniRef90-B4LU87 UniRef90-FoWZA2 UniRef90-X1XYM4 UniRef90-H2R2U6 UniRef90-G3H710 UniRet90 E9CGK7 UniRef90_V4KMJ7 UniRef90-H3C7S3 UniRef90 ${ }^{-}$A0A022RVX9 UniRef90 MOSEBO UniRef90-W4XYP8 UniRef90-M4DN02 UniRef90-M1C2G2 UniRef90 ${ }^{-}$TMMIT5 UniRef90-UPI000234EE8F UniRef90-UPIO002652ED2 UniRef90 A9URA4 UniRef90-D3в3W3 UniRef90-X1Y6K8 UniRef90-W5MQ58 UniRef90_M8ABV7
UniRef90-UPIO002C34175 UniRef90_K7GA38 UniRet90 G1QYR8 UniRef90-W9RED7 UniRef90-V9KXZ1 UniRef90-UPI0003D0D592 UniRef90-FoZPS2 UniRefto -V8NKH5 UniRef90-I1J5F7 UniRef90 UPIO0044398D7 UniRef90-AgUWS2 UniRef90 UPIO0045E2A18 UniRef90- UPIOOOO222115 UniRef90-UPIO003D0E56C UniRef90-F2U8H0 UniRef90 H3F7X9 UniRef90-EЗMX78 UniRef90-FOZGV8 UniRet90 W5SM916 UniRef90-Q1ZXK2
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UniRef90 S9XN27 UniRef90 UPI0003B334F3 UniRef90 F6YG12 UniRef90-UPIO003D07639 UniRef90-UPI0003C4BF23 UniRef90 M8A2U8 UniRet90-F1KPW0 UniRef90-B9IEK7 UniRef90-A0A016UMD3 UniRef90 UPI000359B5AE UniRef90-G1NGC9 UniRef90-UPI000034F2D7 UniRef90-S4RB48 UniRef90_A2DC30 UniRef90-Q8GX37 UniRef90_M4E785 UniRef90-B9783
UniRef90 UPIOOO21A4A37 UniRef90-W5MPP8 UniRef90 U6DTI5 UniRef90-A0A016VT87 UniRef90-F2UF81 UniRef90-UPIo003C4583B UniRef90_V919S4 UniRef90- J9JTY5 UniRef90_-_JTTYS
UniRef90_S4PUR
 DSLAQYFGEDPAR CPFEQVTSILVIFVNMFKKSRDEN

TSTVHYLGYPEKDK $\quad$ YK P DEFFK Q L FA F VR NVETARK KK TAQYYQGGSSKETAENQLFVIVKDFLGMVDQTCDEDAR NKFCLWLGDPLHKVTKPNELCRIVSEFSLEYRTTRERVDQ AKALMHFGEHE
 LELARYLCEDAQRLSLEDTFSYMKTFRDLFVRAQKDFH S ELLASYYLCEDEAQQLSLEDMFG|MKTFRDLFARDADTDNDK KKTTEYYGVSKDKGAHSFQLLVIVKDFLGMVDQACVEDSR VEAVSYMALDKNKPPPPEEFFSTLSKFMADWKRVGDDNQK EETVRFFGEDPSSDCGPDSFFSVLTSFAKLLQSADRDNER

HSFLLFMGHPPDREVNDNKFCRDTSEFADEYRTRERVLQ QSVMAYYAVDMK KVSVEDFFNDLNNFRTTFMQADKENIK GKLLLYFGVSTAKKTKLSEFSTMI SDFAFDYRNVKKQVEA EEVTEQFDGDSSKEGHTLRVFMVVRDFLLSMDNVCNEV RSTGDYFHGKAGRDEGS HLFVIVRDFLVMVDKACLDVKK DALALYFGEDPTRCPFEQVVSTLLDFVKMF

K K T T N Y Y Q A GALLKERNLFQLF VII R DF L G MVDNACSEDAR
 SDLVEFYCADPKKT NMEEFFGTVNNFIKEYVLAQQDNQK RSTVDYFHGSTGKDEGL RLFVVVRDFLA ILDRVCREV
TRLDKWFSTNGGGTPTPADFFEDWATFVGQEEAWAAEK ETVTGFYGESKTTCQPD
DRAVRLFGED GSVVQPEEFFGПFDGF LSA
CSVAEYFCEDP SQFKLEECCSIFHSFCEKFLRAMQENQE RSTVDYF HGSKGKDEGLRLIVVVRDFLVILEKEQE

ESVVEYFGENPK TTSPGLFFS LFSR
DALALYFGEDPAR CPFEQVVSTLLNFVRMF RALAEFLCEDEERFSLEECCSDFNSFTHRFLR AELADYLCEDRNMDSLEDVFNTMKTFRDLFIKARKE HQLVEFFGYPKATTASCPQFFGSTYTFSQLFSKQCQKMEK RRTTDYYGGASKDSVNPLYLFVIVKDFLGMVDQACDEUAR

NEV
ESVVKFYAFN ATKYPMEEFFADDRTFSEQYATAWKE ELADYLCEDPAKLSLEDTFSTMKTFRDLFTRADKE TNVLKFFKYGKKEKITPADFFDTWASFVAGYEECWKA EQ SECTRLFCADSYE APGEFFATLARFIGQMGECQQQMWQ
 NTVVQYFGENAK TTPPSAFFPVFVRFVRAYKEAEQDNED LQLVEFFGYPKATTASCQQFFNSIYSFSLLFSKQCQKDEK LEELAYGCEDPGQQLSUQDTFGTMKAFRDLFHTMRVQLDQ

NNVL STG KEVARFYTEKEVDKVKPSELFKYLWSFALSVDQYRKRDEA DALAHYFGEDP NHYPFEKVTTTLLSF\|RLFKKAHEENVK RDVMLRFDKNADEEEAPAEFFSIIYDFTMSLMKSDRENEL KEVALY KKITEYFHVDSKEEAQLDKVFVIVRDFLNVLDGVCKKMEE KSFAQYFGNDDAKK KPEDVFSQLVPF VRVVRVMQEMVK


CEDANKLSLEDVFSTMKTFRDLFIKALK
RDTTEYYHGDVKDEASPLRIFVIVRDFGGMLERVCKEGEE DSLRRYYAFDPK KYTMDAFFGDMRTF
KRTTEYYGASKQKEANLLQLFVIVKDF LDMVDRVSVDUSQ NNLAVFFCENQSSFKIEECLKIFR SETVVYFGEDPK TMTTNDVFEIFSEFDRNFEKAHRHNDM LETAAYFCMKPKKEVSPHSFFNIWHEFSSDFKDFWKKENK DALVHYFGEDPND

RAFFCVNGPDR LYYLFRKRYTFRDEF
NNIDNLYGESP QKMKLADFLNTFNTFTTEYMKAAEDD
EEVTEQFHGDASKEGHTMR FMVVRFLSVLDQVCKE
K RTTEYYAGGPAKGKNLLHLFVIVRDFLAMVDKVCVE TA KEITEYFGNSAKEEAHPFRIFMVVRDFLSTLDQVCKEVGK FKALHYFGEDPKKDQSPMKFFGVFSKFLKSLSQRKVDTLK
HAFLLY乌GYPAAREVRIMQFCHTLREFADEYRTCRERVLQ ASFTKYYAFDAK KYPMEQFFTDMKTFRRYEERAVEENAE NETLVKFGELPDQD SQELFGWISAFIREFRKVSAD HKFILWDGDPLHRDTKPNEFCRTVSEFALEYRTTRERVIQ QRVAVHFGEDV NKFKDEECFALLGNF
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R R T L LE Q

DMQKRK
Q LDKKASHRE
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RRRDKRDEER
N $\square$ QKRK
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QKQKRA
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TQRKQR
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REVAEVKRRQ

EREA
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## RDAAKR $\square$ F EA

EHEQE
QKKRLAEK
LDDEKSLKEK RKKQEAAMRE EREA

WK EKQ
$R \square K \square E K K A \square A Q$
QADLDK
KR】REEKR LK Q
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K VQKKNDAAR
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L I L Q E R VK EA

RNLQRR
IN N R
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RQREEAARKR

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1



K VPKVDCPMRNFPWNPRD $\square$ S RESFWVG $\square$ NEDQLSDR $\square$ FER
RPTLKMRPLFWKK DDTKPENFWSTSKEPS DDADELER TKKLKPLHWLKLKAVQGSLWAEAQKTGEAARAPE PGAKMKPLYWKR』ILPSESIWDQ\|LEPTFNAKDFEE

VK LK P LH WEKFDANHSMVWDKVGDGSFRFDDDLM $P P T K M K G F F W Q K I N D V Q G T V W D T M D \quad D L K$ PTCPMKPLYWTRIQ】QDNNF
PTETTRQVHFDA $\square$ NKNNKT $\square \mathrm{F} \square \mathrm{K}$ KN $\square \mathrm{AQETNS} \square \mathrm{C}$ K
$K R K T V K / L$ WRE LK L P HSTLWAA L E P P V V
KP $\square$ QTKFRMPLLNWVALKPSQ $\quad$ GTVFTELNDEKVLQE KKLHWEKHRTRRDSLWGQVQ ISEESRAMLEK

HVK LK P L H WDKVNKNHSMVWDK IDSFRFDGDDMEA PKPKSKLKNFMWQKMNNLSGTLFTKLDT DDKTKQK K PQLRQLHWTKVNLPKDSVWHDVDQVDLDMD SIV
K P $\square \mathrm{KTK}$ PLQQUTVQELSEGCFWVKAKEDRYES D
KAK $\square$ KPFFWDPSQMDESSFWAKAEEERFKSKTF KAKLKPFFWDKVTANPNMVWDQ $\square$ KAGSF
$K K \square A W D P \square E D P S G T A F T Q Q F S E \quad Y \square K T L E L$ MRTLQWSKI SASKVMlWQSVGKRL NGLAKE PPVQMKNLLWNQVQANKNTIWEIVDDEQV KLDEQ VNAPRAK LRPFYWDKVNPDQSMAWHDIVKGSFHVNEDMD

 KS SLKPLHWVKVRAMQGSLWAEIQKQADANS NSE
$K$ KK QPKNK LIKAVQWQK TP ERQLTNTDFS KMEGDVAVS KPSKPTSKLHWKKLPAAKNSVWTEITPVKVD PRPK LIK PLHWDKVQASSKMVWDQLKSSSFRVDEEMD
 VAMKK $\$ P WKPKE $\square$ SKDSFWAQTAEEKFANERLFE
$K \square Y K P E V S M K R \prod N W S K D E P S E N C F W \square K V K E D K F E N D L F A K$ QTKYK L P TLN WVALRPNQ VKGTVFSEDDDEDVSSK $K \square H$ WRE $\square Q N \square K Q T \square W A G L E E P Q Q$ DS S T S L $\square$ WE K $\square$ EEPS $\square$
KYPR GVPMKRCNWTK $\square$ NPRNNTFWAECKDYKYENDLFAS PESSCRTLK LDHWRELLS LQQQS IWAGLEPVHLDTNRDEF PPKPAPKLKTFFWKKLPRAVG LWSHI DNAAVEKVMDEK VQWSKINANDDSVWGKLAKASDVDLD E DL


K P $\square$ K T K F R $\square \mathrm{P}$ VF N WT A $\square$ K P NQ $\square$ S GTVFSEDDDEK L LED
R $\square$ H WEA HTNVSNTVWAM $\square$ GRD DQWL LNLAA
MRKFPWTADNPRSDCFWATTSEDCLANDLLEQ
PRPKLKPLLWDKVRASSDMVWDQLKSSSFQVNEEMD KLRPLHWDKVNSDHSMVWDQIKDGSFDDELIET KRKTVKLFWRELKLDAGTLWASLDPVS
RKKSTLRKLHWTALDATTKTIWNRVTKRRHAPVALSG
K VLHPRHRLP $\quad$ LN WVAMKPNQ VKGTVFADLDDEKLYQT RVPKPSGPLKTFNWLKLN EAKVKGTAWEFVEDEKMYKQ



VK LK P $\square$ HWDKVNPDHSMVWDK $\square D S F S F D G D \square M E A$ EAEKFCSRIDAM

TQEGLWQVLeETSLDN

UniRef90 HoZk00 UniRef90 W9RL17 UniRef90_UPI00032A8A30 UniRef90_B3KMP4 UniRef90 E3MLJ7 UniRef90_D2CFQ5 UniRef90_C3YGE1 UniRef90 UPI0002B45500 UniRef90 F4QEV6 UniRef90_F7CFJ7 UniRef90 W2T5B1 UniRef90-UPI00026529CE UniRef90_H0UYY8 UniRef90_A0A059D963 UniRef90 A2F502 UniRef90_UPI000440CDFB UniRef90_G3PRG4 UniRef90_D2VGI5 UniRef90_B0WAV0 UniRef90_M1AS58 UniRef90_U5FSD5 UniRef90_UPI000454736A UniRef90-UPI000273DE60 UniRef90-H3H664 UniRef90_UPI0003C272E1 UniRef90_V4TJH6 UniRef90_Q9NGX2 UniRef90_E9BXV6 UniRef90_UPI000393D5CC UniRef90_V8NDX1 UniRef90_G7NK73 UniRef90_E5SE78 UniRef90_B8ATX9 UniRef90-K7G0T6 UniRef90_A0A023B5Y3 UniRef90-K1Q9U3 UniRef90-G0R3G4 UniRef90_C5XVF2 UniRef90_UPI00044446C4 UniRef90_C1N0Z7 UniRef90_H2YP92 UniRef90_UPI0001623CB7 UniRef90_M0WTA8 UniRef90_W5GLZ6 UniRef90_K2H068 UniRef90_-A8IF92 UniRef90_M0RTK9 UniRef90_G3NY12 UniRef90_D8M9Z4 UniRef90_M0S731 UniRef90_A0A022QMD4 UniRef90_L5MF22 UniRef90_E5S8W1 UniRef90 K3WK49 UniRef90_UPI000443B826 UniRef90_H2UGZ7 UniRef90_H2N3A7 UniRef90_B3S718 UniRef90_H2MQX7 UniRef90_W5KP13 UniRef90_G0V0L7 UniRef90_E3MSI1 UniRef90-I1IFG6 UniRef90-K0RCQ7 UniRef90_H2VAD9 UniRef90_T1EJ38 UniRef90_Q4S671 UniRef90-UPI00046DFDD0 UniRef90_U6DW81 UniRef90_UPI0003C18A81 UniRef90_B7G032 UniRef90_W2TFJ8 UniRef90_UPIO00359F2EF UniRef90_M0T1Q1 UniRef90 UPI00042AFD1D UniRef90_UPI000387DA61 UniRef90_A0A024TK83 UniRef90-H2T5C2 UniRef90_T1FUD5 UniRef90-W2SU29 UniRef90_D2V201 UniRef90_F8W5Y4 UniRef90-M4F8S9
UniRef90-M1UPR5 UniRef90-M1UPR5
UniRef90-Q582D5 UniRef90_UPI0000162EB3 UniRef90_G3H6M7 UniRef90-G3IAQ8 UniRef90_X1YQH0 UniRef90_Q4D1V1 UniRef90_A0CFX0

LF SK T AVVERKKPDS DT\|T K R K T K QVVKLLSNKRS QAV LI D M S E L E N L F S H G R K S F K R N S V G S K T E K V Q
पQTKFGTKPT $\quad$ RSEVLGGK LENKKKVKTAQVIQDDTLLQK
LF GVS A S L D S EA VQ F S K AP K Q GK GK QVGKVLDDKRSRDV M D M S E L E SLLF SA AV PAP D Q L Q K S S K P E KV QLI D HR R S Y N C

LD A NK L VQLFETK HNKEVTLKKPAKPAVLQVLSMKRSQAD L D F E DF EN HF RLLKTMD K L R R DQE K EA L K K V R V V G DNRA K N L | $K$ | $N$ | $K$ | $V$ | $K$ | $K$ | $I$ | $K$ | $L$ | $L$ | $D$ | $G$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $S$ | $Q$ | $A$ | $V$ |  |  |  |  |  |  |  |  |
| $V$ | $S$ | $N$ | $S$ | $S$ | $K$ | $F$ | $I$ | $L$ | $D$ | $S$ | $R$ | $K$ |
| $S$ | $Q$ | $N$ | $I$ |  |  |  |  |  |  |  |  |  |


$\square N L D E L S T V F S K E K E G E K A E P K E K K K E \square K S L L D A K R S Y S V$

VD T A R L E H LIFESRAKE VLPP K R VSEKA VT TVLDPKRSNA $\square$


LFGYVATNRRSPTRERNSKNSTGPNSQVI LLDARKSQNT

 DLFA K L T L R F S TA Q T K
FH H L E EHFSN GNLLT SF QK K T $\square K K V K E A K V L P P N A D K T L$ F NEEMI E S LFGAQS TEKKSTAAKKESQF VRILDPKKA QNL
 MDFNQMEDLFSDSAPPDNSEKRKREMTEINLLEGKRSLND
 E E L F G G Y S G G N G N N L K K D K E L L P S A A D P A S Q M I



ECFD D LEEMFK QKEVKKEDTSKSNKDQYVGワFDGKKS QND VDYETMLENDFAPARSKGGVGSLKRSAPTVTIIDGKRA QNI ET LIFVCNATNGTPKETNKQQVRPVPTQENRVLDQKKS QN I
 I E T L F L S NT GMTTTKEMSGGQDNPPMNQESRILEPKK SQNI TLLKKK FAANRSDSTTSGRS LPMKKVRKPLVIVQDEKULQTL

LA L N F A T QMK GAE P R L K A LAA RVK T E D WR L G F
ID F D A F E E L F K L G P GLLMK DE SVVSNNKK K K S L L D TK R L Q N L LD T N RLE Y LFESKATSTSFKVVSGRQKQSTLSVLGMKRSN

DCHEFEELFSRKKPDSDT $\square$ SKTKAKQVVKLLSNKRSQAV $\square T$ TNFATK R $\square E A K K T D V T D Q P S K K R D K E L R V L D G K S A Q N L$

LFESKK TCSSK TFSCLT NGKK Q K Q S CVSVLT L K R S H $\square$ FLL G MFEVKKKTQAVVMENNKKESKTRKSSAFTDQRQQNI L D F F Gll $V$ D Q D E F E S L F T D T M N P A EN D GA S K Q K K S V Q V I D A K R G M N G

$L D L D K F E E L F K T K A Q C S K N K T A Q K A A S K V T L L E A N R A K N L$ ID H DEMFTLLFSETRDSAPHTRKP GQRKNNKLVIMDSKRSMNL LKEKFATSKAGAKSNDVPKNAKPAKKVKQAQ\|NFKRYPHF
ETGF L $\square$ S N ATNTAP K EMNRRQVLPS LT QENRVLDPKK S QN $\square$ LF GYTTSNRKSP DSSNTSGSSSNTPAAQVFILEPRKS QNT V D T A R L E HLDF E S RA K EVLDPSKKA GERTMTTVVLDP KR S N ADMDRVMA YF GTATAKRALPSTKSSGKFQSALDSRRTNN■

DD F H K FE DVF R L N Q F P K S E R R F S R R P E A P S L L E P N R LR NV L D L E D DA T TFASCS QKYST DS R R S R DA Q DSVI DPRRYQNC L DLGE FQKMFSREDATAKTPMKPKSSVDPATILDMGTNRNV

 LF GYVAVGKKSPDDGGDKKPSSASPAQDFILDPRKSQNT
 LDE F T E L F S R Q VIAA P K L R E E K V V E K LD L Y R K E L A N E F R R V E K K P M E R E T L V M K E V I I D P N R E R N V


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$\square G \square L Q G S M K \square T H S E L K S A L L E V N E K V L T V G F \square E Q$
$A \prod K \prod S R L Q M S M E E V Q E A \prod Y K M D A K K L G L D R L Q G L Y D$ EI MLS KV KVPLDELMSSVLDLEDSALDIDQVENL AFMLAKLPA VEELKRAVDKLDSNKLHKEVIK
$N \square G \square T K \ P \quad P \square N V I P T A \square M K F D S M V L N K D G \square E K \square L K T$
LI AQRRIGLAP KDi RGFVDRCDTTGVPGEYAE

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

E $\square \square H G S T K M S A A E F R D A L L E \square D E S K \square T E N \square L E R F W K \square F$ A ISLKALSVSAEQVRAAVMEGHDL
$N \square A L A R F N K R T F A E L R D V I \quad D D D K S K L T V E E$ NI SLRQFRMSNEEI DQLLREGPSEKI GAEKDRGL EI ILQKLRMSPPI MANAILTVDEKILTLSTLQSL

GI LLMSSLHLDDMKDI QHAVVNLDNSVVDLETLQADYENRA EIMLLSKMNPDVEAIARAVQSMDAAALDAESVAGM


$N D M L N K F K G V S V E T V I D N D S D D M T L F D E V S D I E G L K N A L$ AI RLSKFKGDSHAQLVARLVRMTTTGEDDMDEEMLETVVG A L L R ALNVTKEEVC EALSEAGNADS AI LI S S L HLEMKDDQQAVLAVDHSVVDLETVEALYENRA GIVIGRIRLDVQDIRHALLFVDFNVLTRELVIRLASA A L L KALNNVNKEDVCEALLEGI PSTHFD IFFMVYVCHKGKV A $\square L Q G S Q K \square P L E E W K R V L L E \| D D R V I P S G T M Q Q L$
VISSLLK LIF QVARSGWCMRIVIMRKSTVMEAEKPSDAAAGPK SI IL KQFR MSHAALREAI MKLDPNVLDTERVQGL

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GIFLKQFKRSVDDI IEDIKRGVGGHYGSEKLTEL
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 ALVLK SLGMTRDELVESCMEGHDFHPDTLERL

G

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$\qquad$
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TRVAPTKEEQSKILDF

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RTLRNAAQELVSCSELHITLHLVLRAGNYLNAGGYAGNAF KTIQKVCDEI LGASKLRRVLGVILRLGNELNQAKGAVDAV SSVMEACDEI RRSRGFKTFLELVLLFGNFMGQSSKTYKDF VQNVQASKQLQASPKFVAVLEYGLAMGNHLNEGKEVAKGF QTLELACKELRRRGLLLKLLEAILKAGNRMNAGTARGNGF FDLKVGMEQLVQNATFRCLLATLLAVGNFLNGSQSS GF

HSVIKASTALSSSKKFKQLLALVLATGNHLNYGKRNGNAF KRKQEAIRIVRTSESFAKVLKYVLTVGNYMNRGKKQLEGF SVILSAINELDNCEELHTVLHLVLQAGNVMNAGAGNAVGF GVVQAACEELRNNKTFSRLLEALLKTGNKMSVGTN SHAF EVVLTACRQVFESDRLASVLSAILAMGNYNQGTNRGNGF KRAHDGDRAALDTKRLPRVLQYILAIGNFLNAGSRDAKGF QTLDLACTELRSRGLFSVDGKTTLLNFVVEEVVRSEGKRC ELLLQKLCETLKNGPGVMQVLGLVLAFGNYMNAGNKTRDGF MSVVLACEELKKSESFNRLLELVLLVGNYMNSGSRNAQSF $K T V K Q T C E F L D E S E E L R Q L E S V L L T L G N F M N G G N R T R D G F$
$C R T L E G V S A V M E S Q L P R L L Q V V A V S N F L N T G S R F A K G F$
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#### Abstract

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\section*{}  K   KLDTLLKLSEDKMKDNRTTLMMYVVE』DEKKFG LI ITEQ K K D T L L K L S DVKGADGKTTLLHFVIVYCNRGLS VVSGLSS ALSSLPRKLKDTKRSFDGKTTLLHY LVAHLENTPKDLLQFTA ISNCRWPTHDSKFEKKNVTLMHFLI EMLEKHSPDIDNDPD KLDSLKLADVKGVDNKTTLLHFVVAELNMRMGMIMGLPA RLD SILKLVETRAT RLDSLLKLID DRARNNKMTLMHY LCKVLAGKDPEVLDFVK KMSVLGKLADTKSNDNQKNLVYFLCKYLHEKHPDLSHWME NLETLSKLRDVKSSNPAQTLLHFUARQQMRQCPDESLAE KLDTLLKLADVKGDDGKTTLLHF GLDULPKLKDVK SRDNRDSLVDYVCYCAFFVFNQNAGTDN H GFLQKLNETKTADNKKTLMTVICDMVAHSYPSDLTDDQ K LDAL DKLVDVKGTDGKTTLLHF EMSVLKKLSGTKDDNNSESLLHY LVSCMSTEANGLANFPD KLDSLLKLSDTRARNNKMTLMHYLCKIDAERMPDLLDFSK  RLNDLTKKVQLK SVDK VVTLLHFVARMI RLKKGNLVRGGD     $N L T A$ L R K L S DVVK S A D G G T T L L H F VV I E Y M N L G L P I VGGGLS S T L D A L L K L D E AK A F D K K T S V L Q Y L V K I V K A N E P DL L K V H E  


 ，
$R$ VAS L L K L A D T K A NKPGMNLLHFVVMEAQKKNKNLLSFPD TVKSLSKLNQDKAFDQKMTFLQYAAQ\｜IRENNEELLLFKD EMNVLTKLMDTKDVDNKFTLLHYMVDSMRKYDAKNSKFTE $R L S S L A K L P L L R G R E R R F T L L H A L V E Q \square L S H E P E L A T P P Q$ KLD T L L K L VDI K GT D GK T T L L HFYF H $N L S A L Q Q K L S D V K S T D G K T T L L H F V V E Y M M L G L P A L G A L G S$ E L S Y L E K V S E V K D T V D F E QL T E N L GQQLERRRSRAA E E S L R S

$H\|S\| L P K L G D T K S T N K E M T L M H Y L V G V L E K D S D D T L C F E K$


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#### Abstract

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$E L E S L G Q V Q D S D Q D \square Q T D V G D \square D G Q F N$
 $D L Q F D D D K K G S L E A L T D D I Q G L R K G L E L A K F E R E R Q M N N$ S I FPDPEPQDFFLASQVKKFEDLDEDLRKLKKQLEMMVVC
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EIPALTRCAKVDFELLAENLAQLERRSLAAGDSLRSL
DLHFLDKA
DI DLI SKCSKVAYASLASEKNGDEAGWQK L LREAEATVPS ELEHVESASKVSAQCLKSSGDTMEHQDQRLESD円EKFPKT EFSNVKKAATVDYDAASGTCSTLSARVVEI RELVSQCAAD EVTEIPLAAKVPGAQFESDDKSLEKMYNDUQTAVGKDPED EI P HVLEAVRFNVESVDAHIAALSESVKTARTQLSGUIVN ELHYVEKAAAVSLENVLLDVKELQRGLEDTKREYTMHDHN



C $\square \mathrm{FPDPEPQDLFMKFEDFQKD} \mathrm{\square RK} \mathrm{\square RKDLRACETEAGKVY}$ D FKSLEDMGRLDVGGLEQNLTRLDSAFKALKQQLAAKNNS EMKYLKDA SLASVDNLTTDINSLANKLKNL

EMDNVKRVAALDAEPLVATVVTLRQELLKSKEFL
DLPSLERASRLTFAQTEEELAPLHAGLRALSEEVEAATKE DLKNVETAARVNLGELEKEMNDLRDGLKNLKTELGVQEKQ ELSAVSEAGGFDLNLLQQSVHDLAKGLQEIKSQVREGKYT

D LA HLEEPATKDQHY LCKVLAGKLPEVLDFVKDLLATSEKD EVEAVVPAVRVMGSEVESTFAELKKTVAGFDATLAQLQKT QLAACAPASRLNWPKTMEDLRTMRAKLNEL SAKLP

EFLHVDKASRVNADEVAK GVNADKNALNKVENQLK DLVHLESASKLQLKSLAEEMQAVSKGLEKVEQELAAAEND ELEHI ESASK
ELEAVEKVSSVSLESVLGDVNELEKGYELVKKECTLRGES ALTSLYDVQNILIPELHGDMAKI TEVTDYIGNEDAAQKDK D T A VTKAGKCDYSLVQSNFAQLEAMCKASWEQLKVLEKA DPQDFFQAAQVKFDDLDKDTRKLKRDLTACEKDVQKVCAN

EPQNFFQAAQVKFDDLAKDVRKLKRDDTACEKNVEDVCSK D IT AVTRASKCDYSQVQTNLAQLEMLCKASWEQLRLLEKD
 EFGNVKKAATVDYDVVVNESAQLSRRLTEEXKKLLETC



$K L K S V G A A A R L S E D L L L E D F H K L Q R R V S T M K T S L R$
DMPSLKLAEKI S WEESMQNDESUENSLTRDRKSAEKERGE DFYHCVAAARVNGEEVEK CVAALRQDVNKDQNSGK ELTEFEAVPDASMKGLSAEVDVLKKELENLIQCRRLLKPK

## EFS HVK T A A T $\square E$ YESF $\square$ N $\square$ CS N $\square$ T GRVAESRQLVTCCSNK L  EFQCVEKASAVSLDNGLADVNELDKGMQMVSAEMEKVFKL

ELESAGVCTFGVS $\quad$ TTVDS $\square D \| L F K E F K Q \prod Q D R \prod E Y L H Q V$ $K L L H V Q R A A R V C V D S I H T D F N S L S R R V L Q L Q Q L L H T D E E L$


EFTNVKKAAAVDYDTVAATCLALTSRAKDARRVLAQSEGD CVFPLAE
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D P S DLDKAAIVDYDDCRSQLIMLRSKTEE
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UniRef90 C3YGE1 UniRef90 ${ }^{-}$UPI0002B45500 UniRef90-F4QEV6 UniRef90-F7CFJ7 UniRef90-W2T5B1 UniRef90 UPIO0026529CE UniRef90-HOUYY8 UniRef90-A0A059D963 UniRef90 A2F502 UniRef90-UPI000440CDFB UniRef90-G3PRG4 UniRef90_D2VGI5 UniRef90 BOWAV0 UniRef90-M1AS58 UniRef90-U5FSD5 UniRef90_UPIO00454736A UniRef90 UPIO00273DE60 UniRef90-H3H664 UniRef90_UPI0003C272E1 UniRef90_V4TJH6 UniRef90-Q9NGX2 UniRef90-E9BXV6 UniRef90-UPI000393D5CC UniRef90_V8NDX1 UniRef90-G7NK73 UniRef90-E5SE78 UniRef90-B8ATX9 UniRef90-K7G0T6 UniRef90_A0A023B5Y3 UniRef90-K1Q9U3 UniRef90 G0R3G4 UniRef90-C5XVF2 UniRef90_UPI00044446C4 UniRef90_C1NOZ7 UniRef90- H2YP92 UniRef90_UPIO001623CB7 UniRef90_MOWTA8 UniRef90_W5GLZ6 UniRef90-K2H068 UniRef90-A8IF92 UniRef90-M0RTK9 UniRef90_G3NY12 UniRef90-D8M9Z4 UniRef90_M0S731
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340
350
360
QLS L L E HLQPFKDNMEQF
$340-350$ GPLSE NFCKTLKEFDQYAEAEVRSLASDYSAVGKNV
 PGSEAAMVTSFRCKMKPFLKTNSEHLNSLVKDSKTAQEAY

STK AKHEMKPVLKQRMSEFLKDCAERI IILK乌VHRR\INRF DNST MRQKINDYLTDVAQRIHQLNTIYNVTKNRW RESPKEYDQPFKNK GQFYDGAADTDHALSEGFKKMEEDY $R E S P K E Y L Q P F K N K L E E F F Q K A K K E H K M E E S H L E N A Q K S F$
$G S G L G K E L G R F I D S A E E E L S S L R E E Q R K A M E L V K R T T E Y Y ~$ GSGLGKELGRF DESAEEELSSLREEQRKAMELVKRTTEYY

SDEED
KEADDRGKKFVSTMESFEQKVKDELEGIEAKFKDMKTEI KEADLRGKGTHNHVLRDFGSNSEEKLKKMRVDCKTAQDSF ASENDGLVSEVFRKTLKFLGVAETEVASVTNFYAVVGRNA

PTASDADKDAMATSKNT DKQFCKEVETEDSVLQGLLDKL EDAHD KFVEKDSSFSKNARDHYEKLSNMHNNMI K LUY GGGGFVKEMKTFL G S
D A
$T M L K D$
FPSRTEEKDKFVEKMTSFVVQSNEGKLKK LQDDAK DA QDAF E DLUHDKE VT K I

 NSSDVVPMERD D GGFIAENENRQPDLQKKMNEAKQQF S D QMTNVNQEFRD QMAEFLQDAKSEI EDLQEDLK DIE GLR
 E $\square$ A T I E E T S GFRRSLE CFVEHADNETNFFMKE EKRLRSLV

DAKDAAAERAFREALVSFHADAAARLAERVAALDDAKASF
 KTEPDLSKDTFQETMEKFIKDAGADVEAAQEELGEALQAV

GPVSET FYKKLKEFLADAQAEGRSLASLYSTAGKSA


TFVRQAENDLFPEKMGPFLSKAKTECE\|VEKMYNTMNAKW $G A \vee S G$

FRKVLKT FLDTAEAEVRSLIILLYSEVGRNA

 TYQK C D D DAFVEVMSPFLVKA QTELE IIETMHNKMKCDW ASKATPQESQFSAPRVPGLVGSTDSSAPRVLGSVSAQTAY

E

## QT GFVMEMK GFLEDCEEELEVVREEQDRVME!V

AKHELAPA LDRARLTHFLD QCARRVAMLRUVHRRVCNRF D RMQFE SSEE NLQPPFKDNMDMF LS QAKTELEMQEEQLANDQK $\square F$ SS PVVVATLTEFTSRSADLLKKLHDDCTTAQESY
GAKNERELYE TRLLNTFYSRCAPTLPSVVEAYESLKNS Y Q S
GCSGDQ WMKFETKMGRFLETAGEE VVRワKAQESSTLSAL A N P N K E

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DALI LYFGED
K K T NEYY L $A$ G A TKDNMPNPFF IIVKDF VDKDCQAC TKAVKHFGEEAG K DQPDEFFGIFDQFLQA E S LVV K FAFN ATEYPMEEFFADDRT FSSVQYSTAWKRKEA A SVVEYFGENPK TMQPSMFFPGFGRF』KA

H T LIEF F GYPKTATSS IQQFFGSTYAFSAAFSKMAQK I
 HAFLI YFGYSVNEDQNPNEVFKMVTEFALEYRTTREKI QQ QYTCKMFGEN A DHVEPVNFFKDVKGFRDQYRAAERANSK Q T T VG Y F G M K P K K E I T P S Y VF M V WY E F CS D FK T I EWK R E S K
 K D C L L M Y GETEK D Y S MAAFLEVVFSKFVS QFENI QKVVVK


KECIIEYFGESSRNADA NAFFSLLVRFVRAFKTCDQENEQ DTLILYF GEDPAR D A L A L Y F GE D P A R CP FE QVT T T L L $\quad$ N F VR L $L$

GYEAVQEVRVTRFCQ
NAAKAHFFEEEDTEEELDVLLSHDANFTTEYCREHSKYQA ENLGEYFSFDPKAT GIGEFFGDLSSFRTLF
RKTTE Y Y QAKEH KA H P L Q L F V I I K D F LLGMVDQVC $\square E \square A R$ K K A IQ Y M A LD DA K P P P P E E F F T T L S T F I SNWNRVTEENKK $R S L A D F D G Y S A A A T V T P R E M F Q L V G E F A L E F K K V A D V N Q Q$ DDAVKY FGENPK TTPPSVFFPVVVRF
RELGQYFLFD TNKDSVEEFFTNLRNFKNMFHQAVKENQK Q S I M G Y Y A DDDVIK K V RSLLK YF SFD SK TYPVD QCLA DLLRDFKVAYEKTAKE I

 CELAD FFCEDVK TFKLEEAFRTMQT F CERF KETAVFYCEKVSE PSEKFAEKFGSFPGRAKREKDE KKT $\square$ RYFHGNDSKDDSF R LDFVIVRDF LVMLDKACKEVGA

REAARYYGEDASKGREPERFAKVVADFGALVATARRD
NKVVE LF GEDPKR LQPDAFFNLIFTDFMASFNSARK DNDS RDTNRYFNEAAKNDSDPLKHFRILLKQFLIDMLEKAWKDVIDR

D S LA HYF GEDPVR_CPFE QVVSTLLSFDKTF S KV C QLYG E DT SKLP K S E
E QL R S YL N GTGDKS DMKDFFG LLTRFATDLAKA HTENKE
Q D L V LFF G L K P K TE EVT T G H L F M L WF EFCAD FKTRWKRENK R DLLAAWF GESEKD YTENTFFKV DS DF

ES L R K Y Y S F D P K K C NMETFFNDLK LFKEDYEK V I H DMEK DSLSQYFGEDPAR YPFEQVTQTLVVFNKMFHKAHDENEQ

NDTMTRFDKDTDDDCTPEEFFSTVYDFSVALM HSFVVMF LIGYSRAR DTRAE DFCRTMISNFSSLEYRAMRQA LL Q D MVVS YF GVK P K K EVVAPGYVFMLWYEFS S DFKNA W

Q S V VD Y F G VK P K K EVVT P S Y VF MLW F E F CND F K N A W DR H S K HSFL LY LGYSRARETSADGFCKTVSDFALEYRATRNA LQQ

 $T G V L S Y F G E D P A \quad M T S T A F F G T L N K F V A A F D S A L D E V G$



RS LLEFFCEDE ETFK LEECCKDFK DFCEK
E SLLNYFGEEATEPEVQHFLHFLDEFCNDFENAAERADD TKFAKYYAFDLK KYPME QFFMDMK T FKE QYE SNVLVRFGEPA $\quad D$ LDDSQELFGWDSAFDSDFRKASAEV
$K R T T E Y Y Q A G A S K E A N P L Q L F V I V K D F L D M V D G V R A D T T R$


FELTVVSFSVKPKKEVSLNTFFSVWHEFSTDFKEQWKRQNK QAVVSYFGETS RTMVPTAFFSLFVRFTKAYRQSLVDLEN
KECCEYFHFSKSSKEEEDEFFAY $\square K D F T T Q Y K K A K K D \square E Q$
E EVTE ELFGGSFKEEGHTDRVVMAVRDEDSTLDEVCNDMGE

K RTT E Y Y QA G A VK G K N P L H L F V I V R D F L A M V D K VCDVE $\square A$

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S Q K K

Q R K K K

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K $\square$ H WQLLP T HE GTVFNE $\square K T Q E \square K Y N L I D T$

K P A $\square R$ RK K VY WNKVDA $\square E G T \| W S L L K A S G \quad D T V N F V$ VPKPAPKLKTFFWKKLPRAMG LWSHADTAAVEKVI DE N MKLKP LHWDKV $\square$ ANHS IVWDE DNDGSFDDELMES KLKTFFWKKMPRLSG LWCFSNDFSAETIIDEP

T $\square$ WD S $\square E E P H \square M D T S E F E$ KKYKPEVTMKRANWNK DQPTRNCFWTRVKEEKFENDLAPE QVP QP $\square \mathrm{T} \quad \square \mathrm{KP} \square \mathrm{F}$ WK K $\square \mathrm{R} \square \mathrm{P}$ CPS $\square \mathrm{S}$ S QT DRTVWQ $\square \mathrm{L}$ PE $\square \mathrm{T}$ PPVSKTGTLK LD WKPAQANKGTFWHKLDLPQDDAKK LVQ MKHLPWSR』IVNEES $\square W Q S M M E P K I D V E E L E R$

PKK S VK K $\square H$ WQLLP THEGTVFNE $\square K$ S Q EAKYNL
KPKPR LK SFFWKK DPKPSG ПWAASDPDDMRRAVIDE PRTKLKPLHWDKVNVAHSMVWDKLTGGSFN
QTKYKLPTLNWVALRPNQ MKGTVFSEDDDE\|VSSK KDYKPEVQLKRANWSKI DLSEKSFWVKAKEDRFENELFSK RRSSSLRKVHWTSLEAASESDWTRVTRRKTAPDTLSP KLPMLNWTTL S QA QVADTIFKDLDDDKVLDE

KASVPMRPVHWEKLVGAQSSVWASVALDAVPDDLAQT PSPPLKRLHWSVI PPNKGTI WEDIKENSQDAKDCNE K VP EKRPLG L KLHWQLLPTHEGTVFNEIKTQEVKYNLIDT
KADPTKYRLPVFNWTALKPSQ VNGTVFTDMDDEELLQV

KKMRQLHWNA DPK LIKETFWDN LSPDKGNDN

PTRKMRPVAWNKLPPLSTTLWTQADTPTLLPLTSEQ $R$ LKGAFWTKLDDLKGTLWADLDEGRSTVPLPSR

KKKRMRSFFWKT $\square \mathrm{P} \quad \mathrm{EEQ}$ VRGKTN $\square \mathrm{WT} \square \mathrm{AQEHHYQ}$
QPTVPMKGLSWN LLKPDQNSVFQGMNENE! G K


P QNVNWW LIANDQLKGT\FES KTTFWSQQVEPQGUK\|PL
QA $\square K P V R K \square Q N Y N W R R \square P D K K E T V W D F V K E F P$ VSQEEVEE

FDDEEAEM

 $K K K S S L K R F N W V K I R A L P G S \square W D E L Q D Q Q V C H D \square E D E$

KHADPMLNWNTDKTPGNTD FKVLDDENVYDE



PAPVKPPKG $\square H W Q K W P S S D A \quad \square R G T \square W E A A P T G N \square D A D$ V S H K

ПYKKTRATNTПNWEAVKPAKTTVWDQSGTDSDFSQYQRD


UniRef90 F1M653 UniRef90 T1FY41 UniRef90-Q4YPX5 UniRef90-A9T3J8 UniRef90_I3JM19 UniRef90-J9ESF7 UniRef90_UPI0002A4B60A UniRef90 C5K6N4 UniRef90-B8CAS5 UniRef90_Q385J4 UniRef90-UPI00023B27DE UniRef90 Q4DN07 UniRef90_UPI0002B4A0B9 UniRef90_G5E5C0 UniRef90- J3M361 UniRef90-N6UTY5 UniRef90-D4A4Y9 UniRef90-K3YQG9 UniRef90-C3XX60 UniRef90-GOTVJ2 UniRef90-D8QPM1 UniRef90-B3RJQ3 UniRef90 ${ }^{11 H N 71}$ UniRef90-H3CVQ1
UniRef90-E1GAQ6 UniRef90 V3ZDZ7 UniRef90_UPI00042D074A UniRef90_H2LP90 UniRef90_A2XDP2 UniRef90-A5JZZ7 UniRef90_R1F019 UniRef90-A4HDG7 UniRef90_F2DGI5 UniRef90-A1DYE7 UniRef90_UPIO00441036C UniRef90-K3WPW1 UniRef90 A9VC36 UniRef90_A0A059D3U9 UniRef90-R1D2W4 UniRef90 ${ }^{-}$Q5CG63 UniRef90-A0A024V5A0 UniRef90-F1QXX2 UniRef90-S4R629 UniRef90 E9GFZ3 UniRef90-C5YXZ0 UniRef90_Q54PI9 UniRef90_M7BZK0 UniRef90-MOVTS8 UniRef90-A0A058Z397 UniRef90-F0YB88 UniRef90 H3B784 UniRef90-M2VUW1 UniRef90-A0E3T6 UniRef90-H3D4I6 UniRef90-Q4RLQ6 UniRef90-G7MS51 UniRef90-M4ELI7 UniRef90-A0D1C0 UniRef90_UPI000440BCFE UniRef90-W5L523 UniRef90-H2Z893 UniRef90 E1G0T1 UniRef90-A0CZ15 UniRef90-V8NCJ2 UniRef90 J9JCB4 UniRef90-A0BLV2 UniRef90_E1ZTH7 UniRef90-H3GLR9 UniRef90 M1B3V0 UniRef90_G3WIJ0 UniRef90-A7RRQ1 UniRef90 UPI0001B66E93 UniRef90_C5XZ80 UniRef90-A0C4X2 UniRef90-H2XZX4 UniRef90 UPIO002657C69 UniRef90-B6AAY5 UniRef90-POC5K4 UniRef90-B9H6Q1 UniRef90-F4RPW0 UniRef90_W4XWS5 UniRef90-A0BFK7 UniRef90-F1MNU2 UniRef90-T1MD83 UniRef90-H9FJB1 UniRef90- W2G738 UniRef90_K7F9P5 UniRef90-TOS6Q5 UniRef90-S8BVHH7 UniRef90-X6NOK0 UniRef90-U1P351 UniRef90_A7S8A4
 KTVHK $\square$ FSRMGQERVVKKYKKKSNEEK LITVLDRTRAQN $\square$

## QVLQVLP LIKRSQA】

HDTKELESLFTQRFVNKPHFKSKSTKQSVKVIDAKRGMNG
 LFGYTANQKPPEMNNKPVTSSSSNSPTQDF ILEPRKSQNT FLLDAMLE $\square$ RKKASPLSTSSGESKEPKRNSSAFSFQRKQND

Y LFS K DT TQQKKK P $\square S E A Y E K K N K D K K \square D K L L D G K R S Q T V$ IDIS ELESLFSVMMPNMEAKRQRQHPSVATLI DLQRSKNC DLFHMLQNNFGGGDMVEGKEMKKKKVKELKVLDDKTAQN厄्L FLAELVEGFK RPERRTSDSKPSLVGSVSVLPQNREQNI
VDDTE $\square C \square L F P S R T K P R K \prod N R Q P \square K P S R A K Y \square D H K R S Q S \prod$
 LTE QKTKE

## R S A MMRCRSPQDPPMQ $\square$ SLDDSKRSMN $\square$

$\square D T K A V H K \square F A R V K G E K K \square V K K S N E E K L I T V L D R T R A Q N D$ TLLDPKRANL PFLLELLKKKAVAQASVAESAVKKLEQERRVFTTQRLQNI LDEGTIEALGGTAAVNRKTKSRSNSEEQDFLIEPRKSHNI

 VDFSSFTEAFSHANNVVTTGRRKATHGPDTVLDLDRARNLL
EADFAVPKPAPKPNHGADGGGGGPAAAPDHVLSVQRATNV NDPNELEQFFEDKCNNNASATSGGSKKFRMVLDSKRSQNI
 LDMDSFEELFKTKAQPRCNAAQPKVAPKVSLLDANRARNL

DQTLVESWFSLSPMAKEKMSKENLNNSNNTLDLRRSNNT K QVVKLLSNKRSQAV $\square P$ QQE DEE LFSKKKDAAGAAAAAAGPPEDNLIGGKRSNNM DALVAAFGTTKAAKDDKPKEKKPKGPVLTHLVDGKRNQNV LLNQKVAHNF
NHDGKSERNSTMPLSVLDERRTHLV LLLEKNFNKVQPKDQNMKQSAAQSNVAKGTLLSSERSKNG
$\square$ D T K $\square E E \square F$ GQQEDT T KNSSFREAREE $\square T \square L D A K R S M N \square$ NQESRVLDPRKSQSI FD DK S DEEKFASKPAKQ DQQSKKKEVQK ISLLSGERTKNI LFGQQQGNKGKHGQEKHTNTDRKNTLDKISILEGNRKLKV

 LDFDLLESKFCEKDDPNANKKETKALPKPTLDEQKKVNNT L

EPDPEECEVDGGEGAKEPGSAFLHRKLYVVLLDHKKSQND

TYFYK\QSASSSQTQNSENQUVKKVVQKDQLIATDRSKND $D L F T R L M A T F G Q K K V T K K V E K P Q K K V K E L K V L D S K S A Q N L$


LDFEDFENHFR DKTMDK $\square R R \square Q E K E A D K V R V V G D N R A K N L$ LD DEFLEKEFSKKQQAQQADSNPKSPQKISLLQPERQKNM KLLSNKRSQV
VDTARLEHLFESRAKEVLPSKKAGERTMTTVLDPKRSN EDVASGSFEKSRASSPRGRSKNDQLI EDKRANNL


$F$ LLERVFERAPPNGHR VVGAQRRKRGEVVVCGLTEKRALNL


UniRef90 F1M653 UniRef90 T1FY41 UniRef90-Q4YPX5 UniRef90_A9T3J8 UniRef90_I3JM19 UniRef90-J9ESF7 UniRef90_UPI0002A4B60A UniRef90 C5K6N4 UniRef90-B8CAS5 UniRef90_Q385J4 UniRef90_UPI00023B27DE UniRef90 Q4DN07 UniRef90_UPI0002B4A0B9 UniRef90_G5E5C0 UniRef90_J3M361 UniRef90-N6UTY5 UniRef90-D4A4Y9 UniRef90-K3YQG9 UniRef90 C3XX60 UniRef90-GOTVJ2 UniRef90-D8QPM1 UniRef90-B3RJQ3 UniRef90- 11 HN71 UniRef90-H3CVQ1 UniRef90-E1GAQ6 UniRef90 V3ZDZ7 UniRef90-UPI00042D074A UniRef90-H2LP90 UniRef90-A2XDP2 UniRef90 A5JZZ7 UniRef90-R1F019 UniRef90-A4HDG7 UniRef90_F2DGI5 UniRef90-A1DYE7 UniRef90-UPIO00441036C UniRef90_K3WPW1 UniRef90 A9VC36 UniRef90_A0A059D3U9 UniRef90_R1D2W4 UniRef90 ${ }^{-}$Q5CG63 UniRef90 A0A024V5A0 UniRef90-F1QXX2 UniRef90-S4R629 UniRef90 E9GFZ3 UniRef90_C5YXZ0 UniRef90_Q54PI9 UniRef90_M7BZK0 UniRef90 ${ }^{-}$MOVTS8 UniRef90_A0A058Z397 UniRef90-F0YB88 UniRef90 H3B784 UniRef90-M2VUW1 UniRef90-A0E3T6 UniRef90-H3D4I6 UniRef90 Q4RLQ6 UniRef90_G7MS51 UniRef90-M4ELI7 UniRef90 A0D1C0 UniRef90_UPI000440BCFE UniRef90-W5L523 UniRef90-H2Z893 UniRef90_E1G0T1 UniRef90-A0CZ15 UniRef90-V8NCJ2 UniRef90 J9JCB4 UniRef90 A0BLV2 UniRef90_E1ZTH7 UniRef90-H3GLR9 UniRef90_M1B3V0 UniRef90-G3WIJO
UniRef90 A7RRQ1 UniRef90-A7RRQ1
UniRef90- UPI0001B66E9? UniRef90_C5XZ80 UniRef90-A0C4X2 UniRef90-H2XZX4 UniRef90 UPI0002657C69 UniRef90_B6AAY5 UniRef90-P0C5K4 UniRef90-B9H6Q1 UniRef90 F4RPW0 UniRef90-W4XWS5 UniRef90_A0BFK7 UniRef90_F1MNU2 UniRef90_T1MD83 UniRef90-H9FJB1 UniRef90-w2G738 UniRef90_K7F9P5
UniRef90-TOS6Q5 UniRef90-S8BVH7 UniRef90-X6NOKO UniRef90-U1P351
UniRef90_A7S8A4


MS DEDTIKA\|LSMDSKENDP\DMVEQ
G LISS L HLDEMKDI QQAI FNVDDSVVDLETMAABLYENRA EI MLRN $\quad$ K MP LPDLMGSVLALDDSIVDGDQVDYL
 A I IL QF LRLLDQTIESSLLREDELTLCEEPUSGL

GMLLGS L GVSEEQLCDALLEGNAH GLGVEALR

$\square V A E M R N L R C S L N D L D H S V T V L D S K D L N Q E S L A A L L D D$
G $\square \mathrm{F} \square \mathrm{LRQF}$ KMPAKE 1 V K D $\square \mathrm{K}$ QGSGDHYGAEK LTE $\square$
 GI ILSAV KLPFDAMRRAVLAMDTAALPDDSV

GI TKKKLAMEPA A IVMALNSFDLSALSAEKVE


$G \prod F \backslash R K T S K \square S L E R L C A A D V S L E A S V L E P E L L D S$
 GULMSSDHDDMKDIQNAVLNMDCTVVDLETLQALYENRA

$C T L L S Q F K \square S Y G A \prod K E A \square C F E D G K L S V E Q L D A D D A$ GI $\square \mathrm{L}$ MSSLHLDMKDIQHAVVNDDNSVVDLETLQALYENRA GVVLGAL GFSEEQVRDALLEGNAHGLGVEALR

LI GLGRV K DSPAETRDALVALDVDKLDPSGDASGAEDWL SIFLKSFPTKPNQMKDKLLIIHEEKGLTDEHDASL


A FLLTTLDLTTDDVLQALRDGHYEALGVELLESL
ELILGKLR MSNEKI KNALLECDKSTLNLNVIESL

S I F L G T L K V P HVEVVKTMI LGGVAALDES
SVDLTKLRY ALYNLDLNALPIDQVD
AI VMMKFPVKPNLIIE WLNVLSEKLDDELI EKLIS
AILIA HLKLSHNELRRILLSMESDRLEATHI KQL $\quad$ L
LIVLNKLPQ PQALKDSLRALDDTKITQDQINALDRDFP
ELVISRLK K S AF TLKKALLA ID YDVLTEDKV

DWI I I LT L C DRENVNVID
$\square Q L K K P Q P E P Y T T L W E N L I E P D \square N T S E F A K C F S K V E R K K$

E T A LKAMMQLIDNNNEFDMNP DKEMLGYRSES LLYGDDKFL ELTLMLLNURLPADMMAA $\square M A M D E S V L D D D E I R G L$

GISMSSLGLDMKDTQHAVVNLDNSVVDLKTLQ
$A \prod N \square G L T T L P P V H V \square K A A L L N F D E F A V S K D G \square E K L L T$
ALALASFKI HDHYEI VNDIVTMDERVVNPALL




UniRef90-T1FY4 UniRef90_Q4YPX5 UniRef90-A9T3J8 UniRef90_I3JM19 UniRef90-J9ESF7 UniRef90_UPI0002A4B60A UniRef90-C5K6N4 UniRef90_B8CAS5 UniRef90-Q385J4 UniRef90_UPI00023B27DE UniRef90 Q4DN07 UniRef90_UPI0002B4A0B9 UniRef90_G5E5C0 UniRef90_J3M361 UniRef90_N6UTY5 UniRef90-D4A4Y9 UniRef90-K3YQG9 UniRef90-C3XX60 UniRef90-GOTVJ2 UniRef90-D8QPM1 UniRef90-B3RJQ3 UniRef90-I1HN71 UniRef90-H3CVQ1 UniRef90-E1GAQ6 UniRef90-V3ZDZ7 UniRef90_UPI00042D074A UniRef90-H2LP90 UniRef90-A5JZZ7 UniRef90_R1F019 UniRef90-A4HDG7 UniRef90-F2DGI5 UniRef90-A1DYE7 UniRef90_UPIO00441036C UniRef90_K3WPW1 UniRef90 A9VC36 UniRef90_A0A059D3U9 UniRef90 R1D2W4 UniRef90-A0A024V5A0 UniRef90-F1QXX2 UniRef90-S4R629 UniRef90 E9GFZ3 UniRef90-C5YXZ0 UniRef90-Q54P19 UniRef90_M7BZKO UniRef90-A0A058Z397 UniRef90-F0YB88 UniRef90 H3B784 UniRef90-M2VUW1 UniRef90-A0E3T6 UniRef90-H3D4I6 UniRef90_Q4RLQ6 UniRef90-G7MS51 UniRef90-M4ELI7 UniRef90_A0D1C0 UniRef90_UPI000440BCFE UniRef90-W5L523 UniRef90-H2Z893 UniRef90_E1G0T1 UniRef90-A0CZ15 UniRef90-V8NCJ2 UniRef90_J9JCB4 UniRef90-A0BLV2 UniRef90_E1ZTH7 UniRef90-H3GLR9 UniRef90_M1B3V0 UniRef90_G3WIJ0
UniRef90 A7RRQ1 UniRef90 UPI0001B66E93 UniRef90_C5XZ80 UniRef90-A0C4X2 UniRef90-UPI0002657C69 UniRef90-B6AAY5 UniRef90-P0C5K4 UniRei90_B9H6Q1 UniRef90-F4RPW0
UniRef90-W4XWS5 UniRef90-A0BFK7 UniRef90-F1MNU2 UniRef90-T1MD83 UniRef90-H9FJB1 UniRef90_W2G738 UniRet90_K7F9P5 UniRef90-S8BVH77 UniRef90-X6N0K0 UniRef90_U1P351 UniRef90_A7S8A4

130
A Q T S MR QVK M S VS HFPD
KEKPEEAEDET\RSFMQQQPDAS
PTK EEAEET RSFMQQQPDAS LDR PTKEESDGILEKLKGEGVNEESFRDVE $M$ VM H NTLPN P $M M P N P A E I E Q \| K E A K V A E H P D M P L G Q$ ■LPTPEEAEMLRAY HGDLTLLRP FLP S DEE E G GLTKY L A NVNRDEALGGMTP PTTEEVAS L RAE HTAGNVE W TK K S P TQEEESKILQF RSK LD A LLLGVLPTVEEMERLRMEKVLGNV

RMLMQMTVTNEEELKL

K Y F K D D P S K L C P EDELTKI RKYYET KGYTGKKE K L L L
 HK\|VPTEEDRRLI KEWEKRDPTVTESKLQCL
 MLSQLVLT NEEE LTKRYSKDDPPAKLCV
 LLCSSRDMEK VHHVKRKGAAAQLDY CKLLLPDSEE ES RLL RRFCGERSFLGE
 NALLKCVPSAEELEVANAGVPTAA LGF
 LSRLSISKEEESTILKFS GNPDRLAP MDMLCE DEYDDLAE LLRSEYMASDEEMSMLTERHDSGKPMAEVD
 $K G V S K E R L K M L D Y P T P D E D Q Q L L N S$ K K K SKEECDGILQKLENEK

 SDELEKI EKHGKSSKERENAKSLDK
$M \square A Q L V L T N E E E L K L R Y F K$ D
 $R R Y$ PTPGD 1 D M GKSFKGSPSE
 LDDVEKYTSHTGPVSDLV
 SRVAPSEEEESKLKSYSD
 ANPEELDRES A
 $M V N N L L K Q L D E Q E M 1$ TAVAEYKKQYADQ LIANI APTSMDVFYLLDCESIDP
 A QDVLDGLQEEARQTPEDEEDFDHYQ KWDKGE


F $\square \mathrm{S} \square \mathrm{L}$ KGDH $\square \mathrm{KRAQT} \mathrm{DEDEK} \mathrm{L}$ KEKHGRSCKEKENAKSLDK ESNSMSKLKQKVRGTKEELSTIEQYLEDNPD KAGADR RWS P T S DEE ELRLRY G P \I P T DEE DKT TSEFQGQREKLGVVDRLAP MDESLIDNNLLKQLDEQEMISAVSEYKKQYDDLVE K S Y N GEKEKLGE NGVSKEK LKK LLDDY PTVDETQLLKESSADSSNTSNLPW 1 NL F PTKENMELLMSYT QE पQA】ESFE
GLLNFVPTKEELKK LANNADK GGKWTLEK

LDVITPTEDEI GTVQGYDGDKEEMGE ALYENRYAQSVELEKTEKH【QSSKDKENAKSLGK RMLA QLVLTN EEELK LRYFK D D DP P K L CA
GCLQRFFPTVVEKQALQNF LVANDNSVSTGGK SHVR HVLMVLPTEEEKQKIQQEAQLANPDVGBVAPLGS


Y LS S LIK HFPTTDEACFCLCLLL A YFKKLTS ADDLKD


RK LIPFVVMDKCQC
AERFVAE
VGTVP
DVETYLYTMATTVKRDVQKRLECLAYLLRFEGSLRAAACDV
AEAFLLRLLLDVPNPFARVDALDAAEELEDAVQSISNLL
ED DFMI GLS RIE RLSQKLQUMSFMGNFSDSVSTVLPVL

V FLYY H L NRVPRLRQK LMLLSYLDSCDEVLHSLSPAA




PEQFLYE LS LDPNFSERVFCTLFQSTFSESTCSTRRKL


 R $\square S E Q F M L S V L S L N R F K T R A H C V L S M K T F E E E Y L S C V E R L$
 ADQYVMKVM DDPRDQHRLTMMYRRRFVDEDNDLGPEL

 UniRef90-T1MD83 UniRef90-H9FJB1 UniRef90-W2G738 UniRef90_K7F9P5 UniRef90-TOS6Q5
UniRef90- S8BVH7 UniRef90-X6NOKO UniRef90_U1P351
UniRef90_A7S8A44
UniRef90_F1M653
UniRef90-T1FY41
UniRef90_Q4YPX5
UniRef90_A9T3J8
UniRef90_I3JM19
UniRef90_J9ESF7
UniRef90_UPI0002A4B60A
UniRef90_C5K6N4

TAVT LRACEELLKKSESFNRLLDELILLVGNYMNSGSRNAQS F $V N \perp R L V T E C L M N S Q E D Q K I M A M L A B G G N Y M N G G T \| R G Q G F$ DTYDKA DK EAR S S T R L R S L L K A V L K WG N Y V N Y G I N D N Q D F $F H L K L G M E Q L A A S Q T F K Y I L A T V L A I G N F L N G C K \quad A R G F$

 $A V L Q E A A D Q V R S S N K L R R L L G L V L K F G N F V N H G S T D T R G Y$ D NL LA A CNEL RNSERFRALLAALLK LVNQINS GE ESNKRC




 E IV T R A S K G L L H M K S VV K D L LA LI LAA A N Y MN G GNRTRRDGY





 REL H TACDEI CNSLALLKNLLGGTLLTVGNYLNGGSEK GQGY $E L L Q K L C E T L K H G S G V M Q V L G L V L A F G N Y M N G G N N T R D S F$ $R C L R E A A R E L L S C P E L H S S L L R L V L M A G N Y M G G Y A G N A A G F$ F H N A A C E D L L R G S R L F
 D SVVDAVCA ITQQRNGRFARMMRMILAAFGNYLNRGTPHAEGF QTLEMAS QELRTKGLFFKLLEAVLKAGNRMNAGTGNAQAF D SVV 1 A A A E S L R N A K KLLWKVLLEI LIAFGNYMNSSK

## V

 QV T R A CYEEIL H $L M L$ E EACKE L R S R R LIF LKLL K AVL KTGNRMM QRRGGMG

 E T L G R V C T A L Q S G Q A V L L $N N L K L I C D K L M T S V E V S R V L Q G I L D A G N Y M N G G N R Q R D G F$ A L E GACQEMRNS RLIFHKVLEAVVNFGNFMNTGGPCS K GL


 $S L L R A G C A Q L Q K G G A L R S A L R C A L G V G N E L N A G T A R A B G F$





440BCFE

## 

 V S V TA A C Q D L


KYFEQAFEELRDSKY
$\left.\begin{array}{l|l|lllllllllllllllll}K K & \mathcal{L} & L & Q & T & N & N & A & N & F & L & N & H & G & T & P & K & A & N\end{array}\right] \quad G$
KYFEQAFEELRDSKY LKKI FGFILA LGNIMNGGTAK GQGF
EKIKVG■KMQREDEKLPDLLEYSLAHGNYLNGQSAK GSAF

CTLRKSRLFHK LLEAVLKTGNRMNDGTARGAA

Q1 1 66E93


$\qquad$

## 4

 .
 GVLRSATAEVQRSSKLKRIMLYVLEFGNULNSSTFRGNGF
 $E L L Q K L C E T L K H G S R V M Q V L G S V L G F G N Y I N G G N K T R D G F$
 $F D L K V G M E Q L V Q N A T F R C I L A T L L A D G N F L N$
LVVKRGCRDLVENYSF DEALE Q F F F K K Q

 KLLIDEGYRQIKNSSCFTKILTALLADVGNYMNAGTKEANAV

 niRef90 A1DYE7 UniRef90_UPIOOO441036C UniRef90-K3WPW1 UniRef90_A9VC36 UniRef90-A0A055DB3U9 UniRef9-R1D2W4 UniRef90 ${ }^{-}$Q5CG63 UniRef90-A0A024V5A0 UniRef90-F1QXX2
UniRef90 S4R629 UniRef90_S4R629 UniRef90_C5YXZ0 UniRef90-Q54P19 UniRef90_M7BZKO UniRef90_MOAOS8
UniRef90_AOA058Z39 UniRef90-F0YB88 UniRef90-H3B784 UniRef90-M2VUW1 UniRef90-A0E3T6 UniRef90_H3D416 UniRef90-Q4RLQ6
UniRef90_G7MS51 UniRef90-M4ELI7 UniRef90_A0D1C0 UniRef90_UPI000440BCFE UniRef90-W5L523 UniRef90-H2Z893 UniRef90_E1G0T1 UniRef90_AOCZ15
UniRef90-V8NCJ2 UniRef90-J9JCB4 UniRef90-A0BLV2 UniRef90-E1ZTH7 UniRef90-M1B3V0 UniRef90_G3WIJ0
UniRef90 A7RRQ1 UniRef90_UPI0001B66E93 UniRef90_C5XZ80 UniRef90_A0C4X2 UniRef90-UPI0002657C69 UniRef90-B6AAY5 UniRef90-POC5K4 UniRef90-B9H6Q1 UniRef90-F4RPW0
UniRef90-W4XWS5 UniRef90-A0BFK7 UniRef90-F1MNU2 UniRef90-T1MD83 UniRef90-H9FJB1 UniRef90-K7F9P5 UniRef90-TOS6Q5 UniRef90-S8BVVH7 UniRef90-X6NOK0 UniRef90_O1P351
UniRef90_A7S8A4





 E T E C $\square E D \square$ C G T T $\square$ Q D VGGQS VS QLN F T LQ K M R R A VE A G K $\square D$

ELDCLDSLAGTTVQEVGRSVSQLSFTVQKMRSAVEESKRP
 D L E L P A R A A G I N L D A D H S S E S S T N L K K K L L E M E R K V S S S S VP E
 K T $\square$ G K V S L G E L S K DM A QL R A G L K DVVAR E I E F H R S Q SVFP L P E A S QV K FE DL DK D L R KL K R QL E
DLA HL E P A S KV A L
EI LHVEKAARVSEDTLQK
EL L P V E Y A A G F DLLA GI S N EVVCA LY K N L WK CS A L A R R DP D D
 DI NLLSKAS QLDFDVI NELLNKLDTEFKDCEQ GAKH ELTNTKKAASIDDMSLSRNVSELGVGLGKVHDVLRLDGMA $\mathrm{D} L \mathrm{~L} H \mathrm{~V} \mathrm{D} R \mathrm{~A} S \mathrm{RV}$
E F GAVAARTARFDY DELLESNLKKLEHDCKASWGYLAK ISKN EPSNMRHAAQVSFED』HRALNSLRQELHDVKDRIEGVART
 QLGHVGSA
ELGNVKKAATMDFDVLHGYVNKLETGLEKIKS ILQL
DLNSVLVASKMSSETVDILLASLDKEINYIREQL

$E \square N T \square A D A K R F S N D I C A S Q F K A L H S S \square Q Q L E N E D K E E M V N$ ELHCID KA A G I S I A SLLEQNLLGLERTAKAVSQELELDATH

 DL L S V LT A S K M S S E S ID DIFF S S L E K EI T Y I K G QL K T CTYPLPEAS QMKFEDFQRDLRKLLRKLNGEMEKLNRHKL

A RMP LP EP T D L H L K F EE LIE A S L R QL N KE DEG DEQK A N QVI
 E L D L L D K DP QS S L E N I LDE ESNE I ENK FK QV D QEI Q Y H Q S S C F P L P E P Q D L F M K F E D F Q K D L R R K L K K D L R A C E T E A G K V Y E MP A V D LA GVVGAAAAVVDALEI A G D L R K L E A A L K S V GA EL E V S R K G
 E L K L L R E A S K I S L S E V A E S L Y G L R T E L K D L S D A V R C L E C D
 $S V F P \square P Q A A Q V K F D D L I B D A R K L K K D L T A Q E$
$N$ N QR D G E L L C Q QM E D F L Q F A V E K L


DLKHVHKA QRVSGDQLMKSMSQMKAALSLLQKDVEAFSKS




 E I E NVVKKA A IL D A D S L T G T V S K L G R A L K E S R D F L N


 K M K A F E V L Q R V V V V H QLL V V D L G DIVK K G C S F

DLDGVDVAARFSLETARADVETLRRNLSKLENSVRNAES
 DL QS LESA
QRLQVVKAAGMDS DVLSSYASQPASGAEKVRLVLQY
$D \square L G I \quad I \quad L D L K Z S F S E V L G A D K N M L I D G M T Q A K E E L D \square M$ S

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RGSSPATLEPFQSKMNKF $\square$ YARQS LQEQENNDKDSVKKF NCNFEEKFMEKMKAALJDSETKYIKSMEKYQQUKKEV NTDANSNELKFDESMVPFAQTSSKDFIILQNMAKSSLNKL DEEALAPDGSLRHRLPKILKECEERLKVLRAVHRRVINRF
 YSEEALGRLE

EMKENGLVDLFPNRMALHTQKHLAVVSELALRHQRTKEDV
F LSTDDLK TQ HGKSVQGSLNASKDLQKEFAT IEKKK VQEQYSHRLQASITDSQALEEVFQAFEQKQL
MVTSADSARRFHNTMSMFLRQAEEEILKDQAQESDCDSCDV SPLA NDKFVPVMKEFQATATCKLAEVEDQYQDMKTRF
$K P$ WVLK L G G G THTA L R D DDRVERLLGEFNAKM
 ASAESA RRFHNAMSTFLGQAEEEILKLQAQESACLSLV

DSSSS MKQK $\square$ NDY $\square N D V A Q R \square H Q L K A \Pi Y R \square A F N R W$ DNSNTTYQLKVLSEN YFTCAVEVLAEEDRLLEDTKKYF QVSSKEH DQPFKENMEQF I IQAK】DQEAEENSLTETHK

EKKCTQGQRFFMSMQDFLKEAEREDERVRGEERRALGRV KCTYEDVFKEKMKNILQDSEAKYASAQRRYEETKKAV


## D LK R F

EALLHFRDTVLPQDHAARDDVERARAAF D पGTDEKGEKF DHSMGSF DSYSEESMKELEEDDDRVLLHV SEEERQVALRFRSAMAPFHTDMRRGLDALTAHRDETKTLL KS DVSKEDKESKSQELCSGKDENSDSRDNDKNEDKDENSL NYEEKFKEKMVSLLEDSEQKYNTAQKQYEQTKKDV

AASEE $\square H \square E P F K E K M E S F F V Q A K K S L S E E E E N L T E C K Q R F$ TSA DSARRFHNTMSTF LRHAEEE LLKLQSQES DCLSSV SSSYDQSKDTY SKVMSPFYDTANTRFITVKQSTQQTQKQF

G DGSASKFVETFGPFYADATDKLKRAHDDYAETKTLA KSNRSTQELQFSKDLKAVIQKYEADLSQLTQQCGEMKKIGY
 QEDQVRTF
S R RKTGQQ

LQDEAHT LIDFFCEDKKTMK
SDDEEQECGEFKGTVTKFLETAVKEAKKDETEDGSMLFAV QSKHPNDK VSRFEELSQQLLLEDTDLSQLLSTCES IY

K DPEDKFSEVCSDSFENF
GNGKMAGYRELI R
GNK NKVMEVKGSYRECKNGL
 SPE
$V P A G Q E P D$ AYTDK $V R E F D S V A N R T E E Q E K K D D G \square K A \square Y$ SNDKAAEKFK LL FDQLEETCGTIDKNNKDLDLV A GAGGADPGACLAHMTFFRAEADDRLGAAQAAVEEADSAF DDDLRADLAQSRESMRLYSTVATGNGRALLAMMALRKMNTK EMKNVDDENRFHQT LIKIFVQNAELDDMWLFEEEKR DMALV
RESDANLVQPFKKDMDDVQADLRNDEKKDESCDVMVQKRF LT T TVA SLGHR LVKANEFLSTGMRSLEEDSEDEKRLRSGV


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ERSQESNCRDLYNKNNSDENDKGLKLSEFEVDYKDTVDLY
DEPDTRVKFFFSKK\FLREAGEETNRDKSDERKALSPV SNKELLGGDRF $\square$ PEMKLF LENGEPMIEALEKST $\square E L K N E L$
ENDK【VDTLKDVQSKLQ
 ASAESA RRFHNAMSAFLRQAEEE $\square V R \square Q G Q E S V C L S S V$ RSAQSEEDSKARD $\square L Q R F L A D T R T Q L A E \square E S E F E A M E L W G$ C C VQT FT $\square F \square E Y$ A ATP $\square S R C D A T W G Q T M D G L$ ATAQCGSQGGFPTLMKGFFESAEAEMNLITKEETRVMELV NNNANSNPNRFFEVMDTFLSEAKVTADTLQNDLNGALDSLL


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N NCVT FFMVKPK S SVSPKDFFS DWF SFCQDFKDDWKKEDQ
 HS FLLF L G Y S RARDTKPEDFCKTITSNFSLIEYRTMQQTI KL
 KELRRFFGEDPRR CSVEDFFGTVKAFLDTYKRACGDIVR

AEMLESFGEDPTMDETVNYFLQLRMEVGN\｜LQRVEKEEVT
SAMDEGYGEDPMDDESDLQFGMDVENFC，KRAEMEGDD E E L LAA A
 ERAVRLFGEEAAN AQPDEFFGVFDTFLTA

GLLPDFFCE PTKNFSMNDTMRCDAVFARKYESRDTK LQE D SLA AYFNEDPTTRCPFQQVVSIIFNFDMMFKRALEENSK QDLLYFYYEYQ $\square$ NEYS $\square K D F T S I F C Q L M T Q \prod R N C R$ KEITEYFHSDPADEAQMSR】FVGVREFLAMLDR】CKE
HAFLLFFGYS $\square Q E T \square K P M \square V F K M$ KKTSTYF $\square$ HD RKTSPQDFFQ $\square$ WATF $\square H D T K F Y W K$

KD DTEYFGDTAKEEAHPDRDFMVVRDFDSTDDQVCREVGR QQLGTY LGEDMSKSANLESUF IILSSQVDNFTKCYKD\｜LA VATHAFFAEEAK TSMEAFFSRWATFAGQLEAA SAMMATYGEDPNADETV $\square W G Y V L Q F S K D V Q R C V D T V T A$

RRAVEFFAEDEKAE PYVFFKTF
$R E D T E Y F G N V S K E E A N P L R D F V I V R D F D G D V G S C V Q R$
 K E LGIYLGEDMPKNGNGENIVYILSS凹VDSFTKCYKD【LA

EAVLKYFKFTPKKELDPKDFFGLWSAFASDFKDTWNREQQ KEMAEWFVESGNDEAHMFRDFAGVREFLAMDDRICKE QECCDYFGEDPQN DTSKDFFSNIVKFS DAFK
RSKEDVFHEVMQHSNNENR KVQEWRDSERRTHQQNEE REMAEYFGGDSAEEARLFRVFAGVREFVAMLDRICRE
$\square G V K K K F G \quad A G D E P T \square Q D F L A Q V R D F A A A F E T A R \square A N V K$ SDILIKFGEPQDQD SQELFGWVSSFIKDFKKVYAQUM
 KKSAAYFCENQKD
STVLVRFGEAAADQDSLELFGLICQFVRDFRRAHAE QDMVSYFGVKPKKEVVPGYVFMLWYEFSSDFKNAWVRQSK KEDTEDFGDSAKEEAQLDRVFQIVRDFCTRFNKAVKDN SDLC I FYCENPK T LQQSDAFFQS $Q$ QSVWNNCDRSKQQDEK

CKTMRFFGELVDED $\square$ GPETFFAS KQVGQMYGEN DNYS $\quad$ VKDF LGQLFTFANKFRAAY $\square K M E V$
AKACEYFMDDKGDETNSTEFFKFFVQFDDQVIKSMPKEEK $K D L D N H Y C E D Q K$
$R S L H E Q L G G Q R S T L A D P D E F F Q K U$
$L$ $R S L H E Q L G G Q R S T \square A D P A A F F G V L H A F G A E D D G A H E E N R A$
$K H F L N Y F E E E$
$K$ KSTGDYFHGNAGKDEGL RLVVIVRDFLIILDKVC口EVKN
SVLLPFF YNQLPTDTAQEFFDワWVKFTSDFKVIWKKEQQ RATVDYFHGSTGKDEGL RLFVVVRDFLGULDKVCREV QKTTEYYHAGATKEAHPLQLFIVVRDFL GMVDQACVDUKR K QCAQFYGENPKDPSDKDK LKIIFRQULRQKFEKLQREER
KS $\square$ MEHFCEDERS FN $\square E E C \square R \square F A T F C A K D K E A \square R E N K E$ VK MVETFVMSSS
KEVAEYFHVDAVEEVHPFR\LM\VRYF
$S Q M \square K Y \square G Q D A V T R A \quad E D \| F G A L S T F K S S \square A Q A V E D V M D$
KKTAKF LCENPAD ASDKFGEK $\square$ MKF $\square R$
REVAEYF
DKLLTVFGE SKATCQ】SA】LRVVVELL
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K Q

## QK L V MER

M Q Q D R

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$R \square \mathrm{FKE}$

HRHKSAVLRQQ

K R QLA A LEAK
LE K E
$T \square S K E R$

DEALE
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330
340

K $\square$ KKHDDQSKNNNKFEAFMSNFKRKARDNWNDWNECTT ITA TENHSEYSDEFHNDMK DFYSEKYSQMDKLCSSFRRMLKLY
 QAHMLSKRDLVHDVLQLFIVETRGTMAEVEKEYENMGVLE $K$ S DAFKANDSFGLVVGQFLAHAMQELKLLSELHKTFTERY S DKDAKLAHDAFNQ K ADEDDDKLRGVHESFDKMEESH




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R A R T Q R L K Q R
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