## QUERY

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UniRef90 A1HP37 UniRef90- D4JT97 UniRef90-I6YYQ4

## UniRef90-X81R19

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 TDKVWEALANPELHVVVQTAPAVRVALGEEFGMPПGSRV NI KEVWKALADPEKFVVVQTAPAVRVALGEEFGMPIGTRV IDYVWEALDDDSKHVVVQTAPAVRAALGEEFGLEMGTRV TQDVWAALSDPDKYVVVQPAPAVRASLGEEFGIPMGTAV TDKVFAAI ADPAKHVIVQTAPAVRAALGEEFGYPDGTGV TDLVWEKLKDEDTFVVVQTAPAVRAALGEEFGMK GTNV QLDEVWAALNDPDKYVVFQTAPAVRVAGGEEFGMPI GTRC KVLEAINDPEKYVVVQTAPAVRAALGEEFGLPDGTDV NTSKVWRALADEEKVVVVQTAPAVRSALGEEFNCIPGTSV QTQEVWAALQDPSKHVVVQTAPSVRVTLGEAFQDPVGTNV HVAKVWEALSDPDKFVIVQTAPAIRVALGEKFGMEPGTTV NI DDVWHDLADQSKVVVVQTAPAVRVALGEEFGLPVGTRV VDEVWAAI DDPEKHVVVQEAPAIRAALGEEFGLLPGTLV TEKVWEALANPDKHVVVQTAPAVRVSUGEVFGMKPGSLV I DKVWAA ADPKKHVVVQTAPATRVQLGETMGMEPGSIV QTAEVWAALSDPQKHVVVQTAPAVRVSI GEMFGLPPGSIV E $\square$ D EVFEALNNPDKYVIVGTAPSVRIGLGEEFGMPMGTNT

KVWDKLKDPDVYTVVQTAPAVRVAGGEEFGMPDGTNV ETEKVWQAIDDKEKHVVVQVAPAVRVALGEEFGLEPGSIT

VWQALSDPAKHVVVQTAPAVRVALGEALGMGTGSDV TDKVWDALADPEKVVVVQTAPAVRASLGEAFGYPMGTPV
 YIIDQVWDVIEDPTKHVVVQTAPAVRVALGEEFGYEPGTIS VWDK NDKNTYVVVQTAPSVRVALGEEFGMPDGTNV NVDLVVWE: NNPEKTTVVQVAPAVRVALGEEFGLAPCGTVT HMDRVKEALEDPNKHVIVA DAPSIRTSMGERFKLGYGVDV HTERVKDALENPEKHVIVAMAPAVRTSMGELFKMGYGVDV KVEAALKDPEKFVIVGTA
VWEALADAGKHVVVQTAPAVRVALGEALGLPAAS VV KVLEARNDPKFVNTAPSRATLGEAFGMKIGTNV ETEAVWRALDDPTKHVVVQTAPAVRVQGGEPFGLPPGAVS
 HISRVQEALKDPKKHVIVAMAPSVRAA GELFNMGFGKDV HTDKVWEAI NDPDKHVIVQTAPAVRVALGELFGMEAGTVV NVGDVWQAI ADPHKFVVVQTAPAVRVALGEEFGMPDGTRV QVDKVWRALMDPNKYVVMNTAPACRVALGDEFNMPAGTDV

DRVWDALDDEDKYVIVQTAPAIRAALGEQFGLKPGTNV KI IQALMDPTKKVIVQTAPAVRAALGEEFGMEPGTLV ETSDVWDALEDEDQHVVVQVAPAVQAS GEEFGMEPGTVV NVSKVWDAINS KKYVVVQTAPAVRVALGEEFGMEPGTVV ETDKVDDALANPAKIVVAQTAPAVRTALGRDFGCEPGTLV VDAVWAATADPAKHVVVQEAPSIRVSLGEELGLIPAGTLV HTNRLLEDLDNPDKVVIVQTAPAVRVALGEEFGMPAGTQV NVAEVWKLLAS DKHVIVQVAPAVRVSLAEMFGMEVGLNV HTNDIVRALSDPTKTVVVQTAPAVRAALGEEFDLPPGTLV TEAVLKVLNDPTKHVVVQTAPATRVALGEDGGLERGAIV KVWAALQNKDDHPVVQUAPAVRVALGEEFGLEPGTI Y IE EVWQALDDPAKHVVVQTAPAI QVSI GEEFGLPAGTVV YTWKVIEALVDPNKTVVVQTAPAVRAALGESFGMEPGTLV DVWAALDDPTKHVVVQTAPAIRAALAEAFNDPPGERV H T N $R L D N D L$
$K V W E V L$
KVMAVM NTDDVMAVMNDKSKHVFAMTAPAVRAAI GEEFGYPПGTNT HINRVLEAIDNPKKHVIVA乌APSVRASI GEAFNMGYGTDV QVRKVLEELEKHDKVLVVQTAPATRVALGEEFGLEPGS S TQKVFDAI RNPKKHVVVQVAPAIRVALGEDFNMEPGKVT EDDKVWAALEDDDRHVIVQTAPS QATLGEEFGMETGTIV HปERVKNALKDPNKHVVIAMAPSVRTALGEVFDMGFGVDV HVPKVWEALNDPEKYVVVQTAPAI RVALGEGFGMEAGTIV NIADVLRAIADPSKTVVVQTAPAVRVGLGQDFGFS GRSV QVLKVKQALRSGQLHTVVQCAPAIRVSLAEEFGLPFGTLT EIDKIDEAFRAGKHVVVQVAPAVRASGGEEFDYPDGTPV YVEEVWDATSDPGKHVVVQTAPAVRVGLGEDLGFDPGTRV NI HKVVDDLNDKNGSVVQCAPAVRVAI AEDFGMDLGSLT EปHNVIEALNNPAKHVVVQTAPAVRASLGEEFGMPIGTRV ETGKVIRALSDPTKTVIVQTAPAVRAALGEEFGMEAGSLV
 $\square \mathrm{DKV}$ KKAL QKVLDVLQNPKKHVIVQCA DKVLKALSDPNTTVVVQTA

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$T G K \square Y T A L R Q L G F D K \prod F D \square N F G A D M T \prod M E E A T E D V Q R \prod E N$
T G K MVVA A L S R L G F K K V F D T D T A A D L T I M E E G T E Li I N R I K N

T GRMAAAL R RLGFDKVEDTDFAADLTMMEE GHELLLGRLQN
TGKLAAALRRLGFDKVFDTDFGADLTIMEEGTELLNRMNN





E G K M V A A L C C R I G F D R V

S GKMHAALKRFGFDAVFDTNFTADLTIMEEGSELVIKRING
T GK L M A G L R R L G F D KVVFDTNFTAADLTI ME E G HEELI E R L K N
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E GKMVNALK QMGFDKVFDTNTGADFTIVEEGTEFIKRLQN
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E GKMVAALRRLGFDKVEDTDFAADLTIDEEANELVDRVKN


T G K L V A A L R R L G F D S V M D T D FAA D L T I LIE E GNEFFI K R V T E


T G K M V


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$T G K M V S A L R Q L G F D Y V F D T D F A A D L T I M E E G T E L L Q R L D E$

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ASKTYYP 130
TASKTYYPSTISGLDPKNVFTVTVMPCTSKKFEADRPQMEK AVLKSYYAQKNGLDPSKVFVVSIMPCTAKKFEAQRPELSS ALIKHY $\square A E K \bigsqcup G V D K K N V V V V S I M P C V A K K F E G Q R E E L S N$ AVIKSYYAEKNNIDPKDIVVVSVMPCTAKKFEADREELAA AI VK SYYAEKMGI DPAKIYMVSVMPCTAKKFEAAREELSN AI AKSYYAQKAG|DPKDIVSVSIMPCTAKKFEVGRDHQAA A L K SYYASKAGI APKKMFVVSVMPCDAKKFERQREEMKN ALIKTWYAETHNIDPKDIVSVSVMPCTAKKFETSRDDENA AVTKTYFAKQNDLDPRDIYVVSVMPCTAKKFEIARPEFGR ATLKTWYAQKMDIDPAKIVSVSVMPCTAKKFEVGREDQSA AVTKTYYAEKMGLDPKDIVCVSVMPCTAKKFEVGRDDQDA ALDKTWYAQKNNIEPKDI FVVGI MPCTAKKFEVTRENQAA TIAKTYDADKMGIDPEKIVVVSVMPCDAKKYEVVRPERQH AMVKSFFAKKAGIDPKNMVVVSIMPCTAKKFEGAREELSS SLAKTYYAEKADMDPKKIVSVSVMPCTAKKFEASRPEMSD ALAKTYYPENNGDDPEDVFVVSVMPCTAKKFEDTRPGMDS ALVKTYYAQKVGVDPKDMVVVSVMPCTAKKFECNRPEMNG ALAKTYYAQKEGI DPADTFVVSIMPCTAKKFECQRPEMKD ALAKTYYAQKAGI DPANIFVVSIMPCTAKKFEAARPEMMA AVCKTYFAEKMGIDPKNVVVVSMPCTAKKFEKGREDQSA ALAKSYYPEKAGIIDAAKIVSVSIMPCTAKKYESARPEMNG A VVKSYFAGKNK| DPKK: FNVS:MPCTAKKFESDRPEMGN AI TKTYWAKKMGIDPKNIVSVSVMPCTAKKFEIGREDQSA AI DK SYYAKKMGLNPEDI FVVSIMPCTVKKFEASRPEDSE AVTKSYYAEVMGIPADRIVSVSVMPCTAKKHELGRNDQGQ AIIAKTYYAQKAGIDPKDIVVVSVMPCLAKKYEANREEMRD ALLKTYYAKKEEI DPSKMFVVSVMPCIAKKYERQREEMK A 1 AKNYFTSK PLAKTYYAETKDLEAEDIYTVSVMPCTAKKFEKERGELQD AASKTYYPEDEGLNPKDVFTVTVMPCTSKKFEADRKEMAN AASKTYYPETYDI DPSRVFTVTVMPCTAKKYEADRKEMQN AVMKTYYAQKDG| DPAKMVVVTVMPCTAKKTEVDRDHQSA A TMKTWYAKKLNMDPSKMVVVGVMPCTAKKFETKRDGEAA A LAKTYYAEKAGDDPADMVVVSVMPCTAKKYEANRPEMRD ALAKTYYAKKKGIDPADVFVVSIMPCTAKKFEAARPEMND ALVKSFYAEKKAI DPANIVSVSIMPCTAKKFEAQRDELRD AVLKTYYAKKMG|DPKD FVVS:MPCTVKKYESARPELKE TATKTYYPS AMIKSYFAQTMGIDPGNIVVVSIMPCTAKKFEAQREELAH SLIKTYFAEKNNIDPKNIVVVSLMPCLAKKREANRQELSH VLTKSYYAKTYGIDPQKITVVSIMPCIAKKYEAARPEGQD A A A SYFADK GVDRKDLVVVSMPCDAKKYECQRDEFKV TLLAKTYYAEQEDIDPEDIVTVSVMPCTAKKFEKNREEMAD AVAKTYLAEKLDVKPEDMIVVSVMPCVAKKYESARPELGH AI AKSYFAEKLGVDRKDIVVVSIMPCLAKKYEASRPEFAV AI LK SYYAERNGIKPEDMFVVSVMPCTAKKFEKDRKELAV AVCKTYYAEKAGI DPKTIVNVSVMPCTAKKFECQRPEMND SI AKTYWAEKMGI PREKLVVVSIMPCLAKKYECDREEFKV AIAKSYYAKKEGI DPKDIVVVSVMPCISKKYEAKRDEDEN A $\downarrow$ AKSYFAEKDGVSRKDMIVVSIMPCLAKKYECQRDEFKA A MVK SYYAEVAGIDPKNTVSVSIMPCTAKKAEAKRPEMSA SMFKTYGASVDGVDAREVYSVAI MPCTCKKFEANRPEMKS A IMKNYYAREEGIDPEDIVVVSIMPCTAKKFESKREEMA AMIKAYWAQKAGVDPAKVFSVSIMPCTAKKWEDDRDDMKS ALAKTYYAQKAGIDPKDMVVVAVMPCTAKKFEAARPEMTT A 1 AKSYFAKK DDKKREDLVVVSVMPCDAKKYECTREEFSV ALAKTYWAEKMGDDPSKI YSVSIMPCVAKKFEAARPEMND ALAKTYYAQKMG| NPESUVTVSVMPCTAKKFEADRPEMCD AIAKNYDPQEDS:KRENLAVVSIMPCLAKKHEANRKEMQD ALDKSYYAKKHNLDPKDIVVVSIMPCVAKKVEDNRPHDNA AASKTYYPKLINLDPKDIFTVTVMPCTAKKFESQRDGMDT AVVKTYFAKKI NVDPKNI FLVSIMPCTAKKDDIIRPQHMI AVAKNYFAEKLNVDRKKLVVVSIMPCVAKKYERGRDEFAV TMVKTYYSNKTGIPAKDIVMVSIMPCTAKKAEAARDELGT ALGKTYYPDQTGVDPEKIYTVAVMPCTAKKFEKDREEING AATKTYYPSTSGI NPKDVFTVSIMPCTAKKFEVDRDEMVN A AK YYFAQKLGIPREKMVVVSIMPCLAKKYECSRPEFAE
 A AKNYFAQKDG| DRKDLVVVSVMPCVAKKAEAARPEFSR ALIKTYGAQLDGIDPSHIVSVAVMPCTCKSFECSREEMEV ALVKTYYAKARNDDPSKIVSVSI MPCTAKKFEAARSEMHD AIFKTYGAKDDNKSAKDI ASVSI MPCTCKSFESERTEMNS AMIK SYYAKQHQLDPKNI YVVSIMPCVAKKGEKERSQMMK AIAKTYFADQLGIKREDLVVVSIMPCVAKKYECGRDEFKT AMVKTYFAEKLGVKPEDIFHVSIMPCTAKKDEADRKQLMV AVSKTYYPEQSGI DVNDI VTVSIMPCTAKKFEAARPEHGR ALVKTYFAEKNTIDPKTVFSVAIMPCTAKKFECQRPEMDK ATVKTYFADKDG| PRKNLVCVSVMPCVAKKYECEREELDGV
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D G L R D $\square \mathrm{DA} \mathrm{V}^{170}$



## N


 A GVP $D G Y R D V D V$



EGKKNVDLVITTRELADMLDEAGI

S

## S

DFASGPDEEAEPLMGM




 QDVDAVI
DF VN EDAKFDDPMGE
$\begin{array}{lll}D G G L D V D D V S I \\ S G T Q D & D & A V L\end{array}$
$D G\|R N\| D A V$ I
N N L R N I D A V I T T R $\quad$ I L A

SGYODVDVSI



GGTK DVVDVI

S GFKDVDYVLT

$D G Y$ Q $D V V$
S GYQ DVVD A V L

| $S G Y Q$ | $D$ | $D$ | $V$ | $S$ |
| :--- | :--- | :--- | :--- | :--- |
| $Y$ | $G L R$ | $D$ | $V$ | $D$ | K GlS S I D AVLTARELVKII K DNKI S D F K D T D A V L T

$R G L R R N$
 D G D P D $V$ V

$$
\begin{aligned}
& A Y \\
& E F \\
& D F \\
& D E L \\
& D F \\
& R F \\
& R F \\
& D F \\
& E F \\
& N
\end{aligned}
$$

EVLPDVDAVLTTRELVRFLK I I AGGI
NGMRCI DAVLTTRELAKMDKAAKI

 S GH Q D TADA V L E GNPDVVDI SI Y T RELAARLI RYA N I
NGLKDVDAVLTTRELAKLIKRAGINFNELPDSDFDHPLGE


 D D P DVNYSI S D G $\quad \square K$

 NGNPDVDI SI STRELLAR
 $D G \square R D V D V V L$ S G Y R DVVD YV LTTTRE L S $\quad$ T M I
 NDNPDVDHAITTRELAALIKLSNL





 GKFRKDVOWVLT

\section*{| $D$ | $F$ | $T$ | $K$ | $L$ | $P$ | $D$ | $E$ | $E$ | $F$ | $D$ | $N$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $F$ | $G$ | $G$ | $E$ |  |  |  |  |  |  |  |  |
| $P$ | $D$ | $E$ | $D$ | $F$ | $D$ | $E$ | $l$ | $L$ | $G$ | $E$ |  |  |}

 KFTALPDASYDSPLGLL | $D$ | $F$ | $V$ | $E$ | $L$ | $E$ | $S$ | $E$ | $F$ | $D$ | $D$ | $P$ | $M$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

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 G GLDGTKEATVNINGQDIKIAVTHGLGNARALLEKIRAGEA GLEGMRSGTINFDGVPVKIGIAHGLGNARKLVEEVKSGKS GMQGIKEATYNRGGMDVKVAVASGMKNAKVLLDQI REGTS GLEGVKTATLNVDGLELKVAVAHGLGNARALLEEIKEGTS GLEGVRRATINLNGFELKVGIAHGLGNARRLLEDIRNGHN GLEGIKYASVDDGREKYAVANGLGNTRKLLEKLKNKED GMEGI RSATVDFDGLPLNGGUAGGLGNARKLLNDVRAGKS GQKLIREATLDVAGTAKVAVVDTLKEVKKMLEKVRAGTA GEQGVRKVTLDTGALKLKTVVVSGLKNVIPILEDIURGKA GLEGVKKAEVDIDGLKLRAAVAHGLGNARKLMEM| KDGE GTTGUKEAEVELKGQTLRLAVAHGTNNAKKLMERLKRGEK GMEGSRKA EVVFDGMKLNVGUAHGLGNARKLDEDVKSGKS GDTGVKEATVDVDGTVVKVAVANGLANARKLVEQVRAGES GLDNIKKATVRLNGVELHVGIIAHGLGNARKLLNEIKEGKS GLEGIKEAKVDLNGKEVNVAVVSSLGNAKKIMDEIKYGNS GVKGVKKATVELGGKPVKVVVAHGVENAHTVMEQLKAGKL GFKGI KETTVTINDKEYNI AVIDNGSNVFKFMNSDMINKK GLEGI KEATVDFNKKLKVAVAHGGLNVRRLLDKDVAGEV GMEGLRHAT:DFAGLPLHI GI AHGLGNARKLLEEI AAGRS GLKGUREAEVNDGDLNKIGGAHGLGNARKLLEGLKSKKY GFRGINKAEVRIGDRLIKVGIANGLGNASKLLEQVRKGES GFQGCREAKLPVGDLTHI GI AHGLGNARRLLEAVRKGEV GIDGLREAVVPLNGEEIKI GI AHGLGNARQLLEEIRSGKS GMEGVRSATVDFDGTPVRIGGAHGLANARQLIREVVNGTS GEEG| RTAEVQVGELCLRVAVVAGLQYVQPVLEQUREGTC



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$\checkmark$ E R V K A A I A D P D K I V M F QTA P A V


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UniRef90 F6B9W8 UniRef90 ${ }^{-}$R7IJO4 UniRef90-UP1000477CE93 UniRef90-M1MLEO
UniRef90 F4LUF9 UniRef90-R5DM22 UniRef90-C3W9A4
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UniRef90-R6QNF4 UniRef90-R6S1L3 UniRef90-R6QSB5 UniRef90-A7VEF8
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R G KLL V T S L L K R L




UniRef90_F9MN22

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GGR|LII LIT S CCPS WI K F VEHNFKELI DDPSSCKSPHEMFG HVKLPIMTSCCPAWVKFFEHQFPDLLDVPSTAKSPMQMFG NDNFPMFTSCCPGWVRLAENYFPELLDNFSTAKSPQQDFG GEKDPDLTS CCPAWVNFMEHEYPDLLGYDSTCKSPQSMFS GENLPDLTSCCPAWIKFTEHQKPELLNHPSSCKSPQQMFG

 E A V L P M I T T | $G \mathrm{G} V$ | P |
| :--- | :--- |
| $\mathrm{G} T \mathrm{M}$ | F |
| P | T | 9

$\begin{array}{lllllll}K & R & P & L & P & L & I \\ N & K & D & M & P & F\end{array}$
$\begin{array}{llllllllll}N & K & D & M & P & L & F & T & S \\ N & V & K & L & P & L & F & T & S \\ T & E & K & L & P & L & L & S\end{array}$

| $T$ | $E$ | $K$ | $L$ | $P$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $L$ |  |  |  |  |
| $N$ | $I$ | $P$ | $L$ | $P$ | $Q$ |
| $N$ | $K$ |  | $L$ |  |  |


| $N$ | $K$ | $Q$ | $P$ | $H$ |
| :--- | :--- | :--- | :--- | :--- |
| $A$ | $G$ | $G$ | $H$ | $Q$ |

$G R D F P M F$
$E L K K P L$


| N Q R | L | $P$ | Q F T |
| :--- | :--- | :--- | :--- | :--- |

$\begin{array}{lll}D & K & L \\ G & P & L \\ G & F & M\end{array}$
NENIIPQFT
NK N L P L $F$
NGP F P M F


| $T$ | $V$ | $R$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |
| $G$ | $D$ | $L$ | $L$ | $P$ |
| $L$ | $F$ |  |  |  |

$\begin{array}{lllllllll}G & D & N & L & P & L & F & T \\ G & E & N & L & P & L & F & T\end{array}$
GTKPPQ K P T
D E K L P L

$G G Q P R Q F$
$D H S W P M$
DHSWPM F T
GHDHPMF T
DVKLP LY T
$H E G T Y$ T T


K T K P P Q F T
KQEEPHFT
RYSWPMF
RYSWPMFT
GNA APQFT
GEK
GEKLPLLLT
$\begin{array}{llllll} & E & E & P & L & M \\ N & R & P & F & P & Q \\ G & F & T \\ \text { G } & G & A & P & L & I \\ H & E & P & D & M & T\end{array}$
HEP LPPM FT
K H S M P M F
GGK F P MF
GNP L P P Q F
$G Y K R$
$G R R$
$G R R \quad P \quad T F T$
D Y QWP MF T
S S K L P Q F T
$G K K T P M F T$
$N K A L P M F T$


| $H V N D$ | $L$ | $L$ |
| :--- | :--- | :--- |
| $G$ | $L$ | $L$ |

GK E R P M F T S C C P G W V

A P P L P M F T S C C P G WI D E IVE K R H G E LI P N I S T C K S P Q GMLLG
G G R L P LIF T S C C C P A WVV K Y A E Q F H A D L L E N L L T T C R S P Q Q M F G
GE KLLPLLFTSSCPPGWVMKYA E Q F H P E L L L N N L S S S C R S P Q Q M F G
K Y HWPM F T
K S P LPQ F

NFAMPQFT
NFAMPQFT
$G G P F P M F T$

GGPFPMF

## UniRef90_G5GJ28

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UniRef90-R5DM22 UniRef90-C3W9A4 UniRef90-D7EYH2 UniRef90-R6FYA6
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UniRefo-
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130
140
150
160
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 ALAKTWFAKTHNLDPKKLRFIS:MPCTAKKEEAARPQLAR AVAKSYYAK ILNVDPSKIFSDSVMPCVAKKHEAEDPVMND SLMKGTYAKAMGTDSENIFVVSIMPCTAKKSEAKREEFFK AITKSYYAQKLGVDPEKIFCVSIMPCLAKKDE YTW ALAKEFWAKEKEIDKKDLVCVSIMPCTAKKYEASREEFVR SLAK HYWAQKMGMDPKDVVVVSFMPCGAKKDEDKRPQLK TIIKTYFAKKVNIDPNNIVNVVVAPCTAKKAEIKRKEL S STLKTYWAKKMNLKPEDIYVVSLMPCTAKKDEI ERKNMWD PTVKSYFAESMDIDPKKIVNVALTPCTAKKFEI RREEMKD AVI YFAKKMG, DPRKVNVAVTPCTAKKFEIRRSEMNA AVIKTYYAQKKGIDPKDIVSVALMPCTAKKFECNRPEMTA AVVREYYKNPENNAGKKLVSVSI MPCTAKKEEIDRPESKT PTIKTYFAKLMGDDPEKIVNVALTPCTAKKFEIRREEMKD AVIKDYFAEKDKEDGKRTMVVSIMPCTAKKGEI DRPDNFT
 ALAKSYFAQKKGLKPKEI CSISIMPCVSKKREAALFSMRS A A DK SYYAEK LGVDPHKI FSSSIMPCVAKKSECALPTMND SLAKHVWAEKMGI DKKDLVCVSIMPCISKKYEASREEFTV SLAKSWLPTRMGI DPARVRVVSVMPCTAKKQEAARPQLGR TIIKTYYAEKNNI NPEDIVTVALMPCTAKKYEAGRPEMCQ ALIKSYFAEQQG| DPETIYSVSYMCVAKKSECAREDFTD ATVKNHYAK LDMGLKEDLFVVSIVPCLAKKYEAARPEFAP PTIKTYFAKQNNLDAAKIVNVAVTPCTAKKFEDRRGERNA ATVKTYYAAKMGIAPESIVTVSIMPCTAKKFEAQRAEGSE AVAKSYFAEKDGVDPKDMRVISVMPCTSKKAEAELDTMRD VLAKTYYSERVGIAPEN WVSVAVMPCTAKKFECQRPEMNA AVIKEYFRDSEHAKGKKTVMVSIMPCTAKKAEAVRPNSFT TTIKKYYAEKEG\|DGGRLVNVVIAPCTSKKYEDKRDEDNV ALIKTWYADRNGI DPADVVSVSLMPCTAKKFESRRPEMTD VLSKTYYAEKMGIDPAKIFVVSVMPCTAKKSEIIRKEMSS AVITKNYFAAEAGAKPEDICNVSVMPCVRKQGEADREWFNT SLAKT WLPEKDGAEPSKIRVISIMPCTAKKDEAGRPQLAK
 P M A K T Y L A E K M A I D P A K MRVI S I M P CTAKK K E EAKRPE F T TMAKTYLAEKLGI PADRI RVISIMPCDAKKDEAVRPQLSH A A AKTYVA R K GVDPDKVFSVSVMPCVAKKYERTVJQNYK ALAKSYYAEESKVPKEDIVVVSIMPCTAKKGEAQRDEMED AI AKTFAAEKLGIDPRKMVVVSIMPCTAKKFESKREEMEN AVDKEYYKNPERNQNKKTFVVSIMPCTAKKMEDLRSNNFT S1 DKEEYST KGOSKLVHVAVMPCTAKKFEAARKEFKV AVMKTYFAQK ALLKTYYADKKGIDPKDIVVVALMPCTAKKFECNRPELCS AVVKHYFAEK GRKPEDVELVSIMPCVRKLGESERPQNQS SLVKKHYAREI GRSPEQVVCVSVMPCTAKKFEARRPEFTT SLLKKKYAKELGDAPQDMFVVSIMPCTAKKYEAKRPEFMT AVAKSYFAQKIGVDPKKLFVVSIMPCTAKKAECALDTMKD ATVKTYFARENALDAKKIVHVALAPCTAKKFEVRREEFNS PMTKTYYSDKAHVDPFNIFNVSIMPCTAKKNEIRKNEMYS AVMKTYFADADQVSPNRIFTVSVMPCVAKKGESNMELFYE TTEKDWFAEKAGIDPKKMVTVCVTPCTAKKAEDKRKEWHD A I PREHYQKKDAEDGRSTFHIAIMPCTAKKMEAARPQFYH AVEKTWFAETKNDDPKKDVNVCVTPCTAKKAEDRRPEFNV PVDKAYYAQAE ADGRETCSVA MMCAAKKMEAAREEFRT


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UniRef90_R6FKG3 UniRef90_R5HET4 UniRef90-E3H6Q3 UniRef90-F8AB11 UniRef90-R6N8R5
UniRef90_G7M7U0 UniRef90-A3DCI9 UniRef90-R9M139 UniRef90-H8FVH9 UniRef90_W5VTI9
UniRef90_F6CKC7 UniRef90-K8DXB5 UniRef90-R6CWV9 UniRef90_R7KL93
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GFEK|I K E T T|V|N|IGGTQ|IN|V|A|V|ASG|GNARK|LLNDVRDGDK GMDGVKSAKVQVGSHTLNI GVAHKLGNARKLLEEIREGKS GFEGI KEATVEI NNKEYTVAVVNGASNFFKMMKDNLLEKK GMDGI KEASLEIAGHTVNVAAASSLGNARKLMDELRAGTC Gl 1 K G I KEATLNI NSVDVNVAVVCGLGNARNVLEQI ENGTC GIEGFKESVVKIGELEVKVAVVNSLKNAKKILEMIKKGEC

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GMEGIKKATVDLG
GMDGVRSAEVKVGGTTVKVAVANGLRNAEELVQRVKSGKA $\square S G G I K E A V F E I A^{\prime} G S S I K V A V V S G L G N A R K L V K A V I R K K A$
 GLD GWKEAEFDLDGTDIKVAVASGLGNTRRLMNAIKKGEV
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 GMEGVKK E A S LDDDG DLTVVNAVVYGTGNARKMIDKVMS S DK


 GNESV REATI EVVGDTLRVAIVHGLDAAGQMAKAVLAGKA GFEDIVKSLELKI DN Q TLKVAAIVCHGTSNAKRVLEDILKNGGS
 GMAGI RKAEVADAGVPLKLAVIMGLENARQFI DCMTGGEQ $G L T A D K E A C A E V P G V M V H V A V V V G M A A A R R V L E E V R R G R S$ GMQ G WK E A S F D I P P G G T V R T A V V S G L G N T R K L M E A I A S G HV GLGGVKEAEVMDPGKSLKVAVCHGLKNARMILEKVRGDNS

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 HPHVYKEADMDEGGVKLKIAVVVGLANANKIADEVAAGTC
 GLEGI REASVVLGEGTVNVAI ANSLKSARELLERVRSGEK GMAGVREAKININGADVRIAVVNQLGNLPDFLAKLKNGEP GFERLREATVDLGGGEVKVAMVHGLGDTRALVEAVLAGKA GMK G WK E E T F D K G DK L K V A V A S G L A N A K T L M E A V R R G DV GQKPWREASFSI GETTLRLAVASGLGSARALMDALRAGQV G F K N V T L E Gll K V A S I GDEGIKEFTVNYKGTDLNVCVASGLANAQTVMEDVKSGRK
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 GMENTK $\quad$ GA GI NV GE H K L T L A VVVNGLA A A E E L I I K K I Q S G Q I $G L T$ DVVKEAACVVR A GLL NGKGVKSAEI RIGGDAVVKAAVVSGLGNTRCLLQQIERGEV GLDDGVKEATID FSGDSLHVAVVSGLGNARRFLDKIMADGK GNE A I R E A T V Q V




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## P

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MYHAI EIMMAK GGC $\quad$ GGGGGQPYHHGNTSIVRLARMRA
P Y HF I EVMACRGGCVGGGGQPYGATDE IVRAKRAA G DFHFI EVMTCPVGCVSGGGQPKVL DPDEKADAYTNRTCS

 RYD F V E V M A C P G G CI G GA G Q P NYHFIEIMACPGGCLGGGGQPDPTSPE I I R A A ARAKA
 K Y H F I E V M A CP N G CVVGGGGGQP LPTSKE RYHF I E FMACP GGClS GGGQPKTS DVP P S DWVRQERLLKS



 HYD F V EIMMSCPGGCIN GGGQPFKDDAS MVEERRNV HFDAI EVMACK GGCVGGGGQPYHHGDFEIVKKRAEG
 SYQFI EVMNCNGGCIA GGGQPKTT LLLNMLKTKEARIGG





 HYDFVEVMACPGGCVGGGGQPIHDGEE RADVLGNK








 KYDFI EVMACPGGCDGGGGQPRSAD KQULQKRQAA
 EYHFI EVMACPGGCMGGGGQPKHKRNYRERLTARQQKA


 H Y H I I


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


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


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LYQ QDDKEKYHKSHENQAVLDAYKEYLQEPNSHLAHQLLH TFA ADRELTYRKSHENPATKKIYEEFLEEPNSHCAHHLLH LYDEDAAKPLRGSHQNPAVQALYREFLGEPGSAAAHRLLH K IEDESKALRKSHENPYVKKLYNEYFKEPMSHQAHELLH TYVHDENMEYRKSHDNPEI QKIYKEFLV VLEDNAHHLLH

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 LQ NV YKAMEEG KYI I GMMAPAV RASI QEELGMEDDVVV



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E ILLE K L K DPET IVV SMPAPAVRYALGECFGGAT GTYS

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LNLNKKCDTSEHKVLVVSVCPQSLPYFAAKLNLSVTDA $L N L N K R C D T S K H R V L V V S V C P Q S L P Y F A A K F N L S V G T D A$ $K \mathrm{~F} I V \mathrm{~V}$ L $\mathrm{S} \square \mathrm{Q} P \mathrm{I}$ L S LA E R Y K L T P E E A A $\square \mathrm{S}$
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UniRef90_B4GXC8 UniRef90-F7BFK0 UniRef90-IOYLU4 UniRef90_Q5Y8D3 UniRef90-W5JPM0
UniRef90 K1XQ34 UniRef90-F1S011 UniRef90-B3NO18
UniRef90_M1PIY3

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 QGRIVAALRKLGADCVMDTRWSADVTIMEEGTELLERLDH PARMAAALRRLGFDKVFDTDFAADLTIMEEANEFIEWVQK LDLLVSAAKMMGVDEVYDTDFGADFTTIEEGTEFLQRLEK
 QGKMVAGLKKLGASYVLDTNFAADLTIVEEASELLSRITR PGKLAAGLRRLGFAVVYDTTFAADVTVMEESAELLARIAE EGRITAALKALGVDFVMDTRWSADVTIMEEGTEVLAKLKA




 ARKLTTFFKMLGVHRVFDTSFSRNFTLLESSQREFVRRFRA
 K N K M M Y A A A L R R K L L G F D K
 TGKLVSALKKI GIDVVFDTNFAADVTVMEEATELKHRI E E




 G GK M H A A L

 P G R LLA A AL H A V G F D R V F D T D F A A D L T I ME E G S E F V E F L G S


 L L K K L T A L F K S M GVVKA V Y D T S S S R DL S L I EA CNE F V S R Y Q K







 SRRLCGFLK SLGVHYVGDTSIAADLSILESQKEFVRRFHQ
 A K H L S G Y F R S L G A D Y V L L N T K DA D D L A L L E C R N E F








S R R L C GF L K S LGVHYVFDATVAADFS ILESQKEFVRRFEE A R H L A G Y F R S L G A D Y V L S T K V A D D $\quad$ L A A

## UniRef90_M1Z7H0

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UniRef90 K6G8J4 UniRef90-H3 KBY4 UniRef90-DOWE39 UniRef90-I4CDX3 UniRef90-R5HRR9 UniRef90_C3Z6S6 UniRef90 UPIOOO466CC58 UniRef90-RSSL777 UniRef90-UPIO003316218 UniRef90-UPIO00328D187 UniRef90-UPIOо03B37331 UniRef90-QOAVN2 UniRef90-R5LL27 UniRef90-B1QVK3 UniRef90_13DKM8 UniRef90_B7IGN5 UniRef90-E1K107

UniRef90-E6MHA6 UniRef90-UPI0003762746 UniRef90-UPIO00441D8A6 UniRef90-UЗJKT3 UniRef90-UPI000398FC14 UniRef90 D5A7Z3 UniRef90_UPIOOO37209EA UniRef90-A8J6C0 UniRef90-A0A022QJC8 UniRef90-C6C1Z8 | UniRef90_S6C2L6 |
| :--- |
| UniRef90 B9HD |
| 1 | UniRef90 ${ }^{-}$KIISF1 UniRef90-D7U6R8 UniRef90_E5Y5C6 UniRef90 ${ }^{-}$K4A9F8 UniRef90-UPIO002652BCF UniRef90-O9UHQ1 UniRef90-M5WJ36 UniRef90-FOZB08 UniRef90-R7TEUO UniRef90_A2DJT6

UniRef90 AOKT30 UniRef90-UPI00028933BD UniRef90-L5KKN7 UniRef90-E1RAY1 UniRef90_UPI00034F698B UniRef90_13MHY2 UniRef90_K7ITM6
UniRef90 G4WZV1 UniRef90-A2EA13 UniRef90-W8C5V4 UniRef90-R7ICZ3
UniRefo -F4O417 UniRef90-UPI0004235784 UniRef90-EOVTF3 UniRef90-R4G9U5 UniRet90-UPIO00475C3C3 UniRef90-H2SLW5 UniRef90-M4AE65
UniRef90 E1ZWU7 UniRef90- F6RZA8 UniRef90-B4GXC8 UniRef90-F7BFKO UniRef90-Q5Y8D3 UniRe90-W5Y8D3
UniRef90-W5JPM UniRef90-K1XQ34 UniRef90-F1S011 UniRef90_B3NO18
UniRef90_M1PiY3


NEKFPLFTSCCPGWI|RF $\quad$ GK S QYPDM\| D QLISTAKS P Q QMF G NNK円PLFTSCCPAWI RYAETKHPELMPYVSSCKSPMEMFG NNKIPLFTSCCPAWHRYAETKHPELMPYVSSCKSPMEMFG HKP DPQFTSCCPGWVNFVERRYPEIIPYLSSCKSPQMMMG GDERPMFTSCCPGWVRFVKTEFPHMLSSLSTAKSPQQMFG TRDLPMFTSCCPGWVRYLKSHYPQWTDRLSTAKSPQQMFG
$H D A G P L M T S C C P G W V R Y V K A R Y P Q F V S Q U S T S K S P Q Q M F G$ HDAGPLMTSCCPGWVRYVKARYPQFVSQVSTSKSPQQMFG TGPLPQFTSCCPAWVKYMENFHPDKTAHLSSAKSPDGMQG GKKMPMATSCCPGWVNYMEKHYPDLLDHLSTTKSPMQIFS
 GENLPLFTSCCPGWVQYCEKNYPELLPNVSTCRSPMEMFG DKPRPMF GGPFPMFT GKDRPMFTSCCPGWVKYLENENPKYLKHKSTCKSPMEMFA DPPLPMFTSCCPGWINLVEKNYPELIPHLSSCKSPQGMMG NDKPPQFTSCCPAWVKYVETFHPELLPHESTAKSPGGMQG GGRLPDFTSCCPAWVRHVETAWPELIPHLSSCKSPQQMAG GKKRPMFTSCCPGWVRFALQHYPDFAPQLSTSKSPHQMLG N



## , <br> <br> 

 <br> <br> }GEKLLPQFT $\begin{array}{ll}K & L \\ G & \text { K } P \text { R } \\ G & F \\ M & T\end{array}$

K GKP P Q FT
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## E

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HNEEPML


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K
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$\begin{array}{llll} & K & P & L \\ V & P & M & L \\ L & A \\ P & Q & F & T\end{array}$
$\begin{array}{lll}S & \text { K M P M L } \\ E & H A L L P M F A\end{array}$
$Y \vee L G P Q F T$
$K E Q D P M M T$
$R H H D P M F T$






EPALPMLTSACPGWVRYAERVLGHPVPHLCTARSPQQTMG


## UniRef90 M1Z7H0 UniRef90-K6THR9 UniRef90-R6UD15 UniRef90-B8FRF9 UniRef90-EONNN4

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UniRef90 K6G8J4 UniRef90-H3KBY4 UniRef90-DoWE39 UniRef90-I4CDX3 UniRef90-R5HRR9 UniRef90_C3Z6S6 UniRef90-UPIOO0766CC58 UniRef90-RSSL777 UniRef90-R6AWI2 UniRef90 UPIOOO3316218 UniRef90_UPIOOO328D187
UniRef90 UPIooo3B37331 UniRef90-QOAVN2 UniRef90-R5LL27 UniRef90-B1QVK3 UniRef90-l3DKM8 UniRef90_B7IGN5 UniRef90 E1K1Q7

UniRef90 E6MHA6 UniRef90-UPI0003762746 UniRef90-UPIOOO441D8A6 UniRef90-U3JKT3 UniRef90-UPI000398FC14 UniRef90-D5A7Z3 UniRef90-UPIO0037209EA UniRef90-A8J6C0 UniRef90-A0A022QJC8 UniRef90-C6C1Z8 UniRef90_S6C2L6 UniRef90-B9HD39 | UniRef90-K9ISF1 |
| :--- |
| UniRef90-D7U6R | UniR Refo-E5Y5C6 UniRef90_-11KNK2 UniRef90-K4A9F8 UniRef90-UPIO002652BCF UniRef90-Q9UHQ1 UniRef90_M5WJ36 UniRef90-FOZB08 UniRef90-R7TEUO UniRef90-A2DJT6 UniRef90 AOKT30 UniRef90-UPI00028933BD UniRef90 L5KKNN7 UniRet90-R6K3U5 UniRef90_UPI00034F698B UniRef90-13MHY2 UniRef90_K7ITM6

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| :--- |
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UniRef9-
K1XO34 UniRef90-F1SO11 UniRef90_B3NO18
UniRef90_M1ріҮз

A|I S K T Y Y A E L L H V V D P E R $\quad$ F C V V S II M P C $\square$ A K K Y E C D V S V L N D AVIK EYYKERDASEDKETDSVAVMPCTAKKSEAAREEFDR
 ATVVKNHETELLTEDDPKDLYVVSIVPCDAKKYEAARPEFRS AVMKS Y F A EKIGGKNPNDIVAIVVMPCVAKKAEREMDMYYG
 A MA K T H Y A DVVLGVVEAK DVFFCVVSVMPCVVAKK T EAA A L P T M G E AVIKEHHKH AV I K T Y F A H K K H $\square$ D P E K I I S V A V T P C T A K K A E DA R E E LC D AVLKE HYRE D DRELVSVVAI MPCSAKKFEAAREEFKN A I TK THYAK QENLDPKNI FTVAI MPCDAKKYEITRPEMA H PTIKKTYFAKKAGI DPKKIVNVAVTPCTAKKYEDTRAEKND


 SVLK DKYRA QDAEDGRTTYHIAAIMPCTAKKMEAARPEFQA A V M K S Y F A E Q $\quad$ G K K P E D I F S V A I M P C L A K K G E A N M E L F Y K
 A L F K S Y A A S L D GFDPAAV A S V SVVMPCTAKKHEAARPE LR S ALSKTY LDPQKKGLDAKAI RTIAAIMPCTAKKEEAARPTVRE

 AI $\square$ K D Y F C S $\square$ N N $\square$ K K E N I V S I A L T P C TA A K K E E $\square$ K R SLVKDHFSKQQGKPPDQ\|YHVTVMPCFDKKLEASREDFYN ALTTK R A FARS LGGA EFEEPYVVSIMMPCTAKKDEAARP GVSD SVLKENYRKKDAEDGRTTFHIAAIMPCTAKKMEARREEFRD ALIVE QQKDCE KKHFNIAMVMPCTGKKFEAARSEATH


 AVIREQFRE EPKKHVHIALMPCTAKKREALREGRRA
 AI AKHVFEAP SI DKK FYAKEDGVNPEDI YLVVSIMMCTAKKFEAEREEL P L A K T Y G A K E L GYEPK Q I Y T V S I M P C TA A K K F E GM R P EM D A S V M K T A F A E D Q N L D P N R L F S V



 S L AK TY GA QET GEFS K K I Y T V S I M P C DA K K F E GMMRPE LQ S AV DK S D WA K L S GT D P R A I Y S V A I M P C TAAK K D E VAREARFA T | $A$ | $A$ | $K$ | $N$ | $H$ | $L$ | $C$ | $E$ | $R$ | $L$ | $S$ | $\square$ | $R$ | $P$ | $E$ | $E$ | $V$ | $Y$ | $H$ | $V$ | $T$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $P$ | $V$ | $M$ | $P$ | $C$ | $Y$ | $D$ | $K$ | $K$ | $L$ | $E$ | $A$ | $A$ | $R$ | $D$ | $D$ | $F$ | $D$ | $G$ |  |  | A $\operatorname{L} V \mathrm{~A}$ K T N T G LAA A E A D E A G R R R L L F V V


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

 VAIIK T Y F A QVA G IIP P E KI F TVVSVMPCTAKKDEDERPRHK TVAK TY GAKVVY QMQPENDIFTVVSVMPCTSSKKDEASRPEFNS






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


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

 S L V K Y H H LA E N M G L S P E Q i Y H V T TV M P C Y D K K L S L V

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



## UniRef90 M1Z7H0

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UniRef90
U6G8J4 UniRef90-H3 KBY4 UniRef90-DoWE39 UniRef90-I4CDX3 UniRef90-R5HRR9 UniRef90-C3Z6S6 UniRef90-UPIOOO466CC58 UniRef90-R5SL77 UniRef90-R6AWI2 UniRef90-UPIOOO3316218 UniRef90_UPIOOO328D187
UniRef90 UPIooo3B37331 UniRef90-Q0AVN2 UniRef90-R5LL27 UniRef90-B1QVK3 UniRef90_13DKM8 UniRef90_B7IGN5 UniRef90-E1K107
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UniRef90 B9HD39 UniRef90 K9ISF1 UniRef90-D7U6R8 UniRef90-E5Y5C6 UniRef90-K4A9F8 UniRef90-UPIO002652BCF UniRef90-Q9UHO1 UniRef90-M5WJ36 UniRef90-FOZB08 UniRef90-R7TEUO UniRef90 A2DJT6 UniRef90 AOKT30 UniRef90-UPIo0028933BD UniRef90 L5KKN7 UniRef90_R6K3U5 UniRef90_UPI00034F698B UniRef90-13MHY2 UniRef90_K7ITM6
UniRef90 G4WZV1 UniRef90-A2EA13 UniRef90-W8C5V4 UniRefofo-R7ICZ3 UniRef90-F4Q417 UniRef90_UPIOOO4235784 UniRef90-EOVTF3
UniRef90
R4G9U5 UniRef90-UP1000475C3C3 UniRef90-H2SLW5 UniRef90-M4AE65

UniRef90 E1ZWU7 UniRef90-F6RZA88 | UniRef90-B4GXC8 |
| :--- |
| UniRef90 | UniRef90-1OYLU4 UniRef90-O5Y8D3 UniRef90-W5JPMO

UniRef90
K1XO34 UniRef90-F1S011 UniRef90_B3NO18
UniRef90_M1PiY3

240

210
220
230



 $\begin{array}{ll:l}G T G A G V & F \\ M S G A G V & F\end{array}$

## 

## STGAAQMFGASGGVMEA <br> GSGAAEI F

 AP SHRGGGSGGYLEHVFRYAARELFGIHVDEVTYRPLR STAESHRGGGSGGYLEHVFRHAARELFGDHVAEVTYKALR STGAATI FGATGGVMEAALRTAYEILSGESLGKVEFDAVR YSGGGVIFGVTGGVTESVIRTHYEDQSQKGLKDLQFVGMR SGGUF GA A A 1 Y AAEETHPGGGSGGFLEHTFRHSAQELFGIHVDSIHYKPLK AAGEGHAGGGSGGYLEHIYKYAAKELFGIQVDT:QYKPLK STGAATHEGTSGGVMEAALRDAYEELSGEKLAAPDVKMVR

 MSAQSHSGGGSGGYDEHVFRHAAQELFGDHVDKVTYRXXX VNEEGHLYGVSGGYADTIFRYAAKTLFGRELKPLDFKTVR STGGATIFGVTGGVMEAALRFAYQAVTGDRPDSWDFKQVR VDEEGHLYGVSGGSGEIVFRHAARAIYKREIEPLDFRTLR SSVVSHSGGGSGGFHEHI DRHAAKELFGKELGELQYKVMK DKVTRHDGASSDGHLAHIFRHAAKELFNEDVEEVTYRALR VCGEGHAGSGSGGYLHHIYKHAAKQLFGVDVDELTYKTMK FN EGHDYGVSGGYAETIFRYAGKVLFGREVKPVDFRTDK QQEFYGVKGSSGGYLEFVFRYAAKELFNVDVNEIEYKVGR STGGATDFGATGGVAEAALRFCYEKMTGLPIGQLDYSDLR YTGAGTI FGTTGGVMEAALRTAHKVLTGTEMAKLEFEPVR EEGRRHDGASSDGHLIAHTFRHAAKELNNEDVGEVTYRTLR A SGAGVI G GFGSSGGVAEAVLNYEDPEGCSGRIHWETVE AVVRRHDGTGSDGVMEAALRSAYYLVNKTNPEPDAFQCVR ATVRRHEGAGSDGHLAHVFRHAAKELFNEHVEEITYRALR NSGLGHQGSGSGGYADFIFHYAAKYLFQVTDAKLEYKSLR GSGGGDIFGMTGGVMESADRTAYYYITKNPPKDLYEAVG RSPWAHEFSTSGGYADHTFKYAAKEIFEEAVEKLEYKNLR SSTSGLIFGASGGVTEAVLRTAYYMINGKVAPVKFYHEVR YTGAGTDFGATGGVMEAALRTAYFVLTGEELGELHYEPVR PSDRGHSGSGSGGYAENVITYAAQELFGDRLENLNWKVVR SDLMRHDGRRSDGYLEHIFKHAAKELFDTEVKELTYKVLK YTGAGTDFGATGGVMEAALRTAYFVVTGEEMADLSYKPVR SNVYGDEYSGSGGYLHHVFSYAAKHLFGEEVKELTYKTLK VELMRHDGRGSEGFLEHVFKHTAKEVFAVDVQEVTYKTLR YNKENENRDWSGGYADFIFRYAAKNLFDEENVVI NFKNLR GDVVQDGRTRSDGYDEHIFKYAAKELFDMDDKEITYKALK QRPESMVWSHSGGYAEHLFKFAAKELFNEAPPELSFKQLR APEDGQLYGGSGGYLEYIFRAAAAQLFGKEVEPLPLRTLR YSGAGAIFGATGGVMEAALRSAKDFVEGEYLHKIDYEEVR ARPPAFVWSHSGGYSEHILKYAARKLFNLPVDAVEFKPLR STGAAVIFGVTGGVIEAAVRTAYELFTGKKLEKIDFKELR ERPELMVYSHSGGYAEHVFRFAARELENDARPQLQUDQRR
STGAADIFGVTGGVMEALRTVADILTGEDLKEINYCDVR










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TY K\D A T S Q\IR Q S H A N P Q I V E Y Y K R FAAGT P G
TYS ENVLVANP F ENPGVVKRLYM D DWLLGYP GS E KA KR HLLH
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 $E T \| Y M E N G L V K D P F E N P L V K S L Y D E W L D Q P G S E K A K R H M H$









 $L Y K$ Q LPK S IPP ENE DTK Q I Y N K F F D G S H S D K A K ML L H


L E N L Y K $N$ N Li $\quad \mathrm{L}$ ME EVVYA AVVPVVQLDP E T N G HVVQ K L Y Q E WL E G M D S V K V Q Q S L H


MYR SLDQSNPENESVQHLYTTFLDSDGDNKRQSLLH $\square$ YREDSQKK $\square$ RKSHENPYI $\square K$ LYEDFLGHP LDETSHHLLH MRGVHAAGPGRTPETSAHVQDLYREWLDGADAPRARGTLH $\square \mathrm{Y}$

TKLPRSQPDN $\square$ GTKKLYDDFFDGFGTDKSHNLLH

| UniRef90 M1Z7H0 | T D H R |
| :---: | :---: |
| UniRef90-K6THR9 | $\checkmark \mathrm{H}$ |
| UniRef90-R6UD15 | V T |
| UniRef90-B8FRF9 | THY |
| UniRef90-EONNN4 | TEHK |
| UniRef90-D1PMV9 | T D H |
| UniRef90-R7D1R5 | TD |
| UniRef90-A0A011AA91 | V H Y |
| UniRef90_R6GXK4 | T |
| UniRef90-Q5MIB2 | V H Y K |
| UniRef90-D4KEH9 | THYQ |
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| UniRef90-R6RTM0 | T |
| UniRef90-R6PII1 | VD Y V |
| UniRef90-K1JI19 |  |
| UniRef90-F7UYN5 |  |
| UniRef90-V2YIZ6 | VN Y V K |
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| UniRef90-E1K1Q7 |  |
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| UniRef90-UPI000441D8A6 | T Q Y H |
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| UniRef90-UP1000398FC14 | T G Y H |
| UniRef90-D5A7Z3 | T E Y H |
| UniRef90-UP100037209EA |  |
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| UniRef90-A0A022QJC8 | T E Y H |
| UniRef90-C6C1Z8 |  |
| UniRef90-S6C2L6 |  |
| UniRef90-B9HD39 | T E Y H |
| UniRef90-K91SF1 | T S Y H |
| UniRef90-D7U6R8 | T E Y H |
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| UniRef90-K4A9F8 | T D Y H |
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| UniRef90-A2RRV9 | T Q Y H |
| UniRef90_M5WJ36 | T D Y H |
| UniRef90-FOZB08 | TQY |
| UniRef90-R7TEU0 | T K Y HE |
| UniRef90_A2DJT6 | T WY |
| UniRef90-A0KT30 |  |
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| UniRef90-L5KKN7 | MAYQ |
| UniRef90-E1RAY1 | T T Y H |
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| UniRef90-F4Q417 | T Q Y H |
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| UniRef90-E1ZWU7 | TQYHE |
| UniRef90-F6RZA8 | T |
| UniRef90-B4GXC8 | T S Y H |
| UniRef90-F7BFK0 | T S Y |
| UniRef90-IOYLU4 | T E Y H K |
| UniRef90-Q5Y8D3 |  |
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| UniRef90-K1XQ34 | T H Y |
| UniRef90-F1S011 | T A H Q |
| UniRef90-B3N018 | T S Y H |
| UniRef90 M1PIY3 |  |

#  <br>  

QTAPAVRVALGEEFGFAPGTNV
KKLVVVSVSPQSRASVAAKFNDSDEE T



 E MM R V F D A Q N D N K K F IV V V Sil S I Q S C V S I A T S K N I S V A C C A QDEKK T VV I TLS P Q S R A S LA S H F K I S T L S V V $R F \square V F T V A Q Q P \square L S A K R Y N L P A E E T$ NKTKT I VS VSVQPVLS LAYKCKLSP NDC

VD DVIAALKDPKKFVVAHPSPAVRVALAEEFGGKPGDLC
 EKE EKCDTSEHRVLAVSVCPQSLPYFAAKFNLSVTDA

DELRRRALREKGTTVVVMLAQQVYASMAAKYGLSSHAA
VDEVMKMLDDPNKLVVAHPSPAVRVSVGEEFGAKAGELV $Q \vee N K \quad R K C D A S K Y K V L V A S \square C P Q S L P F F A D K F G M E D G B E A$
$\square K E N K E T S P E K R K \square I V V S V S P Q S R A S \square A A K H K \square D V R \quad K A$
NKVQEA $\square$ NDKNKVVIFSTSPSDRVSLGEEFEMPDGSFV H $\square E R V F A A K A A G K T L V A M V A P A S R V G I A E A M G M E D G S S A$
VSETWEAKQAGKK LTAVLAPATRVGLSESMGQEPGTTC QVKEALNKGKK $\square T V V Q V A P A V R V A L S E A F G Y K E G T V T$

[^0]UniRef90-W4GNW8
UniRef90-W8PTM2
UniRef90 K9LCI5 UniRef90-W8P151 UniRef90-M1PVJ8 UniRef90-A0A024GLY1
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 TEYLAGYFKKLGADLIIDTKIADDLALIENCNEFIKRFQN E GKMVAA LRRLGFDKVFDNNFSADLTIIEEGNELI$N R I Q Q N$ ARRLTAFFKNLGVHYVFDTTFSRNFSLLESQREFVQRFED

EGSELVERVKN
EGHELIERLTK
$\square K \square I N A A \square K E \square G F D L V F D T N F S A D \square T \square M E E A H E F V E R V S K$
ARRDTAFFKNLGVQYVFDTGFSRTFSLLESQREFLERFED VHRMHAAFKKAGF RIVENNDAADQTIMEEGYEFI AKVRA EGKlVPSARKLGFQNAFNTEFGTDMTVVEEATELIKRLAG ERQLVKALRGVGFQYVFDNGYGADDTTREDAAEVLKA KS ASKLCGYFKKLGADLVLDIKLAEDLALLESQNEFIERYKS KKLKTFFKKLNDNYLFDSSFSRDFSLLESAAEFVARYKE FERVAGYFRKपGADLVVDTK 1 ADD DALDE AAKLATYFKMLGADMVVDMTVAQDLSLIEAQKEFIVRYRN GRNEFI EGFELI ERFNT ADDTMMEEGTELLTRLKK TDQMLNADEKAGFT VYDVNQTADQTILEEGTEF: KKKVAA
 SRRLCGFLKSLGVRYVFDTTDAADFSGLESQKEFVRRYED $\square F K \square S T Y$ YRQ $\square G \nabla D A V Y D S \square A R S \square \square R Q V Q Q E Y S H R Q T$
TEQFVNALEKAGFT TYDVNQSADQTTMEEGFEFTNKDRA
 ADLTIMEEGTELLKRVKE GKA $\square$ DAFFKS $\square G A D \| V L D T F A E E \square A L V K T A E E F U Q R Y D$

EGNELTQRVTT EGKMVALLRKLGANYVLDTNFAADLT TAEEAAELVERLTK MAQLVSSLLRKUGFDYVFDVNTAADKTTLDDLDEVVLAALRK EAQLTKSTRDTGFDYTFDNLWGADATITEDAKEAASYKKKK TGKMVSALKALGFDLVYDTNYGADLTDCEEAGELVNRLRD

EGTELLTRGKK
EGHELTSRTKN
EATELLNRVKG
Y $\square R G D N$
MAQLVHCLRTIGFDYVFDVDAGADKTTMDDYAEVIE MKK QR LVTFFKSUGVDYVFDVTVGRS IADRESARELVSRVRE
AR VVGWLKWLGVRAVWDLT TARDLVLLEEAAEFMNRWVC AKRLTGFFKSMGVVAVFDTTAARDFSLLEAGEEFVERFRN AGKIYTALRMDGFDTVFDTSFSADLTVIEEANELLYKLEN EKQ $\square$ KA $\square K Q \square G F D Y V F D \square Q A A D Q T T E D T A E V L$ RAKK SRRLCGFLKS $\square G V H Y V E T T \Pi A A D F S L E S Q K E F V R R Y E$ ERQMVYELKQMGFDYVFDNMWGADATTTEDAKE ILKAKAA

EGHELLQRपKQ GKA DDMFFKT $\square G A H M V L D T S F A R E \square A L L K T A E E F M E R Y R N$ TGKMTTADRRपGFDYVFDTDFAADLTDMEEGTELLQRपNK HRKLVTYFRQ $\mathrm{H}_{\mathrm{G}} \mathrm{VH} \mathrm{VVLDSACAAD} \mathrm{\square ALLEARAEF} \mathrm{\square ARYRH}$

HCKLVTFFRTLGFDLIFDTGCCENMMLLEAREEFLYRYQN HCKLVTFFRTLGFDLIFDTGCFENDMLLEARQEFLYRYQN EDKMVQALRKLGGDYVFDVTFGADMTIMEEGSELVSRLLS

EASEFDAK $\square$ K E
DEHLLSAVYRNAFQWVVDTNTREACLVLGAEEVIASMTD MDKIVAVMRRDGVDEVYDTSVGADLTTLEESKEFLEKDKR

E G S ELLERLKE
ESNEFLRRLDG
$\square R R \square R H Q \square K D \square G F D Y \nabla F D T T F R H \square S G V E \square V N E F S G D Q S$ AGNMDAQLYNNAFTWVVDTNTAREACLVLGAEE!LSDVDG


UniRef90 UPIO00258D5A6 UniRef90-U5EZ89
UniRef90-K7ZLX8 UniRef90_K7ZLX8
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UniRef90_K7ZJF9
UniRef90_R6Q7E3 UniRef90_R4UXD6 UniRef90-UPI000440F26D UniRef90-UPI0003B74C33 UniRef90_G7M4A6 UniRef90_K7R8M7 UniRef90_J9K9Y4 UniRef90_Q54F30
UniRef90 K7ZRA8 UniRef90_K7ZRA8
UniRef90 B0WU52 UniRef90_K7ZRB6 UniRef90_N6TDLO UniRef90-D0EXU3 UniRef90_M1Q4V5 UniRef90_R6A4D4 UniRef90_Q2PWI9
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UniRef90 R9ANF6 UniRef90_K7ZPR5 UniRef90-W3XN64

SLLV|K Y HLA E T K G|L|SPE Q|I Y H|V|T|L|MPCY DK K LDEASRED F Y E

 AI AK S Y Y P TK K A DVDPRKVFVVSVMPCTAKKYEADREEMSV SLVKD YF GKLHNKTPDQIYHVTVMPCYDKKLEASRQDT T E AL AK TYY A ETA G IDDPK DIVVSVSIMPCTAKKKFEAQRPEMAS AL AK S Y F P K VA KLDDPEKIVVSVSIMPCTAKKFEAQRPEMMA ALAKTHYAEKAGVNPKDIVMVSVMPCTAKKFECARPEMTD PVLME LVPQYF GFTKENMKIVVIMMCTAKKVEAKRACLRK
 SLVK NFFARQQQGVEPQKI YHVTVMPCYDKK LEEASRPDBYE A TVVKTWALD $\square W N I$ DPRKI YTVVGIMPCTAK IVYASRPEFKS ASVVKTYFADNYNILDPTNI F IVVSVNSCAAKKYEAEKAEMGR T LI K R QFA A S DGKK A K DL CVVVGCMPCTAKK DEAAR KE LTT T
 T LVVKYYFTEKSKDKPSNI YHVTIMPCYDKKLEASRNDFYN AL A K T Y Y A QK T Gl I D P K D I V S V S L M P C A A K K FE C D R P E M N D VL VK K Y L A K L L G I A A D R I Y HVVTVMPCYDK K L E A S R E D F F S AL AK T YFAEQRGVDPATVKVVSIMPCVAKKFEAARPEMCD SLLKK QWVGQKQS IVYI TVVMSCYDKK LIEAAREDFAAD
 ALTK T F YAKKKNIDDPSKIVSSVSVMPCTAKKFEADRPEMRS AL GK T WAKHVWNKDPRDVCIVVITPCTAK DFEASRPEFDD
 S I DKRFVSGEHGAAPHEVVYVAVMPCFAKKLEASRKABCD
 SVAKS YFAEK LGGI RREDLIVVSVMPCDAKKYEASRPEFSV PVAKT WAEYVWKKDPRDI YVVAVTPCTAKDFEAARPEMNA
 A MIKKSYFA QMMGIDDPGNIVVVSIMMCTAKKFEAQREELAH
 ALI KT WYA QKNNDDPKDINVVGIMPCTAKKFEVVTRENQAA ATAKTYFAQKAGVDPSKMVVVGIMPCDAKKFEASRPEMKS PTIKTYFANKMGI NPSDIVNVALTPCTAKKYE\|LRNEMNA

 STI K K H WVK E I GL NAED I CVVVGFMPCTAKK DEALRREELMT ALI K N Y LP KLLDVVKQEDVLNFSIMPCTAKKDEVERPERTK GI LIKTYWAEKNNDIDPKKIVVSVSIMPCTAKK FEIISRADMEA SLL K HYY A QK DGKKPS DI FS VVSIMPCTAKKAEANRPEMGS SLVKDFFAQQQGLTPDRVCHVTVMPCYDKK LIEASRPDFQE SV AK TYYAAKMGI DPRKMVVVSVMPCTAKKYEAKRPEMQD AI LK S Y Y A Q Q K GII D P A D I FVVVSIMPCTAKKYEKDRDQLKN ALLLKSYYAEKAGI DPAKVFVVVSVMPCTAKKFEAKRPEMNT
 A AAKKR LP GEYKVVDPKNFKVVSIMMPCTAKKFEAKDDKFKR GCDKRGWAKDVGI PVEDLYTVGIMPC DAKKTECQRQQI ALVKY HFAPQLGVKPQDVFMVAVMPCFDKK LEASRRDFYS SLARETLP Q QL NVAPEDDVIVVIMMPCTAKKFEARRSEAAR GLVK SLVVAAAWGVTPGSLYHVTIMPCYDKKLEASRAEATT TIVKKR RVAASLGLDPAAVFHVAVMPCYDKKLAEASRGDFRG AVLKEYYKPADEEAGFETVSVAVMPCVAKKYEAAREEFKR
 T C $\quad$ K K Y F S RE $\square$ NKQA D DLVVVVGI MPCTAKKFEAARA QLT T A LAKTYY AEKAGVDPADMVVVSIMPCTAKKFECQRPEMRD
 S V I K K K Y F A K AV AK T Y L A D KLGGVKRENLIVVSIMMPCLAKKYECQRDEEKV ALLAKTYYAQKAG DDPKNMVVVSIMPCTAKKYECDRPEMAD

 SVAK E I L P G ILGGVKPENVVVVSIMPCTAKKFEARREEFIN $T \vee \vee K R L L A T$ A $V$ A R R FL $\mathrm{S} R$ GVAPESLYVVSVMPCTAKKFEASRTEFAV




 A I A K T Y Y A ERKGLDPKNIVNVSVMPCSAKKYEANRDEMND ALAKKSYFAEKAGI PPEKIVVSVSVMPCTAKKFEAQRAEMCA PMIDKTYYAEKRGUDP K K I FSSVSIMMPCTAKKLEAVRPEMNN ALAK T F Y A QKKK I D P S K I V S V S I MP C TAKK FEA DRPEMA A AI SK S Y Y A K L L Q V E PE NI C S I S I M P C L A K K QECTLP TMD S
 PI AK E Y F GK K L GIDDRRNMVVVSIMMPCLAKKYECQRDEFKV A I A K S Y Y A E L L G V D P H R I Y C V
 ALAKTYYAEVKDIPPEKIVSVSIMPCTAKKFECQRPEMKA ALSKEFGLSGSLGGVEREDVVVVVSMPCTAKKFEAKRPEAMN SLLVK Y WF S Q H I N K T P S DVVYHV T I M P C Y D K K L E A S R Q D F Y S


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$\qquad$

RNSRDVVCVIITPTELIEQMLNEYNVTLSEVNEKEVQKPFGV
 Y QTRDVDCVI TSGEALLKMLEEEGLCLSDVAPVSLDTMFNE


 FETREVDCVI TSGEVLKMLE EEGVSLNDVEPAPLDTM



A

H

## 

SEARDVVAVLTARE
S GYK DVV Y V L T T R E FA K M M K Q A G V S D F E G L D S V P L D H V L G D
 D $\ Y R$ R DVDVVLT S GEVVE E MMI A GEECGTMMDDLIVVVVAADNNNA
 S N M R D M D Y V I T T R E $L$ L



$R$
N
N

## $\mathrm{D} \square$

D I Y R DVDCVIV

 EGPPDVDCVLTTGEVAELLAAAGIADVERDSTEAAGAREG


| D G |
| :--- |
| S | S GYQDVDYVLTTRRE

 N G N P D V D F S L S T R E L A H L I R E A N I N F N A L P DAADFDNPMGE


 N GI S D V
 EDNRDVDCVLATSSELIDDLFQAQKIEFKDLKEAQKEA QMS G D GMRDNDDI L T T K E L A
 S GF Q DVVDLVCT T RELGHMIR Q S GVVDFKEI P DAK F D P F M G D



 | $R$ | $G$ | $V$ | $R$ | $D$ | $D$ | $S$ | $V$ | $I$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $H$ | $I$ | $K$ | $D$ | 1 | $D$ | $Y$ | $V$ | $T$ |



S GF Q D V D Y V L T T R E 1 G R MM R E A G I N L R EMMP D E P A D S I L G E



Y T G GA T $\square F G N S G G V T E A A \square R T A Y C V L S G Q E P A S W N \| E A V R$
 I TEEDNHSGSSGS G GYAH H I F C N A A K E L F F N I N I D K V E F K P L R







## 

## くの

## S Y



 ASGSGVIFGNTGELWKQH

 $G S G A B$
$Y$ T GA G VI F G V T G G VMEAA L R TAVVWTLT GK DS SPDEFKEDR STGAADIFANTGGVMEAALRTAYEIVTGKPFPNLHVSPIAA APAESHRGGGSGGYLE HVFRHAARELVGDHVAEVTYKALR



 HT GA GVVIF GNS G GVVSEAV LVRFAA E A V T G KP MA A K V D F H E V R
 XTGYAF
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 Y S G G G
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$N$
$N$ NPDFREVSLAVEGKEVLKFAISYGFRNDQSMMTKIRRNKC GLKGVKEAEVDLHGVKLKVAVANGLMNARTLLEQUKDGAC GVDFQEASCQDAQGQTRTFALGYGFKSDQSVLRRIKRKNC
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$G L D G V K E L G D I N G M K L N A V V N G V G N V E K L D E V E N G T C$

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AFNE $\square$ P P TEAR EDSA VNQT $\square$ MDY D $\square$ TKSKQ $\square$ F H

QLDNESSYKTAAENTDLLAL LENDSHEEQHHMLH LDEHDKASVYSDCESNKALHDYMDKYM PTEHNDHEVFH A VRTEA

PEDAPGVLELYRQWLQGEDSERARRLLH

L DQQTD DRAANENTDVLGWDDEHFDH QAAHQHDH $\square Y D V A A R S P A N P A V A A D Y G S W L G G P G A P P A R Q L L H$ YRWGDGTVEPRPPDASPEVAEAYRDWVGAVGSERARALFH
$\square E S \square D K E S T F S H C L D N K Q L A E F M Q K Y M S D E S E R K$
E $\square Y$ A D $\square$ PVRRPESSAHVQELYQEWDEGDNSPKAREVLH LDKHDKEAPYSNCTENPTLNEFYERI GTDVHHVMH

VN HVFRDAEFRDVAANPAVAHVYNTYGGQVFSAKAQSLLH

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 K N W $\square$ A E VDEAYFSADEPDVEP DDND

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Q $\square \mathrm{FQLIHADESGREDIADAPAFVGQFGPA}$



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$N A V P E E G R \square F V A S V S P Q V R A S D A A T Y G \square S \quad E K E$
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NE L $\square$ KA $\square$ KEKKK $\square$ F $V$ AS $\square$ S H QARAS $\square$ ATAYYMKVSD $\square D$
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AVLEMVF $\square$ GKLGFHA ILDTNASRETVLQQCAQEFCNS $\square$ NE ARLIARHFKRLGVRYVLDSSFGRYLTLALSYDEFVER

PGK\KTA\KQLGFADVYETATGADTGAADEAEHYVKEVAT $K L L I D L L V N Q M G F K Y V V G T S L G R K L S L I N E A Q H V I T N R G$
$P G K \backslash R S A L L K L G F T D M V E T A L Y A D L I T M K E A F E Y D H F V Q T$ FKKLTTLFTSLGVNSVFDTSCSRDLTLVESCNEFDARYKM
ARK LTAFFKK $\square$ GAHYVFDTAFSRNFSLLESQREFVRRFRG QGLRIGGQHKSGFTYVVDTNQLREACLVLGAEEVADS円AD PEKVKGALKKEDGFADVVEVADGADLCTVVEAEDFLSKVPA AGHMLDNLFRNEFTWVVDTNTAREATLVLGADEVLGTSQT

AK LDH LLLDTLGFDYVVGMGVGREDSLIHSAQE VEK MGKMVTALRLMGADYVFDASMSAYQTVLEEADDFKTRKKG IE QLLSAGYRNSFHWVLDTNMMREVCLLLGADEAMENSNE

A GHMLENLLRNSFEWVVD DNVARDATLADGTAEVLSSPTP TRRVAAALKRAGAGAVLSTSGPREVALAEAAAEFVARYRA

AGYMDDQLLRNGFTWVVDTNNMREAVLVLTADEVDESLNA PEVLKKAMQQLGFKDVVEVADGADLCTIDEAKDFDEKVPA DVLEMVFVGKLGFCTVLDTNAAREVVLQQCALEFCESWKQ A GHMDERLLCSPFDLVLDTNATREVAVRCAAEEVVMAMQN

PRN $\square$ KAA $\quad$ Q E $\square G F S E F Y E V A L G A D \square G A \square A E A H H Y V N K \square T T$
$K M L I H L F V N H L G F V S V V G T G L G R V I A T D T L A H D \square V E G K Q N$ $P G K L R T A F K K I G F H G M M E V A L F A D I D T D K E A F E F D R A D K K$ PKHVKAA LLELGFSEVVEVALGADI GAVAEAHHYANHVAT A GRLRAALLRLGFYGMVEVALFADILTLREALEFDAHVRT SRRLYGFFKSLGVHGVFDEMAVDFSLVESQKESVGRYRQ PEKLTAAMKKLGFDSVVEVADGADLCAI EEAKDFMRDVPE KLLI NLFDHQMGFTYVVGTSLGRKLSLINEAQSLITKKEN AGHLRSAFKKDGFTDMVEVALFADVVTLREADEYNRLVQK $R L L I N L F V N Q M G F Q A V V G T S L G R K L S L I S E S Y N D I H K K E S$ A GNMDEQLYRNGFQWVVD DNAAREACLVLGADELMGP\LA
 SNKIRNAFKALGFTDVVEVAVGADLCTVEEAKDFMEEVPE
 SRRLCGFLKGLGVHYVFDMTIAADFSLLESQREFVRRYRQ A G WL LIE QFHGNGFA WVVDTNVMRQVFLDLSVNEVMESLED

A GYMLDADHGNGFTWVLDTNVAREACLVLGADEVLGGSAA QGLRAGGAHGSGFTWVVDTNVMRNVCLELGVTEVKESLED P IPLP QULAR LGFEHVWDTTFARHLALLEHVREFRERKA H PDKIKA ALLKLGFAGVYEVAMGADMGAMTEAQHYVEEVAT FRKLTALGKSMGVKAVYDTSSSRDVALIEACNEFISRYKV PEKMRPAFQALGFEDVVEVA $\square G A D L C T L E E A K D F V E N V P E$
LLCGPHGLRSSGFTYVVDTNRMRETCLVLGADEVAQSLTG RKLTT LL RMVGTDYVVDTSFALDMALEETACEFVERLGS
AGHMLERLLRNGFTWVLDTNVAREACLVLGADEVLKAAAS LLS GPAGLRSSGFTWVDTNVMREATLVAVADEVIEGSTE $R L L V D L L V N Q M G F T Y V V G T G L G R K L S L I N E S Q S V I E R K E H$ $K V L I Y$ LLK NVMKFKYVIGTETGRRDSHDFTTDDLQNRSPH FNALARFFKRLGFALVFDTDYARELSLAQGRREVLERWQS AGWMIDQLLRSGFTWVVDTNAMREAVLVLTADELTESMAE ALWKIKA A L K K


PGQVTSA LLQFGFEAVREVALGADVVTLEETKEFVAAVPA DEQVITGGRKLGFHDVVEVALGADIVAQHEAKEFAESVEE RRLRVFCKEVLGFDFVFDTTFARHVALREHVKEFDERKEK

UniRef90 L116F4 UniRef90-K7ZRIO UniRef90-W8P109 UniRef90 G8BBU1 UniRef90-K7ZJH8 UniRef90-K9LC19 UniRef90-K7ZL04 UniRef90-F7HDS4 UniRef90-A8N5W4 UniRef90 K7ZMB5 UniRef90_K7ZM77 UniRef90-O9Y7N7 UniRef90-F1L1B9 UniRef90_K7ZPQ3 UniRef90-R5HC68 UniRef90-H8WVT3 UniRef90-K7ZRD6
UniRef90 A1HRZ2 UniRef90-S8DQT3 UniRef90-D3UEC4 UniRef90-A4FV58-2 UniRef90-W9YSLO UniRet90_R6UNE6 UniRef90-_9MC11
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UniRef90_K7ZRG5 UniRef90-G2X2A1 UniRef90_G4U3ZO UniRef90-N1Q584
UniRef90 K1RSJ7 UniRef90-A5DKC0 UniRef90-K7ZM79 UniRef90-C4R096
UniRef90 G7DW35 UniRef90-S7ZXS2 UniRet90-R7C9S2 UniRef90-O5B748 UniRef90-K7ZM74 UniRet90-K7ZL32 UniRef90-F7NQ84 UniRef90 R1AW48 UniRef90_V2XTT9 UniRef90_K7ZPT4 ERKTPVIJASACPGWVICYAEKTQHSALIPFLISSVKSPQQTAG VKFAEQYYPSLLPNLSSCRSPHQMLG KDSKPFTSCCPAWVDYMEKYYCDMIPNFSTAKSPQQMMG KDSKP\|LSSTCPGWVLYAEKTHPYVLPMDSPVKSAQQTTG I KFMEHYYPDLTAHLSTCKSPQQMFG SCCPGWVRFTKSQAPDMLDNLSTAKSPQQMFG
QADCPLRASACPG AHDGHWVSKVS DWA GPGGLQG DSQGPMLASACPGWTCYAEKAHAGMLPFISRTKSPQQVMG G\SGPTLSSVCPGWVLYAEKTHPHVIPKINTTKSPQQITG VKFFEHQFPDLLDUPSCKSPHDMFG NAVLPILSSSCPGWIKYAEQYFPELEPNLSTCKSPQQMLGG RHEAPILTSACPGFVCYAEKTHGDLLPHISRVRSPQAMMG INFLRYQFPNLKYMASSCKSPQQMTG VKYVEQSHPELMANLSSCRSPQQMDG GELPFLLTSCCPSWSMLAKKFFPETIDKISNALTPMVATA KGSNPILSSDCPGWVLYAEKTHPYVLPMLSTVKSAQQUTG ETDFMLTSCCCPVWI KLI ESRFPELIDRUSPSVSPMQASG QADPPVLTSACPGWIKFAEDKFRENMNLISTCKSPHQMLG
 KKPKPVLTSACPGWICYAEKTHPHILPHLSTLKSPQALSG
$E Q P E M A T S C C P A W S V M A K K L F P D F K P Y I S M A L T P M V L T G$ EPAKP ILASSCPGWVCYAEKTHPHVLP VKYAEEFAPDFLDNLSSCKSPQQMTG STQKPVMAASCPGWVCYVEKTHPHVMPYLSSVKSPQQICG GTKKYVSSYCPAWVKHVECDHPELKDRLSAAGSPMQLCG GPSTP LLSSSCPGWVCYAEKTHPYVLPHLSKVKSPQALMG RPSLPMLCSACPGWVCYAEKSHGEYLPFLSSVKSPQAVAG $V$ SYVEKNYPELISNVSTCRSPMQMFS HNKRPILSSACPGWVCYAEKTHPFVLPHLSRMKSPQALMG QQPF MATSCCPSWSMMAKKEFPEFKSYI SMALTPMVLTA HAKLPMLSSSCPGWTCYVEKTHSALIPHLSRVRSPQQACG GRKMPILTSACPGFVCYLESTQPALIPHLSRLKSPQALLG
 VKFVEYFYPELIPNLSSAKSPAQMLG GELPFLLTSCCPSWAMLAKKYFPDVVDQVSQELTPMVATA GAQGPVLTSDCPGWVLYAEKTHPHDLPKDSTVKSPQQVTG DQDFLLTSCCCPMWVAMDRKTYSTLVPHMPPSVSPMVAGG EDDFVLTSCCCPDWVGMVKRVYKDLIPHISPSVSPMVACG HQEEPMLTSCCPGWVHTHSAAGSPHHPHLCTAKSPQQFMG KNNGPVLSSDCPGWVLYAEKTHPYVLPRISTVKSPQQITG EGDFMITSCCCPVWVNMVTKHYPSLNNHLTRTVSPMIASG NFEGPLGSSVCPGWVLYAEKTHPYLLPKMSDVKSPQQ1TG EQUKPILTSSCPGWVCYAEKTHPYVLPHMSRLKSPQALMG KQDYMATSCCPAWHSMDEKDFPGEMHKVSMTLTPMVFTA
 GELPFLLTTSCCPSWSMLAKKYFPELIDSVSNALTPMVATA
 AAAAPILTSSCPGWVCYVENFHPELLKNLSSCKSPMQMFA ASKRPGLSSBCPGWICYAEKTHPHVLPHMSRUKSPQALTG
 GTSLPVLSSACPGWDCYAEKTLGSYIPYISSVKSPQQVIG KLPF MATSCCPAWSMMAKKLYPTVSNCISMALTPMVLTG GSTRPVLTSACPGWVCYAEKTHPHVLPHLSKLKSPQALTG GGPGPLLVSECPGWVCYAEKTQPHALPYMSAVVKGMQVMA SDPKPTLTSNCPGWVCYAEKTHPHVLPHVSKVKSPQALMG AQKKPVITSACPGW』CYAEKTHPHILPHLSK LKSPQALTG GFQGP【LSS $\square C P G W V L Y A E K T H P H V L S R \prod S D T K S P Q Q \prod T G$ CLEQFCPDMLDKLSSCRSPQQMFG SEK PITNSTPGWVLYAEKTHPFTLPRISTHKSTQQMTG NAPDPLLASACPGWI CYAEKTHGELLPFISAVKSPQQIAG TPKRPLSSACPGWICYAEKTHPFILPHLSRLKSPQALSG GKLPFLETSCCPAWSMLAKKTLPDMVETVSSALTPMVATA APKRPI LSSACPGWDCYAEKTHPF TLPHLSRLKSPQALTG
$E G D F V I T S M C P M W V S M D K R V Y R K M A H U T S V S P M D A C G$ IKFMEHFNHELIPNMSSCKSPHEMCGG KKKY DT TSCCPAFVKMAEKDYPEDLDHVSTCRSPQQMFG KKYVVTTSCCPAFVTMUEKHLDPDSLTHVSTTVSPMIATA HRQRPMLAGACPGWICYAEKTHAEMLPFISNTKSPQQVMG

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UniRef90_K7ZPT4
 SLAKATEPEKLGVAAKDLIVVSIMPCTAKKEEARRPEFAT A MIK T W F A R Q N G I D D P R S IVV NV A I T P C TAAK K Y E V L R P E M N A ALI K TYWAEKSEI NPANI YSVVSVMPCTAKKWEIVRNNDDNK CLLKTGTADEFHVPKS QVYHLSIMPCFDKKGESARPEDFG
 AV DK TY F A N A K Q $\square$ D P K K I R S I S I M P C V S K K D E C T L P K F S E AL AK TY YAEK $\square G K K P E D V F V V S V M P C T A K K Y E A A R A E M N S$ FRSDQARPPYHGLG
T L VKE WMA QKWNKKP DGIYHVSVMPCYDKKLEASRQDFYN RI L K T L VA N QLIKVEAA KVYHLSIMMPCFDK KLIESARSENS D TI AK TYYAEKLGLDPKNIVVVSVMPCVAKKAEAARKELTK AVCKTT LPPE ELGGGKHDLVMVSIMPCTAKKYEARRREFNP R I L K D WA V Q Q F S M Q R N DV WH L L L M P C F D K K L E A S R D E F S E
 A LLCK T V L P D E L G $\quad$ H R Q E L V V V S RVIKKEHP DASVVIFI GPCDAKKLEASRRSVRS CLLKTLTAHDFHVQKS QVYHLSIMPCFDKKLESSARPE!FG AVI K T F Y A Q E T GI NPADIVVTVALMPCSAKKFECNRPEMDS RVIKA L QPE AKVVVFIGPCDAKKSEA QLPDDK AVIK NHFCKKFHL R P E D I Y H V T V V M P CY Y K K L E A S R N D F S D
 SLVK DFFA Q QQHLTP DKVYHATVMPCYDKK LEEASRPDFQE TL L K S V L S R T L G I H P S Q I WH LAA M P C F D K K L E A S R E E LT D RLIKKQKP DAKVVFIGPCAAKKLEASRKSVRS
 AVI KE QLKKQQAEDGKENIVVAI MPCTAKKFEAARPENSR S L L K K V I C D TRRVVKPS QVYHV SVMPCFDKK LEEASRDEFQE



 AVLKEHYKNSNGRKVVSVAIMPCTAKKFEAQREEFKE AV AK TYYAEKKGINPEDI FVVVSIMPCTAKKYEAARPEMNP TVFFK T V L G K S L G I S P S Q I WH L A A V M P C F D D K K L
 TAVK S L L H K DVVEDGVK GIVVVGVMPCFDKKLEGARGEDTS
 ALAKTYYAKA $\square$ NKNPEDIFSVVSVMPCTAKKFEATRPENKK RTDKKEHP D D AKVVIF GPCAAKK LEAMRRTVRS
 CI FKRLIGGRQYSCSLDQVYHLSIMPCFDKKLEAARPEHET
 R G V K K L H P
S L V K D Y F T R WQ NLS P D RMVKKENP DAYIAF LLK S L A A C C A AKKLEASRRSI R S
 CLLKNIMAEQLGTDKSNIYHLSIMMCFDKK LIESARPEKEE TL L K T T I S R R L G DS P D RI WHVA V M P C F D K K L E A S REE LT N $T L V K Q W M G G K W G K T P D Q V Y H V T V M P C Y D K K L E A S R Q D F Y N$ $R M V K K D F P G G V K V F V G P C A A K K L E A D R A D D R S$ RLTK Q HY P $\quad$ D C R VVVFI G P C A A K K L EAASRRSSI R S R S I K Q K Y P R SVK Q Q Y
 S LVK K Y FA R RQNLPPEKVVHVIVAPCHDRKLEALREDPHA T L L K T V L S K A L N I S P A QI WH L A I M P C F D K K L E A S R Q E L T D AVLK D YYK S D DKKLVSVAI R P CS S K K Y E A T R E E FK R TLLK T T L S K K L GIP P S RI WHL AVVMPC F D K K LIEASREELTD TLL K S V L R K A L N I S P C H I WHL A I M P C F D K K L EA S R QE L T N A L V K K Y WL L A P K W G K R P D G V Y H V A L M P C Y D K K L E A S R S D F Y N RVI K K EHPD S S VVVIGPCAAKKLEAMRRTVRS A AI K H H MVEKLGGKPYDVYHVTVMPCYDKKLEAVRGDFE E $R \mathrm{~L}$ I K K M H P G A L AK TYPP EKMQLDDPAK I RVIS IMMCTAKKQEAARAEELGR TL L K S V L S K S L G I Q P S QI WHL AI M P C F D K K LLEA S R E EL T D AIIVRKHFPRPAGREQAPI FHASIIMPCBEKKLIEASRDDDAE RLAKTY LAAEKRGDDPRKI RMDSIMPCTAKKEAAARPT LAE TL L K T T L S R K L N I P P S R I WH L A V M P C F D K K L E A S R E E L T D TVIIKEHFKSRDAMDNKTTISVAVMPCTAKKAEAAREETTR VL L K S V L A K K Y G M S P Q N VWHL A V M P C F D K K L E A A R S E LT S
 SLAK QI LPS QLECDAKDMVVVSIMPCTAKKFEAKMPKFAP HLLKK N IVVSK DLLGDEK S Q I Y HL S V M P C F D K K L E A A R SLI K Q YLVTRRPHVERRRIVHVSVMPCFDKKLEASRPDFAD T FLK SVLSSKSLGVSPSRIWHLLAIMPCFDKKLEASREELTN RTIK Q RHP
 $R G V K K L H \quad S E A K V V F I A G C D A K K A E A K E P D V G B D$ IL T K T Y Y A K K M G I P H NKVIVMVSVMPCTAKKFESARPELQS
 KMIKQENPSA

TLVK V WM G S R WGKMP Q DVY HV TVMPCYDK K LIEASRSSDFYN

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UniRef90_O5B748 UniRef90_F6DQD9 UniRef90 K7ZM74 UniRef90-K7ZL32
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UniRef90_K7ZPT4

170
180
190
200 SNSREVIDVVITSAEI DDLLARKG\|INFLEVQEGSIIENVFGE


 ERGQDVDYVLTTRE:DRIVKAAS|NLGQLEPEEFDSPMAE MFSDFVACGFDAGEVERLLEEEDVSWPDLEPAPLDSLCSG
 ENVPDVDQVLTTQELARMLEEAGLKFNQLEPESFDMPLGF NKCREVDCVLSTAEVDKLLEAAGDDENEVDDADEVNWLNA SGARDVDYVITTRELAKMFKEAGDDLRYMEDEAFDNPLGE DGQPDVDYVLTTQELAQMDEEAGLRFAKDPPESFDMPMGF DTDPDVDCVLTAKELTALLEEESYQLVPKVNAPNDWPYVQ SGFKDVDYGLTTREMAQMIKEAGMHLPEMPKSHFDDPFGD ARVTEVDSVLTTGEVLDLTQSKSVDFVSLEESPLDTVLSN DDMKDVDLLVITRELATMIKEAGLDIRNIKDGEFDNPLGV HQTRDVDCVITTGEVFKLLEEEGVSLSELEPAPLDSLY RWWRDVDCVITSRELGSLADARGVQLSQLPDHPLPPPFPD EGVRDVDCVITSKELLMLAESRGLSFFNIPKTFPDPKGHE
 EK IRDVDCVITTKEVVQLLTEKDMSFGGLPEETWPAERDW DGKKPVDVVITTQEFIGMIREYGMSFAALPDTPTDNFFAQ EGVRDVDCVITSKEVLMLAESRGLLSFFDFPDDKVHAFLFP
 NVTRDVDVVLTSRELIRMIKGAGUDFANLPDSPYDPDMGE VSWRDVDCVETMRELLSLASARGLSGPNLPPHSLTPPFPD DGVRDVDAVLT GAWRDVDCVITTRELISLAQARGVDFATLPQSPPLPPPPT DGVPYVDYVITTQELQQMKESGUDFSELESEADDMPFSS DS $\square R D V D A V L T V R E L A T M M K A A N D P G K L K E E R Y D S V M G E$ SGFQDVDVSLTTRELARMDNEAGUDFNGMEAAEGCDTDGGD A

A VDVVITFKELDQVFKAVGI NPEEMDEDTSEH
HSSRGAACVLTSGEIVQUMEQ DLASNNAAVDTLFGDMKE DVDFVLTFEELMGMFEAKDVKFEDITDDEKVE LLNE ESVPDVDCVLTAKELVTLIEEQSPKYSLLPEDPPNWPFDE STYKDVDCVLTAKELVTLDDQHPDTFKLIPDDVNDWPLVE EQYRDVDCVITTGELELLMREKNWDLSQPTARSPHPLADA DIDFVLTFEEVAGMFAAKEVDFNAVEEVDEKPLSE
HGCRAVDFVITFEELSGDFDANN|DFSQYEHEXGESMHN
 NGVPDVDYVVTTQELINMIKESGIVFSELEPEAVDMPFDD

K EVT EVDSVLT
 GGLREVDTVLATNEVAEVLEAPGVRFADLADAPLDPLLNY NGVPDVDVVLTMREFARLLRREGLNLKLLEPSVYDDPMSE NDUPDVDYVITTTELVKMIKKDGDQFNEDESEATDMPFSL HTWRDVDCVITARELLMLAESRDVSFPRPEPAVNDFLESR SVSNDVDCVLTPKELVTLLDECKDKFSGTEDNPANWPYSD EGRPEVDHVLT LS WRDVDCCVLT
 AGNPDVDYVLT AREEVVQMI E E GEMLDODNVDLSSGDAERNAMQMGD FEELDATAASRGVTLPQRDPFPVQSLDAF EGNPDVDIVLTTQELARMIKDAGLDFELPVDSLDMPFGM QNRDMVDYVLTFEEMAAMLDGAGI NITAETEEREYQVS GETDYVITFEELAAMLDAAEUKLEECEEGV

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## UniRef90 L116F4

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UniRef90 A1HRZ2 UniRef90-S8DQT3 UniRef90_D3UEC4 UniRef90-A4FV58-2 UniRef90-W9YSLO UniRef90-R6UNE6 UniRef90-_9MC11
UniRef90 K7ZPM9 UniRef90 K7ZJJ7 UniRef90-Q6CFR3 UniRef90-R5D3H8 UniRef90-N1J142 UniRef90-D6C7A4 UniRef90-G9NMB0 UniRef90-A0A059LKN5 UniRef90-G4U3X9 UniRet90_T1WNV0 UniRef90-AOAO17S6N9 UniRef90-R5R3C1 UniRef90_S9W1wo UniRef90-D5GP26 UniReffo-D3UEA9 UniRef90-K7ZJN3 UniRef90 R9NA74 UniRef90-D6C7A UniRef90-W1QCB4 UniRet90-G2G1W8 UniRef90-R6NP82
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SKПATFDFPKSGSSGGYLYHПMATEQANHPGSTDTVQRGR GTANGRGFAVSGGVANAVKQCIQKEHPDKE
FIRTGNAPREAGTSGGLLYHILKSRAAQTPGAEIVHTRGR RSSAGKMFGATGGVMEAALRTAYKKLTGNEDTNFKITADR TSGAGVIFGVSGGVSEAVLRYYYKERTALSLKNGSYLGVR
 SSGAADIFANSGGVMEAAVRTAYEVVTGKELIPNLHDEPGM
 AASLRNVRGGSGGHLEHVERSAARELFGAEVPRQRLETVR GGGAAQVFGATGGVMEAALRTAYEDVTGKTLPRLDFEEVR ASSDGRGFAVSGGVAKAVVNCLKAKEPEREGSENGOM LTFEEQGGSSSGGYMSYVMSYAAEMLFGDHDANSFVTKVD KSGAGVIFGVTGGVTEAVIRRLPEDKSATELRSMAFNGVR GSGAGLLFGKSGGVMEAAVRGAYYLVTKKVAPKEAFEAVR ATGAGRGYAYAGGVASADEKCVKEYYP
YTGAGLIFGATGGVMEAALRTAYYFDTGNNYEAVKFESTR SSRAGRDYARSGGVSTAVSDTLARLRPNRTIP
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YSWSNDPGSASGGYAYNYLK IFQENLLVKGGYDLQT $T N G R$ SSRGGRVYARTGGVSQAVSDTVKRLSPHEHV
YAWSNDSGSASGGYSHNYLT MKNHLMTKSPELVEDKTDY AKLHSELYPPSGTSGGNLHYLLKHFAAQFVGASVQTTRGR PSRDGELIVHPGTSSGSYDQSVDAQAGDASSREVAVRTVR GTSAGRGFAVSGGVAKAVTDLVHEQYP
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VDDDGHLYGVSGGSGETIFRYAARADFNREDEPGDFK ILR
 YTGAGAMFGTSGGVMEAAIRTLYFVANGREDEGDEVAAVR DAHAGVLFGAPGYLEYALRRAVERVHGVRDAGELSFVPAK YSGAGAIFGTTGGVMEAAVRTMYYVVNGKELEHVEVAQLR YSGAGVIF GVTGGVTEAVDRRVVEDKSQQVLKDIEFLGVR QRGRGQETDTIGTSGGYLWHILQTKRAQHVGSQVMSQRGR GGLGSHLGGGSGGYLEHVMRYAVSQDHGSSVDSLQYKTGR LLSWSSDSGSSSGGYGYNYLQLLQSHLCLRDPFRLESVAGR KTGAGVIFGASGGVTEAVLRYAVEKLRGVTLSAVDFHEVR ASSTSEDGTSSGGYDFNALDAVAASLPQQSMLDLESRAVR ASSRGSSTTQTGTSGGYLHHVLRSFQARNPGSRLTINRGR ATGTGRGYAVAGGVANAIENCINEYYP
EKSFSRQTSASGTSGGYLHNVLDSFQARNPGSEIVTQRGR SSTGGRDYARTGGVSKAVADTLKRTRPDKP DQ
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## UniRef90 L116F4

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UniRef90 F7NO84 UniRef90-R1AW48 UniRef90-V2XTT9

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260
270
280 NSDFHELVLFDQRDNKLKFARCYGFRNTQNIIURQ|KSSKC GEDGVRTATLKVGGDELKLAVVHGLKNAKDLAEKVKAGTC GLDGVREASLECGGQPLRVAVVHGTANARPLADDILRGNV NSDVFEMRLMYKEERVASAAIVNGFRNIIQNLVRKLKPNPS GLDGVKEAAAKDTGAKLKVAVAHGLSNARKVIEAVRSGAK TKENWTEAEFNIAGMKLKVAIASGLGNARRLVNAIRKKEVV GLAGVKEASVTVTGVTAKVAVAHGLSNAAKVIEAVKAGKA NKDFQEVTLEKEGQVLLHFAMAYGFRNWQNLVQRLKRGRC
DYEEFTLAEEASGKUVFKGAKCYGFRNLQNVVKVGRDKR NPDITYELRLVDAEGQVLTSGVINGFRNIQNLVRKLKPNGS
 GEGGMRMATVDLGGQQLKLAVVHGLKNARTIAERVRHGEC GLTEYTLRHPETNEQLISMATCYGFRNDQNLVRRVHGNPS KMKNLEALEVIDGESVLKVAKCYGFRNIQNLVQMMKRGKA GLQGVREATIELGDRKINVAAASGLGNARTILENTEKGSS GEDGLRFRTLNVDGTELKLAVAHGLNNAQNLLEMIQQGEC GKNSYEMRLSYKEDKVASAATVNGFRNTQNLVRKLKPNGK GFEGDKQASVKLEGCVLKFVVAHGTANARKVMEMLDRGEL

## NADFREACL


NTDVMEFLLLSASGDTLKCARYYGFRNDQNLVRKGKPAKN $V L I D S A E G L K N C R T M L M M A K A G K R$ NVDVAEYS LVNGEPVFRAARYYGFRNDQNLVRRLKPARL GLKGRKETKIKINDMELGVAVVSGLANAGQLIEEIRNGKN GIEGMKEATAEIDGRTVRIGIIHGLKNAETLI RKIKSGQE DVMEYSVIDTETGETVASAAQVYGFRNDQNLVRKLKPNPS LGCPKDALENVSGDGKTRVAVVNGLANADKLLEKI|ASGEE GLDGVKKASLKITTGAKKEWAFLEGLSNARKI I EAMKNGE NADVVEYSVTVNGEPVFKAARYYGFRNIQNLVRRLKPARLL GRNAAEVRLCVGGEVKLRFAYVYGFRNGQGLLRGIRGKTC GMKGVKETSITVGDREVK MATVSGLKNADDVVKKI QAGEA GMKDIKEAAVEMNGVTIKVLVAHSLGAARKLMDKI RAGEK NVDVVEYTLMSTEQQPVRAARFYGFRNDQNLVRKLKPARP QNGDLTEYTLRDPRSDLTMSTCYGFRNTQNDSQKIQQRNR NSDTIDYVI STPEKT ARLSRCYGFRNIIQNLVRPGVRSEA GMQGTKEAAVPYGDRELKVAMVSGLKNAETLIQKIQKGEA GLAGMKEASVEVPGVALKVAVISGTKNARALLDRVKKGEA GTEVKVVHAEGLAECRKTLSLAKVGRM GLKGVKEASTLINQDPVRIAVAHGMGNTEYVLKRIKKEEL NPDIYELRLVRGSEVLATAGVVNGFKNIQNLVRKLKNGSH DVDVRSERANGMVACKKMLLKEILNGEI NKDFQEVTLERDGEVLLRFEAAYGFRNTQ VVLKLQRDKF NPD $\square Y$ E $\square R \square M Y N G E K \square A S V E V V A G G R N C Q K L V R K A K A G K Y$ KFKANQADGVKNCKKLLDELKEGKV GKNTYEDRTMYNDEKVASAA VVGFRNTQNLVRRFKPDAS NVDVQEYTVTSATGEILKGARYYGFRNIQNLVRRLKPAKS GADYEEHTVTDRASGAVKGAKCYGFRNLQNVVRRVAEAER DMEI QTARAEGLRECRKLMMLAKAGKF VKVANAQGLDECVKLLRMAKAGKY DNTDVLIENAQGLSECKKILMMAKSGKM DVTVNIEHAEGLDECKKMLLMAKAGKK
wV NSDVIEYSLTSPSGDTTKAAGYYGFRNLQNEVRKGKPPRA GMDGVKEAALTVGDREIKVAVVSGLKNADDVIKKIKSGEA
 NSDVIEYALTSNSGDTIKAARYYGFRNMQNVVKLKPPRT NSDFREVTLEVICCPH

TKVEKAEGLADCRKLLAMAKAGKY GFANVREATMEVGGSTLHVAMAHGLKAARQIAQAVLDGKV NADVTEFTLLSTQEPLLKCARFYGFRNTQNLVRRLKPGAG NADFCEARASAAPAGAPKCACAYGFRNIQNVMRRLKQKTC GLENVRSANVDLGGEEDKVAMCHGLKGTRKLVQAVLDGTA GLEGVKVCELPMGENVLKDGIVSGLGNAERLIVKIESGEE NNDVSEYSVVDADGRVFKAARYYGFRNDQNLVRRLKPAKA
 GODLIREATFTVGDUTLKLAVI HTLKKAAEVVERIRRGEC NSDUYERRLVLRDGQVVSSAVVNGFRNRQNLIRKLKPNHK NADVVDYVLTAEDDRVLKAARYYGFRNVQNVRKLKPARS GTEVY NADVVDYT पMSPEGPGLKAARYYGFRNDQNLVRKLKPARM GVDGTKEGNVIIGGKTLKFAVAHGGSNDRKLIKNAK SERNRREFLLPLGEGGIRMAVVHGLAKAQELLKEDKEGRS DVSLKPYRCEGLANCKNVVAQLEKGQU $S C D G L D E C D K A L K M A R N R L$
$M C Y G F R N L Q N V V R K R B G R K$


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UniRef90
Q9Y7N7 UniRef90 F1L1B9 UniRef90 ${ }^{-}$K7ZL71 UniRef90-K7ZPQ3 UniRef90-R5 HC 68 UniRef90 H8WVT3 UniRef90-K7ZRD6 UniRef90-A1HRZ2 UniRef90-S8DQT3 UniRef90-D3UEC4 UniRef90-A4FV58-2 UniRef90-W9YSLO UniRef90 R6UNE6 UniRef90 - J9MCI1 UniRef90-K7ZPM9 UniRef90 K7ZJJ7 UniRef90 Q6CFR3 UniRef90-R5D3H8 UniRef90-N1J142 UniRef90 D6C7A4 UniRef90-G9NMB0 UniRef90-A0A059LKN5 UniRef90_G4U3X9 UniRef90 T1WNV0 UniRee90-A0A017S6N9 UniRef90-R5R3C1 UniRef90-s9W1wo UniRef90-D5GP26 UniRef90-D3UEA9 UniRef90-K7ZJN3 UniRef90 K7ZM38 UniRef90-R9NA74 UniRef90-D6C7A3 UniRef90 W1 QCB4 UniRef90- G2G1W8 UniRef90-R6NP82 UniRet90_F6B9W3 UniRef90 G1Q198 UniRef90- R6CIJO UniRef90-C5MB04 UniRef90 B8D1H1 UniRef90 G3B8L3 UniRef90-S3CJ48 UniRef90_S8DP64 UniRef90 R5EKG1 UniRef90-R5DTF2 UniRef90-N1Z8S7 UniRef90 R712F9 UniRef90 UPI000328DA1E UniRef90_C5GWQ7 UniRef90-D3UEC1 UniRet90 A0A010SAD4 UniRef90 COS5A3 UniRef90-S7QE26 UniRef90_R5E897 UniRef90 M0ZAY1 UniRef90_UPIo003B58D6E UniRef90-D3UEB2 UniRef90 U1HWL5 UniRef90 ${ }^{-}$M9WIP2 UniRef90-K7ZRG5 UniRet90-G2X2A1 UniRef90 G4U3ZO UniRef90-N1Q584 UniRef90-K1RSJ7 UniRef90-A5DKC0 UniRef90-K7ZM79 UniRef90-C4R096 UniRef90_G7DW35 UniRef90 S7ZXS2 UniRef90 R7C9S2 UniRef90-Q5B748 UniRef90 F6DQD9 UniRef90 ${ }^{-}$K7ZM74 UniRef90-K7ZL32 UniRef90-F7NQ84 UniRef90 R1AW48 UniRef90-V2XTT9 UniRef90-K7ZPT4

A Y H Y|I EVV|MACPSGCVNGGGQDRPDESTKEAPKERLLRVQE
D Y D F I EV
K Y D F V E V M P C P D G
PYQFLEVMACPGG
K V D Y V EIMMACPS GC $\square \mathrm{NGGGGQ} \mathrm{\square KPPNDVSE} \mathrm{\quad KDW} \mathrm{\square GEV}$
QFHFI EV
VY D F V E M M C P G G
Q Y H F I E V
P Y H YVEVMACPS GCLNGGGQLQAPDRPSRELLQHVERLYG Q Y D Y V E V M A C P S G C V N G G G QL K P VA S T T S S S TA A TVVP P N T KCDFI EVVMACPGGCINGGGQ』KEPDGRTNKDWDK E VAG K F H A I E I

E Y D YVEVMACPSGCANGGGQIRAEKAD MRQKLLDS
K Y HVI EI
E VD FVV V
N GCLI E GMAC P G GCTA G


K Y Q F $\square \mathrm{E} V$
D H A Y VEVMMACPGGCTNGGGQ $\square \mathrm{K}$ VED
NGYLL E GMACPGGCVAG
$E Y S Y V E V M A C P G G C T N G G G Q \square K V D D P V V M E R K N Y$
DVH F I EV
K F D F V E V
T Y S Y I EVMACP G GC $\square \mathrm{NGGGQQGAP} \mathrm{\quad EGVAA}$
K Y D F V E V M A
A Y D Y V E V $V$ MACPGGCTNGGGQ $\square$ KE E
EFHFI EV
D F S F V EVVMACP G G C T N G G G Q $\square$ K $\square$ D D A V I L E R K N $\square S$ G K P G P H Y D Y V EVVMACPS GC L N G G GQMQGLD HP TSSVVSRS DA A A EA Y Y D F I E V
D Y H F I EVVMTCPGG


E Y T Y V EVMACPGGCTNGGGQVRYDEE IITQKEWLGRVDE T

| Q Y D | F | $V$ | $E$ | $V$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $Y$ | $H$ | $F$ | $I$ | $E$ |
| $V$ | $V$ |  |  |  |  |

S Y H FI EV
NGCLI E GM GCPGGCVAG
PYHFVEV
 K A N F L E GMGCTGGCVGGPK S LVPVDLATKYVNDYGNEA
N G C M I E G M G CP G GCI A G A G TIL L
EANFYE GMGCA GGCVGGPHVLIDDPGQGREYVNEYGEEAAS PCHFVEVLAC TGCLSGRGQAQAED EHADRALLDWQMEG NGY L L E GMACP G GCVVA GA GT LQQAVEK STMLVNK YAK DAD K

EATFI E GMGCEGGCVGGPKR\ND\|KEATRLVNKFGSKARS
K C D Y V EVMACPNGCINGGGQI SHPEDMLE K D W
 $K G C L L E G M A C P G G C V A G A G T I L P V D K A A K L V E K Y S R E A A A$
NGYLLEGMACPGGCVAGAGT\|NNPDKSAMEVLKSKKESCF
$N G C L: E G M A C P R G C V G G A G T N D V I D$
$N G C L I E G M G C P G G C I A G A G T N I P \| Q$
A CVHV CARVCVSACAC
D Y A Y V E VMACPGGCTNGGGQ $\square R$ VED
HYDFVEV
E Y A YVVVMACPGGCTNGGGQDKVDDP
 $A Y D Y V E V M A C P G G C V N G G G Q L K P P P A D L D G E G K A W T R R D V E$ NGCLIE GMGCPGGCVAGAGTNDP $\quad$ GNKAM

D GY LLEGMACPGGCVAGAGT $\square$ QP $\square$
KYDFIEV
EYAYVEVMACPGGCTNGGGQ $\square R \square D$
A Y QLVEVVACPQACLNGGGQMKPPEGV SRDKWVER
D F D F I E I
E Y T F V E V M A CP G GCTNGGGQ $\square K \square D D P$
HFDFVEV
EYSYVEVMACPGGCTNGGGQ $\square K V G D$
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DYDLI EV
KCDYVEIMACPGGC $\square \mathrm{NGGGGQ} \square$ AAPADQNSKDWDNKATTKY
S Y DFI EVMACPSGCVNGGGQLPPSSARDHMQ
DYAYVEVMACPGGCTNGGGQIRVEPSPHEQRAWLTRVDEA DGCLI EGMGCPGGCVAGAGTNIAIP
D YA YVEVMACPGGCTNGGGQIRIGDAREFNAQH
TANFYE GMGCVGGC $\square G G P H V L I D A E E G R R W V D Q Y G E E A S S$ SYHFIEM
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D ANFLE GMAC $\square$ GGCVGGP
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UniRef90 K9LCJ6
UniRef90 G8BBU UniRef90-K7ZJH8 UniRef90-K9LCI9 UniRef90 K7ZL04 UniRef90-F7HDS4 UniRef90-A8N5W4 UniRef90 ${ }^{-}$W6MM41 UniRef90 K7ZMB5 UniRef90-K7ZM77 UniRef90-Q9Y7N7 UniRef90 ${ }^{-}$F1L1BS UniRef90-K7ZL71 UniRef90-K7ZPQ3 UniRef90-R5HC68 UniRef90 H8WVT3 UniRef90-K7ZRD6 UniRef90-A1HRZ2
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UniRef90 K7ZJJ7 UniRef90 Q6CFR3 UniRef90-R5D3H8 UniRef90-N1JI42 UniRef90 D6C7A4 UniRef90 G9NMB0 UniRef90-A0A059LKN
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UniRef90- G2X2A1
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UniRef90_F7NQ84
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UniRef90 K7ZPT

UniRef90 G1 QBN8 UniRef90-R5BY26 UniRef90-C5VPI8
UniRef90 D1PM53 UniRef90 UPI0003B3A35C UniRef90-UPIO0037B0FB4 UniRef90-R6QXK4 UniRef90-L8X1G5 UniRef90-X0PP45 UniRef90-E10WH8 UniRef90-Q891G1 UniRef90 C5FU93 UniRef90-G2SWM
UniRef90 K9LCD4 UniRef90_C3KWA6 UniRef90-A5DSI2 UniRef90-K7ZM33 UniRef90_U4L106 UniRet90 N2A8R6 UniRef90-R9M4L8 UniRef90-D2V7A2 UniRef90-H2VT80 UniRef90-M1Q4W8 UniRef90-U5HB14 UniRef90 R6RJY2 UniRef90-Q5APK7 UniRef90-D7GQG4 UniRef90 R7B288 UniRef90 UPIO0035F14EE UniRef90-R5KS39 UniRef90-T2B4R7 UniRef90-R5CS28 UniRef90-R6P4E5 UniRef90-N2BKK5 UniRef90-C2BEB9 UniRet90_D4JBM8 UniRef90-C9LRM2 UniRef90-R6FG92 UniRef90-G1QFE9 UniRef90-R6D1B5 UniRef90-C5VNY4 UniRef90-F4RWJ7 UniRef90-U2ENC6 UniRet90 -SOFK07 UniRef90 C0BZM6 UniRef90_BOTBC9 UniRef90-W5F476 UniRef90 WOTGP1 UniRet90 N2ABQ3 UniRef90-R9J002
UniRef90 R6QYU5 UniRef90 TOPJ58 UniRef90 B1R1E3 UniRef90-L7EHM6 UniRef90-A8Q374 UniRef90-R6JVH1 UniRef90-R7YZK1 UniRef90-G4T505 UniRet90_O8RBW1 UniRef90_F4XDL7 UniRef90-R9CFA6 UniRef90-FOXFU6 UniRef90-UPI00041C6FEE UniRef90_M1NOI4 UniRef90 FOYXF7 UniRef90 R6DIP7 UniRef90-R5QEA5 UniRef90-D1AQP4 UniRef90_UZUSV5 UniRef90-GOVNE9 UniRef90-R5V7S3 UniRef90-K6UB38 UniRef90_TONI43 UniRef90 R710J3
Uni UniRef90-13VVL5 UniRef90-X6LC74 UniRef90-R5MEY9
UniRef90-P0CP11 UniRef90-G4Q509 UniRet90-R5XSA4 UniRef90-BOMVT4 UniRet90_C5E1X4 UniRef90-12K424 UniRef90_-I6ML31
UniRef90 LOK4W2 UniRef90-K7RUJ7 UniRef90-D1AQP2
UniRef90_R6WPM0


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NEVLSALQQPGKKFVALLSPQSRAALADALQQTVTNMV KALELLKDDAHPVYALMAPAFTGQFG KDAT Q $\square Y Q L G Q A L R R G E K V A C V A P A F V G Q F G \quad K D A T$


QEVERMDKEPD $\square$ T P $\square \mathrm{MS} \square \mathrm{SPQS} \square \mathrm{AS} \square \mathrm{AA} \square \mathrm{HD} \square \mathrm{S} \square \mathrm{EDTV}$
QELTKALQSQKKVFVVSTSHQSRASLAMAYNVSDENMD YVVQVIEAIKAGKKVVAMVAPAAEGEFGMANSGDMT YIVDVINA RAG KHVYAMIAPASEGOFGA ETLKDKKVPVFA Q $\square \mathrm{F}$ Q VL L L K S


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EEVMSFLQSDHKIPVLSUSPQSLASLAKSSSGSPSMRG LHAVKEFIYAGEK VIASIAPS Q $\square F Q L I Q A L K R G D K V V A A V A P A F V S Q F G D K \quad N V T$ VVDLLLKN NKTVIAAVAPAIIGQFGE $Q \square Y Q L I K A U K S G K R Y Y A V A P S F V G Q F G A \quad N S S$


 VVRELHEYDGPVYALVAPAMEGQFGP


 EMEQYLNEHENGAMTLVFTVSPQVRVSLAANYECHPVVF $H W Q L Q D L K A E N R S V Y A L L A P S F V G Q F G L K$
 QVFDVLQRLREGEKAMVAVVAPALLGQYNA YYOMSLESFD EFMKAMEKGQKDFVASISHQARASLSNALHLSVADVD
 R 90 -UniRef90-E1QWH UniRef90 C5FU93 UniRef90_G2SWM6 UniRef90-K9LCD4 UniRef90-A5DSI2 UniRef90_K7ZM33 UniRef90_U4L106 UniRef90_N2A8R6 UniRef90_R9M4L8 UniRef90-D2V7A2
UniRef90-K0KTB5 UniRef90_H2VT80 UniRef90_M1Q4W8 UniRef90_U5HB14 UniRef90_R6RJY2 UniRef90_Q5APK7 UniRef90-D7GQG4 UniRef90_R7B288 UniRef90_UPI00035F14EE UniRef90_R5KS39 UniRef90-T2B4R7 UniRef90_R5CS28 UniRef90_R6P4E5 UniRef90-N2BKK5 UniRef90_C2BEB9
UniRef90_D4JBM8 UniRef90_C9LRM2 UniRef90-R6FG92 UniRef90_G1QFE9 UniRef90 R6D1B5 UniRef90-C5VNY4 UniRef90-K8DXN9
UniRef90-F4RWJ7 UniRef90_U2ENC6 UniRef90-SOFK07 UniRef90-COBZM6 UniRef90-BOTBC9
UniRef90_W5F476 UniRef90-WOTGP1 UniRef90-N2ABQ3 UniRef90_R9J002
UniRef90_R6QYU5 UniRef90-T0PJ58 UniRef90-B1R1E3 UniRef90-L7EHM6
UniRef90 A8Q374 UniRef90-R6JVH1 UniRef90-R7YZK1 UniRef90-G4T505 UniRef90-Q8RBW1 UniRef90_F4XDL7 UniRef90-R9CFA6 UniRef90-FOXFU6 UniRef90-G4D6S1 UniRef90_UPI00041C6FEE UniRef90-M1NOI4 UniRef90-R6DIP7 UniRef90-R5QEA5 UniRef90-D1AQP4 UniRef90_UZUSV5 UniRef90_GOVNE9
UniRef90-R5V7S3 UniRef90-K6UB38 UniRef90-TONI43 UniRef90-R710J3
UniRef90_A9KQH1 UniRef90_I3VVL5 UniRef90-X6LC74 UniRef90-R5MEY9 UniRef90-P0CP11
UniRef90-G4Q509 UniRef90_R5XSA4 UniRef90-BOMVT4 UniRef90_C5E1X4 UniRef90-12K424 UniRef90-I6ML31
UniRef90 LOK4W2 UniRef90-K7RUJ7


VGKDREAFKRDGFSGVEEVALGADLCTVQEADDFDDEVPD $V G K M K N A F K A M G F E D M L E V A C G A D A V A A H E S E E F I D R L E S$ L L S GP S GLR A S GF T WVV DTN IMMRQAVLELSSTAEVTESLAA

$\square N Q L R S A D K K \square G F S D M D E V A F F A D M L T L K E A \square E F D H L V K N$ $K L L I N L F V N Q M G F Q Y V V G T S$ L V GRKLSSLINESQGMDHRKEE
TELLTKS LGEKQFEMVVDTNPFRQLSLHYASEEVLDS LDD PS RI RTALLKQDGFTGMI EVAAFA DI LTLLKEALLEFQHNMEQ PAKVNAAMKVLGFYDVVEVADGADLDTVQEARDFDEEVPA FKVK F GAVAV FETSTLARLVSHLDELCEFLNRYKE ELLINLFS EKYGFKFIVVGTEFGRILSDTKTNNELIKKGQN



 ME SWR TA L L K K V G F A D MV E V A A GA D MTAAAYEAMMEWAEA FK E








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





HCFRH L LK DKFNAKYVVGT Q $\square$ GRS $\square$ S $\square$ A QM NET $\square Q S K S T$ $P G Q V V D A L L D L G F A E V R E T A E G A A M V T A E Y Q R D D R E$ TGKLRRAAFKA GFHGLIEVAVGADDLTLKEALEFDANI K E
 M D M L R E A F I K I G F S D M I E V V A FA A D I L S

 A GNMISHLLYRNGFTWVIDANTLRSAADVAAAEEVDSSSMDT
 $P Q E M F S G L K A L G F Y G A E E T A V G A E M V S M E Y Q \quad H \quad L K K$









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

SLVGK GI E QL GF T KML EV A A M GA D LV A D S EA DE WA E A Y G E $T G V M T E A L K M L G F T G V Y E V A L G A A D L V A A S E A E E W A E A Y K E$ V G Q I K S A L K K E F G F V D V D
 $\square P L L V L L R R I R A F W R V W D T T F A R H M S L R E S V V E F H E R K D K$ LGG K V K K A C R M L G F T Q V K E V A V G A D M T V I S E A E E Y V
 KSFL T LMMEKFGA $R V L I G L F V E R L G F A K V V G T G L G R R I S L K Q M C Q Q V I D A S Q K$
$P N Q \square K Q G L T K L G F D K V H E V A L G A D I V A D E E T K E L L A K V P K$ D T Y Y 1



UniRef90_E1QWH8 UniRef90_Q891G1 UniRef90 C5FU93 UniRef90-G2SWM6
UniRef90-K9LCD4 UniRef90 ${ }^{-}$C3KWA6 UniRef90-A5DSI2 UniRef90_K7ZM33 UniRef90_U4L106 UniRef90_N2A8R6 UniRef90_R9M4L8
UniRef90_D2V7A2 UniRef90-K0KTB5 UniRef90_H2VT80 UniRef90_M1Q4W8 UniRef90_U5HB14 UniRef90_R6RJY2 UniRef90_Q5APK7 UniRef90-D7GQG4 UniRef90_UPI00035F14EE UniRef90_R5KS39 UniRef90_T2B4R7 UniRef90_R5CS28 UniRef90_R6P4E5 UniRef90_N2BKK5 UniRef90_C2BEB9 UniRef90_D4JBM8 UniRef90_C9LRM2
UniRef90-R6FG92 UniRef90_G1QFE9 UniRef90_R6D1B5 UniRef90_C5VNY4 UniRef90-K8DXN9 UniRef90-U2ENC6 UniRef90-SOFKO7 UniRef90-C0BZM6 UniRef90-BOTBC9
UniRef90 W5F476 UniRef90-WOTGP1 UniRet90_N2ABQ3
 UniRef90-TOPJ58 UniRet90 B1R1E3 UniRef90-L7EHM6
UniRef90 A8Q374 UniRef90-R6JVH1 UniRef90-R7YZK1 UniRef90-G4T505 UniRef90-Q8RBW1 UniRef90-F4XDL7 UniRef90-R9CFA6 UniRef90-FOXFUS UniRef90-G4D6S1 UniRef90-UP100041C6FEE UniRef90-M1NOI4 UniRef90-FOYXF7 UniRef90-R6DIP7 UniRef90-R5QEA5
UniRef90-D1AQP4 UniRef90-UTUSV5 UniRef90-GOVNE9 UniRefofo-R5V7S3 UniRef90-K6UB38 UniRef90-TONI43 UniRef90-R710J3 UniRef90_13VVL5 UniRef90-X6LC74 UniRef90-R5MEY9
UniRef90-P0CP11 UniRef90-G4Q509 UniRef90-R5XSA4 UniRef90-BOMVT4 UniRef90-C5E1X4 UniRef90-12K424 UniRef90-I6ML31
UniRef90_LOK4W2 UniRef90-K7RUJ7 UniRef90_D DAQP2
UniRef9O_R6WPMO

E K VG P M ITC S VC P GFVLY A E K T K P E L VP HMLDDK S P Q Q NKMPNIITTTCCPSVNDLIDEKYYPECAPLMAPVVSPMVAHG EQDFQLTSCCCPVWIAMIRKVYQELMPHVPGAVSPMIAAG KGWK TSSCCPAFVDYVEKNYSQFVDHISTAVSPMI ATA SDKTEFDTSCCPSVMMLI EKYYPELI PSVIPAVSPMVAHA K D DLMUTSCCCPMWVGMLKRVYKDMVKYVSPSVSPMMAAG RMRGPMVASACPGWVCYAEKAHGELLPYVATYKSPQQLAG GKK MTTTSCCPAFVNMDKK HFPELTDNI STTVVSMCAVS KPKKP LLTSACPGWICYAEKTHPHVLPHLSRLKSPQALTG E GS L P ML A S A C P G W I C Y A E K A H A E M L P F GHK GP I I T T A CPVVKNLVEKKYPGLI RNLAPVVSPMVAHA
 PPT STLLLTSSCP GWI CYAEKTHPHVLGHLSRVKSPAALTG D DPF MGTS CCFS WALMMVKNKFPEL SGQQID SGSPMRYTA
 GKK MTTSSCCPAFVHMMRRHFPELADHVSTTVSPMAATAA NEMPNI
GKK MTS
EDQFQLT
G K K K $\qquad$ S C C P S F VVNL I
 C C P M WI A M I
 KEFLTSSCCPAFVAYIEKNFPDLKEHISHNLSPMAE DG GKK MTTSCCPAFVNLI KKHYPQLMENI STTVSPMAAMA
G M K K DK V M T S

K E K MPMLA S A CP GWV CYAEKA Q G DMLP LLLSAARSS QGII G



E QEF LTT S CCPS FFT LLLK QEFP QLIEKKSSSTVVSPMVADA




UniRef90_G1QBN8 UniRef90-R5BY26
UniRef90-C5VPI8 UniRef90-D1PM53 UniRef90 UPI0003B3A35C UniRef90-UPIO0037BOFB4 UniRef90-R6QXK4 UniRef90-L8X1G5 UniRef90-XOPP45 UniRef90 E1QWH8 UniRef90-0891G1 UniRef90 C5FU93 UniRef90-G2SWM6
UniRef90 K9LCD4 UniRef90-K9LCD4
UniRef90 UniRef90-A5DSI2 UniRef90_K7ZM 33 UniRef90-U4L106 UniRet90-N2A8R6 UniRef90-R9M4L8 Uninefe90-D2V7A2 UniRef90-KOKTB5
UniRef90 H2VT80 UniRef90-M1Q4W8 UniRef90-U5HB14 UniRef90-R6RJY2 UniRef90-O5APK7 UniRef90-D7GQG4 UniRef90-R7B288

EEVRपHKGTSSDGYLVHIIFKHMAKELIFNEDMGVFTYHTLIR ${ }^{2200}$

ASADGRGFAASGGVAQAVVNAIKKMDPDRE
GSGDGRAFADGGGVANAVANVIKERYPDRE
ATAAGREFAVSGGVAKAVKTLI EKEHP
AFGAGRGYAVASGVAAAIEACVKEYHP
VEN GILPELAQHPGSSSGSYLQSLIDSVSDPSVSTKATR GSGAGVIFGSTGGVMEAADRSAYYFVNGENADADTFKAVR ASADGRNFAVSGGVASAVVNADHRRYPDRE
GSNYGRGFAQGGGVVSAI QNCIKDK
QTVSRFLSANAGPSDGYLHHLLTTYQSRHPNS\|IQAQRGR SSGAGRIYARTGGVSEAVVRTVEQDHPGRKDA
DTGAGVIFGVTGGVTEAVLCHVTADKSSNTMKQDAMTGDR ASRGGRLYARTGGVSITAVEDVVKRLFPEKA
YSWSNDPGSSSGGYAYTYLRLFQEQLDTTQPEDFSMKVLQ STGAAVIFGATGGVTEAALRTAHYMIFDKELPDIEFQWAR SNPT DQKFADNGTSGGNLTT LLSSLLARYPGSTVTDQPGR SAAAGRDYARTGGVSQAVMECVKNI NPDCQDDPV
GTGMGRGFAVGGGVAAAVVEAVKHIDPDRE
GSGSESDATGSGGYCEDVFKYAAKKLFGMDDRDLIFESKR YLGAA WANRQVQELYSAQQAAQMPRTCI DGYRKETRSSFHRTQRP RSSDPSTSTSSGGYFQNALLADLSNLPP
DSWSNDSGSASGGYAYNYLT UYRNDLILKGYDTDNLINGR
GSVFGKRFGNGGGVTNAVIECFKERGESAD
ASVFGKRFGNGGGVTAAVLESMKEMGQETD
SSTAGRDYARTGGVSQAVAATLERLRPERAD
SSSYGKGFAASGGVANAVVNVLNSIDPDREVKTVK
ASGGSNGFGYTGGEGENILRQICVV KNVDSYKVEKEW
SGKDARMFAVSGGVAQAVVNAlIKSMDP
GSVYGKGFAQSGGVSGAVMEVLDEEGF
SSIFGKRFGNSGGVTEAVLQCLKE
AS OTGRYYAVSGGVAQAVEKRIHEDDP
GSKFGKQYSVSGGVTAAVLETFKEDSPERAD
SSEAGRUYAYAGGVSQAVQMTLDRLSP
KKVRLHEGASFNGYLAH1FRHMAKELSNKDVGMDTYRTDR
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GSAGGRGFAQGGGLSAAVEDYK KK arb KAVA
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SSKAGRIYARTGGVSEAVQTTVERLNPHRKIS
ASKAGRLYARTGGSRAVSEMVEQLRPDRSI
TSPFSRAFARSGGVTAAVDQSLKEALFNREDEPDDFKILR
VDDDGHLYGVSGGSGETVFRYAARAVFNREDEPDDFKVQR
TNRMYPISGGV
 ASSFGRNFARTGGVTESVAHTLKMK
TSRGGRMYARSGGVSTAVSDTIEELYPDK
ASREGRDYARTGGVSISVSEAVAKLFPEKK
ASDA WKHGSSSGGYIFAVLLDAYRSHPDTSQPTVEDHDLR

PLLDAFLIPRGGSSGGYLWHILQTHRAAHPGSSIKIERGR
SAVAGVDFGERENVLEPFI A RSYPLRLGRGGLLKTSSME
GTAAGRGFAVTGGVAAAVKAAIKEIDPDRE
ASRGGRDYARTGGVSTAVGEAVAELYPKKS
AVLDRFLFPPRGSSGGNLHFVLQSVLAQNPGSSDQTNRGR
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ASRGGRGYARTDGVTTALKDAVNELYPDKDP
ASRGGRYARSGGSIVANDVKLYKKA
DPKVNRMYPD
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ATSYGKGFAKSGGVAAAVLKVLEEKG】NED
ASKTGICYAYAGGVAAAVKTTLEKDNPQRAV
ASEAGISYAYAGGVSEAVTETVHQLNPDRQVD
GSVFGKRFGDSGGVTAAVLESMKEQGFTEE
ASRGGRLYARSGGVSTAVSDTIEELYPEK

A SIM G G R F A NA G GVVTNAV L E S MK E K G

TTS SDNLFQYLITNPKSSSCAI DQQLFLHSLSDLQFQVLR
ASYYGRII FARSGGVSEAVGQAIIKE

SSADGCSFPQEAGVSKAVNDY
AS L Q S R RYA $\square$ S GGVAAAVANLIDGRADYRP
STRAAHGFAQAG GVMGAVQLFLTDNNRPQVEGDQVS
ASNEG SASGGYAYQYILHQKSLHPGSCDSTITGKNS
LGABYERFAPHNWLYPVESWTMHRQAAXADCFEI RKLEGR
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UniRef90 G1QBN8 UniRef90-R5BY26 UniRef90_C5VPI8
UniRef90-D1PM53 UniRef90 UPI0003B3A35C UniRef90_UPI00037B0FB4 UniRef90-R6QXK4 UniRef90-L8X1G5 UniRef90-X0PP45 UniRef90-E1QWH8 UniRef90-Q891G1 UniRef90 C5FU93 UniRef90-G2SWM6 UniRef90-K9LCD4 UniRef90-C3KWA6 UniRef90-A5DSI2 UniRef90_K7ZM33 UniRef90_U4L106 UniRef90-N2A8R6 UniRef90-R9M4L8 UniRef90-D2V7A2 UniRef90-K0KTB5 UniRef90_H2VT80 UniRef90-M1Q4W8
UniRef9- U5HB14 UniRef90-R6RJY2 UniRef90-Q5APK7 UniRef90-D7GQG4 UniRef90-R7B288 UniRef90-UPI00035F14EE UniRef90-R5KS39 UniRef90_T2B4R7 UniRef90-R5CS28 UniRef90-R6P4E5 UniRef90-N2BKK5 UniRef90_C2BEB9 UniRef90_D4JBM8 UniRef90_C9LRM2 UniRef90-R6FG92 UniRef90 G1QFE9 UniRef90_R6D1B5 UniRef90-C5VNY4 UniRef90-K88XN9 UniRef90-F4RWJ7 UniRef90-U2ENC6 UniRef90-SOFK07 UniRef90-C0BZM6 UniRef90-BOTBC9 UniRef90-W5F476
UniRef90 W0TGP1 UniRef90-N2ABQ3 UniRef90-R9J002 UniRef90-R6QYU5 UniRef90_TOPJ58 UniRef90_B1R1E3
UniRef90_L7EHM6 UniRef90-A8Q374 UniRef90-R6JVH1 UniRef90-R7YZK1 UniRef90-G4T505 UniRef90-Q8RBW1 UniRef90-F4XDL7 UniRef90-R9CFA6 UniRef90-FOXFU6 UniRef90_G4D6S1 UniRef90-UP100041C6FEE UniRef90-M1NOI4 UniRef90-R6DIP7 UniRef90-R5QEA5 UniRef90-D1AQP4 UniRef90-U7USV5 UniRef90-G0VNE9 UniRef90-R5V7S3 UniRef90-K6UB38 UniRef90_TONI43 UniRef90_R7IOJ3
UniRef90_A9KQH1 UniRef90_I3VVL5 UniRef90 X6LC74 UniRef90_R5MEY9 UniRef90_POCP11 UniRef90_G4Q509 UniRef90-R5XSA4 UniRef90-B0MVT4 UniRef90_C5E1X4 UniRef90_-12K424 UniRef90-I6ML31 UniRef90-LOK4W2 UniRef90-K7RUJ7 UniRef90-D1AQP2
 $\checkmark$ V VANA Q GLADCRKMMTMAKAGKY VKMERAEGLDECKKMLMMAKAGKY GTVVKVQAAEGLKNCRTMLLMAKAGRL GVDVKIDHVEGLAECKKMLLQAKAGKK TTDYEEYTVTDEVDGRVRGAKCYGFRNLQNTVRKVAEEPR GENGCREVTT QLGGKDVKAVVVNGLANTRQLIENLKAGKV $V N$ VANA G GLAEDRKMMKDAVKGKY EGDKFNPLRVSGPDQDKRAMDMAKVGKL NADVVEYTLVSATGDPDKAARYYGFRNIQNLVRKLKPARS VRPMQADGGKACKQMI EAI QEGKT G $\square E G A K E A \square I P F G D K E L R \square A V V S G D A N A K E L I$ EKLKSGEV KFLKAVQGNGVIECKKLLSKAQEGKL GKNTYEMRLLHNGNQVASSAIVNGFRNDQNLVRKLKPGN GMQGVREAWVDFGGDNLHDAVAHGLANTNQVLDRLRSGE N $\square \mathrm{DTRDYLVVSPTGETUKLSRCYGFRNDQNLVRKLKPGED}$ CENGIANCKKLLEDILNGKA NSDYRETVLVDPTDSSLRFVIANGFRNIQNLVRRMKQADE NSDVLEFQLINSTGSKLSSAITNGFRNI QNLVRKDKPSNK K NLIFYTTVTSPSGDVTLRVAKVYGFRNIQNLVRKMKTKKE GRCSFGN NRFRRTTYI GIAHGLGNARKLLNDVRSGKS NDNSVQSTDYRKDQVLVKVAKSYGLHNLLHTVVKKLKEKER ECEI KTERAEGLENCKKLLTMAKAGKY NPD $\square Y$ EMR $\square M Y N G E N K E K A A V V N G F R N D Q N L V R K L K P$ VKVARCSGAAEVKKAL LLLKVGRL
K K K A A K C S GA A E CKK L L TLEFKF GK L EEEGDK EEEGLKYKTCTDGD DK TT $\square$ CVAQGGSQ DDKAAKKVKNGTM DRKVKVAKAAGLDECRKLLLMAKAGKY EMPVTCRKCMGAKECKKALI AMNAGKM TNQEMNAKVCRANGAAECKKALLAMKLGK L ANKEVELKVKTCSGAQECKKALMLLKVGKL DGKS DQVKAEQADGVS NK DFQEVTFERDGEVLDCFEA
$V$ K A ATPRSGPEALDGQV $\square K A V Q A S G H Q N D R K F M L L A K N N K L$ KAVQAHGVKECKQLLQDALLDGKII D Y C E YLITT T T DQDTKKVK GAHCYGFKNLQNLVRKFKG G

 NS DFREVTREVEGSPVLKFALCYGFRNLQNDVRKVKMGKC NSDVVEYRLISEVGQVIASAQVYGFRNIQNMVRKLSQGPT VQSVI AEEEMDSYHKVFVDGLAN

KVQAEQADGVPACREMLERLRKGET
NDDS $\square R \mathrm{~V} H \mathrm{G}$ D
F K SFKS TVASGMDCKTLLEELKKGNL
 STDYTDYT LRAPDGTTLKGATCYGFRN NADVVDYLLLSSTGAVLRMARYYGFRNDQNLVRRLKPKE TSDYEDVVVEAVNQFVFRGAKCYGFRNLQNVVRKVAKDDR GDLLSREVVV. VD GII N CME L L D A L E M G N V

 KHFKSTQASGVK $S G G V I Q S V V A E E D A D I$ VETNVNVRQCNGGE S GGVIO SGGVIQSVITEEDADGYHKVFVDGLENCMEMLECLGKGEL


 G T DFKVSP $\square$ PCSGIE
$\square D A P \square T V A G C N G A A E$
VCNGLDECNKTLKMKAGKL NEDMEEVQLVKDELIVLNMLRAYGFRNDQNVVQKDKKYHK


N

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

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EFHWIEV
$K S V Y V E V M A C P G G C T N G G G Q \prod K W D D E A \square W Q R D L L A R V D E A$ SGNFFEGMACDGGCVGGPKRVDP AQEGTQL

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A ANFI E
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PNNFIEGM
CYHYVE $\square$ MACPQGC LN GGGLLKAQQKKKEWDQLLRNDYKE KNNFIEGMACVGGCLGGAGCLTHEAKDKNEIDKYGKEA
D $\square K Y$ Y $\operatorname{LGMACVKGCLNGPGSLTEPGLTRVLLKRFADTTKV}$ GCNMLEVMCCEGGCI A GPGCL
PAKFI EVMACEGGCITGPSTHNDHD
KTDFI EVMACPGGCINGGGLLNGEAN
ECELI EVMACPNGCINGGGLISGBEDHHSAK $\square W V E Q V F G K$ PYHFVV
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MEG $\square$ Y A A $\square \mathrm{P} \stackrel{330}{\mathrm{~V}} \mathrm{~W}$ P P
KNSTETPYKDS $\square$ S
340
340
$\square$ Y Q E WLWG
350

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S
AHAYDST
Y E E W\LE E
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LYQ TPLENPYVIELLEK
K $\square \mathrm{P}$ ■D S P CM
YYSASEETKERE YGQQAVVGEF LKATGLEE DKLVR
VNDYAA QAPYRTPAENPYVIDLI H
$K \square Y R D D \prod S N \prod K S L C E N E G L N N L Y Y N W D K G V G S V Q A K S I L H$ F NELLNKINELRDEKVLGGFMDIFKKEIGVNNEEKSNDILTT
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R R F L Y
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DQNSEFRTAGQNQVVLEQMN
Q VH S A F H
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I Y A A $\square P \mathrm{~V} W \mathrm{P}$ P PETSHVQELYQEWL
SNPMDSQY
QQVLDN
VN RYGEQANS LTPADNKYVLALFEE $\square$ DD D $\square$ FDEEKAR
KYSTSG $\square$ SPPTM $\square$ SQDEEIED WLKKWF PDQKDHQNDFK



KAAHDSSEE LSKTFEDRS ${ }^{\prime}$ KE AVPTEEE $\square Q E \square L R$ VE QYGEEAEYKTPLENPFVPELDEEFLEKSD KTDNP LE LLKKYP DNDNMERFNHE
NYNLEVKKPLYRSFKNKSMQ $\quad \square H K P S E E E \square Y E \square L$

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Y WNVDQDNS LLDRMN S LDAELVVTEFGEPPDVRRHVALR
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Y
KAARD \(\quad \square\) PDMNT QELAKEFADNHLEDR \(\square\)
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K T $\square \mathrm{KD} \mathrm{A} \square \mathrm{E} \square \mathrm{L}$

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EMEPVARRLANKENLYAVVAPADAGQFGP VI RE:QSGEKVYAVFAPADEG EMRRALDEVABSQKLLVASVSPQTLASGSARYSFSDQQPA $V A A L S Q Q A V A S \square A V H F G S S G G D$ TDTKKSENNSKYKVFAVVAPSUSSQF LTEVIGADGSGKK VVASVAPS


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 VT
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UniRef90_D7JGA3 UniRef90-H7CS71 UniRef90-U2L2E8 UniRef90-R6ETM5 UniRef90-F4LLT0 UniRef90-H6LFH0 UniRef90-R5DXC3 UniRef90_A0A037ZBR3 UniRef90-N1Z3R4 UniRef90_UPI00046F6813 UniRef90_R5DM25 UniRef90_R6MI14 UniRef90-F7Q0G8 UniRef90-UPI0002DED962 UniRef90-17A3B5 UniRef90-H3EDC2
UniRef9O A4XKK7 UniRef90-R5MZ54 UniRef90-E8WI21 UniRef90_UPI00046F28B7

23


NKKELI ISSCCPTVVNLVEKYFPGLCDYLAPVISPMDAHG PK K LLMI TS CCCPMWVGMLKKVYKELMPDLSPSVSPMIAAG EFKGPLISSACPVIVNDVERHYPRLIPPHLSPLVSPMIAHA GSK YMTNSCCPAFLTYUNKKFPKESDNISSTVSPMUATG
 SLK RPMLASACPGWI CYAEKTHGELLPFVSKTKSPQQUSG
 HQQEVI DSSCCPTVVSLI QKYYPAALPYVAPVISPMLASA

T LEF LGTSCCPSWY LAATKNFPEFKKNDSSSATPMVATA EQPY LGTSCCPSWTYVAEKHVPEVKENISASSSPMIFAA KQFLTSSCCPTFVSYIKKCYPKLAEHISHNLSPMATDA
GK
GKPF
GQKF
KRPFMTTSCCPAY円QAARRHMPELTPHISDTPTPMHFTA
EQKY MTSSCCPSFVNMDKKHVPAAESK ISQTVSPMVACG

GQRDVLISSCCHS $\square N L L I Q K Y Y P D L L P Y$ LDADVASPMQAHC SRKRPMLASACPGWI CYAEKTHGELLPYVSTTKSPQQVAG GKK LTTSCCPAFVNLIKKQYPELAEHUSTTISPMFALS
 RLGFITTSCCPAFKRMIETRGPELVEHI SPSLSPMHMLA



K A E F PVIDS S F C P A V V GGL I E K H Y P D L I K Y L A P DA TA A I A C G
DEECFI TSCCCPIWVVSLI QNSFPRILENVSPSVSPMIACG
 PL $\square$ S A C C P AVVNLI E R H Y P E L I P Y L A P S I S P MVA H G
 EKR R
GF D K A AKHAPVLTTSACPGWVCYAEKTHGAVLNHVSAVVSPQQVMG GKK MTTSCCPAFI NLLRQHYPDVFENMSNTVSPMCAIS
 GEMENVIDSSACPSVNMYI EKYYPKLETKYDAPVMSPALVHG
 GK Y K N I I T
G D K
G T S S P R




K QRRKPL L S A V CP GF LI Y TEEK T K P Q L A P M L L N V K K S P Q Q I T G
K TQDV
G K K
GEK K $\qquad$ V

E D K K I M L N S C C P A V V K K A V S L K L L P E L K

G
G
G $\quad \mathrm{DVL} \mathrm{M}$

GD K M M T T S C C P A Y V R A V H K H V P E E L S P C I S DTPRSPMMHY T A




GVQ






UniRef90 R7AMR1
UniRef90-B11210 UniRef90-Q75E78 UniRef90-R7DRU4 UniRef90 UP1000463D33 UniRef90-L2G8G1 UniRef90-16MKU8 UniRef90-B8DOZ8 UniRef90-R6G3J6 UniRef90-A5D6C0 UniRef90 UPI0002886C5F UniRef90 R9NXN UniRef90-J1H4E8 UniRef90-UPIO004560060 UniRef90_D6CWRO UniRef90-R7QF08 UniRef90-R7MLXO UniRef90 R9LWE8 UniRef90 G3CLB1 UniRef90-J4WDY1 UniRef90-E3DQJ4 UniRef90_R6R146 UniRef90-R5TIX3
UniRef90 UPIOOO371B82F UniRef90-R5QNLO UniRef90 G9PZW7 UniRef90-R6HDL7 UniRef9-16MKV6 UniRef90-R5TIB6 UniRef90_R5AHL1 UniRef90_V5E5A5 UniRef90 C4Z1N7 UniRef90_WOFJ16 UniRef90-K4EOK9 UniRef90_C5CFY5 UniRef90 R6PJ63 UniRef90-C4G7X6
UniRef90 H1HROO UniRef90-UP10003722F99 UniRef90-R5FL50 UniRef90-R5CXN6 UniRet90 D5XDS5 UniRet90 C9XRK5 UniRef90-R7BU866
UniRef90 D4JRV0 UniRef90 LOK7F9 UniRef90 BoP9R6 UniRef90-R7BWC7 UniRef90_R4KIX2 UniRef90 C1N383 UniRef90-IOXBXO
UniRef90-R7ESJ7 UniRef90 A6TVD1 UniRef90 R6P7LO UniRef90-R5YGL8 UniRef90-F5T9K9 niRef90 UPI00047A6E6B UniRef90-L1QLJo UniRef90-G8C2Go UniRefo-Gusje UniRef90-R5B957 UniRef90-J8PJ20 UniRet90 Bopgr8 UniRef90 R7HAA7 UniRef90-G2SX67 UniRef90_B3E2E2 UniRef90 A4J5G6 UniRef90-R6X6W8
UniRef90-D7JGA3 UniRef90 - H7CS71 UniRef90 U L2 2 E 8 UniRef90-R6ETM5 UniRet90-B6FW90 UniRef90 F4LLTO UniRef90-H6LFH0 UniRef90-R5DXC3 UniRef90 A0A037ZBR3 UniRef90-N1Z3R4 UniRef90_UPIO0046F6813 UniRef90 R5DM25 UniRef90-R6MI14 UniRef90-F7Q0G8 UniRef90 UPIO002DED962 UniRef90-17A3B5 UniRef90-H3EDC2 UniRef90_A4XKK7 UniRef90 R5MZ54 UniRef90 E8WI21 UniRef90 UPIO0046F28B7

A SVF GKRFGNGGGVTAAVLECLKESGENTD
ASPYGRLFAKAGGVSAAVTRH
DPRVSWCSSAGSSSGGYAYQY LLHMQRLHPGST■ATQAGR F P T T G G $\square$
A S IF GRGF GAA G GLT K A IDE N V T E K G
R R A A HRSS QAA GSSGGNLYFTLQTVASKHPNSQDQTDRGR

TSTCGRSY A R V G G VT K A $\square$ K D T VK EL Y P N K $\square$
NPGPARLFP LE G GQ
A S $\square Y G R G F A A G G G L T S A \square E N Y \square K \quad$ TES $\square D V Q F K P \square K$

A $T$
SVREAHGFA QA G GVMGAVKAY LKKE EADKDNA DQVS
ARTGVNVGSGS GGYADFI LDREAAEEFLGVK LDPDLQWEKAS
ASY F GRIGAARS G GLSDAVA Q GLDKE
LS R F FPKTGGGIECM$\quad D L D F E S G$
Y T GA GT $\square F G A T G G V M E A A V R S A Y F L V N N K E D N V E L K P V R$
ASTSGRGFASAGGVAQAIINTIHKAEPT
ASYYGRAYAKAGGVAEAVKQNLKEKY
ASYYGR】FARTGGLADAVKQALKEQNSS
GSVFGKRFGNGGGVTAAVLECLKETGENAE

S H A Q GR Q F P V T G GVVA G A V A S L V S D K V
A S L Y G I S F P V T C G V K S A V V N A L G D E

Y T GA GTDF GATGGVMEAAVRSAYYLVTK KELPDLNYFPAR
F P T T G G $\square$
AS $\quad$ IY GKRFGNGGGVSAAVAQCMREAGADPDKFNDE
A S L F GKQFAGS GGVAAAVLQVMKELGEDPS

A S K A GRLLYARTGGVSQAVEEMVRQLSPDGKDG

T K LPLD S LP E L VEAPATANARFFP $\square R$
ASYFGRDFARCGGLSDAVSEGLKE QG
A T GFSVAGGIT N
HNGKAKLFPLPGGL LANLGYKLDLSNQEF
A S L S GRVVYARTGGVSKAVK LSVVRRIDKNIVFEEKA FE
ASYFGRIF ARCGGLSDSIKQSLKE
A S Y Y GRi F A R C G GL A D A V A E A L K E Q G N S S WA TAFPVEG
A S Y Y G R $\quad$ F A R S G G $\square S$ D A $V$ A Q A $\square K E H G \square S E E Q F Q A$
F P TTGGI GLARLFP $\quad$ LDGGTVVGVSKQADE
QLHPVVRSGSGGYLDAVFRHAAKVLHGVDVTGPLKYATPR
A SVWGKRFAS S GGVAN AVLE CMQERGEDVSNDTL RARFFPTTGGULKTMKRYM
GK GRRQGQQ
S S Y S R liY P I V D Glv Y D

AS LWWGNNAGSGGVANAVMECMRERGEDTT
$S Y E G G S S F P \square G G L A$
A SVVF GRGFGAAGGLTAADKNYVSD S GVVEVEFKPV
$M$ SMP GYPWSS GGFAY QYVLESQARHQAMGTRCAVLDSTA GK
PSAPAHRAA GSSGGLLYHILQARAAQTPGAAVRVIQGR
SKGRMYAKS GGVASSVVKYL GNPAGLKTEVDN
EKSRARLFPTSGGVLN
$A S N L G G S C G G Y A Y Q Y V A A M Q K L H P G S Q M L V L E \quad G R$
GGRASRFFPRTGG\|IACMHT
A SVYGKRFGNGGGVTAAVLKSMEETGTDTSGLTVE
ASTFGKRFANSGGVTAAVLQS LK E
DP QQGRMF T LS GGPLRAL D $\square A T D F L D T E T$
ASPNGRLFARAGGVSTAVRKHLGE
F P T T G GI L K T MAMKPES GY TYMA

T S R G G R L Y A R T G G V

$P T V S G R N F A V T G G V A E S V G R V R L D P E K L K A A V I V N$
T TPEAFSWALS GGECEYLKN
S SVY GKR F GNGGGVTA A V L K SME E S GVD T S DF K $\square E$
A MREGRSFPVTGGVTA GITAM $\square G D R T E V K P \square S$


S S P E S R GF A Q S G GVVVEAVKA
S S A EARNYCVTGG VVAKAVQVLVPENVEVKPV
ASTFGKRFANS GGVTAAVLESLKESDNCIDA
$T S K R G R V Y P$
$G R G F A D G G G V$
G
G
G
HAYMGKAYP LTGGGLK T T DTHGDILEKE\| IVVE
ALPE E IT GFMRGWLPKNRTKCLQSGRHSGVLDEAGRGGGA
AS GK G I GWAASG GESLALGDDEYVNVD
EK GKTRFFPTS GG LLKTMLC
E H M GRVF S L S Q GSF Q
$S$ V

UniRef90 R7AMR1
UniRef90-B1I210 UniRef90_Q75E78 UniRef90_R7DRU4 UniRef90 UPI000463D33E UniRef90-L2G8G1 UniRef90-I6MKU8 UniRef90-B8D0Z8 UniRef90_R6G3J6 UniRef90-A5D6C0 UniRef90-UPI0002886C5F UniRef90 R9NXN1 UniRef90-J1H4E8 UniRef90_UPI0004560060 UniRef90_D6CWR0 UniRef90-R7QF08 UniRef90-R7MLX0 UniRef90-R9LWE8 UniRef90 G3CLB1 UniRef90-J4WDY1 UniRef90-E3DQJ4 UniRef90_R6RI46 UniRef90-R5I03
UniRef90-UPIOO0371B82F UniRef90-R5QNL0 UniRef90-G9PZW7 UniRef90-R6HDL7 UniRef90-16MKV6 UniRef90-16MKV7 UniRef90-R5AHL1 UniRef90-V5E5A5 UniRef90 C4Z1N7 UniRef90-W0FJ16 UniRef90-K4E0K9 UniRef90-C5CFY5 UniRef90 R6PJ63 UniRef90_C4G7X6 UniRef90-H1HR00 UniRef90 UPI0003722F99 UniRef90_R5FL50 UniRef90-R5CXN6 UniRef90_D5XDS5 UniRef90_C9XRK5 UniRef90_R7BU86 UniRef90-LOK7F9 UniRef90 B0P9R6 UniRef90-R7BWC7 UniRef90_R4KIX2 UniRef90 C1N383 UniRef90-10XBX0 UniRef90-R7ESJ7 UniRef90 A6TVD1 UniRef90 R6P7LO UniRef90-R5YGL8 UniRef90_F5T9K9 UniRef90 UPI00047A6E6B UniRef90-L1QLJO UniRef90_G8C2G0 UniRef90_G3JJ52 UniRef90 U5QA86 UniRef90_R5B957 UniRef90-J8PJ20 UniRef90_B0P9R8 UniRef90-R7HAA7 UniRef90-G2SX67 UniRef90_B3E2E2 UniRef90 A4J5G6 UniRef90-R6X6W8 UniRef90-D7JGA3 UniRef90 H7CS71 UniRef90 U2L2E8 UniRef90-R6ETM5 UniRef90_B6FW90 UniRef90 F4LLT0 UniRef90-H6LFH0 UniRef90-R5DXC3 UniRef90 A0A037ZBR3 UniRef90-N1Z3R4 UniRef90_UPI00046F6813 UniRef90 R5DM25 UniRef90-R6MI14 UniRef90-F7Q0G8 UniRef90_UPI0002DED962 UniRef90- I7A3B5 UniRef90-H3EDC2 UniRef90_A4XKK7 UniRef90 R5MZ54 UniRef90-E8WI21
$\square P D V S M E V L Q V Q G \square E Q G L A A L R S A A N A L K G T R T A D S D K$


IGGVEFRPVKVSGAKEIIKKTMS M ANVGKK NADVTEY VVASSTGDPDKAARYYGFRNI QNLVRKLKPARL
 LMT TSLST DMQNFRAYRANGI K ECKKEILNDALTGNI VSGPFD $\square$ KKTMTMAS $\square G R \square$

## CSGAKECKK Q $\square$ M $V$ MNAGRM

D $\square$ NKKNDALLRACAKTGKA K S G DLMLITTIEETSKKLQFAKAYGFRSLQSILRKVRRG円C QNDTDFELKAVACDGDEECRTALDKKSKNVL
 FEVKTYNADGLHECMKMLKMAKAGKY


FEVKPLVCDGLDNCKLGLIKAMSPSR
GVRNA VVEAVGNGYTTLSGLEGLDKKNQTLLKMMPKKP
EI RTTCINGLSKAMAQLKAYAKNGA
 GAP G LK TMACDRGGAK $\underset{Y}{\square}$ $\qquad$
KCSGAAECKKADTLLKVGK
 VCSGLKECDQTLEKAKKGEV VRCE QANGTKECMEMMRRDQNKET

G
GVIK
$S M D$ L

QNDDFDLKGCACDGDDECR DALLKKSKNLS EDFKLNGLSCDGI EECKRALMRASKNLL GVLKSAELNTDFNSDTLSVSGLDEClNTFQDLLATE
 VLRTTVSGLQNCDRKLASGG N LDDLKEVTLEVDGAVVLRFAAAYGFRNDQNDVRKCKAGGD
 1P CKPNVSKEQKTKYERVVVTGISRSKEILESLSKKEL $H I S G K T Q G T D K \square G G Y D L$ VSAS GLQNVQRLLDEVQKGNI GUEACRAALLKKSKDRLDANFDEGM

D 1 K LRACS GGKECVTALTLLKDGKL
 NHDLLEHRLVDDSGATDSSSEVYGFRNDQNMVRRLQRAKQ NADVVEYVVTEAAVPVFKAARYYGFRNLQNLVRRLKPARLL G

NS D $\|$ VE $Y$
$T M \xrightarrow{\square} \mathrm{~N}$
$R \square \mathrm{~L} Q \square \mathrm{~S}$ NRDTIK I L KA $Y K \ L K A$ DN VI KTTTARL

SEDEDDAKVCVANGAAECKKALLLMKAARL $M E L N V L R V Q G L G Q C L T T L K S A K K S D S$ LDGVENCIAAALRADIESGKV

G LD R A G M
$\square \square F K A V Q A N G V K E$
$K K$
$L$
KVKDFEFNPMVCDGUDKCRTAVGKIAKNES G $\square$ NKAGMKQLAQYGK $\square R S G E A S G G K E A$

$\square$ NGLDKMSMRELKRYSQK
N L E K $\square \mathrm{KH}$
Y H K L S


GKA
VIDGLTKQSVRDLKKYAKNGACD
GVMHVSGDNQT
GKDKVEEILSEMADKKIKS
AVCSGEGVWIQVRNSDVYTSTDR\|VRNDQNMVRKDKTGKK
G IINVI VKVLEE IENGRLNNII
DNDDYTYMS!D GMSSCDHAVKDワEKGND


UniRef90 R7AMR1 UniRef90-B1I210 UniRef90-Q75E78 UniRef90 UPI000463D33E UniRef90-L2G8G1 UniRef90-I6MKU8 UniRef90-B8D0Z8 UniRef90-R6G3J6 UniRef90-A5D6C0 UniRef90 UPIO002886C5F UniRef90 R9NXN UniRef90 J1H4E8 UniRef90_UPI0004560060 UniRef90_D6CWR0 UniRef90-R7QF08 UniRef90-R7MLX0 UniRef90-R9LWE8 UniRef90 G3CLB1 UniRef90-J4WDY1 UniRef90-E3DQJ4 UniRef90-R6RI46 UniRef90_R5TIX3
UniRef90_UPI000371B82F UniRef90-R5QNL0 UniRef90-G9PZW7 UniRef90-R6HDL7 UniRef90-I6MKV6 UniRef90-16MKV7 UniRef90-R5AHL1 UniRef90-V5E5A5 UniRef90 C4Z1N7 UniRef90-W0FJ16 UniRef90-K4E0K9 UniRef90-C5CFY5 UniRef90 R6PJ63 UniRef90-C4G7X6 UniRef90-H1HR00 UniRef90-UPI0003722F99 UniRef90_R5FL50 UniRef90-R5CXN6 UniRef90-D5XDS5 UniRef90 C9XRK5 UniRef90-R7BU86 UniRef90-D4JRV0 UniRef90-LOK7F9 UniRef90 B0P9R6 UniRef90-R7BWC7 UniRef90_R4KIX2 UniRef90 C1N383 UniRef90-10XBX0 UniRef90-R7ESJ7 UniRef90-A6TVD1 UniRef90 R6P7L0 UniRef90-R5YGL8 UniRef90_F5T9K9 UniRef90 UPI00047A6E6B UniRef90-L1QLJO UniRef90-G8C2G0 UniRef90_G3JJ52 UniRef90_U5QA86 UniRef90_R5B957 UniRef90-J8PJ20 UniRef90-B0P9R8 UniRef90-R7HAA7 UniRef90-G2SX67 UniRef90-B3E2E2 UniRef90 A4J5G6 UniRef90-R6X6W8 UniRef90-D7JGA3 UniRef90-H7CS71 UniRef90 U2L2E8 UniRef90-R6ETM5 UniRef90-B6FW90 UniRef90 F4LLT0 UniRef90-H6LFH0 UniRef90-R5DXC3 UniRef90-Q6AKL7 UniRef90 A0A037ZBR3 UniRef90-N1Z3R4 UniRef90_UPI00046F6813 UniRef90 R5DM25 UniRef90-R6MI14 UniRef90-F7Q0G8 UniRef90-UPI0002DED962 UniRef90- I7A3B5 UniRef90-H3EDC2 UniRef90-A4XKK7 UniRef90_R5MZ54 UniRef90-E8WI21 UniRef90_UPI00046F28B7

290
300
310
320
PEDFIIEGMACVVGGCVVGPSKHKAEMEAKKSRDKLIAEADA FTFI ECMACEGGCVGGP
 NGNFI EGMMCEGGCINGSGKFFSGSRSKNTFDKKNAQASK EYAYVEVMACPGGCTNGGGQ $\square K A D D P$
PYHFV
KPRFI EAMACRGGC $\square G G P A M G E D A G \square L A R K Q R \square Y N N L N R G$
 QGNF I E GMMCEGGCVGG

QEDLIEGMACEGGCVAGP
AGQF $\square \mathrm{EV} \mathrm{V}$ ACEGGCDTGPSTHN
KFDY E LMACPGGCNNGGGLLDAPDDPEDTTDTDRQRTND NGNFI E GMACKGGCDGGAGCLTHGEKNKAEVDKYGREVEK NGYFVEMSACEGSCINGPFTRQYKDS ILRSRRRVNQYAQP P Y HFI
K GY LL E
DGYLI EGMACEGGCVGGPGTLLTTQRGAKYVGDFADESPY DFNFI EGMGCVNGCI GGPCCLTHEFKDKTEVDKYGKEAK PDDFVEGMVCVGGCVGGPSKHKSE
EAQFVEVMACDGGCVNGPCSDAP
ENNMLEVMCCEGGCVSGPGC

DCEYFEGMACDRGCMDGPGSMVDYN VVNMLLKKYAAASPQ | DCEYF |
| :--- |
| PY HF |

DHCFVELNLCAGGCVNGPGVDKRRGFRFKATMSDENNALL PYHFI
HHCF $\square E M S$ AC $\square$ GSC $\square$ GGP VMEK YHHTP $\square$ RDFAAVS
PADFDEGMVCEGGCVGGPSRHRSGKNP
QEDFVEGMMCPGGCI GGPSKHQAEAQVLRDRKELLSRADG SYTFI EDMACPDGCLNGGGQVRSGN
$K G$ LI EGMSCEGGCIVSGTRVMVNPRDAMSNLKRDFKVEE DANFFEG MGCVGGCVGGPKAIDDSEKGKRY DADFVEGMVCPGGCVGGPSKHKTEMEDNKARAALLHKADK AEDFIEGMACPGGCVGGPSKHKTE
K P R F I E AMACRGGCIISGPCMLK NKCQPVKRMQVDKFATL

DVNFDEGMACTGGC!GGAGCDTHG
PNNFI EGMACVGGCI GGAGCLTHG
SPRFI EAMVCNGGCI NGPGLSSELGREKUVNYTQNUVKQK PNNFI EGMACIGGCI GGAACDTHGPKDKSEVNKYGQLAKE
 AYDFVEIMACPSGCLNGGGQL
QEDFV E GMVCPGGCVGGPSKHKTETEDSRARESLLSRADG HRCFI EMSACAGSCI DGPVMEK
 KKAFLEVFSCYGGCVHGPFKVSHGSTSYRAR $\square E V K D Y A D R$
PEDF TEGMACEGGCVGGPSKHKAEN
EDDCVVENDCEGSCVDGPGMPKDGVNYYVREKKVKNYAKS PGNFI EGMMCEGGCI NGAGTMVPP
SPDFI EMACPKGCINGGGLLDSNNTKKMNAQLIEHLNQR EYGYVEVMACPGGCTNGGGQUKVDD DSNLVEVMMCEGGCVNGC
EHCF $I E M S A C A G S C V R G P \square M R R K H P S S \quad V R D Y Q A V S$
KGYFVEMSACEGSCDNGPSTRAYRDNILTSRARVDEYAQ
QADFVEGMMCEGGCVGGPSQHRSEMQFKKDRDTLDAEAD
PEDFIEGMACEGGCVGGP
SPRYVDLRFCDGGCVDGPGKNRDLTNLFKRNLIIRYNAAH

| NFTF | $E C M A C E G G C V$ | $G G P$ |
| :--- | :--- | :--- |
| $H K C F$ | $E M S A C V G S C I$ | $G G P V M \quad E K Y H R N P V M D Y M K V A S Y$ |

 KANFIE
TPNLVEVMACESGCTGGPSVITNPG
$P N N F$ GMACVGGCI GGSGNL
GGNF EGMMCEGGCI NGAGKF $\square$ SMPKAKPAFDKKNSQSS PNLI E VMACEGGCI A GP
$D$ D FF F GLACDGGCVGGCDTVENNYVAKMYDQDRAKKMKQ $D V D F I E G M M C E G G C V G G P S R H K K E Q V F$
$P G N F I E M G C E G G C V A G P A N L I$
KNLLVEVSACKGSCI GGP
NGNFIEGMACKNGCTGGAASMCHAVKGDNDVTQYGKSATS PGNFI EVMACEGGClAGPSAH
LGNLI EVMACTGGCLGGNSTVNAYKPALKQVTNYVNESKP
 NADVL EGMCCKGGCCVGGPEMANDLGVSVRREM
 EYDLVEVMACPSGCANGGGQDR YFE GLDACS G GCVGGP
HHCFIEMSACPGSCI GGPAMEKNHRAPVRDYワTVRRFAE

REVH
DFAVDQPDTMD LKKHFEF $\square E R R Y$ K S VMSNKE $\square$ KRFEDVN
QQSCNKG IVSWSYTPRE $\square \mathrm{D} \quad$ YKVPDEEE $\square K R \square L$ $\square$ QEEAASGREAEPGPQLPSGLLYRTY $\square P$ P S P E Q $\square \mathrm{DK} \square L$
H $\square E S V N A K F S E S P \square E N P S V Q D \square Y R H V V G G P G T Q P A K K M L$ C DRSRRTDFS $\square$ KPDFMRP $\square$ P VELVREH RPSEAQ $\quad$ TE EL
K Y A F
KNVCDDSEAAKVSGKNDDVK
 AYAGGKDFP $\square E S \square P D G A \square K K R \square \quad A Y \square G K P G E Q E \square R D \square L R$
R Y P M D Q F S MFRDGH LD P S V
VDEYAKNS $\square$ Y Q T P L E N P Y VR K L
पee HYPMDKFSMHRD
S Y S NFKDYQEF LP K K K R TF LKEPTERE $\square R D \square R$ ED F F PVEQPSPES DHKDHDPTPSDKEDREDL ARRFGEQAK $\square$ SAAGLDLK TCFVDRYPVPSEEE CKE L LK
KNQHRLDSNLKRSYTNK KAE $\square \mathrm{D}$ LDPTENQ KTILDADAVTR
EYAGDKDFVVEQPDSNDLRKHLDERENKMPSEYEDNAALR QCRSEGDDVLQRSFVNRQVV
FPVPSEAEIKEIL
RKVLDN
NYAGRQQFVVEQPDPNE
TSKTVLFEDIK
ANDTADEYDISATFTPKPVIE
D MP TEEQ $\square$ RD $\square$
KEEWEKE $\square$ SFEKTYFNKRVKR KKATEEE $\square Q E \square L R$
Y H E
SYAGKEDFNV EQPEVSQ V T NEYRPKPSHTE $\square$ ME $\square$ LR
PDMHQKPDFDAACEFGLSRH $\square$ ANEFVHEPEPPEA
YRSAVSPAQLSQSFQDKS DK
$\square \mathrm{D}$ A PKGDDVRR\LH
AGNKDFDLVQPDSLLLKKTFEP $\square E R K N R M P T E D E \square A D \square L$ TYE

TST $\square$ HMPDEYVKS $\square$ YNS GMMH $\square K E R \square L P R S P E P \square D Q D \square$

ANS S L A LN G F D LS LIN ME
Y T E V H K
NYDMDKFSMHRD
HSSEQVSKEEKQG $\square$ D $\square$ S REHQP $\square D \square K M N M P S H E K \square K E \square L$
$\square$ NSFDKK VWQST $\square Y$ N N R D $\square$ NT VRNQRRPTPPEET $\square R A \square L$
DAGDNDFKYDALSENELSKKLI YLASPGSRADEETLR



UniRef90_D8M3L0 UniRef90-FOK879
UniRef9O-UPIO0039BF736 UniRef90-LOIMG2 UniRef90-E8LEN1 UniRef90-J3PTX44
UniRef90 F7PVZ3 UniRef90-F7PVZ3 UniRef90-K7ZM35 UniRef90_UPIooo36BE13F UniRef90-Q1JW74 UniRef90-R7MEM4 UniRef90-R6T8GO UniRef90-F4KJV3 UniRef90-UPI000359DF14 UniRef90_U2BP45 UniRef90-ATTQPO UniRef90-R5MRH0 UniRef90-UPIOO0255CF26 UniRef90-D5XCK4 UniRef90-K8EOW9 UniRef90_COQZJ8 UniRef90-G2YBJ66 $U n i R e f 90-B 5 Y 6 Z 7$
$~ U n i R e f 90 ~ S O A Z 77 ~$ UniRef90-UPI0004174C7D UniRef90-C5X148 UniRef90-U7D905 UniRef90-GOGFC5 UniRef90-K7ZMO7 UniRef90-A7FUN4 UniRef90_COGH19
UniRef90_R8W0Q2 UniRef90-R5Y3Z6 UniRef90-C6LPH5 UniRef90_K1XLC8
UniRef90 R9JVN3 UniRef90-R9JVN3
UniRef90 E8RBP6 UniRef90-U2F6A2 UniRefigo-R7HS19 UniRef90-R5A213 UniRef90—UPIO0047A8B5D UniRef90-B8DZB3 UniRef90 E1R406 UniRef90_WYYAX1
UniRef90_UPIOOO360C476 UniRef90-X8J8V9 UniRef90-R6P406 UniRet90-G8LZQ7 UniRef90-E1K140 UniRef90-UPI00036C7297 UniRef90-TOE247 UniRefefo-VgVK25 UniRef90_UPIO003F83228 UniRef90_J3KT43 UniRef90-А0Е3Е7 UniRefefo-F4A513

LEMLRTAFKKVGFADMVEVAFFADMDTDKEAFEFNELVNS
 MAQTYEALQKAGFAEVVEVGLGADVTSVKEAEEYGDKVPA
FKVLKKYFRSHNFALVLDTNFAQRLHLVESQREEKERQQEE


PGQVVQGLKMLGFSEVRETAEGAEWVAKEHALLLAE
$P G Q L V T G L K R L G F S E V H E G A S G V E L I S D S Y M E M D Q E Q$
PKQLKQAI QSLGFDDVVEVAQGADITTKNEAAEFKERMEK
LGQVDSGAKELGFFTVVEAALIGADMVAKESKELVE
K ${ }^{1} \mathrm{EA}$
RGQVKDALLKLGFTDVRDTAEAAAMAT GEYVKLLEK QMF VRYLQEVWGARYVVGIQEGR MAT EESGKYMNEVAD HAQVYGALKRIGFSDVIEVAQGAMDTVHHEGHELDEKLEA TDYVLTALKKLGFDDVFEVSKGAETVSEATRAELSH S PGQVLNAVKKVGFHHVMEVAEGAVDTAREEAAEFRERGEK
 PGQLLKSALLKLGFNKVWEVALGADVTSDREAKEFEERMEK

VDPVIGALELMGFDEVFEVARAAELVSDATRRyMAGF MGQVVTALHQLGFSHVEEVAEGADKTITLEAEEYMDGQK

SVLGGLKKMGVNRLISVSFGADDTTWAY $\square N Y \square Q K$ SRRLCGFLKSLMNVK LYOLAEYTKTATNNSTKEF
 KK FGYLKSGQVKKFYDVSFGADITVWAYLKYGRERENR PGAFAAAMKELGFAGTAETAMAADRVTHALADLLQ KGG
 VSSLTAALKRLGFSGVSETALGAEMVSAAVNEFLDHSPRS AAKYKYALKKLGFAKIVEVAAGAEVTAAAESEELEEKMEA
 FGKLSHLFRILGAKNIFSMNVGEMI AVHESKVEFVNKLKN VNUVLNGLLLMGFDDVFEVGAAAEVVSEATRSYLTEH PKRLFGFLKSLGVKLI YDVSLGADITTWAY LI LKKVMQE
 QDVVLAALLDMGFDDVYEVAKAAELVSDATRRILQ TK K QLGGGLKKMGVNRIVSVSFGADITTWGYKEGVKYTSE
 METVFEAGRERGFHDVLEVADGAMETTRREAEELKEKLEE REQFYTGLGRLGFAAVYEVAEGAVATAEHEARELGEHMKA


 LAQQKAALLSAGFSSVMEVSEGAETTSLDEAAELAQR KG KEDWFSLLKKLGFNNIYEVAWGAELICDKYTEIL DN ILNGLLQUGFDDVFEVSRAAELVTAATKKYMKHH K ECVLSSF KRFNVYKYVDTSCMRSKIYEEVYKEYKA

UniRef90_D8M3L0 UniRef90-FOK879 UniRef90-UPIO0039BF736 UniRef90-LOIMG2 UniRef90_E8LEN1 UniRef90-J3PTX44
UniRef90 F7PVZ3 UniRef90-R6VU03 UniRef90-K7ZM35 UniRef90-UPI00036BE13F UniRet90-O1JW74 UniRef90-R7MEM4 UniRef90-R6T8GO UniRef90-F4KJV3 UniRef90-UPI000359DF14 UniRef90-U2BP45 UniRef90-A7TQPO UniRef90-R5FYV1 UniRef90-R5MRH0 UniRef9O UPHOOO255CF26 UniRef90-D5XCK4 UniRef90-K8EOW9 UniRet90-C0QZJ8 UniRef90-G2YBJ6 UniRef90-B5Y6Z7 UniRef90-SoAZZ7 UniRef90-UPI0004174C7D UniRef90-C5X148 UniRef90-U7D905 UniRef90-GOGFC5 UniRef90_K7ZM07 UniRef90-A7FUN4 UniRef90-COGH19
UniRef90-R8W0Q2 UniRef90-R5Y3Z6 UniRef90-C6LPH5 UniRef90-K1XLC8
UniRef90 R9JVN3 UniRef90-E8RBP6 UniRef90-U2F6A2 UniRefigo-R7HS19 UniRef90-R5A213
UniRef90 A6P1A3 UniRef90-UPIO0047A8B5D UniRef90-B8DZB3 UniRef90 E1R406 UniRef90-W7YAX1
UniRef90-UPIOOO360C476 UniRef90-X8J8V9 UniRef90-R6P406 UniRef90_G8LZQ7
UniRef90 E1K140 UniRef90-UPI00036C7297 UniRef90-TOE247 UniRef90-VgVK25 UniRef90-UPIO003F83228 UniRef90_J3KT43 UniRef90-AOE3E7 UniRef90-O8RBD5 UniRef90-UP100037FCC7C UniRef90-AODWM5
UniRef90 A4J4W0 UniRef90-A4J4W0 UniRef90-M5DWP9 UniReffo-A2E4U8 UniRef90-G7WH32 UniRef90-L1LAH3 UniRef90-G5ICO3 UniRef90_G2FT29 UniRef90-R711P7
UniRef90 G2PWV6 UniRef90- F6BHE5 UniRef90-G9RND3 UniRef90-R9J8A7
UniRet90 B6AFV9 UniRef90-U6HBP5 UniRef90-R7DH06 UniRef90-V5WDU5 UniRef90 K2E596 UniRet90-U5QA02 UniRef90-R5QVI2 UniRef90-EOS7C0 UniRef90-E4RIX0 UniRef90_R6WU09 UniRef90-16UCM4 UniRef90_G7W9NO
UniRef90_UPI00029A973C

HPFDTSNCPGWVICYAEKKTHALVPFLSTTKSAQQDMG K DDLMITSCCCPMWVSMTRK IYKDLARHVSPSVSPMIASG
 K Q GF MTSSCCPAFVKLIDKTQVPEAADKI SDTPSPMLTCA

 $V \mathrm{~K}$ Y A E Q F DP DV DP QL S T VK S P Q Q IT G

 $K$ GER KICSACPGFLMMYEKKQQDLLDPLDDDVKSPMEITG GQSF MTTSCCPSFYEAVDKHDPKLHDFVSDSKSPMYYTA GRKK P VISS A CPAVVRRI RVRFPNLIDENVLDFNPPMEAAAA
 G D Q E C C V GDKL MTTSCCPA YVKAVRKHVPELIPCVSETMTPMTYTA
$M K S P Q A L M G$
$R \square R R P V I S S S C P A V V R L V Q \square R F P S L L D N V L D L C T P M E V A A$ K K E A F MTTSSCCPA YIN AI N KH DP D L K P N V S H TP T P M G F A S

QVRRPVISSACPAVLRLIRVRFPELLDNDLPMHAPDEVAA D GPTTMGGTSCCPA YTEAVRKHVPEFTPHLSHTKSPLCYYSA




 EKYFPS L I KYMIPI A A S S MA A H G

N L

 S Q N R V VI A T C C P S V V


 S A CPAVTELVEKYYPRLASHLSPWKSPMLAHA
 $\stackrel{L}{\mathrm{~L}} \mathrm{~L}$

TNLT PLLCSECP
NF
$N L K K P \square I A Q P C T S V N Y I E K N S P E L L Q N L I P I Q S P L L C C S G$

-ーロ
$\square \Omega$


## UniRef90_D8M3L0

UniRef90-F0K879 UniRef90-UPIOOO39BF736 UniRef90-LOIMG2 UniRef90_E8LEN1 UniRef90-J3PTX4
UniRef90-F7PVZ3 UniRef90-R6VU03 UniRef90-K7ZM35 UniRef90_UPIooo36BE13F UniRef90-Q1JW74 UniRef90_R6T8G0 UniRef90-F4KJV3 UniRef90-UPI000359DF14 UniRet90_U2BP45 UniRef90_ATTQPO
UniRef90 R5FYV1 UniRef90 ${ }^{-}$R5MRH0 UniRef90-UPIOOO255CF26 UniRef90-D5XCK4 UniRef90 CoOZJ8 UniRef90-G2YBJ6 $U n i R e f 90-B 5 Y 6 Z 7$
$~ U n i R e f 90 ~ S O A Z 77 ~$ UniRef90-UP10004174C7D UniRef90-C5X148 UniRef90-U7D905 UniRef90-GOGFC5 UniRef90-K7ZMO7 UniRef90-ATFUN4 UniRef90_COGH19
UniRef90_R8W0Q2 UniRef90-R5Y3Z6 UniRef90-C6LPH5 UniRef90-K1XLC8
UniRef90 R9JVN3 UniRef90 E8RBP6 UniRef90-U2F6A2
UniRef90 R7HSII UniRef90-R7HSI9
UniRef90- $25 A 213$
UniRef90-A6P1A3 UniRef90-UPIO0047A8B5D UniReffo-B8DZB3 UniRet90-W7YAX1 UniRef90_UPIOO0360C476 UniRef90-X8J8V9 UniRef90-R6P406 UniRef90-G8LZQ7 UniRef90-E1K140 UniRef90-UPI00036C7297 UniRef90-TOE247 UniRef90-V9VK25 UniRef90-UPIOOO3F83228 UniRef90_J3KT43 UniRef90-А0Е3Е7 UniRef90-F4A513 UniRef90-UPI00037FCC7C UniRef90_AoDWM5 UniRef90-A4J4W0 UniRef90 R5US35 UniRef90-A2E4U8 UniRef90-G2SXD3 UniRef90_G7WH32 UniRef90-L1LAH3
UniRef90 G5IC03 UniRef90-G2FT29 UniRef90-R711P7
UniRef90-G2PWV6 UniRef90- F6BHE5 UniRef90-G9RND3 UniRef90-R9J8A7 UniRefoo-B6AFV9 UniRe990-R7B UniRef90-V5WDU5 UniRef90-F8EYF4 UniRef90-K2E596 UniRet90-U5QA02 UniRefofo-R5QVI2 UniRef90-FORS91 UniRef90-E4RIXO UniRef90_R6WU09 UniRef90-16UCM4 UniRef90_G7W9No


SYPGIVDCVLTFEELSAWLEQAGVTLEAGTDGNRES
GSVDAVYSMPEMDEWL
D DCVDVVLTFDELSRWFDDAGADLSSGEASFD QSGQVDFVLTFEELNSFFTAYE:DFATAENVADPDMS HGSTVDAVLTYEEFDELLTAHSLETHKGTDECKQSKERD

 SS VVDGATSMSVVY VESGHIDTVLTFVELDEWTNYENDNIEELEDENFDCNNSQ DGTRHVNCVLSSQELFDLI QNPPDFRHASSVVWNEAWWS GYVEYNVTFYHLMKYVKEHNTSGSPVNDEIEY
HGSRGADCVLTSGEI A QIMEQGDLSVRDAAVDTLFGDLKE
 E
 FDHVLTTREFRRVLDELEFEGFLKA

AVLTFSELFSIAEQLEIE
$\square E K P E A D G V L A \square A E V Y K K L L P A M K N \square S E V K P \square A K S G S G G W$ LDF ILTTREFCQVLGKLGFEAFIKSGATNFHGLEK


UniRef90 D8M3L0
UniRef90 ${ }^{-}$FOK879 UniRef90-UPIOOO39BF736 UniRef90_LOIMG2 UniRef90 E8LEN1 UniRef90-J3PTX4 UniRef90-F7PVZ3 UniRe90_R6VUO3 UniRef90 ${ }^{-}$K7ZM35 UniRef90-UPIOOO36BE13F UniRef90_Q1JW74 UniRet90 R7MEM4 UniRef90-R6T8G0 UniRef90-F4KJV3 UniRef90-UPIO00359DF14 UniRef90- U2BP45 UniRef90-A7TQPO UniRef90 R5FYV1 UniRef90-UPIOOO255CF26 UniRef90-D5XCK4 UniRef90-K8EOW9 UniRef90 CoOZJ8 UniRef90-G2YBJ6 UniRef90-B5Y6Z7 UniRef90 SoAZZ7 UniRef90-UPI0004174C7D UniRef90-C5X148 UniRef90_R9LW53 UniRef90 U7D905 UniRef90-GOGFC5 UniRef90-K7ZM07 UniRef90-A7FUN4 UniRet90 COGH19 UniRef90-R8W0Q2 UniRef90_R5Y3Z6 UniRef90 C6LPH5 UniRef90-K1XLC8 UniRef90-R9JVN3 UniRef90-E8RBP6 UniRef90_U2F6A2 UniRef90-R7HSI9 UniRef90_R5A213 UniRef90-A6P1A3
UniRef90 UPIO0047A8B5D UniRef90-B8DZB3 UniRef90_E1R406 UniRef90 ${ }^{-}$W7YAX1 UniRef90-UPIOOO360C476 UniRef90_X8J8V9 UniRef90 R6P406 UniRef90- G8LZQ7 UniRef90-E1K140 UniRef90- UPI00036C7297 UniRef90- TOE247 UniRef90-V9VK25 UniRef90-UPI0003F83228 UniRef90 J3KT43 UniRef90 ${ }^{-}$AOE3E7 UniRef90-F4A513 UniRef90 Q8RBD5 UniRef90 UPI00037FCC7C UniRef90_AoDWM5 UniRef90-A4J4W0 UniRet90_R5US35 UniRef90-M5DWP9 UniRef90-A2E4U8 UniRef90-G2SXD3 UniRef90 G7WH32 UniRef90-L1LAH3 UniRef90-G5ICO3 UniRef90_G2FT29 UniRef90- R711P7 UniRef90-G2PWV6 UniRef90 F6BHE5 UniRet90 G9RND3 UniRef90-R9J8A7 Uninefogo-B6AFV9躬 UniRef90-V7DHO6 UniRef90 F8EYF4 UniRef90 K2E596 UniRet90-U5QA02 UniRef90-R5QVI2 UniRef90 E0S7C0 UniRef90-FORS91 UniRef90-E4RIX0 UniRef90-R6WU09 UniRef90 I6UCM4 UniRef90_G7W9No UniRef90_UPIoooz9A973C
 ASREGRLIYGRTGGVSTSVDEAVKRIFPNKH
AHGFALNGGVMGAVKAYLGKDAGK
FTDCVDTMMPFK $\square$ YP $\square$ EGKT $\square \mathrm{D}$ ASKLGLSFPLTAGVSAAVHDTVAAM

HSKLDEHFCQAGGVGNATKEHLKEK
ASYFGR\FARCGGLADAVAEGIKEQG
RSSSAVLAEVS GGLTEGVLRMDHFRKLGKEADKQDFRK LR SRRRVRWARAFPVEGGLLQSASFEVHLLSRDVVTDT
EPQKGQLFPDTGGPFQVFD
SSAEARNFAVTGGVAGAVNALLEEKATPVVIDGLDKQAVR ASYYGR】FARSGGLSDAVKQALKEQG
SVREAHAFARNGGVKDAVDSYLSNTEEYKDVGRLTAEEDA EEPTSHRGGGSGGYLEHVFRHAAQELDGVHVTEVTYQPMR H LGANLRYPVSGGLLTSVETT
KTNEGSSSGGFA WQY ILHRRFQMSDNDNDNAYKDETVRGR SVREAHGFAQNGGVMGAVQSYDRCQPETADVDKVTTEMDC S GIIGVS WAS S G GEASALLT D
LAALA AELTEVPLEARGFAKST
पARTFPTSGGL
PTASGRKYAVSGGVAEAV KVRGKHPEKLKAAVIN PTLNSFLFPDAGSSGGNLHYADHYFASQHKGSSVQT IKGR

GTNTGRLYPITGGYAEMVFRYAAHVIYKREDEPLDFR\|LR $E G H D Y G V S G G S G G Y A E M V F R Y A A H$
$L S G A G R M G I G W G S S G G E A A A A L R E$
ASAEAWGFATSG GVSTAVAQEVEKQTATTASTDCDD S S EAGADYPVQGGADRTLERMGTMPPGWDFESFS RSSSAALAEVSGGLAEGVLRLFYFSRLKKEADKQLFKKDR K T R S F TLSGGI INSMGNV
GATMGGAFPDAGGL
ATSGGEASGSLSQ KYVAAD

SERAGLFPVDSGMISTM VYWFCGEEVFCKDVEPVDA

A A E EGVLYPVDGGMIA GIRAH
S D GEAVGT A HPVSRLYPKPSGILKSIEPESYG
S YGGGSIYPTPGGLKENVYWFLGEDVF

A $R \mathrm{~L} Y \mathrm{P} \square \mathrm{SGG} \square \quad \square \mathrm{KT} \square \mathrm{D}$

$\square 1 \mathrm{DATMDS} \square \mathrm{S}$
ASRGGALYPVDGGMIAS

KAYEGAYYP IEGGMNKT $\square$ R $\square$ S
AGFTGDRWANSGGMTDTVKAY
$A A K E G A L Y P D E G$
$V S G D G \square G W G R A G$
GMTDTVKAY

##  GENEA $\square \mathrm{K}$ T GS $\frac{L \mathrm{~L}}{\mathrm{~L}} \mathrm{~A} \underset{\mathrm{~L}}{\mathrm{~L}} \underset{\mathrm{~L}}{\mathrm{~L}} \underset{\mathrm{D}}{\mathrm{D}}$


 DKVTRHDGASSDGHLAHIFRHAA

TNNLGFLFSRPGGLKENDQAYDKNII WDR
ATMIGVGWANSGG
SGRSGAVYPVAGGMDE $\quad A D R E D G A C Q D V D C V A V C$ LSTMA INFQEYHNUSSNNYLDY IQQSSVKPNWTVK QNILR QNRDYPVEGGVIWAVAEELRQAGED
NSGKGALY P
AGNLGRQFAFAG
ASRAG ILSSTAEGWTDADVEVFTRKHDNMTEVKKDQE DFS GYGlGGLTYSRPGGLSENVELYKPD

GCGUGLTFSRPGGLRENVEFHSKG

ANAGGESYGTSGE
AGR\GLGWAESGGEAAGLIST
D S Y L A A D
ATCSDII NGKRNNTWEYI FRSSVMELINNVEDPDTTDEYTH
SRTYRHAGSGSGGYAFAVLRHAAEQLFHIHLPPVVTEDPR
GKGFGMSGGVIGAVKAQNLDSARPPGT IDDLKALQVS
RAGKGADYPVDG
GCGLGLTFSRPGGLRENVDFHVPG A WVR SDRAGLFPVDSGMISTM CKDVEPVDA
KAKEGTAYPDEGGMDET GADLGDTASFEDCRQFALSGGVASCVLSRFE

ASSGGEAAGV
$M E \square T Q W D G T S S G G Y S E S \prod L R R F H S V K \| V K D E N G V K E Y V V D$


UniRef90 D8M3L0
UniRef90 ${ }^{-}$FOK87c UniRef90-UPIO0039BF736 UniRef90_LoImG2 UniRef90 E8LEN1 UniRef90-J3PTX4
UniRef90-F7PVZ3
UniRef90_R6VU03
UniRef90 K7ZM35
UniRef90_UPIooo36BE13F UniRef90-Q1JW74
niRet90 R7MEM4
UniRef90-R6T8GO
UniRef90-F4KJV3 UniRef90-UPIO00359DF14 UniRef90-U2BP45 UniRef90-A7TQPO UniRef90-R5FYV1 UniRef90 R5MRHO UniRef90-UPIO00255CF26 UniRef90-D5XCK4 UniRef90-K8EOW9 UniRef90 CoOZJ8 UniRef90-G2YBJ6 UniRef90-B5Y6Z7 UniRef90 SoAZZ7 UniRee90-UPI0004174C7D UniRef90_C5X148 UniRef90-R9LW53 UniRef90-U7D905 UniRef90-GOGFC5 UniRef90-K7ZM07 UniRef90-A7FUN4 UniRef90-COGH19 UniRef90-R8W0Q2 UniRef90_R5Y3Z6 UniRef90 C6LPH5 UniRef90-K1XLC8 UniRef90-R9JVN3 UniRef90 E8RBP6 UniRef90_U2F6A2 UniRef90-R7HSI9 UniRef90-R5A213
UniRef90 A6P1A3 UniRef90-UPI00047A8B5D UniRef90-B8DZB3 nifet90-E1R40 UniRef90 UPIO00360C476 UniRef90-X8J8V9 UniRef90 R6P406 UniRef90- G8LZQ7 UniRef90-E1K140 UniRef90-UPI00036C7297 UniRef90- TOE247 UniRef90-V9VK25 UniRef90-UPI0003F83228 UniRef90_J3KT43 UniRef90 ${ }^{-}$АоЕЗЕ7 UniRef90-F4A513 UniRef90- Q8RBD5
 HL F K S T KVDGVKDCKDI DNKTQAGND


KE TNDHTVAG TKNCKDLLKLVSKKKV LD F ELKPCSCDGI EACKVALLQKSKNRL SSGUFREFKMQLGETEVNAA VVGGAGLGK LRAARATGA VKDDFFHPQF $\square$ STEGEENSLE I RD DAA GR
$\square A E F E L K P V V C N G \square E Q C K$ K MA L L K VGGKV GLD NKDFQEVTLEREGQVLLRFAVAYGFRNI QNLVQKDKRGRC KTKPDRYRKFYVSGVKDCLDVCEAMMTGEV NLDVTEFRLDDEEGK LLRSTQVFGFRNDQNLRRLVKDVKC $N \square D K K T A$

KLKGYAVRGTAPAQ
RYゆAADGDENVIKVLEEDEDEKS GVVNVKKASNDVF TKEVVINGLKKSLNMLKAYARGKA G GLIKNLKLVDGFDPELASVEGUDNCLNDLQNMSQGKV GL DK E GMK QL K GYGKVQ S GE T NADVVDYTVVADNGD LLKAARYYGFRNVQNLVRRLKPARP
 VIDGFTPENFRKLKNFKK

 RYLLA A G GENVIRVLEDLEDEKF
 malarank
ASGSFREAADMVGDKEVTVAVIDGLTGLEKLRYADSAGKK I ENNNLI AMSVSGI E ESIQVLKSMEDGEI
 $\mathrm{G} \square \mathrm{ENVIK}$ ■LEEDEDEKLNDVE
$F \bar{N} G K V K Q Y R Y L L G A T E Y T L L V A R G G R A V R H C D N L I S T G E I$ GYLCFSGMKSVMEVCDELSWNPS
 GLAAVENAL DGLEDL DPM HYRKVCVDGVENCMEDRSWLESEHP QCEGEKHMY G $\square E N V$ V $\operatorname{RVLEEDEDER\square GEL}$

NFSG
$D Y A Y L A V D G \prod D N C \square T A L R D \prod A E G R M$ Y K R A AVEGI ERCQTALQSI ENGHL


GYAFQEFLVD
 S TPAFRDSLQNDDESK DDRTI
GI HNVISILEELENDKLEDV
GI QTI QEAL E GI QNHVL
P
$\mathrm{G} \| \mathrm{HCV} \mathrm{D} \mathrm{S} \mathrm{V}$ L E E I E
P\|VGEPTKSIESKNPRK\|I IQQVEGSKDCDKMDKADK\GKF $N S D F V E V T V V D G E E R V F S G A F V Y G F R N I Q N L V M K T K V G K C$ Q $\square E G E K H M Y H F \square E \quad K N A D R \square K G G K T$

Y NENMESQG $\square Y$ ARVFG $\square K N D A N D V Q \square K T K T C$ Q $\square$ E GQEVVY

EAFGTFTENSПYVDGПDYNVKEYSERMKRGKT G $\square \mathrm{D}$ S $\square \mathrm{WH} T \mathrm{~T} K G \square D P S R M D$
KNKDF DE $\square T \square Y N E D M Q L Q Y A R V F G D K N D A N D I S Q \prod K T K T C$ VEGGMLAGDDGEDKKVIKMAFSGMENIQDVI RNLDDPRK
 QI E GERHVYEF LDD
 NPDFKECILLRSGDIILLRFIIAAGYRNVQNVVRMLK DS T G I ENVIRVLEDLEDQKLPSLIK QVEGREHAYNYLD QYAERMHEHKP

 GTENVIRVLEDLEDEKYRDL

 $N L N K K N G G L L$ RAFSKGKA $N$ KGLDKKQ SNLLKVWSK KPELAA
QVEGREHAYDYLDFYK
DRVSSNQK
NYMCFSGMNQVMEVCSEMSSWKS $\mathrm{G} \frac{\square}{\mathrm{R}} \mathrm{Y} N \square \mathrm{E}$ RE $\frac{\square D N \square Q D T A V}{}$
 SLADGGELLKKVSNHEVQVLPINGVD KKMFRTMKDWEK
 D G S I I S Q $\square \mathrm{T}$

GPQEI YSSY LA


UniRef90-F0K879 UniRef90_UPI00039BF736 UniRef90_LOIMG2
UniRef90 E8LEN
UniRef90-J3PTX4
UniRef90-F7PVZ3
UniRef90 ${ }^{-}$R6VU03
UniRef90 K7ZM35
UniRef90_UPIO0036BE13F
UniRef90_Q1JW74
UniRef90_R7MEM4
UniRef90_R6T8G0
UniRef90_F4KJV3
UniRef90-UPI000359DF14 UniRef90 U2BP45 UniRef90_A7TQP0 UniRef90_R5FYV1
UniRef90-UPI000255CF26
UniRef90_-D5XCK4 UniRef90-K8E0W9 UniRef90-C0QZJ8
UniRef90_G2YBJ6
UniRef90_B5Y6Z7
UniRef90 S0AZZ7
UniRef90_UPI0004174C7D
UniRef90_C5X148 UniRef90_R9LW53
UniRef90_U7D905
UniRef90_G0GFC5
UniRef90_K7ZM07
UniRef90-A7FUN4
UniRef90_C0GH19
UniRef90_R8W0Q2
UniRef90_R5Y3Z6
UniRef90_C6LPH5
UniRef90_K1XLC8
UniRef90_R9JVN3
UniRef90 E8RBP6
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 HGYWi EANACD GGGIN GPAFGRSNSGVVKRKEEVIVNYSKA DCSYIE GMACPNGCIDDGPD

THDF I E GMGCVE GCVGGPKALVNH
DANFI E GMA
KYDLI EV
K F R I E M M S C E G G C $\square$ D G P M
QA R L V D I R F C N G GCi G GP GKNNRLT T F S K R T LI I Q Y F Q S G


P Y H Y V E VMA C P S GCLLNGGGQLKAPDMQGRELLQQVERLYS K GCFI EMNACHGGCINGPATFKVKLDLEATLDREPA ELSA

D LD F I E L N A C P G G CVVGGP LTTVEN PYVAKARDQHLRKYMPV $P G N F I E V M A C Q G G C L S G P C S L T D E$
K P R F i D L L F C Q G C I DGP E I DS D K DLLLT RKALVF DYAQKK

 $D L D F L E A M A C V G G C V G G P$
TGNLVEVMVVEGGCAYGPGCPGLKAPVSAVRDKMAVDKAP
 E Y H F I EVMACPS GCLN GGGQLVK PVQGQSSKELDQQLES Y D DFV E L N A C S G G CVVG G V

$\frac{V}{F} P L F L E L A A C E G G C L N G P A F G S R R G S L D R H L K V L S Y A E G A$
SNAF LEDTACRGNCVGG PNMDKNEVSYYTRDSKVKNY SPALI DULYCR GCIM GP DLHNS Q S L N Q R K K K VI D F I R QR
 $\square C D Y A D L L F C P G G C K N G G G Q Y Q P$



 GKCFIEMSACPGSCI G GPAMGKNRRAAVRDFVTVDRYAGP
 $R P L F L E F D A C K G G C I N G P A T D K K R S$ DYNFI EVMGCEGGCIN GP
A P R Y V D V R F C T G G C I G GP GRTN K L T A F SKRN LIIDE Y R QK EQCFI EMWACS GGCVGGPTDEKLD HNNPVRNYKAVS F L E ALA CPGGCANGPCMDSSKP


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

 LPD DVDALNCGFGCNKGTGTNIGN
DLDF F E GLLA C $\square G G C D G G P L T V E N P F V A K N R \square R K D A E S L P K$

 NYSF L E GMACVGGCI G GPATMM
$D L L Y I C V A E C E G G C L N G D C G S K G D K L L K E N \square L K D H A H K S$ LPF MV D ALLN CAMGCI Y G T
$L P L I L D I L N C Q K G C N G G T A T C N K \square S V D D V D F K M N A L K K E$

 $F V E A L A C E G G C D G G P C$
$K P L I \quad D \quad I L N C Q E G C N K G S A C S L E T P \square D \square I D Y E F D Q M K K N T$ $D \square D F F E G L A C V G G C V G G P$
 TFHYL E I MACPS GCTSGGDYLS QNDSEGDKYK QRVQF LQS PFDFV I MACPS GCLNGGA QLLT D
PVN F I E V M A C E G G CVVTG P S A H
DTDFLEVMCCPGGCASGPGVLWEN
$\square P \square L!D \square L N C S H G C N \square G T A T C K H \square N \square D D A D H A T N \square L K N E V$ K R V Fil E L M A C D G G CVVK G P A T S K E Q G

KYKMAEVF LCKNSCI GGPGQERDNS VEVDSAE YNDYGKE Q RPDLVEVMCCEGGCINGP
 Q Y D F VELLNACNGGCVGGVLNVENPARIRALRKNLKYAASE


TYE
NF $\square$ ND $\square$ SNM $\square$ DCSVDFTRF $\square$ N $\square S$ DKW KMPSENE $\square K N \square L$

STTYKTNPRYQEPLPELDLTRTFRNRDDGPSGDS $\square R K \square L Q$ K T $\square \mathrm{S}$ S A $\square \mathrm{S}$ M $\square \mathrm{KN}$ NQE
$M V R N E A$

SCNHLE $\square K T V P R Y W D N P \quad \square K E L$
$\square$ N N P ARK $\square$ P F
$\square D \square T R T Y S D Q L P Y P S E N E \square R K \square L K$
H H A

ACEGGHWVGKADSEVKP
NSKKEPSAD TTQMDTKRSFHKRPVHHLGEDPEEEDEK IL $V Y$ TQD $\triangle$ Q I $\square D P F S N P \square A K K G Y D E W L G Q P G S E N A K K Y L H$

SREWVRC
$\square$ KNRDTSNT】R
RPA VKEPPEAGK $\square$ K $\square$ S RKF $\square$ A $\square$ A QKA $\square$ Q PSEHE $\square$ RD $\square L$
SCNH DDANEVPNEMMWQEN $\square Q P Y$

SKS SRRSSAWRKATPAQRDHNLNRQF
HARFPETQPVPRPPELD IRRSIMPRPDPTPTETRDSEVLR PKPRDARPAPSAACELDHL RLFRKAEP $\square$ PTEEEIRAIL SKNKEFRHTWSK
SQNHLKGGPDPQVME WEE
ADFLFEPDPPEK MNKRFPLLLTGQV KPGSAADEEVLR


Q $\square P Y Q S S P R Y S A G T G R V Q \quad L T R G F M D Q P S S E A L T R \square L H$ RYAGDEHFD DEQPEEDTRSFEIMKGMMPMPNERKIREIM

NN $\square Y$ Y Y D L L WK R NVEYKP $\square L K L D E D F$

VKKSDKKSPWSRPTPEKRMEA LNKQFKGLK $\square E D Y \square R R Y$
M $\square \mathrm{S} \quad \mathrm{QK} \mathrm{V}$ Q $\square \mathrm{DNQYQNE} \mathrm{\quad QE} \mathrm{\square Y}$
REQPPVDEDLVSFEEVKWDKK $\square$
M DA QK LQQENTQSNEQEMHLTQFKH
SGECVPEI P LKRDFVNRKVEQPY
PSEAE $\square \mathrm{QG} \square \mathrm{L}$ YYTVDQQIEKEHYTENEILQAL

PFKSPLDNPLIQR $\square Y K L D F A K P$
K VQS YGPSRQESE $\square L A$ VYE $\square Y K D F$
$\mathrm{K} \square \mathrm{E} \square \mathrm{Y} Q \mathrm{QR} \square \mathrm{RNQE} \mathrm{\square PTVFE} \mathrm{\square FDKE} \mathrm{\square}$

 $\square$ NSKDYN $\square R V V T P E S L P G V L E L Y K Y$ Y $L$ KH $\square D$

## $\square K K K T K K G V F K Q S Y$

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PYYSDPGLLEEKRTFRPVSVKR $\square$
Y Y NKD $\square$ A A Q $\square \mathrm{DLSCQNED} \mathrm{\square S}$
$\square$ PEPSEEK LDE $\square$ L
P \AAEDKDESFYLWDKMPEVKDVFR
PDIH H L PPELEEKRTFKQIK
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UniRef90-14BYC1
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| PTS |
| :--- |
| E S |
| V |


Y $\square$ D DFFSD $\square K E G K N \square S V A D A P A F Y \square D Y P E \square$
$K Y K \perp A L P A P S L F A Q F D N \quad L D D$ NKYKYRVVLFAPSVAMGGQFQHLDS
$Y \square D D T P D P D P D P$
 RPI CVTIAPQDAASFAARYQLASSAEA


HDYPVLLDPPSFYSQFSA, GQFPED S
QLDE【 DN


QFSHAT LDEVKDY $\quad$ LE D D WELIVRSAPTHVANDAAVRNWSAAKAF

$$
\mathrm{T} R \mathrm{~V} \mathrm{~A} \square \mathrm{~A} \mathrm{~V} \mathrm{~F} \text { F A Q F D D S } \mathrm{V} \mathrm{~T}
$$



| $K$ | $N K T$ |
| :--- | :--- |
| $W$ | $P$ |


jnet
conf sol25 sol5 sol0 jhmm


MGKMASALS 50 IV THAE ${ }^{60}$ TGAADVIRA 70 A S VS W 80







 PSMVQEALLKAWGMELIVMDQAATA FDLSAYAVARALEMSP

F REEF E Y A
$P$ E V
LT

c c c c c c c c c c c c c



[^1]c



[^2]

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|  | UniRef90-R6KU87 |
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[^3]

220
230

G $\square$ REF GY $\square$ NEPGKY $\square A \square R E G \square P D T F T T L R$ DFHESNNTTKGIATLLENMPQTYPDPPHPDRAR QA $\square$ Y GA GFP $\square$ S G MT

G $L$ G $\square$ RYPHPGGLKENVEFF
पGNVPVIQVE VS SYGRGFGASSGVSRAVLHAMEELGE FRGA WWFGGLS GGYAVEVFRYVAQYVFKHRVSDLEPAAVR
 GSHLGGIGWSSVGGQSKAI

RAVLF SSPGGLMRTAERWDPD DKERT R S GGGT1 YPLPGGLKENLEQFL
TSQAGKIGLSWACGGEGSALLND
GLSRPVLDGAFA $\square R D \square Y L R L L N P M R E D E E T T P M A S A$
AP YPNMGRYYP $\quad$ TGG G $\quad$ IKN KNF
GS S Y GMAWGTYGGEDESAGIT
QQGQGAVYSRPGGLRDNLWLH NPDDNDTTSE NSGGYLNN ILFKKYSE $\square K N K T F N K \square K F P N \square R H G V T Y N F \square Q$ PQGQGA $\square Y S R P G G \square R D N \square W F H \quad D E K$ R GEVSGMEGRCLADDEDHNVIEFLEKLENDEDEGIDVLELR
 S $\square$ AWGKHGGEEGIL
 $K S I V G D L Y G D K R L S A I S V E G L S Q D R K A L D L I E F D Q L K H V D$ SLLWGISGGETAGTTIQ


N GASFPVKGGDFS

GQSSHHT GRCLAVDEMHNVIEFLE LLEDEQDTNLQFLELD



GKTRFFPTSGGDLKTMDC
A GSPKVSGEVLUKTNDRWLK WS


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K IIAAD GTNNVISVLDQTEDGNT

 NGLA A H GIDNVYDLLEQVSMNKM G V GKVYRELDMY
 GVHKV

F NEMNMYGR
MPESK

G EADNMKGRCLAVDE $\square H N V I E F \square E R L E N D E P$ ACDESCAGGVLVVGNRF $\square M A L F A C F Q G C I G G Y Y \square W S N P F E G C F N \square E S M \square D$
 SRFDLEDSTNSFDGETLNKRLDSGTKTLDMMSSGKKVMKP $D \square Y G$

 KTGGESMHVRNFSSRPDKTLEVDGLRNVINLFQEMELGKK




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S G Y F L E L IT A C A G G CLLGGP LLRMMN
K FDFI EV
EK ILI E AS A C VGGC $\square$ N G P TMKKEDN

ERTLVEVMACEGGCVGGPCA $\square$ A HP
NWNFVEVMA
$P D L F D V L N C E D G C N G G P A T G V H Y Q R F A M N N D M H D V E Q Y A$ $N N D T F E G Y A C D G G C V G G P D N V E N P F\|A S S R\| R K D S N N E E Y$ NPLLVDCLNCELGCNGGPGSLRQHASPDEVEFYiEKRRKE
PPDFVE\NACPGGCVGGVLT पENPYVAKNR पHTपRRYMPV
PADFLELSSACTQGCVGGCFN

| $P$ | $E$ | $D$ | $F$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $K$ | $S$ | $C$ | $H$ | $Q$ |
| $K$ | $C$ | $A$ | $G$ | $G$ |  |

$K Y$ F $\quad$ E M S A C V G G C $\quad$ I E G P C S R K D $\square$ S
$P Q D Y V E C S A C K G G C L G G$
H P EVVDVLSCEF GCNDGPGAGANQTMFDVMVTMKEVENEA HFKLVEAY DCNFGCVNGPGQLKFED DE

HPK VFDVLSCEFGCN $\square$ GPASGTKQTVFDVMATMRA $\square E N E A$
$F E L T S C A N G C L G G \square L N V I N P Y Q A A F N D E S R \square K N L K N$ $T V D Y L E L R A C D Q G C A G G V L L H G N R F M T V D R M K R R A Y Q L E S$
 $A P R L A Q D D F C K G G C L V G G G Q D R G N S P A Q R R A L I A A T Q E V H$ A GDFVECR $\square$ CD L G C I G G $\square$
$E G V C V E L D M C E G S C L G G P A M P S N H P N C Y V I E K R V R D F A K N$


HHCFI EMSACPGSSCI GGPAMEKNHRAPDVRDY\|TVRRFAE G G D Y V E CRACD L G CI G GV G THESRELSRLRIDDMMMDW $R G D Y \vee E \subset R A C D L G G C I G G V G T H$


DYQKDHH $\square Q \mathrm{MPE} \square \mathrm{PERKFVQE}$

KKVRKAHTTKK
K Y A M D L Y K T K A VCWTNKE $\square$ MQLDDD F MQERYK

S L N G ME Q

K S R R K S GFMGR

K L N K N K LD K $\square \mathrm{NK}$

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UniRef90 E4RJ67
UniRef90-W7Y4W3
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UniRef90 R5QVS9
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UniRef90-E3CXG4
UniRef90 E3PTH3
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UniRef90 14BYC1
UniRef90-K1SG32
UniRef90-UPI0004642DB2
UniRef90-D5EE27
\begin{tabular}{|c|c|}
\hline lupas_21 & \\
\hline lupas_14 & \\
\hline lupas_28 & \\
\hline jnet & \\
\hline conf & 14999 \\
\hline sol25 & B B \\
\hline sol5 & \\
\hline sol0 & \\
\hline jhmm & \\
\hline jpssm & \\
\hline
\end{tabular}
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[^0]:    HLTDTFKAKKAGKK LVAMDAPSTRGGVAEAMGMPDGSTA E LIENAVQNKKELVCVCISQQSYASLAVRFD\|SAVEAC
    DEF $\square S R L A D P H T T V V V T V S P Q S R T A L A A Y Y G L C P S Q A L$ VDEFKQAQSGGRRVTVVSVAPQSRASLAHAAGLSADDA VWQALYAPNKRVVVQUAPAVRVA GEEFGIAPGKNT
    $\square Q \square A K Q Q S K T L V A M \square A P A T R V G V S E A M G M P \square G S S C$
    LNLNKKCDTSKHKVLVVSVCPQSLPYFAAKFNLSVTDA $N I R P V L E Q \square S E K K K V T I A V I A P S T R V G L A E G M G M G V G V T A$
    $\square K E N R E L S P E R R K \square I V V S V S P Q S R A S \square A A K H G E G V R \quad R A$
    GRSV
    F V VT $\square$ S P Q A R A S $\square$ AA HFN $\square$ P $\square$ A V C

[^1]:    lupas_21
    lupas-14
    lupas_28
    lupas
    jnet
    conf
    sol25
    sol5
    jhmm
    jpssm

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

[^3]:    lupas_21
    lupas_14
    lupas_28
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    conf
    sol25
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    jpssm

