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UniRef90 M4F9B5 UniRef90-S8A5C3 UniRef90_E7CIX6
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20
30 30 VLNPDKGA CTVK SVADSSDIAGGCSVVTIDSFTVPAENTVIMKPDSGAT CTVASLDDVAAAQKCTTVTIKGFTVPAGKTFELSSLDDNTV

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 CTFKAFLSAWAKACASMNPGVIVVPAGTFFLSGPCKNDT AFKKAWKKKACSTNGVTTFLVPKGKTYYLKSTRFR CTVVTVISQASTVKSCQDIVI SNLVVPGGQULELDDLPGAR $C$$C$
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A F V A WK AV
EARSVLLVPQGRSYLVNATKFNG
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EALAKAWEAAC

KALAKAWS DACASPSASKVVVPSGTYKILRGPCKAPD AFKKAWE EACSSKGSADIVIPKNK YYYLKPVTFSG CTLTSTTGGSGVNGCSAVIVKDVSVPAGKTVDLTVGLKGAT CTFSAAKASKSQASCAT IVLDSVAVPSGVTLDLSKLKNTK
 EAFGAAWKAACEWKGPSRLLIPE
CT $\square R K F S E V Q S \square N G C T D I L V S N L T M P A G I V L E L D L A N G T T$ KAFADAWK KACESKSPSKIKVRKGKYLVKTPCKSAT EALTNAWK SACASTKPSKVLI PSGTYWLRGPCKAA D CTI
 KAFLSAWA EACASANPSVIYVPTGRFFLRNPCKNTA CTFSASLA DQSQAACAT VVLNNVAVPSGTT DDLSDADGAT CT■EAFTKAWNSSACNSDNSITLQQVPAGNYLLGGPCKSDTT KAFDNAWA A ACASTKSVMDYVPQGRYLLASKNKDTT CTFSDAAAASGKASCSAAIIKDMTVPAGTTLDLTKCKDTT CTFTDAASAKGKTSCSTIILNNIAVPAGTTLDLTGLKSTH EAFVRAWSSACRSTGPATVSVPRGGFLISGPCKNE KAFQSAWASACGSTRAASVYVPQGRFLVKSPCKNST
KAFDEAWA ACAGTGKQTI LVPKGDYVTGGPCKGVT AAAKQGNLITLKDLQVPA

## CT $\square$ K A $F$ LKAWR

 DAFLKAWE
KAILDAFK EACSGTGDGQLVVP
CTFTAATADKNKASCST ILLNGI AVPAGVTQDLTDNKGTT




AFVKTWASACSSASGQANMYVP
KAVQEAW TSACGGTGKQTILIP

CTVSAYTAVSAVASCTNIVLKNI AVPGGKFQLRSNKIT









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| UniRef90-B8YLY1 | K Y R Y S GVK K G S |
| UniRef90-R7RZU2 | K A A SATISGGSY |
| UniRef90-B8P5S4 | SAEDATVSS |
| UniRef90-UPI000440842F | T GFD GIISGGSF |
| UniRef90-S7QDH7 | NNF TGIEEGFS |
| UniRef90_V2YNL6 | RGFN KIVGFS |
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| UniRef90_O93883 | K GIPP S G A S |
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| UniRef90-Q39766 | T S Q C $\square \mathrm{N} V \mathrm{~V}$ |
| UniRef90-M3B477 | K G VP D G A |
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| UniRef90-K7DWA3 | S Y VP K G |
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| UniRef90-K7DWA4 | TMQPSNVK |
| UniRef90-A2QL39 | LNVPS GI S |
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| UniRef90-U5DCF5 | QASCDYAEGT |
| UniRef90-E7CIP2 | C N |
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| UniRef90-R0HZM8 | Q G Q C L N VR G V S T L |
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| UniRef90-B2VRW2 | T R T PKGI S |
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K AF $\square$ N T W $\square Q \mathrm{~V}$ CASPDPATLLVPKGDFDFAGPCKSVT AFASAWK TACSLDNP VFLVPAGRRYFLGPCKDML
$\begin{array}{lll}K \text { A } \square G D T W S & A A C S S A K P A V V L I P K G K K Y L F G P C K S S D \\ \square K A F R & A A C S S R G S A R V L I D R G R S L L V G P C K P I T T\end{array}$
AACSSRGSARVGRKLLSFLDNVE
 RAFRAAWKAAC AVDSGVVLAPENSTIFSGPCKGLV RAFRAA WK A ACSAE SATVVLVPSDGVFTDTSTMFAG A $\square R$ RA WAVACKSEESTVVYIPKGRFLVQPMEFHGG CNLTTYKKGTDUSSCSHDTVNSLSVPAGVTLDLSKKKGAD
 AFMKAWQSACSSTGUVYVVVPKNRKYTIKPVTFSG
KAFKKAWTDACKSSVSMPIMHVPHNKTCLLQPLVLRG AF LIKA WS MVCAMKNGAATLKVPPGKTFMLKPLQFSG

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UniRef9O-D5GPS7 UniRef90-V9LKX0 UniRet90-A7EFT6 UniRef90-UPIO00234ECF1 UniRef90-Q6H9K0 UniRef90-UP1000350FCB8 UniRef90-M1BEF4 UniRef90-A0A022RYJ5 UniRef90-M1CUT2 UniRef90-B9H9W1 UniRef90-K3ZZ88 UniRef90-M8BNC4 UniRef90-C5WW44 UniRef90-UPIOOO4561720 UniRef90 B7EU45
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UniRef90
W9SJO5 UniRef90-M5X400 UniRef90-Q5ENB5 UniRef90-E4ZR71
UniRefo - V9LKZ8 UniRef90- Q949Z1 UniRef90-UPIO002B46E24 UniRef90-K4DDE0 UniRef90-Q2HVV9 UniRef90-W9RBH8
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UniRef90-O97400 UniRef90-UP100015CCBFO UniRef90-T1MK76
UniRef90 K7ME92 UniRef90-UP10002C35AA9 UniRef90 K7M471 niref90_ROGOKO
UniRef9O_A5BHXO UniRef90-M4D320 UniRef90-C5XTT5 UniRef90-A0A058ZYH2 UniRef90-J3MJD8 UniRef90-S8C673 UniRef90-UPIO000235D28 UniRef90-UP100032AAFE1 UniRef90-UPI00046DBDAE UniRef90_11K377 UniRef90-O5ZDR5 UniRef90-UP10002B42AEA UniRef90-UPIOOO2B49090 UniRef90 Dopoal UniRef90-M1CTA9 UniRef90-M5Y383 UniRef90-ROG9Q0
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( PCIDGTIVAPAEPDNWWLDFSKLNGVLFQGS GTLDAKGT
 I RDQGVITAPTDYSGTWLLFQYVDGMSVSGGGGLDGQGA PCLSGVIVPPDGPESWPKNNSRRQWLVFYQGSGVTDGRGD VIFKGETTLGYKEWTGPLIRFSGDNINVSGSGHVVNGGGP FTHDGTLMAPSDNAGNWLHFQSVNGVSVRGGGVLDGQGT PCKSGTLAAPRSLSDWHWIVLHGIINGLTVTGGGTI NGNGE
PCIEGTIMAPDGPSSWPQGNSRROLVEYGGGGVI DGRGE

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VEVQGTVIAPPSGYPTPWFLFEHVDNVVLTGPGTFHGKGE I QIQGTIVAPEEPSEWDWLLFSGLAGARI QGGGVIDGSGS


 FKID GSSVAAPSNNS GYW LIFMKVNWVS FGGT DDGKGAGY
 P C IV G V L M P P D GPA S WP A A D GRRRQWIV F Y S GK G T I E GN G E

 I QV S G NLMAPKTPDAWSWLSFRNVDNDILD GS GKI D GQ G S
 P C LE G DVVA P K S T E A WK WI D F S NVV GL IID G G G Q DD G S G S F RVHGTL QAPKHPHGDSWITFAYVDRLRLSGGGVFDGQGK


\section*{UniRef90 M5VSZ1 UniRef90_UPIO003D70C85 UniRef90-J3JT69} UniRef90-A0A058ZUM2 UniRef90 H3G816 UniRef90 UPIOOO2C36C27 UniRef90-U4UUW9 UniRef90_Q9UR16 UniRef90_V7CKC9 UniRef90-I1GLV7 UniRef90-D7UA81 UniRef90 UPI00042B2593 UniRet90_A1DBR6 UniRef90-J3LOH7 UniRef90-Q7Z8Q7 UniRef90-D5GPS7 UniRef90-V9LKX0 UniRef90 A7EFT6 UniRef90_UPIo00234ECF1 UniRef90-Q6H9KO UniRef90_UPI000350FCB8 UniRef90- M1BEF4 UniRef90-A0A022RYJ5 UniRef90-M1CUT2 UniRef90-B9H9W1 UniRef90_K3ZZ88 | UniRef90-M8BNC4 |
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 E WWDNS CKVNKTMPCALYFQSCEHLVVEDLQVRDSMQMHV T A WA K N N C D K N P N C K H L R F D F L K H A M V R D I T S L N S K M F H I ALDWACRARGGNCPTPALTDANSRDVVVAGVRSVDSELFHV SVWWQ F NDCKTNPNCVH L P AT L H F N DIVVMRLK LI N S M GF H L WACKKNGKNCPSGVTTGAFSNSKNVAINGLTSRNSQMFH11
 IWWWQN S C K VD K N L P C C K DT F Y E C Q N L V V V K N L K I Q N A Q Q M H V E Y WA CKKS GRCTGP T T LLD $\quad$ S S Q S K G V T WWK NSCK I NKALPCKLSFHFCTSLRVVQDLNVVNSQQIHM RWWD GK GSNGGTEKPKFFSAHKTDSHI GPLHUKNTP Q A F

 K WWDLPCKPHCDSPVA I RFFMSSNLTVQGLRIKNSPQFHF

 WA CKTSSGQNCTVEARSITTNWWVNGEI S GLTSINS QLTHLL
 WACRKS GQNCPVGARSITFNWANDILIS GLTSSINS Q S MHI KWWDQS CKHHP G K AVSFDQCSNA H I NE Y V ERSPQVMV T L WS C K A N G Q N CPE GA T T L R FM D S Y N V K II G V L N S Q L F H I

 AF WACRAS GKS CPVVARSVTFNWANNI S

 K K C D H T E Y C G K Q L P D D L R F D F V T N S L V Q D V T T L D S K Q F H V
 CWWD GLLGSNG GVVAKPNHFFQVSGKSCIIHDLVYIVNYP V H G RWWDQK G GNGGKKKPKFFAARLLTDSSSIDGLND KN DPAHGF K WWDLPCKPHCASPTMDRFFMSNNDEVKGLRIQNSPQFHM R F D G Q G S L WWK AL FFHNCNGLQMK GMKHINSAKNH I WSCRKGGKSCPQGARSIQFMWCNNVLLK E WWSRSCK』NTTNPCLPTEHKCKSLKVRNLTVLNSQKMH\| S A WPYNTCNKDSHCKKLPVSFVNNAWINSYKLINSKNFHM Q T S K A K A T V M T P A A N Y G S I K F V V S F Q T L E L D G V T N S T V R GR R WWD TK G S N G GK TK P K F F Y A H S K K S T I S GL T FK D S P V QMM

 E Y WA CK K V S N CT GP T T L D L S Q S K G V S V K Q L T L L N S K V F H M

 TWWENSCKRNKAKPCTKAPTALTFYNSKNLRVNNLRVRNA
 K WWANSCK $\quad$ NK K S P C RVT DD S CRGVRVVRGLRVRNAQQMHV


 WRCR K A GK R CPN GA R S I S F S WS N N I V V S G L T S L N S K E I H I


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 IWWSKSCKINPKLPCLVMFMECNNLRVS
 VWWNS CKVKK S CSSRPTAALSIQNCNNLQQLTGTRRHLNSARNHI
 NVWGK H C N Y C S K L P I N L R R N F I K N S V I K S V T S S L N S K Q F H I



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> F N E D G





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36 C 27

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F
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## 



 $\qquad$
$\stackrel{F}{F}$

A

## F

## F <br> F







## F

E

## I

## 

$\begin{array}{lllll}Y & K & N & H & V \\ F & R & N & I & M\end{array}$

| $F$ | $E$ | $K$ |
| :--- | :--- | :--- |
| $F$ | $E$ | $N$ |
| $T$ | $L$ | $D$ |

## 

$\begin{array}{llllll}F & D & D & 1 & M & Y \\ F & L & G & A & H\end{array}$
$\begin{array}{lllll}F & G A & M & N \\ Y & V & N E D & S N \\ F & E & D I V V Q N\end{array}$
$\qquad$ $V$ Q N P


FADITME $V G N P V L I \quad D Q E Y C P W N Q C N P S$ K S N P I I I N Q Y Y C D P C Q E Q K S A V K I N N V V Y D N





## F




#### Abstract

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| $\square$ VMEN | $V \mathrm{~K}$ N P | D Q S Y G |
| :---: | :---: | :---: |
| HA M T N | V E N P I V | D Q N Y C |
| Q H V M S N | V Q N P I I | D Q N |
| $L \mathrm{~N} \\| \mathrm{EM}$ N N | $V \mathrm{~T}$ N P | $D Q N Y$ |
| $L \mathrm{~N} M \mathrm{~V} M \mathrm{D}$ K | $V \mathrm{~K}$ N P I V I | D Q N Y C |
| $S Q \vee T M Q$ | $V$ A N P I L V | D Q N Y C |
| Q N MVM Y D |  | D Q N |
| $T \mathrm{D} \ \mathrm{~T}$ L L N | A K Y G I D | Q Q D Y |
| $E H A L M R D$ | $V \mathrm{~V}$ N P | D Q S Y C |
| $Q \times V R M Q D$ | $V \mathrm{~S}$ N | D Q F Y |
| N N I H M D T | V R N P I V L | D Q Y Y |
| S N I H M D T | V K N P I I | $D Q F Y$ |
| $E$ D I E M I D | $V$ S N P I L | D Q E Y |
| T D I K F T N | V D H P V V | NQ F Y V |
| Q NVV M E N | $V \mathrm{~K} N$ | $D Q N Y C$ |
| $R \mathrm{~N}$ | $V$ E N P | D Q N Y C |
| $D I V M \square N$ | $V$ S P P | DQEY |
| $K$ D I I VT D | V K N P I L | D Q HY D |
| Q NLL $\mid \sqrt{M K}$ | $V \mathrm{~K}$ N P | $D Q N Y$ |
| M N F | $V Q N$ | D Q Y Y |
| $G A \square V$ | $V$ S Y P I L | $D Q N Y$ |
| Q N I I M N N | $V$ Q N P I I V | D Q |
| $E D L T M K N$ | $V Q \times P$ V I L | D Q E Y C |
| Q N I K M D N | V S P I I I | $D Q N Y C$ |
| Q N I M R N | $V \mathrm{~K} N$ | $D Q D Y$ |
| $Q \mathrm{M} \mathrm{T} \mathrm{L} \mathrm{Q} \mathrm{Q}$ | S Q N P I L | $D Q H Y$ |
| Q HVT M N N | VQ N P I V I | D Q N Y C |
| A D I T M E N | V G N P V L | D Q E Y C |
| K N M M Y N | $V$ S P | N Q Y Y C |
| T N I M E K | $V L C P F V$ | N M Y Y |
| E N I HVVE N | F K Y G 1 V L | Q Q D Y G |
| D D I E L K N | A K R G I V | Q G N Y L |
| E NIQMEN | V L C C I V | D Q Y Y C |



Y R N|I E $\square$ K D V T R H G|I ©






A $\mathrm{A} Y \mathrm{~K}$ VGNCII VGNCII I D VR GCll $\operatorname{V}$ I | $D$ | $Q$ |
| :--- | :--- | :--- |

## UniRef90 M5VSZ1 UniRef90_UPI0003D70C85 UniRef90_J3JT69 UniRef90_A0A058 UniRef90 H3G816

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| I | $R$ |
| $R$ | $T$ | $\vee \mathrm{K}$ $\vee \mathrm{R}$ V T

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$V$ V $D C W S A Y G T$
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TSQCANVK
VA R C Q NVQG
QS F CKN $\square$ G G T S
Q G
K S VCANAK
T S S CKN $\square$ GGT S
LS SCKNAFG
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NSTCTNAK
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$\square$
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C T

\section*{F} EAF LAA WREACNS EAFSNAWKT C T D | $D$ | $Y$ | $R$ | $S$ | $M$ | $F$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $V$ |  |  |  |  |
| $L$ | $E$ | $N$ | $A$ | $V$ | $L$ |

 | $C$ |
| :---: |
| $C$ | $C V$

$C T$ QAFKKAWEK KACNSNVQA

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QK GTYLVGSACKGPM

C S LT | $A$ | $F$ | T | $D$ | $A$ | $W$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| T | V K K | G T | $D$ | 1 |  |  | AFVVSAWS K A C S T S K V S V L C T

\section*{| A | $V$ | $E$ | E A WA |
| :--- | :--- | :--- | :--- |
| A | S A A C G |  |  |
| A A | D A A |  |  |}

DACASTYSS
 TY LVVNPCKGMV

[^1] TT TG | S $G$ |
| :--- |
| A | A FR N A WK I A C A S I T T K A S I V I P H D K K F L V

| $L$ | $K N V$ |
| ---: | :--- |
| $E$ | $V$ |
| $E$ | $Q$ | SFDRAWK AA CNYRGKARLLI PK GTFLI GGPCQQGI $A L V D A W D \quad S A C E H R A P A D F V I P K$ RTMLAGPATAEG


$\qquad$

$\qquad$
CNLTTYKAGTDワSSCSTVESATLLVP

$$
\mathrm{Cl}
$$

AFLSAWTQACASTTAVKIVIPAGVTLDLSKARGAT ALSSAWSGACGNGGGVVN AFKMAWDTACQRNDDDGVILVPY
KAFEAAW $\square A A C$ KVVASTIVVPS SFDRAWR EACQFPTKSTVLIPKGEYKLLGPCKAP I KAFVHAWTAACGARGSSTLLVPSD GVFTVASTIFSG KAFQGAWAAAC TQGASTLLVPPELEFLVGPDSFSG

 CTASVYSQAPCVASSTAIVLNNVAPSGSSIDGTVKGTK AF LK A F T
 - AFLDAWNAAC KAFMDA KAFEAA W A VAA SCTDIVLSNDAAP
A $\square G N A W K \quad E A C \square S T T A A K$ TIV
KGFFKAWN AACGSADSTMMYVPKWRYLLGGSMAFKGT
 AFMLAWT DVCNSSASTPDFHIPGNKTFLLNPVFFQG




CSVTEYSGATAVSSCKNDVLNGFQVPTGKQLDLSSLQNST

E A L T N A W S
A F M R A WR
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## 


 $P C V D G I I$ A $A Y Q N P A S W W L Q F A K L T G F T L M G K G V I D G Q G K$

 P CISS GT I I A P K D P DVVWHWL VEFA GRI T F GYKE WK GP LVKVTGKQLTIIMAHSYAFDGE GH I Q I H GTVEASSDDRS DYWLLV DGVD NLVLEGGSGTDNGNGE
 $P C V D G T I V P R D G P K S W P S S L N K R Q W L A F Y Q G A G V 1 D G R G Q$ LYFK D V VKF GVANWD GP LVVNDE GNDLRDYGAAGI GFSGQ G
 LQFSSDDYPVVTMSRWEGCLYAFDAKNDAVTGF
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 PCDD GTIVAP DEPSNWWLVFSSKLKGVVVFQG K GVVDDGS G S













 $V H M T$ GDITF DNKEQNGHMIV I K GQNITFMGNNHKMVANGQ
 $P C I E G N L I A P E G P S S W W L Y F A N V N G F T V N G G N G E I D G Q G S$




 $V$ QV D G T IQ A P A D P S Q M K A A D Q WI K F L Y M E S G K GVV D G Q G A I R I D G T LVAP G DK SAN WLSFE GVVSGVSDIDGGA LDAK GPA L

 V F F S G T L L A S PVNNANK F K WIDD F Q YVVD NLVI S G G G T I D G Q G S


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


K WWAES CKKNKSRPCK\|LTDDSSSNDRDKG|LI\|QNS QQMHF S CKLLNKPMRCDKGPTALYFRRCTHLVVEDLQVRDSMQMHV K WWA NSCK DN KSNPCKVT DD SCRGVVRVKGLRVQNA QQMHL
 VWWKNSCRIKKT KALTTYKNCTNLRMRNLKLLNAQQMHV


 A WPRNDCRNNPNCPTTMKFDFDTNSKVHNLRSIDSKNNHF K WWS DQCCNDKGRPTADKDDFSKSVTVKELTLMNSPEFHLL A Y WA CKNSAKNCPP GARS ITTFNWANNI S GLT SIINS QQTHVV SFWEANMSAS KRPTQQLYFEGCNNLEIANGIASSLDSPRNH A Y WT CRNNY Q CNDP S A L T V L N A N GS R L S GL K LI N S P S K H L

 QWWA GQCKWDRDRPTAI KFDFSTGLII QGLKLMNSPEFHL MY WD GLGSNGGPKPNHLDAVKMNDSLI ENLQLQNWPVRAF

 K WWS QSCEK IN AT N P C A I I F H R C K K L R V R D I A L I N S Q R T H I RWWK GGRESKLVKPRF
 SWNKTNCPPKRSCKS LPPISMRVVSNATISNLTMMNSKGFHB NWWD LP CKPHCESPAALRFFMSSNVIVKGLSDKNSPQVHL E E Y WDGKGSQGSKKPGFLK $\square N V Q G G E F Y V L N L V N C P E R C T$








 KWWAASCKKNKSN ALTIES S S GVKVSGLTIQNSQQMNF AVWGKNSCAKNYNCK ILLPNGCDDALI EGI TLLNAKAFHM
 $\square W W Q N S C K T N S R P P C K L T F Y$ S CKNNLKLENLKLVNS QQDHM

 ALDACKNSSYNALCPTLEFSNSKNVVVNNLKSLNSQMFHV S F WEALH $\square$ CN
 G S WY WK Q G T S DT R P VF F K LQ NVIG STVVSGFTLLKNSPFRTF T A WK Q NDCTTNKNCKMLCMNFLNNSDVRDLTSKDSKNFHV S A WPSNSSLNRPDSMK FNNVNTA SI KN I S S F D S K F F H F K WWD LD CK P H CDS P I A I R FFM S S E L R V E GV R I K D S P Q F H F
 A A WRVN N C H K T E Q C K K L P D S IR F D Y I V R GI T S L D A K N F H I


 $G L W S C K N S G K G C P P Q R R N D R Y I V K V L I F L V N L L N S Q L F H V$
 A Y WNGYGSND DVPKPNHF DK LVGGSVI ENLYIQNWPVHLF Q WWK L C S




 RWWDGT GTNSGKIKPYMFYVQLADSSVRGLT\|KNSPAHT F A A WK Q NKCMCNS L P Y NFRFNTLTNA QI S GI K SLLN SK L Y H M
 WACKASRTNCPSGATTLSTTNSNNDKINGLMSLNSQMFHI RWWKGGRGTKLVKPRFFEATVDDSTIRNLYFKNPPAWC E WWR IS C R R N S SYYSF LT F D S SAN IT I Q D L K F VN S P Q M H L NWWSSGY $\square$ N ALEVTSSNKVQLTGLSFRNNPHMHV WSCKSVGNHCPFGARSLSFQSCNKVLVSGLKSFNS QRVH11

 EWWARSCKDNTKNPCHPAPTALTFHKCKDLTIRNL
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UniRef90 D7U11


GKDNSVIT 210 TAY 220 TNGVRIKTWQGG SGYIVRAVIR NSWAHVSDVLVEKATLQGTTNGVRIKTWQGGHAGFAERIT GKYPDVNGVRVKSCTLTGTTNGLRFKAWPDKYPGAASDIS KTENYVTDIFVKGAKLTGTTNGLRTKTWQGG SGDARNIV KSTDYVSNVLVNRARLSGTTNGVRIKTWQGGASGYAKNITT GSADNVENVTFINSTILSGGKNAIGIKTHEDGGAGKIVEKV LDEPGVQNVTVKNVVFHGTTNGLRIKSFARKSNGFVKNIV GSEDHVSGVFVNGAKLSGTSNGLRIKTWKGG SGSATNIV GKGNEVSFVHLDGAKF IDTQNGLRIKTWQGG ANENGVENVTLINAVFTKSDNGVRIKTWPTPSNGFVSHIT GKDGEVENVQVTNCTFNETNNGARIKTWPNG KGYARNVV GAGKQVSGIILVNGAKIVGTKNGVRIMTWQGG GRYKDVEDVKVKGCTLVGTTNGLRIKSYEDSKS NSRAEVSYVHVNGAKFПDTQNGLRIKTWQGG KSYNNVTNILFTDSYLRNSTNGARIKSNFNT GKYADVRGVRIKNCSLTGTTNGLRI KAWPERYP GRTDKVEEVQVRDCTFTGTRNGVRIKTWEGG RADNTVDTVTFNNNVVTKSTNGIRVKAKVGA
 NSEAHVSDVIVRKAKLFRTMNGVRIKTWQGG SGCASNI K
 MNEEDVSGVSVRNCTVSGTTNGVRIKTWPGSPPSQASNFT NSHACVSNVTVRDSFIIKFSENGVRIKTWQGG SGSVSGVT YEENVVSNITFDYGVIENSTYGIHVKTVKGSGP GSRACVANITVRNAVI RHSDNGVRIKTWQGG

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 GRYGHVKGIKI INCTLQETDNGIRI KTWPSACSTSASDI H GKYPDVRGVVVTNCTLRNADNGVRIKTWGGSPPSQASNIL NTHACVSNVTVRNVRILDSDNGVRIKTWQGGAGAVSAVE GRNASVEYI DVKNVHFLNTTNGARIKTWQGG KGYAKSIS NTKACVSNVTVRDVNMFRTMNGVR1KTWQGGV
 RSYAKVTNVSIAFNHLDKTVNGVRVKTMKDAKN RSDNTVKTVTFENSEIKNSQNGURIKTDSGA
KSNNNVTNITFKNSQIVNSSNGARIKSNEGT TGFIVSGVT GKQGEVEEVHVKNCTLNATQNGRRIKTWQGG SGYARKIT GRYGHVAGlTVKNCTLIGTONGLRIKTWPSACSTTASGGH


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 GQYGTVENIYVSDVQFKGSLSGVRIKTWQGG KGHARKMV GSENGVDGVIVTNSIFTQTQNGVRVKSWPKASDGYAKNLV KEEKNVEGFRVRDTVFTGTSDGIRLKTWESSVSGTVSQLL EMSGDVKKIVISNCDFDGTDRG|R1
KKWETVQNVIVDGAYMYNTDNGVR1
GKYKDVTGIVVKNCTLTNTDNGVRIKTFPDSPSSTASG| R

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KAFEGAWAEAC KVEASVTY TPPHYAFLVGP
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KAFQNA TY LSSFANKGGAQLFVPAGRWLTFSLVSHLT
KAFQAAWAEAC KVAASTMIVPAEYVFLVGPISFSG
KAFENAWREACNWNTYSTVLVPPGKYLVKGPCKADS
TF LDNGUD DDDQGTLKFTPDTDFW
KALRDAWA A ACSSAKPAVLLIPKGKTVLSGPCKSNG

KAFLNAWA KACASTNP PASI Y V P GGTVHLPKGQTLDKSANKGUS AF $\square$ EAWNEAC QTESGTLLAPSDYNFTITSTDFSG KAFQAADNLSQYQSDGGAQLFVPPGKWLTLTSHFTLY KAFEAA 1 KVAE RQGGGHIVAPPGTYLTFEDQAGAT
EALVAAWQ A C CRVPRATVLLPSGHRELVSPVTLQG

KAFKSAANDSQVAGDGGAQMMVPSGSVFLVKPVTFSG KALTAAWKAAC KVNGASVEVPGFKFLKP TNLV EAFMKAWS DVCKASASPTFLVPGDRRFLINPVKKIK SATDEANQRGGGTVYFPAGDYLTHLEAGAV AFKAAANLSKVASDGGAQLIVPPGKWLTFNLTSHFT TVNTAAFESAIAAIAERGGGRLTVPAGRWLTAPFDERYW KAFVEAWNATCGGEGDMKTLLIPTDKTLLLQPDVAFEG AFLGAWQ QACSSPKSVFLVPEGQRYRVNATKFVG
AF $\square$ A A WNQAC
KAFQNA $\mathrm{K}^{2}$ YNSFADKGGAKLFVPA CLCTAWSQSSAVDNCKD TDSDDHAPKSSALILTLQTGAT

## Y니K S A D

KGGA
AFMQAW VKACHSSGPAKVVFPAGTFLTGGPCDGMT
KAFVEAFKADCRGRYGNTLVVPNGRSFFVRPTKNDN $A F L S A W E A A C F G P B S T V L F P A T Y S F V I G P V E L S G$
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A Y WD GQGSNGGSDKPDHFFVVKDNGVISNLNIKNWPVHCF
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 LWWWDKFHNGKFTRP Y L I E I M Y S D N I QI S S L T L V N S P S WN V
 A WWD GLGSNGGDVKPN HFIEMKGNSSIMDVYYQNYPVHCF D S WP L N D C H K N P N C P K L A M T F V N N S RI N GI T S L N S K M G H F VWWNDSPKMP GTKPTAL RFYGSDGVIVTGITIQNSAQTHLL VWWHDAPSMPGTKPTAL RFYGSSGVTVTGITIQNSQQTHL
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A WWS R D DPVS PPPSQMPRFYGSSDVTVT EWWTYS DKMP Q $\quad$ KK P TA L R F Y G S T N V V R V T





 I WWN WF HN HNYTRP P L V E FMY STRVVVVS




A WWD DS C K I N K K E P T VL L K F D R C N N N L R M N N M N FIIN S P Q T H V
 ALLWDCKNSGKGNCPTTLA FTNSNNI AI GGLTSMNSQLFHD R WWN EFA GR QY LR P I L FY A E N A T N L E I T GI QMKN GPVVWH N


 P WY DE F A S N S S L L R P I I L T VVY Q G D V T V



 S WWK D F K K L K N T R P Y L I E I L Y S R N V Q I S H L T L I N S P S W H V
 S F WE QK VS QR PTAL H FTKC
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 A A AFAACKSGGLDVY PAGDYAMSTWVKAWA
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CTLS A Q D DAPAVRSCDTTR F T S V WN R A CRRK S GS S K IVYV P K ACTCTDPSTVVV SGGGTYVVGPCKNP AFASAWD SACKAGGMSTLVIPAGRSFNVTKINFSG
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A F E R A E A DS K LG S RGGG Q L NVP A G L W LT F NLT S H M T $C T L S T Y K A G T S \| S S C S T \square T \square G T L T V P A G$

NANGGGTLYFPAGTYLTLDLGAGAT $\square E$ QA S S E G G G T I Y F S A G T Y L T L H L E S G A V AFQDAWRALCRGRGRAASLVIHAKETYTLLPQFFIMH
 K A F NTATK L L T Y A A D K G G A QLLYV P A G K W L A DKGGAQLVVPKGRWLTLYLEKGAV GTALDD T $F$ L L H V V D
SAFSAA WN A ACGHPGNSTFY IPKG T F L L V GP I S FP P EAFLAA WKCAC K V S G A T I K V P E K L K F L I K P I T D LT $A I K D A \quad \square Q A C D E A G G G K V V I P A G K F L T L H L E K N S E$ KALMAAWK AACGASGTGTL
$K A \square Q A A D D D C A S A G G G T V K D A G K G P A A G T$ NNGGKVVFDAGK TYTVT F L K S SVD
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 EAFRKA D D T N Ali Q CA



DSAPA $\square$ A A HNCND GGTVVFMPGATYDLTFLKH $\square D$ AAIEACAESGGGRVIVPEGDFVNLHLVKGAR G GRVV L K K G K T L D L S F L N DV E $K$ VEA S I M V V $\operatorname{P}$ A E S V F $\operatorname{F}$ L V G P M S F S G K A F Q NA $\square$ Y L N S FA D K G GA QLIFVPA GRWLT GGF S L IS H

TDDSAA $\square$ VDA V K K C N
$P$ G GK VVFP E GK T Y D LT G L R G M D G S TL YLP H G Q T LDDLTGLSD DH A A CGSTDDAVIVY P K G R Y L L S P I R F K G

$T \square N T A A \square N K A \square D Q C T K A G G G V V L V P R G L W L T L H L A K G A \boxed{L}$
 AFQAAVAI ERRRAPGGALLVVPPGVWLTL L A R GA V E K A S S E G G GTI Y FPA GVVYLTLYVESGAV K A F R A A Y R $\square$ Q H L R R R GGT VLY I P P GVF V T LF LA R GAV

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| UniRef90-M5XF65 | GS ${ }^{\text {d }}$ ELPGGRYRSLINGYMLHDVVITGDNGTINGQGS |
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| UniRef90-UPI |  |
| UniRef90-UP100032AA409 | PCLEGKIVAPSKG |
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$G W W D T H C R D H P G R P M M F S N C G S V T V T L R F R N S A Q A H V$ GWWDTHCRDHPGRPMMTFSNCGSVTLTSGRFRNSAQAH VWWTTMMKDPQDKPTALRFYGSYNVTVGGUTVQNSPQCHA

QSWPGNDCHKNPNCPKLAMTFVNNSNI K
TWWQCESCKRPKVYLUVNACFTKVTNSITSLNSKLFHM
TWWQCESCKRPKV YVLYFHACNDLIVRNLGISNSPQSHV
TWWNMWRQRQFTRPNLVEFVNSRGYIGSNVGFRNSPFWNU
RWWNEFPDNTYLLRPLLFYENATGLSVE
SWWKKYRQKNHTRGPLVQTMFSSDIVITNTTLRDSPFWTU

A WWTKYKKR TYTRGPVQLMWD V S
GAWYWKQGTSISRPVFFRLN RVTGSTL
HWWDA DRVGTNNRPTALRVVESTNVAV T

K WWM E F F Q R R F F R P P F
K WW W WE Y A R R MF R P P F I Q F F E C S N I L I I E N V K I I N S P Y WT I


YWWDKF H N K Q L K DT R P Y M I E DS D Q $\quad$ QI S N L T LI N S P S WF V

A E A WK Q S S CEEKSARC KI D F IVNV S CAT I S N I T L S N S K G F H L
NWWS S S K LYYD DQA I R F Y S S N F VKI R DI K I K N S P L C H L
E NWWPWSGGHHLLRPTFFEPFESENVLIIKGVTFINAPFWVM


SWWA EA R A T H N A R P R L V V F D H CK H D R M E GI T V V N S S P S WQ V
$V$ WWD WF ESSHNYSRR HLVVEFTSSSDLLVVVVSNLITFLNAPA YN I

TWYDLVKKGSNY P R R P H ALLLDDGDSVVFQGL RFVQA QM WTV
V WW
GLWACKNSSSSTTCPTLQFSNSKNVVV
TWWKKYRRKNHTRGPQVGFVACTNMLVK
SWWAEARATHNARPRLVVFDHCKHVRI EGVTIQNSPSWQV
DWWSEVYY IQQVCQCRAL RFYDSHNVTVRDI E IVNSPCQCHL
S F WA C K A A A G R DC P P T L D I S Q S N NV S V


 QWWDAVQQTN RPHGISFVVTNGVVKDMKLWQP $\quad$ VA WNF QWWKKFKH DPNWKP TALRRFYSSYNVTVVRD DQUIN S PQCH L ■WWSK FRNKD H T R P H L V E LI I N S T EVVI S NAT FL N S P F WT I



 T WWKCR
QWWQRFRSS T T WY D Y A D I K D F L R R P N M L S L Q R C K K V L L A
D NWWY NVKVRNWRPR L F FINHCRNVTMH


 V WWD RLTSHKYNRPHLI EFISSENVIVSNLTFLNAPAYTF
 E T N WWP WK GKKEYP QFVQPYGCKNVLI QGVT IVNSPMW A WY N A F S S NTEYR P I L F L T D N A T R V S V E GI T QL N S P C WT N





## UniRef90 Q84M40 UniRef90_G7KUM8 UniRef90-K4A1H6 UniRef90_B9TCU3 UniRef90-Q4WV23 UniRef90-V4JPH5 UniRef90_V4JPH5 UniRef90_R7SIS8 UniRef90_-MOS3I5 UniRef90_V4RM26 UniRef90_UPI00032A8DDA UniRef90-A0A024G590

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UniRef90-W4UP73 UniRef90_R0GNE7 UniRef90_U4LNQ8 UniRef90-W1P040
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UniRef90_K3ZIF2
UniRef90-Q5ASG9
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NSRAEVVSIIF\|DTVHLYGTTNGAR\|IKTWQGG GSSGGVSDVRAEDIHFYDSYTA $\square R \| K T S P G R$ GKGST RAEVSNVTDDGAQ EMSGGDSDVFVEQVHVYNSFSGDQFRTTKGR GADTDISDITYKNI YTWNSNQMMMIKSNGG GRGGTVEDIRVWHVNFTGTTNGARIKTWPGG NTKACVSNITIRDVNMHNTMTGVRIKTWQGG CMSGGIKDVRAEDITATNTQSGVRIKTAVGR GRYGDVTRVHVRNMTFVGTMNGVRIKTWENSPTKSLAAHM GKRDNVSGVKVIHCKMSSTSNGARIKTYSETPEDQATGIT GQYKDVENILVYNISMFNASDGARIKVWPGVVSGSVRNI T EMSGGlSNVYVEQVYMYNSFSGMEFRTKKGRGGYMKRII GQYAGVENVTVRNVVAYGSRYVGRVKTWTGEQLGYPRNLS GGFEVVEDVNVRNCTMKDTLAGVRIKTWQGGE GYARRIA GQYAGVANISVSDVVMKNAQNGARIKVFAGGGTGFVKNVI AKDEGVQNVTVKNVVESRTQNGVRIKAWGKPGNGFARKIL
 KSGGAVNDVVVKISVQNTDSGVRIKAWQGGIGGSVKNVT AGEGEVRNVTVESAVLTGTQNGLRIKTWGKPNAGRVAGVR EMSGGIKNVLI EDLYVRDSASGVRIKTDRGRGGYITNIT GQYDIVANVYVRNVTMRYAQNGARI KVFPGSPSGYVKNIT ENSGGIENITVSNCIFDGTDRGDRIKTNRERGSYIRNIL GKAASVQNI LFENVVMKNHLYGARFKSWTGG NGIARNIT KSVACVSDIVVEKI SLLNTLAGVRIKTWQGGM GSVKNVS EMSGGVSEVYAEDIYIFDSKSAIRIKTSPGR
 EMSGGIKNVTVMNCVFKGTLRGLRVKTGRGR GKDNCVSNITVQNITLQDTAYGARIKTWQGGL EMSGGVSNITVENVHIWNSRRAVRIKTAPGR NAHETVEEIYVYNCSFTKTTNGAR】KTVPGG EMSGKIQNVVITTCTFVDTDRGMRFKTRRGR EMSGGARNLYVTNCTFIGTDVGLRFKTTRGR EDAAGVKDVHI RDCDFMNTDRGLRVKTRRGRRD
 EMSGGISGIVVDNAFLHNSLTGMAFRTTKGR ETSGGVENVLVENVNLYDTGIGIHMKTNVGR EDSGGVRNVFAENSEMNNLDRVLRIKTSSMRGG GQYAGVKDI Y
 NSEAQVSDVVVGANLHGTTNGVR:KTWQGG SGSAKN: K GQYKNVHDVHI ENVWMLNGDYSARI KVWAGNETGTVNNVT REEEGVQNVTVKKTVFVGTDNGLRIKSWANPTSDVLCE
 LEYDUVENVYVYNLSMSNASDGARUKVWPGDDTGYVKN:T EMSGGVKNLYVSNCTFMGTDVGLRFKTARGR GTSGGVTRVRVENNSFDGSMYGLRFKTMRGK ETSGGVEHLLAEHLNFVSSGFGIHIKTNTGR EMSGGVRRVTISNCVFDGTDSGURLKSSRGR
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SGYAKDI V GGYVRN\|Y






KASNDVSDVTVSGIT IINSSLNGFRI KTIGQGA
TDHFYVQNVTAHNIKMSDAQNGARIKAWAGQNSGSVSNIK


GKYHNVVGVTVKNCTLINTMNGIRVKTWPDSPA
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EMSGGI ENVRVEDVTAINTESAVRIKSAVGR GGYVKDIF

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KSVACVSDIVVEDISMKNTDYGARIKTWQYHVNGMVKNVS
EISAGVRNVYVRNCKMDNLDRADRIKTNT LRGGFVENVF







[^2]


$\stackrel{F}{F}$ ..... | T |
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| $\vee$ | $H$ |


| G |
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| G |
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${ }^{240}$

$\square$









| UniRef90_Q84M40 |  |
| :---: | :---: |
| UniRef9 | - G7KUM8 |
| UniRef90 K 4A1H6 |  |
| UniRef90_M5XF65 |  |
| UniRef90_B9TCU3 |  |
| UniRef90_Q4WV23 |  |
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| UniRef90-TOKAL0 |  |
| UniRef90_M1CLM0 |  |
| UniRef90-11MS92 |  |
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| UniRef90_M0T0N7 |  |
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| UniRef9 | -K4CPL3 |

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 FEDFFVSNVDNPVLI NQCYSTPCAQFPSNLSISDVHYDN




 YRNI TFEN VRVGUVMKTDYPDDGYDPGALPDLRDDSFT
 YRNVTLDN VRVGIMI KTDYPDEGFDPKAMPII ANI SFSG YTNNKGSNVKNAVVVHSDYSGYTGKATSAVTI KGVTVSG FSGVRVS AVKTPIVIDQYYCDHCANQTAAVAVSGVAYSG FDGVTMEN VRNCIII DQYYCQDCMNQSTAVHVTDVSYAN VSNIVMSNIKQEAVVLDLKYSKMPDEPKSTPI FRNVHISG
 VKNITYNNNNDYAI ELTQCYGQNCDMYPSNLTISDI HFNN V SNI EMEN VEVALLRFDGNHPDDRFNPEAFPA I S R I TVVK
 YEDMY IEN V DWAI EDTQCYGQKCNEYPSNLTI SDVY $\square$ SN
F

2BCB1D2 VKDIQVGQVKEAFLKI NTYYADYDNQEGEHIPBIKNI HDEN
 FK DITMED VARTSULI DSEYYPKE GDVAAEPVQFHNI T IEN

 WD N V T V Y N GE QA P I Y V VM Q C Y N G Q Q G C S T S L F D V S D I S FA N
 FTNFQVANVDHPILIDQCYSTTCAEFPSTLSISDVHYDN FQHIVMDNVQNPIVI DQNYCPRHKGCPGKV

 FSNI EVSD VKYPVII DQFYCDKCKNQTDAVAISGVKYDS
 VRGMTMKTMKMVFWMAGNYHPDNDYDPNADPVI QNI NFRD
 WRNIVLSNVVPRPIVVTQNYWDPTTDSPNNTN:EDMIFDN



F






 Y R N $N$ H I
 $\square A N V S M H N$
$F M N \perp K L D D$
YKDMYIEN

| $V$ | $K$ | $N$ | $P$ | $I$ | $I$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $D$ | $Y$ | $A$ | $V$ | $E$ | $I$ |

$Q N S$
$F P S$
$H P S$

MRDVVVGTYREAAVRFNMFYEEEGDH





 UniRef90_I9AE81 UniRef90-M4DRX1

## UniRef90 Q84M40 UniRef90_G7KUM8 UniRef90_K4A1H6 UniRef90_B9TCU3 UniRef90-Q4WV23 UniRef90-V4JPH5 UniRef90_R7SIS8 UniRef90_MOS3I5 UniRef90_V4RM26 UniRef90_UPI00032A8DDA UniRef90 A0A024G590

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| UniRef90 Q84M40 | $\text { Q N A K WR K S G }{ }_{T}^{330}$ |
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| UniRef90-G7KUM8 | P WNCSN $\square$ R G Y S |
| UniRef90 ${ }^{-}$K4A1H6 | TSTCENA |
| UniRef90-M5XF65 | T WECSNVS GS S |
| UniRef90-B9TCU3 | KYA HMDTKG |
| UniRef90-Q4WV23 | WY SCQS A Y G S GF |
| UniRef90_V4JPH5 | S S LCS F VLG S |
| UniRef90-R7SIS8 | E Y ICK N $\square$ A S T S EL |
| UniRef90_M0S315 |  |
| UniRef90_V4RM26 | Q WNC T N ${ }^{\text {Q G }}$ |
| UniRef90-UPI00032A8DDA | T SVCNNVK G |
| UniRef90-A0A024G590 | R NLP K K S S G |
| UniRef90_K915P9 | EFECSNV |
| UniRef90-F4JTS9 | T L VCENVD G S |
| UniRef90-UPI00023B3011 |  |
| UniRef90_UPI00032AA409 | P NVPP CLIK |
| UniRef90_UPI00042B54DF | P WKCS DV S G |
| UniRef90-TOKAL0 | V I L C D G 1 K G G |
| UniRef90_M1CLM0 |  |
| UniRef90-I1MS92 | $\square \mathrm{F}$ Q C A F VQ G |
| UniRef90-X0RKW1 |  |
| UniRef90_R7W924 | EN A N A T Y VG Y Q H |
| UniRef90-M0T0N7 | $\square \mathrm{FQCSF} \mathrm{I}$ K G |
| UniRef90-D0NU70 | S G Q P S V K |
| UniRef90-A3BBT5 |  |
| UniRef90 ${ }^{-}$W5H7A7 |  |
| UniRef90-W4UVK6 | F E N C E R $\square$ T |
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| UniRef90-R0GNE7 |  |
| UniRef90-U4LNQ8 | Y Y ACANV |
| UniRef90-W1P040 | WACSNVVGYTLV |
| UniRef90_G7L4S8 | P WNCTDVSG |
| UniRef90-K3ZIF2 | S WSCSNV S G Y S |
| UniRef90-Q5ASG9 | DF\CT C V N |
| UniRef90 UPI00042B7F9C |  |
| UniRef90_G7K056 | Q A M C W S Y G K S |
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| UniRef90-R7W869 | E N A M A T Y V V Y Q H |
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| UniRef90-UPI000374F9E0 | A Y A TVT A S |
| UniRef90_S7ZD03 | F T C TNV |
| UniRef90_B9HXE1 | S WT C S NV DG F S |
| UniRef90-K4CPL3 | $\square$ WK C S DV S G |
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| UniRef90-R7S4J8 | E Y VCKN\VSAS |
| UniRef90-E5GBC3 |  |
| UniRef90_V4M0P0 | LS MCSNAHEEVY |
| UniRef90_A0A022QL27 | IF Q CAFVWG S |
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| UniRef90-B9HTV4 | Q A L C WN S Y GK S |
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| UniRef90-A0A022Q6Z2 | R WHCEFVVSGFS |
| UniRef90-UPI00042B133C | Q WNCTEI A G V S |
| UniRef90_J4G127 | T Y $\square$ C E NVA TVVSEL |
| UniRef90-UPI00037D7657 | P G |
| UniRef90- X8JQ11 |  |
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| UniRef90- G7IBQ6 | WNCSDVK G Y S ELL |
| UniRef90-E3RIH6 | F S LCK S A Y G S G |
| UniRef90_D5EN48 |  |
| UniRef90-Q27UB2 | T F T CNNM G N N L |
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| UniRef90_W1P562 |  |
| UniRef90-A0A022QAY6 | $\square \mathrm{F}$ Q C A Y VQ G S |
| UniRef90_K7KE28 |  |
| UniRef90-UPI0004642AFA |  |
| UniRef90-UPI0003B3C8CC | Q |
| UniRef90-R7A5V3 |  |
| UniRef90_G2WQY7 | V I I C D GVEEGG |
| UniRef90_Q00001 | $L Y \mathrm{Y}$ C R S A Y G S G Y |
| UniRef90_R1GGF8 | F Y S CQS GY G T G |
| UniRef90-R0G4E3 | S WQCS YVY G S S L |
| UniRef90-M0TRZ3 | P WK CVDVS G |
| UniRef90-H1V8Z7 | K WT CTNM |
| UniRef90_U5BXZ8 | F S N T K N $\square$ |
| UniRef90_S8BAT7 |  |
| UniRef90-V4TIV4 | D P Y CWQAF GES |
| UniRef90-M7YV69 | WNCSLI Q G Y S |
| UniRef90_S8D3D1 | Q A $\square \mathrm{CN} \mathrm{N} V \mathrm{~K}$ |
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| UniRef90-I1RHW8 |  |
| UniRef90-V4NLW5 | K Y S CVNVLG |
| UniRef90_L0G468 |  |
| UniRef90_R8BII6 | Q WVC T N M |
| UniRef90_S8D405 | \F Q C S HVE G |
| UniRef90_D2QL64 |  |
| UniRef90-J3A2W1 |  |
| UniRef90-J3L1Y8 | P WKCEAVS G |
| UniRef90_19AE81 |  |
| UniRef90 W5ECW7 | P WS CS NVS G Y S |
| UniRef90_M4DRX1 | T WKCS DVIGGTSLL |

VA AFAACKT G GT TYVPPGEYVS LS GGQ GWA AFAKAA DLSLDAGDGGAALVVPKGKWLTHNLTSHF T

A A $\square$ A A CHQA GGGRVVVPAGVY LT LH LDKGA T TEGLDDHVDVLLS GTVQYTPDDAYW

K A $\square$ K D A

AFEDCGS



DDSPA LIKAFHKCGGTVVLD $\quad$ GGSPLDLT F LHAVD CTMK A A D D A P K I A H A F K T C S I V V V
 D D A P Q ILD A F E E C G G T I VLD K S Y VL D L T F L K HVD

 $C L C T A W S Q A A A Q A N C Q T L T L D N I W K P A S S S I A L T A L E K S A T$ K A F Q T A A D A A NGGA QLYY IPVGSHLT LF LE N G A T
 CTTS A F


K A MA L C K K N N G G T VVVPK G I Y L L L R $\square E K G A K$ N N G GTVVFTKGVTYNLNGLKNVN
NDTAA $\square$ HAASAPPRSVVIFPRGEYLDLYLEEGAV

$G G A M L V V P A G R W L T L F L D H D A V$

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

 K N S G S T L Y VVPA GN Y V D



N A F R K A Y R $\square E H L N R T G G T \square L Y \square P$ P GE Y L T F N L T T S H M T
$\mathrm{KA} \square \mathrm{NQA}$


N S L A M A A A LEA VQQQS G G GT $\square$ Y $\square$ P P G D F L L L Y L E A G S I
VSECHSILVRSLGVPA GLT
VIP A LD D A P A I R Q A F S K C G N N GK V S IQ TVVLQL H NLLK NVQ

 GK A L D L



 A FK D A WK DVVCKS S S C S P II IQ V P S G K S F L L Q P L T F
 $N T T G L A N V T V D L Q G T L L W G T N D T Y W$

A $\square$ D A CHRAGGGTVIVPPGTY LT LHLLEK DA L

A D A A H S A G G GRVLIP K GK WLNLHLE E G A E
A|I $\operatorname{ASCAEAGGGR|IVI|PAG|V|L|T|H|V|EAGAL}$

UniRef90 UPIO00350A32E UniRef90-F8Q2Y2 UniRef90-U7Q2J5 UniRef90 L2FN43 UniRef90_UPIO003B4F97F UniRef90-S8DSM3 UniRef90_UPI000346F09C UniRef90-I3C3J6 UniRef90-K1WR29 UniRef90 FOY3K5 UniRef90 B8NKB9 UniRef90-UPIOOO368881B UniRef90-D3ED50 UniRef90-R7CY64 UniRe90-MPVZ77 UniRef90_UPIo00444A2A7 UniRef90-N4VJ97 UniRef90-D7U2D3 UniRef90-UPIO0023B2D36 UniRef90-UP1000409D80C UniRef90- S8BTG5 UniRef90_UPIOO032A5564 UniRef90-C9SLI9 UniRef90-D3EEH3 UniRef90-A9TKN9 UniRef90-X8JPN6 UniRef90-R7DYT4 UniRet90-B8NPS8 UniRef90-A1DBY5 UniRet90-UPIOOO4621CA8 UniRef90-K7UZB9 UniRef90-UPIO0042B18EF UniRef90_UPIO003F9A685 UniRef90_I1BPA4 UniRef90-Jowx25 UniRef90-UPIO0042B4FF4 UniRef90-R1GZ71 UniRef90_UPIO0037B6A71 UniRet90-M8CS39 UniRef90-MORNW7 UniRef90-UPIOO0469418F UniRet90_18W2P3 UniRef90-F9GG38 UniRei90_UPIOOO39E00D4 UniRef90-G2XD66
 DGDVQFGNVSWAGPLFEVKGSDITFNGNNYLFDGGGP LQLDGDI YRTGTAGGNMVYIEKGKDVETYSSTSQGAGQGN LIMEW WGGKDVWI HGEGVI DGQGQ ILFSRD\PVVYTRFEGPFDYAYEQENLALTGEGTLDGNAD SPNSLYLTFQNATTFWF LIMESGNDVHLYGGGGTIDGNGQ LFTKDKKAYLMNYSPLDYAYKQKNIAVTGKGTFNGQAGK LDQGNDQFTNDTTYWSFFMLGGNDVNVYGGGGTDGNGQ QLDGVIYRNGTTTSYMFGISGGSDFELYSSTSKGADQGS LQUDADLAA\HDRSHWP LPAACTWGTVCGGEGFDDGGGA

VATSGSVSLSDDVEYWAAWRFGGKDVNTYGGGGVIDGNGO VRLLGTLTLKDDASRFLQVDYWGKDVNLDGGSGLI NGNGQ SLEGTIKFVDDDDFWTF WLLSGENILFDGGGGTIDGSGQ VVITGEI DFNDDPYYWVFWKLGGEDVNIYGDDGVIDGRGQ ILGSQDIELPGGRYRSLINGPNLSDVVITGNNGTIDGQGS
$F N V Q G T V S S M D T S E A G W I A F Q Q L D Q F I L S Y G G V F Y G Q A K$ INFTTNTSAYHTSYEGPLIYAYGQKNIAVTGKGVFNGQAD VIMAGTMSWEKTPSNARPMTDNGNGVTVKGAPGKIDGSGQ IHKDAVILGSQDENDWPDFGTNLTDVIITGDNGTLDGQGE LGSEDFELPGPRFSSLINGNGLEDVIITGDNATIDGOGA I NVPGDVTFGYEEWAGPLFQLTGTDITFNGNGYTFDGQGD LLFSPDVDLYPRRCQSPISGRNLENVADTG EGAMDGNGH FQVEGLLQFTSSTDYWNVSDIDGLKLRSVTGSGVIDGNGQ LLANSFKYAFQDSSS FMVQIGGTDINDYGGGEIDGNGQA SQYKEHGNWI ERNVDNVTKGNLDGGP TKFSDKLPMVLTSWEGPLIYAYDCKNIAITGEGTIDGEGG VNDAGTIKLASRATSFHYIQLKGSNVNVYGGGGTINGNGQ LRQNPNASWEGNPLDCFCSLIYGKDVVRIVGDGTLNMEGG



LLGSGPAAGGDANTRHLHGQDLKDVITTGHNGTINGQGQ LGSGPAAGGDANTRHLLFAENAENIAICG LGTVDGQGP LQFSGKTRWEGTELYGPMIYAYHANNIAITGKGTI DAQGG VKFSQNAPVVFSRWEGVI YAFEQTNIAITGNEHWWPWNGR IIASQDVDVPVGRYRSLIYGQNLSDVVITGDNGIIDGQGS FQLEGTLNFSASTEDWNLKNQQGLKIRSLEGQGVIDGNGQ IQVEGLLKFASDTDYWSGRTAMISVSNVDGGSGVIDGNGQ AELLGDTKRENGSWEGNITGMNVKNVRIDGRGCLNGQASK

## $\square Y \square A R D \square K A T V D T K N W P \square I F \square H G D D V I I T G E N G T \square D G Q G D$

LLETIDKSQYAARNESPTSGKDCNVA! GSGGVLKDDGK VLFEPDPAVPGPRCQAPLEAEGATDIAITGSGGALSPDGE
 SAGSCGVRKEGARGCRPLTAVDRADHAGVMGGGTIDGRGW VA LIGT GFNNNISYWTMWRFGGKDVNIYGGDGLIDGNGQ LRATDRLIIPPMPSYGQLHGFNLTDVTVTGNNGTUNATGD
TSFQGTTTFGKMLWAGPLVELQGNNTTVTGPGTLDGQGA VDMFGTLEYSTDVRYWILMEFSGEDITIDGGSGTIDGQGQ LGGKNI AYPDKGRRKALVFERADNISITGEGEI DGNGS LKATGNDDGYTGKPSFVFLYGYEADGCTISGEGTVDANGH LLGSTKRTDYGTVKASALIVAEKQHHTSITGTGTI DGRGR FDIQGThKFMPDVAYWTMLLFGGEDDNIFGGKGTIDGSGQ VVITGTLNFKSDPYYWSFWKIGGKDVHVYGDKSLLDGHGQ L LGSQDPSLPGGRHESLVHGENLEDVVITGENGTIDGQGA LVFSPNDPAVFRWEGPLDYAYGQRNIAVTGQGVLDGGG FQIDGTMKAPSDPSDWWПTFDEVDNLTIRGS GTMDGQGS PCVSGNDLAPSSDSSWHWIHFKCVDGLSIQGSGTVDGQGH LQLDGALKVADRDYDVIVITKGITDVALTGTDGLIDGGGGA自HGQDGNDVVITGSNGT ILGTTDYKAYRNEVGWALLVAVDARNVGLTGEGTIDGQGS LDANPAA VLFSTDKEGVEAYNYAPMIYAANVRNVAITGKGLLNAQGD $V T F S R D F D W Q V R C Q S P D G D Q L D D A T G S G V V E S G G$


UniRef90_MORNW7 UniRef90_UPIO00469418F UniRef90_18W2P3 UniRef90-F9GG338
UniRef90_UPIO0039E00D4 UniRef90-G2XD66 UniRef90-UPIO004412AAB UniRef90-G8TG27 UniRef90-A8MAP2 UniRef90 M7YLI6 UniRef90-SOEWP8 8 UniRef90-R5MV45 UniRef90-W6U512 UniRef90-O5ENB3 UniRef90-I1JBJ1 UniRef90-K9FUH1 UniRef90-Q9UUZ2 UniRef90-C3WD23 UniRef90-G9NE20 UniRef90_B9SAU9 UniRef90 AOAO22R100 UniRef90-Q1PES3 UniRef90-UPIO0035DCD19 UniRef90-UPIOOO37FC281 UniRef90-F8P1Y8 UniRef90-WORBQ5 UniRef90-G9MYN2 UniRef90-A9UZX8
UniRef90 K7UN42 UniRef90-DONHA9 UniRef90-G9MFJ5 UniRef90-K9EEJ7 UniRef90-RGJ2KO UniRef90_G8TBJ7 UniRef90_S8BUV1
UniRef90
XokVL3 UniRef90-UPIOOO29A0D9E UniRef90 D8QUKO UniRef90-K2J263 UniRef90-F9GG41 UniRef90-W1NT09 UniRef90-FOYAA8 UniRef90-UP1000440F29A UniRef90 W5HB23 UniRef90-R91F57

T WWKMFRNKNYTRGYL!ELMYCKQVLISNTTLVNSPSWNV SFMGEELSDSYPRPHLLTLDGCNKLNIDGVTFQNSAYWTV $\square W Y P E T S S E K \square A K K R P R M V R F V R C E R V Q G V V F Q N S P S F H V$ ASWDY ITTNSYKRPYLIRVDGSTNGKMSEVTHKNAPSFHV NENWWNWVDGKDFPNFVQPYKCKNVLIDGVTILNSPMWVM
AWWDAFAANAALLRPILFVIDLHGGSVGGLNMRNPPDWFN A WWDAFAANAALLRP LFVIDLHGGSVTGLNMRNPPDWFN


UniRef90_W4BEV8

KFDSSG S\| |K|V|KN|V|T\|S SPGDS\|NTDG|IHLQNTRD SVSNPAA LTMTGITVVDNQGDATNSGHNTDGFDVSADDV FMDTVTN GE
 HPVLCENVIVQNVT IISHGGPNNDGCNPESSRNV


 $V V$ L RSSSVALDRRLRVASPPGSVNTDGIDLAARDV


 H $P$ LMCE LIA N S S D L V S $\qquad$ \begin{tabular}{l}
$\mathrm{N} L$ <br>
Y P <br>
\hline

 $\checkmark$

S \& V S <br>
K \& S <br>
\hline
\end{tabular} LV H S S K NVLI H D LDDI YPCI S SNRETD LVVHTSQ NIVYDGLTIEAVS TSSVEAKNTDVDDYDS SHV

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

DGNSANS HPVYCKNVVVK SLT

SVKGDTS
 LVVNSSNNDVFDSMYLNASSSNSNPTA NSGEDTYRSDNI $\vee \vee E A G S N G E V Y N M A I$ NM Y

QCKDMLIKDVTVTA
 $G V T N \quad S N N L V L T N T T L N T A S$ T S DNEAKNTDALDVVSSSG $H \quad P L Y S S N L A L Y G L T D Q S D P D S P N T D G L N P E S C E N$
 F V GNSTEDVVFTNI S I H SVSS $\qquad$
VAIVD TVVISAPGDSPNTDDIVVK Q S S DV
H PVVYSSHVIVVSGITILAPPVNSPNTXDINPDSSSS N


 LIANSS NI I V S DLD L K VK S $V$ I QS GQNGEIVNNAAI TL NWTSHYFQSKK T $\mathrm{H}^{\mathrm{L}}$
HLY D
LY S R HV TL $L$ NTSSI A P D YSPN T D GVVVDDS S S D

$H \quad L \quad \mathrm{G}$
H P V Y
$H P V L C R N V I V D N D$
CRNVIVQNVIINSSLKVRNSDGDDDHSKNV

S IQQ N T K T AI F F N L H I E A T S HI VA N S S NVVF D GLDI S GY S T SVHVAKNTDGWDTY SVVKGGATNVVFSNLKMDAN H $\quad$ VMLES Q N F L L T N N N L R F I N L L K I E H I T Y S S SFTAYNLK N
H H
$H \quad L Q A$





 R F HPAG

VETYHE
 CDDyld

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| :---: | :---: |
| UniRe90- F802Y |  |
| UniRef90-U7Q2J5 | DI EVSNRDECVT 1 KDPSQHMLIENTY |
| UniRef | VIEDSYIVSG |
| UniRef90 | RI ERVWVDSDDDCFSPKNNTDTHVNTMYCNNSHGQSLGS䀎 |
| UniRef90_UPIO003B4F97F | LIRNCLFDTGDDCTATKPSENIIIQNCDMKDGHGGVVIGS |
| UniRet90 | TITDSTUNNGDDCVSLKPNTDVVVSNLWCNGSHGISVGSLI |
| UniRef90 UPI000346F09C | VVSDCHFDVGDDCLAFKPTENVTVTNCTMQNGHGGIVMGS |
| UniRef90-I3C3J6 | HI KNCLFDTGDDCIA ${ }^{\text {a }}$ KPSENIVVENCEMKDGHGGVVMGS |
| UniRet90-K1WR29 | QNSTITNGDDCVSFKPNTDITVRNLSCNGTHGTSVGSL |
| UniRef90-FOY | TVDDCWVDTGDDNVATKECVGVEVRGGT |
| UniRee900 B8NKB9 | WI HDVMVTNKDECVTVKTSHNFQVEVYCNWSGGCAMGSL |
| $\begin{aligned} & \text { UniRef90-UPIOO0368881B } \\ & \text { UniRef90-D3ED50 } \end{aligned}$ | WVEGVAFSVGDDCAAGKPTRNVSVRNCLMERGHGGLVIGS |
| UniRet90-R7CY64 | LVVNSTFDAGDDAICDKPTQNVIVYNNTVLHGHGGFVVGS |
| UniRef90-M1VZ77 | VVQSSTVKNGDDCVSFKPNTDIVVQNLACDGSHGTSVGSL |
| UniRef90-UPIO004412496 | TLHSLKVDNGDDCVSFKPNTNIYVDNIWCNGTHGVS |
| UniRef90-UPIooo444A2A7 | VI DNSNI NNGDDCVSWKPNTNMIVANLVCNGS |
| UniRefor ${ }^{\text {N }}$ NVJ | VIQDSYIINTDDCVSFKPNTNTVVQNLD |
| 㑑 |  |
| UniRef90-UPIO000409D80C | HIKNSVFDTGDDCIAlIKPSENIVIENCEMADGHGGVVMGS |
| UniRef90-S8BTG5 | LI NNATVYNQDDCVVVSDCDGVTVVNSYCHGSHGLSI |
| UniRef90-UPIOOO32A5564 | RI EDCYIVSGDDCVAVKSGWQLVI RRLTCSP |
| UniRef90-C9SL19 | VIQDSVIWNTDDCVSFKPNTNVIQNLVCHGSHGISVGSL |
|  | V YDCYFDVGGDA |
| UniRef90-X8JPN6 | TIIEDSTVINQDDCLAINKGSNTVFQRNSCTGGHGISVDSİ |
| UniRef90-R7DYT4 | LIVNSTFDVGDDGICLKSCENVVVDGCTVFKGHGGFVVGS |
|  | T S SVAl ${ }^{\text {T N D D D CVAFKPGNY }}$ |
| UniRef90_A1DBY5 | VIQNSRIFNSDDCVSFKPNTNLVQNLYCNGS |
| UniRef90_UP10004621CA8 | WI HDVEVTNRDECVTVKSPSNLLVERLWCNQS |
| UniRet90-UPIod | VIEDCYISTGDDLIA KSGWNI TI RGLTGHNRNGSGI IGS |
| UniRef90-UPI0003F9A685 | LIENVTFNNGDDNVAIKPSENI IIRNCNFKGLHGVVI GSE |
| UniRet90_I1BPA |  |
| OWX25 |  |
| UniRef90-UPIO0042B4FF4 | VKSGWDIVRRDSGT P T CSGl Gl Gs |
| Z7 | SVTNGDDCVSFKPN |
| UniRef90-UP100037B6A71 | R RNAV DCNDDA AMKAEQN A MNTLLQGRGM |
| UniRef90-MORNW7 | VIEDCYIVSGDDCIAMKSGWDE |
| UniRef90-UPIO00469418F | RINNCYIESGDDCICLKNCENIVISNCTMTSSSCAl KIGS |
| UniRet90-18W2 | LIVNCAVDAGDDAICLKPCANI |
|  |  |
| UniRef90 UPI00039E00D4 | CI ALLKPIENVVIQDCQMKDGHGGVVIGS |
| UniRef90-G2XI | VI QNSVINNGDDCVSFKPNTNVVQGLQCNGSHGISVGSL |
| UniRef90-G8TG27 | RIKNCDIVSGDDALCFKTCSNIVVSGMRLKSNQGALKMGT |
| UniRef90-A8MAP2 | VVRGCMI DVGDDCLVIKPSENI HASGC |
| UniRef90_MYYL16 | V I E |
| Ret90_S0EWP8 |  |
| UniRef90-R5M | ENCTFQTGDDAIAIKPSRNIVIRNCUFHSECN |
| UniRef90 W6U512 | RI SNCY |
| UniRefogo-IIJBJ1 | VIVNCNISTGHDAIVLKSGWNVHIRGVYLSSSGAG |
| UniRet90-K9FUH1 | TISNVSVTNNDDCVAFKPADGVIVKDLTCDGSHGLSVG |
| UniRet90-B60H17 | VIQNSVINNGDDCVSFKPNTNLVQNLHCNGSHGISVGSL |
| ef90_Q9UUZ2 |  |
|  | DFSVGDDCIATKPSKNFIK K C SMKYGHGGVVIGS |
|  | QNSWANVGDDCVSFKPSTNMHVKNLTCYNSAGIAI GSL |
| UniRef90-B9SAU9 | VVSK |
|  |  |
|  |  |
| UniRef90-UP100035DCD19 | EGCVLDVGDDA CLKPTENG |
| UniRet90_UP100037FC281 |  |
| UniRef90 F8P1Y8 | NDDDCVSFKPNTNLLVQNMNCLAGDGMSVGSL |
| UniRee90-W0RBQ5 | ORSINNGDDCVSFKPNTNIVVQGLOCNGSHG\\|SVGSLI |
| UniRei90 ${ }^{\text {A A9UZ }}$ | RDCYFSTGDDSVATKSGWNITIINCVFHPNAAGICLGS |
| UniRef90-K7UN42 | TITNTVIGVGDDCISUGPTSKVNITG |
| UniRef90-DonHA9 | TI TRNR\FGQDDCLAMQSSTNTVFSYNFCCGT |
| UniRet90_G9MFJ5 | K S |
|  | TI TDCVVDTDDDAI CFKSEDNVTVKNCDLSSNCNFIKFGT |
|  | DCICLK |
| UniRef90-G8TBJ7 | KITRCNVNADDDGUCLKSCENVEISDCVVRSSASALKFGT |
| UniRet90_S8BUV1 | II I Q S VVNNTDDCFSWKPNTN |
| ef90 - X0KVL3 | VIQNSVIDNTDDCVSFKPNTNVVVQNLVCNGSHGISVGSLL |
| Ref90_UPI00029A | VIEGSTFDVGDDG\| CIKPTENVIRNNVVYHAHGGFVVGS |
| UniRet90_D8QUK0 | G |
| UniRef90-K2J263 |  |
|  | VVQNSIINNGDDCVSLKPNTNIVVQGLHCNGSHGISVGSL |
| UniRef90- B9IF34 | FVDYSR1MTGDDC, |
|  | VVENSNA GDDC S |
| UniRef90 UPI000440F29A | GDDAISPKNSSNILIQDATFHGTLVSIGQMD |
| UniRef90 ${ }^{\text {W }}$ - ${ }^{\text {HBP23 }}$ | CTEDCYIESGDDLVAVKSGWNIII QRVSTTPTCSGVGFGS |
| UniRef90-891F57 | CDIVSGDDALCFKTCSDIVVTDMKMKTNQAGIKMGT |
| UniRef90-UP1000364ECD8 | D D |
|  | S |
| Ret90_UPI000466D977 | KSGNRHFEAKNVRTGSGGVVFGS |
| UniRef90 W4BEV8 |  |

UniRef90 UPIo00350A32E UniRef90-F8Q2Y2 UniRef90-U7Q2J5 UniRef90-I1P726 UniRef90-L2FN43 UniRef90_UPI0003B4F97F UniRef90-S8DSM3 UniRef90-UPI000346F09C UniRef90-І3С3J6 UniRef90-K1WR29 UniRef90-FOY3K5 UniRef90-B8NKB9 UniRef90_UPIO00368881B UniRef90-D3ED50 UniRef90-R7CY64 UniRef90-M1VZ77 UniRef90_UPIO004412496 UniRef90_UPI000444A2A7 UniRef90-N4VJ97 UniRef90-D7U2D3 UniRef90_UPI00023B2D36 UniRef90_UPI000409D80C UniRef90- S8BTG5 UniRef90_UPIO0032A5564 UniRef90_C9SLI9 UniRef90-D3EEH3 UniRef90-A9TKN9 UniRef90-X8JPN6 UniRef90-R7DYT4 UniRef90-B8NPS8 UniRef90_A1DBY5 UniRef90-UPI0004621CA8 UniRef90-K7UZB9 UniRef90_UPI00042B18EF UniRef90_UPI0003F9A685 UniRef90-I1BPA4

## UniRef90 JOWX25

UniRef90_UPIO0042B4FF4 UniRef90-R1GZ71 UniRef90_UPI00037B6A71 UniRef90-M8CS39 UniRef90_MORNW7 UniRef90-UPI000469418F UniRef90_I8W2P3 UniRef90-F9GG38
UniRef90_UPI00039E00D4 UniRef90-G2XD66 UniRef90_UPIO004412AAB UniRef90-G8TG27 UniRef90-A8MAP2 UniRef90-M7YLI6 UniRef90-SOEWP8 UniRef90-R5MV45 UniRef90-W6U5I2 UniRef90-Q5ENB3 UniRef90-I1JBJ1 UniRef90-K9FUH1 UniRef90_Q9UUZ2 UniRef90-C3WD23 UniRef90-G9NE20 UniRef90-B9SAU9 UniRef90_A0A022RI00 UniRef90-Q1PES3 UniRef90-UPI00035DCD19 UniRef90_UPIO0037FC281 UniRef90-F8P1Y8 UniRef90-W0RBQ5 UniRef90_G9MYN2 UniRef90-A9UZX8 UniRef90-K7UN422 UniRef90-DONHA9 UniRef90_G9MFJ5
UniRef90_K9EEJ7 UniRef90-R6J2KO UniRef90_G8TBJ7 UniRef90-s8BUV1 UniRef90-XOKVL3 UniRef90-UPI00029A0D9E UniRef90_D8QUK0 UniRef90_K2J263 UniRef90-F9GG41 UniRef90-B9IF34 UniRef90-W1NT09 UniRef90-FOYAA8 UniRef90_UPI000440F29A UniRef90-W5HB23 UniRef90-R9IF57 UniRef90_UPI000364ECD8 UniRef90-K7M4Q4 UniRef90_UPIO00466D977 UniRef90_W4BEV8

210
220

240 TS DVTVSGVVIS GNTVVNSQQAFRIKTDASATGSTVSNVT GSALDIH DI RFDKVYSANCNQMFMIKSHGGGGGTVRDCS EMSGGI RDVRAVDNVADDTESAVRI KSGVGR GGYVKDVF GQYEGVKDVVIENVWMLNGNNGARI KVWAGENTGFVENVT EMSGSVRNVFAEDCQMDNGDRALRIKTN SGRGGTVEGIF GQYAGVANLFVKNVTMRYAENGARIKVFAGGGTGYVRNVT

 GEGGTVRDVVLSGVRFVKTSNAARVKTWQGG SGAVANVT GSGTNVSNIVYRNLYTWNSNQMYMIKSNGGD GEVSNLL EMGGGVHDVTVEHCSFRQTDRGLRIKTRRGR
 EMSGGVKNIYVDNCTFLGTDVGLRFKSTRGR GGIVVNIH GQYDUVENVYVYNTSMKNASDGARIKVWPSSYTGYVKNVT GEYDGVENIYVNNVHDQNSENGPRIKTWAKRGYGYVNQIV GQYDTVENVTATNVTMSNAQNGARIKAWAGAGVGGGKNITT EMSGGI SDILVEH DHLDQSSTGDKLKTTKGR GGYIKNGT PNEEPVVGI SVKNCTFTXQQNGMRVKTWPTSHQGTASKMH E $\square$ S A GVRNVFVRNCTMDNDDRADRIKTNTDR GGFVDGVY GSSGTTQNVSFKNCITENNTTPIRIKTDSGGE GQVLNIL EMSGGIEDVRAEDIVADNSESGVRIKTAVGR GGYVKDIV GQYAGVEDLY YYNISMANASDGARUKVWPGDETSFGGLGR
 ASDVTVNNVQILDNTVTDNAQGFRIKTDAGTATGLWNDHR EMSGGVRNVSVSNCQFLGTDVGDRFKSKRGRGGVVENDW SSDDTVQNVYARNDTMINSSKAAGIKTYPDHGLSTVKNAT GQYDDVENVLVYNTSLNNASDGAR:K K K
 EMSGGVSEVYAENDFFFNTSTAI IIIKTARGRGGYVRNIY MS A GVKNVFVENCKTVGY LKRGIYLKTNADRGGFI KNVF GKGGTVKTVRVLDSVCNNCQNGVRIKTWPGGE GSVVDVK $E \square S C G V Q D V L V Q N C L F R R T D R G F R I K T R R G R G S S V V D G V R$ EMSGGI FNVTI EDMHVWNSAAGVRIKTDKGR GGYI ANI T GQYDYVENIVVYNAAMYNSSEGARMKVWPNAFSGLVANVT TSGGVVNNVVAHNHFEGSMYGLRIKSSRGKGGGQVRNIR

 DTGGGIDRVSVRNCRFIDTDTGLRFKSKRGRGGVVSNVV GSNDIVTNSIFKDCTMIGSTKAAGDKYYPGHGTGSISNVT EVSGGARNIYAENCDMDNDDRADRVKTN KVRGGK I ENNLI
 S D G A A
 EMSGGASNVYMNNDEI GTVKNAIVGKSNRDR GGYVIN IV ENMDK INNVVINNCVI SKSNRGI GD QNRDEGTVSNVI EIS G GVRNLFASNCRLDNLDHAL RVKNNAMMGGLLENLIH
 GQYPGVENV LVYNDSMFNASDGARUVVWPGDNSGSVVNVTV
 GQYDVVENI TAEDVTLDGSRNGAYIKTYVGKRTGYVRNVV. QNEKDVNGIMVTNCTLSKTNNGVRIKSWPGSPPSAASSITT


 GQYDUVENVYVYNI SMSNASDGARIVVWPGSYTGYVMNVT

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



 EMSGGAKNIWVYDCSFIGTDDGDRFKTTRGRGGVVEDIV
 GQYAEVVNVYIVYNISMSNASD GARIV V WP GQYS GYVVNVT G $\square$ D G TVEDVHVSDVVFTETTNGARIKTWQS





 RLLN
 FEDFIVDGC DYAFQ DQSCYGEDDTNPGDAVDEGIVVKG

 IS NV T LA G VD TALK FN SNHPDEFYDPNALPVI ERI T DK D
 FS HVVKME QVSHCFVIVNMFYHCDPDGHSDETPAVQNITDSD





 $F$ Q NF $\quad$ S R GTA Y GLLD


 $F R N I D V G Q V A H A V I T I D F N Y E E G A K G S F T P V V R D V T V D G$
 Y D TMSI H N V D WA L L T Q C Y G Q S C DE Y P S K L T I I T D I H F K N

 FQD I M D SVEN PILI D Q NYGSHSSEP S RVKIS DVHYK N


 YDGLYNSNN DWAI ELTTQCYGSTCNEYPSNMTISNVIVFN










 $\square 1$ A N V T M E
 MS HVVYME E AR K GI R DS G D H P D D K F D A NA DP L V K GVVT I K N


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



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




 l FS GTTS GHYK DVVANMDCS G GTCGIVKIEDFTVTAPS G
V T A N T A DN Y A

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1 \text { K C }
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F S \text { GT T S D K Y V } A N \text { L }
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LK GT



 FWGTVVS
$V V A N G A$

| $\begin{aligned} & V \\ & V \\ & \mathrm{~L} \\ & \hline \end{aligned}$ |
| :---: |
|  |  |

$\begin{array}{ll}R \\ R & L \\ S\end{array}$
KA I F VRGLPEMNDKDIVLENVTI QAKK G

M WG T SKRY
 $V$ H GTCK S E V A V S I A C S E S I A C T N I V V N G L E I R S S E P QV I



$V W G M K V L Q$
$\begin{array}{llll}V & S & D & G \\ V & I & C & A \\ V & G & A & \\ & \end{array}$

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K WVCDNVN
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CSN
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K L C G N
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MA $\square \mathrm{C} T \mathrm{NAKGST}$
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PC
Q HVCKNLYRG VYDCQNL

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$Y \square K S F A D \quad K G G A Q L Y V P P G R W L T D F D E K D A V$ KAFKDAWKKTCNFFGAQATMEIPQGYTFLLQPIEFHG EAFKKAWDETCSSNT AVLVVPENKKCHVKPITFSG
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EAFKKA DEACTKNGGGKVVVPTGKFDTLHLEDGAE





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A $\square$ TAAW SACAS GGQVY $\square P A G D Y V S L K H G T G V S$ AFEKA ØADVAAKGGGKVVVPRGMWLTLHVEDGAL EAFLAA WKDACNSSDDPSLFLVPBEKTYLLMPLSFSG


T NDAAA $\square$ QSA $\square$ DACNAAGGGRVVLEGGHTYYLHLEQGAL AA ANCHRQGGGKVII PGGDYVELHLESGAY CTLTASDDGPTFVQAAQEC STVTIPTATTLNMTGLANTD CTFTTAAAASGKSSCTT $\square T \square S N D A V P A G T T D D L T D T K G T S$ ADKGGAQLYVPKGRWLTGSFNLTSH KNPNGATLYLPPGNYQTLNGGSKWA
 $G G G K V V V P P G E Y I E L H V S R G A T$
$G N G E L D R P L K K F K V T Q R Q W D K F$
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CT QAF AQADEACNAAGGGRVLVPAGTFLTLHLEKDAV AIINACNTNGGGKVLIPKGSYLVLHLEEGAR

T LIN T K S $\square$ NQA TT DCNKRGGGVVVIPEGLWLT LHLKKNAL AFESASHIVQQNAPGGTHLHIPAGVWLTFNLTSHMT SAAA ILKAARDCND GGTVVFVPDATYVDLTFLKHDD SDTPA II HAAFKKGGGRITVPEGVFLDLHDAKGAV KAlQDA IDAC TPGGVVVIPAGTYYTLNDEKGAT AIQQAFDDCVLTSSSASTLYVPAGDYVTLTGGTKWA ■DAFRAAWGEACRNSTTQAKVLIPAGTTMFAGPCTSPK

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 GSRLVVPEGQYLLLSNATNWA

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AFASAWD SACNAGGMSTLVVPAGQSFMVTKLNFSG
$K A L Q A V \quad \square D R C A Q E G G G V I V I P R G T F L N L L V E E G G K$

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$K A D Q K A \quad D D T C T S E G G G R V L L P G G H T Y D F H L E M G A V$ $D N T T A G Q S A \square A A V P G T L D R P A G S W M T L L I D E G A V$
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SWYPYAEDKDFDRPNLLVLNRCKRVLLEGVTFQNSPAWNL M WWNMWRQKRFTRPNLLELMHSTDVI SNVVFQDSPFWN TWWNALAGNATVVRPLLLGTDLKGGSI TGLNMRDSPNWFN DEHWWPWKRHYLRPNFIVPYRCKHGLIGGVTVLNSPMWQV LWWNAFAGQEDRRPVLFTVDNANRVLIDNITLKNPANWFN WGGYECRDDGPRLLIRMVTSTDWSLLHLLLVDS ATWPYNDCKKTKGNCAPL NTTWWPWKGKHKRPPFIQPYRCNNVLTEGTTTKNSPSWHV WQTWFSRPPAHMRPHFI QFNRCENVLLEGI QI TNSPFWTI GYE FHKNNKYGPR LLRFFDVKSFSMHDVALVDSPAFHF GYL YRNLNNTDRPRLVRLISPINASVHDLILVDSPKFHM
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GS WY WKQGTSDSRPVFFRMNKVLSSTVSGFTLKNMPYRTF SMQAQHEHMEENAPRLIQTRRSHDIVLEGTTLRNAPNFHV HNFAHWKPRHYLRPAMLEPVNCTDVLI GGVFVDSPFWVI

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$\square D N \square Y M K D \square P T E A L S F N M Y Y$ G GQA P T DET TPPQFRN $\square F L N D$
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 Y T N N KL S N A V K N A I V L H S D Y S G Y T G S P T S E V T
 V C G




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|  | UniRef90 Q9WYR8 |
|  | UniRef90 UPI000441 |
|  | UniRef90_R5JT46 |
|  | UniRet90_R6FSY9 |
|  | UniRef90_UPI000440889A |
|  | UniRef90_J3M. |
|  | UniRe |
|  | UniRef90-UPI00047C32EC |
|  | UniRef90-A9k |
|  | UniRef90_FOXH57 |
|  | UniRef90 UPI00037324B8 |
|  | UniRef90-MOU |
|  | UniRef90 17A6 |
|  | UniRef90 W9C |
|  | UniRef90-E3Q6U4 |
|  | UniRef90-D4KCW5 |
|  | UniRef90_R6KC |
|  | UniRef90 UPI000455F97C |
|  | UniRef90 W5 |
|  | UniRef90 |
|  | Uni |
|  | niRef90-UP10004408 |
|  |  |


| FYGVASKKYDPQVGSVANPDAVSNWSFTKIVVINATNRGNC VKTTDVCDGNA FLIGRPESHCKNVTADNV QUSAKKGUAD FQGTSSKKYLPLVGNLVCSSPCSDIYASDVNVVSPNGT <br>  <br>  VAGTYTYQ AVVRLACSDARPCTGVSMADVRLSPASAA VGTSEKKPAMGQLLCSKSFPCRDVEMNDUNG DNRELDKNSVIFLTGMPDNYDRDI QLNNDQMTVSGGGTF $V$ LSLNSTK APELKGDEGASFEEI CFKNFTVLGLGGQSA I SGTSSGKEKTVVASLSCSPRCSDLNVNNTTLSPPSGGA VKVK NGGKYGGLAKGYKEDPVENVGFKNVTVDKVKE |  |
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| L <br> V <br> V <br> V |
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$\square$ SGTSSGNEKS LVASLDCSPRCSNTNVNDLNLSAAKYQPA MNCKGVSACVLCAVGLPEMP ITGKLTFENVDVS


$T Y C D G A$ EDAVIIQGDPEMK DKN VLNNVVMTSKRGVS $\square$ LSGTIESTATNLLVECGSGSCT FDGTTSSKYSPRVGTLVCSSPCLNTNASKTDTETPTGANP VTCKGTENGVFLSGNEENHIKNVLFENVDV
 पRGTSSEQEA पQ\|LCSKSAPCHG ILHNVDLSANHTAPT

MEGTNDSVAGVLSGDEGDPFTATCLSSLNFDAESAASS WDGAVVVQRSPIQILCADGAPCSEITLQNVNLWSDTNAA

 $\begin{aligned} V V G T S A T E E G U I & \text { VACSS GLPCKKGV}\end{aligned}$

 IRGT DATDSVAAFQCSGAAPCPG IALVGVDVATPNSSAQ
 $V V C D G A A K$ AVVI RGLPEMSDSDIFLDNLTIKAKEG


VRGNSTGAVVSSVICPKGSDC DVKFKNVNDKPKTGAAP ITA AGAKE ASFFQGLQEMPVDGVTLSNINVTADKG WDGNVANGVQRSPDQ\|LCADPCSDITLTDVSLTDEATMKC

 WSCTDGLQRGPDKFNCPADVPCVDLQVDDFTVGSSKGNVV VTGSVADGAKRPP LYLIANDLTTNVTV EDVSVWTETGDSV $V N C Q G A R R A M Y F N G L P E M N V Q N V T V S D C N I T A$
$\square N$ G VGEGA DNDHSEDPDADS GDTFSGVTFN
 FSGSVADGALDRPPLYLFASDLTTNVTVEEFSVWTETGTVV VQATDIDRATAAFIVGLPEAPIQRVTI EN
AHNDCBRPSSVGLKQAPI EDVRLERDHVRFAGGGTP


$V T C N G A$
$I$
$I$


V H A D





| UniRef90_G4ZL42 | T G E P $\square$ T VK |
| :---: | :---: |
| UniRef90-S8BK46 | Y Y SCYNM |
| UniRef90_D1P8N1 | R F V |
| UniRef90-W9VTS7 |  |
| UniRef90_UPI00025596D7 |  |
| UniRef90_M0RS27 | S W $\quad$ C S NVS G F S |
| UniRef90_W3AMD4 |  |
| UniRef90_M5TS94 |  |
| UniRef90-11NNX1 |  |
| UniRef90_V4KM77 | S WQCLF VD G S S |
| UniRef90 R0F991 |  |
| UniRef90-UPI00023B2E92 |  |
| UniRef90-E6X8Z6 |  |
| UniRef90-W9R8E3 | A WHCELVSG |
| UniRef90-W4JPM5 | TYTCQNVN |
| UniRef90-Q153G0 | WNCSNVQGFSSL |
| UniRef90-UPI00047AE9B3 |  |
| UniRef90_R7PMP9 |  |
| UniRef90_W5H7J4 |  |
| UniRef90_R6IEN0 |  |
| UniRef90-F0S4Y1 | ENARHEV |
| UniRef90_G1X1C9 | T F T CRNM |
| UniRef90_Q9WYR8 |  |
| UniRef90_UPI0004411626 | K WS CHNVN |
| UniRef90_R5JT46 |  |
| UniRef90_R6FSY9 | IS Q A R NVT |
| UniRef90_UPI000440889A | $\checkmark$ V K C S A F G T G |
| UniRef90_J3MJD5 |  |
| UniRef90_S7Q702 | TYGCQNVN |
| UniRef90_UPI00047C32EC |  |
| UniRef90_A9KMH4 | K N A N |
| UniRef90_F0XH57 | LY $\square$ C Q N A Y G |
| UniRef90-UPI00037324B8 | V |
| UniRef90-MOUT96 |  |
| UniRef90_17A6S5 |  |
| UniRef90_W9CPL9 |  |
| UniRef90-E3Q6U4 | Q WLLCVNL |
| UniRef90_D4KCW5 |  |
| UniRef90-R6KC49 |  |
| UniRef90_UPI000455F97C | $T C Q N V N L T G$ |
| UniRef90_W5CQC8 | K A K IL A Q G |
| UniRef90 V9LTY4 |  |
| UniRef90-J3NA05 | A WS C S NVS G Y S |
| UniRef90_UPI00044089AF | T NKCRSAFGTG |
| UniRef90_G4RFK4 |  |
| UniRef90-I1D2E4 | T F D N VT $\square \mathrm{NGGV}$ S Y |
| UniRef90-R7ALZ1 | S N A |
| UniRef90_F8EFP4 |  |
| UniRef90_R5CJH9 | 1 N N T D G V $K$ |
| UniRef90_V7BF18 | TNVK P T I T G K |
| UniRef90_UPI000367D7F1 |  |
| UniRef90_B3G4R3 | CS D Y H N P S G |
| UniRef90_B7F1B6 |  |
| UniRef90_UPI0003788752 | $P \mathrm{G} V \mathrm{I} \mathrm{E}$ NVEEG |
| UniRef90_UPI00040CCC1A |  |
| UniRef90-W4JTF9 | S V VC S NV |
| UniRef90-H6W9B1 |  |
| UniRef90-X0C4R7 | E NVP SVA S |
| UniRef90_C6Y3U7 |  |
| UniRef90-M0SP80 | P WT C A DVS G G |
| UniRef90-N4VGD4 | K WTCTNM |
| UniRef90_Q65F26 |  |
| UniRef90-X8JGW8 | V H R C F S VT S |
| UniRef90_UPI000289D701 |  |
| UniRef90-S8DW34 | S G A C L K S G S S Y |
| UniRef90-K7LGW5 | V S S C S N A K |
| UniRef90_G7FZ60 | V NHV V N F T |
| UniRef90_UPI000477C296 | K S I HENV |
| UniRef90-A0A016P7S5 | E HICKNAYGSG |
| UniRef90-I8TRX0 | $\overline{\mathrm{V}} \mathrm{NK}$ K SNVFG |
| UniRef90_R7DIY5 |  |
| UniRef90_W1PGG9 |  |
| UniRef90-G2SCJ4 |  |
| UniRef90_G2Y1Z9 | EA Y C L N VN |
| UniRef90-A2QM67 | $\underline{\mathrm{V}} \mathrm{N}$ K $\square \mathrm{S} \mathrm{N} \square \mathrm{F}$ G T G |
| UniRef90_W0HWF6 |  |
| UniRef90_W5X7J5 | E $\square$ A K T T $\square$ |
| UniRef90-D4IL57 |  |
| UniRef90_UPI00032AA1DE | T N T $\square \mathrm{P}$ N V S G |
| UniRef90_UPI0003B3992E |  |
| UniRef90_B9GA71 | ASFCRNAHG区VA |
| UniRef90_D1PUZ1 |  |
| UniRef90-B9SWS1 | Y A F CNNAYGS S |
| UniRef90_Q0ZJ78 | S GQPSNVG |
| UniRef90_H8L3X6 | $T H \square R L K L L G G$ |
| UniRef90_UPI000289AC97 | VR NAAGGD |
| UniRef90_F5IYV1 |  |
| UniRef90-E0SDK6 |  |
| UniRef90-K7MZJ4 | S WFCSNVIGFS |

CTEAFSKA $\square E A D S Q K G G G K L I V P Q G V W F T L H D E K G G \square$ AFLKAWNETCKAQSPDATMNIPA KTFDVNPAKFWG

$G T V Y$ LPA GKYFT TWWDDEGAV
 A DKGGA QL Y V P P GRWL T L F L E K GAV $\square$ NEA A H N G G G T I VI P A GEY L DLR $\square$ I K N A K K T T D L N NVVK D $\square K G T L L W S K N T T Y W$
$\square D K A A S Q G G G V I V I P R G T F M H L H V A E G A V$






A $\square$ D A A T T A G G GKVL IPR GNWLT L H L E E G A S
A A DD S A H A $\square$ A G GT VV DP K GE WLT LDH LEE GA T K A II D E C S K T G E K V Y FP A G E F
EAFKKA
$\qquad$

CTVYA YDDVPN L L KAFK DCGDGGY PA GQNYNVK

TLINTTADQKA A D R C S A E G G GR V L L P R N H T FM A GPIS NVE


RAFRDA $\square$ RACHRAGGGRVVVPRGRFLDTLHVREGGT
VS A Y VD A S A
K A $\square \mathrm{T} \square \mathrm{CS}$ D N G G G K $\square \mathrm{T}$ VP A G T Y Y MV H L E K G A $\square$ $T V G L Q N V T V D L R G T L L W S T N \square T Y W$ ID A A A EAGGGKVIFPAGTYLVLHDGEGVI SAIDDCSAATHCYVSFPAGKYVTVYGRSGVV

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


NTTGLVNCTVD $\quad$ TKGT LLWGTDDQYW TAFLQAA!MA TPVGGTLIIDEGTYLVLKSNVNDY NSTSDAAA A DA DAFVKCASD【VFSEGVEYVATKLSNVV
$\square D$ K A Y Q K G G G T $\square$ V IP K G T Y LT L L LQ E G A V
 S A I K K L T S V G G G L L KL T S GVVF F H L Y i E E N A T

MK R F S T C G S R L V V P D G Q Y L V L S NGT N WA




 K A L Q A V IDD LTT A A S S


T G L E DVD $\square D$ Y F GMKK D GTI

NT T G L S N CN $\square D \square G Y$ G T L L WS T N I T Y W
$1 D$ K A S QA G G GVVY i $\quad$ Q Q T Y L HLY I E K G G T
 $C N V T$ A LD DVPNGLEAFSRCGGTIVDFPEDQNYNVVIDWRGV
 UniRef90-FOWD02 UniRef90-R6QR62 UniRef90_A7AYR2 UniRef90-E2PY07 UniRef90-W1PWJ6 UniRef90 N6TX03 UniRef90_UPI0003B34FC3 UniRef90-H3НОАЗ UniRef90_UPI0002C2E0A3 UniRef90 C3PWH1 UniRef90_T0K888 UniRef90-S8CV93 UniRef90_UPI000380F7BA UniRef90_A5FF90 UniRef90_R9KSF8
UniRef90 K9DBY0 UniRef90-A2WKJ5 UniRef90_R7DLB5 UniRef90-R6R2V5 UniRef90 G2T2X2 UniRef90_UPI0003B7A009 UniRef90-FOS5R9 UniRef90-F9D3X4 UniRef90-R4JBJ1 UniRef90-DOPOI2 UniRef90_UPI00029B1C69 UniRef90-M5C261 UniRef90_A3XJ51 UniRef90_UPI00035D6F23 UniRef90-F4C6L8 UniRef90-I6YZ34 UniRef90_UPI000469E556 UniRef90_Q022X9 UniRef90_UPIO003740EEE UniRef90_S8ADF5 UniRef90_R6L3W1 UniRef90-UPI0003FF0923 UniRef90-D5EXB5 UniRef90_A7VA73 UniRef90-UPI000479CF56 UniRef90-UPI00036B87F2 UniRef90-A0A024RWG1 UniRef90-E2PY67 UniRef90_R5E506 UniRef90-MONPL8
UniRef90 R6DHM5 UniRef90-K7STY6 UniRef90-K9EP82 UniRef90-J419P5 UniRef90_X5DWG8 UniRef90_S8EEQ0 UniRef90-X8IYB9
UniRef90 W9CEQ0 UniRef90 UPIO004409123 UniRef90-X1FSP8 UniRef90-R7R2C6 UniRef90-W5W2H1 UniRef90_M2ZQ35
UniRef90_UPI000237CBED UniRef90-X8JEP4 UniRef90-R7GAL2 UniRef90-H1UUV8 UniRef90-S8C8R1 UniRef90_UPI000468FC2B UniRef90_R9GT95 UniRef90-F6A9C2
UniRef90-F8F1E4 UniRef90-F9FBF9 UniRef90_R6CJ38 UniRef90-E6MT888 UniRef90_J2KDY8 UniRet90_UPI0004708268 UniRef90_UPI00047E708C UniRef90-R5JRGO UniRet90_UP100037553AD UniRef90_M7TUX5 UniRef90-K9DX54 UniRef90-K2QNA4 UniRef90-E7CIQ4 UniRef90-M7SKB3 UniRef90-I1BY64 UniRef90-M7SGF4 UniRef90-G2Y8Y2 UniRef90_F0R2J8 UniRef90-18×3H3 UniRef90_B6Q638


MHDTGSNLK\S AS P FWFDGK G A LLFSPDYPFVKTSFEGPDSGNGLTNVAITGQQADDGNGE PCVPTR $\square \mathrm{NDQVASNNYWLHFAYLGGLTLTGS} \mathrm{GTIDGQGA}$ LILRGTYQSEDQENEYILGTWEGKDVTICGEGTIDGNWEN


LLGETDDEYNDGTWE GNPDDNFASLVTADDGPGVDDGNAQ $\| V F S G T T A F G E K K W S G P L V L L T G T D L T V S G T G T L D D G Q$ I LGSQDDE DPGGRYRSLI NGYMLQDVVI TGDNGTDNGQGS $\begin{array}{ll}L I D P T R F E G U E K R W R C A F L N F D H S D G V K V Y G E G V I D G K G \\ L E N S L P D G Y Q N Q T T A W V L & G G K H L D V N G F G G T F D G N G Q\end{array}$

LKGSNNDADYPKDYFAALVNAYGVDGFTDSGKGTDDGNGLD VELEGAILLGSTNPEAFIIASDSKN■AVNGKG\|IDGQGP
LKCSTDLSFPAENFNPALVNADGCDGFHLSGEGTDDGAGR
LRFTDNDPAVMTSWEGPLVYAFDCENVADTGTGTDQPDMD 1 VFSEDTTGAKEDRAATAITASKRKNIASTGEGTIDGNGE LVVSKDYPLVKTSWE GMMCWNYGSDDVVVSGEGTIDGGGS AILPGDIESYDETGDYNLGTWEGNDVNLYGEGS I N G GA LL GDGMTLSTDEKSEYNLSSWEGNNLDIIGPGTIDGNAGD ILGGSQDDKDYKMEWPAALDNVLDQEDAMISGKGLDNAQGK LRFDPSYPIVNTSWEGPMDYGYGLHDVADTGKGLIDGNAM

LYFSEDYEGVETYNYSSLIYAKNDENVADTGKG\|LEGQGE FQDTFSYLILKDWKKSSLVSKTGKGLIDGAGQ LLFSEDDPAVDSTWE GMIYAYECENVAITGKGKLKAKMDT I FLS RNTKYGEKKAKRSLFFAKNSENISIEGEGTIDGQGA LADSATIVFSRDSSDYPIIYAYGEENIAVTGNGILDGNAN VLFSTNLPVVFTRWEGPLIVGFEVDNVAITGEGVFDGMAS

 WTFSDDVGYWRNNSYYVKFQNHRAGFAATTGDDUI I NGAG

## L

## L



 $G N K A Y A R G G$



LDF S T NLP AVIT R WE GPLIYAYHVQNDALTGEGTVNGNGS RGAGLPLNYLNMTSAW VFGGSDITFNGNGGTFDGQGQ IQQAIQNNDYYPRKWEWPLINVYDEKNVRITGKGVIDGNGK LNISSDATYPEMQERWYVVLAENATETGITGGGEINGQGT LNSLPAGYQNQSSAWFL GGTNLRVRGFGGTFDGNGQ

LAKDSVLSAYTDRERFP DLPDNVENVVITGQGTDDGNASR $V Q L D A G S T L D Y G H S H F H N A M I W G D R L T N I G F T G S G T I D G G$ LANSMP $\square G F Q N Q T A A W H L G G E N L H F Y G H G G T L N G N G D$ LKNSLPLGYQNQSDAWK WYPTEKSKAGDGKDNFNVPDLS LKKNARILASTNRRDYPIHPSYANNVTIYGEGEDDGQNGD $\square T V A G N L S L P Q D \square P A M T W F Q \square G G T N V K W \square G S A G W \square K S Y G Q$
 V VA S G GVVDPKGR\WYP SEQSLKGSTLKGAG I LEAGK $L L G S G Y M I V Y P Y S T M V R P A S L L I N A E N I R I V G G K G T I D D G N G W$


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






L N F A GR I I L L P P F N T K Y K Y L E E L L S
L NHSMAFGYQNQTSAWWL $\qquad$
 $\qquad$
WTFS DALIDYWRNHSYP』TFQNHH
 GSWPERKGVA ALQLFS ITDLETNGLTHTNPQKAHI WWLDAKEVRGAARPRMI FLNRCEDVTI TGITVQNSPSWNI GALDTGDPRSGEADKDISLTRCTNLTLSGITLREGGHFAA KFVERFEERKWNDTGDCLGDECRPRLVGFI GCRDVHVWDV WWKDAKVKRDAWRPKTDFLCRCKKVRVQGVTVQNSPCWTV SAWYWK QGTS S TTRPVFFRMSKVISSTVSAFTIKNSP VWWD WFS SHNHSRPHLVEIVSSKDVVVSNLTFVNSPAYNI VEWKKIPFGNSGRPRLLCFTDCPGGKIS GLKMINQASWCL TWYDLVKGESNYPNRPHA LLLDGDSVFEGLRGVVQAQMWTV RFWEAFWARRKENPNCTNLEVSRPRLVFVWRCNNVQVQHN KYNYRRMRPEDGRGKLISFVKCDSITMTQITLKNSPGWTQ WDFFRPVMVRLYQCDHILIEDVTLQNSPAWNQ P $\square$ WD RFWT LRKAYKDPGNFPNSRGV

T WRKWFKRPKPHMPHL RFA WWRD LWY PFNLKNQPM HFNRCKNVTV NETWWPMCGKEVFPOLI NFVKGNRVRV ASHENWWKNEKVMPRMLSLNRCRNI RV WWVNAKVKRGAWRPNDLYLCRCKNVNV VF WDYYWNYDARRPRT RFMGRELADSYELK P


HWLKWGTVQPRMRPSFVVFWKSKN IF WWWNAFAGQS $\square R R P V L F T V G A D K V I$ WEWWFAAGQSGRRPVLFTVDGADKVSI TFTK PENNKIRPYLLWFANCKQI SV NDYWWWWCGHYLRPNFI QPYQCKNVWI
 $K$ VRNPKGEERMRGPHALLIYNVRDGSV
$E F N W M P W K F A Y F R P P F I Q Y K S K N I L I$
$G G D D G N G N A W Y E R P M P F V F W N V S Q V I T V$ GG $\quad$ D GNGNAWYERPMPFVFWNVSQVTV RYWTAFWNMDEMRPRLVY $\square S N S K N V Q L$ AFMGA AFMGAEGSDSYELKPLKDQTFDPRPHVLTLTVVKNLTDRDV AKNPETIGALEGRPFG!RMIECNNVVLKGITLRNSAAW GYV FHAQGDYGPRLI RLI NVVNFSI HDI ALVDSPAFHL SFWELKEKKSGRPSPMI RFANCRTVRVTGVRLENSPGWTL QFMDHYDAENEWYPRLLVLEDCADLVIRDLEI RQAPSWTI A WYDRF AVEPTLLRPILLVLDGLDRGSWFNLI A GPWKS WRDHHLRPNMI QFYDCRNILMQD $\square T V L E P P M W T I$
$\qquad$ EFMDGWPVAK $R$ VFDGMDGRGFYK P P
KKFSPWNNDQTVRPGFI EPFGCANVRIEGVTIIDSPFWVI VWYDFADGAGNVAGRPIIIANTTNSRFTGURFVQSQFWTM YWWDKFWGYDCERVRPVVIWKSEDVLLKDFTVKRAGFWTI MFVRRFDERKWNESGACSGDECRPRLVGFTGCRNVRDWNV
 QWWDAMNQDN RPHG $\square A F S K I S G G V \square R D V K \square W K P V A W N F$
ENWWNNPKVRRWRPRMDFLNHCKNVVLHGDTVQNSPSWND GHFDTGNPKSGQADKLI SLTRCDGLTVSGITLKRGGHFAM TWYKFNDSNRHGRPHALLITNTKNAVI EGLRFDKSQMWTM
 WY IN HRVMNIA WRGHSIGMVRSNNINI IGLYVHNTQAWA I A WWDKPGEAGTPNRPHLMQFSVTNGVMRNMKSLKPQGWNF

KFWKTFWSHRDSRPRTLFDWGCNNVNTKNVKDRNSGFWTT F LK KYEDNKDFDRPNLIGLASSKKVLLEGVTFQNSPAWNV KRNDDSQDELGKPLPFYRASDNTRYREDGINVRNVFYGGF PWWNS LWQAKFDRPP I Q W L N CKNDT LQNVTLQNSPFWNT
 TFATWKSQQKY LRPQLI QFFDCKNTTI EGVFITNAPFWCI
 HA WWPPAANGMPRPWLDEFDHVRGGKLRDVQVDNSPMWNV KFWEAFWQRRKENPQCTNLEVSRPRLVF I WKCDNVQVQHN FPVQSKKKPDKYRPYLLWFANSRNDNITGIELRNSAMW HVVDGGKESWWNVPRLIEVTGSQDFTLHKI TLRNSPNFHV PYWKEAP $\square$ NKTLRP ILLTI EGLKGGTMSNLRMRNPPNWFN AFPKVKPDRYRDRPYLFWI ADCKNITVKNI ELRSSAMW AGDWSSMGSHKDRPNMIGLYNCTNVLVEGVTLTNPAMWTL RYWKAFWDRRQWNPRLLYVSNSKNI QI S GVHLKDSPFWTT DWW RWLQQTEKRA DFVYIDECDGVLI E GVQLNQSPQYQ YWYGWIRQQPNTRPHAITFNGLTNSIVKGLTFLRSQMWTM KWWNLPSKHVNA INFASNSKLTMRGLTIKQPQVSHN SWYDR KDNTAPIVLRTTATNSVFGNFRIINAPRGHI VWYDFVNGTNNYPGRPHQLTDTGTRVFEGLRFVQSQMWTV AWYDFVKGISNYPNRPHALTIWNNSVFKGLRFVQSQMWTM RYWKSFWLRRQVNPKCTNLEELRPRLVYIVRLENSPFWTT HQHGNDSKGGPKRPK』IYF\|GCKNVRVQDVTLRNSAYWT

|  |  |
| :---: | :---: |
| UniRef90_X8JME5 | SF GNDAALTVSKVTVNNSDGNSANSLSNGKAAGHDSDGF |
| UniRet90-R6QR62 | NVLI EDVLVRNPAYAQNGDGL |
| iRef90-A5ANK8 | CNGVNLNN1 |
| UniRef90 A7AYR2 | HPYFCSHLKFIGVTVLGPKVSPNTDGLNPESCDD |
| UniRef90 E2PY07 | DCDNVVSERLVIJDTAMDRDGWNV |
| UniRef90-N6TX03 | VVLSKSTNLLVTNDNUDNYDVIGAKDAKNTDGFDVAGGSG |
| UniRef90-UP10003B34FC3 | YYSEDLAFLNL Y Y |
| UniRef90-НЗНООЗ | YRMFS L S S S S S T A GlTVKNNKI |
| -19002С2E0A3 | $V Y C S N V H T H N S V A P P E S P Y T V G I V P D S S N ~$ |
| UniRef90-C3P1 | HV RSARTYTNGFTDDGDDURALEYDPSSD |
| UniRet90-10K888 | KVTDSA |
| UniRef90-UPI000380F7BA | AGFWTSHYYQCRNVKILDAHIYSPYKAPSTDAI D DVCKNV |
| UniRef90-A5FF90 | CFF RECKNIIIDFMKVESRAYWNNDGUDLDGCENA |
| UniRef90_R9KSF8 | A |
| K9D | VTVKHAR |
| UniRef90-A2V | C GVRVDGL |
| UniRet90-R7DLB5 | CDGGI VRNL |
| UniRet90-R6R2V5 |  |
| E6M | HPYFSPLQCKNVTVDGVK WNEGPNGDGCDPEACEN |
| UniRe990_G2T2X2 | K SPN |
| UniRe990 UPIO0038 | DLSFLNLYM NPSDSPNTDGDPESCSNV |
| UniRef90-FSS | QVYSTVHLVGCNDVVIDGVNGLNNDKIDRGDI DID HSRNVI |
| UniRef90 R UJBJ1 | VCRS |
| UniRef90-Dopol2 | SILNSEKT TVSGLTLDSSAGDGTAKNKDGFDLSRNDGV |
| UniRef90 UPIO0029B1C69 | IYSSHIVVRDITINSVESHNGDGIVVLDSSSDA |
| UniRef90-M5C261 | ITYTNVRLSALSANKNPP |
| UniRet90_A3XJ51 | OGDVIIREVNVFAHGH NNDGVDPEMSQNV |
| UniRet90_UPIO0035D | LGCEYVLI DHINVWNHSNKNNDM |
| UniRef90 F4 | VLCENVL EKVKVISHG PNNDGCD |
| UniRef90-UPIO00469E556 | LFCKNLIVSGVDTFNRGPNGDG CDPESSSNL |
| UniRef90-Q02 | SS ERLNIDGITVRGGWDG的NHDTRN A |
| UniRef90-UPIO003740EEE | PVLCENIKIRHISIDTDLY NNDGVDPESCRNM |
| UniRef90- 88 | MNG TNMYFSNITANYNAPWGTNWVQNTDGFDTMDR |
| UniRe990_R6L3 | VFCDNVTVRNVYDDSNY NNDGCDPES |
| UniRef90 UPIOO | NVKLLDLYYYSPAKPVKAPSTD |
| UniRef90_D5EX | DGINLLNNLK\RNGDIDIDHSKHVI |
| Uni | SYIVCRDLIFDGITVENANHNNDALDPDGCKNV |
|  | GQVNNL |
| UniRet90_UP1000479CF56 |  |
| UniRef90-UPI00036887 | CRRVLVDHVRLDNQ |
|  | DILVSDID AVKS ESKNPAKNGD |
|  | LCCNV LVNDVIGRMNSDGVDPECTSDM |
| UniRef90-MONPL8 | SFHGT EEVDIRGVDIYNHLLDPNCDGIAGDTRNV |
| UniRef90-R6DHM5 | ENVIIRGITVNSDGIPSGDGDDDESCKNV |
|  |  |
| 91 |  |
|  | A T Q SENLLLDHIYVNSTSNSSASTLNTDGVDTFFSNNI |
| UniRef90_X5DV | StLYSTRVHVDGLVVRNNIGGHGPSSDGUDTDSSKDEN |
|  | EDVLLENIGVSSRSKSGSPARNTDGADTIASNR1) |
| UniRef90-W9 | KNILLENIYVNSTDVRPVGFSLITDGDTIYAD |
| UniRef90-UPIOOO44 |  |
|  | NCRNVVVNKVTIENHAISPNTDIINPSSCKNV |
|  | SEDL |
|  | VSDHLTISTAGDRDGWNIINT |
| UniRef90-M2ZQ35 | RSEKVLLQDIYVNNSAPDSSPRSNVNTDADTVYANNII |
| UP1000237CBED |  |
|  | EDVLLENIFVSSRSNGYPARNTDG |
|  | KGKNIN AN MLTVM |
|  | (TVTMESTSPNTDGTHVS |
| UniRef90-UP1000468FC2B | DIDIDVCKkV |
| UniRef90-R9GTS | CENLTMSDIIRVNLWYGQNGDGDFESCKNG |
| UniRef90-F6A9C2 | AYHGIMNLETVMAGTVHKTYDANNGDGIEFANSKG |
| UniRef90-F8F1E4 | KEAPNTDGNIDSCSSIV |
| UniRef90- $\mathrm{B6} \mathrm{C}, \mathrm{J} 38$ | KSENITCRNITYDAKLVGS NNDGI |
| UniF | VPQRCNNVIVDGITVRCPWNAQNGDGIDVGNCSN |
|  |  |
| UniRef90-UP10004708268 | NIVMSHSSVTNPPDSPNTDGVDVVSSQN |
| UniRef90-UP100047E708C | NVKVLDVHITSPHKAPSTDAIDIDVCTN |
| UniRef90_RJJRGO | CDQLKIDGVRU FNHSNLNNDMMDUDGCRDV |
| UniRef90-UP1000375 | NNS DVIDGFTAWGMRUDTPATARNTDUDPDSSRN\\| |
| UniRef90-M7UX5 |  |
|  | VNV |
| UniRef90-K2QNA4 | KLLNLKITSPSEPVKAPSTD AVDDDVCTNF |
| UniRet90-ETCIQ4 | VKDS |
| UniRef90 M7SKB3 | SHHVELDSLVNNTGSNDYDSSNTDGDTM RSSHIN |
| UniRef90'11BY64 | AVTG SDNVVFENTYLRTRSTNS NFARNTDA |
| UniRef90-M75GF | SENVLLENIYVNKQDVGFDFSSLNTDGDTIYANNI |
|  | SSILLQDIYVNSTSSSGSPSRNTDGADTIYSDNI |
|  | V |
| Ref90-18X | SHVN WN |
| UniRef90_B6Q638 | NTMNG TNMVFNNITCNATAVYGTNWVQNTDGFDTMDAN |

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 EMSGGVKNVMVTNCQFLGTDVGLREKSTRGRGGVVEN:F EMAAGIKNLQARQCVFLNTDRGLRIKTRRGRGKAVIDGIL ETCGDFTDYRFERLTVKGSDKSGGLGMVSMDGSKIVDVH ASWLEFRNLTFDNLTVVDSHRGLGLQDRDG GKKVSDVT EAAGGVRDVRVSQCEFIGTDRGLRIKTRRGRGERSUDDIL YGEVTDVTYTDNTLSNVENAIVIHGDYSKSEG EMSGGUSNVLVEQVHLYNSLSGIVFRTTKGRGGYYRNDT
 GKRDNEMNTKVINCTVTKATNGVRTKTFADSPELQATGIT SGYGSFKNVTVENTKVFDTFRSAMVADESVDGAEVENVK EMSRSVRNVEVKNCTFDGTDVGIRFKS ADGRGGVVENVTM GKKACVANVTVRNAVIRHSDNGVRIKTWQGG SGSVSAVA EMSGGIRNVYMHDCAAPDSVFRLFFAKTNHRRGGFIEN:CH EFSGGMKNLLVRNNTFQGTDSGLRFKS AVKRGGKTEN:F EMAGGVNNLIVEKCRFYHTDRGLRIKTRRGRGKDAULDNI
 ENVDSVCNVTIDNCVITGSNRGLGGISSQNRDEGTVVNDVS MSGGTVRNVIIEDCDYAGYCKRGGYVKTNPDRGGFVNGII TSSDTVSGLTVVGNAIVNSINGG|RIKTIIGLKKGLVSNAK AQYDRVEHVKVRNDTFVGSSNGARIKDWAGPVGAA VVNDH EQSGGVENVYMGNCEPNAKLNHLLFIVTNERRGGYVKNDY ESTGGFKNIVISNCVVRPSLKKDVIYGKPAVDGGVMENIV EISGGCRFVFAEECKMDNLDRMLRIKSNTVRGGVVEHVY E ETSGGVHDIFAHDNYFDSTEDDYPIRFKTNAKRGGYMENT
 EMSGGVRNIYIEDCKDDSCRNGDYFKSNLDRGGGYFENLN
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 ASPADVQN1VFEDVTVRGGLYAARFKSWLGG QGLAKNIT E CIDHARNITMRNCKVNNNCPILKMKMRGDTFQ LYENIT

 MSSGVQNIF円ENCTYGGYCKRGIYMKTNPDRGGFLRNT EVIGGMKNIYVNNNFFSGTDTGLRFKSAVGRGGGTEDIF TA NGDGRITVRNDRFRGTE EGGRVKSGRDR GGSEEGPD
 ETTAGFKNVAISNCVNSGAAEG| SGISLEVVDGGTMENIT GQYDIVENLYI YNTMANASDGARIKVWPGDESKFGGLGH ESTTGFRNITITNCVIRKSPEGDCGIALETVDGGMMENDN EASGGVRNVFAQDCQVNPADFPGRYPCKYANRGGFIEGVH SESTHNYNI LFRRSKVEDASR\|LWLKMRPDTKQNYEFIK NTAGGVRNVTVRNCVVNGTDRGLYIKSSRGQGGTVEDIH RQFETLERDRDENDTYDNTDHAVYVKTWTGDQNGYVSDVS SQPDYVKNVHFLNNQCHQCQNGIRIKTVPGGKGTVEDVK GQYPTVENVTARNDETNHMRYGAYVKTWTGGGLGYASN1L GQYKGVENVTATGIVFYKTLHGGYVKTWTGEQVGYPKNIT


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 IF RDLMMEQVMTPFTANAFYFCDPDGRTEFVQMKRFCFEN FEN NDMTGVFMPFTVNMFYFCDPDGHDEMTPGIDGSDTGRN
 Y $\square$ N NCKF GEVEDLFYVTSQYAGEGDTSTNYSDISDI HDNG YTNNK LSNVKNAIVIHSDYSKSKGGYTGSAT-SDVTIUG IS DVQMKNDRYEAI NFNTAYTGAGVGPSPLV RNIEIRN YENITVDNVTNPLVVDSCYFSQAYCATGKPSTTDVTVTN
 MKNVQVGTFKEAAVKCNMFYEKPGNH $\quad$ I P T I I R N I WVEN VRNI EVGEVSNAIVRMNMFYPKEDGPRDFPPKFRNIRVEN

 $F S N F D V Q G A D N G P A L T Q D N G N N G S Y A G T S K M L V S N D V W A N$


 FRD D F TARHFSPPWW
YDTFH NNNNDWADEDNQCYGQSCDKYPSNMTDSDVVFKN


 LSNLTMTGC WCPIVIGQYFRDTTLSETAQPRIENVRIA H F R D FA
A





 FKNFDLDNNVA WALA QCTNYE GQS GCDTSKFQUSDI H WGN




 LI H C Y M K N I LLC P L V V N C Y Y GP G GP K S S S P P K I Q N I Y I S H YVNNCQF GEVEDLLFYVTSMYAGEGMDNNHYSEVCNIVYVD

 V E N
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 V E DIV VGTAKS M $\square \mathrm{Y}$ I K WT QFF NLK GEKD DRKSKASNITMKN FY NVVTLEKDGKEA!VIA SLID DGTDAGTDTTPFVRNVNFQG





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S D Y S G ITT G
KHS
$\square$ NRTENVK
S GQPAMMDG
TTPPGN
QEVPS G】S
S GEPSGV
S NVNVNFK G
TGYCSN $\square \mathrm{N}$
K S VI H G F T

S F DNVKMNGS

R Y S

VY R C F S VT S

K S VLRNVK G
A AEKCT
Q A
SMDKRPCKGEGF
LYKCQNAWG

Q W $\square \mathrm{C}$ T N M
NGEN
K

SNV

QY $\square C D S V I G S G$

T DVPS
$R \square K C S N V$

| K V I C M M A |
| :--- |
| E A S C C |

D G
VNK $\square \mathrm{SNDF} \mathrm{G}$
$\square$ D S S C K $\square$ T

T

KNVCNYLVGS
NYLCDNV
GYKCTNVVGTT

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UniRef90 DзНR
 A A $\square E Q A S A D G G G R V I \quad I P K G Q W \square N L H \square S E G A T$

AFKKA $\square$ S A LIEK L G GGHLVVPEGDNDDLHDEKNA T
 K A $\square D E A A R V G G G R V M A R E G A F L T L V V E K G A T$
$T M N T L A F Q K A \square S K L S K L G G G H L N V P A G \square Y L D L H D E R N A M$ TD DAAA $\square Q R A \square D R C S A E G G G R V V L P A G S N I D L H L E A T A V$

TNDAHVIQKA $\square D L C S E Q G G G V V I M E G G H T Y L L V V E T G A V V$

 IT EALITAT WKEACASTSSSSKI LIPRKGTYKLRGPCNAPI

 TE GLLDHV DVLLS GTVQYTPNDA Y W

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





AALASTNYTSNATVLFQKDVYYTFSELTNVE K AI DA AHRAGGGRVTLSPGVWFSRGPVRGAT



$T \bigvee N T E A \square Q R A D D A C N E G G G G T V I L D K G G T L L L K D K V T L H$ NATDDAPAI LDA FDECGGTVLTTENTTYDCHVDIRGT
 A $\square$ QDAWKALCAGKS KS LVI HANEVYT LGPCSSNH $C T V R A$ Q D DVVP N

CT SA $\square$ RAA $\square$ AECHSSGGGRVVVPPGTFATDHLSAGAT
 NTTTVLSNVDI D $T$ Y G Y L L WS N D T S Y W A DDAC TVVGGKVLLD K GTYMTVLDA D GA T
 NTTGLLSNVDI DLPGTLLWDQN DDYW $G G G R V L I P G G R F V N L H L A D D T V$ A GGGTVVVIPEG■F L S S G T L E K K G A V
 TSRAIMDA $I$ KEAHAQGGGRVVIPKGEWLTLHLEQGAV

KA $\square$ QRA $\square$ DK VSNYGGGHV I DP A G K WY D L H LIE A G A E A $\square$ Q H A $\square \mathrm{D} \square \mathrm{A} A \quad \mathrm{PGDTVVVPPGRYWTFEDQTGAV}$




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


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UniRef90
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UniRef90 C7Q3F0 UniRef90_C7Q3FO
UniRef90_W4E9A5 UniRef90-R5P841 UniRef90-T2KMA88 UniRef90-V4SUM8
UniRef90 C9SU12 UniRef90-E5C8C1 UniRef90-UPI00047AC2E7 UniRef90-F2U5U5 UniRef90-UPIOO03F7E528 UniRef90-R6EKM8 UniRef90-UPIO00440DC33 UniRef90-B4RGG5 UniRef90-R6KGN9 UniRef90_UPI0002C31A51 UniRef90-W0EWF5 UniRef90-UPIO0037FCB04 UniRef90-RODOL7
UniRef90 J7FQW9 UniRef90-GOL8Q8 UniRef90-W3WJH9 UniRef90-F7KCT9 UniRef90-R5KV34 UniRef90-M4FG52 UniRef90-G9AFS9
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UniRef90 UniRef90-W3X697 UniRef90_G8WF15 UniRef90-R6LCA0 UniRef90-W3WUM9 UniRef90_J2IDZ9 UniRef90-U2B9E8 UniRef90-B514T8 UniRef90-K2Q674 UniRef90-K7N3U5 UniRef90-D8EOLO UniRef90-J3ARD7 UniRef90-C4T715 UniRef90-R5DOM2 Uni ef90-FOQZV4 UniRef90-F4QPC7 UniRef90-C8VMJ7 UniRef90-HOEUG1 UniRef9O-UPIIOOO46AD205 UniRef90-UPIO0036AAB1A UniRef90-A1D415 UniRef90-F5IYV8 UniRef90-H5XF83 UniRef90-M4PVP9 UniRef90-IGYRY6 UniRef90_K2R3R3
UniRef90_D3HRJI


VMASPDKNDF TKEKDGPMDSASKRKNVSDTGEGA DDGNGA LNHSLPVGYQNQSTAWILVNGGKDVVFEGHGGTFNGSGQ LVASEDIRDYPMTWPSAVVNDMDAENAAGTGEGFIDCRGK LRFSPDPKLYPMNYSPF亡YAFNQQN $\triangle A \backslash T G G G T L D G Q S G E$
ILLSPDKKDHFKTEDGPGПNASNRKNTSTTGEGTTDGNGK LKARPDAAFGENQGEGWLWAKHAVNLSVTGKGTIHGNGD PETCFAAPLHAVEAEGLTISGPGLLDGGGDR NGHWFDFAGTDIGYIGSHGWIYSYGQ LKASEDLTFVNCEYDGYFDYSRDTDGVRISGGGVIDGYGE LNHSMPVGYQNQSSAWMF GOGESVYWEGHGGTL NGGQ WTFSDN: TYWRSNSYFVEFQNHRAAFILTGDGDHIDGHGT
 SQLDGVLRFGPPPFPSCLQUDNSSNITITSGRGLIDGRGP SPNSUYLTYQNAT TAFWFMSGNDIHHFGGGGTIDGNGQ LANSLDVGYQNQSTAF PQDNTRVAGDEMDWPAALVNDNGQQKAGISGKGITNGQGK VTFSDDRAYWRNHSYPTAFQNHAAGFIITGDHGRI DGHGT ACG TVDKDGKGCKPF TTADRTRGSG』FGAGAUDGQGG
LNAS DPDGYQNQSTAFRL GGNNVR NNGHGTFNGNGD LRGSGDYDFSGKHFHAANVRTVGAANASIKGRGT TDSNGS FYLAGGAVIVGTDSDGTYFIRTATNVNDTMGGTIDGKGI


DRFTDNDPAVMTSWEGMTYAFECKNVADTGTGMLMDCWKK LKGSNDIEYPKDPSRAALVNAYEVDGFTISGKGTIDGNGL LQDDGTLAY LDDMKAWPMHLENVDNTTVTSSKGTVDGNGLS

VSVQGNपSYPTNDSAAWFTFKGGSNVTLRGSTGWVDAHGQ LLFSPELPPVKTRWEGPFTYAAGVEDVAITGGGVIDGNAQ LLGSYNALDYKKDEYTALLFAVRQDNIGITGEGTINGRGF LGGTRLDYPVEQERWYVVVAENATDVGUTGGGVVDGQGL LKCSDRIKIVTTRIEGQSLJKYAALVNADGLDGFSIWLRR LKANPDETFGKNQGEGWLWANNADNISTTGHGNGISFMGK LLAAEPTDYGHSHWANSLIFGEGLLNDIAITGPGLIWGRGLL AEDAQLIGSSNPLDYLIGAKNATNIAVTGKGTIDGNGE LLWSTDDQYWLNNSLPVGYQNQSTAFKLGGDRVLIDGHGH LTASNS: DFSEDRDACFLYACHARNTTAAGEGTIDGQGRK IGQDGKIEAPKLVKDWWLSFDKVSGLATMGSGGLMDPHAGE $L R P D P D Y E A Y R D T T R G M I V A R N A D N V R I T G A G G E H F B A G D$
$W$

LLAFSRDLPVVYTRYEGPLVYAHRERNVADTGTGVIDGRAD LQLDGRIVAPSGPNKWSSRNSKSDWMDFYGDHGTMQGGGL LLGPTNRNDYAKVADRPVVMAENQHHDGПSGQGDDDGQGQ LDHSMPDGYQNQSTVWFL GGQNDNVNGGSGTFDGNGQ LIGSDNGQRAECSDRAFLYALDAENUS CGGGGTVDGNGW LKGSDDISTVNTRTEGQLVNADKVNGFTISGKGTINGNGH LNNSLPVGYQNQSSAWLF YGGGNINWVGHDGTLDGNGQ LKGSSEISDYYANSFGHLLYAMNRDNISISGEGTIDGNSD LQGSSADAYDKAESDAMI HGDRDTDVGFVGGQVIDGMGN LLFSDNLPAVHSSWEGLIYAYKCKNUALTGQGEGKAKMDT
$\square H F S G R \square V A T R N S \square G A M \square Y A N G T E N \square A D T G K G R \square F D G Q K K$
LLGSRELEDYPTRVAG DDMVWPTGIINDLQGSGTMDGQGA KGVDAl KYYPFNYFAALINADGLDGFTITGPGT:NGNGL LQFVTDI EGDDCHNVSPLIYAYGETNDALTGKGIIDENGK
 VATRPTVMDSNMGMNQSLIFAEGCENDALCGEGEIDGRGH MUF IEHTTDFEMYSSTSKGAVQGY
DANDGKLKGSDTNYFAALINVDGVRDFSTSGKGTDDGNGL WTFSDNLDYRRNNSFPVAFQNHRVGFIISGHNVTIDGNGN LYGDAGSVFGHSHWKNSLIWGDELENITVCGQGMIDGRGD WWQ LIISANQADYKNS AVFYAEGAEGLTMSGFGNTDFMSHY LNHSDPVGYQNQSSAWLF GGESVTWTGHGGTDDGNGQ

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UniRef90_R6SYF5 UniRef90-K8E8Q1 UniRef90-Q01NU9 UniRef90_R7NB24 UniRef90_UPIO003624873 UniRef90_H1HKG6 UniRef90_S9Q764 UniRef90_C9SRX0 UniRef90_R5J1Q1 UniRef90_R1GCW9 UniRef90-L2FQX8 UniRef90_UPIO00370AEF7 UniRef90_A2Q437 UniRef90_R2SC22 UniRef90_Q7CV96 UniRef90_B7G1E9 UniRef90_J4H1A7 UniRef90-A0A010R6A1 UniRef90-D7VJM4 UniRef90_A9UXY0 UniRef90-S7ZAW1 UniRef90-C6XU06 UniRef90_L9PM82 UniRef90_Q6K829 UniRef90-E4ZXV4
UniRef90-C7Q3F0 UniRef90_C7Q3F0
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UniRef90-A2RAY7 UniRef90_J9HSY9 UniRef90_Q2SHK4 UniRef90-W5CLS6 UniRef90_UPIooo371EA30 UniRef90-M5WIL6 UniRef90 ${ }^{-}$F4KQM8
UniRef90 Unii effo W3X697 UniRef90-G8WF15 UniRef90-R6LCA0 UniRef90-W3WUM9 UniRef90-J2IDZ9 UniRef90-U289E8
UniRef90- 5514 S UniRefto -B514T8 UniRef90-K20674 UniRef90-K7N3U5 UniRef90-D8EOLO UniRef90-J3ARD7 UniRef90-C4T715 UniRef90-R5DOM2 UniRef90-FoQZV4 UniRef90-R6L923
UniRef90 $\mathrm{F} 4 \mathrm{QPC7} 7$ UniRef90-C8VMJ7 UniRef90-HOEUG1 UniRef90-UPIO0046AD205 UniRef90-UP100036AAB1A UniRef90-A1D415 UniRef90-F5IYV8 UniRef90-H5XF83 UniRef90-M4PVP9 UniRef90-IGYRY6 UniRef90_K2R3R3
UniRef90_D3HRJI

 E F HP WY DK QRPDMPSMLQ $I V D A Q R V L L E D Y T I K N S P F W \square N$

Y WRPDPEAQEKMRTHLDRTTDCENVLVKGVT DQNSPKFHL TWYRYVGSTSNYPRRPNQLTVSGAMVFKGLRFVQSQMWTM VFWDKYWEMDCKRVRGILVSNSKHVTLKDFTLVRTGFWAC FWWDRKMRKKAHVPNLVVLVVGCSDVKIVNIVLTNSPHFTV H WWP WA GKRGWLRPMFI QPYRCTNVQI EDVTTITNSPMYEM


 A WWS ANAKAGGTGPNRPHLMAFKATNGVMNYFKSSKPVAW
 $V$ WY D F V NGTNNYPRRPHQIT ITGTKVFNRIRFRQSQMWTM
 $V$ A WK Q N G C G K NK N C N MLL

 V WY D AF NETQFARPVI LTIGNAASNVIVVEDI TEEIAAAPN WNN Y WY E W I R Q Q A N T R P H A L T L N G L R N S V I K G V NF L R S Q M WT L

 HVVD GA S E S WWN VP RLLI E VT G S Q D F T L H K I T L R N S P N F HV
 VLTS GPS GSNRENDKNSQGTKPDTLVVEGITMRDGTTWNF EMRKRKMTNPPATHKQGEGFDNNNFKFDGLTLRDGGFWAF A F M G K E L H D S Y E L K P V T T F D P R P H V L V D N L T I R D I T I H D


WF RQMAVGENHLRPHLIDFNRCENVLLDSFK DRESPFWT KF WEAFWQRRKEDPNCTNDEVSRPRLVF DWKSNNDQLQDV A WWGAVEY DGEN RPKMLYI HNAS QLL FEHILDFKNSPYYHV TREES RLA GVGN KAI SLKLCKNVTIKDVQMVNCGHFAL



 QWNPK CTNMDE QRPRLL FVSNSKNVQVSGVQLLNSPFWTS
 TRGHRF



 SVVVENDVPHDMPVK QRI CRTFYRPKSFSPINCKNVLVFER




D S H WWD WT GHHLRPNMVQFYSCENVLVEGVTLRDSPMWNL DDGRGEK WWNLPCTSALRFLKSSNLKVQGI GVQSSPREHV ELLMEMV Q DTDWK V K R P P L N F K S C S D I H I S S G I TV K K N A S D W VWY D LVVKGESNYPKRPMGLT DWGDSSFKRLNVFQSQQMWTM KRNADVRDERGQTLPFYVPSDNTRYLQDGLNVKNVFYGGF

 VWYDFVNGTNNYPGRPHQITDTGTHYFSGLRFVQSQMWTM V D A WWP WK GD WERPP F IQ P Y GCKRRVLI E GV T I RNSP F WLI
 DKAMGTYVPAKKRPRVMVLDACHNVRLENLHVMASSMWTL
 H T $\square$ D H Q E K A
VWWHK F WGY D C Q R P R N L V VY R S E QVEMS GFTSRRES GF WN RFWE EFWIR RKFNPRLVVYLSHCANVQVQDVRDIDSAFWTN E I N E K T L L Y Q M M R P Q F I N L Y K C K N I L L L E G F T L M R S P F WL I
 Y WY E WIS QQEN T R P I A L T L S S ELT N S V V K G V N F L R S QM WT L GYV F F K K A G A Y G P R I L R L Y DV T N F S V H D L A L V D S P A F H F
 K Y Y D E F WGLR R K V N P R ML Y I S N S Y D V K I C G V RMMIN S GF WT N


 EEENNEWWDPN K WRPKMFIL K ECRNMQLK DFSFSRAPE WGV


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UniRef90_K2R3R33
UniRef90_D3HRJ1

 $\square \quad$ PTRCKNVAVVDTVVISAPGRSPNTDGILHIM QSTV SIIHTS NSWFDSIYVNNLYDDGGSAQNTDGANTIYSKNI QULLYSDHCSVDGVTINNNVGGHGPSTDGDD\DSSTN R

## $\stackrel{H}{\mathrm{~V}}$

HL V G
H PQG
 HLVGGBSNANAVVSVSEDSFPFNTDGVGDGATDV TII HSENILLEEVEVSGVRILNNRMMANCDIDPDHCKHV NI INGTDMVFFSSNATATKAPGRYNWVQNTAGFDTMDARN VPIYCDGVIIRGVTVHSVGIPRGDGDDDESSRNV $\mathrm{N} V \mathrm{~F}$
$\mathrm{Q} \mathrm{L}_{\mathrm{T}}$
H M CKNLTFMDFSATAPATSPNRDG
YCENVLVKGDKDHDNHGPSTDGUDDDSSRHV

 HLLYSS A $\square$ MNG PAFCKNVHDHDLRIIT SGPNTDGVDPDSCQN $N \square M N G$ TNMRFNNIDCNATAVYGQNWVQNTDGFDTMDAKN

 $S I D R S H D S I W E D I F V N N T G N R V S S S N T D G A D T F F S S N$
$N L K D S$
 HIA WACHFYQSKNILVDNI NIYNHANKNNDGUDLDSSHDV $V$ VISSESVRVYQVLVSAPEDSPNTDGIHDTESTN HMY MCNGGIVRNLDVKAHGHANNTDGWDTYRSDU SLDFWSSHYYQCENVKILDLDITSPSKAPSTDADDDVVKNV MAEDVEDVVIRYCDVDARRTDRPYHDAFNTDGFDVAGKNV $\square A T G G D N M T I T N V W V D T N R D G F D \square D C C R N V R \ S D$
 HL



 PAAWTCHFYQSNDI LVENVSIYSHAHKNNDGUDLDSSYDA SII RSHYSLFDNIFVNNTALDGSSSANTDGGDTFFSSHLD
 SIS N HLAD
 ELLDTDTF LIQNQLRVDNFRLSGPTFPLNTDGDDPSGSNY HVEHSRGGIK】EDVTINTHHTGSNSSCS LDGID DSGD D

HPVLCRNVTVRSVVVDSPHGPNNDGDDPESCTDV
C F D D
 $\begin{array}{lll}T 1 & H S N N V L M E D I Y V N S T S H S G N P A R N T D G L D T L F S D N G \\ T V L N P A F H G I M N L E T V L A N T T H T T Y D A N N G D G I E F A N S K G ~\end{array}$
 $\begin{array}{lll}H T Y & R C N N I \\ T \\ I\end{array}$ $N$ PVLSED CRDDVIVRNVNCDSYGPNSDCNPESCNRV

SFNN
LVN G
HM
CENVTSDHLII DTASDRDGWN

H PI Y S S Ni Tli K GL
HPI YSSNLTAKGHGHNNDGGDVDACRRA
 V MNLETENVYCENIIIRDVTVNSFGHARTDGIDFDSSRNG HL CYSQHLYLAHDQVENSGGPSTDG


HPLLSENITVRKVSGQSAGSSDAVDIDNCHD
 MQNYLNCDDLLVEHMTVENQANFNNDGLDGDGCRRV
 AM K K HRVEGATFWGDTDDAPADARNTDGIDPGSQDV



HM
H
T\ITHSENTL M


WI H DCTVWNQDDCIIA|V|KDGSENM|LIERVNAS G|V|GTITGS LI EDSTIRTGDDCIAINSSTRVRVACGPGHGDSIGSL GKG VI ENNFFRTGDDSVVIKPSEYVVVRNNDMGGEDGIALGSE TV RNAVIGT GDDCVSMEGSSDVLI EAVTCGPGHGUS GS L



$\stackrel{\mathrm{R}}{\mathrm{V}}$



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| L | I | E Y C T $\square$ S

TV RVTECHLA C G D DCDAVK P S E DI EVVDHCHVYS GYGITIIGS E


R6A1 T 1 A D V D WV W D D CI SVK D



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 HIHH H S T F E T G D D A I CMK S C S N V Y I H D C L V N E G H G GF V I G S
 LIE N S R F R T G D D S V VIVK S GRDV LV R G N D M G G E D G I A L G S E

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GQYD VVENVYVYNDSMANASDGAR DKVWPGMYSGYVKNTT E I SGGIRNVYMHDCKAPQSVRRDFFVKTNHRRGAFIENIH SES IGNKNI LMRNDKDQDAHRLLWLKMRPDTPQHY EYIT ASHTCVRNITFRDSVMHNTFKGUYMKSRPDPATGSDSDVL
 GEGADVENIWWENVVVNNSLYAARFKSWTGG NGLVRNVTV
 $A S K G G F R D F$
$A S W F D K G G V F D N I T$
S
NTDENCRNVIMRHCTVKNTSHVLLLKMRPDTPQGNVSDVI ENMDS $\quad$ Y NVTVDNCIIKGSNRGLGU Q


 ETVENVHVQHCTFTGADNAARTKTW
ESHGDFDNVVFEDCKVSDSNRGLGLFSRDG GHMRNVR GQYSSVANI RVDKVNI IDDMHSAYLKTWRGDGWGSIRNVL TQHHCIRNVTFRNINFWFPDKAVYIK SNPGHNGGDIENIL AMNGVVKDVEDENVTVMDSRFGLRIKM QKYANGKVENIK
 SEACVKNI
 HT GAWI QNI LAEDNVSDGTDAGLR MKSTNFMGGGARNVT




ETAAMI RNVYVYDIEMEHPRFALYFKSRRPRGGGAENVW HTGAWI QNI LAEDNVSDGTDAGLR MKSTNFMGGGARNVI

 ETSGGDRNIVAYRMKGVGTKCGLRFKS TCQRGGVI EDI Y
 AAGTDISDIEYNHVYTQNSNQMLMIKKNGG LK S G V S DI LVRNLTLDGTTSGLRIKSDRSR GGVVERVT CKFADATNIIMRSCDFNQTSNILLFKMRPDTPQ





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UniRef90 B514T8 UniRef90-B514T8 UniRef90-K2Q674 UniRef90-K7N3U5 UniRef90-D8E0L0 UniRef90-J3ARD7 UniRef90-C4T715 UniRef9O-R5DOM2 UniRef90-F0QZV4 UniRef90-R6L923
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250
YENTVI Y QPE QWATWDD ICLLP APCSNMPNNASY\|D\|ITRN FEQIVQLTNVKNTIIIDQHYGGK



 MTRVK A D SVKYVLAVGGNWNPKEPKEKGYPYFRNVYFSN MRNVKAGQVAQAAIDVDFYYEEGEKGSFTPVVVRVEVVN

 MRDVVMDGVLTAFTANGHYFCDPDGHADGRDEVSGVTVSN WSNI RLYN VTFPDF DTQTYSDQGKASANRPNNSSVQMRN $\square R T K N V S E C W W G F A E P \square N \square A S \square N R K D E \square P S G K V K G L S \square T N$ FSDFRLRNATGDFAVTQCTHYNDGDCETSEFNI RDLRLEN
 FENIIMDNVSNPVIIIDQ
VNHLTMKNVQFPFSWI MDWHNAYNRKDLTG
FSRITECHETPGGFWVTVTVVDRRPERQAG RVENDVVED YQNITMESPSQWPTWI NPCHPNPCSSPTAKCHIRNITLID

 YRNMVI DSVDTAVLINQDYNSVTCVGDALPNFSDILVQN FSNFDIQGANSGPA SQDSGNNGSLSGTSGMSISNVAFVN VDGVKSINTGNVIFLRDGDRWTKGKKPMKNVVIKNVNYEG





Y DGLIFNTNN DWAlELTQCYGQKCNQYPSNM\|IQDVVFKN MENI RTGHVQRVLEDDTVYQWRELVPTRITRIDGIVLKN

 WKNI AFEN VMFPIVYTQNYWDQDDGPKNNTHVQDFLFQN VRNMTVEDFGTLFWFQLNYPGEGGNFPS TYRDTVFEN
 F SNI N IWWGRAEPIYVTTCPRDSYSKEGS VENITGTARSFFSI GPWTQFFDLKGQPEPHSSARHITFRN

I
FTGIQM DRVDMPIFI R RTYRNAEKQEVGISITDVIIGN
 PGSAVKVKDVTHRN
FSRVEVDCHETP DGFWGSGEADTVTVVAVENLIVEE FSNFNVQGASAGPSDSQDSGDNGSYAGTSKMSISNVAFVN YENDWI FEPDWWN YYIQQQKQPDGGGPGPSDTMRNITLRN



 I Q DL T L N R VRRS FAVVNVGQCTS Y S G GS P S S S L F HI G N I T F D N


 IIRDIEI GEVRDAIVINFFY EEGDAGNFPQVNNLHISN
 YR D T M T N VH S P I M Q K $\square$ G T R K R C G N S P GVGG I S D T Y D D FSRIK

 MENDHAKQTKYTADKWDGLGSPEYKEPNALPKFRNM HFKN FRDSAMRNTVK QAFDFTLDYNDPNAK QRSTVPFRDI R VA D






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UniRef90-A0AO10R6A1 UniRef90-D7VJM4 UniRef90-A9UXY0 UniRet90-S7ZAW1 UniRef90-C6XU06 UniRef90-L9PM82 UniRef90_-66K829 UniRef90-E4ZXV4 UniRef90-C7Q3FO UniRef90-R5P841 UniRef90-T2KMA8 UniRef90-V4SUM8 UniRet90_C9SU12 UniRef90-E5C8C1 UniRef90-UPI00047AC2E7 UniRef90-F2U5U5 UniRef90-UPIO003F7E528 UniRef90-R6EKM8 UniRef90-UPI000440DC33 UniRef90-B4RGG5 UniRef90-R6KGN9 UniRef90-UPI0002C31A51 UniRef90-W0EWF5 UniRef90-UPIO0037FCB04 UniRef90-RODOL7 UniRef90-J7FQW9 UniRet90_G0L8Q8 UniRef90-W3WJH9
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UniRef90 UniRef90 W3X697
UniRet90 C3K558 UniRef90_G8WF15 UniRef90-R6LCA0 UniRef90-W3WUM9 UniRef90_J2IDZ9 UniRef90-U2B9E8 UniRef 90 - - 51448 UniRef90-G6XUB1 UniRef90_K2Q674 UniRef90-K7N3U5 UniRef90-J3ARD7 UniRef90-C4T715 UniRefol-R5DOM2 URReforoaz UniRe90_R6L923
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UniRef90-UPIOOO46AD205 UniRef90_UP100046AD205
UniRefololioo UniRef90-A1D415 UniRef90-F5IYV8 UniRef90-H5XF83 UniRef90-M4PVP9 UniRef90_16YRY6 UniRef90_K2R3R3

$\square T$ VESTGSVLEVYAPEGYPDQDVTDRNDTDK VEGTSATATAVRFDCSPSRPCAGIAMRDVRLAAAAERPA VKTAVSVTG $\square$ GGMNCVHDVT $\$ DNSTFFYTKKDKS | SGTTDSSDVASFQCSAVAPCKDITHENVSDAGNTTHAE

 V DCRDARNGDT ACFAGEKGMDHDVTDSNSTMFYT LS W DNWAGGAFLGLAEAPFGPLLLDGVKL
WSCKGEGS
 $\square S \nabla D R A T Q V K A T A \square P E S P \square K N V R \square E Q \square D$


MWGTTSKSHDPNVGTLVCSAPCKNTRAQNTTVTPPSGKPA V DGCDSAD DYELKGDAKLPVKNVVIQDVHV V $V$ EVD W FF
 EVTG
FSGTIQDTPGHV EGSCTTDPCWYAVTNATGKEVAD FKVGGAGT FFEAHAPAQAPLKDVVLRNI VVREAK FNVKLASSKSPASDIDPEDRLQGILLKNDDESPGGGNP TSAN SENGVFLSGSKHGLLSDLRFINLNLT
CTVQCND FLNKKSKQYSLSDFSLENLNMMASGGTND

VKGSAVNPPSGlLMTGTPNHKTGKTLLENTELELPGGG FDGTAPSLKLLASLQCSGVAPCH DI TI RNVTLSNGETSPL
 FTVESADR
FRGTCAQPПATKLDCDKIG CGNIVLEHIN:
 FTGWVDTEKSVVSVSCSEVHPCYNI DYDNVVLYPGKNATT

$\square Q C S T A P S S A A Q G D G E D D E P P F C W K A Y G D$
FHTYGHYNLIPSS\|VGLPGHPVQNVTLEDUEDTYGGRAK
VSVENAQGAA IEVKGDANAYHQGLVFERVRFSGAAKARD FRGLCGECEGALNMHSETPSMINRIRLESI QLT
 VT VQKAQRAFELRGFERAPISGVTLHHVQFNNTAA VSCLAENAVAD

THAENV AFDSKDSGE OVPKNVVRVTADSDRDQS VVATNVTYSA KLEGISNAPFTGI CISNVSUQSEQRKKL I SI DQCPTLITKMVGLPEQP DEQVTYENVK
VSKATEVKGDSRSNAWHQGLVFERVRFSGVQQDGLKDSQF VRSVLSSSEVAFFVEGNSEKPLDNLHFSNVTLVAQEFGKD V解CDN VTA SNARTCMNVVGПANSK TENFTRNVCDEGNKAGK■ 1 TGEDNGPRGSYFLSVPEQP IEDVVLRNVR LHGTTKSERVTSFQCSAVAPCT NI GVFGVDLEFANGTKA WHGTVTNNKPPVQVFCPAAVPCTGITI SNNFMWTEAGSK VHGTGGTLVMRGLDPNHALGVSLDWQVENVVVTVGPSGVW -NTTC
FTGYTSGGTSVTSVSCSEVHPCYNTEFDDVLLYPGKNAS VNVYNADSRYASIISGVPDYH1DDDVTLSDIRGLYKGGGTA
 V FGKAENSIRMNGTKESIIDEVKLENVSVK


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UniRef90_UPI00046378A7
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YFECKNVIQS

ASFCRNAHGVAF
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A Y SKN

T C

TSYCGNA
RHAKN
C A
K Y T A A GVS GLS
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S DLLKVS $\square K$

K F I C T N L

F Y A K C G VT

S Y L C G NV

SCKDVDVDG
KAK ILNAQG
$D G L K$

NY L CD S V
$T G$ VP G N
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QWNCTDVAG
D SVVFSETGGG
A GVNN
K SVIEN
■WAK
E Y L C G NVK
$P P$ VPGGA

E D A K
QLEHANVS
NY L CDNV
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AAEEGGVVVIPRGTFLH $\square$ H $\square Q E G A V$

K L I PPAGKY V VLELLPGAE<br>KAFETAWSAACAAQGKATIVIPEGAYLLGGPCKGDM A $\square$ RKAASGGGGTVYVPAGEY $H \mathcal{H} Y$ LEQGAT CTVKATDDAPA $\square$ LDAFERCGGRVVFEPTTY LVNTWLEDVE

VDLHGY L N FVAD $\square P Y$ W
DVTIE WRGK

 NTSGLLHNCDIDLYGTLLWGTNDSYW LDTKAFQAA DNAVGGKVIVVEGQY LVFHLQEGAV

TATNLSNVEIRMHGNLHLPQNITAV
$T \square N T N S \square Q K G \square D F V N K \square G G G R L V F T A G N Y \square T L H D E E G A T$ AFVDAW TAACGSEEEAVVAVPAAKAYQUWPVQLSG
 ACA G $\square$ R $\square \mathrm{PSG} \quad \square \mathrm{D} \square \mathrm{RFSAGAV}$


VLYFTPGTHY $\quad \square E E T V L$
 FRIPSNTT

A N G G G T VT F K P G T Y $\square$ H F N $\square$ P E G $V$ A



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

TTAAFQTC $\square$ DAANAAGGGTVFVPAG $\square Y V S D Y L A A G S T$ VNGGTVIIPKGEWVNLHLEEGAV KA $\square$ D HVAGLGGGTVYFPAGSYVTLFLADGAV $\begin{array}{ll}A G L H K P T G D E G V F K I & P S N T T \\ A V L V V P E N K K C H V K P D T F S G\end{array}$ GVNLQLD K GVTLLASTD DN N Y
 EAFKMVWDAACSSQVESPVLYVPSGYSFMVQSTIFTG

SAFQEA FDRARETGPARVVVPAGTYRDLHRRAGAQ $T G K A V E L T Q D G A G N N A F G T G P I S I P A G V I L L L D P E Q G V T$

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 LK GS D D $\square$ S $\square$ VD T R $\square$ E G QLVN A D H VD GF T $\square$ T G K G T $\square$ N G N G L
 $V Q V K G Q L L A S T H L E D Y N Q Y W L H F Q Y I N V I S G G G R F N G Q G A$ LIGAFP TPF G G S H WQ N S L I W G $\square$ GLLEDIVTIS GPGTDDGVGN L HVLGT IRRFVF T RWQGIECHNYS T DVAIT GS GTWFD F DGK $V D\|Q G T L L W G T N \square S Y W T A F V L G G N N V R\| N G G K G T F D G N G D$
MHPENTYRVIF $\square$ Q S QASWFVVTGRDFVVDHDTGG』IGNGQ WT F S D DLD YWSNHSYPVAFQNHAAGFVI TGRNDTIDGGYGT IEASSDASFGHSHFHNSLIWGEGEN』AITGGGRISGKRGA $V$ Y G S R NTA G SK S G S C LP L I G $\square$ K GA NAGVMGMMGTID GRGD WT F S P DLA Y WRNNS YHI EF QNHAA GFIL T G D G $\square$ WI D G Y G T LSHS LDVVGYQNQSTAWVIGGKNIRFNGHGGTLNGNGQ $L L G S K D D R D Y P M D W P A A D V N V F D K E N V R D T G K G D I D D G Q G E$


LLGS T NEKDSY $\square R W M S M \square F A V K Q Q N \square G \square T G \quad K G T \prod N G R G F$ PCIA GT IVAPASPDEWKWLYVYGVDGLSVS GGGTI DGVGH
 $V Y \square A G G G A \square L G G Q M \square D H A E N V V V R G R G V L Y$

LVF A ES YEAYAANSRAM $\square$ MARDA VD $\square S \square T G \quad P G \square I R A P G P$
 LRPVP DYSAYGKSDRGMIVARASRRISLTGPGRIEAGCGD





$\square L G G T R G E Y P E E S W R W Y V V V A N A T D V G \square R G G G A V D N V M V S$ LRPVPDYAAYEKSDRGMIVASGARRISLTGEGRIDASCGD L DA S E D $\square$ A G $\square E M Q W P A G V I N F E G D Q N A A L T$ GEGTIDCRGK

$P$ VP SET TVAGGSVLVGS LVCE GVHDVS $\square R G R G V I Y$
L LF S EK LPAVVQTSWE GDECFN Y S P LVVYAYDCTHDLDVWK E I RQE GNLLHLPQNITY IQD LVTTSNSLTYTTALYWFAFAGP $V Y L E G G G A L K G R L L C D H V E N I K \| L G H G M L L E P E Q G$
$\square L G S E S \square E D Y P M K W P A A L I N V L D Q K N V T \square D G E G L V D G Q G K$
QS F A GNSYSPDE


 A D G A I I K G S D D R E D Y P HYT D N GE WMT F I R G R G I I D G S G A
$T V L P T R \square A G \square E M R W P A A D D N \square Y E Q K N A A \square T$ GEGTDDGDGK LYF S GE IGKMEVMS LGA C I YANN QEN $\square$ A $\square$ T GK GRLI GP VA E

PEFRSR $\square$ A G $\square E M T$ WP A A V $\square$ N $\square V E K N A A \square S G E G T \square D C R G K$


 LSF S S NLPA AVHTTWEGPLVYAYNCDNVAI TGKGEL RAEME



 LIACPPD IY CYPSRIAG DEMDWPAAVINNI GGEGTLDCRGK $P C P D G P E S W P K G L S R R Q W L V F Y Q V I G M S L Q G D G L I D D R K G E$

 $L Y F S G T V S A S N T A S C K N L I S I T K A D G A G I M G F G K M N A R G G$

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DNFLPWRKKHY乌RPQFVVQFFNCKNVLVIDGVTLVVDSPFWGIV 120 YDECGPRILRFADVKSFSIHDVALI QVPAFHF RYWKSFWNMDEGRPRLVYGSNSNDVELSGVRLINSPFWTT

Y WWK KF WGNDCYRPRNTYVANSKNDQDHHFESTDSGFWNT SAWPYNQCKKTNDCKPLPMNFVTNATIKSTSSIDSKFFHI KADSLKNCKNVTDKDLNMFQCGHFALVDNLTDTNLKVDTN RGPDWDRDKHFLKPNLIQFYRCRNVLVEGVALRNPAMWTV Y WYA W $\square R Q Q A N T R P H Q \amalg T F N G \square T N S V V R G V N F L S Q M W T M$
Y wws wyrlodgdgrpma LTVWrahrgt Tarfrvegapfwcn GGDDGNGNVWYTRSMPFVFWNVSDVHVDNFYVKDPQLWAL AGDKADALKLCHNVTRRDSDSGGHFGDGGDNDTDN LPMLGKSAT WWNSPDLIKVQNATAFTRYNINLDNAAYFAF GGIFGNGETWYVRPMPFVLWNVSDVSVSNFYVRQPQLWA VWYDYVKSVSNYPRRPHALTVASNSVFQGLLRFLQSQMWTL TWWNYFREDGDGRPDAFTLSNVTRGLVQDFRDEAQPFWCN PWWDANPSSGDDNRPHDMSFKSSQATMKYFRSRKPDAWNV MTNNSVISSLHUVNWPVMHEGF
QTANNMVDYTQNRPQNTYFRECENVTTKDTTLRDPASWN EWWARSCKRKNTQ AVHFEECRGVSVQGVTLQNGPQFHD YWWSWYGNDGDGRPVSLTVWRALRATI ANFRIESQPFWSN YSKRLRRPSEDMRPKLFFFSECDGVEVAGLHLRNSACWGL MKNPAMWF N AYVTGRDEDMGTRPRVMALENCKGVTLTGFSMEASPMWTD HPNRPRGVREQNCDTVDYSGVNLYDSPK KHM
 WNQTGACLGDECRPRLIGFDDCNNVQVSNTTLNQPAYFHG DETVGTFIPAEFRPRVVVFEHCDEVEIGSLTISGSPMWTL FCWDKYWTMRKDYVKRGLRWIVDYDTLKGFTLDRTGFWGC GGDHGNGDVWYTRPMPFVLWNVSDVTVSRFS

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LADFHRFSAFRG\squareR|VFSRS\squareNVEG\TVIDPPHYS|
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WYRNMAVGDNH DRPHFVQFNRCRNVLVEDTT DEDSPFWVL KTQYKGSKDVTTGWDNSYGQAWWDANPVNGTGLASRPHLL $\square A \square S Y S K N \square E \square D G P T N P R Y Y T V S G G Q S E G D T$ KNLKSFSY VYWDYYWNYDAKRPRTFLLQNAENVFLKDLNUQRAGFWTV
HPRYWKQGQSDTRPVFFRDQNVVGSTLSGFTDKNSPFRTF DWWEAFWGYDCQRPRNLVVYESDTILLQDFTSRESGFWNL AFPDDPTSNGLPRPWLVEFYNSRHLRURGVLLTNSPMWNL A WWDANTYPGTSGRPHLMSFTTTNGSMQYYKSRKPDAWNV MWVEQRCLPAWCRPRLVGVVDSADVSMTGVTLTPPVYWCL RWWDTPSRTRCTKPTVVQFNYCNGLRLNGIKLLVNSSRDHI

TFWDSYWT DRKTYPRLYQVFNSSQVKVGGLLLRRSGFWTL R $\square Y D G K D G S F \square F P A M F \| A P \square N C R D V L I E G V R L E R T A F W N G$ YSKNVLI DGI TVVNSR HY
 VFWDKYWEMDCKRVRGILVERSSDI TLSGFTLMRTGFWGC RGIEVTDSKNVLIEGVTVVN PDHYT RWWNEFPDNAYLRPILFYAEHAENLHVEGILMKDSPVWHN

ASARANTGNNLLVPDSTSDFSC SGDLFRNSASWAV TWQKWFARPKAHMPQFIQFNRCQNVLMDGVSVKNSPFWTV GRGDGKDNWDKDPTGPDADKNCRNVLDRDIKLEGGWFAL $T$ NFSKNQVQDD IA TNPRHYSTAGGQSSGITIRN FR IGWKNLCKINDIDPCLISFDQCNDLKVYGLNVQNAQEMHV KFWDQYWSMDCKRVRGILVERSTDVTLKDFTLMRTGFWAC ECEKPETDPGRVRPRLI NMSNCRNVVLSGVTLKNGASW EKDPPADEKRGPSSQG EFHNTSNINLEGFC VQSPNWTD KWRDLPCKPHKSLPGPCDSPRVSYKVLHELQLRNSPQFHF IVKGLDQVVNAQNVKVQGRGVVIPNRWAGLRIVNSKNVTV DCFDPNGEEGFRGAMGIRDCRCEGVRGSGYQFVNAANWSH ANDATTYNGSQQNPRGUQDTSSNNVSLYKFTFRNPPNFHI



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QLYDNVENTTREDVTMVRPDPADQPYMEHGVYFKSWTNVT HNGDFIENI WFENIHHEPQENYWGVMAICAGDNNTI RKVT AQYPGVEHVKVKNITFDGSSNGARIKVWSGPVGAAIVNDH ESHGDFENIEFRDCRLRSNRADGIFSRDG GKVRNTA EVGETVENTVRNTDIHDEDDPLYQGCMTIDCGNLVRNIL AKDYRIENIDYRDVTVSNGANGMTIKSYPGA SGIIRNVT AKGEVIENVTFRNVDVEDDPPYQGCMAVDCGDKNLVRNLL ETHGDITNVVFEDCSUSSSNRALGDFSRDGGGGRISNVR
 KDGMGVIGVTIRNSYVYQSARALLVDQNTLPQEGYAHNIT ISSGGFKNIAITNCIFERCRNRGLAAETVDGGQLEDIV GNPDYVTNVSVSDUKVVGEVSPGYGGATPGGGTGRVSNVT HTGAWIEDILAENNVI YLTDVGLRAKSTTDIGGG ASWFDFKHFVFDNDAVVDSHRGIGFQIRDG
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保 LEDSSVENVVVDNVTIIDMKNGAYIKTWIGEQWGTVEHIY DEDSSVENVVVDNVTIIDMKNGAYIKTWIGEQWGNVRNI RNGDVIESIVFAN:DGLHHEPQENYWGALAGNAGDRNKV
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## EMSGGDEDVRAED\|LATNSESGVRTKTADGRGGYVKDTY

 ETAGGFRNVEAYGITVLDKVPVGILFKSAHTRGGFGDNLR ETAGGFRNVEAYGLTVLDKVPVGILFKSAHTRGGFGDNLR KTGDEVEDILFKNDDFLEHDEDDRCMARNVGDHNLAENOT EMSGGVRRVFAEDCRUHYPVKYPVYLKASKKRGGFVDGVY MSGGVVENVFLWDCDMRPTWSGDELKETSGSIRNVLGYDLKAVGTYTVLRLMMDDCGDKNDVNVI GTYEGLEFVFVKDVVIENDW GQYEG EFVFVKDVVIENDW
EMSGDDRDYADDNRFGTQSDDYADRFKSNARGGVVERTY GDGETIENLTFRNTDTEDDVPYQGCMA DDAGDRNBVKNIL ETSGGVYNVLAEHITLKNMGIGGHEKTNIGRSGGIIRNIT GVWASQQNITFRRAVVYDCSIGLGIHFQAGDSWGVRGVG ISDCFFVGNYEVGSVLDGSWRKMPPSFAPKDHGGTESNGG MEN $\square T \square R N V D \square L E H D E D D P P Y Q G \square S \square D A G D R N$ LVRNVL
ETSGGTRNTLGHDLTAQGTWSVLRLKS AMNRGG\|IENDY MSGGVDDVRDWDCDMSHSMCGDELKGTKK RG RGGY TRGDE:KNIVFEDDDUIHTQRNPKWFTDHNGDRAKIHNVLV N
 A $N$ NLV CRFSGPGEYPH ESSGGFKNITVTNCTFEHC RGLALETVDGGHLEDTE TTGGVNNILFDDNLLYGNSTGDRIKSANDRGNVVQNVQ DRADKVRNIKFENDDIDHSDTGYPLMGDHHGDHAEVSDIV NTGAGIVNVLAENNVISQSDVGLRAKSAPADGGG AHGIV GTDQPQSNVTFRNGVVYDA A GGDGHHRYGSAAVSNVT ESGADFKRITFSNSVVRGLDTAQK PGSGVADESVDGSH
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UniRef90_R5DNF9
UniRef90_M0W

I R NCR SDYAESVI TFTNDYHSYRGG NAPTTFQD|I LLED


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




 F SNFRVEGAEAGPDVNQNGGDNGSFAGTSLMQVSNVAFVN



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UniRef90 E6ZVS2 UniRef90_E6ZVS2
UniRef90 R7FZ04 UniRef90_UPI0004692004 UniRef90-I1N942 UniRef90_WONF82 UniRef90_F0QZ26 UniRef90_V9D738 UniRef90_M5BLT6 UniRef90_W4BTA9 UniRef90_Q153G3 UniRef90_V4PHC9
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ARNFRLDD VTYPDQLYQTNSGHPGDAPSQYRFGNLSFVN VD GLKATNTGNADFVKLGNRAKNDQGY
 Y E D I S V E N


 F S R I A $V$ C N E T P D G F W

F




 VT R CK GED VKNVLVADLNWNP S
FSNFNVQGADLATTAISQSNSNPKTGTGTSNMLVSNVAFVN





 V R H L L L L L $\quad$ D



VK GMTMR TMKWVFWMTGNYGDNNYDPNALPLIQNDNYRD

 | Y | D | R | I | R |
| :--- | :--- | :--- | :--- | :--- | :--- |

FEDIVRVNDQE GQLFHLRVMYNQKYNTGPGRGIKNDVFRN VRRFS GQAVEREVLFVNMDYNGGEGG THPVSVRDUHLS $V R D \square A A S H V M \square H S V T F N$ D D D G VGAET DPVVEDCHFER

FE D $\square$ R VE S $\square$ Q E G R LIF C $L$ K VLY N P K Y N K A P G N S $\square E E \square T ~ F ~ R ~ N ~$
$\square R$ GS R A S N $\square R$ Y V S $\square H$ A T M L Y D E G WM G S Y L P E Y R D $\square R \square E D$
 VS DV Y MVN V R K Gl K IS G DHPDKNYNPNALPVLK HVRIK N



$\square T R V K \quad A D S V R N V L A A D L N W N P Q Y S Y S T$ $V R N V H V E D C A A A R I L F H S V Y N D D G \square G H P V P P V F E N C S F E R$ YK N I R V E D P E N Y LI D D $\quad$ R $\square$ M F S R Y S K D K T R G K V VT RVEAENVRQ
 IK G DVI REDACN GRLI NY DYGSAKGY QTERPGLLNV RFED I SHITMRHIVNAGMFLDLGARMRSPEGTPAGSMKRIMRIS YSNSCFANH GTQMQFTPIYNTNAGTGTPN FKNILLQN




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


## $\square$ T Y D GVGENPS L I K G $\square$ DENHSVRNDT FENVVIDNGKR


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


I RVIGAS QP S
I NAYDVDS RYS S I I S G IP N G I I E DVT F D H I H L
LRFSNQGPVPTGSFTFLGASNNGTITLDNVTITAASANLIL
V Y L G T D N N D LLLLSNSSEKHNDRNVNF QNI NI N G




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EHVCKNAYGSG
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S S Y Lic G
S WN CANVEGVS
TYNCYNV

T G
E Y
$\frac{\square}{G Y} \frac{V}{E} D N V$
SVICMNAT
A S VIC S HVA GYSL
Y Y A Y R GL T
QTNCYNV
$\square$ Y R C F S V K S
DGF\|TN
SNACGKVDSKS
K G $\square \mathrm{ST} \mathrm{N}$

T L L C N N
S D $\square \mathrm{K} \square \mathrm{N} \nabla$
$\frac{\mathrm{L}}{\mathrm{L}} \mathrm{T} \mathrm{N}_{\mathrm{R}} \mathrm{T} \mathrm{V}_{\mathrm{A}}^{\mathrm{V}} \mathrm{NV} \mathrm{V}$ T
S

KY V CT NL S
EWTCSDDHG
TTQNVEAF

K G I I K N
T Y SK
K GVVTNTK G
VGQTNSVS
A GVK


Q WN C T D $\square$ S G $\square \mathrm{S}$

EDLNVNMKG

K G F IT N
PWKCSYVS G
$N M \square P S V A G$
D Y FRQN

S L Q C C N $\square$ T

A P S N A Q $\square$ T
S
T $\square$ T A M N $\square$

# D T D Y W <br> T $\square N T Q A \square Q K A \square D S C S S S T S A K V L I P K G \square F L T F E \square A N G A W$ 

 DDTVAI QAATAANGGTVVFPDGEYL $\square \mathrm{N}$ PVIVNYG FANAPE QALDPSPGPGVVYFGPGTHPLPEGQKSFR


## A A $\square \mathrm{DH} \mathrm{H}$ ASRGGGTLYFPAGSY $\square \mathrm{R} \square \mathrm{Y} \square \mathrm{LDAGAV}$

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TVDTPA DNKAGEAVAAAGGGTLLFPAGTYFTGHLRSRVD

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


$L I V A R D T V G S G \square V G D G \square I E G R G G S L V T S G P N A N Q L T W W D \square$
$H$ VE D VT $\square$ Q G E G S VLD G N G Q
GGAMLRGKLLIDNANNVTVTG RGLIDQAG
VIDE GMTS G GY D H WR N S L I WG E G L N D D I A I E GP G L I WGK GL $\lfloor$ QFSANITYWTTHSSSAFWQWGGND INWYGGGT』DGNGQ LAF TGHK T S Q GRDLT WF ISTRYSSTNDK $\square Y G R G \square I D G N G Q$

$\square$ QVS F TVNWGGRNSRHWULLSNDENVTVRGGGGT\|NGNGK $P N V I Y Y$ GP G $\ H E \square A D G L K V P S$ G K T V Y L A G G S
 LL P GA TTY Y HN HWHNS LI WGE GIIN DVVSI T GP GILI F GK GIL
 ANNSFA $\ddagger E \square Q N Q \square S A W R F H G Q N F V L D G G D G F T G R I D G N G Q$ VDESAAENDPN TLYYGPGYHVANDPVVVESGKTLYVAGGA
$\square H$ G E Y LT N $\quad$ TT $\square R G S P$ G $\square I D G Q G R$ FRGENV SNIDK IC GRGII IS G C





 I VAA DPARF GHSHWQNS LIWGD GVE DAAIT GPGLI D GA GT VI LDDVTENAAETSSSDWYVVVANNATVDVGITGGGGAIDDGQGS
 $L I G E G M I E E S S D E K N E Y N I G S W E G N N V L I V G E G I L D G N A G M$
 $L Y G S R K T A G S K S G G C[L P L I S D K G A R S G V M G H Q G T I I D G R G D$


[^3]UniRef90_UPI000287A34C
UniRef90_R4T3U2
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UniRef90_E6WCF0
UniRef90_U2P4E8
UniRef90_UPI0003FCAF1D
UniRef90_R6FIU2
UniRef90_G3A9P3
UniRef90_C6D6J1
UniRef90_D8GPA6
UniRef90_F0Y650
UniRef90_T1W796
UniRef90_I3I4H9
UniRef90_F4QU86
UniRef90_H6W9A8
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UniRef90_M2N517
UniRef90_M0RGM0
UniRef90_R6DDX2
UniRef90_K6T9C5
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UniRef90_I3ZMM6
UniRef90_UPI0003FC624E
UniRef90_R5LWG8
 A SWNKPGSGHAMRSTFVEPYSCDTVLIEGITLKNPMFWQL


A WY D LYYAKD LAA NA ADELGRQIPVYAKGSPSTVNNLGILAANQVQTHGN ACTKYSEFDG\IFKMKNLEPYSGRHLHFVFKVTNCTFVGG QAWWPP LANGMPRPWLVEMNNVTSSELHNDRLTNSPMWNL HVENERGEEHMRGPHTI LIVNGEKDRFKDFQVTRSANYAU $\square T \square A N S R N V T V D G P \square V L N P N H Y S V F T \square R N \square K S L S A S S W S D$

A Y $\square$ NKTKGLNQQNPRLIQLYNGSAFTLYRVTVQNSPNFHY $R G V R \| M Y S R N \square S V S G I T V V D P P H Y S \square$ PSQHT Y WWD QVHSMTVTRGHLIEFMYSKD RR YY D LSMRDSPFWNN $H Y L R P C M V E F D G C S D V L L Q G Y Q L V D A P F W$ RGFEITKSSNVVI DGPUVINPK HY GRGHDYDKGMP TSGRPワALKLCRNVLLDDFRMLQAGWFGL P WWDAFAKDSTLGRPDLWVMNGVNGASMSGLKMKSPPNWF


ПWWRGFCKVDASMPCDSAPTALSFNSCKNLRVENDKVMHD $V L M G R V L M E N V H D V K L V G R G\|I D H S V K K G\| W L A N S Q N V Y V$
ARLPG RANTSRPS LLGWVDSENVTVTNVDLIHGDFWAF SYGAGPGRVGPPRAGFGPDRPAPAPGAPTPPIVRPPRGNY LGPGLIHGSGLSCGTRSRQAQLDQNSPRGRGLLFDAEQAG VLMGR LIDENVHDVKLLGRGDIDYSDKGGDR ANSRNVYV WYTYSAGGSNTPGRPMTLDVYGSSNGVLRNLIYQPQFWA
$V L K A S V S F D N Q T S S H T ~$
$V$
TPNAGTTQFYNARPNLTVARGVHGLYYEGLTFYN PAFHG
Y WWDRRRHNRDRYTRGHLVEFMYSSRDRMYNDRNSPFWT GKERLAQAKSDPFNQDQLDGTGEHQDVEGLTFTNAPHF YVHREHGG AI HMSNANNTLVEKVTSIGANGFSL
 RFYSGV HWWAEYWGEDTKSGRRQWYDEHDLRWIADYDIKRPRS AS WD H I T T DYVRPK LIRVGECNNDHFSGFTLKDAPMFHT
 HYLRPPMIQII GCTNVLLQGYHVMRTPFW AWWDANQQTN RPHGFAFSKVSGGAI RDMKIWKP GWNF
 WHLMDSNADRFFIYLGKCNNRLLGEGTAVDGPSWHV LD WWKDAKKKNDAWRPNTVFLHNCKNIAMLCIMNSPSWTLI

 $V K G K Y D D Y C N D A L V G G V L V A N S A C T E H S M V H D T G L Q Q S G D$
$\square$
lupas_21
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 HFVANSSNVIFDNDNDEEEQDQRRTRMAGTPTGVQDSRFK NYYSRSRLANFNFVTI DSVRFQTYNDNNGDGDDIGRSSNK Y LY Y Y $\square \mathrm{DGVLIEDCIFDNTVGKGGYGIYADDCRWCKNDHD}$ S L N S EKTTISGLM LD S SAGDGTAKNTDGFDSRNDGV
 GLDFMS CSDVRVD GVFMRNSDDTI A STQCPT G GS DSVTI RNVKVIS SYGWGDGLNVFASNNV AVPGYKCPSGSTPDKVTPATCFTPETVKNTDGFDPGQSTN
 HFYDS ERVHVRNVHI SAKDNSPNTDGWDPDSARD QHHPVASKRIQFRQVRMESKGPNNDGFDPESCDT TVYCGQSNH LATG $V D N T I D D L L I D T N R D G D D D D C C K N V R D S N$ NLIG GS QDVLVSGMTLTAVTNNSNPVKNSDGWDTYLSTH!

 SLEKR TGADASHPTITTPDEDPNTDGIH $\frac{1}{I} \mathrm{~T}$ TQCGTGGSDNVT $\square R N V K S \square S Y$ Y GWGDGMNVLASNNV V PQKSDHVIIDGDNLFNDNDCNNADGDDFDSKGLL TMFQAEQPKNCRNVI FRDFSILKGGHFG L LLTGVDNM VGNKA $\square$ A $\square$ KNCHNVLLRDFSVLKGGHF ALLATGVDNL IVATGCATGGSENVTVRNKSUSY YGWGDGMNVFASNNV Q\|A GSEN ESDGVTVSGLRSFS AVQWGDGIDVFSSKNV




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LFDGVFCRNSDDCTTEGGCRNTTMQNSTLWADVAHPIFIG 1 VMNSVFDTGDDDVNFTPVTDVWTFDNYFGRGHGADVAES SI TNSVISSGDDAMCPKSYDRLVVKNDTINYTKWKGFKYG TI DNLTIDTDRDGIDDDCCHNVRVSNCFVNSPWDDAMCPK TLDNLLIDTDRDGFDIDCCRNVRVSNCTVNSPWDDAICPK | $L F D G V F C R N S D D C T T E G G C R N I T M Q N S T L W A D H P D F I G Q H$ |
| :--- |
| $T F N N F T Y T G G D D C I A F K N S T T I R L A N T C N G I A G S I G Q Y V$ |


 MVMNSFWDTGDDAINFGRVVNNFVRNGHGGLLALGSHTGG DGNRDVRSDRKWGMIVAHNHDYWGHG $\square$ SVGS NHFYDC


 HI HDCSLACGDDCI A L K
$V V L N S Q V T N D D D C V V L K P G D Q V H V E G V T C T G S H G L S V G T P$ TII HDSDVMGGDDCVA
$Y V K H A D G Q G G D D P F S T K T W A N V T F E D L V S W T Y C Y G V K V G Q$ $V V E D C T F D T G D D C \prod A D K P S Q N I V I Q N C I M H S G H G A V T L G S$ SFSSNYVVNGDDCLTVGNGKNIVWIDSYCEGGHGLSIGGED


 TIRNCFFRTDDDSVSPKGDTRAGGEKDS LNLDCMNTPNRDGIDPVDCHDMTIYSCNDMAGDDGLCFKS TIHDSDVMSGDDCVA DKT $\square$ ANDTVRNSRCYATHGDSIGSE $R I S N C T V N S P W D C F V T G G Y Q L G S V L D G T W K R H V N P V R F F G$
$E G M M T Y D V D P A N D D Y P C T N V E V S G C T F S N V Y R G F G H$ SFRDTENVTISDCYVTGYDRGTMLDATWQGYVTGRDKLGT
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GSDTNDSAVTYKDVYTWSSNQMYMDKSNGGGNGTVSDVV
$\square H$ G N S K E P E $\square \mathrm{L}$ E N L N Y $\square \mathrm{N} \square \mathrm{D} \square \mathrm{L}$ D H Q E K Q LD Y Q G C M A $\square \mathrm{NVR}$ NT A A W $\square E N \square L A E D N D M N G T A S G L R C K T A P E \square G G G A B N I I$
 S S Y A A TENLTITNCYVAGSYDVPHLARNGR\|KCGTESNGG S S Y A S T DNVTI ANCFVVS GTYE EMKV SRNGRMKCGTESNGG
 THGNSINPETLSDDTFSNMGYQGCDADNPGD SNLVKDVL


 WDPDSSRNVLI ED S TYRGGDDCVAIK S GWDCF G I DY DTP

 E LT G G $\square R \mathrm{R}$ N V Y A Y Q L K V T G A T K F A L Y I K S N T L R G G F A Q N I N CHTPAMTNLKCRNLYVPEAYWSHA】I WLQATNEMPMTNMH

GANDVVTNS ITFKNCTVASSDKAAGDKFFSGHGSASVSNVT
 EMAGG IQ NVFAQKLVIFNANWQTNPLNDA DNRGGY LRNFY G QVA DVENVLIE NTVMNNTLYAARFKSWTGGMGAARNDT S S YA A A ENIVIRRCAVSGYDMGTMLDGTKRTTQGTESNGG A S WF DFK GLVFD N $\quad$ TI FESHR G LGMQ







[^5] FENI RIDGVEEGML FNFRVVFNEKYSHSPGRGIKNVYLKN $\square T N \| S M R E V T T A P I F L R L G R R M R G P A G V V P G T L K R V I I S N$
$\square V N K V R M Q D V S T P L L I T D S Y S G L A G A V G N S P V I S G Y V N D$ FDD【D $\square E R L S F S N D G N R T W L A M M T G S T A G \square G P V T G V T \| S N$
LENF $\square$ GHGNA YS $\square$ N $\square \mathrm{DQ}$ Q WSSESTVAGNGVQLSS $\square \mathrm{K} \square \mathrm{NN}$
FENDRVEDFRQGQLVNDRDFYNEKYCTAPGRGDEDVLFKN FRDSALKNDTEERFVETSNYSNSTATGTHLPQFKHIVVSN FNRDKMNNVQTPFFIV FKNITDSNCVFDGC MGLALESEDGALCEDDADSNITMRD
 VTNVTVSNCLSY ITTIDDPTANPDKYCNTSTGAYN TIISFNN I EDVRVENFRHGQLITMMVMYNQKYNTSPGRGISNVTIRN

 SENITI RNVTCQG PYAGDADGTEMSGGGVRNVTVEN

 FDGUH $\square R N G E D M P \square M \| A N P R \square T N Y R G S K T A G R V A D \square T I K N$
WQD $\square$ CDKCDYAFRVLT CYQSTTTADCAAHPMQG VVDG VSNVLVDN NALVSTDDAGNRSTDNNGGGPVSQVTYRN FEDFDI E SVPTSNDGNRTWLADWS GSGPEGGPVTGVTDQD VRDVSIPNGVQAVVAFDCDYPTADHVRTRPPVVNNIHISN


FEEND I IHCQYEG
NMGGAA $\square$ S $\square$ HQADGGH $\square$ H D $\square$ HYRN
FRNFTARNDDVIHFPDRDRVQDFWLHPTGEMPMENDCFEN IS DCAlKNVNRCGISDETV

DGAEVENVTFER
TDNNGLR』KTS■A
KGGPVSMVTYRN
FSNDTMRGVRGAPLFDRLQSRMRGPKEDPVGTLKRVLMSN $\square T N V G R G \| D T T T Y S W Y T N Y P T D E D D N P G S L S Y N S N T T I S G$


[^6]

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| UniRef90_UPI000287A34C |  |
| UniRef90_R4T3U2 |  |
| UniRef90_B8BMF8 |  |
| UniRef90_A5ZL63 | $\square Q \\| L D E A D R C Q A S G I Y T N G N T \ S ~ G L V F D K V T Y N G T$ |
| UniRef90_D4VTK2 |  |
| UniRef90_L8G4S0 | FIGGK T S T K |
| UniRef90_Q8MTK1 |  |
| UniRef90_TOIH28 |  |
| UniRef90_D7EYK0 | LS G T A T NL Y DVVA N A M WC |
| UniRef90_E6WCF0 |  |
| UniRef90_U2P4E8 |  |
| UniRef90_UPI0003FCAF1D |  |
| UniRef90_R6FIU2 |  |
| UniRef90_G3A9P3 | FHDLLGSAKNRTMTFLGYAANQQKNITLDNVVFDGT |
| UniRef90_C6D6J1 |  |
| UniRef90_D8GPA6 |  |
| UniRef90_F0Y650 |  |
| UniRef90_T1W796 |  |
| UniRef90-I3I4H9 |  |
| UniRef90_F4QU86 | $\square$ T S S A A A IM P S I I A G VE G Y K V E D I R I S D |
| UniRef90_H6W9A8 |  |
| UniRef90_UPI0003606477 | FKATGA H Y A MVLS GLPEAP L R V L K L S V S $\quad$ T S Q Q G $\square$ Q A |
| UniRef90_UPI00036509E7 |  |
| UniRef90_M0ZT94 |  |
| UniRef90_M2N517 | WT GTEANQRGP\R V I C A D GAPCTGVD |
| UniRef90 M0RGM0 |  |
| UniRef90_R6DDX2 | $\square S Y$ T G K N T E L S V I E G Y NEERK VK N I R F E N L R $\square \mathrm{NG}$ |
| UniRef90_K6T9C5 |  |
| UniRef90_M5T4S2 | FEIR NVYGQE G S S IVQGTEQDPVKDIV F N NVSVK D F K G G |
| UniRef90_UPI000363D866 |  |
| UniRef90_G8NQU3 | 1 T L R D T V D |
| UniRef90_R6VCG8 | $\square$ S Y T GE N A E L S I I G G Y D E K R K VK N $\square$ R F E N L R I N G |
| UniRef90_UPI000440A057 |  |
| UniRef90_C9SW79 |  |
| UniRef90_G2P3N2 | $V$ V Y S G K P L A T C MVL G Y D A D HPVVK DVT FENLVVNGT |
| UniRef90_UPI00026C57D7 | TTIP LIDSAAAP GS S D Y A K S P VL R N F K FEDI KIS G S T GGTI |
| UniRef90_UPI000474ACCC | VKIM G S A GVA N T G G Y G E P G H P L T M S LT NVVTD T P N G $\square$ T L |
| UniRef90_B5Y3E1 | V T F T Y A NKPANDK T G N T R G G Y V H DVVYYQ |
| UniRef90_UPI0003674499 |  |
| UniRef90_T0JVY4 | 1 S ERSKVVNPA Q I L G Y D Q Q R Q I E NVK F Q GL R I G G |
| UniRef90_W7TEA3 | SSST KVVNGVLDVSGLS S D HVA GFTAQNCAFNGVSDD T |
| UniRef90_R7L9N1 |  |
| UniRef90 X0QJR1 |  |
| UniRef90-C9SU11 |  |
| UniRef90_Q3BXR0 | TCLLY GVTS PVVINPFYAS GS S GTK PTVSAVVVDG |
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| UniRef90_UPI00036D3ACF | $V \mathrm{~V} V \mathrm{GNV}$ T K D GK T G S C F Q A GPVASDVP |
| UniRef90_K5WD08 | F A G T I |
| UniRef90-W0AKF5 | VEA R G $\square$ D H R F P A A $\square$ A G LP G H R V A DVVLK D $\square$ A L I Y R G G G T A |
| UniRef90_Q8VZB7 |  |
| UniRef90_R5CDR6 |  |
| UniRef90_E6LLU0 |  |
| UniRef90_UPI000470B5AB | $\mathrm{R} \square \mathrm{NG}$ |
| UniRef90_R5QJE7 | ID M T D V G |
| UniRef90_R0E5N9 | TCLLY GVTS P L VINP F Y S S G G S G T K P S F S D V VNG |
| UniRef90_I3ZMM6 |  |
| UniRef90_UPI0003FC624E | I S I G GA D R N S Gl WA Gl L L S GPA GLYP V S GF TVVT |
| UniRef90_R5LWG8 | $V \mathrm{NVF}$ N A D S R Y S S I I S GVP GA W $\square$ E DVT F S N $\square \mathrm{H}$ |

[^7]
$\mathrm{K} L \mathrm{~L} D \mathrm{~T} G \square \mathrm{~F}$ NCHC
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WY A CRSA
UniRef90_FOY650
UniRef90-T1W796
UniRef90- 1314 H 9
UniRef90 F4QU86
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UniRef90-UPI00036509E7
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UniRef90_C9SU11
UniRef90-Q3BXR0
UniRef90_UPI0003B31110 T $\square$ A Q $\square \mathrm{G} \square \mathrm{T}$
UniRef90-UPI00036D3ACF T N A
UniRef90 K5WD08
UniRef90-W0AKF5
UniRef90_-Q8VZB7
UniRef90 R5CDR6
UniRef90-E6LLU0
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UniRef90-R5LWG8
lupas_21
lupas_14
lupas_14
lupas_28
jnet
conf
conf
sol25
sol5
sol0
jhmm



[^0]:    
    

[^1]:     $M G$

[^2]:    

[^3]:    lupas_21
    lupas_14
    lupas_28
    jnet conf sol25
    sol5 sol5 j̣hmm
    jpssm

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

[^5]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

[^6]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol0
    jhmm
    jpssm

[^7]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol5
    jhmm
    jpssm

