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\section*{| $A$ | $A$ | $Q$ | $A$ | $Q$ | $A$ |
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## QUERY

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$G \square G G S A T N D G G A G M V Q A L G A R L R D A Q G N$
 AALNNGAKHLIVGIGGSSTNDGGAGMAQALGDVLLDDKDGQ A ALDKGVEHLI I GVGGSATNDGGAGMDQALGGRLLDQKRR A A L E Q GVVEHII I GLGGGSATNDGGAGMARAL GAKLL D GK GN A ALDLGVQHII GIGGGSATNDAGAGMDQALGGKLLDDKTGS A ALDEGAEHIIVGI GGSATNDGGAGMIQALGGRLLDRYGK A ALDKGCRKFI I GI GGSATNDGGAGMAQALGVRLLDKEGK
 A A L D K GI E H I I VGI G G S A T N D G G $\square$ G M A Q A L G $\square \mathrm{K} M \mathrm{M}$ D S Q GR A ALDYEVDHI I I GI GGSATNDGGAGMAQALGAKLLNHEGE A ALDAGAERLI I GI GGSATNDGGAGMDQALGGRLLDDSGR

 K A L D QKVVKHII I Gll G GSATNDGGAGMAKALGAKLI NA A A NALDKGVAHFII GI GGSATNDGGAGMVQALGAKLLDKQGR A ALDRGVSA IILGI GGSATNDGGAGMMQALGVKLLDRQGQ DALDR GCRKFI I AI GGSATNDGGAGMAMALGVRFYNKDGK A A L D Q GCRRKF L GI GGSATNDGGTGMAQALGVKFFDKEGR HALDLGVERIVI GI G GSATNDGGIGMVQALGGKFLDVNGN A ALDKGAKHLI I GLGGSATNDGGVGMMQGLGASFLDKAGQ A C L D H GVVNRLLI GI G GSATND G GA GVVVQAL G GRLLLDAE GK SA L D K G V Q N L L GI G GSATND G GA GML EAL GAKFY DKE GN SALDHGI KRMIVGI GGSATNDGGAGMMQALGVKLLDADEE
 A ALDKGVNHI I I GI GGSSTNDGGVGMAQALGAKLVDAEGA DALDRGARHLII GLGGSATVDGGVGCLQALGLKCFDQHGR A A L EHDDQKLIL GI GGSATNDGGAGMMQAL GANLQD GDGR DAI 1 NG CRNFIVGIGGGSATNDGGIGMLQALGYEFRDNNGQ NAL NYGVKKIILGI GGSATNDAGVGMLQALGARFLNAKNQ A ALDLGVRHLILGLGGSATNDGGTGMVQALGAQLLDTEGQ HALHH GVVKKI I L GI G GSATNDGGVGMLQALGVSFKDVDDK DAAEKGVSQII I GLGGSATNDGGAGMASALGVKF LDNRAGE AALDEGVEKI I I GI GGSVTNDGGAGMAEALGVKFLDQNGQ A A L D Q GV R K I I L GI G GSATND G GA GMMQAL GACLL D S D G K $A V L D R G V E H I I V G I G G G S A T N D G G L G M V Q A L G I R M L D C E D C D$ YALDKGCRNLII GI GGSATNDCGVGMAQALGVKFLNAKGK A A L D R G A R KI I I GI GGSATNDGGAGMMQALGVRLRDAQGN K A L D L G V K K L L L Gl G G S A T N D G G V G M L Q A L G M S F L D S Q G Q QALD Q GVVEHI I I GI G GSATNDGGAGMLQAL GAQLLDAS G Q


 H A L D A G R H I L GI G G S A TVD G GMGVAQAL GVRFLDA Q GM
 SAMDHGANHDI L GLGGGSATNDGGCGMAQAL GARLLDD S GR GALDHDVKEIII GLGGSSTNDGGSGMAQALGAKLLDQNNH A A L E Q GV E H I V GI G G S A T N D G G I G M A Q A L G V Q L L D N N G Q
 DAI K NGCRRFLTGI GGSATNDGGVGMLQALGFGFLDKNKK A ALDHGVEHVI LGI GGSATNDGGAGMLQALGVALLDANGD A A L D S GVVKAII I GI G GSATND G GA GMMQALGGVRFLDDSQQR K A L D A GARHIIVGLGGSATNDAGAGMLQALGVRLLDARAN HALD Q GVQHCII GI G G S ATNDGGAGMVQALGARLLDSQEQ

 A A L D H GVVKHI I L GLGGGSATNDAGAGLLQAL GAKLLDRDKQ S A L N E GV E TI I L GLGGGSATND G GA GMAQAL G IR L L A A E D G T A A L E R GVVK I I L GI G G S A T ND G GA GMMQAL GVILRDKQGR A A L D E GVVRHFI I GLGGSATNDGGAGMLQALGVGLEDAD GR
 QALDD GCRRFILAI GGSATNDGGAGMLQALGMRLLDAKGE EALNSEATKILLGLGGSATNDAGAGIVQALGGKLLDKEGK A ALDEGAGRVILAI GGSATNDAGAGAMQALGVVLLDEHGQ

 H A L D $\square$ GVSRF A C L D T G V K Q | $S$ | $A$ | $D$ | $A$ | $G A R$ |
| :--- | :--- | :--- | :--- | :--- |
| $A$ | $C$ | $L$ | $D$ | $Q$ | SALN N G GV T TV I GI GGSATNDGGAGMAQAL GARLLDEQGQ S $L$ GLGGSATNDGGAGMAQALGVRLLAEDGF A GL D Q GCR K FI L GLGG SATND G GA GMLLQAL GYVLL D Q N D Q A A L D H G V R H L V I GI G G S A T N D G G A G M L Q A L G V K L L E GQ A A L D H GYRHIVLGLGGGATNDGGAGFAQALGVKFYQRDGR

 AA D DGIIRHII I GLGGSATNDGGMGMLQALGVKFLDLEGD Q A L A A L D A GARHFIL GI G GSATNDGGAGMVQAL GARLLLDADGR HAIQEGCRRF SAWDKGVRHF H A LD Q G V K H D A L D K GVVE Q I D A V E K G CR HF

| A A | N E G C R K |  |
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GP Q K G A T P E M $\stackrel{220}{10}$
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 GEKGASAVFGPQKGATPEMVKTLDANLADYADVMKSELGS GPNGASAVFGPQKGATPEMVRQLDENLSRFADVVEQTLEK

 GPNGASYVYGPQKGATKEMVVRLDNSLKHFAQUVKKDLDK
 GPAGASAVYGPQKGATPEMVQFLDQNLNHYAEIIKRDLNK GPRGASAVFGPQKGATEVMVDVLDQNLDHFADVAEKVLGT GPKGASAVFGPQKGATPDRVAQLDAALKVWGEHIEQTTGR GPQGASAIFGPQKGANPAMVRFLDENLKHYAEVIARQTGK GETGASAVVGPQKGATPDMVKQLDRNLAHYAAVI EKEMDD GKEGASAVFGPQKGATPERVTQLDNALAHFAEMIKRDLGU GAQGASAVFGPQKGATPQMVEQLDRALRHYGELLERVTGR
 GPNGASHVFGPQKGATEEMVLKLNSNLEHYAKKIKEYLGK GERGASAVFGPQKGADTEMVQLLDKNLSHFAQVAKQHLHV
 GERGASA FGPQKGANP UniRef90-F5LAFO UniRef90_R6GIG7
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UniRef90 D9SNG2 UniRef90_UPI0004790538 UniRef90-K8WEE0 UniRef90-UPI0003B6C1BD UniRef90-UPIO00375B275 UniRef90_COZJU0 UniRef90_UPI00047EE638 UniRef90_UPI00037CC32E UniRef90_UPI0003791BA6 UniRef90-C9R6H8 UniRef90_UPIOOO3942818 UniRef90_E3BHHO UniRef90_UPIO002FB009D UniRef90-N6YV53 UniRef90_UPIO0046EE5A3 UniRef90_W8UK19 UniRef90_UPI0002F029E9 UniRef90-R2PUM3 UniRef90_D9QVS9
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 DVKNSAGAGAAGGMGAALMGDFHADLRPGIVEVMDAVNLS PI RHVPGAGAAGGLGAGLLAFLDAELKRGVEIVLEAVQFQ SIAEVPGAGAAGGI GGGLLAFLDAELKKGIDIVIEATNGY SFRHI EGAGAAGGI GGSLLALLNADLKKGIEIVLHAVDFE QVKDIPGAGAAGGLGAGLLAFLHAELKRGVEIVLETVKFH KVENIKGAGAAGGLGAGLVAFLDATLSPGIDIVIEATKLK EVDRVSGAGAAGGMGAGLQAFCGAELRKGUEVVEALGLE DIK DTPGAGAAGGMGAALLGLLDAELRPGI EI
 ACREI EGAGAAGGLGWSLLVFLHADLKRGIDDVLEAVNLE QV DDLPGAGAAGGMGSALSGLLMGRLEPGISIVTDALNLA DVQSAPGAGAAGGLGAGLVAFTGAELRSGVE
 DVLSVPGGGAAGGMGVALHAFCQAELRRGI E I AVINAPGAGAAGGMGAALLGMLNAELRPGVE RIIDVPGAGAAGGLGAGLIAFLNARLKSGI SVSDLPGAGAAGGLGAAMVAFLGATLKRGVE DVKDISGAGAAGGLGAA LLAFLDGKLKRGI
 NVDNDPGSGAAGGLGAGLLAFLNADLKRGU EVEQQPGAGAAGGMGAALLAFLGAELKPGI EI AEKAGAGAAGGMGGGLLLLPNVTLRSGVQL DVLNAGGGAAGGMGAALYAFCGAELRQGIVE RLHNEPGSGAAGGFGFSLLTFFQAEMKSGI E NVDDAAGAGAAGGMGASLLGCLGAKLRSGAD ADPDHPGTGAAGGLGFAFLSYTNATLQSGI Q DVAHVPGAGAAGGMGAAALAFFGATLRPGI EI RVKDS
EI DS LPGAGAAGGLGAGLCAFLKAELKSGVD TI EHLPGSGAAGGLGAGLLAFTNA】LKPGID $K V D D V P G A G A A G G M G V P L L G W L D A K L Q P G I D I$
 DV 1 AVAGAGAAGGMGASLFGLLHARLQPGVE RILDKAGAGAAGGMGGGLLLLPNAQLKAGVQL DVLNLAGGGAAGGMGAALFAFCGAQLRRGI EI DVKDTAGAGAAGGLGAALLGLFSATLRPGIE
 DMSQQPGTGAAGGMGFAFLTFTNAVLESGIV AVDKVPGSGAAGGLGAGLLAFLGAELKRGGDLMQAVKLE KI DDIPGSGAAGGLGAGLLAFLNASLRSGDDIVI DTLKLE DIDRVPGAGAAGGLGAGAIFFLNSKLRPGIDLVIKESGLK DVASVSGAGAAGGLGAGLMAFTTCEMRRGVDLAIEVTKLE DVKHMAGAGAAGGMGAALLGLFKAQLRSGIEIVI DAVKLD NIRDHAGAGAAGGMGGGLLLLPNVSLKAGVEIVIKAVKLD ADENYPGTGAAGGLGFAFLTFTNAVLESGI NMVLTETQLE DVMNAPGAGAAGGMGAALLGLLNAELKPGVEIVINALQLA SIISAPGAGAAGGMGAALLGMLNAQLRPGIDIVTETLGLA DIDATPGAGAAGGLGGAFLAFTQARLKSGIDIVLDAVEID DVEQTAGAGAAGGMGAALLAFCQAELRQGIEIVTDALGLD DVADVPGTGAAGGLGAGLLVFTNSKMQKGIDIVVNYVKLE DVKDLPGSGAAGGLGAAFAGVLKGELKSGUGIVQLLDLE DVISKAGAGAAGGLGAGLMAFLDVKLKSGIEMVIEYANLE SVSQVSGAGAAGGI GAVLLAFFNAELKPGIEVVLDAVDIN

 A DGEYPGTGAAGGLGYAFFNFTNSKLESGU$K$ D YRHDAGGGAAGG1 SVAAAAFMEAQLKAG:DVVIQAVNLE $R \square H D R P G A G A A G G I G G A F Q A F F P A A M R R G I D V V I E Y T G L R$ NHSGSKGFGAAGGTPMGLSLLFELQDKQGIEMVLDVLEAD $D V R D E P G S G A A G G L G F A A K A F L G A Q F R T G V D V V A Q L T G L A$ DV DD DPGGGAAGGLGAGLMAFMNGRLKRGIEMVIRYSGLE DI AQTDGAGAAGGLGAGLLAFLNVRLKKGIELVIEYTGLE EVHY DA GAGAAGGMGAALLAFLKAELKPGFDIIAQTLNLE
 DVEQIS GAGAAGGLGAGVLAFLGAELKRGVDIVIEATGLA AI HDLPGTGAAGGVAGALLAFLNGQLRSGIEIVIETTGLA DINDIPGAGAAGGLGAGLIAFLSARLMKGVELVIQHTHLE DAANVAGAGAAGGLGAGFLFFTEGRLCPGVDVVLETANFE QIAERSGAGAAGGFGAGLMSFTDAHFQPGIDLIAKQMKLD N Q QQPGAGAAGGMGGGLLLLPNVELKAGVQQMLENLQLA TVDTRPGAGAAGGVGAALI AFLNARLSPGVELVSEALDLA DI LDTKGAGAAGGMGAAFLGILKQRLLPGVEVIMESVGFD $R L H D L P G A G A A G G D G G A F Q A F F P S K T K R G I D I V V E Y T K L R$ AVDRVPGAGAAGGMGAAMLAFFGAELKPGVEVVAAVELD ADPLFPGTGAAGGLGFAFLTFLNASLESGITIILEETKLE
 NHRDTAGFGAAGGTPDGLSLAFNDQUKAGI EMVLDALGGAD





| QUERY | $T \square K A$ |
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| UniRef90-D4GLJ5 | T M K |
| UniRef90-R1GWH1 | T LKLLG |
| UniRef90-G9QHJ3 | TI K M A H $\square$ |
| UniRef90-13E978 | LFK【 |
| UniRef90-E5WMD3 | S M K M N S L |
| UniRef90-E319G8 | ACK\GRNM |
| UniRef90-R1AYN1 | LIKL |
| UniRef90_W0HWV6 | TV KL G Q T L R |
| UniRef90-UPI00036E078D | L L M L |
| UniRef90-F6B8Z2 | 1 WNLA |
| UniRef90_G4NZ01 | Slk La K T M |
| UniRef90-V5BTG4 | VWQMAERNK |
| UniRef90-B8D188 | L I |
| UniRef90_C4LAJ8 | TL R L |
| UniRef90-D5DHM8 | VI R L |
| UniRef90_UPI0004689298 | SLAI GQQL |
| UniRef90_LOMBT2 | VWQLAER |
| UniRef90-B7R717 | V I K V |
| UniRef90_UPI0003AB21FA |  |
| UniRef90-UPI000427661F | L L |
| UniRef90-W8QT35 | V M T F G R |
| UniRef90-F3MC06 | L M |
| UniRef90-F4A7C8 | 1 L |
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| UniRef90-M4XILO | WK |
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| UniRef90-B8K3F4 | T L A |
| UniRef90-F5LAF0 | TLKLLGKTL |
| UniRef90_D3VJI2 | V WS I |
| UniRef90_R6GIG7 | L I Q A |
| UniRef90_S6F319 | FS QLLA MK |
| UniRef90-E1SML9 | LY T L R |
| UniRef90_C5QMR8 | L I K L |
| UniRef90-Q630A0 | V WS |
| UniRef90_U5S6M4 | 1 LYLLA N GI |
| UniRef90-Q7N004 | V WK M G |
| UniRef90-U3A235 | V WHMAS Q |
| UniRef90_L0K8X3 | L V |
| UniRef90-J0MKV1 | V WK I G |
| UniRef90-B9CXD6 | L L K L S L K L |
| UniRef90_I2B604 | GLRVGMSL |
| UniRef90_B5FAP0 | 1 Y S M |
| UniRef90_U6ET20 | L 1 |
| UniRef90_UPI000466D4C4 | LYRKG |
| UniRef90-F2FHG2 | V I KLL G Q D $\square$ |
| UniRef90-UPI0002ECCAA7 | V L K L S |
| UniRef90-17KTQ1 | L I K A $\square$ K A L |
| UniRef90-V6J1Q9 | V WQMAKN |
| UniRef90-V5P3M3 | L L K |
| UniRef90-W8ZVW1 | M Y C L |
| UniRef90_G7SUR0 | FYLLAK H $\square$ |
| UniRef90-R91Y41 | L L K L |
| UniRef90-D2TH70 | 1 WKL S Q |
| UniRef90-K8AVS7 | LWRMAQN |
| UniRef90-UPI000373DE07 | TWQLA Q |
| UniRef90-UPI0004696438 | VIKL A Q |
| UniRef90_UPI0003FDEF54 | A 1 KI |
| UniRef90-Q65UR0 | TLKM |
| UniRef90-R6G372 | L L N |
| UniRef90-S6HF69 | $\checkmark$ WLL G |
| UniRef90_S9T8L5 | ALKL G $\square \mathrm{QL}$ |
| UniRef90-A0A023MNW1 | WRLA RQ |
| UniRef90-D7N0Y3 | L LKM |
| UniRef90-F3B6I3 | L L |
| UniRef90-K8W192 | V LK $\square$ G Q Q |
| UniRef90-UPI00030E3116 | T Y |
| UniRef90_UPI00037BC782 | TLLKLLGA Q $\square$ |
| UniRef90-W8PV72 | L WRAA |
| UniRef90-D9SNG2 | L 1 NL |
| UniRef90-UPI0004790538 | V L K |
| UniRef90-K8WEE0 | TL N |
| UniRef90-UPI0003B6C1BD | TLSMGLNL |
| UniRef90_UPI000375B275 | L $\mathrm{H}^{\text {HLL}}$ |
| UniRef90_UPI0002E568F0 | ALKCGSNL |
| UniRef90_COZJU0 |  |
| UniRef90_UPI00047EE638 | M I Q V |
| UniRef90-UPI00037CC32E | LL A V G M G L K |
| UniRef90_UPI0003791BA6 | TVRVGQAL |
| UniRef90_C9R6H8 | LFAL Q G K |
| UniRef90-UPI0003942818 | LVHIS G K |
| UniRef90-E3BHH0 | TLSLG |
| UniRef90_UPI0002FB009D | TYS |
| UniRef90-N6YV53 | GLRLGM |
| UniRef90_UPI00046EE5A3 | L WR |
| UniRef90-F5S7H6 | $V L A \square S V S L N$ |
| UniRef90-W8UK19 | TLA ${ }^{\text {a }}$ G |
| UniRef90-UPI0002F029E9 | TLKLLGS Q |
| UniRef90-R2PUM3 | L V R |
| UniRef90-D9QVS9 | M L K $\square$ |
| UniRef90_UPIOO0474947B |  |

## UniRef90 F4LRC8

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UniRef90-E4TEK7 UniRef90_UPIO00414D553 UniRef90-UPIO0040B43B2 UniRef90-B4EX08 UniRef90_U7VAA4 UniRef90-R2NVA1 UniRef90-C4SZ13 UniRef90-DOKL97 UniRef90_R9BVF1 UniRef90-A0Aоз8GBн9 UniRef90-K7VVB3 UniRef90_K9U735
UniRef90 V7HVJO UniRef90-B3E6Z3 UniRef90-B3YTY1 UniRef90-R7R4V4 UniRef90-A0A031MFD6 UniRef90-U3HFB3 UniRef90-C0GC84 UniRet90_B2GAZ6 UniRef90 UPIOOO37B2B0D UniRef90-O8EG40
UniRef90
G7MC44 UniRef90-D5V3A9 UniRef90-F6CEHO UniRef90-Q8G606 UniRef90_F9SGW6 UniRef90-UPIO00219758A UniRef90-UPIOOO3B32433 UniRef90- N8X4L1 UniRef90-UPIOOO2E8D323 UniRet90-U3AYX4 UniRef90-C4GBL3 UniRef90_W6LQ81 UniRef90-UPIOOO407552F UniRet90-X1TOT3 UniRef90-F4GTC5 UniRef90_UPIO002556AAO UniRef90-S4YKL4 UniRef90-V6LZJ6 UniRef90-B1KMM7 UniRef90-W7BRN8 UniRef90-UPI0002FF67DF UniRef90_UPIOOO475A127 UniRef90-G5JFH6 UniRef90-A0A011RQ27 UniRef90-A7GK62 UniRef90-B2JSK5 UniRef90-J7IS14 UniRef90-UPIO00401839E UniRef90_V9H6Z4


 MK VIAPDSYKESLTAMEVATADENGFKQVFPNAQYLKL

## M

 M KVV I A P D S F K E S L T A $M K I L T A P D S F K E S$ MKVVIA $\square D S F K G S M T L E A A K A$ MM

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S$M K$
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M K$\begin{array}{llllll}M K & V & A & P & D \\ M & \text { A P } \\ M & V\end{array}$

MKVLVA A
MK I V V$M R I V I A P$MKVVVI A P D S F K K E S S L
M R
M K
M K
MKFV A AM K




UniRef90 F4LRC8 UniRef90-R9L4K3 UniRef90-V5FIV6 UniRef90-C2TRQ2 UniRef90-T0PDB1
UniRef90-K9DFP2 UniRef90-K9DFP2
UniRef90 A0A024AJJ3 UniRef90_U4JV27 UniRef90-Q67LH1 UniRef90_C9P1D9 UniRef90_UPI00047C66B7 UniRef90_UPI00035D5AB1 UniRef90_C2KXF3 UniRef90_A8TA44 UniRef90_D4LIJ8 UniRef90-13DHI8 UniRef90-R7IV28 UniRef90_UPI00046E8236 UniRef90-L1QBY4 UniRef90_U1WSQ6 UniRef90 K4KSF1 UniRef90-W7Z1W5 UniRef90-C9QAP4 UniRef90_FOLY16 UniRef90-W4Q7P5 UniRef90_D4MD55
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UniRef90-A0A037Z173
UniRef90-B2A890
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UniRef90-M1L750
UniRef90-D1ARF0
UniRef90-J8TMT2
UniRef90-E4TEK7
UniRef90_E4 EKI
UniRef90_UPIO00414D553
UniRef90_UPIO0040B43B2
UniRef90-B4EX08
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UniRef90-C4SZI3
UniRef90_T4VKJ8
UniRef90_D0KL97
UniRef90_R9BVF1
UniRef90-A0A038GBH9
UniRef90-K7VVB3
UniRef90-K9U735
UniRef90 V7HVJO
UniRef90 B3E6Z3
UniRef90_S3YTY1
UniRef90-R7R4V4
UniRef90-A0A031MFD6
UniRef90_U3HFB3
UniRef90_C0GC84
UniRef90-B2GAZ6
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UniRef90_UPIO00219758A
UniRef90_UPIO003B32433
UniRef90-N8X4L1
UniRef90-UPIO002E8D323
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UniRef90-W6LQ81
UniRef90_UPIO00407552F
UniRef90-X1T0T3
UniRef90-F4GTC5
UniRef90-UPIO002556AA0
UniRef90-S4YKL4
UniRef90_V6LZJ6
UniRef90-B1KMM7
UniRef90-W7BRN8
UniRef90-I0C7B8
UniRef90_UPI0002FF67DF
UniRef90-UPIO00475A127
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UniRef90_A0A011RQ27
UniRef90_A7GK62
UniRef90_B2JSK5
UniRef90-J7ISI4
UniRef90_UPI000401839E
UniRef90_V9H6Z4
UniRef90_FOYWT5 BH9

FD6

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7B2B0D

170
Q\| GFGGGE|YK|
 PLARGGGRLGDLARIDVSALDPRLQQAHLIVACDVDNPLC
 AI D PS G GTLIHSIV VI




## 

EL

 QVLPGARGLKDITEI PI EP DGEALDNVRQI PVCFGASGLEHLARI ELPPGGAALAGLARI E GF G GEQLRRVAS ELSFGGGELGKLHT1, EI RFGGGHLTEITD
 SI ALLT G G GLLTELA Q
 ELPYGGAALAKLDRI ELPPGGAALAGLDRI EIPFGGGALNKLCKI PLKYGGQELLKLSEI ELHDGGGALHTLAS


## EVGFGGYELERVESI



EIA A G G A A L A GLL H K I

N I A Y G G S S L S QL E A I

| $E$ | $I$ | $T$ | $A$ | $G$ | $G$ | $G$ | $L$ | $K$ |
| :---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $Q$ | $I$ | $A$ | $R$ | $I$ |  |  |  |
| $A$ | $H$ | $G$ | $G A$ | $A$ | $L$ | $A$ | $N$ | $L$ | E L N R G GA A L S E L A S

 EL GAGGAQLSQLQRII
 E L QVVGA S A L L T H L A K I PLLP PGGAAL SRLAA I

 DLPRGGAALQQLDRI E L A P G G A A L 1 D N L | $P$ | $L$ | $L$ | $G$ | $G$ | $A$ | $Q$ | $L$ | $A$ | $M$ | $L$ | $S$ | $R$ | $I$ | $N$ | $L$ | $S$ | $A$ | $L$ | $D$ | $D$ | $R$ | $L$ | $R$ | $Q$ | $C$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $E$ | $V$ | $A$ | $C$ | $D$ | $V$ | $D$ | $N$ | $P$ | $L$ | $V$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $K$ | $G$ | $G$ | $A$ | $S$ | $L$ | $E$ | $K$ | $L$ | $S$ | $Y$ | $M$ | $D$ | $L$ | $S$ | $G$ | $L$ | $D$ | $K$ | $R$ | $L$ | $Q$ | $E$ | $S$ | $T$ | $F$ | $P$ P $P$ VG GA S L Q QL E R

 P I NRGGGGLADLATI EL P L G G G F L D RLL D RI Q L Q M N G S A L E Q : D T I R I E P V G G N L H C I E S F




UniRef90 F4LRC8 UniRef90-R9L4K3 UniRef90-V5FIV6 UniRef90-C2TRQ2 UniRef90-TOPDB1 UniRef90-K9DFP2 UniRef90-A0A024AJJ3 UniRef90 U4JV27 UniRef90_Q67LH1 UniRef90-C9P1D9 UniRef90 UPI00047C66B7 UniRef90-UPI00035D5AB UniRef90_C2KXF3 UniRef90-A8TA44 UniRef90_D4LIJ8 UniRef90-13DHI8 UniRef90-R7IV28 UniRef90 G4CQI1 UniRef90-UPIO0046E8236 UniRef90-L1QBY4 UniRef90_U1WSQ6 UniRef90 K4KSF1 UniRef90-W7Z1W5 UniRef90-C9QAP4 UniRef90-FOLY16 UniRef90-W4Q7P5 UniRef90-D4MD55 UniRef90-18TYQ1 UniRef90-A0A037Z UniRef90-B2A890 UniRef90-A0A014MJA7 UniRef90-M1L750 UniRef90-D1ARF0 UniRef90-J8TMT2
UniRef90-E4TEK7 UniRef90_UPIO00414D553 UniRef90_UPIO0040B43B2 UniRef90_B4EX08 UniRef90_U7VAA4 UniRef90-R2NVA1 UniRef90-C4SZ13 UniRef90_T4VKJ8 UniRef90-DOKL97
UniRef90 R9BVF1 UniRef90-A0A038GBH9 UniRef90-K7VVB3 UniRef90-K9U735 UniRef90-B3E6Z3 UniRef90_S3YTY1 UniRef90-R7R4V4 UniRef90_Q8EMQ5
UniRef90 A0A031MFD UniRef90_U3HFB3 UniRef90-C0GC84 UniRef90-B2GAZ6 UniRef90_UPIO0037B2B0D UniRef90-Q8EG40 UniRef90-G7MC44 UniRef90-D5V3A9 UniRef90-F6CEH0 UniRef90-Q8G606 UniRef90-F9SGW6 UniRef90-UPIO00219758A UniRef90_UPIO003B32433
UniRef90_UPI000466B1CA UniRef90-N8X4L1 UniRef90-UPIO002E8D323 UniRef90-U3AYX4
UniRef90-C4GBL3 UniRef90-W6LQ81 UniRef90-UPIO00407552F UniRef90-X1T0T3 UniRef90- F4GTC5 UniRef90_UPIO002556AA0 UniRef90-S4YKL4 UniRef90_V6LZJ6 UniRef90-B1KMM7 UniRef90_W7BRN8 UniRef90_UPI0002FF67DF UniRef90-UPIO00475A127 UniRef90_G5JFH6 UniRef90_A0A011RQ27 UniRef90_A7GK62 UniRef90_B2JSK5 UniRef90-J7ISI4 UniRef90_UPI000401839E UniRef90-V9H6Z4

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GPNGASA\|YGPQKGATSEM|VE\|LDRNLIKHFATA\|QKQFNK GERGASRVFGPQKGATAAMAEQLDAALAHYAEVARRQLGR
 GQQGSAAVIFGPQKGATSEMVDMLDHALNHYAELILQLTGH GERGASAVFAPQKGADKAMVQTLDNNLYHYAQVVKETINK GPRGASADFGPQKGATPEMVERLDASLRHYAGVIARDLGQ GTKGASATFGPQKGANDADIRLLDNNLNHYGQLIRQQLGR

 GKQGASHVYGPQKGATPEMI RVLDANLAHFDKVVQRDLSK GENGASLI YGFQKGGNKELLSQMDLWMKHYSELVKEYNPA
 GEQGCSA $1 / \mathrm{F}$ GPQ传 GEKGASNVVGGPQKGATKEMVNDKDNNLKHYAEVVKKEGUG GKTGASFVFGPQ $\begin{array}{lll}G K N G A S H & F G P Q \\ G P Q G A S Q Q & G G P Q\end{array}$


 GPTGASAVFGPRKGASKDDVATLDAALAHFAQVIDS QLGV GENGASHI F GPQKGATPEQVVMLDKALAHLALVSES QGCQ


 GQRGASHVFGRQKGASSEMINALDAADHHFAQQSIPQLGT GPCGASAVYGPQKGATPAMVDEDDHADRHYGR AAQTFGR
 GDRGASAIFGPQKGASPDDVAVLDAALSHFADVCARQYGE GPRGASAVFGPQKGASPEQVQSLDAALQRMSRVVASTLGE
 GEKGASAIFGPQKGASPEVVSILDAALTRYADII AQHPLP GANGASVVFGPQKGADKKLVQALDNALHHYGELI GQTLGK
 GKNGASVI FGPQKGATVEMVEQLDQNLKHYTDDI EKDLNL
 GEKGASFVFAKQKGATMEVMGKLEENLQHYSCLLKKQLHD
 GSEGASAVYGPQKGASPDDVRGLDAALKNLGEHMSLVKGT
$G D N G A T N V F G$
$G E N G A Y Y G G$
UniRef90_F4LRC8 UniRef90_R9L4K3
UniRef90_V5FIV6 UniRef90-V5FIV6
UniRef90-D1P277 UniRef90-C2TRQ2 UniRef90-TOPDB1
UniRef90_K9DFP2 UniRef90-A0A024AJJ3 UniRef90_U4JV27 UniRef90-Q67LH1 1 UniRef90_C9P1D9
UniRef90_UPI00047C66B7 UniRef90_UPI00035D5AB1 UniRef90_C2KXF3 UniRef90-A8TA44 UniRef90-D4LIJ8 UniRef90-I3DHI8 UniRef90-R7IV28 UniRef90_UPIOOO46E8236 UniRef90-L1QBY4 UniRef90-U1WSQ6 UniRef90_K4KSF1 UniRef90-W7Z1W5 UniRef90-C9QAP4 UniRef90-FOLY16 UniRef90-W4Q7P5 UniRef90-D4MD55 UniRef90-I8TYQ1 UniRet90_F5IZA2 UniRef90_B2A890 UniRef90-A0A014MJA7 UniRef90-M1L750 UniRef90-D1ARF0 UniRef90-J8TMT2
UniRef90_E4TEK7 UniRef90_UPIO00414D553 UniRef90_UPI00040B43B2 UniRef90-B4EX08 UniRef90_U7VAA4 UniRef90-R2NVA1 UniRef90-C4SZ13 UniRef90-T4VKJ8 UniRef90_DOKL97
UniRef90 R9BVF1 UniRef90_A0A038GBH9 UniRef90-K7VVB3 UniRef90_K9U735 UniRef90-V7HVJO UniRef90_B3E6Z3 UniRef90-S3YTY1
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UniRef90 F6CEH0 UniRef90_F6CEH0
UniRef90_Q8G606 UniRef90_F9SGW6 UniRef90-UPIO00219758A UniRef90_UPIO003B32433
UniRef90_UPI000466B1CA UniRef90-N8X4L1 UniRef90-UPIOOO2E8D323 UniRef90_U3AYX4
UniRef90-C4GBL3 UniRef90-W6LQ81 UniRef90_UPIO00407552F UniRef90-X1T0T3 UniRef90-F4GTC5 UniRef90_UPIO002556AA0 UniRef90-S4YKL4 UniRef90_V6LZJ6 UniRef90-B1KMM7 UniRef90-W7BRN8 UniRef90-I0C7B8 UniRef90-UPI0002FF67DF UniRef90_UPIO00475A127 UniRef90-G5JFH6 UniRef90-A0A011RQ27 UniRef90-A7GK62 UniRef90_B2JSK5 UniRef90_J7ISI4 UniRef90_UPI000401839E UniRef90_V9H6Z4
 DVRNVPGAGAAGGLGAGLLLFTQAEMRRGVEVVLDFTGLR KHFNSPGFGAAGGVPMGLLLFPMLTLKQGIEVVLDLLDAD DYRHLQGGGAAGGIAVAVAAFLNGQLKSGIVLVMEALNDE DVSEIPGAGAAGGMGAAVDAVLKGSLRKGIEIVLDHTNFD

 DVLSKEGAGAAGGMGAALDAFTDAKLQPGIDIVLETVNLK DV VNLD GAGAA GGLLGAGLMGFLGARLRPGI DVVMEVTGLKR DVKDIPGAGAAGGLGAALIGLLGASLRPGIEIVMEAVNLS DVEEIPGAGAGGGLGAAVVAVLQGQLRKGIEIVLDYTNFD SVGNVPGAGAAGGLGAGLMAFLDASLKSGI EVVEATQLS ANPEAPGSGAAGGLGFAFRSFLQGELKSGVSLILEETKLS HVLTQKGAGAAGGMGAAFVGYLPACLKPGIVEVLDTVKLA ADAKYPGTGAAGGMGFAFLTFTDAVLESGUNVVLDETKLE $\begin{array}{ll}N D R E H A G A G A A G G M G G G L L L L P N V N L K A G V Q & V \\ A D P E Y P G T G A A G G L G F A L Q T F L H A T L E S G I & M\end{array}$
 HLHDLPGAGAAGGDGGAFQAFFPSEMRRGI DVVIEYTKLN
 QVRD $\square P G A G A A G G V G A A L D A F D K A D L Q P G A Q L I M R A A D M D$ RLHEKPGAGAAGGIGGAFQAFFPSSMRRGDDVVIDYTGLE AVLNSAGAGAAGGMGAALLAYTHATLRPGUEVVLETVQFS SVI DASGAGAAGGMGAALLGYTQAVLKPG:DVVLETVKDA
 EVAEYPGAGAAGGLGAGLLFFTNATLRPGVEIVLETTGFD EVKDVPGAGAAGGLGAGLLAFTNARLEKGVDIIINYTNLK DIA NVPGAGAAGGLGAGLMAFDNANLKSGVELVIKFTGLE DVKDIPGSGAAGGMGAGLDAFMGAELKSGIDLVMEVLNFE DVEGIAGAGAAGGMGAALLAVLKCRLRPGCEVIAQAVGLD
 RLHDKPGAGAAGGI GGAFQAFFPSTTRRGUDIVDEYTELE DVSNDPGTGAAGGIGAAFDSFLNAKLMPGFEVVSEFHHLE DVLNQAGAGAAGGMGAALMAFTNATLKPGDDLVLEAVQLN PVRDLA GAGAAGGLGAAVVAFDNGTLQKGVRLVIEASRLE TLDNIAGSGAAGGLALDLLAFTQATLSSGIDLVANAVELE DVSNLSGAGAAGGLGGGLVAFDNGKLSPGIDMILEKVGLE AIKDQ1GGGAAGGLGAGLIAFAGAKMQSGVDLIIELTHLA DI RADPGGGAAGGMGDATTVLLKGELKPG:DIIMDAVQLR DI A HIEGAGAAGGLGFGFLGFLNSKLESGIKIILDEDKLE DIASQPGAGAAGGLGAGLMAFTGCTLQKGIDIVIEYSGLR
 D 1 KNKAGAGAAGGLGAGLLAFTDAEMKDGUELVANNIHLE DVREMPGSGASGGL GTGLVALLGAKLHPRYDVVMQYLHLD QVDQ 1 PGSGAAGGLGAGLLAFTNAKLQTGVEIVAQTVKLA TVAAVPGA GAAGGMGAALLALGGRICSGIELVMESVGFE DQRHEAGAGAAGGLGFAARTFLKAEFRSGVEVIAELNQLA
 DVRNVPGVGAAGGLGFAACAVLGAGFRPGIVELVAELSGLA DHSQQPGVGAAGGLGFAARAFLGACFRPGUELVAELAGLA AVEQDPGAGAAGGLGAGDMAFLGGSDRSGIDLVMDTVGFT DLEEKPGAGAAGGLGTGLLAFTNATVQKGUELVVEYSQLE


 AVNDVPGAGAAGGIGAALKGFLNAEFRPGIABVIEQSGLD SI YERTGYGAAGGTPMGLSLLFNMQDKPGIEMVLDVLQAD DLEQTPGAGAAGGLGAGLLAFTNSQMRSGVDVVVDYTGLK

 DKRDEAGSGAAGGLGFAAKSYLNAEFKAGVKVVAELDNQLAA
 ADRMDPGTGAAGGLGFAFLSYTNAVLESGVKVVLEETKLE DVTEQPGAGAAGGLGAALLWFTNARLQPGIEVVIAATGLR
 DHRNIPGMGAAGGLGFAVKTCFKASFRPGVELVAELSGLE DFSEIPGVGAAGGLGFAAKAFLKARFRPGVELVAELSGLA
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 DVESVPGAGAAGGLGAGDMAFLDGQLERGGDLLVDiLDLT DVAEIPGA GAAGGMGAAVVVLKGKLRKGIEIVLDAIRFH DVRSLPGSGAAGGLGAALI GVLHARLRPGLEVVEAMRVA $N L L E L S G G G A A G G L G A G A V G F L G A Q L R G G S Q I I L E V S N A E$ DYADRLGAGAAGGLGFAALAYLAGELLPGDDLVMEIVEAE DVLNVSGSGAAGGTGAAFLVI GAKLESG D HVQAPGAGAAGGLGFALLISYLNARLTPGIDLILDAVR|LE

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DK|V|KEAD\|VI ${ }^{290}$ GEGSTDYQ
300
310
320
 K ILENADLVITGEGKMDNQKAPFGI ATRARNKGMPVI GI A KHLIMDADLVIVGEGSMDGKAPTGVAKLAAKHOVPVIALS EKIIKADVITGEGAMDFQKTPFGIMKLCEKHSVPVIGA C AFVRDADLVVTGEGRDDNGKTPIGVARVAGRHAKPVIAI G EHIHDCTLVVTGEGRIDSQS DP IGVANVAKKYHKPVI GI A DQLHNADLVITGEGRUDHGKPMGVAVLAKOFDVPVIVALA

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 EKMKGAALVETGEGODDOKTPMGVAOEABKFGDPVEATA










 HYMDKTDLVITGEGRIDNQKTPMGVAKIAKKFDUPVVGIA KELKDADFVITGEGRLDHQKAPVGVAKMAKKFDDPVIALA EKMAHADYVFTGEGGMDFQKTPYGVAKVAKQYNKPVEACA EVVKDADLVITGEGRLDNQKAPDGVAKLAKKHGAKVI AIA EKLSEADFCFTGEGRIDSQKTPYGVARTAKENSVPVIAVS SKIEGADFVFTGEGGIDSQKTPMGVASAAKRQGVKTVAFA DK KKADYIFTGEGGMDFGKAPFGVSKLAKKYKKPCFALA EKIAQADYVFTGEGGMDFQKTPAGVAQRAKKYGLPVVFALA ALVQKSDLVITGEGRDDRQSVNDGVARVAARWGKPVIATA AKIQGADWVITGEGKFDNGKTPFGVAKIAQAANIPVIVIT EYIRNADVVVTGEGCLDGQSVPDGVAALAKKHHKKV:AFA

 EQAAGADYVLTGEGSIDAQKVPYGVAKKTKRVQAPVIGLA

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 DLI R RADWVITGEGATDFGKAPAGIAKVAQEFGVPVVCLS

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 QRDKDADLIITGEGRMDFGKTPVGVALAAKQYHIPVIAIC ERAKDADFVFTGEGGDDFQKTPMGTAQAAHSVHVTVIALA KRAQGADFVFTGEGGUDHQTKFGKTPYGVAQATKPVIACAA A A A
 E QLIDD A D L V I T G E G R I D A Q K A P



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| UniRef90_F4LRC8 |  |
| :---: | :---: |
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| UniRef90-V5FIV6 | L L K L G Q Q |
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| UniRef90-W4Q7P5 | V Y K L S F E |
| UniRef90-D4MD55 | T L Q |
| UniRef90-18TYQ1 | V VKVG ${ }^{\text {V }}$ K M |
| UniRef90-F5IZA2 | L L |
| UniRef90-A0A037Z173 | \LK |
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| UniRef90-D1ARF0 | L 1 K Q K K |
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| UniRef90_UPIO0040B43B2 | L WTA |
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| UniRef90-A0A038GBH9 | VWQL A |
| UniRef90_K7VVB3 | L L S |
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| UniRef90-F9SGW6 | TLKLGGHA】 |
| UniRef90-UPI000219758A | LI K |
| UniRef90_UPI0003B32433 | $L$ I $A$ П |
| UniRef90-UPI000466B1CA | FWSLLAQAAR |
| UniRef90-N8X4L1 | LI QF NMN |
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| UniRef90-U3AYX4 | M L K |
| UniRef90-C4GBL3 |  |
| UniRef90_W6LQ81 | L I A VG $\square$ R】 |
| UniRef90-UPIO00407552F | V L |
| UniRef90_X1T0T3 |  |
| UniRef90_F4GTC5 | A WLA G A N |
| UniRef90_UPI0002556AA0 |  |
| UniRef90-S4YKL4 | V M Q $\square$ G Q R L |
| UniRef90-V6LZJ6 | F M K |
| UniRef90_B1KMM7 | L Y |
| UniRef90-W7BRN8 | I LRLLKKR |
| UniRef90_10C7B8 | 1 L KL |
| UniRef90-UPI0002FF67DF | L I R R A R K |
| UniRef90-UPI000475A127 | L V K |
| UniRef90_G5JFH6 | L L |
| UniRef90-A0A011RQ27 | L । A L |
| UniRef90-A7GK62 | V WK L A S E |
| UniRef90_B2JSK5 | $\checkmark \mathrm{L}$ S ${ }^{\text {G }}$ |
| UniRef90-J7ISI4 | V WKL G R |
| UniRef90-UPIO00401839E | LYQLA Q |
| UniRef90-V9H6Z4 | LICEGD K |
| UniRef90_FOYWT5 | L I K K V |





| UniRef90_T2F4F9 |  |
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| UniRef90_UPI0003781A52 | A |
| UniRef90 UPI0002DDC2 |  |



 A A L E A GA E R VVLGGGGSATNDA GS GMLDRALGVRFEDA E GR H A L D A GVVRHIL GVGGSATVDGGMGMAQALAARFLDERGE SAA DA NCKKVVI GIGGSATNDGGAGMAKALGVKFYDTAGN D AVQK GC R K FII GI G G S A T N D G G $\square$ G M L Q A L G Y G F LDD A E G E
 A ALA A GARRIVLADGGSATNDGGSGMLCALGLRLLDANGQ DALERGVKKILLGI GGSATNDGGAGLAAALGVRLLDDHGK DAI D Q GCRDFI I GLGGSATNDA G $\square G M L Q A L G V Q F F D R K R N$
A
 A A NHGVSSI I GIGGSATNDGGAGMAAAI VSLADA AN
 A A L D A GARRFIV GLGGSATNDGGAGMLDQALGAHLADA D GR A ALDAGCKE LLLGI GGSATNDGGAGMAQALGDSLKDKSGN A ALDAGARRFII GI GGSATNDGGAGLAQALGVRLLDAQGE


 A A L DA GA QRDI LAA G GSATNDA GA GAMQAL GVVKLLDA Q G Q
A A L N $\quad$ AGCRDF
A
A


## UniRef90 T2F4F9

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210
220
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240
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 GPNGASAVFGP QKGATPEMAADLDRNDAHFAAIVARDVGP GPQGASATYGPQKGASPAMVKELDRALAHYAEIVERDLHV GPTGASADFGPQKGATPGMVRQLDSNLQHYADLLERDLGV





GKNGASHVF


GEGASHIF
GENGASSVI Y G

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 $G P C G A A A V F G P Q K G A S V Q D V Q V L D A A L A H L A A V I F R H L G V$
 GENGASAVFGPQKGASETDVEKLDKALHNFANVIKQDMGK GENGASYI FGP QKGATPDQVLQLDQALAHFADLSALLLGH


 GPEGASA, Y GP T GA S S I Y GP QK GA T S E MII K I L D D A L S H FA DVI K R DL G K

 $\begin{array}{ll}G E H G A S A & V \\ G & \text { F GP Q K G G A S P E E Q }\end{array}$ GKNGCSAVF GLLE GASAVFGPQKGASAELVASLDNALAVYA RLEA DAG
 GDHGASAI F GPQKGANAEDVPFLDAALSHFADLTAQATGQ GATGSAAVFGPQKGATPEMVKVLNANLTHYAAVDKATLGK
 GPQGAAHI F GPQKGGNEMQVEALDKGMKHLAGLILETTGGR
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 $G P N G A A A V F G P Q K G A N A Q Q V V Q L D A N L G H F A A L V Q Q Q Q G F$ GANGCS A V F G P QK GA T Q T M I P P K M D T W W L M N Y A K K T K E K Y S G
 G Q N G A S MVVG P Q K G G T P K MVVKRLD Q NL S H Y A T LI F Q QL GK

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## UniRef90 T2F4F9 UniRef90-R6VAL6 UniRef90-N8O8Z0 UniRef90- UPIO0046F9F35 UniRef90_C1DFR4

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 GLMTAPGAGAAGGLGAGASVFLGAKLRPGVDIVLDALALD DARDSAGSGAAGGIGFAARTFLGAAFRPGIELVAEVSGLE EVTKVVGGGAAGGMGVAACVFLNAALKPGVDVVIEAMQLE DVRDIPGSGAAGGLGAGLILFTGASLDPGVKLVLEDTNFD D ADDPGSGAAGGLGGGLLAFLNARLCSG|AMV:SSCNFE DVRDEPGSGAAGGMGFAAKAFMGARFRPGVEVVAELAGLD NLLELPGGGAAGGLGAGSVGFLGAQLRPGSEIVLEVANAE II HTIKGGGAAGGLGAAFHAFLNGKLKSGTSLVMEVKLA DVNSMAGSGAAGGLGAGLILFTSGKMKNGI ELI LTALHFD NALTVSGFGAAGGTPMGLSLAFDIDQUKGGIEMVLDTLDFD SLAEFPGAGAAGGLGAGLLAFTQSKMAKGI DVVVEYSHLK SVATAPGAGAAGGLGAGLMAFTRCVMQKGIDDVIEHSGLR DVARLPGGGAAGGLGAAMSAFLNAALRPGVEIVTDALRLR SIAELPGSGAAGGLGGGLVGLLGAELRPGI DAVLSMLDFS RLHALPGGGAAGGLGAALVAYLGAQLRPGVEVAQALGLD DLEHVEGAGAAGGLGTGLLAFTNSDMQPGVEVVVSTGLK DVRELPGGAAGGLGAGLVAFLGATLRRGIELVIEAVNLD ADMWKEGTGAAGGLGFAFLTFLNGTLEPGVNILLDETGI DVRDEPGSGAAGGLGFAAKAFLGAQFKAGVEVVAELVGLA DDAEYPGTGAAGGMGFAFLVFTNATLKPGIELVEEETKLA DVGEMP RLHDLPGAGAAGGLGGAFKAFLPSHFEDGIQVVIKHTQLE SLFSIKGGGAAGGI GATLVHFFQAKMRSGIDLMMEEVHFR
 HCGNMLGFGAAGGTPAGLVLLFPMAMKPGIEMVLDALDAE TDPCHAGAGAAGGLGFAFLTFLNATLESGIQ\|VLDETHAS NVSDQAGSGAAGGLGAGLRYFTNASLDPGVKVVLDAVGFA EFWNFKGAGAAGGLGYGFVSYLNAKLKPGI DII MEEIRDE NTSKVSGAGAAGGMGAACLAFFHAQLKPGIETVLE\|IGFD DVAALPGAGAAGGLGAGLLAFTTAQMKHGIDVVNYTNLK
 DIVDVPGAGGAGGLGGGLLAFTNSTMKKG| DVVVETNLK DKRLQSGAGAAGGMGLGVMAFLGAELRPG:DVMQAVGLD DLANYPGAGAAGGLGAGLLAFTNAKMTKGIDLVIQYSGLK DVEHDPGAGAAGGI GAGLMAFSNCEDKNGAELVIDEDGLK DKRNEQGSGAAGGLGFAAKAY乌NAEFRSGVEAI AELNHLS DYEAVPGSGAAGGLGFGLLAFTNSKMEKG1 DLVTHFARLA S KN|AGAGAAGGSGAAFLGGFNATLKPG| QLVLETLADD KIADIPGAGAAGGLGGGFVAFLKAELKPGVAMVLDALRED $K Q Q K S A G F G A A G G A P L G L S L A F N \prod K I Q A G I D M V L D L Q V D$ GVKYLPGAGAAGGMGAGLVAFLSARLRPGAQTVLEAVALE DIKDIPGAGAAGGLGAGLIAFLDAELHPGTDIVIDAVQLE
 QVRDMPGAGAAGGAGAALLAFLNAEMRPGAELVMEAAGFA DVRDFPGVGAAGGLGFAARAFLRARFRPGVELVAEVAGLA ASPDTAGAGAAGGMGFALMYYLNAELQSGADLITRQTRLE SYAETEGAGAAGGLGFAFLSFLNARLTPGDDLDDAVGLE TVAD IPGAGAAGGAGAGTLAFLNARLRPGFDIVSEMLGLE DLEORPGAGAAGGLGTGLMAFTNSEMARGDDLVVEFTKLK VNQPGAGAAGGLGFAALAYDKATFKPGVEVVAEYAGLD DLADFPGAGAAGGLGAGLLAFTDANMEKGVEIVVHETHLK DVRGEPGSGAAGGLGFAAKAFFAAQFRPGVEVVAELVGLE ALHDRPGAGAAGGIGGAFQAFFPAEMKRGVDVVLDY: KLD DISNDPGAGAGGGMGGGCVAF LQAK SSGI ELITEYIRFK AAADTDGSGAAGGLLCGILPYFPVTVCSGIDDVLDVTDED EVAHAPGTGGAGGLGAGLLAFTQSTMRAGVEIVSSIVRLA SLHHVKGAGAAGGLAAGLMAFTTAKIQSGVETVIESIQLA ADPTVPGTGAAGGLGFAFLSYMNAVLEPGASDVLEETSLE DYRYLPGSGAGGG\| SVAALAFLNATLCSGMETVCQAMHFK $S \prod A E L P G S G A A G G L G G G L V G F L D A E L Q T G I D A V L S \| L R F D$ AlANHAGAGAAGGMGGGLLLLPNVQLKAGVQIIIEATRLA DKRETPGTGAAGGLGYALVALLGAELTSGUSLVMQAAGLAA DTTNYPGAGAAGGMGGGLLAFFNAELKPGTELLLKA DELE KLADRPGAGAAGGVGAAACGFLGGRLEPGTDVVMDAVGLR QVANDPGAAAGGLGAGLLACLPVELKRGIDIVLSVTHFD DISDIPGAGAAGGMGGGFLAFLNAELKPGIRLMLDVLDFG DIASFPGSGAAGGTGGMVAGILGAQLRPGIELVMETVELE ANPNQAGTGAAGGLGFAFLSYTNAVLESGVKIILEETKLE ANAKQAGTGAAGGLGFAFLAYTNAVLESGIKIVLEETKLE PVKD\|PGAGAAGGMGAALVGLLGAELKPGIQIVIEALKLA DLAHYSGAGAAGGLGAGLLAFTNAKMLRGVDLVIKYSGLR QIRNVAGAGAAGGLGFGLMAFTGAMLQSGATWVIEQTQLA TVQDIAGSGAAGGLAAGLLVFTQAKIQSGVETVINLLDMQ ANSDYPGCGAAGGLGFAFRAFDHGKLEPGINIVLEEUGIE SVAQTPGAGAAGGLGAGLLAFTKAQLQPGVEIVIEKTQLK DURDIPGAGAAGGLGAGLLIFTQATLQRG|DIVIEYTGLR S DAHVAGSGAAGGMGGGLLAFLNASLRSGIELILDAMHFD



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| UniRef90-R6VAL6 |  |
| UniRef90-N8Q8Z0 | L LSAQQ |
| UniRef90_UPI00046F9F35 | L $\quad$ A ${ }^{\text {L }}$ |
| UniRef90-C1DFR4 | L WQL A |
| UniRef90-Q765R2 | A 1 KLGQN |
| UniRef90-M1E647 | TL NVVGM |
| UniRef90-R6QZ49 | L WR |
| UniRef90_S0FUZ1 | L M |
| UniRef90-I6YIM1 | L 1 KA |
| UniRef90_Q119M1 | L WR\|VALLQ |
| UniRef90-G7WFT6 | VWKLGNE |
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| UniRef90-17KPG6 | T |
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| UniRef90-R0GKA5 | L I K K |
| UniRef90-F0LZQ1 | M L K L L G |
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| UniRef90-X0PAQ8 | LIA A T R N |
| UniRef90-KONXL8 | V L Y A G |
| UniRef90-N8YFN1 | L I K M |
| UniRef90_C4VMH8 | L 1 R |
| UniRef90_UPI0002F12599 | V WQCS QR |
| UniRef90_A6LGL4 | ALE QQL |
| UniRef90_Q5FL30 | N |
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| UniRef90_UPI00041A2770 | A I R L G S GLL |
| UniRef90-W6EXN4 | LI RIGGQR |
| UniRef90-N9A4Z1 | L I K |
| UniRef90-R7B0U5 | $\checkmark \mathrm{V}$ R |
| UniRef90-D2U0Y2 | $V L Q C G$ |
| UniRef90-E1R2L0 | $\square \mathrm{MK} \square \mathrm{G}$ |
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| $\mathrm{MK} 111 \mathrm{APD}$ |
| MKI I L A F D |
| MRIL I A P D |
| M K F V I A |
| K V V I A $\square$ D |
| R R I V $V$ I A A A D |
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| K I I I A S D |
| M K V V V A I D |
| M NVV L A P |
| MKI V L A P D |
| MKIVVVAPDS |
| M K I V MV |
| K I V I A |
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| $V$ I V A $\square \mathrm{D}$ |
| VMRVVL A P D |
| M R V V V A P D K |
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DA\||RKGCRHF||V|G|IGGSATNDGG|V|GMLISA|L|GFEFLDKSGQ DALDHDVRRFII GLGGSATNDGGVGMAEALGVRFLDHQNQ DALKRGCKNFMIGI GGSATNDGGIGMLKALGFEFFDEDGN AAVNAGAKRIILGLGGSATNDAGAGMLTALGVRLLDADGR DAMHRGARELII GI GGSATTDGGQGMAAALGVRFLNKQNQ QALDLGVSKIVIGLGGSVTNDAGGGMAQALGVKFLDQAGLD DA L R E GVKRII I GLGGSATNDAGLGMLTALGMRFHDSDDN HAMDRGCRKFIVGIGGSATNDGGVGMLQALGCHFYKKDGI DALQRGCRHFII GLGGSATNDAGLGMLRALGFRFPDKTGN $\begin{array}{llll}H A L N E G V R K F & C L G G S A T N D G G S G I L K A L G Y Q F D D E N G N \\ D A L G R G I K R I I L G U G S A T N D G G A G M A Q A L G F R L D K A G R\end{array}$
 DA A A Q GUK DFII CLGGSATNDAGVGLLQAAGYQFLDENGLD
 DALEKGIKHFI CLLGGSATNDAGVGILQQALGYRFLDKNKQ QAL D SVVKKI GL GGSVTNDGGAGMAQALGVRFLNHAGE A ILDMGIRDI YIGLGGSATNDGGAGMLTSLGVKFYNS DGE A ALDAGLRKLVI GI GGSATNDGGTGMARALGARFLDAEGR DALDQGCRKFII GI GGSATNDAGLGMLQALGDRLVDDGGK
 HALNNGYRRFLI GLGGSATNDAGVGLLKALGMKFLGENNK YAVQKGATELI GI GGSASNDGGIGMASALGYEFLDTTGQ LA EQGVDRIVLGI GGSATNDAGTGMAAALGWQFLDKAGQ HALNAGFRKFII GL GGSATNDAGVGMLQALGMQFLDQKGK DALNRGCRKFLVGI GGSATNDAGTGMLSALGVKFFDSQGL AAI DAGCHTVYI GI GGSATNDGGAGMAEALGVRLLDAEGK AALDAGAEKLMLTLGGSATNDGGSGMMQALGARFIDRHGE DAVKRGCRNFII GI GGSATNDGG $\square G C L Q A L G F G M L D K D G K$ A ALDHDDDEDI GGLGSATNDAGAGILTALGARLLDGAGK AALDAGATRIILGLGGSCTNDGGAGMLWALGARLLDAQGR HALRQGVRSFI I GLGGSATNDAGAGMLQALGVSFTDENGE TALDQGAEKALLLLGGSATNDGGAGMLQALGARFDDQHGE DALDRGVRHFVVGI GGSATNDGGAGMLQRLGVSFQDSRGV AAVNEGANHDI I GLGGSASNDGGAGLLQALGVRLLDDSGN YAHALGARNFII GLGGSATNDGGVGMLQAMGYRFLDERGK DALEHGVERVYGUGGSATNDGGLGMASALGVRFFDSHQQ
 DA LYRGYRKFVLGLGGSATNDAGワGVMHALLGVKLSDVNGN HALNRGHRELMI AI GGSSSNDGGLGMLQALGMKTFDDEGK DAFDHGVDTLII GLGGSATNDGGAGMAQALGVRLLDGEGN DALGRGVQQULGIGGSATTDGGDGMAEALGYHFYDKNNV Y GLDKGCRTFI GL GGSATNDAGVGMLLELGVSFRDVHNK EAVRCGAKSLLI GI GGSATNDGGLGMLSALGAVFTDRQGK SALDQGAER ILGI GGSATNDGGTGMLSALGVQFDDAQQQ
 EALDEGIRDFII GI GGSATNDGGIGAAQALGVKFDDRSGK HAI AHGARKFII GII GGSATNDAGMGMLLRALGFKFKDANGA
 DALEKGAKEI ILGI GGSATNDGGMGMASALGYRFLDADNQ A ALEFGVKKI I GLGGSVTNDGGAGMAHALGVKFINQYHE DALERGAQEIILGI GGSATNDGGMGMANALGYRFKDSFSK HAIDNGDRNFIIGIGGSATNDGGDGMLKALGFTFDDRDGN
 HATERGARKILVGLGGSATTDGGIGMAEALGYNFDTSDGE DA ID CGAKTIILGI GGSATNDCGIGMATALGFKFEDENGK HA LDA GLRKFIVGUGGSATNDGGTGMLDAALGMKFRSQNGE KALDHGVDRDLI GCGDSGDNDGGAGMARALGARLLDGEGR DALERGCRNFII GIGGSATNDAGLGMLQALGFRFYDKSGV
 AALDAGATRLILGLGGSATDDGGAGMLRALGARLLDARGQ AALDFDVKEILI GI GGSATNDGGVGMAQALGGSFKDADNLL AALDEGCRHFILGLGGSATNDGGAGMLQALGAELLDSGGR AAKKAGCRKVILGLGGSCTNDGGTGAAAALGGRFFRADGS DA LDHGATAFILGLGGSATNDGGAGMAQALGAHLLDAQGN AALDQGARRDLLGCGDSGDNDGGAGMAEALGDRLLDDKGN DA LDRGCRNFI G G GGSATNDASDGLLNALGGRFLDKQGD DALDHNDKKII I GI GGSATVDGGAGMAQALGARLLDAHNH DALERGCRNFI GI GGSATNDAGLGMLQALGFRFLDKEGK DAYSRGCRHFIVGVGGSATNDAGKGMLEALGCRFLDVNGK AALAAGATTIYVGLGGSGTTDGGAGMLQALGARLLTATGD DALDRGCSSLII GLGGSATNDGGLLGCLQALGMKAWKQDGS
 SALDAGYRRFVI GLGGSSTNDGGFGMLCALGATFTNEKGE ELLDKNDEKII GLGGSSTNDGGDGMVTAGGGKFFDVNKN AALDRGCRKFLVGLGGSATNDAGMGMAQALGVSFFDAAGR SAL GAER G
 DALDRGGRNFII GI GGSATNDAGLGMLHALGYCFYDEAGR A AI A S GA QRII L GI G GSATNDAGIGMASALGWRFQDENGQ

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UniRef90-UPIOOO47276AA UniRef90-W4Q202 UniRet90-E6TTH9 UniRef90-D3UKZ9 UniRef90-10KB40 UniRef90-UPI0003156607 UniRef90-R5K7K4 UniRef90-BotDu9 UniRef90 UPIOOO37213E7 UniRet90-W7UVD5 UniRef90-UPIOOO39579BD UniRef90_UPIO0035F509A UniRef90-K2FQ13 UniRef90-L9U984 UniRef90_UPIO0047901C7 UniRef90-UPIOOO2892530 UniRef90-G5JQ22
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 RLGYTPEELKNVAKMV ALGTGGKIMNQVAS PLRENMEAVQYLSS, EIADGGGNLSKLID VLRPCGG ELGQGGGALRDLHK RLKGCGKDLKSIAQ1 GI PRGGAGLARLQRI TLSPGGAALAGLEHI QVGYGAQGLSQLVRI PI DPTGHGLGALMTL alladgaalgalas vi ELAPGGASLSHLAHI PLPPGGAALNQLASL QLNRGGGSLSSLSSI DIKRGGKYLSQI HKI


## E

 PLLYGGAALANLKTI QLPARGESMHEVARI PVEDESGT DQKIASL PLQAGGADLLRLAT1 ELEAVAQNMIKTAY: ELAGAGEDLDKLATM SLPSGGAALQQLTK: ELEPIGKNMVAVCK ELNPVGSNLNKVKS ELGYGGQULNEICAI RLKAMLPNLGKIEKI DLDPUGKNLNKIHAI Di GNGGGALDQLAHI GNGGGALDQLAHI DLAKFDHRIAESEFIIACDVDNPLI ELPEGGGALQDLAQDVSGGDPRLAGVGDDAAVNWHNMLL EVGYGASEIDEIGA PVGPTGKGVTQVSTV ElPFGARALEKIQYI PLADGAGGGALGEVI ELSFGGAALAGLAA LLPRGGAALARLAAA LLGAPITFMHRLRR1 TLETGGKILLMEVVS PIPRGGAGLRELALV TLPPVFASLEKVVQ1 EINPIGKELINI DYI ELVGPGGAELERLDH: NLPEGGAALINLAQI AL GVGGGALAALARI LLLEGSGSSLGKVVT,
E I E P G G G G L D R L

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280 $K \square A N V A G A G A A G G L G A G F D A F T P A Q L R S G I D L V I D A D V D L A$
 $K L A D Y P G A G A A G G L G A G L L A F T N A V M A K G I V I V V D T T D F K$ $N V Q H Q A G A G A A G G L G F G L L A F A R A K I Q S G V E L L I Q Q T G L A$ $N Y Q E \square A G A G A A G G L G Y A L M S F C Q A E L K S G F D T V A K V T N L S$ DNRNMPGAGAAGGLGFAFASYLGGDLRPGVEVVLDAVLPG $D I S S C P G A G A A G G M G G S L S A F L N A E L K P G I Q L L L E M Q N F A$
 $D F R D E A G S G A A G G L G F G L R A L L G A Q L R S G I D D V L E V T E L A$ QVGQLPGSGAS G GLLGTGLLALLDDAKLYPRYEIVMQYLEDD SI H Y I E G A GA A G GTA G GMLLA FL NA ELVKRGDELVVD FVVKR DVAMNA GSGAA GGMGGGMQAFIDDATLRSGIDEILDQIGFAA



 DIHQKP GS GAA G GLGGAGCQWF LGGELQEGVVVIMEVSNLE
 $D L L T I E G G G A A G G 1 G A A L V A F C Q A S L K S G I N V V M K E V N F P$
 DVSTDP GGGAA G GLGA GAVL FLNGRLVEGVQQLI DHTRLA SLHEKKGAGAAGGAGGAFQVFFSGEMKRGIVDVLEAIGFE

 A SPD TA GA GAA G GLGGAALMYYLNA QICQGADLIIMRTGLE $A \square A H F P G A G A A G G I G A A L G G L L N A Q L V P G V E L L L T R T H A B$ $N A R D L P G A G A A G G L G Y A A L A F L G A R F H P G V A L V A B D S G L E$ $D \| V H T P G A G A A G G M G A A F L G Y F P C S L E K G A A I V A D V T Q L K$ D Y R M LP GVGAA GGMGFAAKAF LNATLKPGDEMIMQQAGMA


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 AVMNSP GAGAA GGLGFAFLS I GASLESGARLI SEAIHLP DVE QLP GAGAAGGLGAGFLAFTNATMRSGVGLVVDATGLK DI S NHP GAGAA G G L G A G CLLWF L N A VL K D GVVSVI I E Q T H I A

 SVKD $V A G A G A A G G L G T G L L A F C H T T L K K G V D V V L T E T K F D$
 $D M S M V P G S G A A G G L G A A L V A F F G A V L K P G I D T V L D D V R F D$

 DLQQEKGAGAAGGTGGGADAFLHGHLTSGIDDI KELSEFD D L R HRS GA GAA GGLGF GLMAF T GADI RSGAALI DE ET QLA


 $D V Q K \square K G T G A A G G M G A G T F T F L N A D L K S G D D L I K D L I G B I D$
 DVAPMPGAGAS GGLGAGLVAFAGAVLDPRFQIMLDYLDFD D I S Q $\square P G T G A A G G M G G G L L A F L N A E L K P G D Q L L L D T L H F S$
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 $D L S Q L P G A G A A G G L G F G M A A F C G G K L Q M G V D V V L D T V G F D$ $D V E T V P G A G A A G G L G A G F L A F T G A R M Q S G V S L V V E A T G L K$ EVGMAP GCGAS GGLGAAVSGLLGGALHPRYDIVMQYLELD DI S DIA GA GAA G GMGGGGVAFLNAELKSGDDVILDVLDFG DV R DLA G G GA A G GMGA GAVA LL G G C L R S G I I V S A TV D L A DVVETAGAGAAGGLGAGLIAFTGATMKRGVELVIEATQLQQ

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 SYAHAPGAGAAGGLGFAFLLLGGTFISGAKLIGEMVQLPD

 DYSNVP GAGAAGGTG\|ALVAFLAAELSRG\|DIVLHETQLK $A L A G L R G G G A G G G L G A A L V A F L G A Q L R P G A D D V A E A B L G L D$
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\section*{UniRef90_R5HARO} UniRef90-F81150 | UniRef90-R6B892 |
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UniRef90 ${ }^{\text {I }}$ IXRR3 UniRef90_UPI0004669A10 UniRef90_UPI0004208D0B UniRef90_G4L5N4 UniRef90_R5HNK6 UniRef90_B7GHW1 UniRef90_N9Y2Q8
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 GSVVAD GFAA AVFPSIDRVASSLPDVVLANA EQNV ERTARA I A A
 G S V T Q GL T A A F S I T T N G P M N L N D A M T N S A Y L I E R Q A E Q V F R


 GVLGHGUDALAT TVVPQPMTLEDCMGQGAALVEAAAAAAAR G S V E D G F Q Glllll|lllllllllllll


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 G S V Q H GVVK A $\square F P$ P I Q P G P C S L

 A



 GSHQ H GID A V F S V L N S IV TVLN EAFS GA Y D NI Y R A S R N I A A






 GS I GE ENVG DI Y S Cll D H C C S L E E N ALLE NA S E NVVYKAA F RLLA R GAV D L G L S Y V T S I L R K VT S L E DAMNS SYDNLVNASYNFAK

 GS V V N A GF L S V L P L L P Y P V S L E Q A M D S T L E N I R R T DE Q Q L R G N V K Y G I D A F F S 1 Q K G T I T L GS V D L G $\square \mathrm{C} Y \mathrm{~V}$ GAVV I K K A N S L E D A M Q N G Y K Y L K L L A A E



 GS YK H GI D LVIDDI I NK P M K I Q E A M K NVEK K T E D A G E K V M R GSVGGEGEAVFSLVNGPMSLEEAMRRTPELLEQTAACVMR



 GNIGKG】DAIFATPE GAKPLKTALADAPDDIA QTAENVAR

 $G A L S G D L T A C F S D V N R P D S V E E S M E Q A Q R L L Y D Q T \square N Q G Q$ GS Y N E GI D LVLLE I I Y K P ML L K E A L A Q T S QL I E R T A E KA Y R







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| UniRef90-V8G3C9 | L WS $\square$ G R Q V |
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MKILVAPD ${ }^{10}$ FKGSLISALJHAAEAMAEG\| ${ }^{20}{ }^{30} E$ ADSTSVPF $\frac{4}{L}$ MRVVIAPDSYKDALAASDAAAATAEGVKRGYANATTCLC


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## $\quad R$ $L_{M} R$ $M K$ $\square$ $M$

K K

MK I I I A P D S
$M R V L I A B C D F K E C D T A K A V A D A B A$


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| :--- | UniRef90_R5FYHo

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$P V A D G G E G T V A V V A A E G G A W V E T E V G B L K E P V K A R Y G K$ PLADGGEGTLEALTYGTEMKKVEADTIDPLGRPMTGWYAY $P M A D G G E G T V D A L V Q A T G G T T V E H Q A S G P E G E P R T V Y Y G E$ $P L A D G G E G T V E A L T L G M G G E L Q S V M V K G P L G V L V N A V Y G /$ QISDGGEGFVAAILANKGGHERFVTVRDPLGEPVSAMWGL PVADGGEGSVEAFLAAMGGHRVEVPCTGPDFRKISGFYGL PLFDGGEGFARALVASTGGEHKELAVTGPVKHKINAFYGF SLADGGEGTVTALVEGMNGTYEHVDVTGPMGQKVHATYGV SVADGGEGTLDSLIKGNKGNTYRQIVQDPLGRKISARFGM PVADGGEGSVDAFLFALGGEKVNVKVKNPYFEDMDSYFGLL PMGDGGEGTLDALLAATGAQRREANAHDALGRPDRAAWGW PVSDGGEGMVDSLLAVTGGEKDTAEVKGPLFEKTEAQYGI PVSDGGEGLLAVLKESCAMDVYPTEVTRLDGKKMLAXXX PMADGGEGTLDALHATLGGEWHRASVHDAEGRPCEAEWLL PVADGGEGLI ATLQKAGDEEVTVTVHGPLFEKRQASY ETADGGEGTTDAVLSAVQGQRIPLVVCGPLWKKTDCFYGK PLADGGDGTDETI ESKLHFKRLYLEVTGPLFKKVEAWYGL PVGDGGEGTIALAQASGGVTEDVRVTGPLGEVVTAKMAF PMADGGEGSIDTLLYAFSAKDIEVFVHGPLMERVKAKYAV P LVDGGEGTAVALAAATGGRLVTVPATGPVGETVGAHFAL PVADGGEGSVDAFLQALGGERRSLTVQGPYAFPMESFYGV PMADGGEGTTQSLQDGLGGEVHTMDAVGPDGSTVKAEFVYY PMADGGEGTMAVLVEAQQGRYQSMMVHGPENQMVQASYGU PMADGGEGFTVSLAEALNAELVKVIPVVDAFGAMDARG
$P V A D G G E G S L E V I A K N L P L A K R I V T V K A P L G N G I Q A S Y ~$ PLSDGGEGLTDALVQATGGELRSEHAHDALGRPIDTRYGF PMVDGGEGFVETIIKLKKGKCIKTKVTGPVGEQI NSHFGT VIGDGGEGTVAAFHETCHGIKQPVQTSDAYGKKIMSEYTI PMVDGGEGFAQTTTQDKNGQLYHLNAEDPLGQKRKTFYGM PVGDGGDGTGELLDKQSNGDHDTGRVHNALGSMDDSSFGL PMADGGEGTAVIMARTLGGHLETRMVCGPGGVPVEARFAV PLADGGEGTVEALLLGTGGEERTETVSNPLGDPVPAKWGV PMADGGEGFVQTLVELTGGRLRPVQVTGPVGQPLEAHLGL PVADGGEGSVDAFITAVGGVKEYVTVKNPYFEDMESYFGL PLGDGGEGTVDSLVEALQLKRKQTEVTGPFGEKVSVSYAT PVGDGGEGTVDATKSSLGLEEKTVQVTGPFGDEVQMPYF PMIDGGEGFAKTITRLKGGELIYREATGPVGKDIHTHFGL PIGDGGEGTMDTLAGVLNDTEYHTQVTGPFGQPVSMPYY PIADGGEGTDDALMHA GGERDTDSCRAAGHPMEAAAGV

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HA|L|NAGYRDF|I|G|L|GGSATNDGGAGTL|QA|L|GMRLLNSNGD A ALDHQDD HLI LTLGGGSATNDGGTGMLSALGARFLDSDGE
 DALQRGCKHI LLGIGGSATNDAGVGMLQALGFRFLNKEGE A A L DM GA DR L L GCGDS GTS DGGAGMAQAL GAKF L DA S G Q SA L D R GAVDLLI GLGGGSATNDGGTGMMLAALGAVLLDAAAGN
 A ALDHGATRILLGCGDSGVNDGGAGMAEALGVRFDDGDGN

 $D A V E K G C R E F I \quad G I G G G S A T N D A G L G M M Q A L G Y K F M D K D G E$ N A L D A GF RKF V G G G GSATND GGMGMMLKAL GMKFQS QNGE


 TALDR GCRDITIAl G GSATNDGGMGAMRALGDRFLDENGE A AL D Y QVEKI II GLGGSATNDAGAGMAQALGVRFYDA QEQ H A A A LD T GAKELI I GI GGSATNDGGDGMLEALGFRFLDEKGE AALDDGARTLILGLGGSATTDGGSGMLLRALGARFLDAQGK RAAESGVVEI LI GI G GSASNDGGGGMAQGVGYRFLDAEGN
 Y A I S K G V V K E I I I GI G G S A TN DA GT GMLDSALGMKFDDEN GH A A L K HRPRTLIVGLGGSATTAGGAGLLQAMGAQLLDDSKGR HA L D L G V V H I L L GL G GSATN DGGA GLLQ A L GAKFY DRF DY AAI LNRPKKLVVMLGGSATTDGGAGLLQALGARLRDADGQ DALDRGCRKFIVGIGGSATNDAGLGMLQALGFRFYDRDGR $R A L D A G F R T F I I G L G G S A T N D G G A G M L E A L G M N F L D Q A G Q$
 A A L D A A E T I IV GLGGSATNDA GCGLLDAL GVRLLDD D GR

 DAI NNGAKKI IL GLGGGSATNDGGCGMAAALGVKFKDEQDQ
 DAIN Q GAKQULI GLGGSATNDAGTGMLQALGVKDLDAS GK D ALLDH GAVR FVVVGLGGSATNDGGA GMLDHALGAQFLDDAS GV DALDR GVRRICMGI G GSATNDA GMGAMDALGAKFYDNT GA
 AALDHGARRLILAI GGSATNDGGAGMLAALGARLLDAAGQ SALLNA GKRSFI I GLGGSATNDGGMGLLSALGAEFRDTS GK A A A QK GVQK I L G L G GSATNDGGCGAAAAA G I R F Y DKN G K
 E A I D R G F R N F Ni G V G G S A T N D A G T G L L
 DAVERGATEIVI GI GGSATVDGGTGFLQGIGIRFYDENDQ ALLDKGYRQFVVGLGGSSTNDGGDGMLSALGARFTDRDGN D A E K GCR N FI G G G G A T N D G GA G M L Q A L GFEMCD K D G N
 A A L L N H G A D R L L I G C G D S G T S D G G V G M C Q A L G A R F L D D N K E C DAVHK GCRNFII GIGGSATTE GGUGMLMALGYEFYDEDDN
 E A AK R GVEKIV GLGG SATND GGCGAAAAA GVKFYNKEGK EALDA GAEHLLLMMLGGSATNDGGAGMLTALGARLLDARGQ D A L K R GCRE I I L Gl G GSATTA G G DGAAAAL GARFLDDKE GY DALNHNDEKI I I GLGGGSTNDGGAGLLQAL GVQLLDKNNN A CLDA GARHIAVGLGGSSTNDGGAGCLVGLGGRLLDREGQQ D A I N R GAKHI LL GI GGSATNDAGMGMACALGFRFFDAENN

 H A L D A K V S E I VI G V G G S A T H D G Gli G MA A A L GAR F Y N L R G E

 $K A D D E G A E R D, L G L L G G S A T N D G G A G M A A A L G V R F L D R S G N$ D A L A K G V K T I V L T L G G S A T N D A G A G M L Q A L G GK L MR R D G Q
 AAI DAGAERVVLGLGGSATTDGGTGLARALGHRFLDADDC
 D A VAK G C K K I I G L G G S A T N D G GM G L L Q S L GARFY D M N H K HA L D HGAERRI L I GCGDS GTSDGGDVGMAQA I GARFKD YK GK

 AALDVGCRNLLI GIGGSATTDGGAGALQALGVRLLDADGQ EA L D L GA QRLLI GCGDS GVND G GA GLDA QALGI RLLSDRR GR AAARKGVKKIVVGLGGSSTNDGGCGAAAAVGIKFYDRDGR $D A L S K G C R E M I L G L G G S A T N D A G T G M D S A L G V K F F T A E G E$ $H V V R E G A R H V F I G I G G S A S H D G G \square G M A A G L G V N F Y D A N G Q$
 A A D H R A D R LI GCGDS GTS DGGAGMMQAL GVKF LN DNGE
 $S L L D R G A R R F L V A L G G S S T N D G G A G L L V A L G V V L R D A A G H$


UniRef90 UPI000470491A UniRef90-UPI0004714B28 UniRef90-W4PN30 UniRef90-XOPRI2 UniRef90_R7J5V0 UniRef90_J2PGG2
UniRef90-A0QVC7 UniRef90_UPI0003B6B229 UniRef90-UPI0004630E84 UniRef90-UPIO00405472D UniRef90_UPIO003A5E7E2 UniRef90 W7AW42

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UniRef90-UPI00036 UniRef90-UPIO00369BD5E UniRef90_F5YEK7 UniRef90-X4Z212 UniRef90-H7F644 UniRef90-UPI00036B4490 UniRef90-E4S916 UniRef90-M1F9P9 UniRef90-N1ZPG6 UniRef90-N6VY22 UniRet90_B2RLR6
UniRef90_M3FAC9 UniRef90_UPI00045EC598 UniRef90-E3EPB4 UniRef90_H8LCH1 UniRef90-F9DRP9 UniRef90-J7LCU5 UniRef90_D4KG18 UniRef90_UPI0004292BF7 UniRef90-A5WF76 UniRef90_UPI00045E5DEF UniRef90_UPI000471D7ED UniRef90_C9KL15 UniRef90-F8FQM5 UniRef90_UPIO003685D92 UniRef90_UPIO0028A1022 UniRef90-C6L9L0 UniRef90_X0QRI3 UniRef90-R7HKF2
UniRef90-K0V0X6 UniRef90_UPI0003B4C07C UniRef90-D6XZ11 UniRef90_A0A015LRM4 UniRef90-R6E956 UniRef90-Q2SMF6 UniRef90-U2Q0D1 UniRef90-C4JDU3 UniRef90_C4ZC23 UniRef90-H5T218 UniRef90-R6N6Y0 UniRef90-W7QCF7 UniRef90-E3ZGE6 UniRef90-G2IXL4 UniRef90-X5E060 UniRef90-G8QYY4 UniRef90_R5TQK4 UniRef90_UPIO0046EE1BD UniRef90-W7BED0 UniRef90_A0A023CJ78 UniRef90_S4MY62 UniRef90-FORSU3 UniRef90_UPI0003B6A57A UniRef90-E6LIO3 UniRef90-K9EXF6 UniRef90-A0Q5Q1 UniRef90-R5H660 UniRef90_UPIO003FAE544 UniRef90-U5F7N4 UniRef90_U7PC73 UniRef90_UPI00041DDB85 UniRef90-G6CAA0 UniRef90_UPI0004723EF1 UniRef90_UPIO00347BDA1 UniRef90-E3HXW1 UniRef90-R5FEX5 UniRef90_S8GWR3 UniRef90_UPIO004288CD2 UniRef90-E8KBL2 UniRef90_UPI000479B596 UniRef90-K8MV77 UniRef90_UPIO002EF495B UniRef90_R5FYH0

GPNGASAVVGPQKGASN
GEQGASAVFGPQKGANESTVAFLDRALQOLTISQQVDGR GKEGAAYVYAPQKGASPEEVDELGDRGLQRYAEVLDRETGQ
 $\left.\begin{array}{ll}G E N G V A R V F G P Q K G A T P E Q V V E L\end{array}\right)$
 GPKGVARVFGPQKGATPAQVDLLSGAMETYAALDETTTGV GELGAAAVYGPQKGANSEMVVTLDQGLQVFGRLLEKKTAM GKAGVARVFGPQKGATPDQVAILEQGLQTFARIVRRDGDD GPNGATFVFGGQKGLNEAEMPQVDQAMETFYNRFFG
GPRGAAHVYSRQKGADDEMVEYLDSSLQKDALTLKEKTCK





 $\begin{array}{ll}G P Q G A A H & F G P Q K G A N P Q Q V A Q L D A A L \\ G K N G A T A & \text { G }\end{array}$ GERGASFVYGPQKGGNDEQLRDLDRALDRYADLAAEVTGR GENGAAYVFAPQKGADENAVKLLDEGLKNFANVAKEYLGK GNDGAAAVFGPQKGASPDDVKVLDANLISHFAQUCVKLNGY $G P N G A S M V F S P Q K G A S P E A V I Q L$
$G P E G A A A$
$G$ GPEGAAFAFAPQKGADEEMVARLDDSMQHDAAVIHRHTGQ
 GPEGASAVFGPQKGASREDVTLLDGALRHVSSVIVRALAE GKEGASFVFGPQKGLKENELAVADQAMHDFYMRFAPQ
GENGASYVFGPQKGADAKAVTLADEGGLRHFADKTAELTGM GERGAAAVFGPQKGASPEVVRVLDAGLARLADVLAEATGQ GRDGASAVFAPQKGADEDMVKLLDEGLAHLAKIIKKDDHD GKDGATYTFGKQKGGSPQVLDELARGMENYRNVICREFGIC GSTGASHVFAPQKGATPEQVLSLDQALSHFADVCQTQSIC $\begin{array}{ll}G P R G A A H V & F G P Q K G A S P D M V E T L D H G L\end{array}$ GPAGCSRVFGPQKGATEAIVARMDGDLHHFAALAEEACGT GPEGCSFI FGPQKGADAELVQAMDHYMAHYAKLI ERHLGT GPAGASFVFGPQKGADFRMVEELDFGVHHLSDVLARETGN GPKGAAWLFGLQKGATNK DLEALDDGMRTFAAVVKKKYGK

GP
$G P N G A S A V G P Q K G A T S A D V Q E L D R L L S H W L A L N E Q V L G R$
 TEQGCVY F GKQKGVQEHEKAQMDKMMRQYADCVEEYAGK


 GPRGATAVFGPQKGVAPEAVARLDAADARFAAVADHAFGQ GPKGAAPVYAP QKGATKRVVEELDAGLRNFNEKVETMFGK

 GEKGAAYVVARQKGANESEIAVLDQALRKLAKLEEDGYAV






 GEKGAAAV GANGAAYVYGPQKGATP GRRGAAYVYGPQKGATPSDVKELDAALSHFAQVAAATTGK
 GREGAA F F P QK GAGGKEVVLLDNGLHRYGELILKTTGT $G P K G A T H V F A A Q K G L A V S E F G Q V D E E M R S F Y Q L V N P T$
 GERGVAKVFGPQKGATWEQVGUL SDADEHYASIIENTAAM GS Q GATYI F G GQKGLNP LLFPAVDQAMQKFYQLVDS
UniRef90 UPIO00470491A UniRef90-UPIO004714B28 UniRef90-W4PN30 UniRef90-X0PRI2 UniRef90_R7J5VO UniRef90_J2PGG2
UniRef90-A0QVC7 UniRef90-UPI0003B6B229 UniRef90_UPI0004630E84 UniRef90_UPI000405472D UniRef90_UPI0003A5E7E2 UniRef90-W7AW42 UniRef90-E3H758 UniRef90_UPIO002FF66F0 UniRef90-R7YGC6 UniRef90-TOD1K2 UniRef90-M3D719 UniRef90-V9H3U1 UniRef90-R5T6C2 UniRef90_V2UMA7
UniRef90_UPIO00369BD5E UniRef90-F5YEK7 UniRef90-X4Z212 UniRef90-H7F644 UniRef90_UPIO0036B4490 UniRef90-E4S916 UniRef90-M1F9P9 UniRef90-N1ZPG6 UniRef90-N6VY22 UniRef90-B2RLR6
UniRef90-M3FAC9 UniRef90_UPIO0045EC598 UniRef90-E3EPB4 UniRet90-H8LCH1
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UniRef90_KOVOX6 UniRef90-UPI0003B4C07C UniRef90-D6XZ11 UniRef90-A0A015LRM4 UniRef90_R6E956 UniRef90-Q2SMF6 UniRef90_U2Q0D1 UniRef90-C4JDU3 UniRef90_C4ZC23 UniRef90-H5T218 UniRef90-R6N6YO UniRef90-W7QCF7 UniRef90-E3GNA7 UniRef90_E3ZGE6 UniRef90-G2IXL4 UniRef90-X5E060 UniRef90-G8QYY4 UniRef90-R5TQK4 UniRef90_UPIO0046EE1BD UniRef90-W7BED0 UniRef90-A0A023CJ78 UniRef90 S4MY62 UniRef90-FORSU3 UniRef90_UPI0003B6A57A UniRef90-E6LIO3 UniRef90-K9EXF6 UniRef90-A0Q5Q1 UniRef90-R5H660 UniRef90_UPIO003FAE544 UniRef90_U5F7N4 UniRef90_U7PC73 UniRef90-UPIO0041DDB85 UniRef90-G6CAAO UniRef90_UPI0004723EF1 UniRef90_UPIO00347BDA1 UniRef90-E3HXW1 UniRef90-RFFEX5 UniRef90_UP10004288CD2 UniRef90-E8KBL2 UniRef90_UPI000479B596 UniRef90-K8MV77 UniRef90_UPI0002EF495B UniRef90_R5FYH0

S DHHKPGAGA
$D$ DSTVAGAGAAGGAGGVFQVFFPS DFHPGDNVVDETDHFD
 DFMNTPGAGAAGGLGFGLLTFCHGQIKSGIEEIINLVGFDD D DQSVA GAGAA GGLGGGCVAFLNARLDSGUDQVKACVNFD DVREMPGSGASGGLGAGLHALTGANLYPRYDIIMKYI DLD ARPELPGAGAAGGLGFALLDFLGAECRPGVEVIAETVGLA $D V A D M E G S G A A G G L G F A L R A F L G A E L K P G V D L V A D A V E L D$ $R V A D A P G A G A S G G I G A A V M G L L G G V L H P R Y D L V M Q Y L D L D$ $N L V E L K G D G A A G G M A D P L V A L F K A Q L K S G L D I V L D E I D F D$ DLEPLKGGGASGGDGAGLHAFAFAKLHPRFDLILRHIKLD V P KNP GVGA GGGMGAGLLKFASAELKLGDDYVI EQLQLK DI A E DPGAGAAGGLGGGFVAFDDGELKPGVDVLQEVGLA SIHHRQGAGAAGGLGGA IQAFFPY IMKPGUEVVMEAVEFR DVSRAPGSGASGGLGTAL ILLGAKLRPRYEAITEYFSFD DVADMPGAGAAGGVGAALLAFCQAKLEPGDEVVLDLFQFD DI SYAPGSGASGGMGAGL QLIGAQLHPRFDII TKFLNDN DI SNDPGAGAAGGLGGAF YLLNGKMSSGПDUILELSNFE DVDQI PGSGAAGGLGAAFSVFLKAEMKSGIETVLDLDHFD QVANIAGAGAAGGLAAGLMAFTGANLHSGVDLVIEQTQLA DIQKQPGSGSAGGMGGALEAFASGKFVPGFQWIAQTSNLS
$K D T E Q P G D G A A G G V G A A L R D C L N A K M E S G A M L V M R Y A G F F$ DHRDTAGAGAAGGLGFAAHAFLRARFRPGVELVAERGGDA HVPEEPGSGAGGGMGAGLLMFLSAEDNPGLEFVLERLEMR HEKDSAGAGAAGGLGFGLLTFFNARAEKGIATILELIADE D SLS G G GAAGGL GFALLAFLNAQYVSG:DYILSASNAE

 ALHHKNGAGAAGGAGGAMQAFFAGDMQRGVDVVLEAIAFR DVNQDPGSGAAGGLGAALKVFLHANMKSGI ETVLDLIEFD QVADHPGAGAAGGIGMALLAVLHADFRPGIDLVI ESGGDD V DEASGSSAGGGMGAGLLAFASGKIVSGI DYVLDLLEFD
 EVKDIKGAGAAGGLGAGS $\square A F L Q S K L T K G \prod D V V L D T I N F D$
 ADSCRAGAGAAGGLGFGLMAFCAAELKSGFDTIADAVAFD
 A GQDMPGAGAAGGLGFAFHVFLNGRLTPGUDLI LSAIGID SLLLSPGSGAAGGLGFALQSIGGRVVPGAEI ADLTGLK DAANLPGSGAAGGMGAAALAVLGGRMQAGDELVDEAAGLA TFQGLPGSGAAGGLGFALRT LGGARLVPGAQVVAEAVRLD DYQHVPGTGAAGAMGAGMIAFFHARLQMGUQTVLDTVKFD SMQNQSYAGAAGGIGGALWAMLDASLTPGGYAMLKAINFE A $D P D A \square S G A G A A G G L G T A L T V F L G G E M K S G I D S V L D L I D F D$ HLRERPGAGAAGGLGFAFMSVLGAEVMVPGAEVVEQLTGLK
 EIADLPGAGAAGGMGAGVMAFLGSRLQMGIETVLDTVGFD DLAKMPGG GASGGLGAGFALIGATLRPRFEAITEYFGDE
 DIGEMPGTGAAGAMGAGMVAFFNAKLQMGIQTVLDTVKFD DHRHVPGTGAAGGMGFAAHADLASSLRPGVEVVMEVGFE KVSLMKRSGAAGGI A A GLTAILNAEI IS GADLVIKLSGLK PCAELPGSGAAGGLGYAL HLLGGRCHSGATALAELSSLS $N L Q N I A G A G A A G G L G A G C V L F L N A E L K S G T E L I K S I A N F D$ IYPGAG AAGGLGFALMTFANAQLESGDALVLSVIGME DVNEDPGAGAAGGLGAALVIFLNAVLKSGIETVLDLVDFD
 NVQEI QGAGAAGGLGGAIVACLNGRISSGVETMIKLTRLE $P D T N L R H G P G T G A G L G A G L A A L G A R L L P R F D V L L D H L D L D$ DVQAIA GSGAAGGMGGGMAAFFGSQLQMGDETVLETVNFD $P V L L E K G A G A A G G L G A G A D A F D N A A L E P G I D I V L E E S R F A$ EFHTUPGSGAAGGLADPLLALGNATFVSGVQYVAEKVKLS

 DLSN】NGGGASGGLGAGLAGFLGAVLHPRFE:I QNYIEDS
 KVDDINGGGAAGGAAAGLFAF LINAQLVNGDDYYLDRVGF
 DFKTAKGAGAAGGMGFGLITFLNARLKAGDDVVLEATQUA DVRTMQGGGASGGLGAGLHAFLGARLYPRFAILSRFLDFD DISQVPGTGAAGAMGAGMDAFFGSRLQMGQQTVLDTVRFD DI FHLPGAGAAGGMGGGLLPF LRAELLPGSKTILE LLHFR
 DVRLLP GS GASGGLGAGLIAFAGASLHPRFSLIRQYINDE RILTIE GAGAGGGMAAGLVAFAGGQISSGDEKSLDLIDFD


UniRef90_UPI000470491A UniRef90-UPIOOO4714B28 UniRef90-W4PN30 UniRef90-X0PRI2 UniRef90_RTJ5VO UniRef90-J2PGG2
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## UniRef90-E3H758

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UniRet90 B2RLR6 UniRef90-M3FAC9 UniRef90-UPIO0045EC598 UniRef90-E3EPB4 UniRef90-H8LCH1
UniRef9O_F9DRP9 UniRef90-J7LCU5 UniRef90_D4KG18 UniRef90-UPIO004292BF7 UniRef90-A5WF76 UniRef90-UPIO0045E5DEF UniRef90-UPI000471D7ED UniRef90-C9KL15 UniRef90-F8FQM5 UniRef90_UPIOOO3685D92
UniRef90-UPIOOO281022 UniRef90_UPIOOO28A1022
UniRef90 C6L9L0 UniRef90 XoQR13 UniRet90-R7HKF2 UniRef90-KOVOX6 UniRef90-UP10003B4C07C UniRef90_D6XZ11 UniRef9-AOAO15LRM4 UniRef90-R6E956 UniRef90-O2SMF6 UniRef90-U2Q0D1 UniRef90_C4JDU3
UniRef90 C4ZC23 UniRef90-H5T218 UniRef90-R6N6YO UniRef90 W7QCF7 UniRef90-E3ZGE6 UniRef90-G2IXL4 UniRef90-X5E060 UniRef90-G8QYY4 UniRef90_-_5TQK4 UniRef90-UPIO0046EE1BD UniRef90-W7BEDO UniRef90 A0A023CJ78 UniRef90_S4MY62
UniRef90 FORSU3 UniRef90-UPIO003B6A57A UniRe990-E6LIO3 UniReftol-K9EXF6 UniRet90-A0Q5Q1 UniRef90-R5H660 UniRef90-UPIO003FAE544 UniRef90-U5F7N4 4 UniRef90-U7PC73 UniRef90-UP100041DDB85 UniRef90-G6CAAO UniRef90_UPIO004723EF1 UniRef90-UPIO00347BDA1 UniRet90 E3HXW1 UniRef90-R5FEX5 UniRef90-UPIO004288CD2 UniRet90-E8KBL2 UniRef90_UPIO00479B596 UniRef90-K8MV77 UniRef90-UPIIOOO2EF495B
UniRef9O RFYH0 UniRef90_R5FYHo

EYLETAD 290
300
310
320
EYLETADLVITGEGRSDSQKTPYGIIAQAARQKNVPIVI LVIS ALLPDAQLVIVGEGSLDAQSTPVGAARLAKKHGIPCVALV
 SIIQDADLIITGEGKVDQQKVVDGI VKSARSYQIPVIVLT RMLQETDLVFTAEGSVDFQKIPVEVAKRAKKHALPVVALV QAVVGADWVFTGEGSVDAQKTPFGVAQVARTAGARVVIFA AKVKGADWVFTGEGSVDSQKTPAGVALIARANGVPSMIFG ALI DEADLVITAEGSLDGQKVPVEVARRAKLRGLPVIAGA SVI SRADMIITGEGKTDAQSAMGKVIKRGKKQNIPVVVIS QRLSKTDLVMTAEGGDDGQKVPAEIARRAKRHKLPVLALA EICTDADFVVVGEGRMDGQTSSGKAPLGVARAGIPVIAIC ESTEGADFVITGEGKDDFQSTPMGVSKLSREKGIPVIAl A ERIDNADLIITGEGRSDEQKAPYGVAKVARELGGPVMLLS EMVQDVDLI LTGEGRTDQQKVVSGVARRARLAGKPVVCLS NLVRGCDLVITAEGGDDEQKIPAEVARDAKAKGVPVIALA EKLESCDLIITGEGSIDNQKTISGUAKRVKNTNKIMIVLA KHI AQADYVFTGEGGIDFQKTPLGVAKVTRQFNKPLFACA
 QALQGATVAFTGEGRMDAQKTPAGVARLAQQAGVPVVALA $K A C A D A D L I V G E G R M D G Q K A P L G V A K Y A P Q G V P V: A$
$E V I A K A D L V I T G E G Q M D N G K A P: G V A Q L A Q K H G V P T I A V$
 A EKI READLITGEGKADRQKVPAGVLAEAMKQELPVVLLA YQIDTVDLIITGEGKSDHQKTPFG|AEVGKEAGKPVILIS AAAQWADVVFTGEGSMDAQSMPVGGVMVAKAKGGKPALA 1

 SRLEDVSLVVTGEGRTDWQSCFGKVMQRCKRKNDPAVALV KHLCTANLAITGEGKLDSQKVASGVARQARAHNVPVMAIC RHVGEADVVITGEGRLDEQKVVKGVATLSARTNKPVVVVA KSLAKADVLVTGEGRMDQQKAPAGVAQLAKACQPHCLALC AALQGADLVITGEGRLDGQSTPVGVATLAARYGVPTUAUG A ALADADWVITGEGMSDAQTRYGKLPLHVATAARRAGARC
 QSLAGADWVFTGEGSVDAQTMPFGVARLAARTGARVV AF A

EAIHNADLIMSGEGKDDEOK
BKANADLMSGGKLDEQKGPDGVATDAADAGKPVLLFG EKVKDADYVITGEGRLDGQKAPWGVAEWAKKYGKPVLAFS DKLKGADLVFTGEGCMDSQSAPLGVAQRAQRAGAPTIALV ALLPGATAVDTGEGRDDRGKVVIGI AHRARQARIPVVAVV KLFDECHLIFTAEGGUDRGKIPGELADRAKRCGLPVVAIA KELKNADVVVGEGRLDGQSVPVGVAKAGRKNGCKVIALA EKI ADADYIFTGEGKLDSQSVVMGI AKRAQEQEKKVIAVV RILSDADLVITGEGQLDGQSTPIGIARAAKRHDVPVVILA RHLQGADFVVTGEGRTDEQSAMCGVSGRAAAQGIPVVALS QQLANADLVIDGEGKMDAQSDPVRVASEAKKAGAFVLAIV DAIAHADWVLTGEGCSDAGKAPARVAEGARAGVPVSLLS EQVKDADWIVTGEGKFDEQTFSGKVDKGVSRTNQQLAVFC ESLKGSTLCFTGEGKIDGQSKPVGIAKLAKKHNVPVIAFA SRLQGVSLVVTGEGRTDWQSAFHGVGMHSKKYGIPAVAVV EVCADADVLVGEGRMDAQKAPIGVANCAPENATVIGIC EKIKRADVVITGEGSLDSQSIPIGVGKLAKKHGKIVIGIA ARLARADLVVTAEGALDHQKVPAEVARRAKLYGRPVLALA AA DQKADWVFTGEGGI DF
NYAEGNCDFVF
E DATKADVVTGEGSDDGQKVPSGIARLAKSQGKPVIAIG $\stackrel{D}{\mathrm{D}}$ NALSKADVVITAEGSUDEQSAPFGVARRAKAKGIPVVGMA QKLHQVDLVITGEGRLDGQKAPYATATLLARQADKPVLAFA ALLERADLVLTAEGSI DGGKLPAEVARRAKQAGIPVVAFG EI GDADYLTGEGKLDSQSVVIGIAERAKKQAKSVIAVV EAKGAS LIGEGKIDRQTVRGKALIIAREENVPVAALC
 RVOKADVVVGEGRMD HALAGADWLITGEGRSDAQKAPGKAPVGVAQRQI P


## UniRef90_UPIO00470491A

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UniRet90 B2RLR6 UniRef90-M3FAC9 UniRef90_UPIO0045EC598 UniRef90-E3EPB4 UniRef90-H8LCH1
UniRef90-F9DRP9 UniRef90_J7LCU5 UniRef90_D4KG18 UniRef90-UPIO004292BF7 UniRef90-A5WF76 UniRef90-UPIO0045E5DEF UniRef90-UPIO00471D7ED UniRef90-C9KL15 UniRef90-F8FQM5 UniRef90-UPIOOO3685D92 UniRef90 UPIOOO28A1022 UniRef90-C6L9LO UniRef90-X0QR13 UniRef90-R7HK2 UniRef90-UP10003B4C07C UniRef90_D6XZ11 UniRef90-AOAO15LRM4 UniRef90-R6E956 UniRef90-O2SMF6 UniRef90_U2Q0D1 UniRef90_C4JDU3
UniRef90 C4ZC23 UniRef90-H5T218 UniRef90-R6N6YO UniRef90 W7QCF7 UniRef90-E3ZGE6 UniRef90-G2IXL4 UniRef90-X5E060 UniRef90-G8QYY4 UniRef90_-_5TQK4 UniRef90-UP100046EE1BD UniRef90-W7BED0 UniRef90 A0A023CJ78 UniRef90_S4MY62
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UniRef9O RFYH0 UniRef90_R5FYHo





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340
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360

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 GTVGHGIDALFASUGKRPCSGDEAGEKADKFLVRAAEDATR

 GCLTPHFDIIESVVNDVVSQKESMEHAAHYI K

 G GMD H G I D S I DT TI N GA M GLLD E A L E R A E E L Y A G A A E R A F R
 GALLS SFDYAVSIACGQ AGLDAMIRDSKRDLVLAAENLDR GSLGEGDTAAFSLLPGSHTLEHALTHASDYLTARARDVMQ
 GRVGDGLTAAFA VVPGPASLGDAMGNAERNLVQAAEQLAR GSI EDGFLGLFPI TPSPVSLREAMAYARDNLRRTAEQVCR GLLVPYFTEIMSUVGEQVSKDRADADAYNQLKDKTQTVVK GGGVGEGGVSVMTGAQGAMSVEEALERAEELYRSAADRTFH GSVDVGISAVFPILPAAVPLQEALQQATDNLHRTAKNIAS G A I E E WF S G L H A L D D G S K TVLGE L M A N A S G L L C Q E TVVHL M S
 GAMGEGICSIMTTVNGVMELENALENAEDLYYGGALRMFR
 GSRADGVNHVISLVNDTTSTEEAlISRAAALI RERV GSATHGUPDAYFPVLHAPMTLSEAMDRAERNLRQTVQQVMH GSHGEGUEGCFASVNKPATLDHCLQEAENLLLQCTRNVVR GA LGDGURAVFACVDRDTTLEAALGNAAANLARVAGNVGA $\begin{array}{ll}G S L Y E T F D G C F S A V P R P A D L A V C M R D A A E N V Y T A C R Q & V \\ G A Y E M G V T A V & P D N R L P Q D F S V S R Q Y S A E N L G Y T V D S \\ M & L\end{array}$

 | $G$ | $S$ | $V$ | $S$ | $D$ | $G$ | $F$ | $L$ | $S$ | $V$ | $Y$ | $P$ | $T$ | $V$ | $S$ | $G$ | $P$ | $M$ | $P$ | $L$ | $E$ | $E$ | $A$ | $M$ | $K$ | $P$ | $A$ | $Y$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| G |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | GSLDHGIESLMTTVDAPMPLEEALGRAEELYYLGAVRMFR GMRTRSFDESYSLI SENGNVTELMAEGAARLEDEVYRVMK GSLYDRFAACFSTVPGPSTLEAC

 GALAMGLTAVFP IVAPGAVTLDQALANAAANLRRSAENATA



 GSYQNG』DAVFPIIPELTDSAT IFCETNDNLARTAENIAN GAVLP DFDGCFSLCSRPDTDLEAADQQAAPLL E QAA E QL A R




## 

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LWRAA QEM
LML
AIKLGGQ
LF QN GCRMK TIIMVGLQL
A L
Ml LVG
$F \perp A$
LVLATRSV
L L KYAK

$M \mathrm{VM} \mathrm{V}$ GRSLK
L WQ
MVKVG S S $\square K$
MVKAGMK L
$\frac{L}{L}$

| $L F$ |
| :--- |

LWMAAARRR VWK G GDK

LILKTKR
L V
L L Q
MI A $\square$ A S KRR
LY
AY $\mathrm{L} E \mathrm{~K}$ QK MLRTGRKLN LMRI
L L QV
KI K
L L
LL K $\square$

L I
LI QSSRK
L L A
LI RAA
LLQAA
Sik K G Q N
TLLIRQN
TL Q
FIKAGMTL
$T\|D\| G R$
LIK


LI K T CRELDR
$\frac{L}{M} L$ K A GNEMK TML
L L K

FI K
L WK
LLQTSQK

- LKGGANM

L L
LLSVARE
S T F I G GMEL
TI
S Q QGMKMN
LLTL

LWLCDREAQ
L
L $\square \mathrm{KAGQ}$
$\mathrm{V} L \mathrm{~A}_{\mathrm{A}}^{\mathrm{T}} \mathrm{L}_{\mathrm{L}}^{\mathrm{L}} \mathrm{GGKMN}$

| $\mathrm{V} L$ | $A$ |
| :--- | :--- | :--- |
| Q | A |
| A |  |

G $\square K \square$
LLKM
LWQA GR
L VIK
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## M T A

MK F ILAPDSFKGT

 MHVLIAP DSFKESLLSA






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UniRef90-Q0CN27 UniRef90-B6HKN0 UniRef90_UPIO004681E4C UniRef90-UP10002F44DEE UniRef90-D1BKQ5 UniRef90-S3Y068 UniRef90_N9CDX6
UniRef90-E7NYC1 UniRef90_E1W0U5 UniRef90-A0A024PLY1 UniRef90-R7PHT8 UniRef90-T1Z5B4 UniRef90-D6X8N9 UniRef90_J9MRS0 UniRef90_UPIO002625CDD UniRef90-A1RAE0 UniRef90_UPIO0046CF47F UniRef90-IIYTC4
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210
220
230
240
GEQGATY|V|F GRQK G LT Q A Q|L|HK|I EHGMENFCYQI K RYKK

 GKKGVARVYGPQKGASPENVEQLSNNLEHLARLIKSFKKE GETGSSAVFGPQKGATPQMVKVLDANLAHYAAVIKRDLKK
 GPNGATY V FGGQKGLANEKFASVDKDMEQFYQSFEPVV
$G K T G A A H V Y A P Q K G A D E E M V L L L D K N L M D L A D T V K S Q L G V ~$ GQEGATYVVFSKQKGLDKEENFQUVDDYVNKFTRDVYNKYNT GPHGVARVFGPQKGATPAQVEEMAAAMS DWADLERGHGGA GK LGGASA IYGPQKGASLEQI QLYDNALNKFAHLI EDQLHH $G P S G A S A V F G P Q K G A T P A M V A E L D A G L Q U Y A E A I ~ E R T V$ GQNGA $\operatorname{CRVYGPQKG\square EPSEDETLDGWMSSFAALLETTVGK}$ GETGAAYVFGPQKGADEKAVKRLDAGLRRDAQIVERDLHK GKNGAAYVYGAQKGASKEDIIILDKGLQDFSTILNEVFTI GPNGAAHIYANQKGATEADD NYLDTGLRNFSKVLADHFNL GEHGAAYVFAPQKGANKNLVKKLDKNLILLSNII KEKLND GNMGAAAVFGPQKGADEAMLSRLDAGLAHLAEVLERDCGA GLNGATY FGGQKGLDPLQFERVDQSMKQF YKAFAP GKQGSAYTFGKQKGLYPTQLEAVDQAMRHYRDKTYEFFAV
 GQSGATYTFAAQKGLTEDQFGQVDQAMASFYQLVV GLNGATYTYGPQKGATQDDLPLLEKGMKNFSTVSNNLMHK GTNGAAYVFGPQKGADANEVKRLDAGLRVVAGLFEKQ GA GPNGVARVYGPQKGASPKQTETLDSALAVYAGVVEGULGQ GPEGVAQVYGPQKGASPPQTKLLAAALETYAVVIHRTLGM GYNGAAYVYAPQKGASQYDVEILDRGLRNLAHLCKDD GMQGATHVFGKQKGLFPNQIKRLEKGMQNYRDRMLEACGL GPQGAAAVFGPQKGATPDDVVALDAGLTRLAEVVAVETGLL GTSGASAVFGPQKGADPATVAKLEGFLGELVEAAEASDPR GPNGASYVVGPQKGADDEMVQULDRSLSHFADVAEQAAGH GAKGAAAVFGPQKGASQEQVQLLDAGLARLADVLEADTGR
 GENGATYVFGGQKGLPDLLFSQVDQAMATF YKQANP GEHGVARVFGPQKGATSAQVEELSAADEHWAGHDTAADPV GPDGVANVFGPQKGSTPEQAACLSDAMEKLADVATGDLCD GTATYGPQKGLSDS
 GSNGAAYI YAPQKGATQDEVKLLDSGLRNLARLCKAD GNQGVARIFGPQKGATPSQVDLLSEGFERYATVIETADGV GLNGAAHVYAHQKGANDAEIVALDRGLRHLSTFFS IS $G E Q G C S R V Y G H Q K G A T A D D V E K M D R S M A Q F A D V V E R D F P N$
$G E D G C S R V F A P Q K G A D A E S V E L M D V Y M K H Y A D V V E R A E G K$ GEDGCSRVFAPQKGADAESVELMDVYMKHYADVVERAEGK

GPTGATA
GVRGAALA
GAEGAAKDFGPQKGLPADHVQTHDRALAHYMTVASG
GKRGVARVFGPQKGATPAEVELLSAGLERLAAVLTRDLAP GEHGAAQVFGPQKGARDGEAEFLDGALVHWAALLERETGV GDRGATYMVYGKQKGGASPEDVEFLDAAVSFAEKNCHD GDSGAVYMFGRQKGLTENEVDRYECGMKNYQEVVSGTLNS GEHGATWVYGAQKGADEAALSELEAGMAHYSQLLTQTLGF GPRGVARVFGPQKGASPRQVEELAAALDRWAGVLARDLPA GPNGATMCYGKQKGGTVEVLEELERGMENYRQVLLKTFGK GWRGASAVYGPQKGATDEDILFDSVLRNFVEVSGKD GKEGAAYVYGKQKGASEKEI E ILDKGLQNVANICG【NPNY GPSGAAHVFGPQKGLTTEDVDRADQELARLADLLEGAQGR GESGAAYVFAPQKGANAEMVRMLDQNLRSAAQTVKEQLSV GENGAAYVYAPQKGATPEMVEQLDRRARLFAEKSALHFGF GKTGAAHVFGPQKGADPEMVLFLDEGDKHLAEVINKDLGM GPKGVARVFGPQKGATPEQVDRLDAALSHWGDLLGAHAGT GKDGATYTFGKQKGGTPEILDELEAGMKNYAEVVLKTTGT
 GENGAAYVF GPTGASAAFGPQKGAKPLQLGKLDRCLKNWGRLLEETTGR GETGAANVFGPQKGANVAMIARLDAGLKHLAEVSGKAK GENGAAAI FAPQKGAGEAMVQRLESGAAHAAKIIDRDVGV GPQGVARVFGPQKGATPDQVEELSEGLDRWAGLLADATGM GKNGATYVFGKQKGDY $\square$ NQMSEVERGMAHYCMKLKQTFHV GQKGAAHVFSRQKGADEESVLLLDDGUKNYASVLEKHTQU GDS GATHVF GSNGCSAVFGPQKGADAVMDKRMDTSLASYAALCRKTFPN GPHGAARVFAPQKGATPDEVELLEHGLVRLAAVLRKQFGP
UniRef90_R7GA07 UniRef90_R4T0L9
UniRef90_S3XIJ2 UniRef90_E7GF38 UniRef90_UPI0002D3274F UniRef90_U4TK38 UniRef90_S4D5I1 UniRef90_UPI00047D2866 UniRef90_U1N4W6 UniRef90_F5X291 UniRef90-H2J9R5 UniRef90_A4F5X7 UniRef90_B9DJ76 UniRef90_UPI000369AB15 UniRef90_UPI000262B1E8 UniRef90_F2N8R1
UniRef90_UPI0002C3D34F UniRef90_U1GTK1 UniRef90-UPI0003732016 UniRef90_S7VT53 UniRef90_L5N743 UniRef90_R7GGX5 UniRef90_G4KXD8 UniRef90_TOTK35 UniRef90_UPI0003B502CD UniRef90_R6DG87 UniRef90_U2TWZ7 UniRef90_UPI00037CCD99 UniRef90_UPI00034C46A6 UniRef90_UPIO0046F1EA0 UniRef90_S3CGB6 UniRef90-Q0CN27 UniRef90_B6HKN0 UniRef90_UPI0004681E4C UniRef90_UPI0002F44DEE UniRef90_D1BKQ5 UniRef90_S3Y068 UniRef90_N9CDX6
UniRef90_E7NYC1 UniRef90_E1W0U5 UniRef90_A0A024PLY1 UniRef90_R7PHT8 UniRef90_T1Z5B4 UniRef90_D6X8N9 UniRef90-J9MRS0 UniRef90_UPIO002625CDD UniRef90_A1RAE0
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GA A G G $\square G F A L Y$ QLGAVYVS $G \square E D V V R W S N L E$ LDD L GA GA G G GMAA G LAAAFTGGGRIIDSGIDA V L DMMLNFD


 $N W Q Q V S$ GA GAA G GLGFAFLS LGGQLESGASLI ADAIHLIE

 $P$ I LE Y P G S G A A G G I G G A F L A LF N S E L K S G I D L V L D L T N F E DASLLMPGAGAAGGMGYGMNVFFGSKLQMGIVEVLDTVRFD $D V Q S V K G A G A A G G M G \square A T K L F D K G A L E P G V Q Q I V K V A N F D$
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 SV A A E E GAGAA GGLGYAFRAF LGGRLQSGADLVVEAVELA $F \vee G D \quad G A A G G L G F A D R V F L K G T V H S G F E F I S A Q V D$ DVSERP GA GAA GGMGAALDAYTGATLRPGDDLVLELLDNAD DVAAVE GAGAA G GLGGACLMALADARPGRGUELVLDAVGDD $R G T D L G A G T G A S G G L G A G L A A V G A R L L P R F D V L L G H L D L D$

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 TDVEWADTVITGEGRIDAQTMPSGVAKLAKKHGKYVI ATG EALAGAHWMITGEGRSDAQKAPFVASQRARRAGVATTLLS AKLAGADLVVTGEGSDDHGKGPAGLAAMAAGHGIPVVAVA EAVKKADLIFTGEGQTDAQKVPYGIAQDASRHKVPVICLS ALIAEADLIVTAEGADDFQKVPAE:ARRAQVTGVPVLALA TKVAQADLVISGEGQVDDQSFPDQLSQLAQTAGKPCYLLV DVL E S A DLL L I T G E G M L D H Q S L P L L L A R K A K Q S K V P V I I A L V ARLARADFVITAEGALDHQKIPAEVARRAHASGVPVLVLA AALEDADLVITGEGSFDSQSVNGKVAAAASPTRPPVVVLA SKVANADLVIVGEGRLDHQSLSGKAPDGVARRGIPVIAIC RT| EGADFVFTGEGAMDRQTLMGKIARVARPAGVPVVAFA
 QALAGVDLVI TGEGRMDAQSAPVGVARRAKAQGKPVVAVV ARLAAADLVITAEGALDHQKVPAEVARRAKLHGRPVLALAC ETIRGATIIFTGEGSMDRQTLMGKIARTAREEGIPIIAFA EHLKGADMVVTGEGKVDNQKLPFGVMKVAQKHHIPTIALA AAVEGADLVLTGEGSLDAGKAPVGVADLAARHRVPVGVLS
 EKIKDADLIITGEGSADRQKLPQCVLMRGKQLGVPVGLVA EVI EGADAI FTGEGKDDFQSLRGKVVDGVARRAKKKGGIE RR1 A AADLVDTAEGADDNGKVPAEVARRAKRLGTPVVALA GLLDGVDAVITGEGRIDWQSVPCGVGMRCKNRQDPAVAIV
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 $\square L$ I A A D K F K G S L T A V Q V $A$ A E R V $\square V I A P D S Y K G T M S A T E V C D D I K K E F L K L N A S E K V K C F$ MDSFKGSLTSQEANRAVRRALA
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$\qquad$ M K I L I S SPNAFKGGTAS







 SFK GALSSREAGSA RIVVAMDSFKGSLSSMEANQAVLRAL $V L I A S D C K F K G S L T A A E V A D A V G D G V R R V L P H A R V V C T$ $M R \vee V$ A MRFVVAPDSFKESLL MK V I A \begin{tabular}{l|llll}
$M$ \& I \& I \& L \& $A$ <br>
$M$ \& $R$ \& $L$ \& $L$ \& $I$ <br>
$A$ \& $P$

 $K \vee \subset C$ K VCCPDSFKESMT 

$H$ <br>
$M$ \& $L$ \& $A$ \& $A$ \& $D$ \& $K$ \& $F$ \& $K$ \& $G$ \& $S$ <br>
$M$ \& $L$ <br>
$V$ \& $V$ \& $A$ \& $P$ \& $D$ \& $S$ \& $F$ \& $K$ \& $D$ \& $S$ <br>
$L$
\end{tabular} L V A A DKFKGSL

$\checkmark V$ I A P D S F K G S L $M V V V$ A P D S F K G S

V V I A P
 $R F A \vee A$
M R



LK L V VP DKFKGS LSS G DVCDA IRR


 $L V A P D K F K G S L S A P Q V A R R L A D G L R R A R P Q V P G V E L$
 $M K \vee A V$
$V \vee V A \vee D S F K G S$


 $\checkmark L$ C P D S F K G S L D A A GVVA E A M A R GVV R V A S P S T R

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




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




## UniRef90 W1TQ91

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 PVADGGEGTVEAVLAA GFHAVTVKCHGATGDLAEVDYAM AI ADGGEGTVDAVVKNNNGQKIAAHVQALDGKKIIAHFGW PLDDGGEGFTRGVVAATGGSHQVVVPGPLNEPVQAFFGM PVAGGEGFTEALKDALDGEWVSCEVVDALGRPCVSQYVL PVADGGEGTLDVLLS VGGRRVDVRVCGPLSDPVEAYYVV PMADGGEGTAELVSHTLGWAWHLSDVRDPCGRHVSAGWGY PVADGGEGTLDVGLAAGGRRVDVDVSGPLSDPVHAHYVV PVADGGEGTLDVLVASGGRRVDVEVTGPLSRPVAARYVV PVSDGGEGFAEAVSAAWGALWRAVATVDALGRPRTAGFGL PMADGGEGTLDALLASVGGRHRSAMVHDPLMRPVRAEYGL $P$ VADGGDGTVSAAI ASGYRRVPVRVTGPVGEPVDAETVAV PMSDGGEGMLEAFISALHGKIIQAEVHDPLMRPILASYGI PVPDGGEGTAHMLAESTEGRLVHRTVTGPVGQPVESHFAL PLADGGPGTVDALLTGTPGERRVMTVQGPLGEPVEAAYAL PIADGGEGTCEDLTKYSNGKYYSKEITFCDLTKRVAKYGF PIADGGEGFMDTVAAMDGAR VEVEVHDQRGLPHMAGFAL $P \vee A D G G E G T L D A A I A A G Y E E R N N A V V G P I L D P V G A S W A!$ PMADGGEGTVDALVSATGGCYFQVQVHNPLNQVVIAKYGF LAD GGEGTSEAFLANQGGRWEYAMVHDPCGRLIAAKYAF $P L S D G G P G F V E V L A T A L D G R R L A V D T V D P L G R P B A R G D V$ TVVS G GE GYREAFCDAVDGNSIEVPTRDPLMRPITAQYML



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140
150
160
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 HAARRGAKQIQLAIGGSATNDAGLGLLQALGWQFLDSQGQ AALQTGAEEILLCIGGSASTDGGTGLLTALGAQFLDAAAA HALDDGARTLVVGIGGSATNDGGDGMAAALGYRFLDRAGE EALSKGVKNIVLGLGGSATVDMGTGILAALGVQFLDKHGA HALSVGAERIVLGLGGSASTDGGAGMLTALGARIYGPDGH AAVEAGARTVVVGLGGSATNDGGAGMLAALGAVALDDTGT HALRLGARRIVLGLGGSACTDGGAGMVQALGGRLLDATGR HAVRSGARTVVVGLGGSSTNDAGAGLLAALGATPADR DAMQQECTHFIIGLGGSATSDCGTGMLRALDNRFHGK DAlKKGCRNFIVGIGGSATNDGGVGMLQALGYGFLDADGK AALRKGATDITVGVGGSASTDGGAGMLEALGVRLLDRNLA AAIDHGAQTIII GLGGTGTVDGGIGLLNALGIIEYDKDQQ AAMEAGAQRIIIGCGDSATCDGGAGMLQALGAVLLDQEGR HAVEHGVKRVVMGTGGSATNELGAGFACALGARLFDADGN HAI DNGARGVVLTVGGTASTDGGAGMLQALGATILDADGA AVLDAGGRHVLIGLGGSGTVDGGAGMLHALGVRFRDREGR HAVEHGARGVVLTVGGTASTDGGAGMLQALGATILDARGH HAVEGGARGVVLTVGGTASTDGGAGMLRALGATVHDARGN ASVDAGARSLLI GLGGSASNDMGLGMLVALGARCLDEQGH HALDDGAHTIIVTLGGSATNDGGAGLAQALGARLLDANGR AALDEGAHTIVLGVGGSACTDGGAGMLGALGARLLAADGS HALHQGCKKFII GLGGSGTSDAGRGMLRALTDIF
AALEHDIHTTLIGCGDSGTSDGGLGALQALGVRIADAQGR AALDAGCTRIIVGLGGSATNDAGTGALTALGYRFLDAKGR AAAAELPGQVLLCLGGSAANDAGTGLLRALGVRFLDAHGD SAlDKGAKTIVIGI GGTCTNDGGMGLLSSLGIKFY HDET AAI DAGAKRLVIGI GGSSTNDAGAGMLSALGVRFQDQNEA AALDAGATEIVLGLGGSAMSDGGSGALRALGLKPLDSAGN DAVNHGAKQIILGIGGSATVDGGSGMAQALGVGLLDKNGQ AASRQGATKIVVGLGGTGTTDAGIDGLMGALGAKLYDSYNQ AAVEAGATEIVVGLGGSAVNDAGAGMLAALGAGPVDESGY DAVKRGAKHIII GLGGSATSDAGMGMLKAL
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UniRef90-D8DV49
UniRef90_GOHD64
UniRef90_S7V4N3

170
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190
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 PVPPGGGGLAGLAGADLSNLDPRLAETEFVLASDVDNPLT EVGGGGGSLADLERDSLDGUHPRLRKVQ EALCNVKNDLC
 ELKVSPDELLELDRIDLSGLDKRIEYCRFTVLTDVKNKLL PLPHGGGPLRELVSADLTGLDPRWKDTEVILAGDVNNPLT DIPLGGGGLIHLQRIVPSS GLLPRITVLCDVTNPLC EFLPVGKNLCEI RSVDFSAMRRLLGLVRINVLYDVDCKLC RLPPGGGALADLAEVNLELLQEVVARATFVAATDVTNPLL DFVPTGNSLEWVERIDHSEVIPMLKDVRFTAVCDVDNPLL PVRPGGEGLASAVDLELTAAIDRLRGDNLIIASDVDNPLT TVEDLPGOEKVRR PVGLGGGTLGRVALAELGPVRERLGSVEVAVATDVTNPLL EFVPTGHTLTRIARIDSSPARDRLRDVDVEVMCDISNPLT VLSTUPHRLEEVASVDWSGLHPRAREVVWRMSSDVQNPLT PFPAGGQWLAQCASLGWVLGNVPLKGVEI GASDVDSPLT EVTPDAAGMARASRLDTSGLDPGWKEVEVVIMGDVTNPLC PLAANGGNLARVASIEMNECDPRLLANCHIEVACDVDNPLV LLAPNGTUNDVLTS PLGTTPAGLASHASLDMGGLDARLKDVSFRVACDVDNPLL PLGPGGGALAALARADLSGLDGRLARTDVVLASDVDNPLT
 PVEPTLSGGADDARADASGLDPRLKETEFVGMSDVDNPLT ELDATPEARAQAARVDASGLDARLREATFVGMSDVDNPLT ELPGGGAALTASAVDLSGLDPRLTHTEVVLAADVDNPLL DLPDGGAALARLDRIDFSGFEPRGKDTKVLASDVDNPLC
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 L EVCYGAEGLSKVCGIHTEDMLQELSVCSFQTACDVTNPVV TLWPSLDTLDALRTATC QRPAQLGRVRLLGLSDVNNPLC
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DLPPGGAALRALHALDLRGLPD

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 AVDRGGEALNSVATVDLTEVRRVLDGVAVRVATDVTNPLL
 KVEPVPAEFSRIRRIDEVPARRRLEGVRITVAGDVTNPLT DLEPGGAAGARLDHLDLARMDPRLAHTVFCLAADVTNSLET APHGTVDDVLTNHTMSGD A A EVGHGGRCLADVATLDMSGDPSALRDVKMVMADNAHNDLT PLPEGGAALARLESIDLSGLPDWVRGLNIEVACDVTHPLV LLDGNGENLIKKNKISLDGLNPKVRDVSFVIASDVDNTLC

 PRLR DTFAPHGNWNSDEELDDVKFTIASDVKNPLC

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UniRef90 $\mathrm{Z} 4 \times 373$ UniRef90-K1L612 UniRef90-F4C9P3 UniRef90-UPIO0031C2764 UniRef90-Q3A582 UniRef90-R7K4Q5 UniRef90-UPI0003B76363 UniRef90-UPIOO0381FB0A UniRef90-X5LR19 UniRef90-UPI0003764DDE UniRef90-UPIO001746AFD UniRef90-R4TCU5 UniRef90-A0А031FZP3 UniRef90-C4KYQ9 UniRef90-H5XF63 UniRef90-UPI000475A856 UniRef90-X5DTT2 UniRef90-W1GDU3 UniRef90-R5MYDO UniRef90-UPI00042753F5 UniRef90-UPIO003B6AE45 UniRef90-M3CDC9 UniRef90-N8T865 UniRef90-M3BQW8 UniRef90-A0K849 UniRef90-SGAAZ4 UniRef90-B2JGL3 UniRe990_UPI0003B755D2 UniRef90_M9SZX6
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UniRef90 U5VWZ4 UniRef90-D8DV49 UniRef90_GOHD64 UniRef90_S7V4N3

210
220
230
240

 GPTGAAYVFGPQKGADEKMVREIDSGLRRMSEVVETELGK
 GENGAAAVFGPQKGATADQVRELDSGLEQLAITLRDAYGT GK NGCS A V Y G P QK GA TP E IV TVRMD A D I R H FA E I A GRA T G V GPKGAPAVYGPQKGASPEDVEALDAALAHFARVLARDVGP GEKKGAA Y V F A P Q K G A D R S TVV K I L D D G L K N L A E V T K N I I D K
 GDNGASRI F GPQK GASEAMIVELDNNLSHYADVI
 GPKGAPAVYGPQKGASPDDVEALDAALAHFAKVLEGALGP

 GSKGAAFVFGPQKGASVEQQE LLDDFLEHLNY I WT TQLKK GP Q GAAAVYGPQKGADPQDVAALDAALSHFAGVLGRT
 GP D GAA AVYAP QK GA GPE QVA QLERGGLTRWA DLVEASSGN GASGATFTYAAQKGATVADLPELERNMSDFADRINTS LGR

 GEH GCTAVV Y GP QK GV
 GESGAAYVFGPQKGLAADVVKRYDRDLNHYANCFEVDRRA GPA GAAAVYGP QKGADPAQVAVLDTALTRWADVVAAATGR
 GARGAAAVFGPQKGATPEMVVEELVQGLQNYARVLQQQTEQ1

 GPS GAA A V Y G P Q K G A S P A DVV T L L D R A L G R L A D V L
 GA H GA T A V F GP Q K G VT A A Q V A T L D A A L A R F A D L L E A A L D R GEHGATAVVGPRQKVLDSAEI ARFDERRLHRFSAAGDRWLGS GDHGATAVFGPQKGVVPEQVGADDAALARFADLVEPAMNR GPSGAAAVYGPQKGADAATVAELEAGLARWVQALAEVRPE


 $G D L G A S A V F G P Q K G A D A A Q V R R L D A A L A H Y A D V L A A S G L P$ GQKGATYI FGKQKGLLDRDFGKIDNEMFRVAKLMEKELDK GAEGAAAIFGPQKGAGPEDVV LINAADAHFVDVLAAAEI GP
 GENGCSYI FAPQKGADAQMVENMEKSMVRYADLVEQQNWS GPNGATFVVGTAQKGVGQDLATADAREERFAKRCAAABVGE
 GANGAA QVYAPQKGADPAMVQRLDQGLRHFARVVREFDGF GPRGAAAVFGPQKGADEHDVVALDAGLTHLSGVLAEHTGD
 GD R G A $\backslash P V$ F G P Q K G L K P E D Q S K F L E A A K K V Y H L F E K A K G $\square$ GPSGAVAVYSAQKGAGPDDQEVLEAALQNWAALVGETHAG $G \operatorname{L} H G A S N V F G P Q K G A D R A D V L L L D A A L Q R W A E V L Q Q Q V P G$ GRNGAAAVYGPQKGAGREEVRVLEAGLRRWADLAEAVSRK
 GEKGAA Y V F GP QK GA D E Q Q VVQLL D R R ARTFA EM SA K Y F G Y GE Q GCSAVFGP QK GATPS SMIA EMDEWLARYA GLTK D KYPE GPEGAAAVFGPQKGLDDEGVAVAEAGLTRLADFMESADGS


 GEHGAAAVFGPQKGAGTAEI ELLERGLRTWSAALARAGTP GRDGAA AVVGP QK GAGPREVVHLETGLRTCADALLRAGGR



 GPQGASVVFGPQKGAAPPVVAELDRALVRFADVVQRQLGV GDK GATYCYGK QK GA NE Q ML E L L E K GM M N F A S Q S K K L L N K
 GPQ GSTAVVGPQK GATEAMIP LLDQNLHHLAQVVKK
GTA GAVQMFGPQK GLTDANLKDFERRFQHFAQQVDPDNQG GLHGASSVYGPQKGATREDVLRLDAALDHFAGVLEQAFA GKYGAAAVFGPQKGATPEMVKLLDERARKFAEI SAASHFGY


## UniRef90 W1TQ91 UniRef90_15CKG2 UniRef90_E8LH55 UniRef90-Q401L6 UniRef90-H5UQB2 UniRef90 C1B521 UniRef90_C1B521 UniRef90_U2UMV4 UniRef90_UPI000382FFE8 UniRef90_S3ZIY6 UniRef90-R5YV87 UniRef90 F9EHB5

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UniRef90-M7S703
UniRef90-K1L612
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UniRef90-A0A031FZP3 UniRef90_C4KYQ9 UniRef90_H5XF63 UniRef90-UPIO00475A856 UniRef90-X5DTT2 UniRef90-W1GDU3 UniRef90-R5MYD0 UniRef90_UPIO0042753F5 UniRef90_UPI0003B6AE45 UniRef90-M3CDC9 UniRef90-N8T865
UniRef90_M3BQW8 UniRef90-A0K849
UniRef90-S6AAZ4 UniRef90_B2JGL3 UniRef90 UPI0003B755D2 UniRef90_M9SZX6 UniRef90-FOM622 UniRef90-KOYT17 UniRef90-D5ETN7 UniRef90_G4CHS7 UniRef90_H3NPL4 UniRef90-A0K197
UniRef90-R5ANZ8 UniRef90_R6U9J4 UniRef90_R5K917 UniRef90-U3QIB8 UniRef90_UPI000477EC7E
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UniRef90_G0J7J7
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UniRef90_C7MPU8
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UniRef90_10UYH6
UniRef90_F3PAU0
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UniRef90-T2S270
UniRef90-R6CGQ8
UniRef90-E7RYF8
UniRef90-FORQT0
UniRef90-R6R1A9
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UniRef90-U2HSX8
UniRef90-F6IXS6
UniRef90-U5VWZ4
UniRef90-D8DV49
UniRef90_G0HD64
UniRef90 S7V4N3
 SARETRGAGAAGGLGFALRM L GAEFKPGAEVVAEKVGLD AVAQDPGAGAAGGMGAGCDAFLNAKLKSGDDAVLDMVEFD DLNQIPGTGAAGGLGGGFIGFLNAELKPGIELILDLFQFD HAADLPRAGAAGGVGWATLAVLGATMRPGIEIVLALNDFD

 QADEYPGAGAAGGIGYGALVGLGASFRPGIDVMLDVLGFA QN SQ $\square E G A G A A G G L G F G L I V G L G A R L V K G A P T V L K A T G F E$ $V A$ GA DLVERAGAGAAGGLGFALMAFLDARLEPGUELVVRTVGLM
DFHLLEGAGAAGGLGFAFDAFDKAQCDSGSGWLLKEMRDE KAAEYAASPGAGAAGG■GYGLLGARFRPGDEVMLDVLGFA GLLVLTGAGAAGGLGFGLLSFGGAQLRGRAEAMDEYFQLE
 AVPDQKGFGAAGGIAFGLAHFFQVELKMGAQWFFSKVGMV DLAAAPGAGAAGGVGFGALVGLNAVFRPGVEVLLDVLGFA DVAHLPGGGAAGGFGAGAQVFMGGRLIPGVSAVMEQVQFE RPEEIKGGGAAGGMGAGAKAFFNADMNRGIDAVLETINFN RTRDVPGAGAAGGLGWGLTTLLGAEVRPGADLVMELLGVE
 $D C S P L P G A G A A G G A G F A A Y V L G G T F R P G G E L I L E L V D L E$ DHQNEPGAGAAGGLGFGLMSFCGARLQSGFDLVAEVTGLR DVSDLP GAGAGGGVAAGADA GLGASVESGFQLIAGLT GVAA AIDALPGSGAAGGLAGGLHAFIGATLKPGDDVVLETAGFH
 CPPKLAPGGGAAGGLGAAILAI GGRUVSGUDLIRDLTGLD DVRETPGAGAAGGTGAALLAVLGARMESGADLLLDLVGFP $N V C Q M A G G G A A G G M G D A A A V F L N A D \square K P G \square E V V L N A V N D A$
 PGAGGAAGGLGFAFLAFLGASLESGVDLVMETVELR KRD
ASPGAGAAGGDGFGALL VGARFRPGDEVMLDVLGFA RGRELPGAGAAGGLGFALHMLGARFEAGAEVVARQVGLD F LSSQPGSGAAGGLGYAL QLLGGRYYSGAETVCQLLGGLD


 DVADSPGAGAAGGVAYGVLAFLDARLRSGUELVLSLVDFD
 DCRAEAGSGAAGGLGFGLRTVLAAEDRRGVDWMVAATGLAA RAAEAPGAGAAGGVGYAADAVLAATRRPGIVVVLEFTGLA
 GCRMTPGAGAAGGLGYAFDMFLHARLRPGUDVVFDGIHLK DVADAEGSGAAGGIGFALR LLGAEMVSGAAFVLGAAGLD DRSDVPGAGAAGGLCYAFMQFLGAECHSGDDLLLEYLHFD EI NFPRAGAAGGMGGGVAWALETKIESGFTAI AKLTQLE DLRTRAGFGAAGGlPVTLVSLLGAEVVPGSTMVAEAVGLA
 E $\square Q D Q A C F G A A G G \square A L G L S A F F P \square K M A Q G A H F F F D K I D M S$ RPGAGAAGGTGFGAMAVL GABMHSGDAVVLELLDFG CPSGADPGGGAAGGDGAALLADGGRCESGUGLVSRAVGDN SARDRPGAGAAGGLGFAALVFLGAQ 1 QPGUSFMLDLLGFA
 SDKNRTGTGAAGVLABPFCPIPM
A YRDDPGSGAAGGVGWALRC LGAKYRPGAAAVLGWAEVV SVPGDGAA G GLGGAAIRTFLHGTSRSGFEFISEQTDLE









 ALHHLPGAGAAGGTAGGLHAVLGARLAPGAALVAAASGLT



Q LA G D $\qquad$ GAAGGMGFA LRLLGASVVPGFQMMSDMAQLA DNLRTLPGGGAAGGDGAALLAL GGEVVSGDGLITSLIGLE DKQNEEGAGAAGGLGYALMQYLHADCKPGIELLLETLRFD

Unke_s 4 ins MRGTPAGAGGVGAALDSV.

## UniRef90 W1TQ91 UniRef90_15CKG2 UniRef90-E8LHY5 UniRef90-Q401L6 UniRef90-H5UQB2 UniRef90-C1B521 UniRef90 U2UMV4 UniRef90-UPIO00382FFE8 UniRef90-S3ZIY6 UniRef90- 5 RYV87 UniRef90- F9EHB5

 UniRef90-16GMU1 UniRef90-R7DPPO UniRef90-M7S703 UniRef90 $\mathrm{Z} 4 \times 373$ UniRef90-K1L612 UniRef90 F4C9P3 UniRef90-UPIO0031C2764 UniRef90-Q3A582 UniRef90-R7K4Q5 UniRef90_UPI0003B76363 UniRef90-UPIOO0381FB0A UniRef90-X5LR19 UniRet90_UPIO003764DDE UniRef90_UPIO001746AFD UniRef90-R4TCU5 UniRef90-A0A031FZP3 UniRet90_C4KYQ9 UniRef90-H5XF63 UniRef90-UPIOOO475A856 UniRef90-X5DTT2 UniRef90-W1GDU3 UniRef90-R5MYDO UniRef90-UPI00042753F5 UniRef90-UPI0003B6AE45 UniRef90-MзСDC9 UniRet90-N8T865 UniRef90_M3BQW8 UniRef90_AOK849 UniRef90-SGAAZ4 UniRef90-B2JGL3UniRef90 UPIO003B755D2 UniRef90-M9SZX6 UniRef90-FOM622 UniRef90-D3Q655 UniRef90-D5ETN7 UniRef90-G4CHS7 UniRef90-H3NPL4 UniRef90_AOK197 UniR Refo- D5ANZ8 UniRef90_R6U944 UniRef90-R5K917

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| :--- |
| UniRef90 F4F1V5 | UniRef90-D1A934 UniRef90-D7B0J3 UniRef90-U2LHD1 1 UniRef90-F3P3U3 UniRef90-R2SZ51

UniRef90 G4MQT7 UniRef90-UPI00035CE3A6 UniRef90-C7MPU8 UniRef90-UPIOO035FC499 UniRef90-H8GEA8 UniRef90-IOUYH6 UniRef90-F3PAUO UniRef90-UPI00047A3F37 UniRet90_T2S270 UniRet90-R6CGQ8 UniRef90-ETRYF8 UniRef90-FORQTO UniRet90-R6R1A9 UniRef90-S3WV36 UniRef90-A1ROY8 UniRef90_- U2HSX8 UniRef90-U5VWZ4 UniRef90-D8DV49 UniRef90-GOHD64 UniRef90_s7v4N3


EETQDADYVITGEGKTDQQKGPNAVASLAKKYHKPTFGFG PALDRAGLVITGEGSLDEQTLHAGVAAAARAAGKDVVAVC SLFDEWDLVVTAEGSLLDQSMTVEI AKRAKNHGDPVIVLA EQLQGVNLVITGEGRMDNQKAPVGVARRAADQGIPTYAVV KKLITKADLLITGEGATDDGKGPFGVAYRAKALGGLPVIGVA PALERATLVITGEGSLDAQKAPAGVAAASRAAGRKVVAVC
 QALARADLVVTGEGRMDRQKGPVALARAAKARGVPVLAIA NLVKGADMVITGEGKDDNQTRHGKVARAAREAGVPVIAFC
 EHILEADLVITGEGKLDAQKGPLGVADLAREAGKRVIGVGG DLVKTADLVITGEGRDDAGKVPDGVAQAVRAAGIPVIVLA EQLEKADWLITGEGKFDAQSFPYGLARLANTHGVPTLVFT RHLPGADLVVTGEGALDEQTAAAAGVPVVAVCGTNNLPAQ GVCRGADLVLTGEGSVDHGK QAVQGAALVITG ELLKHADLVITGEGHADRQK DPERDLQRARKHQVPVWLTA GALAAADLVITGEGSMDSQSAP DGVADAAHALGLPVVVVA EKI RGASFI FTGEGAMDRQTLMGKTLR\|AREEGIPII AFA EALARADVVITGEGSLDAQKAVQGVATAARARGVRVVAVC

SALERADLVITGEGSLDEQTLHAGVAAAARAAGKDVVAVC AALAGAEWLITGEGRSDHGKAPFITCRHARAAGVSASLLS AALEGADWVVTGEGRSDSQKAPWVVAQHAHRQGVPVSLVS AALQGANWLITGEGRSDHGKAPFIIACRHACAAGVPATLLS ELLFGADLAVTGEGSLDEQSTPVGVARAAAAAGVTVAVA ARLARADLVVTAEGALDAQKVPAEVARRAKLSGRPVLALA ERLAGADLVITGEGSLDEQSTPMGVARAAAAQGVPVVAVC
 ELLKKANLVITGEGSADRQK
NK円KNSDLIITGEGSMDSQTYP DRLAGADLVITGEGSLDEQSTPMGVARAAARAGVPVVAVC DAIARADYVLTGEGRIDAQSVPVGVARRAKAAGVPCIALC RLAETADLVITGEGRFDYQSLMGKVIDGVHSGSVPVAVLS AGLGAFDWVMTGEGRSDAQKMPAMVAKLAKARKKKVVAKA GLILGADCVITGEGSADEQKLPYGIMIRARSAGVPTWLVA QAMAGCDLVITGEGCFDHQSVVGGVLELAKKTNKPATIVA EALTGADIVLTGEGRLDSQSLAGKVVDAVSSRDAAVVVIC RHLAGADLVLTAEGRIDGQKAPGAVAAHAARLGVPCIAAA QKI AFADVVIT AKLAFADVVITGEGRYDNQSGSYELLQLARAQGKKVWIIT


SKTSEAGLVVTGEGRDDRQK\PDTMRRTAFDAGVPVWAVC NLI QQVDLVVTGEGKMDKQSVPVGIGR\|AKKYGVPVIAFA ETADSFDLVITAEGGDDRGKMPAEVARRASSRNDPVVADA NRVRLADVVITGEGSLDAQSGPVGLARMARSEGKRVIACA RAIPGADLALTGEGSFDSQSAPAGVADRARRSGTPVAIVA
 DAVRGADLVITGEGSLDAQSAPAGVADRAHGAGVPVAVVA ERLESADLLLTGEGSLDAQSAVSGVLRLACECSVPSMVFA DRARTADVCITGEGRDDQTAYGKTAQIVKQANPRVVVA RRLAGARLVVTGEGSLDHGKAPAGVASRASTAGVPVVAVAA ELLKDTDLVITGEGHADSQKLPERVMRRAQKYQVPVWLVA ALLRGADLVITAEGADDFQKVPAE:ARRAGELGVPVVALA RRLERWDLVWTGEGCLDGGKVVSEVAALAGARGFPVVALA EKIKNVDVVITGEGKIDHGKGPYKIASLAKKYNKYVIAFC RYLAKADLVLGAEGSVDHGKADARLCSHAEQAGVPVMIFG

DK AQLDVADLVITGEGSFDHQSLRGKVAAGARDRGVPCVVIA
 $K M|A N V D V I V T G E G R Y D S Q S G S F E L L Q| A R K H N K K \mid V L I T$


UniRef90-I5CKG2 UniRef90-E8LHY5 UniRef90-Q401L6 UniRef90 C1B521 UniRef90_U2UMV4 UniRef90-UPI000382FFE8 UniRef90_S3ZIY6 UniRef90-R5YV87 UniRef90-S3GLJ3 UniRef90_I6GMU1 UniRef90_R7DPP0 UniRef90-D9X4B2 UniRef90-M7S703 UniRef90-Z4X373 UniRef90-K1L612 UniRef90 F4C9P3 UniRef90-UPI00031C2764 UniRef90-Q3A582 UniRef90-R7K4Q5 UniRef90-UPI0003B76363 UniRef90-UPI000381FB0A UniRef90-X5LR19 UniRef90_UPI0003764DDE UniRef90-UPI0001746AFD UniRef90_R4TCU5 UniRef90-A0A031FZP3 UniRef90_C4KYQ9 UniRef90_H5XF63 UniRef90-UPI000475A856 UniRef90-X5DTT2 UniRef90-W1GDU3 UniRef90-R5MYD0 UniRef90-UPIO0042753F5 UniRef90 UPIO003B6AE45 UniRef90-M3CDC9 UniRef90-N8T865 UniRef90-M3BQW8 UniRef90_A0K849 UniRef90-S6AAZ4 UniRef90-B2JGL3 UniRef90 UPI0003B755D2 UniRef90_M9SZX6 UniRef90-FOM622 UniRef90-D3Q655 UniRef90_KOYT17 UniRef90-D5ETN7 UniRef90-G4CHS7 UniRef90_H3NPL4 UniRef90_A0K197 UniRef90_R5ANZ8 UniRef90_R6U9J4 UniRef90_R5K917 UniRef90_UPI000477EC7E UniRef90-P73408 UniRef90-UPI0003B6D44E UniRef90-V4J443 UniRef90-U5Q2F7 UniRef90_G0J7J7 UniRef90-H6R8H4 UniRef90-F4F1V5 UniRef90-D1A934 UniRef90_D7B0J3 UniRef90-U2LHD1 UniRef90-F3P3U3 UniRef90-R2SZ51 UniRef90_G4MQT7 UniRef90-UPI00035CE3A6 UniRef90_C7MPU8 UniRef90_UPI00035FC499 UniRef90-H8GEA8 UniRef90_IOUYH6 UniRef90-F3PAU0 UniRef90_UPI00047A3F37 UniRef90_T2S270 UniRef90-R6CGQ8 UniRef90-E7RYF8 UniRef90-FORQT0 UniRef90-R6R1A9 UniRef90-S3WV36 UniRef90-U2HSX8 UniRef90-F6IXS6 UniRef90-U5VWZ4 UniRef90_D8DV49 UniRef90_G0HD64 UniRef90_S7V4N3
 GSIDPHFRGCFSPAPGP $\operatorname{SiLDDA} I R D A A D L L A N E A E Q L A R$ GSIHPSAAEAYDLGVTAM
GAVEVD DDSVFC!QNKPDTLEDAMKKEEKNVTVLDRNDFK GRAEEAREAGFERLYRLTDLEPCMAEAGPLLRRLAAHVAR GTVRLRIAAAFS I ARGPAELHELLDNTAELLQEATAQVVG GANAAGUDFFPDLSMPMALDKAMATARENLARTARQVLG GRLSLG HRAYALTELPDVPRCLTQAGPLLERVAARIAR
 GQTDMGUEAI FPIDSRVMP LETALMEAAPLLTNAVSRTFR


G LL NA GFAR VDS $\square$ T PEGMS $\square E E A \square Q P A R R N \square Q K W \square N E T \square N$ GRIA HGVVSAVSAADVARSPEAAMAEAARYVTMAT GKLGEGVEELYP VVKPCTDNDADRDGYANLMNASERVMR $G R V V L G V G R A Y A L S E L E P D P E R S M A E A G P L L E R V G E R \| A R$
$G R L R A G \square R R A Y A L T D L E P D V A V C D A E A G A L L E R T G E R \prod A R$ GAI DEHFSGCFSPAPGPDTLDVAIRDAANLLANEAEQLTR GCIAERFDGCFVLAGED:GVELAMREATS L




## 

 GRTTLTPDSGFRQVYPLTSLEACIAEAAPLLEQLGKHIGA GVTGEGFERVYAASPGGEPFEMVKRHCRETGLRTLAERVAA GCFGEGDDACYS TVDGFSEEERAMQTAMQNMERAVEE GRIVAGFDRVACI NPSGTPTEVATRPARANLSRTVLSLDR $G Q V L P N V L K I F S L V G P D M P D E K A D Q H P Q T A L K K R L V Q V$ EADEAGFDEVIKLADMDFNDPNDPERAGENLRSSLE GRDDEGFMA GYALADVEPDPGRSMAEAVPNLEQVGERDAA


## GRLPEDKRGAFRR\|ICLSD\EPSMARAGFLLSQAVEQVVR

 G TGT T GNG $\square K$ AYACMDQGPSTLAEAMARARQLLEESAASVMR GRIDPEFDACHALDRDGLPLEECDARGAELLQQ\VAE GRIDVGDTA WRSLDDRAATPDDALHRAAPLLRAATADVVR


 $D L Y A C G I D A A F P I I R E P Q S L A D A C R E T A D N L A A T A A N V V R$
$G R C L L P A Q R L H D A G F A A P D P E R S M R E G A E L L V G V G E R I A A R ~$ GQTDDA G S V
GQVDPGLTAAFALADRPLSLTESRARTAELLTRQAEQLTR

GRIKHG\|VAAAQLLDGVPDVADAVANAGKYLA WATSQV
GS $\square Q L G F T T A L S L D Q Q V T D L E R A \square R E G K Q N L R L L M E R V A P$ GRNEAGVTETYALVDHFGSVERAMAEPARGLREVSARLAR GKIS DGFN QVACINPP GIILEEAMKPATKNIRNMVREMIK


| UniRef90_W1TQ91 | $\square \mathrm{L} \text { A A R Q T K }$ |
| :---: | :---: |
| UniRef90_I5CKG2 | M |
| UniRef90-E8LHY5 |  |
| UniRef90_Q401L6 | L L Q |
| UniRef90-H5UQB2 |  |
| UniRef90-C1B521 | L I |
| UniRef90-U2UMV4 | L L |
| UniRef90_UPI000382FFE8 | D F L |
| UniRef90_S3ZIY6 | D F L |
| UniRef90_R5YV87 | DFYNGM |
| UniRef90_S3GLJ3 | L I E |
| UniRef90-F9EHB5 | $L \widehat{W}$ |
| UniRef90_I6GMU1 |  |
| UniRef90-R7DPP0 | K L L |
| UniRef90_D9X4B2 | DF L |
| UniRef90-M7S703 | $T \square R L G M S L R$ |
| UniRef90_Z4X373 |  |
| UniRef90_K1L6I2 |  |
| UniRef90_F4C9P3 | F LQ F A S K |
| UniRef90_UPI00031C2764 |  |
| UniRef90_Q3A582 | R M |
| UniRef90_R7K4Q5 | L W S $\square$ G N R |
| UniRef90_UPI0003B76363 | ALL |
| UniRef90_UPI000381FB0A |  |
| UniRef90- X5LR19 |  |
| UniRef90_UPI0003764DDE | $\square$ H E A G E P |
| UniRef90_UPI0001746AFD |  |
| UniRef90_R4TCU5 | A W |
| UniRef90-A0A031FZP3 | L V M A |
| UniRef90-C4KYQ9 | L I E |
| UniRef90-H5XF63 |  |
| UniRef90_UPI000475A856 |  |
| UniRef90-X5DTT2 |  |
| UniRef90_W1GDU3 |  |
| UniRef90_R5MYD0 | L F Q |
| UniRef90 UPI00042753F5 |  |
| UniRef90_UPI0003B6AE45 | L I T A VR S L |
| UniRef90-M3CDC9 |  |
| UniRef90-N8T865 |  |
| UniRef90-M3BQW8 |  |
| UniRef90-A0K849 | L |
| UniRef90_S6AAZ4 |  |
| UniRef90-B2JGL3 | L |
| UniRef90_UPI0003B755D2 |  |
| UniRef90-M9SZX6 | $\mathrm{MVLL} \mathrm{L} A \mathrm{R}$ L |
| UniRef90-F0M622 | R L A A D L A R |
| UniRef90_D3Q655 | D L L A A |
| UniRef90_KOYT17 | L |
| UniRef90-D5ETN7 |  |
| UniRef90 G4CHS7 |  |
| UniRef90_H3NPL4 | 1 V L |
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El PVFFS 170
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 AKSGSSLVNI QEI DSSCRCKALDSCKDTGAYDVSNPFC DWPA
 ELGRGAELARMPQLKSLRIRLAASDVDNPY SLDRGGAPLAAVSAVDLEPARRAVQGVRLVAATDVDNPLL EIGLGGNELTRAVSI DRSGLHPRLAEVEVVLACNPHNVLC ELPDGGAALARLAAVDLTTLDPRLAETAIVLASDVDNPLL DiASGLAGLEALASVDLAPALAALEGASLTAANDVANPLL PVGPGGAGLAALASVDLRGLDPRLSTELVLACDVSNPLT EIGFGGGELKKVFRIDTKYLDNRLSETKVLIASDVSNPLC PLPPGGAALAGLARVDASGRHPRLTEVELLGATDVTSPLL ELPDGGGALVDLDHVDLDGLDPGVRASRILVACDVDNPLL PVPPGGGGLAALASADLSGLDPRLAEAELVLAADVDNPLT PIAPGARGLAALARVDTSGVLPAVREVRWRIAVDVDHPLT

 QVA QVGNIGLVVGI SLDHLDPRLEKAKFIVASDVRNPLC DVPWGLAGLERAAALDLEALRVLAGVELVALTDVSNPLV
 RLMPSLHSNPLLSAHSLSSLKEKLANIHLTIANDVQNPYC PVGPGGAGAALATRDDAAGLDPRLARTRLLVASDVVNPLC
 ELPPGGAALSRLASLEM PRLSEVDIELASDVDNPLY
 ELPPGAAALSRLAR DDAADML TLQFSYPQGW GDVKLFGLT AVTPIGANLSADSSVSLTDDSRGGTVIR\AADVENPLC PVGPGGAGASHATRLDTAGLDPRLAGARLVASDVNPLC ELEPGGGSLTELLNTIDDAGLDDGALETQWHLAVDVTNPLT RMMPTLDSLPHVMRVDASGLDAGLLKCRLVGMADVDNP T DLPPGGAALRRLASIDPGPLPSRIADVEVVVASDVDSPLL PAAPGARGLRSVAAI EMPVSDGFFSK KHEL A T PNGGGLAALAS:D SGADP PLRHGGGNLGDLHDI ALPYGGGVLADCVTLDGAA RLLRGATIVAATDVDNPLC PLPPGGASLARLSRVDASGKHPRARQVRWRLAVDVDNPLV R L P

K Lla

 IVSPTPQNFKYVQHVDTGGLKKVIEACQLVGLADVRNPLV
UniRef90_R7ZPY7 UniRef90_A0A034JBF2 UniRef90_UPI000373EA16 UniRef90_IOWAC7 UniRef90_M7MUK3 UniRef90_UPI00036EC476 UniRef90_Q2SWQ9 UniRef90_UPI000367FE56 UniRef90_UPI00031FC78D UniRef90_LOIQY3 UniRef90_UPI00047A4894 UniRef90 R6WC59 UniRef90_UPI0003648194 UniRef90_UPI00036D43FC UniRef90_U2KF78 UniRef90_R5CWB1 UniRef90-J9SPV5 UniRef90_UPI00036D5CE5 UniRef90_K6VJG7 UniRef90_UPIO003B6D0A6 UniRef90_G2PCN6 UniRef90_K0F8T8 UniRef90_UPI00035D30A7 UniRef90_D1BX72 UniRef90_H6PBT3 UniRef90_C9A780 UniRef90_UPI00036D7322 UniRef90_R6XDU5 UniRef90_R6C462 UniRef90_B9XM09 UniRef90_F81519 UniRef90_D7C2T0 UniRef90_A4EBA3 UniRef90_C7M3D2 UniRef90_V6PD04 UniRef90_UPI0002DEB0EC UniRef90_UPIO003756C00 UniRef90_E3CLF5 UniRef90_A0A010PL43 UniRef90_R5BB00 UniRef90_I3Z7F4 UniRef90_F0F5R8 UniRef90_D1Y782 UniRef90_UPI00036857FE UniRef90_UPI00040AA7EE UniRef90_UPI0003473449 UniRef90_UPI00036CC094 UniRef90_UPI0003B48D70 UniRef90_UPI00026C720A
UniRef90-E2PX49 UniRef90_E2PX49 UniRef90_X1JRI9 UniRef90_F8CKL3 UniRef90_UPI00047672EF UniRef90_A0A022LK41 UniRef90 F3NQ55 UniRef90_UPIO004698CDD UniRef90_R6DUF0 UniRef90_D9UJG2 UniRef90_UPIO0036DAA03 UniRef90_D5EK03 UniRef90_R9SUQ8 UniRef90_G1WKF2 UniRef90_R5G2H6 UniRef90_UPI0004771B1F UniRef90_R3WI89 UniRef90-UPI0004627D80 UniRef90_UPI0003B468C4 UniRef90_W0JH74 UniRef90_D8HVB5 UniRef90_UPI00041D5CC5 UniRef90_K0ENL6 UniRef90-UPIO0037BF2D1 UniRef90_W7DBZ9 UniRef90_UPI00037E6F99 UniRef90_C5BYZ3 UniRef90-A4AGU3 UniRef90_UPIO00467D569 UniRef90_UPIO0047E0C24 UniRef90_E8N9Y4 UniRef90_M7Y2T3 UniRef90-X7RH92 UniRef90_D7WEZ3
UniRef90_D3Q148 UniRef90_UPI000255CA5D UniRef90_H8ML33 UniRef90_G6AFD2 UniRef90_W7C6J0 UniRef90_UPI00034CDF3D UniRef90-W1G6W8 UniRef90-W6T4L6 UniRef90_D9XKN8
UniRef90_I2N945

210
QK G|L|K LE
D FPAFEEASRSLV $\mathrm{V} H \mathrm{~L} \mid F \mathrm{GRKSNR}$ GENGA TVYGPQK GADAKMIPK GE Q GA A TVVGP QK GA E P E D I P V L E A G L R R F A E LA A A A GPHGAAAVYGPQKGATEADVRYLDSGLDNLVEVFTRSQAR GPQGAANVFGPQKGANERDIAVLDAGLAHLARVLAKLTDG GKEGASYVFGS QK GLHS Q DFESVVDQRMRKF Y Q Q ANP GEH GA T A V F GP Q K GVVTPA QLAA PLDAA LGHFATVVEAAGDR GLRRGATNI FGPQKGVEQERLVVLDAALQRFADLADR

 GANGASY IFARQK GATESMM DDLLEKRANKFA EASAMMLGGH
 GPD GAA AVVGPQKGATPDMIVMLDSRAMRFAEDSARHFGY

 GAR GVARVVFGPQKGATPA QVEEMSAGFEGWASVLRRD GS T
 GTNGAAAVFGPQKGARPADVQTLDDALSQWAKALVQAGAP GEHGAAAVVGPQKGARAGDVAFLDEALARWAGVLVRQSGV GPNGATYIFGGQKGLAKDDFASVDKDMERFYQTFFPA GNQGFAQVFGPQKGASQET\QQLDQQAKRLAEH\|KRTTG】 GPA GAAAVFGPQKGATPEQVPVLDATLARVAAGLVAAGFP
 GENGAAHVFAPQKGADAKMVQMLDDRARKFAEVSAKBFGY GRHGCTRI Y GP QK G L DK K D FP LAAEKA LRR R LATVVKNE LGR

 GPD GAARLVAPQK GASPVEVDQLERALSHFADVVAGSLGR
 GPHGAAAVVGPQKGLDRADVVRMMAFMERLERVIDAA GELD
 $G P G G A A R M F A P Q K G A S P A M V E M L D E W M S R L C E T Y V E F S E M$

 GTNGAAAVFGPQKGADPDLVASLDAALTVFRDRLADALGP GPKGAALI F GS QK GATES DI V F L D D R RAMTFATMSAKKMGK
 GS G G V A R R V F G P Q K G A S T T Q V GADGAAAVYGPQKGLGPEAVTAADRTMLAAAAADLDPS GPTGAAAVYGPQKGADADGVALLDAALVHWASLLGPALAG GPKGAARIYGPQKGATPEVI KELDESLAYFAEIIMRDLNK GPGGAARLFGPQKGADEAGVEALEAALAHAATVLEGD GDNGAAVTYGPQKGATPGQVRQLEMGLTRAAELLD GP LGAARVYGPQKGASAAQIVVLES GLARLVEVLRGQGLA GPKGAAAVYGPQKGASPQDVRALDAALARFAGVLEASLGA
 GE T GA A Y I F A P Q K G A N D A C V V Q R L D A G L R H L A A V L H A Q L G A GP Q GA S A V F GP QK GAS S D Q V E RLLDR HLLARLA ELLS G S E R
 GRRGAVRVFGEQKGADPTTYASYDRWMIAFARLLDDARER


 GTN GA S Y V F G G P Q K GA D S K M V F F F L D N A L A A H F N D L

 GENGAAA I F GP QK GLLA QDA II P S ID N A MQ GF Y S I F E K GD D GAAAVYGP QK GLLP P ER I A EI DA GLGRF GALVERGLGA GPAGAAAVYGPQKGAAPDDVAALDAALARWAAVI GAD
 GPHGATHVFGPQKG GRADSANAHDAA IGRFARLLEAAMGC GQD GA A AVVFGPQK GASATAVREVLEQGLVRDRASVADMARQG GP LGADP V F GP Q K G L S $\square$ A D DPA FE S E L A R V V ML DR K S G K
 G $\square$ N GASAI F GPQKGAS DNDVQULDHALSTFGHVLSGIPGP $G P R G A A A V F G P Q K G A D A D D V A A L D A G L E R L A E V L V G A D A A$ GNDGAARLVGPQKGADAAAVEELVAACLATTFRRIVDE GDTGAAVVFGPQKGATPEMIACLDRRARTFARLAAKHFGF GENGAVRVVFGAQK GLLP DEEDA YDEAMQHYLEVATGALTS


## G


UniRef90 R7ZPY7 UniRef90_A0A034JBF2 UniRef90_UPI000373EA16 UniRef90-IOWAC7 UniRef90-M7MUK3 UniRef90_UPI00036EC476 UniRef90_Q2SWQ9 UniRef90_UPI000367FE56 UniRef90_UPI00031FC78D UniRef90_LOIQY3 UniRef90_UPI00047A4894 UniRef90 R6WC59 UniRef90_UPI0003648194 UniRef90_UPI00036D43FC UniRef90_U2KF78 UniRef90_R5CWB1 UniRef90-J9SPV5 UniRef90 UPI00036D5CE5 UniRef90_K6VJG7 UniRef90_UPIO003B6D0A6 UniRef90_G2PCN6 UniRef90-K0F8T8 UniRef90_UPI00035D30A7 UniRef90_D1BX72 UniRef90_H6PBT3 UniRef90_C9A780 UniRef90_UPI00036D7322 UniRef90_R6XDU5 UniRef90_R6C462 UniRef90_B9XM09 UniRef90_F81519 UniRef90_D7C2T0 UniRef90-A4EBA3 UniRef90-C7M3D2
UniRef90-V6PD04 UniRef90_V6PD04
UniRef90_UPI0002DEB0EC UniRef90_UPI0003756C00 UniRef90_E3CLF5 UniRef90-A0A010PL43 UniRef90_R5BB00 UniRef90_I3Z7F4 UniRef90-F0F5R8 UniRef90_D1Y782 UniRef90_UPI00036857FE UniRef90_UPI00040AA7EE UniRef90_UPI0003473449 UniRef90_UPI00036CC094 UniRef90_UPI0003B48D70 UniRef90_UPI00026C720A UniRef90_E2PX49
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UniRef90_UPI00047672EF UniRef90_A0A022LK41 UniRef90_F3NQ55
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## UniRef90_D9UJG2

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UniRef90_D5EK03
UniRef90_R9SUQ8 UniRef90_G1WKF2 UniRef90_R5G2H6 UniRef90_UPIO004771B1F UniRef90_R3WI89 UniRef90-UPI0004627D80 UniRef90_UPI0003B468C4 UniRef90_W0JH74 UniRef90_D8HVB5 UniRef90_UPI00041D5CC5 UniRef90-K0ENL6 UniRef90-UPI00037BF2D1 UniRef90_W7DBZ9 UniRef90_UPI00037E6F99 UniRef90_C5BYZ3 UniRef90_A4AGU3 UniRef90_UPIO00467D569 UniRef90_UPIO0047E0C24 UniRef90_E8N9Y4 UniRef90_M7Y2T3 UniRef90-X7RH92 UniRef90_D3Q148 UniRef90_UPIO00255CA5D UniRef90-H8ML33 UniRef90_G6AFD2 UniRef90_W7C6J0 UniRef90_UPI00034CDF3D UniRef90-W1G6W8 UniRef90-W6T4L6 UniRef90_D9XKN8
UniRef90_I2N945
 $S V N Q V P G S G A A G G M G A A L L A F F D T T L T K G D D I V F D I T N F H$
 AVADSPGAGSAGGI GFAAM LLGARMVSGAEYFLDLLLDFD DVLDSPGAGAA GGLP LAAVALLGARTMPGSQMISDALDLP

 | $R P A$ | $A$ |
| ---: | :--- |
| $P$ | $S$ |
| $P$ | $G A$ |


 DNS LLS GAGAA GGTAF G L K S F L L N A K F L H GI D FI L H L S G I E $D V E N L K G G G A A G G D A A G M V A F F N A K L T S G U D V M L D G T G F D$ $D Y S K N A G A G A A G G L G Y A F M Q Y M N A E M K S G A D L D L D D I H F E$ VHSDTP GA GAA G GLG WMLLN LGAE DTEGGGFI AK M I R L L DRSKDNGAGAA GGLGYAFMQFMNAKVVSGADVLLETVNFN DLSDRPGAGAAGGLGYAFMQYLGAEMKAGAELDLSLADFG D A G S G A S G G L G A GLLA A VG G L L R S R F D A L L D S G L S G I D D D D DDTGRPGAGAA GGVGYAAQAVLGATMRPGIVVVLGLGEFT D FA T GP GT GAS G GLGGA GLAAAI GA $\square$ R F EA I L D S GLLA GIDD LD


 $V L D L A G A G A G G G M A A G L A A F A G G Q D D S G D D A V D M L D F D$ $D L E V P G A G A A G G L G G A V R L A G G Q L V P G F A T I A S L V G F E$
 DRSEAPGAGAA GGLGYAFLQYFNAEARPGAEVLLEKDEVD DFACEPGAGAAGGLGFGFCAF LGGCMEPGFELFAE YAQLK
 ARA Q GLLLRVPE GARTF GALLAL GAELRSGVETVLDLI GFD D A R A L A GA GAA GGTGFA LAGVLDAMLVSGAS LVGELTGCW


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

 GVLDLPGGGAAGG
A ALT AP GA GA A GGVGY A A $\square A V L G A Q R R P G \square D V V L E F V G \square A$ DCS GMKGAGAAGGLGYAFMEFFDTEKESGADLLLREAHFS $R$ V EPGAGAA GGLLGFALLLLGGTVESGVARVLSAVDLD D I R H GLGTGAS G GLGAGLAAGVGAALRSRFDALLDSIDLD ESEPVPGGGAAGGVGFAADAVLGAHRRPG口DVVLELTGLA GATARAEGAGAAGGVVGALLLLGATQRSGADVVLELAGFD APG A GAA GGVGYAALAALGARMRPGDEVLLDVLGFA $D \square K D \square P G A G A A G G L G A S L M A F L D A E L R P G I V I M I E I V K L E$ TPA GWPGAGAA GGFGF GLLADTGARLVPGYELVSRALGLE $D V T D R P G A G A A G G V G Y A A Q A V L R A R Y D S G S R V V L S A T G L S$ VDPDAPGSGAA GGVGFAAREL L DAS LDPGFEVV GTVLTGLDE RAAECAATPGAAGGLGHAALLLGARFRPGDEVMLDVLGFA
A GSGSGSGAGA GSAGFAAFALDWAEVLDGAEVVAEAAGLDD EVDTLP GGGAA GGFGAGCAALLCGALDSGDT TVVDDTVDFD QAPGAG AAGGLGYGALVGLGARFRP A I A S CE GA GAA G GL G WA IMAFL G GVMRPGVEILI EATGLE
 HA TA GA GAA GGLGFMAMALLSAEMRSGVVDMI L NETGGE
 RPLDTP GA GAA G GLLGFALLDCVL G GHARMGAAYLAELI GLDD QDLKLAS GAGAAGGLGGAFAWLGAEMQSGFS LVADDI GLD APGEWPGAGAAGGLGFAALAVLVGELRPGDDLVLDLLGGDD
 EFASRPGAGAAGGVGFAAMALLGARMRPGDELLLDLLLGFD $V G A S G W P G A G A A G G L G L A F F L L G G R R A S G A K L$ T C E A A V G G L D $A V A Q R P G A G A A G G V G Y A A L A F L G A T V R P G \square E L D L E L M S F T$ $D I Q G D P G T \quad G A A G G L G A A D V L L G G H L E S$



 AA AERAGAGAA GGVGFGAMAFFGATVRPGDGFFLDDR GFT ARPNAPGAGAAGGAGFAL SAWGGVMQSGAAAVADRVGLV



 DHSEDKGAGAA GGLGYAFDQFLGAKIKS GADVMLQMSGFE EAGDG

A A GGIGFA LRFFLKGQLQSGATMLVEANQLQ
 DVLNSKHT GAAGGLGAAIAGPLQGQLITGIDVVLSELTVA



DRMAGTDLVVTGEGSLDEQSTPMGVATTAHAAGVPVVAVC DLDAGADLIITGEGSADKQKDPQKVLQLAQSFKIPVHLIA GLAAGADLLITGEGSFDFQSLPHGVAQVAAAHGLPCVVTA AALDGADAVITGEGSLDEQSTPDGVARLARAAGVPVYAVC ARLAAADLVVTGEGKLDQGKGPAEVARRAAAAGLPVLAVA AALDGVALVVTGEGSLDRGTLHGKVAAAARARGIEVAAVC QAAKDADVVITGEGKIDSQTIYGKAPMAFSSKIFPPVAL RRVLMADVVLTGEGRFDRQKGPGGMARLAREHGTPVVLFA DVVSAADLVVTGEGRLDHGKTPMGVAALCRSHAVPVVAVC PALERASLVITGEGSLDAQTLHGKVAAAARAAGRQVVAVC
 PRAERADLVVTGEGSHDAQSALSGVAGRCQKLRVPAAVLAC RAAAGATAVLTGEGSVDAQKTAAGVARAARAAGSSVVILA MKAALADAILTGEGKFDQSSGPYALIESASQAGVPFIVLA NLIRDADLI TGEGAVDGQKAPVGVARRAKRQHKPVALI A NLYKDYDLI:TGEGKIDSQSMQKVISSVIKRTKDRKIVLV EHLRTSDWVI TGEGRLDAQSVPYGVANLAKKYRTHTLI AVVAGADVVTGEGRLDEQTLSGKAPAAVRAGGAPVVVVC RRIADADLVITGGGSLDEQSLGGKTPPVIAVCGRTTLEPG AASGADV GGESSDSGKPAGVARAAABRGVPCVAVA AA VAASDLVITGEGSFDAQSLRGKLASAAAAHGKPCLVLA

$A A V A G A D V V T G E G R D D Q S G K A P A G V A A R A G G A P V V L V C$ EVI ASADVIISGEGKLDAQSLDGKVVRRAKSRSSFLVVVA T ALEGADWLI TGEGRSDRGKAPFAAAMRARAAGVPATLLS DAVRGARLVVTGEGSDDRQSAPVGVAKAAAREGVDTIAVA AALADARLVVTGEGRFDGQSARGKVAQFAAEAGVPVAVVA
 EKIAGANLVVTGEGTYDEQSVVSVVAELAEGTGATVAVIA EALDSCDLVITGEGSFDHQSLRGKIAEAATERGLPCVVVA GTLTGSDVVLTGEGSLDSQSLGGKVVAAVRDHADEGAAVA
2
34CDF3D
N8
8

UniRef90 R7ZPY7 UniRef90-A0A034JBF2 UniRef90_UPIOOO373EA16 UniRef90-10WAC7 UniRef90-M7MUK3 UniRef90_UPIooo36EC476 UniRef90-Q2SWQ9 UniRef90-UPI000367FE56 UniRef90-UPI00031FC78D UniRef90-LOIQY3 UniRef90_UPIO0047A4894 UniRef90- R6WC59 UniRef90-UPIOOO3648194 UniRef90-UPIO0036D43FC UniRef90-U2KF78 UniRef90-R5CWB1 UniRef90-J9SPV5 UniRef90-UPIO0036D5CE5 UniRef90-K6VJG7 UniRef90-UPIOOO3B6DOA6 UniRef90-G2PCN6 UniRef90-K0F8T8 UniRef90-UPI00035D30A7 UniRef90-D1BX72 UniRef90-H6PBT3 UniRef90-C9A780 UniRef90-UPI00036D7322 UniRef90-R6XDU5 UniRef90-R6C462 UniRef90-B9XM09 UniRef90-F81519 UniRef90-D7C2TO UniRef90-A4EBA3 UniRef90-C7M3D2 UniRef90-V6PD04 UniRef90-UPIO002DEBOEC UniRef90-UP10003756C00 UniRef90-E3CLF5 UniRef90-A0A010PL43 UniRef90-R5BB00 UniRef90-13Z7F4 UniRef90-FOF5R8 UniRef90-D1Y782 UniRef90 UPIO0036857FE UniRef90-UPIO0040AA7EE UniRef90-UPIOO03473449 UniRef90-UPI00036CC094 UniRet90-UPIOOO3B48D70 UniRef90-UPIO0026C720A UniRef90-E2PX49
UniRef90- X1JRI9
UniRef90-F8CKL3
UniRef90_UPIO0047672EF UniRef90-A0A022LK41 UniRef90 ${ }^{-}$F3NO55 UniRef90-UPIO004698CDD UniRef90-R6DUF0 UniRef90-D9UJG2 UniRef90-UPIO0036DAA03 UniRef90-D5EK03 UniRef90_R9SUQ8 UniRef90-G1WKF2 UniRef90-R5G2H6 UniRef90-UP10004771B1F UniRef90-R3WI89 UniRef90_UPIO004627D80 UniRef90-UPIOOO3B468C4 UniRef90-WOJH74 UniRef90-D8HVB5 UniRef90-UP100041D5CC5 UniRef90-KOENL6 UniRef90-UPI00037BF2D1 UniRef90_W7DBZ9 UniRef90_UPIO0037E6F99 UniRef90_C5BYZ3 UniRef90-A4AGU3 UniRef90-UPIO00467D569 UniRef90-UPIO0047EOC24 UniRef90-E8N9Y4 UniRef90-M7Y2T3 UniRef90-X7RH92 UniRef90_D7WEZ3 UniRef90-D3Q148 UniRef90-UPIO00255CA5D UniRef90-H8ML33 UniRef90_G6AFD2 UniRef90-W7C6Jo UniRef90-UPIOOO34CDF3D UniRef90-W1G6W8 UniRef90-WGT4L6 UniRef90-D9XKN8 Unirergo_lyxine
UniRef90_-12N945

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 GAVEEGLSAAFSLARGPATLEDDTRDAAELIEDAAAQACS GSLKDDIQAAFPII
GATDEHFDGCFSPAPGPTTLDAALRDAARLLENAAEQLTR GQVTMGVESAYSLVD LVGREAAFDKPRDSLVALAQRVAR GRVEAGVAAVVPISSGPVPVARALREAEPDLERATATTLR GVSALTPAAGFAGVYALSDLEPSMSHAAELLAKVGERLA GQLDMGVKYVIEIQDADKTLAYNMKNAQDLMVLSVEKFCK

AQITEDFDRVCALTDYADSAEEVKRNPEAYLRHTVVSTF
GKVADTTDAGFSITPQGMLLDDAMKPAKENIRKVVSNL GKVDDRLDAGFTRVAAVTPDDEDTTEAKDNARNNIRNADR GSLGHGLGAMASHIAVPMPGSEAVANGEQLLADAAERTMR GRLTLSPAALTAAYPLTSLEPCRAQAGPLLERLATHDAK GRAELGADA: YQLVD EPDPQVCMQEADRLLRELAGRAAR GTHDIGUDAAASLMPDPMTLQEAVDDGERLLIEAAERFMR GRRAAGFADCYALSDLEPDPDRSUAAATLLEQVGTQLAR GRMQLDTAALAALIDHAPSMDYARAHAAELLRERTAALVR GQVSAG\|RAAFSI APGPTTLDDLLSHTTQRLADVASSVAA GSLKDDIQAAFP:IQGOTSTEAMEK GRVPDGFEAVVPI ATS VPLAEALVRGPALLEAAVA GRVPDGFEAVVPAATSGVPLAEALVRGPALLEAAVA GGVSDGFDRVVQVTPEEMPLDEAMKPARNNI DKADREQFA GAVPKNSKSFFAQARGLTELTTAKGKPAYWLERLAAETAR GALQAGLTAAWPLVSGPMTVEEAMRDAPRLLQQLGENFAR GRLALPADAGDSRAYPLTALEPCDSDAPLLERAAEQLAA GGRADNLDAVYPVCRRPMPLDQALQEATTNLICAGEAAAR GVLGDG| DAVFS:CPRLAPMAEVLASGETNLFNSARNVAC GSIDCTADGARALCDGTITLEQAMTDPGRWDTERT
GSLKDDAVAAFP DPQ
GSLKDDIVAAFPIDPQ GAVQLGLTAAFSIAPGAASDPDLLDRAVELITDTTAQACG $S G N E G L Q D G F D Q V G S D P D L D N F K A D A E E N D R Q V L I D U Y K$ GRVTDGFAQVLCITPPDMPLADAMDPAKANURRT
GRTTLDEEAGFVRTYADTEDEPSMREAGRLLEQVGARLA GRVGAGFTSVSSINTADMPKEKADRPATENIRNTVSRIVK GAASAGVTATYSLVESAGSKEAAMARSAEELRALAASUA GSLGQGAPAVHDIITVPMPLAEAVANGESLLTDAAERTMR GRTTLDADAGFAGVRALSDLERSMAHAG
GAVTLGMDEAFDLVSRAADVPDADARGEALLEEVGREMGR
GQVRRDEGLEDDLFHDVVDLSAHAQPSEAASKVLCEAAAR GQCSLGURRAWQLRTVEPDLEKCLHRADALLPELAETAFR GRLDLGADVAALTEREPDLARSIANAGPLLEDVAAEVVA
 GEVALPAEDCFSLAPGPATLPEERAAAPRLLAETAAQLCG GRVPLDLRAVRSINPTGATLEDARVNAAAYYRTALLETLDK GRUDEGVSALVP TPEGTPLERALAEGAANLRAATARWVR GKAEEDAAAVYSHSPKGAPLAEALAQGPANLQTATASALR ASYKCGVDVVVTALRRPMPLDRAVRETRHNLVCAGETAAR CAMNEDKDELLSTVNDKVTKEMSMSDPETYFRMMDQKMAR GSYKEITDGIFSIQHEPVSLLNQAMDTAYKNITERSRQIFQ GSVAAGFREVFELVSDEADAERCDREPGPLLEEGGRLIGA
 GRCRLGISAAYLTDLEPDARCMVEAAPLLRRLTHRVA GKSHPDLAGVHSVTELLGSVEKAMKAPAEGLRALAESVAR GLRGAHIEAAYALTDDEPDPEVCDAQAGPGLEQLAGELAG
GSVAAGFREVFELVSDEPDAERCMREPDPLERDGRLIGR GRVELGLTAAFSIAPGPVPLETLLPRTAELVRETAAHVAR A I DLGLNVALPLGSGVENRKELFQYAEHLLEARGAHADA GA ARDFAGCFAINDGPMSLEAAMADTSILLHNAAAQLTR GRRALTDQDVFALTDDEPDPVRCMAEAGPLLERAAERIAP GQVSMDADSGFAQVVSLTDLADARADPTRWLRRAGRVLAE SGSEDPGSGFDKWIRLPDLDMMKAGNLVEMAEEELER GCVGDGIDAVFACVPRAMSLSEAMKEADVNVANDAENVAR GGFEEELPDDV TTVEDGEPGESEEDVRDQLDRAGAQAA GRVTAGLTRTMSLTEHFGSSEEAMAKPAEGLTALGAKLAQ ECREAGLTAALS APSAASLEQLQDRAPELIEQTAAQACAA GQVKDGFSQVCCVNPTALPVVEAMSVAKENDRKTVMRKFK GVASEGRRAVVPIVQGPVTIPEAWSAAATNLAAAVERTFIT GVVSAG\|TATYSLVESAGSTEAALTRSAAELRRLAADVAR GSVSADADALFSITPELTSLSLLANSRDNLFRTAYNIAQ

| UniRef90_R7ZPY7 | TL |
| :---: | :---: |
| UniRef90-A0A034JBF2 | L K K L |
| UniRef90_UPI000373EA16 | E |
| UniRef90-10WAC7 |  |
| UniRef90-M7MUK3 | L DE T A |
| UniRef90_UPIO0036EC476 |  |
| UniRef90-Q2SWQ9 | L |
| UniRef90-UPI000367FE56 | T W |
| UniRef90-UPI00031FC78D | $\square L R \square G$ |
| UniRef90-LOIQY3 |  |
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| UniRef90_R6WC59 | NLL |
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| UniRef90-R5CWB1 | LL L |
| UniRef90_J9SPV5 | $M \perp L \square G$ |
| UniRef90_UPIO0036D5CE5 |  |
| UniRef90-UPIO003B6D0A6 | T I L G A S M |
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| UniRef90-K0F8T8 |  |
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| UniRef90-B9XM09 | D W |
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| UniRef90_UPI0002DEB0EC | S ITK |
| UniRef90-UPI0003756C00 |  |
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| UniRef90-R5BB00 | T K |
| UniRef90-13Z7F4 | S I K A |
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| UniRef90_UPI00036857FE |  |
| UniRef90-UPI00040AA7EE | $\mathrm{N} \square$ |
| UniRef90-UPI0003473449 |  |
| UniRef90-UPI00036CC094 | $M \square L \mathrm{~L}$ |
| UniRef90-UPI0003B48D70 |  |
| UniRef90_UPI00026C720A | A |
| UniRef90-E2PX49 | D F A L |
| UniRef90-X1JRI9 |  |
| UniRef90-F8CKL3 | W A A Q R L K |
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| UniRef90-F3NQ55 | D L L |
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| UniRef90-UPI00036DAA03 |  |
| UniRef90-D5EK03 |  |
| UniRef90-R9SUQ8 |  |
| UniRef90-G1WKF2 | $A L L L G R$ |
| UniRef90-R5G2H6 |  |
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| UniRef90-R3WI89 | L I C L T Q K |
| UniRef90-UPI0004627D80 |  |
| UniRef90-UPI0003B468C4 |  |
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| UniRef90-UPI00041D5CC5 | T W |
| UniRef90-K0ENL6 | A W $\square^{\text {L }}$ |
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| UniRef90-M7Y2T3 | A V E L |
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## A M

 $A P D S F K G S A S A V Q V A E A D A S G W$ L A P DKFKGS LT A P EVVA A ALLAA G $\square$ AR SAPDA EV L E L L


A A HVLVAVDKFKGSLTAA QVARRVTAGDRRAAPGVPVQAD
 LI A PDSFK GSSI S A V A F C E QVVRAVRDALDQLPVALDE R MRV


ME IVIAPDKFKGT\TAAEAAGADADGDRAGRTDVRLVLK $M K V V$ FAPDSFK G S L G S VEVA YALAA GWRSVRA GDELVV



$\left.\begin{array}{c|ccc|cccccc}H & L & I & A & P & D & S & F & K & G \\ M & L & S & A & A & E & A & A & H & A\end{array}\right]$


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





$\square N \bigvee V L A \square D S F K G C A T S S Q Q E M W L A E G M H R A G D$
 $M R V L L A P D K F K G S L T A S A V A D H L A A G L R R A A P G L D R R E L$ MTFVLAPDSFKGTATAHQACEFLSAGICEVLPDATI DDA LVAPDKFKGSLTAAEAAEAIAAGLRDADPGLPVVLL

 $H V V V A L D S F K G S L T A R A A T A A L A R G L R R T G A B V E B$


 MRVLLA PDCFGGTLTAREAAQAMAEGWRSAAPADQLLLDR









$P$ VA D GGDGTVEAAVAA GFERREVRVTGPLGGPVTAAFAL $M V S D G G E G F L D A M$ CPDSRVRCYAHDAMMRPVEVEYGLL $P M S D G G E G F V$ E A F L H A GLLA E KE E L Y A Q DP L G R P V K V $P$ LAD GGDGSVVDAAV AVGFSPHQVTVAGATGLPHYGRIAL


PMADGGEGS LDD ILAGDEGEYHPVETFDALMRPVQSAYAV PQADGGEGTLDVVAAASPRYQWHQDVTGPDGRRVHAKWLM $P$ VP D G GE GTAAALAAATGGEVIPARVTGPVGDPVDAHWAR $P M A D G G E G S L D A V L A A W L Q P A L T L S T V D A I G R E R D A S Y G F$




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

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

 PMAD G GEGALDAFADARPARRMPVVVTGPDDRAVAA YWLW GMADGGEGTAERF SGETVTLPTTDAAGRLTEASYRY
 $P M A D G G D G T V E C L V N T T R G E D L R E K V T G P L G G E V L A H Y G I$ PMADGGEETTDALMHATGATKYTVIVNDPLMRPI EACYAR $P \square A D G G E G T V D A A C A A \quad G Y H R V T A T V T G P L G L P V R A A B L$ $P M A D G G E G T S S L F A \quad G S S V T L P T T S A D G M L I D A T Y A H$ $P V A D G G D G T V D A A V A A \quad G F A R R H A T V T G P A G T P V R A S Y A V$

 $P \bigvee A D G G E G T L D A L L G A$
$P M A D G G E G T A A T E$
PMAD G GP GFVDVLHAALL $P M A D G G E G T S E V Y$ S PVSDGGE GLL EVALSTYDADLRVVTRVRGPLGDDHDARWV P I A D G GE GTLLEALMS F LDPHELVVHVMAEDLMHRPFES SYAR $P L S D G G P G F V D V L H T A L G G Q R H E L V V T G P L G E P V T A T W$ SI A D G GEGSLEALFAALGGEY I SVVETVDLLLRPMEARY P L S D G GP GF L T A I G S T R P D H II D HRAP DAL GRESTTYY


 PQAD G GE GT L S AVA A S A S WQWH QTVVD GPD G GTVVSARWL L PVGDGGENSLQALAHAYEWDWYSCKNAFFEDSKVAVLSFY


 PI A DGGENTAEAI YYALRGTWRTID GMDLLERRQRKIDSYLL PIADGGEGTAAVVAGACGGRWHAVDATDANGRPVRMPFAA
 $P V A D G G D G T V A A \quad A L A A G F T A V P V T A A G P T G E P V D T A Y A R$ $P$ I A D G GE GTLDASAAAVPGTARHLDVTGPDGRPVTGAA WL PLADGGEGTLDTIASNRGALRRTRTVTGPDGRPVDA GWLE S L S D G G N G F L N A L
PLFNGRHELMDSVVFLWQS GTK YRVVAHDADMNEVEAVYGV PI A DGGDGTVDAALAA GFTAHTAPVTGPTGAPRTARWAL



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RGD TALVEMAEASGLRLLPEGVRAPLTATTRGFGELLR TGSCQTAVI EVARVVGLEMEPELRNPLRATSYGDGEVVA
 GEETVVVEVANDCGLATLPGGRTAAMDTSSLGLGQALG D S D

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UniRef90_L8H8F1 UniRef90_UPI0003087EB5 UniRef90_C7ME35 UniRef90_U1FVT2

A A ARHGARTVV|M|V|L|GGSASTDLGAGLL|QG|L|GARLL|TCDGQ AALDAGCRQIILGVGGSANTDGGAGVLQGLGARLLDAAGN
 A ALDRGVSRLLLGI GGSASTDGGCGVLVALGARLLDGQGM HALDRGLREIVLAVGGSASSDGGAGMLQALGLRIIDDAGGD RAI K E GAREILLLFAGGSATNDGGAGALSAMGFRFLDDGNA A A L D A GCTH VV L GVGGSATTD G GA GMLLTALGLRLLDDGHGE SALDR G $\square K H I I V G I G G S A T V D G G A G M A Q A L G A K L L D E K G E$ A A I E K GAEVVYI GI G G S A TTD G GA GMA Q A L GVK MLD A T G N EVAERGAATCVVGIGGSATNDGGFGMAKAL GWRFENEAGK D A LTHRVT K I Y F T L G G S A T S D G G L G L L Q S I G A T $\square D A S L G N$ AALEDGAKRLVIGLGGTCTTDGGAGLLAALGAEPA
 A AVPA GARTVVVGLGGSASTAAGAGLLQGLGAHLRDAEGA SALDQGCRKMIIGI GGSATNDGGAGMVQALGAKLLDKDGE DAVSRGCTEVVMGI GGSATCDGGRGMI EALG
A AV R A GCRRVVVLGIGGSASTDGGAGLVDALGAILLPA GPV HAVRRGARRIVLGLGGSACTDGGAGMMQALGVRFLDAAGQ SAI QA GAKTIIVSLGGTGTSDGGQGFLKSLETTD
$A L L D L G V R E I F I G L G G S S T N D G G A G L L H G L G M R L L D A H G R$
 QALRF GPGRIVLALGGSASTDGGMGLLTAMGFRFTAAAGR $A A I D S G C T K V I L G I G G S A S T D G G A G L V R A L G A R L L D A H G E$
 AALDAGARTVVLGVGGSATTDGGASMLIDAGAQFLDAEGE DAWRRGCRQLIVGLGGSAVSDCGDGMLQALKKADFSAR
 HALRCHPKRLVLALGGSASTDGGMGMLAALGFTFHDVAGR A AVDA GARHVVVGVGGTACTDGGAGMLSALGARVLDEHGR VA L E A GVVTIVVGLGGSCCTD G GRGGLVEALGGG
DAMER GIVRNIIGGGGGATNDGGDGMLKALGYQFSDENGQ $E A I E A G C T E L I A A V G G T A T S D C G A G M L A A L G C R F L D G Q N R$




 CAL DMGHRRMAVALGGSGTNDAGAGLLAALGVRFLDDAGA
 SALQTGCDRIVI GLGGTGTHDCGMGMLQALGVRFYDDSNR
 $R A M L D G C R E F V I G L G G T A T S D A G \square G M I R A L$
AALDAGARRILI GCGDSGTSDGGAGALQALGARLTDRHGR
A AVVES GAA QVVI GLLGGSAVNDA GA GMLAALGAAPDLDE
A ARDAGVATAVVGLGGSGSTDGGAGMLSALGAVAVDDDGA A A $\square E H G V D R L V L A I G G S S S T D G G A G V L Q V L G A Q F L G A D G V$ $D A Q T R G A Q R V V L G L G G S A T T D G G M G I L V A L G A A P H D K R G Y$


 $\square A \operatorname{L} D R G C G R I V L G V G G S A S T D G G A G M V H A L G A R L I N A R G$ D AVERGA QRIVLGLGGSATVDGGTG口LVALGATPMDHRGY
 DAKKRGATEIILSLGGSGTSDGGLLGLLEALEAEDF A ALDAGHRRIVVGLGGSATTDGGAGMLIALGARLLDRHGT
 A A DE S GARKIVI GLGGS GTND G GA GVL AALGAT S D G DAETRGAKRIVLGLGGSATVDGGTGILLAALGVTGLNKEGY
 $D A L P$ A ARVVVTLGGSGTTDGGTGMLQALGAVVTSNGR A VRAA GVD TAVI GLGGSGSTDGGAGMIAALG
DALSRGCKEIFLTLGGTGSSDGGRGLLEYFNFNSNS GDYP HAVDRGHTEEVVGLGGTATNDAGMGMLSALGWQLQDANGE HAKAS GADA L LV GLGGSATHDLALGALQALGYRFLDD DSN AALDDG $\square R Q I I V T L G G S A S T D G G T G A L A A L G A R F L D A T G A$ Y ALA GEPDTIVLALGGVATTDGGAGLLQSLGAVLAREDGT
 QLQMD DYKKI I I FI G GT $\square$ T T D G G L G M L Q G L G V R L H D K D H R A A L D A G V P R L L L A L G G S S S T D G G V G A L R E L GARAADHA D G S
 EAI EK GCRNFIVGI GGSATNDCGVGMLQALGFEFYDENDN D A L D A GAK D I I LTVGGSATNDGGTGLLSAL GAVLLDANQK
 ALLQEVEQQVTLGGSGCSDGGL GIAARGFATVGLGGSSTNDAGAGML
 A AI A A GCRHVVLGI GGSAGTDGGAGLLRAL GARLLDDAEDA A ALDTGVRGVLVALGGSASTDGGTGLLAALGARFLDAAGQ AATDAGACRLIVALGGSASTDGGTGALTALGARFLDAHGD HAFDEGHSHIIVGMGGSATNDGGLGCLHALGVRQPDDEDP DAIENGAEHLI I SLGGA $\square$ GSFD GGAGMLQAL GAKFYDDEA Q A AVVVGARTLVVGLGGSASTDAAAGLLQQLGALLRTADGT



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210
220
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240
GPYGAAAVVFGPQKGLSPAEVVSEADATLKHAAHILDASDTH GPEGAAADFGPQKGATAADVGEDDALANFVQVLAAE GP GENGAAKVYAKQKGATEKD】ESLDKGLEYFNSVIKHSLLD GPSGAAAVFGEQKGADASQRAVLDAALAHWSAVLHGAGLT GAHGAVAVFGPQKGSDRQQCVELEAALTNWAELRPAARAT GRFGATYVYGPQKGATKEDLEIMERGMENFCAVTKKATGV GPCGAAAVFGPQKGASPRDVMELDAALGTFRDRLADALGE GNTGAAAVYGDQKGDPENMLAEVDKWLENYSTLLKKDLGD GKNGFAQTFAPQKGASEKTVVEMEEHAQDVAKEILHFTND GLRGAAAVFGPQKGATDDDVQR $\square D A A L T H F A E L A G A \square G Q E$


GERGAACDFAPQKGASPEQVRADDARLRDFARATERAGLA GPHGAAAVYGPQKGATPDDVAFLERALARWATVVAVETGT GPYGAATVYGPQKGAGPEEVKVLEGALARLAAVAAHTHGM GENGAATIFAAQKGATAAQITQFNARDARFAQELLRDRGD GPQGATAVFGPQKGVQAQDVAATDATLARYASLAPALGR GPQGAAAVFGPQKGATEKELELLDAALQHTCEVLDDDSNY GPDGAAAVYGPQKGATPAQARRLDAGLHRFVQTLSHNQSP GDKGATAVFGPQKGVAAEQUKPLDALLGRFASLFEQASGR
 GDRGAARVFAPQKGATPEMVDLLERKAATFAEAAARHQQR GDHGATAVFGPQKGVTPETAGALEFGLARLAEVLAQSFGQQ
$G L A G T A A V Y A P Q K G A D A D V R F L E A L N N F V D A F V R G Y S$ GAEGAAAVYAPQKGASPDDVLRLDDALHRWAGLVGG
GEHGAAAVFGPQKGADADAVSVLEARNARWAEQLESATGK GKNGATYIYGSQKGVTPEIAEELDQAMNHYASITSKFDHN GPKGAAAVFAPQKGADAAAVALLEAGAEHFAAKAAAATGH GKRGAAYVFGPQKGARPDDVEALDHGLRHWAETTLDEAGM GPRGVARVFGPQKGATSEQVEELADALDVWAGLLEEQSPM GPAGAASVFGPQKGADAQDVEELDRGLRRWVDLLADAGLA GRHGAAFVYAPQKGASPHTVVHLDHALSRWADVVAKAVGR GPRGASAVYGPQKGLAPDELPVVEANLHCWADRLDSATGT GPTGATHVFGPQKGAGPEDVPRLEDALAHVAARCEAALGR
 GENGAAKVFAPQKGADAATVEMLEFGTVHACQVLERSCSK GSKGADPVFGPQKGDHGEALRDHEDAAERVFNLLKQKSPT GPHGAAAVYGPQKGADPAAVRFDDAGLRTLMEAFTRSGYP GKRGVARVFGPQKGATPAEVELLSAGLERWAAVLTRD GLHGASNVFGPQKGATRQDVLRLDAALGHFAGVLEKAFDL GEHGAAAVFGPQKGADAATVAALDTALSRWADTLTAATGR GSHGAVAVFGPQKGIEPALERQAEANLANFARQVADARGT GLNGSAEVFSRQKGADDEQVAHLDAALRNLCEVAGVDPNS GPRGAARMFGPQKGLRDEVLAACDGWMAAYGABLTAARDA GPKGASRTYGPQKGATPEVIEE $\square D E S \square A H F A E V I K R D \square H K$ GEKMVLP FMVLK

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 GPNGAAAVFGPQKGLLKKEFQLLDSETNRLADLLCHATGD GPTGTAAVYGPQKGASASDVRELDAALCTFVRRLEAAGVA
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 GAQGAARLFGKQKGGSPETLAFLDGQAVRLAKQLATDYGT GQQGAAWQFGRQKGG\|DTTLAFLDKQAGKIAQQIKDFWEV GPDGAAHVFGPQKGATPEEVEQADAGLGHAARCELALC GSRGAAAVYGPQKGTDAAQVSILDAALGHWADVVAATTGS GPLGAAAVFGPQKGAGPAEIDRLEAGLARLAELIMPGSAGS GEKGAVAVFSAQKGATEEDQKRLEAGMHRVAGFYRDSLGA



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 DVRTGGGTGASGGLGAGLAAVLGARLAPRFEVLLDSEPLD SERGFPGMGAAGG1 AAGLVALFGAKLVPGAQLVADADGLS ADPSMPGMGAAGGVAFGLAAAWRARITPGAARVCGLTGLT D 1 RDLPGVGAAGGLAFGMAAVLGARLTSGMELLELUSFS DVRDAPGAGAAGGVGYALMALGARLRPGUDVVELVGFA KAADLPGAGAAGGLGFALYLLGAARVVGTDFVLDAIGFD EAAVEPGAGAAGGVGFAAIAVLGAVRRPGLDVVLEFTGLAA SVAYQQGSGASGGLGAGLIAFANATLHPRFELIQQYLHIE LIYDRQGFGAAGGIALGLSAFFPTTDEMGSVFFKQTQME HARADAAGAGAAGGLGFAALLLGARMVSGAEFFLELLDFD
DRSQEAGAGAAGGLGYAMMQYMNATCRSGARLLQAVGLS

EDDADRPGGGAAGGDGAALDALGGRVTSGDGLVSDLVGDD DVRDVPGAGAAGGLAAGLLA LGGTTESGAGLVRTLTGLD DPAAPGSGAAGGVGFGLVAWGATLTAGAEAVGAEIGLP EFMGAAGATPVGLIWLSRLIYDHVHLLPGAAVVAQELGLP PGMGAAGGLGLGLTWLSRTLHGHDRLLPGAPVVAASLGLP D $\square \mathrm{K}$ D $\square$ P
$P G S G \quad A A G G V G F A A L T V L R A E R R P G V Q V L L D L L G F A$ AGFGAAGA $P$ P $V G L S W D S R L D H G Q \square Q L Q P G A P F L A A Q H R D A$ GAADHPGAGAAGGVGFAALAYLGAELRPG\|AYLLDLLGFA AHATTPGAGAAGGVGFGVLTGLGARIRPGUELLLELLGFP $D L Q K D P G T G A A G G L G G A L I L L G G T L E P G F N K I A E L L K D E$ SARDLPGAGAAGGTGFALLAACGARMRSGDTLVLDLTNLP
 S LEKGAGAAGGIGFALLALGATREPGDELVAQHVRLA PGYGAA GA $\square P V G \square T$ WLSTLLHDNVHVVSGARVVADSLGLP FDPANEGMGAAGGFASGLTALCSAVTVPGFDAVAQLNGFD $D D A D D Q G S G A A G G L G A G L L A L G G R I I S G F D W V A E T D G L R$ DVRNLPGAGAAGGLGAGLLALLGAELTSGAGLVRELTGLD DLETIAGTGAAGGLGGALVLLGAQLDSGDETIASVVGID HNLHKRSSTGAAGGlGGALATLGAELVPGAKYIADRVDLD QMMNTSGAGAAGGAAFGLMAALDGSVVPGADLVFAWSSGLH PGAGAAGGTGYGLAAA WGARLVPGAATVAEHAGLP $D V L A A T P G A G A A G G L G F A G T L L G G R V C S G A D Y F L T L L G A D$
$S E L D F P Y L G A G G G V S W A L Y V F F R A K I S N S M E L V L S L L D F Q$ HADPAFPGAGAAGGAGFGLLAWGAAVASGSERIA TVGGLY
$P Y Y G A G G G I A A A L S L F A$ AGAGAAGGTAAGLVAWGAVVGSGS $G L A T L P G A G A A G G T A Y G L A A A L G A T L V P G A T T I A E H A G L P$

DKRDKAGSGAAGGLGFAAKSYLNADFKAGVKVVAELNQLE DLDRLSGSGAAGGIGGALLLLGAKMASGFTVVSQLDGLE DLDDIPGSGAAGGIGGAL FLLGAKMVSGFDLVSQITGLE HAAQAQGAGAAGGLGFA MRLLGAQLLPGGSFILDTAGLL $P G M G A A G G \square G \square G L T W L S T L M H D H D H 1 ~ L P G A P L I A R A T G V E$ DLRDTPGAGAAGGVGFAADAVLGARLAPGDELVADLVDFD
 PGSGAA GGTAYGLASA ALGP QQRGGAGGGUAAMLNGLYNAELMTSHELVADQTHLE DHRDRPGAGAAGGTGFGLLL LGAEQRSGADAVVELVGVD


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 EALLSRAALVITGEGSLDEQKAPAGVAAAARAAGVDTVAVC $S C C L A$
 ALLASADDVITGEGKFDHQSLVTTLASAGAAHGVPTLVFA AA I RKAALAVTGEGRFDSQSDHGHI ASFAHAHGDPTIVLC
 DADTTADVILTGEGRLDHQSLDGKVIDYLRGAKSPTAWDA SAAPEADLI ITGEGRFDHTSLTGKIVGHAAESHVSVVVVA DVVQDAALVVVGEGSWDEQSGPVGVARAARQVGVPAVAVAA


 | G |
| :---: |
| $\mathrm{P} V \mathrm{~V}$ VGAAD |

GLLRG $\square D G V I T G E G R T D G Q K M P \square K V A S A A Q K Y G V P V L L V C$ $T L I Q Q A D L V L T G E G R F D R Q S A S H Q L L L L A K K Y G K K S I L I S$


REDDAADLVTGEGSFDHQSVVAGDAGGARDRGLPCVVLA EALDTADLVLTGEGSFDWQSLVTVVARAAAERGVPCLVLA AAI A GADIVLTGEGRYDHQSVPSYVRGLARAAGARTGLVA AAIAAQADLVVITGEGRFDEQSSRSQVAQLVDDAAGQPVLAIAA


DAVRGAALVVTGEGALDEQSLHGKAPVGLARAGVPVVAVT ESIAA A A DVVVTGEGRVDETSFVGCVTELAATADTTAVVVC AKVDGARLVITGEGSLDPQTLRGKGVPVIALAGRRALGRD A A ARDARLVVTGEGSLDTQSLHGKAPVGVLRAGTPVVADA TALQQGARLVIAGEGRVDHQTLHGKAPAGVAAAARATLTPT EMMDEADLVI TGEGAFDEQST
ARAR RADLVITGGEGAFDFSSRPYGVAGDAAEALRPCDADA EQlASASLVI TGEGKYDSQT DALAGADLLIVGEGSLDKQKVPVAAARRAEARGDPAVADA EASLLGADLIITGEGRUDHQSVPVGVARDGQEDDVPVVACLA AA LDDCELAVTGEGSFDWQSLVVTAVASGAAERGVPCLVLA A H I R DA DLVITGEGSFDQRSLDPVHLDNQSAKHDKPALVVA
 ELLAAESDFVVTGEGSLDEQSLCDVALARRARWQGRPVHAVA KLVVRKDLLI DTENVDENGENSINLASKAAKRYN DHLPHTDLLITTGEGRFDGTSLVGHLLTAADRAGVPALVVA



HKDSNADWVMTGEGKFDQQKTVF GVSQDAKAHNVPI IVIA EQIKKSDLVITGEGRDDHGKVPYGVARLAKKYGKTIIALC KKIE EADVI I TGEGRIDDHGKVPYGVAVLAKKYRKPII AI C ATVAGYDWILTGEGRSDRQKGPALIAALGRRHGVPVTLLS
 $R Q L A Q A D L V V T G E G T L D E Q T L H A A G V P V V A V C G R N T L P E W$ AA LAEADLVITGEGRFDRTSLGGKVVGGVVTMAQAVGVVD RALEGADLVVTGEGRDDTQSLMGKVVGHATGLGVAAALVV




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GTVRNKFTGTYSTTPDDTDRVSADKFASKWLKEDSKKASN
 $G L V E V G K R E L Y E V A E Q A G S A Q E A M A H A E L H D T A L A E R V A K$


GAVDDTFDLVAG $\square$ NDAPRPLAVLMEVARHNLAATVARLV

 GAIDPHFTGCFSLAPGPITVEQAMASASALLADAAEQMAR GQVAAD $\square P A G \square N A V E$ L GRRTHWPRAGFTHVYTDADLTPTDTATAHLLTRDGARIAS RLSKAG】TAAYALTDLQPDVRGC\|ADPVPLLRRLGEQ\|AA
 $G R L R T G U R R A Y P L T D L E P D P A V C M A Q A G P L V E R A A A A V A R$ GRVHQGFARVVD NA GPAD $\square D P L C P D V A R$ ERLQSSVAR GRLEDTDKHCFQRLHSTNDETEAMQQAPH GRRNRWGHAGFAHI YSLCDYTD RDTTEDSHLTGELLTR GVDALGPAAVWALVERASSPEDSVARAPELLRAVGRELLD GQVTLDVAMKSVTEFAGSVERAMEEASACLEGLAEHTAR


 GQVDAGUDVTYSLTEMAGSTTQAMKAPSYWLTETGRRAA GRHT E GLGAVYTLTDDEPDESNSMANAESLLEQUGSGDAR
 GAIDHGVSALFSSAPGPDALDE
ELSAAGFAWSRSLAELEPDAARS $\square A G A G E L L E R L A A E L G R$
$G L L L K G V T K \square K P D F Q E S D S F E T L L R D T P E A D R K A G R D A V S$ GSKEEGIQAGFDQVDSLPDLEDREDEAAYNLKMADREFF GSRNRWAPAGFEYIHALGDYTDARNTAADPELTGK ILTR
GQVSAGFADVRA TPVEQSRTEALKSAQRNLRAAVADWGT

GRNETGYREAHTLVEHFGSVRQAMAEPARGLRELAERIAA GQVAVGVERAFSVAEHAGSVDAADAEPARTLAALAADVAG GALQRDFDAAESLTALAGTPAAAMAAPLRWLHEAARRLAT GSV $\quad$ AAEFDVQPGDNVLAVQLAPGADQLRAAGAEIAR


GRCELSTAAGFAAAYALTDLEPC $\square$ SAPGPLLE $\square \square A G R \square V$
 GARAAGFRAVEWREAGFAGVYALTDVEPCVAEARSLLERERAAQLAR GSLSEDLGASYSDQRKVLPLAKAMEKTLKNIEVLTKNVLK ELTRAGFTTAFTLTDLEPDLSRCHTEAAPLLERLGEHIAK
$G Q V A L G \square E S A Y S L V D L V G E \quad E R A F A D P S G A L A E L A Q R T A R$ D A G $\square$ S DV $\square G$ G E $\square$ S D R A G DK D D T $\square$ Q H A A E Y VERATEK LVR GSVGMEFAGVFSIQSTCRPLDEAMLPARAEI ERSAEQIVR GQVSVGVEAAYAVAQHVGSVRAALDDPAGTLRGLAEHVAG GAVSQDVESVFSI QTEVLPLPEAMKKTLRNLYFVDQNDLR GQTHPEAEAVHSLTAFLGSREAALDDAA GGLEKLAAAI AD
 GQLPSGVRTALALATLAGGVAPAVAEPEHW
GRCTLPDDALFRSVQALTALTDANDSAARLLTRCGRTLAE
GQVT A EADGTLS LTELAGSADAAMTDPRRWLRAAGSVAAR GSFDTYFNGVFSI QPGVVT LPDA DTNTEKNLEEFSYQLMR GSVTDGFAAARSLTDLAGSGDAARADAVTWLERAAEDVAR VVVAGQDAAAVALTDLAGGTAAAMAHPVHWLTQAGALLAR

G LYYEHGVSAAFS DANGPDTDEHACEHAAELIYERTVDDAR GGREKDLPSVFSI QLGPI SLEEAMRHEETLVS LLSENLSR GSRDQELEGVLS I HLLGPI GLEEAMEH RQTLE KT GA A D GFDGCFSVQAGPASLAWS $\square A Q G G$

 $G Q V P P G V R R C V E L A Q L A G T A A A A Q D E P V R W L T A A G R Q L A A$ GSKKDIPEGEDHHVYELVDLDTCMNRTAQSLDGLVR A GA $\square$ T $\square G V$ S HAFD $\square$ TSRAGSSDRAFAEGEQLLVEAGRD $\square G$ AT

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LI A A DKFKGSLSAVQVAEHVTAGLRRARPGVEVEAL

$M K \perp \vee V$
MHALVAPDKFKGCLTAAEVGARLAHGARRAGGATTTVL

$\left.\begin{array}{l|lll|lllllll|llllllll|lllllllllllllll|l} & I & L & A & P & D & C & F & G & D & S & L & T & A & V & Q & A & R & C & I & A & E & G & W & Q & R & S & R & P & Q & D & V & I & T & L\end{array}\right] A$




$\begin{array}{cccccccccccc}M & K & L & L & I & A & V & D & K & F & K & D \\ C & C & I \\ R & V & L & L & A & P & D & K & F & K & G & S \\ L\end{array}$

RVLLAPDKFKGSLTAPAVVA DALARGVLAVAPAADDLRRV


$M K V L V A P C D K F K G G L S A$
$H V V$
$A$


SMKAVIAPDSFGDTLTAVAAAQADAAGWKLGRPGDELISV

 MRVLVAMDEFNGIVVSYEANRYVEEAVAS QIENADIVQV $M K V L V A M D E E N G U I$ S S Y Q A N R Y V E E A V A S Q I D T A D V V Q V
 MRVLI APDSFGDTLTAVEACDA】ARGWSAARPGDVLERA MRVLI SPAAFPGILTAVQAAEAMAEGWRRRAPGDDLTLA



$L R V L I A P D S F K G S A P A V D A A A A D A A G W S A T R P A D L I V T L$ MRVVVAPDCFGGTLTAREAAEAI GRGWRSAAPGDELLLR

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

MHHF $\square$ C $\square$ D SFKGC L S S S D A A R A $\square$ R S G $\square L S A D P D A T \square D W S$ $M R V L I A P D S F G E T L|T A V E A A A A| I A A G W S A V R P D D H L V E A$

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${ }^{\mathrm{P}} \mathrm{C}$
 $P L A D G G D G T L E A A R A A G F S L H E A P V T G P L G G T V T A R W A L$
 $P Q S D G G P G F A D V I S A T A G G M R S$ A $A V V G P L G Q A V E A R W V L$
 PLADGGDGSVDAAIAA GFTPHQVTVAGATGHSHSAT
 $P V A D G G E G T V E L A L \quad G L G F D P V A V E V T G P L G R P V P T T F A M$ PI A D GGDGTVDAALSA GWQR】DLVAEDALGGVEGPTYF
 $P$ I A D G GE GT AE A VYHA L G G Q WRVI E GV D L L FRRKVS CR Y L L PMAD GGEGTATA QAAASGGQTDTLDTTMAAGGRLTQASYVL PMAD GGE GTDNAFEAAVPGCWMPVTVPGPAGVDIESSWLL VADGGEGTI LSANGF

$P$ LA D G GEGTADVIASAVPGSVWHEVPRGPDSRPVDARWLR $P V A D G G E G T V E A A V E A$ GFARVLTTRATGPTGEPLEAAFAV $P Q S D G G P G F V D V L A A R F G R T V T E R V V G P L G A A I S A Q W L L$


 PQSDGGPGFV SVLAA QFGSRKTTFVQGPLGAATKARWLI $P Q S D G G P G F V D V L A S R F G T V V T E T V A G P L G A S V S A R W L H$ PLFNGRHE LMDSVF LDWQSGTVYREMVHNADMNQVEAVYGK PLFNGRHELLDSVFLWQSGERYRDPVHDADMNSVEGVYGQ | $P M A D$ |  |
| :--- | :--- |
| $P$ | $G$ |
| $P$ | $G G G T V$ | $P Q S D G G P G F V D V L A V A G G T V H R S D V A G P L G A P V E A T W L L$



$P$ LS D G GE GF LE A IKK DQEGNRRPVRNSDLMDTVPYFRKQ $P L A D G G T G F V E V L L A A L G A E P R S T V V T G P L G E P V S A R W$

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


 $P L A D G G E G T V D A L V T \quad C G Y E A H Q V E V T G P L G Q P V T A R W A S$

 P M A D G G E G T V $P$ QS D G GP G F V EVV LA S RLLGEVVRTM TVVSGPDDA EV A A R WV L


P I A D GGEGTDDAFAAAVPAARRYTRVTGPNGRRVTDASWL $P L A D G G P G F V D V L H G A L G G V L H S S V V S G P R G E A V E A R W L V$

$P$ VA D G GE GTVEA LT A NGFQHVAAATVDLAGRPDEVVY
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UniRef90-A4KSF6 UniRef90_A4KSF6 UniRef90_UPI00038016C0 UniRef90_C1AUA8

$\begin{array}{llllllll}L & G A & K & L & L & D & K & F \\ L & G & K \\ G & A & R & F & L & D A & E & G \\ L\end{array}$


 D A L GR GAKRIL I LT GE T GVVSDGGLLGLLQQAL GVNFYDEEGH



K AL DNDAEHLVI SLGNDIASFDGGAGMLQAL GARYYDDEGQ HALDNDAQHIVI SLGGGDSFDAGAGMLQALGATFYDDEAR A A LA H GVSR LV L GVVGSSSSTD GGAGMLLAALGARFADABGA





 A A LDA GARRIV I GLLGGSGTNDAGAGLLGALGVGPA GR $D A L N K N T D H L I, ~ S L G G M D S F D G G V G M L Q A L G A K F Y D D E N R$ $E V L A A G F R D V V L G L G G S A S T D G G L G G L L T A M G A R G L D V R G R$ $A A L V S G A T T I V V G L G G S S C T D G G R A L V R A L G G L G S A V A$ D A L D R G A D E L T L L L G GS A T T D G G A GL L TA L GVQL L D A S GR
 HA LDKAAQHIVI SVGG DGSYDGGAGML EALGARFYDDEGQ
 D A Q S R G A T S V V L GLGG TA S $\square D G G M G \square L A A L G A A A H D A R G Y$ A ALDD GAKSLLI GLGGSASTDGGAGALRALGVKLLDRHGR A A L R A GAVVRIVVGLGGSGTTDGGRGAADRLGGVPRARA
A A L A H GVVSRLVLGGGGS ASTDGGTGMLTALGARFTDAAGH $A A R A A G A G R I V V G L G G S S C T D G G R G M V E A L G G L D A A R D$ AAFKE ANQVEVSLGGSGVNDGGDGLLAALAKKDDPLE EAVEA GATRVVVGLGGSGTNDAGAGLLAALGVGTP A A L T A GAQKVVV GLGGSSCTD G GLLGLVAA L G GL
DA I K S GF K K I YI GA G G S A TN DA GLLGAL QA L K K 1 N H D E H Y Y
 DAMDAGARQDLVALGGSASTDGGTSLLSALGARFLDAAGH AADGLGCHTIVVGLGGSATTDGGAGLLSV



A A LA D GAKALLVGLGGSASTDGAAGALRALGAKLLDRDGR DALDRGAKEFIL TLGGSGTNDVGDGLLQALGDKFLNTENN HLA E A GYK RVMVGVGGS A S ND G GL GMAA GL GYEFFD DS G H


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UniRef90-A4KSF6
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 $P$ VPRGARGLSEDTSVDLTGLRTAP
PVGTGAGSEGVVLTDVTNPLT PVGTGADELASVTTVDLSAVHERLGGVPVRVATDVTNPLL
S TPPTGGDLQRDERLQPSGFQHYVKGMHFTYACDVT
R

PRYIVGRHLANVKSIVVQQVREKLKDVHFEFCTDVTTPFV
AVGRGGAALAAAARFDPAELPGRLAGVRFTLACDVDNPLL

EVRPGLAGLRDVASUDVAFVRERLAGVALKVLTDVKSPLV
A WY D $\square$ FDTAW
DLSKGPRYLNLVRR\DTSHLNDK ALQPSGRNMSLVHTVDSTHALD
PVHVDALDLERVTRIDSTGLAA
PIDEGPRVLKYLRKVDFSDLH
RI R P
RGGAVAGDAR GQL GEVDLVVA
EVEPVPAFLSRIRRIGVGPARBSLAGVAFTLAADVDNP
TIEPAGVRLLSLAEVVTTGGHSRLGSARLTMACDVDNPMV
$R \square A L G N R G L A E D A S V D E A G L I T L P P D G G M C W S D V D A P L V$
 $P$ I SWQTNPLME RLAPEGA Y Y A WRALTCRGAIREFQSVVLRSPVMLDTR WW
 P TESGGEGLKNLFRI DCSQL D SR

## 

LLGLGGKELTVLHKDNTSGDHPALSSCKFYAACDVDNDLT LIGRDKNATNFKEVRNDESVVQQFNHVEDMDATNTDRPYA EVDPDGSNLARVRRIETSGMDPRDRDVEVLVAGNMHNLLT DGAAHLLRSVTLVAASDVENPLL A Q A R G L L A GVGGLI A A T D V E H P L L P $\square R K G A E V L K Y \square R H V D L S N L H L R L A Q V R I Q L V S D F A S K M Y$ DVSQGVSS KYIRRIDMTN HPKLASARI QLMSDFSSKMY A $I P G G A R G L A D V A N A D L S R L P$

RLARGGGALHEMDADALDGLRDLLAGTELVVATEDRCPL $A V V P G N R G L A S L A R V D L S G L R R D L P G G V R I L S D V T N P L L$ PLAGSGADLNRMHFVDLAPARRALAGVELVAAADVLSPLEF
 LMSSGEVFWIS DILI NTEGLPFQYENLTTIDIA

LGHGGLALAAATPDDVAGLDDRLRGVDLVABCDVELD
 $P$ VRSGGGGLGSLEHLDATGLDARARAMRVAA $P R P Q Q G A E L L D D V T G V D T T W M R R D P E H G A V V L T D V T S P L E L$ $P$ PPKGGAPLVMLDSIDTAQLNDKAAGLKFTLLGDTTCC RVDMGARQIKHVRRIDTSDLDQRLQQCR DQVLVDFESKLY VA FTVACDVDNPLT ALPKGGAPLVQLDS DDTAQLNDKAGMVDFTLLADTRAKA $D I G D G G A A L S E L D T V D V D A L R V P P P G G V E L L S D T T A V L C$ $P \square P D G G R G \square G S \square A G V D L S G L \quad A P L P P G G V T V L S D V V N P L L$ $P L C \square G E K Y L A E \square A \quad \square P N L E N K K L I G G T D V T N P Y T$ $R L G R G G L A L A A T T V D D L A G L R T R F R G V D L V G A T D V D S P L L$
 A LKQGGAALDDLDFLDTAQLNDPAAAMDWVLLSDVTAPAI
 AVPDGAGGLAADAHVDTAALRQPPAGGRIVVASDVTVPL ALEGTPEQLARVARVDVSLLDARLADAQFVGMSDVDNPLT $E!P Q G G A A L A Q A H S L D A S G M H P A L A E A E I T L A C N I H N I L T$
 A I ELCNENLSQIK TIINLDDFEPRTKNINFKI ACDVNNVLY


210
220
230
240
GPS GAAAVVIF GPKGLLTSAD\|VVVJGVDERYAACDARHVDG GPNGAQAVFGKQKGATPEQITIFNKQMTVMNELFKAQVND GENSFLEDRAYRKGADDYDVARLFRGCENFMEKTSDLLGU GQKGATYVYSKQKGLKEEDFLEVDEVVENFAK LVSKELGK GKRGAARVFGPQKGADANDVELLDRALGHLCDVTGVDPQA GPKGAAAVYGPQKGASGTDVAALDTGLTRFAQVVAAAVG GPRGAASVFAPQKGASVAEVAQLELGLTRFARLLEDALGA GMKGS $\square A T F A K Q K G A S D E Q L F L M E Q N L N H M F K L L K S D Y Q K$ GPNGAAHVFGPQKGADPAMVSRLDKSLADFVNTLVRNGFD G $\square R G A S A V F G P Q K G A T D D Q V Q R L D A A L E H F A R A A Q P D V G L$ GPRGAAAVFGPQKGLDADDI ARVDEALGRLAARLGLDPTQ GPRGAASVFGPQKGAGPAEVARLETALTALSHALRRSGAH GPRGAARVFGPQKGADPATVELEEQHTAWAAELDALAGT GPTGAAPVYAPQKGATPAEVAFLDAGLNNLVRAFARYPNA GPQGATAVFSAQKGATAAQQVELEAGMVNLTKHLARLTGV GANGAVRVYGPQKGAGVGDRAVLEAALANWAQVVDPSGAG GERGAAAVFGPQKGADEQTVEELDAHLAEFARLLKAQDTA GKQSAVMKTYPNLQQDREEAVVIDNLLWYWSELEKHQHHQ GEHGAAHVFGPQKGADASAI ELLEQRNAVWAGELARACGR
 GPDGAATVYGPQKGASDDDVRLLDAGLDNLVATFERSGHP GPAGAAHTFGAQKGADQPTRRALDRALHHFGGVMADHFG GCHSEDMQTYEAYGLTREKAAE DN L GPRGAAAVFAAQKGATLEQVDELEESLARWAAVVAEATGR GPHGAAAVFGPQKGLT
G $\square \mathrm{DGSAEVFARQKGADDEAVRLLSAGLAHLAEMVGPAVDR}$ GPQGAAQI YGKQKGGTKTTLAFLDKQATNLTEQIKQTTNI GDCGAAAVFGPQKGMSATQIAAADAGLAHFASRLG

## 

GSAGAAAVFGPQKGAAARQDAELETNLARLAGLVAVDAAT GKQGATQLFGKQKGGSPETLAYLEAQAEKIVEQIKESTAI GKRGAARVYAAQKGATPKMVGELEKYLTNFARVI EKDLGI GPAGAAALFGPQKGAGPDELAALDHALAVLAAHLGGD GPSGAAA YGPQKGATAEDVTLLNAALANWARVVQDAVGP $G P L G A A T V F G P Q K G A D P Q T V A R L E E R L A Q W S R V L A S M A G R$

GYRGAQRTWGMDKGGTKKQDEVFDKRMDGFFMTVDKELNL GERGVARVFGPQKGASPEQVEALEAGLVHWAGLLAEAFHR GPGGAAHVFGPQKGADPQTVSLLEEGMAEWATSLNGLAGR GPSGAARVFGPQKGADAATVKLL EARDSSAAAEFQRVVKR GPLGAAAVFGPQKGADDVTVARLEERMTQWSRVLSSMAGR
 GKNSEIMQTYKSHHLSHNEAAEIDNLVWYFSELFKSELRL
 GFDGTSALDAPERGASPEQCQALETALGHFHDLVRRASTP GPQGAAAVFGPQKGAAPEDVPLLDAGLAWFAEALRAASGR GPDGAAHVFGPQKGATPAAVELLDDGLR GLHGASAGFAAQKGATAEQAQELERALGSFAQVVGQAVAA GPDGAARVYGPQKGATPEVVEQLEGHLAHLADVI REQLGP GERGAVHTFSKQKGATEEQRE ILEKGMNQVAKLIQRHQND GLKGASAVFGPQKGASEEDAQRLENALGHFASVVARVRPP GKNSE $\square M K L S Y N H Q \square P H K K A V E I D N L M W Y L N E I M K N E L H \square$ GPAGAATVFGPQKGASPTEVASLDAALVRLAGVLRERCGA GATGAARVFGPQKGADAETVERLEELNADWAAVLSAAGH GPAGAASVFGPQKGASPDDVAVLDAALEHFARVALGVEAA $G P T G A A A V F G P Q K G \square T P D R I A A F D A R L A D W A R C F P E V D P A$
$P P D H A A S M Y G P Q K G A S D Q Y V P L L T G A L M K L C E V T G D D V E R$ GKQSA $\square$ MKTYTEQQ
 RSHGAAHVFGPQKGADPQLRDLLDTALQRFADRLGTVTT GPTGAAAVFGPQKGADPATIGRLEARLAEWADELENAEGR
 GANGAAYIYGVQKGANAEILAKMDQAAFAWADDVDKAAGR GLKGASAVFAAQKGASDEDAQRLENALGHFASVVARVRPP GPMGAAAVFGPQKGADPATVELLEQRLTAWARELESVAGR GPNGAVYSFAGQKGASENDKIIL EQGMVNVSKMY
 GPTGAAAVFGPQKGAGTNDIARLEAGLARLVNLLDHAGMP GPHGAAATFGPQKGASAWVVARLEDRLAAMDVLEPVRDLP GPS GAAAVFGPQKGDDD VVARAEAGLAHAASLFPLDPMV GDHGATAIFGPQKGVKPDQVASDDAALA
GPRGVARVFGPQKGATPEQVEQLEQGLEHFADLLVDTFPQ GKEGASAVFGPQKGATPEMIERLDTALTRYAHLIARDLHV $G P H G A A H V F G P Q K G A D P A E R D R L D R A L A T F A A C L G A R L C$ GVNGATFTFGKQKGLDDNQLKMVIDNKIHSFAKLCQNS GTTGAAHVFGPQKGLTPQQDKLLDARDSHLGQQLGVEHVA

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 $D Y S S Y E G S G A A G G L G F A F L S F F N$

PQTEARGA
$N L T$ DFE GA GAA G G $\square$ GF TMRYFFNSEMKS G $\square D S \square L K M \square H F Q$ $N A T E D A P G A G A A G G A G F A A M L L G G Q M V S G A E F F L D L L G F D$

 | $V I D A E P G A$ | $G A A G G L G A A L L$ |
| :--- | :--- |
| $P G A$ | $L$ | D PAD

 $A V S A L P G A G A A G G L C G G L Y G V L G G S T Q S G F D L L A A L A D L D$ A AVAAVPGAGSAGGIGFAALLLGGTVVSGAGFFLDLLEFD SVEVMP GA GAA G GVGGGFAAVLGAEL QRGVVLLSRTLGLE DI RHRE GTGAA G GLAGGF V S L L GATDSKGMDYVCK LI QL D $\stackrel{L}{\mathrm{~L}}$
 $L D G T E L Q Q V A V A G A R P G A A F L A L G A A L D P A A D A L D D L D Q Q D$






$P G A G A A G G A G F G L L A W G A T D A P G S \quad A A V G E A L E L P$ $D L N K L A G S G A A G G D G G A L A D V G A T M K A G F M T V S E L V D L E$
 $V P D P V P G A A V T G G S A A$
$D V S V E P G A G A A G G L G A A L L A \quad L G A D R V S G A T V V G D A T A Q G$
$D L R D V A G L G V D G G \square G G A L A V V G G G Q \square V P T G D \square M A N L V G L P$ $D L L T G P G T G A S G G L G A G L A A G L G A R L C S R F D I L M D G V D L D$ DI TEDAGA GAA GGLGAALIALGATRVSGATVIAEATGQQ
 $D I S G D A G A G A A G G L G A A L L A B L G A R R V S G A T L V A B A T D D A$
 $A \emptyset G P V E R G G A G G G I A A V L S G L V Q A E V L T S H E L V D Q L T H L D$
 R A VA GA E E GA GR DA G GTG F GLR RVWGAAMTP GAPAVAEASLGLD


 DI SNLS GA GAA G GI A G GFYSILDNGQLKKGIEMIGADNNLE $D L R D E P G A G A A G G L G F A L M A M G A A V V A G B T Q V V A A T R V D$ ARPEREP GAGAA GGLGGYALHLLGARRVSGVEAVLDAVGFA A LG P DE R G G A G G G I A A V L K A L Y N T E I L T S H E LVV NQ AT H L D $D P A Q T P G A G A A G A V A G A A D A A L G A E V V D G A V F V L T A T G F D$ $D V A D R T G A \quad G A A G G L G G A L A A L G A R Q Q P G A A V V A E R T G Q Q$ $\begin{array}{ll}A \\ T & D \\ D & D \\ G & G A G G A A G G V A S V L R A L T G G E D V A G G A W F A E\end{array}$
 LLGPIERGGAGGGIAATMAALFNAEINTSHELVDQITGLD $\overline{R V} V W D P$ GAGAA GGLGFALMAGLGANRVSGAEFVLSAVGFD EFT GAA GG GP $\square G L T W L S R T L W E H A R V V S G G A H V A K A L G L A$ $T$ T R P NE P GAGAA GGTGF GLSA WGGRLV PGAARI A D L T GL S
 $M V S D D P G A G A A G G L G A A L L A \quad L G G R X E P G A A V I A E H T G L A$
 $D V A V E P G A G A A G G L G A A L L A B L G G R R E S G A T V I A A T H T G L A$

 A GGD RP GA GAA GGAAY GL AAAAFGAELVDPGADTIAE KVGGLP GAGAAGGLGAALLADGASVVSGAGVVRS

A G A

GAA GGTGFALLTWGARLVS
GAEE $\square A R L V G L \vee$
A D $\square H S G R G S G A S G G \square G A G \square M A \square G A T A R D R F D V L L G D E D \square D$ $D V L D L A G G G A A G G M G A A L Y A F C G A Q L R R G D E V V T D A L H L E$

 GAGAAG
D V A A E A

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ELAQKASLVITGEGRYDEQTAEGKVAD\|VQAGTTAAVVA
QLVKEYDVIVTGEGCLDDQS पDGKVISGDKKYHPRLIIIC DHVSRADVVLTGEGSVDTQTMAGKSVLTRRAACTPVVVVA A AAAAVDVIVTGEGCFDWQSVVSGVAELLAMSVARPCVVLA ADDAAADLIVTGEGRFDDQSLHGKVAAGARSHRDPVLVLA

ELTTGAGLVLTGEGRLDGQSAPVGVAALAAELDVPTVAAV EAKKQADLVTTGEGRIDNGKVPYGVAKLAKKHGKKVIALC


RAVAGASVVITGEGRFDAGKVPSYLRALAMDAGAQAMLVA DKIKSADIVITGEGRDDHGKVPYGVASLAKKHNKKVVAFC EKMENADLVFTGEGSIDRQKVPFGVAKIAKKYGVPVIAIAA

AEMARADLVLTGEGKFDSQTपRGKVVAAATEVNAPTVVFA


VLIEkADLVItaEGAVdFQKVpaETARRAQNTGVPVTALA ACLADADLVITGEGRIDHGKVPDGVANDAKRYNKPVIGIA AEFGRADVVVTGEGQFDATSLSGKVDERCAGTATRSVVVA NY LNNCDIVIVGEGKMDKQSIPTDVAQRAKNHNVKVIAIV QKVKEADLVIVGEGRMDRQSLAGKAPI GVARAGIPVIAVC


UniRef90 A0A031G009 UniRef90-K2PXR6 UniRef90-FoGVY7 UniRef90-F3AOK1 UniRef90_UPIO00371247D UniRef90-V6L1D8 UniRef90_UPIOOO262AOD4 UniRef90-R6TQ19 UniRef90-HOR3J8 UniRef90-UP10003651FC3 UniRef90-KoUN01 UniRef90 UPIOO03167511 UniRef90-UP1000379CEBA UniRef90-G41315 UniRef90-R6IZC7 UniRef90-Q5YW35 UniRef90-E9CCG5 UniRef90-D3BDV2 UniRef90-Q5YN82 UniRef90-UPIO002DCFB6E UniRef90-E8SKB7 UniRef90-B6GAD7 UniRef90-E4WIU4 UniRef90-F8NBYO UniRef90-K9АМJ7 UniRef90-UPIOOO36A9121 UniRef90-H5UDX5 UniRef90-HODGW1 UniRef90-A1SFU3 UniRef90 UPI00036D3340 UniRef90-U3JK19
UniRef90 - 5 LLB81
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GRIITSGFAHAVOSTELAGSAEASMADPVRWLQDAGRSLAR 350 GRRDEHLIAAYA TQREVTTLEVA【SPAKSNLELIGKNUAG

GSFSVEVPDGVLRVNDDPSEEQपRRAGADVA $\square$ AY Y
GQLSSTTNDVYA VVPTVATTEESLKEP
GRHKDWTRAGFRQTYALTDVDTASDPTGDLLEHTAEHAVR GQVELGVSAYSVAELAGSAEAAMAEPAVHLEALAARVAR GQVTLGIAAAHSUAEYAGSVQRALDDAAAQLTGLTAQVAG GQVT $\square G \square G A A H S \square A D Y A G S V Q V A \square D D A A N Q \square T G A R R T A A$ G GRST RAAAGFSAVYADGDYTD KDTARLLTHTGHQDGR GVSKVPEEAVLQLTSQFFLDACMHDTAQCLEGLDKR
GCLGD
RLRAAGFTACYADTDDEPDQRRCDEQAAALLERDGARDAA GSAREGLAGLFQLTDKA PVEQAMSDPGPVLT GTADLGVTGMFNTIDMPKTLTDF KMGDQLRNYAVQADR GSRAEGVDVVLPVEMGPQTLGQALSQTRANLDATGETLGR GRVGDEDDAGFKRV
GT
GRTTLPRDRGFEWTYALADLTENTSRDPALTRRLLEHTGH GRFDRPPDLAVELSAVAGSAEAAMADPTAHAAAVRGVA AT
GRNEEEGEAGLSRVYSLSDLEVCMREARRLLRAVAARTAE VRAEQDRDAGFDRVYTLASLEKSDARALELLRLIGRHUA
GSNRLAPDS
GSLDEFLPSVFSTQLGPDELKKALDRQETLVADMTHNLSR GLI EEDFADSRALVDLAGDARTSRAHALHYLEAAGASLAE GSFEHDTDAYCA
GR DRTFAATMSDTELAGSATAAMSSPQTWLHEAGRALAS GEVTERLEQAW ICEADHDPDEVKTVTKQRLARRAEQIVR
GHपEAGFAAAVSLTELAGSSRAAMGETLAWLEEAGARLA GSREKDLPSVFSIQTGPTSLDKALQETLENVRLLSQAISG GNVEDGIEAIFSTTPRTMTLAEDRKNPGQLITNTVEQIMR GVLGEPPCPAVALAHLAGSASAAMNDPARWLSAAGEHLAR
GQVA $\square G \square S G A Y S \square V D Q A G S V E \square A M S D A R N Q \square T$
GQVDNSMRAVFSTQRRPSSLRRSMETAVNTKVVTRNTR GSIGRGMDAVMGI IPVPMDLPEAVSRADELVTDATERALR GQVTLG|ARADSUVDIAGSVQLAMDDADNQLRRLARHVAE QARIAGUADAYSMSEFAGSVDLALLDAENQLRKLAEHVAAC
A T
GaVELGVDAAHATVDFAGSLDVAMNDAAGLEGLARSVAE GEVTLGVSGVYAVADDPERAALMMADPVGSLTARTERLAG GAIPSDFADAVALADDAGGSAAADADPLRWARAAGADLA
 GQAHSDFAGVRPLVGGDVKLHHADANPQAILKRRTAEALR GQLPNENCLAFDLISKFK LEECMSNTFECLAQLAKE GQVSVGVAEAHSVAEHTGSVESALADPAGTLADLAEHVAR GAMTAGLSGVYAVAERPEQVAAALAEPAARLADRTARVAR AT
GQTDAGVVMGVSLAEVAGSVDRA\|VDVLPLLRGAGVAVGE GQVTLGISAAHSISEFAGSVDVAMSDAANQLERLAARVA GSVDAEAAAAMSUAPGPATLDELQRD
 GRLD
GT
GQATLRAGAEVAEVFALTDLQQCTAEPGRVLKEVGYALAA GADNQDTKHVTAELDQEGGMPEQLARAARDII
QLAATPPDASVSLTALAGSAENATAETERWARHAGTAAAE GQVDEGUVAAYSMVESAGSVTRSUTEPVEVLTALAADVAK MLVAGRFAATASLTDLLAGSPQASMAAPARWLTEAGAALAR GQVTLGDAAAHSLTDRAGSVQKADDDAADLLTAVAAEVAA GALEYHFDGVFSDQTRPLTLKQAMTKTLQNLALLAENVIDK GAMAAGLSGVYAVAERPDQLVEALTDP
GQVTLGIEAAYSITDHAGSVELAMSDAANQLTGLATGVAA G GKFSDDPQGTLPTQDAPD NEVASTQDQLTRAGRSVVR GLHERGVDAVVSCVDRLLPDAEAMKEARQTLRYATEQAMR GQVGDAPAGVVALVDGAGSATAMAHPARWLEQAGSHLAR

GSLGKGADNVYSTMTVPMALEDAVRDGRKLLDDATERATR GSHEHGLDAVFSVDYTICTLEDALKNASENVRMTARNVAA GRLAAAPPGIDSLSDLAGSSESALAAPAMW GGYELNDDAVFSSIPFYTDLEHDLKNAAKNDEQTAANVAM GSLREDVVAAFPDSKVDSLENTLASAYQNLERTACNIGN


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UniRef90_UPI00036A9121 K $\square$ A $\square \mathrm{N}$ H D A R
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UniRef90-H0DGW1
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UniRef90 UPI00047BA2FE
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UniRef90-UPIO003B48B53
UniRef90 V5XQ89
UniRef90 ${ }^{-}$X1C5N6
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UniRef90-C7PZS3
UniRef90 L7KNX1
UniRef90- X1E3H2
UniRef90-EONHI1
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UniRef90-UPI0004201F06 Q WR
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UniRef90 L8DGR7
UniRef90-U1L886
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MLS L
$N \square R$
A W
S W

D L
$L\llcorner R$
$L \underset{R}{L} S \square G$
$R W R$

D W

LVE

TL
$R \mathrm{~L}$

LF Q
$\square \mathrm{Y}$ R L R K E

LMNMAR
L L L LGAA 1
NWTVA
Q WA A

R WS A
T W
$\qquad$

T W
$\square$

T V R
MF
D VR
TL
GWH G G
LY L S G N K
E L

LI $K \square G$
SW
QW
$M L Q \square G$
$T L K A G Q Q \square R$
L L
LL A L S Q
${ }_{\mathrm{G}}^{\mathrm{R}} \mathrm{W}$

APDRFRGALLTAAEAARHLLAAGDRRTRPDVPVVQL

FKGSLTASQAAAAMADGARRALPEAKLETV
VVVAPDSFKGSLSAEQVAAATAAGVARARPDAVVRCR MRILIAPDSFGDTMSAVVAARAIARGWGAARPDDELVVA MRVLFCPKSFTGTLTAVQAAEAMAAGWRRGAPHDDLTLAA
$\square C A P D K \square R G A D A R G A A H A D E G A R A A G \quad V P H E L$ MRVVIAPDEFGGTLTAAQAASA\AEGWARARPGDVLEQL $L S A Q E A A V I$ I R Q A LE Q A G LQ GPFHCQ

MKF I IAPGKYSDH\S SKK DGQA DYSGПSRADPSAEIVTM MRHLI LMDTFKGSLASKEAAEAVAAGILQRDPSAIIDQS $\square R \square V V A P D S F K G T A D A A A \square A R A L A G G W L S A R P Q D D L A D R$ $\bar{M} H V L I A P D S F G D T M S A V A A A Q A I A R G W G S A R P S D V L V T A$ MRIL LVAPDKFAGTLTAVEAADAI A A GWRRRAPGDELDLA


MTVLIAPDSFKGTYTAGEVADAVATGVESSGGTA $\square R \square$


 $M R I L I A P D S F K G T F T A A E V A D L I A E G V R \quad G A G G R P V H L$

## MRVLI VPDSVD D LAS PRAA DVIGSGWAAAAPRDRLVLQ $M K I V I A L D S F K G S C S A Q A A C A A V A Q G L R R V D Q T L E L V E M$ 

MKILVA IDS FKGSVTSPELNTSVAQALLSVDKQLVIETR

 RIL I APD K F K GTLLSATRAARAMCSGVRFAWGDAQVVEL MRI IVAPDSFKGTATAAS $\square$ AAA VARDGWLAERPDDDVVLV

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

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

 $M K V L V A M D E F N G I S S Y$ QANRYVEEAVAS QIEDADVVQV APDGF GTSLTPAEAAAALRAGWQQGAPHDDVAVC APDCYADSMSALEASAA』ATGWTRSRPGDRFIVA
$M K V \operatorname{VAPDRFEPGDSGRATDCDEAGLQSVAGMINLIEA}$
 $R V A V C F D S F K G C V G A E E A S R Q V A A A L C E A G Y E A$
$N \square A V M P D S F G G T L T A V E A A A A D G A G W H A A R P D D V V T L A$ $N V L T C C D S F K G T L T A C N A G L A L E R A F R C V E K G A E V V H C$
 MK VIA M $\square$ D S F K GSATSEE LD QA A LKG F
$P$ VQWEKES $\square$ MRVVFAPDSFKGS $\square$ NA $\square$ D $L$ A DA LAA GWAAVRPHDEVVLL $M R I L \square A T D A \square G P Y A S A E A G T A \beth A R G W R T T A P D A D L G A L$

STRVLVAPSDCPG VSAEDAAQFLGEGVRSVIRDADVTLA
GDLP P VEAAHQVGAGWS QRAPHADVEVH
MHVLIAP DSVAPMLSAS DSAAVLAEPWQDRGH TVRQV
$M R V L V A T D S W T G \quad D R S R Q V G T A D A R A W A \quad G \square G D E V A V I$ MRVVIATDSF PAVSSALAGAAMGEAFAHRG AEVAVV

UniRef90 UPI00047B7E16 UniRef90_U1ZSF4 UniRef90_S4XBN4
UniRef90- XOWF34 UniRef90 UPI00016A9C75 UniRef90-J9SLY2 UniRef90_K6XDM5 UniRef90-10V899 UniRef90-R7IKL3 UniRef90-D3FCD5 UniRef90-X1AVK9 UniRef90 L7LIP6 UniRef90-I5CAN5 UniRef90_UPIO0016A49DD UniRef90 UPI00021978DD UniRef90- U6BFU4 UniRef90_Q6AG88 UniRef90-M3VEU1 UniRef90 A1SLG4 UniRef90-D5NU54 UniRef90_UPIO0024926A9 UniRef90-R6HQF5 UniRef90 Q0S6Y3 UniRef90-R1H7R6 UniRef90_UPI000468B25E UniRef90_M2QW99 UniRef90-D6AWZ9 UniRef90-I6YZH5 UniRef90-S5TIH0 UniRef90 UPI0003743CD0 UniRef90-R6GMD4 UniRef90-C8NR65 UniRef90-W9GFY0 UniRef90-W1BCP5 UniRef90-C2CNP1 UniRef90-C3RGN2 UniRef90 A0A030ELT8 UniRef90-UPI0003815E62 UniRef90_IOAJ19 UniRef90-UPI00036A65E6 UniRef90- S3UZ82 UniRef90_A0A022LGD4 UniRef90-L2HZY2 UniRef90 P9WMT6 UniRef90-R5Z942 UniRef90-B9EAD6 UniRef90 ${ }^{-}$X7YVW3 UniRef90-UPI00037CD768 UniRef90-D4QQE3 UniRef90-UPI000262890C UniRef90 D5UXR0 UniRef90-V6VX94 UniRef90-B6WBE8 UniRef90-Q76P02
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PMADGGPGTVEAVVEASGGRTVTATVRGSDGRH贝TAEYSLL
 PMADGGEGTLDALL AHGGARRTLRVPGASSAPRDAAVG
 $V T A C G P T G L P V S T R Y A$

$P \square A D G G E G T L D A F L D \quad G A T V H E L T V E D A L G R P R S A R L L E$ $P Q S D G G P G F V D V L A A A G V G R R \square G V S A S G P L G G A V A A E G V$ P $\square A D G G D G T C A L L A E S L G L E P H F L M V P D A Y G R S V R G V Y Y L$ PVTDSKFGMPALVKHTDGGKWVR\SLFDAFWEEKTGQYLV PVADGGEGTLTVY AAGGYEMRTEWTVDLAGRPCEVMYA PMADGGEGTVAAFAAAVPGARTRTVIVDPDDRPVKAHWVH $P Q S D G G P G F V D V$ LASRFGTVVTEDVHGPDGAGVTARWLH PMADGGPGFVDVLHAALGGELLAVTVRGPHGEPTPAT V | $P M A D G G E G T A E V I A Q G P R V E K V E L P A T D A R G R L N T A S Y F L$ |
| :--- |
| $P V T D S K Y G M P A L V A H T D G G R W V D L P F F D A F W Q N K M G K Y L L$ |

PVADGGEGTLDVLTVP LGLRPDTTRSRNPWGSPCRPTYGL PVTDSRDGMPA LVKHT TGGQWLE LPFFDAFWHNKLGRYLV PLHDGGEGFAKALVATHNGSII EETVLGPVGESVESHIGF



PASDGGAGFLAALAQGVDGRDEAVVTTDPLGREVPAAVLL $P V S D G G E G L L S T L A D S P G A V W Q Q Q R C T S P Y G L S V Q A D F L I$ PMADGGEGTAEAALFGAEVQTITLPTTAAVGRLTEASYYL
$A \prod A D G G E G S L V A L S Q T V A G R W H Q V K T D D L L R R P \square K V A Y Y$

 $P$ LAD GGEGSLVALHSGRPLNLQAEDLPDAGGLKRSVCY $P$ MADGGEGTLDAFESAVPGVRVPVTVTGPAGAPVATQWLR PQSDGGPGFVEV $\square$ GSR $\square G E T R R \square R V C G P L N T V V N A A W V F$ PLFESDNNMDDALLA WEKGAK $\square$ SRQVYNGNLVETD DQVAR MS GPLDTAVDAAWMF $P L A D G G E G T L D A V A R A V P G A V R V P V A P G P D G R P V D T A W D R$ PIADGGENTAEAI YYALGGTWRTIDGMDLLFRQRKDSYLL $P V A D G G E G T V D V L S G P L G L S A R A A A S R N P W G A E C P G S \| A L$ $P Q S D G G P G F V D V L A A G L G T D P D T A V V S G P L G H P V P A R F L I$

$P \square A N G G K G T A E \square F$ GGAK $\quad$ T DPT TD DAGRLIEASY DW PLFNGRHELLDSVF LDWQSGNKYRVSAHDADMKETEA $\square Y G Q$ $P M A D G G P G F V A T L H T T L G G D L D P V T V T S P V G S A T P A \quad A V V$ PQSDGGPGFVEV LASRLGETRRLRVSGPLKAMVEAEWVF
PIIGGGEGFTEALLQQ पDVMGPVRESDPSHFGF PLTSGGQGTTDLAVRAGGGR\|RHWDFSESGHRSRPVKWAE $P M S C G S R G F F R A L Y Y G Q D Y D \| D D L D V R S P G N D K V M N T V P M$ PMADGGEGT A R V LT

PQSDGGPGFVMVLEKAFGGEVRTQSVTGPLGEPTRASW
PMSDGGAGLLDSLEFPSHGTTDSCDSTGPLGEPDNYHFAC $P V A D G G G G T L D V L T R P L G L E L D E M E S V N P W R A P C S G S F G$

P $\square$ A D G GE GTMAALFAAYGGQYKSVTSVGPLGEERVVSYLL
$P$ QAD G GE GTLDA $\square A S C H P H V T$ WHSVVRGPDGRRTTGRWDR P $\square \mathrm{GEAGAGLCDAYAALHGTQAEL} \mathrm{\quad TTDETGSLIR} \mathrm{\quad V}$ PY $\square D \quad D D Y \square T A \square M A F Y Q Q K \nabla Q T M T V T G P \square E M P V T A R Y G V$ $P \square P N G G A G T S E L F A \quad G Q R V T L P T T D A A G Q L T E A A Y T F$
ASSSGAAGFAEVVGRTLRASFLPVVVPGPRGEEVPASLAL $P M G T G S T G L V E A V A A A R G G H V H P V R A T G P$

EAVAEM

PMGTAGAGFRQAFED
LLR A P VE LDMTVA GQV
FTL

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UniRef90 A1SLG4 UniRef90-D5NU54 UniRef90-UPIO0024926A9 UniRef90 R6HQF5 UniRef90 Qos6Y3 UniRef90-R1H7R6 UniRef90-UPIOO0468B25E UniRef90 M2QW99 UniRef90-D6AWZ9 UniRef90-16YZH5 UniRef90- ${ }^{\text {S5TIHO }}$ UniRef90 UPI0003743CDO UniRef90-R6GMD4 UniRet90-C8NR65 UniRef90-W9GFYO UniRef90-W1BCP5 UniRef90-C2CNP1 UniRef90-C3RGN2 UniRef90 A0A030ELT8 UniRef90_UPI0003815E62 UniRef90-10AJ19 UniRef90 UPI00036A65E6 UniRef90- $\mathrm{S} 3 \mathrm{UZ82}$ UniRef90-A0AO22LGD4 UniRet90 L2HZY2 UniRef90 P9WMT6 UniRef90-R5Z942 UniRef90-B9EAD6 UniRef90 X7YVW3 UniRee90 UPI00037CD768 UniRef90-D4QQE3 UniRef90_UPIO00262890C UniRef90 D5UXRO UniRef90-V6VX94 UniRef90-B6WBE8 UniRef90 ${ }^{-}$Q76P02
UniRef90 L2TK23
UniRef90-UPIOOO37369D4 UniRef90-H3VUL6 UniRef90-D5UFV7 UniRef90-X7VGV3 UniRef90-W4TWZ9 UniRef90 N1PUB5 UniRef90 F812X7 UniRef90-A0А023B7Q8 UniRef90-R7EUK8 UniRef90 R6SXM4 UniRef90-L7L815 UniRef90_Q4CNI8 UniRef90-A0A059MU07 UniRef90 A0A029RUF3 UniRef90-T0VL01 UniRef90-R7EWC3 UniRef90_W8GZ67 UniRef90' UPIOOO40C2232 UniRef90-UPIO00346F32 UniRef90-UPIOOO21920B6 UniRef90 J9UZX4 UniRef90-S5T3D4 UniRef90-XOPCZ8 UniRef90-UPI0003B3C8A9 UniRef90 UPI0003B376C2 UniRef90-X7X3W5 UniRef90 A0A055EBY2 UniRef90-A0A034SNK8 UniRef90-X8DAL7 UniRef90-K7S379 UniRef90_UPI0003B69DA2

AGDV AVVVEDAEASGVVRRLLPGGRPRPDAATSVGTGQLT100 ${ }^{120}$ MANAAGLALLPGGAPAPLTASSRGVGELVC HQADHRAV E TARDCGLDMVTPPVEDARRAGSWGVGDVLV VDGQRRGVI EMAAAAGLWRLAEEERDPRVTSTYGGGELVL

 RRGEVAVVELADVSGLGRLPGGRRDPMRATSRGTGEVVA LADAPTFLVEAAEAVPLHAMPAYFRNPRKTTTAGLGDLI R
 $L L D G R T A F V E S A Q A C G L H L I S P G P E T A W C A G T A G V G D L L R R ~$ ERSAQRAFLDLAAASGLGARGKDRLAPFQASTVGTGLLIAA
TDSQDTATIDSEQVVGVDLAKNKSRNQFHATSYGMGELVV QHGQEAVI EVAQICGLSMRHETD DPFLLHTKGVGHLVQ
 LVAAGTAYVEAAQACGVHLTGREGAAESATTYGVGELLL


S DDGTAVIE $\square$ AAASGDTTPHDGPRDPVTATTYGTGMLVA TGDVI A TDGQDTVIMDSEQUVGLELAKGKTRDEFHATSHGLGEFIL IGGANKTAVLDMAAAAGLRLVPKHDRDPTVTTTFGVGQLMK
 A

APGENTAYVEAAQAAGLHLLADAERDPTRTSSAGVGRLLL LPGER A I EMAQSCGLELTPPAQRDVRQASSYGLGEQVK $A G E Q \quad A L I D V A S A T G L P A V A D A \quad D N P L H S D S Y G T G V L I A$
RHAKQAFПESAS $\square \square G \square D K \prod T S N S V T Y A Q A T S Y G \square G \square A V K$ AVERDTAVVDLGTAAGPALLPDARPRPLTATSLGAGQLLA NKSTKEVFI ESAEIIGGKKLPQQKRNPKKLNTFPLGRLIQ DTTSTTAYLECAQACGLALLPASPSTALAAHSRGVGQLV
 DPGSATAYLECAQACGLGLLPPTPETADAAHSKGVGQLIA DA HDTMLIDAGQF WN LTPD GTGVVELAAVSGLPLM DAPDPMGAHTAGLGVVVG TQGKNTAVI ESAQVLGLDLLDPTDQTDRLASSYALGELIK VGASAYLECAQACGLDLLPHGPTPASAEAATSRGVGELIL MYKDK LNVMESSSDGMGEMLV NEQEKYAVIEMAEVSGDQLVPTSKRNPFNTTTYGTGQLIK
A A DTATAYПDLAAASGVSAKTTAS SLLLNDSYGTGVLIA TDSGMTIIEG HLFLNGKKPIQHRSSYGLGEVIK LRVGRTAHVESAHADGLDLVPADLRDPTRTTSRGAGQLLV

LGGTKTAMIVLAAAANLSVVPRHQRNFWYKSTFGVDQLLR LPDGSTAVIVDAKEALGDPNHGAEPLFYSDSFPVGWMLQ LAGVRQPAVDMALKAGLGNREGTSRAVMEASTFELGRMLA
LMHDGVAYLEVAQTCGLQLVPRTPQTALAATSAGLGDLIS DVANRVVVVEMAVASGLPMLPEAKRNPLRTTSYGVGQ1 K LGEDGTAVVELATFSGITTPHKGFRDPMTADTYGTGLAMV TNQKR $\square$ A $\square \mathrm{ECAA} \square \square G \square Q L L D P S D Q T T R A S S Y G \square G L L \square A$

$\square A A G K \square V V \square D \square R S L L G P Q \square P E \square A R S P \square T A T S F G \square G E L M R$ DQATATAY $\square D A A S V V G A P A G V G D K G D \quad T Y G V G V L V A_{A}^{K}$
VRDDDTAYLDTAQVCGRHLVGEDALDPAGMTSAGVGRLLA LLVEGSAYVE AGPLLTRVPEVAEDGLLGSTAPLAAVLL

LREAA G LDD LA P LPD A GADR WT T G S EP D

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 AALDLGCNKIVI GAGGSACTDGGAGFLAALGAEFLDANGQ DAMDRGARRIILTLGGSATTDAGTGMASALGVVFRDDAGT AALDAGCRRLIIGLGGSATNDGGAGMAAALGVRFLDAEDH ALLDDGVRTFYVALGGSSTNDAGAGLLAGLGLRAYDAHGR A ALARGAGRIVIGLGGSASTDGGVGLVEALGGGDRARE A ALAEGAHRIVVALGGSATNDGGAGLLAALLAARSAGTGP AAVAAGCREIVLGVGGSASTDGGAGLLRALGARLLDAEGA HAI TRG $\square \mathrm{K} D \mathrm{FVIGI}$ GGSATNDCGLGMMESLGARFFDENGE AALDRGARRILIAVGGVATVDGGAGALQALGARC
KALNDGCRKVII GI GGSATTDGGMGMAQALGVKFYNSCSN AAVEAGATRIVVGLGGSGTTDGGRGACTALGGL DAVAGGCRE $V \vee G L G G T A S \square D G G M G \square L Q G L G F T Y D N R A G R$ $D A V T S G L R N J V I C L G K T A V A D G G L G A L Q A D G A K L A D A D G R$ TLRRKGMTKI RVALGGTGTTDGGLGFLHEMGCSLRDAEDR A SLDA GVSQLLI GLGGSASSDGGAGALAALGAQLLTLTGT AA AVA A GARRLVVGLGGSATTDGGAGLVDALGGPEAAAR AAAGAGAERVVVGLGGSGTNDGGAGLL AADGATADR DAQTRGAQHIVLGLGGSATVDGGMGIITALGGSPMDARGLD DAVTSGYREIVVSLGTSETFDGGLGALQALGAKDYDEGGD

MRNKCKKLIVGLGGSATNEGGCGAAAALGVRF $\square N S K N E$ DAARRGARRIVVAAGGSATTDGGTGAlAA
A AVRAGCRRVVLGVGGSACTDGGAGMLTADGAR LDAAGR DAISGGHKNIVICLGRTAVADGGLGALQALGAKVYDQGS
 AAIDRGAREVLVAAGGSATTDGGTDAVRADTERGG

MRLLDHDGR
MLDHG DNHIIIGCGDSGTSDGGAGALSALGAKILDDSGA AALDLGARRVVVGVGGLGTNDAGAGLLATLGVGAPDR A ALDAGCRHLII GLGGSATNDGG $\mathbb{C}$ GFAQALGARFWRKDGT DAESRGAKQUVLCLGGSATDDGGMG\|LAALGATAHDDRGY

DADQKGATQ QEDMLGGTGTSDGGKGFLESTNYDFMTGR HVRRVGARRVVLGL GGSAAADGGAGLI QGLGGRLLDAQGR DLLKSKFEKIVIGVGGTST DDFGLGAVNALGDKFLDNYGR A ALSAGAGRIVVGLGGSASTDGGRGLI DELGGL
HMLTLQKRELFLFLGGTAVCDGGLGILDELGFQLLDGKGN AALDAGATGLVLGIGGSASTDGGRPVLEALGGYAFLDEEQS AALRAGAARIVVGLGGSACTDGGKGMIAELGGL RAVRAGAKTIYI GLGGSATNDGGAGMLQALGARVVDDQGC $N G V D M G D T S F I I S L G N V N V F D A G T G M L Q A L G A K F Y D R E Q R$ A AVAAGARRIVVGLGGSACTDGGYGMITELGGL AALRAGVSALVI AVGGSASTDGGAGALAALGARFRDLDGY
 AA AAAGATTITVGDGGSACTDGGAGLAEAFGA DAIQKGATQIEIMLGGTGTSDGGKGFLESLNYDFMTGR DGLVNGCEDFFiGGGDTAVNDMGMGMLYALGGVRFFDKNDN DAETRGAQTIVLSLGDGLTDDGGTGLLVALGAQPDDPRGY AA LDNHTEHLVISLGG\|GSFDGGAGMLQALGATFYDDEAQ


VALVEGADHILFDCGDSETCDGGVGMTQALGAPLFWQQGR KALSLNPRRVLVSLGDVVVADGGLGLLRAFGVNLFGPDKK $E A A E M G F R T I Y V G L P A Q A C D D G G Z G M A Q A L S V D F Y D V D G N$
$R M S G S E G E I V L V G G S A T C D G G M G L L A A L G A R L R F R G A E$

TA LLA GARS VVGLGGSVT T DGGRGAAERLGG
YAVVYVAREVFLGUGGSATNDRGLGALQALGVEMDDGGSE EALRRGATHIVVAAGGSATTDGGLGAITAI

VS GTNDVGI GLLQAL GVKFDNTENN
 AADDDGAKSLLI GLGGSASTDGGAGALRALGVKLLDRHGR $E V L A T R P Q R V L V D L G E L H C H D A G A G \| L G A L G A R \quad S D R$
 HADDNDAKHVVISLGGIDSFDAGAGMLQALGAQFYDDEGR DAATRGARRVVLSLGDVVTVDGGTGVLVALAVNPDNAAGF LARETGVERIVVGVGPLACHDGGVGLLRELGA D
G
D AASATGAQRVVVGLGGTPVHDGGRGLLHALAEHV

G C
AA $\square R A G A A R \square V V G \square G G S A C T D G G K G M \square A E \square G G L$


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UniRef90 - Xow UniRef90 UPI00016A9C75 UniRef90-JgSLY2 UniRef90-K6XDM5 UniRef90 IOV899 UniRef90 R7IKL3 UniRef90-D3FCD5 UniRef90-X1AVK9
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UniRef90- R6HQF5
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UniRet90 D5UXR0
UniRef90-V6VX94
UniRef90-B6WBE8
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UniRef90 L2TK23
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UniRef90-H3VUL6
UniRef90 D5UFV7
UniRef90 - XVVGV3
UniRef90 W4TWZ9
UniRef90 ${ }^{-} 8812 \times 7$
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UniRef90-R7EUK8
UniRef90-R6SXM4
UniRef90-L7L815
UniRef90_Q4CN18 UniRef90_A0A059MU07 UniRef90 A0A029RUF3 UniRef90-TOVLO1 UniRet90-R7EWC3 UniRef90_W8GZ67 UniRef90-UPIOOO40C2232 UniRef90-UPIOOO346F32E UniRef90_UPIO0021920B6 UniRef90_Jguzx UniRef90_S5T3D4 UniRef90-XOPCZ8 UniRef90_UP10003B3C8A9 UniRef90-UPI0003B376C2 UniRef90-X7×3W5 UniRef90 A0AO55EBY2 UniRef90-A0A034SNK8 UniRef90-X8DAL7
UniRef90-K7S379 UniRef90_UPI0003B69DA2
 PLHEGGGFLMDLASVNLDNLDKRLRRARFVLATDVNNPLL PVGGGDADMARETAVDLGGADPRAADGDVVLASDVTNPLY
 ALSRGGGGLAEVTAADLAGLPQRLCGLELIVASDVENPLL QVADGGAALADVATVELGGLRATLRGVSLTLASDVDNPLT LVGGTGDDVKRVTEADLGELLKLTRGCHFRVACDVTNPLCC LLGFGGRQLLKLKR DMSNIHPAVSNTEFNVASDVDNPLT
ELAFHPARFQELAFT
PI GAGGAQLARLARIDVAGRPGGLABLRFTLLADVRHRLF LI PEGENPLISAQRI DLEDVFELLGNTKGEVLCNVDNSLVK PI RFHTNPLVEAQRLTCIDASFSLL P DDEGAAGLAGVTRVVLPAFSLPV


EALLVDVRSHYS LIPEGENPLVNGYEVDLAQDVYRLLAGMKYTLLADTY SFVPVGETLKDGASUDASGUNPLLREVPIVTMCDDDNPLC
EAGG
LRGASVTVLTDVTTR
 DLPMGGRSLSRLASLDWRSI HPRLRE ELGPGGVELSRLARIDTAGLDPRLARTGKVACNPYN KLDVLPANFIKADKVKY DKKKLPFDITIVHDVNNPLL VRGARLTVLCDVTAAF
 RVSPGGRGLSAAVKIDTTKLHPKLADVSLTLACNIHNVLT LGRGGVALADLTVADLAGLDRRFRDVDLLVATDVASPLL ALPKGGAPLVRLASDDTAQLNDKAGALDYTLLADTRAD

SY DDTASPVT LLGLTDVTNPYH
 EVEPDPANFSLISEISNHSMTQPFTQSKMQCIVDVQTPLL PVHS VRNDPNARRLVSPAAFTS GANIKMLSDVTNPLL GTGTGG KVEAGGENDGKПATVDKTNVP DAARRELKAKITVIT

##  GLP

FERATAMPVTVLTDVTTPY
S LNPDAKNMDKDDSDDAS
NNNNNNNNNNNNNNNNNENNNILFKDVLFYFLTDVRNVMI PLRACGRTLPEVATDDSSRAVNLSGIEIVIAGDVTNPLT AVPKGGGYLGVI ESIGDTAQANDKAGAMNWILLADAPFSLS AVRKGAYLIKYURRIDLSGVHPQLTKVNDQLMSDFSSRLY

MTELTRLDLSGLNRKLSGVELTVACDVTSPLL
MNSPGSR
PV QGLRQLVTWQTYDFSQLNPSSTPILGLVDTKSSFQEN ELPHEGNVADRVASLSDDHIDNVMSDCKIIVACESTDPTH VSRPAAKDLANLQEDDLSGV KAPRVRMLVDVRAPLT MIGAEGFLEKTRGLQFTIACDVDTPYI
$P$ LPFTGDDLERDTGARLTPAFRQMFFCEVRLIGDVANPLV VEAGGLGTATVTVLTDVTTRYA AIKKCNENLSQUTINDDFEPRTKNTNFKTACDVNNVLY PAADARNPLLTINYFSITAVQKLLSGIELLVLADVTNPYT DNGDRARDLADLTADDLSALDRRLECTGFTVECDVTNPLT PLDEGAEALAGMTWLDLAPVRELVGTTELIAVVRSEQHLL QTHGGGKLGRLQQVDVTALAWQSSGVRLYYTAKDVVNGPLL VVRQGAGVIKYi RRMDMSNLHPKMETARDQVMSDFSSRLY TLGKGAAALESLADFDTAKLNVAAGALEWVLLADDMAGVD VIPHGVNPLINFAKFELNNARQLLAKVVDILAPDVSAPLS DLEHLPA
SVEPSPENLTAMRAV
VRRDWSGTRLVLATTTEGSLL
DAARRQMATTELVVASDVEHPLL

EGRQGRARLP
PGDAGVEGLRGVTSVDGGAVRALVGRTR\|SGADEVARHLV


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## UniRef90_U1ZSF4

 UniRef90-S4XBN4 4UniRef90 XOWF 4 UniRef90-UPI00016A9C75 UniRef90-JgSLY2 UniRef90-K6XDM5 UniRef90 IOV899 UniRef90 R7IKL3 UniRef90-D3FCD5 UniRef90 X1AVK9 UniRef90_L7LIP6 UniRef90-15CAN5 UniRef90-UPI00016A49DD UniRef90 UPI00021978DD UniRef90-U6BFU4 UniRef90-Q6AG88 UniRef90-M3VEU1
UniRef90 A1SLG4 UniRef90-D5NU54 UniRef90-UPlooo24926A9 UniRef90-R6HQF5 UniRef90_Q0S6Y3 UniRef90-R1H7R6 UniRef90-UPIO00468B25E UniRef90 M2QW99 UniRet90_D6AWZ9 UniRef90_16YZH5 UniRef90-UPIOOO3743CDO UniRef90-R6GMD4 UniRef90-C8NR65 UniRef90-W9GFY0 UniRef90-W1BCP5 UniRef90-C2CNP1 UniRef90-C3RGN2 UniRef90 A0A030ELT8 UniRef90_UPIO003815E62 UniRef90-I0AJ19 UniRef90-UPI00036A65E6 UniRef90 S3UZ82 UniRef90-A0AO22LGD4 UniRef90-L2HZY2 UniRef90 P9WMT6 UniRef90-R5Z942 UniRef90-B9EAD6 UniRef90 X7YVW3 UniRef90-UPI00037CD768 UniRef90-D4QQE3 UniRef90_UPIO00262890C UniRef90-D5UXR0 UniRef90 V6VX94 UniRef90-B6WBE8 UniRef90 Q76P02 UniRef90 L2TK23 UniRef90_UPIoo037369D4 UniRef90-H3VUL6 UniRef90 D5UFV7 UniRef90 - XVVGV3 UniRef90- W4TWZ9
UniRef90 UniRet90-N
UniRefog -
F812X7 UniRef90-AOAO23B7Q8 UniRef90-R7EUK8 UniRef90-R6SXM4 UniRef90-L7L815 UniRef90-Q4CNI8 UniRef90-A0A059MU07 UniRef90 A0A029RUF3 UniRef90-TOVLO1 UniRef90-R7EWC3 UniRef90_W8GZ67 UniRef90-UPIO0040C2232 UniRef90-UPIO00346F32E UniRef90-UPI00021920B6 UniRef90_-g9UZX4 UniRef90-S5T3D4 UniRef90-XOPCZ8 UniRef90-UPI0003B3C8A9 UniRef90_UPI0003B376C2 UniRef90-X7X3W5 UniRef90 A0AO55EBY2 UniRef90-A0A034SNK8 UniRef90-X8DAL7 UniRef90-K7S379 UniRef90_UPI0003B69DA2
 $R A A A V P G A G S A G G L G Y A V I A V L A A R I E P G V V A F Q N I L E L N$
$E V A E E L P G A G A A G G L G F M A M A L L G R M R G V D L V L E A T G F A$ QV $V D^{\circ} \mathrm{P}$ G
$D L A D E P G A G A A G G L G A A L L A L G A T R$ VS GATVVAEATGLA $P L L E R E P G A G A G G G M G Y A L M L G G G Q R A S A V D V V L R A W D F E$ DLRAAQGAGAAGGVGFACLALLGASVRPGIELVLDDAGFA EAAEAPGAGAAGGLGFAFRTALGAELVSGTDLVLQTIGAS $P G A G A A G G L G A A F Q A \square G$ DIS NLLKGAGAAGGLGAGLHAFLNATLRQGTD\II RLRDATGAGAAGGLGAFLLALGATREAGADVVAGVTGRA TFVDQA GYGAA GGVAAGLAAFFS $\square D \square R A G A D F F F Q Q V Q L A$ A VAQLSGGGAAGGLGAAMSAFLTATLRPGDEDVTDALRLR DVHPMPHSDSIKTLAGAFAMINARDLRSSFEWVSKVTGMD GAGAAGGLGGA 1 HAVGG TIVSGAQSILTYIGFE AVPSRLPGAGAAGGTGFGLLLWGASLVSGSAEVARIGLD DITGDAGAGAAGGLGAA LIALGGTRVSGATVVAEATGLE DKGAGAAGGLGFALLL LGGTREPGDGLVADAVRLA EGFGAAGA 1 PVGLTWLSSLLYANGALQPGAQYVAHRLGLQ D IHPMPHSGSIKTLA GAFAMIRAHDSRSSFEWVANVTGMD DV DNLPGSGAAGGMGGGMAAFFNSTLQPGDETVLDTVHFN DPSSVDATGAAGGFSGGMWARYGAELRSGADYILDVI GFD SFAERPGAGAAGGVGFAAMAVLGARMRPGDELLLDLLGFD D $\square H P M P N S D A D K T L A G A F A M I D A R \square F R S S F E W I V N V T G M D$
$K M K \square N G \quad A G G G L A A A F Q L F F D A K D K S A E K F D F E D L G D A$ DPRGVARTGAAGGFSGGMWAHFDAELADGAARVLDVLGFD NVKDIPGAGAAGGMGTALIAFLNAELRPG\|DVVLEETQFK PIADHPGAGAAGGDGMALLAVLHADFRPGUDLVIEQSGLD A ADDHRGGSGASGGLGAGLMALGAVARDRFDVLLSDTNLD RRPERAPGAGAGGGVGYALHLLGGRHVEGVDSLLDAVGFD

E




DVRTGPGADLLGRSDAFALALLGARLLPGATLVADVVDपP DVS
TYRDDPGSGAAGGVGWALRC LGAKYRPGAAAMLGWAKAV KTSLVLG\|GVSGG PVSQUPGSAAGGGLGLALAFLGASFLSA SDYLADLWALP RSACQPGSGCGGGAAYMLSVLLDTELKSGLAVVVDDEFB DVSDMPGAGAAGGLGGAFRAYLGAELKRGVDLVLDQDGFD EVADEP
ALRHTPGGGGAGGMSGFFRFVVGAKWMTGTDVVAELLD $\square$ DPREVDGTGAAGGFAGGMWAQFGADLRSGAEFVLDAVGFD D $\square$ ANKAGSGAAGGVGFALAAFLNAELVSGAELILD\|INFN
$D V S R V L G \square G A G G G \square P A P L V A \square L G A R \| \square P G \square D A V L D A A G F D$
EAALLPGAGADGAYALAA LGGRTCTGPQLCADAADLS EDRDTPGAGG AGGLGFGLLLLGGTVESGVRRVLEAVRLA DCRADAKAELATGLGYCFQTFFG
A $\square G P V E R G G A G G G \mid A A V L K G L Y A E D T S H A L V D Q L T H D E$ PGYGAGGAI PVALHW LSALLHGSADHVHQALDLP
 $S L D A D D S A P R L G R A P A F A L A L L G A R L D P G P E L V A A E V G L P$ GVRDLAGAGAAGGMGAALLALGGRRESGARVAEHTGLK GVSAEPGAGAAGGI GAGLLAV GGRYQSGAAIIAEHTHFA DVSAESGAGGAAGGIGAALLALGGRRESGAAFLAEHTALAE SVESVSAGSGAGGGLGFACLLLGGRVLTGSQWCSEHAGLP

UniRef90_UPIOOO47B7E16 UniRef90_U1ZSF4
UniRef90 S4XBN4 UniRef90- XoWF34 UniRef90 UPI00016A9C75 UniRef90-JgSLY2
UniRef90 K6XD UniRef90-10V899 UniRef90- R7IKL3 UniRef90-D3FCD5 UniRef90 X1AVK9 UniRef90_L7LIP6 UniRef90-15CAN5 UniRef90-UP100016A49DD UniRef90 UPI00021978DD UniRef90-U6BFU4 UniRef90_Q6AG88 UniRef90-M3VEU1
UniRef90 A1SLG4 UniRef90-D5NU54 UniRee90-UPIOOO24926A9 UniRef90-R6HQF5 UniRef90_Q0S6Y3 UniRef90-R1H7R6 UniRef90-UPI000468B25E UniRef90 M2QW99 UniRet90_D6AWZ9 UniRef90-16YZH55 UniRef90- ${ }^{\text {S5TIHO }}$
 HY $\backslash A D S T L V I T G E G N M D E Q S \square P L G I S R \square A S E H G V P V I A V C$ $D L L V Q A D L V I T G E G R \square D A Q K A P A G V A E R A R A A G V P V V A V C$

AEVAAADVVTGEGKFDSQTLSAASSLGARGAGAATVVLA ALVARHDLVITGEGCFDWASLRDSVAAGAARAGRPAVVLA


$R R \square G V A D L V L T G E G R F D E Q K V V A S V A A D A R R A G V P A V V L A$ DLI RQSHCVLTGEGHYDTQSAFGCLAEKVNPDAKRTLISS DAI RGASCVVTGEGCDDGQKAPGGVARUAAECGVPVVAIG
 A ALKDADVVITGEGRYDRQTARGKVASHAAAQNTPVALVA AEVAASDLVVTGEGKFDSQTDRGKVVSGAGGAGATTLVLA ERARAADLVVTGEGAFDFSSRPYGVAEDAQAALRPCVALA DLLDDAHLIITGEGAFDEQSVVGTIADIATDAHSTLGIVA
 TVAADASAIVVGEGRLDGQTKAIISAILARAGATPVYAVV A A LAA GAS LVVVGGEGSLCDEQTLSGKVARAAAAGGDPCVAAVS QTIRSADVLVTATDDUSAESMHFHLSK』AGTSK\|PTFVLC

ENV YDFVLTGEGKFDFQSRSYLIIKKYAPEGDPVYVVC ALLTVDVAVVVGEGRDDGQTAQGKIAVLHRVHGRPVIAVV QRIKDANLVVTGEGKMDKQKTPIGVAKVAKSYD $\square P V I A I C$



EK T S QA D LIVTGEGRFDEQS TTGKVVGTDTADETPGGIIA EKIKKGADLI ITGEGKADRQKVPYRILKEAQKEHDPVIVLA
$G \square A R E A R L V V T G E G V L D R G R T P A S V A R A S A R A G A P V V A V A$ $R N L S E V D Y L I T G E G K F D E G K A T G E L I D K K S D K V K R I F L V S$

DMIRPGDLVLT GEGRTDAGKLVDAVVHLCRKVGADCLVVS NDIANADVVISGEGRFDGQSAVGKVPSVAHAPGARSMLVA




$A Q V A S A Q A V V V G E G R \square D G Q S T Q G K T A V L A R S P G V N R F A V V$ ELLDRVALVVTGEGRFDRGKAAlALAARAARHGVDAVVLA NSLQSCDLVITGEGCDDTQSVPVAIARMAKKYQVPTIALC K QVKDKDLLI DTENVNENGENSINLARFAKRY EKFQSNQLII TGEGCFDETKVVSKMYYYSKTFNCKLLIIC GCLAGMNLVITGEGSDDEQTEHGKLLAVRRAHPVPVIAVA ELLIA A T DLLITTGKAN

$S K \square S G A G L V V T G E G R \square D R Q K \square P D T D R K D A D D A G V P V W A V C$ SLVESSDLIITTAEGGIDEQTIPSAVARITKLQDIPVITPA ELLLDVDWVFTGCTTLDASARVGTVSRLARDYGVPAIALA



AK LQRCDCMDTGEGSFDEQT $\square R F N K$
AALADADLVVVGEGRLDGQSRA

RALTDADLVDTGEGRDDSQSACNGVAARAAARGVPVVAVA
$R T L P \square A D L V V T G A T G F D F G S V V R Y L A D R A E Q A T R P V I A D A$ ERLSDADLVITGEGSFDSQSLPHGVASMASEHGVPCVVTA

NLVEQADLIIFGEGLNENDQ
A HVAA ADFVITGGPAAQSVAGQ LDTAAGEAVVGVDKPDVP AAVQGADLVITGEGRMDTQKVPQGMAD@ANHYHKP IIALV RRLPGALLVLVGTAYDQDTVHEDTARAADETATPTVVLA A AVAEADLVVTAAPALDHDGIPAVVGRAAMEVGVPVVAVG




UniRef90 UPI00047B7E16
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UniRef90_L7LIP6 UniRef90-I5CAN5 UniRef90_UPI00016A49DD UniRef90 UPI00021978DD UniRef90-U6BFU4 UniRef90_Q6AG88 UniRef90-M3VEU1 UniRef90 A1SLG4 UniRef90-D5NU54 UniRef90_UPIOOO24926A9 UniRef90 R6HQF5 UniRef90 Q0S6Y3 UniRef90-R1H7R6 UniRef90-UPI000468B25E UniRef90 M2QW99 UniRef90-D6AWZ9 UniRef90-I6YZH5 UniRef90-S5TIH0 UniRef90 UPI0003743CD0 UniRef90-R6GMD4 UniRef90-C8NR65 UniRef90-W9GFY0 UniRef90- W1BCP5 UniRef90-C2CNP1 UniRef90 C3RGN2 UniRef90 A0A030ELT8 UniRef90_UPI0003815E62 UniRef90_IOAJ19 UniRef90-UPI00036A65E6 UniRef90 S3UZ82 UniRef90_A0A022LGD4 UniRef90_L2HZY2 UniRef90 P9WMT6 UniRef90-R5Z942 UniRef90-B9EAD6 UniRef90 X7YVW3 UniRef90-UPI00037CD768 UniRef90-D4QQE3 UniRef90_UPIO00262890C UniRef90 D5UXR0 UniRef90-V6VX94 UniRef90-B6WBE8 UniRef90-Q76P02 UniRef90 L2TK23 UniRef90_UPI00037369D4 UniRef90-H3VUL6 UniRef90 D5UFV7 UniRef90-X7VGV3 UniRef90-W4TWZ9 UniRef90-N1PUB5 UniRef90 F812X7 UniRef90_A0A023B7Q8 UniRef90-R7EUK8 UniRef90 R6SXM4 UniRef90 L7L815 UniRef90_Q4CNI8 UniRef90-A0A059MU07 UniRef90 A0A029RUF3 UniRef90_TOVL01 UniRef90-R7EWC3 UniRef90_W8GZ67 UniRef90 UPIO0040C2232 UniRef90_UPIO00346F32E UniRef90-UPI00021920B6 UniRef90 J9UZX4 UniRef90_S5T3D4 UniRef90-XOPCZ8 UniRef90-UPI0003B3C8A9 UniRef90 UPI0003B376C2 UniRef90-X7X3W5 UniRef90-A0A055EBY2 UniRef90 A0A034SNK8 UniRef90-X8DAL7 UniRef90-K7S379 UniRef90_UPI0003B69DA2
 GNDALGFTRAYSLRELQPDLSQCINQAGPLLEQIGSTIGS GS GADLIF D RVY ALLTDLEPDVASCLRSPGPVLTRUGQEIGV

GQVALGADEDHADVDVAGSVEVAMADAENQLAALAESVAS $G Q L Q V G L A G A Y A V A E R P A D V A A T M A D P V G T L S A R A Q R L A R$ GVNTLPEDSLYSLADLEPDLSVCFREGGRLLRSLGERIAA GSIGEG DDAFFP $\square G T P A T E A S A M E T A K D N L R R T A A E ~$ GRVID

G QVRDGVTVAYSMADWAGSSARALADPAP LLAGLAQTVAA GTLGRKAPADRF DADPP LQQEMAKKEAAENLFRACYQAF
 NNFVDDFQNYEQMFTGDFSTQMTEYDDEENYESVANQLTR GlVEEK 1 P GALDHVNRPVTLD RLI EAPTTA $G Q V T \square T P E E A H A \| V D V A G S V E V A M K D A E N Q L G R L A A G V A A$ GQVALGDESAYSLVELVGEERAFADPAGALADLAERVAR GRIDVPAPSLSASLSQQGSMHDQLKEAGRALAQ $N N F D D D F E D Y E Q L F T G I T S T Q Q M M N Y A E H Y E S D A N Q L A R$ GAYEEGVTGDFSUNRVALPYEQDKLRAKDDGRLTDDNIMY GSVGDDLGDYRSRFAGVLVATDAVA MHDAGRTIAA GRCADSARDLDSAAYALTDLEPCMAEAAPLLRRLARRVAA NNF IDNFEGUFSTQMSAYSVNKWDEKTFDNYEAVANQLAR
 GSVGDDLGAYAERFAE\|IVASDADA LRRAGGRVA GSLHHGIDSVFS $\square$ MERPCHLDEALKEGALHVKHTTTNIAR
 GSRREAIDAGFSGVYTVV

 GSRRAR HAVYALTDDEPDARGLRQAGPLLEQLTVADAD GKDEDDVKQCFQLDDLFKDEKESLLKPEFGLK I I S KQUK S

G A V A D
GAI EAPLDDYVAAAQTTGEPDDALADPDRFATDAGQRLAR GSVDVGISAVFPILPAAVPLQEALQQATDNLHRTAKNIAS A LRSAGI MAALSI AEYAGSVRDALADAANQLMGLASQVAA GGRADNLDAVYPVCRRPMPLDQALQEATTNLICAGEAAVR
$G Q V V L G \square M S A L S \square A D Y A G S \square R \square A \square A D A A N Q \square M G L A S E V A A$
GSLGFGAET TRDEFTGVL
VASTPEEMRAAGRVIAG GQVQHHVRHAYSLVETAGSVEASMRDADGALRADAEQVAG GSVKEDFLAVFSIQQQP $\square$ SLEAADDKTTSNIKILAANLML G GSRKYWAPAGFEY $\square$ HS $\square$ GDYTD RNTAADPELTGELLTR

GEVQVGRRELYAVAEGADAVRAALADPGGS LRARATRVAR GRCD LPPFERDICDSDQEPDVEASMAQAGPDLSRAVEQAVR ALYDEGLTGGYPLLDRPRPTPSVWRSLATLIEHAAYRVGLL
 GCVRSGLLDGFAAVRGVSPLNASRED
GAVRDGFRIVWAVTPPAMSLEEAMRPAKHLVAVATRND

## G

GQ $\square$ R HG $\square$ S D MYS $\square$ A D TAPD $\square G Y$ A $\square$ AHPAP LLHKTGAA $\square \mathrm{CR}$ A QVQF GDESAYAMEREPDAVTDA DDTEFAARVAR GAVKAGITETYSLVESAGSVKAAMGRSADELRSMAADIAR
 GQRAADLGA
RSVSVGRREGMSLVSGSYEL WEVHVGISASYPVIDPPGTGPAPSTDPLTALQARAERIVK $G Q V T L G I A R A E S I$ AQFAGSVQRAMRDAAGQLAGLAAHVAQ A LRSAGIMAALSI AEYAGSVRDALADAANQLMGLASQVAA GTLGENLGAAFSIQQGP LLLADALENVKTL $G Q V C V D G D A L R S A A D Y A G S V R \square A L A D A A N Q L M G L A S A A A A$

| UniRef90_UPI00047B7E16 | E WL |
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| UniRef90-U1ZSF4 | D |
| UniRef90-S4XBN4 | LI |
| UniRef90-XOWF34 |  |
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| UniRef90-C8NR65 | L LMLGG |
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| UniRef90-L2HZY2 | L L Q V |
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| UniRef90_R5Z942 | S F D L G R |
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| UniRef90-V6VX94 | LI |
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| UniRef90-K7S379 |  |
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| sol25 | B B B |
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| sol0 |  |
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