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 GGILE STVFPGKYAMEDSAVVYKNWVFPDQALPTDLLKRG GGVLERTVFPATYAMEMSAVLYKNWVFTDHALPTDLLNRG GGILEATVFPSKYAMEMSAVLYKDWAFHEQALDADLIKRG



 DGVI ERSFLPGKYSLEMSSAVYKSWVFTDAQALPADLIKRG GGGIFE $\quad$ TTVFPSKYAMEMSSFI YKHWTVPDQAGLPAELKKRG


 GGILEQTVFPTKYAMEMTSAAYKDWVFPEQALPADLIKRG

 GGI I E QAFLPGKYSMEMSSVVYKNWVFTDQALPADLLKRG


 G GVLEKTVFPGKFALEMSAVVYKNWVFTEQALPANLLKRG GGILEATVFPAKYAMEMSAVVYKNWNFVEQALPADLIKRG DGII ESSFSPGKYSMEFSSVAYKQWRFDHEALPKDLI SRG GGVLERTVFPAKFSMEMSSADYENWVFTEQA$L$ PADLKKRG


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 A GII ETTFSPGKYCMELSSVAYKDWRFDTEALCAADLI RRG DGLLEATHFQSKFAMELSSYDYRDWNFDEQALPADLLKRG



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L P S Q T P P K G L L R R L



P S Q T P S GL R R L R K E E I I L R G N G L G K Q Q A G D R I Y D Y D V Y


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 E ERR
E HAR
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WK ILK
PRVVKAVAEAD


D ILQFDSPILL
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$T L A G L N P L C I$


## $\frac{V}{T}$



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440
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 EGLEMTVFPAKFAMEMSSVVYKHWVLTEQGLPADLIKRG AGGI ESTYLLGKYTMEMSAVVYKDWVFTQAGGPTDELKRG GGLIEQTFTPGKYALEMSAVVYALWRFDQEALPEDLI RRG DGVEACFTPGRYGMEISASAYKNWRFDLEGLPADLI RRG GG｜LESVVFPDKFAMEMSAVVYKSWNFMEQALPTDLIKRG GGU ERSFSPQKYSMELSSVAYKLWRFDTEALPADLVRGG GGI I ERSFSPQKYSMELSSVAYKLWRFDTEALPADLVRRG NGI ESSFSPRKYSMQLSSDAYAQWRFDHEALPADLISRG
 NGII EITSFSTNKYSMEISSVAYDQWRFDLQALPNDLIHRG GGVLENTVFPGRYAMEMSAVVYKNWVFPEQGLLSQUSSRE GG｜ESSFSPGRYSMELSSAVYALWRFDMEALPADLIRRG
 NG｜：ETSFSLGKYAMEFSSVAYDEWRFDQEALPQNLISRG GGILESTVFPSKYAMEMSSVIYKNWVFPEQALPTDLLKRG GGIVETCFWPGKYSLELSSDVYKLWRFDREGLPADDLISRG SGILEDTFFPKKYTMELSSVAYKDWQFDMQDLPNDLINRG DGII EESFWPGRYADELSSVAYATWRFDAEALPEDLLRRG GGVIENTFSPGEYCMEMSSVIYKQWRFDEQAEPRDEMKRG GGI ETCFWPGKYSLELSSDVYKLWRFDKEGLPADLDNRG DGVIESGFTPGRYCMEMSSFAYDNWRDDQEGLPADLIRRG DGVIEMTVFPGKHAMPMSSMVYKNWNFTEQALPDDLIKRG
 GGI FEKTMFPGKYALELSSAMYKDWRFDEQALPKDLLKRK DGULEKTSVQGKFSLEYSSWVYKHWNFVDQALPDDLVKRG GGU ESDFSTKEVSMEDTSFAYKNWRFDMETLPADLIRRG GSIU
 GGII ETDFSSGKYSTEIISAAYKDWRFDMEALPADLIRRG DGVIELGFTPGKYSTEMSSK円YKEWKFNEQGLPADLLKRG GGLVESTFLFEKYCMEMSAVVYKDWVFAEEGLPTDKKNRG GGFFEMTVCPGEHADRDSSEVYRNWNFTEQACPVDLIKRG GGUESSFSPAKYAMELCSDGYKLWRFDREALPADLISRG GGVIESSFSPQKYSMELSSVAYKLWRFDMEALPADLVRRG KGUIERTFSLRRYSVEMSSLAYKGWRFDQEGLPADLLKRG DGI ESTFSPGKYCMLLSSAVYDFWRFDKEALCAADLIRRG GGV ESNFTAGKYCMEMSCAAYRDWRFDLEGGPADLRRG EG｜I ESFFSTVECSMEDTAPVYRNWRFDMDSALPADLIRRG GGULEKTLFPGKDCMELSSELYKEWRFDEQACPKDLIKRR
 EGUIESSFSPGKYSVELSSVAYQQWRFDREALPADLINRG GGVIEKSFSPGKYSFEMSSAAYDSWSFDDQSLPADLIKRG SG\｜IEANFTPGKYSDEDSAVVYSQWRFDQQGLPADLIARG GGLLEMTMFPGKFALEMSSALYRNWRFREQALPDDLLKRG GGU IEDCFTTGRYSMEMSAVVYGSWRFDQEGLPADLIKRK GGILEKTLFSAELSMQLSAELYKEWRFDEQALPADLLKRG DGI I EQTFSPGKYSLELCSVAYK【WRFDTEALPADLIRRG GGVLEGTVFPGRYALEMSSAIYKTWVFPDQALPVDLVKRG DGIIEKTFSPGEFSMEDSSAAYKQWRFDMEALPEDLIRRG GGIIEGCFSPEKYSIELSSAAYEQWRFDMEALPADLI RRG
GGIIEKTFTPHEDSMQMS GGI IESTFSARGYCMEFSSLVYKKWQFDTQALPEDLIRRG GG｜LEKTLFTGELSMELSAELYKEWRFDEQALPADLLKRR EGLIENIFSTGKYSMESSSLVYKQWQFNLEALPADLIHRG



## UniRef90 b9RHK9 UniRef90-W9QWQ0 UniRef90- COPT31 UniRef90-K4BYJ7 UniRef90-V7BNL6 UniRef90 W5CP87 UniRet90-UPIOOO42B8A80 UniRef90-V7ATG3

 UniRef90-B9S7M3 UniRef90-T1LHL5UniRef90 ${ }^{-19 G M A 5}$ UniRef90-V7AS97 UniRef90 D7TZR1 1 UniRef90-UPIOOO2B47E60 UniRef90-W90X55 UniRef90_Q14ST8 UniRef90-A9SEG6 UniRe90-R9WTS6
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UniRef90-K4A5M1 UniRef90-V4TFT4 UniRef90-IILWA1 UniRef90_Q9ZU05 UniRef90-J3MFV3 UniRef90-D8R2L2
UniRef90 A4ZFZ1 UniRef90-M1AD08 UniRef90-UPIO002B4C254 UniRef90-K4CVG4 UniRef90-A7YX85 UniReffo-O9XFL9 UniRef90-G7J629
UniRef90 J3LAl4 UniRef90-V4W091 UniRef90-V7C680 UniRef90-M4CH43 UniRef90-111Y79 UniRef90-T1LYGO
UniRet90 O9FEN8 UniRef90- Q9CAG3 UniRef90_U5DD53 UniRef90-M0тA05 UniRef90-UPI00042B431B UniRef90_K7L7J5 UniRef90-G9L7U1
UniRef90 B9RZA3 UniRef90-11M240 UniRef90-B8LLK5
UniRef90 G7LY4 UniRef90-W5GF10 UniRef90-W9R031 UniRef90-MOTAZO
UniRef90 J3MUAB UniRef90-D8S603 UniRef90-A4ZFZO UniRef90-K3XV98 UniRef90-UPIOO042B1560 UniRef90-A4ZFY9
UniRef90 V4UAR3 UniRef90-V4IAR3 UniRef90-G7LIY6 UniRef90-F6GUDO UniRef90-UP10002C3065A UniRe990 D8R7D5 UniRef90-D8TFY6
UniRef90
MOS5 UniRef90-D8R6V6 UniRef90-D8QSL88 UniRef90-V7APW9 UniRef90-MOSDU5 UniRef90-UPIOOO42B2137 UniRef90-Q8GSM3 UniRef90-Q01S17 UniRef90 UP100046DDFF6 UniRef90-UP10002B4AODF UniRef90-V4U026 UniRef90-A9SNEO UniRef90-UPIOOO2B4B986 UniRef90-B9SMP UniRef90-M4Z108 UniRef90-UPIOOO42B484F UniRef90-W5H5B2 UniRef90-MORJ28 UniRef90-111FF6
UniRef90_E5Rsoo
MA


A
 SHYYPD DPS LV E S D E E L Q A WWT E I R T V G H G D K Q D E T W WP V L NHYYSSNSSVVKS D Q E L Q A WWTE IGQKVGHGDKYKEPWWPSL


 SFYYYK D D K MV S N D S E L Q S WWK E L R E K G H E DK K N E H WWP KM

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

 NHYYPDA G LI T S D E ELLQA WWSEV KN DGH GDK K DEP WWP E L A A Y Y A S D EAV Q S DYELLQSWYAEAVRSGHPDKR DAP WWPRL
 K HF Y S D S K S I T S DLLELQ A WWDEIIKNKGHYDK K DE P WWP KL $S\|F Y R N D V S V R N D S E I Q E W W F E\| R Q V G H G D K R N E N W W F K M$ $T \| Y Y P S D D A L R A D A E L Q A W W K E M R$
TYYYPSAGBI QSDPELNAWYYEFINVGHADIRHESWWPRLD

 N Y Y Y P E P S L V Q F D T E L Q S WY K E S IVN V G H A DV S N A N W WP R L






 NYYYPDASAVNFDTELQAWYNESINLGHAD DRAHASWWPKL
 $D$
$S$

SLFYENDSSVNS NFYYKSDKDV者 HYYYPSASVLHSDTEEQAWYMESINSGHADLDRHASWWPKL NTFYKSDAALQADNELQKWWSEVRSTGHGDKSHEKWDSGV DIFYKDDASVRDDTELQAWWQEVVNVGHADKK VGWTDL AYFYPDDRSVASDVEVQSWHEVRTVGHGDKRNDECWDPG DIFYKEEASVAADTELQSWWHE:RYVGHADKKDADWWDKL
 DYYYPDASHVKEDS SFYYPSDEVVKEDNE

NH
EVFYKDNTSVRSDKE
RRDEELRKWWE

DHYYPNPNVVNSDDELQAWWTEIRTVGHADKKDEPWWPIL
N VVYGSDKAVQDDAELQAWWKEAVEVGHGDKKDAPWWPKA
 A HYYACAADIVDDVELQAWWKE
AHFYHRDEEVAGDAELQAWWDDVRSVGHGDRQDPACWDED $N \prod A Y K S D E A V R G D K E L Q A W W N E I V T V G H A D \square K \quad T G W P K A$


 ETPK DLI D IIT T I A WI A S GHHAAVNFA QYTYGGYFPNRPT
 DSKKNL ALAALTTIDWVASAHHAAVNFGQYAYAGYMPNHPT NS $\square$ E S L I Y T L T T A WVA S CHHAAVNF GQYAYAGFMPNFPS


 D T R D GLVGGL T T M MVV T S GHHAAVVNF GQYHYGGYFPNRP T
 K T Q D D L I G VAT T A WV A S GHHAA V NF GQY GYGGYFPNRPT






ARTKMPDPTFEEWEAFMEKPEDVLLNCFPTQDQATKVMA


L S RRFMPE
lin lin in live G G
ATHKA I PAENSDEHKKLLANPEKFELESVSRKLGA IVVML




L LRKLI P E E
L GRRFI PDEGTPEF
Y

 KMRRLVPMEGDVEYANFLADPQGYFLSSLPSUSQTTYFMS


 VARLLKMPTEDADE WKKFMEKPEFALL QCFPS QIQQATTVMA $K F L L N P Q Y M F L S A L P S Q L Q A T Q$ M A $\square A R T K M P V E E P D D M A K F L D N P D C A D R D C F P S Q V Q A T V V M A$ T T H R P I P E K D S D E H K K L L A D P E R F F
 HMRR L L P E E H DP E Y T T F MQ D P Q K Y F L S SFP S L L E A T K Y M A






 L CRRRFIPPEE GT F E Y A E F L T D P D K Y Y L N ML P E R G E M L L GI A I A R T N M PVED


$\square A R T N M P T E D D Q \square P E A F \prod N N P E N V I L E A F P S \square A Q A S T V A Q$ I ARTNMPTE EP DDMKFFLENPQAVLLDSFPTQLQADQVMA MTRKLIPDEGTAEFEEFRNDPESFYMSMDSNETQAAVI A $\square$ IA R $\square$ NMPTEDFD DPEK LINNPE SVMLEAFPS DAQASTVAQ
B47133


L L D LS S H S P DEE Y DG T S ME A S WE A E P A DK S A FEEF C G R L L I EIL S K H S S D E V Y L G Q R DE P E WT S DAKALDDAFKRF G S R L V L DVL I L NLLSNHSSPDEEYI GQYMEPSWAENQTIKTSFERFNKRL L I Ell L R R H S S D E V Y L G Q R S T P E WT T D S A A L E A F E K F G K K L
 TIIEI LA THA DDEEYLGQRATPNWSNDEKVLNAFAKFT QKM
 -$-1-\Gamma$

| T |
| :---: |
| V |



LI E V L S R H S A D E $\square Y$ Y L G Q R D S P E WT S D A E P L A A F E R F G K K L



VLDVLS THSPDE E Y L G N Q ME P A WGK DP T I FA AF ERFS GR I T EALS THA I HEEYLGQGPSPNWTSEDRVLAAFSRFQKRV

 $V$ L H L L S T H S AD E E Y L G D R K D S T WA G D P E I L GA F YK F S M E M



UniRef90 B9RHK9 UniRef90- W9QWQ0 UniReforocopt31 UniRef90-K4BYJ7 UniRet90-W5CP87 UniRef90_UPIo0042B8A80 UniRef90_V7ATG3 UniRef90-B9S7M3 UniRef90-T1LHL5 UniRef90-B9GMA5 UniRef90-D7TZR1 UniRef90_UPIo002B47E60 UniRef90_W9QX55 UniRet90-S8EN84 UniRef90_Q14ST8 UniRef90-A9SEG6 UniRef90-R9WTS6 UniRef90-G3GC08 UniRef90-B8BCA6 UniRef90-B8BCA6 UniRef90-R9WSO4
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UniRef90_MOTAZO UniRef90-Ј3MUA8 UniRef90-D8S603 UniRef90-A4ZFZO UniRef90-K3XV98 UniRef90-UPI00042B1560 UniRef90-A4ZFY9 UniRef90-V4UAR3 UniRef90-B91B24 UniRef90-G7LIY6 UniRef90-F6GUDO UniRef90-UPIOOO2C3065A UniRet90 D8R7D UniRef90-D8TFY6
UniRef90
MOS5 UniRef90-D8R6V6 UniRef90 D8QSL88 UniRef90-V7ASW9 UniRef90-S4UTF2 UniRef90_UPIO0042B2137 UniRef90-Q8GSM3 UniRef90-Q01S17 UniRef90-UP100046DDFF6 UniRef90-UPIOOO2B4AODF UniRef90-V4U026 UniRef90-A9SNEO UniRef90-UPIOOO2B4B986 UniRef90-B9SMP7 UniRef90_UPIO002B47133 UniRef90-M4Z108 UniRef90-UPI00042B484F UniRef90-W5H5B2 UniRef90-MORJ28 UniRef90_-111FF6
UniRef90 E5RSOO


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KKLDD\DSRNRDP【LR VEIEKRIVKMNNDPANK MELKGII NLRNADKNLK KEIEGLIDSRNGNYLK


NRTGAGLVQYQLLKPFSGHGVT NRTGPVKMPYMLLYPNTGEGLK NRHGAGSLPYELLMPADKSGVT NRCGAGLVPYELMKPFSGPGIT NRVGPVKVPYTLLYPNTSDGLT
$N R C G A G V V P Y E L L K P F S G A G V T$ VNVENLIHELHADRSLR RAGPVQLPYELLIPTSGPGLT NRVGPVNLPYTLMFPTSTEGLT


KE: EGTVVDRNNDPELR
NGAGDMPYESLKPFSGPGVT ANRNGAGVPYLL
$\qquad$ NRAGAGVVKYELLKPITSEPGCT VRRAEEETERRNADPARR
 NRTGAGMPPYELLLPTSPHGVT NRSGPRVIPYTLLYPSKKGGLT
NRNGPAKMPFTLLIMPSSEVGIT
 NRTGPAKFPYTVLLP SSEPGLT
NRYGPSQVPYTLLYPSTEGGLT


NNRCGAGIPPYELLVASSAPGVT



EETEETINRRNKNYMK KEI EGVIDGRNKDRSLK RKVERSIDNRNDPAKK GEI EELIKARNQEKRLK

NRSGAGVPPYELLLPLSGPGVT NRCGAGILPYQLMKPFSGEGVT NRVGAVNVPYTLLYPSSANGIT NRYGRVQLPYELLYPSSDHGLT

NRKGPGVVPYVQLKPNYGDSVM NRCGAGVSPYELLMPSSEPGVT NRCGAGVSPYELLDPSSGPGVT NRNGPVKVPYELEYPKSGPGLTT
$N R W G P A K I A Y K L M H P D D G G L T$ NRSGPAKLPYEGLYPDSTWGYT




 REVEHQVMANNKNPSLK

RR1 EEE: EKRNADPKLR
 NRHGAVDGYTLLCDNSKPGLT


DETESRTMDRNNDSRKNRTGPVKMPYTLLYPREGGLT RDIAEQVEEWNKDDSRRNRHGAGVVPYVLLRPLNGKTVM LEVEKNUVAKNDKGSGFKNRTGPVNIPYNLLFPYASGGVT

NRRGAGVVP YEVLKP TS GF GVT NRNGAGVVPYELLKPFSGRGVT HRHGPAQVPYELLHPSSEPGLT NRRGAGLVPYEVLKMTSGSGVT

 | $R$ | $N G A$ | $G V$ | $V$ | $Y$ | $E$ | $L$ | $L$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $C$ | $G A$ | $G V$ | $L$ | $P$ | $Y$ | $E$ | $L$ | NRR



 | $K$ | $E$ | Q | R | $R$ | $M$ | $M$ | $Q$ | $R$ | $N$ | $R$ | $D$ | $P$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $M$ | $L$ | $K$ |  |  |  |  |  |  |  |  |  |  |
| $L$ | $E$ | $R$ | $I$ | $E$ | $C$ | $K$ | $N$ | $T$ | $D$ | $P$ | $R$ | $L$ |  |

| UniRef90_B9RHK9 | G K G\|V|P N S TTS $\|l\| l^{690}$ |
| :---: | :---: |
| UniRef90-W9QWQ0 | CRGVPNSVS |
| UniRef90-СОРТ31 | GRGIPNSVS |
| UniRef90-K4BYJ7 | CRGI P NSIIS |
| UniRef90-V7BNL6 | GKGI P Y SVS |
| UniRef90-W5CP87 | GMGI P N S V S |
| UniRef90-UPI00042B8A80 | GK GVVPYSI S |
| UniRef90-V7ATG3 | FRGIPNSI S |
| UniRef90-B9S7M3 | G K Gll P N S V S |
| UniRef90-T1LHL5 | A R GIP P SI S |
| UniRef90-B9GMA5 | GKGVPYSI S |
| UniRef90-V7AS97 | F R GII P N SVSI |
| UniRef90-D7TZR1 | CRGIP |
| UniRef90-UPI0002B47E60 | GK GVPYS |
| UniRef90- W9QX55 | ARGIPNSIS |
| UniRef90-S8EN84 | CRGVPNSISI |
| UniRef90-Q14ST8 | F R GIP P S I S I |
| UniRef90-A9SEG6 | MRGI P NSIIS |
| UniRef90-R9WTS6 | CRGVPNSISI |
| UniRef90-G3GC08 | GK Gll P N S V S I |
| UniRef90-B8BCA6 |  |
| UniRef90-B8BCA6 |  |
| UniRef90-R9WS04 | G K GVP Y S 1 S |
| UniRef90-K4A5M1 | AMGIPNSIS |
| UniRef90_V4TFT4 | G K GVPP S S I S |
| UniRef90-I1LWA1 | GK GVPP S A S I |
| UniRef90-Q9ZU05 | GRGIPNSVS |
| UniRef90_J3MFV3 | GRGI P N SII S |
| UniRef90-D8R2L2 | GK GVP P S I S |
| UniRef90-A4ZFZ1 | GK GVPNSI S |
| UniRef90-M1AD08 | GK GVPPYSI S |
| UniRef90-UPI0002B4C254 | GRGIPNSVSM |
| UniRef90-K4CVG4 | GKGIPNSVS |
| UniRef90_A7YX85 | G M GVVP Y SV S |
| UniRef90_Q9XFL9 | A K GI P N SI S |
| UniRef90-G7J629 | GKGVPYSII |
| UniRef90-J3LAI4 | GRG\| P N S |
| UniRef90-V4W091 | EKGVP Y S I S |
| UniRef90-V7C680 |  |
| UniRef90-M4CH43 | GMGVPYSVS |
| UniRef90-111Y79 | C R GVP NSV T |
| UniRef90-T1LYG0 | AKGIPNSI S |
| UniRef90-Q9FEN8 | GRG\| ${ }^{\text {G N S }}$ |
| UniRef90_Q9CAG3 | GRGI P N S I S |
| UniRef90-U5DD53 | GK GVP P S V S |
| UniRef90-M0TA05 | GKGIP P SVSI |
| UniRef90-UPI00042B431B | CRGVP N SVTI |
| UniRef90-K7L7J5 | FRGI P N SVS |
| UniRef90-G9L7U1 | GRGIPNSVS |
| UniRef90-B9RZA3 | GRGVPNSIS M |
| UniRef90-I1M240 |  |
| UniRef90-B8LLK5 | VQGVPNSISI |
| UniRef90_G7LIY4 | GRG\| P N S |
| UniRef90-W5GF10 | AK G IP N S IS I |
| UniRef90-W9R031 |  |
| UniRef90-MOTAZ0 | G R G $\\|$ P N S $\square$ S I |
| UniRef90-J3MUA8 | GMGIP P S TSI |
| UniRef90-D8S603 | GK GIIPNS $\square$ S I |
| UniRef90-A4ZFZ0 | GK GVP P S TSI |
| UniRef90-K3XV98 | EMGIIP T S 1 SI |
| UniRef90-M5WM47 | CRGVPNSISI |
| UniRef90-UPI00042B1560 | SRGVPNS |
| UniRef90_A4ZFY9 | NKGVPNSISI |
| UniRef90-V4UAR3 | GK GIIPNSIISI |
| UniRef90-B91B24 | GK Gli P N NISI |
| UniRef90-G7LIY6 | F R E IE |
| UniRef90-F6GUD0 |  |
| UniRef90-UPI0002C3065A | A R G $\\|$ P N S 1 S |
| UniRef90-D8R7D5 | G R GIIP N S I T I |
| UniRef90-D8TFY6 | GRGVPNSISI |
| UniRef90-M0S5H6 | GRGIPNSVS |
| UniRef90-D8R6V6 | A R GIP P SVSI |
| UniRef90-D8QSL8 | GRGVPNSISI |
| UniRef90-V7APW9 | GRG\| P N S |
| UniRef90-S4U7F2 | GK G IP N S $\\|$ S |
| UniRef90-M0SDU5 |  |
| UniRef90_UPI00042B2137 |  |
| UniRef90-Q8GSM3 | EMGI P N S I S I |
| UniRef90-Q0IS17 | GK GIIPNSASI |
| UniRef90-UPI00046DDFF6 |  |
| UniRef90_UPI0002B4A0DF | GK GVP Y SVS |
| UniRef90_V4U026 | EKGVPYSIS 1 |
| UniRef90-A9SNE0 | GK GVPNSTSI |
| UniRef90-UPI0002B4B986 | GK GVP Y SVS |
| UniRef90-B9SMP7 | GK GIIPNSISI |
| UniRef90-UPI0002B47133 | ARGVPNSVS |
| UniRef90-M4ZI08 | GK GVP P S V S |
| UniRef90-UPI00042B484F | C R GVPTS AS I |
| UniRef90-W5H5B2 | GMGVPTSDS |
| UniRef90-M0RJ28 | GR GVP P S V S |
| UniRef90-11IFF6 | GKGIIPNSVSI |
| UniRef90_E5RS00 | $\mathrm{GRG\mid V} \mathrm{P}$ N S\\|I $\mathrm{S}_{1}$ |

UniRef90 A9U1H4 UniRef90-M0TSS3 UniRef90-B9F5I2 UniRef90-I1KLK0 UniRef90 B1ABU5 UniRef90-D8R7D4 UniRef90_A0A059B6X9 UniRef90_Q41244 UniRef90- M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAV0 UniRef90 A0A059AVJ6 UniRef90-F2DM79 UniRef90-W5G3J1 UniRef90-11PU88 UniRef90 A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90_UPI0002C35D23 UniRef90 J3LKL7 UniRef90-K4B0V2 UniRef90-B8LM20 UniRef90 UPI0003EAC6EC UniRef90-W1PMR3 UniRef90-K3YE85 UniRef90_M8BQS2 UniRef90 E5RRZ8 UniRef90_UPIO002BC8F24 UniRef90-M8CDG7 UniRef90 A1XCl1 UniRef90_UPI0002B46164 UniRef90-Q9M3Z5 UniRef90_UPI0002B416B8 UniRef90 ${ }^{-}$K4AJD2 UniRef90_UPI00046DB33B UniRef90-A2ZLM2 UniRef90 M0TA04 UniRef90-Q39874 UniRef90_A0A022S312
UniRef90 G7LEB2 UniRef90 ${ }^{-}$MOWVM6 UniRef90_B3VA22 UniRef90-A3ALS8 UniRef90 A3ALS8 UniRef90-V4RZ49 UniRef90-T1N5E9 UniRef90 ${ }^{-}$M8A1U0 UniRef90 K7KYV5 UniRef90-W1PNW9 UniRef90_I1LBC0 UniRef90 UPI00032AB47A UniRef90- V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90 UPIO0042B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90 K7LX80 UniRef90-V4UAG7 UniRef90-U5GV40 UniRef90-K7KYV6 UniRef90 D6PAW4 UniRef90-A0A059B6Y5 UniRef90_F6H9C9
UniRef90-IODHH2
UniRef90_G7LIA2
UniRef90 B9T7Z9
UniRef90- S8CJ37
UniRef90_A0A059AAV9
UniRef90-UPI0002738C05
UniRef90 A5ANS7
UniRef90_G3NY91
UniRef90-R7WBQ0
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UniRef90_M5X714
UniRef90-K4ATG3
UniRef90-C0PHP9
UniRef90-UPI00042B0E85
UniRef90_G7K037
UniRef90-D8RHQ8
UniRef90_UPI0002B45BD5

L|PHETPAGLLKELREKE|L|KETRGDGTGMRNETER|IYDFDVVY



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

|  |  |  |
| :---: | :---: | :---: |
|  |  |  |
|  | L |  |
|  | PSQTPKGVEKLRKSELEA | RGSGHGERTAHERI |
|  | PSKTPGGMKKLRHSEL | RGNGTDERKPHDRIYD |
|  | L | R1 |
|  | PASLKALREQELI N | $R \mathrm{GDGTGERQDGDRI} Y \mathrm{D}$ Y A |
|  | K D TPSGLQKLRSFEMATL | RGNGTGERKHHDRI Y Y Y D |
|  | GLRRLREEELE | RGDGQGERKAFERI |
|  | ALIKL R K E L S |  |
|  | L RELREKELK | $R \mathrm{RDGTGVRKDSDRIMSYA}$ |
|  |  |  |
|  | L K K L R EQD MVEL | DRI Y |
|  |  |  |

MPAPLVPYWQDELK ILRRGDNHGPYEKHDRVYRYDYY LPS QTPNGVVGLRKRELEVVRGNGCGERKAHDRIYDYDVY $L \operatorname{P}$ S D T P P G L Q K L R T L E M E H L R G D GT G E R QVA D R I Y D Y DV Y $L P S Q T P N G L L Q L R K Q E L D T L R G D G E G R D R E W H R A Y G Y D F Y$


LPERTPGGLLKLRAEDLSNDRGDDMNERKAFERDYDYDFY D TPSPLLAYREDELAVLRGEGEQPFQEWDRVYDYALY
LPS QTPRGVKNLRKEELRATRGDGRGERKEWERTYDYDVY $L P G D T P A P L K P Y R Q D E L L N L R G D V T G E L K E W D R V Y D Y A Y Y$
LP TE T P S G L E KYR QK E LEA L R GD GRGERK TADRDY DY DF Y LPS QTPRAL A ELLRKEELD KL RGNGME ERKEWDRI YDY DYY $L P S K M P A L L V Q Y R Q D E L N N L R G D D T G E Y K E A D R V Y R Y D Y Y$

LP CQTPEPLRKYRREELVNLRGNGKGELKEWDRVYDYAFY


LPSETPDALKK LREEELLNLRGNGVGELKEWDRVYDYAYY $L P S E T P M P L L K Y R E E E L E N L R G N G K G Q L Q E W D R V Y D Y A L Y$
$\square P G Q T P A P L V K Y R E E E L V N L R G D G T G E L Q E W D R V Y D Y A Y Y$ LP S QTPGGLKR LRTEELEALRGNGVGERKAFERTYDYDVY LPGKTPEALRLLREEELRKLRGDGRGERKEWERVYDFDYY

LPSETPNGLTK LDRKEELETLRGNDNGERKKGERDYDYDVY LPSATPGPLVKYREEELEILRGNGTGERKEHERIYDYDVY LPSETPAPLVEYREEEEKSGLRGNGTGERKEYDRIYYDYDVYY

LPSQTPSGLRALRKEELKVLRGNGKGERKWFERVYDYDVC $L P Q D T S G P L A K L R Q K E L Y A L Q A S G T E Q R K S P D R I Y D Y Q A Y$
$\square P N E T P E A L D E L R K E E L E S \square R G H G T G E R K E W D R D Y E Y D Y Y$ LP D D T P P P L K WY REEELS $\quad L R$ GKGAGEPMMWDRVYDYACY

LP SK T PEALVLLLRDEELRS L RGDGKGERKDWERDYDYDRY LP DETPAGLKE LREME LRRQLRGDGTGLRLPS DRTYDYDTY

LP S Q T PAP LVYYRQEELQNLRGDGT GQRKEWERVYDYDVY


UniRef90 A9U1H4 UniRef90 MOTSS3 UniRef90-B9F512 UniRef90-I1KLK0 UniRef90 B1ABU5 UniRef90_D8R7D4 UniRef90_A0A059B6X9 UniRef90_Q41244 UniRef90 ${ }^{-}$M8AUY3 UniRef90-M1CAP5 UniRef90_D8SAV0 UniRef90 A0A059AVJ6 UniRef90-F2DM79 UniRef90-W5G3J1 UniRef90-11PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90_UPI0002C35D23 UniRef90- J3LKL7 UniRef90-K4B0V2 UniRef90-B8LM20 UniRef90 UPI0003EAC6EC UniRef90-W1PMR3 UniRef90-K3YE85 UniRef90_M8BQS2 UniRef90 E5RRZ8 UniRef90_UPIO002BC8F24 UniRef90-M8CDG7 UniRef90 A1XCl1 UniRef90-UPI0002B46164 UniRef90-Q9M3Z5 UniRef90_UPI0002B416B8 UniRef90 ${ }^{-}$K4AJD2 UniRef90_UPIO0046DB33B UniRef90_A2ZLM2 UniRef90 M0TA04 UniRef90-Q39874 UniRef90_A0A022S312
UniRef90 G7LEB2 UniRef90 MOWVM6 UniRef90_B3VA22 UniRef90-A3ALS8 UniRef90 A3ALS8 UniRef90-V4RZ49 UniRef90-T1N5E9 UniRef90 ${ }^{-}$M8A1U0 UniRef90 K7KYV5 UniRef90-W1PNW9 UniRef90_I1LBC0 UniRef90 UPI00032AB47A UniRef90 ${ }^{-}$V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90 UPIO0042B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90 K7LX80 UniRef90-V4UAG7 UniRef90-U5GV40 UniRef90-K7KYV6 UniRef90 D6PAW4 UniRef90-A0A059B6Y5 UniRef90_F6H9C9 UniRef90_UPI00042B5F1C UniRef90-10YJS7 UniRef90-UPI0002B46D89 UniRef90_M8B5F0 UniRef90 F6GUC9 UniRef90-11LE57 UniRef90-F6HWH9 UniRef90 V7C0Q5 UniRef90-UPI0003D780D1 UniRef90-IODHH2 UniRef90_G7LIA2 UniRef90 B9T7Z9 UniRef90- S8CJ37 UniRef90-A0A059AAV9 UniRef90-UPI0002738C05 UniRef90 A5ANS7 UniRef90_G3NY91 UniRef90-R7WBQ0 UniRef90 B8A697 UniRef90-M1B0R2 UniRef90-UPI0003DE7E7D UniRef90-M5X714 UniRef90_K4ATG3 UniRef90-C0PHP9 UniRef90-UPIOOO42B0E85 UniRef90 G7K037 UniRef90-D8RHQ8 UniRef90_D8RHQ8
UniRef90 UPIO002B45BD5

NDLGTPDVDPKNVRPTLGGSAEFPFPRRMRTGRPPTKFSP NDLGNPDKG $\square E F A R T T L G G E K M$ PFPRRLRTGRAPTATDS NDLGNPDKGKEF $\square R P \| L G G E K$ GPYPRRCRTGRPPTDTNM NDLGDSDKGDRFARPTLGG QHNPYPTRCRTGRPPSTVDT

NDLGNPDYNPDLLRPVLGGSSTYPYPRRCRTGRMPSNTDN

GRGT\VFDA
NDLGDPDKGEEYARPVLGGSSEYPYPRRGRTGREPTKTDP NDLGG G 1 GRPKLGGSKEMPYPRRCRTGRDQGLLGE DDLGNANKGHEHARPVLGGTQAHPYPRRDRTGHTCSNKDP NDLGDPDHD DDTKRPVLGG KDHPYPRRGRTGRPRSKADP $N D L G N$ KRPVLGGEKR PYPRRCRTGRPHYTQGQ NDLGNPD NDDHVRPVLGGTKTHPYPRRCRTGRPDSKTDG
 NDLGDPDHDVSKTRPVLGGSKEFPYPRRCRTGRPRSKKDP NDLGDPDKGAEHKRPVLGGSALLPYPRRGRTGRPPSNAGD
 NDLGDPDSDPELVRKVLGGSKDFPYPRRCRTGRSPTQTDP NDLGNPDKGVTSARPVLGGEQXXXPRGGAGAARPSTATDA $N D L G E P D K G E H Y A R A L L G G R Q Y R P Y P R R C R T G R S Q Q K L Q L$ NDLGNPDDDKNTTRPVLGG KEHPYPRRCRTGRPRSKKDP $N D L G \| V G V A E R P T L G G P E R P Y P R R C R T G R K D D P E S G$
 $N D L G N P D L R Q D L A R P V L G G S Q E Y P Y P R R T K T G R P A A K T D P$ NDLGDPDLSMDLKRPVLGGSEEYPYPRRCRTGRPPTQNDP

NDLGDCDGPAEWKRPVLGGS DHPYPRRCRTGRLHCKTDP NDLANPDLRKDLARPVLGGSREYPYPRRTKTARPPTRTDP
NDLGDPDNDPATRRPVLGGRGRPYPRRCRTGRRRCRTDP NDLGSPDQGANLVRPILGGSAEYPYPRRGKTGRAPTKTDP ND $\quad$ GDPDSDDDRPILGGSSTHPYPRRGRTGRYPTRKDQ
 NDLGEPDNDN PRPVLGGTQELPYPRRCRTGRPPTETDP P

NDLGNPDKGPEYARPVLGGSQEYPYPRRGRTGRKPTKTDP NDLGNPDRGKEFDRPILGGDK DPYPRRCRTGRPPTDTNM NDLGNPDLREDLARPVLGGSEEYPYPRRTRTSRPPSKADP NDLGNPD DPDLARP LLGGSKEFPYPRRGRTGRPPTKTDP NDLGNPDKGPQHARPTLGGSKDYPYPRRGRTSRPPAKSDP

MRARGRPTMGSG ND $\square G N P D K D A K Y A R P V L G G S A E Y P Y P R R G R T G R P P T K T D P$ ND DGDPDSD DTKKRPVLGGSQDLPYPRRCRTGRPPCDSDP NDLGNPEKDDDHVRPVLGGTMAHPYPRRCRTGRPLSKADG

NDLGNPDSDPETARPVLGG KEHPYPRRCRTGRPRTESDP NDLGNPDKDVKLARPVLGGSSTYPYPRRVRTGRKATKKDP NDLGNPDKSEKLARPVLGGSSTFPYPRRGRTGRGPTVTDP NDLSEPQKGPNYVRP LLGGSTDHPYPRRGRTGRPPTKEDP
$N D \square G D P D C D P S K T R P V L G G K G L P H \square R R C R T G P P P C P R D H$ $N D L G N P V K S P D L E R P T L G G T A G P F P R R L R T G R P L V P G T E$
$N D L G N P D K G Q E H V R P \square L G G S D S Y P Y P R R G R T G R P C C N Q D P$

NDLGDPDRGRDYVRPVLGGTTDFPYPRRQMTGRRPSKADP

NDLGNPD NPEHVRPVVGGTRTHPYPRRCRTGRADSNTDG

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UniRef90-G3NY91
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UniRef90-M1B0R2
UniRef90_UPIO003DE7E7D
UniRef90_M5X714
UniRef90-K4ATG3
UniRef90-COPHP9
UniRef90_UPI00042B0E85
UniRef90_G7K037
UniRef90-D8RHQ8
UniRef90_UPI0002B45BD5

VSEKRSERFYVPRDEEFSEVKQHYF ..... P S LTETRVSQDYVPCDERVG T A
SSESPPAKDYVPRDEAFTERKAGAFATKKADSALSAFTTA KTESRLPNIYVPRDERFGHLKMGDFLTYAIKAISTGLLPT

 K S E T RKGNVYVPRDEEFSPEKEDYFLGKTVGSVLQAAVPA

NS ERRLPDDYVPRDERFGHLKFSDFLAYALKS VVQLLLPE LSESRVEKIYVPRDETFEELKQGAFISGRLRAVLHTLIPS ASETRAEGVYIPCDERTGAVAKAPNL
 KCESRLNDIYVPRDERFGHLKMADFLAYAALKSGVQVLKPE
 NTERRVPD $\square Y V P R D E W F G H L K M S D F L A Y A D K A V A Q L L K R K$

LSEKKGNDFYVPRDETFSEVKQLTFSAKTVYSVFHAVIPS VTETRNLDYYIPPDERFSPGKLAEVLAMGVQAVTHFVVPE

RADD DYVPRDEAFSD DK LAA A DSKKTYSFVSTLPT L LTETRSSSFYVPRDEEFSEVKMGTFSAKTVKSVLHALVPS


ESETKSNNVYVPRDECFSEVKQRKLGEETASSLLHALNPS YEVAPPKQLCAPK $\square 1$ KARQHTRTALKCSDRHLLRA

## AND $\square$ Y $V$ PRDEKFGH $\square K$ TS $D F \square G Y S \square K A \square T Q G \square L P A$

$\square$ TESRPTD $\square$ Y VPPDERFSPKK $\square$ SEF $\square E N S V Q A \square V H F P \quad D P E$

RTESRN $\square$ D VY VPRDERFSS $\square$ KFSDF $\square$ AD TVKS $\square G Q \square V P$ PE
 RDGRAFLPQDDKTSLVKRHRQKELEARYRWKEWQPG VTETRKHDFYIPPDERVSPGKDEEVLKLGVQAVTHFVIPE RDGRARLPQHDKTGVAKQHRRKELEQRQKWKEWHPG

NMESPENE $\square$ Y $V$ PRDEEFEEAKQGA $\square D V G K \square K G \square L R H \square I P T$

KS ERPGVMYVPRDENFGHLKSSDFLTYGTKSLSQDVLPL RSES LPDNMYVPSDETFMREKNSNFVGDTIKAAAHYLVPA

UniRef90 A9U1H4 UniRef90-MOTSS3 UniRef90-B9F512 UniRef90_I1KLK0 UniRef90 B1ABU5 UniRef90-D8R7D4 UniRef90-A0A059B6X9 UniRef90_Q41244 UniRef90-M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAVO UniRef90 A0A059AVJ6 UniRef90-F2DM79 UniRefto WG53J1 UniRef90-I1PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90 UPI0002C35D23 UniRef90-J3LKL7 UniRef90-K4B0V2 UniRef90 B8LM20 UniRef90 UPI0003EAC6EC UniRef90_W1PMR3 UniRef90-K3YE85 UniRef90 E5RRZ8 UniRef90-UPI0002BC8F24 UniRef90-M8CDG7 UniRef90 - A1XCl1 UniRef90-UPI0002B46164 UniRef90-Q9м3z5 UniRef90_UPI0002B416B8 UniRef90-K4AJD2 UniRef90_UPI00046DB33B UniRef90_A2ZLM2 UniRef90 MOTA04 UniRef90-Q39874 UniRef90-A0A022S312
UniRef90 G7LEB2 UniRef90 Mowvm6 UniRef90-B3VA22 UniRef90-A3ALS8 UniRef90 A3ALS8 UniRef90-V4RZ49 UniRef90-T1N5E9 UniRef90 M8A1U0 UniRef90-K7KYV5 UniRef90-W1PNW9 UniRef90_11LBC0 UniRet90 UPI00032AB47A UniRef90- V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90- UPIO0042B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90 K7LX80 UniRef90-V4UAG7 UniRef90-U5GV40 UniRef90-K7KYV6 UniRef90_D6PAW4 UniRee90-A0A059B6Y5 UniRef90-F6H9C9 UniRef90_UPI00042B5F1C UniRef90-10YJS7 UniRef90_UPI0002B46D89 UniRet90_M8B5FO UniRef90 F6GUC9 UniRef90-11LE57 UniRef90-F6HWH9 UniRef90- V7C0Q5 UniRef90-UPI0003D780D1 UniRef90-10DHH2 UniRef90-G7LIA2 UniRef90 B97729 UniRef90_S8CJ37

I STKLSRKESWSSMEEIKNLYSAPGEEIVGGEKDQHPLLFL 160 LRSLQDQLFHKDPFQGFHHDDNDYKEGLRपKपGLQEHLFQ LVDKIMGNEGVFNDDYF LAAL LVGSHNEFNNDQEVLMLYEGG胃ELPEGKESGQSIV LHKAY ASRPFFDNFGELRSLFTEGFNLKPE
 IQTAV DDAKDD
GKGSKHL
LKASVSASHN
FKALFD STPNE
FKALFDAETHNTFQGG


LYASUS
PDDRDAGFKQEQLY
 LRARASS
LREKFDE

VQs







TETKFDGDK KFEYFTETDEDFEDGFSTPPNLNESTWN LSTAM VDSELGFPFFSSIDALFNEGHNLPPLKKQGFWK LENIFDSDLTWNEFDSFEEVRDLYEGG\|KVPTDVLSDTSP


## L WRR\IGFPNDAADDQLFDEGMESPQFLIGKDHG

 WGKTGMETSTUSNVD CSVTKTACRPKAC VRTYVD TTPGEFDSFQD $\square M N \square Y E G G \square K \square P M E E \square R K Q F P$

VKAAF HKTPNEFGTFSH $\square \mathrm{DD} \square \mathrm{Y} \mathrm{DGG} \square \mathrm{P} \square \mathrm{PDVS} \square \mathrm{SRY} \square \mathrm{P}$ FP $\square S \square D A K Y H D \square Q F D S E K G D D F V L N Y S K A M E N \square F V N F M H$ FPMSTDANRHDTQFDSEKGVDFVLNYSKA DENDCVNQFMH ARTLVHGND FKSMEQLRKDCYS RPVQPAVDGEV FPMSIDCKAHD $\square$ QFDSEKGVDFVLNYSKA $\mathbb{S} E \mathrm{NLYVNQFMH}$
$\square T \quad \square I$ ASRDSNVFKGYVDTNCLYSTDMS पPK

EKMKK LVP
 MKSAYRRDKSPYFQSFEQ1 DALYDDG ELANEKKKLRNP

UniRef90 A9U1H4 UniRef90-MOTSS3 UniRef90-B9F512 UniRef90 ${ }^{-} 1 \mathrm{ABBU5}$ UniRef90-D8R7D4 UniRef90-A0A059B6X9 UniRef90 Q41244 UniRef90-M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAVO UniRet90_A0A059AVJ6 UniRef90-F2DM79 UniRet90-W5G3J1 UniRef90_11PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90-UPI0002C35D23 UniRef90-J3LKL7 UniRef90-K4BOV2 UniRef90 ${ }^{-}$B8LM20 UniRef90-UPI0003EAC6EC UniRef90_W1PMR3 UniRef90-K3YE85 UniRef90-M8BQS2 UniRef90-E5RRZ8 UniRef90-UPIO002BC8F24 UniRef90-M8CDG7 UniRef90 ${ }^{-} 11 \mathrm{XCl} 11$ UniRef90_UPIOOO2B46164 UniRef90-Q9M3Z5 UniRef90-UPI0002B416B8 UniRef90 ${ }^{-K 4 A J D 2 ~}$ UniRef90-UP100046DB33B UniRef90-A2ZLM2 UniRef90 MOTA04 UniRef90-Q39874 UniRef90-A0A022S312 UniRef90 G7LEB2 UniRef90-MOWVM6 UniRef90-B3VA22 UniRef90-A3ALS8 UniRef90_A3ALS8 UniRef90_V4RZ49
UniRef90-T1N5E9 UniRef90-M8A1U0 UniRet90-K7KYV5 UniRef90-W1PNWS UniRef90-11LBC0 UniRef90 UPI00032AB47A UniRef90-V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90_UPIO0042B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90 K7LX80 UniRef90-V4UAG7 UniRef90-U5GV40 UniRef90 K7KYV6 UniRee90-D6PAW4
UniRef90-AOAO59B6Y5 UniRef90-F6H9C9 UniRef90-UPI00042B5F1C UniRef90-10YJS7 UniRef90_UPI0002B46D89 UniRef90-M8B5F0 UniRet90_F6GUC9 UniRef90-I1LE57 UniRef90-F6HWH9 UniRef90_V7C0Q5 UniRef90-UPIOOO3D780D1 UniRef90-10DHH2 UniRef90_G7LIA2 UniRet90_B9T7Z9 UniRef90-S8CJ37 UniRef90-A0A059AAV9 UniRef90_UPIO002738C05 UniRet90_A5ANS7 UniRef90-G3NY91 UniRef90_R7WBQ0 UniRef90-B8A6972 UniRef90-UP10003DE7E7D UniRef90_M5X714 UniRet90 K4ATG3 UniRef90-COPHP9 UniRef90-UPIO0042B0E85 UniRef90-G7K037 UniRef90-D8RHQ8 UniRef90_UPIO002B45BD5

170
180
190
200
REFTSKRADGKDNDLLKFPLLPRII LKADEKAWQTDAEFARE KDPLVGKKEESSEGLLRYDTPDUETKDKFAWLRDDEFARQ $M F N L G G A V Q E \quad F F K F D P P K T F S R E K S H F L L D D E F G R Q$ EELFKELFRTDGGKFLKFPVPQVIQDNKSAWRTDEEFARE

ADNLEGYFREVLQKQVKLLLKGEKEEFKEELRKD FEMIRELLRTEGQNFLKLPKPHVIQVDKNAWRTDEEFGRE MPVVKELFRTDGEQVLKFPPPHVIQVSKSAWMTDEEFARE LPRLVKADADSDNVLHFETPEFIGRDKFAWFRDAEFARE LQFIKSLLPVAGDDLLNLPLPHVIKSDKYAWRSDEEFARE PRLLEHLRDTPAEKILRFETPA NIQDKFAWLRDEEFARE

WEMLKE LVRNDGERFLKFPMPDVIKEDRSAWRTDEEFARE K $\square P \mathrm{FV} \mathrm{V}$ KIQESSEGMLRYDTPSILSKDKFAWLRDDEFARQ FPVPQVI SANRTAWRTDEEFARQ | $V L M$ |  |
| :--- | :--- |
| $F E M$ | $K$ |

 $\square P L \operatorname{L}$ T E L F R S D GE S TVV K F P P P K L V Q V D H S A WM T D E E F A R E


पPRLLKADSDGSDNVLRFETPETMERDKFПWFRDEEFARQ HKTYKQVAKMVKDTPVKFP $\square P Q V I Q H D K D A W R S D E E F A R E$

FFWFSDEEFARE
TPRWITRKIKETGEQYLQFETPEALHRDKFFWFRDEEFARQ LPNLFRAVTDGTKDVLKFETPDTMERDRFFWFRDEEFARQ LPVMKELYRTDGQHLLKFPQPHVVQVSQSAWMTDEEFARE ПFTTVWRFTGYHFCLWPFKAPQPMQRDRFFWLRDDEFGRQ ALTPSSCVTSRPRQASKFKLPRVRRNRQLVWCSDEEFGRQ
पQLIK DLLPVGGDSLLK पPDPH DQADQQAWRTDEEFARE ELDPQDKFSWLWDEEFSRQ
DD $\square$ FKE $\square K E A S K K D P M K F P \square P K \square \square E E N E \square A W K D D E E F A R Q$

## RTGRPKCRADNDLAMEDEEFGRQ

CEFFREDFRSDADYLLHPDPDVIKEDRRAWRSDEECRE MFQSSWSDFADFEKDFVK $\square$ SNT $\square$ SEYVMKHWQEDFMFGYQ MFQSSWSDFGDFER DF VR TQNT TSEYVMQHWKEDFMFGYQ MERLK SSVPSHEEHPAKFPIPQVIQQDPEAWRSDEEFARE MFQSSWGDFADFER DFVR】KNTISEYVMEHWKEDFMFGYQ

AELIKQVTHASKQDH\KFPGPQIIRDNEWAWTEDEEFGHQ



## UniRef90 A9U1H4

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W5G3J1 UniRef90-11PU88 UniRet90-A4ZFY | UniRef90-E5RRZ9 |
| :--- |
| UniRef90 | UniRef90-UPI0002C35D23 UniRef90-J3LKL7 UniRef90-K4BOV2 UniRef90 ${ }^{-}$B8LM20 UniRef90-UPI0003EAC6EC UniRef90-W1PMR3

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UniRef90 G7LEB2 UniRef90-MOWVM6 | UniRef90-B3VA22 |
| :--- |
| UniRef90-A3ALS | UniRef90-A3ALS8

UniRef90 A3ALS8 UniRef90-V4RZ49
UniRef90-T1N5E9 UniRef90_M8A1U0 UniRet90-K7KYV5 UniRef90-W1PNWS UniRef90_11LBC0 UniRef90_UPI00032AB47A UniRef90-V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90_UPIOOO42B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90-K7LX80 UniRef90-V4UAG7 UniRef90-U5GV40 UniRef90-K7KYV6
UniRef90
D6PAW4 UniRef90-A0A059B6Y5 UniRef90-F6H9C9 UniRef90-UPIo0042B5F1C UniRef90-10YJS7 UniRef90_UPI0002B46D89 UniRet90_M8B5F0 UniRet90_F6GUC9 UniRef90-I1LE57 UniRef90-F6HWH9 UniRef90_UPI0003D780D1 UniRef90-IODHH2 UniRef90-G7LIA2 UniRef9_B977Z97 UniRef90-A0A059AAV9 UniRef90-UPI0002738C05 UniRef90_A5ANS7 UniRef90-G3NY91 UniRef90-R7WBQ0 UniRef90-M1BOR2
 UniRef90_M5X714 UniRef90-K4ATG3 UniRef90-COPHP9
UniRef90 UPIO004 UniRef90_UPIO0042B0E85 UniRef90-G7K037 UniRef90-D8RHO8



MLAGVNPVITSRLQEFPPASNDDPKVYGNQHSSTTRDERN AVAGINPVSIERLTVFPPVSKLDPAIYGPPESSITEQHDQ TLAGTNPLSI ELLVGLPLTSKLDRALYGDQDSKITKEHIE MIAGVNPCVIRLLQEFPPQSKLDPSVYGDQTSKLTEEHLE

 MLAGVNPVVIRLLKMEELASPCKLLCNCTQPST:TKEEDN MIAGVNPHLIKKIQTFPDKSNLDSQLYGDNTSTITKEHPN TLAGGNPYAI QLLTE WPMK SKLDPDUYGPPESADTKEMDE MLAGLNPVVIKRLEAFPLK NSTUTPEHIQ
 TLARLNPCSIO
TLSGLNPCCIKMVTEWPDRSKDDPEDYGPQESADTAEMVE MI AGVNPNVI RLLKEDPPQSKLDPTLYGDQSSTISKEHIN MI AGVNPCVI RGLEEFPPKSNLDPAIYGDQSSKITADSLD


 VLAGVNPVM| TRLTEFPPKSSLDPSKFGDHTSTITAAHIN
MLS GVNPTVIKGLEVFPPQSR M $\square \mathrm{A} G \square \mathrm{NPT}$ R $\square \mathrm{RC} \mathrm{LE} \mathrm{VFPPKGK}$

NGVWS S $\square K$ ASH $\square$ QHN NGKMSS $\square$ T $\square$ A D $\square E G S$
 F पNGCNPVMDRRCTK $\square P E K F P V T E M V E C S E R Q$
 MLAGLNPVAI KRLQTFPPVSS YLNGCNPVVIKKCTEDPDKFPVTHN VEDS
$M \square A G T H P T R \prod Q C D T T F P P Q N K$ G $G Q S S \square K Q S \| I E Q K$


MLAGTNPMRTQSLKVFPPGGRL QYSSTRKSDVEHN MVAGVNPCVI RLLQEFPPKSTLD DAVYGDQTSILKKEHDN T:AGLNPMI KKLESYPPVSSLDPKIFGPKATALKDEHDQ

UniRef90_A9U1H4 UniRef90-MOTSS3 UniRef90-B9F5I2 UniRef90-I1KLKO
UniRef90 B1ABU5 UniRef90_D8R7D4 UniRef90_A0A059B6X9 UniRef90_Q41244 UniRef90_M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAV0 UniRef90_A0A059AVJ6 UniRef90_F2DM79
UniRef90-W5G3J1 UniRef90-I1PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90_MOTZQ6
UniRef90_UPI0002C35D23 UniRef90-J3LKL7 UniRef90_K4B0V2 UniRef90_B8LM20 UniRef90-UPIO003EAC6EC UniRef90-W1PMR3 UniRef90-K3YE85
UniRef90-E5RRZ8
UniRef90_UPI0002BC8F24
UniRef90-M8CDG7
UniRef90-A1XCl1
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UniRef90-D8RHQ8
UniRef90_UPI0002B45BD5 S312

250
 260

270
IN KLENSKNY LN GMSVQQALEEKKLFILDFHDVYLPFIDRINAQDGRKAY





| $A$ | A |  |
| :--- | :--- | :--- |
| A | 1 | $K$ |
| A | $V$ | $A$ |

 EQDMTAEEAMRRKKLFMLDYHDMFLPFVHKVRMLEDTTLY



 LEGLDS VQAI ASKRLFILDYYDVYMDYAERINQQSDDKTY


 GHTMTVAEAVEKKRLFMLDFHDLFLPYVHKI RALEHTTMY MGGMTVQQAVEEGRLYVVDHHDWVMPYLKRINELPQRKVY

 MSGLTVQQAVEDGRLFVVDHHDWVMPYLKRI NELPQRKAY





 ALDSNRLYILDHHDRFMPFLIDVNGLEGNFITY ALDSNRLYILDHHDRFMPFLIDVNGLEGNFIY




 CEEMTFDEAMKQKKLFVQDYHDLLLDPYVKKVRELEGTTMY

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 GKTLT ERLEEGGRLYRADYTAGFADYDERINAQKDRTQH
 REIMTIDVALEQKKLEI I DYHDLFLPYVSKVRQMEGTTLY

पD GLDDT
A I E NKK

## Y EA

 MFFEQAAI QLIK R L MNGMSVQEALEENKLFiVDYHDAYLPFLDRGINADDGTMGY MNGDTVEQAVKDGKLYVLDHHDTFVPYMTRINNRTETKTH

|  | ASRTLFFLSKE |  |
| :---: | :---: | :---: |
|  |  |  |
| UniRef90-B9F512 | ATRTI FFLTEAGTLKPi A | ELSLPPAKPGEPRPS |
| UniRef90-11KLK0 | A T T Til Lf LTKMGTLKPi A | QLALPTGNPNTS SKQ |
| UniRef90-B1ABU5 | S SRTLLFLENDGTLKPLA | LSLPHPDGDQF GClS |
| UniRef90-D8R7D4 | ASRTI FFLTTDAGTLTPVA | ELSLPSPGE A |
| UniRef90_A0A059B6X |  | SLPHPEGDEFGA |
| UniRef90-Q41244 | ATRTILFLKDDGTLKPLA | LSKPHPDGDN |
| UniRef90-M8AUY3 | ATRTLLFRRGDGTLAPVA | ELS SPLIQGDLLT T AKSTVYTP |
| UniRef90-M1CAP5 | ASRTLLFLQDNGTLKPLA | S KVYTP |
| UniRef90-D8SAV0 | A TRTFLFLRGDGTLKPIA |  |
| UniRef90-A0A059AVJ6 | ASRTLLFSSKDGSLKPVA | L S L G S S S E E P P W |
| UniRef90-F2DM79 | GSRTLFFLTEDGMLRPIA | T RPMSP SKPQWREV |
| UniRef90-W5G3J1 | GSRTLFFLTGDGTLRPIA | LTRPESQDHTKDEWRQV |
| UniRef90-I1PU88 | ASRTLLFL R D G G A R PVA | LSLP D G GVGGGE |
| UniRef90_A4ZFY6 | A TRTLLFLSKDGILKLLA | ALPP KTVGEERI |
| UniRef90-E5RRZ9 | APRAFFFLTDDKKMKPVA | L SLPPPYNGENQSHKRV |
| UniRef90-M0TZQ6 | GSRTDFFLTNDGTLRPLA | LIIPASA T GPQWKQVF |
| UniRef90_UPI0002C3 | A SRTLLFLK S D S TLRPLA | L SLP G S G G D E $\square$ NQVLVP |
| UniRef90-J3LKL7 | A TRTI FFLTEAGTLKPIA | L SLPPTQPGEPGP S K V |
| UniRef90-K4B0V2 |  | LSLPHPDGNQYGAVSK |
| UniRef90-B8LM20 | A SRTLFFLS DDGVLKPVA | L C P P T A D L K A VRNV |
| UniRef90-UPI0003EAC6EC | GTRAI FFLTAAGTLKP | LCLPP MTDGCKRAKRV |
| UniRef90-W1PMR3 | ATRTI FFLSALGTLKP | S |
| UniRef90-K3YE85 | A SRTLLFLMDDGTLKPL | L Q P H D N G |
| UniRef90-M8BQS2 | GSRTLFFLTDDGTLRP | ELTRPKS KRKPQWRQV |
| UniRef90-E5RRZ8 | APRVIFFLTDDNKLKPV | L S LPPQE G Q K GSYNR |
| UniRef90_UPI0002BC | A S R TLLFLK D D T L K PLA | SLP Glis R G |
| UniRef90-M8CDG7 | GSRTILFLTDDGTLRLL | LTRPASPAM PQW |
| UniRef90-A1XCI1 | A ARTLLFLDGEDSSMPL | S SPHPEKEQLGAV |
| UniRef90_UPI0002B46 | GSRTLFFLNSDGTLMPL | LTRPP MDEHLEQW |
| UniRef90-Q9M3Z5 | A T R T I LFLK D G T K K P V | L S LP HSNGVQYGAESKV |
| UniRef90-UPI0002B416B8 | GSRTLFFLKSDDTL ${ }^{\text {L }}$ PL | LTRPPV DGYPQW |
| UniRef90-K4AJD2 | A ARTILFLNDDSTLRP | L S SPHPDDERLLGAVS |
| UniRef90_UPI00046DB33B | A S R TVLFLKS G T L K P L VI | L LPPPDGDRFGRI |
| UniRef90-A2ZLM2 | ASRTLFFLTEDGTLRPI AI | PN TPQWR |
| UniRef90-M0TA04 | A T R T L LFLKEDSTLKPLA | L S LP HPD GEQF GAVSKV |
| UniRef90-Q39874 | ATRTILFLRENGTLKPVA | LS L P PA GGLS GAVS QV |
| UniRef90-A0A022S312 | GSRTLFYLTSCGTLRPV | D GKPQWK Q |
| UniRef90-G7LEB2 | ASRTLLFLRSDGMLK | SLPGS SLALEIQ |
| UniRef90-M0WVM6 | A SRTLLFLKADGTLKPLA | LSQPHPDGIQHGA |
| UniRef90-B3VA22 | GSRTVFFLTDDGTLQL | LTRPASPSQ PQWR |
| UniRef90-A3ALS8 | ATRTLFFLRGDGTLAPLA | LSEPMIQGDVTAAKST |
| UniRef90_A3ALS8 | A TRTLFFLRGDGTLAPLA | LSEPMIQQGDVTAA |
| UniRef90-V4RZ49 | A S R | S |
| UniRef90-T1N5E9 | ATRAI FFLTQGGTLKPVA | L SLPPAQS GEPQP SKV |
| UniRef90-M8A1U0 | ATRTLFFLQDDSTLKPLA | LS SPHPKDERLGAT |
| UniRef90-K7KYV5 | ATRTILFLKDDGTLKPL | ELS LPYS G GQQLGA |
| UniRef90-W1PNW9 | ASRTLLFLQNEGTL $\mathrm{I}_{\text {P }}^{\text {P L }}$ | ELSLPHPDGEIHGATSKVF |
| UniRef90-I1LBC0 | ASRTILFLQDSGTLKPLA | LSLPPHPEGDQYGAlSKVY |
| UniRef90-UPI00032AB | ATRTILFLQNDGTLKPL |  |
| UniRef90-V7AQA4 | ATRTFFKPHQC |  |
| UniRef90-A0A058ZUF9 | A TRTLLFLK D D G L K PL | S LPP HPEGDEFGAlS KVYMP |
| UniRef90-Q9ZSQ2 | ATRTVLFLQDNGTLKPLA | ELSTPHPQGDSFGPVSKVY ${ }^{\text {SP }}$ |
| UniRef90-UPI00042B1267 | GSRTLFFLNPDETLRPLA | ELTRPP MDGKPQWKEVYRP |
| UniRef90-J3M5U1 | ASRTLLFLKNDGALKPVA | LSLPGDGATAGGEDSRVFVP |
| UniRef90-Q0ZDG2 |  | LS L P PQGDQF GA IS KVYTP |
| UniRef90-K7LX80 | GSRTLFFLTKQGTLKPLA | LTRP $\quad$ DMDGKPQWKQVFTP |
| UniRef90-V4UAG7 | GSRTIFFLNPDDTLRPVA | LTRPP MDGKPFWRKVYTP |
| UniRef90-U5GV40 | GSRTLFFLTHEGTLRPLA | LTRPP MDGKPQWKQVFRP |
| UniRef90-K7KYV6 | ATRTI LFLKDDGTLKPLA | LSKPHPSGDNLGAESKVVLP |
| UniRef90-D6PAW4 | ATRTILFLREDGTLKPVA | SLPHSAGDLSAAV |
| UniRef90-A0A059B6 | A TRTLLCLKEDGTLKPLA |  |
| UniRef90-F6H9C9 | GTRTLFFLTTVGTLKPIA | LSLPPT DPNCPLK QV |
| UniRef90-UPI00042B5F1C | GSPTLFLLNPNETLRPLA | LS RPPLDGK P QFWK |
| UniRef90-10YJS7 | A GKALEYYTD |  |
| UniRef90-UPI0002B46D89 | A T R TLLFLK D D G T K P L V | L S LP HPQGDQF GANSKQYF |
| UniRef90-M8B5F0 | ATRTLFFLRGDGRLTPLAI | LSEPVIQGGDT $\mathrm{S}^{\text {P A K S K V }}$ |
| UniRef90-F6GUC9 | GSRALFFLTPDGTLKPLA | LTRPPI E G K PQWKQVFTP |
| UniRef90-I1LE57 | ASRTILFLQDDGTLKPLA | LSLPHPQGEQHGAVSKVFTP |
| UniRef90-F6HWH9 | A SRTLLFLRDDHTLKLLA | LSLPGSSAD MEINRVFLP |
| UniRef90-V7C0Q5 | A TRTIFFLKDDGTLAPLA | LSKPHSQGDEHGPVSEVYV |
| UniRef90-UPI0003D780D1 | A S R TLLFL R S D A L K PVA | LSLPS I S S D EVNRVFLP |
| UniRef90-IODHH2 | ASRTLFFLKDDGTLKPLA | LSLPHPGGEKLGAVSTVYKP |
| UniRef90-G7LIA2 |  | S SPNPKGDRFDP I S Di Y |
| UniRef90-B9T7Z9 | A TRTIFFLTPLGTLKPI A | LS LPPTAP SARSKRAVTP |
| UniRef90-S8CJ37 | ASRTLLLLQDDGTLKPIA | LSLPHTTGNQYGSFSSIYTP |
| UniRef90-A0A059AA | GSRTLFFLTPDETLK K P A A | LTRPPTD DGKPQWKQVFTP |
| UniRef90_UPI0002738C05 |  | NQVPGNE NPIFLP |
| UniRef90-A5ANS7 | GS RALFFLGPDNTLKPLA | PP MDGKPQWKQV |
| UniRef90-G3NY91 |  | GKNNPI F L |
| UniRef90-R7WBQ0 | A S RTLLF LKADGTLKPVVI | L S LP S D GEGDTELSRVF |
| UniRef90-B8A697 | APMCLLYKNSQNKI MPI AI | , |
| UniRef90-M1B0R2 | A S R TLFFYTSRGVLKPIVV | LSLPP $\mathrm{S}^{\text {P P S SPRNKRI F S H }}$ |
| UniRef90_UPI0003DE7E7D | A S R TLLFLRRSDGMLKPLTI | ELSLP G Q P H L E $\square$ H R V F LP |
| UniRef90-M5X714 | GTRTILELTPDGTLKPIS | LSFPPTNSDS PSKQVLTP |
| UniRef90-K4ATG3 | GSRTLFYLTPNGTLRPLA | PPVDD KPQWKQVYCP |
| UniRef90-C0PHP9 | A TRTLLFLRGDGTLAPVA | STVYTP |
| UniRef90_UPIO0042B0E85 | ASRALLFLREDATLKPLA | LSYPVSSDSNEME SRVELP |
| UniRef90-G7K | A TRTILFLKDDGTLKPVA | L S LP HPNGVKY GAESKV |
| UniRef90-D8RHQ8 |  | LSLP A ATATGQRKNRVFVC |
|  |  |  |







VAVEDPSSPYGLRLLIEYYFYASDGLEDWAADKSWVEEYV MAVKDVSAPHGLSSAIKDYPYAVDGLEIWDGIKSWVQEYV
VAVK DPSAPYGDRLLIEDYPYASDGLE DWAA $\square K S W D E E Y V$ RLRE
MASKDERARGGVSDHDQDYPYAVDGLDVWLADEGWVRSYC MAVKDTDAPHGLRLLI EDYPYAVDGLKVWSAI ETWVEEYC MALEDPNAPQGLMLTIEDYPFANDGLLIWDADKQWVTEY MAAEDPCSPHGLKLTIEDYPYAKDGLDLWD ILKKWVTDYV

VAVPDTTKVHGLRLLIEDYPYANDGLLIWSSDESLVQTYV MAMEDPTAPHGLRLKSRDTLSLMTGFFPGTSLKNWSLTMS







$\square A D E D P T A P H G \square R \square A D E D Y P F A N D G L L D W D A D K E W V T D Y V$ MDSKED
 MASS SNEPGGLTLHIEDYPYAVDGLE
MDS QEELPYYFYRDDGCAVWETVKSFVSDVV MAVEDTSMPGGVKLVI EDYPYAADGLLI WSAI K EYVVSYV MAVVDPDKNNPI QLLLLDDPYATDGLEIWVAUKEWVKDFC MAVPDSTQVHGI RLNCR
LAEENPNAPYVLRLTIEDYPSASDGL VWD L LK QWVTNYV
 MALEDPESPTEAQILFQDYPYGLDGLDVWLALDTWVKDFC

UniRef90 A9U1H4 UniRef90_MOTSS3 UniRef90-B9F5I2 UniRef90 ${ }^{-1} 1$ ABU5 UniRef90-D8R7D4 UniRef90-A0A059B6X9 UniRef90 Q41244 UniRef90 M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAVO UniRef90-A0A059AVJ6 UniRef90-F2DM79 UniRef90-W5G3J1 UniRef90_11PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90-UPI0002C35D23 UniRef90_JKLKL7 UniRef90-K4BOV2 UniRef90 B8LM20 UniRef90-UPI0003EAC6EC UniRef90-W1PMR3 UniRef90-K3YE85 UniRef90-M8BQS2
N UniRef90-UPIOOO2BC8F24 UniRef90 M8CDG7 UniRef90 - 1 XCl1 UniRef90_UPIO002B46164 UniRef90-Q9м3z5 UniRef90_UPI0002B416B8 UniRef90-K4AJD2 UniRef90-UPIO0046DB33B UniRet90_A2ZLM2 UniRef90 MOTA04 UniRef90-Q39874 UniRef90-A0A022S312
UniRef90 G7LEB2 UniRef90-MOWVM6 UniRef90-B3VA22 UniRef90_A3ALS88 UniRef90 A3ALS8 UniRef90-V4RZ49 UniRef90-T1N5E9 UniRef90_M8A1U0 UniRef90-K7KYV5 UniRef90_W1PNW9 UniRef90-11LBC0 UniRef90 UPI00032AB47A UniRef90-V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90'UPI00042B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90-K7LX80 UniRef90-V4UAG7 UniRef90-U5GV40 UniRef90-K7KYV6 UniRef90_D6PAW4
UniRef90-A0A059B6Y5 UniRef90-F6H9C9 UniRef90-UPIo0042B5F1C UniRef90-10Y YS7 UniRef90-UPIO002B46D89 UniRef90-M8B5F0 UniRef90 F6GUC9 UniRef90-11LE57 UniRef90-F6HWH9 UniRef90- V7C0Q5 UniRef90-UPI0003D780D1 UniRef90-10DHH2 UniRef90-G7LIA2 UniRef90_b9T7Z9 UniRef90-S8CJ37 UniRef90-A0A059AAV9 UniRef90_UPIO002738C05 UniRef90_A5ANS7 UniRef90-G3NY91 UniRef90-R7WBQ0 UniRef90 B8A697 UniRef90-M1B0R2 UniRef90-UPIO003DE7E7D UniRef90_M5X714 UniRef90-K4ATG3
UniRef90 COPHP9 UniRef90_UPI00042B0E85 UniRef90_G7K037 UniRef90-D8RHO8 UniRef90_UPI0002B45BD5
 AAYYSDDEAVQSDSELQSWYSEA A AYYPDAGTVQCDLELQGWYHESDHVGHGDDRHAPWWPP NHYYKNSNAVSSDNELQSWYREFINLGHPDHKNASWWPKL SFYYKNDEMVQNDSELQSWWKELREEGHGDKKDEPWWPKM NDFYMYDVSVCADTELQNWWREITEDGHADKKE GWQDLL SFYYKSDQTVQNDKELQSWWKELVEEGHGDKKGEPWWPKM SLYYPTDAAVQQDTELQAWWKEAVEKGHGDLKEKPWWPKM T IYYPDDGVLQGDVELQAWWK EVREVGHGDLKDAAWWPKM NFYYKSDDTVQKDSELQAWWKDSAKKDMVTRKMS DVHYKDDATVQNDAELQAWWSEVVNVGHGDLKDDPTWFKM SVFYKQDGHI QSDEELQAWWSEIRNVGHGD KKREKWCEM EHYYPCTADI 1 GDEELQGWWTEVRTKGHEDKKDEPWWPKI KYYYPGAKDIIDDHELQGWWTEVRTKGHEDKKDEPWWPVL DHFYHADAAVAGDAELQAWWDDVRRVGHGDRQDAACWLDL D YYKDDAAVLQDSELMTWWTEMREKAHEDKKDSHGWPEL MLIFYTDDASVVRD EELLQQAWWSEGIRTEGHGDKKDEPWWPKLL QLYYPDAGTVQGDLELQGWYHESVHVGHGDLRDAPWWPPL NYYYKSDDAVQKDAELQAWWKELREEGHGDKKDEPWWPKM SDYYKNDASIERDQELQAWWNEIVNDGHGDDKNDPRWFKM AAYYPSDEAVQADYELQSWYAEAVQSGHADKRGAPWWPRL
 DDYYPNDGELQHDEELRKWWKEVREEAHGDLKERDWWPKM NDFYSCDEQVREDVELEAWWKE1REVGHGDKKDEPWWPSC SRYYRRDASVTGDTELQAFWTEGRTEGHADHKGAPWWPKL A $\square Y Y$ YDDGAVARDSELQGWWSEVRNVGHGDLDAAPWWPAM
 NHYYGDDENVINDKELQAWWNETQEKGHPDKKE GWPTL
 NHYYPSASDI YSDEELHGWWNEVQTNGHPDKKD GWPEL STYYPSDDAVKADTEL
SLYYARDDDVKPDSELQQWWKEAVEKGHGDLKDSHGGLSC TYYYQEPSLVNSDSELQAWWTETRTVGHGD
SFFYKDNEAI DADTELQVWWSEIRTIGHGDNHNETWWYQM A ПYYPNDGALEAFKRFGSRWVEI
ARFYPDADSVAGDEELQAFWTEVRTKGHGDKKDAPWWPKL A TYYTDDGVLRGDAELQAWWAEVREVGHGDLKGAAWWPRM A $Z Y Y$ YDDGVLRGDAELQAWWAEVREVGHGDLKGAAWWPRM
QLYYPDAGTVQS DDELQE WYHES IDHVGHADLRD
AI Y Y A E D G AV A GD S ELLQA WWSEVRNVGHGDLSDAP WWPAM SLYY YAT D DALE EDHELLQAWWKEVVEKGHGDLKDEPWPK LL

NFYYKSDGA IA QDSELQAFWKELVEVGHGDLKNATWWFKM SLYYSEDDAVQQDTELQKWWKEVVEKGHGDLKDAK WPEM
NFYYKSDGA $\square$ AQDAE $\square Q A F W K E V E V G H G D \square K N A T W W F K$
SHFYHTDGAVAGDAELQAWWDDVRHVGHGDRRDAACWLEL KFYYKNDKMVREDAELQSWWKELREEGHGDKKDEPWWPKM NHYYSNSSVVKSDQELQAWWTEI QKVGHGDKYKEPWWPSL NHYYPNQSLVESDEELQAWWTE $\downarrow$ RTVGHGDKEDEPWWPVL

NYYYSDAEMIDESDELQAWYNESRSVGHADLCHASWWPTL TTT TQMQVSWSHEELQAWWTEMREVGHGDKKDESWWAVL QLYYASDVKLKEDVEI QSWWTEIQAEGHPD KTEGWPAL SLYYKNDNT QNDVELQSWWKEVREKGHADKKNESWWPKL A IYYPDDGVLRGDTELQAWWKEAREVGHGDLKDAPWWPRM NYYYKDANMVQSDPELQAWWTEDQTKGHEDKKDEPWWPNLL NFYYTSNDMVEDDSELQSWWKEVRNEGHGDLKDRHWWPEM
AFYYKSDEALQKDPELQAWWKELVQVGHGDLKDKPWWPKM STFYKDDDSVKSDEEI QAWWKEI REVGHGDKRNASWWFEM A YYPNDFSI QHDSELQAWWK ELREVGHGDDKDQTWWPSM YFYYKSDANIAQDSELQAFWKELVEVGHGDLKDAKWWFKM NRYYPNSSIVGNDRELQAWYAESVNVGHADLRHADWWPTL
SHYYPDPSRTASDKERQSWWTE RTVGHGDKKDSPGWPD DDYYESDQVVKEDTELQDFVNDVYVYGMRGKKTSGFPKS


D $\square Y Y D K D E T V Q E D E E T Q A F V K D V C F G M Q D \square D H C E F P K S$ DHYYSEPNSVTSDVELQGWWNEIKNKGHVDKKNEPWWPKL SFFYKDNEA $\operatorname{SEGDVELQAWWSE\backslash RTQGHGDKYND\square WWYQM}$
NHYYPQAKL!ESDEELQAWWLEDKNVGHGDKKDEPWWPED A YYPNDGVLQADVELQAWWKEAREVGHADLKDEHWWPKM DLFYEDDDSVKSDTE乌QGWWSE $\square$ RNVGHGDKRNETWWYQM


K Q LK S L LK F LS Y GLLQPSMQP LTVNDHMEVSFR $\square A Q L$
T T L S D LVETLT T L DW $\square$ S A A R H A V I N H Q K H A Q N G Y P P N Y P T
D SPESLAHTLT T V WWVA A A H H A A VNFGQYDFGGYFPNRPS DAVSELRDACTT』IWUASALHAAVNFGQYPYAGYLPNRPT

D SVNDLVETCATIIWLGSAYHSAVSFGQYAYNGFVPNRPT HTREELIQSCRT I WIASALDAAVNFGQYPYGGFILNRPT

QTRKELIEACT\LIWDASALHAAVNFGQYPYGGY LLNRPT KTSEELVETCTT\IWUGSALHAAVNFGQYPYGGY LLNRPP


DTVGHLAESLTTLIWVASALHAAVNFGQYGYAGFPPNRPT QTVK ELLDDTCTVVIWWVASLHAALNFGQYPYAGYLPNRPT E TPKDLI D IIT TI AWI A S GHHAAVNFAQYTYGGYFPNRPT K T P Q DL L E T I T T I DWVT S GQ HA A VNF GQYTYAGYFPNRPT

STPNDLTS $\quad$ LLT T I $\square W T V$ S GQHAA VNFGQYPYGGF $\square P A R P P$ RTPKDLIQTVTTIAWVSSGHHTAVNFGQYEYAGYFPNRPT DTVT DLRDILTTI AFTGSAHHAAVNFGQYDYSGYMPNRPA
 QTPNDLIGUITTI TWVASGHHSAVNFGQYAFAGYFPNRPS K T KEELI Q S CT II DWLAASAFHAAVVNF GQYP FA GYLPPNRP T

Q S R G D LVAVSTTLIDWASALHAAVNFGQYPYGGLILNRPT NSRDNLI QALLTILI WTSSALHASVNFGQYAYAGYPPNRPT



K T P S D LVM I IT TMVWVT S GHHAAVNFGQYTYAGYFPNRPT K SKEKLVEYLTVVIFTASAQHAAVNF GQYDWCSWDPNAPP K T P Q DLI G VVTTMVWVT S GHHAAVNFGQYAYAGYFPNRPT K S REALIDE YLTVVIVFTASAQHAAVNFGQYDWCSWDPNAPS

QTKEELVEYLTVVIFTASAQHAAVNFGQYDWCSWIPNSPP


K T P NDLISSIVT TIIWWVTSGHHAAVNFGQYSYAGYFPNRPT
 T T K T DL TK TLTTLI WISS ALLHASVNFGQYAYAGYPPNRP T

## UniRef90 A9U1H4

 UniRef90 MOTSS3 UniRef90-B9F512 UniRef90_I1KLK0 UniRef90 B1ABU5 UniRef90-D8R7D4 UniRef90-A0A059B6X9 UniRef90 Q41244 UniRef90 ${ }^{-}$M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAVO UniRef90 A0A059AVJ6 UniRef90-F2DM79 Uniref90-W5G3J1 UniRef90_11PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90 UPI0002C35D23 UniRef90-J3LKL7 UniRef90-K4BOV2 UniRef90 B8LM20 UniRef90 UPI0003EAC6EC UniRef90-W1PMR3 UniRef90-K3YE85 URe90 E5RRZ8 UniRef90 M8CDG7 UniRef90 - A1XCl1 UniRef90-UPI0002B46164 UniRef90-Q9M3Z5 UniRef90-UPIOO02B416B8 UniRef90-K4AJD2 UniRef90_UPI00046DB33B UniRef90_A2ZLM2 UniRef90 MOTA04 UniRef90-Q39874 UniRef90-A0A022S312 UniRef90 G7LEB2 UniRef90 Mowvm6 UniRef90-B3VA22 UniRef90-A3ALS8 UniRef90 A3ALS8 UniRef90-V4RZ49 UniRef90-T1N5E9 Uni efo-K7KY UniRef90_W1PNW9 UniRef90_11LBC0 UniRef90 UPI00032AB47A UniRef90 ${ }^{-}$V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90- UPIO0042B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90 K7LX80 UniRef90 V4UAG7 UniRef90-U5GV40 UniRet90_K7KYV6 UniRef90 D6PAW4 UniRef90-A0A059B6Y5 UniRef90-F6H9C9

MCRRTI PEEGSKEMEELRADPVKFYLSTIISDTDTTTTAMA MMRRLVPMEGDPEYEHFRADPVKFFLSALPS LTQATTFMT L $\quad$ RRLLPDDERDAAERPSS LMRKLIPKEEDPEYSDFVMDPQRYFLSSDPSLFQASRFMA I SLHFMPEEGTPEYEELKTNPDKAFLKTFTPQLQTLLGMA



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

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

I A RTVMPVEEPVDMERFDDNPDQALRECFPSQVQATVVMA VSRRRMPEPGTEAYGELGRDPERAFIRTITSQLQTII GIS VSRRRMPEPGTEAYGELGRDPERAF $\mathcal{L}$ T ITSQLQT I GUS

VTS GEMPADAGAAV TEAE F LGBMTPKNEAFG LMA LSRRLIPEKGTAEYDEMVNSHQKAYLKT ITP NLS

K S R R YMPEKGSPEYDELAKNYQKTY LRTDTPKNDTLTDDT QSRRW $\square$ PKEGTPEYDEMDKNPQEAYLKTITPKYQTV $\quad$ LDT
 RCR
LSRRFMPEEGTSEYEELKSDPEKALLKTDTPQLQTLLGDS I ARDKMPTEDPEEWENFLKNPEQTLLECLPSQLQATLVMV ITRLNMPDEDNE 1 WK $\square$ F NEKPDNALLHTFPNPTQATKVML

LMRRLVPKEHDPVYVDFTEDPQAYFLSSLPSLLQATKFMA I ARRNMPNEDPSEWKSFIEKPETIL

TARTNMPCEEPTEWQRFDDNPNSELLACFPSKLQATR\MA VSRRFMPEPGTPEYEELKSDPDLAFLKTDTAQFQTLLGVS
Th RRFMPVEGSAEYAALAKNPEKEFLRTITGKKETLIDDT LCRKF $\square$ PDEGTHEFAELLDDSDKYYLKMLPERFADTLSTA
 LT R RLIPPEETDPEYES F IE DPQKYFLSALPSLLQATKLMA
$\square A R T K M P D P T E E E L K D F W D K P E T T L L T C F P S Q \square Q A T K V M A$



TMRKPPPMKK GEVDLQY IVESLPDRGRSCWHLG LMRKLIPHEDDPSYENF LLHPEYTFLASLPTQLQATKVMA LCRKFVPLEGTVEFGEFLKDPDKFFLKMLPDRFEMSLAAA

TA R S K MP TEDPTEWEDF LNKPEEALLKCFPSQLQATKVIA VSRRPMPVPGSDAYKELEKNPEKFFVRSITAQFQAVVGIS RCRKF $\square P D E G T M E F A E F L E D P D K Y F L N M L P E R F E A T L G U A$

UniRef90 A9U1H4 UniRef90- MOTSS3 UniRef90-B9F512 UniRef90-I1KLK0 UniRef90 B1ABU5 UniRef90-D8R7D4 UniRef90-A0A059B6X9 UniRef90_Q41244 UniRef90 ${ }^{-}$M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAVO UniRef90 A0A059AVJ6 UniRef90-F2DM79 UniRef90-W5G3J1 UniRef90-11PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90-UPIO002C35D23 UniRef90- J3LKL7 UniRef90-K4BOV2 UniRef90 B8LM20 UniRef90 UPIO003EAC6EC UniRef90-W1PMR3 UniRef90-K3YE85 UniRef90-M8BQS2 UniRef90- E5RRZ8 UniRef90-UPI0002BC8F24 UniRef90 M8CDG7 UniRef90 - A1XCl1 UniRef90-UPI0002B46164 UniRef90-Q9M3Z5

VFEIVVIAAHAPNEEYIVERT ${ }^{620}$ TWTQNEQAKAAFQRYTDKK ${ }^{630}$ VIDTLLSTHSVDEEYLGERPDPYWTGDGEMVEAFHEFAAEV WWNTLSTHSPDEEYGGEGRDEPWTADEAAVAAHGMFAADV VIN GSAHSPDEEYI GQTKDSSWSGEPEIIDAFNQFSMEM SIE ESRHPVDELYLGQRGTPEWTTDADMLQASEDFRKKL Al ELLSSHLPGQEFLGEQPSSKWTSDQRVMAAFESFSQRL VIELSRHASDETYLGERETPNWTTDKKALEAFKRFGSKL LMEILSKHSSDEVYLGQHETPAWTSDAKAQEAFRRFGARL
a TevLSGhadteey LMEVLSQHTSDEEYLGQRSMVQWTDKEEVRQLIFMKFKRNL I MDLLSSHSPDEEYMGTYQDPAWKDNVKISKAFAKFKGRL I LNLLSSHSSDEEYMGTYQELVWRKEEKIKEAFDRFKSKM

$\square A E V L S Q H T S D E V Y \square G Q R \square S S Q S \square K N E E V G Q K F E K F N R E L$
 VVDTLSTHSADEEYDGQRQQGDWSGDPRAFDAYRKFSAEV FI ELLSKHAPDELYLGQRDKPEWTSDARALEAFKRFGSEL ILDLLSSHSSDEEYMGTHEEPSWKQDGAIRQAFQEFKERT TMMVLSNHAETEEYMGSRNETNWTSDPAVKAVFEKYADQV LLEVLSAPTSDEVYLGQQQSPNWDDDVWVKQRFQQFAEEL I ASGPMGLKGTEVYLGQRPDEQWTRERRAAEALAEFRARL TMF LLSGHSPDEEYUGDADEPAWAGDPSUSNAFEKFKANL VIELLSRHASDEVYLGERDSKFWTSDSRAVQAFQKFGSK MSAKSGARTGEVFLGQRPDSEWTSERRAGEALTTRFQARL ALNLLSSHSPSEEYMGTHTEVAWMANREVRAAFGRFNERM
VIE ILSRHASDEVYपGQRNNPHEPLTQKHYKPFKNDETSS LVDF LSRNSYDEVY LLRCQPSHWDDNE VLNRFAEFKEED VLDVLSSHSTDEEYGGGEQTRPWNSDAAVQAAYDGFAARL LI EVLSKHSSDEVYLGQRDTPAWTSDARALEAFRRFSDRL LIEVLSKHSSDEVYLGQRDTPAWTSDARALEAFRRFSDRL

LTMSPPVKPGEPLMGERPDTARWTSEQRAAKALLEFNAKL VIE LLSRHASDEFYGGQRDNPNWTPNPRADEAFKKFGNKL

ITEVLSRQASDEQYLGQRDEGDWTFDSQPVEAFKRFGKKL VMEILSRHTSYEVYLGQRDSLDWTADQHAKDLFKSFTERL
$\square$ IVVLSRHASDEQY $\square G E R \square E D D W T S D S Q P K E A F K R F G R K \square$
LIETLSRHSSDEVYGGQRDTPEWTTDAEPLKAFARFGNKL I LNLLSNHSPDEEYIGQYMEPSWAENQTTKTSFERFNKRL ILSLLSCHSPDEEFLGKDMEPAWGEDPEUKVAFEEFRGRL
 ПYVVLSSHAPNEEY DHKDPQWDDDRNARAAHENF $\square T A \square$ LIEILSRHASDELYLGERASTEWTSEKDALELCEYFGKAM

TLDLLSEHSSDEEYLGKDRKDTWDEEPVIKEAFNRFSAKL LIEVLSRHSTEEVYLGQCENPEWTLDAEPLAAFERFRQKL
VTETLSRHASDETYGGERDGDHWTSDAGPLEAFKRFGKKL LVEVLSRHTSDEVYLGQRQSSEWTDDQEVLLKFEEFGEKL LIEVLSSHASDEVYLGERASGEWARDNRVIEAFNRFGSNL VVDTLSTHSPDEEYLGERQQPSWSGDAEMKEAFKRFGKKL
ILDVLSNHSPDEEY GQDPEPALKEEPAGKTAFERFSGR AV WALSQFQENELFLGTYPEEHFIDEPGVKEAMVKFRKNL VLDVLSSHSPDEEYLGEELEPAWGADPLVKAAFERFSGRL
AVWALSQFQENELFLGMYPDEHFDEKP VKEVMVKFGKK VQDTLSTHSADEEYMYQLHEDQLFSDHEVLKLLKRFSAKL

VLDVLSNHSPDEEYTGTNDEPFWKDEPVINAAFEVFSGKL LLEILSSHSSDEVYLGQRDTKEWTSDAKAQEAFKRFGARL LMEVLSRHTSDEVYLGQRPTSEWDDNNEVKQKFEKFDESL

UniRef90 A9U1H4 UniRef90- MOTSS3 UniRef90-B9F512 UniRef90_I1KLK0 UniRef90 B1ABU5 UniRef90-D8R7D4 UniRef90-A0A059B6X9 UniRef90_Q41244 UniRef90- M8AUY3 UniRef90-M1CAP5 UniRef90-D8SAVO UniRef90 A0A059AVJ6 UniRef90-F2DM79 UniRef90-W5G3J1 UniRef90-11PU88 UniRef90-A4ZFY6 UniRef90-E5RRZ9 UniRef90-MOTZQ6 UniRef90-UPIO002C35D23 UniRef90- J3LKL7 UniRef90-K4BOV2 UniRef90 B8LM20 UniRef90 UP10003EAC6EC UniRef90-W1PMR3 UniRef90 K3YE85 UniRef90 M8BQS2 UniRef90- 5 E5RZ8 UniRef90-UPIO002BC8F24 UniRef90 M8CDG7 UniRef90 - 11 XCl 1 UniRef90-UPI0002B46164 UniRef90-Q9M3Z5 UniRef90_UPI0002B416B8 UniRef90-K4AJD2 UniRef90-UPIO0046DB33B UniRef90_A2ZLM2 UniRef90 MOTA04 UniRef90-Q39874 UniRef90-A0A022S312 UniRef90 G7LEB2 UniRef90 Mowvm6 UniRef90-B3VA22 UniRef90 A3ALS8 UniRef90 A3ALS8 UniRef90-V4RZ49 UniRef90-T1N5E9 UniRef9-M8A UniRef90-W1PNW9 UniRef90_11LBC0 UniRef90 UPI00032AB47A UniRef90 ${ }^{-}$V7AQA4 UniRef90-A0A058ZUF9 UniRef90 Q9ZSQ2 UniRef90- UPIO0042B1267 UniRef90-J3M5U1 UniRef90-Q0ZDG2 UniRef90 K7LX80 UniRef90 V4UAG7 UniRef90-U5GV40 UniRef90 K7KYV6 UniRef90 D6PAW4 UniRef90-A0A059B6Y5 UniRef90-F6H9C9


DKVGETILSRNKDPSFK RDI QGRI I ERNGNPELK IEIVAQI NEWNTDRKRK V DI AAQI DKANMDPKLK RRVEKRVEERNKDPRL ERLE HMFHQRNHQRKDL

QN $\square \mathrm{E}$ K R $\square \mathrm{E}$ D K N A D A N $\square \mathrm{K}$

VQVQKNVIARNNNPNLK
QRVERVIQERNADMRFP EKI EGRI MEMNRNPALK REIVEQVDKWNSDPDRK REI ARKI EERNADSQLQ
 KAVEGIMDERNKNRMLK EEVAGNIDRRNADPALK
 KDLEQQIDENNKNNK K EVVVA D R I Q R R N A D R T L K A E: E D R I T S M N N D E KLK K MRIAETIDRRNRDPE R
$K K L R K N Q Q$
KEDQTRVLQKKQ
KEDEGVIDGRNKDRKLK VEI EGKVVGMNGDAGLK VEIEGKVVGMNGDAGLK

NRCGAGDLPYQLMKPFSDSGVT NRNGPAEFPYMLLYPNTSDGIT NRNGPAEFPYMLLYPNTSDGIT

DAVAEAVKKRNADGALR AELETKLSERNHDPNLR

NRNGPVEVPYTLLAPRADPAPH NRTGPAKLPYTVLLPTSEPGLT

AEMEQKLTERNNDETLR KE $\square E D E I$ SKRNLDNQELR
AE $\square E Q K \square T Q R N N D E S \square R$
DEVEEKI DDMNNDKELK KEI EGUIDSRNGNYNLK MELEGTINERNGD $\square$ NLLK

NRNGPVKMPYTLLYYPSSKEGLTT NRTGPINLPYTVLLPTSEKGIT NRYGPVKMPYTLLYPSSEEGLT

NRVGPVNVPYTLLFPTSEGGLT NRCGAGLVPYELMKPFSGPGIT NRNGAGVVPYNLLKPFWKDGDK

RR $\square E K E \square E K R N A D T S \quad R R N R C G A G \square S P Y K L L I P S S G P G V T$ A K LDED I S A R NRSGSK R GVVGTRGDPYELLRPNSKAGVT SEVESNIDERNKDVNLK NRSGPVNVPYTLLLPSSAEGLT

EELERTMDDRNKDNSLK LEIESNI DERNKDKRLK

NRNGAGVVPYELL
NRNGPVKMPYTLLFPSREGGLT
AEDEEKLVKKNNDETLR KEIEQKIVERNRNARLK
 G R I E K E I ERRNKD K KL R

NRTGPAKMPYTLLYPSSEEGLT NRWGPAK\AYKLMHPDNDGGLT NRSGPAQVPYTLLAPSSEPG1TT NRYGPVKMPYTLLYPSSEEGLT

KELEGU!DKRNTDQRFK NRSGAGUVPYELLKPFSEPGVT EVIVSGITERNKNK KKLPYYYLSPDR K E EGGI DARNEDKNDK NRHGAGVVPYELLKPFSGAGVT AE IS GS SK LRNDGKKLPYYNMSPDKIPNSV

AEVSKTDKNRNEGKKDPYYY LS P DRDPNSV
KEIEDTINQRNKDDRLK NRSGAGVPPYELLLPTSGPGVT KEIQTRIMQRNRDPKLK NRRGPANDEYTLLYPDTASGUT

KELEGLIDARNADCNLK NRNGAGVMPYELLKPFSERGDT
 QEIEKQVMERNRDSKLK


| UniRef90_A9U1H4 | $\text { G R G\|\| } \mid \text { P N S }\|1\| T\|V\|$ |
| :---: | :---: |
| UniRef90-M0TSS3 | CRGVPNSVSI |
| UniRef90-B9F512 | CRGVPNSISI |
| UniRef90-I1KLK0 | GRGVPNSVT |
| UniRef90-B1ABU5 | GK GIIPNSVNT |
| UniRef90-D8R7D4 | G R GVP P S V S I |
| UniRef90-A0A059B6X9 | AKG\| P N SVS |
| UniRef90_Q41244 | F K G 1 P N S I S |
| UniRef90-M8AUY3 | ARGUPNS $\square$ S |
| UniRef90-M1CAP5 |  |
| UniRef90-D8SAV0 | G Q G\|VP N S I S I |
| UniRef90-A0A059AVJ6 | G K G I P N S I S I |
| UniRef90-F2DM79 | EMGI P N S I S I |
| UniRef90-W5G3J1 | G L G I P Y S I S I |
| UniRef90-I1PU88 | G R G I P N S V S I |
| UniRef90-A4ZFY6 | S M GVPNSI T |
| UniRef90-E5RRZ9 | GRGUPWSIS I |
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| UniRef90_UPIO002C35D23 | R K G $\square$ P N S $\square$ S $\square$ |
| UniRef90_J3LKL7 |  |
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| UniRef90_UPI0003EAC6EC |  |
| UniRef90-W1PMR3 | G R GVP N SVS |
| UniRef90-K3YE85 | A M GIIP N S I Sil |
| UniRef90-M8BQS2 | EMGI P N S I S I |
| UniRef90_E5RRZ8 | GKGVP WS |
| UniRef90_UPI0002BC8F24 | A $\square$ GII P N SIS M |
| UniRef90-M8CDG7 | GK GII P N S T S 1 |
| UniRef90-A1XCI1 | L R GIP P N S I T V |
| UniRef90_UPI0002B46164 | G S GVP Y S V S |
| UniRef90-Q9M3Z5 | FRGIPNSI S I |
| UniRef90_UPI0002B416B8 | GR GV P Y S V |
| UniRef90-K4AJD2 | $\square R \mathrm{G} / \mathrm{P}$ N S |
| UniRef90-UPIO0046DB33B | GRGIP ${ }^{\text {P S V S } 11}$ |
| UniRef90_A2ZLM2 | EMGLP N S |
| UniRef90-M0TA04 |  |
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| UniRef90-A0A022S312 |  |
| UniRef90-G7LEB2 |  |
| UniRef90-M0WVM6 |  |
| UniRef90-B3VA22 | G M G $\$ P N S T S  \hline UniRef90_A3ALS8 & A K GIP N S 1 SII  \hline UniRef90_A3ALS8 & AK G IP N S S I  \hline UniRef90-V4RZ49 &  \hline UniRef90-T1N5E9 &  \hline UniRef90-M8A1U0 &   \hline UniRef90-K7KYV5 & F R G LiP S S S I  \hline UniRef90-W1PNW9 &  \hline UniRef90-I1LBC0 &  \hline UniRef90-UPI00032AB47A & F R G $\$ P N S $\$ S  \hline UniRef90-V7AQA4 & F R GliP N SVSI  \hline UniRef90-A0A058ZUF9 &  \hline UniRef90-Q9ZSQ2 & CRG $\square$ P N S $\square \mathrm{S} \square$ |
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| UniRef90-J3M5U1 |  |
| UniRef90-Q0ZDG2 |  |
| UniRef90_K7LX80 | G K GlVP Y S A SI |
| UniRef90-V4UAG7 | E K GVVPYS $\square$ S I |
| UniRef90-U5GV40 |  |
| UniRef90-K7KYV6 |  |
| UniRef90-D6PAW4 |  |
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| UniRef90_F6H9C9 | S K G $\square$ P N S $\square$ T V |
| UniRef90_UPI00042B5F1C |  |
| UniRef90-IOYJS7 | S R GVPPCSTSI |
| UniRef90_UPI0002B46D89 | GRGUPNS $\square$ S 1 |
| UniRef90-M8B5F0 |  |
| UniRef90-F6GUC9 | K G VP Y S 1 S 1 |
| UniRef90-I1LE57 | GK GIIPNSIS I |
| UniRef90_F6HWH9 |  |
| UniRef90-V7C0Q5 | F R G 1 P N S 1 S 1 |
| UniRef90-UPI0003D780D1 | GK GIIPNSISI |
| UniRef90-10DHH2 | A K Gl\| P N S I S I |
| UniRef90-G7LIA2 | CRGIPNSISI |
| UniRef90-B9T7Z9 | C R GVVP S SVSI |
| UniRef90_S8CJ37 |  |
| UniRef90-A0A059AAV9 | G K GVP Y S |
| UniRef90_UPI0002738C05 | 1 P N S V A 1 |
| UniRef90_A5ANS7 | G K G V P Y S I S I |
| UniRef90-G3NY91 |  |
| UniRef90-R7WBQ0 |  |
| UniRef90-B8A697 |  |
| UniRef90-M1B0R2 | C R G $\Pi$ P N S $\square$ S $\Pi$ |
| UniRef90-UPI0003DE7E7D | GR G IP N S IS I |
| UniRef90-M5X714 |  |
| UniRef90-K4ATG3 | G K GVP Y S I S I |
| UniRef90-C0PHP9 | A K GIP P S I Sil |
| UniRef90_UPI00042B0E85 | AK Gl P N SVSI |
| UniRef90 G7K037 |  |
| UniRef90-D8RHQ8 |  |
| UniRef90_UPI0002B45BD5 |  |


| UniRef90_IOYLY0 |  |
| :---: | :---: |
| UniRef90_H3CTD7 |  |
| UniRef90_V4LU46 | $\square P$ S Q T P K P LK Q LR K E E L K T LQ G K N |
| UniRef90_H2UDI3 |  |
| UniRef90_H2S191 |  |
| UniRef90 B1PYN9 |  |
| UniRef90-H0WL19 |  |
| UniRef90-UPI0003334419 |  |
| UniRef90-R4GAL6 |  |
| UniRef90_F1R442 |  |
| UniRef90-G7L7K2 |  |
| UniRef90_UPI0003C8FC9B |  |
| UniRef90_UPI00046B301B |  |
| UniRef90_UPI0002B491A2 |  |
| UniRef90_UPI00033436A4 |  |
| UniRef90_UPI0004571F19 |  |
| UniRef90_Q10EG7 | $\square P$ S K M P A P L I P Y R Q E E L N L R G D GK GP Y K E H D R $\square \mathrm{Y}$ R Y D Y Y |
| UniRef90 H9G9Y4 |  |
| UniRef90 UPI0003503872 |  |
| UniRef90_UPI0003C8471C |  |
| UniRef90 K7FKD0 |  |
| UniRef90_UPI0004419B5F |  |
| UniRef90_UPI0003504158 |  |
| UniRef90_F6HB90 | S G L K K L R E $\square \mathrm{ELLE}$ NLLR G N G K G E R K T S D K $\dagger$ Y D Y D T Y |
| UniRef90_R4GBA5 |  |
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| UniRef90_UPI000441E335 |  |
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| UniRef90_UPI000388C1D7 |  |
| UniRef90-F7F9J1 |  |
| UniRef90_UPI0003336DB8 |  |
| UniRef90 M3VWH8 |  |
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| UniRef90- W5QBT2 |  |
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| UniRef90_UPI00042AD81C | D T R SLF RKYREQEMEDRR KVYRWGSW |
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50
60
NDLUGGKDSNAANRRP\|LGKARGLPYPRRLRTGRQPDKNND
RELVDP KHARPVIGGLS HRYPRRCKTGRKPCDNDP
$\square G D Y \square E F P C Y R W \square \quad$ T G E G
GETYHFPCYQWME GYRT LE LRE G

RPPTDAPLLFPCYQWLEGAGSLVLWKG $\square G T \square D P D A W F C R P P G G A S L R F P C Y Q W L E G T R N L V L R E G$
$N D \square G Q P D K G S K \square V R P V L G G S Q E \square P Y P R R G R T G R A P T K T D P$ GA AYHFPCYQWMEGYQT DELREG

GQS YRFPCYQWDEGYRTLEKGQM GMTYNFPCYQWIEDSQPLELREG

NDLWDPDDSKDLARP LLGG QDHPYPRRCRTGRPSSKKDP

CGDY IEFPCYRW RKRELQAR G $V A Y H F P C Y Q W M E G R G S \square E L R E G$

TATFPCYRWVRGDSLPEGSAR GK MQ $\square \mathrm{FPCYRWFVGDSKIEDREG}$ GQTYRFPCYQWVEGYRTLELREG
RPGTGKT $\square$ CHDS $\square P L L L D H R K K E L R A R$

CNWDSVQGPGANGEERFPCYRWVEGSSLPEGTGC FPCYRWFVGDVKMEIREG


CKW $\square$ A VQGPGTQGEAFFPCYRWVE I C DPEGTAR GGETYFPCYQWIEGYRTFELPEG

GDTRHFPCYR L S EEARVH $\square$ REGP

GRTHFPY RPPVDVRN
NDLGDPDNDPATRRPVLGG RERPYPRRCRTGRRRCRADP
K E
REGTAKRLCDETNH SYHPPVR RCRNPNRPEWNG $T V Q G P G A S G E V A F P C Y S G Q G V L T L P E G S A R$

CK W $\square$ TVQGPGTQGEVHFPCYSW $\square$ K $\square L C D P E G T A R$ PPPRTRYCSCNLFFKVE

RFPCYQW $\square E$ G NTTLH $\quad$ R E G

GSTQTFPCYCWLVGDMKVEVREG K D LTDSDTC $\square$ SVRGPGTQGEA $\square$ FPCYSWVQGY RPPVVCRHR $P G A C A E A A F P C Y R W V Q G N G V L S L P E G$

UniRef90 IOYLY0 UniRef90－H3CTD7 UniRef90－V4LU46 UniRef90－H2UDI3 UniRef90－H2S191 UniRef90－HoWL19 UniRef90 UPIO003334419 UniRef90－R4GAL6 UniRef90－F1R442 UniRef90 G7L7K2 UniRef90 UPI0003C8FC9B UniRef90＿UP100046B3011 UniRef90－UPIO002B491A2 UniRef90＿UPIO0033436A4 UniRef90－UPI0004571F19 UniRef90－Q10EG7 UniRef90 H9G9Y4 UniRef90 UPI0003503872 UniRef90－UPI0003C8471C UniRef90－K7FKD0 UniRef90 UPIO004419B5F UniRef90 UPIO003504158 UniRef90－F6HB90 UniRef90－R4GBA5 UniRef90 UPI000441 E335 UniRef90－UPIO00441E335 UniRef90－HoWJRO UniRef90－S9XU85 UniRef90 UPI000203AAE2 UniRef90－M4ACF3
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RDGRAFLPQDDKDSLVKQHRQKELELRYGWQEWQPG SSEKRYGEFYVPRDEEFS RDGRAFLPQDDRTSLVKQHRQKELELRYRWKEWQPG

E $\square V L R D G R A R \square A R D D Q H L L K Q H R R K E \square E T R Q K Q Y R W N P G$ TAKLICDDAGSPRQERSE ELKQARREC GSPLQHRSEELK SRQEAYRWDVFAPGMPRC

AAKVPGEDDHP乌LQQQRREELQARQHKYRWKTYTPGWPHC AAKLSRADQHPKLQKQRQEELQARQEMYHWKTYIPGWPHC

## LLQQQRKEELKVRRET YRWKTYLPGWPHC

RDGKARLPQDDTSQITKLHRRRELEERQKWKEWHPG NTESRDPNDYVPRDERFGHLKMSDFLGYSLKAlVEGVLP乌 TAKTPAMDLPL EVVLRDGRAKLPRDDKTQILKQHRRKEDENRQKWKEWHPG VFDDADQPMLLQQREQREEELQARREMYRWKTYNPGWPHC MAKTPAMD SLPRQHREEELQRRQNTYWWKEFAPGVPYC LSETRSDDVEVLKEHRRKELKKARQDAYQWKNYAEGWPRC QKRQADYGWK IIFAEGVPHC

YGWKTYAPGWPRC
QECYRSWK TYAPGFPRFSLTKMPPRVEQGNSSGNRYD PG E\｜VLRDGRAKLACDDQTHILKQHRRKEDETRQKLYRWMPG TAKTPAMDLPLLREFR\｜KEVEKRQCD YRWKIWNTGTPEC RDSREQELKQ RQKDYGWDVYVEGLPHC
LavDNASDDFQKHRDKELEERQQM
YRWATWKEGLL
KATTVKDDT SPKLLEHRKQERRETYRWITWAAGIPRC KGQMLCNDADSPLEQRQAELKKHRRECYRWKEFAPGLPRC QECYR WK TYAPGFPRMVDVNSFEEMESDRKFALTKMTPS NNALDVFQRHREKEL EDRQQTYRWASWRDRLPLT NALDVFQKHREKELKERRRLYCWATWKEGLPRT HELESRKDMYSWKTYYEGWPHC TVVEDSEGVFRKHREQ ELQERRKDYGWGNWKDGLLLN TAKTLTGDSALQLLEHRKTELQERQKTYRWVTWAPGIPRC GSAKTPTMDTLPLLKEFRRKEQKRQSFYQWKVWNEGVPYC TMRDDPQNQFKKHREQELEE ERRKVYRWGFWKEGLPLP TAKTSGDDTHPLLQKHRREEVVRRKERYQWKEYSPGIPWC DLPVERFLEDKR】DFEASLAKGLADLLDA AVRLCDERLPVLLNHRREEL QERQKLYRWQAWESGIPKC DDNDLGRYSRMQELKQREED YRWDVYLEGITHC DQREDGAQTYLLQKHRREELVLQQER YRWKEYSPGAPWC SSESPPDGTYVPRDEAFTERRAGAFATKRALSMLSAFTTA WDLPRNQRFMEDKDLDDFSLSLAKVLKDFATKG पARYSREKEMKTRTEQYCWDTYKEGFPGSMKADNPLDLPS


RQQRESELEKKRE TYGWKTYMEGAPPC QERQQKYRWSEYFPG $\square P R C$

## 】P L

SVSDDPQNLFKKYREQELED SSNPKAMTEEVS पWERGS SWADHHPILRRQRQEEL QSRQRMYCWKTYSPGWPHC S WADDHPVLQQQRREEL QARQDSYQWKTYRPGWPRC REEELQERKKDYRWGTWKDGLILNMDGD KGKKYSDDTEFGKEHRRQEEKKKKQQNYQWKEYAPGWPRC WNGYlPG QG SHL
TAKKLSDDV LPKEHRKAELKQ RQETYRWDAWAPGUPKC NPNRREWNGYIPGFP\｜LINN KATRFLDLNLRYSF
TARTVSNDQSLLKTHREQELGQERKTAYRWGSWKDGLLLPR
$A R Q E M Y Q W K V Y N P G W P H C$
$R V N K P S E S L S W D Q L K D G L P H N$
$E \square K Q \quad R Q Q E Y R W S E F F P G \square P H C$
CAK
TVVDDSQGFFRKHRE
RRKAYRWGSWKDGLILP SPGSWKTYSPGWPHC

GQKWSEYFPGLP C

## NTKRQTHQWKTYAKGAPRC

 E ELQE R R K L Y R WGNWK D GLI LGG


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 UniRef90-H3CTD7 UniRef90-V4LU46 UniRef90-H2UDI3 UniRet90-B1PYN9 UniRef90-HoWL19 UniRef90_UPIO003334419 UniRef90-R4GAL6 UniRef90-F1R442 UniRef90-G7L7K2 UniRef90 UPIO003C8FC9B UniRef90_UPIO0046B3011 UniRef90-UPIOOOOB491A2 UniRef90-UPIO0033436A4UniRef90 UPIO004571F19 UniRef90_Q10EG7 UniRef90- H9G9Y4 UniRef90-UPIO003503872 UniRef90-UPIooo3C8471C UniRef90-K7FKD0 UniRef90-UPIO004419B5F UniRef90-UPIO003504158 UniRef90-F6HB90 UniRef90-R4GBA5 UniRef90_UPIO00441E335 UniRef90-UPIOOO441E335 UniRef90-HowJRo UniRef90-S9XU85 UniRef90-UPI000203AAE2 UniRef90-M4ACF3 UniRef90_UPIO0020F60A0 UniRef90-G1U492 UniRef90-UPI0002A47DDD UniRef90-UP1000388C1D7 UniRef90-F7F9J1 UniRef90_UPIo003336DB8 UniRef90-M3VWH8 UniRef90-Q8K4F2 UniRef90- G3U763 UniRef90_UPIOOO3343952 UniRef90-13J7M6 UniRef90-H9GA86 UniRef90-UPI0003C8E9E9 UniRef90-W5PG76 UniRef90-UPIOOO3C25DOD UniRet90-G3TIG3 UniRef90-W50BT2 UniRef90-W5N9Q5 UniRef90-V9KL88 UniRef90-G3NLB8 UniRet90_HOWPR2 UniRef90_UP100046C2E6B UniRef90-A5C523 UniRef90 ${ }^{-}$B8BMH9 UniRef90-UPIO0042AD81C UniRef90-B5XOR4 UniRef90-G5B5F0 UniRef90-UPIO00443E818 UniRef90-I3N674
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FPLSTDAKCHDTQFDSEKGVDFTLNYSKAMENLFTNRFMH LEVSVSDLDDRNUKYSTVKAAKFKLKTSSAFTELKIKGLLD LEVESLEEMDTNSKFNFTKMSGFLGKSKLTTGELKLKGFM

LEKTVKDLDLNDKYSTVKNTNDYLEGSSAFAELRTKGLLD LEATVKDLDNTKYSTAKNDHFYLRGGSALTELRUKGLLD


RRVSGDRRRS FPS $\square A A \square D A \square Y E D G Y K N R P P Q R Q V K L L$
 FSFAKKASFFERLAPMSGALKMRGLDD
ПAADSTDDपPPNMRFHEDKR पDFEWTQKAGALETVLKRVY
TNADSPTDDPPNEQFSF MKDSRFSFSAVSGTVGQKLLG LDAELKDLDPNGRYSVTKDVNQKFHFASPSЏVLKLKGLLD SVDATSEKD $\square$ P $\square D F H E E K G D F N G A V T A G \square M E M T \square K R V G T$ VAGKTQRDLPRNERFDEDKDDSCHSDHRKNTA LEEKSVDVDLNGKYVMKNSCFYGKVSSALTELKLKGLLD

DDAKNDKELDPNDRSLTSKNVVLKPHTMPPQMGDKMKGMD LQPTAKDLDLNDKYSVVKNTKFYTKGSSALPAHYQLKПKG LEKTVKDLDLN KYSVTKNVHFYGKAGSGFTEMTLKGLLY TKEDLPADERFLEDKRIDFEASLAKGLAELAVKDSLNALA I KAENPLSLPCEVRFSFTKTTEFLDFTATAALAEFLQLKARD KADSLLSLPYDDRFSLTKTAEMVY TGATGLGRLGLMGI MDAKTEAELPQDDFANEKRSDFEGSLHYALLELSSLKKLAD VVGRTPWDLPRNEFREDKDLDFSFSLARALEGLVLKGADD ปAAECKDDLPDNMRFHEEKRQDFEWTVKAGAGKIVFKRAY पSAETVTDLPPNDRFSFKKTDSFGFNLLSSSLGATLKGYL DKQSLPLFPEELTELKLKGLDN LKRTVKD DDNKKYTAKNANFYLQAGSAFAEMKIKGLUD

पDAENLKELDPTLRYS $\square$ TKE $\square$ NQKFHHAS $\square$ NVVLK $\square K G L L$ FP पS TDAKCHD DQFDSEKGVDFVLNYSKAMENTF TNRFMH MAGSKLTDLPDNEFLEDKRIDFEASLAQGLASLAVKDSLN

UniRef90 IOYLYo UniRef90-H3CTD7 UniRef90-V4LU46 UniRef90-H2UD13 UniRef90_H2S191 UniRef90-B1PYN9 UniRef90-HoWL19 UniRef90 UPIO003334419 UniRef90-R4GAL6 UniRef90-F1R442 UniRef90-G7L7K2 UniRef90 UPIO003C8FC9B UniRef90_UPIO0046B3011 UniRef90-UPIOOOOB491A2 UniRef90-UP100033436A4 UniRef90-UP10004571F19 UniRef90_Q10EG7
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FEFSRDKILRDAFNNFPQWPLTMKIRDRRPRTWQSDEEVGRQ
 WPKLIKAVSEAQDDLLQIDPPILLNKDRFSCIRRDEFARQ
WMYSSWSDFADFERI FVRIKNTISEYVMKHWKEDFMFGYQ MFQSSWKDLADFERIFVAIKNTVSEYVMKHWKADFMFGYQ DVHLCGGSHQWTDTTFHCN MFQSSWSDFADFEKDFVK TSNTVSERVMKRWQEDVMFGYQ RTGL WKSLQEMKRMLNFHSTPVAEYVFQHWQEDSFFASQ


RKGPWRSLKEMKRTENFQKTPAAEYDFEHWQEDAFFASQ RKG WRSLTEMRR!LNFRKTSAAEYAFEHWQEDTFFASQ
RKG PWKSLKEMRRVFNFRKTPAAEYVFEHWQEDTFFASQ MFQSSWNDFGDFEKIFVRTSNTTSEYVMQHWKEDFMFGYQ FELIKSLLPVAGDQVLKLPLPHVIKEDKFAWRTDEEFARE SQKSWENL ED TKKVFWFNKSDLSVYVTEHWKDDALFGWQ MFQSSWSDFADFEKIFVRDSNTISEYVMQHWKEDFMFGYQ RKGL WKSLKEMTKVFSFWKTPAVGYVFEHWQEDAFFAYQ SCTNSWAKLEDDSKVFCFSKSPDTEYVQEHWREDTFFGYQ RQESWDK LEDIKKVFWFNKTEMSEHVMEHWKRDEFFGYQ RPN SWRSLDEMRSIFSRTKDIVPEYVASHWQEDAFFGYQ IDPRLVKTIAEGEGDI LLFETPAMIDRDKF DSQESWKHLDDIKDVFWFNKSDLSEYDTE HWKEDADFAYQ DLTESWDSLNDLRKIFWFHKTPVTEYVMDHWMDDDFFGYQ DLTESWDSLNDLRKIFWFHKTPVTEYVMDHWMDDDFFGYQ
 DSKRSWGNLEDIKKVFWFNKSDTSKYVTEHWKEDAFFGYQ DKKTNWTNUDDVNRVFCCRQTDRSDYVQQHWKEDAFFGYQ TLLSSWDRLEDFDQU FWGGKSALAEKKVRQHWQDDEFFGGYO RFGKSWNDLEDFKRIVFWKLRSPIAEYCMDHWKEDWLFGYQ NRQGSWKKLDDIRKIFWCHKTLTSQYVTEHWKEDHFFGYQ TLLSSWDHLEDFNQUFWGQKSVLAEKVHQCWQDDEDFGYQ TLLSSWSRLEDFDQIFWGQKSDLAERVHHCWRDDELFGYQ DRKRSWKKLDDDRNFWCHKTFTSEYVTEHWCEDHFFGYQ NVLTRWDDLDDFNRIFWCGQSKLAVRVRDSWKDDAFFGYQ SKK SWGSLDDIKHVFWFNKSETSEYMTEHWKEDAFFGYQ

 KMDASWDSLQDFERIFWRVKSPIGVFVRENWQDDCFFAYQ DSRKNWPDIDSDKRVFWLKHTDLSDYVRDNWKEDDFFGYQ TLLLSSWNRLEDFDQVFWGQKSTLAEKVHQHWQDDELLFGYQ पKGEEEEFKEELRKDFKFQTSETHDKDKपAWDRDEEFARQ LDEDYRIFPCGKTALAGRVRESWKEDALLFGYQ CKR SWKRLKEDGKVIFCCNRTVISDYAQEHWKEDEFFGYQ TFLSSWNHVNDFDQIFWGQKSDLAEKVRECWQEDELFGYQ LSNSNWNDVDDYNRIFWCGYSKLAERVRQSWKEDAFFGYQ SER PWQSLEEUQRTFVFPKSQVSEYVFQHWQEDAFFASQ MTDEEFARE $\square \square S$ S WNS $\square E D F D Q \square F W G H K S T G R R V R K S W K D D D F F G Y Q$ LANCDHRLEDYKKDFPREKTADAVRVCDSWKEDDDFGYQ RKG PWKSLNEMKRMFNFRKTPAAEYTLEHWQEDTFFASQ

DRKGPWESMDEDSEDFAFDKSEVSEYVAEHWQDDEFFASQ LLDRTGLWRSEMRRMFNFQKSPAAEYVFEHWQDDTFFASQ RKGL WKSLHEMKRMFNFHKSPAAEYVHEHWQEDAFFASQ
 DREESWTDTESDNRVFCFKRTDISDYVRDHWKEDSFFGYQ LLDEKWKRLKE: RKI FPATKTAISEYVYNHWKEDQFFGYQ LQSNKFTCMEDUKQLLNVHKTQVSEYVCNHWKEDTFFGYQ RFGKSWNDLDDFKR1 FWKLRSPIAEYAMEHWKEDWFFGYQ LTNPVRRLEDFQRLFPCGKTPLAERVRNSWKDDTLFGYQ TFMKSLNNLEDFNQUFWSHKGALAEKVHQCWQDDELFGYQ DRSDSWKDLRDTKKVFSTEWTDTSDLVSEDWKEDSFFGYQ CKKKWDNIDSINRVFCCKKTEISEYVHEHWKEDAFFGYQ


DSQRPWKSLGETQHTFTFPKSQVSEYVFEHWHEDAFFASQ
SWKDLEDDKKVFWFNKSDIS EYVTEHWKEDAFFGYQ



## UniRef90 IOYLYo

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UniRef90-R4GBA5
UniRef90-UPIOO0441E335 UniRef90-UPIOOO441E335 UniRef90-HowJRO
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UniRef90-UPIOOO203AAE2 UniRef90 M4ACF3
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UniRef90 UPIOOO3336DB8 UniRef90-M3VWH8
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## GPGTSLQAELERGSLFLVDHGILSGTQTNVINGRP QFSA

 GPGTSLQTELERGSLFLVDHGLSGURTNIINGRP QFSAGPGTCLQAELERGSLYLVDHGLSGTRSNVVNGRP QFSA
LSLEEEI EKGNIYLADYQILDEVPANSTDPCTDQYLA MEGLSTVQNALKGNRLF: DDHHDHFMPFLDKINKLDGNFIY ERNDTLEEEVKQGNIFIVDYELLDGVDANKTDPCTIDYYA GPGTSLQAELEKGSVELVDHGIL SGGVRTNVINGRPQFSAA
 GRGTTLDKEMKEGRIF:VDYEVLQGIPAGTVHGRQGQYAB GDDTTLEKELEKGNDFIVDYKLLEDVPAGLNNERQQYYA GKSTSLEKELKKGNIFI ADYKILEDIPTCKLNG KQQYLA GPGTSLQTELEKGN FLADYWI ABAPTHCLNGR RQYVT GDNTTLEKELK KGN: FLCDYKQMDGVKASTINDEKQYMM ADGTTLEKELQNGSLEEADFDLDGGLPANVIRGGEQQYMA
 GPSTCLQAELEKGSI FLADYWI GEAPVGHLNGRP QYVA
 GPGT
 T E K EL पQNGT

Lekelockil GPGTCLQTELERGTLFEADFSLLDGI KANVILFEQQHLA
 LGGQSLADEMKKGNLFLCDYKLLDGVKNVINGKKQQYMA
 GQ DNGVMQAVEKKKLFMLDYHDVLLPLVHAVRELDDTTLY RGSSSLEKELQAGSLFEADFSLLDGVKPNDIIIFKQQYVA GEGTCLQAELEKGNYLADYRTLEGIPTVELNGQK QFHC LEKLQNGSLFEADF FLLDGAPANVRGEQQYLA
NLKKELKEGTLFEADFYLLDGUKANVICNHQQHEA GPSTNLQTELQNRNIFLADYKILEGIPTNVINDEPQYLA GPGTSLQAELERGSLYLVDHALLSGLCPSTINGRPQFVAA LEGLTVDKAUKDQRLFILDHHDTFMPFLRRIDESKSSRAY LERKLQEGCLFEADFSLLDGDQPNLI QGERQY TLA LNKELQAGSRFEADYTLDGVKPNLITFKQQYVA



UniRef90_10YLYo UniRef90-H3CTD7 UniRef90-V4LU46 UniRef90-H2S191 UniRef90-B1PYN9 UniRef90-HoWL19 UniRef90_UPIO003334419 UniRef90-R4GAL6 UniRefofo-F1R442 UniRef90-G7L7K2 UniRef90_UPIO003C8FC9B UniRef90_UPIOOO46B301B
UniRef90 UPIO002B491A2 UniRef90-UPIOOO33436A4 UniRef90-UPI0004571F19 UniRef90-Q10EG7

## UniRef90-H9G9Y4

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UniRef90-S9XU85

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SPMTLLYQRPCGPLLPLATQLNWNPG APCLCLYNNSSNKLEIA: QL
 ASRTILLLKDDGTLKPLAIELSLPHPDGQQHGAVSKVYTP
 PMTLLYQWPGCGPLLPLA: APCCLLYVQPSGELVPVA: APLCLHODANGHLRPIAI GSRTLFFLTMDGTLRPLAI VPLCLGHLSKQKHLMPLAL APLCLEFLNSKGQMMPI Al APLCLLWLNSQGALVPLA: APLCLLYGSPRNHLMPLA APLVMLKLEPDGTLGPMA! APLVMLKMQPDGKLLPMVI
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 APLVMLKLQPDGKLLPMVI
 APLVMLKMEPNGKLLPMVI
 APLVMLKLQPDGKLLPMVI APLCLLWLNPQGALVPMLA AP:CLLYOPPSSPLIP:A! A VGLKMABKLA APLVMLKMEPSGKVVPMAI ASRTLLFLRDDHTLKLLAI ASRTLFFLTEDGTLRPLAI APLVLLYRTPDEKLIPIA AP LCLLHLNSQGNVMPIA APLVMLKLQQPDGQLEPMVI
$A P M C L L W K S P Q N K V V P I ~$


 LILLIPQGALGPLAIQLS

APMTLHQKPDGGPLP A QQN APMTLLYQSPNGPLLPLAUQLS GASIP APLVMLKПQPDGNLTPMA QL APLCLVHQNQAGELQPMAIQQL APLVLLHNTPDDKLMP: A: Q APLCLLHCGPQGDMMPIAIQLS APLVLLWKNNADHLVPVAI APMCLYEHPESGLIPIA! APLVMLRLQPDGRLLPMVI APLVMLKLKAPDGRLLPMVI ASBTLLSLQDNGTLKPLAI APMCLLWKSPNDEIVPIAI APLVLLHKDPHDKLMP:A! APMTLLYOSPCGPLDPLAIQLKQTPSD APLVLLHKTPDDKLMPIAl QLS ASRTLLFLKDDDTLKPLAI ELSLPGLSR A A PTLLHQRPGGGPLPLAL APLCLLHLSAQNHLIPLAI AP CLLLYKNLANKIVPIA APLVMLKGQPDGKLMPLVI
$E P N$
$C Q S$
$R P R$
$N Q V P$
$\qquad$ Qilpgednpiflp TPQWRQVFTP QSPGPNSP:

SRPHP

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L
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GQKPGPENPIFLP
TRPPVGD

S R PVGD
$S$
$S$
$S$
$S$
QVP GVG


Q P P N S
$Q L P R \square G$
Q
Q P P N S $\square$ S
$Q P P R N G$
$S$
$Q P$ Q E G
Q H P
$\begin{array}{lll}\text { Q T } & \text { P } \\ \text { Q C } \\ \text { Q } & \text { P }\end{array}$

$\qquad$
$\qquad$ Q T P

## Q|VP G D E

Q T P G P D S P I F L P
S Q S S N
S R P P VG D
T
S
S
S
S QVP GDE
G ${ }^{L}$
$\begin{array}{ll}\text { L } & Q \quad P \quad P N A G S \\ L & S\end{array}$
SP C P I FLD

Q L P R $\square G \mathrm{~S}$
YPPG
C
G
C
$\begin{array}{llll}G R D & T & P \\ G & L & S & P\end{array}$

EA

## S

| $R E$ |
| :--- |
| $Q$ |

WN P G
 Q T P GPNSP $\underset{Y}{F} \underset{F}{L} P$
$\qquad$

| $Q \square P G P D S$ | $P$ | $F$ |
| :--- | :--- | :--- |
| $K Q$ | $L$ | $P$ |

## QL Q P P R N G

Q L P Q G
$\qquad$ $P$
$S$
$P$
$S$
$S$
$S$
$S$ V L L

K
Q P P N P S S Q $\square P$
Q
L $\underset{L}{L}$ LDPGSSA



| S |
| :--- |
| Q |



| $P$ |
| :--- |
| $S$ |

$T P$
$P \quad L$
$P$

A PLVLLHKNEDDEMMPI A| Q

## S

UniRef90_10YLYo UniRef90-H3CTD7 UniRef90-V4LU46 UniRef90-H2S191 UniRef90-B1PYN9 UniRef90-HoWL19 UniRef90_UPIO003334419 UniRef90-R4GAL6 UniRefo-F1R442 UniRef90-G7L7K2
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UniRet90 UPIOOO3C UniRef90-UP10003C25DOD UniRef90-W5QBT2 UniRef90-W5N9Q5 UniRef90-V9KL888 UniRef90-HoWPR2 UniRef90-UP100046C2E6B UniRef90-A5C523 UniRef90' ${ }^{-}$ВВВМН9 UniRef90-UPIO0042AD81C UniRef90-B5XOR4 UniRef90-G5B5FO UniRef90-UPIOO00443E818 UniRef90-I3N674 UniRet90-UPIOOOO6A1F26 UniRef90 UPIOOO3C92103 UniRef90_Q9ARI1
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370
380
390
400
FAl| ATRRQLISAMHPVVYQLILPHFRYTFNIINSSARGNLIINA FAI AMFRQLPAVHPAFKLLIPHVRYT $\mathrm{IA}_{1}$ INTKAREQLICD Y I AANRELSAMHPAYKLEHPHFRYTMEINARARQSLINA F Al AMFRQLPAVHPVYKLLDPHDRFTDAINTKAREQLCE YAI ALFRQLPAVHPVYKLIPHIRFTIAIDTKAREQL GE
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 FTLALLRQLPHCHPLFKLLIPHTRYTLYISTLGRELLI AS



 YTMATLRQLPTCHPIYKLLKPHTRYTLHINTLARTNLI QP FAMATLRQLPLCHPI YKLLLPHTRYTLQVNTLARATLLNP F G I A M M R QLPAVHPI FKLLVAHVRFTIAINTKAREQLICE FAMAADRQLPMCHPLYKLLI PHMRYTFHI NTLARESLISK



 I A
 FAVATMRCLPSLHPVFKLIIPHLRYTMEINARARNGLVSA
 IAAVATMRCLPGLHPVFKLLIPHDHYTGEINDRARS QLVSY

 FAMAT LRRQLPDCHPI YKLLLPHTRYTGQVNTDARATLLNP


 Y V A T R R QL S VM H P V H R L L DP H FK D TMMH N AL S R S III I N S YVI A A NRRLSQMHPI YRLLHPHFRFTMEI NAQARRMLI SA


 F A L S L L R QL P MCHP I F KLLTPHFRYTFHVNVQARTGLLAP
 Y I I A A N R Q L S Q M H P i Y Q L L HP H F R Y T M E I NA Q A R Q M L V N A
 YVI AT N RQL SVVIHPIV RLLDPHFRYTVVI NAFARKDLVNA


F | F | S | $A$ | $T$ | $M$ | $R$ | $C$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $L$ | $P$ | $S$ | $V$ | $H$ | $P$ |
| $F$ | $T$ | $R$ | $R$ | $Q$ | $L$ | $P$ |
|  | $M$ | $C$ | $H$ | $P$ | $L$ | $F$ |

$\begin{array}{llllllllll}F & A & C & L & L & R & N & M & P & M \\ A & V & H & P \\ R & L & Q & L & P & M & C & H & P \\ L\end{array}$

F

## 1




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


 LLHP $H T R Y T L H$
$H L R Y T M E$ HYRFTMEI $N$
$N$
$N$
$N$ A
$\mathrm{N} T$ R A
L $A$
L

A \begin{tabular}{l}
R <br>
R <br>
A <br>
\hline

 

N S <br>
N F \& L \& G R <br>
A R
\end{tabular}

 $N V L A R S N L V E$

 N T L A R K TLL I GP N F L A R R LL I S D | $N$ | $M$ | $A$ | $R$ | $E$ | $L$ | $L$ | $V$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $F$ | $L$ | $A$ | $R$ | $K$ | $L$ | $L$ | $I$ |
| $S$ | $D$ |  |  |  |  |  |  |  | N A L A R S TVV L K G

 M V P HL R Y T E N VRARNGLV S D


## UniRef90_Q10EG7

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UniRef90_R4GBA5
UniRef90_UPI000441E335 UniRef90_UPIO00441E335 UniRef90-HoWJRO UniRef90-S9XU85 UniRet90-UPIO00203AAE2 UniRef90 M4ACF3
UniRef90_UPIO0020F60A0 UniRef90-G1U492 UniRef90-UPI0002A47DDD UniRef90-UP1000388C1D7 UniRef90_F7F9J1
UniRef90_UPIo003336DB8 UniRef90-M3VWH8 UniRef90-Q8K4F2 UniRef90_G3U763 UniRef90-UPIO003343952 UniRef90-13J7M6 UniRet90-H9GA86 UniRef90-UPI0003C8E9E9 UniRef90 W5PG76
UniRef90-UP10003C25DOD UniRef90 G3TIG3 UniRef90-W5N9Q5
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UniRef90-F6U085
UniRet90 W5FMV4
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UniRef90- BOFFI4 UniRef90_BOFFI4
UniRef90-UPIO00329ED4C UniRef90-UP100045E36E3 UniRef90_M4ALZ4 UniRet90-K4CT85 UniRef90-UPIO002740CF8 UniRef90-H9GA71

GGVFDKTGVGFKGLVEVLQRGTQA $\square$ TTS SGCDEDLEARG CGLFDKVNIKAKG
RKVVDRTGLGLEGLSELDQRHMEEDNYSALCDPEDSRARG GGIIDKAMGSGVG| TELMAKGMSGMTYTSLCFPDDDQERG GGVVDKAGGTGEGLVQLLQKGTAATMYSSLCLDPEDIKARG GGIVESCFSPGKYALEESSAAY GGVFDOATASGRGMLKLLAKGTRALTFSSLCLPEDLEARG GGVFDQATATGRGMLKLLAKGVEASNYSLCLPDEERG EGLVDKVTSTGRQGLYLMSTGLAHDTYTNFCLPDSGRARG YGLFDKLPTGGGGHVQMVQKAMQNLTYSSLCFPEAMKARG GGIFDDYTAVGEGLVEVLQRGTRALTLTSLCCPDDLEARG EGVFTKFSAGGEGMMTVLRRSLSSVTYSSLCVPEDIAERG GGUFDQAVSGGGGHVQLLRRAVAQLTYHSLCPPHDLAERG RGLFKRVVSGGEGLLVLAQREYKVLTYRSLQPRFDFIJDGG EGLVDQVTSDGRGLLYLMSTGLAHFTYTMFCRPDNLKARG GGVFDKAMTGGGGHVVLLQRALAQLTYCSLCVPDDAERG GGlVDKAVSGGGGHVHLLRRAMAQLTYSSLCPPDDLAARG GKVVDKTGLGDGGFSDLIKRNMEQLSYSVLCLPED:RARD

 GGLFDKAGTGGGGHVDLLRRAVAQLTYRSLCPPHDLADRG
 MGIFDQVVSGGGGHVELLKRAGAFLTYSSFCPPDDLADRG EGLVDKVTSDGRQGLYLMSTGLAHFTYTNFCLPDSLRARG SGI DTKVVASGGPGMVMFQRGFRALTYRSLCFPENDEERG SGVFPKI AASGGDDMKLLKRDWSSVTYSSLCIPDDVAERG GGVFDRAIAGGRGLAELLRKALENLTYTTLCFPDDIGQRG GG|LEK LLFTQEDSMELSSATYRDWRFDEQGLPADLIKRG NGIIESAFAPGKHCMELSSAVYKFWRFDMEALLPADLIRR CGIVDLVVSTGGGHVDULQRATACLTYRSFCPPDDLADRG GGLSARAMSLGKGFAEVMVRALSELTYDNLCVPNDFMERG GGIFDKAVSGGGGHVQLLRRATAQLTYRSLCPPDDLADRG

## 

GGSDRAMSLGAGFAEVMCRALAETKYEDLYLPNDFIRRG EGMFKRVVSTGGGLLVLAQREYKILTYRSLQPTYDFLDRG GGLVARGTSLGEGIAEVMVRALSEITYDSLYVPNDFVERG WG|EDLVVSTGGGHVDLLQRATACLTYRSLCPPDDVADRG GGLEDAANTGGGGHMQLLRRAVTQLTYCSLYPPDDLAERG KGLFDQAVVTGNGGVVLLARAMESLTYSALCLPDDIQARG
 GGI IEKTLYSGEVSMELSSSLYKDWRFDEQSLPGDLLKRG GKLIDKSVSLGEGCLELDAKGLATVTYRSLCLPHQLADRE CGLFDKANAGGGGHVQMVQRAMKDLTYASLCFPEAIKARG YGVFDQVVSGGGGHVELLRRCKAFLTYRSFCPPCDLADRG

UniRefigo loylyo UniRe90- $-\mathrm{HzCTD7}$ UniRefi9-V4LU46 UniRe ei90-H2UDI3 Unirefo--H2STM1 UniRef90-HowL19 UniRef90_UPI0003334419 UniRef90- R 4 AAL 6 Unizefoio-F18442 UniRef90 - G77 7 K2 UniRef90-UPIooo 3 C8FC9B UniRefi9-UP100046B3018 UniRef90-UPI0002B491A2 UniRef90_UPIO0033436A4
UniRef90_UPI0004571F19 UniRef90_Q10EG7 UniRef90_H9G9Y4 UniRef90_UPI0003503872 UniRef90-UPIO003C8471C UniRef90_K7FKD0 UniRef90_UPI0004419B5F UniRef90_UPIO003504158 UniRef90_F6HB90 UniRef90_R4GBA5 UniRef90_UPI000441E335 UniRef90_UPIO00441E335 UniRef90-HOWJR0 UniRef90_S9XU85 UniRef90_UPI000203AAE2 UniRef90_M4ACF3 UniRef90_UPI00020F60A0 UniRef90_G1U492 UniRef90_UPI0002A47DDD UniRef90_UPI000388C1D7 UniRef90_F7F9J1 UniRef90_UPIO003336DB8 UniRef90_M3VWH8
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490
490 D D V E LT A WY K
E R E G $\begin{array}{r}510 \\ \hline\end{array}$
510
D K K E
520 S L H YKDDEAVQHDHELQAFVKDVQKFGMKALDHCAGWDEL
 NHYYQLASDI HMDKELQGWWNEVRTKGHPD KEEGWPEL


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


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

| DFYY Q N D S SVKE D WE L | QQ K WME E I | $F$ K K G M S Q K S G $\square$ S S L L |
| :---: | :---: | :---: |
| Q $\ Y Y$ Y S D EVV CE DVEL | Q A F VK D I | Y M Y G M R G M K S G F P K V |
| N NYYP S D E SVRRD D S E L | Q A WV WE I | $F$ S E G F L G R E S S G P S S L |
| QHYY HS DA HVLA D S E L | Q A WVVD E I | F R K GF L G N K A S GI P A S L |
| DLY Y K M D C SVQ E D S EL | Q S WI Y E I | $F$ QK GF L A R T S S Gl P S S F |
| AFYYTDNAAVQGDAEL | Q A WVM D I | F T N G F G R T S S Gl P S S L |


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



 HLHYSGDKVVQSDLELQAWCREITE LGLCGAQAQGFPASF KHYYKCAKDI IDDQELQQGWWTEVRTKGHEDKKDEPWWPVL GLFYKSDKAVKQDSELQAWCRE: TETGLQGAQDRGFPLSSL GYYYPXDASVQQDLELQAWVGEIFAQAFLGRESSGFPRRL NHYYPNQSLVESDEELQAWWTE:RTVGHGDKEDEPWWPVL


## UniRef90 IOYLY0

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## UniRef90-H9GA86

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UniRef90- BOFFI4 UniRef90-BOFFI4 UniRef90-F6XZP5 UniRef90-UP1000329ED4C UniRef90-UPIO0045E36E3 UniRef90-M4ALZ4 UniRef90 ${ }^{-}$K4CT85 UniRef90-UPIO002740CF8 UniRef90-H9GA71 UniRef9O-UPIIO001D37E6E UniRef90 UPIOOO32B24D9
UniRef90 UPIooo2A47F5E

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SSVQELKKFLTMVLYTCSAQHSAVNSGQFDपGAWMPNFPS KTREKLAEYLTVII FTASAQHAAVNFGQYDWCSWDPNAPP RTREALIQYVTMVI FNCSAKHSAVSAGQFDFGAWMPNLPP QSVSELIKYVTMWI YCCSARHAFLNNGQFDFGAWMPNFPS KTVAELNKFLTMVVFTCSAQHAAVNNGQYDMGAFLPNAPS

S S VEELKKFLTMVVYTCSAQHAAVNSGQFHFGAWMPNFPP ENKAQLIKFLTMVI FNCSARHSAVNSGQFDFAAWMPNTPA ENKAQLIKFLTMVIFNCSARHSAVNSGQFDFAAWMPNTPA
 KTKKKL SEYLTVVIFTASAQHAAVNFGQYDWCSWDPNAPP



SSRELCHFLTMCVFTCTVQHGALNQGQLDWYGWVPNAPC SSMPELUKYLTMWI YCCSARHAAMNNGQFDWCAWVPNTPC


GSRAQLCRFVTMCDFTCTAQHASTHLGQLDWYAWDPNGPC STVPEVVKFVTVVI FTCSGQHASVNLGQLDWYAWIMPN PCC RTVPELIRYVTTLI YTCSARHAGVNSGQLEFTSWMPNFPP QSQNQLCHFLTMCVFTCTAQHAAINQGQLDWYTWVPNAPC

 QT LQEL I QS CSTI W WA S A LHA AVN
QSRADLCHFLTMCIFTCSAQHSAINQGQEDWYAWVPNAPG DSHESLVQVLATIMWVTSAHHAAVNFGQYPDAGYVPNRPT ESDDQLCHIVTMCIFTCTGQHASAHLGQLDWYSWIPNGPC
 KTPQDLI ETITTII WVTSGQHAAVNFGQYTYAGYFPNRPA


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QSRAQLCHFASMC
ATRMELI KY LTMVMFTCSVQHAAVNSGQFDFYSWMPNGPS TSVTELIKFVTMVIYTCSAQHAAVNSGQFDYAGWMPNTP
 T TLSDLVEALTTLI WDS S GLHASVNFGQYEYVGHPDNRPI
 K SREQLSEYLTVVI FTASAQHAAVNFGQYDWCSWDPNAPP


UniRef90 IOYLYo UniRef90-H3CTD7 UniRef90-V4LU46 UniRef90-H2UDI3 UniRef90_H2S191 UniRef90-B1PYN9
UniRef90 HowL19 UniRef90-UPI0003334419 UniRef90-R4GAL6 UniRef90-F1R442 UniRef90-G7L7K2 UniRef90 UPI0003C8FC9B UniRef90-UPIO0046B301E UniRef90-UPIOOO2B4391A2 UniRef90-UPIO0033436A4 UniRef90-UP10004571F19 UniRef90-Q10EG7 UniRef90-H9G9Y4 UniRef90-UPIO003503872 UniRef90-UPIo003C8471C UniRef90-K7FKDO UniRef90-UPI0004419B5F UniRef90-UP10003504158 UniRef90-F6HB90 UniRef90-R4GBA5 UniRef90-UPIO00441E335 UniRef90-UPIO00441 E335 UniRef90-HowJRo UniRef90-S9XU85 UniRef90-UPI000203AAE2 UniRef90-M4ACF3
UniRef90_UPIO0020F60A0
UniRef90-G1U492
UniRef90-UPI0002A47DDD UniRef90-UP1000388C1D7 UniRef90-F7F9J1


SMRKPSPTTK GTANDENYKDTTPEПNTTC\|ILS




SLQRPPPTKK GTTSEATMLATFPDVNVTVQGMA
SMQLPPPTSKGLATR G EGFI ATRPPVNATCDVIL
GEATEETLLDTLPSIIDTVHGMA
KCRNFDPMEGTKEFAEFLHDPDKFFLKMLPNSSETTLYMA
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## UniRef90 IOYLYo

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UniRef90-UPIOOO2C47055
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UniRef90-UP100046B3736
UniRef90 UniRef90-BOFFI4 UniRef90-F6XZP5 UniRef90-UP1000329ED4C UniRef90-UP100045E36E3 UniRet90_M4ALZ4 UniRet90-K4CT85 UniRef90-UPIO002740CF8 UniRef90-H9GA71 UniRef90 UPIO001D37E6E



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ATWLLSAPQGDVTPLGKYPDEHFTE EEPKRLILALQEEL LLSiVSYEPGDLRPLGHYPEEHFTEEMP KKLI AAFRESL LLSIVSYEPGDLRPLGHYPEEHFTEEMPKKLIAAFRESL




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TVSLLSKEPHDRNPLGRYRN NQFVEDVPKKCDERFREK TVWLLSKQSSDFVPLGQYPEDHFTE EUPRKILKDFQTEL
 TV WLLSKVSTDAEYLGNYPEK RFDEDVPRNNIKVFKEQL LFWSLRNETKDTQCLGNYPDEHFTE EAPQRSMAAFQSRG AVWALSQFQENELFEGMYPEEHFDEKPEVKEAMARFRKNL
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UniRef90 UPIo003336DB8 UniRef90-M3VWH8 UniRef90-Q8K4F2 UniRef90 G3U763 UniRef90-UPI0003343952 UniRef90-13J7M6 UniRef90-H9GA86 UniRef90 UPI0003C8E9E9 UniRef90-W5PG76 UniRef90-UP10003C25DOD UniRef90_G3TIG3 UniRef90-W5QBT2 UniRef90-W5N9Q5 UniRef90_V9KL88 UniRet90 G3NLB8 UniRet90-HOWPR2 UniRef90-UPIO0046C2E6B UniRef90-A5C523 UniRef90 B8BMH9 UniRef90-UPIO0042AD81C UniRef90-B5XOR4 4
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VEISASTKRRNEGKKDPYYNMSPDKTPNSV
ADITYSIKKRNERKDLPYYYMSPHKIPNSV
MS:AEM| DCRNKDPERK NRQGPGVVPYVLLKPSYGDSVM EVIVGTI AERNKNK KLPYYYLSPDR
AQI SRSIKERNQGLPLPYTYLDPPT
 PYYWYLSSP DR PYSYLDPPL PYTYLDPPRLD
 QK TTNA!TERNDNKKLPYYYMSPDR $\square$ PNSV
$K K \prod S K E \prod D K R N E \quad S W G N T G V P Y E Y L Y P P K$
DEIVSAITERNKNKKLPYYYLSPNRIPNSV
AQUSRDIRERNQGLEL PRYTYLDPPL
A Q


AVMDKEDEVRNAGLDL
KVFSETI NARNSRLP
NQ QS H D I RQRNKCLP

- AI PYNYLDPVL

AEI SKVVKERNQSKRLKYHYLDPEV
A Q $\square$ S S A $\|$ QERNRD $\square A L P Y P Y L D P A V V E N S \square$


SEDSQQTKQRNKTKRDTYHYLDPEETECSV
 QELSLQI EARNKQLEL $\quad$ PYTYLDP
NKVDKRIVERNADPKLK NRRGPSNDPYKLLRPKSCQGDT

GKi SKEI EERNKSVA NMEVP ${ }^{2}$ L A YKYLYPPE
EAIVSLI AERNKNKKLPYYYLSPDRI PNSV


GMGVPYS

| EMG |  |
| :---: | :---: |
| $S R G$ |  |
| G R G | (1) |
|  | $\square \mathrm{E}$ N S V ${ }^{\text {¢ }}$ |
| Q E |  |


| 1 | $E$ | $N$ | $S$ | $V$ | $S$ | 1 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $Q$ | $N$ | $S$ | $V$ | $S$ | 1 |
| $V$ | $Q$ | $N$ | $S$ | $V$ | $S$ | 1 |
| $I$ | $E$ | $N$ | $S$ | $V$ | $S$ | 1 |

TE N SVST
I ENSSVA
V
I ENSITI


LVVENSVS

GK G $\square \mathrm{PNS} \square \mathrm{S} \square$
VENSVTI
V ENSSVA
I

I E N S V Si


VENSVAT
$K \vee V$ E N S S V S S
A IGGPNSIS M
$\square$ E N S VS $\square$
VENSVAI KLVENSLVA

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UniRef90 W5LZM4
UniRef90-W5N623
UniRef90-D8UD18
UniRef90 W5KEZ0
UniRef90-UPIO001D36BF2
UniRef90-H2MEV4

LPS QTPSGLRKILREDELIELRGNGEGERKKSDRIYDYDVY

K T P A A LLK D REDE $\square R \square L R G E G D K P \square Q K W E R V Y D Y A L Y$

LP K Q TPPSLAAHRADELENLRGTGQRRREEWDRVYDYDVY $L P D K T P D A L R L L R D M E L R S L R G N G R G E R R D W E R V Y D Y D Y Y$ SDDPQNLKKYREQELEERR K VYRWGSX


NDLGDPD\|T T DLLKRPVLGGTKQYPYPRRCRTGRKHSDTDP G GVIYHPCYRWDEGYPTVELAEG

AEATFPCYRWVQGQDVLSLPEG $N D L G N P D L R K D L A R P V L G G S K E Y P Y P R R T R T S R P P S K A D P$


NDLGEPDKGADHVRPDLGGTPEYPYPRRGRTGRPPSSSDP NDLGDPDKDKDHARPVLGGTAVHPYPRRCRTGRPDFKTDG
$K D \quad G \square I L P \square A G$
GEEFTFPCYRGSG\LS LPEGTGR GDEFYFPCYRWVETLT LPEGTGS GGEVEFPCYRWV TDDK

N F P CYRWLK G K E S L E L R E G GDY $\square$ E F PCYRW $\square$ T G D G

CKWDSAQGGT
CKW $\square$ SAQGPGTQGEAFFPCYRWVG LCDPEGTAR AEAAFPCYRWVRTLSLPEGSAR
$K D$
NDVGDPDKDERLARPVMGGDS HPYPRRCKTGRKPCEKDA

EAAFPCYRWVQGEGVLTLPEG $N D L G N P D R G S E F V R P T \square G G E Q R \quad P Y P R R C R T G R L P T D T D M$
 SYHPPVRRCRNPNRPEWNG EFPCYRWITNDKE\|VLREG

TVQGPGACAEAAFPCYRWVQGED【LSLPEG NELGNPDK EELVRPVIGDLERPYPRRCRTGRPPTRSDP

TVQGPGAFGEATFPCYRWVQGEGMPEGTAR CSW $\square$ S $V Q G P G A G D E F R F P C Y R G K G \square L S \square P E G T G H$

G D Y $\square E$ F P C Y R W
$\square \mathrm{T}$ GE G

[^1]UniRef90 Q5FWK8 UniRef90-H2MRU5 UniRef90-Q39611 UniRef90-F7FTE7 UniRet90 G7J632 UniRef90-B5A597 UniRef90-UPIOOO3942437 UniRef90-13JS17 UniRef90 UP10003C12DD3 UniRef90-G3GYA8 UniRef90-UPI0004441FF1 UniRef90 13 K 6 V 0 UniRef90-UPI0004439775 UniRef90-I3JSH3 UniRef90-UPIO004441B9B UniRef90 UPI0003347D7E UniRef90-MOYNU1
UniRef90-UPIO0027F5AEC UniRef90 UPIO0044482EA UniRef90 S4RFK5
UniRef90-N1R1J6 UniRef90 V9KDM7 UniRef90- H2SRY9
UniRef90-P27479
UniRef90-UPIOO02655625 UniRef90 UPI0002A4BB0C UniRef90- s8EKA5
UniRef90-C5YRF1 UniRef90 UPIOO04442ECA UniRef90 G3SUT9 UniRef90-UPIOOO39441D1 UniRef90-UPIO00273DFC2 UniRef90 UPI0003BD1A65 UniRef90- JgP4L3 UniRef90-H2LQV2 UniRef90-UPIO003314874 UniRef90 G1 QCE UniRef90-UPIO003EAAFE7 UniRef90-UPIOOO2740B81 UniRef90 UPIOOO4421135 UniRef90 UPI0003318F6F UniRef90-UPIOOO4438E67 UniRef90-W5LVI9
UniRef90 UPIO000F2BF64 UniRef90-UPI000328D884 UniRef90_UPIO002A4C9FB UniRef90 UPI000332FACD UniRef90-L5KCZ4 UniRef90-S7NG96 UniRef90-UPI0002ADAC62 UniRef90 UPI0003F0B99F UniRef90-UPI0002ADAC55 UniRef90-UPIO003EC2F10 UniRef90 Q7T2A9
UniRef90_UPI0003EE2A85 UniRef90-G3RWW0 UniRef90-M4E187 UniRef90 S7PBR8 UniRef90-Q95103 UniRef90_UPIOOO3DE8103 UniRef90_G1QAU7 UniRef90 V4UKL7 UniRef90-H3AEE6 UniRef90-UPI0003957333 UniRef90 L9KM76 UniRef90 F6QV45 UniRef90-UPI0002C2DCDD UniRef90 G10041 UniRef90 UPI00045DD881 UniRef90-UPI0002C34562 UniRef90-G7ZZ16 UniRef90 Q4S6Z4
UniRef90-UPI0002A49F5D UniRef90-M7CL10 UniRef90 L5M3S5 UniRef90 UPIO00273DE34 UniRef90-UPI00042C7127 UniRef90-UPIO0046BA88C UniRef90 ${ }^{-}$W5N841
UniRef90 S7NEW5
UniRef90_UPI0003344EB1 UniRef90-UPIO0032AEF18 UniRef90 UPIo00462CAA1 UniRef90-D8UON8 UniRef90-UPI000388F689 UniRef90 B8BL65 UniRef90 W5LZM4 UniRef90_W5N623 UniRef90-D8UD18 UniRef90 W5KEZO UniRef90-UPIo001D36BF2 UniRef90_H2MEV4

90
KQREEELEQRQ

> THK ${ }^{110}$ WKYAVGVPRC ${ }^{120}$
> 120 YRWAVYKEGTPDC

LYEERSTDFYVPRDEAFAETKQTQFNTSAVSLGLTT\|IQS TAMSSASNLHVVTMKKQRESDDEQRRKVYRWKVYHPSFPKC


Q Q Q R R E ELLQARRETYR WKTY LP G WPR C Y R WNQFKDGLPFS

RQAE $\square K E R Q Q K Y R W S E F F P G$
RHKK LSQLKETYCWQVFEKG $\quad$ PHHDQAM TARDAGNTLDVFQMHREKELKERQQD YRWATWKEGLPLT ASETRAEGIYIPCDERTGPV
HYFQEGSAKF पSQEEQLCWTKEEQRA $\square Y S W D Q P K D G \square Y S$
M $\square S E G A \square K A L L H N F M P L$ VLQQHWDDEDK ARQEDYQWDSYIPD DPR HTMKADGPLSLPAEVRFSFTKTTDCWVRADTSTERNAECF TVVDDPQGLFKKHRE EELAERRKLYRWGNWKDGLILN

ESPDGKVYVP DYHWLTDSKKHFFREGAAVLDFQETNPQ


RDGRAHLPQDDKTSLVKQHRQKELRKTYRWREWQPG NRQPDLPGDERFLEDKDLDFNVSLAKGLKDLADKG TVVDDPQDLFKDYREKE LEKKRNLYRWGNWKDG LI LNV

$E \square V L R D G K A R D P Q N D K T R D A K Q H R R K E L E T R Q K W K E W H P G$ S WADHHPVFQQQRQEELK ARQDMYHWKTY DPGWPHC YRWGNWKDGLIPN

QRDLPR
KAKKPQEDLD L LQKHRKSELESRRTLIQWAKHVHYERPED EVVLRDGRAK LARDDQ $V H \square L K Q H R \square Q E L E T R Q K Q Y R W M P G$

NRPEWNG Y DPGFP LLINFKATRF DDDNDRY S


 SSEKREGEFYVPRDEEFSSTKGTAFTGKA ILDAALPSVFPQ

TARDAGESFDKFQKHREKEDKE RQLIYCWGDWKEGLPDT HAESRDEKMYVPRDEQFEESKHDAFSAGRLKAADRNLIPL RARARDDVNAVAKQHRYKELVQ RQKNYRWKEWYPGFPM S
$Y \square P G F P \square L I N D K A T K F L N \square N L R Y$
TAKSRDDVTQVLKQHRRKEL QERQKLYRWKEWYPGFPDS EVESDKKFALIKRVPCADQGDSSGNRYDPGF
T

T A RLLP G D NLLDVVF Q K H R E K E $\quad$ L RCETRPHPVYVPRDET FEELKQDAFAAGRLKADFHNLIPK

LAEESTGDEFQKHRER ELLKE RQLIYRWSTWKEGLPLT TVVDDPQALFKKHKEEELEERRK RRHRNTQPARWNGYIPG $L A G N N T W D V F$ QKHRE QE L E E R Q Q

## GA $\square E E A A F P C Y R W V Q G E G V L T L P$

K T L R WG S WK D GXI L P
$E \square V L R D G R A K L A R D D Q \square H V L K Q H R R Q E L E L R Q Q Q Y R W M P G$ YLQRRRHRREELVQKH SKYGWKEY LPA DPWC

WK E Y A A GLPRC
 STLSSETLP LLRDHRAREG QAK QK $\square Y R W R T L H E G V P R C$

UniRef90 Q5FWK8 UniRef90-H2MRU5 UniRef90-Q39611 UniRef90 G7J632 UniRef90-B5A597 UniRef90_UPIO003942437 UniRef90 I3JSI7 UniRef90-UPI0003C12DD3 UniRef90-G3GYA8 UniRef90-UPI0004441FF1 UniRef90 I3K6V0 UniRef90-UPIO004439775 UniRef90-I3JSH3 UniRef90-UPI0004441B9B UniRef90_UPI0003347D7E UniRef90-M0YNU1 UniRef90_UPI00027F5AEC UniRef90 UPI00044482EA UniRef90_S4RFK5
UniRef90-N1R1J6 UniRef90-V9KDM7 UniRef90_H2SRY9 UniRef90-P27479
UniRef90-UPI0002655625 UniRef90-UPI0002A4BB0C UniRef90-S8EKA5
UniRef90_C5YRF1 UniRef90-UPI0004442ECA UniRef90 G3SUT9 UniRef90_UPI00039441D1 UniRef90_UPI000273DFC2 UniRef90_UPI0003BD1A65 UniRef90-J9P4L3 UniRef90-H2LQV2 UniRef90-UPIOOO3314874 UniRef90 G1QCE1 UniRef90_UPI0003EAAFE7 UniRef90-UPI0002740B81 UniRef90-UPI0004421135 UniRef90_UPI0003318F6F UniRef90-UPI0004438E67 UniRef90-W5LVI9
UniRef90 UPIO000F2BF64 UniRef90-UPI000328D884 UniRef90_UP10002A4C9FB UniRef90_UPI000332FACD UniRef90_L5KCZ4 UniRef90_S7NG96 UniRef90_UPI0002ADAC62 UniRef90 UPI0003F0B99F UniRef90_UPI0002ADAC55 UniRef90_UPI0003EC2F10 UniRef90-Q7T2A9 UniRef90_UPIO003EE2A85 UniRef90-G3RWW0 UniRef90_M4E187 UniRef90_S7PBR8 UniRef90_Q95103 UniRef90_UPI0003DE8103 UniRef90_G1QAU7 UniRef90_V4UKL7 UniRef90-H3AEE6 UniRef90_UPIOOO3957333 UniRef90_L9KM76 UniRef90-F6QV45 UniRef90_UPI0002C2DCDD UniRef90-G1Q041
UniRef90 UPI00045DD881
UniRef90_UPIO002C34562
UniRef90_G7ZZ16
UniRef90-Q4S6Z4
UniRef90_UPI0002A49F5D
UniRef90-M7CL10
UniRef90-L5M3S5
UniRef90 UPI000273DE34
UniRef90_UPI00042C7127
UniRef90_UPI00046BA88C
UniRef90-W5N841
UniRef90- 57 NEW5
UniRef90_UPI0003344EB1
UniRef90_UPI00032AEF18
UniRef90-UPI000462CAA1
UniRef90-D8U0N8
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UniRef90-B8BL65
UniRef90-W5LZM4
UniRef90-W5N623
UniRef90 D8UD18
UniRef90-D8UD18
UniRef90_UPIO001D36BF2
UniRef90_UPIOOO1D
UniRef90_H2MEV4
 MEADTLKSLPPDDRYPFTRELEFGFTAVAALAKLGLEAWS

LDADVT D DNDGFANFED DEA AYKEGFQLPNLESNDSNF


 I A A D CK D D FSAAKSDEMLHTKRMTGAELMFKGLAG $\square P R C L D A E N G K E \square D P N G R Y$ S VSKETTLS LCRNDALALKA
LP SHDPRNDQFDEQDEFKKNQEQTVVWKKLKKESTKCYDT IAASTDELDPLNVRFHELKKLDFEWSKKDGVV D IVVKHDY A A APNLPKLDGHFGSLADVHGLF

LVS SVSPDSRD FAGFHDVDNLFKEGDRLKQADHDQDFQ $\| K N S T A D L^{\prime} P K D A Q F T V E R K V D L L F D L D R L C L Q F G F T R N N M$ L CKRVF INSAVN CGRFRGLLMHPKLTELQLKGLDDCEEN I A A T I NDLPVDERF LEDKRGDFEASLTKGLADDADKDSLN
 FRADF HETPGEFDCDNDVLRDYEDGDKUSSDRDREKDP SKALLRANL VNSFRSFQQLDLYSRRSPRQPVAVDAQVMD SHFKDVFELFAEVRFSDSKSEEYEHTQRMDTLELAMKGLA
 TLDF NCVKR
I RTDTSLPYDV CFSDTKNTELAYNYMRGPVELELAELL VGAT ISDLPADERFLEDKRDDFEASLAKGLADLAIKDSLN


FPMS DDANAHDDQFDSEKGVDF LLNYTKA DENLYVNRFMH LLEMTVKDLDLNDGKYTVKNTNFYLQGISAFADLRIMGLLG NERFLEDKDFDFYFSLLAKAMKDLADKGSGDFTSSI RKL
 FP LS $\square$ DAKCHD $\square$ QF DSEKGVDFVLNYSKAMEN $\frac{\square F D N R F M H}{E L M F K G L A}$

## EFVMFSERMENLF DNSFMH

ASFFFRDGPMA LRFK LRGFVDCKR
AGNRQPDLXRDEQF LEDKDLDFNVSLAKGLKDLATKGTDD $\square A A D S Q N D L P$ L
$\square A A G S K D D L P$ VNMRFHEKKTLDYKWTVT TGGLEDAFKYVY IDAKSEADLPDARFDNEKRSDFEGSLHYALLELSLKKLAL
T LD F $\square \mathrm{NCVKR}$
$\square E A A \quad L L D P N L P F P H F K S \square E D \square Y E V G \square D \square P K D A G \square \quad \square P M$ $\square$ A A GSEDD $\square$ P A NMRFHEEKRLDFEWT $\square K$ A GTLEMVLKRVY
TIA A SVK DLP P DMKFHGEKRLDYEWTGKTGVLEMVLKRVYT LKASISAHNR DFSGFSDIRQ

SF LK TASFFVRLGPMALAFKLRGLV $\square D A S H S D D P D D Q F D S E K G V D F V L N Y T K A M V H H S S K G F M H$ MKTDDPSLLSMEPNDRYSATKTSSLLFNAIPASLGMKVLG $L V Q G L D W T E Q G Q G W I S P R G V L I V T M M A S L V M K D S L N F L A C$ I A A ERKDDLP PNMRFHEEKRLDFEWTLKAGALEMALKRVY

$\square A A D S E K D \square P P \quad D M K F H G G K R \square N Y E W T E K T G L$ FP\LINFKATNDRYSFDKTASFFVRLGPMALAFKVRGLLR AGATICDLPDDERFDEDKRDDFEASLVKGLADVAI KDSLN LT $\square$ A A D S D DLDANTRFHEKKRLDYEWTMM TMMDI ALD HVY

 ADIDTPNSMEYNIQYSFPKSTAFFGRGTMALFEAKMKGFL
$\square A$ VENVIELDCNTMYSFTKSTNFLLRGGNAQVE LRLKGFL
LPKHVDCENQENQFSFTKDDEYKFAADKADYK DGDHERSY 1 D S L E A LVPN L RYT RQSPSTNGHYLRGFAERAESWGSFQE

UniRef90 Q5FWK8 UniRef90-H2MRU5 UniRef90-Q33611 UniRef90-G7J632 UniRef90-B5A597 UniRef90_UPIOOO3942437 UniRef90-13JSI7 UniRef90-UPI0003C12DD3 UniRef9O-G3GYA8 UniRef90-UPI0004441FF1 UniRef90-13K6V0 UniRef90_UPIOOO4439775 UniRef90-I3JSH3 UniRef90 UPIOO04441B9B UniRef90-UPI0003347D7E UniRef90-MOYNU1 UniRef90-UPIO0027F5AEC UniRef90'UPI00044482EA UniRef90_S4RFK5 UniRef90-N1R1J6 UniRef90-V9KDM7 UniRef90-H2SRY9 UniRef90-P27479 UniRef90-UPIOOO2655625 UniRef90-UPIOOO2A4BBOC UniRef90-S8EKA5 UniRef90-C5YRF1 UniRef90-UPI0004442ECA UniRef90-G3SUT9 UniRef90_UPI00039441D1 UniRef90_UPIo00273DFC2 UniRef90-UPI0003BD1A65 UniRef90-J9P4L3 UniRef90-H2LQV2 UniRef90-UPIO003314874 UniRef90-G1QCE1 UniRef90-UPIO003EAAFE7 UniRef90-UPIO002740B81 UniRef90-UPIOOO4421135 UniRef90_UPIO003318F6F UniRef90_UPIOO04438E67 UniRef90-W5LVI9
UniRef90-UPI0000F2BF64 UniRef90-UPIO00328D884 UniRef90-UP10002A44C9FB UniRef90-UPI000332FACD UniRet90-L5KCZ4 UniRef90-S7NG96 UniRef90-UPIO002ADAC62 UniRef90-UP10003F0B99F UniRef90-UP10002ADAC55 UniRef90-UP10003EC2F10 UniRef90-Q7T2A9

170<br>180<br>190<br>200<br>KCSNSWTDLCDIKR|VIFSTQWTPUSDLVSELWNEDTFFGYQ HCIDEKNSMSDIEKLFECHVTSMSDYAMKHWREDAFFGYQ

> PWEKDEDVSRTFDFKKTPMSEYVAEHWKEDEFFTWQ पQKLIPKFFNDSQNVVRFDTPEPYKRDRFFWFSDVEFARE GRQESWKSFDESKRVYWTLKTAKSEYVSHHWKEDAFFGYQ CKKNFTCDEDSRLSHVHQSVTSDYVQKHWKDDAFFGYQ LKKKWTH1DDLSHLLCAHRTQVTDFVHKHWKEDSLFGYQ
 ECKSKWTNIEDIGYLYRCHRTKTSDYVYEHWKDNSFFGYQ LLTSQWRSDDEVQQTFIFPKSPTSEYTFEHWQEDAFFAYQ WPDFEQDSE SLMDYSKDILGYVKDNWKDDAFFGYQ R LLGSWNKLEDFDYIFPSGKSVLADKVHQHWREDTLFGYQ DSNAKPFAFPVPQVISANRTGWRTDEEFARQ HKM KWTN $\square E D \square R R \square H C C H R T E \square S E Y$ YF EGNWKEDAFFASQ K $\square P F V R K \square Q E N S E G L L R Y D T P D \Pi T K K D M K H$ WQEDFMFGYQ FPRKSFFGLEHTHQUCSRKSTPTSVYVAKAWKEDPEFARQ WPDT \| LT
 पk s LP LK STPPDDRYPTREL
 EPGKKWKRDEDMKNVFQFKKTTMSEYVSEHWKEDDFFGYQ MF LSS SWNHLENFNQ:FWGQKSMLAEKVHQCWQDDELEGYQ ECKKRFTSREDFKKLFPHGKTVLAERVYDSWKNDAFFGYQ LLFTCWNDLDDFNRIFWCDQSKLAKKVRDSWKEDALFGYQ LELKLWTNUHDVDQVFCCKQTDUADYVQKHWKEDSFFGDQ MFQSSWSDFADFERTFVRПSNT TSEYVMQHWQEDFMFGYQ RKGLDWS WHEMKRIFSFQRTPAAEYVYEHWKEDAFFASQ ESHKKWKDEFQRISPHAKTTLDERVRDSWKDDTLFGYQ ESHKKWKD $\square$ D DMKN I Y E K F NF TS WKS DEDFDQ FHYKTTN SEKVQKYWKEDSFFGYQ MFQSSWSDFADFEK WG MFQSSWSDFADFEKIFVKDSNTISERVMKHWQEDDMFGYQ GSCKEWKS DEDLEKVFKSRKTSMSEYVSKHWKEDDFFGYQ
 SWKRLKDUKKVFPAYKTTISEYVAEHWAEDSFFGYQ FTNCVKRLEDFKKIFPRGKTALAEQVCDSWKNDTFFGYQ TFLNTWSHLEDFKQUFWGQKSALAEKVHQCWQDDEFFGYQ HWAEDTFFGYQ
CWQDDELFGYQ

 DEDFKKПFPHGKTVLAERVYDSWKNDAFFGYQ $\square P K L I K V V A E A Q D N L L Q F D P P G L L N K D R F S W D R D D E F A R Q$ TLLS SWTSLEDFDLDFWGQKSPLAEKVHQCWRDDELFGYQ
प पNSWDSLEDFDQTFWGPKSTLCEKVHQRWQDDELFGYQ DGKIQQSSQGLLKYNTLNILSRDKFAWLQDDEFACQ MFQSSWSDFADFEKIFVRDSNTI SEYVMQHWQEDFMFGYQ LRHSSWNS DDEMRTVFSRGRDVVPEYVAKHWQEDDFFGSQ MFQSSWNDFADFEKIFFNQPHQMREYVMQHWQEDFMFGYQ WNDRKWRKLDDURN|MCCHKTFTSEYVTEHXCEDHFFRYX TLLSSWNCLEDFDQI FWGQKSALAEKVHQCWQDDELFGYQ MFQSSWSDFADFEKIFLRDSNTISEQVMNHWQEDLIMFGYQ NLLVGKVMKNSGERLLKYDDPAGVKGDRFAWLRDNEFARQ SQDKDLHKHHMTPTSEYIMNHWKEDDFFGRQ
DEMDSWDSLEAFDQTFWGPKSTLCEKVHQRWQDDEDFGYQ DCKHSWKRLKDISKIFFGKKSVVSEYVAEHWAEDTFFGYQ ILT SWNSLDDFNRIFXCGXSKLAERVRDSWKEDALFGYQ AFLRSWNSLEDFDALEWGQKTALAEKVQKCWQDDELFGYQ ALPRSWNSLEDFDELFWGQKTTLAEKVQKCWQDDELFGYQ DVTKCVNHLEDFKRIFPQGKTAVAERVSDCWKDDALFGYP MFQSSWSDFADFEKIFVK円SNTISERVMNHWQEDV
DKPFSWGKLEDDRKVFWFYHTPI TEYVFQHWNDDEFFGYQ


FVDPWQSMQ TYEKFFNHSTKTDVSGKVQDYRKKDWFFGSQ LERLFNLNHKDN NNLLYFNPPRVLDGRPDAWHCDDEFGRQ
WK R L K LEMVF

UniRef90 Q5FWK8 UniRet90_H2MRU5 UniRef90-Q39611 UniRef90 ${ }^{-}$G7J632 UniRef90-B5A597 UniRef90_UPIO003942437 UniRef90 - 13 JSI 17 UniRef90-UPI0003C12DD3 UniRef90-G3GYA8 UniRef90-UPI0004441FF1 UniRef90 I3K6V0
UniRef90_UPIOOO4439775
UniRef90-I3JSH3
UniRef90 UPIOO04441B9B UniRef90 UPI0003347D7E UniRef90-MOYNU1
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UniRef90 UPI00044482EA
UniRef90-S4RFK5
UniRef90-N1R1J6 UniRef90 V9KDM7 UniRef90_H2SRY9 UniRef90-P27479
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## UniRef90-L5M3S5

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UniRef90-D8UD18
UniRef90-W5KEZO
UniRef90-UP10001D36BF2
UniRef90_H2MEV4

VTVSA ${ }^{24}$
$F \square N G L N P \| L I R R C S Q \square P P Y \square P V T D A M V A$
TLAGANPYSI QL EWPLKSKLDPQIYGSPESADTRESPF
 $F$
$F$
$L$
$L$
$N G G V$
$N$ RCCKALPKNFPVTGDMV
FLNGLNPVLI RRCHHLPKNFPVTDAMVAP
FLNGANPMLLRRCTSLPSRLVLPSGTEELQAQ
FLNGVNPMMI RRCKTLPRNFPVTDDMVKNQNQKDTKE
FLNAINPNVIKRCSELPPNFPVTEEMVKP
FLNGSNPVLI RRCRCLPENFPVTDAMVAP
FLNGVNPILI RRCTALEDNFRVTDKMV
FLNGINPMLI QRCTSLPDNFPVT
FLNGVNPMLLRRSTSLPSRLVLPPGMEELRAQ


FLNGCNPVVFKKCTEEI P AKKLPVVTHEMV

FLNGTNPMLLRRSVRLPARLEFPPGMGELQAE
FLNGLNPILICRCHSLPKNFPVTDAIVA




FLNGCNPVLI RKCKKLPDKFPVTHEMVAVVGEREDTLEEE
$F L N G A N P M L L R R S S R L P A H L A L P P G M E D L E G Q L Q K X L Q L C$ $F L N G V N P G M I Q C C V E L P K N F P V A D E G V F P D G Q N K D T D E M E$ FLNGANPMLLRRSRQLPARLKFPPGMEEDQQQ
YLNGVNPDLI RRCTELPRNFPVTDSMDFPSGQ
FLNGANPMLLRRSTAFPDRLVFPPGMEELK
FLNCTNPMLLRRASRLPARLVFPSGMEEVQAQ

FLNGSNPMLLRCSNHLPARLEFPPGMEELQAQLEKEQQVA
FL NGANPMLLRRSTCLPARLVLPPEMEDLKLQLEKELQVE
FLNGTNPNVIKRCSKLPPNFPVADEMVKP
YLNGTNPILIKQCKQIPPNFPVTNDMV
HEFLL
FLNGMNPTMLKRSTSLPSRLVIPPGAEELQDQ
FLNGCNPVLI ERCTRLPEKLPVTTEMVECSLERQ

YLNGVNPVMLHCLS SLPSKDPVTS DMLAP
FLNGCNPVLI QRCTKLPEKLPVVTTEMVECSLERQ
Y L N G $\square$ N P S V

$Y \mathrm{~L}$ GVNPGLI$R R C T R M P D K$
FLNGANPMLLRRSTFLPSRLVLPSGMEDLQAQ



FLNGANPMLLRRSTSLPSRLVVPSGMKDLQAQ
FLNGANPMLLRRCTSLPTRLVLPSGMEELRAQ
F L N G A N PMLLRRSTS【DSRLVLPSGMEGLRAQ
ALAGVNPVTIDGLQAFPPVSNLDPADYGPQESADKEEHDQ

Y L N GVNPGLLCRCTCLCPDKFPVTDDMVAP

FLNGANPMLLRRSSGLPARLVFPSGMEGG LINQESTW FVNGANPMLLRRSTSLPSRLALPSGMEELRAQ FLNGCNPVLI QRCVKLPENLPVTTEMVECSLERQ ALAGVNPVNI ELLKEFPDRSKLDPTMYGPPESADTKEEQE $F$ NGVNPMVIKRDKALPANFPVTDEMV
FLNGVNPMVIKR】KALPGNFPVTDEMV
F L N GANPMLLRRPTSLPSRLVLPAGMEE $\square R A Q L E K E L Q C C$ YLNGVNPGLI RRCTRIIPDKFPVTDDMVEGTCFASGAGAPL FLNGSNPTLLRRS IHLPARLEFPPGMEELQAQ

FLNGANPMLLRHSTSLPSRLVMPSGMEDLQAQ
F RNGANPMLLRRSRSLSACLVLSPGMEDLK
$M F G Y Q F \square N G C N P V L I$
F $\square \mathrm{N}$ G $\square \mathrm{NPDMDQKCER} \mathrm{\prod PENFPVTQDMVA}$ AVAGYNPCVIKALTELPETFGGSADREEHVDGDLQGDTM FLNGVHPMVIRRCTELPCNFPVTPAMVASS

YLNGTNP\|LIKHCKE\|PQNFPVTNEMV
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$\square G G G P \square S V S P Q K G T \prod F L V D Y R \square L E G \square P T G Q D N G R Q Q Q S A$
 LQ
H G G G S LA DEMM K GN
$R D G T S L K Q E M G K G N$
GPGTSLQAEDESGS
C

CHYCN L
EGIE K NI
LEKELQQGSLIFEADF T I LDGLPTTDVIRGEEQQYQA


 G GQTS L Q Q QL Q A GNL Y

,
04442 ECA
T9
039441 D 1
00273DFC2

$F$ L $F$ L $P$ L $X$
L E K E L
S F F H S L Q

GDGS | G D G M |
| :--- |
| $L$ |


A G S
LEQELQG
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MI F LLCDYSI WME

 M
E

ETGTTLEKEMEKGN
EKS S SLQEELEKGS
L K R K L Q E G C

G

## 



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${ }_{G} P$ T T T ${ }^{L}$
LNE KE $\square \mathrm{MS}$


LE E E LQ NGS LFEADF ILLDG DPANVIQGEQQYLA
 GE G

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$A P L V M L K Q D G G L L P M V I$
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APLCLLHFNAEGNLMP A AI APLVMLKMEPNGKLQPMVI


$P M T L L F Q R P G G G P L L P L A I ~ Q ~$


L Q
QPPRHG
$\qquad$
QLPRVG
K QKP
C


CPPPPFP $V_{\text {PPpp }}$ s
 APLVMLKMEPSGKLLPMVI QUQPPES VW V A CLYKKTENK APLCLLHQGTDGLLRPIAIQDLNK HCAPMCLLHGPNGMMPIAIOLS A PGLYKNGKMP A Q S
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 PGLCLLYVNSDKKLLPI AI QLQQEPSE AAPLVLLHRDANEMKPA: QLKQKPGE
 $\qquad$ RCSELLLLRVHKERY


 $P Q Q C V F F L Q Q Y$ QLN APLCLLHQKRTGELDPLADQLS QLIQTPGEENPIFLP AGRALEYLKKDAEGNPVAVQEAHPGPAPSFGHVYSRSQLS

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FAVATMRCLPALHPVFKLLIPHTRYTMDTNTRARNQLISD IAVATMRCLPGLHPVFKLLMPHDRYTMEINTRARTQLISD FAIAA A H R HLS SVMHPVVFKLLKPHLKHTLQVNAGA I AVA TMRCLPGLLPVFKLLDPHTRYTTEVNTRARTQANSD




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 N GS S A K F F TA G G K G A A E A LAKK S L A T V
 GGMHEVNFFASKYGMEMSSKA YA SYN FTEAAFPNEADDRGG
 NGI FTKFSSGGEGMFTIL RKALSSMTYRSLCLPDDIISDRG







G GVFDKVVSGGGGHVQLIRRAMAQLTYRSLCPPDNLADRG GGIFDKAVSGGGGHVVHLLRRALAQLTYRSLCPDDDLADR
 S GIVFS QAVSTGGGHVQLMRRAMA QLT YRSLCPPEDLADRG $D G$ G C GLFDK ANAGGGGHVQLVLRSMEELTYTSDCFPEAMVMKG
 G GLS A R GMSLGEGFAEAMVRALSEITYDNLYMPDDFVKRG
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RTSEELIKFLSMIDFTVSAQHSAVNNPQYDYCS LDPNYSL $\square S L V D L V K F V T M V M F T C S A Q H A A V N F G Q Y D F Y G W M P N C P A$ KTREKLSEYLTVAIFTASAQHAAVNFGQYDWCSWIPNSPP QSRAQLCHFLTMCI FRCTAQHAAVNFSQHDWFFWVLNAPC RTVPEL $\quad$ RYVT IVI YTCSAKHAAVNTGQMEFTAWMPNFPA QSKDQLCHFVTTCIFTCTGQHSSNHDGRLDWYAWVSDAPC QSRVQLCHFLTMCVERCTAQHAAVNAGQFDWFAWVPNAPC TS L L E E V T K F V N MVVV F TVVSA QHAA V N S GLLF D F S S WMP N S P S QS RA QL CHFFLTMCI FTCSSAQHAAVNTGGQFDWFA WVPNAPS




K T V A E L V Q S CA T II W $\quad$ DA S A L H A A V N F G Q Y M Y A G Y VP N R P S PTVQKLTKFLTMVIFTCSVQHSAVNSGQFDYCSWMPNVPF
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ESVLEA LP EVG GTTN【MT
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$S M Q \square P P P T S K G L A T R$ TLERPPPSKK

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TMRRPPPADKDKVTKHD $\quad$ WHTLPDTTATTTVLT T LQLPPPTTK GTTSEATMLKTLPDVNATVQGMA TMRLPPPTTKDVT DEK GKMATLPNFHQASLQMS

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CKGQ

## QTVLETLPDVEDSVK\MS

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F LQ HFLDTI PEVATTANILV
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 LFWGVSHETEDTRRLGTYPDQHFTEEEAPKQSVVAFQSRGL TLYLLSRRYSDFV PFGTYPE HHFTEEQPGKLMEKFKEEL

ALWWLSKEPGDRRPLGTYPDEHFTE EAPRRSTATFQSHL AVWLLSKESTDSEFLGNYPE QRFDEDVPLKNI KVFKEQL AVWALSQFQENE $\square F L G N Y P D Q H F T E M P I L E A I A R F K E R L$
T $\square Y$ YLLSQTARDEASLGDYTEE RFTEPGPRECDERFQSRL TMWLLSKRSTDFVSLGQYPEEH FSEEDPFTFI KDFQAELL
 T I WLLSMQSSDARYLHEFVEEHFTEDFPKYKVT TFQRDLL

AAR पLSEKYT DVVLLGEFPEEH FDEP DPKE I IKVLQADL $\square T W H L G R R Q P D M V P L G H H K E K Y$ FSSPEAKAVLNQFQ


MF WMLS DKYTDMVP LGAFPEE RFSEPHDKQMDKDFQAEL LFWLVSQEPKDQRPGUTYPDEHFTEEEAPRQSIAAFQNC
 IT WHLGRKQPDMVPLGHHKEKYFSNPKAKAVLDQFQTD $V L W T L S R E P D D R R P L G H F P D D H$ FVEEAPRRSDEAFRQRLL L P WLLSRPPADMVPLGHHQEEY FSDPEPKAVLRQFQ $I$ TWHL GRAQPDAIPMGQYDEQYFTEP ALLWLSKEPGDQRPLGTYPEEHFTE EAPQQSDTAFQSRL $F T K F L G R R Q P V M V V L G Q H E E K Y$ FSGPEPQAVLRQFQEEL

VT WHLGRPQRDMVPLGHHQEEY FSGPEPKAVLRQFQ I TWHL GRRQPDMVPLGHHKEKY FSDPKAKSVGHHKE $V V N \square L S Q H S P D E E C I G Q R K D S D W T G D T E \square I Q A F Y E F S M D \square$ $\bar{F} V R Q V G R Q Q P D M V P L G Y H T E E Y F S G P E P K A \| L R Q F Q$

A VWALS QFQDNE LFLGGMYPDEHFDEKP VKEAMEKFRENL $A L \frac{1}{1} L S S Q L K D R R L L G Q Y P E E W F T E A E P R R L I D A F Q G Q L$ VLWTLSREPDDR
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【S WHLGRRQPDMVPLGHHKEKY FSGPKPKAVLNQFR

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 LP WLLSKRPPAD MFA WF
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$\nabla K \square P Y$ TFLDP
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S YLSE
EKİDEI NARNTSTETK
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A Q ITSKD RERNRRPS
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AD पDK Leke IVARNEQLDLPYEYपKPSL
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ADLDNLERETVARNEQLD $\square P Y E Y$ YKIKSC
DK円S S S S ERNKNKK PYYY SPDRDPNSV
EE：RDR：EERNHLAELRYNYLNPGET

to Den
SEFSKETSEKNDERSPPY $\square Y$ MDPAQMENS


ATMDKEПEVRNTS DDLLYEY DRPSMVENRV
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KVIENSVSI
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RS GNLCLLAEETEERAKQHRLGQDRWGVFVEGVPQC S LP Q D D LK QE QRQFELLKKRS LYEFECKS EGL P Q QRQNELEERK KVYQWDYVSDDMPGN NEG $\square P P S A A A \square P R S E Q F S \square P Y K \square T L L A F N L K S K L S A F L N G$ KVNDDTQNLFKKYREQEME GRRKVYRWGSWKEGLIPV RATKAFEDLCDHRQRELSRKKQL YTWRTLAEGLMED


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$\square S A Q R D M E T Q \quad Q R R Q T \square K W K H D L L G \square P G Y \square K A E K H E D L P K$ QFMYDFLPPM $\square P Q N D A S P Q Q R A K E \square Q E K Q T H Y V D D R K F P G$ QRQEELKARKEM YSWKTY $\quad$ IRGWPGHC QRQKELEQRKVTYQWDYVSDDMPGNDKAK DLPPDENFSTSST\|DLIGNGVKLLGKAA TR DLPPDENFSISSTIDLIGGGVKKLLGKAAIRS E VRWRL: WH LL KTA $\square \mathrm{L} Q \mathrm{NSRHREQRQEELTEMKKRYASFFPVEG}$


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\mathrm{Q} \triangle \mathrm{~V} \mathrm{Q} \square
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UniRef90 I1GDD9 UniRef90_UPI0003AFBADC UniRef90-W4XK16 UniRef90_UPIO003339AA4 UniRef90_W5KPZ6 UniRef90-H2S192 UniRef90-H2S192 UniRef90-UPI00044335E2 UniRef90 W5MRT5 UniRef90-H2NSF9 UniRef90-UPI00042AD146 UniRef90-UPI00034FD201 UniRef90-F1QKM3 UniRef90_UPI0003838D35 UniRef90_UPI00042B10EF UniRef90 Q2N410 UniRef90-UPI0004433E84 UniRef90-B7Z445 UniRef90 Q4SKY3 UniRef90-Q4SKY3 UniRef90_UPI0003C8F33C UniRef90-S4RNB8 UniRef90 T2MH56 UniRef90-UPIO002A48879 UniRef90-H2VCF5 UniRef90-UPI000443FDD5 UniRef90_UPI00042C93D4 UniRef90-M3ZX99 UniRef90-I1R766 UniRef90-W4XYB8 UniRef90-Q1DBH9 UniRef90-B0YQF5 UniRef90-UPI0003F0988D UniRef90-UPI000359A959 UniRef90_H8MVG8 UniRef90-H2VCF6 UniRef90 W8JJ08 UniRef90-V4AFD1 UniRef90-UPIOO03298001 UniRef90 ${ }^{-}$K1RVU3 UniRef90 K 1 RCl 8 UniRef90_UPI000383CBF1 UniRef90_F7AJ61 UniRef90 F7AJ61 UniRef90-B3RT70 UniRef90_K4B0V4 UniRef90-UPI0002B4A6D7 UniRef90 G5B5F1 UniRef90_K9PY12 UniRef90_A8IKX4 UniRet90-UPIO003ACA628 UniRef90_UPIO003ACA628
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TKVFLV QAFEKLLTGLSLLSEDKSMTTLDKYEDF $L K A Q N P L L P S E V Q F S F T K T T E F V Y T A S T G D T E L K D K G D D N$ A $\square P Q V K S F P K D E S F S N D Y L W D G G K N M V T L T L K A K M T Q$
 $\square$ D A T S E K D $\square$ P $\square \mathrm{DVRFHENKKSDFEGTLIAGMMK} \mathrm{\square ILKR} \mathrm{\square Y}$ $\square N V A A T S L S D L P V D E R F E D K R F E F E A S Q V L G K T D V L F N F P$ AGSSPQDLLPRDQRFLEDKDLDFNFSLAKGLKDLAI KGTDD DAMTSVADLGPN FSFTKYDIVKRPVTNVHYUKGFIERKTS IQQS VVFVLRKPKSPSHQDTQSVDVAIFSDKQLKEMDERV $V$ DAEEPKSLPKDVQFTDEATSSLFRVGLADFANLGLSHLF

A GAC DND LP VDERF $\square E D K R \square D F E A S \square A K G \square A E L A D K D S \square N$ VDSSFLDLPCDTRFDDEKSADFNASSAKGSVQDGGLKDSLN

WSVR\|LSPCFSSMCASFSSRTAMVLKGLLGSEENWESL
$\square K S \square S D G G N L S Y T H \square S P S \square D \square H Y \square R G F A G R A E P W S S F S E$ $\square K$ T F PMDESFSNDYQWD $\square \mathrm{V}$ T $\square K$ A K $\square \mathrm{M} \square \mathrm{Q}$ T AT $\square \mathrm{K}$
TKAATHDDLPRDVQFTDEKSRSYQESRKAADVNDGDGSFF LVS S
AGSTQQDLRRNQRFMEDKDLDFSLSLAKVLKEFA $\quad$ KGTLD NGTDVSQDPSELQFSDSKNFSSMCASFSSRTAMVLKGLL K RDVQFTDEKSRSYHESRKEALVNLGI GKLFT LDEHDDQRKMELEDKRKQYE ICQKEKGLPVQWDIVSTKAD
VKTVPEDENTDAK LDDIAKRKYCLLAGKALELTFGSGSWKT FPVQUK KVPEDEDF SFSHKWDLLSKKY SLLAGKTVEMVF IDAAGSEDDLPANMRFHEEKRLDFEWTLKAGALEMVLKRVY


LLKDAW
SKMRR
 $R N R X F L Q D E D L G F T L F$ LVKVLKDLALKGTLGLTNSAKR FP LSDDAKCHDVQFDSEKGVDFVLNYSKA
 TGMI MMASLPKDEMFSFSDQFDLKA DKMRLKLEH KKLDG MPVQUSKMPPDEQF SFEYKWDIVTTKAQLSRLVKDTAGQ ENFS $\square$ S Y Q L M L RK G L S A L 1 A NSVAT K DE

LEETVKDLDLNVKYPVVKKTKFS LK KGG GVAELKLKGLLD LDEETVKDLDLNIKYSFTRNASFYLKS S SVFAELGLKGIL


A M LKKSVPPAENFSTKY $\square$ AERTLEAAEDP $\square$ NMMKTHAM

LLKG GSRDFRE DDD DFFSS $\square$ KESG $\square S \square$ FKDS $\square D R \square I E M M Y$
पDAETEAD LHPDRFDNEKKSDFQYWGGLLRPVTEAARFSQ IKLEKGWMSSTDW

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UniRef90_UPIOOO45434D4 UniRef90-W8JN16 UniRef90-Bов ${ }^{-1}$ UniRef90 ${ }^{-}$W4YEWO UniRef90-W4YEW0 UniRef90-BOC2A2 UniRef90-K9RLT1 UniRef90-X5FOX0 UniRef90-UPIO001CE21FD UniRef90-A4S026 UniRef90_UPI00031599F6 UniRef90-K9V5R7 UniRef90-F9U5X3 UniRef90-W4Z5M6 UniRef90-H2SQ49 UniRef90_UPIO002A478D7 UniRe90_UPiooo
 RKEK KDNDDSUNRVFCCKKTEDSEYVQEHWKEDAFFGYQ CSE SWRSFNQLQSTLRHPEPKAGAYVQQHWQEDEFFGYQ YVRKHWKEDGMFGYQ
YVRKHWKEDLMFGYQ YVRKHWKEDLMFGYQ
KVRQSWKDDDFFGYQ TLLNSWNS SEDFDQ FWFSKSTGAKKVRQSWKDDDFFGYQ
RWRTUEDGRRVFLFPSKKAVEYISKNWKDDAFGGQ LNTLCWKDLDDFKWVFKTGHTKLAEQVRRSWKEDALLFGYQ LAVCMKTLEDFXXVFSRRLPWLGMRVCDCWKDDTLXGFQ WRSLQEL
 G $\square W D D W D C L E D F R Q L I T P A \square K S G L P H A A E Y W R D D V W F G S Q$

REYVMQHWKEDFMFGYQ REYVMQHWKEDFMFGYQ TLANWNNVDDFNRTFWCGPSKLAVYVRDSWKEDAMFGYQ LDGMSWTKIEDFRRLFTRVKSEIAEYISHHWDQDWFFGYQ LTSEKWTTIGDYLKLYKGIFPVPYGFN NWQSDEKFGEQ EDMQRDFSFRTTPMSEYVAKHWREDDFYGYQ

S WKK DDD DR MMC CHKTFTSEYVTEHWCEDHFFGYQ पetafalls GHQNNUAKFVK AHWMEDWYFGYQ MTSKSWEK $\square D D \square G E Y T G \| D P D Y G M N$ NWRSDKEFGYQ DI FDFFKHLEVPQLAQRWKDDDEFARQ SQFEDWDNYEDYHLYRNW LGDTPNMADKWSDDRWFGYQ FTSRVQKL EDYQKTFPYGTTALAGRVRDSWKDDALFGYQ F IVRVQKLEDYQKIFPYGTTALAGRVRDSWKDDALFGYQ SEENWESLEDMQRI FSFRTTPMSEYVADHWREDDFYGYQ MFE DWDSYDDYRILYRNWILGDTPNMADKWSEDRWFGYR HWMEDWYF GYQ
DWKSDESFGWQ LENLKGV YSKMFGYPKGMNDWKSDESFGWQ

 LTSDTWSSLKDLGNIYKKGTSLDDPMGMYRWKEDNYFGKQ

WQRLTNDPSHDTNDLLYFPVPRVLDGRPDTYQEDTFAYM
 EDFKKDYS
 पDEDKWQDPDYПNN WDTD WESERWESKEDLGNVYKPPHFPUPSVMENWKSDKEFGNQ WESDA HLKKNIYTQNVFHLPK NVFDPFDKLEDYEQLEPLPKPTSTK GADRWSNDUNFGLQ GVMDKWDQFADFKNVLMHPKDPKVPDFQQNWERDEEFARQ LP SPWKRGEDFDQ| FWGQKTAMAEKVRRRWQDDELFGYQ LKK NWTHUDDDSHLLCAHRTQVTDFVHKHWKEDSLEGYQ RKGGGHRSLTEMRRVFSFRKTPAVEYVFE RTGLWRSTRE MKRMLNFRSSPVGEYVYKHWQEDEVFAYM SRRGLWKNLKEMRNVLNFQKTPASEYTFEHWQEDAFFAYQ

$\qquad$
 EK LRGWKGปEDYER】MNTVCPTAPACDEDWASDAEFGRQ WDP DDE ODYEDFFPDQKPNVMKTYE VF SGDWKSVDDITSNYQTGCGFDVPQGRYRWDEDSYFAKQ HPTGHVNSLKDYQKLF TTTELPADAKTFDQDQVFAYM RTGLWRSLRE MRRMFNFHKTPAAEYVFEHWQEDAFFASQ LFE DWDSYDDYH LYRNWILGDTPNMADKWNEDRWF GYR LSDYSQLFQA YNDLEQUIYLPCISSQRWWWTDRAFVAQ
 RPRGHAKSLNDYHKAF RAPEMGIPKGAENFST
 ERQPKGHVKNLNDYR LLPKME WLAKRNGLDGYRFDKPPTMAR WRE
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FLNGVNPNIITKCTVLPTNFPVTEEMV LK K S F

Y LNGVNPVMLHCLSSDP SKLPATNDMVAP S
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RLTGCNATNTRLCTETPTKFPVTDAMLE PL
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RINRVNSNLI RRCSEIPAKFGVTDDM
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$R V Q G V N P V L V K L C T E V P N F K V T N E M V E Q D S P$


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UniRef90-H2S192 UniRef90-UPI00044335E2 UniRef90-W5MRT5 UniRef90-H2NSF9 UniRef90-UPI00042AD146 UniRef90-UPI00034FD201 UniRef90-F1QKM3 UniRef90_UPI0003838D35 UniRef90_UPI00042B10EF UniRef90_Q2N410 UniRef90_UPI0004433E84 UniRef90-B7Z445
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UniRef90-I1R766
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UniRef90-B0YQF5
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$\qquad$

GAD 250
250
M K
GADLLDKEMKDGR|Y/V 260 Kill MDGLQCR

270
280
$P$ LGNMT $\square$ EEA LV Y K R L LDEGGS
$E$ R G
E R G
T
T A G S
L

## LE M T

L E E E E L

LEKELQAGT
PEGSSLDQEMEKGRVYLLDYEVLDQLPANTVNG KQTYLS
 DRGYTLEKAMKEGLIF ITDYK LEEGDPTMDTPEDK RY IT ERGLTLEEETQAGNDYMADFELLDGGIKANVILCSQQHLAA ERGLTLEEEIQAGNIYMADFELLDGVKPNDTDPRTQQYIAA
 LDGFTLEETEKKQLFIVNLATLENLILENG RTVGC




FTTEYVTEHWCEDNFFGYQY
$\square \mathrm{L}$ GVN PVMLHCLS
GEEDSLAAARSEGRLYLCDYADLDGADEGDFPVA QKYL EQLVAEAAAGAKPRLYL DDHWDLSAYWQEAEEEAEAARQH LEGNSLQYLLDNNRIFICDFN VLDEKASKEGYCVC LEGNSLQYELDNNRLCGCDF LINGCNPVLI QRCRKL
LEGRTLEEAMQAGKLYVGDYSKLLADVPERRTYVTTEMVEC

 LEKELQKGSLEFADLEMLDMPCGRSPI NQTTYFSC HGRGSLADEMMKGNVFGCDYKLLDGVQPNTINKKK QYLM GPGTSLQAELEKGSI FLVDHSVLSGVRTNVVNGQP QFSA


GPGTS
GET
SLAA A AYA LA GDSLAKEAGQGGTL
 GKEDSLAQAI QDKRLYLADYKIFDGIVAGDVPPVEYTKYI GNSDNLDERLATGNLYVADYR SLAFVQGGTYAKGKKYL
 GPGTSLQAELEKGSLFLVDHGULSGIQTNVINGKPQFSAA GKTLQEEMRDGHIYLVDFKILVGPDGVNHENADDRYCA

 LE GLKLAAAGEKGRMYYVDHTMMKITSFGNTTGPAPMC GPGSSLQAELERGSLILLVDHGULSSVISRTNVVNGRPQF



GED D S | $S$ | $E$ | $A$ | $A$ | $G$ | $D$ | $E$ | $H$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $F$ |  |  |  |  |  |  |
| T | A | $A$ | $G$ | $T$ | $E$ | $G$ | $R$ | $L$ |
| $A$ | $S$ | $A$ | $I$ | $E$ | $K$ | $K$ | $R$ | $L$ |
| $Y$ |  |  |  |  |  |  |  |  | $\begin{array}{ll}Y & L \\ Y & A \\ W & C\end{array}$

LE GLTVVSEAL KAGNL





## UniRef90 I1GDD9

 UniRef90-UPIO003AFBADC UniRef90-W4XK16 UniRef90-UPIo003339AA4 UniRet90_W5KPZ6 UniRef90-H2S192 UniRef90-H2S192 UniRef90-UPIO0044335E2 UniRef90_W5MRT5 UniRef90-H2NSF9 UniRef90-UPI00042AD146 UniRef90-UPIO0034FD201 UniRef90-F1QKM3 UniRef90_UPI0003838D35 UniRef90_UPIo0042B10EF UniRef90 Q2N410 UniRef90_UPI0004433E84 UniRef90-B7Z445UniRef90-Q4SKY3 UniRef90-Q4SKY3 UniRef90-UP10003C8F33C UniRef90-S4RNB8 UniRef90_T2MH56 UniRef90_UPIOO02A48879 UniRef90-H2VCF5 UniRef90-UPIO00443FDD5 UniRef90-UPIOO0042C93D4 UniRef90-M3ZX99 UniRef90-11R766 UniRef90-W4XYB8 UniRef90-Q1DBH9 UniRef90-B0YQF5 UniRef90-UPI0003F0988D UniRef90-UPIOOO359A959 UniRef90-H8MVG8 UniRef90-H2VCF6 UniRef90_W8JJ08 UniRef90-V4AFD1 UniRef90-UPIOOO3298001 UniRef90-K1RVU3 UniRef90-K1RCl8 UniRef90-UPIO00383CBF1 UniRef90-F7AJ661 UniRef90-F7AJ61 UniRef90-B3RT70 UniRef90-K4BOV4 UniRef90-UP10002B4A6D7 UniRef90-G5B5F1 UniRef90-K9PY12 UniRef90-A8IKX4
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 G GWVD QCMA $\square$ GRGMFEI DRRSWDRWSLEKQSLEKDLDARRG
 GSALDNMMT G GRDAFKILLDRSWKEWRF DVNTLDPKDMEARG


 G GlVVDKSLS G G G GHVVEFMQECFKKVNLQDYMLPKALRKRG


 G GWVDK T IS LG R GMLELLIGRGLSLWRMDNECYPENLKKRG




 G G GVV N K I LAA T DID N A R L G G WVD KVMN $\quad$ GKGMFKLIEK GLDEWR DDLHTLPNDFKSRG WGIF DLVMMTGS G GHVDILQRSQLLTYCSLCPPDDLADRG Y GLF DKANA GGGGHVQLVMRAMQELTV N


 $G G \operatorname{li} D \mathrm{D}$ G W S G G G G H V Q V M R R A M A Q L T Y R S F C P P D D
 $G G G V D R L L S S S D N S R V L A V L G L L Q S Y S N S T L L P N Q F Q Q R G$


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



 G G GVD L L S S T D N S R L A AVR G L Q S Y S F N E A M L P N Q L K Q R G
 G GTVDSVVMSGTESSKELSVKAVQPYGFNDSMLPATLSRRG
 GGFADKNMNIGAGMVGII KRAFATYRLDVESLHADLQERG
 G G G V D K L L A S T D N S R V L A A V G L Q S Y G F N E A M L P K Q L E K R G G G GLD R T S Q I GQGDFKLIRERLKTWR LDDGTLPEDLMNRG STGLGIGGFSELIQRNMEQLSYATLCLPEDDRARG G G VT D R VV A V G G G HMD L M S K A Y QR F K L D D L H V P T S F K K R G D GVVDRLLA GK DSALGLSAWAVQGHAFMDLLDPTESFRRRRG G G GVDRLLSSSDNSRVFAVRGLQSYKFNSAMLPKQLQDRG




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 QLYYRGDKDVQNDSELQNWITDVNTHGF SQRAGFPPSF DHHYDTDERVTSDFELRHWKTLSTE CGMKGVPNGGEF
RHFYRTDADLEADTEMQQWWKDLTE HGLPVDKLPCREL STFYKNNDDVKRDNEDQSWIFDVHKNGWPGHDDHGVPASF ELIFYTSDSDVRGDPELQVWCRETTEGLQGGQDRG GHFYKSDEDLVHDADMQRWWKDLTEMHGGPVDKLPCAEL D TYYKKDEDVKRDNEI QSWITYDVHKNGWPGHDDHGVPASF NLYYDGGDKIADDWELQGWGRELRESGGVGLKGLPHNGTF ELYYHGDNAVQRDPELHGWLTTDYNAHGF NGEGSNGFPQRF SLYYDKTEKLIEDFEIQNFGKDLFNPGCGLLGLPFENGRL HLFYHGDDVVKGDPELQAWCREDTEVGRRQAQERGFPVSF HLYYSGDKVVQNDHELQAWCQEITEIGLFVQDHCIGFPAS EGHYENEKAIEDDWELQEFSKALVSPNGCNDKGDPGDGKF S $\square F Y K D D D S V H D E E L Q A W W S E I R N G G H G D K P H K S G W Y E M$ GYYYPSDDSVQQDSELQAWVSELETQAFGGRESSGFPNR ALYYAGDAAVVEDAELQAWWNEVKIEGHPDLVAFGLKTEQ SLYYDSEDKITGDWELQNLIGKELSSQGGVGVLGVPNDGELD HLFYHRDDTVRGAPELQAWCREITEVGLCQAQDRGFTVSF
 DHHYDLPGKIAADHELQEWIRFMGTKPKGHDKGLPNDGHF DLYYDTEDKVTGDWELQSWVKELREKGGGDPNDLVSGSC SLYYTSDADVNEDTELQAWVRKLMSPEGGGDKKLVSDGK
TSYYKTDAEVQKDSELQKW QQD $\square Y E H G F \square S Q A S T G \square P Q K F$
NLYYTTDED QK DRA QAWAAEDPAYDGGRDPDFGEDGG KLYYPTDADVEKDAALQAWATEAQAYEGGR』TGFGEDGGUL PSAL
S LYYANDAAVQQDNALQAWAQELSAHNGGRVQEFGEEGQL NLHYKTDVAVKEDTELQAWCRE:TERGGRGAQDRGFPVSL DLYYDSEETVAGDDELQSFAKEMALEDEKGNGGVPNNGVL SI YYHNDQDIVDDSELQHWVHSLTKDNGGRMKGFGESNSI QLYYKSPADLKADGELQAWARELVAQDGGRVKGMSDPGI SLYYPTDKDIQNDTALQAWAAEAKADNGGRVPDFGENGGD
GTYYENDEDVKRDSEDQSWTYDVHKNGWPGHKDHGVPASF DLYY EHHYDTPEKIAGDEELQEWACFLGGQPKCGMKGFPNGGRL EHHYDTPEKIAGDEELQEWACFLGGQPKCGIKGFPNGGRL SLYYPTDDSVQTDAALQAWAQELQAEEGGRVPDFGEDGQL KYFYG\|DDNLKDNTEIIQAWAKALVDFG
K LHYTSDAEVAADPY QSMILEMQGYGYQGTDRSQHPGS RCFYRSDAEVAADVEVTAWLTEVSATTGGRTSGVTP SSYYDADEEVQKDTYLQKWATEVQAFDGGRIQDFGENGGD AHFYASDDDVVNDDELQAFHAEIRDPRGGNIPDMPRDAGF

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530 MF G 540
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(MFTGSAQHAAVNFGQFEDYGYVIPNAPF
 LKVEEVVDTVTNFMY DCSVAHASVNFGQYDEYAYPPNYPA ESRDQLCHFVTMCDFTCTGQHSSAHLGQLDWYSWVPNGPC CTTEPLKEFFY LLFHLLSGDHQDMVASKFDFGGWMPNLPT


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ENREELVHFLTVVVFTCSCQHAAVNFSQMATYGFHPNSPT QSRADLCHFLTMCIFTCTVQHTGINQGQIDWYAWVPNAPC QARDQVCHFVTMClFTCTGQHASVHLGQLDWYSWVPNAPC KNVATVQVTLTEFPFLCNNTRGAGNPDRGYFYSFSSARSG KNVATVQVTLTEFPFLCNNTRGAGNPDRGYFYSFSSARSG QSLDQLCKFATMCIFTCTGQHSSNHDGQLDWYAWVPNAPC TCVVSELSEFLTMVVFLCSAQHSAVNYGQFDFYAWIPNAPS D DLNDLIKFVASVIFICSVGHAAANFCQYDEYAFPPSYPA | $T T V A E L V K F V T M V M F T C S A Q H A A V N T G Q Y D G Y G W M P N G P S$ |
| :---: |
| $T T A E E L I$ |

 RSPGELVKLRPALLFDWPTDSTGVGSPQHDCGARTPNAPS QTEAEVSKFVTMVI FSCSADHAAVNFSQLDFADWMPNCPA STADEVTEII TNFI FIGSVGHAASNFSQYDEYGFPPNYPS R RVDDDLVDILTTVLFTVSVQHAAVNYDQYEHYAFVPNAPL

 T T A E EL L K FLTMVI FTVS AQHSAVNNPQYDFCSMMPNYSL

 S S V D E L VAL $\mathrm{I}_{\mathrm{T}} \mathrm{T}$ TLI F TSSSVVHAAVNFPQYDSYGFPPNYP QSQNQLCHFLTMCVFTCTAQHGAVNQGQVW ISLPLLKDKI ERYFFACSGQLRAQVPGSLNYFSLSPHPQG $\square S \mathrm{~L} P \mathrm{~L}$ K K D Z ERYFFACSGQLRAQVPGSLNYFSLSPHPQG



 QRRSDLVHVLAT AWLASGHHAAVNFGQYDFTGLVLNASS KTKEDI SLLFTSVIVTCSVMHCATNFPDYQNYAFPPNYPA QSWA QLCHFLATCI FTCTAQHVADNQSQEDWFFWVSDAXC
 TNDEQLDEDCVTLMFTSSAQHAAVNFGQFETYKFIPNATV





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D WYTWVPNAPCSMRQPPPTTKDVTLMDTMPSVYQSSTQMS DWYT WVPNAPCSMRQPPPTTKDVTLMDTMPSVYQSSIQMS


$T M Q L P P P T S K G Q A$
$A G G Y L P A S T$
$A G G M M P A S T$
$T$
A GYTPAPKSTTGA
TMNGTPPKTKDPVDADFM
A $\square \mathrm{MQPPPPA} \square K R V S S D D D \square A K V$
A GYSSAPSTATGA
A AYQE $\square$ QQKGD IEDR
FMNGKAPRDKSPI
A GYVSAS $\square \mathrm{NG}$
TMQLPPPTSKGQV
LLRKPPPKKK
AGYRPAPKSTKATT
WLSGKPPHDKTALC
WLSGKPPHDKTALC
A GYQPAPNSTAMSSQDRGNQ

MLEGNPPKTKD
$T M Q L P P P T S K G Q A$
$\square M R K P A P T K K V P V$
AGYAPAPAFKQGA
AGYAPASTLLKPEV
WMNGSPPQDKTP
TMRQPPPGDKDAVTM
KPEGFTATLSPVNATCDVVI EVTEQDYLNLLPPLDQAQRQYN


TLERFLATLBPVNATGDVIG

TEADFFAMDPPDDQAKSQLT LK T QADKD I T LDDMI LPAKPASLRQAA

## To

 QALI DFLPPAKPTNTQLS TEADLLKQLPNK
## EVSEQDYLNLLPPLEQAQQQFN

GESRPEGFIATLPPVNATCDVII
GESTLESTLATLPSKAQAAKAIVA EKDILDKLPGKTQTLLQTMA


S M Q L

S WQGSRI SWQGSRPQQDKVLLGHYK



| $V$ | $S$ | $L$ |
| :--- | :--- | :--- | :--- |
| $L$ | $L$ | $L$ |GHYKEKY

AVWALSSQFQENEDFGGMYPEVSYTLSQFSPDFAYLGMYPEEHFDEKP VKEAMARFRKNLVSYTLSQFSPDEAYLGTFAERLFTE
VTK LLSGKGTKSLGDFIIMHTLTAFQFNRFG
LCHALSKHADEQVYMADYPSRND ..... Y P P TLWVLSKEPGDRRPDGTYPDE DE H E F

 AL WLL S Q E P G D R R P
 KHFTDF
KNDFDD
K P K IQGALK QFQARL 23B4A6D7 UniRef90-Q2N410 UniRef90_UPI0004433E84 UniRef90-B7Z445
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EVNYTYDPVGVAALKQFNDEL LLSLLGSIYYN QLGEY
 TVY TLTKFSEDERYLGNYSAEAFTED $M T Y L L G$ S LYYTLLGEYGEEH FTDTRVQPLLKAFQQQQL


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650
KTLKEKLTKRNESLE VIPYPYMLDSR

 KILEAEVENRNQSLEPGY LYY LDPTTVDNSV A El Tr F



A A MDKEDEVRNAH LDDLPYEY LDQPSKVGNSV
K D D K D A A DRNSQLELPYPYMSPDY
AFFSEYVEDRNADL LVVPYKYMTPEN
VS P Y T WL 1 P

A NDT K Q TT E R N Q GM A DI T S SIIKRRNEGKELP YYNMSPDK\PN SV




$\qquad$


A A L D K E I VE $\quad$ E $\quad$ R N A K L D M P Y E Y L R P S V

\begin{abstract}
$\square$ I S S F VTA MVS YYRNPPYVYMDPTQMENSI


| UniRef90_I1GDD9 | \\|IP N S IIT ${ }^{69}$ |
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| UniRef90-UPI0003AFBADC |  |
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|  | VEN S VA |
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| UniRef90-W4YEW0 |  |
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S Y R P P A R R N P $P Q N V T N A$ CGDY $\square E F P C Y R W \quad R W \square R K Q T R \square K \square$

P E G T A R FPCYRWVEGDG $\square$ C $\square$ PE T

PNWRNF

PDRGTSRHFPCHSVV


NRPEWNG Y QCRKRAEEDELKKFEWQPHPKSDKELSWGVNRYMKASNFE EMESDKKFALTKMTTCVDQGDSSGNRYLPG

QQQRREELQARQEMYRWKTYQPGWPHC

T R WDS VLP QF DPNLE QRQREMEEMRANYEDMVPQEGLPPK $E \square V L R D G R A K D A C D D Q \square H V L K Q H R R K E L E T R Q K Q Y R W N P G$

PPY LVGLPRGEGFNGFK LLWFDFTALKSALILI DTQ
$\square A G N N T W D V F Q K H R E Q E \square E E R Q Q \quad \square Y$ CWATWKEGLPDT
$\square P Q N V K N H Y$ VKS $\square R H K E \square E Q K R A M Y A W T D R$

A R QEMYQWKAYNPGWPHC ERVFNA】NNLVRGLSN【


EELQELKSD
YRWS E F FP G
$\square \mathrm{KKFGADLQNL}$
TA WMRNESQG $\square$ FQKHQEEE $\square$ K ARRT $\square Y$ GWVSWKKG $\quad \square P \square$

GSN【PAGSDSVPPGEGFP $\square K K \square L A L N L G K W K D \quad T A G$ QKYELEYMKR LDRTHPDVP L
LSKVRPGEVS LIPQYDCHEVLRQERLLELRDRHLDYLWQRA IE A A LKGLSHLPK DL $\square P Q F D P N R E E R Q K E L E E K R L L Y T F G Q T A P D$


MKPS LPQDDPNQEQRKDS LNRQQQAY QFDYES $\square$ SP $\square$
 QNE PNPEKRNNDLSDQQQAYY
RF QRLQELLKERQQNFRWKKNY DTF LPP QFDPRRDQRNAELE LKYEYEEKVPG

D VF QKHREQELEERQQ $\quad \square Y$ CWATWKEG $\square$ PMT VLQQHW $\square \mathrm{DE} \square \mathrm{K} \quad$ ARQEDYQWDSY $\square \mathrm{PD} \square \mathrm{PR}$ R YDPRPEQ RNSE $\square K E K \square M \square Y E Y Q V K R P G$
$\square \mathrm{PG}$
$\square$ A GESTSDEFQKHREK
E L K E
$R Q L \square Y C W G \square W K E G L P \square T$ $R S M Y S L D V K T K G L P \frac{L}{P} Q$
$\square P R \square K D F P S D E A F S D D Y K W D \square G S T A D K V G \square A A K \prod R A$ ID Y L G RVA A P MA KLAA N TLAV FFR LGPMXVCATEAGGFSGVPDQSSSVQGLSPTLLCPXGX
 ED $\square$ LS LPEGTARLPGDNALDVFQ


$\square K N L P P D E D \quad F S A D Y K W N V A K R R V N \square R M Q Q K \square S S$ FPLS $\square$ DAKCHD $\square$ QF DSEKGVDFVLNYSKAMENLF $\square$ NRFMH
 $\square A A G S K D D \square P V N M R F H E K K K \square D Y E W T V \square A G \square M E \square A \square K Y \underset{F}{V}$ PTSS $\square$ PRYMNANTYKE $\square$ PS $\square$ FQRNE $\square$ RQKH $\square$ DNED $\square K A H \square$

KEASKRFKDGPS LSH L PPEYYFTQ LEKTVEDDELNDKYSTAKNANFY LQAGSAFAEMKDKGLLD FGNRAQSQN I KHDVKDEQHPEKVSARISADAKD【QETAES

VLMESVPAAENFSFQY $\square$ TERLAATAELPANMVKVKSF

K DLPPDENFSTS STFD LVGNGVK LAADMNFTVET LDAENLKELDPNLRYSVTKD DSQKFRLLSPNQALKLKGLL


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


 $L$ D KVPHQE LDFSPKYTAKRLASMANLVPNMLAAKARN $\lfloor Q A \square G D D F L S P F A D N V L K T V D L Q T D A G H A S S L E Q F R K L F A$

A LLKNVPAVENFSSKY $\square$ GER $\square L A T S E L P A N M A D S R T F$

TSK PP LVLLKK 1 PAFENFSAQYIAERVVATSELVPNMDAAKAR LIPSSIDVNSSEVRFSFTKDMEMKYNAVEVLLELELESLMA $\square P \nabla Q V K K \nabla P E D E Q F \quad S T S A K W D W N D Q Q T K Y K L A V K C K L T K$


$\square K N S T A D \square P K D A Q F T V E R K D D L L F D \square D R L C L Q F G F T R N N M$ $\square P V Q \square K N \square P D D E Q F S D \quad S H M W D L L T R K Y T \square M A G K T V E M \square F$ R LRAQSYADLPPELRFDPEKEFDLAARFAKNLSAVNSTKL \AADSVKD $\square P P D M K F H G E K R \square D Y E W T G K T G A D E M V L K R V Y$ VKS $L$ PVDEEFSFPEKWD $\square$ GKRKQRLIEE NQLED

## LLDLVNGNVSDAANQGSS $\square K A$

M LQQSEAMDLFQQ LILLGN
 FKEA T GMDMF DLKA LGGMRKLEHKL $\frac{A}{1} G$
$\square E \operatorname{VIASVDELDSNNKYSVTKTT\square FMLRT\square KTELELK\square KGFF}$

FTTERFQSLDDVEDLY YPPILPKPWAVNNWRCDKEFGYN K L K S A WD PLDELQDYEDFFQVLEKPKVISTYQSDKAFAEQ $P G T V$ LNDYKKLYSKTGFN LLDRKWKKLDDMQNDFWCHKTFTTKYVTEHWCEDHFFGYQ KHREKEL KDRQQ $\quad$ YYATWKEGLP LTDAADRKDDLPPNM DDLKDFQELFQTIDLPAIAYTYEEDEVFASM ERKGSWRSLSEMEMVLNFQKTPATEYVFEHWQEDAFFASQ
 LTTGRFKTLDDLINVYEGVLGTPKGVENNWRDDREFGRQ MF QSSWSDFADFEKI FVKIVNTISERVMNHWQEDFMFGYQ
 $\square F Q F$ FKWPF L P K P L $\square A E L$ $\begin{array}{ll}W Q E D V & E G R Q \\ W S N D & C \\ \text { WGAQ }\end{array}$ A LTPRSWNSLEDFDELFWGQKTALAEKVQKCWQDDELFGYQ $H Q D G R W E T F D S D D Q V F$ V NTTLKVLSVDSFHRFYEREKLDVKNDFLSDWDTDEGMGRQ
$\square N E F L E D F P D Q N Q N V K N F P \square P A \square A E \quad N L E D D E M F A Y M$ RKGL WRSLNEMKRIFNFRRTPAAEHAFEHWQEDAFFASQ
$\square D P \square D E \square D Y E D F F A \square I P \square P K \quad \square A K V Y Q T N D A F A E Q$ WQSDTEFCRQ WDS $\square$ KED EE TYQEPHFPTP MPEKGVVQNWRSDKEFGNQ DSQRPWRSLDELIKRSFVFPKSPVSEYVFEHWQEDAFFASQ LKSEVEGNSSLAQYRALFQTDELPKVADLICCSDQAFAEL EVVDKWDQFADFKNVFLHPKMPKVPDFQQNWERDEEFGRQ $\square \quad \square S$ S WNS LEDFDQTFWGGKSALAKRVRLSWGEDEDVFAYM

DDYARLF
ATFERPWFADRYDS
 LA QVKGDW DPWKANFSGY LPANEKDIEEWQKDEEFCRM MF Q SRWEDFADFERILQKMKSTVSEYVRKHWKEDLMFGYQ $\square P K F V K S C T N D A T T L Q P G L P D G P K G D M C K S V Q D D V D F G R \square$ RDY LQAKGLEDYELLFNLPTPQAMDDERKAWMPDDEFGYM LESKVLHAHWKTSS $\square$ F $\square$ T CTNERQSRGRMDWDTDDGMGRQ KDEKYHNMEYI I RHWRDDAEFARQ FQRLVQQEVREHRDYKDLFKKLPLPAVAEVFQQNDCFARF FFDPLDELEEYEDLLPDLPKPSVIK Y VDLPE IAAN T

LDP LDE L
FQT VVPEVSSTTQA
QDYEDFFA PLPAVAK LI WNLNTLDDYAYLGRYMPVNERLIGEWQTDEEFCRRQ TCKPSTVGFFLFGFFFVKMI NFSSEYIINNWNKDTFFGRQ
 CSESWWRSFQQQS LLRHPEPKAGAYVQQHWQEDEFFGYQ LT SDPWEKLEDLDNVYKG SMGKPYGLYNWKEDSAFSRQ GSGSWETLEDLTGVYL KTFGDPKEMENWKSDEHFGWQ DWYSDRRFAEQ



GQTA WET TEDMKS VFSN $\square F G N P \square D M D V W H T D E N F G C Q$ LP I I N WN $\square$ YEDTPK LLSKY $\square$ K D SDT VVGHWKNDEEFGRQ HFHRDDVFARL T L L N S WD S LEDFDQTFWGPKSTLCEKVHQRWQDDELFGYQ IGCGEWESFEEMMSVYRFEKP RCLDHDWQSDKHFGEQ D GVERYRQLYATMPVPATADNFRDDLVFARM FETYNK $\square$ HRKSGTD $\square E Q G$ AN $\quad$ GLLPDWYGDRRFADQ

LRTNVQALLKTNQS $\square$ GSFGTPDGDARYNA $\square W Q D D N F F A Y \square$ KTRSLWDPLDELQQDYEDYFPVLPKPNIIKTYQSDDSFCEQ FTSERWESLEDLENVYK PPHFPKPSVMENWKSDKEFGNQ E IVSNHDERSEENFKALFSTFPLDPDI SAAYQRDDHFASG
 LD LIFKT LP SPELLS $\quad$ KRQS WMPRDDEQE $\square W Q Q D W Y F G Y M$ YNKYHRKTLDDYNRLYQ IVEKPLIADVGFRDDRDFAYL

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UniRef90-C3Z117
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RMNGCNPSHTRLCSQपPDSFAVSEDD

 SGLL FMNGVNPLVLDRCDKFPENLA RVAGPNPVMLQRLTEPEARLPITEAQYAP QAVM VLTGISPLAFERCTKIPNGCDVTNEHV ILNGVNPTSLEKCTELPTGFVPTKFECGDEDQDQ RLSGCNPNRITLCTEVPNNFAVTNEMVE FLNGCNPVLI QRCTKLPKKLPVTTAMVECS LERO AVAGYPCVILTKLESFSARGEHTNGTDLGATL RVAGPNCMLIEAVTKVPKKCAVTARQYAAVV FLQGLNPVLMRKCKEEDDKFPVTED
FLNGANPMLLRRSTSLPSRLVMPSGMEDLQAQ
 FLNGANPTVVRQCRRLPDNFPVTDSMVQAS

QAVM K S SVLM

RLSGANP LVLHLLKPGDARAQVLNQD PSSKTDFEPL Q| AGFNTTNLRGVRTQKEAHELSELLEKMPVSDDTLQQVS RLAGCNPAMI RLCTEMPENFAVSESDLE
RVAGPNPML QQVKQLPNKDPLKDKDVAP HL RLNGCHPTVLKKCTELPKKFPVTNKMYASSQLTRGVSLE FLNGVNPTLLRKSSSSLPTRLVIPPGTEDLKAQ
ILNGINPIMI ELCQEMPENMAVDKEM RVAGFNPLVLQRVATPGEKFPVTDAQFRVSTGDT
$\begin{array}{ll}R V Q G P N N M L I A A A G D A L P N F P L S P A R Y A A V V \\ R L V G I N P A H I & R R A T P A D L A D F L S G A E P K A V T V A\end{array}$
QVAGFNPGMI ERVSSFGANFPIEDSHY QAVM



MVNGLNPMKITALTSMPATFPLKEHAV
RVAGQNPMLIKGI TAMPANFPVTEQGY
RLSGANPMAMHRIDALPENFPVTND
RVAGANPLVIARMTAPDPRLIPVTEADY
RVAGPNPLLLSGVDALLPDNFPVDAARFEA
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VLTGVSPLVVKRCVTLPEYCNVTDSDV
ILNGINPIMI ELCQEIPENMAVDKEM
RLSGANPFVI RLLDEDDPRSQVLEQMPSFKDD F RLOGCPTMI RLNSVNPNLIHLCTEDPSKFGVTEEC QFTGTNPTT TQAGKQWIGEFLTAARDGGYNAWDSAEAAD
 FLNGTNPMLLRRSTSLPSRLVLPSGMEELRAQ
Y LNGSNPVLI RQCRQLPPNLPLTDQMVAPS
RLNRVNSNLTRLCTSTPDKFGVTESM 】APF RLTGVNPTSIKLCKG|PQGFGVTEDMV KPF



 FLNGLNPMLIHHCQXDTLNEFVEAERGGYDDWAKASKLGGL

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RVAGQNPVLIKRISGLPSKFPLTNAQF
FLNGVNLVVMRKCTSGPENFPVMEELVAGS
RI AGPNPMLIKRLNEPMINFPLSEADF
QIAGFNTTNLKGVQDSNSHSPLADLLKKMPDTDTVGVM
QVAGANPLVLQGFDQQHGSCPVAPD KMPYSAVFQ


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UniRef90-UPIOOO2EB1276 UniRef90-R7T7C1 UniRef90-F6WI80 UniRet90-R7UU77 UniRef90-L8JBT8 UniRef90 UPIIOOO2FB5537 UniRef90-A6GOH4 UniRef90-K9VMV7 UniRef90-C3ZW13 UniRef90--F6U005 UniRef90-H2ZV54 UniRef90-UPIO00440A9FO UniRef90_A7S1H7 UniRef90_K1PNX6
UniRef90 Q7SOU2 UniRet90-A6G9N6 UniRef90-B7JX99 UniRef90-D3BBM6 UniRef90-UP10003BBE4B8 UniRef90-V9KT47 UniRef90-A9TT87 UniRef90-K1R5X6 UniRef90-C3Z117
UniRef90
UTT 655 UniRef90-UPI00046A895A UniRef90_L5M3Y1 UniRef90-UP10003F06757 UniRef90-X7AYL4 UniRef90-W8A5S2 UniRef90-UPIIOOO3F16205 UniRef90-E9DUF6 UniRef90-UPIOOO3592C1C UniRef90-B2J873 UniRef90-W4YS49 UniRef90-Q1Z9C8 UniRef90_Q2SW25 UniRef90-M7BC11
UniRef90 O12N1 UniRef90-B1KK05 UniRef90-B1WT74
niRef90_GoSH46
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FFI ALRRHVSVMHPVYKLMLPHFRYTLNINRDARSGLINA ITAATHRQLPDVHPINALLVRHFEGTLFINDAAANSLI VA
 LKVGIIKVMKPPPPTFQLLDPHTRYTMEINTRARTQLIS S
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 IALGTYRRLGTEHPLGKLLLPHFEGTLFINAAANSLIAP I AVATMRCLPSDHPMFKLLIPHLRYTMEINDRARTGLVSD
 AVSLGTHLPPDHPGYRLLDPHFKDTVGDNYLARHSLVSR VVIATHRYLAPSHPIFRLLAPHFLYLLVINNKAMSDLMGE FFLSTDRQLPMCHPIFK
FTVATHRTLNENHPIYQLLVPHFEGTपS पNNSAATSLTAE FSLAAHRCLSQSHPLLKLLLPHDRFACAGSLVARTLLINA FVLATHRQLDRSHPLSVLLRPHFEGTLADNDAAQRVLI AR FAVATMRCLPGMHPIFKLLIPHDRYTLEINTRARTKLISN FWVAAYRQLADDHPVYKLLIPHGRYTLQI NVAARKTLINE MVIATRRCI PDEHPVSTLLRPHFEGTLNI NDMAQATLVAP FAVATHRHLAQAHPLWALLVPHFEGTLFI NDQAATSLIAA FAVSTYRNLPAAHPLHQLLRPHFFNTLAINELARRRFLGR FJI ATRRQLPENHPLSRLLRPHFEGTLAI NDAAQRLLIAP LVVAMHTHLPPDHPIHRLLLPHFKDTIGINYGARHSLVSR FAl AMFRQLPAVHPMYKLLIPHDRFTVGANTAREKLICK
 VSVALNRHVSPTHP YKLESPHLLFLLAVNARGLDQLSTP GGTALYKYFPKCHPVFKLLQPHLRTVEAINTDARATLLPE DADATVRQLPSVHPVFKLLVPFLKKVVAINTDYRKWVMPK FTVSTNRCLAETHPVNLLLPHFEGTLFINNSAANSLTAP FVMATHRQLPATHPLFKLLVPHFQGTLADNNAAQAFLVAP FAVATHRNLAQTHPLFLLLLPH四GTLFINESADTSLIAP IAVTARQLAQNHPLSLLEPHFRFMLTNELARSYLIAP


 $\pi$ CVGTHRQVSPSHPVFRLLAPHFLYLLAINSLALALLVSP CIGATNRCLSPSHPMFRKLAPHFLYMLAANSLALARLVSP MIV VA T H R R L P S V H P I F VLLL Q P H F Q F T L A I N N A A M S S L I DP FVLATANELAPNHPLSVLLKPHFQFTLAINELAREQLISA FALATARQLSESHPIFQLLHPHFNLLLDDNWRARGDLLGK (VATMRCLPGLHPVFKLLIPHTRYTMDINTRARNQLISD VIVGAQRSFGDTHPVFQLLYPHWQKTLSI NAAARTSLV P FCVVAMRTLPNAHPLFKLLMPHDKFTLHINTQARKLLISE
 CALAAKQNLAPSHPILRLMAPHFDYMMAINKFADWTLISP FAVATFRNLPSAHPVFKLLYPHLLCYADPI GVTSRKHLYDH FAMATNRNLPPAHPLHPLLMPHFEGTLFINEGAALALLPP IIAVCTHRNLSSSHPIFKILAPHFVHLMAVNNRALSYILNP
 FSMAMLHQLPHCHLFFKLLDPH $\square W C T L H I N V L A C K L L I T P$ LIVATHRTI PMDHIVYKLLEPHWYKTLSLNAAARSTLV P VTVATHRNLSQSHPIFKVLAPHFLYLIANSRGLEVLVSD FALATNRTLAPNHPLSVLLKPHYEGDLFVNFLAATIILPP FALVTARQLAENHPLSLLKPHFRFMLANNDLARKRLISR
 FTVATNRCLAESHPLNVLLPHFEGTLFANSAAGSLIAA YCMATLRQLPMCHPVYKLLDPHTHTLHINTLVRTNLIQP FALATERELAQNHPLNLLTPHFEGTLFINSAAGSLIAK

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UniRef90_K9F1Z1
UniRef90_UPI0001796E0C
UniRef90_H2XV50
 $D G F P T K A A A T S A T S ~ L T Q K M F K S T K F Q D L I I P K V L K K G Q G$




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

T A A
$G G P D V$


GGI IE K S F S A GPYAMRLASVVYKYWNFATEALPEDLKTRG G GII EKSFSAGPYAMRLASVVYKYWNFATEALPEDLKTRG

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








 GGAMDKLLSFGGGSQKHILRACKSFKYEDLNIRKLLAKNG






 GGSAETYMS DGSEGFKSLVKKFYTFSFESMDDPLLLNQRGG
 GSSTNKSMAISSATS LARKAYKTFHHNDIVIPKLLKKKQG DGAISEVVLAGEEGHLDLMKKQVNRSKFSLLVVPNNFSARG D GP I DN IVFGGK $\square Q A T Q Q A A G T D R N D D F Y Q Y M L P N D L A S R N$
 G GVVVA ML LA GADIE S WA V


 NGI FDDFTGLGGLKGHEELASRAFKETTYESLLCLPADMQKRG
 $N G W I D \square C M Q T G E G L M G L C G A S W K K W R M N V N G L P K E L K E R G$
 QVIVD VVGISPE QCHSFIRHAYDTYDFVAHYVPNDVARRG G GTIPVVLSPSKGSMDLI RGASEDWRFDEQTPQSEFVRRG



 G G YV D KTMA GS D GLSEL MVRGDGQWRMNME GDYLE FKQRG

 S G DF S Q A V S T G G G HVVQLL H Q A L L S Q M T Y R S L C P P P E D L A D R G







 G GPD E S I FGA E $\square T$ A T QKA A A DD R A LDD F Y A S MLDP N DUAAAR G GGVVASVLSTSESSAKLIVDAHEKWRFDQQFPDTDFKHRG $G G T V D S L L A S S D G S D Q L S S Q G T Q S Y L F N F N A D N F P Q N L V N$


| UniRef90_W4Y597 <br> UniRef90-H2Y9R7 <br> UniRef90-R4GBDC UniRef90 W4Y514 <br> UniRef90-UPI00034816B5 <br> UniRef90-UPIO0042BCBE3 UniRef90- F7AWK4 <br> UniRef90-H2NSM3 <br> UniRef90-A7T4A3 <br> UniRef90-H2QC17 <br> UniRef90-K9F1Z1 <br> UniRef90-UPIO001796E0C UniRef90-H2XV50 <br> UniRef90-H2YON3 |
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KLYYKSDEDVKGDTEDQAWWHEVKTEGHPDLIRRGLRPGG KLYYKS DEDVKGDTELQAWWHEVKTEGHPDLIRFGLRPGG RTYYSSDKDVTGDTELQAWAAA A A S S GK LKGFSAP K N H Y P D NQ A V EN D GK L Q A WK NE L







 NGAYASDPAVAADKALQAF CKMLEGPGQLH
 EHHYVGLAMKHWYKQVS $\square$ F GKE $\backslash$ ATFERLLLR $\square$ SQG
NVYYGTDNEVKQDAELTSWTKEVSEQG RTFYKSNEDVTKDDEIQNCLREIMRTEGFGGKDTDKGLPA I $N L Y Y A K D E D I Q K D A A L Q A W A A E A Q S Y N G G R V V D F G E D G G G$




KIF YK S DEDVQMDSEDQA WIDED IQERGMGVLK SATS LLETT

 SFYYK S GEDIDS DF CLLQTWAQ GSVVTEGWQDNNPRGFK SH $A L Y Y E E D E D V E K D D E L A S S M D D D D R T N G F \quad N N K V E L P G Q F$ EI Y Y K A D D DIV VN D Y ELLTA WT E S LIMT E GA QL Y Y K T P Q DL SEDYELLQNWARELAA QDGGRVKG AL YYT D S DKVTE DA H L Q Q WA KE I VA F E G GRRLTDFGS DGRG A I Y Y ND DAAI DA DSELQA WF A DV SAT DGGTVVSLGEPPRD $K F F Y P$ T E $\square A B V Q D V E L Q T W A Q E L A S D R G G K V K G B M P P R D$ DKIYVNDQAVASDQALQRFCQMIEGPGQLH $R Y Y Y W S D K D I V N D Y E L Q G W A H D V A V E G F G W Q D G N T R P E N$
 $K C Y Y L S A E D V K K D S E L Q N W D S E L F N F G F L G R E Q S G M$
 ALSYPSDESVAQDRYI QSWCKEMRQGG AHMSSFPEI ELYYTS DAEVVADAEI QA WVNELSAS DCAAVKGMDGLQRM S L Y Y Q S P V Q I R Q D T E L Q N WV R R L V S P E G G RV T G LVVS N G E L $N V F Y K H P E D V E R D F E L Q A W F N E L H S S W G G Q M Q S L D T Q S ~ G K L$ HL F Y H GDD IVRGDPELQAWCREITEVGLCQAQDR ELHYPTDECVACDPCI KSWCKEMQAPGGEGDTGGAGFPT $G V Y Y Y E D D G B V G K D C E L Q A F V$
$V D R D T D E R T R G L E R R T M V A K T R N S T G S G G D T D H P H L G G L$ SLGYYDTSEKLLNDAEDQNFGQELFENGCGILGLPFENGRF NYFYDDSKKLKEDHEVQAWAKALHS DMKIPFSQEHPENF




 | $K$ | $V$ | $A$ | $G$ | $F$ | $R$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $V$ | $K$ | $G$ | $F$ | $K$ | $R$ | SDYYP S DVVI H D D S KL XA WVWE I F S E GF L G L E S A GMP S S L

 , QI Y Y K T P Q DL A E D L
 S I Y Y T D DATVTED YELLAA WAES LLMTEGA
 EVVYYSDDAAVLNDYELDKWVAAVAIDQGA ALYYT GDSKVTEDYELQNWINEMVNQGLVKTDNSEQAYQII UniRef90_B1KK05 UniRef90_B1WT74
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 UniRef90- F1SDU7UniRef90 ${ }^{\text {D8UD }}$ UniRef90-D8UD17 UniRef90-UP10001DD08D6 UniRef90-B1WVQ1 UniRef90-G1QD42 UniRef90-C3YRL2 UniRef90-H2Y5X3 UniRef90_UPI000440C084 UniRef90-B4WU29 UniRef90-B4DU98 UniRef90-B0C868 UniRef90-UPI000383D1B7 UniRef90-L7E8T2 UniRef90 C3YUW5 UniRet90-R1GW18 UniRef90-W4ZGS4 UniRef90-UPI0003344B07 UniRef90_UPIO00362D601 UniRef90- H2YSA1 UniRef90-UPIO0034A5B2C UniRef90-G3VB36 UniRef90-UPI0003C1A485 UniRef90-S9PBG6 UniRef90-N9WHR8 UniRef90-S4XW14 UniRef90_UPIO002F1FB34 UniRef90_C3ZW10
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UniRef90
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UniRef90 UniRef90-Q12NL2 UniRef90-B1KK05
UniRef90_B1WT74 UniRef90 GOSH46


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 QSRVQLCHFLTMCIFTCTAQHAAVNTGQFDWFAWVPNAPC
 RSKDELIKFVTMVIFTMTAQHSALNSGQFDFGGWDPNSPP CSM
RTLDYLINATTLITFTCSAQHASVNFPQAS LMTFVPNMPL QSKDQLCHFVTMCIFTCTGQHSSTHLDQLDWYSWVPNAPC CTVEDL SNKKLLDCLINNGYVSAQHSAVNFPQYDYYSFIPNRPA ETSGE TTVI TDFI FMFTANHAAVNFGQYDNFGFPPSYPA
 TSDEELVEFASCIIFTATFRNAGVSNGLFDICMNVPNAPL KTRDYLVDAVTLIIFTASAQHAAVNFPQKDLMGYAAALPL LSKE KTKDDLVEYLTMVIFTCSAQHAAVNNGQRLLGQYSENH QTVAYLCQALTMIIFTASAQHAAVNTPQAELMTYAPATPP ATRDQLADVCTMVMFTASAQHAAVNFPQKDLMAFAPAVTG QTLNYLI DAATLII FTATAQHGAVNYPQKDLMSYAAAAPL STKKLLIDCATNI FNVSAQHSAINFPQYDYYSFDPNRPA DVLFSFCSYICEVVCNCTRQHQTLYUVQFDWYSWVPNAPS DDEDYLARVVAQU YTASAQHASVNFAQYPMMGYGPGATG
 VTLEELVNFCTVVIFRCTGQHAAVSRGMLDMYGYCPNAPP TTREQLANVLTMVIFTASAQHAAVNFPQRTLMSFAPAVTG ETREQLADVVTVVVFTCAPGHSALNFSQYEYMAFVPNMPY

 KTKDDLVEYLTMVI FTCSAQHAAVNNGQRLLGQYSENH TTVQELIEIVTTIIFDCGPQHSAVNYAQDGYMTFAANMPD


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## UniRef90 W4Y597

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UniRef90 UPIOOO1796EOC UniRef90－H2XV50 UniRef90－H2YON3 UniRef90－S4XZS0 UniRef90－C3Z8R6 UniRef90－F1SDU7 UniRef90－D8UD17 UniRef90－D8UD17 UniRef90－UP10001DD08D6 UniRef90－B1WVQ1 UniRef90－G1QD42 UniRef90－C3YRL2 UniRef90－H2Y5X3 UniRef90＿UPI000440C084 UniRef90－B4WU29 UniRefofo－B4DU98 UniRef90－B0C868 UniRef90－UPI000383D1B7 UniRef90－L7E8T2 UniRef90－C3YUW5 UniRef90－R1GW18 UniRef90 ${ }^{-}$W4ZGS4 UniRef90－UPIO003344B07 UniRef90－UPI000362D601 UniRef90－H2YSA1 UniRef90－UPIO0034A5B2C UniRef90－G3VB36 UniRef90－UPI0003C1A485 UniRef90－S9PBG6 UniRef90－N9WHR8 UniRef90 UPI0002F1FB34 UniRef90－C3ZW10 UniRef90－H2RJ10 UniRef90＿UPI0002EB1276 UniRef90－R7T7C1 UniRef90－F6W180 UniRef90 R7UU77 UniRef90－L8JBT8 UniRef90－UPIO002FB5837 UniRef90－UPI000345563A UniRef90－A6GOH4 UniRef90－K9VMV7 UniRef90－C3ZW13 UniRef90－F6U005 UniRef90－H2ZV54 UniRef90－K9Wзм2 UniRef90＿UPI000440A9FO UniRef90 A7S1H7 UniRef90－K1PNX6 UniRef90－Q7SOU2 UniRef90－A6G9N6 UniRef90－B7JX99 UniRef90－D3вBM6 UniRef90－UPI0003BBE4B8 UniRef90 NiPSV1 UniRef90－V9KT47 UniRef90－A9TT87 UniRef90＿K1R5X6 UniRef90－C3Z117
UniRef90
RTT655 UniRet90－UPIo0046A895A UniRef90 L5M3Y1 UniRef90－UPloo03F06757 UniRef90－X7AYL4 UniRef90－W8A5S2 UniRef90－UPI0003F16205 UniRef90－E9DUF6 UniRef90－UPIO003592C1C UniRef90 UPI0002E62CA0 UniRef90－B2J873 UniRef90－W4YS49 UniRef90－Q1Z9C8 UniRef90－Q2SW25 UniRef90－M7BC11 UniRef90－Q12NL2 UniRef90－B1KK05 UniRef90＿B1WT74
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LVRRPMPAPGDESWEEL
LVRRPMPAPGDESWEEL

AGFNEGPTEKASEADYFSLLPPLSLAEQQLDLGYTLGSVY TMRLPPPTTKDVTDEK AAYCDDPEADKDTTGSDIGDTEKDILQLLPPYKKAADQLQQ QLSAPMPDGPNDM
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WLSGKPPHDKTALC
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AVWGK VK
NMAGPPPTEK
AGYAPASTLTK
G VTEQQDWVDAMPPLILAFQQQT GKGTHEMLLQSLPTKASSCMQVT
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AAYRAAP【S
AAWQAAPDCERGQDKP
ATYRSFGDVLNGSEKR
AGYMPASTLK
पDSENSDY贝DY乌PPQEMAALQMD
FKPLER
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TMRRPPPKQKGLADMTLT
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CMVLPVHKRGEGSLER

AAYRD DPKQSHKPQDQPTATPSVAVQTTDPPYKRTADQLQ
F乌RGKPPTSKE
KI KGVPPKNKGYC
MLCTAPPTSLSALQQMKEHDLVASLP $\quad \square N R Q R Q W L L S A Q$ TAYKAPPTASEVVEDPL EWMPPDDTALYQLS ATYATPPNKESNLSEAT：LND
C $\square Y$ RP $\square$ PATRAN $\square$ NAFTERDVEALLINHPRPH $\square$ PY $\square L S A K$
MLKGPPPKNKNPL

 HMKHMN
LLKEAPPKKKKA पRVSDT VKCDPSKDTTVDTMA MSAAPAPDSP GGKSEADWLKMMPPTLVALLEKVN LTSAPAPTTP LTGLAEPDWLRMLPQLLTSMAQLY
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AlWGKDPTNTQTEKAWLQNDPPMSQSLEQLSLLQLLGGVY LLSAPAPTSA VGKSKADWLKMLPPLVSGlIERVA AVV WGFPVSKPDVISQLERGEEPWVLDML
ANWCEKPES
$\square T$ S QAQWI ENMAPLKKSLQQLS
TLYAKAPTRSEELTM
ARYSPPPT
HVKETESYLKYLPPLDVALYQAT


## UniRef90 W4Y597 UniRef90－H2Y9R7 UniRef90－R4GBDO UniRef90－W4Y514 UniRet90＿UPIO0034816B5 UniRef90－UP100042BCBE3 UniRef90－F7AWK4 UniRef90－H2NSM3 UniRef90－A7T4A3 UniRefofo－H2QC17 UniRef90 UPIO001796E0C UniRef90－H2XV50 UniRet90－H2YON3 UniRef90－S4XZS0 UniRet90－C3Z8R6 UniRef90－F1SDU7 UniRef90 ${ }^{-}$D8UD17 UniRef90－D8UD17 UniRef90－UP10001DD08D6 UniRef90 B1WVQ1 UniRef90－G1QD42 UniRef90－C3YRL2 <br> UniRef90－H2Y5X3 UniRef90 UPIO00440C084 UniRef90－B4WU29 UniRefofo－B4DU98 UniRef90 $0^{-}$BoC8688 UniRef90 UPIOOO383D1B7 UniRef90－L7E8T2 UniRef90－C3YUW5 UniRef90＿R1GW18 UniRef90＿W4ZGS4 UniRef90＿UPIOOO3344B07 UniRef90－UPIO00362D601 UniRef90 H2YSA1 UniRef90－UP100034A5B2C <br> LLGSLYYRPLGTY $L V K V L T D L P P D T S K T L D N P F Q H E S D Q Q V F K N F Q R M K$ LPWLLSRPPADMVPDGHHQEEY FSGPEPKAVMRMPP FTASVQHAAVNFMQWDQ DAYALSKFAPNEVFLDADSRKYFTED VVIGFQDKYVGKL AVWGLTRKPEEFVSPH ILQLLGGVYHTQLG DYPSNSFGADVKGAQQAFQQA <br> YT QLGYYKANDVD\DDDNDHTYFKDDQVKQADRDFQQRD ITWQLGRRQPDMVALGQHEEEYFSGPEPKAVLRGHL SLF TLSDYRYDQLGYYDFRELYGRKFEEVFAFLRQFQQNL FAYLLAGVQYDTLHYTDDPRTQYFTDKRVAPILLQFHMNL MTALLSSRDNKPLGDF MEEVQYMHDPNGLQALERFRAEL LFWGVSNDMKDTRPDGTYPDEHFTEEAPQRSLAAFQSRL LCHALSKHGEEEVYMADYP VDVFCEEPAQRAAVHFRDEL LLALLGSDYYNRL GEYPQGYFTNPQVKPLLQEFQNNL

 UniRef90－G3VB36 UniRef90－UPI0003C1A485 UniRef90＿S9PBG6 UniRef90－NOWHR8UniRef90 $\mathrm{S} 4 \times \mathrm{W} 14$ UniRef90－UPI0002F1FB34 UniRef90－C3ZW10 UniReffo－H2RJ10 UniRef90－UPI0002EB1276 UniRef90－R7T7C1 UniRef90－F6W180 UniRef90 R7UU77 UniRef90－L8JBT8 UniRef90＿UPIO002FB5837 UniRef90＿UPI000345563A UniRet90－A6GOH4 UniRef90－K9VMV7 UniRef90－C3ZW13 UniRef90－F6U005 UniRef90－H2ZV54 UniRef90－K9Wзм2 UniRee90＿UPIO00440A9FO UniRef90＿A7S1H7 UniRef90－K1PNX6 UniRef90－O7SOU2 UniRef90－B7JX99 UniRef90－D3BBM6 UniRef90－UPI0003BBE4B8 UniRef90＿N1PSV1 UniRef90－V9KT47 UniRef90－A9TT87 UniRe90＿K1R5X6 UniRef90－C3Z117
UniRef90
UTT655 UniRef90＿UPIo0046A895A UniRef90－L5M3Y1 UniRef90－UP10003F06757 UniRef90－X7AYL4 UniRef90＿W8A5S2 UniRef90－UPIOOO3F16205 UniRef90－E9DUF6 UniRef90－UPIIO003592C1C UniRef90－UPIO002E62CA0 UniRef90－B2J873 UniRef90－W4YS49 UniRef90－Q1Z9C8 UniRef90 Q2SW25 UniRef90－M7BC11
UniRef90 Q12NL2 UniRef90－B1KK05 UniRef90＿B1WT74 UniRef90GGOSH46

FLHMLGGVFY TRGGHY ETHWFKDKQVAEPLARFQKKL


LANVMQFHKPDENP酸NNDETY FVEQEATDVKDQFSSAL FAYLLAGVQYDTLHYTDDPRDHYFTDKRVAPILSTFHMRL VCKVLSARGTKSLGEWEFPDQQHYDPMALKAEKDFRDEL VSYTLSQYAPNEVYLGEFPDRQLFVETEDEETQEEYRKDLC VLEVLGGVYYREYKTNEFPYLNWFEDPDDTKPLDQFRQAL WSDLLTGSFHYDK I GDLLGGVYFTRLGEYDRHEEPYFSDPRVREPLASFQAEL ｜IGFTLSAYRYDRYYDKSFREL
 S LF VLSAYQYDR【GYYEKAFQQDDNNQA $\square$ I $\|$ VRQFQQN VTK $\square$ LSRGTNP $\square G D E E V Q Y Q Y$ DP $\square G T K A V E N F R R K \square$ VPWLLSFRTPQDRMWRVYKTKKGRREKMVAEASERDYARL FLYILSADQYDTFVYSPNPRKPYFLDPAARALVGEFRYEL


PGDKGSLIIYAASKYHMYKAKSGEKEQK DKAAAAKFYTS VVESTSTHTPDEEY DGHNFHTKWTDDQRSDDAFKRFSAR AFSTLANGVRPEPSLLDNHEVQW SDKADLAATEGFSVDL $\leftrightarrows L G G V H Y R K L G D Y L C N S F P H R P L M V D P R \| T G P L Q R F R Q S$


YRQLGEYRSNNFPY配WEDDRTTDQGGP LSQFQASL $\square Y E \| L A G V Q H S Q Y R S N V F P Y R P L I T D P A \square T G S L E H F R Q A L$
LLE ILGGVYYREYKSNNFPYFEWFEDKNDIQSLAKFTSSL FGYLLSNVQYDKDHYSDDPRKSYFEDPQVSPLVTEFQMKL


UniRef90 W4Y597 UniRef90-H2Y9R7 UniRef90-R4GBD0 UniRef90 W4Y5I4 UniRef90 UPI00034816B5 UniRef90_UPI00042BCBE3 UniRef90-F7AWK4 UniRef90 H2NSM3 UniRef90_A7T4A3 UniRef90-H2QC17 UniRef90_K9F1Z1 UniRef90 UPIO001796E0C UniRef90-H2XV50 UniRef90-H2YON3 UniRef90-S4XZS0 UniRef90 C3Z8R6 UniRef90-F1SDU7 UniRef90_D8UD17 UniRef90 D8UD17 UniRef90-UPI0001DD08D6 UniRef90-B1WVQ1 UniRef90-T1FYM2 UniRef90_G1QD42 UniRef90-C3YRL2 UniRef90-H2Y5X3 UniRef90 UPI000440C084 UniRef90-B4WU29 UniRef90-B4DU98 UniRef90 UPI000383D1B7 UniRef90_L7E8T2 UniRef90-C3YUW5 UniRef90-R1GW18 UniRef90 ${ }^{-}$W4ZGS4 UniRef90_UPIO003344B07 UniRef90-UPI000362D601 UniRef90 H2YSA1 UniRef90_UPI00034A5B2C UniRef90-G3VB36 UniRef90-UPI0003C1A485 UniRef90- S9PBG6 UniRef90-N9WHR8 UniRef90-S4XW14 UniRef90 UPI0002F1FB34 UniRef90-C3ZW10 UniRef90-H2RJ10 UniRef90-UPIO002EB1276 UniRef90-R7T7C1 UniRef90_F6WI80 UniRef90 R7UU77 UniRef90 L8JBT8 UniRef90_UPIO002FB5837 UniRef90-UPI000345563A UniRef90- A6G0H4 UniRef90-K9VMV7 UniRef90_C3ZW13 UniRef90 F6U005 UniRef90-H2ZV54 UniRef90-K9W3M2 UniRef90-UPI000440A9F0 UniRef90 A7S1H7 UniRef90-K1PNX6 UniRef90_Q7S0U2 UniRef90_A6G9N6 UniRef90-B7JX99 UniRef90-D3BBM6 UniRef90_UPI0003BBE4B8 UniRef90 N1PSV1 UniRef90-V9KT47 UniRef90-A9TT87 UniRef90_K1R5X6 UniRef90_C3Z117 UniRef90-R7T655 UniRef90_UPI00046A895A UniRef90 L5M3Y1 UniRef90-UPI0003F06757 UniRef90-X7AYL4 UniRef90-W8A5S2 UniRef90 UPI0003F16205 UniRef90-E9DUF6 UniRef90_UPI0003592C1C UniRef90 UPI0002E62CA0 UniRef90-B2J873 UniRef90-W4YS49 UniRef90_Q1Z9C8 UniRef90 Q2SW25 UniRef90-M7BC11 UniRef90_Q12NL2 UniRef90_B1KK05 UniRef90-B1WT74

650
660
K AV|TAEI DKRNKER VRPY ${ }^{670}$ LHPSC
A DLEKK L E LRN A S L K K H P Y VF L LP S RVP
AALSKSI EERNSVLPDAYNYUNPAVVENS I
PYTYLH P
DVVEAEIDRRNQNRTVPYPYLKPSL
VK L Q S K F E ERNKK LKYPYTY L LP DK $\square$ P $\square$ S $\square$
QK $\square$ SES $\square R K R N E G \square T$ WPYRS LLPEG $\square P N$
TDLEKLEKEDTARNEQLDWPYEYLKPSC
EEDTDV!YQRNRNRP


QDVEEQ VARNSERMRPYTFLLPSLDPCS
ES $\square$ SQT $\square$ ESQLKERNQKLKKEGKTPYVYLQPSR Q AK $\ A K D$ DEHENSTQRFK KELESKILSRNQRLEHEYKYLLPSR\PKS $\square$

EE $\square$ DSR $\square$ D KRNHEFPSKFNYTY $\square K S Y N$
EE $\square E L I I Q D R N E T R P T Y Y D \| L L P S K \square P Q S$

|  |  |
| :---: | :---: |
| NMNEQE |  |
|  | HERNASRP MPYVMQL |
| KQIGNTI | DKRNKTREEK YLW |
| A QVSGAI | RERNQGLALPYTYLDPAVVDNS |
| EALEKEI | T G D \( |
| ) L A RDRKYK L L |  |
| QRMSTLV |  |
| KQVEA TI | NQRNLKRPT |




SCLSEEDKARNNQLEAE GKVPYPYDDPDNV DKLATELKRRNQDLKYPY $\quad$ D $\square$ MPGR $\square P \square S \square$
NMVEQE $\square$ DANNKKR
V VP Y L Y L K P S L
TEVSAVLDERNKTRPF
P Y P Y $\square \mathrm{N} P$
RETQRVVWEN SRAMEKGSLPYMVLDP
A Q IERTIHERNLHRPYPYQLQLPSRMPNSI

AESEQEF RGYAAECWDADVHMYDVLSPSW
AGVDKQ $\quad$ QKRNGD $L K \square K \quad H R A G A G T \square P H E L L L H K S G P G \square T$ KSVSRKIHQRNDKVENK YDYLLPE
$K R V E E D \square C A R N S D L R T P Y T Y L L P S R \square P$
EKIEDLINLDNRNRPW
REDSKGTNMRNKGRQHHYDY LDPA IVPNSV
KEVEATIRTRNQARRR PYEYLLPSR
SRAEDTI GARNTQRE $\quad$ PYTYLLPS




A D $\square E Q T \prod N \square R N E T R Q$
GDVESQIN ARNS $\square$ R

EYSFLLPSK
KTPYEYLLPSR

AS $\square E T T \prod D A R N Q H R P \quad E Y N F L L P S N \square P M S \square$
NQi ELTIHQRNKSRPF PYYFQLPSM NQAHTII HQRNQSSE
$R D F P Y E C L L P T N$

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| UniRef90_C3Z8R6 | REVPNA【SI |
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| UniRef90_L7E8T2 | L L N S I S |
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| UniRef90_UPI0003344B07 |  |
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| UniRef90-H2YSA1 | $\bigcirc \mathrm{P}$ P L A I S |
| UniRef90_UPIO0034A5B2C | 1 PQSILI |
| UniRef90-G3VB36 |  |
| UniRef90_UPI0003C1A485 |  |
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| UniRef90-N9WHR8 | $\square \mathrm{P}$ T S $\square \mathrm{N} \square$ |
| UniRef90_S4XW14 |  |
| UniRef90_UPI0002F1FB34 | $\square \mathrm{P}$ Q S $\square \mathrm{N}$ ! |
| UniRef90-C3ZW10 |  |
| UniRef90_H2RJ10 |  |
| UniRef90-R7UV30 | $\mathrm{G} \quad \mathrm{G}$ |
| UniRef90-UPI0002EB1276 | $1 \mathrm{P}^{\text {N S }} 1 \mathrm{Sl}$ |
| UniRef90-R7T7C1 | I P N NI G\| |
| UniRef90_F6WI80 | K NIP N S I A I |
| UniRef90-R7UU77 |  |
| UniRef90-L8JBT8 | $\square \mathrm{PV}$ V $\square \mathrm{N} \square$ |
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| UniRef90_UPI000440A9F0 |  |
| UniRef90_A7S1H7 | K E $\square$ P N A $\square \mathrm{S}$ ■ |
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| UniRef90-Q7S0U2 |  |
| UniRef90_A6G9N6 |  |
| UniRef90-B7JX99 | VP N S T S $\square$ |
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| UniRef90_R7T655 |  |
| UniRef90-UPI00046A895A | $\square \mathrm{P}$ A S T N $\square$ |
| UniRef90_L5M3Y1 |  |
| UniRef90_UPI0003F06757 |  |
| UniRef90_X7AYL4 | 1 P A S T N I |
| UniRef90-W8A5S2 | GIP T S T N |
| UniRef90-UPI0003F16205 |  |
| UniRef90_E9DUF6 |  |
| UniRef90_UPI0003592C1C | $\square \mathrm{P}$ N S $\square$ S $\square$ |
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| UniRef90-W4YS49 |  |
| UniRef90-Q1Z9C8 | $\square \mathrm{P}$ P S $\square \mathrm{N}$ T |
| UniRef90_Q2SW25 | 1 P A S T N |
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| UniRef90_Q12NL2 |  |
| UniRef90_B1KK05 | V P N S ${ }_{\text {d }}$ S 1 |
| UniRef90-B1WT74 | 1 P Q S I Ni |
| UniRef90_G0SH46 | A V S 1 |

PPP L Q A GTYRGTK $\quad$ PAT

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UniRef90-M5EDW4
UniRef90 С 3 YCB0
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UniRef90_FOZJX7
UniRef90_X8JC18
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UniRef90_A6G0T6
UniRef90 W9XYM7
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AF $\square$ FD D LD YESS VP QKFEEKKEKYTWSHSDKFPPHLA $\square$

ERQQNFRWKKNSD
D R QLA QF L L $\stackrel{\text { P }}{\square} \mathrm{S}$ S N

NFD D P P NEQFS Y VQERRSMGQRLLAATKAAE $\square$ A RQLE LWE GFDKYKWSHDQPA

VP G<br>$\square P S E L Q F S D S K N L E D H Q N T Q S S Y G P F L Y V F$

## $\square K \square P E Y \square E K K Q P T Y$ K K L $\quad$ N L

$\square A E E S T$
$N$
$N$

TVVDDPQG $\quad$ VFKKHRE EELAERRK $\square$ YRWGNWKDGLI LN QMMKR $\square E T$ F D $V A G F E T \square G \square A V K P T E \square Y T H Q K P G S D N Y P P H$ Q GW■K S


F N L R R F V DV V V V LLP K PD
$\square$ A A DSEKD $\square$ PP
KFHGEKR【DYEWTGKTGLLEMDLKRVYT



LRAFVLWWPKRVPF SFEFFFKSVVRWTTLVPLVLLAWLK
$\square P K D \square D H E N T P Y K G P T \square A D V E K F N K A Q F P K T D G D A S N Q D N$ DMKFHGGKRLLNYEWTEKTGL
$\square$ QKVIPEKF LDFAYDEPNQRSFAL

EKLGLIFAKRMAEYVYSEVGLD LD I V D QVNLLN $\square$ FDFMRLLDTGTLVGTLIPDTILDFIHD $L P S \quad D E M F S G K Y M V M F E L L S H K Y V T N F S N K L D G$

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N E Q S Q $\square$ S $\mathbb{V}$ T $\square$ R N E $\square$ Q
R S $\square$ F Y E A $\square E$ K S G Q G D R Y $\square$ P T

FPGGLNMSRMPH DVRRDSERDPEFRDQKGSS IVA



FNFDLPPNEQFNNSYDRERKK LVER VVEAVDKNDPP DT $\square L H R Q E D W \square F N K L D T\|I G G R P Q A G P T\| A D C E R Y N R W H$【DADSASNDPNEVRFSFTKDMEMMFTADKVLAELEKTKRLL PEKVALDLEKLSEEPRDQNDKEIIKSTAKLAELAKYQVHS $\square K \square K E Y D T S Q P E D A N S E Q R$ $\square K Y N A K L L E L A E H Q T P \stackrel{\square}{F}$
$M P H G \square S L L F T D F Q S K \square N ~ N$

K LTE WNKERHRKQGWVKNMFSEPN GEKDDWFSDAVFAQQ KLTKWNAERHKNQGWVKDMFNEPNIGGLRNDWYTDAVFAQQ LLTSKWNS LDNF LDHYKGG TFD DPHGYYNWDSDVKFGEQ LK RNAEQRK LIFFQALAKYPP DMSMDHERDGGDSDREFVRQ RKSGTDIERGTNDGLLP FDPLDELNEYDEMFI F LDKPG\|VRG DWHSDRRFAEQ GCSESWRSFNQLQSILRHPKPKAGAYVQQHWQEDEFFGYQ LKFFADASSLENYN RRQFQAIAKPDISYHFQEDKYFAYM $D Y N K L F T R\|S L P K\| S A R F Q E D Q V F A Y M$
PK LIDFFREFRFR $\square$ ASK KPDGSPGDMCHAVLKDEDFANQ P T K NPKSMYDWEDDEAFARLL LYESFFGD!LPTPTK! $\quad$ IAT MRYLLGKPMESYRDYIFYPFSPPNPALVDNFQQDLIFGLQ T LPSPWKH RTE LKK KE DFYDTYKSEKT GM MGFYHWKSDQHFANQ

EWNQERHRDQGWLIKDMF NAPNTGLRNDWFSDRRFADQ】EDGRWKAFED $\square$ NEAFPEGK $\square P K G K A N W K T D E H F G A Q$ HDND LDFAAM
$R P V$ V $L I W Q R D G G$
NMGEHDDWYSDAKFAQQ LSDREFARQ $D T D A A F A E N$
$L S D R E F A R Q$ DWYSDRRFADQ PDWYSDRRFAEQ
SQ DAKS DR DYEQLMESAVKEDPEFDQDFRSDEYFAEEV LR YLLGGKPMESYRDYVFFPASPPNPDLVDSFQQDLIFGDQ AETSVEISKNSENGLEDFDKQFRVISKPEDFQEDLVFAYM $M P M G L S L H L T G S V R G G T P S S S V V D G Y S K V W G F D N L G Y G$ FEYLKMIVLPDPPKI DARQTTESLNQFE D W D WYSDAVFAQQ

$$
\begin{aligned}
& \text { GKDYENFY }
\end{aligned}
$$

RKPGVAN $N V G D A P D W Y$
EDMQRIFCFRTTPMSEYVAD
EYFKELSRTSPKSLLKYPGPKVLSRDRF H WREDARFAQQ
DWGY EYFKELSRTSPKSLLKYPLPKVLSRDRFAWTRDGEFARQ DWYSDRRFADQ MLIKG F PFPEFQDYF LYSFYPYPFKRF HKDWYSDARFAQQ D WY A D DVY A Q Q
PWK D $\square K D \square K Q \square F S \square Q K T P V Y E Y V V E H W K E D E \square F A S Q$
L NKAAD MMKGR N N DGEYDDWYSDARFAQQ D D Y D RLGHSPRPEVATR WREDWAFAHLL HLPDWYSDARFAQQ L ELNSWDSLEDFDQ FWGLKSPLCEKVHQRWQDDELFGYQ
 $P \square Q \square P K \square W Q D D V E F C R Q$ $P \square K K P D S V F D F D E D D A F A R Q$
$\square$ ESVNKK $\square$ F DERRD $\square$ GK $M A N V G M R K D W Y S D E V Y A Q Q$
$P H W F T D E K F A Q Q Q$
$W Q D D S E F A R Q$
PPPAEYVFQHWKEDTFFAYX $\square$ LT CWKS LDDFNR $\square F W C G Q S K \square A E R V R D S W K E D A \square F G Y Q$ $R Q Q \square E K D V Q D G G D P W T A Y Y A K W \square P V Q \square P Q D W K D D V E F C R Q$ HPE GPTVDIEARNNEDHKNKEDIFDEEN IDWWTAAVVAQQ L $\quad V D W K T V D D V K K L F T K T T D L R R E Q P Y P N W H K D R W F G L Q$ WLNDKEFGRQ
TEAN $\square G \square R E D W Y$ TDEQFAQQ
K WWY QK D $\square \mathrm{FD} \square \mathrm{KN} \square \mathrm{GN} \square \mathrm{P}$
DWYSDARFAQQ PDWFTDRRFADQ LEEKMKALQTEEKND GTEPNDGYRKDWYSDAVFAQQ D WF TDRRFAEQ
 DWYTDAAFGQQ
KA $\square W T E K N \square G Y R E D W Y S D E Q F A Q Q$
EAA $\square$ QKK $\square K E S P F R L T F G G D H P A P E R V I E T W R D D E E Q A A Q$ TEPS $\quad$ GYRKDWYSDAVFAQQ
PFFGS
TFDLVISMEEYMRYPSQETPFKNII HNNDWQNDDVFTQQ EEVKA V VRENGLDVFNGAVPEPKLVVERCTR DEEVAGQ DWYSDRRFAEQ
PCF LIFNLLPQGDENWWFDKMFGQQ


F पNGLNPVLIRRCSQLPPHFPVTNAMVAP LL
HFSGVNPSTПETASQDK KKEY TSEAQKQDKVKA LDEDGKD $R L A G P A P M V L T R V G R L P P H F P V D E R L Y A R A L S A L A R Q S A T$ HLS GVNPSTI EAA $P$ P DQVKAYTAEAGKQGLD FLNGANPMLLRRSTSLDSR VLDPSGM

DEQFSNDYRHD $\square \mathrm{M}$
$M \square Q G V N P M Y \square T \square C K$
RLQGPNCVVLEKCSETRQKDKVLDSDPTYKNLKDK
RLS GPNPMELRNVLDYNLRDKLGDTDE DFKAVLNAKKGRK
QFTGVNPVTIKKASEEWIRQFKAAARAQGKWESVIEEGER

 $F L N G T N P M L L R R S V R L P A R \square E F P P G M G E L Q A E$
$\square I Q G V N P M Y \square T \square C T D$ ASA DPQEMDNDTA
QFVGTNPTTI QKASPEWLKGFTDLAQSNTEMHSLLSDGNP RVQGCNPVLI KLCKVIPEKGGVTEEMVA $R L Q G L N A G L I R L T N E K V Q E L D L F N K K F E K M D P T F N M I L S S$ HLTGPNPTTLTLASDNWIQSFRATAEAQEKNDFIAALERN HFSGVNPTTIAAAPAATVREYVAQAKKQGLADMVELLETG
FFTGGDPST TTKAGKWVQ\F TDAATDPKDAAMKAK DQGR SFTGTNPTSITVVPEALLNEFIAAAKQGYDKWATILPTDD YFTGPNPSSIALAGQTWDRFKKSALDQGNKEMHSLLEDFN YFTGPNPSSI ALLAGHTWD

 H F $T$
GTN T $H F T G P N P T T D S W A S D K W I G S F K E A A K L G T T D Q V N H D N G V P$
$M \square R G D N P M K L R R V T D D A A A E L P P A F H G L R D D A G R D V A A D$
 F I RGVNPMKIVRVT GDPTAALPS RLAGLNPMSLRKMTNEDFNRDFDNKTYDWDAAMQRAS
 AFTGTNPVNIAKTPGNLLQEFDDAAEYKEWHQKLTKAQSK


UniRef90_M5EDX0

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250
260
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280
REVVALFRSAPPHSFYVQDFSDFRDRMGANPDEETPRYGC

$\stackrel{\stackrel{\rightharpoonup}{P}}{N}$
 PK S L Y V Q D G S Y F R R A A GV $\quad$ S D P V T I L H H K QP G S D E C WT V

 LE G S SLETEM
 NGT F P Q QQ K Y $\quad \square$
NGT F P D Q Q K Y T Y $G T G D S L A A A V K E G R V Y K A D Y S L L E G G M E N G T G P D Q Q K Y T Y$

 G Q GK T V L E L I S E R R L F I V $\operatorname{L}$ D Y N

 E T D G T LID A A LLA E G R L Y F F LIE H P Y L N N R I K G G E






 L D H A I A A GRRVY WI D Y EAMMSA LD D N GTAP Q S P K Y M D R GWS L R Q E IA A GHMYYV DCS LMK G L S P N V L G T E V F Y HA

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## GGRTSLDAELKRGTMFLVDYKLLDGDPAGQDNG KQQHVA

ID Y S YFREATGATNEQDFQNTVYELKGTTPTGKTTSRYAA LAGDTDAAALAEGRAFTCDYAGAEGUVA GNFPAAQKY D GMKKLLLSLSEGRDLVVQDYSYFRAATGQPTGKFTFRYAC
 GEGTCLQAELEKGNUYLADYRULEGDPTVELNGQKQQHQC
 QGKTIPELIDEKRLFMLDYADIED VPQLQGKVFY $R \square N K T L D S A D Q K G G L F V T D Y A L L D D L Q P$ DGGLYVQDCSFFRKFAGVEEGEPLDLQP VSDDQENKLC QDYSYFRASMGQKGSYDLSYTSTLQDRFTDLHGFHERHAC
AQGKGMSELIADKRLFLVDYKE
 DEKELQQGTLFEADFSLLDGU KANVNLCTQQYVA QGKSTQELIAENRLFMVDYGDLEDIPQLDGKVFYAPYLL DSFY QDCSYFRDAVGAGQHADL LEGSSLQESMNANKIFIVDLDD SGSDYDQDYSYFKKAAAVD SKHEFSSEKTRRFGQRYTG KDLLIQDYSYFRKATGLGDNEPFVNVIYELDNPKDPRYGC
ADSLYVQDYSYПRRTSGYDDKEMSSEPMLGGVKQDKRWSV PATLYVQDARNIRRSLGVD ENEILFNKEPKSDDSWGC SESFYIQDCSFFRE GUD WAGTS K
 TAGDNFDSAFDNRRLFFVDYAMLQGLVDHQGEYAGRKQYV VEKL DESHSGDLYVEDYSDFMGLPPSHEFTTEGRYGC KDSLYDQDYSYFRKAAGVEY DEELASTENQYRFGKRYTG AAANALEYADYELDEETGAYHHQAESAVLDSTVGGVKYWY KEMHSLDERFNSNSFFDQDFHEWAGASPDATLKFDNRFGC PDGRGLGALVACKSLFYADYSERALGEEDEAPVGARKYWY GEDSTFSEMIDAGRVYVVEFSYLYDLSNNTTDRREMRGSR




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360 SDK SVEDWP WRYAKTCVLSSDWALHEMVI HLTNTHLVEEA
 SDSEKQDWP WRYAKTCAQVTD WMRHEDLAVHLTC S HFVEEA GDTGEAADDWMKAKDYFQTADATHHELLIAHLCSYTHLAMEA RDSDLD WFVAKLCVQUADANHQELGTHFARTHVVMAP TDSQ WDWLLAKIFVRNAEFHEHELNFHLLRTHLL LVTDTNADTWMTAKNTVQMADSNYHELISHLGRTHLVVEP LK GES WMVAKTILQMANVNYLELVSHLGQTHLVIEP

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 $\begin{array}{ll}D P P L A \\ D P E & Y \\ D Q R T D & W\end{array}$ Y T WMMA AKTWVRS
AKCYFNL ATQYHNFLSHLLLTHLAMEP WPWRYAKTCVQTADASIDHEASSHLGFTHLI GEL WLFAKLCVQVADANHQELGSHFAFTHTAMEA RDSTKEDWPWRYAKTCAQVTDWMRHELAVHLTGSHFVEEA LDNQANDWP WRYAKTCVLSSDWALHEMIIHLNNTHLVEEA DDP PYTWLMAKMWFNCADGNYHEAVVHLGFTHLLVEA VDDTEAWWA WQSAKTAVQVADFNYHEMFVHLGRTHLMSEA DDAEKDDWPWRYAKTVAQTADWARHEVATHLVDTHMIEEA AD GYSWKLAKNCVLVAQNAYHEVI THLGLTHLLTEP

 R D G GYSWMLARNCVQVA HNTYHEVGVHLLGRAHFLMSEA
 SKDGNDWLTAKMFAQVADGNHHILYTHATRDHYVMEA

SDP P
ASYPPAS WVFAKDWFQSADGQHMEFITHLYECHLLGEV ADEEAHDWPWRYAKTCVQSADWLRHEVTIHLVNTHLVEEA TS PKTHDWPWRYAKQCAQVADWHAHELGSHLTHTHLI EEG RDKD LD H WTAAK LICVQLADANHHEMSTHLGRTHLVMEP RTDEAHDWA WRYAKTCVQCSDWLRHEVTVHLTNTHMIEEA S D SET D WLLA K F FI K NA Y A L M H Q S I TH L LR T HF MVE A TDSSDNDWA WRYAKTCAQVSDWIRHEVSVHLTRAHMUEES GNQPEEGYLLD Y AKTASQVT DWMRHEDAVRLRTQACTEP DDKDVDEWPWRYAKTCAQTADWARHELATHLVDDTHVEEA A $N G N H W L M A R A Y A Q S A D A N D Q D T W T H A V F D H F V M E G$ SDPK YTWQLVKMWYNVADSNYMQADTHDGNTHFLMEG

$\qquad$ WD WLTAKTWVRSAEFADHEAVTHLGHAHLLPEV
 A D GHAWTQAKLAVHTAEGNLLHEAVYHLGRTHLFMGA NDDEKHDWPWRYAKTCVVTADWARHEVAVHLVDTHMVEEA FPSDPPPLAWLLAKTWVRSSDFQLHELQYHFLNTHLLAEV

 SD HEYTWMMAKMWYNMADCSYHQSCTHLGLTHLI AES S S P HPHRY LIFAK IHTACADDQFHQRVVHL GLLHL AVEA D D GY N WKIA K ACFEAAD F II HEVVVSHLGNTHVVLE G S S PK THDWS WRYAK QCA QVS DWHHHELGGVHLTHTHLI E E G S H D E E H D WP WR Y A K M C A QV S D WHRHE I A I HL VNTHLVEEA DSNQPNRFMFAK $⿴ 囗 十 ⺝ 刂 Q C A D N Q \square H Q F L Y H L G L A H L A D E S$
 MDSDFD P NKYLLAK $\square H$ TACADDQLHEFVVH LGMTHLVVEP S SP EK D DWP WRYA KTCA QVS D WLVRHEVTTVHLVDTH L V V E E V V

 S VTEA Q D WP WRYAK T C AQAS DWAR HE
 S QQKED WP WRYAK TCVMAS DWIR H N ITVVH LTCRTHUI E E S T D S E E H D WP WR Y A K T C A Q VT D F L R H E E V S V H L T Q A H L L V E E A K D P K E E D WP WR Y A K MC S LI S D WTH HE V T L H L N D C H F V E E A K D SK D D D WP WR Y A K M C S L I A D WT R HE L T L H L N D C H F V E E A

 EDKRHNDYPWRYAKMCAQVCDWHRHEVGIHLVHTHLI E E A
 K DPKDND WP WR YAK MCSLVAD WTHHELTTLHLNDCHFVEEA S T H APMVYLLAKAHMTCADNQAHQFVSHLGMTHLLAEP VD G S K WL M A K Q E F QRA D DT Y A E II I E H L L K T H L L M E P ATHPPSTYV LAKVHLTCADNQAHQFVSHLGMTHLLEAP R D P E E S D WP WRYAK S CA QVS D WMRHEVGVVHLTRAHFIIE A T DP PYT WLLVK M WY NLA EASWHLACANFGFSR LAMES


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 QIAVDIVGLSPDQTYHFLCDAYDTYDFVASYVPNDLKRRG GSAIENLMAPTEASSKLMNQAYREKSFWYYSLLNDUEVRG DGPVEHMMAGTEESDGDSAAFYKEWRLDEAAFPDEIARRK GGLFDKFTSDGQKDATYLPNVFSTLTYSSLCLPENVKERG GGGVDELLASSDGSDQTLAANGAQFNFNDAFPNTLTNRG GWDVDKLLASTDGLDAVKGAQSHLHNFNEVSFPKLLASRG GGWVDNTTLTAEATFQLINKFWEKYNFEEFCLKMEMEKND NGAVDKYTSLGRGFQELMERHWSQFHFDHLNPRKDFERRE NGALDDLQANDESSWDLVLEQFFNRITAEDFSPEADFASRQ IVTDPEFSVGTGGGLMMCVMRWKQYNFMKESFPEQLKKRG GRYGELFAGDYDATTQCMANGMTSFDFRASAFPNDIASRE GGMEDKGWSGGGGHVQLMRRAMAQLTYRSFCPPEDLADRG HGLLDTMTCGSTGLSEITKRRWATWGVAD
KVIIDLVGLTTEQAKQFIRSEYETFDFKGRYVPLDLERRG
 VIVPIAGFS APH $V$ RF $\square R E S F T N F D W K S L Y V P A D L E S R G$ VTVI
LTTGDVILAAPDETDQSCGRDRDAYDFQDMMDPNDLRTRG VIARDSGFASGQGAFGLVNWSYKNFNFQDKYIPNDLKKRG GAAIDKLMAPTEASLGLINKAYRQRPFTEYSLLNDIQRRG GEPVDLLVGASLPSLRLLDQERRNYSYRDNYMPARFKRYK GAA DDDLMAPTRASLELINRAYRDRPFQDYALPNNGQQRG QVIKDLVGMSPEQCFKYMAYEFENFDYQQNYVPNDLEHRG GRAVEYI GSDLKSTYPWLAEHRAKRSFRDNYL
GSVLDEICSLSAGRKHLIATAFRDFHDRDLHFPAMMADRG GRYGELFAGDYDSMTQCMANGMTSFNFKESAFSDDVARRE KGGLDSVVGSEQKLAMKAAQSYLFNFHEVAFPDTLNSRG DGPIESLLGGGSAADKLIAKHHKEYLWRENTFIARLKKND EVITKLAGVGQTELNAFLNHAYSSFDWTGLRIPNDLDARG QVIVHINGLPEKGSLQMVRTQYETFDFVGGYIPHDLASRG
 $H V V V D L I G F Q A S E G F A F I R H A Y E N F D F K G R Y V P T D L R Q R G$
$D G A L S E V S S L G N G I V E L M R R D L D G H Y S Y F L P E N V A R G$ QVI KDLVGUNPDYLYRFVRYEFENFDYVKSYUPNDLSNRG QVVADIVGVTPDQAYSFIRDAYDTYDFVGSYVPNDENRRG VIARDSGFGPTWNPVDLVDYSYKNFNFVDKYDPNDEKKRG
 QVIVNDDGLKKEGTLSMVSKQYESFDFVQNYVPNDLESRG GGGLDLVTQLGEGAFTLLREKLKTWRLDDGTLPEDLKNRG DGVVQRSTAVGSGFSELVRRDLEQLTYSTLCLPEDVQTRG GSVLDSVMSLGQGRHELLRKCYKAFNDRALDLPASLKDRG VIARIAGFGPGNNAFKLIDWSYKNFNFQDKYIPNDLKKRG GGGVDYVLAGTVDSTRDAAABVDWNLDEASFARSERRGG VGARLJGFGPKNRVYRLVDWSHRHFNFQDKYIPNDLKKRG SGGFSQAVSTGGGHVQLTGRAMAQLTYRSLCPPDDLADRG GGLTARATSLGKGUAELMARYLSEMTYESCYPPNDFVERG
$G G T D D R V M G G G H L E L M K R F K K S I E D F D V P C L A K R E ~$ GGTUDRVMSGGGGHLELMKRGFKKWSUEDFDVPKCLAKRE WKDWRLDVQTLPAELKNRG VVPFDRTFATGAGGLQLVLKAWRRWDFFGMSFPQQLLERGG
DAAVDRLLANIE GGAVDTILPGSESSLQLAERGVSDYNFSDFALPTYLRQRG QVIVHINGLSEKGSLSMUKNQYETFDFUGNYY PHNLEARG QGADTQSTFGTAQGVQMVSNGWKTYDFFKSSFPEQLKARG GKPGTDGQRAGNSHLLLPLSALPTADAKYYYQDNALWUWA SGVEDQVVSGGGGHVELQQRAGAFATYSSFCPPDDEADRG GSILDISPYDADGRKELIKRYYANFKFKMLNFPTMLAEKG VPFTDKTFATGAGGLQLFWKAWKKWDFFGMSFPQQLLARG
 FGPI ESLLGGGSAALHLIVKYHKNFDWRDNTFLNRLKKNN KIILNTAGMDKKHMSNYLKTEYYTFHWEDLYYPNDLERRG VVARVAGFGPTNRCFKFIQHAYKNFNFVDKYIPNDLKKRG GSLANMSNHLNAPSS VRKRYKTFNDHHLDIPASLKMKG LVIAPLMGMEAKNTYKYLMSEYRSFDFVGSYVPNDLAARG QII KDIVGVKPDNLYQYVRSEFESFDYVGRYVPNDLASRG QVVTKI NGFTEQQTYEFLLSSYKNFNWTGNYVPTSGITRGG QVVLNLVGDSLDGLYNYINYEYSNFDYEQNYVPNDEKRRG VVAPLLGMAPN HVYKYLMSEYRSYDFQGSYYPRDGAARG KIIIGMTGFTAEETYAFLKTSYNNFNWTDHYVPNDLRKRG KIIKNDAGMDETQLSKYLNNEYGTFHWEDLYUPKDLERRG VAPLDATFSVGTGHLSDFAAAYDGWDFEGDNFVGALAKRG VAPLDATFSAGANGMDVFSAAYQGWDFLGSNFVNGLAARG EEFLHKLFADGHGGVELGNKAYPDMSWGVTEFDKNLERRG VAPFDATFSVGANALDLFSAEYGKWDFLGDNFVNGLAKRG QVIKDLVGISPEYLQKYVLYEFENFDFVKHYVPNDEEERG QWMDETTRUGRDGFIDDLLQRGWKHWRMNDGNVPNDEEERG


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UniRef90 B0DCB4 UniRef90＿S8AA97 UniRef90－R9UEL2 UniRef90－A7ELY5 UniRef90－J7JU42 UniRef90＿Q27901
UniRef90 Q40954 UniRef90＿G9P0Y9 UniRef90－C3XS61 UniRef90－G3GY57
 $G V F G N G K F$
R AFPTDASVAADAA DQHWATE $\square$ QTAGHM
PTFPT

LTAYDEDEAVQEDLY I QEWCKEAQTNG
ALLYYQSPEDLVQDQEL RNWARELTANGGGRV KCYYLSAEDVEKDSELQNWDSEI FNFGFLGREQSGMPGRG

 D I Y Y K S D K D V EEED Y ELL QAMDE E L V D DG K VY W L K D Y Y DVCYQSDGDVAEDCEIQAWAHDIGARDRGRDPGF PARF HLFYHGDDIVRGDE
DHYYDSPGKIVGDYE DQEWAAF $\square$ AS Q GNGG $\square K G L P N D G H F$ ALHYGSDKAVAGDKCVQDWATIMTSPNGQGGANIKSFPTI SI YYKTPEDI REDYELQNWAKELAAFDSGRVKG H $\|$ RFPNDGCVAADEDIQRWVNETKTAAHM RDYYPDDASVAGDTQI QAWCDEMRSGMGAGMTNF

 | $A T Y Y Y L S D G D V$ | $T$ |
| :--- | :--- | GTYYRSDEEVRADDELQAWAQEISSPEWGQVS QQYYS DD T A V Q Q D R Y L Q A WA A E L G E P L LTHYDEDEKI RNDNFI QDWCKEAQTGG GAYYKSDVDVVGDHELQAWAAEVASAEGGQVRDFGTPGQUI

 SYFYTNDGLIFADKNLQRWSGKLASPKGGRLK EYFYR $\begin{aligned} & \text { S } \\ & \text { S } \\ & \text { K } \\ & \text { O }\end{aligned}$
 GPYYDGDEHVAADPYLQDFCNEMRSSQGAKMTS F
RPSYASDSAVSSDTHLQDWCREMQSPDGANDSSF
 ALAYPGDHKVRNDQCI QAWSDEMRSSDGARDPSF
 L M Y Y D K D K M V K E DK Y V Q Q D WCKEEVQRTNGW R】SFPTDESI ANDKYI QDFVKEVKTAGFM ETKYKCDADVQNDKY L LD WCKEIQQSKDGGQVTSF

 K $\operatorname{MFY}$ Y N SAK SLHYDRDATVLDDLEVQRWDSDVYEHGFNWEDDRGQPHRQ
 ALQYHSDRDVTDDACI A A WCKEVQTHG HLIF Y GDDVRGDPELQAWCREITEVPDGYHTEEYF
HLLFYHGDD
E LIYYKSDQDVANDSELQDFMEESKKFGFSYADDDK $\square$ PSK $L$ EATYDVPAKIAEDHELQAWVRELQSEGGCEDKGVPGGGKF ETVYANDAAVAADKDIQAWAAETADPKKAAVPGFPPATD DVYYSTDADVTDDYELQAFVNELVTVGEFKW LDAEWDNST GIYYKSNRDI REDFELQNWLQTL RKPVNGGFGIVSGP
 KSAYSDDAAVLADPAVQA WAKELADPDMGAMPGF

KLFYDDTVALRDDLEDQNWDRDVKQQGLQWEDESDKPDGV

 NHYYKTEDDLTNDHELQEWRKE LVKNGVGMLGVPGDENGF SKFYTSKEDIERDFELHSWVDEGTSEHGGTIKGLDEGEKL E DYYAYTTTVEEDEQVKSWVKEMQDDMGARLT GTKYKCAADIKNDPYLADWCLE DQTKG MHYYTCDADVVGDHELQSWMYDVAHEG口GWQDGRGFP D K K ELAYPRDAQVQADQHVQDWSREMRSQTAADGSGATTFPEL LTYYTEDAVI SKCEDI KAWYTEVQTAAH STYYTGDADVAKDTCVSTWCNEMQSPMGGQMPT F ATYYTSSADVSKDTCVVTWCNEMQSPAGGQMPTF ALTYKSDAHVKSDNYLSDWGND DRTNGKL ALKYPGDAQV DADKPVQDWSSEMRSPTAADGSGAS $\square F P E L$ NLYYPNTK』LAEDNEI QA WARFMADDDGMRDKGF TTAYPGDTQVANDPSVAAFCQEVRSGSGGQQPSF TDYYEDDNAVADDEAIKSWVSEMQDQKGGALRFF HGHYAADDAVAADPVLAAWCAEMRDPAAAGVASF GTFYTGDADVAKDTCVSAWCNEMQSPTGGQMPTF | $T A A Y G P D G D A A V A A D A D L W V E E M R S P D K A A V T S F$ |
| :--- | :--- |
| $N L Y Y S D D S R V A G D S E L G R F F N Q L S A D G T G T D G G \square G M P A K ~$ | HAHYDADAALAADADVAEWCAEMRDPKRAA $\square$ PSF PKAF LT TYKQDAEISNDTHI QNWVKE LRTNG R R K K FPD





QT LDQLCDALTMS THDAAPFHTAVNYLQNFYQAFVLSKPP DSPESLVRMLTTKI WI ASGHHAAVNFGQYDFTGYVPNQPC KTLDALVDAVTMCI HI ASPYHSAVNYLQNFYQVFVVSKPP


 KSFRQLVDIVTGII WTCSVQHAAVNNGCRD\|LGFVPNA TTVEQLIDAVTMCI HTASPQHTAVNYQQDYYYSFVPAKPP ATRAELGEFLTHLLDTMASAEHAAVNFPQAEVMAYAPAFPD

EKKTELIHLLTG I I FMSSVQHAAEGNPMFDDYGNPPAHPD TTVDEVVATVTGSI I F IICSVVSHAAANFAQYDEYAFPPNYPA TTRALLANALTNNI FLASAQHSAADNSQYQYGGYVPGRPN DKKGLLAKVLASLI YSASTLDHAAVNFPQKTTMSFVPSNPA T N R D QL 1 D L L T Q M F F TA GP Q H S A I A W WQ Y Q Y M A F I P P M P G | $H$ | $T$ | $F$ | $D$ | $A$ | $L$ | $V$ | $D$ | $A$ | $V$ | $T$ | $M$ | $C$ | $H$ | $H$ | $A$ | $S$ | $T$ | $Q$ | $H$ | $T$ | $A$ | $V$ | $N$ | $Y$ | $L$ | $Q$ | $N$ | $Y$ | $Y$ | $L$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $F$ | $P$ | $N$ | $K$ | $P$ | $P$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $K$ | $T$ | $R$ | $E$ | $S$ | $L$ | $I$ | $N$ | $V$ | $V$ | $T$ | $M$ | $C$ | $H$ | $H$ | $A$ | $S$ | $P$ | $Q$ | $H$ | $T$ | $A$ | $V$ | $N$ | $Y$ | $M$ | $Q$ | $E$ | $Y$ | $Y$ | $Q$ | $T$ |

 D S CA DL DEFLLTMTlDS CSA QHTAVSTGQFDFSGWMPNSPS

| 0 l V S V | $F$ TC S A H Y A GHNA A Q Q DVY S LVPP N S |
| :---: | :---: |
| ETRDLL V N S L T N I | F LA S A HHSADNFSQYQYLGYVPNR P N |
| K T DD S L V D A V T M CI | HI A S P Q H T Ald Y Y LQ S Y Y Q T FVIS K P S |
| T T NEQLI D TVVTA I I | AVCS $\square$ A H A S A N F Q Q Y D E Y A F T P NYP A |
| VELLT Q V V E L V T D |  |
| TTMD QL I D A V T M Cli | $H \mathrm{I}$ A S P Q H T AVNY LQE Y Y Q VF VP N K P S |
| T T VDEL I D A V T M C I | HI A S P Q H A V N Y L Q D Y Y Y S FVPP S K P P |
| T T R DEL I R MAT | F ASTAQHAAVNF GQMETYRFIPNAPG |
| KTFGALVDA VTMCI | H I A S P Q H T SVNYLQ NFYQAFVIN K P P |
| T T LD QL I D A V T M S | HI A A P F H S AVNYL Q N F Y Q VFVVIA K P P |
| K T L N L L N TII T M C | HI A S P Q H A A N Y L Q N Y Y M S FIP P |
| Q T L D ELT NAI T M C | HI A S P Q H N AI NYLQ NYYMSFVPNKP A |
| D TLLDRLTDAVTMA | HI A A P F H T AVNYLQ NYYQSFVIT K P S |
| KTFDALVDAVTMC | H I A S P Q H T SV N Y L Q NYY Q A FVVNK P P |
| E TVEAL A Q A V G Q I | FIT T A H H S Sil H Y PQY LFS GFTPAMPF |
| K T L D GL I D F A T M CI | HVASP Q H T AVNY LQQ Y Y Q T F VP NK P S |
| A T I D QL V D A VTMCl | HI A S P Q H T AV N Y L Q E Y Y Q VFVVP N K P S |
| T T V G A L V E A | F L C S A Q H A AVNFPQR D Y VA Y V P NRPD |
| R T L D ELT T A I TMCl | HI A S P Q H N A I $N$ Y LQ N Y Y M S F I P N K P P |
| G SVVKATEA | FMCSAQHAAVNFSQEEYVTYVPNRPD |
| E T I Q D L D V V K I V | $\mathrm{F} \square \mathrm{P} \quad \mathrm{~V} \mathrm{Q} H \mathrm{HA} \mathrm{~N} Y \mathrm{P} \mathrm{~V} \mathrm{~A} Y \mathrm{Y} G \mathrm{~F} V \mathrm{P}$ |
| T TVVDALTEALVSL | F MCSAQHAAVNFPQAEYVTYVPNRPD |
| K T L D A L T D A L T M Cl | H $\square$ A APFHTAVNYLQ NFYQAFVPAKP P |
|  | F TCTVV S RAVSLQQMYSQCAFPPNYPL |
|  |  |

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UniRef90 - X 8 JCl 18
UniRef90-G2YFV2
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WMNGQPPQDKT ALTEKD DAK DPNKKK LKKTMS CLYRPLPTSREEDDHYKEQNLVDALP MNHPREWLLASH AAYHPVPEQKGDDME TVGFRPYKQAADQVY
 MLEGNPPRNKNV LVTEQDILNALPGKSKTAEINJL $T G G M P A P T G S A G Q$
$A L C T P L P K S$ ALYSRPDTPS TLEELLPSTQQDLGQMQ AGYTPEPTGSGHT AAY SPPDVCTAVSNLLPPDEKQLGQMELTLALSGIRWG SLCRPPPRTLEQLRAYKEPDLVAALP NRRRQWLLAAQ
 ALRQY
SAYAPPPAGKNAEDDKFDPTFRAAYSQTWTYFLTNFCVNS ARYTPAPTNSQES EDFINGLPSILEKAQEQIN ALEGNPPKTKA $\quad$ TGTEQ AMYTPLPRS LSELQGYKEKHLLDALPFKRTWLDGAQ
 CLYTEPPTS LQSLLGYTEKELVEALPMNHPWLLASH A LCNALPKS पAELKAYTEKSLVDADPDQREWLLAVQ L A R
CLCKEPPTTIGGS SASSTSRTCFK ALCTALPTDLKTLQGYKEAE DTKALPTEGPKWKDWLLAAQ AI YEPPDTDLNKPIF KENLIKLLSPNKLTTLIQTY KLKGAPPKNKDQM KEEDIIKCLADKSSILDTMV ALFAPDPES LLEGNPPTNKNDT EQDVLDALPGKRKTVEDGL HKRVYNPEGT TDMNRNPFGGGS ALCTPLPKDRPGSLGGYTEKDLTAALPDWKDWLLAAQ $A Q Y A P A P T R V D G G S M$ AS A LCTPLPPNLAALQAYTEKDLTAALPTDGPKWKDWLLAAQ

LLRQPAPTNKEKVSMEDTMN FMHGEPPKTKDPL
$V M F K G M P D T E G D I T M E Y ~$
VMY SVYVPPPTDKT
ALYQP1PTAKGQFAD
 ALYQP P AKGQFAD ENSLTSFLPVIQPTLVQVQ ALFTSLDP NSLEEDKSGREKDLISALPEPRVWLLGSH SFFKPIPKSNDELKDVKEDNLLKPLKNTVGVGNVWLLAAB


NMRRAPPKRKPRKGETEMED IMEALPDRQASCKQLNMADA VLFKGVPETEGD TVLEY LDSALANFPPDGHFQVFFSN
 CLVGKIPKDKTP ALYMDPHK IIEGTPTTF LI EMI I NSLPPKKETQDQIA CLA HPDPGSLPELEALKESDDLTALDWLMSAYDPHLLSMS ALLCTPLPAS LADGLQAYTEKELTEALPGWKDWLLAAQ SMILPPHKRG EADHKRMMESLPGVVTSSILIS
 SLQQPLP

## SLQQPLPNSLGALQRYREDD\|INALPWПQSSQLPYLLSYR

 SLCAAPPK TLAELKEYTEQTLTAALPIIRQWLLSVQ ALEAAPPTTREQLARYGEPELVAALPMNQT HDWLMASH AAYEPAPT TIMCDLINQE YLLNADPGRQPSMTQAF ALCCARLPQSLTELQAYGEQDVLLJALPAGVRRQRDWLIMAQ SLQQPLP G GSLSALQKYREVDVINSLPDNDPTLWD SMRVPMPPTPPAGED GPPTALAAAFPTAGVSLFQTF SMRAPMPPTPAK GDLSRADFDAALPDTPVSLFQAL AVCQKLPAS




VP WLLSFKVPSDRSLVSFAQSQWREVQAVRNTSEMFYLDL
VDDERSLLNYAASQWNVYRYKKGANELKVKEASQRLYEDL LPELLSFKVDDRYNLLTYADNPEFNAAALKDAAKTLYSRL LFYLTGF KINRLGDYPDEKFDDQAK EVVQKFQLKL I T TI LSERTNNALGDFEVTYTYDPAAVDIVEEFK
LLPWLLSSV

 LGVLLGKLYYSRLGDYRGLLRRHFDDERVHGAEDRLVAAL
 VTKDLSDRGTQPLGDF ERQYMYDP GVKAWKEFCSEL FSNFLSTPSLHPLSNLDLEE NFFPEIHAAFDA LFTFLGNVFYTTLGDY EADQFSDKRVLAPLAKFQQAL
FIPSLLSS
LP HLLSEEVHAPDDMSSYSDERRSGTPDSTKAAEEFRTRD LSWMLAMPSETSLAN YDPGENDHPEDSQA FAAEM LF WTVSNETKDTQYLGTYPDEYFAK EAPRKVSVFHSHL


VAEDQTLSSYARELRDAA TNPQSRFAGPVRRAAEKFLADL LP WLLSFKVEDLLSSLMKFSSSHVMSRGERKKDNGKLHQQ


FGYLLS SPTQAPATS四AQSALREEFPAEVGALAADL

FGYLLSS
LS MSL
GSDRYDVLF
VP WLLSFKVADERSLIKFAYSQSRNYR

M
ADWMLSKEPGDRPLGHYPDEHFTEDAPRRSMAARMQL


```
A VS \P N S \N\
    Q\1TP PQ S
        \squareP Q S\N\
        N A/VS!
A V S I
    K L VP N A \S \
AVS \}|\textrm{PNSTNN\square
AVS\lil
        \squareP N S T N\square
```


$V \mathrm{~L}$ S IT
NAVSI
A V S $\square$
$\square \mathrm{P}$ N S $\square \mathrm{S} \square$
K LIP P N A
$\square \mathrm{PN} \mathrm{A} \square \mathrm{S} \square$
VP Q S $\square \mathrm{N}$ 【
$\square$ A A S $\square \mathrm{N} \square$
$\mathrm{K} \square \mathrm{V}$ P N A $\square \mathrm{S} \square$
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-M4G8G5
UniRef90-G2YUA4
UniRef90- W9C649
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NAVS $\square$
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UniRef90-R1DTS5
UniRef90-W8UK02
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UniRef90_D3AWS6
$D \square P \square S D R \square Q A E K F A G M P W D V D P T A M E T L L P F$

NRLEVTVEDYKKFLLPF<br>EQRRTE LKKKE $\square$ FYDTYKS

 YPGAPPYV $\square \square P Q G E G F S P F K \square F F F D F T A L D S V L S L L L A Q$ S VA G D T A F Y P S G

DHK $\square$ QS $\square$ S M $\square$ K Q Q $\square E N F Y E S F \square K P D N \square D E \square K F \square P Y K ~ L P D G$ S S NASGRAAA $\square \mathrm{E} \quad$ KTRQGFQYGTDDTLDGVNPW
$P \quad$ L

ETFLPQHEPFPDLRQLERRQQLLILTQRA RG

T S A R K D D S VE $\square$ D G VD LIF R Y S R S S VQVP QLLK K A A A S F VQS

RS WYK $\square$ T DENEPSNSEF P LKNVPF LESSWLILYQTWTAS

EFVKTERKEFTTYKEYEDVYYYF $\square A T A A S L L P N \square P \square F D N \square P S G G P L L R Q S R M P S N K L K P S S Q A$ K D C X NVLT C WN N

LLHHAR LDRK QLNFESRQAVYVSDKVFLPEAMNGSEFDTM
 VP E E $\square$ D P Q D T P F Y G P T L A D VEA Y N R E H P S P S T D $\square \mathrm{M}$ $\square$ A H VFGFAKHG DEF KGVADFGLIAS $\square$ AP T DYWEK $\square K D$ NSPC L MKKDK VENF VE
$S \square G G P V A K K \nabla T D R F S T F \square D V H A N V I N D S R \square A A A S \square S R E G G$ $N G L Q T$
$\square R \square F K$ QADQCGKGFSFRADVE ILRSVFLQFGAYMD F $\quad$ G
 GKNA $\square$ KAQYSAFE KSEAS $\square Y K H V D E D T A Q A Q V S \square N G T \square Q$



VK A A E N SLADNRPGRMTFEEMDPMLLTFPSRKCNNVDELDF

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

LK Q Q P PMQ RRRYRFPYDTPFKSTDNNHTWRSDREFARQ LK QUQEPMQLRRYFRFPYDTPFKSTUNNHTWREDQVFSEM ARRRWRK $\square R F A \square A F \square T K \underset{F}{V} \square P D P K G D M C R S V Q D D V D F G R Y$

IA QGQFSNFTSDLLFAME QVKEVTANNWQDDSFFCHE LDDFNR】FYGHGWWGLEGPRTQUPQNVWDFRKQDALFGYQ

DAKGQFSNFTSDLLFAME RKFFKDGDKSEENLIKEYDPSDEEPFDNGDWKSDKYFAEQ N DRNDI FNLP NMGDULDWYSDRRFAQQ WSTGKCET LED DEKLYR PPLLPVPEGFYHWKSDQHFANQ PSGPVPGMLTNYTQDLLFSME D GKN $\square$ GF $\square$ P DWFSDARFVQQ
TDFFKPFTLLPKPLIDADSWEEDVLEFGKQ VSPGMLI N WT QDL LF SME D DE WVQS TNPTGVMMGMLLTNYTQDLLAKSME FTNYSSDLLESME

FKKMVPENVYDRQRLIK
HWKSDVVFGRQ DEDTFFASF $\square A R G Q S E N Y T S D L L F S M E$

VASGMLTNWTQDLLFSME F L K P P CS M DE R

WKDDEEFARG NYTDDLLFSMT
$\square K S \square H D Y A K \square Y K E Q W K Q S A P E G P Y P G \square L T N Y T D D L L F S M T$
MMND $\square$ CF GAQ
LEDYKKLY EGYWAATSAPTGVSPGLLTNYTQDLLFSMQ PD WY S DDRFAQQ NYTDDLLFSME KKSVSNDDQFYSPF $\square$ PKGEKFLILKDVQQNWHNDEYFCHE LDSFEDY LKLYDGQWQNSVPDGLAEGVLRNARSDLSFSME QMRLE LDRELNKYQFVTLNEGLPPVNMQFWDKDWYFGAQ
 $\square$ N S F E DYFK $\square$ Y E ERWKRSVPS G $\square$ AE GVLSNSRSDLLFAME NYTSDLLFSME
LD S L E DYFK NSEESWDSLDSDGSGYKRHNDTEPLSLSYWMMNDVAFGAQ FTPDQ■ARLTSFWADDAEFARQ NYT QDLLDFSME
SDENFGAM SDENFGAM】SKGMLSNYTSDLLFSME

S D LYF S MQ FA $\square$ VYEAFYKHHKKYSAMSALKRVPS $\square$ EDNFYKDRCFADQ NSDENF GA L
T D DLDSFSMT NYT DDLSFSMT LEKANVYQGMLSSNRSNSSDASFGAM

MYFDK S LYRETFTD
YPDFCTTHPQYEQRINQWPK YPDFCPSHPEYDARIKQWPK


TENELWKSNK IVFA QR ASYDNDFRSDDVVGWL APYDNDFRSDDLVGWL NSDENFGAM RPVDMENAVKMLED VYYGNNFQT $\square P A P K F W \square K S D D E F A R Q$ FPQRKA DNIEELNFFPDNQQRYPKQAYDSDIFDDDLMGWL YPTFCTDHPKYEERDKQWPK KAPYDKDFRSDDLDGWL PEYQPAAYKFYDSDKAFARE

P Q Y QPAAYRFYDSDYAFARE RSDEFFGLR

T I I LERENPGCTRSDEFFGDR $L I R S E G A G \square F A S P Q N F V A S Q T R K \square L L K S V P W G D K$
 UniRef90 UPI0003339EFF UniRef90_L2G8T0
UniRef90_J916F9 UniRef90-UPI0002743504 UniRef90 F6R494 UniRef90-A0A010QM65 UniRef90_F2Z929 UniRef90 M3AZH4 UniRef90-UPIO002652D1F UniRef90-M2NA54 UniRef90 ${ }^{-}$W9WWF7
UniRef90-E9EHR8
UniRef90-W71036
UniRef90-A3IQN9
UniRef90 W6PR13 UniRef90 S8AOS5 UniRef90-F9FRH4 UniRef90-G2YVY5 UniRef90 W3XA02 UniRef90_UPIO003F0EAEB UniRef90_C3ZEB5 UniRef90 UPI0002744F5D UniRef90-L7HX92 UniRef90-M7SZA4 UniRef90_Q4WA38 UniRef90 S4RCZ7 UniRef90_ROIM76 UniRef90-M2TYC9
UniRef90 B3S833 UniRef90-G7YRY4 UniRef90-G1XMM9 UniRef90_M7TFK6 UniRef90_M3B6Q0 UniRef90-J9INR4 UniRef90-S3E0X4 UniRef90 F9FEF3 UniRef90 UPI0003F0D242 UniRef90-U6IOT6 UniRef90-W7MIM5 UniRef90 K3X954 UniRef90-N4VUR5 UniRef90-M7SI31 UniRef90_G9N3X0 UniRef90-SOE1N4 UniRef90_U6IMN5 UniRef90 UPI0002E5F647 UniRef90-F9XFM8 UniRef90-H3GN17 UniRef90_G4ZNJ8 UniRef90 J3NWC7 UniRef90_G4V9T8 UniRef90_M1VX01 UniRef90 A7RUD1 UniRef90 H3GV31 UniRef90-R0JZ09 UniRef90-M7T7JJ9 UniRef90-K3XCQ7
UniRef90 UPI0002B41F3 UniRef90-UPI0003654A12 UniRef90 UPI0002F51A96 UniRef90-B1KQS7 UniRef90_G4YSK3 UniRef90 UPI0002B4B7C1 UniRef90 G4ZRI8 UniRef90_UPIO002F06626 UniRef90-B1KF56
UniRef90 R1HX9
UniRef90-W7TYD4 UniRef90-B7K2Q5 UniRef90_S2DPW9 UniRef90 K8Z815 UniRef90-B4VU87 UniRef90-B3S831 UniRef90 Q1DBH8 UniRef90-L7U4Y6 UniRef90-K9UBW3 UniRef90 B0C6P5 UniRef90-R1DTS5 UniRef90-W8UK02 UniRef90 UPIO00360E80A UniRef90_D3AWS6

240 $\mathrm{N} \mid \mathrm{I}$ RLAGLNPMCLTKVTGDHESNGVKWSEDRRRDNPQFDWEKM FLMGPNPVML R RLRNSLPNFPIADSMCAGYMSLD FLNGCNPTVIEKPRD LDEVKRQMPLELLRLRAPQ
$R L S T N P Y V V R R N P N S D K L P F$
SVDANNVTH LINGVNPFSVQVVDH VIVK DNQEF DQLKD FLNGANPMGLRLS SHLPTHLVFPPGTEELQAQL EKE

RLAGTNPMTLQKIMPFQELKKLDNPKFEWTVALNRALPEV FLTGSNPTTI ERASQKWUVHFIENATQADQRMKLKDQSLV $R L T G C N P A M I R Q C T Q \square P E N F A V D A K Q Q E$ $R L S N S P Y Q V R R L N P T S D T L A F T \square A D N \quad \square A Q N$ RLS FSPYQVK RLNPSSDTLQFNVDDNTTTQ HFSGVNPTTI ATAPAAKVQEYVLADMVELLEAGKDLLIQD $R L S$ NPYAVRRDMLGRDS $\square P \square P$
FLQGLNPVLMTKCK
RLS TNPYVVRRLHPRDGSLPFPVEDGVVQHLA

RLS LSPYQVK RLNPTSDELQFSIDDAVAQN
$F L S G F N P L T L R R C R K \quad \square P E T F A R K \square D E \square \quad D Q L L$ FLNDLNS LI HCCHXLDPENFLVTDAM MVPAL

RLS $\quad \square N P Y V V R R \backslash H P R K D R \ P F A$
FI QGGSPRLARGLDGRAQPALARPPM

$R \square R G C N P F T \square E D C R E D P E S F D \quad A \square A T W \square K P H$ RLS T NPYAVRRLAPETLPFSVDDTDVKNDTGTDNGSEV YFTGTNPTTIHHANEWDQVFATDPEDVGMKGKDSGRAAES RLS FNPYAVR RLTPE EDLPFTVDDEIVRK



 RTTGFSMRTFRDGTDSYPVDKLTDAAVA
 RLS VYPES LRRVRTDEP R LADLQVEDD DARKDT TQ
$R L S$ QNPYPLELVVKPSDPLPFDDPDDLAPQDA
RLSE HPHAVRRVMAHEPPFPLDD VITVKIV


RLGAANPDVMRLFTEP DSTDEALRDSTGAHDPH
RLS L N P Y AVR RLGGKDEP LPFEVPDDQATS
RLSGNNLKLVHSGEYAEYDWEVPSFLLQDVCGEPA
RLSGNNLKLVHGGEYWDIPFPLFQDVCGEP
$R L S S \quad N P Y V L K R L \quad H P A K D K L P F S V E S K V V K K \square T A$
$R L T \quad L N P F V L R R L \quad H P S E R L P F A V P D D V$ V $V$ R RLAGANPFQI WRVTRSSANEKLDNRDFDW HKAFRKVLET
 QLSENPYRIFRVPKDT KLPFTVSNTSA $\square$ A
RLSVAPFRLFRVKADDALVFSVDNA ES RLG GIKGYNLKLVRDSEYSKY DDHLSDAQVADVCGWHSK RLAGSCPFHLRKVTRNEEDGFHESTLLELLNKDYDFDEYE MTAAPTPVFLKPYTQHQRNFPVTN KHFKRVAG MTAAPTPVFLKPFTEHMKNFPMTNDKF
QLAAQTPVFFKPFTQYQDNFP ITNGMF
$R L S G F S L R A M R E S D D D P E D E T L T A E N V$
$R L A G A C P F H L R K V T N F P E K S L F K L L N K N Y D F D D L I N R A V C ~$ NRASR RL GIDRYKI KLVQS G EWSDPLDSLSSSLVLEQ QLAGFMPTLLEKVSTADDRLVSDAGIVD
QLSPASPYRLKPYTQHLSNFPVTN THFRSTPA VTAAPTPVFFKPYTHHMSKFPITN RLT ASPAFLT LVKNVAE DPFTQADVTGYNTDTGSE $V L N G M N P C L L K$ RSKSDPNQFKMSF IWDNYEKDT
 1 L NGMNPCL

PKKNKHNPNEYKVTFNWDAYEKDQ


MLNGFNPVIFKK


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| :---: | :---: |
| UniRef90_KıRO46 |  |
| UniRef90-ATS208 | TVGSAL EKGLLYI |
| UniRef90-SOF3P2 | SVEKLLEENALF WADYKMTSGAYTNSTKYETM |
| UniRef90-UPIO003339EFF | HTLFEADFSLLDGIK KANVI |
| UniRef90-L2G8T0 | DTGT ThDA |
| UniRef90-UPIO002743504 | LEGST LFEADFSLLDGI KANIILCSQQHLA |
| UniRef90-F6R494 | A D |
| UniRef90-A0A010QM65 | GRLFLAD |
| UniRef90-F2Z: | GRLYVLYH |
| UniRef90-M3AZH4 | LNDPESLYMQDYSDFMKCSYTEYYDAGLGKMSKESFRYGV |
|  |  |
| UniRef90-W9WWF7 |  |
| UniRef90 E9EHR8 | YSYFRKATGLGDNEPFVNVIYDLTEDY KPTGKTANRYGC |
| UniRef90_W71036 | TGGSTLADLLQRGLLFYADHSSQAKLAP |
| UniRef90_A3IQN | GDNFSLT T ALEQDKLYLVDYKDF DUIUDSAQEDQLGRYTC |
| UniRet90_W6PF | EGRTLADLHQEGRLF |
| UniRef90-S8AOS5 | GT S S S L S |
| UniRefao-grrh4 | ( ${ }^{\text {a }}$ |
| UniRef90- W3XA02 | TGMTLQGLFSDGRLFYADYRDQKDL |
| UniRef90-UPIO003F0EAEB |  |
| $\qquad$ |  |
| UniRef90-L7HX | LTKTSLKALHAAGRLFVADHS YQRNYTRLANR |
| UniRef90-M7SZA4 | LTGTGVTALHEAGRLFFVDHS YQKDYPVTEGKYVA |
| UniRef90-Q4WA38 | AAGSTLEALHCDGRLFFANHSADAGYAPYPKTPGRWTA |
| UniRef90 Rolm76 | GQTLTALQETGRLFLTDFLDQ GRLRKTADRYGA |
| UniRef90-M2TYC9 | GQTLASLQEAGRLFLTDFLDQ ASLRKTTGRY |
| UniRef90 - 33888 | GWTFVDAVQDGRVYVSEFPELLRGMRTIDPNDGRTMMTLM |
| UniRef90-G1 XMM9 | G |
| UniRef90-M7TFK6 | SLYVQSSYFRKAGGIDDFTESAQEGEADKTLYRYGV |
| UniRef90 M3B600 | VSGQPLAEDHSSSRLFYDDHREQD |
| UniRet90-J91NR | HVDL RAFPHGDLFISRYPETRPFHPNSPLPAQRGDYF |
| iRef90-S3E0X4 | UTGMTTQSLLASGSLFYIDQRFQADL |
| UniRef90-F9P | KTQRSLQKEGRLFIIDHS |
| UniRef90-UPIO003F0L | NWS |
| UniRef90-W7MIM5 | KTQRALQKEGRLFIVDHS |
| UniRet90-K3X954 | STTDAQLVQANRLFVTDYS SYGHWS |
| UniRef90_N4VUR5 |  |
| M7S | EELHSSGSLFLVDHR |
| $\begin{aligned} & \text { UniRef90-G9NXX } \\ & \text { UniRef90-K1WUB7 } \end{aligned}$ |  |
| UniRef90-SoE1N4 | RSLQREGRLFIVDHSDLANDT LTKG RYAG |
| UniRef90-U6IMN5 | LEGWTLQQTLVARRLFYVDYADMRGL |
| UniRef90 UPIooo2 | KVGQRASQANNAGRLIM |
| UniRet90-H3GN17 |  |
| UniRef90-G4Z | SNHKLFVADLSDYGELTDEA |
| UniRef90-J3NWC7 | TLEVLHKGGRLFLVDHS YQKKYTPQPGRYAA |
| UniRef90 M1 M $0^{1} 1$ | WTLRQMVSANRLYLLDF |
| UniRef90-A7RUD1 | DDNDALDKAlda GQMYVTFYPE鸟EGLNATKLFNHTVSP |
| UniRef90-H3GV31 | CNDDTI DAAVSNHKVFVQDFSAMGQYTDS SKTESK |
|  | GQSLESLQSSGRLFLTDFLD |
|  | GLISLEALQSQGRLFLVDHSDQKDLP RSSTFKYGG |
| UniRef90-K3XCQ7 | KTQSGARKDHR\|FVSDFSKHREYTDEAAPDVQHQKYV |
| UniRef90-UPIO0003654A12 | FESDDLDQAMAEDRLFILCFKDFHDETVAPRNWDNSGARL |
| UniRef90 UPIOOO2F51A96 | FEADDLDQAMAEGRLFLDFKDFQEETVAARNWDNFG |
| B11 | NDDLDDAMSEGRLF TIDFHEFNDEVLAHLDVPAS |
| UniRet90-G4YSK3 | DGASVQSLRADKKLFVVDLDQWGDPTVSKVESYPPTKYL |
| UniRef90-UP1000284B7C1 | GSVKSISQAIKDGVLFILYHELYNDILGKDWNANRTVMNN |
| UniRef90-G4ZRII ${ }^{\text {UniRef9-UPIO002F06626 }}$ |  |
| UniRef90-81KF56 | NDDLDTAMNEGRVETVNYGEFHDEFVNSRPTEAYGA |
| UniRef90_R11Hx9 | SDNLDQAMAEGRLFILDFADFHEETVAKRNFDNF |
| UniRef90 W7TYD4 |  |
|  | (LGMCATFVPDKVEKDKYWVRYFGACDYEVND EYAF |
| UniRef90-K8z8 | GVS LS SLVAQGRLFTVDYYP पYQAGVLEASPDAF■ |
| UniRet90 B4VU87 |  |
| UniRer90-B3S831 ${ }_{\text {UniRet90 UPIOOO37B80E2 }}$ | TFGNTVNQALEDGRIFVMQFP |
| UniRef90-Q1DBH8 |  |
| UniRef90-L7U4Y6 |  |
| UniRef90 K9UBW3 | NGEQF |
| UniReego- ${ }^{\text {a }}$ |  |
| UniRef90-W8UK02 |  |
| UniRef90_C4URV2 |  |
| Uniref90-UP1000360E80A |  |
| UniRef90_D3A | EMRLSFSGYEIRKDVWLPDNTCC |



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| :---: | :---: |
| UniRefg | WTLIMKESFEVTD Y A Y VEMVE |
|  | WDMAK |
|  | RPNYTFAKMHVAC |
| UniRet90_UPIOOO3339EFF | TDPPM VWLLAKCWVR |
| UniRef90-L2G | LDD |
| UniRef90 J916F9 | MW1 |
| f90-F6R494 |  |
| UniRef90-A0AC | M F N |
|  |  |
|  |  |
| UniRef90-UPIO002652D1F | DPE YTWMMAKCYFNL |
| UniRef90-M2NA54 | AD DAADWILAK VFNVNDFWFAQ |
| UniRef90 W9WWFF |  |
| UniRef90-E9EHRE |  |
|  | ADSSED WKLAK |
|  | WLFAKMAFGM |
| UniRef90-S8A | ADS ANDWLLAKMMFNVNDF FHGQFHHL |
| UniRe990-F9FRH4 | LDEETEPNDWL AKDMFNVND F G GMY |
| UniRef90- W3XA0 |  |
| UniRef90-UPIOOO3FOEA |  |
| UniR | ADPQCD WML |
| UniRe90- | LDPA DNNNWLLAKTMFN |
| UniRef90-M7SZA4 | DENDWLLAKAMFNQNDL |
| UniRef90-Q4WA38 | MD ETNDWLFAKMAFEMNDL |
| UniRet90_S4RCZ7 | RSP PYRY |
| UniRef90-ROMM6 UniRe90 $^{\text {M2TYCS }}$ | QDLPSD W WLLAKMMFNSNSFWYAQ |
| UniRef90-B35833 | WT |
| UniRet90_G7\% | WL |
| UniRet90 G1X |  |
| UniRe90-M3B600 | RDSPED WLLAKIMFNCADFFMSQ |
| Ref90- J91 | F |
|  |  |
|  | WTLAK K |
| UniRef90-UPIOOO3FOD242 | W |
|  | TDPAEE ENDWLQAKLUFNLLADS |
| iRef90-K3X954 | FDKQEE WTLAKMAVDTAD |
| RRef90- N4VUR5 |  |
|  | NDWL |
| UniRef90-G9N3X0 | DWLLAKMMF NANDMF |
| UniRef90- SOE1N4 | WT AK |
| UniRef90_U6IMN5 | WLQAKL WFN LTA SCHHMV |
| UniRef90-UPIOOO2E | A WLLA KL HVA |
| UniRef90-F9XFM8 |  |
| H3G | WQLAKMALHATEVNFQQMR $W Q L K K M A H A T E V N F Q Q M R$ |
| Ref90- J 3 N | WL |
| UniRef90-G4 | WLQakL WVNLIADA |
| UniRef90-M1VX01 | W |
|  | WF Y A K A |
|  | WQLA K M ALD |
| Unit | DNDWLLAKMMFNLNSLWY TQW Y |
| UniRef90-K3X | PEE WQLAKMALDAADANFQQMR H |
| UniRef90 UPIOO | SSLED KWL |
|  | A N WAWQMAKNC T M S M A A V |
| UniRefoto-b1k | ADNE WTWKMAKNTF TTMYSMSNVVDHLS ${ }^{\text {A }}$ THVV |
| Unil | FDSPAE WQLA |
| UniRef90-UP10002B4B7C1 | SSPEDQ WL |
|  | SAGE WQLAKMAL |
| UniRet90-UP10002 | NNDYWS WQMAKSTI |
| UniRef90-R11HK9 | GDNY WAWQ |
| W7 | QDPHPD WFLAKAVFNCLDRDV LFFVYFVL HTAMNN |
|  | WL |
|  | K WEYAKRV |
| UniRef90 B4Vu | Q WL |
| UniRef90-B3S83 | NWS IA K T R |
| iRee90-UP1000378 |  |
| UniRe990_O1DBH8 | YTPADGEAWEAAKRMARVSATLETELGNH |
| UniRef90-L7U | AD DGPNWEAAKRMARVSATLDTELGNHLGQCHFNLEQ |
| ef90-B0C6 | E |
| UniRet90-R1DTS5 |  |
|  |  |
| 俍90_C4URV2 |  |
| UP1000360E80A | A AKTSMTVYG |
| UniRet90_D3AWS6 | VEM |



| UniRef90_K9R046 |
| :---: |
| UniRef90_A7S2088 |
| UniRet90-T1FQA1 |
| UniRet90_SOF3P2 |
| UniRet90_UPIO003339EFF |
| UniRe990_L2G810 |
| UniRet90_J916F9 |
| UniRef90_UPI0002743504 |
| UniRef90_F6R494 |
| UniRef90-A0A010QM65 |
| UniRef90-F2292 |
| UniRef90-M3AZH4 |
| UniRet90-UPI0002652D1F |
| UniRet90_M2NA54 |
| UniRef90_W9WWF7 |
| UniRef90 E9E |
| UniRef90 W7 |
| UniRef90-A3ION9 |
| UniRef90-W6PR13 |
| UniRef90 S8A0 |
| UniRet90_-F9FRH4 |
| UniRef90 G2YVY5 |
| Ref90 W3X |
| Reto- ${ }^{\text {a }}$ |

UniRef90-UP10003FOEAEB UniRef90-C3ZEB5 UniRef90-UPIo002744F5D UniRef90_L7HX92 UniRef90-M7SZA4 UniRef90-Q4WA38 UniRef90-S4RCZ7 UniRef90-ROIM76
UniRef90 M2TYC9 UniRef90-M2TYC9
UniRef90_B3S833 UniRef90-G7YRY4 UniRef90-G1XMM9 UniRef90_M7TFK6 UniRef90_M3B6Q0 UniRef90-JginR4 UniRef90-S3E0X4 UniRef90_F9FEF3 UniRef90_UPIO003FOD242 UniRef90-U610T6 UniRef90-W7MIM5 UniRef90-K3X954 UniRef90-N4VUR5 UniRefto M M S 131 UniRef90-G9N3X0 UniRef90-K1WJB7
UniRef90 SoE1N4 UniRef90-U6IMN5 UniRef90-UPI0002E5F647 UniRet90-F9XFM8 UniReffo-H3GN17 UniRef90-G4ZNJ8 UniRef90-J3NWC7 UniRef90-G4V9T8
UniRef90 M1VX01 UniRef90-A7RUD1 UniRef90-H3GV31 UniR Refo-roJZo9 UniRef90-M7T7.J9
UniRef90_K3XCQ7 Unirer90-K3XCQ7
UniRef90_UPIOOO2B41F37 UniRef90_UPIOOO3654A12 UniRef90-UPI0002F51A96 UniRef90_B1KOS7 UniRef90-G4YSK3 UniRef90-UPI0002B4B7C1 UniRef90- G4ZRI8 UniRef90_UPIO002F06626 UniRef90-B1KF56 UniRef90-R11HX9 UniRef90-W7TYD4 UniRef90-B7K205 UniRet90-S2DPW9 UniRef90-B4VU87 UniRef90-B3S831 UniRef90-UPIO0037B80E2 UniRef90-C1DBH8 UniRef90-L7U4Y6 UniRef90-BоС6Р5 UniRet90-R1DTS5 UniRef90-W8UK02 UniRef90 UPIIOOO360E80A UniRef90_D3AWS6
 KAYMHQLFADGNGAVQLLVRAYMTMTWKDTDFRGKIRARG
 GPFTDAGFALGNGGQAFLAKKYSQWNFRHQAFPKQLQLRG GVFDQVVGTGGGGHVQLLQRAGSFDT GGLFDQSFAFSNVYARKFATDFYPTPFQANYFEEDLRARG VDDQLSEFFGDQGS RKFSTRCFSGGEHHVELLKRAGAFLTYSSFCPPDDLAVQG SPCPPQGMSLGAGFAEVMCRALAAMRYECLYLPDDFRRRGG
GGFFDQNFAFSNAAVRQFGAEFYPTVFQRNYFEDNLRSRG RKADHEDFGYGHGGAQLVRDSAQVLHWDNDQPARNIKDRG NVI CELI GMKLDQAKAFI LTEYKKFDFVSSYAPNDLARRG H GLLS DIMTCGSTGLSEIIKRKIVGDYELQEWAAFLASQG GAAVDLTFAYTGQAAQDYSTDYYQGRFVDNYFQTDLQRRG GAAVDQVFAYTGTSAQDYTTNDYEGRFQANYFTAELESRG VIARIA GFGPTNRCFKFDQHAYKNFNFVDKY DPNDLKKRG GGS $\square$ GKYFWTGESAAKFSGEQYSNGAVQGNYFLTNLRNRG GGFFDSTGALGYTSSELLSRAYWGEGLSTDYTGEPWEFYK GGFYDSSFAPNWAGKKFATDAYWEHHFRSTNFYRDFADRG NGSDDNFFAHSGGAAQTYSATLYNGAVQSNYFETNLRRRG $G G L I D Q N S V F S N V A V R K F A T D F Y P T V A R S N Y F E A N G R S R G$
$G G F F E R S F S I N S E G V K L F A S E F Y P T R F M P N F F H K D L T$ GGAADEDFFTGTEAQDYSTKRYSEGRFEANYDETDLESRG WS IF DLGF LGSGGHLDVLKRATACLTYCSDFPPDVLXQRG RAFSKFTWREDVLPAWLHDRG GKLDHQVKALGMGCLELITKGLAAATYHSLYLSHQLADFK GGLFEQNFAYPQDMVYKFVGDSYPTTWRAGYLDTDVRARG GGYFDQSFAVNNNGVRQFATDFYPGAFRSNYFEENLRQRG GGFYDSSFAPNWAGKKYATDAYWEHHFKATNFYQDLFDRG VGPDTNSTFGTVGGDRDAVASFQRYDFMEWSFPRELHNRG
 GGPIVDELEWNGREASNYTDTLYQSSAFQSNYFELNLQRRG GWUSRNUQLSHKGQKQLLKRGFKRWRFDVQNDYRELGESRGG
$G G L I D R H F G Y S G R A A E S Y S N Y L Y E S G I Q A N Y F K A N L K R R G$ $G G L D D R H F G Y S G R A A E S Y S N Y D Y E S G D Q A N Y F K A N L K R R G$
$F V I A P L D P M K E D N A Y Q F L R S E Y E S F D F K G C Y D P E D L R S R G$ GAADDRYFGYGASAVQWGAELYASGSDQSNYFLTNLRKRG INNQLSNFQGVRG EDFGELIDAWYTQKEDLWNTDVGFY GGYVDNLFAAAAVTTTDLYNEMGAGNFQANYFLRNDENRG GGDIEKNFWNGDQADKYSKQVWECAPWQANY LETKLKRRG
 GGEI EKNFAWGDQAI DDYSKQLWKSECWQANYLETKKLTRRG STDLDKTFGFGPGGTTFFGNQLGLLSLDKDEFTADIEQRG R GSIE QNFAWGAEAVRYSQQVWKSEA WRSNY LSTKLVRRG GGHWDQLF LINNVGCRQFVTDNWPTRYQSGYLKTDFRARG GGHWDQLMVFNQFGCRQFVTDSWPGRYQSGYL ENNLRARG GGAFDQAFMTARGAKEFVAEWYPVGRLKSNYGLDPDLASRG GWDARNDQLTRKGIKQLLRRGFKQWRFDVQNVYAELESRG GQFCDAVLPGGRIGVYETINAFYVYAFSDNSFPTELQDRG GAGVDKYF GLS GAAAGLFSNETYFNGYASNYFHANLKRRG
 GGFWDQNFLPASAAIDFPGSVYGGGGFQAGYLEKDLRSRG $G W \square S R N D Q L S R K G U K Q L L R R A F K K W R F D V N N$ V GTYTDQYSFSGSTGSNYTAY DYAESPFHGNYFPDRGEREG
 DSPYDQSMAFGAGSMRYUYAEFSN TSMAGDFAADI ANNG GGPDDKDFWTGAQAANYTHALYQSSAFQANYFGPNLEKRG KSDYDQTMAFGAGSLRYDYQDFDKVSFQD DFPTDI EARG NSMGHRLDAMGNGFIKLSKQAYEEAYYGQYEFEPHLRKQG QVIGEADPYGNPYNGLLTGADQRLSGFSSTTFLNATVRRK DIVYNNPYNGLLTGAVQRLSGFSSVTFVNATVRRKDQYHF NGYGDPLNGLLTGAVNLIS GFSSKSFLDSTVRRSQHYHF $K L V A S A M G G K G F S K L S K I G G D E A Y Y G Q Y D L E H H L K R Q G$ GSPYDRVAAFGAGSVRYLFAEFAN TSDAVDFPADVADNG NGTPGVYN IGFVYDL $D F S C G R \square G N Y Q L Q D K M Y Y D K D R F R E$ GEYGNGYDGLLTGAGRLS GFTSEAFVESTLRRASEYHF
$N G E G Y E Y T Y G N P Y N G L L T G A D Q R L S G F S S T T F V N A T L R R K$ DAAFNEFLSLSSGSSVAGLSSFYFMEQFDWTNLWEDLKARG GLFVTNGPLTYPGFLQMCTEVVATYDWKDWQPRQPDCDDH FGAFDTY LSLSGASI QSLLFPYLMERFDWQNDKDNLQARG GYVVTAGPLTPESVVQDCHESMSQLDWKGWQPRQPLCETH VCVVGNRHLPLKHPLRQILRRHCVGTLYGDD TSISDT GKFLT ICNRFSATHDFFATDPLNTLAWSN TGYITRASALTERSVETLLHLMGSYDWKGFAPAPPICESH
 K GGFFAKDEPMPDMLKWVRSNLGSYDWTDWQPRTPLCESH QGVLALSPLNSASLI DVMRDDLGQCNWRNWSPRSEVNSTG RSMGPRCFALTD GMDLAWSALLQSGVEAAKAQTDPKLYW AHNNQYLPYTPYCGWGNVPVIHKNMGWPGF LNNAFNGVE GHNNQYLPYTPFPGWGNIPVIHKDMGWPGQ LKDAFCGIN TS S STGKF $\quad$ S CNAFSAGHDFFSTDPANMLAT GVVTLAAALTYEGQVQMLTEKFKHMTYRW


## UniRef90 K9R046

 UniRef90-A7S208UniRef90_T1FQA1 UniRef90-S0F3P2 UniRef90_UPI0003339EFF UniRef90_L2G8T0 UniRef90_J916F9 UniRef90-UPI0002743504 UniRef90_F6R494 UniRef90_A0A010QM65 UniRef90-F2Z929 UniRef90-M3AZH4 UniRef90_UPIO002652D1F UniRef90-M2NA54 UniRef90-W9WWF7 UniRef90-E9EHR8 UniRef90_W71036 UniRef90-A3IQN9 UniRef90-W6PR13 UniRef90_S8AOS5 UniRef90-F9FRH4 UniRef90-G2YVY5 UniRef90 ${ }^{-}$W3XA02 UniRef90-UPIO003F0EAEB UniRef90-C3ZEB5 UniRef90_UPI0002744F5D UniRef90-L7HX92 UniRef90-M7SZA4 UniRef90_Q4WA38 UniRef90-S4RCZ7 UniRef90_ROIM76 UniRef90-M2TYC9 UniRef90-B3S833 UniRef90_G7YRY4 UniRef90_G1XMM9 UniRef90-M7TFK6 UniRef90_M3B6Q0 UniRef90-J9INR4 UniRef90-S3E0X4
UniRef90 F9FEF3 UniRef90-UPI0003F0D242 UniRef90-U6IOT6 UniRef90-W7MIM5 UniRef90-K3X954 UniRef90-N4VUR5 UniRef90-M7SI31 UniRef90-G9N3X0 UniRef90-K1WJB7 UniRef90-S0E1N4 UniRef90_U6IMN5 UniRef90-UPIO002E5F647 UniRef90-F9XFM8 UniRef90-H3GN17 UniRef90_G4ZNJ8 UniRef90_J3NWC7 UniRef90-G4V9T8 UniRef90-M1VX01 UniRef90-A7RUD1 UniRef90-H3GV31 UniRef90-R0JZ09 UniRef90-M7T7J9
UniRef90_K3XCQ7 UniRef90_UPI0002B41F37 UniRef90_UPIO003654A12 UniRef90_UPI0002F51A96 UniRef90-B1KQS7 UniRef90-G4YSK3 UniRef90_UPI0002B4B7C1 UniRef90-G4ZRI8 UniRef90_UPIO002F06626 UniRef90_B1KF56 UniRef90-R1IHX9 UniRef90_W7TYD4 UniRef90-B7K2Q5 UniRef90-S2DPW9 UniRef90_K8Z815 UniRef90_B4VU87
UniRef90-B3S831 UniRef90_UPIO0037B80E2 UniRef90_Q1DBH8 UniRef90-L7U4Y6 UniRef90_K9UBW3 UniRef90_B0C6P5 UniRef90-R1DTS5 UniRef90-W8UK02 UniRef90_UPIO00360E80A UniRef90_D3AWS6
 RNHYQN
E Y S Y P K S S LMGSDHELQA W $\square$ MEATSEAQVID
FP A P L NSYYSNDATVVGDAELQAWMGEAVTAGSIDFPSS KS $\square Y K$ SDKVLAKDWELQQAWDAEA
$\qquad$
 DSYYQKDSDVTGDTELQAWVTEA

 A AYYEADAMLAALDWEVQAWI KE EAYYPDKTLMDVDNELQDWI IDEATEAAKVID CRHYHTDADVLHDKGLQDFAAA LIADRRRGNVTGF QSYYPNPGDI TDDHELQAWVREARPAEIVDF
QSYYPDPSDVGGHELQSWVREARPAQUVDF

$$
\begin{aligned}
& R Y V Y G G T E D L L Q D G E G Q L W R N E I A S P M E E G G L G L L G V P G S \\
& H S Y Y P T D A S V A A D N E I M A W M D E S A N G S A V V D F P N R A T M
\end{aligned}
$$

HSYYPTDASVAADNEVMAWMDE ANGGAEVVDFPNRATM
LLRYDPDLRVRQDQDVQNWSQEMRASVQDKGANMKTFPEF

$$
\begin{aligned}
& \text { DAYYATEDDVGADGEVRAWFAEVPAANDADF } \\
& N S Y Y K S E N D L S G D F E V Y N W F N E S T M A K A Q D P Q E
\end{aligned}
$$ RVFYTRGSDLLEDDELQTWRNEMAYPM DATYATDAELAADRA KDWMDQDT QAFNHGRQ PNFFYG DSYYDSDDAVDGDVELQA WLA EADT,AQVFDFPTKATQ

 DSTYGADDGLLRDYELQNWDAEANGPAQVRDFPAAPLRR

 KAYYDSEEAI QHDSELQTWAGRAAVV WGVNDF
 HAYYPTDAKVRNDSELQLWAKRASQD KK DLYYDNDAQVQSDAELQSYANELSKPDGGKGKVKDFPDTF RLYYHSDQDVRDDNEVQAFLYETTHEG R R V RGFPDNA

 NLYYKHNDDVDYDEELQNFANELSVEGGGDGKVKGFPSFF AVQYPGDQGMADD QQLQRFFDKLIAAFNHVDNATFAHPAEFV SLYYANDSDVAEDIELQNFCQETVNEAGVN RLYYHSDQDVKDDTELQGFLYETTHYGNV A GSYRKRGSVRGDPELRDFLAALTNSSNSLAFLQGFPTSVV EHSYQPDEGUMANTDSDYEWYDTGELDKPDLPRATFNPSA
 NHYEPGKDSGSDDGYEWYDTNELTQPNNSRRTINSDKPDA
 GHSAPAFVCVPGRAAPWFVRSEATHAKAVSAVTRTDAPQP AHSVPAFVCVPGKPAPWFVRSERMDLEVKAAAPTPKAVSA QHSVAHVALTMEQVDDGDEWYDLNEIDHSSNPRREVNGEV NHSVVPFVPPSITDGEQYVDNNEVSVERPANQKADSPDTET
 RHDSPTDPTVA



GTKGELAAVLATLLFLATAKHTAVNNTMLDAYGFDPNGAF RSVSDLADLMAHFGFIASMAHHTVNLNELDEGGVLPFHP SSHDELVRVLTHFIFQNAIKHHFMNGQASWHSIAPPFHAP S NADDLVRVLTHFIFQNAIKHHFMNGDASWHSIAPPFHAP RAQLVDVLTHVAWVTGGAHHVMNQGSPVKFGVLPLHPA $N T V E E V V K F L M G I L Y L S G I V T S A L R D P M F D E Y G F P A Q Y P G$ MSRSTLVDILTHVAYLTSVQHQAMNNNDQFDSSLLPMSPM SNATELSSLLTTLMWAMIGQHAATTYPDQEYGGFVPNSPH T GYDDLIKLVTNLVFQSDVKHHFMNGRVSWHSQAAPFSAP DNAGTVIDDTHHAHLVSIVHGTLNSNALFSSGSLPFHPF D K ETVVDILTHFAYLVSVQHGVLNTNSPVASASLPDHPG
 DSDE ELVDTVARTVYWMSVNHGFTSLASFMKGGALGFY RSIEELVDIVSRIVYWMSVNHGFTSLASFMKLGALGFY STRRELINTVTHLIYWMSVNHALGNFGALGYYSSLPLDPN GGKGQLRQLLTRLVFQSVVKHHAMNGEVTWTTVAMPFSAA T GYD DLVKLVTNLI FQNAVKHHFMNGRIVTWHSQAAPFSAS KTVAA LRDVLTMFIWQFSVQBTVVNDGAYNHAAFVPNAST LLFDTLVDTVTRLI YWMSVNHALDRFPSFDKLGSLGYYSD DTLDELIDDVSRII YWMSVNHAFGSMVSFMKLS
RNLK
 RNLKDVSELLAQULWDSGVEHHALNFRQLNFDLVYPSHP NDIE YLKQFCRFAIFHVTLWHSWVNDSQTDAGGEVLYSS L
 GEMEALKQLCRYVI YFATFRHAWANNLQWDDAGEVLYACLL VTREALKQLCRYVI FFATFRHAWANNLQWDDAGEVLYACL KAVANLKQVCKYVIYQTTYWHSCDHNEHNPEFA MTHENLKQACAYAIYHATIWHDWRNDNQANYGG HLAE E LPAELSAEDFWDATVANDAVTAGHEQVGTVPVYAQD TQDD IFVRALTSFI WDVSVAHSADHLGQYQQN NSKAALKAVVTSVLYRITFHG GGLRNVGAPVPPFAPNYPP ETMEELRDCCVFI IYQAVFRHAWIHWKA W

## UniRef90 K9R046

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UniRefto M M S 131
UniRef90-G9N3X0
UniRef90-K1WJB7
UniRef90-SOE1N4
UniRef90-U6IMN5

ANYSRPDTP $\stackrel{570}{V} \mathrm{~N}$
K $\square \mathrm{Y}$

<br>600


SFNQPLPETKGG DESLIPWLHNETEALKQASLLVRF A LYKDIPTAKGVTNVADYLIPVGPVLDMDQNQ
 SLGYQAPPASKGSVDATFLPKLDKVETQLGGAALDAREGFAA





 $K \ Y N V D G V T G F D P I K$ SLF GSPPSDPGVSEASMMSNAPNEVITSLPNRQMTVVVVL
 A 1 Y K P VPT QK G $\square \mathrm{T} \mathrm{D} \mathrm{V}$ AS YLP P LS K CLGFLTVVGA
 S L Y Q P L P D K G $\square$ S S L M S F L P D L E A S I QQL V TAFN QAQMA GT



$\begin{array}{llllllllll}S & L & Y & R & P & L & P & T & E & K \\ A & G & \\ A & A & P & L & P & E & E & K & G \\ A & V & A\end{array}$


A M N A APPTAPDVTADMVIRSLPDPFDLSDPANTVLPQDGF
 A L Y S K P L P T K K G V EVVN


 RLFADENGEDKYSTLMFGNK
 A F Y S P L P T T K V I M AFYRPLPTEKGT@AS A I WNK KLPTK
KLYS DPEFVDSYPH R G H P I E P THPYSERDWLNVCPPMNVGAGLFF


ILLYHDSEFKNNFPY
ALYNAPPTEK GVEVDPFDYVIPSNVFQLLT
LMY $\quad$ P LIPA GKPSSQQWKPA DVLA CLDPSQTATYPT LGNMN
RTPRNDEVKS QQDWLN
$V C P P L N A G M G L F$
$K \square L A P L P A S T G T L T D D T M S G N Q A S A A K T S A S Q \square S T M D \square G T$ A L R N
GLLR G DKKE G $\square$ F LIPEND YS $\square S \quad$ P D L T R A T QMMW
$G L R N$
$K Y Y D V D G V A G F Q$
C LQSTT IPDPRA
GL R WGK A G A L S TEA D H
$G L R W G K G G A L S T E E D$
PERFPTGSQSTTQVN
PLPTSELLKTY LDPNAGTLGQL


ASFCAAFAWKKGEMMATKQAALNAAVLMAFTSPMPPDMRKT



UniRef90 K9R046 UniRef90-ATS208 UniRef90-T1FQA1
UniRef90- SOF3P2 UniRef90- UPI0003339EFF UniRef90-L2G8T0 UniRef90-J916F9 UniRef90-UPI0002743504 UniRef90 F6R494 UniRef90-AOA010QM65 UniRef90_F2z929 UniRef90 M3AZH4 UniRef90 UPIO002652D1F UniRef90-M2NA54 UniRef90 ${ }^{-}$W9WWF7 UniRef90 E9EHR8 UniRef90-W71036 UniRef90-A3ION9 UniRet90 W6PR13 UniRef90-S8A0S5 UniRef90-F9FRH4 UniRef90-G2YVY5 UniRef90 W3XA02 UniRef90-UPIO003FOEAEB UniRef90-C3ZEB5 UniRef90 UPIo002744F5D UniRef90 L7 $7 \mathrm{HX92}$ UniRef90-M7SZA4 UniRef90-Q4WA38 UniRef90- S4RCZ7 UniRef90-ROIM76 UniRef90-M2TYC9
UniRet90 B3S833 UniRet90 G7YRY4 UniRef90-G1XMM9 UniRet90_M7TFK6 UniRef90 M3B6Q0 UniRef90--J9INR4 UniRef90-S3EOX4 UniRef90 UPIOOO3FOD242 UniRef90-U610T6 UniRef90-W7MIM5
UniRef90 K3X954 UniRef90-N4VUR5
UniRef 90 M M 7 SI31
UniRef90-G9N3X0
UniRef90-K1WJB7
UniRef90-SOE1N4
UniRef90-U6IMN5

610<br>620<br>630<br>

A MF QVQF CQLLTLQPTKT LMELDDDK DSCPEAYNGLMK DL MTWQMGRRQPVMVALGQHKEEY FSSAEPKAVPSFHF LLARFNRPKTVENNEHMFDVETLLSGEAVKAANEQFMKAM IS WQLSRHQPDMVAVSQHKKEY FSGPQPKAVLKKFR $V L W T L S R E P D D K R P L G H F P D D H G F V E E T P R R S M Q T L R R C L$
$F N R P L V V E K N Q T L R Y M F N A E S L L A G T K K A V A A N D R F M K D M$

 FTKL K L S M M
RFPQFVGTNRTLMHMFDDQAMLGKMNAQTAASAFMSSM GTNR MHMLD



VMAGTADVDYR TWGDGQR LYGYPVSQPKQVQAVNGYHDGL GTNRT LVGMFDSDELLARSHPSARVANEDFKSTM YSWFTRQVPVNASALHFYEGEPFTSEAVLAEPDQEFQQSM WFSREVPVNASALHFYEEEPFASETVLAEPLRQFQQSM | $L L A R F N R A Q V G D R K Q T V R P D L L A G N G P G Y A A A N A R F V E D T$ |
| :--- |
| $Y T R L A S R V Q$ | YTRLASRVQ QSVLGQY ESDFDFKKKAVVLLDQFRHDLD




```
FSRTFTDLPEDWRSLGKYPKGQFKHDYNVYPLLDVFQSQL FSRIIFTDLPEDWRSLGKYPKGQFKHDPNVYPLLDVFQSQL TPW HRSLGKYPQGNFMHDPRVYTHLHEFENKI SALIN NRPRPEATTLKSVYNVAPFTDDSRLQPA I RAYDAEL
```

FMDVQDNASVTEPS DDF LDQTYGFVNPQDRDAVFEYYRDV VFSRIFVDLPNKWHRGKYPKGQFMHDPDVYQHLSRFQTRLL

P LIEFF $\square G T Q G Q K T G R \square T N \square Y$ S D TEDKRTAKAA $\square$ A $\square R Q R \square$
FSNLLSRTEYGF $\square$ TRNEEND $\quad \square$ D P $\square$ FAELLEKRRTAF


EEDDWSFLFPSEWKSADVPSP KARADAAYNQFQADL PPRSVEHLYNTWYGFDHPTLDQLNKLFLEQL


UniRef90 K9R046 UniRef90-A7S208 UniRef90-T1FQA1
UniRef90- SOF3P? UniRef90 UPI0003339EFF UniRef90-L2G8T0 UniRef90-J916F9 UniRef90-UPI0002743504 UniRef90 F6R494 UniRef90-A0A010QM65 UniRef90_F2Z929 UniRef90 M3AZH4 UniRef90 UPI0002652D1F UniRef90-M2NA54 UniRef90 ${ }^{-}$W9WWF7 UniRef90-E9EHR8 UniRef90-W71036 UniRef90-A3IQN9 UniRef90 W6PR13 UniRef90-S8A0S5 UniRef90-F9FRH4 UniRef90_G2YVY5 UniRef90 W3XA02 UniRef90_UPIO003F0EAEB UniRef90_C3ZEB5 UniRef90 UPI0002744F5D UniRef90 L7HX92 UniRef90_M7SZA4 UniRef90_Q4WA38 UniRef90 S4RCZ7 UniRef90_ROIM76 UniRef90-M2TYC9
UniRet90_B3S833 UniRef90- G7YRY4 UniRef90-G1XMM9 UniRef90_M7TFK6 UniRef90_M3B6Q0 UniRef90-J9INR4 UniRef90-S3E0X4 UniRef90 UPI0003F0D242 UniRef90-U6IOT6 UniRef90-W7MIM5 UniRef90 K3X954 UniRef90-N4VUR5
UniRef90-M7SI31 UniRef90-G9N3X0 UniRef90 ${ }^{-}$K1WJB7 UniRef90_SOE1N4 UniRef90_U6IMN5 UniRef90 UPI0002E5F647 UniRef90- F9XFM8 UniRef90-H3GN17 UniRef90_G4ZNJ8 UniRef90- J3NWC7 UniRef90_G4V9T8 UniRef90-M1VX01 UniRef90 A7RUD UniRef90-H3GV31 UniRef90-ROJZ09 UniRef90_M7T7J9 UniRef90 K3XCQ7 UniRef90-UPI0002B41F37 UniRef90-UPI0003654A12 UniRef90 UPI0002F51A96 UniRef90-B1KQS7 UniRef90_G4YSK3 UniRef90_UPI0002B4B7C UniRef90 G4ZRI8 UniRef90_UPIO002F06626 UniRef90-B1KF56 UniRef90 R1IHX9 UniRef90 W7TYD4 UniRef90-B7K2Q5 UniRef90-S2DPW9
UniRef90 K8Z8I5 UniRef90-B4VU87 UniRef90-B3S831 UniRet90_UPI00037B80E2 UniRef90 Q1DBH8 UniRef90_L7U4Y6 UniRef90_K9UBW3 UniRef90 B0C6P5 UniRef90 R1DTS5 UniRef90-W8UK02 UniRef90_C4URV2 UniRef90 UPI000360E80A UniRef90_D3AWS6

| $E \square{ }^{650}$ |
| :---: |
|  |  |

EKAHYVIKA RNDT DEDETPHLAPYEF LDP T R S WP $\square$ A GFPTS $\square Q T$ R LLEMPYEYLKPS $L M$
 EELAALDEELRSXNATRDMPYKYLRPS DQISHDTRQRNQNLPLLAYTYLDPTL GSISRKISGRRFDMPF IWT GMDPGVIP F Y L

QAFSSQVSGRTFGMPFDWQALDPNVAPFSL
QAFSQQVAARTFDQNFVWKALDPNVAPFSI

LADIDEETRTRQFDEPFTWRSTDPRKIPYYL
QAQSQVVKNRKFDMPFLWQSLDPNVAPWSL


A QUS A DVLE WS RGDALPYSYLNPA
NQSSDEVKARRFDDRFIWQALDPGNTPFYL
NE 1 S EQU NDKTFDMPFVWKAMDPAQQ P P FF L
HKLSCEI KERNARLEAVVGKVYYPLDPENVASST
NRYSMAVRSRTFDRN GLCGGMPYSTLDPNS
DRYSAAVRNKVFDQD GLCGGMPYSTLDPNS
DTIQANLVARNNANVANGHLSYKYLHP
ADAVAQI DANNRDMHHQYRALDPSLMPN
EARSTIFKHRRLDMPFVWKTLDPDVAPWSL
AESEGEFKAYGED TDDGTVVYNVLSPSW
QARSSEVRARDFDQD GLAQGMPFLWLDPET
AVLEKDI EKDNATAQFRYDHLQPSKVDDSI
$M V Q S G V V S S R G F D E R F K W K A L D P Q R A P Y$
LKFSEDVKARK DDGNSYSQ GMPFNVFDPSTAPGD
I EVGK II ES R NKDRDAKYLYLHPSLL
KAASEQIATNNRDLHHKYLALDPAVMPN
SKFSKEVKGRKDGPDGCSQ
QS $\square$ DATIVSVEQGERWPY LLLRPSMLPH
KAFGDEVGA RKDDSNGLSQG MPFNLFNPRTAPGD
E D L S A E I N A R S F D E N F
EEVSRGI RAKTFDMPFVYRNLDPGTVPFYL
$K G R K \square R G D G R S Q G M P F V W N V F D P S T G P$
$T N V N A Q \prod Q R N R Q R R \prod D N Y$ VAQGGDR\PNSVIYP
YARSEAIKSRKFGPD
RDMEHFVNFAEEQEAHPTD TFKPSSLPF
NDMEQFVNFAEEQEMYPSDIFRPSSLPF
GRISREMAGRGFDGK
EDVARQVD $\square$ NNRDMHHQYRALDPS LMPN
EKLSAEVAGRRFDAE
DSLSKDILTEND QRVRDGLLPYPYFLP
A A MEDTVSTAEAAETYPDTFVKPSLLP
KRHSNVVRGRNFGRDYCWTTLDPDTASYWL
DAFGAEVAARGFDMPFVWNALDPDKAMYWI

QDLDDETRAKNSERRWSYDLRMPSTI
QSLDNEI RDKNADRRWAYDLRMPSTI


VK IGEATGARQARDTADY LNAHPGADPETVLF DLIT KNLNTGIEEKNRQRRWGYELMMPSSI
$R A \square S K R \square Y K R E A A V T P K Y T L L D P A \square L P F N \square F$
K E $\square \mathrm{Y}$ VE $\square \mathrm{D}$
$S T L E A S L \square A T N \quad D Q N V A D G H L N Y A Y L F P S L$
ADI $\square R \| L Q D W D Q T G Q W P R N$
$R \mathrm{R}$ V S S R

A R L E
AETEKNLTCRQF
AETEKNLTCRHF
KA DESFIADLQPD

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| UniRef90-T1FQA1 |  |
| UniRef90_S0F3P2 |  |
| UniRef90-UPI0003339EFF | E N S Vill |
| UniRef90_L2G8T0 |  |
| UniRef90-J916F9 | \D A S $\$ S  \hline UniRef90-UPI0002743504 & PVENSVAI  \hline UniRef90_F6R494 & E S S I S  \hline UniRef90_A0A010QM65 &  \hline UniRef90-F2Z929 &  \hline UniRef90-M3AZH4 & N A V S $\square$ |
| UniRef90_UPI0002652D1F |  |
| UniRef90-M2NA54 |  |
| UniRef90-W9WWF7 |  |
| UniRef90-E9EHR8 |  |
| UniRef90-W71036 |  |
| UniRef90_A3IQN9 |  |
| UniRef90-W6PR13 |  |
| UniRef90-S8A0S5 |  |
| UniRef90-F9FRH4 |  |
| UniRef90-G2YVY5 |  |
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| UniRef90_C3ZEB5 | HIP A S I |
| UniRef90_UPI0002744F5D |  |
| UniRef90-L7HX92 |  |
| UniRef90_M7SZA4 |  |
| UniRef90_Q4WA38 |  |
| UniRef90-S4RCZ7 |  |
| UniRef90-R0IM76 |  |
| UniRef90-M2TYC9 |  |
| UniRef90-B3S833 | K N V P N S $\square$ S |
| UniRef90_G7YRY4 |  |
| UniRef90-G1XMM9 |  |
| UniRef90-M7TFK6 |  |
| UniRef90-M3B6Q0 | \P WS L S |
| UniRef90-J91NR4 |  |
| UniRef90-S3E0X4 |  |
| UniRef90-F9FEF3 |  |
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| UniRef90-U610T6 |  |
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| UniRef90-K1WJB7 |  |
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| UniRef90_U6IMN5 |  |
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| UniRef90_G4ZNJ8 |  |
| UniRef90-J3NWC7 |  |
| UniRef90-G4V9T8 |  |
| UniRef90-M1VX01 |  |
| UniRef90-A7RUD1 |  |
| UniRef90-H3GV31 |  |
| UniRef90-R0JZ09 |  |
| UniRef90-M7T7J9 |  |
| UniRef90-K3XCQ7 |  |
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| UniRef90-UPI0003654A12 |  |
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| UniRef90-B1KQS7 |  |
| UniRef90-G4YSK3 |  |
| UniRef90-UPI0002B4B7C1 |  |
| UniRef90_G4ZRI8 |  |
| UniRef90-UPI0002F06626 | P V N V M N T $\square$ |
| UniRef90-B1KF56 |  |
| UniRef90_R1IHX9 |  |
| UniRef90-W7TYD4 |  |
| UniRef90-B7K2Q5 |  |
| UniRef90-S2DPW9 |  |
| UniRef90-K8Z815 |  |
| UniRef90_B4VU87 |  |
| UniRef90-B3S831 |  |
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| UniRef90-Q1DBH8 |  |
| UniRef90-L7U4Y6 |  |
| UniRef90_K9UBW3 |  |
| UniRef90-B0C6P5 |  |
| UniRef90-R1DTS5 |  |
| UniRef90 W8UK02 |  |
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| UniRef90_D3AWS6 |  |








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[^0]:    $\square P S Q T P K G V E K L R K S E L E A D R G N G C G E R K K H D R \square Y D Y D V Y$
    
    
    
    
    
    

[^1]:    NF P C Y R E CLELLRE GK G VY H

