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GRFAQSQTREDY乌ALLAEDIDERDTPYDPEPПGRYNVAPGT GRFAQFNTREDYLALLPESAQRDIPFDPEPLKRYNVAPGT GRFAQAQTREAYLAFLLEKAERDIPWDPKPUGRYNVAPGT
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## GRFSTVANPLDFMSEFEVDG

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GRFSLATEQSII EEQFDVLIQEELSTY
GRYTLTVDGQVVEERFGGLTAEELSY GRYSLTVSLEELDAYYALEEDAAAALISSYGPRFNVAPGQ GRFTLTETDHKDQLLFGFEYA DEGEGVMPRYNIAPSQ
GRFTQSQSAETIT QVFQVAV

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80 KVLLLSERDEHLHLDPVFWGYAPGPPLINARVETAATSRM
 KV L L L S E R N E QL H L D P V H WG Y A P G W W D I N A RVVETAAATS R M
 AI ATILLPDDTERQLQMLHWGLIPRWAKINARAETLTEKPS RVLLLSSESND QLQLE PVVLWGYSPEWWHINARDETAAAGRM $M V L A V V N D G R N N R I G E L D W G L I P E W K M L N A R A E T A A D K P A$ $Q \vee V A V V S D G K K N R L G F L K W G L V P P W K M I N A R A E T A A E K P S$ $Q \vee A A V R S \square P D W G L V P A W A D D L D I G N H M I N A R A E T A D A E K P S$
 $T V L A I V N D G E K N R L G Q L R W G L V P F W K M I N A R A E T L A E K P A$ $M V M A V V S D G K R N R L G E L K W G L V P P W R M L N A R A E T A A A A P A$ QVVAIVVND GDKNRLGGKLKWGLIPPWKMINARSETAAEKPS N I L A V A A GK G GRQAA E L R WGL I P F WK MI NARSE G I E S K P S S V L S V I N D G S R N R L G Y L R W GF VV P S W K M I NA R A E T L A E K P S

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 $M V T A V L C N P E S A H R E F Q K L R W G L I P S W F N A R A E T V A E K P A$
 KILACINDGAHNRLGRLQWGFIPPWKMINARAETLSEKPS QVLTVTNDGQWGLVPFWAKD LKVGARMINAAGETVAATKPA $M V A T V L H N A E \square N Q R E L D R L R W G L I P S W I N A R A E T V A E K P A$ P I LSVVVLEEGARVGRHMRWGLVPGWKMINARAETLDEKPT RVLLLSMDEDTLHLDPVVWGYAPEWWHINARVETAS QSRM
 TVMV L H H P E H H RVVF QL L Q W GL i P S WS K i
 QVLTVVMEED GVRIGKMMKWGLVIGWKMINARAETVDEKAS
 E I LA AV VCDRERNKAGYLRWGLVPSWKMMNARGETVDEKPA
 EVLTVI VEEGERI GKMMRWGLVPFWKMINARAETVDEKAS

 P PVV LD N G ARRFRLMRWGLIPSWVK NARSETVLDKPA PISAIVQGEFKNRAGYLHWGLEIGYKMINARAETLHEKVS

 $M I P A V I A D G G K R R A G Q L R W G L V P S W K M I N A R A E T L Q E K P A$ II L V V L Y N S E S H K R E DQQQLRRWG LIDP S WI N A R A E T V A E K P A


 PI PAVI H D GA KLRRIGP L R WGL K I G WRTMNARAETLRSKPA KVLLL NERDEELHLDPIVWGYGPEWWDINARGETAATGRM $N$ I I TVVGEGKQRI GRQMKWGLVPFWKMINARAEGIDSKPS SVV L S V I N D G E K N R L G Y L R W GL I P P WK M I N A R S E T I A A E K P S DV PVI RMQA DGREL E GYRWGLI PSWKMI SVA TI LQT PEHQDRQFKMLDWWGLIPS WI | $L$ | $P$ | $A$ | $I$ | $S$ | $D$ | $Q$ | $G$ | $K$ | $R$ | $R$ | $\square$ | $G$ | $Q$ | $L$ | $K$ | $W$ | $G$ | $L$ | $V$ |
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 RI LAV TEE G GKR ILRTTFRWGLIPFWS F

 N MLVI PEETPHQADFYRWGLI PHWNRLI
 S I FII I RTE GD RRRFATAHWGLI P F WS M I $M V I T V L H H D E S N K R E F Q Q Q R W G L I P S W W$
 $P$ VPIVFQESPNKVEEMI WGLLIPHWNKLI $P \vee A T V I N A H G Q R R F Q L V R W G L I P S W V K$ $P \vee P V V V R E N G A R H F R L M R W G L I P A N V K$ DI YI I RNEAESRILDS ASWGMI APWHA
 $M L P V$ I RQRRPT GE CVV A H L R W WG LV P S W S M TV PVVI G GEGAGRWLALMRWGLI PHWAK





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 FKHALRRQRCII PADGFYEWKQPMRDKLKSDEVFGFAGLW FRDALRRKRCLI PADGFYEWQQPMRITLRSREPFAMAGLY FRNAFKKKRCLVVADSFYEWQRP $\square R \square K L K T G E P F A F A A L W$ FRDAFKQRRCLILADGFYEWKQPYRFILKEGRPFAFAGLW FKQAFQHRRCLI I A D S Y Y E WK RPMR K K L K S E K L F A MA Gill W FRSAFRRRRCLVVADGFYEWQQPFYFRLQDGQPFAFAGLW FKGPFRRNRCLILADGFYEWKQPYRFIMMKDEKPFAFAGLW YRNAYKKRRCLILADSFYEWKRPMRDKLKSEDLFAMAGLW FKTPFKHKRCLIVGDGFYEWKQPFRFVMEDGRPFAFAGLW FRSAFKRRRCLVVADGFYEWQHPFYFCLQNGKPFGFAGLW FRKPLVSKRCII PADSFYE FRKPLVSKRCII PADGFYEWKRPMRIKLKSDGLFSFAGLW
 FRSAFRHRRCLVVADGFYEWQQPFYFRLLQDGKPFAFAGL FKPLWQNGRAIVEADGWYEWQQPYFDYREDKAPLCFAA G FRKALKDKRCLIVADSFYEWKQPMRIKMKNNELFAMAGLWW FRAAFRSRRCIVPADGFYEWQQPFYIHRPDGQQLAMAGLW FRSAFKKRRCLVVADGFYEWQQPYYFQLQDSQPFGFAGLW FRGAFRQRRCLI PADGFYEWKQPYYDRHHDGEVFAFAGLW W W
FRRVLRRRRCLI

F R HAFKRRRCLI LAD GF Y
FKHAFKRRRCLVVADGFYFWK PYYRFIMKNKKPFAFA B W
FRTAFRRRRRCLIIPASGFYEWQRPFYFTLDDDDDMAFAGLLD
F R NAMKRRRCLVPADGYY



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FRNAYKKKRCLILADSFYEWKRPMRDKLKNDQPFGMAGL W
FRNDMPRHRVAVIADGYYEWKQPFRFQLESKAPFAFAGLY
$F R S A F R H R R C L V L A D G F Y E W Q Q P Y Y F R L Q D G C P F A F A G L W$

 FRNAI RRRRCLVPADGFFEWKQPFRDRRRDRAPAAFA GI W

 F K Q L W P N GRA L V VA D G WY E

## T

FREAFKK RRCCMI I PA D GYYE

FKQSFVKRRCLILAADGFYE
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FK S S F E K H R C L V LA D S F Y E WHVP Y R I LQ G GKPFAFA GI Y

FRTSFKQRRCLI PADGFYEWQQPWFISLRNREPMAFAGLW
F R A AFRRRRCLVVADGFYEWQQPFYFS LQDGQPFGFA GL W



FKNAMKRRRCLLPVDGYYEWHQPFFI RPRNGGLIAFAGLS
F R HAFRTSRCLI PAS GYYEWKQPFY S SNND GNQLS $\square A G I W$
F K N A F K K S R C L V P A D GFF E WK K P Y R FVVF LD E S L F S FA GI W
F K N A F R Y R R CLI P P A N G F Y E WK S T G N R S R Q A M C L F A M A G L W
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 DTWGRGEDLLQSCTVITTRANETASDVHDRMPVVEPEEAY DEWDKNGEPLYSCTA1 TTTPNELTQEVHNRMPVILEEDAY EKWKNQGTPLYTCTIITTKPNELMKDIHDRMPVILTHDHE
 EKWUPEQEEETSCTILTTDANELLQPIHNRMPVILDFKDY KTPFDANSEAEGFVIVTAAADAGLVDIHDRRPLVLTPEAA ESWSPNGK VVTCTILTTEPNELMSSIHVRMPVILKQADE EHWMPPGEPLLTFTLLTTEANDVMRPLHDRMPVVLHEEDV EQWEETGQQ| DTCTATISANSLMAPIHDRMPVILKPEDY
D T WS P A G A


DTWFDE GRKVSTCTIITTTEPNELMAPI H D $\square$ WNK GKAP LLDT C TTI T TGPNEVVTE EVV
 E R WQP DGEAI E S CTTLLTTEEANELMMRPI H
 EAWTPNGEELETACIVTTRANATLAALH



 E L W R P A G E S L G T C T I V T T E P N S S L M A S ill H


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 QE WL R PAN QD DR Y L E S $\square L L K P Y P S D E M E A Y E V Q S L V V N S P K$
 $D$ L W L D P E V Q S L P A L Q S L L S P P Y P A T A M T A Y P


 E T WLL N PN NN QA T S V LT A L L K S Y P P E K M K A Y P V D A WL D T K L L D T D Y I K S L L Q P Y P A E E M K M Y E V S T IVVNSP K $D V W L D P E T P D E T V Q A D L Q Q P F A D E P M R L Y P V S R R V N S P K$ A W WL D R S $\quad$ E D S DVLK S L L L P Y D S E Q MEAFEVVALVNS P H
 EDWLD P R LDD D E Y L K S L L R P YP S S EMRMYEVAPLVNSPK
 A R WLL D C A A V SAA E E A A MLLLDHPP A $R \square W L S \quad R Q E L T R S E D S D M L Q P F E A D H M Q A Y E V V A V V N S P K$
 $D \square W L$ S REATSEE $D$ T P L F QP YP S DLLAAMYPVGTGVNSPR

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 D L WLL N P QMMK QQE S L E ALLL C P Y P T E E M TA Y P V V

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 D A WLLDP SFHDTS SLLKKHLTAAA EDFFEDTAVVRRVNHVA D S WL D R S IS ETA QLLHQLLQPPFPSEKMAAYKIISSLVNSPK
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 A R WL D P A




| QUERY |  |  |
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 GRYS L S K S K S DLLE ERF QA EMLLS DFK

GRYSLNKSKDELLE ERFQAEMLGDFK PR R N NIAP TQ GRFAI TLDNDAMA QLFAARPANDLP PVPNYNVCPTN





 GRFNMLATPEQLLETEGLE


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




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40 Q Q

D A AFTPRYNMAP GQ NWK P S Y N I A P S Q $D N F G Q S Y N$ A A GQ















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M|V|SAVLQTSDRRELLQQLQWGLI PSWAK|I $P \vee G V V R V H P Q R R R R E W A L V L W G L I D S W I N A R A E T V P E K P A$ | $R$ | $V$ | $E$ | $V$ | $I$ | $R$ | $R$ | $V$ | $D$ | $E$ | $G$ | $L$ | $S$ | $V$ | $D$ | $R$ | $V$ | $K$ | $W$ | $G$ | $W$ | $S$ | $P$ | $F$ | $W$ | $D$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $V$ | $L$ | $L$ | $L$ | $N$ | $Q$ | $R$ | $E$ | $D$ | $T$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $L$ | $C$ | $L$ | $D$ | $P$ | $V$ | $Y$ | $W$ | $G$ | $Y$ | $G$ | $P$ | $E$ | $W$ | $W$ | $N$ |  |  |  |  |  |  |  |  |  |  |  | HI PAV DHD GRQNRLGELDRWGLVPSWRMII




 $P V C A V R A G E A T R R E A V F L R W G L I D S W S$ ${ }^{2} 14$
 DV A V I I E V F V V Y E D G D L R R L D GFHWGLVP GWRM
 S V A A V L LA P E R R D R E L K M L R W G L I P A A GILGI A Y Y E N S L VP MF L K WG LI P HWK M $M$ I AT V V T R H P T R R V R M M R W G F V P S WA K I


 L A P V V T S D K P D V I D V F H F GLLV P H WY K M I



 $P$ V A V I R Q Q H Q P R E F R L M Q W G L I P S W A K I NA R C E TAA A E K P S $T$ L $P$ V I T N A N P N R F Q E LL $L$ P I P V V I I E N G GR H F R L M R W G L DP S WV K
 A L P V I T G DE P E T I $\operatorname{CR}$ R R M E W GLLV P S WF E F


 $R V E I I$ RP T E T GLLSV DKVRWGWAP FWA Q I



 K I M A V V S D G S Q N R L G D L K W G L I P P WA K I I A R A E S VA D K P S PIGVVIFGE QSGRHFQLMRWGFIPAWVKINARSETVLEKPA

 WI P A I R E E P E A N R L G E L R W G L V P S WRMMNA RAAESAA E K PA





 QV LAA I I H D GRRRKRAGY L R WG LI P S WK MI NA R S E TAA QKPS $K V L S I I H D G K E R R A G Y M K W G L V P S W K M I N A R S E T M H E X P S$

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

 $P$ I L IVME GERWGF LMPGWVK DP K D F P L L I $P V V A I R A \| A G L R R A D P L R W G L I P H W S M I$


 N A R A E S V D T K P A


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



 II PVI RKPDAGRVGQLVKWGLVPSWAKNNARGETVAEKPS
 $K \vee P V V R F T G S E A S D D P A R W G L L P S W K K F N A R G E T V A B E P S$
 $N L P V V R R D D D G E G F V L H C M K W P D F Y K M F N A R S E S V T E K A S$


 $P$ I L V V M T S E R W G LI P G WV K D M K E F P L LII N A R S E TA I G K A S $P V L A \operatorname{A} \mid$

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 KAPYNDPHGHEGFLIVTSASNKGMVDI HDRRPLVLKASAV EHWEPTGELLETCTILTTEANEVLRPIHERMPVIMHPDDY QVEPPSPDEPPGFLI ITSDAAGGMVDVHDRRPVVLSPEDA ERWEPEGPTVETCTII TTAANAVLAPIHERMPVILAPDDY DEYENKGETEHTFLILTTSPNEVVSEVHDRMPVILDKSDE
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WTPDGQKTSGLAIVTTEPNPIVAEIHNRMPLILKPEDE
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 ETWMPNGEEVDTVAIVTAEASCDVSSLHHRMAVVLPPESE ARWTPPPDPRETFAVVTTEPNSLVADLHHRMAVVLSPDEE
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 DTWSDPGGEIDTGALLTVPANRAMQAVHDRMPAILEEQDF EFWDDPQKWLVTCTVITTDAEDQLGRIHDRMPMMI ERERW DTWVADGTKLHTCTILTTAANDLVAEVHERMPVILPREHE ELDSPEGEWVWT CTLI TTAAPDDLGRI HDRMPMVVTPDRW
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 DRWKDQNEEVISSCTIITTEANESMQSIHHRMPVILNKDNY
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$D L W / L A P Q V Q T P E M V Q Q L L \quad Q P Y P S E A M A A Y P \mid V I S T A V V N P K$ ATWLGDGTPAQLAQLKHLFRPFPAGRLKLYPVSSYVNNPR REWLDPATSGERLEAVVEFGCRPAKDFRWFPVGKAVGNVR PD WL NPATHPGQAQEIAHDASDPAEAFSWHPVSVSVGSVK SQWLDRNNQ EEPELMKLLVPYNAEDMRAYPVSAAVGNVR



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K MWLEPDQNPKDLLKLLN

 Q R WL A GEAADGKE LLDE

 A R WL D C S E D R A E P V MA LLVGP Q E E G S FA WHEVVSTRRVN H A D
 Q Q WL T G DPDAVVESLLDD R E WI K Y D V E HI R A EVV LA M E C C Q LTTE D F E WF P V S K IVVGNVK
 REWTDPSTAPSRAAE $\square A R E C$ CTPDVEFEWYTVVGAMVNVR



 A A WL D T GQVVRAE EARRLLLRPVADDYM E FDPVVSSRVVNSAA

 D A WL D P ALLTTP DEVRS LLVVPAMA GTMDAYPVVAPLVGNVR A T WL D P D A T DVT DVVAEL L APPPDLD DALEDRPVVSQAVNSVR D T W L D GP STSSN D A WLLD P S LT EP DRVRGLLVVPAMAGTMDAYPVVKAVNNVK E A WLDPRVVPEE LAPVWEPFPAEAMEAYPVSPRVNSPR
 E E WI E P K SHNSVVDWKYWLDDYEK Q DRLIDHY PVVSTHVNNNAK K E WL Y S S N I VLS E IVSEES QA LMT QK A D WH KVVSTAV NS YK





 K T WL D P HETD K QVLVK LLQQPFDASRMTMYPVVTVVNSPK QEWLDPATPKERAEQMARHQSEPAKTFEWFRISTAVGNVR
 D R WL D P D A P LDE GLLDRGHGDL
 D A W L D P L S S D P D E L L D L L V P A A P G R L

 S E WL A PEPPKSAD AL Q P L L LP Y A DEEMMEAYPVVSTYVNRPT
 A $\square W \mathrm{~W}$ D RRETGT

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 A Q WL ETEDVPK S P A D QHEL FAP VESSDHMVCRPANP VVNNNR


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 GRLS QYRG GHDFVKALSMPNALVNNAGDQPFEFYNAAPT T $G R Y S \square T A N G Q Q \square A L R F G V Q V A G D$
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 GRYAVVTTMD A K L A A E D D A V D D E VP EP E D S A P GP N Y NV A P T T
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| GRFVNSKAPEELAEI FAAE RLVLATRLGP |
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G
GRFVQYRTA DDYLQA LGRSETPLASGDDPVPDARYNVAPGB
 $G R Y V L D A T E Q Q\|I D H F S L R \quad R L A N Y Q P D Y N\| P P G Q$

 GRFGIS A NAEQLA LLLLE ITTPSEV



 | $P$ | $N$ | $Y$ | $N$ |
| :--- | :--- | :--- | :--- |
| $P$ | $R$ | $A$ | $P$ | GRFSLHTS PRVI QQVF KLD S

GR Y A L A V P 40 $T D$
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K V L $|A| V \square H N G K E K K A G F M Y W G L V P S W K M \mid I N A R S E T A H E K P S$ A MPIV MASAQPRVLRRLATWGLVPRWRMINARAETVASRPA LVVHAV QA GEA GRQLVAMRWGFGPHWYKI NARAETI A EKPA SVPVV GNDAPERQQFRTWGLLDPSWHGYVNARAETVVEDPS PI LAAVT P H H S K PLR WWSK DPTDGS RLI NARAETVISEKPA
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 $R V Q L L H E E T E G D R F D P V P W G Y A P F W P V I N A R V E T A A T S K M$





 LMPVVTNDGA RMLDAFRWGLVPSWAKI NARGETVAEKPS DAP I V ID D H R H R Q L L M M R F G L I P F WS K DI N A R V E T A K E K P V
 $P V A V L$ REDDAGPRAD LVRWGWRPHWAPINARVEKVAHGAF PVALLHLENGLLDADLVRWGWRPHWPPINARVEKVANGPF KI LTI V E D D Q S R K A V Y L Y W G L V P S WH LI NARAE TI R E K P S RVWAVLERTPRRQLRPLRWGLVPSWRMINARVETVHEKPA $T V M T V V K R H S P L R I R A M R W G L V P P W A K F N A R A E T A A E K S S$
 QVPLI RFD GEVATLDSARWGLLPSWKKFNARGETVAEKPS TVPIV VERGGERSVRPVRWGLVPTWPMDNARAESITTTKPA EVVAVVVERPPQRQLRVLTWGLVPSWRMINARMETVABEPAB QAA LL HLQ GD LLHADLVRWGWRPHWAPI NARDEKVABGP F GLPVIT DAEP DTVQRRFEWGLVPSWADDI NARAETIIDEKPS HGLVVYRQWGLVPFWTKRNPDYGNKLKTINCRDDSLVEDRG
 SLPVI TNDAPET I DTLEWGLIPBHNRPI NARAETVAEKRS $N \mathrm{~N}$ L A 1
 QV P A V L T R D P VREL RT L R WGLVPSWRMINARAETVHEKPA QI LTVVVERHEHGHLRRMRWGLI PVWTKFNARADKAAT TNS
 WLPVVRQRNGERVI HRLRWGLVPSWAKI NARGESVAERPS PVVAVVVQRHPKRTLRVMRWGLVPKWRMINARSETVIVKPA RLIPVI ANDDPKT FRRRLEWGLVVPSWAE DI NARAETI DEKPA QVTTLRLEGDALVVQAIRWGWRPFWAPINARVEKVAHGRF QVYAVLERPGDRQLRVLNWGLVPSWAKTNARIETAAEKPS QLALL HLENERDLADAVRWGWRPHWEPDNARVEKVABGPY $R$ I F TVVVSGA Q GRRVGA MRWGF LDP H WY A I N A R A E T I A D K P A $P V V V L$ RVDGAGLRADRVRWGWRPHWPPI NARVEKVAHGAF $N V P I V A E R L D D R R L L I A A R W G L I P S W A K I N A R S E S I L E K P S$

 DVWAVLERAPQRELRPDRWGLVPSWRMINARVETVMEKPA QLALL HLEPD GLHADSVRWGWRPHWAPINARVEKVABGPF PI LMMVSGGEGRNALLVRWGLIPAWVKFNARGETAAEKPA TL PVI TDEEPDKVRHL EWGLV PRWADYDNARSETVSEKPA RVLLI HADAD GLLRME PVP WGYAPA WA QI NARVVETLASSRF

 HGLVYRAD GPEPFWTKRNPDYGSKMKTVICRDDS LIDEDRG S LAVLHQHDRRLYADNLRWGWRPHWAPINARDEKV ANGPG PVVVVLGRNGRKHFT LHRWGLIPNWPIHNARSETVNEKPA LAAPIVRHNAERRALHWVRWGLVMPSWAKINARSETVVNDKPA PVWAVLERADRR QL RAL R WGGVMSSWRMINARDVETVGEKPA NVIFSVVQRHPRRTI RVMRWGLVPMWRMINAKSETVTTKPA $M L P V V R Q R P G G R V V H L L R W G L V P S W S K I N A R A E T L A E K P S$

 P I LAA R K K E GKNDAALLRRWGLVP HWAK I NARAE TLAC S K P A P IL L V RAERGQRRPALVVRWGLI PSWTKFNARSETAAACPA

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DYLE
EVHPGDE TYASADGSELDTAALLT TWSSADGSQI DTAGILTTSANGLLQPI HERMPVVVQPEDY EHWSPDGTVLETFSILTTSANKLISGLHERMPVILQPDTY

 ETWRDPKGETDTCSI I TTDAVGPLADVHHRMPLALPSDRW DAWYPDGSYIPS LGGITTSANDFIQPLHERMPL LLNPS L Y EVWGRGDDRLYTCTIVTSPAVGALTEI HERMPLVLPPDRW $E R W E D G D D V I E T F A V V T T E P N D L V A D L H H R M A V I L D P G E E ~$
$R F Q R G E P R D G D G F V V I T S S S A A G M L D I H D R R P L V L S P Q Y A ~$ GLTFQRGGD LHFVIMTSAANEKLSEIHHRQPLVIAADAW
 E E WN A GTTPDATTFTVITTTSANSMAAAVHNRMPVILEPBETE QFHRQHEHEDDGFVII TAAADEGMDDI HDRRPLVL TPEAA ELWPDPTRWDWSCTVI TTEAEDSGGRI HDRMPLMVERERW ELWRDPDRWVWSVTVLTAPAADALGHIHDRSPVVIPDGDR EQWПPETTQI DTYAVLTTDPNEPVEQLHHRMAVILEPEDE


D WENEGEKLYTFTI ITTSSSSALGWL

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 ERWQPPQDPVETFTIVTTEPNAVVGELHHRMAVVLQEGDE EKWNPVGNPLYTCTIITTKPNELMEDIHDRMPVILXDENE SVWRPGQPPLLTCTII TTMAVGELAEIIHDRMPLVLDEADW ELWSPDDAWVWTCTVI TTDAPDDLGRI HDRMPMVVRPDAW SVWRDRTEPLLSCAILTTDA $\quad$ GDLLTRI HDRMPLPMPQEHW
 ATWRDQGQPLVSCAVLTTEAVGELAGIHERMPLVLPRHHW ERWEPDEETTQTFTIVTTEPNDLVADLHHRMAVILEPESE QFPRLDGDERYGFVII TADAEGGMVDI HDRRPVVLSPDDA ELWRNPAHWWWSATILTTESTGALRDIHDRTPMLVRPDAW QYPDAPHREHDGFVILTADSAGGLLDVHDRRPVVFSPEAD QT WGPEEARMPTCAIVTVGAGPDIAAIVHRRQPVI LPS DQW
QF EFWPDPERWLLSCTVLTTTTQDALGGHVHDRSPVILPKDRF EKWQPTGE IIESATIINTQARGIMAEIHPRMPIILKKCAY
 ERWTPPARQVESFTVLTTEPNAVVSPCLHARMAVVLRPDAE
 E RWP E GVVEPLDTGTVLTTTSSSGLVABLHERSSPVVIAAPADY RFPREGAREGDGFALITRPSEGRMGEVHDRQPLVLGADMA
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 NRWLSRDNNDI ANLAELF L P YPSDLLEEYVVANTVNHVS
 A A WLDPDRADATDLLRPPEEP WVDTLELRPVSTRVNSVR DTWLNPAAQNPQELQLLLTVPESEIEELVMYPVSRRVNKPE
 A RW DRWLGCRDLEPREVADRMCKPAPDDFFEAFPVSKAVSNAR REWLDPATPKERAEQVVLLQGEPTETFEWFKVDQAVGNVH

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 KEWAAP VPGLGDGELERGGKPFPSERMELYRVSREVNDDAS
 REWLDPATSRNRAEQLVLFQGEPSEVFEWYRVDTAVGNDR HQWLDKTAEPDHAFELLLANQAY A QMATTPVVSDWVNNPR DAWLDPAHQDPEALRALLSQPA GGHLDAREVSTAVNNVR D D WL DP D HPAPGELFAPPPQPL AEAIEDREVAPLVNRVS
 EQWVRGTP EEALELVHPSRVAGELSYRPVSKAVGDVR A D WLDPQRTEVPELLS P P P PGVLDELVLHPVSTEVNSI R
 QEWLTGDDPKALLE RTWLDLSRTEWNDDLQSLLRPF GGKLECYPVSKDVGKVG DLWL NPEEHNDTKLRNLMQPAAPGGLLSMHPVSKYINKAW PLWLGEADKGAARLLMDAPDDLLSWHRVSRAVNSNR WRWLDDG DAELLQPYPDDEMTAYPVSAAVNDPS KQWLNPKNTDPDYLQSLL LLPYDADDMEAYQVSSLVNSPK
 D A WLD P D HPAPASLLETRSVEEVIAGEMDAYPVVPPRVNNVR
 WA WL NGATAADQVQALV RPCPEAALAVYPVGRAVGNVR DRWLDPDNENVDELLNPPGHDLVNGLALRPVSRAVNNVA
 D A WLS P GQEKPA GA LREMLIDPSTEELVARPVSTAVVNVVR REWLDPATPKERAEEMALSQGE $\square$ SDAFEWYKVDKAVGNVR
 AFWLDP DMTDKADVQR LLD SDPEPT LTPR VVSTKVNSVR


 H E WLL D P A T P K E R A E Q M V L M Q G E V S E V F E WY R V D K A V G N V R ER WLLDCRNYEPREVA DLLAAPPPADFFEALPVAKAVSNAR A AWLEGE RA WI D P R RTPA QAEE IALHR GMPSAA F E WY P V G LAAVGNVR
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$G R F A L A D V R T R L E E H F R A E L D$ GRFAQYQGQADYLRELDAGQDVISGYNNVPDGRYNVAPGS

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DNFQPRYNIAPTQ

RFALYAS LKMMMEKYH
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 L L P V I T A D A P E GLLS WF Y W GL I P S W S K N I N A R A E T V E E K A S $\bar{N} V L T V V Q R H P R R G L R V M R W G L V P F W K M I N T R A E T A A E K P S$ $N V I T V V Q R H P R R S L R I M R W G L V P F W R M I N T R A E T A K E K P A$
 EVLAVVIDDSGRRRGRLLFRWGLVPFWAKVNARIIESAADKPA $R V Q V L H N A A D G L R D D P C H W G W V P F W A P I N A R V E T V T T G K F$

 Y Q P I V REDTGDRELA QARWGLVPFWNTINAKAETLSTS PA DVLDCLDKTNHWGLI PSWATDRKKDGSILNARAETLIFEKPA
 A VATVVSRHPTRRVRLMRWGLVPPWTKINARADKLTTSPA NALVI RAHEAKRELTLMRWGLI PNWSKFNARAETLDTMET
 HGLVVYRENDP QY KL Q S M Q WGLVVPFWT K I N CR D D S L V V E D R G
 S L P VI T A D E P GT I QRME WGLI PS WF EF IN ARAETV T E KR S $N V V T V V E R H P R R S L R V M R W G L V P F W R M I N T R A E T A T S K P A$ $R V E I I$ RP T A E GLLS V DKVRWGWAP FWAP I NARDVEVMTGKF
 $N I P V I V Q Q D G L R S L E M R Q W G F I P F W P M I N A R A E T V S E K P G$ QVLTVVVERYDRD HI RAMRWGLI PVWTKFNARADKAATTAAS PILVAVVSNPDRMAVLVRWGLI PSWVKDNARSETANEKAS
 PI L MALSSGPPSRSALLVVRWGLI PSWAKFNARSETAAQKAS
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 $V M N T G \square W \square R F S$ GYAPGWWDKPPDLINARDETAATSRM $T V M T V V Q R H E H R R V R A M R W G L V P S W T K F N A R A E T B A D K P A$ QVA A RLVGED LVA QLVRWGWRPFWAQDNARAEKVA HSRF E I L A A A A I H T A P KA C FF H WG L I P H WK P I N A R A E T I A D T M P QAAVVLTRRPRRQLRMLTWGLVPAWRMTNARAESVLGKGA GVGVVTSDGQGRRYRPMRWGFLPHWYKDNARAETI AEKPA
 KI LA I V QEDGSNRAVNLHWGLI PSWHLINARAETLITEKPS RVL TVVVRRHDHDH IRRMRWGLVPVWTKFNARADRAATAPS
 EVWAVLERAPRRRLRPVRWGLVPSWRLINARVETVHEKPA SVLLAVVVERHPRRSVRVMRWGLVPHWKMINARDESVELDKPA $N L P V V R R E D G G D G D G V V V H C M K W H Y K M F N A R S E S I I C E K A S$ EVLTVVVERHDRENDRRMRWGLVPSWTKFNARADSLAEKPA TVMTVVVKRHDP LRIRAMRWGLVPAWAKFNARAETAAAQKS S
 QV GVI TQ E GE HLAAYSEMR WWLVP S WWTFNARSE DUA SKPM DIVTVVVERFPRRS LRDVMRWGLVPFWRMINTRAETASEKPS Y GAVL R A D GTKYKI QAMKWGLI P F WT K I N CR D D S LLMEDRG PVPLI RERHAGRVVDTARWGLLPPWRMINARSETVAASPA RLPVI TNTHPEQI QLLLQWGLLEPAWPRPI NARAETLAAEKPS
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 D L A VVR F NPR WGLVVPSWEK D LIK G GA K LI NAR SESLAAERRS
 I SPVVRRNLDTHEMEMFPSLWGLVPSWFNARVETAHEAAS
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 E F E D D E G D M V H T F T I L L T T K K A N S T L E SWR D P K S P L L
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$D T W T D P G K G I E S F T$
 D R WK DK G I WLLETYTLITTTDPNELMEPFHNRMPVIVVPPADY DTWQSATEVI HSCCLLTTTEANSVVMQSVHHRMPVILDCEGQ

SVWR GGPRCDPSVTII TTGAAGEIIA GI HDRMPLLLLPEKRW
 SPWGP EAALLTTCSVLTTTAA LGGGLARVVHDRMPLI LIPRERW DCVQFEGEKLFTYTI I TTES NQQLRFLHDRMPVILES DAD



 S A WR D P N P WL DT C A V L T V D A F GP L A E V H E R M P L L L P R A S F


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 E F WR D P N A WWVTC S V I T T D G P R S L A D I H P R M P L M L T P D R W
 EHYTPDGQVI DSAAILTREATGVVRRLHDRQPAILPAQTH E S WPGTGKVLRTFTIITTSANDMAAPVHDRMPVII QREDW
 W
 STPFERGGDEAE GF LIVTAAAADQGLVDI HDRRPVVLSPBEAA A A WRDDS Q WVS STAI I TT DAVGPLESVHHRMPLIMPVEYW
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 E FWRDPAA WLLT CTVITTEATDAAGRVHPRMPLALAPGDY SVWWDERKP I IT CAVLTADADGEMTQVHHRMPLVLDPRDRW
 S V WR P K D A P R DS C S L L T T D A V G H L R D V H D R M P L I MP F D S W
 D R WKDRGEEVTSSTII TCDANPFMQKDHTRMPVILQESDW
 DCYEDTEDKLYTYTVI TTSSSNSQLKG LHDRMPVILNPGEM TKWR GETLSSSVVLTTAAS GGLQAVVHDRMPLILIPAERW D E WVD R GEVLPTFTUVTTEPNELMARLHHRMPVILPDRAA


 EFWPDP HR WL LSS CTVLTTTTA HDSLGGHVHDRAPVII P P GMY DCAHDDGSELDNTFTILTTTQPNDLMAGIHTRMPVII HPDNY EFESESGKVNHTESLLTTEAADALLHQDFGDRMPVILERDQE SAWGP E T WS S R GSSEVTT SVITTTAALGGLTRVH


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UniRef90 CoZX06 UniRef90-K6VNQ9 UniRef90-G5ZWY6 UniRef90_WOJYoo UniRef90 M5JVC1 UniRef90-C7MXX3
UniRef90 C5FEE9 UniRef90-R4LUV8 UniRef90-W8EUU9 UniRef90-UPIO0047D6628 UniRef90-S9R5M3 UniRef90-Q4KEV2 UniRef90-UPIO004788482 UniRef90-A0AWJ1 DGWLNPDVTEVGELLAPP PAYHRDQTRFYTVSSLVNTAT AGWLDPDRSEVDELLAVPAPPAVVESLELRPVSKLVNNVR
 RAWI DLEVPADQAERLARERGLPVEAFEWFAVGEAVGNVR D D WL NPESPDVMGMKEQLLVGDP EAWLLDPSFRLEHSSI ERWMAPADP ARLPVDLLRPYPPEEFQYYPVSPRLNLVV
 GTWLDP VNHDRNVLPILKSVADETMKAVPVSLSVNAD RKWLDPT RTEWNSEL QSLLLKPY QGEMECYPVSKKDVGKVG D A WLDPDTPLDTALLDSSPQ APGLVLREVSTLVNSVR DEWLNPETRDLSGLINE LLS GE T GPVVWYEVSRLVNSSR
 DAWLTGSSSKVGADLK LLQPYEDPGLVWYPVTPAMGKVG DPWLDPADNDPAAAQ PMLEHFPADEMQAWPVSKDVGKPS A $\square W L H G D D D E R R A L L E P Y$ DGGELAARPVSTAVNDPS Q GWLDPDRTDVAELLAPPEQA WVDSLEVRPVSTKVNSVR
 E Q WLLAPD Q D S K A V A A D L L T P V

 A R WLLD C A R R D P A A L A H DLLLQ S A P A A D WT L E P P V

 D A WL D P H H R N T D DLLRALLSS P L A G G H L D AR P V V S P A V N S V R
 DTWLSSASSF KSVMKPYEESDLVWYPVTPAMGKPS P R WLLD C LS Q E P R EVVA DL M K P A DE D L F E A DA V S DLVV K VA SKWL GEDGKGAATMLMRAAPNDALSFFRVDTAVNSNR EAWLRGGPDEAAALLDDPSSELAAHPVSTRVNSPS

 A R WL D CRTLE PRDVADLLKKPALP DFFEADPVVDRVVKVA
 A A WL D TK H T DRGDI EEVLNNLSPP DMMAVPVGTLVNSPR $P \square W L G E V A G H A A D L L D P P P D E L T L A W P V G Q A V N S P R$

 D A WL D P K L D E V D D V Q A L I N S S L P E P H L E P Y E V S S A
 D A WLDP DHAVDPSYGA PPAAELVDADEDREVVSDVVNRVA REWVDDGATPPERAEQMVLQE GEAPEVFTWYRVDRAVGNVR
 E HWLDPD EQDPAYVQGVLDFSRAGGRFDAHPVSRAVGATR AKWLGEEGKGAALL MKPAPEGRYRRWRVDPRVNSNR


 D A WL D P D HP APA ELLLETPGM QLVSSVVARPVAPLVNSVR
 $P L W L G E A G H G A A V L M K P N P \quad E A L A F H R V D P K V N S N R$ D A WL D P GHRSADGLRALLAPPA GGHLTARRVSPAVNSVR


 Q T WL ERWLTADDPSD R A WL A WA A EPRVDLLVKPANDDNLQAWRVSTNVNSSR A D WL D P A R T DVT D L L A P P E P G WVD E L E L R P V S TVV N NVR VT WL DP HTTTWTVNELQS LLKPY E GELETYPVVKDVGKVG A A WL A GGGEPAELLQPLSPQALAA I AVRAVGALVGNVR E LA WLAE GDVAAHQGLLRPLSDGRLQEYVVSTAVNSPA $P$ T WL A E DTP G D Q QLD FA D RAATVVARSLVMHPVVRRVVGNR $P L W L G E A G H G A A R L L M A P P E G A L R M V P V G P A I V S A R$ WE WL DPATPKERAEQMALQQGEAAETFEWFKVSTAVGNVK

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

 G P W
E R WLL
N R T A P E R

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N N F P ELI LE P $V$
NNGPELVKPL
 NDGPELTARV TDEPSVIA P N N GAALLERV N NGPELLRR NQGAELI ARL S D G P ELLS P NEGAQLI NEGPELLNPL N N D PDLI K P NDSPDDL A R L N E G P E L I Q A
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NNGPELAB A
NEGSDDLI R R P
N NSPSSFLVP I
F D GPECIE
NQ G
NDSPAVLD
N NGPELLERV HQGPEII D NTGPDVQVRV N N GPELL F D NP GCLLKKL NNGPELL $N V G P E L Q A A V$ D D D P GL DE PL NAGPEL
Q DVP A CLER HDGPD LAVPV N N GPELI DRV


 | $F$ | $D$ | $G$ | $P$ | $E$ | $C$ | $I$ | $K$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $N$ | $E$ | $I$ |  |  |  |  |  |
| $N$ | $L$ | $G$ | $P$ | $D$ | $L$ | $Q$ | $T$ |
| $P$ | $V$ |  |  |  |  |  |  | $\begin{array}{lllll}N & L & G & P & D \\ A & Q & T & P \\ R & G A & L & R & P\end{array}$ VD A P DLLDE D $\begin{array}{ll}\text { F D H P WA ME P } \\ \text { N D GP D L VA } P & L \\ \text { L }\end{array}$ N NGPELLEEL

NTGPEI
ENGPSLLAPV NDGPEELAP NQGP QL NDHAGLLD
NTGPEI QER N NGPHLVDPV ND
NQGAELIQPV N NGPELLEPV NQGA
$Y \mathrm{~K} G \mathrm{P}$
NNGPALVEP
A S GP E L I E E L S N G S EL HQ
N D D R S L I E K $\square$
HNDESCL
N NGP QLLD
$N$ D Y K E L Q



| $N$ | $N$ | $D$ | $P$ | $S$ |
| :--- | :--- | :--- | :--- | :--- |
| $F$ | $L$ | $M$ | $D$ | $A$ |
| $N$ | $V$ | $V$ | $C$ |  |
| $N$ | $N$ | $G$ | $H$ | $E$ |

NNGHELI EP


Q D N A S L V A A | $N$ | $D R P D L V$ | $A$ | $V$ |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $Y$ | $G$ | $G$ | $D$ | $M$ | $P$ |

N N G E D E L I E P L V

HNTPA TAP
E S GQDLV S P V
SRGADLI R PL
NHGPELIDR
NDDPTLMDR

VDAEFLL

NDDPALLA
HEGPDCLL
NEGAQLI A P
$N$ D TA

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UniRef90
M2X443 UniRef90-L8JHE9 UniRef90-A7II70 UniRef90_V2XJJ5 UniRef90-Q0RP92 UniRef90-UPIO0047C3F78 UniRef90_N1RNG6 UniReffo -J3K298 UniRef90-LoLNW2 UniRef9O UPIOOO36DBE93 UniRet90-F8B3F5 UniRef90-F2T2C2 UniRef90-S2VVD0 UniRef90-E9T1s0 UniRef90-B8GF79

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GELEEFPARYNIAPTQ GRYAVTTDPAK AAEDAADDDDTAPRALGPNYNVAPTS
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 K GRARCTLRADD VACHRTGVVDLENMDRFRPLFNASPGS
 GRYASTKTKLQLAETFHVSADYAAPDGVREDYNVAPTK


 GRYALA Y D S E NL SK Q DGEDNTVVDETDNGGHTDAAYNDAPTAQ GRFVLCTTDEQLLQVPG FAAVHAPMGLPAPRYNIAPTQ GRFALFHSREEYLTALQLPVIVNKTVD TPKWCYNISPGT GRYAASRRPED VLEFEAVPAEGQSPLP ADADVAPTK GRYAVSQSADDLADEFGVD RVDVRERLQPDWNUAPSK GRYSLGVRMAFVRQRMQEQQDDEAPEDDE!RQTYNFAPGY GRYAVTIDPALLAAEDAVDETATSAVQSPTIPNYNVAPTD
 GRFALHASPEIVAEFLSLD US
GRYALT $\backslash P P Q A A R D Y G Y V D Q$ GRYSMAYDWSADIEYFRLTDN GFRYPPRYNIAPTQ GRYALTMEPEALYGTFDAEPDEHAGGGDPVRPRYNAAPTL GRYVSTKSTADLDDEFDA VEVAESDDPVIVPDYNVAPTT

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 GRYAQFRAA QELADAF DVDEIMDDAE ELEPPSWNVAP T D
 GRYAATANPEE LVEAYEVEDDATGEPPPPGHPDHNVAPSK







 GRARCTLSAA QAA RAF GFPPAVRTLQMDRFRPSYNVMP GA GRYASFREAQDLLADAFADVSAGTVAQDARLLPPSWNLAPTD

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 V S Y D Y T
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 GRFVQTFKPDQL G L P DLA Q GLLELPPSYNLAPT Q GRYAAAKSPAMMLNEFAAVDRTGEQGPSE N YNIAPTD GRFVLFTVGERLLSAVAGLPGVASVGAPQGTPRYNVAPTQQ GRFVSFTDGEGLTSALATVPGGPAPATTDSKPNWNTAPA

 GRYAMG $\square R L A F I$ R N Q L Q Q R G QPVVEAADDY DVRYNFAPGS GRYAASARPDELVEEFDVDEDRTPQDPPPGQPDWNMAPSK GRYASTGSRRDDLVAA F DVGTETVGEELPPSYNVAPTQQ RYTDTVEAEALLKERFNAEV PGRYEPRYNAAPT Q
 GRYTQKLKADDLVAAMSARDETGGGVAE GRYYRRSDKQKI AEAFHVPRVDDFPLP P $G R Y A D A L R P S Q B A R Q M L E F D D A P E D V G D G A P R D Y N V A P N T$
 GR $\square$ Y I KASLLRELLLLNFSFAGP GDTEPLSNSFPNYNAAPT Q
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UniRef90 F8B3F5
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UniRef90_E9T1S0
UniRef90_B8GF79

P ILVLIRADE
50
60
70
80 PVYAVRQRHHRRIAHLARWGLIPGWTKFNARSESAGERNS $P V Y A V R Q R H G E R E L P Q D S W G F V P S W K P D N A R \square E T V A C T S G M$
$Q I G V V T Q A G N D L T Y S E M R W S V V P S W F K H N A R A E G V A T S G M$ LASSVILDRGTGRQVSRGAWGLLPFWSTINARDETVATKPA PILMMAVAAPRWGLLPAWVKDTRGFPLLFNARSEEAATKPS TVMTVVKRDP LLRI RAMRWGLVPPWTKFNARAESAAEKSS SIVPALVLRAARWGLLPEWKKDTTGPVLFNARAETVASKPS
 PLLVIRQDVEKREALFMRWGLIPHWSMINARAETVASKPT PVYAVVTRRGWGLVQFWAKDPKDGARMINARSETAAEKAS
 TIMTVVSRHSHRRI RAMRWGLVPSWAKFNARAESVGEKAS TVMTVVKRHDHDRVRAMRWGLVPPWAKFNARAESAGEKNS QAPVVLTRPPRRQLRLLTWGLVPAWRMIDNARAESVAEKPA KTAVVRAEPARWGLLPSWKQDDSGPPLFNARAETVTEKPS NVVI QQQQERKDELSLAYWGYAPKWWRINARAETASSSKM DVYVVRQKKEHRELRAVRWGLVPSWRMLNARVESLTEKPA KVYAVLTRGPERRLRTLKWGLVPSWAKVNARVETAAEKPA YGAVYRRWGLDPFWTKRQPDYGSMMRTINCRDDSLANKGM PVLAVVARHHQRRIRAMRWGLVPNWPLI NARAETLTTAAT EVLTVVARHDWGLVPHFAEEVGGSAPLI NARSESVATKPS PVPLFHHDDDQLQLMPVDWGYAPAWWRI NARVETAASSRM PI LI ADGGHQDRPIPSWVKDASKFPLLINARGETAATKNS PVPVVRQERDPRGGEARRFQLVRWPLIFNARAESAPDKPS NVMAI ISDGNERRAGMLRWGLIPRWSTFNARAERDATAPS VVPVIAYDGRKRKVVPMRWGLHPHWPMFNARVETAAEKAS TVPVVRPEDAARQLEPMRWGLVPSWRMFNARVESLGAKAA
 HGLIYRAWGLVPFWTKRPPDYGSQMRTM NDRAETLTSKPS PIPMAlTPDDPRRLTFARWGLIPFWSRINARAETLAERPA EVYAVLDRPPVRQLRKLKWGLVPSWRMLNARAETVHEKPS
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 TLPVVRRDGDDYVVHCMKWGLPDYYRMFNARSESDNEKAS YLPVGTAEEQGPVI QCMKWGLPDHFRMFNARSESIKEKAS PVRVVVEREPRRSLRLARWGLVPGWRMTNARVESLVDKPA
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| UniRef90-W5GF88 | F QGPDCIKEV |
| UniRef90_UPI00045E9439 | ND GPELI |
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| UniRef90-UPI00034A9334 | N NGPELLEPV |
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| UniRef90-M7DHY5 | HDSPEILRR |
| UniRef90-TOLA31 |  |
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| UniRef90-UPI000465F0FC | NVGPDLQERV |
| UniRef90-G8P0V3 | NNGPEML |
| UniRef90-L8H6G4 | N NSPECI QRL |
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| UniRef90-UPI0004764015 | VNDPELI APV |
| UniRef90-H2AM91 | N NGPYL |
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| UniRef90-L8JHE9 | NEGPSLVRP |
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| UniRef90-F2T2C2 | N NSPDF1 $\mathrm{P}^{\text {P V }}$ |
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| UniRef90-E9T1S0 | NDRPELLN |
| UniRef90_B8GF79 | E D D E V L I A R V |

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FQPSYNVSPTN GFTLDAQMQQLRDTFGLTNS■ WEPEIIPTWNRAPGA GRYAASRSPEDLVGLFEVENGWEPEEALAPDWNDAPTK GRFASFRNAQDVVD D DADAELAEDARLLPPSWNVAPTD GRYAMALRPSQVRQMLQNDYDLQVDDTPAPRQSYNFAPGY


GRVAQFMS WAE $\square Y H \square L \square H H \quad S \square P G A P \square E P R F N D P T T$
GRYAASRQAEELVEDFGVQHWEPA ETLAPNWNTAPTD GADGDNRAAAVRSPGVNNVAPTT GRY\VYSRPDPদRQSLERSNTKFTKWIDEYRSSYNVAPCH GRFVLFT ESLLEEVGAWESITEVHAPEPPARYNIAPTQ GRFTRYDTWSE HRLYGRETLDWEKQKNDEPRYNICPTE GRYTLTAELSDLTDEFADDRVQD GRFTNTTSMKKLKNNF FIVVESNLVNDNDSYNUAPSH
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 TGAVYRRWGLIPFWMKRQPDYGSLMRTVNCRDDSLIEEDRG PI TAVLGDEVSRVLRAMRWGLVPSWAK NARVETAFEKPS RVDLLRRVGAGLVWNPERWGWTPSWAQI NATREKVAHSAY AVPVAVAGEDGPRLTMASWGFPGAPRPINARAETVASSRY EVPAILDRPPVRQLRMLTWGLVPSWRMINARAETVHEKPA YKLQVAKWGLVPFWTKRQPDYGSQMRTVCRDDSLIEDRG HPLAVYPDETTRAVHWPWATQKKLPQTINARVETAATSAY NDLALDSDGSNQRLGKLRWGLIPPWKMLNARAETGAEKAA NAPVVRRRDSELDOTMUWGFQWSWAKKNARCETAPEKPA PHWLLRRGPTGRTLDRVPWGDRNPRGNNARSERABADGV QAMAVRRHPTWGFVPHWEDDLKTERKP NARAETVATSPM P TMTVMNGEPDR\|AMLVRWGFVPSWTMINARSETAHEKPS NVRVVLERPPRRQLRLLTWGLVPSWRMFNARAETVLEKPA LVPVVMQTKGERVADLMRWGLVPHWAKNNARSEGMADKPS QI RLVVDTPEARRLESAKWGLVPGWRAFNARSETAVSKPT PVRIVVERPERRQLQVARWGLVPSWRMDNARSETLLDKPA QLP PIKKDDDALTLTNYHWGLVPKWSEKNARLETLMEKRT SSPIIIHDGLAKWGLIKPAWAKAGMKAPHNARLETATKPY NVHAVLERPPVRQLRRLTWGLVPSWKMTNARAETVHEKPS DVRTVVERPARRSLRLARWGLVPSWRMI NARVETLDDKPA YKLQSMRWGLIPFWTKRKPDYGSMMRTINCRDDSLTEDRG NGVVYRADAGAGHNHHMKWGLDPSWDK NCRDDSLAQSGG PARVYHDSRLQTMKWGLDPFWTKPWRTFNARDETLSESRF VPVMQWGLIPFWKRDGYQLSKTNCRDSLSTGG HVP UVLQTGGERVLDERWGMVPFDSLNADIYAVHENSA HVPIVLHQDGERVLDEFRWGFIPYWDCVVADMNTVRVNPS TVPIVLERSVKRQLHVAKWGLVPSWAKINARSETLDEKPS SIPVVCQDGENPEVVFAKWGLVPFWWLINARSDSLTEKPA WI AAVHQALENEEPLIDEMWWGYRPKWI NARVETVATNAY P $\operatorname{V} V V V A S E R W G F T P G W V K D P R K F P L L I N A R A E T A D E K A A$ PALAVRRHPEWGLVPHWTKDLKAARRPNARAETIASSPM
 YRPLMHLQDGVRHVDDVFWSYQARWVCN NACMEKLTNNGL QVQVVKWGLIPFWTKRNPDYGSMMKT, NARAEKVAHGPF
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## UniRef90_UPIO00469BC10

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UniRef90 UPIOOO36F7762 UniRef90_A0A031G5XO
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 EDWQGKGEDRTCAILTREADAQMKPIHHRMPVMVPRAQY A WWQPDGTWLLSTTILTTAASGALADIHERMPVVVSPEMR SWWSPDGQQLLSCALLTKEAAGPVAAMHERMPVILAPEQF SF ATWQQNNEVQHSCCLITTEANCLMQPVHHRMPLILNEGAQ DRAMDDGSEIDTFTLLTKPNDLMAGLHTRMPVILHPSDY SWWTGPGGHEGSTTMETREATGPLAELHDRTPVMLRRDQD A EFWRDPDRWLVSTTVVTRPASESMAALHDRMPLVLPPSAW EVWKDRKEPLRTCTMLTTVANTAMREFDSRMPALLTADQV

 EFWRDPQAWWATYTVLTTEGPRSLADIHPRMPLMLTPDRW LWTPSAQEPGERAAI TEEARGLARQVHPRMPVVLSAPCW DTWRDPDEDDRTFCVITCPANEMDATIHDRMPVIGHAQDY THWTPPTRQTETFAVVTTEPNAVVEKLHHRMAVILDREGE DCYEDADSKLYTYTHITMTDSNKQLNFLHDRMPVICRDPDAD
 DSWQDEGNWLTTYTHLTDSSKRLQWLHDRMPVIL SDAQA DSASPA DHEGDGVVLLTGPGERGPVDTQSRPPLVFTGESA QAW GKDEPVKTCALVTAANQSUGHHHRMPLMLAQEDW
 ESWQPVDPPVRSCTVTMRANHQMAPVHDRMPVILEAENW DCVQYEGRKHYTYTHTTDSNPQLKFLHDRMPVILDSEDL EVWSKGEQPGTTFTVLTTDAAAGUEF:HDRSPVVVPRSAW
 DCYEGSDEKLYTYTFVTTSSNAYLKFLHDRMPVVLEPNAM EFWRDPAAWLATATLLTTDATDRAGRVHDRMPLLVPPAAL VPGGHAGGALPGMALITEPARGAARRHHPRMPVVLDPSCW EFWRDPSAWWVTCSVLTTEGPRALAD:HPRMPLMLTPDKW DMVQYEGSEDMTFTLITTDSNKQLKFLHDRMPVILEADEM SHLSDEDAPGAGFVIVTAAADEGLVDVHDRRPLVFSPTVA EVWKPQGTPGGTCTHITMTPNEFMKDVHDRMPVIGTHGDE DSVAVEGEPLCEFAIVTTDASKELSWLHDRQPLITSQEETH LLLFAGLVERGRFVVLTTAPSPDVAPIHHRMPAILEPEAV TWVSGDGSQMDTAAILTTASNHALSHIHERDPLVIHAGDY
 ETWMPHGEELDTACLVTTAANGATAALHPRLPAIIEKKHF EWWKDDGSAWLLSATILTRQSENGEWLHDRTPVFLDRGDV EFWRDPDRWLVSATVVTRPAATELERIHDRMPALLPRSAW DYDEDLHHYTFTIVTSKAPKELAWLHERMPVILKEEEW EKANENASPAVTFTILTQPAVGPVAEIHHRMPVVLAPDSY EFWRDPQAWWVTCTVVTTEGPQALADI HPRMPLILTPDKW EFWRAGRDWLVSTTIVTTAAAPSMAHLHDRMPVALPSSAW DRYEDSNEELYTYTIITTSSNPYLKFLHDRMPVVLDQEKM
 DIWKDRGEAYRTCTLLMTRANDQLAEFDARMPAILEQSEA
 EWWRDQARWLLSMSIITADTPDELTALHDRVPLPMSKDTM DTWTPEGDGRNSCCIITAGANAEVKQVHDRMPAILSGKDC A WSERDDGSMGCAIVTEPGRGRAAEVHDRMPLILDDDSL EWSSADGSEVDTAAM LTAGANRVVSHVHDRMPVVVQPEDF DTKNGNEQNIQSFTITTTRASSQFSSVHSRMPVILTQQGA EEYADKGELVRTFAI ATCEPNSLMATIHDRMPVILAPADY HFSFTENRAEAGFVIVTDDASGGMLDIHDRRPVVLDAADA
 KAPFESGSDSEGFVIVTAAADIGLDIHDRRPVADTAEAA EFWRDRTAWWATCTVVTVEGPRALADIHPRMPLVLPPDRW SVWHDRSDPDASCSILTTDAVGHLREVHDRMPLIMPFANW DCYEDTEEKDYTYTIITTDANKQLQFLHDRMPVIMDPEAV LLWWATGMERLSATMVTTDATEEMAWLHHRLPKFLYTEEV D A WDD SEKNEFPMCTVDTAGMAFGTDHAMPIVLDRNGM

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UniRef90_UPIO0047729EE UniRef90-F6FPY7 UniRef90-D0RR85 UniRef90-12H021 UniRet90_B4WMB1 UniRef90-D1BYY0 UniRef90-A0A017S853 UniRef90-B2ADY4 UniRef90_Q6CVF5 UniRef90_L2FJ56 UniRef90_UPIO002DB742D UniRef90_EORIO0 UniRef90_UPIO00468F5E9 UniRef90_U1YUZ7 UniRef90-E1RK18
UniRef90-T2LCK5 UniRef90_UPI000365BD58 UniRef90_F0J7Q4 UniRef90-R9AH72
UniRef90 LOKM18 UniRef90_UPI00036717C8 UniRef90_C9SPZ8 UniRef90_U3HGS8 UniRef90-K8C0F7 UniRef90_UPIO004756145 UniRef90 M7AOW6 UniRef90-W9X6W5 UniRef90_U9SP58 UniRef90_C3PEN0 UniRef90-Q11IY1 UniRef90-UP100047C9C3A UniRef90-UPI0003749841
UniRef90 UPI00036F7762 UniRef90_AOAO31G5XO

A L W/L GEKGK GAAPL MRAAADDVLQWHR|V|DRA|VNSNR N S WL G L K D S N WD K L S K L L K V HE K ED $L$ E WY K V K K E V G N V K GAWL D YWLDTSNHNPTI
 R $G V S$ AVP K EV GKVG
 D A WLLDP GR QDP E R SRA L L A T P A A G R V T V E Q WL VG D A D D A K E L L H P T P DE LR GRFFVTTEVVDSRVGNVR
 RTWLD A DNRKVVEHL YEP FPTADMHAWPVNPAVGNVR D S WL D T S L T A PREVVQD WVLRRDTP DAASLAVREVVDPAVGRVGG

 RQWCE GTPDEAA ELLHPAPQS LRRES LSSWRKADKAVGNTR
 WS WLDPG DS DRETRLRRVARRLDP ERLVAYPVSTRVNRPA D A WLDPANTAPESLLAPMPEGLMRAYPVSTDVSNVR


## E R WL S P E A D P S DL

REWLS GDP
MKPFPAKLMTMWP I DRKVGGPK


 E EAWLQ DGVLDSKEYAA LCAPY DGDDL Q WYPVVT TA MS K P D


 R QWL QA GKPGAEKLLDE PSGEGTLDDIYPVSTRVNNPG
 SRWI DP



 R A WL D P AL N A RER DR V A VR PVVPGEQLRLWPVVTRVNSPR D A WL D P S K T DVGGEVREEL L GAP P E G L M R A Y P V A T A V S N V R
 R R WLD A GA S LLEDVAALVVRSDGVPASHFVWHRVSTDVNRAT K E WL N P S H TEPA HLLQP Y
E H WL D P ATSSSAHLMMQLVDR YPEDELVIDAFPQALNDSR D S WL D T S S Q S WN P K LQAAMMR P Y H D E E L K C Y QV P K E V G R V G GLLWLS DA GAEAAPELLLVPGRR GLLEAATPVVSRVVNDVR

 GRWLDPRVDDRDEI AAMLAFARP GRFEARPVGRAVGSSR

 D A WL DPAVGADEALEVVQGAGV A LVSTVVVNRVGSVR N NYL NAADPM
NTWLDKK TWSKGELTECLTARFNE
 D ALDPARTDVD DLLPLLAPPPPAGGMRAYPVVTDVSNVR K A WL D P A V G A E Q A A $\quad$ G



 D L WL D RE K Y DPELLLQSLLVVPYDASEMRAYPVVHAMVGSPB E A WLLD P K Q K D A E E L V R MV RAA D A A A D WT LD A V GAA A G N VR
 S S WL D C K S QEPPR DV A D L M V P P A A E D Y F E A DP I S E K V N K V T $P V W L G E A A G N A A E L L H H \quad A P A G L V E T W P V G R G V V S P R$ VK WL DK S K K WD T ELAR LLEP F F N D DL D DY AV TK K M S K P G MRWL GP E Q D P R D L $\quad$ M K P FP S D L M K M WP I D S K V G S P R A L WL D P D L S A E Q A A E L A R RTA LPP P EAF E WHKVVGTA V NRVG K T WL D P G R HE WS GELLQALLKP F TGKDDCYPVVKEVVKVG

 DAWLDPDHRAPSEELLAPPGE E $\square$ AEADDD AREVAPDVNRVAA
 APWLA GEALLE PSSVCGFQARPADLAVGNV R
 E EWLDRSTSGTKAKELLLQDNL DDRLEFHRVVRDVVNSSK F D Y L N

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AS GPELIEP PT
 NDGPGLVVE
$\square D S P K C L$


NNGPGLLA
NDSADLLRPV
FDHPLAL EPL

| NQGPQLI | E E |
| :---: | :---: |
| NDGPELL | EP |


HDTRQCI QE
NDYPELI
NDHPGLLD
HDDP
NDDPGLVEP
N NGPEL
NDEATLIE
NEGRSLI EPR

NNSPNFIVPV
NDSPNFIVPV

FQGPECCKPL
HNSPDLIRE NDSAQLI RPD
AQGAELI EP
NNSPDF: DP I
Y I R R D Cl A

NSGRHLVDRV NNGPELLREL
 N N GPE LTRPI DNGPELLA $\begin{array}{cc:c}\text { NEGPH LI } & \text { EP I } \\ \text { ND DP GLI } & \text { R R } \\ \text { N }\end{array}$



VEDPS LLRPV
AESATYI QPL
NDDPACIRP
NNDALLME
YFGTDVHEVV


ENDEHLIDEV

NNHPGLLDP

NDSADL
$N N G P E L V K E L$
$N N G P S L L$
NN SPPDFLIPV
$N D D A V F V V P V$
$N N G K H L M E P I$
N N S P S FIIPPV
YDTSDCIKE HDNRECI QE
 AEGPELTERV EQGEELDNPV
 S SKPSYVQPT
 N NSPSFI IP NQGAHLVEPL



$\begin{array}{llll}\text { N N S P D } \\ \text { N D Y A E L } \\ \text { LI } & \text { DE }\end{array}$

| F Q GEQC | A P |
| :--- | :--- | :--- | :--- |
| HESPD | V |

HESP
NNSQECTK
NNSQECI
NQGAGLI
DE

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GRFTQLFSCPEDLAFYRIVGD■ CPDLAASWNVAPTN RFSLSAGLEEVNQRFGI H RVMYYYKSRYNISPTQ GRFFRHVSWADYHAADNMDTPEGV DPPEANYNIAPMS GRYFVQREPER $\square Q R H M G$ S VPLP
EPE
GPA
GRFTQAYTWSEVHAFDSV $\quad \square \mathrm{GPAQNLAPDYNVAPTK}$ GRFALHNHMNRVRDEYPDIPPRRWDDEEQFHPRYNVAPQT GRYSLGRPRNQLQHDPEYNVQAAVVAEDQFAPRHNI APRS



GRYSMDATWADVVEFSKMP $\square A$


WE E E I IP S Y N TCP T Q TKMLTS YRQRYNI S P LQQ




 $R Y S I T A D V G D M 1$ EAFKVEQLINC YTNRFNVAPTQ
 GRYVMSKATGDLVSAFNVDEAA GPEVNPSWNVAPTQ
 LE E DE DFPPRYNI APTQ
 RYSATS ELGMRYF QA P V DE GF DAPRYNVVA P G T
GRYAASRSPEDLASDFDTERWEPTEALP A DWNVAPTK GRFGFYELKYFLDLLDRQLELPFEENQDYPQTNRYNIPPET GRDT QHRKATA Y LTEMMGWDASAALGEQA GRRSPS WNVPP S S
 GRYAASRQAED LVGVVFEV TVWDPAETLAPDWNVAPTK

 GRYTLTAPPEAVKTFFGAEAAHEAP
GRYAASRGAEDLARLFEVE KWEPEEALDPDWNVAPTK GRFAVKKIT WEDYQRWLKLISGAKAPSNLE PRFNIAPTD
 GRYAMAVDPNDLPQYFGEQAVDEMHDSEMAQPRFNIGPAQQ GRYAA GRRPGELAG
 GRTACSLDAADK L R RACAYRDRRGRQRQQEWQPSYNKAP QS

GRFANDATTDELIREFVAEGGRPEDWWKSWHGAYSDAPTE GRFAQARNLHGLQLAFD DPGAAPAPVGEELEPDYNDSPGK
GRYTKYLSWSEDHRLYRLTAPAETGRNDE
S RYNAS P G S $R F S L A A D L D D V R D H F K I Q Q \quad R V M Y Y Y K N R Y N I S P T Q$
 GRFNDTSTP QA LLLE GLGVVNLQLARAPAC NVAPTE GRYSLALPPSLIVRQLLEDDGVPITDVPDDPHQSYNFAPGS

GRYT $\square R K P$ VT K T V D $\quad \mathrm{V}$ V T N $\square K V E D S D$ | $V$ | $E$ | $D$ | $S$ | $D$ |
| :--- | :--- | :--- | :--- | :--- |
| $V$ | $P$ | $P$ | $P$ | $G$ | $\checkmark \mathrm{V}$

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UniRef90_UPI00041CC7AC UniRef90_UPI000360899D UniRef90_UPI00047AE0CA UniRef90_J9YW72
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UniRef90_T2M7U6
UniRef90_UPI00037BB551
UniRef90_F3GUU3 UniRef90_S3B1A9 UniRef90_UPI0003A38323 UniRef90_F2RU00 UniRef90_UPI00036310D0 UniRef90_W6MQK8 UniRef90_UPI00029A6293 UniRef90_F8A2J8

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UniRef90_UPI00036C6C6F UniRef90_UPI0003B4FF99 UniRef90_A0A059E3L8 UniRef90_K4ZR20
 MK WGLIP FWT K R S P D Y G S L M K TII N C R D D S L I E D R G



 QGLI Y R A Q G Y Q Y IL Q S A K W GL I P S WR T in CR D D S L A R G G M
 PVHAVLGTPGPRSLATFRWGLIPSWKMDNARGETAAEKPA $P V L V I$ TE DHANGWVRVMTWGLVPRWRMFAARVETVADKPA


 MAP V Y H GQT LE LMN WGVVPRRSSHRYSTFNARSEKLLE S QL WLPVMTS D D YNWQLNAKRWGLIPP WEYDNARDVTLHEKAA PI LMVIGGASRWGFLPGWAKNPRDMP LLI NARSESAAEKAA

 SVPPVVT DEAPETVVRQLEWGFTPDWA DINARAETLAETRS



 IAPI R PLE H H MP GWWKKPLSEKKFSTENARSESVNESKT MS WVV RRNP QNGARH L G L L R WGLVPR WMNARSEGLTEEXPS QV HVI LEERPPVR QLRTVVKWGLVPSWRMDNARAETVMHEKPS $M \operatorname{DVI} R P \mathrm{~V} A \operatorname{AREELVPMRWGLVPSWWKFNARAETVAEKPM}$ $N V P V I M R E P Q D L V V R T M R W G I Q A R W C P D N A R S E V V L E G S A$

 $R Q W V A H A D G E G D W G Y R P V W A G D D A P Q P I N A R A E K A A D V P B$ DKPDHFRMFNARSESVVKEKAS LA NVIVA D D G H A $\square$ A R R M R WG LIP S W S K IN A R V E T V A S K P T




 TV ARMFREQPAIGPAGWGYP PRTVVFNARGETAFDRPT
 DLEGFRS D DHPMFWGFRPPQRVVEGPRPD NARAEKVATSSPY $R V R L V A D R E M G R R L E T V R W G L V P S W R M I N A R M E T I T T E K P S$

 QV PMVLLDERWGLIP FWWKQEKLPA LTFNARSSEAAPTMPA DLETMRAAGEEERAAFQPMFWVGGDGPRTVNARAEKVATSSPY RVG I LTVEE GTWGVRPFWVREKNWPSTITARMETAAS SK $\square$ EVVAVLDREPVRQLRVLRWGLVPSWKMINARSETVHERAS D L LTV L Q A N H GAY K L T SAR WG L I P Y WR P I NARSSESLVVSKP Y S P WL MH R A DGRE HMD LVVH WGYRP S WA A I NAR IIEKAAAS GAF K L P V I K Q Y V N GK MLE KL E WG LTP S WA KI N GRLLE T L G E K IS QVHVI LDREPVRQLRVVRWGLVPSWAKINARSETVHEKPS DMAI I MREGNERRLDQSRWGLVPFWDA NA D DDAVMRNPA VY HI I Q DNARRWGFMPT GMDPRRRAPAIVRGDTMATH HM S AVLLIN CNYERVLQPMQWGLVPSWHMDNARLDTLTNKKS AVHAVLDRPPDRQDRPDRWGPRDNARVETVMTGKF TAPVALRTRHGHEMREMRFGLVPSWWK NARAETVQE SKA Y G AV L R A WGLIP F WT K R S P D Y G S L M K T I N CRD D S L I E D R G



 MKWGLVPFWTKRNPDYQT $\quad \mathrm{MRT}$ T I NCRDDS LSTPGG
 SAP VVRDRGEGR LLELVRWDWQSPPNRINARMEKLAAAGW SVQAVLGTPPGRTRMGFRWGLIPSWKMDNARSETVARSPA TPVVTREADGSRTMRTMRWGLDDFFRMFNGRSETMAERPA DVPFVRLREGRWWLVPFWAKEMPKAAMFNARIEG\|DTAPA

 $N G V V C T A D T P H R D L Q V M K W G I V P S W S R D N C R D D S S L R T P G G$
QLPIIKS YTNGKALELCEWGLVPAWSKINARKETMLMEKVT



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## UniRef90-HOZBV0

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FRGAFAHHR ${ }^{90} \mathrm{CL}$ । $\mathrm{L} A \mathrm{NGWFEWK}$| 100 |
| :--- |

## 100

110
120
MWSMKRKKR MWS MKRKKRCIVI CQGFYEWRDPYYTRRKDGDLMCFAGLW
 FAWAFRNSRILI PMDGYYEWHGGIPYYVSTHQLLWTAGLY FQDAARFRRCLVPANGWYEWQRPYY ITQPNQEPDETLFFA FRSAVKARRCAVPAEGYYEWKRPFYVHPADESLDFFAGLY FKKGIRTRRCIVPASGYDEWTTPWYLRPQDGEMLHLAGLY WKSMKLRKRCVVVAEGFYEWKVPHFVRRADGGLMCFAGL $\begin{aligned} & \text { W } \\ & \text { FRSAFAARRCII }\end{aligned}$
FRAALAHRRCLLPADAYYEWQKPFSVSYPDGEPLALAGLE FRDAAATRRCLLPADGWYEWKYPFYSTRYDGSTLAGAGI W FRGSLSRYRALVPMNGYYEWQNPHYDHDPHAPLLYAAGLV FRQAFQRRRCLI PADHFYEWRQPYLIKPSAGGLFSFAGLW
 WEPLCARTRCAVV DTGYYEWQQPYFVHRKDKQVLFLAGMY
FKSYLKRQPCLI PASGYYEWKVPFYLYQPDQLLLMAGDWN
FRAAMRHRRTLVPASGFYEWRQPFWVRPRSGGIVAFAGLMM
FKSAFKSRRCLIPATGYYEWKQPFYISNKDKS SI A I A GIY YRHALRWRRCVVPVDGYYEWQQPWLI RHAQQQPLLLAGL W MWSMKRKKRCVVVCQGYYEWRIPHYTRRKDGDLMYFAGLW FRSAYVKRRCLVLADGFYEWKQPYRIAFEDDRPFAMAGLW
 FADSARRRRCLMPATGWYEWRQPYLCTRESGTSLAMAAVF
WIDRPCERKRCAMI MS GYFEWKTPYFISRRDGKLMFVAGMY MWSMKRKKRCDVICQGFYEWKDPHFI KRKDGDLLCFAGLW FRQALQTRRCVIPVSGFYEWRQPYYIASAGGTHLSLAGLW
YRKADDTRRCVI PCNGLYYWRTVGKRSYGENE IFGMAGLY
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FRRAFAARRCIVPADGYFEWKQPYFVTPADGSVFAMAGLY
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FRAAWKARRCLVPASGYYEWRQPYWIHDADVESVLMFGGLW FER LLKRQRCIIPCSGFYSTRTEGKNSDRDQPVFGMAGLY
 F S R LLPAKRCLVSVEGFYE FRGAWKSRRALIPASGYFEWQHKQPYYVHRSSPLKFAGLY FRAAATRRRCVLPADGYYEWQRPYYLHGAEEEALAFAGLLY FAGSLS
FERMLRKQRCVVPCSGFF FRTAVAKHR FRSAFAHRRCIVLADGWY FKKLIDQLHRCVAVADGFY FANSVVSKRAIIPATGYYEWKRPFYFMRNDKKTIFIGGI Y FRAAMRHRRVLI AASGFYEWQRPPKGSKQKSTPYWWG GLME WRDADRHKRCLIMPAAGWYEWHQPYYHHADDNGVLA I AGIW FRSAFAHRRCIVLADGWYEWRQPYYDA LAEDAPQDI LMMA F GEDWKNGRAVILADGWYKARQHYYFNLQSEKPLD I AADG YRRAFAARRCLLPADGYYEWKQPYFVTPADGSVMALAGGLY YRHLVGRNHCLIPASGFYE WKQPWYI HRADGILPMAFAGLD W
FRPHWKSGRAVVPADGWYEWQPWYI RLDSDQPMFLAALTS FKNLIKSYRCLI VADGYYEWKRPYYFERQDDETIFFAGIY FRRPFVSRRCLI PADGYYEWKQPYFVTPADGSVMAMAGLY YPKMDDRRRCIIPCNGFYYWRYP $\square R V V M K N R G \| F G V A G L Y$

YQKAF RARQRALLPADGYYEWVTAEQELKGEQPVMAMAGLY MWSMKRKKRCIV ACQGFYEWDKTG
FRGAYRHHRCLVP PSGYYEWKTPFADGLRNRRHFCLAGLY VWKMVRSRRCVVPMLGYYEWKDPYFI K RKDSKLMFLAGGLW YRRAFAARRCILPADGYYEWKQPYFVTPADGSVFAMAGLY FARPFATRRALLPADGYYE WRQPYFLHPADGSLVADAGGLLY
WQQHSGGK WK GWR L




UniRef90_H2JEG8

## UniRef90 W7QGP4

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 EEWINPPQTITTAAI TREVVGVLKPIHHRMPVILPKSLW ERWNDPGHVVETFALLTAAAVGGVQSLHTRMPIMLDPSMV ERREPPAGDSQTVTIVTMEPNELVGELHDRMPAILEPAAE Dsw
SAWWAPDQPLVT CAVVTTDAVGELANGEDRMPVVGDKESW DYVEKEG LYTFTIITAQGPRELDWLHERMPCVIEPNSW DCYEGSDEKLYTYTLI TTSSNSYLKFLHDRMPVILEPEAM EQWNDR LTTAITVPANPLATIHERMPALLAAEDA ETWRDRGNEMRTCTVLMTDANEAISEFETRMPAILSEDNM NRAMIDGSEMDTFTILTTTPNDVMAGLHTRMPVIIHPEDY EGWQPDGEWLRTFTLITTEANAKQALVHHRMPVLLPPEDW ENWHDPGEDMASATIVVGPAEDWMARFHNRAPIMLITPQRW EIVKDPPRTTYTCTILTTEANSQLAFLHDRMPVILSGEQA DRAF EEGEPLYTYTIVTTDANKEFSWLHDRQPVILSPEAS TARRUGEEWQVSTAVITRESRDASGELHDRMPVFLQRDVW ERWRDPEAWVWSCAVVTTEAAPELLAH HERMPVVVPPEDW
 ENWRDDGETVHSFS:I TQDAVDDMHELHDRTPLMLPREVL DCSGPDGKVVESVTHITVPANPLVADGHGRMPAMADASRC DEWKENGEQIQSFTIITSKSTAKMSWLHDRMPVLLSEEHA ERRDDAGNELDTYSVITRDADQTVETIHDRMPLILPPTVF ERWDDPDRWVWTCTVLTRPASDSLGRIHDRAPVVLPMDMV
KVIDGQ KVWRNYGQEVRAFTMITADATGGMSQWQPNVPVI LDEEGM QAWKGPSGWVASCA CTRSAPDA GHDHERTPVIVPEQAW GПWEPTADGGACCAITTEPASDRLAHIHDRKPLVLDASCR EFWPDPDKWLVTCTII TTTATDTLGHIHDRTPLIVPADLQ A WWRDPARWVLTATILTTDSLGELAGIHDRMPVILSEEWW TYMSADGAEVDTAAVLTVGPNREVAPIHDRMPVVIAPENF SEWTPMGAPVTSCALLTKEAEGLVAAVHHRMPVILSPEQW G WEPMADGGACCAIITEPASERLSHIHDRKPLVLDAACR YLRERKPYDGDGFVIVTTESKGSMADHHDRSPL L SAELV DTWKSKHTEDTTCTIITTVANEQIAPLHDRMPVILESENW YRPGKEPDENTGFVIVTAAAEGGMVDVHDRRPVVFSPEDA K EFWRDPQAWWVTCTVLTTEADTEPAEIHPRMPLALTPDRW ENWRDRGVEVRTCTLLMTNANTTVREFDSRMPAILDEEGM
 EDWSPDGGVMETATILTTSANEALAPIHERMPVVIHPDDF HVHSGEARDGDGFVIITAASDSGMVDI HDRRPVVLSAEDA EFWRDPQAWWATCTVITTEGPRSLADIHPRMPLVLTPDRW DEAVIDGEPVLTFSILTGEPNDKVAKLHDRMPIILPTGAW PGDSDEKLYTYTVITTSSNSQLKFLHDRMPVILDPGAM DVALIDEGSELHSFTVLTTQANEATAGIHARMPVILQQQDF DSDEETTHVIYSFSIVTGPAPQQLEWLHHRMPRVLEPGEF EFWRDPGAWWATCSVITTEAEKDPADIHPRMPLMLTEDRW DCWEPPGEMLYTATVGRPATPEAFVHDRQPLMLPRERW TARKVGDEWEVSTSIITREARDASGEVHDRMPVFLGRDAW STPFERGDEAEGFLIVTAAADKGLVDIHDRRPLVLVPDAA DCYEGSDEKLYTYTIITTDSNKQLKFLHDRMPVILDPDK
 DSWQEQGRDGWTFTLLTTEASPSFQTLHDRMPVILPDEAS A WAYNSNDD DSWKSSSQDVMFTFTLDTGSNSTSEWGHDRMPVIGNQESU DVWFDDGEPLLSCTLVTTAAADSFKPWHARMPVMLARKDQ DQHEATGDKSYTYSUITTSSNQQRRFMHNRMPVIFDADDF Q NNQFCLITREATEKISAIHHREPLIINQSQI NRAMDDGSEDDTFTILSTRPNRMISDUSSRMPVILKASDH


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DDDPTLAP
NNGPELLEP HHGPRL $\qquad$ NEGAHLDDR
REGPE $\qquad$
NDYELI爵
NNSARLMRPL
NNFPSLMEP NVGPDLQERV $N T G Q A L A A Q L$
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NNSPNFIVPV FDDPSVVEPI
 NNGERLKPL


 ENDAPGELTERL


 NDDAELIAE
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 HQEPGLANRI NNEPRLIAPL NNDPSLLAEL NNYPELIA YESPDCl|RET
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YDHSDCVQEL

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A Q LA GWMQG LAPGETEDFTRYNVAPRS GRTSCHLPRDVLTRACAYRDRQGQPQLPEWRPSYNKSPQS

## EPEEALQPDWNVAPTK

GRTACTLAPDEVRRACTYRDKQGKRRKPEWRPSYNKSPQS GRYA $L A D R P D Q Q R Q R \square R A P A P A P T P S Q G Q P R Q S Y N F A P G Y$


 GRFALD DKVNQL ITD F VMS G GRLDD YVPA WVPSWNLSPTMD
GRFANHQDMHRWVS LLKHWPANTEHGEPVAPTGFNTAPTK
 MA P T K DAVIGSAAEPLYNAAPGS $F$ VPRYNVAPRS

GRTACTLAPEE $\square$ ARACAFRDK $\square$ GRRRNPDWRPSFNKCPQS


PSEDRQ I IEVEDAPEDGGSDAPRQSYNFAPGH GRYYVDVSKDELS

F VNNFSEFEYEQNFNDAPQT
YRPRYNVPPKS
$R Y \square F V Q K P N T\|R K R F \quad Q V F A P G N \square Q W T P S Y N\| A P G K$ GRTACTLAPDEVSRACSYRNRGGRRRQPRWRPSYNKSPQS GRIVQKSGPLDYVERTFPNPHRV FDDPAGPRYNTPPGT GRFALSDSVEQWTEFVTETGRRPDEWSPDWESSYNIAPTQ GRYSLGLPRPSURHVVGDDEDDEWDDEDAFTPRHNIAPRS GRTSCHL P RELLTRACKYRDRRGQPRQPEWDPSYNKSPQS

GRDAQKSAPEDYVEIL WPNARLIFDDVAGPRYNDPPGT GRYSLGVPHAEVQQL/HGYNVHVEWVGQDDFDPRHNIAPRS GRYCLESTTAEEARQLKPWLADDAAWLKHYAPRALI RPGE GRFVFAFSKKELENISGTKSWINA GRFTLTN K K KIKKKFD $\square$ D LDESFNI CPST GRFVVAGSNKDLVDLFDVDTVGENLDPDPSWNISPTD GRIAQKSAPEDYVEIL WPNARLIFDDVAGPRYNIPPGT GRYTDSSTPGEFDARFGGQVDVSA GRTACTLAPQELSRARRRRPEWRAGDADQYRPSYNKSPQS
$R \square Y \nabla S Q S F D E L T Q S F S F A E C G K D Y D \square G E R \square P R Y N G A P A E$ GRTACTLDADELKRACSYRNRRGQRRHPNYRPSYNKNPQS GRYGRRADKQRIAEWMQANDKNVFDESVYAPSFNVAPTD

## D A R D Q VQ A A VHAMGYA $\square$ S P H Q

GRTSCHLP DDVLTRACAYRNRQGQQQDPEWRPSYNKSPQS GRTACALGADGIRRACVYRDDHGRTRHPEWRPSYNKSPQS GRFALTADALQLPEVLRERMSDV HLLARYAPRQLIRPSE RYTLTAEEKE LKKTHPHQLQA
 GRTSCHLPRDALTRACAYRDRRGQPRLPEWRPSYNKSPQS
GRAT $\square T P A V E L E K R F N A A F A K G A V L Q E N V$ V $V$ NDSAGN GRFALSSEVNGLPAPLRERLDGEHRR HYAPRDLIRPGE SMSKKAKELAARYGRNLEKDLEEQEQYRVNAFTFPDY GR VVQKSGPMDYVERLFPNPRRIDFSDPAGPDYNDPPGR GRTSCHLP LDVLTRACAYRDRRGRPRDPEWRPSYNKSPQS GRFANAQPLPEYARSVREQLPPSHPPEDDYRPSYNVAPQT GRYVMFSTTETVLARLVGEQVGAVGGGRPPTPSWNDAPTH HSSWNI APTQ R LVPSLTDSEPLIESPNLAPRQ GRFANAQTDPQYRAAVREELPDPAPDADDYTPSHNVAPQT GRFAMDRVNAEDTEFVERTGRRPEDWRADWEEAYNI APTE GRFTLIADLT TLQALFRFR YQGSLAPRFNIAPSQ
 SLAVDQAALETRYNATLPADVHSEPQYHDNAYTFPRY GRATIITPQEQLEKRFNAVFKNNV QLPENVNISAGE GRFVNHADMHRWAALLKGWPAGGAL GRAACS LDNPD LLCRACDYKNAAGAKSD DEYVPSTNIGPKD GRTSCH $\square P R D V L T R A C A Y Q D R R G Q Q R \square P E W R P S Y N K S P Q S$ $G R F C L T T D L D Q L L P R L G G R D P A E L \quad E R H Y A P R P L I Q S G Q$

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UniRef90 M7SG23

## UniRef90 Q6ZN47

 UniRef90-V6L2K5 UniRef90-A4YPT5 UniRef90-H3B8N7 UniRef90-H3MVSO UniRet90_G4MS88 UniRef90-I4EAX0 UniRef90-UPI000477EB44 UniRef90-S4X158 UniRef90-UPIO0034DDB5A UniRef90_UPIO003B662B5 UniRef90-G2QFY1 UniRef90-C5BNV1 UniRef90-UPIO0047E2731 UniRef90-KOKDY6 UniRet90_Wov963 UniRef90-W4K241 UniRef90-HOTPQ8UniRef90_V9KVK2 UniRef90-UP10002EBB5AE UniRef90-UP100034990BF UniRef90-S6AV80 UniRef90-K4LEU8 UniRef90-B8KTR6 UniRef90- W4HLIO UniRef90-UPIO004782074 UniRef90-G4UYV7 UniRef90-G3J5U7 UniRef90-S5DJU4 UniRef90-A0AO24S7X5 UniRef90-U5HCJ7 UniRef90_UPIOOO4723115 UniRef90-E6ZFW0 UniRef90-UPIO00468BAFB UniRef90-A0A022L6W9 UniRef90-UP100044163E4 UniRef90-G2QV03 UniRef90-F7FE87
UniRef90 GOEB43 UniRef90 F4LCW4 UniRef90-J4G960 UniRef90_Q3AX21 UniRef90-M2WSZ3 UniRef90-Q4JMX5 UniRef90-UP100047BA9AB UniRef90-K4QJk5 UniRef90-UP10003B5284B UniRef90-UPI0003EA7ECD UniRef90-M4FRQ0 UniRef90-UPI00037681D8 UniRef90-likWY0 UniRef90-UPIOO047B8D47 UniRef90-X1LXV9 UniRef90-E4ZQP0 UniRet90_M3KIX2 UniRef90-G3TCA6 UniRef90-K7FXT2 UniRef90-G4FLW9 UniRef90-UPIOOO4694EE6 UniRef90-D7BQA4 UniRef90-U2D106 UniRef90-UP100046B8430 UniRef90 UPIOOO37400F3 UniRef90-L7WBR4 UniRef90-A3Z5S9 UniRef90 K6BD48 UniRef90-V9RVS4 UniRef90-G1SQ26 UniRef90-UPIOOO4560D02 UniRef90-HOJKY2
UniRef90
X5DQ23 UniRef90-X5DQ23 UniRef90 ${ }^{-}$F7SOR7 UniRef90-R9P721 UniRef90-U2T491 UniRef90-B4BKE5 UniRef90-UP1000371CC6D UniRef90-UPIO002001E7D UniRef90-10KF65 UniRef90-O26HR7 UniRef90-Q21LT2 UniRef90-UPIO0021A6FOA UniRef90-G3AX89
UniRef90 0 D 6973 UniRef90_D6R9T3
UniRef90_A3YVA
 TMPII DKTEEKREI DQSVWGLKFEGEGEGASQEEIAESEK
 NSPVLLSRLLHEKCYQLSDQEPRMDEEKNCRSDTMTEKQS MTDARAETVLDKAG
MKTMNCRDSLADPGG
DVYAVLDRGPVRQLRALRWGLVPGWKMI NARSETVHEKSA RWGFLPAWVKDPRGFTLLINARSETVREKPA NSPVLVSRKHFRLLATMRWGLVPSWFRNNCRSDGIMKKKS

YGVVYRADTPDWFWTKRNPDYSSMMKT DNCRDDS $\square A A N G G$ QTEVLWAEAGGNELVQMRWGLVPGWWKFNARAETVAEKPM NVWAVLERDPVRQLRVLRWGLVPSWKMDNARAETVHEKPS RTAVVVRRAGRLVL GPATWGFPAPWKPFNARGETVFDKAS AVHAVLGPPGPRSLHTMRWGLVPSWKMINARAETVAEKPA PHYKL MKWGLVPFWTKRNPGYPSLLKTINCRDDSLATPGG SVPVVCAAGTYAMRWGLVPSWSPKFATFNARDETVAEKPT DVPFITAREGRWWLVPFWANEMPKATTFNARGEGVDTTPA YRPLMHDAGGQRRI DDLHWGYQASWAVINARGEKVSNGRY QAPVLRRREDKLVLHTMKWGLVPHWNTVARSESVEGGG NSPVLVSRKHFEKDTAMRWGLVPSWFRSNCRSEGMTQKKS PPA乌NARVETAATSKF DA LVITNSEPNETFGFTPSWAQKKMYVINARSEGDISKPM TVPVLRLDDQWGLIPSWWKEAKPPTMSFFARSEEAAGKP YI PVITGGPRREAFMMRWGLIPRWYRMFNARAETVDRKPA EVLVLTETPVDKPWDYSPSWADPAMHLINARSETLRQKPA QUATIRTDEGTRRLAPMRWGFDPHWYD NARAETVADKPA

PQPIINARAEKVASSPY
YGAVYRADTPDHKDQTMKWGLIPSWKTDNCRSDSLSTAGG VAPCIIDNNNWGYFPDWLKQQSNPRPLFNTRYESLLEKKT PKAlNCRDDSLRTHGG NSAVLIRDKEYYS DDLLQWGLIPAWHTDNCTYENLSQTPL YAPVITSQQPET LQHYLWGSMPFPSKDKIDAFVSHIDVKPR MSPVLMRWGLVPGWFKENDPSKMQYSTSNCRSESILQKKS RPLAMHRLAGEFELGRLPWGWRPHYLMSNARLDKVLAGAW D DPLLLERARWS LVPPWSKDLKVKFATHNAKAEGULEKNT KLQSMKWGLVPSWTRRRPDYGAMLKTHNCRADNSASPGG DSPVLLSRQHERVITAMRWGLVPSWFRTNCRSDTMMEKRS
 QAPVLRRREPNLILQTMKWGLVPHWSKHNARSENLVERGG PVLALRREHGQSRAAHMLWGLLPGWRPDNARAESAEKPS YVPIVRTFDMKRVLHVMKWGLQPFWSCI NARSETLLGKSM DI LVITNKLENGKWGYSPTWAKSPMNLINARYETYNEKPS PIRVVLESARWWLTPSFSRELLKTKGPTFNARAETVGSKPT KPLTMHRLDAGGEVVDRQWTWGSKYAMNCARLDKL LGNKW
PVPVVTRDAHWGLLAPWASTRKEKLKPVNARAESLTEKKL VVPVTRDAHWGLLAPWASTRKEKLKPDNARAESLTEKKL MKWGLIPFWTKHNPNYAGLLLKTINCRDDSLAAGGG VYHVMRRDAERWGWITPSWMERPRHQLPALAPCDEEASNEG MSPVLMRWGLVPSWFKESDPSKMHYSTSNCRSENDDQKKS VYVLTDTTGLVPFWTKRVKDTANYPGM|NARSETALDKAS NSPVLLSRLHFGFVASWVKDPNDWNLVFNIRSETAAEKNS NSPVLLSRRHFRVLAAMRWGLVPSWFRSNCRSDTMMEKDS PVLGLRREECKTEAALMMWGLIPSWRPDNARSETVADKTS MGLVITADEPDVQQQMSFGGVPHFAESLNGKSETALESND NIPVVLKNKFKEFLRWGFKIKGLGREVINARDETVNEKPA DSPVLLSRLHFRIIAPMRWGLVPSWFKSNCRSDTVMEKRS KTPVTTSAQQMF ILGYTPHWAHKQTYMDNARSEGIFNKPM PLLALRRDEGHTEASLMLWGLIPSWRPFNARAETVAEKAS PIITADREVQSFKWGLIPDWVKDKRMT【NARTDTIFQKPS QPLAMHQLAGEFEVERLPWGWRPSNSKHNARLDKLLAGAW RAPVIRRQAERLLLQPMKWGLIRSHNRHNARDDTMLESKS PVRRRIRRMRWGLVPHFAEEVGGSAPLINARSESVATKPS TVGVLRRFSGAVTLGPAAWGYPAPWRAFNARGETVFDKAS
 DVPVLDDSAKDRELRFERAHWSLVPGWFNARAEGVVEKST EVLTVVAEEGKRVGKMMRWGLIPFWKMINARAETVDEKAS PVITLSEWGLIPSFVYEEMALDMKSKTLNARSDTIHEKRS PVLALRQEHGQISPALMLWGLLPEWRPFNARSETVAEKAS QLPVITSDAPDE I QLLFTYGFTPHWYMLNARSEGIFNKPM QVPLLTAQGSQVMSWGLVPAWKTQYATFNARMESAAEKPA


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UniRef90_UPI0003619195
UniRef90_R7RZ43
UniRef90_A3PJ57
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UniRef90_V6L2K5
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UniRef90_H3B8N7
UniRef90_H3MVS0
UniRef90_G4MS88
UniRef90_I4EAX0

FRTAYRNRRCLLPADAYYEWQKPFSVVHSGDEPLADAG|IF Y LK QLRSLPCLIPDSGFYKWKEPFYLR\|LTRDVTAVAGLY MWDS IKKKRCVVVAQGYYEWRLPHFTRPKDKRLMLLAGLY FRAA YRGGRCLVLASGYYEWQVRGGVKYPHYDRPSMAGLE FKVPDCKRRCVVLAD GFYEWQRCQK KVWDNWRLLTMMAI F $F A K A A V A R R C L V P A A G W Y E W Q Q P F F I H R E D G Q P I A A A B G L Y$ MWSSMKARRCVVVAQGFYEWKVPHFVKRRDGRLMCFAGLW FKNAMKRRRVLVDSDGYYEWQRPFFI HRRDGQPTGFAALA Y R K P FADVR R CL L P A D GYFEWK P P YFVVTPAD GAVMAMAGLY FKNADRRRRVLVPADGYYEWQRPDFIHRSDKAPFGFAABAA YK DPLKG GQRCVI LAD GFYEWQRQKAEKWK GWRLLTMAGLE MAGRFALLMDGSEDKKEPYFIHRKDGKPI FMAAI G
 FRTAFKTRRCCI PA SGFCEWKTPHYFSARSGEPLAFAA L W FRRAFATARRCLVPAD GYYEWHQPYF DT PA DGSVMAMAA I Y FRGA EPALVVMDGWYEWSGVGKEKRPY LVTGGGTVVA

 FRSTWNKRRCLVVPLLGYYEWVQKQPYFVRQQHGGEDLAMA
 WA P LLL K N GRAA L P A D G WY E WK QP WH I H RA D H T P L F I A A L A MWGSI K S RRCVVPAQGYYEWQKPHFTRHKTGKLMLLAGL Y
 YKEPFKGQRCVVVLAD GFYE WK KQTGQKWQGWRMLTMA GLG
 WR QSLLRSFRCLMPAN GWYEWNPQQQHCPDDPDVLAMTAMWA
 FRAAARERRCLIPSSSGFYWKQPY LITTRNDGAPLVMAGIW FRSAFAHRRCIVPADGWFEWQQPHFITDTDDATQDVLGLA WS R $\square$ K H R H R CVV I P A Q GF F E WK IP H F V K R K D G K L M L F A G L W
 MWQGMKN R R CVVVVAQGFF E WKIP HF VKRKD GRDMCFA GLL W

 P WK M L TH G R IL V PA D G WY E WK QP Y Y WRKPV QSHRA I PA H GFFE WK QP WF I H H P E G Q L L GF A G L WNS
M W K G K N R C C A
 Y F $\square H$ R A D G Q P I F M A A I G
P WKMIGVGRILVPAD GWYE WRKQS
 F R GP WR H H R C L L P S S S F F E K G H

FKDA KRCVEIMMDGWYEWKRYFDWKRRENDPYYHHLNS FKPS S LESRRALIPA S GYYEWRTEPFY DHLP GEQVVVFA GLLY
 Y K E P L K G QR CVV L A D GF Y E WQRRQKR CEWT GWRLLTLAAGLA



 F R A A L N H R R AL I PA S GFYE WRREW $\square R P R N G G G V A F G A G V E$
 Y K GPLVK R R CVVVLAD GFYE WQQHNDEKWKS WKL L T M A GI F FRAA WRHRRCCLI PATGGFEKNY F V G R R LD QRSFWDA GL W
 FKKAFESKRCIIDANAFFEWK IKYK I S IDSNRSLEAMA GL Y
F K S G
 WEKVWDNWR
FRSAFQRRRCLVPADGFYEWKQPYYFSMADGQPFALGGLLW

FSGAWRHRRCLI PATSFFEKGHRDV RDDGEPDWUAGLW

 GASMWHPQRCVVECQGFYEWQKKP LAAGRDERKLMPLAGLGW FARS S LRYKRCLVPMD GWYE WQVP YFMAPAD GS RICMA WV W FRGS APCLFVMDGWYEWKDRQPYYDAGHEPMVVAGLC FKAAVQHGRCAIPVTGFYEWSGPQGARDPHADHGPDAGLY FNEAFSARRCVI PVVGFY DWKQPYLVTHVNRGPLLLGALW WHS LLP S QRCVVVVQGFYEWHGREDKT GHGRRRLMPLA GL W WRKPVQSHRAIVLAR GYYEWQTPYFDRYPDDQLMGFAGL Y FRHAFKRRRCLI LADGFYEWKKPYRFTLATDEPFAFAGLW YKDA $\square K$ S QRCVVLIVD GFFEWRHPFY IYPKDETVFY LGCI Y






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UniRef90 HOTPQ8 UniRef90-V9KVK2 UniRef90-UP10002EBB5AE UniRef90_UPIooo34990BF UniRet90-S6AV80 UniRet90-K4LEU 8 UniRef90-B8KTR6 UniRef90-W4HLIO UniRef90-UPIO004782074 UniRef90-G4UYV7
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UniRef90 GOEB43 UniRef90-F4LCW4 UniRef90-J4G960 UniRef90_O3AX21
UniRef90 M2WSZ3 UniRef90 Q4JMX5 UniRef90-UP100047BA9AB UniRef90-K4QJK5 UniRet90_UPIO003B5284B UniRef90-UPI0003EA7ECD UniRef90-M4FRQ0 UniRef90_UPI00037681D8 UniRef90-likWYO UniRef90 UPIOOO47B8D47 UniRef90-X1LXV9 UniRef90-M3KIX2 UniRef90-G3TCA6 UniRef90-K7FXT2
UniRef90-G4FLW9 UniRef90-UPIOOO4694EE6 UniReffo-D7BQA4 UniRef90-UPIO0046B8430 UniRef90-UPIO0037400F3 UniRef90-L7WBR4 UniRef90-A3Z5S9 UniRef90 K6BD48 UniRef90-V9RVS4 4 UniRef90-UPIO004560D02 UniRef90-HOJKY2 UniRef90-X5DQ23 UniRef90-UPIOOO34C490D UniRef90-F7SQR7 UniRef90-R9P721 UniRef90_U2T491 UniRef90-B4BKE5 UniRef90-UP10002001E7D UniRef90-10KF65 UniRef90-Q26HR7 UniRef90-O21LT2 UniRef90-UPIO0021A6F0A UniRef90 G3AX89 UniRef90_D6R9T3
UniRef90_A3YVA9

E R WR $\frac{130}{}$ 140

160
 NSFKDQGRIVHTFAVVTMPANPLVEPLDNRMPVIIEEKDF

 EFWRDPQAWLATFTVVTAADPGMDRIHDRQPLVLEREDW
 EFWRDRTRWWVTCTVVTTAGPQSLADiHPRMPLVLTPDRW ETWMPNGEEVDTVAVVTAAANTDLATLHDRVPVTIRPDDF DCWPDGGEPLFSYTVITVDASKTMDSIHDRMPAILEDEAG DCYENDDRKHYTYTIITTDSNKSLKFLHDRMPVILEPDDL EQHSGTGEPFTSTTIIVGAANNWMNRFHDRQPVILDWRDA EFWRDRTAWWSTCAVLTVEAETEPADTHPRMPLTIPQDRW GLVRPDDGGDLRATVVTSASAGPVAWLHDRMPRVLGEDA ERWRDPEAWLWTVAVVTTAAVPGLDFDHERMPVVLPEEDW SWWDDPDRWLDTATVLTADTVQTLADYHDRNPVMLPREDW GLWEQRGEMVSFTVLTEPASGKMSELHHRMPVFLNEQNA LWAYNSNLDDTSCTIITEPSAAPVNQIHDRQPLILDPAYY DYQDTPDDKFQSFTIITGPAPKQTKWLHERMPIVLEPGEW HFGPASATPAAHFTLVTADAEGGLLDVHDRRPVVFNYDDA
DTAAVEGDPLWTFTVVTTAASKELAWLHDRQPVITSEADI
D RFQRGPGEPLYTYTVITVDASKAMDCVHDRMPVLDGDDAV DEWVDKGEDFKSFAIITAPANSVTKKLHHRSPVILSQEDE
NWTSPDGRSITSCALLTREAAPGIRAIVQRMPVILPPEQF DCWVEDGRRILSCSILTTDSNDYLKEVHNRMPVILADDDY LYFAGTYNETSGCAIVTREAHDNLQFVHHRQPVLEESRAV


## WNRSSGDDES

 DSNEDTGDKTYTYAIITR
## \section*{D}

DCWTPPGEPLYTYSVITVNASPGLQSIHDRMPILDGEEEV NWRPGMEDEAHGFAIVTNDAAGGMIDVHDRRPVALPPDLA
 DCRDGDAGRLYTYTIITTDSNAQLRFLHDRMPVI LEPRSE DCWEPPGDLLYTYTVITVNACKGLNSIHHRMPLLDGEEAV STPFERGDEAEGFLIVTAAADKGLVDVHDRRPLVLSPEAA
WRRGAELDEAHGFAVVNDALGGMVDVHDRRPVALPPELA SRSLDETRALWTFTVVTTVANKEFEWLHDRQPVILSTGAL DLPKAKANKEDQFTIITVDASPSVAWLHDRMPALLKLDQL
 WRPGAEMDEAHGFAIVTDDAGGGMVDVHDRRPVALPPELA DCWSPPGGGTYTYTIITVEASQNGQSIHDRMPVLDGEEEV


## | <br> .

$$
\begin{aligned}
& \text { ESWKPDGQLRTCCCLTGPNEVMVPVGDRMPVIVAPADF } \\
& \text { DTWQHGELHHTVAIITAANRLERIHHRAPVVLSRADE }
\end{aligned}
$$

DCWPEGGDLLYSYTVITVDSCGGLNDVHPMPILDGDEAV DKVVFQGHEDYTFTLITTSVNDQLDFLHDRMPVILPDAHL REGRGADRGRLEATMVTAASVAPVAWLHDRMPREVGSDET RPGQGADRGRLEATMVTAASVAPVAWLHDRMPREVGSDET
 SWWRDHDRWVLTATILTSDAVQTLADIHDRNPVILPEDMW ERWDGPSGPLETCTIITTKANKQ
NSWVNKGEIHDTFSIITTDANPMMEYTHNRMPLILHKNNV DRWIPDGSEVETCCVLTTAPNALVAPLHDRMPVIVPEGLE DSWOHPGEIHHTVAMVTTTANRLINRIHHRSPVLITDE EPRQAA ESSFTLLTRPACENLNALHPRQPCVLPVEAL STWKDDGKKDYS SHNKNFTDNFNNFTHITKEDSNDLSWLHSRKPIFLKPQQW DRW $\square$ PDGSELESCCVLTTSPNALVKPLHQRMPVLGPDGLE

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UniRef90 H3B8N7 UniRef90-H3MVS0 UniRef90-G4MS88 UniRef90-I4EAX0 UniRef90_UPI000477EB44 UniRef90-S4XI58 UniRef90_UPI00034DDB5A UniRef90_UPI0003B662B5 UniRef90_G2QFY1 UniRef90-C5BNV1 UniRef90_UPIO0047E2731 UniRef90-KOKDY6 UniRef90_W0V963 UniRef90-W4K241
UniRef9
UniRef90-HOTPQ8
UniRef90-V9KVK2

## UniRef90-UPI0002EBB5AE

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UniRef90_A3YVA9

A $\operatorname{V}$ WWLDPATGAEE LDAHVLDDSPVDRFSVDEVSTDVNSVK ESWLSGDA ADMVKKGFSGNYLLPDMSVFRVPELVNDPS RT WL DTSAASWSSELSALLNPYPDCPLECYAVPKEVGKVG ADWLGGGP S K WL NGEVSTQEA LKL S RWLDP GLT DPAEVGEMLAFAPTENITFHPVSTVVNNSR RSWLDPK RHEWSNELQQSLDKPG EGREAABPMVSPAVGATR ERWLDGRANDVEDVMPLLRAPR VGEFAWHEVSTRVNRVA

 NT WLNPKRHEWNKELQSILKP WDGDLEDYAVVKDVNKVG NAWMRGDDPGA
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 ALWLDPDGPAQQAEQLARSMALGPQAFHWFKVDRAVGNVR HA WL DTRSQTWTAA LNT L LDPYHDAALECYPVPKEVGKVG ThWLDCNAHDVDEVMTLLRCPE KGTFIDWYEVSTEVNSAA $A$
$A$
 E CWLEPRTTAEQLQQAIAQAR DRFTGYAVST
QQTWLQERRIAEVKRLLHPYP GEMDAVPCSP
 P LWWL GEEGKGAARL MRAAPEGTLAFEE
WD WL DPEDTEREQVRH TTRRMPPS ALLRAYPVSTRVNRPA KRWLDPAKDVWNRELQDVLKPF GGELECYPVDKRVGKVG
 QEWLH P S R R R WTDDLQSLLKPYR GDL D I Y PVVSKDVGKVG RLWWLSEEKWTKPDENLIVRPY F R RELTVYQVPKGVGKVGG REWLNTSTPLNEIAA MLQPYPAERMNAYPIAPTIKNPQ RRWLDFG KVKSLDALELLQSKD ILLTFHPVSSIVNNSR LHWMDPDFPTAQALD VLGLGLPESAFTWHPVRPEVGSSR
 AMWTWLDPGRAEWSKELQAVLRPEGELVEVYPVVAKEVGKVGG SKWDDGEVPTQEALKVI H LDPVENVTFHPVATVVNNAR $R E W M R Q D I G G K E A E E V S V D G A V P A D K F D W H A V T R A V G N V K$
$R E W V D P A T P V A R A ~ K E I L R A G L P E T A F S W Y P V R Q E V G S S K ~$ $N T W L D T S S L Q W T P A L C T K V D P Y N D S N L L C Y Q V P K E V G K V G$
$E L D W E P G D Q H H R H A L E P M L T B C A E Q G W S C R$ DEWLD VKRFS LVKEA $\square A V L K P F D G D L K V Q R A S P L V N S V K$ QKWLTGNHILRDNI SGNI QIHKVSSYIVNSPR NEWLNPTTKGTQELADEAVAAPVAERLQFHEVGP VR REWVDPATPVARAMEDLRAGLPETAFSWHPVRQEVGSSK RRWLDFG EDVRSLEALSLLRRNNTLTFHPVSTLVNNSR

 QRWLEPGDPTR
SRWL DCKTQEPRHVADLLKPAQP DFFEADPVSDKVNKVA RTWLDPSRTEWSKELDQLLRPF E GELDDVPVSKEVGKVG ARWLNCKTLLPREVAD IVMPVQDDFFEA IPVSDKVNKVA
 EA WLAVADGHDLDALDPLLMGWDPQGWKVDP I QRRRNEPS


SKWLDGEVSTQEALKLIH PTENDTFHPVSPVVNNSR EA WLTADADTALLSLVMRPYPETMQSWPVDRRVSRSA EKWLNPD DSVQELTR MMQPFDSKGFNAYPI SQKUKKPE EAWMAPS DGAELRALEPLLSGWAPDGWQARPLTP ERWLDPK LAKTE EE RLLLRPFPPERMDAYVINNDFDKKK
 ATWLDKEDTWTPEVARLLRPDKKP LECYKVPREVGRVG DAWLDPDSLGHPDLIVPSVEAISA 1 EDRRVSAKVNSI R $V A W L D G S D G V R R T L A A S P P G A G I L G T L V T G E A D R R V G N V S ~$
$A E W L D P L P N G D Q R L A A V E R A T A$


AKW【NPETPQSEDDE EA WMEPDGPGLRALEPLMQGWSPEGWAAEGPVKPK QA WLHENLTEAEALKLLADAYPAGHMHSHAISKRTTSRT QKWIQPDLNTAE ISKL MKMFDSKGFNAYPISQKIKKPD

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| UniRef90- ${ }^{\text {H3B8N7 }}$ | N NTP |
| UniRef90-H3MVS0 | NQG |
| UniRef90-G4MS |  |
| UniRef90-14EAX0 | A |
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| UniRet90-S4X15¢ | VDGP |
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| 4L |  |
| UniRef90-J4G9 | SPTFVQPI |
| UniR |  |
| UniRef90-M2WSZ3 |  |
| UniRer90-Q4JMX5 | N |
| UniRef90-K4QJK5 | YQ |
| UniRef90- UPIo | ADGP |
| UniRef90-UPIO003EAT | NNS |
| UniRet90_M4FP | V |
| UniRef90_UPIO003768 |  |
| UniRet90-I3KW | N |
| UniRef90_UPIO0047B8D47 |  |
| iRef90-x1LX | N |
| 込 |  |
| UniRet90_M3K | V |
| UniRef90-G3TCA6 |  |
| UniRef90-K7FXT2 | TPECLAP |
| UniRef90-G41 |  |
| UniRet90-UP100046 |  |
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| UniRef90_U2D |  |
| UniRef90-UPIO004688430 |  |
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| UniRef90 LT7WB | $\bar{A} \bar{i}$ |
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| UniRef90-K6BD48 | A dop |
| UniRet90_VgRVS4 UniRef90 G1SQ26 | N ${ }^{\text {K }}$ |
| UniRet90-UP10004560D02 | N |
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| UniRef90-F7SQR7 | Y QSS |
| UniRef90-R9P721 |  |
| UniRef90-U2 | DDGPQLIJEPL |
|  |  |
| UniRet90-UPI000 | K |
| UniRet90-10KF65 |  |
| UniRei90 Q26HR7 | A N |
| UniRef90-Q21LT2 | N D |
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UniRef90 Q9VHI3
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UniRef90 A0Ао23F2K0 UniRef90-R5RA52 UniRef90 F4Q474 UniRef90-UP100037F5B7B UniRef90-R7VO50 UniRef90-V4BBR4 UniRef90-s3BUI6 UniRef90_S6LXT7 UniRef90_UPI0003315557 UniRef90 UPIO004790EDA UniRet90-W5KPA0 UniRef90-W1DS10 UniRef90-G8B8P1 UniRef90-UP100030DE23C UniRef90_UPI0001E2F638

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 GRTACTLAPDEVVSRACLYRNRTGRRRQPRWRPSYNKSPQS GRFANAQPDPQYRAAVRERDPTPAPDADDYTPSHNVMAPQT GRTACTLAPDEVSRACRRQPRWRDGDQEKYRPSYNKSPQS
 GRTAVSLGADRI RRACAYHNNQRERKYPEWHFEKNASPSE $G R L A L F R W S P A L A S L P G F P A G Q Q \quad P H W N L A P G G$





 LLT PEWRSEFNCGRTYQPSYNMTPTD LLT P E WRSEYNCGRKY E P S S Y NMVP S D
 SLDT D QPALES S RFKATLPKGSPDEPVYHASAFGFPAW GRFVISSS ENVFGLEYKASFNUVPS Q
 $G R Y A L F R W S Q D F A A L P G$ GRTSCHFPADDQQPHWSLAPGA GRTSSCHLPR DVLTRACAYHDRQGQQRLPEWRPSYNKSPQS
 GRYRRRSDK QRDAEAF DLGGMGLEEVVF SNAFEPED DIAP GS S L N VKA A E L E A RYE AVLPPPTAAF QPVYHANAYNF PVW GRY LT DLLGSDEELKNYYD QLEP KAAAND DTGASNEVVFPSN GRYALFRWSPAFAARL A A A F P P DQRPAWNDAPGA
 $G R F A N A Q P D P Q Y R A A V D Y Q P P T P A P D A D D Y T P S H N V A P Q T$
$G R Y G F D H R P E A D Q Q A W G R$
 GRFGMDNN $\square$ D D L A QQQQVFP PEQSNFAPNYNTSPGD GRYY $\square$ N DETAKEIDEKLIRQDDDALLASCKERDVYPSA A RYGRKSDDVE IVYQDMLNE QY HVNAFNFPKYPI DTK S

 GCYSLLTTPRDTLRKVLAPDWLANSSTWWLSHYAPRAELHP GE
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 GRYALF RWP P A LTALRGG FPSDLAPHWS』APAA
GRTACTLAPQELSRARRRRPEWRAGDADQYRPSYNKSPQS
 GRTGLSSLNKE QVQSAC GYKPNDRNVYGKNFVPSYNDAPTE GRFLLNTSDEDLKEYYN VVKEVEEKRQQNYYKKGEVFPSD GRYAL FR WTPAFAALPGFPADQQA Q W W LI SPA D


DQPPGHEFHPSAN】APTQ GRYFL E L K A L M E LEERDDYTFER DLLIDAKDYYPSN GRSVLTLE P Q DI QA R T NTTRVIGQ YQQSYNVTIGM GRYAL IRTTADLERDYEAQGA DLGEWQPRGSVNITA
GRTACALAPDD $\square$ CK ATARYPAWKDAPGGKKYYPSHNDAPAS
 GRFAAEDDYPEDARMDRAQPSAGDPER SWNDNPSE GRTACTMAPDEEQKASSYRDRTGQRRRPQWRPSYNKSPQS GRFA QAQSREE YLAH L VEAA ERDDA WDPAPDGRYNVAPGT
 $G R Y A V F T E Y E Y D E D K S\|I D E V S E K Y K T S E D\| V N G E V F P T N$

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UniRef90-E2BKA9
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QS LA TTEDGF DEPVWGYPM

 SALI I Y MMDSGTQFNAKY ILDEPSKFKYFNCRRESLKAAKS
 R DPV AFTDRTD GSRRFEYAFWSLVPVWFNARSETAAEKAS $N$ SPVLLSSRQHFRILVAMRWGLVPAWFKFNCRSDTMMEKFC R A AVI HR DTES G RAMDE TMMQWGLIP H W DNARSETLLDDPGM




 $P L P I \quad L D R A R W G L V P G W A K D D K D G F R A F N A R S E T V D S K P M$ $R I L V A M R W G L I P A W F K E A D P S K M Q Y N T S N C R S D T M M E K \square C$ $R V L M L R E L D G Q R R V D E A R W G L T P A W T P A H A R V E T L A D Q P M$ F QP I R A DEDWGFVPFFFHKA EKFPPTTAFNARAE GI AK AP M NAPAVTGRDGVLCLVWGFPGFEKSRVIFNARQETALEKRT EAPVLAAGNHEMKLEWQHWGFPGFQVIFNARSETVLEKKM

 H T P V L V S E E D D WV I QP M S W G L V P H W S M PLLVLVREEDKDA SAALMLLWGLIDPGWRPFNARDVTLDDKAM

SALIVYKVQQKYVLEPSKFGLLPSWKYFNCRRESLQEHQP $P$ QPVI R R SHE T N EREELVMMMRWGGIVAPWF I N A K S D R L T D S K M RADLVKWGWRPHWATDRAAP NARVEKVAHGPF $\square T$ PVIVST DHFCDVVPMMWGMDP FWHKNNCRLLEHMLLES KL PVSAI RMA Q GRMTLSPLFWGLTPPWAPHCARAETLSKRAM VTPVIVSADHFMMWGMMPFWHK GDYR R HNCR LIE HMLLESK L QVLLLRA GRDGREAARARWGLTPA WTPAHARAETMAAEQPMM PIL TIIRWGLIPR RWVRSADDADQDRAK TDNARSESIIFEKPS

 S S P V L M R W GLVVPCWWF K EA DLLS KMP F N DT N CR S D T I L E K R S

 PIIVTI H WG LIDP R WAR T K E D A T D D R T KT D N A R S E T I Y E K P S HVVTLLELNQESKVVRWGFDGFKKGQDMINARSETVEEKK T V GPVLLSSRLHERI LTPMRWGLVPSWFKESDPCKLQFNTAN QVLLL R RLDGELRLDRARWGLTPAWTPA QARAETLAE QPM







 $P$ VLAL REHQRHT DVTHEDWGFWRGPRPINARAETI AEKPS L Q M WG LVP SWSKERPDYGTVVLKTINCRSDSLARGGM AAPVI T GHHDEELFTWGFPGFGSKNLII NARAETAMEKRT QVLMVREDAGARRADLARWGLTPAWTPSHARAETLAEPPM

 $R \bigvee L M L R D A D G A R E A A L A R W G L T P A W T P A H A R A E T L A G Q P M$ AMILHTMKWG LVPHFNKHEDKS LNT $\square$ NARSEALGHS GM

 MS MVLHN K E WVLI MRAAENAD GI E LVVRARWGLTPA WLHARAETVAEQPM TSPVIVRAGGYRAVVVMHWGLIDSWHKFNARSETVAVKPM


 HAPVLLERGRWRFVPQREEDFRPAPL DNARLDKLQRWS G RVLMDMRWGLVPSWFNKDDPSKMQFNTSNCRSDTMLLKKS S H TPVMDE E GVVERVIQPMKWGLVPSWHKNNCRSEGMLITK RT

$R$ VIA P M R WGLVPSWF KEDDPSKLQFNMTNCRSDTWPMEKRGS $T$ I A V GQ DA H GVV HLA PA Y WQ QL S SPVVLMRWGLVPA WFRENDPSKMQYSTSNCRSEGLL E KK S KVLL L NERRDEQLHHDDAVVYWGYAP GWWD DNARDVETAASSSRM T AL MV Y M T E P T K DI T Q NY F G L VP S WK Y FN CRRRE S L A A H RA A SLVMYNNE

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UniRef90-H2MQU1
UniRef90-Q9VH13 UniRef90-K9P7A1 UniRef90_UPIO002ED5051 UniRef90_T1DD96 UniRef90_S68032 UniRef90-E8X7B7 UniRef90-UPIO0037972D6 UniRef90-R5TRB8 UniRef90 R2SNA2 UniRef90-UPI000332ECAA UniRef90-R7TQJo UniRef90-A5GJY9 UniRef90-V5GGG1 UniRef90-G3AFG1 UniRef90_UPI00035E402D UniRef90-J8UYJ2 UniRef90-A0A034WSS7 UniRef90_UPIO003076522 UniRef90-W8C504 UniRef90-A4XYK2 UniRet90_UPIOOO37C7C70 UniRef90-UP10003B74239 UniRef90-C1E3T2 UniRef90-W9TSU8 UniRef90-UPIOOO38C1177 UniRef90-UP1000462ACE5 UniRef90-D7A6N6 UniRef90-C1F6L1 UniRef90-D2QP24 UniRef90-V5XSH8 UniRef90-L8Y750 UniRef90_UPI000378F797 UniRef90-C4ZFK4 UniRef90_V5GK33 UniRef90-G0JLH3 UniRef90- $\mathrm{X6JOG} 1$
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 F Y E WK IP H FVK R K D GQ L MYFA GL W QWNASRKHRCVVP DQGYFEWK 1 PYYVHSKKSALVY乌AGFY WREPFAKRRCLVPASGDYEWPKPGHDTTVEPGPFAFAGTW FRADWPH RAITPTDGWYEWVDEGGPNESSRTTSAAALCA YRGPFRRQRCVVLCEGFYEWYNKSTWTADNVNLLKMAGLF FQEAFNARRCVIPVSGFYVWKPQARNKQPYLVTHVQALWC YSGPFRKQRCVVLCEGFYEWYDKSTWAPESVNLLKMAGLF FRTAAQQQRCLIPMTGFYEWHYPFYDTTTDTPIFSVAGLW FKNA KRCVIFHNGWYEWQRKDKQKDPFYHHCPSNSFA FSRALDRRRGVVLINGFYEWAAERAGSSQVKQPYYCAABY FKAEDATGAVDSAETWGKAWDNWRLLTMAGTFDC
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W7OLF2
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 DCWEPQGEPLYSYSITVNASECVRSIHHRMPI LDGDEAV EAYPVGDVEYLSLAMVTQPVADLDEKYHRRPLVLDEQAQ NVFGD RIHKKDVGFETESTLMTTSPNESVAPTH GVFKDKDGSVKKCITVTTEPNSEVKDIHNRMPLIVEKDHI DCWDPPGELLYSYTIITVDSCRSLRDIHNRMPVILVREKE
E

ERWWGA D G S E E L E S Y V T I I T


EVYPVGGHEYDSVAMITQEAASL
DEWPESGELVAT GLYNEIG DRWKAAGGELVTVTVIT WEPPEGGDPLYSYTIITVDSCKSLTDTHPR
KEDYKTGE
DRWRETGEV
 EAYPVGERCYLSVAVVT D WF ENRRF
 LWAYNSNGD DTSCTI I TEPAAEPMKQLHDRQPLILDPAYY CRYHTSSEHADSMALITVPAAAPDAPLSDRDPALIAAEDA G $\square$ WEPTADGGACGAII TEPASQGLAHI HDRQPLVLDAECR DSWVDQDKNVNSFA I TT DPNALLQQIMHRSPVILPKAAE RHYEDGDR DRWKETGEEYATF R IU K NGAGFETESVI MTTTPSKSVEPIHDRMPL EAYPVQEQVWLSTAVVTQPA MTQRRPLI KKND I RQY EGSERFVILTTQANASLEGIHHRMPLI LEPEEA

 KEY EEGTRFVILTTEANDSMKSVHNRMPL E A YPVHGQTWLSVAQVV GETLYTYTVITVDASPNLQSMHDRMPV | $K$ |
| :--- |
| $N$ |
| $N$ |
| $E$ |$\frac{\square}{K} D$ EAYPVGGQVY L S VAMVT QAAASQRRPLILDEAGQ DCAVLEGEPLWTFTVVTTDACKEFSWLHDRQPVILPDEAA

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S
S

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 K D WI F S REKAEEMLGQTPVMLNGSTEYE K D WV M D D T K F S GMLLK Q
K EWL
QLY $L$ RKEFN $\square E \square L D L L \quad K P \square D E G R \square V I E N V D K$

 D G WMA A D GA G L RA L QP LLLDA WDP T G WI R D R P
K T WLDP T RTTWSKELQS L LK P Y Q GEL E CYPVAKEVGKVG

 Y E WI A A A MPS ERAE QLVL NLLGEPAEAFEWYRVGGAVGNVR

 $G V W L S N D T P P E Q L A A L L D A K P Q V A L R E R A L A T L V N D P B$ Q A WL H E S LDEK Q TLLELL LA T A Y PA SRMHS H S I A K R I T S R T Y S Y L Q GENLLNSKANY D D DNFYRVVNEVNSPK

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 WD WLLDS ELTER DA!RARTRRVDP DALIHYPVSTRVNRPF K QWLS NA A A DEILP LLKPYNAHHMQAYPIDAGIKNPQ Q T WL F D DNAT D F L L H K R PAP L E K E
EKWLDPDLQKADVTSLD LKMFDTDKMDAY
N N WL
A A WLLD P E T P L A D LHA L $\quad \square$ A S P P A A LRERVLLANFVNDPR E S WM
E A WLIE GDATHLHALESLLNPWEPHDWCVSQP
$R \square W L D P D R T D W S D E L Q Q T L D R P W P D A A D E F D V V S K D V N K V G$ D A WL F D D D QTELLI L RKI P GP LINK DTEYE
D T WL A P D T P L P AL I S L R R WL D F G E V K S L E A $\square \mathrm{KLLLQP} \mathrm{K} \mathrm{S} \mathrm{CLLT} \mathrm{F} \mathrm{HPVSSSLVNNSR}$ D $\square$ WL K D S T S $\square \mathrm{Q}$
EDWITSE
A L WLDA AS PMGALQEL $\quad$ LSRPAPARLRERALADLVNDPR A T WLLD T S P GK WT P E L T K L C E P Y H S S A L V C Y Q V

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 WS WLD YEGMP FRDALDE Y LITPVKNLLSSHPVSNLVNNSR H D WL
N R WL S ES T T DEESYGMMKQF $\square$ G L S S HRVVMLVN S $\square K$ D D WLLDTSTRRE WKEA LGGSMSAP TA A RLKA HPTSRAL NNTR RKWLDAEVPTGEAVKLDQ PTENVVFHPVSTFVNSVR NEWLDFG NVPLKKACKLIRPTESVTMHPVSSIVNNSR EA WL D P A REWS A DLLASQLK PWPVVDTVLVDVVSKEVNKTG RE WTD S AT D PARA A E DA QECCTPVVDEFAEWYKVGKAVVNVR



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 NNS DECl|


N S DP SFI LP I
NS DPSFLLPV
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NNYPECDQPL
N NWPGLADP


NSTPECLAPV NKSEDCFKPV
N NSPDFLDPV
NNGEDVI ERV
N NGPEML
NQGAELMNPL
NKSEQCNKPI

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 NDMPECVTPL
YKEADSVEPV
N
TDYPEL

NSDPSFTLP
NQDPACAHP
NTGPEIISPV


LD A P E C LT P

RSSPSFVVPV
T D GPECLT P NNSPECLQPV

| $\square$ |
| :---: | :--- | TESSPTMIQPDV NNSPACVQPV NKSDNCNKRL

 FNSPDC 1 K P NKDSCCNKP■

NNGPELIE $\begin{array}{ll}T \\ N \\ N & V \\ N\end{array}$ | $N$ | $N$ | $P$ | $E$ | $C$ | $A$ | $P$ | 1 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $K$ | $S$ | $P$ | $D$ | $C$ | $V$ | $L$ | $Q$ | HSSASFIVPV $N Q G Q D L I R P$ NNTPECVTPV $G D G P E L T A P$

$N N S P E C L Q P V$

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GRY L $\quad$ F LP DE Q $\square E E \square K N \square L Q R \square N Q K F Y G T P F L D G E D F P T E$ GRYFTDPSAEELYDTFRDPGTEDVVPAAE

| $D$ | $I$ | $H$ | $P$ | $T$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $V$ | $H$ | $P$ | $A$ | $D$ | GRYTLSVT QRPELDALGLQTAD RFN A A P G S

 $G R Y A L F R W N P T F A A L P G$

FP T D Q K A Q WN $\square$ S P N D
GRTCLTTLEPKELESCCQPRYRNEFNCGKKYVPSFNVAPTD GRYQFTAEDNKEDQR VVQEVQDRCGRGK FMPGDVYPSA GRLDIT DDP LL A QWIS D S L G L E F HPSTNHDVRPT Q GRYY ID I E D A E L R S I IA A VER K T TVV T GE GRAACSLLNPDSSLCRACDYKDAT GKRRD DEYVPSTNIMBPD
 GRY W WT D AVF DSEAEPHLNVVPGT

 GRFALAVPRRLVAEAMGLPGMPDVPARPEDFPSELI

GRFY VS EETAKE $\square$ EK $\square$ I R N VD $\square R M Q R M H F G D \square Y P S R$
GTDFE $T$ S QTRLLNPYPRRYN $\square K P T Q$ S LAVTASEVEARYAVK LD DSAHFEPVYHANA WQLPDVW GRFALAAVRRLVTEAMGV PDMPEVPQRPEIFPAAQ P E P L PFPRRYNIKPTQ

 GRFEEL KTKF DKLL P K VL K Q D Y P S G L GRFA Y T P FRRLGQQL GLDF D


YRYTQSPDTLRE EFSIPDRRAGGDATPNQF QGDILPTN




$S \square A \square D Q P E L E N R F K A K \square E A G G S S A A G S G P K A G F L P V Y$ DFAPSYN I APTN $R R F \square G P P \square P V R D P N A D E L S A S W N V K P T Q$ T D S PE $\square$ QR $\square Y Q Q A L D N G$ Y QLLK S G EIIF P T D
 R TVVE E I I D NLLIP F T D L P I Y HA S G Y S H P E L L I Y T D R R A Q DL L A LAE E DE D RLP LT DLPLHHAS GFNHP T D

 $G R Y C R R S D K Q R V A N A F Q V E A D V D \quad D L S L G P E D D I S S P G B$
$R$ Y A LE K D LP E LK D $\square$ ID A A S R S R L S Y A R P F $\square T Y$ GEVR P T D
RYNA $G R Y$ LFD PMTGELKEYYKLAFQ MKQD

 GRFSSLATDDYTLQDQFNFEFNHEVT DNP D DLVVYHYAN GWAHP LMWI IDP QES S K H I A P GQ $G R Y L F E P D K N P E I K R \square Y Q L A K D A G F N P K$ | $S$ | $K$ | $H$ | $I$ | $T$ | $P$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $M$ |  |  |  |  |  |
| $G$ | $E$ | $V$ | $F$ | $P$ | $T$ | $D$ |

 GRYAFFRWSPAFSGLPG GRFAQYEARSDY LAALDNSPLACRASEDTLPNGRYNISPGS

A A L VDVLNLDGTEP GFEWSPTYSVSPRT
S LTKK QEEFK ERFDAAMKELDVYEPYFHRS GFEDP YD GRYGSWSASGALADHLGARP IPADEDPGPSWNLAPGA
 GRFF LTRP $\square G E \square A L F L N V E D S \square G$

P Q P ARKN $\square$ QPGQ

## $N$ VP P G S

GRYFFNLE S ELLQNYYREAQKK QPEQAAELAAGE\|FPSN

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 NTPV LIS D QHHR VI QVVMKWGLVPQ WHRNNCRE DGMF DK P S

 FAPVI EKSERGGKLDVCKWGYPGAKGNDNARTESVMMDK V TALVLTS NGNDII I PASMDWGFPKWGVIFNARSETAHEKPM
 $N V L T L$ GANKNNEVVPWGFEGFKKGQLEINARAESVVEEKT

 RAGDLSGESTP HWVK NEDDLKKQWNNTLNARGETIFEKS S

 R S PVAT WGGVPHWTKDTAQQKKLWNATLNARGETIFFEKPA


V VRRRNGEQNHDFWGLTSRDNK LI I NARAESVLDKPM $\square A P V L D A K G E D R \| L R N Y K W G \square W N S K S Q K Y A R \square E S I K T S P G$ PVLVL NEHGERVI ERMRWGFKLPDRMLFVARSEEILLEKPF
 PALI L RADHDE IVSEVLKKWGYGKK SLIVNARSETVQEKPM $M G P V I R L D E G E R E L T S M Q W G F L P A W W C F N A R S E T V H E K P T$


 ETAALIA GQRQVQVVGMKWGFPGFKTGGNARSETVQQQKMM $P \square S I$ I RQDAGEAHWATAFWGLTPPWAPHCARAESLLEQRPM IE GLC $\square R$ T MNWGMYS QKAKAFSMN $\quad$ RRSESVVAEK

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







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WYHHLEGELL
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山山
$\stackrel{F}{\mathrm{~F}}$
FKKPFEEHRCVFPMSGFYEWNTEKEKFLFTADI LYYVGGFY
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FKNALMRQRIAI PTTGFYEWKTKFFFTHPSENLLWLAGDY

FRRPMMEGRCLVPASWYFEWKQKVKYALMAPEI STVWMAG
$F Q D G V L H R R V V I P A R W F Y E W N R K I T F A L R D D A P I L Y M A G F Y$
$F K V P L G K R R C V V L A D G F Y E W Q R F W E K V W D N W R L L T M A G V F$
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FRAAFKHRRCI PASGLYEWQQHWFITDTEGDGLGFAGLW
FSNG $\quad$ WWY HR IVI PASGFYEWNRKNTFTRSDASVVGYLAGFC
RSFAKSERCLI PSDGFYEFTTPPNQRLKDKHLDTGAGEP


F S E S F K K R R C $\quad V \quad Y P$




 CHA IV GK S I E M C GRY

 F S E S A K S K R C L I Y Y V D G F Y E H H H H P F F LI Y R K D H E P F A L A G L W




FSDSFSNRRCL | I | $P$ | $A$ | $S$ | $S$ | $F$ | $F$ | $E$ | $W$ | $K$ | $V$ | $I$ | $V$ | $E$ | $I$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $H$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $V$ | $A$ | $D$ | $S$ | $F$ | $Y$ | $D$ | $W$ | $K$ | $P$ | $K$ | $Y$ | $E$ | $F$ | $N$ |
| $L$ | $P$ | $A$ | $S$ | $G$ | $Y$ | $Y$ | $E$ | $W$ | $K$ | $T$ | $P$ | $H$ | $Y$ | $\square$ |




Y R N A F K K R R C L I P A V K F E E K T H $\quad$ W

$Y E G T$
$G R A V \vee P V$

WTGE WR IAA P R D G G L L F F A A I T


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

$F R D A Y R S R R C L V P \square S G F \square E W N Q P H A D A L K D R S T R A L A G \square W$
$F$ R S S F S S A R A LV V M T G Y Y E W Q E A V E D G K T V K N P S Y IA GAB
$F K$ K H I K T Q R C L L A D G F F E P H Y P H Y I K Y R D S N L F A FA G I Y
 F H GP WRY R H CVVVPA EAAFY E GA G P WR I T R G D N Q P L A F A G L W
FA K S F Q A R R C V Y P T S G F F E WT P D K Q K Y WF N Y K D Q P E P L Y I



## $F R D A$

WA GP LK H GRMMV PA D GWY E WK QP WY DRP P G G Q K P L WM A A V S


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140
150

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NWF
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AGLVSRWNDMDTCALIVTVPANLLLSBPLTDRLDPVTIPNHALL
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RAVTAAGEVKDTVAILTRPAVGAAASVHDRMPLIVPSAAM SKWSPDGAELESCCVLTTEPNNLVKPLHHRMPVIVPNGYE ERWADPGETLESCTIIVGPANDLS
WF WIAGLVKEGAFAMLTTSPGPD APYHDRODVVLGRQEM CRYFDIUTAFDSMALITTTVDMPLTPGTDRFPVVIDAARA AGLYDRRGSEECYCLLTTAPNASMRPIHDRMPLILTGEQR AGCYKVFDGEPHSVLLTTAPNDSMIQ1HHRMPLILQKKQ\| SEWPETGEPDNTFSIVTTEGNTMMSRIHNNMPLILPDEDA AGCYNFFDGQARSVLFTTEPNQSVAPVHNRMPLILKKTQU SEWPDNGGRMHTFSLVTTKGNPMMAKIHNNMPLMLSENEE DEWPDTGEDIPTYTMLTTDANPLLAALHQRMPCVLIPREAE

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DVWNPGGVTVEQVATVTCPPNADVEPTHHRMGVLLGPSDR
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EVWHPVGDDTRTFAVATCAPNDTDATПHNRMPVVLRPEDY HRESDEDEWRTTFTI ITTRTGEDAAGDVHDRMPAFLTSAAW S
SWWRPHDGWLVTCALLTRPAGRDLAWLHDREPVALRREDA DEARTFEGDVFSFTVLTRPAGPDMQAVHEREPVVLGPDDW GGFYNDFEGTPQSTLMTTEPNDSVSVIHNRMPLYLKKSED DCWPEGGDLLYSYTVITVDSCKSLHDVHHRQAFLMPEEAV VKGDGEGEDRATVVTTASADPVEWLHDRMPRVLSDDEA GWRPDLNEMTTGFAIVTDAAAKGMVDVHDRRPIILTAEHA LF AGLENGSEATIITCAPSSVIAHIHDRMPVVIGPNHL

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EHWLKGHDDFASAITH
RVHCHEVSTRVNRPS
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DVWLDGS LSVSTIKEVIKDDMPDELLRAYPVSKDVYNPK Q $\square W \mathrm{WLSELLT}$ TNALKL LAEPYPASHMHSYSISKRDTS AAWLDPGRTERADIE
SAWLDPDTDTETLNSLLAPAPDELLGAAFPVSKHVNNPA DAWLAGSDDPE $\square$ GA GAQ $\square R H P P V A R F$ GTA AP WLRGEDDHAAAQD GGSWEGRMRFHQVPKF GLK EEWLLIVKDRYERALEKMLVGWSSEGWKAEALSKA
K Q w
A DWLDPDRSAPADVAPLLALEPPPG
EQWTEQVKDAHE
EDWFDNE

HAWLDPATPPASARELLAPAAPALLG AFPVERLVNNPA QRWLADADAATE ILL
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DKWLHMEDELDKKNIDQELIQQSPEDEDKAHTVRRDRGKPG A A WLSDFNAASEMIANPMPEDF
DQWLASENDTDQQKIQNLVKQHSEDDLKAHTVGKDRGK
QVWLHEEDSEKDVLDL LARAYPASRMHSHSISKRITSRT Y D WLKPSGSWSNMLLLNSAKNDAYKNDDCYRVSNKVGNPT
YPWLSGNGENDEEQRLGGTVWDGRMRAHKVAPFGRD
NRWI YDSNFAKNLLAKQMP
RTWLDPKRYTWSKELQALLQPF KGEDECYPVSQEVGKVG
LQ Q M DESAKESKRLKPYPHSDKMRKEIAVLPI STEVKKIGK AA WLHPADATAKKGIDDLIAPLPDGELTAYPVARLRGK D Y WL NP DN DEDDKLKIEEI KEFPEENLTAHTVNRLRGK
 DKWLNGTATEEAKAMIRPATDGLLKAHTVRRLRGKEA A M WL DRSVTEPDVLQ P LLEPVHSDILEAYAVSPQVNSAR QDYLQDASAAMDMLKEPMPELERSTDYE
DAWLEGNADP
EKAERPPVHDFRVLPAEELRATLVGR


SRWLS P DIVEPQPLQQ HLDRPYAEDLID
R DWL
$\begin{array}{ll}A \\ Q W W L Q G D A S ~ D V \\ V & V \\ N\end{array}$ NAWI YN DDFAKSFLDSAMPQLYSQTE
 DDWFAPHATSGNADANPDATSGPAAALVFHEVAPGHG QLWLDEQTPLDVLLDGLNS PQPQLRERVLANLVNDPK

ERWLSADPDPHDL MKPFDAKAMTMWPVARRVGNAR DTWLDPEKVDKDQATDLVDLLDVESRTVARPVSRSVNNVR
 D RWLRRRP
RA WL M D DEFANRFLT RQMPMLM
EKWLYPE LGNRPA IEE F LQPFDSDRMEAYVIDNHFLQKS SRWLDGDVPMQEALKLI RPTENDTFHPVSPVVNNSR
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PYDEG $\square$ EP $\mathrm{P}^{\frac{210}{}{ }^{0}}$


NK S D Q CNKPL

CKNEDC
ADDYTLLEP
S DVP EVLTP NKSSECVVK

NDALECLVPV


Y QS PACAHP
SDGPELIDP DDGPELI EPV

NQQWHCARP

N $\square$ PE $\square$ TEEV

SDVP EVLAP NKGKEILKKV DDGPELIEP

N N S PKFVIPV


G D $\square$ P E LT E P V

VD S P D I DDEV
HQDWACGHP
N N T S KCl K PL


RAGPE $\square$ LS RV

ARGPGLIDPV

P Y D P T VIK P L NNTPECLTPL
VNGPELI
YQGED

$$
\text { D P } \stackrel{30}{L} P R R W N \mid V K P T ~ Q_{40}^{40}
$$

GRY LLDMDTVEDSNDLH NDKWSCGET LDKTGEDYPTN GRYHVAKE IEK I QLTEENVRKRAS DNFQMQAR DLHPTE RFCIDQEMWRELKELFGDLDRMFS GWKWNRSGQDIRPTN

$\qquad$
$Y R L E$
$R Y Y$ YA R S LDELLLQEFS Q DPLEWWEGGAPNLEPRDSI RPT D Y LAA APE ELARHYGRRADLVEELPTPGRVCAFSHRPY
RYAQTSKAYEYQDYYGARLLEDIEEIMQTWYKADGFAHP
RYALDIT QPELLKE I IDD DAKSSRLTHARPLVTDGEVRPTD


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



GRYFFSDKTTH EVEDD $\square$ G $L$ GHGLLKKTSAGD TTPGM RF A Q A A D T E S LPA G LPAAA LARTLAA GPD H Y N I A K GS


> | $Y$ | $H \square S$ |
| ---: | :--- |
| $Q$ | $L E$ |
| Q | N K K |
| $\square$ | $\square$ |

GRTACTLAPDEVSRACSYRNRGGQRRQPRWRPSYNKSLQS
DPFGGRFNVKPTE
 A Y AVEK E L ELP ERM MTLPA GDVVVPGM
 $S L A A G A E E L A R R F G R K T D L V R K F R P A Y H V C A F S H L P Y$ $M T \square D P A L L A A E D A V D E T A T S A V Q L P T D P N Y N V A P T T D$ MD D Y L R H L A A D R T V I N GYD HERIN RYNVAPS T

LP D D ME S AE T A R I A P T V E Q D Q DN S WN F P K H GRYF $\square$ ATEQDDAEKK $\quad$ I EE $\square$ NDRFKDTPE LMKTGEDYPTN S GDLLYPSD

PNFEFYPSS S G DLYY P A D<br>RFELNAGSRDLIRRFGLTVPPPFPGGTERR

$R \square S L G C T H E E L L R R \square R D S V D L P T \square D Q D Q F V P Q H H \square G P S G$

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

F A LT A G LEE E $\square$ R D HFE $\square \quad$ NKV RTEIHPCD

 $G R M N V I A D P \quad L C Q W V G E \square L G L D F H A S D N R D L R \quad P T Q$ QSKAATEVENRFKA KID K IDALFQPKENINGFDFALN
 SGNI RPTD S LT EES QK LE NRYNAKFT $\square \quad$ KEYK P $\square Y H E N G F N H N$
$G R Q \square A S Q S W E$
LE T D LK VK VS NAPKL IGKD D CAP T D
S G N $\square R P T$ D RYNVAPHT A Q Q L P L $\quad$ A D N $\square$ M N A M S K S K A M S G N I K Q Y LT E DLLDLP L VEP K IN DE E K DV F $P \mathrm{~T}$ D

GRKACTLAPDD $\square$ Q A CTYRDKRDAPGGQQYSTSYNMAPGA GRLYTPPFPDDLRELFGATAALARQLREEMLISANRAPRM R Y NCGPGH

YTVRKSAAEVAAHFGVAAPASFNTPEETDPGYPGADGE Y S L K M D T A T I V Q DLA AVEA R F S E G A P N I EA R D S 1 R T T D


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MHWGF $\square Q Y$ QKKG LLINARAETADERRT MRTETITEKKS FAPVIHSEEKGEWNLLEPMQWGDQPEWFNTRVERLFTTPF $\square A P V L A P N K Y G N M A G F P M A W G F T H Q A M V N C R V E T A D S K P L$ AVLVIGRDGACLMPWGWAVEWQAAPL NARAETGAAKPT


 DATSI SMYRWKLLPHWLKSESDWKANTLNAKGEEELEEKGA
$E A P I L V R R K Q G E P V I Q M G L W G L V P P W A Y N A R S E T L L E K P T$
DVP VIVGRKRERMLVESRWG LFPFWDSVHADDSGVLSKPM EAAVFRTEASMMYWGFRALKGNADSLVFNARSETVSDKVM PVPSCDSMFNWGLDPPHSTEESDKRYTLNARDETIEKTKS LAATLDAQGHA LRKWSLLPRWSKEPKTFNARAETLTEKPT
 PIIIIITHYNWGLIPSWSKDEE円KKLTLNARПETVTEKPF EGEARVMTWGFPLVLKGKSGQPLKPKPVNNAREDKLWTAF T LATVGAGAMGMQQFDLRWGQKPHWVIINAQAETVASKPT MAAVFRGDMAVYPMDWGFTHDSSPKPLINCRDVTAELKKSV
 LSAVITHQNPRE $\square E Y M R W G L I P A N T H S \square N \square R S E T I A K S A K$ MAAVFAPNKQGNMAVFPMDWDASPKP LINCR DETADQKSV YAPVLRRAEPDRDLHTMKWGLIPHWNKINVRSENLVEGSS MAAVLAPNKQGNVAVFPMDWGFTHKPLI NCRDETADQKPD QVACLASDGSKLQQRNLAWGDKPDWVI INAQAETVTQKPT TAP VLRTVQNKQLGQLVNKNWGYPSPKPQRFNARDERVYNFRS PVIVILPGQKAASRRWGLSVSTLNAPLINARAETLDQKPT HAPVITTVHSWGLIPSWSKDIEFRKNTLNARGETVVEKKPS

 RVLESMVWGFPRWAKTNPEGFRKKSNTLNARSETIFEKSS SAPDLRTIEGEGGTGDLVQRRWSWPGPGGRP VVNFRS

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| :--- |
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FR DA Y K S K R CLLIPPAD GF Y E WT DS PA D GKK DP WHI Y QP GH

 MWDEFAKQRCII LSSSKFFEYAKKTYQKRYHERYSFKANHP
 Y Q GP LN K QRCVVVA DGFFE WYREEVE E WR GWRPLTMA GLF FKDLWPNGRAVAPANGWFEW M WAPLRGRRCIVVAQGFYEWRVPHYDRRRDGLPLLLAGLW F S D S I S K R R C L L P A T G F Y E WD K K F I F F K R D D A K P I Y L A G Y Y A QA WA QRPCVLPMTGYYKWDRPDFVQRKDGRVLLAA GLW YKHSTTDKRCLI LAD GFHEPHYPYFCHYMDDSLFYFAGLY WS E S F L E R R C I V P A D A VF E K K P K Y E $\quad$ I A $\quad$ P G Q E P L F NRCTEANRAVV LIDRGFYEWKQPYYV S RKDGEELGCVCAVM YRDYWQNRCLVLDTGFFEPHTPGGTTQTHSWYI KPAHGG FK N $\quad$ TTHNRCLI I A SAYYE WHDKY Q $\square$ NS QD DE IFTFA GLY MD G WY E WQ $\square P$ Y Y M H P D D G S RLF M A GV W Y K D P LK G Q R CVIMMADYEP QK N GP S QERKED WR L L TMA G V F F Q E A L LK Q R CLV P S T GFF E Y Q Y P Y RI F L K K E EVVF S L A GI F
 FRDSVSHRRVAV PVVWFYEWNQKYTFTREDGQVLGLAGFY QVVANK L N R CVLAVDGYYEWT EDKKK DYADKPKQVNQRM
 FRHALQNHRAVVDCSGFYEWDLFKQKVFFDQDQP $F R \mathrm{~V} P \mathrm{I}$ RRRRCLI PVSGFFGWHHPYYVTVKDRPVIALAGVF
 FRTAA QSKRCLLVPMD GWYEWRT QFYMNAGD GKRLLFAA GLLW
 FK GPWLYRHALVPAHCFYEWS GPWRDARGDNQPLAFA GVV FRESSDMK R R CIV P S T G Y F A WR R P Y H L L L K G E E I F S M A G I F


 WY A A AKSNRCII PASFFNEWK $\square$ KYKII SPAS GESFCFA GI Y WRDSWYRRRCVI PAS WYYE WGYP FRPDLRGGRVLVPATA WWEWPQKTRDALGDGEPFAMAGL YK D SI M E K R CLI P V S GF F EP HYP F HFK SK S N DVLA LLA GLLY
 WS SAA K C K R CII PA S YF NE WK VIK Y K IFPPK S GESFCFA G I Y WK K VYP TKRCIV PVSAFHEWKDK QY NDHPQNEATALDAGLG F S T PL L R R R CVV LAA GYYEWK T T K DK QK $\square$ P H L I F FMA G V F

F REAFK SKRCLI PADGFYEWRNPWHDHLPDHAPFSFA GL W

F V E C S N N R CLVVDA D GFYE WK H K Y L I S L P D N S L F A F A G L F
Y R D S A E NK R C L I LA D GF F E P H HE C Y QP S E S N L
$F R N V V N Q R C L V D A N G F Y E W Q S K F E D G L E N E K L F A F A G L Y$

 F Q E A I L K H R CLLV P S T G F F E Y Q Y P Y R i Y L K K E E E V F S L A A G I F


 Q WK DK GK R R C AVVA QVF Y E WQ KP H F TARAK D N R L L L F A G L Y

 FRPDLD RRCLI PATSWFE FK NVVTNNRCLI IAT SFYEWRERYQUYSQEQEVFAFA GLGY YK $\square P L Q K Y R C V V L M D G F F E W$
FSKAFRETRCVI PVSGFYEWDSEKRFTAGDNDVFYLGGFY FRESFIVSQRALI PVGGVYVWKQPF LVTHADRAPLLLAADW HKRLLNKRRCVVVID GFYEWLDAPGLVSPLDQDKSAKSQKR





UniRef90_UPI0003C4D1EF UniRef90-A8MLV7 UniRef90-R9JDC4 UniRef90_C0CX00 UniRef90-R8B3T0
UniRef90 UPI0003 UniRef90-B4RF63 UniRef90_UPIO00417450A UniRef90_UPIO00289E0DB UniRef90-UPI0004684457 UniRef90-D4IYL4
UniRef90-J9Z088
UniRef90-V7GZQ3 UniRef90 C2CZH4 UniRef90_UPI00035D88A4 UniRef90-A0A023Y2A4 UniRef90-A5DMI3 UniRef90-C2EQK2
UniRef90_17J1Z2
UniRef90-S4R8V4
UniRef90_UPI000467D78E UniRef90_U7Q4S4 UniRef90-EORVF9 UniRef90_GOLCD5 UniRef90_C1F5M0 UniRef90-K8EKD8 UniRef90_UPI000470FF72 UniRef90-A5FDY7 UniRef90_U0E9Z5 UniRef90_UPI0004443D14 UniRef90-M6KII2 UniRef90-Q12J66 UniRef90-D5APU3
UniRef90-C5ERE8
UniRef90_Q22MQ5 UniRef90-UPIO00402F7CA UniRef90_UPIO0038165A2 UniRef90_R6XR19 UniRef90-C6LJ01
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UniRef90-UPIO00444A101
UniRef90-B9YC25 UniRef90-BOSFW1 UniRef90-A1U072 UniRef90-B3RVM1
UniRef90_UPI00037A4138 UniRef90-W5X6R3
UniRef90_U1WYN0 UniRef90_A0A015ME39 UniRef90-E7GJG1 UniRef90-K1Z0T4 UniRef90-I2JH50 UniRef90-A0A024FFX0 UniRef90-A1S2B6 UniRef90_UPIO004689C7B UniRef90_A4XE34
UniRef90_U4KIOO
UniRef90-E6UL33
UniRef90_M6VBD9
UniRef90-A3M697
UniRef90_UPI0003B501B3 UniRef90_A0A024UNB9 UniRef90-E6UJM5 UniRef90-R7RYX0 UniRef90-W7UZT3 UniRef90-F9TAW6 UniRef90-Q138H3 UniRef90-E4SKG9 UniRef90_UPI000424C8E5 UniRef90_UPIO003598863 UniRef90-FOPG14

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$\square$ RNEQDGPRS I IMTTEPNQNVSPDHNRMPVLIGEKD】 G $\square$ WEP $\square$ AD GGACCAI TTEPASERLSRI HDREPLVLDAECR EHWGEDGQEGDSFTVLTAPNPGUPAPLTSDGPVFIDASVA SHNTNYDSYLSTETLLTKTDSKDLSWLHPRKPLMLDPGAW



DSKDGTGTKTYTYT\ITTDSNKS LRFLHDRMPVVFDYQEL D LSENRDSFVILTTKANKSMEPVHDRMPVMIEKSNI

 DTYKGDGE LLRTTSSLLTRDSKGTRSWLHDRMPVMLKKEAV LIFTFTRWKDLFTFSIITTDAGPHMAAIHNRMPLILEGEAA STWTDPDEDKNTYTMVTTKANK DMDFVHNHMPIMLKKQDE


 SKYEDGD HFVILTTQANQSMAPVVSRMPLVLERDQV

 SRSGEED CFVILTTQANASVRAVHPRMPLVLRENEW SVWKPAKAPLLSCTIVTTDAVGPLREIHDRMPLMLGADSW

DCAS $\square$ AEGD $\square W S F A \square I T R D A G D D M R T \prod R D R E P V V L H P E Q W$ D LWLDQGEGHSTFAI I TTESNPDTSYIHFRMPVILSKGDE
 NWRPDAEDEAHGFAIVTNDAAGGMIDVVDRRPVALPPDLA NRFQDGAR



## TVI

 AGFYR LLEAGPHFVI MTRPALPELSALIHDRMPVVLNEEGA GNVPNQSTNQLWFSILTQEGNQLMKEIHNRQPVHLTEDCW QSWHFGDDQVNSFTVI TLPPHPRFSHI HPKSPLMLRPEEF E I WHPPKEPI SVWKDI

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E PANSVSNVQ
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AMNEALG


 AANNKNEPTGAKLVTLTTAPDPSCAPYHNRMPLFIDPDND
 GLWRPTEEWGQAYSMVMVDGCPQMADVHDRMPVVLARSDW
$Y M A A \square A L E S M N K V V T V T T K P D Q G Y A Q Y H H R M P L L I P R S D V ~$

 T T WL LDRENPVRSFAI PTCEPDKHYSKIHERMPVAFNKQER DA WRDEGNITYTYSI TTTESPPKMKWI HTRMPLILDADEA RFEEHRGVQDPMFAVI TRESVEPVSTI HDRMPLILGKDS L
 YMAA $\square$ SLENNSKVVTLTTKKPNSQCAQYHHRMPLLI DAKHV


RVHKTGAGFETES I TMTTKPNNSVAP円HDRMPLIIQRDHI TRHFSPPEGRDSFALISVACAGVSARLTDRMPAVI APHQV PFF $\square Q R A D G K P L C L A G L Y D V W G E K S W L H D R M P A L E G D Q I$ GLYNDLDSELFTATLLTTEANDFFAGVHNRMPLVLDENYL RHSDEWGAVYSG $\mathrm{H}^{2} \mathrm{MTDANAADAPVHNRMPVLLQEDEY}$ WF WRTAPEVGEAFTMLTTAPGPDIAPYHDRQVAILDRADW

UniRef90 S5XV52 UniRef90_UPI0003C4D1EF UniRef90-A8MLV7 UniRef90_R9JDC4 UniRef90_C0CX00 UniRef90_R8B3T0 UniRef90_UPI0003B4FD21 UniRef90 B4RF63 UniRef90 UPIO00417450A UniRef90_UPI000289E0DB UniRef90-UPI0004684457 UniRef90 D4IYL4 UniRef90-J9Z088 UniRef90_V7GZQ3 UniRef90 ${ }^{-}$C2CZH4 UniRef90-UPI00035D88A4 UniRef90-A0A023Y2A4 UniRef90_A5DMI3 UniRef90 C2EQK2 UniRef90-17J1Z2 UniRef90-S4R8V4 UniRef90_UPI000467D78E UniRef90- U7Q4S4 UniRef90-E0RVF9 UniRef90_UPI00030E5809 UniRef90_G0LCD5 UniRef90-C1F5M0 UniRef90-K8EKD8 UniRef90-UPI000470FF72 UniRef90_A5FDY7 UniRef90_U0E9Z5 UniRef90_UPI0004443D14 UniRef90-M6KII2 UniRef90-Q12J66 UniRef90-D5APU3 UniRef90_C5ERE8 UniRef90-UPIO00402F7CA UniRef90_UPI00038165A2 UniRef90 R6XRI9 UniRef90 C6LJ01 UniRef90_UPI00047333BE UniRef90_U2UDY4 UniRef90 V4P4V4 UniRef90-W4UV14 UniRef90-LOF4J2 UniRef90_W7UVL9 UniRef90-R4Y214 UniRef90_R9JM42 UniRef90_K8KTJ66 UniRef90 R9A1T9 UniRef90-UPI0004664193 UniRef90-Q2W372 UniRef90_M7NALO UniRef90-UPI000444A101 UniRef90-B9YC25 UniRef90-B0SFW1 UniRef90 A1U072 UniRef90 B3RVM1 UniRef90-UPIO0037A4138 UniRef90_W5X6R3 UniRef90 U1WYN0 UniRef90_A0A015ME39 UniRef90_E7GJG1 UniRef90 K1Z0T4 UniRef90-12JH50 UniRef90_A0A024FFX0 UniRef90_A1S2B6 UniRef90 UPI0004689C7B UniRef90-A4XE34 UniRef90_U4KIOO UniRef90_E6UL33 UniRef90_M6VBD9 UniRef90-A3M697 UniRef90_UPI0003B501B3 UniRef90 A0A024UNB9 UniRef90-E6UJM5 UniRef90-R7RYX0 UniRef90-W7UZT3 UniRef90 F9TAW6 UniRef90_Q138H3 UniRef90_E4SKG9 UniRef90-K2IOL UniRef90_UPIO00424C8E5
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D MWLDPCLTNTDPLQH
K T Y L
A A WL GP PEEQPP $\square$ GPLPAGS LTTVT QV
ADYLYDEAAAYDLDKKKMPELDRSCDYE
ERWLTPGLLTDAQUAALLDKPYPDRTMRSEPVPSD
SDWINPNTSEAKI DEIMRYSC DDSYLSAYRIRRDGKTA ED WIN PSKNPEELI
KRWFASE
K Q W L
WDWLDPERTDR
MA WLSGA LHTPAELQAQAATPP LEAYPVSRAFRDPA D D WL NPEKE WSNSLVETCHKS $\square$ AY $\square D L T W H T V N K S V G N P G$ R R WL
R R WL
VRRWLDFGTLPGGKAALDELVRPSERVAFHAVSTFVNNSR
QMWDDPTHDAWSNELQTLLRPWPGAALIVDVVSKDVNKAG
 SDWLRHDLNPNGIKELTKVGFTTKEUEAYPVSRD
A EYL
 EA WLS PT LTQSRMKEL MVPYTDESRLTTYRVMDGVFNAR T A WLDQSVKIED
EA WLLDPDNTVDSALLEPVPDLF ERDDVDRVRPLVNSVK R RWLDF G EEVK SLDAI K LLLQSKDVLTFHPVSS FNWIDPDLDQIKEIEKLFEV YPDTEMDAYTVSYKPNRYK LY WF HSEPKQLEHLLINNP
EAWLGSTDDVSALGAGAM GAHHPVAPF GLQ RDWI MDEDSFQGMLEQVPARLSKSCEYE
QTYLSDDNFSEMKQK DQYNEEFDKSEDEDFRVGENVNDQK


ERWL HPELSDGQIAALD LKMPYPEQMMV
D S WLLD
EDWLRNRP
ERWLAPD L S K DE DT S $\square \quad \square K P Y C A N \square M K V N F D S$
GVWLSGEMESHDMMHH
KE WI RPDGDPFN I AERALTNMVFEKAVEYHKSPTE
■H WMDPEFPTAQALA LLEHGLPETAFTWHPVRQEVGNSK ED WVYDDKFTEYALHKTPPELWREQEYE
TK WI DPD 1
ESWLDRKL DEETKILNLDQTYPNEFLKAEPES
LD WI RPDGDPSTIVEKALTN\|VFEKAVEYHR
A A WI DGARSFSEVEPLLRPHPGP
HNWLSVDLDASDLKDVLKYH YPENDLEVYPVSKDLTNDD NAWLDLSFPQLHHLFEPHDQSDLEKKLTWYQVPKELGDSR LRYCQGE
EEWLDPK DS EEQQ $\square R S L I Q T Y S S E F \prod D A V P$
DVWLDPEFHATDAFQGLMRTHTSAP LVCEPV
SQWLDYE NDPLSEAANDIKPDDTLEHFPVSSCVNNSR DA WL LPD DSKTEMA GLMTPYPE DDRLEGFRVMDGVTNSR ERWLDPQASMSELHSLMVPCPPQATIVE


EKWLNL DQWLTASPEEAGHLLRPPRH
EDWLDDGMSDQEDNEDMMAKGFTKKEFKAHPVSRDFKNDD DFWFCSTPEQLQPLLQNEH
QKWLQHDP
EQWLSGTPAEAFALCQTCSSADEVDR
SRWLFASPSDAKDLDQDEEQQP $\square K A \square P \square$
RDWVRPDSDPKSIAEK

QDWLH CKKHEEAKEFFLDMPADEFTA QPRS E LIKNFR
RTWMHPEASFEQLMKLMETYYDSFLKFKEVGRK
D RWLDEAADKRFKPFLSLVRPYPHDDLTYYPVTK
RDWVRPDGDPSRDAKK
K LWLDTSSSQRWTKEKNKLLDPHVDCPLECYPVPNEVSTDG
SEWURPNGDPNK I AKKI

P L P S G S $\square \mathrm{K}$ VE Q $V$ G
R R W
A G WLDPVNGFD A VRHMLGPVPNHVLDW
K D WI
T DLDFARNYLIADMPELTHTEVAK
REWLTADTP
EAWLDAEANTFE
QDWLDTGRS EQSVNEDMATGFTSNEELKYYEVVADVVNNVK
D RWLHGSLADVEAFRDRVFP


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UniRef90 D4IYL4
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UniRef90_C2CZH4
UniRef90-UPI00035D88A4
UniRef90-A0A023Y2A4
UniRef90 A5DMI3
UniRef90 C2EQK2
UniRef90 ${ }^{-17 J 1 Z 2 ~}$
UniRef90-S4R8V4
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UniRef90 U7Q4S4
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UniRef90-UPI000410FC2E
UniRef90-A0A024IYV2

D D GPELLEP ${ }^{210}$
NNTPECLAPV

RDDYTLLEPV F NSEEA』KEV

N N S PECV
HSSPSF IVPV
RDDYTLLEPV

FQGDACVKEV
LD T
N N G HELTE P
NNSPECLLQPV Y Y Y P D L

DDGPELIEAL
DRSKNCL

Y E LIP D A $\square$ Q P V
$S N \square P S \prod 1 E R$ KDSRELTLPV

NK S Lie CMVKI. IDTPEVLEAL WP GDEA $\square$ E P $\square$

EDFDNLL
T N K P Y $\square$ I E E

P N A P D

TESSSF $\square$ EP $\square$
niRef90 G4LZIO UniRef90 R6Q0V9 UniRef90-UPI0004652433 UniRef90 E4RWI4 UniRef90 R7K5D2 UniRef90-A4S3S9 UniRef90_UPI0002B4C8F0 UniRef90 W6W461 UniRef90 ${ }^{-}$N1WLV9 UniRef90-M3ADX5 UniRef90_W7UGE0 UniRef90 UPI0004742889 UniRef90-UPI0003720B62 UniRef90-UPI00037D6756 UniRef90 R5CHF8 UniRef90-A0A011VSQ2 UniRef90_UPI0003B2E63F UniRef90-N9BNS6 UniRef90 N1MT46 UniRef90-M4S4H2 UniRef90_G2PQ81 UniRef90_Q1GQ41 UniRef90 UPI00036773FA UniRef90-UPI000401C905 UniRef90-F9N154 UniRef90 UPI0003AFA096 UniRef90-UPI000363F6A8 UniRef90-I7IVE9 UniRef90 V2UWS8 UniRef90 UPIO00382A5EF UniRef90-UPI0003B5479F UniRef90_V4QFI6 UniRef90 A0A031GY5 UniRef90-H2IKF6 UniRef90-FOVR86 UniRef90 A6D3B4 UniRef90 A5VAY7 UniRef90-F2TYJ9 UniRef90-V6RV70 UniRef90 UPI0004682FAA UniRef90 E8M2N5 UniRef90-D9SJZ3 UniRef90-T0H9G2 UniRef90 UPI00026CCEB9 UniRef90-M9UTH7 UniRef90-UOF247 UniRef90 UPI000317C715 UniRef90-N9KE65 UniRef90_UPI00037B64EE UniRef90_T0GA44 UniRef90 19WH35 UniRef90-UPI000469069C UniRef90-E1X1V9 UniRef90 X6P2H6 UniRef90 UPI00041F8A18 UniRef90-V4R911 UniRef90-A5FTB2 UniRef90 N9E6H0 UniRef90 ${ }^{-}$WOPMH5 UniRef90-UPI00037901E3 UniRef90_Q2NC15 UniRef90 JORT62 UniRef90-R9PII9 UniRef90-A0A023WVK9 UniRef90 Q2G4N1 UniRef90-Q0DC91 UniRef90-E9BWD6 UniRef90_N6YVS0 UniRef90 G2J4C0 UniRef90-N9REQ6 UniRef90-15BHO3 UniRef90-R118T0 UniRef90-N9RG85 UniRef90_UPI0001DD061C UniRef90_N9BEC3 UniRef90 DOSIC8 UniRef90- M5JLL9 UniRef90-UPI00024869F9 UniRef90-A0A011QB29 UniRef90 W8IAK4 UniRef90-W4W2V2 UniRef90_F1Z8R9 UniRef90 J2D9S9 UniRef90_UPI00036F0A65 UniRef90-V6UTW1 UniRef90_UPIO003B4F3D1 UniRef90 UPI000288A096 UniRef90-F5JUK8 UniRef90_C6B7D7 UniRef90 R0G133 UniRef90-UPI000371E78E UniRef90_UPIOOO3
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A YYAP I IT RAQK LKKA D DMMRHLGKPLTMSGEMRPTD
GRFAVTVDPALLAEQDDA FQLSTEATPFDTPNRNTTPGA VNEIPADAYPGPSYNVAPTD RYYVELS P E E A A S R S RLLK E N MVTK LGGRAFK F S GEIIR P T D
YRLLVDLDTVAADFGDR\|RLTYPEGPNTAPRENTPTD TOKVLK $\square$ GA

TLNSTVDEVASYFKSRRPQATNASP
G DVY P G G
YQLILPFDDI DEAFN【SGNR乌VGGMPNFGP\ASIRDGD


Y LT PTPHQLRSHFSARFDHDADWPEEAWQDY AAPGY YLT P T P H QLR S HFSARFDHDADWP E E EAWQ D

PTQ
$G R \square N \square D D P$
CAFPGETDAFDSHFPRPRFNVSPTC GRTACTULPSTVEAALPVKGVKTTGDTDRYRQSHNTTPHQ


P T E
YRMTAPAEAVAGLFRASTGTAPNFAAE VY P G Y
 GRFA V T T D PA QL A E K TTA A DEATGCGGGKT SYNVM PTD $G R L N V T D D P$ ASRKQLE QDFGVA APDSDYKAEAYPGY MAPMI
 $P N L A P R A D \| K \underset{P}{\square} \mathrm{~T}$ D
Y A N A L GPDEFKKVMG LK R VP K GE L F K TPEDD GRVYYPGV GRFACSLLNS QALQLL M TNTSQFVDCSKYVPSYNMCPGN
 R A QLLNLFEPTFEYKADTYPNY

YEVKSSHTEV ADFFDAIAEDFSANTAEE VYM GY
Q GASRNDVK LR F N $\square \mathrm{A} \square \mathrm{N}$ N T GQFYEGVF VNGFEHP
TPERLQEEFGVEFDAQEKLEPFLRKPRNVDPSE
D R H Ml T Q LIF A ASPARPFNDGPPI
 GRAACALAPHRLQQATGVASSDNWAQSDKYRPSYNVGPGR
$T R Q Q L L D L F D V E P P Q$ L L D WP LEVVWQD Y I AP




EISPTREALTLLLDVNED QLDLELKKPHYYPGY


MTAS VDE $\square$ A RMF DVAEGAGAN $\quad$ PP P LDA $\quad \square Y P K T$
FEPTFEYSND $\quad$ YP GA EMMQS $L$ A $\square R \square P A H Q S E L D \square P T A D D D I K \square G D$
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UniRef90-R6QOV9 UniRef90-UPIOO04652433 UniRef90-E4RWI4 UniRef90-R7K5D2 UniRef90-A4S3S9 UniRet90-UPIOOO2B4C8F0 UniRef90-W6W461 UniRef90-N1WLV9 UniRef90-M3ADX5 UniRef90_W7UGE0 UniRef90-UPIOO04742889 UniRef90-UPIo003720862 UniRef90_UPIOOO37D6756 UniRef90-R5CHF8 UniRef90-A0A011VSQ2 UniRef90-UPIOOO3B2E63F UniRef90-N9BNS6 UniRef90-N1MT46 UniRef90-M4S4H2 UniRef90-G2PQ81 UniRef90 ${ }^{-}$Q1GQ41 UniRef90_UPI00036773FA UniRef90-UP1000401C905 UniRef90-F9N154 UniRef90 UPI0003AFA096 UniRef90_UPIO00363F6A8 UniRef90-I7IVE9
UniRef90-V2UWS8 UniRef90 UPIOOO382AEEF UniRef90 UPIOOO3B5479F UniRef90_V4QFI6 UniRef90-A0A031GY52 UniRef90-H2IKF6 UniRef90-FOVR86 UniRef90-A6D3B4 UniRef90-A5VAY7 UniRef90-F2TYJ9 UniRef90-V6RV70 UniRef90-UPI0004682FAA UniRef90 E8M2N5 UniRef90-D9SJZ3 UniRef90-TOH9G2 UniRef90-UPIO0026CCEB9 UniRef90-M9UTH7 UniRef90-UOF247 UniRef90-UPI000317C715 UniRef90_N9KE65 UniRef90-UPIO0037B64EE UniRef90-TOGA44 UniRef90-19WH35 UniRef90_UPIo00469069C UniRef90-E1X1V9 UniRef90 ${ }^{-} \times 6$ P2H6 UniRef90-UPI00041F8A18 UniRef90-V4R911 UniRef90-A5FTB2 UniRef90- $\mathrm{NgE6HO}$ UniRef90-WOPMH5 UniRef90-UPIOOO37901E3 UniRef90-Q2NC15 UniRef90-JORT62 UniRef90-R9PII9 UniRef90-A0A023WVk9 UniRef90-Q2G4N1 UniRef90-ODDC91 UniRef90_E9BWD6 UniRef90-N6YVs0 UniRef90-G2J4C0 UniRef90-N9REQ6
UniRef90
ISBH03 UniRef90-R118T0 UniRef90-N9RG85 UniRef90-UP10001DD061C UniRef90-N9BEC3 UniRef90_Dosic8 UniRef90-M5JLI9


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QWKPSKYTSFNSRWEGQGFKKS TALILLYQNNELQLVPKSWGYPNKQVIFNARTERFAKKSM DGPII IATDQGLEWRSARFGLVPNWNTYNARSETVATKPS LPHGI AKTASYGMDPKAHQPEGARLSTMNARAETLGERPA
 AYPIITQGPKSWSLVPAWATAPQKAATFNARDETAAERPT IVSTVGVVDGELQQLDLPWGMQPDWANVNAKAETVAVKAT SVPDI EEATGQRRLRAARWYLRVSYHTFNARAEGLTQSRLD P SVIVRARQGQTELITRRWSWPSGKPVYNYRSEG VRD TSPVLVKQGDELVVHYMRWGLVPSWHMVNARKEGRGNDSS ENPNTIKHFNWGLIPSWSKDEDUKKLTLNARMETVEEKPS QVACVGWSHSQLQQCNLAWGDKPDWAI NNAQAETVAQKPT
 VAPIVRSGEGRGSGEVINRRW SWPGQNGRP VYNFRS TIATVVPRHPTRRVRLMRWGLDPSWDKПNARADKVATSPA NVSVVAFEAQAYCQKDIVWGTRPEWAIINAQSETVASKGT

 TAPIVRTGASRLEGELVQRPWSWPAPNKKP AYNFRS YTPVITTQRPREIQYMRWNDLKEYAPMLNARAETLFTLPS FAPVIVLENNKRVGRPMRYRUPSKYNVFNARVDSLEKRKT PVITYDSPGEIRMFQWGLWPRKWKKQATLNARVETIETKGLL HERLVDGKPDGYEVEDMRWSLIPNWFNFNAKUEEAADKPT
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DAP VRQNDGKRT四ARTWGTPPPASDASTRPDTNSNFWK PLLPRAALLAQWWLTPPFSPTLRGKHATFNARSETVTQKPT



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FKNS $\square$ NK RCLVIANGFYEWQVKYE $\square G \square G N E D \square F A F A G \square Y$ WDNSFARQRCI IVASEFFEYSKNTYPATNGKTYHERFEHP FAHAFQHHRVIVPCSGWYEWRQEGDHKVKYDFSPAEPNPL
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FRNAWKKNQCLIPVET $\quad$ FEKSHWYGDYRRDEMPFTVAGIY FKKAFVDSRCIIPINTWFEWPTKVRIFMPKRPTFGAAGIY RWAAEPRQRCLI PTARFAEAVTETWLSVKDQPDFAWAGLW WRFSFEERRCLI PVSTFAEAKGKMTRTWFSMPDAPLLFATA YR N $\square$ T Q NRCLI IAT SYYE WREKYQ



Y R RLV V K K R C YNQSWHGRRCLVPMQFFFEPCYEWRIGLASGQPFAVAGIW FLEAASKCKFGVPVTEFYEKPQRWAVRRKDGKAFFIAALY SA LANPSRRCLVPVAEFQEWSVEPMPDTGKKKPFWFAFAG AGDAFRQTRCII PASGFVETQQGNAYAMDPVSADAFGGLG
 FFEPTTKCQFGVPVTEFYEKPQRWCVRRKDKKAFFI A A L Y
 R IIVDQRYRCLI PLTHFANPDTRTWFSFGRQPLIAWAGIC

$\pi$
F
R
F
PML $A F R T R R$
$P L R Q R R$

F R FRGAVKHQRAVLPADGYFETKPVPHYDNSPSGLLFFAGLY
 Y A GP WRQ GHCCLLPMQCFYE P NYE WA $\square$ GMADDQPF CVVA GLDW F R K A A V K R R A L L A D GYF E WQ T T C W
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130
140
150
160 RKKTEGWE RKKTEGWE
RFEEHRGD
REDGG $\frac{\text { RLT }}{\text { R R L }}$
RR R
FGGTF DKHSSEEGEDYTYTITTVDASDTFKVLHDRMPAILSPDAV RVSDEWGPVYSG $\square V M T D A N E A D A P V H N R M P V L L H R D E Y$ SRDDN S KVTFTVLTQEASPLFAKIHNRQPVILNAEQV RFEERNGLDVPVFSVLTRYADGELREIHDRMPMILQREDV

RTEEREEFRYPVFTVLTREPSELRRTHDRMPLIPEELM RFEEHRGVQVPMFAVITRESVEPVSSIHDRMPLILGKGSL RTVPDHGE CFTMLTTQPGPDIAAYYDRQVVVLGRSDW EYAVVNGEEVMSMDTINSDHHPFMKQFHKRSVIII PPDDR GLWTQSDEWGAVYTGVMTDNAPELAHDHDRSPVILDPQDW RPHAEVGEV FTMLTTDPGEDVAPYHSRQUI PLPRERW TNTSDG GLWVAGLIKDGAFAMLTTEPGADIAPYHDRQ\|VLLRPEDG SEWKDPGDLINSYTMATTDANELMQETHNNMPIILKNSDR REYKSQETRIRHVSMLTTEAKGLMSEDHTRMPI ILPQSFE
 EHATVNGEDSMSMLTINADDHPFMNQFHKRSIVVIPKGRR RTWQTATGERSHAFTINADDHPLMRRMHKPSLVIVRPEEY RETPEVGQ GDAFTMLTMEPGPDIAPYHDRQLVILDRSAW E $\underline{L} F R P Q D L L L S F S M L T$
$N$
SP $\square Y M G Y P E S T R V I T \square T T A P T Q E Y \square R Y H H R M P A L L A A E S V$ WF WKADETVGEAFTLLTCDAGPD\|APYHHRQVVLLDRRDW


 RSHPE DGE AF TMLTMDPGDDQAPYHSRQDVPLPRDRW S VWK S Y

ADDGNLVILTTSPNTQCपPYHHRMPFLVPD\GV ERKQDGPNGSFSMLTVNADGHPLMQRFHKPMLVILAPDQY ETCKDNNQIIRSMLTMNAVDHPMMKEFHKRSVVIIPHDRD SLDDDHKTPMYSASDITTEANSFEKEVHYRMPLILDPTDY AFTMLTMEPGPDAPYHDRQUAILDRSDW


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 EDRKLNDKIIRSAAMLTMDDHPMMKDFHKRSVVIIPHEQL DVIKDSKVRSFSMLT NSDNHPFMKQFHKRSIIVIPEQYR SCWQSPQGKAMHMLTI NAESHPGMRQFHKPMVVILHEDRY DSWKDRGKTVTSCTIIVREADAWSAKYHDRMPCMLHPRDF
VYKTEEGNII HSCVITVDSNKVLSWLHDRMPVCLSNEEE AVWRATEEWGDAYSMVMVESSPQICEVHDRMPVILRQDHW TNSDEWGGVYTGVMTDNT PELIDIHDRSPVILDPADW $N Q L E T L Q G A L E S C T V V T R P P T P D E A E V H D R M P A L L L N R D L$
$E V Y P V Q E Q E W L S C A V V T$


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NEWLDNGD KEEGDANLLKAHFDEDQLNDHTVSTDLFHPK A A WI DGSKPFEAVAPLLRPHAGP
E S WI K P N G NPQEVSRR
E QWTEQAKDADELLFA $\quad$ MMS WSPDGWLV
WA WLS RAYQTREEVRGUTKRLDPGGQVATADDR
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SEWI HPNGDPDKI AK

DAWL TAPLADDYRFDRPYPADR LE
A D WL D P S VP A E EVVLQV $\quad$ LP K G S L A VR R V


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R R WL
ND WL


Q A WL H N DL F D P A LPP E D FYR F EPVG DVQ
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L N WIS G E
S D WL N C NALEAEALLK
A GWLD GSVPAPDL
M R P T P A G T LT VE P
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R R WL
R D WL A GSSCHAERLL
D DWMNA GVVDDCREFL/RE YPADMLVAGP
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A D WLDP SVPAENVL
E Q W IT T A T P QQA QS Y LE LG W
D G WLL H
D WW CPVEDAPDFFAQYPASRLAAHPAPK
D D WL L K QP H Q M I Q F M Q GFPVE EFECSHVPKA K $\square$ A

DFWLL QAPLEELVYRFDHPYPAERM
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R L WM N P S A T K D QL I
D A WLS P ERSREE $\square Y Q \square L G K$ A HRPHYEYEW
Q NWL N G
K L WL D R K P PVPNEDGEKVWPSAPKGTFRFKP
P $\$ WL GEAA GESAGLL L HPPP DELIDEAWPVGQADVSPR
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Y D WLS STPG E VQR LIHPYEDSQAFDFE VGKK
N A WLL TAPLEALYQ LD RPYSADRM
DRWLNGTPSEAYDLCVPYAGDLLVDR
QA WL D S END $\square$ NE
LR WL A GDPCKYKAEQFHYH
Q D WL A TAPAEDSSEFMTQYPADRLVAYP
EAWL TAPLEELRRFDRPWPASDTNIVRTPVP

GDWLR AKSESAARAFFQGFDSGAFVAEPAPR
Q D WLACRD P E $\quad$ CARS C LT N Y P A E Q MLA EPAP K
D E WL S LKQP HQ L LYEFMQGFPVEEFECLHVPKA
D R WL R A D LD D A
R K WL
S N WL T CDNEEAT QF LHEEFSP


D R WLL H G S S DEDVIA FQF REP P S S D E F E
NDWLNVGSEHAHE
D D WL R A D A Q CSSEFLDN PYPADALKA
D G WL D GRAAER D L L M Q $\quad$ P P R E L R E W V S K R VN

K T WI E GSPREAF GLCRTWEDELAVEQ
D T WL H A P L L E ELYR F D R P Y P A E R MV
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A L W L D P GTPMM AKLLHELLLAKPPTA LRERALDAFVNDPK
GRWLSADYDEACALA QPYPDHSMAA
D D WL DPRTLGDENFVRATVAASASEQLHAEPQPRR
ND WL NCKNTEARDFFLDDMEP
R H WL A LS K P Q D Q L L K
Q QWLN A GTPERAVAMLLN
D E WLTN $\square$ K S S N $\square$ Q S F V E

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YNEPNC $\square K P \square^{210}$

पD T PEA L LP
YQNEDAVKP
HDSSSCLKR $\square$
VNS E E ! LD K V

SNYAG $\square$ DK V

NNTPECLFP L

KQTPQL
VD S
Q

N N G P D L L A
$\square \mathrm{dGPECDT}$ P

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 A P NLE A RED DK $\square_{P}^{T} D$
YRMTKNVDEVAKWFDAMAAQGGANFGEE
V $Y$ P G Y
 T N Y R A P HEDFELR E L R $\square E P$ F S D L Y R RAP WK DE $\ddagger$ WP D Y
 $R Y A L R R D V D E L A V E F E V D D N T L A A A P A G T G A P A D V V P A T$ GRTACTLAPDEVSRACSYRNRGGQRRQPRWRPSYNKSPQS



MT A PADA VAK LF RAKAAGSPNFAAEVYPKYTVAEG $R D L D D L V R \quad T E L L N R D S R D Y P G N Y V P V L V A E G D$
 PNLE P R D Gll K $\square T$ D

P PADD DK VGD
NLF E P T FE Y K M DI F PS D
Y R L M M V D VA S $\quad$ I I E E F A E $\square$ K $\quad \square$ R F G E G T P P
$Y S \square T R P D P B G Y$

 F TPT QRA QWVK DALDGVDLPSDFPDET FP GY
 FEPTFEYKA D Y

TSRDLLADLFQLT LFE GDDWP P A E P Q ADVGDVRPGN $R Y Y \square D P G M T E D \square S R V V Q N \square D G R \square R L A$ TAAELAAAFGVDMGD

Y A Q Q D $\begin{array}{llll}R & P & Q \\ F & P & G \\ F & G\end{array}$
$P E \cap P$ F D Y E VYPGY
DE $\square$ DLEFSRRARREWLAHRS QERSPT D YEQHVA WAEYCRMMESLALRDPSHQSELPQADDDRDND YSNTTAQEAMRS LFD VS L ELDR LGGNAQPLPA I WPKY $\square C E Q L G \perp E L W W P E T G M V E Q R F \square R$
AEPESP E E Y S Q QE FD YPEPEDAS TERR DDVYPK S
FAAHPSAEVPADMWPRYMGVFVRRPPEWDAGDEAVPAR
DAD\PQADDVR\TD
FPPTMDYKSEVYPGY
T A QPEEDVFPMMGLAPF $\quad$ RR A VS DEPDGE GDLTA GS SRRDVKIRFNIEVNNTGQFYEGVFVNGFEHP
A LD K KAE E IT K QTGRSFH $\square$ PEEFTP YKHNDAFTK GEFNNFKTLSNENSK DFKRMGSDGKVFPGSFAPVSDYNNQ
 Y S MTRT QDEMRRLFE EFEAAD HLGNQGPLEEI YPDQ
 GRARCTLSPAQUARAFGFPPAVPTLQMDRFRPSYNVSPGA

 T S A KVA GALT GASTEGIGDWPEETWQDYAAPLV YSS Y A T Q A A MR Q A F D D VTR D S A G N
$A Q L E A L G L T E \square P F E Y S D E V Y P N Y$ FA Q Y Q GPADY LR VLGAEQPVLDSASNEPPGHPTI EPGT
 VRRPPEHDAGDEAFPPGN QK $\square$ S E LIF DAE NVLNPEHVPVYNGFSHA G D

P T Q
YS LVT S QAE $\square R E A F G \boxtimes E E D R A G N \square P R V P G$
$\square$ F P D Q

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UniRef90-W2UQ40
UniRef90 S3HCV6
UniRef90-TORQW2
UniRef90-UPIO0036DC515
UniRef90-U2HVJ5
UniRef90-UPI000375CCAA MAP $\square V R \square E D G K R T \square E M \square R W G \square P G P K Q H P V T N V R N V K$ S P H W
UniRef90_TOP055

MAPIV｜RSVE G ${ }^{50}$ RGVGELVN ${ }^{60}$ RWSWPGNHGKP ${ }^{70} \quad$ VVNFRT ${ }^{80}$ GADVVRMSPSLEVGELTGGVRTRGSLVINARRETLGERPLD
 PISLLRAEGPRLHSQ\｜VRWGRDVPRPVINARLETLSQRPL $P G L V V A G G E G F P L V M K G K S G Q P L K P K P V N N A R T D K L D S F F$ HGFVVREEDGQRRLEAMTWGFPRHNPVNNARDDKMMSAHG
DCPLI FSKDGHIDEWRQWNHDLKFSKYTYNARTETVDKKPS LAPVVRSAGEGAEAVAANFGMGKKFMTVNARSETVAEKPA VNARSETLATSTP $P \square Q \square R E V N G Q R M L Q N A T W W \square P S K Y T S F N T R Y D K L N V P G S$ TAPVVLERPPTRSLRALRWGLVPARRTAEVRAETLLEDPA MSPVLMRWGLDPAWFKESDPSKMQYSTSNCRSENIL EKKS


 EVRAMTWGFPRHAVSKKAKDTKLARRTYNARTEAKM RYVVKPMRYQCRPAGKPAMYDTKYPGTYNARRDNLEGFW PGHVVREEGGQRLLSAMSWGFPFQGKPVTNVRNYTSPFWK $\square G A I V R A A P D E P G T A D L V Q R R W S W P G P N K Q P$ V MREGRWWLVPFWAKEMPKAAMFNARDEGI DTAPA $M A P V \square R A G D N D V E L A Q M K F G F P P \square G G Y R G G P V F N R S$
 MGPVMRATANDREVELERMNFPEGGPVFNFRSEG

GQF GLVAHWAKDSAVGRRTYNARSETAASKPS
VNARSETVSTAQA MNARAETIASKPA YAPVLVVEDGQRVVKPVRYQCRDYPGTYNARMDSLAKFW MAPVVRAVDGARVLTMMRWGFPPPPKAGSQPVTNLASPYW NLCVVTMENPNKIWGLMPQDFKEDWQDFNVQMDELQSVGW ESPVI IAE GDELARADLA WGVEVPWKRFNARDESALGGSG ELAPLVVKSRQSERVACWAKDDKGSRHTYNARSETAAEKPS

 DCPLIFSTGNTIEWREVKFGLVPKWNTYNARTETVHEKPS RVLVPAQWGLVPHWVKSASDAKLRPKLVNAKSDTASTGTP PAPVLISGSLAVTLTWGLPRKGG LII NARSETLAEK GQLVCTTATYGLVPRRQUPPGVKPWDTMNARSETVAQLRS



 PAPTMRATAGSDAIELASMTFGFPPPVFNFRSEG EAPVVRDDEGRREMVMMHWGFLTPKTWNNARDDK RGSGLD
 PAPVMRAAGDADELASMTFGFPPGGPVFNFRSEG EAVAGRWGLISAMTKADGLDKAGKLSTFNARSETAAKSFT
 NSPILVKHKNHMEWREADFGLIPKWHTYNARLETVAEKPS AANRLLATG $\square$ FRFVPDFVAKLEWARRTYNARSETVAEKGT NLPIITNDNPTELTMDSFWGLMPSWKGKLNARIEEIEEKP PNLYI $\quad$ PQDAPAK $\quad$ YPAVWGYVNRYKTFNARGEEFFEKRS
 SAPVVVNGDNGRELAGLTWGMPSPQFVTQGKPDTVTSPHW
 YLPVGVRGELEPVI QCMKWGLPDHFRMFNARSESI KERAS IVLVRPMRYQCRPAGKPAAYDTRYPGTYNARRDSLEGFW PAYVVRQENGARALDVMAWGFPHKKRVTNVRNYTSPFWRS TVAAYRAEDGALVTVSLTWGFPKPHAVFNTRLETALQQAR RADAGGRPEGTYGMLPKRFQQGTP母STLNARAETMSEKRS MAPVIRKHDGKRELIQMRWGFPPPPK $\square$ GNTNVRNVGSPFW VVPLIAPTGAQLALADMDWGFEVSWKRFNTRIETALSNPL


 HWATDLK $\square C R S T Y N A R S E T V A T K P S$ NARSETI GERRT YAPVMVMEGGQRVVKPMRYQCTKYPGTYNARRDSLEGFWA EACVGRWGLISAMTRADGQDKAGKLSTFNARAETAPASFT NVMVMTQEEPD\｜IQLATWYWKKYTGGTLNTRDDKFFQNYF TAPVMRAGDN』AELAQMKFGFPPPRNVFNFRSEG

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UniRef90-N8TV14 UniRef90_A0A022DNI1 UniRef90-M2U1W3 UniRef90-G4F847 UniRef90-TOHC35 UniRef90-UPI00034D6FED UniRef90_UPI0002E06291 UniRef90-I3TMR7 UniRef90-Q984C5 UniRef90_UPIO00472000D
UniRef90-D8JIN4
UniRef90-A6UK51
UniRef90_F7UC91
UniRef90-A1VMU7
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UniRef90-B0UNF5
UniRef90-G2PKX1
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UniRef90-W2UQ40
UniRef90-_S3HCV6
UniRef90-TORQW2
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UniRef90-U2HVJ5
UniRef90-UPIO00375CCAA
UniRef90_TOP055 UniRef9O_TOP055
 FRGALSGGRCVVPIRGFYEFTGP RGARSPVFFHWNG FRHAWKNNQCLI PVETDFEKPQWYGDYRCDGMPFTVAGDY EGREFTSGRCLIVADGFYEFTDPWLFTKKEEPDFCIAGI W FRPQLGRFHCLI PATA WFEWRHEYRFAPQQGRLWHFAGLY

 YRTA WRGQRCLI PVKWVYEKHVSYRI GVGDWRPYCVAGI W FRDAWASQRCVVPMMAFFEKAVPTRIARVDGKPDGVAGLW A GYPFRTARCIIPARGFGESEFEQQGNKKDPMHYHFAGLY
TAEAALLRRCLVPADAWYGSGQDVAVEPADGSVLALAGVY
 Y S K ILKRNRCLIPATAFHEWWQKMR DSHAK GKT LMFAGDF
$F$ H QPFLQNRCVFPMSGMKKKTNDCFQIR
FRHAWFKNQFADPVETDFEKSHWYGIKRKDGQPFTVAALY
FRNAWAKSQFADPVDKUYEPKYRWGUYREDGMPFTVAACY
SADKRPERRCLVPVTAFCEWTGPKGAKWFDLIDDPPLFAFA
FRSAWRGQHCLI PAKA I MYEPD
WRDSFRDRRCLI PVVAWAEAEGAAGRMTRTWYSQEL FAVA
 SA LDANPARRCLVPVTEFQEWKKAFWFSVPSQPVFAFAGUW
 QGRHFDCHRCLVPASAFFEPAKKKYQK $\square K Q R D A M F M A \square A A$ FKHAWNDQFALI PVEADYEPKHWYGDFRQDEQPFTGAADIF
 FRDAWQRQRCII PVEAFFEPDVATRDTRADGKPMGLAGLW GNRYYEWKTPYYVKHPQDHLLLLAGFY
F RDA WNGQRCDVPMAAFFEKADPTRISRDDGKPMGVAGVW
YSRQWHTQTCLLPTQWFYEPNYEWAIGMADDQPFCVAGI W KPGLGYSHCLMIVDSFYENVARSKMRPNNGRQMLVACLW RPWLKPAQRCLVPVSSFSEYADTKPRKTPDWPDFAFAGIW
$M Q D S Y K K R R C L I D A T G F Y T H T C S Y Y ~$
MQDSYKKRRCLI IATGFYTHTCSYY IYKPSEKPFYGAGTY
YRSAWRQRQFGVLVDNFYEPSYRWKIERASGEPFGMACDW




YAKCWREGQCLVPMTGFFEPNYEWQDGRADGAPFAVAGVW $F Q N G I L Y H R L L I P A G G F Y E W N E K S I F T R L D S S V L Y M A G F C$ KGQFGHTHGLMIVKTFYEKNVVLQFTPDDREPMLVACLW FRSAWRRQHCLIPARADYEPDVATRDCRADGELMGIAGLW
 WSKFAFNRCAIPALEFYEWKFKHRIFFPKKPEFYFAGIY RQFANSKRCLVPASGFFEKYPKAKHRFTDNGSPFDA IAG WRASFQSRRCLI PGSSFREAKGRAPATDFERPPFAFAGLW AGFPFRQSRCI PAKGFGETEF DNKKPDHYHDMDA LEGEE
WRASMEHDRCI I ACRWFYESSERTGRT KKQQMFT $\square$ SRMP

F GNAWRKQHCIIPAEADYEPDVPTRFTRADGAPDGDAGLW
RQFGGSKRCVAPASAFFEFKYPKAKHRFALNGSPFMA I A
RSFANTNRCLIPASAFFEKSPKTKHRFTARDAPFMAAAG

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 RPWLGVAHRCLVPVNAFSEKTPVWFALDEDRPLAFAFAGGUW

 KNQFGYTHGLMVVNAFYEHVSKPEFKPRPVQDMLVACLW A FRDSALENRCLI ISHQYYEWHHPFALKVKGRDYFYMAGGW EGRDMWHGRCVVPVRAFYETHERTGKMVRRQYRFRLPGAR YASAWRVQTCLLPTEWFVEPNYEWADGMADQRPFCLAGLW
 WAESFARRRCVVPAWAFYESHATETVCSLGRSGKPVKRQYA FRDAWKRSRCIIPAAADYEPDDPTKIVRSDGKPMGIAGDW
 $F H A L W P Q T R A L V M A D G W Y A W R R C H F V R L K S G A P D F V A A L T$
$R S F A N S N R C L I P A S A F F E K Y P K A K H R F T L K N A P F M A G A G$
$M$ PAFGHTHGLMVVETFYEKNQVVQFTPRTGEPMLVACLW FREAWKRQHCI IPAQA PYEPD PTRDERSDGRPMGIAGLW FS GPWKTGQCLVPMESFYEPNYEHRIWDKDEPTFAVAGLW PCFGYTHAVLLVEVFYENVSRAKYRPGNGEDMHVACLLW FGNAWRRQHCIVPADA!FEPDVATRFARADGEPMGIAGLW SWKDLLKNKCLI LID GLYEPHKPNDPFFFERPNHEMFGLL
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K E S P QL

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