

## QUERY

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 D TP D G R L A A A S DT L L

 D Y R Q Q L F K N GVVWI RRRE G $\quad$ DWQAKVRTRTNSTFTNSRFE SAPYRDFANTDEALRRDRSLGGQAVLTYKGPKLDKVSKTRE QHPCRDFASTDEALRVRISGGRVGVTYKGPRMGFGGKTRV NAPHRDFA Q T DEALRI REGGKRIILTYKGAKLDGVSKTRK
 D T E DLLRLA A A S L T L R R R T G G G WH L K F P V T T G I QHPCRDFSETBEALRRRFNGHFEAMTYKGPKIDEMSKTRK
 D S D A R L S K A GTYVVRQR NGGWQMMVVKRGGTVVNSRSQ $D Y R Q Q Q L T N G D V V R R R E \quad G \| W Q A K V R T R T N S T Y T N S R F E$
 D R A G L L L A A GVVWV R L R NG Q WE A KVVRKGGS F

D

D TEDLLRLAAS GDT L R RRTGGGWHLKLPVAPGVRD
NAPHRDFATTDEALR TRREKRHDPDEKSDATSSTTELTYK

 HPTYSLSLSNNWLRQR DNRWELK IDPNNDYNSNLSTYQ
 Q H P CRD F A E T D E A L L R VRRSGSDVVEVSYKGPRMRSNAKA RLL NSPHRDFAKTEDALRRLRSVDGGTRMTYKGKKLDEVSKTRE





 NAHDRDFGVTDEALRMREGKRFLLTYKGAKMDDLSKTRQ
 DAPHRSFPETDEALRDRTE RAETGADEVRLTYK
 DAPHRDFAETDEAFRVRRE TRKGETNAKVTYK
 D AP H R EFA E T DE A L R I R R E T P L E A GVVSA A A P D P A A TVVT Y K NAPDRDFAKTDEALRDRSVDGRSVMTYKGKKLDTLSKTR


## QUERY

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 RAPAKLIVYLQRFRP ADGEKTEALLQ Q L G

ELVE
ELSS IDDDA T LWKEDSQEKT D I EN

## EI HEPLSD


ELTHVDDDSACDKRITGIDDREA
EVEGEMAI REIFAIPV
ETEDEAELCQLVGEVLKAGCA
EVQAPLSSMCTLDRSGAGLVRSRMRDTGCGVFAEYTT
EFQGKVADEAMMAETSGSSAPDVPRLDGDEILAPFARFKT EVSDLATMSTHMKS
E $\square \mathrm{QAP} \square \mathrm{S}$

ELSEPGEVLRLVQRLVSLPTERDGSDIRQSGLEVMARYTT
ELETPVDE
ELSAAADV
EI EVDVSDSEK
E I EVELTDPDKYVE
E: RAPLSD
E I EVPRLSPDKHAELPPELAALIRSRVRDAPVVPVVRLRS GPKIDEKSKTRLEDEVEEDVDKYFELLEDLGGKEVLVKVSK
 ETSELSDPDITSSHVKSLTGRDSAVGDVFGLTRWADFTT E L SEPSSEDLKQVQRFVPLPTEKDGSDVRLCGLEVMARYTT E ELEVPFAEGEPSFE ELETEV
$\qquad$ ADPGQLARELFNHLGFRKVAAVRK $G P T \square P P G B A L A D L L R S R V R D D D L V P V V R L R S$
ELEVEV
E पT A D पCEVPG
GPRIDDSTSKTRKEHEVSVGTTLVRARTRGAPLVPVVRLLS VGDSVVAILDELGFDPAATVVK
 EI EVPLGDGD TAAADMQRLLVALGYTPVTTVKK EI EDPKE ILLNVLVNLTSTPDEVLKKRLEDSGMKEYATIKT EI RAPLS D EI EVPIEDPDAHARILEA

## ELTASAE

EFETPVDGVA
GDVEAVLEALGFKKVAVIVK ARGILNALGFFESGVVKK
 EVEVEVGDRDKMED ETSDDRE GPLVEEASKTRLIERVLAADGASFEEILES LDQCWCAI RT GPLVEEASKTRIEHETGVGDREMAGVFDGLGFSPAATVEK
 EVQAPLS $\quad$ ENLDPDDLRELVLSRTRGAELTPVVRIVS GPRDDGRSKTRVEHETAVDDGEMAGVLSGLGFEPAAVVEK E DHAPLS YKGPLIEDASKTRAEHETGVDDLAAVLSGLGFEPAATVEK PLVDEETKTREE
 ERTGLAALAARLLGVPAPEAPTAAPA SVGPYGLLDT GPLVDDASKTREEETAVASGEK DDTVLTKLGFEPAATVRK EFETPVD GAK LEESSKTRPEHEDKVDSEELVQII ESLGFEDAAAVDK GPLLEAESKSREEETGVEDGDDIDAIVQHLGFEPAATVRK EF NLSVASGETLETILSRTGFLRAAMVSK GP LLEEASKTRTEHETGVDDGEAAAVLSGLGFAPAATVEK DASGPDGNN
EFETPVD
$\mathrm{E} \mathrm{D}_{\mathrm{V}}^{\mathrm{R}} \mathrm{A} \mathrm{P}_{\mathrm{R}} \mathrm{L} \mathrm{T} D \mathrm{D}$ $T$ VP A E L A D V V L A I V R D R P L Q P VA R T T


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NEAS ITEAEKEKI RTLVGMLNCDDTSKARGKLEWYLDNNRR NARD GGAA QSVMRSMDERIVRHYAWAFSSGKLSAYF

 D E K D L
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E EKD IV N EVKKL R G I L E DLGGVERFER
T GQELEDHKQRVEEIVAFMERYRWAFA $\square G K L T A Y F E R Q$ K EANLP A A Q A AV DDLARELGLTDVEP RSYLRMHL D G S D Y A G A L R E I
D D A D P S V V L D A I E K R L K K A GVVR P S A A P S K L A R A L K E PALLDAVDKRLRKAGIRPAAS PSKLARALEE D GS D Y GD AL S E I F E LYYR K LGGVSE GF ERKS Y L E L
$D G A D P P A F L D G A D K K Z R K A G L P A A A S P P S K L A R A L$
A E S D $\square$ P AVRS GLID TLA T L G V D P D D Q $\square$
D D G D P A F L D TV GRALE EAGI RPSAS HSKLARALAETGP
D K E L I IN K A T E E V L Q L G D R L G L K R W D
T D A Q Y D A A K T V L L A A A T E L G L T E Q E P R R S Y L S MV L Q

 DSDIE A HRERLFEFLES MGIKKEDS SRS YLEMLMM
N Q K E IGGAKRDEVIT I L R E LGGVRGDLIDRESYLEMLLQQKQQ
EPE EV HRAEGAVDAVESSRFALE DASGGKVENFIRE QK P DESAVADARDGARDLLT DLDCDPDTQ QR


DESADEATRDEALEALDDRLGLDDGDSQDR
E GA D
E EREVDAAREAAVEALDRLGLDAGEQVR
D GK D T T D S L N Q $\square F E$ E I YK T M GI E D G F E R R S Y L E L
A E A D L E T A REGAYDVLER LGLLDPD DQLR

DEADLESAREGAYDVLERLGRDPDEQVR
P G S DI E H N S S K IIF E FL L N KL G I E E K D S I R S Y L E L VME E K

T D GDI E P VREGAYEVLQDLSLDPSDQ
TEA G GE D A A R R $\square G A M A K D L G V E G P P D Y T S Y L E M L L$
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QD Y QRLLEVNS
QDYQHLLEVYS LDYQRLLEAAS QD Y L R L L EVN
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THYEAL
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EHYARLLIREH EHYAKLLSAH

EHYAKLLS
EHYAKLLR
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VHLEKLMEKH KHLAVLVS
EHYQELLK
E $\square$ Y Q MC $\square \mathrm{E}$
RQLEVL
EHYRALVRH
ETYQSMSE
T L Y N A L

D F Y A R M $\square$

D H Y D A C VEA
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80
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 NAPHRDFADTDEALRDRCVNGASVGTYKGKKLDTASKTRE DTENLDLAGNRLTLRRRTGGGWHLKRP QHPCKNFAETDEALRLRENNSKSGKTYKGPKRGGWAKDRV DAPHRDFAETDEALRVRRV
 DADGL पSSKGWWVRKR DGDWEAKDKDGGNFAQNSRFM DAPHRSFPETDEALRTRRESTPGSESDAAEDAESRDTYKG


 QHPCRDFAKTDEALRVRVVKERVELTYKGPKEGGVYKARR KHPGRDFAKTDEAFRGRKDVEGVTITYKGKKMDPETKTRE DAPHRSFPETDEAGRRREDDGAQLTYK

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UniRef90-UPI00037E5491 UniRef90-C4UU23 UniRef90-A0A024M6Q2 UniRef90-X5L2C9 UniRef90-D7WEF7 UniRef90_UPI000468B202 UniRef90-O28291
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UniRef90-G4I353
UniRef90_G4F9T4
UniRef90 A4THT7
UniRef90-A4THT7
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UniRef90-D3V215
UniRef90_D3V215
UniRef90_UPIO00420359D
UniRef90-Q2NFC2
UniRef90-Q0S711
UniRef90-M3AW81
UniRef90-H0R2B2
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UniRef90-D2TRP8
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UniRef90-A8MCR5
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E V WWAP L S D
90
GSHDP
DV 100
110

E 1 QAPPSS
EFETAVE
A A L S D



## $P \square T G G D A V P A E L L D V$

ELTVGFDEAPADGDVPEPLLTPVLAVVRDRPVEPVARITT EIVSRV GPKVDSESKAREEDETGADGEDAGA】FEGVGFTPAATVEK SDSLPSEEDAALLRSRVRTGT PLVGENSKTREEHETGVEDGE VVGS LLDSLGFVPVETVEK EMRNPEED SRHLQLYTGUSQTELTNFGLRELASFTT P LLDDESKSREEDETAVADGEKMDAVLTNDGFAPAATVRK


v A ALGD
EMRASASS ASGDAVPAELLPSVVELLEKLGFAKVAVVKK
 PLLDEGSKTRTEYETAVADGDAAAGVFAGLGFEPAATVEK EI TVQVDSAS
E E KV

## Q

LVDDQSKTRAEH
$R \backslash Y G D D Y D$
$E T A G G S A B$
NVRALDEALGFKPVAVI RK
E PLRK
ELSEPT
GPLVDDESKTREEDETGEDGEAFNAVLIRNLGFEAAATVSK DAGEPDERGVANCAPPADLLDGVFLVLRGARVSPVARLVT
DASGPDTVPE ELVDV
EVEMKDEDSAK
ELSVRVDDAAA
CAKI FENLGF GEVRTVKK
GPLTDPESKSREAETPVADATALERILTGGLGYPTATVHK

E LS EPVLDDARLPAEDWPKGTDVAALQQR LQPLFTTHF
RSKTVPGRLARL V SAWTRGGR E ID S DKLDLARFPADDWPEGWNIAALQTE LQPLFRTDF
 $D L S T P P A Q R E P L A P V A Q U D N N R A E T Q L L G A D G G V V A E F C D$
$E Y N V P L E K P E L A L E K L P A E D W P A G T D P A A L Q Q Q L A P L F S T$ GPKVDVETKSREEVKLKVENFEAAQULEKGGFRAVAEVKK DPEIPPE L L QVRAUVREPDAQVDNNRREVTDAPVAEFCD
 E F GEPLLKDHP

ELHAPLGQPGVVPDSLLAH

ETRMP
GPKLLDSKSKTREVEVNIDDTDNMVEI LVKSLGFKPSAVVNK
 EI QVS FDEAPME GDAPDELLLRPVLAADTRRRRRLDPVAAAI ST E I EVVPIS DVDAYS
 A D TLIP PDLAALI RSRVRGRPVVPVVRILSA
EYNVALSTPELDLLALFPAEVWPDGKLPTELASQVQPLFST
 E I EVE
 E V V $\operatorname{V}$ FP L L G R A K K
 EI R A P L S D

## ELHAPLGRPDAVPD RLLA H

 $L$ H A Y L R G S VPVPVVRLE T



 E DEEVK DE DK E K GPLVDSASKTRTEEMVVSDAESAEGILLSGLGFSPVVETVEK $G V I A A K Q E T N V A L A D T$ AQVAHAHALL$E A L G M V R L A R V E K$

 | $E$ | $R$ | $A$ | $L$ | $A$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $D$ | $V$ |  |  |  | E $\operatorname{l}$ R V $V$ P E V R A P L S D

E L R L L P A $K \vee P$


E QAP L G




|  |  |
| :---: | :---: |
| UniRef90 |  |
| UniRef90-A8KYC4 |  |
| UniRef90-W9FQ84 |  |
| UniRef90_A0A024YMW5 | S R RVVSHLLDADGAAELSTDEVVLAERGDATAAWTEVEVELA |
| UniRef90-UPI0004776CF8 | T R S L H RLL D A D G D L L A E L S MDAVVHAEGGHAVTE MEVELA |
| UniRef90-K4MCH5 | SREIYR Y H F I I CLDTVETLGEFVEVELMAD |
| UniRef90-X7Y0Q4 | R R E |
| UniRef90-M3TS70 | T R TVTRLL LGVDDEPLA E LA EDLVTAQSLHQWAEWEFELL |
| UniRef90_S5Z5R4 | HREFYMI K GVEVSI DKVEGLGDFV |
| UniRef90-U3ADQ0 |  |
| UniRef90_UPI000309DC51 |  |
| UniRef90-D8J2L3 | DREHFSL G E YVVTLDSSIA GLGEFVEVETEVP |
| UniRef90_G7XPU8 | F R Q W VV |
| UniRef90-F8D6Q8 | EREHYTVVDDDGDERTYTYTI T L D AVD DVGEYVEVETDVE |
| UniRef90-M5T2Z9 | RRETYRL G G A E A M I T I D SVESLGLFAEI E CVLP |
| UniRef90-UPI0002FE8E10 |  |
| UniRef90-UPI000346BC65 | HREKWLV S Y Q NSEI EVAF DQGDLSEPLHEI ELELLK |
| UniRef90_D9VVH7 | S R R T S HLLDADG A LL A ELT TDAVTADTTATWTEVVEVELA |
| UniRef90_A3MS60 | RREYY E GL GVLVSLDEVEGLGEFVEIE KVVA |
| UniRef90-A0A042BK | HRES QIL L G A G G D |
| UniRef90_UPI000380663D | ERDTQVLY D A A G Q |
| UniRef90-MOPF44 | RREFW A Y DGFTVTLDAVDGVGEFVEDEREVP |
| UniRef90_G0EE08 | KRRYYRL GRVKVTLDEVEGLGCFAEIEAID G |
| UniRef90-N0BFS1 | $\square \mathrm{DK} \square \mathrm{Y}$ R M D N A I I CLD T L D F G K F I EI E |
| UniRef90-M0M943 |  |
| UniRef90_W5WBN5 | HRQRWTLS GKS R A L A EVVVDDVSAQTLGESATLEVEVE |
| UniRef90-P30871 | D REKWLVAVDGSQ |
| UniRef90-W0JQU1 | RRERFEL ESDEGYTI TCDAVDGVGEYVEVETDAT |
| UniRef90-E3IUN2 | TRTATRLLDAAG A GLVE\\|VDDHVTVLTQWREVEVELL |
| UniRef90_D5P752 | RRETQVLYAADG |
| UniRef90_D3E0J2 | NREYFKL E NFEDSLD DVEGLDPYMEDEDALDE |
| UniRef90-A0B7C3 | R R A Y R L G DADVALDDVDGLGRFVEVEIS A D |
| UniRef90_U1MWX5 | $R R D R Y R V$ E ECAVVLDRVEGLGEYVEVETE |
| UniRef90_D5E951 | V |
| UniRef90_R9NQE2 |  |
| UniRef90-E1SEC9 |  |
| UniRef90-UPI00037E5491 | ERTATLL HGADGPLLAEVADDLVTAEPSDTWREIEVELLS |
| UniRef90-C4UU23 |  |
| UniRef90-A0A024M6Q2 | RRSVQVLHGSDGT A L A EFCDDRVTASAIGGWREWELELLL |
| UniRef90-X5L2C9 | $R \mathrm{R}$ R I DVLYGHDG GALAEFCDDAVTASTIGEGAEDELLS D |
| UniRef90-D7WEF7 | D R T A WSLL P G GQQ S WREWEV |
| UniRef90_UPI000468B202 | HREKWVITT Y L S S I EVAL D Q G E E P P L REDELLELK |
| UniRef90-O28291 | LR R $\square$ Y GLC |
| UniRef90_UPI0003622A06 | DRTA WS L L P G G Q K T WREWEVEL |
| UniRef90-W0K321 | LREKHEL D C F TVLLDAVEDVGEYVEVETEVD |
| UniRef90_D1A1E3 | ERTVILLRDAGAEVADDTVTGRLDDSEGAEQPGEIEDELGM |
| UniRef90-C8X9W8 |  |
| UniRef90-G41353 | T R NVVMLYGSDGDDEVSAWALGSGDGEAGEEWHEWEL ELL |
| UniRef90_G4F9T4 |  |
| UniRef90-A4THT7 |  |
| UniRef90_A0A024GZJ0 | R R T T HAL Y G G D G |
| UniRef90-D3V215 |  |
| UniRef90_UPI000420 | ERTTTELYGEDGSARAEDVA DVVDATVLRSDVAEVEVVELA |
| UniRef90-Q2NFC2 |  |
| UniRef90-Q0S711 |  |
| UniRef90-M3AW81 | R R DVRHLL DARGSLLA EVVSTESVSAGRAWTEIEVELGM |
| UniRef90-H0R2B2 | SRTADELVDDTGHIDIDAVFCDDLVTAQSLQT WSEWEFELV |
| UniRef90-W015Z0 | VREKY |
| UniRef90_K0UIP0 | ERSVQVL HGAEGVALLAEFCDDRVTASATGQEAELLEM |
| UniRef90-D2TRP8 | DREKWRL EVVDSRIEDA |
| UniRef90_G2NHE5 | R DVHHLLDADG ALLAEVSIDEVLAERL |
| UniRef90-A0A023V2V | DREKWCLDVDGSR】E |
| UniRef90-A1UID2 | RRTVDLL H GPA GDAEFCDDEVTA S A E G GEEWREWE |
| UniRef90-M5DJV8 | NRSTRTLCL ADGSEAEF C L D R G A SVP@CEDELELLK |
| UniRef90-G0H0L5 |  |
| UniRef90-10S3H8 | $V R \mathrm{~V}$ V R VMY G A D D AVLA E F C D D QVT A |
| UniRef90-IORT74 | RRTV DVILLGADGSPVAEFCDDQVSAVRLQA WREWELEELV |
| UniRef90-W7J4L6 | RRDEWTLLDADGEQVLADDHVTAVPTDGATTWREDEVEAA |
| UniRef90-UPI000378CDD9 | TRTET LLAAADAT I D D Q V I S TALLLPGGVLK Q WREWELELAA |
| UniRef90-14BL | TRADELLYGPDGSAEFCDDQVTA R A E G G DEWREWELELA |
| UniRef90-A0A022M | TRAVRHL LDARGTLLAELSSVDA D T A D D R G S WTE $\square$ EVVELA |
| UniRef90_UPI000368F8DC |  |
| UniRef90_K0RL28 | FRTCYTPAREGS QFSTWRVDVDKTDFGYSDG |
| UniRef90-UPI00035FE297 | QREQWLVTYAG S S I EVVAFDRGELSEPLYEVELLELK |
| UniRef90_D8MX45 |  |
| UniRef90_C2CNB1 | NRTAFSFLP G G GQQS WREWEVEL |
| UniRef90-A8MCR5 |  |
| UniRef90_UPI0003B3D243 | K R TA WS L LP G G E T S WRE WEVEL |
| UniRef90-F2KMT7 | $R \mathrm{R}$ R \( |
| ) Y QVV GEAVV CLDEDDGLGKFVEVEDESE |  |
| UniRef90_R9SJS7 | DREIYR YKNYELSLD DVKGLDPYMEIEALVEE |
| UniRef90_Q57692 |  |
| UniRef90_E4NKY9 | EREFYHLL D GYTVTLDAVS DLGEFVEIEAETA |
| UniRef90_UPI000475AB83 | SRTCYR DSGQPELSVVVVDTVAGLGSFVETEVVSE |
| UniRef90_UPI000467E788 | T R LV ELLLYGPDGAPLLAEFCDDQVTAEGGEE WREWELELDK |
| UniRef90_UPI0004639 | ARDVRHLVDAKG RLLAELSVDTVRAERLWTEDEVELADD |
| UniRef90-G8SJV6 | HRVETPLRDAEGRTL A A Q D RVRADS G E H S A W Q V EVELV |
| UniRef90_UPI000475CCA4 | ERDEWELRSADGTTLLAADDRVTLDEEPRSWRELEVVEA |
| UniRef90_UPI0002D8E5EB | T R A V R HLRDADG A P L A EVSLDEVGGRAEWREVEVELA |
| UniRef90_R4T8W5 |  |
| UniRef90_J7LY08 | ERTS Y SLV G N D GHRMADFVD D SVQAQSVIGEPRQLEW |
| UniRef90_U1NG07 |  |
|  |  |

UniRef90 S1S3S4 UniRef90-A8KYC4 UniRef90-W9FQ84 UniRef90_A0A024YMW5 UniRet90 UPI0004776CF8 UniRef90-K4MCH5 UniRef90-X7Y0Q4 UniRef90 M3TS70 UniRef90-S5Z5R4 UniRef90-U3ADQ0 UniRef90-UPIo00309DC51 UniRef90- D8J2L3 UniRef90-G7XPU8 UniRef90-F8D6Q8 UniRef90 M5T2Z9 UniRef90-UPI0002FE8E10 UniRef90_UPI000346BC65 UniRef90-D9VVH7 UniRef90 A3MS60 UniRef90-A0A042BKE0 UniRef90-UPIOOO380663D UniRef90-M0PF44 UniRef90_GOEE08 UniRef90-NoBFS1 UniRef90-M0M943 UniRef90 W5WBN5 UniRef90 - P30871 UniRef90-WOJQU1 UniRef90-E3IUN2 UniRef90 D5P752 UniRef90-D3E0J2 UniRef90-AOB7C3 UniRef90 U1MWX5 UniRef90-D5E951 UniRef90-R9NQE2 UniRef90 E1SEC9 UniRef90 UPI00037E5491 UniRef90-C4UU23 UniRef90-A0A024M6Q2 UniRef90-X5L2C9 UniRef90 D7WEF7 UniRef90-UPIO00468B202 UniRef90-O28291 UniRef90 UPIO003622A06 UniRef90-wok321 UniRef90-D1A1E3 UniRef90 C8X9W8 UniRef90-G41353 UniRef90_G4F9T4 UniRef90_A4THT7 UniRe990 A0A024GZJo UniRef90- D3V215 UniRef90_UPIO00420359D UniRet90_Q2NFC2 UniRef90 Q0S711 UniRef90-M3AW81 UniRef90-HOR2B2 UniRef90 W015zo UniRef90 ${ }^{-}$KOUIPO UniRef90-D2TRP8 UniRef90-G2NHE5 UniRef90 A0A023V2W4 UniRef90-A1UID2 UniRef90_M5DJV8 UniRef90 GOHOL5 UniRef90-10S3H8 UniRef90-IORT74 UniRef90 W7J4L6 UniRef90 UPI000378CDD9 UniRef90-4BLL34 UniRef90-A0Ао22MET5 UniRef90 UPI000368F8DC UniRef90 ${ }^{-}$KoRL28 UniRef90_UPIO0035FE297 UniRet90_D8MX45 UniRef90 C2CNB1 UniRef90-A8MCR5 UniRef90_UP10003B3D243 UniRef90-F2KMT7 UniRef90 R9SJS7 UniRef90-Q57692 UniRef90-E4NKY9 niRe990 UPI000475AB83 UniRef90-UPI000467E788 UniRef90_UPI0004639D4A UniRef90 G8SJV6

S GGNGK LLKAAEKTLRAAGARPASSASKL DKGGGLEAVREI ASLLGL GEPVPTYLELY LEKFR DVASAREGAFDVLRRLGLDPTEQIR
DGAGDPALLDAVEKRLRKAGIHPSRSA
EAEDDSARDGVARTVESLGLDPAAEDQSYLELLL
LPRSPSS $\square R T T E E R \square R R F M T R Y A W A F P K G K L A A F L E R$

DDGD PAF LDAVEKRLDKAEVRPSD ASSKLARALAETTP
S G E


GEEAVGEA $\square$ R


SG DTRAVLKLANQLVSQTGLR
DEADLESAREGAFEVLDRGDLDAADTVRSYGGMLLEE
D GSDYNEAQDK TF D $\square$ F E Q $\square G \square$ T D GFERTS Y $\square E \square$
NPRDRARVLEMI
TDADVETARERAVAVLEQLGLDPADQlR
S DADMEESKKRIFAMMENFGLKPEDS\|RSYLELVME
NGQ RDELLAFASEL
SGE
GGDR A LLKAAAKKVRRAGAVPGTS PSKLARVL
QGAD LLALATELAHDGGLRQGNLSKAARGY
TAADVPDDLDRLANRLADDAGAEAGH
RDDVPDDLLDRLSNRLFDAGAAPAGH
S G

GEAAVEAAREDAYELLRS $\square G L D P G D Q V R$
$P A G T P E L L R A A G E R L Q Q A G A R P$ AS GPAKLGRVLE
SEELIDEADAVIR

Q GTQ
KGAD LLLADKL
ASEPESTFGGGEELLGAAGDERSPSA SKL
K DED DEEDRNNI DKVFEKLEI T SGFERTSYLELLEQK
A GDR NLEDAI DSRLTVAGITRSDAPSKLRRAL
PGAD PGLEDVLEPRLREAGLRPS RSGSKLARAL
DGTGNAKSDKKLLKQARKLLLDAGAQVSS
A DVPDD $\square D R \square S H R \square A D A G A A P A E H$
DDGD PALLDAVERRLRKGGVRPSGSA SKLARALAETAP SG DTRAVLKLANQLVSQTGLR
$G A G D A K L L D R L T N R L L D A G A S P A G H G S K \square G R V L D T G Q P$ SGSPDP LARDLLHNDPVRLEVSGSRSPPSK
DDSKREQA
GGADRE LLDRLSNRLLDAGAQPAAT
D AAALDPIGEALG
EPVEKGSQGEKLLDGFNK $\square$ A S D $\square G A H \square P$
$P G A D P G L L D R L A N R L L D A G A R P A G H$
EGGD
QGS RDDLMQFAAELG
DQGMVGELVKNपMGFARRNपGपKEDSVEPK TY位
DVEGAKKKVFEVARSLGLEGES $\square$ RKS Y LIEM
DGTDYSEAQEGLFKVEEKLGI
D $\square$ NEKDKVLE EMMEI LKALNI SKD
TEEE DDAVVEGAFDVLRDLGLDPDDQDR
$P G T D$
AGDADAA LLDADEKRLGKAGDHASASA SKDARALADTAP
$D G D E R R L D V E K A L L K A G A T H A A G P S K V T R A L A$
TDRDVLTAV
DGVGGAGLLDTLEKKLRKKGUVRSDS PSKFVRALRE
PGAD PAVLQSLERAVVEGGAERS RWPSKLRR
REWEVELAPDETDD
$E D R R D A R A G A V E \square L D R \square G L D A D D Q \square R$


UniRef90＿UPIo0036D7CB0
UniRef90＿A0PNG4
UniRef90＿L7LIJ5
UniRef90＿Q2SN50
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UniRef90＿W1IP16
UniRef90＿Q8TX10
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UniRef90－C3PHM9
UniRef90＿LOIDH8
UniRef90＿G5Q1T0
UniRef90＿LOMJY3
UniRef90＿D4HV93
UniRef90－N9QM54
UniRef90－U7LZV3
UniRef90＿W7KM01
UniRef90＿V5XED2
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UniRef90＿C1BC87
UniRef90＿A2SSL0
UniRef90＿UPI0002FCC2D1 UniRef90＿E0DGA1 UniRef90＿UPIO002893218 UniRef90＿G7CDY2 UniRef90＿UPI00047A3D1F UniRef90＿D4F140 UniRef90－K8WBY9 UniRef90＿T1W7P0 UniRef90＿N8WQW2 UniRef90＿G2P7I5
UniRef90＿UPI0003823A9B UniRef90＿C7BKE0 UniRef90＿UPI00037D06D1 UniRef90＿Q9V028 UniRef90＿UPI0002E8A198 UniRef90＿UPI0003B58BFC UniRef90＿UPI00046FDF8E UniRef90＿UPI00047B950C UniRef90＿D2RRJ3
UniRef90＿I9KFN8 UniRef90＿D4E1G7 UniRef90＿G7WJY4 UniRef90＿W2EHB2
UniRef90＿A0A031GS6s UniRef90－N9KZX0 UniRef90＿IOQNP3 UniRef90＿UPI0004678D5B UniRef90＿M1XZG2 UniRef90－R7JW67
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UniRef90－M0AMH8 UniRef90＿E2CGK3 UniRef90＿UPIO00425DEE3 UniRef90＿UPI0003116062 UniRef90＿UPI00046EF441
UniRef90＿F4H3G7 UniRef90＿UPI0003781F29 UniRef90＿UPI0002D6ED24 UniRef90＿W9GLE2
UniRef90＿S3A032

## D

D

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50
60
70
80
$D$ T P DLLHLLRHGAGLVRVRKDGAWDQTMKAGGSVQSGLHRRN
 DTPDFAMQRSRVAL RLRNGGAWEQTDKGGGRDAAGLHVR D T D DHDLF GHRVTLRRRAGGGWHLKVPA D K A R T
 ETAD NTLRSYDMGLRDRGGDRYEMTLKTA GKTVGGLHQRP A HPVRNFAETDEALRIRRNGTDNR\｜TYKGPKRATVSKVRK ETPNNQLRRWDMGLRIRGDEQYEMTDKTAGRVVGGLLHQRP QHPCRDFAETDEALRLR
NAPHRDFTARSEWLRVRTE
ARGSSVNFKRWH H H P CRDFKKT DEALRVRAVSGKYLLTYKGRRLDSQTKTRE

 DAPHRTHAETDEALRDRRERD
E T P D N WLRR R DMGLRR RENGRYEMTMK DA GRVVTGGL H QRP
ESADNFLRRHDMGLRI RGDDRYEMTVKTAGTVVGGLHQRP ETNDNQLRRWDMGLRIRGGDRYEMTLKTAGQTVGGLHQRP


## N

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D T E D L R LT R S K ITM R R R T G G G WHI K FP G K T G

D
D
 I DRYDLVAARVTVRRRTGGGWHIIK D T A D GQLAA A A D K S L C DRE N L L W W L K GP GA D C C





 DHPVREFAETDEALRIRRR


 S R P DVVD ME TVVECLRVR R R NGFEVTYKP PS GA DTHRV NAPHRDFLADVSEWLRRLRT ADDGASLNYKRWH


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



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D T D D L

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UniRef90_G5Q1T0
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UniRef90_D4HV93 UniRef90-N9QM54
UniRef90-U7LZV3
UniRef90-U7LZV3
UniRef90-W7KM01
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 P I N ELI K T H A D E Y E T KVVD DVGA I R R L L E A L D F T P L V T V D K EI E I K V D D N K I F D I L K A L T F S K V R S I E K


 E Y N V A A A T P ELLA L S Q L P A D













 EQHFP LT DDA

 $P$ L LD DESSKSREEFETGGVGDGETMDAVLTSSLGFEAAATVVRK


 E L H QP P A L D L S


 E WE A E I A G E T I E L Q T F P A E A Q T V L A P L I G R L L D D SVEA
 $P V D V R V K T H A D E Y E T P V G D A E A D R R L L D A L D F T P M V T V D C$

 E Y N I D D

 E Y NVD DDAPELDLDPAFPVEDWPEGTDVQQLQSQLQQILFST
 E LEE K I D GTKEKNEFKKRQEDEDEVGBADAQKLESGLGYEKVLVFEK
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 $E \square Q E P L G N A \quad D T V P V E L M D R V L A Y T R G H A V A A I A T T L N T$
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$\qquad$ QRGFYR
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$R R L V T E L V D A E G R V L A$





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 RRTP YALLDDAGTEVAEVVVETVVEGVVVHRFRELDVEAR
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 NRSELEVFDQGE



SREKY
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EDQ
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S G
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Q G E
SG
N G S
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Q G
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Q G Q

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K G E
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S G
S E $\square E L K$ S ARDGAYTVLES $\square G L D P D D Q L R$
S G A
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$N H P C R D F S R T D E A L R K V G R W V Q T C K S G G Q A A A G L H Q R P$
$R$ ETDGFDLRRHG\|GLR\|RQDGQYEMTMKTAGQV\GGLHQHP
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 GTGDTP

 E Y N IP L S R P E L D L A A L P A D D V WP P E T D DVAA L Q S S L Q A R F T T



 K L D K I S M S R M E L E T E V S D A E V L K N I L D H L D F S P V A S V M K
 E
 EWEVVQLNSKYDKKILSLFKELGLKPVDKIVK EVVRAAL A D A K L D K I S K T R V E HE T EVV E D IDDVMD NI F K S LLGFK S V K P V R K EI Q I RVE
 E V R F P L G D


 E WNVEP D GVLDDLDKFT DE DVGGLLDKHVKKKK DERIFETDD
 E GPGRMRVVQE L R R D E V VRA AL E Y N V Y LD E A K P DLDR L FP LS A WP K T DD VD D L Q GKI E T L F T T $N V R E E L A A A G P E G E P P P E L A R L V T G W L R T A A D A P V V S L E T$
 E Y N $\square$ A L E K P E L A LEE KLR A GVVWP D GA LPA G L S E QV GP L F S T

E WE Y Q I S E P K LIE W S L L P S A A A E L L S G I





 E F N A E H T S N S P L L S L L P P Q D I WP P QR D L E T L Q E QL I P L P A T EYNAEHNCNDPVLALHPSDI WPNGKDIDTLQLSPLIFSTNF

 GPLVDE ESKT RE EVETEVGDDEMDDVLTNLGFEPAATVRK EIKDEKNEEFDEIEVGVEDFNKMKEILERLGFKEDVWVKK
 E GEDD GTEHGARASVVAA LLKELGDLVQRDLLMPVARVRN E I DVVDAPATEPPPEVQRLLAAQLRGRTLLVVAELVT $\mathrm{E} L \mathrm{H} A P \mathrm{P}$ G




 E WEREA G D WP T IDDESMPLHT LI GGFDPARLAP VEEVRV A AVDEESGSKPEHETQVADSEAAHTVIQGLGYVPVIDAQK
 E Y T A P L G S A R S F $V$ VP A S L R E VI A P II GREVVLLPVVVLRT E F E M P V H R G G L D S R FPP P E A L A Y V
 GEEVVPTAVRAA DIAA WT TA A
LGTAPPELLEMVADLLVLRTRRVVTALRDASGRVLAAEAD EVVVPLG ASEREVPAELAVRIVRAYTRDGEPVPTVRLRT




#  

160
TRKNYK
$N$ Y Q Q S Q $\quad$ S
EREKWVVVTQGT



LRAESTLVAENGDPVAD

D REKK WL V
HR T $\square W W$ L $L$ QLPS G D
LRTKHHE





MRKYMKC
HRHARLLDLPGAVIEFA
D R VVR HLL LAA D G TVV
K R EII FRI

YREK

WRSFY Q
RRTT WKDLRI Y L DEVVRGLGNFMELEGTSW
RRTTHALYGDDADFADDTVDAELLQGAGGIPAGEWELEVH
QRWRHRLDDDE G RA LAAEIVVDDVVATRGE GWREDIEV E L A
$K R T D W L L R S$ Q A G D
ERII YR
A REKWRVTQG
ESQQ
ERHVT DVMVD
RREEY LFMDA
K R S A V DLT Y R D A $\square$ ME L

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## 

3910000


## A

D

H

- T R E K W WV F T ERTIWWLLETEAGDQ TRVTTVLRRDAAAEDCD DHVRGENLRTGGGRDEWREWEVVELD

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


| $V$ | $R$ | $H$ | $I$ | $T$ | $E$ | $L$ | $R$ | $D$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $V$ | $A$ | $D$ |  |  |  |  |  |  |
| $R$ | $D$ | $R$ | $F$ | $T$ | $V$ | $D$ | $G$ | $T$ |
| $N$ |  |  |  |  |  |  |  |  |

V
Q
ERTTRLLVDDSGSDGDA
QRMVWDL RLK D GT
I

## , <br> V

## T


 WRTDYQL GNDEDALDEMPYGN FTELE

 $R C R N Y D F T A R G R Q M L A$
$K R R \cap R T L R L S G G$


VR VR R E D
H R TA WLLVVGK G G A Q Q DE V
KREQWLI SMSDG
DRHTYLI TLGSGTQ
EREDWLLDYAGAH
D VR E V R L V

D R R A WH
T R E Q WLV
Q
S M
SLVVEVALDTGEDQEALCEELEFELL




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UniRef90 ${ }^{-}$K6XE57 UniRef90-UPI000381AC08 UniRef90_F9TE69 UniRef90 Q15P37 UniRef90_UPI000255993E UniRef90_UPI000469B44C UniRef90_H6RJF2 UniRef90 UPI00037E1FF2 UniRef90-A1RGA4 UniRef90_UPI0002D9178D UniRef90_Q4FR82 UniRef90_Q2JGE5 UniRef90_D2PX78
 TG QLKD LIALIAQMPVMQGU

D A A D $\square L K L S R Q L A T L S C L R Q G S \square S K A A R G Y$
GGEPAPALVDAVEHSLLNAGAAPAASTSKLARAM DSEDVETAKEKLFSLAEELGFKREES LR K ESYLD LK A GKPEAL

E GADLLTAAKALAELLR LAGRSKAAR
S G
AEHAVS GAREDAYAVLRRDGLDPTDQDR

HGDE
QESERKE LLSKMEDLLA $\square L G$



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D G
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ENARGARVLDQVRSLVEEAGAHESDS PSKLLTAL
GGGS PEVLERLANRLLDAG
SLE QKDEALEKLFSVLETMGDNK
GEPEV
$S A G \quad$ TD $L \square D A D E D R \square T A A G \square E R \quad$ APNPSK $\square H R A L$
A G A

DHHDGDAQRDARGFADDFLDRAKKSSSPSKLIMAM
DK DSAAEK DNE IKEFLEVTGES DQTSYLEMDIDEK
E GALD D L A L E L QRTVP LIFLSLRSKAS
S G Q
DADLLDSALK
$D G D Q \quad A L L G A V A D A F A D Q G V T \square A D H \quad P S K \square S R A L$
K G
AHGD $\square A A A M R G T A T L L A E A G A T G G E F V P K A \square R A$
DPSQSASRELLDDRLSNRL
TGAGTPALLDAVEKRLREAGDHR ATGPSKLVRAL
RVDDVLALSAQL
EGDE SALVALIASELQFFELTPSDQSKAE
A G G
GPHTPS $\square$ PKR L $\square R$ R $\square K$ AAGARPS RFPSK $L$
SG DVNA
DGAD DS LLDNLT GQLAEAGAKPSERT SKDATAL
K GQVADV A LAT A LGEQGGLRDASRSKAARGYYLAKDKP
$\square G S G D R D L L E A \square G R R L L D A G A R P A R T G S K L L T L L$
S G Q
DGTLDEEADSVLLQSAQSVLTAAGAFVPSKLVSAL
VGQHLLALAKE\|AEFGGMRQGS LSKAARGY
LKAGDPQAL
KRS GRTALLDGDEERLIEAGARPSAS
DTAD I L A L A R RL
s GQ
EDAARAAFFEAVERAVLAAGGRPAGS DSK $\square$ ARA $\square$

N $\operatorname{GNDDVEAKERDWEVAGK\square GLKEKD}$

SRRGRAELFEGLEVVVRDAGGTPSASTSKLERALR
HGRGAKQARRAVVAALRNAGCRRGRQLP KLMRVL
TWREVEVED
TE L PVA HRLLDEVVDRL
KQDEVEFELK
KEEERAGGLDMDYEDMRMLGCEKTETVRSYLSMLEKR
PAAPADGARTALFD

KRKQRTALLDRDERHVVDAGARPSDSA SKLARAL
$S G S A G A \square A K Q L A D \square T P L R F G L Q S K A A R G Y R L A D N L Q Q$
EGA PAAL
DEDEVPAALED\RAVLAEDGDAPGD
S GSPLPDALDLLHTIPLRLE
AGQ $P D A L$
SGQ PDAL
SGQ
Q GE
S G
DDAGRAAFFAA $\square E R A D H A A G R E A G S D S K L A R A L$
DGDE
S GE
S GQ
S G E
$N G G P P E V L D E V A G L L T A A G A T P A A D S \quad S K \square A R V L$

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UniRef90-UPI0002D9178D
UniRef90 Q4FR82
UniRef90-Q2JGE
UniRef90-D2PX78
E H Y Q A


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| 4BB46D | EL |
| UniRef90－C9P1J3 | DSADHWLRQHDUGLRTRRDEVYVQTVKTAGRVVAGLHQRP |
|  |  |
|  | DTPQRDLKATGRLLRLRSQ QWAQQY GRDRRCVLTLKVP |
| UniRef90－E3B | DTPDSWLMQHDIGMRIRQDGVY川QTVKTAGRVVAGLHQRP |
| UniRet90－X0QMZ0 | DTPDQQLAEAGI GLRIRKEGDWVQTIKAGGDGIAARLEHN |
| UniRef90 W1YUM3 | DTPSRELRALDLGFRTRADSKCEQTIKLAGEVVGGLHQRP |
| UniRef90－H2C6T2 | NGLDRDFRKTDEALRLRVNGEVELTYK GPKLGRMTKSRE |
| 1W572 |  |
| UniRef90－UPIo | DTPARDLAAAKVALRLRRDGQFILTLKSRGQSVAGLSERN |
| UniRef90－F7RK | DTPDLQL R W Whagl |
|  |  |
| 6G |  |
| UiRet90＿A0A011P | DTPDRRLQAKRIAVRYRQKGEWLLTVKSDAPSPGGLAQRN |
|  |  |
| UniRef90 C8KZ96 | DTAEQFFAKNQMGFRVRTNGHHEMTLKMKGEIIGGLLHVRP |
| iRef90－F4AJ | ETPQRTLRKHDIGLR\｜RHNGEFEQTVKTKGRV |
| UniRef90 U3P5C9 | D |
| UniRef90－UPIO0036C |  |
| UniRef90－UPIO0036FA190 | DTAEHDLQAHGLLRRRDDTGWQL |
|  |  |
| UniRef90＿A1SF | D |
|  |  |
| ， |  |
| A0AOO9 |  |
|  | P |
| UniRef90－ULXW7 |  |
|  |  |
| EOS | QHPCRDFRESDEALRIRAGCIYRLTYKGPKK\｜INGVKYRD |
| UniRef90－Q3SJV | A |
| UniRef90－U1EKLI |  |
| V6M |  |
| C6CL |  |
|  | DTPELALAQSKSAVRRRTPHGWLQTFKTVGSAEAGLHRRH |
|  | D TPDRLLA Q CLVA |
| UniRef90 M4R4X7 |  |
| UniRef90 B1M5M6 | dipdral reaglitlrvrakgarh otvkags gavalfo ra |
| UniRef90－CMY55 |  |
| UniRef90－UPIO0037 | DEPSGS的AQDQEL |
| Uni |  |
| UniRef90＿A4SN49 |  |
| UniRef90－S3N7B4 |  |
| UniRef90－K6UUO2́ | E |
| UniRef90－A0A011M | DTPDQRLQRKRLAVRFRQKGEWLDTVKSDAPSPGGLAQRR |
| 5w |  |
|  |  |
| UniRef90 A0A031M162 | DTASRELAAARVALRVRRDGQFI QTLKK S SQSVAGLSERS |
| UniReef90－C6C8M3 | D |
| UniRef90－W01163 |  |
| UniRet90－UPI00036F |  |
| W6WP |  |
| U1IDL |  |
|  |  |
| UniRet90＿B5SIW9 |  |
|  |  |
| 1V7E8 |  |
| A7C |  |
| A2SEY1 |  |
| UniRef90－UP100016A2FD7 | D |
| UniRefoto E8N | D |
| 隹 |  |
| UniRef90－V4HWA2 | DTPSRELRALDITGRTRVNDECEQTTKLSGEVLGGLHQRP |
| UniRef90＿E6KW |  |
| UniRet90＿U1k |  |
| UniRef90－UPIO0035 | ETDDRRLSQKGFSLRITRTGASHVQTVKASGPAKSLFVRS |
|  | DTELLDLSSRITLRRRTGGGWHLKLPDGAD |
| UniRef90－UP1000364C426 | $0$ |
| 9DCF2 |  |
| UP10003 | R |
| $\begin{aligned} & =8 R 2 \\ & =80 \end{aligned}$ |  |
| P10004713210 | RKWDMGLRVRRNGDHEQT KTAGQVVGGLHSRP |
| UniRef90＿K9D5 | DTPALDLHRAGFSLRVRRKGRAHVTIKADGGRAAGLFARS |
| UniRef90 Q2V | DTPALALAGSKSALRDRTPDGWLOTFKTVGNA |
| UniRef90－B2S2 |  |
|  | DTPDCALAKAKSALARRTPEQWLQTFKTLGKSVAGLSNRH |
| UniRef90－UPIOOO35E9DDE | DTPEQKLAKYDCGLRVRTRDDYEQTLKTAGKSIGGGLHKRP |
| UniRef90－14EYC4 | DTADLRLATAG |
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| ef90－UPI000 |  |
| UniRef90－Q9YB34 | RHPCRDMLSRDEALRLREDNGGRLTYK GPRMGGGFKARE |
| 90 | DTPDHALAKKGFSLRI RRSGRRTQTVKADGASAAGLFVRS |
|  |  |

UniRef90 Q2BYU2
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ELSIPDDSVPTSAQLTSLYP EWDWPLDQSELINLALLDDSWPEAFANLPSAALQP GFSTDF EYNVTIQADSPDLSLLPATTWPVAANLDKALLQPVFTTDF $K$ SNAEPEDDLSLFQAYPEVMQRLQAVLGDQVKTLCMQFKT E WEVPGOHETAVADAKAAAALLDALGYK PVLAYAK EWEGEPDYTK TTDPSLTPMFDNPALWQ PALLPPIFTTDM EYNGNDDQKTPILSARPKEGWPDGNDQDKVSTSLTCDFEM EYNLPLETKEPDFKRLNSHFNLQULEAEQLSAQLKAKFST DGRIPPEEVPPIAPVARVTNTRVTTVLRDAAGRDLAELCD EYNAEHSCNTPDLTLHPEDDWPEGKALDTLQTEDTPLEFST PTDALPDALKELLTGTSLGRR
 EWESLVEGDAPDLPVLRDLVASDDDWARKAQLTP IFSTRI ELS TAVADTGAMEAVLTGLGFVRRMAYVK QCDVEPELNDELFSENKVVKDLLDQVLGEQQLQLMLQFKT EYNLPPDLHAFDSSUPMGV QLESIASNLLGP VFLGKCDQEPDLNLELYKDNKAV T DLASTQALGSEFPQFET EYEVE EFEMPLDGDALDWARFPDIDNYALKSLGFKVLSFSK EYNAPVEGDQPALAAFPDABWPSLAVRDGMQGELVAQFRT E LPGPQLDTRLELARFWAEDCDENADLAQLEAQLDLFSTNF EWEGPVAGDALEGDALVADVPEAATALRDAAPTLHALFRT
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 N N EKDNFLVCIDTVEGLGDFVE

## GDV GDV

 ELTAVTVDE L S SLDDDGLLD A GED A $K N$
R Q
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E
LELDE
L
SGREQA $\square$ AA A $\square P A \square R \nabla L A A G \square G \square T E E$
EGSEVAMALQK
G G
N LADVFSLLAQMPKRDGMWLSS LSKAQRGYLVGHTEHFRE SGQLFELAKQLVDVTPGRFGLQSKA
L
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$N E T E$
$K G D E$
E G
DRA पG $\square$ AA $\square P V I R S Y G A A \square G \square T R \quad E Y P R A Y T D \square F \square$
QGS
QGADLTAFLDTL
DGDRDDLFL L ALQH $\square G \square R \square G \square Y S K A$
Q GA
DEQAVPELLNDDRHQALADGLEDSQR
DEDRVRELMER
L S KGEPDAL
$\stackrel{s}{s}$
KGSDVIA $\square A A Y \square G E K G G \square R \square A S R S K A A R G Y \quad Y \square A K D K P$
D G
QGS
Q G
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Q G S
SGS
EG
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S G
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S G
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 E WESEVENDERLAAEAKVGVLGEAEL WEHPVAGPAPDLSAIVESQEALDLLGSISAARGVPVFETDF

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 GSRDESQFKARTED $\quad$ NVNVSEDPARLL EALGGTRYVEVVK $E W E M P V A G E R L E D D A L E C D E P S A A D A L R Q A A P E L I$
$E$
$E$ E WETVVDGPEPDRDADALTPA AAMLEDRPDAPVFTTHV


 $E Y N L P P D L A A F P A E V W P E G T D L G A L$
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 E WEVVP GAELAARLEATP WS K F DP D GS V FK A L A P C DV T T F E P A V H A S G SK P E H E T T VA D G Q A V A A L L T G L G L T E R I A F S K


E Y N
 E LAEA E WE WPVD DLA R LGETPAGDVLGRKSVLRRPLFSAGV
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 S LT G S P D TL DVSSSLVPDVSLIT EPTVVAQL
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 | $E$ | $I$ | $A$ | $V$ | $E$ | $I$ | $S$ | $D$ | $P$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $E$ | $A$ |  |  |  |  |  |  |  |  |
| $L$ | $E$ | $V$ | $E$ | $V$ | $S$ | $S$ | $F$ | $E$ | $T$ | ELETEVK

E GDSE
EFNVA
$\qquad$ $Q D$
$V A$

HVVVP
 E LETTVVGSATVSD
T R $\square$ A N G K S A A K
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 ET
ERETKVES F
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WE A
EYNDVF
EKT D
K D R C E A VNDIS DVVA K A K
 E Y NEPI E GLEPELTRFNNK DWPKGCNLLSELQEQIAPAFST
 HE EANQWMNDSPD DP KP HTMA QLMK K GI A V E ELL H Y Y G S LIT $K E Q A Q R M L A L T S F D A T E V A E A L Q T L D V S P A Q L N L I G G T L T T$ E IDE LDEVKPEEHA QAVNLLRRLGYI $G A A P \square P D D V K V W D E V A V A D A D A M H H V L T G L G Y A V A F G Y D K$
 E I ETEVADPAALLEAAFAVLGYLPFLDRYEK




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 DQRTHRMDRSGS ARIELADDGEDRSGAAEI EFELK
 ERRLWTIDENGSQIEVATDKGSVVSGDRSTPLREAELELK
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E
AEQAYEGGlLCLDKS FYFDVVETEFE
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QRRTWWIIVTETA
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DCHVCLDRLSGDFL

LRQYYH

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DVQRTVVLLRPGPRVEVEMATDTGQVTASPATSEVELELK TRRVGGAGEIAVCVDELHGVGAFLEVELTVD MREEWAL GNVEICLDELSFDTVVELEGE $R R S T R V I R T R G A V V E D A F D E G Q V V A G P L Q R R V R E L E G E C L$
$E R H$


 ERSVSLLRLDEGGD
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RRSSYLLLATGGASQ
TRSVYFM
RRSVYFM

## T R R

 VREVWSL DRRAMVVEHAGARTEAA

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D
R
SRAEKK DPQGLA
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D GK $\quad$ PSA $\square R K \square E A L V P R F G V A S K A$
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A GE
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| Ref90_C6 | DPGRTLYKRSALLIRIVRQAEKVTMTVIKPAGPVSGKAKVYU |
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| Ref90-M8C |  |
| RRef90-A5WFF3 DTPDQVL |  |
| Ref90-LoF |  |
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| UniRef90 N1MLI3 DTP |  |
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| UniRef90 AOAO24PIT5 |  |
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| UniRet90-E8WWYO |  |
| UniRef90 B6W |  |
| UniRef90-UP1000 |  |
| UniRef90 G9A5E8 | DTSGRDLDKRGLSLR\|RQGNERVQTVTSSDGPPGSSAQEK |
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| UniRef90_UP10003A09398 D T P D A QLF F S G RLLRL |  |
| UniRef90- ${ }^{\text {G8N }}$ |  |
| UniRef90 U1X200 |  |
| 90- V8QWY3 |  |
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| UniRef90-UPIO00474 | Q |
| UnRef90-UP10002556834 DTPARDLAQAKVALRLRRDGEITQ ${ }^{\text {d }}$ |  |
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| UniRef90-s7 |  |
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| UniRet90-W4QZG9 |  |
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| 512 |  |
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| UniRef90-L5N540 ETGDGQLRGKGAALRTRKNGSWTMTLPHKDGLLETHAPLT |  |
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| UniRef90 N9L007 |  |
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|  | DTPNLTLRQHKIIALRTREIECFEQTIKTSGTVIAGLHQRP |
| Uniref90-UP |  |
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| UniRef90-O475C0 |  |
| UniRet90-K6ENX7 |  |
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| UniRef90-UP1000471C9EB DTPDLHLK QAGLSLRVRRSGSLTLKTDREEGQLADHRGEW |  |
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| UniRef90-ROMTII |  |
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| UniRef90-9ZR60 |  |
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| $\begin{array}{ll}\text { UniRef90-R6VUS3 } & \text { DTK K F EFGKRGITCR }\end{array}$ |  |
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| UniRef90-UP10002377A56 DTPTQALRQQRATLRLRRGAQWLQTRKTAGRCDSALSQRG |  |
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| UniRef90- UTNHL |  |
| UniRee90-HOFCX |  |
| UniRef90_KONTN0 |  |
| UniRe90-F5ZH180 |  |
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| E6V003 |  |
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| UniRef90-UP100037830EA |  |
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| UniRef90-R7F6A2 |  |
| UniRef90-UP10003802FAC |  |
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| $\begin{aligned} & \text { UniRef90-M1E529 } \\ & \text { UniRef90 }{ }^{\text {D2RML }} \end{aligned}$ |  |
|  |  |
| UniRef90-UP100028818B4 |  |
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| $\begin{aligned} & \text { UniRef90 W4Q1R2 } \\ & \text { UniRe90 A0AO23VIF4 } \end{aligned}$ |  |
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| UniRef90-F3GF27 |  |
| UniRef90_UPIO00225B29A <br> UniRef90-U6BBU7 |  |
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UniRef90 LORE77 UniRef90-L0F710 UniRef90-N8X8V6 UniRef90-N1MLI3 UniRef90 ${ }^{-}$A0A024PIT5 UniRef90-W9URQ6 UniRef90-Q5WF03 UniRef90-R6HQH3 UniRef90-B6WT24 UniRef90_UPIO00475A861 UniRef90-G9A5E8 UniRef90_D7DMR2 UniRef90-A9L2K5 UniRef90_UPI0003A09398 UniRef90-G8NY55 UniRef90-U1X2Q0 UniRef90-V8QWY3 UniRef90-UPIO004740794 UniRef90_UPIO002556B34 UniRef90_UPI00035D756E UniRef90 A0RB26 UniRef90_UPIO003B3C135 UniRef90-SOSBX1 UniRef90-S7V5U9 UniRef90_W4QZG9
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IREEW EFAGCHI CLDDQPFGPF IIEIUEGS

 KRTSLDLICEDGS D D ${ }^{1} \mathrm{ERR}$ DRR
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$G$ FGETEAEGK ERSTY CYKSPTVEYNGATIVLDHSLYDKEDYELEVEAS I RHFGSLTYYRMEVPYKGGVLCLDHVYAGTEDYE DEYE ERRDCLLK $\square$ SAATT


RRK ELPYNGAL VVLDHSLYDKEDYELEVEAP FRTAYQLA

GVHVVLDDHSLLY DK E DY E L E V VEA P $K R \quad Y Q F N L E \square G$ EI ALDESWYHQHDYEL E LDEA
TRVRRTVFDVTRDDAA $\mathrm{V}^{\mathrm{V}} \mathrm{V}$ VALDDADVEGAFSELELEFK


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 ELDALDESWYGNHDYELELEVVS GRTRVHLDRVEGLGDFDELEVVLA GKFH1 TI D NLNGLGDFAEFAIVMD



 ERRERSLTGSQGE
TR CE $\square$ TLLEEGLLALDESRYGGHDYELELEVD
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QGT VQDLISF ILPRVKRYGWDDVRSKAQQGFQQENP $D P A G L F A F A R K I D A A A P R L G V L A K A$ SQENGKKVIREILNAC
VKGDVS DLVS LAIDDLANDGSLT PSDDSKAE
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E G I ENEDACQHVMDALSSSLGYSFTVNQKSK
DETQG LLAFESLLQDFS $\quad$ PKRNTAN K $\quad$ KRFYD
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DEETGKAA
PEGTPADLTRATDVLINAGAFGS RSPSKLARAL
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D E S E L D N L Y Y T K L L i S A A H Y G F E A L I E T R S Y K Q M Y L E
DETAL A R YRERLV ALDA QQFHLSEADR
$S K \quad E A G L Q V I K Q \square L E A C K \square P E R Q T D N K \square K R F Y Q$ E Q H QLALSS L GLCWEARV
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NGD $\quad$ AQAL $\quad F \quad 1 \quad$ AKLLFS QLS LRP GQLT
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S G
D A A A L N SLLETECRHLADKLGLLPEQQ
QEYNS GLAQ FHALLDAEHD IDA VTPDNKVQRFFNRK
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DWDEGKLAFEKL LLQQFS LPQRET KNK IFRFYE QKR
D DEHFYAFLKK
EGDADAFQTACEAQAARFALTPE
PEGEV

S G QVEDVVRLGEALSEAYRLTPEERSK
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D GESAHA GME EARTLMA GLGVAPE QLLPG
DPA L I K D C L A Q L K D R F K
A D A P V VEA QRQ LA A F VA G LGGDD A E
$R G \quad D V Q G L V A L A R R W S Q Q H G L$
TGS $\quad$ LAAALFALT RKLNLITP PAH $\square$
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 EDEEEPQ\|GQEVSRUWRRVVDEQGVADDGGEFVCLGGFRN
E AAGGVAPATDPDRHQVTPDAQMHGALDALGYEPTVR\|VK AAGGVAPA DPLRHQGAPGERLAQV A HTPKTGDVPEDTREVVESYGUNDNELTVLGALRTARLET IEPKLDKEDKVDDLPTDDYRMVTETFGNDSALILGALTT RADEAVARESAYELLAVDDPATVRATLDER LGGTADVLIK EASKIEDI GKVQSMLATLGYQPAFILEK H TT PTNEPDK LRETLT LACGQIGRVRK RQEARS DIESCHFPDNADKSLIVEQGVDCNQLKNLGHLTT SYEAE KMLRHNTFPEGKVRTILQNLNLEYLGSLTT EPS IGRDCVADPSKLSEVDSRILRRVRDEFGFVCLGGFKN STVCGKTDLSERCDILVERGVDLESU EPFDPALGRACVAEPWRLLAVDSSEDMEGSGLVCLGGFRN
 EYNVDLDDESKFDPQWWTQD QDVKAVNDKLQ EYETEVKNEKQLRK REIVQDPNAMDALLKSGGFGPVFNYEK REDIVQDPNAMDALLRGLGYAPRLRYEK EVASDDDRNVPASEVPGLIREELERFIDTAQRKMYGALST

 ELTKDQLDLSLLTEVPLPEPLQDMSWANAAGVEVYRTDF


 ENSPEA EWNFPDDTPSLDYARLEGLDLPVSSVIQARLLEVVFENAF
$E V S R V E E D E E P L E P A L A V A C T D D P A R L G G G P R E C C G G F G N$ EVSRVEEDEEPLEPALAVACTDDPARLGGLPFLCLGGFGN LA EKGPATAGTVP EPLPRLHTGTVAGLLEALHAANGPLTET LSQMEADACMQTGSIPDGLIKEALELMKAAELEYFGSLST EWETAADTAAEA ELLGAFPPEARELLAPLAAALAPVFRT E GQQFQTFRKQAKLPTGDVVNQLEELELHYLGALQT EPEAESYQFKQKLDQGKVLEKLAKNQGUNGEDWLVLGCLST EWEQPFSGHFDFSADDDPALRTELETLRDRGLVTVFDTTF
 EWEWPGDPGANLELGLLADTPAPADRVNLAELEVIVETNF EGLLEFEKPVPKNADTSLEDEELQKLLHRYQLQKIAELHT EI ETSFPEKSAVEEMEDSKVKQMLSRIAGSGLFP FEDDH ELDGLCECECQVSENSSAVSNDDQQLLGEYAIVPVYTLTT KAALEANACVELKNLLSASNG EWELVGTPGELDFSQVKDGTLRHLLESVRAELRPAFTTSF LTLAEAKELLQLGRDPNEGA VAQALETLGDHPFAELTT YIRSPTAEPDTLRQALTLAHGQ
 D VDTTDUHKDTDCEVLG EWDWYLSKAKLDLKKLDDSCWPASAELDKKQLKPLETTDF EEEAEN
EEDTLKMMKQGLPPGEVSDALLKLGVGMKKFLHFGTLST LEEAKYIVKGQFPEDTEAASLILEKGVDPTKKABFGGQLTT EVHISKEDGERVLSFFKNNVCDLHTVLDNAALMKIASFTT RPDTDAARASDYERVGVGGTADALHRVLGRGLGVRARVRK LTLEEAKYCLENCKLPQ GULILEELKSRGLVVLGCLTT


## ERRSFLLHNEGAT

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ER AETTFKGGILVFDHSYYNHDDYELEYEVQ
 EREDY

EGLILELDETEYGGTSYEDECETT
IRSLYFV GKFHITVDSGDGIGDFAEFADMTD

N
N
Y YR NELLVLDRSDY MYOGDLLVDKVDY $K R V I R Q V K M G K R 1$ IVAE


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 D P SLI K KVLGELQK
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EPERD RKLIEGLLEENGDEYDFSDFSKFADF
S G
S G

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AFES\\FDALLLTQFH\P\QPPAQKK\ARRF
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A GE
D E
 DEHS $\square E$ T CQEQVQWF $\square K H F E \square D R S$

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DSEQG KKDF LAFLLKKNHIEFRFSKSKVVRFL

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S P A A $\square \mathrm{K}$ E A $\square \mathrm{A} E \square \mathrm{~K}$ T R
DESMLATYKVELEKLASQFGLSASD
RGE IVKFASA $\square G V S K R E F \square \quad K \square D \quad Y \square Q$
S $\square \mathrm{T} D \mathrm{DQA}$
D DRDGLAA QAEDDAWARGLDV
D Y A QGETF LDELEDFSRRREI TKSERFYTK L S
DP
DEGDFK QLLLNKFE LDPYRK
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SGNE
D GEDFQEF LKAND $\square$ QYKK APSK LVRF $\square K$
D E
ETYG QR $\square$ FTKLLDDFA $\square$ PKRKTPNK $\square E R F Y Q$
DEQAGQAA
QERLYH $\square A D E L L A A T V P \quad \square R F D P M S K A D R G Y E M L L Q H H Q P$ GDPQAGKAFFLDLLNQAGLTYRENKRSK

SG DVEQ
EPDRVKAVLERLLTVAG
DQREGYA KFLD $\frac{1}{1} K P F G \square E Y T S N C P S K \square Q V Y M Q$

```
S DSEKGKKEF|LF|KLLN\PER K T E NK\KRF
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K G
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N E
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S G
KEHDGQD $\square$ MK Q $\square$ NVVYEKNC VSK $\square Q R A$
S F L Q AN SKLA DFLTKYNI ERKTTANNK $\quad$ KARFFQ
GGTE EELDQLVSVMREDFGLTPGGSCK
QPHDGLAVFQKLLAC $\quad$ GLVYEKNCTSK $\square Q R A M Q$
KEDDEYKGEKIAQDLMNK LGVVK QQD
NDQGNLDFQE FLCANELQYKK APSKLVRFDE
RQA
D
DEET LDESGQEAEQ $\square$ MAA $L G \square A E A Q L V R G \quad A Y \square$
RGHDG $\quad \square$ KKFNEF $\square$ KRFG $\square H Y \square K N C P S K \square A R A M$
DPEQ
DE ARGK $\square$ EQLLREH VIP $\square R P A K N K \square V R F M E E K$ SHAEKGEKDFQHLLDT $\square G \square$ PFQPAKNK $\square$ QRM $\square E S K N$

GTDRESAQAT $\square R S F E G E L G L P A W Q E V K S Y$
EPQKAMEDLRAFFSA $\square$ NVM
E DQ
NGDDFQEF $\square$ QAND $\square H Y K K \quad$ APSKLVRF $\square E$


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| UniRef90-Q49WD3 | NNE:EFKQLLTQSQYQSUYKTYFQDVGTFSQTNYY |
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| iRef90-D4KG | ME K |
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| UniRef90-D5H269 | L |
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 E L D E R N E E F Y E L E F E V E D F K K A T E M F K R L G L K K V Q G V I K K
 Y I LS P T A S P D T L R A A L V S A H G E R SID K QTKD YI LA T GIIPNGDVANQLRELGFILLGTLTT

 $R$ PD T D GPKLS RYS $\square$ S PTSDPSGLRTVLSDA LGVKGEVRK



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 EINDDLSLDDAKNFVDQAKNNQKFVFSGNIGSYLDKHFKD ETQQ GT TEDETEDAD LHALDREAMHAA LIAMGFAPTVRQVK $E \square D E G T T E D E T E \square A D L H A$



 WETP C D DI G LAA AKE LCK L GAP E DLLLP LTA GGLT EA CSAR F
 $V$ LSA T S S P D S L R E A L A $\quad$ LA Y GVIGRV T K







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 $\mathrm{V} T \mathrm{~L} E \mathrm{P} E \mathrm{I}$


WREYEN


V S D
 E WR QTLLT G D R P V L D D D H T P V P A L L L G A K I A D D $\mathrm{E} \square \mathrm{NV} \mathrm{P}$ L D E S S K E P T V L P T L P P N
 $H L I S S S E R N E D L L S$ GEDKPRDYNEFQQLPLVAFGTLRT

 ESEFDLDDPSKKLPAVTSAVVQRVVREFGVTEFVCDGGFKN
 K VT L N K S A CNCI A N I L SAS N G
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DESMLE QY K Q E LLE L A A K L R L
D
DPERV KRVLEGFLKENG DDYKYSEMSK
YDGDLGAAH
EESGKKAF LELLNHFY $\quad \square$ PMRETNNK $\square$ QRFFNLKHK D P QLI I EEVKLELLEHKFAF

D
$T E A D P A E V T Q Q R L A D R V H R \square G \square A G S$
DEASVRQAAALLE
EPV AGEQNFMNDMKKFNVPD RPVKNKVRRFYE
DPEE AKR LLEEFLKENEI DYSYSVASKFS $\quad$ F
EKADFEAF LQAlUKKYAKSKVARFSATLAK
D PALIGKKVLLMMLEK
TD D A S GQQSFYE LLKKH H $\square$ PKR $\square$ TPKK $\square$ ARFMK
S G
 DYDEGKKA
DGESEADGREVAEGLLEALGLSAAERVP
D P
ENENQQALD【IDNDLDKSNNPVGKYKRFDMKHQK DFEAGQQAFNNLLAQLKLSPVVPKNKVQRFFEYQR
S G Q
GDG
D E


DDSQLSLLTEQMMSLARQYGFSEE
D P DE AKR L LEEF LKENG $\quad$ D Y S Y S VVS K
S G D E
D Y D E GLQ K FNDLLKS F HMTHEKPLLNKVQRFFNRK NYEAGLVAFEK L D P
NHEKG KADFQRF $\square$ HENH $\square$ TYQKAPSK $L I R F \square K$
TDLPEDRKNLEELMEKLTDRPGDLDTG
S IQNAQESLEEVCKLAKVP
DYDDGLIQFKM!LEAFD $\ddagger$ KHETPENKVQRFFNRK
D
D E Q
SENELEEपLSLI
E G Q TVEQLQK DAEDLMQK $\square G V S N K D L I S A Y M D L L L K K Q$
$D P D G V K K L L E$

S
DEQD DETGEK $\square \mathrm{AQDLMSK} \mathrm{L}$ DDTKHED
NPD
D GEPAQAGVAEAGAMV
A

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[^1]

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lupas_28
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conf
sol25
sol5
sol0
jhmm
jpssm

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lupas_14
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180
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D A $\square$ KGN $\$ DEF $\square Q Q Y G \square D K Q \quad P T D K K \square A R F M K A L K A$ DEASVRQAAALLD
DPERV K K RE L E GF L K ENG DD
QPHDGLSVFQKL
PAGDGPTCVAKVAWLRRALGV
EDESMTDGERVADEIRQKLGVLTEDLLEG
D K
D E
EP ERAKKLLEGFLEENG $\square$ S

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D

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lupas_14
\end{tabular}}} \\
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\hline \multicolumn{2}{|l|}{lupas_28} \\
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\hline conf & 99999986299 \\
\hline sol25 & B B B B \\
\hline sol5 & B \\
\hline sol0 & B \\
\hline jhmm & \\
\hline jpssm & \\
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[^0]:[^1]:    lupas_21
    lupas_14
    lupas_28
    jnet conf
    sol25
    sol5
    sol5
    solo
    $\underset{\text { jhmm }}{\text { jpssm }}$

