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D92EC CF81A

1 S MVEF GRDDI E SAMRKMSAAELDNMAFGAI ELLDRNGRIL
 D A K F S N K L G T L T Q A E A D A A A F G IV V V V D G N G K L





A S LA QRALDRFSEGVCALDVNSRVV $R V I T V H P S$ GT GA DRS GLLA A A D L E R L P D A F L E RL P D GCC S L NVE G R I V


A A CADGAADLLP Q GVF CLDRLGLVV A A R MVAR L P Y GL C S L D L H G RVA

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RPY GMCSLDVS GRV
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G【P G T L G A L E A VR MVGRLP Y GLCS L D L H G R V G E A A L R E RE A R LTT S MFSLEPEEDARLLEER EAAFQAMSEGI AI DTEGR T

E T L R T T AADFAERMLD
ASAAEECLD
E QKESAAR $\square Q S$ S $L$ D S A LDA A
A IT DVA Q D

L P E G V | $F$ | $C$ | $L$ | $D$ | $P$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $G$ | $L$ | $Q$ |  |  |

MEQVP FEEVT T GAARDAGGW LGALPVAVVATS S D GR V A ERTAR N L L E T A N D A V V T I D A D S V I I


$$
\mathrm{E} S \triangle \mathrm{~L} V
$$

LD ALS QA ML R V T D
VF R V T D GI F AL D D D WTVVI
$\begin{array}{llllllll}V & R L & R & D & G V & F & S & L \\ L & D & P & G & G & R & I \\ L & G & M & D & A & A & L & C\end{array}$
VFPLHNEIEQRLRREKA K L L
L TVVDSLVVLLDNE GRI I
VF P L H N P DLR D WLA A
A ELLLA ALL
E G S D D A I I S K D LS GR I Q
D Q M A A $\square$ GRAE S RNEA I L Q A V P DVVI L G L D A G G R V

 $A A R T Q L L L$

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

T N AVID T A GAADVVVMD P F GR V
SAAVLHDLGAGVI TTDPDSR T
$D A L S R A L R H M S D G F L A F D D E W R I I$
E D $\square$ H F $\square$ E S R L E D Y R S R L T A A E L D A L P M GV C S L
 E S RLLAL VDTAV D

D GLL D A M D | $G$ | $I$ | $T$ | $D$ | $G$ |
| :---: | :--- | :--- | :--- | :--- |
| $G$ | $R$ |  |  |  |
| $G$ | $V$ | $V$ | $L$ | $D$ |
| $R$ | $H$ |  |  |  |

$L L A A L L D G M D A A L L C A F D A G G V V T$

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QYNAAEGDT ${ }^{50}$ GRDPKQVIGKNFFKDVAPCTDSPEFYGKFK ${ }^{60}$ HYNAAEGAITGRNPKEVIGRNFFSEVAPCTDTPKFKGEFD RFNHVESGISGRRAEDVVGKNFFNDIAPCAKGQVFYNHFF LYNKYESELLSNLPNDTVVGKNFFTEVVADCANNRIEYGKFK LYNKWESEMAGVPDSTAEGSNFFTQVAACTNNRLVFGKFK KFNQTEAKLARIVRERQLGRNFFDDVAPCTKVREFYGRFG AYCKSESH V TGIISKEYAVGKYYFTQIAPCANNQMVAAKY
 CANAMALEVPGUDPASVVGKPFFDALAPAARTPDFYGRFA R $\square$ NQAMADI NGASPQAHLGRRF QEMAAATAVBTFEPMFR CANAATGDLVGDPAADLVGRVLWTSVVPWLNDPVYEDRYR
 FCNDYLLKVTGWRREEVIGGNWFTEYL P
FANDFLLRLTGWQCEEVLGQDYFT IFVPPEDRPQDRQVFE FANAAAGELLGMSVSSLLGTQLWAAVPWLNDPVYEDRYR Y VNPAAARLADRERESLLGRPLW EAMPWLTGPRYDDHLR FANAAASELGGVASDGLLDRHLWAAVGPWLNDPVYY YANRRCEEML GGGREALLGR YPWEVDTWLRDPAYEDRYR QVNEQACRIL GLARTELI GRHYGEFI APE
FANAAASELLGVPVGGLLGSQLWASVPWLNDPLYEERYR FWNKAAEESTGYREEEVI GRSIKVLSA DAGEAYEEDR FWNPKAKAILGYEEDELLGKDFHKIVAPKAFHEAAKKGYA FINPAGTDLVGAGAGSLLG NRPWEVLPWLHEPAFEDRYR LVTPAAADLVGADPDRLMG SLPWEALPWMDVPHVEDRYR RFNRQCEKLTGYSAAEMIGRPDIWERLLDPEELQPVRSTFD
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 IIANNEAGRI DGKNREEIVGRHI KEVIPNTRLPEV SWNRGAERLFGYTAEEAI GRSV TMLIPDDNQDE EPRUL YMNPEAERLLDTAASEVVGTN YWDLFDSDAVKPFRERYE $F$ LSSGAAELLGGDAGQLLGT LPWQSLP WLDDPSYEDRYR FVSDSAADLVGRAAGELCGAPLWEAL PWLEDPTFVDRYR FLNSTAANLLGKPRTQLLGRPPWKEL P WLQDPVYEDRYQ A WNPQAEVIFGYSREESIGRDVADLIVP GIMPIHREAHR FWNKSAERLFGYRRDEAVGRDLHQMVMPGGPGPEVNRAMR SWNTGAQLLKGYTASEAI GRHFRMFYRPELALGMPENELR YANPAAARLTGRARERLLGQALWEAL PWLTGPPYDDHLR RWDPAAEDLLGYPPHEVLGRHIADLLHPDADRSLGRSLWE MWNRAAEQMFGWTADEILGRPYP $\square \mathrm{L}$ VPTDEWKDFEKLYE
 EWNQTAERITGFTKDEVIGKNLVAEYITDDYKKPVKEVLID YVNQQAERQLGKSGEELLGNNFWKTYPDADNTVFYQRYH RFNQACEQTTGYSFDEVRGRHFWNDFLVSEEVEPVKAVFQ FANDRWAELVGRDKAEVIGRDLAEVVGRRAMV ALAPHLD YVTPAAAALLGADEAGLLG ALPWEALPWMDVPQVEDRYR FCNRAMEEVLGYHRNELLGQHFDTLLTPATA PVASQHFL TFNPACERLFGWTAAEVIGSNV KMLMPSPYQEEHDGYLE YWNDAMAERTGVPAAEALNRDFR ELFP EVGSEDHGALE YASRNLAD LLGGVRLEDVLGRT PWEALPWLADPSYEDRYR HWNREAERILGWSAEEAVGRRFAGWAVRTADAEEDEARDM HFNRACERLSGYSFQDLQGKEITFKRLI PPEEAETVRSFFM SWNPGAARI FGYAANEVIGKPI T ILIPPERLDE EPRIL


 VFNSAAENILGYARDEVVGQTDTTAFLHHTFS ENSLC YYNRAAADLAGREPQ $\quad$ VGKDKW
DANPAMVRLLGLPRETLVGRELGADFAPADSRDEVQAR LFNKSAERII GYKKEDAI GKYI L EVIDP
FVNPAAAKMI GWSTAELIGQPMHAVLHPKENCPDYAA FR FLNAAAAQMLSLAPEAAMGRPLHSVYPSSTLDRILR YWNHAAERMMGMSRRDALGR VVVDHIDDEVSQAFQ GWNAQAEHTFGYSSEQALGREMAELIVPPAYREKHRQGLS ITFNAKASQISEYSPDEVMGVDVVETLI SEEFRPAVAAVFQ

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 MWNRAMEELTGQSAERVVGRNLLEDFVQRSDEHLYKQRL F $\square$ NTAGAELVDAGAAALLGRRPWEALL WLHDPAFEDRYR MFNLAASKVTGLAAGQAVGRHV TEVMPLLD
SFNQSAERIFGWTAGDVLGRNI RM LMPSPDSEAHDGYLQ FWNRWMERASGTTEPDI HGREL VEALPSLRDTRLHNAVR LWNRWLA ERS GVSAQE QGRRL EEVFPHLANSRLAHAVQ

$T G G A Q E A L D T A F L Y T F T A A G T P R A F A V H M Y R A S T$
$R M I E T G E P V D A V E F S D P G N P R T Y Q A S F H P \square R M P D$
NWQKNGQLPKTFENIFTISWQNTEVREH
A A LMS QRTTSFDW LDFRLLHPGR
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A A LFS QHVTSFDTWLS RLYPSTTGLSMRDSRA
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$R Q T L Q K Q V F T S M P L S A T R R D G$
KFAKTGEGDA
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RLVA GNFPSEFEWWLTKNGA
KFRLTGKVGKTVEMTRHKNGHEDDVELS LSAVRDKDS
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RYQRTGE
EA $\square$ ATQQP
ERDRRGERVETYETDRDGTVVPVSDTVSPVRNAAGH
KAVKTGE KVSFESYFPPHDRWYEVE
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AAAISRRPTATVELD $\square$ DFHPDPTGVS LRL
A A LVSRQV
QGMAR
RFAQTGTGDA
TALEKGRAEEE
GALLS PEPVHFHARRPADD

RFIVETEEDNRRUETALTRHAGEIDVELSDWPVKDGDNF
RATRGTVLDGAPLAARRRDGGAVQVRVHPASGP
KAL A AGEQANYEFP L
EAMKTKKH $\square$ QFEEF YPPSERWLEVNVYPDDEG $\square S \square F F$
Q LQA
RCLA GEV ATFEYAFPRKGR
A A M1 S RRP
NGVAGRRDAPFFEVADHRDGGKVHDEVR
RYHRTGE
AAMASGATTTRDDTR $\square$ DAFDVRVSAR $\square Y$ PDDSGVSV
A A MLSQQPG
AAM HAAGRQVHEFALVTKDG GRVLVRTQSAAVRG
TK $\square R S G E R V D H F E T V R R R K D G S \square \quad V D \square S \square T \square S P \square R D A$
A G $\square$ S S GTYVARFE $\square A \square R R G G T P F P A E V S \square S R T E T A D G$
K A
ERLRRGEHVDHFETVRQRKDGS PVEDSLTDSPD
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EQVQSGETVTAVETRLRNDGSPVDVSLSVAPLRDEGG
DTFDSGELDEKF WW DKEGRPVPVKFSLLYSPSG

D G
DALGKRENTTDEYYVQDRNSWFNARLVPFYSETS
RFALATGTSN I I ANFEFP VVTKTRKVE LLLNATPRYD

KA GRGESLGGAVMRRQRKDGTPLQVAD
E DDETGR
N Y $\square \mathrm{A} T \mathrm{GTGPT}$
SGVTEQGSD
SAVDMDEPAS EYLLRDVRMPERRV
EAVDDEF LDDVTVEYR
$F D V R M P E R R Y H L R L V P G P G G R T V Y D$
$H R Q R E G G W V W L$
A A V VT R R
RYLATGE
DVLETGAP
$T A L Q Q Q \square P A \square L S Q \quad T L N R R P F P D Q D H \square H N D A H P \square E Q A \square$ SAMAAPGRQVHEFALLTKEGG RVLVRTQSAAVRG

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| iRef90－UPIooo37B905D | W |
| UniRef90＿E6P | （ EVVERITDGFFVLDREMCIR |
| UniRef90－UPIO0040131CD | IT SQRVAQQESSFQASLLDAVGQS |
| UniRef90－I4YS57 | LSAAANAV |
| UniRef90－NOCSL3 | AALLDGMDAALCAFDAGGAVT |
| UniRef90－J2Z986 | ETIVETVQDGIYTVDDEGRF |
| UniRef90 ${ }^{-}$W4 | DSADADGR |
| UniRef90－14VW | VLDLMPDAVCVVDTEGHLL |
| Unit | GFIAVDPDGR |
| UniRef90－AOA0316 UniRef90 D3RPK7 | VDTAADGL T DGQGKVR |
| UniRef90－D3RPK7 UniRef90－14F5B1 |  |
| R4 |  |
| UniRef90－UPIOOO2F015DD | AARVEAETAQEDESTTDGFIAFDREWR |
| UniRef90－R1DGEO | GLLDPNGKMN |
| UniRet90－G8BOP7 | VDa VVIDRAGTL |
| UniRef90＿G4ZJ94 | G】GQ DITDRIAQEQERLIDSANAPIFGVDTNGCVN |
| UniRef90＿B8DK80 | LlantidsmpsVmVGVSPEGRIT |
|  |  |
| UniRef90－V5TTK7 | LETTNQRLEsLI EATPLTVMETDTDGTVI |
| UniRef90－UPIO0031686EB | DRKALEQELA QLL |
| UniF |  |
| UniRef90－E8W148 UniRef90 L9XMV6 | VIKEREDDLARLTLFQRT， |
| UniRef90－16D8C8 |  |
| Rego－vides | KLRKQFELILNSAGEGILGLDTDGNFI |
| Ref90＿V9X1Q2 | J Y A IIY MLID P S G Hiv Vil |

A A NQSALALLLGRPAEELIGRDVR DVLPEAAASDEAAR

 FANSAAQAMLGYAENELIGRNLHETLHPVLPD SWNE GAERVKKGYAAAE MGRHFSTFYTPEDRD
$\square$ IWNRKAAETTQYPNEEVLGVNLVENFIPEDFREADEGIPE YCNSAS LEEDLRDSKK DVLGKSFKELFMNNKKNRAVFNTVLS HVNAEAERLL GRSREEVLGQVIWTAF PATVNSDFEKYYR RIN N T E L G WL GYEAHEVVGVKHYHEFMTPASREVYEREFD

 Y ANPAF LDRLSGYELADDLGKNCRFLQGPDTDPPATRQSLH SWNAGAERIEGYAAEEI I GRHFAEDVAAGKPVRELEI
FVNPAAVRMTGLAAEEQLGRDQHAVI HRPDGSPYPKQECP $H W N R E A$ ER L L GWSAREAVGRK LA GWAVRAADA REVEA R L M E I N K VP LE NAQVQLE DVVGKPLA DAPWWASSSAMQQRLH EVNQTWLDTLGWSRKEVI GKSFAEFLHP DWRPFFAENFP YVNP F F L E LVE Y T S E EV L GK N WY EVF L P P H QRQR VQEHF L RWNEAASETFGWKRHEVVGELLLP I ADDRREEVEA L L Q


 $L V T P G A A E L L G V D R S L L V G B A L P W E A L P W M D V P H V E D R Y R$ YMNE QMAERVGRDPEAVI GANLWEEF PFTVVGTELEEKYR SWNT GACRIF GYEEREILGRDVGTLFLPTDR
QFSAAAEELWGYRASEVVGRHF TMLIDMEEVEPDEAVLQ Y VN H A A A QL L H RTP D E L L G K HVWHE I FP E L VGGGLA Y QEL H EWNRAAAHMFGYTRAEVLGRMLEDVIVPPAYREAHHQGMQ QVNRAAADAA GLPPARILGRPF E EI CWLSFDDA GRDRDR LFNP GAEKMTGYAADDLVGKHLSEEI ARSAELSAAYGRFR
 F VNRSAERLLDWHEDQ
F CNRWDAQHI G[LPEKDLLGRTL
 FLND A A K P I L G Y D P E DL I GE H A A A I I P S D DIIERAR D M I R
 F VN P A A E R L L G WR A E E L V G R D M H GMV A D G S HYP E HE C P I M
EWNPAAERLFGWVRDEAVGADLSKLIVVEAHREAHRHGLD QWNPAAHALTGDAAADAVGGRLPFDVPPPGESRTBRA
T WNPATERI F GFTAKEALGKHPYDLI VPKETGPHVDD DWR SWNA GAER KGYRAEEVIGQHFEQDCAQGRPDVLLRQALE

 FVNDAACTMTGYT RDELI GKNDIQFVYPDDREFAYR HAAA EFNRAAE QVFGFSAGQUVGRDLADMIIPEHYRAAHRAGLL
 MWN R A MEELTGDSA QQVVGSRLLS LEHPW
VWNKRRVVDI TGGFSSQRV L GRPMMSDFVVYGAQRKREVAA VLH S WN A A CERMLGFTAAEMI GRSVY DI DP P DLDEGARA I R HWSPSAE QIY GWLA E EVI GQPFHEDI QPEYRYQSREEVFA SFNAAAT R I FQYQPE EVI GKND T L DPE LYHNE H IG
 FANARMAELLGRDPDDMI GFSVVFDAVD DVGKEQFRHHLA $F M N G E A K R L L G A D G R D V V G M R V R A D L D P T F A N S V F E E Q Y Q$ Y WNDASVQMLGWSAGDAVGRHFAD
SWNA GAQRIKGYAAEE II GKHF SVFYPAEDVAAGKPEDE



 FVVNASFKRI F GYTPEEVLGRRIFELVHPDDRAATAAQA DWNA Q A A R I T G L A A A D AL GRPV EQLLDPEERRAAFRAAFA S F NP A A E S L F GWREAE IVGRD A S S VL L Q PA DA A E Y E G Y L R EYNPAAERLFGVGRPFALGAVFVERFLPDVARPAFRHRHR $Y L N P A G A A V V G Y T V E Q L V G A D Y W T A F P A N V D N E F G R A Y R$ YANEAAERLLGYDPDVLVGTNAFDLVHP ADLEETRETF D Y VN Y E GT RTLLGRSRK ELL GKNVWE E F P E L LA ET SF GT L Y K
 Y A S P A L E K I L G Y P VR T V I G K V F Y M NV HP E DLDE E I K G K F E

 FWTP QAEELFGYTAEDVLGKYAAQMLIRREHVQAVVGGTT






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UniRef90 UPIO0025592B7
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UniRef90 J2Z986
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UniRef90-E7QV53
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UniRef90_V9X1Q2

RFGESGA
DAARQGAVVVEFE
AA L A A ARRNGSF
QALEGQETANFEF
ESIDKGKVKTS $\square R$ YRF
SAVRSGEP
RFKESGMVDVEFEFV
$R A V Q R G Q R G V R M E W R \quad D A T G A P V P V D V S$
QAVAE
 AVAEGRLEDE
RALATGRPVTADDEVFHRDGTAVPVELIAVPTDEDGAV
AAMDAQGRQVHEFALLTKDGGRVLVRTQSSAVPRADGR
DAVAQAGKGEVV $\frac{R F D A R V Y P K K V G E R ~}{\text { R }}$
LFKELG VVTSVEF
QLQQQGLHNYYQNS ILTKSGQER
QS DEEGGL
Q MEDGDVE
AFVRRGEDDER EWTY
E II RNG GY LEFDTMHKRKDGS $\square$ PVHDSTYSSVSGGRCFV
A ALVSRRP
TAAIETGSP VTFEQH $\square G G P \square D Y W V Q V R A F P D E N G \square T V F$
DGAPQREMKTALE RGRAENERFHLRK DGSTFW
RFVETGEGEVLVGTALT ADGHPAEMRAGAARSDDHLLITV
RAVAEQAPVSWEEF
$R L Q Q S G$
QALADGA

QFVLT G
TLVTSGGEAEQGE $\quad$ KVTRQGRNLLVRMSLRRGDDG
$D A C L N G M G R L L S Y Q L H K R L L P L K Q R$
E L L R S DVP S Q TVVEVL
ELLRRDEPSRTVEVVL

$R Y L R T G E$
$A A F R E G E V R Q \square D D E V F R K D G R P \square R V E$

$R$ LLA
Q GVA QDE
DTLEHGHVDVAVEMPLPRQMLDVSASSSLLRDSHG EVLRTGVPIMNFEYHGRTVADPHR
K I NCGKTLS G DE T Y CLT K DGKK VGVNDS
HAVDRQEPTAFEAY FEPHSTWLEVRAYPSESGLSVYV
QVKETGS
 SGVLTAEIEETGELVLDFR
KALLTGQHRTV $\quad$ R L R K DGTRVPVRMSFAPDEG
RGQADRRLIDT
A RVSMGES ESFETRDTKQGRP DEVS $\square$ TFSPDRDPQG Q IEKQGS

DGSTHRVMDEVF
KAFED VETANFEFPLITKARRVE\|LLNATPR
ELAAQGEPGDNLECSL
KALDTGAPTSFVEYSLTY $\square W W$ FDVKAFPAPDG $\square S V Y F$
VAVEQGRDEDE
RVMASGE
SAMDAPGRQVH EFALLRKDGS RVLVRTQSARVLGA
DGDDETAVLETTLTTADGSTGPVEGTFTLLPSDAGGER
R LRKDGSI QASYNPILDVSGRPYKV
RYVETGELDESVETIAHRDGHEDPVTUSFRS
EQVMAGQLQLHF
ECALLGRTTETN LLHDS GRLVPVELAVTVLPAADGKGASV
D Y L E TGA




RYHRTGE
KA GEGTETANFEFPL $\square$ TKTRRVE $\square$
R
EVLETGR
R GRGEPVPHFETHRDGHLIDVLVSVSPMRGRDG
RA
H L LTTGE
E VVRQGRPVRHDETTRVRRDG RRVAVALTVSPDRG

RYIETGEKN I DWAVHKDGHEVPVSI S FRREHEYDGTR
DTLKHGTEHVALEDSFPGRDRTIELSV
$D G V V H S S S T D V F \quad$ WTKDGASFPVE
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UniRef90-D7C185
UniRef90-D6U7A2
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UniRef90_Q9KYY8
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UniRef90-B8IVC7
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UniRef90 UPI000367C77B
UniRef90-X1H0N5
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UniRef90 Q21B38
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UniRef90-H3GW92
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UniRef90 UPI00039DD3D9
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UniRef90-V5TTK7
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UniRef90 JORXF4
UniRef90-E8WI48
$\mathrm{Y} \square \mathrm{RK}$
UniRef90-L9XMV6
UniRef90 I6D8C8
UniRef90 ${ }^{-}$V4J4B5
UniRef90-V9X1Q2

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UniRef90-UPIO003800206 UniRef90-F8FRB1 UniRef90_O89S17 UniRef90- K 5 C 027 UniRef90-A0A024ILK8 UniRef90-K9XJU8 UniRet90 UPI00036DB28A UniRet90-D8PBG3 UniRef90 MOLGW7
 UniRef90_R8ZM79 UniRef90_B5ZGV8 UniRef90 UPI000364EF07 UniRef90-Q5NY28 UniReffo-COQBE4 UniRef90-G0A7C6 UniRef90-H3GW90 UniRef90_UPI000382F7FA UniRef90-K2LGN7 UniRef90 H2K6G4 UniRef90-UPIOOO344E94E Uniref90_E9CCX6
LRQSEGLKAA L R A A GE
EAELQQMSAALVNAVA
MEMDADT R D $\square$ T A

MF T LIEP E ELA R

LT F V R K Y L E D L L E R
LRESEANAL T E E A L L R E S E A L LK A S
QLALL

MEMVA VT R D $\square$ T A
ERRRRLFDSVLS

A
APAGSVTAASATAY
A D R I

D A I G R R M L F Q R T L L D N VA H GII STAP D G TVVT


QQVAERTAQLEKTL TLQS
SELAVTTERLQSAI L ERAAYA
SELAVT TERL ETLVEAAPVAVI ATDVRGII T


GKM EVVVD YAIVVLL DAE GNIIE
MTA $\square K E T E D A L E D R$ K

DNEDTMRA I D S A L D A
D A RVA R VL E S MP T
V V Q M N
P N G
E R V A A R T Q E LA D LT R F S T L L L N A A G
D D RRRYTE I I LQ N V E A G V IS LD E
QATAERLS DRFQRTLERAT DAIVAVDGDWRVE
APCGYHSLDAEGRYV
RRFTDHLIETANV
D P S R Q LRLL IDD SVRDHA
TGTVDTEA ELLAR S QRQTEMI LDRAA SE GVVV L L D P D GIVVC DDAYEYDEQLMDKLLLDCRPAPVVVVFDREGGHIV LE Q S E E R N RLL IT E S AL N A A QRLSSA S DA EVLDA A T S D A F L A V D E N Q R PEGLLT I DKDSQIV

DDAN I LR I L E CLS L
L K L A Q E AVTTAREAHLDT SILDTVPDAMIVID HE



ER $\square$ A R P D Q S N A D WLR A V VD T A VD GVI LI D A R G T


EGALLRKSEGRTRLI DD TALDSAVIAGMDER GLI I
TVIDAMDQRATVERQMRLFKAIAADTAPYGTVIIDANHTIV AK QANMLNNVLDA

D GAARDIL DRLP E IV FRTDAQGRWT
$D V T$ D E VAR RTAA HL NHAGRGVMVVLDDR DR V
LR RADALRRTDYDSAPFAIVAL DLRGVI Q

EATLAALRVSELDNA G DGII ILND QGLI E



UniRef90_UPIO003624CE6 UniRef90-JOS3C7
UniRef90-UЗAH75 UniRef90-KoW4R6 UniRef90-Q21Y56 UniRef90- W9FXF7
UniRef90 ${ }^{\text {B4DB }} 7$ UniRef90-W0AAS6 UniRef90-F6CM33 UniRef90-L1JDJJ5 UniRef90-14D099
UniRef90_O08RM UniRef90-Q1 YM22 UniRef90-A0A011 QNN3 UniRef90_L9X016 UniRef90-AOLDH2 UniRef90_UPI0004786135 UniRef90-F7QLS4

A WNK QAEHIIF GWGDEEAIIGRKLDKLIIPNELQQAHQAGMR YVNS Y WS AI T GVVP LE E A L GK G WER A L HP DDRDRVLA
 SWNTGACRRI F GYEEDEEI IGGRD ARDLLDPPDDRRDGADERDEMK

 IWN E GA E R LLKG WS EQEAAGGQHFYPADAVQAAGKPE A DLLE









 $F$ V N R S A E RLL LD WQEDQQ

 VF NPAAGE I LGDPVQEALGK IVVEFNPGAGDPRVLER





 V FN P A A E RMLLGYKAE ELL GRASPLLLFHDPRELAE QA DALR


 HWNRAMERIS GRAASEVIGRPFYPDIHPT LAAD
M WNRAME ELTGGDGARVVGSRRLSALPNPWQDDFEYKQRLP Y WNK GA Q S I F GYTVA EA L QRRLTEELVGAPDHRPK DNQS L R GWNPQAEABVGWTVSEAVGRPMHELIVVPGYREAHVRGLR QANAEAERLLGRGRDEEVGGDDDWALVPAAVGSDFEVHYR SANPNFVVELTGYYKEEVVGRHFTKSTDPDADDPKY LYMF

 YMNDTMAERI ERDPERIVGGNTDWE AFPSUVGTELEERYR $K$ K N D T E L Q WL GY S RE QL L GRRRLAD F LTP ES GE ITE SNFE
 SWNP GAERI KGYRSEEVIGTHFGRFYLPADRDTGEPQRLL LVNPAAAQILGYRASDLGGRELHDLI
RFNKACESAT GYDFGEMRGSRVWLLELDPDEEREEVTAVFD MFNKAAERDTGYTMDEDTC DDWFEKIVPKDRYAHVWEVFN FWNK QAE EIF GWKSEEVIGKKLQDNII P DQHRAGHA DRY


 S VN DNF L $\operatorname{LNAVGYQREEVVGKHHRMFATPELASPEYRGEFD}$ FLNRAA QT LGGQCRERD SLGRRRFPFMAADPTLDDTDPRERFE $I W N L A M E V M T D L D A K D A V G D T L H R L P A P W G N$ L WN R M L E Q WT D S K R E QMI G Q NLIFECR P P E L N A P Q L R DQ QD SWNAFMVAHAGKGRREVLGRS I F EVVFPELPRSWLQRKFD
 R GNS A FA K L L S V P V E K V L G S H F R D F THP D D DE A D V D L F E S $\square$ N D T E LLE WL G Y T R D E VV G K L N F F R D M DP P H QV P L L E A RM G
 GWNTQAE QI FGWTRREALGRAMTDTLDPPAHRETHQRGL E Y ANPAVERI LGHAPE E LVGGS KVTII PPRLR RTHLLEALQQ Y ANPYMARI HGYRLE EVMGQHL
Y WN K A A E K I F F WK E E E V I G K NL LTT E Y L R F T N D E VI E K V N L Y L N P A WTVVTGGEVVEASLGKHFLDVVHPDERDHTVABLGM YV N P A F T RLL L Y R P E DVVGRDVSVILSPDVD DRAALLGEFR


 DWNVKAA D ITQQYSAEEV MGKDLVNRFVAEEHRATVVELELQQ


 $R \mathrm{~V}$ S A A A E RL WG YP VESSLVGESITRRVHPDD

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RFALLEKQSDMM
$D F \square R T G Q$
AAAERG
RGNQADEHG
EVLASGTP
RAREQGK VEEE DWR $\square$ RKDGSEF LDA $\square$ S $\square$ T A L R D GS G
NALK GRGTANFEFPLYTKDG RRVEVLLNATPR
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QYQKS G
RGMER
DGAVHQVDDEVF
DAHRRG
QM R R GRVEVE
ETVK
KGEYDGELNEKF
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L $\backslash A$ V $\operatorname{ENGNL}$
EK K R R GEHVEHFETV HMRKNGERDHM
R VT GQPERRLTYAGPTRDHDFNVTVRYTRQA
RAMRTR KHFNFEEYFDALDMWFSVSVYPSEGGLAVYD
DAHRTG
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RVMETQELSRTSSVFFGGRHRWDRVHKSP IVDANGLVYGV
DG $\square$ PREA EVFFHHRAGHRVPVNVRVSP $\square$ RGE $\square V G A V E V$
A GFLT
AQGi A AEPN $\quad \square R V L L H R L R Q N D P D T V W T$
R VLE GERLSGHETELERKDGS RVDVSLAAAPDRDL
TEVRAGRFVEPYETQRRRKDG RLVEVLLSVSPIRDAN
RGERVDHYQTRRMTKDGR $\square$ LTVS $\square T V S P \square R D S S G$
QEHEQRWLN
NTHETRASVDEDLC
HF L $\quad$ AT GA L N N R L A A MESGQQAAFEAYYPPPLDSWYEV RAWPSPEGLSVYF QAVMRGRKPPKFKY
$D G Q V R R R E G E V F$ WHARGEPVPVAVSPTHGPGG


LFKQQGYLKD
RLVAGGE
NALK GKEAANFEF
R LAAECGHHAAEGWRVRRDGSPFRASV
A $L \square A G K A P \square R H E N H W \square H K D G$
SYQRTGTMPTNFE
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R A A A
A N L $\square$ E T T DD I I F E


Q V LIA D G A S VT
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Q VLRGARD GYT $\square E K R \square R P Y G E \square V H V L$
 RAVRE
RFLKTGD L NKR DEVT DRRDGTEFPVE $\square$
RYLETGERNLNWPYV
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$\stackrel{\wedge}{\mathrm{R}}$
ASQLSAELGE PVPAGVEVRARRGRPDEREWT
RLKESGRGGE
R FKA $\square G G E G$ VEFEMV KKDGAT ILVSFNGKDQRNDQGYF $R V Q K G G R A T E D Q A Y Y A D K S S F P V E L S D A C L Q Q L T K G R V Y T$ RAFEGEQTNNFDFPLDTKTG RRVEI LLNATPRYD RAAADGRPA AFD $\square Q W P T D D R W Y$ HIVRLVSVPDGLTAYL EGIVRRVDDEVF WRSDGKPDRVE
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| UniRef90-UPI00036B8770 F $\quad$ D |  |
| :--- | :--- |
| UniRef90-14EQ91 | $L$ |

(1)

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DFNAAAARFAGVMAEQVIGHD DTVVFPPATAQKDDEQDR SANRAYAESAGYPLAEIGRHCYQVSHPCYLNGEVQHVFN TDNRFAERLLNDDKNLFIGLNFR DVMPPYQAAVVDGFIE SWNRAAERIFGHRKEDMYGKSLRKL YWNREAEQLLSMPREEVLGKNLWEVYGKEAVPLFFSEYH R NNTELNLLGYTRDEVIGKKKFSDLLTESSRATFQECFP FVNDALSQTIGYDPDALI GEHVST VMAAEDIETAQDRIR
 Y保 FWNRCLEAWTKKTRKEVAGRSL GDVYPHFNKEDFKGRIN SWNAGAKRIKGYDASEIDGQHFSRFY MEDERERGEPQ EWNPAAERLSGDLKDEARGMKGWDDMPRMMLPERKTRHH QANRALGELIGAPAAQLVGRRDDEFVGRDGAGAGEDE RFSREAENLTGYKASEMIGKQTPVIFH YTPEVEERFD RWNKEAEK FGFTEVGAMGQSGD FHPEEGRSEAHWKGFD LWSPQAEELYGYSAEEALGQYAAPLLI HQEHWGLVIKKFA LLFNREAERITGLAREDVLGVPFVEALLP TMNQAAQQLTGFTLEEVIGRRYKEMVF RENDQFHSLLL TLNPAGAAILGLRADEAEGRSLAEVFM GEEGYAAF MFNPTAAALFLCSPQDALGSPLAERFLPDAARALAAWHOFS ICNQAFLEISGLSSDEVIGSRYADTMTYSLEDRAVQGNYL AWNSFMENHSGRNASQVARQSLF ELLFPEIDRPWFAHKVE QDNHAAAAFTGMTADEFLGKRI SDMDPEQLASQDEASLR SWNEAATRGFGYQPAEIGQSIYHVVPPEDHEEME ILL SWNTGAERMYGYREDEIIGKSISVIMPPECQDEL SMVL YWNAAAQRLYGYTAAEVVGRH SLL APDDRHDEIAMLL E TANQNF DDATGYQLDEVVGRHFWADLARGEYTSGVYKRLA LVNRSASQLLGREPSVLVGEMDDQVLPVFAEVFLAVHRRP YVNPFFASLTGFDRDSLLGRDWFETLLPPSYHSSVRRYFE
 DWNPQAENIFGWSREEALGLLLAETI DPEEFREAHVNELK SWNAGAQKLFGYTAAEAS GQPI TIVFPAERRNAEEGELAB SFSAAAERMFGYLEEEVLGENVAM LLMPSPDRERHDAYLE
 YANPVASEISGYQNDEVMGQNLEDDFIPPENREPIA YLNERAATLLDRDVGDLLGERI WDRFETLRGTEIEERFR FWNQGAERI FGYTPSEAVGQSLD II PPDFRRRHWDGYQ

 DANPVGLELGGMEPLVGHPWREVI GRC WSNAALEQFGGGPAAQRLGLRFADVQPGMNADAVEERMR LCNGEMEKMFGYSPGELKGSPDRELVPGMGARQHEPQHR
 YANSKAGAFVGVERAPSUGRHLLDDVSPDLYREKTMQAFA SWNRGASRMFGYAPDEIMGRNVTQLMP LKHMRERHD ESFGSASALLAAPPDTLVGRTLD EVFPAETSSRFLAVIR YVNAEAEKVLGHARAELLGGSVL DLFPAELTSRFESEYR DFNPAAEQTFGFKQHEVKGKLLAETIVP YVNDRWSQTTGSAAEARGSGWLQTLHPEDRDRVFQAWYQ TMNPAAEATTGYKRQELVGQPYATLFA LYNQAASTI SGHNVDHVVGSTDAEIFPSEEAKLLTQQDR YLNSQAEVLLHKNRSEMLGNHLW DLFPDAEASEFYRQYH LFNQHSQKVTGHAEAEVHGRDFLSTFLPAAADPAMEKLFLD SLNQAAERMFGWLPQEIIGQHFTSVLPQFTDDKRLMEES YMNSACAKLDHVSAPDVIRSSFTDLFLQNKKNRAFNKLFK
SWNPAAVRLIF GYTEA E ALGGRSILDMLEPP
HFSTAAERLFGYSEHEAIGQNV SLLMPEPDSSRHD
S WN E GA R Q
Y A N E R A A G Y
K

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$R Y / L R T G D R N V D W D Y$

EFQRTGQGNA
KALK GEETANYEFP
 E GVKTG
T GI R
RYLQTGQ
RALAGETL
KFAETG
EVMESGT
D WA GAFP $\square$ RTR RVEFRNMR LLDD
M $\square$ MA S GRVN $\square$ FEDEVLH
T GEPHTAVHTHYTAAGEPLYVETKAYPLERDDL
$E L Q V T G$
HFSRTGQGNA
$K M V Q V I G R T V E \square E G L H K A G H T F P V E L S L A K \square D D H G E V F$ RALEEG ITVVREEYFDYN
IFKRRGWVNDLEFQILRKDGTIVPVLLSATADKDAAGQYL LA IE S EDPLSHVDLVLECEGRLLPVLLSLKRVPTP
ELLSKNEPSQTFEMVLTVDGELIDVENHMALLPMDDG
RA ATEQVTVQFEEFLAPDDKWLGVRV YPAANGLSVYL A WAATAGRFEFENWRLRKDGSWAHVAVSALRDEDGQL QAMEAGERSVQGNTTLTRDGRDRVI AVRV
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TVLAEGAP
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TFT $\square R S Q L N N E F E W T Y D G T H \square P V S L S V S A L R D N D G$
AAMQAG
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VD A LIF E A VY S GVMQP
S $\square T T Q A V L G E M T G L T L S G R E \square P M E \square S V S F E H H S S G D T T T \square$
DDFNRGEDVHRYKHRLD LRGQPHWLNLH
QAVAQNAP MTFERVFTDKRDGRRV
TAVMDG
RVLETGQPDE
RKLRAGERDDHYE T T R MRSVSVTDSPVRDETG
TAIAKGQGVTYFDSVRINKAGERVDVSVAVTP $\operatorname{D}$ TDA R LRLGEKVEHFETTRTGGLLDVDVTVWPRRAPDG $K G G R Q M W L R A T Y N P \| L D L R G R P L K V$
RVMDDDRSLTFQEF
DEDAERQLD $\quad$ TEEGVST VNLSVRAAQDDDG
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A WVEQGQ
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RVMQTGE
QVLETGEPEERF
QTMATGD LL R VVPA LHKDGRTDS $\square$ AFTVS LLKGPDGGVQG■
K S
DGHE
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E GFMQ
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RFKSIGELGVEFEMV
N A 1 LAR
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DAHTRG
AA QANQRADQTVAWVF
$\square A M R R G D V L T \prod E R D \square R C A D G T P R R M R \square$
RAVREQVPDELVEF YPALNTWFEVHSYPSKEGDS $\square Y F$
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$F V N P R W M E L S G L S M A E A L G T G W V K A V H P S D R E L V F A E W Y E ~$ FVNPRWMELSGGSMAEALGTGWVKAIHPSDRELVFAEWYE HWNTALEELTGUKAEEVIGKGFYKDQRPYLADAVLEDESG LYNKAQEKMEDLQAQEIGGKPLWDAY NYNPQFRHVFD YLNQRMSDLLGYSQDQMLGRNIEDFLFP EDLEDHRQRME
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 FANATALRLLGSSAEEVPGAELWG HPVIRRTKMAASHR FANRSAQRLLDLDEDASHKLPLRAAV YTNPAFEE:TGYSRDEVLGKTLDSDEMPDDRPEHFDELW W SFNKAAEQLFGYSTDDVGGKNLRTLVAE
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TANHACYRIFGYTPPALVGQHWRTLLSSSEN DEQHFD YFS VAEQ FGWDRDDIVGKSMAETIVPTPMRDMHIGQGMR YVTPNIENISGYKPEEVIGKNFVEFVHPSDDRRGMEQFR NWNAGAERLKGYQGEEIIGKPFYPEEERSAGKPEAEQLE LLFNQAAMKYPELDKEDVLGRHV TDLVKHTRLPEVKGQYD RFNPYFERTSGWKLSDCLGQDWFDVCLPSRDRATIREVF RWNRASTALFGFSAAEALGQNLDLIIDPEHLRAAHWKGFE DWNKKAAETGFTSEDVGGKDLVKLVSEENRDAVGFADR SVNPAEERMNGVPAAEHVGRHV SEVLPYDDRS RERF




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A VVERGE NVTVESAF
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QVMQTKEP
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$Q$ VFEGGPPTDFSSQDHKHLIP
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SA $\square$ KTAQFPNEYECW $\square$ T K D GR
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A GVRQ
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T G
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A ALKNGQ
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AR $\square R R G E R \square D H Y E T \square R R R K D G S \square V E \square S L S V S P \square$
SAI LNGELWEE

RYLTTGE

EVLATGEP
KRIEVGERVDHFET $\square$
KGQWRGE I
RAVATRAP VGFDTRWPGKAGWYHVRL
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T
 $K$ VLS G DEPSEYRF
RAQREGRV
$R L Q V R G S H A E Q E Q V N L I R G G A Q E S L L V R M R R S E D G$
QELR!GD
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D A MRE
NS VIKGQRVSHF HTMH $\square R R D G Q S \square F V S \square S \square S P$
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LQR
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$\square R T S E R Q M N E I V E F L D A T F A I D R E G K V I$ StVELPFDHLHASQEQLKATVSALPDLLFEVDQDGRYV DVIDER

$\square \mathrm{AA} \nabla \mathrm{V} \mathrm{KGAL}$
ESALDAL
QADLAAREANLMDNGEASTVSGVI

पFGLEPEADANRDEER NAMLQSVYEGULAVDSQGVIT
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RRYSESILRSIDVGLVLDDNLIVQ $M R R A M E D S M V S G M R A M D M N G N I I$
$R R F R Q L L E H S S L V A V V L D Q R G C I$
$E$ NQQEAVLAALLNTAV
MEETA EKERपANRDQND DDLDGGVIVIDDQGRVR
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$\square A A E T S A V L R M R D S L A A L E G L P \| G L A M L G P D L R Y V$


Ena Lreserraral|rda
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 SWN QAA ERMF GYSAE EA IG QS I LMMLIPD HLK GEEVVEIISSR HWNSACEKLTGGVAANSILGRAFYTSERPMMADLIVAG FFNPAAEELWGYSADEVVGNNVRMLV
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 F L N D A TA S VA GY D P E D L L G E HVVS T V L A A D D L E I A R E R T R HWNRACAVLTGVVAEDMIGRSEQWRAFYDSARPILADFVV
 $R V N E A L A E I N G D S V A D H I G R H$ A WDVVPSLR ETAEPLLDR LFNTGAERLLGYRREEVVGTHLAEEVA ARGAMLAAAFR

A

## Y Y

 Y A A AFLA SGYRQDEVIGQTLRSGLTPRATY IALWDADK A WN R A M E E M F DV S K E A M L GR G D H E Y A V P GE R R P L L A D R R L DFHTSQDDLLFVSPKDFLG HTYDEVMPPA』SAII RKALQ

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$H V N K T G L D K L G Y S L E E M L Q M R L W W D V P K G R E A E V L A Y L E$ RANETALSFAGVDVDDVRGHPFP ETPWWNHDDEQRAKCR YCNEQAATVFDASREEL LGRVLWR VVPDEDGTTFRKRCE Y VNP WVEHVTGGPRERLI GRPFTAVI DPDDRQSVA GSHAR $R M N L V A E Q L T G W P A S F A V G R P V E D V F R I I N E E T H E$
A WN RWS EN I WGGRNDDVT GEPFLDDLDDGLPVQMLRRPLQ YVNRAFCNMVGMPAEELDGHHAPMPYWPPEADEACRADVYK Y A N Q T L L Q K TG WK R S E I I E R NWF E Q
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 Y Q S P S A E RVF G L P D D EVLGEP A F D FVV H P D D RERVM DE F F EANPAACDMLGGPDE GELWREVITRC




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SFSAAAERLFGYE ESDLL GRNV SLLLAPSPHREAHD GY LA QANLTAARLLDHPKEKLI NRKLAQYIDPADQDPYY $L$ SWN QQAEAVF GWTEADAI GRRMADLI DP TWNRGA ERTFGYSEEDVLGGRSAEEL F L P P E DRNGVLRQE E L R R VCNEPAARMLGDEAPE $\qquad$ GRAFA EL D L P A D VL V AL R GEAAR FCNKSCLRLLGYSPEELLGSDFADFLTPEKNGGE S WNKA A ENI F GFKEEEMVG $\square$ S LLLN VMPEKYRKAHEKRYN S WN P A A E Q FG WTA DEMI GNS IR VLDPP DRQHE E D D L L Y L N A ATRELLGGDPDELVGTDAFDLI HP DDVDRDRTAFE GWTAAAEQLLGLSADQVTGRPARELLADRAADAHALGRRA Y V S A A V E K V L GLLT P A E V I GR N L N D L V H P
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SAD GVVFCELTGYDREA I IGREFADLAAAES D D

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A G
QTMATG
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QI $\llcorner Q Q G K$ VEFE
$R L \operatorname{MR}$
K
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DA L RTGRTTVT
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R G
$R Y$ LA T GE
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LARRDGRADDE
DAVA I G D
TGVLRRADGTCFD
QTRISRA $\square G R T L E L G L H K N G S T F P D E L S D S T V E D G G R T Y F$ QRIRTGEMVPKFETRLHKSGRHVAVTVSPLRDPDG
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D A T I R RLLS T GldD Q N P Y P ODYALITDTDGNIQ MRDAYMLDADGRV

m $\square G V G W E S D E S R S A R D T S R A$ LRHMRDGFLAVDDEWRIT A पSERKTAARLAERFNRALNTMSHGLVMLGPDGKVV A QLYDSSPVGHLTLNDAGIIQ MNRTEFTLSDV HWLMDL LQTIEVGLVVLDGDNRVR LDLLGVAAAVLDDEGR!T ATERQVDQLSAEVFERVSDAFYALDSDWRFT | DYA | YMLAPDGRVT |
| :--- | :--- | :--- |
| REGAI | WAMDREFRTT | ILRKSEERYRRIVETAREGUVAMDREFRTTH rLESELEQTLNRVTDAFNAIDTDWNFT FDVAPLPYQSLDEKGNDI

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$S W N R W S E N T W G M R A D E V I G Q P F L S L E I$
$G L D V G H L E N G L Q$ SWNRWSENTWGMRADEVI GQPFLSLEI GLPVVHLLENGLQ
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 $Y$
$F$
$F$
V N S E A E Q L F G R P R A GLL DVNEAACRTLGYSREELLNRGVF DVDPDSPPEVWAQHFP FFNPAACDIFQVSQAMAVGRSV SEVDPNTRDPAV SWNSGAERIKGYKRQDVLGSHFSRFYTPADEVAAREGRFE DFNKGAKALFGHEPREVTGEDFSLLFTPDSRPAMQAALQ SWNFGAERIIKGYRPQELI GQHFSTFYTPALGDARAEGRVE SWNPGAERIKGYRADEILGQHFSRFYPPGLDVATREGRFE EVNKA LT DLAGRPRESLLGVS HWEAFPASRTNKAWSEYH
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 YVNRVDAEAT GKTPDQLVGRRLFDEF
 DYNPMAESMLHCSRDDIIGQNFTRHFDDPADHAAFTGMLR RVNRMYEQLTGLTQEQURGKNVRDLVFDCULDPED SWNVGAKRISGYEANEI IGQQLIDSELAAATDNPGYGRFE Y WNKAAETLYGWTAAEALGKDI H
SWNLGAS RVVGYTAQEMVGTSILRLIPAEDHSDEIIGK RFNRLSEEYTGLKEQEVI GRNVFQLFMAAASRRNIAGFFR EANLLTGCDLLGVTRERLLGRRFPLFV DTEFRGHFA S WNAAAQRMFGYTAEEAVGRSVLMLI EANQTALDDFSGLTPSETVGKPFWWQUWWTKSTQ贝ENPLK EANQRYADMLGYSPEEILQLHVWDWDTQWTR EELLDIIR GWNKGAERLFGYTAAEAVGRHILFLYA YGNQSAERLLGDDWEGPL GKSI
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