$M \square 1 D P \square E \square Y R Y P E K W \square K D R D A E K K V R S G L Y T L T E D G Y L R R$ K T GLYVIGN QKKL H F MYVDSDGKKLRC

GEFIVKNGKRLKC KDPSKMRH K DPSEMRH MYVENEGKKLRC F VVK E GRK K K C $D \square Y \vee Q S G G K K L R C$ PAGPLRH PKKELAK $Y$ VYDDGKKYRR $K N G L Y \vee 1 R N Q K K L R F$ KDPKDMRH MYVDVDGKR LiRC KNGNKLRC


K K L R R

UniRef90_R7DCW3 UniRef90-W1U4N1 UniRef90_K6TXK8 UniRef90_E3GJD8 UniRef90-UPI0002DD02C0 UniRef90 K1KKY1 UniRef90_U5MTU1 UniRef90-SOFRY1 UniRef90-N9WKD8 UniRef90-E6MIT UniRef90_UPIO003FD1319 UniRef90-R7FVP5 UniRef90-UPI00047CDD99 UniRef90-R6L551 UniRef90-B1HRF2 UniRef90-A6LVU2 UniRef90 ${ }^{-}$W0EPU8 UniRef90_UPI00047B9EC6 UniRef90-U2BHN9 UniRef90-S6EQH3 UniRef90-B2UXF7 UniRef90_UPIO00465DCEE UniRef90-R6SJU7 UniRef90-R6QCV9 UniRef90-R5J1J5
UniRef90-T0BDX9 UniRef90-A6V313 UniRef90_Q3JSE4 UniRef90_U4WXF4 UniRef90-D5BRA4 UniRef90_Q0TR61 UniRef90-B0NJA5
UniRef90 ${ }^{\text {Q48DG3 }}$ UniRef90_Q48DG3
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UniRef90 LoM4F4 UniRef90-LOM4F4 UniRef90_-M4WUV8 UniRef90-A9KP87 UniRef90_C6L9S4 UniRef90_A6TJE5 UniRef90-S2YQX9 UniRef90-FOSZ44 UniRef90-U2PPM1
UniRef90-F7JNP5 UniRef90_N2J740 UniRef90_UPI00047D2EFF UniRef90_R4YN27 UniRef90-R4K0V9 UniRef90-F7KC06 UniRef90-FOYXC1 UniRef90_Q5KZ00 UniRef90_UPI00047C9F06 UniRef90-B9DZM2 UniRef90_UPIO002F9A202 UniRef90-D9SOS8 UniRef90_R71M82 UniRef90_D4KEP2 UniRef90-R7A2H4 UniRef90-I3VYP5 UniRef90-J7U2D8 UniRef90_UP100040DCE08 UniRef90-W0FGE4 UniRef90-R5GYI2 UniRef90_G8LZA5 UniRef90_R9KEE3
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UniRef90-R9L9H1 UniRef90-R7CP83 UniRef90-C4ZB06 UniRef90-F4LUT3
UniRef90 R5EKC8 UniRef90-R6MJL1 UniRef90-R6BSA3 UniRef90-UPIO001E2CC0A UniRef90_H6LI76 UniRef90_C6PWW0 UniRef90-A0A037Z6H3 UniRef90-X5DDV3 UniRef90_UPI00036B1EB7 UniRef90_S0J988

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| UniRef90 $\mathrm{R} 5 E K \mathrm{C}$ | UniRef90-R6MJL1 UniRef90-R6BSA3 UniRef90-UPIO001E2CCOA UniRef90_H6L176 UniRef90-C6PWW0 UniRef90-A0A037Z6H3 UniRef90-X5DDV3 UniRef90-UP100036B1EB7 UniRef90-SoJ988

UniRef90_F4XEX9

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0kFSGDHEFD ${ }^{100}$
110
120
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E E E CVVTAETTIKADAGD
KENEVMCETVDAGD
E E GWVVCAVTKKDAGD
NEDFVRVSVIKDGGD
TAEAVTCSVIKDAGD
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E E ERVSCAI RKDSGD
ERDSVTVSVIKDAGD
DNNFVQCTILKFSGD
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A EESVSCAVRKDSGD
TENYALCAI EKYSGD
EEEQAVCAVRKDSGD
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E
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EGQQAVAAI RKDGGD
DNDWAMCSVRKDGGD
EFCRAEAGTLKDAGD
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ED DQVSCAIDK A G D


EQHGVRCAVRKDSGD
EHCEADASIDKDAGD
EKEGVCCSVTKDGGD
K A Y QS SASTIK DAGD
TENYVECCIIKDGGD
EEGRVSCAIVRKDSGD
EGATATAAVVKDSG
EGETYVECCVIKDGGD
E E CRVLA GTV K DAGD
K N MGE A

E EGKVSCAVQKDGGD
TSTGARAEVDKDAGD
$S E T K V S C A V E K D G G D$
$G D G W V R C G I M K D G G D$
EGQSATAAI RKDGGD EKDSVSCAVIKDGGD E EDAARCAVVKNSGD
E E GWVSCGVRKDAGD
NEASASCCI IKDAGD

 EASQAVAAIRKDGGD KENQVSCAVEKDGGD NDDYVECSII KDGGD $\begin{array}{lllll}T E C A V T C A V I K D G G D \\ E G N K A R A V V I & K D A G E\end{array}$ SGGKAVYGVRKDAGD EGNQVTCAI QKDAGD TENEVSCAV 1 KDGGD A EDWSSCGIVKDGGD
EDDCVRCAIRKDSGD

$D E Q Q A S C A I V K D G G D$
$N D K A A S C C V I K D A G D$
HEKSASCSVIKDSGD
EEDYDECCVIKDGGD

FPEWAACTVIKNGGD
ENNKSIVTVIVKFAGE
EREFVSCAMAKDAGD
TEGWAQCAV $\ \frac{1}{\square} K D G G D$

## D D D D D $D$ $D$ $D$ $D$

 DPDTTNG VYARVGKGVGRVTGR

 DPDATHKARI QSTVRFGVGRVTKA

 DPDATHGATIVATVSWGVGRVTKP $\begin{array}{ll}D P D \ T N G V L V Y S Q V R D G V G R V T R P \\ D D D T H T M H I Y A R A G D G I & G V V T R K\end{array}$ DPDTTNGILVYAKVEKGVGRVTKP $D P D A T H Q A L I V G T V S W G V G R V T K P$
$D P D N T H G I E I K A M V G T G V G V T R E ~$


 D DDATHTMDIGSKAGKGI GRVTKK
 DPDVTNGDA, YSRVGEGVGQVTKP $\begin{array}{ll}D P D A T H G A R I V A T V G V G V & G R V T K P \\ D P D V T H G A L V F A R V R P G V G T V T R P B\end{array}$ DPDVTHGALVFARVRPGVGTVTRA


 DPDVTS GAKI FASVCLTVERVTKP DPDVTHGALLYSRVRLRPGTVTRP
 $D P D V T T G L D V F A K V G E G V G V V T K P$ DPDVTHGALVFVRVGEGVGTVTKP
 DPDVTNKLAI YSKLGEGVGTVTRP DPDI TNGIGVYASVRRGVGRVTKK
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 DPDATHGALIVSTVGEGVGRVTKP
 DPDVTNGIEIWARAEKGI GIVKGE DPDATHGARI QSTVTWGVGRVTKP


 D $\square$ DATHGMLI FARVGEGVGRVTKA $D P D V T T G A Y Y$ Y AKVGHGVGRVTKP
 $D P D V T N G I R I Y A R V E K G V G R V T S A$

 DVDATHGMLI FARVGEGI GIVTRQ $D P D A T T G T W I$ YAKVGTGVGRVTRP $D \square D V T S G L D I$ WA RAGQGVGKVT DD $D \prod D I T N G \prod E I V A R V G G K G V G \| V T K$ $D V D V T N R L L I C A E V G E G V G R V T R P$ $D P D T T N G L V Y A T V G[V G V G R V T K A$ $D P D V T T G A Y I Y A S V R D G V G R V T K P$
 DPDITNG\|LVCATVRKGVGRVTRN
 DPDVTNGIKI FAKISPGVGTVTSV DPDVTDGMEI WARAEKGVGTVCSE





UniRef90_R7DCW3 UniRef90-W1U4N1 UniRef90-K6TXK8 UniRef90_E3GJD8 UniRef90_H2JDF6
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K LKTAMQ 210
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SLI AMQYHRIAITT GRKAWLYARKKFPEYQPFVFGVH1D
 SVKLEITQKRLVLTFGNLGDNYCKEGFKEEEIVICSNYIG SMRKAKEVDAVI FVPGNYGKDFVESHLNTEVLVKTSNFI G


 Till R A E N QE T L L I S P G N Y G R D FAALLK R F G L DD L E I K C S N F I


 S L S

 S I K DE DT Q K R L V L T F G N L G D N Y C K E L LF K E E EVVV T C S N F I G T I RLE MNCRDLLVCPGNYGETEVRSTLGESSLIHCSNYI G $T V R T E \square R V K K L L V A P G N Y G L T F L K Q E Y G E N D A V L C S N F V N$ | T | I | E | V | E | M | $K$ | $Q$ | $R$ | $K$ | $I$ | $L$ | $T$ | $P$ | $G$ | $N$ | $Y$ | $G$ | $M$ | $D$ | $F$ | $L$ | $K$ | $E$ | $H$ | $L$ | $E$ | $Q$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |




 SIA YAMNVTTVVVLTTGGGREKYADRMFPEEAFVEMGDFVGG SI A R A NGVRHI A ACTGNASEDAMRRRYPEDALI EMGDFA G SI A R A NGVTHI A ACTGNASENAVRARYPD』ALI EMGDFAG SVA Q A DQVA K I A DT T G G R S E K T A M E Q Y P D ES F FI Q M G D F V G SIARANALPHVI GSTGATSEGFAKERYPDDALLDMGDFVGG


 SIAKTNGYLHI AACTGNASEDTMRRNLPEDALIEMGDFVG S I HVVEMK Q H Y L V T P G N Y G A D Y LiR E H I P F E N N I K C S N Y V G S I K R A A GQT RVV LVVPGNHGEREVREQLDDDSEVVMSNFVGG $K V L A A S G C K Q A V L V P G K Y G E K F A K L G L D P H M V V I S S N F I G$ SI ARANGFRHLAACTGNASEDAMRRRYGDTALI EMGDFAG


 TIRVE I Q M Q WLL A A P G N Y G LD F L K E T Y G D D R A V K C S N F V G TII Y L E M K V H R L L V C P G N Y G Q N F I R A S L G I N P A I K C S N Y L G T I E

 S HQTNGYRHIAASTGSSSEAVIRDHYPEDALIEMGDFVGG

 SI AKANGCRHVVI TTGGGRSEKYAMQHDPEEAFI EMGDFVG
 SI AKV NGCHHVVI TT G GRSEKFAMKQYPEDAFI EMGBFVGG SVK K LIIS YKDLI L LF GNMGE DKARE LGMDDKSV DMSNYVG

 T I RVVELNYDYV AVSPGNYGLDFMKQSYGLDKSVKCSNFIG SVAKANGFDDI I FVVPGK $\quad$ GGEN $\square$ ASKLLLPAKAMVQTSNFI G



 T I


 S I K L E I N Q K R L I L T F G N M G E R L C K E L Y K E S E IV I I S N N V G
 TI RAE LD MLRRIL LTP GNYGERFASKELPDDRAALCSNFIG


 $T$ I HVE LR QRRVLL AP GNYGVDY IVKGAMGIDPAVMTSNFI G T I $\quad$ F $L$ L
 SLKLLELS YKE I I FVVPGNYGKNFSEELLSEAVLVKTSNFIGG SIIEI EIVNYKDLILLEGNMGENMAKEQLDPNKMVIFSNYLG
 SVA YNS GCEEVVVLTS GK RSENRRLRSEFPDTAFI HF GNGVGG SVALLANGYKNLI FTPGNDGTKYAK DHLNDDQDVEVSNFWG


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UniRef90_R9L9H1 UniRef90-R7CP83 UniRef90-C4ZB06 UniRef90-F4LUT3 UniRef90-R5EKC8 UniRef90-R6BSA3 UniRef90-UPIO001E2CC0A UniRef90-H6LI76 UniRef90_C6PWW0 UniRef90-A0A037Z6H3 UniRef90-X5DDV3 UniRef90-UPI00036B1EB7 UniRef90_S0J988

EADKHPGEK 250 V 260
270
280

ETIDMAVNILFISHGKFVKVAAGDMNTHSHSA


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ETIDYAVNILLI GHGKLCKIAGGIMNTHS RTADCRCE
FSMKQCKKVSLVGMGKFSKVAQGVMMVHSKSAPVDFHFLAA FTLKH $\square$ ARVSLVGMGKFSKVAQGVMMVHSKSAPI SFLLFLA


 FAAKQAKEI RFVGMGKFSKVAAGMMMVAKRAAVDFALLA QTIDMAVEVLLVGHGKLIKVSGGIMNTHS RWADCRM
 F T L K H C K R V S L V G M G K F S K V A A Q GlV M M V H S K S A P I D F N F M A FALE TCVSI IIV GHGKMSKI A Y GCFNTHSK
EMLDFTVVELLI GHGKLVKLAAGIMNTHS
 EALDKAVEVLLVGHGKLVKLGTGVMNTHS






 $F$ SAK Q GFTH H MV G M GK L S KVVA Q G A MMMVHSKM S S V D F E F L A
 F SI E CAKD LTIVGHGKLSKIAFGCFNTHS
 AVLVK H P V D K L
 E T I D M A llo I L


 F M M D Q SVRILI GHGKLVKVA GGIVHTHSK


 AVLKHTKRSLCGGFGKI SKM A A GHMDLHSRSSSID
F MLD E GKK LL LIG H GK IVVKVA G G IF HTHSK

 E T I D D A V S L L L I G H G K L I K L A A A G V M N T H S
 F T L K Q C K R V S MVV G M G K FS K V A Q G V M M V H S K S A P V D F G F L A



HMLEFAADVLLFGHGKLVKVAGGIVYTHSK A TVVDMAVEMLLTGHGKLIVLLAGGIMNTHS
F MLLEKAVVEVI LA GH G K L I KVVAA GII F N TH S H
Y MLQEAEQVVI LGHGKLVKIAAAGIFHTHSH DALEE GFEKLLVGHGKLVKVAGGIKNTHS
 EAFD F A V K V I L V G H G K L V K Li A G Gli M N TH S EALDYAKKILLVGHGKLVKLAAGVMNTHSK E T I D M A V K ML L A G H G K L V K V A G Gll M N T H S $\square$ A D A R L E
$K \quad R$

VA D A R A E
$M Y G D H R M E$
$R E G D G R A E$
$R$ VA D CRCE
RAA DCRNE
D TVVMAAKILVCGHGKLVKVSGGIVNTHS S
Y AL E S CVSIV MVGHGKMTKI A Y GCFNTHSK Y G DHRME $V N G V R L E$ VA D ARLE
EA D CRME Y MLQEASRVLLVGHGKLIVIAAGVFHTHSH E T I D M A V E L L L T G H G K L I K V A G Gll M N T H S Y AL DCCKEVILVGHGGKI SKI A YGCFFNTHS $R$ V S D V R L L E Q TI D MAVEMLLTTGHGKLIKVAGGDMNTHS F M L D K A K E I L V F G H G K I I K L A A G G I Y N T H S K

REGDCRME
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 ETIDMAKRMLLTGHGKLIKVAGGIMNTHS F A L E K VVVEVL L I G $\square$ G K L I K V A A GUV D T
D ALLEMCREVLLI GHGKLVKLA G GMWNTHS DAI DYASDILII SHGKLVKLGSGIMNTHSKYA ETLDMAVEVLEVAHGKFVKVSGGIMNTHSRHS E A L D HAEKLLLVGHGK LVVIIAAGVMNTHSK
F MLD D E A E KI LI I GHGKMV KLA G GII F N THS S
D A RME
 $R Y G C R M M$
$R G R M E$ IA D C R N E
A
$A$
 F A L D C C K E I I L V G H GK L C K I A A G C F N T H S $\quad$ R I C D V R D S V K L A VQQLAL MLGK AVKLA E GNDDTHSKNVQFNPA F LA A


| QUER |  | VI |
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| UniRef9 | W1U4N1 |  |
| UniRef90- | K6TXK8 |  |
| UniRef90 | E3GJD8 |  |
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TGLYIRNNKKMRF



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LYTFKDDKKLRC

VIKK GKKLRK
MR Y
MA $\square D Y Y \square H S E G K R M R Y$ R


K T GLY Silk NNQKMRLL
E E K E K Lill R
YVSKGSKKLRC
EIWYEQKKLKT

Y $\square \mathrm{Y}$ K Q Q K K $\underset{P}{\mathrm{~L}} \mathrm{~L}_{\mathrm{R}}^{\mathrm{R}} \mathrm{R} \mathrm{Y}$
Y VY F Q GKR $\underset{M}{\mathrm{~L} R \mathrm{R}} \mathrm{Y}$
MRY
DKELRS
YQFSQGKVLRC
Y $\square Y K$ K QKKLR W
PEKPAGPKFEHYVRSGQKLLRC
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YVYKNQKKMRC $D M Y V D C D G K K L R C$
$M A \square E R Y V I S G A K K \square R C$
MARDKDRHTWRE
VWHKGKSYRK

$G R \underset{M}{L} R_{Y}$

YVYKNQKKMR
K L E H Y I DVGDRK L R C

L R M
EQP RN
NSMLR

|  | $H N S K L L R Y$ |
| :--- | :--- |
| $Y$ | $V$ |
| $Y$ | $H$ | MNDHY IEKSGKK LDRY

QK LRR
KPAKELRR
MK LDE E Y VYRGAKKLRC
K PLKT
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EQASFPEFKPAAEQVKQAVEPG $\square P A E T P A P P D R R$ MYVNCDGKKLRC EKTPEEKRPLFEHYVVSGQKLLRC
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$P G P D \square R E P D L P R T M K \quad V R Q K A L R T$


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IOXAM UniRef90-10XAM8
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 $D P D A T H G A R V W V E V G A G V G T V T R P$ DPDVTTGVHVCASVGTGVGRVTRP




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 D P D A T H GA T V F V EAA E G V G T V T K T


 D P D AT H L A W I EA S V G R G V G R V T K P

 D P DV TH GAHLTARVGEGVGVVTK P




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 SI ARANHLDAHIAATTGNASENAARHELTDMALLIEMGDFVG Ti RLDDRQQTLVLTPGNYGETFVRERLGDDRAVKCSNYIG SIARANRLGHIAACTGATSEQTMRYQLPDMALIEMGDFAG SLAVELKMKEAIFLFGNRGKKYGSDHFKDNQAVVISNFVG THVELKQKRAAISPGNYGREYMKRAYGDDRSVKCSNFIG TIQVELRQKKПAVTPGNYGLDFMKEAYDLDKSVKCSNFIG SMFAELKVEWVVFAFGNHGKQFCDDNNDDEQMVVTSNYIG TMQKARGNKNLLVFFGNYGEDFTRDKLDLDGHVTCSNFVG T RLELRQNRLVVTPGNYGEAFLRDHLGLEQAVKCSNFIG TIRVELRQQRVVISPGNYGLDFLKNHYDLDKSVKCSNFI G TI QLEMNQRRLILAPGNYGLDYLHERYPEDPVVKDSNFIG SIAVAYGHKAIVLTPGNYGFRAATAELPEEALIQMANFVG TI RTEMKMHTLLITPGNYGQDF乌HETLKDERSIKCSNFIG SI ETELNYKDII LLFGNMGEDMAVKLLDKNKMVIMSNYLG T AKALRVKEVVFATGGRSEAFCQKLFPEEAFVQVGDFI G T RAEMNVRRLLVTPGNYGETFAAQTLHDSPAVLCSNYVG SIAVAYGHQAIVLTPGHYGFRVATENIPTEAVIQMSNFVG SLALEDEQKRIILVPGNHGERFVREQMQLDSVVTMSNFVG TVARAQGAARVLLTPGNYGVDFLREQGLDAAVVKCSNFIG SIARANDCPRVACCTGGTSEAAVRERYGDLALIEMGDLFG

 TIRVELRQQRAAVSPGNYGLDFMQQTYGLDRSVKCSNFIG TVRTE KMHVLLIAPGNYGQDFLLNTLGIERSIKCSNYIG
 SLRKECSVARLVMNSGAKSEAYIKALYPQLAFVHYGNFIG TI YLEMKYERCYIVPGNYGMDFLTEQLELDAEVKCSNYVG SiALEDKQKRPVLVFGNMGEERAKALFNKNDMI IVSNYIG S $\downarrow A R A N N F T H L A A S T G V A S E H A D K A Q M N E S L I E M G D F V G$ TTRVELNMCRLLLTVGNYGDDFASCKLGLSLAAl KCSNFIG SLSVELMKRILVPGNHGEEFDQNELGLDIVVRMSNFVG T RVETKVRKLMVAPGNYGLSFLSEVYKIDAVVLCSNFVY TIKVELNQKKAAVSPGNYGLLDYMKKTYGLDRSVKCSNFIG SVALAAGWETLVLTPGRDGQRQAEEKYPATADILTSNFIG SIHRAAGHSHVAGCTGATSEKTVQALYPETAMLDMGDFVG TI RAEANDRRAALTDGNYSEDYVQKQLPDEHSVTCSNFIG SIARANAFTHLAATTGNASEEALKAHYQETALIEMGDFVG SI RQAMGNDTVVLTTGGRSEDFAKKILPEHCFVQMGDFSG SLRLEMKMSYLVITPGNYGQAFSKEQLDLTYSMKCSNYVG SI SLEDEMKKVI LCPGNYGETFALKKLNETRIVSMSNFVG SVALASGFKHLIFVPGNUGLRMAKKLLNEDQIVIVSNFWG SIIKLEMNQKNFTFLFGNMGEDKAKEMGDDKGFVDMSNYVG THLEMGQRRLILAPGNYGLDYLHEKLPALPVVKTSNFIG T R R R RQRNLLVTPGNYGESFVGNGLGLGQAVKCSNFUG $S V V Q A T D V D T F V L S T G G L T E R A A M R L L P H L E E V C F G D F T G$

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ET\|DMAVS\|LIFVSHGKF\|K|VAAG\|MNTHS DF

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GVLKHPVPKLTLGFAKFTKLAEGHMDDHSGRSSVNFNWLA EALDMAVSILFSHGKFVKVAAGDMNTHSGBCADARAE DAI DDGVRLLLVGHGKLVKIAAGVMNTHS RQADARME DALDEGFEKLIFGHGKLVKVAGGIKNTHSK YGDHRME AALRMAVEVVFVGMGKLTKLAAGVLMTHYTRSQVDTSLL] ELLDYAVYKLLIGHGKLVKLGQGVMNTHSKYA KTLEFAAELFVAHGKFVKVSGG|MNTHSH FALECCVKVLLVGHGKISKIAYGCFNTHS DTiDMAVKLLLTGGGGKLIKVSGGDMNTHSK YMLQEAVRVMLAGHGKLVKIAAGIFHTHSH AGADGRME AVLKHSVKKLSGMFGKFSKLAQGVLMVHSKSAPVDFGFLA FALKNDKKVLVIGHGKMSKIASGCFNTHS SKVSDVRLE DTLMMAFEKLLVGHGKLVKVAGGITNTHSK YGDNRME RILEHKGEKIVVGFPGLLSUVWAGGYERUVSKARRYSAKVE
 mid ETLDMAKEVLSGHGKLVKVAGGUMNTHSK FAI DEAGHVLLVGHGKLVKLAGGIFNTHS FALDEAGHVLLVGHGKLVKLAGGLFNTHS R RTADCRME FALNSCKKVTIVGHGKMCKI AVGCFNTHS EALDGAARVLLVGHGKLVKLAGGMNTHS ETIDMAKGILFISHGKFVKVAAGMMNTHSRSA FMI ESAVKVILLGHGKAIKLAGGAFHTHS TLLEECAKRLLEGHGKLVKVAAGAFHT DVI DDAVNLLFVGHGKLIKVAAGVMNTHS AVLKHARKVICGGFGKIIKLAQHHMDDNSRVSS ASI DMAVEVLLVGHGKLVKVAAGIMNTHSS AVLKHLRRSLAGGFGKISKLAAGHLDLHSRNSSVADGRE YMFDRAKKIYFIGGGKFVKVAGGDFHTHS KTMDMAVEVLLTGHGKLVKLSGGAMDTHS FMI DSAVKMVLIGHGKAIKVAGGIIFNTHS ELLD YAVTVLLIGHGKLVKVAGGVMNTHSKYA NTIDMAVEILLVGHGKLIKLAAGIMNTHSSAA DTI DMAVEELLAGHGKLIKVAGG\|MNTHS DTLDMAAEVLLVGHGKLVKVAGGIMNTHSHTA FLLEEAAKVLLFGHGKLIKVAGGIFHTHTH KALNMCKKVLVVGHGKLCKVASGCFNTHS KALNMCKK VGVGHGKLCKVASGCFNTHSKHN EAVDCAVRLLLVGHGKLVKLAGGIFDTHS FLLEEAAEVVLLGHGKLIKVSGGIFHTHN YMLQEAERVVLIGHGKLIKVAAGIFHTHSH
H
$\square$ EADCRAE RYGDGRM RVADVRLE
I ADCRME R A DARME RVCGDRLE RTADARAE


| RTADGRRE RQADCRME |
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|  |  |DALEMHFASVSLGDGKAVKLAEGNLDTHSKKVVMNKDFDEATEDAKGILLIGHGKWVKLAAGVMNTHS RQADCRMEYALKElKS ALVGHGKMCKIASGCFQTHS RVCDVRMEAMLKYLRRSISAGFGKLTKLANGHLDLNSRQSSIDFQQLAQTLSDADRVLLIGHGKLVKLGAGDMNTHSAQG

YMLVEAKKILLAGHGKFIKKSAGAI FHTHSK
DAVDEGFSRLLFGHGKLVKVAGGLKNTHS
DTI DMA KMLLTGHGKLVKVAGGIMNTHS
YLLEACVERLLWGHGKLVKVAGGGFYTHSH REGACRME
GLLKHPVPRITLGDGKMTKLAQGARDLHSGRSQVDFDQLA

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YVLKEDQKVLMVGHGKLIKVSAGUFSTHSK RDADARAE

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S TIDDMAVE ILLI GHGKLIKLAAGIMNTHSSS WADGRME
Q AVRRAAKRGLVGMGKLAKLASGVMMTHWTRSRVDTSLLA
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| UniRef90_UPI0003805E8E | $V \mathrm{~L}$ |
| :---: | :---: |
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| UniRef90-G0VQT5 |  |
| UniRef90-R5TXP0 | V |
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| UniRef90-S6IF01 |  |
| UniRef90-U2PF95 | L |
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| UniRef90-W6RSS3 |  |
| UniRef90-10XAM8 |  |
| UniRef90-W1J895 |  |
| UniRef90-UPI0002F200AB |  |
| UniRef90-K8QYX4 | V |
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| UniRef90-N0BJD3 |  |
| UniRef90-R6V7L8 | L |
| UniRef90-H1PTG2 |  |
| UniRef90-UPI000465C986 |  |
| UniRef90_UPI0003B750C9 | 1 L |
| UniRef90_UPI00047D5675 |  |
| UniRef90_UPI0003B767CB | T |
| UniRef90-UPI00047BBEC5 | T |
| UniRef90-R5HAS7 |  |
| UniRef90_UPI0003B6E963 |  |
| UniRef90-R6RBY8 |  |
| UniRef90-I3DJY9 |  |
| UniRef90-F6B824 |  |
| UniRef90-R5DYJ9 |  |
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| UniRef90-W6LWE4 |  |
| UniRef90-D0GL60 |  |
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| UniRef90_R6WG56 |  |
| UniRef90-C5EU35 |  |
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| UniRef90-Q1AYB7 | EI |
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QKRMRS Y V Y K N Q Q K M R C S A P EPVEK P AFEHYY LVVGKKNMRC
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MARDK D R H T WR E
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MKNEKYRLVNGKKLRC
VIKGQQELRC
K K L K
Q Q P L R T
MDREYYADKDGKKLRC

R Y
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EHRDSPDKVENK
EK P K G Q R T
CPAGPLRR
QQELRS


MAFERYIWSGNRR $L_{L}^{R} \underset{R}{R} \frac{L}{T}$
EKKMRR

MALDYY $\operatorname{lRSGQKQLRC}$
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$Y V Y \square D G K K Y R R$
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GYTTGTCAAAAAQAACTYHFTGPENVID GY GYTTGSCAAAGVKVALEALGKKSEEVE G

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 GYTTGTCAALGAAGAARLTGREPETVAA

 GWTTGTCSSVAAKACALLLGGAAPDEV
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 GVTTGTपATACS $\square A A \square E S \square L$ GEFPDPVTITP
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$G F T T G A C A Q A G V K A C L L S M L D$

 GFTTGACAAVAAKAAAVMLQ

## UniRef90 R7R612 UniRef90-W6EQR0 UniRef90-UPI00039E117C UniRef90-COGDX3 UniRef90_A0A015KUP7 UniRef90-TOCBE2

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UniRef90_UPI000374F7FD

90
E T G D S VCAlIRKQSGD E K E L A I VTV DK D G G D QNNFASCAI KKFAGD AEGWACAAVKKDAGD TADMAQCATIKDAGD K ENYAQCSVKKDGGD EGYQAACAVRKDAGD H DVKVECSVIKDGGD Q C CK T $\square C A V K K Y S G D$ DTESASCGVQKDSGD E S DYVQCAVEKYS G D ECCTAEAETIKDAGD

 ESVWGNAGI I K DAGD QEHTARADVLKDGGD H QVEARAVVIKDGGD ENVDAQCSI QKDGGD EDNSVSCCVTK DAGD $\bar{V} D \square Q V T C A B V I K D G G B D$ EEDWAFCCMVKDAGD E D $\square \mathrm{SV} \mathrm{V}$ CGVRKDAGD
 TETAVVSCAV 1 K D G G D EDEFAQCSVKKDSGD E K D CVK C S V F K F A G D E E N A A IA A I I K D A G D A Y E S A A A GI I K D A G D $A D V T V S C A V I K D G G D$ $N T V R \vee R A S V I K D G G D$ VD G GVMCETIKDAGD

 | $C$ | $E$ | $D$ | $V$ | $K$ | $C$ | $C$ | $I$ | $V$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $E$ | $D$ | $A$ | $G$ | $D$ |  |  |  |  |  |
| $E$ | $N$ | $V$ | $E$ | $C$ | $C$ | 1 | 1 | $K$ | $D$ | $\square \mathrm{Y} \subset \mathrm{R}_{\mathrm{A} V} \mathrm{C}$ A I RK D G G D A D GWARAGIVKDAGD HPHEGCSSVI KDAGDD E ECEAVASI I K DAGD $\begin{array}{llllllllllll}S E & C & V & S & C & G V & V & K & D & G & G & D \\ L & S & C & A & R & A V V & V & K & D & A & G & D\end{array}$

 A GP WARAGVIKDAGD E GERAACAV I K D GG D EETSARAVVRKDAGD E DTQVSCAI RKDSGD E E GWAQCAVRKDAGD E S CRASCAVRKD GGD | $H$ | $S$ |
| :--- | :--- |
| $S$ | $G$ | Q G Y QVRVS TI K D A G D ENDEAVCAVI KDGGD TGGAAMAAVVKDAGD EENCVKCGMIKDAGD EKNRAKAVVRKYAGE A ECRAYAATVKDAGD E ENTATCAVRKDAGD T PEGVT A WVVKDAGD $S G V E A R A E V V K D A G D$ FNNYVICGIKKDAGD DQ Y S T R A DVTK D A G D

 ADFSATATIVKDAGD E EDCAQCAVRKDGGD A GDSAVCATVKDAGD E E K GVRAATIKDAGD K N N Y S I C S I EK D G G D PDGRVRAEVLKDGGD GEGYALAA GIIK DAGD D A SGVTCAVRKDGGD
 A ASEGRASVVKDAGD
 DECKACAVAHKNPY TEYGARAAII K DAGD HEGGARATVIKDGGD
 A S $\square E A T A F V V K D G G D$ HERRAACSIIKDGGD E P LT A E VS I I K D G G D ADGSATAGVVKDAGD D N $\square N \square S$ E C S I K K D G G A PGWARAGVVKDAGD ATESASAGVIKDAGD QPNKAVYSTVKDAGD FHEKAVCAVKKDAGD

100
 D A DVT T S GLEI GARVGE GVGVATK K
 DPDATHKAKIVATATWGVGRVTK P


 D P DV T D GMKVYAKAGEGIGRVTKA $D P D A T H G A L I D A R V S W G V G R V T K E$


 D P DVT H G L P V VVE A R P GV G R V T K P $D P D V T A D G \square H \quad Y$ Y A E V G E G I G Q I T T R K



 $D P D V T H G A L I, D S T V R P G P G T V T L E$
 P DATHKARI
 $D V D V T T G L P V V A S V G E G V G R V T K P$
 D P D I T T G T I I YA S V G L G V G R V T K P
 $D P D V T H G A T I D A T V R P G P G T V T K P$

 $D P D V T D G L V F A R V C R T D G P G T R E$
 DPDATHGARIIVEVSWGVGRVTKP D P D A THGAS I FVVEL RLT PGTVTK T


 D P DV T H GARRIEATVRPGVGTVTKP


 D P DVTHHGASIDTSVREGVGTVTKP D P D T T N G I L V Y A K V G A G V G R V T K P
 D $\square D A T H A M D I F A K A G V G I G I V T K K$ DPDATHGATIHATVGEGVGTVTQR

 $D I D A T D G A L I C A R V G A G V G R V T K P$ | $D$ | $P$ | $D$ | $V$ | $T$ | $H$ | $G$ | $A$ | $E$ | $I$ | $V$ | $E$ | $L$ | $G$ | $E$ | $G$ | $V$ | $G$ | $I$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $P$ | $D$ | $I$ | $T$ | $N$ | $P$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $D$ | $A$ | $E$ | $V$ | $I$ | $K$ | $A$ | $G$ | $P$ | $G$ | $V$ | $G$ | $T$ | $V$ | $T$ | $K$ | $P$ |  |  |  | D A DVVTH GLDP LA TVTKGVGRVTK P


 DVDATD GMLI GAKVVKIDGRVTEV
 $D P D V T H G A L V V S T V G E G V G T V T L P$






## UniRef90 R7R612

## UniRef90-W6EQRO

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UniRet90-D3E2H7 UniRef90-D1A9W2 UniRef90-W0E6C4
UniRef90 G3J1R4 UniRef90-F6CHV6 UniRef90-T4VZS6 UniRet90_R6QU16 UniRef90-UPIO003B3C89E UniRet90_A5UQT7 UniRef90- G5HLC8 UniRef90_UPIOOO47B8295 UniRef90_UTUS37 UniRef90-D4KVY8 UniRef90-UPIOOO47896F8 UniRef90-F4A770 UniRef90-G8PPQ3 UniRef90-UPI00047D7397 UniRef90-UP100041AD4AB UniRef90-D1AFJ2 UniRef90-F9DU53 UniRef90-E3HDC5 UniRef90-F9MSK4 UniRef90-Q897K1 UniRef90_E2ZJMM UniRef90-UPIIOOO3F79A82 UniRef90-W4M8KK UniRef90-O87693 UniRef90-R5YEH5 UniRef90_UPIO003B59003 UniRef90-R6NH03 UniRef90-UPIOO0475C121 UniRef90-D5WT70 UniRef90-UPIO00477BA1F UniRef90-R6KSN1 Uniref90_C7N898 UniRef90-J7ZZ15 UniRef90-F8FEN3 UniRef90-S6HGS7 UniRef90-W2C203 UniRef90-D2AR08 UniRef90-D4J6T4 UniRef90 N6UUL3 UniRef90-E2ZBZ8 UniRef90-A5D302 UniRef90-F6DJW1 UniRef90-A6LKW1 UniRef90_A6FFK9 UniRef90-ATFSI4
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UniRef90 A5ULG4 UniRef90-E2CF36 UniRef90 UPIIO00477A4BD UniRef90-R5A767 UniRef90-G9YT88 UniRef90-C6HVT2 UniRef90-J9ZE85 UniRef90-H5WXH1 Unireigo-_18058
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220
230
TI IR|VEMKVRRLDTAPGNYGRGFMQDKYG\|DAAVKCSNY| G SLSIIELDTDTFVFTFGNYGRKFATNNLGDEN\|IIISNFVG SMFVELKVDWVIGAFGNYGERHCQKVGLDEQMIVISNFVG SVAKAAGCGHLVLTTGGSSEKAAMKLLGEEAFVQMGDFVG SMKKAQGLDKIVLVPGNHGEMFMKEKLGGDMVVRTSNFIGG TVEVEMHQHRVILIPGNYGEEFLEERGLSAPVVKISNFLGG SIKVELNMKTIILTFGNYGSDF LKKHFDTDNAVKDSNFIG SLRVEMRHRDVLGTGGNFSAAFARDFRGLSAQLKCSNF:GG SI ARASGCEHVVISTGGRSEKYGIDAQPEEAFIEMGDFVG SI A AA QVARAVLTTGGRSETYAMRLYPELPFIEMGDFVG SIKVEISVESTLIFDGNFGKKFTEEELKLSPGIMCSNFID SVEQAVSVRTLVLCTGGRTEKGAMKLLPHLPEVCFGDFTG S EVYVRVASIAL LPGKTGRTYAKEALPEQRSVQDANFLG SMARAAGFDQVVLTPGRLGARTAVDGYPAEAVVEMSNFVG SMKKAQGMDKVILVPGNHGEMFIKESDGDDSIVRTSNFIG STEAEMRDGYLLVTPGNYGADYVKTHISGDNVLKCSNFVG TVRVELNQKKALVSPGNFGQQFMKDNFGLDKSVKCSNFIG SVIQANHVSKVVLCTGGRSEKFAMRELPELAFVELSVFTG TI RLELRYERVIIAPGNYGEAFLEHSLGLDQAVKCSNFDG SVEQAVSVETVVLCTGGRTEKGAMRMLPKLPEVCFGDFTG Ti RRAAGERHCLAFFGNYGVDFSRHELGLDGRITCSNYVG SLAA ESVDRLILSPGNYGRDFSEKDGLDTELI KTSNFIG S:ALELSVRRPI LIFGNMGEKMAGKLFDSKDMVIVSNYIG SiARAKGLQRVAGCTGSTSEKTVQQLYPDHAMLDMGDFAG
 SLADERKMKEVIVVFGNHGKKFIKEKFDEGKILVISNFVG SLTVELGGFTTVVFTFGNYGKRFIKENLPGEDVFVISNFVG SIYMELEMQELLGTPGNYGKEAVKKSGLDLPVVEVSNYVG TI QLEMNQRRLVLAPGNYGLDYLASALPQFPVVKTSNFIG SiARALSLTHVAGCTGSTSEAAARYGLPDTALLDDGDFAG SVAVAQGCDVLVFVVGGRGERFARRLLPDDGYVQDGNFFG TIYVELRQKYVAVSPGNYGLDYMKRAYDLDTSVKCSNYI G SVGQADDVMHAVLTTGGRSERFARRLLPELDPVCFGDF:G Si ARATGLTHVAGCTGNTSEKAARALLPEESIIDMGDFVG SVAQADSCRQVVLTTGGRSEKVAMRHLPEEAFIEMGDFLG SVAQAQGFDSVVLVPGRDGQDAAKYGLPEESVVQMSNFVG TI RTEVSMHVLLAAPGNYGQDFLLNTLNTERSIKCSNYIG TI RTEMNVRHLLVMPGNYGRDYAEGELGLDEAVQCSNYI G TVAAAMGSRH1IGTPGNFGGDFASAQGLDRPVVKCSNFVG SVAQAlRCTHVILSTGGRTEKFGMDLYPEEAFVEMGDFVG SIRQGVDVTHIAASTGSSSEAA AAELYDEMSLIEMGDFVG TIKVAENPERILDAPGNYGMDFCKTYLGLDKAAEDSNFVG SI ARAAGRRHVAGCTGSTSEKVAAELYPEDALLDMGDFAG TI AVD $\square$ RMHRLLMAPGNYGLDYLKAAYH SVALANNYKDLVFVPGNDGRVYAKRILNEDRIVEVSNFWK SIARANGYDHI AACTGNASEDYARRHYPDMALI EMGDFAG TI HVEMNSRHLLAFFGNYGVDFAASQMNTQDRVTCSNYVG QI ARGAGMETLLLTPGRRGKTLAQEHTPPEAVVLVSNFLG SLARALGYRLLVLTPGRMGVRKAEELLPRSCVAETSNFIG SIATTNGHTHIAASTGNRSEDADKAQLPDDALIEMGDFVG
 SIALARDIGTLVFTTGGQSEKFAQKILPEEAFILQGDFTG SI QVEMKMKHLLVTPGNYGADYLRGHLPFEKNMKCSNYVG SVAAAMGNRQIILTTGGSSEKYAMAMFPEEAFTQMGEYVG SIRQANGDKHLAATTGSTSEAATKAHYDEMALIEMGDFVG SMKKAQGMDKIILVPGNHGEEFIRDYLKПDNCVRMSNFVG STEVYVRVDAVVYTPGKLGRDFARAHLNLDRIVQDSNFVG S $\|$ AAEGVKHVIAATGSTSEDAAQSLYPDFALLDMGDFVG SMKKELGMDKIILVPGNHGESFMSDRIGENSSVVTSNFLG STAAALGARDLVVVPGNYGSDYVSGNLGAVPVVACSNFMG SVRQAMGNDTVVLTTGGRSEDFAKKILPEHCFIQMGDFSG QI ALEAIRQHKLILVPGKVGQDIARCNLPQDATVQTSNFIG SIARAAGRRHVAGCTGSTSEKVAVAHLPEDALLDMGDFAG Si ALALNLDNLVFVPGNDGEKLALKQLDDTKIGQGNYVG SiARATNIQHVI GATGSTSEDAVREQLPEAAYLDMGDFAG SMARAAGYSRLVLVPGYLGWQDARLGLPAAAVVETSNFAG
 SI SLELEMKKVILCPGNYGEEFVTMKLNGEN VVSMSNFVG S:SAKAGMETVVLTTGGQSEAFAMKLYPEDPFIQMIGDFTG si SLSDELQMDKI ILVPGNHGEQFIREKLNLDVVVRVSNFDG S ARACGLAHVAGCVGSTSEKAVRRGLGEEAIIDMGDFAG SIARAMGVTHVAGATGSTSERVVAELYPETALLDDGDFAG SIAVANGMTELLINSGARSEKMLRSIFPNDSEVSCGNWIQ Ti RLELHMKAVILVPGNYGEAFDQETLGLDDGVDCSNF:G

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UniRef90 G3J1R4 UniRef90-F6CHV6 UniRef90-T4VZS6 UniRet90_R6QU16 UniRef90-UPIO003B3C89E UniRet90_A5UQT7
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250
260
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 D TID DAKGILFI GHGKFVKLAAGVMNTHS RQADCRME FTLK QCKKVSLVVGMGKFSKVAQGVMMVHSKSAPVDFNFLA

 F I L E E A K N VI L L G H G K L L K V A A G GIVF H T H N H R V A D A R M E $D A L D F L Q Q A L L L G H G K$ L AKVLDDGVWDTHSSRSDMAMSVVA
 Y ML K E A K KI L MA GHGKYVKIA G GIIF N THSK DTIDMAVNLLFVSHGKFIKLAGGIMNTHS E T i D M V C E M V L T G H G K L I K V A G G I M N T H S H D A L K T CVVEAVVFVGMGK MV KTA Q GHM Q THVA GNQ



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


 F ALDCCKDDTLVGHGKMCKIAA GCFNTHS R R DADVR D TLDMAAQVLLVGHGKLCKLAAGVMNTHSHTA DGRAE




 F S L K Q C AK R TLLCGMGKFSKAAA GHMHLLHSKGSSVVDPGWLA
 EALD DAASSLLLVGHGKL AKVSAGNMNTHSRTSSADARAE D A L D A C A TV L L A GHGKKLGKLLSGGDM NTHS R R A D CRTE Y ML E E A A EVI L L G H GKLLDKVVSAGIVFHTHN R R VA DARME FAI Q QCAKVTLVGMGKFSKVAQGVMMVHSKSAPVDFGFLA
 $A \vee L K H P V P R L T V G \square G K$ L SK L A D GHLDDLHS GRS QVNP GMLA E L L D ALLLKYLRRSIVGGFGKISKLACGHLDLHSKASEIDDDFIA EMLD M A K DVLLDGHGKMLKLA Q G I M N THSRYGDGRTTGLA

 A VIK HLKKV I C GGFGK I S KL A M G K WN L H S K V S A I D L P F LA F AL NCCMKV TIVGHGKI SKI A S GCFN TH H S R R V C DT R $F L L E E C R R V V L W G H G K L A K V A A G V F Q T H N \quad R V A D G R A E$
 F S L L E H A KK I T L A G M GK F S K V A A G A M L I H S K N A P V D F G F L A ALLKHAKLSI CGGFGKMTKLANGHMDLNSRSSSI DFQHMA Y MLNEAKKILMAGHGKF DKISAGIFNTHSK IICDARNE FALDATMQALLAGHGK LAKTLDGVWDTHSKRSGMAMGAVA GVLKK H D DD RLTLGF A KFTK LA Q GHLDDHSSKS QVDK D F L W W
YMLMEAKKILLAGHGKFIVKLSAGIFNTHSK VADARNE
 Y TI Q Q CAR KIV GF DGK LAAKMAA GVVK Q THVVK G SK V D M N F L A $F M L E K A V E V L L F G H G K L V K V A A G I F H T H N \quad R M A D A R M E$
 AVLK H P V D RLLTVGFAKL SKLAA GHLDDLS ARSQVDKGF LA FMFEEAKKRTF F GHGKLIKI A GG』FNT, KHAIADGRRE GLLKHPVPK LTMGFAKFTKLAQGALDLHSARSQVDFMF LE



 Y M I K E A K K IL M A GH GK F DKVV S A G $\square$ F N TH S K
 $A V L K H P V D R L S L G F A K F S K L A A G H D D L H S K R S Q V D L G L L A$



$K \square R R$
VY K N Q T T LRR EKNKLRS

R T ENE $\square$ R VEKPATA $\quad$ RRR KEMRH
K $\quad$ K C

LR S $K E L \underset{R}{R}$ पYVYKNNQRDRC GK QP $\underset{K}{\square} \underset{G}{\square} R T$

T R K P D G P L R K
MRS
TEHESKK L ${ }^{\text {R R R }} \mathrm{R}$ MTDTRTLRK $P L R \underset{Y}{S}$

R T PPKPEKPQFEHYVRSGQKRLRRS G GVNS LDRT LLEKMLDPFPLRS MRELERAEFDLTVPAPNGGLRR PKEWTEVF GPYGLRDA DRLYPDFFLHC

NTK K L R H
MK DPVSEFEYPPSWVEAPDLLALVESGLAVLTSSGQLRR MAFEHYIRSGQKWL RQ
 MK S

GKVLRE
ERSEYD LAAVALNG LRR

KKQLRF
GKRLRC
$\square P M \square V V K R P T G P Y G \square R K E \square E R \square L P D F E M K K$
TGRHGFRKQ $\square E R F$ V V GFP L R S
EKKPKGTRT EKRMKN KREPTLRC

Y $\square$ YKNQKK LR W EKPKGNLRT
 QQLRS KSEQPMRH NGRHGLRRMVELYHPGFYLRS YVYYNGKRLRK YDFRNEKSL
M $\square$ DPVNKSK $\quad$ PE E W $\square E R K E L E E G \square R S G L V V L S N G S V L R R$

M $\square$ R DPVTGFEYPEAWVKSPDSLECVRKGLCVLTSSGVLRR
$\checkmark$ WHNGKARRR EKAP R R


| UniRef90_R5TTE4 | GFTTGTCAACAAKAAAVMLQEAVIESVIVVMTPGGTRAELVi |
| :---: | :---: |
| UniRef90-R4KLP1 | GITSTGACAAAAAKAAALALFKNKNQL |
| UniF | TGTCSAAAAKAAS $\downarrow$ ALGDTPPLV |
| 890-UP10003B48454 | G |
|  | GKPVEKVKI LIPAGEIVTFNI |
| Uni |  |
| UniRef90-101593 | GYTTGSNAAAAAKAATLALLFTRPQAVTHTLDGETATMRL |
| UniRe990-R8V | GYTTGSCAAAAAQAATLLLGQLPEVIELLTPKGDDDFLHP |
| UniRef90-E7G | GTKE |
| UniR | P |
| UniR | GFTTGTCAAAAAKAAALLGEKPDRVEIGL |
|  |  |
|  | GLLTGDFPDVELTLPKGGTTAFAL |
| UniRe | GYT TGTCSAVGपKAGLEALINNDEQL |
| UniRef90-E4N261 |  |
| UniRef90-A0A017HE |  |
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|  | G |
| UniRef90-UP1000380BF5D | GRTTGSCATAAVKAALRLLLQRVSKVDL |
| UniRef90-G8UMV1 | GYTTGSCATAAAKAALLALGSPQKNVTFTLPDDEE |
| UniRef90-R5 | GVSTGSCMTGGAEASVIWTGKCPSVVKVETP |
| UniRef90-UP | GWTTGACALASTAAAALLTGRFPDPVSVRLPKGHEPAFAL |
|  |  |
| UniRef90-UP100046 | GLT TGSCATAAACAAACALF |
| UniRef90-F6 UniRef90 | GYTTGSCAAAGAYAGLYFLKNRLNYVK |
| UniRef90-K2L895 | GACATAATRAAWQALGEFPDPVT LPRGE |
| iRef90-A3 | G GRFTSPVKITLPRGQKPVFEL |
| UniRef90-UPIC |  |
|  | GWTTGTCAAGAAKAAFAALGAFPDPVE |
| UniRef90 K9H2 | GWTTGACATAAARAAFAALRTGPDPVTIRLPKN |
| UniRef90-12JP9 | GLTTGSCATACAVAAARKLFESTSCASITLPKG |
| UniRef90-F6D7G9 | GITTGSAATAAAVAALLSUKEEV |
| Uni |  |
| UniRef90- UPI000466DE53 | GYTTGTCAAAASKAAAQALLTKVKNVDLLPKGG |
|  | GFT G |
| UniRef90-Q64TA9 | GLTTGS |
| UniRef90-J2L3T7 | GRTTGSCATAAVKAALTML |
| UniRet90-UPI | GYTTGSCATAATKAAMMTLLTVNEKVSI |
| UniRef90 M6DG | GFTTGACSAAAAKAAVLILGQAIREDETTLPN |
| UniRef90-UP1000368A14D |  |
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| UniRef90 UPIOOO374 | GLLTTGTNAHACS DLIKER |
| Unif |  |
| UniRef90-F8A | GYTTGSCAAAGAYCGVYYLKKGMDYVQ |
| UniRef90-UP100047E |  |
| Uni |  |
| - |  |
| UniRef90-R5TB65 |  |
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|  | F |
| UniRef90-C8W683 | G |
| UniF | G |
| UniRef90-TOJY90 | T GTCAAAAA |
| UniRef90 OZN | GRTTGSCATAAVKAALMLLGDGVDEVFISLPDD |
| iRef90-W2C5 | GYTTGSCATAAAKAALMALLTGEEQIEVS |
| $-060$ | GYTTGACSAAAARAATLGLGRVPDOVECELPNGORVEFAV |
| UniRef90-UPI00036C4DF1 | GFTTGACAAAGTKAALLALGE |
| UniRet90-S7TGC4 |  |
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| UniRef90-UP10003800FBB | G |
| UniRef90-A1H | GITTGACAAAAAKAAVLWRGMFPETVEVISPQGRV |
| UniRef90-EOI5K | GFTTGACATAAAKGALTMLQQSV |
| UniRef90 F3PF79 |  |
| UniRef90-D7DR5 | GYTTGSCACAGAYSGLYYLGKILLDFVEINA |
| UniRef90-K41 | ar |
| UniRef90-C4KC | GFTTGANSAAAAAAAT |
| UniRef90-V6F3H9 | GWTTGACATAAAKAACLALFGEPQQVGM |
| UniRef90-H8IAC | GYSTGATAAAACKASVLSLRKAVDYVEVKIPCGL |
| iRet90-12B7S | TGSCATAAAKVAALMVLRQUHQVSITTPSGVV1 |
| UniRet90_-6CST8 | CA |
| UniRef90-EOE2E0 | GYTSGSCACGATKAALIMLLEKTNEVRIGTPKGVDLDLKI |
| X7 | G |
| K6T3N6 |  |








HRRPFD LA T L A P N G $\quad \square R$ R
EKRLKP $M K \square D M Y V I K D G K P L R C$

EKKPKGTKTK
ETNNQKLRS
DKK G GRI
Y A YVNGKKLRK
EKEAKPLRH
KPARGTRT
Y V Y Y E GKK $\quad \square R K$
S GKE L R Y
K E S E Y
DHYAVKEGKELRC MAFEHY $\square$ YTGTTRLRC K K K L R E
$\begin{array}{llll}\mathrm{E} & \mathrm{L} \\ \mathrm{R} & \mathrm{S} \\ \mathrm{L} & \mathrm{R}\end{array}$
$\square$ REPD $\square$ PRTAK
VRPKALRT ARKPEGKLRR GKKLKE

MPPSGP $\square R R$ EAPPPTEKVRKGTAKRERGN RRT EQAATPEK $\square R K G S A R R E R G N R R T$ VP QEDPP $\quad$ RRR
 RQLK V

P A G P $\square R$ Q
VRPDGKELRR
K PLR E S S K $\underset{L}{L} \begin{aligned} & R \\ & R\end{aligned}$

K Q L R E
EKKAKGTRK KPQGE L RR
$Y \square E K G G K R L R Y$ QGPVGLRKAVERDCPDFPMKT GKEKLRC
E EKPMRH

 PDERQRAEYDLALLAPNG K L R R R

H Q N K G Y K F
EKVRKGDA KRDRGNR

NPKEMRY $\begin{array}{r}\text { M }\end{array}$
K DPSELRE
M $\square$ DPVNKSR $\square$ PDEW WESSSMDEG $\square K N G L V V L S D G S V V R R$


APARVRKGDGRRARGN RS
KEEDYVYYNGRADRK
S GKELRY
KEKKKLRQ

K P L R H

EKDPSNMRH

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UniRef90_M8E1R9 UniRef90-E7RVM9 UniRef90-H3SCT9 UniRef90-I4ERU0 UniRef90-B5EC81 UniRef90-I3TPB9 UniRef90_FOTAY7 UniRef90-A4FM57 UniRef90-G9YES8 UniRef90-W1TWX1 UniRef90_UPI00047DD6F4 UniRef90_UPI0003602BD4 UniRef90_UPI000237B5EB UniRef90_UPI00035F0819 UniRef90-P61986 UniRef90_U6EDF5 UniRef90-A3V4F5 UniRef90_K0B3P0 UniRef90-D9PX46 UniRef90-B0UI56 UniRef90_G8QGW5 UniRef90-F2J5F7 UniRef90-Q47FE4 UniRef90_UPI00047EF308 UniRef90-F3LJ06 UniRef90-B115Q0 UniRef90-F2NFE7
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 GYTTGSCAAGAAKAACLWLQ GFTTGACSAAAARAAVLGLDQGP


GFTTGTCATAATAAADSMDNQDDEEV GYTTGSCATAATKAALTATQQEQREAT $G F S T G A C S A T A A R A C A \emptyset G L$
$G Y T T G T C A A A A A K A A A A M U Q$

GFTTGACAAAADKAAAQMDQ $G \square T T G S A A T A A A L A A L F S \square N$ GYTTGTCAAAATSAAAKMLGKSVASVVR GYTTGSCAADAAKAACEMLLSRKPVVS GFTTGTSGTSAAAALKAAAGE GFTTGSCAAAAAKAALMMLLKD | GE |
| :--- |
| $G T$ | GFTTGACSAAAARAAAQLTGHLPATVD $G W T T G A C A T A A T K A A Y T A L L$

$G F T T G A C S A A A A K A A T R L L G$

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GWTTGACAAAAAKAADAGLRTGP GFTTGANSAAAAVAATQGLGQVPAQ
$G W T T G A C A T G A A K A A F E A T G T F P D P$
$G F T T G A C S A A A A R A A T L G L L E V P D T V$
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## GYTTGSCAAAASFASVLWQ

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UniRef90 B2A0F4 UniRef90-A4EKK8 UniRef90_UPIO004196D73

130
140
150
160
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## UniRef90 UPIO0046A3D34 UniRef90-D6ST69

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UniRef90

- 7 KWK UniRef90_U1WRB6 UniRef90-G8X4A3 UniRef90-UPIO004781042 UniRef90-P61987 UniRef90-J3HVA5 UniRef90_C9LWA4 UniRef90-R9SK29 UniRef90 UPIOOO37CC011
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210
220
230
240
 TIARACGLDRVVCTTGRRSERFAQEIFPEDAFVQI GDYFA SVAEAMGVDTLVFTTGRRSERFAMDLFPEEAFVQI GDFFK T Y Y MEVDAENIILVPGNYGEKLAKSLDLKGGVVKISNF G SMAKANGFRTVICLTPGRLGEKWAVEKLPVDCVAQMSNFVG SUREMSVARIVINSGAKSEKYIRSLYPELAFVHYGNFIGG SVAANQGQDTVVLTTGGRTEKFVMGVLPHLAFVQMGDFLK SIAAALDRRFPVVPGNDGRKAALAHFPEEQVI DVGNDWG SVVQAVGVARVAATTGGRSERFAMRHLPELAFLEMGDFVG SITDELTYRSVVLAPGNYGEDFATNVLPPHR【VNMSNFVG SVAQAMGCRHIVLSTGGKSEQFGMTQYPEEAFVEMGDFVG $S V V Q G D Q V A A V V L T T G G R S E A F A M R E L P P A C F V Q M G D F L R$ SMKKAQGFRKIILVPGNYGERFVEEQLGDDGVVSMSNFVG S ARAAGHTHVAGCTGSTSERTVQQLYPEDALLDMGDFAG DVALACGARTVVLATGRSSEVVAQKHLSEEAFVMMGDHFG SVAVAGGYEYLVFVPGNDGEKIAKQLLDEDQIVQMGNFVG SIARAEGLRHVAGCTGSTSERVVTELYGDEALLDMGDFAG Ti HVEMNSKHVLAFFGNYGVDFTRNEWGDDTEITCSNYDG SIELEDRQHAVVLTPGNYGGQF $\square$ SGHFHLNPVVF $\mathbb{C N N F V G}$ SLIRAAHQRWCVVTPGRDGYDAARKDYPVTDLVETSNFIG TI RTEVKVRKLLAAPGNYGDTFLSKKDDKDUAVMTSNFVY SIREALDVARAVFTTGRRSEKYHLMHHPDTALVQAADFFE SVEQAVSVRVAVLSTGGRTEKAAMRLLPDEPEVEVGDFTG SIHRGIDVAHVAGCTGSTSEKAVMDFYGEGDMLDMGDFAG SVAKEYGIDTVVLTTGGKSEKFAMDLLPELSFI QVGDFAGG SIARADGLVHVAGCTGATSETVVQAIYPDHAMLDMGDFAG SUY YEDDSDEV VLYDGNHGEKDYSEMNEKVSGVKDANFDG SI AVARGFRELVFVPGNDGERFAREYFKEERDIQMANFPG SVARASGLLAHVAGATGSTSEAAVQRLLPPEGLIDMGDFAG SIVRASGLGHVVGATGATSEAAVRARYDDAAYLDMGDFAG SVVQAVDVAAVVFTTGGRTEKFAMRQLPDLDFVQMGDFVK SIVAAAGLRHVAGATGSTSEDAVRRLLPEQALIDMGDFVGG SVAQADNCERLFLTTGGRSEKYAIALYPEEAFIEMGDFVG SVARASGCGEVCLVPGNDGRRAARRLQPEEQLVEVSDFLG TVVSALKVARVVLTTGGKSEEYLKRHLPEEGFVQMGDYVG S| AAADGLTHVAGCTGATSEKVVQDLLPDHAMLDMGDFAG SVVQAVHVRTVVLCTGGRTERAARALLPDLPEVCFGDFTG SIALLANCREIVINSGGRSENALRKHLAEFAFIQYGNWDG SIARAAGTNHVLGSTGSTSEDAAIKVYGFEATLDMGDFAG Si ARATGLEHVVGATGAMSEKAVQSRLDDSAYLDMGDFAG SI RQSNGVTHIAAATGSSSEAAIAKHYQDMALI EMGDFVG S:RRALGHDHVAGCTGSTSEKVVRSGYPETSLLDMGDFVG SIAVANGCRHIAASTGHASETAVRSILPDMALIEMGDFVG SLALAEDNYELVFTFGNYGKQMAQSMGVDNQWVKMSNFVG TLYLELSMCRCAFVTGYAGESFLKRQYPQKALVLCSNYLG Si A RAAGHRRVAACTGSTSEQVARDVLGDEALLDMGDFVG SVAASQGRDTVVLTTGGRTEKFAMQALPDLAFVQMGDFLK SIARAAGLAHVAGCTGATSERTVQALLPVVAMLDMGDFAG SiARATGLGHVAGSTGSTSEAAVKAFLPDTALLDMGDFVG SLRLELSVHTAVFSPGNYGRDFIQNGIGEKLLIKTSNYAG SVAKAAGYEDLIFVPGKDGERLAKEQLPEAAMVQTSNFDG SUAVALGADTVVINGAKSEKYLKAAFPELPFVQYGNF:G Ti KVEERMRRLLLTIGNYSQNFLAENMPMIMNVKCSNYI G SI AQADSCDHLI ATTGGRSEKFAMKLYPEEAFIEMGDFVG SIADANGCTEIVINSGGRSENLLRKQFPDFAFI QYGNWI G Si ARARGFDHI AGATGATSEAAVQAHYGDSALIEMGDFVG TI Y LEMDKKEI LLVPGNYGEGLKEKLI DDLDPTVKMSNYIG SVEVYURVDAUAYLPGKDGRAFVAQLLPDRRSVQUANF SVALAAGFDTQIFVPGKMGENAARFGLPREAVVQTSNFIGG SVVQAlDVRSVVFTTGGRTEKFAMRELPELAFVQMGDFVK SIAKALGCSRIVIGSGAKSEKTLRARFPELAFIGYGNFIG SVVQALEVTAVVFTTGGRTEKFAMRQLPDLDFVQMGDFVK SIKLANGHEELTLLFGNMGENMAKELLREENMVIISNYVG A:RREVEVSRLIINSGAKSERFVKKEYPGLAFVHYGNF:G SI DQAMQVARVVLTTGGSSEKYAMKLNPEEAFIQMGDFVG SI GREMEVEHLVLNSGGRSERFDKARFPELAFVQYGNFIG SIVQADSVEHLVFTTGGRSEKFAMSMYPEVAFIEMGDFVG KDDLIKESSKVVLTTGRDGDRYSTMLFPDYTVVLAGSRIS SVEQAVSVTAVVLCTGGRTERGARELLPGLPAVCFGDFTG SVVQAVDVTRVVFTTGGRTEKFAMRQLPELDFVQMGDFVK SIVQEMNIHRLILTPGNYGEDFLKDHIP VTKQVQMSNFVG TVDAAVDVRTVVLSTGRTSELAVQQNLTEESFVMMGDHFG TI ESALSVAHVVLTTGRRTEKHAQAELPEEAFIQDGDFFQ SVAQAIQCRHIVLTTGGSSEKHAMKHLPEEAFIQMGDFVG SIARAAGLDHI AGATGSTSEAADQRLLPDMALI EMGDFAG SVAQADRCEHIVLSTGGRSEKFGIDDLYPEEAFVEMGDFVG T:AKAEGMKAIVLSTGGRSERFLKELFPETAFIVQUDFFS SLK QLPQDTLVIVPGRSGEKDALSRGVNGDCI ADGNYUG SIARAEGLLHVAGCTGATSEKTVQALYPDHAMLDMGDFAG


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UniRef90 G2J3K7 UniRef90-H8L515 UniRef90-D9QVV7 UniRef90_U2JSB5 UniRef90_UPIO0036A344B UniRef90_UPI00036EF7E6 UniRef90-Q2CG94 UniRef90_UPI000369F78A UniRef90 W8U9T2 UniRef90-IOGRR9 UniRef90-U2IFD7
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UniRef90-W6MDR6 UniRef90-W6MDR6 UniRef90-A6L4V0 UniRef90_UPI000463ED1F UniRef90-X4ZWW8 UniRef90-UPI00036CF2B3 UniRef90_UPI0002D3728B UniRef90-F7XKR2 UniRef90_UPI000475C78B UniRef90_A0A011QGE8 UniRef90-J3JCJ6 UniRef90-E8WQB8 UniRef90-B8FH67 UniRef90_UPI0003B4F27B UniRef90-B2IFH4 UniRef90-F5LGR0 UniRef90_D8F449 UniRef90-H1LK53
UniRef90 B2A0F4 UniRef90-B2A0F4
UniRef90_A4EKK8 UniRef90_UPIO004196D73 UniRef90_I4YWT1

A SLID Y A Q QAlLVLGHGKLLAK|LMGDAWDTHSSKSRMAM
ESMKRAARILVVFFGKAVKMAQGAPHTHAARSRLA
ASLDAAEA I I TVVFGKAVKMAMGFPHTHAAKSELTMKRLE DSIKGFKSMTLVGHGKFAKDS $\square G \square F N T H S N$ I I DARME YMLEVCVKVILVGHHKLTKIAAGCFHTHN RVADARDE ETIRDAAEQLTLGDGKAVKLAEGHDDTHSKKVTMNKEFLK
 YMLDYAFEAILLGHGKLAKLANRDWNTHSSHSKRA YMLLKA ARKVRIVGMGKLAKLANRDWNTHSSHSKRA
 HVLKEVQRILMVGHGKFVKVAGGIFSTHSKDS D DARME FALKQCKKVTLVGMGKFSKVAQGVMMVHSKSAPVDFGFDA YALDEVVRLVVFGLGKDTKIAQGETDTHANRSVVDTDVVA YMLKETQRVLMVGHGKLIKVSAGDFTTYSK DADARAE AVLK HPVPRLTVGDGKLAKLAEGHLDLHSGRSQVSFAALA YAMRSCAEVVVAGFAKLVKIACGHEQTHVTSSQMDLDALA A LAAKHPVPRLVVGFAKLVKLAQGALDDHSSRSTVDFSR YMLDEASK MLLGHGKLIKISAGIFNTHS VADGRHE AVLKHPVPRLTVGDGKISKLANGHLDLHSKRSQVDFAVLE ELLDYAVDVLLI GHGKILKLAQGIMNTHSRCADGRTTFLAA DAI DCCVRVLLVGHGKLVKVAGGIMDTHS RTADCRAE FMLEEAVEIILIGHGKLIKVASGSFHTHN RMSDGRME DSVMDAKEMVFAGHGKLVKVAGGDKNTHS RYGDHRME A ALRSFQEVWWAVFGKLVKQAQGLEYTHAKTHPVDFGLLA A ALRRAVEVVFVGMGKLTKLASGVVMTHYTRSKVDTALL GMLKHPLPRLTIGFGKLTKLAMGHLDLHSGRSQVDMSWLA TGGKTSVKEVIVGMGKLSKMADGVMMTHRGGSSVNTTMLS FMLEEASKSILMGHGKLVKLAGGIFQTEH GRLADGRRE

 GMLK KPVPRVTVGFAKMTKLGQGLLDDHSRAGPVDDAWDA AAFQSAIKRVYI GVGKLTKMGQGLAVTHAWKQEI DRDLLA
 GMLKHPVARVTVGLAKLTK LAQGRLDLHSRRGGVDLPALA FALKQCKAVTLVGMGKFSKVAQG』MNVHSKSAPVDFHFLA AVLKHADKQLTFGDGKDSKLANGHMDLNSRVSAIDFQHMA $F M L D E A A R I V L V G H G K L A K G L N G D W Q T H S R F A$
FALKTAVRHLT GFGKALKMAQGFSHTHASQGLANFGEL
 A AVTA AVGVVFVGMGKLAKLAAGDLMTHYTRSKVDLSLL ETLEKPLEKVTMGLGKAAKLAQGELDTHSGKSTWDKKFI

 $V S L D Y A Q Q T L V L G H G K I A K L D D G V W D T H S S K S G M A M G S V A$ AVLKHPVARLTLGFGKLSKLAAGHLDLHSRHSSI YMLERAAERILLGHGKLIKVGAGIFDTHSS VADARLE YLLDCAEEVLLAGTGKLVKPAAD MYLHSHTA $A V L K H P V P Q L T V G V G K L A K L A A G H L D L H S G R S S V D \square A G L A$ YALDTAVQUVIGGMGKLTKIAQGETITHANRSAVDTELLAA

 FMLEAAKRVLLFGHGKLIKVAAGCFYTHN

RIA D GRLE
 FTLKMCKKVGLVGMGKFSKVAQGVMMVHSKSAPVDFGFLA DTLTKDNKKVTIGGGKAAKLAQGELDTHSGKSTWDKEFI GMLKHPVPRVTVGIAKMSKLGQGMLDLHSRRGAVDLER DSLSYAKTMTLLGHGKFAKLSIGIFNTHN RTADTRME DALDFTQQALLAGHGKLAKVLDGVWDTHSSKSDMAM FMLERAAERLLFGHGKLSKVAAGVFYTHN R R BADGR YMFEEAEKRTLVGHGKLVKLAGGIFNTHS I ADGRRE AAFQTA IKRIYGGVGKLTKMGQGLAVTHAWKEAVDRDLLA ETLKLABASVTMGIGKAVKLAEGNLDTHSKHVVMNKAFI A
 ETLKIAVPLVTLGIGKAVKLAEGNDDTHSKKVVMNKEF
 FSLQHAKRISLVGMGKFSKVAQGVMMVHSKSAAVDFGFLA
 FSMKQCKKVSLVGMGKFSKLAQ
ESLAA GDVVI CGLPGLILKWG
A ALLRRAVRVVFVGMGKLTKLAAGVLMTHYTRSKVDPGVLA AAFQSAVKRVYLGVGKLTKMCQGLSVTHAWKAEIDRDULA YVLHEVQKLLIVGLGKLIKVSAGIFSTHSK ADADARAE Y SLQ S CAEVVVAGFAKLVKIACGHEQTHVTSSELD MSMQGVAKTLAVFFGKALKMAQGDPHTHASKSSLTMDWLA FALKHAKRVSLVGMGKFSKVAQGVMMVHSKSAAVDFDFLA GMLK HPVAKVTIGFAKDTKLGQGFVDLHSRRGSVDDAWLA FALKQCKK TLLVGMGKFSKLAQGVMMVHSKSAPVDFGF

 GMLKHPDGRVTVGDGKMTKLAQGAVDLHSGRSQVDFSQLA


$R K S G \square P V V V I K R P V L P E$


SSKTLKK
$\square$ P E F PQ Q

## UniRef90 Q8TTB6 UniRef90 E4RKA1 UniRef90-P61985 UniRef90 B3QW09 UniRef90-G8ARL4

 UniRef90_UPI0003B7062C UniRef90-UPI00047709B3 UniRef90_UPI00030E9FD6 UniRef90-A6UPK3 UniRef90-C7RS79 UniRef90_UPI0003B3E294 UniRef90-B3QPL9 UniRef90_UPIO00365E314 UniRef90_UPIO00380B3E6 UniRef90-D7GCP2 UniRef90_A8LLQ5 UniRef90-T0M0G7 UniRef90-A0RYY1 UniRef90-Q129V0 UniRef90_A1VP90 UniRef90_B0TIJ5 UniRef90-D8PF06 UniRef90-F5LB01 UniRef90-AOLCDO UniRef90_S5ZMY0 UniRef90-H7EII3 UniRef90-Q2NHX5 UniRef90-A0A023X0X8 UniRef90-W6KE18 UniRef90-R5NT19 UniRef90-A0A011NX23 UniRef90-H1HS16 UniRef90-B4S8C4 UniRef90_UPIO00378F2A4 UniRef90-D7EAL9 UniRef90-L0D9D4 UniRef90_UPI00041F4161 UniRef90-Q12VD1 UniRef90-A0A010ZL49 UniRef90 E3GYU9 UniRef90-A0A016QSG2 UniRef90_IORAT6 UniRef90-F3Z2C3 UniRef90_LOL211 UniRef90_UPI000377DA45 UniRef90-D5E8M2 UniRef90-A4FWX4 UniRef90_U2KV84 UniRef90-A9WIP8 UniRef90_UPI0004092201 UniRef90-UPIO0016C0DCD UniRef90-F217F1 UniRef90-UPI0003654D0C UniRef90_P61984 UniRef90-A1ANJ7 UniRef90-F2KRZ9 UniRef90-R7AR60 UniRef90-HOULM7 UniRef90-V6AVJ0 UniRef90-UPI0003B6FC5B UniRef90_L9PJT0 UniRef90_A0A011NJR5 UniRef90_C7NCV8 UniRef90_C6BW90 UniRef90-LOA1L6UniRef90 H0C2B0 UniRef90-M8D7D9 UniRef90-R5AZY9 UniRef90-B7IHGO UniRef90-X8GX38 UniRef90-UPI000371ED11 UniRef90-K9T8V2 UniRef90_K8GIQ0 UniRef90-UPI0003759FD9 UniRef90_U2RB93 UniRef90_C7LYE6 UniRef90-D7GX16
UniRef90-B3EBR9 UniRef90_A4J815 UniRef90-E1RHX5 UniRef90_A0A059KI82 UniRef90-D4CFM7 UniRef90-C5DAN8 UniRef90-F9ZBN2 UniRef90_A3CSU7 UniRef90-KON1Y3
UniRef90-R5C532

GYTTGT 50
60
70
80
 GYTTGACAAAAAAGAARMLQELADEAEIVLPRGERVAFRLL GFTTGACAAAATKAALQTLLTAPSEVEI ALPSGRRVSFPV
 $G W T T G A C A T A A A R A A C G A L \mid G D F P D P V T V T L P G G Q T P A F A$
$G F T T G A A A S A A V K A A L E T L G N P P Q S V V I D F L T K G T R T V P V$ GERSAAAEVVLPRGRVVSLALL GFTTGTTATAAAVAATKSDQEAQTVITVLAANGQKATFEV
 GFTTGTSAALASQGAALYLLTRPSEMSVMTPAGGRVSCDE GFTTGTAAAAAVKAA
 LT GEAWSHVTIRIPAGMDVTFEV GWTTGACAAAAARAAWLHTGNFPDPVEVELPAGRRPAFAL



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GYTTGSCAAAASKAAAEMLGKRVETVDDLTPRGDPLHDSV
GYTTGACAAAAARAAALGLLEGPD
GYTTGSSCAAAAAKAAA I ILLKE I I Y S SVV I
GFTT$G$ S A A A MA A MA A A RA T G T F P D Y A R
$\mathrm{G} \square \mathrm{T}$ T GTCSAAAAAAA $\begin{array}{lll}G F T & T & T \\ G & T & A \\ G & T & T\end{array}$ A A A LAAAA A GYTTGSCATAAARAAL $\begin{array}{ll}G Y T T G S S A S A A A A G A A \\ G Y T & T \\ G & T\end{array}$

GFTTGTCATAATVAALNL
 GYSTGSCAAAAAKAAAMRAL

GFTTGTAAAAAAKAAALH Q A A A R T GYTTGT TAAAAAKAAARSRKDVA GFTTGACAAAAARAAVQGLGQVPDAVE

## 

## G Y

## GYTTGTCATAATKASAワMLLT GYTTGTAATAATMAAMEMLQK

GFTTGTAMTAGAVAALRHVF GFTTGTCAAAAAKGAALMLDRDCD Q $G \square T$ TA T T T S A A $\square$ C G A
$\qquad$



## UniRef90 Q8TTB6 UniRef90 E4RKA1 UniRef90－P61985 UniRef90＿R7FBX4 UniRef90－G8ARL4

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UniRef90 E1RHX5 UniRef90＿A0A059KI82 UniRef90－D4CFM7 UniRef90－C5DAN8
UniRef90 F9ZBN2 UniRef90－A3CSUU7 UniRef90－KON1Y3 UniRef90＿R5C532

SKSSGRAVV｜KKDPNDHESDVVTRGLEFV｜GEAREG\｜IGTV｜KRD NPERAQAAVVKDAGD DPDVTDGLKKIYVAAGEGVGIVTKK
 QE $\square \mathrm{RY} \mathrm{L} \mathrm{C}$ GVQKDSGD A WGWAAAGVVKDAGD ERVSCEAVII KDAGD APGGAEAAVIKDAGD ESCEATVAITTKDGGD QENTAFATVKKFSG DDGRAHAAIVKDGGD EEKTAYCTVVKNAGD DSYRARCGVRKFAGD DSVSVRAVVVKDAGD HNDMAACSVIKDGGD TDDTAMAAITKDAGD AHQWAEAGITKDAGD HGESAFAGIVKDAGD EHQK ICMAAVKKDGG SDGSAVCAVIKDGGD QDGRAHAMVIKDAGD NGDTAHAMVIKDAGD EDGAVTCQVIKDGGD $A R C R A I C S I I K M A G D$
$A H C Q A T A G T I K D A G B$ EEGAVSCAVRKDGGD AEGCAHAVIDKDAGD EK L Q A DA AVQKDAGD KKMEAQCSVKKDAGD DGSWAEAGVVKDAGD HRTSARASVIKDAGD DSRKASYKVVKDSGD DDGRAHAAVVKDAGD ES IS AVAAVVKDAGD TADKARAAIIKDAGD
EAGRASCCVRKDAGB EKNGAVGSVIKDGGD DAHHGHSVVSKDNNDH AEGTATAGVIKDGGD $H E Q T A T A A I Q K D G G D$
$K A K D G H A V A V K L N N D$ $K A K D G H A V A V K D N N D$
$V G G D G C C G V I V D A G D$ SINEAEALVVVKKY P
${ }^{P}$


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SEECATATAIKYSGD
DPDVTHGALLI RARVVGEGVGTVTRN

 KD DD DTNNMTINVEVTDGVGDVTKR $D P D A T H G A H M T A D V R P G V G T V T R E ~$
$D P D V T N G D H I R A E V G E G I G R V T L P$ $D P D V T H G L L V V S E V G E G V G R V T L P$ DPDITHRARIGAVVGKGVGVVTKP $D P D V T D G A V I R A T V E R G V G T V T R P$ DPDVTHGALVIARVGDGVGHVTKA DPDVTHGATVIATVGDGVGTVTKA $D P D V T T G L Y I Y S R V G E G I G T V T K E$ DPDVTHGAEIVARVGEGVGTVTKP
 $D P D A T H G M A L R V T A G L G V G R V T K P$
 D A


THRAAMS
$T$ D G $\ \square$
 $D V T R G M E I \quad D S E V G D G V G R V T K P$ $P$ DVVT D G A H L TA R V A W G V G T V T K P
 $P D A T H G A H L T A D V R P G V G \square V T R E$
 $\begin{array}{llllllllllllll}N & G & L & L & C & C & R & V & G & E & G & V & G & M \\ N & V & T & L & P \\ N & H & E & A & H & V & G & K & G & V & G & Q & V & T \\ L & P\end{array}$
 $T H G A E I I V A V R R G V G T I T Q P$ TH GLLI FSTVGEGVGRVTEV
 $T D G G L D K A A V G E G V G T V T M P$

 $T H G A A E I D V T A G R G V G M V T R P$ $T R G G L E V V A R A G E G G I G \backsim V T R N$ סססס エ ロロロー



 $P$ | GTY |  |
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I G V $\begin{aligned} & \text { GR } \\ & \text { V } \\ & \text { G }\end{aligned}$ | $R$ | $T$ |  |
| :--- | :--- | :--- | :--- |
| $R$ |  |  | K A

K P
L P
 NG
R ME FV $V^{\mathrm{V}}$
$\begin{array}{ll}1 & H \\ A & R \\ A & R \\ A & \\ A & A\end{array}$ TLI
S P EKQDCMVRKDSGD
A WVRACAGVVKDGGD
SKCEARCSVIKDGGD

AEKGVQATVIKDAGD HDDHAHAMVIKFAGD | DDRRVCAAVVKDAGD |
| :--- |
| $D D N Y A L A S V L K D G G D$ | EGNQVRGVVIKDGGD ADGAVRAEVLKDGGD

HDHSAHAMVVKFAGD
HLHAASATVIKDGGD HQGKATA IVVKDAGD KEGEVDC GVRKDAGD EKGAVTCFVRKESGD GESEASAFVIKDAGD EENTALATITRSDGDN N
N
N A A AVGEG

E G C F A L A V T R S D P G D N
TKDYATATVVKDGGD
EWD A GRAYV EK D A G D
E ESWAECAVRKDAGD
EDEWCAASVRKDAGD $E \quad E Q V C R G A V V K D A G B$
$E G K D G K G T A H K Y S G B$ $D$
$D$
H GRAHAMVVKAGB
GRRREDCAVRKDAGD

| $E$ | $G E S$ |  |  |  |  |  |  |
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| $D$ | $V$ | $K$ | $A$ | $T$ | $I$ | $K$ | $D$ |

D GQS I DCTVVK DAG D
DGYRGQAS CRK DA G D Y


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UniRef90-H7EII3
UniRef90-Q2NHX5
UniRef90-A0A023X0X8
UniRef90-W6KE18
UniRef90-R5NT19
UniRef90-A0AO11NX23
UniRef90-H1HS16
UniRef90-E3DP27
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 GHELPLGEAAINPVPRQMI
 GLPVPVGEPAI NPVPRAMI ROAVASVAGTAGGAAVTISI







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 G GLEI GEPAINNVPREMDTHELRN

GI G R A S G Q P A


| $G V$ | $G Y$ | $K$ | $I$ | $G$ | $D$ | $S$ | $A$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $G$ | $A$ |  |  |  |  |  |  |
| $G$ | $G$ | $L$ | $E$ | $V$ | $G$ | $G$ | $A$ |





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UniRef90－S5ZMY0
UniRef90－H7EII3 UniRef90＿Q2NHX5 UniRef90＿A0A023X0X8 UniRef90－W6KE18 UniRef90－R5NT19 UniRef90＿A0AO11NX23 UniRef90－H1HS16 UniRef90－E3DP27 UniRef90－B4S8C4 UniRef90＿UPIO00378F2A4 UniRef90－D7EAL9 UniRef90＿LOD9D4 UniRef90＿UPIO0041F4161 UniRef90－Q12VD1 UniRef90＿A0A010ZL49 UniRef90 E3GYU9 UniRef90＿A0A016QSG2 UniRef90－IORAT6 UniRef90－F3Z2C3 UniRef90－LOL211 UniRef90＿UPI000377DA45 UniRef90－D5E8M2 UniRef90－A4FWX4 UniRef90－U2KV84
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UniRef90 F9ZBN2 UniRef90－A3CSU7 UniRef90＿KON1Y3
UniRef90＿R5C532

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$R G D L I R C T D K V V L T T G R D G M K Y S H M L I F P D Y T V V M V G S R \prod S$ S LAVELKQKKLYFVFGNNGRDRLLELGKEEQII RMSNFVG TVALACGCRTLVLSTGRTSEALAGEHLREEACVMMGDHVG SI RQSIQCSEIVLNSGSKSETFLRADLPEDAFVHYGNWI G SLRDELSMCRCALVTGYSGETYLKQTYPNCGIVLCSNYLG S A ARAAGLGHVAACTGDTSEKAARYGLPEHALLDDMGDFAG T A A A A RD HTLVFTTGRRSERFAMDMFPEEAFI QTGDFFK SI HQAVDVARVACCTGGTSERVARERYGLDEMVEMGDFFG S I S I E MNLHRII LTP GDYGEDFLTQTLSNKQQVQMSNFVG SUA I QNGFENLVFVPGNDGTKYAKSVLNEDQQI EVSNFWG SVAARQGQTSVVFTTGGRTEKFAMRQLPEDDFVQMGDFVK SI RQANGCTTLALTSGDRSERHLRALYPDLDEI HYGNFGG SVARACGCDHVVLTTGRRSERFSQNHLHPEAF Q Q SVAVANGCDHLALTTGGRSERVAQEELPEEAFIQMGDFAG


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 T I Y Q 1 DEVATMVLTTGGRTERFTQAQLPEACFVQMGDFLQQ SVALANGYKDLLFVPGNDGTRDAKEKLVEDEII EMSNFVG SVVQAVDVDTFVLSTGGLTERAAMRLLPEDEPVCFGDFTG


 S L AVA L K Q K K LI F V F G N H GK K I A K A G F K E E R II R M S N F V G SIA RTIRRVTHLVACAGARSEKLLRRMYPDTAFIMYGNRVGG DVSLAAGVECIGFSTGRRSERLLMEADPDDAFVQAADFVQ



 $S V E V Y A R V D A V V F T P G K L G R D Y A R D T D P P Q A V V Q M S N F V G$
 KEDLIRSADKVVLTTGRDGDRYSTMLFPGYTVVLAGSRDS SVVQGVQVA AVALTTGGRTESFAMATLPAACFVQMGDFLR K GDLIRCSDKVVLTTGRDGDRYSTMLFPDYTVVLAGSRGS SVALANNFKNLI FVPGNI GTKHAKILLNEDQI I EVSNFWD


 S I RREMGVEHLVINSGGKSERWLRAHFPDDAFVQYGNFIGG SVARALGHRRACLSTGRRSETLLMRRYPDLAFVQAADFVG

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


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



 T I R L A C G I K D P I L V P G H I GA R A A E R H F R E H Q L V E V G N E WG


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



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EGLDNAGDI। ICGLPGLVLKWG
F M L E Q S S E I I I F G H G K I V K V A G G $\quad$ Y F N T H S K K A $\quad$ D GRK E Y A L R A C A R KV L A GFA K L L K I A C G H E Q T H V S S S E L D L R L L A
 YLLDCAEEMLLAGIGKLIDKPANDMYLHSHTA
GTLLK H P I P R L T L G F A K F G K L A R GLL LD L H S K R G S V D D D WLA A A D A A V K I Y TVV F F GK A V K M A L G F E H THAAA K S E L T L K R L A
 YVLKETQRVLIVGLGKMIKVAGGDFSTHSK DADARAE


 $M S M E C L A E H L A V F F G K A L K M A Q G V A H T H A A K S D L D M D C W L A$ $\square A L K H C A Q K L S G M M G K F S K L A A G H M N L H S K G S Q V D F E F L A$
 GLLLKHPVPRLTIGGAKMTKLAQGALDLHSSRSQIDDNHF F AVKRAVKVI IA GMGKワSKLAD GNMDLHSSKSSVNFDFLA Y A I Q Q C A K K I A G F DGGK L A K M A A G K K Q T H V K G S K V D M A F L A
 YAMSAAVKVVI GGMGKLTKIA QGETITHAGRAEVDT GLLAA

 F A L K Q C K R V S L A GM G K F S KV A Q GVVMMV H S K S A PV D F N F L A D F L D M A V E V L L VG L G K L VK I A G G I M NTHSRNA D SRME P ALEAVVNVVI GGMGKLVKMA QGERNTHAGRNPVNMGLVA D GL T Y AKNI TL LGHGKFAK LA IG GIFNTHN RTA DTRME
 Y MLE EA HKIT LIFGHGKLIKIIAAGI FNT K Q S V VADARRE
 A LFK YP F L C C A G GFA K MV K L A Q G NL N L H S S A S R V D M A A L A A AI K RHMRQVYVGVGKLTKMSQGLAVTHAWRAEVD E T L D A A V Q V L L A G H G K F V K L A G Gll M N T H S FMLVEAKEII I LGHGK IVKVAGGIFNTHSKKA DAREE S T L DM GF R NLTVVGLAK ATKLA Q GELDDLSSRTVGLNPQFDE F S L E S A A DKWS CF F G K L VKKL A Q GHA Y THAK T S P I D F VL L A E GLLEVA GDVI I C G L P G L I L K W W D GLR RAVERTVCGMGK L AKLLAT GQMQTHVAGGGVDVAF LA $H V L K E V Q K V L M V G H G K L V K V A S G T M S T H S K D S \quad D G R I D$ EFMES AGKVAI CGLP GLVLKWG
HLLDEGLERLLIGHGKLLKVAAGSFNTHNR
Y MLNEASKIVLLGHGKLVKI A GGDFNTHSK VADARRE A A L D H P LDPLLVVGHGKL AKV LN G DWNTHS GHSGMAMN VLA
 DAVAA A KDVI ICCGLPGLVLKWG
 EALEAA GDVI I C GLLPGLII KWG
 F MLLDRAA ERLI LGHGKLVKMAAGVFHTHN R R I A DARDE

 A A A E R G F E A L A W G F G K L V


 Y T I Q Q C A K KV A G F V G K L A K I A T GlV K Q T HVVK G S K V D M E F L S A AFRYGFKKI LCGWAKLLKCA

 FSMQQA KVRWA FI GK LVKHAMGFPYTHAKDWAID FNLLA Y A LDDAA QTALLAAGHGKL AKTDDGA WDTHSQRSPMAM








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 EALRAVGDAVICGLPGLI


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| UniRef90-D7EAL9 |  |
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| UniRef90-A0A059K182 | E ${ }^{\text {L }}$ |
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| UniRef90-C5DAN8 | Al |

iR
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MQDPVS GF $\square$ YPEEW $\square$ S DETERLLVSQGLAVLTSDGTIRR
NKPLKY EGRSLRR

$\square D T A L A G S \square P V L V I R R P P \square P H G L R K Q \square E T \square S P G F F L K T$ GKN $\underset{M}{L} R \mathrm{R}$

TGEHGLRRKVEQLLPDFYAQT
MRS
K EKKF
MRR
K K N L E E F Y E N Q LYYD $V$ S GKK L R R

R T
$\square R R$
MTQATALRR
IIKNGSKLKT
【RDPVSDFFYPEEWSGKCSSTEDLRDGLAVLTSDGNLMR $K R P M R S$

LQ G
L R S
MK F


S
M $\square \mathrm{DP}$ VTGFAYPESWCRDAEALAAAKSGFGVLTSGSVLRR F $\square \mathrm{Y}$ Y N GKK K K K

LRE
EKKNLRQ MQSDPARKTGLFVDHNHQKLRC $F \square N \nabla N N K K \square R R$
DAKAPE LIDERNSD RSG QESADRK $Y$ VYVEGKKYRR

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 EGTTTATSTVI KD G G D DGP R A C S
 ESCEATAGTT T G D A G D
 AHHSACATVI KDAGD TPGLAMAAVTKDAGD E ENIALLA IARSDPGD N $K K N N A L A D A R S D P G D N$ LDITRNTPVWAMVGERLTDRGGR
 K
 DAQTARAEVVKDAGD VS CEVVEAGTIKDGGD SYGESSATAIKDSGD $\begin{array}{lll}S & Q & Q A L A V V I \\ A & G & D \\ R & A & G \\ G & D\end{array}$ $R N Q Q A S C S V I K D A G D$
 $D G D C A H A V S I K D A G D$ T $\quad \square A R G T G E C R K Y S G D Y$ YPGDVVTA GLLVET SHE DEKCVVVVK DA G D D P DIITNGIVEIIAKA GK GDGIVVKK K
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TEAG $\square$ CAEVVKKSGD EHNKG!ATVTKDFS D
 $K K D G V T V Y S R K Y A G D$ E ENRALAADTRSDPGDN GGCEAQGWVFKDAGD DAEAAHAMVIKDAGD TDAGAYGEVIKDGGD
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 | $A P D G A E A A$ |  |
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CDGRAHAVS\KDAGD
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## UniRef90-UP1000 UniRef90-FOJX4

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 VCDRAVHAERVVLTTGRTGMRYARMLFPDHEVILAGSRLG STKCEIDVKYFFLVPGKDGERHDKSVKGDDPVVQVSNYFK TI DAA DDVETVVLSTGRTSEMVAEKHFGEESFIMMGDHAG LLAKAQQFRNLIFCVGENGLDLAVKMFNPQQLKTANWIGG Sil ARATGRAHVVGTTGATSERAALDHLGLDAVIDMGDFVG SIAKADGCETLVINSGAKSERYLRSLYPPQSFVHYGNFIG LAQKAKEFDTLVFCVGENGLDFARRQGVNQQLVKTANWLG SIHRAAGLKHVIAATGSTSEDAAQANLPEDALLDMGDFAG KVAKALGVKHLI TNSGAKSERHLKKLYPDQAFVQYGNF円G TY FTELDVTACCLVPGNYGEATARKLGPAEALVKTSNFLG TIARAAGLDHVVGATGSVSEAAAQALLPETALIEMGDFAG SVAATLPHGVVVLTTGGRTEKFAMAQLPATCFVQMGDFLR KI AKAQEFDSLVFCLGENGVDLAPKLGINQRIVKTANWI G SHAKSMDVARVVINSGAKSERFVRAYYPDLAFVHYGNF:G SIRREDEVREIGLVAGMKSEKALREER DDRCI HYGNFIG SVARANNYKKLIFTPGNTGTKYAKIKYGDDNCVEVSNFWS SIE EANNEDYFFLVPGKIGERHLKSMTIDTPCVQVSNYFD L
 SVEVEVEVVATVVLTTGGRTEKFAVAELPGLPFVQMGDFLR SIA RALGLLPHI AGSTGATSENSVRSLYSDPALI EMGDFAG TICLEDDRNILLTPGNYGRNAALEKFGDDDEVKDSNY GG SVAKEAGFSTLVFVPGKIGLLRSRYGLPREAVEVGKYME TISACMDVARMVISTGRTSEKGAQQLLPEEAYAMMGDYLQ LKVKAKQFDMLVFCLGENGGDGAKKQLIKTANWLSPLLIT SIARGGGYETAVLAPGSLGERSDLNLDPKDQVIQDSNFVG DVVKEKGYTTVVMVPGNDGETAARKLLNVDPIVQMADFVG SIHRANAAEHLAACTGNSSETFDQYQLPEMALIEMGDFAG SVAAAQGQTTLVLTTGGRTEQAAMGAFPEVCFVQMGDFVK T:AKASNANLISLSTGGKSERYMRRKLPDSSFIQVADF: K SIRKCMTVARVVINSGGKSERFVKALYPELAFVEYGNYIG LAEKAKKFDNLVFCDGENGLDLAVKLYNSEQLVKTANWLG SLIDQAVRVAAIVFSTGGRSEQAAQSDLPEVCFVQMGDFVK VSERIAGAKNVVDTTGRMGLRYSRLLFPEYEVVLAGSKUS SVTQALSVARAVFTTGRKSERLYLDLYPDTPEVQAADFFG SVVKTYGDDQVVLVPGNDGETSARRKLNVDSGVQMADFTG SVVQA EVYTVVLTTGGRTEKCAMRSFPEACFVQFGDFVK SFSLELNLKCVGLCFGNSGEKAMRRVWNDGGRVGMGNY: G SUAKASGCEHVVITTGGRSEKYGDKEYPEEAFIVEMGDFVG TTRTELNARHIVVAPGNYGERFAKEMLNTDEMITFSNFVG ELKASSHSTTLVECVGENGGDLARGLGMNERLVKTANWLG LKAKTKQFDSLVFCVGENGLDLAKKQGDDNQLI KTANWLG TIALSMGNGDMI LTPGNYGADYIKNNDLDVPVVQMSNYVG SIKKAQGYKQVVLVPGNDGYNTMVKHFNEDMVVKMSNFIG SVRQGVEVAKLI LTTGSRTEKQAMILHPDDAFI QVGGDMG TFRKASQFETLVFCDGENGLDLARKLGDNEQLVKTANWLG SMVRALGYDEVVFAPGKDGQDIARYHLPTETVIQTSNFIG TVRQAQGERAVCFTTGRBTERYCMETLPDLCFVQMGDFVG ELQAKRHFHCLVFCDGENGLDLASKRLVKTANWLGPLLVE DVAKALKCERIVINSGAKSEKFVKSHYPELPFIHYGNFIG SIAKQNGQNHLVLTTGSRTEKSAMAMLPSMCFIQAGDFVG TI YMEMDMSNIILVPGNYGEKDSDTLGLSEARVK DSNYIG DVVRSFG[DYVVLVPGNDGETSARKKLKVDSIVQMADFTG DVARAAGIEHVAGSTGRTSEQAVQAQLPDEALIDMGDFVG SLAKEKGCTGUVLTPGNYGQTFIATHIPQDCVVTTSNFIG SI AQALNVDNIVETTGRRSERFYMEHHSETNMVQAADFFK

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FSLEEAGRKGFAGMAKI IKAALEVPQTHVRNGRDADARLE AATEKПNS LLEGHGKLIKLAGGLFHTHHHDA DGRDE FMIDLVAQLLVLGHGKLAKLPLGHWDTHSSRS GMVKAAKEIVLMGHGKMVKNADKDWNTHYK SGGDGR E

AAAERGFKE1 CFFGKLVKMAQGFSNTHAKHSGMNDEKL ETLKUALRSITLGUGKAVKLAAGHLDTHSKRATMDKAFIS SMLEQVKSIILLGHGKLIKLAGNDFHTHHHDA DARLE AAFRAAMRHLIVGVGKLTKMAQGLAVTHAWRADLD EALEAAKNAVICGLPGLI HACRTASEKWSLFFGKLVKQAQGFDNTHARQAE DDFSLLA
 AAI RHDDRHIVLGVGKLTKIAQGLSVTHAWREEVDRALIA FVLDEAERALICGHGKLDKVAAGTFDTYN RTGDGRRE VGLRASAKELVVMDGKLCKLACGTMMTHVTGRQVDFERLA ETI DMA ПDMLIVSHGK! TKVSGGIMNTHSH PLLVAAGELLLFGHGKLIKLAGGIFHTHHHDA DALEYDSDVLIAGFAKAVKLAGGIFNTHSH AAI EKVSSILLFGHGKLIKLAGGIFHTHHHDA EALDHAGRVLLVGHGKLVKLAASVMNTHSS YMLMEAEKVILAGHGKLIKLAGGIIFNSHS VGLRASVRKLVLMDGKLCKLVCGTMMTHVTGRAVADARNE PLLVEAKEILLFGHGKLMKLAGGTFHTHHHLA DGRRE HMLESAVQVLIFGHGKLVKVAAGAFHTHN FAVADARFE AALDAARDRVLVGAGKLAKMAQGLRVTHARKAPIDMARLA AAVQQVDAILLFGHGKLMKLAGGIFHTHHHLIA DGRRE ETVKLGFKYVTMGLGKAVKLAEGSLDTHSKKVVMNKVFL] VGLRAAKRTVVAMIGKLGKMVAGHMMTHVSGKAVDFSLLA GMLKAFKEVLLYGHGKLVKSAIGLWNTHYK KGQGDGRLE GMLKYPVPRVTVGVAK TKKLAQGFLDVHSRRGQADLAALA FSMQQAKVRWSLF $\square G K L V K H A M G F P Y T H A K D W A \ N F P Q \square S$



MK S
MERPSQRKALRS KKKLRS
$R G E N G F R H Q L E R L L P G F P D R T$
NTHPLRR
R S
R S
A L K E E G VLR R MAKAKK LR E $M L N$ S NGEHGLRRMVEKS $\square$ PDFTLHS


R H
$R T$
$R$
$R$ $R$
$R$

MKTAK】LKS
R $\square$
GKELRR

$K K R \square R Q$

LR R


## S

LK Y
$\square R R$
$R$
VVDPVTGYVYPEEWCASPDGLDLAASGLGVLTASGVLRR


M R F
R $F$
R $S$
$E L K G$
R S
S
$L I A D P V S G F S \square P \square S W \square E D P R A R E K \square L S G R W \square L S S G Q L L K R$
SNRPLKR
P D K P L K R
MS DFFVIKEGKRLRC

SKKLLKK
D G T
MTPSQP $\stackrel{E L}{\text { R }}$ Y
R A
MRG
APERP $\square K R$

UniRef90_UPIO004793BD8 UniRef90-UP100037867A5 UniRef90-E3CWUO UniRef90-E8RER3
UniRef90-M1PDW7 UniRef90-D4TNF5 UniRef90-H1DGz8 UniRef90-C7JHY4 UniRef90-QOBUD8
UniRef90 K9PE19 UniRef90-Q7MXH8 UniRef90-K9ZJR9 UniRef90-K6AM51 UniRef90-W7YHR9 UniRef90-B7K184 UniRef90_O314P1
UniRef90_K9QKS7 UniRef90-KgYK13 UniRef90-E6SSV1 UniRef90-E1JVJO UniRef90-B8GJl3 UniRef90-Q4JBL6 UniRef90_D1B7N9
UniRef90-C9RCUO UniRef90-K9XNTO UniRee90-UPI00047B37C2 UniRef90-UPI00035E1A70 UniRef90-UPIO00476F153 UniRef90-K2DC93 UniRef90- L8B128 UniRef90_UPIO004785857 UniRef90_W3ASE2 UniRef90-A0LK61 UniRef90-E4TKE1 UniRef90-F4B853 UniRef90-UPIOOO4720801 UniRef90- T1CQW3 UniRef90-UPIO002F4C8C9 UniRef90_19JEQ3 UniRef90-H6QAB3 UniRef90-G2JAK6 UniRef90-T2G794 UniRef90-K9TPW9
UniRef90
O96ZL3 UniRef90_UPIOOO4083330 UniRef90-A717N1 UniRef90-D4H1Z1 UniRef90-F5IXS8 UniRef90-T21HZ7 UniRef90-G1UTC7 UniRef90-Q8ZZB0 UniRef90-UPIO00365A3C4 UniRef90-F8X4A2 UniRef90-W5YD65 UniRef90-UPI00034C6A01 UniRef90-JoSoss UniRet90-D5VON2 2 UniRef90-R7EMK9 UniRef90- S7T382 UniRef90-UPIo00287DDB9 UniRef90-E6VQN8 UniRef90-A3MWC6 UniRef90-C3NOH9 UniRef90-B4WH48 UniRef90-Q1JZX2 UniRef90-UPIO004649026 UniRef90-EOUF99 UniRef90-UP10003B50DAC UniRef90_D3EN53 UniRet90-F4BURO UniRef 90 -M4Z5N1 UniRef90-S958J6 UniRef90-A0A017RXB1 UniRef90-Q9HKE5 UniRef90-K01G27 UniRef90-K9Z691 UniRef90-UPIO0034DBFB1 UniRef90-UPIo0031F982C UniRef90-M1 WW57 UniRef90-D5QB47 UniRef90-U2DCM9 UniRef90_UPIO00468DA16 UniRef90-UPIO0047698AO UniRef90-A0A024K8D7 UniRef90-UPIo003B4A57D UniRef90-A0YJ02 UniRef90-B0CF07 UniRef90-B1 $\times 1$ A2 UniRef90-F9N7A 1 UniRef90-H8GXZ9 UniRef90-HOTFP9 UniRef90_UPIOOO3661F30

 GYTTGACAAAASKAAALLLFTGVENVEIPFPDGSRVKFSI GYTDPVFACGGADAALYWLRHCRADVDLTSPDGQVEMPIV GWTTGSCATAAAKAAWLMLNGHPACVNITLPAGQQVGFAI
 GYT पPVFACAAAVAALHWLR GFTTGTCVAACAKACCTADMEGQAWVEVVLPSGEKVRLPV GYTDPVFASASADAALRYLQEEVEKVWLNLEPAQRVEIE GFTTGTAASAAAAAVKLLDTGSQAVSVAPNDQRLTVPV
 GFTTGTTAAAAAMAAVLSGDGVPGTVDVPLPNGSRMSLAV

 $G Y T T G A C S A A A A R A A V Q G L G H V P D T$
$G Y T G V F A V A A A K A A L M H L Q Q K D D T$ GYTTGSHATSALKAALFALFTGNTE
GYTTGSCAAAAATAATQA $\square$ GAPVESVT $\square$ D $\square$ PNGMRASFE $\square$
GFStGTAVTAAAVAALRLTGRAVE\|VAVRLPNDVFLPVAV GDTTGAVAAAASKASVIVLGEKPDKVVVPTPGGDR:MED
 GFTTGTCAAAATQGADWLLAGQPLPATVTLPDGKRAHLPM1 GITTGLAAAAAAKAAALAAGVEA GYTTGTCAAAAVKAALGLLLRGLR GYTLPVFAVAAAKAALMVLS

GWTTGSCATAATRAAFEGLGHFPDPVTV GYTTGTTAAAACKAA LLSAGDDSRVTI GFTTGSAATAAAKAHFlSTGVKP GYT $\square P \square F A C A S A \square A A \square W H \square Q N K S D$
GПTTGLAAAAAAKAAAYSKGIVPKSVTVPTP $\square G \square R V E V F V$ GFTTGANAAAAVRAAVLGLLQGPATVESRLPNGQRLFTV ENQTKISTLPNGEWI KLSI GWTTGSCATAAARAAWNGLCGFPDPVT TLPGGQHVAFAL GFTLSVFATASAKAALQSLLDRQQTVTLDLDDGNVGEVEV GLTTGAHAFLLDCSALTDFFERKKL
GLTTGTCAAAAAVAATWYFKKRPTEFPVVLPNGETDQVPV

LLTGARPATFMVPLPPGGHLEVPV GПTTGLAAAAAAKAAAFALGERPRAVVVPTPDGLRIEVPV GITTGAAASAAAKAAVIGLLEKRNTVVIPTPLGLRLEIPV GYTLPVFACAGA
 GYTLPVFACASSTAADFRTGFPNPVTITLPRGETPSFAL GILPVFACASSI AALFRLQNRLDLVEITVPITNQVVK GLLTGTTAAAAAKGAVVSLVRATESLEVMTPAGIPVSVSV GWTTGSCATAAARAAYELLGNCPTMVEVADPGGRRVSFAV GYTTGSCAAGASKAAAQMLMEKVDKI QDTPAGISTSTKV
 GYTLPVFACAAAVAALRWLKHGAQPVNLDPA GYTLPVFACAGAVAALRCLRDRPASVSGDLPADI GWTTGSCATAAARAAWMRYGDFPDPVTITLPAGQEVAFS
GYSTGMHASFAFSLALESTLITKDVVHVKTNKMDNDDLDV GYTLPVFACAAALAALKHLQRP爵TVSLPLPETATDAIEL GWT GGACATAATRSALLALGQFEDPVT TLPGGQQPAFAL GWTTGTCASVSAKAATYALLGK円KKVEVSLPKDQKACLETM GYTLPVFACAAA!AALHHLYDAPSQVTLDLIJN Q Q GWTTGSCATAAARAAYELLGTCPAMDD TLPGGEFVLAR

\section*{UniRef90 UPIO004793BD8} UniRef90-UPIO0037867A5 UniRef90-E3CWUO | UniRef90-E8RER3 |
| :--- |
| UniRef90 M1PDW | UniRef90-D4TNF5 UniRet90-H1DGZ8 UniRef90-C7JHY4 UniRef90-QOBUD8

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UniRef90 W7YHR9 UniRef90-B7K184 UniRef90-Q314P1 UniRef90_K9QKS7 UniRef90-K9YK13 UniRef90-E6SSV1 UniRef90-E1JVJO UniRef90-B8GJJ3 UniRef90-Q4JBL6 UniRef90_D1B7N9
UniRef90-C9RCUO UniRef90-K9XNTO UniRef90-UPI00047B37C2 UniRef90-UPI00035E1A70 UniRef90-UPIO00476F153 UniRef90- K2DC93 UniRef90 L8B128 UniRef90_UPIOOO4785857 UniRef90_W3ASE2 UniRef90-A0LK61 UniRef90-E4TKE1 UniRef90-F4B853 UniRef90-UPIOOO4720801 UniRef90-T1CQW3 UniRef90-UPIOOO2F4C8C9 Uniinefool-l9JEQ3 UniRef90-H6QAB3 UniRef90-G2JAK6 UniRef90-T2G794 UniRef90-K9TPW9
UniRef90- Q96ZL3 UniRef90_UPIO004083330 UniRef90-A717N1 UniRef90-D4H1Z1 UniRef90-F5IXS8 UniRef90-T21HZ7
UniRef90 G1UTC7 UniRef90-G1UTC7
UniRef90 O8ZZB0 UniRef90-UPIOOO365A3C4 UniRet90-F8X4A2 UniRef90 ${ }^{-}$W5YD65 UniRef90_UPIO0034C6A01 UniRef90-JoSOS9 UniRef90-D5VON2 UniRef90-R7EMK9 UniRef90_S7T382 UniRef90-UPIOOO287DDB9 UniRef90-E6VQN8 UniRef90_A3MWC6 UniRef90-C3NOH9 UniRef90-B4WH48 UniRef90-Q1JZX2 UniRef90-UPIO004649026 UniRef90-EOUF99 UniRef90_UPIO003B50DAC UniRet90-D3EN53 UniRef90-F4BURO
UniRef90 M4Z5N1 UniRef90_S9S8J6 UniRef90_A0A017RXB1 UniRef90-Q9HKE5 UniRef90-K0IG27 UniRef90-K9Z691 UniRef90-UPIO0034DBFB1 UniRef90-UP100031F982C UniRef90-M1 WW57 UniRef90-D5QB47 UniRef90-U2DCM9 UniRef90-UPIO00468DA16 UniRef90-UPIO0047698A0 UniRef90_A0A024K8D7 UniRef90-UP10003B4A57D UniRef90-AOYJO2 UniRef90-BOCFO7 UniRef90_B1X1A2
UniRef90 F9N7A1 UniRef90-H8GXZ9 UniRef90-HOTFP9 UniRef90_UPI0003661 F30

649026

$\qquad$

LWEGAEAAVICKDAGD
DPDITHGSEI RVRLRWGVGTVTLP EPHSALALTRSDPGDN DDTR
 GKQ EESGALAITRSDPGDN
 ADHRAMAGVIKDAGD DPDVTHGAM RATVRDKAGDVRA SENMALAGTHSDPGDN LDDTRDTPLVALVRERAGGVKGGE SENSALADTRSDPGDN LDDTRNTPI WAMVEWFKGUKGGE DSDSATCSVIKDAGD DPDVTNGSMIVANVGPGVGTVTLP

## E

## S

S A C S RTAAVVK D G G D D D P
$E A N Q A L A D T R S D P G D N$ GK S QA LA A TRS D P GE N
E P QRNSATVIV D A G D D EGDGAAACIIKDGGD DPDATHGARIGCRVGEGVGRVTMP TTHAGVAVCRKYSGDYPSDVTSGLAAI RAEAMPADQTSAGE KESEFCASAKKFSGDN PDILDGLEI DATAEEGVGTITRP GGCEAQAWVFKDAGD DPDVTTDRMA AAKVGHGI GLVTRP
 E E D R A H A V I EK D A G D D P D C T H R A R L TAA DV GA G I GL DT R P


TQDGARCC $V$ V DAGD D
TACFAVATVVKDSGD TAKNNVAGVKKWGGB E E G K K K C A E V

[^0]




A DGWARA GVVK AGD





 $\begin{array}{lll}N & P \\ D & S \\ D & D & L \\ D & D \\ D & D\end{array}$
 E K V
 $H$ Q NK S LAATESNPGDN
KAEN GYCNARK GGD H Q
N
$D$
$D$
$D$
$D$

 AMHEATAGVIKDAGD
 EMMKGDAAMVRKFSGDN
E GNKATCAADKD GGD
 D
N
N



UniRef90＿UPIO004793BD8 UniRef90＿UPIO0037867A5 UniRef90－E3CWUO UniRef90 ${ }^{\text {ERRER3 }}$
UniRef90
M1PDW7 UniRef90－D4TNF5
UniRef90 H1DGZ UniRef90－H1DGZ8
UniRef90 C7JHY4 UniRef90－QOBUD8 UniRef90－K9PE19 UniRef90－K9ZJR9 UniRef90－K6AM51 UniRef90－W7YHR9 UniRef90－B7K184 UniRef90＿O314P1
UniRef90＿K9QKS7 UniRef90－KgYK13 UniRef90－E6SSV1 UniRef90－E1JVJO UniRef9－B8GUI3
UniRef90＿Q4JBL6 UniRef90－D1B7N9
UniRef9O＿C9RCUO UniRef90－K9XNTO UniRef90－UPI00047B37C2 UniRef90＿UPIOOO35E1A70 UniRef90－UPIO00476F153 UniRef90－K2DC93 UniRef90－L8B128 UniRef90＿UPIOOO4785857 UniRef90－W3ASE2 UniRef90－A0LK61 UniRef90－E4TKE1
UniRef90－F4B853 UniRef90－UPIOOO4720801 UniRef90－T1CQW3 UniRef90－UP10002F4C8C9 UniRef90－l9JEQ3 UniRef90－H6QAB3 UniRef90－G2JAK6
UniRef90－T2G794 UniRef90－K9TPW9 UniRef90－Q96ZL3 UniRef90＿UPIIOOO4083330 UniRef90－A7ITN1 UniRef90－D DH1Z1 Uni Ref90－F5IXS8
UniRef90－T2IHZ7 UniRef90－G1UTC7 UniRef90－Q8ZZB0 UniRet90－UPI000365A3C4 UniRef90－F8X4A2 UniRef90－W5YD65 UniRef90－UPIOO034C6A01 UniRef90－JoSOS9 UniRef90－D5VON2 2 UniRef90－S7T382 UniRef90－UPIO00287DDB9 UniRef90－E6VQN8 UniRef90＿A3MWC6 UniRef90－C3NOH9 UniRef90－B4WH48 UniRet90＿Q1JZX2 UniRef90－UPIOOO4649026 UniRef90－EOUF99 UniRef90－UP10003B50DAC UniRef90 D3EN53 UniRef90－F4BURO
UniRef90
M4Z5N1 UniRef90＿S9S8J6 UniRef90－A0A017RXB1 UniRef90－Q9HKE5 UniRef90－KOIG27 UniRef90－K9Z691 UniRef90－UPIO0034DBFB1 UniRef90 UP100031F982C UniRef90－M1WW57 UniRef90－D5QB47 UniRef90＿U2DCM9 UniRef90－UPIO00468DA16 UniRef90 UP100047698AO UniRef90＿A0A024K8D7 UniRef90－UP10003B4A57D UniRef90－AOYJO2 UniRef90 BOCFO7 UniRef90－B1X1A2
UniRef90 F9N7A1 UniRef90－H8GXZ9 UniRef90－HOTFP9 UniRef90＿UPI0003661F30






7D

G OUPAGO
140
150
SQRGAELLEVISII
$\qquad$ S
160

GLAVAVGEPA：
 GLGLEDGAPAINPVPRRMMEEELRKLQSFYKQGIDIMLTVV G G V
GLGLVGGPAI
GLGREVGGPA：N

GLPIVPPGEPAI NPEPRRQIAAAVLEQCARHGYGVEVTICLV
GLGKADDQPAIYSYAQRLLQENLQRMLTQGEKITVTITL GVGKQNNKSAIYSYAQKLLECNILNNLKSSAGVVEVKI I Li GLPVPVGQAAI NPAPRQQI DAALTEAARQCGYGGGLVVTV G｜GRYVGEPAISTSAEACILQAIRDAGGDSCKGASVKLSV GLKGDVGDKS：SPPDAKQMILDAVKEVVSS CGGVYVKLYV

GLGRLGSAA NTAPRLM｜MQE GLKKVETGEPKA I

オーエ

| $G$ | $L$ | $L$ | $E$ | $I$ | $G$ | $G$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $A$ |  |  |  |  |  |  |
| $G$ | $L$ | $A$ | $G$ | $E$ | $P$ | $A$ |  |
| $G$ | $R$ | $T$ | $A$ | $G$ | $N$ | $P$ | $A$ |

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G

G
G
G
G

## G



คロ
$\begin{array}{ll}G \\ G & G K A \\ G & \text { G } \\ \text { G }\end{array}$
$G L P V A V G E$
$G L K \square Q P N F \stackrel{A}{P}$
GIGHHOGAAI


 GLALLLVGEPAINPGPRTMISYVFEELVPK GMGUHVKVSV


UniRef90 UPI0004793BD8 UniRef90_UPI00037867A5 UniRef90_E3CWU0
UniRef90 E8RER3 UniRef90_E8RER3
UniRef90_M1PDW7 UniRef90_D4TNF5 UniRef90_H1DGZ8 UniRef90_C7JHY4 UniRef90_Q0BUD8
UniRef90 K9PE19 UniRef90_Q7MXH8 UniRef90_K9ZJR9 UniRef90-K6AM51
UniRef90- W7YHR9 UniRef90_W7YHRs
UniRef90_B7KI84 UniRef90-Q314P1 UniRef90_K9QKS7 UniRef90_K9YK13 UniRef90_E6SSV1 UniRef90-E1JVJ0 UniRef90-B8GJI3 UniRef90_Q4JBL6 UniRef90_D1B7N9
UniRef90_C9RCU0 UniRef90_K9XNT0 UniRef90_UPI00047B37C2 UniRef90_UPI00035E1A70 UniRef90_UPI000476F153 UniRef90_K2DC93 UniRef90-L8B128 UniRef90-UPI0004785857 UniRef90-W3ASE2 UniRef90_A0LK61 UniRef90_E4TKE1
UniRef90_F4B853 UniRef90_UPI0004720801 UniRef90_T1CQW3 UniRef90_UPI0002F4C8C9 UniRef90_I9JEQ3 UniRef90-H6QAB3
UniRef90_G2JAK6 UniRef90_G2JAK6
UniRef90_T2G794 UniRef90_K9TPW9 UniRef90_Q96ZL3 UniRef90-UPIO004083330 UniRef90-A717N1 UniRef90_D4H1Z1 UniRef90_F5IXS8
UniRef90_T2IHZ7 UniRef90_G1UTC7 UniRef90_Q8ZZB0 UniRef90_UPI000365A3C4 UniRef90_F8X4A2 UniRef90_W5YD65 UniRef90_UPI00034C6A01 UniRef90_J0SOS9
UniRef90 D5VON2 UniRef90_D5V0N2
UniRef90_R7EMK9 UniRef90_S7T382 UniRef90_UPI000287DDB9 UniRef90-E6VQN8 UniRef90_A3MWC6 UniRef90_C3NOH9 UniRef90_B4WH48 UniRef90_Q1JZX2 UniRef90_UPI0004649026 UniRef90_E0UF99 UniRef90_UPI0003B50DAC UniRef90_F4BUR0 UniRef90-M4Z5N1 UniRef90_S9S8J6 UniRef90-A0A017RXB1 UniRef90_Q9HKE5 UniRef90_KOIG27 UniRef90_K9Z691 UniRef90-UPI00034DBFB1 UniRef90_UPI00031F982C UniRef90_M1WW57 UniRef90_D5QB47
UniRef90_U2DCM9 UniRef90_U2DCM9
UniRef90_UPI000468DA16 UniRef90_UPI00047698AO UniRef90_A0A024K8D7 UniRef90_UPI0003B4A57D UniRef90_A0YJ02 UniRef90_B0CF07 UniRef90_B1X1A2
UniRef90 F9N7A1 UniRef90_H8GXZ9 UniRef90_H0TFP9 UniRef90_UPI0003661F30

Pr

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1

P

PGGVELIAARTFNPR|LGV|RGG|L|VLGTTGR|V/RPFSDEADKA PEGRQLAKRTSNEAFGVVEGLSLLGTSGIAHPLSAPDQLE
 RDGEALAEKTLNRRLGVIGGLSLLGTTGIVRPVSAKAWTD
 PGGKELAALKTFNP K L
 PEGREAATQTFNPRLGIRDGIS GRSALRTSNAAFGVVEGL PGGEELATRTFNPKLGIVGGISIIGTSGIVRPFSADAFIA
 PEGRELRAQRTSNEAFGVVEGL PFGRSLAVRTSNAAFGVVEGL
$P E G K I L A Q R T S N E A F G V V D G L S L L$

## EGGEAI AKRTLNPRLGIVGGI

 PEGERVA PGGEEVAARTFNPRLGVGG1
$P F G R Q L A Q R T S N E A F G L E G L$ $\begin{array}{lll}P E G R Q L A Q R T S N E A F G G L & G G G L \\ D D G A R I A E Q T W N P R L G G I & G G G\end{array}$


 P E GE E L A K K T F N P M L G I E G GI S I L G T T G I V E P M S E A S I VA
$P K G R E I A R H T L N P R L G V V G G I$

PA GAELAKRTENPKIGGIGGG


 E N G E K L $\quad$ A PEGRTIADOTLNPRIGIEGGISVL
TNGEE:ALKKTNPKLG|VGG|
PQGAEIARHTFNPRLGIMGGI
$P D G K L A B E K T M N P R G I V G I$ P Q GEAMAK K T LIN D RLGGI I G GI S I L G T T G I V A P P Y S T A A F R A




## $P$ S P <br> P

## P

PEGRRLAENTLNKMVGIVGGU


## P

## P

P E G V
P

S 1

PEGKKLAEKTSNSAFGVL
PQGRELATRTSNEAFGIVGGSGGTSGSQP SKYEE PEGRALGDRTSNAAFGVIEGLSLLGTSGMAAPLSDAYCED PEGIQLAQRTSNEAFGIL

\section*{A} SDGEVI AKQTANEKVGVLG RDGERIAQKTWNPRLGLLG | $P D G R E R A K K T M L E R L G V I$ |
| :--- |
| $P E E G R Q L A K R T S N E A F G V V$ |
| $P$ |
| $P E G R A$ |

PEGKKKAKRTSNEAFGGVI E
PAGETLARKTLNGTLGI EGGI
VDGEAI ARRTFNPRLGIVGGI

 UniRef90-UPIO0037867A5 UniRef90-E3CWU0 UniRef90_E8RER3 UniRef90_M1PDW7 UniRef90-D4TNF5 UniRef90-H1DGZ8
UniRef90 C7JHY4 UniRef90-Q0BUD8 UniRef90-K9PE19 UniRef90_Q7MXH8
UniRef90-K9ZJR9 UniRef90-K6AM51 UniRef90-W7YHR9 UniRef90-B7K184 UniRef90_Q314P1
UniRef90_K9QKS7 UniRef90-K9YK13 UniRef90-E6SSV1 UniRef90-E1JVJ0 UniRef90-B8GJI3 UniRef90_Q4JBL6 UniRef90_D1B7N9
UniRef90_C9RCU0 UniRef90-K9XNT0 UniRef90-UPI00047B37C2 UniRef90_UPI00035E1A70 UniRef90-UPI000476F153 UniRef90-K2DC93 UniRef90 L8B128 UniRef90_UPIO004785857 UniRef90-W3ASE2 UniRef90_A0LK61 UniRef90-E4TKE1 UniRef90-F4B853 UniRef90-UPIO004720801 UniRef90-T1CQW3 UniRef90_UPIO002F4C8C9 UniRef90-19JEQ3 UniRef90-H6QAB3 UniRef90_G2JAK6 UniRef90-T2G794
UniRef9-K9TPW9 UniRef90-K9TPW9
UniRef90-Q96ZL3
UniRef90_UPIO004083330
UniRef90_A717N1
UniRef90_D4H1Z1
UniRef90-F5IXS8
UniRef90-T21HZ7
UniRef90-G1UTC7
UniRef90-Q8ZZB0
UniRef90_UPIO00365A3C4
UniRef90-F8X4A2
UniRef90- W5YD65
UniRef90_UPIO0034C6A01
UniRef90-JOSOS9
UniRef90-D5VNN2
UniRef90_R7EMK9
UniRef90_S7T382
UniRef90
UPIOOO28
UniRef90-E6VQN8
UniRef90-A3MWC6
UniRef90_C3NOH9
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$T \| A V A L D Y R K V A L V P G H D G E K A A R T H F G P E Q \mid V V E V S N E W G$ LFRKARRFDTLVFCIGENGLDLAAKMGIETANWIGSLLVE
 TI ATSMDVAKIILATGRTSERAVQEMLPEEAQIMMGDYLH VFRKAKEFNSLVFCDGENGLDLGRKLGDNQRMVKTANWI G TIRKALGCKHIVINSGAKSERIVRERFSELAFVHYGNYIGG Si ARAEGLTHLAGSTGNVSEKGVQKNLPDSALIEMGDFAG SIAARASGLRHI AGSTGHASEQAVKKLYPDTALIEMGDFVG AFRKASQFDSLVFCDGENGLDLAPKUGDNERLVKTANWLGG AFRKASQFETLVEC $\square G E N G L D L A Q K D G \square N Q Q L V K T A N W L G$ S $\square$ AKA $\square$ GCRTLVINSGAKSERYLKARYPEDAFVHYGNFIGG SI RQESTCGEVVLTSGKRSENRLKEHLPSVAFI HFGNMVGG LKLKARKFDTLVFCVGENGLDLAQQMGDNEQRVKTANWLG TIVQGMKVARVYLSTGRRSERLLMQLHPETAFVQVADFAE
 SI HKSMEVAHIVISSGAKSEKYIKAYYPDLAFVHYGNFIGG SIAKALGHGTVGFSTGRRSEAFLRSLYPDLPETACFALAE
 TI GAELSVLRVCLAPGNYGRDVAVRLGPVHRVVNVSNYVG SLKAAVNVRILVLVPGRSAEKLALSYFPAEAVVPMANYVGO AFRLDLQHANLVFCLGSNGMHVAKQLIPEETIVQTGNWIGG

 | $E F R L Q$ |
| :---: |
| $S$ |
| $S$ | SLAAEI NVKNIVFTMGNSSLKLAQNNYPENDVVEVGNFVF SVAKALEI NEVVLTTGGKSEQYAMNLLPEEAFI QVGDFVG AV DQQA HHLERVVLTTGSRTEKYAQRLFPDLDPEVFTGAGLR TI ETE $\square R Q K L L I A V P G N Y G K R Y A E E L F D P G R C V T V S N Y I G$ $S V A A A C G C R G V V L S T G G K S E R L A R S L L P E E A F V Q V A D F V R$ SFKDAQRYNFLWIVPGNDGEKCLLQENDTPSVMVSNYFK

 SI ERAVDI DTIVINSGGKSEYKMKEMYPHLPFVQYGNFIGG SVVLATNHDQVVLVPGSRSKQWADQYFPSES IVV DGRF L G
 HVKAELKADSVALAQGNQSAEGSRRLFGNADVVKTGDLVG SI EVVI RVAAI ALLMPGK DGREYARSGLPDARSVQIANFVG

 DVARASGFTHVSAATGNTSEQAAKALYDDVQLI DMGDFVG VI ARVAGATDPVITTGRVGLRYARLLFPDREVVLAGGKIGK TI A CEI DDVEEICLVPGKIGEKHLQKLMPEVQTVIMSNYAG SIRREMGCERVVINSGAKSERFVKQRYPDLAFI HYGNFIG SREKAKQSDTLVFCDGENGENLAKQMGDKEQN KTANWLG T 1 A QATGCRTVVCLSTGRRSEKLLMARYPELAFVQAADFAE HI EAELSALRALLAQGNTSYKAAQAVFGDVVVVKDGDMVG SVAANQGQDTVVLTTGGRTEKFVQHTFPELPIVQMGDFLG SI RREMQCKNVVVNSGAKSERFVKQQYPNLAFI HYGNFIGG S IHRALGGLPHVAGCTGDVSERATRALYPEEAMLEMGDFAG DFREDLQLKALAFCDGANGYQVALKLGEPTCDVQTSNWDG AFERDRGAERVVLTTGRDGLRYSRLLFPDHEAVLVGVNLG SVKTEDEYETLYFTGGNSALEVAKKYSNEEAGI EIGNFVG SI RKSMEVARIVISSGAKSERFIKAYYPDLAFVHYGNFIGG DVARAT GQREI GLCTGGRSERLLRREDPHLPEQCFVQAAD SIIALANGMQHVAGCTGSTSEKLVQNHYPDEAMLDMGDFVG HVKAELKVDRVVLAQGSGSAQYARSADCD CVVVKGGLVG HIK CELNYDFVVIAPGNSAAKYASKLFDSNSIIKVGDRIG LRQKAAVYQDLVFCDGENGLDLADRHGVDAQRLKTANWLG SLLKCALDDITAPVVFVPGNMGRNAALRHMVTQQVVEVSNEWG
 NCQKELQTDTLVFCLGENGLFVAKK\GDHSQIIKTANWIGG RAEELKGAKKVVVSTGRTGLKLSRLLGPDHEAVLMGNQLGG $S \square A R A A G L P H I$ AGATGSTSEKAVQRLYPETALIDMGDFAG S A AA A GUNH A GCVGNTSEKAVVRHYGLEAGIDMGDFAG
 SI RQAMGADTTVLTTGGRSEDFAKTLFPDHCFVQMGDFAG LINKSKNHDQLI FCTGENGLDLAVKLFNPSQLVKTANWDG V RKKA GQFDCLVEFI GENGLDLA QKQLVKTANWLGPMLVE


 SIQTE DNFAKLVFTGGNSALHVAQKKYKKEQDI EDGNFVY LE QKAQQYRSLVFCVGENGLDLAKTLIPPEQTLKTANWLG

 QFRKADDQKHLVFCVGENGLDIARTLIPPEVQI KTANWLGG

 $\left.\begin{array}{ll|lllllllllllllllllllllllllll|llllll|l}S & V & E & V & Y & V & R & V & A & A & V & V & L & T & P & G & K & L & G & R & D & Y & A & R & E & T & L & G & V & S & D & V & Q & M & S & N\end{array}\right)$

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FALDHAKKRTLAGHGKLAKDAMGHYNTHSKMSPMAQGYTA ETIKLGFKSLTLGLGKAVKLAEGSLDTHSKKTVMNKEFL
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GFs $\quad$ PDWVTGAAKSAVKK TTGLPDYELTKTPNDKNTITKV GYTLPVFACAAADAALEHLQDQKNTVTVDLPETAEIVIDI GYTTGTCATAASKAAALLYGKEAKKVEVTTSAGDKVEMAV LDLLNPPQTVEIETEQGARLS GSFPDPVII TLPGGQCPAFAL
 KAVVVPTPDGLRLEVSV
 GYSTGACAAAAAKAAWDRLGGAPQSIWVHFLDGRERELPL
 GFS LP LWWVA GAA R SALLKKLLF

LLT G

GFS $\square P \square W \square A G A A R S A K K L V G \square P N Y V L L K \Pi P N E Q E \Pi K \Pi E \Pi$ MYLNDKRDMVDVELPAGDTLSVPL GFSLPDWVTGAAKSATKKLIGLPDYELIKIPKEKNLIIKV GPTTGTCATAAAKAAADRLLEGVRTVRVRLPVGTVIGVRI GWTTGSCATAAAKAAWLMLHEAPACVVIITPGGQRPAFA, GDTTGGSAAAASKAAVIWALTGVKQVVIPTPDGLRDEVPV
 GWTTGACATAATRAAWQALGDFPDPVTITLPGGETPSFKL

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KAVTVPTPVGLRLETYV
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GAFPDPVEVVLPGGQNVAFAL
GFS $\square P \square W V V A S A K A A T K K L L D D P E F I K V P N L K K Q K V H S A A$


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 EGSGGQGSARKVPGDYPGDVTAGLLFVAEVPKNKGDIFGE A GHGAWAAVVKDAGD DPDVTHGADI HAAVREHPGVTFVA EAGMALAAVRSQPGDNDLDLTRNTPIWTVVTEPDWLVGGE DGEGAYGAVIKDGGD DPDATHGAEVVVDGGEGVGRVTGP ERHTALADTKSDPGDN DDLTKNTPI WALVKLDPVLEAGE AVEEARAGIVKDAGD DPDVTHGALI KSTVVREGVGTVTRA

 ADGEAMAGIVKDAGD DPDVTHGALVKSTVREGVGLVTRP
 DSTTALG TTQSDPGDN $\square D L T R N T P: W A W V Q L S P R L E G G E$ Hi I I K G GPGVGRVTLP



TDGAVTF QAGEGVGIVTKK HKDESHALGDSFASGLDLDVTQNQEIWTVAGLDEI NI I PGY SDHAALGITRSDPGDN LDITHTPVWA VERPIVIVGGE
 $A P D G A R A G V V K D A G D \quad D P D V T H G V L V V A R A G P G V G T V T R P$



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 A D GAAFAGVVK DGGD DPDVTHGALI GCDVGEGVGRVTGP









ED GMALLA $\square$ TRSSDPGDN LDDTRNTP TWAEQTES VLLGGE DD GWARASVIVEAGGDDPDVTHGAEDDSTVRPGSGUTFHA EAETALGVTRSDPGDN LDDTRRHTPVWAWVHLEVGTEAGE

 PAPGRMAEMVK DGGD DPDCTHGAVLDARLSEGIGRCTRQ




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P $\square$ STGDCAAAAAKAAAANLLFR $\square$ DTVTVTHERGFRNDMNC

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

P LTTGGDCAAAAARAAAASLLFKYEYVTDQH DGNTRTDSV
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 DKDHALA TTFANS ELSSLDLTQNLEI WTLVSFQINIIPGY EDGRVLA I ARSDPGDN LDLTRHTPVWALVAWGDA VRAGE K EDYAMA SVVKDGGD DPDVTTGLVI YSKVGEGDGRVTKE A GDAAVCTLIKDGGD DPDVTHGARISAHVRRGVGRVTGP KNNTALAVTRSDPGNN LDLTHNTPI WAMVELVKVCQTDT ENNAA $\square$ A $\square$ TFANSG $\quad \square D \square D \square T N N \square E \square W V I A S F T \square D \square V P G Y$ AREEATAAVVKDAGD DPDVTHGALVHARVRPGVGTVTRP SDTEARGTVVKDGGD DPDVTHGTDVVTTVGFGVGTVTKP DDSHALGGTFAKSG LDLDITQNLEI WTIASGPINIIAGS
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 D G A Q A L A I S V GEKALGI TNCDPGEC LDLTRGLEI WVCLRY EENIIPGY DGETATASVVKDGGD DPDATHGALIVSTVGEGVGRVTKP GEQALSISHCDPGP GLDLTRGLEVWVCVQWQENLVAGK E E GWVSCAVRKDGGD DPDVTHGMQI CARVGVTPGLVTKA GDGQALLGMARCDPGDG LDLTRGLLVWVRASPPQGLEAGE


 DEFTALAVVVSDPGDN LDLTSGTPVWAWVQLTTSTEAGE $C N N D S S E Y Y S V M E G G T A P D I R E K A E V H A T V G E G D G T V Q A S$
$G E G L A L G E S C C D P G E G G L D L T G L V V W V A R W L R G L E P G E$ GEGLALGESCCDPGEGADDLTRGLVVWVLARWLRGLEPGE NDDSSEYYA $\quad$ ME GG $\square A P D\|R D R A R\| V V N V S R \| K D L Q G G E$

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 GATPPD $\square$ K DRAE $\square R V C V S E G \square G T A M G K$ LYLDGGEGISRLTAA NNNESHFYAVME GGMAPDDREKADI HVSVSKVTDLYAGE QQNTALADTVSVPGAN LDLLTRNTPUWAIVELKENNDNNE E N H A MREYCVLTSGSN $\square$ NG $\square$ S G $\square$ SE $\square H V I V E R S D S \square F \square K P$

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#### Abstract

180 190 200 PEGKLLLAERTSNAAFG|VLEG|L|ALLLGTRAEVVESSSQARQE PEGQRMARHTLNPRLGIVGGISILGTRGTVRPYSHDAWQA ADGEALARQTLNARLGII GGLSVLGTTGDVDPYSCSAWIH PRGRELADRTSNAAFGVVDGLALI GTQAEVQRSAAPDQLK  PEGRRLAQRTSNEAFGILDGLALVGTSGI SQPHSSEEYRA  P E GEA RA QK TYNSRLLGI L G G I SI I GT T GIVVTPMSEAS WKR    PEGRQLAARTSNSAFGIVEGLSLLGTTGVSQPLSEVYQEE  

\section*{} P N G E V L A K K T DN S T L  P LG RELLAQRTSNAAFGVVDGLAALSTYSSASPDQ      P E G R QRAARTSNAAFGVVVDGLALD GTAQALVQRSAAACDQLDD  PS GQELAEKTSNHAFGVVDGLALI GTQADVQESASHALRS PGGEEIAKKNVEP $P R G R D L A A R T S N A A F G V V D G L A L I G T Q A D V Q S A S P D Q L Q Q$ PEGEARA LDDTENGRLL $P R G R E L A G R T S N E A F G V V D G L A L I G T Q A V V Q P D R L E Q C L E$ PAGRRLAERTSNAAFGVVDGLALI GTQAVVQRSAAPDLRD $P E G Q S L A E R T S N A A F G V V D G L A L I G T Q A E V Q T S S P D Q L H Q$ PDGAELAKK PRGREELAERTSNAAFGVVDGLALIGTQATVQSASPDQLQD PEGKALAKRTSNAAFGILEGGSLLGTSADSKPLSVEDKLE  $P E G M M I A A K Q S M G Q N G F V G G I D T I R G S Y G H I D P P I H M R E D S D$   PEGEA RAQK




 $P$ T GARLAERTSNRAFGVVDGLALLGMGARVQP P G GEAL A Q K T L N P R L G IV G GL SI L G T T G IVVVPFSCAA WDH
 $\stackrel{\rightharpoonup}{P}$ PEGK
$\begin{aligned} & T V S F \\ & T \text { N N N P A T N } \\ & \text { T }\end{aligned}$

lupas_21
lupas_14
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jnet
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sol25
sol5
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## UniRef90_Q2J170

 UniRef90-B8DKG5 UniRef90 V8A3LO UniRef90-Q062K5 UniReffo_-G9WEYO UniRef90-K9EI20 UniRef90_Q8UBQ66 UniRef90-G5NVB7 UniRef90 UPI000307DD6E UniRef90-U5D9X1 UniRef90-Q3V8B2 UniRef90_E11GF5 UniRef90-Q117L9 UniRef90-E1QNJ6 UniRef90-K9U5B5 Unire UniRef90-F2ZFS0 UniRef90 ${ }^{-}$F8AZLL UniRef90 R5BDK3 UniRef90 UPI000472F852 UniRef90-Q01E38 UniRef90-G0LY76 UniRef90 UPIOOO2002051 UniRef90-A5GPZ2 UniRef90-K9SVZ9 UniRef90 A3Z3Z0 UniRef90 WoGVB2 UniRef90-A5JHC6 UniRef90_UPI0002001A1A UniRef90 Q3B0W2 UniRef90 Q7UA54 UniRef90-A4CWP5 UniRef90-Q7VEH6 UniRef90 S7SX91 UniRef90-A2C5P1 UniRef90-C0D1C1 UniRef90 A3YWK6 UniRef90 B5IJCO UniRef90-A9B9J2UniRef90_F7JV92 UniRef90 Q05UQ9 UniRef90-L8N148 UniRef90_UPI00047A3329 UniRef90 K9P8Z6 UniRef90 UPI0003B3869B UniRef90-UPIO003B63E61 UniRef90-F1YVW5
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RARAELVRRALVLVIGENGLDLAPSLLPAPLLLKAGNWTG RAERPQGCPELVLVVGENGLDLAPRLLPVEVLLKSGNWIG EFRANLQVKALVFYI GANGYQTAQNMFSPDQLVQTANWI G LTRAAAFEGGLVVVI GENGLDLARSSGLAEPVLKVGNWIG KVADAAFQGRLVLVIGENGLDLSRQQ GLGPVLKVGNWVG
 QVLLDLA QLTLLLVIGENGLDLARQA QLAPLLKVGNWLG QVLRELRAGSVALVIGENGLDLARRAGLSPLLKVGNWLG RCAESSFTGSLITVIGENGLDLALQYGDDSSTIKTGNWLG

## T $\square$ E QLRFCGAMTLVIGENGLDLARQLLAVQPLLK $\square G N W \square G$

TLRQWPHSPHLVLVIGENGLDLAPRLLPAGLLLKAGNWLG RVRSPDFDGALVLVIGENGLDLAPRLGVPDRLVKAGNWLG SLDELRNQGALTFVIGENGLLLAQSGLNLQPLIIKTGNWLG
 EFRKAATYPAIAFYIGANGYQVAQNLFSPSQLVQTANWIG STRNQTMVKSILVAPGNYCADKIREHVPDTTAVRCYNFPG RTLAALATRDLVLVIGENGLDLAPQLLPPELLLKAGNWLG SIDAQI HYKSILVSPGKYCEQIAQSLHVDLKSILCYNFPG SIDAQLGVKSILVSPGSYCADKISSQLNLDTAURCYNFPG S ARAEGLTHLAGSTGNVSEKGVQKNLPDSALIEMGDFAG TURLEERCRSLLLTLGNYSQSFIQRNMPLDRCVTCSNF $\square$ G

STDQTLFQTRTLVSPGKYCAEVINSQLHVDTSTMCYNFPG
 SUDEQIRFRSULVSPGRYCADKUNQSLHVDTSUVCYNFPG

STARASGLPHVAGATGSTSEKAVQQQ\PDAALIDMGDFAG
 EI A GA I Q I R NVI AVVPGNAGHKY I Q D H I SMA H C I R CR N Y

ETADEEQYDRTMAVPGNAGHKYVQDHTSMTHCTRCRNYTG EIA A EQGIDRVIAVPGNAGHKYIQDHISMAYSIRCRNYIG

[^2]


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AALHNVKK ILLFGHGKLIK\AGGDFHTHHHDABDARDE $P L L A A A G A A G V Q S H G K L L K L A G G I F H T H H H L A \quad D G R L E$ FSI RRAAEIII ACMGKASKLAMGMEDTSSRNSGVDFDFII AALRTCVEVALVAMDSRVKTAQGRMVTHVAGNPVDLAFLA

 AA AKKVKKILLLGYGKLI KKA A GIIFHTHNHLA AVLKHPVDKLSLGFGKISKLAAGHMDLHSRHSSDDDARDE
 $F M L E Q C V K$ VGFKKI I KLASGSFHTHN R R MSDGRME

AAAEQGVERLLLFQGKLIK\AGGDFHTHHHDA DGRDE AAAEQGVQRLLLFHGKLLKLAGGIFHTHHHLAA DGRAE

 EALEAAGDVII CGLPGLI IKWG AAAEAGVRRLLLFQGKLIKLAGGDFHTHHHLA PVLVAAAEALLLGHGKLI KLAGGIFHTHHHLA PVLVAAAEALLLGHGKLIKLAGGIFHTHHHLA AAAEAGVQELLLFHGKLVKLAGGIFHTHHHLA A A QEKVQQLLIVFHGKLIKLAGGVFHTHHHLA

DGR L | $D$ | $G$ | $R$ |  |
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| $D$ | $G$ | $R$ | $E$ |
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| $D$ | $G$ | $L$ | $E$ |
| $D$ | $E$ | $E$ |  |
| $D$ | $N$ | $R$ | $L$ |

A A A E A G VE QLLLGHGK LVK $\square$ AGG $\square$ FHTHHH $\square$ A $\quad D G R \square E$
AAAEAGVERLLLFHGKLIK\AGGワFHTHHHDAB DGRAE


AAAEAGVKELLFGYGKLLK LAGGTFHTHHHLA DGRSE AMLVEAALLGVTSHGKLLKLAGGIFNTSSHLA DARDD YAADMASEELLVGVGKLVKLAAGVMNTNSYAS DGRRD A A A E A GVERLLLGQGKLIKGAGGIFHTHHHLA $\quad$ DGRAE
 GLLKHPVPHLTIGIAKMTKLGQGFMDLHSKRGPADMRQLAA


GMLKHPVARVTVGFAKMTKLGQGLLDLHSRAGEVDDGWDA QAI DSCVSMLLVGVGKLIKLAAGITNTNSFAS DGRRE DTLDMAAMVLLVGNAKLI RLAAGIMDTHTWNA DGRRE SAlDAACDALLVGVGKLVKMAAGUMNTNSYAS
SADDMAAA LLVGNSKL!RLAAGワMDTHTWTA D TLDMAAMVLLVGSAKLLRLAAGIMDTHTWNA

D GRRE
$D G R R E$

[^3]

| UniRe |  |
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| UniRef90 UPI00047DE349 V L |  |
| UniRef90_UPI00040B4209 V L |  |
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| jnet |  |
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[^0]:    20

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    lupas_14
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    jnet
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    sol0
    jhmm
    jpssm

[^2]:    lupas_21
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    jpssm

[^3]:    lupas_21
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    lupas_28
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    jpssm

