

## QUERY UniRef90_Q5JI30 UniRef90- F8AFIO UniRef90_Q2RJB8 UniRef90-K9QDK4 UniRef90-I4WZA7

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UniRef90-UPIOOO3 UniRef90_DOSP02 UniRef90_D9SJF5 UniRef90_UPI0003736C73 UniRef90-UPIO0037EE0E6 UniRef90_UPIO0030BF4F9 UniRef90_L8JKW5 UniRef90-H1YG61 UniRef90-F4D1M5 UniRef90-S3NSV6 UniRef90_UPIO003816792 UniRef90_K9X5N1 UniRef90-C2G1N8 UniRef90-W4QKR0 UniRef90-Q2JTF1 UniRef90_UPIO00365663B UniRef90_D4TM19 UniRef90_F4B2G2 UniRef90_UPIO003789228 UniRef90_U1LP52 UniRef90-K6UIG8 UniRef90_L7W899 UniRef90_UPI000255A53F
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UniRef90_G7UWA2
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UniRef90-R5EFB1
UniRef90-H0PWU7
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UniRef90-C6VU01
UniRef90-K7TBR9
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UniRef90-F9ZCX4
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UniRef90-C5AAY1
UniRef90-T1CQC1
UniRef90 R6EYH88

UniRef90 R6EYH8
$\bar{L} L T T D V L N E G D H F D R S Y \square P E A V G W K A \square S V N V S D V D A N G G L D$


 $V V$ T VVADDTLVEGVHFPPGTAPADDGWKALAVNLSDLAAMGAS VFSVDTLVEGVHFPAGYDPEHLGWRSLAVAASDLAAMGAQ


 LATTDVLLEGIHFDLTYTPKHLGYKSAVVNFSDIYAMNGQ $V V S T D L L V E G V H F D L S Y V P K H L G Y K A D M V N D S D I Y A M N A S$ VASTDILLEGRHFRRDWTAYDVGRKAAAQNMADIAAMGAY LVSTDLLVEGRHFPESTAAFDVGYKAMAVNLSDLAAMGAR A AFSADMLVEGRHFLSTVDPSRLGHKALAVNLSDLAACGAS
 VVSVDTLI QGVHFPAQTPPAAVGHKALAVNLSDLAAMGAM
 AI TTDMLVEGTHFLPDTDPRDLGWKTLAVNLSDLAAMGAR AI STDMLVAGRHFFPHAEPRALGHKALAVNLSDLAAMGAE


 VVTTAMCVDKVHFDRTTSAEDAGWRAAAANL


## V

 V





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


 AVVT T D M L V V
 A I T T D T L V A G V H F F E D D I P P R A L G H R A L A A VICADTLVAGRHFPLSTSAHAIGWKSVAVNLSDIAAMGAK


## A


 VI CTDTLI A GRHFPLSTSAHAI GWKSVAVNLSDLAAMGA T |LVSTDMLVEGVHFNLMYVPFHLGYKSVAVNVSDIAAMNGT
 $V V S S D T L V S G L H F L P D I D P A D L G Y K S L A V N I S D L A A M G A D$ AVSSDTLVAGIHFPDSCDPYLLGQRALAVSTSDLAGMGAT
 AI STDMLVEGRHFFPD DDPEALGHKALAVNLSDLAAMGAK VTS SVDMMV E GVDD F R R D WS P Q DVVGHKA VA I N L S D L EA M G A T AISSSDMLVEGRHFFSDVDPGALGHKALAVNLSDLAACGAT AV T T D TLVAGVHFDKDAPAKSVAYKTVAVNLSDLAAMGAE AVT A DMMALGSHFLENASPYTVGRKALAVNLSDLAAAGSE AVSTDMLVAGTHFFPDADAEALGWKTVAVNVSDIAAMGAE AI S S D MLVEGRHFLSTVRPERLGHKALAVNLSDLAACGAR
 VVCSTDLLVEGVHFRTDWSGGDVGRKCVAVNVADLEAMGAT


 AI S T D T L V R GKHFFPDTDPYKLGYKSLAVNLSDMAAMGAK VVTTDMMVDGVHFSDQTTPEDVGWRAAAANLSDLAAMGAS


 AISTD MLVEGGRHFFADVDPQALGHKALAVNLSDLAAMGAQ AI STDMLVEGRHFFPDVAPRALGHKTLAVNLSDLAAMGAQ

## QUERY

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UniRef90_A7MFG3 UniRef90_UPI0004751844 UniRef90_A0L3Z7 UniRef90_H1G304 UniRef90_UPI00034D7D40 UniRef90_UPI00031E2F7B UniRef90_B2UCD2 UniRef90-N8Y543
UniRef90-K1L4H6
UniRef90_U2NI39 UniRef90_Q2S9S1 UniRef90-K9XHG9 UniRef90_C7PMI1 UniRef90_A3I0Q7
UniRef90_V5E0J8 UniRef90_UPIO003687DD4 UniRef90_E4LAE3 UniRef90_F8IB33 UniRef90_UPIO0034BBEEF UniRef90_DOSP02 UniRef90_D9SJF5 UniRef90_UPI0003736C73 UniRef90_UPI00037EE0E6 UniRef90_UPI00030BF4F9 UniRef90_L8JKW5 UniRef90_H1YG61 UniRef90_F4D1M5 UniRef90_S3NSV6 UniRef90_UPIO003816792 UniRef90_K9X5N1 UniRef90-C2G1N8 UniRef90-W4QKR0
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UniRef90_H0PWU7 UniRef90-A2SG70 UniRef90_F4KL40 UniRef90_UPI00047EF5E1 UniRef90_D3IGW9 UniRef90_G0J020 UniRef90_C6VU01 UniRef90_K7TBR9
UniRef90 K2H1V8 UniRef90-F9ZCX4 UniRef90-B8HTW5 UniRef90-R5PRD8 UniRef90_UPI00046CFFE1 UniRef90_C4UK07 UniRef90_UPI000475F86E UniRef90-E1T9F4 UniRef90_C5AAY1 UniRef90-T1CQC1
UniRef90-R6EYH8

PKWALISSLNLPEDLEVSYVERFY DGVKRACEFYKCEVVGG






P
A T Q V T TV $P L G L G I V P V D L P A T W P T E L M M$ G G ALP SI EP DWLEAFAKGFYD EA QVASAAVVVGG

PRAF LL S L S L PRA D ENWLAA GFCQ GLYQLAADAHGCELI G G
P R WY L L S M A V P N R T S Q S WL E E F A R GVVKA ASEMF HVA LV G G

PA WAL L A L A QPA DAQQD LVVDGLAE GFAQLARMHRVAALVGG PRWVLLALSSLPAADETWLAAFAEGLHGCAREFGVDLI GG PRAFTLAVALP KADPAWLKPFSEGLLALADAFHCELI GG

 $P \vee G F T L A L T L P T \quad I N E A A W L Q A F G S Q L Y E S A D A W R D P L I G G G$
P
 $P$ L A A T L A L G L


 P H S I L L A L S L P S V D ET WL A E F S R GLLF E CCCDQRNNVACL G G PRWATLAI SLPAADDM WLEQFSAGFFALAARYGVDLVGG



 $P$ H S I L L A L S M P T VD H D WL Q GFS D GL Y A C C E R Y G VQ L I G G

 $P \square Y Y I V S V A A S A D W K Q E E L E D V Y K G M F D L A Q E Y K M D L I G G G$ $P \bar{R} A L V V G L G L P G T S P D A W V E E L Y E G M M A C C A R W G A E E L V G G$ PRWATLAAIALPEANDA WLTAFARGFFRMADQHGDELVGG $P L G D T V A L G L P G D L A D N W V E Q L Y Q G M S D C L Q K Y H T P D V G G B$





 P T A F T L A F S L P S A E E T W L A E F S S H G L F E L LAADA H S C E L I I G G P H S I L L A L S L P Q







 PKAFFLSISLP RIDENWLEGFSRGLLEEARRFNCPLRGG
 $P Q Q \square T V S L G I S A K$






 P A WL S L A L TLPEVVNEP WL QAFS DS L F D QLDNYYGMAQLI G G T T A L L L G L A A P K DL P P L A WA E E FA E E GVVREECAVVVGCTVVVGG



## QUERY UniRef90_Q5JI30 UniRef90-T0BTQ8 UniRef90-Q2RJB8 UniRef90-K9QDK4 UniRef90-I4WZA7 UniRef90_R8AWN1

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UniRef90 R6EYH

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NTSK 130 R
150
160

 DTNEGREVVDGGALGLTERPLDRSGARPGDLVCVTGDLGG $D V V R S P V T T I S V T A F G Q V D R I I R R S A A K V G D A V V V T G V H G$
 D TRGPR S Q M GEVPSGAALLRTGAEAGDFLCVSGTGG
 DTTKGPS

 $D T V K S P V L S L A V T I M G P P D R M L T R S G A Q S G D L I A V T G T L G$ DTTRGPSMTL GIHGFVPAGRALKRSGARPGDWVFITGTPG DTTQGPNDAI TVMGDVPQGQSIDRSGAQDGDDLYVSGHDG DTVRSNKIVITVQMLGLIGQHVARSGAQVGDRLYLSGTLG DTTRGPSITVQIMGVAPVGAALRRRGARPGDRIMVTGTPG
 DTTRGPTVLSLTVFGDVPDAAALRRDAARPGDDLWVSGTVGG

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UniRef90 UPIOOO3B5360A UniRef90- D1J9H7 UniRef90-UPIO00377CCE3 UniRef90-DXXJ49 UniRef90-D7AU96 UniRef90_B9QV41
UniRef90_C9PQP5 UniRef90- UPIOOO4253107 UniRef90 Q1QUDO UniRef90-B8KAA6 UniRef90-Q6AKX6 UniRef90_UPIO00374341C UniRet90-E2MTM6 UniRef90-G7SV64 UniRef90-E6QQV2 UniRef90-UPIOOO36E3956 UniRef90-E5XMG9 UniRet90_F8A1C8 UniRef90_Q8K9A5 UniRef90-G2J552 UniRef90_G2J552
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UniRef90-H6MUL7
UniRef90-R4W6T8
UniRef90-M1XNB5
UniReffo - $\times 5 E 8 \times 4$
UniRef90-W9G4C7
UniRef90-17CYE8
UniRef90-UPIO003043D6F
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UniRef90-L1MM59
UniRef90-D6STQ8
UniRef90-Q5WJP9
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[^0]GEFSLIDKYFAHKQQQAQGDDCAIIVAPPDSHIL $T P S V G D \square G E F G L I A B D A R D P Q G G P G D D A A V V A A P D G R V$ GEFGDLI

## 닌 <br> $M K \square E E \square G N$ $M R N T \square G G \square G$ <br> MRNTIGGL

 GEFEL!
,

M
 GGEF G LD E


EYNEFEIISKFF LS E K LEELGEEGLI D G
MA $T$ LRQ
$\qquad$ GE
GE
GE
GE
$M R E$
LDE
GE
GE

RLA D L
LSE F D L L I
GHFFR
$A R$
$K$
$R$
$K$
$K$
$A$
$E$
$G$


$\square$
$\qquad$ EFAF
$\qquad$ EFAFI
 S
L
G
G
G
S $\square$ S $V$ S E



 A $A$ $\mathrm{K} G$
 $K$
$G$
$A$
$A$
$A$
$S$
A
A
V
E
$T$
A
A A $\vee G I G$
$\quad M$ MGE VAT T D LLVAGRHFRRDWSPHDVGRKAAAANLADVAAMGAV
 AV T T DTLVA GRHFPHHADAFDIGWKALAVNLSDLAAMAAR VITT T D TLQESTHFPHG DSAFQMGWS IVAVNLSDVAAMGAY


,
 A 956

 VMTQDTSLVDRHFPADMAPADVGYRCLAVNLSDLAAMGAN





 | $V$ | $V$ | $T$ | $T$ | $D$ | $M$ | $M$ | $F$ | $K$ | $S$ | $T$ | $H$ | $F$ | $P$ | $S$ | $I$ | $L$ | $T$ | $P$ | $F$ | $Q$ | $I$ | $G$ | $M$ | $R$ | $V$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $A$ | $N$ | $V$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $L$ | $S$ | $T$ | $D$ | $L$ | $M$ | $V$ | $E$ | $G$ | $V$ | $H$ | $F$ | $D$ | $L$ | $A$ | $Y$ | $H$ | $P$ | $K$ | $H$ | $L$ | $G$ | $Y$ | $K$ | $A$ | $V$ | $A$ |
| $V$ | $N$ | $V$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |






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## UniRef90 A6CX16

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## UniRef90_Q6AKX6

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UniRef90_M0MQL4 UniRef90_A5WHT2 UniRef90-F3KMT2 UniRef90_U1PE46
UniRef90-C6CV19 UniRef90_E8UGD4
UniRef90_F3PBD3
UniRef90_UPI0003B2FAEA
 PTALLVGFAAPADLPAAWAEEFAAGLAAECATVGASVVGG
 $P L G V T L A L T L P \quad E A D E A W L G A F S A G F F A L A Q Q A G V P L I G G$ PFAFTI AMGIPAQTETSFLDELVAGDEKCAASYNTSVVGG
 P T GLLLI GFAAPADLPDVPWAEEFTAGVRDECAVAGGAVVGG


 P A WVS FAALTMP E P DEA WL A P F CEESFF S L A D YF G DQL I G G
 $P R Y A L V A L S D P K H T P V E G I R A D Y D G L R A C A D R H G I D E V V G G$ P TAMLFAI SAPLHTPVSVVTGGAEGLWQEGKQCPABLVGG


 PVVCLV S L A FP QKL T Q H WL R GFYK S L M DLA GRYK A A L A G G
 P T W

 PLGMVISMGF DSPDKNFDDEMSKGIINFDSKEYECPI A G G
 $P L W A L V C L G V P P G A R A A E L V R L G R G L G A C A R R H G I A V A G G$ $P R W F V L A L T L A E V D E S W L A D F A H G L Y S L A R Q H D I A L V G G$
 ATGLLVTVVADP QTPLEWVLDMARGLGEAARAMDVAVLGG $P V A F T L A L A L P E A N R H$ WLAAGSEGGLFALADEFGCELI G G
 $P V A M V I G F G I P A D L P A E W V R E F A K G V R A E A D D A G D A L V G G G$



 P F Gll L L G L



 $P L G I \quad T V G L S L P P T D P V V W L E G L Y R G M Q A C L D R Y G T G I I \quad G G$ $P$ I A TLL SLLA I P H DLP E GWI E DFME GYRDDSA QY DVVGLVGG





 PLLAYLLTLLALPEAPERAWDADFAKGLRAAQTEFGCKLIGGG PFGYLLACCWSDRCGWPEREAFAAGLAQDQALFGVVLMGG T TA A FVVAFGAP GDTQTKLALDELADGMWHEA GLLGAAGIAGG PA WLTTLA LTLD EVVEVWLEAFSDS LFVQLDDYYAMQLIGG PAAFALGVVWPKAVTE EEI A AFMEGLSADCARYGLLGLIGG
 P K F Y L V S I A V P S GWNDA D I E A M Y E E M N QL L A K L $P T S V L V N L A L P N R Q S A Q M V D D L Y K G \square Y A A G F E Y E V E V V G G$
 $T T G V V V A L A C P P Q T T V G W L A D D N T G D V D A A H R L G A R V L G G$ ATSAV AVYAAP EFDESELLDFVAGASDVCESVDAAYVGG A TVALAVVYGAPSEGDSE LVSFLAGCDDVCAAVGAAYVGG

 ATAAVVAAYAAPT FDRDELLAAFVRGARDVCEHVGAEVVGGG $P R R G L L V V A A D P P G W T E G W M A D F A A G L G E D A A A Y G C P B L G G G$

 $P L G F N L N L D W P V Y L D E E F C R S M L S S M A E L G A K F K D A G T G G$ PQFYLVSIGAPPNWSAE ELTS LYE GMRAVGDRYGMDLIGG A R A AV AVVYAAP E LIDE E DLVNAFVVDGAR DVVEACGAE YVGG PHS ILLALAALPQQLAKEWLSDFAKGLFHACS QFGVQLI GG PRYGI I SLVLPRKIS QKKI DEMSNGIKRAADEFNIIKILGG $P \vee G V V A A Y G A P$
 $P$ L Q AL V S V S VP K Q L GPEPMMRLYD GLY A CAEQ Y GVA V I G G


## UniRef90 A6CX16

 UniRef90_UPI00037701FE UniRef90-UPI00046E8FC5 UniRef90 D1J9H7 UniRef90_UPI000377CCE3 UniRef90-D4XJ49 UniRef90_D7AU96 UniRef90_B9QV41UniRef90_C9PQP5 UniRef90-UPI0004253107 UniRef90-Q1QUD0 UniRef90_B8KAA6

## UniRef90_Q6AKX6

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UniRef90_UPI00037AFB7D UniRef90_UPI0002EE80BE UniRef90-Z5X7L7 UniRef90_UPI0003789CD5 UniRef90-W0V012
UniRef90 X0ZBG6 UniRef90 UPI0001E89461 UniRef90_D7GE79 UniRef90-B8IPI5 UniRef90_G8AMQ4 UniRef90_W9DQG7 UniRef90_U5N8D6 UniRef90_UPI0004630F5B UniRef90_UPI00036A4D21 UniRef90 L2F954 UniRef90_V4YKU5 UniRef90_A0A031M1F6 UniRef90_D6Z3R9 UniRef90-W5WWF8 UniRef90_XOSAE8 UniRef90_Q21F21 UniRef90_K9UPH0 UniRef90_R7JLF5 UniRef90_H8FUV3 UniRef90_B8ZS03 UniRef90_E0XWB8 UniRef90_D1C275 UniRef90_A0A024LW74 UniRef90_W5Y0A6 UniRef90_Q5P3R5 UniRef90-S7UEX9 UniRef90_N0B7L8 UniRef90_B4W5V8 UniRef90_LOIXB2
UniRef90 W1DNJ1 UniRef90_E0TEC5 UniRef90_A5G0D3 UniRef90_UPI0004183CF0 UniRef90_UPI00040DCE79 UniRef90_UPI00037A7F6E UniRef90_F8D9J2 UniRef90_H6MUL7 UniRef90_R4W6T8 UniRef90_M1XNB5
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UniRef90-C6CV19 UniRef90_C6CVI9
UniRef90_F3PBD3


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


 $D V T R G S S I G V T V I G D V P A G Q A L R R T G A A P G E R L A V T G S L G$



 D T T R G N S M T L T V V D G E V $\operatorname{P}$ L L N DLARSERITVVDVMCCGRTGRAMLRSTAARVGDQ:CLGGVGG
 $D L S G A P V V V V G V T A H G D L R A P V L R S G A R P G D V V A B A G D L G B$
 D T S S S S N E E L S

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N V
 $\square$


UniRef90_UPI0003B2FAEA

## UniRef90 A6CX16

 UniRef90-UPIOO037701FE UniRef90-UPIOOO46E8FC5UniRef90 UPIOOO3B5360 UniRef90- D1J9H7 UniRef90-UPIO00377CCE3 UniRet90-D4XJ49 UniRef90_D7AU96 UniRef90-B9QV41 UniRef90-C9PQP5 UniRef90-UPIOO04253107 UniRef90-Q1QUD0 UniRet90_B8KAA6

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UniRef90 - xozBG6 UniRef90_UPI0001E89461 UniRef90-D7GE79 UniRef90-B8IP15 UniRef90-G8AMQ4 UniRef90-W9DQG7 UniRef90_U5N8D6 UniRef90-UPIOOO4630F5B UniRef90_UPIOOO36A4D21 UniRef90-L2F954 UniRef90_V4YKU5 UniRef90-A0A031M1F6 UniRef90-D6Z3R9 UniRef90-W5WWF8 UniRef90-XOSAE8 UniRef90-O21F21 UniRef90-R7JLF5 UniRef90-H8FUV3 UniRef90-B8ZS03 UniRef90-EOXWB8 UniRef90-D1C275 UniRef90-AOAO24LW74 UniRet90 W5YOA6 UniRef90_OSP3R5
UniRef90
S7UEX9 UniRef90- Nob7L8 UniRef90_B4W5V8 UniRef90-LOIXB2 UniRef90-W1DNJ1
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UniRef90
H6MUL UniRef90-R4W6T8 UniRef90-M1XNB5 UniRef90- $\times 5 E 8 \times 4$ UniRef90-O3ARAO UniRef90_17CYE8 UniRef90-UPIO003043D6F UniRef90-UP1000289C4B9 UniRef90-UPIO0047D9D27 UniRef90-M3VIE9 UniRef90-L1MM59 UniRef90-D6STQ8 UniRef90_O5WJP9
UniRef90_MOMQL4 UniRef90-A5WHT2 UniRef90-F3KMT2 UniRef90-U1PE46 UniRef90-E8UGD4 UniRef90-F3PBD3

170
180


200 ASAAGLAVLSAGVRGHQSLVQAHRAPT PPYAAGPAAA
 NAALLALKLMRGELKVPGDVGVEVKKALSQPVPRINITIAN
 LS A A GLAALLEQGDDGPAE CLLSEHRRPSPPYARGAEAA DAAAGLKARLDRGFASTAGEAHVLDRYLLPRPRTRLAPLI
 GGHA DSKAGLDVILSAQQEDKPYASELEQRHYLSSPRVVVGQQALC SAAAGLFLFQNHRETDKDEYASLLRHHLAPMPQVELGRALL MSAAGLAMLLERWHCASGWEAALVQAHCRPEPQUAAGRLL YSAAGLAALQUCGSPPREFAQLVAAHCTPEFEYRRGATAR
DSAAGLSLLLSQQTPLNSDHEFLIQRHLRPTPRVGLELAV
 GAAAGLAVMRGAN WRRQKRPQPRワEAGLKL CSAA GQALDPGARAQDDGALIELVERHQSPRPPLMESVAA


 LAARAGLLALEEKGRHAQADFPHAVACHLCPCDSPKASNSR DAAL GRVP GAHGGLRAWFDGER SADNPLLDAYLRPRPRVDAGDAL DAAGGLQFVLDKDLTAVKYKQHLLARFNHPTPRVAFGLAV


 DAALGLRLRRWAAGLGEADRQHLADRYDHPHPRGPLAPAL DAALGGEGAYGTLEVADDARAALLGRGRRPDPRTTLGPRLC D A R L A A L EALQ GK RELPAQVLRWARDRLEMPPPRGLGRGMA SSAAGLSHLETHPQSAFVETDYFDHRHKRPEPRVSVGGRLC SASFALN EAAWALDVN
 GLAAGGLELCRRDLAADPQWQEAVQAHDDPPAQVELGRAA
 NGAASLLQVLGKLQSPNALCSELDDLFYRPEDAFYVAQQL DSHGGL QLLLDANADAEPERQALDDAHQRPLPRDDVLPAS ESGAGLRDILAGRGSYDTPLAQUHRNPAPQVAEGIWLGE

 $M A A A G L R V F Q Q Q L L T L D G N P A M R E A Y S R P K P R V R E G R L L A$
$C S A A G Y A L L L G G V D G F T E L R Q R H L T P Q P P Y G Q G A R A A E A$ ASAAGYALLKRFGRDGVPREFMPLDQSHCKDPRGRGFVAR RGALGLAFLRGETALDAAAVTPCIDALHRPQPRVAAGLALD LLARAGLLALEEKGRAAMADFPSATAWHLCPTLFPSASEAR DGLLGLQAAQAKLKLDAERLARLIDHYRTPMPRDDFADVV
 DAALGLHAARGEIADPTGG
DAAA ALALLEQG VEAYRPRPPID VDAL S S A A G LS F L LE K IPVVK D E R Q Q Y F I A R H K R P T P K V E A G L I C A A LA GL R V L M F WE Q H G N E G I Q P DL S E Y E F V V K R Q L V P K A R

 RS GAAL R F FEDGATERGNDLFRFDPRVATGRAL HAAAGEA I LRYFGSPDNAVLQDLVHRHCAPELVVRGSVAR
 LA DAGLRLLQAGRAERHTEAVARQRRPRSPLDQ GPRAA RS GAAL A R L F D R D H TD R A ND LFRFEPR RAT GRTG D A A L G A L L H TGK G GA WE E E R GH L L V D R Y L H P R P R T N L A A A V WS A A GLLALL QHYGS RPDQF QPLVDQHVSPEFHYGRGPVVR
 Y S A A GLA L L R H Y GRASVVPA GFAPDLIDABCAP TALIPGRI A R LA A C GL SLLE ENDP GLDRYPECVAQHLRPP LVVE GQVLA G

D A CYALYH
YTASGLKILLLGKNKKSNQFVKKVIKSFVNPRPKLDFGVRN

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## UniRef90 A6CX16

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## UniRef90_Q6AKX6

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UniRef90-U1PE46
UniRef90-C6CVII
UniRef90-E8UGD4
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 ELRAAADELGASATQWMLTGGEDHALAGCFAPD VDLPDG GLRAAADEAVGASARQQALLGGGDDHAEAGCTASPARRAESDGO ALQA WCAS QD LQATRWALA A GDDYELLFTAPAHRHDEILP EI RSDLRLSTREQRELA YYFGGDYELLFTDDAGADEKEVK
 ALVEAVRVLGRAARDLMVAGGEDHALAAVFPPHTVLPA H

 A L DM T LGREA ALLHAALNGGDDYQLLVSVPDAAWADAVA ELVQFDGS AEQAQQYALSSGEEYELCFTVPEQNDGADES EFTRLCKRYQLTATEELALGGGDDYLLCLFTVRAGREKEVER AQA A A GEYLGDDPWEWVLTGGEDHTLI GSTPGEAADAPTA SLVNVFGVVGEAETFALSGGEDYELCFTVPDSNKAKDVGD QAAEVADKPMLQ QCVLSGGDDYELCFTAPASATNKIIDD $P V L A G C S A \quad D K Q R A L Q L Q G G D D Y L L L F T L P A A Q P V P R G$ GASLA A A ERLGASAT RQWLLHGGEDYELLAFTVAPQKKI A GLP QLA A A ERLGASATRWLLSGGEDHALAAVFPSEEAVP QW ILT DNFK D DEYLNWALNSGEDYELCFTDSKKNKKK\|IK WMAENRGRLA

 AARRLSRGGAA ARDAALSGGEDYELLLAA AP $G L^{\prime} V A A L G A D Q A L Q A A L G G G D D Y Q L L V A M P P Q N E A L G G A$


 DLQRY DADNALKWALTGGEDFELVGSIPETDWAAGVK PVAVVAAAVNKDPLDFVLTGGEDHALAACFPPGELPEG AARAALAADEGLI DPILTGGDDYEILLCAVAPERVEADRD
 GI RTVFPEWLLQWREWALSGGDDYELLFTAPPACAASVTQ D L HK LLDPAWKEWVLIF AVEKY I A QTH LLNHLP NSDKWQHIVNGGDDYQLCMTFNNNWQHGVR AL STAPADYRRQCCA AGGDDYELLMTAPPDNDACGVA ALRAWPAA QQREWMLRGGDDYVLLFTLPPEHAAQGWP LLHRAAAVCQADPLNWALCGGEDYRLLFTADPARDGADAE
 TAKSLAERLTAQQQQWALYGGDDYQLCFTAPAHAVAELLA SLTRIFPDTALD SAALYGGEDFELVLCMPREDGLELVE D L
SASRAVD
$F G L V T L A$ TAV

AALDAAA
AIKWNFD HYPEDCVDWAL DVDLAL GGGEDYVLLFTGPPAKVNHVVG VVAEAAAAVDADPWEWVLIGGGEDHALDATAPCAAVPA L MRKAAELLSADPWEWVLSGGEDHTLLAT T T NCAPPVG LLAAGADV EFALRCVLGGGDDYELLIFTAAAAQREHFLP ETVAKAQAAGQPPSLFAALGGEDYALLGAAPAELSARLPG SVRAALAA DPKVQDADLAGGGDYELLIAVSPEKAEKFLA $\begin{array}{ll}A \\ A L L G A A G E M A M D P W V W V L A G G E D H A L V & A T\end{array}$ AMLRQVD SEQALRWALAGGEDYELCFTVPELNRGALAR SARAYAEDSG DALLS LLGGGDDYQVIATVPQDNVDPLVP AARAA GGPAWRETILTGGDDYELLIAAPAGQACAGTP
 ETRHVADEMEEDVDRYALFGGEDLEMVFTLPEEQVEKFVD AVRDVAD GEREALEYATTFGEDFELVATVPEDALEAVVA EVDHVAALLGADARTWALTGGEDHELLASFAPGAVPPG

 TTRQLADEMQEEPLTWALT GGEEYQLLFTDPEATYQQLRD DVAALAGALGETAADCVLSGGEEHSLLATFPAGTLPEG AVHDVTDGDG DALEVATTFGEDFELVATDPEDALPAVRD AARSALGA DETLVEAIATGGDDYE
 DLDA D DA DELGADDVGEWVVDTGGEDHHLLAAFEPASVPA G LLRKAGDHLGDDPWSWVLTGGEDHTLLATTTSDAPSGFRT EVAFFCRDRGLDPLATALKGGEDYALLGACTRKGWDK LID
 ALQN I E DT


 SFLLE P V A A L R ALLA R T WLL T G G




UniRef90_G7H4F3
UniRef90 W9C1U7 UniRet90_W9C1U7
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U8B466 UniRef90-R7DVS7 UniRef90 UPIOOO35F196F UniRet90-A4BAR6 UniRef90-B1L7H6 UniRef90-D8KM94 UniRef90-UPI0003B3DA7F UniRef90-UPIO0029A8264 UniRef90-UPIo003B4B5A3 UniRef90-S2VW29 UniRef90-B5WVO3 UniRef90-U1R3Y4 UniRef90-UP10003B5C51D UniRef90-UPIO003682FF1 1 UniRef90-UP10003B7780 UniRef90-A0A059G3Q0 UniRef90-R5ILJO UniRef90-E8T1Z4 UniRef90-13TFZ3 UniRef90-JOS8H3 UniRef90-A8G211 UniRef90-EEYBB4 UniRef90- Q3ANM2 UniRef90-C1F4L5 UniRef90_R4Тзв2 UniRef90-UPIO00374DD41 UniRef90-V7MH19 UniRefofo-b8GJK1 UniRef90-G9YIZ4 UniRef90-H2C6U6 UniRef90-E7NAU7 UniRef90_R9VK53 UniRef90_S3UIO6 UniRef90-UPIO0041600AF UniRef90-D4M1M5 UniRef90_A7MF77 UniRef90_J9Z7A2 UniRef90-GOHKV1 UniRef90-F2NFX5 UniRef90-ASFPQO
UniRef90_R5HJS5 UniRef90 ${ }^{-}$K2RBH 1 UniRef90-N6XQ64 UniRef90-UPIo003B3B9A2 UniRef90-C7NOP6 UniRef90-UPIO0046394DC UniRet90_WODFT1 UniRef90-UP10002882BDB UniRef90-012CQ2 UniRef90-S4Y5M9 UniRef90-D5XEU2 UniRef90-UP1000255CD2C UniRef90-Q6AQR4 UniRef90_UPIO0029A6B40 UniRef90_B8ERW3 UniRef90-13ZWQ7 UniRef90-K9Q8J2 UniRef90 A8V1s0 UniRef90-D1CEL5
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VLTKDMLVEGVHFLPDDPPADI AWKLVAVNASDLAAKGAT VVSMDTLVQDADFRLVWWPGYDVGWKAAAQNLSDINAMGAH $L F T S D S L V E D V H F K W D Y T P F Q V G W K A L V V N L S D V A A V G G N$
$V V T S D M M V H G P D F R W A W S P T D V G W K A A A T N L S D V A A M G A V$ LATTDTLVQGVHFNLANSWKELGWKALAVNLSDIAAMGAVI LIATTDTLVQGVHFNLUNUSWKELGWKALAVNLSDVAAMGGV
 $V V S A D T A V A G R H F P E W A S P E Q V A Q R A F L P A V S D L A A M T A T$
$V F K M D M V S S S T D L L P G M S D R Q L A K K C V A N F S D V A S K G A R$ TVCSDTLVAGRHFFADVAATDLAWKALAVNLSDLAAMGAD VVTTDMLVQDRHFRLDWTPAEIGRKAITQNFADIEAMGAR LVADDMLMEGTHFFPPATPRLAGRKALAVNLSDIAAMAGR IVTTDTLVEGVHFLSTDPFETVGKKLVRVNVSDCLAKGAL LVVTDALVEGQHFRRDWTPGELGARAAVQNLVDVAACGGS VLTTDMLHETTDFPVGVTRRTAGWRAVGASLSDLAAMGAE VVTTDMMIEGPDFRWAWSPEDLGWKAAATNGSDVAAMGAR

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AVHTDPISGSV G ALKIID GFP LK YSFP F M D S Y D
 $L I T T D T \| V E G T H F R R L D W S P Q$
$\begin{array}{lllllllllllllll}A & L & T & T & D & S & F & V & V & R & P & L & F & F & P \\ A & G \\ A & S & T & D & G & F & V & S & P & A & F & F & P & G \\ A & F & S & T & D & S & Y & V & D & P & L & F & F & P & G\end{array}$

| $A F S$ | $D$ | $S$ |
| :--- | :--- | :--- |
| $L$ | $Y$ | $D$ |
| $L$ | $D$ | $D$ |

$V A S T D P D T$









AF T T D S Y V V D P LLF FP G S D


GDUGKLAVCGTVNDLAVSGAK GDTGALSVYGTVNDLAMTGAR GDIGKLAVCGTVNDLAMGGAQ
 GDI GRLAVSGTVNDLAVMGAR GD: GSLAVHGTINDIAMAGAR GELAI NGTVNLAVSGAK GNIGKLADAGTVND:SMMGAK GTATDTGNLADHTTMNDLASAGAE VVTTDSYVIKPPVFPDSD IGRLSVSGTINDLAVMGAT VITKDLLVESTHFFPFAEPRNLAKKALRVNLSDLAAMGAE
 A VAT D P AFSTDSYVVRPLFFPGGGDDGRLAVYGSVNDLAMAGAR VITTDMLHERTDFPAGTTRYTAGWRAVGASLSDVAAMGAE $\frac{V}{A} H$ DDPITA $A G$ AMTTDSFVVSPVFF AgrLag wLavivacndvavigar AYTTDTFVVQ VMATDSHVVSPDFFPG GDIGCLSVHGTINDVAMMGAK
 IYSMDAYRVRSLMDP WR AFTTDSYVVDPIFFPG LLSCDAlYPQ LAAAEPFWAGYCSVLVSVNDIYAMGGK AFTTDSFTVSPDFFQG GNDGNLAVAGTLNDLAMMGAA VATADAYTVNPPFFPGGGNIGSLAAHGSINDVVMMGGK



UniRef90_G7H4F3 UniRef90_W9C1U7 UniRef90_UPI00036B74DC UniRef90_X1MJU4 UniRef90-A0A022L0Y3 UniRef90_X1KK28 UniRef90_F8B466 UniRef90_R7DVS7 UniRef90_UPI00035F196F UniRef90_A4BAR6 UniRef90_B1L7H6 UniRef90_F9ZTG4
UniRef90_D8KM94 UniRef90_UPI0003B3DA7F UniRef90_UPI00029A8264 UniRef90_UPI0003B4B5A3 UniRef90_S2VW29 UniRef90_B5WV03 UniRef90_U1R3Y4 UniRef90_UPI0003B5C51D UniRef90_UPI0003682FF1 UniRef90_UPI0003B7780D UniRef90_A0A059G3Q0 UniRef90-R5ILJ0 UniRef90-E8T1Z4 UniRef90_I3TFZ3 UniRef90_J0S8H3 UniRef90_A8G211 UniRef90_E1YBB4 UniRef90_Q3ANM2 UniRef90_C1F4L5 UniRef90_R4T3B2 UniRef90_UPI000374DD41 UniRef90_V7MH19 UniRef90_B8GJK1 UniRef90_G9YIZ4 UniRef90_A3MSD8 UniRef90_H2C6U6
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UniRef90-U1QND9 | UniRet90_UPIOOO20011D0 |
| :--- | UniRef90-MOP9G7 UniRef90-GOEGX6 UniRef90-G9Y3D8

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170


200 DGWAGLGLL QQAGKAEPASLVQAYRRPQARLADGPLL RAAAGWA LESRHS IDADQRQVVNTFCRPQPPLGAGPAAL

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LEGTS II IASERAGEDERAFGREFVERAKGFIEMIDALTTAN
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DHGUAI MAQREGLNFK DAVESDCAPLNGLI ADMLKACP



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 RHGUAVLSVREALSFEEPVESDCAPVAE LDAAALVESA
DHG M M AVMAERQGLSFQSR DASDCAPDNKLVAKMLEV
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DHGDT MSKQAGDA DDGNLRSDTMALHKMVAKL LAELPA
D


LEGTSI DAKEKGQELAARYPMQLIWAAQGFDQYLSVLPEAB


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VEGTA LLATVFEGVLVERVGRDVANERAKSFTMRRVADGCAL
DHS DHLLS DREGLGFEQRVKSDCA PGNNDI EALLSSSAA
 GTGVITTADKAGAADPADVEAAVASMLKLNRTAAADMQE】G $\square$ ATTA T KKRGMASKA LTKKVVGIMSTLNRAAGETFASGK GGMGFVALHGVEKAGELEWVVKASRRTSVRVEVAHVIMST DHG AVMAEREGLDLRTADRSDCAALNDLVAEIIAA $G R Q F K N Y L Q W D S T S F R T P Q D L Q S K D A V L P M L A E R Q L A A A A$
$R H G A V V M S A$
$R D N M N G S G L N S D C E V L W P V V E A L I N K$

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UniRef90-R5HSS5 UniRef90 ${ }^{-}$K2RBH 1 UniRet90-N6XQ64 UniRef90-UPIO003B3B9A2 UniRef90-C7NOP6 UniRef90-UPIO0046394DC UniRef90-W0DFT1 UniRef90-UPIOOO2882BDB UniRef90-012CQ2 UniRef90-S4Y5M9 UniRef90-D5XEU2 UniRef90-UPIO00255CD2C UniRef90-Q6AQR4 UniRef90_UPIO0029A6B40 UniRef90-B8ERW3
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A R A G A H A T D|V|S D G|LTE E L S LL L S A S S G|V|A V A QVA H A MMDV S D GLL DDA A RMARASRLAVRIDDA QVPRSP


 RAGATA LLDDVS D GLLLA DL G HVVAAAS GVVLDEVDADALR



S A QHANASAD I S

 RPMPP $\square A A G P T A A E A G S T A M L D V S D G L A D D A G R D A E A S G V$
 AGHASAAMDVSDGLLIDAKALAEASGVALEMDLDAVTFAG



 LP WRA GGTDSS D GLLS AVA GL CSSS GCGAVL RHD QLPTAE

 A GGAQAMIDVSDGLIADLRHVAEASGVGMDV GTVHA MK DP TARGGFAA A N EMARKA GVGVRREEEVAVPDRA D DIHV DR D A T R G G V G T V L Y E I C E Q S GVVGI R L D M E A V P V S P AFATSMHDPTEGGVAGGLAEI AYASGVSIVVDRGAVLTRP


 V
 $P G V K A L R D A T R G G V N A V V H E F A A S A G C G I E L Q E R A L P L K P$ E DQVVVATMDTS D GL GQAIFAMADQS GVSVRRLDPPENWLDD


 R GL

## A


 EI HAMRDP TRGGLSAVLHEWASSSKVNFVI EEENIPDVKE

 $R A G A S A G D D V S D G L L R D A G R L A A A S D V A L D D D E A A E E E D E$ G S IIH T L R D P TR G GVVAT L






 K G LVDAMHDTE G GVLLGGVYEMAYAS GLAAEVVWE EI P V V A E





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


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UniRef90-R5HJS5 UniRef90-K2RBH1 UniRef90-N6XQ64 UniRef90_UPI0003B3B9A2 UniRef90-C7N0P6 UniRef90_UPI00046394DC UniRef90-W0DFT1 UniRef90_UPIO002882BDB UniRef90_Q12CQ2 UniRef90-S4Y5M9 UniRef90-D5XEU2 UniRef90_UPI000255CD2C UniRef90-Q6AQR4 UniRef90_UPIO0029A6B40 UniRef90-B8ERW3 UniRef90-I3ZWQ7 UniRef90-K9Q8J2 UniRef90-A8V1S0 UniRef90-D1CEL5
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UniRef90 Q31DZ3 UniRef90-S6A5Y1 UniRef90-MOM7K0 UniRef90-E5WNB4 UniRef90-D3P5U9 UniRef90_A0A015M1F3 UniRef90-H5XLG9
UniRef90 Q3AAF7

 $A L A S A A R L$
$A T E Q L A K$

##  $L \vee K V Y S$

AAVPGVD VRHLLTGGEDHGLVGTLPAGVAPPSGG GFTAAQAAGD GEDYELLVTFRPGDRERVTP $R L V E V G S A L G A D P L S W V L T G G E D H A L V A T F A V A A A V P$ EQ DLKQREDEG $K$ K LAL A GGDDYQLLETADPVAEREVVA EVGLF $\quad$ LGGDSISAAFHGGEEYEVVFTRREEDVAKVRD ALRPA LGEDWEA WQRWPLTGGDDYELILCVPPELRETGVP AVRKVPDFLTPAPDERAVQSGEEFALGLFTVPPGKAEELRP
 $V A L K H L D V G Q L N T C E L V F N R G E D H A L L A T F P S D V N V P P P$ ALRRL A VAETTPA DERDAAATTVGEDFELLVTDPPERVADAVA RIDFSSAALGSDPA AALA GGEDHALLACFPPSVALP EP
 GETELGEMLK L $\square A$

TWGDDYQTLLF TAPEEAQNS G $\square E$
EVKF TCDMLGYDPLY L A NEG EVYELCEGRLQCLYELSLNGGEEYGVVMTVSKEDLDSYGVEV NVRSAAAMLGDDPLEVANEG KAIMGVAAEDAEADLD NWPK GNKWDEYYFFGGEDYELVFSLPKKWANKLCD SLLLFCQKYGRKTEE\|IVEGGEDYELLFACHPDTYKTIAD GWPE GAPWTDWCLAGGEDFELVLSLPEAWADVWQR



SVRSAGSLLGTDPLEVANEG KVVMGVPEEDAESILD AVQGVCGMLGLEPLYLACEG RLVIIVPAADADGILIN
 VAEEFMSSKGLPLE ELLRVSGEEYETVFLVKKESEPLFIR SFELEPVSALRALARRWL LTGGEDHGGLATVVTDDAELERLPG

 AVRGVCELLGLDD ALNFANEGKLVVGVAREAAQHVLD HLQRPSSLLGQDPFGMAWDGGEDYDILFAVRPGVGGDAIK


$G L D F S S A A L G P D V R L A L A G A E D H G L L A T F P P G T T L P A \quad P$


 KLCCFVPDKY A DKVLE GARELAAA TGASGRNWASYGKESGG
 PLMA A C EFLGGFDPLYVANEG


 ALLIAAPREKAKKGIN KLVVI A V P P EK EAAERTLDE
 GLLIA VMQEQADEFTA SVFSACEMLGUDPLEVANEGKVIIGVILSVLKKHEEYGUN EAKSVL LKK PE RKELLTAGDDYQLLETVLPRENPVTGRK
 DVRAAC GLLGLDRQVACEG DV A AVCSTLGMEPWRATSSGS
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$A V Q G V C E L L G F E A Y D F A N E G$ SVKRFAEMLGVDPLYLASEG GVEPVCEYLDIDPWAATSAGS
 QVA A ACE LLGGDPDYAANEG AKLIDCAPEERDRLLD
 $E V R G A C E L L G D D P L Y V A C E G$
$G A W E F A G M Y L L P H L D F A G E F$








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UniRef90 D8HMQ6 UniRef90-D8HMQ6
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UniRef90-A0A031LJ71 UniRef90-F9VJA2 UniRef90-C8W32 2 UniRef90-LOHLW9 UniRef90_U1QCJ4
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 NFDISSMHDDTEGGLGALEEMSYASRNGFRIFCENIEVHP D DHCMRDLTRGGLATALDEDSTAANKQMMLDETAI AI AD RHGVHADTDDTFGFAGHALEMARGSGVRLAVSFRALPLYP
 EEVHVLRDPTRGGISGTLNEMAQVAGVELVLDEALLPMPD SKYVNASMDISDGGFLDLEKLSKSSKDGFEFF TAGVHAMTDLTGGGGGHLLETRASKLSAQVELGRDPLLP DSMHCMRDDTRGGLGTVLNEVSETDNTGIKQEKDIPMLA
 ATGVHACTDUTFGLEGHAAEMARGSGLSGQUDSSVLFLP EGVRAMHDTTEGGLLGGLHEMASGADVRFDIDTDRVPSDD DGVHALTDDTGFGLEGHTLELARGANLTARVRYADLPWDP KYDVHACTDVTGGSALGGNLNEMVAGDCSAVIEEEAVPVHP DTPLAMRDATRGGLSAVLNEWAKFCKVSAKVKEARUKYSD DGTHGMHDVTEGGILGAVWEMCMNSKLGAVIYEDEDPLND DYVNTMHDATEGGI LQALREVASASKKDIVVLDKAFYIDE NNLCNAGKDDSGGLVGTLLMLIEASQCGAILNLDSAIGPD LNLKLMRDPTRGGLATTLNEFVHAQNVGIU GIRVHAMRDVTRGGLGTVLNEFEASKCSDELNEEDPVSA YDVRACTDVTGFGLLGHTLEMAKGSNNGIRIQKSSVPMLE FNAHAATDDTGFGILGHSQNLAKQQRNEVSFVIHNLPIIA DPAVHAMTDTGGLAGHLLEI CRGSGLAAHVRFAALPLA AGVHALTDVTGFGLLGHLLELARGAKLAAHLEMAKVPLLP CPSLRLMRDPTRGGLGNALNELQQSGLSMRI WEEALPI RT NKVKVLRDPTRGGLATTLNEVAGQSKVSMKLKEEKLLIRD YKПNACTDITGFGLLGHLYEMGKGSGMSIEVDYKSVPIYK YEVHGCTDVTGFSLAGHALEMAEGSQVTVKIDTKKIPFLP DGTHGMHDVTEGGVDGAVWEMCNDSGLGVLIDEDKIAVSE PSVALLRDPTRGGLGTVLKEIADQSGVGMKVDESALPDHD GSHVKWMRDPTRGGVGTILHEFNAFSLGVRLFDQDIPIKP DGLAKAAKDDSAGLVGTALMLLECSRVGAALRMDRUPRPE KD SMAGVLGTLLMLGECSGQGAQLQLDALPHPPAEAGWP

| UniRef90 U7FN25 <br> UniRef90_UPI00047564E0 <br> UniRef90-A4XL04 <br> UniRef90-H0QZT6 <br> UniRef90-A0A058ZP00 <br> UniRef90-Q2NEU7 <br> UniRef90-R7AGD9 <br> UniRef90_A0A059KMU0 <br> UniRef90_UPI0003B5C223 <br> UniRef90_D3EQK6 <br> UniRef90-A8ZNR3 <br> UniRef90-A8FUI7 <br> UniRef90_W0EVL8 <br> UniRef90_1015E2 <br> UniRef90_S5ADA5 <br> UniRef90_A9WK86 <br> UniRef90-D4MAH7 <br> UniRef90_B8D1S4 <br> UniRef90_A1S670 <br> UniRef90-I3VW10 <br> UniRef90-K5BGY9 <br> UniRef90_U5LC67 <br> UniRef90_Q2JY25 <br> UniRef90-B2FT13 <br> UniRef90-D8HMQ6 <br> UniRef90_UPI000225C020 <br> UniRef90_UPI0003B4FAA9 <br> UniRef90-K4LJ51 <br> UniRef90_UPI00034D423D <br> UniRef90-UPI000479F921 <br> UniRef90_UPI00037225EA <br> UniRef90-E6L944 <br> UniRef90-B4S641 <br> UniRef90-UPI0003692668 <br> UniRef90_M0L9J5 |  |  |  |  |
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## 


$\qquad$ ETRHFDQMLSDNERLLLNDAQTSGGLLVSVSSQEQADDFCK

## 

 | $A$ | $R$ |
| :---: | :---: |
| A | R |
| V | T | RAVVELG DFERWLT SHLEKFNINPLDYILSS AARLAPELGLDAARRALEGGEEHELLATFPVGAVPTGWV LTAAACELLGLDPLFVANEGKLVAVVLLAVMRAHPDGRG GVDELARDTGASQRNWASYGSESGGLLVSCAPASRDAVFD ETIMAADMLGVNPMYLANEGN VCMFVSPEVSEEVVE

 EVKNLASMGM1DUTGFALYDPQSGGLL AVVEEKKKDLLME AVRAAGEMLGISPYDMANEG KVVMIVPSKFAQDALD DVAA CSCLDMDPWRATSSGS MVVAVEPHATSSVLA GVVEFVEATGASGRNWDAYGKDSGGLLVSCSPDAVDDVLD EARDYAKEFNRNYLEDKILFNDDGGLLVAVNPDDVEDILP EVMGICEULGFEPCDLANEG QARELASMGARETRDLAFDPQTSGGLLLSLLPESEARELMR EVKRUTSAVNVDPLRLSSG CIVATVAPELKKHG|R KVAGLCEPLGFDPGDULLLCFPSYGFLLSVHPQHAEKS|S PVRDYIAQQSDEQRALLFCDPQTSGGLLIAVQPEHAAALEQ AVRDFCGILGDNPMYM GNEGKMVLSVHKDDAORAVN RVREMAEAGNFDHVKDEDDFPEEGGLLIAVEGSQAEAGLE DFRFQKAGNVSEREMYRTFNMGMGFAVIASEDVAKDILD KMAALSKASGRFGLLQGTSAETSGGLLICLPREQAARFCQ EAVEHVQATGASNRNWAGYGHESGGLLVSCAPEAAAEVLE GVEQLAHFTGASGRNWEAYGKDSGGLLVSCDAGSVDEVL
 EVDGVCEI LGGDPLYLANEG

SVIESAEMG
DVEEYAKMGKTK乌NDTTKESFEDGGLLVSLKKKAAKEVLK VTKKVCKYFSUDWKRLISSG CMLIVASTEKAEYICA NC EVRSVCDILGYDPLYLANEG KAVFLVEPVVTERVLD GVRGVCELLGLEPLHASEGMERMVIVDNSNADALIN GLDLA RWLTAFPSFGYLLSVSPSNVDRGI A QAETLARETGASERNWASYGGESGGLLVACDAASADSLVK GWAATGPEAQAAQLR WLSAFPSHGFVLAVAPEQAAEVLA

| UniRef90_U7FN25 | $\text { A AKU\|GE\|! VE DADCM\|V\| } 290$ |
| :---: | :---: |
| UniRef90_UPI00047564E0 | ARIVGEI I D SPAGlV |
| UniRef90-A4XL04 | CYVVGEIIEEPKI |
| UniRef90-H0QZT6 |  |
| UniRef90-A0A058ZP00 | A AACGDVSDGSAVQITEREGTALFWD |
| UniRef90_Q2NEU7 | A Q I I GEVTDKKHVIME |
| UniRef90-R7AGD9 | A A I GRVES GPCVRV |
| UniRef90-A0A059KMU0 | A ARI GLVTD DPHRFVQ |
| UniRef90-UPI0003B5C223 | TVVGRLVEGDAGTI |
| UniRef90-D3EQK6 | $\square \mathrm{YVIGEVIE}$ |
| UniRef90-A8ZNR3 |  |
| UniRef90-A8FUI7 | A A I I GTVT DEHGKVVIK T P W |
| UniRef90-W0EVL8 | ARLI GHVTDDRR |
| UniRef90-1015E2 | A AII GRITAEPGVVV |
| UniRef90_S5ADA5 | AAI I GEVIE |
| UniRef90-A9WK86 | AALI GYATADPGVVV |
| UniRef90-D4MAH7 | SSII GQT TK G D |
| UniRef90-B8D1S4 | ISII GTIVD |
| UniRef90-A1S670 | AVI I GRVGGESPAGRV |
| UniRef90-I3VW10 | ATIVGKI TKYGKYLI DGNK |
| UniRef90-K5BGY9 | A A El GEIAEEPASTV |
| UniRef90_U5LC67 | AA I GEVTDQS |
| UniRef90-Q2JY25 | ARRI GRCQA G E G $\$ R VVGE  \hline UniRef90_B2FT13 & A AVVGRLSEGPGVSV  \hline UniRef90-D8HMQ6 & A AVI GRI A GDPPGIV  \hline UniRef90-UPI000225C020 & ARII GEVTEE  \hline UniRef90-UPI0003B4FAA9 & A AVVGQVTA T D QVI I E N S R G S K VLF D  \hline UniRef90-K4LJ51 & A A EI GQV V  \hline UniRef90-UPI00034D423D & ACII GEVIDSPGVV  \hline UniRef90-UPI000479F921 & $\square V K N S K Y G E G A T I \quad$ G NVLE K |
| UniRef90-UPI00037225EA | ASMl GETTENHPGRI |
| UniRef90-E6L944 | ANII GEILPPSEARVI |
| UniRef90-B4S641 | L TV V GRATS S P |
| UniRef90-UPI0003692668 | A QR GEV |
| UniRef90-M0L9J5 | A ATVGTVAEGEPEVVIGEPV |
| UniRef90_Q1Z836 | $\square \mathrm{L}$ R |
| UniRef90_UPI00037786C7 |  |
| UniRef90-C4UKG0 | A VTIGEVTVDPQVCVR G A |
| UniRef90-E6NB80 | GRII GKIKQGMRVIEDGREERDK G |
| UniRef90_G8MDG7 | SAVI GEVDASREVVL |
| UniRef90_UPI0003682C6C | VTVI GEVQVGQA GVV |
| UniRef90-E4TGI5 | $1 \mathrm{~L} K \mathrm{~K}$ GFIT D GE GVFLRKKE\S R Y GYEH |
| UniRef90-W0JWJ4 | AADVGVVEEGAGVTVDGDPL |
| UniRef90_UPI0003B6E01C | VLGGAEQVQGEPVRLGEQALDPGGWDHF |
| UniRef90-H1XSX2 | CAIIGKITA QKDPFIRVQPTQQTG |
| UniRef90-Q3AT46 | A ALI GSVVADHPKMV |
| UniRef90-UPI0001D2E089 | SARI GEIVADEHGFVQ |
| UniRef90-F9VIR0 | A SVI GEI IDE G Y F I K |
| UniRef90-KOC2W3 | A AVI GNVHKGSQAMV |
| UniRef90-UPI00046D8472 | AAVVGRVEEGEPALVI |
| UniRef90-S9SIY1 | A VCl GEVVAEHP\HVVGSS可GRQ |
| UniRef90-A2BLL4 | ATII GEVR |
| UniRef90_R5DJT1 | AAVI GCI QERDHTLVKMKTL |
| UniRef90-UPI0004230ACA | AT\\| IGKVTKNKG\LVNGVELE |
| UniRef90-UPI00047C96E5 |  |
| UniRef90-UPI000372E793 | A TEDGQLQAGHNVAV |
| UniRef90-C3P203 | A AVI GKVT |
| UniRef90-A0A031LJ71 | EAVI GRV |
| UniRef90-F9VJA2 | YKVI GEVRK |
| UniRef90-C8W3P2 | F A A I G K V V D R K C L L |
| UniRef90-LOHLW9 | AMII GRVTKD |
| UniRef90-U1QCJ4 | A AVVGTVESGSGVVVDDDGTEPP |
| UniRef90-E1TFF9 | A RVI GEMVAGAG |
| UniRef90-T2GAN2 | A A RII GTIQEPQGKTRAGQVL |
| UniRef90_R5X751 | CGVI GKVVEAK |
| UniRef90-UPI00046F9511 | ANII GETFKDDKNRVILET $\square$ |
| UniRef90-B0PI01 | ARVI GEV |
| UniRef90-C7H113 | FSVIGEIVEKEGIVLK |
| UniRef90-B8D6Q8 | HSVVGRVTRGEGVI I K G D S E |
| UniRef90-UPI00034A1A92 | CNVVGEI T L G SELILKKSKKQSY $\square$ F WN |
| UniRef90-UPI0003A2F9AE | AAIVGEITSDP |
| UniRef90-UPI0003B33E5C | A Q Cli GELVAE |
| UniRef90-UPI000403392E | CCII GQVHKDE |
| UniRef90-V9GF31 | A GRVGEVHRDHPGRI |
| UniRef90-N0BN55 | CRIVGRVEE G N G I F VK D L R $\square$ D |
| UniRef90-W5PMC4 | A WIVGIVEKGDRI |
| UniRef90-G8QL13 | A AVI GELSPGPGLAV |
| UniRef90_L9PQ05 | A AVI GRMAAGDRVTVE |
| UniRef90-D5XCJ4 | AAII GEVIPGKG |
| UniRef90-B2JX87 | AALI GEVTDDARGLV |
| UniRef90-UPI0003805D2E | A RVI GEVVEDDNNRV |
| UniRef90-Q20XQ8 | ACAIGEIJTAGP |
| UniRef90_Q73JP8 |  |
| UniRef90-R6VKH9 | SK\VGEVEEKQEVHLI |
| UniRef90-H1PJW5 | VS Q\| GTVTEEAS |
| UniRef90-W0J2J3 | LTCIGRFVPAGQLPP GA LD DLEFHGFEH |
| UniRef90-W3Y577 | 1 LHTFEEGKEAVLIGKTLDK |
| UniRef90-UPI000380745D | SRII GEVTS D |
| UniRef90-UPI0003795BE5 | A SVI G GVD A GR】ATVSDGTEEAVVWD |
| UniRef90-UPI00046CEC6B | A S IVGYTQPGP |
| UniRef90-UPI0003484A4E | CADI GQVCAGTAVDV |
| UniRef90_UPI0003484199 | $A M E \\| G Q V \underline{V} E$ |

20 VGD G ${ }^{30}$

UniRef90_UP10003
UniRef90_A1S1Z5 UniRef90_UPIO003ACDA6C UniRef90_L1QEF2 UniRef90 D5V5A6 UniRef90_UPI000470683F UniRef90-E2ZIU2 UniRef90_UPI0004792766 UniRef90-UPI0004235B97 UniRef90_J4UEY1 UniRef90_F5L8B6
UniRef90_F3B4E5 UniRef90_U2R9G9 UniRef90-B8См 33 UniRef90-UPI000237B2E8 UniRef90-IOK0A6 UniRef90_D0GLY0 UniRef90_V2Y278 UniRef90-Q8NKU8
UniRef90 UPI00047B5B05 UniRef90_UPI00047BEAFE UniRef90_G2IGE2
UniRef90_L7ZGC0
UniRef90-I3CHZ0
UniRef90_IOGML8 UniRef90 A6TQLO UniRef90_C0D213 UniRef90-U1QUS3 UniRef90_G8TLQ0 UniRef90-Q7VNG0 UniRef90_E5WTC1 UniRef90-A3KAG2 UniRef90_UPI00026256C6 UniRef90-J3DCI0 UniRef90_E1QLU1 UniRef90-A0A059FKQ5 UniRef90_R6LUM7 UniRef90_F0S2E4 UniRef90_E6SKE6 UniRef90_F6B937 UniRef90_F4AUR6 UniRef90-S7ULL8 UniRef90_U1NFL4 UniRef90_Q55946 UniRef90_UPI0004114FD7 UniRef90 UPI0004676437 UniRef90-F8KQ87 UniRef90_L7LHS1 UniRef90_C5EGR7 UniRef90 B3U4I2 UniRef90_U7L223
UniRef90_J5HXI7
UniRef90_F0JCM8
UniRef90 E1RG80 UniRef90_UPI000465B35A UniRef90_I3BRA9 UniRef90_U2TCU4 UniRef90_N0AMZ6 UniRef90_UPI0003B6772F UniRef90_S3JDI4 UniRef90_T1CGY9 UniRef90_Q6MK42 UniRef90_A3I2B8 UniRef90 H3NT01 UniRef90_MODHJ3 UniRef90_D6B2C3 UniRef90_Q8TY09 UniRef90_F2LK99 UniRef90_F5XZB6 UniRef90_C3MRJ1 UniRef90_W2ET32 UniRef90_K7RKL5 UniRef90-I3BNF5 UniRef90_I3ZTF9 UniRef90 UPI0004678D86 UniRef90_UPI000255EEFD UniRef90_UPI0003B44F9B UniRef90_D0L864 UniRef90-F6D269 UniRef90_W7YHQ4 UniRef90_UPI00045EB30A UniRef90 F8XUL2 UniRef90-N9WFA4 UniRef90_A3MZ45 UniRef90_F5LMQ3 UniRef90_Q8U3M6 UniRef90_S2XYY9 UniRef90_A8FAM7 UniRef90_A0B8K7 UniRef90_C5A5U1 UniRef90_K9TNU9

GEHEL D D A AVYKLNDTT
FREAFGNPLLDDDSARFTLNGADL D TF FKYFENEYLNNDST\|LPKLDNKI E LIEVVFKAFKND ILSEDAAVIQ
$L G D D C A A I E D G D G Y L$
 HDGAI DD FSGK $\frac{L}{M}$ D D A A V Y K L T D D A F

 GDDAAVVRADGGA DAAI I EWDKTRY
 LQ R LF F S R LP K G G VG D D GAVLQQ N NL
 MKMGKLNLK DFD DVIKNYMGSSSIGEDSCIIDDKEDF RELIQLFAKHLQHPTLN D D A A V
T D HD GALLV KMS G E D A A V Y QID E E
METGK $\square$ DREFFTEY $\square$ ASRLGAS GPGVD
HD GATLQL NGRV
KLLVGNETADDAAVYDIGNGLA
$D Y M V R T N T V V A P G S D A A M V R D R G T R L$
$R D L I E E V V S V F Q P P G M E D Q A R L M S A P G A R L$
D D A A V Y D L G NGTA
$R L L V G A G T A D D A G V Y Y G L S D D A L$
$L \vee D A G T S D D A A V Y K I N E T A L$
 LINDVFKNTANKE $\square$ DD A AVYRLNDEAT

D ED A C
LT G A A Y G EDAA A
D A A V
$Q R \square I G D G E A \square R \square G$ $\begin{array}{ll}\text { D D CAA } & \\ \text { D D } & \text { Y } \\ \text { D D A A A Y D } \\ \text { L }\end{array}$
E L I E G VF K P Y L Q E F L G E
E G GVVF
D D A A V V $R$ V $\operatorname{A} D G L A$
D A A VYRLTDDAM
D H M V R T N T M V R P G S D A AVLRVKGKA L

A GGPGDDAAl LSFPGKA L
VGHFAGLVDFGDYVL
FANLLVGTETADDAA AVWDLDGTS I $E \square I L P A F G N P L L N E D G A R L E M R G E$

D YMVRTNTVVAPGSDAAVLRIRGKAL | D | D | A | A | $V$ | $Y$ | $K$ | $L$ | $N$ | $D$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $A$ | $L$ |  |  |  |  |  |  |  |  |
| $D$ | $D$ | $A$ | $A$ | $V$ | $Y$ | $D$ | $L$ | $G$ | $N$ | $G$ |

$\mathrm{G} L \mathrm{~F}$ D

D D S A AVDI GD GRL
DGGGD DA A V V R L L A E R A
QAVAVVGDDCAAAIAD G DGY
 EAVFLEA A RNP LL E PL E D GAVVGVVGS S R L


P A ENLGH A A L L F R D FY L
G D D A A AVRRLTE G A L $\begin{array}{lllllll}D & D & A & A & V & D & I \\ D & \text { G } & \text { G } A & \text { Q } A \\ P & D & S & D V\end{array}$
GFGDDASAlDIGNGNI D D A A VYDMGNGGI D D A A V Y QV S E D A F $L I Q N Y$ A K R T $\square$ N E G L G S F G G MVVE D Y MVVRTSTAVQPGS DAAVVTIR GK A L
D Y MVVRTNTVVAPGS DAGVLLR DR GK AL
M D A MRRR LDPLTG GGHYAGLI DMGEFA
$G F D S S A V L$
$\square G G F S$
$G$



UniRef90_A1S1Z5
UniRef90_UPI0003ACDA6C UniRef90-L1QEF2 UniRef90_D5V5A6 UniRef90_UPI000470683F UniRef90_E2ZIU2 UniRef90_UPI0004792766 UniRef90_UPI0004235B97 UniRef90_J4UEY1 UniRef90-F5L8B6 UniRef90_F3B4E5 UniRef90_U2R9G9
UniRef90 B8CMJ3 UniRef90_UPI000237B2E8 UniRef90-IOK0A6 UniRef90_D0GLYO UniRef90_V2Y278
UniRef90_Q8NKU8 UniRef90_UPI00047B5B05 UniRef90_UPI00047BEAFE UniRef90_G2IGE2 UniRef90_L7ZGC0 UniRef90-I3CHZ0
UniRef90-I0GML8
UniRef90_A6TQLO UniRef90_C0D213 UniRef90_U1QUS3 UniRef90_G8TLQ0
UniRef90_Q7VNG0 UniRef90_E5WTC1 UniRef90_A3KAG2 UniRef90_UPI00026256C6 UniRef90_J3DCI0 UniRef90_E1QLU1 UniRef90_A0A059FKQ5 UniRef90_R6LUM7 UniRef90_F0S2E4 UniRef90_E6SKE6 UniRef90_F6B937 UniRef90_F4AUR6 UniRef90-S7ULL8 UniRef90-U1NFL4
UniRef90-A0A059KIU2 UniRef90_Q55946 UniRef90_UPI0004114FD7 UniRef90_UPI0004676437 UniRef90_F8KQ87 UniRef90_L7LHS1 UniRef90_C5EGR7
UniRef90_B3U4I2
UniRef90_U7L223
UniRef90-J5HXI7
UniRef90 E1RG80
UniRef90_UPI000465B35A
UniRef90_I3BRA9
UniRef90_U2TCU4 UniRef90_N0AMZ6
UniRef90_UPI0003B6772F
UniRef90_S3JDI4
UniRef90_T1CGY9
UniRef90_Q6MK42
UniRef90_A312B8
UniRef90-H3NT01 UniRef90_MODHJ3 UniRef90_D6B2C3 UniRef90_Q8TY09 UniRef90_F2LKM9
UniRef90_F5XZB6 UniRef90_C3MRJ1 UniRef90_W2ET32 UniRef90_K7RKL5 UniRef90-I3BNF5
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UniRef90_UPI0003B44F9B UniRef90_D0L864 UniRef90-F6D269 UniRef90_W7YHQ4 UniRef90_UPI00045EB30A UniRef90_F8XUL2 UniRef90-N9WFA4 UniRef90-A3MZ45 UniRef90_F5LMQ3 UniRef90_Q8U3M6
UniRef90_S2XYY9 UniRef90_A8FAM7 UniRef90_A0B8K7 UniRef90_C5A5U1
$P \vee L A V|N| L L G W P R E R P T E L L J T V L|R G G A T V A S T A A C H| L \mid A G G$ PMMAIAILGWPVNKPAEVAQQVVDGGRQACMDAGIMLAGG $P$ L H L S A G F P L Y I S V G Fill E E GL L F N ELLERRVVK SMA E TA K KA NV K I V T G


 PKY L S L S F I I E E GLDP MTEFWEIILVS I KNAAQKSNDQVVTG VK TA $A$
 $V K T A L N I V C F P Q N S D L N Q L G E I M R G G L E K V K E A G G V L A G G$
 $P V L A V N L L G W P R G V L P$ F $L$ F LAAEGGCHI GGG $P L V I L S S W I L E A G L S M E V F Q R E V K A M A R A A K A A S V I I A G G G$
 AKVAMNDVAFPNCLDS GILGGDIMKGGADKVAESSDALEDGG
 P L LA L A I V GM P L D K P L E V I E R I LA G GA A V C H S A GI P I A G G





 $P$ LMAIA I L G FP DDKPAEVAQKI IDEGGRFACQQAGIVLAGG

 $P$ I MA I A I L G WPVNVSPEVA Q QVVDGGRAACQAA GDALA G G
 $P$ I F S LA A VGMPI GQSPETI RAI LAA G GQSVVAETA GAPV A G G $P \mathrm{KV}$ AL NIVGFPNCLDP QILGDI LAGGADKVKEAGAVLVGG




 $P \| A V V D A L \quad W S K S S D Q A Q Q I$ WAGMQAASARFNVPIVGG $P$ KVAAL N IV C F P N CLDDRE I L G E I LIK G GA DKVLDEA GAVVVIGG $P$ LMAIA I F GWP DDKPP EVGREVI E GGRATCEAA GIPDLAGG P E Y L GM GFMLE E GLPDA TLERRI LE S VRA QLR LGGKLKLLS L $P V V V A D N L V G W P R E V P M E L L T T E V L D R G G L D V G A Q A G C P D V I G G$ VKTALN IVVCFPEAMDLNVLGQILLGGSEKVREAGGVLAGG PI GIVTD CJL NF GNP QRPEVMWQFI EGGK DACEALDVPIVGG

 $P$ WA A MNIVVCFPADKPMSVLAEVLDRGGKDTVEEAGAVPSGG





 $P L L S L N L T H Y P S K R P L E G L R E I L R G G Q E A V E E S G A D T M G G$
 PVFANAILSWPVEKAPELAAKVMEGAKS ICKTAGDEAAGG $P$ TVA $\square A \operatorname{L}$ L GWPVDTAPEVASKVLAGARATCAEAGIAALAGG $P V A F V D Y L A D D T P D E R F A E Q V G R G L S A G A E A A D V E V V G G$
 $P$ L C L V D CL $N$ F GSP E NYY QL R R S I E G L G KAAREF EVVPVVG G PI AVVDAL


 $P$ L F F L D Y L A A A S R L D P E V L A G L L R S L AA EAACRA Q G I P L L G G
 VKVAL NMVCFP E DEDPAI LGGEILRRGGAEKVKEAGGVLCG G $P \vee L A I N L L G W P A D L D D D L A R G V L R G G A A V A A E A G C P V A G G$
 $P L G L L D A V G A P \quad T R S H L T R V V R G D A A A A Q A W R T P V L G G$ $P M G M T N V L S T \quad R D M G V C N E I V K G \| T A G V K K F G V P M V G G$
 $P$ VASCSSL L LE E GLP FT LDEKMMCSMARAA QAARVR VGG $P L Y F L D Y V A C G B K L E A E V A A D L V K G V S E C G L Q S D C A L I D G G$
 PLAVTDNLNFGSPEKPEI FWQAVDGMAEACRELSTPPVIGG PI ALVD YFADKE PNE RVFEEVAK GDYK GAKEA GDAIVGGG

 $P$ L $A$



UniRef90_A1S1Z5
UniRef90_UPI0003ACDA6C UniRef90-L1QEF2 UniRef90_D5V5A6 UniRef90-UPI000470683F UniRef90-E2ZIU2 UniRef90_UPIO004792766 UniRef90_UPI0004235B97 UniRef90-J4UEY1 UniRef90-F5L8B6 UniRef90_F3B4E5
UniRef90_URR9G9 UniRef90-B8CMJ3 UniRef90_UPI000237B2E8 UniRef90_IOK0A6 UniRef90-DOGLY0 UniRef90-V2Y278 UniRef90_UPI00047B5B05 UniRef90_UPI00047BEAFE UniRef90-G2IGE2 UniRef90_L7ZGC0 UniRef90-I3CHZO UniRef90-IOGML8 UniRef90_A6TQLO UniRef90_C0D213 UniRef90-U1QUS3 UniRef90-Q7VNG0 UniRef90-E5WTC1 UniRef90-A3KAG2 UniRef90_UPIO0026256C6 UniRef90-J3DCIO UniRef90-E1QLU1 UniRef90_A0A059FKQ5 UniRef90_R6LUM7 UniRef90-FOS2E4
UniRef90-E6SKE6 UniRef90 F6B937 UniRef90-F4AUR6 UniRef90-S7ULL8 UniRef90-U1NFL4
UniRef90-A0A059KIU2 UniRef90_Q55946 UniRef90_UPI0004114FD7 UniRef90-UPI0004676437 UniRef90-F8KQ87 UniRef90-L7LHS1 UniRef90-B3U412 UniRef90-U7L223 UniRef90-J5HXI7 UniRef90_FOJCM8 UniRef90_E1RG80 UniRef90-I3BRA9 UniRef90_U2TCU4 UniRef90-NOAMZ6 UniRef90_UPI0003B6772F UniRef90-S3JDI4 UniRef90_T1CGY9 UniRef90_Q6MK42
UniRef90_A312B8 UniRef90-H3NT01 UniRef90-MODHJ3 UniRef90-D6B2C3 UniRef90-Q8TY09 UniRef90_F2LK99 UniRef90_F5XZB6
UniRef90_C3MRJ1 UniRef90-W2ET32 UniRef90-K7RKL5 UniRef90-I3BNF5
UniRef90_I3ZTF9 UniRef90_UPIO004678D86 UniRef90_UPIO00255EEFD
UniRef90_UP10003B44F9B UniRef90-D0L864 UniRef90-F6D269 UniRef90-W7YHQ4 UniRef90_UPIO0045EB30A UniRef90_F8XUL2 UniRef90-N9WFA4 UniRef90-A3MZ45 UniRef90-F5LMQ3 UniRef90_Q8U3M6
UniRef90_S2XYY9 UniRef90-A8FAM7 UniRef90_A0B8K7 UniRef90_C5A5U1

[^1] H T N R S T H N S L

 H S lin D P K F G L A C T G $\quad$ D




 H S V V E P I Y G L V V L G L V H P D R V K K N G GA R P G D S L I L G K P L



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 H T $V$ V HTVEVTPGVVATALGRTPAARLVPSGGARPGDVLLLTTKWAG


 H T NT H S GY A L GVVAI L GRRA K S L I T S S F D A QV G D R L I L V H S V D E P K Y G L S V S GVVVM P D K I L K N C G S K E G D I L I L T K P
 H S I S D VK Y G L S V T G T I IH P D K VVFA N S G C K E G DLL L I L T K P L
 HSSSP E P I F G L A V T GII P T E K I K R N A S A E V G C QL F L T K P L G





 H S A K D P I F G GL

 H SNRA GSA QLAVVAVLGRARRLL S SFAARPGDRLLMAVD LR














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| :---: | :---: |
| UniRe |  |
| UniRef90 A1s | G\| G LTTAQKQK |
| UniRef90'L10EF2 | DHGISIMNERENLNFSSNIKSDCCLLNELISDILSNS |
| UniRef90-D5V5 | KHGATIFAAREGIDESTSLESDCASLWPVVKKLIDSGDKI |
| UniRef90-UP1000470683F | GRWHDPHPFWDASSTLLCG TDRVARLRGDLDLLPGIAED |
| er90_E2Z |  |
| UP10004792766 |  |
|  |  |
| 4U |  |
| F5L | EELQQVMQ |
| UniRef90-F3E | VSGVG ICTAARIGETDE |
| UniRef90 B8CM.3 |  |
| UniRef90-UPIO00237B2E8 | GI GVL |
| UniRef90-10K0A6 | DHG IVLLARGEDELEATLQTDSRPLWP I I EPMIRLEP |
| UniRef90-Doglyo | GVS I NSAHMDGECSEETFAKCTKQN |
| UniRef90-V2Y278 | TGLVSTAAKVDMASK AVDEA |
| UniRet90-Q8NKU8 | VHGAVIAAMQ |
| UniRef90-UPIod | GVLSAALK |
| UniRef90-G2IG | MEGT, LLF DE |
| UniRef90-L7ZGC0 | IGVLTTAEKQSKLR PEHQGLATDVMCRLNKPGADFAE |
| UniRef90-13CHZO |  |
| UniRef90-10GML | G |
| UniRef90_A6TQLO | GGVGINTADKVDMVDESQYEDAVKVMVTL |
| UniRet90-U1QU |  |
| UniRef90-G8TLQ0 | THGTADMSVRKGLEFETTDESDSAPLKYQVLSMLEEYGDA |
| UniRef90 O7VNG0 | GIGLLTTAEKRGLLTLPHQHLVRDLMCQLNTIGTLLAP |
| UniRef90-E5WTC1 |  |
| UniRef90 A3KAG2 |  |
| UniRef90- J3DCIO |  |
|  | GTGVIJATALKAGLASPQAVERAVAQMRRLNALIAGRVMNE |
| Ref90-A0A059F |  |
| FOS2 |  |
| $\begin{aligned} & \text { UniRef90-FOS2E4 } \\ & \text { UniRef90 E6SKE } \end{aligned}$ |  |
| riRef90 ${ }^{\text {F6B9337 }}$ | G |
|  | DHGACVLLA REDYGLHGQLKSDCASVFPLVNAIRDL |
| UniRef90-S7ULL8 |  |
|  |  |
| UniRef90-A0A059K1U2 |  |
|  |  |
|  | GTGLINTAAKGEMASKESLDEAIKWMSLLNKYAGEVIR |
| UniRef90 UPIOOO4676437 UniRef90 F8K087 |  |
| UniRef90-L7LLS | 信 |
| UniRef90 C5EGR7 |  |
| UniRef90-83U4122 | EDLGGTEYLKV |
|  |  |
| 5H | GVLT T AEKKGLLKAEHQGLARDVMCQMNLIGAEFSQ |
| , | VLATAVK |
| UniRet90-E1RG80 |  |
| UniRef90 UP1000465B35A |  |
| -32TCU4 | A |
| UniRef90- NoAMZ |  |
| niRef90-UP1000 |  |
| , |  |
| Ref90_T1CGY9 | GIGVQLAGKRLDLTPKDSYQL |
| UniRef90_Q6MK | T G |
| UniRef90-A312B8 | G\\|GVLATALKRQKDQDKDYAHLIDD A CRLNSIGELIGNH |
| iRef90 H3NTO1 | GVGI STAGKREKASSRDLVLASQSMRTLNMLGAELSSU |
| iRef90_MODHJ3 | $\square$ SNGLTLA |
| UniRef90-D6B2C3 UniRef90 O8TY09 | EELGGSLYLIEYHGTKGGKVPRVRYREERALADASLRAMAR |
|  |  |
| UniRef90-F5XZB6 | GVGVLSAALKKEALDAAGYARMIATTTQLNTPGPELAEDL |
| UniRef90-C3MRJ1 |  |
| UniRef90 W2ET32 | P |
| UniRef90-K7RKL5 | PHTNGYSLIRRLVEGGESLKEALLRPHRAYLEEFRTLKAQ |
| UniRef9 | DHGVA L NARGDLALDADI ETDCAPLNRLTEAMFAVCP |
|  |  |
| UniRef90 UPIO004678D86 | GVGLVTSSYKAGEASUKSFEQAVDSMQTLNKYGAEASK |
|  |  |
|  | Q |
| UniRef90-F6D269 | GQKHPKFPLNWDTTTSKT PRQLVQA |
| UniRef90 ${ }^{\text {W7YHMQ4 }}$ |  |
|  |  |
| UniRef90-F8) | K |
|  | ${ }_{Q}^{K}$ |
|  |  |
| UniRef90-SLM |  |
| UniRef90-Q8U3M6 |  |
|  |  |
| UniRe |  |
| UniRef90 C5A5U1 |  |
| Ref90-K9TNU9 |  |


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| :---: | :---: |
| UniRef90_UP10003A212D2 |  |
| UniRef90 A1S1Z | AGHLLEMCQGATVDAELNLEAVPLLE |
| UniRef90 ${ }^{\text {L10 }}$ LIEF2 | KVLR DPTRGGIATTLNEISEHSKISMEINEDDL |
| UniRef90-D5V5A6 | datrgavSavLnewak |
| UniRef90-UPIO004 | GLSRAAKDDSMAGLLGTALMLA |
| UniRef90-E2ZIU2 |  |
| UniRef90 UPIO004792766 | F |
| UniRef90 UPIOOO4235B97 | T D |
| UniRef90_JUUEY1 | KYD HACTDITGFGF |
| UniRet90_F5L8B6 | DFEVHACTDITFGLL |
| iRef90-U2R9 |  |
|  |  |
| UniRef90-UPI000237B2E8 | A GVV |
| UniRef90-IOKOA6 |  |
| UniRef90-Doglyo | N Y P |
| UniRef90-V2Y278 | FPVHACTD |
| iRef90 | GYVHA |
|  | DSVHAMTDVT |
| UniRef90-UP1000 | YGVNSMHDITEGGVLGALWEVVNASQSGFKM |
| UniRef90-G2IGE2 UniRef90-L7ZGCO | VANVTAMTDVTGFGLGALSEVCQGSGLQATVWNE |
| UniRef90--13CHZO | TGLRFMRDPTRGGLATVAHEISQATGKTVILEQGN |
| UniRef90-10GML8 | AVLR DPTRGGVAAVLNEIAVASKCGILIDED |
| UniRef90_A6TQL0 |  |
| cob |  |
| UniRef90-U1Q | A |
| Reef90 G8TLQ0 | 硡 |
| UniRet90-Q7VNG0 UniRef90 E5WTC1 | AMADVA |
| UniRef90-A3KAG2 | A CRD |
| P10002 | A T D V |
| UniRef90_J3DCIO | GVSAMTDTGFGLLGHLSEDCHGSGLRAEVNAAN |
|  | VGAA ${ }^{\text {a }}$ |
| UniRef90 R6LUM7 | FPVNACTDITGFGLLGHCVEMAEASNVTFELNVHD |
| UniRef90-FOS2E4 | VGVSACTDITGFGFL GHLYEMHKYSKV |
| Ref90-E6SKE6 |  |
|  |  |
|  | EGVR |
| UniRef90-S7U | LGLRAATDVTGFGLGGHLLEMAHASN |
| UniRef90-A0A059KIU2 | LTA AVHAMTDTGFGLLGHLLEVCRGSGLDATLDLAAVPVLD |
| UniRef90-Q55946 |  |
| Pi |  |
|  | EGVTALTDVTGFGLLGHLIEMCGGSGIAAQLELSKVPLLP |
| Uni | GYPLYALRDATRGGLAALLHEWRASLVADEVEETQ |
| UniRef90-C5EGR7 | G |
| Ref90-B3U412 | EGLVLSAHDCSDGGLAVALTECCITSGSAQRLGAVVQLPL |
|  |  |
|  | GF GLLGHLKELCEGESN |
|  |  |
| UniRef90-UP1000465B35A |  |
|  |  |
|  |  |
|  | HD |
| $\begin{aligned} & \text { UniRef90_UPIO003B6772F } \\ & \text { UniRef90_S3JDI4 } \end{aligned}$ |  |
| UniRef90-T1CGY9 | - |
|  |  |
| UniRef90-A312B8 | EEVHAMTDVTGFGLLGHLDEMCEGSE |
| UniRet90-H3NTO1 | DGVTAM |
| UniRef90_MODHJ3 | PMREAGVRAAAHVTGGGWTNLERMGGF |
| UniRef90-Q8TY09 | KNMVSSVT |
|  |  |
| UniRef90-F5X | PGVHAL |
| UniRef90 C3MRJ1 | P |
| UniRef90-W2ET32 |  |
| UniRef90-13BNF5 | DIHCLRDATRGGLATVLNEFAERSGVDFVLKEEYLPIRT |
| ef90 |  |
|  |  |
| UniRet90-UP |  |
| Ref90-UP10003844F9B | VTAVRAMTDTGFGLLGHLSEVCEGSNLTAEVEFSAVPLIP |
|  |  |
|  |  |
| $\begin{aligned} & \text { UniRef90-W7YHQ4 } \\ & \text { UniRef90 UPIO0045EB30A } \end{aligned}$ |  |
|  |  |
|  |  |
| UniRef90-A3MZ | D |
| iRef90-F5LM | ASAHDLSEGGAAAVAESSISGGLGADVDFRT |
| ef90-Q8U3M6 | PLLELLKSVEVHGLA HITGGGLLNLKRITNYGFNMPPIN |
| UniRef90_S2XYY9 |  |
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UniRef90_UPI0003A212D2 UniRef90 A1S1Z5 UniRef90_UPI0003ACDA6C UniRef90-L1QEF2 UniRef90_D5V5A6 UniRef90-UPI000470683F UniRef90-E2ZIU2 UniRef90_UPIOO04792766 UniRef90_UPI0004235B97 UniRef90-J4UEY1 UniRef90-F5L8B6 UniRef90-F3B4E5 UniRef90-U2R9G9 UniRef90-B8CMJ3 UniRef90_UPI000237B2E8 UniRef90-IOK0A6 UniRef90-D0GLYo UniRef90_V2Y278 UniRef90-Q8NKU8 UniRef90_UPI00047B5B05 UniRef90_UPI00047BEAFE UniRef90-G2IGE2 UniRef90_L7ZGC0 UniRef90-13CHZO UniRef90_10GML8 UniRef90-A6TQL0 UniRef90_COD213 UniRef90-U1QUS3 UniRef90-G8TLQ0 UniRef90_Q7VNG0 UniRef90-E5WTC1 UniRef90-A3KAG2 UniRef90_UPIO0026256C6 UniRef90-J3DCIO UniRef90-E1QLU1 UniRef90_A0A059FKQ5 UniRef90_R6LUM7 UniRef90-FOS2E4 UniRef90-E6SKE6 UniRef90-F6B937 UniRef90-F4AUR6 UniRef90-S7ULL8 UniRef90-U1NFL4
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UniRef90-I3BRA9
UniRef90-U2TCU4
UniRef90-N0AMZ6
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UniRef90-N9WFA4
UniRef90-A3MZ45
UniRef90-F5LMQ3
UniRef90-Q8U3M6
UniRef90-S2XYY9
UniRef90-A8FAM7
UniRef90-A0B8K7
UniRef90_C5A5U1
UniRef90_K9TNU9

250
260
270
280
GAREAAEQGNLDWVWPHTRWGASVGLLLADAQTVAGELPG RAEHYLDLGCIPTHRNFDSYGESGGLLVAVCDEAEAALCE
 EVSGICEMLGFE ALSSANEGTFVMAISKDQVDRALE N A
 EVAGACELLGLDPLYVANEG V V V MAIVSADDADAFLA GTRALAEKGGIDELEQWCDAVTSGGLLMMAAAEQDAQQGVD KAKALADEFNVEFDNDAFAMEESGGLLLAVDKDEAKANMP

 EVRGACEULGLDPLHADASEGATSGFVAVVDQKKAPGGEE DARDLAEMG
DVKAlitevi GLDPDNLASEGVG VLAVDSNVEDDVLE EAVQHVQATGASGRNWAGYGAESGGLLVSCAPEAEAAFER


 GVKEFARMGIIPGGMYAN A CEEYVEEFAAQRNRNHLQGQTSGGLLVSMDPADAEAGDP GVTETCTTMGVDPWRAATGGTMGLLAVDPDDADRDTP QVEGACEMLGLDPLYVANEG GVEEYVEQGMI PGGTQRNFESTSGGLLIAVEPQAVEKIQQ
 GARAALAEGNLDWVRPHSAVAEEEALLLADAQTLAGEIPG GVDDYIAAG
EAREMATMGNRQYCDRWLASQTSGGLLMGDEPDQDDRAVG GARKLAEDGNWDSVKHLVTGDMSGGLLVSCAPDVAEDVLA EA IS YAKMGGYSYQKVDFRNVEDHGLLI SVEAQYAEAVME
 GARELARMG
EVASVCD $\backslash L G F D P F V L A C E G \quad R V I D V V P D \square S S E V L$


EAKEYAD
HA LDY $\mathrm{C} A A \square T P D Q Q A \square L C D P Q T S G G L L V A V K P E A \square D A F Q A$ EVRGVCE ILGLEPYVLANEG GALEALRDGNLDWVRPHLGAGEDDLLLLADAQTVVGEVPG ECEAYVEEFYLDKVEFAGCGFTSGGLLVSMDREDAAPGLP

 $G V K A Y I A Q G N F D S Y G H L L S P I T D G G L L I A V Q P Q A V E K V Q E ~$
 EAEALAQEGLEDWRRHVLTDPQSGGLLVAVAANEAENLVR

 $G A R R L L D Q G G R N W R D M L C D P Q T S G G L L V A C A P D A A A D V L A$ GVESYIEQG
GURYVGDA $L Q \operatorname{VRCSTNQLYLSADGGLLMAVDSEHVDSTLQ}$ KALAFLE
GIQEYINQF DFPDNTYRNWEGMDGGLMLAVDPENQSWFEN DLQLYIDQG
VFEFVQQEGNVSDEEMHRTFNMGTGFVAADAPDDAETLTE DARTAVADGNLE WVAPHVEFGEAGRLLLADAQTDAGEIPG S LS LS EVVNSVSRWDFLLLSESHGRAIVTVLGAAEEAGVP DV GVAELAGRTGASGRNWAGYGAESGGLLVSCTPQSVDQVLA


 GIFKLVHENGVPLEEMFRVFNMGVGFVAVVPQGEKEAALE EAYRLAEE
GARESLAE GNDDWVRPHDEAGGDVALLLLADAQTSGGLL EAELDYRAQGAIPGGTVRNWDSYGH

MGEWLTCFPGYAMLMADRREHTPAPTT MVEDEY $\operatorname{CODCDPTHEEWLKLYPGSGFVLTVKEENVNEC\square K~}$ MLDEY DAQD CDPTHRNWDSFGDK
GIQGYIDDFPDNTYRNWNAYGMDGGLLIAVSPENKQAGQE
 IVL 1
 GDFKLDHENGVPLEEMFRVFNMGVGFVVVVSQEDKEEALQ VFSMLKEKGSLEDRDLYNVFNMGIGFVI ALPEDQAQQAMN EASLFSETQSRFVVTVKPEHREAFKD VFKFLQEDGGVDDVEMYRTFNMGMGFVVVLPEEQADDACR
$L$ VRKVLDFYGLEPWSVSSTG
IFNWLAEVGNVTLPEMFNTF
$T$ L A

UniRef90 UPI0003A212D2
UniRef90-A1S1Z5
UniRef90_UPIO003ACDA6C UniRef90_L1QEF2
UniRef90 D5V5A6 UniRef90_UPI000470683F UniRef90_E2ZIU2 UniRef90_UPIO004792766 UniRef90-UPI0004235B97
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UniRef90_F5L8B6
UniRef90 F3B4E5
UniRef90_U2R9G9
UniRef90 B8CMJ3
UniRef90-UPI000237B2E8
UniRef90-IOK0A6
UniRef90_D0GLY0
UniRef90_V2Y278
UniRef90_Q8NKU8
UniRef90_UPI00047B5B05
UniRef90-UPIO0047BEAFE
UniRef90_G2IGE2
UniRef90_L7ZGC0
UniRef90-I3CHZO
UniRef90_IOGML8
UniRef90 A6TQL0
UniRef90_C0D213
UniRef90_U1QUS3
UniRef90-Q7VNG0
UniRef90_E5WTC1
UniRef90-A3KAG2
UniRef90_UPI00026256C6
UniRef90_J3DCI0
UniRef90_E1QLU1
UniRef90-A0A059FKQ5
UniRef90_R6LUM7
UniRef90-F0S2E4
UniRef90-E6SKE6
UniRef90_F6B937
UniRef90_F4AUR6
UniRef90-S7ULL8
UniRef90-U1NFL 4
UniRef90 A0A059KIU2
UniRef90_Q55946
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UniRef90_U7L223
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UniRef90_F0JCM8
UniRef90 E1RG80
UniRef90-UPI000465B35A
UniRef90-I3BRA9
UniRef90_U2TCU4
UniRef90-N0AMZ6
UniRef90_UPI0003B6772F
UniRef90_S3JDI4
UniRef90-T1CGY9
UniRef90_Q6MK42
UniRef90_A3I2B8
UniRef90-H3NT01
UniRef90_MODHJ3
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UniRef90_Q8TY09
UniRef90_F2LK99
UniRef90-F5XZB6
UniRef90 C3MRJ1
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UniRef90_UPI0003B44F9B
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UniRef90-F6D269
UniRef90_W7YHQ4
UniRef90_UPI00045EB30A
UniRef90 F8XUL2
UniRef90_N9WFA4
UniRef90-A3MZ45
UniRef90_F5LMQ3
UniRef90_S2XYY9
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UniRef90_C5A5U1
UniRef90_K9TNU9

A P VV GELTEAS


A A V I G K V T S
T AVI GQCTA T QR LDVVT WE GETEPFWD
AKIVGEII
A A QI GEVLEGSPK I
AAVI GEIVAE HPKQVI
A A IVGEI RERE
A AEI GYVTSD
A A IVGEI KEKENTT $\square \mathrm{K}$
SAIVGGKVVK
A A I GKVVNDKP GKVI L N T P W
A P V I GRV
A R I I GVI S N K P P G KVVA LS G Y
$S A V \vee G K V 1 / K$
T A S IG Y V VEEK G I V V
A AR GEMEVGS GARLQ



C GVVGEVTERCGHTVI
A A VVGHVESGEGVVRDG
AAVI GEVTEHPGKVL
$\square A$ Q। G
ATLI GEVTEAP ULY ITSNEE
$A V Q V G R A L D G P P G R V$
A PV I GEVPR GEHVVV
A A I I GRVT A E P A GVV
AAlVGRVEAGA
AFEIGTVTEKS


A HVVGRVHA
A AVI GEVREPS G
A A CVVGMQA
A E A $\square$ A T $\square Q P$ G H N LT $L K$
$\square$ A K Q E G LA L H S $\square$ G R T VE A S S Q S H LA A I GKV
$H P \vee I G H T V A G P G D T V$
CAIVGEIVREKAVTVK
AARI GTVGGDRLVIVDG
$P G Y P \vee \cap G R$
$\square$ A
$M L E A A G E P A A L V G R A D P A G$

AAlIGEVSEEA
ATLI GEVTAEPSVT I I SEQVE
A VQUGRLDAGNPMI
ATV G S $\quad$ VP G A G VCL
A WE $\square$ GKFTEKNEFTV
$G R V I G R V E A G S G V A V R G L D L$
HPVI GEVRGTAPVVVRG
$A Q V \vee G E V T \quad G D G V L$
CAPI GVVDASRELVLAEGGETGRDWD
$A A V V G R M E S G S G A R L Q$
LAA I GQVIDEKKKVVI KNTE $\square K N T G W D N F$
AAVI GHVKDDPPGLV
A H R V GRVV R GQGVHL $\quad$ Q

LVG E LPP G LIG TVIGRTLPS P
K G TV T DE QRA WL

A WQ $\square$ GS F T P K QEF T VK
A L R
$A Y E \square G Y \square T S G$
A F E V G R L L
AEVI GTVVTGTNKVDINGKP
$\square F E L G T V S E R P G I D V E N$
$A Y V I \quad G R V V A G E G V Q F N G$
AKEV G T V T N D GVFTVVK NQ E E G Q Q W $\square H$
AFELGEFTEEERVVLVEGGDEKP

UniRef90 A0Z5V9 UniRef90-G4QFA4 UniRef9-P60819 UniRef90 UPIO003AD1C0A UniRef90-UPIOOO36A5131 UniRef90-R6KPF7 UniRef90 D8SHG9 UniRef90' ${ }^{-}$B9NNU7 UniRef90-C7HVN7 UniRef90 G4RM60 UniRef90 QOYQH3 UniRef90_UPIO0039BA14A UniRef90-R6QS17 UniRef90-UPI000262966B UniRef90-K2QYY6 UniRef90-A0A059MH25 UniRef90-A6DB65 UniRef90 D3STH6 UniRef90-H2YQM2 UniRef90-17J734 UniRef90_10A006 UniRef90 D4XPYO UniRef90-Q9CMM8 UniRef90-D7U2F7 UniRef90 UPIO002FF342B UniRef90- D7N7Y1 UniRef90-UPI0003B34EBE UniRef90 UPI000471EA74 UniRef90-D5MG14 UniRef90-Q1NM90 UniRef90-UPIOOO4706974 UniRef90 UPIO0047C1D16 UniRef90-UPI000365095C UniRef90_G2IGH9 UniRef90_UPI0002D9BF93 UniRef90 A5VDE9 UniRef90-R5ХM20 UniRef90-A9D6B3 UniRef90 MOLFC8 UniRef90-W5JSF0 UniRef90-R4LU36 UniRef90_W4D155 UniRef90 UPI0004130962 UniRef90 ${ }^{-}$K21Z62 UniRef90-G8TX12 UniRef90 B9L5P2 UniRef90 С2CK13 UniRef90-F6D2X9 UniRef90-X1T6A2 UniRef90 UPI0004661899 UniRef90-W3ACT5 UniR Ref90-C5FOY3 UniRet90_R5VEF9 UniRef90 E8V365 UniRef90-K6CKB4 UniRef90-B9KFC8 UniRef90 V6F077 UniRef90-UPIO00416C943 UniRef90-O8PX06 UniRef90-F8EVEO UniRef90 G7WLU3 UniRef90-I3ZZHO UniRef90-S5ZX76 UniRet90 WTYMA UniRef90 Q28RA9 UniRef90-M7XYZ5 UniRet90_R5G914 UniRef90 C3PBN0 UniRet90-K7SC48 UniRef90_DIYVN6 UniRef90 EOIAG9 UniRef90-S9PJ09 UniRef90-D9QUJ4 UniRef90 A4JRS4 UniRef90 xovmwo UniRef90_14C8Q9 UniRef90 A6POX8 UniRef90-UPI00036BB6AB UniRef90-A5VHT8 UniRef90_Q2G630 UniRef90 UPI000362F122 UniRef90- Q8ES96 UniRef90_UPIo002377ABD UniRef90_B2UNI3 UniRef90-E6RZX2 UniRef90-E7FZ37 UniRef90-MOQEF6 UniRef90 U2WJE3 UniRef90-F21411
UniRef9O_UPIOOO401 1939
 NEGKNDATTLGKISGEI MDEKSLLRTFLRELGEEE DDCALVRVDKNNG DSMVQTNTVTPVGHDAAVIRT QAFPNLLVGDDAAVFRLNDEQL
 GDDAAAVRI GSTA
FRNTEDEQLGDAATVRLDSGERLD LLEAFGSDLTTEYAALLDLGDRYL



QGPGENAGVVDTGDGD ${ }^{\mathrm{M}}$
LLEAFGSDLT TEYAGLLDI GDRYL R■AEATKRPLGSLVSGLTPAGWVGDDGA PPVMGSD DDAAVIQLPPDQL DHLVMGNTTQRPGGDSAVVRLEGKGI

RVLVGNETHDDAGVYGLTMTAM DDAAVTDIDGETC EKD TTTSTASQFPNNDFESDSELYQFDSKKL LKTLSRPDLLTGPGDDAAVVQVGGQRQ EKAF $\square K T L A Q S K S T F G \square G D D G V A L K N M E E P D V$ KYPDPVL DYMVRTNTVVSPGSDAAVTRDRGKALL DH $\bar{M} V M G D T V Q R P G G D A A V V R \square H G K A V$ DDAAAYDMGDGKV
LIDKLRKGDGAPGDGHYAGLLDFGEYAL
DHMVGADTVQRPGGDAALVRVHGKGL
GI GSFAGALYDMGEYAL
GLLKSDPKTFYPGLLSDDAAVIKMSEDLA
LLRRFPTTGPRVGPGEGAGUVDGDNQ
 MR $\square G K V K E S \square L K R S V L R Q L H N H A S G E D A G V L F M P E$

QGPGEGAGIVDIGDNQA

TNPSFGEDAALI IDNGEYALL
DYMVRTSTAVQPGSDAAVVTDRGKALL

ANLQMDDP!L
QGPGEGAGVVDIDDGQA
GGDAAVVRIHGKAL VGPGDDAAI I KVDGKTC QGPGEGAGVIDI GDEQA DDAA VYA L D DARAA
KQRS $\square H Q A F G D F A A A Y D L S S Y K I$


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 UniRef90_A6DB65 UniRef90_D3STH6 UniRef90-H2YQM2UniRef90_17J734
UniRef90_IOA006
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UniRef90 UPI0002FF342B UniRef90-D7N7Y1 UniRef90_UPI0003B34EBE UniRef90_UPI000471EA74 UniRef90_D5MG14 UniRef90_Q1NM90 UniRef90_UPI0004706974 UniRef90_UPI00047C1D16 UniRef90_UPI000365095C UniRef90_G2IGH9 UniRef90_UPI0002D9BF93 UniRef90_A5VDE9 UniRef90_R5XM20
UniRef90_A9D6B3
UniRef90-M0LFC8 UniRef90_W5JSF0 UniRef90_R4LU36
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UniRef90_G8TX12
UniRef90-B9L5P2
UniRef90_C2CKI3
UniRef90_F6D2X9
UniRef90-X1T6A2


VSGTD GVGTK L L LA Q Q SK R Y H $\square G \square D C V A M C V N D V L A Q G A F$ $V V$ F KAESTHNHPTTVVEPYQGAAT GVGGDLLRDIDFSMGAR AIS T DC T TPRYCYADPYEGGKQAVA ETWRNDICAVGAR 1 A $V$ MAMESHNHPSY DDPYNGAATGVGGIVRDIDSMNAK



 $V$ S GTD GVVGTK L R LAA FMLDRHD DGQDAV AMCVNDILVQGA E

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UniRef90_P60819 UniRef90-K1LL88 UniRef90-UPI0003AD1C0A UniRef90-UPI00036A5131 UniRef90_R6KPF7 UniRef90_D8SHG9 UniRef90_B9NNU7 UniRef90-C7HVN7 UniRef90-G4RM60 UniRef90_UPIO0039BA14A UniRef90_R6QS17 UniRef90_UPI000262966B UniRef90_K2QYY6 UniRef90_A0A059MH25 UniRef90_A6DB65 UniRef90_D3STH6 UniRef90-H2YQM2
UniRef90_17J734
UniRef90-IOA006 UniRef90_D4XPY0 UniRef90_Q9CMM8 UniRef90_D7U2F7 UniRef90_UPI0002FF342B UniRef90_D7N7Y1 UniRef90_UPI0003B34EBE UniRef90_UPI000471EA74 UniRef90_D5MG14 UniRef90_Q1NM90 UniRef90_UPI0004706974 UniRef90_UPI00047C1D16 UniRef90_UPI000365095C UniRef90_G2IGH9 UniRef90_UPI0002D9BF93 UniRef90_A5VDE9 UniRef90_R5XM20
UniRef90_A9D6B3 UniRef90-M0LFC8 UniRef90_W5JSF0 UniRef90_R4LU36 UniRef90-W4D155 UniRef90_UPI0004130962 UniRef90_K2IZ62
UniRef90_G8TX12
UniRef90_B9L5P2 UniRef90_C2CKI3
UniRef90_F6D2X9 UniRef90-X1T6A2 UniRef90_UPI0004661899 UniRef90-W3ACT5 UniRef90_C5F0Y3 UniRef90_R5VEF9 UniRef90_E8V365 UniRef90-K6CKB4
UniRef90-B9KFC8 UniRef90_V6F077 UniRef90_UPI000416C943 UniRef90_Q8PX06 UniRef90-F8EVE0 UniRef90_G7WLU3 UniRef90_I3ZZH0 UniRef90_S5ZX76 UniRef90_W7YMA4 UniRef90_M7XYZ5 UniRef90_R5G914 UniRef90_C3PBN0 UniRef90_K7SC48
UniRef90_D1YVN6 UniRef90_EOIAG9 UniRef90_S9PJ09 UniRef90_D9QUJ4 UniRef90-A4JRS4 UniRef90_X0VMW0 UniRef90_14C8Q9
UniRef90_A6P0X8 UniRef90_D6XAQ7 UniRef90_UPI00036BB6AB UniRef90_A5VHT8 UniRef90_Q2G630 UniRef90_UPI000362F122 UniRef90_Q8ES96 UniRef90_UPIO002377ABD UniRef90_B2UNI3 UniRef90_E6RZX2 UniRef90_E7FZ37 UniRef90-M0QEF6 UniRef90_U2WJE3 UniRef90_F2I4I1
 P L M A A A IL G WPTKT GPE A A Q QVI NG GRYTCQEA G IQLA A G






 $V M A L A L V A M P \square N V L P H D Q D A K D L Q G G A D V C Q Q A G \square P V A G G$ $V$ K T A L $N$

 VKTALLN LVGFS CHHTNEVLQQEI LAA G GESKDRECGGVVLVGG



 $P$ M A I A I L G F P DK LIP P EVA Q R IVAD G GRFA CR QA GI T L A G G PLEF L D Y F A T S H L DVDLA E KVIVGGVD GCQQS DCVLLGG $P L L A I A D L G W P \square D K A P E V A A Q V M E G G R K A C A D A C I I I A A G G$
 $P D H V D V S I L L S E D D E E K Q L K E V V R D C D D G C N A A G T L L Y A G G$ $P \square A N M N A L G H P D H P K T R H L V S V V A G Q S G Y G N C M G V P T V G G G$ $P L F A D N D V G F P D G S S L S I L G B I L R G G A D K V R E A D T P D I G G$
 P TA L L D TVVWAP DTA SAE P L L A G L PK YLTC GCI LE E GMDLDD DLDKII ASMAKTAEEAGVSIVVG

 $P$ V A N M N AL GRPDHPKMRMLIGGVVGGGGYGNCVGVPTVGG




 | $P$ | $V$ | $L$ | $L$ | $N$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $G$ | $G$ |  |  |  |

 $P H S V L V L A T L P H G G Q Q Q L L D A Q L A A G L D A L N V Q K \square A L I \quad G G$
 $P$ L T A L N L L A A P A D K D A DVI A K M L W G G Q Q V M D A H R T Y V L G G VKTALNLVGFSCHHDREVLKEVLIKGGEDKIKECGGVLAGG



 P K Y A L L


 P L M A I A IL G WP DN K GP E V A A Q V L E G GRK A CA DA G CM L A G G
 P L A F V D Y L A L E R R V D P E M T A Q I A V G L
 PVCALN VVCYP DDGGYSALEKILLGGTEK DKEAGAALAGG


 PVALLNSLRFGELQSPRVKYLFEEVVAGIANCDGIPTVGG
 $P$ LGMVDVFS
 $A Q A V V N A Y$ WHHDAAAADQLLAGMEAACAAYGVRLAGG P DAA TVDGLNFGNPMKPE DF WQF E E CDS EACDLA LDDTPVVTGG $P \square A V V D A L W W S D G D D A A R P V L A G M A A A A S A Y G V P D V G G H$


P L F F LD Y LA VG K N S P Q M I E E IVAA GVA E G CVQA HCA LIG G PI A SLD S L HFDNSTTRRMKVTNTVRGUGDYGNCMGDPTIAG
 PI AL MD AL GEEK DKVR WL DE GVVVKGDGDYGNRIGVPTVGG
 $P L L A D A D L G W P V N V P P E V A R E V L A R G G R A A C A A A G I A A L A G G$ $P L L F L D Y L G D S N E R E R S R I T R L V A G M C D Y L E S C N C I L A G G G$
 P T Y L S V G F MLLE E G L E L T L L E Q L L A S M R T E L T L L G K L K L L L
 $P$ L F F L D Y L A V G K LDP P E QV A A V V G GV A R A C K E S G C A L I G G


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 UniRef90-P60819 UniRef90 UPI0003AD1C0A UniRef90_UPI00036A5131 UniRef90_R6KPF7 UniRef90_D8SHG9 UniRef90_B9NNU7 UniRef90-C7HVN7 UniRef90-Q0YQH3 UniRef90_UPI00039BA14A UniRef90_R6QS17 UniRef90_UPI000262966B UniRef90_K2QYY6 UniRef90_A0A059MH25 UniRef90-A6DB65 UniRef90_D3STH6 UniRef90-H2YQM2UniRef90_17J734
UniRef90-IOA006
UniRef90_D4XPY0 UniRef90-Q9CMM8 UniRef90_D7U2F7 UniRef90_UPI0002FF342B UniRef90_D7N7Y1 UniRef90_UPI0003B34EBE UniRef90-UPI000471EA74 UniRef90-D5MG14 UniRef90_Q1NM90 UniRef90_UPI0004706974 UniRef90_UPI00047C1D16 UniRef90_UPI000365095C UniRef90_G2IGH9 UniRef90_UPI0002D9BF93 UniRef90_A5VDE9 UniRef90_R5XM20
UniRef90_A9D6B3
UniRef90 MOLFC8 UniRef90_W5JSF0 UniRef90_R4LU36 UniRef90_W4D155 UniRef90_UPI0004130962 UniRef90_K2IZ62
UniRef90_G8TX12
UniRef90_B9L5P2
UniRef90_C2CKI3
UniRef90_F6D2X9
UniRef90-X1T6A2

130
140
150




 $K V V E N A G L Y P D G V L Y E M S G C A V G S L N K N S G B V L V G L P S T G$
 HS IH HDPKYGLSVT GKVDID KVWKNNTPNEKD ILILTMKPL


 HS I D A P E Y G M A V T G T A D P E QL M R N D A A E G G LiPL T L T K P L G $H V H P D A P Y N V S I T G M M N R E D V I T S C G A K P G D K V L V A D D L D$ DTKVVGRGAAD GLLY VPA GRRLGADDVRPGRRVLI S GT L G

 H T G I Y D GTVDYTVVL SVVAKK GNYVTYTMMAEE GDLLI LMMTK GPA H T NI H TQPPTLSV AI QGLANHLLSVFHVQAGQKILI
 E T A EMPD F YAD GVGVVKKDSVIDGKN IVPGDVLIGLLDSSG

 ETNFHESYD GNILVNADADNIFYSAAAGIGNPVVYVGSIH
 HTNRSK DLLNLADVSVTGGAKRLI S S FAAAP G D DVLIAAAVDHA


 EVNFHAAYDGNIVGVAAETNKI FYSAASGVGNPIVYVGSIIH




 H SIIPEP KM GYA V T GIVVHPRHDWRNSTASPGEWLYLTMKPVG H TI ETPEMGLSVTGVVNPKQMIRNNTLKKDDVIILTMPLG







 ETA SLLP E $\square A$ GTAI GMIVKK E DVVVT GE K I E K E DVVVV GLDP S S G E T A E M P GMY GF CV G VV E K D E I I D G S K I K A N DV L I A L P S S G
 D NSYD GNP LVNAMCVGLIDDHDKDQRGVAKGPVGYVGPPTG
 H TAVSPFVVSLSVTAMMGQKKKEEARAEYTNDDLVIAAGTIG EVQ F D P C Y E GN P L V N A M C V G L I N H E D D K K G QA H GA G N T V M H TIE T P E M G L S C T G F V V H P D K I L R N N TVVSE G D L I V L T K P L

 H THQAPGNCLAVAI TGWARTLLDTFHAAPGQLLAMAVDLD $N V S F Y N E S P T A A V Y P T P D D Q A T T A D F K D E G D V I L L L G G E T K$ S NTRSA QRQLAVSILGRARALLSSFNARPGRRLMM

 ETAEMPGFYPASVGGVDEEK IDDGKA LAEGDVLI GLASSG

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GaVLA KOGKLQDKHQGIATOLMCOPNQIGQQLSAI TQTAMAEERDYDINKAIEDMTTSNRYALKALRKAEERVGD $G$ G
S GV
EHGAA IMN E
SH S N G Y S L A R R
 $L T$ LE GS E Y L VM Q Y G TP G E D A P P V D L Q H E K K V Q E L L VA LA A
 VG GVIH P Q F HLLNWDTTTMKSAQLVQAQIMAMNE

SGV LLAADMARAAKGCHVAAMLDRMARPQDDAAQ L TEFGGSELQKMVEGR\FGKAPSDDLTDEAKRQEQULSAIQQ
 LHTNGYYNPDLYVTADKDKVGNALMQTHRSYGSVKRKLTA
 E S LK G L N L
 $G I G G L T T A E K Q G K L L D E H K G L A T Q Q M C Q S N R L G Q Y Q S D$





 YVGASTGRDGIHGATGASEELSESSEAKRPAVQVGDPGME G L G I L I T A I I M A D L L L D E P GRVVHP SCDLLNWDT T FLLKDAS V V $R Q Q V G S M V E E L A$
 GRWHGDAPYWKAFEGVPGERLRARLELLPALABA

 $G V G I D T$ TAF K A DEA EAE HIIA LAATEWMKQLDRDAAAAAR
 VH SN GFN LKK E Y H E S L G T T L G E A L L A P T R I Y V K A V K A L L K A
 THSNFFKDHQWTLQDQLPSGKLLIDELLAPTKTYVEDMMP YVGAKTGRDGMHGATFASADFNDENMTQRSAVQVGNPFME THLGQSLYDREIGGREDGDAPSVDLAVERRNGEQVREWDA YAGPPTGRDGGHGATFASDDLAEDSNKDRPAVQVGDPFME G


RGAHAMTDVTGFGLAGHLDT DCRASGVSA ILDLAA $\square$ PVFA S GLVASAHDVAEGGVAALAEKAFGNGVGDDVTLSGAA NDVAKAGMDISDGDFVELGRLGQDNKVDFELLKPKGE GVRVKACSHI TGGGFYENDPRMLPEGKHAVVEKNSYPVPP
 AGLVVQSAHDLSEGGLAVALCLFTGEGMGAEVHVTGNAVSD $D G Q I T A C H D V S D G G L V A V A E M A M A S G I G A S L E A P S S$ MAGI A AVTDTGFGLLGHLAEMMQGSDLSASVKFSAVPTVS VLKACEVHGLAH TGGSGLLK LRRDTKLGFDFYDPLEP QE GKMVGAVHDDSDGGLAVAL TEMAAGNLGVTVEABNKDDP


 REVI S I HDVREGGUFAALWEMAAAKNVGLSVAGKNNIPIVR $K L L I E A C L E L I Q S D A L V G I Q D M G A A G L T S S S A E M A S K A G M$
$E F D A H A C D V T G F G F L G H L A E M S G G T K T D E V E C S A V P F F A$
 GRLRAAKDISNAGULGTLLMLLEPTGCGARVDLDALPCPA D GLVDAAKDDSAGVLGTALMLVECSRVGARIADDADPRPP GATLHAVTDITGFGLGHAWEVASKSGLRQQVRFDDLPFHP




GKIKAMKDLGAAGITSSCSEMCYSGGVGAEDY LENVILRE KLLIEACLEVIQSDALVGIQDMGAAGLTSSASEMASKAGT A GVRAMTDVTGFGLLGHLLEMAEGSGLSAVLDAAAVPRDP NVTPKAYAHIT GGGLPENLERFLGDYGA DLSI PYWD KFHPSAMSDVTGFGLLGHLKEMLNKNISFEDFESELPFDD
 LLRPAAAKDVSMAGIAGTAGMDAEASGTGVELDDAAVPRPS

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UniRef90_UPIO0039BA14A UniRef90_UPIO0039
UniRef90_R6QS17 UniRef90_UPI000262966B UniRef90-K2QYY6 UniRef90-A0A059MH25 UniRef90_A6DB65 UniRef90-D3STH6 UniRef90-H2YQM2 UniRef90-17J734
UniRef90-10A006 UniRef90-D4XPY0 UniRef90-Q9CMM8 UniRef90-D7U2F7 UniRef90-UPI0002FF342B UniRef90-D7N7Y1 UniRef90_UPI0003B34EBE UniRef90_UPI000471EA74 UniRef90-D5MG14 UniRef90_Q1NM90 UniRef90_UPIOOO4706974 UniRef90_UPI00047C1D16 UniRef90 UPI000365095C UniRef90_G2IGH9 UniRef90_UPI0002D9BF93 UniRef90_A5VDE9 UniRef90-R5XM20 UniRef90-A9D6B3 UniRef90-M0LFC8 UniRef90-W5JSF0 UniRef90-R4LU36 UniRef90-UPIO004130962 UniRef90-K2IZ62
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G L V D $Y$
 GAYEAAKAGGAKRNRQYYEDQDDFGLLI TVPEDQLEANIQQ GARAAVR

EVSEFSDLLGLNPLYMANEG KVIIIVSNQHAQEGQE IF NWLKDAGNVEEEEMLRTFNMGDGMVLVVEPRVADKDLP GAAELSDQGVRSTLYPDNTGGKADLLCAAVAADQADKLCP
 EVVSEALRLGFEPEEVVFNAGEEYLPVVADVDPRCVPEGYV GARELAEQGGRNWHRVELAEGMSGGLLLAVSPEAVDEVLA DAERYADEFDVEFSDVPFWMEESGGLLAGI RPEDAQSGLP
$G V D A A L A E G N L D W V R P H L E G D A E E D L I L L A D A Q V V G E V P G$ GV DV NWEDWLKKYPGA TVTGACDMDGDDPLYVANEG EADEFASMLSFEEEMLDFDAQTSGGLLISIEENKANEGIN ■FEFVQAEGNVTDEEMHRTFNMGTGFVVALPEERAEAGVA KMSAI AKACGNMFGLLQGTSAESGGLLI CLPREQAAKYCA
 H T GVQRYDEKGCDPGGTERNFESYGHGLLIAVDADSEQQVL E VFKWIQEAGQUEDAEMRRTFNMGQGMVLVVSPEASLRILGG E DHDYLD DENEKQRH LLCDPQTSGGLLIAVKKEAAQKVLY GAKKAAEDF
ETVEDCEFFEDNPYQ LLSGG A LLFAADDDLKNAGПP REVGMTPYE IMLSESQERMLMLLKPEEEAKATLD DAWDLIHEGGTQRNYESLDGATSGGLLIAVPKDKTAALIQQ

$H V$ V LTRWLTAFPSFGY VVSVRPDRAERGDA S S I E Y VKDG IID WLENDLFEPQSGGLLESUEAEDDDKFKK GAREAVRDGNLEWVAPFTDFGEETRLLLADAQTVAGEVPG GAVELAQMGNREYSGYMVDTGDSGGLLISVAPEYTDDVMN E $\quad$ VF VQEEGNMSAYEMMLSESQERMMLMVLEPEKEAEAGLDD KMSAVAKACGNMFQLLQGHSAESGGLLICLPREQAAAYCK



 EA A NQASMLSFEEQMLLFDAQTSGGLLISLPQEKAEEYLK $S \square Y S \quad \square G V P \square D E M Y H V F N M G \square G F V V I V R E D D A D R T V K$

GAEDLARQGHHSNRDAAPVVGPDGGLLAAVPADRAQALLA TTALFSESQSRFILTVSPEHAQAVTD WFYSPEEYQMLYALSAKNLKKAQN TFTLMAREGNVDEHMMYNTYNMGLGMVLAVDPADVDKTME LF QHLQE LGNVEQDEMMRTFNMGIGMIVVVPAEQVKKAKA LFSETQSRFLLSVKKEHQERVVD L NSAEEYE LIFAFDKKHKA
$\square P \square H A W C F G E D Q G R Y V L E V G Q D D G L V A V L E A A Q E H D C D$ GAFDY! 1 E
GFKFLRKEGGVDDLEMYRTFNMGMGFLIILPEKDAEKAAE IFRFLQEEGGVAEDEMYRTFNMGMGWVFVLSEDDVDAVLK
 EAYKAANEFDFAMEE LLFDPQTSGGLLFAVSKREAEKILEP VFGWLAQEGALDQAELLKTFNAGLGMVLVVSADAVDAGES RAAALAQETGASHRNWASFGSQSGGLLVTCTPGRAEAGLA HTDEVCEYFNLDPY MDRSGGT LLLLACAEQFQKAGIE G I EMYLDETGMTPYEMMLSESQE RMLIVVKKGREQEIVD EALPMASMGGADDEMLLFDAQTSGGLMI AATPKNAEKMVE
S L E


 GALHYADELRLEYERQLLTFCPEGGLLISLSPQEAEAFLA GARDAASMGLVD DADLLFDPQTSGGLVMAMPEEKVAEFVA $\square F R L I Q E K G N I P T R D M Y N T F N M G \square G M I L A V P A P Q A G Q A L D$
 GQSGMQREPGMSAYE DMLSESQE RMLLLCVKKGHEEDVLEE

GMTPYE\|MVSESQE G $L$ MN $\square D E Q G M T A Y E M M L S E S Q E \quad R M L L C V Q A G R E Q E I I D$

RMLVAVEEGSEEEVLP $G V D D Y$
NTAAQK $\square L K H V D P Q D R F N T F N M G \square G W V A \square V R P E D A E A A \square K$ GVKEYFNMG
EVRGVCEILGLEPYVLANEG
AA FRLLQE WGNVDWKEMYRTFNMGDGMVL DAAEDEAERGEP


|  | 290300 |
| :---: | :---: |
| UniRef90_A0Z5V9 |  |
| UniRef90_G4QFA4 | V |
| UniRef90-P60819 | A FEVGRVVK GE GKAVLS K DVK |
| UniRef90_K1LL88 | A A H $\downarrow$ G Y $\square$ T |
| UniRef90_UPI0003AD1C0A |  |
| UniRef90_UPI00036A5131 |  |
| UniRef90_R6KPF7 | A T I I G V I A D |
| UniRef90_D8SHG9 | S Y L I G TVV Q G K G V V Y D |
| UniRef90_B9NNU7 | A A V I G Q I D A Q P GLRVH |
| UniRef90_C7HVN7 |  |
| UniRef90_G4RM60 | AFA $\quad$ RVVE G S GVIVYK G K P L K Y R G WS Y F |
| UniRef90_Q0YQH3 | VRVI G K V V P G T A I A V N G Q E |
| UniRef90_UPI00039BA14A | A SVI GEVGA |
| UniRef90_R6QS17 | C A AV GRIT K |
| UniRef90_UPI000262966B | Y P V I GR T T T EP G L R V |
| UniRef90-K2QYY6 | $\square A \vee V$ G S I I S D K K L Y L |
| UniRef90_A0A059MH25 | A A El GEI L A EPEGIV |
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| UniRef90-H2YQM2 | A WI I GIV E A G S R ARII D K P |
| UniRef90-17J734 | A RVVGEVTTE E P G V R L K G VE $\square R$ |
| UniRef90_I0A006 | A GII G R I R E K R G V Y I K G K |
| UniRef90_D4XPY0 | CAV I GEVTNS GKV |
| UniRef90_Q9CMM8 | 1 A |
| UniRef90_D7U2F7 | A Y K I GEVA\VGE GVR |
| UniRef90_UPI0002FF342B | A EP G EL I E K S E L L |
| UniRef90_D7N7Y1 |  |
| UniRef90_UPI0003B34EBE | A S VIG F L Q E G N R K DI 1 N E D |
| UniRef90_UPI000471EA74 | F AVI GKV T D T GRMVL |
| UniRef90_D5MG14 | A ALI GEIVVEDPTGR】 |
| UniRef90_Q1NM90 | A M R I GEVQE |
| UniRef90_UPI0004706974 | A S A $\square$ G H A T D S S R $\square$ D LT S G G A R A T F WD |
| UniRef90_UPI00047C1D16 |  |
| UniRef90_UPI000365095C | A A R\I G S L A G R A VR VR D A |
| UniRef90_G2IGH9 | Y K V I GEVRE |
| UniRef90_UPI0002D9BF93 | A PVVGELV |
| UniRef90_A5VDE9 | F AVI GRVVTDTGRMVLD GETV |
| UniRef90_R5XM20 | A S RIG G TVREADEKWI |
| UniRef90_A9D6B3 | F A IV G K T T D D L R FRI |
| UniRef90-M0LFC8 | GRVI GHVE E G D S VE I R G |
| UniRef90_W5JSF0 | A WI I G IVEEKGSRARIID K P |
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| UniRef90_W4D155 | $V E$ I I G TV G G D R RVA L D G A A |
| UniRef90_UPI0004130962 | S AVI GRT】A |
| UniRef90_K2IZ62 | A K R I G T T G G A E LT VA G A |
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| UniRef90_B9L5P2 | AK I G NV K E K E E K F $\square \mathrm{K}$ |
| UniRef90 C2CKI3 |  |
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| UniRef90_C5F0Y3 | $\square A$ |
| UniRef90_R5VEF9 | A Y V V G K IT D G E G VT L |
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| UniRef90_F8EVE0 | 1 F R L G V T G G S D I V L D G Q T V S |
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| UniRef90_I3ZZH0 | A Y El G K V V E S D Q P I V |
| UniRef90_S5ZX76 | LWWQI GEI HKRE |
| UniRef90_W7YMA4 | CA KVGKVT D D G R L K L |
| UniRef90_Q28RA9 | $\checkmark \mathrm{V}$ R G TVT A G A GV R Y S G |
| UniRef90_M7XYZ5 | A AVVGRFEAGPAA |
| UniRef90_R5G914 | S AVI G Q T T S G |
| UniRef90_C3PBN0 | A VT M G K VT E D K M L R L |
| UniRef90_K7SC48 |  |
| UniRef90_D1YVN6 | A T K V G K V S A P R L L V K G K E |
| UniRef90_E0IAG9 | HAVI GTVTGA G S L KL D |
| UniRef90_S9PJ09 | CAA G QLD A S A RLWVEHADQRAEFWN |
| UniRef90_D9QUJ4 | V T E L G Q V T G D R L Al N N A |
| UniRef90_A4JRS4 | CAVIGD D D T REVVVEEAGETAVLDD |
| UniRef90_X0VMW0 |  |
| UniRef90-14C8Q9 | A A E $\square$ G AVERSDTL |
| UniRef90_A6P0X8 | A Y Q I G Q 1 P G D GVVL D |
| UniRef90_D6XAQ7 | WKVI GEV SALLP QVTVVDGAPWTSKGWDHF |
| UniRef90_UPI00036BB6AB | A T R I G QV DK A S |
| UniRef90_A5VHT8 | A VT $\triangle$ G R $\downarrow$ T A G H D Y VLD G E E V |
| UniRef90_Q2G630 |  |
| UniRef90_UPI000362F122 | A SVIGK T T D T K K L VMNGETV |
| UniRef90_Q8ES96 | $\square$ F EVGGKV I E E K V F R $~$ K |
| UniRef90-UPIO002377ABD UniRef90-B2UNI3 | A T V I G T LR E G R G $\mathrm{TH}^{\text {V }} \mathrm{K}$ |




VKANTLVRPGSDAGVVRTRGKAL QGPGEGAG\|VEIGDGQA QGPGEGAGIVDI GDGLA $E \square M K K H D R R T S V P G V C E D V G G F D L G G M E L$ DSMVQTNTVVTPGSDSAVIRITDKAL DSMVRTSTVVGPGSDAAVIRIRGKAL



DHMVRVGTVQLPGSDAALI RLNESEV GDDAA I DI GDDVI
VKTNTVVLPGSDAAVVRIRGKAL E VELIKKDVKETHGKEIGGFAGAFGLTNPVL DHQVGTNTAVIPGSDAGVLRIRGTQI
$E L V D R \square K R P G V V G G \square G S F G G L F D L G E L H L$ DTLIQGNSLQIPGGDAGVVRVEGKALL LLRRFPTS GPRVGPGEGAGIVDI GDNQA


QGPGEGAGUVD ${ }^{\prime} G E G L G$
RNAIVGAGHYSGVVKVGTQNI
$R G L V Q S T H R P E V L G G L G G F N G C F Q L P M G Y L$ EVVDRDKKHVKRGGFGQFTGLIDFGDIVL

AG G GENAGVVD IGDGN A MRDGKVTESVLKRSVLKLIKSDSNRESAAAIDEDGSVL


PAPPGFVGDDGA PVPGTDV


$V Q T N T V V A P G S D A A V V R I R D K A L$
DHMVGLNTVVLPGSDAAVLRVKGKGI
GLIFDASAFQRYKRPLL



UniRef90 ${ }^{-}$X1L9A3
UniRef90_F2P9P4 UniRef90_F0T7R8 UniRef90-X1T3H4 UniRef90 V2XFW5 UniRef90-X8J0K5
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UniRef90 W9DMZ1 UniRef90_Q38XW7 UniRef90_C2CF46 UniRef90-F0SUS9 UniRef90_E3C804 UniRef90_K2N0S3 UniRef90-E0RH01 UniRef90-W4L7F5 UniRef90-W5YKQ3
UniRef90 R7BER4 UniRef90_M3IEA7 UniRef90-W7KL29 UniRef90_B4W402
UniRef90_UPI00036B2CBD UniRef90-TOU5Y4 UniRef90-E3GWE6 UniRef90_Q9A5F0
UniRef90-F7VGR5 UniRef90_R5S1S3 UniRef90_Q00SW9 UniRef90_E0QIV6 UniRef90-UPI0004157FFA UniRef90_B8DTT6 UniRef90_Q0AQW7 UniRef90_UPI00035EDB31 UniRef90_A4FVZ3 UniRef90-D7UUA8 UniRef90_H1LH98 UniRef90_G4T9P8 UniRef90-A4J723
UniRef90 W2F9T3 UniRef90_UPIO0041505FC UniRef90-G7CGL8
UniRef90_C1A3V4

$P \square M A D A \square L G W P V N \square L A P E D A Q Q \prod E G G R S V C R E A G D S L A G G$
 PRFLSDDLNLPMEMTKEQLE IVWDTMHQECERLGI AVI CG $P L F F L D Y$ LA C DKVVPEKIVAIVKGIADGCDQAGCALI GG PLYFLDYYGCS KLEVSVATQVIKGIAEGCRQANCALI GG

 $P$ I AVMD QL AVVDPDTTRVVNGVVQGVGGYGNCLGLPNIGG $P$ I A AMNALLAPDHPKTRHLVAGVVAGVVGGYGNSFGVPTVGG $P$ QAATASLILPRMSPERTLHEI MATAAEVMQQAGAAII GG $P$ LIF F LD Y L ACGKLVP EKI EAIVKGVADGCEQAGCALI GG $P$ S SALQLVCWPNDISFDULSEVI RGGLDDTMEKANCTVVGG PLAATDCLNFGNPEKPEIFWQUEDGMSEACRTLSTPVIGGG $P \vee A I T N N L N F G N P Y N P E V Y W Q F V Q G I I N A C E K L G T P V T G G$ TRSLLTRVLRGVVRASDIWDVPI DGG PLFFLDYFATG KLELDAATRIINGIAKGCELSGCALIGGG AVALI SDVHLADDGDVGKILDFTAGICTVSEAIDNDPRVGG PLFFLDYLAVAKVSPTQVADIVGGI ARACKESGCALI GG PLFFLDYVATGH LEPDQLVEVVRGITQGCQQAGCALLGG


 PLGGTVGLNGNPTNPEVIFWQMEEGMSEAARHLETPVVSG AVALISDIHLADDGDVSKDFDYTSGICAVSEAVSVPRVGG PLFFLDYLASSGRDKMETSMADIEGIAARGSEAGCALIGGG PLAMVNVLSTKDENTCFKV, MEGVREGAKKFGDPMVGG PLFFLDYLAVGKADPVK IES IVKGVADGCEQSGSALVGG $P K A F T N C L N F G N P E K E G I M W Q F V E G I C E A A K V L E T P V V S G$ PLAMVNVMA SSDLDETEEDMKGURDGDSKFGVPMVGG PLG TIDCLNYGNPEKPAVFWEFDQSAQAACETFGTPVISG PL F FLD Y i A T G KLDDPKKMAELVKGVAEGCKDSGAALI GG PLAMTDCLANFGNPEKPEMFWQFEQACSEACRVFNTPVIGGG PLYFLDYI ATGHNDPAKMAAIVTGVAQ GCRDAGAALI GG PLAATDNLNFGNPEKPEQLVMAIKGIGEACSALGFPIVSG PVAVLNSLRFESDRVKYLFEHVVSGIAGYGNCIGTPTVGG PLSMVDYMAVQEAH LDDLDDDLSKGLCAGAEMANISIISGG
 PLFFLDYYACGKNYP EKIAMIVVKGVAEGCKMSECALIGG PI AMLNSLRFDNPHTKYLVNEVVKGIAGYGNS $\square G \square P T V G G$ PVALVDYLALERPME DVVEQLTKGLVKGAKESDAEIVGG $P L F F L D Y L A T G G L D N A Q L T Q V V A G I A Q G C R Q A G C A L L G G$ PISFVDYMAIDAPNPP LMEQI GIDGLNKGCELANCDLVGG PI YFLDYVAVG KNDPEKIEQUIAGVAEGCVQSGAALI GG PI CIVDCLNFGNPEKPEIFWQFKECMAKVAKEFKVPVISG PIALLNALRFSHPKTKRLVDGVVAGDAGYGNCVGVPTVAG $P \vee A N L N A L S P E T P R T R Q I I D G V V R G I G G Y G N C V G V P T V G G$ PLFFLDYVAVGKNDP SKVEAIVSGVAEGCRQAGCALIGG PHAALA IATVVPGLEEETLYQIMAGACSILRDAGCALAGG PLYFLDYDACGKNVP EKIEQUVKGVCDACVESDCALDGG $P 1$ AVMD QLRFGPPDTARVLPGVVDGISHYGNCLGLPNi G G $P T M A V L N$ LLAA DAEESELKKVMRSAIDKANDLGGIAEGG PLFFLDY ACG KNDPAVLEQVVSGVADGCVQAGAALIGGG PI A TTDCLNFGNPEREEIMGQCIDGMAEACTKLDFPVVSG $P V G L L D A V G \quad A R D A T H A A L I L A G L T R A A Q A Y G V P V L G G$ SI GMTNDI G $\square$ K KDCDKGRDLLK GLKEGVSKFGIPVVGG PLADT DGLNFGNPEKPE IFWQAADGUSAACLK LDTPVI S G $P L G L T D C L N F G N P E K P D Q L D Q A V M G M S E A C E K F A A P V I S G$ $P L F F L D Y Y G C S K L D V D V A S S V I K G D A Q G C K D S G C A L V G G$

 $P$ L A V T N C L A N F G S P E D P D V M W Q F A E A V $V$ R D G C A A L
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UniRef90_B4W402 UniRef90_UPI00036B2CBD UniRef90_TOU5Y4 UniRef90-E3GWE6
UniRef90-Q9A5F0 UniRef90-F7VGR5 UniRef90_R5S1S3 UniRef90_Q00SW9 UniRef90_E0QIV6 UniRef90_D8KPK3 UniRef90_UPI0004157FFA UniRef90_B8DTT6 UniRef90_Q0AQW7 UniRef90_UPIO0035EDB31 UniRef90_A4FVZ3 UniRef90_D7UUA8 UniRef90_H1LH98 UniRef90_G4T9P8 UniRef90-A4J723
UniRef90-W2F9T3 UniRef90-W2E9T3 UniRef90_UPI00041505FC UniRef90_G7CGL8
UniRef90 C1A3V4

H T $\square E G P Q M A A G F T V N G Q A D Q L W H K H G A R D G D R L I D T K P L G$ ETAEHPEYDLAGFSVGVCDRMITGENLKDGDVLI GMASSG
 ETAEMPGVYGTVVGVVVDRPRDIDGSCDQAGDAVIALDPSTG




 $N \bigvee S L Y N E R S G G A V Y P T P V D H D T T Q A V K H A G D L V Y L I G D T K$ E TA EMP GMYLA GFAVG DA E E DE LINP KVK E G DGLI ALLPS S G
 ETAEMPGMYHA GDFDAMERGTELDRDVVKEGDVLLGGLPS DG





 ETNFHPA YNGNVLVNVDQDKIVELSAAKGAGNPVVYVGGIH

 E VEFD D NFKVNVVGV GLVRKDSDMKGDNVGDVFVLMGTGR HTARYENCHYTIVGI GEKNEYVTPKGATTMGDKIIITTKGPA ETAEMPGMYGFTVGIVDKKNVIDGSRIRPGDVVLGLASSGG E T A EMPGMYGFAVGAVERNQLLPKSDDVPGDVLLLGITSSSG




 ETAEMPGMYPD GVGIVDKKKAI DGSADAPGDTVI GLASSSG

 HTQLGPP ALLSVTALGRTTRPVPGGAGRDGQELRLTADLGG E TAEMP GMYLA GFSVGAMERGADPS GVA EGDVLLGLDASNG D MVLGDRMVSSVGAI GVIGKPTARKRAEVGRVILMTE G S G ETAEMAGFGGFAVGVVEKEE\|ITGETDQAGDVLLGLPS S G ETAEMPGFYQPCVGVVEKANLVDGSRMAVGBRVIACLASHG





 H LTT P Y N V V L D V



 ETAEMPGFYPAAVVGVVDEKNLITGADDKPGDTLVGIASSSG ETAEMPDMYGTVTGVAEKGEMLTADR PAA GDVLLGLPSS G







 ETAEMPGMYGYT TGVVEKSRLIDDGTKVKEGDVLVGIAS S G HSSEGAE LSSLGFSVVHGAAPREKLMKKGGMKPGHKIIVVTKP


 $H T Q L G V P A A L S V T A L G R T D R P V P G G G G R R G H A V R L T A D D G$

 NV S P MVGMVGLIKGLDHVT TQDFKQAGDLVYVVGKTG
 E TA E M P GM Y A D TVVGMA D R P K I I I D D G S A I
 $N V S F Y N Q T G S T P I L P T P V R R I P P T G F G A E P G E T L W L L G D T H$

## UniRef90 W7A9A9

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170
180

200 VHSNGFSLVRKVFDMTKELGEALLAPTRIVVQALKSIKKA

 G S WRPGYQGRQWDSTSHRTSEDLVQLANLVSA AEF G GSELQK L VE GQVSGGRPPEDDMDVEKAL HETVLATADQ GATMSSAEFSADSEEKRPTVQVGDPYSEK LLIDEACME LMA





 GR D G $\square \mathrm{H}$ GVT G
 L H TN G F S L A R M ALDD GLDDWDEA RLDPVPP HR S Y L Q A H A A L E S A GATMASAEFSEDSEEKRPTVVQVGDPFTEKLLLEACLELMA G


 L HA S G L S YL S P CPWNS QMTLG RAL L E P T R I Y Y
 NHS SHILS MREGLGGEQRVLSDCAP LNHMLDSLLAR HAAA

 SGVVMAAEMA GEAD GG WVAAA LEQMS QPQGEAAARIL VH S N GFK Q GYRLT DK LPE E LE GRTDGDVLLEPTRDYVKTVL

 G



 NDFNGSEDQMEQMKQLLKGDLDRPLDLNQEKLHQDLIMRQADN





 GRVGKNSSYSWDTTSFKDA DVVRERFMVMQE VGE $D N Y A G S E L Q K M Q Q G T \square S D Q L G H F S L A T E K A N Q D L V L K A D Q$ VHSNGFVVSLT DKFNEDQT IGGEKLLTPTKKDYVKE I EAALLEK
 L H S N GF S L V R Q I L F K D H QL A L D D A R P A E L K K Y V NWGTHLVVYLRDLVGRTMGPTPPVDLAHEKKTGDFVRGLI R GATFASSVELTE ESEANRTAVQVGDPFMEKVVMESCLLELIDD $\square \mathrm{D}$ D S N G L S L A R H DF F E Q H P L G D E L L E P T H D Y V R A A LAV A A S



 K E L G G S E Y Y K V V H G l S S G G V P K V R I A A A K S IV N L V S K D NE GA TM S S SA E F S E D S E E K R P TVV V V G D P F A E K L L i





 GK $\square H E T F N \square N$
AEFS GSELLQKLFTGKDSGGKAPA LDDLDTEAKHQTAVVLEAIQQ


 L H S N GF Y S L D E H ME ELLR GK L G DV L L T P T R IVYVK TV L K LVVK


## UniRef90 W7A9A9 UniRef90-R5XGC8 UniRef90_UPIOO03687047 UniRef90_E8U7E5 <br> UniRef90_C5F2A1 UniRef90-IORUB3 UniRef90_UPIO0046920AE UniRef90-G9ZVT8 UniRef90_LOJNR5 UniRef90_C6RHF3 UniRef90-A6DDK6 UniRef90_UPIO0037DC18E

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UniRef90-Q0RD85
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UniRef90 W2F9T3 UniRef90-W2E9T3 UniRef90-UPI00041505FC UniRef90_G7CGL8
UniRef90_C1A3V4
 GVTVKACSHITGGGFYENVPRMLIDGVHAVVEKNSYPVPP NGQVTACHDLS DGGLAALADMAMAGGVGVDV KYTIHACTDITGYGLLGHLYEMTNPSUSLHLYSNQDPLLQ TRPRAAKDVSMAGVVGTAGMLAEASSTGVELDVAAVPRPA QGLLSSAHDVAEGGLG
TDA VADQDMGAAGLTSSSVEMAGKGVGDELNDDNVPQRE EPMRECGVRAAAHVTGGGWTNLLRMGEFEYVVDDPLPAQP G $\square S V T A A T D V T G F G L L G H L S E M L N D K D S F E I V A S N V P V I D$ H GMVSSAHDVAEGGVAVALAEKMMDGPLGLDIKDALPVDN KPFINALAHITGGGIVENFPRVLPNDLEAGVYKEKIKVDP


WAMAKGVD VVTQLPTTD
ADAVSALAHDTGGGLTENLPRVLPVGLAAEI DLNAWDLPP VGVHACTD TGFGFL GHTVQLAQKSRVGDNIDIASIPLFP
 ALINGLSKVNGGGFYENVPGRMFADGLCAEDKLGSWDIPM TAPRAAKDVSMAGLVGTTGMLAEASGTGAVLDVASIPKPD $N L P V K G D A H 1 T G G G L P E N L P R I L P K R L D A Q U E D K S W R V P P$ GVDI RGMAHITGGGLVDNPPRVFPAGUGMRVDTSSWSVPP TDA $I L A \square Q D M G A A G L T S S S V E M A A K G A A A G E G G F D L D L D R$ TAPAAAKDVSMAGLVGTDGMLAEASGCGAVLDVAAVPRPD SRLAHSMMDISDGLSSDLAKI CEASGVGAII WEDKI P DSK VE GVK A LTDVTGF GLGHLAEICE GSNLKAKVWFDKVPTLP FEALEKVDDQGLKDLGGGGLTCCKCGNGAK $\operatorname{V}$ K VELKGLAHDTGGGFLENIPRVLP EGVNVVI DEGSWPVLP

$\square$ S I



 INNATADTDTGFGLLGHLYEMLKNSSLSATVNFENVPLDS KGYAASAHDIAEGGLA
AGLVASAHDVSDG
TAPAAAKDVSMAGDAGTAGMMAEASGLFALTESALPRQL GGMDRADAHDTGGGLTENGMPRVLSAGLGVEDVNGARAWTMPP NHVHTMTDVTNGGLRGDAYE I SKTANVSLVFDKEYKQUNP RFDLRGLVHITGGGFYDNIPRVLPEGTAVEVD DEAWPRPA G $\square E L R G M A H I T G G G L P E N L P R C L G S G L S V A L D R Q S W T \square P P$ QGLLKSCHDLSEGGLLA
KLLMDACVEVVRHHKEATQDMGAAGLVSSSAEMASKAGTG
 EGLVRSAHDLAEGGLGVTLAESVFNGKGLGL AGLIESAHDLSEGGLAVGLMFDTALGFDVTVAMDKTWLFS K Y V HVMTDVTNGGLRGDAYE ISNTAKVSLEI DKEDVYINP FTIKGADH TGGGFFDNDPRALPEP CRAVITRGAWPIHP KKLVNA GKDISNGTDGTLGMMLEASNTGAIVEDDKDPRNE GKVDGMAHVTGGGFI ENLPRMLP EGLGVEI DNGSWPVPP



 Q GLVNGDAHITGGGLIENLPRMFGDHLQAVVNAGSWPVPP A GLTTASHDCSDGGL AVALAEMA DAS QAL SGIVLGDQDMGAAGLCSSAEMASKAGNGLEDYLDQVPQRE D 1 AL KALVBDTGDGLLNLNRDDAEAGFVIDD QLPPVPP
 I HEHADDLI G GQDMGAAGLVSSSSEMASKAGSGLRLVMD
 $K H R V K G M V D V T G G G L R N F L R L R K G D E V R F D D D P D P V P P$ PLLEKQLIDDTGGGFIENIPRMLPPQTTAEDTLGTWPQLP

 NCDVHGVAHDTGGGFDENDPRULKEGQGUHVDEGTWEDLP HGATACTDVTGFGLLGHLVEMCKGSGVAAVLDMDAVPILP $K \ Y V K A D S H I T G G G F Y E N I P R S \square P D A L C A E V V Q D R I N I L P$ $G V V V G 1 Q D L G G A G L A C A T S E L A A S G D G G M E V N L D A V P L R A$

 ARPAAAKDVSMAGlAGTLGMLAEASGCGAVLDVAEVPRPT EHLANSCKDISNGGLGTLGMLLEVSKKGAMVDVSKLPVPE A GLI KSAHDLAEGGLAVALTEA
EKLLASAHDISEGGL
GLLKGLAH T T G GGFI ENVPRMDPQ GLGCEDDVSAWKLPE $N G L 1 K S A H D C S E G G L A A L A E C C I A G G L G A D I T M V R R F R G D$



UniRef90 W7A9A9
UniRef90－R5XGC8 UniRef90＿UPIOOO3687047 UniRef90＿E8U7E5
UniRef90＿C5F2A1 UniRef90－IORUB3 UniRef90＿UPIO0046920AE UniRef90＿G9ZVT8 UniRef90＿LOJNR5 UniRef90＿C6RHF3 UniRef90－W7Z1S5
UniRef90 A6DDK6 UniRef90＿UPI00037DC18E UniRef90＿A4WHD3 UniRef90－A9E5B6 UniRef90－X1LWC6 UniRef90＿UPI00036D34CB UniRef90－M4R9A8 UniRef90－K2RVU5 UniRef90＿UPI0003A991AA UniRef90＿UPI0004631D09 UniRef90－C1CVZ1
UniRef90 E0TCS8 UniRef90－Q0RD85
UniRef90－X1L9A3
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UniRef90 EORHO1 UniRef90 W4L7F5 UniRef90－W5YKQ3 UniRef90－R7BER4 UniRef90－W7KL29 UniRef90－B4W402 UniRef90＿UPIO0036B2CBD UniRef90－TOU5Y4 UniRef90－E3GWE6 UniRef90－Q9A5F0 UniRef90－F7VGR5 UniRef90＿R5S1S3 UniRef90－Q00SW9 UniRef90－E0QIV6 UniRef90－D8KPK3 UniRef90＿UPI0004157FFA UniRef90－B8DTT6 UniRef90＿Q0AQW7 UniRef90＿UPI00035EDB31 UniRef90－A4FVZ3 UniRef90－D7UUA8 UniRef90－H1LH98 UniRef90＿G4T9P8 UniRef90－A4J723
UniRef90 W2F9T3 UniRef90－W2E9T3 UniRef90－UPI00041505FC UniRef90－G7CGL8 UniRef90＿C1A3V4

GTLSLIEEQG
IFGLMAKEGE DDEQMMYNTFNMGLGM■VAVDPADVDKTME
 EAIEFAQMGII KHCHFKLTPNTSGGLVFATPQNQAQELLN DAAMGAWLTCFPGFGMLTVGGEPVPL PDGVA
D GMSAYEMMDSESQERMLM\LKPGEEAEA LDD $\square F E F V Q D E G N V S D G E M H R T F N M G T G F V V A V P E D R A A D L V D$ AAREFADMG SFSE SQSRFVVTVQPENEQUVED
 QVPPHAYFFGEDQARYIVTAAPDKA NAIDMESQQAGVA DVEAFAEDRQLDLEEVVFNGGEEYLPVFAVRPEVKPPYVA EAGEFAKQG
$\qquad$ RFIVTVAKENQAEFED VF QTIQQE LG N $\square A E D E M Y Q V F N M G \square G M V I A V P A E N V D S V L K$ LT K V V L REEGMTPYEDMLSESQERMVFVVNPQDVDGLLAA AAA MGEWVTCFPGFAMI TADRPDAAPSGPA LTFRFLTKVGKLSQEESYRVFNMGVGMVLIVSGGRVARATAD $V$ PQREADMTA YEMMLSESQERMLMVLRPEDSAAAAVVD
 GVYNY $V E$ Q GCVPG GTERNFMSYGHKMGAMTDQQKA EVEEDCSYF GMTPYEVMLSESQE RMVFVVHPEDVDDLLP I FE LLMQREGHI SKDDMYRTFNMGDGMVVIVSEEQADAAVK VFKFLMKHGGVEPLEMARTFNNGIGMVVIVSKENDGATID VFEWLSKRGGVEPLEMARTFNCGIGMVVVVAKEDAQKAKE ETRMASEMLGVNPIYLA NEGCVCLIFADPAYSAD【VAE GLDKY IS L G
P S MLP HE I L A S ES QE
RMLLIVSPENVEAVLA E RAMTYEMMDSESQERMLMVLEPQEVAEALLD GAADDADRGQAADPELKTTGWQD LLFALLKQLRAAGYP $\square F G \square M Q R D G A \square S D R D M F T T F N M G \square G M V L V V P A G Q A E R A V K$ D $\square Y$ Y Y LD
$G V E V S L S \square P Q G L R K D A A L F G E S Q S R V V V S V K P E N Q A Q G Q A$ NAALA EWITCFPGFAMLTADSPGAATADPG VFGWLAARGGLDQVEMLKTFNSGDGMVAVVPEDQVDAGHD KVLDMLNKGDIDDLGVSIDS LLII APEEYADEIRK I F SLLLQQWGNVA WPEMYRTFNMGワGMILVVPQEQAQAVMD $V F Q W L A A A G S V T E S N M F E T F N M G V G F V A V V A P D Q A D R G L G$

## MVLNLVRESGMTPYEMMLSESQE RMLLCVNQGYEQEILD

 GLI LDLDEVDLSAYEMMLSESQERMLLVATGEKLPEDGVP GFNLDAEKGDISSERDMFNTYNMEVGMSIVVPAEETEKGVDETQS
KVLKMLEE $\square N D D P \quad L G V S \square D S$


| SV V |
| :--- |
| I |
| S | DEMFRVFNMGIDG

WERWLKLYPGSG GMMI I VS EK DAP DIME IFSFDQEKGQDKAEMFNVFNMGDGFVESCPEECVEECLT SLRNDKLKGQGENAEEMFNVFNMGEGFVLAVKEDDLVDVIK
 ■FKK $\square$ QE WGN $\square \mathrm{DTDEMYHTFNMGVGMVVFVDEKDVKRALDD}$ SLETEDSLGTLFGERIGRDIIAADPAKAEELEK TF RMLATDGDIEEKIMYNTFNMGIGMVLAVDSKDVDTVLA


## E

 ITFSLMQQDGGMTPYEMMLSESQERMLFVVEPKDEAQALVIT VF QWLKEAGGVADEEMYRTFNCGVGMIVCVPAEQKDLALD $I$ FKMLQREGNIDDEHMMYNTFNMGVGMVLAVDPADADSGEK DVPQ RETNMSAYEMLLSESQEMRMLLCVKKGHEAEILH EVFKEDERAGVPHDEMYRVFNMGVGMVVFTDRENAEVLKE I FKWLAEAGQVSREEMFNTFNMGIGGFVVEVSSVQAEKIVT
 QRETGMSAYEMMLSESQE RMLAVLKPGREQDGLD】FRFLEKHGK $\square$ AHREMFN $\square Y$ NMGVGMVLAMDESEAQKAID GALDEVEDGGAKRYPLLFDPQTAGGMLASVPSDRAEDTVE





VFK WLKKAGNDDAREMARTFNCGDGMVAVVSEDVCDAATG
 IFQFDEREGQDSQRDMYTTFNMGGGLVLVVPAEEGGLACLK



 LKEPVM QGPGEGAGIVDi GDNQA QGPGENAGII DI EDDDA
 GLGSFAGMFEIGCGYL

PGGDAGVIR DD NS DL
 DLSQFDVKEPVL
 D SMVQTNTVVTPGSDSAVVRIKGKAL



 ARTRRPEVLGGLGGFGAMVSIPAGYL

VGMGENAGVVDVGEGWA
VEKTFSPQVLTG $\square G S F G A M Y D \square K P P V M$ QGPGENAG $\square D \square G D G W A$ PGFDAAVLK $\square$ N D S Y L EPTL QGPGEGAGVVDVGDGQA $K \| L V G P N T G M D M A I V R V G E D V L$ QGPGEGAGVVDI GDGLA

 | $G P G E N A G V V$ |
| :---: |
| $G D G E N A G V V D$ | GMDCAVI PLKD Y S L DSMVRTNTVIKPGGDAAVVRLRGKAL KHLLRNFPTTGPGENAGVVDAGNGWG


$D R Y V M G N T A D A Q P D D A G V V R V D G R G V$
ARTNTVLAPGASAGII RVRGKGI
DASLGYKDPVL

GLGSFGALFDYNEPVL
GlGENAGVVDIGDGWA
DSMVGTRTAQGPGGDAAVI ILEEKAL
$\begin{array}{rl}V G P G E N A G V V D L & G D G D R \\ \text { G DAA }\end{array}$
DLSVF QLKEPV

D G $\square$ GSFASFFQLPAGYL
GPGENAGVVDIGDGLA D DAAVYRLNDSQL

DLSLLNYKEPML

LGSFGAMYKLGNPVL
DTLIQGNSAATPGGD
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UniRef90 K9VGQ0
UniRef90 UPIO002894272 UniRef90_UPI00036131DD UniRefo_Jgel4 UniRef90 UPI000288468F UniRef90-UPI0004788826
UniRef90-G2DZH2
UniRef90 U2B6Q
UniRef90 N6VMYO
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UniRefo-ORD
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UniRet90 13DIH6
UniRef90-H8LEK7
UniRef90-UPIO0041CBBO
UniRef90 D9RY25
UniRef90 G9WH11
UniRef90-K214B5
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UniRef90-U2S9X3
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 UniRef90-LOWFR1UniRef90 D9RY27 UniRef90_-14YTG9 Unireigo-G9ZIV
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UniRef90-G9PXI6 UniRef90-R5CF72 UniRef90_UPIO0040155C9 UniRef90-A1TZ73 UniRef90_Qocovo UniRef90_W4RQ77
UniRef90 U5ZKS1 UniRef90-I4F4E8 UniRef90-R9NFX2 UniRef90-G8UV63 UniRef90-R61835 UniRef90-UPI00047ADB05 UniRef90-K9ZFR6 UniRef90-I3RCJ5 UniRef90-R6YEA5 UniRef90-S0JMG4 UniRef90_UPIOOO3775588 UniRef90-UPIOO02F80CB6 UniRef90 E1LOX9 UniRef90-W4KMM UniR Refo-EOMK17
UniRef90_V9XGZ2
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 VAGTDGVGTKLRDADDHNRHDVGDDLVAMCVNDLVVGGAE VV MKLESHNHPSAVEPYQGAATGVGGIIRDIFAMGAR $\stackrel{A}{\mathrm{~A}}$ VV FKAESHNHPSAVEPFQGATTGVGG\LRDIFSMGAR VSGTDGVGTKLMLAFAADKHDlGKDAVAMCVNDVAVQGAE DTIGUDCVAMCVNDVVVQGAE
A V T T D C TPRYCRANPRSGGAQAVAEAWRNITATGAK VT FKVVESHNPSYDEPYQGAATGVGGDVRDI DAMGAR VSGTDGVGTKLKLAFEMDQHDVGIDLVAMCVNDVVAQGAD VSGTDGVGTKLKLAMLLDKHDVGIDCVAMCVNDVVCAGAQ VSGTDGVGTKLKIAQEVNHHTVGUDLVAMCVNDILTSGAE VSGTDGVGTKLKLASNLDRHDVGMDLVAGCVNDVLTSGAE $V$ V FKMESHNHPSAIVPYQGAATGVGGII RDVFSMGAR
 VVGTOKMESHNHPSFIEPYQGAATGVGGIMRDVFTMGAR VGIDGGKLEATLNKFDGIDCVAMCVNDILCHGAK LSGTDGVGTKLKLAFLLDKHD:GADAVAMCVNDVLCAGGE LSGTDGVGTKLKLAFLLDKHNVGUDCVAMCVNDVACAGGE AFSSDV

PRYCEADPYEGGKQAVAECWRNISTTGAT VVTVDGM HSRLSDFPFLAGFHVARAALRDVYVMGAT VSGTDGVGTKLRLAIDLNKHDIGQDLVAMCVNDLVVQGAE VSGTDGVGTKLMVA!QADKHDIGTDCVAMCVNDIVAQGAE VSGTDGVGTKLKLAFMLDKHDVGVDLVAMCVNDIVAQGAD AITTDCNSRYI YLDPEVGGKIAVAEAARNIVCSGAR AGKG $\square$ A $\square S V G A N Y C F L D P H L G A Q H A V A E C A R N I A C V G G E$ VV FKMESHNHPSYIEPYQGAATGMGGILRDVFTMGAR

$\qquad$ DSGTD GVGTKVDGAFDMDRKKFGEDAAANSLSDVYAMGGR ASADSTVTAPVQAMQKOVGYYAVYNAINNLYADGDT AI FKMESHNHPSYIEPYQGAATGVGGILRDVFTMGAR VSGTDGVGTKLMLAFMLDRHDGGDDAVAMCVNDVVVQGAE VT FKVESHNHPSYVE I QTVDFFTPIVD VQSIDGVGTKTIVARMMOPMFGQTAAANSLSDVWAMGGE VSGTDGVGTKLKIAFLMDKHDVGIDCVAMCVNDIICCGAK CA FKIDESHNPSYIEPYQGAATGVGGILRDIFTMGAR

 VV FKAESHNHPSAVEPYEGAATGVGGIIRDIFSMGAR $\angle V$ MKDESHNHPSAVEPYQGAATGVGGIVRDIFAMGAR VTSTDPVV TRPELGWHDSSWFAVQVVASDVAVSGDM IVV FKAESHNHPSAVEPYEGAATGVGGILRDIFSMGAR VSGTDGVGTKLRVAVDAGDHDVGDDLVAMSVNDLIVQGAE VV FKMESHNHPSFDEPYQGAATGVGGILRDVFTMGAR VT FKVESHNHPSYIEPYQGAATGVGGIVRDIMAMGAR VQTVDFF AMTTDVNAR
 $\square$ IITDFFPAMV EEPATFGE $V A A A N A L S D Y$ YMGGE AA FKVESHNHPSAVAPYQGAATGVGGDLRDVLALGAR VAGTDGVGTKLATAHACNCHDVGVDLVAMCVNDVLAMGAE $V S G T D G V G T K L L L D Q E Y D P H V A G I D A V A M C V N D L A A L G A T$ LSSTDGVGTKLKIAQLMDKHDVGIDLVAMCVNDLICQGAM AVATDCNGR FAQLDPYAGAQLALAEAYRNVATAGAE AMTADCNSR FAYLDPETGGKIAVAEAARNLVCSGAE ISGTDGVGTKDMDAQMMQKHNDGDDCVAMCVNDIAAQGAQ AMTADVEGPRYCEADPFEGGKQAVAEAMRNLTSVGAR VSGTDGVGTKDKLFMTGQHNTVGDDLVAMSVNDIDAQGAR
 L
I ST FKDESHNHPSADEPFQGAATGVGGMLRDIFTMGAR VA DEADK DFRIAANA SDI FAMGGK VAATDGVGTKRAAIDTGNVDTIGIDLVAMCVNDLVCQGAE VSGADGVGTKLKIAFMMDKHDVGUDCVAMCVNDILVHGAE VSGTDGVGSKLLLAQAADHGSIGQDLVAMVANDILVQGAK LV F FMESHNHPSYDEPYQGAATGMGGILRDVFTMGAR VATTDFFTPVVDADPYDGRTAATNALSDIYAMGGT VSGTDGVGTKLKMAFEDNDHNDG|AVVAMCANDILAQGAD VAGADGVGTKLKLAFLMDKHD:GADAVAMCVNDVLAQGAE VSGTDGVGTKLKLAFHLKKYD:GUDCVAMCVNDILCHGAE ALATDGNGR YMKLDPYAGAQLALABSYRNVAATGAR AFSVDV VSGTDGVGTKLIMAFIIMDKHD GIDDCVAMCVNDIVCSGAE VSGTDGVGTKLKVAQMAGKHDVGIDLVAMCANDVLATGAE VSGTDGVGTKVILAHKLNKHDIGLDCVAMCVNDILCQGAK VSGTDGVGTKLMLADQYDKHDIGQDCVAMCVNDI DAAGAE

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90 $\qquad$ 100 110
V L E GARVKVEEAGAVLVGG PLFFLD YYATG KLDVDTAASVVTGIGEGCELAGCALIGGG

 P L F F L P L F F L D Y I A C G K A I P E K I E H I V K GI A D G CVVEA G C A L I G G PLAVTDNLNFGNPEKPE\|MAQFIEGMGEACRVLDFPVVSG

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 P I A F L N S L T LDDEA HT R Y L F A N NV V A GI G G Y G N CVVG DP TVV A G P L F F L D Y L A T G K L N P E QLAA AV A Gl A D GCK QA GCA LL G G

 P V A N M N A L R F S H P K T R H L V A G GVV H G I G G Y G N C M G V P T V G G PI F F LD YI AC GKLDSNIAADIVVKVVNGCDQSSAALI G G
 P L F F L D Y I A C G K NVVP E K I A E I V V S GVVA E G CK Q S G A A L V G G PLAATDNL NFGNPEKPERLDFAI KGI SEACRVLDFPIVVGG

 PLYFLDY IATGKNIPARLEQVVAGVAEGCVQAGAALI GG P L F F L D Y I A C G K N QP E K I E Q I V K G I T D G CVVQS G A A L I G G
 PI AVVTDCLNFGNPEKPE 1 MWWQFAECVRDACRALGTPVVSG $P V A A M N A L G S P N H P R T R H L V G V V S G I G G Y S N A F G V P T V G G$ $P$ I A A L N A L G S P D H P R T R H L S GVVVS GV G GY GNS F G V P T V G G $P \vee A N L N A L R F G R D R G D S D I N K Y Q R H I G S Y G N C M G V P T I G G G$


 $P V A L V N A L R F S H P K T R Q L V A G V V A G I G G Y G N C V G D P T V A G$ P L Y F L D Y I A C GKA EP E K I EA I V R GIA D GCEQA GCA LV G G PLA I T D CLLNF GSPEDPEELLEQATKGMTEACKLFDTPVVISG $P V A V M D S L A A D A P D T A R V L P G V V A G V G G Y G N C L G L P D I G G$ PAVALNDVGFPNCLDPAILGDILAGGAMKVKEAGAVLVGG

 $P$ L F F L D Y V A T G K LDD K E QL T Q V V A G I A T G C K L A G SA L L G G P L A LI D N L N F A S P ERRPE VVYWAF GETVVR DAARAAGGLAA YV S G


 P I A V L D S L R F S S L D N A R TAA Y L F K E II I H G I A N C I G I P T V G G
 PI A AMNALGSPDHEKTRHLA GVVAGVGGYGNSFGVPTVGG $P$ I AVMD QL A A D H P D T R R VVV GVV R GV G GYGNS L G L P NV G G

 PAAS MDGGBPE

 P 1 $P$ L F F LDD Y I A C G K N NP E I LE QVVVS G V A D GCDQAAES GL I G G


 PIAVVD QLAADAPDTRRVLDGVVRGVGGYGNSLGLPNIGGB

 PIMAI A ILGGP DNVLPAEDAQKI DGGRYACRQAGUALAGG $P L Y F L D Y L A T \quad G K N D P L R L E N V V K G V A D G C V Q G N M A L I G G$
 PLFMLDDYLA $\square$ DHVVESDKVAKIVVAGIADGARQAGMALI G G $P V A A M N A L S F E H P R T R S V V H G V V A G I G G Y A N A F G V P C V G G$ PI MALLALVGMPDAQPPEVI GRVLEGGAAVCREAGIDPAGG
 $P L Y F L D Y V A V G H A D P Q R \quad L E Q I V K G V A D G C I Q A G C A L I \quad G G$
 P MF F L


 P L




## UniRef90_B9KF86

 UniRef90_LOWFR1UniRef90_D9RY27 UniRef90 I4YTGO UniRef90_G9ZTV9 UniRef90-UPIOOO3629ED1 UniRef90-M8CU78 UniRef90 UPI0003F4F021 UniRef90-F8JVL3 UniRefofo N4W8Z1 UniRef90-D1B4P5 UniRef90-K9XYI7 UniRef90-UPloo041793B8 UniRef90 K9VGQ0 UniRef90-UPIOO02894272 UniRef90_UPIooo36131DD UniRef90-J9E141 UniRef90-UPI000288468F UniRef90-UPIO004788826 UniRef90-G2DZH2 UniRef90-U2B606 UniRef90-N6VMYO UniRef90-D1JBY6 UniRef90-J5HSS4 UniRef90-R2VFK8 UniRef90-UPIOOO3815913 UniRef90-W9AMV8 UniRef90_A7HIJ4 UniRef90-Q6FZ19 UniRef90-UPIOOO3617B15 UniRef90-A6QAK6 UniRef90-G9PXI6 UniRef90-R5CF72 UniRef90-UPIO0040155C9 UniRef90-A1TZ73 UniRef90_Q0COVO UniRef90-W4RQ77 UniRef90-ULZKS1 UniRef90_14F4E8 UniRef90-R9NFX2 UniRef90-G8UV63 UniRef90-R61835 UniRef90_UPI00047ADB05 UniRef90-K9ZFR6 UniRef90-13RCJ5 UniRef90-R6YEA5 UniRef90_SOJMG UniRef90_UPIOOO3775588 UniRef90_UPI0002F80CB6 UniRef90 E1LOX9 UniRef90-W4KMM UniRef90-EOMK17 UniRef90-V9XGz2 UniRef90_B4JPY3 UniRef90-UPIO00219318C UniRef90-EONJC8 UniRef90-D5EFF6 UniRef90-U5DFS4 UniRef90-UPIOOO36E4F74 UniRef90_W8T5K8 UniRef90_W9G.J70 UniRef90-F9DT53 UniRef90-14M3 $\times 3$ UniRef90-Q218N3 UniRef90-UPIO00368533D UniRef90-LOKEG9 UniRef90_10RDH5 UniRef90_AOPLA6 UniRef90-UPIO002627EBD UniRef90-UPIOOO3492932 UniRef90-I3DIH6 UniRef90-H8LEK7
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UniRef90 D1AK48 UniRef90-R5P458 UniRef90-UPIOOO36E7A61 UniRef90-G8PS18 UniRef90-G8LV21 UniRef90-UPI0003A935DD UniRef90-C8WMS3 UniRef90-UP10002E3CD6C UniRef90-UPI00035C88E7 UniRef90_UPIO0037828FD UniRef90_W5DQR9

HTDENDEFGLLSVTGVV|HPKKFIIANNSAKDGDVILLTKPD ETAEMPGMYGFCVGVVEKDGVLDGSRVQVGDKLIASGPHS EVYFNPLVNAMCVGIIRHEEVVRGRAAGVGNSVMLVGSAT DTVFDDAYKHNPLVNVMCVGLMDLDK ETAEMPGMYEPTVGACEKSDLITGERIVPGDALIGIASSG ETAEMPGMYGFAVGVAEKDKVVTGDGIVPGDVLIGLASSG NVSLYPTPADGALGVLTDVRKTVGLALPASGVLVLVGETG EVVFDPCYQGNPLVNALCVGVMRHEDIHYGARTGGDGDGG HTDEAPEMTMSVTGFVHPLKIYRNNTPRVGDVLI LTKPLG AEMPGFYGFTVGIVDEEKI LDKNNVKVGDMI। GLASSG ETAEMPGFYGFCVGVVEKSKLLDGSQVQIGDVALGLASSG DEVYRDNPLVNAMCVGPADGMVRGTASGVGNVGARTGRDG ETAEMPGFYSSCVGIVEKSKLLDGSRVQVGDVAVGLASSG ETQFDPCYEGNPLVNAMCVGLINHEDIQKGIAAGVGNTVM EVKFNSSYNENDLVNVKKNKIFYSKAKGSDQPVIYVGSI H EVNFDSCYNGNILVNAMCDKI FYAAATGGGAPVVYVGSUH ETAEMPGMYKDGVGIVDKKDI TDGSKПKEGDALIGIASSG ETAEHPGVAGFAVGVVDKSEMI DGSTIKPGDTLI GVASSG ETAEMPGMYGFCVGIAEKSELIQPDRVRVGDVLIGLASSG NVSLYNETNGVEILPTPTSKMATDNNMQNGDIIVLVGPCG DVVIGERMTGCVGAVGVADTVVTREGAKEGDVILM SEG ETAEMPGMYGFCVGVVEKSEIIDGSAVKVGDVLVALASSG ETAEMPGMYGFTVGIAEKSQMI TGEKISEGDILVGLPSSG ETAEMPGMYGFVVGIADKKQTITGEKIKVGDKIIGITSSG NVAFPTPDVGMVGLHESGEHUTPSHFQAAGDVIYVIGETA NVNFN YNGNGVNDVEKTCTSAFKNAGDVILVVGTLQ EVNGDERYNGNIVNAFVAGIAKTDSUFYSKAQAKTGRDG
 ETAEHPGYGLDDVGEVERDEMWTVGSAKEGDSLLLTKPDG HTEVTDALTDSGTGRDAASDNNHPRKAKAGDALIMTKWAG ETQFDEGYNGNDLVNAMADKI FYARGADPGDQILYVGSIH ETAEMPGMYSPSVGACEKADIDTGQKIKEGDVLIGLASSG NVSYPTPMVGMVGLIENPAWITTDDFKKSGDLIYILGETT ELLFDDCYAGNPLVNALCVGVMKHKAEGAGNKVVLFGTGG HSVDEPKYGGCVSGFVHPDKIFKNYGCRPGDVLVLTKQD ETAEMPDTYLIITGVVEKDEAILGKDDTPGDSVLAFPSSG ETRFEECYSGNPLVNVRRDEIFYAKATGMGNPVIYVGGIH ETAEMPGFYGFCVGIVEKSRMLDGSQVQVGDVAIGLASTG $N V S F Y N E P T P V V A G L G K V K D E K D P G G P E E G D L V A I I G E T R$
$E T A E M P G F Y P A S V G V V D Q K D M I G K E L K S D V L V G M A S S G$ EVQFDACYEGNPLVNAMCVGLIDHKDIQKGQAKGVGNAIM ETYFANCYQRSCAGDADISKLQTGKASGDGNPVLIVGGIG RपMYSDYATFPVIAQGHQSHYITPADASLGDEVLCTKGAA
 ETAEMPGMYLPGVGAVEREQILPQPNIAAGDVLIGVSSSG EVNFHERYNGNDLVNAFAAGLAKTDAIYVSKAGAKTGRDG ETVFDASYQGNPLVNALCGNKVLLFGARTGLDGIGGVSVL NVSYPTPMIGMVGLHTDTADITTISFKQPDDVIYELGDTT HSIHDKKYGMSVTGVVHPDKI WKNTGSKVGDEI Fi TKKLG KTVYDSCYTDNPLVNVRLDQLVSSKTARPGDRVLILGSIA ETAEMPGFYGACVGIAERSQLLDGSRVADGDVAI ALASSG ETAEMPGMYAPCVGVVDKPKM1 DGSKIAAGDIGLGVASSG ETAEMPGMYGFSVGICDKEKLITGENVKEGDAIIGIASSG DVADHPTPVIGVLVMEDVARRNGSGFRTEGAHVYLLGTTR NVSYPTPTIGLVGIVHDLKEVTTPGFKQAGDAI YIIGQTE ETAEMPGMYGFAVGVAERENIVDGSKDTPGDVLIGLASSG NVSLYNETNGRGILPTPSTKSATLAFKAAGEAILLIGETR NVSLYNETQGAVGVLDDVSKSATVAFKREGEAIGLIGDGB ETAEMPDFYDSVVGMVDKDKITGANDAAGDKVIGLASNG DTVFDACYAGNPLVNALCVGVLRQEDLHFGARTGLDGIGG NVSLYNESGGEAIYPTPIHHVTPSNFQSLGDQIWLLGETF EVDFEP YSGNPLVNMETDSIVKSGASGUGNPVVYVGSTT HSAPEPIFGGAVTGIVATEKIKRNASAEAGCKLYLTKPL ETAEMPGMYGFAVGIAEKSQLLTGETVNPGDVLLGAASSG ETAEMPGFYGDAVGVVNKDRIIDGSKIKEKDUVLGUASSG DMYPKNEYDLAGFAVGVVDKTAILDGSQSAEGDVLLGSLV EVRFHPSYNGNCLVNAFAAGLARADAIFYSAASARTGRDG $H S V L E P T Y G L V G L G L V H P Q R V R R N A D A Q A G D V L V L G K P L V$
$E T A E M S G Y G G C V G Q E K E L L L N P E N T K A G Q A V I G S L V$ ETAEMPGMYQDTTGVVEKSKLIDGSKVSVGDVLVG| ESSG ETAEMPGYDLAGFAVGAAERGTLLPGKDIGDAVYGAASSG ETAEHPGLMGFAVGVCDKKDMITGQNIKPGDALIGIASTG
 NVSLYNETYGGVGLLKDVTKRVGSAFVSTGETVVVLGGKG ETAEMPGTYGDATGIIERKNIVDGSSVKEGDLIMGIPSLI EMAEHPGVMDPCVGVVDRSKMLDPASVREGDVLDGLASSG ETAEMPGUYGFAVGIVDKDKIIDGSDIKEGDLIFGLSSNG HTGEGAEPATAVAVQGEPERVLRKRLTRTGNRLLLTKPI


## UniRef90 B9KF86

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UniRet90 E7MK5 UniRef90-K9XY17 UniRef90-UPIO0041793B8 UniRef90 ${ }^{-K}$ KVGQ0 UniRef90_UPIO002894272 UniRef90_UPIO0036131DD UniRef90-J9E141 UniRef90-UPIO00288468F UniRef90-UPIOOO4788826 UniRef90-G2DZH2 UniRef90- U2B6Q6 UniRet90-N6VMYO UniRef90-D1JBY6 UniRef90-J5HSS4 UniRef90-R2VFK8 UniRef90_UPIO003815913 UniRef90_W9AMV8 UniRef90_A7HIJ4 UniRef90- Q6FZI9
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UniRef90 U5ZKS1
UniRef90-14F4E8 UniRef90-R9NFX2 UniRef90-G8UV63 UniRef90-R61835 UniRet90_UPIO0047ADB05 UniRef90-K9ZFR6
UniRefo
UnRC
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UniRef90_R6YEA5 UniRef90-SoJMG4 UniRef90_UPIOOO3775588 UniRef90_UPIO002F80CB6 UniRef90-E1LOX9 UniRef90-W4KMM UniReffo-EOMK17 UniRef90-V9XGz2 UniRef90_B4JPY3
UniRef90-UPIO00219318C UniRef90-EONJC8 UniRef90-D5EFF6 UniRef90_U5DFS4 UniRef90-UPIOO036E4F74 UniRef90-W8T5K8 UniRef90_W9GJ70 UniRef90-F9DT53 UniRef90-14M3×3
UniRef90 ${ }^{\text {Q21 }}$ 2N3 UniRef90-UPIIOOO368533D UniRef90-LOKEG9 UniRef90_10RDH5 UniRef90_AOPLA6 UniRef90-UPIO002627EBD UniRef90-UPIO003492932 UniRef90-I3DIH6 UniRef90-H8LEK7 UniRef90-UP100041CBBOF UniRef90-D9RY25 UniRet90_G9WH11 UniRef90_K214B5 UniRef90 UPIOOO4652F5D UniRef90-U2S9X3 UniRef90-R7GLD2 UniRef90_O215Q6
UniRef90 D1AK48 UniRef90-R5P458 UniRef90_UPIO0036E7A61 UniReffo-G8PS18 UniRef90-G8LV21 UniRef90-UPIO003A935DD UniRef90-C8WMS3 UniRef90-UP10002E3CD6C UniRef90-UPI00035C88E7 UniRef90-UPIO0037828FD UniRef90_W5DQR9

 $\begin{array}{ll}\square H G A S ~ F A S E E G S E D S T & L\end{array}$ YVGAK T GRDGVNGASFASFQFDSEHESQRSAVQVGDPFTE



 $M G V L T T S D K A D M L E S S V V E K V A S I L A T \quad$ LINKASRIMQQ VHSNGFTTLQDYANVLGKSLGETLLTPTRLYVKPVLHVLK $V$ HSNGFS LAR K $\square V E T P H S L G Q V L L T P T R D Y V Q P V L A A L N S$ I HGATFASAEDPHEKERSAVQQVGDP F F GKLL MEACDLE DA V H S N GF S L VR K $\square$ A G D L G F D WHV L L T P T K I Y V K P V L E A I K S YVGAKT GRDGDHGATEASEE LTETS DENRPAVQVGGDPME GASMASAEFNKNDEEKKPTVQVGDPFTEKLLLEACLELMK GATMASAEFDDASEEKRPTVVQVGDPFTEKLLLDEACQELMA VHSNK L I K K Y D E K L G D K T L GE I L L T P T K I Y V V S V M E I M K R V H S N GF S L V R Y Y D E L G C T L G E ALLL T P T K I Y V K M L K E I KN E
 SHLLGQSIVYARDVLDNEAGAPPYVDLQLEKKNGQFVRNADN
 P H S N G Y S Li R K V L E E G K P L S E H L L A P T K I Y V K S S V L E L V E N



T
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 PH S N G Y S L I R K K I D E M G E R T T



 GATMASEEFKEGSEQKRPNVQVGDPFMEKLLLEACLEAMK
 $Y \mathrm{~V}$ G A K T G R DG $\square$ H GAT F A IQQATASITEFLGGENAE E K L L YVGGA K T G R D G D H GA T F A S E E F D T T K K S S K R S A V Q L H S N G F Y S S P CP WD T N V T L G R A L L E P T K DY T K T L L P A V K A
 $T$ QLATSSAHDWQKEKNEKDTFQMADKSMTYLNRNAALLMHK



 DELGGGSEWAHVIHKHLGGRPPAVDLAA EQKLGQVLVAAAQ



 VSVLAS DTESSD GEGEGARKKLPSVQVGDPFMEKVLI ECC A ELLE GS CYQE DRASRDGFGNAP K LDELDDREKR LQEAVL LADG






 V HS S GF Y DANAPFSPVMTLGGGALLAP TK LYYVKSCLRAA RE
 VHSNGFSLVRKVVDMTKELGEALLAPTRIVVKALRGVKDA E E L G G S A WS QVV H D H L G GL LP P A V D L E R E R L L A E I L I S A S R K H L G S S Q Y L Q E V L G R E E G A P P P V




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UniRef90-U5ZKS1 UniRef90-I4F4E8 UniRef90-R9NFX2 UniRef90-G8UV63 UniRef90-R6I835 UniRef90_UPI00047ADB05 UniRef90_K9ZFR6
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UniRef90_UPlooo378
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 $\left.\begin{array}{ll}K L I V & H A L A\end{array}\right)$ $S G Q V K T V H D V S D G G U A L A L A E M A M A G V G A E$
$K L V E A C L D V D N N H A A A A E M G S K A G G N G M V L D D D L V P Q R E ~$ LDVVKMAHVTGGGFFENDPRMLPA GSGAVVDPHNWEKPA




 GLEI HGMAHITGGGLPENLPRCLGVNQSVRLDSNSWPNLP KLLLEACLELVKFDSLVGI QDMGAAGLTSSASEMASKAGS
 S DA I A I Q DMGAAGLTSSSVEMDKGGVGUELNLDKVP


 KKVHLMTDVTNGGGRGDANEDAKVSHVKLVFDRURALVNK

 A GLVESAHDVSEGGLSVGLAESVFNGAGLGVDATFSG EGLLSSAHDCSDGGLAVALAECCMMHGVPAGAEKAPWDGA MELKAAIDQDMGAAGLTSAVEMGAKGLGIQLNLDKVPTRE SGSVVA IQDMGAAGLTCSAVEMGAKGLGURLDLENVPV

 EVDVRALSHDTGGGLPENDPRVLPKGTVAALDTQSWEDPP




 GVKI KACSHITGGGFYENIPRMLIDGTHANIKKDSFVIPP KLLLEACLILDHSDILVGIQDMGAAGLVSSSSEMASKAGS TGYVVAVVQDMAA GI TSSASEMASHGVGMESDEDKVPARA KGVSTMHDATEGGGLGAVYEDAVASDLGVELDADNIFVYP KLLLEACLDIIATCLVGI QDMGAAGLVSSSSEMASKAHMG GLLKGMSHDTGGGFVENIPRVLPK GLGCSDDASAWELPP $M G A V I A D Q D M G A A G L T C S A V E M G A R G L G D E L D L D T V P V$ $K L V V G I Q D L G G A G L S C A T S E L A A A G D G G M H I D G E R V P T R A$ YEAHAATDVTGFGLLGHAKNLVEFQKQSLLFKIHKLPIDK
 KFNPTSVTDVTGFGFLGHLKEMVEGKGAALYKDQVPMDS

 EGLLEAAHDLSDGGLAALAEAVMRHGVGARVDVAD VGE







 S GAVISDQDMGAAGLTCSAVEMDKGGLGDRLNDDAVPVRE


 GVTIK GCSHIT GGGFYENIPRMLPDGIVASVKKDSYEVPA DGMI DAAHDLSDGGLVQAVVESCLKGGHGARLVVPEGQEA EGRITAAAHDISSGGLVAVALAEMAIKGK





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UniRet90
U5ZKS UniRef90 I I4F4E8 UniRef90-R9NFX2 UniRef90-G8UV63 UniRef90-R61835 UniRet90 UPI00047ADB05 UniRef90-K9ZFR6
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UniRef90 R5P458 UniRef90_UPIO0036E7A61 UniRef90-G8PS18 UniRef90-G8LV21 UniRef90-UPI0003A935DD UniRef90-C8WMS3 UniRef90-UP10002E3CD6C UniRef90-UPI00035C88E7 UniRef90_UPIO0037828FD UniRef90_W5DQR9

GVLISMANMG
250
260
270
280
VF QWLQKEGQVPAFEMYRTENCGVGMVIAVPAEQVDQA!A E
G $\square A \square H A F \square F$ GMTPYEVMLSESQERMLVI VEKEEDVQK LLH A VFSFDQEQNMTPFELMLSESQERMLLCVVLQVFADHGVD VFSFLQEQGSLSDVDMYGTFNMGDGLVAAVAAEEAEVGEG IFNFLQQHGKLQRAEMFNDFNMGIGFVMAVDSDVVPDGEQ EAFW GGEDQARYLVA $\square E G D A D A L I A R A K A Q S V S A R V$
 $\square F H Y \square Q E T A N V H E E D M Y G V F N M G \square G M A V V V E A H E A E M A L E$ EAKAMADMG
ITFHLLQEKGNVPEHDMFNTFNMG\GMAM\VSPEDVEKGVE IF QWLAEAGNVSQAAMLDTFNLGIGFVVIVPPQQAQSTLDD
 DFQWIAAEAGQVAPADMFNTFNMGDGFVLLLDYREVEQGI$G$ $G \square E M N L D E T G M T A Y E M M L S E S Q E R M L V V V K K G E E A K Y G L D$ CREKKMTPYE IMMLSESQERMLLISGKEENAKKGL D CRETHMTGYEMLLSESQERMLMVLKPGREPEAGLD TFKYLMEK GVDENHMFNTYNMGVGMVLAVDDNDATKUI E

 KLPHHAELDGEDQGRYLL
$K V L A M L K R R A D D Y \square \quad G V S D D A L L V I C P V E V A E S V K A$ I F S W L Q E K G N I S R Y E M Y R T F I F D A L A K Y G K I P E M E M Y E I F N M GII G MV L AV S P E K L D A VEA

$\mathrm{A} V \mathrm{R}$ VP F P A
E RETGMTA


 QRET GMTAYEDMLSES QERMLMI LKP GKEAVADLD

$R M C A \square V E P G K \square A E F L A$ DAVDYAKMG




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

 K GMTPAEVLSSESQE
 GALKAAGDF E GMT P WE $\square A L S E S Q E R M M L L V E P E D Y D E V L D$ VF Q WLA A A G G VA P A DMF STFNMGVGFAALVSPE DVELALG
 $I$ F S V I K E E L D M V E E R E L Y Y R S F N M G I G L V M V V D K E DA N K V I E GVDA F T A L F S E S A A R A $\quad$ G $\square F N L I E K S G K V D H S E M F N V F N M G \square G M V L A I D A N K A D E A M Q$ H IGA A LD A GPEA IVVPHA WWF GE DARYVVVTVDA DEKAVGVV

 $A V \mathrm{~V}$ I LRAKEM TPAEVLCSES QERMCAVVSPENVDAFMA


 $V$ F S IL Q K M G NVVEKAEMYRTFNMGI GFVVVAP E E EAADKVIK

AAAKFA
IF NF LDAEK G G DDEEEMYHTFNMGVGMVLVVEKEDVGK TDS $V$ F K F L E H Y G K V A H REMFNLYNMGI G LVV LALDEKDAS K A I K

 $A \operatorname{V}$ V L F S E S Q G R A V V A V P R S E E M R F T D M C G A





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AAT G G G GLTL
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WYQI GQVVAGKR
IANI GRVTDDGRLRL
AWAI GEVIEGKGELI!G
AVSVGVVTDDQQFRL
FSII GKTTNTNNLVLNGKEVAR
FAVVGTLTDTGRMVVHHE
A YKI GKVVSG
A WIVGSVEAGD
A WTI GQI EETEG
AYVVGS $\downarrow$ EAGDGVTL
VVRПGQVVAGEG\|VVDG
AWVIGKIEA
FFLI GKVTEEAAD DFKGKKD
AAIIGEVTEETGVTFSNE
ATQVGIVTEDARIQDNGAQV
$\square A Q \quad E C G A P V I V G G D T L E D Q G$
FSIIGKTTDDLRFRVQGEEV
FAVVGHTTDDLRVYLNGE
VAVI GEVTDTERMEL
AEII GSFHAGD
AAVIGEIVAAE
AAVIGRVCDGNDRLIDGEK
VWQ GVMEAAE
AEVI GVTTDSGRLVLK

ATVIGEVTDGDR■T $\square \mathrm{DGER} \mathrm{\square}$
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I YIIGEIVSSA
ATIVGTVIAEPRLRT
AYAIGEVVTGTGELVMG
VKVVGRVGGESAIKINREKVEKS
AYIMGEIVAGEGITL
AVSIGEVTDDGLYRLHGEEV
AEVMGHITDDQMMRI
AVKI GEVCEG
A YMI GQVSDKAGVEMQN
FATVGKTTDDDRFRVQGEEV
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VFVIGEVAD
CTDTGETMPGDQYTT
AWPLGTVVAGKGNVL
VYR GSVVEGDAVTLI
CVHLGTTGGRDLVVDDQ
AVKi GTVTDGGQLVIKDAE
AYVI GKMIKRENVAVE
CLQUG GTAGHTLSIAGER
ATRI G TGGDRLI
AYVI GEVQESA
ATVIGEVTDGNRRR?
A MMI GE EVVSNQ
ATLAGRVIADPVVRI
VYETGKVIAKERVVFTGEE
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LCRTGEICRGEGGVV
$V Y P I G H L T K D Q A L T F V G Q P$
$F A \backslash G E T \| A E D R V V V H E$
LIFVLGEVTNESGTKI
AYKIGVVSAKEGVELK
AYETGRПEKGD
AWVI GETKAGE
AAR G VVDGDAVEVQG
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UniRef90_B1YBL6 UniRef90_D3SP74 UniRef90 K7S7B4 UniRef90_UPI0003608333 UniRef90_U2B3G0 UniRef90-C0Q8X6 UniRef90_S7UQU7 UniRef90_E0WSK6 UniRef90_K8F3A0 UniRef90-A1WUY0 UniRef90_UPI000360D811 UniRef90_E9EKT3 UniRef90_UPIO0036DEB7D UniRef90_E4ZJ52 UniRef90_Q6A6C0 UniRef90_V4Y379 UniRef90_Q1G9G0 UniRef90_J0X113 UniRef90-A3UDW4 UniRef90_MOH168 UniRef90_F3YBA6 UniRef90_B1KN06
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UniRef90_L7MD89

A ATDGNGR
A $\mathrm{F} \cdot \mathrm{H} V \mathrm{D}$ G V G T
 DPYLLGRIATNHCLSDI YAMGGT GENGDTYVESHNHPAYYVDPYEGARLAMLASSYNVAATGAR

 SVATDCNAR $V$ V VALDPYTGAQLALAEAYRNVATSGAV
 AT F GVVESHNHPSYVDPFDGAATGVGGIVRDTLSMGAY A LATDASGRYTALADPYQGAQLALAEAFRNVAVTGST $A T S T D G D G T K V A D A Q A M D K H D D G F D D V G G M V V D D I V V M G A K$ $D V Y V T T A V D G V H S R L D D Y P F D G G F H V T R A T L R D V E V M M A N$ V S GTD G V GT K L M L A I K Y D K H D I G Q D C V A M C V $V$ S GTD GVVGTKL RLALDNLKKHDD GQDDVAAMCVNDLLVCGAE
 ALTTDC VLTTDGVGSKMIVAEMA $V$ I TVDCNSRYVN AMATDGNGR YAK ${ }^{\text {L }}$ NKFDVP DDMIAMNVNDAICDGAE VSGTD GVGTK V K $\quad$ AAK LDPYAGAQLAALAEAYRNVAASGAR
 $V V$ V KAESHNHPS AVEPYEGAATGVGGDLGRDISSMGAQ $V$ S GTD GVGTK LIKLAFDWNRHDVGDDLVAMSVNDILVQGAE $V$ S GTD GVVGTKLKI ADA A GRHDI GIIDCVAMCVNDILTVGAE


 AVATD S NPRYTFLDPLWGAADVFLEAYRNVVASGAR
 STSTDGVGTKVLLAQQMDKHD\|GVDLVGMVVDDLVVSGAE AFK
 TMTTDCNAR

SFSTD T L H V D | $L$ | $A$ |
| :--- | :--- | AVT F FKAESHNHPS Y V V P P $\begin{array}{rlll}G & G G Q & C & A \\ N & V \\ V\end{array}$

VS S T D GVGTK LKIAFMMDK GI DLVGMVVNDI AVQGAR $V$ S $V$ S A T D GVG T K L R L A M D L N R H DI GIV L L V A M C V N D L V V Q G A E IV Q TVVDFFRSF I D VAGTD GVGTKLRLA IETGRHQGGTDLVAMCVNDVVVQGAE


 ALS LD A NGRQT $\quad$ TLNP Y L GAQQLALCEAYRNV AVSGAT
 $V A C T D A V V P S \quad M V E R D P E W A G W C G M L V T A H D L A A M G A R$ V S GTD GVVGTKIIAAQKMDKNDVGDDVVAMCVNDVLAQGAE


 ISTTDFFMP IVDD $\mid V \mathrm{~V}$ FKMESHNHPSYDEPYQGAATGVGGDLRDVFTMGAR I S GAD GVGTKDNICRAFDYS TIGQDLVAMCVNDVICS GAK $V$ S G T D G V G T K L R L A L L N L S R H D I G Q D L V A M C V N D L V V V G A E
 1 Q TVVDFFYMPMVN
 $V$ S GT D GVGTK L K L A MD L G $\square H D D G G I D L V A M C V N D L V V A G A E$

 AAVTDCNSR YCLLNPYRGAQDAVAEAARNLVCSGAE ASATD GVGTKVDIARQL GVYD I GHDDVAMVMDDIVVCGAE

 $M \vee A$
 VAT T DFFMPMDD DPFDFGR $\square$ AATNALSDAVWRLND
 AS ATD GVGTKVAIA QRMDVHDDGHDVVAMVVDDLVVCGAE VSSTD GVGTKLKIFMMKKHSTIGDDLVAMCVNDIVVLGA E

 $V L S T D G V G T K L R F A D D T N M K N D G D D L V A M C V N D I L T T Q G A K$ $V$ S G T D G V G T K L E L A Q D H A G H H V G I D L
 $\frac{T}{V}$ GTDCNSTHVLL $\quad$ NPYDGAASAVLESINNAIISMGAR


UniRef90 G2PA15 UniRef90 N6VAXX UniRef90-UPIO00362A6CC UniRet90-AOYCF1 UniRef90-S3AQF7 UniRef90-L9X9R7
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UniRef90_V4Y379 UniRef90-HOETF3 UniRef90-Q1G9GO UniRef90-JOX113
UniRef90 A3UDW4 UniRef90-MOH168 UniRef90-F3YBA6 UniRef90-B1KN06 UniRet90-B6AUR2 2 UniRef90-E3SRA5 UniRef90-A9NA98 UniRef90-Q9VKY8 UniRef90-A3MXE8 UniRef90 WoA199 UniRef90_Q2Z074 UniRef90-11XRV6 UniRet90-R5S549 UniRef90-UP10003B5CF36 UniRef90-S1TOY8 UniRef90-C7N1F5 UniRef90-V5UV51 UniRef90-K2CWF9 UniRef90-UP1000225ECF3 UniRef90-R5NMY2 UniRef90-B4W985
UniRef90-D2B964 UniRef90-UPIO002E892F4 UniRef90 $131 \mathrm{IM}^{2} 35$ UniRef90-D7DSH8
UniRef90 Q18JI5 UniRef90-R7WK85 UniRef90-H6Q4Y3 UniRef90-A3Z921
UniRef90 UniRef90-Q2NEB6 UniRef90-V1CRQ4
UniRef90_L7MD89
 NVSLYNETVISVALIGIVKNVENSISKDDGDLIUTVNDTK
 SADFHPDYNVACVGLTDEDRVVTAVAQEPGNKLVLVGNAT ETASLPDVINGTGI GUDENEVIDGSRDEVGDVVIGMKSNG NVSFYNQTGSTAILPTPVVGVLGVFAGGDGDAVILLGSTA $H S G E G A E L A L D V D S H G Q M T G V L R K G G M Q V G D V V L L T K P I$
$S T A F H E G Y E G N P L V N V A P D R L V T A E A Q R P G N R L V L V G N S T$ NVSFYNQTGAEPILPTPVRRIPTGLGLEPGETLILLGDTY ETAEHPGVAGAATGIVEADKVLGPDRVQPGDVLIAMASSG DMVIGDRLVSAVGSVGVSPYPPTRKGATDGDILLMTEGAG ETAEMPGMYGFSVGVVEESKIIDGSKVKSGDVLIGIASSG ETAEMPGMYVAGFAVGAVERDPRMDQMQAGDQLI GLASSG NVSLYNETNGEATYPTPVARVVARAFRGEGDALVLLGENF NVSLYNETDGALGVIDDVSKTI GNAFKADYDIVLIGATKG ETATLPDMAGTALAIVEKDKIITGEKVREGDVI GGLRSG NVSFYNQSSGMLGLMDNPDHRMTLNFKNEGDLIYLI GPST ETAEMPGMYGFCVGIVEKAKIIPGSKVATGDTLIGLGSSG ETGFDAVYQGNPLVNVMAVGVIDQAAMQVGRAEGVGNTVM ETAEMPGMYGFAVGVVEKSQVITGRDVRPGDVVLGLGSNG ETAEMPGMYLAGFSVGAMERGETPRNVKSGDVLIGLPSSG HSVLEPDYGLVGLGLVHPDRVRRNADAQAGDVLVLGKPD ETAEMPGFYGFAVGVVDKSKILNMDSQKEGDVLIVMQSSG KVSFYPTVMDTMI GKVENVYNAKRARAEEGDLLVLVGETF EVVFDECYQGNPLVNALCVGSLRHEDLHFGAKTGGDGDGG ETAEHPGAMGAGTGVVEADAVLGPDRVRAGDAVIAMASSG
 NVSLYNEMDGMVGLIDDVEHITTQDFKESGDLI YISGDTS DTKVVQKGAVSGIGVIPRGIDWGMHRITAGDNIIVSGTTI ETAVLPGHGIDVVCTVLGVKAAYTRPPAPGDVLIGLPSTG
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ETAEMPGMGCAVGAVTSEERLPRQNTMTEGDVRLGGLGSVVGB

 $H$ T GE G Q E LIA L GFAA I NGGIDD D D MR K G GM QA G D V L V L T K P I G H T Q L G V P A A L G V T G LGG H A S D P I P A G G G H V G D A L T V T A D L Q
 E T N F D K GY Y G G N I L V N A M A V D K
 $N$ V S Y P T S I I I G M V G Q V

 E TA E H Y R A T G F C T G I V V E K N N E I


 E T A E M P G M Y G F C C V G V V E K S D D I I D G S S




 ETAE HP GVAAGAGTGVVEAERLLGPDRIARTGAVIAMASSG





 ETVVF D E SY Y N GN P L V N A L C G G N K I V L L F GA R T G L D G I G G V S V L





P H A NGY S L L R R LIF K P G E E V C G R P A A E L L LA E V A D Y S A V L N
IH GA VMA S A E V S T E T E E K R S T V V Q VG D P Y F L I E A I M E I L E K



TGA
PHSNGYSA LA A MRSRAKAS

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


GGWRP GYQGRQWDSTSWRGREQLRPMLDAV
VH S N GF S L V R K I LF K D H D V K G E S L L A P T R I Y DK S V L P L I K





P H S A R A K I P L S Q S F E N K S L A D GL LA P T R I Y V K T I K R L F S E






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

$V$ H S NGF S L V WK M D R P A L F D Q D K L L V D H L M E P T R I Y V A S L L
M S GT V A L A K E K Y N E L K E K F Q V


V H S
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 $D L I V G M Q D L G A G G L A G A S S E L A G K S Q M G V E L F D E K V P Q R E$


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

 CDVVRAFAHITGGGGIPGNDDRVLPAT MDAVVDRSTWRPQP GLI K GMAHITGGGLLENIPRMLPKT LAAELDAKTWPVPD
 A HGATACTDTGF GLL G H LVVEMT RPS GVDA QI S L S S L P L LDD ARPRAAKDVSMA GIVVGVGMLAEAS GCGAELDVAAIPRPD Q G V V H GVA HIT G G GLIDENVPRMFNDGGRAE IAAGSWEVPD



 TGAVIS $\quad$ Q DMGAA GLTCSAVEMDKGGLGVRLDLECVVV

 Y QAHCATDDTGF GLLGHANNLAQFQKEKVLFQDNKUP I I K $E G V V K A V A H I T G G A F A K L K R V L G D L G A K L E L G N L P C W A E E$
 V DV HA I A HLT G G GFWEN I PRVLDP PSVKAVI YENSWQWPA GS G $\square K$ GCSSH DT G G GF Y E NDP RMLH D GVVRA QI KA D S Y E DP P $F D E L V G \square Q D M G A A G L T S S S S E M A A K G S G L H L K L E N V P T R E$ NGLXHSAHDCSEGGLAA
TAEVVHAFSHVTGGGLAANLARVIPDGLHAVVDRSTWTPGAA

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

 K KII K GMAHITGGGGLLENIPRILDPDGCAVKLERAKWSVPK

 $K V L I E C C D D V G \square Q D L G G A G L S C A T S E L A A A G D G G M H D R D D$

 N D N I T



VF DWLARAGNVERGEMLRTFNCGVGFVACVAAEDAERALE GMTLYLDEDGISS YEMMLSETQERMLLVVEEGSEEDHGLDD
 $V$ F R WL K S A GRLLE H EFARTFNTGLGMMVLVS QDKVKA TME
 GALETVAAGQLSSLQPAN

GVTGGDWWLCFPGFA VITVDAPDRSRFLP I F N Y LK QVG NLS D D D CWQTFNMGGLGMI LAVPADKKEEEGEK V F TVI E R Y G H V G H L E M Y N I F N M Gll G I V L M V R P D D V R R T V P
 ETQS $R F I L S \square S P E K Q Q Q V E \quad Q$ KAEKYLELG

RETNMTAYEMMLSES QERMLMVLKPELEAEADLD LF NKIQEAGD\AENEMRNVFNLGDGFCLVVPQEVV, $V$ F D W $L$ L Q Q Q G N V D E H E M H R V L N I F H WL L Q K Q G K V P I E E M WR TFN M GlV G M V L C L D K K E V R K Th E $N V L K F S T L V G Q S K F R S G R S V E T S G G L L I D C D A D A A D K F C E$ $V V K R \quad G V P R E E A Y R V F N M G V G M V L V A L R R A E D D G L R$
 I F S WL L Q A E G N V E DR E M Y R T F N C G V G M V V C V S P R D V E K S L A $V$ F S WL Q Q Q GNI T DHEMYRTFNCGVGMIVALPQEDVAAGEN

 V T A L A AVA E A G L T K A E A Y K TV N M G I G M A L I V A P S QVADVVAR L F T K I Q Q Q A G D 1


 G S $\quad$ D A QA T GA S VR N WS A Y G G D
$P S L R P E E D L M S E S Q E$
VF DVVVA GAGGVA RAELEKTRMMAVVTPDDDDAFIP I F S I I Q D L G K I K D E EM F H V F N M GVGMV AVV P A T L A D R G V D GT D ELA S MF G PAMNAMEDLLDAESQERMCYEP DDVVETVGDDAAK YDLGG EAPTRAANM TPAEVLSSES QERMCAVVTPENVDEFMA IF K WLS N $\square$ AS S IQK LEMYNDFNCGIGMUIIVSEKNAENGEK

 ELS QDD K LY SEESNSRF DITVVKEDA LTTIIEEALSKNNVA


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AAR G VIDGDA!DVQGQ
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ACVI GSI
A A RI G VVDGEA \(\square E V Q G Q\)
■AVI GEVTDG
AYRLGTIVEGDGVEL
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AAR\|GD TGGSALR
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$A \square E \square G E V K Q G G G L R V N G V E \square$
GAVVGRMTDD
ATVI GEVTDGDRLLVD
VFVLGEIVEGHRGVV1]G
CYEIGRITKGDR
A Y LI GEI
A WA GEI $\square$ ARKGV
A WKIGNIEDAERVIIN
A WRDGEVVAAPRLTDNGEA
AAVI GEVTGGDRLCL
A Y Ki GRLV
LWAVGEVIEGSGVV
GLEEFGEKVYVVGS LKKRSGAD
TAR $\square G E V I D H G E I E V N G$

CYII GSIT E Q A G
$V A T G G K T A P H G R L V L R H K$
$L I C D G S V T Q T K N L V L N$
FA $\|$ VGET $\square E E D R L I V H N G E V K A$
A W L L GETEEEQRVT $\square$
ATQl GHVTA
ARVVGRVKEEGPVAVDG
AFRIGAI EAGRGCTVQG
AWEI GRI APGD
A WVI GEV
AFIVGEIDKGEGVTL
L A V I GEVTNTDRFVL
A WVA GEПTD
A YV $\$ GS $\square P G T G V V$
MWI I GEV
A WI AGEI TE RGAHTTGAEL
TY I GEVIAGQR
$V F A \operatorname{GEVEAGRGCDVDG}$
ARII GRLTANDKVILKNED
ATVIGEVTDSGRWVM
AWVAGEI TEREAVTLTG
GTIIGEIVKGDKII
A $Y \mathrm{~K} V \mathrm{~V}$ K V V
YAVI GEI RDGNYV
ATVI GEVTDGEHLTT
A WKV GKI I
A WLI GEIV
FAVVGETIPEDRFVI
YSVI GSVCSD
A YVI GKADEAK

lupas_2
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UnRef9-
UniRet90_G9PFR1
UniRef90_Q2GLC0
UniRef90-17JW79
UniRef90 D7B9D1
UniRef90-W4VRN4
UniRef90-F9CWH4
UniRef90_Q47B77

VGMGENAGVVDTGDGWA<br><br>G D A E $\square R E Q V L R V L G A P G V G D D A G M \square R \nabla S D D S V$<br>



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#### Abstract

$P \vee A V M D P|L R F B P D D D E D T| L|P G| I V A G V G G Y G N C D G L P N D G G$ PI ALLLD S L GKLLKDHTTKHLFDVVRGISHYGNCIGVVTVAG PLAVVLDTVCGNAEKETIASLVKGISQACQNNECSLVGG $P$ PFLDD FACG KLDVVEAATVINGIAAGCEQAGCALI GG        P $\qquad$ PLFFLDYFATG PLFFLDYFATG PLFFLDYFATG P

P PLFFLNSMFATGDARTR   P PLLMTDYIACGHVVP朗 PLAATDNLNFGNPERPE

PLIFLDYFATGQVP PL F D Y FATG KLDVNQI PIFFGDYFSCG KGVAADV  $P V A M L$ S DLGHLA D D GDVGKLG   $P L Y F L D Y F A C G K L S V D T A A R V V G G I A R G C E L A G C A L I G G G$ RCDNMLMMVMATEKQRDIVVPLLIMKIVDLAEEAGTRVVGG    P L F M T D Y I A T G R V V P E E R I A D V V R G I A Q A C A V A G T A L V G G   ECDTMLMLLAASTDMDENERYMMKGFTQVAKAAGTTVTGGG P VAF L D Y L G PLLFF L D D Y I A C S VE RDS E E H E S F I K E L VNV V D S V DVK L VG G  $P$ VAVMD QLAVDHEDTARVVHGVVAGVGGYGNCLGDPN G G     


lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm


lupas_21
lupas_14
lupas_28
jneat
cont
sol25
sol5
solo
hmm
jpssm
170
180
190
200
SETFDAGEDGSSGPAKRPAVQVGDPFMEKLDECTLEDFA SHGASFASKELSEESKEDRPSVQVGDPFMEKILIEEILED RMDMDKYPQ KKLER DMNETFIEQIMKPHTPYYQALKGLFT DHSNGYS LVRRMIERARPDLNALMAPTRDYVKPDRALLER LHSNRMNLAGYVEEFGRT LGEELLEPTRIYAKDCLAGLAEE SNGYS LV RKVVEEK
S G GY




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, V

UniRef90_E2SF46 UniRef90_K2DE68 UniRef90 G2J9R4 UniRef90-K5B7NO UniRef90-IOAOP8 UniRef90_F4WZJ9 UniRef90-B5JXJ5
UniRef90-E6WRX9 UniRef90 B4RZX7 UniRef90 UPI0004646B2E UniRef90-B9QX65
UniRef90 B0VXG8 UniRef90 UPI00020D9C00 UniRef90 E3EZY1 UniRef90-G5ZWE7 UniRef90_UPI0003B4E608 UniRef90 B0C6R3 UniRef90_UPI00037A8BC7 UniRef90-UPI0003B3B90F UniRef90_B7TWJ4 UniRef90 C7R2J4 UniRef90-A0A021W934 UniRef90_UPI00036BF66C UniRef90 UPI000414A3EA UniRef90- UPI0002EF2B99 UniRef90_V9XGZ5 UniRef90 UPI00030FB7FO UniRef90-A8FM09 UniRef90_UPI0002FCCF96 UniRef90_C4YC54 UniRef90-L9U9U6 UniRef90 T1FV43 UniRef90-MODK71 UniRef90 19AJS8 UniRef90 F6D7N0 UniRef90-KOJ261 UniRef90_UPI00037F2135 UniRef90 W8X0N7 UniRef90-A0A023GES2 UniRef90-UPI00045E7567 UniRef90_B4G4C8 UniRef90_W9V3J5 UniRef90_W6T5X4 UniRef90_J9HYT1 UniRef90-F8A4G7 UniRef90_D3STZ8 UniRef90-I0EMJ7 UniRef90_W2BSA5 UniRef90_S9U213 UniRef90-A5IMV5 UniRef90-M1E6N7 UniRef90-G9PFR1 UniRef90_Q2GLC0 UniRef90_17JW79 UniRef90_D7B9D1 UniRef90-W4VRN4 UniRef90-F9CWH4



210

240 PEVVACQDCGAAGLLSSSSEMAYKGECGVDIVHLDAVHLRE

 TNLVKAFA HITGGGGLTENDPRDLPENLGGVMLDAKKWNVLP


## T

T GLIKSAA A I TGGGGV
 A EVRGMVHVTGGGFYDNDPRVLP DGVAAKVSFGSWEILS TGAVVA AQDMGAAGLCSTAEMAEKGGVGDDLDLDLIPN


 DGAVHADSHVTGGGG1AANLARVLPRGGSWTQLERSRWSPDP DILV HALLSHITGGGLAANLARVLPAGLVGDVDRSSWRVPP ETEVVRTFCHVTGGGLAANLARVMPKGLVAELDRTTWSPAP $K V G D F V R A L I A D G I A T A V H D L S D G G \quad L A V G L A E M A M A S$ TDY IVG 1 QDMGAAGLTSSSFEMAGRGSGMKLYLDKTPM
 PA I R R G M A H I T G G G L V E N I P R A L P K H L Q A QV D M S T WE VP A




 $H G C H G A T D V T G F G L L G H A Q N L V Q V Q Q R S V G F$ D GLVDAAHDVSEGGLALALVESSC
 QVQVNALSHITGGGGLLENDPRVLPKSTKAVLFTDSWQLPP



 LVAA MSHVTGGGLASNLERVLPK GVGARVERGTWALPA

FDLVKGDA HVTGGGVVRALKRVLGKLGAHVSLPKRDFVD GMINGLAHITGGGIEGNDLDRILPKNVKAVI KKDFD IDPW K S G $\|$ S YGYFVSRGLADAVLRLHRDSGFGVKLYADRワPFEG

 $R G L A E A A H D L S D G G L A V A L A M R G G R G V R V T V D G D V F$

 $K \bigvee T I K G M A H \square T G G G L L E N V P R V L P E N T V A E L L E K A A N P R P B$
lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm


WILKY $V$ V FNEAVNTFNMGVGMFLIVEKQKVDEVLD IFRWDAD H GVSEEEMYKVFNMGGGMVLVVSPSNVDEVLN NSFSLGKELDIDPDSAAMNGGDDFCLMYVI SDSKYEEFKK $P S$ LTAGEDLMSESQE IVTWLE GAGNDPKEDMLETFNCGVGLVLVTARETSAELMA
 VF G WLIAANGNVSDAEMLRTFNCGDGMVLICDSKNWRKLVN

[^3]| UniRef90 E2SF46 | AVVV\|GE|V|TD ${ }^{290}$ G HLVID |
| :---: | :---: |
| UniRef90 K2DE68 | A AVIGRTTE |
| UniRef90-R5QYX1 | CYEIGV1ENGQ |
| UniRef90_G2J9R4 | A WRI GSI R A |
| UniRef90-K5B7N0 | CWVL GSIT K G |
| UniRef90-IOAOP8 | LVIL GEVSKGS GLL |
| UniRef90-F4WZJ9 | $\mathrm{K} V \mathrm{~V}$ IGS V |
| UniRef90-B5JXJ5 | A AR |
| UniRef90-E6WRX9 | HRA\GQVVSASG D GERVR |
| UniRef90-B4RZX7 | A WVI GDI A SKD G |
| UniRef90-UPI0004646B2E | AFVVGQLA E |
| UniRef90-B9QX65 | A LEE TA GETVVK $\square \mathrm{GR}$ R $\square \mathrm{ETAG}$ |
| UniRef90-B0VXG8 | A WVI GSVVA |
| UniRef90-UPIO0020D9C0C | A Y VI GTV |
| UniRef90-E3EZY1 | VY TLLGQIT A G A GVS Y T G A |
| UniRef90_G5ZWE7 |  |
| UniRef90_UPI0003B4E608 | ASVIGETVEREG |
| UniRef90-B0C6R3 | $A V V A G S V I A E P \square V K \square$ |
| UniRef90_UPI00037A8BC7 | LGR1LARKDGPAVT F N G E |
| UniRef90_UP10003B3B90F | LWPIGTVERGD |
| UniRef90-B7TWJ4 | SWVCGEVVDRDAAH |
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| UniRef90-A0A021W934 | HWRI GEVVEGERVHI |
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| UniRef90_UPI000414A3EA | A WVLGVVHDEAWVGAS G A R V |
| UniRef90-UPI0002EF2B99 | A WELGTVHDAAERTPSGRVV |
| UniRef90-V9XGZ5 |  |
| UniRef90_UPI00030FB7FC |  |
| UniRef90-A8FM09 | A V V M G EV T |
| UniRef90-UPI0002FCCF96 |  |
| UniRef90-C4YC54 | FRKAGE |
| UniRef90-L9U9U6 | HLE AEGESVYR\GQ VER R Q G |
| UniRef90_T1FV43 |  |
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| UniRef90_19AJS8 | Y Y QVGTVQA |
| UniRef90-F6D7N0 |  |
| UniRef90_K0J261 | A Y L G EVTTDK S GVKL |
| UniRef90_UPIO0037F2135 | VA R V G K \ VAR S |
| UniRef90_W8X0N7 |  |
| UniRef90_A0A023GES2 | A WII G DVVE GERV |
| UniRef90-UPI00045E7567 | VLR G VTD T A D R D G |
| UniRef90-B4G4C8 | A K KI GRVEE |
| UniRef90-W9V3J5 | A WEI GVIESAD |
| UniRef90_W6T5X4 | F Y QVGTVN A G S |
| UniRef90-J9HYT1 | S WEVGQVTKGS |
| UniRef90_F8A4G7 | A WEL G S V R T A D PVR |
| UniRef90-D3STZ8 | CSVI GEVTEE |
| UniRef90-10EMJ7 | A CVIGGHVIKEPNTKL |
| UniRef90-W2BSA5 | S WICCGEIVEGERVELVG |
| UniRef90_S9U213 |  |
| UniRef90_A5IMV5 |  |
| UniRef90-M1E6N7 | ARIIGKIVPSDERRVE |
| UniRef90 R5BYG5 | $\square \mathrm{F}$ VVGHLVGA VLVTPD G H QVS A Q G W |
| UniRef90_G9PFR1 | ASVI GEVNGS GRLT $\square$ D GERI |
| UniRef90_Q2GLC0 | A YVI GAVI |
| UniRef90_17JW79 | A WVLGEVTA A E |
| UniRef90_D7B9D1 | LAEHGVPVEQ $\mathrm{L}^{\text {a }}$ V VGGETLS |
| UniRef90-W4VRN4 | AKC【GTVVKRETAAVI |
| UniRef90_F9CWH4 |  |
| UniRef90_Q47B77 | V Y R $\\|$ G K \( |
| ) R A R S G |  |

[^4]
[^0]:    

[^1]:    $\qquad$ G

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol5
    sol0
    jhmm
    jpssm

[^3]:    LIF DWMQAEGNVAENEMHRVFNCGIGLVIVVMAELKAQGEA

[^4]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

