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UniRef90-B2A9K8 UniRef90-J6F6C1 UniRef90-Q0CRP4
UniRef90 G2XAW5 UniRef90-E3RNTO UniRef90-Q2GXB4 UniRef90-A0A010RP15 UniRef90-BOXRY3 UniRef90-E3QYT9 UniRef90-TOM6E7 UniRet90_A0A017SR61 UniRet90_S3D7R0 UniRef90-Q5AX00
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UniRef90
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10
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GSSTSNDLKQGQAGS NELEQGAAGS TGNELRDG GSSSGNDLRDG




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RS
 RNDLEGGDSN
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GGSTRNDLEQGAAGS

| GTEANEFKNG SSTSNDVTSG GATANEFVNG |  |  |  |  |  |  |  |
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GC
STSNDLDDGKATA
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TTQNDLLNG TPCKPVTY S S RSELEEQ
 NAACADAIL

GCKDI 1 FLWARASTEPGLLGGISTGPA GSTANEKKG GCKDIVFWARGSTEDGNMGTVVPGV
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## GTTENEFYDG <br> NELRNG

A
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HS
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STANEFKD

GTTSNEYT
SLTANEF
GGSTEN

$N T G G C K D V V L V F A R G T A Q L G N L G A T P G P D$ AEGCADMIIVFARGTTEAGNVGSVGPPL TPCRAVTVIFARGTTQSGNVGSEGPVF UniRef90_B2ATB3 UniRef90-B2ANK5 UniRef90 ${ }^{-}$E4ZHG2 UniRef90-A2R2W3 UniRef90-11R135 UniRef90-C9swo1 UniRef90-M2UJJ2 UniRef90-Q0TWK1 UniRef90-Q5B2C1 UniRef90-Q5AVY9 UniRef90-A1C9G0 UniRef90-GOSEJ8 UniRef90-W2RTF9 UniRef90-G9MY62 UniRef90-ROK615
UniRef90_B2A9K8 UniRef90-J6F6C1
UniRef90 QOCRP4 UniRef90-G2XAW5 UniRef90-E3RNTO UniRef90-O2GXB4 UniRef90-A0A010RP15 UniRef90-BoXRY3 UniRet90-E3QYT9 UniRef90-T0M6E7 UniRef90 ${ }^{-}$A0A017SR61 UniRef90_S3D7R0 UniRef90-Q5AX00 UniRef90-M1 WOZ 1 UniRef90-A1CVT3 UniRef90-G1 X382 UniRef90-R1E682 UniRef90_F9XNG3 UniRef90-F9FVF1
UniRef90 QOCES UniRef90-A5ABE6 UniRef90-11RF76 UniRef90-M4GEE6 UniRef90 R1EKM3 UniRef90_W3X6TO UniRef90-B2WMC2 UniRef90_Q0CD01 UniRef90 AOAO10RK56 UniRef90-C9SN46 UniRef90-P30272 UniRet90 N4UY72 UniRef90-AOAO10QTQ3 UniRef90_SODK74 UniRef90-K2RG68 UniRef90-S3CYR3 UniRef90-P29292 UniRef90_A0A010RJG3 UniRef90-F9X4F2 UniRef90-P52956 UniRef90-M7S6PO UniRef90 N4XZY9
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$k 1 \times 146$ UniRef90-K1X146
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UniRef90_S3DGE6

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$C Q N L K K G G O G O Q G V G G A$ GQGKDAFGAASVAVEGTD CSNLKSTLGSDKVACQGVGGAYTAGLDQNALP GDGKTVLGEDQVWTQGVGGDYSAAIGDNGLP
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GQGLKNAFGATKVAVEGlVD
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V ACQGVDGK
Y AA GLAASNFALP
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CDALDQQRGTKTVSUQGVESYPATFAGFNKNGTEGVPSM
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$\square D L L K A A L G D A V V A A Q G V E \quad Y P A N L L D N L H E G G C D P D D A$


S N GLLK QAF GA T KVVATAE GI D YA A S I GTN GLIPGGTADAR S K


$F Q A L A K E I G S D K L A V Q G V E \quad Y P A S I M A G M D L G \quad S D G G$



NDRMS K P G K V A C Q G V GPKYTA DLEPSNALIPGNTSSPAA I
LC QSLKK SSRRSNGVACQ GVGPRYTADDPSNALPDNTSPAA
$F N A L A S M D G T E N L A V Q G V N \quad Y A A N I L G F L L \quad G G D P A G S$





$F N N L A S R I G L N N L A V Q G V A$
$F$ N A L A A S R V
$\begin{array}{llllllllllllllll}\text { F } & N & A & L & A & S & R & V & G & A & S & N & L & A & V & Q \\ A & G & V & D \\ \text { A } & D & A & F & P & G & Q & V & A & V & Q & G & V & D\end{array}$






UniRef90 B2ATB UniRef90-B2ANK5 UniRef90_P41744 UniRef90_E4ZHG2 UniRef90-A2R2W3 UniRef90-11R135 UniRef90-c9swol UniRef90-M2UJJ2 UniRef90-Q0TWK1 UniRef90_O5B2C1
UniRef90 QOCNE3 UniRef90-Q5AVY9 UniRef90-A1C9G0 UniRef90-GOSEJ8 UniRef90-W2RTF9 UniRef90-G9MY62 UniRef90- $\mathrm{B} 2 \mathrm{A9K} 8$ UniRef90-J6F6C1 UniRef90-OOCRP4 UniRef90-E3RNTO UniRef90-Q2GXB4 UniRef90-A0A010RP15 UniRef90-BOXRY3 UniRef90-E3QYT9 UniRef90-T0M6E7 UniRet90_A0A017SR61 UniRef90-S3D7R0 UniRef90_Q5AX00
UniRef90 C7ZNC0 UniRef90-M1 W0Z1 UniRef90-A1CVT3 UniRef90-G1 X382 UniRet90_R1E682 UniRef90-F9XNG3 UniRef90-F9FVF1

UniRef90 Q0CES4 UniRef90-A5ABE6 UniRef90-11RF76 | UniRef90-M4GEE6 6 |
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| UniRef90 |
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UniRef9O_G4MZV6 UniRef90-G2XGJ6 UniRef90-W3XG36 UniRef90-B6HLS9 UniRef90-STZPP89
UniRef90 E3Q7U5 UniRef90-K5W682 UniRef90-E5A4G5 UniRef90_A0A024JZ96 UniRef90-E2LZ46 UniRet90-S3E4AO UniRef90-AOAO16PA98 UniRef90-H1V665 UniRet90_A0A016PE87 UniRet90 N4UYC5 UniRef90-W3WUT2 UniRef90-W3XGQ2 UniRef90-QOUA76
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UniRef90 UniRef90-Q0UA76
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 TEAQKVAAAVTFGDP四RAQ PFRNIDQSKTKIFCAAGD AVSAKVSSVVIFGDPNYGSAVGTMP ASKVKVFCHTGD VRARVVGTVLFGYTQNQQNNKGIKDYPQEDLQVYCEVGD ATMAKINSVLTFGDPGNP GAITGA EGKTKI DCHDND AVKAKI AGVVLFGYTKNQQNRGVIPGYPASQTKVYCNTGD DVQDKIKGVVLFGYTRNAQERGQ ANFPKDKVKVYCAVGD AQKSQI AGVVTFGDTQFRADRGQIPNFPKDKIKITCNPRD AVAARIVAGVTYGDTQREQDGGLIPGLDAERTH:ICHDCD GVKDQUAGVVLYGDTQKLQDRNQUPDFPKDKVKIICQPGD DVASRVAAVALFGDPDNGQ PVVGVSSDDVITFCHEDD AVKEQIAGVILYGDTQKQQDRNQUPNFPANKVKIICQVGD
 ATTSKIAAVVTFGDPFKSQ SFQGIDEGRCKVFCRSGD ATANFVSSVVTFGDPFKNRGFGSMP SSKVKIIFCNWGD AVRARIAAGVTFGDTQKQQDGGRIPGDDASKTLIDCNTGD RTKSQVQGVVDFGYTRNAQSGGRVPGFPVERTRVFCRAGD AVKAQI AAAVTFGDTRAEQDDDQ\|PDFDTSKTLI DCNDGD DVQAKIKGVALFGYTRNAQERGQI QGFDKDKTKIYCAVGD NVKNMIKGVTLFGYTRNAQERGQIANFPKDKVKVYCAVGD

AQDARISAVLIFGDPFNGQPVGLVP ASKVKVICHTGD SVQNRVNAVVVFGDPDNGDG FP VNAARVAAVVVLGDPKRGQSFGSTP EVANHVAAVALFGKPSTQQPPVDUGPLYSAKTLEGGPGD SVADHVAAVALFGEPKSGQPLPTTNPIYTTKTISLCAPDD A $I R N R I N A V V I F C D P K R D Q \quad A V A G L P S$ SASKVSAAIIFGDPDNGKAVGSVG ADQLSGAVLFGDPGKMEGVGKLS AAKTKVFCNATD SSKIVKEFCASGD SVTNRVTAAVTFGDPKQKQAFGTVPMSSSRTRGFCRAGD DQQDRIAGVIMFGDTQDRADGGQIPNFDPAKTEIICAPRD DVRAKVSSVVLFGDPGGGQ AVEGVDGTRLLVVCHTGD ATTSHIVAAVTFGDTYYEQDGNKIPNIAASKTKVFCNEGD

ANAAKVSAVVTFGDADRDESFGQVA NGRSITFCANGD
$A T A Q W S K V|P G D P Y S K Q \quad P| V N V A E S K R K T F C N A G D$



## UniRef90_G4NEV7

 UniRef90-J3PGL5UniRef9O_ROKMT9 UniRef90_G9P4J3 Uniref90--
UniRet90-
PZWH2 UniRef90-W3WX64 UniRef90-K9HRM0 UniRef90_M3BAL4
UniRef90_LOJ5G9 UniRef90-G2WTY6 UniRef90-_J3PAP1 UniRef90-K1X9E7
UniRef90 K1XNY3 UniRef90-K1XL88 UniRef90-W3X1M9
UniRef90_QOTXX8 UniRef90-A0A024JQF9
UniRef90_K2SON4 UniRef90_B2HE93
UniRef90-UP1000465620D UniRef90-IORM11 UniRef90-10S007
UniRef90-U4LVG7
UniRefolo-R7Z2H1
UniRef90-X5K140
UniRef90-G4MR24
UniRef90-UPloo0464BF47 UniRef90-B6QGO4 UniRef90 U6NLE3
UniRef90-G1WXL5
UniRef90_E6TLE7
UniRef90-Q8X1P1
UniRef90-A1UE80 UniRef90-G8RNC7 UniRef90-TOLLF7 UniRef90-K0UTS7 UniRef90-UPI0003793B6D UniRef90-UPI000363CA44 UniRef90-F7VZC8 UniRef90-W3WWE1 UniRef90-G3JJ84 UniRef90-G2WYM5 UniRef90-J3P0W3 UniRef90-U5WQG2 UniRef90-G4NOH2
UniRef90-W9AWB9 UniRef90-J4UW69 UniRef90-UPIO00477830C UniRef90-G4HRW7
UniRef90-R4UHW7 UniRef90-H8JLF7 UniRef90-10S3K0 UniRef90-UP100035ED2A3 UniRef90-UP10002D4FBA9 UniRef90- $\times 5 \mathrm{KL} 18$ UniRef90_K9F8C9 UniRef90-A0A024M9A6 UniRef90-V5X8P8 UniRef90-A0R5Y1 UniRef90-K1W5Q0
UniRef90 ${ }^{-18 N 2 Q 5}$ UniRef90-12A7N2 UniRef90-W3XCG2 UniRef90-G8RNC6 UniRef90-l4BRC3 UniRef90-L7IOF7
UniRef90-L2FUC6
UniRef90-LOJ365 UniRef90-S8AQV5 UniRef90-M2TON1 UniRef90-UP1000377CF1A UniRef90 A8NBB2 UniRef90-K9HTF5 UniRef90-S7ZH20 UniRef90_B2HQY3 UniRef90-UPIO004655A1A UniRef90-A1T525 UniRef90-LOIQX7 UniRef90-A0AO51TXX0 UniRef90_V5XEK0 UniRef90-UPIO0037AE006 UniRef90-E9DX35 UniRef90-M3AX85 UniRef90-FoUXso UniRef90-UPIO003705683 UniRef90_N4X4991
UniRef90_A0A017SIZ4

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 TYPASILGFLL GGDPDGA
 VDELRPRIVGRSSLSVYVNYPASSNFGAG|EFARTVVDGM
 FFQAVSELSGGKVAVQGVD SGGLK STYGDSRVATEGVN GQGLKSAFGAGNVAVEG AQGLEDMEGCENVAVEGTG YAANV YPASLDF YAAlPAPNFDPG
$\qquad$ YPAAVSGFLA

FKAVADITGPKNLAVHGVTYPA
SDGGKRAFGRDAVATEGGGTNA
ATNAS ASGPANAVQGVN
 YPANDDYHTSASLGSDDAS
YPASPDFPTADQGIADAST
 YPASDSFVS
YPASDDF
Y NYKADIWGYL GGAVDGV YAAS WAGALQGGDAAGS
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YSASVLGYLV
YSGNFGDRIEFARTVVDGID
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YPASPDWFRAMVG
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GAYAADLISNTYPLGTSQGAD
YPASWN GFFAGGSPNGA
VDYPASNDFGSSPPAGADAA
VDAGRARQAGNKSVAVYPVNYAASSDFGNRLDFVQSVVDGV
A S S S L Q T S L L G A D R V A V Q G V D
K Y A A D L LA N L K G L R T D N K A $\square$
YAANVLGFLA GGDGAGS
Y P A NI P PGFDA

YKADLMENFTENGTDDAA $\square$
Y A A DI A
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Y P A S D Q WD T G L


A S S D L G G GVVD FA R






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

    \(V\) D AL QS HLLA GRSMQVYAVD YPAA DRGFM
        Y P A DVRGFM
        Y P AT D D
        \(Y\)
    $Y$
$Y$ A T F E G
$S Y$ S A S V Q G Y $L A$

$Y A A G L D G Y L I \quad G G D P E G A$

A A TAASNVAMGSNGG


YPAT $\square D F P T A L D G$
Y P

YPATWDF DTM FAQNVVDGV

$Y P A T I A G Y L$ E G G DKGGA
VYPASYDF LAAAD GANDASA
$Y A A N V$ GFLAGGDAAGA
$Y P A D A A G N A S \bar{M} G S S G G$

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TEMKRLI|AKANAECPDSMLVVGGYS QGAA|L|THRADVN|L|PQ NTMTAHVARAATQCPNTKI ILLSGYSQGAQLVHRTAGQLTA
 RDAADRVQTTAANCPDTRIVLGGYSQGAALAGYVTEPMPR
 A EMTSSLLNAAASACPSSKLVVAGYSQQAAMVHRADEDATA
 QK M A S A AMSS LLLGAAMNCPASKVVVGGYSQGAAVAHRSDESLPP ATMAQMVTSKAAACPNTKIVMAGYSQGGQLVHNAAEQLPA TAMKNLLNGAASKCPTS ILVAGGYSQGAALTHRADENLSE KMMRDL FLDAA GKCPYSI LLGGGYS QGAAL CHRAIDENLPE RNMAELAELAAAKQCPETKIVLSGYSQGAQLVHRAAKLLSA A GAVKLIDNAASQCPDASILLGGYSQGTAVMDNAVQALSA

 $K T M A Q L A N D V V K K C P G T K V V L A G Y S Q G A Q L V H K A G A Q L D S$ | $A$ | $H$ |
| ---: | :--- |
| $H$ | $Q$ |
| $V$ | $T V$ |
| $Q$ | $V$ |
| $V$ | $C$ | $H V Q Q V A T N C P Q T K L V L G G Y S Q G A A V M G F V T Q P M P S$ GDARAHVESMAANCPSTRMVLGGYSQGAGVDDLATESMPP DDAGNHLDSMTENCPNTKMVLGGYSQGAAVTGYVTGPLPA QDMANSVVDAAK QCPQSKVVMSGFSQQAQVTHKAA YK L KP QKMA QLTRDAVARCPQTQVVLAGYSQGAQLVHNAAMMLDT TSMANLTNYASTKCPSAKLVLSGYSQGAQLVHNAAKTLSA R D T A D H DEATARDCPNTKVVLGGYSQGAVVAGYVTPPMPP SKMA QLATEA GQKCP GTKVVLGGYSQGGQLVHNAAR LGBP A D A A GRVQ WMA DNCP DTKLVLGGNS Q GAGVIDDLIT T PL P P S NMASLISEAYSSCPNTKLI AAGYSQGCQVTHNA DS QLDA

 MA A L QNYLT TNNQAVT QCPNSKIVIGGYSQGAQITHNAAALYSP DDTSNRVREVVATCPDTKMVLGGYSQGAAVMGYVTGPMAP GHIDQYMVNNCPNTRLVLGGGYSQGAAVDDGFDNPLPP DEALRRLFDLASTKCPDTVVVAGGYSQGTAVMAASDSVLEA AFMTRVVAQQTMSMCPNTK LTMSSGYS QGSQVVARDAIAAMPT
 K DAATHVEATAAACPQTRDVLGGYSQGAEYTWYAPKPMPP SEMKRLLNKAATECPNSKIVVVSGYRYGHDDSDRAVESMSE ADMADLI ANDSSTCPDSQIVLSGYSQGAAMVHRATEQID D $K T L Q N L V T D A V L Q C D N S H I V V A G Y S Q G S A V V H A A L S R L G E$ RTMANLTARAASQCPNTRIVLSGYSQGAQLVHNAAEQI SA A EMAK QVQSFDAKCPGSQVVMSGYSQGGQLVHNAABALPA KVMAANAATAASKCPNTKVVLGGYSQGAAVVVRAA GLLSA A ALQ GHDQWMMDNCPATRLVVLGGYSQGAAVIDGFNAPLPP
 IDASNRVRDMAGRCPETK VVLGGYSQGAAVAGYVTGPMPP
 K DA GA HVVSTAN GCPRTKMVLGGYSQGAAVMGFVTKPLAP NDASAHVQATAANCPNTKDVLGGYSQGALVIDLITDSLPQ R D A T N HI QAMAADCPTTKMVLGGGS QGAAVAAFVPPPMPP RDAGTHI ENTAASCPNTRQVLGGFSQQAALAGYTTAPMPP DDASNKI RQTAADCPSTKTVLGGFSQGAAVAAGDTBPDPA AK LVGQALSQCPQTK ILLGGYSQGAMVVHNAANSL
 A DATNH
 R D A S S Hill S MV A S C P N T R EVV LG G Y S Q GA A V A D K V P P P M P P

RDEANHVEAMAANCPDTKLVLGGYS
 SDAGAHLQN VAATCPKTKVVLGGYSQGAGVVMDLVADNQLDP P SMTN FI NKAIT NCPNSKI AI S GYS Q GALVVVR STA QSLDPA A DAVNKI Q S VTA QCPSTKIVLGGYSQGAAVAGYTTSPMMPA AEMARQIKAAKAQCPGTKLI ASGYSQGCQIVHNADNQLDT $K$ L M A Q M V G Q V K A K C P D T T L V M A G Y S Q G G Q L V H N A A A A M L $K T M A N M V T T T V R Q C S N A K V F M S G Y S Q G A Q V T H L A A R Q L S D$ R NMASDVVTSFANACPDTAIVMS GYSQGAQLVHLLSAN QI S S AKMA QLVTQAMT QCPDTKVVMAGYSQGGQLVHNAAKMLPA $P \square M A N L V K T A L A Q C P D T K V V L G G Y S Q G S M V V H N A A N S L S$ $R$ D A G T H VVVSMA G Q C P Q T K MV L G G Y S Q GA A V M G F V T K P L Q P
 HI QYMMANCPRTRLVLGGYSQGAAVIDGFNAPLPP RDASAHVESTAANCPNTKMVLGGFSQGAAVMDGVPNPMPL GDAHAHVQSMVASCPNTKLVLGGYSQGAMVDDLITDALTA
 ADAS GHI QSVVT TCP KTRMVLGGYSQGAGVISMATAGMPP VTMAK V VT DTIA ECPKTEFILGGYS QGGYAVHNAAKNLDA RE A A EMFADAAS QCPDAA V A G GYS Q GAALMASAVS T L DA ATTA QLLEQAAS QCPDTQUVLSGYSQGAQVVHLGQAMVSA HI QWMA ENCPNTRQVL GGYS QGAAVVMDGFNNMLDP TSMFNLI NQTASRCPNTKVVVSGYSQGAQLVHTATARLSA P K M A S L V|K Q A L K Q C P N T K V V L G G Y S Q G S M V V|H N A A N S L S

## UniRef90_G4NEV7

 UniRef90-J3PGL5UniRet90-ROKMT9 UniRef90-G9P4J3 UniRef90_G7CE77 UniRef90-X7ZWH2
UniRef90-W3WX64 UniRef90-K9HRM0 UniRef90-M3BAL4 UniRef90-LOS5G9 UniRef90-J3PAP1 UniRef90-K1X9E7 UniRef90-K1XNY3 UniRef90-W3X1M9 UniRef90-Q0TXX8 UniRef90-A0A024JQF9 UniRef90_K2SON4 UniRef90-B2HE93 UniRef90_UPIO00465620D UniRef90-IORM11 UniRef90 - 10S007 UniRef90-U4LVG7 UniRef90-R7Z2H1 UniRef90-G2XN51 UniRef90-X5K140
UniRef90 G4MR24 UniRei90-UPI000464BF47 UniRef90-B6QG04 UniRef90-U6NLE3 UniRef90-G1WXL5 UniRef90-Q8X1P1 UniRef90-A1UE80 UniRef90-G8RNC7 UniRef90-N10768 UniRef90-TOLLF7
UniRef90 KoUTS7 UniRef90-UPI0003793B6D UniRef90-UPIOOO363CA44 UniRef90-F7VZC8 UniRef90-W3WWE1 UniRef90-G3JJ84 UniRef90-G2WYM5 UniRefto -33POW UniRef90-U5WQG2 UniRef90_G4NOH2
UniRet90_W9AWB9 UniRef90-J4UW69 UniRef90_UPIO00477830C UniRef90_G4HRW7 UniRef90-R4UHW7 UniRef90-H8JLLF7 UniRef90-10S3K0 UniRef90-UP100035ED2A3 UniRef90-UPI0002D4FBA9 UniRef90- $\mathbf{x 5 L} \mathrm{KL} 18$ UniRef90-K9F8C9 UniRef90-A0A024M9A6 UniRef90_V5X8P8 UniRef90-A0R5Y1 UniRef90-K1W5Q0
UniRef90 $\mathrm{B8N} 2 \mathrm{C} 5$ UniRef90-12A7N2 UniRef90-W3XCG2 UniRef90-G8RNC6 UniRef90_14BRC3 UniRef90-L7IOF7 UniRef90-L2FUC6 UniRef90-LOJ365 UniRef90_S8AQV5 UniRef90-M2TON1 UniRef90-UPIO00377CF1A UniRef90 A8NBB2 UniReif90_W3X273 UniRef90-S7ZH20 UniRef90_B2HQY3 UniRef90-UPIOOO4655A1A UniRef90-A1T525 UniRef90-LOIQX7 UniRef90-AOAA51TX00 UniRef90_V5XEK0 UniRef90-UPIO0037AE006 UniRef90-E9DX35 UniRef90-M3AX85 UniRef90-FoUXso UniRef90_UPIO003705683 UniRef90_N4X491
UniRef90_A0A017SIZ4

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160
AQKNQIKAAFTFGDTQKQQDRNQUKGFPREKTNTICQPGD DVAGKVTAVLTGGDP FMKRTLANDPASKHRVICHDGD AVKNQIAGVVTFGDTQARADNQQIPRFPRDKLKIFCAVRD ATASKISAVVLEGDPRDGQ ALPNTAASKVLTVCHDGD EVADHVAAVVLFAQPRYGAPPTAIGSVYQDKTLELCTEGD QUANHVAAVTLFGRPSNQFPPITVGPLYAPKTIDLCAPDD TTVSRIAAAVTFGDTQKAQDGGKIPNIATSKTKIYCNTGD SVRERVNAVVVFGDPKNGDG FPGVLDDRSITFCAFGD TDMN AVQIFGDPFRGR PPENVSSQRTLITCHAFD DVAKHVAAVVMFGKPSSGFPPDTVGKLYTGKTLDLCDPED VAKNQIVGVLTVGDTQKTQDGSR|ENFPPDRVSFLCNPGD SVASRVSAAVIFGDPKNGEPVAQUPNFASRTMI CNSGD EVKDRIAGVAMYGDTQNTPDKGRIPKFPPEKTLIICNDQD ATATRISSVVVEGDPYHP AAIIPGDPDWKVATFCRKGD DVKSKVKGVVLFGFTRNAQDNGQUPGFDASKTKVFCALGD NVKEQIAGVVLYGDTQKLQDRNQI PNFPKEKVKIDCQPGD
 TVADHVAAVALFGEPSSGQPLPTINPLYGAKTINLCAADD DIADHVAAVTGLGTPSERQPPVKVGSLYQPKTVELCVPND QVADHVAAVALFGNPESNFARPTLSPLYRPKTIDMCVPDD EVAEHVAAVALFGKPSNAWPPDTIGHRYSAKTIELCAEGD ATASKIKAVTVFGDPKQKE PVVANVQANVKKYCHQGD AVTAKIAAVVMFGDPDYGQAVGTVP SSKVLSTCHDQD EVSDHVAAVVLLGTPSDGAPAMVIGPRYKDKTIELCEPGD QGISVVSAAVTFGDPYNPMAPVPGDPSDDSMIFCHTGD HLADHVAAVAVFGNPDRDDPGGQLSGTYGPRADDLCGDDD TTAAWIDKVLLFGDPDNGQ A DPNDSANVYTACHNGD $T V Q N R V A A V V V F G D P D N G Q G$ FPGVLNGRSDTFCSDDD AAANKIAAVVMFGDPKNGDALGKGADA KSKTFCNAGD DIA DHVAAVALLGAPSDRQPPVTDGALYQPKTLELCVPGD LVTSRIAAVVLFGDPYTDKPVGQVSPSS FVLEICHDGD EI ADHVAAVVLFGKPSTRFPPDTDGSLYADKTLSQCDPDD NVPEHVAAI AVFGNPSTK LGLPTASPVWGGRSIDDCNPGD AVQEQI AGVVLFGYTRNSQNSGRTPSFSTDRALVYCNEGD DAQAKISSVVLFGDP DGGKA! QGVDSTRLLVVCHTGD AMVNHVAAVAVFANPSRDQPLTKISPLYGHKTVDLCADGD QIADHVAASALFGTPRTSFPLPALAPQYAANSIDQCNQDD AI ANHVAALVLFGKPSSQFPPDAIGPAYVAKTI EDCVPDD AVKNKIVAAVTYGDTQRLQDRGRIVNFPEEKTLELCNTGD ETVGQI AAAVTFGDTQKDQDDDQVPNVDTAKTLILCNDGD DIHAKIAAAVTFGDTMDKKNKGRIPNFPGDKMLSVCNEGD AVTARVTAVLTFGDPDRDEAFGSIP AARTRVI CRSGD A ALQRVSSAV FGDPKNGQ DVASKVSAVLTLGDPFQKR EADARVNAVVTFGDTQSKKNADKDPNYPAKHSLFICNKGD ELAPRVAAVVVFGNPLFGQKПTTASPLYGPKAKEFCNLGD EIATHVAAVALFGKPSNGFPDTVGALYAPKTIDQCVPGD DLEKRVAAIVLIGNPKNWQVAGSI RDDQRSKDI DIGNPGD EVADHVAAVVLFGMPNDGQPPVVIGPTYAAKTIKVCVPED DTADHVAAVATFGNPSDRYPDSA: SPWYGAKA:DDLCADGD SVADHVAAVVLFGTPSNGAPPVRGGPGYASKTLQLCADGD DVADHVAAVALFGKPSNGFPPITVGHRYTAKTVEMCVDGD QVADHVAATALEGTPAAGQTLPMLAPQYTANSIAQCNEGD DIASHVSAVVLFGTPDNWFPPIAAGDLYAGKSLQLCAAGD DVAKHVTAVTLFGKPSNGFPP EVAKWISKVVLFGAP NVDTATAVANYPPDKVWKSCHPAD ADASKISSVLLFGDPTGYAGKAFPNVDASRVHTVCHAGD STMSDLSSIVIFGDPFNGF PIGQADANKVLTICHVAD S DQSNIAAVVAFGNPAAKFSNPLTGSVFGGRADDLCKDD QATDHVAAVVDFGTPKYGAPADTVGPRFADKTLQLCVPGD QLANHVAAVALFGNPSSSYAKPAISGLYRAKTVDLCLPDD QLANHVAAVALFGNPSSSYAKPADSGLYRAKTDDLCLPDD SVASHVSAVALFGTPDRNAPPDTIGDLYAGKTIQLCATGD TAAGWISSVLVFGDPLKGQAVGMKGVSPARVFIACAALD SLMPQIAAVVAFGNPAAKFGNPVTSSDFGGKADDLCTDGD EDLDRVTGVVTFGDP YKDTALPGTLEQRRKTFCRNGD SVQEKVKAVVVFGDPDNGDG FPGVLNSRSTTFCADGD STTSKVAAAVIFGDPNN GDAVQGVSSANTKVICHTGD ADQVAGAVLFGDPFKMQAVGKLP KDKVKEFCALGD DVAEHVAAVVLFGMPNVRAPAVEI GPAYQAKTIKVCVPED PVANHVVAVALFGPPSSPYWGGPLPSSYRPKTVDFCLTGD DVANHVAAVALFGKPNARQPQVNVGPAYAGKTIELCVPDD DEADHVAALALEGNPSARYLGGPVSPWYGAKAIDCAPGD EVSDHVAAVVL LGNPSFGAPIGTVGPRYAPKTHELCAPGD QUADHVAAVVLFGNLRSAYAAPTVGTAYTGKTLDLCLPDD TAQAQVKGVVLYGYTKNAQNDGKIPNYPPEQTKVFCNVDD EVSARIAAVVVFGDP FKGRPFPNDPESNVDTFCFADD



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| UniRe900-G7CE77 | TH CNGVAD |
| Rei90- 7 YZWH2 | AVCNGGGQPSFA |
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| UniRef90-R722 ${ }^{\text {H1 }}$ |  |
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| UniRetoto-G4 |  |
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|  | GAHARYISDGVVQAAD |
| Unineet90-Ali | FAHSQYGANGMDQA |
|  | RAYAGGPTNAA |
| UniRefo-Tollic |  |
| Uniret90-K0UTS7 |  |
| UniReri90-UP1000363CA44 |  |
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| UniRei90 G3JJ\& | IPCGNGRMITLAHTDYNRRSTEGAQFLFDMLDKA |
| Unireet90-G21 | N\|Coge |
|  | AVCGGGNDPVAHVSYAMNGTTQGAD |
| Unir | EAhraycGgatnoansfva |
| Unife |  |
| UniRefere-UP1000477830C | PVCAGGFNVFAHLCTYGFDGTANGASFAVSKVRAL |
|  | gilgr hmorksdgsadatop |
| UniRef90- ${ }^{\text {Hos }}$ | PVCSDGLN FAAHNYADNMIDOGAN |
| Uniret90-UPIooos5 |  |
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| Unireei90-K5k-18 | P |
|  | A ${ }^{\text {A }}$ |
|  | PVCFPGGWDRAAHSSYKSGMNQAADFVVGRLGA |
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| Ref90 ${ }^{\text {a }}$ | AAA |
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| Unireet90-s8 |  |
| UniRe90-M2TON1 |  |
|  | L CERVHTPDPPHEEYHNDA EEAARWVADRV |
| Unifeifo |  |
| Rei90-STZH20 | PVCENGANVMA |
| Unifere90-82h |  |
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|  | Alaall |
| (190 V5XEK |  |
|  |  |
| Unirefer | a VE |
| UniRer90-Fo |  |
| O-UP10093705683 | VPaHKTYAGGPTNEAAGFVAGLL |
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UniRef90_E6TP83 UniRef90-R4UPJO
UniRet90_M3VFSO UniRef90-F5YXS3 UniRef90_G8RR92 UniRef90-POA537
UniRef90-G7CNG6 UniRef90-UPI0003725C4F UniRef90-K1XKS2 UniRef90-H81362 UniRef90-V9FUI6 UniRef90 B 2 HCY 2 UniRef90-17F7S6 UniRef90_UPIO0036244E8 UniRef90-A8NHAO UniRef90-UPIO003749D16 UniRef90-A0A024JZG9 UniRef90-A0A024k 1 J 3 UniRef90-X7V144 UniRef90-X5LDF3 UniRef90-A0A040FOD1 UniRef90-LOJ5U1 UniRef90-K2S780 UniRef90-A0A024JU36 UniRef90-A0QNX2 UniRef90-UPIO00467DB7D UniRef90-UPIO004660A59 UniRef90-T5ABD8 UniRef90-J4KM15 UniRef90_G4ZWV0 UniRef90-A8NBO UniRet90-G2WQ49 UniRef90_W9AWJ5
UniRef90_Q4X078 UniRef90-P63880 UniRef90-14BJT3 UniRef90-C8VJF5 UniRef90—W3X991 UniRef90-A6R4H4 UniRef90_UPIOOO476A191 UniRef90-A4TEI9 UniRef90-J4JVF7
UniRef90-D5P9C9 UniRef90-TOKDZO UniRef90-A0A016P6A8 UniRef90_W2NTY4 UniRef90-17FTE3 UniRef90-10S005 UniRef90_UPIOOO467407B UniRet90-E5XPT8 UniRef90-K2RUAO UniRef90-J1RB07 UniRef90-Q8TGB8 UniRef90-G4HUL5 UniRef90-E3JBB1
UniRef90 LOIXV0 UniRef90_K5B9T1 UniRef90-A0QDC6 UniRef90-DOL5W8 UniRef90-D5PCl4 UniRef90_UPI0002F602A2 UniRef90-I4BL04
UniRef90-14BJAO
UniRef90-UPIO0037BBF16
UniRef90-RoJ2P9
UniRef90-G7GPVo
UniRef90-W9B1J1
UniRef90-14BEZ9
UniRef90_X7SNPO
UniRef90-S4VCH4
UniRef90-A4T482
UniRef90-KOVKS6
UniRef90-K6WTR4
UniRef90_Q2UIH1
UniRef90-A0QKU1
UniRet90-L7KLT4
UniRef90-V5XCU6
UniRef90-UP10003754567
UniRef90-W9AU05
UniRef90-H8IOS3
UniRef90-G4NHM4 UniRef90-X7YKM1
UniRet90 K5BAl3 UniRef90-K5BAl3 UniRef90-E3QQQ8
UniRef90_M7AA33

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KMVNHVAATAVVGNPSRDGPLTKIISPLYGSKA DDDCATGD EVADHVAAVALEGKPSNTAPPDNGGHLYVAKTMDMCVPED TLARNVKAIVLFGAPSDRFDVGAPPAPYRSRTVRFCVPGD EAADHVAA VAVFGNPSNK DGQPTNSPVYGFKTIDGCTDGD AVAGNVAAAALFGGPRSSFADSLSPGLYGKTIDLCVPD AYADNVAAVAVFGNPSNRAGGSSLSPLFGSKALDLCNPTD D AEHVAAVVLFGMPNARAPPVVIGPLYEDKTVKLCAVDD DLASRVAAAAVFGNPSAKFSHPLDSGLFSNRSVDLCLWGD
 SLAPRIKAIVTFGNPLKLYGQTISSPTYGSKAIEFCNDGD EIADHVVAVALFGKPSTRFPPVVVGPDYVTKSVDLCVDND
 FVADHVAAVVLFGKPSSGFPPITVGSRYVSKTLDLGADD ADQARVTGVI TFGDPNRDR ALPGGLENRRKTFCNAGD AVTHHVVAVALFGPPSSPYWGGPLPVLYRPKSDDFCLAGD EVANHVAAVALFGKPSTQQPPVTVGPLYAAKTIELCAPND DQADHVAALALFGNPSDRYRGAPVSPWYGAKAI DLCAPGD GLEDRVVAIVLFGDPKNDRPPGVDANLLLHKVIDVCNPGD EVADHVAAVALFGKPSSGFPPDTVGSRYAAKTDDLCDPED ELAANHVAAVTVFGMPSVAFPPIVIGPGYAEKTVQLCAPGD TTAAKVSSAVIFGDPDNPKPIPGUQNQ ADKAKVICANGD EAADHVAAVALFGNPSGRAGNTALSPDFGGKILNLCNPGD DDADHVAAVVLFGLPNERAPRVVIGPDYETKTRTYCATED EEAEHVAAVAVFGNPTDRYLGGP:IPMYGAKALDLCADGD QVMSKASAVVLFGDP EMR NVSAVVTFGDPMSGKSEAVANVDPSKVKVFCHEGD NLAPRIKAVVTFGNPLKLFGDASSSSTYGPKADEFCNQGD SVQSRINGVITFGDPYVKR A LDPGAMENRRKTFCNDGD GTMAKVSSVVTFGDPRNPAP SVAPHVAAVVLEGTPSRQAPPIEDGGRYQAKTLELCAPGD QGQIAAAVLFGDPFKSQAVGKVGGDKANVKEYCAAGD AVADHVAAVALFGEPSSGFSLPTIGPDYSSKTINLCAPDD GLADQVVGAVTFGDPFKSQKPDNIPRTFGPKFKTFCASGD DVAGKLSSVVLFGDPGN GQTAVPGVGADRVFTACHQGD ATSDHVAAVALFGKPSTRFPPI TIGPDYTAKTIDLCVDND GLNGNVAAVAVFGNPATKFGNPVSAGSFAGKALDLCADGD QAAGHVAAIAVFGNPTSPLANPPIGPPYAAKTIDECADGD EMTAKVAGVVIFGDPLNGQARAVGVDASRTKVICHNGD GTREKIAGTVLFGYTKNLQNRGKIPSYPEDRTKVFCNVGD TLAPRIKAVVTFGNPLKLMGQTSSSSTYGPKALEFCNMGD EVSDHVAAVVLIGKPSDQFPPIVIGPRYVDKTLNLCAPGD SVADHVAAVVLFGMPNDGQPPVVIGPAYQGKTMKVCAPED AVAGHVDAVAVFGNPSNKDGRPALSPLYGSKTDDLCNGAD DVAERIAAVALFGDFVHRFFNGPQPIFLAGKVTDVCADGD DQASKVKAAVTFGDPFKSQ A/LKNVPEGAFKTFCATSD DVASHVAAVVFFGKPSDRFPP VVVGPLFGPKTDDLCAPGD ATTAKIAAAVTFGDPDN GSPVQGVPAAKTKIICHAGD NAPDHIAATAVFGNPTAKVGLPTSSPVYGGRAIDLCNAGD SLAPRVAAVVVFGNPLYGQHIPTASSLYGSKAQEFCAAGD EVSNHIAAVALFGKPSTRFMRATDGPQYVGKTDDGCVDND SOAPHVSAVAVFGNPAAKFGNP TNSWFGGRAMDCKDD DQAEHVSALALFGNPSDRYLGGAPVSPWYGAKAVDLCAPGD AAADHVAAVALFGNPSGRAGGSALTPEFDGKTIDLCNTGD EVADHVAAVVLFGTPNERQPPVVIGPAYASKTIQLCTPED GDEPHIAAI AVFGNPMRTMNNGGPSPVYGSRTI DCCADRD AMVNHVAAIAVFGNPSRDYPGTKDSPLYGDRT DGCATGD TMAPHVAAVVLFGTPSHSAPPLVIGPAYAAKTLQLCNTGD DLAPRVAAVVVFGNPDALTAGTTSSPGYGPKAKEYCNLGD SVADHVAAVILLGAPRWMRDVGTPPDPYRSKTYRYCTPGD QTARHIAAVALFGTPSDGAPPVVIGPLVADKT\|NICLPGD NAPDFVSALAVFGNPSAKLGIDPTASPVWGARSIDLCNAGD SVANHVAAVVLFGTPSNEFLRGADGPLYAPKTVQLCASDD GTMSQVNSAVIFGDPDNGQPPVAGLSAAQTKIICHAGD SVADHVAAVVLFGTPRFGAPEDTIGPLYADKTLKLCAQGD NTPDFVAAI AVFGNPSTKLGLPTVSPVWGPRSLDLCNGAD SLSRNVAAIVFFGAPSDRFPPVRVSTPYRGKTVRYCVAGD DVANRIVGVALFGDATHRVFNGLQPVFLAAKTTNDCADGD ADAl SGAVLFGDPFKTQGVGQLA SNKVKEFCASGD DLASHVAAVATFGDVADRAGGTLPSALLGSKAIDLCNPND SVAPHVAAVALFGTPDNWFPPDTVGPDYTAKTIQLCAPGD QTASRVAATALFGAPRTGFAGPELAPQYVANALQQCAEGD E TANHVAAVALFGKPSARFMRATVGPQYAAKTVDLCVDND QYADNIAAVATFGDVADRAGGTLPSQLLGSKAIDLCNPND NTPEHVAALAVFGNPSAKVGLPTVSPVWGSRSGDLCNPGD LAATKLAGLLTFGDPDAKE GADEHIAAVALFGNGTQWVGPTTFNPIYNDRTIELCHGAD GADEHIAAVALGGNGTQWVGPTTFNPIYNDRTI ELCHGAD D $\$ ADHVAAVVLDGMPSERFPPVRTGPAYADKTLEMCAPDD AVANHVAAVALFGKPSAQFPPVTVGPGYA KTVEDCVPGD $D Q Q A R I S S V V L F G D P \quad$ GGGAAVSGVDETRLLVVCHAGD

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| UniRefero-R4UJJo | S |
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| UniRef90-G8RR92 |  |
| UniRe $90-$ G7CNG | VA S |
| UniRefieo - K1 1KK2 |  |
| UniRef90-H81362 |  |
| Ref90- | PVCAAGFNMMAHLLMGSDAAROAAA |
| Unireeigo- | CICSGPGNDWNGHTOY |
| Unirei90-17F7: | LVCDPKGSSFAVHNQYOEFGVTQAATFVAQKLQA |
| Unireigo-- | PVCSNGGGDNAAHVYYDNGMDAAA |
| UniRei90-UP10003749D16 | YCEESGSVEV HLMYVQDGADEGAF |
| ifeteio-AOA | A |
| Unirete-A | P |
| Refo- 5 |  |
| Uniret90-Ac |  |
| Rei90-K25780 |  |
| Unirereio-AO |  |
| UniRei90-A0 | PVCSDGLN FAVHSSYDGDLTDOGA |
| UniRefi90-UP100046600A59 |  |
| UniRef90 | NLCEGGALVLPPHLTYAEDADAA AAEVVSRLL |
| UniRefo Gollw | P |
|  |  |
|  | PVCSPGSLDRAAHSAYKDNGMDQAADFVVRQLG |
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| Unireferecry | R |
| UniRef90-A6R4 | PICRGGLDVT A LlS YAADA NSAASF LA |
|  |  |
| UniReforo-J4UYF79 | PACSPAGGNLMAHGSYVSGMTAATYVAGRL |
| UniRetap-To |  |
| Refi90 AOAO 16 Cb | $\stackrel{L}{\square}$ |
| Rei90-77TTE3 |  |
| UniRef90-10S005 | P |
| UniRef90-E5XPT8 | PICWNLDGDFNTHVSYVSGTSOAADFVVER N |
|  | NiCDGAGRPNVAHALYPANGMTAA |
| Ret90-0 |  |
|  |  |
| UniRefe90 E3, 3 B81 |  |
|  |  |
| Unire |  |
|  | PICSGGTR WASHLGYVPTLTNQAARFU |
| Unipetio-UP10002F602A2 | PVCSEGMNFAAHAPGAYDSLVDEGAAYAAN |
| UniRefero-licjai | PFCSNG HDLFAHFAYPLNGMNEAGFVARRV |
| UniRef90-L8FEH3 <br> UniRef90-UPIO0037BBF16 | PVCYPGGUDEAAHSAYKNGMDQAGFVVDHLGATS |
| UniRefororojaps |  |
|  |  |
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|  | L1 |
| RRei90-A47482 |  |
| UniRefio-Kovks6 | PVCSGGGNDIAAHSTYSTGFTEQAAAFVAGLV |
| Refi90 D6zA91 | NAN |
| Uniretio-O2UH1H1 |  |
| Unizefori-LTKLT4 | VVCDGAGQPNALHHLYGVNGMNQAAQYAAARL |
|  |  |
| Uniree90-Wo |  |
| Refero-V |  |
| UniRetolo-G4NHM4 | R |
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| Unirerso- ${ }^{\text {UniRei90 }}$ |  |
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UniRef90 C5GBL5
UniRef90_Z5XBZ2
UniRef90_LOJOT7
UniRef90-LOJOT7
UniRef90 A1THB9
UniRef90-COSOD7 UniRef90-R9P014 UniRefefo-L8DCB9 UniRef90-Q9Y7G8 UniRef90-AOROQ0 UniRef90-H3GP95 UniRef90-L7HR54 UniRef90-B2HE68 Uniinefoo-U4LG17 UniRef90-A0AO24KOF2 UniRef90-A1T9Q7 UniRef90-G4HRPO UniRef90-G8RUB3 UniRef90-A0AO 11ADR5 UniRef90-M3UZQ9 UniRef90-UPI00040ED615 UniRef90 W9B0A0 UniRef90-W9CS11 UniRef90-Q0CZ47 UniRef90-KoV9C1 UniRee90-A0A024LX75 UniRef90-UPI000463BD4B UniRef90-Q744K8 UniRef90- D5PH14 UniRef90-FoWQY5 UniRef90-K0V8N7
UniRef90-L7V761
UniRef90-G2YOE1 UniRef90-F7W8D1 UniRef90-UPIO00477FBFC UniRef90_R1FEJ2 UniRef90-G8RR07 UniRef90-UP10003FDD1C5 UniRef90_W9AVG8 UniRef90-C5GOV3 UniRef90-H8IPT1 UniRef90-X5L9U3 UniRef90-S8BQL5 UniRef90-UPIOOO36794F5 UniRef90_UPIO004770D22 UniRef90-U4LUU3 UniRef90-D1AATO UniRef90_KOUR71 UniRef90_LOJ3L6 UniRef90-R4UF19 UniRef90-A0A024GBR2 UniRet90_H6N352 UniRef90-G8RS32 UniRef90-G7CKG0 UniRef90-V5XDE4 4 UniRef90-K0UXP9 UniRef90-D6ZA90
UniRef90 - Iopsk3 UniRef90-UPIO0035C95A9 UniRef90 UPIO0036044A3 UniRef90-MOQMG7 UniRef90 A4TAWO UniRef90-E3QV97 UniRef90-N1J4Y1 UniReffo-DONL95 UniRef90 F1YMA9 UniRet90-A1UNU1 UniRef90-W9ATT9 UniRef90_M4FLG6 UniRef90-W9C9B4 UniRef90_V5XD59 UniRef90_S8A2H8 UniRef90_A1UP17
UniRef90 R4LFY UniRet90_UPI0003AA165C UniRef90 DOL5V9 UniRef90-K1WQ90 UniRet90_G8RNC8 UniRef90 A0A024GNJ1 UniRef90-25XJ31 UniRef90-U4L062 UniRef90-N4VJA6 UniRef90-F5Z026 UniRef90-UPIo0035D368B UniRet90_V5XDQ8 UniRef90-F5Z0A7 UniRef90_UPIo00363D72F

A N A A A Q C TTSSSPNCAEMMVVF ( ARGTSEPGNVGLFSGPF

 A E C S D V H V V V F A R G S G E S A GL Gl C G D P L PSTDAANCPQVEVVFARGRFESPGPGVLGNAF A S C P T T E V L F A R GT F E P Q G D G W I G P F
PSATA EPCPDAQVVF

A S A D P C F A

AGCPDVEV ATAACSDVQVVFARGTAEAPGVGGVGQAF
 DCPDVEVI FARGTSEPPGVGRVGRAM D P
 TANGVTDKDA CQPLTFIFARGTTELGNMGNTVGPA

P EAAAN $C P D V E L V$ ASAADCADVEVVFARGTDEPPGMGRVGBL E ADVAA G C P D V V Q V V F A A R G T G E P P GVVG Wi G Q Q F GADPCPDVEVVFARGSGEPPGIGGIGGQPF

PSA $\square$ A A P A A C
DT QNDVLD SNGSCATMTVLF GFAAANPLQTPRQSS D Q C S A A A C T DVVDVAVA

EAPSTAAPGC
P C
N N A N
A D
AAAD
d
S S T R N D L Q N G
CPDVEVVF

TRSD $\square$ T A GK D D

PEAS A QA C P
Q P C

LTVVK S A P D CP P V A L F F A R G T FE R P G L G QV G D A L
P TA HAERCP DAKVI AARGTVEMPPGVGVGGLS

A DSQP QAHADACPDVEVAF
 (
AAPGCPDVEAIFARGTVEPGPLGLTGAAF

## Q D G L S

 Q S CPDIDVVV$R N D \square L G K K A R D C A S L N V I V A R R G T$
A

GGSTAGRTDAGAAPGCADVHVLFARGTVEAPPLGLTGDAF QPCPDVVEVI FARGTA E P P GVVGGTGQAF
 DTMKDSNDVKT GECKP YTVIVVRGTWDPGNMGIAVGPF SSTYNELLGGACTEYTVIFARGTDDPGNTGIVGPPF QP QP CPD $\square G V V F A R G T A E P P G V G G V G Q R F$ ATRNDLASG ACKPYTLI FARGTLE
A A P $\begin{array}{llll}R & C & P & D \\ G & C & A & D\end{array}$
PSASAA
CADLDVVA
Q N GLLRNTNQTDCP R MQVAFARGTVEPPP GLTGLA Y
P S A S A Q S C P A VEV I FARGRLESP GTGRLGNAF

GSDVRNDV

A T A A A
 $\begin{array}{ll}C & D \\ C & D \\ C & \text { C } \\ \text { C }\end{array}$
$P A C M Q V F A R G T F E P P G V G R V G Q A F$




| UniRef90_C5GBL5 |
| :--- |
| UniRef90_Z5XBZ2 |
| UniRef90_L0J0T7 |
| UniRef90_A1THB9 |
| UniRef90_C0S0D7 |
| UniRef90_R9P014 |
| UniRef90_L8DCB9 |
| UniRef90_G4ZWV7 |
| UniRef90_Q9Y7G8 |
| UniRef90_A0R0Q0 |
| UniRef90_H3GP95 |
| UniRef90_L7HR54 |
| UniRef90_B2HE68 |
| UniRef90_U4LG17 |
| UniRef90_V5X9N8 |
| UniRef90_A0A024K0F2 |
| UniRef90_A1T9Q7 |
| UniRef90_G4HRP0 |
| UniRef90_G8RUB3 |
| UniRef90_A0A011ADR5 |
| UniRef90_M3UZQ9 |
| UniRef90_UPI00040ED615 |
| UniRef90_W9B0A0 |
| UniRef90_W9CS11 |
| UniRef90_Q0CZ47 |
| UniRef90_K0V9C1 |
| UniRef90_A0A024LX75 |
| UniRef90_UPI000463BD4B |
| UniRef90_Q744K8 |
| UniRef90_D5PHI4 |
| UniRef90_F0WQYY5 |
| UniRef90_K0V8N7 |
| UniRef90_L7V761 |
| UniRef90_G2Y0E1 |
| UniRef90_F7W8D1 |
| UniRef90_UPI000477FBFC |
| UniRef90_R1FEJ2 |
| UniRef90_G8RR07 |
| UniRef90_UPI0003FDD1C5 |

 $N H 1 A A T A A A C P S T R F V L G G Y S Q G A A V V D M S A P P L P G$



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 T DMTNHVVSVAKECPDTVFVLGGYSQGASVTEDS DDTMPE AKMANII KTLATTDCPNTGIVISGYSQGAMLMHNAAAQLDP $N D M S G H I Q Y M V N S C P D T R L V L G G Y S G G A A V T D G F E N P L P P$ A DMMRRI TEQAKACPETEFVVTTGYS QGDMVDHGD E L S A A D A R NKVLSTVSSCPDSKVVVGGYSQGAAVAAYLTMPLPR RDAGAHI ESMAASCPTTKMVLGGFSQGAAVMGFVTKPLAP
 RDA GTHI EATAANCPDTQUVLGGFSQGAALAGYVTNPMPS

 DDASNKVRATAAACPNTKVVLGGFSQGAAVAAYITGPMPA KT LAASLTN QASTKCPSAKLVLGGYSQQAQLVHNAAKT LSA P QMA QLVQQQALLKQCANTKVVLGGYSQGAMVVHNAASKLS S NDAAGHIA WLAD QCPGT QVVLGGFSQGAAAVSMSAPPDPP K D A $\square$ S HI K S TLLS S C P D T QIV L G G Y S Q G A S VI N VVA G N L P P
 RDAGAHVVSMAQQCPNTKMVLGGYSQGAAVMGFVTKPLDP R
 TDASTHVES MAASCPNTKLVLGGYSQGAMVIDDIT QTDSA K T 1
A AVVK AVT S L N QR C NDAAAHI A WMGEQCPGTQQVLGGYS
 NEASAFVQNTVATCPDTQUVLGGYSOGANVVDNDATAPA
 QARI A TLAA QCPSTKIVLGGYS Q GAAAVVDMSAPPDLPG T NMKKMITTEYATRCPQSKLVLMGFSQGAQVI GDTLCPIAP
 RDAGAHVTSMAATCPDTKMVLGGYSQGAAVMGFTTKPLAP RDMAA L A A GACSTTK II LAAGYSQGAQLVHNADALMS Q
 GHVQWMDDNCPNTRLVLGGYSQGAAVIDDGFNAPLPP DSMATEI QRAARQCPNGKIVISGYSQGAQVAHKGAAKVPS Q DLVR HVVTQQARECPNQKFVLVGYSQGASVVNGAATEELPR RDAANRVQTMSDDCPNTRLVL GGYSQGAVVSGFATKPLPP RDAGTHVQATAANCPNTRIIIAGYSQGAVVAGYVTNPMPP D DLLRNHLSEVASSCPNTKFVI GGYSMGATVVDDVAGNPPP
 NDARAQI LATAASCPDTKMVLGGFSQGAAVMGNVPTPMPD ADAGARI RATAANCPNTRFILGGYS
 $N D L S Q H V Q N V A R S C P S T K V V L G G F S Q G A G V V D L V T Q P L P T$ NDLS NH L Q SVAAASCPRTKKVIGGGYSMGAEVIPDGFNRPLPP $N R I$ ES I A A S CPATKIVI GGYSQGAAVAGYSTMPMPA

 QTMAT LTEQAITKCPNSSII MSGYSQGGQLVHNAAAMMSQ TKMARLVTQUIENCPDSYLLLSGYSQGAQLVHRAVEMLEP
 KSAQRRVESDATTCPRTRLVVGGYSQGAQYSSYVPDPDPA RDATNRVQVMSVICPNTRLVLGGFSQGAMVSGLVTGDAVP GHIA WMAD QCPGTRIVLGGFSQGASAVSMSAPADDP QTMANLVLQAKQQCPHTKI I LSGYS SELTTK WI KK A CGCSK TKLII S GYS Q GA QIV HRADD KL P Q
 RAMAALVNRA CAKTKDILGGYS $T A L T G D V R A T A A T C A G T R F V L M G Y S$ LDVVNHLNAQAAACPNQRFILVGYSQGADVVGDAVVTLPA A N V D $\ \vee A$
 NDMS GHI QYMMNTCPDTRLVLGGYS LGAAVTDVVLAPPLPP ADAVRHIQSRAVQCPYTMFALGGYSQGAMVIDHGMMLDP T D GWVHVENLVAAACPATHVVLSGYSQGADVIDDGTPTPMPD NSMASSLTAKAVS QCPNSKII WGGYS QGAQVTHKAAAARDST $L V N H V R S Q A A A C P N Q K F V L V G Y S Q G A N V V D N I V A Q L P A$ TSASKQVRQYMDKCPRSAVVMAGYSQGAAMLSRLLSAREP S D A TARI QATVANCPNTKLVLGGYSQGASVIGEMSSNSEPP NKVRRDTATACPNTKVVLGGYSQGAAVAAYDTEPMPA

UniRef90 C5GBL5 UniRef90-Z5XBZ2
UniRef90-L0J0T7 UniRef90_LOJOT7
UniRef90 A1THB9 UniRef90_C0S0D7 UniRef90_R9P014
UniRef90_L8DCB9 UniRef90_G4ZWV7 UniRef90_Q9Y7G8 UniRef90-A0R0Q0 UniRef90_H3GP95
UniRef90_L7HR54 UniRef90_B2HE68 UniRef90-U4LG17 UniRef90_V5X9N8 UniRef90_A0A024K0F2 UniRef90_A1T9Q7 UniRef90-G4HRP0 UniRef90_G8RUB3
UniRef90_A0A011ADR5 UniRef90-M3UZQ9 UniRef90-UPIO0040ED615 UniRef90-W9B0A0 UniRef90 W9CS11 UniRefefo-oOCZ47 UniRef90-A0A024LX75 UniRef90-UP1000463BD4B UniRef90-Q744K8 UniRef90-D5PH14 UniRef90-FOWQY5 UniRef90-K0V8N7 UniRef90-L7V761 UniRef90-G2YOE1 UniRef90-F7W8D1 UniRef90-UP1000477FBFC UniRet90-G8RR07 UniRef90-UPI0003FDD1C5 UniRet90_W9AVG8 UniRef90-C5GOV3 UniRef90-H8IPT1
UniRet90 UniRef90-T2GW00
UniRef90-X5L9U3 UniRef90-S8BQL5 UniRef90-UPIOOO36794F5 UniRef90-UPIO004770D22 UniRef90-U4LUU3 UniRef90-D1AAT0 UniRef90-K0UR71 UniRef90-LOJ3L6 UniRef90-R4UF19 UniRef90-A0A024GBR2 UniRef90-H6N352 UniRef90-G8RS32 UniRef90_G7CKG0 UniRef90-V5XDE4 UniRef90-D6ZA90 UniRef90-10P5K3 UniRef90-UPI00035C95A9 UniRef90_UPIO0036044A3 UniRef90-M0QMG7 UniRef90-A4TAWO UniRef90-E3QV97 UniRef90 N1J4Y1 UniRef90-DONL95
UniRef90 AOPMC2 UniRef90-F1YMA9 UniRef90-A1UNU1
UniRef90_W9ATT9 UniRef90-M4FLG6 UniRef90-S8BTZO UniRef90-W9C9B4 UniReffo-V5XD59 UniRef90_A1UP17 UniRef90-B4LFY5 UniRef90-UP10003AA165C UniRef90 DOLL5V9 UniRef90-K1WQ90
UniRef90 G8RNC8 UniRef90-A0A024GNJ1 UniRef90-Z5XJ31 UniRefofo U4L062 UniRef90-N4VJA6 UniRet90-F5Z026 UniRef90-UPIO0035D368B UniRef90-V5XDQ8
UniRef90-F5Z0A7
UniRef90_UPI000363D72F

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 A GQVARAVLFGDPDQS DP LRSI $\square E$ E K DVMSICARGD ANNVVGAVTFGDPYKMMPVPTTPNW K TVGCHMGD A IA SRVVEAVVVFGNP LGLFGRKTASSTYGSRATSFCNFGD SLAPRIVAVVTFGNPLKGQT DASASPTYGSKADEFCNRGD A T M A K I S S L V V I F G D P N ATASSHVAAVVLFGTPKRNAPPDT GQSYVPKTMQLCATGD
 ETASHVVAAVSFGDPFRRRMPVNGDDQSRTLVVCHAGD
 DLK Q WV KAVVSF GDPCKWRA GYTWP DDSVNVWDKCVE D
 EI AD HVAAVVLFGTPNTRQPQLVI GPAYQAKTMKVCANED



 QYAD QVVAVTTFGNPADRTGGPISSADFGSKALDLCNPGBD EVAD HV AAVALFGKPSSGFPP\|TVGSRYVGKTDDLCIPED AVVSAKI A A V I V F G D P D N G Q A V G S V P G G T Q V S G A V L F G D P F R S Q EGTDRVAAVAVFGNPGNRFGTPLSGGQFAGRAIDLCSPGD
 EAADHVAAVALLGRPSEAFPPVTVGPGYAAKTIDLCADGAD EVAKHVAAVTLFGTPSGQFPPLAI GPLYQPKTLQLCAVGD SVA Q HV S S V VLF GMPNVRAPPVVIGPTFADKTIKVCATED TLK S K V DGI A VVG G D Y R S T A A Q WP V D S R S K VV A Y C A L G D EVAD HV A AVALGGKPSPRFMRVLVGPYYAAKAIDLCVDND EVAD HVAAVAVFGNPTDRYLGGPISPWYGHKAIDLCAPND TTTSRVRSVVMFGDPKN GTALAGDDSSKVMTICDPKD
 ASAD EI R A VAVF GNPGQRFGTPDSSGGFA GRADDQCSPGPD $D L A P R I A A I V L F G N P D R A D G R$ SVVGTYQSRTKDYCADGD
 ETASHI A A V I QFAPPPRFLRDVGAPPDRPSKK IARYCDVGD

 GLASKI A AVAVFGNPGNRFNTPSTTGAFAGRAI DLCSDGD DVAEHVAAVVLYAPPNVRAPPIVIGPEYEAKTLKVCAPED ATANKI GAVVMFGDPDNGDALGK GLDA KSKTFCNSGD EYNKNIAAVATFGNQADRTDGAPPTSPDSPKADDLCNPA D NAPDHI A A V AVVFGNPSAKLGLPTASPDVYGARAIDDLCNPD D

 EVANHVAAVVLFGKPSAQWPPVVIGPLYVPKTLDLCADGD DVA GRI R Gl ATFGNDDRR G G GMTGPLA GRWI DQCNPGR DLAAS S I DA IVVVFGDPYRHLLPSKWPDDASQKDVICDCRRGD NAASHVTAAILFAPPSSGAPPMNVGPLYEGKTKRYCIAGD $D V A D N V A A V A L F G K P S A R F M R A I I G P K Y V D K A V E L C V D D D$



 SVASHVAAVVLFGTPSRTAPADNIGSAYAGKTIQLCAPGB QYAANVAAVATFGDTRTGEALSAKSTLLSSKAIDLCNPND DLS R R I A A V VLLFAPP S D R F P A L R V S P KVA N R T V R Y C DP G D GVAD NVAAVVLIFGTPKYGAADIDVGPAYASKALEFAAPGD


 QAA Q HVAAVTLFGNPSGRAGGTALSPHFGGK』LNLCNTGD GVAPHIAAVVEFAPPSARFPP\|QPQPVYAGRTVKYCIQGD DVADNVAAVVLLGKPSGPFPPVVTGPLYAARTIELCAAGAD GLA GNVAAVAVVGNPGARFGTPSSS GQFAGRTIDLDCAGD QM $\square S A V V A A V T F G D P Y N P \quad A P V P G L P S S D T L D F C H N G D$ EMADRVNAIVTFGDPEQRHNFGK GLDA KAKRICYDSD
 $D V I D N V A A V V L F G M P K Y G T P V I D V G P A Y T A K A L E L C A P G B$ AEAKKI DAVVMFGDPKNGKALGK GVGPRSRTFCNAAD $A V V P R I A A V T V F G N A R V G Q P L T R L S P V F G S R T A D L C N T N D$

 SVT R HI A AIVLFGAPSDRFPPDRVGAPYAGRTVKYCDPTD


 SLIHSKI YA A AL F GDPND GQ A AFPGALNGKVRTWCHSND AVEPKVAAVLLFGNPDRADGK SVVGTYQSRTLDDCAKGD A YRNRVVAAVTFGNTMQRYNHNNIPEFPAESVKMFCNDFD AVA QRVAAVALFGPPSSPYWGGPLPVLYQPMTITFCDAGD SVASHVAAVALLGKPSSGFPPDQVGAQYAPKTLDLCIPED


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| :---: | :---: |
| UniRef90_C5GBL5 |  |
| UniRef90 $\mathrm{z5X}$ | ${ }_{P} \mathrm{P}^{1}$ |
| UniRef90-A1THB9 | PVCSPTGRDNAAHGGYATGMTDRAAE |
| UniRef90-COSOD7 | PICRGGDDIPAHLSYTENA NKAAA |
| UniRef90-R9P014 | PVCENGMNVMAHLT |
| UniRef90-L8DCB9 | PVCQ\GGFSTFAH |
| UniRef90-G4ZWV7 | PVCAAGFNMAAHLMYVTDGVTTAAQKAAALVKGGR |
| Ref90_Q9Y7G8 |  |
| AOR | PVCFPGGLDRAAHSSYKSNGMAQAADFAARQVTGGS |
|  | N |
|  |  |
|  | PICSPADPNTPQHLAY ${ }^{\text {CODGMNEAADFVAGKL }}$ |
| UniRef90-U4LG17 | PVCTGGTGSTLNHLSYMAN TDEAVDFVRARV |
| UniRef90 V5X9N8 | PVCSPSGRDQGAHGAYAVRGTGQAADYVVAKLGS |
| UniRef90-A1T907 | CSPGFN LPAHFAYVDNGMEEAANFAAGRL |
| UniRet90-G4HRPO | PTCAGPGNEWAGHTQYVPGYTDQAAAFVAAKLDA |
| UniRef90-G88 | NICNGAPAGPPAHAMYGV |
| AOAO | PVCGNGANAAAHDRYAF |
| UniRef90-M3UZQ9 | N1 CDGGPISSRPVHGQYAVNGMTDAANFVARR |
| UniRei90-W9B0A0 | PVCSPSGHDQGAHNAYVSNGTDQAADYVVARLGGQR |
| W9 |  |
| UniRet90_CoCz |  |
| Ref90 | PI CVQGGRLRAAHSAYEPPYPD |
| UniRef90_AOAO | PI CEGQGNEWSGHTGYVPVYTTQAAAFAASKLLAGSG |
| UniRef90 OP744 | PICGGGGDDLAAHAYAPVNGTAQAADYVVESHLL |
| UniRef90-D5P | CSDGMN FAAHNTYADD |
| UniRef90-FowQY5 | GADI AAHDTY TR |
| UniRef90-K0V8N7 | CDPQGRSFGVHTEYAGTGVNQGAA |
| UniRef90-L7V761 UniRef90 G2YOE1 | PUCTPGALLALPAHLSYAQSGMSQAAT |
| UniR | PYCCNG NDANSHQQYVNKYGTQALAFVKKLVD |
| UniRef90-UPIO00477FBFC | VQRGRDRAAHSNYEPPYSDRAANFVASRL |
| UniRef90-R1FE | GLNULAHLSYGNQAGD AA |
| UniRef90-G8RR07 | PVCSNG NDRPAHSQYVEAGTTQAAQFV |
| UniRef90 UPI0003FDD UR R9AVG8 |  |
| UniRef90-C5 | VYCDAGT DGKVHSSYFAKYGADAAAFVVSKVKS |
| UniRef90-H8IP7 | PVCVVGGRDRDAHHDYAPPYPGQAASFIAGLV |
| UniRef90-X5L9U | AVCSDGLN FAVHNTYAYDGDTQGVDFAANHLG |
| UniRef90_S8BQL5 |  |
| iiRet90-UP1000367 | A |
|  | G |
|  | CLGAGPNPI AAHLAYGADAAAAAQWEANLI |
| UniRef90-K0UR71 | SVCDGPGAANFAHALYPVNGTNEGAAYAVGRL |
| UniRef90-L0J3L6 | T C CNGAGGPTVAHAMYPMNGMNQGAAFAAGRL |
| UniRefo-A0A024GBR? | PVCQNGLTDWRAHLEYEADAPACAASF |
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| UniRef90-G7CK | P CSNGRNPF AHTNYETSHDETAADFAAGLI |
| UniRef90-K0U: | SGAPGSPAAHQQYANNGMDQAATFAVGMLA |
| UniRet90-D6ZA90 | DDLSNHDSYDDRGTDKAADFVVQHLG |
|  | AGPNSWDAHTSYERTGPA |
| UniRe990-UPIO0035C95A9 | P1 C GGGLLDRSAHSAYFNGMANQAADFV |
| UniRef90-UPIO0036044A3 | P:CAGPGNDWSGHTGYDPVYTTQAAAFVASKLLAGSG |
| UniRet90-A4TA | AVCSGTTQDHGPHQQYGVNGMADAATFAMGRLLEELK |
| UniRef90-E3QV97 | N1 CEGGSQRRAHLTYGDN |
| UniRef90-N1J4 | D |
| Ret90_DONL95 |  |
| UniRet90-AOPMC2 | CSDGDQ WKAHTGYVPGLTNKAASFVAGRT |
| UniRef90-F1YMA9 | TICNGAGGPNALLHLLYSVNGMDQAADYVARHL |
| UniRef90-W9ATT9 | PICSAGARDRAAHSNYAPPYPGQAAGFVAARV |
| UniRef90-M4FLG6 | DI CKGGEQLFDPHFTYNRDA |
| UniRef90-S8BTZ0 | LI CKEIAVPVGAHWIYELK TKEAAEFVAGKV |
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| UniRef90 S8A2H8 UniRef90-A1UP17 | VICKGRFQITAAHKTYAND |
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| UniRef90-UP10003AA165C | P CoNGG |
| UniRef90_DoL5V9 | GAGGPNASHVLYTVNGMADAAR |
| UniRef90-K1W@90 | DICKGGAKVTADHLSYSKDASA AAMWAMGS |
| UniRef90-G8RNC8 | P CNPADDNWPAHLAGAAGMANQAADFVAARI |
| UniRet90-A0A02 | PICCNSGADLL AHMRYVSSGVKQAAQFAVSRLTSAAG |
| UniRef90-U4L062 | PICDG\PLPIDGHL |
| UniRet90-D9XEQ8 | PVCESGGGDVGAHLSY |
| UniRef90 N4VJA6 UniRef90 F57026 | PVCKIGGALMPDHRDYRPSAKPAAEFMLQR |
| UniRef90-UPIOOO35D368B | NDNGA HNMYAD |
| UniRef90-V5XDQ8 | AVCSDGLDP VA HQTY |
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UniRef90_G7CKF9 Uninefolo-M4B7G2 UniRef90-U4KUG4
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UniRef90-L7LCB6
UniRef90-U4LUL5
UniRef90-LTEUU1
UniRef90-M3в2S3
UniRef90-X5KVE7

| UniRef90- -77 LP 61 |
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| UniRet90 |
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UniRef90 M4FMM1

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DASVG70
YPADVPGFLI
YPASDQW
YPASVAG
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Y
GGSPSGS ${ }^{80}$
GGSKAGS
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YPADYEIT
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PYPATVAGYKA

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SAGGA
TSGA
GGSPEGS
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G SRTSSPRARRGAPS VS SLQAQLVGRSVAGHGTRYAASGDYARPLNYVRSVRAGV VDALTARLPGKSVDVYAVN YPASLDF
 FTALQADMGNNIAVQGVNSYPADVAGFDA GGSNTGA YSALQRKLTGKSLSSYKVN YPADLSLTSAAQGNSD CSGLKRHPGSANAAGQGIGGPYDATLAGNFDPRGTSSDT覆 GNAVRNRLPGKSVRIEAVDYAASGNFTDRLAFARTFVDGV


 LVAALGMAVGNNMAVQGVP YPANMAPGFLAGGDAAGS
$\stackrel{\rightharpoonup}{T}$
 VDSLRPMLKGKTITTYAV KKYPASWDFMKAAVG VDGGA ASYLRWTLTPEK AV QGMEYPAKLSDNDCLSVDLCHPKELV AQD GQA GTQNLAVQGVN YAADVGG FTAETGGAGT
 1 GDATSVQGQDPGSDAEAVDYPAEDNPASSYNPSEEAGV VDALRPQLGGRTLGVYGVN YPASYDFVLATDGAADA ADAMRPILGGRTLSTYGVN YPATYDFLTTAAGAADATA
 QTNTQSALGADQVTVEGV SYPADMGGTMSESTGSGPGS VDAVRAQAAPRSVDVYPVNYPASADFNNRIQFAQTVIDGU FKAl RSA LGANRVMVQGVDYPASAAGN $\square N Q G A D G G$
FKAIRSKLGADRVTVQGVD YPASAAGNVNLGG DGG VNMVAQAYPGATREAIVYPACGGQSQCGGVSYENSARQGT

 VSSLRQQ TNKSWGTYGVNYPANGDFLAAADGANDAS
 AAACDNRLAGKSVRTSAVRYPASGNFNNRVAFVQNVVTGIB


 VDALRAKTP FNSLADRDGLENLAVQGVTYKARADRRYUFKGGCNEGS
 AA RSK KGNKN GVYAVQYPAD SAMRWRVGGRPVGVGVYYPVNFPSVSEGPTVAAGV
 YAAVTAAVP RRANVGAYAVRYPADLLDPASLSRGTSDLV
 VSNVSAQLPG VNTLKPMKGLSTGTYAVEYPASASFDFSSDAPAGTVIDGA $V Q E S K R H P S S T V E$ VRDDPAGMED YDVSVTAGT ASDLGQALGAGNVAVQGVAYYGADVGGDFTEAPTGGAGT
 NLILNAYPGSTSEADNYPACGGQSSCGGVSYANSVVAGI VAGVRNADPG VNVTGSAVDYAANVSQSSAGPG VEAVRSQLPGRSVAAYGVNYPASSNFGNRLAFAQTVVNGA
FKARAKLGNDRVTVQGVDYAASAAGNDNDGGDGG

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## UniRef90 K1Y229 UniRef90_QOUXX8 UniRef90_IOS3NO UniRef90-G3JJS8 UniRef90-14BCV3 UniRef90 G7CKF9 UniRef90-M4B7G2 UniRef90-U4KUG4 UniRet90 H1VCZ3 UniRef90_H1VCZ3 UniRef90-Q2GRL9 UniRef90-G7GUG9 UniRef9O-UPIOOO361E1BD UniRef90-U3NZK6

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UniRef90 V5 V
V8L8
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UniRef9O_M4FMM1
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$N D M S R R I Q H M A A T C D T R L V L G G Y S L G A A V T D V V L S P L P A ~$ SDMSNHVMQMAQHCPNTVFVEGGYSQGASVTDIVATVVIPE
EAMAQLIERADTQCPESEMILSCWSQGCQVLHNAVNLTSP L TKPSACSRWPTPSVPNAAVVAGGYSQGTAVMSNSLSELSG LGTQARDISTDKRCPNTQIVLGGFSQGAAVVGYADKPLPV ADASNKIQSDAASCPATRIVLGGYSQGAAVAAYTTSPMPP
 KFMADIVQQAVTSCNSTKIVMAGYSQGAQVVHKAAAQLST LVNHVRSQATSCPNQRFVLVGYSQGANVVDNSVNHVRS GEGSRLLKLANSKCPDTQVVLGGYSQGAAVVAGGYSDLS KTAQRRVKS TAAACPDTRIVIGGYSQGGALAGYADEPLPA QAMVADVQKADSKCPDTQLILSGYSQGAMLVHNTMNKLSA NHAQFMATNCPDTKLVLGGFSQGAAVVDDMATPIPP NDMSAHTQSMANSCPNTRLVPGGYSLGAAVTDGFTNPLPP NDMSRHVQYMDNACPATRLVLGGYSLGAAVTDVVLSPLPP
NDMSNRIKYMMDNCPNTRLVIGGYSLGAATAFGFKNPLPA AYMASTTSRCPSTKFVLGGYSKGAMVVHSПK KTMAQMIJSTAVTNCPNSKDVMSGYSQGGQLVHNAAKMLPA RTMAQLTARAVTQCPNTKIVLSGYSQGAQVVHNAAGQLTA AALKTHLTNQANRCPNQKIVLIGYSQGAHIIGTRTPAIDS ADLVAHMASRVAACPAQRFVLAGYSQGAAVVHTALVRLSG TDMSNRAQNTASRCPKTQIVLGGYSQGAAVVDVVATPLPA NRDAThAEQCPSTRVVLGGYSQGAAVVDMSAPPLPS NDMSKRVQTIVAQCPDTKIVLGGYSQGAAVVDGYTAPLPA NDMSQHI QYMMDSCPNTRLVLGGYSLGAAVADGFKSPLPA AGASDLVRVYMNKCPGSTVVMAGYSQGGGMLDRVIDEQLES QAMLSVAQQA SKGPDTKLGGYSQGAMLVHNTASRMG KAMTSQASEWLSKCPETKLVLTGYSQGAMVVHNAAKMLN HDQRMAVNCPNTKLVLGGYSQGAAVIDIVTRPLPP TAMSAHVREVAAACPSTRFVLGGYSQGATVTDIALTPVPA KAMTKLVQDYAARCPDTKMVLMGYSQGAQVTGDVMCPQSA VNFIGNTARSCPDTRVVLGGFSQGAAVVDMLAPRD
$\qquad$
RIASVSSQCP
NDGSEHVONIARTCPNTKLVGGF VAMANQANSWLQKCPSTKLILTGYSQGGMVVHNAAKKLSG RVAYLLDACPNTRVVLGGYSQGAAIVNMSAPPLAS RDAADKIEATAATCPDTQIVLGGYSQGAAVAHYIPDPMPT $K D M A S V Q T A L S Q C P D T K I I V S G Y S Q G S M V V H N A F G N G L S$ EKMAALVKQAKSLCPNTKVIVSGYSQGAMVVHNAFSKGLS AAVVRAVTTLNQRCPDTKIVLIGYSQGGQIMDGALCGLTG RMTVEYITAQAARCPSQRFALGGYSKGAMVLHS MSLSS LVNHVRSQAASCPNQRFLVGYSQGANVVDNSDGISSA NDISQRI DYNTNNCPNTRLVLGGYSLGAAATDMVLTLLPP FI DNLSRNCPNSRVVLGGFSQGAAVVDMLAQPLPA DHIQQMASACRATRLVLGGYSQGAAVIDGFTQPLPP NDMSAHVQQMARSCPSTREVLGGYSLGAASADGFTNPLPP RDESYVESVDKRCPNQPFILIGYSQGAMGVVRSDMRDE RNAQAQLLSTIRRCPGTDIVLGGYSQGAAVVAQAPDPLPS A ADASNKITATAAQCPDTDVVIGGYSQGAAVAAYDTEDDIPP NDMSNRI QHMMNTCPDTRLVLGGYSLGAAVTDVVLAPLPA KMMAQMISTAVTNCPDSKVVMSGYSQGGQLVHNAAKMLPA NDDSSRI QDMAGRCPDTRLVIGGYSLGAASAWGFNRPLPP KTMARLINQAASQCPDTKIVIAGYSQGAQLLHKAAKNVTA RDDGAHVRSMASSCPNTRIVIGGYSLGATAADLFANSLPA NDMSARVQYMASSCPDTRLVLGGYSLGAAVTDVVLNPLPP NDMSAHI QSMMNNCPDTRLVLGGYSLGAAVTDVVLNPLPD ADAAGHISDMVAGCPDTTLVLGGYSRGAAAADGFPPPLPP RDAGAHVVSRATNCPNTKMVLGGYSQGAAVMGFVTKPLDP KA $\square$ AQAVSSFNSKCPDTKFVLMGYSQGGHVIDNALCGIPA DHLVERSAQCPGQRYIVSGYSQGALVVHGALRQLPP RNAAVQI RDMVKKCPDVKLVLAGYSQGAAVIHEDELD NDMSQRI QYMAGNCPDTRLVLGGYSLGAAAAFGFKSPLPD QDVVRLLSSSSACPNQTFSLVGYSQGASVMHRAAAQLPT RDASSHIESMAAKCPATREVLGGYSQGAAVAGYVTKPMAP QAVKKQITSYVERCPKSQVVLLGFSQGAHITGDALCPLSH AAMFAAAQQVLSSCPDTKLVLSGYSQGAMLVHNTATRLGA KAMAAWVAKACGSTKIILGGYSQGAQLTHGAVRLMSA KSAQTRПKQLAAACPSTDIVVGGYSQGAAYQRYTPKPLPA NAVVSAVNSFNQRCPNTQLVLVGYSQGGQIMDNALCPLSS TEMTRHIVSVAAQCPDTKFAI GGYSQGASVTDDAI ESIPE DDTQGRIKFVAATCPRTRIVLGGYSQGAVVAGYALAPRYA
QALVKHVTKQARACPKGFVVVGYSQGAMVVGALGKLPK QKMADLVQLAKKQCPSTKDIVSGYSQGAMVVHNAFSKGVS

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UniRef90 V5 V
URE8
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UniRef90_V9YOL4 UniRef90-K6VVS4 UniRef90-D1AAT5 UniRef90 E3RS45


150 QDAAFVNSAVIFGDPNNGKPVGKVA SSKVLevchVad QDAAFVNSAV FGDPNNGKPVGKVA ABADTMVVCHAGD EVADHVAAVVLFGTPNARAPTVVIGPAYRAKTIKVCAPED DVAD SPLYGAKTIDLCNGAD GVDRHIAAI ALFGNGMAWAGPASFSPLYAERTIELCHGGAD YLAPRUKALVTFGNPLRLTGUASASALYGSKAIEFCNFGD PRTR PRSTRTKSLTFGDPRHLDTVVIGGADKTKDTCHEND
 AVQDQVKGVVLFGYTKNLQNVGR\|PNYPRDRTEVYGNVGD SISDHIAAIVFFSPPSDNWDUGAPP RYYGKSMRYCLPLD AVAPHVAAVALFGTPDHDAPP $\square$ A $\square \mathrm{G} \square Y S A K T D Q \square C A T G D$ KALEAVKAAIFMGDPHNAQGFAARPRGFQCK IQSYCDSTD DVSRRVAGVVTFGAPGDRWPPMRTGAAYRHKTRKYCDRGD TAQSKVMAIVTFGDPDNGQ AFPGVLNGREKSICRNGD QATGRVAAVLLFGNPDRALGK SVTGTYQSRTDDFCAKGD AAADQVAGAVLYGYTRKAQNDGR\|PNYPAERTKVFCAVGD SVVPRIASVVVFGNPSARQPLTRMSPVFGSRTADLCNTND AVAPHIAAVVEFAPPSARFPPVQPQAVYRNRTVEYCDQGD $D Q A G K V K A A V T F G D P F K S Q$ A AAADRVAAVAVFGNPRVMGPLNVLSPGFGARTTDLCNAND GSDEHIAAVALFGNGS QWVGPITNFYNDRTIELCHGDD GADEHIAAVALFGNGS QWVGPUTNFYNDRTIELCHGSD GADQHIAAVALFGNGAAWVGPITFSPVYNDRTIELCHGAD ATMAQVSSVVDFGDPDNGAAVAG ASAANTKVICHTGD AQTNRVTAVLTFGDPKRNQPFGTDP ASASRTRVICRTGD
STANRVVAVAKFGDPRHARDGMFPRTFRSRVKSWCDFND STANRVVAVAKFGDPRHARRDGMFPRTFRSRVKSWCDFND DLGDRVVAVLLFGDPMRLGGWSVPGPYLGRTGNWCAPGD AVVPRIASIVVFGNPRLGQPLTRMSPDFGARTADDCNTND NLMNNVAAVAVFGNPSAKFGUPVTSRFGGRADDACSDGD AAVPHITSIVVFGNPSARDGNPRMSTDFGARTADLCAPAD GAADHIAAIALFGN GAAWVGPISNFYRDRTIELCHGAD QYKDRIVAAVTFGNDVQADDHDRVPNFVEDKAALFCNSGD DAASKVVA AVTFGDP GKDVLAAVTFGDPFKS FKSVALKGlPAEKFKTFCATAD AAADHVAAVALFGNPSGRAGNSALSPNFEGKTIDLCNPGD ELAGRVAAVVVFGNPLGLSGRATASSTYGPKSKDYCNSSD EVAAKVAAILLMGDPSHSHNNGRFPNAVADKMVSFCNTGD DVAGNVAAVAVFGNPATKFGNPTSAPLFAGRAIDGCRDGD SYVSDVAAVTVFGNPATKFGNPVNAGLFAGRGDDLCSDGD
 NLAGNVAAVAAFGNAKFGYPVSAAGPPFSGRG\|DLCADGD EMADHVAAVVLFGKPRWLQDVGAPPPAYADKTLDLCADGD T

SKVAGAVLF

## GDP LKRSPVGDMP

ANKVKDLCADGD
 APLAAVKAAIFMGDPMRARGFAGRPNGFQCSIQSYCDSTD ALKAKVTA VVFGDPYRG円NNNWPTSSPSQNVASFCNDGD GAVPRVSSVLLFGNPDRADGK SVTGVYQSRTLDFCATGD GADSHIAAVALFGNGGQWLGPITNFYRDRTIELCHGAD GLAQKVAAVTAFGNPAAKFGKPTSSPMFAGRAIDLCTNGD AADDHIAAMALFGNPSGRAGGSALTPQFGSKTINLCNNGD ALDQQVAAVALFGNGTRGDPVPDFSPAFAGKTVDVCAKGD $M$ QDKNVVAVVMYGNPYRTPGDVRLPERYQFVTLDICLLGD AGVARGAAVVLFGTPKYGAAGIDVGAAYVSKALELCAPGD EVARHGSAVVLFGPPRWLRDIGAPPGAYRGKTARYCNGGD RLADRVAAVVVFGNPLGLQRRAGSSAVFGPKAKEFCNTGD D ASKVAAVVAFGDPLRSQ AFAGVDASKVKNFCGSAD SVANHVAAVALRGKPSSGFPPTTVGSRYVDKTLDGCDPTD GADQHIAAVALFGNGS QWVGPITNFYNDRTIELCHGAD GADRHIAAVTLFGNGDAWVGPISNFYAERTIELCHGDD ATMAKVSAVVIFGDPNN GSPVAGASAAKTKVICHTGD GMDSHVAAVALFGNVTHRMGGSNISPAYGDRTDDQCNGAD GVTQHIAAAVTLGYPEKPMGKITA ASRSLSVCRPGD DINQHVAAIALFGNGGKRLG PPAPAYAGRMIDQCADGD GLDQKVAAVALFGN GGAWVGPDSNFYKERTVEDCHGDD
 GADTHAAAVALGGNGSAAWVGPITNFYSERTVELCHGAD DVADHVAAVVLFAMPNERAPTIAGGPGYQAKTLQVCAVED SVAEKIMAVTFMGNPRFQVGLPGFTCTYADKDQSYCDIGD VLAPRVAAVLLFGDPLRLNAWSWADMYAGRTRSYCAPGD DLASSIDAIIVFGDPYRLSLPPKWPDGASRGVICDCRSGD GVDRHI AAVALFGNGS QWVGPIANFLRDRIIELCHGDD SLFPKIKSVVMFGDPNLRDGGDEFPEGLQAKVLQVCAKGD AVVPHVAAVVVFGNPRLGQPLTRMSPDFGAKTADLCNKAD DI ADYVAAVTLFGTPSYGAPPDTDGPDYQPRTDELCASGD DISSHISAVVWYGDPRHREGANQSCDKYSDILASYCDDGD AGKVAVWYGDPRHREGA DAKKIDATVTFGDPKKGKAYKKLQG APAEKKKTFCATGD SDAPHVKAVVLFGPPSDRFLRDAVGRAYRAKTKTYCHAGD SAVINMIKAAI FMGDPRYVAGDPRPPGFSASK\|QSYCDAAD SLAPRIVGVVTFGNPLGLSRRTSASPDYGPKALEACNRGD QYASRVPAPLTPASARWLRD $\ G R \| G V P F A D R T V R Y C D P G D$ NTHAKIAA LDFGNPNRMAGKSGVAKKFAGRTLDDCKKGD


| UniRef90 K1Y229 | -19 GG ${ }^{170} 180$ ¢ 190 |
| :---: | :---: |
| UniRet90-Q0UXX8 | L CAGQAVILAPHLTYGTNG AQAATFAMQNMR |
| UniRef90-1053N0 | PICSDGLNFAAHN |
| UniRef90-G3JJS8 | N |
| UniRef90-148CV3 | PVCSNGD DRPAHSRYVEGFPTQAADFVAAKV |
| UniRef90-G7CKF9 | PICNPADDNWSDHAAYVQSGMDQAADFVAARL |
| UniRef90-M4B7G2 |  |
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| UniRef90-Q84JB5 | PVCGGGF |
| UniRef90-O2GRL9 | AVCWGTDF DAPAHFL |
| UniRef90-G7GUG9 | NICDGTSPPNPLHL |
| UniRef90-UP10003 | PVCDPGGMNRSAHSSYKDNGMAQAADFA |
| UniRefoto J3NZ | PYCC TGNDANSHQQYVNKYGRQALDF |
| UniRef90 L7LCC | NI CDGGPVNRPIVHGNYSRNGTGAAADFVARYVR |
| eef90-U4LUL5 | V |
|  | EGTLIVDVA ${ }^{\text {a }}$, |
| 隹et90-M3B2S3 | EGTLI VDVAHFSY |
| Ref90 - X 5 KVE 7 | PVCSLGR DFDAHVRYPQSGVKLIA A W |
| UniRef90-L7LP61 | TICCGAGGPNALHLLYSVNGMDQAADYVARHL |
| UniRef90-R1E5S6 | AVCGTGSASSSGHLGYGADANTAAQFVKTKVQ |
| UniRef90-P63882 | PVCHPADPNTPQHLAYVSSGMNQAADFVAGMLQ |
| UniRef90-U5WIX7 | PVCNPADPNTPQHSAYVQAGMNQAADFVAGKL |
| iRef90_L8FHL1 | PVCNPADNNWPDHLLAYLSGGMNQAADFVASKL |
| UniRet90 E6ZVU7 | PVCENGFNVM AHVTYGMQDVGQGVQFLSQAYRS |
|  | GGFTITPAH |
| UniRef90-B9U445 | LFCASGL ST IVHLTYLERYQNDAARFVLDKTGG |
| UniRef90-UP10003 | PVCAGGLDPAAHVVAYG DSTRAAANFTADR |
| UniRef90-UP1000477495F | PVCSLGR DFDAHVRYQQSGLDQGAQWASR |
| UniRef90 17G478 <br> UniRef90-V5X6M5 | PVCSLGR DWDAHVQYPESGVKLGAEWTAKLVKAAK |
| UniRef90- ${ }^{\text {¢ }}$ | PICNPADNNWPDHLAYMDGGMNQAADFVAGRL |
| iRef90-N4UNL5 | PVCENGFLPGAAHQDYKPSAK PAAQFMVTKIASARG |
| UniRet90-F5Z2Y2 | PVCSAGADGAAHAAYATNGMTADAADFAVQRU |
| UniRet90-K2Sowo | CGLGGSSMASHLGYGADAPA |
| UniRef90-E3QWT UniRef90 H8IOS4 |  |
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| UniRef90-E3C | PFCDGGRN LQVHLSYVQTNGDAANQFTMS |
| UniRef90-K5BCC | PGCSPGRNPFAHSDYVQAGMAEAANFVAGL |
|  |  |
| UniRef90-A1UBY9 | V CDGRNPFAHNY |
| UniRet90-L2FKW6 | SVCSAGGTSASGHDGYGSDTKAAASFIKTAVA |
|  | PICSGGRNPFAHTR |
| UniRef90 IORMN9 | TICNGAGGPNFAHASYP |
| UniRet90 E4ZUW5 | M CGGDGGATGSHCSYGSA NDAASFA |
| UniRef90-В2АСА3 | YCC TGNDANSHQQYVNKYGQQALAFIRRQLDAA |
| UniRef90-X8JFV0 | CRGGLSVPAHLTYGEDGTG\AAAFIQNHL |
| UniRet90_M3G1C7 | PVCQSGGGDVGAHLGY |
| iRef90_G4HUL2 | CNPADPDTPDHLAYQKAGMDQAAD |
| UniRef90_10S0 | PI CSPGRNPF AHSDYHAMAVA AANFV |
| UniRee90-A0A043N2D1 |  |
| UniRef90-F4S2G6 | IVCSGRGG MKA LLRYGSPQEQEAVRFAANNLQGKQG |
| UniRef90-E6TJ57 | CSGTTEANGPHHQYGVNGMADAAAFAVSRLAAL |
| UniRef90-L7L993 | NVCDGAGQPTAVHVLYSVDGTTR |
| UniRef90 10H884 | PVCGGGGNTFAAHLAYPRNGSVQAMKIVGVVG |
| UniRef90-10RJ | PVCAPGGNDNASHGGY面FNGMAQAAQFAADRIVSAR |
| UniRef90_D5P484 | P CNPADPNTPQHLAGAAGMANQAADFVAGKL |
| UniRe990 kovis3 | P CNPTDDYWPDHLAYMSAGNQAADFVAPRL |
| UniRef90-UPIO003740498 | PVCMDGLPQTIA QLQGGSGMVNQAADFV |
| UniRef90-W9BGN2 | CDGSALLSLA HV |
| UniRef90-W9NS | SFCDKTLTMLDTHGDYNENATAVA NWTADRV |
| UniRef90 G8RF | P CGGRGFNWDSHLSYGSGLVVQAAGFIAGKL |
| UniRef90-C5FSF7 | PVCLNGF DLDAHSKYGIVADDAAKFLDKAAGA |
| UniRef90-LOIU65 | PICNPADPDTPAHपAY\SAGMNQAADFVAGRप |
| UniRef90_UPIOOO2 | GA DGAAHT |
| UniRet90-UPI000464CF36 | GMNFAAHDSYAGDMVQQGADFAARQL |
| UniRef90-M1W | PYCCKGKDV AVHGAYVTRYGDKALQFLEGKLGG |
| UniRet90-FOWE19 | P CLNGDNP KSHLDYEDD |
| UniRef90-A1T523 | PICNPTADYWPAHLAYGAGMVNQAADF |
| UniRef90-RokBV9 | PVCDSG SCQYYHLTYVPQYMEGAVMFIVRAFKG |
| UniRef90_G8RK14 | CSLGGRDWN |
| UniRef90_A0PVG7 | VCSGG |
| UniRef90 M1W5U8 | AFCATTGDNLIVHVTYPERYDEMAAEFVNEKLAS |
| UniRef90-S8CE | TICSVSMQTKPAHKTYPDDVKA AARWVKSMVG |
| UniRef90-M3UYL2 | TICNGAGGPNAMHLLYPVNGMTDAAR |
| UniRef90_B0XXE4 | PYCCNG NDANTHQGYGTEYGQAALTTFVKSK |
| UniRef90_VgYoL4 | CGTGTGPGFGHLSYPRDGSVTAASFVAD |
|  | rFa |
|  | GAT |
| UniRef90${ }^{-}$4FFMM1 | MFCDNGP DLEVHLTYVDTQGQAAAQFVLDQ\|VKKTQ |


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UniRef90_L2G3D5
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UniRef90_V5FYA5


ATLLQALP
VS S T A Y R VNY PA D L LDD PA
F $S / \begin{aligned} & \text { V } G T\end{aligned}$
ANGACAQLGG

 $M$ GS L A N LI I A N N G DADYEN I I Y PA T F D Y I S S T R Q GMSA T
 $V$ A A L R R K $\quad$ T K K N T T L Y S V VNY P A D T Q $\square$ L $V$ QS V V N AFPGATSEVVNYPACGGQAQC GG $\square$ S YA NSVVKMGV $V D A L R G K L G D K N V D V Y A V N$ Y P A S LD F QRAADGIV DA S









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UniRef90_D5ULP3

D S VAK TVVNDFNAKCPKTK|LVMMGFSQGAQ\||MDNAFCG|ISQ TAMTKLVQDYAKACPQTKMVLMGYSQGAHVTADVLCPQAT $N D L S A H L Q Q T A N N C P D T K L V V G G Y S Q G A G V V D T A L L N P V P P$ $N D I S D R I Q Y M A G S C P N T R L I V G G Y S L G A Q S G L G F D R P L P P$ QTEVKKMITGEDSKCPKTVFVLLGYSKGAMVQTQTLNNK E A AVVASAVNSFNS QCPSTVKVLVGYSQQGEIMMDNTAVQLSS D D A QRRVVY $\square$ AANCPATRIVL GGYSQQGAALAGFATMPMAP
 NAVVTAVNNFHNSCPNTKLVLVGYSQGGQIFDDALCPLSS $R D A R R Q I V T T A A A C P R T K M V L G G F S Q G A A V A G F V T A P M P P$ D A M T K LVVQDYAK Q C P Q T K MV L M GY S Q G A HV T A DV L C G T S A

 NAVT TAVNRFNSECPNSKVVLVGYSQGSEIVDNKAVLLSS NTASQFIAS $\square$ AAKCPTTKYALAGYSKGAMVVHR\|
$M R K L L D A A S K C P N A K L V A G G Y S Q G A A V A H R S I E S D L D$ HDMTGHLDWQAAACPDQRFILVGGYSQGAVVTHGVLGTLPG Q N GTK QLTDYAERCPDSKLIL GGYSQGGQLVTDVLGGAGA R DA GA HVVSMARDCPNTKMVLGGYSQGAAVMGFVTKP LDP P A D LVA HL AN QAA A CPD QRFVLAAGYS QGAAVVGHAAVRMD G QTMANMVTSALSSCPDTKVVIAGYSQGGQLVHNAAKLLPT NAVAS QVNTFNTECPSTVLVLIGYSQGGQIIFDDTA』PI ST

 N D M S R R I Q A T MA NCP NTMRLVL GGYSSLGAAATMDVLMPMPA
 RDMTTHLLA QAAACPDQRFVLVGYSQGAAVTHGVLDVLPP A AMQKYVEARTQACPQMKFAL SGYSQGVMVVHG LLKLS TFMRS S S SRCPSTKFALGGYSKGAFVVHGDRG $R T L T E V V N N Y A K A C P K T K M I L L G F S Q G A H I \quad I A D V M C P Q P P$ QAVANAVNSFHQRCPNTKLVLVGYSQGGQIMDNAVCPISQ NDMSARIDQDMAARCPDTRLVL GGYS LG A A V T DVVLDNPL P P QKMA QLAT DVVKKCPDT QVVLAGYS QGAQLVHKAGAQLDS

 N DMS S H V V Y M A K H C P N T R EVV L G G Y S L G A VAA D G F K N P L P P QAVASAVNSFNQRCPNTLLVLVGYSQGGQIFDDAAYPD TA
 L A V T A QL QAVYN QVSAFAAKCPNTALVLVGGYSQGAEI EDDALCGGGD ATMMKRTAAACADTEFVLVGYSQGANVVGDALVGRSA A AVATAVNNFHNNCPNTKLVLMGYSQGGQIIDNALDPDSA NDMSRRVQWLARNCPSTKLVLGGYSLGAAATDLVISPPLR


 S A V A K A V N A Y N T K C P T T Q L V L V G Y S Q G G QI M D N A F C P I Q A A A V A S A V N S Y N K Q C P S T K L V L V G Y S Q G G E I D N TADVQL T N A VA T A V N S L N A R C P D T Q V V LVGGY S Q G G Q I M D N A V C G I N A K V T Q N R I K Y L A A T C P R T R I V L S G Y S Q GAVV I G Y A L N P L P A
 A A MK A DI, I A AVDA C P S Q K IV L L G Y S Q GA E CI S D T T P A D D
 A AVATAVNDFNKKCPKTKVVMLGFSQGAQIMDNAYCGISN EAMK $\square A L T Q Q S S S Q C P N S K I A L L G Y S Q Q A Q V V G N F T T P V A A$

 TAMYNLVIGA CP
 ENLKKK TI SKYTSECPDTKIVLIGGYSQGGQIMDNAYCGLSG
 K SAQR DI K R $\square$ A A T C P R T R V V F G GF S Q GAA YA H YA P S P L
 K DVVNRLLKSQAAA CPNQNFSLVVGYSQQAAAVMHAAAAADIPA
 A NMTNLLTQQ $\square$ QACPQTKIVLMGYSQGAQVSFNATQAQAP A A MTKLLIE EYTARCPDTKI ALLMGYS QGAQVVGDVLCPDA E
 TR R Q A Q MT A Y I E R C P N S R $V$ V L
 TAMTK LVVQDYAARCPDSKMAVVGYSQGAHVSADVMCGLSA

 V K A L S H L K A R A G E C P N T K F V L $N$ D 1

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UniRef90-E3L1Z8
UniRef90-W9B4X7
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 AAQSKVAAAIFFGDPRRDPGAPRPAGFFASRVQSFCDAPD D $\square$ GE HVAAAVWYGDPRHVAGLA $\square \square N Q Y Y A D K I R S Y C D D G D$ ASVSAI RAAI FMGDPRYAQGFAPRPVGFVCKIKSYCDASD $V T A T V W F G D P R H 1 G G P S Q S C D Y Y A D R L E S Y C D T G D$ A ADSHI AA $A \operatorname{ALFGNGQWVAPDTQFNPAFQSRTDEDCHGDD}$ NADNMIKAALFMGDPRHIPGPAGFQCQFANNDQSYCDAPD DVAEHVTAGTLFGKPSSGFPP $N$ NGHPYTDRTVDLCDETD ELSSRVVSVLLFGDPLRLVGAGVAPLYADRTANYCTAGD AAKNNVAA I AAFGDPYTLLGAAAPDNNPTSNVYRDCNAGD VISNVIGAVTFGDMEKSQAVPT TNRFKTFCAMGD KVSSKVVALVLMGDPSSSQGNGDFPRQ $\quad$ SHKTVSFCDAGD SALDAI KAVILMGSPRYAQGFAARPRGYSDK QNYCDSTD
 VIGDKVTAI IFMADPRHVPGKPESCDYFAPRLRAYCDSDD SALTQUKAVI $\square M G D P R F T A G A P G F A P R P A D K V Q S Y C D S R D$ SAQAQIKAAIFMGDPRHIPGAPRPAGFYASNIQSYCDSSD GMDQHVAAVALFGNGRVLGPVPGFSPAFAGKTIEECAPGD A ATNQI KAAIFMGDPRHIPGAPRPAGFQAAN QSYCDSAD SLFPRIKAVVMFGDPQQRLGGDKFPDGDRPKVLQVCAKGD GAERHVAAVALFGNGANWAAPDTFNPAYRNRTIDLCHSDD T $\square$ GDHVSAIVWLGDPRHRGNDG $\square F P R \square Y A A N L Q S Y C D T R D$ PNQGNIKAVI WAGDPRFTPGAGGFDQRPSSQTQSYCDASD A LSDKVAAVILDGDPTFTAGDGTRSGVFARRTQSFCNRND SAAQMVKAAIFMGDPRFEYGASRLGGFAARKDQSYCDSPD GADQHI AAVALFGNGSNWAP ISALSPTYQNRTIDLCHSDD $\begin{array}{llllll}G M D Q H & A A I A\end{array}$ A ALKAVKAAI FMGDPHNRSGLPTCSPGSSSLIQSYCDSQD NALAAVKVAIFMGDPHNVNGLPQCTPASPSILQSYCDAAD SYEDNI IAVVLFGDPSHVVGNGDFPDPYSSKMRSWCDTGD GVGDNI AA ILLYGNPRHMPNAGQLANVYANRVHDYCNYQD SAI SMIKAAI FMGDPRNHGFAPRPAGFSAAKVKSYCDAAD
 SALNQVKAVVMMFAPPSARF DRGQDDRDYARKTVRYCDPGD EMGEKVVATLWMGNPRFAREQGFVCATYAERIQSYCDERD NASRNLAAAIVFGDTRHTANQSSALDVYATRMRSYCDKND SYGSHIKAAVMMGDPRYMVNNGLFPRTYSS VVKSYCDFGD SAVQQVKAVI MLGDPRFVSGDARPAGFSADKVQDYCDSQD
 SVADHVAAVVLFGNGTRSIFGPANSPVYGPKTIDQCNVDD NALAAVKAAI FMGDPHNRQGFAARPNGFTCSIQSYCDSQD QALGAVKVAI FMGDPRHDQFAPRPQGFFGNNIKSFCDSAD AQANKIKAIVTFGDPKRTEAYGK GLLAKATTYCHAGD NALAAVKAAI FMGDPHRAGGFAARPSGYTCSIQSYCDSQD SALNAVKATVWFGNPHYRPPGFQCSPGNPDNI KSYCDAED SAGAFVAAAVGMGDPTFNPGLGWFPRAYDY IVISYCDKGD RIADKVSAIIFMADPRHPRPDSESCDEFASRMRSYCDSGD NITRNIAAVVLFGAPRFDRDVGAPPDT DAPRFRKYCEPGD KTTDHVAAVILMGDPRFPRGGDAPLDAFAARTQSYCDTGD VASDNVAAVVLMGDPSNAQNAGRFPGAVTDRDASFCNTGD ELYGRIKSLVMFGDGYLK LGASQFPAGLNEKVRQVCAAGD ELAKNI DAVVGMGDPTHNPGKGWFPRLYDHLRVSYCDHGD PVGQRI GSIAVFGNPGARFGSPLSSGQFAGRAID DCSSGD TIGMKI AAIVTFGDPTS $\square$ ANDGIFPRRDTSRIASFCDETD KYQKNIVAVI QMGDPSHMPNFPPRPDTAACKTKAYCNADD APGNAIAAALLWGDPYNVLDGAGLQNRYSSVLRSYCAKGD VI LERVSSAVTFGDPLQPSPLKGLGEDRSLVICNSGD APGSSIVAVVTFGDPRFPYNIGRGSNQYEDULAMWCNAGD SALNMM KAVILMGDPRYMAGAPGWTCPS GSKVQSYCDSTD DVAGKVVAMVLMGDPTHLFPRKDDSSCPAEKSISYCDTGD
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UniRef90
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 NSTSCAPDHLIDARGTTE GYPGT CAP HMLIAHGS NSTDCADiHFMLARGTTEPGTTYTMAELV

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UniRef90 - X7UIQ0 UniRef90-U7Q170 UniRef90-K5X1J3
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UniRef90 - $88 . J 80$ UniRef90-G9NJW6 UniRef90-M5CCY2
UniRef90_H1V638 UniRef90-G2XCA2 UniRet90-R9PBII UniRef90-G9MLT2
UniRef90 W5TJX8 UniRef90_M5CGS8 UniRef90_L1KPZO UniRefofo-J3PH09 UniRef90- 88 JH 18 UniRef90_W7ZXI2 UniRef90_R9PEN1
UniRef90_J3NQP5 UniRef90-E3KTZ7 UniRef90-W7A477 UniRef90-14BEZ7 UniRef90-X7XTN5 UniRet90-X8FG23 UniRefoto U4L822 UniRet90-A2QT66 UniRef90_C9SFD2
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 DAVASAVNSFNTQCPSTQLVLVGYSQGGEIMDNTAVRLSS $T G G L S Q U T A Y A N R C P N S K I V L S G Y S Q G A Q Q Q S N S A L N P A T$
$R D A G N R V Q T V A T C P D T V V G G F S Q G A V V A F V T S S T V P ~$ QALTGLLNTSVSSCPQSKIVLLGYSQGAHVIGNVLCGVDR ANGLAQTAYAARCPNAKLVLTGYSQGGQLVGDILGGGGA ADVRNKVESIAATCPSTKIVLGGYSQGAAVAGGTTGPMPA AAVVKAVTALNTQCPDTKIVLIGYSQGGQI MDNALCGLTG AAVASQVNSFNQRCPSTVLVLVGYSQGGQIFDDAYCPIST QTGLKYLKAQASKCPKMVFVLMGYSKGAMVQSQLDAAKD KNLTELLEDYHKSCPDGKVAI LGYSQGAQVSLDTLCGISS OTLADLIASQASACPDQRFILSGYSKGAMVVHSSTADLTD ADVVNKVQTSLAADPSTCFILEGYSQGAAATCNAMPMLTG QDAT TLVVQKQVAACPNQKIVLVGYSQGAHATVAALSQLAG TGGLSQITTYANRCPNSKIVLSGYSQGAQLFGDILGGGGG AAVATAVNNFYQQCPTTQLVLVGYSQGAQIMDNAVCPDSA DDLRNHLSEVASSCPNTKFVIGGYSMGATVVDDVAGNPPP TNLVRLLNTSAQECPDQRYVLLGYSQGGGVVGDALLPNGQ VNGVRQITEYNAKCPDTLIVLNGYSQGAMIVDPQTTGLDP I AMNLALTAYSSRCPDSKVALLGYSQGAQVTGDTMCPIAS EAVTTAVNDFHSRCPDSQIVLVGYSQGGHIMHNAICPTTA
 TNCASLVKQALSKCPDTKDVLAGYSQGAQQVHGCDMNLGS SMEMKMLTSTELAKCPKTKYVLLGYSKGCMVQTQVLS SKK TAMTKLVQDYATQCPQSKMVLMGYSQGAHVTADVLCPVAA AAVAAAVNAYNTQCPSTQLVLVGYSQGGQUMDDAFCPIKA FEKLVLQYVDACPDSKVALLGYSQGAHAMMDAVCGNSD QAVVDHLTTRSAQCPNERYALVGYSQGAQVVNAALGVLPQ EAMLNAI DDYATRCPQSKIAIMGYSQGAQVSADADCGMVP NHVTSQAAACPRQRFVLAGYSQGANVVADASGGVSSD KLVVNYITAQAARCPNQVFALGGYSKGAMVVHSTT LSA QAMQKLLGAYGQACPDSKLALLGYSQGAQVSSDSVCGLST TSAERQIRQYMDKCPEAVVVAAGYSQGAAMLSSVANRLEK NAVASAVNSFNQRCPNTQIVLVGYSQGGQDMDNALCPLTA QDIVNKVKSTLIASNPSTCFILEGYSQGASATVNALSQLTG KAMQQLLNNYGQACPGSKDAVLGYSQGAQVSTDSICGMSD
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GLQAKSMTYCHAGD AA GTAVKAIILAGNPRNPRPAGFSCSTFAARDRSYCDAAD MVGSKIAAVVLFGDPTFDAGNGDFPRSDTSKFASFCDDTD NVANRVNAII QMGDPRHVVGNGLFPRLPSQRDKSFCDFND ELAPRIKAIVTFGNPLKLMGQTRSSQLYGSKADEFCNLGD A ALNQIKAVIMMGNPRSAQGFAPRPRGYADKMKSYCDSTD S LKAKVVA L V FGDPARN IN QPWP DNSPSQNDASFCNTGD AYANNVIA SVMFGDPTRAANDGLFPRVYGAGMKSWCDADD LP PDKVAATVDFGNPYFQPGS SQVPKEYVSSAWDCCDTGD SAQQMI RAAI MMGSPRFVAGPASFQCPFAANDQSYCDAPD AVSNNVVAMVLMGDPSHVPKNGLFPRQPTDRTVSYCDDMD SPGNKI KAALLWGDVRHTANPGTWPNRFSSVLRADCVSTD

 DVPAKI SSAVVFGDP DDGKPDQGVPKEKTLSDCRDGD
 DETKNIVAVI QMGDPTFVPGRGLFPDQFASRI QSYCDAGD A $\square G K H V K A M I W M G N P R H K P G A T Q Q C T A Y A S I I Q S Y C D Q A D$ $K A$ LACAVTFGDPFKGQKVAGVPD APGNAI AAALLWGDVMHLQKDGRSSNTYAP LLRSYCAKGD SALDNVKAAIFMGSPRQAQGFAARARGYASKI QNYCDSVD SPGDKIVAVTLFGDVRHTAGNGAAPNRYSSLLRSYCVATD SVQSRITALLLFGNPDRGDGK A $\quad$ TTGPYADRTYDVCNDND SPGNKIAAALLFFGDPRHAANQATSDNRFSNK RSWCDAGD DAVPAVAAVTLFGDPSPQWPPVVIGPGYAPKTLQLCAEGD SPGNKI AAALLFGDVRHAANQPQSLNRFSSVLRSWCLAGD APGSSIVAVVTFGDPRFAYNDGRGSGYSGVLAREWCNAGD AMANHI AAVALFGTPDRSAPPDT IGNPYAARTDQLCAVGD A A LIKAVKAAI FMGDPHNRQSGFQCSPGSPS I QSYCDSQD AA QAKI AAAI FMGDPRHDPGAPRPAGFYATNI KSYCDAAD
 SAVDNVVAVALFGDPTHPRNNSASCEKYASKI ASWCDTGD
 AAFNAVKGVVLIGNPEHQPGLASIPSNWVSKTLDDCI YGD
 $A$
S S D K V V V GALAQIKAVIEMGSPRFAQGFDARPSGYVCKIQSYCDSTD DVAGRIRGI ATFGNDDRR GGGMTGP LAGRWIDQCNPGD RIWGKNAA IVMFGEMRRPRPRGALDNAYADRDRNYCVAND S P GNKIVA ALVFGDTRHVAGQGLFPNRFSSVLRSYCVATD
 FVTDKI SSVILLGDPSFPRNDPAGCDSDAKKTVSVCDKGD SAVAQVKAAILLGDPRYVSGDARPAGFVAAKVQLYCDAED
 TEAAKVA
SVKSKVDSVLVFGDPLRSSRTAAWPGSDNQTVASFCNSGD VPSANVGAVVFFGNPYFKGGRPTLPADDTDRIYDCCTTGD D $\square$ A DKI A AVVLMGDPSHPRGDSAACGALASRMASFCDSGD SAVNMI KAAI FMGNPRRAQGFAPRPSGFSCKDKSYCDSAD DLGSQV $\square$ AlVAFGSPDHPWSAGTSTGAYAARIRSWCDEGD ALNPRI ASIVFYGNPDKGDSR PVPPAFQDRVLDNCAEGD AVADHVAAVALFGEPSSGFSLPTIGPLYSSKTINDCAPDD EFASKIVAVVLMGDPSRVKGNGVFPGNMDSRMVSYCDEDD GVAPRVAAILLFGNP DRSDGR SVTGDYESRTKDYCADGD ALKAKVKAIVVVFGDPYRGSSNA WPI NSPSQNVASFCNSGD SVMDNVVAVAIFGDPTHVANDTDVCKSYASRIDSYCDTGD DVK S RVLAI LVF GDPHRKVGRANSWPDNSQNI ASFCNKGD

 EVMNSVVAVAI FGDPTHVANLTDVCKKYASRIISYCDKGD SVASKI AAI LLFGNPDRGDGR SVTGPYAGRTYDTCTDND KI K S KV $\square$ SVLVFGDPQRRQTTASWPNTGTQNVASFCNSGD LVNPKVAAVLLFGNPDRALGK SVTGTYQSRTDDFCATGD NAGRQVAAILTFGD IRHATNWGTSPRTYAGVWRDYCNAGD SLKSKVSTVLVFGDPRRKNREDTAWPDDSPNVASFCNCND GPPDRVAAVGLLSDPRRSPTDA\|VGPWLSPKVRTFCAAGD A AFDAVKAAILIGDPTHVPGQAGTPSNWVSKTKNDCDPGD DKS SKIAAVVMMGDPSNATKDGVFPGPAASRMVSYCSAGD S A DKVVAVVLFGNPNHKPDAPQ $\square P S Q Y \square S \square T Y D C C \square K W D$ APGNAVAAALLWGDVMHVANQPARLNRYASVLRSYCAKGD GADQHDTRLVLGGYSLGAAATDVVLNLYRDRTIELCHGDD EVADHVAAVVLFGLPNHRQPPVAI GPAYQAKTIKVCEPED KVGDRMTALVLYGDPRHDPNISILENQYASKIADYCNVED QYADN $\square A A V A V F G N V A N R S G G T T Q S S L L G S K S D D L C N P S D$ F YK $D V S K H T A A N V Y Y G N P R H A P Y Q G K Y P D R Y R H V T A D W C N D G D$ VAKDQI VGVLMVGDTQKMQDGSRПFSFPPDRVSFLCNPGD AYADNVAAVAVFGNPSNRAGGSSLSPLFGSKADDLCNPTD DPSDLVVAMVLYGNPYFTSGAPQMPTQFSSMTFDCCLTGD DPGSSIVAAMVFGDTRHTADNGLFPRPYGDVFQAYCVATD
FDAGNSTSDGLFPRPANL


|  |  |
| :---: | :---: |
| UniRef90-S8ASF8 UniRef90 F9xD U |  |
| UniRei90 ${ }^{\text {AOAOO1OSS1F1 }}$ | CASGQNDTVA HLGYFQDY |
| UniRef90-U6NF13 | PFCSSGVDVTV HLTY |
|  |  |
|  | C TGNDANSHQQYGTKYGQQALTEVKSKLSTSGG |
| UniRef90-G4T) | VFCWPGGLSLLAAHLAYPTDGSGVAANFVKAR |
| UniRef90-J3P6 | RYCDRGSNQADHHV YFEKYTADAAAWV |
| UniRef90-E3JUN4 | CTKSGGDANHLKYGGQSATDA |
| ef90_CSSSL |  |
| UniRet90_W9CSL9 | EFCDSG SSLLVVHLSYVTTYGTAAAKFIVT |
| Ref90-Q0 | NDGSVHQGYGTAYGQDALEFVNGLLA |
| UniRef90-L2FU188 | SGQNLTV HLGYFQDYVDQAVNFV |
| UniRef90-U700S2 | NGT DAAFHQGYGTRNGGDA |
| UniRet90-J3NMC3 | SAGTLVLIP HLQYDQGA GKAAQFV |
| Ref90_W9K749 | AQGDEV ETHLNYFDVFTDVAEWV |
| UniRet90_N4VTA8 | G |
| UniRet90_Gosw | EFCASGA SLAVHLSYVTKYGSQA |
|  | PYCSNGNDASVHQGYGSEYGQAALKEVNSK |
| N4V863 | P CANGDDV |
| UniRef90-B2AFR0 | CC TGNDQQAHQAYGTKYGQQALTFVRARLNQSGG |
| UniRet90-W9Y4Z1 | PVCAAGSDNSSTHLTYFDDYTDDAASWIKEMINKA |
| UniRef90-H6RBG1 | G S N WN |
| UniRef90_Q0C1 | PYCCNGSNAATHNGYGAEYGQAALTFVKSKL |
| UniRet90 A1 | CDGGGGPSAHADYGNGMOAGAYAVDRL |
| UniRef90-A6R5 | PVCDSGF DREVHSAVVEKYRSYAVAFVTRV |
| UniRef90-M4FS20 | TVCNAGRFDPQAHTSYFDDFSNEAGAWV |
| UniRef90-V9D552 |  |
| UniRet90_X7UIQ0 | PVCSPGGLDRAAHSAYKSNGMAEA |
| 770 | PYCCNG NDANHHQQYVSIMGQKAA |
| UniRef90-K5x1J3 | PYCCNG NDANTHQGYANEYGSAALTFVRGK |
| UniRef90-A2QT47 | GVCDAAGT |
| UniRef90-A0A014PS15 | VYCDLG EDTAVHGQYFSNYGPEIVQFIVDKYNGKSG |
| UniRef90-D805S5 | G |
| UniRet90_W3XIF1 | Q |
| UniRef90_V5F1 | GVCDHGFGINAQHLSYPSNVQTMGANFA |
| UniRet90-F9FJ8 | GVCDHGFG |
| UniRee90-BODSL6 UniRef90-A0AO16P8A0 | PFVCAQGADVPVAHTSYFNVFSQEAGVWVKTKV ${ }^{\text {P }}$ |
| UniRef90-G2R5H0 | PYCCTGNDANSH |
| UniRe990_V6Z8L4 | GGRS |
| niRet90_D1AAT | GSt A ALRYFVNGMRDGADFAVSKVRAALLG |
| UniRef90-H6B UniRef90-M2U | P1 CAAGSEDATTHLTYFDVYTDAAAGWVKEMVNKAQ |
| UniRef90-TOL3J2 | VYCDIGNN TKVHGSYFANYTDDAVEFVVAQFNASK |
| UniRef90-A0A016P9J7 | PFCEAGGKDLSVHDGYTPVWGD |
| UniRef90_CTZGL9 | CDG NDANHHQQYVTLYGT |
| UniRef90-O4PBK7 | DSGFGITYQHFFYPTDSQTAANF |
| UniRef90-M5C4P0 | DLMGGEVEPHLLAYGTDGATKAAAFVKG |
| UniRef90-X8JN | CNPPGTTFP |
| UniRef90-E3L127 | QSTGSIMS HLTYGSKAT EAAAFVTKSLNAKLG |
| UniRef90-N4VA25 | DSGNSLQVHMGYVRRSGDAAASFVVGMVQG |
| Ref90-w9CB24 |  |
| niRet90_B2A | IYCDLG SDRSVHGSYFANYTLDAAEFAERFNS |
|  |  |
| UniRef90-A0A040UW62 | TGGGNIMAHVSYVQSGMTQAATFAANRL |
|  | ADAAEFV者 |
| UniRef90-88J | A HLAYGTDGTGVAATFIKNKVA |
| UniRef90-G91 | VHHL Y 1 DRYGDDIVDFVVSQYQ |
| M5 | EFCDPAGVSPGPHLAYKDDGSDVAA |
| Ref90_H1 | PVCRAGGAALPGHRDY RKSAKPAAEFLVKKLAA |
| UniRef90-G2X | PYCC ${ }^{\text {PGNNQAVHQGYGGVYGQAALTEVRSKLNS }}$ |
| UniRet9 | Sticher |
| UniRef90-W5TJX8 | KVV |
| UniRef90-M5CGS8 | $\square M P$ HLAYATDG |
| niRef90 L1K |  |
| UniReef90- 33 | NVVDEHLINYFDVDTPDAAAFVQRRIVAAFQG |
| UniRef90 $\times$ | DPPDPDDNAHTRYATDGVDAAATFAKKRV |
| Uniego- | GVCophVGTTPPHFDYGFDPSVQGARFATSALI |
| UniRet90 J3NQP5 | CDSGNDLVVHVGYVDTQGAAA |
| UniRet90-E3KTZ77 | FVCQ TDGTVANHMAYGSQEEKNAAAFVISQL |
| UniRet90_W7A477 | PICANGDDV EKHLTYFERYTEDAS |
| UniRef90-14BEZ7 | NPTDDYWPDHLIAPAAGMVNQAADFVAGRL |
| UniRef90 X7XTN5 | VCSDGLN FA A HDAYAGDGVEQGVAFAASRLSAAPG |
| UniRet90-X8FG23 | SGPGNDWNGHTDYVPTYTTQAASFVAAKLAASS |
| UniRef90-U4L8C2 | DGG $\mathrm{D}^{\text {dVLS }}$ HLVYVEKYGEEAVEWIVGKIGG |
| IRe990_A2QT66 |  |
| iRef90_C9SFD2 | V CDGQLVVLAPHLDYTRRA GEGVGFLASK GKLI |
| UniRef90_D6FM24 | CHGPGNEFSGH |
|  | SICQTSGSIRP |
| SQ1Q4 | G |
|  | ag NDYM |



QSTGSGSCTDVHDFTARGWNEPYPG RQGTL RQDSCADVHIFLAKGWNEPGRQGKLAGSI। SADPAACKSLEVIADPGTWETPGNTPVGNGLL

G R A L A S P VD DE E R Q S CPE $\square H V$ VGARETTVSPGLGTARVVV P S S C A S YT I IN A R GT S EA Q GESVGFK TM
 CASYTIISTRGTSELQGPSAGFRTM NS G G G GCKK Y K I SAR GT GEP QA TP $\square$ S Y R K Y $E \square V S F$ Q T S DCKPF HVVIVRGSDE P Y P G G R R Q GNV




 $H \cup V V A R G S E P Q G P G$ V $L$ G $P V$
T DECQP F H HFLA R GSTSS GHV IE TVVGKV NGSE $\square$ ARARDCPS DEFITTRGANDSFEQSFWLMEM PCATIHLLVARGTTEAPGVGR MGVV
Q S T GD GECRDV HV FLA R GNNEPGRQQKLVT A



T P C S A V H V L L L R GTNNEPYP G L Q K P I
QFERLNT
TECQTYHHFLARGST
$T P C S$
$V Q C A$



KYAIVSARGTGEKQKNPTGYAGF
A Q C A DVVI FMARGNDAPY HDGRT T P
YSA $\square$ S NTSTSACP GAHI I VARASTEPDGYGVIGGF CNSYTVI TTRRGT GEAQGPSAG
$P$ T A A P TNCVDLQI FVAR GSGEQPGLGR $\square$ GVV
 NSGGGGCSKYKI I SARGTGENQVSPTGCRGF

A GGSACNTYTI I SARGTGETQARP\|GNRGF NEEEDARARNCPE DEFITTMRGANDSYPDSNWLMEM $P$ LT P R Q TVSCSGLY, VARGSGQAAGEGSVAT V



## UniRef90 G4NIH2

 UniRef90-W7ML98UniRef90 M1WBQ0 UniRef90- M3D7V2 UniRef90_W7L9P9 UniRef90-X8JF42
UniRef90 - T5ABP5 UniRef90-M2R5Y3 UniRef90-G1X3Q3 UniRef90-U4L9E6
UniRef90 B2WH88 UniRef90-M7SW59 UniRef90-G2YUJ6 UniRef90-G4THL7 UniRef90-B2VYG1 UniRef90-Q0U1B7 UniRef90-W3X9X6 UniRef90_W9Q215 UniRef90_W9Q215 UniRef90-12G4V2 UniRef90-UPI000455D8D9 UniRef90_C7Z935 UniRef90-H1VD91 UniRef90-LTJE76 UniRef90-A0AO10R5E9 UniRef90_M2UKDO UniRef90-G4NFB6 UniRef90-L2FHK2 UniRef90-M4G9B6 UniRef90-Q4PHG8
UniRef90 V4HVK9 UniRef90-V4HVK9
UniRef90 G7DY75 UniRef90-X8CA62 UniRef90 ${ }^{-W 7 M U 15}$
UniRef9- A4QXPD UniRef90-G4TKX2 UniRef90-M4FMN9
UniRef90
F4RL14 UniRef90-J3P8X2 UniRef90-M4FX09 UniRef90-UP10002629DDD UniRef90-X8CB84 UniRef90-M3AUZ6 UniRef90-W2S5J2 UniRef90-UPIOOO4664B35 UniRef90 $\times 8$ DE95 UniRef90_K1XKB7 UniRef90-M2RTP5 UniRef90-S3EOVO UniRef90_UPIOOO4560329 UniRef90-F4S751 UniRef90-Q0U4U8 UniRef90-G4UK63
UniRef90-B2W9X2 UniRef90_M2MX17 UniRef90-S3CTP7 UniRef90-F4RHC8 UniRef90-G2X1L1
UniRef90 G2WZN4 UniRef90-G2WZN4 UniRef90_C7YIQ7 UniRef90 ROKHQ1
UniRef90 O4P8K UniRef90-UPI0001BF796A UniRef90-L2GEA9 UniRef90-E6ZKK3 UniRef90-A0A010R9F3 UniRef90-R9NYW0 UniRef90-N4V5K22 UniRef90-E5AE17 UniRef90-H1V7K5
UniRef90- V2XQP0 UniRef90-V2XQP0
UniRef90_J3PCB7 UniRef90-F4RZ16 UniRef90-OOUH92 UniRef90-N1QF68 UniRef90_UPIO0045611E7 UniRef90_J3NQL3 UniRef90-E4ZPY5 UniRef90-UPIOOO462DCEB UniReffo-A7EBS4 UniRef90-F4RL65 UniRef90-F4RUO3
UniRef90-R9NYK5 UniRef90-UPIO004560CA4 UniRef90-F9X4S7 UniRef90_UEIO1
UniRef90_R9AN9

SDLLGQTVIKDYVKMCPDSKVVALLLGYSQGAQAVADLIJCGASS RAMTELINRAATQCPGTKIVLVGHSVGGALVHQSAENITT KSLSQLI SEHVKSCPNDKMAL MGYSQGAQVTDNTAADASD RDMTSVI RNY $N M A A Q Y L A S Q S A R C P N Q R F I L S G Y S K G V M V M H N A L R V N P$
$E A L Q Q A V Q N Y T Q S C P D K V A I M G Y S Q G A Q L T T D A L C G G T G$ EALQQAVQNYTQSCPDSKVAIMGYSQGAQLTTDALCGGTG EALKQLISKQAKECPNQKVVMMGYQGAQVVGDAIPGMSA AALKTQLTEAVRRCPDQGIVLLGYSQGAHVVGDVTPPVST ANGTAQVTAYAERCPDAKLVLTGYSQGGDCEQAVNEPLSP AAMQKLVQAYAEKCPGSKMAVMGYSQGAQVAADVMCGLSA QAVASQVNSFNQQCPQTQLVLVGYSQGGQITDNAFCGISAS

MTNLIGSTASRCPNTKIVLSGYSQGAQLVHNAAVRTSA TNGYSQI NDYNSRCPDAKLVLSGYSQGGHVASDILGGGSS AALSVVLAQYVTVCPKTKIILLGFSQGAHVDADVMCPSPS AALSVVLAQYVTVCPKTKILLGFSQGAHVIAADVMCPSPS ASIVAKVKNTLASNPNACFILEGYSQGAAATCNALPQLTG QSMAQTAQAYVQKCPNAALVI AGWSQGALVAHKALDQLDD KNGПQQ TA YNKRCPDSKLVVSGYSQGGHVVGDILGDPKT QNGAKQINSYAQACPESQUVLMGYSQGALVLGDLLAGGGD VAMANQANSWLSKCPQTKIVLTGYSQGGMVVHNAAKKLSG TSGTSQDTAYANRCPNAKLILTGYSQGAHVVGDILGNPST ANGQQQMKTYAGRCKDSNLILVGYSQGGDQATNGPLKKTE SNGAKQПTAYAQSCPKAKIVLLGYSQGAMVLGDILAGGGD DNGQNQMKSYSEKCPDSKLMLLGFSQGAACTQDSNPALDQ TNGRAQIIAYNKRCPDSKIVVSGFSQGAQVVGDIALDITS
 TANIDSIVKGCPNSNIVLVGYS NDMSGHI QYMANTCPDTRLVLGGYSLGAAVTDGFTNPLPP EALSEALNDYHSSCPNGKI AVFGYSQGGQVATDVFCGGSD SRLAKLVRDYVKMCPQGKIALVGYSQGAHVVGDLVCPLDP A TTTYLSAQAARCPNQRFVLSGYSKGALVVHSMT LS SKLRSMVEDYAKMCPNSKMALLGYSQGAQAVGDLVCGLDS NDALKYILEQKKLCPKQVYVLIGYSEGAMVMTQLANK PN EAGQRQMADYAEKCPNSSLLLVGYSQGAAVVGDLLGGTGG
 TNGLQQIQSYYAKCPDTKLVVSGYSEGANIDGDILSGQTS ASGVAQMTAYAQRCPDSKLVLSGYSQGANVAWSAGLSRNS AHADGMMGADAAECPSSKFAI $\square G Y S Q G A D V A G D L A A R T G H$ RDAGAHVQSTATNCPKTKMVLGGFSQGAAVMGFVTKPLQP AAAAAAVNAYHTKCPNSILVVVGYSQGAQIFDNSICPIEA KDLIDQVGKDLAQNPSECLILEGYSQGATVVVDALRKLTG ANGVAQMTAYNQRCPDTKLVVSGYSQGAQIVTDILIDVVS NDIVNKVNSVLRTNPNECFILQGYSQGAAATTNALPRLTG ADALKYITSQQSSCPKQLYVFDGYSEGAMVVTQQAAKPS SGGQAQVKAYSEKCPKSKLILFGFSQGASVAQDILPALES FEKMLIEYHEKCPDTKVALLGYSQGAHAMMDSVCGGIP ANGQAQMKDYNANCPDSKLIVLGFSQGGACKQDMNPALDP QDUVNHMNSGLASNPNMCFILEGYSQGAAATVNALPKLTG NAMLSLIKAYADACTGKKVLVGFSQGGNVITDVLIDPLSA VSMTDLLTQQTAACPQTRLVVMGYSQGAHVALDTLCGSSS EALTAALDRYSDACPNGKVVLLGYSQGAHVTLDALCPIPE AAMTQLVGDFTHECPNTKVIILGYSQGAHVTMDTFCPLPS VNGAAQMRNYTERCPDSHLIVMGFSQGGDQASNPSMNITS WWVANYTTLLAQSCPNTKIIMMAYSLGAA ANUVASTRPR IAFEKRLIAYHERCPDTKVALLGYSQGAHAMMDSLCGNSG ANGTAQVTAYNKRCPDSKLVLSGYSQGGHVIGDVLGDATK ADVVRKVQSTLAQNPSTCFILEGYSQGAAATVDAMPKLTG ANGTAQI TAYNKRCPDAKLVVSGYSQGCQQKANAGLDATK $M N V A K V K N T L A S N P D A C F I L E G Y S Q G A A A T V A A L P Q L T G G$
$A N T K K A V T E Y A T R C P G S K I V L S G F S Q G G V V G D L L G G G G G$ ANGLSQLQAYTQRCPNSRVALSGYSQGANVIJADMLADPSA LI GAA QMRNYTERCPDSHLIVMGFSQGGSVMDNPAMNDAS ANTARAVTDYATRCPDSRIVLSGFSQGGQCVQEANEGI SP RTMADDI TNAANSCPNAKI VTAGYSQGGQLVHNSAELLSP TDAMKYI SKQKGKCPSQKLVLLGYSEGAMVVVQLLAKQDF RNGQSQUAAFQAKCPCTHIVVNGYSQGAHVVGDVLIDNNS DGMRALVETFLAQCHNAPLVLMGYSQGAQVVNDYLSPAPA QDVVNKVTTTLRSNPNECFLLQGYSQGGAATTNALPKLTG SRLKSLI EDYAKNCPNNKMALLGYSQGAQAVGDLI CGTS S KAVVTAVNEYNKKCPQAKIVLI GYSQGGQLMENALCGINP $R M L I D T L N V Q A E A C P E Q R F V L L G Y S Q G A L V I G D A L S A V S E ~$
$A M K A D L D A V E A C P Q Q K I V L L G Y Q G A E C I S D T L G G G Y A$ R YWIANYTTLLAQSCPDTTIIMMAYSLGSA ANIIATNRPR QDIVNNVTNTIRQNPNECFILQGYSQGAAATTNALDAKTG DNAKSKIRSYVDQCESSRLALVGFSQGAHVMTDTMGP:ED


## UniRef90 G4NIH2 UniRef90-W7ML98 UniRef90 M1WBQ0 UniRef90- M3D7V2 UniRef90_W7L9P9 UniRef90-X8JF42 UniRef90-T5ABP5 UniRef90-M2R5Y3 UniRef90-G1X3Q3 UniRef90-U4L9E6 UniRef90 B2WH88 UniRef90-M7SW59 UniRef90-G2YUJ6 UniRefto -G4THL7 UniRef90-B2VYG1 UniRef90-OOU1B7 UniRef90-W3X9X6 UniRef90-W9Q215 UniRef90-W9Q215 UniRef90-12G4V2

 UniRef90-UPI000455D8D9 UniRe990_C77935 UniRef90-L7JE76 UniRef90-A0A010R5E9 UniRef90-M2UKD0 UniRef90-G4NFB6 UniRef90-L2FHK2 UniRef90-E4ZXP4 UniRef90-M4G9B6 UniRef90-Q4PHG8UniRef90 V4HVK9 UniRef90-G7DY75 UniRef90-X8CA62 UniRef90-W7MU15 UniRef90-A4QXP0 UniRef90-M4FMN9 UniRef90-F4RL14 UniRef90_J3P8X2 UniRef90-M4FX09 UniRef90-UP10002629DDD UniRef90-X8CB84 UniRef90_M3AUZ6 UniRef90-W2S5J2
UniRef90 UPIOOO4 UniRef90-X8DE95 UniRef90-K1XKB7 UniRef90-J4UMJ8 UniRef90-M2RTP5
UniRef90 $\mathrm{S} 3 E 0 \mathrm{~V}$ UniRef90_UPIO004560329 UniRef90-F4S751 UniRef90-Q0U4U8 UniRet90-G4UK63 UniRef90-B2W9X2 UniRef90-M2MX17 UniRet90-S3CTP7 UniRef90-F4RHC8 UniRef90 G2WZN4 UniRef90_C7YIQ7 UniRef90-ROKHQ1 UniRef90-Q4P8K0 UniRef90-UPI0001BF796A UniRef90-L2GEA9 UniRef90-E6ZKK3 UniRef90-KOEFN7 UniRet90 A0AO10R9F UniRef90-R9NYW0
UniRef90
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UniRef90- V2XQP0 UniRef90-V2XQPO UniRef90-F4RZ16 UniRef90-OOUH92 UniRef90-KOVA13 UniRef90_N1OF68
UniRef9O_UPIO0045611E7 UniRef90-J3NQL3 UniRef90-E4ZPY5 UniRef90-UPIOOO462DCEB UniReffo-A7EBS4 UniRef90-F4RL65 UniRef90-F4RUO3
UniRef90-R9NYK5 UniRef90-UPIO004560CA4 UniRef90-F9X4S7 UniRef90_U5EIO1

130
140
150
160
E|L|M P N|I I AA M|I L|F G D P T R A A N D G|L|F P R L
 E I K K H V VA V A I F G DP TY V P NVTYNK G RYA D I I S S WC D T G D G DG D AV KAVFLVGNPSRQPGLGGDEGGWVERTRDVCDS G D
 AV R S K V V A V L GF G D P R N M R S P WP I S G N S G Q NVAS F C N A G D
 DACDAL KAALLWGDVKHTANQPERMNRFSSVLRSYCAAGD E L D R I T A VV L M G D PR H M A G D GVVF N S Y K N KIS S Y CN R K D

 $N \square S S N V V A M V L M G D P S H L F A R Q N D A A C P T E K T V S Y C D N Q D$ SALQQQIKAVI MMGNPRRAPGDPRPS GFSGSKVQSYCDSPD ANAARVAAVVVFGDPKRGQSFGSDA TSKTLT ICHTGD D A GKMI K A ALTTF GNVRHTAN QPALLDDEYE DVWRD YCVVSGD A MNNNVAAVVLMGDPSSSVGNGIFPRQVSDKTVSFCDAGD A M N N NI A AVVLMGDPSSSVGNGlFPRQVSDKTVSFCDAGD
 R P A NKIVAAMIF GDTRHTANDGLFPRPYGDVLHNYCVDTD NAGKQI SA ILLYGNPRHMPNDGNVSNKYADRIHDFCNFHD
 SPGNKI RAALLWGDVRHTANNGDNPNRFSNVLRAWCLSGD SPGS QIVAALTFGSFRHTPNGANFPGVYEDRYRDWCNSND $N V G K Q$ AA LLLYGNPRHMPNQTAAFNLYADRVHDYCNYHD DIGNKVVAAATFGDGRRARTPEQLSALYSDVLLDYCHHGD SAGRQVAADLTFGDVRHATGWGLYPRNPAGVWRDYCNGGD
 RTAARISAVLEYGDPRRQSANPRPPGQWQDRLQNYCAQGD SAK $\quad$ K L G AL L F G S P CE GRGDK GA E D
 VYNKNIIASLQQFGDPSRRANRNKPCGPYSEAMRSWCDEKD SLLK S KI AA I L VF GDPARNDNQPWP INNPSQNDASFCNFS D

 VPGSNVARVLMF GSVKHTYNVGGGSNLYANIVTRYCNSGD

 SPGNKIAAVLLEGGTRHSSWNPRTPDTYADRMIRSFCVQSD GQADRVVGVGLLSDPRRSEYDHLVGGALTEKIRTFCAPGD
 SALSKKLAAAIFMGNPRHDVGAPRPAGFSASKUQSYCDEAD
 A A GKK A A A L V F GNTRHTANNGGFPRTYTSVVFHDYCVAED A A F D A V K G VF NDG NP LH K R G L A G I P Q N WV S K T M DVC A F G D

 GELAAKVVAAAATFGAVVRSRDDGTSPNTRSDRFLDYCHYGD A AFTAV RGVF LIGNPEHKAGLAGDPSNWVSKTLDVCAFGD A Y DK HIS A V T V FG DPSRGTD SLAALLNTYAS Q I QSYCDTGD
 SIVDKV DAVILYGGPTHMRDDTAACEPYAPK\|ASWCDTGD
 APGSKVAAALVFGPTRRSRGGGQVSDGGAPRTREYCQPGD FPASRI SAAVVWGSPGRPQNRGRTPRGMQPKVRDYCKTGD EGNDYVVAAVAYGDPSNGTDGGAPWNLLADRIASWCDTGD APGNKI SAVLIGGDVRHTAANGLFPRAYAGFFRSYCVES D
 APGNKLAAVLI FGDTRHAPDNGLFPRAFSSVMRSYCVESD
 EP G D H I A A ALVWGSPRHVANQTGFPNRWSARYRDYANADD APANQI CAALLFGDPNHVPNQGRWPNNFAGVLRSWCNVDD A P G S K I DA AV AF G P T R R S Q N K G L Q P Y Y N A GI L R E Y C Q P G D EAGNRIAAALIWGSPRHVANQSASLNRWSSILARYCNFDD DVVSRINAAVIF
QMIS AVSAAVTFGDPYNS APVPGLPSGDTMDFCHNGD PAAS V S SVI MYGNPYWQA GKA WLP PAFGPK TQDDC LN GD A A GKAI A A ALIWGDVMHTANQPALLNRYA GVLRAYAAAGA $G L N G N V A A V A V F G N P S A K F G S P V S A G A F S G K A L D L C A D G D$ STFDRLAAAVTMGDPSRQDNSSAVLNQWEAKLQSYCDPGD
 E YEKN V VA IVLYGDPARAAGQSWNAGTY SANMRSWCDT G D K A L P A V KA AI L L GP $\square$ S FR S D K G G I T A RPA GYTRSYCDAT D QA A E QV LA DVFYGDPRFVGGEGAVSGLFADRLRDYCDARD


 A GF D A V K GVVVMVGNPLHRKGDAGVP QNWVS KTLDDCA Y G D



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| :---: | :---: |
| UniRef90-W7ML98 | PWEPTHQNYEKNANATA DW AGRLNG |
| UniRef90-M1WBQ0 | VYCAGG NS |
| UniRef90-M3D7V2 | CDSGFGLTP QHLS |
| UniRef90-W7L9P9 | YCEAGGKDLSVHLSYI |
| UniRef90-X8JF | MFCNPPGT\\|II HMAYPMDGSGDAA |
| UniRef9 | VFCDAGG DRKVHGSYDGRYGDDAL |
| UniRef90-M2R5 | PVCAGGTNVAQHENYFELYTDESSSWVVDK |
| UniRet90-G1X303 |  |
| UniRef90_U4L9E6 | DSG IDDTVTHLILYTAKYNDK |
| ef90_B2WH88 | CAGGNDGT |
| UniRef90 M7SW59 | VCAGGSDSNAHTAYFGDYVEEEVAAW |
| UniRef90-G4THL7 |  |
| UniRef90-B2VYG1 | P TCAPQTDDMSKHLDYFDKFGDEAAAWVIDLAKKAEG |
| UniRef90-Q0U1B7 | N1 CEGGTS ${ }^{\text {CTAAHLNYQNDAGTAGA FVAGKA }}$ |
| W3x9 | PICAQGDTVADHLSYEDVYTDSAAEWVRGLLDA |
| Ref90-W9 |  |
| iRef90_W9Q2 |  |
| UniRef90 - 2 G4V2 | GVCDSGLGLTAQHLQYPFNSQNTGASFA】KALQG |
| UniRef90-UP1000455D8D9 | P CAQGDVVETHLNYFDVFTDDVAGWVKERVN |
| UniRef90-H1VD91 | GVCDARGSDLSAHLAYSADYDAEADAW |
| UniRef90-L7JE76 | LFCDSGD DLGVHLSYAEKNL |
| UniRet90-AOAO10R | GVGSCSSQSASGHIGYGSD VNTAGTF |
| UniRef90-M2UKD |  |
| G4 |  |
| UniRef90 L2FHK2 | GVCDAGTGNLTAHMAYPSDYDTEA |
|  | PVCAGGHNVEDEHNYFDVDTPEAAAWVKERIAAFKG |
| UniRef90-Q4PHG8 | GVCDSGDGITAQHLQYSSSVQNMGATFA\KALRA |
| UniRef90-V4HVK9 | A G G |
| UniReef90-G7 | MNVM AHUEYQKGSTPQAANFUEK |
| UniRef90 ${ }^{\text {- W71 }}$ | D |
| UniRet90-A4QXP0 | F |
| G4 |  |
| UniRef90-M4FMN9 UniRef90 F4RL14 | MYCAMSGNEPVAHGSYASESEKSAVKFVVGK |
|  | QVCNAGTLDPRAHTSYFDVFSTEAGAWVKTK |
|  | PI CAVETEDLKQHWNYFELYTNETTDWL |
| UniRef90-UPIO002629DDD | FICQSSLDDEEPHVEYYS |
| UniRet90-M3AUZ6 | LVCAPGLDTVEAHTNYFKYYSEDAASWVAGLVNSFQ |
| UniRef90-W2S5J2 | AVCAAGPFVDDDHLNYFDRYTDEAAGWVRWRL |
| 004 |  |
| UniRef90-X8DE95 | CSDGLIN FAA |
|  | PYCCKG SDQATHQGYGTEYGQAAFTF |
| UniRef90 J4UMJ8 UniRef90- M2RTP | SVCDRGTLDTDQHMAYPTDAGDMGAKFLLKQ |
| UniRef90-S3E0V0 | PICAGG NVVADHLNYFDTYTDSAAAWVKSK |
| UniRet90-UPIO004560329 | GVCDHGFGINAQHLSYPSNV |
| UniRef90 F4S751 | M1 CQTSGSMMP HLGYGGS |
| UniRef90 QoU4U8 - | PICAVGPVDVAQHLDY |
|  | HLINYFKHNAQVIE WVAAMAKVGA |
|  | DDGYG ${ }^{\text {d }}$ AQHLSYPSSTSVQGTTFVEGKLKGTS |
| UniRet90-S3CTP7 | VYCASGD DSKA G G EVPTWEDAA |
| UniRet90-F4RHC8 | VAHVAYQSSAFKEAQT WAVGKLKG口GG |
| UniRef90 G2X1L1 <br> - | RFCAGGDSDPVHLSYFGNYVAEA |
| UniRef90-G2WZN4 | EAGSQNLTVHMSYATV WDDALAD |
|  | DDMSKHLDYFDIYGDEAANWV |
| UniRefo-Q2 | CTGWGNLTV HLSYASSYQDE |
| UniRef90 UP10001BF796A | C |
|  |  |
|  | CDSGY |
|  | GGD TAANHTYFDVYSSDAGKWVQEMVGKA |
|  | Al\|LQ G |
|  | QG S S WDA He YGLKYaEDAAQF |
| 90-E3OKY4 | DGGELA HTNYFQVYTNEAASF |
| UniRef90-E5AE17 | PACAQGT SWDAHENYGLKYAEDAAQFV |

D $\square$ CKGGEQLFDPHFTYNRDA GKAADFD
DI CTGQGGMMAHLKYGTQYEKDAVTFSAKMLSGGS
PVCAGGNNV ADHLLNYFELYTDDASSWVVGKIDG
PYCASAGNFDSVHGYVQEYGEDAAQFVVQKDQ
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RYC ATGNQSEVHGSYFNKYEGETTKWVVDKFEKAK
QFCCSGKN LPIHSTYVTTYGDDALKFIKQAV
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PFCCSG VDTLEHLTYTVKYNAFAVSFVLGKIL
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IICTSSGNLTV HLGYANSSQDETVDYVKAALQA
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RVCQGGDPAAGGHFAYFNDYRGQAATFVREQLGS

UniRef90- J9NBP7 UniRef90_M5C5W4 UniRef90_V8D404 UniRef90 UPIO0036248D1 UniRef90-F4R3Y0 UniRef90-W8H2E2 UniRef90_F0X8S2 UniRef90_S8BS86
UniRef90_E3Q7T7 UniRee90-UPI000476AF6A UniRef90_R1EKM2 UniRef90-E7A3BO UniRef90-R8BW67 UniRef90_UPIO00364D308 UniRef90-M2VWD1 UniRef90-W3XGR1 UniRef90-Q5Z3Q1 UniRef90-E3QIP4 UniRef90-R4MT46 UniRef90 L2FB73 UniRef90-M2STL4 UniRef90-UPI00037DAFE5 UniRef90-Q874E9 UniRef90-xoww27 UniRef90_UPI0003483BC8 UniRef90-UPI0004647EB9 UniRef90-A0A059MH10 UniRef90-W3XJG4 UniRef90-IORE71 UniRef90-N1Q7Y5 UniRef90_UPIO00456060C UniRef90_UPIO003B3209E UniRet90-F4REH4 UniRef90_N1PXB3 UniRet90-X8BAU3 UniRef90-W7ZYA8 UniRef90-W9AY22 UniRef90-K5B7G2 UniRef90-LOJ660 UniRef90-G8RNM0 UniRef90 A0A010R860 UniRet90_M7AFK5 UniRef90-X5LTZ1 UniRef90- C7ZHUO UniRef90_UP100037B353C UniRef90_G7CEA6 UniRef90_AOR619 UniRef90_ROKJV9 UniRef90-KOFOR2 2 UniRef90-W5T6Y2 UniRef90-C2CRH5 UniRef90-C3PK60 UniRef90 M3AT12 UniRef90-M7SVU0 UniRef90-05Z3G3 UniRef90- S5SX94 UniRef90-HOR337 UniRef90-M2MSS1 UniRef90-G3J580 UniRef90 D8K082 UniRef90- W2SAG UniRef90-A1UN81 UniRef90-AOPWZ4 UniRef90-M3DBF7 UniRef90-K5BKH6 UniRef90_UPI0003697E20 UniRef90-UPIo0047A369B UniRef90-M1UHH4 UniRef90_C9SX20 UniRef90-IORLU1 UniRef90-E3QTG4
IRe9o_MoQLU3

UniRef90 U4LMH5
UniRef90-J9N8P7 UniRef90-M5C5W4 UniRef90_V8D404 UniRef90_UPIO0036248D1 UniRef90--4R3YO
UniRef90 W8H2E2 UniRef90-F0X8S2 UniRef90_S8BS86
UniRef90_E3Q7T7 UniRee90-UPIO00476AF6A UniRet90-R1EKM2 UniRef90-E7A3BO UniRet90-R8BW67 UniRef90_G9P6M2 UniRef90-UPIOOO364D308 UniRef90 M2VWD1
UniRef90 $\mathrm{W} 3 \times G R 1$ UniRef90 W3XGR1 1
UniRef90 Q5Z3Q1 UniRef90-E3QIP4 UniRef90-R4MT46 UniRet90-G2XTU7 UniRef90-L2FB73
UniRef90 M2STL4
UniRef90-M2STL4
UniRef90-UP100037DAFE5 UniRef90 Q874E9 UniRef90-x0WW27 UniRef90-UPIO003483BC8 UniRef90-UPI0004647EB9 UniRef90-A0A059MH10 UniRef90-W3XJG4 UniRef90-10RE71
UniRef90-N1Q7Y5 UniRef90-UP1000456060C UniRef90-UPI0003B3209E UniRef90-F4REH4 UniRef90-N1PXB3 UniRef90 X8BAU3
UniRef90-W7ZYA UniRef90-W9AY22 UniRef90-K5B7G2
UniRef90-LOJ660 UniRef90_G8RNM0 UniRef90_A0A010R860 UniRet90_M7AFK5 UniRef90 - $\times 5 \mathrm{LTZ1}$ UniRef90-Q2H3D7 UniRef90_C7ZHUO
UniRef90_UPIOOO37B353C UniRef90-G7CEA6 UniRet90-AOR619 UniRef90-ROKJV9 UniRef90-KOFOR2 UniRef90-M9LZU1 UniRef90_W5T6Y2
UniRef90_C2CRH5 UniRef90-C3PK60 UniRef90-M3ATI2 UniRef90-M7SVUO UniRef90-05Z3G33 UniRef90-J3PQ70 UniRef90_S5SX94 UniRef90-HOR337
UniRef90 M2MSS1
UniRef90-M2MSS1
UniRef90 G3J580
UniRef90-D8K082 UniRef90-W2SAG6 UniRef90-M4Bkm9 UniRef90 A1UN81 UniRef90_AOPWZ4
UniRef90_M3DBF7 UniRef90-K5BKH6 UniRef90-UPIIOOO3697E20 UniRef90-UP100047A369B UniRef90-M1UHH4 UniRef90_C9SX20 UniRef90-loRLU1 UniRef90 E3QTG4 UniRef90-Q8FM02
UniRef9O-UPIO00382216A UniRef90-V9XJN4 UniRef90-B60797 UniRef90-D5NYE0
UniRef9O-A0A016Q3C UniRef90_U7LU06 UniRef90-K6WWH8 UniRef90-KOEQR2 UniRef90-U5ELC4 UniRef90-F5Yu96 UniRef90-M1PAB5 UniRef90-UP10003FC1FE6 UniRef90_MOQLU3

A

AEDVSKAQSNDSVIVQSDPY AATTKSIVSGDSSRADVYTVPYVAQFDRVAEVYVTVAAGA ANS MLKKVSGDSSRADVYTVPYVAQFDRQUDYNTSRAEGT $\Pi N G V L A A V P G G A \quad N Y E V V Y P A S V D Y T T G P L Q G$ LNGVTNGLPGSTIRTDYVEYYATAFPWESEVYGRSKAQAV LSAVLEAGPSSGSUALD VVAPASVVDPEUYSSVTDGU
 LS GVTRGLPG SVDVDYVDYAATAFPWEGD DYGASKKQAV
ARQVMSR SNG TTRRTESNYDSNDGNDTTSQNAATNGS VNGVCGQLDN CGYEDITYFA GEEQVYCDTVHQGT VNLIDAHPGTTSEALNYPACGGQASCGGVQYNASVVAGD LTAVTDRDASSDTRTDFVSYPATAFPWEGGIYGESRADAT LAGVTNRLRGADVRTDYVRYAATAFPWEGEVYGASKRQAV QKAVQSSLGADQVTMKGVTSYPADMAGDTSEATGSGPGS CDGLDSCDYEDIQFYNPLPAPY ATMDFPAMQSVVDGV $\square Q S \square A K$ VPDGV SLGVVYPAGVDQNTTSGQ CTGLSSCDYEDULFDASNPSGYP CSAli GGTAKCGYEDVEYPASAWSKTSWCNAVEEGR
 NSQUTAALSGGT■ YNTVYTADFSQNSA
SRATAEARPDQAVRT DLDYPADTDNNGGGSGG GNPVREQFPESRVDVYTVPYVAQFSPDGQESYNNSRSEGT FNPLQERFDAQRADVYTVPYVAQFSPDGQQSYNNSRTAGT VDALRADLPGTTVSAYAVNYPASFDFLKATDGATDAS ATALANAA GADKVYSEGVEYAASSSGNTNMGADGGAA NQQLLMAAPGGKQ YNTLYPADWSQISTVG TKPLQAEYPADDVKVWTLP YTAQFKNIMSYDESRDEGT DKGLMKQVPGGA NYEVVYPATTDYLHGPQEG KDNVLKAVPGST

AEYVVYPATLTD YF
GGRSFDVYPVNYPATDQW
CNGLSSCDYED\|LFDASNPSGYPAAVEEGR\|SG

VTSGDGPETK VTYVGYDATAFPWESADYGKSKAQAV SRPMAEQFDQARLEVYTVPYTAPFSADKQMSYNDSRAEGK
$G D P V V S N T L R L P A R G Y P Y$ Y AEDVADRVKGSIVE PRDYPATFLDPAYDESEADGV $\stackrel{\rightharpoonup}{V}$

## S


 ARQVMSRLPEGTS $V D Y V S Y A$

 | $M$ | $L$ | $S$ | $I$ | $T$ | $N$ | $P$ | $L$ | $K$ | $E$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $T$ | $M$ | $V$ |  |  |  |  |  |  |  |
|  | $E$ | $A$ | $R$ | $V$ | $P$ | $N$ | $S$ | $G$ |  |  | REALRAKFP S L A AFQGVSTDYS A NP L R E QFP A ERRLDVYTVVPYVAQFSP DGQQSYNNSRSEGT EKKILGGAVPGGAIDDELQYDTSADYSY ANPYS FMLS $\square T$ QPDVVVVWTLDYTAQFEHEMSYDESRSEGT

 AKNISSDAVPGS DI


 ANLI EAQLAGS
MTELAERVQGDG $L$ R
MTEL A ERVQGDGLSMTYEAV
L Q DL S QQVVQRDGRTVTAA AVNYPANLLDWAGFMNSVDA GV

S




T NPLKEQF GEDQVRVWTLP Y

 ANPVAQQFPKERLDVYTVVYVAQFSPDGQQSYNNSRTEGT

ANPLQERYTPDEVKVWTLPYTASINSRNEMTYDASRNEGT


| UniRef90_U4LMH5UniRef90_J9N8P7UniRef90_M5C5W4UniRef90_V8D404UniRef90_UPI00036248D1UniRef90_F4R3Y0UniRef90_W8H2E2UniRef90_F0X8S2UniRef90_S8BS86UniRef90_E3Q7T7UniRef90_UPI000476AF6AUniRef90_R1EKM2UniRef90_E7A3B0UniRef90_R8BW67UniRef90_G9P6M2 |  |  |
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|  |  |  | UniRef90-X0WW27 UniRef90_UPI0003483BC8 UniRef90_UPI0004647EB9 UniRef90_A0A059MH10 UniRef90-W3XJG4

UniRef90-IORE71
UniRef90_N1Q7Y5 UniRef90_UPI000456060C UniRef90_UPI0003B3209E UniRef90_F4REH4 UniRef90_N1PXB3 UniRef90_X8BAU3
UniRef90_W7ZYA8
UniRef90_W9AY22
UniRef90_K5B7G2
UniRef90_LOJ660
UniRef90_G8RNM0
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UniRef90_M7AFK5
UniRef90- X5LTZ1
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 K ALS A A L D GYHS S CP NGK K A AV F GYS Q G GQV A T DVFCGGS D
 RTEVDTMNVQAEACDEQRFVLLGYSQGALVIGDALAAADA

 GALJDLI AKQAGECPEQKLVLLGYSQGAQVVGDATPGLNP
 DNARGLI GSMAARCGATRFAIVVGSQGADAAGDLAAEIGT

 NAAVTAI DNFHTSCPDTQLVLVGYSQGGQVVDDVVCGGGD A NA G GML K SVA DRCGATKFGII GYSQGADAA GDLAAS IGT
 SAARGLIGAMAQRCGGTRMALVGYSQGADAAGDLAAEIGGT A N GTA Q I A Y NKRCPDAA LVVVGYS Q GAHVVGDVMMDATK $H V E Q T A A N C P Q S K L V L G G F S Q G A A V M G D A P R P M P P$ E F II D T I N Q G L Q K C P N Q T Y A L F G Y S Q G A T L I L R T L E K L S S


$M L G G Y S G Q A G V M D L T S H Q L S P$
$R T L V T M L N L Q A Q T C P E Q K F V L L G Y S Q G A M V V G D A A D E E L D P$ K R A T DAL S SMA K R C P LT S YV I A GFS Q GAVI G GDDA A D I I P A A T E D ILLTRRRFAECPLTNYVLTGFSQGAVI AGDVAARIGP

 S K L E G E L R QMH E R C P G T K F L L T G F S Q G A V L T G DVA D R I G P
 RDA GAHVVSMAHDCPNTKMVLVGGYQ GAAVVMGVTKPMTP


 D NVVA QVK A Y S E K C P S S K K V V L S G Y S E G A NVV G D I LA D S G A D NVVK G L A T T M L R R C P G T K IVAL T G Y S Q G A D A A G D V A S E

 K A A V R A I DEMNE RCP LT S Y V LI G F S Q G A VI A G D I A S DI GP RTTVKAMTDMNDRCPLTSYVI AGFSQGAVIA GDIASDIGP K N GQDQMRAYNKKCPKSKLIVLGFSQQGGEQADNPPDDSTS $N G T R A L L T G M A Q R C D S T R F A L L G Y S Q G A D A A G D V A A A E G T$
 D NARGLIQAMAARCGGTRYALVGYSQGADAAGDLAAEDGT




 VA GHVVQMTAYAAERCPNSKL I LAA GYS QGGQDASDILLGNRST K DVV D K VIT K Y H Q D C P G H K M A Y L G W S Q G A Q I A V N A F C G I P A
 TDMTNHVVMVA QECPNTVFVVLGGYSQQAQTVLGSGDDVIPE QAAVKALVDMNNRCPLTSYVIVGFSQGAVIAGDIAS DRGP RAMVVA EMTDMNNRCPLLTSYVLVGFSQGAVIAAGDVASDDGP E DTKK S DQ E Y VAA A C E D A R I A L I G Y S Q G G NV M T D T L E P I A E







 A K L E G EL S WMH GE CP Q T Q FI L A GF S Q G AVIV G DVVAD D I G G K K L K D L S S Y F Y Q C P K N K V A V V G Y S Q G G QV A S DV F C G G S G


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UniRef90_R4MT46 UniRef90_G2XTU7 UniRef90_L2FB73 UniRef90_M2STL4 UniRef90_UPI00037DAFE5 UniRef90_Q874E9 UniRef90_X0WW27 UniRef90_UPI0003483BC8 UniRef90_UPI0004647EB9 UniRef90_A0A059MH10 UniRef90_W3XJG4 UniRef90-IORE71 UniRef90-N1Q7Y5 UniRef90_UPI000456060C UniRef90_UPI0003B3209E UniRef90_F4REH4 UniRef90_N1PXB3 UniRef90-X8BAU3
UniRef90-W7ZYA8 UniRef90-W9AY22 UniRef90_K5B7G2 UniRef90_LOJ660 UniRef90_G8RNM0 UniRef90_A0A010R860 UniRef90-M7AFK5 UniRef90-X5LTZ1 UniRef90_Q2H3D7 UniRef90_C7ZHU0
UniRef90_UPI00037B353C UniRef90_G7CEA6 UniRef90_A0R619 UniRef90-ROKJV9 UniRef90_K0F0R2 UniRef90-M9LZU1
UniRef90- W5T6Y2 UniRef90_W5T6Y2
UniRef90_C2CRH5 UniRef90_C3PK60 UniRef90_M3ATI2 UniRef90-M7SVU0 UniRef90_Q5Z3G3 UniRef90_J3PQ70 UniRef90_S5SX94 UniRef90_H0R337 UniRef90-M2MSS1 UniRef90_G3J580 UniRef90_D8KQ82 UniRef90_W2SAG6 UniRef90_M4BKM9 UniRef90_A1UN81 UniRef90_A0PWZ4
UniRef90_M3DBF7 UniRef90_K5BKH6 UniRef90_UPI0003697E20 UniRef90_UPI00047A369B UniRef90_M1UHH4 UniRef90_C9SX20 UniRef90_IORLU1 UniRef90-E3QTG4 UniRef90_UPI000382216A UniRef90_V9XJN4 UniRef90_B6Q797 UniRef90_D5NYE0 UniRef90-A0A016Q3C8 UniRef90_U7LU06 UniRef90_K6WWH8 UniRef90-K0EQR2 UniRef90_U5ELC4 UniRef90_F5YU96 UniRef90-M1PAB5 UniRef90_UPIO003FC1FE6
UniRef90_M0QLU3

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140
150
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E H C A N|I K A V $|\mathrm{M}| \mathrm{L} \mid F$ G D T R D A R
PFPGS LHDK\KWACNPSD

 $V A A D V V G V Q L D A D G R R Q P N Q V P D P G D D A N R T Y S D C A P G B$ SAVERVLAVVFYGDPRFVGGEPFNAGSYADRVRDYCVARD N GPADKI A AV GLVGDPRRSPSDAQVGGWVSQNTRTECAYGD
 ALID RVTAAVLMMGDPRHMAGNGVFPNRYKDKIISSYCNIKD
 GPPARVVAGVGGLDDPRRSPTDVQVVGGFDSDRVRTDCAEGB EAASRVAGAVIVFGDPDNPKPVANVQNLDGVACAAGD FPTSRI A A AVYWGSPDLRSPGRPQTPRGMETRVRDYCVKDD
 SAAAA K AVVLMGDPRNDAGNAGFQCAAASKVQSYCDAAAD GPADKVVAV GLIGDPKRSDADADLVGGYVSPVVRTFCAVGD
 A GKS V V GAVTFGDPYVGQ GPPDRLAGVGLIDSPRRSPTDVQVGGWVSDRVRTDCAVDD APGNKI A A V L L F G DTR H A P D N GLIFPRAFSKVARSYCA D S D
 T P GS K V CAALLVFGDPTHIA D Q GQMANNFSSVLVRSWCNGED APGANVVAAVTFGAVSRSRNRARTPEQLANLTQDYCHYGD GPADRIVKGAALIA DGRREPGVGVVPGVLNDRVMDVCAPDD
 EAAAAVSAIVFYGDPRDETRDGLLPRPFADRLRDYCVSDD $V P A D K V L G V T L I A D G R R D F G P G Q V P G I L A D R T N T I C A P G D$
 A L A D R V A A
$D G S K V A A V V A F G D P F N G Q D \quad F E G V D A S K C K E F C G S S D$ A A F D AVRGVVLVGNPERQPGKGGDPANWVPKVLDICIFGD
 FPAES V S S I I M Y G N P Y WQ A G G I K L P P A F G P DT Q D IC LD G D STLQSVVAAVVMMGDPSNATKNGIGPRGLASRAKSYCDAGD


V DEDLVLGVTLIADGRRQPGVGQPPGQGANRVFQDCATGD
 $V$ D E DLVL G V T L I A D GRRRQP GVGQQPNAP GQRTYE I CAT G D APGSQQVCAALLEGDPTHDAD GSSFSGQMARSLRSWCNGE D




 APGSNVVAAVTF GAVSRSRDQNFTVGRYSDVLLDYCHYGD
 GPPDRLS GVGLISDPRRSPTDVQVGPRVSDRVRTDCAAGB

 DARSRVAALVLFGDPSGDWTDTSFPELPSNTQLVYCTTPD VP A D L V L G V T TL DA D G R R E A G P G Q V P G I L A D R T Y T ICC A P G D $\operatorname{VPA} D K \operatorname{RAGVALVA} D G R R E N G V G V N P G N P A D R T M Q F C A P N D$
 SPGNK I A AVII F GDTRNLQ GYFPRP DYYAP DMRNWCVSTM D A VK DVVAI AI FGDPSFRNGIGACANF TNNIVSYCDAGD
 $T$ LAPRIVADVVTFGNPLKGQSVDGSSMSYGSKAVEFCNQ GD $I D Q D L V L G V T A \prod A D G R R E S G V G Q P P G V G A D R T F E \| C A P G D$



 $G P A E R I R G V A L V A D G R R V P G V G Q F P G T F N D R V Q D D C A P D D$ SLAA P LPKS I IL FG D P T F RR G NHKACNAVGDHUASYCDA G D VDD D L VL $\operatorname{VGVTLDADGRREHGVGKPP~GQGANQTNEDCAPGBD}$ SP GS S I CAATLEGDTTHAAASQSRNMNQRAGVLRSWCN GDD GPA DR R GVALVA D GRREP GVGQTVGNPNDRVVADDCAAND
 S Y ID Q I SA A TVVFGDPS FTHGQSALLDNTYA GKIIRSYCDA G D GPAESVAGVTA DADGRRENGVGINPGAPADRTYQDCAPS D DVEKNVVAI DTFGDPSHVANDGGFQRNYS G L L H A Y C DT G D GPAENI AGVALIA DGRRENGVGQNPGEDADRTFQDCAPDD $G R A G Q V A G V V L L S D P R R S H D N N L V G G W L L P R A F T I C E P R D$ VPAKRILLGVTLI SDGRRTGDTGPVPGILAERTFTICABGD

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


UniRef90 U4LMH5 UniRef90-J9N8P7 UniRef90_M5C5W4 UniRef90-V8D404 UniRef90 UPI00036248D1 UniRef90-F4R3Y0 UniRef90-W8H2E2 UniRef90 F0X8S2 UniRef90-S8BS86 UniRef90-E3Q7T7 UniRef90_UPI000476AF6A UniRef90 R1EKM2 UniRef90-E7A3B0 UniRef90-R8BW67 UniRef90_UPI000364D308
UniRef90_M2VWD1 UniRef90-W3XGR1 UniRef90 Q5Z3Q1 UniRef90-E3QIP4 UniRef90-R4MT46 UniRego-G2XT3
UniRef90-M2STL4 UniRef90-UPI00037DAFE5 UniRef90 Q874E9 UniRef90-X0WW27 UniRef90_UPI0003483BC8 UniRef90 UPI0004647EB9 UniRef90 A0A059MH10 UniRef90-W3XJG4 UniRef90-I0RE71 UniRef90 N1Q7Y5 UniRef90-UPI000456060C UniRef90_UPI0003B3209E UniRef90_F4REH4 UniRef90_N1PXB3 UniRef90-X8BAU3 UniRef90-W7ZYA8 UniRef90-W9AY22 UniRef90 K5B7G2 UniRef90-L0J660 UniRef90-G8RNM0 UniRef90 A0A010R860 UniRef90-M7AFK5 UniRef90-X5LTZ1 UniRef90 C7ZHU0 UniRef90_UPI00037B353C UniRef90_G7CEA6 UniRef90 A0R619 UniRef90-ROKJV9 UniRef90-K0F0R2 UniRef90-M9LZU1 UniRef90_W5T6Y2 UniRef90-C2CRH5 UniRef90-C3PK60 UniRef90-M3ATI2 UniRef90-M7SVU0 UniRef90-Q5Z3G3 UniRef90-J3PQ70 UniRef90 S5SX94 UniRef90-HOR337 UniRef90-M2MSS1 UniRef90_G3J580 UniRef90-D8KQ82 UniRef90-W2SAG6 UniRef90-M4BKM9 UniRef90 A1UN81 UniRef90-AOPWZ4 UniRef90-M3DBF7 UniRef90 ${ }^{-}$K5BKH6 UniRef90-UPIO003697E20 UniRef90_UPI00047A369B UniRef90_M1UHH4 UniRef90 C9SX20 UniRef90-IORLU1 UniRef90-E3QTG4 UniRef90-Q8FM02 UniRef90 UPIO00382216A UniRef90_V9XJN4 UniRef90-B6Q797 UniRef90 D5NYE0 UniRef90_A0A016Q3C8 UniRef90_U7LU06 UniRef90_K6WWH8 UniRef90 ${ }^{-}$KOEQR2 UniRef90-U5ELC4 UniRef90-F5YU96 UniRef90-M1PAB5 UniRef90-UPI0003FC1FE6 UniRef90_UPI0003FC1FE6 UniRef90_M0QLU3

170
180
190
AlICHGGFNRNGFHYEY DEYFAPAAEWVI NQVVGDS G VYCDVGKN NETHGSYFEKYGKEVVDFVVERYEKA LFCA IP GYS LPAHLAYPTDGSGVAAAFAKAR
LICDAPTDANP
FI C Q S S SLDDLS GHVAYFD NGMQQGAAFVIDNRL
SICQTVGSUIPBLAMAGSSSERAANFAVARL
LYCSTPKEDFVTRLAA
VYCASGSDTTAHREEDPTWATAAETF\|VSK
ALCAKGKGNLGGHYDT $\operatorname{LF}$ S $\square F S R Q A R E W V L E M D$
LFCASGQNLTV H LGYFQNYVAMASSFIVQNVQ
LYC S
LICAGQPVILAPHLSYGANA GAAADFVAS
II CSNWG SLAFHLSYANSSQDETVDFLVQSALAA
PICAGGDTVAEHLNYFDDYSDDASD
$P Y C C N G N D P N T H Q G Y G T E Y G S Q A L A F V N S K L$
LYCSTPKDDYVARDA
LYCSTENDDFVTRMA
SVCGAGSSSTSGHLGYGSD VNAAAAF $\square K S$
LYCATAPDDFVT
PICAGG KTAANHDNYFD DYSGDAGKWVQEMVG $P V C S S G G N W A A H N G Y A D D G M E Q A A V F A A G R L G$
GVCAPNP ILPAGHDSYGDSVQTTAAEHVDARVA
TVCAYGDGTRDAHTNYFQLYTNDGAAYI KEK
PICAVGSEPQDVHLNYF $\square K H N A E V T K W V A G M A K A S T G$
PVCDAPRDVRNA
GVCDHGFGI NAQHLSYPSDVQTMGYKFAVNKLGG
IYCTEGGSI LP H HLQYVPGSTDQAATFVAQKL
$F I C Q A T G L D E A G H V E Y F D N G M Q Q G A A F A \square T Q L A$
MI CDA
GI C DAPPNALPDHALYVDDSGTTATQWVA
GVCDAAGSNLTAHTAYAKDWDTTAAAWLED LLA
F LCSGGTTGSGGHVSYGGDAEA AASF $\|$ VQAVGA
GVCDHGFGINPPHLLYGSSVQGMGASYMKKALG
SVCDAPDDVNGVHALYATNPGTTANQWVVD
$\square V C T S S G G M K V H F K Y G S Q Y E K D A V A F S A D M F G$
PYCSGNFSMLSVHLGYVQEYGSAATTFVV
PVCSDGMN FAAHDTYADDGADKGVSFASSHLG
LICSA
L I C A A
L I C S A
1 C A Y GE GRTDAHTNYFQLYTNDAAAY $\square K E K$
L YCN
LIC S A
P V
TYCDRGSDE DVVHGEYVSKYGDEVVEYVVDQYEKA

LICAA
L I C S A
$P \mathrm{C}$ A V G P Q D VN E H L N Y F LQ H N S E VT K WVA A M A K A
LYCAl P D G DFA A
$V \square C T S W G \quad T L G P H L S Y A S T Y Q D E T V D Y L V Q A$

| $L$ | $Y$ | $C$ | $S$ | $T$ | $E$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |
| $S$ | $I$ | $C$ | $D$ | $A$ | $P$ | $L$ |
| $S$ | $G$ | $L$ |  |  |  |  |
| $S$ | $C$ | $D$ | $A$ | $P$ | $L$ | $D$ |
|  | $V$ |  |  |  |  |  |


$A \quad \mathrm{C}$
$M \mathrm{C} D \mathrm{~S} P R \mathrm{R} A \mathrm{~L} \mathrm{SP}$
$T$ C Q T A G T I L A H L S Y G DEHMAGAFDF VVKNLQALLG
SICDAP Q D I S N A
LYCN
$\stackrel{L}{\mathrm{P}} \mathrm{D}$ C A A N Q T WF S S H L S Y Y N T D S QA A A S WIQS
VYCS GGNN RSVHGLY LVNYPKQMMQFVIDGYNNATG
TICDAPADVGNAHALYATNPGTTANQWVVDWAKGLIG
P I CA A GP E EVVE T H L N Y F D DS S NVF GE WVQN MVA
$P V C G G G F N T M A H M M Y P M D G V T T A A Q Q A A S L V Q R G A G$
LI CAA
L I CAA

AVCDYDPNSVAIIHTAYGRSGDQLA
PVCDA $\$ S D D Q A I H T G Y A R S H A G
$P V C Q G P G F D V N A H L R Y P E D E A H K A A Q W L R A R L$
TICDAPANVGNA
$P$ I C DVE S EVT E T HVT Y LIE R Y L E E S A E WV VE R
LI CAA
$P \vee C S$ GSDGGEAAHTNYFQLYSNDAAAF $\square K E K$
SICDAPRDIGNA
$\begin{array}{llllllllll}L & I & C & D & A & T & D & N & P \\ L & Y & C & S & T & P & P & E & D & F \\ V & V & T & L A\end{array}$
$V$ Y C A S G D V S SVVHGQE VP T WGS DA VR F $\square V S M$
SICDDAPHNIGNA
VYC D R GD DT DVVHK S Y F EKY GK K VED LVVEK YES A
SVCDDA T GVV GV HA QYASNDGTTANQWVVD
LYCN
L 1 CD A PREALSP
L Y C S
L 1 C A A G G A GQPV V A L Y G T T A V
SICDAPRDVGNA
$F \mid C G S S R S G N S G H K H Y A D D S \square D K A V R E \square A S \square L K A$

UniRef90 UPIO00476AF81 UniRef90-Z5X4M0 UniRef90-H1VNJ3 UniRef90-UP100029A67AE UniRef90_UPIO0047674A4 UniRef90-W5T7P0 UniRef90-H2G8S2 UniRef90-U5EIL1 UniRef90-J4VVA5 UniRef90_-17FG37 UniRef90-F1YMG7 UniRef90-UPIOOO399EOB4 UniRef90_U5EIB3
UniRef90-E9T814
UniRef90-D5Z925 UniRef90 U3GZz5 UniRef90-KoUH65 UniRef90-F9WYC7 UniRef90-A0A024JQ09 UniRef90-G8RPJ4 UniRef90-N4TQY3 UniRef90-K3UFR0 UniRef90_U7KW34 UniRef90-F4RZ64 UniRef90-J3Q3Y8 UniRef90-G3J5W5 UniRef90-X8F796 UniRef90-HOR143 UniRef90-V9D6T2 UniRef90-UP10003FD1AEE UniRef90-F5Z027 UniRef90_UPI0004660E3E UniRef90-C1BBT3 UniRef90_L8DNV6 UniRef90-UPIO0036DD44C UniRef90-R7WJW4 UniRef90-A0А059MK40 UniRef90_W7ZV69 UniRef90 ${ }^{-}$A0A022LKV4 UniRef90_UPIO00465640C UniRef90-C1B934 UniRet90-F6EEB4 UniRef90 V9XQ70 UniRef90-L7INM44
UniRef90- $\times 0 B 5 F 7$ UniRef90-A0A024QWC5 UniRef90- V8D4M8 UniRef90_UPIO003747FE1 UniRef90-14BQXO UniRef90-L1M9Y7 UniRet90-L2G5M6 UniRef90-B8ZTV6 UniRef90-UPIO00465A28E UniRef90-T1VHY0 UniRef90-UPIO00378B24A UniRef90-J3NKP1 UniRef90-D7W914 UniRef90-H81KN8 UniRef90-D5P9888 UniRef90-B6GW76 UniRef90-H6MUO9 UniRef90_UPIo00381BB69 UniRef90-UPIO0036A5644 UniRef90-UPIO0040355C9 UniRef90_W8H3J5 UniRet90_E2SFT4 UniRef90 - V9xJW4 UniRef90-W7ILL1 UniRef90-M3VE15 UniRef90-L8DI70 UniRef90-V9XPV2 UniRef90-D5Z3F1 UniRef90_QORY47 UniRef90 W8B2G9 UniRef90_V8CU04 UniRef90-W5Y3T6 UniRef90-X8DFX5 UniRef90_UPIO0021926D3 UniRef90-H6R7G5 UniRef90-EODED5 UniRef90 N1PU29 UniRef90-W5Y4K1 UniRef90-UPIO00382D1C3 UniRef90_E9T237 UniRef90-K0VV66 UniRef90-C4LGS6 UniRef90-K6W9V3 UniRef90-UPIOOO3824698 UniRef90-F8DYQ4 UniRef90_J9MPI3

QPAHCSDVVELI S AP GTWESSPSDDPMNPT GCADYHWIGAAGSGQNGGMGSVVYQS
QPADCPDVEMTAVPGTWESSPTDDPFTPVV QPASCPDVQLLSIPGTWESRSDDDPHNPV S S
 A A P GCPSLYV VA $\square P G T W E T G H D K A P G P G M$ L HILVGRGTGEPA GLGETG
A A P D CPDLHW GVVA GS GENGGMGRVVYRS
P Q A QPADCPDVLTLVIPGTWESSAKDDPYNPT
 A A P S C P N L QVVV A I P GTWETTP GA SRGP G L

A Q D A S C P DVVQMLVIPGTWESSPTD DPDNPM QT DCPDVHWUGAAGSGENDGMGRVVYQS

QPE WCPRVEFISAP G S LEE P Q GP G D S GGCKS Y M M M G A R G T T E T Q G R S

C S S Y T $\square$ LS A R G TVE P Q G G S ID F Q T M
QRPDSQPASCPDVETVVIPGTWESANPRSLMLRV QDASCPDVQLI AVPGTWESSPQDNPLNPV

Q P E WCPS VEV VAAPGTWES SATDDP $\square$ NPM
QA QPASCPDVQVISVPGTWESSPTDDPHHPT ASSGCPAVEVVMMPGTEETDSTANPDVAQ
$P Q A G A P A C P D N \square L V A \square P G T T E T N E Q A D P N V P V$
$T V P A D A Q A G T T A C A S T F N L L I P G T W E T D E H A D P A A P V V$ $P G P C P S L Y V V A V P G T W E T A P D G R Q P G P G$ QADPAGCPKLQVVAVPGTWETSNTPDPQNGM
 $P D C P G M Y V V A V P G T W E T S R E D P R E G M$
 QPAHCPDVQLLSI PGTWESSANDDPFNPS
 A Q S CHD $\square H \square F S A R E T S$ VAPGLGSAGQ L

SAVSAPTASADPAGCPELYVLA DPGTWEKSADAQDRGML
 QDASCPDVLMV SIMPGTWESSD QLNPMNPV QP D WCPNVVEV A AP GTWESASTDDPYNPT
SAQPQNCTPYKILDARAS GEPQGVSLS
 D P CPGLYVVAMPGTWEPSGTSPGAGMLL QSA D CP DVQLI SIP GTWES S RALDP LDN PV

A CPPAHVMAARETTAPPGFGT
PGWCPAVEVISAPGTWESSKSDDPFNPT

 TTPPNRPEAQPADCADVVLTLV DDPGTWESSTPNDDPPLNPDV QPEWCPRVEFI SAPGTWESAADDDPFNPQ
$P T A Q P A D C P D V Q T, V I P G T W E S A A N D S P T A P H$
ERPNANPPASCVDVVQVIAAPGTWESAPDCDPVNPA A DCRDVVVLVGVRGS GEP Q GP D PSTPAV



A HADPCSSDDAVVFARGTHQASGLGDVGEAF
TAHAASGAATFNLLDPGTWETSETADPHQPV
A QPSSCTPYMAYLVPGTWETTATADPSKP

Q P E A Q NPP GCVAHEVI AAP

V N A | QP A S C C | $P$ | $D$ | $V$ | $Q$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |

| $A$ | $A$ | $P$ |
| :--- | :--- | :--- |
| $A$ | $V$ | $P$ |
| $V$ | $A$ | $P$ |

GQD TEDEPLP
QSTTCHSYVII S $\square R G T Y E L Q G R S D A F T S M$
A QP DWCPSVVEVVAAPGTWETANPNSYMLT $\square$

P E A A

P | Q S A D C C P P | $D$ | $V$ | $E$ | $V$ | $A$ | $A$ | $V$ | $P$ |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $P$ | $V$ | $C$ | $C$ | $P$ | $P$ | $A$ | $V$ | $Q$ | $V$ | G C A P Y E $L$

$P$ A $T$ A A P G T
D A R G S PG G P Q GVS


UniRef90_F9WYC7
UniRef90 A0A024JQ09 UniRef90_G8RPJ4 UniRef90_N4TQY3 UniRef90_K3UFR0 UniRef90_U7KW34
UniRef90_F4RZ64 UniRef90-J3Q3Y8 UniRef90_G3J5W5 UniRef90_X8F796 UniRef90_H0R143 UniRef90_U5WT98 UniRef90_V9D6T2
UniRef90_UPI0003FD1AEE UniRef90-F5Z027 UniRef90_UPI0004660E3E UniRef90_C1BBT3 UniRef90_L8DNV6 UniRef90_UPI00036DD44C UniRef90_R7WJW4 UniRef90-A0A059MK40 UniRef90_W7ZV69 UniRef90_A0A022LKV4 UniRef90_UPI000465640C UniRef90_C1B934 UniRef90_F6EEB4 UniRef90_V9XQ70 UniRef90-L7INM4
UniRef90- X0B5F7 UniRef90_A0A024QWC5 UniRef90 V8D4M8 UniRef90_UPI0003747FE1 UniRef90_14BQX0 UniRef90_L1M9Y7 UniRef90_L2G5M6 UniRef90_B8ZTV6 UniRef90_UPI000465A28E UniRef90_T1VHYO UniRef90_UPI000378B24A UniRef90_J3NKP1
UniRef90_D7W914 UniRef90_H8IKN8 UniRef90-D5P9B8 UniRef90_B6GW76 UniRef90-H6MU09 UniRef90_UPIO00381BB69 UniRef90_UPI00036A5644 UniRef90_UPI00040355C9 UniRef90_W8H3J5 UniRef90_E2SFT4 UniRef90_V9XJW4 UniRef90_W7ILL1 UniRef90-M3VEI5 UniRef90_V9XPV2 UniRef90_D5Z3F1 UniRef90_Q0RY47 UniRef90_V8B2G9 UniRef90_W5Y3T6 UniRef90-X8DFX5 UniRef90_UPI00021926D3 UniRef90-H6R7G5 UniRef90_E0DED5 UniRef90_N1PU29 UniRef90_W5Y4K1
UniRef90_UPI000382D1C3 UniRef90 E9T237 UniRef90_K0VV66 UniRef90_C4LGS6 UniRef90_K6W9V3 UniRef90_UPI0003824698 UniRef90_F8DYQ4
UniRef90_J9MPI3
$T L A D S Q Q F P S S R \quad V Q T Y T V P Y T A Q F N N Q M S Y N D S R A E G T$ LQELS AEVAK DGRTMTAEAVEYPAGVGEWLGF $\quad$ GGSVDA GS


 $N K N V F A E R T G G K L \quad Y N V V Y P A D W D Q N S A S G$ $A$
$T$
SKA LQE QFPTS RTEVYTVVPYMAPTNLADRQADYNTVSSQGY

 ANPLQERFSPD DVKVWTVPYTAQFNAMHEMSYDASRNEGS
ANPDQEQFPESRVDVMTVPYVAQFAAPPEATYDDSRAQGG

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## L





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

 YR DFAAMVQQS GRTDTA EAVNYPATPDDWLGFMGSVDTGAA





 SK A I K S E F P E S RTEEVYTVVPY C TA E F R N DR Q S S Y N D S RT Q G Y A N P L Q E R Y A P D DVVRVWTVMP Y



 A N K L R D E F G E S T A D
$A$
$A$
A VA H ALDN NA H G D A V EVV Y T L P Y MA R A F F DN G H T Y A D S K A D A V
 Y GMLADRLPAS ISAYRVNYPAAYSFN

A GLL LG KVGGAE LEE ESYGITVVIYPNYSAASAFDK GQTYA S S E


 $T R P \square Q Q A Y S A D Q V K V W T Q P$ YTAQFRNDMTYDDSTTEGT





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 DDVTRY门TTGLQSCPSQKYAI LGYSQGASATMLTLDAITD NTLNAELTATHAECPLTDFDLTGFSQGAVIAGDVANQUGT AATIDLIERRHAECPDTTYLLTGFSQGAVI AGDVAARIGP AALGNQYAAFTQQCPDSKVVLAGYSQGAMVVHRNLIAPLAG RIVNAELSATHDHCPATKFVIMGFSQGAAIAGDIASDIGN KRAAGEIDSTNKKCPLTRYVIMGFSQGAVIAGDLASNLDP NRTFAELNTKHSLCPLTRFVLTGFSQGAVIMGDIASEI GN


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VP A D R|V LG|V|TLLADGRREPGRGSRPGGFGDRTNE\||CAPND
 $G K G V V A A V T F G D P F K G Q G$ $\qquad$ VA G V P T GK F K S FCA A G D IPAELV RGSV LIA D GRR IPPGEGQSPGLSPDRTAQDCDSRD $V P A D L V L G V M L I A D G R R D I G P G Q A T G A V A D R T F T V C A P G B$


 ATSPNLAAALLVADGDRLPTDPT@PPTVGSRTISVVCRGD $A D Q D L V L G V G L I A D G R R Q P G G P S P P G V G A D R T Y S I C A P G D$ $V P A E K V L G A I M M A D G R R E N G V G V N P G I L Q D R A F Q I C A P N D$
 $V D E D L V L G V T L I A D G R R Q Q G V G Q V P P S P R$ $V$ PA ERR RGVALVADGRREPGVGQTAGDLDDRDFEDCAPDD
 VD D D LV V LGVTVLIA D GRRQPGVGNPPGQGAEKTNEDCAAGD QASPNLAAVLLVADGDRLPAPGPDSPAVGARTDSVCDLGD
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 GAADRLVAVGLLSDPRRSEAAGARPGGFGWATVSIICATGD GPPHRLAAVGLLSDPRNGAGGPRDGGFGSGBDVTFAADGB
 V
V
V

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 V D A S RVLAV GL LA DP GA GTPGAA TVGALS GRVASICDPGD AVAD HV AAVALFGEPSSGF
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 S IV NAI K AVLVVGNPYHVPNRGIPE\|YYQNKLLDICHTED







$P \square C G D S L N V W P N H W A Y G S D L I N Q A A D F A A A R \square R$
Q Y CN
LICAA
H C D A P L G VGA A
LVCAPDP DLASDHLS YGQSVQDLIASHVMSR
LI CAA
AV C D Y DP D S VAVHTSYAR
LYC S T P K D D F VMM LA
L I CAAPT
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S I C D A P P NVG D A
LI CAA
LI CAA
$\stackrel{L}{P} \vee C D P T D G L L A A A G Q W A M Q A D G S A$
GVCS CSCALVAGHLSYGDAVQNTAFQHVVSR $\square$
LI CDAPTASNP
PI CAAPESVLDAHAQYGTN
LI C D A P T I
A V C D A P A Q $\square G D A$
G I C D A
VV C A R P GATMGPHLTYSTEDLQSVAVWQGARVAA
SICDAPPNALNP
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LI C D A P TVVTNP
L I C A S P S D G L S
LYC S
$\square \mathrm{Y}$ C S $\square \mathrm{RKGGNP}$
LY C S
S $\square$ C D A P H N $\square$ G N A
L V C S A P R D $\square$ N A V H A Q Y A T N G G
LI C DAPRDAL
AI CDAPREDGNAHSVYATNPDTTANQWVVEWAKGL
$\square V$ CAPGSSFSPGHLHYGDNVQT LGKNFLI EK LG
SI C D A P Q DVNVA H SLLY A T N P G S T A S D WI V G
A I C D A P Q D $\square N G V H H A Q Y A S N G G T T A N Q W V V D$
G I C D A
AVCDVTATA $\quad$ DA VHTS Y A R S S S G
A $\mathrm{A} \vee \mathrm{C}$ D
LI C D A P T $\square$ A N P
TI C D A P P S V T D A
LV C D GPR DPN P DHK E Y A K N G GA TAP Q WVVG


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 RRAEEK LDRKTHAHCPDT RYVLMMGFSQGAVITGGDVASPIPA EAEQRQMTDYAKKCPNSSLLLVGYSQQGTAVVGDILDGSTGG


 K R A A GK IIDDTNKKCPLLTRYVIMMGSQGAVIA GDLASNLDA NDTKKKI QDYVAQCTSSKIALVGGFSQGGNVMTDLLAPDDP
 VKAR QAVAAVA A SCEATRFALLGGYSQGADAAGDLAAAEI GT EALGNQYAAFVQRCPDTTVVL AGYSQGAMVVHRNLHALAG
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 D A L GLQQYQQ F VA QCPTS QVVLAAGYSQQAMVVHRNLAA L

 DKARGLVGAMAQRC GATKI GLLGYSQGADAAGDLAA E I G T E D TK T KI Q D Y Vid A C G S S RIIA LVGGYS Q G G NVMTD TLDA G GT G

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 A ATEAQQAQ $\square Q Q E C S D T E D A I V G Y S Q G A D \| A N R V A D D \square G P$ T QAVVNWTSTCRDSKIVTCGYS QGAAASTRAM
$D K \operatorname{L}$ S D L L D S E G R R C P K E WTV L A G Y S Q G A Q A I T E A L G R T S

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UniRef90 L 7 LNV 7 UniRef90-J3NYY1 UniRef90-M2YMS1 UniRef90 L7KMP2 UniRet90-M2X1A9 | UniRef90-D5UQU1 |
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SDQDLVLGVGLTADGRNQHDVGPSPGVLEDRVFSTCASGD SP NFAGALLI ADGDRLPTDPPLPPGIGARTVSVCELGD VPADRVLGVSLADGRQELDKGKLPVVPGDRVNNYCAPAD VDQDLVLGVTVI ADGRRQDGVGQSPGPLUDRTNQMCGTGD VAEDKVARAVLLANPSRWKPDGQPPEFGSMEVVEI CNEGD AASPNLTAVLLIADGDRRPNDGTASGTPQHRTISVCNLND
 ADQDLVLGVGMDADGRRQPGGSMVPGTLSDRVYSDCAPGD VPGSKVAGVLMFGSDKRTYNVGGASHLYANLTRDYCNAGD
 GKAEQVLAVGLLADPGSGTNGEAVIGPASGRVASICDPKD GPAENVLGVGLISDPRREPGDARTPNPPGDRTVSLCGNKD GDQDLVLGVGLIADGRRQAGDGPSPGTLQDRVQSICAGGD RYYKN1 GVTVVGDPTNGSGGGDESNVLADKVASYCDGDD VAAERLIGVGLISDSRRVQGEGAlGPDPADKVVTDCGSND GAPHRVELVGLVADPRRSPTDNLIGGWLSRTTYTFCAPGD VPAENTAGVSLIADGRREDGKGTLVGALQDRVNQFCDPAD VPADRVAGVSLFGDPTRPAGSPLFPGRDG
TV VRSVVLFGD GEDGAVVGVDARFVKTFLSRGD VDPSLIAGVALTADPGATMRGGRPDGFLNDRVKNFCAAGD GDQDLVRGVGLIADGRRQSGGGLVPGGLRDRVQSMCAPGD GPADKVDGAAMI ADGRRENGVGI NPGALQDRAYQ:CAPND GEQDLVLGVGLIADGRRQPGGNLVPG\|LRDRVQSICAPGD IEADRVVAVGLLADPHRDPNRGRDFGALTDRVRTLCADGD VTPQQVKAVILLANPKRGTEGATLIGPPAGKVFDICHPDD
 1PAENVAGVALIADGRQQLDKG
VPADRVAGVSLFGDPTRPKASPDFPGRDTGRVASYCASGD IPADKLTATGLIADPQRGTDGEKMYGTAPHKVVNVCNDGD KYASNVIAVVAYGDPDQSWNVGGACEPFASSLKSYCDYGD GPAESIAGVTLIADGRREAAYGQVVGNPVAKVNETCAPDD
 VPAERVRGIALVADGRRVPEQGPVSGVGADRVYQVCAPDD
 SDQDLVLGVGLIADGRREKGGPRSGGFDRDRVQSDCAPGD KPDPAVEAAVVFGDPRFNAGQAYSAGAYAGDLRSYCDEGD ПPASKLGATVLDADPRRGTPGPRTEGFAGMKVMTDCDPAD VPRLAGGLLLADPDRLTYDSR\|SSAVGNKFDSYCQDQD VDPRRVAAVALFADPQRADNSNVIAGTNQSR
1 PAEKVAGASLFGDPTRPAGSGLFPGKDGATTPD N \S CDAYGDRTRSYCDEGD DTADHVAAVATFGNPRSARGMGPRPLTCARTEIRFARRAS DPGNRVAAVLNFGNANQSWNVGSGSGRWADRFRDYCEAND $V$ VEDLLLGAGLIADGRRDPAAGARPGGFADRVVQUCAPTD
 DDPDRV DGVALDADGRRVPGQARVPGDIADRVYSVCNPSD I EADRVAGVALFGNPARPTNAPLFPG
I SADRVLGVGLLSDPAAGDPRPRGMGALSGRVTSTCDPND VPADLVLGVGLI ADGRRDPAFGPRPGGFGDRTYQUCAPSD QAPSRLAAAILIGNPSHYPG
ПPAEKLDAVGLVADPRQSPSAGARPGGFASVTRSYCAPDD VPAANVAGVALIADGRREDGKGTLVGSPQDRVNQFCDPAD VPAENIAGVSLI ADGRREDGRGPRPGALQDRTKQFCAPAD ESKAKVFSVLAFGDPVNSPSVGLDPSTSAKSVASFCNKGD VPAATVRAVALLADPKRGNDGAGVAGSLEGRLKWVCDEQD
 VEADQVLGVALLADPGAGTKGAATVGTLSGRVASUCDPKD GHVAHVAGVVLVADPGRAPVVPNPP
$\square P A D R V D G V G L I A D P Q Q A N T G G Q V V G P D T S R V A Q Q C D D S D$ DPQSQVEGV LYADPRNSAGGGARGGFGD苗AVQEVCDEGD DPVDRILGVTLADGRRQPGVGQ
VPADAVAGVALIADGRREDGKGELIGSPQDNTLQFCAPAD DTPQRLAGAILVGNPDHYPG
GQPQQVAGVVLVSDPRRGRGGGPRPGGFGWRVNTDCDPND DVQRNIAAVVLMGSPRFARPEGFSCPVFDDRMVSFCDEGD GANKVLAVGLLADPGRGTSGGPRPGSLSGRVATDCAPAD $V$ VAA VVAGGMLIFSSPNRPPGSGFFPGADGQST IQPDRVDGVGLDADPGSGDPRPQGMGQLSGRVASMCYTGD DTAEQVLAVGLLADPSGTQGEAVIGPKPSGKVASICDPKD GAADRVAAVALFGDPTRNPNAPLFPGSPGKRTPD LRPGQIAGVVLLADPRRSRADQLIGPPGSRKVFTDCEPSD VARQNLDGVVLFGDPAYRAGEPTTSATPVTMLHSWCVPDD VAAEDVLGVALTADGRRDPAHGPVGPEPADRTYQICAPSD VDADRVLGVALLADPGAGTKGAATVGPNSGRVASUCDPKD VPASRVRGVYLISDPNRTVGADLVPGAPG


M I C D APTVTNP
AV C DVTATGVAVHTSYARSTGG
LI CDAPADANAVHAEYATNG
LICAAPPD
$V$ WCDS $\quad A P T H R \| V G P V A T N P$
$A V C D Y D A N A V A V H T S Y G V G Q T Q G \square A W T A$
LFCA $\quad \mathrm{P}$ GVSLPAHLAYPTDG
PICAPQTEDMNFHLDYFDKWGTEAADWVVSKAREAAG
LICDSPT
$\mathrm{P} \quad 1$
$\begin{array}{ll}\text { Y C S } \\ \text { Y } \\ C & N\end{array}$

| L |
| :--- |
| L Y C |
| C |

Pl CNQPKD IF QA
LICDSPTVTNP
LVCASGASS EVHSNEVAAHAQEAADF 1 VARAR PICN
LYCAMPDGDFA
PVCDYDPAAGSAHTSYVSGHG
LVCSAPRDVGNA
GVAGGEGNVIGPHLEYSLDAPA AAMFVMQR
TVCDAPPTIGNA

LICDSPTIVNP
LYCS
AYCNTDGQSTP

LACDAPSDAPVTHL
1 YCDSAPGYRA
YQCCSPDDANAAHHTYFTKYNQDVVAF $\square$ QSR R $\square$ G
S CDAPPNVEDA
AVCDYDPDAVAVHTSYAR
LI CDS
HICDAPRDVANA
LICDSPTVANP
LYCATASDDFVT
PFCASGD DLDVHYATTAKYTEAATDFVVG
LYCATPGDD
PICQ TYGSRKGHREYATNG
$P \vee C S \quad F N P G \square A G V T Y G$

TYCAGGNNTLI HVTY $\square$ DRYTDDAVDFVNSKLAA
CATVTRGUVFPAHLSYASGMPGQAAAFVAGRL
PLCAQGG DPASHRDYFEKWRQMAAEFVASRLG
SICDAPQD DNGTHAMYASNPGTTAPQWTVDWARGV
GICDAPAGAFKP
G $\square$ CNAGMAGNPAHAMYASFAGTTATQWLAG
LYCSIQKNANP
$G \square C D A P A A A D P V H A M Y G T T A T Q W M A Q W A A E K \square D A A$
LYCSTNSN
LVCSAPRDIGNA
LVCSAPRDVGNA
TGCE $\square$ RTII PPEH $\square$ S YPTGGS $\square$ EAAKFVKAA $\square K$
M Y C N
$Y Y C N L P Q G D L V G H L G S H L D A S D P A G S \quad A Q K L A T$
PVCDSVPD G』A $\square H$ T GYAPAGSGPHAW
LYCS
MYCS
LVCSAPRD $\square$ GNA
MYCNTPPNYYVTK $\square A G A \square A E G G Q N P A \square A A G V L N$ PFCSDGEDEEVHGGYGEVYGGEADGFVVERV $\square \mathrm{Y} \mathrm{C}$

LYC S
PVCT PGGMVS PAH $\square S$ Y QS GMPA QAATFVAAH $\square$
L Y C S
MYCN
$\mathrm{L} C \mathrm{C}$ Q GTSAT A
GICDAPAGAFS
LYC S
PYCS LGPLDDPGHLKY NEAPTPA GTADLSGLGMAALLHYLRGQARQA

UniRef90 D7WD48
UniRef90-A4T1R1 UniRef90_UPIo0037212DA UniRef90_K1X112 UniRef90 E2MW14 UniRef90-UPIO00288C3C2 UniRef90- $\times 8 \mathrm{JF} 30$ UniRef90 E2VUK1 UniRef90-UPIO003619DDE UniRef90-G7DXA7 UniRef90_D915P0 UniRef90 l4BEM4 UniRef90-D5UXM3 UniRef90-L7KZY6 UniRef90_W8AAR7 UniRef90-A0A024QNG9 UniRef90_R9AMW3 UniRef90_V6V6LO UniRef90 A0A024YXT1 UniRef90 ${ }^{-}$F9XIU1 UniRef90_UPIO0015843DC UniRef90 UPIOOO2DEF240 UniRef90 UPIO00365132B UniRef90_UPIooo3B65B0C UniRef90-J3Q1X7
UniRef90 T1VXX1 UniRef90-UPI00035C261A UniRef90-F6ESH4 UniRef90-W5TTN6 UniRef90 D6ZD15 UniRef90_COVTZO UniRef90-G4ZTM3 UniRef90-K0F1V5 UniRef90-UPIOOO3785BF6 UniRef90_LOJ9N1 UniRef90 H6R9N3 UniRef90-H0JUB3 UniRef90-D9QA08 UniRef90-N1PTA3 UniRef90 F6ES27 UniRef90-UPIo003652B2A UniRef90_X8JFZ1 UniRef90 Q5YN12 UniRef90-R1HIG5 UniRef90-L7ERW1 UniRef90-G7DXA6 UniRef90-K6UXL1 UniRef90_KOEZD5 UniRet90 мзтнВ7 UniRef90_C0ZYC0 UniRef90-14Y7L2 UniRef90 L8DBE7 UniRef90 Q6XN97 UniRef90-U7V191 UniRef90-W8A8M1 UniRef90 UPI00035F03D2 UniRef90- $17 K 7 \perp 6$ UniRef90_UPIo003606CFC UniRef90- UPIO003B35447 UniRef90 UPIOO0463EOCO UniRef90-H5XN51 UniRef90-E3JUN7 UniRef90_A0A059M,91 UniRef90-J9RU63 UniRef90-×8DK29 UniRet90_M2WCG4 UniRef90 UPI0003B30C04 UniRef90-A0A034U5L5 UniRef90-D7BNE1 UniRef90-R4MAS4 UniRef90 E4BHPO UniRef90-H6MTJ7 UniRef90 W WIRTIT UniRef90 G2WSB2 UniRef90_V8CYW3 UniRef90-F8DZS5

# AQPAQCPR EETAVTGGSGNSSPDDPQTNF 

TQDCSEYIVVFARGSSQPQDVSPETRRF
HI I VARASQEPLGYGTlG
NSTACAPVHLLLARGTTEPGTLKTLAELI GECPALFGLGVQGTGQSAPTGMLSQVF NSSQTESPPSEPDWCPAVEVVSIPGTWESAANDDPFNPQ NSSQTESTQASAASCPSWLFUGVRGTNEKAGSGKSRWGH

DSAPMPCTALGVFGVQGTNQSAPDADPTIDS AQDCPDVLMLAVSGATDSSPASNWVGNV DSCPGLYVLAMQGTGQSSPSAPVKTDV RDTRLTSSVTECHDMVTVSVAGRNDSPNPNSTVDAN

GQGPQCPDVRVFAVGGTHESKEDDDPFNPT
SASTCADVEFTGAAGSGQDDGVGS\|VNT SACPALYALGПQGTGESSPTGMLSTVF AACAPTILLVVPGSSETSTSARSDQHL
PSALAASCPAVEAI AVPGTTQTSTQADPNKPV ASVTECRDMVTI SVAGRNDTPREGTTVDAN SDCPDLYVLGMQGTTETSPDAPVKSND
VEKRATYCVPAVVFAVRGSDDQSTLENPQDVF ADCEPLYVVATRGSNEPPGMGPLLLNDF
TADEPATAAPADCAKVHLVTTAGTNESSPKDDPNDI
STVDTELKASVTECHDMVS $\square$ SVAGRNDTPREGSTVDAN
ADDPVCTKVT TIGVRGSSEPYGMGPAAQAA TMDTADTASTTDCHDMVTLSVAGRGDTPRSGTTKMAL AQCAKRRVIVSRGTGELPGTCSACTPA PGCPALYVLGVQGTGQSSPGADPDTGM SSDCADVIFVGAAGSGQRSGMGEFVGDT

Steas $\square E L V S T A T C Y D M V S T A T G G R G D T P R E G W L T P D$ QSAPKPACPDNLLLAIIPGTTETTADADPTQNV ADPVTASVADCHDMVTVSVAGRNDSPQSGTTKMNV
QALDDSCRPVTLYAVGGG LFIPGTWETPTHATGALAG
APPDCADFEFTAARGSGEDNGMGGELHDV TRDTRLTSSVTECHDMVTISVAGRGDTPVAGSTKLAL STAPTTLTASVTECHDMVSTAVGGRNDSPRPGPWVDEVV A QPGGCPGLMVYAVQGTGQSSPDADPSGFLl TASTTECHDMVTVSIAGRNDTPP DTVPRL MVEAAGTDESHSWHPSAQPI AEPMPCVATMNLFDPGTWETDEEADPARPV
RTSDHCGKVDVFARGSGESSAFKTLFLQR
 EVELASTATCYDMVSTAVGGRGDSPEAGMLETPT GVAAAEPTPDRTGTKCPRWTALLAPGTYETTPAMTVGQS GSAVTAPAVQADPAGCPKLQVVAVPGTWETSNTPAPQNGM DSCPALFALGLQGTGESSPTGMLSQVF
CEASYFLALLRGSNEPPGMGPLLSAF
TAVCTDIKIITARASTELPG EGAII
TRDTQLTTSVTECHDMVTVSVAGRNDTPVAGTTKLLV
QDCEPVHIVVTAGTGES
QDAGVGGGTGES
EPATTDACPDTAVFE/VDG

UniRef90_D7wD48
UniRef90-A4T1R1 UniRef90_UPIO0037212DA UniRef90_K1X112 UniRef90-E2MW14 UniRef90_UPIO00288C3C2 UniRef90-X8JF30 UniRef90-E2VUK1 UniRef90-UPIO003619DDE UniRef90_G7DXA7 UniRef90-D915P0 UniRef90_14BEM4 UniRef90-D5UXM3
UniRef90- L7KZY6 UniRef90-L7KZY6
UniRef90 W8AAR7 UniRef90-A0A024QNG9 UniRef90-R9AMW3 UniRef90-V6V6L0 UniRef90-A0A024YXT1 UniRef90-F9XIU1 UniRef90_UPI00015843DC UniRef90-UPI0002DEF240 UniRef90_UPI000365132B UniRef90-UPIO003B65B0C UniRef90-J3QIX7
UniRef90-T1VXX1
UniRef90-UPI00035C261A UniRef90-F6ESH4 UniRef90-W5TTN6 UniRef90-D6ZD15 UniRef90-COVTZO UniRef90-G4ZTM3 UniRef90-K0F1V5 UniRef90_UPI0003785BF6 UniRef90-LOJ9N1 UniRef90_H6R9N3 UniRef90-HOJUB3
UniRef90 D9QA08 UniRef90_N1PTA3 UniRef90-F6ES27 UniRef90_UPIO003652B2A UniRef90-X8JFZ1 UniRef90_Q5YN12 UniRef90_R1HIG5 UniRef90-L7ERW1 UniRef90-E9SW06 UniRef90_G7DXA6
UniRef90_K6UXL1 UniRef90-K0EZD5 UniRef90-M3THB7 UniRef90-COZYC0 UniRef90-14Y7L2 UniRef90-L8DBE7 UniRef90_Q6XN97 UniRef90-U7V191
UniRef90 W8A8M1 UniRef90_W8A8M1
UniRef90_UPI00035F03D2 UniRef90_L7K7L6 UniRef90_UPIO003606CFC UniRef90_UPI0003B35447 UniRef90_UPI000463E0C0 UniRef90_H5XN51

## UniRef90-E3JUN7

UniRef90_A0A059MJ91 UniRef90-J9RU63 UniRef90-X8DK29 UniRef90-M2WCG4 UniRef90_UPI0003B30C04 UniRef90-A0A034U5L5 UniRef90_D7BNE1 UniRef90_R4MAS4 UniRef90-E4BHP0 UniRef90-H6MTJ7 UniRef90-W7IRTO UniRef90-G2WSB2 UniRef90_V8CYW3
UniRef90-F8DZS5 UniRef90 R4M7Y7 UniRef90-UPIO0036DC3CE UniRef90_U5EL18 UniRef90-L8DBN0 UniRef90_UPI00029B09A7 UniRef90-C1BE64 UniRef90_UPIO003641105 UniRef90-F6ES28 UniRef90-W9C1M2 UniRef90-K0F949 UniRef90_UPIO00382BF62 UniRef90-J1ZC22 UniRef90_UPIO004636527

A QRIV H QRTGG ${ }^{50}$
TTQPVWI TYPAVPFTLMTYTDSARAGY GRVI AKSYRDSGRTITAEAVNYPAGILDWAGFMGSVDTGT $\begin{array}{ll}T R P L Q E Q F D P S R A S V Y T V P Y V A Q F S P D G Q Q S Y N N S R T E G T \\ E Q L L Q S L & S N T T\end{array}$ AN PHSLL LGLTSSSDVKVWT TPYPAQDKTHQLPDQLTYDDS ANKMADLIAGTFKVVELSGVDYPAAAFWESENPGSVQLGA

## $\square D A L R S K \square G E K S M G V Y G V D \quad Y P A T T D F P T A M A G \square Y D A G T$ GLETRYGTEGKDYRIEI DYPGVLWGGTSYDQSV MS PMLSQAREDGASVDRAYVPYPGSFGGDTSYAVSVAKGE YRDFARLVQQSGRTI TAEAVDYPAGALGWLGFMGSVDTGA   YQQLSNALAAGGRTMTAEAVQYPAGLGGWMNFMDSVEDGT AKHVARLHSDVRVWTGVVGGGSKTGFDRFLTYGDSYRGGV FDAI DEVIRHEAK I GFVSVEYPANQATSGSYHDSRAAGS MVKDKVDAANSASNAEYVVYPATLAG TDANPRTDYESGAMVVGGDMLAGGGGDTGLGAGNGSGPGS ANPLSFMLSITTGPLQQQYPIPYTAQFRNIMTYDDSRAEGLL GWTSVARKLRNDVRATVESVNYPASWSGSVVYWNSEAKGQ   

YRNDRDD $\square$ GEDA TVNDRAVEYPADRAAWSEFLNSVSEGA RPMLAKAADAGLVDRAYVPYFGGATAGAAVPYSESVTGGL A HVTRPATEERLGRKLRVHYANYPAKLD GGGYFASKDAGY $G N P L P A A L S G D D V A E G S Y A A V Y D A Y P A N M A S Y E D A V N A G V$
$M G P L D D Q A R E L G A S V D R A Y V P Y P G S F G G L T S Y V E S V T A G E$ $M G P L L D Q A R E L G A S V D R A Y V P Y P G S F G G L T S Y V V E S V T A G E$
$G T N F A K H V A R L Q P G V H V W Q T P Y Y A S F N R F L N Y G D S Y R G G V$ $G T N F A K H V A R L Q P G V H V W Q T P Y Y A S F N R F L N Y G D S Y R G G V$
$A N A V I S K N G G Q S S T G N Y T A V S T A T N L A N G W Y Q Q S V N G G G U$
$Y D T V T Q E L T A R G E T P A G F G V A Y P A W F R Y P T H Y R D S V A E G A$ $Y D T L T Q E E L T A R G E T P A G F G V A Y P A W F R Y P T H Y R D S V A E G A$
$G L A F T K N G A D R Y Q D V S A W Q T P Y N A S L N S V S E P R G S K A E G \square$

GNP LPAA LPADDVDPGSYAAVY $\square$ AYPANMATYEDAVNAGV
ADLLVSHYGHARSD DSTTSLVYPAAASDVLNWWDSVRTGA VDANGREDPAASVAPGSYAAMYDAYPADMASYENAVTTGV $\square D \square A R A K F P$ D $\quad 1$ VNVEYPA
 FENLLNDANDMDKRVEKQTVDYPAAATQPQVFLDSITTGV

KAPAGSVKDGSYASVY $\begin{aligned} & \text { YA } \\ & \text { Y }\end{aligned}$
GERDPAAMSGDYSSDWAVYVEYPAD MASYENAVQTGV TDPLANEFSTAQDQVEYVPYMALIVDDKADTYGTSKKQAI
 TDPLAQRFGEKVSVVTVPPPS YANLVTGGSYAAAESAAVV VADSISRTHGDSATIYFLPYMARA F F DNGRTYADSKATAI YERDEHTASAQGVTVAAYGVPYPAFGDTAAAYLKSAELGA SDDYHSNAPAGSVDPGSYAAVYVAYPANMDSYEDAVTAGV NNSAFNANPPAGWE IIQVPYYAGVFPGDERADDESVAGGV
AKSVLAAVPGGGL
K $A K S V L A A V P G G G D$ MDDQYSSSAEYMKSP $V$ VNAPRDDVPEGSYS AVVYVEYPAN K M MSSYDDAVEAGV SQULHPA TAARGDMDRAYVPYDAGFGGAVAYEQSVQGAV VRENGNQLDPAARSDDYSYANLYYLASGDKQMSYNDSRAEGT ALDLQNEYGSETVSV YNVRYPSTLGRFATYGESHAAGM
 AQQELKLSSDD I I HELDKSEYPASAGKSGNYGASVDRGU RDALAQKWRGRGTVRQVYLDYPAADPHTTEYFDSAALGA

 SRVLTPAMREAGEYMDRAYVPYDAGFGGAVPYAESVDGAV GQALLRAKHPGKVVDRY VSYRSTPGGAYTYEQTRNNGY

GTRLPAALAGDQVKDGSYAAVYDEYPANMATYESSVETGV TNGILTQLGESDTTRYGTDVEVRTDAPSTGAGSVSGADLS GMLATVGNALKQKYGNDDEVYYPAYAASAFDKGRTYADSK MA MVVSNTTDSAGATVAGRAYPYPAGFGGNVPYSQSVEEGL FAPMLAEADAAHVKVARAYVPYEASFGGFASYAKSVQGGV $F T A L Q Q Q T G E R S L A P A G Y G I V Y P A G L S Y F S N Y V R S A R V G A$ GALAAADQFATSQSVTRTSVSYPALLD LDPAPSVASGV $G A D L P A A M A G D Q V E P G S Y A A V Y \square A Y P A N M A T Y E D A V N A G A$
$T A D L D D S F D G D S A W Q T P Y N A S A G S R A K H F L P Y A A S K K Q A A$
 LAQAPERGLVGRAYVPYESGFGGAVPGGQAPYSESLAQGL

UniRef90_D7WD48 UniRef90_A4T1R1
UniRef90 UPI0003 UniRef90_K1X112 UniRef90-E2MW14 UniRef90_UPI000288C3C2 UniRef90-X8JF30 UniRef90-E2VUK1 UniRef90_UPIO003619DDE UniRef90_G7DXA7 UniRef90_D9I5P0 UniRef90_14BEM4 UniRef90_D5UXM3
UniRef90 L7KZY6 UniRef90-L7KZY6
UniRef90-W8AAR7 UniRef90_A0A024QNG9 UniRef90_R9AMW3 UniRef90_V6V6L0 UniRef90_A0A024YXT1 UniRef90_F9XIU1 UniRef90_UPI00015843DC UniRef90_UPI0002DEF240 UniRef90_UPI000365132B UniRef90_UPI0003B65B0C UniRef90-J3QIX7
UniRef90-T1VXX1
UniRef90_UPI00035C261A UniRef90_F6ESH4 UniRef90_W5TTN6 UniRef90_D6ZD15 UniRef90_COVTZ0 UniRef90_G4ZTM3 UniRef90_GOHAX7 UniRef90_K0F1V5 UniRef90_UPIO003785BF6 UniRef90_LOJ9N1 UniRef90_H6R9N3 UniRef90_H0JUB3
UniRef90_D9QA08 UniRef90_N1PTA3 UniRef90_F6ES27 UniRef90_UPIO003652B2A UniRef90-X8JFZ1 UniRef90_Q5YN12 UniRef90_R1HIG5 UniRef90-L7ERW1 UniRef90-E9SW06 UniRef90_K6UXA6 UniRef90_K0EZD5 UniRef90_M3THB7 UniRef90_C0ZYC0 UniRef90 - 14Y7L2 UniRef90_L8DBE7
UniRef90_Q6XN97 UniRef90_U7V191 UniRef90-W8A8M1 UniRef90_UPI00035F03D2 UniRef90_L7K7L6 UniRef90_UPI0003606CFC UniRef90_UPI0003B35447 UniRef90_UPIO00463E0C0 UniRef90_H5XN51

## UniRef90-E3JUN7

UniRef90_A0A059MJ91 UniRef90_J9RU63 UniRef90_X8DK29 UniRef90_M2WCG4 UniRef90_UPI0003B30C04 UniRef90_A0A034U5L5 UniRef90-D7BNE1 UniRef90_R4MAS4 UniRef90_E4BHP0 UniRef90_H6MTJ7 UniRef90_W7IRT0 UniRef90_G2WSB2 UniRef90-V8CYW3 UniRef90_F8DZS5 UniRef90_UPIO0036DC3CE UniRef90_U5EL18 UniRef90_L8DBN0 UniRef90_UPI00029B09A7 UniRef90_C1BE64 UniRef90_UPI0003641105 UniRef90_F6ES28 UniRef90_W9C1M2 UniRef90_K0F949 UniRef90_UPI000382BF62 UniRef90_J1ZC22 UniRef90_UPIO004636527 UniRef90_C7MZN2

110
120
GFSI GAQLI NDI AHDRGP
A A L G QQYQAFVAQCPTSQVVLAGYSQGAMVVHRNLHSL
AAARAELARVSDRCPDTSYVLAGFSQGAVI AGDIAADIGP

 QHLILKQWALCPDQHYVI GGYSKGAMVIHS M NLPH HVEQTAANCPQSKLVLGGFSQGAAVMGDAPRPMPP ENLETAVAVYHEACPD QPVVIVGYSQGARIAGDVLSEDPV E NLT T Q A A T T TVALAA K C P K T T K L L A A V V TALGKQYADFVA QCPTSKVVLAGYSQGAMVVHRNLAALDG GNTQGDVD VVVKECPSTKIVLVGYSQGASAVHRALQRMGP ANASRVLAADRAEADPDLKFTI SGYSQGADAAGDLAAEA IGP


 EAAARLLNDRSAHCDGQWFILGGYSQGAHVMREALLRLTD T GMK ELVEEAYLAKCPN AP V L M GYS Q GA QVVS DYTEPAS D SK $\quad$ IGD RM QNLRDMASEVAAACPDTKFTLAGYSQGAHVVSLFAEEVGK ARANAELKYVADTCKSTKFIVAGFSQGAVI AGDIAN QIGA
 A Y L S D QMV
DKTSQAISSYADRCP Y A D R C P S S M IAVTGYYSQGA QI AD TVVR NI G P D NLE S A A E RVLDA D C P G T R R I A A I G G Y S Q Q G G H V A S R F
 Q A L Q DVMK RTAE ECPATKY LLVGYSQGAVVAGDVASA I GA ETATAELTRLGRRCPSTKFFLVGYSQGASVIGNAAAAVAA $R R V L A D \square T \square G \square K T V L G \square G E V I P E$
DAAEQLITDTLEECEDAK VVVAGYQGAMAMHRALEAL GP VR L R T MAK NVA D R C A D T R FA V VGYS Q G A HVVASVFA Q E I G Q RAA WSAALTYAAACPTSTFALLGYSQQGHIA GDLAAT I SP DATNARLKSVSAACPRTVFLLTGYSQGADVAGDVAAAI GH ANAKQVMSEI AAACPDTKFSIVGYSEGADVVRRVAMEVGH $E N L S L A A Q K V L S Q C P S A K L A V V G F S Q G A H A A S N F L D S S V G T$

 A KVVT E H L L K A K K A Q C P D D K FVV L S G F S Q G A A V T S S DV L E A M ANT Q QVMRE $\quad$ DA QACPDTRFAIVGYSEGADVVRRVAMGI GH


 $R S L D A A V S E \| A E A C P A T R D A A D G Y S Q G A Q A I S G F A A D R G P$ SRATTVITDAADRCPDSTIVAVGYSQGAMVMHRTLQSISP D N T R A V MK A DSAACPNTKFSVVGYSEGADVVRRVAMDIGS
 TNSSQTIMKS ITA SCPKTRRAMVVGYSEGADVARRTAMAVGN DTASKMIA DKAA ECTNTKFGLTGFSQGADAAGDLAADI GP



 ANTQQVVMREISQACPDTRFAIVGYSEGADVVRRVATTDGH EKLDDRAVVR DFHAS CPGSRRVLVAGYSEGAVVAGBTAFARSGB Q T GLLK Y L K A Q A S K C P K M A MV $\quad$ V

 R D ALLRDI ETTAA HCPGTRFALIGGYSQGAHIMMGVAADIAAA NNARSVLLDYGTRCPAARFTI NGYSQAGDIAADDIGNDRGP
 KKLTVLLNAEKKQCPKEWVVLAGFPKGSK
ANASQQLREHAAVVP GASYTI T GYS QGADAA GDLAAA I G P A TMDRLVREFHASCPGSRITITGFSQGALVAGDTLGNLSK ARVAAFAAATTARCPGSGlAMAGYSFGAKVVRSALARGNS
 RQARALIA REAAACPKATESSIGGYSMGADDVNDVAYGRGP A NTKTVMNA $\quad$ TA ASCPKTRFAIVGYSEGADVTRRAAME IGN A GMKGL C C DTRVVL AGYGQGAEVTGDLATTMGP ETGKSSAlNNILTSCATSKFLLSGYSQGADAAGBIAAEIGN DNARGIVAATAAACPEARFALVGYSQ
$Q N L I D T A A E V A Q A C P N T V F T G A G Y S Q G A H V M S M F A K R V G P$
 A AMKADLIDAAVEACPQQKIVLLGYSQQAECIS DTLA GGGG A NTE QVMRE ESKACPDTKRSIVGYSEGADVVRRVAQK IGH T A IT E HLLA D QKA RCP GT S F I L A G Y S Q S A D AV G DV L A D I S A DNLQTAAEKVLDDSCPATK LAA A A YS QFAHAASEWLLTEVVGA S R L R A MA G QV A Q R CA Q T RFA VGYS Q GAHVAS LFAQEI GA

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 DASPNLAAALLVADGDRLPQDPTVPVTMGARTISVCNDGD

$G P A E R \square A G V A L L G D P R R D P N Q G V N Q G V P$
$D V I D Q V S G I A T F G B P$
 EVAD HVAAVTLFGMPS
S I D P T QVT GELY S DPRRTGDNGAREGFGAAKVTQFCVE G D AGQS

ALL F G S P C R T P GA DQV

 $\square P A D R V L A V G L L A D P G N G D P R P R G M G D L S G R V T S I C A P A D$ GAAEKI AAVALFGDPNRNANAPLFPGKP
$N P \quad Q V V A A L L V A D G D R L P A D T T \square N P R M G A R T V S V C D V G D$ EARDAI KAVILVGNPYRKPNQDSNAGGFGSKVLDFCLGGBD GTAEKLLA SYL LAADPGRPRPAGAFSNLPG KVRSVCSSGD A A R Q RVLYVALVFGDPTFRDPE QQVPADLVDNTES YCD GRD
 GAADKVVGVATFGDPTRAAGAPLFPGSPGQ
VT P E RLL L A V I IA D GRRETGDVGIN PGDVADRAYEDCAPND TAQANFRGGVL A GNPTYRWGGGLNGKLYPWHVRSYCFPND SAD K VVA IVLFGNPFHTPNAPQ
IT A DKLAA GALFSSPNRPQGASTFPG
$V$ T GD DI A GVVMDGAP YRPAGVPNFGGFQSQTAKDYCRPYD GAASAVAA GAVFGSPTRGAGAGPFPGT
DDPNHVLGVVILADAGRTAGDGPFPG
VPADRMLGVVLLSDARRQPGVGQ
GRVSHVRGVVLVADPGRSPDI DKPADLAAKNGGVFAANGE ALAPRRIKAIVTFFGNPLFGQTISSTSTTYGPKAVEFCNLGD T E QIV VA GVLIGDGDKMATVVLLPEEWSAIIIIDACACDGD GPADKVAAVALFGDPTRNAGAPLFPGSPGKATPD
$\square P A R R L S A V A L L A D P A R N P G D N T L G T S F T K V V I G L C T D F D$ NPANKLLGVGLVADPSQSP $\square G Q P T \square G L S R N G L I S V G C A P Q D$ QDPENVLGVVILADPGRSTGDGPFPG
GPARSVAAGALFGAPTRSPGSGLFPGTSQ
GPAKKLLASY L LAADPGRPRPAGAFSNDPG KVRSDCSSGD


 $D E A G Q V V G V \vee I L A D A G R S A G D G P F P G$ $K V L G R V G Y V A L$ FG D P K F WTG D P Y V P E S L A S R T G S WC D K LD D $H V A Q A V R G A L L D A D P R G M L R R Q A V P V S F Q G V T R D \square C R D G D$ QDANNVVGVVILADAGRAEGQGPFPG
$N S P H I S T L V F G S P P T K A T G L E T L A G S D K N R L L D \square C A S A D$ ID A S RVA GV ALLGNPVRQA GAPTFAG
V D A D RI A GI A L YA HPDRAPDAPTFPGRPGQFTPD
NGS I IGGVLLDADGDRQPSDPPFAS DWRGNLLSWCVSGD ESPDNVVGVVIFADAGRLAGEGPFPG
EARGVI DAVILDGNPYRLPSHKP DP EAFS GKVLD FCYTD D QVAD QVVGVVI LADA GRVAGEGPFPGADNPRVASFCSEGD VDRNRMFGVALLADPGQSKNAGKS $\square G A P S D \| A V S V C A A G D$ EQRSKVAFNAFFGDPKMNLPEGR
QNAGNVAGVVILADAGRSAGEGPFPNHPDNFGQSYQTGKD GLEPRVVRAVGL FGDPARSPATRAVPGTLDARTDQDCAPGD IPA D K V LA V $V$ GL LA D P GNGTA G GPRP GRLLS GKVTSSICAP S D $V A A D R V A G V A L F G N P A R P T N S P L F P G A P D Q T T P D$
AARESLRAAVFFGGPSTPSGENWADAFGDTPDFDYCHNGD


NKVV A VALLFGNPYFTA GAP QAPK QYT S II WDCCLDT GD QDPDSVVGVVILADAGRTAGEGPFPG
$\square G A D K L A L L A N L G D P G R P E G A S L F P G K P G Q$
G
QDPANVVGVVIFADAGRSYEQGPFPGAQNPYT
GDASDVVGVVLFADPGRSLNGGGTPVLPGRKVLSLCHADD



VTADRVRAVALLDA DPRSGTDGPQGMGALAGKVITDCHPDD D $\square$ P H DL DNGVLYS DARRVGVNGGPGGVMTNPVVSLCNSND $T V R S V V L F G D P E \quad E G A P V E G V D S R F V V T F C H E G D$ IDADKLALVANFGDPGRPEGAPLFPGRPGQ




$\square P$ A N K L V G VA L F G D P T R A P G S P L F P G A A G Q
GSPERVAABALF GDPVRAPGAPVFPGRAGQQVPD
 GTLGAKTAAVDFA
QEAGQVLGVVILADAGRSAGDGPFPG
GTPEDIAAGAYLGDPARSDLGATLTPT
GPASSIASAALFGSPTRAEGAGIFPGTSQ
$G P P E R V A A V A L F A D P T R N P G A A L F P G A P G R S T$

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$P \square C S$
AVC D Y D P D A VAV V T S Y ARKAGA
LICAA
$\square 1$ CRAGARAKP HR $\square Y E E D G$
P $\square$ CD G L L G Y F $V$ K H L T Y D D D

AVCDYNPDAAAVHTSYARN
PVCHWTGDVSNSHSDY
LYCS

CI CNEADEDEMGHTGYENNVIQQATRHLVDRL
PVCSVIPN
LFCGGGRELGALL AASQAKD\|LLSAVG
PYCASAPNTISVHDGYVNEYGMDAVK
PVCASGNN■TAHGVYPQTWDTTAAAWVQT\|LDG
SVCDAPQDVNGNHAQYATNPGTTASDWTVQWARSV
LFCQTFGTSLPVHNSY
$\square A C D A P D N \square V A \square Q A \square G$

IVVGGSTGVLP
PVCANGTN A I A H LT YPTDGVTSAARQAAALVRGGS VVCAPSLRNLDAHQSYDAD

PVCNAAPPYAAAHTGYATK
FYCNLPQGDLVGH $\square G S Q \square D A S D P A$

PVCGVIPN
EFCDSGDEAPP $\square$ HGNSPEYFQQQATAFLTSK
$N V C D P$
IVCSSYPDQPAA
VI CGAGWS I SAHWRHRKD
$G \square C T G N \square L Q L P A H F E Y P Q S E V P Q A A N E \nabla A V A \square R K \square R$ $G \vee \mathrm{C}$

P V C

TVCSN
CVCDACTGDKEGHLRYGSDET $\square$ QAAKH $L V K Y L$
LTCADPENTSLLHLA
LYCNTPDD
$\square A A G G Q G A \square A D H A G D F G S \square N G R \square A S F$
PVCDSPATTSPTHATYAQLPVAQAPQWAAASLGTV LYCS

P $\square$ CGGVDDRT\DGVDYP
LTCSAPQNI
GlCNSTNMITND AAFANGLVGYASG M ICQTSGGMTS HMKYGGKPASDAQAF $\| V G K L K A V K$

LA C S A P DH S VA
LY C S
YVCGSGLWETDGHMTYGETAVPAAVNESVTRLGEKLG
$\square Y C S$
G1 C
LVCQRTSSVVGPH LDYS LDAPA AAMFVMQR
IVCDTPRSAAP
SI C GDGNSPVAHGLYAVNGMGQGANFAASRL
LTCAMPKNTSLLHLA
SYCSTTAESS P
LY C S

NVCDPGVT P LDR RHS Y A D N A K D C A A H MVA D R L R T

GRPTENDLDEDRADCKDVVIGAAGSGERSGVGEFVNEV
 A QERVCPDMVVLAARGSDQNGYEGPNFTAL


LTVLAVGGTGESRPDD HRTF
A GMAEVTVLAVGGTGESGDHGARVRGL
PDCRPLVVGVGGNGERAAQAAGAHTM QNVSAADCATVHAILARGQGAGNDLDVLSSI

CAPTVVLAVDGTKGPETPDS DDP APL YCSAYRGLL VVVVNGTNDDPPPDTT PAM DCDSPTFI GVRGSGESPGMGES $\square$ APM FEHARPAS PAVTVFVVGGTGES HMGDRRTEV $E T R \prod A D G C P G T M V F G V G G R A D P \quad D A A F$ $\square T S A A P N C P R V M E F S T G G A A A Q P D \square R D G A M$

SRGAQPCAA $\square$ TVLAVGGTGESYR GDRRTAV
PCPAVAVVAARGSGENGGEGPTDAAM

## AS GTWATPFQGPPF

A GCPDLLVVATSGAGDSTPGANWDNR■

| QPAGCPEFVVLAARGSDQNGYEGANLSALRAAACATVAVFET |
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T GTWGSWDNGF


UniRef90-N1Q4Z3 UniRef90-W8GSK6 UniRef90_U5E780 UniRef90_C3JHL8 UniRef90_L8GCH4
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TAPTGEANKDDPGTVGWMYVPYPSTYGPVPTYQDSMAAGV GNPDPAADS GDHSSVWVYAADYDAYPADMRTYEDAVNQGV VEANGDN GKKGVIDRSYVNYSASFGGKDTYEQSVEMGI NLVLNAHSGST $\quad$ AEAVVYPACGGQSSCGGVSYANSV VNAPQQSVGGGSYA AVVY EYPANMN S E E DAVNAGV MIKADHPGAASEAI DYPACGGQASCYGVSAKQGT VGQVANQDSAHGDAQRTV SYRASAGGAFVPGLKPSAPV EQELAARTAKARPDLKLVYLDYPASLDDMNAYSDSVDKGV
 LDGVTRQPQYAGYTVERVEYPAS $\square W P \square G A F G F D D S Q S Q G V$ A AGLAREDPGLT S LGGPYNTSAEYLVTPAQGAVTGV GVGVRNAAPGRVIDRY VAYQSVPGGFSPYTETRDAGL GTGQMGVKLGLQPDTNATFVGYQAFPFAVSKYSDSSNEGY GDDEDYGFGDKTTM $\square Y Q V A I K Y K A P F V A P G P Y M D S V Y Q G T$
KNDYQPWRTQLAARVELSPVDYPAVSVASAATGDSDRDGV AVNMTRRFHNVTAWQLPYYSSAGDTASNNDAYAVSKNRGV DPVVNAPRDAGADAAAVYDAYPANMN SYDTAVQQGV TDALDDRFASRWVG $\qquad$
DSAEFGPGVRKDHYTATFFPDSANF
 GEATADRPGS $\square G W M Y V P Y P A T Y G L G F E D V P T Y Q D S V A A G V$ SDLILKQDPGSTTLGLPYDHGMNVNTVAEYVKTVRAGA
 GDTRVTSVPYNTAYPTLLWW SYNESEASGU
GPADEARVIGSSLDRAYVPYPAAAVPGGKQPYTVSVEEAA AK 1 SARYAAPGTV VEH $\square R Y P A V V S G R D A Y D E S K R \| G H$ LE VNAPQQSVGGGSYA AVYVEYPANMN SYYEDAVNAGV GDGLQRQFGPD

 TGLLASVMGALDDRFDGQWVGYPASYGPVAGMGGLSFRHSA RPGLAKAAEPGLVDRAYVPYEAGAVPGGAVPYTESVAGGL
 TGALLGQMFGGDRVQRSYIAFGYTADDGTADPYDDAVAAAA $\square$ IAPMSEHAP GEGYAAI Y IEYPADD ASYENAVNKGA YRNLLADASAAGKDVDLRVVEYHAQPGAPDEFPASADAGT A $\square A L Q R$ D DGVSVIGVDSLD R R R WSEKSPQQTA SGLVEARH DRDDERFDARWEAYYPAAMDLPAALAEEGENDSA S G L
LY VT GLLGHVTGDRFACRWVG YPASFAFNH LSAVTDELDSR FDSRWVAYPASYGPVADGGLSFRHST $M D T H L D Q A A A Q G A R V E S L D Y T S S V W P T G P Y T K D Q S V A E G E$
$Q S L L L E N D N G S T S A L P Y A Y ~$ $\mathrm{V} P \mathrm{~A} G \mathrm{GNAPPAKRFIQQGVG} \mathrm{\quad YPAMGFLTPDPQVSYVESR}$ NSYTDQYRNSPDFAVRHVGRYPAGFGWDTFMDQSVQUGV
 $\begin{array}{ll}T & T \\ \text { T R R }\end{array}$ $G K S V P A \quad D G O R T K V R Y S A S \square G G N \square S G A E S T A E G E$
S GMLAA VVDDLDERFVPRWVGYPASYGPATGRRGDSYADS
S GGQAFEYGRSVRDGV FHYFESRYNWDSVKVLGLDFKYPAAAPERD VA A N A VP F V V T A Y T Q DQA D Gl|
$T V S L G Q A N R D Q P G T V G W M Y V P Y P S T Y G D V P T Y Q D S V A A G V$ GA $\square G K S V G F E Q V P Y V A Q V G G P I A L G Q S R A N G T$ FHLVEKRHPGDKVHVLA LDPQYPASMNDPPLAQEGEQLNP FNQNPPA GYEDVEVPYYAGVFP VVDAQALDESVANGA YTGLAAKAA DDGVVIGGVVYPATAPGNNLSTYATSEANGT SSAFNQAGGDDSQAARREYIPYNSGMGFPGAYRDSVDGGV
 NLVLGAYSGST T GMLSHVVAEDDERFTAEWIVYPASYGPVPAGGGVSFAEA VEPVISAPLENHEAGNGYAADYDEYPADLASYENAVDKGA RRSLINPSVKFTYVSYPGMFGPATGAHHMSAAESIEAGA

G WD TMQLLDKKRFD $\square Q G \square G Y N T N A F M L G N D P T H S Y L D M I$ AADDPSLVARSY $\square$ SYPASFGGAPGTGGGTAPYAASASAGL
UniRef90_M7ADG6
UniRef90_N1Q4Z3
UniRef90_W8GSK6
UniRef90_U5E780
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UniRef90_M4KCV0
UniRef90_U6EFD3
UniRef90_L8DTD9
UniRef90_M3VGW6
UniRef90_U7M3K0
UniRef90_H5U4Y7
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UniRef90_D8PQN9
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UniRef90_Q0S477
UniRef90_U0FNR7
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UniRef90_M1TV51
UniRef90_M
 A D S ID REQS ILSSCCPGTK LVLGVVYFQ GAMVVMDALGS QS L
 A NT Q QVMMREDSAACPDTKFSIVVGYSEGADVVVRRVAE GIGN TNATS MLLT DLLASKCPDTAVFVVGYSQGAQVASALSRELGP Q Q D NTETVMMSTIHASCPDTKFS IVGYSEGADVARRVAMEVGN EAVTTAVNGLNKRYPNTKVVMIGYSEGGQIMDNNDCPL SA A Y SESMMLQEVANNCPNTKVFLDGHSQGAQVASTVAREIGS
 ATTNRLMMDEYKTKCGDTKFALLGGYSVGGEVLDRLALLELGH


 EVLT T MVAR DAAACP GARI SVVVGYSEGADDAAHFLDHGNGP NRTAAK』QQ DQNDCPNSKISLVGYSEGARI DNDAAHGRGP DMLDARMAKEA DDCPASVFVVVVGYSQGALSAHDAFRQMNP
 D A LD A HL S NQAVVKCPDT QFVI A GFS Q GA DI A GDMAERI PA
解


 L L M Q Q F V Q E Y S E S CP Q T K IV GA V I M M D S L C G T S F V A P L A R

 $P$ G S K L V I S G WS R G GA L V $\operatorname{L}$ S D A TP P P L A NLEAAAEKVVSSCPATRLAI IGYS QGAHAASNVLEAI GA QRLRETDTVRHGSCPDSELVVLGYS QGASDAGDVLAEIAAA

 T L E D R L H Q MV S GLLCAT T R L L L A GYS Q GA D GI GA LAAT E I G N


 A DLVRRLAT QYANPVINT QYIL SGYSQGAMILANHEAEL A R L R S M A G QVA QRCPD S R LVAVVGYS Q GA HVVAS LFA Q EVVA

 AVATS MIK DAQQQCPGSTVVAAGYSQGAMVDHRAL
$D D L A R D I A R T Y N A R W H T S H V A L V G Y S F G A D V M P F A Y N R D P D$





 D A GVVA E L L R L A L P D P R P K VL I GY Y Q GA DV AT HA L H QWPA




## 




 A E L M RL I L M NA GQ FYL CGYSQGAEVVVRTLRMMPG

 LQL DR RLGGVVMEHPQPRYDTAGYSQGAIVATSAERYL
 A A I A D EVVA A Y T K K C P GVVK A L L G Y S Q GA QVVQ D AL C G G L G




 E QLRRRQLDT DR GECPEAP VVLAGYS QGA DVINQAMGMAQR


## UniRef90 M7ADG6

 UniRef90 N1 Q4Z3 UniRef90－W8GSK6 UniRef90＿U5E780 UniRef90＿C3JHL8 UniRef90－L8GCH4UniRef90 QOSKJ2 UniRef90 ${ }^{-}$A0A016PEY4 UniRef90 E2S772 UniRef90－M4KCV0 UniRef90 U6EFD3 UniRef90 L8DTD9 UniRef90－M3VGW6 UniRef90－U7M3K0 UniRef90＿H5U4Y7 UniRee90 ${ }^{-}$UPI00035D7FAB UniRef90－D8PQN9 UniRef90－UPIO002193293 UniRef90 U7M3A2 UniRef90－UPIO003B52F40 UniRef90＿UPIO003708FDC UniRef90 C8XF28 UniRef90－H2G2Y6 UniRef90－R7WHZ5 UniRef90－Q0S477 UniRef90－UOFNR7 UniRef90－Q5YMB5 UniRef90－G8FS33 UniRef90－AоАо59МММо UniRef90＿L8WMD8 UniRef90－W6Q3L7 UniRef90－A0A024K6Q3 UniRef90 M1TV51 UniRef90＿UPI00037D7F93 UniRef90－L7J3P0 UniRef90＿L8DV43 UniRef90 ${ }^{-}$V9XMW5 UniRef90－UPI00037E5622 UniRef90－C1ASM3 UniRef90＿K6X3B1 UniRef90－W8AB06 UniRef90－10UX73 UniRef90－UPI000367DCB1 UniRef90＿L7KL19 UniRef90－L8DFJ5 UniRef90－C3PHZ6 UniRef90－U5E4X4 UniRef90＿C9SN49 UniRef90＿UPI00037F183E UniRef90－K0F184 UniRef90－V9XDL5 UniRef90 L7LAR8 UniRef90－K8OZG66 UniRef90 UPIO0047C5F98 UniRef90－G1D5A5 UniRef90－J4J0A6 UniRef90－UPI00035D175C UniRef90－T1VRM9 UniRef90－Q5YSQ0 UniRef90－G7CF45 UniRef90－AOAO59MGF3 UniRef90－A2EII2 UniRef90－D0L8K5 UniRef90－C3JL94 UniRef90－M3VCL7 UniRef90－UOFHS2 UniRef90 UPIO0035DE9FD UniRef90－M3VAC1 UniRef90－M1TPB4 UniRef90－H5TSF1 UniRef90－EODGX0 UniRef90－C2GK41 UniRef90－X5EEB1 UniRef90＿LoJ3B7 UniRef90－M2X718
UniRef90 E9TOS6 UniRee90－UPI000378ACF4 UniRef90－U7KQQ8 UniRef90－W7ICMO UniRef90＿U7PJR6 UniRef90－UPI00047E8906 UniRef90－L7KZR3 UniRef90＿V9X8U0 UniRef90－H0ЕНА5 UniRef90－D5UXD9
UniRef90－UPIOOO36D91BF UniRef90＿F9VYX8 UniRef90－M2X6S1 UniRef90－IOPAB4

GEAD ${ }^{130}$
140
150
GEADLVRGVGLTADGRRMPAEGRPPG｜VIGADQVVT\｜CAPGD N GSKI AAAVLSGDPFNGQ APDDTDTLRVKGLCGGTD VTADDAGVALIGDPYRPAGTPSMGGAGGGK』1YACRPYD DDPDDVLGVVMFADAGRQAGDGPF $\square G$ USADRAGAALIFSDPTRPAGSPVFASSSQ QDPAAVVGVVILADAGRNLGGGPFPG GPADKVAGVALESDPTRMQGGASTPGQLASRTASWCSEGD ПPAKRFATAAL！ANPHNGPGAMRGYGELGDRVLDDCNDDD NLDANLLGAIVLGNPLR
VTADDIAGVIMVGSPYRPAGVPNFGDEPGDKVTWSCRPYD R】SRAGLSGELYSDPRRTMSGPRDGGFGDDPVKQVCTEGD Q DKGAGA YLL NPLRRPDGGPDPRYLIADRRIDYCLAGD AMMSRLTAVVLFGDPQFSQGILRTAGIPAVKVRSYCGAGD EEKGKVCGVSVGGDPYDEDGUGVCNVYGGNV1EFCNKND VDEDRVTSAFLLANPNRGVPGGAMPGGYGDRVLEFCNAGD SLLAKVAGVAFVADPGRVVGGA
GARAHI KAVVLLASPSFRPGQSWNAPNQARTTREWCFEGD QQQKQIKAVYLI GDP
LTPERVLGVYLLADPGRPRAAGAFSNLPGKVRSПCSSGD AQPAAVVGVVI SDTGRAVGDGPFPGALDGRVASFCSDGD GAADNLSAVGLVSDPEQPAGVVPAPGPDSVPVQWDAHPDD GPYANRISGVLYADPKRPGGUTGPRHGFNVPVRSECNPRD VDPSRILAGALLSDPKRSA
QLP PYMEAYYGI ADPRRGPDPGGFGGRASDRMFQFCAPAD RPADADAGVVLVGDPYRPAGVDSMGGALIADRVVYSCRRYD TDKSKFIA LLVFGDPपRSQRTASWPSTGAQNVVSVCNSGD TYNSTTIAAIAYGDPGMPWNVGALCGPFTSSMHSYCDYGD GAPDKVAGVALIFSDPTRARGAATVENTVANRTASWCAPGD VPAASFSSASLVANPHRMEGSGAIEGELASRVLELICYPGD DPGNRVAAVLNFGNANQSWNVGSGSGRWADRFRDYCEAND GPAEKVAVGALFGSPTRAPGSPVFPGSSS DPPERISGV YSDPRDTRGGGGRDDFGT TAVERTCTEGD AVRPADLAGLLIADPRTSSPTGARAGFGDVPVATVCAAGD QDPASVVGVVILADAGRNLGEGAFPG PVVDRVIGVGLVADPGHPPGAVPGCDGWPVMWVGAPDD GAADRVAGVGLLADPHRDPGDPQPGGADTDRVRTLCVDGD QDPHEVLKGVLYGDPRRPGDPGPRPGDGDVAVTQNCQND SDADQUNGVGUGDPRRPGVDGGPGGDETNTVKEICNTND D SSEGVSGLLYSDPRQAGNIGVDPGFGGVPVTTVCFSGD AHRGQLAGVVTFGNPDTRAGGGPMGHFPQLRAVDYCLPLD NAADKVAAVALFADPTRGTNAPLFPGAP SIVDKVIJAVILYGDPTHMAN
RALGRMSAAVLMADGFKLAGFAKFPAS DAAK $\square Y D V C A W G D$ DTPEENAGALLANPARPANATVFPGRPQASTASECSEGD

A VRAQVSY $\square S$ MMGFAPDADFQ $\square R V T G W L G M K A S D$
ADTGRLHGAVTIGNPLHKYWMMERAVLPEDKRVDYCLDGD A LVDRIAAVGLVADP HQPPGVIAGCDGWPVYWDGAPGD SLEERIDGSITYGNPCRELGVA
$N D L D K G R V V L F D G P K S L L K M G L T P D Q D G K K D E Y Y V N P F D$ GA1 PTVTAAGLISDPQQPAGAGVGPNVPAEETMWIGHPHD PTGANITGVGLISDPQQPTGGDGPEVQPWDPVKWI GHPQD $V V V Y G D P R R P G G D D A \square P G D Y A P N V T S V C H E Y D$ A
DRRNE $\square A M V V T F G S P G R A P G P T L F P A W A R P R T W D F \| L D G D$ AAPVHDDGVHLIADPAQGRPGPLVPGDPAGEDRH पCLEGD DPNHKISGVINMGPILNMKN
VPANKI V VLYADPBRDRVAGQRGGSLAHRVVEVCIIGD VRAPEVKSVVYFGDPNLRPGRAGMSDYLSSHVSSFCLSGD GLRDRLLAAGLVAPMRGWGVAGQHGSYAHKVYDFANPDD EPKNQVDGVGYADPRRVGPNGTPGGFAGIPVHEMCNQND
 NLRERVIGNALFGDPKLYGPEGQPPEGWTHTTGLWCNDND

## Q

 $\frac{\mathrm{Q}}{\mathrm{Q}}$ LHPSRVAGVFTVGDP亩QKPNADGVFGLPGVDRVSDCHDDD VTADDIAGVALVGDPYRPAGTPSLGGALAGR LYDCRPMD VPAHRILAAGLLSDPQNVPGQGAVGGVLADRVTSFCAEGD AQRGKLAGAVYLGNPLSRPHGMQPAALPDSRRLNYCLDGDSPHDKLSGMTVGNPRRSFNLPTFAPGVTMRVRDVCNEND SPHDKLSGTTLYGNPRRSFNLPTFLPGVTMRVRDVCNEND GDADQIAGGSLFGSPTRIDAAPDFVGTDS
PVVTRLLGVGLVADP HQPPGAVPGPPGLPVMWVGAPDD DPPERISGV LYSDPRDDRGGGGRNDFGEปHVERVCDEGD SADSMIKAAIFMGDPR
 QDPGAVSGVVILSDAGREAGEGFFPGALAGKVASFCSEGD KRPEDVRAVAAMGNPHEPLHRGARGGTLPRKLLSVWAPGD ENSNNVKKIVVLADPSHQPDGITADPGAIAFKVSSICIVGD DRRDEVAMVLQFGDPNRPEGPTLLGNNPGGHGIS

| UniRef90_M7ADG6 | $\text { LI C D A P T VT N N P } \quad 180 \quad 190$ |
| :---: | :---: |
| UniRef90-N1Q4Z3 | HLCSA GGGTTGSGLRYDSDA DAAVQY |
| UniRef90_W8GSK6 | $\square$ A C D A P Q E $\square$ A VLEL A L G |
| UniRef90_U5E780 |  |
| UniRef90-C3JHL8 |  |
| UniRef90-L8GCH4 |  |
| UniRef90_Q0SKJ2 |  |
| UniRef90-A0A016PEY4 | PYCCNG NDAAHHQQYGAAGGNTG |
| UniRef90_E2S772 | LVCD |
| UniRef90-M4KCV0 | FVCN |
| UniRef90 U6EFD3 |  |
| UniRef90_L8DTD9 | LACCDAP D K $\square$ |
| UniRef90_M3VGW6 | GIC D VP D |
| UniRef90-U7M3K0 | FVCDLNLRNAAHHASYFRDSEGDAA |
| UniRef90-H5U4Y7 | $P \mathrm{C}$ C D |
| UniRef90_UPI00035D7FAB | PVCCNPLVPMPWHFFYTKNGVDAAVNFDFDRMKAA |
| UniRef90-D8PQN9 | IVCDGGLDV D A HRAYP T D GVDKAVAFLA |
| UniRef90_UPI0002193293 | V V C S T |
| UniRef90_U7M3A2 | 1 l C N |
| UniRef90_UPI0003B52F40 |  |
| UniRef90_UPI0003708FDC | A F CQSAFNGMT $\square$ HRNYK S S A M E A WGF $\square \mathrm{Y}$ Y Q K $\square$ T S |
| UniRef90-C8XF28 |  |
| UniRef90-H2G2Y6 | PACA |
| UniRef90-R7WHZ5 | LF C A A P Q N $\square$ |
| UniRef90_Q0S477 | M 1 C N A S |
| UniRef90_U0FNR7 | $\mathrm{G} \\| \mathrm{C}$ D |
| UniRef90 Q5YMB5 |  |
| UniRef90_G8FS33 | 1 DA S S N P |
| UniRef90_A0A059MUM0 | V A C D A P E D I A V |
| UniRef90_L8WMD8 | MF CSPPGS $\square$ G $L$ H L A Y PRDGS G |
| UniRef90-W6Q3L7 | E Q C CSP ED GNAAHHGY |
| UniRef90-A0A024K6Q3 | YFCNLP Q A D L VGHLGGSHLDASDPA |
| UniRef90-M1TV51 | L V C D |
| UniRef90-UPI00037D7F93 | SVCCDT T NVIA P V S NL |
| UniRef90_L7J3P0 | PLCAQGGDP ASHRDYFEKWRQMAAEFVASRLG |
| UniRef90_L8DV43 |  |
| UniRef90_V9XMW5 | $A \vee C D G$ |
| UniRef90_UPI00037E5622 | A V C D |
| UniRef90_C1ASM3 |  |
| UniRef90_K6X3B1 | $\mathrm{M} \square \mathrm{C}$ N A R A D S LVRRD $\square$ A D LT R A M T F A A |
| UniRef90-W8AB06 | L Y C S |
| UniRef90-I0UX73 | Gl C N S V N P F T N A |
| UniRef90-UPI000367DCB1 | GI CHSENLIT |
| UniRef90_L7KL19 | P I C D |
| UniRef90_L8DFJ5 | M I C N A S D D L |
| UniRef90_C3PHZ6 | AVCD LS A H L Y A A K T G |
| UniRef90_U5E4X4 |  |
| UniRef90_C9SN49 |  |
| UniRef90_UPI00037F183E | A V C D P T V IT NV |
| UniRef90-K0F184 |  |
| UniRef90_V9XDL5 | F TCSAPEN■ |
| UniRef90_L7LAR8 |  |
| UniRef90-K8QZG6 |  |
| UniRef90-W5XTA2 | FVCD F S LE A A N A L S T K A E K H A S Y F L |
| UniRef90_UPI00047C5F98 | VICNAS D D L |
| UniRef90_G1D5A5 |  |
| UniRef90-J4J0A6 | MVS ML |
| UniRef90-UPI00035D175C | $\mathrm{M} \mid ~ C N A S$ |
| UniRef90-T1VRM9 | M I C N A S D S |
| UniRef90-Q5YSQ0 | F V C D S |
| UniRef90_V5FD27 |  |
| UniRef90_G7CF45 | WY A A R G L LP LL LYE L LT R MELSS LE F A M F L VQRLSS T A A G |
| UniRef90_A0A059MGF3 | M $\square$ CDPEGNVTGEHATY |
| UniRef90-A2EII2 |  |
| UniRef90_D0L8K5 | $P \square C D S V R P D D A G H T H Y G P E V G Q P M A D$ |
| UniRef90_C3JL94 | II C N P PVVDVVG |
| UniRef90-M3VCL7 | $\overline{\mathrm{M}} \mathrm{I}$ C N A R PD S L V |
| UniRef90_U0FHS2 | MIT N A D P D S L |
| UniRef90_UPIO0035DE9FD | GAC |
| UniRef90-M3VAC1 | $\mathrm{G}!$ C A A P N P V L D P |
| UniRef90-M1TPB4 | Q! A S G VD G T GVA A VT G Q T T A T G A A P Q |
| UniRef90_H5TSF1 | M I CNA EPD S L |
| UniRef90-E0DGX0 | FVVCGSDLNPLVGHHQYVENGP D Q A VREALDR |
| UniRef90-C2GK41 | PFCDGQWVDNSAHGSYFR |
| UniRef90-X5EEB1 | Y $\square$ C N S |
| UniRef90-L0J3B7 | MYAT T T D D T L L HLG Y |
| UniRef90-M2X718 | T I C TVGP FKF D T HL T Y F N D |
| UniRef90_E9T0S6 | $\square$ ACDAPPD $\square$ |
| UniRef90-UPI000378ACF4 | A I C S L T G |
| UniRef90_U7KQQ8 | FVCD L L L A S A H D ALA T K A A R H A S Y F V |
| UniRef90_W7ICM0 | GlCNSTNMITNANGLYGYA A G D H A |
| UniRef90_U7PJR6 | LFCDSGSSALI H T Y P L T Y E NVA Q F L VDR |
| UniRef90_UPI00047E8906 |  |
| UniRef90_L7KZR3 | VICNARADSLVRDFADLTRAMTFAA |
| UniRef90_V9X8U0 | AlC D G |
| UniRef90 H0EHA5 |  |
| UniRef90-D5UXD9 | V IC N A S $\square$ D SFV |
| UniRef90_UPI00036D91BF | FTCSAPEN $\square$ |
| UniRef90-F9VYX8 | P IA D |
| UniRef90-M2X6S1 | G $\square$ C D G D A L G N G V H T T Y G R T |
| UniRef90_IOPAB4 |  |

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lupas_14
lupas_28
jnet
conf

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lupas_14
lupas_28
jnet
jnet
sol25
sol5
sol5
solo
jhmm


lupas_21
lupas_14
lupas_14
lupas_28
lupas
jnet
jnet
cont
sol25
sol5
sol0
jhmm


ADS STLAGA \({ }^{130} \mathrm{~L}\) LGNPAHHPG \({ }^{140}\)
AD S S T|L|AGA|LLDGNPAHHPG
lupas_21
lupas_14
lupas_28
jnet conf sol25
sol5 solo sol0 jhmm
jpssm```

