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 LVVK K L W D T F H I P V F T L L V D A D P H K Y G S M A M S F EA H N L T V P A
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 LL L N R L








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| $F$ |  |
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ANSF $\square R / W$ WKVMEMCYQ LVQEKKVTQREDFYK LLCDSPH SATKFALILKMLSSIVKMVQDNTYATKRDIYYSD

SRKKFVLM TMDMAEVHHLLLTNTTKTRRAFYYDLKKETTK EARKFMQTVLMAS II YDSLVNNEYPTDRDDYYRGKHVHEN K F VLMTMLMAEVHRLLLTNATRTRRSFYYDLKSMTES SKAFVRVWKLMEMCSQILIQDKKVTQRELFYKLLCDSPV HLLRRLDVLFRVLVIVQQLLQENRHGSKRDIYYMHPS
AKTFIRVWKVLELCFQLLVHGKQVTQRELFYKLLSSSPK S $\square \mathrm{K} \square \mathrm{F}$ ALI L K K L S M I Y K L V QSNTYATKRDIYYTDSQ SARPFAQLFRVIDLI HEALVDGVPVTKRDIYYKDVQL EAKKFTNTLLMASLI YEALLLNDEYPTIRDLYYRGKHTEEN EARKFMQTLLMASI I YEALVNNEYPTIRDLYYRGKHVHEN S LRKYTIMMVCLCHCYKLILMGKHSTKRDIYYSNVNL KFALTMTVMAAAHRLLI INSTDTRRSLYYDLKNDKTN QAKKFLQTLLIAKQDK LLEEDKPASDRQLFYTLKHDGEN $H V R P F A Q L V W L A K F A K Q L L E A G K T S T L R D T Y Y V A L G G E Q D$ S ARKYT GMWLVLQDAHQLLLEDKTVTQREDYYLHP
S $\square$ QP LDAQFFRVVNLVYEALESGVPMTKRDMYYKDVGL K FA TDMYL L S KI HKAL T T G QVVSTRRELYYKNL

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 KKLTWVLS LLDQI HGLLMTNRAATQRELFYGLVN



 QAKDFSQLLWI AFFAKENLITDRSCSDRDLFYNSFNDLK


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 RRFCRLVVMLGGVYNLLENNQKLTKREVYYQDKHLVVTN $A Q M L T L L C R V Y L L L S S N R F A T K R H L Y Y L D K G A$
RFVLIVFLLSEDFRMDASGSSCTKRELYYRNPQ TT DN EA WKFAALLRI LELSHEALVTGUVTTKRDI YYRDPDL V WK V M E M S Y K LiL S Q E K R V T Q R E Ll F Y K L I I C D S P D
 K
A

 H $\square$ RPFTQL $\square W T A W F A K E L V N M R K T S T L R E V Y Y S A R G Q R D \square$
 SRHRFCLVVYMLAK HR LQVNGGSYTVRGLYYSDPQLI SMCACSLI I LLLFKLGFENKHSSKRDIYYMHPS
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 F V L C V V E T G GMMRDRRVVENGFD E EY D A V V V H L G GQPARAATRR


 $Y V L V V E K D A V F Q Q L H R Y G F W K K N K A I L I T S A G Q P D R A T R R$
 Y I I V I
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 $Y V L V V E K D A V F Q Q L H R Y G F W R K Y R A I L V T S A G Q P D R A T R R$ Y I L V I E K E A I F QRI A E H GFQEKKLHSLI I TGKGFPDVNTRM $M V L I V E K D A V F Q K L L K D D C T S S L S C C L V T G K G Y P D V T T R M$ YI LVVEKYAVWNLLNQEKFWKKNNCILLTGKGQPARAERR QVFVVI EKGAVFSRFVEEGADRKFKALLI HTAGQSPRNCRK Y I I V V V

 Y L I L V E K D A I F Q R L A E D R L Y N N QL

 $W V L V V E K E A V F Q T L C R L R D G T H G K G L V I T G K G Y P D V A T R X Q$ FVLVI EKDAAF QKLLQENCPRVLNCILVTGKGYPDVSTRM Y I L V I E E K D A V F Q R L S E D R F F Q TIIP S I L I TAAK GY P DLLA S R V



 | $A$ | $V$ | $L$ | $V$ | $V$ | $E$ | $K$ | $D$ | $T$ | $V$ | $F$ | $K$ | $R$ | $L$ | $L$ | $E$ | $D$ | $G$ | $L$ | $M$ | $C$ | $A$ | $N$ | $S$ | $L$ | $L$ | $L$ | $I$ | $T$ | $A$ | $K$ | $G$ | $Y$ | $P$ | $D$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Y$ | $T$ | $R$ | $L$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $I$ | $I$ | $V$ | $V$ | $E$ | $K$ | $D$ | $A$ | $I$ | $F$ | $Q$ | $T$ | $L$ | $C$ | $E$ | $Q$ | $Q$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $I$ | $W$ | $N$ | $I$ | $I$ | $P$ | $C$ | $I$ | $L$ | $I$ | $T$ | $G$ | $K$ | $G$ | $F$ | $P$ | $D$ | $F$ | $V$ | $T$ | $R$ | $K$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  | YI LVVEKETVF QRLANDMFCKLNRCIVI TGRGYPDVSTRR WV L V V E K E A V F Q T L C R L N DT A H G P GL LI T GK GYP DV A T R Q YVIVVVEKDALWQRL NE DGFWK K E NAA L I S P Q GQAARRGTRR WI L V I E K K E A T F H R L A T A N Y H K T S P P G I L I T A K G Y P D I C T R A

 LVI AI E K G A IF R RFIE E QVY S K L N A
 WV L I V E K D A V F Q T L Y L R SPR S S S P L I L SQ GK GYP D L A T R H FILVI EKDGIMSSAEDLFFDAMPCILVTGKGFPDLATRC WVLVVEKEAVF QTLCQLGVTHGLNGIMVTGKGYPDIATTRH
 WI L V I EKEATF RRRLATANYHKTSPGIMITGKGYPDLCTRA WVLIVEKEAVF QTLCRDG LTDVDS IVLFQGKGYPDVATRH FVILI EK DTI F Q K L LDDESFLLEHGPCILITGGKGVPDMNTRV $Y \vee L V V E K D A V F Q Q L H R H G F W K K Q K A I L I T S A G Q P D R A T R R$ FVI YMEKATI WDRLNEDKAWKKLHCVII ASQGQATRGDRR WVLIVEKEAVF QTLCRLRFTKHGPGLIITGKGYPDLATRQ WILI I EKEAV FHRLATSNYHATSGGGILITGKGYPDLSTRAA



 WI LVI EKEATFRTLHHARTSRAGPGLLVTAKGYPDIATTRA Y I I V V E K H A DF QR L T E D GFF N Q VP S I LI T A K G Y P D I A T R L
 Y V L V V E K D A V WQ R L A E D GF WK K E D A I LI T P K G Q A S R G T R R
 KI LVI EK GAMFTRRVEEKAHEKFNAILVVTAGQSPRSTRN WI LVV E K D A V F Q T L SRA GLLTN H GP GI LI T GK GYP DLLA T R Q FVLVVVEKESVVFESLLDARDLGFGTFRCDLVTGKGYPDCSTRR



 Y I L L V E K D A I F Q K L L D E GAALDRGPVI L L T G K G Y P D V C T R Q WVLVVEKDAVF QTLAHCEITSPGKGLLITGKGYPDVSTRH WVLI I EKEAVF QTLCNLEITNSHDGLLITGKGYPDIAATRH WVLVLEKEAVYRRLASSNYHDRSKGVLVTGKGYPDLSTRA WVLI I EKEATFRSLDGSSQWDTMHGVMLTAK GYPDVASSRK


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UniRef90 ${ }^{-13 M H B 3}$ UniRef90-R1BXD0 UniRef90-K2R8X5 UniRef90-A0А024F3T4 UniRef90_UPIO0035057F4 UniRef90 L-5NS99 UniRef90-W9Yイ6
UniRefgo- 17113 UniRef90-B6QFV3 UniRef90-S2JRB6 UniReffoc C6S3D8 UniRef90-U1MM35 UniRef90 H1UWK4 UniRef90-G4ZQQ3 UniRef90-M7X1C8 UniRef90-P40384 UniRef90-A0Aо22UKA3 UniRef90 XOXPE66 UniRef90 K KFOH 4 UniRef90-Q00XE2 UniRef90-M4SJ51 UniRef90-C1MN96 UniRef90 MOUTY9 UniRef90-UTPJS5 UniRef90-L8GHM7 UniRef90_U1GMS6 UniRef90-Q2QMOO UniRef90-Q6WRU4 UniRef90-N1QER2 UniRef90-V7PHLO UniRet90_E4UUB0 UniRet90_J9MXL1 UniRef90-AOAO24UPQ3 UniRet90_L8WQ55 UniRef90_W2S916 UniRef90_Q66KK5
UniRef90 J9KKD2 UniRef90-L11KF1 UniRef90-M4SL01 UniRef90-UPI000455DCB7 UniRef90_S3D4Y5 Uniref90-M3AX93
UniRet90-D6PBX2 UniRef90-G2Q9M9 UniRef90-UPIO002B4BA4D UniRef90-B6K3T2

 EAWKFTVVIRILEAUAQAUESGLVVSKRDUYYNDP

E
$\qquad$ WRAC RTAFLMQCLSRI

D Q A




S K R

## $D \square Y Y$ DD D

 GQQSTKRDLYYDNK SL AKELAMLLRIVEITHDAISRNVTVTKREIVYRDVNL KTIA GTLKVAELAHLALKEEIBTTKRDVFYGDVKL
 EARKFMQTVLVAS EAWNFTVLLRILELISHGGLVDDTMMTKRDIVYYRHPDL EAWKFSALLRILELSHEALVTGNILTKRDMYYRDPEL K $\square$ A Qi L QVLDCDHEAI ETESVITKRDIFYHDVQL
 SVKNFAGI LKI LSMQYKLVQSNTYATKRDI YYTDSQL S RHSFCVLIYMLSRVHRLQVRGGSFTVRGLYYDNPQL
 NVIKTILDSINEEMRESHQGTYYQGRNANEN
 S WRFAVLI RVLDLI HESLVSNTPVTKRNTYYRDINL

 RYIAKVICVANTLHNVIGGRMSLRELYYHN



LSVYISLLSTIHHLLSTNSVVTKRDIYYRNPS

KYFADF LRRLAVIYHSLQNGEVISKRSTYYREPS L



ENKHCSKRDDYYMYPS
SRHSFCLLVYLLARTHSLQVHGGSYTVRGLYYGDPEL SARKWAI TTRRLMQIVLELCSKGDHVTKRDLFYTLLHPHVK



EAWRFTCVGRTLGE THTATRQG TVVTKRDTYYHDPMAA SAEAVARLWVLLEAVHEMLLAGLQATQRELWYRFKTLEE EA WKFTCILRVLSLI DEAVQDNLLITKRSIYYDNPGL
 HASRFAFCARALA QI YQLRITTTFATKRDLFYEQKSL EATKFTRLMRJLQMSLGALTAGRTDTKRSIYYQDEHL RRYTGGWLILQTAHALLTENKTATQRDVYYLDHP
$T \square A Q L F R V L D C V H E A V R D E X V S T K R D L Y R D V \square D$
EGWRFGVLTRILGLISEAI KGGFISSKRDIFYQDP L V V
VKTFAQTLRMMALCKEAI DTDEEVTKREAYYVSKNWGEA
TFARVI AMLNL!HTNVRQGKTVTQREMYYCASAKEPLL
TFERFWDVADVLARGLRRESSMTLRELYYVMNARSAP





KSFVVMLRIIMEVVHELLDSNKHATKRDDYYMDVTL



LKVAELSHLALKDDVPTTKRDTFYSDVEL EAWRFSCVVSVLNAMHAAI CANVTVTKRDI FYGEPEL SAQKFALMLKVLSVIYKLVQTDTYTTKRDIVYNDVQL
 A QVLGVLNLVHEA S G GYT TTKKRDVYYKDVEL AALLRILELSHEALVTGVVTTKRDIYYRDPEL EAWRFAVVLRIMELLHEALDNDVVISKRDMFYRDP

H P

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## UniRef90 A1CzR0

 UniRef90-AOOO17SHR7 UniRet90-X1K3Q7 UniRef90-KMFS82 UniRef90-A0A016STN6 UniRef90-UP100042B10BB UniRef90-F4REZ5 UniRef90-X8JM14 UniRef90-M2YLA7 UniRef90-K7JAQ5 UniRef90-UPIOOO4410EF6 UniRef90-B8D613UniRef90-C5FVK2 UniRet90-E3S622 UniRef90-W9CE27 UniRef90-V9EKG8 UniRef90_UPIO003AEA129 UniRef90-Q7KPA5 UniRef90-C1MKX4 UniRef90-UPIo002C35719 UniRef90-V5HRL4 UniRef90-M7PIL3 UniRef90-10A182 UniRef90-B4MRR1 UniRef90-UPI0002C344F9 UniRef90_B6AG59 UniRef90-O5KCK4
UniRef90 H2VQW3 UniRef90-H2VQW3
UniRef90 W9X2H0 UniRef90-U4L006 UniRef90-B7QAT2 UniRef90_J3LSW7 UniRef90_A2FYEO UniRef90-TOYA29
UniRef90 W9W7W UniRef90- ${ }^{-}$BL238 UniRef90-X1EW37 UniRef90-M8BE82
UniRef90
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-UniRef90-R1BXD0 UniRet90_K2R8X5 UniRef90-A0А024F3T4 UniRef90-UPI00035057F4 UniRef90-L5NS99 UniRef90-W9YX6
UniRef90-E1Z113 UniRef90-B6QFV3 UniRef90-s2JRB6 UniRef90-C6S3D8 UniRef90-H1UWK4 UniRef90-G4ZQQ3 UniRef90-M7X1C8 UniRef90-P40384 UniRef90-A0Aо22UKA3 UniRef90-X0XPE6 UniRef90- K 8 FOH 4 UniRef90-Q00XE2 UniRef90-B4J621 UniRefofo-M4SJ51 UniRef90_C1MN96 UniRef90_U7PJS5 UniRef90_L8H153 UniRef90 L8GHM7 UniRef90_U1GMS6 UniRef90-GONRM7 UniRef90-Q6WRU4 UniRef90-N1QER2 UniRef90-E4UUB0 UniRef90_-ј9MXL1 UniRef90-A0A024UPQ3 UniRet90_L8WQ55 UniRef90-W2S916 UniRef90-Q66KK5 UniRef90-L1IKF1 UniRef90-M4SL01 UniRef90-UPI000455DCB7 UniRef90-S3D4Y5 Uniref90-M3AX93
UniRet90-D6PBX2 UniRef90-G2Q9M9 UniRef90-UPIO002B4BA4D UniRef90-B6K3T2


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FFRVQY IVD H IVD DLA Y T $\square G V N R T A L N V E A A A K G L V T G D$ FKQQETVDRYVDDIAHTCQVTRRDLNVCASPKGLVAG

$\qquad$ F T DQLVLL GL K T Q T QV D RLVD DLA A T LIEIS RAELHTFASSKGL LS GN F GKQAVVDTLVDDLAVTLGVKRGDLGDKAALKGLFCGSA
 HFRNQKECDGTI LDVAKILNVPRRALGLSASPKG RFKRE Q QVE WAI NQVTMMLE CGPWEI GFYT TSKGL VA G D LF Q A Q A T $L$ LVD DLAA T CGGVAR S DL HDEAA CK GLLWC GVG
 YFGS QK LVDR YVDDI A FTFGVVRAALDHVTAAAKGA I GGH
 FFK G QFVVDELGDLA CT GCPRSALNVEAS GKGL VYGP FFKGQGIVADATKGCFTGDS

 FK D Q K D S D GVLD DI S C L L G CT R N SLHVVVASEKGV V VG FTKRQEY
Y
 T WE E Q Q E S D A V L R D $\operatorname{D}$ V VF K S M M S V S A VI D DI C C MI GS T R S S L RVTTACEKGVVVIGN LFDNQNQATVIVRKI S IMLLRDPRRTLGLFPSPKGGMIGGR

 $A F Y L K V$
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$R$ $\begin{array}{ll}\mathrm{V} & \mathrm{I} \\ \mathrm{V} & A \\ \mathrm{~V} & \mathrm{~L} \\ \mathrm{~A}\end{array}$







LF K Q Q E TVVDRYDD D DAYTCRVTRRDLNVSASPKGLIAG VFRSPRDVGEAI QDAVGMLQVPRSALGI TASSKGL VA GR F GTQAVVNAIVDDIAYTIGVDRTALHVASVGRGLAVGA FGKQSVVDIIVDDISRHYNVPRSSLNVSAASKGLVVGP
 Y G T Q R N L D IS I T A V C R L L N A S R S S Q NV L S T G R G VVM G S L
FF
$\qquad$
 Y F G S QRLVDRYID DIA FTLDVDRAALHVAAAAKGAT GG N RFEEQPESDTVVMDIVA LGGVNREQQGFDPEEKGGEVAGE L F S K V V H V L N A I K K D I A G L L R I D D R G A L N I T T S A S K G L V V G


 KVASLLNCLRGNL GVTASERGTIIGGC EKQA



QRNLDS SI K S

## F GS Q T TVV D R Y V


 F G K Q S EVA D E C I L FGDQVIVDSLI DDIVHTCQVRREDLHVTAS PKGLFVSP
 VF GK Q I N S D K Al ELLAR I CNVPRRFQLNIVSYSKGL V Y GA

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

FK S Q S A VD D MVD N L A F T LGGVGRED L N V V TAKG L $\square$ S GP
F E R Q S TVD A LVRE LTT RTFCCS RSELHVT A A GKGL VYGP




## UniRef90 A1CZR0

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UniRefgo－ 17113 UniRef90－B6QFV3 UniRef90－S2JRB6 UniRef90－C6S3D8 UniRef90＿U1MM35 UniRef90－H1UWK4
UniRef9O－G4ZQQ3 UniRef90－M7X1C8 UniRef90－P40384 UniRef90－A0Аог2UKA3 UniRef90－X0XPE6 UniRef90－K8FOH4 UniRef90＿Q00XE2 UniRef90－B4J621 UniRefofo－M4SJ51 UniRef90－C1MN96 UniRef90＿U7PJS5 UniRef90－L8H153 UniRef90 L8GHM7 UniRef90＿U1GMS6
UniRef90 Q2QM00 UniRef90＿GoNRM7 UniRef90－Q6WRU4 UniRef90－N1QER2 2
UniRet90 V7PHLO UniRef90－E4UUB0 UniRef90＿－у9MXL1 UniRef90－A0A024UPQ3 UniRef90＿L8WQ55 UniRef90－W2S916 UniRef90＿O66KK5
UniRef90－ $9 k K 22$ UniRef90－L11KF1 UniRef90－M4SL01 UniRef90－UPIO00455DCB7 UniRet90＿S3D4Y5 UniRef90－M3AX93
UniRef9O＿D6PBX2 UniRef90＿G2Q9M9 UniRef90－UPI0002B4BA4D UniRef90－B6K3T2
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$\square R W \square G H P S E P A L G T G A V A L V A G D N K K \square N D L L A R H D L$ VKWLGLLP SDLKRL
MT WLGVWPSDRRDDEDAGEDLSEKDDAEVDNLLKKE FVK THWLGLRTSDVVSGAEPLMRLSITRDKKADAILKNNPVFA IK WL GVHSNDFHKNQNGYDPMNNKDDKKAFDLLQKE WDQ ARFLGVTMSDVGGDDVPLEEVKSGDTKKGREEKKERNMD VRLLGILHKHLQKYPLRKLKMSSHDRKSAKRMLATDHLDN

 VQWLGLRASHWSDLH HLIPLEQSDDQMAMSML RRDHQT R WVGDKAEDVLDUGNPTUQLSKRDRMTADGLLWRDQAGT LEWI GPRMEDVQKGWHA I RWLGVHPSDVVTFELKDCPPLSYGDKSKLRNLLARPYVD MMWLGIRPSDLNFLSSNEMTITDKEEKILRNGLTFDHLSE SEF GI TASDILNYDLP | $M R W$ | $G L K A Q D C Q S A Y D P S R Q T G K R D R D A A T S M L A N Q E W R E ~$ |
| :--- | :--- | :--- | MRLGGVLTDLDKYK PR RIKMNKQDEKRTKDLL NEDFVK LRWLGVETSDFEEYCLPDCCLSSEDRRKMEGLLTRCYLHK UKWLGVRPSDLDKYSDPQQCRLEMSEHDLKTELLEEDFDK VKFLGVLPEDVKKYDLPHYKVKESDLKKAKDALENDPFFL

AKFVGTQPQD VDYDLPTDPLADSDDNALESELEDPRFMG MVW GLKAEDI HAAHGVLLPLSMRDRALAVSMLGSAEWRD LGWLGARSSQLQADAGAFQELTARDRSMAANLSAVLRGAA LQWL GTRLIDVEDEDWVMISLSYRDVKKDRSMLKNPVFAQ IEGLGLTCQDRQEFNVSLIPLSERDRAKCLAMLDERGWQQ
 MAWLG1KSGDLPNLFEHSSSITRKDRKSAARLISDEDGTD TK WVGVRPSQIAALGLPSSFKALTRKDDANSLLQASFVQ LEWLGVKGTEWDDLGVDLLPGSLHDRRKALAMLKREGLPD UQWVGLQASEMMSAANHTDPMSQRDRKKAEAMLKRNPSFA
$A V F L G V S H E D V L A A K V L T S K H T K K E S R D \square A N A L R R K R G P L$ LTW GLRSEDLRDVAADAMQDLTTRDAALIRNALEGDDAH
 VKWLGVRRADLERDARARQPLTELDKAKUKNMLAAETGAS

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TK WLGVYPTDTESLNTPSTALTNTDQDRTKSLLKRS YTN MRWLGLHSNDMKVFGVPKLELSSRDRARISRMCERK VIK LEW GLKLSDLENFHLKNMLQLUDRDKTLANNLIAKFEKL I ESVGI WGSELSDLGVGLIPITKQDEAKALAMLQRPDSLM IK WLGi RSSDFIDDCQGLLRLSARDRRTARKMLEKDMFEE MEWLGLRSTNLVRTSQGLLTLSCRDRKKAVKMLDDNHSPA ATYGGUTADDIVAYDRPSDDLSKKDIEALNAELSDPRFAD



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UniRef90-B8D613
UniRef90 ${ }^{-}$C5FVK2
UniRef90-E3S622
UniRef90_W9CE27
UniRef90-S9QYB2
UniRe990-UPIO003AEA129
UniRef90_-OPIK0033 UniRef90-ROKDH6
UniRef90 C1MKX4
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UniRef90 UPI0002C344F9
UniRef90 B6AG59
UniRef90-05KCK4
UniRef90-H2VQW3
UniRet90_W9X2H0
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UniRef90 Q2QM00 UniRef90-GONRM7 UniRef90-Q6WRU4 UniRef90-N1QER2 UniRef90 E4UUB0 UniRef90_-у9MXL1 UniRef90-A0A024UPQ3 UniRet90_L8WQ55 UniRet90_W2S916 UniRef90-Q66KK5 UniRef90_-9 9 KKD2 UniRef90-L1KF1 UniRef90-M4SLO1
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UniRef90_B7G1L8


EEPSWRKELQSLLVMMKAEDEDLYEC DGGVEGWLDGK

 ANDHFKDEVQMWLALPWK】ELEALHVLGFTFLTS FLQAC



DNPRSKEELKEMKRTGKKANDEALEKFGPAWLSKGFRPYK EEPRWRSELQQMLMDNLKAETEVLNDR DGGLQGWI DQR EH $\square$ NLKNELCRMUFTRVKAE $\square Q L L S E N D E R C L T E$ YLADK
G VRQELYK LQQMQLKAEDESV VDGDGDYTPNK LDEE LKYMLEKGIKLELEAFASFSVRYWSRVYLHLE ACNKLH GQCKMMFKSGYKCELEAFQA DS SDFLVNSYLPNK LP VE WKRELSHMLHLDHRKAEI E II S S WS S D HV
EQKAAQE LD WMLQNKCKLELESITMCGKEFMSRYLIAPR $P \mathrm{LP}$ GLQEEVVRMLMLNRKAEI QSLDERPGG LEGWLTGK

 E

DTGDVLAGLQRMDMLNRKVEDQS LDEAAQGGLEDWLADK CSAKVRTEI TQMEKLSKKFEI EAMESDGTDFFIRRELDRR K NKA WETDLK LAAKLK LKAEI QAFASHGFRFLTDRYLPEK $E A P E W R D K L$
$G$
$G$ ANPKWHRELELMVKTK KAETALSSFGFQYLSKTYLPRK

DNKNLAD ILRWLIKEKIRCEQQSFFSVDPK IGKTEKLILEK
DY WTEQ E LQLD GKKAEQQALASRGLDFVTDEYRPTR GEQECTAQLQRMLKLGRKAETQ\LDHGEGGLERWLDTK PEWAAELGRMLSSGSKAEIEAL
DGPEWRAELQTMMMLNTKDETEVLY GTEGGDEGWПDRK SHQSYIKEI NQLLASDHKCETQALNHNGPYNLTN YLIKK STSQLKNE DQMDRDNYKFEI EAVQYLGMDFFIGKYLIKK DWTLLNE LNCLRESGTKLELEAVSSIAPGFMCNGMLAEK YDUDCRRELQVMLF LGAKAE:QAVDDAGD T T S SWLDSH ANEHYRDEVQMWLELPWKDELEALHFLGGTFLTS FLQDC E P WSRELQYMLHLGRKAE: QULASSSS EEPTWRKELQSLLVMNLKAELQALYE LEGBGSEWWKGK


#### Abstract

  


 D NPRCERELEKMLEAGVKVEIQALSHLGSLSCITSHVVTK K PTWRNQLKSMLAGGKKIEMQALSSIS ISFLCDTFLPDK VDQQCRDELQRDLVLNVKAEDQLLEDRPGG LDEGWLNGR LS DVWKRRI EEMM SFDKKASFEA HSGLGFDYFATNLLPDM




 ELLDCREELQRMLMLDNKKAEIQVL
SNHKLLQQVLLLHHLNRKSEDESLTTFTQTYLTEVYTKEK ENPRWRNELEEMLIQDSKYEI ECLNSNSLSNLSNHYIHDK NEHELDNELEFMI KSNTKAELQYLQNDDQSFLCDFYMKDK
 E CVVTAKELQTMLMLNMKAELQRLDA S W WQ W Qi N M ML ELLDKKAEQQSLLAKYGLDFDTETYLPEK EGADQVRELQRMLMLNVKAE QQAVDSYGD DANWLDGK



| UniRef90_A1CZR0 | M |
| :---: | :---: |
| UniRef90-A0A017SHR7 |  |
| UniRef90_X1K3Q7 | L K N R S K F L P |
| UniRef90_K9FS82 |  |
| UniRef90-H6BV76 | LR N R |
| UniRef90-A0A016STN6 |  |
| UniRef90-UPI00042B10BB |  |
| UniRef90 F4REZ5 |  |
| UniRef90-X8JM14 | 1 V E |
| UniRef90-M2YLA7 |  |
| UniRef90-B8C807 |  |
| UniRef90-K7JAQ5 | $\square R \square K N Y Y$ |
| UniRef90-UPI0004410EF6 |  |
| UniRef90-B8D613 |  |
| UniRef90-C5FVK2 | $\square S \mathrm{~K}$ L G |
| UniRef90_E3S622 |  |
| UniRef90-W9CE27 | $\square G E Q \square D$ |
| UniRef90-S9QYB2 |  |
| UniRef90-V9EKG8 | $\square \mathrm{E}$ |
| UniRef90-UPI0003AEA129 |  |
| UniRef90-Q7KPA5 | $\square \mathrm{N}$ |
| UniRef90_ROKDH6 |  |
| UniRef90_C1MKX4 |  |
| UniRef90-UPI0002C35719 | L |
| UniRef90_V5HRL4 | L |
| UniRef90-M7PIL3 | L S K G E WL |
| UniRef90-IOA182 |  |
| UniRef90-B4MRR1 | VN |
| UniRef90_UPI0002C344F9 | L Q S |
| UniRef90-B6AG59 | L L K R W W |
| UniRef90_Q5KCK4 |  |
| UniRef90-H2VQW3 | VR G E |
| UniRef90-W9X2H0 |  |
| UniRef90-U4L006 |  |
| UniRef90-B7QAT2 | 1 K F S G W |
| UniRef90_J3LSW7 | IK |
| UniRef90-A2FYE0 | FANH D W |
| UniRef90-T0YA29 |  |
| UniRef90-W9W7W7 | LRELDD $\square$ W |
| UniRef90-B3L238 |  |
| UniRef90_X1EW37 | L T T G D W |
| UniRef90_M8BE82 |  |
| UniRef90-B3MHB3 | 1 KRK |
| UniRef90_R1BXD0 | LK E G D WL |
| UniRef90-K2R8X5 |  |
| UniRef90-A0A024F3T4 | $\square \mathrm{K}$ R G S Y |
| UniRef90_UPIO0035057F4 |  |
| UniRef90_L5NS99 | L |
| UniRef90-W9YX63 | LR D |
| UniRef90-E1ZII3 |  |
| UniRef90-B6QFV3 | M G S L S Q |
| UniRef90_S2JRB6 |  |
| UniRef90-C6S3D8 | I L RKEWL |
| UniRef90_U1MM35 | LAEF |
| UniRef90-H1UWK4 | MKER |
| UniRef90-G4ZQQ3 | $\square \mathrm{QE}$ |
| UniRef90-M7X1C8 |  |
| UniRef90-P40384 | $\square \mathrm{A}$ D A D K |
| UniRef90-A0A022UKA3 |  |
| UniRef90-X0XPE6 |  |
| UniRef90-K8F0H4 | 1 |
| UniRef90-Q00XE2 |  |
| UniRef90_B4J621 | 1 N |
| UniRef90-M4SJ51 | L E |
| UniRef90_C1MN96 |  |
| UniRef90-M0UTY9 |  |
| UniRef90_U7PJS5 | L |
| UniRef90-L8H153 |  |
| UniRef90-L8GHM7 | MA K A W WL |
| UniRef90-U1GMS6 | 1 K T Q |
| UniRef90-Q2QM00 |  |
| UniRef90_GONRM7 |  |
| UniRef90-Q6WRU4 | LLS Q S |
| UniRef90-N1QER2 |  |
| UniRef90-V7PHL0 | L R K W W |
| UniRef90-E4UUB0 |  |
| UniRef90_J9MXL1 |  |
| UniRef90-A0A024UPQ3 | IM N A D Y F |
| UniRef90_L8WQ55 | 1 L E |
| UniRef90-W2S916 |  |
| UniRef90_Q66KK5 |  |
| UniRef90_J9KKD2 | V LT Q |
| UniRef90-L1IKF1 | 1 CRFD Y L |
| UniRef90-M4SL01 | L E |
| UniRef90_UPI000455DCB7 |  |
| UniRef90-S3D4Y5 | LANE |
| UniRef90-M3AX93 |  |
| UniRef90-D6PBX2 | L A ELLG |
| UniRef90_G2Q9M9 |  |
| UniRef90-UPI0002B4BA4D | I E S E LT LL |
| UniRef90_B6K3T2 | IS QF S T EIP |
| UniRef90_B7G1L8 |  |

UniRef90 G2XGS7 UniRef90_UPIO0026578B6 UniRef90-W7TGSO UniRef90-H2SES1
UniRef90 X1J7E7
UniRef90-S4RJNO
UniRef90 U4TR13
UniRef90 E9J375
UniRef90- ${ }^{-} 3$ 3D6W4
UniRef90-A0АО24JMA3 UniRef90-M2SYD4 UniRef90 UPI0003F48FE4 UniRef90-U5H0X8 Unirefolo-K K YZ 15 UniRef90- ${ }^{-14 C H M 1 ~}$ UniRef90-F4P6G8 UniRef90-C1E5G3 UniRef90 A8X137 UniRef90-A2QUM0 UniRef90-E3QTT4 UniRef90- F2TZY6 UniRef90 K1XEX7 UniRef90-B4FWUO UniRef90 N1 JJN8 UniRet90 G1XTH9 UniRet90 W3VSF5 UniRef90-A4S672 UniRef90 - M2Y777 UniRef90-M5G017 UniRef90 X1E019 UniRef90-UPIO004416839 UniRef90-J9B328
UniRef90 D7G356
UniRef90 UPI0002C315C9 UniRef90-UPIO003D731CB UniRef90-R9PEQ3 UniRef90 UPIo001982AA3 UniRef90_U9UE56 UniRefofo-G7E6A9 UniRef90 ${ }^{-}$A0A01604S9 UniRef90-FOXY35 UniRef90-UPIOOO2C35179 UniRef90-UPI0002C3E95D UniRef90-V5F110 UniRef90- x1S1K5 UniRef90-A5DEU2 UniRef90 UPI00046DE70C UniRef90-M8AQWE UniRef90-E3KGK8 UniRef90 G4T754 UniRef90 G7K7E5 UniRef90-Q0W5E7 UniRef90-J3Q4H0 UniRef90-M8BY72 UniRef90-M1VV90 UniRef90-Q6BWA4 UniRef90 ${ }^{-}$M0ZDR3 UniRef90 H81452 UniRef90-CONTWO UniRef90-K4CPF5 UniRef90-G3JUDO UniRef90-V7PRP5 UniRef90-R1F7K5 UniRef90 UPIOOO2C3E19E UniRef90 B7ZXJ6 UniRef90-R9AIR0 UniRef90-057U90 UniRef90-UPIOOO2C35557 UniRef90_Q23RZO UniRef90-A3FQ36 UniRef90 K4DK35 UniRef90-F2RN32 UniRef90-O6C1H0 UnRelable UniRet90_S8C2W9 UniRef90-KOKNX4 UniRef90- F9WBV7 UniRet90-C7YUT5 UniRef90-W8B8R6 UniRef90 B3LCG5 UniRef90-A7E8A1 UniRef90-F2QLJ7 UniRef90_J3NXT9 UniRef90 G8YPV6 UniRef90-E2AF06 UniRef90-A0A059LHR9





## $E \square Y$ Y Q $\square K T D$

E S K L F T Q VLS $\square L Q L S H Q A L L S G T Y V T K R N \prod F Y Q Y P E L$ KNRKFITKRDI FYNDK

A E A WK F T VLLR I LELIHGSLLDNTVMTKRDI YYRHPDL
 S V K K M S S R C I QARKFMQT TLVASKAKELIDQQGSTAS DRELYYQLKHLDEN

AERYARIWTMLAS SHAHLRRNEKVTQRGLYYLMSSHTSS



 EAWKF TALLRILELSHEALVTGIVTTKRD\|YYREPEL
EAWKFTVVIRRILELCHEALTAG\|LMTKRDDYYREPELYPS
L R L L CHEALTA G L M K R D I Y Y R EPEL
 $\square C R \square F \square L M D K \square H A L L V Q G S Y A N Q R A L F Y E M R H L K M E$ $T \square R D V F Y R D P S L$

HRDIFYQDP
LA QLMS VLS STHEAVVTDMPVTKRDI YYQD DNL
 MS F SMRLLLETRKTATQREISYYT $R A L Q Q V A N M L E E G L M N T T R G M F Y T \quad F V K$ A K A F V R V WK VMMETCFQQLLSQE KRV T Q R E MLFY K L L C D S P E K H A A QV L R V L E L I Q R NL L R G TLV T K R D $L$ Y Y Q S L S L



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

 NHPRDESS

$K \square F D H I L N H L T L I I T L K D N S Y S T K R E F Y Y S D K E L F E Y$ QAASLAKLQF LINHVIETVVANSVSTKRDCYYMLKNQFQK QL F R V ME L SHD A I L G K M I M T K R DV F Y N DV N L
 EAQKFARIVF IL QLLAHDALVVSNTTLTKRSIFYQHQEEL EARRFAAVIVVLKKMDVNLVQDRTTMKRDVYYQDVGLGQ

 SAKSF IDRVWKVMEMCY Q ILVQEKRVT QRELYYKLLCDSPD

MQLAHQAMTTGTILLTKRHIYYQHQEL
 HTSRLNVLLRVLGVVQQLLQQNKHCSKRDIYYMYPS I TLLVMNYVLNALHSSRKVNDRSIVYQNVNA




Y Q N I H C G II S T QR DVYY R L A R L VP FEAI K G GFi S S K R DI F Y Q DPV

S VNRFS $\square$ Y L R L L Q $\quad$ I K S CLLDK D K I T T K R D I Y Y D A V
$F$ V R I L E L I A E A I K L D K I Y Y T K R D V

 QQLLVLRQLYTNTHNGUCTQRDVYYQLSR EAVKFAR QLLILLQLSHDALVS GT』LTKRHIFYQHQDL

MARRLFCIIEIVSKNLKTNTHSTLRQDFYTNPHL
WTALLRIVTLSHEALVT GNIIT KRDMYYRDPEL



UniRef90 G2XGS7 UniRef90-UPIOOO26578B6 UniRef90-W7TGSO UniRef90-H2SES1
UniRef90-_S 4 RJNO
UniRef90-U4TR13
UniRef90-E9J375
UniRef90 S3D6W4
UniRef90-АОАО24ЈМАЗ UniRef90-M2SYD4 UniRef90 UPI0003F48FE4 UniRef90-U5H0X8 UniReffo-K1YZ15 UniRef90- ${ }^{-14 C H M 1 ~}$ UniRef90-F4P6G8 UniRef90-C1E5G3
UniRef90 A8X137 UniRef90-A2QUMO
UniRef90-E3QTT4
UniRef90 ${ }^{-} 1$ X1XX7
UniRef90-B4FWU0
UniRef90-N1JJN8
UniRef90-G1XTH9
UniRef90-A4S672
UniRef90-D6PRJ67
UniRef90_M2Y777
UniRef90-M5GO17
UniRef90- $\times 1$ E019
UniRef90-F9XI86
UniRef90-UPIO004416839
UniRef90-J9B328
UniRef90-D7G356 UniRet90_UPI0002C315C9 UniRef90-UPIO003D731CB UniRef90-R9PEQ3 UniRef90_U9UE56 UniReffo-G7E6A9 UniRef90-TOKGP6
UniRef90- A0A016Q4S9 UniRef90-F0XY35
UniRef90-UPIOOO2C35179 UniRef90-UPI0002C3E95D UniRef90_V5F110 UniRef90-X1S1K5 UniRef90 UPIO0046DE70C UniRef90-M8AQW6 UniRef90-E3KGK8 UniRef90-G4T754 UniRef90-G7K7E5
UniRef90-QOW5E7 UniRef90- J3Q4H0 UniRef90-M8BY72 UniRef90-M1VV90 UniRef90-O6BWA4 UniRef90-MOZDR3 UniRef90-H81452
UniRef90 CONTW0 UniRef90-K4CPF5 UniRet90-G3JUDO UniRef90_V7PRP5
UniRef90_R1F7K5 UniRef90-UPIO002C3E19E UniRef90_B7ZXJ6 UniRef90-R9AIRO
UniRef90 O57U90 UniRef90-U6HTP7 UniRef90_UPIOOO2C35557 UniRef90-Q23RZ0 UniRef90-A3FQ36 UniRef90-K4DK35 UniRef90-F2RN32 UniRef90-O6C1H0 UniRef90_S8C2W9 UniRef90-KOKNX4 UniRef90-G3B1W2 UniRef90-C7YUT5 UniRef90-W8B8R6 UniRef90-B3LCG5 UniRef90-A7E8A1 UniRef90-F2QLJ7
UniRef90 J3NXT9 UniRef90-G8YPV6 UniRef90-E2AF06 UniRef90-A0А059LHR9


VCTQRHTDSA $\square \mathrm{R} \|$ IIRMLNGMWALNTTA QKGL VYGN FKEQRVDTVDDTAYT田TGRDSGLATAKGLVAGN LFRTQYVVDRAVDHi ALSLGI ERQALNIVASPKGLTYAD FVIKQSVVDRYVDDLACTFDITRSQLNV
FKTQAVVDKLVDDLVATAGLKRRDFNVCASAKGLASSSS FGRQKVVDEVVDDI AATLCLRRSELGVGSSPKGLSVSGQ TFEDQDESNPVVVDLEAATGTDREELHMFAETKGGNFGP QFRTQKQVDEDVEDLACSFGTSRDQLMIVAASKGV VYGR LFPDPATVNSALLDSVSLVAVSRRSLGVVAAPRGEVGGA QRNLDSSITSICELLNQSRAMLNVFACGRG IIRGA CFGSQKTVDTLVDDLAHTMGVDRAALYVGAAAKGLVVG
FKKQSVVDNLVDDLAYTLGLGREDLGIVATGKGLVVAGP TMKQSADRA FLVCMLGVPRSLLSTSSRGLYHGPP
 LFGSQQTVDKLVDDI ASAGGVPRRSLHITAAAKGLVVGD VFDTQRASDLVVERLAQLLGCTRGALGVASTRGLVSGS TRVTEHQ DAATIRKUSQALGAPRПALGUVAASKG QVAGR YFPSQПQVDTTПRKTSGLLGSSRNELHIFPNSKG FLSGA FDNQGVSDKLIDLLSELLGEKRGALNURASPRGMFAGSA
पFGSQPIVDRYVDDTAHTFNTTRTATNVTAVAKGTVAGAR IVAGAA
 HFANQTKCNDAB LDCCSLLGEPRHCLGGVASSRGYLAGR VYGSQKRSDFII RHLASKLEVDRAQLNVFPGDAGS V DGP

 FEKQREVDDLVDDUAFTLGUSRGDLNVAASKGV LAGP

FTCQNTVDR\IKRLSKVFKAPKEAFNVIAAPKGFF FRTQAASDRUNQUTLLGCARAELNIVASPRGMTAGP FGDQKNSDKCI EDVATMLYTTRNSTHIVASAKGSCIGGR QLESQRYCDTRI DSIATSLMCDEVDGRIVPSRKGLIVGS YLDQAKSDGINDLCCMTGCRAKSLNVVPAERGVVMGN FKKQVVVDRLVDDLAATFETTRGQLHFAASPKGLF QGD K QENSDEALEHIAALLGYCCKDCLIVYADNRGKVVG


 FDTQRVVDELVDNLAVTLHDDSDLN KSQPFANELIECIVGSLMCAERDLKLFASQKGLM FGN Y LDGQGESDRLTGTLER TTRMQRENLNDTADPKGL IYGD CFGSQSVVDRCDDDACTIGVDRTAL FETQRVVDELVDDLAYTLRCSRYSLLGMMASSRGA MAGR FESQNIVNRTVGKLTQTVKKPREILNIYNSPKG WIAGN FTSPQQVYDRVSESGADIAECPRESLGVGAAPRGSMTGGD FVEVAVVDRAI NDI CILEKCSRHNLNVVPVVKGL VMGW | FKKQSNVEEALQRVSHVLGMRRESLNVRASHKGLFLSSA |
| :---: |
| $F F P D Q G V N R V Q Q L V Q Q L G P R Q L L V V P G T R G C V G G S$ |

F
 YFGSQRLVDRYIDDIAFTLDVDRAA
FKTQGVVDSCIARUTDFLQVPRDSLNVVAAQKGLIYSAC
$\square F R S Q Q T V N N L V D D S \square A \square G V P R T \square H \square T A A A K G \square V C G D$ FENQSNVDKLI NSICKSLGFNNDEI GAVAAQKGL CFGN KDQSECNQLLDLLAHSLKASTTQLNTYPNQKGMMFA


FMSQNVSNVATGKDTK TK TPRELLNTYNSPKG TTRGN FTKQAIVDRFVDDIAYTLGLKRDAMNVS
 KSQTYVNEILDCVSYSLGLSMDDLGIFASQKGMLFS
RपPHQRSIDCAVNSVANLLECAPWDLRLLATPKGLVAGN


UniRef90_G2XGS7 UniRef90-UPIOOO26578B6 UniRef90-W7TGSO UniRef90-H2SES 1
UniRef90 $\times 1 J 7 E 7$ UniRef90-S4RJNO UniRef90-U4TR13 UniRef90_E9.J375 UniRef90_S3D6W4
UniRef90_A0A024JMA UniRef90-M2SYD4 UniRef90-UPIO003F48FE4 UniRef90-U5H0X8 UniRefol K1YZ15 UniRef90 K4CHM1 UniRef90-F4P6G8 UniRef90-C1E5G3 UniRef90-A8X137 UniRet90 A2QUMO UniRef90-E3QTT4 UniRef90-F2TZY6 UniRef90-K1XEX7
UniRef90
B4FWUO UniRef90-N1JNN8 UniRef90-G1XTH9 UniRef90 W3VSF5
UniRef90 A4S672 UniRef90-D6PRJ67 UniRef90-M2Y777 UniRef90-M5GO17
UniRef90 $\times 1$ E019 UniRef90-F9XI86 UniRef90-UPIO004416839 UniRef90--J9B328 UniRef90-D7G356 UniRet90_UP10002C315C9 UniRef90 UPIOOO3D731CB UniRef90-R9PEQ3 UniRet90_UPIO001982AA3 UniRef90-U9UE56 UniReffo-G7E6A9 UniRef90-A0A016Q4S9 UniRef90_FOXY35 UniRef90-UPIIOOO2C35179 UniRef90-UPI0002C3E95D UniRef90-V5F110 UniRef90-X1S1K5
UniRef90 A5DEU2 UniRef90-UPI00046DE70C UniRef90-M8AQW6 UniR Refo - E3KGK8 UniRef90-G4T754 UniRef90_G7K7E5
UniRef90-COW5E7 UniRef90 J3Q4H0 UniRef90-M8BY72 UniRef90-M1VV90 UniRef90-O6BWA4 UniRet90_MOZDR3 UniRef90-H81452 UniRef90-K4CPF5 UniRef90-G3JUDO UniRef90-V7PRP5
UniRef90_R1F7K5 UniRef90-UPIO002C3E19E UniRet90_B7ZXJ6 UniRef90-R9AIRO
UniRef90 O57U90 UniRef90-U6HTP7 UniRef90-UP10002C35557 UniRef90-Q23RZ0 UniRef90-A3FQ36
UniRef90 K4DK35 UniRef90_F2RN32 UniRef90-O6C1H0 UniRef90-S8C2W9 UniRef90-KOKNX4 UniRef90-G3B1W2 UniRef90-C7YUT5 UniRef90_W8B8R6 UniRef90-B3LCG5 UniRef90_A7E8A1
UniRef90_F2QLJ7 UniRef90-J3NXT9 UniRef90-G8YPV6 UniRef90_E2AF06 UniRef90_A0A059LHR9

130
140

160 VVLIVEKDADFQKLLDQDFFRNLNGLLVTGKGVPDLNTRQ YIVVVEKECMFKRLI GDGLLGQAGGL LTGKGYPDLATRA FVLIVEKDATFQRLLDDDFCKLSPCIMITGKGVPDLNSRLD FVLVVEKDATFQHLLDDDFCKFHPCIMVTGKGIVPDLNTRL FILVVEKESTFNKLLEEDLDNKLPFILITGKGYPDLNTQL FVLVIEKDTIFQKLLEENCCRILRCILVTGKGYPDVATRM WLLVIEKEATFRTLAAAGYASNSPGALVTSKGYPTLVTRC GILVVEKEAVFRELC YTMHDYFIITGKGFPDFATSK WVLII EKEATFRSL!GSAQWSTLHGVVVTAKGYPDVASRQ WVLVIEKDTCLMKLLEDNGLGGPGMLVTGKGYPDLATDQ WVLVVEKEADFSALSSSSLLDDGRGVLITGKGYPDMATRH YCLIVESEGTANTLVNSGFTKRHNVILLGAQGVPSNAVRG YVIVVEKESVVNRLVEDYHEKEDA GAGGQPSRGTRR TVLVVEKDAVFFSMLQYGFWHTHPHIIITGRGFPDMATRR YVLVVEKHSVFHRLAEERVHTRLPCVVVTAKGFPDLATRA FVLVVEKDTIFQKLKDEDFQKMFPGILVTSKGYPDIATRN GVLVTVSADTPDTFXETYQ WVL A ATFRAAAYWDASACLVTGKGYPDLLTKQ CALVVEKDA ILQQLVDCNFAETHNCLLITGKGFPGVDTRY WILVIEKEATFRTLASAQYWQSSRGILLTAKGYPDIQTRQ YILVVEKETVFQRLANDKFCERNRCIVIT TVLIIEKEATFRTLASSLYWKSSNG|LITAKGYPDIGTRR VVLVVEKACVFQRLDDLQL GSDLIVVTACGYADAATDE YVIVVEKDAVFNRLCAERVFEKLPCVLVTAKGFPDAATRK VILLVEKDAAYMRLAEDRFYNRFPCIIVTAKGQPDVATRLD FVVVVEKEVTYTRVHGKSLKIFSRPLLLQGKGYPDLATRD FILVLEKDAAMDRLAEARFWRKYPCIILTAKGAADIATRM WILVIEKEATFRSIAASMFWETSEGIILTAKGYPDLASRA WVLILEKEA CILVVEKDATFQKLDGEGFDKLFPTLLVTGRGYPDVATRD VLVVEKDGVFNRMVEDGFYDRDPSVLVTGQGFPPLAVRA FILLVESLLAVYSILATANFHNRYRCLLMTGRGMPDVNVRE
 Y VVEKHADFQRLAEDRVFNQDPSILTAKGYPDDATRF YILSSKMHEQF RSLAHMLEADHPCILITGKGYPDIATRQ WVIVLEKEAVFRSDAHMDEADHGPG\| I TGRGYADLATRS WVLVIEKDDT AVFRSLCSSQFWRVSPGVLVTAKGYPDLTRS CVVVVEKDGLFRRLVEDRFFERYPCVLVTGMGVPDIATRA GILVVEKYTVFEK VSSHWFASMKGLVVTGCGFPDTATCV LVLVVEKEAVFKTLLQHQALDWGRVVIVTAKGYPDHATRT
 FILLVEKNTVLHDLAQANFHENAKCI MVSGQGYGDGSTKV FILIVEKEGMMYLEEMDYHNKHHCIILTGLGMPSGSTRQ WVLVVEKEAIFQTLCQAEFTRDNPGIILTGKGYPDIASRQ FILLVESVATLVSLHSAGFEQRFPCIIVAGSGVPDVCSRK VIPI EKTGFMDLKKLKVADEGNGGLVHGGGQPARGCRA FILTVEKEAIFNMLVNMDFTSDGPSLLI CGDGYPSRSTRQ FILLVQRDDVFWDFARSQLRHEDNCVMI GGDGEPNVMTRA WILVIEKDATFRSLATSRYWERAECLLITARGYPDMATRS GIVVIEKEADFKSFCKYDQNDDVNLI AVTGKGFPDNLTKR LVALEKTGVFMDLKKLKVADGLKDGLIHGGGQPARGCRA Y T TMVEK RTAEDRVFNHTPCILITAKGFPD WLLVVEKDAVFRSLVAVRFWETSSGILVTARGYPDLMTRS YVLIIEKETVFFKLLQSNFFKYGPLILITAKGFPDINTRQ YVVVVEKDTVFTRLLDDRFTRLLPCLLITACGYPSLAVRA FLLIIEKEAFFERVVQSKVREMFPCLILCSRGFPDNATLD YILVVEKETVFQRLANDKFCERNRCIVITGRGYPDDPTRR FVLVVEKETVFSTLRETRFTCHGPTILLTGKGYPDFATRD
 FLVVEKETVFQKLRSKMDWR FYLVVEKETVEQKLDAEKDEQLLNCLMMTGKGYGDYSTKQ YIIVVEKHAVFFRLMEERIFERLPCVLLTSHGFPTVAART IQVGACTEAVFHRLDTSGYHNASSGILLTGKGYPDLSSRE CILIVEKEAVFTTLCANNYDPKDTLLITGKGYPDHMTQD TVLIIEKEAI FRTLTESGDWRRDPGILLCGKGYPDIATRE YILIVEKDSI FQLI CDP LLKMSNNLITTGKGFPDNNTKM SVVIVEKDAIFRSLVSCGQEKHKGILFVTGKGFPDLLTKS Y ILVVEKHSVFFRLMEERVFERVPCVLLTSQGFPTASALS WFLVVEKDA

KGYPDLTTRA
FVLLVEKDTLFSKLISQKDFESFDDILITGKGYPDICTRY YVLIVEKETIFFRLLQSDFSNYGPCILITARGFPGINTRQ WILVIEKEVVHFNLQVATSLTQYRLPFATAKGYPDIQSRQ WILVIEKE
AVIILEKEATFKSFCQFVKEKNLNLVVTGKGYPDLCTRR


|  |  |
| :---: | :---: |
| UniRef90_G2XGS7 |  |
| UniRef90-UPIO0026 UniRef90 W7TGS0 | CVKALVDAFAVPVVGLCDCNP |
| Ref90 H2SES 1 | MVRKL |
| UniRef90-X1J7E7 | FLKKINDDLNIPIFAIMDAD |
| iRet | RKL WDTFHIPTLALVDADPHGFE! |
| UniRef90-U4TR13 | FLKKKL WMVME:PVFI FVVADPDG |
| UniRef90-E9J375 |  |
| UniRef90- A0A024JMA3 | $V H N L A A C L D V P I Y G L U D S D P Y G L$ |
| UniRef90-M2SYD4 | RQLNNAPQIPMFVLVDLDPDGl |
| UniRef90-UPI | SETFPKQVHALVDADP |
|  | LLKKLS ${ }^{\text {L }}$ MPHTPIMALVDADPHGDEILATYHEKEELVIDR |
|  |  |
| UniRefoto-GOQA60 | NL L HERLDLPVYVFTDADPYGY |
|  | RLLIDKLHEM |
| UniRet90 C1E5G3 | KRLQTHPHVPFLGLVDWNPSGVL LGTYRAGGRTSSA |
| UniRef90-A8) | , |
|  | RKLIEDSHQQFYALV |
| UniRef90-E3QT | FLHLLIHDKPELPMMALVDYD SDG |
| $\begin{aligned} & \text { UniRef90-F2TZY6 } \\ & \text { UniRef90_K1XEX } \end{aligned}$ | FLGHLSTHPSIJALLALVDFDPDGIGE M |
|  | (T) QLAHDANLL R V D |
|  |  |
| UniRet90-W3VSF5 | GDPYG |
|  | W |
| UniRef90-D6PRJ66 | MKMELKLPVLALVDS |
|  |  |
| UniRe990_M5GOI7 | NKELKPLPVFTLVD |
|  |  |
|  | LVNQLANDLNVPILALVDWDPHGI GSIS MLHEKDTLAASR |
| JgB | LVNKS NA P L G G |
| UniRef90- UPIooo2C315C9 | rvaeald |
| UniRef90-UPIO003D731CB | LLHRLNRAFDLPILALVDCRTSHMMHLQRKHRNGN |
| UniRef90_Rs | LVQLLSN |
| UniRef90 U9UE56 | D |
|  |  |
| A0 |  |
| A0AO1604 | NKVSTRYPP LGGLFDFPDGGK MRCYRYGSLGTET |
| UniRef90 UPIO002C35179 | VKKLWDTFHIPIFTLVDADPHK |
| UniRef90-UPIO002C3E95D | FVSTISTTTKCPVYCLVDFDPCGLDIFASYVKLGD |
|  | LLRLLSSSQCQRVLGLEDGDPYGVH1HHQ FG |
| Ref90-X1s | FLKRISKELSSLPVF |
| Uniref90-A5DEU2 | FLKKLHRELRTP\\|LATVDC |
| UniRef90-M81 | KWLKDHTGLPVYGLCDPDP |
| ef90-E3h | S R L |
| iRef90_G4T754 |  |
| G7K | K |
|  |  |
| ef90-M8 |  |
| ef90-M1 |  |
|  |  |
|  | S |
|  | $V P Q P P \backslash F M L V D G D P D G M A D M S T Y H D N T N L A V$ |

FLTKDAECPHLPMLVLSDFDP DGLSDFSCYRYGTTNFSN LVYEVQKKNKTKFFCLTDYDAYGLNLAFTYYYMDDDSGNN LAKA VSQSGVIPCCLVDGDVYGMEIFLQRGCNGWKNDPN HV
HLSHLAK\|LPTPFTALVDSDP HGLHTFFTYKFGSSRCSR LLSNLHRTAGVPVVALVDYNP SGLSILQQYKHDYASVHS
 F KLL WETFRLPTYGLFDCDPYTVGSIEKAYDNVSLTCPS YIKMLANNPNSPLFYLGDFDPFGLDVLFNYSVYQQDNLPN LVSDLHCKSGITALYYGGDFDPHGGNIYLIYGESQLAACPS FLRLLSRHSPPPIFILVDSDP DGMAILMSTYKYGSMAMPS FVRLFDEML PLF CVDADPHGMHIAATYRYRSFVRAPS FVRRIFQTQAPPFYILADGDPDGI AIMSTYKYGSMAHPC
 FI WHLA CSGLPIYGFMDSDTYGILIFKSYRENKGVATER LLMNMQEMANVPLVALVDFNPSGLLI LQRMHESRCSAAHS FLNYRSRHPQLSMLGLVDYDPDGVRILRCYHGSDRGSHQA LLYEI RRNKGLKVFCITDYDAYGLSI AFTYYYVEDVISIDN FLHYLAENHPIPIYALVDFDPDGIGIMSTYHENEDLSVPS FLDLMMKHTSLKVYGFFDSDITGAL DANTYKYGTLEKNR



UniRef90 G2XGS7 UniRef90-UPI00026578B6 UniRef90-W7TGS0 UniRef90-H2SES1
UniRef90- X1J7E7 UniRef90-S4RJNO UniRef90_U4TR13 UniRef90-E9J375 UniRef90 S3D6W4 UniRef90-A0A024JMA3 UniRef90 M2SYD4 UniRef90 UPI0003F48FE4 UniRef90-U5H0X8 UniRef90-K1YZ15 UniRef90-K4CHM1 UniRef90-F4P6G8 UniRef90_C1E5G3 UniRef90-A8X137 UniRef90_A2QUM0 UniRef90-E3QTT4 UniRef90-F2TZY6 UniRef90-K1XEX7 UniRef90-B4FWU0 UniRef90-N1JJN8
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UniRef90-X1E019 UniRef90-F9XI86 UniRef90_UPI0004416839 UniRef90-J9B328 UniRef90-D7G356 UniRef90_UPIO002C315C9 UniRef90_UPI0003D731CB UniRef90_-R9PEQ3 UniRef90-UPI0001982AA3 UniRef90_U9UE56 UniRef90-G7E6A9 UniRef90-TOKGP6
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UniRef90 A5DEU2 UniRef90 UPI00046DE70C UniRef90-M8AQW6 UniRef90-E3KGK8 UniRef90_G4T754 UniRef90_G7KKE5
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UniRef90_W8B8R6 UniRef90-B3LCG5 UniRef90_A7E8A1 UniRef90-F2QLJ7 UniRef90-J3NXT9
UniRef9O G8YPV6 UniRef90-E2AF06

$\square$ QW L GVFVQDCDNYS DPLLPLTAEDKRKDEAMLPRCYLQR SIWVGIHPTSWMDDADSLIPRTPHDRCKVYRLL DRNHDR LK WL GVRSADDAT NPARIPLTDDDRAKARTMLRDASTER I QWI GLFPTDFKNFF DDKLPLDRSDYVK DENGIPRS DQL
 MS WL GIVKSGDLTGGLFEHSSSLTKKDRKSAARGIMEEDGAD

 L Q WL GVVDADE FDLA PQTHTA LIRADERTKAAMRLLLRBHPSPDR
 I Y WL GL HF SQLSQ
 LQWL GLKSSHLERNPQGVLKLTSRDRRKARAMLQHTPDVR V Q WL GI Y S S DVLK
FEWI GLSRCKKLPKFVISADPDQTSEDVKVEKDCQR DADLD

VR WVGVDVRDFEEKGEGLVGLRNDERRTAVRLLRGSGNKE EA Y RYLSPDK LLT FAVLEELNIKMPRDLQDAKSLKSSEILDE

 LQWLGI KSTHLFRDYNPVSYMSARERTAADSTLKKSHLGT


LTLAGVF LTHEYSQGHLDEDHLAQNFLLYDQKNQSDKQSFE I RWL GVRPLDVEKYKVDVEDNKGTGRASMAKGFDEQDFVK

 IVWLGGVRPCDADHYDGAPSGCVKQPTELLKSVKSGMAKPFMK A AFLGI ESADVDTWKSVQEPLSKNDLLRAQNNLSLPYMQD AEWI GUSSSD WNELSV $\square K L I A Y D G D D A L H L S H B L Q P D A K R D R S \square L K G L C A Q K H V I G$ V RWLGIKSCHDESLQSSTPELSLRDRKTIVDTLSRGDSSS
 L R F L GI E S S DVDS WLKDQEPLS DLDDARARNNLS $V Q W L G L Q A S E L V P S S L A L I P L T S R D R K K A Q D M L G R S P V F A$
FGWLGDQSGHLGTLHNNRLALT\RDRRMLRKSFDAGDGDF


LMLLGLRCEFFDF TS DPS LRDSDKDD DRQYSSRDDPCEGI
 $L K$ LL G L L P S D TS M L Q V K N Q D LT K S D K L V L R S I K E R S Y Y K E




 L R HL GVVKFSDIL DYCCS D
$M V H F H C Q N L K L L D L L S N L H F L K T F D C K L I E S E F D D N D N N S$ FTFLGCF


 R R WL $\operatorname{G} L$


UniRef90 G2XGS7 UniRef90-UPIO0026578B6 UniRef90_W7TGS0 UniRef90 H2SES1 UniRef90-S4RJNO UniRef90_U4TR13 UniRef90-E9J375 UniRef90- S3D6W4 UniRef90-A0A024JMA3 UniRef90_M2SYD4 UniRef90 UPI0003F48FE4 UniRef90-U5H0X8 UniRef90-K1 YZ15 UniRef90-G0QA60 UniRef90-K4CHM1 UniRef90-F4P6G8 UniRef90_C1E5G3
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UniRef90 J3NXT9 UniRef90 G8YPV6 UniRef90-E2AF06 UniRef90_A0A059LHR9
 LRRQWYQEVLKLLSLRCKAEIQALDQFGHSFLLRTYLSDK AHLP WREEVETMASEHLKCELEALNTFSGDFLS QYVVSA

RKPRWEEQLQTLLASGYKAETQALNARDPQY\TNFYLPQK LLHPEWRNELEUMQARAVKAEMQALESVSPGGLSRYYLPNK
 QEEEQCREVQVMLMLSVKAEVQAADESGD DERDWRRELQWMLMLNVKAEMQVLDELSGGLVS AYLIRNK D D WRRELQHTLHRGYKAEIEIIGSSSSD
NDPFFK
EVPQWRFELELLLHKGVKFEDEALSVHSLTHLSHEYLPSK SCKEYQRQLSRMVFMNCKCEI QEFS
 GEDSVTRELDYMIQNPDKFELESINMCGPEYMGRYLI APR PEPEWRVELQRMLMLNVKAEME LLYDMGLTGWLDRKLVHLL
 AEWMREL RVMLVLNVKAE, QULI GGGGRLAEWLDEK


 K NPGWVEELNLMVKTKQK
 LD SRWREELQUMLFLQRKAEI ECLS SL
KNKAWETDLKDALKLK LDEE WQSELRQMLMLNVKAELQ\LDAD

GNTALLDELDRMRQCSNK LE LIEAVSGDAPGSMCQYLLRTK NPDTYGEEVEYWLDT
DN RLGEEVRHMVSSKQKTT $\square C V L N C E S A S G V S E F V L L K$
E E QEVKMRLTEMLLGGYKVEDEAAYDFGEKGLVAYMEHK EN YRNELEVMVQSGRRAEI EALYFRGYNFL GKYDAKK E WKKEI CLILYMGYKAEIQSLDDC
LDDEVKQELSRMLWNHRK
YNDECRRELQTMLELVNVKETQAVDDAG
EVSETKHELQLMLVLGVKAEI EWLDESGDLF SWLDDE
 CQPFWRKEMEDMADSKMKAEGQALTFGLSSDY LSSRVYL PNK

ELDAKWQRELCRSMTLYKKSEMN LVDPGDSKSADDYILSK MDDNWVCEI EKMDEIGNSVNDERLHTKGDDFLSMKFLAEK TSNEWQRRI RHMQQFKKKFAFEELFRFGASFLADVLLPKM S WKNEVRRMKETRKKSEDQULCS
PQ पWKNELRFMLERGQKAE LEAVYSGGLQ
NHPD
DY WKGENEWFVRHARKTELEALSPLKKKEFYKSYLRAK

## $D E Q L R E N \square H F M M N R G \square K C K \square E A L Y Y \quad \square Q Y \square P T D Y \square R K A$

 EAPEWR
GY WKGENSWF TRNGKKTELEALSPLKKKSFYEKY DRAK EEPTWRRELQHMLMTNVKAEIEMLYER EGGDETWLDHK
 ETNRWIEQVENMKKSGVKYEI DAIIAD MEKHLDAK N NEQURYEAEAMRADRRK LEELEALHADGPEFFA YFLRDK NNEE $\square K N E \square N T \square A F K N R K A E L D E L D D S H K F N L E N \square I I T S C$

S $\square$ DN N R NE $\square K \square M K S H N \square K W E \square E A \square Y N A S S S H \square A D T Y \square D N K$ A QRVWFREAQUMQTSRVKVELEALYECS
EKK
DNPRLKEELKEMKRTGKKANLEALEKFGPAWLSKGFLPYK RWKKWIENAEFDRQNNTKYEIEDIYPFSQKNLTSQFIDNK VSTNDKYKCKLMYEHNYKCELEAFQSDSSDYLVNTYLPSK EGCEWKEEALKMQHLRVKVELEVLYQHGTDEL EEPTWRKELQSLLVMNLKAELEILYE LDDGGMEGWLDRK MNK WKLELQRMLFLGKVAEMNVAGDGSEGRNLARYI FDR PEAEWRVELQRMLLLNVKAE IEILYDRAGG LEGWIDRH
ENEKFRNQLQRTMFFGKKAEDDLIKSNDDNKSNNKFTDER DQEK WKREIQRGDYLHKKAEMNVISKDQSDYSTLHYILAK ACRTWLREAQKMQQLRDKVDIEALYERGTSRL

 GEKE WRRQLQDMLMDNTKAEI QVIGNGDLNMSINKY IKEK K LLTKHREGERCTTCHTKSQI $N D E H Y D G E L Q Q M L M L N V K A E V Q A V D N D G D \quad \square T T W L D S K$


| UniRef90_G2XGS7 | L |
| :---: | :---: |
| UniRef90_UPI00026578B6 | LRGKEG |
| UniRef90-W7TGS0 | L L S G Y L |
| UniRef90-H2SES1 |  |
| UniRef90-X1J7E7 | $\square \mathrm{ETGDF}$ |
| UniRef90-S4RJN0 | LQ F G G WL |
| UniRef90-U4TR13 |  |
| UniRef90-E9J375 | TD GQD Y |
| UniRef90-S3D6W4 |  |
| UniRef90_A0A024JMA3 |  |
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| UniRef90-U5H0X8 |  |
| UniRef90-K1YZ15 |  |
| UniRef90-G0QA60 |  |
| UniRef90-K4CHM1 | $\square \mathrm{H} \mathrm{N} \mathrm{G} \mathrm{G} \mathrm{K}$ |
| UniRef90-F4P6G8 |  |
| UniRef90-C1E5G3 | I L R G D Y |
| UniRef90-A8X137 | $\checkmark$ K |
| UniRef90_A2QUM0 | 1 Q N T S |
| UniRef90-E3QTT4 | MR D H |
| UniRef90-F2TZY6 | L H T |
| UniRef90-K1XEX7 | L LD |
| UniRef90-B4FWU0 | 1 K |
| UniRef90-N1JJN8 | L R E R |
| UniRef90_G1XTH9 | L G G Q |
| UniRef90-W3VSF5 | L Q |
| UniRef90_A4S672 | 1 |
| UniRef90-D6PRJ6 |  |
| UniRef90-M2Y777 | $\square \mathrm{FH}$ Y E D L P |
| UniRef90-M5G017 |  |
| UniRef90-X1E019 | L S T G W W |
| UniRef90_F9XI86 |  |
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| UniRef90-J9B328 | L |
| UniRef90_D7G356 |  |
| UniRef90-UPI0002C315C9 | LK |
| UniRef90-UPI0003D731CB |  |
| UniRef90-R9PEQ3 | L |
| UniRef90-UPI0001982AA3 | 1 |
| UniRef90_U9UE56 |  |
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| UniRef90-TOKGP6 |  |
| UniRef90-A0A016Q4S9 | 1 GE |
| UniRef90-F0XY35 | I T T Q P L EP |
| UniRef90-UPI0002C35179 | LK F G G Wi |
| UniRef90-UPI0002C3E95D |  |
| UniRef90-V5F110 | LS ELDS |
| UniRef90-X1S1K5 |  |
| UniRef90-A5DEU2 | A D V W |
| UniRef90_UPI00046DE70C | LES K D WI |
| UniRef90-M8AQW6 | IE N C S Q |
| UniRef90-E3KGK8 |  |
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| UniRef90-Q0W5E7 | LR E K |
| UniRef90-J3Q4H0 |  |
| UniRef90-M8BY72 | VGNLE D |
| UniRef90-M1VV90 |  |
| UniRef90-Q6BWA4 | \K Q H |
| UniRef90-M0ZDR3 |  |
| UniRef90-H81452 | LK E K |
| UniRef90-CONTW0 | L Q T |
| UniRef90-K4CPF5 |  |
| UniRef90-G3JUD0 | LQ |
| UniRef90-V7PRP5 | I K E |
| UniRef90_R1F7K5 |  |
| UniRef90-UPI0002C3E19E | LT H T S T F |
| UniRef90-B7ZXJ6 |  |
| UniRef90-R9AIR0 | M |
| UniRef90-Q57U90 |  |
| UniRef90-U6HTP7 |  |
| UniRef90-UPI0002C35557 | L |
| UniRef90-Q23RZ0 | Q Q S NKY L |
| UniRef90-A3FQ36 | 1 L R RTW $\square$ |
| UniRef90-K4DK35 |  |
| UniRef90-F2RN32 | M |
| UniRef90-Q6C1H0 |  |
| UniRef90-Q5ATX1 | M K T Q G Q |
| UniRef90-S8C2W9 |  |
| UniRef90-K0KNX4 | 1 K |
| UniRef90-G3B1W2 | 1 D S E |
| UniRef90-F9WBV7 |  |
| UniRef90-C7YUT5 | TG T ALLS WS P |
| UniRef90-W8B8R6 | 1 K |
| UniRef90-B3LCG5 | I E E |
| UniRef90-A7E8A1 | M |
| UniRef90-F2QLJ7 |  |
| UniRef90-J3NXT9 |  |
| UniRef90_G8YPV6 | 1 K |
| UniRef90-E2AF06 |  |

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UniRef90 L2GUQ8 UniRef90_G0TW03 UniRef90-E4XIE0
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KKYFKLLVILSTDYELILTNKQFTVREDYYTHKTI


 MRIMQLSLGALTEGRLITKRNI YYQD


## 

SRRLVIFWRVAD IIQTSGCDKKAISKRDSMK LDKS $\square$ NHK
KQWAQFFSVMAQVHAALVSDTVLSKRDIFY RDP LI EAKKFEA LLCI IEESSHALLSGMLITKRSI YYQSPDL QLRRLRDQMMVLQLLHKNVQEGS STQRDI YYHLVR EGQKFARA LLI I QL SHDALVSGSLLTKRC: FYQHQDL
 $S \square R T L S G V L Y G M S R A L D H L E N G L T M T K R D F Y Y L H K R L K G T$


 ■QNRTCTRREEL
 KLAALIKLIKILKQNLTLNKSTT@RDIYYQDI EL
 SADKTAILISLMKRVQRQLDLKETCTI RDVFYLNVEL SRKVALLFNILNTVKNRLENGQVSTIRDLYYSNVELYEN SRTLATRLRLYEII DEMQELGITRNEREIFYMDVN



SRTLVVRIRLEEII IEMQESGISRNEREIFYMDVN


 TCLVSVMNTLHRNVKEGFHSTGRDTYYNNPS LYTK YQNIHCGUISTQRDVYYRLARLVP



## 

QSMKFAATVRVMN LIDQLQNRQVSTMRD $\square$ YYKDVT $\square \mathrm{VF}$

> RS

QSFARDWQA $\square A A V Y Q L V Q E G K T A T Q R E A Y Y C L V$ H LKKNHLVWLLMKDVHLLLNCRKK DTQRELDFYMNV

K
T

 KKCS ILLNLLK VVMEKLPLGKNTTVRDIFYSNVEL
QK LS DTFTLLKEDQRNDEKCTAFTSRD DFYRNVEL FVRK $\triangle K F L S L I K E M K L H N \square K R T K R E F F Y T A V N$

ESRRFAAVCK LIS LLIKHLKTNQDTTDRDDYYQDV EVV


VYLLNVYYVLLNESKEMTVREVFYRCKRL
NLILNKTTTVRDI YYQDV
RAVRMHFLLSEILKLLQLKKVIDVGAI GYLEKFKFG SSKLS ITELSLINVI ESTLKKNEVRTIRDVYYGNVEL





FKDQTELENLIRDTKLLFGVNDLNTLHLTHTPRG\LFGE FGNQSTVEQLLQRLESMFQVEKQFFNIVSTQKGLLFAGP


FRSQSAVDNMVDNLAFTLGVGREDLNDVAAAKGLDVSGP FRSQVTVDNLVDDI ATALGVSRRTLHITAAAKGL VCGD


## FIAGD







 VFKTQSAVKRMI SS VLELEVSRHELRVKNTAKGTFFIGGN
LKDQTQLDSILKDLSSSWRVNRHDLHIVPQSKG EVCGP
YGKQVTVDRWI NTIAQSLELTRDNLNVIPAQKGLVFTTQ

FKSQTAVKRLISTIASELRVSKSDLRIRNTLKGTFIGG

YKNQRTVTEWLNAI SKAFELPRDMLRVVAAQKGLC
VFRTQSVVRRLVSSIASELQISKHDLGVRNTQKGIFIGRL
YGKQSKVDOWIT TI ARCFELNSKNLNVDPAQKGL GFTL
$\stackrel{Y}{\mathrm{~V}} \mathrm{~F}$
FMSQTTVKRMISS A SELRRVKYELGVRNTLKGTFIGGR
FCSQRTVDKLVDSLA ALALGUHRDELNDVASSKGVFSGSG
F DNQRNSNKUI GKLTKIIKTSREQINIYNAPKG IIRGN
TFEDQDESNNVVVDI ETATGASLREDLHLFAEPKG RLGGP

$D Q G C D N R V I Q Q L V Q L I Q Q P R Q W L G V V P G A R G L I V Q G Y$
YKNQGNFDRSI STI CDLLDEPRVVLNIISSS



FQRQANVVQWLDV!RFNFKLPRKSLNDIPAQKGLVIYDN TAQEQSVVDRYVDDIACTFGISRSQLNVTAAAKGLワVAGR

## GRQAHSNNVLDA $\square$ ANSLNVSQSDLGVYPTPKGVIWSNN

FTSSNQVNKY LKKR DCT L DNVCKSDLNDSNSNRG DS LICS HFKSQTEFNNTLQGM TF R DQ DQCNRCLSTVGDVLKVDRSLLNNIICMSKGF IIYSND

FKSQSKVVQWFGVLQHSMGLSRDVFNVVPAQKGDCFSPV SNLLIE DLEVLCQRLREDFRLHPEENGASVLGD GAWGGGGAAAAARRTRFTLGGLQYRRWEWVGPSGRALPGD



 $F K K Q S I V D M L!K D T C N K L K C T Q S D L L I S T T L K G V F Y G N D$ FSHSQKECRRLLQDLLGHLELPRASLSVFASERGMSFAGS FK

LFERQSYVDQIIDD\AFTFGVNRDALNDVATSKGLVAGGP
 F NRDQQECRKLL T DLVVGLGWSLARDFNI HPTQKGLLM YGN


 Y K R Q Q V V S D W S T FE Q C F GVVEK S T F R I V A A Q K G
UniRef90_W1QFR5

|  | 20 |
| :---: | :---: |
| UniRef90 L2GUQ88 |  |
| UniRet90－E4XIEO | EAQGHLHLIPGCNFACEQGGQIPADLSELINFSGVQ |
| UniRef90－U6Q0K9 | QVLTSES |
| UniRef90－B0EG64 | VTLVTPDYVMDFTKKロQ |
| UniRef90－WOTCD2 | KLS |
| UniRef90－V42700 | FLLTEUSYSADVEVDCNNVFEGHQLSSFGVSRITCYAKPN |
| UniRef90－A0AO24SCR6 | A VVPARICLHDDTVVGPAGGDAVRIACLAR |
| UniRet90－G2QV39 | GSITSCDTSTDTGVLLPSVASDRQ\｜NFRAAR |
| UniRef90 ${ }^{-}$W7ICK1 | KICKTDGSTINC CITRGEGTLVPASSDIEKVVIDCDSV |
| UniRef90－A0A010RTL5 | SRTSE DDASSSEHGILTPSARSVSEIDFGPAR |
| UniRef90＿J9DKQ7 | GGADLVRPN |
| UniRef90－G9A007 | DIVVQTNGQENLIPAKTSSMTPYLAQNSTARIVMRGDAN |
| UniRef90 UPIOOO46DDD8B | LRFCQNGRGMVDCANAR GREVTLSDVDSSGGDMTSNA |
| UniRef90－ 18 U992 | CSLLTKSG ETMDVQLPAKDCLVPSSQDDRELNITSDAS |
| UniRef90＿M2X339 | RIVGRNSIE |
| UniRef90－B2B6D6 | LISRDG SVIDCGLSHSTGTL |
| UniRef90－S9W774 |  |
| UniRe90－5AFO2 |  |
| UniRef90－V6U2S |  |
| UniRef90 G9MZH1 | S CLQ |
| UniRef90－W7AJN1 1 | 俍 |
| UniRet90－E2RTV8 |  |
| UniRef90－I6TIN8 | GSFSTTET SSGDSIPQLIPDMT |
| UniRef90 F9G4R5 | RDG STLNPCSGDLGVAIPTVQSISSVDV |
| UniRef90－D2VKE9 | EISLIDIUENVSASKGCNLPSIP HLQI VEFS |
|  | EIRILTKGEERINPYHSLIPHMDQNSLCQLVPGRNA |
|  |  |
| UniRet90＿Q4UGG8 | NR P Y GLl ${ }^{\text {a }}$ |
|  | KLAFVKGPD I EMS C R N P PLIP DEGIVEVFCSYE |
| UniRef90 G8BAJ66 | QMQEPVLIPUDYCNYFKWNCS |
| UniRef90－R9XE62 | （ ${ }^{\text {a }}$ |
| UniRef90－C5DLE2 | DLHHGNSMIMKRQKSLIPFMDANTSFTGTWSEIID |
| UniRef90－Govgl2 | NNEKVQLI TPFETTLTPY的GDNKTVLSKQAN |
| niRet90＿Q8S |  |
| UniRet90－S6EM21 |  |
| UniRet90＿G3AKD8 |  |
| UniRet90－GowF50 |  |
| UniRef90＿6ZTB2 | KCGSLSAMEIC SPENTPQLIPDMSKVKEVLCDYK |
| UniRef90－K6UEV4 | K NSSPWVDCMSITEERGHLICPFGVSDIEISPDVK |
| riRet90＿G9P551 |  |
| UniRef90＿Q815N7 | KSS WVDCMNAFELLRGHLICPFGLENINI S SGVQ |
| UniRef90 J7RL29 |  |
| UniRet90－H0ACM6 | NDSGDT I DGMSMGSAGMAIPSIVDHLEFENNAD |
| UniRef90－E6ZNM9 | ATLIPPEDDLHRVDMWCERP |
| UniRef90＿Q5CW77 | CMSTFES |
| UniRet90＿A9Q0M0 |  |
| iRef90＿W2T4H3 | SGALAFLTKDKQLIDCRNQQVLISEYLMDHRVVSEAQ |
| Ref90＿J91 |  |
| UniRef90－UPIOOO2C2E572 |  |
| UniRef90－UPIO004560DD1 | SYLTAAGRRRDVAAAGTAKLVPSEGVEQYDVETGAP |
| UniRef90－W9YGH5 | S H L ا R |

## UniRef90 $\times$ X0U8C4

UniRef90－P23179 UniRef90＿Q0TYH8
UniRef90－LOAZR1
UniRef90＿C4XX38
UniRef90 Q7RCA5
UniRef90－17J9D3
UniRef90－11ELT1
UniRef90 D2VU03 UniRef90－A0AO24US79
UniRef90－A7TTH3 UniRef90＿TOY238 UniRef90 D8TYB1 UniRef90－10Z5511 UniReffo－O59Y60 UniRef90－HoGVJ9 UniRef90－12FV69 UniRef90＿Q6FWU6 UniRef90＿S7WDQ2 UniRef90＿G4MS23
UniRef90 C4VB43 UniRef90－U6L427 UniRef90－B9WCF6 UniRef90
UniRef90
U2G1D7
L2GNG UniRef90 UPI0003C383E0 UniRef90－W3X216 UniRef90－13EIP9 UniRef90－H8X3N3 UniRet90＿O6YFD3 UniRef90－G8BWK5
UniRef90－A0A059EII UniRef90－AOAO59EIE UniRef90－G8JTZ7 UniRef90＿W1QFR5

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| :---: | :---: |
| UniRef90_L2GUQ8 |  |
| UniRef90 GOTW03 | YIVVVEKHAVFFRLMEERIFDLVPCVL |
| UniRef90-E4XIEO | FVLVLEKFA YQRLVEEGFCASRNCLLVTGRGMPDRATRA |
| UniRet90-U6Q0K9 |  |
| UniRef90-B0EG64 | FLLIVEKEAFFERLVQSHLSDQFPCIILCSRGFPDNA |
|  | KVVVLEKDADFQQLIQCKNLVQNWIVITGKGYPD |
|  | FILVVEKETAFQHLLAANFHCLYPCVIMTARGFPD |
| UniRef90-A0AO24SCR6 | S |
| UniRef90-G3XLP1 | WVLVLEKEAVYRRLASSNYHDRSKGVLVTGKGYPDLS |
| UniRef90- G2QV39 | WLLVIEKEA KGFPDL |
| UniRef90-W7ICK1 | LII EKEVDA】FRTLAESGDWKRLPG\\|LLCGKGYPDIATRE |
| UniRet90-A0 |  |
|  | IVVIEKDSLFSLTCQQKHAILQNVLFVCGK |
| UniRef90-G9A007 | LKLIVEKEAVYNKLV |
| UniRef90-UPI00046DDD8B | GSYGAYFRLTKDEVDRRFPCI |
| UniRet90_18U992 | WVLI EKEVQPHLVHRPSTADSQEVI |
| UniRet90_M2X339 | IMIVEKNSVFHHLTQHQFFDRFPG |
| UniRet90_M5EA47 | VEKHADFQTLQSCNFLHHGA |
| UniRet90-B2E | WILVTESSSRYGF |
|  | FILVIEKHAVFYRLMAERLYGRVPCVLVTSHGFPTHTARL |
| UniRef90-T5AF02 | A 1 CHCRYQVRRRQMDSSSGNILSHLILPVGGYPDLVIRS |
| UniRef90-V6U2S7 | FTLVIEKDTUFEHLVDNYEA RDNFMVITGKGYPDAATRA |
| UniRef90 G9MZH1 | KPSDGSCILSFFSVL FVLIAVLRWSRTTHNGYPDMLTCS |
| UniRet90_W7AJN1 |  |
| UniRet90_B1L6W9 |  |
|  | FVLVIEKDTVFEHLIDSYEA |
| UniRef90_16TIN8 | VLVVEKDTULQRIASEIRREKEGMLLVCGRGYPCRNTML |
| UniRef90-F9G4R5 | WILVVEKD YPQLP LLGLIDYDPDGIKILRCY |
|  | KVIVVEKESVFQVLKSQASSLKDTSLI |
| UniRet90-C5E1 | RVIVLEKEA |
| UniRef90-C4QXPO | CVIVEKDAVFKRLCESSWAQDQYVVT |
| UniRer90-Q4UGG8 | RVLVVEKDT, |
| UniRef90-G8BAJ6 | LIIVLEKDAVFHSFSKYMQLQHCNYIIL |
| UniRef90-S9VVY1 | FIIVVEKHAIFFRLMSERDYDK\PCVLLTSHGFPTLAARR |
| UniRef90 R9XE62 | AVIVVEKEAVFHRLTRTAAY CRNKIIITGKGYPDQLTRV |
| UniRet90-C5DLE2 |  |
| UniRef90-GOVGL2 | RVLVLEKEA FSKLVSSRNSDQ LIC |
| UniRet90-O8SVS9 | VIVVEKEAIYNKLINSGNGKLLDSITVCGKGG |
| UniRef90 G3 | IIVIEKDAVFQSFCQYSHNTFQNFVVITGKGFPDRLTMR |
| UniRef90-GoWF50 | KVLILEKEAVFNKIVSNYSTCCTNCILITGKGYPDFLTRN |
| UniRet90_16ZTE | KVLVVEKDTILQRIASEIGRERCGVL |
| UniRef90-K6UEV4 | YVLIVEKETIFFRLLQSDFSNYGPCIMITARGFPDLNTRQ |
| UniRe990_G9P551 |  |
| UniRef90_Q815N7 | Q |
|  | GVTVVEKEAVYNKLVRCTRDPR |
| UniRef90-H0¢ | FILVVETSAMVNRLVEEDFHEEHNAI |
| UniRef90_E6ZNM9 | LVLVVEKEAVFTHLLQLQLLCDWGRVVMVTAKGYADQATRA |
| UniRe990-25CW7 | FVVEKDT |
| UniRet90_A9Q0M0 |  |
| W2T4H3 |  |
| UniRef90_J91TP7 | VVLLVEKDT |
| UniRef90-UP10002C2E572 | FVVVVESYCVYHELVQANFHKTYCCLI MTGKGMADVKDRL |
| UniRef90-UP10004560DD1 | WMLIVEKEASFRRICDDQ |
| UniRet90 W9YGH5 |  |
| UniRef90-P23179 | NTVIVEKEAVFTKLVNNYHKLSTNTMLTTGKGFPDF |
| UniRef90-Q0тYH8 | WVLVIEKEA |
| UniRet90-LOAZ |  |
|  | VVFEKEAILK SFMCKKIATGV |
| UniRet90-07RCA5 | YILVVEKYSLYQKLCEKK】WNILPLILITGKGFPDYATRK |
| UniRef90_17993 | Y LVVEKQSIF |
| UniRef90-11ELT1 | LSFYEDAVFTYLCGQRIWDSL |
| UniRet90_D2VU03 | TVGLGEKDAIFRRLVEDKIFKVRNCLITTGCGYP |
| UniRef90 AOA024L | K LVEKDAAFMRLAEDRFYNKYPC R A A G G |
| UniRef90-A7H3 | KVIVIECGGMVDRL |
|  | YLLVVEKDAVFQRL |
| UniRef90-10z5J1 | FVVVVEKDAIFQRLVDDGFAEHIGGILVTAKGMPDM |
| UniRef90-Q59Y60 | VVILEKDAVFQCLCTHQHNDIIRFLIVTAKGYSDNDT |
| UniRef90-Q3SD96 | WI LVVEKETVYFHLINEMHQEFLNTVLITGK |
| UniRef90-HoGVJ9 | NLVIVEKEAVFTKLVSNYHRLNAN |
| $12 F V$ | VVVEKEAVFKHLI QHPTVAR QWVVV |
| Q6FWU6 | MILVIEKDA |
| UniRef90 S7WDQ2 | NILVLEKDS |
| UniRet90-G4M | CL EKEATFRTLAS |
| UniRet90_C4VB43 | CL |
| UniRef90-U6L427 | VVI |
| UniRef90 - B9WCF6 | LVVLEKXAVYQCLCTY |
| UniRef90-H2B1D7 | KII L EKEAVYSKLVQNKL MLNSLIT TGK |
| Uni | MVVEK |
| UniRef90-W3X216 | WVMIVEKEATFRSLVAARYFDHSPGLLITAKGYPDLATRQ |
| UniRef90-I3EIP9 | VVIVVEKEADFNDII ENDENKVGKVLIITGKGYPC |
| UniRef90_H8X3N3 |  |
| UniRef90 Q6YFD3 | VEKLSIFNMLVNLNFHVTHNCII I TGCGKPDMATRG |
| UniRef90-G8B |  |
| UniRef90-A0A059EIB1 | FCLVIEKDSLFN |
| UniRef90-C4 | HILVEKYTVFSQITKTSWFNKNNLI TACGFPDSATKY |
| Ref90_G8JTZ | VVLLEDAVFHKLARDAQYNK DKILVTGKGY |
| UniRef90_W1QFR5 | EII I VEKESVFSKLCKE HDHGNKILITAKGFPDRLTK |


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| :---: | :---: |
| UniRef90 L2GUQ88 | LQRLLEMNCQIYGLLEDDPFG TNTER |
| UniRef90-GOTW03 | LLSNLHRKALVPVVALVDYNP SGLS L Q |
| UniRef90-E4XIEO UniRef90 U6Q0k |  |
| UniRef90-B0EG64 | AHHLTQKLNIIPCCLVDGDVYGIE |
| UniRef90-WOTCD2 | LLHHMGQKLPQEVLIYTDSDPYG\\|DIVTKYMSHATLRCSR |
| UniRef90-V427U0 | L HLMNCHLNTRLFCLCDYDPHGLAIAMTFYYTEECAIPQ |
| UniRef90 A0AO24SCR6 | FLQLVRNCPQUPVFVLADYDPDGLNI LYYRLKK S |
| UniRef90-G3XLP1 | FVRKLFDHSHQQFYAFVDGDPDGMAIMATYHENRNL |
| UniRef90-G2QV39 |  |
| UniRef90-W7ICK1 | RYL YLISKNTLYCLV V Y P P HGLD |
| UniRef90-AOAO1OF | KPELSIFALVDFDCY |
| UniRef90-\90DKO7 | RM EGKVE: F GLFDYDPFGM HIYCVYKY |
| UniRef90-G9A007 | NRLQQNLDWRIY TDADPHG\\|DIALKYMQN |
| UniRef90-UPIO0046DDD8B | FVRKMKEELDLPVLA AESSPRLVKNFSLIVVA |
|  | FLVLLRNCPEAPILFLVDADPYGV |
| UniRef90-M5EA47 | FLWLLGTSFNGKIFILMDADP HGLDIARDYMDAL |
| UniRef90-B2B6D6 | SVVHMRPSLVIFGLADFDPD |
|  | HNLHAAPHLIPVVGLVDYNPSGLAILLQMRENTFTSVPA |
| UniRef90-T5AFO2 | FLQLI HEHAEMPILVLTDFDP DGLNI FRCYRFGSARSDG |
| UniRet90-V6U2S7 | DSCRMP L GL ADGD A H GM |
| UniRef90 G9MZH1 | QLI R N CPQ\| Pl FVLADYDP |
| UniRet90 W7AJN1 |  |
| UniRef90-B1L6W9 UniRef90 E2RTV |  |
| I6TIN8 | KML EHRTAISGLFDFDPFG |
| UniRef90-F9G4R5 | SERLSHEADLGI EALRWLGITRSV HLSRG |
| UniRef90-D2VKE9 | VTLTKQRSLNIFTLTDGDPYGA EIANVYMNGS |
| UniRef90-C4OXPO | FLDKMMKHTSGKVYGFFDSDTYGLDLAMKYYKYGTGLKNK |
| UniRef90-Q4UGG8 | N |
| UniRef90-EOS | MI EHKTA GGLFDFDPFG |
| UniRef90 G8BAJ66 | WLARTYCTTTLGFFDSDAHGL |
| UniRefo ${ }^{\text {a }}$ |  |
| UniRer90-R9XE62 |  |
| UniRet90_CLDLE2 | FLKMLSESEKESTKITTDADPYGVNI ALKYMQT |
| UniRef90-Q8SVS9 | DLDPFGL HIFCDYKYGSKETPD |
| UniRef90-S6EM | DADPHGMDIASKYMK\DH |
|  | SLI GFFDSDVYGLRICQQYQKCGS |
| UniRef90 GowF50 | FINLLFYKCCSSF:HILTDADPHGVNIAYMYAK |
| UniRef90_62TB2 |  |
| UniRef90-K6UEV4 | EIRNCPQIP I FALVDYDP DGLNIFRCYRFRSVTAPG |
| UniRef90-Q885N7 | LYEIQKRYREKIFCLTDYDVYG LSIACTYASKN |
| UniRef90-J7RL29 | FI SLLVPET VQVHVFVDADPYG【N【ALKYMDA CPQV |
| UniRef90-H0ACM6 |  |
| UniRef90 E6ZNM99 |  |
| UniRef90_Q5CW77 UniRef90-A9Q0M0 |  |
| UniRet90_W2T4H3 | LLRWLVDQLAVPVYGLFDSDPHG\\| |
| UniRef90-J91TP7 | VKMLSQUAHLPILYLGDADSFGAD $\square$ YFQYAFGNTNCPL |
| UniRef90-UP10002C2 | FVKYVMEKLEVPVFYLSDSDPYKYGSANMAYDAENVANPH |
|  | RFLIDNAHTPIFGIFDWDPDGIMI |
| UniRef90 - XOUBC4 | LLRRMHEELKLPVFVLLDNDPWG |
| UniRef90-P23179 | FLKKLEQKLISDCSIFTDADPYGIDSALYTHSNERNACTM |
| UniRef90_Q0TYH8 | RRVADQPKIPMF |
| UniRet90-LOAZR1 | VELSMNSDIEICYLGDYD |
| UniRef90_C4XX38 UniRef90 O7RCA5 | GLQACLPTPMVYFVDSDVYGLQUFWSYMQMSELLLAQN |
|  | ILNKIITNTKLAALYLGDYDPYGMLIYLTY DEADCDNDCC |
| UniRef90-I1ELT1 |  |
| UniRef90_L2VU03 |  |
| et90-A0A024 |  |
| UniRet90_A7TTH3 | SSDIDWEVYTDADP H |
| UniRef90-TOY238 | RRVTEELKLPVVVFTDGDPWSFRII KTA HLS S Y LiA P S |
| UniRef90 D8TYB1 | FAARLAASFPAPPVGLVDYNPAGVVNLATYKYGSDRLPG |
| UniRef90-Q59Y60 | FLTWLQTNENCKFIGFFDSDVYG LNI Y WQY NQKLPE |
| UniRef90-03SD96 | FVKYLSMNPYTPVYYFGDMDP |
| UniRef90_HoGVJ9 | KKLEQDLISSCSTFTDADPYG\\|SI ALNY |
| UniRef90 12F | QULGAELECRMVGVFDCDPYG D A M HRQYVQVCGG |
| UniRef90 Q6FWU6 | FLHRLQCNSNLQFVILT ${ }^{\text {P }}$ |
| UniRef90_G4MS23 | LVYCLRERPRTPIYSLVDYDPDGI R L LCTYKYSSSAV |
| UniRef90-C4VB43 | FDFDPYGL |
| UniRef90 U6L427 |  |
| UniRef90-B9WCF6 | FLTM |
| UniRef90-H2B1D7 UniRef90 L2GNG7 |  |
| UniRef90-UP10003C383E0 | LLSKLVNEHNLPIYMLADADPYGTEIMLTYQYAHQLATPQ |
| UniRet90_W3X216 | FLHAIHSQYPFPLHGLVDFDPDGVGILRTYKL |
| UniRef90-l3EIP9 |  |
| UniRet90-H8X3N3 | D |
| UniRef90 Q6YFD3 |  |
| UniRef90 A0A059EIB1 | FLSKLEEVNWPIYGLFDFDPYG LNAYLNYKKH |
| Un | - |
| UniRef90_G8JTZ7 | LRQLLKPAHIQVEAFCDSDPYGIDITLKCCEVGSPTARR |
| UniRef90_w | FILYHLTQ THYPEKVVAILVDSDVYGLLM ULJE Y K Y |


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| :---: | :---: |
| UniRef90_L2GUQ8 |  |
| UniRef90-G0TW03 | LRWLG\| RGCHIVEVRVPFQRFTRRDEVVMSNLITREDSKE |
| UniRef90-E4XIEO | EQDLGMRPNQIKTRFDAQLALLTKTDRSRISNMRNQKDEQY |
| UniRef90 U6Q0k9 | IGWLGLKPSDVSSLS |
| UniRef90 BOEG64 | L R WS Glvip ib |
| UniRef90-V4Z7U0 | MEPLGII REEDTKSMTPLDLHLLQTLHSRLKHLEQQ |
| UniRef90-A0A024SCR6 | RWLGI RSQDLLELREPI SPLSVRD |
| UniRet90-G3XLP1 | L H WL GL RLA |
| UniRet90-G2QV39 | L R WLGI LS ${ }^{\text {d }}$ |
|  | THWGIKFS |
| UniRef90- - 9 I | MQRUGMCSD |
|  | GALLTQLLRRKEAQLQMSQRD |
| UniRef90-UP100046DDD8B | 1 KWLGLRPSDVVALKMHMRPMNSKDFKLAQRLLEKDAVVK |
| 184 |  |
| UniRef90-M5EA47 | VYWLGL |
| UniRef90-B2B6D6 | LCWLGIKSRDLLHFQNPSDKLTLRDRKKAGDILRA |
| UniRef90-S9W774 | LRWLGVRAAQLLPRGMPHKPFTERD |
| UniRef90-T5AF02 | RWLGVKARH1 QDLRDP |
| UniRet90-G9MZH1 | I RWLGUKSQDLLERKSRLDALSTA |
| UniRet90-W7AJN1 | 硡 |
| UniRef90-B1L6W9 | ARF: GLLTRDVEDYKFALEPLTQADYKAALDNKSLPNLQN |
| Ref90_E2RTV8 | VP GVFNSHMQRSIKGSRHCDPA |
| UniRef90_I6TIN8 | CMED |
| UniRef90-FGG4R5 UniRef90-D2VKE9 | MS WITGV GCRNDPSKWKNCWMPLEEAALSK |
| UniRef90-C5E117 |  |
| UniRef90-C4QXPO | LQWAGVE |
| UniRef90_Q4UGG8 | RWLGI RSDDVLRYD |
| UniRef90_EOS6R3 | VVRIGVCAEDLLDKRUHQDGLNKYDLKMVDRLMEF |
| ef90-S9V | R D |
| UniRef90-R9XE62 | FDYGGIFIRDLTDAGVCANPLTEREWKMAQKMLTSLCGEG |
| 既ef90-C50LE2 | LCYKGML |
| Ref90-G0VGL2 | D |
| UniRet90-Q8SVS9 | RD |
| UniRef90-G3AKD8 |  |
| UniRef90-GOWF5 |  |
| UniRef90-16ZTB2 | IT R $\square$ GVCVEDALKWEGGFLELSDHDLKMUDKLLMKFKDLAS |

TC WLGTK S QDLLEYERPVSLLSTRDRKVAVGILEKLLDVK LHWLTLFNTDLTKLTLKDIRILDNLCAKLKNNNKYSAAER VQYAGATLTKLLHRETTLLALNERDRTTLQRIIANSPADTA

VEWDGVDGSDLAGQNSALVPDRNDERATAVRLLRGLGTSH
 $L \sqrt{H} W L G L R T H H I / A E G R E P$

MRWTGVKAED TTTGGHALLPDSMRDRA $\square$ AASMLASEEWRN AKFUGVSSFDYQRCDMSDDVLDANDDKRAKQIANYAWFAS ANYKGIRDTEVHNKSTQLLSLNQRDYSLAKNLTSWDTATS ПQWПGVRRHHICRTPVGLMKLTARDRTKAACMLEWDLCAE YKWIGIRASDVEEYGIKKVVDLTKREMRALENLDSDPEVA AKLGGAF I CDDRTEWLTMDKREWDRSVNFLQRNARTE

HK VQQESALKDRDQWLGMNYEDVKDПPHYYNQPDSQR MK WLGARPPDVTKYK PDQPMKDSDTKAGMDLL DEEFMK पAFKGAF पSRLVNQTLDD LD LKPRD TS LATKLIQQPTNQT A
LR WLGLRSRQLADVHHHLQPLSERDRVMVRGL RERLGD AQYGLSGLTWLAARAALGP TVRDKALTVSLKAGPLSA MVYSGGYLS LESQPHTWLSITHRDTAMMIKLCKNGNNKY VDYRGIYIT QVLAQNDQLLNLSQRDCTLAKNLINEEIATS



 AQYKG|TVAALIKDEDNLMKLTPRDRNLLVKLQRLTSHQK LKWLGGHPSDITN LDQUPQEDLSEMDYRKMNSRLMRRNYIDE LLWL GVKSHDMFR


LIHKGAR


UniRef90 L2GUQ8 UniRef90-GoTW03 UniRef90-E4XIEO UniRef90 BoEG64 UniRef90- WotcD2 UniRef90-V4Z7U0 UniRef90_A0A024SCR6 UniRef90 G3XLP1 UniRef90-G2QV39 UniRef90-W7ICK1 UniRef90_A0A010RTL5 UniRef90_-J9DKQ7 UniRef90_G9A007 UniRef90 UPI00046DDD8B UniRef90-18U992 UniRef90-M2Х339 UniRef90-M5EA47 UniRef90- ${ }^{-} 236$ B $^{\prime}$ UniRef90-S9W774 UniRef90-T5AF02 UniRef90-G9MZH1 UniRef90-W7AJN1 UniRef90-B1L6W9 UniRef90-E2RTV8 UniRef90 ${ }^{-16 T I N 8}$ UniRef90-F9G4R5 UniRef90-D2VKE9 UniRef90-C5E1T7 UniRef90-C4QXPO UniRef90-Q4UGG8 UniRef90-EOS6R3 UniRef90-G8BAJ6 UniReffo-SgVVY1 UniRef90 C5DLE2 UniRef90-GoVGL2 UniRef90-Q8SVS9 UniRef90- S6EM21 UniRef90-G3AKD8 UniRef90-GOWF50 UniRef90-I6ZIB2
UniRef90 K6UEV4 UniRef90-G9P551 UniRef90_-Q815N7 UniRef90-J7RL29 UniRef90-HOACM6 UniRef90-E6ZNM9 UniRef90_O5CW77 UniRet90 A9Q0m0 UniRet90_W2T4H3 UniRef90--J9ITP7 UniRef90 UPIO002C2E572 UniRef90 UPIO004560DD1 UniRef90-W9YGH5 UniRef90-X0U8C4 UniRef90 P23179 UniRef90-Q0TYH8 UniRef90-LOAZR1 1 UniRef90-C4XX38 UniRef90_Q7RCA5 UniRef90-17J9D3 UniRef90-11ELT1 UniRef90-D2VU03 UniRef90-A0A024US79 UniRef90-A7TTH3 UniRef90-TOY238 UniRef90_D8TYB1 UniRef90-10Z5J1 UniReffo_-259Y60 UniRef90_Q3SD96 UniRef90-H0GVJ9 UniRef90-12FV69 UniRef90_Q6FWU6 UniRef90_S7WDQ2 UniRet90_G4MS23 UniRef 90 C4VB43 UniRef90-U6L427 UniRef90_B9WCF6 UniRef90-H2B1D7 UniRef90-L2GNG7 UniRef90-UPI0003C383E0 UniRet90-W3X216 UniRef90-I3EIP9 UniRef90 ${ }^{-}{ }^{-18 X 3 N 3}$ UniRef90-Q6YFD3 UniRef90_G8BWK5 UniRef90-A0A059EIB1 UniRef90 C4LZW3 UniRef90-G8JTZ7 UniRef90-W1QFR5

EFS EDIISFLEGLGKKMETEDFTSYHTTFTV QYDEKK ACEVWRREAEKMQLLQVKVELETLYDTGMS DNVSMKKHWDKVMFFN KELVMEDLGYKKLSSK GEDEVVAELDLLRLQRTKDELEAVSS $\backslash A P Q Y$ I CNQEI ELLEI KTLLKNNTKMELDELANTNVSFFETTIISSC TQDELRDELQKQLFFQRKGEMNVVNNGDLEYFSEEALRN LHASWRKSLESMLHNRVKYELDAFSDL


NDRDCRRELQVMDF $\square G \square K A E \square Q A V D K G$
DMLHRDQFLKNVDKMEMEDFTGRGSSF TMTYDCDK
 PELE WRAELQQMLMLNLKAEIEILYDW DGGLEGWDDQK

पpsehaqe
LS T WLD D N
 GRSEWAGEVQNLAADGMQYELENDDGGGQEGGLVSYUADN EDFAWTEYANHMKTSGVKYEVDAIQDDSPEYFDR YLSEK E RLEWANEVQNLAALLGMQYELETE
DLLF KKKEGQGMGMNKKVEMEAFFSKTSKEL

PNMTTVQELQRQDFLQKKAEMNVMGR EETVGQK
 AFLSKG LGPKVHREDTRGLFGYKKAEMNVVSK
EYAPWLAE EKMKKSSRKYEDEEVY
DHGHMRRELQWQLLSFKKGEMNAI
LSGKNKRMLTQELQRQKKAEMNSVSNSDFSYFSKK
QASKLKVALQRQMFFQKKGEMNALYSR
DLLFLRKI
 NSKVFDRELQRQLFFHKKGEMNSIFS
 NN WIENUSNMKKFGVKYEIDAIND IEEHINNR

DDERVRARLTDMLLTGYKAE DEAAYDFAP DEKWLIKV
CHSE $\square$ HKS $\square$ LKN $\square Q \square$ KKFE $\square E A \square T$
DTGEMDADLQRMLMLGRKAEDQLLGYGDDG DEPWLVKK KRP WQREKKMLQNGFKMEVEAMISKDLSYLTEAYVPMK PLKNVIDECQREDFFQKKAEMNEVDARDFEY GGPEWRHELQAMLMLNTKAEMQULDEL ENTLLRHEUEQQRTVQKDEDEALEESTSTGVLFEYVRRK YSSKLRTEI SEMNEKNDKFEI EAFEYVGMEFFVKNYL DKK TGNKLKQMLVKMKESSFKVE UEALQSUCDDFLENYUTKK

YAP【W
 RNKTFKTEDQRQLFYFKKAEMNS पS

MEPGWAGEDDVMEASGYK
EPAVLAELDAMLEMDAKAEDEALYEKGDDNFT
NDDPYRE TRGLYDFKKAEMNVVQANDANQSYVNYMVSK SNANLPEEWKQLMDNKEKYEDEDMQFQNGSEFV PFKNFIVECQREIFFHKKAEMNEDDA
DEELWRTKLTNMLLTGYKVEDEAAYTFAVGGLVG YLQHK DYANMRTELQRQLFLTKKGEMN
DEKE乌IDDLKFTQGMDKKMEVETF NNDTNFL! KFTEDK EHDKYLRELRVMLMLDNKAEVQAVDNDGD RGI TEWLDKK E ANEKTKNECKYMLKNNIKMEVEGLESMAKGFDINNY
NNTAAYRELTRGLYLFKKAEMNVIQAKDTNQSYVNYMVLK GLPGAKLALQRHLFFGVKGEMNSM NEVEFIEGLMVLQQGMKMELEDLFNR MDFDDFEYDDKY
 SSFSTKTETQRQDFFAKKGEMNALY KELDNELTF LKGGGNKDELEAMVRENCNF YEEYDKRK
SQRMLQREDQRQपMF■KKGEMNVV

| UniRef90 L2GUQ8 | $\square \mathrm{M} \square \mathrm{S} \mathrm{S} \mathrm{Y}$ |
| :---: | :---: |
| UniRef90-G0TW03 UniRef90-E4XIE0 |  |
| UniRef90- U6Q0K9 |  |
| UniRef90-BOEG64 | LH H |
| UniRef90-W0TCD2 |  |
| UniRef90-V4Z7U0 |  |
| UniRef90-A0A024SCR6 |  |
| UniRef90-G3XLP1 | Q ${ }^{\text {NGG }}$ |
| UniRef90-G2QV39 UniRef90 W7ICK1 |  |
| UniRet90- Whick |  |
| UniRef90 J9DK07 | $\square$ |
| UniRef90-G9A007 |  |
| UniRef90-UPIO0046DDD8B | MVA Q DW■ |
| UniRef90-18U992 | MAGFS |
| UniRef90_M2X339 |  |
| UniRef90 M5EA47 |  |
| UniRef90-B2B6D6 | ■ |
| UniRef90-S9W774 |  |
| UniRei90-V6U2S | $\square$ |
| UniRef90-G9MZH1 | L |
| UniRef90-W7AJN1 |  |
| UniRef90 B1L6Wo UniRef90-E2RTV8 | LE Q H |
| UniRef90-16TIN8 |  |
| UniRef90-F9G4R5 |  |
| UniRet90-D2VKE9 |  |
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| UniRef90-C4QXPO |  |
| UniRef90-Q4UGG8 UniRef90 E0S6R3 | LD SIVDKVL |
| UniRef90-EOS6R3 UniRef90 G8BAJ6 |  |
| UniRef90-S9VVY1 |  |
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| UniRet90_GOVGL2 | Le |
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| UniRet90_GoWF50 |  |
| UniRef90--16ZTB2 | LR R M K |
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| UniRef90-G9P551 UniRef90 O815N7 |  |
| UniRef90_O815N7 UniRef90-J7RL29 | IKE |
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| UniRet90-X0U8C4 | LK D K K W W |
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| UniRef90-C4XX38 |  |
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| UniRef90-11ELT1 |  |
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| UniRef90-A0A024US79 | LR D G D W $\square$ |
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| UniRet90-Q6FWU6 |  |
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| UniRef90-G4MS23 UniRef90 C4VB43 | LCs |
| UniRef90-U6L427 |  |
| UniRef90-B9WCF6 | $\square \mathrm{LD}$ T |
|  | $\square$ |
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| UniRef90-Q6YFD3 |  |
| UniRef90 A0A059EIB1 | VT N |
| UniRef90-C4LZW3 |  |
| UniRef90-G8JTZ7 |  |
| UniRef90_W1 QFR5 |  |

Q $\square$ Q C L A R $\square L S L V N S \square N G A V T S K A T C T E R D L Y Y C N P P L F A P$ NNDTMNDRALYYQ FPD H $\square Q A \square A Q T F Y V L Q \square V Y S G F Q T G D V C T E R D L Y Y R N P P L F A P$ RSLEQTA QLLDALPRLLAWKSESF LDALGGNSKTLEEK

FAR $\square L K M \square D F \square E K \quad N S K S \square Y V R E V \quad S V L V Y G D S$
MRFLMRNAA LGKTEMVRAFEYQ KKSDR D MKMLCF LENNTEE LYYRELVYGDSKWFEN LSHA QlCAENA CLKR VDK S R $H \square Q A \square A Q T F Y V L Q \| I Y P L L Q T G G D C T E R S L Y Y R N P P L F A P$

VFKVLEADEKATGNGKYVSARTLYYQVRPLDQT

SVTRFQQLSKLLE $\square$ FYEVLS $\square G \square$ P $\square T$ YRA $\square$ YYRDQQ

UniRef90 UPI0002C33742 UniRef90-B3S267 UniRef90-M2W4Y1 UniRef90-UPIO002C356E5 UniRef90 M5XUM9 UniRef90-I2GVX3 UniRef90-A3LTU3 UniRef90 M3K5K2 UniRef90 H8ZAW7 UniRef90-X1ERC5 UniRef90-W6QIN8 UniRef90 B6AAX0 UniRef90_Q6CQT1 UniRef90-T1MXD8 UniRef90-B8BKY5 UniRef90- M1V6Y7 UniRef90-UPIO0015C3978 UniRef90-K2NOS1 UniRef90 14 YBC 2 UniRef90-I1GF71 UniRef90-E5SQF8 UniRef90-R0MJ86 UniRef90 Q4XR55 UniRef90-E3KYN2 UniRef90-M1AW70 UniRef90_L2FMC7 UniRef90-A9USH0 UniRef90_Q38AP1 UniRef90-B5VJQ7 UniRef90 G0U703 UniRef90-M2UFF2 UniRef90-A0A059EH00 UniRef90 KOTMA2 UniRef90-W7FLJ3 UniRef90_B8FPU7 UniRef90-N4VJU7 UniRef90 M1USH9 UniRef90-K4KYD6 UniRef90-GOW2C4 UniRef90-UPI0004138799 UniRef90 T2K046 UniRef90-A5DYY9 UniRef90 UPI000361C8FE UniRef90 Q2GWG3 UniRef90-T2JAT3 UniRef90-B2J2S7 UniRef90_J7INJ0 UniRef90 ${ }^{-}$K5A262 UniRef90-L7HRA5 UniRef90_C5M4V8 UniRef90 UPI0004719169 UniRef90 K9R987 UniRef90-X8J984 UniRef90_U6MS60 UniRef90 F3E8S2 UniRef90-K9S7Q4 UniRef90-W6KZ97 UniRef90_K9WSE7 UniRef90-W6KGB7 UniRef90_D5XBSO UniRef90 V6LB25 UniRef90 E9AT55 UniRef90-B4CXF7 UniRef90_B4VYU7 UniRef90 UPI0003717C43 UniRef90 C9R843 UniRef90_K9RAE5 UniRef90-R6DSU7 UniRef90 K9UPJ4 UniRef90-H6C2V7 UniRef90-R9NAU1 UniRef90 W9YPR3 UniRef90 A4HPE4 UniRef90-UPI0004776856 UniRef90-F1ZVU2 UniRef90 Q4U9R2 UniRef90-F5UDM9 UniRef90-M3IJQ0 UniRef90-F6CJN4 UniRef90 UPIO0036914D2 UniRef90-K7WXV7 UniRef90_D8FZT2 UniRef90 E0UMT7 UniRef90_L8LQ03 UniRef90-D4TPL3 UniRef90-A1ZDX3 UniRef90 V6MLX3 UniRef90-R7E9Q4 UniRef90-UPI000379A5F9 UniRef90_K8GHM1 UniRef90-X1RRX9
UniRef90_K1WMK5


YKK Q T VSNNTDAMITRLDRIPREFDNVVSTSKGMDFGSD FESQQMVEMLFQRIEAMFNVEKGFFNVVSTQKGLIYSGP $F \square K P Y L I D G U V D \| V C I L L Q A T R W S F G V N V D A K G L I D G P V$ PFREKLSVRRGLMLLEKVFQEPRYQLGALPMPKGLLWAPS SQSVVDDMVDNLAFTLGVGRNDLNIVATAKGLDVAGQ GQRDVHTSIERLCRWMCYTREGLRUAASGKSILIGGN

CENRALSSPKGLVLGDL

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

SFRTQHDAQQALLDTSTLLCVRQEADPVFASNKGD VCGD GQRDTHCSI ERLCRWMSCTREDLRIGASGKSGNLAFD
FQRQANVVQWLDVIRFNFKLPRKSLNI IPAQKGLVYSPF GGQHETRRSTERLCQWMCYVREDLHUGASGKSGNVSFD
FKTQATVDK LVKNT T L EFPMVTNLIKPS LKGLYCG $D N V S Q Q F S D D M I Q L S T S L S V P L Q G L N V K E R K N T W I F G S A$ ETGREPDYNYFCRDLVGGYEA RH GD
 AF GGKQYFCQVITEYEA YYGN

##  RPMSQDFAVSQS

AF D GK Q Y F C Q $\square$ T D YEAM

## DKVLPH $\square$ A AT $\square \mathrm{DVNMRDLG} \mathrm{\square LPKE} \mathrm{\quad SAGLFGK}$

 QGQRGVHRCLQR LADVMR $\square$ TREA $\square G V V A A P K S L L V G P$ $\square F P T Q V I S N S \| L R Q L Q \square Q L N D Q K R F L N F T T S A K G L F M Y K N$ RGQRATHESI NRLCGWLEVTRESLGDTAAGKSL LAAGA L $\quad$ QS K $\square E A C L H R I S A G R L Q T L A D L G U R E N P R G V T L H G P$

K WF QENNYEE DCS LLRALLDVPQSDFHVITSEQE $\quad L L K G R$
 HNCDE VCAWLRNFAGMSDAVLAHYHI $\square P A E Q E I F I K G D$ AFSSQ $\square K S D E M L N D L A D T L E V H P F L L G V E P E P S G L V F V P D$ QGQRAAHASVKRLCDWLEVTRESLGITAAGKSL LAGA

FQSSDKASSLVSS $\square$ AENFDVKETELNDYKTSSTLDTGDV

## VQD

ATRREQNFNTIITDYE FDTGKDLPGVYRDERG
S G L I GK $\square$ FRRFSDDMEDMNDVILAEYG $\square Y R T P N Y V Y V K G S$

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UniRef90-B3S267
UniRef90-M2W4Y1 UniRef90_UPI0002C356E5 UniRef90 M5XUM9 UniRef90-I2GVX3 UniRef90-A3LTU3 UniRef90 M3K5K2 UniRef90-H8ZAW7 UniRef90-X1ERC5 UniRef90_W6QIN8 UniRef90 B6AAX0 UniRef90-Q6CQT1 UniRef90-T1MXD8 UniRef90-B8BKY5
UniRef90-M1V6Y7 UniRef90_UPIO0015C3978 UniRef90-K2NOS1 UniRef90-14YBC2 UniRef90-I1GF71 UniRef90-E5SQF8 UniRef90_ROMJ86 UniRef90 Q4XR55 UniRef90-E3KYN2 UniRef90-M1AW70 UniRef90_L2FMC7 UniRef90-A9USH0 UniRef90_Q38AP1 UniRef90-G0U703 UniRef90-M2UFF2 UniRef90-A0A059EH00 UniRef90_KOTMA2 UniRef90-W7FLJ3 UniRef90_B8FPU7 UniRef90-N4VJU7 UniRef90_M1USH9 UniRef90-K4KYD6 UniRef90-GOW2C4 UniRef90 UPI0004138799 UniRef90 T2K046 UniRef90_A5DYY9 UniRef90_UPI000361C8FE UniRef90 Q2GWG3 UniRef90-T2JAT3 UniRef90-B2J2S7 UniRef90 J7INJO UniRef90 K5A262 UniRef90-L7HRA5 UniRef90_C5M4V8 UniRef90 UPI0004719169 UniRef90-K9R987 UniRef90-X8J984 UniRef90_U6MS60 UniRef90-F3E8S2 UniRef90-K9S7Q4 UniRef90-W6KZ97 UniRef90_K9WSE7 UniRef90-W6KGB7 UniRef90-D5XBS0 UniRef90_V6LB25 UniRef90_E9AT55 UniRef90-B4CXF7 UniRef90-B4VYU7 UniRef90 UPI0003717C43 UniRef90 C9R843 UniRef90_K9RAE5 UniRef90_R6DSU7 UniRef90_K9UPJ4 UniRef90-H6C2V7 UniRef90-R9NAU1 UniRef90-W9YPR3 UniRef90 A4HPE4 UniRef90_UPI0004776856 UniRef90_F1ZVU2 UniRef90_Q4U9R2 UniRef90-F5UDM9 UniRef90-M3IJQ0 UniRef90 UPIO0036914D2 UniRef90-K7WXV7 UniRef90_D8FZT2 UniRef90 E0UMT7 UniRef90-L8LQ03 UniRef90_D4TPL3 UniRet90-A1ZDX3 UniRef90 V6MLX3 UniRef90-R7E9Q4 UniRef90-UPI000379A5F9 UniRef90_K8GHM1 UniRef90-X1RRX9
 FRFIMKSGH FLCGSFENKI QSDPLVADIAGIESTAK LRIVFQNGTE $V A G L F S F K M D G \square E H F C S N L G G K T I P P R T K M A T D M K N H G A L D$ TFVCDDTPH DCSS SAEEIASCHR\|VRTSFNSCDAS

 SLKIQEKVVQMEN TS T I DPR DQKETK TFTKAS

 RLQQGSQLFHAECQ CTCSKRLAYPGRRVSCYDDGLQARICVQVVVEIHIQKDDR LFKVGED GFVLQWSPNRDVHHELELSSVVPVPPEAHFGNPNFGAKLR VELIMRGGSK DCAESSDSGKG VLQTQNHLTGTVEVNGMRHDS G $\square L V N M A V G M R S C H F R G A E$ $S$ QVS
 GHLICPFGIIDLKIPTTVK LK V V K VKNDRVTVDGAS S STLIPPMETVKEV DPGQNVR LLLQEPDKEVVDCSTCGSSGYAISGDLELLEKLTMETDAR
$\square T$ LLDSMGRT LISREQA $\quad$ SSRSDNLIPS LRAKDTRR I PTVSATSTGGAQELPTCVPSAKVPSVEVNAKHHDSHNFR YDNILTCANEPKMQKQTIFPGKPCLIPFFQDDAVIKTS $\square C$ VPARSPGLRKPLVVSANTDAYGDLVDTAMGDRGCNFRDAS

VLK IGE YRDGVVREVDLSLDDHGWLPISSDMNTGNDKSGII

G TQ QQKRSTENERPRYARLCTPHRGLMP\PDD\|VLDPGAY LMYRDERGTLYHPHSGQDiPDGTDAVENYQKPVW TFN



HSCDVAGDTGTLPTSHQNDDFPVDDAT
 $\square$ PMMYRDDRGT LYHPHRD $\square P \square G T \square A V E N Y R K P A W \quad$ SFD $\lfloor P G M Y R D P R G T L Y H P H T G E E \| P L G T L A V Q D Y N R P R W T \quad F N$

T F $\stackrel{L}{N}$
RWQE $\square$ NGT T T NMLPSARQENTPANDNPD\TAY SFD VYTWTTTLDEERPSSDHTVQD $\square$ DFAVMT IVKDYECRPGLH
$T \square \mathrm{~N}$
RWNQVNPPSEKLLPS LGSGSTAR DQPTSDAGDVTVYSFD $\square S M M L C Y P Q G G A A D S A P V Q V G C H G D H L T A E M A L Y G R G Y S$

LCMMLDHRSGKEAAGGSSVQVCCDGNGVFLTAFMGDHSF LKI RLKDRTADLAPFCYGTGLGTETDEA LIDEVVDCNCR | $L$ | $K$ | $R$ | $R$ |
| :--- | :--- | :--- | :--- |
| $K$ | $V$ | $E$ | $L$ |




WK L H WK N
F S M D S S Q LR G G $\square$ A $\square$ S S A D $\square$ P F $\square$ A R $\square E \square$
K LAMMETSSARVYVDTSLNGGKRHQDPRLLVDDAKVNSFD WKIA WE QYVLETDRFP G G G $\square$ A $\square$ ASKDV RSIVRRITVNAS
 LI LEELCDP V VELIDVSARGSSGDTLTYPLATRMVGCRPC $\square Y Y D P R G \square L Y E P Y T R K T L P L G T R E V E K Y E F P D W V F$ $\square \mathrm{T} \square \mathrm{SE} \square \mathrm{F} N \mathrm{NHQ}$
$\square \mathrm{I}$ S N C $\square \mathrm{S} \square \mathrm{F}$ Q $\square$
$F$ VKH $\quad \mathrm{V} P$ R P Y V I GENFKEELEVKRNDP

$\square D R E V S A Y S F D$
WLRKWQT $\square$ NGSFEK $\square L S P S F A A T Q P V Q \square N P E \square L N Y$

T L L H P H T HEE $\square$ R LG T K S VERYHRP VF N
$E M Y Q \operatorname{V} T V^{F} A_{T}^{N}$ GRLR $\square$ GTPEAYD $\square D L R S \square R Q G \square G L S G E D L D G L E W K V D V K$

|  |  |
| :---: | :---: |
| UniRe |  |
| Uni | FIMIVEKNSVFHHLTQHQFFDRFPGILLS |
| UniRef90-UPI0002C356E5 | FVLLVQNSSVFDTLTQYGFVNDYQ |
| UniRef90-M5XUI | FILLVEKNTVFHGSAQVKFHENAKCI MVSDKGYGDRSTKV |
| UniRef9-12GVX3 | RIVVLEKEAVFNSLGKYQERKDQDTI IITGKGYPDTLTRT |
| UniRef90-A3LTU3 | YAVVIEKEAVFQSFCKDNFVPDNLIVVTGKGFPDN |
| UniRet90_M3K5K2 | TVVILEKDAAYNYLCNNLKHQFSN |
| Ref90_H8Z |  |
| UniRef90-X1ERC5 | KUGV |
| UniRef90- $\mathrm{B6}$ | FVLIIEKDTVFQRL |
| UniRef90-Q6CQT1 | LVIVLEKDAIFQQLIQCQEMUK DWI I VTGKGYPDHLSRE |
| UniRef90-T1MXD8 | VEKAAI MSKLVSIEFYKTYRCIILSGKGHSDIV |
| UniRet90-B8BKY |  |
| UniRef90 M1V6Y7 | A M\| |
| UniRef90-K2NOS1 | GVI |
| UniRef90 | LVVEKETVFSALREIQFSRHGH |
| UniRef90 l1GF | EDAVFTY CGQRIWDSL |
| UniRefo-E5SQF8 | CLVVEKDTIFSKLRSKNLSDHVPFLLVCGKGYPCRN |
| UniRef90-Q4XR55 | YVLIIEKETVFFKLLQSNFFKYGPLILITAKGFPDTNTRQ |
|  | MILIVEKEAVLSALVHNGTNNHSPCIVISGKG |
| UniRef90 M1AW70 | IMMVEKWLGLRKDDUNQLIPEECLVPL |
|  | MP HTAQRFKPA |
| UniRef90-Q38AP1 | ALVVVEKESTLHTLADVKSATSDRCAYLCSKGYPCRA |
| UniRet90-B5VJO7 | NIVIVEKEAVFTKLVNNYHKLSTNTMLITGKGFPDF |
| UniRef90_GOU703 |  |
| UniRef90_M2 | WILIIEKEA |
| UniRef90 AOAO59EH00 | FCLVIEKDSLFNYLC NFNRIKDCLLVTGK |
| UniRef90-Kot |  |
| UniRef90-B8FPU7 | KVLYIEKEGFFNVLTERKDPEKYDMALLTSKGY |
| UniRet90_N4VJU |  |
| UniRet90_M1 USH9 | QILVEKFGVFRCLVDEGFASILPTILVTGGGQPSLATRA |
| UniRet90-K4KY | Y'EKEGFFNVLKEKKIPEKYDMALLTSKGYASRAV |
| UniRef90_GOW2C4 | K1 FIEKEGYFASLRDVGFPEKYDCALLSSKGYASRA |
| UniRef90-T2K046 | RAI CDKPETAQFLDRNNFHFENNCAVLSDDGYPQE |
| UniRef90-A5DYY9 | CVAIFEKDAVFESLANGKFKFSTRLIVVTAKGYADS |
| UniRef90_UPIO003610 | VT |
| iRet90_Q2G |  |
| UniRef90_T2JA | AV |
| UniF | RLVVCDSANIAQLLIANNFHFENNCAILSITGYPQSI |
| UniRet90-J7INJO | KVLY |
| UniRet90-K5A262 | D |
| UniRet90-C5M4V8 | EKDSVFQYLCSY酸RHKSNFLVVTGKGY |
| UniRef90 UP100047 | K LYCEKEGLFPLLKQAKFPERYDCALVTSKGYASR |
|  | RVVVCDSAEVAQLLIANNFHFENNCAVLS |
| UniRef90-U6MS60 | NRLLQLLPCVLITGRGFPDFCTRD |
| UniRet90-F3E8S2 | SVLFCEKEGLFSTLRESGWPERNDCALVSSKGFASRAARD |
| UniRef90 K9S7Q4 | RLVVCDSVEVAQMLIANNFHFENNCAVLSISSGYPERIFST |
| UniRef90-K9WSE7 | RLVVCDSSTIAQFLIANNFHFENNCAI |
| UniRef90_W6KG |  |
|  | RVISVENKAVFRDLVRAGTDD QTLLVCLGGFAGPVKRG |
| UniRef90-V6LB | KIII IEKDTIFSKLGALS ${ }^{\text {a }}$ ( NKYL |
| UniRef90-E9AT55 | LVLISVHHAVLQSIAKSGSPHTYSCILLCTKGYPCVAARE |
| Ref90-B4CXF7 |  |
| niRet90_B4V | A 1 IA ${ }^{\text {a }}$ |
| UniRee90 UP100037170 | YYEKEGFFETLRAIQWPERHDCA |
|  | K LYVEKKGLWPVLQAARLJAERYDMAVVAAEGYATQAARV |
| UniRef90-K9RAE5 | RVVICDSAEDANLLIANNFHFENNSAVSUGOYP |
| UniRef90-R6DSU7 | RVMICONPA |
| UniRef90-H6C2V7 | AVVVCEHRSIVEKFPKAFEDARFRGVLVTTGGYPDV |
| UniRef90-R9NAU1 | SLLTVENKTSYQRL KNHNMAMMY的GGFAS |
| UniRef90 W9YPR3 | HQSIIDELATLSGDAR |
| UniRef90-A4 | QSMMKSDTPQTHSYVLLCTKGYPCVATRQ |
| UniRef90 UP10004776856 | NNFHFENNCAVLSVTGYPQSIFST |
| UniRef90-12VI2 | OVFPDYA ARE |
| UniRef90-F5UDM9 | IA QFLIANNVHFENCAILSTSGYPQS |
| UniRef90-M31JQ0 | FILVLEKASMYPVLSLLEKRKWDNYLI ISSRGYRDS |
| UniRef90-F6CJN4 | KVLYVEKKGILPVLKAAGLDKKYDLCICAGEGYASRAAKD |
| UniRef90 UPI00036914D2 | RVIICDRATIAQLLIANNVHFENSCAILSLNGYPAAIFDT |
|  | V |
| UniRef90-D8FZT2 | RAIVCDSDEITQFLI ANNVHFENNCAILSISGYPRSIFKT |
| UniRef90-EOUMT7 | RVIVCQSTE: ARFLI ANNFHFENNCAVLSVTRYPENIFDV |
| UniRet90-L8LQ03 | RLVVCDSNA A MML ANNFHFEHNCA S S |
| UniRet90_D4TPL3 | RLVVCSSPS |
| UniRet90_A1ZDX3 | AGFCEKHDCALLTSKGFASRAARD |
| UniRef90_V6ML | R |
|  | RIITIENLTTFR |
| UniRef90-UPIO00379A5F9 | $v$ |
|  |  |
| Ref90 1 1R | KVVMVEKMGLFHMMRANDFDRRLDAILICTEGFSTE |
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UniRef90 ${ }^{-15 V J Q 7} 7$ UniRef90-G0U703 UniRef90-M2UFF2 UniRef90-AOAO59EH00 UniRef90-KOTMA2 UniRef90-W7FLJ3 UniReffo-B8FPU7 UniRef90-M1 USH9 UniRef90-K4KYD6 UniRef90-GoW2C4 UniRef90-UPIO004138799 UniRef90-T2K046 UniRef90-A5DYY9 UniRef90-UPIO00361C8FE UniRet90_Q2GWG3 UniRef90-T2JAT3 UniRef90-B2J2S7 UniRef90_J7INJO UniRef90-K5A262 UniRef90 LTHRA5
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## L M F F

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AVFKLSYCLPVKVYILADLDD DGLQTYFTYKLGSVASRD LVRYLAKTEGI PVFLLTDCDPNGIAIALQY FLAA HSRPRLLMFALVDFDPHGDSVLRTYQYGSQRLDH LLNHLANPENVPFIGLVDSDP HGLRIFLTYKFGSMACPR LLKQLQTQFDLPVLGLFDYNPGHGLRLLTYRYGSVRMVD FLSKLKDK K ILGLFDYDPYGLDIFLNT LIYEIQKKNSTKFFCLTDYD A Y D MDD $\square \mathrm{S} \square \mathrm{N}$ LCYKLASDPG
SSEMLQDSYKEEVAAMVQSGRRAEDEALYCHGYDYD FLHLLHSKPELPIYGLVDFDPYGVNDMRCYSHGSVTVPS WRARM $P$ VG SAFGLLTLPA FLRSLHRE पPEP ILVLVDGDPHGपRПA LTFMGSVVAALDP FLK
LLRNLHHELPTPIVALVDGDPHGTRIVLTFMGNHTLRWDP FLRQLGTNHH:PMFVLVDDDPDGUALSTYKYGSLCLPN FL EKVNIPDFGLFDFDP
WLSFLKAAFSVRCGVVHDLNPCGYGHAFSTNKFPGYNAYD LLYEI QKRYREKIFCLTDYDVYG LSTACTYASKNMSDEN LLDALGEHAEEEVFCVHDADAYGT TIYETLQNETGARPG LVAQU HYPRFDIYVITDYDPYGLCIARQYRRSDSKFTRLD LLDTLGENSEEELFGVHDADAYGTMTYYDTLQNETKARPG
 VMEMLKRNPDLQVYGLHDASPKGVSLIYELRNNEQWSSVG
 FLSVISTRPQLDLFGLVDFDPHGV AI MRTYRYGSRTVPR VMEMLQRNPDLQVYGLHDASPKGVSLIHELRNNEQWSSVN TMQMLRRNPDLKVYAVHDCNPRGLSLVHNLRSNDSWFLNS

 I MEMLGRNPDLKVYYALHNADARGTK LIMETLVEETKARPG WLFTLSERYDKAFFALMDWDPYSMD VYTTLRTGSLADRR LLGHLCQSLQLEAAFVGDWDPHGDY IYGTYKYGSSGCSS VMQMLRRNSDLQVFAFHNCSPSGGGLGSVKAHQLRTDP FVRRLNEHPQLPLLALVDGDPHGLRULDMLECRSLTRNS $T M E M L R R N P D L Q V Y A L H D C S P R G M N L V N H L R S S D A W S N V T$
$F M R R L C A E L P R P L L A L V D G D P G L R I L L T M L E G G P S A G W$
 WLHRVHAWPA DOLY TMVDGDPHGLC ALTVM FLRALPGTL EFFHFGDSDPAGFDILRHLRERTQLSTTA VLDML RRNPERKVALHNASPHGDTLIHNLQTSSNWSTVT LLDLLGEDEEVQFFAVHDADGYGTKIYESLVEATRARKVR LFRRAERNREYRLFVLHDADPYGY NIARTLREETRRMKG
VMHMLRRNNDLKYVLHDASPSGVSVVNTLFSNTSNSNVT FLLKKIEDNPELKYVHFGDIDAGGFLI HQNLCQATGKQFE TMEMLYRNADLKVYALHNCSPTGVRLDHRLREEAWFPNPE FLHLARHRAFPFLYUSDGDPNKFGSKACAFAAPQMTCPN FLKK RDNPDVMYQHFGDDDDGGFLDHRHLCKKTSAAFG FLNQLSHNPACPFLYASDGDPQGIGIYAVLKYGSMTCTP WLRRAHAWPALQFYVMVDGDPHGLCIALTVM
VLEMLNRNPDLKVYALHNASPRGVTLTHHLRTSPNWRNVI
 VI EMLRRNADLKVYALHNASPGGVGLVNQLRTNPEWFTNQ YLSWLTQLSSFKLFVCTDPNDGGMNIYCDIKKVFKNCQR VMAMMAEKQDLVVYVLHDATPQGISEI HTLLTSEEWFENQT TMEMLRRNPDLKVYARHDCSSKGVSLVVHHLRTSEKWSNVA VIEMLRRNADLKVYALHDASPSGVSLVHKRLRTNPDWFANQ VLAMLKRNQDLTVYTFHSASPSGTYKISTDVNWFGETYVG TMEMLKRNPNLQLFARHDCSPEGVSLVNYDRTDENWFLNS FLCRLAEHLEKNLEVYHWGDVDGGGI RGFEYKRKKKFFSN FLQKLYQVFPEEYFHFGDGDVGGFEIYEDLCRRTGDPFTT



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210
220 230

IK WL GVLPSEFNKYTNDK円P SK WUGUSVEDVERVYDATLSUTARDRAKAQKLLQNSDEKT

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MQWLGDKSGDLESNFEATDVLKERDRKTAKTLLRNDDLDE VATI GRQVSDLFDLKAACLPQEGNDFNLLERLLAHPAL IRWVGVRPSCLSHDNKGRAPLTEHDRRULKQVIUR

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## VRVIGLQ



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PEPEWRVEDQRMLILNLKAEDEGLY GCQGGLEEWTNRR NCDEWIK CE QUI LD GVEYEUDCIEQ LDENWVEEVIKEK $M R Q N L K Y E V Q R Q L F F Q R K G E M N V V N N$

DRDRLNTVLDWNFTLN LTHDLLDYEN VVEYLTNR DG $\square$ SLQPPL A WMAATGYKSEDESLSNPDLTEFVIRALKQR TEREHK LELQRMLMLN $\square K$ AEIQAVDDFGD $\square T N W L D E R$

GVKELKDETKQMVTYDRKFETEALYSAPSGQVLGEYワDSK GVPDY $\square R E L E \square M E R K E T K A E I E A L N G H G A A G G G M D T L E S K$

ETNRW $\square$ EQVDNMKKS G $\square$ KYE $\square$ DA $\square$ AD MEKH $\quad$ DD T K
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$D E R G W R R E L Q W M \square M L N V K A E M Q V L D E L P G G L V S R W L S D Q$
 DSHDCRRELQVMLF LGGKAEIQAMDDAG GPMPSQRAL VLARNIFAE
$\begin{array}{rl}P E W E S W L \\ E & W K \\ \text { W W } \\ \text { Q }\end{array}$


| WL E K K |  |
| :--- | :--- |
| K WL |  |
| D WL | E K K |


LS A E E L A WLES GRFVELESFTT

LTPEE L DWLESGNFDELESFSPRSL
LSAEEDA WLESGKFVELESFS
PAWKDWLQE YRVELNAMST PQFDA WLEGK WSDWLQ SNRVELNAMST PHFI EWLESK
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ECKSELKTMKEH
ANEK KKSECK LMKEKNCKCEVEALECTDTSELQRV

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EELAW LDDSNFVELESFT
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CFHDVI NDMLEHGCTDEQEAV
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EEFAW L L K S GNFVELESFT


EEIK W
LAPE $\square$ RASLNVWLDAGCY LDDESFS
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