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 S LETNLDGILPLVARGKVRDIYQVDSKTLLFVATDRISA TVTQTNLDGLLPLVARGKVRDIYQVDDNMLLEVATDRUSA QGKVRDLYDL GDKLLLVATDRISA LTTTDLTSKKTYSGKVRDYYLDGKLMVSDR SA TLYESSLRS LKLGRGKVRDNYAVGNDRLLIVTTDRLSA TLLYESSLRSGLPLLGRGKVRDNYAVGNDRLLIVTTDRLSA LLKTN NS LLKLIHQGKVRDUYALNDETMLLVSTDRLSA LIYSGKVRDLYELPDGRLLFVATDRISA
 SITSTELDGILPLLAKGKVRDIYSVDAETLLFVATDRISA ALVESNLP ALTLLARGKVRDVYRIDDKSLLFVATDRISA TLLQADLPGLDLIHRGKVRDVYALSGNRLLIVATDRLSA
 ALLETDDRNT RLLGRGKVRDLYAI GDELLLVATDRISA HLHSGKVRDIYEVDENTLLLVASDRISA ALFESDLPS LERLARGKVRDNYAVDDEKLLVTIRLSA SLTTTNLDGILPLIARGKVRDIVQVDDQTLLFVATDRISA AVTRTDLNGALPLLARGKVRDVYTLNDSELLFVATDRISA MELVHSGKVRDVYA DGDELILVASDRVSV $L L Q S H$ ALYESNTSGTLILLGGRGKVRDMYAVGEDKLLVVTIDRMSA A AVTNDDI QGKLPKVASGKVRDLYAIGNDTLLFVASDRISA ALLTTSITS LPLLSRGKVRDNYAVDDDLMLMVASDRISA TLLQSEIAGLPKR SGKVRDVYDL GDSLLIVATDRISA TLHQSSLKS RMLLARGKVRDMYAVGDDKLLIMASDRLSA EVPG HLHTGKVRDLYATESGELVMVASDRVSA LLETSDKS पKKLHQGKVRDi Y DIDDHTMLLVSTDRLSA
 TATVTSESLRPFRRGKVRETYDLGGRLLMVATDR SA TLFQSERPD HLGNRGKVRDIYEVDSHHLKIVTTDRLSA VTTTDLQGSLPLIARGKVRDLYQVDDKTLLFVATDRISA TVVPGW MSDIELADY PLIAAGKV|RE
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RGHITGGAWKEYLKSGTVHGAVAPTGLQESQQFPEPIFTP R G Y I T G S A WK E Y K K S S TVVA G L P P V K S G L Q E S E A F E K P P I F T P
 R GY L G S GLK DY QATGAVCGI NLPEGLVNSSKLPEAI FTP
 $R G Y L V G S G W K E Y K A K G T V C G I N L$
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SGARYTVGSSQDSYDKQYLRDWL

AAATYREGEVQPSFDKQFVRNWLNANWDRSGNPPHLDEEDV


$P L V Q Y Q V G S N P P S Y D K Q F V R D W L$
PADLWEPGRPQPSFDKQFVRDWL
PADQYEPGRSQPSFDKQYVRDDL
PADQYAPGGPQPSFDKQFVRDYL

PADEYRVG SMPSYDKQFVRDWL
SVNSYQAGTNPPSFDKQFVRDWL E
DAK LDWKPGGAQASFDKQFVRDYL
PADSYAVGSNPPSFDKQFVRDWL


PADSYEPGRAQHSDDKQFVRDWSS
PADTYRPG SPPSFDKQFVRDYLETLDWNKQAPPELPPDV
PADEWEPGHAQPSFDKQYVRDWLGWDRAADTPPPAGCEEV
P E EQYT L GQGQPSFDKQYLRDWL T
PKDTWEQGKAQPSFDKQFLRDWL
PADQWREGDSPPSFDKQFLRDWLE

PQESYAPGGGQKSFDKQFVRDWL

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PKDQYRPGUSPPSFDKQFVRDYL
PSAQYKAGQAQPSFDKQFLRDYL
DAHAYQPGKSQASFDKQFVRDWL
$P A D E Y Q P G V N P P S F D K Q F V R D Y L E T$
$P A D E Y E P G R V Q H A F D K Q F V R E W L T$
$P K D E Y E P G K P Q K S F D K Q F V R D W L$
$E A A G Y T P G Q V Q P S F D K Q I V R W L$
PADEWRPGRSQPSFDKQYVRDWL
PK EWRPGRSQPSFDKQYVRDWLGWDKSSGNPPPRLCD DHV

PVAGYEPGKVQPSYDKQYVRDWLRANWDMTGEPPHLPQEV

PADQWEPGRSQPSFDKQYVRDWLGWDPKGEDDPPALDTQV

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

SLTWDKQPPPALPEEV
WDKTSGEAPPALPADV
WDKASDTAPPALPADV
WDRASDVPPPALPADV
NSGWDKETPPRLPDDV

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PAEGYAPGKVQPSFDKQYVRDWLTAEWDKQSEPPALPEDV
PADAYEPGHPQASFDKQYVRDWLTWDRHSGDAPPPLPEKV


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| UniRef90_J7SAX0 | VEQTRAKYIEAFEC | S Y T |
| UniRef90-Q96VP6 | AAKTAAKYKEAYEA | A |
| UniRef90-C7MPL4 | VQKTSEKY | Q |
| UniRef90-R5G1B1 | IKKTSEKYIQAYEKI |  |
| UniRef90-C1D5P0 | AQKTAD |  |
| UniRef90-UPI0003733CF6 | AKTSEKYREA |  |
| UniRef90_A3LZN7 | VARTRAKYIEAYEA | T G D K WT |
| UniRef90-UPI0003744 | AHKTSEKYLEAYEK |  |
| UniRef90-F6FSX5 | VRRTRER |  |
| UniRef90-A0LWU1 | VAQTRARYIEAYER |  |
| UniRef90-B6WQW4 | V D A T A R Y R |  |
| UniRef90-UPI00035E34DF | VAKTQRKYLDA |  |
| UniRef90_W6MX25 | RTAEKYI EAYEA | W |
| UniRef90-E9C8W9 | V Q NTLAK Y Q |  |
| UniRef90-I4WFX9 | I ARTRAKYAEALQQR | A G |
| UniRef90-D6SMA3 | I NETTKKYLLAYKL | T G K |
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| UniRef90_C8X276 | A Q T R D | A |
| UniRef90-W0E1R0 | I DRTAAKYLEA |  |
| UniRef90-N4XMD8 | VEKTAAKYREAYEK | T G K T |
| UniRef90-E6PWH7 | L DGTAAKYREAL |  |
| UniRef90-FOSMP5 | VANTAAKYREAY | T G R E F |
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| UniRef90-R7YPR5 | AERTARGYREAYER |  |
| UniRef90-A8LCN0 | VESTRARYVEAYER | T G 1 S F |
| UniRef90-D1CG72 | VEATRQRYLEAYRM |  |
| UniRef90_S2JAV7 | I ENTLSS |  |
| UniRef90-A6C1A7 | VMKT REKYFEAFQML | T G Q |
| UniRef90-R8BHJ9 | AQATSERYQDAFRRL |  |
| UniRef90-S0FPE9 | IRKTEAKYIEAYEK | T GQKF |
| UniRef90-U2FYJ3 | VAATRARYI EAYERL | S GA QF |
| UniRef90-C5CCY1 | VAKTRDRYVEAYER | T GRPF |
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| UniRef90-M2YFF3 | VEPTRARYI EAFER | T G |
| UniRef90_C3PJ92 | $\checkmark$ Q ATR |  |
| UniRef90-LORG17 | ASKTREKYMEAYKL | T E TE $\square$ L |
| UniRef90-B1MHW4 | AVATRERYDEAYER | S G |
| UniRef90-UPI000476 | I GKTSEKYQEA |  |
| UniRef90-S7TL73 | VEKTSRTYMR\FEML | T G |
| UniRef90-K9DJP6 | I EKTQAKYFEADER |  |
| UniRef90-UPI000050F7C1 | VEKTRARYDEAFEK | T |
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| UniRef90-R713M1 | QRTSEKYREALIFR | A |
| UniRef90-R7XU12 | VERTRARYVEAYE | T GETF |
| UniRef90_D2AQN1 |  |  |






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 A AKADHDENI TFARAEEMVGBDVAA RLRDTSI ALY QRARA STKETHDQNVSFEGLCNAIGTELATKLRDDSLALYEKASK



 A AKADHDENITTERMVDLVGRDLAERLREATLTIYRAAEE A DKA QHDENIS Y A EVEQRI GKDLAA QVRDATLAI YREASA STK A E H DEPMS Y A A V E A A I G S G L A A R AR E LTT TA I LAA R G N E STK A E H DENDSFERTVVELGGKDLADEVVRRISLRLVTA AAA ATKAEHDENIT $\quad$ TGTVVDRVGA DTAAELERLARTVYEFGRA STKAENDENI HPSEAAKVVGEKYAARI E ELLALSLYKAARD

 STK A D H DEND S Y E Q S V E Y L E K E Y A K M L R D A T L A L Y K K C A D

 A T K A E H DE N I S F E R M S Q I I G G E L A E R V R A V S

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 STK A E K DEN I S RERAA EVVGGAARAARI E E L A L L A L Y Y A A A Q AVKAEHDENVSFDAVASVHGTALASELRDI TLRRLYERGRE STKAEHDENLSPEQGAKLIGADLYARVSE』ALKLYSTAAA


 S T K A D H D E N $\operatorname{l}$ S S Y E K A F P GHGGEE Y A K K S T K A Q H D E N I P Y E K S V VE L L E R A Y A A K I R D Y T L A L Y K K C A D
 STKADHDENVSQAQDANQI GAELASHI REDSIQUY LEAAAA ASKADHDENI SFDDVVEKVGLNLAMKLRQDTLDI YDRAAM A WK A E H D E NIIS Y E R TIG LVVGA E TA G T L R E L S L A V Y G R GA A
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 A AKAEHDENVTGERVTHMVGETAATALRGTTLALYTRAAQ STKA QHDENISSQQQAKEYLDKQYADRIAELLAVQIFKAGQE








 A A K A E H D E N V V F E RTCA Q M V G E E A A T A A L K E K T


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UniRef90-M3VF82 UniRef90_UPI0004078374 UniRef90_A3DJF4 UniRef90-J6F825 UniRef90_D3SE46 UniRef90_UPI00037B90B4 UniRef90_A0A016XEG7 UniRef90-V5DRW9 UniRef90-D1C3B0 UniRef90-UPI0003646E38 UniRef90-NOE5X2 UniRef90_UPI0004788307 UniRef90_UPI00047D4EB9 UniRef90-L8FQF1 UniRef90_UPI0003B3E9D5 UniRef90-E4TFP5 UniRef90_UPI0003B5C0D1 UniRef90_UPI0003B64929 UniRef90-B8PB86 UniRef90_S8E7J6 UniRef90_UPI0004239138 UniRef90-B5EGN6 UniRef90_UPI0003768A41 UniRef90-E6VU51 UniRef90-R4SYA9 UniRef90-W2BVS3 UniRef90_UPIO003B48122 UniRef90-D3FAI3 UniRef90_D3P9C5 UniRef90-X5ECD3 UniRef90-R6QXQ0 UniRef90-W0JDY0 UniRef90-V4JDL1 UniRef90-V9HLG8 UniRef90-UPI0003682357 UniRef90-G4QC97 UniRef90_UPIO0036262C6 UniRef90-E2ZCH2 UniRef90-A4BSD1 UniRef90-SOEWJ8 UniRef90_UPI00036BAOEC UniRef90-UPI00029B1FDC UniRef90-D9Q4E8 UniRef90_UPI00035F2A73 UniRef90_UPI00036CD81A UniRef90-Q0A6D8 UniRef90-F9MQI2 UniRef90_UPIO003B4613F UniRef90-D8K036 UniRef90-J5HXV8 UniRef90_K2RFF3 UniRef90_UPI0003463C41 UniRef90_F8NG93 UniRef90-E8R2Z5 UniRef90-F9ZJP9 UniRef90_UPIO0036DD139 UniRef90-M3CVM9 UniRef90-R5CHY6 UniRef90_C4GAE6 UniRef90_A3ZPX5
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## P

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$P$ VE S Y Q P G R A Q F S Y D K Q Y V R D WA T R S G W D K Q S P P E L P G E V
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D A S A W
$P N$ SLLE
$P A D Q W E P G R P Q P$
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$P V D K W Q E G Q V T P S$
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| UniRef90－A3DJF4 | VKNTELKYIEAYERITGNKFA |
| UniRef90－J6F | VAETKSKYEEARDRVMGRKFA |
| UniR | A |
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| UniRef90－A0A016XEG7 | I AQTAAKY |
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| UniRef90＿D1C3B0 |  |
| UP10003646E | TAAK |
| UniRet90－No | VERTRAKYVEAYERLTGTTFA |
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| UniRef90 UPIO0047D4EB9 | RTTSLRY |
| Ref90 | VDNTKVKYVEAYELLTGKKW |
| UPIOO |  |
| Ret90＿E4 |  |
| niRet |  |
| UniR | VDKTDDUYLEA |
| UniRef90＿B8P | VEGTRQR |
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| UniRet90＿W2B | KTDAKYKEAY |
| UniRef90 UPIO003B48122 | dKTRAR |
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| UniRet90＿D3P9C5 |  |
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| R60X | VDK |
| WOJD | AKR |
| UniRef90－V4JDL1 | I EKTSERYEEAA |
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| UniRe990 UPI0003682： | DKTVAKYKEAYQMLITGKEF |
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| UniRet90－UP1000362 | KGIRSRY ETYERUTGQPW |
| UniRef90 E2ZCH2 | ， |
| A4B |  |
| UniRef90 SOEW | VQRTAEKYREAY |
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| UniRet90－UP100029B1FDC |  |
| UniRef90＿D9Q4E8 |  |
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| UP100036CD81A |  |
| UniRef90＿Q0A | RRTAEKYREAQRRLLG |
| UP100384613F | EQTVQRYREALERLTG ${ }^{\text {a }}$ |
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| UniRef90－K2RFF3 | S |
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| 8NG |  |
| UniRef90－E8R2Z5 |  |
| UniRe990－＿9ZJP9 |  |
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| Ret90＿M3CVM9 | K |
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| UniRef90 A3ZPX5 | VNQTRAKY EAF |
| UniRef90－4JUL1 | AAKYAEAE |
| UniRef90－V9XL17 | DKTRARY |
| UniRet90－O6ACE5 | VGATAGRYRALEVERLL |
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| UniF |  |
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| UniRet90－W3XHJ8 | SERYQDVFERLVGKKLD |
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| UniRet90＿B216R9 | D |
| UniRef90 X8K |  |
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| UniRef90－K0 | T |
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1


## LIKTRFEG

 Agkvaty VAQTHTQS DPLLASGKVREIYRIDDEHLLMVASDRISA ALLETHLLPFP RR $\qquad$ QGKVRDVYDV LlpLLGRGKVRDNYAVGD
MSA $\square D \square \mathrm{DGW}$ KHVYSGKVRDLYRPADD HVYSGKVRDLY

|  |  |
| :---: | :---: |
|  |  | PRLCRGKKVRD1 |  |
| :--- |
| $Y$ |
| $Y$ | APLP

## LFESSIKS ALITNTHLPS

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TIRETNLRELGTPYRGKVRDVYTVDGHLVTVTTDRISA S SQLPLVRQGKVRDIYDL GETLLIVSTDRISA A LATAEGLVKAPLIHKGKVRELYDLGGEHLEVVVTDRISA
 ALHTSRDTS LPLLARGKVRDNYAVGDDRILMI ASDRLSA

TPLP T ELAT A LFESTITS ALLLGRGKVRDIYAMDTEKLLIVTSDRLSA TLLKTDFHPAQTAVYHGKVRDVYTINDSTLVMVATDRISA MFQSNLDPGWTKHVYSGKVRDLYVVDDDSVLVVASDRVSA TTVKLOS PLLYKGKVRELYDLGDEVLIVVTDRISA俍 ALTKTSFNFPGQKHYKGKVRDVYNINDDFLVMVVSDRISA T四TTNFQFPGQNVYSGKVRDLYVDDEHVFVASDR SA TLTKTADPGWKRVATGKVREIFDPQDEKLLLVATDRISA ALDASDGSGQL GVYN

PLLYKGKVRELYDLG
ALTKTDFNFPGQTVYHGKVRDVYSVGEKLVMVATDRISA L INT SLSS GKRIHQGKVRDIYDIDANTMLLISTDRLSA TITQTNFKPNQKSVYHGKVREVYTIADQVLVMVATDRLSA
 A HTSADTS HVYSGKVRDLYVPADGHLLVVASNRVSA ALHTSALTS SLPLLARGKVRDNYAVGDDRILMVASDRLSA A: KETNFNFPGQTFYKGKVRDVYT:DNKYLVMVVTDR:SAB ATQETNFNENQTSFYEGKVRRLYRLPDGRLLMVATDR|SA AI VKTDFHFPGQKVYKGKVRDVYNIKDEYLVMLVSDRISA AI QETNFQFPGQTFYRGKVRDVYSF A LQETNFQF SGLRLLHR
PELPKYK
PLLYK
AVTTVDDPG KTVATGKVREDYGLGDHYLIAVSDRISA PELPNRYNGVRENYDLPGGERIIIATDRLSA ATTDFHNGQKSVYHGKVRDVYNINDDLLMVMVATDRISA TLHFDTP QLELLHRGKVRDSYRAPSGERLIVVTDRLSA ALTHTDLSPGIQSVFHGKVRDVYFLEGDLIAMVATDRISA AI VETNFQFPGQKHYVGKVRDVYNI DDKYLVMIVSDRISA CITKTSVPGYPTPYKGKVREVYDLGNEKLGIVVTDRISA AVINTKIPNTGKFISRWKVRDLYEIKDGELGFVATDRISA TTTNTEFTPGQENLYSGKVVREVYNPDNEQLVMIASDRLSA AIKETNFKPKQTGFYKGKVRDVYTIDNQYLVMVVSDRISA T EOTGFDDGGE RYHGKVRDNYROGDRRIVTSDR SA ST TATNFDENQKTVYKGKVRDVYTMGEDLLVMVATDRLSA TITATAFNPKQKNVYHGKVRDVYNINDELLVMIATDRLSA AVTS $\square D \square P F \quad P K \downarrow A T G K V R E N F D L G D A L L A A S D R L S A$

SGGTHFYRGKVRDVYTVGRDVLVMVASNRISA

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RGY T G S A WSEYS K S G TVVH GI DV P

| $R$ | $G Y$ |
| :--- | :--- |
| $R$ | $T$ |

$R G Y A G H S A R E Y K A G R S V C G V A L P$

RSY L T G S GLAA DYRAS GAVGGHHLP

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 A W K A E E H D E N A R K A A H D E NI TY R E MVE MVGGDRLA ES I R D L S L A L Y H R A E Q

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 T T K A E H DLDPMS PA E VVE L V G A DVAA EVVSRLTRAI LAR GNE SAKNDHDEEDSFAQMSGLI GAELAEQLRSRSSLELYEFARK
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 S T K A E H D E N D S Y R E F M S RMM E S L A V Y I K D K S L E L Y S S Y A H D A GKND H D E D I P F E E M A R R V G Q E L A A E E L Q E R S L K L Y E F GR D A Y K A E H DENIT YER SVVE LV GE EVVAS QL R EA S I R I I F T E A R E S T K A D H D D E N A AKAAHDENISYAATVQMVGEPDAAKIR DTADALYEAAAA STKAEHDEAI DFAAVVTAVGAARAEELRELTLALYRRGAE STKAPRDENI DFGRCVVVLGRALAGEVVRASLELYRRGAA


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T T K A D H D E N I E KAEHDLPLTPSEAERRI GADLYARVASLSLALYGAGRN
 A AKNDHDED DS $\square E R M K E L V G A E L T E Q L Q A K S L Q L Y N Y A H A$ STKAEHDENI SRAQAAELINPAHAARIEELDALAVYTAAAE T S K A F H D E P L S E D E M L E E QL T K K Q Q L D T V V W S Y A L A L F A R G Q A
 TTK E S DRE $\begin{array}{lll}T & \text { K A S H D E } \\ \text { A T K A E H D E D }\end{array}$ STKAEHDENI AFKAEKDQNINF STK A D H DE D D S
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S T K A D H D E D I S R E D I MK G I V S S P E D Y A L M E

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 S K A DY QVG RE QD SF D K QVL R N WL T D N G L K GK P DVEMP P EVV

 SVVD D Y RVGGVVQRSF DK Q F V R N WLV S P E S G WVR P P S L P D D I

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 Y A D GY Q E GE P QR QLS KE F V R QWLI S N GFMGK D GQK V P D E V



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 Y L K GY Y K G E Q Q K QL S K E F L R E WL M E H DF Q G QV LP D L P D E F

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SKFP
GE $\square P$
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DYPDPNVVVCRRLDIMPVEIVV HPNVSI GRLCEPYPVEMVI
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EK|L|YEGKAK|I I Y A T D P DK|VI A Y Y Y K D S A T A $V Y E G K A K V L Y E P E P G T L I Q H F K D D A T A$ I Y E GK A K V L F E P E P G T L V Q Y F K D D A T A MP T K Q QLLL Y E G K A K KI Y A T D E A D V L WWV Y K D S A T A
 NDQK LLYE GKAKKVYSTDNPHYIVEYKDEATA
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 L L Y E G K A K I I I Y A T D P D V L L A E F K K D D A T A Q $\mathrm{QEGK}^{2}$ K
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 E LLL Y E GKAK KVVYT T E NP DVVLIVVYK D DATA
 MK L LE QL Y E GK AK K V F A T D D P NVV LVVYK D DAT A
 KLYE GKAK $\square$ MYEPEP GT D DQYFKDDATA

TMEKTEF

$P$ VKYE GKGKTLHSTEDGELIVQVFKDDATA

SQLEKLYEGKAK IVYRSEPDVFDTYFKDDATA GELLYEGKAKKVYRTNDENTVWEYKDSATA KLYEGKAKILYSTEDSEILLHFKDDATA L Y E GKAKIVYP GEDDTLVLFFKDDTSA


EQLYEGKAKKVWATEDPDVVIVYKDDATA
ELLYE GKAKK Y YLT S DENLI WEY LDD QATA V Y E GK A K K MIPP DD D D K L I ME F K D D A T A
$C L G E T R L D P G L R L A A K G K V R D V Y E \quad S G E H L V L V T T D R Q S A$ EFLYE GKAKKLYGTDDPTVVVEYKDHLTA
KKI Y E GK A K IL Y EP K P G T I V QY F K D DA TA
E MLYYE GK A K K V Y T T E D P E L Y I V Y Y K D D A T A
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AMDLIAKPEEVVKMKELALKVVNDVLRE TAFGWATPQEI DDMMALALRINDFLTG TAFGWATTQEDDDMALSLRVNDFLTG CAFGWATQQDLDDMISLALRVNDFMS TTKAEHDENMTMEEVASYCGADVARQMKELSFKLYERGAQ
 ARKANPDRF L S WEEFR


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 ELASVEQLATIKSIALKVNDILKA DAMGWATREQMATI DELSLKI NALLVN
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FI ND

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$\mathrm{L} \mathrm{L} \mathrm{T}_{\mathrm{T}}^{\mathrm{R}}$



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$\square$ Y F LALK A EEDLAEIRRLALKVNGILQK

## M ND <br> MI NDYH!A

 LVNNYYH:A A L A L GLA EQEE
FINEDHI M
LI NDDHARVL

LISEDHARVL KLAATAEQLQLMR
T TK A EHDLDPLSMDEMK G LINNDH R RLL NLIAAPEEVEAMRAAALVVNEVLKE MVSEEHI
T A F G WA
LI ND YHVLS!
LI NVSHILEL
MI NSDH $\qquad$
 GVA T O Q

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MI SPD
$\square V S E E H \square$ Y $\square A F G Q W A$
LINDTHAVALGFS

L

TTKDDHDVPITPEELVQRMTQADFDAARKAALDLFAFGQR
AEKRRPGCPD $\quad$ P $\square P$ WEEFVGESTAERVRVLALNLYRHAHA
M $\square$ NTEHAVLFNWATA
AAKADHDENISFERMVATTGWDQLAQQMRELARQVNRIMCD
ATKADHDENISFARVIEMVGGVRANQLRDRTLQI YVQAAD



LINDSHANGOA
GDPLLTRERLLLL GATTFE
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## MVNEYHI

MI NYYHARリLG

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EAFGWATKEQL EQMKALTFKVNSVLKS
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A A DEELAAGDQVEAMEGYAWKVNELLTE LAAMDAAEDEI RFDEETSLRVNEILKE




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MITEHHVEA AF KLJT E E DVK K A A A VEEI TILREKALEVNAVLSS KAASWDELAYI KF DARRRVNEILDP ELLATSAEVSAIYDKALAINKVLQP
M TEHHVEA AF GWATREEMARMHELTTLKANHVLKA $N V A S P E Q V S V L R D M A L Q D N Q V L I D$
STKAEHDENITPEQAAKIVGEKYAARI EADALLKVYKAGAA
$\square$ CGFATREEVDTI KDMAFKI NDVLKE FI NEEEHIYFLQL MIN Y Y HAKVLG
TTKADHDVPVTPDEII
 LVLED DALLF

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$T A F G W A T Q Q D L D D V V P L A L R R V N D F M S G$ AL AMQLCTREELDQI ASYAFKINEILKA




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 E L Y E
 NKLEMLYEGKA KKVYM $S K G E M V Y E G K A K R M F L T D D P R L V V E Y K D S D T A$ LLYKGKAKSVYETENDYLILHFRDDTSA
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 $K P \vee H S G A B A$ E ELYS GKAKSI FKTD D DRFIMMEFRD DTSA NKLT LL HEGKAKKV WQT DDPDLI DEFK DDATA
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MEKLYEGKAKVIYKTEEDKVIVFFKDSATA LYAGKAKSVFATEDDRVILQFRDDTSAA L Y R GK A K T VV Y S T E N P D L V L E F R N D T S A K $\square$ GEK $\quad$ EE GK T K $\square V Y$ A P D G N HVVLLK S K D K $\square$ T A MPHKTKK Y OGKA K VVY MP HKTKYEGGKAKELGTTEE GVLRRAKYKD DATA L L Y E GK AKKLFKTNE E DVLVVYLDQATA L Y S GK A K TVV $\square$ T D D P T L I L YF R D D T S A
 KLYE GKAK I Y Y TEEPDILL A YKD DATA LL YE GKAKKVY ATNEKHVLWEYKDEATA
 $N K G K Q L Y E G K A K R I Y A T D Q E D V V W E Y K N S A T A$
 L Y E GK A K KL Y E T DENTLWVEYK D D A T A E ELYRGKAKSVYKTDDDRLILLFRNDTSA LYRGKAKSVFATDDPNLIVMLFRDDTSA $\square A M$ M Y E G K A K K I Y D T D D K NV F WVVYK D DAT A EALYEGKAK II FPPDSSSVVQHFKDDDTA LA ML Y E GK A K RVYE T D Q GVYIVVSYKD D ATA LYRGKAKSVYATDDENFVLHFRNDTSA LE KL Y E GK A K K L F A T D DPEVLWVYMNQATA E E L Y S GKAKSVYK T D D DRYI LTFRNDTSA EMLYEGKAKQVFATENPEVVVRYKDDATA
 KLLYEGKAKQVFTVEPELLI LSYKNDATA $M K L L Y E G K A K Q L E D T N P E E V V Y V H Y K N S A T A$ K LGKKL NE GKTKEVYELPEGCVLMKSKDQ1TA V H S GKVRSVY WLD T P LAIMMI I D RI SA$\square \mathrm{E}$ Q QL Y Y E L Y A GKAKSVYT TDDDKLVIVGRNDTSA KLYEGKAKILYATEDPAVLI YFKDDATA E $\square$ K L E E $\square$ L K K L Y S GK A K S I Y E DD D D K V L I E F R D D DT A MKKLYRGKAKTVYSTDNPELILEFRNDTSA LL Y E GK A K R L Y A T DEE GI L WVY K D S A T A


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LEMMY E GKAK QVYAT D D DRVVI I HYK D DA TA
E LVYE GKAKQLFKTEEGVL RVAYKDDATA
 $N \square G E$ VYE GKAKKI WSTEEDLYI SEFKDDLTA LL Y E G K A K RII Y A T G N E S VVVVQYK D S A T A L L Y E GK A K QL F S T D D S DVV WVY L N QAT A EMLYEGKGKKLFKTDDENLLIEFKDDLTA

G K L I 1.
$\qquad$
$P \frac{L}{P}$ HKGKAKSVYEI LYRGKAKTVYTTARPKVA

## $\qquad$ <br> $K$

 $K T I Y E G K A K V I I G T E A S A V L I V Y Y L D D Q T A$ MEPLYE GKAKRLYATDDPNVLMEYKDEATA LL Y E GK A K K V Y Q S DEH QLV LS YKN DA TA MEKI KE GKAKSLFTTEEHKLVMHFSDDTSA LYEGKAKRIYTTEEGIYRVAYKDDATA GHLLYE GKAK S L Y ATDDEPNVIMMTYK DDATA
 GKKLLYE GKAK I I YA T N DKNLI Q Y F K D DA TA

LYKGKAK SVYATDDKRLVMLFRNDTSA K PVVHSGKVRSVYAPDAP LAAIMVISSRDSA MALLYEGKAKRVFSTEENQLRVEYKDEVTA MAKMI Y A GKAK QL WT TDDDQL LVVVYNQATA LE K L L Y S G K A K T I Y Y A T D P P D T L I A A E F R N S L L T A $L E K L Y$ E GKAKKLYYATNDPDI LVVYMNQATA


$\checkmark$ H S G K VR S V Y WL S P E L A V MVI S D RIS A
EKLYEGKAKKLYATDNP DILWVYMNQATA

GKLI N E G K T K K I Y N N L D P T L C C L L E S K D R IT A
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A VFETTDTS $\square$ TLLYEGKAK NDYKTDENELLVMYK DQATA
AVFETTDTS LDPLIARGKVRDIVSVGTQYLLMVTTDRDSA KLA E G K T K IVVYA H D P E L V I LVVHK D A I S A
$K$ LL Y E GK AK NVY QA ENDEVVLMVYK DQATA LD KL Y E GK A K K L Y A T D N N NVLWVVYMNQATA MTLVYE GKAKRVYSTDEDHVEIVEKDEVTA

E E L Y S G
P T LGEK I IE G
T E N P MNNKYELI YEGKAKKI F THDDDKVI I EFKD DATA MS LLYE GKAKRVFETEQPYLRIEYKDEVTA MSLLYE GKAKRI FSTGEPEI LVEYKDEVTA
T V L Q T N $\square$ G G Q K P R R GKVVR D I Y D L D D K L L I V A T D R I S A
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L
K K N F
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M S
LE GKAKRIYSTDPNELRVEYKDEVTA
L Y S GKAK DVVLLT D D P E I V A AVF R D D DT A
K KVYEGKAK LI YEPEPGTLI QYYKDDGRA

 ELL Y E GKAK KL F S T D DENLLLIE FK D DLLTA
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VD ME LTK LLYE GK T K RVVYSK T P E L L V L E F K D DVT A
GELLYEGKAKRIFACDPQQVLVEFKNDATA EKNKMAKLLYTGKDVKMWSTDDPEVLVVVTDQATAA
$\begin{array}{rl}L G K M F & C \\ I & G \\ I & K\end{array}$







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UniRef90_A3Z881 UniRef90- S5PE05 UniRef90-Q30TBO UniRef90-TOU684 UniR Ref90-A4Y165 UniRef90-A4BHX8 UniRef90-A1BF89 UniRef90-L8D8J2 UniRef90-UPIO0037C3351 UniRet90-B8D414 UniRef90-A4CRC4 UniRef90_FONWD3 UniRef90-F6TJV9
UniRef9_J4WRW9


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L FLK SRGLILPDFKLEFGRDS LFDRADUDLIDFKLEFGR FFRDLELQLVDFKLELGCNRS YFAQKGLNLVDFKLEFGKDS
$\square$
 DFMRLIVADEDSPDSCRLW YDGRLLLADEF SPPDNCRLW
 VISKMGL ILYDFKLEFGRV
 ELAKLDQ| FVDTKFEFGYVE YANSRGMI ADTKFEFGY $L F S G A G L K L V D F K V E Y G R N R$
$F F K D G G L Q L V D F K L E M G L N$

$\square \mathrm{M} D \square \mathrm{~S}$ K T Y T Q $\square \mathrm{AEK} \square \mathrm{T}$ G Q K L E KLKE

L E R V V Q A

YEEVLNR\LGE
A HRT
FNR LNQR
$\frac{1}{A} E S T S K \square Y R T M Y E R \square T$ GQNW AEQL

D V I A K Y R $\square$ VAE K $\square$
LQR

L N RLL

LR R LT A

T $\square$ QLS K VYY K E $\square$ Y Q K $\square$ T G D K

DEATTKRYRQAYERLTGQK
$\square M D L S K T Y L S \square A E K V I G E K$
LR R L A S K
FE
EERLAE
$\square \mathrm{P}$ A $\quad$ YED $\square$ Y AR $\square T$

MS KVS D T Y L S $\square$ A NK $\square$ T
LA RLE K
LARLSk

LEALKQKYAQVAEM
LQRLQDK
FSRL
F E E

D L I E G Y K E V L N R $\square \mathrm{NG}$

LN R L K K
LT R LIE N

GLIEAYGEVYKRVQG

LNRLEKEY
LT R L T Q

MLEVSNTYVGDASKTVGKALT
VRKTQEKYMDAYNRLTDE IIEALRTAY $\square$ E L CNRL

LK E
SNQLTA

UniRef90 A0A023CTY7 UniRef90-D7JE44 UniRef90-FOQVW6 UniRef90 U3ABP6 UniRef90_UPIOO0472EC37 UniRef90-SOAMK7 UniRef90 CoB500 UniRef90-A6UWZ9 UniRef90-Q2GHH2 UniRef90-UPIO0026593AC UniRef90-E6TWL5 UniRef90-17CY53 UniRef90-A0B9A7 UniRef90-A0A033V590 UniRef90-C7XXZ5 UniRef90-H815M3 UniRef90-UPI00036FB4C5 UniRef90 I3QG68 UniRef90-UPIOOO42B4ED2 UniRef90-A2C740 UniRef90-U6ED68 UniRef90-F6D4Q1 UniRef90-H4GK28 UniRef90-H3NV36 UniRef90- E6PEA9 UniRef90-LOHE42 UniRef90-F7XKC1 UniRef90_R71758 UniRef90 U4TTU1 UniRef90-D5E9E0 UniRef90-UPI000465DE42 UniRef90 D2RWF6 UniRef90-UPIO0035DA2AF UniRef90-V4J017 UniRef90_G9WH06 UniRef90_W7BOF4 UniRef90-Q88U22 UniRef90-U1L929
UniRef90 - TOPI40 UniRef90-H1YWD5 UniRef90-A0A016X249 UniRef90 A9VBB9 UniRef90-EOSQN6 UniRet90-M4SM18 UniRef90- A0А031LMX8 UniRef90-A0A015IT14 UniRet90-LOAGP4 UniRef90-W2UZS2 UniRef90-A8AAS3 UniRef90-G8LQS6 UniRef90-D4GVC6 UniRef90-T1A4U8 UniRef90-G2MG13 UniRef90-S8B6D9 UniRef90-R6PZC6 UniRet90_C6XGE3 UniRef90-D3BCJ2 UniRef90 XopFU3 UniRet90-UPIO00287D42C UniRef90-UPIO0020DA2AD UniRef90-UPI000288E6E5 UniRef90-B2GF71 UniRef90- XoX494
UniRef90 H1ZCF1 UniRef90 ${ }^{-}$W4EMT2 UniRef90-W0JNL3 UniRef90-A0A034WN23 UniRef90_Q8ZZK5 UniRef90-U1PXC5 UniRef90-L9хв33 UniRef90_C7P369 UniRef90_V4Y6.J1 UniRef90_KODE89 UniR Ref90-M51935
 UniRef90-UPIO0047A07CC UniRef90_LOIDF4 UniRef90 Q2LSH1 UniRef90-UPIO0020017A6 UniRef90-M1XNN8 UniRef90-UPI000359B51F UniRef90-O24EU0 UniRef90-R4W9J8
UniRef90 R6DYE7 UniRef90-D2EKX6 UniRef90-M0P9V9 UniRef90_U2J737

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 MELLRKGKVKDVYD DGKDLVFKFSDRDSV ■NVKEDMKNLYSGKAKS:YK YDDEKVLDDFRDD:TA EKIYEGKAKDIFATDNPEVIQHFKDEITA K LGNKL DEGKTKAVYADEPENCLLISKDKITAA KLLMRGKVKEAYDLGSELEFQFTDNTSV MSLLYEGKAKRVFNTDEGILRTEYKDEVTA MGELLYSGKAKQMWTTEDPDLLVVYLDQATM
$\square T A A D \square S S \square 1 \square E K Y S G K A K S I Y A T P D P R Y L V K F R D D V T A$ LLSEGKTKKIYTTNNPEVLI HHTDNITA CLSETNDHLTVPGUTGKVRDLYDSGDYLVLVTTDRQSA PDHGPLLYEGKAKRVFAADPDCVLVEFKNDATA LIYKGKAKDVYETDNSEIVIVFRDDITA ELLYAGKAKEMWSTDDPEVLVVYLDQATA HSGKVRSVYWPSAELALMVISDRLSA $T A R G K T K V L Y E V P P D Q L V V A Q G D A T T A$ ELVYTGKAKSVYRTDKGQLIVEFRDDITAA ELGKLLTEGKGKRVYATDDDQAIVYFKDEAMA LLYSGKAKQVFATADPDVLMVYQDQATA VFEGKGKILYYPEPGTLIQQFKDDTA $\square L Q \square E \square P G \square P K \square K S G K V R E \square F D G$ GDSF $\square F \operatorname{FVADRGSA}$ KLLYSGKAKDMDQTDDPQVIHVYKDQATA KKLYKTEAGVLRVAYKDDATA

 GELLYKGKAKSUYRTEDDELLAVFRDDATA HSLNEDVVLIRSKDQLTA MEMLGKTVVEGKTKVVHQHNFDQVILVSKDRITA QTLLVENMEVITEGKVKTVYAGDDQQVIMEYHDKVTA KLGEGKTKEVYSFEDGKVLLKYKDSUTA
KTHEGKTKTGATDDGRGAFVFTDDYSV MKK YEGKTKKVYSYPDNYICQHFTDNITA M $\square K K K Y E G K T K K U Y S T D P D E 11$ HYKDS
$\square E S E T D P G \square E R \square G R G K V R D \square Y$
MEKTYQGKTKDVYKLENGNVLDKFKDDCTG VYEEKTK IIYELEPGTLI QFFKDDNLL MSSTHDPKAFTFIASGKTKSLFKLEDQYVLILSNSSDTA MKKLIRKGKVKEVYEVDEDRLKFFFTNNDSV KLMYEGKAKKIFTSGEDEVVVYYKDDATA MELKYTGKTKDVYEDPDGNYLLQFKDDVTG
$\qquad$

## ME


 MELVYEGKAKRVYKH GDFY FIFTDKYSV FAFTDAYSV FVFTDAYSV GELKYTGKAKEVYTTNDPDGLWHYDDQATA LLIVRGKKEVYETSDPHVLWVHNNQATA LKYTGKAKQVYTTDDPDILWVYLDQATA LFYDGKNADLYTTNEAKVLLVRSDRTSA
S四GSLLYEGKTKNVYULENGNYLLKFKDDVTG
MATAEVLNDGRKПYEGKTKEVYE $\square N P G R V L L Q S K D Q Y T A$ LLYSGKAKNMFQTDDPELVIHYKDQATA
$K L V Y T G K T K N V F E M E N G N G G V$ G E K F T D D Y S SV


MQLI IYK GK T K DVVYNGGNSQY/LLKFKDDVTG

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UniRef90 AOB9A7 UniRef90-AOBSA UniRef90-C7XXZ5 UniRef90-H815M3 UniRef90-UPI00036FB4C5 UniRef90-I3QG68 UniRef90-UPIO0042B4ED2 UniRef90-A2C740 UniRef90-U6ED68 UniRef90-F6D4Q1 UniRef90-H4GK28 UniRef90-H3NV36 UniRef90-E6PEA9 UniRef90-LOHE42
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UniRef90 R6SUF3 UniRef90-A0A031LMX8 UniRef90-A0A015IT14 UniRef90-LOAGP4 UniRef90-W2UZS2 UniRet90-A8AAS3 UniRef90 G8LOS6 UniRef90-D4GVC6 UniRef90-T1A4U8
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UniRef90_ Y2J737



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UniRef90_G8LQS6 UniRef90_D4GVC6 UniRef90_T1A4U8 UniRef90_G2MG13 UniRef90_S8B6D9 UniRef90_R6PZC6 UniRef90_C6XGE3 UniRef90-D3BCJ2 UniRef90_M1P1T1 UniRef90_UPI000287D42C UniRef90_UPI00020DA2AD UniRef90_UPI000288E6E5 UniRef90_B2GF71 UniRef90-X0X494 UniRef90-W4EMT2 UniRef90_W0JNL3 UniRef90_A0A034WN23 UniRef90_Q8ZZK5 UniRef90_U1PXC5 UniRef90_L9XB33 UniRef90_C7P369 UniRef90_V4Y6J1 UniRef90-KODE89
UniRef90 M5J935 UniRef90_G1LHX0 UniRef90_D8MG91 UniRef90_UPI00047A07CC UniRef90_LOIDF4 UniRef90_Q2LSH1 UniRef90_UPI00020017A6 UniRef90-M1 XNN8 UniRef90_UPI000359B51F UniRef90_Q04EU0 UniRef90-R4W9J8
UniRef90 R6DYE7 UniRef90_D2EKX6 UniRef90_M0P9V9

R NVA A GHFSTRFVKE GLIFES PVEEMYFK SDELDDP FTNE RNIAA GSMAKRLGKTGTQLSTPVYE DTYKS DELSDPLINE



 $R N I A T G S D C R R F F E N$

RRLATGSFLKRMP

$R N R V V D V G S S L R R R T E$
R WY V A GS LLFDR I E S G E
$R N V A A A G S L C B R L L$
$R N Y A A$ G S VVK K Y E F
$R N 1$ A A G S L CRKYP F E
 $R G F V A T G S T D T S$ WK GVKEGVHLYNPIFEDFYKNDKLKDP
 RNLAA GS LLRRRFFQEGQTFNPP I I QMDYKNDEYHDPMMLND

$R Q Y \mid T G S M W R A Y E R E R D F C G Q Q L P D G G L T R D Q R L A E L L L D T P$ $R G V A A G S F V R R H \quad T G L Q R G S L L V P R V T E F F L K D D A N H D P$ R NVAA GS IVR NYPFK EGARLNPPVIVIDBKDDSRHDP
 GLPTGTKLDTTVGLELK
RNLAS GHFESKFQ VAHLLRPFSPADHEYYFKSDALDDP

 $R$ G Y L A GS G WK E Y Q K D R T V C GI T LIP D GLLK E S SEELP E P I F T P

$R N V L A G S L A K R L G K S$
RNAAS GSFERKFA $\square$


R NVAA GSMAKRY
RNRAA GS VVKKFPFK
$R R V A T G S F L K R N P$
 RNYAYGSLLKRMP口YKSDEA RKDDPRDLEFFYYKDDANHDP R N RAA GS RNVIA GSMAHRGMDEGVVPDEPVIDLCYKSEDLGEPLI



 R N IV A GS M SRRDD $R N T V P V G S S D R R R G E P A D Y G L E L D E W P D E A V S L P E P V V E F$



 $R Y$ Y V A G S L H D R DK K G K L H E K L G F E E E P DY GE K L P EP YF E V
 RNYASGHFVSKFAATPM QTLTTPVVQEFYFKSDALDDP $R Y R A V G S F L R R Y G L Y$ AEEGQAL DAFVEVTDKD RNTVAGHFASRFGLEEGTALPQPVEENFYKDDELDDP
 R Y R A V G S F F R R Y N D Y C T E G Q A L
 R NTVMVGGSSLRRRTEPADHGLEFSSWPDEPVDLENP VVEF RRLATGSG LLKRN TGVPEGYRFSPPKQETFFKDDANHDP $R F K A Y G S Q L R R M P \quad R L R E L Q H L S R P L V E F H Y K D D A L B$ RNRVPVGSSLRSRREPAYF DLPLDEWPQHPVDLPKPVVEF


 R S $\square$ A T GPF L K R N P D V K E GYKF CP P KVVKLGFKDNANND S RNYASGHFVSKFAATPM QKLTPIVQEFYYKSDALDDP


 RNTVPVGSSLRSRADPGDFGLEYDAWPDGPVDLPEPVVEF
R NFAAGHFASRFN VPMHKALKPAVHEFYFKSDSDDDP R N S V P I G S S L R S R T D P A D H G L D F E T WP D E P V D L D D P I V E F





UniRef90_A0A023CTY7 UniRef90-D7JE44 UniRef90 FodVw UniRef90-C2ETY8
UniRef90 U3ABP6 UniRef90-UPIO00472EC37 UniRef90-SOAMK7 UniRef90-C0B500 UniRef90-A6UWZ9
UniRef90 O2GHH2 UniRef90-UPIO0026593AC UniRef90-E6TWL5 UniRef90-17CY53 UniRef90-A0B9A7 UniRef90_A0A033V590 UniRef90-C7XXZ5 UniRef90-H815M3 UniRef90-UPIO0036FB4C5 UniRef90 - I3QG68 UniRef90-UP100042B4ED2 UniRef90-A2C740 UniRef90-U6ED68 UniRef90-F6D4Q1 UniReforo-H4GK28 UniRef90-H3NV36 UniRef90-LOHE42 UniRef90-F7XKC1 UniRef90-R71758 UniRef90-D4T1 UniRef90-UPI000465DE42 UniRef90-D2RWF6 UniRef90-UPIO0035DA2AF UniRef90-V4J017 UniRef90-G9WH06 UniRef90 W7BOF4 UniRef90-Q88U22
UniRef90 U1L919 UniRef90-FOK3F6 UniRef90-TOPI40 UniRef90-H1YWD5 UniRef90-A0A016X249 UniRef90 A9VBB9 UniRef90-EOSON6
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UniRef9O-G2MG13 UniRet90-S8B6D9 UniRef90-R6PZC6 UniRef90-C6XGE3 UniRef90- D3BCJ2
UniRef90 - XoPFU3 UniRef90-M1P1T1 UniRef90-UP1000287D42C UniRef90-UP100020DA2AD UniRef90-UPIO00288E6E5 UniRef90 B2GF71 UniRef90-X0X494 UniRet90 W4EMT2 UniRef90 WOJNL3 UniRef90-A0A034WN23 UniRef90_Q8ZZK5 UniRef90_U1PXC5 UniRef90-L9XB33 UniRef90-C7P369 UniRef90-KODE89 UniRef90-M5J933 UniRef90-G1LHX0 UniRef90-D8MG91
UniRef90-UPIO0047A07CC UniRef90-LOIDF4 UniRef90_Q2LSH1 UniRef90-UPIOOO20017A6 UniRef90-M1XNN8 UniRef90_UPIO00359B51F UniRef90 Q04EU0 UniRef90-R4W9J8
UniRef90 R6DYE7 UniRef90-D2EKX6 UniRef90-MopgV9 UniRef90_U2J737
 IFAEIGGTVVDVKFEFGRTA DGTLVLADEDTSPDTRLW
 LFEKAGMQLVDFKLEFGRDSNGEVILADEFMSPDNCRDW LAEKIGRRLIDEKGEFGRGREDGTVLLADEVGTPDTCRLW



RAAETGFVHEDGKDEC $\square W V N G E R V A D V A G T D E N R F A$ FFDEQGILLVDFK ETGR FGGELLLADEASPDTCRLW ELAKKGLDLYD花FEFGYN NNEVIL DDEIASGNMRVYK LFLGMNIQLVDFRMKCGRDDDULRIVLADEIFPDCCRLW AWASI DVVLVDFKVEFGVTT DGEIILAD VIDNDSWRIW FFADIDITLVDFKLEFGLD FEGNILLADE IISPDTARLI NGEKNGLLHVDGKKEFAMDENRD I LVDTFGIDADERFW SYKKQN|KLVDFKLEFGRTANGKILLADE GSPDTCRKW ELAKKGIELYDUKFEFGRTGENKQVVEIDEEGSGGNMRAYK
LFEKAGMQVDFKLEGRRSRDNQIILADEFSPDNCR

ELAKKELETYDTKLEFGRDKATNETILIDETSGGNMRVY ELAKKGLELYDIKLEFGRDAKTGEILLIDEISGGNMRAYK QATGADLVHQDGKIEC DTFDGEURVADVVGTFDENRFS AWATRNCALIDMKVEFGDDT



UniRef90 D7JE44 UniRef90-F0QVW6 UniRef90 C2ETY8 UniRef90 U3ABP6 UniRef90_UPI000472EC37 UniRef90-S0AMK7 UniRef90 C0B500 UniRef90_A6UWZ9 UniRef90-Q2GHH2 UniRef90-UPI00026593AC UniRef90 E6TWL5 UniRef90-17CY53 UniRef90_A0B9A7 UniRef90_A0A033V590 UniRef90-C7XXZ5 UniRef90-H815M3 UniRef90_UPI00036FB4C5 UniRef90 I3QG68 UniRef90_UPI00042B4ED2 UniRef90-A2C740 UniRef90-U6ED68 UniRef90 F6D4Q1 UniRef90-H4GK28 UniRef90-H3NV36 UniRef90 E6PEA9 UniRef90-LOHE42 UniRef90-F7XKC UniRef90-R71758 UniRef90 U4TTU1 UniRef90-D5E9E0 UniRef90-UPI000465DE42 UniRef90_D2RWF6 UniRef90-UPI00035DA2AF UniRef90-V4J017 UniRef90_G9WH06 UniRef90 W7B0F4 UniRef90-Q88U22 UniRef90-U1L919 UniRef90 F0K3F6 UniRef90 ${ }^{-}$TOPI40 UniRef90-H1YWD5 UniRef90-A0A016X249 UniRef90 A9VBB9 UniRef90-EOSQN6 UniRef90-M4SM18 UniRef90 A0A031LMX8 UniRef90-A0A015IT14 UniRef90_LOAGP4 UniRef90 W2UZS2 UniRef90 ${ }^{-}$A8AAS3 UniRef90-G8LQS6 UniRef90-D4GVC6 UniRef90 T1A4U8 UniRef90-G2MG13 UniRef90-S8B6D9 UniRef90 R6PZC6 UniRef90-C6XGE3 UniRef90-D3BCJ2 UniRef90-XOPFU3 UniRef90 M1P1T1 UniRef90-UPI000287D42C UniRef90_UPI00020DA2AD UniRef90 UPI000288E6E5 UniRef90 B2GF71 UniRef90-X0X494 UniRef90 H1ZCF UniRef90 W4EMT2 UniRef90-W0JNL3 UniRef90-A0A034WN23 UniRef90 Q8ZZK5 UniRef90 U1PXC5 UniRef90_L9XB33 UniRef90-C7P369 UniRef90 V4Y6J1 UniRef90-KODE89 UniRef90-M5J935 UniRet90_G1LHX0 UniRef90_D8MG91
UniRef90_UPI00047A07CC UniRef90-LOIDF4 UniRef90 Q2LSH1 UniRef90-UPI00020017A6 UniRef90-M1XNN8 UniRef90_UPI000359B51F UniRef90 Q04EU0 UniRef90-R4W9J8 UniRef90-R6DYE7 UniRef90-D2EKX6 UniRef90-M0P9V9 UniRef90_U2J737

D L
DTKTLE
260
K S K Q HMDKDVYRRDLGSLLT
270
SLVVY K E
SGDTURVLINGRHLDRERFR
$D$ DKTDQ HMDKDVYRRKLADLTQTYDQVLARLEDV YRDQQVSKEVVRQFYRSFDPTWVEAVSDCGTSPDHLPADV


DKETKEA
D 1 STNK
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DKETKE NFDKDVYREDTGSLIDTYET
DRETNA HLDKDVFRKNLGGDITTTYDEVYERLQKV
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DKET
DKETMKK
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DKET
DLKTNA HMDKDVFRRQLADLTETYDQVLARDQTA DAEAYVQGKVLENSKEGFRQALLSYADDPDASSTVLPRQM RH GHEDQMLDKQLYRNLDPVDAAGLTRVKAAYEQV DKKTKESDKDVYRFDK
DKTTGD S LDDKD $\quad$ FR R KGDLTKAYEEV
DARTHEP MDLDRFRRDLGGVEQAYQDLLHRM

DAGTRESLD
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DVETNEK LD K DVFRRNTGNLITVYDETLARLEEV DLKTGA SGLDKDVRKDL GDLTVVQEV DGPAYRDGK VVENSKEGFRQLLINNVPDSDAKGYKLPVDV DMNTGEKLDD KDRFRRELG DLL DRETME SFDKDVYRYDKGDFMSAYARVVE
PH
PQ
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K 1 G G DE

DKGGR
LSGLNYEVGKSQESFDKQY $\square R N Y$ L $L$ S $\square D F D K K T S \square E L P N D T$ YEGTQLSKEVLRQYHKRTQPDWVRWKSLCEERPASLEDDV NQNENEP IQQLDKDCFRNDL
KGGE AYDKDDFRQGASG
DRKTMKK LDKDRFRNKFNDK
YGGQQVSKEVVRQYYKRVQPEWVEAVKDAKAEPDRLPAD■
YDGQE $\square$ SKEVVRQFYKEYDPAWVEAVSEAKGQPEQLPESV
DKKQEKS
DGK IVEPVE
PH GDKNQMKDKQVYRN
DQKTGK SLDKDVFR
ENDEYENGNFVQKSKEFVRQHYRRENGEEEPP $\square$ PP $\square$ PDDM
 D 1 ATGKSLD NGEYIEPLELEKMF
DTTTH H H $\square$ DKDVFRRN $\square$
QA GQY
GS D Y IDEPLE
HEGTQLSKEVLRQYHKRTQPEWVDWKSLCERDPEPLDEDM
CRGEH $\quad$ DDKEYFRKTKD
YDGVETSKEATRQYYKSADTEWVNAVSDCERHPTPLPDHV YEGVQLSKEVLRRUHKRTQPDWVGAVDDCDASPEPREEDHV
 $\begin{array}{ll}D L T T G D & S \\ D Q A T G A D D G F R E H K G D M T V G Y H\end{array}$ DQATGA SLDKDVFR
D I ATGGNSLDKDVFRKHSGDVTVGYQEVLTRLQQD AREDFEEN NFTSMMDKQLLRDFGKASNWKEQSQVNVPKEII YEGTQLSKEVLRQHHKRTQPEWVDWKALCEREPEPLDESV DGKYI EP ISSLELFLDK

DLQVSDASDRLLDKDRFRQDL, GGVVEAYGEV YAGQQLSKEVLRQYHKRTQPEWVDWREDCGVDPEPAYGAHV P SGDRSQQKDKQSYRDLKEVTPEGLQMVKKNFEWV DKESGK SLDKDVFR
Y DGQQLSKEVLRQYHKRTQPKWVDWKGLCDAAPAPLDDDV DGKY IDP
D T T
KTSLDKDVFRK
KTGDLVTVYQEV
YGGRGDSKEVVRQWYKANDPAWVDAVSEAKASPDPLPAAV

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| UniRef90_D7JE44 | L N R L S E K |
| UniRef90-F0QVW6 |  |
| UniRef90_C2ETY8 | IA E |
| UniRef90_U3ABP6 | I E T VA DLLYR A G T N A Y T G T Q W |
| UniRef90_UPI000472EC37 | L E R L E R |
| UniRef90_S0AMK7 | V K T V S D L Y $\square \mathrm{H}$ M Y E K $\square$ T G L K W |
| UniRef90_C0B500 |  |
| UniRef90_A6UWZ9 |  |
| UniRef90_Q2GHH2 |  |
| UniRef90_UPI00026593AC | A EQMKK |
| UniRef90_E6TWL5 |  |
| UniRef90_17CY53 | LE T A S DLY CA GA N A Y T GRE |
| UniRef90_A0B9A7 | V Q R T S E $\dagger$ Y $\square \mathrm{K}$ L Y E R $\square$ T G E R F |
| UniRef90_A0A033V590 |  |
| UniRef90 C7XXZ5 | V M E |
| UniRef90_H8I5M3 |  |
| UniRef90_UPI00036FB4C5 |  |
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| UniRef90_U6ED68 |  |
| UniRef90-F6D4Q1 |  |
| UniRef90-H4GK28 | L E E |
| UniRef90_H3NV36 | M M D V S S T Y $\square$ D $\square$ A E R $\square$ T G R P |
| UniRef90_E6PEA9 | A D |
| UniRef90_LOHE42 |  |
| UniRef90_F7XKC1 | A R R |
| UniRef90 R71758 |  |
| UniRef90_U4TTU1 | LR R L Q E |
| UniRef90_D5E9E0 | F E |
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| UniRef90_UPI00035DA2AF |  |
| UniRef90_V4J017 | VGADA D L Y A A G A N A Y T G S D W |
| UniRef90_G9WH06 |  |
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| UniRef90_Q88U22 | LTR L A |
| UniRef90_U1L919 |  |
| UniRef90_F0K3F6 | L A K |
| UniRef90_T0PI40 | $V E G Y$ Y T K L L R $\square \mathrm{NG}$ |
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| UniRef90_A0A031LMX8 |  |
| UniRef90_A0A015IT14 | VT K T M E R Y $\square \mathrm{E}$ A Y K M $\square$ T |
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| UniRef90_W2UZS2 |  |
| UniRef90_A8AAS3 | E EVLKK Y VELLEAL |
| UniRef90_G8LQS6 | E EVIDD T M M L L K R L |
| UniRef90_D4GVC6 | VEALS DLYCA GTN A YVD H D W |
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VD K T S E L Y V N LM S R LT N G K F
L N R M S Q

A DLT A T Y QE VY A R L
$\square E T A R D L Y C A G T N A Y T G$
VN GL I E R Y R D L LQ Q $\square$ T K E T F T $V E I A A T F Y A A G A N Q Y T G T Q W$ I EVAARDLYCS GANAYTGRE $L$ G V A R D L
V T AVA D MYSAGANAYTGTGW L D RLLS

KDK $\quad \mathrm{L} N \mathrm{G} Y \mathrm{NT}$ TLE R L S LQTARDMYCAGTNAYTGT

LKRV
V DAAREMYTAGTNAYLGR A D RV

LQVA R D MYAAGANAYVGEQF
LRR LI N SREEA
$\underline{V} \mathrm{D} A \mathrm{~V}$ A MYAAGTNAYTGREW

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| UniRef90-A7C1W2 |
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| UniRef90-F2F5Y3 |
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| UniRef90-A7HM09 |
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| UniRef90-K1Z4A8 |

M S S TE
M K|LV|YT G K T K D V V Y A L D D N G N Y Y L L K F K K D D C T ${ }^{20}$ L L T T GK AK AV Y A T D D P NVL WHS L N QATA $M E L I Y T G K T K D V Y R Q P D G S Y L L R F K D D V T G$


MEKVYTGKTKDVYKLNEEEYLLKFKDDVTG MKKI YVGKTKDI YKNSAGNYVLKFKDDVTG $M R L V Y$ S GK T K DVV Y E D D GP Y L V F H F K D N V S G $M K$ QI Y E GK T K K V F L $N$ E K G N L V L Y F K D E V M Q K I Y T G K T K DVVY E V D E K TVVL L K F K D D V T G GS GRKLYKDNTKEAYELLNPGKVLLQSKDHITA
$K \square G R K L N E G K T K E V Y E L P P G Y V L M Q S K D Q \square T A$
 MALLQRGKTKDVYSHGDHTLELKFTDRVTG
 EGKAKKVFTHDDNKVKIEFKDDATA $M K L V F A G K S K V I H Q \quad N G D D Y \| M R F L D N V T A$

KKLYE GSSK IIY Q GNE GT LIQYFK D D L $\square$ MELKYKGKTKDVYELENGNILLKFKDDVTG $M K T I Y Q G K T K N V L E D N G R C Y L Q F K D D M T G$ $M K K I$ Y E GK TK TVV QLDD GNVKLLF F K D DVT G MEVTYRGKTKNLFQ EDGKFFMQFKDDMTG

M N LIY R G S $V$ K D L Y Q N N D K IVFE Y S N R Y S $\square$ $M K T L Y N G K T K T V M L D E A T G V V L F F K D S A T G$ $H \square Y P G K V S D L Q T P D G P \square R L M Y R T N R V S T$ GSVKDLIVIEKPTGRFLFSDRYSV $M N L K K E G S V K D V Y H F E N D$ LLLFKFSDRYSVV QVIE GTRKTLFDTESGAYVMQFRDALAP
K LVYRGKSKDVFEDTEGKYRFVFTDRATG


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GNAARKDQMEGKAAVSNKTTSCVFKLLQ
F D GEMPDK\EDKGRALCMVT A YFFELEEAGTATHYLGLVE FDTGGNEVIKGKGSAVLKQAEFFFKLLEHGIVTHFV K
 FNALKKEKFEGKGKLNCLIDSARDFELI KKNI PTHFI ELE QGGNKTARVFGTG\|VRAAUSEKUFHVLEDGUATHLISS
 KDGKFDPTIDGSGRAGLSLTKYFFERLKDGIKTHYIDCDI



FDGEMPDEDPHKGEALAAMASMFFEHLARGFSSHYLSGRS ENGVFDPGVEGKGK\|GLKDSKHFFEMEKNGDPTHYLGADV FDGQMPDALPGKGAALCLAGAATFELLEAGVPTHYRGVAH

HDQHR GS $\square$ PFKD QVLA $\square$ NHH HM $\square D L V Q P \square L G S S Q \square E \square P G$
FDGEMPDLIDDKGKA DCTATAYFFEKLENGTKTHYTGLVE FDGEMPDLI PDKGESLLEFSYNTFKFLENGVKTHLLDLMD LDKNKM TIAGKGALNNRDSELFMTRLNDGLETHFV

Y N G K $\square$ F GE $\square$ P GKGA $\square$ ACKFATYF $\square K \square M E K K D P T H Y \nabla E T \square D$
KVTDMGYPTHFLSMPE
DDDPKTR LLEGKGAWANTTTCNVEELIRRGLPVSYLG GDAAKKETUHEDGDHKTTQAANVFSLLKKGLPTAF NLISTLLFKLLNNGUPVHFI CSGT



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UniRef90_R5BEA6 UniRef90_UPIO002193189 UniRef90_H9Ul32 UniRef90-A7C1W2
UniRef90-A0A037Z4R3 UniRef90-F2F5Y3 UniRef90_U7PHN3 UniRef90-A1RQQ6
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UniRef90-H1Z2G2 UniRef90_Q9X0X0 UniRef90-B6G0X4 UniRef90_UPI0003F581BA UniRet90_UPl000273B8F4 UniRef90_A4WMX3
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UniRef90-C7RD67 UniRef90-E4L9W0 UniRef90_W8P085 UniRef90_B2A872 UniRef90 UPI0003625C73 UniRef90-G1TIJ8 UniRef90_UPI0001555DC9 UniRef90-H3A7B4 UniRef90 O28996 UniRef90-F8AIT7 UniRef90_C3X2K2 UniRef90 UPI00029A58DF UniRef90-UPI0004736538 UniRef90_19MFJ1 UniRef90_UPIO0026579AE UniRef90-UPI000360760D UniRef90-H3NMF3 UniRef90_E4KXP6 UniRef90_G9X9Y9 UniRef90-D1VVIO
UniRef90 K2ELL8 UniRef90_K2ELL8
UniRef90 A0A024EXI5 UniRef90_R5HV67 UniRef90-U1PRE4 UniRef90-H1D8H5 UniRef90 UPI0003479E69 UniRef90-UPI0001926A10 UniRef90-B5YAR6 UniRef90_E1X0W1 UniRef90 D91396 UniRef90-TOZUC2 UniRef90-UPI0003610994 UniRef90_W9U0L5 UniRef90-T1CLB8 UniRef90-K2EZE4 UniRef90-Q5NVT8 UniRef90 R7GDJ3 UniRef90_B3G407 UniRef90-K1Z4A8 UniRef90_UPI0001746899


RTS DEVQPVKVLRPEWKGEAYDYSMYASRQCDVPDEVIF EQGL EVQPVKVLRPEWK GEAYDYSMYASRQCLVP DGGPVQSLSNATAPPDEMADYDAFHADAGANYLVP

MCQKVQIVP LEV VI LEPTATVIVAENLNP】AFENV

ECDVRCRMDRCM
 GKNYLKVKKVHVPNDEFKDKSWDYREFTKKNTIIPREVIFF RRLNMSEQLI R $\square$ AD PYNFRVTV
ENVMD
VEPA $\square$ P $\square$ NMDSEDPE $\square E G A S P L N L E F T W$
R\|VESGASMFDTNY LVPLEFVV KTMDREFSSELCEMI LLEVVI RRASPNELLCYGCDMLPLELVV
 $N \square P Q E L R D R C Q A I E L C R Q L E V E V D G Q Q Q G$ PSTFNVVRRFPVMKPVQKPELGDYSMFYQAATVIPLEYIV



R Y Y VA G S LMD R DK P GVVDFKTGFNS VP S Y GEPDPDPYFTK RRNKVGSYLERFPNFKHPKDLPLP DDPKKNDPLDDPFDK RRYAWGSYLYRNPQFKGDRPHRFETPVWELFHKQSPITDR RFVCDESFSKRY G I APGUVFDDMVFELQY DNEELKNP RRLANETYVKRNPGGI ANGHRFVPPIVEIYHKRHPVFSC

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## UniRef90_R5BEA6

 UniRef90-UPI0002193189 UniRef90 H9Ul32 UniRef90-A7C1W2 UniRef90-A0A037Z4R3 UniRef90 F2F5Y3 UniRef90-U7PHN3 UniRef90-A1RQQ6 UniRef90-A7HM09 UniRef90-H1Z2G2 UniRef90-Q9x0x0 UniRef90-B6G0X4 UniRef90-UPI0003F581BA UniRef90- UPI000273B8F4UniRef90-A4WMX3
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NGQY\|DP 250

MMLSELFFA ${ }^{260}$ SLDKDVFRQGTGDLRDGYTT
DQATGQ
HGSAVAPLE
Q WN
N GE Y $\square E P$ L $\quad$ K
QGDTY
K DGKY
CNGEHLDKE
KSGE FDKD NGEYIMP $\square E \square E R M V D D E$ $K K G E \underset{Y}{I}$ KDGE VVDPMDKDVYRRDL GDP LKKYREV DGAY IDEPLK
LS G E
CNGEHLDKE
EGDAYRQGQVVERSKEAFRQALLMAERLAFAATTTGPLEL AGDDNR LQLDKQFYRDL
GEQY $\square E P \square D L E K M M$
CGGEHLDKE
DLQSN
YDGQP $\square$ SKEVLREYHREHQSEWVQWHTRCDRSPAPLPDAA GDKY IDP LE

D DKTVTQKE
KGDEY
PS GERSHQKNS $\square$ NS D
P SGDRSQQKDKQSYRDLKEVTPEGLQMVKKNFEWV PA GDRSQQKDKQVYRDLKEVTPEALQMVKRNFEWV FDGFEVSKELLREYYRK TEWYDKVRQLKGQPPPLPDEV NGK
DMSG
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KDDVY
D GVYVK P LDVSKY L
DGKSVKPI E
DGKYUKPLEDSKYM

D
HDGQQVKGNVPNQUD
DKETGEK LD KDRFRRDLGN
K LDELDAQGNPQSYSKEFVRGMAFDPSTGLLNPHQQQDI
 GDKRLMKDKQVYRNLSVVTTEAMSEIDRKNYTWV K DGVQLSKEV $\operatorname{LR}$ SLKKRENRDDWK $\square C I N E L K S T P S K L E R E K$ D LRTGERDDGRTQDDR DKKSFEDGK IVELSKESVRQYYRRDNHMEEPMDSALDEK』 K GYVPDE
DAKEYQAGNIVENSKEGFRQFLLNHFPDPDARDNDLPVES ESSAFQKGETVELSKESVRQYYRSSGYHNEPEDPALPDEM
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UniRef90 R5HV67
UniRef90_U1PRE4
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UniRef90-T1CLB8
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UniRef90-K1Z4A8
UniRef90 UPI0001746899
lupas 21
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jnet
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MMDVSQNY LG $\square$ GREDTGSE

VEAASDLYAGVNHYtdeaw


R気EAYQEVAQRL

DEKTQDRYGEADKRL
II QVSS WLYYLALANEI
ПEEAYTEVVKRDT AVRYIEAlIQHISGQPF SNEVV KLFTSKPFA KDLI SLIYKAYVNEDTEDEW $\square E$ T S K M Y K G L
$\square K E T S$ SLIYREMFTKLTGEKW
$\square M D \square S R T Y \square G \square A E K \Pi T G K P \square T$ KKATEDLYRTMFERLTGMKW MEK $\mathrm{I}_{\mathrm{A}} \mathrm{Y}$ NYAKVAE


[^0]:    lupas_21
    lupas_14
    lupas_28
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    conf
    sol25
    sol5
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    jhmm
    jpssm

[^1]:    lupas_21
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[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

