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H H Q I R S L GRYK C Y E VK TVG D S F M I A S K S P F A A VQLA Q E H H R L工「「「
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## RSM3

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A7SPS9
$\qquad$ Q2 704C8 6PKM6 Ref90＿K9TPG8 UniRef90－AOSELO UniRef90＿D8FZZ5 UniRef90－V3ZJI3
UniRef90 V4A8R3 UniRef90－H2W508 UniRef90－UP10001CBA347 UniRef90－UPI0002B40DF8
UniRef90 UPI000477EB1F UniRef90－X0XL00 UniRef90－R7V4Q1 UniRef90＿UPIO0036B3F00 UniRef90＿O62179 UniRef90＿J9F3L3 UniRef90＿Q6UCJ4 UniRef90＿L8MS80
UniRef90＿U1MRS8 UniRef90＿K9VDH4 UniRef90－K1R426 UniRef90－V4AZ64 UniRef90－S9P7H8
UniRef90＿UPI0003EDBE7D UniRef90－B0WDM1 UniRef90－K8GF77 UniRef90＿Q94428 UniRef90－K1WDT1 UniRef90－A0YL05 UniRef90＿C5L3U1 UniRef90－U6NXD3 UniRef90＿UPI0003F063A5 UniRef90＿R7U9J6 UniRef90＿UPIO004442D57
UniRef90－B5YEI4 UniRef90－B5YEI4 UniRef90＿K7J2P7 UniRef90－B3RTKO UniRef90－Q7YXG2 UniRef90＿C3Y9J3 UniRef90＿B5DZO9
UniRef90＿B2MVM2 UniRef90－D5A5G2 UniRef90－A7BXS6 UniRef90＿U7NSE5
UniRef90－C0A011 UniRef90＿Q9GPU1 UniRef90－U6PQW3 UniRef90＿UPIO003452AC1 UniRef90－AOYPF4 UniRef90－UPI00036F2CFF UniRef90＿T1G6Z7 UniRef90－N1PBB3 UniRef90－T1KIY8 UniRef90－14B5Y1 UniRef90－K9RKQ6 UniRef90＿A0A016UGD1 UniRef90－TOF3D6
UniRef90 I0XN10 UniRef90＿C6GAK9 UniRef90－K9WFI3 UniRef90－W8I8Z7 UniRef90－UPI00034ABC1B UniRef90－A0A011R3Z3
UniRef90＿EOV9C1


TA MMS LD LVCG DS GF $\square$
I A H M
I A S M
VATMALHLLH
$\prod \mathrm{ATMSLH}$

| $I$ | $A$ | $T$ | $M$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |

$\square$ C S M S LD F M D

E $\square$ A S T S $\square \mathrm{H}$ LL L E D D
$A \square D M Q Q A$
S L C C L E A I K E $\square$ ARMSLALLHEIT


## NGLTHAA

## 6RSM3

16 RSM3
S9
15
S7
$\square \mathrm{A} Q \mathrm{M}$
G Q EMALLGMVK DVAEMSFEALVRADR $E \| V R M S L A L D Q A V G$ AEMALDMQAK
1 A T M S $\square \mathrm{DLL}$ T A VK QVKVP $\square$ P $\square$ E H N C 1 A TM
 AEMALDMQEE
$E \square A R M S L T L D N K V$
A $\square \mathrm{D} \square \mathrm{AKMA} \mathrm{L} \mathrm{D}$ I L S M MG LPQRNGDNHASEAAMMSLELLCGMS A EMALDMLGE NG $\square$ HHAAE $\square$ ARTS $\square A \operatorname{L} L K A V T$ E $\square$ A EMS $\square$ S L L L E AVK
$\square$ ADMALEMQAEMSRFQTTS $\square$
AARMGLRMD
$\square \mathrm{ATMALD} \square \mathrm{L}$
AVYSSLEDQSKLRELQREW
VCDMA L D MLLEAGUTDLTAD


## ADFALDMVED  $\square T E \backsim A T M A L D L M D A S S$

MCDMALDMRSSMCNL
I A D M
ALDMQRT
FSCVSMA $\square E M R K H M K \square M R Q K W R S Q G \square$

 $E \square A N M S \square D \square L S S V G$

E $\square$ ANMALD LLSAVG HCADMAI KFMQALL NITSEDALDMMTFLE HAEAVAELALAMTNE


I A NMSLD
1 S S M
A L Q S A K MMMDA $\square$ T D $\square R \square E$
$C \vee M A$
$\square$ AA MA $\square E$ MQNA $\square E T F$
TAQA
ACAASTAQM
$\square$ AK LDA L HFTRATTK K $\square$
I ANLAIDMQHAV
MVRM
AEMALDMLDD
UniRef90 A7BXS6
UniRef90_U7NSE5

A $V A A A K G M \square D R L E R \square N D S$



QUERY
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UniRef90 X0XL00
UniRef90-R7V4Q1
UniRef90_UPI00036B3F00
UniRef90_O62179
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 A 1 ALRGVPDPVKMYQLEAVPGRKFAALRVDLEVEE
 VIPIKGKGE MRTYWLVGDPAQRLARIREE EVTLKGK GTMTTYWLI GEKA LI SMKGKGE LQQTFWVSG
PMTLCDGLEPVELFQLNAVPGRTFGPLRL A I EVKGKGE MTTYLLK SVEMKGKGGMQTTYWLRG
LVE $\square$ KGKGE MQTYWL LEKKS LI SMKGKGQLVTYWLI SADPSRRSSPFRTAEE TVEVKKG GTMETFWLTG
SIIIKGKGKMMTYWLTGRK VI SII K GKGERLT Y WLI GEDP EVEMKGK GTQTTFWLKG
LTQ $\square K$ GK GAMHTYWL $\square$ GKEGPTPPP LESEEE $\square$
FVPMKGKGE MLTTYWLEG
FI PMKGKGE QRTFWLVGEDPEARAKRTQER
EVIIKGK GVMETYWVHGRHG
$M 1 S M K G K G E Q R T Y W L L G$
KVFLKGKGTWD TYWLVG

FI EMKGK GTVKTYWLTGA
MI ALKKRGE MLTTYWLNS
EVMVKGK GALETYWLLTPEEQENG
A $I$ QVKGK GMMKTYLLLGLKEE
EVDMKGKGR MKTYWLNG
T I PVVKGKGD MTTYLLTGRKS
E: NIIKGK GTMETYWL E G
E:IVIM KK GVMETYWL E
E IVEMKGK
EYELKGK GMVKTYWL 1 GKDG
KVEVKGKEEPVEAYQL
EI SVKGKGD I ATYWLLGD
EV K GK GVMETFWLLGEESGYTA
KI SVVKGKGECITYYLLQGKESENV
LVTMKGKGE VLTFWLNSAKPE
II MVK GK GEMM TYWLNSRK
EVIIKGK GVMETFWL DPPEG
TI PVKGKGDMVTWWLLGKDTLRDNSDSPPEKEY
PVEMKGKGAIVTSWLI GEREAR
RIP IKGKGE MTTYLLEGRK

TI QVKGKGE MAAYLLTGRK
EVVMKGKGKMDTYFLLG

LVEIKGK GKMNTYWL

EVIIKGK GVMETYWLDGRRSASSSAPVIEE
LIDDKGKGQ MTTHWLRGKKG
RTELKGKGTEETFWLVGKKG

EI QVKGK GTMKTYWLEKREYRSDQSTK


T:I P K GKGEMTTYLLKG
TI EI KGKGEMD TYMLKG
EVVKGFGKPVPDYEVVDFR RDMGPHRSFLEH
RTELKGKGVE ETYWLTGRDG
EI DVKGKGE CCTYWL K L C KRKDNSYF

TLITVK GKTQTVDVFEV
EI EI KGKGLQL TYFLEGRNGEK
LI DIKGK GVQTTYWLEGREGYTRPLPK
$P \vee R \quad L \quad K \quad G K Q Q Q P V P L F R$
E\|E\|K
E A AVKGK GPDAMYFVD
EILVKGK GLMTTYLLMG
EIIIKGK GVMETYWLMG
TVVKGK GAMHTYFLLGKK
LVKVKGKTKPVRDYELDLVNEEDLKLLRRP
EVVPVKGK GTMETFWLNGLDG
II QVKGKGE MTTYLLMG

VI PVKGKGD MRTWWLTG
E A VK GKGR MRVY YLK K


## UniRef90_UPIO002EFD09B UniRef90-B8GBH5 UniRef90-BOSDM6 UniRef90 A6UFJ6 UniRef90-UPIO004575E1B UniRef90-E3FVJ6 UniRef90-UPIO00368B40A UniRef90 R7UFR9

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UniRef90-K7H877
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UniRef90_D5CMT7 UniRef90-D5CMT7
UniRef90 A8Q578 UniRef90-N1W5T6 UniRef90-B5VU28 UniRef90-UP100037FFD7F UniRef90-A4BGN9 UniRet90-UPIO002988E22 UniRef90-F4P089 UniRef90-UPIO002484CE9 UniRef90-K9P962 UniRef90-UPIOOO4779709 UniRef90-D5WMP9 UniRef90-A0A023XP27 UniRet90_K9QGL6 UniRef90-UPI0003F7CCAD UniRef90-W5L8E5 UniRef90-E1K1D6 UniRef90_I4B4T4 UniRefefo-A6UFZ5 UniRef90-S4R4B4 UniRef90-W2EVA8
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UniRef90_D2VNH UniRef90-C7YK97 UniRef90-D8G9R2 UniRef90 W4LA38
UniRet90 R9B3X9 UniRef90-Q86C56-2 UniRet90-W4XRT1 UniRef90-G8PN83 UniRef90-W0DYY6 UniRef90 M9NF51 UniRef90-B6IPB1
UniRef90 H 2 W 405 UniRee90-A8XQW5 UniRef90-UPIOOO47DDF58
UniRefo- 0 OSD
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 YHGCVADTVAHLGGFVAKYMGDGVVVYFGYPQAHEDASQR LYTTFDDVI DNHDVYKVETVGDAYMVVSGVPRE ALGMVANALVRHGGTIDKYMGDAVFALFDDPLKAVAAARQ MFRQFDLLTEQHGVEKIKTMGDSYMAACGDPEPTTDHADR LYKEFDSIVDSHDVYKVETI GDAYMLVSGLPKRNGCHHA YHTAAVPCVLGNGGTDVQFVGDAMLALFNAPAQQPDHAAR
LFEEMTQAVEAYGGFVDKFVGDALLALFGAPVAHEDDPVR IFSQFDELTQDLQLEKDKTVGDAYMVAGLPEPRTDHAQA
 YREACDTAIKRYQGHVARYFGDGVMAFFGWPSAHEHDADR
 GDGYLCVSGLPGRNGKQHDK YFETMVEAVENHEGTLDKFDGDALMAVFGAPMPLLENH Y YFNTMTPLI HATGGTVDKFIGDAVMAFWGAPLDDAHHAEH
$H N G T M R R Q L R S D G G Y E V K T E G D A F M V C F P T T T S A L F W C F T$ YHAALGELVFAYEGTLEHFAGDGLMVFFNDPPPCADAPER YFSEMSKVVDEYGGTLDKFDGDAMMVFFGDPHSRGPKEDA VVNGFDSLTDKYQLEKIKTIGDAYFCVGGDGNTQSDHPER HNEFMRRQLRKDGGYEVKTEGDAFMVSFPTATSALLWTFS CFSYFDRVVDKYSLEKLKT GDSYMCAAGDPKPNPNHAFD YHAACVKVDERFGGHVAQYLGDGLLIYFGYPHAYEDGARR YLSHMTEIAKQYEGTVDKFMGDAILIFFGDPN LYGVEDSREGYDVYKVETVNETYMLASGLPVRKGDHAGE HFKLLVSAVEAHQGTVDKFVGDGMLAFWGAPNEMEDHAQR
FFTRMVELVTRYGGVVDKFMGDSVMAVFGVPERRDDDLLR LFGRFDQLAHDNHCLRDKILGDCYYCVSGLPEPRKDHAKC


$I$ A Q M
ACVA A $\square$ A Q $\square D H \square K V L Q$
A LRA
VANFALGMR】ATRKV
ALQAALEMQDAVDDL
AVCCALA
IA N M S
AAHM
$\square$ I T M
A $\backslash$ ACA 1 AMQRAMQQV
$\square$ ATMSLELLKHVNSFT $\square$ PHMP
ALYAALRMQEAMH QHALRAVAAAVEMLQAQQRL

## A L Y A A L R M Q E A

A L R A
\ARDLIDDMVRTAETVKS P
$A V L A$
$A V N A S G G L E R L E Q \square N A$ RVLKFADETFGV VND DNSNRLKSVDNNEQEEVVKETDNEL CITA

AVQSALDMR
$\square$ QS QLLDVQWPQE ILNSVNG
AVKSAVAMDYELEKLNQKM
AVRACLEMRRALEFL
1 A S M
AVAAAKGMLDRLQNLNA
VQI H LL S LLNWPAEML NSVIC
A VRAALAMQVA L R TL

## $A \vee\llcorner A$

A CI A DVA $\square D M R K Y \square N S Y$

A $\square$ A CAVAMQLAMESINQTMKA WGYANDEMG
CVAMADEMRKHMKVLRQRW
$\square$ CDMALDMLSS $\square$ DHLK DPST
ATETATLALDILSKVH

 A V R A
AVRAS $\square$ A $\square$
A
$A \square R A G$
ALATALGMVDAAREFQGW
1 QNLYLE
$\square V A L G K S M \square R S L R D M E P E Q E R F$
$M E \square A N V A L D \square L S F M G$
A A Q A A $\square E \square Q E$ A A A R $V$ S RE ALGA
A
A VRAATRMM $A \square D M \square R R A T D V$
$\square R T G \square A M Q S Q L G D W$

EVAALACELMDMTTHRAFSHDATRF
A V H A
$\square$ I CAVAMQLA MQQV
$N G \square L H A A E \square S N M A L D L V S V G C$
$M$
$T \nabla Q A$

T QA
A L K C
$E \square C S M S \square G F I D$ SLK
A WRAVQSALEMRQRLAEF
AVRAALAMRQAMEGL
VQTQLLVAD WPQEIL
AVRMALAMRRRVAELAE E W
LQCDRMA LDAMQRRM
ESADGRD $\square Y$

VQTGLLDVPWPSEVLNSVSCQPAY $A \vee \square A$
A $\vee \vee$
ALEDQQFMEDR
T G L G
$T Q G V E Q D A K T C V E M A M V M R Q Q M K L L$
1 LDCASQFLVEAGKMVNMNNKDHK
VAT $\square A D D L Q Y H V S F L$
A! A A AEDMARAIQQAN
ALACAVEMQRAMVALNRDHRAWNEPSLYAG
A
VEMGLDMDDA
A V R A L R A A RA $\square$ A L A M AEE
VA S A S LIE
$A \vee R A G \square A A \square D A V R N L Q P$
AVKTAVAMMREIESLNQKQKC

UniRef90_UPIO002EFD09B UniRef90-B8GBH5 UniRef90-BOSDM6 UniRef90-A6UFJ UniRetionplovo4575E1B UniRef90-E3FVJ6
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UniRet90 H2W405 UniRef90-A8XQW5 UniRef90-UPIO0047DDF58
UniRef90_BOSD27

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GDFHRPDGRPFQLRIGIINSGSVVAGVIGIRFIYDILWGDT VSRLEPDKAFTDRI GVNTGPAYTGFFGTRHRLEYTAIGDT QKWAERHVPVIDI GCGLNSGPAVVGNMGHRMEYTCMGDT GERWNPDTGDP QQRVGI HTGPVLAGVVGEKMPYCLFGDT NERRKAKGRQPIQVGGVNTGQAVVGYMGERHEFTAMGDT AGQKKGQQTLLAGLGGNTGPVIAGNVGSAMRMEYTVIGDS
 NFPGRHMPEKKLQURGGHSGSCVAGVGMKMPFCVEGSD KLKLRTGNLPGLDMGSVLNGPCVAGVVGLKAMPYCLFGDT ADRVRLEQETPLQQ RVGI HTGEVVVRSIHTRADYEPVGQS TAHMRHMPDVPVR1RGGAHSGPCVAGVVGLTMPYCLFGDT SFRURHRPQEQLRLRVGIHTGPVCAGVVGKMPRYCLFGDT SDRWHRRDGLPLSLHGGNTGPVVTGGFGDTKSYSVTGDT
GYKDPHRPSRVRCRGFHTGAVAGGVGSSPRYCLFGDV IRQLKTGAGERAELRIAIATGLVVVGDGDASEEHATIGDT KVKSSSPPPQQLNURVGINTGSVVAGVIGMKKFYDLWGDT LEERNRKHEDKWRMRVGIHSGPIVAGVVGKKFRYDLFGDT REEHGFSRPFRMRMGTGGCTVGNFGSNERMDYTIIGGT NEKDQAFGLAPFEMGGGVHTGDVVVGNDGKRAKYGVVGSQ AELSQQEGDALGLGHGNEVVAGNIGGQKRAQYTVIGSH NQRRYAANKPRINIGI GI NSDTVISGNIGKRMEFTAIGDG TFKIRHRPEMTLMLRIGIHSGPCAAGVVGHTMPYCLFGDT NTSRPSETNFK GIGVSSGEVVSGNGGSEKRMDYTVIGDA GFQRRHTPDVP GVRVGVHSGPCAAGVVGLTMPYCLGGDT
 NEKVNPDKDQVGI GDHTGEADVGNDGSDRRLDYTVIGDN NEKRIARNQPPINIGMGLHAGSAISGTIGERMEYTVIGNT SFRIPHKPDDKLKURAGUHSGPLVAGVVGTKMPYCLFGDT FDRNNNLIFRGLSVRMGIHWGEPLAEPDPVTRRMDYFGPM NAEWEKQGRVQVNCRTGI HTGMLVAGNLGSDQVFDYTGDS QPSFRERGWPEIRIGVGINTGRVSVGNMGVRVAYTVMGDA

GVVGLTS PRYCLFGDT
■GKSGTK■SMR\|GDNTGPVVAGVIGKKFDYDIWGDA TGVHTGEVVVGNDGSEKRTKYGVVGKN HDT $\square P D G R P Y Q P Q V S I G T N G E M V S G N D G K R \square D Y T V I G D N$ RAQGIQQPREI RMGINTGYCTVGNFGAETRMDYTGKE AFKFSETPGDN|LRVRVGLHSGMVVAGVVGLKMPYCLEGDT

 AERWNTRTSLPLALHTGVNTGPVVAGGVGSSKAYSMMGQT MPDLARALGRPVSVHIGLAGGEVVASGTGSATHREYTVDT LLSDGSFVRLGVRUGVNTGVVVVGSVPGEPPDRREVEGST NEHNKKMNLPILEMGUGTNTGEVVAGNIGKRAQYTVIGSH
 NAMREDRDQPPDEMRUGUHSGKVIMGNVGSAERLDWIGDV SFHTQHLPGLPVWVRIGIHSGKCAAGVVGNKMPYCLFGDT AGRLSRVE WPAFRVGVNTGPALVGNDGSPEFRGFNAMGDA GDRWRSRAGVPLRLHIGTNSGPVVTGGFGSTKSYSVTGDT TETFSEQHSVPRQLRVGINSGVVVAGVIGKKFDYDLWGDT NDKRSTEGKMALDHGMGUNTDSUVSGNUGSPKRMDYUGDG SSAML
 VPNLRTALSSPLQVRGGATGLVVVGGKGAAQEQAVVGET SFRIPHLPQQGVNLR|GMHTGSVVTGVVGLTMPYCLFGDT KTEMDAAGKPAFEMRVGIISTGPVVAGDVGIKFQYDIWGDT LRKFNSENNMNLDSGIGI HFGPAIVGNI GAPFRMDYIGDT AGRLRERGLPPVHMRIGLHTGRVVVGNVGQRFSYTAIGDA DERGDGYSLGFGVGMAQGFATLGRVGFEGRWDYAATGTV WQAMGNRKAFQTRCGINTGYCDVGNFGSDRRMDYTTIGPE NLENRQALGHQNVRVGTNTGGVVAGVIGTKKFYDLWGDT DKDNSLIFKGLSVRMGI HFGDCIVSETDPVTRRMDYFGPM KMQKSQQNISYWSIRRG|HSGPLLAGVIGNKKFYDVWGDT RERWIKMGYPPIHTRMGISTGYCHVGNYGHRMAYTIVGRD EVPHKRNEKLD:RAGVHSGSVVAGVVGSMPRYCLEGET EAAPENELHVRIALHTGPVIVGNVGERWNYTIVGDA VAVSCGRLMAGSFGSPLHNEYTVIGDP DATVVEATDVILNMRVGПHTGRVLCGVLGRKWQFDVWSND AAEARTLGRPPVCLRIGUHSGRVVVGNIGSRINYTIVGDT TFTVKHCPDEKLRLRIGNHSGPVVTGVVGIRMPYCLFGDT NFKLAHRPEELMMVR GFHSGPVAAGVVGAAPRYCLEGDT

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|  |  |



E TM L L R G K T G S I P V Y R L K GL R EAARPARGLE
E DEVVK GK G K MLTYF LI H NL H A
VAQVK GKEK GVQTFRVTGSE
$P I Q L K G K T T S C K V Y R L E G L S G A G \square E A D R L V R E E T D$
LLVI K GK G QMMTHW



$\mathrm{A} \square_{T} \mathrm{P}$
$K$ TELK V T L WE
DVEMK GK GKVRTYWLLGERG
ATQ T K G $\square P E P L A V Y E V L \quad R P G A L R T R L Q L$

EVEVKGK G ICDTYWLE
H I DI K GK G H MK T F LLL G S QE GEEVR P L
RREVK G IA E P IA VWAVE GATASRFEAVRAAR
$D Y T F K G l D H P V T V Y Q$
E VDVKGK G IVVKTYLLNDKHHRHL
RI HAKGKGE MEMYFVVK
E I Q VK G DA H P V S T Y R V E
A I ELLK GKQEPHQVYEV

Q $\ddagger$ E P K Gl K K E P I T I Y D I G G I G G E Y N L H L P K E N DV
EKA I K G R S E QV A V F K L R GLL N P R

PTELK


ETYLK
ERRLK GLDENPEY I Y
$R \vee I V K G K S N P \| T V Y E V V C L D$
A AEVKGRSEALKMFKVRGYRAEDGSMVEVRTPYSD
$T L N V K G K G E M I T W W$


| $E$ | $M$ | $K$ | $L$ | $K$ | $G$ | $L$ | $E$ | $N$ | $P$ | $E$ | $Y$ | $I$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $Y$ | $S$ | $L$ |  |  |  |  |  |  |  |  |  |
| $L$ | $K$ | $K$ | $G$ | $K$ | $N$ | $E$ | $P$ | $V$ | $R$ | $Y$ | $E$ | $V$ |


K V EIIK GK GVLLTYWLE

E V A L K N K A E P V M I Y E V V
QI R AK GFSRPIPVYRVVDFR KDLGARRS
K I F V K GK GY MK TY WL K GKK DLS F
$E \perp D V K G K G K M A T Y F L T G K D G F P F E$
Q QKLK G $\square$ S D P $\square \mathrm{D}$ IF QV
SRELKKGFP QAVQI YAV

ALSSVK GFAETV TAWSLLRSRPGRPLVGRHHEMQRF
$R Q A L K G V E G P V E A W R A E A L E S R F D R A R R S P$
Q $\$ QPK GI REPI T $\square$ Y E V C G V G G Q



II E L K
DLS L K GKENTVHAYRLVAL
A QT L R GKS GNV I V H R A GLLLEAPHTAR GLE
LIDDIKGR GKMRTY ILKGRAG
L L V V K G K T Q P VPVFEV
YVV I V K GK T E P V GVV Y EV

S RELLKG I S T PVVA WA
EVII K G K GVMETYWLLGRTGE
$R \| R V K G K H G A V S \square Y E L I S D R G$
K I EVV G K G E I E MWFV S

$A D E L H G L A R P V D V F E V L G A T G R E A S S$
P I A AK GFA QPVRAHAVLGEAQAFFAP T
$M \vee E \backslash K G K G$
E K K L K G L E N P EVVVY S L


E I E K G K G L L T T Y WL N G K D
SHEVRGRKGKVEVWQLN S
QVTVK GKARPVTLYELRADD
S S Y L R D H GVVDTFFIVPPPHRRKP
R F S L R GRA G S V K V WA L
K I V FK N K QE V $V$ M Y W $\mathrm{M} N$
K I E V K
FHPLK GFPASVPAWRVLGESSARFEAL

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UniRef90 E9IEH7 UniRef90_K9PQl4 UniRef90_UPIO004759533 UniRef90_B2HQL9 UniRef90_E1BR32 UniRef90_D6TLV9
$Y\lfloor L S R V S P|V I| R N Y N G F|I| D K Y|I| G D A|V| M A|L| F P E K A D H A L D N A$ YFTEMSEEAHRYGGTID KFIGGAMLI FFGDPETKGDRADA





 $F$ L A T M T D V I Q Q H Q G T 1



 Y F E A L N LI V ERRHGG TV V Q Y I G D S V F A M WN A PVVRDER HVVEN Y H TAA A VPI L G N G GTVVQFVGDALLALDFNAPAPQPGHAAA


 $H N D \square L R R Q L G \| V G G Y E V K T E G D A F M V A F S T T S A A L L D C F N$ Y LT RMT QVVG DHHGT LDKY IGDA $\square M A D F G A P W P Q E D H P D R$ $F N N R M G P I I R R N G G F I M Q Y L G D G F M A L F P E G A Q G A L N A S$ YFPVMADAVFRHEGTLEKYDGDALMAVWGAPFSRSDDADR HNEVMRRQLR I DGGYEVVK EGAAFMVSFPTATSALLDWCFA
 I DA D F D E L L R F Q D D E K K I K T I G S T Y M A V S G L S P D K Q Q C E D K
 $V$ F R H F D L V T D KY DLY K C ETTK DVVMVAS GVPKKDRHHAS
 YLE YMA DAIA QY Q GT I NEFMMGDGULVELFGAPTPREDD LFARFDGLAQRHNCLRRIK LGGDCYCVCGLPEPRPDHAHS
 LYNAFDLLLDECGCYKVETI GDCYMV
$Y F E A M S A Q Q V A R G G T P E K F I G D A V M A V F G V P V$
$\square V N G F D S L T D T F H L E K I K T L G D A Y F C V G G I H G S A T S D H P E$ HDA $\square$ MR RTLRSVGGGYVKTEGDAFMVCFKNITAALLLWCFT
 $L$ FT K F DR LI G DQKAYKVVETVGBSYM SVGGUVDDVDD HCEVV
 LF G K F D Q I A K E N E C M R I K I L G D C Y Y C V L F A R F D K L A E E N N C L R I K L L G D C Y Y C V V G L P EP LR S D H A Q C YLAEMTDD I M K G GVEKIDK TVGSTYMAAGLSAVPSQEAAQE LNELVSDDDE FFM GFDRIIDSKHNVRKDKTVGDCYMCDS GUPSQQKTHADD Y LT D M S NI I LE N R GTVVDKYEGD A I I A F F GAPVVME E H AV L


 I V H GF DK LT T E I H F I D K I K T I G D A Y F C V S
VLNLMKEAVHRYDGVVNKTQGDGVMALFGAPVPHEDHAVR HD RVLRRSLLVGS TGYEVVKTQGDSFMDAFPSVLDALTWCLE
 H N A A L R GLL K R H R GY E VVVFI R D S F CMA F QHA A D A L A WC LDD






 L F A R F D R L A H E H H CL LR I K I L G D C Y Y C V LNE IIADFDEEYN







 YYE H A R Q II I P Q H G GT L E K F I G D A VM A I F G L P Q A H G D

ACRAALD ${ }^{\top}{ }^{G} \mathrm{G}^{\mathrm{G}}$ AVHAA】AMQRAVLRL
A
ACRTA L LMFE
CQS QLLEAE WPTEDME
CCWA
A 1 RCA $\quad$ DMQVA
1 CHLALDMMEDAGQVQ
I A LM
CVQMALAMQKRMSELGETWW
ITRLAI DMDRVMTSIQLRIHAAQD
ALEAGLEMVAA IPGI QQRFQARGWPA $\square R \square G$
AC $\square C A \square R Q M K A L E E L$
$A C R C$ A
A ARAALAMQEAAEEDCAGTPGYPRFRDGUNTGLALVGNDGG A A S A A L EMDAALDGL
AVA A A VGMLRHLDRLNA
A
A A $\square \subset A L A M S A R \square E A L N A E W R$


PQCKER
A LR A
$\triangle \mathrm{V} Q \mathrm{QALLEDQWPSEVLSSS} \mathrm{\square GQEVYDNDH}$
$L L S \square K S M \square M M R E A \square L T F N R$

A $\square$ K MMEL
QACVRMAWAMQRRLSEL

A

A $\square$
$\square$ ATMA $\square$ D MF

C VN
AVACGLAMLEALEAL
$A V L C G V R M L D A L R E Q Q M W$
VVAMAMDMLEA
CGGLFARPCGGPEGGEMLLGGDDPDHAAKVLRFAQQMASV VREDDARRADAAALGMRRALDAL
RVLRFAMATFAVVH
VQLQLLKADWPAGILN
VRARDSHAD
PDHAGRVMNFAKA EMEGRAA
1 CHLALGMVMEARTVCDPI
AC C F A ME $\square K S F M T Q \square R S F K Q M \square G Q D F W E$
CVKMGLDMCEA $\square$
VQMQELLREY
AVDMQRDLQGL
WG MQTAVEMRQRLQLF
ELALADFSLIALNES
$E V S N M S D D U L H S D G$
$A C A V D M K R M E E I I$

C
AVACALEMQKAMEGLNRSNDQQGLPELQMG
1 KT $\square$ GSTFMAASGLNPSQRKENSNEHLYQLMEFAFALQAA
ICAAAMDMLKFVEGTNDQYEADGKPCWE
ACRTA $\square Q \square K K A E T R \square N$ Q DAMADYALRDREQLAYVNEHSFNNFRMRVGDNIGPVILNN
AAKCAYAMWQAG
ARNAVG CGVIMQKRLAEW
$\square A D M A L K M M E S E E V L T P D G S P \square K V T P D F F \square L S Y A N D I N T G$ GLHSCKSSDHPERMLKFADE MSF

## G C

A Q D VLLRAPWPVD L
LGALA M
C
VQQALM QVDWPDRLLAHP DAERSCSHDGTMIEMGLAMIEA VEFAVALGSK
I VALGKSMLDA LK PLA W
I CHVA 1 GMLW $\qquad$ GAAEELAENG

A V H D 1 NR R
ATKASLRMLAKLEDLRKTWNKEHRY
$V Q N Q L L N E D W P T E V L E T N E C C$ E
VEMGLHMTTV

I KSTGATYMAASGLTANTCDRVNFSHVTAMADYALQDFDK VY LEKQSHGKFNNNLR $\square G N T A F R N A$ NVMDEAALASQ\|
A VRA
ACRAALKMRS $\square V E Q L N D$
ATKA

GVAMLQA AFSGF

ALKMMEL | $V E E M G L$ | $S M L K$ |  |  |
| :--- | :--- | :--- | :--- |
| $A$ | $D$ | $Y$ | $A L$ |
| $A$ | $M$ | $Q$ | $Q V$ |

VVLAAGEMQD V VKEKRQQYSD THMSHNL
A
ACESA $\square$ A MRRA $L D E \square N \square E$
A V L C
A VACA LKMQSAMEE $\square$ SR QNEAEGLPHLEMGAA
D MEHLCR LVDYAVAMRHR
A \A CAVAM QLAMQQVNQQNQQMNLPSLEMG

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 NAKWRAEQPFRSRI GI NSGYCNVGNFGSADRMDYTIIGAE LK NDNENSYNNFELRVGQNVGPVVAGVIGRKPQYDVWGNT REQWRQRHGDDIQ Q DRGGPGKPDIR GCGVNTGDCLAGQDGSAERMEYTVIGDA RKEWVHKGLPSLWCGUGINTGPMVVGNLGSVRRFDYIGDH YDSDDNVIYRGLSVRMGVHWGTPVCEQDPVTGRMDYFGPM
 NRQFRQRGYPEVEMGVGLHTGEVIVGNIGKRSKYGVVGRVV
 TDFAFK
 NAKWPPEKRLNDGLGDNSGDMTVGNMGSPGRMNYTLMGDN SNRAAGRPELVTRFGLHTGPAVVGSVGAETRRQYTA】GDT SPELRGFNAMGDCVNV NAELDRDFGSTLAVRIGLNSGEAVTSQDLEGDGTVVSGEV AKVWPEPGEIHVAINSGKAVVGDVGSHQRVDYTVAT NKEDMDDGYPALEMGIG』NTGSVIVGNIGSRMKYGUVGGA EA QGRPWHPVRCGIGLATGPCCVGNLGSAQRLEYSCLGDD YDKDGNLIFRGLSVRMGTHWGEPVCEKDPVTNRMDYFGPM
 NAR LLARGHPELRI HVGLNSGPAAAGNDGSERYLQYATDV NKDRDAKDKK AUSVGMGUGWGGPVCEHDPVTRRMDYFGPM $\square$ QEINKHSFNNFEL RIGI SHGSVVAGVI GKKPQYDIWGKT

 KFEDPGTNNNVLQLRIGLHSGPVVAGILGTSPQYCIYGDS

 NAERERRGEEPGRDGUGIHTGRVVVGDVGQRREYTVIGDA
 A S R L R T P L G EP V EMMR GL H S GP CMS GVVVGRRMP F CLL F G D T
 $\square E K D G V I \quad \square Y K G L S V R M G I H W G T P V S E R N P D T Q R M D Y F G P V$ D QVLLP T T G T P V Q M R DGI H S G P V V QLNEEHVLSHPLQ IRIGIHTGPVVAGVVGKTKFYDVWGDT
$K$ K VRDAT GVDDSMRVGVHS GNVLCGVI GRKWQYDVWSHD TK SVVQKTGVNLDMRIGI HTGSVLCGVLGRKWQFDVWSND LDAINKHSFNDFKLRVGINHGPVIAGVIGQKPQYDIWGNT $G V S T G Q L I V G D \| G S E K R K K Y G A V G S P$

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\squareDNFN HLLLE F NL I
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\squareDNFN HLLLE F NL I
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LDK TLDSPPLFTRIGINTGDMIVGNMGTPDKMNYTIMGHA
 RKSVDPSLLP P GRTRVGQHFGEAVVGNFGRRDQYTALGDA $N L L R K S E G K T P \square A \square G I G I H T G E V F A G N D G S D L H R E Y I G D A$
 QDSIARLLADPHLQVRVGLHTGEVIVQVVENSMYYDAAGAN EVGPGGLLFRGLRVRMGVHVGEPECRVDARSGRTDYLGRM I KQF D DE RRE GVVNMVVGVHTGTVLCGMVGKRFKFDVVSND LDVINKKSFNNFRLRVGLNHGPVVAGVIGQKPQYDIWGNT AEGGGVMLYRGLRVRMGVHS GTTRMIRDPMSRRVEYIGPT
 RAS GRPEDSVGI GI NSGVMSV GDMGSAARRSYTVVGDA IIP EARDMNI RI GLLNTGLLAKVGFMGTDALASYTMMGDT

 NAVQQSLPEHDRFSVVRYGDNTGPAIVGNFGSDERMDYTGHA A AR GFADPVVRDGGGLNTGTACVGNMGSSRRFNYSAMGAV N Q N R E K DG E K P I S I R I G I H Y G P V I V G N V G K R L E Y T V DG D T SNGVMTPAGEPI QMRIGLHTGSVLAGVVGVKMPYCLIGNN I R Y V R S R T K H D I D M R I GI H S G S V L C GV L G RK WQ F DVV W WD
 $N Q Q V T G L G L Q P L E M G I G I N T G E V V V G N I G K R T K Y G V V G A Q$


 LE DVNVHS FNNFDLRVNTGRVVVGNGGSEKRTKYGAVGSE LE DVNVHS F N N F D LRVGG $\quad$ VSCGPLVGGVIGARKPFDVWGNT VA D L K DP Q GRA V P L R G L A A GPVVA GVVGR K F F Y DVV W D A $R E Q G L P E L G I G I G V H T G E A V V G T \| G S P R R Q K Y T A D G K N$





|  |  |
| :---: | :---: |
| UniRef90-F6SW71 | CFDA I DNFDVYKVETIGDA |
| UniRef90-M4Z0E9 | YHAALGKLIFKYEGTLDRYAGDGVMLLFNAPIPFEDHAMR |
| UniRef90-B4GN65 | LYTVFDALTDSKNVYKVETVGDKYMAVSGLPDPCEDHAKC |
| UniRef90 ${ }^{\text {A }}$ 7C | DIIATTAIAKAGGVVVNYMGDAVMAIFNAPNAQSDHTRR |
| iRef90-D9 | GTVASVLRRWRGVVEKYVGDAVMALFGTSGSDGDDAYR |
| UniRef90_A5E, | TPLTNAI LIARKGTUDKYMGDA\MAFWNAPLDDARHQLIN |
| UniRef90-F7HXIC | GDFDELLSKPDYEKIKTVGATYMAASGLNTAQAQDGS |
| UniRet90_U4UVZ5 | SCFDSLMDTFNLIYKVETVGQIYMSVCGAPEETPLLHARN |
| UniRef90-NoBA73 | ADTILNYRGT DDKFMGDA |
| UniRet90-H2SKC5 | K |
| UniRef90-11BPN8 |  |
| UniRef90 GO | E |
|  |  |
| 90-W4VR45 | GCEKISTLGDCYYCVSGCPEPAPDHATC |
| UniRef90 - UPI00047CB5C3 | MGTEGDSFFVVFPTA |
| UniRef90-F4KPN8 | - |
| 34M1 |  |
|  | HNDVLRNQLNLFKGFEVKTQGDCFYVVFKDPLLDGIDWAMS |
| UniRef90_17MA50 |  |
| iRef90 BOXDW1 | VAFFAPVPDOHAR |
| UniRe9 |  |
| UniRef90-H3C | C |
| Uni | DE |
|  | A |
| UniRef90-K81AP5 | AVMA |
|  | KFLGDAMA FEGDEAFKSARHA |
| UniRef90-K9WA83 | STFDQLVEKHQVYKVETI GDCYMVCGGLVEEDAEG |
| UniRef90-UPIO003B35232 | DFDELLSKPGVEKIKTI GSTYMATAGL |
| UniRef90-A01 | HLSMLGAEI TKEGGTI DKYı GDS |
| UniRef90-F2NFS8 | YLSAMVELHHHGGTIDEIIGDAIFVLFGAPMVMPDAARR |
| UniRef90-E2B374 | AFDDEKNPNYKVETVGD |
| UniRef90-B3RQH4 | LYTGFDRIIDRYSVYKLETIGGA |
| UniRef90-Q1GZE1 | YLTAMTRVIHQHRGTIDKYMGDAlMAFWGAP |
| UniRef90_H2LYV3 |  |
| UniRef90-Q1 | YLAEMTRAI FANGGTVDKFVGDAVMADYGSPEEPQEQARR |
| UniRef90_X6GHD | FQNTVAGEVVRYEGHVAKLMGDGVLAYFGWPQA HEDEA |
| niRef90-5Y8K2 | RMSDVLINQGT DKYEGDALIAFFGAPLHMENHASLI |
| UniReego- V40026 | , |
| UniRef90- Q8998R2 | AMTDIIEGHGGYVDKYIGDSVVAMFGAPADDPA |
| iRef90-A8Y4A3 | MYQRFDQIISTNG |
|  | VKFDKLTNVHDVYKETI GDA |
| UniRef90 G3PBK9 | FDELRKPNMEK KT GATYMAAAGLNAQQCADAAH |
| UniReer90-UP1000329 | R |
| Q6W2 |  |
| UniRet90 | YF |
| UniRef90 O1NSQ: | IFRMIDDLVLKYRLEKIKTIGDAYMMVGGLDPMDD |
| UniRef90-U1N |  |
|  |  |
| UniRef90-W0S | N |
| UniRef90-L11478 | D ${ }^{\text {d }}$ |
| B0UM70 |  |
|  | D |
|  | YMDAMAPHVINHHGVILRFTGDGLLAVFGAPLARHTEEAT |
|  | G |
|  | LFGRFDII CQKSGCEKISTLGDCYYCVSGCPEKRPDHALC |
| UniRef90-B1LS | AVKHGGTVDKY: GDA |
| UniRe | AVVDAGGHVNKF |
|  |  |
| UniRef90_K5C | CFSYFDSLMERHKLEKLKTIGDSYMFVGGIPKSNATHADD |
|  |  |
| UniRef90-14B | PI QRHGGFIDKFI GDAIMMALFKSVVDAVGA |
| niRef90_A0BG69 | RKFDEIVKNNL |
| UniRef90-V4AP59 | DGIIAKHDVYKVETI GDA |
| UniRef90-A0E8U0 | KLCQRYNVYKMYTIGDCY |
|  | YFERMVGAIVRNGGTIDKFIGDAVMAVFGGIIELPNPSEA |
|  |  |
|  | YFYQFDEILRHNRLTKLKTUGDSYMFAGGLPEARRSHADD |
| UniRef90-13E | HNTTVRSLMKKDGGYEVKTEGDSFMMDFYDEQCAMQFGSE |
|  |  |
| UniRef90-UPlo00462BDD2 |  |
| UniRef90_UP1000462BDD2 | , AKDNEMRDKLGDCYCVSGLPS |
| UniRe | MDHG |
| 1 Y | HNHLLRRHLRTDGGYEVKTEGDAFMVSFQTVTSALLWCFT |
|  |  |
| UniRef90-UPI00047C7E9A | H HARH |
| Ret90-B4LLEW0 |  |
| niRef90_L1JLM9 |  |
| f90 |  |
|  | LFGRFDHLTEERHCMRIKILGDCYYCVSGVPKPQSTHA |
| UniRef90 S3HP84 | YFELLNETVEQHDGTIVQYLGDSITFGMWNAPTRDEHHVAK |
| ef90-11FE79 |  |

UniRef90_G8UUV2 UniRef90-F6SW71 UniRef90-M4Z0E9 UniRef90-B4GN65 UniRef90 A7C3X9 UniRef90_D9SXZ7 UniRef90-A5ES90 UniRef90- F7HXIO UniRef90- U4UVZ5 UniRef90_NOBA73 UniRef90 H2SKC5 UniRef90 I1BPN8 UniRef90-G0R3J3 UniRef90-A0E179 UniRef90_W1QHP4 UniRef90 ${ }^{-}$W4VR45 UniRef90-UPIO0047CB5C3 UniRef90_F4KPN8 UniRef90 B4M1P0 UniRef90-D2W018 UniRef90-17MA50 UniRef90_B0XDW1 UniRef90 W4M9B0 UniRef90_C5DCI4 UniRef90-H3CDG0 UniRef90 UPI00036ABB90 UniRef90 59 SC 22 UniRef90-K8IAP5 UniRef90_E1VJ37 UniRef90 K9WA83 UniRef90-D8UD34 UniRef90_UPI0003B35232 UniRef90_A0P2D1 UniRef90-F2NFS8 UniRef90-E2B374 UniRef90_LOKZZ9 UniRef90 B3RQH4 UniRef90_Q1GZE1 UniRef90_H2LYV3 UniRef90 Q10ZP1 UniRef90 X6GHD3 UniRef90-F5Y8K2 UniRef90_UPIO002235330 UniRef90 V4B361 UniRef90_-Q89SR2 UniRef90-A8Y4A3 UniRef90-B3RIY3 UniRef90-G3PBK9 UniRef90_UPI000329F758 UniRef90_Q6W219 UniRef90 I3XFE6 UniRef90-17GAT6 UniRef90_Q1NSQ3 UniRef90_U1M3C2 UniRef90- SOEWC7 UniRef90-WOSHF0 UniRef90_L11478 UniRef90 B0UM70 UniRef90-K9GLN0 UniRef90-UPI0002B4A982 UniRef90-W4LSP8 UniRef90 K9TQ08 UniRef90_R7VBF0 UniRef90-B1LS65 UniRef90 KOV306 UniRef90 U3J6R6 UniRef90-K5C472 UniRef90-P91550 UniRef90 14B3W8 UniRef90-A0BG69 UniRef90-F2IF73 UniRef90 V4AP59 UniRef90 A0E8U0 UniRef90-T0F2M5 UniRef90-M9LWY0 UniRef90 H2CE49 UniRef90-I3ESP2 UniRef90-B8HTJ3 UniRef90_U6HQQs UniRef90- UPI000462BDD2 UniRef90-A0L8S3 UniRef90_J1TA46 UniRef90_14YHB8 UniRef90_R5DYJ3
UniRef90_UP100047C7E9A UniRef90-B4LEW0 UniRef90 L1JLM9 UniRef90-G0SZ05 UniRef90-W5NIZ6 UniRef90 S3HP84 UniRef90-I1FE79 UniRef90_Q98DR2

A C L $\square$ A
100
110
120
A VKMALEMREEDGLLTERWK
MARVALDMMDM
AVEAGLT
$A \vee R A G L D \square Q A A L$
A CEAALDMLARVDELN
HPQEHLQULFEFAKEMMRVV

LQ A M $\square$ S D Y Q T

KVEMSYTHVRAMV
VQLQLLEADWPAGILE
IK QRGKGERLVTMAKEM A
VQSQ
CVEMG $\square$ GM $\square$ QA MR $\square$ F D

$G G A V Q A A V Q A Q$
L H E Y
IQAALDMQS Y
$\square G S T V M A A S G L D P S H R G T G D E H \square H T \square M E F A \square E M Q R V V N E F$
CQHE LMS $\square$ AWPSELLQMYDCR
AYNVIM MAFQMIEF
$\square K T \square G S T F M A A S G L D P G S R G E D Y E H \square Y T L L D F A D A M Q Q V V$ ALRTALGMQQMLT DLREKWHAEDDRWPDLVKQMR
$V Q L K L L E A E W P E E D T S \square Q G G C L D T D N E D$
CVQMGLDMCTA $\square$
AVQA A $\square E M Q \square T \square S D M$
$A V E A A L A M V R K M D D \frac{L}{F} N \square K G K E \square \quad R D$
SI NAALLMRRALIEFNLKGKEI TEMQCDLVEY
AVLAA A L Q $\square K A F M G W R$
VTEAVDPLHAHKVFAFAADMLEAARCVMMPG
1 EKKQAQUG】
MVEFA $\square$ A MNGK
A ARACA $\square$ ANMQKAMRGVNEYNFQMDWPEDEM
NPQVREQSEHEYTHLFQLLDFAVAMHKVI $\square G N L A D D M M D K A A G V \frac{1}{1}$
I ACMALD 1 VEGMKTL
A V N A

A VAS A QAMLKALDKLNERWQNLQL
ERADRAADAVVAA
AVRSALEMKKAEVLINKEAMEKGLLNADVAQALLAK

## LERQHAQll|l

VTEMCDMA LSNALMSK
AVRAALKCHE
11 CM
$V$ ARMALSMVDCAVQVSSPS

I Q Q A LDRRNKEM
ACRCALA
PHAHDRAGFEFTDEMMRV
PHAH LDRALFEFTGEMMRV

VADMA LE LMMREDRDKQE $\square Q \mathrm{~V}$
VEERLGTFNA
HAEALAALALDMAAA
SLDDDCDFIDATDWGEKKKADN!AYRNATVMVEFATAMCSI F QMSLLQAAWPPALA
A VMVGNRMDTGLHEL
A GPDAAERVVRFADEA $\square \mathrm{D}$ AGFALDARRA A $\square$ AEDARRAVRAA $\square$ AMEAALDA LAA KEQEMTENASKKCQKG GQDAVHAVQCA $\square G M Q R E L I K R N R \square W M E Q Q E P L V$ A QDARNA
C VEMGLMMCKA $\square Y$
VAS GLA MS DRLQEL
QACVRMA $\square E M Q T R L G Q L$
ALS A
AVLI
$\square$ GATYMAASGLNTSQCQDNNHPHGHLQTLFEFAKEMMRVV SVLA

A GE $\square A$ A L E I QAFMNQM

GG L K K A VDQGTKF $\square$ NQSAVKRAVQLSLEMMEY A VL $\quad A A \square Q \square Q E Y M T N L K T$
$E \square A N M A L D L \square S A V H$
A $\square$ N T VK M G F Q M VE $\square$ I M QV
ATAA
 $A C \square A A L E \square Q A F M H Q Q R N V K A S L G \square P F W E$
!
ADDAQRAVACA HK LLMMNWPEMG!EYNPLIYVK A GEVATMAMGDRLEQLL
CVKMGLDMCQA
AVRSAFQMDEAMQAL
AVKASTAMQDA $\square \mathrm{GTL}$ N
VOLQLIS QDWRKELL
AlAAGUEMQNRMDEVNEFCKEQGYPLLEMG
A I DGAFAMLDADEALNEQFFKA
RPDHAVCSVETGLHMDKA ALRVAGFALDAVEAASNI
VQLELLREDWPQEILDSE
UniRef90 G8UUV2 UniRef90-F6SW71 UniRef90-M4ZOE9 UniRef90-A7C3X9 UniRef90-D9SXZ7 UniRef90-A5ES50 UniRef90-F7HXIO UniRef90_U4UVZ5 UniRef90-NoBA73 UniRef90-H2SKC5 UniRef90-GOR3J3 UniRef90-A0E179 UniRef90 ${ }^{-}$W1OHP4 UniRef90 ${ }^{-}$W4VR45 UniRef90-UP100047CB5C3 UniRef90-F4KPN8 UniRef90-B4M1P0 UniRef90-D2W018 UniReffoli7MA50 UniRef90-B0XDW1 Uniref90-W4M9B0
UniRef9O_C5DCI4 UniRef90_H3CDG0 UniRef90-UPI00036ABB9C UniRet90-S9SC22 UniRef90-KKIAP5 UniRef90-E1VJ37 UniRef90-D8UD33 UniRef90_UPIooo3B35232 UniRef90-AOP2D1 UniRef90-F2NFS8 UniRef90-E2B374
UniRef90- $0 \mathrm{KZZ9}$ UniRef90-B3RQH4 UniRef90-Q1GZE1 UniRef90-H2LYV3 UniRef90-Q10ZP1 1 UniRef90- X6GHD3
UniRef90 F5Y8K2 UniRef90-UPIOOO2235330 UniRef90-V4B361 UniRef90-Q89SR2 UniReffo-A8Y4A3 UniRef90-B3RII3 UniRef90-G3РВВ UniRef90_UPIO00329F758 UniRef90-Q6W219 UniRef90-I3XFE6 UniRef90_-17GAT6 UniRef90-O1NSQ3 UniRef90-SOEWC7 UniRef90-WOSHFO UniRef90-L11478 UniRef90-BOUM70 UniRef90_K9GLNO UniRef90-UPIO002B4A982 UniRef90-W4LSP8 UniRef90-K9TQ08 UniRef90-R7VBFO UniRef90-B1LSE65 UniRef90-U3J6R6 UniRef90-K5C472 UniRef90-P91550 UniRet90_14B3W8 UniRef90_AOBG69

UniRef90_F2IF73 UniRef90-V4AP59 UniRef90_AOE8UO UniRef90-TOF2M5 UniRef90-H2CE49 UniRef90-I3ESP2 UniRef 90 - - B8HTJ3 UniRef90-UPIO00462BDD2 UniRef90_A0L8S3 UniRef90- J1TA46 UniRet90_14YHB8 UniRef90-UP100047C7E9A UniRef90-B4LEW0 UniRef90 L1JLM9 | UniRef90_GOSZO5 |
| :--- |
| UniRef90 W5NIZ | UniRef90-S3HP84

UniRef90-I1FE79
UniRef 900 O9DR2

NQKNKHILGFPEFKIR\|G\|HTGDAlVVGNIVGDRDSYTALGDS GFKDRHRPNEQLKLR|GUHGPCCAGVVGKMPRYCLFGDT AKNVRGHSLGFGVGIALGYATLGQVGFEHRLEYAAIGSV KNEDEQDPLLHFGVGI NTGMATVGNIGAQWHYQYTADGDT ERRRPAG R RVRVGVIGEVLLDLAGVHDHGAASGAV EAKDGGHVYIPRNIGI GLNTGVCVVGNLGSDQRFDYSVDS DDFNNNMLWFNFKLRIGFNHGPLTAGVIGTTKLYDDWGDT ESRLRGEAFVPVRLGGGLNGKCVVGVVGSPQRFDYSVDT LESINKHSFNIFKLRGGINGPVIAGVIGHKPQYDIWGNS IQKENKITYRGLSVRMGA HLGTPVYERNPDTKRMDYFGPV
 $\square G L E G R T W P G D E R L R V R M G \quad$ ITGTPQVHQEDYVGMD KELRIKQGKPYFEARUGMHTGPVVAGVVGDKFAYD WGDT NKDLLE KNNLILRIGMNIGGDVTAGVIGTKLYYDIWGDA LKRTTELVENQLDMRDGVHTGKVVGGLVGTQRYDVYGVD MRIGDNSGEFVTGNMGSRMNYSMHGDS
RKDYLGGSVRMGIHWGCPVPELDVVTQRMDYLGPV
SKDREATGVEISMRVGVHTGNVLCGVIGQKWQYDVWSHD MQMRNEQGKQVFEVGI GVNTGQVIVGNVGAEDRMDYIGDT DFVARGWKP TKVGIGLNTGPMNVGNMGSDFRMAYTVLGDA NQYRENSGYQAVAVGGINTGNVVQSTVGSHERMDSTVDN RYEKMQKQQPFWEIRLGI HSGPLLAGVIGKKKFYDVWGDT TGQPVRLRVGI HSGPVMSGIVGRKMPFCLFGDT पDVINRHSFNTFRLRVGI NHGPVIAGVI GARPQYDIWGNT NQAR 1 ARGEAPVR $\|R\| G L H M G P L V V G D \| G E R V N Y T V I G D T$ YDFNRDLLGFKLILGRGGYNYGDVTAGVIGATKYYDVVGDA RVDGQRVQLT GDHTGEVVTGVI GQRMPYCLFGNT RIIPNMLDTQLSMRIGIHTGPCAAGVVGLKMPYCLFGDT NAGFQARNWPRLDGGGGLNGEMTVGNMGFRMAYTVMGDA LIGSNGVPPVRFRCGII HQGNAVVGMFGGPKRSDYWGPS VADLSLDDGQQLSVRVGIATGVVVVGGVGAAQENAVVGET K NSVDEPLIFTRLGI NTGMIVVGNMGTPNKMDYMGNS LDG|NRHSFNSFRLRVGINHGPVIAGVIGARPQYDMWGNT NANNAAFAGHGLSHRLGLNSGEAVVGNI GRRFNYTVMSDT HFEDPHRTGQYLNCWGFNSGEVFAGI GQRPRYACFGEA VDDFNKNMGFGFKLRIGFNHGPLTAGVIGTTKLYDIWGDT LRYVRRELQQEVDMR GVHSGSVLCGVLGQKWQFDIWSWD QQKERGDPEFRTRFGAGNGTADVVGVGDRERLQYTAMGDG VADLTDPEGRRVPLRGGAAGPVVAGVVGRRFFYDVWGDA
 $T D F S L R V G L A T G P V V S G V I G V K F A Y D L W G D T$
$Q N F Q L A U M S S G P L V A G V I G Q K P Q Y D U W N T$ NLRRVARGGEPIRIGVGISTGNVVAGNDGKRMEYTVIGDR LVKHNNAGEFALKDRAG| ASGPVVAGVVGTMPRYCFFGDT VLETGERHGAAVQMRFGIATGQVISGVIGTRPVFDVWGST FLLLLRQKGELPNIDLEYDCSPVVAGVVGLKMPYCLFGDT GMRVGATGPAVAGSLGSSQRLEYTIHGDT NRWQKRGLPVIQMRVGIFTGAVVAGSLGGKERQEYIGDS EFDEDHNEEVNMRVGVHTGTVLCGIVGRRFKFDVWSHD NARWRRSDERPFQARIGINTGYCNVGNFGSDERMDYIGAE
 DDFNNNMLWFNFKLR GFNHGPLTAGVGGTKLYDVWGDT NAYRTGKGYKPEGGGMSGPCVAGVVGLKMPYCLFGDT AKKFKFGQSGNVKIGGVHYGRVIAGVIGHHPQFSLIGDT NF EGLKTGSEFWELRLGUNTGEVTAGVIGERLAYDIWGAT
 LRTGINTGPVAAGVIGDRFTYDVWGDT TKPVYR GLQIRVGISKGACIVENDPDTKRLDFYGKS NVYWQKKGLPQVQMRAGLFTGSVVVGSLGSKTRLEYDGDS TFTIKHLPEVPLRLRIGLHSGPCVAGVVGLTMPYCLFGDT KKLRDATGVDI NMRVGVHSGNVLCGVIGQKWQYDVWSDD AFKAKGWPELKI GVGI NTGTMNVGNMGSEFRMAYTVLGDA EAAATGRPLHVLKMGVGDNGECIVGNMGSTRRFDYSCDS LDANGNSIARGLLSVMGIVVGYPVCEADPVTQRMDYWGPV G GH SEAF GNVGSEKIMRYNVVGKV TKDRQPYVEVGLGANSGMNVGDMGSNFRRAYTVLGDA LLDDDQPQLGTVTLRVG|HSGPVVASLIGQKLKYTLFGDT LRDVQKQLDHAVDMRDG\| HSGSVLCGVLGQKWQFDVWSRD NSANRQAGRPQLVTRFGLHTGQAVVGSVGARRQYTAMGDT
LDKMNHDSFTDFKMRGGGSHPVVAGIGKKPQYDVWGDT

## UniRef90 G8UUV2

 UniRef90-F6SW71 UniRef90-M4ZOE9 UniRef90-A7C3X9 UniRef90-D9SXZ7 UniRef90-A5ES90 UniRef90 F7HXIO UniRef90_U4UVZ5 UniRefolo-NoBA73 UniRef90-H2SKC5UniRef90 I1BPN8 UniRef90-GOR3J3
UniRef90-A0E179 UniRef90-W1OHP4 UniRef90 W4VR45 UniRef90-UPIO0047CB5C3 UniRef90-F4KPN8 UniRet90_B4M1P0 UniRef90_D2W018
UniRef90_-I7MA50 UniRef90-B0XDW1 UniRef90_W4M9B0 UniRef90-C5DCl4
UniRef90 UniRef90-UPI00036ABB9C UniRef90-S9SC22 UniRef9-KBIAP5 UniRef90-K9WA83 UniRef90-D8UD34 UniRef90_UPIOOO3B35232 UniRe990_APP2D 1 UniRef90-F2NFS8 UniRef90-E2B374
UniRef90-LOKZZ9 UniRef90-B3RQH4 UniRef90-Q1GZE1 UniRef90-H2LYV3 UniRet90-Q10ZP1 UniRef90-X6GHD3
UniRef90 F5Y8K2 UniRef90-UPIOOO2235330 UniRef90-V4B361 UniRef90-Q89SR2 UniRet 90 -A8Y4A3 UniRef90-B3RII3 UniRef90_G3PBK9
UniRet90_UPIO00329F758 UniRef90-Q6W219 UniRef90-13XFE6 UniRef90-17GAT6 UniRef90-O1NSQ3 UniRef90-SOEWC7 UniRef90-WOSHFO UniRefofo-L11478 UniRef90-K9GLNo UniRef90-UPI0002B4A982 UniRef90-W4LSP8 UniRef90-K9TQ08 UniRef90-R7VBFO
UniRef90

- 1 LLS65 UniRef90-KOV306 UniRef90-U3J6R6 UniRef90-K5C472 UniRef90-P91550
UniRef90 $1433 W 8$ UniRef90-AOBG69 UniRef90-F21F73 UniRef90-V4AP59 UniRef90-AOE8U0
UniRef90 $\mathrm{TOF2M5}$ UniRef90-M9LWYO UniRef90-H2CE49 UniRef90-13ESP2
UniRef90 B8HTJ3 UniRef90-B8HTJ3 UniRef90-UPIO00462BDD2 UniRef90-AOL8S3 UniRef90-J1TA46 UniRef90-14YBB8
UniRef90_R5DY UniRef90-UP100047C7E9A UniRef90-B4LEW0 UniRet90-L1JLM9 UniRet90-GOSZO5 UniRef90-W5NIZ6 UniRef90-S3HP84 UniRef90-IIFE79
UniRef90_Q98DR2

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VNVASRGEGANKGTADMASEATVAQT DHGDAFAWREDD VNTASRMESHGLPSTIHTSEACY VNTASRMDTTGVECRVQVSEESYCVLSAMD YEFDYRG VDVANSLEAAGVPGQVHISKATLDCLGGDYETEAGHGQDR


##  <br> v

## V <br> V $V$ $V$

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 N N MASRMESMGKG
$V S \square A N K M E S S G E E G R V Q V S Q T T K Q M I E R A E K H P F K F K F H H$







 $M N V S S R M E S S S L P G K I Q C S K V T \quad I L R G A D S H \| I V T E R G$ $V N$ R A A R I S A VA E G G Q I S A S Q DV I D I I Q D




| UniRef90_G8UUV2 |  |
| :---: | :---: |
| UniRef90-F6SW71 |  |
| UniRef90-M4Z0E9 ${ }^{\text {a }}$ | DLHLKGFNHPVLAME LRWRG |
| UniRef90_B4GN65 UniRet90 A7C3X |  |
| UniRef90-D9SXZ7 | TLTLAGKALPLDVWRVTGAAGSRPARHRVP |
| UniRef90-A5ES990 | FVMVKGKTEPEVIYAITGRESERFQRLR |
| $\begin{aligned} & \text { UniRef90_F7HXIO } \\ & \text { UniRef90_U4UVZ } \end{aligned}$ | TVKLKGKGGD METYWTL |
| UniRef90-NOBA73 | TVMPRGKDRPERDFALDGDEA |
| UniRef90-H2SKC5 | VVNVKGKGD LITTYFV |
| UniRef90-118PN8 UniRef90 GOR3J3 | EQPKGL DVMTAYETAGL |
| UniRef90-A0E179 | KVT\TA |
| UniRef90-W1OHP4 |  |
| UniReego-W4VR | D |
| UniRef90-UP100047CB5C3 | L-L |
| UniRet90-B4M1P0 | SVYVKGKDH MEVF |
| UniRet90_D2W018 |  |
| UniRef90-17MA50 | DVYIK ATDTN $\square$ RTFF |
| UniRef90 W4M9B0 | YVQFVGKTEPLEVYLVVLA |
| UniRef90-C5DC14 | EKKLKGLKEFITIUYPKADEARH |
| UniRet90-H3CDGO |  |
| UniRet90_UPIOOO36A | EVKLKNRVE |
| $\begin{aligned} & \text { UniRef90_S9SC22 } \\ & \text { UniRef90_K8IAP5 } \end{aligned}$ |  |
| UniRef90-E1VJ37 | DVLVRGRQAPVRLYEV |
| UniRef90-K9WA83 | K1AAKNKGN பDMYFVNGLPNDEFNALYSDR |
| UniRer90-D8UD34 | F NVKGKGE LKTFFVCTDTSKQL |
| UniRef90-A0P2D1 | LHQVKGRVEPLEVVRLIG |
| UniRef90-F2NFS8 | VHAKGMREPLKCRELLG HGDYPELMLEAE |
|  |  |
| UniRef90-B3RQH4 | cL LVK |
| UniRef90-Q1GZE1 |  |
| UniRef90 H2LYV3 | $V K V K G K G E$ LTTY |
| UniRet90_-210ZP1 | FLKLKGDDED LGFLVS |
| $\begin{aligned} & \text { UniRef90 } \mathrm{X} 6 \mathrm{GHD} \\ & \text { UniRe90 F5YKR } \end{aligned}$ |  |
| UniRef90-UPIOOO2235330 | LINVKGKGE LTTYFVCTDTAKF |
| UniRef90- O89SR2 |  |
| UniRef90_A8Y4A3 | GVTV ${ }^{\text {a }}$ |
| UniRef90_B3RIY3 |  |
| UniRef90-G3PBK9 | TVNVKGK G Q PVPQ PQLSV |
| UniRef90_UPIO00329F758 <br> UniRef90- Q6W219 | SEFLR KHNIDTYLVRPASKEDVEPPKARRPSYD |
| UniRef90-I3XFE6 | SAQAKGRASALEIYEV |
| UniRef90-17GAT6 | EVEVKGKGVMRTWYLVGRRDGER APLRT |
| UniRef90-Q1NSQ3 |  |
| UniRet90-U1M3C2 |  |
| UniRef90-W0SHFO | LIRVRGREMPVAIHE |
| UniRet90-L1448 | K VVKGK GAMQTYWVRGDK |
| UniRef90-BOUM70 | D A K G ${ }^{\text {a }}$ |
| UniRef90- UPI0002B4A982 | PVLLKGK GSVVTYFLVAGYDGKNLPNDR |
| UniRef90-W4LSP8 | EVSLKGKEQKVSVHRVLG |
| UniRef90-K9TQ08 | PLALKKGKQ TVDVYRVVARRHPT |
| UniRef90-B1LS65 | P $\mathrm{R}_{\text {RMKGПSREVVPYAVEGD }}$ |
| UniRef90-KoV306 | FFALRGKSAPVQVFGLDPA |
| UniRef90_U3J6R66 | TVNVKGKGQ MKTY |
| UniRef90-K5C472 | EVPAKHKGN DKMYFVEGLELOA |
| UniRef90 P91550 |  |
| UniRef90-A0BG69 |  |
| UniRef90-F2F73 | KVKTKSK GLIEMFTVER】KPE |
| UniRef90-A0E8U0 | DVELSKFNMSTKGYLVEWDKTRD |
| UniRet90-TOF2M | QVSVKGKSKP $\square$ Q $\square \mathrm{Y}$ |
| UniRef90-M9LWY0 |  |
| UniRef90-H2CE49 UniRef90 13 ESP 2 | FRPVKNHGE MEMYFLNRD |
| UniRef90-B8HTJ3 | PLELLKGKETKILVYRVVGPRS |
| UniRef90-U6HQQ9 | LIEFEG GMEIT S |
| UniRef90_UP1000462BDD2 | DSY R E ENK RTFLVIDPRAEEV |
| UniRef90_A0L8S3 | KGKAEPVAIY EPVGFTSEVDEARLSELEQY |
| UniRef90-J1TA46 UniRef90 4 YYB | RIVVKGRTVPSP |
| UniRef90-R5DYJ3 | Q ${ }^{\text {MAKGUQKPVAVCEVAADGGAYGCA } \square \text { R }}$ |
| UniRef90-UP100047C7E9A | KVKVKGKTQPVNIYA PVPPSRQAA |
| UniRef90 LiLLM9 |  |
| UniRef90-GOSZO5 | EサP■KGK GпMT |
| UniRef90 W5NIZ6 |  |
| UniRef90_S3HP84 | TARAKGRMEELLVYELVG |
| UniRef90-11FE79 UniRef90 Q980 |  |



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| UniRei90-L5KRF9 | FGRFDRLCEVTGCEKATLGDCYYCVAGCP |
| UniRef90-K9W3B0 | YLEAMTK |
| UniRef90-ToG8N0 | YMRRMGPVIRKNKGFVDKYLGDGIVALFPNSPDDALQA |
| UniRef90-No | LVTAFDELAQRHGVEKIKTIGDAYMVASGVPIPRPDHAQV |
| UniRef90-B2IU62 | YL E |
| UniRef90-UPI000441ADCB | FDELLKFSGVEK KTU GSTYMATGLNVAAGQDADC |
| UniRef90-UP1000175830D | FDKLATHDCLRUKLLGDCYYCVSGLPNAREDHADC |
| UniRef90 - 4 WC 75 |  |
| UniRef90-L8FJI8 | EVVPAVTEVGGHVNKFLGDGALAIFGAPND |
| UniRef90-M4A | GDAYMVASGVPTRNGNRHAA |
| UniRef90-H5Y | AFAVLVDLDREGGIVNKFLGDGFLALFGAPLEASDAAHR |
| UniRef90_OOVS | H |
| B4V | EPAIIREYNGFVDKY G |
| UniRef90_FOZIZ3 | YLNRMVEVVFRHGGTKDKFMGDGILAYGGA |
| UniRef90-H2URG3 |  |
| UniRef90 K5C2E3 | SNAIEDHGGFIUNKI GDAlL |
| UniRef90 | SDFDSLADEPKFRKIKTIGSTYMAASGVTSD |
| UniRef90 G3VZA2 | IIADFDES SEEFRKIKTIGSTYMAASGLNAA |
| UniRef90-UPIO0025 | YLTEMSD |
| M3HL |  |
| UniRef90 UPIOOO3759493 | AMSD MALGGGTIDKYEGDA |
| UniRef90-UP1000476B3F1 | A |
| UniRef90_O5LV | D A |
| D1ZZC5 |  |
| X5L14 |  |
| B8EME3 |  |
|  | FDTV NRHDSYKVET GDA |
|  |  |
| UniRef90-UP10003B6 | D ${ }^{\text {d }}$ |
| ef90-H3CL |  |
| 25 |  |
|  | VFGREDLCGM GCEK ST GDCYYCVAGCPEPRLDHAGC |
| UniRef90-T1J3K3 | DGTVEKYI GDALVAVFGV |
|  |  |
|  | A |
| UniRef90 W0: |  |
|  | de MVSF EA |
| UniRet90-H9KSA |  |
| niRef90_13x6S3 | VINENHGFIDKYMGDA |
| 2VIL2 | TVSGFDKLTDKYELEKIKTIGDSYFCVGGLHQASDHPERV |
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| UniRet90-K7H4 |  |
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| 8G | D |
|  | HLIDVNMHNGM NKF GDG |
|  | N GDA |
|  | 1 RETLTECVFEFGGTLDKYI GDAVMATFGTPYPSDDPAAD |
|  | YLEQVIG\\|AFRHEGTLDRIVGDAVA |
| Ref90-UP10004548 |  |
|  |  |
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| UniReef90-B6JF40 | FLT ${ }^{\text {P }}$ |
| UniRef90 UPIO00265: |  |
| ef90 UPI0000150AAD4 | A |
| UniRef90-K8GT52 | YMEAMTQVVLDHGGIVDKFIGGDCITMAVFGVPIARTTEAEIT |
| UniRef90-H2RUG3 |  |
| K1S | VYVKFDDLLKNPDVYKVETVGDKYMAVSGLPEPCTEHARC |
| UniRef90 AOBNX5 |  |
|  | YQQAIGRIVIERHQGRIVDAPGDNILAEFPSAVEAVNGAVE |
| UniRef90-H2J2S9 | L |
|  | YFOSMTEAVFKYGGVIEKY 位A MAVFGAPVELEEHAWR |
| UniRef90-UPIO003 | GDA |
| UniRef90-V616L5 | AMVKCINANGGSVNKYI GDAl |
| UniRef90-UPIO003501F7B |  |
|  |  |
| UniRet90-V81 | 1 ISDFDALLDDPCITKIKTI GSTYMAASGVTPDVNSNGYN |
| 㖪90- |  |
| 3BFMO |  |
| $\begin{aligned} & \text { UniRetgo_H2U465 } \\ & \text { UniRef90_V4H6P5 } \end{aligned}$ |  |
| niRef90-b3RIR3 | D FDE |
|  |  |
|  | N |
| UniRef90 H1G348 |  |
| UniRef90 R7TKD3 | A |
| UniRef90-D2VSH1 |  |
| iRef90 | VVNGFDNL |
|  |  |
| F8 | LYTRFDHQCGFLDIYKVETIGDAYCVAAGLHKKSLSHAKA |
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UniRef90 K9JOG4 UniRef90－H2KPM3 UniRef90－L5KRF9 UniRef90－K9W3B0 UniRef90－TOG8NO UniRef90－NOB6B1
UniRef90－ $\mathrm{B2IU6}$ UniRef90－B2IU62 UniRe UniRef90 UPIO00175830D UniRef90－F4WC75 UniRef90－EOVG99 UniRef90 L8FJI8 UniRef90－M4ARR6 UniRef90－H5YJM5 UniRef90－Q0VSG5 UniRef90－B4VIF1 UniRef90－FOZIZ3 UniRef90－Q09BE7 UniRef90－H2URG3 UniRef90－K5C2E3 UniRef90－E2BM54 UniRef90－M3ZQ93
UniRef90 G3VZA2
UniRef90＿UPIoo025554BB
UniRef90－M3HLU2 UniRef90－UPIOOO3759493 UniRef90 ${ }^{-}$－ 8 H 5 M 2 UniRef90－UPIOO0476B3F1 UniRef90＿O5LVX3 UniRef90－D1ZZC5 UniRef90－X5L174 UniRef90－B8EME3 UniRef90 K7GX34
UniRef90－10XA51 UniRef90－UPI0003B69DD9 UniRet90－H3CLT8 UniRef90＿O5RHR2 UniRef90－E9HPX1
UniRef90
T1J3K3 UniRef90－H9UFW5 UniRef90 A0A016SK01 UniRef90＿UP100036E8C65 UniRef90－W0SHS8 UniRef90 E9C9Q1 UniRef90－H9KSA7 UniRef90－13X6S3 UniRef90 F5UG71 UniRef90－D2VIL2 UniRef90－Q238W6 UniRef90＿K7H476 UniRef90 Q4RZ92 UniRef90－L8GDF5 UniRef90－N1WH25 UniRef90－ 3 CBY7 UniRef90－U6GCV1 UniRef90－TOFGN8 UniRef90－F6ADQ0 UniRef90 UPIOOO4548524 UniRef90－Q050A5 UniRef9－AOCF34 UniRef90 B6JF40 UniRef90 UPI0002658E43 UniRef90－UPIO003451A7A UniRef90－UPI000150A4D4 UniRef90 K8GT52 UniRef90－H2RUG3 UniReffo ${ }^{-K 1 S 3 W 9} 9$ UniRet90＿AOBNX5 UniRef90 UPI000362C938 UniRef90－H2J2S9 UniRef90－UPIOO0180C823 UniRef90＿UPIO0037EOD20 UniRef90 UPI0003728C7D UniRef90－V616L5 UniRef90－UPI0003501F7B UniRef90 B4VIF3 UniRef90＿V8PDM9 UniRef90－T2M187 UniRef90－F3BFM0 UniRef90 H2U465 UniRef90－V4H6P5 UniRef90＿B3RIR3 UniRef90＿R7TWB9 UniRef90－F5Y8T2 UniRef90－H1G348 UniRef90 R7TKD3 UniRef90 D2VSH1 UniRef90－D5CTY7 UniRef90＿D2VS06 UniRef90 G6DDS1 UniRef90－UPIO003D0A8F8 UniRef90＿T1GK12

CIIEMGLGMTRATEHFCQEKKEMVNM AVEMGRAMCLALQQFD
SSNKEEKSDKERWQ

$\square A A M$
TPNEQVRRSI
A A A R AMEMLKELENL
$\frac{L A}{R} A M N T A R A M H R S \square A D \square N Q R W R E Q G V F D G D$
A L D L L V A
A
NQQDTERSYTHLGTMVEFAMALVAK
C DLLK QQDHNVIVLVEMGAVAMIKA
$\square P E H A D A A V S A A A A A$
$E M A N M S L I L S L G$
A VA A GREMLT A M
A L C C A VM
A MFE

VAHMSLGMLSVI
AVECGLRMLEALLEAL
SHILALA
AFATALQMQKNDDL
CVNMGLQMIDAARF
MKKEEQSDRERWQHD
SHTTA LA
DYAMRDREQ

SHIT ALA
ACRSATKMKKREDEDRTEDMK
AARAAVEMDETLERLRQEWKAKKVY
CVRAAI AQQKELDRLRPVWVAAGYPA
VQRALLQVEWPEALLDHPGAAEEW
ACKA
AVG
$\frac{1}{A}$ A WMA $\square K M \square D T C S H H H$
AVACAVADSKAC
A D LA D F A $\square$ A MK
SDGAFYTPLSKL

A M
C
C VD M
GDTDDRRPFLDH
ALGMLKATERF
LT A A L LE

$A V R A A \square A M Q R A V C D L S T R W L Q$
A L E A
A Q $\square Q L L E M E L P$



TVYYNVERLINLGG DMQDYVKNDSW
 ПCDMALDMVRS四HKKDPSNGNDQDRVGGWKAARVEFTH VQRALLAADWPEALL
VKNAVEASE
 A！KALS
AL
Si $\square \mathrm{m}$
Al NGSLMMREA
AKNVVELGFGMDE【IRNVRQ【I
ACAAGLD
MLACLKVVNRERKA

$\frac{\square}{A} L N Q Q K M G F C M D D \square Q Q V R A V V N F D E \square E M$
$A L N V I K M G F C M \mid D D I Q Q$
$A Q D A N Q A V S C A M K M A H V$
GWHHLSE
LQA
$\square \mathrm{A}$
AKN【VD【AFEM
IQK
A $\$ A CA $\square$ DMRRK $\square K D \square N K$
TFMDASGDNPHTDQDQETTGKNYHLCKDMDFCDAMQDAVD A

A $\square \mathrm{NA}$
ALDDMRKSLIQF
A MDGRMRI
TKEDRSEKER
C 1 A M
GVEAAMSMDHGDTK $\square$
$A$ VK CAMHMQRQVDDLQAQMDEQGFPPFATG
$S T Y M A A S G L Q P T T N E E \square V N P K T Q E S F V I V L V E Y A F A L M S T$ AMEHQERWQHLSDLV EYGDAMKEA
ACRSAl QMKKKELEL
$K A Q D M D P E G A F Y S P L G K L$
A $\square A C G V M L Q R L V S R L N R \square R V A A G Q L P V R F R$
QIA DMSLALLDAVIH

GGLHGSSDHPERMDKFAMSTFQVINDFNSG
A L RMVET
A L K K M M E L
 VEMGLDMDD T

V C D M A $\square \mathrm{DMVDA} \mathrm{\square TD} \mathrm{\square KDPS}$



R｜V｜GVTGTVLICGTLGMRRFFD｜VWSND
LTNDEDHKESVNMRVGVHTGKVI CGLVVGRRFKFDVWSND $L T N I N N Q S F N N F M L R I G M N K G G V L A G V I G R K P H Y D I W G N T$
$Q G I V G S E G R P P V Q F R C G I H Q G T A V V G M F G S A E R S D Y I G P S$ NLSRKERKYEPI RTGTGLHTGTLMLGT\GEEERMDVISDA VRDVSAAENLDLNVRIGMASGPMMAGVIGNKFSYDVWGDP DNK RTSVQFRCGDHQGTAVVGMFGSAERADYIGPS


VVATRRVLYKGLRVGM NAADHTYPPVAIGIGLNTGACCVGNLGSERRFDVSVIGPV ARLLEENPEHGLHVGI GVAS GEVVMGAMGARARMDFAVD T H Q GQP I R MRIIGLHTGSVLAGVVGVKMPYCMFGHN A DAVSDEFTGTLSVGIGLNSGPVVAGNVGGRLEFSVIGDA RPEARALGDGRTRIGLETGPVII GDVGGKRKLDYTAHGMA DFEVPHRRNYRDTI RLGGAS GAVAAGVVGNSPRYCLLFGDT
 IASVVEATEVDLNMRVGLHTGRVLCGVLGRKWQYDVWSND L R EIVNKHSMNNFQLRVVGIMAHGPVVAGVVGTKPQYDIVGMT
 $\square K L V R E M T R V N V N M R V G U H S G R A H C G V L G K K W Q F D V W S D D$ ERNFGIQVHIGINTGRVAAGNIGSPKLIQYATIGDT NTELAA E GLAP L E I GIG IV S GEVVLA GYVGSRKRRDFIGDP $N G P D G E L L F R G I S V R M G I Y T G L P D C E P D P L T G R M D Y F G P V$



GKHGDKMRV花，
GINTGSVVAGVI GIDKKFYDLWGDT
TY $\quad$ L H H S Y K LR R R I G H Y GRVMA GVI GHKP Q F SL $\square G D T$
 H A GP LAA GVI G $\square R P R Y C L$ F G D T $G D T D D R V L Y K G L R V R M G V H F G S A R V V R D P M T R R V E Y I G P V$




 $N Q G R G G E K K P I I D Q G C G L N Y G P V I A G G Q G Q R D E Y T V I G B A$ GF D GL DMRIGIV T G RV I A G I L G T E I R Y DVVY GA D








## 


 L F A EN NQPAI KI G $\square G L S T G D M N V G D M G S V Y R K A Y T V L G D T$ IT S VA EATEVNLNMRVGLHTGRVLCGVLGRKWQYDVVSND




K F TVR H M P GRR LK L R N $\square$ T S R K P VE K QI N I R I NAGRERAGYAPVNI GI


|  |  |
| :---: | :---: |
| UniRef90 K9JoG4 UniRef90- H2KPM | V |
| UniRef90-L5KRF9 | $V N V A S R M E S T G V M G N I Q V V E D T Q A$ |
| UniRet90-K9W3B0 | VNIAARLQVAAEPNSILVSAVVADYLEDE |
| UniRefofo-ToG8N0 |  |
| UniRef90 NoB6B1 | VNMASRLEQSSEVGR TICPTCHAAL |
|  | VNVAARLGAAALPGT LVSASVAD |
| UniRef90 UPIO00175830D | VKIANRMEATGIIAGRVGISDAT的ALTKEFRVEAA |
| UniRef90-F4WC | VNVASRMDSCGEMGK |
|  | TLANKMEA |
| UniRef90-L8FJI8 | VNVAARVEQLTKGDA L L TRDCVEALACRPPG |
| UniRef90-M4ARR6 | NFASRLEALNKGS |
| H5YMM |  |
|  |  |
| UniRef90 ${ }^{\text {FozZIZ3 }}$ | I NTSSRMASHSVIGK |
| UniRef90-009BE7 | $V \mathrm{GAPLLV} \mathrm{S}$ |
| UniRef90-H2UR | ASRMDSTGVPDYILV TTDLYHVLDGNGYKLDCRG |
| UniRef90-K5C2E3 | VNTASRVEGLCKGLKKNLLLTENTSILLPENURSKLKPEG |
| UniRef90-M3ZO93 | VNVASRMESTGVMGNIVVVEDCYNILKGERYGFRFVRRG |
| UniRef90-G3VZA2 | VNVSSRMDSTGIPDRI QVTTDLYQVLAAK GYQLECRG |
| UniRef90-UP1000255: | VNLAARLEGVNKTNG |
| UniRef90 M3HLU2 | VNLAARLEAAGKDYGV SIULVSESVQREDKEEFFTRLL |
| UniRef90-L8H5M2 | VNAAARITAMTHGGQVMSHAAHHKLDAPDSDGARV |
| UniRef90-UPIO00476B3F1 | VNVASRLEGQTKAYGil IVGEQTARAVP |
| UniRef90-05LVX3 | VNLSARLCSKAAADQVLIDRETR |
| UniRet90-D1ZZC5 |  |
| UniRef90 ${ }^{\text {O }}$ - 8 EME3 | INTAARLEAANKEDGTTICTGPMAAARGAPG DFVETP |
| K7GX34 | $V N T A S \square M E S T G E G G R \square Q \\| T E!S$ |
| UniRef90-10XA51 | VNIAARLESANKAYG SKAIITEAVFEKLQGSFDC |
| UniRef90 UPIOOO3B6S | VNLASRMESYGMPGRIQISQSTFEALG |
| UniRef90-H3CLT8 |  |
| UniRet90-_5RHR2 | VNLASRMDSTGVSGR QVPEATRN |
| UniRef90-E9HP |  |
| UniRef90-H91 | MSIASRLEQLAPLNGILVSQSAKEQCEN DFYFGPAR |
| AOAO16SK01 | MESGGLPGR |
| UniRef90 - Plooo36E88 |  |
| UniRef90- 9 ca |  |
| UniRef90-H91 |  |
|  | VNIASRLESLTK ElKRPVLLSRAFVERAGCAAQ |
| UniRef90-F5UG71 |  |
| UniRef90 O238W6 | I NTTSRUMSTGEDNRMT\SSQAYAKIQTHNDSNYR |
| UniRef90-K7H476 | VNFASRMQSNCPPNQ\QTSEDTAKLLF ETHEYKLVKRG |
| UniRef90_-24RZ92 |  |
| UniRef90-L8GDF5 | VNTAARITAMTHGGQ VLSHAVHARLHLLDEQPAARLVAMG |
| UniRef90-NWH25 | VNLASR |
| UniRef90 U6GCV1 | VNMASRLEAATKOYGVTILSSSLYDLMSPQTQTYCROL |
| UniRef90 TOFGN8 | VNTASR1 |
| UniRef90-F6ADQ0 | VNTTSRLESLNGGQVGTLLCVSAADREHCPEVPM |
| UP1000454 |  |
|  | S RVEALIKPTDILITQN LLDHVPDITFNVEKMQ |
| UniRef90 A0CF34 | VMLSNKMESNGEKGRVQVSEETKQLLESQYPESFNFIHNK |
| UniRef90-UPI0002658E43 | $V N V A S R M E S T G K A G Y I Q V V S E T K D I L C E T F G F E F E Q R G$ |
| UniRef90-UP10003451A7A | VNVASRDEGLTKQYNILI TESVVNSLGNPEDFS |
| UniRef90-UPIO00150A4D4 | $\checkmark V$ ANKMESNGESGRVMI SEATYNLVNDGYQQEY |
| UniRef90_K8GT52 | SRLIE SFDK CR |
|  | NVASRMESTGVSGM QVPESTS CULVERGFLRQLRG |
| UniRef90 K1S3V |  |
| UniRef90 AOBNX5 UniR | VNIANKMESNGVKGFVHS |
| UniRet90-UPIOOO362C938 |  |
| UniRef90-UP1000180C823 | VNTASRMDSTGVQGRVQLSNDSKNAL ADHY |
| UniRef90-UP100037E0D20 | VNLGAYLERVSKGCDITISDT Y M P PCADRVWARE |
| UniRef90-UPIO003728C7D | VNLASRLEGLTKGCPLLVSGDMHARLP |
| UniRet90_V616L5 |  |
| UniRef90- B4VIF3 |  |
| UniRef90-V8PDM9 | $V N V A S R M E S T V M G N I Q V V E E T H$ FILLKEYGFRFVRRG |
| UniRef90-T2M187 | VTIATHMESGGLPGRI |
| UniRef90-F3BFM0 | VNLGARVESLTKGVAILVTEETMKKCP H H |
| UniRef90-H2U465 | V'LANMMEAGGLPGKVHI TRSTLLECLNGDY |
| UniRef90-V4H6P5 | VNLGSRLEGLTKGVGVLISEMTHELCPN Y |
| UniRef90_B3RIR3 | VNVASRMESTGKVGKVQVVEDTKDI |
| UniRef90-F5Y8T2 | $V$ NLAARLEGVNKTGGILISDFTRNQUGDE |
| UniRef90-H1G348 |  |
| UniRet90_R7TKD3 |  |
| UniRef90-D2 | INTASRMESTSLPGRIDQSRKTYERV |
| UniRef90 D5CTY7 | V NLTTARLLEEATKTYHAPL |
| UniRef90-G6DDS 1 | VTLANKFESGSEPLKIVNVSPTTYEWLTKFPGFEMEPRDR |
| UniRef90-UPIO003D0A8F8 | VTLASKFESGSHPRRINVSP |
| nRef90_T1GK12 | R M E S T S T A M Klv/HUS E S T K N LV |

PTFVKGKGELLTFFLKGRDKPATFPSVTLPHQVVD
SLNLK G $\square \mathrm{DETVLTFSVDVNP}$
KVIVKGKSKSSQVYEV
LI I Dil K G V


PTYVKGK GTLLTTYFVKTP
S HA VK GK S A P V Q VF GLDR
E VEVRGYEQKVAVFQL
AMRIRGKEQPVSTHRIDGVHA
KVNVKGKAKKVTVYEV
KI QI K GKGLMRTFYLIKT
PLPVAGKPAPVVTF
LVKVKGKGE MTTYFLTSGP
EYELKGRETKES $\quad$ Y
SRESY LA Q HKVVETFLIMPPK
$P \square F V K G K G E L L T Y F L K G R D K Q N G S S V T \square P H Q V V D$ VVKVK
RVVRVVGVNTPLRLYEMLEDREDASPA
VVRVKGKNESVQLYELIG
RARVVGRSTPVDI YE
KFEMPDVPNGARLYELKGLEARFFGGVTND
$R V R V K G K T V P \square S L F A L M G D A S P A F E S L R$
P I ALLKGYAAPVPAFA
GLALK GK T T P VQ DY A
RLKIRGRSEEI EVFE
I EVRGDNKEVNTFWLTGKDEEYF
LLTVKGKSEPI R $\square Y E$ I

E $\square \mathrm{Y}$ IKGVSERVRTYFiST
$L V S V K G K G K L N T Y Y L!$
DCQIK GSQEADTAYPVVGRAQRPYPS
$P \vee N V K G K S E A L Q L Y R L D W Q Q L R S$
TQEIKGRS PLHVW
L I K L K G L K E NVRLILPPS LRARTF
ERNAYLKEHNIKTYL!
SYA LR GLDEPIEVFALSGAK

SI EVKGK GVMRAYLI
EVEAKGKGVMVTYQi FKQNQKY $\square K G T S K K T E D F$
IVVBVGKGEVNCYWLN
RFEMPDAPGGAKLYELKGLEGRFFGGVTKE
S IVQKGREQPVDVYELL

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

STKVK GKE E P QVIY A VLGRK
LI EFKS $\mathrm{D}^{2} \mathrm{R}$ QTHGYFVE
VI AVKGKAEPET $\quad$ Y A AV $\square G R E$
LVTVK K K GQLMTYYLI


SIVVKG $\square$ S EK $\square R T F F V S S R E E R S$
CVKMKGKPEPMECYFMT
TIDLKTIKRQ\EGFLVHKDEQDHFP
E QHVKNIKAKINVYRVRASDQQPPRVTR
DFKVKGKEKPLKLYKIK
EKLVKGKGKMQTYLLVRDDEGSRV
LI GVKGKHHPVAIYQLVADRSEEIP
RVTVKGRHEAVELFQPMLVTETDGTELTEQVERFN
$P \square K V K G K Q S L Q T U Y A V L G$
DPYIK EQNITTYLIKATEQPRRA
KVKVKGKSELVTVYEVFDAD LPEDKAAKL
HIFVKGKGDLL TYFMKGREKQD
K VQVVGKTAADQLFE
$K$ VKVKGKNDAVTDFEPDALKSE
KI PVKGKGE LTTYFVQELP
LVSVKGKGQLM TYFLEG
RVVVVGKKDPV
YLSLRGKEAPVHTCVVEDVGEPHRP
S I AVK GK GILQTYLLD
R I RVK GK S Q PLS DYE I
$R V E V K G K G D M Q S Y L L S A$


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|  |  |
| UniRef90 ${ }^{\text {a }}$ | LFARFDKLASENHCLRIKILGDCYYCVSGDPEPRADHAHC |
|  | RDVDPTIAVHNGRIVKRTGDGSLIEFRSVVDAVRCAVE |
| iRef90-X | LRDLINPTIAVHNGRVVKLMGDGTLVEFRSVVDAVRCAI E |
| UniRef90-G9AEL |  |
| UniRef90-K9WBZ7 | YLHQVCPIIRQHNGFIDKYIGDAIMADFPETVDDADMA |
| UniRef90-Q2G501 | YLDRLSAVVLQYGGTLDKFVGDAVVAFWGAP |
| UniRef90-UPI0004 | NECMRIK\LGDCYYCVSGLPESLPNHAKN |
|  | R |
|  | YVGGMTEUVFTHEGTVAK\IGDALQVLFNAPGDQPDYATR |
| UniRef90-SOFVI | VFSSFVDPI HRSHGEI NETSGDGFMIIFKDHEPKTNAMNA |
| UniRef90-UP1000348 |  |
| UniRef90 UPIO0019 | KINNCEKISTLGDCYYCVAGCPEESVYHADS |
|  |  |
| 2v |  |
| UniRef90-UF |  |
| UniRef90-L8H9 | 佰 |
| D3BFN2 |  |
|  |  |
| E3FWL3 |  |
| Ree90-T1KRW | G |
| UniRef90-K8R | GTMTEVIRAHRGTLDKYIGOADMGFWGAPVDDPDHARN |
| UniRefo-WPIOCO258 | VFSCFDSLMDEFNVYKVETVGRVYMAASGAPDRTE H HAQN |
| UniRef90-K95975 |  |
| UniRef90-K9FJTO | N |
|  | MEPAUAQENGFUDKY GDAUMALFELSDTNSNLAKN |
| Ref90-F 1 QH15 |  |
| UniRef90 AONC | VISDFDALLEFQDIIKIKTUGSTYMAASGLTVRADCA |
| UniRe UniRe | A |
| UniRef90-J3C |  |
| UniRet90 AoDNU5 |  |
| B4VC36 |  |
| OG | GGELKF GDGLLAIFPLHEP |
| N1W1U4 | AI FQYKGSLDKFIGDAVMATFGTPSASETEGED |
| 14 B | GDGLLAVFGHPEAHEDDAHR |
| Ref90-UP100030E726C | ALLAFWNAPLDDADHPRK |
| UniRe | D A VMAFWNAPVPDPGHAAA |
| UniRef90-G9AIG5 | DSVEALFPGSVQGVQAADD |
|  |  |
|  | ( |
| A3z3 |  |
|  |  |
| UniRef90 UP10004790 | Y/GDSDMAFWGPPFVGEDEHAL |
| UniRef90-K4DN73 | HHRLIRSLI AKYRCYEVKTI GDAFMIACRSAFAAVQLVRE |
| 1LVR1 |  |
|  |  |
|  |  |
| G9A8T2 | YRELVDPTIEEFHGRIIKLMGDGALVEFASVVDAVHCAA |
|  |  |
| ${ }^{\text {JCHW7 }}$ | A VGQAVERAGGRLDKF GDGAMALFGLQGSSEDASRQ |
|  |  |
| M6MGD3 | - |
|  |  |
| UniRef90 M9WQ03 |  |
|  | RVGPIIRHNNGFIDKFI GDA |
| UniRef90-F4LJD1 | HYDRADHSIHEQNGII GSII GDAVLA |
| UniRee90-K5D6J7 | NMCEIAKKYGGTKDKFI GDSVMAFGGVPNVNRTNVVD |
| Uni |  |
|  |  |
| 90-UP100036360CC | F |
| A3Y | YFEVMAEAVLAEQGLLDKF GDSVMAEFGVPRSRGD |
| 32x81 | GSTYMAASGLTEKTCDLDSK |
| 7ETR5 | YLGDGLMATFGTPLAGPHDATN |
| UniReef90 A0L6N6 | R |
| UPIO003F76745 | A |
|  |  |
|  | - |
| UniRef90- I4B827 |  |
| UniRef90-UPIO0046722E8 | YLTPMTDAI LDSEGTIDKYVGDAIVAFWNAPLDVADHPRK |
|  | YLDAMLATVFKHEGTLDRIVGDAVAVLFSAPVQQADHRQR |
|  |  |
| UniRef90 G4T4× | HNELLRRQLLN\\|GGYLLVKTEGDAFMCSFPTVASALLWCLT |
| Ref90_ToRUU9 | A |
| UniRe990 R8ZVB3 | ${ }_{\Delta}^{K}$ |
| ef90_B4VNLO |  |
| f90-B1 |  |
|  |  |
| UniRef90-B6A3Z7 |  |
| (1) | NKAVNDAVDAHAGVRPOGEGDSFVAAFSRASDAVACATA |
|  |  |



## UniRef90 K9VCN3

UniRef90-F5UKR2
UniRef90_UPIO00443C574 UniRef90-Q4RVX9
UniRef90_KOVF98
UniRef90-X5Y8Z0
UniRef90 G9AEU5
UniRef90-K9WBZ7
UniRef90-Q2G5Q1
UniRef90-UPIOOO440A477 UniRef90-O89HD9 UniRef90_UPI0004044237 UniRef90-SOFVB4 UniRef90_UPI0003482F2E UniRef90-UPI000192771D UniRef90-K2LT07
UniRef90-H4F7R5
UniRef90-D2VSW1 UniRef90-UPIO0037D2C1F UniRef90-L8H920
UniReffolod 3 BFN2 2
UniRef90-F4NXY1 UniRef90-E3FWL3 UniRef90-T1KRW1 UniRef90-K8R2J3 UniRef90-UP1000258ECBD UniRef90-K95975 UniRef90-K9FJT0 UniRef90-K9SEL4 UniRef90-F1QH15 UniRef90-AONC47 UniRef90_UPI0003A8851B UniRef90-A0A044ROP6 UniRefolo J3CN72 UniRef90-B4VC36 UniRef90-IOGDV3 UniRef90-N1W1U4 UniRef90_M1HLN3 UniRef90-14BK90 UniRef90-UPIO0030E726C UniRef90_W6VAL1 UniRet90_V5SC54 UniRef90-G9AIG5 UniReffo-X1RBF6 6 UniRef90-A3Z3F8 UniRef90-B8ZT28 UniRef90-A0A016U4K9 UniRef90-UPIO004790845 UniRef90-K4DN73 UniRef90-U1LVR1 UniRef90-K9SY70 UniRef90-R7UUW8 UniRef90-G9A8T2
UniRef90 A0CKZ UniRef90-J3CHW7 UniRef90-A0E1Q2 UniRef90-M6MGD3 UniRef90-A7RUA8 UniRef90-M9WQ03 UniRef90-BOSFI4
UniRef90-F4LJD1 UniRef90-K5D6J7 UniRef90_UPIO0036182EF UniRef90-UPI00047E37FB UniRef90 Q7T6Y2 UniRef90-UPIooo36360CC UniRef90-A3YU70
UniRef90_C3ZX81 UniRef90_17ETR5 UniRef90-AOL6N6 UniRef90_UPlooo3F76745 UniRef90-Q1N5D6 UniRef90-UP1000364CC8D UniRef90-K6DX59 UniRef90-14BB27 UniRef90_UPIO0046722E8 UniRef90-Q12FL5 UniRef90-G4T4X8 UniRef90-TORUU9 UniRef90-R8ZVB3 UniRef90-B4VNLO UniRef90-B1MLW8
UniRef90-Q2K042 UniRef90-B6A3Z7 UniRef90-UPI0003B3B6F4 UniRef90_D5PFJ5
UniRef90_АОАОЗ4WT81


140


160 NWLTRGLPAAKMRVG\|FTGPVMVGSLGGTTRLEYGVIGDS LDEINYQSYNDFVLRVGDNVGPVVAGVIGRRPQYDIWGNT ISLVREVTGVNVNMRVGI HSGRVHCGVLGRKWQFDVWSND QPEHRIEFRVGIHLGDVVEESDG DLMGDG EARAAGRQPKMLRGGGGNTGEVVGNMGSARRFDYSGDA NESLQNRGCLPISUGIGI HSGSMMLG\|IGERLSSTVIADA RKSVPEGVPKIGRTRVGLHYGEAVVGNFGGRIQYTALGDA
KKVRDATSVDINMRVGVHSGNVLCGVIGQKWQYDVWSHD NAEFAAEGLTPFVTRFGIHVGEAVVGNVGERMNYTALGNT $R Q K A R G V N F G T T R U G I H A G P A L V G N F G G N R F F D Y T A Y G D T$
$S D D G P M T V N M G T S S G T A L V G M T F K G M L D T R M T F A S G S V$
$S M$ SDIGPMTVNMGDSGTALVGMTMFKGMLDTRMTFTASGSV DKSFRKKTGEEVDMRVGI HTGNVLCGIVGNRRRFDVWSND KTRQFDGLSI HCRCGVNTGRMI AGNVGARLSFTVHGDA KRERFAGEPLRLRMGUHSGPVVAGVIGKRRFYDLWGET
 GDTDDRVLFKGLRVRMGVHVGTPRAVRDPITRRVEYIGPV QLCDEKGMHVKLRVGIHTGSVVGGVMGWKFKYDIWSQD SAEVAPRLGRPLHLHTGLTTGTVLVRPSDDRDGYSVTGDT DKSVREETKSCVDMRVGIHTGGVLAGVLGQKWQFDVYSRD EFEAEGKTHDDLKMGGINTGDIVVGNMGSDLRFDYSCDS
 NQEFTAQGLPTVRFGGGLHGALVAGTVGSRHRANYFGDT NQTRAQKNKPPIADGIGINTGLLMLGTVGGKERMDVISDA EMSETVNMRVGVHTGTVLCGILGMRFKFDVWSND
 EQSFNHFVLKMGVNHGPI TAGVIGRKPHYDI WGNT RSIIDPDTEKPLQLRFGGNSGPIVAGVDGKKMPYCLEGDT RAMPAPCDLRDGI ATGEVLTGSIGSMMSFTVMGDA VQGRKYGKGNQ EMKIGIHVGRVIAGVIGHHPQFSLDGDP NVRLLEQGVGVRLEMRI GLNTGQAVTGSALLRQAM VSGEV
 SEQAKRRFGVGUABRGVHRGLV GMGDIERDDIFGMA EAEGRPHKEAAMGLGLHLGPASVGNMGSIRRFDYS:LGDN A AEGLPHTPDRGGUGLNYGACCVGNVGSPERFDYSVLGDA
 NRDLQARGAWPLKLRGGHSGLVLTGSLGSRSRDEY円GDT AAEVGDRDGVDLQLRVGLNSGQVIVGEVGSAGYTAVGVQ KYEMKHRKDMKLQVKIGUNGAVASGELGSSPRFCLFGDT DAAVYRQYWNGLRVRVGVHTGLC
DARIVPHPAERINIRIGIHTGPVVAGVVGLTMPYCLFGDT NQTWMQRGLPPTVTGI GI NTGVVIAGSLGSKERLEYIGDV DGMVREATDMDLGLRVGVHSGSVLCGVIGKKWQYDVWSDD DQEVSDTRRDQFRLGVNLGDVIVDAGVIGHKPGDDLYGDGA VKTMKYGDNQDVQLKMVIHYGRVDAGVIGHKPQFSLIGDT KHEGLNARTKDYSVRMGFHLGWGIEGADGSSFKIDYLSPN NADRDCQGYKPDETGDALHKGPVMLGTIGNRMEVTVISDT RKDAGEHGCNHAHDRLRLNDGPVVAGVI GRKPQYDIWGNT DFRDEHDPDTRLEFRMAIHTGPCVAGIVGKKPRYDIFGET SQTQKSHDGKAVEMRMGVHSGSVLAGVVGTKMPYCLEGNN NHHRANCGYDPIEVGGGHTGNLTLGLLGEHKRMEVISDA KEVHSLRGRDFWEVRLGMHLGPLVAGVVGTKFVYDVWGDT EPADRRTALRAGVHSGVCSVGNFGSDQRLDYVGRA FDRTDQLIERGLRVRMALHCGSVIKISQDPMTRKYQYSGST NADRAARGERRVEFRVGLYAGEMLAGNMGDRMQFTVVGET NRERAARNRPPLRHGUGLHVGEVIAGNLGQRLEFTVVGAS NAERRRYGEAETHVGGVHFGETVLGNIGNRLEYAVIGNA ARQAQPGWGVR GVHTGRVVVGNFGGSKLLDYRGDP NAQRKEQGKPVIGIRIGVHCGEVMAGTIGDHEHFSISGDT ETDLGLPAGT AARVGVHTGEVVVTWAADGSWR LSGDV QPVEAGRSPVR GMGINTGNGMLGTVGGSNRMDGTADGDA EAQGHPHRPAAMGIGVNLGPCSVGNMGSTRRFDYS LLGDD AARGQAQGQPAGHTRGGSHSGEVIVGNFGGKTVFDYRGGDP DSDGTVLARGLSVRMGLHWGAPLCEPDFITHRMDYFGPM VAKCKASSGNGURIR GLHSGRVISGLVGMKQQFSLFGDT TLRHRTGTHMDARIGLNSGPAKVGFMGTDALASYTMMGDT RLRHRIGIDHLGEVFFLQNDFGVSPSRNFINTYQDDVMGNV

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


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| :---: | :---: |
| UniRef90_K9VCN3 |  |
| UniRef90-F5UKR2 | LL P L K GREQKVNVYRILGGRK |
| UniRef90_UPI000443C574 | RVSVK G K GE M L T Y F LEGRTDGS GSQTR |
| UniRef90_Q4RVX9 | NAYLK E H N I ETG LVLG |
| UniRef90_K0VF98 | P \ H L K N I A E P M R VY SL |
| UniRef90-X5Y8Z0 | EKELLK NIA R P VRR TYRLR |
| UniRef90-G9AEU5 |  |
| UniRef90_K9WBZ7 | R V Q V R G K Q S F V A V F E I |
| UniRef90-Q2G5Q1 | TV T L R G R R T PVEI F E |
| UniRef90_UPI000440A477 | DAYLK E H GVVTY LVINPKAERRSP |
| UniRef90-Q89HD9 | AVIAK G M K E T R If ELLVGA S A |
| UniRef90_UPI0004044237 | $D L M L R G R S E P L R A F E P L R Q T E F E A P A T A Q Y S E A F$ |
| UniRef90_S0FVB4 | $K A K M K G \square F E P I Q V Y S$ L |
| UniRef90_UPI0003482F2E | VRVK G K S E Q V SVFEVVF D A D A P E LK A S K L K K R |
| UniRef90-UPI000192771D |  |
| UniRef90-K2LT07 | Q $\square$ Q $\quad$ R G R H T E T L I Y |
| UniRef90_H4F7R5 | E TEL R G T GRVRMWRLS A |
| UniRef90_D2VSW1 | K 1 EVVK G K G |
| UniRef90_UPI00037D2C1F | $R \vee R V K$ G K R E A V A T Y E |
| UniRef90-L8H920 | RFEMPDSPNGSKLFELLKGLEARFFGGV |
| UniRef90-D3BFN2 | $\square V \mathrm{~V}$ VGK GKMKTWFLLHKKDCANASAKKE |
| UniRef90_F4NXY1 | TVVVLGRE $\quad$ IS T Y HI TA M R E E S S S A |
| UniRef90-E3FWL3 | PLDLLKGKARRVPAYRVLGPAARTSFEVSQRR |
| UniRef90 T1KRW1 |  |
| UniRef90-K8R2J3 | $R$ VR\VK G R V $A P \ A \ V E$ |
| UniRef90-W6K8B9 | LI KVVK G K K E A V R V F T C $\square$ G F E S Q N F K D LK E T H D |
| UniRef90_UPI000258ECBD | $L$ I WVK GK G N METYWLS S K E |
| UniRef90_K9S975 | PQRVK G Q P Q P $\square$ A VY CLLP A P Q G |
| UniRef90-K9FJT0 | Q I QL R G R T A Q T T V Y T L |
| UniRef90-K9SEL4 | $V \mathrm{R} V \mathrm{R}$ G K N R P V A L Y E V |
| UniRef90-F1QH15 | GHQLK GK T H |
| UniRef90-A0NC47 | LVAVVK G K G Q L M T Y Y LQ G K VP R P T |
| UniRef90_UPI0003A8851B | K Q ELK N $\quad$ A R PVGVY AL |
| UniRef90-A0A044R0P6 | K M K I K K K GAMETYFLK S |
| UniRef90_J3CN72 |  |
| UniRef90-A0DNU5 | QKEAKGL G I I T TYQV |
| UniRef90-B4VC36 | PLLLKGKS D RVA A H R L L G LDEEEPEALRRR |
| UniRef90_IOGDV3 | K HEVVR GFS DPI E L F A |
| UniRef90-N1W1U4 | S V T L P GREQKI NL Y A |
| UniRef90-M1HLN3 | K I K V K G K E ELI TIIF |
| UniRef90-14BK90 | $P \vee S V K G V A T P I A H H L V L G$ |
| UniRef90-UPIO0030E726C | R I IVVGR S EPTHVFALA A D |
| UniRef90-W6VAL1 | $N V F V K G K G E \quad M R T H L L E P P D R A F$ |
| UniRef90_V5SC54 | QL S GKDRPERLFALAGDE |
| UniRef90_G9AIG5 | F HRLK K L R Y PEAL F DLVVP |
| UniRef90-X1RBF6 | KLKI K GKK DLVLA Y T L K GEK K R |
| UniRef90-C5BKV4 | V L P L K N I Q S K R G Y L R P L |
| UniRef90-A3Z3F8 | EVVHVK G R T E P L R VF E |
| UniRef90_B8ZT28 | $T V R 1 K K G A E D A V P A R R L L R V A E P R Q P$ |
| UniRef90_A0A016U4K9 | LVEVKGK GPTCTYWLTG |
| UniRef90_UPI0004790845 |  |
| UniRef90-K4DN73 |  |
| UniRef90_U1LVR1 |  |
| UniRef90_K9SY70 | N $\square$ A L K G R T S E T A $\square \mathrm{H}$ R V |
| UniRef90_R7UUW8 |  |
| UniRef90-G9A8T2 |  |
| UniRef90-A0CKZ5 | VA AK GK GMI E TYKL |
| UniRef90-J3CHW7 | EI TVVRGRAEPLRTYVVTQEMSAHF |
| UniRef90-A0E1Q2 |  |
| UniRef90_M6MGD3 | RTFVVRGKKEDLS ILEFCDTES |
| UniRef90_G3N8G7 | LVTVVK G K G E M M T Y F LT G GP P S |
| UniRef90-A7RUA8 | E ML I K |
| UniRef90-M9WQ03 |  |
| UniRef90-B0SFI4 | $R$ VNDK G K T E S VF V Vev |
| UniRef90-F4LJD1 | TVVQVK G K T E G K K I F |
| UniRef90-K5D6J7 | CVV M K G E T D IP L Y V VK G F LP EFA D G L K VP N D LF |
| UniRef90_UPI00036182EF |  |
| UniRef90_UPI00047E37FB | $E$ QRLKK NI A E P V RVV RII E T A |
| UniRef90-Q7T6Y2 | K $\square \mathrm{D}$ D P D YP S K M T L Y E I K I L K N R F F G G $\square$ T |
| UniRef90_UPI00036360CC | QHRLH G L R P PVDVVRVS |
| UniRef90_A3YU70 | A HLLKK G W P P L EVLAL Q G L R S P |
| UniRef90-C3ZX81 |  |
| UniRef90_17ETR5 | GCELR G L T L P M T L WVL |
| UniRef90-A0L6N6 | A LILLK GK S Q P LEV F EPLS QES Y D S P |
| UniRef90_UPI0003F76745 | F Y ELKK GK GPL ELVECE G I D |
| UniRef90-Q1N5D6 | E I LVK K K K A PV T A Y QVS HL |
| UniRef90_UPI000364CC8D | $E \vee A L K G K A E R V A A Y R V A G$ |
| UniRef90_K6DX59 | $V \mathrm{~K} V \mathrm{~K}$ GKS T F V S VFEI F ENDPPEDK A L K L |
| UniRef90-14BB27 |  |
| UniRef90_UPI00046722E8 | AA V A GRRAPTEIFALA G DAGAAFGDWRSEHD |
| UniRef90-Q12FL5 | QLVLK GKSKPLLVFE |
| UniRef90_V4AY67 | $D V L V K G V L K P Q \\| K K Q L S V L K N R N A P$ |
| UniRef90-G4T4X8 | ERKLKGIJEAPEAL |
| UniRef90-T0RUU9 | TVEAK G K G Q MKTFLL |
| UniRef90-R8ZVB3 |  |
| UniRef90_B4VNL0 | ERLL K N $\square$ P R P I P V Y 1 I T |
| UniRef90-B1MLW8 | T V T L R G R T EPTEL |
| UniRef90-Q2K042 | E I SVRRGRALLPLKV Y |
| UniRef90_B6A3Z7 | E I S V R G R A L P L K V Y |
| UniRef90_UPI0003B3B6F4 | T I GLK GKS SRTRLEAVVGDESAEFGELRRQ |
| UniRef90_D5PFJ5 | $S$ YPLRDLPRPERVVQLCHPDANEFPPLR |


UniRef90 B2HF62 UniRef90-UPIO0046F6C4C UniRef90_U1HM97 UniRef90-X6DNY0 UniRef90_UPI0004415A87 UniRef90_Q1YER4 UniRef90_UPI000424735F UniRef90- 14 BIL7 UniRef90_FOV9H2 UniRef90-R7UZ22 UniRef90-XOUEL2 UniRef90_UPI0003605798 UniRef90_UPI0003F0DC01
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 LREVVEPTI SKHHGNIFKDMGDGLLAEFVSVVEAVECAVS
 YRELIDDPAI REFRGRMVK LMMGDGALVEFASVVDAVQCAAA $H N N L L R R L L R T S G G Y E V K T E G D A F V V S F Q N V L S A V H W C L E$



 YF D RMNSAISRRHGGNVEKFDGDEDMAVFGEPVRREDDALR






 HNKLFYKQVEKHGGHVVKTQGDGFMIAFAAADEAVRCSLDD $F F R \| V V A E V D Q R D G L V N K F Q G D A A L A V F G A P D R I A D P A G A$ LD K AV S GVV A A H DGPVVEQGEGGSFVVLAFACASDAVAAADD

 YF S H M DE I Q THQGIIVDFYGD A MVF F

## 


 WRE IIFDPFVEDYHGRIV K L M G D GA IV E F G S
LF GS F D E A S E R H NV L R I K F L G D C Y Y C V YFETMVSAFHAHGAEVVKFMGBAVLDA I FRI
FF V E M I D I I L R N N GY L D K F I G D A L MVV V G i P PA K S E D N E T VI S D F D A I L D Q K D I I K I K T I G S T Y M A A S GI T D S E E S E
 YFA QV G DI I ERNGGF $\square$ DNF $\square G D G L M A I F G D D D Q R D A P L R A$ VFD QF D SVI K H HVA Y K V E T T G E TYMMVAS GV P E EN D
$V$ VERSAAMARRYGGTVVEYNGS GMMALDG AP DA LIED HAFR


 Y A E IV VS E L V S S H G G R V F N T A G D A L M A E F S S P V V A



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

 F LT PMTBALLKRGATDDKYMGDAIMAFWNAPLDTPDHRTK
 $W F D R I A G A V H A F G G E V L K F I G D G V L A D F$ $A \square A A M R G A V R Q F G G \square V S K E L G D G L A A V F G A P \square A D D N B A P D$





 Y LS EME ELVVYKTA GFVDKYMGDA LLA LDFADYNDRAAEK


 I I A DF DELLCE ERFQKIKTVGSTYMAA

 FFRDIVVDVVNHGGFVNKFQGDAALADFGAPDEHPDAS GA




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UniRef90-G6DAJ
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UniRef90 J9K961
UniRef90-UPIOOO372DBF4
UniRefoo-V5HEM1
UniRef90_V5HEM1
 NADLSADHPIRVRI GINLDGEVIIEGN DRFGEG
 DQGTSDPHRDRFRIGVNLGDVIVVEENDIYGDG RDVNGTVIVRGDSVRMGIHRGAPVCEPDPDTKRMDYFGGV AESFEAAFSVRPQMRVGVSSGQVVMSVEGETGPLTVVGNC
 $\square T E V R E R L C D P N N M R G G L H Y G C V G G V I G R R D R Y D L W G M D$
 NSELEASWGVQLAHRVGI NTGEVITGDDRQGQRF LTGEA


 I K KVRSVQFEELEMRI GVHTGSYIGGVIGTRDRYDIYGPD LPEATA GIGVTAGTVVAGTVGDIRRHEYTVIGDP
 DTAGGVGSADRFEYTVIGTP DTQAGGGEPVR GIGIHTGQLMLGTIGENQRMDSTVISDT (1QHFNQTQHLPLITRFGLACGEISVGHTGGRYVYRAIGDP $\square G V E L R R \square P \square D \square G / G V A G P G F A G R R G D$

[^1]
 VKNFSAKDGDQIFIRAGLASGPTVAGVVGSMPRYCFFGDT NATFAEQDREPLRIGDGIHAGPAVLGRVGVAMGGHTEGDT NRKWNFEKKPLLNTRI GI HCGEAIVGNMGWRMDYSVLGDN



 QA DVAS G R LLLRMG NLGDVVDGDGNKWQYDLGGG RARVQRESGVDVNMRDGVHSGKIISGQLGNKWQYDVWSRD NASRREQGLTPYEFGASLHVGDVMYGNI GASDRLDFIGPA $G N E K D E D T D G I H F G K V V A G N V G E R K E Y Y D I G B N$【S S $\square$ NEQSFNHFVLKMGI NHGPVTAGVI GRKPHYDI WGNT
 KPFFASMYG $\square \mathrm{DFDIR} \mathrm{\| GLHYGEAVIGGFGGNQRDTAVGNV}$ HDPKY IVSCGFDRI RTGFHMGPIAAGVIGIKPRYCLFGDT A A EVARRDDVSLQLRVGLDSGRVIVGEIGSADGYRATGQH



 $F Q L R I G L H C G D I I F F D H G D V F G D A$ | $R$ | $G$ | $H$ | $G$ | $G$ | $V$ | $V$ | $V$ | $E$ | $H$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $I$ | $G$ | $H$ | $V$ | $G$ | $D$ | $V$ | $L$ | $L$ |
|  | $E$ | $G A D$ |  |  |  |  |  |  |  |

R
K
PFK
REKSARRGHS
D ${ }^{\prime}$ K L R R KQER $\square R M G K P Y$
 DTAKRGLADGGTRIGVHAGPADVGNFGGVRFFNYTAVGDT
 VEATNP LHLLYYTGDGLSYGHVIEGNMGSSLKMDHTLLGDA
 NQASARPIEIG

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

 $\square K E T R A H T K K N V D M R I G I H T G A V L T G V L G R K F Q F D I I F S T D$ GRLLA GRHRVRTRVGLATGEVIVDPDLMTFDGGYAMVVGSV
 $N R R R R E A G L P E L T A D C V V H F G T V V Y G N V G T E R R L D F D G R A$ E A LVK Q K Y HI E WK A R L GI H S GPV I A GVVGQK LA Y D I WG D T $R K G L S T E W N L E D G \square G I N T G S L I L G T V G S Q R R I D T T V I G D A$


 RRLAE EVTE CEAGVGVVFGATVAGNIGAESRFEYTVIGDP LKNIDNENSYNNFMLRVGVNVGPVVAGVIGRKPQYDIWGNT

 $D E L V T V L G T T E F G I G V S A G R A D A G H I G A L A R F E Y T V I G D P$
 $\square R D L Q F$

PEEERFDVRI GI NTGEVIVDGE


## UniRef90 B2HF62

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UniRef90-UPIO003605798 UniRef90_UPIO003FODC01 UniRef90_G7GXC7 UniRef90-W4GV06 UniRef90-K9EXF9 UniRef90 F6UWM3 UniRef90_Q9U928 UniRef90_UPI000463BF09 UniRef90-A0A016UHQ0 UniRef90_UPI0004667A51 UniRef90-F4LNM3 UniRef90_UPI00037AD5E8 UniRef90-W9ARX6 UniRef90-K5B9L7 UniRef90_D6FXK8 UniRef90-B8CAW2 UniRef90_UPI00036806C7 UniRef90_UPI000225BC57 UniRef90_S0G5U8
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UniRef90_V5HEM1
V



190
KKGAFELQECP HAVHASTlELREDD HAVHKVDVGFASLG IQERRRHGI GMLDEVG EI $V$ E W $\square A$
$\qquad$ A E VNA
 V NMAARMESSGE
VILAA RDA AKAEGEEVVASDVVRQLVAGK GFDFSDRG V SLANNMEAGGRPGRV自UEDSLECLNGDY
VAMAARVAGQAEGEEILVS DDAVLDEDGDSYRVPETR
 $V$ SLAANGMEQHGQPGRVVIVSKETLSELGDEV
VMVANKMESNGEQGKVMVSKTTMNLLLENYGNRYNFNKGN V NEAARLTELAKPGRLLASMTAVGESAPAEASHWKAGE V NEAARLSEHAKPGRVVVADAVLTGAGVDERRY WVDAG V NTASRMESNGKA
VNEAARLTELLAKPGTLASETVLALADPAEQAHWVLGE VNTASRMEQLTKKYETDILLSQNVVAEDREPERYGLREDG


 V N LAA SMERTSKKMK QQVAEI TYYRLLQQDADNDNFQLKKRS






V

V


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## V

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V

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 $V N$ LA A R ME QTCDPSMMVRVTDDVHDLVGDA ET
$V \operatorname{N}$




 DA E E T L E









 $V$ NEAARLTELSKPGRVVASMRAVEQADAAEADRWRGTE







UniRef90 b2HF62 UniRef90-UPIO0046F6C4C UniRefefo-U1HM97 UniRef90- UPIO004415A87 UniRef90-Q1YER4 UniRef90-UPIOO0424735F UniRef90-14BIL7 UniRef90-FOV9H2 UniRef90-R7UZ22 UniRef90-XOUEL2
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UniRef90-L7U118
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UniRef9O_V5HEM

A A A VKGVVEP VVHRTVAARSARGPVVGRDREV
$A Q K V K N D S E P V N A R V T P D P Q R Q S D G R R R$
RLVAVGQTQPVAVFEI TGKKDELTPA
EQRLKNDADPVRAYRLLDDPA
EKKLKGLEVPEVLSLVRALEGRLDYHTRSDSE EHPVKGUSTPQULWHLNAV

dValtrgaedpva
PRALKHGEKFHAF $\square V \square$ S $\square$ AARRFEAPGREREM $\square$
EVTLKGDPGTHAVHADDWAE
DI KANVKTYVVQLEPGHDLPRSDSPRR
PLK KKNDKEPLTVYHINVAGDDTAAAAKS
DVFTKQFhRNDEGYF DS
EVTVRGRNRPTQL
avelrgagrp tLlalvpasrsr
SVTLRGRTAPTRL
FEHIRGKSVSVCIYAVEDA
LFKLKGKAKSVHVFEL
DVELKGLQGRHTVYPVTI EDAAPVR
TEVLRGRTAATEM
THALRDDSRPERVMQLCHPEDRDFPP $\square R \nabla A N D$
EGVDFGDKGLDNAYWVDFAYKRDDDAKAKER
EMSVRGRSEPLTVYA ADDPTVFAGRPKPRD
IVAVKGKKKGIKI YELDADK
PADLKGVDQAMTLHVIEPAKS
KVAVKGKSEMVSVFET
TVNAKGKGN IKTYQV
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AFELKGMPGKMRVFHVPRAPYR
EQHVKNIKRPVRVYRVR
RHPLKGVPHPMRTYTLGSESSRTVAA
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LVFVKGKGQLLTHYLIS
IVITQGKSRPTVVYNV
MRQLRNLIARPEHVFELR
RVRLRGSCERTSLFEV DR पKPECDAE DRQPRE
LVYVKGKGD GKCYLLGRTYR
WLHIKGTDEPVLTRRLLAMGQRD
RQQVKNTEEPIRAYVVGRL
AFPVKGLDDPIDVFA
KHRLRGYKEPIQLYSLKA
EDNIKGK GAMTTYYLTGKK
SFELKNVAHKVELHALTNPP
RKRLKNISAPVPVYRVLPKPRSSLRQL
LLQELKG| PYRVQLYQVLS
EQQLKNIAKPVRAYAVRA
VLHLKGKSQGIEAFE
KVQAKNKG
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KISVKNMGEE
VLYLKGKTEGVSACEDDTQENRT
VAMKGKG
GVD TPVAKKKVEAYF
AHQVKGKQEADEVYTVN
LHRLRGFDDRERLYQLAAPGDERFPPPRT
NVPIKKRGGTMETFELESDKSE
TLGVIGRDQPLTVHTVLGDAA
NVRPLGVKEVVELYELQT
PTFVKGVDE ELELEMAV
RKVLRGFGEPQPVYRVMGASDLSS WRVRRAR
PVAVKGVDGLIGHHHVLGTPLQTPPLIGRDRE

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

KAYIGKRNRPVDMYEVE
ERSMKNDPRPISVFRVDWL
NLKVKGRSKRDSIFEL
EVVLRGRSLPTRL

WEAVHEAALLKRTYWL $\square P H R T G G S \square A S E$
RVTVK GSVRPIGGYTVDA
SVTLKGLSDPISVLRMLA
$T 1$ DVKGKGNMV TFF D DUGETPMPGVK
RQKVKNDEEPIDVYHVR
LVTVKGK GKMETFWVDRKP



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UniRef90-A2FBV8 UniRef90-B6IUR5 UniRef90_E6JDD4 UniRef90_WOICQ9 UniRef90_S4VR00 UniRef90_I4YXC9
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50
60
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80
SRDAMSRLLIGAHGGRVI NTWGDGLIAEFPSVVEAVRAADD HDS I I RKCYADHGGYEITTEGDAFNLAFQHPADAIGGALK
 HNELLRAALLVKHHGYEVRFSGGGGGGKNGNAAVGGGNSGE



 VFA T Y D Q $\square V$ S QY D $\square T K I$ K L I G D D YMA A A G

 YHDRLGMAVFENGGTVDKYLGDGLMATFGTPEPGRQDTRN

 HRELLVDPA I A K N K G R I I K T T G D G M L V E F Q S V T D A V K C A V E RTELLF E P E I A GHHHGRVV K L M G D G L L LA E F G S V V D A V V C A V YF D RVV T SVVLA H G GEVLLKFM G D GVVLAVV D FHVLID K TAV DCGGVI I S F L G D GAMILLF GLPEATP D DAAR FLGI AT DETLKRDGTIDKFMGDAVLAFWNAPLDQPDHRER $F H$ Q I A T T Q I GA Y G G V V EK Y DG D A V MA S FA A F D D L P S P A S N FF DHVVDCVHRNKGII NKFQGDAALAVFGAPDPLDDTAGA

 SRRYDDKTIAEHRGRIANTAGDSVI AVFESATEALTCCSLK YFEAVGEAVLKYKHALDRCVGTAA\|AVFGSPLPLENHAWC



 NFEEVIVVPELLAR GGVVVDKVVGDAVMAVFRDAGHLERALVAB


 II IA DFD DLL S E ERFDKIKTVGGTYMAA




 YF E DM G G AV Q E R G GEVVVKF G DAMLAVFA DPAGGG F F R AVEAVDDSNGGYINKFQGDALLAVFGAPLEVDN


 LRQQIDPAI ATHGGRVVKSMGDGLLVEFPGPTAAVYASLS
 YR D A MARLIE SHDGRIVNTWGDGLI A EFPSVVEAVRAGVD YF GRMCAALDAGGGEVLKFVGDALLGTF







 CF A L F R D L S A E HR GE FVVK S TG D GVLLALVEDSVSDAVN Y A VT
 $\left.\begin{array}{llll|llllllllllllllll|llllllll|lllll}H & D & E & V & V & R & T & A & I & E & T & H & G & G & H & V & V & K & T & Q & G & D & G & F & M & V & V & F & R & H & A & S & D \\ H & V & R & A & A & L & A \\ H & D & K & S & V & R & K & F & V & D & K & H & E & G & H & V & V & K & S & Q & G & D & G & F & M & V & A & F & A & K & P & E & Q\end{array}\right)$

 H N E II R DL DEKY K GYE E R N T G E G F C V DF S D T K N A DIE F A I N


 Y F E A MVS A VA A H G G E V L K F




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UniRef90 V5WEE2
UniRef90-UPI0004657009 UniRef90-A8P4E7 UniRef90_S9QRF2 UniRef90-UPI00037479B5 UniRef90-A2FB45 UniRef90-W5JJIO UniRef90_U4TS98 UniRef90-A2FXW9 UniRef90_UPI000476F9B0 UniRef90-X5ZFI5
UniRef90 S9PIN0
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UniRef90 A2FBV8 UniRef90-B6IUR5 UniRef90-E6JDD4 UniRef90-W0ICQ9 UniRef90_S4VR00 UniRef90_I4YXC9 UniRef90_UPI000470BCF7 UniRef90-A3W4X2 UniRef90_10GCN8 UniRef90_UPIO00365E326 UniRef90-K9F767 UniRef90-13XAL6 UniRef90-HOHPC5 UniRef90-FOLBI4 UniRef90_UPI00046A0098 UniRef90-B5ZUM1 UniRef90_Q72N34 UniRef90-A8QFP0 UniRef90_A6UAW4 UniRef90_UPIO0046507DC UniRef90_W4XR28 UniRef90-D9SF36 UniRef90-FOIXI4 UniRef90-A0A023XBZ2
UniRef90_X6E9K5 UniRef90-D2W392 UniRef90_UPI0003C8012D UniRef90-E6TL29 UniRef90-G4YZN5 UniRef90_UPI000379F2A3 UniRef90-A2F426 UniRef90_G5CT46 UniRef90-A4ET00 UniRef90-G7GWH1 UniRef90-H5TH70 UniRef90-KOPQ89 UniRef90_UPI00036BBE53 UniRef90_UPI0002FD82D0 UniRef90-H5WW00 UniRef90_UPIO00415E719
$R$ P A E GRM|L|YR\|G||NWGD|VTAEGD $150 \quad D \mid I Y G D G$
EKKAFRGFRVRFGMHHGPVTSTVHETTGRTIYQGEA


 GDVDDRLIFFKGLRVRMGVHFGEPRRLRDAVTRRVEYHGSV NAGVPGRERLRYRIGVNI N A R V P G D R R | $G D V$ | $T$ | $Q$ | $P$ | $N$ | $G$ | $D$ | $L$ | $G$ | $G$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $G$ | $D$ | $L$ | $I$ | $F$ | $D$ | $D$ | $D$ | $V$ | $Y$ |
| $G$ | $D$ | $G$ |  |  |  |  |  |  |  | GDPVPVRIVGHMGDVVY





 DKY $\square \mathrm{NK} N \mathrm{~N}$
$\qquad$ ELTA GAPEDRRI A FRVGI NDGDVIVE $N$ GRRND PHD\|FGDG
 $D Q \operatorname{LRDRPQRDFILKGVHRGASIAVTLNER~LDYFGQT}$

## D P A V

 MA S L L P P A $\square$ WH P A LREELL

PGRKFNLRI GLHM

K ENE K
$R E V P G L D D G I M G V A G L A V A G N D G A A N R F E Y T V I G D P$ NAR R V S P D K R L M F R V GL H M G G I I Y T R G S DVL G S G DEKENSASHPEIKIGI GINS D
 $V$ K R L L G V $N$ N P Q G N F L G I
 $P D R R R \| V L R \square G \square N L G D V \frac{1}{1} G E G A$
A K G L G RLD
 K PMT $\square T V G I$ HS GPVAA GLVGERT QY CLLF GD T PADRHFAFRI GLNLGDIVF

DADDFHGDG QAVREEMQVPGLNMR\|GLHVGSCVGGVIGSRRRYDLWGLD Q G D H P L P LRAGAH T G S A I V $\quad$ R $\quad$ T D N DVV G NV ANNRFPDDEKMQLRDGDNVGDVMV K K K GDIIFGDG $L L N D N E N S Y N N F M L R V G I N L G G P V A G D I G R K P Q Y D I W G N T$ L E V F N S R N N T N VK L GV G L H H G IV QL GTI GYEQRLDV DS D T


 NA QRAAWGQPRLGAGIALHHGDVMFGNIGAPDRLDFI GPA QSRLLAELSPLSAG GGVSYGTVIAAGHDGHAKRFEYTVIGDP


 NDLRKHQNLPTVELDVALHDGEVMYGNVGSASRLDFTVPA ELT Q S E DLR I R L RVGIN H G SVLID G S VG DVVERFRFGVALHVGNI LYGNDGGGNRLDFTVI GPAA
 $\qquad$ NEII
1 N N S DVM G N G NAERA GTGEPRDEHGGALHUGDVMYGNDGGESRDDFDGPA

 $E G \| G V K A G U A L H Y G E V S Y$ G N V G S G R R L D F I G G D
 $\square$ Q Y $\square$ NE H S F N N F N L R GI NVGPVVAGVIGKKPHYDDWGNS
 VP GLVT LDPDVT LRRVRTGIAT GLVVVGGEGAAREESVVVGET




 Y D $\square$ WTRLVFNGLRVRMAI HDERLVCSRHPTTGKMTYLGPS

 GAERQAMGRNPVRAGIGLHMGDVFSGVVGDEARLEYFGDT

 RDEVLAT GELD IGGGLS RGTVFAGDVGSKKRLEFTVIGDP $G G V L H E G E V F F G N \square G A P D R \square D F T V I A A$ LGTEPSVRLSLRI GFHWGPVVQRDG DVF GD T
RQREGSRLVLRIGDNLA DVLVDGT$\quad D L F G D G$


 E V S I L Y A D V V N Y T R L S T T L N V E L I N IL L H D SVVTVI F DDDVVGFSEMCEHKPQAVL RFL E H NHAS Q GEEKE L A L L F L D D M R GFTAART T Q L P Y Y D V V F L L N R A R H C G DV TVVLFCDVA D F P Q L V A A L P K Q L I L M I H R


ATVVLFT D 1
GEND $\square$ S F MVQ S



STWA
Q $L_{L} L K$
ERK
A A L L DCD

GRYHRP
V A G D V G Y S RL M S E DEAS TYA AL R A




DVVSIL
S L T F L F T DL R GS T A L Y ERVGDAAFDLVRA
 $\square P G A R Q I T V A F A D L V G F T R I G E A V S A E E L G H L A N$ EPHPEVSI LEAD MVDFTGLTTTMEVDLVA ILLHE

$\begin{array}{llllll}L & T & S & L & K & D \\ M & A & F & L & N & Q\end{array}$
D Q G VA P GDE $\square G N L A V L F T D L S G S T A D Y E R \square G D R A F A F V Q S$ M L A A DVAA GY S R L M GA DE E G T L A A R L K V PREEYR $\quad \square F \operatorname{L}$ F S DMK S S T S V A E S L G HA Y F E F L R A
 UniRef90_K0VWJ5 UniRef90_B0SC78 UniRef90-UPIO0029B145D UniRef90_W8I8Z2 UniRef90-B3R4D6 UniRef90_L7UP55 UniRef90_A8TIW5 UniRef90_UPI0001C4F35D UniRef90_UPI000376B46A UniRef90 A2ElI5 UniRef90_LOLGQ1 UniRef90_W4LV51 UniRef90_L2T7V8 UniRef90 S5ZR62 UniRef90_W4XMR3 UniRef90_M7Y1Q8 UniRef90 M2C5L5 UniRef90-A0A024IJI5 UniRef90-UPI00037491F8 UniRef90_UPI00037EE271 UniRef90 H4F0Y0 UniRef90-L0J5A0 UniRef90_K0TKX8 UniRef90-D5PD34
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27E017


SLLTFLFTDLR
ASVLFTDVVGSTELARIGDAAYRDLRAA RAAILFTDIVGSTYMYSKLGDRAFGLVRE SLAVMFASUPNFKEFYTEEGLECLRLLNE SAALFTD KGSTLMYSELGDAAFALVRD ELTUAFVDLTGSTSVFETLGNDATKAVTK
GRA $\square A D P S R T L A V G F A D M V G Y T S L T R R D A D L T E L L E Q$
QPRSENRVFLFVDLVGSTNYAERFGDRTQKYLGE
RQVAVAFGDVVGFTRLGEALSPEDLGLLAR HFGNAIFGFCDVRDFTFATEGLQQDVMLFVNK
lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm

|  | UniRef90 R4Z |
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|  | UniRef90_C1EEZ1 |
|  | UniRef90_UPIOOO4 |
|  | UniRet90_C5K9E |
|  | UniRef90_A2EZ |
|  | UniRef90_UPIO0040B |
|  | UniRef90_UPI0004244241 |
|  | UniRef90-A2D79, |
|  | UniRef90_V8CW |
|  | UniRet90_L1EP9 |
|  | UniRet90_J2IQT6 |
|  | UniRef90_UP100047D |
|  | UniRef90-UPI00046CCBFE |
|  | UniRef90_A9M |
|  | UniRef90-K9W951 |
|  | UniRef90-F6EK3 |
|  | UniRet90_UPIO0036FFD61 |
|  | UniRet90_Q9VK5 |
|  | UniRef90_K0001 |
|  | UniRef90_UPIOOC |
|  | UniRet90_A0A024JUL9 |
|  | UniRef90_D5PGE |
|  | UniRer90-M9PH04 |
|  | UniRef90_\5VP25 |
|  | UniRet90_l4YSG3 |
|  | UniRet90 A8HXP4 |
|  | UniRef90 C11 |
|  | UniRet90_U1HNE3 |
|  | UniRef90_A4CG63 |
|  | UniRef90_UPI000427E017 |
|  | UniRet90_Kovw. |
|  | UniRet90_BOSC |
|  | UniRef90_UPI00029B145D |
|  | UniRef90_W818 |
|  | UniRet90_B3F |
|  | UniRef90-L7UP |
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|  | UniRef90 UPI0001C4F35D |
|  | UniRef90 UPI000376B46A |
|  | UniRef90 A2EI |
|  | UniRef90 LoLGO1 |
|  | UniRef90 W4LV51 |
|  | UniRef90-L2T7V8 |
|  | UniRet90_S5ZR |
|  | UniRet90_W4XMR3 |
|  | UniRet90_M7Y1 |
|  | UniRef90_M2C5 |
|  | UniR |
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|  | UniRet90_UPI00037EE271 |
|  | UniRet90_H4F0 |
|  | UniRef90 LoJ5A0 |
|  | niRef90 KOTKX |
|  |  |

 YSDAVISAVHEAGGTVLKLIGDGVLAIV RADRQVDACDA LYGRFDKAALMFRVQRIKFLGDCYYCVAG乌IDADPDHAKN YFELVDKMAEEHGVTKVRTVGDGYLAV
FFDAVVPTDNBAGGSVDKYLGDGFLALFE
LTF SNIDKLVFVHALTKLETVSESYVVCSGLNPDGDSSDHV MFKEFDAITNSHKTMKIKCIGDCYMAAGGI FDEVNQPAVH YFDCQVPAILNHGGEVLKFMGDGLLAVFPIGKEGD HDELAKQMVAKHRGTLIKNTGDGULATFDGPGRAVRCADA VNDASATVIKRRGGIVTKHLGDGLMAVFADGAEALEAAHE VFEKFDDAVDHHGMYKYQNVGDWYD MCPRAARPFDQKLQ AFELIDPTVEKHGGETFKTTGDGLLAVFFPSMDGTDACQH VADA EPPIVDRGGQVVKRMGDGVMAVFASPDSAVR
IF SALALPVHRSRGSIIDDYVGDMALVSWTMKRGTREAA
WFRQSGDIIRRSGSWVDKYIGDAVMA $W$ WFHSSQGVSHAHG FFEVIVDTVHAHGGMVNKFTGD
LYCEFDTYGMKFGITKIKTNGDEYMAAAGLANSDNS
LYGRFDLAAYRYKVQRIKFLGDCYYCVAGLSDPDPDHANN HFQVLHEIVATEAGAVVKTI GDAVMATFPSPDRAVAAALR YFERVGSAVREAGGLPNQFI GDSVMADF FYAAATQTLLRHDAVIDKLIGDEVMAFFVRGWSGPHYRRR RLAVLARDVTVPPVRFIKTVGDAVMFVCPEPLPMLDVVVK
 LRDVVEPLLAQHRGRLVKLMGDGLIAEFGSVVSAVACAAA HFRYLRDAVIRDNGGVVKQMGDAVMATFADAREAWSAAAS
$V N A V V D P T I A A H R G R V K T V G G L V E A S A V D A A R S V E ~$ VNAVVDPTVAARGRVVKTGDGLLVEFASAVDAARCSVE YYSDFSDAI VRHSGEVYQYVGDEVIVSFTHA
HFRALLEDIASEKGAVVKTVGDAVMATFDRPEHADTAGDR $\square \underset{\square}{L} A T F A E P V R R H K G M I N D Y V G D A A D T W P L A$ YFSRFDEVIKTKGMEKLRMTGDMYLAAGGLPVGNFTHAVD COAVVVETV EKYDGVVDSFLGDAALVVFGEPRSMVDPATA CQAVIAELVSKHRGRIGAGAGDSVLAEFASAVEAVRAAVD
CLGAMKACSEASQGRRIKTIGDEVMVLFPCAEQALQAALD CLLGAMKACSEASQGRLIKTVGDEVMVLFPCAEQALQAALD HFAFLTRTLRAHDGAVVKTDGDAVMAAFAEPADAVRAAVA
 HFGILAHEVVAAEAGAVVKTVGDAVMATFPTPDRALTAAMR Y LEAMTPHVIRHGGVLLKYIGDGUMVAFGVPGARQTDDAD HFKILFDVIKEFEGVPVKTDGDAVMGVFVNPQKAVDAALE IIADFDELLSKPK HFRLLHDVAAESGAVVKTDGDAVMATFDRPERALAAALR HF L FDVIKKFGGVPVKTIGDAIMGVFMNSKKAVDASIE FESVATNDQDERGTLDKY GDAVVAMYGAPDPMNDHAYQ FLKTVALSVRRFGGTVDDYVGDAAFVTWRFESGMRNSAC RLSDLTREVVAHPVQFVKTVGDAVMLVCTDPKRLDMTVLD DAEDTHEVVDSGGHPNKNI GDAFLLVWKLKSGKNTNS FYGAATQTLLRHDAVIDKLIGDEVMAFFVRGIGGPSYRRR
lupas_21
lupas_14
lupas_28
jnet.
cont
sol25
sol5
solo
hmm
jpssm



[^2]

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm

lupas_21
lupas_14
lupas_28
jnet
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## UniRef90-R4Z315 UniRef90-W8FPJ5

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UniRef90_UPI00040B0345
UniRef90_UPIO004244241
UniRef90 A2D795
UniRef90 ${ }^{-}$V8CWW6
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UniRef90-J2IQT6
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UniRef90-A9W030
UniRef90_K9W95
UniRef90 F6EK37
UniRef90-UPI00036FFD6-
UniRef90 Q9VK50
UniRef90 K0Q0V6 UniRef90_UPI000382D529
UniRef90-A0A024JUL9
UniRef90 D5PGB5
UniRef90 ${ }^{-}$M9PH04
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UniRef90_A4CG63
UniRef90-UPI000427E017
UniRef90-KOVWJ5
UniRef90_B0SC78
UniRef90 UPI00029B145D
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UniRef90 S5ZR62
UniRef90-W4XMR3
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UniRef90 UPI00037EE271
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UniRef90-LOJ5A0
UniRef90-K0TKX8
UniRef90_D5PD34

A Q R|L|RG|IT E ${ }^{210} \mathrm{~V}$ EVV|F S|V|TPCPA
A Q R

E 1 DVV K
LI S VVA GFA A P ERVVY
SHELKGDPDRWDLFA
ELKKGKGKQMTYLVSPL
RFRAKGTPKDLVVYEV
IISVKGKG
PQRVSGFDVPIGVHALR
RRQAKNDPEPLAVYAVRVEPGR
YRRLNGVPEGMRIFRLA GD
SRAVRGRHEPLRIAAV
TVHLKGYDSPTTTYA
SVTLRGRLTPTRL

E ELLQGDGREVK\FALLS
A $I T V R G R S Q P L D V L H V A R P S S L R T P$ RLNLRGYDRPI EAYALNG A RRLKG $\square K N E V K L F R \| R R G D G$
EQ LLKNDERPVRGYAVR LDGPEAAPT
E LRRLKNI ARPMRTYR
MTEVKGK GLMRTWEWAGDMDAPFDGDQLQR
TTELKGDGEEQTLWRL

$P \square Q L R G \square A D K \overline{M V V Y F}$

SEVVRGRDEPTEL
PQRLKN
PI HVRGRAQPVELYE
SI TLPAREEQLQLYRLRAAEGLPFGGRFEKQ
TVSVRGVERSVAVMRLA GP
$T Y R L D D L P R P E R V V Q L C H P D L H N F P P L R T R K$
TVHLKGYDKPALTYA
ETFLKGKGKQLTYY
HVALRGDTDAIDDFA ا
$T V R L K G K E Q G V S V Y R I D D L K$
EHDLKGVPDRWPLYSLTDADHRTVPR LDAPKLGMDD
RIIKFKGI IDESVIYHI
IISVKGK GK LKTY V VRRM

R IT FKGI KEESTI YHI KVKE
A MRIIKGKVDPCEVFRVEW
K YVVKGRSQPVAMYEPTG
S L R R V G F
S YAVRGKGQTLSVTA DSPAP
QRHLKGDRSEVRLYRATRAATEH
KVIFKGSTDPIVIYA
LNLRGRQDPLGAF



[^0]:    80

[^1]:    0

[^2]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf sol25 sol5 sol0 jhmm jpssm

