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 MRKILDRGA:AKVRVGDNAEELDPKLGGDFQIVNVEC $M \square R V T D G V F i A R V S V R N V E E V I P Y L G G N V Q L V N T G C$ MEEVVPGIVVTAVYV DEVEKLIPHLGSELQAVSGPC $R \prod A \prod A K D L V E N T Q \mid F E I L P N N V Q L L N V E C$ MKFDEGVATVEDVNAFVTDVGAI ADETGATVQVFDARY MRVVEGTADLDDVGAFVETLGA GDRHGVTVQAFDARY MRLAEGRATVGDVDAFLADLDATATETGCTIQAFDARC MRRLTGTETVTHLDDYLATVDTVGDETGCTVQTFDARY
 SKTLDKLN NSLKN MELLECTLADDDLDSFVADLGALGETHGTTLQAFDARY VEILGFKGTI ESIPKTLEEIDNIRNSCCGTIQLMNADA
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 MELLECTLSSDDLDSFVAELGAMGETHGTTLQAFDARY ПK LGFTSEDDDVSRTDAKVPDEIFKMGLEFQLINADL MQLIECRLEIDEIDSFVADLGDLGDRHSVTIQAFDAKG MKLVEGTTTVQQVDRALSQLAEI GETHGTVVQAFDARY $E \square K 乌 S$
 MRLLEAEATV MQLLECSLT, IVGGRVEIKD


E M解 ECTLA GGKK HVADV MQVLEGHLLVEDLD VKNSLDEIASATQTTVQAFDADY VKNSKVPEEIFKMNLEFQLLNADL D IKNAKINQDIFKLKLLPFQILNAELL MELLTGTAD
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 MRTVEGVAT DDTDAFVGALGDIGDANDCVVQAFDARY RIVEGRLTVGDLDEFLAAVDS:AEATGAVVQAFDADC MEVLEGQLTVADLDSLVARLGELSERHEVTI QAFDANY MHVEFIGGRIFIEDLKPFLRTIADISKTNNCTIQAGNADK MRTVDGYASAADLDTFLGRLTEVAEETDTVVQAFDPSLL MELLECTLAVDDLDSFVTDLGELGDRYGTTI QAFDARY MEPVEGVATVEDLDAFVARLGAVGDEGVTVQAFDARC IRHAKVSKEVFNLINLPFQILNADLL MRMK LGGLGS LEG|LDDVEDVEEF MKSVVATTTUEDUDAFLADIEATSDATGAAVQLCDDARA IRGAKI KNEIF SDDLNFQILNADV LVAGTFAVPDLDAFLADLDEAAETGAVVQAFDADL MELVDGRVTIKDIDRFVAELTAI GEEHGCAI QAFDARY MKIFSGEARI NEVDQYI RSVHALADEDETTI QVFDAKY MQVVEGNLRIDDLDAVLDRLDAI GDEHGVAVQAFDARY

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 LRHLERSVELADRALERGENVARDRAVEILLYAAGRRQI D VKHLQFAVVKACRAFVQERNAAKDIGIEIMRYASGKRQI E VGHLTTAADNAARAFERGENVAQDRGVEWLLYAAGRRQU VRHLERAVAFADRADERGENVARDRAVEILLYAAGRRQI D VAHLRRAVELADRSLARGENVARDRAVELLLYAAGTRQ1 D VAS KKHIIHSDNQAKTKKPISNNMWMEILVRASAQRQI T HAHAELAARKALRAWHDGRNVAKTLPVEVILYAAATRQI N IVHVKHAVIHALNAMKRNENIANDLGGEDCVRAGERQI S VRHLRRAVSLAARAREQGTAVAHDPAIE:LLYAAGRRQ: N VAHLRAATRLAARSIARGEAVARDPGVEVLLYAAGRRQ D



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EA TKKVGAKEGENY VTFGENASALLQK 110
TheTKKELE ${ }^{120}$
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$\square$ Q A $\square \mathrm{DAAM}$
EVRVVG $\quad$ VRGGFTFEQAVDHFAS $\square$ GAEVVLLEPSV MELLEGERTVESVDRALARVEEDREATGATVQLFDARY

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I NFKSKNTLDILQVINGR RIFN
$R L V A G T A A D D D L D A F L S A L D G I A A E T G A V V Q A F D A D L$ VRLVTGTFEIDDLDAFLGDLDAIAAETGAVVQAFDAAL

V WL R D E T AD D FVEKMRSVVQVFDAD S $\begin{array}{ccccccc}V & V & L & D & F & R \\ C Q V & F & N & P & E & A\end{array}$
S V VRLA S SKKDLKELLPVLNSACQVFNPEA VRLVAGTFAIGDLDAFLADLDATAAETGAVVQAFDAGL
$\square V K G Y \square G N L S A E D S Q L F A S K G I Y V F N V G C$
DDVDEFLRKLATIDKENRTTSQVFEASS
T $\square E D K \square G F L N E\|R R\| A D E F E T H \| I L F D A D R$
EVTVTEPD LLLEVLRA $\square$ ADRAGSC\|VCFDADK
 $\square A D V P S F L S R L R E D A K Q F S T H L D C F N A D G$ MRVAFGEDYVEDPSAFRADYAAFIDSKYVV

TGVI TQA DSTEY
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E L L D R L R A A F Q A VS QRL

RTEEELEKLADSLEADVSLASRHS
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S
NS $\quad$ QQFFSDKY

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V K H R S AVMHAS
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 I A H I E S AV MHAERSFAEGKNIARTLSMEILLYAS GQRQCS V K HVVSFAVRKA LR A DE E N Y N A A K D P G I E I MRYA S G K R Q $V T$ QL R E A A R L A A R S I A R G E A VA R D P GV E V L LV A A G R R Q I D $V A H L D H A L R T A R R A D D R G E A I A R D P A V E V L C Y A A G T R Q D$

 V R H L I A S K K H I I H A D I N Q A T S K S P I T N N I WM E I LVVRA S A Q R Q I S V R H A A F A A E K A V R A F T E R R N V A K






1


 $V T G L S E A A R L A A R A D A R G E A V A R D P G V E V L L Y A A G R R Q L D$
 I E H L V H A A R L A L I A Q A T K K N FA S S L H I E LF C WVA A E R Q I A
 $\square \mathrm{A}$
 KRHAEAALRYAVRSCRKGAA I LEVVEFAANKALKNWQKGRRI SRSLD DE ILLLHYA
 WE SHILLAF DNTLK S F RTNTNNDARKF DVVEYLI R L F N E R Q I N






UniRef90-F7XLH8 UniRef90-B0R7Q3
UniRef90_N6VP97 UniRef90-K6T789 UniRef90-UPI0003666B11 UniRef90-K2RU85 UniRef90-G9BAN2 UniRef90-Q2FNA3 UniRef90-F4BW61 UniRef90-D2RH38 UniRef90-F8AJP9 UniRef90-A2SUA7
UniRef90_K4MB28 UniRef90-MOD975 UniRef90-J1KZF6 UniRef90-R4W8B4
UniRef90 R7PVJ6 UniRef90-H1Z1U6 UniRef90-MONBE5 UniRef90-V4Y5U6
UniRef90 A6UVC2 UniRef90-G7WL32 UniRef90-Q2NEQ9 UniRef90-Q12WA3 UniRef90_R9T863 UniRef90-A5UK25 UniRef90-M4YU93 UniRef90-U1PIH2 UniRef90-T1AKZ4
UniRef90-D3S2D7 UniRef90_LOHPV2 UniRef90-K0ICA6 UniRef90-D7DRR0 UniRef90_UPI00036CA317 UniRef90-M0PE82 UniRef90_M0E2Z0 UniRef90-E6N7J9 UniRef90-TOYCE2 UniRef90-C7DIR3 UniRef90-M0ED18 UniRef90-17L1N7 UniRef90-B5ID18 UniRef90-X1L428
UniRef90_AЗСYH3 UniRef90_G6CRM3 UniRef90-A7IB62 UniRef90-TOLJY8 UniRef90-N0BKJ9 UniRef90-LOHD71 UniRet90_O297YM6 UniRef90-EOSPU4 UniRef90-TOZ753 UniRef90-UPI0001D6283B UniRef90-T1CBR2 UniRef90-C5DM08 UniRef90-E1RHI3 UniRef90-X1HI01 UniRef90-Q4SDW1 UniRef90-X0X2A5 UniRef90_W5NGQ1 UniRef90_D8QMC7
UniRef90 ${ }^{\text {Q9HJ90 }}$ UniRef90-S4P8E8 UniRef90-AORXD9 UniRef90-X1BP78 UniRef90_F6TJV5 UniRef90_A2BKK5 UniRef90-H2MXR4
UniRef90- D3BJD5 UniRef90_D3BJD5
UniRef90_I1GIU1 UniRef90-I3D0X6 UniRef90 B9ENU0 UniRef90-A1RWP5 UniRet90-G3ANS2 UniRef90_W5UCP4 UniRef90_C3KH40 UniRef90-H3AZ53
UniRef90_M7NP95 UniRef90-B8GGD2 UniRef90_S5Z649 UniRef90_G8B9S9
UniRef90_R4WE38 UniRef90-G4Z5F0 UniRef90-J4HOV4 UniRef90-EOVU35
UniRef9O KOBD39 UniRef90-KOBD39 UniRef90-E1BXT5
UniRef90_I3JU00

90
100
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120
EAFSM G|V|RKGENM|L|A|LVVMMGDENDVRES|V|TELKDTEKPL R A DDM GVDEGRVCVVVAGGGDEAAAADAVAAMLASVEPV EAIMDMGAKDGNVCLVCEDEEDNK IVYNIGGGEDDDSVLDL QALK LGGDGNGKMDICMVAVDCDEQVEEVLGKQHDEVLLD KAVKKMGVKVGDERVALVLFDVDDVSSLLASCRFARDDDV

 | Q | K |
| :--- | :--- |
| $\mathrm{A} P \mathrm{P}$ |  | ALNM GVSDKTERIALVL

 VAIKII GVEKSNVCIVCEDKETNKLINMDGGVVDDSVLEL LA PRFGLQAGQNQVYVLILDGD
EAFSMGGVHEGDMDLVFVVIIGDMES $\square R S M \square S E K D V$
RADEDGGVSEGEQTAVVLVAD
VAMD LGLHEGENCYVCI SPAAAEADER LLRPDDGDWEGD VALK LGVAEGRTPVVVLVARLDDDI DA
KALKKMRPKDGTMVAAVLGDDGDDALSDLGADRDDS
 RALA LGAREGEPAVVVVAGDGEAGAAEAVGADDCFDTHP NA QALNLLGI KKQGNTTVVYI NTTDKQIMEVEMFLSNRRDEL EAFS GLSEGRLDVVFII DGAPVNVGEAAKKI
KAADKMGVKSNNVALVIFDMKMEEVLSKLNLKQDDSLLEP KAFEDLGLKKEGKMNLCAILI NCSDESVDELSNMFDRDNNV KALKKMKPTDGTAGMVAAVLNYPGDL VLSELGAEDDSLL RALRM GILSAG
YAIKKMAPKQGKPFII I TNDSELLKDVEKHCRDSPFNP DAVK $\triangle G L K E G R N E V V V V A E E N C D E K L K K L G F K E E N V L K \square$ DALRLAGI DGAEEI AAI SEKDFD ALLERDDSVLEC DAMKKAGLKNGSAGCLIADSQENEEDRHFSEEVDDSVLEP

RAFA LGVEEGRQRTVVLVERPDADLDTAAASVADLLASG

 EAIKAVGAKSSRRLLLFCSDK
RALE LGITSEGERRAVVLAADDLDGAVDSLRSLATDSTEI
 RAFEKVGLHKGSKDLAILTLGDSNDRRDLGIKRDDDVLDV
 TAVS FGLHKGENYVCCCPEGDWDLLSNQLQFRAGPSEDG KAFGMVGVK GYSGRVVKVENSN
 DALK LGVKKGLDRVVILDESKMEGFKEI

## FA DRAEPGDEFVLVVASRD



$\stackrel{F}{\mathrm{E}}$

AFKKF GLADNDSGVLIVLEDGTKKSQEIISQIDGEQVPI
 SLRGF GAKDDSNSVVAVFTSDEESLKSLVKGLGGEVLQDD
 $A F K R F G M S D S D S A V L I V L V E E T Q H M T D I I A K V D G Q Q I P I$
$A L K A F F S S C T E S F V V A F S L G R E A E A L A L F R E L G F E E S E P$
 EAFKRFGVSDSDNAVLIVLVHNKEEADDVLSKVDGQQIPA
 V

 EA AKRFGVSDNMTALMVV
Q L H TFGl DEKDVAIVI FEKKGENKFEKDKEYF
AI KNVGIRPKSNFILI SDGNKKTLNYLYREYTPDSVNUG
DALRRFGVNENQSDVI VIKVLPS GTNEAGLDKLNNSVIEL

| UniRef90 F7XLH8 | $\text { LK CSSSKMN } \frac{130}{1} \mathrm{MAAQ}$ |
| :---: | :---: |
| UniRef90-B0R7Q3 | VASEPAVLRAFFD |
| UniRef90-N6VP97 | NEKKEK\IRNT |
| UniRef90-K6T789 | A DVDALQELYEDS |
| UniRef90-UPI0003666B11 | LEPSAEKAVRF |
| UniRef90-K2RU85 | LQA DVSTTLQEVYE\\|S |
| UniRef90-G9BAN2 | KESKADELKK |
| UniRef90-Q2FNA3 | SEEKKSRLDQFFE |
| UniRef90-F4BW61 |  |
| UniRef90-D2RH38 | D K A R $\square \mathrm{ENVKR}$ R L Y |
| UniRef90-F8AJP9 | TQSKMENI I R A Y |
| UniRef90-A2SUA7 |  |
| UniRef90-K4MB28 |  |
| UniRef90-M0D975 |  |
| UniRef90_J1KZF6 | DEAKKMRLLMKRY |
| UniRef90_R4W8B4 |  |
| UniRef90-R7PVJ6 | CDASEEKARND |
| UniRef90-H1Z1U6 |  |
| UniRef90-M0NBE5 | DEFDEARVRDF |
| UniRef90-V4Y5U6 | VELDRATLRGFFE |
| UniRef90-A6UVC2 | LD SK $\square$ N NIKK |
| UniRef90_G7WL32 | PRWS EAAVREAFD |
| UniRef90-Q2NEQ9 | E E Y D K K I VEK Y E |
| UniRef90-Q12WA3 |  |
| UniRef90-R9T863 | SEEKMMR |
| UniRef90_A0B6X0 | \RFA AERVRRFYD $\square$ S |
| UniRef90_A5UK25 | L I A DELKLMKIYY |
| UniRef90-M4YU93 | YAPSEEKARNL |
| UniRef90-U1PIH2 |  |
| UniRef90-T1AKZ4 | K A S S R A K LM ETLDEKMS |
| UniRef90_D3S2D7 | DEEKVEKVMKLY |
| UniRef90-LOHPV2 | K DKKIEYL |
| UniRef90_K01CA6 | SRQKRDLLT GM\|LE |
| UniRef90-D7DRR0 | NDVNNEKFKKIVE |
| UniRef90_UPI00036CA317 | D D C L L F Y N |
| UniRef90-M0PE82 | T D P D A RVREFY |
| UniRef90-M0E2Z0 |  |
| UniRef90-E6N7J9 |  |
| UniRef90-TOYCE2 | S R NHEDAAAKS |
| UniRef90-C7DIR3 |  |
| UniRef90-M0ED18 | P DADEERVREFY |
| UniRef90-17L1N7 | D PAKRERLAELDF |
| UniRef90-B5ID18 | RADKMEYL |
| UniRef90-X1L428 |  |
| UniRef90-A3CYH3 | DPAKRALLADL |
| UniRef90_G6CRM3 |  |
| UniRef90-A7IB62 | SPERKNQLMLLFA |
| UniRef90-T0LJY8 | T D SKKNYVE QLLERMA |
| UniRef90-N0BKJ9 | VDCNEEKLKKFME |
| UniRef90_LOHD71 | DGEKRDGLMK $\square$ F |
| UniRef90-O29731 |  |
| UniRef90-Q8TYM6 |  |
| UniRef90-E0SPU4 | S N SEDS S ${ }^{\text {I K R }}$ |
| UniRef90-T0Z753 | R A VDEGVLERL |
| UniRef90-UPI0001D6283B | DHSDDM IFERMS |
| UniRef90-T1CBR2 |  |
| UniRef90-C5DM08 | S D E N |
| UniRef90-E1RHI3 |  |
| UniRef90-X1HI01 |  |
| UniRef90-Q4SDW1 | ED T D Q E R I K K L Y |
| UniRef90-X0X2A5 | LD GDRNTLKKF |
| UniRef90-W5NGQ1 | DESDVNKIKK円Y |
| UniRef90-D8QMC7 | ERRSVDELATVVDWAA |
| UniRef90-Q9HJ90 | DHSDDM IVFERMS |
| UniRef90-S4P8E8 |  |
| UniRef90-A0RXD9 |  |
| UniRef90-X1BP78 | F S P T SEKTS S L M |
| UniRef90-F6TJV5 | T A T D $\square \mathrm{K}$ K V K K M Y K LT A |
| UniRef90-A2BK35 |  |
| UniRef90-H2MXR4 | E ES D P A K $\square$ R K L Y |
| UniRef90-D3BJD5 | EESDEALKK Q Y Y |
| UniRef90-I1GIU1 | NDLDLK S L K K V Y |
| UniRef90-I3D0X6 | SKNNEQFLKKYF |
| UniRef90-B9ENU0 | EDTDTAKVKKLY |
| UniRef90-A1RWP5 |  |
| UniRef90-G3ANS2 | N D |
| UniRef90-X0VF71 | NDKT\EK\KKYFE |
| UniRef90-W5UCP4 | DQS DLAKI K K L Y |
| UniRef90-C3KH40 | EETDHAKIKKLY |
| UniRef90-H3AZ53 | D D T D ${ }^{\text {a }}$ KI K K M Y |
| UniRef90-M7NP95 | NDSNIEKIRD |
| UniRef90-B8GGD2 | S SEKRARLMKLDF |
| UniRef90-S5Z649 | EEQGKNESID FYAE】A |
| UniRef90-G8B9S9 | VETKDEVLLDLVD |
| UniRef90-R4WE38 | K E L K |
| UniRef90_G4Z5F0 | T D A DVKLIKK F Y K $\square$ S |
| UniRef90-J4H0V4 |  |
| UniRef90-EOVU35 | E $\square$ C D P E E $\square$ C D Y S D |
| UniRef90-K0BD39 | SKNNEGHLKKHF |
| UniRef90_G8XZM3 |  |
| UniRef90-E1BXT5 | DE T D $\square$ A K VKK ${ }^{\text {L }}$ |
| UniRef90_I3JU00 | S S S D H T K\|I K K L | Y |

1
10
20
30
40



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





[^0]

| UniRef90_J7R1T9 | $\text { QFYDKELLJR } \begin{gathered} 130 \\ R \\| Y \end{gathered}$ |
| :---: | :---: |
| UniRef90-A9TNT7 | EELSKE |
| UniRef90-JoCXZ5 | T I V P L S R I P E F C D |
| UniRef90-Q6CT72 | S DADKEIIKTVC |
| UniRef90-C4QZ50 | L H C S T A LVK K |
| UniRef90-E9HDH7 | FECDENELRKIY |
| UniRef90-A0A024TC33 | T A $\square_{\text {d }}$ |
| UniRef90-F2TWG8 | SE LHELYDAAA |
| UniRef90-G0W7H7 | 】EFNDDNLK ${ }^{\text {L M Y D }}$ |
| UniRef90-S8EZG9 |  |
| UniRef90-H8X870 | E LVDVSKFKKVY |
| UniRef90-F1QZ15 | G QVS EMK |
| UniRef90-F6V6G9 | DKTDETKLRKTY |
| UniRef90-M3ZWV2 | D Q S DLE R $\square$ R K L Y |
| UniRef90-B3T8R5 |  |
| UniRef90-G3B5G8 | Q D A D $\square$ S K FKK $\square$ F |
| UniRef90-D5ACB3 | RADKA Q $\square$ QKHY |
| UniRef90_W4FBM6 |  |
| UniRef90_J3SDJ7 |  |
| UniRef90-A0A059LK01 | LP Q D EK L L R K Y Y K $\square$ S |
| UniRef90-C1BRD1 | LECDESVIRKKY |
| UniRef90-R9XDU7 | K S A D D T I R E N Y |
| UniRef90_S9PVQ4 | CDEDMKLVKKYY |
| UniRef90-J8TXA9 | EEFNDENLSKFYD |
| UniRef90-G0ECP4 |  |
| UniRef90-G0VJB7 | ND D NLSKFYDR |
| UniRef90-UPI00038BD54D | E S LP ES EVRKA Y |
| UniRef90-C5MGS5 | T DE |
| UniRef90_R7SL73 |  |
| UniRef90_G8JT42 |  |
| UniRef90-E2C6G5 | ER】S I S RliQEFT D |
| UniRef90_A5E2A5 |  |
| UniRef90-H9J846 | E Q C S $\square$ T ELCN F |
| UniRef90-R4G7S1 |  |
| UniRef90-Q6C7C9 | K N T D $\square$ K L V K K V Y |
| UniRef90_A6ZM27 | QEFNDDNLSRFYDEA |
| lupas_21 |  |
| lupas_14 |  |
| lupas_28 |  |
| jnet | $765{ }^{-}$ |
| conf | 7652789999987289 |
| sol25 | B B B B |
| sol5 | $B \quad B$ |
| sol0 | B |
| jhmm | - |
| jpssm | - |


[^0]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

