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 D I G M H I A A A N P QY L T R E EVVPVVDVLQ HE R DI L L A Q A L N E GK

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 ELAMQVAAANPLFVDRQDVPPERIENEKKIYETQARNEGK NI AMHI AAANPAGLTPEDVDQSVVEKEREI FKAQMLEEGK DIA MQI AAANPRYVSKEDVPADVLEKEKEILRQQAINEGK DI A M HVAAANPKYLNPEDVPAEEVVEHEREVLTDQAQNEGK NVAMQI A ANNPAAVDAESV DI AMHIAASKPEYI SRDEVPAERVEKEKEI LRAQALNEGK EIADQIAAMKPQYVKREDVPREVVEKEGEIAREAAVAEGK NLAMQVAAANPDAI GREDLDAEVI AKEKAI LLAQARESGK DMAMQVAAQNPKYVSREEVPQEELEHEKTVLVEQALNEGK NVAMHI AAASPDAI RREEVPADALERERNI YKQQALDSGK DI AMHVAASNPTYVNPDEI PEEALEREKEI YRSQALAEKK DI A MQVAATNPQYVRRDEVPADVIEHERAI FRQEALNEGK DI AMQVAANNPLYVAREEVAEELLQHERDVLRAQALNEGK
 NI AMHIAAANPVSIRREEVPQELIEREMAIYRAQAEDGGK NLAMQIAATNPVAVSREQVPPELLEREKKIYEEQLREAGK
 K I A MHI A AMSPRWVTREEVPADVI EKEKEIYREQLKDSGK
 EI A LQQI A GMAPEYVAVEDVPEEVIEQEKEIYRKQAENEGK DI AMHI A ASDPKFVRKEDVTPEYMEKEKEI YRDQAAKTGK

 KI SLQQI ASMAPRWI SREDVPADVI EKEKEI YREQMKNSGK SI A M QVAASNPLAVDESGISSQSILDKEKEIFMDQAKSSGK DVAMHVAAMSPAYLDRASVPEDVIAREARKELEEGAVPPGK $N$ N A M QUA C P P N V E Y V R V E D I P E A V A Q K E K E I D I S M H DA A T DP RYVV K
 D L A M QVA CP QVEYVVSDE DI P E SVVVIGKEKEI EMQREDLQ S K DVALQI ASMKPTCVA IVELDAKAVEDEREIYKNQALAEPK
 D I A K Q I A C Q N V E Y V DV S M Q V A CP NV E Y V S T D D I P Q D I I D R E K S I E M G R D D L D G K
 DI C L H H A A S A P L Y V S A K DI S Q EVI D K E K E I Y K E Q A S A E G K
 DI AMQVACPNVEYVSVDDIPAAI TQREKEI EMGRDDLAKK EI A MQVAAASPRWVRREEVPADVVAKELEI AKAQAREQKK




 D V A M H I A A A N P Q Y V R R E E V A T D K L D K E K E I Q R E L L L K Q Q G K
 DLCMQVA ATKP $\quad$ CAVKREDI PA HII I E E QK KI FMEEAKE K

 \begin{tabular}{l|l|llllllllll|lllll|llllllllll:llll}
$N$ \& $A$ \& $M$ \& $Q$ \& $I$ \& $A$ \& $C$ \& $P$ \& $N$ \& $V$ \& $E$ \& $F$ \& $V$ \& $T$ \& $T$ \& $D$ \& $D$ \& $I$ \& $P$ \& $A$ \& $D$ \& $V$ \& $K$ \& $E$ \& $R$ \& $E$ \& $T$ \& $N$ \& $I$ \& $E$ \& $M$ <br>
\hline

 Y I A M GI A G Q NV Q Y V S A D DI P A EVVFEREKQI EMGREDVLKNK 

$D$ \& $A$ \& $M$ \& $Q$ \& $I$ \& $A$ \& $C$ \& $P$ \& $N$ \& $V$ \& $E$ \& $Y$ \& $V$ \& $T$ \& $T$ \& $D$ \& $D$ \& $V$ \& $P$ \& $K$ \& $S$ \& $F$ \& $V$ \& $E$ \& $K$ \& $E$ \& $K$ \& $G$ \& $I$ <br>
$D$ \& $V$ \& $M$ \& $G$ \& $R$ \& $E$ \& $D$ \& $L$ \& $G$ \& $N$ \& $K$ <br>
$S$ \& $M$ \& $H$ \& $I$ \& $A$ \& $A$ \& $A$ \& $N$ \& $P$ \& $T$ \& $Y$ \& $L$ \& $K$ \& $R$ \& $E$ \& $D$ \& $V$ \& $P$ \& $E$ \& $T$ \& $V$ \& $I$ \& $A$ \& $K$ \& $E$ \& $K$ \& $E$ \& $I$ \& <br>
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\end{tabular} Q I A M H I A A T N P DA I S S E D D I D P P KI I E E E K E I Y K E Q A L A A G K D I A M Q I NLA M H I A A A S P A Y V D R T A V S E E TVVA T L R Q GF LS EVVM D D I A M H I A A M N P K Y L K K P E E I P P Q D I L

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 A AKGVVQSYIHGGGRIGVLVELSCEKE

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 A S E G l V

 E GVVVSTY I S E D GK S A A I V E V N C E T D F V A D D D K F V K F TA


 A A E GVVLDATVDPDTKVGVVI EVVSETVFVAKNEKFIDFVK
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 AENGALASYI HMGGKI GVLVEFAFEKAETAQAESFKTHAH


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 E GIVTTYISSEDNKTAVVLEVNCETDFVAVNESFVEFTN
 K D GVVA S Y I H N A GKI GV L V A L E S T G D K T $\quad$ K L A E L G K


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TSEGTVQAYVHATGKVGVLVQVECNTDF
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E I A M H I A DPAPRFVTKEEVTQDFLDTEKRTAMEQALATGK DI AMQVAAMNPKYVSKDDVDPEYIAHETEILTQQALNEGK DIAMQVVASNPKYVSREEVPAEEVEKEKEVLDHQALNENK NIGQHI LSTSPADRD
$N V A K Q A V N \quad T$ K


 $N \vee A K M A A \square S S S N T V E E$

 $N$ L A K Q AVVTAS SVDE
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TI AK QI A E SNVS DVV A
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PEN V V K MVMGRVNKYYKEVCLVEQVWVKNGDYTITKYLQ
PEKVVEKMVEGRLQKYYKEVCLIEQLWDRDQDLTTRKYDE PADIDA PEK IVDKMVEGR DQKYYKENCLVEQVWVRNSDYTVIDKYVK PEHTQEKMAEGRLNKFFQEQCLTE QTFVKNGDQTVGEYVD PEKI VEKMVEGRVKKY LK EVGCIDDQVWVKNSDYTVKK L E E
 PEN I DDKMLVGRLNKQLKEDCLVDQVYVKDGDLTVAKYVE TPEMKDK■IKARIDKRLKDMCLI YQPFI KDQNIVIKDGVK
PANTVEKMVEGRVKKY PEAI QEKMAVGRLEKFYKQSVLTEQEFI KDSSDTI KKYAE


 PAAVVEKMDEGRDRKFLEEVVLLKQAFVMNPDQTVEQLVA $P$ VQLRS Q IV EAKVKK QLQKQCLLDQPFI KDEQLTVVEVIR PDND DAKMLEGRLKKEELKEDCLVEQAYVKDGDMTVQQYI N PENIKEK IVQGR】DKRLKEMTLLDQPY LRDQNDSVAELI K LGQTMMDNGSTVQDYIN
 PEKIVVEMVEGRLTKWLSEVSLLDQPFVKNPDDTVGQLVK PANII EKMVEGRVKKYYDEVVLEEQAYI MDPDKKVVDVI A
 PEQUVEKIAEGAVKKFQKEVCLMEQPY RDDKKSMTEVVR P DNDVEKMVEGSVKKFVSENTLLGQVYVIDGKAKVADVVA PENI I EKMVEGRLRKFFEEVVLLKQNFVINPDLTVEKALA QI PENA NKEGTGEDVLKQPYFQDPSQTLEDVIK PANIVEKMVEGRLSKFFEEYVLVEQPFVKDPDKKVSALLK

PAETVEKMTGGRTKKFDAENSLVEQAFVKDPETTVGKLVS PDAIKKKMVIGRIGKFYKENCLLDQEFVKDPDDTVGKYIA
$P$ A

P E NIV V E K M V E G R L S K F F E QVVCL L D Q P F VV K D G D Q K V G K Y V K


|  |  |
| :---: | :---: |
| UniRef90－V9HEN3 | LI AKLGENMTVR |
| UniRef90－K1ZL42 | DAVSRLKENIQI GK |
| UniRef90－K2DXJ1 | EKISKIGENI QI GD |
| UniRef90－K8EFG1 | EATAELGEKISIRR |
| UniRef90－W1NP | QTDASLGENIRV |
| UniRef90－UP1000378C62 | QAGSALGEKI EVVG |
| UniRef90－10JXA5 | QRIA Q G GENIVIR |
| UniRef90－A9SG13 | QTMATLGENGOR |
| UniRef90－UP100041729CC | QKMAESGGKLGVRRF |
| UniRef90－ToCFX2 | DVAKKVGSDikVARV |
| UniRef90－B0S185 | DLlaki Genl kirratramva |
| Uni | $N \mathrm{~L}$ Q R R |
| UniRef90 A0A03724X6 | ALIAKLGENMSVRRF |
| 寿 | EK |
| UniRef90－U5MNS4 | HKSKEVGSPI TVTRR |
| UniRef90－R4K4C2 | AKSKEVGAPITISAFTRFERG |
| UP100028 | ALIAKLGENMNVRRFTKYNV |
| UniRet90－10YVM3 | $V A A I G E N$ |
| UniRef90－FOY5 | SYVAVLGENIQVTRFTKFNL |
| UniRef90－UPIOO031217C3 | QQVAQL GENMQVRRL |
| UniRef90－D21576 | OHIA GEN |
|  |  |
| UniRef90＿UPIO00： |  |
| UniRe990＿U2E | QVAKELGGNISIVKFARFEKG |
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|  | NMV PO |
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| UniRef90－R6BG63 | EK\QTIGENIKIRR |
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| UniRef90＿D8QTi |  |
| UniRef90 R6UG | NVAKELGGSIKITDFVRYEKG |
| UniRef90－R5AC， | N R S OF |
| UniRe 90 O OENO 4 | ERIAKKGGNLIISRA |
| UniRef90－R6Q613 | QQVAVIGENLNI |
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| UniRef90 Bopay | K ${ }^{\text {N }}$ |
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|  | KLGEN NLRR |
| ef90＿C7N4N5 | AVAKELGGTIKVTGFKRFQLG |
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| UniRef90－G8P | EAAKE1GSPIKKLTGF |
| UniRef90 A9KNC3 | SVAKELGATMKIKRFV |
| UniRef90－W8DVP5 | QHIALLGENIKVRRF |
| UniRef90－A0A017R | ALIAKLGENMSLRRF |
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| UniRef90－R6 | V S K EL |
| UniF | KLSKELGVA |
| UniRef90－E0E1G0 | KVAKEVASDISIASM |
| － | EFARKNGAAVSV |
| UniRet90 UPIOOO47， | EAEKEGAAAK GMV |
| UniRef90 R5VVY 1 | EATASUGEKVSLRAF |
| UniRef90－08 | TT门AQVGENI |
|  | SVAKEI GADITITRYVRFETG |
| UniRef90－D4TVF1 | QVESKLSEPIIVHQFVRY【LG |
| UniRet90＿Q5LOK1 | EAI AK GEKIT R R |
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| UniRet90＿R61020 | EAAKELGTD dKLKEFVCFRLG $^{\text {a }}$ |
| UniRef90－UP100037DFF46 | SKAGGSGE MKVARFVRYKVGA |
| UniRet90 B6 | EVAKAAGGD KVAGFSRIVQAA |
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| UniRef90－K2MBL1 | EAEKEIGAPAKI VAFV |
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| UniRef90－UPIO002ED29A4 | R |
|  | LKISYFNENTKIRRFDKYIL |
| UniRef90＿F3BA13 | L |
|  |  |
| UniRe90＿－9C369 |  |
| UniRet90－J1 H9Y7 |  |
| $\begin{aligned} & \text { UniRef90-IOJMP2 } \\ & \text { UniRef90- W8A68 } \end{aligned}$ |  |
|  | DLSAKTGENV |
|  |  |



UniRef90＿G9QMU1 UniRef90 UPIOOOX736A7A
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UniRef90＿I8AHC5
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Di AMHI AAMSPSYLYNEEVPAADVEHEKE！LRNDPKNAKK
 DVAMQ AAANP LCVSPDQ $\square P A E T \square A Q E K E \square Y \square N Q A K E G K$ QLAKHIAN VDENSDRQGT DVCLQI AAAKPEAVRREEVDAKDAKEAETQRAKADESGK DVSMHI AAVNPRYITRDEVPAEVSNHEREVLTQQALNEGK DVAMHIAAINPKYVSRDQVSQDEIAHETKILTEQALNEGK KIAMH：AATQPLSLSSDDLDPAAVERERTVLTEKAREEGK DITLQIAAGSPGVVSREHVPADVIAKEREリASQSDRLKGK DVAAQALASESK
SITKHVA
LT K
EVVIEAA
dTEAAD風AFKA
DVAMHAAALNPKYTSRAEVSEDEVDRERKVLTEQALNEGK QI AMHVAATNPLALSTDDLSKDEVDREREVLITEARESGK ELAEHLLATKPETVEVAN
DLAKHVL HIAMHI AATNP DAMT $\square$ AEVPAEAVEREKNTFSEQADASGK NVAMQVAAMYPKYVSRAEVSQEYMDHEKEI LLA AAKKENK DITLQIAAAHPDSVDRTSVPAATVERERAIYVEQVPA GK
 D：AMQ｜AAMNPDCVYREEVPKDVLEKEMEIVKELSRKEGK Q｜AMH：AAAAPQSLSTDDLDPALVERERAVLVEQARASGK DIAMHIAAMKPSFLNPESVPADVIEKEKDIAKAQLLKEGK DVAMHVAAVSPQVVSPEQMPEDVVAKEREVEAAQAAESGK DVAMHIAAANPSYLDRTQVPASELDHEKEVLAEQAKNEGK Q｜AMHVAAANPAYLDSSSVDPDVLEREKNVIRETAKEQGK DVCMQI AAAKPEYLNREEVPQEVVAHEMEILKAQAMNEGK DIAMHVAATNPTYVDRTSVSEETVNHEREVLKQQALLNGK
 DVALQUAAMRPEFLSPETVPQDVIEREKA KYMEQAKKEGK S
SLVAH
D AMHVAAVNPRYDSRDAVSEEDVAQEKEVLKTQALNEGK DIAMQVAAASPIVADRSAVPADYIEKEREIYRQQALGQGK DI AMQVAAAAPVAANRDAVDPAVVEHEKSI YMAQAAESGK Q：AMH：AATNPASATVDDLDPELVEREKSVLTEQAKESGR QIAMHIAAASPLALDPAGLDPATVEREKAILGE KHAGK Di AMHI AASHPVCIDESQVPTEMLDKERAIFKAQAEESGK Q｜AMHVAATNPLALTSAEVDAAAVEREKAIFADQARQSGK Q｜AMMHAADNPKYVSRDQVAQDEVDREREVLKQQALNEGK D AMHVAACVNPKYUSRDQVSEEEANREREVLTQQALGEGK GVARLAL
DIAMQVAAATP IVVDRSSVPAEYTEKEKETYRQQALAQGK QI AMHAAAARPEALDVADVSAESLDRERAVLDEQARESGK Q AMHDAATNPVALDASVDAATVERESNILRE KNAGK QIAMHVAAANPLFLDSASVDKAALERETAVLTEQAKASGK NVAMQUAAMNPKYVAEKDVPADFLEHEKALLLEQAKNDPK $\mathrm{N} \mid \mathrm{VQTALDSND}$
 NVAMQVAADSPKYVSEEDI PEDVRAHEKEILLAQAENKRK QVAMHVAATNPMALTAEQIDPAAVEREKAI FSDQARQSGK DIAMQVASMNPKFLDRSFVDPEYLAHEKE！LRHQVLNEGK QVAAQVA MTSATDVD
DVAMHIAALNPKFVSRDQVSEEELAHEKEILKQQADNEGK SIAMHIVATKPLFLSKELVSAAALENEREILRTQAESSGK DVAMHVAALNPKYVRREEVDEDVVNAEREVLKQQALDEGK QVAMHIAATNPRALTSDDVDATVADRERNVFI EQARESGK
 DVVKQVA
DCAKTI DATGVKTVEE
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ENDPADVEALKACKM
NVANTI
DVAMMV


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 PEKAI EKMVMGRLOKFYKEDCLVDQEF：KDPDKS：STLLK A AD I EKMLEGRVRKYYEEVCLI EQRFIMDGETKISKVIE
P
P

## P P

 A VEKEN

WFKDESETVVNDVIK
PE HVEKMVE GRLNKYFEEICLLEEQSFVK DPDQKVKQVVA PAGEK VIGRLEKYYQENTLTEQFIKDGNZKVSDVLS
 PEKII EKMVEGRI NKFYEEVCLLE QKF V
PA NVI E K IVV E S G L L K T Y Y K E V V CLL L D Q A F

 P Q N V I D K M V E G R V R K Y L L Q E V T L L E Q P F IV K D P E R S V A A L L K
 PEDLEA LMACELNGQD
 PESDI EKMVEGRI RKYYEQVCLLEQDFVIDGETKI RKVVE
 P E NIL L E K MLLT GRLL K K EMK E I CLL L D Q E GSLE QLLATV




 S QMAMD K MVVEGRLLRKYFE EVVVLME QK YVVLNDSTNNI KTVVL N

 P A D L E R

TAAEYMGTGRTVSETLN

 P Q DII I D K MI E GRI S K F V D EVVSLLGQP Y V K D P N K K V G QL L K
 PEQVLEK DAAGKLGKFYKENCLVDQEFVKENHENVQTYIN A A MGQKMANGS
P EAMDEKDTES GLKTFFKEQT LLEQP FDIFD DKKSVVGQAL K

 P E N V V V K M V E G R L A K Y M E E VVLLE QK Y VA DETKWI N VL L K L E D F Y K Q S C L L E Q P F I K D D Q L T I K D Y L T
P E QVK A K I DE G K IVK K F Y T EVVCL LDD T FVVRS D D G S V S G YVA HAAMVAK』GE

## $K T V A T L V T$

PANIIEKMVTGR\NKFLAEDSLDDQEYVKDPDQTVAKYVA P


| UniRef90 G9QMU1 | $\begin{array}{lr} \text { S K G A } & 130 \\ T \end{array} V \underline{K} \text { D F\|V\|RFEVVG }$ |
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| UniRef90-R7CRC6 | E AVAKI GENI SVR |
| UniRef90-R6GRQ7 | K VGK SVGAKI T L K K F TR F VM G |
| UniRef90-UPI00035FFD3B | SNIA K I GEKl SLRRF |
| UniRef90_C7LR50 | NAEIVRFFRFA 1 G A |
| UniRef90-D3SMY3 |  |
| UniRef90-R71490 | ETAKAAGTTLDI VRYV |
| UniRef90-K6CUI7 | SKGA SVK K F |
| UniRef90-K8EHU5 | SKGA SVVITVR |
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| UniRef90-B9XRC6 | SVSKQL GDEITVVGFVRFQVG |
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| UniRef90-G4Q322 | EAI A KI GEKVDI R R F SVYEYGS |
| UniRef90-R9NG52 | A M I A K IGENMN |
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| UniRef90-U2WCP2 | NAASDTGGEVKLAGFVRFGLG |
| UniRef90_S2XLD2 | NAIA KI GEKI TLRRRV |
| UniRef90_UPI00047D5AEE | GQIA K I GEKI SLR |
| UniRef90-R5YN34 | EFAKENNTDVKLGGFVC |
| UniRef90-N1ZWS7 | KVAKENNANVTVTKF |
| UniRef90-B4D1W9 | EKSKELGDELVIRRFLR |
| UniRef90-UPI00037645E0 | AKSKELGDTLKLVRYERFS |
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| UniRef90_A8TUK8 | A A AKDVGAPVTLKAFARLQ |
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| UniRef90_XOSI90 | NK G |
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| UniRef90_B4U9Z9 | A N NVTIKGFCRFELG |
| UniRef90-E3DRX3 | A A $\square$ A N $\square$ GENINLRRFKK |
| UniRef90-C1A3Z2 | GASARTGEAVNVKRTARFDAGA |
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AI AKHVA ATK

ADVTD ${ }^{\text {A }}$ KVAMHVAATNPASATTEDLDPELTDRERQVLTDQARESGK DLAMHIAASKPKALDASGIDAELIDSERRIAAEKAREANK DLAAHVLAHAPTGATDEE
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## PE

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P

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## P

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E A A A ANTVNVAYNHMGGVI GTLVALEVVSDNLKDNATVKELGK
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 TAEGVVGTYLSADGKLAAMVELNCETDFVAKNDDFDGLAG SDEYIA HYVHSDKKTGVIVVLKSDKPAVLIDKTFQDFAY A AEGLVSSVYKLURSAVGVLVAYTGSGDEAGNA ASEGAlATYLHSNNKIGVAVSVTGE VVTAYMHRTNKVGVLV A T DAAGAEVAR TADGVVADYDDEPGKIGAIVEDNSETDFVAKNADFDAFAN $\begin{array}{ll}A K G A V I P Y V H N A G K & G V L V A L E S E \\ D D E V F G N Y S H L G G Q & S \\ D & A L L\end{array}$ ANEYVTSYIHGDGNIGVVVKLGADKADVLQKEEAKALAF TQGVIEAYI HTGGGI GAMVEVNCETDFVARTDEFKELAH
 GTIGAYIHSDGRLAALVSLD
 FVGSYUHAGNKA ATLVGLSAEVDGASNVDGVEAGK
 AAEGAVMDAVSEDGKRGVMVEVNCETDFVAKDASFAAFAE $\begin{array}{cc}E G N L A T Y V & H A G G S V G V M V S F D V A D E A K V A M A E F K E M G K \\ G V & A S Y V\end{array}$

 VGSYLHMGGKDATI AVLDGADTTVA K

 ASNGLDAVEEHVGDSDAALLEDNCETDFVAKNERFQALAR $\square T$ S Y L H QR S AVGVLVVAYN GS GE EA A Q G A A A DNQVFGTYSHMGGKVVTLAVLEGTDAEVA





 GK GVLVALQSNGD KA KKLAAFGR A Q GRLDTYVHGGAK』AAMVDMIGGD EELAH
 SANGVVSSYLHTSGRMVGLLTMESEKGGAPTEVLQRVGS
 AAEGTVQSSVSADGKRAVLI$E \operatorname{EVDCNTDFVARNDDFDAFAR}$ SEGVVSSYVHSAGKGGVVAGRSSGD AGEKDSFIGE
 VVGAYVHSNNRDAAVALSGGDVETAR
$\begin{array}{ll}A K D G F V Q T Y S H D G G K L G V I V E M S G E & \text { G } \\ \text { TANGKVASYIHNAGKVGVLVALEGTGD }\end{array}$ TANGKVASY HNAGKVGVLVAAEGTGD SHGVLSTY LHASGRIA GVVSLDVE DSSAPLDSVRTVGS
 FI DSY HTNGKVATIVGFSGGD KEVSHEVGK






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HIAMHVVAA


$N$ N ALQVGAYPTPYLNKESVPASVLAEEQKVVEEQPKNANK


QVA LQQ:A A LIKAQYLTREDVPAEVLEKERSVAEQDTREEGK










| D | A |
| :--- | :--- |
| R | V |


QI AMHVAAANPLSVDDDGLDADTVARERAVAAEQARES GK


E M A D H
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 PDNVKEGIVKGKLNKHLAEI CFLEQAFVKDDKVSVAAKMK PEQA TPKIVEGRLNGFYKDVVLLEQPSVADNKKTVKQLMD LLEDWNEDSKKVKDALV SRETAEKMLEGKMRKFDAELTLLGQPFVKDANQTVAQLLK PEKALPK TVEGRLNGFFKENVLLEQAFAKDAKQTVGKVLE PADVAAPAEI DEKMVDGAVKKFAKENALLSQLFVMDGKTPVSDV PDSIKEKTVEGRLGKFLDELALLNQPFVKGDGETVAEYLK PANVLDNLKGKUSKYLADUCLMDQGFVKDEKQTVAQTLS

## GADI EPETA

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| UniRet90-D2R7E | K $L^{\text {K }}$ |
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DLAMHI A A SKPVCVSSEQVSPELLERERQTYTAQAAESGK DVAMHVAASNPQFNKADDVAPEVIEKEKEVDKAQPDMEGK GVCLDI AAMNPRWVNRDEVPADVVDHERTVAADMAREEGK DVAMHVAAMNPAYATQEDVPAADI EKERAFLTAQVEDSGK DVCMHVAMYNPRYLDEQSINHEDLAHEEEVIKAEIANEPK
V A MQVAA LKAKYLTREDVPEEVVAKEREI AKATAKEEGK DI AMHVAAVNPRVGKPEEMPQDEVEKEKDI IRAQPDMEGK DI AMHVAAINPSVSHPEKMPQAELDGEKAII MAQPDMAGK QI GMHVAATRPAALEVASVDPQSLERERAVLVEQARESGK EVAQHIAAFGPRWLSREDVPADTVENERRVAEATSREEGK LVAEAAANSDAADV

EALSAVATAEGT
A MQ D $\square$ AMHVAAFNPLCLSKDDLDQEILNRERAI YENQAKDSGK LA MHI A A A RPRYL SREEVPAEAVVTERRVAEQTAKEE GK DVAMQVAAMAPVSVDKDSVPADVVETELRI GREKAKEEGK DI A MHVAAAKPKALTAAEVSTDLI DTERRIADEKAREAGK DLAMHI AATKPKALNADGVNAEDIAAERSVAEQKAAESGK QI A M HVVAMKPEALSDDDLDQMKLNNERSI DEEQVRSDNK DI AQHAAAMAPQYLKADSUPAEVVEKERKLFEEMTREEGK DVAMQVAAMNPDSVSRDEVPADVVAKEDEVAKDKARQEGK DI A M HVAAASPQFVKPSDVSPEVVEKEKEI Q DD DA DQSGK KVAMHVAASRPEFVNPEDVSAEVVAHERQUQIDIAINSGK GMQVAALKAKYLTREDVPAELVAKEREIAEATAKEEGK
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$D V A Q Q \| A A M S P K Y L T R E D \prod P A E A V A K E R A L A E Q L T R D E G K$ EI AMHIVAERPQFLSREEVPQEVIHRETEVDSSQT EGGK QVAMHIAAQNPAALSEADMDPAVVEKEKQVQMDDARESGK DCCDHAAAFMPLYVKKEDVDAAYIKEQEEIFKGQVAEDNK EAVKLVA
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 D $\operatorname{A} M Q V A A M N P V A V L P E E V S E H T I E Q E R T I A K E K A E E A G K$ KLAEGVANNN

PADLL ELSSNLI F
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 VEEVRKK
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## P


P





 P QAVVDKII SGKLNTFFKETCCLEQAFVKDGKKTVAKVLIE P E Q V I E K M I V G R M K K F F V A E S T L L PADVAA LLELPDLVKDDKLSVVGKKMA P A QUV K E K I V M G K M N K F Y E E N C L L Q M E F V R G D S G T V E Q Y i A





P E A MLD K I A A E G K V N K F L K E N T L L N Q D L V K N N K I S V G T Y I K P E A A L P KI I E G RL G GFFFK DVVLLLE QP LAAKDP KK S


 P A E IVV E K MV A G RIV S K F L A A E A S L V E Q A F V K D D S I K V G E L V K | $P$ | $E$ | $A$ | $A$ | $P$ | $K$ | $V$ | $E$ | $G$ | $R$ | $L$ | $N$ | $G$ | $F$ | $F$ | $K$ | $D$ | $A$ | $T$ | $L$ | $L$ | $G$ | $Q$ | $P$ | $Y$ | $A$ | $L$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $N$ | $K$ | $K$ | $S$ | $V$ | $Q$ | $K$ | $V$ | $L$ | $D$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | PANI I DRIVVDGALQKFFKENTLLQQ





 | $P$ | $E$ | $K$ | $V$ | $D$ | $K$ | $V$ | $E$ | $G$ | $M$ | $G$ | $S$ | $F$ | $Y$ | $K$ | $D$ | $N$ | $C$ | $L$ | $L$ | $D$ | $Q$ | $D$ | $F$ | $A$ | $K$ | $D$ | $P$ | $K$ | $K$ | $S$ | $V$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
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| $P$ | $D$ | $A$ | $I$ | $E$ | $K$ | $M$ | $V$ | $D$ | $G$ | $R$ | $I$ | $R$ | $K$ | $F$ | $Y$ | $E$ | $E$ | $V$ | $V$ | $L$ | $L$ | $E$ | $Q$ | $V$ | $W$ | $V$ | $H$ | $D$ | $G$ | $E$ | $S$ | $R$ |
| $V$ | $R$ | $K$ | $V$ | $E$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |





 P E K I W W K II I P G K I E R F Y A D N T V L D Q R Y V M D D K K T I E Q V I E




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| UniRef90_U7JKM1 |  |
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| UniR | S |
| UniF | DAG VTVIRFVRLEVG |
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 NLAK V A VNNPKDI D
HVAMQVAAFNP\AVDEANVPADTLAREKD\｜IEAKAKESGK AVAKAVAVHNPATLE A LIAEAK DLAMHI A ASKPKSVDASGVNPEDワATERRワADEKAKESGK NIA MQVASMNPSYI SRDYMPKEIVDHEREI QVQLLNNANK A AAMQVAALKAKYLTREDVPSDVVEKEKAVAEQVTREEGK DMAMQI ASMSPQYVSQAEIPSEIIDHETNIQVEIVKNSNK QLAMHIVAAKPEALSDDTLSSDVVDRERELVARQVEALGK

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## P 는

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P

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$P \square D\|I E K\| V D G S V Q K F \square K E V T \square M S Q A F D K D E K K T V K Q M D D$

PEEDAAK DATGK LGKFYEEVCLEEQKFIVKDSSLSVINVVK



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## P

$\stackrel{P}{\mathrm{P}} \mathrm{L}$ PAQAI AKLTEGRLNGFFKDVVLLEQPSVTESKKSVKAVLD PEAGVPK VQGRGEAYFKENCLVDQAFARDPNKTVAQVLK PENMIENUAKGKLQKFFKENTLVHQAS苗KGKVAVQDVVK PEAVIEKMIIGRMKKFMAEVTLLGQAFVVNPDLTVAKAAE PEAMLDK AEGRLNKFYKESCLLEQEFIMDPALTVEKYGK PANGLDNUKKKMQRFYKDNTLVHQDFVKDGSVSVADYVK
 — PDAVIEKMDTGG■QKY■NEVTLLNQPYVIDNEKKVGDILK T
PEAMLEKTAEGTVQKFLKEVTLLGQVFVKDGKQTIEQLLK PEKVKAGI LEGRLSKSLQDMCLVDQEYFLDTNLKVKDFLK PEKAIPKVVEGRLNGFYKDVVLLEQPSLEDSKKTVAQVTE
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DMVNKPALPHDKYGSKSQLTDE\TAQAEEDTKAELKAEGK TAMHVTAMNPKYTTPEEIPTTTVEKEKETWVEQLKRENK NIAMHITAMNPDA!DKKEIPENLMKKELEI IRFQIEKEKK DIAMHITAMNPIAI HEKEIPHSLMNEELEIDEDQVQKKNK DVAMHLAAMKPVALSSEGVSPELTERERSVAAQKAAEDSQ AAMKA RYLNREDVPAEVVEKEREIAEATSREEGK AMVNKPADPHDKYGSKAQLTDEVIAQAEEDDKAEDKAEGK LSMHTAANKPVYITTNDIPAEA ANETADQMEDEKLKGK NVAMQVTSMHPVSVSEADCPKETVEMYKQQ1AEDPKMAGK DMVNKPABPFLKYGSKAQLTDSVLAEATESITKELKAEGK EAALQTSAMAPQWLSREDVPADVVESERRVATEKSLAEGK QFAMHIAATNPVSLSEATLDPTLLARELLEVTAKALEENK QVAMHVAATNPAALNEAVLDPAVVEKERQVQDDWARESGK GTAMHVAAMNPPYVKAEDVPADFI AREKDIALAAMKEKNK NIALDQILGMKPDYITKENIPADVLQKEDDRIKAEFGDSGK SIT TQLAVMNHKYGSEKQLSDELLAKAKEDIKAELKKEEGK NLADHCVVNTPKYLKREDVPNGEVQKEKEVLLEQVTKEGA DVAMHVAAMKPVALSAADVPAALIETERSTAMQKAAEDPQ IAABISFADPLYVTRDEVPAADVEKEREVVTEDSKNEGK DVAMHIAAMKPVSLSSNEVPAELIEKERSVAQAAEGKPAQ GCAALVANQNPDALSSEQVPAEMTEKERSVAEDVAALSALL AVHAAAFAPTYLTRDEVPADTVENERRIAEETARAENK NLALQVACPSVKYVRADQVPESERARERAVLEEQEDVKVR QI AMHVAAANPAALDEASLDPAVLAKELEIQTQKALEENK AVPPVTSAMPLAVDADGLPQADLDEARKQYEDEAKATGK EVAMQDAAMNPKDVD
QVAMHASAMKPQYVSMMQLTDEVMAKAEADDKAELDAEGK K!AKLDTENTPDNLDQ
KMVNKPALPFLKYGSKSQLTDEVIAQAEEDTKEELKAEGK QLSMHTAASNPLALSSDLIDKDLLQKEQDLVAEELKNSGK EIALDUAAMEPKNVEE
AMVDKPALPHDQYGSKAQLTDEVVAKAEEDTKAEDAAEGK D IAMHVAA INPKYTSQDEIPQVEKDRQTEDMANDPKLANK KIAMHIAASNPKYISVKSIPNITKENEKMIYПKSALKNGK K VNKPABPHLKYGSKAQLTDEVITAQAEDIKAELKAEGK QVAMHTTATNPDVLSPSDISDEIVAKEKETMQQDPKNTGK KLAMHVVAARPQYLSPERVPGEVLKKEKEI LLKQMEGSGK QLSMHI AASNPLALEPSLIDQSIIDKEQELVTEELKNSGK STLKTIVDQK KNVKFNDEQ DVAMHVAAMKPVALTSADVPSDLIEKERAVAAGKAAEDAQ DVAMQAAAMNPVALNESGVDQSíIDKEDEปAKDQLRQEGK DAAMHIAAMKPVALSAQDVSAELVAAEDAETAKAAGKSVQ DVAMHVAAMKPVALTSADVPADLIEKERNVAAGKAAEDPQ DVAMHIAAMKPVSLTSADVSADLIEKERAVAAEAAGKPAQ VAMHVAAMNPEFIFVTDMPEKRVSETKAKFEEPNNFASK I AMHVAALDDEYIFVKDVPQEQUKKLEQEFKASPADAGK DI AMHVSAFNPDCLSQDDIDKDRLEREKADYQNLAKDSGK S SMHTAALNPDYIFESDVPAEKMSKGQQEFASSKVLEGK QMNHKIELPHHEFGSKSQLTEEVLAAAKASFEEELKAEGK GVAMHVAAMNPPYNKAADVPADFVAKEKEDELAKMKDKAK

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| :---: | :---: |
|  | PA A |
| UniRef90- UPI00036717 | PPHVLEKII |
| UniRei90-UPIO0047100AC | PENLLDR |
| UniRef90- ${ }^{\text {K }}$ X | SQMAMDKMVEGRLRKYFEEVVLMEQK |
| UniRef90-10x7D0 | PQNVKDGTLQGKVNKHLAEICFEDQMFVKD |
| UniRef90-D7BN24 | PEAAVAKIVEGRLKGF |
| UniRef90 C1MKD 6 |  |
| UniRef90 UPIO004718055 <br> UniRef90-F8KWI2 |  |
| UniRef90-F7WZ82 | SALLLQRII DGRMKK |
|  | PADIVAKMVEGS |
|  | PLNUQEKDQEGWFNKQLSEFVL |
| Un |  |
| UniRet90 O83NN3 | P |
| UniRei90-FOSJS8 | PENLVEKIVEGRMKNFYSDQGVLEQAFAKDEAKTVAQVL |
| UniRef90-T186M0 | PEAALPKIIEGRMNGFFKQVCLIEQDYAKDDKQSVSQVL |
| UniRef90-P61330 | GRMKKFTGEVSLTGQAFIMEP |
|  | 硡 |
| UniRef90-12F9, | PEQ WDKILPGQMERFLADSTLLDQRYVMDDKKTUAQVL |
| UniRet90-x | N |
| UniRe90_B3L4FO | P ENV |
| UniRe990 R7GK | N VKM AGRLNELKALC |
| UniRef90-UP1000 | QALTKLVEGRLTGFFKEGVL |
| UniRet90_S6110 | ElVEKMVAGRISKFLAEASLVEQA |
| UniRef90-C9LG69 | PENLVERUAEGRMNAFYKEATLLNQDFIQDSKVTV |
| UniRet90-K1S7V4 | PQNVLEKIVDGRMRKFAEEICLLDQPYVKDPNL |
| UniRef90-S3DL99 | SSE\\|VER\|VLGRMKKFVNELSLTSQNFVMEPKKTVG |
| UniRet90 |  |
| UniRet90_UPI00047 |  |
| UniRet90-Q9F | PADILEKIISGKINKIVKEVTLYGQPYVLNAD |
| UniRef90-UP | PEQURDKLAQGKLNKWFKEIALLPQEHINPD |
| UniRef90-K1YCE7 | RDG |
| UniRef90-K1ZV95 | KIWENIMKGKERKFREENSLTKQAFVKNP |
| UniRef90-G8LRO2 | PDQUKEKMIFGKTKKFПMENTLLNQKYIKDNN |
| UniRet90-M4ZTX9 | NUIGGKIKKFlLENTLLNQKFIKE |
| UniRef90_C3X | RRVE |
|  | S |
| UniRe990 Q1G9N7 | M |
| UniRe990 R6SEW2 |  |
| 5R |  |
| UniRef90_UP10003602 |  |
| OL | PEKIVPKIVEGRLQAFYKEVCLLDQAYVKDPSRTIADLFR |
| Unip | PEAVIQNIIPGRMKKFVAENTLLGQAFVINP |
| UniRef90-A3VWT1 | PDAVIEKMIVGRMAKFMAEVTLMGQSFVMNP |
| UniRer90- UPIO00047C18DB |  |
| UniRef90 UPIOOOO6CE5B1 | PQAVVDRMIEGKLKKFYEDNVLYDQTLLTDD |
| UniRef90-Q044C9 | PEKIWDKIIPGKMQRFDDDNTVLSQNYIMDDSKTVG |
| UniRef90-X6N152 | EVQ |
| UniRef90 Q2GC15 | PASVAEKLIAGKLSKFYKKVVLLEQPLFSDPERSVKQYIS |
| UniRef90-E6P | PAEIVAKRVEGSVQKYLKEVSSLFNQAFVKN |
| UniRef90 UPIO0046AF92A | PEAALPKIVEGRLNAFFKQVVLGEQVHALDDEKRDVKKVA |
| UniRee90-A0AO31GRE0 | SPEULAKRLEGSVQKFLKEVSLLNQAFVKNDKLSVEQMLK |
| UniRef90 K9DFA7 | R |
| UniR | L NGFFKEIVLLDQPFAKD |
| UniF | K |
| UniRef90 S9S | PEA RNN1 DPGRMKKFVAENTLLGQAFVVNPDQTVAEAAQ |
| UniRef90-10IGA6 | ATK AEGKLINKWKDERTLLGQTY |
| UniRef90-017YZ8 | DKIVLGKMERF 1 ADNTLI DQRYVMDD |
| UniRef |  |
| UniRef90-S5R1C1 | - |
| UniRef90-G5J | DK\PGKMARFLLDNTKVD |
| UniRef90-04FM68 | D UAQKUSLGKMNKFKEENALLTQAWV |
|  |  |
| UniRef90-R5QQB8 | QEFIKTPKES |
| UniRet90-Q8D2G3 | TKEIAEKISNGKMKKFFEKDALEEQFFI FDDTKK |
| UniRef90-K0 |  |
| UniRef90-K2A | E: MLK I EGKM |
| UniRet90-W9E1F7 | PDD ${ }^{\text {a }}$ AKKISLGKMNKFKEENALMTQAWVMEPKKKVQD |
| UniRef90-WTKFPO | KDQ LQFLQNNTLNKE TEGTKNE NMD |
| UniRef90 UPIO0037 | SPEVVAKRIEGGVQKFLKEVSLFNQAFVKNDKQTVE |
| UniRef90_COBP7 | PEAMLDNUAKGK TRFMKDNTLVNQEF KDS |
| UniRe990_U5N3V5 | EVAKRIEGSVQKFLKEVSLLQQPFVKN |
|  | EIVTKRVEGSVQKFLKEVSLFNQTFVKND |
| UniRef90-B1XXJ4 ${ }^{\text {den }}$ | SAEVVAKRIEGSUQKFLKEVSLFNQTFVKNDKQTVE |
| UniRef90-EOTK52 | PEKKQENILRGMMNKELAKYVLVAQE |
| UniRef90-LORUQ7 | PVQ QEKIQSGWFDKQLSEFVLEKQPFVMEDSLSVQK |
| UniRef90 UPI000473 |  |
| UniRef90 | PENIKANILKGMISKELSKFVLEYQDFAMDSAISVSKYLQ |
|  | K1 WD K |
| 90-2 | WDKILPGKMAKFIVDNTKVDQQFIMDDSKTVEAFLE |
| IRe990-UPIOOO379985C | AVEK GGKIAKTVNENLYGQAYVLDTDKS |
| UniRef90_D8THC1 |  |


| Un |  |
| :---: | :---: |
| UniRef90－G7K | QS TAA AGENTKAGR |
| UniRef90－UPI0003671FA | EAEKHAGAPVTLVGF |
| UniRef90－UPI00047100AC | GVSKTL |
| UniRef90－K3XR06 | DLSKEVGSKVTIIGKF |
| UniRef90－10x7D0 | ETGKAVGATLSFA |
| UniRef90－D7BN24 | AAGGK |
| UniRef90＿C1MKD6 | GADGSLG SLHVS |
| UniReef90 UPIOOO4718055 |  |
| UniRef90－F8KWI2 UniRef90 F7WZ82 | QKGKDL KVOLLS SGERWT |
| UniRef90－A0AO |  |
| UniRef90－UPI |  |
| UniRef90－AOAO59K | GLIGK】GENMT RRFKRYEGGG |
| UniRef90＿Q83NN3 | ATG ${ }^{\text {a }}$ ， |
| UniRef90 FOSJS8 | AKLKAKAFVV |
| UniRef90－T1B6M0 | A |
| UniRef90－P61 | KNATVTSFVRVEVG |
| UniF | SEALEMI |
| UniRef90－12F9， | SKSQELNDSUE\｜VEYVRFELG |
| UniRe90－X0xik8 | MNTS |
| UniRef90 B3L4FO | DFCKKHDMNTS |
| UniRef90－UPI00047EC472 |  |
| UniR | KAGAE GVSFTYFKVG |
| UniRef90－C9LG69 | QADKDL TAVA |
| UniRet90－Dowr47 | G |
| UniRef90－S3DL99 | Ent ${ }^{\text {a }}$ |
| UniRef90 ${ }^{\text {K2AS02 }}$ | EAlakLGenlVVKDF |
| UniRef90－UPIO00471 | AAGAE VIGF |
| UniRef90＿O9PAD9 | AAGAD |
| UniRet90－UPIOO047D9613 UniRet90 K1YCE7 | QLIGALSGENIVIKRFII |
| UniRef90－H6PCS2 | SV V ${ }_{\text {V }}$ |
| UniRef90－K1ZV9 | TAK1 A |
| UniRef90＿G8LRO2 | SFSKNKNSY |
| UniRet90＿M4ZT |  |
| UniRef90 | L |
| UniRef90 U3GUY8 | EAG ${ }^{\text {S }}$ ，VKGTGFVRYEV |
| UniRet90－R6SEW2 |  |
| UniRef90－R5RR | TADK DAKVLAFR |
| UniRef90－UP1000360 | NATVDT FT |
|  |  |
| UniRef90 UPIOOO39A54C1 UniRet90 A3VWT1 |  |
| UniRef90－UPIO003656432 | AA NTTVTRFARFEVGA |
| UniRee90 UPIIO00047C18DB |  |
| UniRe90＿UP1000 | EQCKQQNS Q |
|  | EKGAKL |
| UniRef90 X6NI52 | NSSKKLKFDVQUKFVVF |
|  |  |
| UniRef90－UPI00046AF92A | EAAG TVTSFARSKVGA |
| UniRef90－AOAC | A A ${ }^{\text {a }}$ ，SVKGFAMYVG |
| UniRef90 Q47Fs | VGK】GENMTVR |
| niRe990 K9D | A ${ }^{\text {a }}$ SNTTVKAFTMYVVG |
| UniF | G A |
| UniRef90－S9 | AAG VTVTGFIV |
| UniRef90－101GA6 | GVEITGF |
| UniRef90－Q17YZ8 | ELNDTLEITEY |
| 2201Z4 | GKVGENIKV |
| UniRef90－EOUUT7 | T A |
| UniRet90＿S5R1C |  |
| UniRef90 G5JW | VKA A F VRFEVG |
|  | N ${ }_{\text {d }}$ |
| UniRef90－V7HY54 | SVV DASVVTFV |
| UniRef90－R5QQ | AKVLEM |
| UniRef90－O8D | NTYIKKFlRFEVG |
| UniRef90 Kon | S |
| $\begin{aligned} & \text { UniRef90-K2AW } \\ & \text { UniRef90 } \end{aligned}$ | G |
| UniRef90－W9E1F7 | DLK KEFFR】K】 |
| UniRet90＿W7X | N |
| UniRef90－UPIO0037 UniRef90 CobP71 | EVK |
| UniRef90－U5N3V5 | AAAT ETVHAFTLY |
| UniRef90－A2S | AAST TIKGFTMYIV |
| UniRef90＿B1XX | AAGT KSVVKGFTMYVV |
| UniRef90 EOTK52 | TNHSET SKVLS |
| UniRef90－LORUQ | NH N |
| RRef90＿UP |  |
| UniRef90－C5 |  |
| 7J | SKDAKA |
| UniRef90－Q9CDR5 |  |
| UniRef90－UPIOOO379¢ UniRefo－D8THC1 | ${ }_{\text {ACG }}$ |

UniRef90 UPI00047B4F61
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UniRef90＿G7SQ77
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UniRef90－E6X4L5
UniRef90－F7HSY3

UniRef90－R7B0K8
UniReffo－C4ZA77

UniRefgo Riva
UniRef90＿U6MIQ4
UniRef90－J1U3E9
UniRef90－R5EL23
UniRef90＿LINET8
UniRef90－R6CRF3
UniRef90 R7J1A5
UniRef90－Q5L8W8
UniRef90－J9GQM2
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UniRef90－G5BEB3
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UniRet90－R5AW33
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UniRef90－U6GHJ3

| UniRef90－UPIOOO41C2312 |
| :--- |

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UniRef90－A7SPW6
UniRef90－G7KPJ5
UniRef90－B4JC90
UniRet90＿R6Q021
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UniRef90－AoCRL1
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UniRef90＿C5KE57
UniRef90－W5HAA6
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UniRef90－R7SFUO UniRef90－TOYEG4 UniRef90－R6ETZ9 UniRef90－UPI0002B472E1 UniRef90 T1KRD7 UniRef90－UPIO00190FD13

10 TT R T 20
40
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VVS YVHHDKTKAAAVLGEGD
AEAADR
QADAY
 SENSTFTNYLHNKSKI ASVVEDSTND TKKASEDSDDGK SDGVVVSYIHAGGKGGVVEADAQANETVEASMKTMAMQ EQS

 SEGVISSY四HGGK■GVLVEADAPANDAVTAAEPDTLPK
TKDGLVHAYTHGTGRVGS VVLACETDFVAKTDDFTK■DH SSEGAVTAKVNADNTKGAI VSLNCETDFVAKNEAFVALAK VAVSYIHGGGRDGVIVAANGADDAAR EALT
 AAEGTVLAVVKDDKTAAYVEVNSETDFVAKNDKFKTFVA AAEGRIGTYIH

VACYRHNNGRMSAF／VILN KDLKDEDTY FVTNYTHNN Q■ATLVGFNSVID KKVAK

 QGFVFSYAHQAANLVVLLHLSYSLLQQQQQKQLRHFGK TKEGLIGG LLQEGNTTVLVEVNCETDFVSRNLKFQQLVQ
 $\square$ IESYロHQR RVGVLVEDSAESDFATFTDEFKTFAR VVTSYGHGGGRDGVVAGTGASDDAAK TEAEADT


FTGDYVHFNGKLGATVAFNKEGKAVAQKDEMVQKAV $V$ VS YLHGGGRUGVLVAGEGAADDSVKEALGNVAMQ
 VTSYNHFGNKLSTIVSFNLEGVDAQTKEELVKKAV SYQHHNSKLGVLLTGKKNNPSTT $\square \mathrm{D}$

A VEAALK
TSQGLIGQLL GDRTAVMVEVNCETDFVARNETFQQLVH TKEGLIG LQQDGAAVLVEVNCETDFVSRNEKFQQLVQ TKEGLIG $V V V D Y L H G N G R D G V V A G N G A S D D A A K$ EADKNVAM AKEGLIGLFVGDKAAVMVEVNCETDFVARNEKFQQLVK TAQGLVGVLI RGNRGAM回回NCETAFARNDTFKRF
TKEGLIGLLQEGNA AVLVEVNCETDFVSRNSKFQQLVQ SEGILNAYVHNPGKUGSSVLMKAEDKK HNAELEALSQ AKEGLIGGVLKNDSAAVMVEVNCETDFVARNEKFQQLVQ ATEGLIGVIVHSDMNLGAMVEVNCETDFVARNENFVDLVN TAEGRI GSYI H DSRUSVLVEVK TTQGLVGVLV SGNR GAMVELNCETDFVARNETFKRFVD AKEGLIGLDF GKQAAAMVEVNCETDFVARNEKFQQLVK KKEGIKEYIHKNGKLGGLVAFN TKEGLIGLLQEGNA AVMVEVNCETDFVARNAKFQQLVH $\square A A Y R H$ G $\square R \square G V V V S Y E G G D A D T-G K$ TNNSIFGVYQHNCLKSGSVVELITEGLNDVKSQULREGAN

KKAGDNANLV
TTEGLVG LLQDGNTSVMVEVNCETDFVARNSKFQQLVQ TDEGTVAVLLGGKRVA MVQLACETDFVARNDVF GKAAR TTQGLIGVLVKNN IGGMVEVNCETDFVARNVSFRKFVE TAHGVVYSYVHSAGKLAVMVGKSGQGGGMVDEDALAFIGK TKEGLIGGLQEGNTAVLVEVNCETDFVSRNLKFQQLVQ MVETNCETDAGGKKAG\｜NPAHV
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UniRef90 UPIO002B472E1 UniRef90-T1KRD7 UniRef90-UPI000190FD13 UniRef90_T1JEJ1

NI AMMASAMK 50 - 60

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80 (V) NVSMH $V$ TALNPSYLSEDALDANELKEDHERLEKSPALANK NVAMHVAAMAPKYINMDQIPDDEMHKIKEQAKDDAKLQAK QVATHAVAFPPAVVSKDQLSQEMLEREDETETQRAMNEGK NVAMHVAAMAPKYINMAQ1 PAEFKEAEFHITKEQSKEDPK VCMHSVAMNPEFTFESEIPBVKLNKDKSDLSQSPALVGK
 NISMHVAALNPQYILKVEVPNEQLEVEKKAFAEVKNFEKK
 NISMHI TALLNPSHLFESCLCEVELKEDHDRDDASPALANK EI AMQVVSMEPTNVEE
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DLAE\|ALSVNSK
EELLASDYKGDTVTEKDTEQ NIAMQVAAMNPTYTSRNDTSAEELDEDKADYEEKKSNMNK HVAMHIAALNPAHLFETCLDEEELKE $\square Y E R \square N N D P K L A S K$ NVANQVLATSAKDID
DVSMQVASMVPEFISMAQLSPEVLAKAEEDAKAEDTAEGK DSCIVAALQVQFVSDEDILKTIVAKEKELKMQREDLALK GLAVHYAANNPKFISSDQVDESWINSEREI TTGLEKENK DIAMHVTAMDPDALNEQEDPEYLMKKELETVQHQVKIVKK DLA THVVAEKPKDI DVERYDKEGLEESKKELEALLR SGK QVAMHIAAMNPQYVSAADDEPSVYESFRAPRQLGAANASP NVCMQVASMVPKYISALQLTPEVLKQAEEDAKAELKAEGK QLCLDIAAAKPMA AVEDLPPEVVARERQFALDSLSSSPM GATTKTLKNVPQFISMRQLTPEVIANAEEAAKAELKAEGK

LGKTMKNVPQYTSMAQLTEEVLKMQAQEDAKAELKAEGK NVAMQDAAMNPQYISRDDMSDAELAKLREDIQESALND DSALNDATTLPKP: DNKLIDKA DNEKLWSDDDGNNFNEHK NVAMQПAAMSPTSISE

1 MKGHDTAEQADQDRDTKKAAKAANL $N \prod A M Q T A A M N P Q Y \| S R A D M A D E E V A K L R E I T V D S A L N D$ KVDEDIA $\square Y E E K K S N M N Y \square P N F L S N E A K E K L A E D A R E A D S$ ICLHUAASRPLAVRVEDLPPDMVAQERQYSSNSSKNKDM WI KKLKLTDDVIAQAEAD
 ШAAMEEDRK乌KKETAEEASL DTTTDSALNNEKDWSEDDTQQFEEHKNNMNYVWNDKESTV DAALHKAGINPNLVDSEDLTQEEADKARKDSKETAKAANL KLALHYAAADSTFLTEDQVTTAWVNAEKQKLIRENLLSKNP RVALATMGRHQSTAGSGWITAEDVAKAKEVIATEQKAANLD
QVALGTMLYCQSLK KDQSTYR
QVALGTMLYCQNLKDQLSTYS
QLNKLIAKAVDGVWSAEDVA DYEEKKSNKAQLAEDATADK DVAMQVASMNPVAVDREHVPAEVVESERNVAUEKTKEEQV
DVAFATM ABPARRVEDDPPMVAQERQYSKNSSSSKDK QLCLH AAARPDAVRVEDDPPEMVAQERQYSKNSSSSKDM
 WПTAEQAEQAREपRKTVAKAANL
$Q V A \prod G T L L H C Q T T A D P P S A F G S$
KLL HLAGTDSLFLTKEDVTGEWDSKESEADKESMLKKNP QLALHDAAMRPVYLNKQQVPQEV KQKLLEEGP DVALATMAHHC TVTSTTLAYRRGUI QRNQMFGDQVTHLREFILT

DVTATBHHO
GIVMQVASMNPVSDSAADCPQSVLDSERQVAVEKTKEEQK QAATGTMFHHQGA DSEDHTSNDKKGWLTREEADKA TIDRNTVAAEKAANLN NLAMHIAAFNPVAVDDEDVAADVLAREKDIDEAKARESGK NLAVTYLGLKPKFLYENEVASDVIDLIRK EKVGRDFGSK
DSEDHDASNDTKWLTQEDADKA KQ RRETVSVEAAANGK
QVAVSTLRHCQS
SIAETAAFLDVVPDHPKPVGADPDEVFPTEALLSAPVITM ATSDACFNY
QVAMQVVAKRPKYVQVGDVPKDVLEAERQTGRAAAGGKED
 QVALGTMAHCQNLTDRLSTYS
DSEDHDESNTKKGWDTEEDAAKAREDKKTVGEEKAASLN D $\square$ AHTTAFHAEA

MS K G WLT
EПAMHVMPVVPMAПSRDKVDAADVDEARMADVEGEAN NAALHKAGLNPNHFDSEDITAEDVAKFRETKETVGAEATA ELAMHVVAAKPLFLTKELVASDALENEREILK QLTSSLLSPTTNKPSPSILPNTNLA

## UniRef90_UPIO0047B4F61

 UniRef90_N9VCJ4 UniRefofo R5V476 UniRef90-W5X929 UniRef90-S6G8Z6 UniRef90_W5UT94 UniRef90- Q6F0Q5 UniRef90-J9Z018 UniRef90-R5YSU6 UniRef90-Q601Z2 UniRef90-A0A014NQS8 UniRef90-W8VUE1 UniRef90-NgVDL0 UniRef90 ${ }^{-}$K1ZU49 UniRef90-R5KUG1 UniRef90-K7KNQ9 UniRef90-K2E0G7PEKI|WAN|I I ${ }^{90}$ GQ|IERFITTDNTLLSQAY|VIMNDKQTV|EQ PEKIQQSIKAGLLKKELNEKVLLYQPFVMDDSKIVAQYLA ELLTNPKAIEGLKGKDADEVSLLEQDFVKEDKUKVGQYLK PENIAKNIAQGRVNKYIKAVVLTEQPFYKDPSKSVGQWH PENVAKNUAGGKLNKKLAAVVSLLDQAFVVVDESEKVGQDFLS PENVLENVLKGKLSKRLSEUSLVDQQYVVDESFKVGQFLE



ENKIFNGLVEGRVSKQLKEVCLKQEYIRDGSKTIEDLVK PQMA VEKMVEGRLRKYFENAVFMDQKFIMNDTMNVKAVLD TGVTGEKTEVGSFEK DLLNAEYV DALVSDKUADGRVSKQLKEDCLLDQTYVKDGKQTVAKY PEKLQVSMKSGMLRKEFNERVLMYQPFVMEESKTVQQYLT PEKTWDKTLPGKMERFTQEKCLLDQNFIKDEKKTVAKYVE PENLREKIVEGRTSKRLGGLSLIEQPFIKDDSVSLKDLER PKEFHANVIEQRIKKKI AQEAFVVEPYLYDTSKKIKDRLN
 PEKIWDRILPGKIGRFIADNTLLDQYYIKDESKKVADYVR PEALKQKVLEGKMNKYYKETVLLKQPWVLDDSGSTEKVLK PEKUWDKLLPGKMERFMQEQCLLDQNFIKDEKGNVATYVS PEKGWDR WA GGKMERFIQEQCLLDQNF MKDEKKSVAEYVE
 NEQMDQNLAKGRMNKFFKESCLLNQEYIQDSKDTVADYLK PEQMDQNTANGRMNKFYKESCLLNQEYIQDSKMSVARYYK PASLPKPI LNKLIEKAVAGVWSAEDVAGYEEKKSNMQYLK GDKIFNGLVEGRVSKQLKEUCLLDQVYVKDGKQSVAKYVE PEALKOK VEGKMGKWYOETVLIKOPWALDDSKSTEKVL PEKYWDKIIPGKMDRFMLDDNTKVDQAY M MDDSKTVEAYK
 PA EMIQNI AKGRMAKFFKESCLMNQEFIQDSKLSVSDYLK AEKMFAGVVDGRVSKQLKEDCLLDQTYVKDGKQSVAKYLE NDPNLDSHVEKQURKDISDQTFSSQMFILDSSLALSTLL
 PEDLPGG GDTETRLLAQSLLSQP KGFLNSSELSELPAGPGREGSLKDQLT KAFLNSSELSGLPAGPDRDGSLKDQLA DVIVADK IVEGRTSKQVKEDSL LDQVYVKDGKQTVAKYLE KAHIESNIAKGRVNKFYKESCLIEQEFIKDGNDTI GKFLE NQGQKQK TGYVKSLLAAEDLSKLNLGEDASSLADQLA $P E Q M \square Q N \square A D G A L K N L R T N G D O E F B G R T L G D H A$ STKNVEQVEKQGGLNSSELSELRAVPDREGVLKDQLA ADKALWKM
A AEDLAKMVEG KRAGEVTFTEQAFILDSSTKMSSILE

RVKKQFGEVILTEQ
HELSNLRVEHNNPDSMLLSDMVA
PEQSRSR VEGWपRKR■
 NEN KLTGYKSVLTGDELN KLVSMGEGSSLADHVA A ANLPAQMIEGRVQKFLKECTLEEQDYQMDEKISVKAALA
 PDNTVEK
TPQQQNF VQGKDQNYYSDNVFEHQEY ILNEDQTIKQYTK PEQMILNDAKGRLAKFFKDNCLVDQEFQFGDKQSVAEYLK EAMLQNUAKGRLSKFFKENCLVDQEFQFGDKISVGDWLN PEDGTEPAPDGK NKNY亩TKI

LESENDKQ DQSGEAGTVQQLLLA KGFLNSSELSELPFGPERKGSLKDQLA PDQVLEK पLDGKAAKMRAEDTLYEME पLLPPS

KGFDNSSELSELAAGPDREGSLKDQLA EQMDQNDAQGRLNKFFKENCLVDQEFQFGDKESVAAWLK DAPLMQK PANIV
K LNMUENTAKGRVAKF LKEVCLVNQEFQFGDKQNVAGYपK

| UniRef90 UPI00047B4F61 |  |
| :---: | :---: |
| UniRef90-N9VCJ4 | EN HLLELVDAKRFEVG |
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| UniRef90-Q2SSA7 | S K HVSSLVKMIR Y EVVG |
| UniRef90_W5X929 | ETAK G TKI T D Fil Y L G G |
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| UniRef90-R5YSU6 | EVSKEVGAPVALKSFIRFETG |
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| UniRef90-N9VDL0 | D S K L K L I N A K R F EVG |
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| UniRef90-R5KUG1 | EVSKEVGATVALKKFVRFETG |
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| UniRef90_D1J8T9 | EN K L QL DDATRFEVGG |
| UniRef90-R5NKQ6 | S Q $\square$ A V I G E NLTI R R F VKIIE |
| UniRef90-G2ECP5 | $T Y \mathrm{G}$ D DVTIT NFKRVSVG |
| UniRef90- G7KP13 | Q S 1 A |
| UniRef90-E8ZK23 | D L GAEV |
| UniRef90 ${ }^{-}$G7SQ77 | K F T K GE\K $\quad$ V S S Y R |
| UniRef90-J4DQD8 | E T S R K L G K N K L K K F $\square$ T Y S |
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| UniRef90_F0IGM2 | AF NVVEIT T GFKRVSL |
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| UniRef90_R5QFJ9 | EAA A Q L |
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| UniRef90-R6CRF3 | $S \mathrm{~V}$ SK D D I TE MVRFEVG |
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| UniRef90_J9HUT9 | DRESELLGS P L L I K E WT LF N $\square$ G A |
| UniRef90-W5K2D3 | LT $\square$ G RLGGENISIRR A V |
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| UniRef90_A7SPW6 | K V IG K L G E N $\square \mathrm{K}$ L |
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| UniRef90_B4JC90 | LL I G AVGENAS $\mathrm{V}^{\text {R R A L C F K V }}$ |
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| UniRef90_R9QZ51 | A AI DPEAKVVAFKRFSL |
| UniRef90-M7B9Z0 | $\square \mathrm{L} \square \mathrm{G}$ K L G E N M A I KR A A WVAVP A |
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| UniRef90_X0QMJ6 |  |
| UniRef90-A0CRL1 | E LE D V I K D K VK $\$ G R  \hline UniRef90_D3HWT2 & S LLD K DLTIVA Y K R F T L A A  \hline UniRef90_D1PU81 & QQEK GMKVVAFKRFGLS A  \hline UniRef90_F7AM59 & LA 1 G K L G E N M T MKR A A  \hline UniRef90-J6EWI6 & ASLA QTGENLQLKR AVSFA  \hline UniRef90-U5ES43 & LM I G TVGE N A SLK R A I C Y K  \hline UniRef90_UPI0003C4BD97 & $L A \\|$ GEYFPVGSFSELQL |
| UniRef90 C5KE57 |  |
| UniRef90 W5HAA6 |  |
| UniRef90-Q9CX33 | $\square \mathrm{A} \square \mathrm{\square} \mathrm{E}$ |
| UniRef90_G1WE03 | KQG D L K I L A Y K R F T L |
| UniRef90-R7SFU0 | D T $\square$ A K VGENI SLRRA $\mathrm{R}^{\text {R S V V L }}$ |
| UniRef90-D5EXE2 | AKQDKDLKIVAF QRFTL |
| UniRef90- TOYEG4 |  |
| UniRef90-R6ETZ9 | SQDKD L K $\quad$ E A Y K R F T L A A |
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| UniRef90-T1KRD7 | QA V I Q LGE N $\square \mathrm{K}$ VS R |
| UniRef90_UPI000190FD13 UniRef90 T1JEJ1 | WHVNTLLGEN\} |

lupas_21
lupas_14
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jnet
conf
sol25
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sol0
jhmm
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90
100110 110



lupas 21 lupas_14 lupas_28 jnet conf conf
sol 25 sol5 sol0 jhmm
jpssm


STIVIS R|L|GEN|I|T|L|SRCATLVV
EVAAMVGENVKLRR
LMMDGTVGENASLNRADCY
Q VVSLGENDHLSR



