## QUERY

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 GVGAMYA: I GLDDDEKVABLACTQACENEVVAPVVNNSPGQV GS GKMDAVLNTDAKLI EEI CEEASSVGVVSPANYNTPGQI
 GT G S M A A A I G L
 GE G GMAAVLGMQDDQVEAICA QLSSYKVVQPANYN GPGQL





a GAGGMAAVLGLDDDAVRAACSEAGSA
 G Q A MAAVI
T M A A V L G L D D A KVV E E I C A L V Q E
G
$Q E D E$
$A E G S$
$A E G E$

| $A$ | $I$ |  |
| :--- | :--- | :--- |
| $A$ | $V$ |  |
| $K$ | $L$ |  |


 G E G

A M A A
S M A A $L$
$L$

$L$ | $T$ | M A A | $V$ | $L$ |
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| T | M A | A | I | GAGAMAA V L

## $G$ $G$ $G$ $G$ $G$ $G$ $G$ $G$




UniRef90 UPIO002890CEE UniRef90-14W6H1
UniRef90 ${ }^{-14 V X D 1} 1$ UniRef90-UPIO0037D406C UniRef90_R5E766 UniRef90-W8EUC6 UniRef90_UPI000255D857 UniRef90_R5R5L6 UniRef90-R91HU5 UniRef90-R9YYO6 UniRef9-K6FET4 UniRef90-UPIOOO4660402 UniRef90-B3EUM5
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UniRefgo-H9BV7 UniRef90_H9UBV7

1
M M AVI ${ }^{10}$ D
20 N
GAEVVPANYNCPGQL GVGAMAALLGGDDAQ AAVCDEVAQGQVVAPANFNSPGQL GTGKMVAVLNTDVNLIEEDCATVTSGGVSPANYNTPAQU GLGAMAAVLGMDDAEVMAACADAAQSEVVEAVNFNSPGQL GHGAMAAVI GDDSGKIEEVI CHSGDDNVGIANYNCPGQi


GEGAMAAILGMTGEAVEHVCKER G Li GKGAMAAVLGLDADAVRGVCEAAATNEVVSPANLNSPEQT GQGAMAAVLGLDADAVDRVAQEAAQGDVCQLANENDPTQN GQGAMAAVLGLDADAVDRVAQEAAQGDVCQLIANENDPTQN GEGSMAALIGDDEQDVEEICKTVS

GQ GAMTA VM GAMVTILGLE

GTG
TMAAVLGLE
$\qquad$


## GT



 GQGTMAALKGATLDMAREVCLAARDAGVVSVANVNGAGQL

STG GGMAVVFGLEDNIIEKICQE DKGIIVPSNYNSPGQL GTMAA GMEAAKDEEVLAGV DGVVEAVNFNEPGQT
GKG amanll TMAAVL
G

EGAMAAVMSTDTDLIERVCRE: SQ GQGAMAAVLGLDRDALGAITDAV GSMAALGGDEKVLEDVLSEANTFGTVQAANFNSPGQV

 GGMAA | a |
| :--- | $\vee M$

 EA S T AMAAL
$\mathrm{E} V \mathrm{~S}_{\mathrm{S}} \mathrm{A}$ GKGAMAAI IGGLETAVSAIVEQAQSAGVVSVANHNTQNQI GAGAMAALLGLDDETARSVASEAAEGEVCQAANDNAPGQV GEGAMSAVI GLDRESVERICREASEQGVVEPANYNCPGQL GVGAMAALLGLDFETAQEVASEAAQGDVCQAANDNDPSQV GTGAMMAVVGNNVKEVEDLCKECSSDYYMTVANLNCPGQU GYGGMCAVLGLPGEQVEALTAEWKQGGDLYAANFNSPKQV GQGAMGALVMKLPDRKEVEAVQTVGDGNSLYIANYNGPGQL GLGSMAAILKLNNEKINELLNRASDFGMIEGANYNCPGQV GRGAMSVIIGLSDDVVFELCNKVAQDQTVSPASFNGPGHV GVGAMAAVSGI DKNILQAKCEEYSNDNIIVISNYNSPSQI GEGAMAALLGLDFATADKLAKQAATGGVCQAANDNDPGQV



 E G T M A A I MS R D DCELVV E K $\operatorname{L}$ GFGGMAAVLGLEPDVLEALLK SNTDAVTVANYNCPGQQ
 VGAMAAVLGAEIDLINEVINKNSNEGVAEDSNDNCPGQ $G M M A$
$G M G A L D D A G V E K V C A E A A E G K Q V W P A N Y N Q D G Q L$
$G$ GTMAAVLGGSDELVEEACAQVKDAGVVAANFNSPGQV



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| :---: | :---: |
| UniRef90 X1DZG0 |  |
| UniRet90_D5V |  |
| UniRef90-G8NB94 |  |
| UniRef90 UPIO004734659 | VIAGHKNAIARACEAAKAKGAKRALPLAVS |
|  | VCAGEKSQIEAFCQKVEEA |
| UniRef90 ${ }^{\text {W }} 1$ | V SGHRGAVERAVAMVKDHGRKRGVLLPVS |
| UniRet90 A5 | VISGHAEA DRADEMAKEHGIKRGIKLPVS |
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|  | $V$ AGNLLG |
|  | VISGSREGVALA |
| niRef90- UP100037F |  |
| UniRef90-C4Z8 | R |
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| UniRef90-R7NO | M K ${ }^{\text {d }}$ |
|  |  |
| UniRef90_B8FK8 |  |
|  | G |
| UniRef90-H6S | VVSGHRAA |
| UniRef90-U4WLB1 | VISGHRQAIAKAAKKLLEQGATVIVFLRVS |
| UniRet90-O2PY16 | GDLAAI EAACEAAKQAGARRALILPV |
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| UniRef90_K9QBE8 |  |
| W4 | 1 SGPKAA |
| UniRef90-K9ZZQ0 UniRef90 UPIOOO3FD | IVISGEKAAVEAAGVALKARGLK A |
| UniRef90-U2JZ84 | $V$ SGTAEGLAEAEKLCMQAGAKRF |
| UniRef90-Q1D5F1 | VSGPAQDI |
|  |  |
|  |  |
| UniRef90-TOPV33 | $V$ SGNAVAVDAAIKMAKEFKVRRA |
| niRet90 UP | VISGTKRAVEVACERAKAAGARRA |
| UniRef90-UP1000 |  |
| UniRef90-UPIO0041EAEBF | VISGQ\GAIERSLVIAKEKGAKRAVKLPVS |
|  |  |
| B8IYS5 | $\mathrm{k} \nabla \mathrm{~s}$ |
| UniRet90-W1HVW5 |  |
| UniRee90-A3X |  |
| UniRef90-Q3AQ10 | v |
| UniRef90 O3AC54 | VLAGESK KELTKTQLKEVGARKIVELPVS |
|  |  |
| UniReef90 W7 | AGTPEGAAEVSDIAEMKA R V |
| UniReego-UPI | V SGHKGA ERADEAKAEGDR AMLL V |
| D2 | SGHKSAC |
| UniRef90-UP100046EF5D5 | VVAGEMAAI |
| Unif | VVSGAKAAVERAIDEIAKTKGAKRSMLLPVS |
| UniRef90-D41 |  |
| UniRef90-UPI0004 | DAVMQA $\mathrm{DAQAKAQGAK}^{\text {a }}$ |
| UniRet90-U1LL | VLSGLKDDISRAQQA |
| UniRef90-UP10003FBB250 | V SGPSQA ERAA |
| UniRef90-Q3A UniRef90 A3 | VISGPTATVQQAAQAL |
| UniRet90-UPIOOO4 | VLSGSQEGLDN |
|  | $V 1$ AGSDEAMNNV |
| A8U1 | VLSGHAGAl |
| UniRef90-E8RXY1 UniRef90 K9UM35 | VLAGSTAG\|ralv |
| UniRef90-K |  |
| UniRef90-TOR |  |
| UniRet90-V9TRQ7 | VLAGPTEDLKTVALACEKTND |
| UniRef90-V4JDY3 | VVSGSHDGLARFSPQAQEVGGK V |
| UniRef90-U4WKG7 | VVSGLOSD |
|  | VISGSİAGLDGIGGRIIEENGGK |
| UniRef90-85 | VISGETAKIAAAVEAGKERGFR |
| UniRef90-L8J | VVSGLKEDINKAQPYFEKAN TMFV |
| UniRef90-UPIO00311CE2A | VLSGNKETLDKDS KELKCKRFI |
| D4 |  |
|  | AV |
| UniRef90 UPIooo3821E37 UniRef90 D3RUF | V |
|  | VVAGSVAAIARAEAYWKEASKKRSRLR |
| UniRef90-A6FZ59 | VI SG |
| UniRef90-UPI00037EDF62 |  |
| UniRet90-A33327 | $V L S G T P E A V Q Q V S E Q L T \quad C K R A$ |
|  | VISGTPEAI ESV |
|  | T |
| UniRef90-F2F9P3 | TLSGHKEAMQNVLDYVSGKGASSAKMLNVS |
| et90-Q6 |  |
| ef90_K9R114 |  |
| UniRef90_A8FY83 | V |
| UniRef90 Q1IUIO | VIGGGASDAVDEACTKLLAAGF NVVPLPVS |
|  |  |
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## UniRef90 UPIOOO3B5CE44

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UniRef90_Q0R4M5


GDGAMAAVMAG GRARVEAILAELGCSGEVIVANHNAPN QU




$T G$
S LLAA A L $\quad$ VN P D L L

Q
GM G V I V $G$ G L T R T













$L G A$ Q

GAMLAVMGVVREDVATLTDGFEDA V V WAANENAA GQV
GTMAA V GASAETVVVRTLHTAGAPGSVVAANLNSPD QT


GQGTMAA VGLPQ A ELLLPFLEA Y A D


GM GVI VGGLT R REVVERLVVERCTTNDAPIVYVSNQNE EDQLL
GA GAMA AL L G I E C E V A H EAAA A A A GA G E I C QV A N D N G G G QV



GTMAAVSSADAAEVEALLLSRY DGQVSIAALNGPRNV

GLTAl S GLLQPPQMERLLAEYSVASPVYLANIDNAEDQM
GGGTMA GISAAGPDDVA PLLAEYSVAGEPVVAAGYNA E Q M
GAMAAAVQGPESEVVRSALVVA GEPVVEVAGYNSPQQT
G Q MVALIDPNVAQVQQ\|CAAVAQGEWVAIANVNSPKCI
EGMMAALI GCDRDQLDQQLQQTP GVVLANDNNAGQV
GEGAMAALLLGADAKAEDLAEAAEAEGE CTVVANDNDPTAQV
$T G A M A A L S V E A Q V T E L I D A \quad G R D V V V N R N A P D Q$


I A V A DAGLAAQVVVANHNSP GQS

GAMYAVEATEQEALAEL AGHDGAVSVASINAPT GT

K G A MMA V G A S P E EVVEA WL A K L T R G R R V VV A C I N S P T S V



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UniRef90 $\mathrm{H} 1 \times 9 \mathrm{D}$ UniRef90 UPI00047DF5A9 UniRef90_C2EUB3 UniRef90-B6QN84 UniRet90_UPI00038107FA UniRet90_B4VZM4 UniRet90-X1MUP5 UniRef90 W7ZT11 UniRef90-UPIO00307355F UniRet90-C7MX35 UniRef90-D2SOR55 UniRef90-UPIO003F05D95 UniRef90-O8RL73 UniRef90-U2LKE4
UniRef90- $22 G U J 4$ UniRef90_UPIO0047811E8 UniRef90-UPIO00377252C UniRef90-UPIO002627ECC UniRef90- Q9R9J2 UniRef90-A0A023RYY8 UniRef90-D3D723 UniRef90-K9RLW1 UniRet90_K9WRK1 UniRef90-F2SL05
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W6WQVO UniRef90 H0R9L8 UniRef90-07S380 UniRef90-SOFL56 UniRef90-M9SUS3 UniRef90-K3VFZ9 UniRef90-E5WL26
UniRef90_Q0R4M5

VI S GQS GAL A A A GALVKERKG VLAGPTDAVK QL V QALLADKGI VISGTKAAVDKAI EKAKELGA
 VISGTAAGVSAVTALLTADP $V V S G G E D V V E R V M A V A R E R G$
$V$
$V A G P T A E V K K I Q Q K F R E L G Y G$ VIAGSSEQUAVAITALGKAGF TISGSDEAMSRTLEKAKQYQAQTAKLLKV VIAGRDTALDEVAARVRRQGQGVARBLAVS IVLSGEAAAVEAAGRAALLEGAEKVVALKV VLSGDRSKLLQUVEHLVEQGG IV SGPAAGVELAAKALEAGG VI SGPTQAVAEAVRLLREAGAKRD VISGPTAAVDEAVSHLRAAGVG AKRTPV VLSGPAADI GKANELL ACEALMCVPLKVS VISGKPEAI DIVLEKVQ


RAVPLAVS RAI ALPVS | RA | PL |
| :--- | :--- | :--- |

 V AGPTDEAKVRDALHNQGYAVLLPVS VIGGPEKEVQLVAELLKQQAAKRVIVLNVS


 IVISGEKLAVQQVVDSLLNAAGVTMARMLPVS
 VLSGTPEAVASVTATVR CKRADPLAVS

 IISGKEDDI DKATILFEQDENVRCVRLNTS VISGDKAAVDAAAAELKGRGLK VIPLKV VVAGPKDQI EKAFDFFKS GMRVVSLPVS VISGSFEAMNQVAVLAKQQGVV AKKLDVS VLAGPEDAVDTLLREMAGTAVRAVRLNVS
 TLSGDEDAVTEAEDDFKSQGIFFARKLKVVS IVIAGPKAELARLESAVEAAGGMLYYPNTS
 VIAGASAATQQAAKADSELGFK ALALPVS VLSGRADAVDRLERRLGARGVA VRRLRAS VI SGPTEDVETAVRLLRAAGARRI VIAGSVEAMKAVLEKALLQGARKAELLDV
 ILSGDMALEEIAELQDE
 VVSGTRAAVNCAI EDAKAKGARRSVLLDVS |VISGTKTAVEAVLKNLSEHEI VISGPGDAVATAVERLRAHGYG RSRPLAV VVSGDTAEVDRVVAHEKGLGHK ATRRLRVS VFSGAPAALDDLVAHARDQDVRVRRYDV VVAGNVEALEFLEQNAKALKIRRMKRLAVS VIAGSDAAMQRVIQRARDAGAHKAQRLAVS
 VVSGDREAVEALVAAWKGRGTRASLLRVS VISGTPEAVETMLNGVKDAKRAVKLNV
 $T L S G D K D A V Q E A E E D F K D E G K F A R A L K V$
$V$
$V$
$V$
 VISGATAGIERAVELLRTAGLG AVRLEVV
 TASGDAAGIDELLAMVQQAGV ThSGDADAMEEARLLLEDEGKFARLLKV VVAGSDAAMRELATLAQEHGAQRCERLDV TLSGDVEGLVELEQTMKEENI FARRLKV









UniRef90 E3QUN3 UniRef90-HOKC15
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9




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Q Q




$\begin{array}{rl}\text { Q G C M T A } & V \\ \text { G S M M M A } & V \\ K ~ G ~ G ~ M ~ M ~ S ~ & V \\ K & G\end{array}$
G
$G$
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$\begin{array}{lllllll}M & L & A & G & l \\ L & L & D & E & V \\ R & V & G & A & W\end{array}$


| $A$ | $G$ | $L$ | $E$ | $I$ | $A$ | $H$ | $N$ | $S$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $E$ | $A$ | $I$ |  |  |  |  |  |  |
| $V$ | $L$ | $Q$ | $V$ | $A$ | $V$ | $V$ | $N$ | $S$ | $P$ |
| $T$ | $S$ | $V$ |  |  |  |  |  |  |  |





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