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UniRef90-A1VEK4 UniRef90-A1VEK4
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UniRef90 G5JMX0 UniRef90_R6LUB3 UniRef90_F4B254 UniRef90-C9LHA3 UniRef90_R5I9Q9 UniRef90_Q7N388 UniRef90-P16538 UniRef90_UPI000471866D UniRef90_R6ZMK4 UniRef90_F5LFP6 UniRef90_R6NMR4 UniRef90_E7RY26
UniRef90_F8E799

1
10
20
30
40 MRRVVVTGMGIVSSTGSNTEEVTASLREAKSGTSRAEEYA

 R R V V V T G M G I I S P L G N DVVH T F W S N L L H G K S G I D R I S S F D $R R \vee V \vee T G$ $R R \vee \vee I T G M G V I$ 1 PL | $G$ | $S$ | $N$ | $V$ | $K$ | $D$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $W$ | $N$ |  |  |  |  |
| $K$ | $K$ | $E$ | $T$ | $W$ |  |  | N $R$ RVV V

 | $K$ | $R$ | $V$ | $V$ | $T$ | $G$ | $L$ | $G A$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $V$ | $T$ | $T$ | $M$ | $M$ | $L$ | $T$ |  | Q RVV I T G I G V I S $M S$

$M R$ $\begin{array}{lllllllll}R & R & V & V & I & G \\ R & R & V & T\end{array}$ $R R \vee V 1 T G G A V T$ L VVI T GL G AVSPI GNTLAETWSNALAGKSGIANITKF D $\begin{array}{llllll}R & R & V & V & V & T \\ R & L & G A V & T\end{array}$ R R V V V $\quad$ T G L G A V T

$R R V V$ I $G L G M L$ MRRVVITTGMGIV S | $M K$ | $V$ | $V$ | $V$ | $T$ | $G$ | $M$ | $G$ | $V$ | $S$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $R$ | $R$ | $V$ | $V$ | $I$ | $T$ | $G$ | $M$ | $G$ | $A$ | $T$ |

## M

 R RVV V T K R V V I T GI GLLV T $R R V V V T G L G L I$
## L $M$ $M$ $M$ $L$

 TGLGAI K VVI T GL GVV R VVVT GMGAII $K R V V V T G M G M L V$ KR RVVVTGGLGAVVT QRVVVTGGGAAVTPMGNTPEETWNNLVAGKSGAAPIVGDFD LRRRVVVTGMGMLSPVGGTLEESWKNLLAGKS GIGTIDHFD MK RVVI T GIG VVMSAL GKDHETHWNSLLAGKS GI SLIIESFD $M \operatorname{R~R~V~V~I~T~G~L~G~V~}$ HAWK
 $M R R V V I T G M G M V T P L G A G V K T N W D R L I A G Q S G I G A I T T T F D$ $M K R V V V T G M G A V T P I G D T V E K F W E S V L E G K V G I G P I I Q N F D$





 MRRVVI T GMG AVVTPVGNNVNDMWEAVKAGKCGDGKI THFN

 $R R \vee V V T$ $R \quad R \vee V I T T G Q G V V I$ | $R$ | $R$ | $V$ | $V$ | $I$ |
| :--- | :--- | :--- | :--- | :--- |
| $R$ | $T$ | $V$ |  |  |
| $R$ | $R$ |  |  |  | R LK M $M R$ H R V V V

$\square$
 M S $R R V V V T G L G L V T$
MERVVVTGMGVI S
$\begin{array}{lllll}M & R & R & V & V \\ M & V & T \\ M & V^{\prime} & V & V & T\end{array}$
$M R R V V$ I T GLL GTV
MRRVVV T GLLGLVT

| $N$ | $R$ | $V$ | $V$ | $T$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $R$ | $V$ | $V$ | $I$ | $T$ |


| $L$ | $R$ | $V$ | $V$ | $V$ | $T$ | $G$ | $L$ | $G$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $T$ |  |  |  |  |  |  |  |


| $L$ | $N$ | $R$ | $V$ | $V$ | $V$ | $T$ | $G$ | $V$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $M$ | $A$ | $I$ | $T$ |  |  |  |  |  |
| $M$ | $K$ | $R$ | $V$ | $V$ | $V$ | $T$ | $G$ | $M$ |
| $G$ | $A$ | $I$ | $T$ |  |  |  |  |  |



## LR <br> $M R$ <br> L <br> $M E$

## QUERY

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UniRef90-F6DE13
UniRef90-N9VL56
UniRet90 R5WNX7
UniRef90- A8LSD7
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UniRef90 G5JMXX UniRef90-R6LUB3 UniRef90-F4B254 UniRef90 C9LHA3 UniRef90-F3Y7Y1
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UniRet90 F5LFP6 UniRef90-R6NMR4 UniRef90-E7RY26
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PAGFRCQVHGAPD $\quad$ DD $\square E S$ LVDRRAMRFHGRGTAWNHIAMD
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P ASEYKTKFAGVRDFQPEAYHDRREARRMDRFCQFAVAAAK


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 A S S Y P VQI A GEVDDNPEAY DDKRELRRDDRFTQLALIAGH
A
T PF ATTFGGVRNFDVT QYIPAKDAQRMDGF』HYGLAACC E Q G L R S QVWG DVVK LD DS EH I D R KA DR FMGEAA GYA YIA ME
 EHGFRSHVYGAPKVDPFEVLDRRQTRFLAKGSAWNYLAMQ

T E

## T

VSEYPTRIAASEIDFNAEDYVERKEARKMDRYVQLAVAA K K EM G L R S Q V S G SVVD L N L E E L I D R KVVLRRFM GNAAA YA YA L M E
 ATEYTARQAAEVTDFDPTVYDDKKEARHMDDSTQYAVCAS K


A
R
V VTASKTKVALVRDFDAEGUFGKKEARKGDRFSQFAALAAAE ASKKKTQFACVKGFDPLDQFMEKS DARKY DLYTAQYALAA VA


 ATDFATTFACEKGFKAVDYI DRKAADRMDPYCQYAV DAAT TTDMPTKDAQVKDFDPLQYMSKKDASKWAQFTQFAVAATK PTNFAAQI AEVNDFDVTQYDPAKDARRMDTF $\square H Y G L A A G \square$ D L GFRSHVHGADR $\square$ NPAEHI DRKTFRFMADAAAYAYLAMEA

E M G F V S E GF AT Q IA A QVIK N F DVVT Q Y L T T K D A R K V A LRRSCRFAEVKNF VPENY IDRKD DKKMGRFIQFAMAATG A SLIF KTQFACEIDDFNVEDYLDRKEARKMDPFTQYAM\AVD







## A

## A

AEKFKTKFA
SKETGDTLLAEVKEFNPQE
A S LLF KTQFA CVVKDF DPSEVL
AAPY R K A A GVKGFNHEDFISRKDARKMDDF QYG A A GV

TSDFAVKAAEVNDFPFDKYFVKKDLNRFDTYSLYALYAAN

T T R Y K S KI A GVVR F D GEA
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QUERY
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160 EKGPSRVVSFFVPMMDANMAAGQTSDTFGLQGPCSCVITA


##  <br> 

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R  E R G P K R M G P F MV T R C M S S T N S A C L A A T P F K I K K GV N Y S I I T S A E R GDV R V G P Y R V T Q T M G S T T S A C C L A T P F K I K G V N Y T I S S A

A

## 

Kix

EK GPNRVNP LVVPRTMSSTVSACLATPRKIKGVNYSISSA


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A M GAMSSKYNDTPSTASRAYDKNRDGFVIAGGAGVLVLED CSMKAMSTRNDEPEKASRPFDRDRDGFVMGEGAGILILES ANMKALSRRNETPQAASRPFDAQRDGFVMGEGAGIIVLEE GAARALSTRNDDPKTASRPWDKDRDGFVMGDGAGILVLEE NAMKAISTRNEDPQKASRPFDAKRDGFVMGEGGGILILEE A A ARALLSTRNDDPATASRPWDKDRDGFVLGEGAGVLVLEE A A CRA L STRNDEPTKASRPFDKDRDGFVLGEGVGILI I E E A A ARALSTRNDDPQAASRPWDKGRDGFVLGDGAGAVVLEE CAMKAMSTNNDEPTKASRPFDAARDGFVMGEGSAMLVLET GNATALSTRNDEPERASRPFDAQRDGFVAAEGAGVLVLES A A MKALSTRNDEPERASRPFDKDRDGFVMGEGAGVLVLEE AVMRALSNRNDEPQKASRPFDRDRNGFVMGEGAGVVVLEE A SARALSSRNDDPATASRPWDRDRDGFVLGEGAGVMVLEE A S A K A L S F R N D D P A T A S R P F D A ERRDGFVI GE GA GVLV L E S CAARALSSRNDDPQAASRPWDKDRDGFVLADGAGVVMV A VMRALSTRNEEPEKASRPFT LSSRDGFVMGEGAGVLVLEA A AAKALSTRNDEPHKASRPWDKERDGFVLGDGAGVVVLEE DALTALTE T DNPLKASVPFDKDRDGFVLGEGAGIVVLEE AMGAMSSKYNDTPTTASRTFDATRDGFVIAGGGGVLVLEE AMGADSTVKYNDSPDKASRAYDA ARDGFVVAGGGGCLVVL E E K GVMRALSTRNHEPEKASRPFSKSRDGFVVSEGAAVVVVARE A NMKALSRRNDEPEKSSRPFDADRDGFVMGEGAGILIL E E SAARALSTRNDDPTTASRPWDKDRDGFVLGEGAGVLVLEE SSMRAMSTRNDDPAAASRPWDKDRDGFVMGDGAGVLVLEE $\square S A K A L S R R N D S P A T A S R P W D K D R D G F V L S D G A G V V V L E E$ NAMHALSTRNDDPTHASRPFSKSRDGFI MGEGAGLLI LE E A MGALSTKYNDSPEKASRTYDADRDGFVDSGGGGMVVVEE TALTAL NTTEDPMRAS $\quad$ TP F DKERSGFVVGFGAGVVVLES A A AKALSTRNDDPQAASRPWDKDRDGFVLGDGAGVIVVE E AMGAMSSKHNDTPSTASRAYDKTRDGFVIAGGAGVLVLE E A A MRALSTRNDDPKTASRPWDKDRDGFVLGEGAGVMVLEE NAMKALSTRNDDPEHASRPFSASRDGFVMGEGAGCLILEE CSMKAMSTNNDDPEHASRPFDSGRDGFIVGEGAGIIVLIT A A MKALSHRNDDPEHASRPWDKDRDGFVLGDGSGVLVLE E CAMRAMSTRNDEPEKASRPFDTDRDGFVMGEGAGILILES AMGALLSTQYNETPEKASRAYDAKRDGFVIA GGGGMVVVE E ALKALSSTAHNDSPEKASRPFDKERDGFVLGEGSGMLMLES AL RAMSTSFNDTPEKASRPYDKDRDGFVMGEGAGVVVLEE A AMKALSTCNDDPEHASRPFDKDRNGFVMGEGSGIVILEE AMGA L STKYNEAPETASRPFDS GRDGFVDA GGGGMMVL E E SAARALLSTRNDDPQGASRPWDRGRDGFVLSDGAGVVVLEE A ARALSTGYNDTPDRASRPYDKGRDGFVMGEGAGVVVLEE
 NALHALSTRNDDPKTASRPMDKDRDGFVLGEGAGALVLEE CSNTALS TNDDPTTASRPFDKDRDGFVIGEGAGVLVLEE GNATALSTNNDQPTKASRPFD\|NRDGFVMSEGAGIIVLES A A MKALLSTRNDDPTKASRPWDKDRDGFVMGEGAGVMVL S NASRAMSTLNDDFSKASRPFDVNRDGFVLGEGAGALVLEE AMGAMSSKYNDTPQRASRAFDADRDGFVISGGGG\|VVLED ANMKALSTRNDEPHKASRPFDKDRDGFVI GEGAGVLILEE
 TALTALSTVDDPTKCSLPFDKNRSGFVMGEGAGVVILEE TSMHALSK AEDVNRASIPFDKERSGFVMGEGAGVLILEE NAMRAMSTLNDAPEEASRPFDSNRDGFVDGEGSGALLI L E E ANMKALLTRRNDEPEKASRPFTADRDGFVMGEGAGVLIL E NALLKALSTRNDDPTKASRPFDKDRDGFVMGEGCGILLLEE NSAKALSTANDRPEQASRPYDRDRDGFVMGEGAGSLILES A N IH AL S R R NDAP Q Q A SRPFDRNRDGFV IGGGAGVVVLE E ASARALSTRNDDPATASRPWDTGRDGFVLGEGAGVLVLEE A M GALSSKYNDNPSVASRPYDRDRDGFVISGGGGIVVVEE DAMHALSRRNDAPEAASRPFDKDRDGFVMGEGAGVLVLED GSAKALSTRNDDPEKASRPFDKDRDGFVMGEGSGILILEE A M GALLSTKYNDSPEQASRPYDANRDGFVIAGGAGMVVLEE AA ARAMSTRNDEPEKASRPWDKDRDGFVLGDGAGVLVLEE ACKALLSTKRGDDPTKASRPYDADRDGFVMGEGAGVVVLVE ASMRALSTRNDSPTTASRPWDTQRDGFVVGEGAGILILET NAMKALSQRNDDPQTASRPFDNDRDGFVLGEGAGAII LEE CQAGALSYDEN PATASRPFDANRTGFVIGEGSGILILED
 GNAQAISSRREEPKKASRPFDRNRDGFVMSEGAGVVVLES A QRAALTTTNNDAPEKASRPYDKDRDGFVMGEGAGVLVL E AMGAMSSKYNDTPSTASRAYDVDRDGFVIAGGAGVVVLEE A A ARSLSTRNDCPQAASRPFDRDRDGFVLSEGAGILVLEE ACKALSTTKRADEPEKASRPYDADRDGFVMGEGAGVVVLED
 NAMHALSTRNDDFETASRPFDATRDGFVLGEGSGALILEE NAMHALSTRNDDPDHASRPFSASRDGFVIGEGAACLVLVTV AALSALSTSTTDPNRAS IPFDAERTGFVMGEGAGMLILEE NAMHAI STRNDDPKRASRPFSASRDGFVMGEGGVCLVLEE GAARALSTRNGNPQGASRPWDKDRDGFVLGDGAGILVLEE DADKATSANNDDPAHASRPFDRNRDGFVLGEGSAVVVLDE QSLTALSTTEDPKRASIPFDKDRNGFVMGEGSGMLVLES
 GNATAVVTRNEEPAKASRPFDAGRDGFVMAEGAGILILES T S LT ALLTSS DDPKHAS DPFDKNRSGFVMGEGAAIVILEE GMGAMSSRYNDTPELAS RAYDADRDGFVISGGGSMLVLEE

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| :---: | :---: |
| UniRef90＿A1HN83 | LDHALARGA |
| UniRef90－UPI00039BA06B | LEHALRRQA |
| UniRef90－АЗҮНКЗ | YEHAKARGA |
| UniRef90－H1） |  |
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| UniRef90－W0DR23 | A |
| UniRef90－F6B | A |
| UniRei90－UPI0003033D4C | L HAEKRGA |
| iRef90－D5 |  |
| － |  |
| UniRef90－UPI000382BA47 | YEHAKARGA |
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| UniRef90－E3IC |  |
| UniRef90－L8D7s | HAKARGA |
| UniRef90－F6DE13 | YEHAKKRGA |
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| UniRef90－Q47EG7 | YEHAKARGA |
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| UniRef90 H8G | LEHAKARGA |
| UniRef90－R6AE94 | A |
| UniRef90＿K2KI | LEHALARGA |
| UniRet90＿GSINP1 |  |
| 俍et90＿Q9R6Z2 |  |
| niRef90＿UPIO0036FD |  |
| K018 |  |
| R6 | A |
| UniRef90－B5JLK2 | HARNRGA |
| UniRef90－R5EM33 | YEHAKARGA |
| 8F9Q2 |  |
| 俍et90＿U3AWT1 |  |
| A1VEK4 |  |
| W3RF |  |
| UniRef90 F9MQ24 | A |
| UniRef90－M7CYZ3 | LEHAKKRGA |
| 俍100046F6178 |  |
| niRef90＿UP100040 |  |
| niRet90＿R5SQH2 |  |
| QW1 |  |
|  |  |
|  | Le ${ }^{\text {a }}$ |
| UniRef90－UPIO0036F9B6D | YDSAV |
| UniRef90－E4RTN4 |  |
| UniRet90＿A6FPN5 | LDhalarga |
| 2LWY8 | YE HA |
| UP10003B58988 |  |
| UniRef90＿C4Z |  |
| UniRef90－C4Z3C0 |  |
| UniRef90－UPIOOO35D6E54 |  |
| U7V8 |  |
| iRet90＿12GBZ6 |  |
| iRet90＿B4SBB1 |  |
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| UP10004754D21 |  |
| UniRef90 L8XV80 |  |
| UniRet90＿R5 |  |
| UniF |  |
| iRef90－UP10003B3AD69 |  |
| iRef90－R4YM17 |  |
| 2AXL1 |  |
| UniRef90＿E8WZE1 |  |
|  |  |
| UniRef90＿18AG |  |
| UniRef90＿D6 |  |
| UniRef90＿UP100047B793B | AVKR A |
| iRef90－C6DOH2 | LAHAKKREA |
| UP100037 |  |
| 47CD3 |  |
| UniRef90－L0D7Q5 |  |
| UniR |  |
| UniRet90＿G5JMX0 | LEHAQKRGA |
| UniRef90 R6LUB3 |  |
| UniRet90－F4B254 |  |
| UniRef90＿C9LHA3 |  |
|  |  |
| UniRef90 R51909 |  |
| UniRef90＿Q7N388 | Yehakraga |
| P16538 |  |
|  |  |
| UniRet90－E4L2B6 |  |
| R6ZMK4 |  |
| F5L | SHAQRRNA |
| R6 |  |
| Ref90－E7RY26 | AKARGA |
|  |  |



UniRef90 R5RNI8 UniRef90-A0A016QPW5 UniRef90-H5T8U1 UniRef90-Q5HOL1 UniRef9-Q82U56 UniRef90-D6SQR5 UniRef90-V6EZV8 UniRef90_-66MBT7 UniRef90-A0PQ37 UniRef90_U2STZ9 UniRef90- J9YYQ2 UniRef90_UPIo00288EDF8 UniRef90-A6VMR1 UniRef90_K5ZH41 UniRef90 B1LTE8 UniRef90_UPI000422117D UniRef90-M4TK18 UniRef90-A0A023D3F1 UniRef90-UPI0003718AA0 UniRef90-U5DJ15 UniRef90-R9VV48 UniRef90-E1VVU8 UniRef90-UPIO00345AEB4 UniRef90-A5EXE1 UniRef90-K6DDJ4 UniRef90-UPIOOO4758D21 UniRef90-E8VOR3 UniRef90-19KPD5 UniRef90- F1TAZ3 UniRef90-UPIO0047ED6EA UniRef90-R6BD40 UniRef90-UPI0002555527 UniRef90-UPIO0036527E7 UniRef90-R7HKK4 UniRef90-U2NMV3 UniRef90 V4IXR6 UniRef90-UPI0002C31F19 UniRef90-B21HC5 UniRef90-Q8YWG5 UniRef90-UPIOOO379257D UniRef90-K9WUUT UniRef90-UPIO0035C1CB6 UniRef90-UPIO002884691 UniRef90_UPIo003F98FE3 UniRef90-R5DWIO UniRef90-R2SLV8 UniRef90-B1X1s9 UniRef90-K9PUU3 UniRef90-UPI00047A8CB2 UniRef90-A0A024KDP4 UniRef90-UP100047CCE86 UniRef90-B4K8H7 UniRef90-J2XSVO UniRef90 OTVRU8
UniRef9- D8UYP3 UniRef90-E6MT91 UniRef90-E8NEV1 UniRef90-C7Q5R5 UniRef90-V4PEW4 UniRef90-A8TYZO UniRef90_UPIOOO3084393 UniRef90-D7DJC4 UniRef90-M1MTR3 UniRef90-G7D860 UniRef90-A3INX6 UniRef90-MOTOS8 UniRet90-D3HPPO UniRef90-UPIOOO36CA5A7 UniRef90-UP1000473A995 UniRef90-D7P5Z3 UniRef90-Q93TW7 UniRefofo-L1LY1 UniRef90-R5JX57 UniRef90-D6GQF4 UniRef90 W2F5Q6
UniRet90 $-17 Z I S 3$ UniRefo-LㄴZIS3 UniRef90-UPIO00479D110 UniRef90 W7 SZM9 UniRef90-Q93NX9 UniRef90-B2THK7 UniRee90-4GNE9
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UniRef90_D5GD8

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CTGYASRI AEVRDFDPTAYMSAKEAKRMDRFCHLGVAGAQ VSDLPAK AGGVDPRDLDKYAPAKERRRMDDF VYGLAAAM CEDYPTRFADIPNFEAGEYLDKKQARRVDKSUAYTMVAGK ADALYTDDHTPSEFDAEFF:PPREAAAMDPQQRLFLEVAW ELGMRSHVHGKPNLNTEEHVDRKLLRFMGEGAAYNHIAMQ ASPFRSRVAAECDFDPSAGLSHRQ1RQWDRTTQFAVVAGK ETGMRSHVAGTVKLNAAELLDRKDYRFMGDAASYAYLSMK SADLPCRGAAQVPFNPDEVMEVKEQRKVDPFVVYAMAAAD EAGMRSQVWGNIKLDTAGLIDRKVMRFMSDASIYAFLSMQ PSDLPAQVAGEVPEGPSDWVPPKEQKKMDRF HLGLAAAD
 EYDLPVTFAARAAVQPTEVLTRPETKRMDPSTQFAGVAAR
A ASLGRTQFAAEKEYNASDYLNHADTKRTDRFTQYALIAAD ASDFDUKDAEVKGFAPEEFMDKKEARRMGRYSQFAVASKM



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UniRef90_R5RNI8 UniRef90-A0A016QPW5 UniRef90-H5T8U1 UniRef90-Q5HOI1
UniRef90_Q82U56 UniRef90-R6FT00 UniRet90-DGSOR5 UniRef90-V6EZV8 UniRef90-O6MBT7
UniRef90-A0PQ37 UniRef90_U2STZ9 UniRef90-J9YYQ2 UniRef90_UPIO00288EDF8 UniRef90-A6VMR1
UniRef90-K5ZH41 UniRef90-B1LTE8 UniRef90_UPIOO0422117D UniRef90-M4TK18 UniRef90-A0A023D3F1 UniRef90-UPI0003718AA0 UniRef90-U5DJ15 UniRef90-R9VV48 UniRef90-E1VVU8 UniRef90-UPIO00345AEB4 UniRef90-A5EXE1 UniRef90-K6DDJ4 UniRef90-UPIOOO4758D21 UniRef90-E8VOR3
UniRef90_-19KPD5
UniRef90-F1TAZ3
UniRef90-UPIO0047ED6EA UniRef90-R6BD40 UniRef90-UPIOOO2555527 UniRef90_UPIO0036527E7 UniRef90-R7HKK4 UniRef90-U2NMV3 UniRef90 V4IXR6 UniRef90-UPI0002C31F19 UniRef90-B21HC5 UniRef90 ${ }^{\text {O8YYWG5 }}$ UniRef90-UPIOOO379257D UniRef90-K9WUUT UniRef90-UPI00035C1CB6 UniRef90-UPIO002884691 UniRef90-UPIIOOO3F98FE3 UniRef90-R5DWIO
UniRef90-R2SLV8 UniRef90-B1X1S9
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 UniRef90-A8TYZO UniRef90-UPIOOO3084393 UniRef90-D7DJC4 UniRef90-M1MTR3 UniRef90-G7D860 UniRef90-A3INX6 UniRef90-MOTOS8 UniRef90-D3HPPO UniRef90-UPIIO0036CA5A7 UniRef90-UP1000473A995 UniRef90-D7P5Z3 UniRef90-Q93TW7 UniRefofo-L1LY1 UniRef90-R5JX57 UniRef90-D6GQF4 UniRef90 W2F5Q6
UniRet90 $-17 Z I S 3$ UniRef90-L7ZIS3

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 QAI RRDAGIS DVSGGNADRIGVIGSGI GGMPMDENTDAAYH EALLDSKLDDENYDKERDSII FGSGI GGIETIQNQDRQLD
 KSLESNEENDKRLQKERCGVLVGSGMGGMTMFADGVQTLV EALADAKFEDTPENAERVGTII GSGQGGDDIIEQEDRKLV EALEDSGUDGQSDSWRTGVMVGTACGDSEYAVVSDQGKAW EAI EDAGLTEEQVSNERTGLVIGAGIGSHYQVKAADAVRS EALKDAGWAPKSHEDQCATGVLDGSGIGGIGGDYDSVTLH $D A F A D S G \| A V T S E N A T R Q G A M V G S G G G G L P G D E E S H S V L L$
$E A M K D S G L S D D M V S N N R T G L I V G S G G G S P R N Q V A G A D G M R$ QAAI ED S WEPPNEESQFRTGVVMI GS GI GGGLQAMANGALLLE
 EAWADSGLVKEEMDQNKLAVAFATGUGGVWTLLNAWDTLR EAWQDAGAP E EVDPIRLGTVVSSGIGGILITILEQYDIFR
 QAIK S S GFALS QLDPFDVGVIWGNGQGGMDVFEEQVTEYV EAVADSGLEFGTRDPYRTGVTITMSLDQEYRIVSDSGRLE

 QALGQADRRRDKGDPNKAGVVLGNGIGGFDVVTESFRKLF DA L A D S GLLD F GTLDPHRVGVALGGAVAAATSLENEYLVMS MAI ENSKI DLD I NKERLGVIVGSGIGGIETLENQHKVLL EALAHSGLVIDDENCGRVGVITGCGMGGLPTISAQHKILFF KALVDGGFTEMEKDDKTKCGVLIGSAMGGMKIFNDA IEAL
 EAWEPGADEGFRVDGDRLGVVVSSGIGGLHTALNSYDVYK
 EALLDANLEDTEDLEEEVGVSMGVGIGGLGCDERYSKDI E EAVAQSWRPATPREQERTATIIASGVGGFPYIVETVRTVD EALKDSGLNGENEDAYMAGVSVGSGUGSLSAMENSHKKLL EAMLENAGLDPSQLS GTQTGVVVGINNSDYNR QDQVIMS
 DAI A QS GLGEDQVSNPRTGLIMGSGGGSPTNQI ESADTLR

 EALD Q GWHPEDRESQERT GTIIAAS GVGGFPAIAEAVRTTD Q AV Q D S G L S K D M I N D Y T G L IVVGSG G G S P R N QV L G SN GMR TALEDAGYSKETLZRRYDGDVGVLVGSMNNSYAYYGFENM EAWEDAGAPDDDPDRLGVDFA TGDGGVWTLDDAWDVLR
 EA A A A G LDEANEVSNPRTGLIMGSGGPSTSNMMTAFDTAR

 EALEDGGDIPETLSGTQTGVFLGLTNQDYQR
$K A L V V G S Q T L N K D D K V R A G V L V G T G M G G L S \square F S D G V Q A L I$
QAFDDAGILPTEQTASRWGVVTGSGMMTAEFDYLSRFQQM EAVA D S GII D F A GTTDP Y R L G V T L G S A VGATMMDDRE YR VV H D A L K M A GI D E S Y LDD S P K I GIVVA GS G GA S T RVVMLES G D IVA R E A V E R A Gll D P A S L H G S Q T G I FA G V M Y S D Y G ARLL E A L E R A GQD M T QL A G S R T G V F V GIV S D D Y A L
EAVVAD A GVLDVAD GDRVGVTVGTAVVSSTSRLEDEYVVACLD EAMQDADLHPDAPEARTVPIVVGTAFAGIATIAETQNSDS EAIQDSNLQLDELDKTRCGVIVVSG■GGLETIEKE HTTGM D A I A D A GL D A S QV S NPRTGCVVMGSGGGSSQDDVEAN QLLG


 E T L L E D A GQ I P E D L

EA WK QA GAPDVVDPERFA V VIGGSAYGGLGS TMLEQDRTLA

 QAMEQA GLMP DEDNPNRFGVILGNGDGGLTTIQEQVIKMH


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UniRef90 D6SQR5 UniRef90-D6SQR5
UniRef90_V6EZV8 UniRef90-Q6MBT7 UniRef90-A0PQ37 UniRef90_U2STZ9 UniRef90-J9YYQ2 UniRef90_UPIO00288EDF8 UniRef90-A6VMR1
UniRef90-K5ZH41
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UniRef90-R2SLV8 UniRef90_B1X1S9 UniRef90-K9PUU3 UniRef90-UPI00047A8CB2 UniRef90_A0A024KDP4 UniRef90_UPIO0047CCE86 UniRef90-B4K8H7 UniRef90-J2XSVO UniRef90-Q7VRU8 UniRef90-D8UYP3 UniRef90-E6MT91 UniRef90-E8NEV1 UniRef90-C7Q5R5 UniRef90_V4PEW4 UniRef90-A8TYZ0 UniRef90_UPI0003084393 UniRef90-D7DJC4 UniRef90-M1MTR3 UniRef90-G7D860 UniRef90-A3INX6 UniRef90-MOTOS8 UniRef90-D3HPP0 UniRef90_UPI00036CA5A7 UniRef90_UPI000473A995 UniRef90_D7P5Z3 UniRef90-Q93TW7 UniRef90_LLL1Y1 UniRef90-R5JX57 UniRef90_D6GQF4
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UniRef90_D5GDX8

130
140
150
160
EKGASRIVISPMF PMT\| GNMAAGNDA\|RFGAKG】NED\|VITA ERGPGRISPMFIPMMIANMSTGHVAMRYGATGPSSTVVTA
 A GGPRKISPFFI PSTIDNMVAGNLSIMFGYKGPNGAIVTA

 EKGP

$F V P$

- $\frac{1}{2}$ T NMCGALLGID GFMGPN STA EK GPKKI SPFY\|PAA\|LNMASGNTS\|YVGSKGPNKTVVTA EKGVKKIGPYMVTRTMSSTNSATLATPFGDKGVNYSISSA LVDESHGSPYLYDYFVPSSMAAELAWTAEAEGPVGVVSTG
 EKGPRRISPFFI PGRI NLASGQVSIAYGLKGPNNAVVTA
 EGRARRLSPFFIPSALINGVSGHVSTRYGFKGPNHSAVTA EKGPRKLSPFFI PSALINLVSGQVSIKYGYKGPNHAVVTA TRGPSRCSPFMVPMM ANMAAGQTA HTGARGPNTCPVTA
EKGPRRVLPMTVPMLMPNGPAAAVSLDLGAAGGAHTPVSA EKGWKRVSPFTVPMLMPNSPSAAVALEFTARAGAHAPVSA
 LVDHTYAVAHLYDYLVPSSFAAEVAWVVGAEGPTTVVSTG SMGNGRVSPFFVPLMLPNIAAANIAIRYGVKGFVECVTTA
 DNGKRMLPL HLSYMNAAGNVSMVVGARPAY
 EK GP GRRVSP F LVVPMMI S NMAS GLI A DK Y GAK GF V E C A V T A D R GPKRIS P F FI PMAIAANMPSGHISMADGDKGPNLTLTTA RVSYKKMNPFCVVPFATTNMGSAMLAMDLGWMGPNYSSISTA
E K G P
 EK G WARVVSPFTVPMLMPNGAS GHVGDEFGATAGSHALVSA
 ERGPKRVVPFFDPMTLSNLAPGYVS LLDRAKSYAACTVSA

 WQDFDSLNAYS GTGTDVCDVANRLSYGLNLKGPSLAINTA
 E R G $\square R R V G P Y Q V T R T M S S T V S A C L A T A F G I V G L N Y S I S S A$


 L M R GTAMS GSEVGVMANM KHDSAMLGYGLI F QSMNSTVNMNLSTDFHLRGVNFTISAA EKGPRRVMPMTVPMLMPNAAAGNLS LHFNARAFARTVASA DVDHRRAEPH L ERAFMPSTLDASAVABERGGAAGPVQTVVSTG DKGPKRDSPFFDPSSLINLAS GQVS DRHGLKGPNBAVVTA EKGPKRVGPYMVPRTMSSTNSACLSTFFGIKGHNYSISSA
 T G K S S K R $V$ V S P P F F V V P M A M
 EKGHRK $\square$ TPFFIP YA $\square$ T NMGSALLAMD GFMGPNYSISTA CAPD GEADWMQLLANTQEFYKSLLIQQFG\|KGYASSVHTA LVDHEYAVPHLYDYLVPSSFTAEVAWAVGAQGPATVVSTG
 VGNPSARDSSSVVTGALNCVVPGRLSYLLDDGQPCLAVDTA
 T GA Q S K V S P R F V P K V I G N I A A A Q I A I A K GLLR G P S L T TV T T A
 SRGAK RLSPFTIPSFWVNLAAGHVS IKHHFKGPDGAPVTA LLD HE Y AVVPQLY GYMVPSTLGVEVAWAVGAEGPSSVI STG VGRYED DDA Y MMT GNGHS TAVGRISY LLGLNGPSVAVDTA



 A S GPRKVVSPHTDLTRLMVN GPAA WV S DDL GARGGARTMVSA

 DKGPQRVVSPLFVPES DPNMVSGNVSLRFGAKGTNMTIVTA K K N T A M V G S G S I F Q SMNSTIVMNNLSV DF H L K G $\square$ N F T I S G A



## UniRef90 R5RNI8

 UniRef90-A0A016QPW5 UniRef90-H5T8U1 UniRef90-Q5HQ11 UniRef90 -Q82U56 UniRef90-R6FT00 UniRet90-DGSOR5 UniRef90-V6EZV8 UniRef90_-66MBT7 UniRef90-A0PQ37 UniRef90_U2STZ9 UniRef90-J9YYQ2 UniRef90-UPIO00288EDF8 UniRef90-A6VMR1 UniRef90-K5ZH41 UniRef90-B1LTE8 UniRef90_UPI000422117D UniRef90-M4TK18 UniRef90-A0A023D3F1 UniRef90_UPIO003718AAO UniRef90-U5DJ15 UniRef90-R9VV48 UniRef90-E1VVU8 UniRef90 UPIOOO345AEB4 UniRef90-A5EXE1 UniRef90-K6DDJ4 UniRef90-UPIOOO4758D21 UniRef90-E8VOR3 UniRef90-19KPD5 UniRef90- F1TAZ3 UniRef90-UPIO0047ED6EA UniRef90-R6BD40 UniRef90_UPIO002555527 UniRef90-UPIO0036527E7 UniRef90-R7HKK4 UniRef90-U2NMV3 UniRef90 ${ }^{-}$V4IXR6 UniRef90-UPI0002C31F19 UniRef90-B2IHC5 UniRef90-Q8YWG5 UniRef90-UPIOOO379257D UniRef90-K9WUU7 UniRef90-UP100035C1CB6 UniRef90-UPIO002884691 UniRef90-UPIO003F98FE3 UniRef90-R5DWI0 UniRef90-R2SLV8 UniRef90-B1X1s9 UniRef90-K9PUU3 UniRef90 UPI00047A8CB2 UniRef90-A0A024KDP4 UniRef90-UPIO0047CCE86 UniRef90-B4K8H7 UniRef90-J2XSVO UniRef90-Q7VRU8 UniRef90-E6MT91 UniRef90-E8NEV1 UniRef90-C7Q5R5 UniRef90-V4PEW4UniRef90 A8TYZO UniRe90_-A8TYZ0
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UniRef90_W2F566 UniRef90-L7ZIS3 UniRef90-UPIO00479D110 UniRef90 W7SZM9 UniRef90-Q93NX9 UniRef90-B2THK7
UniRef90 $14 G N E 9$ UniRef90-UPIOOO3618DE5 UniRef90-A9EWA0 UniRef90-A0A024H6U2 UniRef90-UPI00031D827A UniRef90-M7N3M8 UniRef90-G3J046 UniRef90_UPIO002195276 UniRef90-A6KZ41
UniRef90_D5GDX8
 SNMKALSTRNDAPQEASRPFSASRDGFVLGEGAGVVVLEE AMGALSTKYNDTPEDASRTYDANRDGFVSAGGGGMVVVEE SASRALSTNNDPETACRPFQEGRDGFVMGEGAGDVVLES ASARALSSNNDDPAAASRPWDLKRDGFVLGEGAGVLVLEE SAMKALSTRNDDPQKASRPFDKDRDGFVDGEGSGQMI LES CACKALSQRNENPAKASRPWDKDRDGFVMGEGAGVVVLEES TSTACSRWGMLSPEGQCKTFDADADGYVRSEGAGVVVLKR ANLKALS TNPDPKKASRPFTADRDGFVLAEGAGILILEE AMGALSSKYNETPEVASRAYDADRDGFVIGGGAGVLVVES DADKATSARNDSPETASRPFDRTRNGFVLGEGSAFFVLEE AMGADSTKYNETPEKASRAYDANRDGFVIAGGGAVVVVEE ASRALSTGFNDRPTEGSRPWDKDRDGFVMGEGAGVVVLE SCRALTTGFNDTPEKASRPYDRDRDGFLMGEGAGIVVLE AAARALSRRNDNPEKASRPWDVDRDGFLLGDGAGVLVLEE AMGALSTHYNDTPEKASRTYDAKRDGFVISGGGGIVVVEE AAARALSTGNETPERASRPWDRERDGFVMGEGSGIVVLE ASRALSSGYNDAPEKGSRPWDQGRDGFVMGEGAGAVVLE ASMKALSTRNDEPQRASRPFDRDRDGFVDGEGSGMLILE AARALSSSFNDDPTAASRPFDRDRDGFVMGEGAGLLVIES ASMHALSRRNDDPTKASRPYDVDRDGFVMGEGAGALVLEA ASMRALSTRNDDPRAASRPWDTGRDGFVMGEGAGIVVLES
 SADKAMSTRNDEPATASRPFDVARDGFVMGEGAGALVLEE AAMRALSTRNDDPTHACRPFDKDRDGFVVGEGAGLLILED CANKTMTTNKEPLSACRPFDAQRDGFV GEGAGAFVLE QNMKALSES DDPKRASTPFDKDRNGFVMGEGSGLLLLEE ENMKALSFETDKNRASLPFDKQRNGFVMGEGAGLVVLE E DAIKATTPRNDEPETASRPFDGTRNGFVLAEGAAMFVLEE NSMHALSTRNDDPEHASRPFSGSRDGFVMGEGSACLI FEE SSMKALSRRNDEPAAASRPFDEERDGFVMGEGAGTLVLEE VACRALSQRNSDPTKASRPWDTNRDGFVMGEGAGVLVLE E SKTRADSPDGRCKTFDRDANGYVRGEGCGMVVLKR GSMRAMSTRNEEPERASRPYDKNRDGFVLGEGAAVMILES SHMIFSQARMMAPDGRCKTFDASADGYVRGEGCGVIVLKR ASMHALSTRNDDPQKASRPFDKDRDGFVMGEGSGMLILEE AARALSTDFNDTPERASRPFDQARDGFVMGEGAGLLLIEA AA TALSES TDPGKASDPFDKNRNGFVMGEGAGVVVLEE AFSQGRMMAADGRCKTFDASADGYVRGEGCGVIVLKR
QTFSQAGMMSGAGRCKTFDESADGYVRGEGCGAVILKP ACKALSTQHNDNPEKASRPYDADRDGFVMGEGAGDVVLEE GMGALSTRYNATPERASRPYDVDRDGFVDAGGGGALVLEE AVRALTTGFNDTPEKASRPYDKDRDGFLMGEGAGVVVLEE QTLAYSQARMMAADGRCKTFDANADGYVRGEGCGIAVLKR AARALSSDHNETPEKASRPFDQARDGFVMGEGAGLLVIEE AMGALSTKYNDTPEKASRPYDLNRDGFVIAGGGGUVVVE SQAHFTTK SAEVVRSYGLGADGTDLGEGVGTLVLKP A LDAFS VRMDEPTKASRPFDRDRDGLVPSGGAASLVLED ASMQALSKRNDSPETASRPASIDRDGFVMGEGAGVLIETV DCRALCTAFNDNPTQASRPYDKDRDGFVMGEGAGVVVLE AMGALSSKYNDTPERASRAYDRDRDGFVDAGGGGVVVLEA ANMMAMSKNNDDPQGASRPYDTARDGFVMGEGSGVVVLES EALRTLAEEDVDD\GACKPFSVDRTGLVLGEGSAMLVLES NSMKALNTDNN PTKASDPFDKDRSGFVMGEGAGVVILES AARALSSGFNDAPARASRPFDRDRDGFVMGEGAGILVIEE VACRALSORNDDPKTASRPWDKDRDGFVMGEGAGVLVMES CLLGALSTYNSTPETASRPFDATRNGFVLGEGAAFLLILEE
 AMGALSSNFNSTPTDASRPYDSNRDGFVISGGAGMLLLED SSSRVSRAQALAPDGRCKTFDARANGFVRGEGCGVVVLKR DADRATTPRNDEPEAASRPFDDNRQGFVLGEGSAFVVVEE ASAHALSTQNNSPESASCPFDVNRDGFVMGEGGGCIVIET SAMKALSFADDDTRASTPFDRERNGFVMGEGSGILILEE AMGAFSTSYNNVPTQASRPYDVARDGFVDSGGGGVLVLEE AARAMSTAPTELARQASRPFDSARDGFVMGEGAGMLVIET DA SYSKWGML G
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ESRPA $\square$ GE D T G GE GYVAT GAVPSVGPNRDVY FFDWHGPSEPDVETA MTPSKMPNPFSSLPLTATNMGSATLAMDLGWMGPNYVI SAA $T Q G L E Q D D A Y L G T G N S H S T A S G R I S Y D L G L K G P S L A D D T A$



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A Q L
S NLTTAT
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 $C Q M \quad R M L S P S G L C R A F D A R A D G F V R G E G C G V V V L K R$ D Q M

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 C Q A
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| UniRef90-V4K4F0 | LS D A |
| UniRef90-D2R1F7 | YESAKRRG |
| UniRef90-UPI0003830F8C | LS DARRNG |
| UniRef90_V6KVL2 | L R A A |
| UniRef90_A5FKY0 | YESA】ARGA |
| UniRef90-K4JII8 | LS DAHRDG |
| UniRef90-L8LMU6 | LTEAlA S G |
| UniRef90_UPI000465D0F6 | L S D A L R D |
| UniRef90-Q9ALM6 | LS DARRNG |
| UniRef90_L8G177 | L EHAKARG |
| UniRef90_UPI00016AA83F | L G A |
| UniRef90-G4NVE6 | L A DAERDG |
| UniRef90_C7PXR3 | L S Q A |
| UniRef90_L7U9K9 | S Q A A D |
| UniRef90-R5CMV1 | KEHAKERGA |
| UniRef90-J4V1T3 | NHAKNRGA |
| UniRef90_W9G053 | S D A R R G |
| UniRef90-G2NX65 | LS DARKNG |
| UniRef90_UPI00032A87EF | L E S A K |
| UniRef90_UPI000369230C | L T S ARR |
| UniRef90-G8P102 | L EAALARGA |
| UniRef90-D7F197 | LS D A L |
| UniRef90-U9QQM2 | HADALA |
| UniRef90-K2IZ45 | LS EARRD |
| UniRef90_UPI00042B0852 | L E H A |
| UniRef90-F4XWJ8 | D A |
| UniRef90_U5Q989 | YESAVRRGA |
| UniRef90-UPI0003A9D751 | LS DAEADG |
| UniRef90-C8W6B3 | L D R A |
| UniRef90_UPI0001FFE27B | QSTAVARG |
| UniRef90-D3B7P7 | LS LA ERDG |
| UniRef90-A0A010Z423 | LS DARRDG |
| UniRef90_UPI00036054C0 | LS DAMRDG |
| UniRef90-A8LUX2 | RSDAERRG |
| UniRef90-D3G7A7 | LS D |
| UniRef90_S3WTD8 | L EHAKSRGA |
| UniRef90-R4LBX5 | L S R A L A D G |
| UniRef90-D9VBL5 | LS DARREG |
| UniRef90_Q9ZGI5 | LS D A R R N G |
| UniRef90-E5FNE5 | L G R A VA D G |
| UniRef90_G8SM54 | L A D ARRDG |
| UniRef90_Q52V52 | L S D ARRNG |
| UniRef90_C7PSG3 | L S D A L A A G |



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UniRef90_B1GYF5 UniRef90_U6BRZ8 UniRef90-S9XJZ1 1 UniRef90-NOCMA3 UniRef90-UPI00016A5595 UniRef90_DOLN43 UniRef90-F2K069
UniRef90 C5C4T2 UniRef90-C5C4T2 UniRef90-Q30CS0 UniRef90-D6MSY2 UniRef90-F8JKR1 UniRef90_UPI000367FBC5 UniRef90-A0FCL3 UniRef90-I2AWK2 UniRef90-K4MMN0 UniRef90_UPI0002E71BF2 UniRef90-UPI0004764EF6 UniRef90 D7C2C2 UniRef90-UPI00037FC880 UniRef90_A5DZS1 UniRef90-D5ZKC5 UniRef90_L7RT73 UniRef90-E3E975
UniRef90 F4Y2Q3 UniRef90_E3E973 UniRef90-UPI0003627123 UniRef90-UPIO0047A39A8 UniRef90-A8LD05 UniRef90_D9W5N3 UniRef90_Q2J933 UniRef90-A8M6C7 UniRef90_UPI0002FD76FD UniRef90-EORFQ4
UniRef90 B4VBWW0 UniRef90_LODAL9 UniRef90-E8S0C5
UniRef90 V4SS60 UniRef90-K1UQK1 UniRef90-A0A014MG73 UniRef90_UPIO00315C00C UniRef90-K2JKC4 UniRef90_W5WGP3 UniRef90_UPIO00381BA77
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UniRef90-K4QTR6 UniRef90_Q3S863 UniRef90-D7A6B3 UniRef90_R4L991 UniRef90_I3WY28 UniRef90_DOLQX4 UniRef90_UPI000476EC70

WEQFDSFILP ${ }^{50}$ DAFDAEFF ${ }^{60}$
70
PSEADKMDPQQRLLLEVAW ADAYYAQDPDADWFDSEFFLSPREANYVDPQQRLMLEVAW TQGWKCRDADAEGFAPEAAMDSRELRRNDLFQQYAMAAAK
$G W D V D A L F A D D P D F D A G F F I S P R E T L G M D P Q Q R L L L E T S W$ YDGRGGYIDGFDEFDPRFFI SPREAEQMDPQQRKLLEVSW GWDLGDFVYDADEFDPAFFVAPREALTDDPQQRLLLETSW
VEKFYDPDPLAMKKTYSKWMGTQDVDRFDAQFFNLSRAEA WRKHYDPAGF $\quad$ NDVDAFDPLFFNDSPKEAVSMDPKERLF L HQAFYHPDGHFDDQDDATFI AQQEADTLDPQQRVVLETTW GWDLDSAAAEGGFVDAAGFLGRRERISMGQESEFAYMATLD YKGIIPCSVAAFVPFHEENFVSTVNLKSMSSPTVMAMGAAE
 GWDดDGF HDADDFDAD
$\begin{array}{ll}\text { WDTTHGF } \\ \text { GWDLD } & \text { TV VGHFDAGF } \\ \text { WW }\end{array}$
DWPLGAFVHTADEFDPQFFMS DWPLDSLFHPDPDHDAEFFDSPREALADDPQQRQVLETSW WDRWGGFIPDHDAFDPRFFLSPAEAELMDPQHRLLLQAAW GWDLGGFLHDAAEFDAAFFI SPREAMVMDPQQRLLLETSW TENQKVKLAEVKDWDPESVLDKKEAKRMARYTQLAMAAAK
 WRDYYTDIDGVGEEFDPLF $\square$ NNYYDPLSQIDGFDAP ASEDSSRRAEVRDFS DDGLYFKKQAKRMDEFTHFAMABSN GWDLDGFLDSAGDFDPEFFISPREALAMDPQQRLLLETAW
 ADAWYGPVGPDDRFDPAFFISPREAATLDPQQRLLLEVAW VDAYYDPLDSVDGFDPAF AEGLYRSPLGKVEEPNASK WDRHGAFI ERVDQFDAAFFDAPREATYDDPQQRLLLEVAW WDRDAWHVDGVFDFDPAFFI SPREARQMDPQQRVVMEVSW WTKWGGFIKQPYKFDAAFFLTPVEVSSMDPQQRLLLEVFW
 GWDRGGFVDAVADFDAGFFISPREALAMDPQQRLLELECAB P S GYS A Q
A A A L H D WDRWGGF LDGUDLFDPAFFI LDPREAMADDPQERLFLETAWW GWDVGGFLYTAAEFDPAFFISPREAIAMDPQQRLLLEASW
 GWDLENLGDPDPDHDAGF

 KDGWDKDPSKVIKWDP LD
 EHPNYVK RPDUDQFDAEF WRGLYGFMRRVDEFDPLF SDNPYDRHHPVDRFDPLFF $G W D L D T F L Y D V A D F D A G F F$
$G W D V A L Y H P D R E H D P G F F$
DALS $G W D L A T F L Y G A G D F D P G L F$
$P T Q F R S Q V A A E C D F D P A A A$ GWD R G GLFAPECDFDPAAA
 GWNVGGF LHDVADFDPAFF WSRWGGFVEGIDRFDPHAF
GWDLDDRLFHPD GWDLDRLEFAPDPDFDPDFF GWDGATFLHDVADFDASF ELDCD FMYTAAGLDPAA
RAGFPKRGGFLVDIDRFF GWPLGGFVYDAAQFDPGFRISPVEAERLDPQQRLMLETAW G R L G GWDLE GLEGPDPDHDPEFFDSPREALVUDPQQRLILEAVAN GWDLGGFVHDVAGFDAGFFISSPREALVMDPQQRLLLEVCSW WS PADFYDSCDHAPNPTPHKWMGVLEDVDKFDPLFFNISP HSKWLGADPGVDEFDAAFF ISPRREAQSMDPRQRGLLNESY GWDLDALFDDDPDFDAEFFI SPREADAMDPQQRLLLETSW PRALLPSQVAAVVCWDVKEWLSPTDERKMAKFSHYAMAAAQ
 GWDLDAF LYDAAEFDAGFFISPREALAMDPQQRLLLETSW DDTARTTAAGTVDFDPES SWDLDAFLSQASEFDAGFFD
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| UniRef90_X7Y656 | LT D A Q R D G |
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| UniRef90-UPI0003724525 | LSHAEGR |
| UniRef90-UPI0003830BF8 | LS DARRN |
| UniRef90-UPI000371D18A | L S D A |
| UniRef90-G2G4P5 | LS D A |
| UniRef90-D4NZD5 | S DA |
| UniRef90-C4B384 | RADA |
| UniRef90_G9P1G0 | LD D A |
| UniRef90-C7M957 | Y E S A |
| UniRef90-UPI0002EA97DD | D A R R |
| UniRef90-UPI00032AE02E | QE H A |
| UniRef90-H1ZZT4 | LS DAER |
| UniRef90-R4LL83 | LSDAQRNG |
| UniRef90-UPI00037DAE9 | ASRARRHG |
| UniRef90-A0A010YPM4 | LS DARRAG |
| UniRef90-R4LG23 | S DARRAG |
| UniRef90-J1ZM27 | S DARRN |
| UniRef90-UPI00037CE579 | S DARRNG |
| UniRef90-A9EW96 | $R$ A |
| UniRef90_S3C8Z4 | D |
| UniRef90-A6P115 | Y S HAVARGA |
| UniRef90-A0A024K197 | LD D A MRD G |
| UniRef90-W4BH68 | L S RAEA |
| UniRef90-G4XG28 | LSQAlR D G |
| UniRef90-F4Y424 | LS D AVA |
| UniRef90-V5WM84 | L EHAKA |
| UniRef90-U5E9R4 | S D A QR $\square$ G |
| UniRef90-L8P0X6 | AEHAR |
| UniRef90_S4Y352 | LS D A A |
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| UniRef90-U6BRZ8 | LS A Q A G |
| UniRef90-S9XJZ1 | D |
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| UniRef90-F2K069 | EQA |
| UniRef90-C5C4T2 | HARA |
| UniRef90-Q1D5F8 | LERAKADG |
| UniRef90-Q30CS0 | LS D A Q |
| UniRef90-D6MSY2 | AEDAR |
| UniRef90-F8JKR1 | LR R A L A D G |
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| UniRef90-UPI0004764EF6 | LESARARG |
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| UniRef90_UPI00037FC880 | LS R A R R L G |
| UniRef90-A5DZS1 | EHALARG |
| UniRef90-D5ZKC5 | L A D A V |
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| UniRef90-E8S0C5 | S D A Q R G |
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| UniRef90-A0A014MG73 | LS D |
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| UniRef90-K2JKC4 |  |
| UniRef90-W5WGP3 | S D A |
| UniRef90-UPI000381BA77 | L EHARRRRA |
| UniRef90-UPI0003830A05 | L S A RRNG |
| UniRef90-UPI000377289A | L S A R R N G |
| UniRef90-K9EGV7 | L EDAERDG |
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| UniRef90-G8NU15 | LVDAKAAG |
| UniRef90-F8QPG0 | L S E A |
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| UniRef90-K4QTR6 | Y ${ }^{\text {d }}$ A VR |
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| UniRef90-D7A6B3 | L E HA |
| UniRef90-R4L991 | LSDAQRHG |
| UniRef90-I3WY28 | L S D ARRRG |
| UniRef90-D0LQX4 | LS D |
| UniRef90_UPIO00476E | A G |



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50
GWD|L|DAF|LYEAGAFDPGVF|ISPREALAMDPQQRLDMEAAW GWDLDAFLHDAGDFDPAFFI SPREAAAMDPQQRLLLETSW WDGWGAY MDMAGFDAEFFD TPREAAAMDPQQRVVLEVAY GWDVDAFLHDAPEFDPEFFMSPREAVSTDAQQRLLLETTW
 RQDYVSCAAGVGDFDAELFISSREALAMDPQQRLLLETSW GWDHGGFDHEAGEFDPGFFDSPREALATDPQQRLLLETAW WDKMYTRWGGFLEGDVARFIAPREAATMDPQQRVLLEVAW GWDVEGLYDPDPDRDPAGFMSPREALATDPQQRLLLQTAW GEAYYDPIDQFQEFDPQFFDSPREVLSDDPQQRLLLEVSW
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 WSKWGSFDEGFAEFDPDFFISPREALSMDPQERLFIEACW
 GWDLDAFLHGAAEFDAGFFISPREALAMDPQQRLLLETAW WEAFWGDPKTE DNKSNSKWGFDEDVDAFDAGFFSLSPREL GWDLGGFLPDAGGFDAGFFDSPREAVAMDPQQRLLLEVVW GWDLDGFLHTAADFDPEFFMSPREALTTDPQQRLLLETAW DEDLYDPDPDRPGRSAVRHDSPREALAMDPQQRLLLETAW


## 


TSALKVKCAAQDDWDPVAMLNKKEARRMDRFTQFAMAAAK ESGLSVTDAAPMATDPANSLTPVAAKRLDRVQQAAMVAAA GWDLGAFLYDADHFDADFFVSPREALATDPQQRLLLEVAW YRRYY



## $\stackrel{H}{H}$ <br> A

K D PYY S R I D D I D R F
PEKLYSKRNYVQYFDPQFFYN

A
AEAPD A FWAA DAT D F D A E L L F I

E D GWD Q I T S K VIGGKVPS G
WD R R G G F V P S
P E P F R S QV S F D
A A E A D F D A E A A
WSKWGAFLDDFARFDAAFF
A DSFY HPDPDQPGWD\|DQF

| $G$ | $W$ | $D$ | $E$ | $A$ | $L$ | $D$ | $P$ | $D$ | $P$ | $D$ | $F$ | $D$ | $A$ | $E$ | $F$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $F$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $G$ | $D$ | $D$ | $G$ | $L$ | $L$ | $H$ | $D$ | $A$ | $A$ | $Q$ | $F$ | $D$ | $A$ | $E$ | $F$ |

$G W D L G B G Q Q D P Q F D A Q L F$

GWDYGAF L D DAAGFDAGFF
WRDYYSFGD G IDQFDP LIFF
H S KYF GFMK NVDK F D P L F F
GWQLD GF LPDASRFDADFF

| $G$ | $W D V$ | $A$ | $S$ | $V$ | $H$ | $D$ | $L$ | $A$ | $D$ | $F$ | $D$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $F$ | $F$ |  |  |  |  |  |  |  |  |  |  |
| $T$ | $T$ | $K$ | $W$ | $G$ | $G$ | $F$ | $V$ | $R$ | $D$ | $V$ | $A$ | $A$ |

GWDLDTLYHPDPDHDADFFI
GWDHGGFLDGVGEFDAEFF






 S PR D A ERMD P QERI F L E T A W P R E A L A M M P Q Q R R L L L E G S W PAEAA WMNPEERILLLEVVW K S E L R T M C P A T A Y A LL I A S E GQEA SYMDPPQQR I F L E ES W $P P T A E A M D P Q H R L L L E E V G W$ S S P R E A L MMMD P Q E R L F L Q C A Y S P R E A L A MDPQQQRLLL EAS W
 S PRE ALLAMDP Q QR L L L E T S W
S E GK WN PN D H FA E A E SR R L A S P R E A R S LLDP S Q Y L M L E T C W
 SPREAARMDPQHRLLL E VA W SPREAALAMDPQQRRLLLETTWW

 SRREA IAMDPQQRLLLEVAW SPREARAMDPQQRLLLEVCW A P LLEAELLDDPQER L FLLQU A W
 S P R E A L A M D P QQRWL L E T S W







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UniRefol-R4LIN1 UniRef90-R4LIN1
UniRef90-UPIOOO36D8EB8 UniRef90_UPIOOO36295D6 UniRef90-W0CAB1
UniRef90-UPIO003496EF2 UniRet90_R4LDQ0 UniRef90-G2P425 UniRef90-UP100035CFAE8 UniRef90-Q79ZNO UniRef90_BoPCX2
UniRef90_FOMC64 UniRef90-C4TANO UniRet90-U5E5TO UniRef90-A4X8MO
UniRef90 XoMIK5 UniRef90_UPI000364710D UniRef90-O33954 UniRet90-G2PEV5 UniRef90-B21HH5 UniRef90_UPIO00466D642 UniRef90_W5TA95
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UniRef90_B8HJC9

EALESAGVDPVSLRGSDTGVFAGAMYRDYASRFTTAPKGN EALENAGLAPDTVGDDRGAVMLGVYYNEYQS EAFEDAGYSRETLQRRYGGQVAVIVGTMTNDYNDYGFQNM EADERSGDDPVSLRGSQTGVFAGVMYHDYANLLASPEYEG EVFERAGLDPTGVRGRRTGTFIGGNRPDYAAHLGTVP EAFERAGUDPASLRGNRTGVFVGGG EAFAQSGLERDSQDVREAACIVGVGVGGDGTLDDSYYRLY EAFEQAGIDPETVRGSRTGTFVGASYQDYGAG A ALEDAGVAPNRLAGTAAGVFMGVSSTDYSS EALEHAGLRPDGLRDRRVGVYGGLMYSDYGSRP EVFERAGUDPASLRGRRDGCYTGVMHHDYAPRVRQVPADL VLERAG DPATLRAGRAGVFTGSHQDYALGLNTSA AMENAGLSPASLRGSRTGVFVGL GGPDYASLL EAVAQSGLDFAAGGGGRTGVVIGTGVGGETTQDEQSRRLY EAFERAGIILPERLMGSDTGVFVG SGOYQEYAAL EALEDAGYTREQLAVRHNRRVGVFAGDTKTGYELYGPELW EALEDAGVVPETLRSTATAVIVGADAGDYAALAH EVFERAGI DATSVRGTRTGVFAGVMYHDYASRLR
ETVERAGLVPAALRGENVGVFVGAVPQDYAPRHGDPAAED
EALDPQQRIMLELSWTCLEDAGVCPSHYVGVFNFDYKELQ
EALENAGIDPFALRGTDVGVFVGVMGQGYGMF
EAFERAGIDPAGLRGSRTGVFAGVMYNDYGARLHQSPNAP EAVERAGUDRALRGSRTGVFVGASPDEYGPRMD
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KALEDAGYAGPGEHTRRCGVYVGSCGSDYARLFG
EALERAGLDPSGLRGSDTGVFAG
EALEQAGUPAGHLKGSTGVFTGASSAGYAA
WALADAG KPQEAEGFEMGVVTASSSGGFEFGQNEDRKDW ESIAHACLNPDSLRGTPTGVFAGLTYGDYAARFPTAPAGF
 EALERAGПDPAS $\square R G S R T G V F A G V M Y G D Y A A R$
EALDDAGIAGGAAGAQVGVYVGGFVVDQSVIGVVGPALFH EAFERAGIIDPASVRGSATGVFAGVMYHDYVSGHSAGSV
EALERAGMDPATLRGSRTGVFAGVMYHDYSTLLSGREFEG EALEDAGMDPTTLRGADTGVFVGTNGQDYGSFLA EAIERAGIDPHSLHGSRTGVYAGVMPQEYGPRLA EAFEYAGVKPAALRGTRTGVFVGTNGQDYSTRML
 EALEDAGYRQALLAKHN ENGMGGNVGVFAGVMYEEYQLY EALVDSGLEFDRTDPCDTGVVVGTAVETEYVRMSDHGRLW EAI EDAGYTRQALAQSTMDDKTPGVVGVYVGVTYQEYQLY EALERAGLDPEQLTGSRTGVFLGVNT
 RLLENAAIIPRRKLAKERVGVFIGVTSMTYPLVT
EALTDARWKPTDEADKRDTGVSVGIGMDDLVDVCMTYEAL EALEHAGYAPDSLTGSATGVFLGVSTTDYVRLRQE

 ETVVNAGUVPASLRGSRTGVFTGVMYHDYGSQLDTVPD EAFERAGIVDPAAVRGSRTGVYTGVMYNDYGT
EALEDAGVDPTSVHGTDVGVFSGVFTQGYGAG
GALEDAGYTRAQLAAAGSVGVFVGSMYQEYQLHGVDEASR EALERAGDHPRSLAGSRTAVYAGTGGQDYDAVLAGDPVAG QAVEDDGEPLEPGTGVVIGTTMAGVTSLTEAQRQLD
QAVME
EAFERAGUDPHSMKGSHTGVVVGGATQGYGGGLV
EGFERAGYTMEQLRGSQTGVVIGGTSNILAMDVCLNENA EAVEDAA WSETCPPERAGVIVGSATKLEEVYRQLSRDGSL
EAMERSGRSPSALHGTRTGVFIG MMGQDYTQLA EAFEQAGDDPTAARGSRTAVFAGTNGQDYGDTVR


E A L E HAAVAAPKKQE ERT DSVVFAGMTDSTYYLHENLLMNNRG


## EADEDAGY

 DAFERARTDPATIKGTPTGVFVGAMPQDEALERAG|DPASLRGSRTGVFAGSTGQDYGTVLM RALEDAGLPPERLAGTRCGVFVGVTNNDYRALRLQQRPEL
EAIERAGIDPA TARGSRTGVFAGASGQDYAG
EAFERAGLDPAALRGSKTGVFVGAAYQGYDPDWPHMP
EALETAGYDPQRYHGAVAVYAGSADNSYSFNLYTNPQSRL
EVVERAGDAPLSLRGSRTGVFAGTNGQDHGAKV
EV F E R A GID P T S V K G S R T GVVVGA SAMGYGSDVS
H A I E D A GYT A D KLAAPA H A GRENRVGVYVGMMWGD Y QL EAI ERAGLAPSSLHGSATGVFIGASSSGYESTLPPDD
NALEDGGLTLQSLRGRDVGVFVGDASFDYGHQQHSYS

|  |  |
| :---: | :---: |
| UniRef90-D9W5N6 |  |
| UniRef90 ${ }^{\text {A44 }}$ | G R |
| UniRef90-UP | Y |
| UniR | YQGSGSAGSV ASGRVSYTFGFEGPAVTVDTA |
|  | ( DGVEGHLLTGSNSSVTSGRIAYTFGLEGPAVTLDTA |
| UniRef90-UPII | HETVPDVAGHRLTGIAASVQSGRVSY |
| UniRef | A |
| ef90 UPIO0036A |  |
| $\begin{aligned} & \text { UniRef90 B1GYGO } \\ & \text { UniRef90 KOK5JJ } \end{aligned}$ |  |
| UniR | D A HLGTGTAHSVASGR |
| UniRef90-H9TE | EAYUGRGSTGSF |
| UniRef90-A4KC |  |
|  |  |
|  |  |
|  | TR |
| UniRef90_C0Z477 | A |
| $\begin{aligned} & \text { Buc } \\ & \text { EOP } \end{aligned}$ | K |
| V6 | V |
|  |  |
| UniRet90-18U3Y2 | FRTIGTHHSIGTAAGVIANRVSHYLNLKGPSFTVD |
| UniRef90-R4LIN1 |  |
| Unif | GD VEGYLVSGSAGSVASG |
| UniRef90_UPIC | ESVQGSVLTGSAPSVMSGRIA |
|  | EATQA |
| UniRef90 R4LD | LTTQRASEGYRLTGNTPSVASGRVAYALGLEGPAVTV |
| UniRef90 | SVASGRVSYTLGLEGPAVTVLT |
| UniRef90_UP |  |
|  |  |
| BoP | EKGPDRVSVFMPMMICNMAAGQA |
|  | DGFEGHVGTGSAYSVA |
| UniRef90 U5E5TO | TPASASYTMLSNRIAYALNL |
| UniRet90-A4X8M0 |  |
| UniRef90-X0M |  |
| PIO | G |
| 俍ef90_O339 | AYTLGLEGPAVTV |
| UniRef90-G2P | DAPEDFGG |
| UniRef90-UP1000466L | PGNPSSTANRVSYFFNFHGPSMSVD |
| UniRet90-W5TA95 | EVNERAASPNYYSYY\PSSIAAELALEVDARGPVSVVS |
|  |  |
| UniRef90-E5AR | SAPDCTEDAVDSSFGSUANRVSYVFDCNGPSMAVD |
| UniRef90-G2POH2 | 为 |
| UniRet90-G8YZM2 | D |
| UniRef90 E91932 | YSKVSPF FVPRILPNMAAGQ SIKYGFRGPNHAVS |
| UniRef90 UPIO00248D7D4 | APPPQSFWGKAGSIIPARIAYYLDLHGPAIAVD |
|  |  |
| UniRet90-L8JTH8 | S DLDHFSAALLNDKDYLCTRASYQLNLNGPSVIINTA |
| UniRet90-29EX53 | S |
| UniRe990_R4T3F6 | dill |
| UniRef90-A8M6D0 | PELEGFAGTGSASSVASGRVS |
|  | LP G S |
|  |  |
| UniRef90_A1St | AVHRKLNITAWPNMAAGQIA $\square$ RYALHGPLLTV |
| UniRef90 W5WH5 |  |
| UniRet90-G8YR |  |
| niRef90-M7SY | DRDLADLDGYTITGSAGGTMSGRISYQLGLEGPAMTIDTA |
| UniRef90_Q7X |  |
|  | S |
| UniRef90-Q09 | L |
| $\begin{aligned} & \text { UniRef90_Q0F } \\ & \text { UniRef90 } \end{aligned}$ |  |
| UniRef90-H1ZZU0 | GYLGTGSAAAVVSGRLAYTFGLEGPAVTVD |
| UniRet90-G2G4P2 | GHAPEGFEGYLGTGSAGSVASGRISYTLGLEGPAVTVD |
| D3 | CREYDLFHQRIATSLSM LSTQTSYRLNLKGRSVNVNTA |
| UniRef90 D5 | A |
| niRef90-D8P |  |
| UniRef90-UPI0002 | AAQEQKVGNPIVLSGNPASIANRVSYFFDFHGPSLAID |
| UniRef9 | DNVEGFQLTGNTTSVISGRLAYCLLGAVGPTVTVD |
| iRet9 | AVT1 ${ }^{\text {d }}$ |
| UniRef90-UP1000368F823 | S |
|  |  |
| UniRef90-UPI0003F771C0 |  |
| UniRef90-A0AO14MMV2 | A V Tid |
| ef90 |  |
| iRef90_09AL |  |
|  |  |
| Uni | T |
| U5 |  |
| niRef90-88НJC9 |  |




| UniRef90＿D9W5N6 | LS DAVRNG |
| :---: | :---: |
| B1 | LSDAERNG |
| Ret90－A4TA92 | TDAVRDG |
| UniRef90 UPIO00415DAB8 | E |
| UniRef90－G00942 | ， |
| UniRef90＇－UPI00037203E7 |  |
| F1Z5 |  |
| UniRef90－UPI00036AB195 | LS DAR |
| UniRef90＿B1G | LS DA |
| UniRef90－K0K5J3 | LSDAVR |
| UniRee90－UPIO002E850E4 | LSDAVA |
| UniRef90－H9TEAO |  |
| UniRef90－A4K0 |  |
|  |  |
| UniRef90－COZ473 | LSDARRNG |
| UniRet90－UPIO00346569C | M |
| UniRef90－C0Z477 | LSDAERR |
| UniRef90－B5BQN4 | LRDAQRD |
| UniRef90－EORF |  |
| V6J |  |
| UniRet90－G2NX62 |  |
| UniRef90－81W485 | D A |
| UniRef90－18U3 | 佰 |
| 俍Ref90＿44LIN |  |
|  |  |
| niRet90＿UPI00036295D6 |  |
| UniRef90＿WOCAB | LSDARRNG |
| UniRet90 UPIO003496EF2 |  |
| Ref90－R4LD |  |
| 俍俍90－G2P425 |  |
| UniRet90 UPIO0035CFAE8 |  |
| UniRet90＿Q79ZN0 | D A |
| iRef90＿B0PCX2 |  |
| UniRef90 FoMC64 |  |
| C4TA | SDAQRNG |
| UniRef90＿U5E5T0 | D D A |
| UniRet90－A4X8M0 | L S |
| niRet90－хомік5 | LSDARRNG |
| UniRet90＿UP1000364710D | LSDARRNG |
| UniRet90＿O33954 | LSDARRLG |
| UniRef90 G2PEV5 |  |
|  | AVA D |
| UniRef90－UPI000466D642 | K A 1 |
| UniRet90＿W5TA95 | MSAAV |
| IiRet90－8J3G2 | A |
| UniRet90－E5ARM1 | LSAAEADG |
| iRef90＿E3FL63 |  |
| UniRef90＿G2PO |  |
| UniRet90＿G8YZ | SRALRDG |
| UniRet90－E91932 | NHALAR |
| －7sko |  |
|  | KDALADG |
| 俍ef90＿V5UWF0 | LDDALADG |
| L8JTH8 |  |
|  | L |
|  |  |
| UniRef90－UP1000383016 | LSAKKNG |
| A8M6D |  |
| J7FF93 |  |
| A0ACIO |  |
| A1SP80 |  |
| UniRef90 J9V | EAQANG |
| UniRet90＿W5WH52 | DA |
| UniRef90 G8 |  |
| M7SY8 |  |
| Q7×245 | dina |
| 俍et90＿DOU2E4 | AAEADG |
| UniRet90＿Q091 |  |
| UniRef90＿Q0R |  |
| O30 | LSDAERLG |
| UniRef90＿H1ZZUO | D |
| UniRer90－G2G4P27 | SSARRNG |
| UniRet90－D3HN57 | Ledando |
| UniRet90＿D5UX38 | SSARRNG |
| UniRet90＿Q6MZA4 | ARN |
| UniRef90 D8P4C8 |  |
| UP1000225BC02 |  |
| UniRet90＿UPIO00376CB64 | LSDARRNG |
| UniRef90＿D9T6W9 |  |
| UniRet90－UP1000368F823 | ESDALAR |
| UniRet90＿D6AIT5 | DAVR |
| UniRet90＿A8J6Z6 |  |
| UPI0003F771C0 |  |
| UniRef90 A0A014MMV2 | LSDARRNG |
| UniRet90＿K9XMF | G |
| UniRef90－C9ALM3 | Starkna |
| UniRet90－G2NX69 | LSARKNG |
| UniRet90＿D2BW70 | SRAQA |
| UniRef90＿12NBR1 |  |
| U5DIS4 |  |
| ef90＿B8HJC9 | A D R A S A G G |


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UniRef90-A0QFF5 UniRef90_UPIO0030179BC UniRef90 UPI00036171C3 UniRef90-UPI0003651FCD UniRef90_F8JVX1 UniRef90_A9EAC3 UniRef90 F0V3Y8 UniRef90_S3CQX3 UniRef90_C5HV14 UniRef90_Q0RTS4 UniRef90_A0FCL2 UniRef90-Q70100 UniRef90_UPI00039B73DE UniRef90_I7IAC7 UniRef90_B6JZB7 UniRef90_UPI000463FF68 UniRef90_D7C9R5 UniRef90- X0MS98 UniRef90_UPI00037A2D65 UniRef90_A0A023BPU4 UniRef90-M2Z9N4 UniRef90_UPIO004646EBA UniRef90_G0Q9U0 UniRef90_A8H9H6 UniRef90_F1TIW0 UniRef90_UPIO003460032 UniRef90_C5BJI2 UniRef90_A0ZEC0 UniRef90_L7RRG8 UniRef90_V4IWI8 UniRef90-C6W8L0 UniRef90_Q1L0S8 UniRef90_UPIO001AF2C93 UniRef90_G2NML5 UniRef90_V4GYJ4 UniRef90_K2KT85 UniRef90_UPI0003A57F81 UniRef90_Q53840 UniRef90_I3VKA7 UniRef90_V6KLY5 UniRef90_UPIO003807683 UniRef90_D7F1P3 UniRef90 D0LS52 UniRef90_UPI000477AB7E UniRef90_UPI0003782BB3 UniRef90_UPI0003648315 UniRef90_D9WG11 UniRef90_UPI00046F7BE7 UniRef90_W7IRM3 Unireato - OSSEB UniRef90_UPI000373BC7C UniRef90_Q1WEK8 UniRef90_UPIO003820705 UniRef90-D2CKM4 UniRef90_R5EMJ1 UniRef90_F7QLT3 UniRef90_Q1L0T2 UniRef90_J1RWK2 UniRef90_Q9F6E1 UniRef90-D6C473
UniRef90 IOUWP6 UniRef90_UPIO003830A1C UniRef90_D4D5Z6 UniRef90_F5AN00 UniRef90_UPIO00400E522 UniRef90_F6AGV2 UniRef90_D7C488 UniRef90_D3U9Y5 UniRef90_UPIO003830B4C UniRef90_W7SRM5 UniRef90_UPI000382F638 UniRef90_H8GC79 UniRef90_UPIO00402095F UniRef90_K4HD97 UniRef90_V6KWC5 UniRef90_A0A011AJE8 UniRef90_F3YZB3 UniRef90 F1R7W6 UniRef90-B1VMY9 UniRef90_UPIO003702130 UniRef90_R1HUV2 UniRef90_D2AZU2

ADAFYDADPEAE
SPLLIEARAMDPQARTTLEECW SPREARMDPQERLFLEEW WSKWGGF DGVDAFDASFFMGSRQMRRMDRASQCALLAAR WS K WGGGF I E G F A E F D P LLAF F I A P R E A L S M D P Q E R L F I E A C W
 A D R W D WRRQ Y F D R T P GT E G R V Y S P W G G F DG Q D D Q F D P L F F H WSK W G G F V E GMN L L F D P G A F GWAYHDADPDAPGDAAF
WSKWGSFVDDIAAFDPLF SFRWGGHLDDIDDLFDPLF
REDTGTKWWGNFLNDRDA WHHVGAF LDEDDRFDAP GWDHGGFLHDAADFDAEF GWDDDGFVYDAAEFDAAF GWDHGGFLHDVAGFDAGF WADFGGFLADVTGFDADF $\begin{array}{lll}A S D & \text { ACKVAGQHCFNS L } \\ R Y G G V P R G E K D G E W N T Y\end{array}$ QS DLPVHFGGQLKMNPAD
WDAYGRWGGFLSDVDLF ADPRYVR $D P D V D D F D T A F$
$W S K T P G K T H S T M G V L E K$ WSKTPGKTHSTWMGVLEK PDRYPVRGVAGEEDSFTPEE
$G W D E P G S G G F L L D F D A D F$ GWDEPGSGGFLLDFDADF WSKWGGFI EGFADFDPLF


\section*{L

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GWDTDAFLYEAARFDPAF WDRWGGFLGDVDRFDARF $G W D V E S D A R Y G G F D A G F$
$E R A P G A R G A L I K D F D T F D$ DQLYDPDEDVECFDAGF
VGAFYSPDGWGGFIDEAA VGAFYSPDGWGGFDEDAA
TAPDLVPVAGVLDFDAEF
GWDVDALYDPDDDHALF
 REGLNTRLAPVTDFSTPAYYG GWDVGGFLHDAGEFDAGF
GWDLDALYHPDRDHAGE
GWDYGFLRGVADFDAA KEGADGQGQYVPQFDATLFITS GWDLGGFLHTAPEFDAGF $G W D \square G G F$
$D R Q M R S Q V A P E F D A G F F M S P R E A L S T D S Q Q R L L L E T S W$
$A$ AADLPVKACPEFGFDPDRAVPKKDQKKMDRFDQFAMMAAD GWDVETLFDGAGDFDAEF R



| $A$ | $P$ | $S$ | $E$ | $A$ | $A$ | $M$ | $D$ | $Q$ | $H$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $P$ | $P$ | $A$ | $L$ | $L$ | $L$ | $E$ | $L$ | $L$ | $S$ | $W$ |


S P R E A A S L D P Q Q R L L L E V A W
 S P R E A V A M D P Q Q R L V L E L G W
 P R E A LA T D P Q Q R L L L E T S W S P R E A A A M D P Q Q R L L L E A S W









 $\begin{array}{lllllllllllll}P & R & E & A & L & A & M & D & P & Q & Q & R & L \\ P & L & L & E & A & E & L & M & D & P & Q & Q & R \\ L & F & L & Q & S & A & W\end{array}$ $P$ R E A L V I D P Q H R L L L L
 GR R L A R R L D R S T H L V L L A A R

 S P A E A E V M D P Q H R L F L L E H T W
 S P G E A E L M D P H Q R I F L Q T V W
 $P R E A A L T H P A A R L G L E C C H$ SPREALAMDPQQRLLLETSW SPREAMMTMDPQQRLLLLETAW GRKR LRRTMGRVSKMSVRAS E PR E A LSMDPQQQRVLLE TA W S P R E A L A M D P Q Q R L L L E T S W
 AREA E DMD P Q Q R L L L M C A Y

 $S P R E A L A M D P Q Q R L L L E A S W$
 H
 $A P R E A T A M D P Q Q R L L L E T S W$

 S P R E A E AMD P Q Q R L A L E T S W






| 1 |  |
| :---: | :---: |
| 9 |  |
| G9 |  |
| UniRef90-E3E |  |
| UniRef90-L7RX | LSDARRNG |
| UniRef90-F8J3 | LSDALSDG |
| UniRef90-Q4K | L |
| UniRef90-L7UFF | LSRA |
| UniRef90-F8TTL0 |  |
| iRee90-A00 |  |
| UniRef90-UPI00030179BC |  |
| UniRef90-UPI00036171C3 | LSDAERNG |
| UniRef90-UPI0003651FCD | $L$ SDA |
| UniRef90-F8JV | LSDA |
| UniRef90-A9EAC3 | LKD |
| UniRef90-FoV3 | LRT |
| UniRef90-S3C |  |
| UniRef90-C5HV14 | LADALADG |
| UniRef90-Q0RTS4 | LSD |
| UniRef90-A0FCL | LSD |
| UniRef90-Q701 | LSAARRNG |
| UniRef90-UPIO0039B73D |  |
| UniRef90-171A |  |
| 矿 |  |
| UniRef90-UPI000463FF68 | A |
| UniRef90_D7Cs | LSDAVR |
| UniRef90-х0M: | LRDAL |
| UniRef90-UPI00037A2D | LDDA |
| UniRef90-A0A023BPU4 |  |
| UniRef90-M2Z9N4 | L |
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| UniRef90 G0Q |  |
| UniRef90-A8HS |  |
| UniRef90-F1TII |  |
| UniRet90_UPI0003460032 |  |
| UniRe990-C5BJI2 | HL |
| AOZEC0 |  |
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| UniRet90-V4IWI8 |  |
| UniRef90-C6W8L0 | SAARRD |
| UniRef90-Q11 | LS ${ }^{\text {d }}$ |
| UniRef90-UP10001AF2C93 |  |
| G2NML5 |  |
| V4G | A |
| UniRef90 K2KT85 | LEDAQNDG |
| UniRef90_UP10003A57F81 |  |
| UniReef90-Q5? |  |
| I3VKA |  |
|  |  |
| UniRet90_UP10003807 | DARRAG |
| UniRef90_D7F1P3 |  |
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| UniRet90-UPIO00477AB7E |  |
| 俍e990-UP100037828B3 |  |
| UP10003648315 |  |
| D9 |  |
| Ret90_UPI00046F7BE7 |  |
| niRef90_W7 |  |
| Q5 |  |
| UniRef90 UPI000373BC7C |  |
| UniRet90_Q1 | L |
| UP200388 |  |
| D2CK |  |
| iRet90_R5EMJ1 |  |
| F70 |  |
| UniRef90-Q1 |  |
| UniF |  |
| UniRef90_Q9F6E1 |  |
| UniRef90_D6C473 | SDARRNG |
|  |  |
| UniRet90_UPI0003830A1C |  |
| UniRef90_D4D5Z6 |  |
| F5 |  |
| UniRef90-UPIO00400E522 |  |
| UiRet90--6AG | dana |
| UniRef90-D7C488 |  |
| UniRet90_D3U9Y5 | DARRNG |
| UniRet90-UPIIO003830B4C | DARRNG |
| UniRef90_W7SRMS |  |
| UniRef90 UPI000382F638 |  |
| UniRef90-H8GC79 |  |
| UniRet90_UPI000402095F | VDDA |
| iRe990-K4HD97 | SARRNG |
| iRef90_6kWC5 | Sarrng |
| niRef90_A0A011AJE8 | SD |
| F3 |  |
| UniRef90 F1R7W6 |  |
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| O-UP10003702130 |  |
| R |  |
|  | SRALADG |
| 003744 |  |



UniRef90 M3E6K2 UniRef90_R4LLEO
UniRef90_B5BQL3 UniRef90- F8JYE3 UniRef90_E5U1P4 UniRef90-UPIO0037D699E UniRef90-D3CZB6 UniRef90_UPIO003830D10 UniRef90-R9UUC6 UniRef90_UPI0002FE6F9D UniRef90-_8S8W3 UniRef90-V4KPQ6 UniRef90-D9W5N4 UniRef90-B2WW42 UniRef90-V4PJK7 UniRef90-F8QPF8 UniRef90-E3FL94 UniRef90_UPI00035D2980 UniRef90_D3D0C0 UniRef90-E8S0C2 UniRef90_UPIO00395D640 UniRef90-D3CXU0 UniRef90-M3UUY6 UniRef90_UPIO00464F5ED UniRef90-B2HFX0

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UniRef90 A7Z474
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UniRef90_UPIO00466E965
UniRef90-Q1WEK9
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UniRef90-A2R1Z2
UniRef90-E3JBT4
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 A WP LG GF L D DA GGFDAAF FM
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WDHWGGFDNGYKEFDADF
 WDRWGCWLDEPDKFDATFFII
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 GWDFGGFLYDAAEFDPRF

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## B

GWPLD GF L DEAT DF DAALF
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$\begin{array}{ll}P D A A Y F D A Q A D G E G G S F Q S S A \\ G W D G G G F D E R P G D F & D\end{array}$
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$S I D P E G L E G H L G N G S A G S I A S G R U S Y G G F E G P A V T V D T A$ EGEERLRGNPVHANSAFWCDANRVSYFFGFEGPSIALDTA LGDEGREWLVDQSYQSPHLFDYFVAWTVGAEGPVSVVSAG KKDNASLEPGDVTGSGFSFLLSGRVSYFFGFQGPGITVDTA QMGGEGVEGYSLTGNLTSVISGRIAYTFGLEGPAVTVDTA RAGGRPAEAHTLTGAALSVIPNRISYGLDLRGPSVAVDTA EKTPKRDGPFAVPKMSSGVSGRAMWFERGINYS SSA MHHATDTEGFRLTGGSGSVVSGRVAYHFGFEGPAVSVQAA AAY $\square P N G S S G A V \quad V S G R I S Y L F G L E G P S M T V D T A$ GAGGELAGYVLTGSTLSVASGRVAYTLGLEGPALTVDTA PGVEGYVLTGTAASVVSGRLAYTFGLEGPSVTVDTA GKGPQRLSPFTVPAFLANLAAGQVSDRHQLKGPLGAPVTAA
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GTGNSAS
V s
EGAEGISEGHLITGNTASVLSGR SVVGLGAMSDA AAHGTPPDAFTSTGNAHSMLANRISYVLDIHGPSEPVDTA RSGDDADAQVLMGNDTATLPARISYLLNLRGPSDALNTA ADEQGGEGFGVTGGAASVASGRVSYTLGLEGPSMTVDTA VGERDAGGGYGLTGTMASVASGRVAYCLGLQGPAVSVDTA VADPSTAHPYAITGTASSIIANRVSYFYDFRGPSMAIDTA RVSGGGKFAHYHRRFMFASVVADHLADTYGTKGSPISLSTA ARFGMELNAQAFMGNATSILAARIAYHLDLQGPSLAADTA EDLPGUDAWTGDGAAVCAVSNRVSHALDLRGPSLSVDTA GAEETLRGNPIAVGGSYASIANRVS F G S TATSASVLSGRVSYTFGFQGPAMTVDTA AGGTDDDDGHVGNGSAGSVASGRISYLFGLEGPAVTVDTA GLTDEQLDGSLTTGLGAYSLSGRLSYFLGWRGPSLTTDTA LSERAAVTLHSATGQSLNIVANRLSYTLGLKGPSLTVDTA RTSYKKMNPFSVARSSFASIUANRISYYFDFKGPSIGLDTM PGANAFB GR NYFFKFSGPSYAVDA SNSGQDVDLYYVPGANRAFTPGRVNYF KFSGPSYAVDTA STPSAEVAQPYIPGGTLSSII ANRVSYFCDFHGPSLTLSTM GHYQD L D A S RVVVSS FAAIAANRVSYAFDLQGPSLTVDTM DAPPEVEGLLGAGTTGSVASGRVAHVLGLEGPALTVDTA HRVPDDVQGYLMTGAASSVASGRVSYVFGFEGPAVTVTA LMNSESVRDYLGNGSLGSVASGRVAYALGLEGPTLTVDTA DIPDGLEGHLLTGSVSSVLSGRIAYTLGLEGPALTVDAA V FAGVMNKNYPTGYGYWSIANRVSYHLNFRGPSLVVDG
 A A GSHRAPQ AMIGNESSVIAGRIAYTLDLDGPAVVVNTA

$E G Y \square A G G S \square G S V$ LGNSGTGSLVS S GVAY TFGLE GPAVSVDTA EGDS RLD GYYLVTTGM (
 GEARLPS GERDAPALS FASLS A RTSYVLDLRGPSLTIDTM QLPD D S E GYTMTGVAS SVLS GRVSYSFGFEGPAVTVDTA $R \quad$ E D A P A Q A
 DKF G DG DP P WL S H F A L A N R V S Y I L N L H GP S EP I D T A DEVE GY LY $\operatorname{V}$ GS A G S VAS GRVVSYVGLEGPAVSVDTA
$\mathrm{F} \backslash \mathrm{G} \square \mathrm{S}$
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| UniRef90-UP1000465E50B | LSDA |
| UniRet90_G1UL |  |
|  |  |
| UPI0004 |  |
|  |  |
| E3J |  |
| UniRet90-G2PEV1 | LSDARNG |
| UniRe90-99ALM |  |
| UniRet90_UP1000382FEE |  |
| UP10003 |  |
| UP10004766FC7 |  |
|  |  |
| UniRef90- UPIO003478F3A |  |
| UniRet90_E5D | LS ${ }^{\text {d }}$ |
| UniRef90_A0A014MGM4 |  |
| A1TGV5 |  |
| 隹ef90-Q216M4 |  |
| UP10003D |  |
| UniRef90 M3C0 |  |
| UniRe | LSDARRNG |
| UniRef90 W4MOF4 | EDAERDG |
| A8LUX |  |
| D976W3 |  |
| D9W5.9 |  |
| 2LRJ4 |  |
|  |  |
| UniRef90-UP100037DEF70 |  |
| UP10002C36AC8 |  |
| UniRef90-FOXMV4 |  |
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| - |  |
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| UniRef90 UPI000474C93B |  |
| UniRef90 Go |  |
| UniRef90-UP1000476300 |  |
| VR |  |
| iRet90_Q79zC4 |  |
| 俍et90_R1FV99 |  |
| UniRef90 UPI00036370AB |  |
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| UniRef90 A6GIB1 |  |
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| UniRef90 W9G2P5 |  |
| UniRef90-UPIO0035C638E |  |
| UniRef90 ${ }^{\text {W5 W222 }}$ | D |
| UniRet90-0 |  |
| UniRet90_UP10003604207 |  |
| UniRe90-LIMAJ4 |  |
|  |  |
| UniRet90_G0Q189 |  |
| UniRef90-UP100037C85B5 | LSDA |
| UniF |  |
| UniRef90 E9KTB5 |  |
| UniRef90- J90316 |  |
| UniRef90-UPIO002 |  |
| UniRef90 A0A014MMC1 | LSDAQRDG |
|  |  |
| 60 F |  |
| Ref90-E3JBU2 | LS D A R A N G |




## UniRef90 D7C9Q7

 UniRef90-R1HZA3 UniRef90-LOBNE8 UniRef90-K2H795 UniRef90-UPIO002FA800A UniRef90_R4L8T3 UniRef90_12H1K7 UniRef90-Q9KID7 UniRef90-H2A147 UniRef90-G4RJC7 UniRef90-UPI000403D7AB UniRet90-H0K9K9 UniRef90-W7J4T6 UniRef90-UPI00046682E6 UniRef90-F6KOW4 UniRef90-L8JSV9 UniRef90-D7W916 UniRef90-12NAV4 UniRef90-S4WILT UniRef90-R8BHJ2 UniRef90-C6W869 UniRef90-V9TTR4 UniRef90-UPIO003752FB3 UniRef90-F1TGL3 UniRef90-UPI00039B1E53 UniRef90-UPI0003A0784D UniRef90-A0A014L866 UniRef90_L8EG47 UniRef90-G2KXB0 UniRef90_UPIO004201299 UniRef90-Q1MX63 UniRef90-UPI00035CD619 UniRef90-UPI00040B31E1 UniRef90-F8QXP0 UniRef90-UPI00037AC818 UniRef90_UPIOOO476C414 UniRef90-A9GJ40UniRef90_O9KIE1
UniRef90-G3Y419 UniRef90-UPIO004774F7A UniRef90-UPIOOO375CAFD UniRef90-SOADM5
UniRef90_D9W7F0
UniRef90-D8HZ84
UniRef90-UP100035EE9BD niRet90_W5TDZ9 UniRet90-G2PG70 UniRef90 HoR263 UniRef90-UPI0001D32013 UniRef90_B1GSN2 UniRef90-W715U1 UniRef90-M2NBF6 UniRef90-K7WEW6 UniRef90-UPIOOO3818336 UniRef90-R4LMP6 UniRef90-J2K8C1 UniRef90-E3CJ16 UniRef90-G2GEF8 UniRef90_UPIO0037B2711 UniRef90-G413A6 UniRef90_UPI000382F627 UniRef90-D8HZ85 UniRef90-V9TTQ8 UniRef90-Q0QMQ0 UniRef90-OOCCC2
UniRef90 M1LN31 UniRef90-S3D4S4 UniRef90_UPI0004776A77 UniRef90-A0A023UYM9 UniRef90-S3D5L7 UniRef90_UPIO0037E6640 UniRef90-UP10003652403 UniRef90-V9G868 UniRef90-F8JLT0
UniRef90-U6ZZ87
UniRef90-UPIO00345038D UniRef90-UPIO0036CE803 UniRef90-W3X2P4 UniRef90-B5M9L2 UniRef90-11WSW2
UniRet90 K9UFS UniRef90- T2JB40 UniRef90-UPIO0036EAEAO UniRef90-S3C7U8 UniRef90-UPI0003AA70C3 UniRef90 A3NJF5 UniRef90-S5R120 UniRef90-K2R8F4 UniRef90_D9SXW6 UniRee90OUPIO0037A466D UniRef90_M3DVR2

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90 90 Ala G R T G ${ }^{100}$ 110

120
halledaald rilags rigllfvgaeptsy
EAFERAGLDPDSVRGKRDGVFAGTNGQDYPA GGGRGGML AA EDAGYAPSTLSGTRTGVFVGVTTSD EAVEQSGLSFDGALSERAGVVVGTSGGGLNTQDDNYRAVY EALENAGYNSETYNGSIGVFAGSSLSGYLLNIYLNQNDRN EAFESAGITPDSTRGSDTGVFVGAFSGGYGH EALEHAGVNPEQLGGSKTGVFVGDYHSDFSN AA】EDAGWMPESITGRRLGVFVGAQFHEYAQLLASAGLSR EAFERAGDDPDSVKGSQTGVFVGAAAHGYGDSVD
EVLERAGLDPSGLRGSRTGVFAGVMYHDYAARLR DYELAR WALADARITPAEIPAFTMGVCTASAQGGFEFGQHELQKLW
 EALEDAHQPANELRGTPVGVFVGSSSNDYGM
EAFERAGTDPDSLKGSRSGVFVGCSHHDYGSRVT
EVVERAG| DPTSLRGSRTGVFAGVMYHDYGSRLR
EAIVSAGUPDESLDGSDTSVNDGSFVKDYEQUCN
LALENAGYPAARIAGKKVGVYVGASPSGYEQNLDARELI
 RADEDAGYDPYGWYGQKHGDFVG RGMSCGVY $\underset{M E}{V G}$
ETFERAGMDPRSVEGRDDAVFAGGSGQGYGGGPG
EAWADAGAP EVEDPERLAVVIGTGTGGALTLLGQDDVLE EAVERAGVPGSURGSRTGVYTGVMYNDYASRVAQVAPEY
 EALEHARIPASSLRGEAVAVYMGSTNGDYQN
EAL EDAGYVPNSSPSFRPEAFGC
EAFERAGVDPTALRGSRTGVFVGMMNTDYTLVGAATQDY(I) EAFEHAGIDPQALRGSRTGVFAGVMYHDYASRVL HAMEDAGVTVDSLQRSRTGVYVGVMNDDYTWIAA
EALEHAGIVPDTLRGSDTGVFVGGFYYGYGTG

EALEENAGISPPQLAGSNTSVVMGVNSDDYAK
ALERAGIDPDALKGSPTAVFTGVAYHDYPN LL
 ELLERAGDDPTSLKGSPTGVYAGVSSQDYLSRMP
EALEGVGLDPASLQGTDVGVFTGAGGSGYGGG
 ETLEHAGDDPSSLEDSDVGVFTGLANGDYALTVD
 DGTGLGGAEALVDAVQTMD MALADAHVDLADFPEYERAVVTANSSGGVEYGQHELQKMW
 $K V I E D A G Y S A G A L A G S T L G D Y V G T \quad G G T G Y A G L I$

 ECLERAGWQARDLSGTATGVFVGVGHQDYLLTSDAARDDI
 RAWQHAGSPEVDSKR LMVA L G TG GGSSEELLYAYEAMR EA A ERTGTDP LDSMKGSDIGGVFTGVASMGYGAGGM HALEDAGYGQQELAKRAVGVYVGVAPDGY AALEHAGDDPAGLEEAKAGVFVGRNYHEYGAPLEYAP QALEQAGYFQQDD $\square$ DKN $\square$ GCYI ASCTVDYEHNVNCHP EALEDAGYNSDKYDGK VGLYSTYDEQLYDWNY LMR EALEMAGYSPSSAKGQQSPPRIATYFGQTVDDWKTDNE EALDDAGLAGVAPGSDAGVYI GGFMSDNQIRRCMS HALEDGGYAGYEPPCPVGVYVACGPASYLTQQVLANRQDK


 EALEHAGLPPDMIKGSEAGVFAAANSFDYGHRML EALENAGYDSQRCDSR IGVYAGASLNNYLTFSLNGD EALUAT GVDATSGKGSDVGVFTGVF EATEDAGI PLEKLSGPGPNTSVFVGCYTKDY
EVLERAGLDPAALRGTDTGVFAGASASGYGSGAQ
LLLQHA WKADEDGCTRERTADAGGVYMSASNSYYQAMLRAA TALENAGYDSQKYPGAI AVFGGAGMNGYLFNVYSQSKN

 LAFEHAGIIDPHSARGSRTGVYFGV
WA IE DAGYNPAALAGSRTALFAGIAQSGYAD
LAALEDAGYNPAALAGSRTALFAGVAQSGYAD
EALEMSGYVPNRTPSTKLHRIGT EALADAGIEVGRDVDPERDAVIVGGVGGMSTBEGQVLARA
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UniRef90 D7C9Q7 UniRef90－R1HZA3 UniRef90－LOBNE8 UniRef90－${ }^{-1 H 2 H 795}$ UniRef90－UPIo002FA800A UniRef9－R4L8T3 3 UniRef90＿12H1K7 UniRef90－Q9KID7 UniRef90＿H2A147
UniRef90 G4RJC UniRef90 UPI000403D7AB UniRef90－HOK9K9 UniRef90－W7J4T6 UniRef90－UPI00046682E6 UniRef90－F6KOW4 UniRef90－L8JSV9 UniRef90－D7W916 UniRef90 I2NAV4 UniRef90－S4WIL7 UniR Refo－R8BHJ2 UniRef90－C6W869 UniRef90＿V9TTR4 UniRef90－UPIO003752FB3 UniRef90－F1TGL3 UniRef90＿UPIO0039B1E53 UniRef90＿UPI0003A0784L UniRef90－A0A014L866 UniRef90＿L8EG47 UniRef90 G2KXBO UniRef90＿UPIO004201299 UniRef90－Q1MX63 UniRet90＿UPIO0035CD619 UniRef90 UPIOO040B31E1 UniRef90－F8QXP0 UniRef90＿UPIO0037AC818 UniRef90 UPI000476C414 UniRef90－A9GJ40
UniRef90－Q9KIE1
UniRef90＿G3Y419 UniRef90－UPI0004774F7A UniRef90－UPIO00375CAFD UniRef90 SOADM5 UniRet90＿D9W7F0 UniRef90－D8HZ84 UniRef90－UPIO0035EE9BD niRet90＿W5TDZ9 UniRet90＿G2PG70 UniRef90＿HoR263 UniRef90－UPI0001D32013 UniRet90＿B1GSN2 UniRef90－W7I5U1
UniRef90 M2N8F6 UniRef90 ${ }^{-}$K7WEW6 UniRef90－UPIOOO3818336 UniRef90－R4LMP6 UniRef90＿J2K8C1 UniRef90＿E3CJ16 UniRef90－G2GEF8 UniRef90－UPIO0037B2711 UniRef90 G413A6 UniRef90＿UPIO00382F627 UniRef90－D8HZ85 UniRef90－V9TTQ8 UniRef90＿Q0CCC2 UniRef90－M1LN31 UniRet90＿S3D4S4 UniRef90＿UPIO004776A77 UniRef90＿AOAO23UYM9 UniRef90－S3D5L7 UniRef90＿UPIO0037E6640 UniRef90 UP10003652403 UniRef90－V9G868
UniRef90－F8JLT0
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UniRet90＿B5M9L2
UniRef90－11WSW2
UniRef90－T2JB40
UniRef90－UP100036EAEAO UniRef90－S3C7U8 UniRef90＿A3NJF5 UniRef90＿S5R120
UniRef90 K2R8F4 UniRef90－D9SXW6 UniRef90 UPIOOO37A466D
UniRet

130
140 ${ }^{130}$ FTGASDA $\frac{140}{V A}$ SRISYF ${ }^{150}$

SRILSYFLDLRGAALVVINTA ERSAESLEGHAGVGNAASVVSGRLSYVFGLEGPSLTVDTA DENRLKHAKNPVVAAGPNYLAANLSQFFDLKGPSLVLDTA EAGKDRVHPFVVPKLMNSAAAAHISIIRHNLRGPSFTVSSA STDERQIT UAGDKDYLATRTSYKLNLTGPSYTVQTA ELPYAQLDGHLAAGGTMFPLSGRLSYFLGWRGPSDSVDTA YOPNKKISPFFID KILTNMAAGNVSDKFKLKGPLHSSSTA $\square A$ KLDPKESS GHVGSQTSVLSGRL $K$ LPKESSSHIVGLSQNFIASHVS
DPRRDDLUSGTGTSNNVAAGRLS AQIGTGVEHS

MLANRISYLLDARGPSEVVDTA SVPEDLEGFLGNGSAASVVSGRVSYTFGFEGPAVTVDTA KERGVQTTQHSAVGNGLDIVAARLSYFLGLSGPSLVVQTG RQGSQYVSAYQSFAWFYAVNSGQI STRNGLQGPSSIVVVSD YQLFGARGKGMALMNSYASIANRVSYVLNLHGPSMTLDTM SRAAAHYALTGTASSIDPNR SYAFDFRGPSMNVDA AVPPELEGYLSSGGSGSVVSGRVSYTFGFEGPAVSVDTA RVAEEFEGHLADGSSGSVASGRVAYALGLHGPADTVDTA T

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A ESDYPLTESSAITSVHTGTAPARIGYFLDTKGPLLAIGTA TSGVRRVSPHTVPMLMANGPAAWVSIEGGARAGAHTPVSA PANPFAAGKEFSFAAGRIAYHLGVHGPAMAVSTA
 PAAEGFVMTGTTVSVISNRLSYTFNLGGPSLTLDTA LSDPSUTHPYADTGNSSSUANRVSYFYDFRGPSVTVDTA
$\qquad$ MGTGGSLG
 DEDLDRLGGFGAYSTQPAVLAGRLSYFFGMEGPAVTVDAA

解
LGAEPGSTTAGSVVSGRVAYTGGLEGPAVSVDTA GAEPANYHHGSFVGSSEAIIASRVSYFLNMKGPAMVVNTG RVPEGFEGYATTGSLTSVVSGRVAYTFGLEGPAVTVDTA LTGPEMQSFAGTGLASSVASGRVSYVFGFEGPAVTIDTA
E DGGYYGNG LAMOMMMNGPATVGVELGCRAGANPVSA
T
AASPQNVDAYSGTGNAHSDTVGRISYLLGLRGPAVAVDT SGGPMRVSAYMSVAWFYAATTGQLSUHHGLRGPCGLIATE CNSGQFDDTYEATGGNRAFVPGRVNFCFEFCGPSYSNDTA LVQRDAAGHTDP品ALNHAPIANRVSHLCDFHGPSMVIDTV FRM
E $\qquad$ PVGEFQVMDANEKDYDTTRVA GSRLSGKPARSLKALYNMPAL解 SRAGQDAEGYLLTGGAGSVASGRVAYTLGLEGPAMTVDTA AKGLRAVSPLAVQMYMPNAAAAAVGLELKARAGVITPVSA LRLSDGGAGFGMTGNASSVASGRLAYTFGLEGPAVTVDTA
 GSVEGHLVTGSVASVASGRIAYTLGLSGPAVTVDTA ASAYAATGLLRSFLAGKLSHYFGWRGPAFCVDSA
QKGDWYLNYHLAEDNLGGTFSTRIAYKFNFQGPCTMSKYA ARG DHYLIGNRFAPGRLAHYFQWAGGFYSDTG SQTSQM QLLIGNDKDYAANRISYKLNLKGPSVVVQSA RDANS $\square P T Y F A T G T S R A D L S R I S Y F F D W R G P S M T D T A$ AEAHDALGATGSVASGRVSYVYGLRGPADTLDTA QVPPEVEGYVGNGTAPSVATGRISYTFGFEGPAVTVDTA GAQEQUQGNPLALPGLPASAANRVSYYCNFHGPSMTVDTM ADLSHDEPWVVNGGMLSGAANRVAYHLDLKGPCLVVDTA RTGSASSFQKLIGDDKDFLSTRVSYKLNLTGPSLTVQTA
 EATEGAEGYAMTGAATSVISGRVAYTFGLEGPAVTLDTA GTDDASDEYQAWLLAQGGTVPTRISYELGLTGPSLFAHSN ESRGFLPMOTLVGVDKDYLPTRVSY DHGRDWHVDADYAGPFLYQASADI AVRFGVHGPVQVVSTG RPPPPGVGGYAYFGSAGSASGRVAYTFGLGBAVTVM RQAGEGIEGNSFLGVVPSIALNRISHLLDLHGPSEPVETA DNAAENVDTYFITGGVRAFAPGRINYYFKFSGPSYSIDTA ARGRAAVSPYLLTGILPNMPSARIADAHGTRGYSSSVGTA AAGRADDRVLASTGTAASVLSGRLLYALGLAGPALTVDTA



| UniRef90＿D7C9Q7 | $L A D A V A D G$ |
| :---: | :---: |
| R1 | LSDALREG |
| niRef90－LOBNE8 | A A AVKDG |
| 90－D2SUE1 |  |
| K2 |  |
| UP |  |
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| iRef90－12H | LEHAQRRNA |
| UniRef90－Q9KID7 | d |
| UniRef90－H2A147 | L K A K |
| UniRef90－G4RJC7 | LSDAL |
| UniRef90－UPI000403D7AB | L A |
| UniRef90－HO |  |
|  | LSDARRNG |
| UniRef90－UPIIOOO46682E6 |  |
| UniRef90－F6KOW4 |  |
| Re990－8JSV9 |  |
|  |  |
| iRef90＿12NAV4 |  |
| S4WIL7 |  |
| UniRef90－R8BHJ2 |  |
| Un | LSDARRAG |
| R |  |
| UniRet90－UP10003 |  |
|  |  |
| iRef90 UPIOOO39B1E53 |  |
| UniRee90－UPI0003A078 |  |
| UniRef90＿AOA | LSDARRNG |
| － |  |
| G2K18 |  |
| iRef90＿P100042012 |  |
| niRef90＿Q1MX63 | LDRALADG |
| UP100035 |  |
| 100 | diarrda |
| 80XPO | LSDA |
| P100037AC |  |
| UP1000476C414 |  |
| AgGJ40 |  |
| IRet90＿Q9KIE1 |  |
| UniRef90＿G3Y419 | LDKALADG |
| iRef90 UPI00047 |  |
|  |  |
| UniR |  |
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| W5 |  |
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| W7 | A |
| UniRet90－W71511 |  |
| 俍e90＿M2N8F6 |  |
| K7WEW6 |  |
| UP10003818336 |  |
| R4 | LSEAQRLGG |
|  |  |
| 隹 | diabkica |
| NiRef90－G2GEF8 |  |
| 相 |  |
| UPI000382F6 |  |
| Z85 |  |
| UniRef90－V9TTO8 |  |
| UniRef90－Q0 |  |
| Qoccc 2 |  |
| 俍et90＿M1LN31 |  |
| iRef90＿S3D4S4 | LSDA |
| UniRef90 UPI0004776A77 |  |
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| UniRee90 ${ }^{\text {－}}$ | d |
| iRef90 UPI00037E66 | LSDARRHG |
| Ret90＿UP10003652403 | LSARRNG |
| 俍et90＿V9G868 |  |
| niRet90－F8JL90 |  |
| U6Z287 |  |
| UniRef90－UPIO00345038D |  |
| UniRef90－UP100036CE803 |  |
| UniRef90 W3X2P4 |  |
| UniRet90＿B5M9L2 |  |
| iRet90＿1WWSW2 | A |
| iRef90＿K9UFS1 | LEDA |
| UniRef90 T2JB40 |  |
| 3EAEAO |  |
| UniRet90＿S3C7U8 | LSDARRNG |
| UniRee90 UPIO003AA70C3 | LGDARRNG |
| UniRef90＿A3NJF5 |  |
|  | AALSG |
| niRef90＿K2R8F4 | EDA\AD |
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| M 3 I | LIS D A R A N G |


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| :---: | :---: |
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| UniRef90_Q3S866 |  |
| UniRef90 V6KXN9 |  |
| UniRef90_S3DJP3 |  |
| UniRef90_I2C4I5 |  |
| UniRef90_A9EW83 |  |
| UniRef90-E9LIP4 |  |
| UniRef90-R4LIM2 |  |
| UniRef90_R1GBG3 |  |
| UniRef9 | G7XTA3 |
| UniRef90_F4CN |  |
| UniRef90_B1LZR4 |  |
| UniRef90-A8J706 |  |
| UniRef90_K7WYZ2 |  |
| UniRef90_T2LFB8 |  |
| UniRef90_Q5Y9G4 |  |
| UniRef90_C3ZIP9 |  |
| UniRef9 | UPI00037C0C60 |
| UniRef90_W1IYS0 |  |
| UniRef90_UPI00046757CA |  |
| UniRef90_H0BQM0 |  |
| UniRef90_Q55E72 |  |
| UniRef90_UPI0003781BFA |  |
| UniRef90_UPI000366B640 |  |
| UniRef90 J4TDG1 |  |
| UniRef90-N4TZN1 |  |
| UniRef90_UPI00037BA88C |  |
| UniRef90-D7C2B7 |  |
| UniRef90_R7YU14 |  |
| UniRef90-B5FCF9 |  |
| UniRef90-C6C2W7 |  |
| UniRef90-W9AFQ4 |  |
| UniRef90_F9FU54 |  |
| UniRef90-UPI0002895D03 |  |
| UniRef90-A0ACH2 |  |
| UniRef90-J7FEN4 |  |
| UniRef90_E0D204 |  |
| UniRef90_UPI000376816F |  |
| UniRef90_R4LB52 |  |
| UniRef90-UPI000470E9F8 |  |
| UniRef90-U4WK59 |  |
| UniRef90_S3BDE8 |  |
| UniRef90_W6C8A1 |  |
| UniRef90_W7IDM9 |  |
| UniRef90-UPI000382992A |  |
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| UniRef90-UPI0004675ED7 |  |
| UniRef90-UPI000382F4FC |  |
| UniRef90- Q55DM7 |  |
| UniRef90_UPI000364128E |  |
| UniRef90-UPI0003629EFC |  |
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| UniRef90_A0A014NVF1 |  |
| UniRef90_R1GEG8 |  |
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| UniRef90-D8P2N5 |  |
| UniRef90_E5ADK6 |  |
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| UniRef90-D5P4N3 |  |
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| UniRef90_D8G9D1 |  |
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| UniRef90-L7WCE4 |  |
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| UniRef90-UPI000378BF2C |  |
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| UniRef90_W4BR31 |  |
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| UniRef90-UPI00037DE062 |  |
| niRef90-UPI00034C81FC |  |
| UniRef90-H3NBN9 |  |
| UniRef90-H1VF09 |  |
| UniRef90_V5XEZ6 |  |
| niRef90_C3VLZ8 <br> niRef90 S3D9F1 |  |

 GAVVGYSCRLPGAPDPEAFWRLGLLDEGRCGVRQAPHDR
 QPDALI GM S CVVFPGSKNADEFWWNLIDNEKDLIDQEIPPPDR V I GVS GRYPMADDLDAFWENLAAGRDCI TPADRFP
$M A C R F P G G V S P E G L W D L V V G E R D A V G G F P V D R$ AVIGMACRTAAGNTENDIWQAILEGKSVVREVDEKR



 I A I V GLWCRFPNADGPDDFWRVLVNGEDCVEELLPD DR $P \vee A V V G M A C R Y P G G V S P E D D W R L V E S G T D A V G B F P A D R$ RRVVI GMGG\|T ALGDNWQSVSAGLKAGINTVQQMPAWA $M R R V V V T G L G V M A P N G M G A E K Y W S A I L A G D N G I R R I G R F D$ $P V A V I G M G M R L P G G D N R E Q L W E V L S N R T D V V E P V P A D R$
 PI A I VAIGGCRYPGGDDPDGFWRLVHDGVDAMTDLDTDR

N
 PVAIVGMAGRFPGAANDAALWTLVVGGESGLTLFSDEE II V S MACRYPGGVSPEDLWRLVIGGEDGISGFPTSR





IVGMACRDPGGVSPEDLWRLVESGTDADTGFPADR

 PVAVVGI GCRYPGGVDSAGLWRVVSEGRDAIRGLPTDR DI A I I GL A GRYPHA PTVDAFWRNLVAGRDCVDP PQRWP $R E \operatorname{A} V V I G M A C R F P D A P D V G A F W R N L A A K R C S V V P G S R W D$ $P$ G

R



 DAI TAMACRLPGGADPEALWELVERGGDAVGPLPRDR
 QP DA I $\quad$ GMSCRFPGNVTPEEFWELLARCRTGFSPSSRPA I AVI GMSCRFPGAPDLDGYWRNLCEGKVSVTFLDRKD
 K DI A I I GMALD FPMAKSVDEFWNNI KS GKDCI REYPDNR R DVAI I GMAGRFSSAND TEEFWK IL R DGVNGIREDHPED
 PI AIVAATGCRLPGGVDPEQLWDMVSQGREARGPDPDDR





UniRef90-A2QTE9 UniRef90_J3ET30 UniRef90_Q3S866 UniRef90_V6KXN9 UniRef90_S3DJP3 UniRef90_I2C4I5 UniRef90_A9EW83 UniRef90_E9LIP4 UniRef90_R4LIM2 UniRef90_R1GBG3 UniRef90_F4CNW7 UniRef90-B1LZR4 UniRef90-A8J706 UniRef90_K7WYZ2 UniRef90-T2LFB8 UniRef90_Q5Y9G4 UniRef90 C3ZIP9 UniRef90_UPI00037C0C60 UniRef90_W1IYS0 UniRef90_UPI00046757CA UniRef90_H0BQM0 UniRef90-Q55E72 UniRef90_UPI0003781BFA UniRef90-UPI000366B640 UniRef90_J4TDG1 UniRef90_N4TZN1 UniRef90_UPI00037BA88C UniRef90_D7C2B7 UniRef90_R7YU14 UniRef90_B5FCF9 UniRef90_W9AFQ4 UniRef90_F9FU54 UniRef90_UPI0002895D03 UniRef90_A0ACH2 UniRef90_J7FEN4 UniRef90_E0D204 UniRef90_UPI000376816F UniRef90 R4LB52 UniRef90_UPI000470E9F8 UniRef90_U4WK59 UniRef90 S3BDE8 UniRef90_W6C8A1 UniRef90_W7IDM9 UniRef90_UPI000382992A UniRef90_A2QW90 UniRef90_U5QR0
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GWDLDDAF $\ddagger$ R D A D RFD P A F F $\|$ S P R E A L A M D P QQRLL L E T S W

 $F A G L P V Q L A A P V A V E P A D L L S R R E M R T M S R C A Q F A V L A A R$ VDAFYMPEGDVVSEFDP E F FI S GKEA EAMDPQQQRLALEEVAVY
 VDA Y Y D P L S DVDRFD PLVFI A PREAELLMDPQERLELETAW
 GWDLD GF LAADAAGFDAGFFISPREALAMDPQQRLLLETS W FPGRDGKMWGSFMSDDDLFDHQFFQRSKDPHQRVLLETAY DS GRYA WVSTVPDFDPTAWMDDRVVDGTDVFAQYAIAAAA LERFA HPRAHVWSFDPAVFDSPREAEQMDPQQRMLLEELTW GWDVGGF LA GAA EFDAGFFISPPREADAMDPQQRLLLEVSW
 D WDVVDALL H QVAADFDPAFFLSPREALAMDPQQRVLLELLSW RSQGALYYDANENEFDPGLFMTDEEASRMDPQQRFMLECSY
 P G Q Y P T G L A E VVVE F A A E E H L S S RLLL P QTADHMTRRLAALARAA D

 GWN L G G F LLS D DVG D F D A A A F F
 WN P Y GC W W R E P G L F F D S R F F L S S P R E A D Q S D P A Q R L A A T T A Y
 WQK WGGF $G E D V D C F D S Q F F V S P R E A Q W L D P Q E R L G L E T C W$ LY D GLLNTAAAP I S N F NVVPK H YT R K QLRRAMGRDV K L A TVVAS E
 GWDLDAFLHEAAEFDAGLFISPREAVAMDPQQRLLLETSW


GWGQGGF LDDAAGFDAA RDPAYVKACGYLDFDASF WWY DDTP $\quad$ TE NKY GGF L E D V G GWDLA DLYGTDPDFDAEFFGCSPDAPF FGDSEKDAAMMDPQ



 WS K WG GF ID GIIADF DPEFFISSPR $\square D R F Y H P N P T H H G T T A F F$
$W D K W G G F D E G D D E F$ D P L $\quad$ I
A




 A E S WY HE AH H GT S NVT K S Y F L A E D P TAF D S Q F F NI PPK E C A D R L G DR DA QVR D Y DE A A HFSSRSEAADMDRFA QFAVLAA R F S ALL H S RLA C PLLP F E V P S TYP R K K T R SM G P V S MY A V RAT E A AGFYHKDGSYHGHDAGFFDNPAEANVLDPQMRLLLEVTY

 APD QVLA G GVLVEAADAFDALLSRKEAAALTDPAHRQGFLEVAH HTPF GCFVENAG LGFDPRFFMSPREATGT DPMQRLALDTAY
 RYQE LNTAGP I EDFQAPAHWTRKQQRSMGRVSQQLVRAAA

 LA A A GVD H GLLRDF DA AFFGYAGSEEK I DPQQRTFGLECAW

 GWDLVGMYDPEPGKPGKTY DSPREAVAMDPQQRLLLETSW



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| UniRef90_A2QTES |  |
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| UniRef90-120 | KAIEDAGYKASKLSGKNTGV |
| UniRef90-A9EW83 A TLENAGYARGALAKRRVG |  |
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|  |  |
| UniRef90-R1GBG3UniRef90 G7XTA3 |  |
| UniRef90-F4CNW7 ${ }^{\text {a }}$ ( ${ }^{\text {a }}$ |  |
| UniRef90-B1LZ | EADEDAGLRPSSVAGSNDGVFVGA |
| UniRef90-A8J706 | EALERAG DPVSLRGSRTGVFAGVANQDYAETMARHGYRP |
| UniRef90-T2LFB8 EAMEDAS LP S SLRGSQCGVFL |  |
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| UniRef90-J4TDG1 E AL ERAGI D P A T L R G S A |  |
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| UniRef90 UPI00037BA88C QT EHAGCDPATFTGADGLYAGLLTS P W WLIN |  |
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| 55F |  |
| UniRef90 W9AFQ4 QALTQSGLLGGHVTNGNG |  |
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| UniRet90-UP10004675ED7 KA1 EDAG\| A HSKLAEQPTGVFVSAVGLNEY | KA EDAGAAHSKLAEQPTGVFVSAVGLINEY TVNDYASLD |
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| UniRef90-A0A014NVF1 EAVERAGI APDSLRGSDTGVFVGTCA |  |
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| UniRee90-C5AHL5 |  |
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UniRef90_T2LFB8 UniRef90_Q5Y9G4
UniRef90 C3ZIP9
UniRef90-UPI00037C0C60 UniRef90_W1IYS0 UniRef90_UPI00046757CA UniRef90_H0BQM0 UniRef90_Q55E72 UniRef90_UPI0003781BFA UniRef90-UPI000366B640 UniRef90_J4TDG1
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UniRef90_F9FU54
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EVP 130 140
150
160
 NVACHPPNAFMATGNLKSFVVAGKISHWFGWTGPGLCIDTA D A D E Y V R W L M G Q G G S I P T M I S Y K L G L S G P S V F L Q T N ARGARFVSPHTAPMVVPNSAAA QVAVDLGARGEARTVVSA HKDLE HYPKYSVTGTGAADLLANRISYYYNLHGPSVTLDTA MRHSDGAHAFAGTGNSQALI SNRVSHYFNFRGPSESI DTA

 $R G A R D D V E G Y L G S G S A G S V A S G R V A Y S L G F V G P A V T V D T A$ LASNPH SPYTGLGMMRSFVAGRLSHYFGWTGPSHTID TA

 $\stackrel{\text { E }}{\text { E }}$

F GLT QA D SMIA NRIS YQF DLA GPSELI NAT
D D M A A D D A STA T G N T S S IAA S N R L S Y VF D L H G P S M S L D T A A E G G A GVVE GYLMTGTTSSVAS GRIA YTLGLEGPALTVDTA SDHPT QAGDPSISGAAASLLAARVSYTFNLTGPALTVDTA QVPE GAA GFRLTGSADAVLSGRISYVLGLEGPALTVETAA
 AK GSSYVSAYQSFAWFYAVNTGQDSIRHGLRGPGGVVVAD HEAYTYTGNMANAS AGRISYTFGFTGPSMAIDTA


 A
 AAE $\square V N R G Q V V P L S M N Y A P \square A N R V S Y F C G F H G P S F A V D T V$

 A A DPEAAD GYLAT GAVASVLSGRISYVFGLE GPALDTVDTA GQAGVAVTGSSAAGLVGSMGPNRMSYWLNWHGPSEPVETAA
 GI GA DLGGF GT TA GSPSVLS GRVVYFFGLEGPAIDVDTA


A APRAAEGYVVTGTTGAMVSGRVSYTFGLAGPSATIDTA DAAQRRGARQFAAPSQ $\quad$ RFS I SNRVVYVMNFTGPSDTVDTA GMGTD
 TRD DMDMPHNSATGNGRTMLAN RLLSWFFDLRGPSIMMD TA
 A A EAGVKGRH\|GLPGG\|SS\|ANRVSYRCDFQGPSDSVDTM GQDVNMVRTYAGTGTAASNASSRVSYFFDWHGPCMTIDTA
 NGVTD DLNANSYVRMMPHTTAANDGDFFGLKGRDIPTSSA


ESAGRGL
$T M V G N S P$ SASVGSVV S GRTS

 A E GRNR V HPFTVPRLMANAGASHVSMALGLKGPAFTLSSAA

 G $\quad S V G T Y Q V G \square S N E K D F L P T R V A H K L G L R G P C I A V Q T A$ $F R D L D T L P Q Y A A T G T S Q A D V A N R I S Y F F N L R G P S I T V D T A$
 $\mathrm{G} N$
G

S
NGVTDDLNANSYVRMMPHTTA


 RDSET $\square P M H Q A T G C A M A M Q S N R I S H F F D F R G P S F T V D T A$ KAGNGAEAFQCLVGNDKDYLCSRVSYKLNLNGPSLCVQTA



 VVP E ELA GY L GN GSMA SVA S GRII S Y T L G L E G P A VVSVD T A R D K Y A E S D G V V T L T G L
 A K GLLRAVSPLVVQMYMPNGAAAAVGLERKAKAGVNTVISA


230
240

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UniRef90_A0A014KWT9 UniRef90_D5P4N3 UniRef90_H8N207 UniRef90_I7ZPB6 UniRef90_UPIO0035FDC33 UniRef90_V5GBX6 UniRef90_X4XVI4 UniRef90_D8G9D1 UniRef90_R9UR31 UniRef90_UPIO003486195 UniRef90_J7LFZ8 UniRef90_L7WCE4 UniRef90-B6WQE7 UniRef90_UPIO00378BF2C UniRef90_C5AHL5 UniRef90_G8M270 UniRef90_A0A022PKQ8 UniRef90_UPI00037DE062 UniRef90-UPI00034C81FC UniRef90_H3NBN9 UniRef90_H1VF09 UniRef90_V5XEZ6 UniRef90_C3VLZ8
UniRef90_S3D9F1

SFTGFSRQRG|L|AEDGRCKSFAASADGFGMAEG|V|LLVLVER AAASFL S S T GQCKPFDASADGYCRGEGFAAV FL K K QPGLL NFSSSGQCRAFDAEADGMVSGEGVAMLLLKR GALVAAGSGALSPDGRCHTFDERANGYVRGEGGALVVLKT TAMRALSPGAEGPEAASRPFDKARDGFVLGEGAGVVVLEA

$\qquad$ SRQRGLAVDGRCKSFAASAD GTGWSEGVGVLLVER $S R Q R G L A A D G R C K S Y S S D A D G T G W G E G A G M V V L E R$ $S F V E F S R Q R G L A G D G R C K P F A G G A D G T G W G E G V G L V L L E R$ S S DALRASGFTNETGTCKAFDSRADGYCRGEGVGVVILKP TSYGMS Q GTPD PTMAMLPFDRRRTGGVEGEGAAVLVLER

NDAS QLTHR SKASMLL $\qquad$ S P
A A GQVFSFGENGDGFIRSEGVGTLLLER $Y R A G T A \quad G P D G R C K P F S A A A G G Y V R G E G C G V V V L K R$

RMGSLAADGRSKAFSADADGFGMAEGAGMVVLER $S R Q R G L A A D G R C K A F G A G A D G T G W A E G V G V L V L Q R$ DTLFATSQKNEHPNTTPSPFDVNRDGLVIGEGAGTLILEE ARGEMSSS DDPCAAYLPFDARAGGYVPGEGGAILVLED GHLSWSRLGALAPSGRCRSFDDGADGYIRSEGGAVVILKR

 SRQRALAADGRCKAYAGAADGTGFSEGVGVLVLER
TAL

## HEGM

 $S A Q G G L A$ DRGHF SA Q DTLFATS L G L A K N DAP


 S RQR GLLSP DGRCKA F S S A A D GMAGFAEGGVGFMVVLIR R S RQRGLAAD GRCKAF GDGADGTGWGEGVGVLLVER
 TFDEFSRQRGLSADGRCRSFAASADGTGWSEGVGVLLVQR AM QDGLAADGRSKAFSDSADGAGFSEGVGVLLVER $S D L N M L P$ G E L L S P D GHCRAF DA QA GGTVMAS AVGCCVVL K R


 TLFATSTCNDAPHTTPRPFDSERDGLVLGEGAGTLLLEE QRLS Y M H M L S A D G $\square$ SHSFDS KANGYGRGEGFGAILLMP
 LRGLLS S Q G QFISSKGHCGSFGAGGDGYIDAEGVGVLLLKR SF $\square T \square S K L N M L S P T G R C R M W D A D A D G Y A R G E G V A A G V L K T$ SFS KA GMLLCDDGRCKTFSSAANGYVRGE GVVGMLBLRK ALYA T S QRNDAPELSPRPYDSQRDGLVDGEGAGMLVLES GFARQRGLSADGRCKAFADAADGTGFAEGVGVVVLER EAMGF LSSH DGQTRPFQANANGYVRSEGVGVLVLRP K Y A MVTSK $\qquad$ VD $\begin{array}{ll}D G L C K A F A D A A D G T G F S E G V G V L L L & E \\ T & G K C K A F D E S A D G F V R S E G A V V L I L\end{array}$

## $R \ G$

S R QR G LAA E D GRCKSFA GAADGTSWSE GVGLLLVER
GVDSSDGHCAPFSEQASGTVWGS GGGTVVLKR $S G Q G G L S R D G R C R S Y A D G A D G T G W A E G V G V L L L E K$ $T T Q G G L A P D G R C K S F S D D A D G T A W S E G V G M L A L Q R$ A ESKKLKMLSPDGRSRMWDQGANGYARGEGIAAVVLKT $G \square K A W E G L R V M S P T G$ CRPFCATRDGMVQGEGAAVFVFED $T L Y A T S T R N D E P H L T P R P F D A A R D G L V V G E G A A T L V L E E$
$\qquad$

$D G R$
$D G R$
 S P GRCKAYAGAADGTGFSEGGGMLVV ER P TGHSRMWDANAD GYARGE GVVAAVVMKR
$\qquad$


 KE $\quad$ FGFLSPDGRCRSFGRGGTGFGPGEGVGAVVVKP TRKGGLS PDGRCRAFGADADGTGFSEGAVVLVLER
 QKKGQGG\|GIESTDCRARPFDDNSDGTGWGEGVAAVILKP


## S L

SLQRGLAADGRCKSFSAGADGTAMSEGAGMLLLER
$K L L G A T A T T E K W A D G R C K A F S G G A D G A S F S E G A G M V V L E R$ A QMR SK L NMLSPS GRSRMWDA GADGYARGEAVCSVVLVT A QMR ILSSNTNDDPPGACRPFDVDRNGFVFGEGGAMMVIGT
 A M T E Q GVLS P D G A C K S F D E S A D GYARGEA\|NA\||Y|I|KR

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| J3E |  |
| UniRef90－O3S8666 |  |
|  |  |
| Ref90－s3DJP3 |  |
| Ret90＿12C45 |  |
| Ref90＿A9EW83 |  |
| Ref90＿E9LIP4 |  |
| RiRe990 R4L |  |
| UniRef90－R1GBG3 |  |
| UniRee90－ $7 \times 1$ du |  |
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| Re990－B1LZR4 |  |
| Ref90＿A8J706 |  |
| Ref90＿K7WYZ2 |  |
| T2 |  |
| UniRet90－Q5 | LSDARRHG |
| iRef90－C3Z1 | LQRALE |
| UniRef90－UPIO |  |
| Ret90－WITYS |  |
| IRef90＿UPI00046757CA |  |
| iRet90＿HOBQM | der ${ }^{\text {a }}$ |
| UniRef90－Q55E72 |  |
| UniRef90－UPI0003781B |  |
| UniRet90＿UPIO003 | LSDARAG |
|  |  |
| IRe90＿N4TZN1 | A |
| UiRet90－UP700037BA |  |
| IRef90＿D7C2B7 | DAQRNG |
| 俍et90＿R7YU14 |  |
| B5 | A |
| UniRef90－C6C2W7 | Y |
|  | A |
|  |  |
| UniRet90＿UPI0002895D |  |
| iRef90＿A0AC | SAVRNG |
| UniRet90＿J7FEN4 |  |
| E0 |  |
|  | abar |
|  |  |
| UniRet90－UP1000470E |  |
| 俍iRe90－U4WK59 |  |
| Ref90－S3BDE8 | Salerig |
| UniRef90－W6C8A1 |  |
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| UniRef90－UPIIOOO382992A | LEAQARGA |
| Ret90－A2QW90 |  |
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| niRet90＿3in88 | aHALDRGA |
| H2AKE4 |  |
| $A O A$ |  |
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| UniRef90－UPI00037B | DHALARGA |
| WSTIDO | LSAVANG |
| niRet90－UP1000467 |  |
| iRet90＿UP1000382 | SARAKG |
| Ret90＿O55 |  |
| niRef90 UP1000364 |  |
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| UniRet90 |  |
| UniRef90－A0A014N | DAQRDG |
| Ret90－R1GEG8 |  |
| iRet90＿S9R27 | 硣 |
| D8P2N5 |  |
| UniRef90 E5ADK6 |  |
| A0A014KWT9 |  |
| UniRef90－D5 | D |
|  | LTDALAQG |
|  | SA RDG |
|  | LDRALADG |
| UniRef90＿V5GBX6 | LSDAEAD |
| UniRef90 X4） |  |
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| UniReef90－R4 | LEHAQARGA |
|  | rabada |
|  | ADARAG |
| UniRet90＿J7LFZ8 | SARRAG |
| 俍et90＿LTWCE4 | DQALKD |
| iRe |  |
| 8BF2C | G |
| UniRet90＿C5AHL5 | LDHALRDG |
| Ret90－G8M270 |  |
| Ref90－W4BR31 | HRALEDG |
| niRet90＿A0A022PKO8 | Q A |
| niRet90＿UPIO0037DE062 | DAERHG |
| $34 \mathrm{C81FC}$ |  |
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| UniRet90＿H1VF09 |  |
| UniRef90＿V5XEZ6 | EEHAKARGA |
| niRef90 C3VLZ8 |  |
| iRef90 | $S D A \square R D G$ |

UniRef90_UPI000364954F
UniRef90_D8P4D1
UniRef90_Q54296
UniRef90_F8B0I3
UniRef90_E2Q805
UniRef90_G8XG92
UniRef90_F7W5E8
UniRef90_UPI0004776B96
UniRef90_UPI00034661F6
UniRef90_UPI00037A6F25
UniRef90_N6UIH3
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UniRef90_A6EWZ2
UniRef90_G2WWW70
UniRef90_UPI00037EE7FD
UniRef90_A2CLL2
UniRe90_E9KTB4
UniRef90_Q4ZNC8
UniRef90_C7R9X8
UniRef90_S9YSX6
UniRef90__L8EV57
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UniRef90_C7BQL4


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UniRef90_UPI000364954F
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UniRef90_Q54296
UniRef90_F8B0I3
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UniRef90_A6EWWZ
UniRef90_G2WW70
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UniRef90_S9YSX6
UniRef90_L8EV57
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UniRef90_UPI0004661712
UniRef90_UPI00035DE4C3
UniRef90_K7Z660
UniRef90_M2UBF6
UniRef90_UPI0001FFEFCB
UniRef90_L2G0G0
UniRef90_UPI0001BC7656
UniRef90_S0EJI4
UniRef90_E3SA90
UniRef90_UPI00041E9B05
UniRef90_Q93C90
UniRef90_A0A014PJF9
UniRef90_UPI000464B821
UniRef90_C7BQL4

GHPVD FACGAMDFEPAET ${ }^{60}$ GERQADNTDRSTQMALVAA ${ }^{80}$ WREYYGFIDGGVDHFDPLEFTGSPREAQLMDPQQRLLMTYAW
 GWDLGSFDDGVGDFDASFFICPREALAMDPQQRLLLEVSW

 SHPNYVKAGAVLPFDASFFGYSSKEAEDDPQQRIFLECAW
GWDTYGRLAGAAEFDAEFFGSPREAAAMDPQQRLLLETMW VEGLNTIIAGTVDFAKLQESTMGASALSEKLAHLAAE VATWIENAGVAPDVDPAELYDRADPCLDRYVLLALAAADD LSPDYVKAKGLVDFDAKFFISPDEARVMDPQQRLLLEDSW GWDUDALYDPDPDFDAGFFISPREATAMDPQQRLLLETSW
 GWD PSGLTGGPDADRGGFISPREALAMDPQQRILLETAW
WSKWGGFVDDGECFDANFFISPRESKFMDPQQRIIMMEMAW EEGLRTSLAAPVDYTFPKLPRKRIDRSMGRVSLLATCATQD WDHWGGFLSDVDKFDPLFFVSPREAELMDPQERLFLQSAW KADMYDYLDRIDRFDARFFIPPDEADYMDPHQRIGLEVAY ASRWGGFIDGVDEFDPLFF: SPSEAEDMDPQERLELQHAW DSNFWHFLKGFNEFDPSFFIPEVEADFMDPQQKLLLQCSY

 VSMHESFRAMQNEKWKPKWFGNFDDGADEFDWNFFRSNVK GWDTGAFLDGAGDFDAAFFMSPREAVSTDPQQRLVLETAW
 IDSFWHPDGDVAAFDASFFIPPTEAKSMDPQQRILMETVY AKGFYHADGTHAGHDAEFFANPVEAKAMDPQQRLLLEVVY VEEYPVRDGGHLVEAPESFLSRTELRRLSYQQKMALVLSR FNGHGCWINDPGLFDAKFFISPKEAEQSDPGQRLALATAY



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 AKTGVPI EGYSATAMVPSVGPNRMSFLLDLHGPSEPVETA TAAPNVLSG R RLSYFFGLEGPADTMDTA A VS NS GRNWLVNPAYASSFLYYALARRFGAHGPAAVVSTG AGH $N L N P T T D D G S G G \square G G A A S V A S G R I S Y L L G L A G P A V T V D T A$ QRDDLSVSQYYATGNARSI DSNRVSYFFNFHGPSMTIDTA A AQEQLA GHLMTGNASSUASGRLSYTYGFEGPAVTMDTG

 AKGRTG $\square$ SPYMIPGILPNMAAARIALRFGLRGYSAAIATA DSYGV LNCGLANEPDLLSTR SYK LNNKGPSDNVITA PRY SERATGTGNAILANRISYFYDLQGPSMTIDTG

 GGPMTGFTSTSYVEMMSHTAPVNMGVFFGCKGRIIPTSSA GAVDALRGTGPVTESSYSLIANRVSYLLDLHGPSLAVDTM DPAYLPDGFQMALHHDKDFLATKVAYHLDLSGPAFTVQAA YRMFSERHAMQLSGSWEGLVASRISYVLDLTGPCVMI DTA SEY LQCADNDPEVGS SYASIA NRVSYALDLRGPSLAIDTM ETITHYNCTGTAVSVAANRISFTFNLTGPSLVIDDA EALVTYVGNGSA

GSVATGRMAYTFGLEGPAVTVDTA
 LVGGPATASGKVVQNGHWSDANRLSYHLDLTGVSMAVDTA NTNAYPPTAYSAVGTIRAFLCGKLSHCYGWTGPAEVIDTA QNSPDDLAGHALTGLIPGLTSGRLAHLLGLEGPALTVDTT
 RDPETAPLYSVTGNGAAILSNRISYFYDLKGPSLTLDTA





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UniRef90_UPI000364954F UniRef90-D8P4D1
UniRef90 Q54296 UniRef90_Q54296 UniRef90_E2Q805
UniRef90-G8XG92 UniRef90_F7W5E8 UniRef90 UPI0004776B96 UniRef90-UPI00034661F6 UniRef90_UPI00037A6F25 UniRef90 N6UIH3 UniRef90-UPIO0047ED0C7 UniRef90-A6EWZ2 UniRef90-G2WW70
UniRef90_UPI00037EE7FD
UniRef90-A2CLL2
UniRef90-E9KTB4
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UniRef90-E9KSM4
UniRef90_UPI0003B5F34D UniRef90-UPI000368D6EB UniRef90-UPI0004661712 UniRef90_UPI00035DE4C3 UniRef90_K7Z660
UniRef90 M2UBF6
UniRef90_UPI0001FFEFCB
UniRef90-L2G0G0
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UniRef90-S0EJI4
UniRef90_E3SA90
UniRef90_UPI00041E9B05
UniRef90 Q93C90
UniRef90-A0A014PJFs
UniRef90_UPI000464B821
UniRef90-C7BQL4

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240
$F R \square G A D S R R T H D P L G A S R P F A A S R D G L V F G E G A G D L V L \mid E N$ A QUSFNKAGMLALDGRSKTFSAQANGYARGEGVGMIVLKK A RQRGLASDGRCKAFADSADGAGFSEGAGLLLVER DAIRATSARNDDPEHASRPFDATRDGFVMGEGAAVLVLEE GHL GADAPNGMSKPFSADADGFGVSEGAGVLVLER A RQRVLSADGVCKSFSDDADGAGWGEGVGLLLLER SS LDHMLSPTGRCHMWDDRADGYARGEGVAAMFIKP SRQRGLAADGRCKAFAEGADGMGFAEGVGLVLLER
 SLLSALSTHNDPAEKASKPFSRDRNGFVMAEGSGALVLES VNARATANGWADPAQASRPFDKGRNGFVLSEGSCVVVLES QEGSMLSK NFDSPGCRPFDQDATGTTFNDGAGAIILKR TALNFLSPDGRSFSFDARANGYGRGEGVGFVVLKR
 EQ QGGLSPDGRCRAFADAANGTGWAEGAGVLVVER GAFTKNGMLSKDGKSYTFDDRANGYVRGEGGGLLLLKA S LFA TSVDNQNPQNTPRPFDKDRDGLVDGEGAGTLILED SQSKFLST, DGRCRSFGAGGSGYVPGEGVGSVLLKP RP QHIFSKDGHCRPFSDDADGTIGASGVGVVVLKP MSGA TMDSVESRDSAVRTFDARADGTVWGEGAGIVVLKP $S Q G \quad R F V S P R G R C H S F G A D G D G Y V P S E G V G V V C V K R$

A LSKARMISPEGTSKPFCTSADGYGRGEGCGV
ASPGQTGPAGDGRCKPFSASADGVGWGEGAGLVLLER
S A QRGDAYDARCKSYAAAADGTSWSEGAGVLVLER DA GKAGFL SPTGQCKPFDESADGYCRGEGAGLVVLKP ALVGHSRQGGLAPDGRCKVFADDADGTAWAEGVGVVVLKR TSQGFLSPDSKCYSFDHRANGYSRGEGFGILLLKR SRQRALARDGRCKVYAGAADGTAWSEGAGVLVVER AMSNMHFFSPDSRCYSFDARANGYSRGEGDACLILKP
 SRQRGDAPDGRCKAFADAADGTVWSEGVGVMLLER
 EAGLYFLSR ESPDYKLRPFDNEANGTVWGEGVSAVVLKR D ILGALSKEQESVEKACCPFSKDRSGFVMSEGAAVLCLED

[^3]

| UniRef90_UPI000364954F | DAHARARGA |
| :---: | :---: |
| UniRef90-D8P4D1 | RAQAEADG |
| UniRef90-Q54296 | LS DARRNG |
| UniRef90-F8B013 | WEHARRRGA |
| UniRef90-E2Q805 | LS DARRNG |
| UniRef90-G8XG92 | L S D AVRRG |
| UniRef90-F7W5E8 | LS K ALA D G |
| UniRef90-UPI0004776B96 | L S D ARNG |
| UniRef90-UPI00034661F6 | LS Q A $\square$ A D G |
| UniRef90-UPI00037A6F25 | L S DARRHG |
| UniRef90-N6UIH3 | LESALDRKA |
| UniRef90-UPI00047ED0C7 | AEHADARG |
| UniRef90-A6EWZ2 | RDDAERDG |
| UniRef90-G2WW70 | LT DADR D |
| UniRef90_UPI00037EE7FD | LS DA RRAG |
| UniRef90-A2CLL2 | M S D A VR D G |
| UniRef90-E9KTB4 | LS DAERNG |
| UniRef90-Q4ZNC8 | LDKAlEDG |
| UniRef90-C7R9X8 | YDHAVARGA |
| UniRef90-S9YSX6 | LARAIEDG |
| UniRef90-L8EV57 | L R L A R R D G |
| UniRef90-H0BQL7 | L A R A L A D |
| UniRef90-E9KSM4 | LA DAERDG |
| UniRef90_UPI0003B5F34D |  |
| UniRef90-UPI000368D6EB | LS D A QRNG |
| UniRef90-UPI0004661712 | LS DARRNG |
| UniRef90_UPI00035DE4C3 | ARAARERGA |
| UniRef90-K7Z660 | LD R A L A D G |
| UniRef90-M2UBF6 | L K Q ALA ${ }^{\text {d }}$ |
| UniRef90-UPI0001FFEFCB | L S DARAAG |
| UniRef90-L2G0G0 | LSDAVR |
| UniRef90-UPI0001BC7656 | L VDa RRDG |
| UniRef90-S0EJI4 | L ADA 1 R D |
| UniRef90-E3SA90 | L S Q A L A |
| UniRef90-UPI00041E9B05 | EEHAKARGA |
| UniRef90-Q93C90 | LS DAQRNG |
| UniRef90-A0A014PJF9 | L E D A ${ }^{\text {a }}$ D |
| UniRef90-UPI000464B821 | LSKAI K |
| UniRef90_C7BQL4 | Y DSAVARGA |
| lupas_21 |  |
| lupas_14 |  |
| lupas_28 |  |
| jnet |  |
| conf | 56665359 |
| sol25 | B B |
| sol5 | B |
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| jhmm | $\dagger$ |
| jpssm | $\bigcirc$ |


[^0]:    lupas_21
    lupas_14
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    jnet
    conf

[^1]:    lupas_21
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    jnet
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    sol25
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    jhmm
    jpssm

[^2]:    lupas_21
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[^3]:    lupas_21
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