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 TGD $\square$ MSA VVRDI FNSFQDYLNNEQEIREQI RVI VKDI EK M M D SFNDYLVKEQELRTEIRDIVRDIDQ MSTTDIFASFNDYLTQDHEI REEI R L S SVRNLEQ SEDCMPNSVVI SAFK SHAPLPAFMARFESFRAQLDGSSALRDRIRAVVSEVES


SSSPVILTFKSFQQELDARHDRYERLVKLSRDVTV VMAAFKSFQQLELDTKHDKYERLVKLSRDI TI


 MSSRI-TKMFTSFQDCLNNEQEIREQIRNIVKNI EK


 AFMDAQI FEDLQTSUDADAKVREQIKTILQKLER REEVRSLE DSPSPSQQIFNAFQDYLNNEQGTREEI RVIVKEIEK TNSARSEELRSKLEESGRLLREKIRAVVLEI ES TNSAQSPSPFMPMFEAFRAELDEHHDRRERI DKASRDITA | $M D L A D F A$ | $Q Y Q N L L$ |
| :---: | :---: |
| $M D P Q N L D$ |  | TANENSMIPPGVFESLQRKI DDDSAVKDALRETVQELEK

 MDPSDLEQLNVLLDGDSELREKIRDQVTEFDK TPPSPTVHTLEQFEVFQHKLSDSGTLRERIRGVALEDES

MQNT $\quad \mathrm{V}$ K D KQFDS
MDPRDL
STTGNAGVIDPADLENDNALLDQDVELREKIKKQVTELDK STKPQQASSPFDPMFEDLGHKIDEDAAVKDALRDVVQNLEK

 MDP EDLTHDNNLLDHDADLREKIKDHVTDFDK APA पP पE T GSPSSAIM SVFRVFQQELDTKHDKYERLVKI SRDVTI TPPPPSCVSASQFEDFRVQLDETASVRERIRAVVMEMAA


 SNPPPSSPF $\square P M F E A F R A E L D E H Q D R R E R V \square K A S R D I T A$
 STGP A GM $\quad$ GD P Q $\square F R Q V Q D D \square D E D \square K V R D E \| R G L L K A L D K$ DFSSLLAELEQQRDLTENMRERSKDLDK TQDTGGPVQPGDFEDLQRKI DEDSVVKDQLRDVVQTLEK



 S S PVVVA A F K V F Q Q E L D T K H D K Y E R R L V K il S R D il T I
 MNAQDFAFDENALTSDAEDKEKLRDEVVELEK
 S R D T L A V F D D Q F R E E L D D D H N D R R E R L I K S S S R D V


 MAP GD $\square R$ D T F E K F R D E L D E H N D R R E R L

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 | $K$ | $E$ | $V$ | $P$ |
| :--- | :--- | :--- | :--- |
| $A$ | $Q$ |  |  | A ALIP K TKFPA DQYYR Y H D H WHYMTQQRIV F ATKK P S D Q Y Y R F H D H WR F V T Q Q R L T F L A A F T V Y

 A A AFPVDEYYRFHDHWKYGI QR LAAFSAS LI IGLEHERL AT A E K I P E N Q Y Y R Y S D M WR F V S Q R F V Y L A G L I V F L R D G R L V T
 SAKI PEN QYYRFNDHWKYALLQKL SF L








 HE E LIA G D R F WR Y Q R N V S P GiL Q E Y i A E S A S K Y P F Y K WN S IVW Q R D I Q T LI S S M Q L L C D W L K S G N L L T S EVVAS K F P Y Y K Y N GM WT K D I Q N V I F A I L L C G W L E A G R L L T

 S A LVV $\operatorname{P}$ AEII CPGQQYYRYHGDWRSETQ V V V V S L L L T L M H W L E T G N L L M

 S E V A S K H P Y Y K Y N Y A WT R H V Q D V C Y S I L L C G W L E V G Q L L S
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 A E I L R E CP Y Y R Y H G D WR S E T Q A V V S Q L A F M H W L E T G T L L V




 A D L L S P D Q Y Y R Y H G D WR S E T Q T A V $\operatorname{S}$ S L L AA F TA H Y L E T G N L L L
 A DLVVP P H Q F WR WK D M WC N S L R T T V F V A A L S Q Y L T D G S L I S

 A S LI P L A Q F WR WK D M WT N S L R N A V F A A T M M V G Y
 A A VIV H D Q Y Y R Y H D QWK S V T Q R L C F L A S L V V Y L E V K V L V T ATVVASKYPYYKYNGLWTREIIQTASYGIVLAGWLGEGRLMT






 Y E LI I P P D Q F WR WK E M WS N S M R N A V F C A A T L M E Y L T S G T L M S

 R P E L S G D K Y A R Y Q R N V S P G L Q E Y I E A L A A F A H Y L E H R A L I S
 Q E IIA S K Y P Y Y K Y N Q K WN R QV Q N A I F TVVL L C G W L G G A R L L S


 K TK F PP E Y Y Y R F H D H WR F VL Q R L S Y L S A L L V Y L E A E S L I S


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## $V$ $V$ $V$ $V$ $V$


 $V$ N S V T A G D Y G R P L R R I S N F I N E L L
 $V$ N S V T A G D Y S R P P TKll A N F V





 $V N R V T G G D Y D C P R K V L S F L T D L H A S F R M L N L R N D L R K K F$ $V$ N Q V T A G D Y D C P R K V L K F M T E L H A A F R M L N L R N D
 I N S V G N G D ID T P F E V S Q F L R QVVY D GF S FI N T GP Y EVVSK K L

 $V N$ QV T A G D Y D C P R RK V L K F L | $I$ |  |
| :--- | :--- |
| $I$ |  |
| $V$ |  |
| $V$ |  |
| $V$ |  |
| $V$ |  |
| $V$ |  |
| $I$ |  |
| $P$ |  |




 $V N Q V T A G D Y D C P R K V L K F M T D L H A A F R M L N L R N D F L R K K F$

 $V$ N S V T M G D Y E Q P L K I S T F V K R N S V T L G D Y R R P L Q I A Q F TK K DV H A G F Q V L N L K N D A L R K R S


 $V$ N Q V T A G D Y D C P P R K V L K F L T D L H A A A F R M L N L R N D



 VTAAMTS G DVVDTP R N V L E D MR E L R T H L L E GL D I G S D D V D K K M
 $V$ N S V T S G D Y A R P P L R I S K F M M N E L N A G F R L L
 $\vee$ N A V T L G D F E A P $\square \mathrm{K}$ I S $V$ N Q V T A G D Y D C P R R K V L



V
$\vee$ N AVTLGDFDQPI KI

$\stackrel{+}{\mathrm{R}}$



 $\left.\begin{array}{l|ll|l|lllllllll}V & N & Q & V & T & V & G & D & Y & D & C & P & R \\ V & K & V & L \\ V & N & Q & V & L & A & G & N & Y & D & C & P & R\end{array}\right)$ |  | $N$ | $A$ | $V$ | $T$ | $L$ | $G$ | $N$ | $Y$ | $E$ | $E$ | $P$ | $\square$ | $R$ | $I$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $I$ | $T$ | $T$ | $M$ | $A$ | $M$ | $N$ | $G$ | $E$ | $M$ | $P$ | $R$ | $S$ |  |  |



 \begin{tabular}{lll|llllllllll}
$V$ \& $N$ \& $Q$ \& $V$ \& $T$ \& $I$ \& $G$ \& $D$ \& $Y$ \& $D$ \& $C$ \& $P$ \& $K$ <br>
$R$ \& $V$ <br>
$I$ \& $T$ \& $T$ \& $I$ \& $T$ \& $T$ \& $G$ \& $D$ \& $A$ \& $E$ \& $Q$ \& $G$ \& $E$

 

$I$ \& $T$ \& $T$ \& $T$ \& $T$ \& $G$ \& $D$ \& $A$ \& $E$ <br>
$V$ \& $G$ \& $E$ \& $R$ \& $I$ <br>
$V$ \& $N$ \& $A$ \& $V$ \& $I$ \& $A$ \& $G$ \& $D$ \& $Y$ <br>
$N$ \& $K$ \& $P$ \& $L$ \& $L$ \& $I$ <br>
$I$ \& $S$ \& $F$ \& $G$ \& $R$ \& $T$ \& $G$ \& $G$ \& $R$ <br>
$S$ \& $R$ \& $A$ \& $N$ \& $E$ <br>
$V$ \& \& $V$
\end{tabular}

$\begin{array}{lll}l & L & \\ L & S & Q \\ L & S & Q \\ l & S & T\end{array}$
QF
T
K
$A$ $V \operatorname{N}$ S V T

A T F I N





$\begin{array}{llllll}H & A & F & Q \\ Y & N \\ N\end{array}$
$N \begin{array}{llll}N & L & N & G P \\ N\end{array}$ $\begin{array}{lllllll}N & L & K & N & G & P & L \\ N & R & V & R & Y & S \\ N & L & K & N & D & S & L \\ S & K & K & L \\ R & R & R & S\end{array}$ N S V T Y G D Y N R P L L Q -



1
PST 10
20
30
40






 $M \square D R V I F E N L Q A K I D E E A A V R D E L R D I V Q N L S A$

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S S M K


A NLS P F M $F M P \quad M F$
$S P V A A F$
$S H Q$
 A

A A MSATNDLELFDNFRADLDDHNDRRERDIKASRDVTN $M I D P S I F E S L Q A K I D E E T A V R D E L H E I V Q T L A R$ N N PVVQCFREYARELDAKHDRYERIVKCSRDIT』
D D NARSAI L RT F VA F REELDD Y N DRRERLI K S S R D I T N NNPVLLKAF QAYA DELDAKHDRYERRVKMSRDI T $\square$ T PEETKSPFLPDFETFRAELDEHHDRRENITTKASRDVTA $M$ S Q M D D Q S D D Q LK A Q I D Q D A K A R E S L S E I V E K L E R TSES GDNS DS S IF G G DQQGFANEQREDE E K I L V G S L E K F A K HAEYLNALNDKRERLVKASRDI TM MFENFRAELDEHHDRREKII KASRDITA
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V HRMF
S N P
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A P P M DD P A LIF D QL LK D N I E K D S S DR K D L EQ I I E E L N Q TAPGAASPFMP S S MA D $A F S K Y A$
$Q F E P L D$
SVSK VF K Y A LLEHRELSDAIRRKSKELDR DEPSSSKVLDS IV G T F R D E L D E H H D R R E R I I A D R H G M V $\operatorname{N}$ N P G $\operatorname{I}$ ASFDVLS MFEGFRDELDQHHDRRERLIGI SRDITA
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 ASKRTIFLLHRVAE GASPTKRAADGAKDKLADIVRLLFAGLL
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ESKRDIFLLHTVDSKKNNV PVLDDATKEILAQKAEVAKL
 QS K K I I F AL L Q R V R E L G K P D D P S I


 $H V S F T Q G L L S K I H S P R S K Y A T L L P Q V E E G D K S Q V A T V G K L$ NS K K V I F Q V H R M S K Q N K E D E V L D K A VIK D L A A V T D Q Y S R L L S K K I I F S L H R V R R A L N K P L L P K N I Tr E D Q E R L A Q












 E S K R V I F L L L H R V Q D E T S K M














\section*{UniRef90 M2N6A4} UniRet90 A0A016PDJ9 UniRef90-S8B8G44 UniRef90-U9TEM7 UniRef90-C5GQP2 UniRef90-F8NIG3 UniRef90-K5WN51 UniRef90-BOCVA4 UniReffo-B8M4B9 UniRet90- X8JHY5 UniRef90-G3UEC6 UniRef90-C3ZZJ6 UniRef90-M5GAV1 | UniRef90 |
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S GD LQ CLLH TYRYSRQ $\square$ S GGCQEWMEAACFQHY|L|ETTT|L L|S S E VA S Q HP Y Y K Y N Q K WA R TVVQNA I GTAVVY TA WL G G G R L L T

 V SVAS Q H P F Y K Y N H DWS R E L Q N L V FT I Q F CA WL K A K G F MT


 A QSLS GHYKHYEFKVGGFSGLQEYVEAVSFQYFGKTRSLLIS A L E L Q GE D LY Q F DR AV S P G L Q E Y I EAV A F H H Y CLLGQ G L V S


, DTVASKHPYYKYNQRWTRSMQHAI GTAIVYA WLGGGRLL




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 SA F A S Q Y P Y Y K Y N H K WT R P L Q D D S L S T CLL L F T W L S T H T L L T $V P D L A B G N E H R Y Q W Q \square S P G I Q Q E Y I$ EAATTFQHYVETQRLQS








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


 S D DLQ Q G L N A H R Y A R Q



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 K S KVVP E GQ Y Y R F H D H WR Y LTTQR L CF L V A L T V Y L E E E R L V E G DVAS A HPYYK FNQRWTRHLQDAIFTVLLAAWLGGGRLL T TA DLLQS DNRYRY GFSMRCLLE ELV EA L SF S SHYLLRHQ T L I T


 AKLI P DN EFYK Y N DLLWS RTTQQQAVF LIVVFKS Y L DRGMEDT A L EL R N Q DVY QF RAAYSPGLQEFI EAYTYMEYLEGKSVGD



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UniRef90-F2Q3T9




200 PNAVTHGDFELPLVVSAFLKDLFAGFQLLNEKNDVLRKRA $V L S L S S G N A S A T Q L I V G D L R A L R A G F E A L S V M F R D M A K K L$
$V N S V T A G D Y N R P L K I ~ S K F V K E L Y T G F Q L L N L K N D S L R K R F$ VNSVTLGDYSRPLQUNKFVSDLHAGFQLLNKNDSLRKRS
 VNAVTHGNFDEPQRYSVFVKNVFAGFSMWNGKNDTLRRRY VTTLSTGDVDEQIEVVVDLRYMRAMLEKLNVPMKDMYKKM VNAVTLGDFNRPVQISVFVRDLYSGFSLLNLKNDSLRRRF VTSVSSGDMDDPFQLCQFMREVYHGFSSFHAGSWELSRKM VTALSAGSVASEEKLVVDLREMRSGFEGLSVSRRDLGKKM VNRVTLGDYESPLQFSQFAKELSTAFGLLNLKNDSLRKRF

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 DEQNPVVLA FRSYASELDSKHDRHERTLKLSRDTTI


NNPVISQFRVYAADLDAKHDRYERDFKVNRDVA STQDGPRTRFHNMFEDFRDELDEHYDRKERIVKASRDVTA APPMIDPALFDELKTKIEEDTNDRKELDQULDDLNQ PASRLLDPQUFEHLKNKIDEDQLVREDQSQTVQKLDR EA ERALSSEDLLREHAKVLDR
$S L A P D S P \quad \square L A M F K N A A D K L N E R Q D R H E R L V K L S R D I T \square$
QASSSSAK LLETFGSFRDETDAHNDRRERLIKSSRDVTA DTEQTSPVQSLFMYFRNELDEHHDRRERI I KVSRDVTA GPVIVQSMM E N FRRS E L D E E H H DRRRERRI I K A S R D I T A
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## UniRef90 B4JU39

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IINSLGSGDTDTCMETCKALLQQFYSGYVSLINCRARELLWRK\| I N S L G S G N S E S C F L H C R F M Q E LY K G F L SV T IR S R D F S H K M









 IG R DS D GEF EF A QE I HRFA HEVI YR QF IL V A PKMMD MK TK M



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 IT M V A L G G G E VVA KV L K D L R G I R Q G L E E F E V G A A R D A D K K I




 VT A I A S S H S F ID R S I L T D L R H L R S S F E A L D T T S G E D D K K M T N A V G Q G D T A V V






 $V$ N S V T L G D N S M A V Q I S G F I K D L H A G F QV L N L K N D V L R K R V TN A V T M G D F A M P V E I S S A F V K K D L F A G F Q L L N L K K N D I L R R K R I
 TNCVNVKDYNECFRINTEI RTI YNGFKFFHLL
$\square N$ S I S N G D S K E C F H A C Q V V R N L Y T G Y L G L F G DG K E L A R K M
 $\square T A M S M G N V D G P S D V C G D L R E L R A M F E K D N V P$
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TTS TAALA GAEDERTVVVEDMHELGGSFFEMLDPMKA GDWEKKLL

 I N R V T L G D Y A A P V Q Y S R F A K E L S S N A F G L L N N L K N D S L


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| UniRet90－D8SFW9 | EVMLQSLVKIETTCYSMHVRG |
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| UniRet90－A7EHA5 | EVMRTCVEKVETAVYGMIVRG |
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| A0AO2 | SLTKMENA |
| UniRef90－D3TLJ3 | MRQS LKA DVCYNVK |
|  | DSMKYD |
| UniRef90－U4LW43 | DGLKYHVKRAEDIGYDLIVRNLV |
| UniRet90＿W5JUA0 | NTLRQSLVKSENVCYN |
| iRef90＿C5FG25 | KVERAVYG |
|  | S R |
| UniRef90－G7E7C8 | IK Y LkKKTEEVVYDL |
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| UniRef90－V7CHI2 | DVMLQSVMKIENACFGVH |
| M5FX73 | S L R K |
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| UniRef90 ${ }^{\text {C4 }}$ | EVMQTSVEKVERAAYGFL |
| UniRet90－G4MPV9 | SVLKVEKLGYGL |
| UniRe990－L8FUZ75 |  |
| UniRef90＿12FP77 | K |
| UniRef90＿FoXG88 | DGVKYAVKRVEGV |
| UniRet90－G3GX | YTLKQSLAKVENACYAL |
| UniRef90－V4MM5 | DTMLD |
| UniRef90－G3Y | Gik Y SVKkV |
| UniRef90－84M5Z2 | MRQSMLKAENVCYNVKV |
| UniRet90＿W8BKS8 | N |
| iRet90＿W4 | RQSLKKMEDACYVIKVRG |
| UniF | TVTNQSLRKIED\｜LYAUTVR |
| UniRef90 J4HW | D KK |
| UniRer90－E2BA24 |  |
| UniRef90－E9EH30 | MRQSVRKVEKLGYGLVVRG |
| UniRef90－Q2HAR3 | DSTKYAVKKVEDVVYDLSLRNLT |
| UniRef90 L2FW67 | DAVKYDVKRVEDVV |
| UniRef90－M5EKQ6 |  |
| Ref90－H9，5 |  |
| UniRef90－L8Y5N8 | DVKKVEEVVYDL |
| UniRef90＿V5E8U4 | NQSLRKIED\｜LYALTV |
| 俍et90＿C5PJE6 |  |
| RiRet90＿B6Q |  |
| UniRet90 | Mras Vrkve |
| UniRet90 UPIOO022CA4AB | NLHKL |
| UniRet90－M7SFQ2 | 俍 |
| UniRet90－M7WRP6 | DSIKY DVKRLEEVVYDLSLRGL |
| UniRef90 M9M7G6 | QSLQKIEHILYAITV |
| ef90 | TSVKKVERLGYDLRVRG |
| Ref90 FozR80 |  |

 UniRef90_G7EA43 UniRef90-UPI0002742B28 UniRef90-Q8INE1 UniRef90_B3LZR5 UniRef90 D8SBW4 UniRef90_UPI000258EEFD UniRef90-A0A023EYX3 UniRef90_J3PBQ6 UniRef90 M4FJN6 UniRef90-U1M3U2 UniRef90-Q2GMD2 UniRef90 J9VQM4 UniRef90_C6H5S2 UniRef90-H7C1D4 UniRef90_D5GB38 UniRef90_T2M698 UniRef90-J9VPR1 UniRef90_Q29BD9 UniRet90_M2Y744 UniRef90_ITG0A4
UniRef90_A9UX38 UniRef90_E1FUJ5 UniRef90_S8AGU0 UniRef90-V4ARL4 UniRef90-UPI0003F4978D UniRef90 E4ZTJ5 UniRef90 G3VV61 UniRef90_S9R9G0 UniRef90-A0A023FVK5 UniRef90 D2VXF3 UniRef90-B6K5W6 UniRef90-M7TNM4 UniRef90_Q4PE56 UniRef90-T0QR62 UniRef90_D8PNA3 UniRef90 A0A044RGP4 UniRef90-A0A024TX99 UniRef90-K4BND7 UniRef90_R4X7U7 UniRef90 M5BJC8 UniRef90-K7KFT6 UniRef90_S9PUZ0 UniRef90 UPI000180C8C1 UniRef90_Q9P7V3 UniRef90-D4D2P7 UniRef90-UPI00042B5FD2 UniRef90 UPI000455FDC6 UniRef90_Q7ZXK0 UniRef90_Q4TDU8 UniRef90 B3SAH4 UniRef90-14YAW0 UniRef90_C1FH49 UniRef90_G1Q4M6 UniRef90 14Y6L7 UniRef90-M1VGF9 UniRef90-I1CKY7 UniRef90_Q6C1F9 UniRef90_DOMTM1 UniRef90-B3RQE4 UniRef90 BOWVM4 UniRef90_UPIO0038BBE10 UniRef90_Q5KFV7 UniRef90-M1V7C0 UniRef90_UPI0003627A1D UniRef90-FOXOB9 UniRef90 E5T2E8 UniRef90 M5ECC6 UniRef90_FOVLR6 UniRef90-A0A059LLU5 UniRef90_K4ALG9 UniRef90_R7Q6T0 UniRef90-B3SAH2 UniRef90-A8Q1I3 UniRef90_G5E3P1 UniRef90-R8BSM6 UniRef90 R9AB02
TTTPVRE ILMKLWSFLVAEQYMXKENXRVVQRLEQ

MEQFESFRAEMDASNAVREQLRSAVSELDN

VIVMAAFRKFADELDTKHDKHERIVKKISRDD T I
MFEGFRDELDKHHDRRERIVKASRDITA

SEPTPRALSVSSTLSSALASLENDQNGRKQIKESVEPI ED

S S DNDY A MVDPEDFAAVQEQ IEKDSQVKEDI REALKIIDDK
QNLFLWVRDRLDSRNDKREKI LKFSRDI TN

MESSFFFKLNDYLEKESQCRENLRECRDRCDA
MSVVD FF LKYNDYELEKESQCRENLIRECRDRCDA

TQQPAPTGPDRKDFVSYQKEMDERRDRYERIVKKLSRDVII


VEK L F D DY S NSLDDSNNRKERTYKATRDVTI
FDVFRQVMQEYQDKRERLDRVSREIT T
SMFEGFRNELDEHHDRRMKI QKVSRDVTA

AEPKAVLDQSSFQRMSADMEAYDEKREDVIKHSRDVLK
VLGAFDGFRQHLDEHHDRRERLI KSSRDATN
$K N D V V N Q K E M D E R R D R Y E R I V K L S R D V I I ~$ SDKYAALVDRASFQRLSAEMNAFDDKREVI I RESRDILكK

VDLS DF SKFKNDDDH HYDRRER LIKTSRDVTA ILTAFEGFREELDEHNDRNEN SDEGRD



S S $\quad$ K D A F S T Y A D Y L N A L N E K RERVVK A S R DVT M NAPSQSI RDVFDGFRQELDDYNDRRERLIKSSRDITN $M S V I D M F V E L Q S G L S A D Q D V R E E I R K V V Q S L E Q$
HDDAKNNND $\square A Q F V K Y Q M E D D R K N D K H E R L V K S S R D \square T \square$



FAA A T A B GQ


## QVK A A VD K LE A

SSPSPMML AFKSFQQEDDVRHDKHERLVKDGWDDTV
PEASHTDTKLF TA LGAALDEEMERRERFVRASRDLTM MIDPNDFESLKQELEDYDKARDHVISKSNEIVK KNYANEMDAVYDKRDRILKASQEI V $\square D G Q D F D S M \square A L Y G Q E D E Q R E D I$ I KKARDI $\square K$ A ASPVMD A QFESFRAQLDESSTGRDRI RAVVSEIES




NSKKVIFQVHRDSKNNRE EVLEKAEKDLAAVRDHDFRL


ASKRCDFLLHRALNDSSKQEEVLLEAKNKDDEDQKQWSK■ LSKRMIFSLHRVYKQFKQFDKIRNDQFKQIQDUADEFDYQ ASKVA I YCLHR GE $\square$ DKADAQUATAAAVADEL

HLQNAMANAQRDHTTKQED DKVIEPTTSCDKQFREFYSEF AVRSLETQLSRLHYEVDWSDAVAG ARQQLRTDGSGF LEVL



 EHKRTUVLLHRDTS APDMEEI LTK SXUILDGDRQKDXQV

$\begin{array}{ll}L & S \\ A & K \\ A & K \\ S & K \\ S\end{array}$
SSKRVI CALLHRRCVNENEENK
LSKKLI FHLHRY LAKQA FALHR
AAKHAUFSLHR
ASRVATAALLLVHQPV PLE


| RED |
| :--- |
| K |
| 1 |

EMRKK I E L R E E M K G DL ENEENK DFEQAVEKLKSLUANDQFKTVV RDVELSERNIKHCRRIVAEV NAFAEADSRIASAMKVVEELL


$R K S D F T D Q R V R R D H Q D Q P D G F N A D Q S R D A E V R K D L S S D$


vkellogtdfwkrbayspg
KOGEPGANWHORSDUS GLOEYTEALSEAHYLEHGTLIT

TAKVDNDDYGYARYMPGLEEEVEAMYYYLKESKLS

 Q S L V P E GM F Y K Y N D L WR Q C S I H IV V Q S C L L I R F F E TA A L V T $A \operatorname{K} \operatorname{L}$



 $R Q E L S D A R P G W E$
 R Q E


 A EV L K E CP Y Y R Y H G D WR S E TQ A V V S MLAAFMH WL E T D GL L M




## UniRef90 Q55BS7 UniRef90-T1G812 UniRef90 S8C0F7 UniRef90-D2VRN8 UniRef90_A9UQ64 UniRef90-E9C9U8 UniRef90-F0XIS7 UniRef90_G4T6C6 UniRef90_C9SQR2 UniRef90-F4PUD3 UniRef90_Q4P162 UniRef90-Q5NBG9 UniRef90-E0V932 UniRef90_G1WXR4 UniRef90-G7EA43 UniRef90-UPION02742B28 UniRef90_Q8INE1 UniRef90-B3LZR5 UniRef90 D8SBW4 UniRef90_UPIO00258EEFD UniRef90-A0A023EYX3

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UniRef90_A9UX38 UniRef90-E1FUJ5 UniRef90-S8AGU0 UniRef90-V4ARL4 UniRef90_UPI0003F4978D UniRef90-E4ZTJ5 UniRef90_G3VV61 UniRef90-S9R9GO UniRef90_A0A023FVK5 UniRef90_D2VXF3 UniRef90-B6K5W6
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UniRef90 Q4PE56 UniRef90-B6JX99
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UniRef90_C1FH49 UniRef90_G1Q4M6 UniRef90_14Y6L7 UniRef90-M1VGF9
UniRef90_l1CKY7 UniRef90-Q6C1F9 UniRef90-DOMTM1
UniRef90_UPI0000E2CBE1 UniRef90-B3RQE4 UniRef90_B0WVM4 UniRef90_UPIO0038BBE10 UniRef90_Q5KFV7 UniRef90-M1V7C0 UniRef90_UPI0003627A1D UniRef90-FOXOB9 UniRef90-E5T2E8 UniRef90-M5ECC6 UniRef90_FOVLR6 UniRef90-A0A059LLU5 UniRef90_K4ALG9 UniRef90 R7Q6T0 UniRef90-B3SAH2 UniRef90_A8Q113 UniRef90-R8BSM6
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170
190

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UniRef90 B3L ZR5 UniRef90-B3LZR5 UniRef90_UPI000258EEFD UniRef90_A0A023EYX3 UniRef90_J3PBQ6 UniRef90_M4FJN6 UniRef90-U1M3U2 UniRef90_Q2GMD2 UniRef90_J9VQM4 UniRef90_C6H5S2 UniRef90_H7C1D4 UniRef90_D5GB38 UniRef90_T2M698 UniRef90_J9VPR1 UniRef90_Q29BD9 UniRef90_M2Y744 UniRef90_I1G0A44
UniRef90_A9UX38 UniRef90_E1FUJ5 UniRef90_S8AGU0 UniRef90_V4ARL4 UniRef90_UPI0003F4978D UniRef90_E4ZTJ5 UniRef90_G3VV61 UniRef90_S9R9G0 UniRef90_A0A023FVK5 UniRef90_D2VXF3 UniRef90_B6K5W6 UniRef90-M7TNM4 UniRef90_Q4PE56 UniRef90_B6JX99
UniRef90_T0QR62 UniRef90_D8PNA3 UniRef90_A0A044RGP4 UniRef90-A0A024TX99 UniRef90_K4BND7 UniRef90_R4X7U7 UniRef90_M5BJC8 UniRef90_K7KFT6 UniRef90_S9PUZ0
UniRef90_UPI000180C8C1
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UniRef90_-14Y6L7
UniRef90-M1VGF9
UniRef90_I1CKY7
UniRef90_Q6C1F9
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UniRef90_M5ECC6
UniRef90_FOVLR6
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UniRef90_R9AB02

 I NASGS G GESRCYRI CVFIRVI YKRFVGLSKK DKGLTKKC I Q L LGSA D I S LIER V VELI K SVVRG L E D N Q NHFNL Q QK $\square$
 I N S VGNG DI D T P F EVVSQFL R QV Y D GF SF I N T GP Y E V S K K L V N TV I M N E F D R P K RI S A FLK L

 VVKATAREVDEVKRCKDMVEADS GELI QFDFRNGPLRRRKF
 $V$ N C V I H E D Y Q R P DK I A S F L S Q L N A A Y K M L N L K N D A L R R K Y
 TNALGTGD HETPLDSCD FVVRTVKT


 I NA I A S H NLAKI ERVLQQ MQYTIMS GELRKK Q


IA A A A R A D R N AVVRDVWVLMNHDDLAFKGLHKYARGLGRKL I A A A A R A D R N A A V R D V



| UniRef90_Q55BS7 | D S M K Y D L LK R\|I|E E V V V Y D|I S V V|R N L DK K |
| :---: | :---: |
| UniRef90_T1G812 | DVMQQSLLKVVESALYTLKIRRG |
| UniRef90-S8C0F7 | D SIK Y S |
| UniRef90_D2VRN8 |  |
| UniRef90-A9UQ64 | D SLK Y DVK K T E GVI Y D L S I R GLIPP K |
| UniRef90-E9C9U8 | RVMQS S L E K I E Q V C Y NI TVVR G |
| UniRef90-F0XIS7 | QVMQ S V Q K V R L L G D L R V R G |
| UniRef90-G4T6C6 | AVTK Q S I R K I E E |
| UniRef90-C9SQR2 |  |
| UniRef90_F4PUD3 | NVTM M N L E K I E K I C C S I R I R K |
| UniRef90-Q4P162 | TVTN Q S L Q I I E D I L Y A I T V R |
| UniRef90_Q5NBG9 | ETMLQ S V VKi E NACFSV HVRR G |
| UniRef90-E0V932 | IVLK Q T L L Ki E MVCYNI HI R G |
| UniRef90_G1WXR4 | RVMQDSVKKVEYAFYGMVVRG |
| UniRef90_G7EA43 | SVTGQSLLRKLEDARYT L A L R |
| UniRef90-UPI0002742B28 | D GLLK Y NMKKVEEVVYDLS TVWGFSKE |
| UniRef90_Q8INE1 | TTMKQSVLK A E NV CYNVKVRG |
| UniRef90_B3LZR5 | T TMRQSVLK A E NVCYNVKVRG |
| UniRef90-D8SBW4 | D G T K |
| UniRef90-UPI000258EEFD | CTLK Q S L H M E NVCY T $\$ K V R G  \hline UniRef90-A0A023EYX3 & SIVVRQSLDKMEYACYVMHVRG  \hline UniRef90_J3PBQ6 & LTL R Q SVGKVEEALLGYELKVRG  \hline UniRef90-M4FJN6 & STLH H S V G K V E A L GYELKVR G  \hline UniRef90-U1M3U2 & RVLR A S L M K V E Y EL Y S L K V R  \hline UniRef90_Q2GMD2 & EVTR Q S VVKVERLGY D RII R G  \hline UniRef90-J9VQM4 & D SLKK Y DLKR CEDVVY DLTLR G L  \hline UniRef90_C6H5S2 & D G $\\|$ K Y S V K K V E DVVY D L S L R NL I S R |
| UniRef90_H7C1D4 |  |
| UniRef90-D5GB38 | D GLKK Y NVKKVEEVNYDLILR N L I P |
| UniRef90-T2M698 |  |
| UniRef90 J9VPR1 |  |
| UniRef90-Q29BD9 | T T M R Q S VLK A E NVCYNVKVR G |
| UniRef90-M2Y744 |  |
| UniRef90-I1G0A4 | S T L N E CVVT K V E R V C F Hi R L R G |
| UniRef90-A9UX38 | DVLES S L K K I E N A C Y T L TVVR G |
| UniRef90_E1FUJ5 | QVFRECLMKVENALLYKWKI R |
| UniRef90 S8AGU0 | EVMQQSVQKVEYAFYGIAVRG |
| UniRef90-V4ARL4 | T T L Q Q S L R K V E N A C Y T L R V R G |
| UniRef90_UPI0003F4978D | D SLLK Y DVK R CEDVVY DLT L R G LT P |
| UniRef90_E4ZTJ5 | PVMRECVDKVEK A L Y GVTV R G |
| UniRef90_G3VV61 | Y TLLK Q S L A K V E N A CYALKV R G |
| UniRef90_S9R9G0 | D GLK Y Q L K R A E DVVYDMRIHNLL |
| UniRef90-A0A023FVK5 | WTL F Q SVR K VENACY T I K V R G |
| UniRef90-D2VXF3 | E IMETS L S K V E K L C Y N I T L |
| UniRef90-B6K5W6 | EVMRSSIQKVENI CYGRTMRRHTAE |
| UniRef90-M7TNM4 | DVM M I E Q V R K V E R L A Y G V T V R G |
| UniRef90_Q4PE56 | D SLLKY DVGK N I E E I V Y D I S L R G L V |
| UniRef90-B6JX99 | D GI K Y DLK R A E DVVY DI K I |
| UniRef90-T0QR62 | D SLLK Y NLK K L E H TLLYELSLVGG |
| UniRef90-D8PNA3 | AVTS QSLQKI E D A A Y T I A V R |
| UniRef90-A0A044RGP4 | QVFRD CLMKV |
| UniRef90-A0A024TX99 | D SLK Y NLK K L E N T L Y L S L |
| UniRef90-K4BND7 | ETMLQ S V M Ki E N A CFS SV HVR G |
| UniRef90_R4X7U7 | A VMES S L K K V E R G VF ERCVR G |
| UniRef90-M5BJC8 | S ETS A S L R K I E D A L Y A I R I R |
| UniRef90_K7KFT6 | D A M K Y DL R K L E EVYY DVKI R G LT P |
| UniRef90_S9PUZ0 | GVMDNSI S K V E S I C Y S K I L R |
| UniRef90-UPI000180C8C1 | RTMHSSLIKCEDACY TVKVRG |
| UniRef90-Q9P7V3 | D GLK Y DL KR SEDVVY DL R I H K L V |
| UniRef90_D4D2P7 |  |
| UniRef90_UPI00042B5FD2 | VTMLLQ SVVKI E N A C F S V R V R G |
| UniRef90_UPI000455FDC6 | HVT A Q SLEKIE T A VYS I V V R G |
| UniRef90- Q7ZXK0 |  |
| UniRef90-Q4TDU8 | $H T L R Q S L G K V E D A C Y T L R V R G$ |
| UniRef90-B3SAH4 | HQVQQNLA KI ENTCYELKLRK |
| UniRef90_14YAW0 | N TLLENSLKK KI E D T R Y T Y EVVR K |
| UniRef90-C1FH49 | D S L K Y T L K K V E N T L Y E M S L |
| UniRef90_G1Q4M6 | Y TLKK Q S L A K V E N A CY A L K V R G |
| UniRef90_14Y6L7 |  |
| UniRef90-M1VGF9 | D ALKKYAI Q R L D S I L Y D L R I R K L |
| UniRef90-I1CKY7 | D S I K Y DVVK K I E EVVVY Dil |
| UniRef90-Q6C1F9 | EVFQQ S L A K L E RLLY D Q S L |
| UniRef90_D0MTM1 | D SVKK Y NL R K L E N TLLY E L S L |
| UniRef90-UPI0000E2CBE1 | DVMQS SVEKVERAAY GI L V R G |
| UniRef90_B3RQE4 | D GLKKY EVKK A E G IVVY D MKI R R L IP |
| UniRef90_B0WVM4 | F T L R Q S L K SENV CYNVKVR G |
| UniRef90_UPI00038BBE10 | Y T I K Q GL V K Vel V S Y V K |
| UniRef90-Q5KFV7 | Q K I E K V C Y A L R L R |
| UniRef90-M1V7C0 | VTM GESLQKVQDVCYRLCLR |
| UniRef90_UPI0003627A1D | D G I K Y N L R K I E DVVFELKKLR |
| UniRef90-F0X0B9 | DSLKYNLQKLENTLYYELSL |
| UniRef90-E5T2E8 | KEFLDSIMMVENIFYN |
| UniRef90-M5ECC6 |  |
| UniRef90-FOVLR6 | D TLLKY T EKKLE S L C Y ELQM |
| UniRef90-A0A059LLU5 | D A L K Y T L L K L E N TL Y ELS L |
| UniRef90_K4ALG9 |  |
| UniRef90-R7Q6T0 | K T L A N S $\quad$ S K V E R S A C D L A VR |
| UniRef90-B3SAH2 |  |
| UniRef90-A8Q113 | DS \( |
| ) K Y D VKR L E E T L Y D L T L R L L |  |
| UniRef90_G5E3P1 | F ALK Q R P SKVENACYTLK |
| UniRef90_R8BSM6 | Q TLR T S V L K V K L G Y GLTVR G |
| UniRef90_R9AB02 | D A L K Y Dil |

> 10
> 20
> 30
> 40
> F L S E S D F D A M R E A M T LY DE QR D TVV PS L I VES D WD QLGTHLAAYDEQREA I IKRCRDMQK
 S S D SK P LDDLSALEA Q TT T LED QR QRAFELS R DMQV SSDSKPLDLSSALEAQI T TLLEDQRQRAFELSRDMQV


 DMNRVYHPALT FRFCAEMHEYDEMREK IIVKRSREILLK

SLFEELADKLNQKKEKRERLVKASRDVYY





A QFESFRA QLD GS SALRRDTMRAVVSEVES T P P S P TV V T L E QF EVF Q H KL S D S G T L R E RI R GV ALLEI E S


 N $\square$ E E Q $\square$ F $\square$ P A R D H L R VK Q D ER E T V $\quad$ R S C R E $!T S$ $L D E K D R L R E E A L Q \square T R D \| V R$

ME $\square E A \square I E S V R K \square L D E K D S L R E E A D K \square T R E V V R$ FESSI K H T V D Q D Q D K R E R V I K A S R D I TA $M L D K K Y V Q S V R Q Q L L S Y A Q K R R E V I M M S G D A Q Q$
 TNSP TDAPTSM

$\square F \square P A R D N \square R \square K Q D D R E E V I R \square C R D \square T S$
T DKYTA LID QASFQ HMSAEMNAFDDKREVIIRQSRDDLK MID P S IF Q S LQ D K lid E E S Q liR D EL QD Q VQ T L

E I V E V L R T R L D E K D E L R E E A L Q i T R E V V R

 $M L D K K Y L N S \square K K N L L Q Y A E V R R E V I G S S D D A L H$

PASRLLDPQ TFEHLKNKTDEDQQVRDQMSQTVQKLDR E V F Q P A R E Y L L K F H D E R E L V I R L CR D I N I FKPARESLLEKQDGREKLI RSCREI TS
 MIP S V VE S A D R F L K S L D S D R E E I V V K T S R D V i R $M \mathrm{~K}$ M A A $P S S P L M T S$

S E L L N V I R L N S L

 MS LIE E I G DILI E E E L D D K D S V R E I Gillk S A R V I DR
 N MLLS LAAVVDDD I R D D L R A Y E R A K D E V V Q T S DV V SR

K E I I S E I R GY L D E R D MEREKL I V I S R DV IR | $D$ | $S$ | $K$ | $A$ | $K$ | $L$ | $R$ | $E$ | $Y$ | $E$ | $D$ | $A$ | $R$ | $D$ | $K$ | $V$ | $N$ | $N$ | $T$ | $G$ | $\square$ | $R$ | $L$ | $N$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $E$ | $E$ | $E$ | $L$ | $D$ | $E$ | $K$ | $D$ | $S$ | $V$ | $R$ | $E$ | $I$ | $A$ | $I$ | $K$ | $S$ | $A$ | $R$ | $V$ | $I$ | $I$ | $R$ |  |


E I C D R I R A R F D A M D K A R E Q S L A L S R K I T R E Y L S V K

E L R E K V L D V S R E V I R
M A G S L N E E I VE $\quad$ I I R Q E L

\section*{UniRef90 C1MLX6} UniRef90_Q0JNU1 UniRef90-A8 15 CB 3 UniRef90- D8LJ47 UniRef90-li3MW34 UniRef90_UPIO00440EA25 UniRef90-A8PSX0 UniRef90-074955 UniRef90-W2HPF7 UniRef90-B5Y4Y7 UniRef90 B5Y4Y7 UniRef90-Q4RTK2 UniRef90-A5DM47 UniRef90-UPIO0035A1B6B UniRef90-UPI00035970F5 UniRef90-F7GG13 UniRef90-H3GED9 UniRef90-10Z7W1 UniRef90-M2XOL5 UniRef90-I3REL2 UniRef90-UPI0003FOCE2A UniRef90-B7PUK1 UniRef90-D8U4D7 UniRef90-C5MDL6 UniRef90 A0A024FWT9 UniRef90-Q6C332 UniRef90-17GJS6 UniRef90 ${ }^{-}$KosYC8 UniRef90-A0A023FFM4 UniRef90-A0A059DEA0 UniRef90-L8X5P3 UniRef90_s2J616 UniRef90-M7ZJQ8 UniRef90-A0A022RFL4 UniRef90 A3GEY8 UniRef90-UPIO002B480D9 UniRet90-Q8U265 UniRef90-Q0CQ74 UniRef90-M3H160 | UniRef90-M4BYQ6 |
| :--- |
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UniRef90
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UniRef90
T11RD7 UniRef90-V4SMS9 UniRet90-C5A5AG UniRef90-E5SWH1 1
UniRef90 Q5A0X1 UniRef90-Q0V5H4 UniRef90-W4GME8 UniRef90-A6R5S7 UniRef90 ${ }^{-}$Q5JI46 UniRef90-F1KSF3 UniRet90-J5SPQ3 UniRef90-K2ECRO UniRef90-AOAO24JIC3 UniRef90-E3QNC9 UniRef90_Q6B164 UniRef90_A5E725 UniRef90- LOACM7
UniRef90 G4RQ47 UniRef90-D9Q2H4 UniRef90-W012R2 UniRef90-E8R7U4 UniRef90-Q5Z194
UniRef90- B8D386 UniRef90-A6UV69 UniRef90-A0A059LLZ9 UniRef90 Lo HND5 UniRef90_R4X9T5 UniRef90-M7TFY2 UniRef90_A3MU12 UniRef90-A8MBX5 UniRef90-B5IE99 UniRet90_A2BK30 UniRef90 QOWOHO UniRef90-IITCN1
UniRef90 R1DXR1 UniRef90-X1Q795 UniRef90_D7DB20 UniRef90_1012P6

A AKVA TYC $\square \mathrm{H}_{\mathrm{R}}$
पGKQAVYTLHRGET
ESKRTMFLLHRDTSASPDMEEDLTESEVKLDGVRQKDLQV LSKKVIFHLHRFSMEHTQTPALLVSANAKLHELYDVIREXL NSKQAllFALHRSDK
AlLQAKTAL
EYNEDTSSVTTKLDTLLEN
AILQAKTAL EYNEDTSSVTTKLDTLLEN TARELTVLQSVHSGFKEDPGKCAKA



AAPE LTTLQGDHQGFQD $\square S K R C L K A R E H F G V K T H \square M S L$ ASKQAIFALHRADR DEALKLLDNAEKVIPEL DAKQAIFAAHR SDDEKSLSQTAEAEHIAGQL QSKKAlYLLHRA ADEDLFSUCSSAKEQLENDRQLIKLL ESKRTI KLLHRVTS GRAMDDVDSEADTK NDDTERLKK

YSKKGIFSLHRGUSK
NELIKELTMYLKILSNRLKKI
SKQAIFALHR
 LSKQAIFALHR RDTPEAQSHLQMAQKVFNE NUWPI QAKQAI FALHRNDRMKTASTLLSKCEECVEENSAQNL ESKRTIFLLHRDVRKEDKDKILAEADHKIQELNTSALREL KSRNASGIMNRIHSTLEELQRLTDSSSSDTKSCYEEFAK ASRAASAALLLIHQPV PLSDVLGKAKAQVEVIKGAYSQL YSKKIVFSGQRI KAVPDRSGNYKEDKTNFSI ALIRLA AV
 KGRSTQABLSRAHSTPDG AS TTSTIHQVYYV

YSKKATFTLHRSVSD
MPDVAKQGYEKLRQVQDLYASL DVVTKELTGYLTVISEHLRKV
LS GDA $\downarrow$ KA $\downarrow$ HR NVRDGLGDM
$N$
$N$
LS GDAVKAVHRND
LINLAEERLSEAGKRVNLL
LSKRM| FSGLHRVYKQPRQFNQLSSURNTQLTQDHKWWVEA
YSKKAIFSLHRTFSENNDKVKDLSELVKHLQLLGTRLSQL RAREAI FALHHGD

GKAGTELERARELIKEL
ESKRIIFLLHRQKKEEDKESTLLEAEKRLKDLLESGLLKQ

LSGDAVKALHR
YSKKG $\square \mathrm{FS}$ SHRT $\square \mathrm{S}$
A S K Q A $\square$ F S M H R SKRVT
LSGDAIKAMHRGEDKRARER
LSGDAVKAlHRND


EDELIK


LSGAVKATARQRKSAQQLVEMI ESKRDIFQLHRYTATKTDAEKLLKKVEDRLGDGRKGFFAV NAKRAIIFAMHRNMKEAEEKLANSKNLLSSLLKKYAKYSEV



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UniRef90_A5DM47 UniRef90_UPI00035A1B6B UniRef90 - UPI00035970F5 UniRef90-F7GGI3 UniRef90_H3GED9 UniRef90 I0Z7W1 UniRef90-M2X0L5 UniRef90-I3REL2 UniRef90-UPI0003F0CE2A UniRef90 B7PUK1 UniRef90_D8U4D7 UniRef90_C5MDL6 UniRef90 A0A024FWT9 UniRef90_Q6C332 UniRef90_I7GJS6 UniRef90-K0SYC8 UniRef90_A0A023FFM4 UniRef90_A0A059DEA0 UniRef90 L8X5P3 UniRef90-S2J616 UniRef90_M7ZJQ8 UniRef90_A0A022RFL4 UniRef90 A3GEY8 UniRef90_UPI0002B480D9 UniRef90-Q8U265 UniRef90-Q0CQ74 UniRef90_M3HI60 UniRef90-M4BYQ6 UniRef90_D6RJU9 UniRef90 H8WZJ3 UniRef90_F4HNP8 UniRef90_B8CG74 UniRef90-B8CG74 UniRef90_W8NSI6 UniRef90_R9AS32 UniRef90_K1Z1T0 UniRef90_G3AEV2 UniRef90-A1RY03
UniRef90-T1IRD7 UniRef90 ${ }^{-}$V4SMS9 UniRef90 C5A5A6 UniRef90_E5SWH1 UniRef90_Q5A0X1 UniRef90 Q0V5H4 UniRef90_W4GME8 UniRef90_A6R5S7 UniRef90 Q5JI46 UniRef90_F1KSF3 UniRef90_J5SPQ3 UniRef90 K2ECR0 UniRef90_A0A024JIC3 UniRef90_E3QNC9 UniRef90_Q6BI64 UniRef90_A5E7Z5 UniRef90_LOACM7 UniRef90_G4RQ47 UniRef90_D9Q2H4 UniRef90_W0I2R2 UniRef90-E8R7U4 UniRef90_Q5ZI94 UniRef90_B8D386 UniRef90_A6UV69 UniRef90-A0A059LLZO UniRef90_LOHND5 UniRef90_R4X9T5 UniRef90_M7TFY2 UniRef90_A3MUI2 UniRef90_10A1B5 UniRef90_A8MBX5 UniRef90_B5IE99 UniRef90-A2BK30 UniRef90-I3TCN1 UniRef90_R1DXR1 UniRef90_X1Q795 UniRef90_D7DB20
UniRef90_IOI2P6

LA E D N D L L E L G D K S V E P L Q I N NV L D Y VV L G|V A D L S G E SDEL P K S A L E E EVVA D K S A L E E EVVAD M D E L N K E L V V F T T E D S GKENK T

| $F$ | $D$ | $D$ | $V$ | $Q$ | $Q$ | $T$ | $L$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $H$ | $E$ | $D$ | $E$ |  |  |  |  |  |

HEDLQQQHLRTP DGHL $\square M Y V S P M R Y L L G L C D L N G E L M R L A$

$R R D V P \quad V L K$

$P$ A A
$P$ A A
$R G E V A Q L G$
FENL Q Y IVVVF LF QPEK T P Q $\square D P$ Q D Y F M G $\square F D F T G E \square M R Y T$ LDKI QK QLL
R D GQCSPSSDEQDKTWSLKDT PVD Y L L G VA DLT GELMMRMC

R R DV P VVQK K
SKELP

LN E FQK S LT F TVD S K
REEVAA MLG
S D E L L P T E L P D P E NVS T IE L
 P DLVSK QLGVP F GNENTCHLT DYDYL LGGVTMDNELSRLA

R K E $\square$ KE $\square \mathrm{KE}$ E $\square \mathrm{R}$ V
E E Y L G GLMDCTGELNRFA


HNE A G ERL GL N N S Q $\quad$ G G L D LEE D Y L VG
K E QV D GYF K D E Q G Q M WVPV K T E D Y i L G L A D C T GEELMR Y A HAEAQEK LGG LGSGEFGLDVEDYLTGLCFMSNDF
HAEAEEKL GCMFHLPFKFQL
YEKMVE II K GMDRANTGNNI DEPD YFMGLFDLTGEDMRFT HPEAEEKLGLNESD

HVDD G


F NEVQKTLSDP H GAPYFP LTVSDYLLGL S DLT D





 FEEL LVVEPQAYLAGLGDLVGELRRYV | $L$ |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $H$ | $K$ | $I$ | $T$ | $D$ | $E$ | $L$ |

HTEAE EKLG
VPEA D Y L L G LG DF $\square$ GELLR R HF
LVVA E R E E N G F H L D LAE D Y L H A A L L S T S E F C R F A Y D V F L K M I Q
 I E E V G E F L G VP V N D Q D S F H L S I E E Y L Q A L I S L V V E E L
 PWDL G
ID QVA D GLR FEK QD DE G
 L P H L Q Q Q A L T D E E GE K
IT D
 LE E VG E I I FK Y T EFVK SLNMEEDDFKNVLVDQSDFLMGLFDCTGEIMMMV


YSD FK DTTKNDRNDVVP Y V P Y L Q Q G L G D L I G E L R R Y
Y S D F K D T T K N $\square$ N I NIMK P E N Y L L G L C D V I G E L R R M I


QTTYS S Y L M G L C D VVGE L R R G A
K

## $\begin{array}{r}Y \\ H \\ H \\ \text { H } \\ \hline\end{array}$

UniRef90_C1MLX6
UniRef90_Q0JNU1
UniRef90_A85C3
UniRef90_D8LJ47
UniRef90-D8LJ47 UniRef90_D8LJ47 UniRef90-I3MW34 UniRef90-UPI000440EA25 UniRef90 A8PSX0 UniRef90 O74955 UniRef90-W2HPF7 UniRef90_B5Y4Y7 UniRef90 B5Y4Y7 UniRef90_Q4RTK2
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UniRef90_A0A023FFM4 UniRef90-A0A059DEA0 UniRef90 L8X5P3 UniRef90- S2J616 UniRef90_M7ZJQ8 UniRef90-A0A022RFL4 UniRef90 A3GEY8 UniRef90_UPI0002B480D9 UniRef90_Q8U265 UniRef90 Q0CQ74 UniRef90 M3HI60 UniRef90-M4BYQ6 UniRef90_D6RJU9 UniRef90 H8WZJ3 UniRef90-F4HNP8 UniRef90-B8CG74 UniRef90 B8CG74 UniRef90_W8NSI6 UniRef90-R9AS32 UniRef90_K1Z1T0 UniRef90_G3AEV2 UniRef90-A1RY03 UniRef90-T1IRD7 UniRef90 С5A5A6 UniRef90-E5SWH1 UniRef90_Q5A0X1 UniRef90_Q0V5H4 UniRef90-W4GME8 UniRef90-A6R5S7 UniRef90-F8AEM6 UniRef90 Q5JI46 UniRef90_F1KSF3 UniRef90-J5SPQ3 UniRef90 K2ECR0 UniRef90-A0A024JIC3 UniRef90-E3QNC9 UniRef90-Q6BI64 UniRef90_A5E7Z5 UniRef90-LOACM7 UniRef90-G4RQ47 UniRef90- D9Q2H4 UniRef90_W012R2 UniRef90_E8R7U4 UniRef90_Q5Z194 UniRef90_B8D386 UniRef90-A6UV69 UniRef90-A0A059LLZ9 UniRef90-LOHND5 UniRef90_R4X9T5 UniRef90-M7TFY2 UniRef90_A3MUI2 UniRef90_10A1B5 UniRef90-A8MBX5 UniRef90-B5IE99 UniRef90_A2BK30 UniRef90-Q0W0HO UniRef90_I3TCN1 UniRef90-R1DXR1 UniRef90-X1Q795 UniRef90_D7DB20 UniRef90_1012P6

I S K A TVVRDVAEVRKCRDVVIDALLMGTFDKFDFRNGALLRKKY I GRDSDGEVEYAKNDCAFVRDI YRELTLVVPDMDDMKKKM i ARATVRDKAAVQRCRDLVDAVMGRFLKFDLRNGAMRKKY $I T Q A S I L D R S S G L A C A S L C R G V F G E L V Q F D L R N G P L R R K F$

ITNAAACPDMHVIERVLSMQRATYDG
VTNGSKFSVQQLTQQVKFLRGLHSEDEHDPSKVKELQQK L


$\square T E M A Q R D A S S V L G N \square Q F L R S L Y S H V T L L V S K Y P H D R K K L$ $\square$ NS VGNGD $\square$ D T P F E V S Q F $\square R$ QVY DGFSF $\square$ NTGPYEVSKK
$T G D H V E A V L Q L G L T V E A T S G E L I Q F D F R N G P L R R K F$ TA KATVRDIDEVKRCRGIAEALMGEFLQFDLRNGSIRKKY I NCSSRNESKKAFEVESFLRQLSAEVKY LAVYM
L $\square N \square M Q G N \square E V A E S T Y R F M E E V Y E E L M T L E Y P K G N D R Q K Q$

DARATVRDKAAVQRCRDLVDADMGRFDQFDDRNGSDRKKY ISQSTKGNFEVTWHNYKFLQQLYEQYILLTEYNTSFNKKLC

VLRATEGHRAAVQECAAFVAAVHEQMLLLDLRNDPDRRKY $V Q R G T V R D K A G V E L C L Q S S K T V Y N G L K L L G \| P G R S S A K K V$

## $\square \mathrm{Y}$ V VS

## LNLKNDSLRRRF TDFD【I ATYMPQLSKKL

$\square I N \square M K G N \square D E A E S T Y R F M E E V Y E E \square M T \square E Y P K G N \square R Q K Q$
 VVKATVRDVEEVKRCKAMVEAISGEVIQFDFRNGPRRRKF ПSSDTSGEFTKTLQNYNFLKDLHEQYI ILTTYNYSFKKKL LINLMKGNLKVAEETYNFMERVYEELMTLEYPKGNDRQKQ
 TNAVVTDPDVPAVQKKARDIVSKVLVMLKEFDFRNGPGRRKY LHRLLEGDLDTAETVYREMERVYNALITLEYPKGNVRQKQ Q QLLGMADLT LIERUVELITSV
I KSATARDFETAKKCFGYAQEI DGELIDMDLTGYN RNKF I QHSSGFQLETTERQYRYLQDLYQQFTLLTQKNYSFMKK L $L N \square L R E G M V D K A W S G L E F M E E I Y V E L G K F S Y P V P G L R H K V$

LhblLRGEDERAESVYEFMEKLYGEDMTLEYPKGNVRAKQ VNFATFGHYERVDDVAD ILGGKI SAAFRLLNFKSGNLRKHY I S SQSTGDFEATLNNYRFLQKLYDQYVLLTQHNDSFTKKG VTSMTNGEVHKPRTVLEDLRAD R LQLEMFDAPGGSETKKM VAQATKRDVAQVEACRDIVEAISGE
LILLMEGDLRGAEEVYRFMEETYEELMTLEYPKGNVRQKQ $L L L L D D G K V E E A E E V Y R F M E E G Y G E L M T L E Y P K G N I R T K Q$
TNA $\square$ STGDHETP $\square Q \square$
$\square K S A T E K D M D K V K E C A N M A Q E D T G E L I E F N L T S Y$ GRNKF


 LENIKNDNIKNAEKYYKFMEELYDFIMLEDCYNDGLRRKQ LL V RTSNPQWTA HVYGTDASSVYTTYSEMDSRNEPGRRKC

[^0]| UniRef90_C1MLX6 | $\text { D A\|L\|KY T\|L\|KKME NTGYE\|L\|S\|L\| }{ }^{210}$ |
| :---: | :---: |
| UniRef90-Q0JNU1 |  |
| UniRef90-A8J5C3 | DALKY TLKKMESTLYELSL |
| UniRef90-D8LJ47 | D GVKY DVRKVDDILYELALVG |
| UniRef90-D8LJ47 | D GVK Y DVRKVDDILYELALVG |
| UniRef90-13MW34 |  |
| UniRef90-UPI000440EA25 |  |
| UniRef90-A8PSX0 |  |
| UniRef90_O74955 |  |
| UniRef90-W2HPF7 | D SVK Y NLRKLENTLYELSL |
| UniRef90-B5Y4Y7 | D GTKYSLKALETLLYELAV |
| UniRef90-B5Y4Y7 | DGTKYSLKALETLLYELAV |
| UniRef90_Q4RTK2 |  |
| UniRef90_A5DM47 | EVFR Q S VE K V E S A $\square$ C GA A $\square$ N G |
| UniRef90_UPI00035A1B6B |  |
| UniRef90-UPI00035970F5 | Y T L K Q S La K VE N A C Y T L K VR G |
| UniRef90-F7GGI3 |  |
| UniRef90-H3GED9 UniRef90 IOZ7W1 |  |
| UniRef90-M2X0L5 |  |
| UniRef90-I3REL2 | D Q A R Y $\square \mathrm{L}$ E R L E D $\square$ |
| UniRef90-UPI0003F0CE2A |  |
| UniRef90-B7PUK1 |  |
| UniRef90-D8U4D7 | D SLKK Y ThK M MESTLYYELALL |
| UniRef90-C5MDL6 | QVFENSIKKDEATLLDI LV |
| UniRef90-A0A024FWT9 |  |
| UniRef90_Q6C332 | D S ILK Y DVK K VEE II Y DLTVRRLV |
| UniRef90_17GJS6 |  |
| UniRef90-U6KY83 | D A LK Y S Q R L E A LVYE LAL |
| UniRef90-K0SYC8 | A MVQKNVEKLERVLYEQSL |
| UniRef90_A0A023FFM4 |  |
| UniRef90-A0A059DEA0 |  |
| UniRef90_L8X5P3 | D S LK Y D M K K I E EV |
| UniRef90-S2J616 | GALKK G $\square$ K K V E Q A C Y T F Q $\square$ R G |
| UniRef90-M7ZJQ8 |  |
| UniRef90_A0A022RFL4 |  |
| UniRef90-A3GEY8 |  |
| UniRef90_UPI0002B480D9 |  |
| UniRef90-Q8U265 | D Q A R Y T L E R LE D L |
| UniRef90-Q0CQ74 |  |
| UniRef90-M3HI60 |  |
| UniRef90-M4BYQ6 | D SVK Y NLRKLENTLYELSLL |
| UniRef90-D6RJU9 | AVTSNSLEKI EDAVYAI FLR |
| UniRef90-H8WZJ3 |  |
| UniRef90-F4HNP8 | DQARYILER |
| UniRef90-B8CG74 | D GTKYKLKTLETVLYELSVAG |
| UniRef90-B8CG74 | DGTKYKLKTLETVLYELSVAG |
| UniRef90-W8NSI6 | DQARYALER |
| UniRef90-R9AS32 |  |
| UniRef90-K1Z1T0 | DQAKSA LQKLEQVIYEVSLR |
| UniRef90-G3AEV2 | EVFNNSURK\\|ETTLLDILI |
| UniRef90-A1RY03 | D V A R |
| UniRef90-T1IRD7 |  |
| UniRef90-V4SMS9 |  |
| UniRef90-C5A5A6 | D Q A R Y A Le R |
| UniRef90-E5SWH1 | DTLLKYSLNKVEEVKYNLT!RGLRK |
| UniRef90-Q5A0X1 | QVFESS L K K I E S T L L D L V |
| UniRef90-Q0V5H4 | $P \vee$ M R E CVI KVEKALYGLTTVRG |
| UniRef90-W4GME8 |  |
| UniRef90-A6R5S7 |  |
| UniRef90-F8AEM6 | D Q A R Y TVEERLEDLV |
| UniRef90-Q5JI46 | DQARH【LER |
| UniRef90-F1KSF3 |  |
| UniRef90-J5SPQ3 |  |
| UniRef90-K2ECR0 | D QAKMAAQK\EQ VYELSL |
| UniRef90-A0A024JIC3 | D T L K Y DVK NVENIVYDLCVR |
| UniRef90-E3QNC9 |  |
| UniRef90-Q6BI64 |  |
| UniRef90-A5E7Z5 | EVFQSSUKKLETTLLDLLI |
| UniRef90-LOACM7 | DVARNLVDETKSLIVDLQSR |
| UniRef90_G4RQ47 |  |
| UniRef90-D9Q2H4 | D VAR S |
| UniRef90_W012R2 | DQA R Y ILE R |
| UniRef90-E8R7U4 | D V |
| UniRef90-Q5Z194 |  |
| UniRef90-B8D386 | D V |
| UniRef90-A6UV69 | DVSRSLLEKTNDLVYNDK LTR |
| UniRef90-A0A059LLZ9 | $\mathrm{DV} \mathrm{L} R \mathrm{R}$ M L R |
| UniRef90_LOHND5 | D T A S L I EK |
| UniRef90_R4X9T5 |  |
| UniRef90-M7TFY2 | D $\square$ A R GLI E K |
| UniRef90-A3MUI2 |  |
| UniRef90-I0A1B5 | D T A R |
| UniRef90-A8MBX5 |  |
| UniRef90_B5IE99 | D T A R ALIE K |
| UniRef90_A2BK30 | D VA R |
| UniRef90-Q0W0H0 | DVARSLIE R |
| UniRef90-I3TCN1 | D TAR |
| UniRef90-R1DXR1 | E P L R T A VRKMETLLYELS $\square$ |
| UniRef90-X1Q795 | D MVR |
| UniRef90_D7DB20 | $\mathrm{D} V \mathrm{AR}$ |
| UniRef90_1012P6 | DVLTR S V V E R |

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SGIVINQVLERILDMEREKMLLQLTREMS ${ }^{40}$
KHFDEKDAAREEALRLSR\|VIR
 MS GPSTFENDSEGLD DKDRAREEALSLSRRVIRR I E A R L M L E E $\square$ S A R $\square R E N E$ E A K D S $\square$ R E E G L
AAPTTLLHRQDFTDMNQEMHEYDEMREKTTKRSREILK NSFDGAF DQGMSAYDERQSRYDQIVIGSRMVIR

E Y L I D Y L K E K D S T R E E M V K L A R E I T R
 D $\square A N R \square E S R L E E K D Q V R E V A \| K S S R A I N R$ Q $\square$ AESAHVVFEAETKARDDADSKARALTR


M $\square \mathrm{D}$ T D
 D Y L DEYLTKKDQTREEILKLAREI SI KDSFEEKDKARESTLAI SRDVVR
 MK $\square$ NK $\square$ FAE $\square$ NE S LIEKLDTDRESLLKLSRVII R
$M \square K S \square I E Q \prod R \square D \square E E K D K A R E Q G \square K \square S R E V V R$ K DIISDSIRARFDAMDKAREGALAATRKITR RNLYNELREYESVKDEVVQTSDKVAR
 $M S \square E Q \square V A G C V V Q L E S \square H A A R E R A I A A T R I L V R$ MQANHWSEIAER RQQLEERHQAREEALQACRKAVQ
 KLEQRFQSREDLLLLSREVIR
 NMEEVNKLRNYFDRDDSVRENLVKRSRDFL



LLEFFEKKNETREK LLKTSREI VK QRLRADFEAKNQAREETLRLCREII Q S $\square$ AE Q $\square R$ QSFSAKDATREKLLPLCREVI R
 MS G LS DSK DAEQVRRDFTELDAAREKALPCCREVIR
MDATA $\square V R \square T E R V L A R L D L L N S A R E R A L A E T R Q \prod T R$ DEI KRYLDLLDTAREELLKLTRDLRR


A Y VSVEDQDRESLLKLSR\|I I R
 PE $\square A E R \square H Q A L E A R T R A R D Q V L T Q A R V L T A R$ NKI AKSLSEVQDAREFLLKNTREII I

K L S A R S D S REQLLLKSRELIR
LEKTNDEREMLLKNTRQIVN
 RLEGVNAARERALAETRBSIR A QIE ASHTAREQALTLARALTR

NK TAKNLEDVQDSREFLLKNTREGVI MSRLTDES $\square$ AEQURPSFSAKDAAREKALPLCREA $\downarrow$ R

ITSK SLKATNASREFLIKNTRDVVI SVEARLRSRFESREKLLLMAREVI R A $\square$ ARHIRSYL $\quad$ TEDEARENALRGCRQVVQ HEAAYERAFTKSRAAII R

 DKI GVLSRDSVR TRRAFERKDAAREKALPL SREAI R EY $\operatorname{L} E N V E K K \square M D R F D N K E K L L L L S R E L I R$ $M L V Q K \| L D S \square S H T L Q E R F E N R E R V L L L A R E L!R$ KLQERFDKREKVLLIAREVI R

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UniRef90 E1QUQ9 UniRef90 D5VTE? UniRef90-W9DRX1 UniRef90-F7XNM5 UniRef90-X1G9K9 UniRef90-X0VU40 UniRef90_Q74ML9 UniRef90-LOKSX2 UniRef90-A4WIL1 UniRef90_A1RUW5 UniRef90-A9WI09 UniRef90-H5SN79 UniRef90-F4FZ93 UniRef90-D7EB41 UniRef90_UPI000379BC84 UniRef90 F6BE79 UniRef90_UPIO00373B077 UniRef90-EOSNI1 UniRef90-C7P7M7 UniRef90-D7DUF8 UniRef90_Q57639 UniRef90_A4YI80
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 KDLVEHQDVRYSGFVDDAEQEFVEASVLYSLIFEGRMPT
 RELLGNHQDVRYAGFVDGAEQEYAEAISVYSII TRNEILT RSLLDAYPELWHSGLVEGALQEDAEAVILIALLD RRVLEPHPDLMSSGFANNAFSEYVEARLFIDDVIGRGLSS EVLFEGHADVYHAGFVEHAQQEYSEVSVLSSLLEGKKLPS VTLTEKNPSLR DGALSSSLEEYAEAKCFCYYLDTKCLLP ARLMKDDSGFEYNAMQAY QQEYSEAMLFWGVKKKGRLPD DSLLEEHPDVYHASFVEHAQQEYGEGYVLFALVKSKG LSLLSSKHPDLLYSGLSYNALSEYAESUIVYHLVVEGRMPLD RSLLLEDYPEELWESGLVEGAALQELAEAAALLDALI KDEAFPD


E $\square L T E H K D \square Y F T G Y V Q N A H Q E Y V E A N L F Y H Y L L D E E F P H$ AKYPMYYNNAVISLQEYVEAMTMWFFMTENRIPS KELTQYPEFDHY LSTPEQEFVEAYTLYSTKFYNTVPK DTLLADHPDIYYSGFLEHAQQEFVECLVVYNILSGED
 LLLVSNNPGVFGLKYLKTPEQEYTEAIAFYAVI SKEPLPG
 $H$ G SLLE D F P E V Y Y S G Y Y V E D A Q V E L A E L K WPMFYGSAATGLQEYVEANVLYYFMKEGKLPP NEWPMFYNNAATGLQEYVEA DTLYDFDKEGRFPT YDATAGAPEVRYAGYTQDALKEFAEAHLVVAFLAGDAPPT

 NELVKKH VIDFEKYANTPQQEFVEAKALYDIIIFNNKIPT KAKLVEAPDLWFAGFVQDADKEVAEACIVYAFLRDEPVPS
 FPEFKKY S PQQE Y EAKALYMVKFNNK P S FP P F V G Y KNIVQNFPELLF GDVGVAFQEISEASVVLSFYFNLDPL SNLVCCDDHPEF KNY SENHFEFQKYRGTPEQEYVEARVYYSVIFENKILN $N E T L G K Y P E T Y Y K G P V G Q A Q Q E$
$R E R L Q D Y P A L L Y A G Y T Q D A F K E ~$ EQTVADYDELNYTGFFRDAQKE
TA H DA DYPA YY WS GYVQDAHKEYAEAS LVTGADVAGRP PS KYYEDDFPEIYYPDT RDP RTATNSCPEI RHAGYSQDALKE LAEAHVVAAF KNR
DLLGDFPELLRTGFAENHLQEYAEAEVLYSVVKDRRAPS LLVSNNPGVFLKYLLKTPEQEYTEALIAFYAVI SKEPLPL $K E Y K V Y P D V Y Y P V T F D A M Q E L V E A Y V F R H I V E N Y D I$

 Y D LTE GYPELYHAGFVENAAQELVEAHCLYNIMQNKDLPD E Q V S N YPEELUYGDVGTAFQEL LEKYRKHTDSSLHRYLVTPEQE VSHLDA D P S 1 Y WS GYVQDAHKEYAEAR
ARDLA HPA LHAGYTQDAFKEYAEARLTYALVHGDELPS RESLADHPDLLYAGYSQDALKKYAEAALVYAFLH



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UniRef90- $\times 1$ G9k9 UniRef90-X0VU40 UniRef90-Q74ML9 UniRef90-LOKSX2 UniRef90-D1YWJ2 UniRef90-A4WIL-UniRef90-A1RUWW5
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UniRef90
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UniRef90 D1CCT3 UniRef90-TOZFN4 UniRef90-D8KOE4 UniRef90-AOAO31LMY8 UniRef90 T1CQ71 UniRef90-C3MQE1 UniRef90_Q970U5


TEA DNGRDVRRAESYFED KKKDYDYTRPVRVSDPGFRRKQ LEAMKEDNVEEVEKYFKFMEDI YDFLMSFDYYVDNLRRKQ V ELLLD S LEKLREGDI EQARKHDDLMEDMFLVLMRFDYPDAPIRRKQ LLLLLDGNUEDAEKVYRFMEETYEELMTDEYPKGNVRQKQ MDLLRMGYSDEAETLLSEMDDDYSVLITMMDYPDNGLRRQT


 LEAMKEDDKEEAERYYKFMEELYYDF MMSFDHYDDNMRRKQ





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L E MK ND D VE E VIE RYF K FM E E L Y E F L M N F D Y Y V D N L R R K Q

LL E S L R K G D D K A R G R E ILLAE E M E N L Y D I L W K L E Y P V P G L R Q K V




STTTS Q S S N Y S I A L I $\operatorname{L}$ N S K I V















 $L$ E S L R K G D K A K G R E I M E EME T I Y E E L WK LE Y P V P GLLR QKU
$L D G L R R G D F S$
IL Th







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| UniRef90-R9T8H9 | DI A R S LLE K |
| UniRef90-U3TI03 | D V A R |
| UniRef90_Q46D70 | DVSRSLIEK |
| UniRef90-E3GYY3 | DHARYILER |
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| UniRef90-E0SNI1 | D V Y R |
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| UniRef90-I3ZRK8 | DQARG\\|LERLEDL |
| UniRef90-V6ARC1 | D V |
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[^0]:    LD F L LEGEASKANEY DNHMDK VYGA DMS DDYPSGPDKRKQ TEELLQKNVEAASRDKEAVEKLYGDLDALEPRDYELRKKVV
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