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UniRef90 U7VAF8 UniRef90-A0A010NSB3 UniRef90_10GRD9 UniRef90-U4Q8N7 UniRef90-A0A023CUF2 UniRef90 F6CNP1 UniRef90-A0A022LIQ8 UniRef90-UPI000371F620 UniRef90 D9S3L9 UniRef90_UPI0004716D9F UniRef90-V6F5T0 UniRef90_UPIOOO3
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RCYVVGVTRGAREPLITLS


RTHPNLVRKL 90 V $E \prod A D G$ KCFVVGVSRGMRGTQITLSRTHPNLVRRLFALEVPEIADG


 KAYVVAVSRTFRGPQVSVSRTHPNLVRKLFALEVPEIADG RCVVVHVVKSPRGPQVTVSRSHPALVKKLFALEVPEIADG $R C Y V V Q V R R G P K G P S I T L S R T H P N L V R K L F A L E V P E I A D G$ $K C Y V V S V T R G V H G P T V T L S R T H P E L V K G L I R M E V P E V A D G$ KVY V V EVVRTPKGPQILI SRSHPNLI KRLFELEVVEIHDG KAFI TKVEKTTKGPQVLLSRTHPGLLKRLFELEVPEIYEG KCYVVGVTRGARGTQITLSRTHPNLVRKLFALEVPEIEDG RAY L EVVRRTPKGPQI LLSRTHPGFLRRLLELEVPELQEG RCYVVGVSRTPRGTAVTLSRTHPNLVRKLFAFEVPEIASG KAYIVEVKKTTKGPQVLI SRTHPGLLKRLFELEVPEIHDG
 RCFVVSVKRGPNGPQUGLSRTHPNLVRKLFALEVPEIADG RAYVVDVHRGLKGPSITLSRSHPGLVRKLEELEVPEIADG

 K V Y I V E V K KTTTKGPQQLISRSHPGLVKRLFEMEVPELQQGO $R V Y V V G V R K G F K G P Q I T V S R T H P N L V K K L F A L E V P E I A D G$ KTYI I EVVKKTKGPQI MVSRTHPGI I KRLFELEVPEI YEG KCLVI SVRKGMRGPQI TLSRSHPTLVKKLFALEVPEIADG KAYIVEVRKTTKGPQVYVSRTHPGLLKRLEELEVPELEEGO $R V F V V S V R R E L R G P Q V V V S R T H P N L V A K L E A L E V P E I E Q G$ KTYVVEVKKTPKGPQVLLSRTHPGLIKRLFELEVPEI HDG K L Y V V V E V $V$ K K T T K G P Q V V Y L S R S H P GLLV R R
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## \section*{} <br> 

 RAYVVEARRGQKGP KAFIVEVKKTNKGPQVVV KVYVYKVENTSKGPQVTVS KTYVVEVRKTTKGPQILVS KAYITKVEKTTKGPQIMISRTHPGLLKRLFELEVPEIYDG



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| $R$ | $V$ | $F$ | $I$ | $T$ | $K$ | $V$ | $E$ | $K$ | $T$ | $T$ | $K$ | $G$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $K$ | $Q$ | $Y$ | $V$ | $V$ | $N$ | $V$ | $N$ | $R$ | $G$ | $P$ | $R$ | $G$ | $V$ |

R A Y I M D V R Q E P R G P Q I
$\begin{array}{llllllllllll}R & A & Y & & Y & D & V & R & 1 & E & P & R \\ K & G & A & Q \\ K & T & F & V & E & V & G & K & R & S & A & K \\ G & P & Q \\ V & R & N & N & R & N & L & Q\end{array}$

| $F$ | $V$ |
| :--- | :--- |
| $F$ | $L$ |


 UniRef90＿C8XJB6 UniRef90 UPI000374FE8F UniRef90－A0LV29 UniRef90－H6RVV3 UniRef90 UPI00036A4DD9 UniRef90 UPI0003828CD3 UniRef90－F8B3B7 UniRef90－K6PY52 UniRef90＿D5WPJ1 UniRef90＿G7GU23
UniRef90 C9R8X9 UniRef90－UPI000368FF60 UniRef90－BOTHRO UniRef90－D6Z8N0 UniRef90＿D5XF10 UniRef90 K6W6B3 UniRef90－UPI000255DD96 UniRef90＿U7JST3 UniRef90＿L7ZQF5 UniRef90 C5BWS5 UniRef90－I3VWD5 UniRef90－D2Q1L4 UniRef90＿W4V319 UniRef90－R7XVB6
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UniRef90_W5Y1G4

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D

## N D D D



$\rightarrow$ $\quad$ ா | $K$ | $A$ | $T$ | $T$ | $V$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $S$ | $A$ | $R$ | $V$ | $V$ |
| $P$ |  |  |  |  |  |

D E K
$\begin{array}{llllllllllll}D & A & A & A & R & A & A & R & V & V & V & P \\ D & D & Y & Q & L & S & L & A \\ N & E & E & E & K & S & A & K & V & T & V & P \\ D & F & Q & L & S & L & A \\ A\end{array}$

## D <br> 

 $\begin{array}{lllllllllllllllll}P & D & T & R & S & A & R & V & V & V & P & D & N & Q & L & S & L \\ E & D & D & R & S & A & K & V & I & V & P & D & Y & Q & L & S & L\end{array}$ $\rightarrow$ 「「「
 $G K E G Q N A R L A A R L T G W R$ $G R E G Q N A R L A A R L T G W R$ I
 $G K E G Q N A R L A A R L T G W R$



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UniRef90-G9ZSK8 UniRef90_D0WR23 UniRef90-UPI000371D5BF UniRef90_V8A4E0
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UniRef90_A1AML9 UniRef90_D4J330 UniRef90_R5JW52 UniRef90_B8FCY4
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UniRet90_HOEAPM
UniRef90_G8QPW3
 R N F D Q A Q N V R V D I N Q T T G S M HVVYA QK E V V D E I L D S E E I E V T



 S R Y G Q E T E V R A E I $\operatorname{N}$ N P K T G E I


 $R N F G S S Q N V E I V I D K E D G E I \quad R V Y A N K M V V E \square E D \backslash V K \square E V T$
 SRYGAEYEDRCKI DPRSGEMRIRRVTPEVENHFVEDPDDF R NF N Q A Q NVRVDL N LQ T G S MVVYSRKDVV E EVVEVVEEEVT $K N Y N Q A Q N V R V D L N L D R G T M H L Y S R K D V V E V V E I V E Q E E T$

 R HF K S N E N L R D M G A S E D S V V D I N P D T G R F Y V A M R K T V V D D G D V V E I P D D
 K HT D QASSHARVVHLDRKT GHVVTVYVP EF DET GNVI GE SED S








 RRPGAA E EAYVVEI DPA S GTVRVICQQELDENGTVVRE WEDT



 S RYGSEMMDI RVMDDRKTGNATVVEDEAVENYQDVFERQVP K K Y G N E Y DL EVI YN E EMGEVEAFEFKEVDPETEIGD DKMD ARYGSETVVHAEIDDAKKGELVRLRHMLVVENVENPANQDS



 E F R G VVQP D P R V D I NTT T G A V S V I V T E GK GEGTKARVDI DTQTGAVAVMVSELDDDGNVISEYDDT

 K NYGTS E N V R V S I D P V N G DI A V L M Q M T L E E A H E I D E F A V A

 S GYGPK DNAEI Q D D E NT G EVVRVYSKREVVEVGDIDK VEVT
 SRYGA EDDD L RAK I NPDVS G DDS L K H R DTVVV E DGEVVEAE D L P

 S R Y G S D LDD R V K I D R K T G R A RIDRTV VE D E DP KI G D E I E V P K K H G GE I DVRVVSIHRETGEYETFRRWTHPDDQVGEY I E EP RKLLGS K V EVVDVAA Y N D E DG E V E V F E R R L D P D C E L G D E I K V E
 AKYGFEK DVVRAKVDKH T G DVVNI WKH QI DK S Y NVVGDEVVVEP

 KKYRNTRDLEARYNSDTGEVEDFEFVI DEAREDDPDVEI D NNYGKADNAKVEDDKNTGEYHVVKTVVDEVMDPVEEIVEVK KDFGADENIDVVMDRETGEFHVYAK KEVVADVEVVTKEITT $K K L G P R A D I E V Q Y N E E A G E L E V F Q F R \quad E V V E E V T E P D L E$ K D F G K S E NV TVVNMD R E T G A I E V Y Y V D Q V E D PA T E I S N V E I T RTDGAYRNSRAELDRKTGHVTVWARE EFEVPVYGPEFDDT





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UniRef90_LOESW8 UniRef90_C8NEV2 UniRef90_A3PNL0 UniRef90-B8GP01 UniRef90_UPI00021929C0 UniRef90-N2ALH8 UniRef90-D913B3 UniRef90-EOTEQ1 UniRef90_F4X9L1 UniRef90-A1AML9 UniRef90_D4J330 UniRef90 R5JW52 UniRef90-B8FCY4 UniRef90-R5EJ46 UniRef90-A3TRX8 UniRef90-U2WT21
UniRef90_U1MSW6 UniRef90-R5REP9 UniRef90-A4G7S8 UniRef90-H0EA15


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KVEAKLIAEPEQMPTENYRVHDR|I
KVEATLSKNEQMPNERYHAHDRI D K V E A V MG PR DQMPNEVYRPQERL RHDSR
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## G

$N G V N P R M V H V D L G T$
K G N $V E Y$ VD G L LV

RANDRGITVVNHLGTEAD RNN
 RANERGVVVHKEGVLLPS RAKERGIIVVHLGTEADGQDGIILPAEQIEGETYNQGDRI RANERGIAVVRLGTELLKGQDGILLPSEQIPGETLKHGDRVV

PRN $\square \mathrm{Y}$
KVEAALPVNE
K N N

## VLIDLG <br> ${ }_{G}^{G}{ }^{V}$

K


 GKN VFINLG K DEARLPESEQMPTERYEVHDRL GKN NPRMLHVDG

 NDN GPNPRMVMDLG
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$\qquad$ K EAVLS
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HANNRGVVVVQLGTEHD
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NGVVKRVEYGSV
KANARGIVIVELGTEHD
$R A N E R G M I I V Q Q G T E A E$
$N G T V K R V E Y G N V I V D G G$ $N G T V K R V E Y G N V I V D L G R G E G L I L R D E$

 DA AQRGIVVVQLGTE D
KNN
 GSTMFVTV $D N K K I V Y V R \square G$
ERSDSRFVYINFG
EGN
PAESRG TVVRAVLIPR
TGGVQRYVGKN IVSDNLGKVDAGLESEN

A R Y T
$N G T V K R V E Y G N V I V V D L D G$
$N G V V K R E E Y G N I \frac{G}{1} V D \square G$




PRNGGAVTLRRVSSGSEFTDAYLGANEQVKGESYVEGQRLD
$T G V V T R F S G N N L H V N L G K L E G F L$
GNNILVSL
R G
GKNDSVS L

## DPRHVTVDFGT



## GRN

R G
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 RAYVYSVSKGMKGPQITVSRTHPGLVRKLFALEVPEIASG KAFVVEVKKTNKGPQRVVSRTHPGLLKRLFELEVPE:YQG
 RAYVVSATRGAKGPSVTVSRSHPGLVRKLFEQEVPEIADGO

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 K L Y $V$ V $V$ V














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 $K V Y I M D V K K T T K G P Q V F L S R T H P G L V K M L F E L E V P E I G Q D G$
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\begin{array}{ll|l|l|lllllll|l|l}
R & A & Y & V & L & D & V & K & R & V & S & R & G \\
K & P & Q & I & L & S \\
K & S & Y & V & T & G & V & T & K & T & P & R & S \\
\hline & V & Q & N & L & S \\
K & L & Y & V & V & E & V & K & N & T & P & K & G \\
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 $R$ V F I T K V
 RAY L R D R N A R GPQVILSRTAPEFIMKLFELEVPEIEQG







UniRef90_G2IVV3 UniRef90-S9RWF4 UniRef90_D9QRG2
UniRef90 B3PI95 UniRef90-B3PI95
UniRef90- A514J6 UniRef90_U4QSU8 UniRef90-F8JFL3 UniRef90-U2Q5Q2 UniRef90-I4BWB6 UniRef90-D9QJ13 UniRef90-W1TN63 UniRef90-UPI0003B49678 UniRef90-A6NTX6 UniRef90-R5WKA9 UniRef90_V4JNZ4 UniRef90-R6GR72 UniRef90_UPI0003B6B69C UniRef90-X8IT89 UniRef90-D9SKN3 UniRef90_UPI0003B59E0B UniRef90-UPI0003B44028 UniRef90_D5BU78 UniRef90-F8A9F7 UniRef90-R7ITK2 UniRef90_C4GBG0 UniRef90_UPI0003FB8BAF UniRef90-D7BN49 UniRef90-G4E594 UniRef90-F7V6C8 UniRef90-D1NVA2 UniRef90_1015T0 UniRef90-UPI000465BB4F UniRef90-EOS1N0 UniRef90_W5WYLO UniRef90-H1D1Y8 UniRef90_A0A031M4U7 UniRef90-R6Y8X1

UniRef90 R6P3Z2 UniRef90-C0D3R6 UniRef90-R5TW95 UniRef90-I1XIB1 UniRef90-C6WSM8 UniRef90_B4RC57 UniRef90-D9SFJ1 UniRef90_UPI0003B52E63 UniRef90_UPI000378D109 UniRef90-E3GNX1 UniRef90-R5YNW7 UniRef90 A2SH41 UniRef90-Q4L5W8 UniRef90-R6H1H1 UniRef90- S6B4L2 UniRef90_U2F180 UniRef90-LOB3V9 UniRef90-D3R078 UniRef90-UPI00037ABC0C UniRef90-U7UBN6 UniRef90-C0QHM1 UniRef90_B2UAA2 | UniRef9O-A0A037Z4Y |
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70
80
 SRYGSEMDI RVVI DRKTGEMTVRQYMAEPNVGDVYTEEVPB KNFGS K Q N V E I EI D E E N GEVVNVY DDPN YEA GDVV S V KRFDEDSTI EEVII NRTT GDYETWRSWDVVSSDDILLAE EK I E KNYGSTNNVKVIDMRENGEDKVYAQKKVVELDEDIDNDEVMT



 KNF GSAQNVRDDLNRETGDIVVYSQRVVVDEQDIIDEHEVT NAPGALEDARVEVDRKNGHVMVMAAEIDEDGNKIGEFDDT KNF GYTGEDRVVHDP T DNSIVVVYSRTVVDDEVMEETEVV
 K D F N T DE N I T V K K H G G D $\quad$ D A R V A L N R E T G E Y D T F R R WE V V E D T D G E E E Q I E


 $K K Y G D D \square D V R V Q I D R A T G Q Y V T F R R W V V V E D N D V K E E P M D$ A K Y G L E R DI RAMID RKS GA I RLERWMEVVE EVEFS K Q S LP
 KFSDNATNLRAVVDRETGDFHVVVKKTVEEAHDIDEEELQQ ARYGAENDDRAKLDPNTGDVRLWREVVEEVDDYFKQVDLDP

 NHFGTSENIRVVMNRETCEYHVYADKEVVEEVFICQVEVQ KTPNAAKHVRVVEDERAGTFTI WARDEDPHGHIGEEYDDT RNYGPAANITAKVDRATGEMRIVTERVEEVLNERTE DTDD $K$ L Y D R D VEV R VEI D R T T GE H Q T Y R R WL D E A GLLQEPE EP V A

 KRYEDEVDVRVAI NRQTGNYDTFRRWTVVVDDDVVEEKI E


 K RYEMEDDAHV AIDDRQT GNYETFRQWDAKVGDYI REPMDS KKHHDDADVRVAI DRESGEYQTFRRWQENSAYQI DEEDER ARYGAEHDI RVVHIDPKTGETT $\square$ KRRDKDAEVGKVYEELLP
 R K Y G D A M D I E V T F N E D L G E DIE V Y Q V V V D E V H D E I S E II L K T RYGAENDI RAKIDPRTGDL RLWRVVVEVI GDFIVVDPLPP

 $K$ L H G GEVVDI RVSVVDRDTGEYETFRRWLVVPDGDYI E EA I E
 N H F G K A D N V H V T T D H E T C E F S V Y A D K T V V E V V V E I K R F HE DVVEVRV DL D R E T G E V R L WHVVP D DA V E F YVVE EP L E




 K R F E E DVDVRVA $\quad$ DDRES GEHETFRRWLVEVD DFVEEQIES



 K MA GTE E EVEVQIDP NKGGIVRIFVVKRDAVVGDVIRFDRT K QP GAAPY A QV EMDRE LGDFTVWFEK LDE YEDQI ERVDVT
 K RFKD DADI RVVSI DRETGGHEGFRRWLVEVGEYDEEALEP K L Y E GEVVDI RVAAI DRETGEYDTFRRWQDRVPDVI E E E QV E

 $N V P G A L P K A R V E I D$ K H GHVIVMATEEDEDGNPIGEFDDT K NF GSA Q NVRVSVDREGGEVVVYRRVVDESDGDIDENEVT KRHDNK $\square D V R V S I D R K T G D Y E T F R R W E V Q V G D Y I E E P D E S$
 KKYRNTRELEAHYNTEQGEVELGEFVTVVDEVQDSYKEID

 K MPGS IVEARID DDRKTGKVAVMATEFDDDDNP IGEFDDT


 K N Y G Q A Q NVKVT F D A K R G D ITVFA VK EVVNEVLDS DF EVT
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UniRef90_D9SF1
$|V| E \quad F \operatorname{R|I}|G A Q A A K Q| V I L|Q K| I R$
110
120
RDAERERREHLVVSGTVKRIE
 NAEFGRI AA QTAKQVIVQKVREAERDRMGELVSGTVKKVT PKKFGRIAAQAAKQVVIQRI KEEEREKEEDILTGTVLRKD IDDFGRIAAQAAKQVMFQKVREAEWDRQGDIVNGVIIGHE PLEFGRVAAQNAKQVIVQKVREAERDRQGDVINGTVKRVE PRNFGRI AAMQAKQVVLQRIKEAEREKEFDIITGTVDRKD PRDFGRIAAQTARQVI IQRLKDAERQKVGETVTGVVFRDE NDEFGRVQTQMARQVI TGKVVEAERANQYEEFKDRVGEDV PMDFGRI AAQTAKQ।VVQKI REAEREKQDELITGEI SRTS PSGFGRI ATTTARSII MQRLREAERDKKGEVVS QPALARIAAQTAKQVVVQKLREMERDRLLAEYSQRVGESL
 SELDFGRIAAQTAKQVIVQKVREAERERSGELVTGIIKKAE
 PKDFGRVAAQAAKQLVIQRIKEAEREKEFDIINGTVIRKD HAEFGRIAAQTAKQVII QKIREAEREKEGDI I MGAV HTVD


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UniRef90_E1VI05
UniRef90_G2SNX2


UniRef90_G2IVV3 UniRef90_S9RWF4 UniRef90_D9QRG2 UniRef90-B3P195 UniRef90_U4QSU8 UniRef90_F8JFL3 UniRef90-U2Q5Q2 UniRef90_I4BWB6 UniRef90-D9QJ13 UniRef90-W1TN63 UniRef90-UPI0003B49678 UniRef90-A6NTX6 UniRef90-R5WKA9 UniRef90-V4JNZ4
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UniRef90-E1VIO5
UniRef90-G2SNX2
 RCY KDVRREARGPQU FLSRTAPEFMAELFKMEVPEI YDG K IVYVEVKQTTKGPN LVSRTHPGLLKRLFELEVPEI HDG RALLLDVRTEARGPQLLLSRSAPQMLVELFKIEVPEIAEE KLYVVEVKNTTKGPQVLISRTHPGLVKRLFELEVPEIYNG KALLLDMRTTSRGPQLVLSRTHPDFVSRLFEKEVPEI AEG RAY YEVRREQRGPQ FLTRARPEFMSMLFRAEVPEI YDG KLYVVEVKNGKGPQVLVSRTHPGLVRRLFELEVPEIYTG K YYVLDVRKTSKGPHIFLSRSHPGLLRNLLEEVVPEVKEG KFYVVDVNKTSKNPQULLSRSHTGLVKRLFEMEVPEIQDG RAVVVKTMMGEKGARIEVSRRHPDLVRGLFSREVPEI TSG KVYVTDVRATPRGPQVTLSRTHTSLIRRLFEREVPEVADG KVYVVEVRRSTKGPQVLISRTHPGLVKRLFELEVPEIFDG KLYVTEVKKTNKGPKIVVSRTHPELVKRLFEKEVTEIAADG RGLLYEVRSEPKGPQLFVSRTAPALLIELFKLEVPEVGEG KLYVVEVKNTSKGAQVVVSRTHPGLVKRLFELEVPEVYEGG KVYVIDVKKATKGPQIFLSRSHPGLVRRLFELEVPEIGDG KLYVVEVKKTSKGPS VVSRTHPNLVKRLFEVEVPEVYEG RAYVLEVKKTARGPEIILSRVHPNLVKKLFELEVPEI HDG RAFLLRVDRTGRGPQLILSRTTPLLVGKLFALEVPEIIEEG RAYII DVREEQRGPQIFLSRACNEFMAKLFTQEVPEIYDG RALVIGVNKSGREPQQVLSRTHPDFLAKLFEQEVPEVQQEG RVYVLEVKDAAKGPRIRVSRTHPELVKRLFEEEVTEVKDG
 RGYLREVRTEMRGPQLIVSRTAPEFLDELFKLEVPEVGQG RVYVIEVRDTPKGAKILVSRTHPDFVRCLFEEEVSEIREG RVYVVNVNRGGRGPEIVVSRSHPDLVRKLFEREVPELVSG
 RVYVLEVKNGSKGPRILVSRTHPDLVKRLFEQEVAEI QDG KAFVTDVNNGNRNVQVNMSRTHPELVRGLFSQEVPEVADG
 KAYVVSVERGLKGPQVLVSRSHPDFVRKLFEFEIPEVYEG KVYVVDVKETEKGPRAMISRTHPDLVKRLFETEVPEIYDG KVYILEVKDTPKGPRTSVSRTHPDLVKRLFESEVAEVRDG KLYYVEVKNTPKGPKILVSRTHPELVKRLFEAEVAEVKDG
 RCYIYDVRRETKGPQLLSRAHGGFMAKLFAQEVPEVYDG RAHLGRVDRGPRGPQVILSRTSTDLLVKLFEDEVPEIEEN QGYI DVQKESRGPQVLISRSHPNYMAALFHREVPEVADG RSLILKVGREVRGPQIFLSRAHPDFMKKLFAQEVPEIYDG
 RAY TEVDTTQRGPQUMLRSAPGFMVELFRHEVPEVEQG QGYLSEVRQTTRGPQ IMSRADERYLVKLFEMEVPEIYDG KVYVNKVEQTTKGPQYYSRSHPGLLKRLFEQEVPEIYDG KVYVLEVKDSPKGPKIMVSRTHPELVKRLEEAEVTEVKDG KVYVVDVLATDRGPK MI SRTHPGLVKRLFEMEVPEVYDG RALVLRIDRNDRGQRVILSRTAPEFIKYLFENEVPEIEQG RLYMLRVNEKMGRPVVYVSRSHPNLVRKLFEHEVPEIKDG KVYVVSVDKTTKGPQVIVSRAHVNFLKRLFEQEVPEIYDG RALLLEIRTDNRGPQLMLSRSSPQMLMELFRDEVPEIAEE
 RAY L NVDRTARGPQIELSRTCPEFLDKLFENEVPEMEQG
 KLYIVEVKNTKKGAQVLVSRTHPGLVKRLEEEEVVEVIRDG QVYVERVENTTKGPQVYVSRSHPSLLKRLFEQEVPEIFDG RAYLYEITPQARGPQLEVSRTRNEMLDELFRDEVPEIGEN RAYVVGVQKEGARVQVLLSRTHPELVRGLFELEVPEVGDG KVYLLEVNKDTRGPQLIVSRTHANLIRRLFELEVPEIYSG KAVIKDVSASTKGPSIIVSRRDPELIKALFELEVPEIADG QAFIVDVRKEGRGPQVVVSRSHPDYMVSLFKREVPEVDDG KCYVSEVKSGTKGTQIIVSRTHPGLVKKLFEAEVPEIIAEG RAFVLRVDHAARGQQVILSRTSPEFIRQLFENEVPEIEQG RAMIMEVDTTQRGAPIMLSRSAPAFMIELFRQEVPEI EQG RAFLLRIDRGARGPQLVLSRSAPQFDMKLFEREVPEVEDG KVYVIEVKDTPKGPRVSVSRTHPDLVKRLFESEVAEVRDG RAYVVRADRTEKGARIELSRRHPELVRRLEEREVPELTDG KVYLEVKKTNKGPQIVVSRSHPGLVKRLFEMQVVEIFEG RGYLKAVRPETRGPQLFVSRTAPELLDALFRLEVPEVSEG KAYI YEVKNTSKGPNIFVSRSHPYFLRRLFEMEVPEI YDG RAYIAEVKMSPKGPQIILSRTHPSLVIELFKTEVPEISEG RALLVKVDPEARGAQLQLSRTSPDFIIELFKDEVPEIAEQ KVYMLEVKNTTKGPRALVSRTHPDLVKRLEESEVAE:ADG KVYVVEVRRATKGPQVLISRTHPGLVKRLFELEVPEVYDG RSYVYEVRREQRGGQLLLSRTHPQFMVKLFLMEVPEIYNG KVYVVEVRRSSRGPQVLISRTHPGLVKRLFELEVPEIYDG KVYVSKVDKTNRGPQIIVSRAHANFLRRLFENEVPEIFNG




|  |  |  |  |  | 32 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| UniRef90_G21 | DEDNHAMDVVVELDQL |  | A A |  | $N \mid I$ |
| UniRef90-S9RWF4 | D E D A ERIDEVVVPP EQL S L A | $G R R G Q N V R$ | A S Q | L T G L D | D |
| UniRef90_D9QRG2 | D EEEQVAVVVVPD Y Q L S L A | GKEGQNAR | A A K | L T G WK | D |
| UniRef90_B3PI95 | DEDARSMDLAVNEENLAMA | GRGGQNVR | A CE | L T G WN | N V |
| UniRef90_A5I4J6 | DEENKAARAVVDDSQLSLA | GKEGQNVR | A A | L T G WK | D |
| UniRef90_U4QSU8 | D MSEKVATVVVQDSQLSLA | GRRGHNVVR | A A K | LT G WKV | $\checkmark$ D |
| UniRef90-F8JFL3 | D E D S N R IE V V V P E A Q L S L A | GRRGQ NV R | A S Q | L T G WD | D |
| UniRef90_U2Q5Q2 | DEEVVKSAKVVVDDS QL S L A | GKEGQNV R | A A K | T N WK | D |
| UniRef90-I4BWB6 | LD E DKAVNVYVRPDQL S L A | G K G G Q N V R | A A K | T G WKV | $\checkmark$ D |
| UniRef90_D9QJ13 |  | GRRGQ $\mathrm{V}^{\text {V }}$ R | A S | T G WQ | D |
| UniRef90-R5JMB4 | NEKEKSAVVIVPPDYQLSLA | GKEGQNAR | A A R | T N WK | D |
| UniRef90-W1TN63 | P A EHVLA HVVVPDFQL S L A | GKEGQNAR | A A R | T G A K | D |
| UniRef90_UPI0003B49678 | EGGKAALAIVPDVQL S L A | G K C G Q N VR | A A | T G C R | D |
| UniRef90_A6NTX6 | D D GK S CRVVVPD DQL S L A | GKEGQNAR | A | T G F K | D |
| UniRef90-R5WKA9 | D LD EKS AFVVVPDTQLS L A | R | A A K | T G Y K | D |
| UniRef90-V4JNZ4 | DEEARSMDVAVKEENLSQA | GRGGQ ${ }^{\text {G }}$ VR | A S | T G W D | N |
| UniRef90_R6GR72 | DEETKSAKVIVDDNQLS LA | $G K E G Q N V R$ | A A K | T N WK | D |
| UniRef90-UPI0003B6B69C | NKDRRMARAIVPD DQASLA | GKEAQNVR | A A | T G WA | D |
| UniRef90_X81T89 | SEKEKMATAVVPEQQLSLA | GREGQNV R | A A | S G WK | D |
| UniRef90-D9SKN3 | DEQNKCAKVIVDDNQL S L A | GKEGQNVR |  | T G W | D |
| UniRef90-UPI0003B59E0B | QRAEI I A S D D QL A L A | GKREQNL R | A S | T G WK | D |
| UniRef90_UPI0003B44028 | DEDNHAMDVVVEDDQLALA | G R G G Q NV R | A G E | T G WV | N |
| UniRef90-D5BU78 | DEVAGRMEVVVPD D Q L S L A | GRRGQNVR | A S Q | S G WY | D |
| UniRef90-F8A9F7 | DEDNKTLEVIVPD D Q L S L A | GKQGQNVR | A S | LG WR | D |
| UniRef90-R7ITK2 | D P Q K T ARVVVP D Y Q L L A | GKEGQNAR | A A | T G Y K | D |
| UniRef90-C4GBG0 | DEDAREAKVVVPDYQLSLA | GKEGQNAR | A A | T G Y K | D |
| UniRef90_UPI0003FE | DEEESRDEVVVPD DQLS L A | GRRGQNVR | A S | T N S Q | D |
| UniRef90-D7BN49 | NRDMRQARAIVPDDQASLA | GKEA Q NVR | A A | T G WS | D |
| UniRef90-G4E594 | DEDRRAMD I AV T E EKLS Q A | GR G G Q NVR | A S | T A WE | N |
| UniRef90_F7V6C8 | DEEEKKAKVVVPDYQLSLA | GKEGQNAR | A | T G Y K | D |
| UniRef90-D1NVA2 | S DKNNTAVAYI H D DQL S L A | GKEGQNAR |  | T G WK | G |
| UniRef90-1015T0 | E EGPKTATVVVPDRQLSLA | GKEGQNAR | A | T G WR | D |
| UniRef90-UPI000465B | DEEKHSMDVVVDETELAI A | GRS GQ N VR | A S | T G WQ | N |
| UniRef90-E0S1N0 | D P DEKSAKVVVPD Y Q L S A | GKEGQNAR |  | T G | D |
| UniRef90_W5WYL0 | D P D Q Q $\square$ A R A V V P D Y Q L S A | GKEGQNAR | A A | T G WK | D |
| UniRef90-H1D1Y8 | E E EK SSYVIVVPD Y Q L S L A | GKAGQNAR | A A K | T N WK | D |
| UniRef90-A0A031M4 | DEDTHA ${ }^{\text {D }}$ DI AVAEDNLAQA | GRS G Q NVR | A S Q | T G WT | N |
| UniRef90-R6Y8X1 | EE EKFAQVIVPPDDQLSLA | GKS GQNAR | A A R | T N WK | D |
| UniRef90-R6P3Z2 | P D GMKACQVTVVPDHQLSLA | G NK G Q N A R | A A | T G WK | D |
| UniRef90-C0D3R6 | DEEEREAQV IVPDYQLSLA | GKEGQNAR | A A | T G F K | D |
| UniRef90-R5TW95 | D P D EKVA S V I V P D Y Q L S L A | GKEGQNAR | A A | T G Y K | D 1 |
| UniRef90-I1XIB1 | DEDAHSMDI AVED GQL SQA | GRGGQNVR | A S Q | T G WE | N |
| UniRef90-C6WSM8 | DEDAHSMDVVVEEEQLALA | GRS G Q NVR | A | T G | N |
| UniRef90_B4RC57 | DEEDERVEVVVPDEQLSLA | $G R R G Q N V R$ | A S | T G WQ | D |
| UniRef90_D9SFJ1 | DEDRHSMDVVVEEENLAQA | $G R G G Q N V R$ | A | MT G WE | N |
| UniRef90_UPI0003B52E63 | DEDE VLEVVVPD DQLT LA | GRKGQNV ${ }^{\text {R }}$ | $A$ | L G WK | D |
| UniRef90-UPI000378D109 | DEDDERIEVVVVPD DQL S L A | GRRGQNVR | A S | G K A | D |
| UniRef90-E3GNX1 | NKTEKTA | GKEGQNVR | A A | A S WK | D |
| UniRef90-R5YNW7 | DPDEKEAMVIVPD Y Q L S L A | GKEGQNAR | A A R | T G F K | D |
| UniRef90-A2SH41 | DEEKHAMDVVVDEENLAI A | GRGGQNVR | A S E | T G WRI | N |
| UniRef90-M4VRG0 | DEENKEMEIVVPPDAQL SLA | G K K G Q N V R | A A K | T G WK | D |
| UniRef90-Q4L5W8 | DEDNQSTVVVVPDYQL S A | GKRGQNAR | A A K | T G WKI | D |
| UniRef90-R6H1H1 | DPDEKTALLVIVPDYQLSLA | GKEGQNAR | A A R | T G F K I | D |
| UniRef90-S6B4L2 | DEEKHSMDVVVEEEQLA QA | G R L G Q N VR | A S E | T GWT L | N |
| UniRef90-U2F180 | DEEQRTCRVSVPD GQL S L A | $G N K G Q N A R$ | S A K | T GWKI | D |
| UniRef90-L0B3V9 | DENNHSMDVVVDDDNLPKA | G $\square$ K G Q NVR | A S | T G WK | N |
| UniRef90-D3R078 | P E S M A A V $\square \mathrm{V}$ VP D N Q A L A | GKEGQNAH | A | T G WK | D |
| UniRef90-K1M5Q2 | DE NVVCl V V V P D D Q L S L A | GKRGQNAR | A A K | T G Y K | D |
| UniRef90_UPI00037AB | DEDTHTMDVAVSEDNLAMA | GRS G Q NVK | A A | T G WD | N |
| UniRef90-U7UBN6 | D D K K S ALLVVVP D Y Q L S L A | GKEGQNAR | A A | T N WK | D |
| UniRef90-C0QHM1 | DEDNRSMEVIVPDDFL S I A | GKNGQNVR | A CR | T G W H | E |
| UniRef90-B2UAA2 | DEEKHSMDVVVDEENLAVA | GRS G Q N V R | A S E | T G WQ | N |
| UniRef90_A0A037Z4Y6 | DEDNKSAKVVVEDNQL SLA | GKEGQNVR | A A K | T G WK | D |
| UniRef90_R6QW23 | DE EKTAQVIV P D Y Q L S A | GREGQNAR | A A K | T G F K | D |
| UniRef90_UPI00047891C6 | DEKNKSATVIV DEGQL SLA | GKEGQNVR | A A K | S G WR | D |
| UniRef90-D4YE42 | P GETSCVVVVPENHLSLA | GKRGQNAR | A A | T N H K | D |
| UniRef90_D3HP07 | DEDTHTMDLAVEKDQLSQA | GRNGQNVR | A S Q | T G WT L | N |
| UniRef90-W5XSZ8 | DPEAQFARVIVPDYQLSLA | GKEGQNAR | A A R | T G WKI | D |
| UniRef90-D1C373 | NEAEKVARVIVPTEQMSLA | GKDGQNAR | A Y | T G WR | D |
| UniRef90-D3FE22 | DDDGKQATVIVPDDQLS L A | GREGQNAR |  | T G WR | D 1 |
| UniRef90-T2G9X3 | DEDEKLLEVVVPD D Q T L S | GRKGQNVK |  |  | D |
| UniRef90-R6MAJ7 | NEEEKSAHVVVPEYQLSLA | GRAGQNVR | A A R | T G WK | D |
| UniRef90-F4LGZ9 | DEDKHAMDVVVDEENLPKA | GAKGQNVR |  | L T G WQ | N |
| UniRef90-UPI0003741C96 | DEEKHAMDVVVDEENLAVA | GRGGQNVR |  | L T G WK | N |
| UniRef90_UPI00036E3BA3 | DEEAHSMDVVVDDNNLAMA | GRGGQNVK |  | T G WN | N |
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| UniRef90-K0YW03 | P NSEAMAKVLI PDFQLSLA | GKEGQNAR | A A R | T G C K | D |
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| UniRef90-H0J580 | DED A HAMDVAVA Q D NLA Q A | GRS GQ NVR |  | L T G WR |  |
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| UniRef90-C0W0C3 | S LP EKKA TVIVPPDFQFSLA | GREGQNAR |  | C G F H | D |
| UniRef90_V2YD36 | PAQGRSCRVVVPD DQLSLA | GKEGQNAR |  | L T G Y K | D |
| UniRef90-U6B6P6 | DED $\square$ K R $\square$ EVVV V P E QL S L A | G S R G Q NVR | A S | LT G WA | D |
| UniRef90-R5H9V9 | LE GTK S CRVVVPD DQL S L A | GKEGQNAR | A A | T G Y K | D |
| UniRef90-E4KQC8 | DPENNHCDVVVPDYQLSLA | G K K G Q N AR | A A R | L T G Y K | D |
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 QLYVVEVKKGSKGASVLCSRTHPGLVKRLEELEVPEVYEG KVFLVEVATIDKGATVIVSRSHPGLLRRLFEMEIPEIYSG EGLIVEVRKEGRGPQUIVTRSDPEYMTALFRREVPEVADG KVYL MEARRDPRGPRLVASRTHKDLIKRLFEMEVPEI YNG RAF KEVRSEMRGPQVFLSRTAPEFMAELFKMEVPEIYDG KVYVLKIQRDTKGPQI IVSRTHPGLVKRLFELDVPE:QSG RAYLREVRTQTKGPGLFLSRTDVGMLQRLFEQEVPEIQDG K YVLDVRQMTRGPKVVISRTHPGLLRKLMREEVPEVAEE KGYV V VKEARGAQL SRTHPDMVELFR EVPEAEE RAILSKI ETGMRGPQLILSRTAPEFLIRLFELEVPEIEEG RAILQEI RTEGRGPQLILSRNSPEFLIELFKIEVPEIAEE $K V Y V T K V E N A T K G P Q V F V S R T A S G M L K R L F E Q E V P E I Y D G$ RAYVVAVQNGARGPELIISRSHPNFVRRLFETEVSEDADR RGLLFAVRPEARGAQLFVTRTQPEMLDELFRLEVPEVAEE RAALLKIETSMRGPQLILSRTSPEFIDKLFEDEVPEIEEG RAVVHEVKKQGQRVKIILSRTHPDFVRKLFELEIPEIADN KVYVSDVDRGTKGTH VVSRTEPSFVKRLEELEVPEVYDG RAYVLDVRRENKGPQVFLSRTCPEFMAKLFTQEVPEIYDG RGYLKSVEEVTRGPQLTVSRSAPELLTALFKLEVPEVGDG KMLI LSVEKSTKPQVVSRSHPDLIKRLFELEIPEVSEG RGYLRDVRSEPRGPQLFVSRTANEFLVELFKVEVPEVGQG KVEVLDVTQTNRGTKITVSRTHPDLVKCLFEEEVTE:CDG RGYLLDVRAEARGPQLFISRTAPEFMMELFKLEVPEVGQG RALLQEVSTEGRGPQLMLSRTAPAMLVELEHIEVPEISEE KVYLKEVQRSSKGPSLTVSRAHEELLRYLGKQEVPE:AEG RGLLFAVRPEARGAQLFVSRSHPDFLDELFRIEVPEIGGN KCY SEVRKTTKGPEIFLSRKSPELLKRLFEVEVPEI YSG
 RAYLREVRNQPVGPLLILSRADAGMVQRLFEQEVPEIQDG K IFVVDVKDGSKGPK MI SRTHPGLVRRLFEQEVPEVFDG RAILYKVSREPKGPQLFLSRAHPTFMVALESQEVPEVYEG KVYLKQVQRSAKGPSLLVSRASEELLKYLDRQEVPE: NEG RAYVLDVRKTAKNTLVILSRTHVGLIKRLFELEVPEISEG MVYVVDVLTGGKNPKLMISRSHPGLIKRLFEMHTPE:KDG RGLLREVRSEDRGPQLFVSRTDPQFL1ELFKDEVPEVGQG RAYLREVRNQSKGPLVFVSRSDAGMVLRLFEQEVPEVQEG RAMIMEVDPTLRGAPILLSRSSPDFMVELFRQEVPEVEQG KGLLKEVKPEARGTQLFISRACNEMLVELFRQEVPEFNEE RAYITEVDPTLRGPALLLSRAAPAFMIELFRNEVPEIQQG RAYISEVKMSTKGPQIILSRTHPGLLISLFKSEVPEVAEG
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 M S K E E L V M S K E L L A A A E A V MSKELLAAEAVSNEKGLDKREKLVEAVLSSAVLSAA
 MSKELLVAEAVSNEKDVPKQVI FEAVETALASAAC MNKDMLALDELCKDKNVEKEVI LDALEKALVKSYQ



 MS K K E D R VE LDD A M D L E K E K GI K K EVVI I E AL K D A L A N A Y Q
 M N K E L LA V E A V S N E K N I

| $M A A$ |  |
| :--- | :--- |
| $L L D A$ | $Q$ | MSKELLAAEAVSNEKQLPM

 EKSV S R A ALEFALAAATK

 MDKE LRRVDDSLHRDKEIAKEVVFQGIEAACITAAK



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L L A M DE L E K N N GI N K D F L M E S I E S A L V VA Y K


EALMALCQEKHI DELYL
ME ALMAL D RLE Q S LAK S Y T M N K E M L $M N K N L L M A D V V S N E K G V D K D T I F A A L E A A B A S A T K$ M N K E I DA LEE E L E K S K NVD K K I I L E A L E K A L V K S Y Q $L Q A L E N G T K E K G I D D K S V V E A M E A A L N A A Y K$ K QI SKEII I QAMESSSLLAACK MSVDVEEALKLLA QEKKLPDERLINAI ENEVAKAYS M S K E L L A A E A A

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 D AL REVVA QARNI NELQLIEAFEQSLAQAYS $M L K D L Q A D R Q N T A Q T D L P E Q V F V E A D E E A B A R A A A R$




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RAY/LKEVVQQGTRPVVIMLITRTSGEFLIRKLIFETEVPEIIEND

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 KGLLAAVKPEARGSQLFISRTHPDFLKELFRMEVEVGEE KFLIKEVRNSSKEPQIVLSRSSQDLITRLFELEVPEI TDG RGLLYAVKPEARGAQLFVTRSKPDMLIELFR EVPEIGEE RGFLKEIRQDARGPQUISRSDVNFLIELMKLEVPE:SQE QVYYYKVKRQYRGPLVLVSRTDPGMLKRLFEKEVPELQNG RALFLRVDELGNRKQVILSRTSGDFLAKLYANEVPE:ADG RAIIVDVRDPNQRPSUVVSRTHPDLLRRLFELDVPEVYDG KAVIVDVRDEHSRPPIVISRTHAELMRRLFEQEVPEVYEG RGYLKEVRAEGRGPQLVISRTAPELLIELFKLEVPEINEN RGYGEVGGQQRGPQLFMSRTLPQFLMELFKLEVPE:AQG KVLI KDVKNTTKEPQULSRKDKDLVVRLFEDEVPEITNG RVY SKVDFGPKGPFILLSRTHYGFLKRLLENEIPELEDG KLYVVEVKDTPKGPRITVSRTHPEFVKRLEEEEVTEIQDG KCFVVDVKQGEKGPEVTLSRTHPAFVKMLFALEVPEIKDR RGVLYAIKPESKGPQLFVTRAKPVMLEVLFKLEVPEI GEE KVYLYKVESDPKGPGLTLSRTHPDMVKKLFELEVPE:FAG KCYIVEVKKTTKGPQIMISRTHPGLLKRLFELEVPEIYEG K MVYVKKVRTAGRNAQILVSRTSTGLVKKLFENVVPEIEAG NAILYNVNREGRGAQLLLSRARPEMLIDALMRKEVPEISEE KAIVVDVRDPNSRPSIVISRTHPDLIKRLEEDEVPEVYDG KVYLKKVDKSAKGPSLLVSRAHEKLLEHLLKQEVPEIAEG RAILSEINTESRGPQLVMSRACREMLTELFKDEVPEISEG KVYVTKVENNNKGPLILLSRNHYGFVKRLFELEIPEINEG
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## 23

L L E I K E V A R D
G F R A K $\mid$ | $\mid$ | $V \mid K$
N D P R\|| $\|$ P Q G T C\| $\|$ VR G S R
I I ELK GAARDPGSRAKIAVKTNDKRIDDVGACVGMRGARV



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UniRef90－A6VND9 UniRef90＿A6VND9
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## 15

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 $\left.\begin{array}{llll|lll|lll}D & E & D & A & H & S & M & D & A & A \\ D & P & A & D & N & L & A & Q & A \\ D & N & K & E & A & L & I & I & P & D \\ N & Q & L & S & L & A \\ D & E & D & N & S & M & D & A & A & E\end{array}\right)$


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 G K R G Q N V R L A A K L T G Y K I D I

 | $G$ | $K$ | $G$ | $G$ | $Q$ | $N$ | $V$ | $R$ | $A$ | $S$ | $E$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $L$ | $G$ | $W T$ | $L$ | $N$ | $V$ |  |  |  |  |
| $G$ | $N$ | $G$ | $Q$ | $N$ | $V$ | $R$ | $L$ | $A$ | $T$ | $Q$ |
| $L$ | $T$ | $G$ | $W V$ | $L$ | $N$ | $V$ |  |  |  |  |

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EDGKNSAAVVVDDSQLSLA
PDTREATVGVTPDQLAQA


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$\square A \square N Q V S N E R G L D P A V V L D T V K N A T A G A A G$ MKTDLHVLEQLEKEKGVSTPAMISALESALAASK


MTKE EMEA FR LLL | E | $K$ | $G$ | $I$ | $S$ | $K$ | $E$ | $K$ | $V$ | $I$ | $E$ | $S$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $K$ | $E$ |  |  |  |  |  |  |  |  |  |  |
| A | $K$ | $Q$ | $L$ | $K$ | $K$ | $E$ | $D$ | $I$ | $I$ | $E$ | $A$ | $V$ |
|  | $D$ | $R$ | $A$ | $E$ | $L$ | $Q$ | $G$ | $L$ | $L$ | $Q$ |  |  | A $\qquad$



MASEMM MNSKE M N S K E F K

F $\square$ K A

 D M S K E M M E A F R DL NKELSVMDYMEREKGLDREVLIETIKSSLQSAAR

 L A M R T I A E E K N L P E E TVV L S II E Q A I A A A WR
 S DK $\square$ S S K E L N A I D E I Y E EKK GI T R E Y L DE S L K M A L E A A Y K



MS KE LKVVVEDGREK G IAR RELLQEALEESTFAAVA M GKE I DAI E ALLSNERAI PRDKI FEAL ETALATATK MK S K D G K $\square \mathrm{FL} \mathrm{L}$ A L E QL E K E K GI N K E S L L E A V Q A MLA A Y K


MS KE I L L L E A L A S E K NVSNE VVFE A L E VA LG $\square A A K$ IDSGQEFK D F K N I D R P TMM S VL E DVVFR SMMR
 L $A$
 M N QE VLA L E Y M A REK GI QREAF L EAMQAA LLAAAR





 M N S R D M MAKKEV

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KL N D F M TAM Q A $\square K$ A L N T U VE E K N



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UniRef90_U2LWE UniRef90_Q89AF4
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 KKYGPTVNAEVD $V$ DDETGQ $\square R \| T A R F E D E E F Q V I L E R P V E$
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KKADREQD LE $\square R \square D R E T G D Y K T \ R K W \square Q E E Q P E D Y E E E L P$ KKYGTDENCDVIVNTDNGDLEVWRTRVDPDLEVGDEHDEL RAYGTADNCYVEFEDDDSDVSVYSRIVDGVYDPVTEDEI D
 KDHPETEEFTVTLDENTGEARVFHKKED KNYNSKTNVKVVI DKKTGEFKVMRYYVVVPEYVEGEEEVT
 $K \| F G S D E N F D V I V N D K G D F E I W R N R E V V P D G E V E D P E V D$ K RYDEEDGAKVVI NPRTGEYKSFRDWTVVDDEDVHEVPI E EQF GPVTNLEDEUDRTSGDDHVVVDGQAK DIDR KYYKTQENMRAEMDKDTGEIRVFKTVVETPEEDVDEDNQD KQYNQSQNVT IEYNDAKGDFIVYREVVDEVFDSRLEFEEK KRYGSDEAFEI IFNPKQGDIQI LHWEVEDPVTEDKESELD KMFGTDENLDVILNPDKGDVQI FQNDNDPDAEVGEEKEI F
 RFPGEDAD VVRVDRTAGEFSAVRRWLVVPDEFGLQEPD K LIF GSNDNYDVII NPDKGDDEDWRRKIDEDFEVGEDVEVF KRFEDEVDLDVEINRHTGSYETFRRWTVVDGDVDEEKDES KMF GTDENFDIIVNPTKGDFEIWRRKTDPDFEVGEEMEVH K $\square F G S D E N F D V I V N P D K G D F E I Y R N R V V V A D D E V E D E R V D$
 K NYGEKDNADITITNRTGEVKVFSRRTVVETVDVMDVEI N K H S G GK Q NVDVKID K ETGEIKI Y S Y K ID KTKNVGDKI EVD
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SI 1

## $\stackrel{\mathrm{V}}{\mathrm{P}}$ <br> <br> 

 <br> <br> }$P D D F G R \| A$
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## s

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 K N F NVVAK NVRV DF N R T T G D Y K V V E E V V Y D D E V G D I Y E V V D

 K MF GS DDTFSVII NDKKGDFEI WRQAVDPD DSVGEDFTDA




 KTYETDENFDVII NPEKGD LIE $\square$ WRRRK DDPTYEVGEEVVEI K





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 K H D




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$N \square E$ LE S F S D F K D N K S DD R VT L M S DLE E VF R A A LK L E A DS LIDA E E K GI D K NTIVF E GI V E GF QKA F E
 IE QVA K E K NLP E W V VE G A LIK N A I A LA VK

 $\square E M L C K E K G \square S K E D V I A A V K T G \square I D A A K$ LQ Q L S D E K D I S VEELLKEVIAS TME LALLK A MI S E IS K R N NLPTTAGVEEALAREALLLKGYE E L E A I QE RQAQKAAER DAMDAAPEE LPRPR Y D


$V V D Y$ L A E A L K I A A I T
$\square E$ QVAK E K NLP E WLVVERALLRNSLA L A V K
MATKQATKEFEA IQQFCQDKS LDRELVLGVIRDSLLAA YR $F N$ T I EAVVA D E R GLL N K D QV L E A F E K G L I A G C K



MK S K D K A T F LD A $\square E E \square E K E K G \square Q K G D L L E R L K T G L L A A Y K$
LGEDIK EVAE S M S LS EN QVLE A LK E GL I A G C K MEKIVVDII ESSIAHEKGLD DNEVRNTVTMALVKTAK MEK ILDI I DA I A HEKNIS REHALDEAFKEALVNTAK

MEK LLD DA E A IG H E K G L Q P E K VM E A L K T A F VQ T A K M D N E L L ill

 | $L$ | $V$ | $A$ | $V$ | $E$ | $Y$ | $L$ | $E$ | $Q$ | $E$ | $K$ | $A$ | $D$ | $K$ | $A$ | $L$ | $F$ | $D$ | $L$ | $I$ | $E$ |
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 L G A I N E I A M E K G I A K E VVVL I G I K E G F Q K A H E MKKELLVAAETVSNEKEVEKELIIFEAI EAALAMATR
 ME K DQ D L L S LVVAN E K G L D F E E V K E A F K R S il 1 K T A K

 MNEII E GL KA I TKERSSI SWDLAENSSLK EA IIAQAAR MEKVLDDLLS LVANEKGLDFDEVKKAFKRSDIGTAK



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 RKYGSDDNFDVIVNPDKGDLEVWRKKEPDFEVGEEVEIK KDYASDTNVEVSLDLPNNAIEEIFSIWDMVEIDDVTDEILEN KYLHDEKKINVDIDMETNEVHVFLNEMDEGYMLVDEARDF KHபEPDALVRVDINEKSGE UKVYQQRQEVELGDMDENEVS
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RKFGEDDNFD!ITNPDKGDLETWRNRVVVEDGMVEDEEVK KKFGNDARYDVVVNMDKGDI EIFLLERTEEELEVGDDYVEK KRNNSDAK RTVVDEKGRIRAFRLWDVVETVEVLEEETE KKFGDDVDIKAQUEKSGDFNLTRRWLVKAGDYVEELLDD KKYGEDCVVKTSLDTQNQDFNIYGRKIDPNVN GDDVEFD KDFGEDTDEEVHFNPKTELMMAEAKKVNKKAKLGEVLETV
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K DRKDKEHLQVELLEEG TKVYTVKRNNSETVRFPLETS KFFDTDAVVRVDFDQTTGKUTVVEEVDDDWGDVILKPIEF
RNFNQAQNVRVDLHQENGTTRVFARKE\|VQVF\|VEDEVT KDRKDKNNLEVELTEDG I KVYQVRKGEKFPL D DV EVEDENKEITLSEARKDEPDYEVGEETVD KA GYRGNLVVK KKYGNDDNFHTHFDDKNKEUSLEEKKLDQDUNLGDEVVDQ RFEEYFNNFEVELDTEEEGFRVLKRGVEEVDEVVLDVTPE DEDEGESEEGPSFNPKTDIMAKVLKMGSEIGDEIKIELPM KHFDPEATIIVNIDNQTGQUTVQKELKNEAKKEYGEEP N NTDDPQANFMVIDDSNKDFHVVEVCADDDPRLVADYE: S


KKVGTDDRCQVEFDNKNE\IISVLRDVVEVGSQTRVFEKP KAHGVRS CRVEDKEDKSEI LLYKQYYVLDEDTLEEDKVD ECDDTRAHFVVDGDPKTNTVALSQAHKDDPPSDILHYEIS KKLSEESELVVETNFDESEVKFDAVVVEEPTGFLDEVVMP RFEEHFENFNVHLDTEEEGFQIVTTKTQEVQDLVGESDIQ RTHKVNS CRVEFKEDKNELLVYKQYLVVDDYDILEDKVN ECLDAQAHFVIDSNKDLTLLVVQVCADDDPRLETDYEDS KDFNDQEN पE $\square E \square D Q \square T G D V K M F C E \square \square D D E V K V Y N E \square E G N$ RTHQVNT CRVDFDEVKNKLKVFRQYLVIDEПETGEDEVK KTYGAEYEYGAETDSATKTLKLYQKEVDPEDEIGDEYELP KLTSFTSNFEVTIDNDTKTYKV TTVVADDEQLFVEVEFV
 RVIGQQFAFEAQTDEDTKNIKIVQTITDDEKLQDEEIDHD RFYDTDA ITKDDINEKTGELKVVEELDDDWGDIDYKPDEF KKYDSSKNYDI IVNPDQGDLEI WRRKIEMDFEI GEEVTEK KELDTPKETKIEENGSSGKFLVFVKTIPEDEAVSDWI EFP KNYGEKDNVKVT KSRGHSS CRUEVNPDKNEVLVFERVPDEGEYEVDEESVN
QTLDPNDSYDAEDDKKNKT LHZYQRKHDSEDKVGDEYELS KKAGQDIDVRVAI NRRTGDYETFRRWTVNGGDVISEPMPS RFFDTEAVVKTEINEQTGSTNLFQELMVKVGDKVYKPDDF KRQYGDPRISVEI DRKSGEITISKRPQETQGGVVEETHET K LGG DEADDVDVEMEDKKLKI YQNFTDENAQIGDKLELD KKCNVEADMKAEINRKSGTVVIKRRWDYVEELVDDENTNK RVIDKRFAFEANIDKAKRSVDVVQTDTDDERLVDEEDPHD KGI KKAPATGVTI DKETGDISAYTYQKVVDDDEDEEENDD KVLG DIDVEVDDENGELK YYQTFEVRNDDVALEEPEK K SLDEHDAYDV 1

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LENMNRSAVNALFRELEFKTFDKYKAQVGKIVSGSVVRTD NEEFSRLAVIQQRQILQQKIKGAERANVYDKFANLEHTIL VEFGRIAAQTAKQVIDQKVREAERERI GQLLSGTVKRVM DEEFSRVAVGQVRQUEQQKGRATERAMVGQLESGTVKRVM QEYDDIIALSTAKSLVREKQYNCYKDRVGELVVGVVKKID LSKDGRSGAMALQREFEREDNETYRKKLNTIVSGEVIKVD

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$|G \square E| L \mid A H E \square^{4}$ M E K $\quad$ T D I I E S MEKI DDIV EA ANEKGLKSDKVKEALKAAFI QTAK IVVDNI A R D K N I D R E S V V V V D L E E A MV S A VR
 MSKEMQALDALE QEKGVKKEVVIEALEAALVSAYK M N S K D  MEK $\stackrel{F}{\square} \quad \mathrm{~N}$ $\qquad$ S F FA
$\qquad$ D A Y E K Gll K S E H V
$\square D A \square N K L A A \square K Q L N K D T \square Q T \square I \quad L E A V T S T L Q$ MEK ILDDI DLI AYDKGLDNGVVLEIVVNGLIK\|AQ DKI SQERDLPKEFVVEAFTKGLI A GCK
$F$ K L L D K I A Q E S GLLD K D QVI D A FAAK G L I S G C K MEK K T D I I E S I A N E K NL Q $\square E D V R E R V K K A L I N T A K$ ME QAI QKA GR MEKILDI I ELLA HERGLEPAAVSQVVKETIIKTAK


M D I I E I I A Y E K GIP Y D MVVADIVAK N L I I K T A K
 E K A L P R E KI F E A L E S AL A T A T K MEK $\square$ GD $\square \mathrm{I}$ E S $\square \mathrm{ANEKNLEDKDVKETVQTAFINTAK}$ I E S FT DFK K Y N H I D SVGTLMT IL E Y S I L N TVI M N DE I E A L E EMA K E K GI A R E D L Y E Al R K G L A VA Y Q

AATMALVDDYKFDPYQVLETVKAGTKSGFK LATIKNVAKTKNLSTEEVVFCLKTALEQAYK

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

M K K $\square$ N HE $\square$ D LD A $\square$ S K L S VA C S LD K E G $\square$ A E F L A E S F K Y V LT
A A IMQLVDDYKFDPYSVLE\|VK $\quad$ G $\| K$ K GFK


LR A $\quad$ AK EK GYEA DHMS K K S F DF F L K
MEKDS DLI E CI A Y E K N L P K E MI S K V I Q G CLL L K M A Q
 S QIF NAI Y NVS QDK KI DEEAVIQLFKRAVE QVIL NASNSKKWFLLLNSFSKNKEI SNDEFIAMSQEVINHII N K N Q Q K K I V E A L

SAl A QLIA E EK GI S S E K V L E G DE MA I A A A Y K
$\square$ Q A $\square$ Q D $\downarrow$ A K N S E $L$ N L E A V ID $\square$ F Q E A $\square$ E F V IT

MS $\square$ F $\square$ A A $\square$ N Q $\square \mathrm{V}$ D E K G $\square$ A R E R V IE T $\square$ E A A VA A A Y R
$E V L N G Y A E T K K L S D E T \square K E \square F R S E \prod Q K V V N$
$M N K D \square L L I A Q \square A N E R G V E E E V I F E A \square E A S L A A G V E$


$L$ K A L

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$K R L E P E A G \square Q V Y \square D E D A G C V K V K F R N D Y Y H N V Q L G E Y \square E K$ E EINPLYHYIVEPDVKERILKLFYRCADDVKLTEEDCELQ K N NRVKSCRVHLKENKNEVLLYKQFIVVDETQVLETKVN KNHKVKS CKMIHLKKEDKSEIILLYKQFLVADEATVIVSIVKVD
 KQFGEELNYIIDEDEKERDFRLDHVCADDDENDEDHYEI S KMVDYSLDF DAT DDRTNKDDRL NEDTKDKEGNDI NKYE L E

KNYDSARNVRVELNMDQGTFKVIARKDVVEEVFDYEEDVT KKYEQEIDVRVEIDRKSGDFDTFRRWEDESLNVGDYVEDQ RMFGENYEYDAVFNETSKKDDLFQK ID NSAEVGDEL Q DD KKYRHVENLDLFIDYENGSIDI WRKQI EYDFEVGEEITEQ EEYHTETPVEVEI NPNSGDILI NGKRIEDAK

K DYPQYKKSEVMVNDENGTVTTYREDEDSKEVEDVETTPK K HLDN VNVEVNI NFDKGUI NVFNVVSDENEDYDDFLETP




REY SECPTEVN $\square \mathrm{D} \square \mathrm{ENCK} \square \mathrm{D} \square \mathrm{FK}$ K $\square \mathrm{K}$ DEEGE $\square \mathrm{Y}$ SEP $\square \mathrm{Y} \square$
K DFPEFKKSQUIVNDENGTVT TYKE IVVNKESEDEDPELQ GQYDPDAELEFII DKENREFRVINHTDDEKDNFCPCDEIT KEYPDND IDDVDVDLKKAKDEI WRHTDDYYNGEGNEDDET
 NELDPARYSVI E ENKQLQLI QLVVELVEDDDERLVNDPSKY
 GKGDDPEAEVVFSVDNEKEEILLLNKNTEKKVGDLISYPVEF
 KRFGTDENFDVII NTDKGDFEI WRKKIDEDYEVGEEVEVR
 KDYGKKQVIKAKLDSESGEVKFWQVKLVVAGQELEIILKA

K K $\square$ D P D A Q $\square$ K $\square$ E A D $\square E Q \square S$ F K VF N D $\square$ T DEEK D D $\square$ F S $\square E \square N$ | $D W E$ | $D$ | $D$ |  |
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| $E$ | $D$ | $F$ | $D$ |

RFEDES LNVGDYVEDQ

 KRYNAEVI I RVAID RKTGDYESFRRWEVIADDAVEEEPVA

QYFSHSEDTHTNFTPEKGLLRVYTRKDDPTAT\GKEDE\P KYFTHNEKINISFLPEKGELRVYTEISLEDAKEINEIDLP





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 FLDFGRRAILSLRQNLSARILELEKDR GDVITGEVYQIW


LESFEHWLFMADMHAFKQKDSESYRRGEMVEAVVSEG

 DETFDRITTGTAKQVIVQKVREAERDQEGEIVTGVVKKVN HQDF GRIAAQTAKQVIIQRLREAERDVIFDEFKGKENQLL QGMSNLRKQKVYETFKNRIGERVQ FNDLPQRSKAA LLNGFKLEI KNAEQQRVQSIFVDKIGQEVV

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 PKTMGRRGTQVAKNLLLARLYQEYSKKKGMLVTGM!KKUE

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## D I <br> $\square$ <br> 

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|  |  | GKQGKNV |
| NERKKAlVLI | K S DQK SKA | GKGGVNI RLA SMLCDCD |
| NDRNKHALAI | P D D Q F S ${ }^{\text {L }}$ | GKLGKNVKLAAEVTKWN |
|  | PDDQFSLA | GKLGKNV |
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NEKNKTASVVVADDQVSLVIGK $\square G K N V K L A A Q V T K W N \square N \square$


DEEENS LLLITTDENLLLADGRRGDNVKLVSMLTGWKDFL EDSTNSFTVIVPNAHHTLAIGKKGQNVRLASELTRSRLEII


KPTNGAY VVIVPDVQHTLADGKKGHNVLLASD\|VKAKLDT PSKNSSFNVIVPTIQHTLA $\quad$ GKKGQNVSLASELVKAKLD

DEHGDKYVAYVNQFDEAKA IGAGGDNVKLAAALCGCFILIT K $\square$ GHKRF VVVPDFQHSLA 1 GKNGSNVKLVADLTRCQVQL


NKYDANARVIVAKDNLTPADGRRGVNVSLASSLTGLNDDL

NEKNK LIASVFVNEQQ\PLV
NESQNTFYVITGKVALSAA $\square G K K G A N T M L A S K V S H C N L D \square$

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| UniRef90-W8GFA4 | K T |
| UniRef90-W7YHP3 |  |
| UniRef90-UPI000466E313 | TS QS E |
| UniRef90_D1J8W2 |  |
|  |  |
| UniRef90_C1MUN8 | ERYEP |
| UniRef90_Q4A9A1 | 1 PYS |
| UniRef90-D5E4K5 | L K V S E |
| UniRef90_UPI0004713CC1 | LS DEE |
| UniRef90-G5S1F5 |  |
| UniRef90-K1XD69 |  |
| UniRef90-N9TUN5 | TT E |
| UniRef90-11A6L9 L S |  |
| UniRef90-K2C7F1 - |  |
| UniRef90-F6KTD7 |  |
|  |  |
| UniRef90-X1KQG4 -T E |  |
| UniRef90-X1JLP4 |  |
| UniRef90-K1SAC3 |  |
|  |  |
| lupas_21 |  |
| lupas_14 |  |
| lupas_28 |  |
| jnet |  |
| sol25 |  |
|  |  |
| sol5 |  |
| sol0 |  |
| jhmm | $\checkmark$ |
| jpssm |  |


[^0]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    jhmm
    jpssm

