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 MS

STNF
LF SALLEVASAAVA MDNK FIPQAI ALVTQALGEDTNGNYEAAFKLYKQSLE SSNSLEKAI ELVTKATEEDKSKNYEEALRLYDDAME MASTTYLQKAI DLAGKAAQEDKAGNYEEALQLYQHAVQ QKAADLASKAAQEDKAQNYAEAASSYEAAVQ LYAALEEASAAVAKEEEGDDGETLDLYQQSLG AVATLKRAVELDSASRFQESLVCYQEGI D
HMPNKENYERAVSLI KRAVELDGAGRLQEAFEAYRDSLR
S S F K E Q A $\quad$ E Y A R K A V A E D N A G N Y A N A F P L Y M M N A L
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| QUERY |  |
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NSAGVVLRRAVELDGKGRYQESLVCYQEGIE SHAPTKENYDKAVELIQEAVKNDSEKNSKEAFHLYCEALR MSPTNFREKAI QTVGKAVEADKAAQYQAAYDLYMDAFE STNFRDRAI AEVQKAITADYAKEYQSAFDLYMSGME LEAAIKLI KAAQHEVEKEDFDKALKHYEMSLG
LEAAIKLIKAAQHEVEKEDFDKALKHYEMSLG HAPSEENLERAI GLINDA MSTTA LNKAIVELVTKATEEDTAGKYDAALRFYDQA| E DCSRLLQQGLGLVQTAAQQDAAGNYQEAVRLYSLALD SN DMVRKGIELAKEATELDRQEKFEEAKHGYESAV MDSEETINQAVKLAKDAVIEDEKKNYKSALDNYYQSLQ MST LQKAIDLVKKATEEDKNQNYEEAERLYGSAVE KSDYLDRASELISLAVQKENEQDFHAAFSCYRNGVD MAKRDYLVDAAKQLRALDREVSEDYEAAFNYYKNGVD MAATSNLQKA NNYQKAIDLASKAAQEDKAGNYEEALQFYQHAVQ

LERAAETLKRAVQLDAASRFQESLVCYQEGID ATSVLRRAVELDGSSRLPEAVCYQEGUQ AL ASAATKEEAGGEQDALDLYQHSLG SHMSKRDYLVDAAKQIRLALERDVSEDYEAAFNHYKNGVD MSASDFLSKGDDLVQKALDADTATRYEEAYKLYYNGLD MAETNF MESGMEHAKRA

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QWSIVCKYQKNPQLQEKFFNKMKEYVSRAETLK YFIPIVTSETDLKRKESLRSRDNDYIGRAEVLKA VFITAIKYTKNVTKRDLLRKKTMEDTERAEKLKEY RENCD LLQVMKGTKDCTKKSNLRDKLSGYMERAEN:KKYLAQEK LLLQVKGTKDDAKKTHYRQKLSSYMDRAEEKKQHVLKEK LF MKAIKWEKSPK TKEILRARIGEYMDRAEELKGYLADAE MWIKTLKWEKSRALKTIMQEKMAMYLGRAENIKQFLQSEA VLIKILPEEPPGKRKDILNKEVPKWLSEAEE:KSYLSVKQ VLIKLLPEEPPGKRKDILNKEVPKWLSEAEE:KKYLSVKQ保 YFLHAIKYESQGDKRQAlRGKVVTYLNRAEQIKKFLKE LLMEVLKATKDDTKKGHYRQKVRNYMDRAEQUKYLTKMK AFLSVLKMERNPRDVDTLKGKVVDYMNRAEELKTLLAQQQ LLMQVLKSVNDAGKRQRYRLKUEEYLARAEELKVFVKEEK YLDMGLKYEKNKTTKDMTNAKCGEYLSRAEQLKDKLS YFNFFCKYEKNSNDRDLIDKKMEDYMTRAEDLKELINKKE YFLHAIKYEQSDKAKETIRQNCTGYLERAE QLLRGVQGEPSPTRREAVKKKTAEYLMRAEQI LLLKGVQVDPNKERREAVKRKTTQYLKRAEEGDSHQQGSL KYEQGDKAKQNIRAKCTEYLDRA LLLQARKATTDEAKKHRYQQKTSEYLTRAEETKEHTKKQD LLLDVLKATTDETKKSRYRERIREYMDRAEEIKKHVQLEK QLLLLLAAEPPGRRRELLHAEVQNLMARAEYLKEQMRES QLLLLLAAEPPGRRRELLHAEVQNLMARAEYLKEQMRES VLLSGVQVDPNKERREAVKRKITKYLRRAEEINCHLQRTL YFLTALKYEKNSKTKHIIRAKVEEYMDRAEETKKVLHEPR NWMLI YKYEVNPAVKSRLSTK ITEYMNRAEEIKKYLEQMQ YFMMALKYEKNDKLRVLIRKK
VLLQGVPGDPNCARQEGVKRKVAEYDRRAEED
YFKTYLKYEKNEKCREAVMAKFKEYLARAEYLK
QLLTVIKNLKDAGKQSKFRTKATEYMERAEKLKCHTEQEK YFVPLI IAETNTKKKNALRAKVNEYIDARAESLKKFVCDSS ILLPVLALEPKGKRRDLLHTEIQRIMARAENIKDYLR ILLPVLALEPKGKRRDLLHTEUQRUMARAENI KDYLR QWTIVCKYQQNPVLQDRFYAKMREYVERAEALKQMLKAGN RFTMGQKGTKDDNKKGKLREATSRHLDRAEKLKKYLDQEK LLLDVLKAVKDEAKKMHYREKIKGYMERAEQIKEHTTKLKK YFVVALITEESDASRRQELRNRALAYMKRAEE:KNVLIEDE LLI QVRKGTQDHTERCYLREKITHYMDRAEDDKKYLDQVK LLLQGVQGEPSPTRREAVKKKTAEYGMRAEQUSL LLLSVLKATKDENKKAYYRNKDS SYMNRAEKIKKYVMKEK KLLELAPDETDTAKRERLMDEIQRCMNRAEEIK LLNQMK


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UniRef90-T1JMQ7 UniRef90-T1JMQ7 UniRef90_W6UPB9 UniRef90-F6YUM7 UniRet90-L8FTAG UniRef90_-UPIOOO44031E3 UniRef90-s4RIIY UniRef90_W5JGX3 UniRef90-J8QHS5 UniRet90_O6NU31 UniRef90-H9KMQ0 UniRef90-EOVDR7 UniRet90-U6M2W7 UniRef90 W5KYB9 UniRef90 UPI000441AA9D UniRef90-T2M8Z8 UniR Ref90-V4A550 UniRet90_F7AKB5 UniRef90-F7AKB5 UniRef90 BOE7C2
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EATARGLEDGWQAAKEASENKLDAALDSYTSALS

$\qquad$ AVELEKKAAALDENKEYEQAYRWYMET D AVSLITRAVELDAEGRYDESLTFYQTGIQ
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DITTNAISQIFEARNFEKNENFKKALEITYEAI G
DIITNA:SQUFEARNFEKNENFKKALELYYTAIGG
MATEDYLVAAGMVFSKAVEAEANGDYERAFEQYKAGI D HAPTKENYDKAVMLVHKAVEMDTEKNVKEAFHLYCEALR AAMAKRDYLVEAAKQI RMALDSEVNEDYEASFSYYKNGVD

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MSNDSFKDQTIKMVKEAVQEDNSGNYAKAFLLYMKALE AASTLQRAVEKDKKEQYTMALLALYQEGLK
MEGGASTDKA $\square$ AFVREAVREDQAGAYEAAFKLY乌VALE
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SQALHAALIVGESAEKLDQEDKYDEALNKYFLALD AHAPCPQSI DKAINHIVIADDLFSAGDLVDAYFNYKEGLI LS KRDYLVDAAKQLHVALERDVNEEYEAAFSHYKHGVE MSNTDFLGRADDVVKKALESDTNGDYDKAYQLYYOSLE HMPSGESLARAT MATAOMD AVSVLSRAVDLDRESRLPEALVCYQEGI Q
MATAQML AVTLLTRAI EYDVVGRKLEALKLYEDGIE MSNSNFLDKALAIVQKALEEDVKQNYSRKRTSSDKMLL K $\square S K P D Y L T K A G S L I T M A M K K E S E E D Y E S A$ EFFKKGVD AAS LKRAVEMDSNKQYTMALVLYQEGI Q LRT
KKDYEKKASEQIGLAVQKEVEQDFAAAFSYYRSGVD MSTGGTLQKADDLVTKATEEDRNKNYEEADRDYEHGVE AKLGRRDYLDKAGELIKLALKKEEEEDYEAAFGFYRKGVG MESATQMLKRAVELDSNKKYSEAKVCYEEGLE SKGDYMVVAASQUGLAQECESNGNYEMAFAYYKDGVD TEAAGQMGFERKAEKNDKFQQALDEYTEVLGO
TSLL PTPAYL SQATDLITQAMRDEKAGAYAAALQGYRDGVH PAPAYLSQATELIMQAWRDEQAGAYPAALQGYRDGVH AGGYLSDA ERI QRASESEVAHDYPEAFRGYRSGVD
SSETTKKGIEVAKKADELDRSQEYEQALALYKSASE MDAATLERDAVHFAQLAVQKDQGGRYQEAVFYYKEAAQ MDAATLERDAVHFAQLAVQKDQGGRYQEAVFYYKEAAQ

GTYRERAKVYGELAAKADNEKRFQDAYDNYVKAVE HMPSGESLGKATALVTEAVKKDQAGDASSALSHYSKALE AVSVLTRAVEMDEKEQYTMALVLYEEGVQ QK
KRDYQKSYLIQQAAISDRNGQYSTALNLYTNGLE DABAKLLALDKEVSEEYEAAFNHYKNGVD DAIQKA!E
$\qquad$ DASRYLPDATERANDVRDDNAGNYEDADNKYCKAAE MASSSS DRADETVRAVRCEATKDYSGAFHGYRSGVD MASSSSLDRADEVVQRAVDEDVKQNYAEAYKQYNNSLD ANSNFLDKA $D$ DLVQKALDEDVAQNYAEAYKLYQNALD MATVDFKAKADEKARTATELDKEEKYDEALHAYRTGLDD DYLVQAAQLISMAQKAESERAFEFAFHCYKSAVN MDGAAQEQDAVKFAQLAVQKDQEGRYQEAAFYYKEAAQ MDGAAQEQDAVKFAQLAVQKDQEGRYQEAAFYYKEAAQ

M S N P
MQAKELLIRRAVECDQSGRILE
SSLPNP S SRTQYVRRAVQVAQRAVELLDECGRAEEAFPLYQEAVA SRTQYERDAVEFASRAVKFDLEGNPGPAAYYYREAAQ EKAIELDKEAVDDDNKEYKRSLDMYDRALQ MDFTQLEQDAVKFAKAAVTYDQHAKYNDAVFYYKEAAQ MDFTQLEQDAVKFAKAAVTYDQHAKYNDAVFYYKEAAQ AAAVLMRAVEMDTKERYTMALVLYQEGVQ


UniRef90_UP10003F17CA2 UniRef90_Q7QEQ2
UniRef90-Q7QEQ2 UniRef90-A4HHP9 UniRet90_G3NES5 UniRef90-R7TJN8
UniRef90 Q4S8A8 UniRef90-R4XB13 UniRef90 G3MFM5 UniRef90-UPIOO03831D63 UniRef90-R7TBM6 UniRef90 UPIO002658875 UniRef90-H2Y8Q1 UniRef90-H2Y801 UniRef90-V9G117 UniRef90-Q7PYF
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UniRef90 $L 5 M 484$ UniRef90-G3WJP5 UniRef90-H3E5A7 UniRef90 WWYUD1 UniRef90 W5LHE7
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W5LHE7 UniRef90-S4PCS5 UniRet90-UPIO003C84FC1 UniRef90-T2MBQ7 UniRef90-T2MBQ7 UniReffo-TTJMQ7 UniRef90-W6UPB9 UniRef90-F6YUM7 UniRef90-L8FTA6 UniRef90_E4XGH1 UniRef90-UPIOOO44031E3 UniRef90-S4RIY6 UniRet90_W5JGX3 UniRef90-J8QHS5 UniRet90_O6NU31 UniRef90-H9KMQ0 UniRef90-U6M2W7 UniRef90-W5KYB9 UniRef90-T115M1 UniRet90 UPIO00441AA9D UniRef90-T2M828
UniRef90 V4A550 UniRef90_F7AKB5 UniRet90 F7AKB5 UniRef90-BOETC2
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UniRef90 H2ML81 UniRef90-A0A026W5N3 UniRef90-K7G8R7 niref90_B6AJD9

TI位LKG ${ }^{50}$
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 HFMIGVKCTKNPTSKEI IMKRVEGYMTRAEQLRGMLEKET RLLSGAKDDTNETRRKIAKEKSCKYVAKAEEIERFLEEQS YFIP 1 LTNENDGRRKEVLRHRVSDYIKRAETLKAFIDENS LLELNGVQLDPNKERREAVKRKT VFLTALKYNKNPTKKELLKKKVHEVVERTEKIKEYDEA SFKTHFKYEKNPNDKEALTDKSNQYLHRAEVIRALEDD VLVDSTKEMNDPVRKKHFQTRAAQYMDRAEKIKSLTEEKK HFGVYLKYEKNPRMAETVRGKYKEYLVRAEELQKIVQGRK TLLKGVKDDPCADRRNTVTRRTAEYLSRAENLKEHMSGST CFL HVI KYEHSDEAKEGIRAKCVQCLDPAEKLEGCLWNKE
 YFLHSLKYEANGERKESIRVKCTTYLERAEQ ALIYA GMAGSKLDNIQGKVNEYLERVQTLLSAVQAQS ALIVA GMRGGSKLDNQQGKVNEYLERVQTLLSAVQAQS LLLEGVQGESSPTRREAVKRRTAEYLMRAESLINRMD ICMSLLSDSTNNDYRYLIKEKAEKMIERAEEENRYID AMLPLLQTELTGRRKELLNGQURNWMERAEQUK HLVSALQ TELDHWRKQII RAKLSQYTKVAEDLNRHDDD LLLSGVTVDPSRERRDAVKRKISQYLKRAEEINCHLQ LFMLALKWEKNARSKEMI RAK
YFLESI NYETESDKKEKI LAKCKQYDERAEKTAEYTNSDK FFVPALHCECDTHRKEAIKKKVGQYVSRAEELKTVVSSSN LLI DILKADKEDAKKSHYRQKIEVYMERAEKIKQQVNDQK ALLKESKAETDPKRKQHYQTKILEYMNRAEQVKELV MTSCCVRFEKNEKLKELIRNKFTEYLDRAEKLKEHIAKSE LLEGVQGEPSPTRREAVKKKTAEYLMRAESISSL ILLDSKKETTDPAKQKYFAVKASEYLDRAEKIKILTEKEK ILVDRVKVLEPGKKKEALKQKDHEYVERAEFIKKHIEKQK NWRIVCKFQHNPTLRERLYRRMDEYLTRAEQLKQLLRQGS YFLHAIKYEQSERAKDSIRSK
LLLEGVQGESSPTRREAVKRKTSEYGMRAERDSSL
 NLI PILGKEKPTRRKELLHSQVQFLLTRAESIRSYVSVQE NLIPLGKEKPTRRKELLHSQVQFLLTRAESURSYVSVQE CLVAHKKTEKNEKVVNIINKRVKEYVERAEYLKRIISGE VLLQGAPGDPDPARQEGVKKKAAEYLKRAEELRLHLSQ 1 LLQGVPSDPSPARREGVKKKAADYLKRAEEL
LLLQGMQGDPNEARREAVKKKTAEYLQRAEEIQQHDK YLLKGMQYESS QVKQil GKKCSEYLERAEKI DSMLKD ALIYAMGMAGSTLENI QDKTNEYLERVQALYSAVQSQK
 V GR GVVYVDPNKEREAVKGK ISKYLRRAEEL MLLNVVKETKEAHKRGHFTGKAKEYGDRAEKVKKLVNARK LLMEALKKGQEDGRRAELRKRVVDYMDRAEFLKKHVENEK KMMAQLGQLPDDEAKTKLRQKINEYMVRAEYLKDWTAEQ YLMTATKYEKNPVTLKTIREKSLEYVQRAEALKQGLI YFMLIALKYEKNDKLKQLIKGK
Y $\square$ AA YFMMALKYEKNDK
LLLQVMKATKDETKKSQYRQK DTEY DNRAEQTKKHTEKED TFMTAMKWEKNPNDTAQLRKFAKEYMERAEKVQEDLKD


 ALLKESKAETDPKRKQHFQAKIVEYMNRAEQVKDQV LLLAAVK QDRAGNDQTKRAANKYLTRAEEIDRLLTDRK ALQSAM ALQSAM QWSMILCKCNTDTNLRDKYFNKMKQYLERAENIKSYILNTTS ALI Y A GMAGSKREGMQDKVNQYLERAENGKYLNTTS ALIYA LCLKTANETSDAVLQSKLRQLARKALDRAEALKE


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UniRef90-R7QE58
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UniRef90_W7T8H7
$K G A Y 10 \quad 20$ MSNGSTLQKAIELVTKATEEDKKKUIVKHYDYUMESII PRASALERAVQFARLAVQRDHEGRYSEAVFYYKEAAQ PRASALERAVQFARLAVQRDHEGRYSEAVFYYKEAAQ LDPGGYLAVATEEMTLALKREAAKDYAGALCGYRNGVD
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TSFVDKGIEFANKATQTDREARFEAAYHYY LRADE MDSAALELDAVKFAKTAVTHDQTGKYNEAVFYYKEAAQ MDSAALELDAVKFAKTAVTHDQTGKYNEAVFYYKEAAQ DTRTFUDQGVTHAQKAlDYDRAEKYDNAKNSYGRAAD SRNDLSRAVDVVGTAGEODTAGKYESACELYGQALE SRNDLLSRAVDVVGTAIVEDTAGKYESACELYGQALE

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AQYIIDASTHVNTATEDENEKKYEDAFTAYKTAID MDATALERDAVQFARLAVQRDHEGRYSEAVFYYKEAAQ MDATALERDAVQFARLAVQRDHEGRYSEAVFYYKEAAQ STNFVAKGTEVIKKAVIKDNNEEYPEALKLYSSGVE पSNRCFLEKGLGLVLQAIDDDNNHSYPEALRLYRDAID SDYIVSAATAIISEAQLNEADGNYEMSFMFYKRSVE NGDYLVHAAHLVSTAQRAEHEHAYELAFQCYKNAAS DDADQQVMEAVAADKAEKYQEAVDGYASGDE SKGGQKERCRQARSAVEADONKYTMASTMYOA SKGGQKERCLQLARSAVEADQNKNYTLASTLYEQAIL SQNLDRAIEUVQRAI EEDTRQNYAEAYKQYNNALD MSNVDFLGRAVNTVKQAIEADNAGEYEKAFNLYKQSLE ANSNFAEKACVVSNKAVDYDCKGQMQAAVYYYKEAAT SDYIYDAALEFSSAVQAEANLDYNDAYTRYKSGVD LDKAKEFSKKATEEDDKGHNKEAVENYKKAIID $K E D Y$ YLAA SQ CMA QNSEANGDYEVAFAYYKSGVG DYLYQAAGKI SMALDNESVGNYQASFDAYKAGVA AKD LIKAVQCDKDGRLLEAQDLYQDGIQ
TDYLEAAAELVSLALRKEDDAEYAAASGFYRDGVH
LEKGISMAKLAVQCDLAGKYDTALLFYYVEAAQ
LEKGISMAKLAVQCDLAGKYDTALLYYVEAAQ
YLSTAAEQTKEALEREARQDYAVAFKCYRNGVD DNGDYIIMAANQISLAQQCEANGSFQLAFSYYKSGVG SVDFTSKADELFKKASKHDEQKEYEEAFRWYMESI E AKELLHRAVECDQVGRULEAQTLYTEGIVG
MDPSALEQDAVKFAQTAVGSDQSGHFTRAVEYYQE MDPSALEQDAVKFAQLAVGSDQSGHFTRAVFYYKEAAQ
MTKRDYLVDAATQDHLALERDVSEDYEAAFNYYQN MDPAALELDAVKFAKSAVFYDQTAKYDEAVFYYKEAAQ AQFERDAVEFASRAVQFDKEGSAGPAAFYYREAAQ
AQEERDAVEFASRAVQFDKEGSAGPAAFYYREAA A $\downarrow$ TLTKA EYDVSGRK MSKSDVNSDAHALYNKATKEELARNYDQAFGLYDKATE HPSQKAMLSKALAKANTAVQLDNAQNFEGARISYIEACD MSSVDYLY AVQEAQAAVDLDENGHYRQALNKYQRAAE DTSTF NQGFTHAERALQYDKLENFDQAKHSYLRABEE DLQRAVELDNLGKYKEALPCYENGLE NMDSNALI QDAVKFATQATQRDHNRDYKTAIIFYYTEAL SDYI YEAALEFSKAVQAEANLEFQEAHARYKRGVE NGAYVVQAGKLITQGLEYESTGQLDESFDLFKAGVD ADYLAQAAAHLRLAVEREEAGDYGAAVQQYEAGVD MS LQYLIEKGTEYAHKAVAADKKGDYETATVYYAADD MI NNDLDLDKQGTEKEKDGNDEEALNDYDSALQ SQKTMLSKALQKANAAVLLDNATNYEGA乌DAYNDACQ LSRVEAYEAAKNFSFKGRKEEEVKNYRGATQFYEQACS LSRVEAYEAAKNFSFKGRKEEEVKNYRGATQFYEQACS SPGSNLQKAI ELASRAAQEDKAGNYEEALELIIISRS DKGIEYAHKAVSADKAGDYETAVKYYNSADD



HAPSAQSLDKA AEYLERAPQLESLGKLCEAYDCYLEGLDN SQKAMLSQALEKANAAVQLDNSRNFVAARLAYSEACD SHELQTGLQLAKQAVEADTSKQYTLASQLYEQAAL MSKEDNLESAKK SLLTKAVDYDRKEKPNDALRLYMEGID | Q E A Q A A |
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## UniRef90 S4RJ31 UniRef90-F6XJCO UniRef90 JoDLM9

 UniRef90'UPIOOO3C91135 UniRef90 UPIOOO3C91135 UniRef90-UPI000388D7C7 UniRef90_UPI0003314C2A UniRef90 G6DAN5 UniRef90_UPIO0035AOD2E UniRef90-UPIO0035AOD2E UniRef90 M1V9M2 UniRef90-G3NA95 UniRet90-G3NA95UniRef90-B7QE58

UniRef90-T1GVS 1 | UniRef90-M2NDR3 |
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| G9 | SLIARATALVVQAVKKDQDGE |
| UniRet90-TOS | SLATSAVAADEAHAYAEALELLYRLI Q |
| UniRef90-UP10000222315 | KLVATAQRAEEEHAYELAFQCYKSAAS |
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| UniRef90-Q54RJ5 | NSVRQALALARDGVNADNRGDYAVAI HNYREASN |
| UniRef90-W2SQH5 | ELLEKAKVSLIDAVKFDKNDKPNDALRSYMDGID |
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| UniRef90 E1FRA9 | EKSKPULQKAVALDRDNKKDEAVENYAEGIIT |
| UniRef90-H3F7 | a AQHDQKADPQPADENYMAGTE |
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|  | EEDKAQNYEEALKNYQNA: |
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| UniRet90-N6T9. | RCYFLMQQAIEEDEHGDKLDAI ELY |
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| - | VQVTRA QLDNQ |
| W4FAU9 |  |
| UniRef90 UPIOO |  |
|  |  |
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| UniRef90- ${ }^{\text {M2R }}$ | MYYNCVE |
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| UniRef90-F8NRR1 | YYEAAE |
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| UniRef90 S2KGD1 | DKAKFSFDQGELNESQGNTDHALEYYSDAAE |
| UniRef90-TONQF6 | A CSHATELTTQALQDEKAGAYPAALQGYRDGVH |
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| Ref90-F0ZEB6 |  |
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| Uni | SQKAMLSKALQKANTAVLLDNAANFEGAMEAYNDACQ |
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F F V P AL H


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L L L DVLK A DK DESKKTHYREK

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 F F SK YL K L Y Y D A A MS D WYRE
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 Y L L P ML Q
$N$ LL RAME GRPEAEVKD $\square R K R A E S Y$
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jnet

