## QUERY <br> UniRef90 A0AO21W1R3 UniRef90-G21XZ5

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 NI RGYKPIYVLPFWTSNRNVYPSSPNPLNQDLKFTESKF FQLRAHQPVYLLPFWTSNKNERPHSPNPDNQHLDSTESKF QRPHRPMYLLPGWNSSPNRYPSSPEHRADDQNHAETKF FSTREHEPMYI MPAWYSSPNYTPSTPTRGVTQQKRDETKM YVIPHKVNY LDPVYSASPNMAPFAEEAAEHLDNMEAKF FTLYPYETNYLI YTDTSDLNKEADKSYSWAENARKDEVKF FVLRAHKPTYMLPAWYQSPNARPGSPTQEGQKMNNVEVKY FVITPHKRNYVMFASYNSPNSRPYAVT DEDFSNTEDKF FNFRVYKPMYLLPFWTSDVNDTPSSPNPDNQSLDSLETKF ATTAYKRNYLLPAYNSTPNAESFNQVTREGDVDKTEVKY FVLLPHRPNYI I DSNNASANERPFELADPGRDYQPWETKF FSLLPHKSNYLLPTYNTSPNNNAYNGTDSNETLDNDEVKF TVRPYRPTYVMPFYTFDPNLSPSTPTRPSNDTRNTDLKF NI RAHQPVYLLPAYWSSPNPENTVSAEDAQDLKSIUEAKF FVVTPHQPNYLLPAYYNSNDDASSYEDAEGEKLDSMEVKF FNLRGYKPIVVLPFFSSNQNRQPSSPNPEPQHLDNUESKF
 FVLTPHKANYLLPVTYTRTNSLPFEVKYPDEDIDKLEAKF FSITAHHRNYLLPFYTTSPNQETFSEIDRDASPDRLEVKF FSIIRPYQPVYLLPVYHNSPNDRPTSPNPANENDDRNELKF TIREHQPTYILPAWYSSPNYRPYSPTRGTVNNKRLETKM FHLKSYKPSYVLPVFTGNTNDLPFSPNPENEDTSRVEGKF FNIRGYKPVYVMPVFTSNQNDRPTSPNPVNDALQNAEMKF TLYPYESNYVLYTMTDHDNKNADESYDWAQDARRDELKF YAITAYRRNFLFPVSYNHPNQASYQAGTGEEAMERTELMF FLLRPYKPMYISFVWTTSLNGAPGTPNPGNNQGRRAETTF YVITPHRMNYILPTYTNDVNKDAYAATGWEDSLKDVEAKF FNIRGYOPMYVLPVWYSSPNYTPYTPSRGYQNQLRTEAKL FVITPHDRNYLMPVSYKNPNSEPLREAYDDAELDNLEAKF FNFRPHRDTYLLLANYSDSNDEPFQDFTPAGKSQHVELTF FMLTAYKPNYLLFATYNSPNSQPWQQAYPDAHDDHGEAKY FALMPHKPNYI IFANNSSTHETPFEQDDPNRDYQPWETKF SFVGHRPTYILPFTWVDTPNDVPVSPRLGESLDNKEAKY FATTPHRPNYLLP DSYNKSPNETPFEVQNDDNESSTEDKF FVLTPHKPNYFLPSYTSNPNDRAFLGSNDPESLQSVEFKF FVFRPHHDNYVLFANYSSPNNAPFTPVPQGTKLSHVEVKF FVIPHRMNYLLPVTYTDTNRGAYDKTDWAGHLKNTEAKF FVITPHRMNYFLPVMTDSUNNAAYEDSPWAGKMKNAEAEF SFVGHKPTYILPVTWVDPNSTPSSPSDYDYDLEREEVKY FSLVAHRTNYILPFTYSDVNKRAYADTKYGDELRKEEAEF FVITPHKVNYLLPVTYNSPNNAPFESDEVHYPLDKVEAKF FSVREHHPISLIMPVWYNSKNNTPQSPTRQADGDQNVESRM FAILPHKPNYLLPVTFNNRPNQASLDAGEDREVDNIEVKF TVRPHKPDYLMPAYNANRNPDTPTQHPDSNDLDNVELKA YAI LAHRPNYLLLASYNRPDNAPFARDASADSAQKLEAKF FTLASHKANYILPFTYNPSPETGGVTDYEDRDLDNIEVQF SLREHNPMY LPVWYNSPNVKPYSSTRGETDAKRGETKG FVIDPHHPNYILYTYNHNPNDDPYSPTDGFKDLDRSEAKF TIRPHDPMYVMPLWYNATPNYDDHSPTQDDSLQHLDSKL SVREHNPMYLLPVWYSSPNYSPHSPTRGTTSAKRAEVKM FVITPHKMNYLLPAFTTNUNHKAYEKLSEADNYEKLEAKF
FRFRPYQPNYLMPWRRSNNLQPFSPTHGSAHLQPTEVRF FVITPHHVNYLLPATYNDPNIAPFLEEMAQDPYDKFEAKF NFRPHRDSYLLLANYSSNNDQPFKEFSPDGEAQHVELMY FVITPHKPNYFLP DKFQDDTDTSDASAFSGE LDDDEFKF
FHLYSYEKNFLLYTFTNHDNKKADSKYSWAEKAKKNELLF FVLTPHNRNYLLPAVYTDTPNERPFEEESGEDYQNDEIEF FVVTPYRPTYLLPFSYDFNPNEAAYRSDDMESVDHTEVKF FLTPHQRNYILPVSYSHPNSRPFSGSDEGEPLDHVEVKY GVREHNPMYLMPLWYNNSPNYAPGSPTRGGQQKRAETKL FALYPYESNY IMHTYTSNDNRKSIDESYSWAEHARKNETKF FVLTPHNVNYILATYNDSPNDEPFREEGYEPSLDNFEIKF TPHKRNYILPVTYKHPNEEPFGDTNTGENLDNVEXY FA L LPHKQNYILPLSYNARPNQAPWTGFGVSPVKKAEIVK YVITAHRLNYLLPLTYSDDNEDAYSDTDWGDGLRNAEAEF FTLASHKTNYLLPTYNPSPNKGGIGADYPDGDLDSUEIGQF

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 RYMGNGELGGALYKMMGDHS LDDLML RNNDLRSNK GANVQL G WS F




R D Y L G Y G A DlV T M V AR A F G D Q E DS LL M R G N P GK D H Y GA Q L D Y S F

 D Y M GRA EAQ V VHEWH GQEFGL LL R H S L R G GHGAGKFT WS F
 $R$ Y M G Y G DV T LAR RFGDNELS LMVRGNPGAGHMGGQLDVSW NFYGRGEAVADYRHGGYEWALVVRHSDRLNRGSVGGLEHAF




 $K Y M G Y G E L H L G Y Q V Q E H N L G M T L R N N L R S N K G A V Q L D W S F$ NYFGYGEFNLIHDID DYSID F MLIRNNLS DNKGAI QVGFNF



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UniRef90 E1VA82 UniRef90_F2JVN8 UniRet90-W1N6K6 UniRef90-COOL60 UniRet90_D4ZBT6 UniRef90-_11XG37 UniRef90-UPI0004775623 UniRef90_U3BCB3 UniRef90-U7FZH6 UniRef90-A3JE74 UniRef90_12JHQ5
UniRef90 G2DQF8 UniRef90-UPIOOO3690971 UniRef90-I0K9L6 UniRef90_UPIO00361E432 UniRef90-GOAB76 UniRef90-Q2SB98 UniRef90-D4DTK5 UniRet90_A3WK15 UniReffo_-a3lJ39 UniRef90_Q1K1F7 UniRef90_UPIOOO4666E34 UniRef90-UP100047693D9 UniRef90-V4HM95 UniRef90-UPI0002FE255F UniRef90_UP1000378D682 UniRef90-UPIO00379CC98 UniRef90-U1KQR4 UniRef90-A1TYA5 UniRef90 UPIOOO393FC15 UniRef90-F5SWQ7 UniRef90 ${ }^{-}$A4AAU2 UniRef90-UPIOOO46341E0 UniRef90-UPIO0047A3D5D UniRef90-DOLOP7 UniRef90_UP100037F404E UniRef90-G2E274 UniRef90-UP100047C27C3 UniRef90-HOJ4Z5 UniRef90_C1D419 UniRef90-A6CY08 UniRef90-UPI000472094F UniRef90-F0M047 UniRef90-K0C6P4 UniRef90_UPIO00360C2F4 UniRef90-S7VAF7 UniRef90-UPIOOO36DB470 UniRef90-UPIO003B65003 UniRef90-B3PBE8

## UniRet90_W8KLF6

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UniRef90 E1SMZ3 UniRef90-UPIOOO3B79B2F UniRef90_LOWCC4

## UniRef90- Q47E98

FAITTHRRNYLLPSYTARPSDRTLSSGQDEASADRMEMQF FVLTPHRPNYFLPVTYTDDPNGREFVVNDSSDLDNVEFKF FAITTHHRNY PDUSYQKPNEASFVGEEGREMDNTEVKF FAI RMHRSNYILPFSFNSPNEDPDKDGFPGRKVQKSEATF FAITTHRRNYLFPSYTTNPNHPAFGNDSADNGPNDLEVKF FVLTPHKMNYULPVYSTNDNPDAYSEQAFNDGLKNVEAKF
FAFTPHRPNYFIGSNNVGSNEAPFDAADPDDFQSWESKF FAFLPHRPNYFLGSNNVGSYNEAPFDAADPDDFQSWESKF
FNVRPHRDTYLLLANYSSNDAPFDDTPAGKSHTELTY FVMTAHRMNYILPVTYSDTNKDAYAETDWADDLRHAEAEF FSVAHKPNY LPRTWDHPNPNPVAPTGYDYFLENEEAKY FVLTPHRSNYILP SYRDDDFDYNSLVPGADQQDNEEDEF FSVREHEPMYLIPFWYNRPNFHPETSARGRTEARRDESKM FVFRPHHPNYLIGTRTYRPNEAPYEPFRDETGLSKGEDEF FLITPYKPLYVTAGRWSSDPNEPTYNYPFYDPLGRYEARW FSVLSHRPNYLMVAYNFSGTSDKAGLVNDAEQLDDLDEVEV
 YTVREHNPMYLMPTWYSSPNYAPSSPTRGASDQKRDETKM YVLTPHRRNYULPVWTTD TNTAPYQNFGYEDNLEEYEAKL F VIPHKRNYLLPDSYSHPNNSSFETFDEDEPLDNDEAKY
$\stackrel{F}{\mathrm{~F}}$ FAMTAHKRNYLLPVSYQERNTAPYA VLTPHHRNY POVSYKNPNNRPFDGFKDGEPDDNVEAKY FVLTPYRMNYILPVYTTNTNPEVYRNGDADEGYKEVEAKF YVLTPHKMNYILPLSVVDINHGAYAGFDWADDLKDTEAKF VITPHKKNYLLPVSYSHPNDEPPNQTTEAVDLDNMESKF
VITPHNRNYILPVTMMDRPKNTPASDPNAPLDELEAKF SFFVTHRPNYILPFTYDDPNPRPTAPRDGPAGYDEEEAKY FVLLPHKENY LPTYNPHPNSDPYSDTFNHKPLDKYEAKF FSITTPHHPNYILPMTFSSNPDYSDFGPDEESFSDYEDKM FTIQPYRPNYLI DGSYNGTNEHPFQTLPQATHFEPYEAKF FLITPYKPDYGLPTRWSSNPNEKPVSGNPSDDYNNHESRF YVIAPYRLNYLLDGSYRRPSNAVFSTSDGTDTRQKSESKF GI RPYRPNYLLPVSYNDNPNESTDDPFLGDALDNVEMKF
 FKFKPYAPVYLMPLNFQRINNDPCSSNPVNQQYDKVGVKF FVITPYRQNYILPITMSQVNTAPYTSDVFSDELKDEEIKF FVMTAHRMNYILPVYTDSDNNEAYRESGWADGLTHSELVF FSLLPHKPNYI ASYTSDPSTTPFEAAYPNPDLQHDETKF YTIAFYRPNYLQVARFSSPNNTPFKQLFPDAELDATEARF FALTTHRPNYVLPFYNHSPNTSVYPGDLSEGDVDNTEVKF F TLRPHYQTYFLPVFHKDPNETPHTPTHDYPDLQHVESKM
 FLLTPHKRNYFLPAYHRRPNDAPYDNTDTSSELNHTEAEM YVIASHRPSYLLPARYSDPNEQPFSPGAELADADRVEARF
 FKLTFYKPDYVLPARWSSDPNEPDNSFTEPGNYDQVEAKF FSI TPHQPNYILPVTYSDNNGYPDFG EAANAFSDYEDKM YVITPHRMNY LVAYTSGYNERAYESSTGIDPQQQVEAKM YIITPHKMTYLLPFSDSDNMNREDYDGQWGEEDQSDEAKF ATVYKRNYGMPWTWNRPNRAAFRNGDSESGMDKSEVKF
TVREHNPMYIMPFWYNSPNLYPSSPSRGVTDNKHLEGKF FVITPYRLNYILPVTHTSVNTQPYGDDRFADGLSDEETKL FLVTPYKPMYVLPIRWSNNPNERPESAPAGVDYNNBEAKF
FTPYKPVYALP A STYR NYVLP AHTKKPRMGDYRAAGNHHPEHTE1KY FRVRHNPMYVLPVFHGKPNRSPNTPSHEANEFRAPELKF FALNAHYNNYILPASYNRTPNEDGWRYHP ESMDNWEVKF FLLSPYKPVYVLPTRWSSPNEQPYSGNGYPDDYNNDETKF FVITPHRRNYLLPSYWS NRKWHDPTKNDSDLQPTEVKF FLFRPHHPNYFLPLKVSNPNNTPFQATPAGIGLDSVETER FRLLPYKPVYYLFAYTTNVNHSPASSNENNVPYNNVELRAF FALIAHRQNYLLPVHTSKINRDAYDFAEYTDELSQTEAKL F SLVSHKPNYLIGSYYLSKPQTAPFEAQFPGNLEPDLELKK FLVTPYKSMYVLPVHWTSKPNEQPSSGNTDPDYDNVEAKF
 F VVRTYPNFLLPLYTSNINRTPHSPTAANSGYRSDEAKD

FALLPHKPNYLLPVTFANDSKRPYEGDPKAEKYQDTEAKF FKIVPYKPVYFLLAYTSDI NNQPGSDNPEPSDFTNTEGKF FSFRGYRPMSVSVVTSSRINQQPYSPTRGAEDYQKNEMRLD YTAGHRPNYLQRARYSSRPNNAPFQTDPDVELDSAEARF
FMLTPHKDNYFFASYTRTPNESPYRDNDEDLSKAEADF

UniRef90＿E1VA82 UniRef90－F2JVN8 UniRef90－W1N6K6 UniRef90＿C0QL60 UniRef90＿W7Q199 UniRef90＿D4ZBT6
UniRef90－IXXG37 UniRef90－UPI0004775623 UniRef90＿U3BCB3 UniRef90＿U7FZH6 UniRef90－A3JE74 UniRef90＿12JHQ5
UniRef90＿G2DQF8 UniRef90＿UPI0003690971 UniRef90－10K9L6 UniRef90－UPI000361E432 UniRef90＿G0AB76 UniRef90＿Q2SB98 UniRef90－D4DTK5 UniRef90－A3WKI5 UniRef90＿Q31J39 UniRef90＿Q1K1F7 UniRef90＿UPI0004666E34 UniRef90＿UPIO0047693D9 UniRef90－V4HM95 UniRef90＿UPI0002FE255F UniRef90＿UPI000378D682 UniRef90＿UPI000379CC98 UniRef90＿U1KQR4 UniRef90－A1TYA5 UniRef90＿UPI000393FC15 UniRef90－F5SWQ7 UniRef90－A4AAU2 UniRef90＿UPI00046341E0 UniRef90＿UPI00047A3D5D UniRef90－DOLOP7 UniRef90＿UPI00037F404E UniRef90－G2E274
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UniRef90－J2IE60
UniRef90－E1SMZ3 UniRef90＿UPIO003B79B2F UniRef90＿LOWCC4 UniRef90＿UPI00035C877E UniRef90－F0Q7S3 UniRef90－13YWR3 UniRef90－A0YF93 UniRef90－UPI0003794EEA UniRef90－H1ZFA3

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QFSAKFELI ${ }^{50}$ DQQPAN GDLLYF GYT QRSWWQA YNTDASSP ${ }^{60}$
80 QLSVKFP V A Y DVVGRGSTLWFAYTQQAFWQAYNSKDSAPF QFSAKFNLAEDLLGDNGDVVFAYTQRSWWQAYNGEESAPF QFSAKVNI LD DL FGDTGDLYFAFTQRSWWQAYNTDASSPF



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 QVSFKVMVKWESVFENNGYLVMGYTNRSFWQAYNSVSSAPF QLGFKMKLIESMFLKPVDLWFGYTQNSFWQAGNHRASSPF QLSLKVKALQGMFGKHGDLWVGYTQKSHWQVYNTTFSRPF

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 RETNYEPEVFLDLDTNWRMLGWTNTRNRFAMNHDSNGRSE RETNYKPELFYVMPLDWHPYENSNTGFMFGVEHQSNGRSG
RDSNHEPEAWLSFANDTELFGFKNSLIVNGFNHQSNGQNG RDSNHEPEAWLSFANDTELFGFKNSLINVGFNHQSNGQNG
 RETNHEPEAMLTFTNDWEWLGFRNVGNQLGFNHQSNGRSE RNTDYSPEVLLTQPVKSDLLGGK RVLGGGFVHQSNGQSR RETNYQPELMLVTPLNVGVLGANLRFLNLGFVHQSNGQSS


 RETNYQPEVFYTTPTGWHPFG TNTGLAVGVEHLSNGRSQ
 RETN RETNYEPEVVFIDFANDSNLFGWDNTRNRLSMCNGSNGRSA

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 RENNYMPELIGSFRPGDAFWGWRWELFNDGYTHQSNGRAD RDTNHEPEAWGYQPAKADLFGGDSRMIGGAGLVHQSNGRTE
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 DNIGRADATVIVHTDRHMFSVVGSHS LIRGGRGQVQFDWTF HYMGHSQFRFVTNQDDHQLSVMARNNFRKNKGAVELGYSY D Y M GH G DVRAMYRQD GHEYS LTGRRRNFRTGHGAGLEAGWA F NYMGY A E FGATYK H D E NVA S L R L F F N N F N D N H T TVVQLS Y S F K Y L G Y G DVKLQ Y RLN DHNFSTILRYNPKSGYGAAEAAYTF






 E Y M GNF EFGAAV Y K M D NHSFDD L L R N N L



 KRIGNGDATVIYSMMKSVVISFTGSTNFAFNSGYAEASWSY $R F M G Y G D V R L A K R L N N H E V A G F V R G N P S A G N Y G T Q V D Y S W$ D Y M GRVEVVLASY P WRGHNFS LLLRRNNLRFGRTFTQQLEWAF
D YMGHFELTAA YKYQAVEFS GV ARYNVRTGYGGFEAGMSF
D YMGRGDLVVTYRSNGNDYSALLRRNFSTERGAVQQLSWA F D Y M GHF EL MGAYKWDNLTTLNFTGRENFATHKGYAELGLT F

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 NFVGRSEFLGVYRHNEQTFGLLGRSNLKALRGAVQLNWVF KYMGYGQVTALYTTNNHEDSLAAKGNPVHGNYGAELDYTF $\begin{array}{ll}K Y M G Y G Q V T A & L\end{array}$ NF DGSTELQLNWLPGSATASLTRRMNWQDSKGSWQLDLTY DYMGYSEFLVVHKREQRNLSLRVRGNFNTGKGGMEAGWSF DYLGYGDLQAVYSKGRNTYSLLLRNNLRDNRGALKLNWNF DYMGRGEVQLGWNYDDNTLSLMARSAFGSGRGAVRLEWMR SYMGHFDFTAAYRSGNHEMTMLLRNNLRSNKGAVELGWSF KYLGNFEFYALKEWKDQTLGDMLRNNLRDNHGAVQLDYTF EF GGRGDVNIDYAKNGNII SFMGTHNDNFNRGSGMFSWSY KYRGHF EDTAYKYDVLEF GVGHYNFRTGYGGLEAGVSF KYRGHFD ALAYYYRDHQFKLSGHYNPDSNKGGLEASYSY DY GGRGEVNMAWLPGTSTLGLTWRTNMKSSRGSLQLGWTY DYYGGKMSVIYKRSSSTFTLTSRNNLESGKGSTEFSWSF DYYGYGDVSVGYRFDEHDLKTTARYNPRTNKGGMEDSWSY NYVGRVELGSAFSKGRHDVSI TARHSLRGGRGSIVRLDYAV DYI GRGEVRLGWNVNEHHLALTARASLGKGRGSGRI EWFR RYLGYANYMA!YKWEDRTLSMKLMNNLISSNKTSVELGYSF DYYGHGDVTAIYKWHGHSFS LMGRGNLETDKGAAQFSWTP DYMGKFEFNAAYQRKDDTYSVMLRNALDDNRGALELGWSF KYMGYYQLKDGYHLGDAVLSAKGQYNWNTGYGGAELGQSY


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F D I S VY E P F Y F L G S Y DFSDKDGRKNGEVKF GI S SYKMNYFLPF AYSFNSLGTNNNKSEAKF


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 HY LG H E R I M FA Y V F F N N K M Q A S I A L T N I E S G R G A V E L D Y S F





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 LYMYEPTYIGWAYDFN F LIPHRPNYFMPFAYMQKPRDDKDGRNGKGRKNDELKF FYKILGDGFDNYEAIF Y ALLPHKGTFLIPFSYNNTPNERSEFQDRGAYNRR DEAEF
 TISSYEDNYALGTYTSD ${ }^{\text {I }}$ NDEAYESGSGMDNGQHFEVKF GI S S YK M NYFLPFSHTNEKDSDS YEP DYMLFTHDFSKKP DRKADELHE
 F GMLLPYEKTFLIPIAYT T QNRDS IIYPGYSEFNNNDETEF $N L S A$ Y QP Y A VY GP GTNSEAR $\square$
Y S LK A YKPNYF/LPASYRHDGQYA

NTNGHKAEDIETEF | $T$ |
| :---: |
| $F$ | NLAPYEP

GPGTNTDARL


LSFHEPMYF AAGNSGGNRNA
LS F NDPMYF IVGAHDGGN
ADGWGQDGDND AKF



VI SANEPMY LVLGSRGGVN ARF
$Y V L L P H K G N F F I P F S Y N N P N K E V Y E S L T S R E E F K K L E A E F$ LTFHEPMFAAVGAHGGLN AKF
 GLSSLYKSMYLLPATYSGRYPGASS YYAVGAHGGANAKF
F G L L E G VY K S Y VP T DE YR N $\square E A E L$ LS Y Y D P M Y I A F G H N G D T N

N $\square$ S A Y E P $\square \mathrm{Y}$ A $\nabla \mathrm{Y}$
P N L S VY E P Y A VY
GPGTNSDARII GPGTDADARI

Y NFKAHNANYF LTPFSYRYDNNY DEVNGHEAGKVETEF $N L S$ A YEP $\square Y$ A $V \bar{Y}$ $\frac{L}{Y} S N N R R L S F N E P M Y F S V G$ NSGGDTNARF 1 S S N E P MY MAF GRNGGSN AR F LT F N DPMYF LGAM DGAPNEYQSVIPD DGKLSKYNVN F $N$ IIATYEDNYVLGGTYTDDNRDVLRGAEDVDQLQQFEVKF LS A Y Q P $\square Y$ A V Y G P $\checkmark N L S A Y E P Y$ A VYGPGT
 LS Y Y E P MY $\quad$ IGVGVN G DV GVA A NMSAYEPYGAYGPGTNSDARLL Y LAF GQRGGTNAKF S LS $\square$ Y D D TYFMQTYTS D $\$ N QE VIY DEA Y DN DKMSKA E DK Y I LSNGNRLSFHEPMFFTVGNSGDNANAKF $N \square S$ A Y E P $\square \mathrm{Y}$ A $V \overline{\mathrm{Y}}$

Y A VY G P G T D S E A R I

Y A V Y G P GT D S ETAR
 AL YRHKSVY LLPFYHS FSDPAVGNNDTETKF

$N L S A Y A P Y$ A A YGP GTNSDARLL
$N L S A$ Y E P $\square Y$ A V Y GPS T D
Y FAVGKNGDTLGKF
HEPMYFV
AGGRNPRSARY
Y Q P N Y FADGFASN
HK Q N Y L L L LS Y R N
LS F HEPMFFVAGAGVDAN YKDNFILPVYYTSNPDKSEYSPPGGDHFSNTKMVF $N L S A Y E P Y A V Y G P D T N S E A R \square$

 NEP DYF LVGSSHERGADARF $\square$ ID YR GTYFMPAYYSFTP DYQWYHPD DNR YQPVEFKF FSAHEDNYLLPFYTSKVNQARFTPTNPNADAKDVLVQF EP PY F LFGNGDEYGTDARF

## HEPMYF LV

$R N L S A$ Y A P Y A V Y G P G T N S A V R L
FA I $\square$ P HRPNF VL PAS LT S $\square$ N QEP Y $\square$ D T P VG D K LDD DVV $\square$ K F $N L S$ A Y E P P DY A V Y Y

GPGTDSEAR I GGEDPVSARF
Y A A Y GP GTNSDGRL S F S S Y Q D N Y F
F S A H R D N Y G
I SFSSYHDNYLISGG
$A L S E Y Q P M Y F A V G T$

| $L$ | $L$ | $H$ | $E$ | $G T Y$ | $M$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $F$ | T | $L$ | $F$ | $W$ | $W$ |

GFS I HRDNYF I
$\square P$ TN MP AN K VN S D ll K Y
YAVYGPGTNSDGR』
QS LGPYY $\square Y G N N M N T E L K F$
$\square P \square G N K P T A R N S D V K F$

| $A$ | $R$ | $N$ | $S$ | $D$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $F$ |  |  |  |  |
| $R$ | $N$ | $N$ | $S$ | $D$ | $l$ |
| $K$ | $K$ | $Y$ |  |  |  |
| $L$ | $S$ | $A$ | $N$ | $A$ | $K$ |

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## 4

A
A

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140
150
160
SDSRSTNSIYVMPMAANYSLVVAPKLLTVYVGDKSDNPD\|V


## T

 A LS R S L N T V Y L A P M A E D L R L TVVAPRAWL Y L G DL S D N P D I R EES R S WN R L Y A Q S T WS A G GF S IT PR VWYAFWGDRTNE D I A



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170
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RYRGHAGLLIMEVGDDEGR|LISTSARLNFGSGKGA\|INADLLSY DYYGY GELLTAKWQDNEHRLSF LGRNNFKKNKGALDLRWSY D Y Y G Y G E L T A K WQ: N E H R L S F L G R N N F K K N K G A L D K Y L G Y A N F I WF R K R G S H S L L F R A GNNL N D N K G WTE L E WT F $K$ FIGF GE IRVDRVYGRNRLGGLVIDPGHSMGVELSHSY $\mathrm{K} \| \mathrm{H}$ G
$R$ YRGNTGVSVEDGQENGRLSTSSRFNLGSGKGSVAADLSY D Y Y A P Y EI WMKLYSAA G $\quad$ F F NARGFYNWDDSRGGVEVGYT F


 D Y L G Y G H L N L N Y II G K H QF DL T WRN NL G DN R G S I E GE WS Y
 D Y M GHGHL R F L L P Y EK H LLE LLLFRHNFSDA GAI EANYSY

 NYYAP Y E L WAKVVTRA GVVNTRGFYNFADDKGGVELGYTF


 D Y R G Y V DL L I K Y G S P D G WL L A T L R K G T K H WY G S V D T Q L T Y
 HYRGFGDFRVSYGAPNGWLAATLVRKGTRKAYGSVDACLTY A $\square$ T G
$R Y R G Y M D L R V A Y G K P D S W L A A T V R K G T R Q W Y G S V D A Q F T Y$
 D Y L G Y M S V K F N Y F T G R Q MF T L M GR GN F T T GY G A V E T T Y S Y
 $R Y R G N L S L Y V E L G E D D G R L S T A T R F N F S S G K G A L N A T L S Y$ NYRGYMDLLVLWGKPNGWIGATLRKGMKRNYGSVDVQVTY D T IGGH GYFRI AVVPYKK HL F D M KI MN N FN S K G S I E F NYT H D Y R GHMD LK L S Y GKP D GEVA T MLLRK GRLGGGTLTSQT QVS Y $R Y R G N T G L V V Q D G R D N G R L T T S S R F N F S S G K A S L G A D L S Y$ D Y R G Y M DL L V LW W K P N G WV G A T L R K G DK R N Y G S V DVVQV T Y
 DF Y AP Y KLL WSKFYTGPGVIDARGFYNFSSDKGGVELGYTH $R Y R G D T G L E V E D G E D E G R L D T S T R F N F S S G K G A L S A D D S Y$

 D F DP P Y E V WMK Y H GKA GYFK LK TA Y N F S T DK GHVVEVGYTY
 RWRKRWNGA RLGYT
 DYMGYGNAK ID YRRGRHHFELQLYWRYKRWHGAFRLGYTY
 $R Y R G Y G E L G V R F G R D D G G F A Q L R L R H S T H G G S S Q Q D L D S$


 RYF GYA E FYFYRKSNDSAFS GMVRGNPSTGKGAI QADYS W

 Q Y R G N T G L M


 D F L G Y GE LLEAA W DS ND HK L NLTVVN NLFTEGKGFYRASWNF HYRGY A DWQLLRYGRED GLMVTGLYRQGTK GYAMGQVDIS Y $D Y R G N T G F F A E$
$R Y R G Y V G K Q$
$R$ H
$R Y R G N G A L F V E L G D P A G R \square S A N G R L N L D S G K G A V A A D L S Y$ $R Y R G Y A E L G L R Y G K E D G L M L T S S L L R R G T A G K M R R Q F D L G Y$ RYRGNT GLIFAE $\square$ GEDEGRLTTNSRFNFGSGKGA $\square D A E L S Y$ D Y V G L G E V K V E Q T DIDN N R L D LTVVR K G L K GLLK GAA SA R V L Y
 D Y V G L A E V K K V E Q T F F R E L F E I T L R R K GLLK D WK G S V G T K L Y Y

 K Y N G $\quad$ IF Q Q $V$ A A N Y R T D N R R F N



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LS F YEPMY GVGRN PHEPVYFIYGS SS SYEPTYFLL L

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LPP F G $\square \mathrm{Y}$ GSN $\square$ PSE $\square$ K ${ }^{40}$ GHTTARF EGPAAKF GADPGDEKSKF GGREGLDARF AGSRGDTTARF

FGF HEPMYFL
GLA F HEPMYFLV

YKDNYFVTGS

## LTAHRDNYFLPFY

 F VL T P H NVNY I L L A S YAFSTYKDNYFSTGTT
$N \square S A Y Q P M Y V A Y G T$
YKDNYFVTGS
A $\square$ S EYQP $\square$ YFAVGT
AFTlYKDNYIITGTT
AFTIYKDNYIITGT $\square G E T P T S S G G O N D V K Y$ FTYKDNYF GGTS NYSAARFAPODPMYFVVAPTNSDVKF FRLNYYKPFY!TAGRWSNSPNNPDYSVPETSPYNNYEAKF GVREHNPMYLMPLWYNNPNYAPGSPTRGTGQQKRAETKL S $\frac{1}{F}$ FEHEGTYFLR $\quad$ YHSFTPVWGDNDRNELKF
 FAYK A $\square S \square N E P V Y F I V G G Q D P B G D D D D \square K$ ARF VFSAHRDNYLLPYYESNVNQARFAPLNPNDSAKDTFVQF FSLFKDNYFI GGTTLGAKPT GQNSDVKF AFSTHKDNYFIFG TSVNHTPTKT $\quad$ GNQEDNKTNTDIKF SFAVYKDTYFVTG $\quad V \mathrm{~V}$ GNEEVNKTTADAKY AFAVYRDTYFVTG VPLDEKISENSADVSF FSIHKDNYFITGGVPTNNAINSSTANAKY
 A ID TYEPDYF GVGQRDGTNARF
 A $\square$ S A YEP $\square Y \mathrm{~F}$ DF GTKHGNN FRDNYFVTG
N L A P Y E PMYFLV
$\square$ P T N H K $\square$ D K N T A D A K F GADPENSKF
AFSAYKPVYFSVGT RGGTTARF
GLSAHKDNYFLPFYERRVNQQR FTIHKDNYFITG
AFAVYRPTYF V VTG $\square$ PDNKRVTNET GNKGGNNARF FSLYKDNYFLVGTDPFRKPTA NNSDVKF SFTIHKDNYFITG VPTHTGDSKKTADAKY AFTIYKDNYLITGTNFS GGGKITKYNSDAKF AFTIYKDNYVVTGT SFTGGK $I$ SKYNSDAKF P $\square Y \mathrm{Y} L \mathrm{PAYY}$
RDTYFUYLYNFTPMENPRHDPN NEP $\square$ Y FSVGGGGGRN E ARF
A I S S Y E P $\square$ Y F YKDNYFVFGTAVNSKP AVGRDGASARF SFSSYQDNYFVTG


FS $\square \mathrm{H}$ K D NYF $\square \mathrm{T}$ G VPTNTADNSTTANVKY FS $\square$ HEDNY I ITG

FRDNYF ${ }^{\text {F }}$ G SRFSFNEPMGNEYTQF HPYAPDYGVFGAGDSGAKL IPTNREINGSSADAKY FKFYEPWYILPAYYS FSDMYSPDLTRTEIKA SFGMFRDNYFITG VPTNKDVNKQTADVKY
 LYSYDTNYLI YTYGSSMNKPA IHSYDWSDQARKDEVSF NFSSYKPVFFLIF
N LS FYEPTYF पPGT
P LINKQUNKESADA DF
HPFAPTYAVMGAGNSGAKL
N P Q Y $\square R G E L K G$
S F S VY K D N Y F $\square$ T G T T VE E K P S N Y N S D $\square \mathrm{K}$ M

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 HDTSYRPSLFWQLEPAHALLPGYWRGMKGYEHESNGKDG RDTTYKPSFFYEFGPYRQIGARHMFSAQAGYEHQSNGRDG RDVNYQPEFLYFYTRPKNEAGDQLGVRGGFEHESNGRDG RSTNYSPELYADTPYDETAKRGSLALSGGYEHESNGKED RSTNYSPELYADIPYDET HDVSYQPELDWILHNWAPRSNGVRF GVRGGFLHESNGKGG RDTSYRPSLFYEWGGSGR GLMPDDWRGGVEHESNGQGG AESNYNPTGGLGTPDTRRDKLVGDGMDQ FEHESNGRGG RDSDYNPELFYR RETNHEPEVFMMFNNDWQUAGLTNSLLWVGFVHQSNGSYS ПDTTFNPSI FWMTDRLWASQDARWRGLNTGVEHRSNGKDG RDTNFNPGI GMLTRPGMNKKGKLGYYSLMVEHESNGKDS RDSNYMPELFFRTPA MADGSNGAAGLQLGVLHESNGRSG SDNNYNPTLGLG NLLRKNGKAVGLVMLQYEHESNGRDS DDTTFNPSIFWLSDNLWTSSSQNWRGLNTGDEHMSNGKSG EEDNFNPGUGLGKLLFKDRGKLKGSLALQVEHESNGRDS RDLNFNPGTGLAKHDF VKNRYIGKVTLLVEHESNGRDG YDTSYKPALYYEHANAAQLPHVGRFDLAYGFRHESNGKGG RELDYEPEVMLNFGLNANPLGFRWRTVGVSFNHQSNGQDLG RDTDYKPSIFYSYPVGVE LGGRLEEVRFGFLHYSNGDGG
 RDLNYNPTLGVGKALVRD NRFLGTLTFQFEHESNGKDG EDSSYRPSFFFEF DKVNDGWLPDFWRTGYEHESNGQAG YDLNFNPGIGLTHPVDYH DRFIGQITLGLEHESNGQDS VDLNFNPGIGLAKPLF VKNRYVGKVTLMAEHESNGRDG QELNFNPAVGLGKPIYNQEKHLS GDASLMLAHESNGRDS RDTNYNPGVGLGKYILYK DRVVGAAFVQLKHESNGRDE KDLNFNPSLAVGYDKDERLKGLAV QEINYNPTVGLAKFD YNKNNHVKGDATLMFNHNSNGRDS VDVTYNPSLFWHRERDWSPEEHSPFYLGLGVEHKSNGKSG TDLNFNPG|GGTKPLFWVKNRYDGKVTLMAEHESNGRDG VDTSFKPSLFWHKDALWQSPEKNWVGLATGVQHESNGKSD KDTSYKPEFFYASGNKTRPSWMHGLFYQAGFQHESNGRDE DDTTFNPSVFWLSDDDWKSENQDWRGMNTGVEHNSNGKDG KEDNFNPTLGVGFDKNDRIDRGDGNLYYGASEHESNGRDS RDTNYNPGLGLGKYLFHNNKLA GAAFLQLMHESNGRDG HDFDFNPGI GLSKPLFHK NRFDGKLTLLIEHESNGRDS KEUNFNPGUAYSKYGYDKSNKVNSLATLALEHESNGRDS TETNYNP TLGFGHNFVKDKRIAGVAFLQFEHESNGRDS RDGNFNPGDGLGHLIIRHNK YDGKAYLMDEHESNGKDS ADNNYNPS MLGFGRNFTGEGRIKGIGMVQFEHESNGRDS RDNDFQPEFLFTYPMNVVFWGGTLTELTTGWRHISNGEAA YDSSYRPS SYAHDAGSRILGGRFGYAGGFEHESNGQDG VDTY Y PSGFWARDSDWATGDKRWSGLNTGFDHQSNGKED TDLNFNPGUGLAKPVFNHKNRFIGKLTLMLEHESNGRDG
 HDSLYRPSLYYYLPTGDSSGWLKRVAFAAGYEHESNGEDE EEVNFNPSVGLSVKVVYNNNDEAKAGVSLMLINHESNGRDS RDLNFNPGVGLGHLIVYHNK Y VGHAGGGFREDSNGGGV RDUNFNPSLSLGKPUFNKNEELKGLAVAA FDHESNGRDS RDTDLSPAISFIYKKPDPDAGGYFNWFSIGYRHVSNGESD ADNNYNPGTLIRPVNQQLKGG VALSEHESNGLDS HDTNYNPGIGGGRYVIRNNKL KGAVMLSLEHESNGKAD
 RETNYEPQI FLARLTDHEFAGWHLREDEMGFNHQSNGRPE RDUNYNPG| GFGKYIVRNNKLDVGAVFAQDEHESNGKDE TAQGFAPEVF VDVPVDRTLSLNAWV QAGLKHESNGHSG
 EET $\square \mathrm{FNPG} \square \mathrm{G} \square \mathrm{GKF} \square \mathrm{FKE} \quad \mathrm{GRH} \square \mathrm{GFGT}$ GQEHESNGTDS KSAQIGILHDSNGKSG TDHEPEDY YPHQDPDAGWSYRLSGLGLVHQSNGQAD RMDNFMPELIYVYPDNFKPFGGNFSEDWUGWQHDSNGVGA

\section*{UniRef90 N2BJ34 UniRef90_UPI0004671D86 UniRef90-B1ZWT9 UniRef90_UPI0003B47D9E UniRef90_UPI00047CFB84 UniRef90-UPI0004763B555 UniRef90_UPI0003B351C1 UniRef90 C4ZPE3 UniRef90_UPIO00304277C UniRef90-N6YFP4 UniRef90-UPI00035EEC1D UniRef90-C6XDD3 UniRef90_UPIOOO30C42F8 UniRef90_UPI0002EB8121 UniRef90-A6FAD1 UniRef90_UPIO0047203D8 UniRef90-J3C2E8 UniRef90-W0A9F1 UniRef90_G5H618 UniRef90_A9HYJ4 UniRef90_UPIOOO4720222 UniRef90-R5P952 UniRef90-R7HNB9 UniRef90_UPIOO03732954 UniRef90_U5BYM5 UniRef90-R0TWL7 UniRef90-V8C700 UniRef90_UPI00040B809F UniRef90-U3ANN0 UniRef90_F5J425 UniRef90-K2KC24 UniRef90_UPI000306DA12 UniRef90-W0EPI8 UniRef90_R5AUP7 UniRef90-A0LXD9 UniRef90_F5IXV4 UniRef90_F8X220 UniRef90-F6GD06 UniRef90-G2E935 UniRef90-G0L8K5 UniRef90_UPIO00313A483 UniRef90-R7J533 UniRef90-F4GUM7 UniRef90_UPI00038265E7 UniRef90-B8FHZO UniRef90_H0F705 UniRef90-R1GTS4 UniRef90-E6X417 UniRef90-JOJFZ2 UniRef90-F5IX30 UniRef90-R7EUK7 UniRef90-D5BDR4 UniRef90-H1DDH2 UniRef90-R7JA16 UniRef90_F9Z4Y0 UniRef90_V8CIH5 UniRef90-C3XEG8 UniRef90_16AXY9 UniRef90-W8X8N4 UniRef90-R5AYM4 UniRef90-F4AWL9 UniRef90_G7EEB6 UniRef90_A6ERC9 UniRef90_UPI0003782DDB UniRef90-T2KK54 UniRef90-UPI00026CC5EB UniRef90-W2C842 UniRef90-l3C1S5 UniRef90_N2BHN1 UniRef90_S7V6Z6

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UniRef90_UPI00047CDF14 UniRef90-JOIS46 UniRef90-E6NNY7 UniRef90-N2BH36 UniRef90_W2CTX9

D COMGN 130
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CSMGNRIMLELTWENSTFGTHDTAWPY IPKRKDNPDIIS NDSRSIN AYYVQPIMPWSTQLTLAPKDYYYLQKSENSDIAA

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DIDEVSWNRISYITGIF E F N
ERSRGWNRVYGVAVFDKGPFALARGKVWWRIPEDE
D D S R S L N DVVYAEPALDH Y D T L S S FA P R V R A Y F GVVEDEN R D Y L






PESRSWNRI YAMAGMEWGKLTVI PRV
EECKA ANRLMLEADWERDNLGVHDSAWPYDQQRKDNDDLP

QVEVVSWN R L Y M DVV Q W Q L R S G F


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$D$ VA
D D SRSTNYAY DQPSLVFK LLEVSPKVWDYVNNDNDNGDLS EDSRSWNFMSIAYYFFNPRFSTHTKVWIPLE ${ }^{\text {I SSSDNSHLL }}$ DESRSTNYTYLKTGFVFDRMGISPQVWMFHNNDDNPDLE TNSDDVNRFFLRATFALGNLGIAPMVWGYFGDQGLAPDLD SRSWNRLYADFLLFQRGDWAVSDAPHWRDPEDDDNPDLE TLSRSWNRVYAQVGLERAGWTVLGRVWKRTNEDDDNRDIV




SA G Q R P V F R L V W E K G G L K I M V A Y W P Y $\operatorname{V}$ V P Y D Q
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A Y A GRVD WKLRWEQNNGAVVSALYRQGHDQRRTTQLDFNW
 A Y R G V T GLL D F Q $\square G K D D G L L A T H G R Y N D S N G R G A L E T E L S Y$ Y YNGYGLVAANYKSDNERLWLTKRGGWNLNANTLEVAWRA D YA GY VD WN LR WA QD DGAVVSAMYRQGASRHRT TQLLDFA W

 GYRGYVDWRFKGGNGQGLTMSSLIRYGNKDKGSFQLDLSY DF $\square$ GRAEATLA

DYRGYFD DETS $\square G D P T G Q A D R S H Y R H G E K G G T \square R \square D L S Y$ RYRGFGTFS $\square N Y L S R N N R W W S T A E \square N P R R G W G N V N T T L S V$ DYRGFFEDETGVSKLES FALISTFRHGSAGPTVHVDFSY RYWGYTSLGLSIGQRDGVVAVSGRGNPGTGKGSAETFVSY NY GYGDGTVVRAFGDQEFSLLLRGNPDKHHYGAQLDYTF KYLGSFEAKVNMRYGNHLLADFSLGGLDSHPTPYFRTSYTY DYMGRGDLVVTYRSNGNDYSALLRRNFSTERGAVQFSWAF NY YGYGEITLDWEFVKNKFDANI DFARGHN
NYKGNADIEISYNLNNMRFDATIANNLKTNKGFFQFDFDF DYVGRAELTGSWQUSKHTLGLTLRHSLRKDRGSARLDW



$P L K R N G Y D H L Q Y F N G Y G E T L L G Y N Q R S S Q F R L G L S L V P$ $K$ PS SNLY LMLQ GFHGYGENLLQYDKKVSMIRVGGII KPNF PDSEEFYL FVQNFTGYGESLI DYDRRMTRLRFGUAIT $\square R K C N L Y L T L Q Y Y N G Y G E G L L A Y N Q F H N Y L R \prod G F V I K P$ PLRRNGYLHLQYFNGYGETLLGYNQRNSQFRI GLSLVP KPSGNAYVTLQWYQGYAENLI EYQQRSSMLR L GLA K K P FRFDNQYFFLQYYNGYGESMI DYNHFHHWLRVGIVIKP FKKDNQF LFVQYYNGYGENLLDYNKFHSRLRVGLVIKPKL $P \square R Q W L Y G Y L Q Y W D G Y G E S L R S Y D Q R T N S U R V G I G F V$
$G \square N D F T S D Y V Q F Y G Y G D N L Y E Y N H \square S H R D G \square G L R V R S F$ R PYRNYYLTLQWFVGYTENLDYYQEHRSMLRI GFTIKP $P V Y Q G D R G Y M K V E T G Y G L T I S N Y N F D E T A A G I G F A F$ RLFSNQYLFLQYYNGYGESMLDYNHHRQR\|RLGFVIKPTF P R R K I Y GYLQ LF HGYGDSFLTYDQKQDQVRUGFA V $P I Y Q G L R G Y M K V E T G Y G L T V S N Y N F K E S A Y G M G V A F N$
 $\begin{array}{ll}F & R R D N Q F L F \\ K M S & N Q Y M L\end{array}$ R $\square$ SENQYDFARFFHGYGESLLDYDKYSMNIRVGICIKPDF KMSSNQYLFARFYQGYGESLLGYNQYTMNIRVGICIKPNF NPFKNQY MMLE WFVGQAEGLLNYEQSSSMI RLGYVI FNSKNQYFMLEWYAGHGESLI DYDQFSSMVRGGYVIK
 WKRRNGY 1 H V Q Y F K GYGET
 KPSRNEYLGVQFYNGYAENLLEYNRYVSMVRFGUCIKPVL


 RISENQYLFARFFQGYGESQRDYNKYVINDRVGI CIIKPDF FKKANQFFFIQFYNGYGENLLDYNQFHRRIRVGLVIRPKF NPFNNQF LVLEWFTGYDENLI EYDRYRSVI RI GFLLK FKLDNQYVFLQFYNGYGESMIAYKYFQRCVRVGVVIKP NKRENQFFFIQYYNGYGENLLEYNQYKNMLRVGFVIKP RLSKRVGVYY QVIVHGFGDSUYEFNYSLTRAGSGLRLN
 P LKKRNGHLYVQYFRGYGETLLDYNKKADQLR G DAFVP
 P DWGRVRGYAQYFNGYGESLI DYNADDERI GVGGLLTDLL NPFKNQF MMLEWY LGQAEGLLNYQNSSSMURGGYVIK PLARFFYLYLSYFEGWGETLLDYNRHSSQFRVGYSL NPFKNQYFMLEYFAGYGESLI NYEQFNSMVRLGFVIK
 KNRSNQYFMLEWYLGQAEGLLNYKESQSMI RI GYVI K GVSKHYADYVQYLYGHGDSLYEYSDPVNRIGVGVRLRDF
 HKNENQYLFLQYYNGYGENLLDYDRFKSVVRLGMVIKP
$P \square D Q D \square Y$ LYARYHSGYSEQMLEYSQREDVFS LGFALV HKSDNQYLYARFFNGKGDSLLNYEDYS INFRVGDCIKGDF PLSRDFYLYTQYFSGYAETLKNYRQKYEA DR IGI AIT PLARHIYLLF GDFYTGYAETLIAYNRIVNHARFGUALT PLAGKVRGHVQYYDGYGESLIDHDQDVQRLGDGFSLNTFL KINEYYGILYMQYFVGYGDILYEYNSYAHRIGGGIRFV PLA GH $\square K$ GYAHVFS GYGQSL $\quad$ D YNYYQNTVGVGL
$P \square N S G F Y G Y L Q Y F N G Y A Q S \square 1 D Y D K H E S R V G A G F V F$
$R \prod N P F V G \prod Y A Q W F N G Y G D G L Y E Y D V F S N R \prod G V G \prod R L N P$ $K L N P Y Y G V Y M Q Y F V G Y G D Y L Y E Y D K M G H R I G I G V R F V$

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