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 QRDSALNDTLKLAFDDTQLSTQQVNNLPYASSYAKLDGDA QKFEAVRDTISLAFWDIVLPADKVDNLPYASLYAKTAQGS

Q
KFSDVNDTLNDALFGDTDTDD:RNDPYASDYARIGDGP
TTRGLGASLWHSVAGVQLTDDE AGMRYASQYMS NNGP
S T K GLLGK S L WD S L F GVVQLTA D D I Q NMP Y A S Q Y I Q L N N GP
TTSNTSETI KYALDDVVVTNAHVTNLPYASAYLKIGDNP

A L N D T L K L A A F I D V K L S T Q Q V N D I P Y A S S $\quad$ Y A Q I G D M S
A QKNVNDTI YHLLFDVELTDQEI QSLSNPSAYVRIDGQQ
LGETMK LAI WDTDLT P Q QVAKVPYASAYIVVGEAP
$T T K G L G S A L W N S V D G V Q L T D D D V Q N M P Y A S Q Y V R L N N G P$


T Y H A YY D T L K $\square A$ F S D PQMT P E Q V S A S K T D V M S
NRGLGKSLWESVF GVQLSQDEI HNMPYASQYMRDNNGP

GVVHLTDEDI QNMPYASQYMTLNN GP
T T K G L GQ S L W N SVFGVVQLTY D DI R NMPYAS QYMQL N G GP
A TVE E A Y S N Y ID V V L T S D E I K QVP Y A S A Y L R I G T Q K





QKFSHVNDTIKEAFDDITMTAEDINKLPYASSYMRFNDGA
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QK F N DVS A TVVK E A Y S D V E LTS A D E I R N V P Y A S A Y L T I G S Q K

Q N T



ATVQEAYSNYMDVEMSADEVNAVPYASAYLKKGDGK
S Q N S $\operatorname{S}$ L V V
TYHAYYETLKIALKEPSLSLDDVKVSKTDIMSVIRGDRA
D S Y Q QL L K F L F S G IT I T P E A I N K L P Y A S A F L T I D D R P

S $\square$ N D S $\square$ K F A A F GV T L T K Q QI E QI P Y L S S Y V T I ND K A
K A SWDTFKASAQGPELTPAQVVAAVPYPQQLVTTVTSE
QKMTDVVGSSLSEAFD DVTLSTNEIVSELPYASTYVRDNEGR
K A SVVDTFKAT LE PVVQLTAD DVAAVPYAQDLVTTPS S
QKFNDVNATMDEAVFDVVLSKQQI DELPYAS SFVRDNGGA

A TVVQE A Y S N Y I D V V L S A D E I R D V P Y A S A Y L K I
QRF Q DVNS T IDD EA L F G V $V$ D L S V
SRSSITKAMRLDAVKGVQPTAAEVAAKPYFQLQATSPEGS
Q QF Q D V V N S T F D E A F S D D
Q A SWD T L R A A T Q GPELTTQA QVDAVP YY QIKLQTQGGE
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QRF D D M S T T L L ill

G S I D

$A L$ T N E Q I A D D $\quad$ I P Y A S M G V


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50
RTFVVG 60
70
80
QIFVVLGFDENGQQKWITRDAMLVTHNGRVVKTVKNN
 R $I$ FVVLGYNENGQQKWITQDKAMLVMQHGRLVKTLGLPSN QI FVVLAYAEQGDLKWATRDQAMLVTRNGRLI KTLGLPDN

 QAFVVLAFAEPKELKWLSADKGMLVTVNGRLVKTHNLTGN

 R I FVVLGFDENGQQKWITRDRSMVVTQHGRVVKTLGLRDN QAFVVLAFAEPKVLKWLSADNGMLVTDNGRLIKTHNLEGN $Q A F V V L A F V E Q N Q L K W L G A D K N M V S T Q H G R L V K T Q G F G E D$
$R \square F V G G Y L E N G Q Q K W V T Q D K A M L V M Q H G R L V K T L G L R D N$ QAFMV LA ALAESAQLKWVSSDKGMLVTESGRLVKSLNGMGN QGFMVLAFAEPSQLKWLSGDNEMLVTRNGRLVKTVNLDGN QI FMVLAALAETKQLKWMSSDNGMLVTENGRIVKTLNLQDN


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 RVFVVLAYVNGEDLSWLTADNVMIVTRHGRII KTVGLEND QLFMVLALAEPPQLKWLASDNGMLVTQSGRII KTVNLSGN QVFIVLVFAEPKVLKWLSADKGMIVTVNGRLVRTHNNPGD QIVMVLGAFENGEEKWVSQDRTLMVLRQGRLIKTDGWHDN
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 R A FVVVLA F V D N Q QL Q WV T E D K N SVVTTTRFGRLVVKTQGWGED

 QVFVVVLAFAEHNQLKWVSADKAMVITENGHIVKTLNLQNN


 KLFMVLAFAEPNQLKWLSSDKAMIVTENGRIVKTLGLPQN
 QVFVVVAAFAE EN QLK WVVSADNAMIVTENGRIVVKTLGLQSN $K I F M V L A F V G Q N Q L K W M S S D K A M I V T E N G R V V Q T L L L P Y E$ QALMIL A WAEKE SLLK Y L S A N HEMIVVTSAGRIVTKTVVNLDAN
 $G V L A K L R Q Q Q D L E F W V A S G K Q V L L M R D G L I V R T V G L G \square N$ RLFVA GYQENGLDHWI TRDQVVFITQNGRLTRTVGYRDN $Q \vee V L A L A F D E Q G Q Q K W I$ SA DQVVVFDEQGRLVRTAGLSND

 QI FVVV GY L Q D GFEK WSTGD QVVFI TQ NGRLV R STGYQ G D TAVMALAYLENGKHKWLSSDNALLVLEKGRIVRTIGFERD K I F V V V L A F V D N N RLLS WI S S N R Gl V V T E H GRRI TMK T L K F D N D
 $G V M A M A R R R G D L Q F W L A S G N Q V L L M R D G L V V R T V G G L G V S$ QVFMVLAFADNTQLKWVSADHSIIVTENGRIVKTYGFDGD Q GVMAKLRQQGDLQYWVASGKQVLLMRNGLVVRTTGLEPG NLFMVLAFAEKNQLKWLSSDKAMIVTEGGRIVKTLGLAEA


 $A V M A L V R Q Q G D L Q F W L A S T H Q V L M M R D G L V V R T T G F G D N$ QIFMVLAFVEKNQHKWLSSDKAMIVTEEGRIVRTYNLPEA $Q V V L A L A F M E H N Q Q K W I S A D N A V V V M Q Y G R I V R T A G L P H N$
 RIIFMVLGYAE QNQLKWVSSDGGMIVTENGRVVKTLDLDPYG PI LMMILAFAEKNRLTWVSSDKGAIVTENGRITHTSGLNSA A L L $\square L A S V Q G D L Q G W Y G H D G Q A V V L R H G V L V R T D G L D A N$ GAVLVL GNDD A GRQA WYS S ERS IVVFLQDGLLVGTHGGTPE
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QUERY
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90
LLEVTNSGQDP
LLEVTNSGQDPLRNALATKDGSRWTRD\LWSEDNHFRSAT
NNLQQDP
LLSV SNLQQQDPL
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## D <br> \section*{I}

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160
LSTVSFALETLNTAGRNVLCNVWQEEVTSTRPEKQWQN ATSRFSRLKDQVLTLGGNTVACRVWQEEVELPAEGKSWTN
 FVSRFS $\square$ ADNETLTI $\square N V P R A T R V L E E D V T V V E L K T H Y R N$ ATSRFTRGQDAVLQLAGRSVACHVWQEEVALAKNGASWLN

 VNSQFEFDAA ENIVI NGTSSTPTLHY S E EVVEMVEADGKSWEN LTSHFS LSGTENLTI A GNTLRCQVWQETVVQAGLDRRWHN
 VTSQFKLIADENVLINDTPTQLLHYSETVSVEGLNDQYQN M SVFHARGKETI KILDTSRELLRFDEQVTVPTLNESYTN


 LTSSFAHKGDQTLDI NEKPVETLYVVETVNVPELDIQFEN LTSHFNFVGLENILI NDDQTQAQHYTEVVSVEHLNIQYQN VESRFERQGMRTLIVNGKSVHALHFLEYVYMPELDMSFTN

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AHSTFHWGDRETLTLAGSETPVRVLEETVTTDQAN WRN
MKGHITQRGQDTLDLVTRQDNADRFEEKISGTPSSTSWTN


 AS DHADPGEKSTLTSLLVWTKEVTAUQELVSFSALDLTKTN A LAATLT KGLK
 ARSTFRWTGHDTVTLAGETTNVRVLDEAVTTDQLTRWHN
 ARSTFTWDGTEDVQVGSESTPVRVLDEEVVTGAAKNSWHN ARSTFRWDGADTVTLAGDSTAVRVLDEAVSTDEA RWHN
 LSMHYR RVVGNEVVLEVMMDKPYTTTLIDEESVVTASPSEVQWNN ITS EFEPEGVEQUKILDDQEKKLIVRYEHCEVAEGNYKYTN ASMARNYQGKEVVTGPDSSISAHVYRESVEFPSLSKTVEN LSMHYTQMGSEVLNDMDRPYKTTIVEEHVVTAPNEERWLN ADI TLKKQGKQKLDSVIWSKNTTQWQEQVHLPQLDQSFTN A S SHFTTPENETLTLLSKPDHTYHYVETLSYQAPNQSWQN
 A QSRFVVQGEEQKLLPQGARNLLHVVENVTVLAADQQYTN ARSQFSWEGRDSLKTGSD DTSVRVLKETVTTDQA RWHN
 $V N S R F S R E A \square E T V T I L D K D Y A L Q R I D E R I D D P E L G F K A T N$ $V T S R F S P R G Q Q V L T L A G K S V A C Q V W Q E D V T V E A T G D S W Q N$
$I$
$I$




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 E Y W W L H P V S G D V DA S K Q T PA P G MA S I A M T ML K K P F A T F WI E ATT G LVVRQS QQRS G GEDLDS L E T L L K K A
 T F WI DN R D GTVVLQA QQMLA A DQYPI A T T L L K P A QFWI D GKT GKVLK S QQKLAP GLPPFI DMTLLKPYS DYWL A NDTGRIVVKSYQHLAPNLPAVTLTHLKPY

 E F W W T P GT G NV I K S R Q K I T P N Q P F I
 R F WV D EFWWI HP ETGGVVKK S K QKLA P S LP Y I E DTLL KP Y S $R Y W V D \quad D D G Q I R K S K Q Y L G P G Y W P I T V L L V K A A$ RYWVDDE GQ I RQS E QY L GAGYFPVKTTLI KAA T F WRDSSTGQVVKTQQQLGPNMPVIELTILKPFS T F WVVD Q T T G KVVVK S Q Q Y L A P S L P S V EMTILLKP F EFWLLTPETGNVIK SRQKIAPNLPBMIDDSLLKPFA R F WL E P Q T GTVIK SVQS IGGNYFPI ETTLLK Q Y WL NANT GQVMMS RQYMGPDMALVQFTALKS YA TFWVDASSGQVRQS QQTMGTDALSIEATVLKPA RYWI DSE GII RQSQQY LGADYFPVTMTLIKAA QYWLD NTGEVVKTRQFIGPNMATIEMTFLKPF
 F Y WF D K Q S G T L V K S T Q T L G P D V S E A I E F I I Y L
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 L Y WV NNK GQVV K TVVQ Y L GPEMTRLLELTLLLKPY HY WL E P S S GEVVVASEQTPAPGMARFELDV AKPFS R F WI D E D GQUIRRSE Q F L G A D Y F P V T T Q L I K A A Y Y WV N E Q GQVIK T LQ Y L G P N M IP V E LTT L K G Y
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 Y Y W W D K K S G L I RK T DQ K L GPD N S T I EMVFTKP Y S T Y WVV D $\quad$ D G Q V V K T R Q F L G P N M V P V T F WVVD RNGNVVKS S Q WL $\quad$ DP D A L K I D MEI L K P
 H Y WV R P A D G I L L Q S E Q Y V T P GLL L R IVHL R P Q Y WL D E Q F NVVK THQYLGPD LGDI EMTILIKPFAL H Y WV SKE GWVLK S IQ HI GP Q MGQI EMDI L K P Y T Y WV T S S G QV VK K SL Q Y L GP N M V P I E F VV L K G Y A K Y WI DTQ GDVVK S QQWLVP QRLKVDIEI L K P Y A H Y WV D P R D GFI WK S DQQVAPGL SLQLVQLRPY

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RASWYTLETSVSGPGVTRAQVDAVPYSSTLVSTNDGK QGSLNTLGASLHGPEVTQAQVDALPYYQI QVTTEYGS QKFQDVGVTVEQSVWDVVVADERLQKLPYASLYARVAQGP TYRTYYEMFKLALSDVSLTYSALAEAPYDFMYLRQGEKP
$Q Y$ Q
RASYDALRA

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SSRTALDTMK LVRWK S PVRVEKLDSVPYPVMQVEGAGY

Q T
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$D V Q N T \quad D N Y$ ALLQ D S D L S P A D I I EAAF P Y S A Q Y I R R D G SN

LTT P Q A $\ A$ Q V D GPVI F A E IP ERE
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 DVTSHAEE LPYASLAVHT ENH LT R A K L A RVT S P L L VV E VG T S A
T RA G L N E $\square$ K A P Y $\square E V T \square E K N D V F A Y$ L S Q Q L R R D D S P

T R A A LD TVKGAF $\square \mathrm{VEVTDEESDVFAYLSRQVKHDDFP}$
LGASLQSMVSGGPDASSRAEEIPYASLAVHT EHH $K N V A D T A K T A L F D V V L T T E E Q V N D Y P Y A A A Y Y I K T A D H P$ AS LQ SMVVGGPEVVSSRAEED PYAS LAVRTVEHH $D$ LP T P Q A IVQTLSAT

Q TVNQRRAGPVQQ VP T QQQQD E T N EP VLQU N A ALVQDTATPALLLTVENGA $\vee \mathrm{B}$ - R
$\square$ D T $\square$ Y A VLIF G S P $\square$ S P E Q V VR T D LP P V F F A MP E R E


E T T T A SEARAMLT R D R I ER $\$ N R P L L L VE WP D G A $P V L T R A R L D G I E T A H L E V V I E E R D$
 PA QAA E $\square P Y$ Y S L S L RMGGGM GNSAGQPTAAPPVTRQA LSAFSTPMIMAEDPAKA ALSDPRDLAGGQAAEDPFASLVLDAGDR QSFQDRALNVLLDEPVVGPSYDGQFPRFRPLL$Q A G G G P$

A A D D P A GEAMP $R S R L P A P A G D G L P A P A L S V R Q G S R$
 ETLGLAESLPEAEAE DVSALLRRPALLYRWWHGR

LR GK T R S E DE I N AF S R A QLLLQQGRGK $P E L A A S E D D \quad$ TPSSLRLSPGGS A ATVDPALAPDVIAAQPQDFLVVTVNAAG
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 A L MVL GNDDA GQTSWYSNDRHMVYLRDGLLVGSTGFAQD

 RALLAL GYNDNGHYSWLSGSAEAFVTYQGRIVATEGLPSN
 $R V A L G L V F I D N N Q L K W I D Q N H A M L V T D N G R I I I T I D G M E N D$ $G V M A K L G R Q E D L Q Y W V A S G K Q V L L M R N G L V V R S V G L D N D$
 TAVMVL GYV D GGRQSWYA GSNAVF Q
 GAVLVLGNIDS GRQAWYSSERSIVFLRDGVVVGTHGSSPE PAVMALAFI ENGRNKWVSADKAQLHIHHGVIVTTTHGLDND

 $R G A M V M T A D D G S R Q A W Y G G Q G E L M L L R D G L V V G T H G L E A N$ SAVMLLGNDDDGRTAWFTDQHVVFL CEGDLVVGTHGLSAR HALLVLA WDEPGQLKWWSAQQELIVTEAGRITKTVNVVGN PAFVVLHSAQGGRLDWLSADRVAVVTEGGRVVALAGVEGA RAVMVLGNDDEGRESWHSRQAVVVFLCEGGVL CGTHGL RAG
 NAVLVLA Y LDE HGQYK WVVAD DAMLVLDEKGRVI KTTGGEND RA YLL HIGANGDVATWSSTD G IMI SLRDGVVVRTLGLGQD A A S L A L A Y ll D G D K Y R WV S G D K V I F T M H H GVIVVRTEGGLDNE GYIE QEQSKWLS QDNAMLVTHNGRLLKTVIKNNN $G V L A L M A R E D D L Q F W V A S G K Q V L L M R D G L A V R S I G L G Q G$ A R V A L A D T R D GTVLVWRARDRA EVVTR Q G LV R TV G L P D N AMLVSNGTGTGLVEWY GNTEMLLTQHGRVTRTAGLPAD $R G L V V L G Y V D D G Q Q V W M A G K H A V L R L S A T G V L V S L S K Q D A$ $R V L V V L G Y I D E K Q Y S W \square S R D S D T V V T E N G R V I G T L G G Q H D$ T AVAVLGYID G GRQQWFAGSHAVFEMDAHGLLLGGSGLGQ $R G I M V L N E V R G D D L Y W \square S A N R I L L V T R K G R I V R S V G L A C D$ QATMFVAAENGGVRNWQTQDRIVLVMVDGVLVGTRGLGGD
$T L L V L A A R S G D F A E W H G P \quad Q Q M L V T H N G R L V Q S A G I P G D$

 $R G L M V R E T Q R N G L T T W L S A D G A S L Q T R N G L L Q A T R G L G A G$ QTLLVRDEQNNGYDTYANAGRQAVVMENGHIVKTDGLQTT $R G L L I L G A M A N G H T Y W P S A E R Q L S L Q M R R D G V G V G T R G F G G D$ WALMVPF QTNGGVVTWSSTDDVTVMALRDGVLLATAGGLGPD GTVAV WRTEDNISLTTLRNGVLVATRNLGND


 $R G G F L R E A K R G N D E S W L G N D G V S L T F D R G V L H G T R G I$ GAA Q G L L I L GAA $\quad$ I S D E H T F W W S A A G G L
 QTGRMLREARNGVDTWLSSDLTALMLLEDGMLQGTRGLGSE




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

 AVTSI Y G QNGSVITWVGADRKTTSLDRGMLTATRGFGND Q GLMVMGAQA GDMTYWPGRNGVVLELDQGGLHAFQ GLDAR $R A L A V L T Q Q N G E N R M W Q S P G G L V V A T D G A R V V A T A G M R E W$ $V A P M L$ V $A D A L L I Q Q N G E T$ R L W WR S Q G G V V V A T E G A R I T A T A GLL R Q W





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 VQARLVPAGTE QLTILGQTHTVLRVDEHLSAPAAHYRATN



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 AT I A T K RVGGE E QL S S L L W N K T L T K K WT E D L V F D Q L K T N A Q S
 $V$ NSHFYVEKGHTVQYFGHDIAVIKVTEQLTYESPDQNWQN




 ARSVLHGEGPIALASAVKRPPCGCWMK K $V$ GRLQQRGSERVEVLGKERDLLMFEESLS GP GVVRGN


 $V$ S S T WRVVHGEES QTYLLGATLTVTKIT ESVIGPETNLEWEN

LN S R F L R K S ME T LEE ILNKEYTVLRVDEQDDAPADGLSATN
 $V V G T D R A K G E D T V T L L D K R R T L L R F D E Q L S G G G D M R A T N$ $V V$ S EFRDVS GPEPMMGFPS GEFTVVYHVVETGHFTAS GVAFEN $V$ T G T L S R G A L E Q V D L L G S R R T L Q QR F DE R L Q G G G GMS G R N FVCDFRRESGVAASTAFRSFRALLHVVEDCD NPDRDFEN
















 LTCAIT P GETQSVTS GEDSTS A RIIMRETCQTATGEFSTTN GAPHCSPARRFELP LGERRLETCQIEWHWATGDTNSA

 VCDV T NS GPREFTLA GA QYTATLMME DCVGPA S QFTN | $L$ | $N C R L S A A P Q G$ |  |
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