

Nucleotide

COVID-19 Information[Public health information \(CDC\)](#)[Research information \(NIH\)](#)[SARS-CoV-2 data \(NCBI\)](#)[Prevention and treatment information \(HHS\)](#)[Español](#)

GenBank

Bat SARS-like coronavirus RsSHC014, complete genome

GenBank: KC881005.1

[FASTA](#) [Graphics](#)[Go to:](#)

LOCUS KC881005 29787 bp ss-RNA linear VRL 22-NOV-2013

DEFINITION Bat SARS-like coronavirus RsSHC014, complete genome.

ACCESSION KC881005

VERSION KC881005.1

KEYWORDS .

SOURCE Bat SARS-like coronavirus RsSHC014

ORGANISM [Bat SARS-like coronavirus RsSHC014](#)
Viruses; Riboviria; Orthornavirae; Pisuviricota; Pisoniviricetes;
Nidovirales; Cornidovirineae; Coronaviridae; Orthocoronavirinae;
Betacoronavirus; Sarbecovirus.

REFERENCE 1 (bases 1 to 29787)

AUTHORS Ge,X.Y., Li,J.L., Yang,X.L., Chmura,A.A., Zhu,G., Epstein,J.H.,
Mazet,J.K., Hu,B., Zhang,W., Peng,C., Zhang,Y.J., Luo,C.M., Tan,B.,
Wang,N., Zhu,Y., Cramer,G., Zhang,S.Y., Wang,L.F., Daszak,P. and
Shi,Z.L.

TITLE Isolation and characterization of a bat SARS-like coronavirus that
uses the ACE2 receptor

JOURNAL Nature 503, 535-538 (2013)

PUBMED [24172901](#)

REFERENCE 2 (bases 1 to 29787)

AUTHORS Ge,X.-Y., Li,J.-L., Yang,X.-L., Hu,B., Zhang,W., Peng,C.,
Zhang,Y.-J., Luo,C.-M., Tan,B., Wang,N., Zhu,Y., Cramer,G.,
Wang,L.-F., Daszak,P. and Shi,Z.-L.

TITLE Direct Submission

JOURNAL Submitted (08-APR-2013) Wuhan Institute of Virology, Chinese
Academy of Sciences, 44 Xiao Hong Shan, Wuhan, Hubei 430071, China

COMMENT ##Assembly-Data-START##
Sequencing Technology :: Sanger dideoxy sequencing
##Assembly-Data-END##

FEATURES Location/Qualifiers

source 1..29787
/organism="Bat SARS-like coronavirus RsSHC014"
/mol_type="genomic RNA"
/isolate="RsSHC014"
/host="Rhinolophus sinicus"
/db_xref="taxon:[1415851](#)"
/country="China"
/collection_date="17-Apr-2011"

[CDS](#) join(265..13398,13398..21485)
/ribosomal_slippage
/note="ORF1ab"
/codon_start=1
/product="non-structural polyprotein 1ab"
/protein_id="[AGZ48805.1](#)"
/translation="MESLVLGVNEKTHVQLSLPVLQVRDVLVRFVGFVGFVVEEALSEARE
HLKNGTCGLVELEKGVLPQLEQPYVFKRSDALSTNHGHKVVVELVAELDGIQYGRSGI
TLGVLVPHVGETPIAYRNVLLRKNKNGKAGGHSFGIDLKSYDLGDELGTDPIDYEQN
WNTKHGSGVLRRELTRELNGGAVTRYVDNDFCGPDGYPLDCIKDFLARAGKSMCTLSEQ
LDYIESKRGVYCCRDHEHEIAWFTERSDKSYEHQTPFEIKSAKFDTFKGECPKFVFP
LNSKVKVIQPRVEKKKTEGFMGRIRSVYPVSPQECNNMHLSTLMKCNHCDEVSWQTC
DPLKATCEHCGTENSVTEGPTTCGYLPTNAVVKMPCPACQDPEIGPEHSVVVDYHNHNS

IETRLRKGGRTRCFGGCVFAYVGCYNKRAYVWPRASADIGSGHTGITGDNVETLNEDL
 LEILSRERVNINIVGDFQLTEEVAILASFSASTSAFIDTIKSLDYKSFKAIVESCGN
 YKVTGKGPVKGAWNIGQQRSVLTPLCGFPSSQAAGVIRISIFARTLDAANHSIPDLQRAA
 VPTILDGISEQSLRLVDAMVYTSDLLTNSVIIMAYVTGGVLQQTQSQWLSNLLGTTVEKL
 RPIFAVWEAKLSAGVEFLKDAWEILKFLITGVFDIVKGQIQVALDNIKDCVKCFIDVV
 NKALEMCIQDVTIAGAKLRSNLNLEGEVIAQSKGLYRQCIRGKEQLQLLMLPKAPKEVT
 FLEGDSHDTVLTSEEVVLKNGELEALETPVDSFTNGAVVGTVPVCVNGMLLLEIKDKEQ
 YCALSPGLLATNNVFRKGGAPIKGVTFGEDTVEVQGYKNVRIITFELDERVDKVNE
 KCSVYTVESGTEVTEFACVVAEAVVKTLPVSDLLTNMGIDLDEWSVATFYLFDDAGE
 EKLSSRMVCSFYPPDDEEDCDECEEEVLEESCAHEYGTEEDYQGLPLEFGASTEMQ
 VEEEEEDWLGDATELSEHELESEPTPEEPVNFQFTGYLKLTDNVAIKCVDIVKEAQN
 NPTVIVNAANIHLKGGGVAGALNKATNGAMQKESDDYIKLNGPLAVGGSCLLSGHNL
 AKKCLHVVPNLNAGEDIQLLKAAYENFNSQDTLAPLLSAGIFGAKPLQSLQVCVQT
 VRTQVYIAVNDKALYEQVVMYDLSLKPVEAPKQEEPRTEDEPKIEEKSVVQKPIDV
 KPKIKACIDEVTTLEETKFLTNKLLLFADINGKLYHDSHMLRGEDEMSFLEKDAPYM
 VGDVITSGDITCVVIPSKKAGGTEMLSRALKKVPVDEYITTPYGGCAGYTLLEAKT
 ALKKCKSAFYVLPSETPNAKEEILGTVSWNLREMLAHEETRKLMPICMDVRAIMATI
 QRKYKGIKVGQEGIVDYGVRFFFTYSKEPVASIIKMLNSLNEPLVTMPIGYVTHGFNLE
 EAARCMRSLKAPAVVSVSPDAVTTYNGYLTSSSKTPEEHFVETVSLAGSYRDWSYSG
 QRTELGVEFLKRGDKIVYHTLESPVEFHLDEGEVPLDCLKSLLSLREVTKIKVFTTVD
 N'NLHTQKLVQDMSFTYGGQFGPTYLDGADVTKIKPHVNHGKTFVFLPSDDTLRSEAFE
 YYHTLDESFLGRYMSALNHTKKWFPQVGLTSLKADNCCYLSVLLALQQIEVKFN
 APALQEAAYRARAGDAANFCALILAYSNKTVGELGVDRETMTHLLQHANLESKRVLN
 VVCKHCGQKTTTLTGVEAVMYMGTLSDNLKTVSIPCVGRDATQYLQVQESSFVMM
 SAPPAYEKLQQTFLCANEYTGNYQCGHYTHITAKE'LYRIDGAHLTKMSEYKGPVTD
 VFYKETSYSYTTIKPVSYKLDGVTYTEIEPKLDGYKKNAYYTEQPIDLVPQTPLPNA
 SFDNFKLTCNFKFADNLNQMGTGTPASRELSVTFPDLNGDVVAIDYRHYSASFKK
 GAKLLHKKP'IVWHINQATTKTTPKNTWCLRCLWSTKFPVDTSNSEFVLAVEDTQGMNDL
 ACESQQTSEAVVENPTIQKEVLECDVKTTEVGVNVLKPSDEGVKVTQELGHEDLMA
 AYVENTSITIKKPNELSLALGLKTIATHGIAAINSPVPSKILAYVKPFLQAAVTSN
 CAKRLVQRMFNMYVVLTLFLQCTFTKSTNSRIRASLPTTIAKNSVKGVARLCLDA
 GINYVKSPKSKLFTIAMWLLLSICLGLSIYVTAALGVLLSNVAGPSYCSGVRESYL
 NSSNVTMDFCESGFPCSVCLSGLSDLSYPALETIQVTISSYKLDLITLGLAAEWL
 AYMLPTKFFYLLGLSALMQVFFGYFASHFISNSWLMWFIISIVQMAPVVSAMVRMYIFF
 ASFYIWKSYVHIMDGTSSCTMCMCYKRNRRATRVECTTIVNGMKSRYVYANGGRGFC
 KTHNWNCLNCDTFCGTSTFISDEVARDLSLQFKRPNPTDQSSYVVDVAVKNGALHL
 YFDKAGQKTYERHPLSHFVNLNLRANNTKGS'LPINVI'VFDGKSKCDESAARSASVYY
 SQLMCPILLLDQVLSDVGGSTEVSVMFDAYVDTFSATFSVPEMKLALVATHASE
 LAKGVALDGVLS'TFVSAARQGVVDTVDVTDKDVIECLKLSHSDLEVTGDCSNFMFLTY
 NKVENMTPRDLGACIDCNARHINAQVAKSHNVSLIWNVKDYMSLSEQLRKQIRSAAKK
 NNI'PFR'LCAT'TRQVNVNITTKISLKGKIVSTWFKMLKATL'LCVFAALV'CVIVM'PV
 HTLSAHDGYTNEIGYKAIQDGVTRDIISTDDCFANKHAGFDSWFSQRGGSYKNDKSC
 PVVAALITREIGFIVPGLPGTVLRAINGDFLHFLPRVFSAVGNICYTPSKLIEYSDFA
 TSACVLAECTIFKDAMGKPPYCYDTNLEGSISYSELRPDTRYVLMDGSIIQFPNT
 YLEGSVRVVTFFDAEYCRHGTCERSEAGICLSTSGRWLVNNEHYRALPGVFCGDAMN
 LIANIFTPLVQPVGALDVSASVVAGGIIAILVTC'AAAYFMKFRRAFGEYNHVVAANAL
 LFLMSFTILCLAPAYSFLPGVYVYLYLTFYFTNDVSLAHLQWFAMFSP'IVPFWIT
 AIYVFCISLKHCHWFNNYLKRVMFNGVTFSTFEEAALCTFLLNKEMYLKLRSETLL
 PLTQYNRYLALYNKYKYFSGALD'TSYREAACCHLAKALNDFNSNGADVLYQPQTSI
 TSAVLQSGFRKMAFSPGKVEGCMVQVTCGTTTLNGLWLD'TVYCPRHVICTAEDMLNP
 NYEDLLIRKSNHSLVQAGNVQLRVI'GHSMQNCLLRLKVDTSNPKTPKYFVRI'PQGP
 TFSVLACYNGSPSGVYQCAMRPNHTIKGSFLNGSCGSVGFNIDYDCVSFCYMHMELP
 TGVHAGTDLEKGYGPFVDRQTAQAAGDTAITLNVLAWLYAAVINGDRWFLNRFTTT
 LNDPFLVAMKYNYEPLTQDHVDILGPLSAQGTG'AVLDMCAALKELLQNGMNGRTILGS
 TILEDFTFPD'VVRQCSGVT'FQKFKKIVK'GTHHMLL'FLTSL'LLILVQSTQWSLFF
 VYENAF'LPFTLGI'MAIAACAMLLV'KHKHAFLCLFLLPSLATVAYFNMVYMPASVWMI
 MTWLELADTSLSGYRLKDCVMYASALVLLILMTARTVYD'AAARRVWTLMNVI'ITLVYKV
 YYGNALDQAI'SMWALV'ISVTSNYS'GVVTTIMFLARAI'VFCVEYYP'LLFITGNTLQCI
 MLVYCF'LYGCCCCY'FLGFLCLLNRYFR'LTGLVYDYL'VSTQEF'RYMNSQGLLPPKSSIDA
 FKLNIKLLGIGGKPCIKVATVQSKMSDVKCTSVVLLSVLQQLRVESSSK'LWAQCVQLH
 NDILLAKDTTEAF'EKVMSL'LVLLSMQGAVDINKLCEEMLDNRATLQAIASEFSSLPS
 YAAAYATAQEAYEQAVANGDSEVVLKLLKSLNVAKSEFDRDAAMQRKLEKMAQAMTQ
 MYKQARSEDKRAKVT'SAMQ'TMLFTMLRKLNDNALNII'INNARDGCVPLNI'IPLTAAK
 LMOVV'PDYGT'YKNTCDGNTFTYASALWEIQVVDADSKI'VQLSEINMNSP'NLAWPLI
 V'TALRANS'AVKLNELSPVALRQMSCAAGT'TQACTDDNALAYYNNKSGR'FV'LALL
 SDHQDLKWARFPKSDGTGTIYTELEPPCRFVTDTPKGPVKYLYFIKGLN'LNRMGMVL
 GSLAATVRLQAGNATEVPANSTVLSFC'AFVDP'AKAYKDYLAGSGQPITNCV'KMLCTH
 TGTGQAITVTP'EANMQESF'GGASCCLYCRCHIDHPNPKGFCDLKGYVQIPTTCAND
 PVGF'FLRN'TVCTVCGMWKGYGCS'CDQLREPMMQ'SADASTFLNRVCGVSAARLTPC'CGT
 TSDTVVYRAF'DIYNEKVAGFAKFLKTNCCRFQEKDEEGNLLDSYFVVKRHTMSNYQHE
 ETIYNL'VKNC'PAVAVHDFKFRV'DGDMVPHISRQRLTKYTMADLVYALRHFD'EGNC'DT
 LKEILV'TYNCDDDYFNKDKWYDFVENP'DILRVYANLGERV'RAQLLKT'VQFC'DAMRDA
 GIVGVL'TLDNQLNGNWDYDFGDFVQVAPGCGVPIVDSYYSLLMPLITL'TRALAAESHM
 DADLAKPLIKWDLKYDFTEERLCLFDRYFKYWDQTYHPNCINCLDDRCILH'CANFNV
 LFTSTVFPPTS'FGPLVRKIFVDGVPFVSTGYHFR'ELGVVHNQD'VNLHSSR'LSFKELLV
 YAADPAMHAASGNLLLDKRTTCF'VAAL'TNNVAFQTVKPGNFNKDFYDFAVSKGFFKE
 GSSVELKHFFFAQDGNAAISDYDYR'YNLPTMCDIRQLL'FVVEVVDKYFDCYDGGCIN

ANQVIVNNLDKSAGFFPNKWKARLYYDSMSYEDQDALFAYTKRNVIPITITQMNLYA
 ISAKNRARTVAGVVICSTMTNRQFHQKLLKSI AATRGATVVIIGTSKFYGGWHNMLKTV
 YSDVETPHLMGWDYPKCDRAMPNMLRIMASLVLRARKHSTCCNLSHRFYRLANCAQVL
 SEMVMCGGLYKVPGGTSSGDATTA YANSVFNICQAVTANVNALLS TDGNKIADKYVR
 NLQHRLYECLYRNRDVEHFVDEFYAYLRKHFSMMILSDDAVVCYNSNYAAQGLVASI
 KNFKAVLYQNNVFMSEAKCWTEIDLTKGPHFCSQHTMLVKQDDVYVLYPYPDPSRI
 LGAGCFVDDIVKTDGTLMIERFVSLAIDAYPLTKHPNQEYADVFLYLQYIRKLHDEL
 TGHMLDMYSVMLTNDNTSRWEPFYEAMYPHTVLQAVGACVLCNSQTSRRCGACIR
 RPFLLCKCCYDHYISTSHKLVLSVNPYVCNAPGCDVTDVDTQLYLGGMSYCKSHKPP
 SFPLCANGQVFLYKNTCVGSDNVTFNAIATCDWNTAGDYILANTCTERLKLFAAET
 LKATEETFKLSYGIATVREVLSDRELHLSWEVKGKPPPLNRNVYFTGYRVTKNSKVQI
 GEYTFEKGDYGDVAVYRGTTTYKLVNGDYFVLTSHTVMLPSAPTLVPEHYVRITGLY
 PTLNISDEFSSNVANYQKVGMMQKYSTLQGGPGTGKSHFAIGLALYPSARIIVYTACSH
 AAVDALCEKALKYLPIDKCSRIIPARARVECFDKFVNSTLEQVVFCTVNALPETTAD
 IVVFDEISMATNYDLSVNVNARLRAKHVYVIGDPAQLPAPRTLLTKGTLEPEYFNSVCR
 LMKITIGPDMFLGTCRRCRPAEIVDVSALVYDNKLAHKEKSAQCFKMFYKGVITHDVS
 LAINRPQYIGVREFLTRNPAWRKAVFISPYNSQNAVASKILGLPTQTVDSQGSSEYDY
 VIFTQTETAHSCNVNRFNVAITRAKIGILCIMSDDRDLKQFTSLEVP RRNVATLQ
 AENVYGLFKDCSKIITGLHPTQAPTHLSVDTKFKTEGLCVDIPGIPKDMTYRRLISMM
 GPKMNYQVNGYPNMFITREEAIRHVRWIGFDVEGCHATRDAVGTNLPLQLGFSTGVN
 LVAVPTGYVDTENNETFTRVNARPPPGDQFKHLIPLMYKGLPWNVRIKIVQMLSDTL
 KGLSDRVVFLWAHGFELTSMKYFVKIGPERTCCLCDKRATCFSTSSDYACWNHVS
 FDIYVNPFFMIDVQQWGTGNLQSNHDQHCQVHGNHVASCDAIMTRCLAVHECFVKRV
 DWSVEYPIIGDELKINSACRKYQHMVVKSALLADKFPVLDHIGNPKAIKVPQAEVEV
 FLEDAQPCSDKAYKIEELFYSYATHHDKFTDGVCLFWNCNVDRYFNAYIVCRFDRVL
 SNLNLPGCDGGLYVKNHAFHTPAFDKSAFTNLKQLPFFYYS DSPCESHGKQVSDID
 YVPLKSATCITRNLGGAVCRHHANEYRQYLDAYNMMISAGFSLWIYKQFDTYNLWNT
 FTRLQSLNVAYNVNVKGFHDGQAGEAPVSIINNAVYTKVDGV DVEIFENKTTLPVNV
 APFLWAKRNIKPVPEIKILNNLGVDIAANTVVWDYKREPAHMSTIGVCTMTDIAKKP
 TESACSSLTFLDGRVEGQVDFRNARNGLVITEGSVKGLTPSKGPAQASVNGVTLIG
 ESVKTFQFNFKKVDGIIQQLPETYFTQSRDLEDFKPRSQMETDFLELAMDEFIQRYKL
 EGYAFEHIVYGDVSHGQLGGLHLMIGLAKRSQDSPLKLEDFIPMDS TVKNYFITDAQT
 GSSKCVCSVIDLLDDFVEIKSQDLSVISKVVKVTIDYAEISFMLWCKDGHVETFPY
 KLQASQAWQPGVAMPNLYKMQRMLEKCDLQNYGENAVIPKGIIMNVAKYTLQCYLN
 TLTAVPYNMRVIFHGAGSDKGVAPGTAVLRQWLPTGTLVSDLDLNFVSDADSTLIG
 DCATVHTANKWDLIISDMYDPKTKHVTKENDSKEGFFTYLCGFIKQKALAGGSVAVKI
 TEHSWNADLYKLMGHFSWWTAFVTNVNASSEAFILGVNYLGGPKQIDGYTMHANYI
 FWRNTNPIQLSSYSLFDMSKFPLKLRGTAVMYLKENQINDMIYSLLEKGRILIIRESNK
 VVSSDILVNI"

CDS

265..13413
 /note="ORF1a"
 /codon_start=1
 /product="non-structural polyprotein 1a"
 /protein_id="AG248804.1"
 /translation="MESLVGVNEKTHVQLSPLVLRVDRVLRVGFVGGDSVEEALSEARE
 HLKNGTCGLVELEKGVLPQLEQPYVFKRSDALSTNHGKVVVELVAELDGIQYGRSGI
 TLGVLVPHVGETPIAYRNVLRRKNGKAGGHSFGIDLKSYDLGDELGTDPIEDYEON
 WNTKHGSGVLRRELTRNLNGGAVTRYVDNFCGPDGYPLDCIKDFLARAGKSMCTLSEQ
 LDYIESKRGVYCCRDHEHEIAWFTERSDKSYEHQTPFEIKSAKFDTFKGECPKFVFP
 LNSKVKVIQPRVEKKKTEGFMGRIRSVYVPASQECNNMHLSTLMKCNHCDVSWQTC
 DFLKATKEHCCTENSVEGPTTCGYLPTNAVVKMPCACQDPEIGPEIGVSVVDYHNHN
 IETRLRKGGRTRCFGGCVFAYVGCYNKRAYVWPRASADIGSGHTGITGDNVETLNEDL
 LEILSRERNINIVGDFQLTEEVAILASFSASTSAFIDTIKSLDYKSFKAIVESCGN
 YKVTGKPKVKGAWNIGQQRSVLTPLCGFPSQAAGVIRSIFARTLDAANHSIPDLQRAA
 VTIIDGISEQLRLVDAMVYTSDDLNTSVIIMAYVTGGLVQQTQWLSNLLGTTVEKL
 RPIFAWVEAKLSAGVEFLKDAWEILKFLITGVFDIVKQIQVALDNIKDCVKCFIDV
 NKALEMCIQDQVTIAGAKLRSNLGVEVFIQSKGLYRQCIRGKEQLLMLPKAPKEVT
 FLEGSDHTVLTSEVVLLKNGELEALETPVDSFTNGAVVGTTPVCVNGMLLEIKDKEQ
 YCALSPGLLATNNVRLKGGAPIKGVTFGEDTVLEVQGYKNVRIITFELDERVDKVLNE
 KCSVYTVESGTEVTEFACVVAEAVVKTLPVSDLLTNMGI DLDEWSVATFYLFDDAGE
 EKLSSRMYSFYPPDDEEDCDECEEEVLEESCAHEYGTEEDYQGLPLEFGASTEMQ
 VEEEEEEDWLGDATELSEHELESEPTPEEPVNFQFTGYLKLTDNVAIKCVDIVKEAQN
 NPTVIVNAANIHLKHGGVAGALNKATNGAMQKESDDYIKLNGPLAVGGSCLLSGHNL
 AKKCLHVVGPNL NAGEDIQLLKAAENFNNSQDTLLAPLLSAGIFGAKPLQSLQVCVQT
 VRTQYVIAVDKALYEQVMDYLDLSLKPRAVEAPKQEPPEPRTEPDFKIEKSVVQPIDV
 KPKIKACIDEVTTLEETKFLTNKLLLFADINGKLYHDSHMLRGE DMSFLEKDPY
 VGDVITSGDITCVVIPS KAGGTTEMLSRALKKVPVDEYITTYPGQGCAGYTLLEAKT
 ALKCKSAFYVLPSETPNAKEEILGTVSWNLREMLAHAETRKLMPICMDVRAIMATI
 QRKYKIKVQEGIVDYGVRFFYTSKEPVASIIKMLNSLNEPLVMTPIGVVTHGFNLE
 EAARCMRSLKAPAVVSVSSPDAVTTYNGYLTSSSKTPEEHFVETVSLAGSYRDWSYSG
 QRTELGVFLKRGDKIVYHTLESPVEFHL DGEVLPDLKLSLLSREVKTIKVFTTVD
 NTNLTQLVDMSTYGGQFGPTYLDGADVTKIPHNHGEKTFVFLPSDDTLRSEAFE
 YHTLDESFLGRYMSALNHTKKWFPQVGGVLSIKWADNNCYLSSVLLALQQIEVKFN
 APALQEAAYRARAGDAANFCALILAYSNKTVGELGVDVRETMTHLLQHANLESARVNL
 VVCKHCGQKTTTLTGVEAVMYMGTLSYDNLKTGVSI PCVCGRDATQYLVQQESSFVMM
 SAPPAYKIQQGTFLCANEYTGNYQCCHYTHITAKETLYRIDGAHLTKMSEYKGPVTD
 VPKYKTSYTTTIKPVSYKLDGVTYTEIEPKLDGYKKNAYYTEQPIDLVP TQPLPNA

SFDNFKLTCSTNTKPADNLNQMTGFTKSPASRELSVTFPDLNGDVVAIDYRHYSASFKK
 GAKLLHKPIVWHINQATTKTTFKPNWCLRCLWSTKPVDTSNSEFEVLAVEDTQGMNDL
 ACESQOPTSEAVVENPTIQKEVLECDVKTTTEVGVNVLKPSDEGVKVTQELGHEDLMA
 AYVENTSITIKKPNELSLALGLKTIATHGIAAINSPVWSKILAYKPFPLGQAAVTTSN
 CAKRLVQRMFNMYVYVLLFQLCTFTKSTNSRIRASLPITIAKNSVKGVARLCLDA
 GINYVKSPKSKLFTIAMWLLLSICLGLSIYVTAALGVLLSNVGVGAPSYCSGVRESYL
 NSSNVTMTDFCEGSPFCVCLSGLDSDSYPALETIQVTISSYKLDLITGLAAEWWL
 AXMLFTKFFYLGLSALMQVFFGYFASHFISNSWLMWFIISIVQMAPVMSAMRMYIFF
 ASFYIWKSYVHMDGCTSSSTCMCYKRNRAIRVECTTIVNGMKRSFYVYANGGRGFC
 KTHNWNCLNCDTCTGSTFISDEVARDLSLQFKRPINPTDQSSYVVDVAVKNGALHL
 YFDKAGQKTYERHPLSHFVNLDNLRANNTKGSLLPINVIVFDGKSKCDESAARSASVYY
 SQLMCQPIILLDQVLSVDVGGSTEVSVMFDAYVDTFSATFSVPEMKLALVATAHSE
 LAKGVALDGVLSVFAARQGVVDTVDVTDKDVIECLKLSHSDLEVTGDCNNFMLTY
 NKVENMTPRDLGACIDCNARHINAQVAKSHNVSLIWNVVDYMSLSEQLRKQIRSAAK
 NNIPFRLTCATTRQVNVVITTKISLKGKIVSTWFKMLKATLLCVFAALVCYIVMPV
 HTLSAHDGYTNEIIGYKAIQDGVTRDIISTDDCFANKHAGFDSWFSQRGGSYKNDKSC
 PVVAALITREIGFIVPGLPGLVLAINGDFLHFLPRVFSAVGNICYTPSKLIEYSDFA
 TSACVLAECTIFKIDAMGKPPVPCYDITNLEGSISYSELRPDTRYVLMGDSIIQFPNT
 YLEGSVRVVTTFDAEYCRHGTCESEAGICLSTSGRWVLLNNEHYRALPGVFCGVDAMN
 LIANIFTPLVQPVGALDVSASVAVGGIIAILVTCAAYYFMKFRRAFGEYHNHVAANAL
 LFLMSFTILKCLAPAFSLPGVYVYLYLTYFTNDVSLAHLQWFAMFPIVPPWIT
 AIYVFCISLKHCHWFNNYLRKRVFMNGVTFSTFEEAALCTFLLNKEMYLKLRSETLL
 PLTQYNRYLALYNKYKYSFSGALDTSYREACCHLAKALNDFNSGADVLYQPQTSI
 TSAVLQSGFRKMAFPSPGKVEGCMVQVTCGTTTLNGLWLDVTYCPRHVICTAEDMLNP
 NYEDLLIRKSNHSLVQAGNVQLRVI GHSMQNCLLRKLVDTSNPKTPKYKFRVIRIQPGQ
 TFSVLACYNGSPSGVYQCAMRPNHTIKGSFLNGSCGSGVFNIDYDCVSFCYMHMELP
 TGVHAGTDLEKGFYGFVDRQTAQAAGTDAITLNLVLAWLYAAVINGDRWFLNRFTTT
 LNDFNLVAMKYNIEPLTQDHVDILGPLSAQTGIAVLDMAALKELLQNGMNGRTILGS
 TILEDFTFPDVVQRCSGVTQKFKKIVKGTTHHMLLFTLSLLILVQSTQWSLFFF
 VYENAFLPFTLGIIMATAACAMLLVKHKAFLCLFLPLSLATVAFYFNMYMPASVVMRI
 MTWLELADTSLSGYRLKDCVMYASALVLLILMTARTVYDDAARRVWTLMNVTILVYKV
 YYGNALDQAI SMWALVISVTSNYSVGVTTIMFLARAI VFCVEYYPPLLFITGNTLQCI
 MLVYCFGLYCCCCYFGLFCLLNRYFRLTLGVYDYLSTQEFRYMNSQGLLPPKSSIDA
 FKLNIKLLGIGGKPCIKVATVQSKMSDVKCTSVVLLSVLQQLRVESSSKLWAQCVGLH
 NDILLAKDTTEAFKVMVLSVLLSMQGAVDINKLCEMLDNRATLQAIASEFSSLS
 YAAAYATAQBAEQAVANGDSEVLLKLLKSLNVAKSEFDRDAAMQRKLEKMAQAMTQ
 MYKQARSEDKRAKVTSAMQTMFLMLRKLNDALNNIINNARDGCVPLNIIPLTAAK
 LMOVVDPDYGTYKNTCDGNTFTYASALWEIQVVDADSKIVQLSEINMNSPNLAWPLI
 VTALRANSVAVKLNQNELSPVALRQMSCAAGTTQACTDDNALAYNNSKGRFVLALL
 SDHQDLKWARFPKSDGTGTIYTELEPPCRFVTDTPKGPVKYLYFIKGLNLRGMVL
 GSLAATVRLQAGNATEVPA NSTVLSFCFAVDPAKAYKDYLASGGQPIITNCVKMLCTH
 TGTGQAITVTPKANMDQESFGGASCCLYCRCHIDHPNPKGFCDLKGKVVQIPTTCAND
 PVGFTLRNTVCTVCGMWKYGCSCDQLREFMMQSAADASTFLNGFAV"

CDS

21492..25262

/note="S"

/codon_start=1

/product="spike protein"

/protein_id="AGZ48806.1"

/translation="MKLLVLFATLVSSYTIIEKCLDFDDRTPPANTQFLSSHRGVYYP
 DDIFRSNVLHLVQDHFPLPDSNVTRFITPGLNFDNPIIPFRDGIYFAATEKSNVIRGW
 VFGSTMNKSQSVIIMNNSFNLVIRACNFELCDNPFVVLKSNNTQIPSYIFNNAFNC
 TFEYVSKDNFLDLGKPGNFKDLREFVFRNKDGFHLVHVSQYQIPSAASGLPTGFNALK
 PIFKLPGLINITNFRLLTAFPPRPDYWGTSAAAYFVGYLKPTTFMLKYDENGITDA
 VDCSQNPLAELKCSVKSFEIDKGIYQTSNFRVAPSKEVVRFPNITNLCPFGEVFNATF
 FPSVYAWERKRISNCVADYSVLNYSFSTFKCYGVSATKLNLCFVSNVYADSFVVKG
 DDVROIAPQQTGVIADYNYKLPDDFLGCVLAWNTNSKDSSTSGNYLYLRVRRSKLN
 PYERDLSNDIYSPGGQSCSAVGPNCYNPLRPGFFTTAGVGHQPYRVVLSFELLNAP
 ATVCGPKLSTDLIKNQCVNFFNGLTGTGVLTPSSKRFQPFQFGRDVSDFDTSVRDP
 KTSEILDISPSCFSGVSVITPGTNTSSEVAVLYQDVNCTDVPVAIHADQLTPSWRVYS
 TGNVFTQAGCLIGAHEHVDTSYECDIPIGAGICASYHTVSSLRSTQKSVIAYTMSL
 GADSSIAYSNNTIAIPTNFSISITTEVMPVSMAKTSVDCNMYICGDSTECANLLLQYG
 SFCTQLNRALSGIAVEQDRNTREVFAQVKQMYKTPTLKDFGGFNFSQILPDPLKPTR
 SFIEDLLFNKVTLADAGFMKQYGECLGDINARDLICAQKFNGLTVLPLLLTDDMIAAY
 TAALVSGTATAGWTFGAGAALQIPFAMQAYRFNGIGVTQNVLYENQKQIANQFNKAI
 SQIQESLTTTSTALGLQLQDVVNQNAQALNTLVKQLSNFGAIVSSVLDILSRLDKVEA
 EVQIDRLITGRQLQSLQTYVTQQLIRAAEIRASANLAATKMSVCLGQSKRVDFCGKGY
 HLMSFPQAAPHGVVFLHVTVVPSQERNFTTAPAI CHEGKAYFPREGVVFVNGTSWFT
 QRNFSPQIITDNTFVSGCDVVIIGIINNTVYDPLQPELDSFKEELDKYFKNHTSPD
 VDLGDISGNASVNNIQKEIDRLNEVAKNLNESLIDLQELGKYEQYIKWPYVWVWLGFI
 AGLIAIVMVTILLCCMTSCCCLKGCSCGSCCKFDEDDSEPVLLKGVKLYHT"

CDS

25271..26095

/note="ORF3a"

/codon_start=1

/product="hypothetical protein"

/protein_id="AGZ48807.1"

/translation="MDLFMRIFTLGSIQAPGKIDNASPASTVHATATIPLQASLPFG
 WLVIQVAFVAVQSAKTIISLNKRWQLALYKGFQFICNLLLLFVTIYSHLLLVAAAME

AQLFLYLYALIYFLQINACRIIMRCWLCWKCKSKNPLLYDANYFVCWHTHNYDYCIPY
 NSVTDITIVVTAGDGIPTPKLKEDYQIGGYSENWHSVGVKDYVVVHGYFTEVYQLESTQ
 ITTDTGIENATFFIFNKLKVDPPNVQIHTIDGSSGVVNPAMDPIYDEPTTTTSVPL"
 25692..26036
 /note="ORF3b"
 /codon_start=1
 /product="hypothetical protein"
 /protein_id="AGZ48808.1"
 /translation="MMPTTLFAGTHITMTTVYHITVSQIQLSLLQVTAFOHQNSKKT
 KLVLIRIGTQVLKTMSTLYMAISPKFTTSLSLHKLLQTLVLKMLHSSSLTSLKTHRM
 CKYTQSTALQEL"
 26120..26350
 /note="E"
 /codon_start=1
 /product="envelope protein"
 /protein_id="AGZ48809.1"
 /translation="MYSFVSEETGTLIVNSVLLFLAFVVFLLVTLAILTALRLCAYCC
 NIVNVSLVKPTVYVYSRVKLNLSQGVDPDLLV"
 26401..27066
 /note="M"
 /codon_start=1
 /product="membrane protein"
 /protein_id="AGZ48810.1"
 /translation="MAENGTISVEELKRLEQWNLVIGFLFLAWIMLLQFAYSNNRNF
 LYIKLVFLWLLVPVTLACFVLAAYRINWVTGGIAIAMACIVGLMWSYFIASFRLF
 ARTRMSWFSNPETNILLNVPLRGTIVTRPLMESELVIGAVIIRGHLRMAGHSLGRCDI
 KDLPEITVATSRTLSYYKLGASQVRGTDGSGFAAYNRYRIGNYKLNTHAGSNDNIAL
 LVQ"
 27077..27268
 /note="ORF6"
 /codon_start=1
 /product="hypothetical protein"
 /protein_id="AGZ48811.1"
 /translation="MFHLVDFQVTIAEILIIIMRTFRIAIWNLDMIISSIVRQLFKPL
 TKKKYSELDEEPEMELDYP"
 27276..27644
 /note="ORF7a"
 /codon_start=1
 /product="hypothetical protein"
 /protein_id="AGZ48812.1"
 /translation="MKIILFLTLIALASCELYHYQECVRRGTTVLLKEPCPSGTYEGNS
 PFHPLADNKFALCTCTSTHFAFACADGTRHTYQLRARSVSPKLFIRQEEVHQELYSPLF
 LIVAAALVFIILCFTIKRKTE"
 27641..27775
 /note="ORF7b"
 /codon_start=1
 /product="hypothetical protein"
 /protein_id="AGZ48813.1"
 /translation="MNELTLIDFYLCFLAFLFLVLIMLIIFWFSLELQDIEEPCNKV
 "
 27782..28147
 /note="ORF8"
 /codon_start=1
 /product="hypothetical protein"
 /protein_id="AGZ48814.1"
 /translation="MKLLIVLGLLTSVYCMHKECSIQECCENQFPQLEDPCPIHYSD
 WFIKIGPRKSARLVQLCAGEYGHRVPIHYEMFGNYTISCEPLEINCQNPVGSILIVRC
 SYDVFMEYHDVVRVLDLFI"
 28162..29430
 /note="N"
 /codon_start=1
 /product="nucleocapsid protein"
 /protein_id="AGZ48815.1"
 /translation="MSDNGFPQPNQRSAPRITFGGPTDPTDNNQNGRNGARPKQRRPQ
 GLPNNATASWFTALTQHGKEELRFRGQGVPIINTNSGPDDQIGYRRATRRVRGDGKM
 KELSRRWYFYLYGTGPEASLPYGANKEGIVVATEGALNTPKDHIGTRNPNNAATVL
 QLPQGTTLPKGFYAEGSRGGSQASSRSSRSRGNRNSTPGSSRGNSPARMASGGGET
 ALALLLLDRLNQLSEKVSQGGQQGQTVTKKSAEASKKPROKRTATKQYVNTQAFG
 RRGPEQTQGNFGDQLIRQGTDYKHWPIAQFAPSASAFFGMSRIGMVEVTPSGTWLTY
 HGAIKLDDKDPQKDNVILLNKHIDAYKTFPPTPEPKKDKKKTDEAQPLPQRQKQPT
 VTLLPAADMDDFSRQLQNSMSGASADSTQA"

ORIGIN

```

1 atattaggtt ttacctacc caggaaaagc caaccaacct cgatctcttg tagatctgtt
61 ctctaaacga actttaaaat ctgtgtagct gtcgctcgcc tgcgatgcta gtcacctac
121 gcagtataaa caataataaa ttttactgtc gttgacaaga aacgagtaac tcgtccctct
181 tctgcagact gcttacggtt ccgtccgtgt tgcagtcgat catcagcata cctaggtttc
241 gtcgggtgtg gaccgaaagg taagatggag agccttgttc ttggtgtcaa cgagaaaaca

```

301 cactgccaac tcagtttgcc tgttcttcag gtttagagacg tgctagtgcg tggcttcggg
 361 gactctgtgg aagagggcct atcggaggca cgtgaacatc ttaaaaatgg cactttgtgg
 421 ttagtagagc tggaaaaagc cgtactgcc cagcttgaac agccctatgt gttcattaaa
 481 cgttctgatg cctttagcag caatcacggc cataaggtcg ttgagctggg tgagaaattg
 541 gacggcattc agtacggctg tagcgggata actctgggag tactcgtgcc acatgtgggc
 601 gaaaccccaa tcgcataccg caatgttctt cttcgtgaaga acgtaataa gggagccggg
 661 ggccatagct ttggcatcga tctaaagtct tatgacttag gtgacgagct tggactgat
 721 ccatttgaag attataacca aaactggaac actaagcatg gcagttgggt actccgtgaa
 781 ctactcgtg agctcaatgg aggtgcagtt actcgtctatg tcgacaacaa cttctgtggc
 841 ccagatgggt accctcttga ttgcatacaa gattttctcg ctgcgcggg taagtcaatg
 901 tgcactcttt ctgaacaact tgattacatt gagtcgaaaa gaggtgtota ctgctgccgt
 961 gaccatgagc atgaaattgc ctggttccact gagcgtctcg ataagagota tgagcatcag
 1021 acacccttcg aaattaagag tgccaagaaa tttgacacct tcaaagggga atgccaaaag
 1081 tttgtatttc ctctcaatcc aaaagtcaaa gtcattcaac cacgcgttga aaagaaaag
 1141 actgaggggt tcatggggcg catacgttct gtgtaccctg ttgcactctc acaggaggtg
 1201 aacaacatgc acttgtctac cttgatgaaa tgtaatcatt gcgatgaagt ttcattggcag
 1261 acgtgcgatt ttctgaaagc cacttgtgaa cattgtggca ctgaaaattc agtcaatgaa
 1321 ggacctacta catgtgggta cctacctact aatgctgtag tgaaaatgcc atgtcctgcc
 1381 tgcacaagacc cagagattgg acctgagcat agtgtttag attatcacia ccaactcaaac
 1441 attgaaactc gactccgcaa gggaggtagg actagatgtt ttggaggctg tgtgtttgac
 1501 tatgttggct atgaaatgca gcgtgcctac tgggttccctc gtgctagtgc tgatatttgg
 1561 tcaggccata ccggcattac tggtgacaac gtggagaccg tgaatgagga tctccttgag
 1621 atactgagtc gtgaacgtgt taacattaac attgttggcg attttcagtt gactgaagag
 1681 gttgccatca ttttggcatc tttttccgct tctacaagtg cctttattga cactataaag
 1741 agtcttgatt ccaagtcttt caaagccatt gttgagctt gcggttaact caaagctacc
 1801 aagggaaaag ccgtaaaaag tgcttggaac attggacaac agagatcagt ttaaacacca
 1861 ctgtgtgggt ttccctcgca ggctgctggg gttatcagat caatcttgc acgcacactt
 1921 gatgcagcaa atcaactcaat tcctgacttg caaagagcag ctgtcaccat acttgatggg
 1981 atttctgaac agtctattgc tcttgcgat gccatggtt atacctcaga cctgctcacc
 2041 aacagtgtca tcattatggc atatgtaact ggtggtctg tacaacagac ttctcagttg
 2101 ttgtctaatt tgttgggac tactgttgaa aaactcagc ccatcttgc atgggttgag
 2161 gcaaaactta gtgcaggagt tgaatttctc aaggatgctt gggagattct caaatttctc
 2221 attacaggtg tttttgacat cgtcaagggt caaatacagg tcgctttaga taacatcaag
 2281 gatttgtgaa aatgcttcat tgatgttgtt aacaagccac ttgaaatgtg ctttgaccaa
 2341 gtcactatcg ctggcgcaaa gttgcgatca ctcaacttag gtgaagtott catcgtcaaa
 2401 agcaagggac tttaccgtca gtgtatacgt ggcaaggaac agctgcaact acttatgcct
 2461 cttaaaggcag caaaagaagt cacctttctt gaaggtgatt cacatgacac agtacttacc
 2521 tctgaggagg ttgttcttaa gaacgggtaa ctggaagcag tcgagacgac gttgtatagc
 2581 ttcacaaaatg gagctgtcgt tggcacacca gtttgtgtga atggcctcat gctcttagag
 2641 atcaaaagca aagaacaata ctgtgcattg tctcctgggt tactggctac aaacaatgac
 2701 tttcgcctaa aaggaggtgc accaattaaa ggtgtaacct ttggagaaga tactgttttg
 2761 gaagttcaag gttacaagaa tgtgagaatc acatttgagc ttgatgaacg ttttgacaaa
 2821 gtgcttaatg aaaaagtctc tgtctaacct gttgaaatcg gtaccgaagt taactgattt
 2881 gcatgtgttg tagcggaggc tgttgtgaa actttacaac cagtttctga tcttcttacc
 2941 aacatgggta ttgatcttga tgaatggagt gtggctacat tctatttgtt tgatgatgct
 3001 ggtgaagaaa aactttcttc acgtatgtac tgttctctt atcctcctga tgatgaggag
 3061 gatttggatg agtgtgagga agaagaggaa gtcctggaag aatcctgtgc ccatgaatac
 3121 ggtacagaag aagactacca aggtcttcca ctggaatttg gtgctcaaac tgaatgcaa
 3181 gttgaggaag aagaagaaga ggactggctt ggtgatgcta ccgaattatc ggagcatgaa
 3241 ctagaatcag aaccaacacc tgaggaacca gtttaaccagt ttactgggta tttaaaactt
 3301 actgacaatg ttgccattaa gtgtgtggac atcgtgaagg aggcgcaaaa tgcatacccc
 3361 acggtgattg taaatgctgc taacatacat ctgaaacatg gtggtggtgt agcaggtgca
 3421 ctcaacaagg caaccaacgg tgccatgcaa aaagagagcg atgattacat taagctaaat
 3481 ggtcctctcg cagttggagg ttcatgtttg ctttctggac ataactctgc taagaaggtg
 3541 ctgcattgtt ttggacctaa cctaaatgca ggtgaggaca tccagcttct taaggcagca
 3601 tacgaaaaat tcaatttaca ggacacttta cttgcaccat tttgtcagc aggcattatt
 3661 ggtgctaaac cacttcagtc tttacaagtg tgcgtgcaga cagttctgac acaggtttat
 3721 attgcagtca atgacaaaag cctttatgag caggttgtca tggattacct tgatagcctg
 3781 aagcctagag tggaaagcacc taaacaagag gagccacca ggaacagaaga tctaaaaat
 3841 gaggagaat ctgctgtaca gaagcctatc gatgtgaaag caaaaatgaa gcttgcatt
 3901 gatgagggta ccacaacact ggaagaaact aagtttctta ccaataagtt actcttgttt
 3961 gctgacatca atggttaagct ttaccatgat tctcacaaca tgccttagagg tgaagatag
 4021 tcttctcttg agaaggatgc accttacatg taggtgatg ttatcactag tggatgatc
 4081 acttgtgttg taataccctc caaaaaggct ggtggcacta cagagatgct ctcaagagct
 4141 ttgaagaaaag tgccagttga tgagtatata accacatacc ctggacaagg atgtgctggg
 4201 tatacacttg aggaagctaa gactgctctt aagaatgca aatctgcatt ttactgttta
 4261 ccttcagaaa cacctaagtc taaggaaagc attctaggaa ctgtgctcctg gaatttgaga
 4321 gaaatgcttg ctcatgctga agagacaaga aaattaatgc ctatatgcat ggatgttaga
 4381 gccataatg ccaccatcca acgcaagtac aaaggaatta aagttcaaga aggcattgtt
 4441 gactatggag tccgattctt cttttatact agtaagagc ctgtagcttc tatcattatg
 4501 aagctgaact ctctaaatga gccacttgtc acaatgccaa ttggttatgt gacacatggt
 4561 ttaatacttg aagaggtgac gcgctgtatg cgttctctta aagctcctgc cgtatgtgca
 4621 gtatcatcac cagatgctgt tactacatat aatggatacc tcaactctgc atcaagaca
 4681 cctgaggagc actttgtgga aacagttctt ttggctggtt cttacagaga ttggctctat
 4741 tcaggacagc gtacagagtt aggtgttgaa tttcttaagc gtggtgacaa aattgtgtac
 4801 cacactttgg agagccccgt cgagtttcat cttgacggcg aggttcttcc acttgacaaa
 4861 ctaaagagtc tcttatccct acgggaggtt aagactataa aagttctcac aactgtggac

```

4921 aacactaatc tccacacaca gcttgtggat atgtctatga catatggaca gcagtttggg
4981 ccaacatact tggatgggtc tgatgttaca aaaattaaac ctcatgtaaa tcatgagggg
5041 aagactttct ttgtactacc tagtgateac acactacgta gtgaagcttt cgagtactac
5101 cacactcttg atgagagttc tcttggtagr tacatgtctg ctttaaacca cacaagaaaa
5161 tggaaatttc ctcaagtttg tggtttaact tcaattaaat gggctgataa caattgttat
5221 ttgtctagtg ttttattagc gcttcaacag attgaagtca aattcaatgc accagcactt
5281 caagaggcct attatagagc cegtgtctgt gatgctgcta acttttgtgc actcactact
5341 gcttacagta ataaaagttc tggcgagctt ggtgatgtca gagagactat gaccoatctt
5401 ctacagcatg ctaatttggg atctgcaaag cgagttctta atgtggtgtg taaacattgc
5461 ggtcagaaaa ctactacctt aacgggtgta gaagctgtga tgtatatggg tactctatct
5521 tatgataatc ttaagacagg tgtttccatt ccatgtgtgt gtggctgtga tgcacacaa
5581 tatctagtac aacaagagtc tcttttggtt atgatgtctg caccacctgc tgaatataaa
5641 ttacagcaag gtacattttt atgtgcgaat gactacactg gtaattatca gtgtggtcat
5701 tatactcata taactgctaa ggagaccctc tatcgtattg atggagctca ccttacaaga
5761 atgtcagagt acaaggacc agtgactgat gttttctata aggaaacatc ttacactaca
5821 accattaagc ctgtgtcaca taaactcgat ggagttactt acacagagat tgaaccacaa
5881 ttggatgggt attataaaaa ggataatgct tactatacag agcagcctat agactctgta
5941 ccaactcaac cactacacaa tgcgagtttt gacaatttca aactcacatg ttctaacaca
6001 aaatttgcgt ataatttaaa tcaaatgaca ggcttcacaa agccagcttc acgagagcta
6061 tctgtcacat tcttcccaga cttgaatggc gatgtagtgg ctattgacta tagacactat
6121 tcagcgagtt tcaagaaggt tgctaaatta ctgcataagc caattgtttg gcaatataat
6181 caggctacga ccaagacaac gtttaaacca aacacttggg gtttacgttg tctttggagt
6241 acaagccag tagatacttc aaattcattt gaagttctgg cagtagaaga cacacaagga
6301 atggacaatc ttgcttgtga aagtcaacaa cccacctctg aagcagtagt gaaaaatctc
6361 accatacaga aggaagtcct agagtgtagc gtgaaaacta ccgaagtgtg aggcaatgct
6421 atacttaaac catcagatga aggtgttaaa gtaacacaag agttaggtca tgaggacctt
6481 atggctgcct acgtgaaaa cacaagcatt accattaaga aacctaatga gctttcatta
6541 gccttaggtt taaaacaat tgctactcat ggtattgctg caattaatag tgttccttgg
6601 agtaaaattt tggcatatgt caaacattc ttaggacagg cagcagttac aacatcaaac
6661 tgcgtaaga gattgtgca cgtatgtttt aacaactata tgccctatgt gcttactaca
6721 ctgttccaat tgtgtacttt taccaaaagt acaaatctta gaattagagc ttcactacct
6781 acgactattg ctaaaaatag tgttaagggg gtatgtagat tatgtttgga tgcctggcctc
6841 aattatgtaa agtcacccaa attttctaaa ttgttacta ttgcaatgtg gctattattg
6901 ttaagcattt gccttaggtc actaatctat gtaactgcag ctttaggtgt attattgtct
6961 aacgttggag ctctctctta ttgtagtggc gttagagaat cgtacctcaa tctctctaat
7021 gttactacta tggatttctg tgaaggttct tttccctgca gtgtttgttt aagtggatta
7081 gattcgtctg attcctatcc cgctcttgaa accattcagg tgacgatctc atcgtacaa
7141 ctagacttga caattttagg tctggctgct gactgggttt tggcatatat gttgttcaca
7201 aaattctttt atttttagg tctttcagct ataagcgagg tgttctttgg ctattttgct
7261 agtcatttca tcagcaattc ttggctcatg tggtttatca ttagtattgt acaaatggca
7321 ccgcttctg caatggttag gatgtacatt tctctgctt ctttactacta catatggaaa
7381 agctatgttc atattatgta tgggtgcaoc tcttogaact gcatgatgtg ctataagggc
7441 aatcgtgcca acgctgttga gtgtacaact attgttaatg gcaatgaagag atccttctat
7501 gtctatgcaa atggaggccg tggcttctgc aagactcaca attggaattg tctcaattgt
7561 gatacatttt gcaactgtag tacattcatt agttagtaag ttgctctgta tttgtcactc
7621 cagtttaaaa gaccaatcaa cctaccgac cagtcactgt atgtcgttga tagtgttgc
7681 gtgaaaaaac gtgcaattca cctcactttt gacaaggctg gcaaaaagac ttatgagaga
7741 caccactct cccattttgt caatttagac aatttgagag ctaacaacac taaaggttca
7801 ctacctatta atgtcatagt ctttgatggc aagtccaat ggcagcagtc tgcgtctagg
7861 tctgcatctg tgtactacag tcagctaag tgccaacctt tctgttgc tgaaccaagt
7921 ctgtagcag atgttggagg tagtactgaa gttctgttta agatgttga tgccttatgtc
7981 gacacctttt cagcaacttt tagtgttctc atggaaaaac ttaaggcaact cgttgcatac
8041 gctcatagcg agctggcaaa ggggttagct ttataggtgt tcttctctac atttgtgtca
8101 gctgctctgc aaggtgtgtg tgatactgat gtacacacaa aggatgtcat tgaatgtctc
8161 aaactttcac atcactccga cttggaagt acaggtgaca gttgtaacaa ctctcatgctc
8221 acctataaca aagttgaaaa catgacgcct agagactctg gcgcatgtat ttatgttaat
8281 gcaaggcata ttaatgtcca agtagcaaaa agtcacaatg tttcactcat ctggaatgta
8341 aaagactata tgtctttatc tgaacagctg cgtaaaacaa ttcgtagtgc tgcataaag
8401 aacaacatac ctttttagact aacttgtgct acaactagac aggtagtcaa tgcataaact
8461 actaaaatct cactcaaggg tggtaagatt gttagtactt ggtttaaact tatgcttaag
8521 gccacattat tgtgcgtctt tgctgcattg gtctgttaca tctttatgcc agtacataca
8581 ttgtctgctc atgatggtta cacaatgaa atcattggtt acaagccat tcaggatggt
8641 gcaactctgc acatcatttc factgatgat tgttttgcaa acaaacacgc tggttttgac
8701 tcatggttta gccagcgtgg tggttcatac aaaaatgaca aaagctgccc tgtagtactc
8761 gctatcatta caagagagat tggtttcata gtgctgtgct taccaggtac tgtgttgaga
8821 gcaatcaatg tgacttctt gcattttcta cctcgtgctt ttatgtgtgt tggcaacatt
8881 tgcacacac ctttcaaac cttgagtagt agtgattttg ctacctctgc ttcgcttctt
8941 gctgctgagt gtacaatttt taaggatgct atgggcaaac ctgtgccaata ttgttatgac
9001 actaatttgc tagaggttcc tatttcttat agtgagcttc gtcacagcac tctgtatgct
9061 cttatggatg gttccatcat acagtttctt aacacttacc tggaggggtc tgttagagta
9121 gtaacaactt ttgatgctga gtactgtaga catggtacat gtgaaagatc agaagctggt
9181 atttgcattt ctaccagtg tagatgggtt cttacaatg aacattatag agctctacct
9241 ggagtattct tgggttttga tgcaatgaa cttatagcaa acatctttac tcccctgtg
9301 caacctgtgt gtgcttttga tgtgtctgct tcagtagtgg ctggtgtgat tattgccata
9361 ttggtgactt gtgctgccta ctactttatg aaattcagac gtgcttttgg tgagtacaac
9421 catgttgggt ctgctaagtc acttttggtt ttgatgtctt tcaactatact ctgtctggca
9481 ccagcttata gctttttgcc aggagctctac tcagctctttt acttgaactt gacattctat

```

9541 ttcaactaatg atgtttcgtt cttggctcac cttcaatggt ttgcatggt ttctcctatt
 9601 gtgccttttt ggataacagc aatctatgta ttctgtatgt ctctgaagca ctgccattgg
 9661 ttctttaaca actactcttag gaaaagagtc atgtttaatg gagttacatt tagtaccttc
 9721 gaggaggctg ctttctgtac ctttttctgc aataaggaaa tgtacctaaa attgctgtagt
 9781 gagacactgt tgccacttac acagtacaac aggtatcttg ctctatataa caagtacaag
 9841 ttttccagtg gagccttaga tactaccagc tatcgtgaag cagcttctgt ccacttagca
 9901 aaggctctaa atgactttag caattcaggt gctgatgttc tctaccaacc accacagaca
 9961 tcaatcaact ctgctgttct gcagagtggg tttaggaaaa tggcattccc atcaggcaaa
 10021 gttgaagggt gcatggtaca agtaacctgt ggaactacaa ctcttaatgg attgtgggta
 10081 gatgacacag tatactgtcc aagacatgct atttgacacag cagaagacat gcttaatcct
 10141 aactatgaag atctgctcat tcgcaaatcc aaccatagct tccttgttca ggctggcaat
 10201 gtacaactcc gagttatcgg ccattctatg caaaattgtc tgcttaggct taagttgat
 10261 acctctaacc ctaagacacc caagtataaa tttgtccgta ttcaacctgg tcaaacattt
 10321 tcagttctag catgctacaa tggttcacca tctgggtgtt atcagtggtc catgagacct
 10381 aaccatacca ttaaaggctc tttccttaat ggatcattgt gtagtggttg ttttaacatt
 10441 gattatgatt gcgtgtcttt ctgctatag catcacatgg agcttccaac aggagtacac
 10501 gctggtactg aactagaagg taaattctat ggctcatttg ttgacagaca aactgcacag
 10561 gctgcaggtg cagacacagc cataacatta aatgttttgg catggctgta tgcgtctgtt
 10621 atcaatgggt atagggtgtt tcttaataga ttcaccacta ctttgaatga ctttaacctt
 10681 gtggcaatga agtacaacta tgaacctttg acacaagatc atgttgacat attgggacct
 10741 ctttctgctc aaacaggaat tgctgtctta gatatgtgtg ctgcttggaa agagctgtg
 10801 cagaatggta tgaatggctg tactatcctt ggtagcacta ttttagaaga tgaatttaca
 10861 ccatttgatg ttggttagaca atgctctggg gttaccttcc aaggtaagtt caagaaaatt
 10921 gtaagggca ctcatcattg gatgctttta actttcttga catcactatt gattcttctg
 10981 caaagtactc agtggctact gtttttcttt gtttacgaga atgcttcttt gccatttact
 11041 cttggtatta tggcaattgc tgcattgtct atgctgcttg ttaagcataa gcaagcattc
 11101 ttgtgcttgt ttctgttacc ttctcttga acagttgctt actttaatat ggtctacatg
 11161 cctgccagct ggggtgatcg tattatgaca tggcttgaat tggctgacac tagcttctgt
 11221 ggttatcgcc ttaaggactg tgttatgat gcttcagctt tagttttgct tattctcatg
 11281 acagctcgca ctggttatga tgcattgtct agacgtgttt ggacactgat gaatgtcatt
 11341 acacttgttt acaaagtcta ctatggtaat gctttagatc aagctatttc catgtgggccc
 11401 ttagttatgt ctgtaacctc taactattct ggtgtcgtca cgactatcat gtttttagct
 11461 agagctatag tgtttgtgtg tgttgagat taccattgtt tatttattac tggcaacacc
 11521 ttacagtgtg tcaatgctgt ttattgttct ttaggctatt gttgctgtgt ctattttggc
 11581 cttttctgtt tactcaaccg ttacttcagg cttactcttg gtgtttatga ctacttggtc
 11641 tctacacaag aatttaggta tatgaactcc caggggcttt tgcctcctaa gagtagtatt
 11701 gatgctttca agcttaacat taagtgtttg ggtattggag gtaaacatg tatcaagggt
 11761 gctactgtac agtctaaaat gtctgacgta aagtgcacat ctgtgggtact gctctcggtt
 11821 cttcaacaac ttagagtaga gtcatcttct aaattgtggg cacaatgtgt acaactccac
 11881 aatgatattc ttcttgcaaa agacacaact gaagctttcg agaagatggt ttctcttttg
 11941 tctgttttgc tatccatgca ggggtgctgta gacattaaca agttgtgca ggaatgctc
 12001 gacaaccgtg ctactcttca ggctattgct tcagaattta gttctttacc atcatatgct
 12061 gcttatgcca ctgcccgaag ggcctatgag caggctgtag ctaatggtga ttctgaagtc
 12121 gttctcaaaa agttaaagaa atctttgaat gtggcctaaa ctgagtttga cctgatgct
 12181 gccatgcaac gcaagtgtga aaagatggca gatcaggcta tgaccccaat gtacaaacag
 12241 gcaagatctg aggacaagag ggcaaaagta actagtgtca tgcaaaacat gcttttctact
 12301 atgcttagga agcttgataa tgcattgact aacaacatta tcaacaatgc cgtgtgaggt
 12361 tgtgttccac tcaacatcat accattgact acagcagcca aacttatggt tgttctcct
 12421 gattatggta cctacaagaa cacttgtgat ggtaacacct ttacatagtc atctgacctc
 12481 tgggaaatcc agcaagtgtg tgcagcagat agtaagattg ttcaacttag tgaattaac
 12541 atggataatt caccaaattc ggcttggcct cttattgtta cagctctaag agccaactca
 12601 gctgtcaaac tacagaataa tgaactgagt ccggtagcac tacgacagat gctctgtgct
 12661 gctggtacca cacaaacagc ttgtactgat gacaatgcac ttgcctacta taacaattcg
 12721 aaggaggtg gtttctgtct ggcattacta tcagaccacc aagatctcaa atgggctaga
 12781 ttcccctaaga gtgatggtac aggtacaatt tacacagaac tggaaaccac ttgtagggtt
 12841 gttacagaca caccaaaagg gcctaaaagt aaatactgt acttcatcaa aggtctaaat
 12901 aacctaaata gaggtatggt tctgggcagt ttactgtgta cagtactctc tcaggctgga
 12961 aatgtctacag aagtacctgc caattcaact gtgctttcct tctgtgctt tgcaagtagc
 13021 cctgctaaag catataagga ttacctagca agtggaggac aaccaatcac caactgtgtg
 13081 aagatggtgt gtacacacac tgggtacagga caggcaatta ctgtaacacc agaagctaac
 13141 atggaccaag agtctcttgg tgggtcctca tgcgtctgtt attgtatagc ccacattgat
 13201 catccaaatc ctaaaaggatt ttgtgacttg aaaggtaagt acgtccaaat acctaccact
 13261 tgtgctaatt acccagtggt ttttacactt agaaacacag tctgtaccgt ctgcggaatg
 13321 tggaaagggt atggctgtag ttgtgatcaa ctccgcgaac ccatgatgca gctgctggat
 13381 gcgtcaactg ttttaacagg gtttgcggtg taagtgcagc ccgtcttaca ccgtgagcca
 13441 caggcactag cactgatgtc gtctacaggg cttttgatg ttacaacgaa aaagttgctg
 13501 gttttgcaaa gttcctaaaa actaattgct gcccttcca ggagaaggat gaggaaaggca
 13561 atttattaga ctcttacttt gtagttaaga ggcatactat gtctaactac caacatgaag
 13621 agactattta taacttggtt aacttggtt aaaaattgtc cagcggttgc tgttcatgat ttttcaaac
 13681 ttagagtaga tgggtgacat gtaccacata tatcacgtca gcgtctaact aaatacacia
 13741 tggctgattt agtctatgct ctacgtcact ttgacagagg taattgtgac acattaaaag
 13801 aaatactcgt cacatacaat tgttgtgatg atgattatgt caataagaag gattgtgatg
 13861 acttctgtag gaactctgac atcttaccog tatatgctaa cttaggtgag cgtgtacgct
 13921 aagcattatt aaagactgta caattctgct atgctatgct tgaatgaggg attgtaggcg
 13981 tactgacatt agataatcag gatcttaatg ggaactggta cgatttgggt gatttctgtc
 14041 aagtgcacc aggctgctga gttcctattg tggattcata ctactcattg ctgatccca
 14101 tctcactct gactagggca ttggctgctg agtcccatat ggatgctgat ctgcgaaaa

14161 cacttattaa gtgggatttg ctgaaatatg attttacgga agagagactt tgtctcttcg
14221 accgttactt taaatattgg gaccagacat accatcccaa ttgtattaac tgtttggatg
14281 ataggtgat ccttcattgt gcaaacctta atgtgttatt ttctactgtg ttccaacta
14341 caagttttgg accactagta agaaaaatat ttgtagatgg tgttcctttt gttggttcaa
14401 ctggatacca ttttcgtgag ttaggagttg tacataatca ggatgtaaac ttacatagct
14461 cgcgtctcag tttcaaggaa ctttttagtg atgctgctga tccagccatg catgcaagctt
14521 ctggcaattt attgctagat aaacgcacta catgcttttc ggtagctgca ctaacaacaa
14581 atggttgctt tcaaaactgt aaaccogtga attttaacaa agacttttat gactttgctg
14641 tgtctaaagg tttctttaag gaaggaagtt ctggtgaact aaaacacttc tcttttgctc
14701 aggatggcaa tgctgctatc agtgattatg actattatcg ttataatctg ccaacaatgt
14761 gtgatatcag acaactccta ttcgtagtgg aagttgttga taaatacttt gattgtttacg
14821 atggtggctg tattaatgcc aaccaagtaa tcgttaacaa tctggacaaa tcagctgggt
14881 tcccatttaa taaatggggg aaggctagac tttattatga ctcaatgagt tatgaggatc
14941 aagatgcact tttcoggtat actaagcgta atgtcatccc tactataact caaatgaatc
15001 ttaagtatgc cattagtgca aagaatagag ctgcaccctg agctgggtgc tctatctgta
15061 gtactatgac aaatagacag tttcatcaga aattattgaa gtcaatagcc gccactagag
15121 gagctactgt ggtaattgga acaagcaaat tttacggctg ctggcataat atgttaaaaa
15181 ctgtttacag tgatgtagaa actccacacc ttatgggttg ggattatcca aaatgtgaca
15241 gagccatgcc taacatgctt aggataatgg cctctcttgt tcttgctcgc aaacatagca
15301 cttgctgtaa cttatcacac cgtttctaca ggttagctaa cgagtgctgc caagtattaa
15361 gtgagatggt ctactgtggc ttactcactat atgttaaac aggtggaaca tcatccgggt
15421 atgctacaac tgcttatgct aatagtgtct ttaacatttg tcaagctggt acagccaacg
15481 taaatgcact tctttcaact gatggtaata agatagctga caagtatgct cgcaatctac
15541 aacacaggct ctatgagtgt ctctatagaa atagggatgt tgatcacgaa ttcgtggatg
15601 agttttacgc ttaactcctg aaacatttct ccatgatgat tctttctgat gacgocggtg
15661 tgtgctataa cagtaactat gcggctcaag gtttagtagc tagcattaag aactttaagg
15721 cagttcttta ttatcaaaat aatgtgttca tgtctgaggc aaaatgttgg actgagactg
15781 accttactaa aggacctcac gaattttgct cacagcatac aatgctagtt aaacaaggag
15841 atgactacgt gtacctgctc taccagatc catcaagaat attaggcgcg gctggtttg
15901 tccgatgatat ttgcaaaaac gatggtacac ttatgattga gaggtttgtg tcattagcta
15961 ttgatgccta cccccttact aaacatccta atcaggagta tgctgatgct tttcacttgt
16021 atttacaata cattaggaag ttacatgatg agcttactgg tcacatgcta gacatgtatt
16081 ctgtaatgct acccaatgac aacacctcac ggtattggga acctgagttt tatgaagcta
16141 tgtacacacc acacacagtc ttgcaggctg taggtgcttg tgtattgtgt aattocacaga
16201 cttcacttcg ttgcgggtgc tgcattagga gaccattcct gtgctgcaag tgcgtctatg
16261 accatgtcat ttcaacatca cataaattag tgtgtctgt taatccctat gtttgcaatg
16321 caccagggtg tgatgtcact gacgtgacac aactatatct aggaggtatg agctattact
16381 gcaagtcaca taagcctccc attagtttct cattgtgtgc taatggtcag gttttgggt
16441 tatacaagaa cacagtgtga ggtagtgaca atgtcactga cttcaatgcg atagcaacat
16501 gtgattggac taatgctggc gattacatac ttgccaacac ttgtactgag agactcaaac
16561 tctttgcagc agaaacactc aaagctactg aggaaacatt caagctgca tatggtattg
16621 ccaactgtacg tgaagtactc tctgacagag aattgcatct ttcattggag gttgaaaaac
16681 ctgagaccacc attgaaataga aattatgtct ttaactggtta cctgtgaaact aaaaaatgta
16741 aagtacagat tggagagtac acctttgaaa aaggtgacta tgggtgatgct gttgtgtaca
16801 gaggtactac gacatcaaaa ttgaaatgtg gtgattactt tgtgttgaca tctcacactg
16861 taatgccact tagtgacctc actctagtgc cacaagagca ctatgtgaga attactgggt
16921 tgtaccacac actcaacatc tcagatgagt tttctagcaa tgttgcaaat tatcaaaagg
16981 tcggtatgca aaagtactct acaactccag gaccacctgg tactggtaag agtcattttg
17041 ccaatcgact tgctctctac taccatctg ctgcgatagt gtatacagct tgcctccatg
17101 cagctgttga tgccttatgc gaaaaggcat taaaatactt gcccatagat aaatgtagta
17161 gaatcatacc tgcgcgtgag cgcgtagagt gtttgacaa attcaaaagt aatcaaacac
17221 tagaacagta tgttttctgc actgtaaatg cattgccaga aacaactgct gatattgtag
17281 tctttgatga aatctctatg gctactaatt atgaottgag tgttgtcaat gctagacttc
17341 gtgcaaaaaca ctacgtctat attggcgatc ctgctcaatt accagccccg cgcaattgca
17401 tgaccaaaag cactactaga ccagaatact tcaattcagt gtgcgactt atgaaaaaca
17461 taggtccaga catgttcctt ggaacttgtc gccgttgtcc tgcgtgaaat gtcgacactg
17521 tgagtgtctt agtttatgat aataagctaa aggcacacaa ggagaagtca gctcaatgct
17581 tcaaaatggt ttacaagggt gttattacac atgatgttcc atctgcaatt aacagacctc
17641 aataggcgt tgtaagagaa tttcttacac gcaatcctgc ttggagaaaa gctgttttta
17701 tctcacctta taattcacag aatgctgtag cttcaaaaat cttaggattg cctacgcaga
17761 ctggttattc ctcccagggt tctgagtatg actatgtcat attcacacaa actactgaaa
17821 cagcacactc ttgcaatggt aaccgcttta atgtggctat cacagagca aaaattggca
17881 ttttgtgcat aatgtctgat agagatcttt atgacaaact gcaattcaca agtctagaag
17941 taccacgccc caatgtggct acattacagg cagaaaatgt aactggactt ttaaggact
18001 gtagtgaagt catcaccggt cttcatcaca cacaggcacc tacacacctc agcgttgata
18061 caaaatttaa gactgagga ctatgtgttg acataccagg cataccaaag gacatgacct
18121 accgtagact catctctatg atgggtttca aatgaatta ccaagttaat ggttacccca
18181 atatgtttat taccogttag gaagctattc gtcacgttcc tgcattggat ggtctcgagc
18241 tagagggctg tcatgcaact agagatgctg tgggtactaa cctacctctc cagctagtag
18301 tttctacagg ttttaactta gtatgtgtac cgactggcta tgttgacact gaaaaaaca
18361 cagaattcac cagagttaat gcaagacctc caccaggtga ccagtttaaa catcttatac
18421 cactcatgta yaaaggcttg ccctggaatg tagtgcgtat taagatagta caaatgctca
18481 gtgatacact gaaaggattg tcagacagag tctgttgygt cctttggggc catggcttgg
18541 agcttacatc aatgaagtac tttgtcaaga ttggacctga aagaacgtgc tgtctgtgtg
18601 acaaacgtgc aactgtcttt totacttcat cagatactta tgcctgctgg aatcattctg
18661 tgggttttga ctatgtctac aaccatttta tgattgatgt ccagcagctg ggttttacgg
18721 gtaaccttca gagtaaccac gaccaacatt gtcaagtgca tggaaatgca catgtggcta

18781 gttgtgatgc tatcatgact agatgcttgg cggtoctatga gtgctttgtt aagcgcgttg
18841 attggtctgt tgaatacccc attataggag atgaactgaa gattaattcc gcttgacagaa
18901 aagtacagca tatggttga aagtctgcat tgcttgctga taagtttoca gttcttcatg
18961 acattggaaa tccaaaggtc ataaagtggt tgccctcaggc tgaagtagaa tggaaattct
19021 atgatgctca gccatgcagt gacaaagcct ataaaataga ggaacttttc tattctctacg
19081 ctacacatca tgataaattc actgatggtg tttgtttgtt ttggaactgt aacggtgatc
19141 gttaccaccg caatgcaatt gtatgtaggt ttgacacgag agttttgtca aacttgaatt
19201 taccaggttg tgacgggtg agtttgatg tgaataagca tgcatccac acocagcctt
19261 ttgataaaa gtcatttacc aatttaaagc aattgccttt cttttattat tctgacagtc
19321 ctgtgtgatc tcatggcaaa caagtagtgt cagatattga ttatgtacca cttaaatctg
19381 ctacgtgtat tacacgatgc aatttgggag gtgctggttg cagacacat gcaaatgagt
19441 accgacagta cttagatgca tataacatga tgatttctgc tggatttagc ctatggattt
19501 acaaacagtt tgatacttat aatctgtgga atacattcac caggttacag agtttagaaa
19561 atgtggccta caatgttgtt aacaaggac acttogatgg acaagctggt gaagcactg
19621 tttccatcat taataatgct gtttacacaa aggtagatgg tgttgatgta gagatctttg
19681 aaacaagac aacacttctc gttaatgttg cgtttgagct ttgggctaag cgtaacatta
19741 aaccagtgc acagattaa agttaaagc atactcaata acttgggtgt cगतatcgct gctaactg
19801 tggctctggg ctacaagaga gaagcaccag cacatatgtc aacaataggt gctgcacaa
19861 tgaccgacat tgctaagaaa cctactgaga gtgctgttcc ctcgcttact gcttattttg
19921 atggttagagt ggaaggacg gttagacctt ttgaaaatgc ccgtaatggt gttttaataa
19981 cagaagggtc agttaaaggt ttaacacctt caaagggttc agcacaagct agtgaactg
20041 gagtcacatt aattgggaaa tccgtaaaaa cacagtttaa ctattttaag aaagtagatg
20101 gcattattca acagttgctt gaaacctact ttactcagag ccgagactta gaggatttca
20161 agcccagatc acaaatggaa actgactttc ttgagctcgc tatggatgaa ttcatacaac
20221 ggtataagct agagggttat gccttcgaac atatcgttta tggggatttc agtcatggac
20281 aacttggcgg ccttcatcta atgattggtt tagccaagcg ctccacaagat tcaccctta
20341 aattagagga ctttatccct atggatagca cagtgaaaaa ttacttcata acagatgcac
20401 aacaggttcc atcaaaatgt gtgtgctctg ttattgacct tttacttgat gactttgttg
20461 agataataaa gtcacaggat ttgtcagtaa tttctaaggt agtcaagggt acaattgact
20521 acgctgagat ttcattcatg ctttgggtga aagatggaca cgttgaaacc ttctacccta
20581 aattacaagc aagtcaagcg tggcaaccgg gggttgcaat gcctaacttg tacaagatgc
20641 aaagaatgct tcttgaaaag tgtgaccttc agaattatgg tgaaaatgct gtcataccaa
20701 aaggaataat gatgaatgtc gcaaaatata ctcaactgtg tcaatactta aatacactta
20761 ctttagctgt accctacaac atgagagtta ttcactttgg tgctggatct gataaaggag
20821 ttgcaccagg tacagctgta ctacagacat gggtgccaac tggcacacta cttgtcgatt
20881 cagaccttaa tgactctctc tctgacgcgg attctacttt aattggagac tgtgcaacag
20941 tacatcagcc taataaatgg gatctcatta ttagcgatat gtatgacctt aagacaaaa
21001 atgtgacaaa agagaacgca tcaaaagaag ggtttttcac ttactgtgtt ggatttataa
21061 agcaaaagct agccttgggt ggctctgtgg ctgtgaagat aacagagcat ttttgaatg
21121 ctgatcttta caagcttatg ggacacttct catgggtggac agcttttgtt acaaatgtaa
21181 atgcacatc atcagaagca tttctaattg gggttaacta tctaggcaag ccaaaaggac
21241 aaattgatgg ctataacctg catgctaact acatcttttg gaggaacaca aatcctatc
21301 aattgtcttc tttgactact tttgacatga gcaagtttcc tctcaaatga agagggactg
21361 ctgttatgta tttaaaggag aatcagatca atgacatgat ttattctcta cttgagaaag
21421 gttagacttat cattagagag agtaacaaag ttgtggtgtc tagtgatatt tttagttaa
21481 tctgaacgaa catgaaattg ttagttttag tttttgtctc tctagtctcc tcttacacta
21541 tagagaagtg ccttgatttt gatgaccgca ctccacctgc aaatactcaa tttttatctt
21601 ctacacagag tgtttattac ccagatgaca tttttaggtc taatgtcttg catttagtac
21661 aagatcattt cctacctttt gactctaacg tcaccagggt tataacgttt ggctaaatt
21721 ttgataatcc cataataccc ttacgggatg gtattttatt tgctgagact gaaaagtcta
21781 atgttattag aggtgggttt tttggttcta caatgaacaa caaatctcaa tccgttataa
21841 taatgaacaa ctcaactaat tttagctata gggcttgtaa ttttgagttg tgtgacaatc
21901 ctttttttgt tgtgttgaat tctaacaaca ctcaaatacc atcttacata ttttaaatg
21961 cattcaattg cacatttgaa tatgtttcta aggattttaa cctagacctt ggtgaaaaac
22021 caggtaatth caaggatctc agagagtttg ttttcaggaa taaagatggt tttttgcatg
22081 tttattccgg ttaccaacc ctttctgctg ccagtgtttt gccaaactgtt ttaaatgac
22141 tcaaacctat tttcaagtta cctctgggta ttaatattac taatttcaga acacttctga
22201 ctgcttttcc gcctagacct gattattggg gtacttccagc tgcagcttat tttgtaggat
22261 atttaaaacc aactacatc atgctcaagt atgatgaaa tggtaacaac acagatgctg
22321 tcgattgttc tcaaaatcca cttgctgaac tcaaatgctc tgttaaaagt tttgagattg
22381 acaaaggaa ttatcaaac tccaatttta gggtagcacc ctcaaaggaa gttgtgaggt
22441 tccctaatat tacaacctg tgtccttttg gggaggtttt taatgctact acatttctct
22501 ctgtctatgc atgggagagg aaaagaattt ctaattgtgt tgctgattac tctgtactct
22561 acaactcaac atctttttca acttttaagt gttatggcgt ttctgcoact aagctgaatg
22621 acctttgctt ctccaagctc tatgcagatt cattogtagt caaaggagat gatgaaaggc
22681 aaatagcacc aggacagacc ggtgttattg ctgattataa ttacaatta ccagatgact
22741 tcttgggttg tgtcctagca tggaaacacca attctaaaga ttcttccact tccggttaatt
22801 ataattattt atatagatgg gttagaaggt ctaagcttaa cccttatgag cgcgacttat
22861 ctaacgacat ctattcacct ggaggtcagt cttgctcagc ttaggttcoct aattgttata
22921 accccttacg tccatattgg ttttttaca cagctggtgt tggacaccaa ccttatagag
22981 ttgtagtagt ttcttttgaa cttttaaatg caccgctac agtctgtgga ccaaaattat
23041 ccaccgacct tattaaaaat caatgtgtca attttaactt taatggactc actggtactg
23101 gtgtgttaac ccttcttca aagagatttc aaccatttca acaatttggc cgtgtgttt
23161 cggattttac tgattcagtt cgagatccga agacgtctga aatattagac atttcacctt
23221 gctcttttgg cgggtgaagt gtaatcacac ctggaacaaa tacttcatca gaagttgctg
23281 ttctatatca agatgttaac tgcactgatg ttctgttagc aatccatgca gaccaactca
23341 caccttcttg gcgcgtatac tctactggaa ataattgatt tcaaacccag gcaggctgct

23401 ttataggagc tgagcatgtc gacacttctt atgagtgcga cattcctatt ggagctggca
 23461 tttgtgctag ttaccataca gtttcttcat tacgtagtac tagccaaaaa tctattgtgg
 23521 cttatactat gtccttaggt gctgatagtt caattgctta ctctaataac accattgcta
 23581 tacctactaa cttcttcaatt agcattacta cagaagtaat gcctgtttct atggctaataa
 23641 cctctgtaga ttgtaatatg tacatctgog gagattctac tgaatgtgct aatttgcttc
 23701 tccaatatgg tagcttttgc acacaactaa atcgtgcaact ctcaaggtatt gctggtgaac
 23761 aggatcgcaa cacacgtgaa gtgttcgctc aagtcaaaa aatgtacaaa accccaactt
 23821 tgaagattt gggtggtttt aatttttcaac aaatattacc tgaccctcta aagccaacta
 23881 agaggctctt tattgaggac ttgctcttta ataaggtgac actcgtgat gctggcttta
 23941 tgaagcaata tgggcaatgc ctaggtgata ttaatgctag agatctcatt tgtgocgaga
 24001 agttcaatgg acttacaatg ctgccacctc tgcctactga tgatattgatt gctgcctaca
 24061 ctgctgctct agtttagtgt actgccactg ctggatggac attcgtgctt ggcgctgctc
 24121 ttcaaatacc ttttctatg caaatggcat ataggttcaa tggcattgga gttactcaaa
 24181 atgttctcta tgagaaccaa aaacaaatog ccaatcaatt taacaaggcg atcagccaaa
 24241 ttcaagaatc actcacaaca acatccactg cattgggcaa gctgcaagat gtcgtcaacc
 24301 agaattgctca agcattaaac acacttgcta acaacttag ctccaatttt ggtgogattt
 24361 caagtgtgct aaatgatatc ctcttcgctc ttgataaagt cgagggcagag gtacaaattg
 24421 acaggttaat tacaggcaga ctgcaagoc ttcaaaccta tghtaacaaa caactaatca
 24481 gggctgctga aatcagggct tctgctaact ttgctgctac taaaatgtct gagtgtgttc
 24541 ttggacaatc aaaaagagtt gacttttgcg gaaagggcta ccatcttatg tcttcccac
 24601 aagcagcccc gctatggttt gtcttctac atgtcacata tgtgccatct caagagagaa
 24661 acttcaccac agcggcagca atttgtcatg aaggcaaacg atacttccct cgtgaaggty
 24721 tttttgtgtt taatggcact tctgtgttta ttacacagag gaacttcttt tctccacaaa
 24781 taattactac agacaataca tttgtctcgg gaagttgtga tgtcgttaatt ggcattcata
 24841 acaacacagt ttatgatcct ctgcaacctg agcttgactc attcaaaaga gactgggaca
 24901 agtacttcaa aaatcacaca tcaccagatg ttgatcttgg cgacatttca ggcattaacg
 24961 cttctgtcgt caacattcaa aaagaaatg accgctcaa tgaggctgct aaaaatttaa
 25021 atgaatcaact cattgacctt caagaattgg gaaaatatga gcaatatatt aaatggcctt
 25081 ggtatgtttg gctcggcttc attgctggac taattgccat cgtcatggtt acaactctgc
 25141 tttgttgcat gactatgtgt tgcagttgoc tcaagggtgc atgctcttgt ggttcttctg
 25201 gcaagtttga tgaggatgac tctgagccag ttctcaaggg tgtcaaatca cattacacat
 25261 aaacgaactt atggatttgt ttatgagaat ttttactctt ggatcaatta ctgcacagcc
 25321 aggaaaaaatt gacaatgctt ctctgcaag tactgttcat gctacagcaa cgataccgct
 25381 acaagcctca ctccccttct gatggcttgt tattggcgtt gcaatttctt ctgtttttca
 25441 gagcgtacc aaaataaatt cgctcaataa aagatggcag ctagcccttt ataaggcctt
 25501 caagttcatt tgcaatttac tgcctgctatt tgttaccatc tatcacatc ttttgcctgt
 25561 cgctgcaggat atggaggcgc aatttttgta cctctatgcc ttgatattatt ttctacaatg
 25621 catcaacgca tgtagaatta tcatgagatg ttggtttgt tggagtgca aatcaagaa
 25681 cccattactt tatgatgcca actactttgt ttgctggcac acacataact atgactactg
 25741 tataccatat aacagtgcca cagatacaat tgcgttact gcaggtgacg gcaattcaac
 25801 accaaaactc aaagaagact accaaattgg tggttattct gagaattggc actcaggtgt
 25861 taaagactat gtcggttgc atggctattt caccgaagt tactaccage ttgagctctac
 25921 acaaatctact acagacactg gtattgaaaa tgcacattc ttcatcttta caaagcttgt
 25981 taaagacca ccgaatgtgc aaatacacac aatcgacggc tcttcaggag ttgtaaatcc
 26041 agcaatggat ccaatttatg atgagccgac gacgactact agcgtgctt tghtaagcaca
 26101 agaaagtggag tacgaactta tgtactcatt cgtttcggaa gaaacaggta cgttaatagt
 26161 taatagcgtc cttcttttct ttgctttcgt ggtattcttg ctagtacacac tagccatcct
 26221 tactgcgctt cgattgtgtg cgtactgctg caatattgtt aacgtgagtt tagtaaaacc
 26281 aactgtttac gtttactcgc gtgttaaaaa tctgaactct tctcaaggag ttctgatct
 26341 tctggtctaa acgaactaac tattattatt attctgtttg gaactttaac attgcttatc
 26401 atggctgaga acgggactat ttccgttgag gagcttaaaa gactcctgga acaattggaac
 26461 ctagttaatag ctctctattt cctagcctgg attatgttac tacaatttgc ctattctaat
 26521 cggaacagggt ttttgtacat aataaagctt gtttctctgt ggcctctgtg gccagtaaca
 26581 cttgcttctt ttgtgcttgc tgcgttttac agaattaatt ggggtgactg cgggattgcy
 26641 attgcaatgg cttgtattgt aggcctgatg tggcttagct acttcattgc ttccttcagg
 26701 ctatttgctc gtaccgctc cttcttttct aatgtggtca tcaaccag aaacaaaact tcttctcaat
 26761 gtgcctcttc gagggacaat tgtgaccaga ccgctcatgg aaagtgaact tgcattggc
 26821 gctgtgatca ttctgtgcca cttgctgatg gctggacact ccctagggcy cgtgacatc
 26881 aaggacctgc caaaagagat cactgtggct acatcacgaa cgctttctta ttcaaaatta
 26941 ggagcgtcgc agcgtgtag cactgattca ggttttctg catacaaccy ctaccgtatt
 27001 ggaactaca aattaaatc agaccacgoc ggtagcaacy acaatattgc tttgctagta
 27061 cagtaagtga caacagatgt ttcattctgt tgacttccag gttacaatag cagagattt
 27121 gattatcatt atgaggactt tcaggattgc tatttggaaat cttgatatga taataagttc
 27181 aatagtgaga caattattta agcctctaac taagaagaaa tattctgagt tagatgatga
 27241 agaacctatg gagttagatt atccataaaa cgaacatgaa aattattctc ttcctgactt
 27301 tgattgcaact tgcactcttc gagctatctc actatcagga gtgtgttaga ggtacaactg
 27361 tactactaaa agaaccttgc ccatctgcaa cttacgaggy caattcacca tttcatctc
 27421 ttgcccataa taaatttgc ctaacttgc ctagcactca ttttgccttt gcttgtgctg
 27481 acggtaactag acatacctat cagcttctg caagatcagt ttcacaaaaa ctttctatca
 27541 gacaagagga agttcaccaa gagctctact caccgctttt tctcattgtt gctgctctag
 27601 tttttataat actttgtttc accatthaaga gaaagacaga atgaatgagc tcaacttaat
 27661 tgacttctat ttgtgctttt tagcctttct gctattcctt gttctaataa tgcattattt
 27721 attttgggtt tcaactgaa cccaggatg agaagaacct tgaacaaag tcaaacgaa
 27781 catgaaactt ctcattgttt taggactctt aacatcagty tattgcatgc ataaagaatg
 27841 cagtatacaa gaatgtgtg aaaatcaacc attccaactt gaagcccat gtccaataca
 27901 ttattattcg gactggttta taaaaattgg acctcgcaag tctgctcgcc tagtacaact
 27961 ttgtgctggt gaatatggac acagagttoc aatacattat gaaatgtttg gcaattatac

```
28021 tatttcatgt gaaccacttg aaataaattg tcaaaaccca ccagttggaa gtctcattgt
28081 acgttggtca tatgatgttg actttatgga gtatcacgac gttcgtggtg ttctagattt
28141 catctaaacg aacaaactaa aatgtctgat aatggacccc aaccaaacca gcgtagtgcc
28201 ccccgatta catttggtgg acccacagat ccaactgaca ataaccagaa tggaggacgc
28261 aatggggcaa ggccaaaaca acgccgaccc caaggtttac ccaataatac tgcgtcttgg
28321 ttcacagctc tcaactcagca tggcaaggag gaacttagat tccctcgagg ccagggcggt
28381 ccaatcaaca ccaatagtgg tccagatgac caaattggct actaccgaag agctaccgca
28441 cgagttcgtg gtggtgacgg caaaatgaaa gagctcagcc ccagatggta cttttattac
28501 ctaggaaccg gcccagaagc ttcaacttcc tacggcgcta acaagaagg catcgtatgg
28561 gtcgcaactg agggagcctt gaacacacct aaagatcaca ttggcaccoc caatccta
28621 aacaatgctg ccaccgtgct acaacttctt caaggaacaa cattgcaaaa aggcttctac
28681 gcagagggga gcagaggcgg cagtcaagcc tcttctcgtt cttcgtcacg tagtcgctg
28741 aattcaagaa attcaactcc tggcagcagt aggggaaatt ctctgctcg aatggctagc
28801 ggagtggtg aaactgccct cgcgctattg ctgctagaca gattgaacca gcttgagagc
28861 aaagtttctg gtaaaaggcca acaacaacaa ggccaaactg tactaagaa atctgctgct
28921 gagcatcta aaaagcctcg ccaaaaactg actgctacaa aacagtacaa cgtcaactca
28981 gcatttggga gacgtggtcc agaacaaaacc caaggaaact ttggggatca agaccta
29041 agacaaggaa ctgattacaa acattggcgg caaattgcac aatttgctcc gagtgcctct
29101 gcattcttcc gaatgtcacg cattggcatg gaagtccac cttcgggaac atggctgact
29161 tatcatggag ccattaaatt ggatgacaaa gatccacaat tcaaagacaa cgtcactactg
29221 ctgaacaagc acattgacgc atacaaaaca ttcccaccaa cagagcctaa aaaggacaaa
29281 aagaaaaaga ctgatgaagc tcagccttta ccgcagagac aaaagaagca gcccaactgtg
29341 actcttcttc ctgcygctga catggatgat ttctccagac aacttcaaaa ttccatgagt
29401 ggagcttctg ctgattcaac tcaggcataa aactcatga tgaccacaca aggcagatgg
29461 gctatgtaaa cgttttcgtc attccgttta cgatacatag tctactcttg tgcagaatga
29521 attctcgtag ctaaacagca caagtaggtt tagttaactt taatctcaca tagcaatctt
29581 taatcaatgt gtaacattag ggaggacttg aaagagccac cacattttca ccgaggccac
29641 gcggagtacg atcgagggtg cagtgaataa tgtaggggag agctgcctat atggaagagc
29701 cctaattgtg aaaattaatt ttagtagtgc tatcccatg tgattttaat agcttcttag
29761 gagaatgaca aaaaaaaaa aaaaaaa
```

//