**Severe acute respiratory syndrome coronavirus 2 isolate SARS-CoV-2/human/BHR/21120016543\_S81\_L001/2021, complete genome**

GenBank: OM067048.1

[FASTA](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?report=fasta) [Graphics](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?report=graph)

[Go to:](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1" \l "goto2171661271_0)

LOCUS OM067048 29769 bp RNA linear VRL 30-DEC-2021

DEFINITION Severe acute respiratory syndrome coronavirus 2 isolate

SARS-CoV-2/human/BHR/21120016543\_S81\_L001/2021, complete genome.

ACCESSION OM067048

VERSION OM067048.1

KEYWORDS .

SOURCE Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

ORGANISM [Severe acute respiratory syndrome coronavirus 2](https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=2697049)

Viruses; Riboviria; Orthornavirae; Pisuviricota; Pisoniviricetes;

Nidovirales; Cornidovirineae; Coronaviridae; Orthocoronavirinae;

Betacoronavirus; Sarbecovirus.

REFERENCE 1 (bases 1 to 29769)

AUTHORS Alwasti,H., Altaif,Z., Marhoon,A., AlHujairi,Z., AlTooq,M.,

Khamees,F., AlAnsari,W., AlAbbas,Z. and Almoamen,G.

TITLE Direct Submission

JOURNAL Submitted (30-DEC-2021) Communicable Disease Laboratory, Public

Health Directorate, 1124, Manama 12, Bahrain

COMMENT ##Assembly-Data-START##

Assembly Method :: Abiomix v. 1.0

Sequencing Technology :: Illumina

##Assembly-Data-END##

FEATURES Location/Qualifiers

source 1..29769

/organism="Severe acute respiratory syndrome coronavirus

2"

/mol\_type="genomic RNA"

/isolate="SARS-CoV-2/human/BHR/21120016543\_S81\_L001/2021"

/isolation\_source="nasal swab"

/host="Homo sapiens"

/db\_xref="taxon:[2697049](https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=2697049)"

/country="Bahrain"

/collection\_date="2021-12-08"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=228&to=21505) 228..21505

/gene="ORF1ab"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?location=228:13418,13418:21505) join(228..13418,13418..21505)

/gene="ORF1ab"

/ribosomal\_slippage

/codon\_start=1

/product="ORF1ab polyprotein"

/protein\_id="[UHU37310.1](https://www.ncbi.nlm.nih.gov/protein/2171661272)"

/translation="MESLVPGFNEKTHVQLSLPVLQVRDVLVRGFGDSVEEVLSEARQ

HLKDGTCGLVEVEKGVLPQLEQPYVFIKRSDARTAPHGHVMVELVAELEGIQYGRSGE

TLGVLVPHVGEIPVAYRKVLLRKNGNKGAGGHSYGADLKSFDLGDELGTDPYEDFQEN

WNTKHSSGVTRELMRELNGGAYTRYVDNNFCGPDGYPLECIKDLLARAGKASCTLSEQ

LDFIDTKRGVYCCREHEHEIAWYTERSEKSYELQTPFEIKLAKKFDTFNGECPNFVFP

LNSIIKTIQPRVEKKKLDGFMGRIRSVYPVASPNECNQMCLSTLMKCDHCGETSWQTG

DFVKATCEFCGTENLTKEGATTCGYLPQNAVVKIYCPACHNSEVGPEHSLAEYHNESG

LKTILRKGGRTIAFGGCVFSYVGCHNKCAYWVPRASANIGCNHTGVVGEGSEGLNDNL

LEILQKEKVNINIVGDFKLNEEIAIILASFSASTSAFVETVKGLDYKAFKQIVESCGN

FKVTKGKAKKGAWNIGEQKSILSPLYAVASEAARVVRSIFSRTLETAQNSVRVLQKAA

ITILDGISQYSLRLIDAMMFTSDLATNNLVVMAYITGGVVQLTSQWLTNIFGTVYEKL

KPVLDWLEEKFKEGVEFLRDGWEIVKFISTCACEIVGGQIVTCAKEIKESVQTFFKLV

NKFLALCADSIIIGGAKLKALNLGETFVTHSKGLYRKCVKSREETGLLMPLKAPKEII

FLEGETLPTEVLTEEVVLKTGDLQPLEQPTSEAVEAPLVGTPVCINGLMLLEIKDTEK

YCALAPNMMVTNNTFTLKGGAPTKVTFGDDTVIEVQGYKSVNITFELDERIDKVLNER

CSAYTVELGTEVNEFACVVADAVVKTLQPVSELLTPLGIDLDEWSMATYYLFDESGEF

KLASHMYCSFYPPDEDEEEGDCEEEEFEPSTQYEYGTEDDYQGKPLEFGATSAALQPE

EEQEEDWLDDDSQQTVGQQDGSEDNQTTTIQTIVEVQPQLEMELTPVVQTIEVNSFSG

YLKLTDNVYIKNADIVEEAKKVKPTVVVNAANVYLKHGGGVAGALNKATNNAMQVESD

DYIATNGPLKVGGSCVLSGHNLAKHCLHVVGPNVNKGEDIQLLKSAYENFNQHEVLLA

PLLSAGIFGADPIHSLRVCVDTVRTNVYLAVFDKNLYDKLVSSFLEMKSEKQVEQKIA

EIPKEEVKPFITESKPSVEQRKQDDKKIKACVEEVTTTLEETKFLTENLLLYIDINGN

LHPDSATLVSDIDITFLKKDAPYIVGDVVQEGVLTAVVIPTKKAGGTTEMLAKALRKV

PTDNYITTYPGQGLNGYTVEEAKTVLKKCKSAFYILPSIISNEKQEILGTVSWNLREM

LAHAEETRKLMPVCVETKAIVSTIQRKYKGIKIQEGVVDYGARFYFYTSKTTVASLIN

TLNDLNETLVTMPLGYVTHGLNLEEAARYMRSLKVPATVSVSSPDAVTAYNGYLTSSS

KTPEEHFIETISLAGSYKDWSYSGQSTQLGIEFLKRGDKSVYYTSNPTTFHLDGEVIT

FDNLKTLLSLREVRTIKVFTTVDNINLHTQVVDMSMTYGQQFGPTYLDGADVTKIKPH

NSHEGKTFYVLPNDDTLRVEAFEYYHTTDPSFLGRYMSALNHTKKWKYPQVNGLTSIK

WADNNCYLATALLTLQQIELKFNPPALQDAYYRARAGEAANFCALILAYCNKTVGELG

DVRETMSYLFQHANLDSCKRVLNVVCKTCGQQQTTLKGVEAVMYMGTLSYEQFKKGVQ

IPCTCGKQATKYLVQQESPFVMMSAPPAQYELKHGTFTCASEYTGNYQCGHYKHITSK

ETLYCIDGALLTKSSEYKGPITDVFYKENSYTTTIKPVTYKLDGVVCTEIDPKLDNYY

KKDNSYFTEQPIDLVPNQPYPNASFDNFKFVCDNIKFADDLNQLTGYKKPASRELKVT

FFPDLNGDVVAIDYKHYTPSFKKGAKLLHKPIVWHVNNATNKATYKPNTWCIRCLWST

KPVETSNSFDVLKSEDAQGMDNLACEDLKPVSEEVVENPTIQKDVLECNVKTTEVVGD

IILKPANNIKITEEVGHTDLMAAYVDNSSLTIKKPNELSRVLGLKTLATHGLAAVNSV

PWDTIANYAKPFLNKVVSTTTNIVTRCLNRVCTNYMPYFFTLLLQLCTFTRSTNSRIK

ASMPTTIAKNTVKSVGKFCLEASFNYLKSPNFSKLINIIIWFLLLSVCLGSLIYSTAA

LGVLMSNLGMPSYCTGYREGYLNSTNVTIATYCTGSIPCSVCLSGLDSLDTYPSLETI

QITISSFKWDLTAFGLVAEWFLAYILFTRFFYVLGLAAIMQLFFSYFAVHFISNSWLM

WLIINLVQMAPISAMVRMYIFFASFYYVWKSYVHVVDGCNSSTCMMCYKRNRATRVEC

TTIVNGVRRSFYVYANGGKGFCKLHNWNCVNCDTFCAGSTFISDEVARDLSLQFKRPI

NPTDQSSYIVDSVTVKNGSIHLYFDKAGQKTYERHSLSHFVNLDNLRANNTKGSLPIN

VIVFDGKSKCEESSAKSASVYYSQLMCQPILLLDQALVSDVGDSAEVAVKMFDAYVNT

FSSTFNVPMEKLKTLVATAEAELAKNVSLDNVLSTFISAARQGFVDSDVETKDVVECL

KLSHQSDIEVTGDSCNNYMLTYNKVENMTPRDLGACIDCSARHINAQVAKSHNITLIW

NVKDFMSLSEQLRKQIRSAAKKNNLPFKLTCATTRQVVNVVTTKIALKGGKIVNNWLK

QLIKVTLVFLFVAAIFYLITPVHVMSKHTDFSSEIIGYKAIDGGVTRDIASTDTCFAN

KHADFDTWFSQRGGSYTNDKACPLIAAVITREVGFVVPGLPGTILRTTNGDFLHFLPR

VFSAVGNICYTPSKLIEYTDFATSACVLAAECTIFKDASGKPVPYCYDTNVLEGSVAY

ESLRPDTRYVLMDGSIIQFPNTYLEGSVRVVTTFDSEYCRHGTCERSEAGVCVSTSGR

WVLNNDYYRSLPGVFCGVDAVNLLTNMFTPLIQPIGALDISASIVAGGIVAIVVTCLA

YYFMRFRRAFGEYSHVVAFNTLLFLMSFTVLCLTPVYSFLPGVYSVIYLYLTFYLTND

VSFLAHIQWMVMFTPLVPFWITIAYIICISTKHFYWFFSNYLKRRVVFNGVSFSTFEE

AALCTFLLNKEMYLKLRSDVLLPLTQYNRYLALYNKYKYFSGAMDTTSYREAACCHLA

KALNDFSNSGSDVLYQPPQISITSAVLQSGFRKMAFPSGKVEGCMVQVTCGTTTLNGL

WLDDVVYCPRHVICTSEDMLNPNYEDLLIRKSNHNFLVQAGNVQLRVIGHSMQNCVLK

LKVDTANPKTPKYKFVRIQPGQTFSVLACYNGSPSGVYQCAMRHNFTIKGSFLNGSCG

SVGFNIDYDCVSFCYMHHMELPTGVHAGTDLEGNFYGPFVDRQTAQAAGTDTTITVNV

LAWLYAAVINGDRWFLNRFTTTLNDFNLVAMKYNYEPLTQDHVDILGPLSAQTGIAVL

DMCASLKELLQNGMNGRTILGSALLEDEFTPFDVVRQCSGVTFQSAVKRTIKGTHHWL

LLTILTSLLVLVQSTQWSLFFFLYENAFLPFAMGIIAMSAFAMMFVKHKHAFLCLFLL

PSLATVAYFNMVYMPASWVMRIMTWLDMVDTSFKLKDCVMYASAVVLLILMTARTVYD

DGARRVWTLMNVLTLVYKVYYGNALDQAISMWALIISVTSNYSGVVTTVMFLARGVVF

MCVEYCPIFFITGNTLQCIMLVYCFLGYFCTCYFGLFCLLNRYFRLTLGVYDYLVSTQ

EFRYMNSQGLLPPKNSIDAFKLNIKLLGVGGKPCIKVATVQSKMSDVKCTSVVLLSVL

QQLRVESSSKLWAQCVQLHNDILLAKDTTEAFEKMVSLLSVLLSMQGAVDINKLCEEM

LDNRATLQAIASEFSSLPSYAAFATAQEAYEQAVANGDSEVVLKKLKKSLNVAKSEFD

RDAAMQRKLEKMADQAMTQMYKQARSEDKRAKVTSAMQTMLFTMLRKLDNDALNNIIN

NARDGCVPLNIIPLTTAAKLMVVIPDYNTYKNTCDGTTFTYASALWEIQQVVDADSKI

VQLSEISMDNSPNLAWPLIVTALRANSAVKLQNNELSPVALRQMSCAAGTTQTACTDD

NALAYYNTTKGGRFVLALLSDLQDLKWARFPKSDGTGTIYTELEPPCRFVTDTPKGPK

VKYLYFIKGLNNLNRGMVLGSLAATVRLQAGNATEVPANSTVLSFCAFAVDAAKAYKD

YLASGGQPITNCVKMLCTHTGTGQAITVTPEANMDQESFGGASCCLYCRCHIDHPNPK

GFCDLKGKYVQIPTTCANDPVGFTLKNTVCTVCGMWKGYGCSCDQLREPMLQSADAQS

FLNRVCGVSAARLTPCGTGTSTDVVYRAFDIYNDKVAGFAKFLKTNCCRFQEKDEDDN

LIDSYFVVKRHTFSNYQHEETIYNLLKDCPAVAKHDFFKFRIDGDMVPHISRQRLTKY

TMADLVYALRHFDEGNCDTLKEILVTYNCCDDDYFNKKDWYDFVENPDILRVYANLGE

RVRQALLKTVQFCDAMRNAGIVGVLTLDNQDLNGNWYDFGDFIQTTPGSGVPVVDSYY

SLLMPILTLTRALTAESHVDTDLTKPYIKWDLLKYDFTEERLKLFDRYFKYWDQTYHP

NCVNCLDDRCILHCANFNVLFSTVFPLTSFGPLVRKIFVDGVPFVVSTGYHFRELGVV

HNQDVNLHSSRLSFKELLVYAADPAMHAASGNLLLDKRTTCFSVAALTNNVAFQTVKP

GNFNKDFYDFAVSKGFFKEGSSVELKHFFFAQDGNAAISDYDYYRYNLPTMCDIRQLL

FVVEVVDKYFDCYDGGCINANQVIVNNLDKSAGFPFNKWGKARLYYDSMSYEDQDALF

AYTKRNVIPTITQMNLKYAISAKNRARTVAGVSICSTMTNRQFHQKLLKSIAATRGAT

VVIGTSKFYGGWHNMLKTVYSDVENPHLMGWDYPKCDRAMPNMLRIMASLVLARKHTT

CCSLSHRFYRLANECAQVLSEMVMCGGSLYVKPGGTSSGDATTAYANSVFNICQAVTA

NVNALLSTDGNKIADKYVRNLQHRLYECLYRNRDVDTDFVNEFYAYLRKHFSMMILSD

DAVVCFNSTYASQGLVASIKNFKSVLYYQNNVFMSEAKCWTETDLTKGPHEFCSQHTM

LVKQGDDYVYLPYPDPSRILGAGCFVDDIVKTDGTLMIERFVSLAIDAYPLTKHPNQE

YADVFHLYLQYIRKLHDELTGHMLDMYSVMLTNDNTSRYWEPEFYXXXXXXXXXLQAV

GACVLCNSQTSLRCGACIRRPFLCCKCCYDHVISTSHKLVLSVNPYVCNAPGCDVTDV

TQLYLGGMSYYCKSHKPPISFPLCANGQVFGLYKNTCVGSDNVTDFNAIATCDWTNAG

DYILANTCTERLKLFAAETLKATEETFKLSYGIATVREVLSDRELHLSWEVGKPRPPL

NRNYVFTGYRVTKNSKVQIGEYTFEKGDYGDAVVYRGTTTYKLNVGDYFVLTSHTVMP

LSAPTLVPQEHYVRITGLYPTLNISDEFSSNVANYQKVGMQKYSTLQGPPGTGKSHFA

IGLALYYPSARIVYTACSHAAVDALCEKALKYLPIDKCSRIIPARARVECFDKFKVNS

TLEQYVFCTVNALPETTADIVVFDEISMATNYDLSVVNARLRAKHYVYIGDPAQLPAP

RTLLTKGTLEPEYFNSVCRLMKTIGPDMFLGTCRRCPAEIVDTVSALVYDNKLKAHKD

KSAQCFKMFYKGVITHDVSSAINRPQIGVVREFLTRNPAWRKAVFISPYNSQNAVASK

ILGLPTQTVDSSQGSEYDYVIFTQTTETAHSCNVNRFNVAITRAKVGILCIMSDRDLY

DKLQFTSLEIPRRNVATLQAENVTGLFKDCSKVITGLHPTQAPTHLSVDTKFKTEGLC

VDVPGIPKDMTYRRLISMMGFKMNYQVNGYPNMFITREEAIRHVRAWIGFDVEGCHAT

REAVGTNLPLQLGFSTGVNLVAVPTGYVDTPNNTDFSRVSAKPPPGDQFKHLIPLMYK

GLPWNVVRIKIVQMLSDTLKNLSDRVVFVLWAHGFELTSMKYFVKIGPERTCCLCDRR

ATCFSTASDTYACWHHSIGFDYVYNPFMIDVQQWGFTGNLQSNHDLYCQVHGNAHVAS

CDAIMTRCLAVHECFVKRVDWTIEYPIIGDELKINAACRKVQHMVVKAALLADKFPVL

HDIGNPKAIKCVPQADVEWKFYDAQPCSDKAYKIEELFYSYATHSDKFTDGVCLFWNC

NVDRYPANSIVCRFDTRVLSNLNLPGCDGGSLYVNKHAFHTPAFDKSAFVNLKQLPFF

YYSDSPCESHGKQVVSDIDYVPLKSATCITRCNLGGAVCRHHANEYRLYLDAYNMMIS

AGFSLWVYKQFDTYNLWNTFTRLQSLENVAFNVVNKGHFDGQQGEVPVSIINNTVYTK

VDGVDVELFENKTTLPVNVAFELWAKRNIKPVPEVKILNNLGVDIAANTVIWDYKRDA

PAHISTIGVCSMTDIAKKPTETICAPLTVFFDGRVDGQVDLFRNARNGVLITEGSVKG

LQPSVGPKQASLNGVTLIGEAVKTQFNYYKKVDGVVQQLPETYFTQSRNLQEFKPRSQ

MEIDFLELAMDEFIERYKLEGYAFEHIVYGDFSHSQLGGLHLLIGLAKRFKESPFELE

DFIPMDSTVKNYFITDAQTGSSKCVCSVIDLLLDDFVEIIKSQDLSVVSKVVKVTIDY

TEISFMLWCKDGHVETFYPKLQSSQAWQPGVAMPNLYKMQRMLLEKCDLQNYGDSATL

PKGIMMNVAKYTQLCQYLNTLTLAVPYNMRVIHFGAGSDKGVAPGTAVLRQWLPTGTL

LVDSDLNDFVSDADSTLIGDCATVHTANKWDLIISDMYDPKTKNVTKENDSKEGFFTY

ICGFIQQKLALGGSVAIKITEHSWNADLYKLMGHFAWWTAFVTNVNASSSEAFLIGCN

YLGKPREQIDGYVMHANYIFWRNTNPIQLSSYSLFDMSKFPLKLRGTAVMSLKEGQIN

DMILSLLSKGRLIIRENNRVVISSDVLVNN"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=1&to=180) 228..767

/gene="ORF1ab"

/product="leader protein"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=181&to=818) 768..2681

/gene="ORF1ab"

/product="nsp2"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=819&to=2762) 2682..8513

/gene="ORF1ab"

/product="nsp3"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=2763&to=3262) 8514..10013

/gene="ORF1ab"

/product="nsp4"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=3263&to=3568) 10014..10931

/gene="ORF1ab"

/product="3C-like proteinase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=3569&to=3855) 10932..11792

/gene="ORF1ab"

/product="nsp6"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=3856&to=3938) 11793..12041

/gene="ORF1ab"

/product="nsp7"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=3939&to=4136) 12042..12635

/gene="ORF1ab"

/product="nsp8"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=4137&to=4249) 12636..12974

/gene="ORF1ab"

/product="nsp9"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=4250&to=4388) 12975..13391

/gene="ORF1ab"

/product="nsp10"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=4389&to=5320) join(13392..13418,13418..16186)

/gene="ORF1ab"

/product="RNA-dependent RNA polymerase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=5321&to=5921) 16187..17989

/gene="ORF1ab"

/product="helicase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=5922&to=6448) 17990..19570

/gene="ORF1ab"

/product="3'-to-5' exonuclease"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=6449&to=6794) 19571..20608

/gene="ORF1ab"

/product="endoRNAse"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37310.1?from=6795&to=7092) 20609..21502

/gene="ORF1ab"

/product="2'-O-ribose methyltransferase"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=228&to=13433) 228..13433

/gene="ORF1ab"

/codon\_start=1

/product="ORF1a polyprotein"

/protein\_id="[UHU37311.1](https://www.ncbi.nlm.nih.gov/protein/2171661273)"

/translation="MESLVPGFNEKTHVQLSLPVLQVRDVLVRGFGDSVEEVLSEARQ

HLKDGTCGLVEVEKGVLPQLEQPYVFIKRSDARTAPHGHVMVELVAELEGIQYGRSGE

TLGVLVPHVGEIPVAYRKVLLRKNGNKGAGGHSYGADLKSFDLGDELGTDPYEDFQEN

WNTKHSSGVTRELMRELNGGAYTRYVDNNFCGPDGYPLECIKDLLARAGKASCTLSEQ

LDFIDTKRGVYCCREHEHEIAWYTERSEKSYELQTPFEIKLAKKFDTFNGECPNFVFP

LNSIIKTIQPRVEKKKLDGFMGRIRSVYPVASPNECNQMCLSTLMKCDHCGETSWQTG

DFVKATCEFCGTENLTKEGATTCGYLPQNAVVKIYCPACHNSEVGPEHSLAEYHNESG

LKTILRKGGRTIAFGGCVFSYVGCHNKCAYWVPRASANIGCNHTGVVGEGSEGLNDNL

LEILQKEKVNINIVGDFKLNEEIAIILASFSASTSAFVETVKGLDYKAFKQIVESCGN

FKVTKGKAKKGAWNIGEQKSILSPLYAVASEAARVVRSIFSRTLETAQNSVRVLQKAA

ITILDGISQYSLRLIDAMMFTSDLATNNLVVMAYITGGVVQLTSQWLTNIFGTVYEKL

KPVLDWLEEKFKEGVEFLRDGWEIVKFISTCACEIVGGQIVTCAKEIKESVQTFFKLV

NKFLALCADSIIIGGAKLKALNLGETFVTHSKGLYRKCVKSREETGLLMPLKAPKEII

FLEGETLPTEVLTEEVVLKTGDLQPLEQPTSEAVEAPLVGTPVCINGLMLLEIKDTEK

YCALAPNMMVTNNTFTLKGGAPTKVTFGDDTVIEVQGYKSVNITFELDERIDKVLNER

CSAYTVELGTEVNEFACVVADAVVKTLQPVSELLTPLGIDLDEWSMATYYLFDESGEF

KLASHMYCSFYPPDEDEEEGDCEEEEFEPSTQYEYGTEDDYQGKPLEFGATSAALQPE

EEQEEDWLDDDSQQTVGQQDGSEDNQTTTIQTIVEVQPQLEMELTPVVQTIEVNSFSG

YLKLTDNVYIKNADIVEEAKKVKPTVVVNAANVYLKHGGGVAGALNKATNNAMQVESD

DYIATNGPLKVGGSCVLSGHNLAKHCLHVVGPNVNKGEDIQLLKSAYENFNQHEVLLA

PLLSAGIFGADPIHSLRVCVDTVRTNVYLAVFDKNLYDKLVSSFLEMKSEKQVEQKIA

EIPKEEVKPFITESKPSVEQRKQDDKKIKACVEEVTTTLEETKFLTENLLLYIDINGN

LHPDSATLVSDIDITFLKKDAPYIVGDVVQEGVLTAVVIPTKKAGGTTEMLAKALRKV

PTDNYITTYPGQGLNGYTVEEAKTVLKKCKSAFYILPSIISNEKQEILGTVSWNLREM

LAHAEETRKLMPVCVETKAIVSTIQRKYKGIKIQEGVVDYGARFYFYTSKTTVASLIN

TLNDLNETLVTMPLGYVTHGLNLEEAARYMRSLKVPATVSVSSPDAVTAYNGYLTSSS

KTPEEHFIETISLAGSYKDWSYSGQSTQLGIEFLKRGDKSVYYTSNPTTFHLDGEVIT

FDNLKTLLSLREVRTIKVFTTVDNINLHTQVVDMSMTYGQQFGPTYLDGADVTKIKPH

NSHEGKTFYVLPNDDTLRVEAFEYYHTTDPSFLGRYMSALNHTKKWKYPQVNGLTSIK

WADNNCYLATALLTLQQIELKFNPPALQDAYYRARAGEAANFCALILAYCNKTVGELG

DVRETMSYLFQHANLDSCKRVLNVVCKTCGQQQTTLKGVEAVMYMGTLSYEQFKKGVQ

IPCTCGKQATKYLVQQESPFVMMSAPPAQYELKHGTFTCASEYTGNYQCGHYKHITSK

ETLYCIDGALLTKSSEYKGPITDVFYKENSYTTTIKPVTYKLDGVVCTEIDPKLDNYY

KKDNSYFTEQPIDLVPNQPYPNASFDNFKFVCDNIKFADDLNQLTGYKKPASRELKVT

FFPDLNGDVVAIDYKHYTPSFKKGAKLLHKPIVWHVNNATNKATYKPNTWCIRCLWST

KPVETSNSFDVLKSEDAQGMDNLACEDLKPVSEEVVENPTIQKDVLECNVKTTEVVGD

IILKPANNIKITEEVGHTDLMAAYVDNSSLTIKKPNELSRVLGLKTLATHGLAAVNSV

PWDTIANYAKPFLNKVVSTTTNIVTRCLNRVCTNYMPYFFTLLLQLCTFTRSTNSRIK

ASMPTTIAKNTVKSVGKFCLEASFNYLKSPNFSKLINIIIWFLLLSVCLGSLIYSTAA

LGVLMSNLGMPSYCTGYREGYLNSTNVTIATYCTGSIPCSVCLSGLDSLDTYPSLETI

QITISSFKWDLTAFGLVAEWFLAYILFTRFFYVLGLAAIMQLFFSYFAVHFISNSWLM

WLIINLVQMAPISAMVRMYIFFASFYYVWKSYVHVVDGCNSSTCMMCYKRNRATRVEC

TTIVNGVRRSFYVYANGGKGFCKLHNWNCVNCDTFCAGSTFISDEVARDLSLQFKRPI

NPTDQSSYIVDSVTVKNGSIHLYFDKAGQKTYERHSLSHFVNLDNLRANNTKGSLPIN

VIVFDGKSKCEESSAKSASVYYSQLMCQPILLLDQALVSDVGDSAEVAVKMFDAYVNT

FSSTFNVPMEKLKTLVATAEAELAKNVSLDNVLSTFISAARQGFVDSDVETKDVVECL

KLSHQSDIEVTGDSCNNYMLTYNKVENMTPRDLGACIDCSARHINAQVAKSHNITLIW

NVKDFMSLSEQLRKQIRSAAKKNNLPFKLTCATTRQVVNVVTTKIALKGGKIVNNWLK

QLIKVTLVFLFVAAIFYLITPVHVMSKHTDFSSEIIGYKAIDGGVTRDIASTDTCFAN

KHADFDTWFSQRGGSYTNDKACPLIAAVITREVGFVVPGLPGTILRTTNGDFLHFLPR

VFSAVGNICYTPSKLIEYTDFATSACVLAAECTIFKDASGKPVPYCYDTNVLEGSVAY

ESLRPDTRYVLMDGSIIQFPNTYLEGSVRVVTTFDSEYCRHGTCERSEAGVCVSTSGR

WVLNNDYYRSLPGVFCGVDAVNLLTNMFTPLIQPIGALDISASIVAGGIVAIVVTCLA

YYFMRFRRAFGEYSHVVAFNTLLFLMSFTVLCLTPVYSFLPGVYSVIYLYLTFYLTND

VSFLAHIQWMVMFTPLVPFWITIAYIICISTKHFYWFFSNYLKRRVVFNGVSFSTFEE

AALCTFLLNKEMYLKLRSDVLLPLTQYNRYLALYNKYKYFSGAMDTTSYREAACCHLA

KALNDFSNSGSDVLYQPPQISITSAVLQSGFRKMAFPSGKVEGCMVQVTCGTTTLNGL

WLDDVVYCPRHVICTSEDMLNPNYEDLLIRKSNHNFLVQAGNVQLRVIGHSMQNCVLK

LKVDTANPKTPKYKFVRIQPGQTFSVLACYNGSPSGVYQCAMRHNFTIKGSFLNGSCG

SVGFNIDYDCVSFCYMHHMELPTGVHAGTDLEGNFYGPFVDRQTAQAAGTDTTITVNV

LAWLYAAVINGDRWFLNRFTTTLNDFNLVAMKYNYEPLTQDHVDILGPLSAQTGIAVL

DMCASLKELLQNGMNGRTILGSALLEDEFTPFDVVRQCSGVTFQSAVKRTIKGTHHWL

LLTILTSLLVLVQSTQWSLFFFLYENAFLPFAMGIIAMSAFAMMFVKHKHAFLCLFLL

PSLATVAYFNMVYMPASWVMRIMTWLDMVDTSFKLKDCVMYASAVVLLILMTARTVYD

DGARRVWTLMNVLTLVYKVYYGNALDQAISMWALIISVTSNYSGVVTTVMFLARGVVF

MCVEYCPIFFITGNTLQCIMLVYCFLGYFCTCYFGLFCLLNRYFRLTLGVYDYLVSTQ

EFRYMNSQGLLPPKNSIDAFKLNIKLLGVGGKPCIKVATVQSKMSDVKCTSVVLLSVL

QQLRVESSSKLWAQCVQLHNDILLAKDTTEAFEKMVSLLSVLLSMQGAVDINKLCEEM

LDNRATLQAIASEFSSLPSYAAFATAQEAYEQAVANGDSEVVLKKLKKSLNVAKSEFD

RDAAMQRKLEKMADQAMTQMYKQARSEDKRAKVTSAMQTMLFTMLRKLDNDALNNIIN

NARDGCVPLNIIPLTTAAKLMVVIPDYNTYKNTCDGTTFTYASALWEIQQVVDADSKI

VQLSEISMDNSPNLAWPLIVTALRANSAVKLQNNELSPVALRQMSCAAGTTQTACTDD

NALAYYNTTKGGRFVLALLSDLQDLKWARFPKSDGTGTIYTELEPPCRFVTDTPKGPK

VKYLYFIKGLNNLNRGMVLGSLAATVRLQAGNATEVPANSTVLSFCAFAVDAAKAYKD

YLASGGQPITNCVKMLCTHTGTGQAITVTPEANMDQESFGGASCCLYCRCHIDHPNPK

GFCDLKGKYVQIPTTCANDPVGFTLKNTVCTVCGMWKGYGCSCDQLREPMLQSADAQS

FLNGFAV"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=1&to=180) 228..767

/gene="ORF1ab"

/product="leader protein"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=181&to=818) 768..2681

/gene="ORF1ab"

/product="nsp2"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=819&to=2762) 2682..8513

/gene="ORF1ab"

/product="nsp3"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=2763&to=3262) 8514..10013

/gene="ORF1ab"

/product="nsp4"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=3263&to=3568) 10014..10931

/gene="ORF1ab"

/product="3C-like proteinase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=3569&to=3855) 10932..11792

/gene="ORF1ab"

/product="nsp6"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=3856&to=3938) 11793..12041

/gene="ORF1ab"

/product="nsp7"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=3939&to=4136) 12042..12635

/gene="ORF1ab"

/product="nsp8"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=4137&to=4249) 12636..12974

/gene="ORF1ab"

/product="nsp9"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=4250&to=4388) 12975..13391

/gene="ORF1ab"

/product="nsp10"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UHU37311.1?from=4389&to=4401) 13392..13430

/gene="ORF1ab"

/product="nsp11"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=13426&to=13453) 13426..13453

/gene="ORF1ab"

/note="Coronavirus frameshifting stimulation element

stem-loop 1"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=13438&to=13492) 13438..13492

/gene="ORF1ab"

/note="Coronavirus frameshifting stimulation element

stem-loop 2"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=21513&to=25325) 21513..25325

/gene="S"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=21513&to=25325) 21513..25325

/gene="S"

/codon\_start=1

/product="surface glycoprotein"

/protein\_id="[UHU37312.1](https://www.ncbi.nlm.nih.gov/protein/2171661274)"

/translation="MFVFLVLLPLVSSQCVNLTTRTQLPPAYTNSFTRGVYYPDKVFR

SSVLHSTQDLFLPFFSNVTWFHVISGTNGTKRFDNPVLPFNDGVYFASIEKSNIIRGW

IFGTTLDSKTQSLLIVNNATNVVIKVCEFQFCNDPFLDHKNNKSWMESEFRVYSSANN

CTFEYVSQPFLMDLEGKQGNFKNLREFVFKNIDGYFKIYSKHTPIIVREPEDLPQGFS

ALEPLVDLPIGINITRFQTLLALHRSYLTPGDSSSGWTAGAAAYYVGYLQPRTFLLKY

NENGTITDAVDCALDPLSETKCTLKSFTVEKGIYQTSNFRVQPTESIVRFPNITNLCP

FDEVFNATKFASVYAWNRKRISNCVADYSVLYNLAPFFTFKCYGVSPTKLNDLCFTNV

YADSFVIRGDEVRQIAPGQTGNIADYNYKLPDDFTGCVIAWNSNNLDSKVSGNYNYLY

RLFRKSNLKPFERDISTEIYQAGNKPCNGVAGFNCYFPLRSYSFRPTYGVGHQPYRVV

VLSFELLHAPATVCGPKKSTNLVKNKCVNFNFNGLKGTGVLTESNKKFLPFQQFGRDI

ADTTDAVRDPQTLEILDITPCSFGGVSVITPGTNTSNQVAVLYQGVNCTEVPVAIHAD

QLTPTWRVYSTGSNVFQTRAGCLIGAEYVNNSYECDIPIGAGICASYQTQTKSHRRAR

SVASQSIIAYTMSLGAENSVAYSNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYIC

GDSTECSNLLLQYGSFCTQLKRALTGIAVEQDKNTQEVFAQVKQIYKTPPIKYFGGFN

FSQILPDPSKPSKRSFIEDLLFNKVTLADAGFIKQYGDCLGDIAARDLICAQKFKGLT

VLPPLLTDEMIAQYTSALLAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGVTQNVLY

ENQKLIANQFNSAIGKIQDSLSSTASALGKLQDVVNHNAQALNTLVKQLSSKFGAISS

VLNDIFSRLDKVEAEVQIDRLITGRLQSLQTYVTQQLIRAAEIRASANLAATKMSECV

LGQSKRVDFCGKGYHLMSFPQSAPHGVVFLHVTYVPAQEKNFTTAPAICHDGKAHFPR

EGVFVSNGTHWFVTQRNFYEPQIITTDNTFVSGNCDVVIGIVNNTVYDPLQPELDSFK

EELDKYFKNHTSPDVDLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGKYE

QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCCSCLKGCCSCGSCCKFDEDDSEPVL

KGVKLHYT"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=25334&to=26161) 25334..26161

/gene="ORF3a"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=25334&to=26161) 25334..26161

/gene="ORF3a"

/codon\_start=1

/product="ORF3a protein"

/protein\_id="[UHU37313.1](https://www.ncbi.nlm.nih.gov/protein/2171661275)"

/translation="MDLFMRIFTIGTVTLKQGEIKDATPSDFVRATATIPIQASLPFG

WLIVGVALLAVFQSASKIITLKKRWQLALSKGVHFVCNLLLLFVTVYSHLLLVAAGLE

APFLYLYALVYFLQSINFVRIIMRLWLCWKCRSKNPLLYDANYFLCWHTNCYDYCIPY

NSVTSSIVITSGDGTTSPISEHDYQIGGYTEKWESGVKDCVVLHSYFTSDYYQLYSTQ

LSTDTGVEHVTFFIYNKIVDEPEEHVQIHTIDGSSGVVNPVMEPIYDEPTTTTSVPL"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=26186&to=26413) 26186..26413

/gene="E"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=26186&to=26413) 26186..26413

/gene="E"

/codon\_start=1

/product="envelope protein"

/protein\_id="[UHU37314.1](https://www.ncbi.nlm.nih.gov/protein/2171661276)"

/translation="MYSFVSEEIGTLIVNSVLLFLAFVVFLLVTLAILTALRLCAYCC

NIVNVSLVKPSFYVYSRVKNLNSSRVPDLLV"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=26464&to=27132) 26464..27132

/gene="M"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=26464&to=27132) 26464..27132

/gene="M"

/codon\_start=1

/product="membrane glycoprotein"

/protein\_id="[UHU37315.1](https://www.ncbi.nlm.nih.gov/protein/2171661277)"

/translation="MAGSNGTITVEELKKLLEEWNLVIGFLFLTWICLLQFAYANRNR

FLYIIKLIFLWLLWPVTLTCFVLAAVYRINWITGGIAIAMACLVGLMWLSYFIASFRL

FARTRSMWSFNPETNILLNVPLHGTILTRPLLESELVIGAVILRGHLRIAGHHLGRCD

IKDLPKEITVATSRTLSYYKLGASQRVAGDSGFAAYSRYRIGNYKLNTDHSSSSDNIA

LLVQ"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27143&to=27328) 27143..27328

/gene="ORF6"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27143&to=27328) 27143..27328

/gene="ORF6"

/codon\_start=1

/product="ORF6 protein"

/protein\_id="[UHU37316.1](https://www.ncbi.nlm.nih.gov/protein/2171661278)"

/translation="MFHLVDFQVTIAEILLIIMRTFKVSIWNLDYIINLIIKNLSKSL

TENKYSQLDEEQPMEID"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27335&to=27700) 27335..27700

/gene="ORF7a"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27335&to=27700) 27335..27700

/gene="ORF7a"

/codon\_start=1

/product="ORF7a protein"

/protein\_id="[UHU37317.1](https://www.ncbi.nlm.nih.gov/protein/2171661279)"

/translation="MKIILFLALITLATCELYHYQECVRGTTVLLKEPCSSGTYEGNS

PFHPLADNKFALTCFSTQFAFACPDGVKHVYQLRARSVSPKLFIRQEEVQELYSPIFL

IVAAIVFITLCFTLKRKTE"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27697&to=27828) 27697..27828

/gene="ORF7b"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27697&to=27828) 27697..27828

/gene="ORF7b"

/codon\_start=1

/product="ORF7b"

/protein\_id="[UHU37318.1](https://www.ncbi.nlm.nih.gov/protein/2171661280)"

/translation="MIELSLIDFYLCFLAFLLFLVLIMLIIFWFSLELQDHNETCHA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27835&to=28200) 27835..28200

/gene="ORF8"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=27835&to=28200) 27835..28200

/gene="ORF8"

/codon\_start=1

/product="ORF8 protein"

/protein\_id="[UHU37319.1](https://www.ncbi.nlm.nih.gov/protein/2171661281)"

/translation="MKFLVFLGIITTVAAFHQECSLQSCTQHQPYVVDDPCPIHFYSK

WYIRVGARKSAPLIELCVDEAGSKSPIQYIDIGNYTVSCLPFTINCQEPKLGSLVVRC

SFYEDFLEYHDVRVVLDFI"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=28215&to=29465) 28215..29465

/gene="N"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=28215&to=29465) 28215..29465

/gene="N"

/codon\_start=1

/product="nucleocapsid phosphoprotein"

/protein\_id="[UHU37320.1](https://www.ncbi.nlm.nih.gov/protein/2171661282)"

/translation="MSDNGPQNQRNALRITFGGPSDSTGSNQNGGARSKQRRPQGLPN

NTASWFTALTQHGKEDLKFPRGQGVPINTNSSPDDQIGYYRRATRRIRGGDGKMKDLS

PRWYFYYLGTGPEAGLPYGANKDGIIWVATEGALNTPKDHIGTRNPANNAAIVLQLPQ

GTTLPKGFYAEGSRGGSQASSRSSSRSRNSSRNSTPGSSKRTSPARMAGNGGDAALAL

LLLDRLNQLESKMSGKGQQQQGQTVTKKSAAEASKKPRQKRTATKAYNVTQAFGRRGP

EQTQGNFGDQELIRQGTDYKHWPQIAQFAPSASAFFGMSRIGMEVTPSGTWLTYTGAI

KLDDKDPNFKDQVILLNKHIDAYKTFPPTEPKKDKKKKADETQALPQRQKKQQTVTLL

PAADLDDFSKQLQQSMSSADSTQA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=29490&to=29606) 29490..29606

/gene="ORF10"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=29490&to=29606) 29490..29606

/gene="ORF10"

/codon\_start=1

/product="ORF10 protein"

/protein\_id="[UHU37321.1](https://www.ncbi.nlm.nih.gov/protein/2171661283)"

/translation="MGYINVFAFPFTIYSLLLCRMNSRNYIAQVDVVNFNLT"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=29541&to=29576) 29541..29576

/gene="ORF10"

/note="Coronavirus 3' UTR pseudoknot stem-loop 1"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=29561&to=29589) 29561..29589

/gene="ORF10"

/note="Coronavirus 3' UTR pseudoknot stem-loop 2"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM067048.1?from=29660&to=29700) 29660..29700

/note="Coronavirus 3' stem-loop II-like motif (s2m)"

ORIGIN

1 actttcgatc tcttgtagat ctgttctcta aacgaacttt aannnnnnnn nnnnnnnnnn

61 nnnnnnnnnt gcttagtgca ctcacgcagt ataattaata actaattact gtcgttgaca

121 ggacacgagt aactcgtcta tcttctgcag gctgcttacg gtttcgtccg tgttgcagcc

181 gatcatcagc acatctaggt tttgtccggg tgtgaccgaa aggtaagatg gagagccttg

241 tccctggttt caacgagaaa acacacgtcc aactcagttt gcctgtttta caggttcgcg

301 acgtgctcgt acgtggcttt ggagactccg tggaggaggt cttatcagag gcacgtcaac

361 atcttaaaga tggcacttgt ggcttagtag aagttgaaaa aggcgttttg cctcaacttg

421 aacagcccta tgtgttcatc aaacgttcgg atgctcgaac tgcacctcat ggtcatgtta

481 tggttgagct ggtagcagaa ctcgaaggca ttcagtacgg tcgtagtggt gagacacttg

541 gtgtccttgt ccctcatgtg ggcgaaatac cagtggctta ccgcaaggtt cttcttcgta

601 agaacggtaa taaaggagct ggtggccata gttacggcgc cgatctaaag tcatttgact

661 taggcgacga gcttggcact gatccttatg aagattttca agaaaactgg aacactaaac

721 atagcagtgg tgttacccgt gaactcatgc gtgagcttaa cggaggggca tacactcgct

781 atgtcgataa caacttctgt ggccctgatg gctaccctct tgagtgcatt aaagaccttc

841 tagcacgtgc tggtaaagct tcatgcactt tgtccgaaca actggacttt attgacacta

901 agaggggtgt atactgctgc cgtgaacatg agcatgaaat tgcttggtac acggaacgtt

961 ctgaaaagag ctatgaattg cagacacctt ttgaaattaa attggcaaag aaatttgaca

1021 ccttcaatgg ggaatgtcca aattttgtat ttcccttaaa ttccataatc aagactattc

1081 aaccaagggt tgaaaagaaa aagcttgatg gctttatggg tagaattcga tctgtctatc

1141 cagttgcgtc accaaatgaa tgcaaccaaa tgtgcctttc aactctcatg aagtgtgatc

1201 attgtggtga aacttcatgg cagacgggcg attttgttaa agccacttgc gaattttgtg

1261 gcactgagaa tttgactaaa gaaggtgcca ctacttgtgg ttacttaccc caaaatgctg

1321 ttgttaaaat ttattgtcca gcatgtcaca attcagaagt aggacctgag catagtcttg

1381 ccgaatacca taatgaatct ggcttgaaaa ccattcttcg taagggtggt cgcactattg

1441 cctttggagg ctgtgtgttc tcttatgttg gttgccataa caagtgtgcc tattgggttc

1501 cacgtgctag cgctaacata ggttgtaacc atacaggtgt tgttggagaa ggttccgaag

1561 gtcttaatga caaccttctt gaaatactcc aaaaagagaa agtcaacatc aatattgttg

1621 gtgactttaa acttaatgaa gagatcgcca ttattttggc atctttttct gcttccacaa

1681 gtgcttttgt ggaaactgtg aaaggtttgg attataaagc attcaaacaa attgttgaat

1741 cctgtggtaa ttttaaagtt acaaaaggaa aagctaaaaa aggtgcctgg aatattggtg

1801 aacagaaatc aatactgagt cctctttatg cagttgcatc agaggctgct cgtgttgtac

1861 gatcaatttt ctcccgcact cttgaaactg ctcaaaattc tgtgcgtgtt ttacagaagg

1921 ccgctataac aatactagat ggaatttcac agtattcact gagactcatt gatgctatga

1981 tgttcacatc tgatttggct actaacaatc tagttgtaat ggcctacatt acaggtggtg

2041 ttgttcagtt gacttcgcag tggctaacta acatctttgg cactgtttat gaaaaactca

2101 aacccgtcct tgattggctt gaagagaagt ttaaggaagg tgtagagttt cttagagacg

2161 gttgggaaat tgttaaattt atctcaacct gtgcttgtga aattgtcggt ggacaaattg

2221 tcacctgtgc aaaggaaatt aaggagagtg ttcagacatt ctttaagctt gtaaataaat

2281 ttttggcttt gtgtgctgac tctatcatta ttggtggagc taaacttaaa gccttgaatt

2341 taggtgaaac atttgtcacg cactcaaagg gattgtacag aaagtgtgtt aaatccagag

2401 aagaaactgg cctactcatg cctctaaaag ctccaaaaga aattatcttc ttagagggag

2461 aaacacttcc cacagaagtg ttaacagagg aagttgtctt gaaaactggt gatttacaac

2521 cattagaaca acctactagt gaagctgttg aagctccatt ggttggtaca ccagtttgta

2581 ttaacgggct tatgttgctc gaaatcaaag acacagaaaa gtactgtgcc cttgcaccta

2641 atatgatggt aacaaacaat accttcacac tcaaaggcgg tgcaccaaca aaggttactt

2701 ttggtgatga cactgtgata gaagtgcaag gttacaagag tgtgaatatc acttttgaac

2761 ttgatgaaag gattgataaa gtacttaatg agaggtgctc tgcctataca gttgaactcg

2821 gtacagaagt aaatgagttc gcctgtgttg tggcagatgc tgtcgtaaaa actttgcaac

2881 cagtatctga attacttaca ccactgggca ttgatttaga tgagtggagt atggctacat

2941 actacttatt tgatgagtct ggtgagttta aattggcttc acatatgtat tgttcttttt

3001 accctccaga tgaggatgaa gaagaaggtg attgtgaaga agaagagttt gagccatcaa

3061 ctcaatatga gtatggtact gaagatgatt accaaggtaa acctttggaa tttggtgcca

3121 cttctgctgc tcttcaacct gaagaagagc aagaagaaga ttggttagat gatgatagtc

3181 aacaaactgt tggtcaacaa gacggcagtg aggacaatca gacaactact attcaaacaa

3241 ttgttgaggt tcaacctcaa ttagagatgg aacttacacc agttgttcag actattgaag

3301 tgaatagttt tagtggttat ttaaaactta ctgacaatgt atacattaaa aatgcagaca

3361 ttgtggaaga agctaaaaag gtaaaaccaa cagtggttgt taatgcagcc aatgtttacc

3421 ttaaacatgg aggaggtgtt gcaggagcct taaataaggc tactaacaat gccatgcaag

3481 ttgaatctga tgattacata gctactaatg gaccacttaa agtgggtggt agttgtgttt

3541 taagcggaca caatcttgct aaacactgtc ttcatgttgt cggcccaaat gttaacaaag

3601 gtgaagacat tcaacttctt aagagtgctt atgaaaattt taatcagcac gaagttctac

3661 ttgcaccatt attatcagct ggtatttttg gtgctgaccc tatacattct ttaagagttt

3721 gtgtagatac tgttcgcaca aatgtctact tagctgtctt tgataaaaat ctctatgaca

3781 aacttgtttc aagctttttg gaaatgaaga gtgaaaagca agttgaacaa aagatcgctg

3841 agattcctaa agaggaagtt aagccattta taactgaaag taaaccttca gttgaacaga

3901 gaaaacaaga tgataagaaa atcaaagctt gtgttgaaga agttacaaca actctggaag

3961 aaactaagtt cctcacagaa aacttgttac tttatattga cattaatggc aatcttcatc

4021 cagattctgc cactcttgtt agtgacattg acatcacttt cttaaagaaa gatgctccat

4081 atatagtggg tgatgttgtt caagagggtg ttttaactgc tgtggttata cctactaaaa

4141 aggctggtgg cactactgaa atgctagcga aagctttgag aaaagtgcca acagacaatt

4201 atataaccac ttacccgggt cagggtttaa atggttacac tgtagaggag gcaaagacag

4261 tgcttaaaaa gtgtaaaagt gccttttaca ttctaccatc tattatctct aatgagaagc

4321 aagaaattct tggaactgtt tcttggaatt tgcgagaaat gcttgcacat gcagaagaaa

4381 cacgcaaatt aatgcctgtc tgtgtggaaa ctaaagccat agtttcaact atacagcgta

4441 aatataaggg tattaaaata caagagggtg tggttgatta tggtgctaga ttttactttt

4501 acaccagtaa aacaactgta gcgtcactta tcaacacact taacgatcta aatgaaactc

4561 ttgttacaat gccacttggc tatgtaacac atggcttaaa tttggaagaa gctgctcggt

4621 atatgagatc tctcaaagtg ccagctacag tttctgtttc ttcacctgat gctgttacag

4681 cgtataatgg ttatcttact tcttcttcta aaacacctga agaacatttt attgaaacca

4741 tctcacttgc tggttcctat aaagattggt cctattctgg acaatctaca caactaggta

4801 tagaatttct taagagaggt gataaaagtg tatattacac tagtaatcct accacattcc

4861 acctagatgg tgaagttatc acctttgaca atcttaagac acttctttct ttgagagaag

4921 tgaggactat taaggtgttt acaacagtag acaacattaa cctccacacg caagttgtgg

4981 acatgtcaat gacatatgga caacagtttg gtccaactta tttggatgga gctgatgtta

5041 ctaaaataaa acctcataat tcacatgaag gtaaaacatt ttatgtttta cctaatgatg

5101 acactctacg tgttgaggct tttgagtact accacacaac tgatcctagt tttctgggta

5161 ggtacatgtc agcattaaat cacactaaaa agtggaaata cccacaagtt aatggtttaa

5221 cttctattaa atgggcagat aacaactgtt atcttgccac tgcattgtta acactccaac

5281 aaatagagtt gaagtttaat ccacctgctc tacaagatgc ttattacaga gcaagggctg

5341 gtgaagcggc taacttttgt gcacttatct tagcctactg taataagaca gtaggtgagt

5401 taggtgatgt tagagaaaca atgagttact tgtttcaaca tgccaattta gattcttgca

5461 aaagagtctt gaacgtggtg tgtaaaactt gtggacaaca gcagacaacc cttaagggtg

5521 tagaagctgt tatgtacatg ggcacacttt cttatgaaca atttaagaaa ggtgttcaga

5581 taccttgtac gtgtggtaaa caagctacaa aatatctagt acaacaggag tcaccttttg

5641 ttatgatgtc agcaccacct gctcagtatg aacttaagca tggtacattt acttgtgcta

5701 gtgagtacac tggtaattac cagtgtggtc actataaaca tataacttct aaagaaactt

5761 tgtattgcat agacggtgct ttacttacaa agtcctcaga atacaaaggt cctattacgg

5821 atgttttcta caaagaaaac agttacacaa caaccataaa accagttact tataaattgg

5881 atggtgttgt ttgtacagaa attgacccta agttggacaa ttattataag aaagacaatt

5941 cttatttcac agagcaacca attgatcttg taccaaacca accatatcca aacgcaagct

6001 tcgataattt taagtttgta tgtgataata tcaaatttgc tgatgattta aaccagttaa

6061 ctggttataa gaaacctgct tcaagagagc ttaaagttac atttttccct gacttaaatg

6121 gtgatgtggt ggctattgat tataaacact acacaccctc ttttaagaaa ggagctaaat

6181 tgttacataa acctattgtt tggcatgtta acaatgcaac taataaagcc acgtataaac

6241 caaatacctg gtgtatacgt tgtctttgga gcacaaaacc agttgaaaca tcaaattcgt

6301 ttgatgtact gaagtcagag gacgcgcagg gaatggataa tcttgcctgc gaagatctaa

6361 aaccagtctc tgaagaagta gtggaaaatc ctaccataca gaaagacgtt cttgagtgta

6421 atgtgaaaac taccgaagtt gtaggagaca ttatacttaa accagcaaat aatataaaaa

6481 ttacagaaga ggttggccac acagatctaa tggctgctta tgtagacaat tctagtctta

6541 ctattaagaa acctaatgaa ttatctagag tattaggttt gaaaaccctt gctactcatg

6601 gtttagctgc tgttaatagt gtcccttggg atactatagc taattatgct aagccttttc

6661 ttaacaaagt tgttagtaca actactaaca tagttacacg gtgtttaaac cgtgtttgta

6721 ctaattatat gccttatttc tttactttat tgctacaatt gtgtactttt actagaagta

6781 caaattctag aattaaagca tctatgccga ctactatagc aaagaatact gttaagagtg

6841 tcggtaaatt ttgtctagag gcttcattta attatttgaa gtcacctaat ttttctaaac

6901 tgataaatat tataatttgg tttttactat taagtgtttg cctaggttct ttaatctact

6961 caaccgctgc tttaggtgtt ttaatgtcta atttaggcat gccttcttac tgtactggtt

7021 acagagaagg ctatttgaac tctactaatg tcactattgc aacctactgt acnggttcta

7081 taccttgtag tgtttgtctt agtggtttag attctttaga cacctatcct tctttagaaa

7141 ctatacaaat taccatttca tcttttaaat gggatttaac tgcttttggc ttagttgcag

7201 agtggttttt ggcatatatt cttttcacta ggtttttcta tgtacttgga ttggctgcaa

7261 tcatgcaatt gtttttcagc tattttgcag tacattttat tagtaattct tggcttatgt

7321 ggttaataat taatcttgta caaatggccc cgatttcagc tatggttaga atgtacatct

7381 tctttgcatc attttattat gtatggaaaa gttatgtgca tgttgtagac ggttgtaatt

7441 catcaacttg tatgatgtgt tacaaacgta atagagcaac aagagtcgaa tgtacaacta

7501 ttgttaatgg tgttagaagg tccttttatg tctatgctaa tggaggtaaa ggcttttgca

7561 aactacacaa ttggaattgt gttaattgtg atacattctg tgctggtagt acatttatta

7621 gtgatgaagt tgcgagagac ttgtcactac agtttaaaag accaataaat cctactgacc

7681 agtcttctta catcgttgat agtgttacag tgaagaatgg ttccatccat ctttactttg

7741 ataaagctgg tcaaaagact tatgaaagac attctctctc tcattttgtt aacttagaca

7801 acctgagagc taataacact aaaggttcat tgcctattaa tgttatagtt tttgatggta

7861 aatcaaaatg tgaagaatca tctgcaaaat cagcgtctgt ttactacagt cagcttatgt

7921 gtcaacctat actgttacta gatcaggcat tagtgtctga tgttggtgat agtgcggaag

7981 ttgcagttaa aatgtttgat gcttacgtta atacgttttc atcaactttt aacgtaccaa

8041 tggaaaaact caaaacacta gttgcaactg cagaagctga acttgcaaag aatgtgtcct

8101 tagacaatgt cttatctact tttatttcag cagctcggca agggtttgtt gattcagatg

8161 tagaaactaa agatgttgtt gaatgtctta aattgtcaca tcaatctgac atagaagtta

8221 ctggcgatag ttgtaataac tatatgctca cctataacaa agttgaaaac atgacacccc

8281 gtgaccttgg tgcttgtatt gactgtagtg cgcgtcatat taatgcgcag gtagcaaaaa

8341 gtcacaacat tactttgata tggaacgtta aagatttcat gtcattgtct gaacaactac

8401 gaaaacaaat acgtagtgct gctaaaaaga ataacttacc ttttaagttg acatgtgcaa

8461 ctactagaca agttgttaat gttgtaacaa caaagatagc acttaagggt ggtaaaattg

8521 ttaataattg gttgaagcag ttaattaaag ttacacttgt gttccttttt gttgctgcta

8581 ttttctattt aataacacct gttcatgtca tgtctaaaca tactgacttt tcaagtgaaa

8641 tcataggata caaggctatt gatggtggtg tcactcgtga catagcatct acagatactt

8701 gttttgctaa caaacatgct gattttgaca catggtttag ccagcgtggt ggtagttata

8761 ctaatgacaa agcttgccca ttgattgctg cagtcataac aagagaagtg ggttttgtcg

8821 tgcctggttt gcctggcacg atattacgca caactaatgg tgactttttg catttcttac

8881 ctagagtttt tagtgcagtt ggtaacatct gttacacacc atcaaaactt atagagtaca

8941 ctgactttgc aacatcagct tgtgttttgg ctgctgaatg tacaattttt aaagatgctt

9001 ctggtaagcc agtaccatat tgttatgata ccaatgtact agaaggttct gttgcttatg

9061 aaagtttacg ccctgacaca cgttatgtgc tcatggatgg ctctattatt caatttccta

9121 acacctacct tgaaggttct gttagagtgg taacaacttt tgattctgag tactgtaggc

9181 acggcacttg tgaaagatca gaagctggtg tttgtgtatc tactagtggt agatgggtac

9241 ttaacaatga ttattacaga tctttaccag gagttttctg tggtgtagat gctgtaaatt

9301 tacttactaa tatgtttaca ccactaattc aacctattgg tgctttggac atatcagcat

9361 ctatagtagc tggtggtatt gtagctatcg tagtaacatg ccttgcctac tattttatga

9421 ggtttagaag agcttttggt gaatacagtc atgtagttgc ctttaatact ttactattcc

9481 ttatgtcatt cactgtactc tgtttaacac cagtttactc attcttacct ggtgtttatt

9541 ctgttattta cttgtacttg acattttatc ttactaatga tgtttctttt ttagcacata

9601 ttcagtggat ggttatgttc acacctttag tacctttctg gataacaatt gcttatatca

9661 tttgtatttc cacaaagcat ttctattggt tctttagtaa ttacctaaag agacgtgtag

9721 tctttaatgg tgtttccttt agtacttttg aagaagctgc gctgtgcacc tttttgttaa

9781 ataaagaaat gtatctaaag ttgcgtagtg atgtgctatt acctcttacg caatataata

9841 gatacttagc tctttataat aagtacaagt attttagtgg agcaatggat acaactagct

9901 acagagaagc tgcttgttgt catctcgcaa aggctctcaa tgacttcagt aactcaggtt

9961 ctgatgttct ttaccaacca ccacaaatct ctatcacctc agctgttttg cagagtggtt

10021 ttagaaaaat ggcattccca tctggtaaag ttgagggttg tatggtacaa gtaacttgtg

10081 gtacaactac acttaacggt ctttggcttg atgacgtagt ttactgtcca agacatgtga

10141 tctgcacctc tgaagacatg cttaacccta attatgaaga tttactcatt cgtaagtcta

10201 atcataattt cttggtacag gctggtaatg ttcaactcag ggttattgga cattctatgc

10261 aaaattgtgt acttaagctt aaggttgata cagccaatcc taagacacct aagtataagt

10321 ttgttcgcat tcaaccagga cagacttttt cagtgttagc ttgttacaat ggttcaccat

10381 ctggtgttta ccaatgtgct atgaggcaca atttcactat taagggttca ttccttaatg

10441 gttcatgtgg tagtgttggt tttaacatag attatgactg tgtctctttt tgttacatgc

10501 accatatgga attaccaact ggagttcatg ctggcacaga cttagaaggt aacttttatg

10561 gaccttttgt tgacaggcaa acagcacaag cagctggtac ggacacaact attacagtta

10621 atgttttagc ttggttgtac gctgctgtta taaatggaga caggtggttt ctcaatcgat

10681 ttaccacaac tcttaatgac tttaaccttg tggctatgaa gtacaattat gaacctctaa

10741 cacaagacca tgttgacata ctaggacctc tttctgctca aactggaatt gccgttttag

10801 atatgtgtgc ttcattaaaa gaattactgc aaaatggtat gaatggacgt accatattgg

10861 gtagtgcttt attagaagat gaatttacac cttttgatgt tgttagacaa tgctcaggtg

10921 ttactttcca aagtgcagtg aaaagaacaa tcaagggtac acaccactgg ttgttactca

10981 caattttgac ttcactttta gttttagtcc agagtactca atggtctttg ttcttttttt

11041 tgtatgaaaa tgccttttta ccttttgcta tgggtattat tgctatgtct gcttttgcaa

11101 tgatgtttgt caaacataag catgcatttc tctgtttgtt tttgttacct tctcttgcca

11161 ctgtagctta ttttaatatg gtctatatgc ctgctagttg ggtgatgcgt attatgacat

11221 ggttggatat ggttgatact agttttaagc taaaagactg tgttatgtat gcatcagctg

11281 tagtgttact aatccttatg acagcaagaa ctgtgtatga tgatggtgct aggagagtgt

11341 ggacacttat gaatgtcttg acactcgttt ataaagttta ttatggtaat gctttagatc

11401 aagccatttc catgtgggct cttataatct ctgttacttc taactactca ggtgtagtta

11461 caactgtcat gtttttggcc agaggtgttg tttttatgtg tgttgagtat tgccctattt

11521 tcttcataac tggtaataca cttcagtgta taatgctagt ttattgtttc ttaggctatt

11581 tttgtacttg ttactttggc ctcttttgtt tactcaaccg ctactttaga ctgactcttg

11641 gtgtttatga ttacttagtt tctacacagg agtttagata tatgaattca cagggactac

11701 tcccacccaa gaatagcata gatgccttca aactcaacat taaattgttg ggtgttggtg

11761 gcaaaccttg tatcaaagta gccactgtac agtctaaaat gtcagatgta aagtgcacat

11821 cagtagtctt actctcagtt ttgcaacaac tcagagtaga atcatcatct aaattgtggg

11881 ctcaatgtgt ccagttacac aatgacattc tcttagctaa agatactact gaagcctttg

11941 aaaaaatggt ttcactactt tctgttttgc tttccatgca gggtgctgta gacataaaca

12001 agctttgtga agaaatgctg gacaacaggg caaccttaca agctatagcc tcagagttta

12061 gttcccttcc atcatatgca gcttttgcta ctgctcaaga agcttatgag caggctgttg

12121 ctaatggtga ttctgaagtt gttcttaaaa agttgaagaa gtctttgaat gtggctaaat

12181 ctgaatttga ccgtgatgca gccatgcaac gtaagttgga aaagatggct gatcaagcta

12241 tgacccaaat gtataaacag gctagatctg aggacaagag ggcaaaagtt actagtgcta

12301 tgcagacaat gcttttcact atgcttagaa agttggataa tgatgcactc aacaacatta

12361 tcaacaatgc aagagatggt tgtgttccct tgaacataat acctcttaca acagcagcca

12421 aactaatggt tgtcatacca gactataaca catataaaaa tacgtgtgat ggtacaacat

12481 ttacttatgc atcagcattg tgggaaatcc aacaggttgt agatgcagat agtaaaattg

12541 ttcaacttag tgaaattagt atggacaatt cacctaattt agcatggcct cttattgtaa

12601 cagctttaag ggccaattct gctgtcaaat tacagaataa tgagcttagt cctgttgcac

12661 tacgacagat gtcttgtgct gccggtacta cacaaactgc ttgcactgat gacaatgcgt

12721 tagcttacta caacacaaca aagggaggta ggtttgtact tgcactgtta tccgatttac

12781 aggatttgaa atgggctaga ttccctaaga gtgatggaac tggtactatc tatacagaac

12841 tggaaccacc ttgtaggttt gttacagaca cacctaaagg tcctaaagtg aagtatttat

12901 actttattaa aggattaaac aacctaaata gaggtatggt acttggtagt ttagctgcca

12961 cagtacgtct acaagctggt aatgcaacag aagtgcctgc caattcaact gtattatctt

13021 tctgtgcttt tgctgtagat gctgctaaag cttacaaaga ttatctagct agtgggggac

13081 aaccaatcac taattgtgtt aagatgttgt gtacacacac tggtactggt caggcaataa

13141 cagtcacacc ggaagccaat atggatcaag aatcctttgg tggtgcatcg tgttgtctgt

13201 actgccgttg ccacatagat catccaaatc ctaaaggatt ttgtgactta aaaggtaagt

13261 atgtacaaat acctacaact tgtgctaatg accctgtggg ttttacactt aaaaacacag

13321 tctgtaccgt ctgcggtatg tggaaaggtt atggctgtag ttgtgatcaa ctccgcgaac

13381 ccatgcttca gtcagctgat gcacaatcgt ttttaaacgg gtttgcggtg taagtgcagc

13441 ccgtcttaca ccgtgcggca caggcactag tactgatgtc gtatacaggg cttttgacat

13501 ctacaatgat aaagtagctg gttttgctaa attcctaaaa actaattgtt gtcgcttcca

13561 agaaaaggac gaagatgaca atttaattga ttcttacttt gtagttaaga gacacacttt

13621 ctctaactac caacatgaag aaacaattta taatttactt aaggattgtc cagctgttgc

13681 taaacatgac ttctttaagt ttagaataga cggtgacatg gtaccacata tatcacgtca

13741 acgtcttact aaatacacaa tggcagacct cgtctatgct ttaaggcatt ttgatgaagg

13801 taattgtgac acattaaaag aaatacttgt cacatacaat tgttgtgatg atgattattt

13861 caataaaaag gactggtatg attttgtaga aaacccagat atattacgcg tatacgccaa

13921 cttaggtgaa cgtgtacgcc aagctttgtt aaaaacagta caattctgtg atgccatgcg

13981 aaatgctggt attgttggtg tactgacatt agataatcaa gatctcaatg gtaactggta

14041 tgatttcggt gatttcatac aaaccacgcc aggtagtgga gttcctgttg tagattctta

14101 ttattcattg ttaatgccta tattaacctt gaccagggct ttaactgcag agtcacatgt

14161 tgacactgac ttaacaaagc cttacattaa gtgggatttg ttaaaatatg acttcacgga

14221 agagaggtta aaactctttg accgttattt taaatattgg gatcagacat accacccaaa

14281 ttgtgttaac tgtttggatg acagatgcat tctgcattgt gcaaacttta atgttttatt

14341 ctctacagtg ttcccactta caagttttgg accactagtg agaaaaatat ttgttgatgg

14401 tgttccattt gtagtttcaa ctggatacca cttcagagag ctaggtgttg tacataatca

14461 ggatgtaaac ttacatagct ctagacttag ttttaaggaa ttacttgtgt atgctgctga

14521 ccctgctatg cacgctgctt ctggtaatct attactagat aaacgcacta cgtgcttttc

14581 agtagctgca cttactaaca atgttgcttt tcaaactgtc aaacccggta attttaacaa

14641 agacttctat gactttgctg tgtctaaggg tttctttaag gaaggaagtt ctgttgaatt

14701 aaaacacttc ttctttgctc aggatggtaa tgctgctatc agcgattatg actactatcg

14761 ttataatcta ccaacaatgt gtgatatcag acaactacta tttgtagttg aagttgttga

14821 taagtacttt gattgttacg atggtggctg tattaatgct aaccaagtca tcgtcaacaa

14881 cctagacaaa tcagctggtt ttccatttaa taaatggggt aaggctagac tttattatga

14941 ttcaatgagt tatgaggatc aagatgcact tttcgcatat acaaaacgta atgtcatccc

15001 tactataact caaatgaatc ttaagtatgc cattagtgca aagaatagag ctcgcaccgt

15061 agctggtgtc tctatctgta gtactatgac caatagacag tttcatcaaa aattattgaa

15121 atcaatagcc gccactagag gagctactgt agtaattgga acaagcaaat tctatggtgg

15181 ttggcacaat atgttaaaaa ctgtttatag tgatgtagaa aaccctcacc ttatgggttg

15241 ggattatcct aaatgtgata gagccatgcc taacatgctt agaattatgg cctcacttgt

15301 tcttgctcgc aaacatacaa cgtgttgtag cttgtcacac cgtttctata gattagctaa

15361 tgagtgtgct caagtattga gtgaaatggt catgtgtggc ggttcactat atgttaaacc

15421 aggtggaacc tcatcaggag atgccacaac tgcttatgct aatagtgttt ttaacatttg

15481 tcaagctgtc acggccaatg ttaatgcact tttatctact gatggtaaca aaattgccga

15541 taagtatgtc cgcaatttac aacacagact ttatgagtgt ctctatagaa atagagatgt

15601 tgacacagac tttgtgaatg agttttacgc atatttgcgt aaacatttct caatgatgat

15661 actctctgac gatgctgttg tgtgtttcaa tagcacttat gcatctcaag gtctagtggc

15721 tagcataaag aactttaagt cagttcttta ttatcaaaac aatgttttta tgtctgaagc

15781 aaaatgttgg actgagactg accttactaa aggacctcat gaattttgct ctcaacatac

15841 aatgctagtt aaacagggtg atgattatgt gtaccttcct tacccagatc catcaagaat

15901 cctaggggcc ggctgttttg tagatgatat cgtaaaaaca gatggtacac ttatgattga

15961 acggttcgtg tctttagcta tagatgctta cccacttact aaacatccta atcaggagta

16021 tgctgatgtc tttcatttgt acttacaata cataagaaag ctacatgatg agttaacagg

16081 acacatgtta gacatgtatt ctgttatgct tactaatgat aacacttcaa ggtattggga

16141 acctgagttt tatgannnnn nnnnnnnnnn nnnnnnnntc ttacaggctg ttggggcttg

16201 tgttctttgc aattcacaga cttcattaag atgtggtgct tgcatacgta gaccattctt

16261 atgttgtaaa tgctgttacg accatgtcat atcaacatca cataaattag tcttgtctgt

16321 taatccgtat gtttgcaatg ctccaggttg tgatgtcaca gatgtgactc aactttactt

16381 aggaggtatg agctattatt gtaaatcaca taaaccaccc attagttttc cattgtgtgc

16441 taatggacaa gtttttggtt tatataaaaa tacatgtgtt ggtagcgata atgttactga

16501 ctttaatgca attgcaacat gtgactggac aaatgctggt gattacattt tagctaacac

16561 ctgtactgaa agactcaagc tttttgcagc agaaacgctc aaagctactg aggagacatt

16621 taaactgtct tatggtattg ctactgtacg tgaagtgctg tctgacagag aattacatct

16681 ttcatgggaa gttggtaaac ctagaccacc acttaaccga aattatgtct ttactggtta

16741 tcgtgtaact aaaaacagta aagtacaaat aggagagtac acctttgaaa aaggtgacta

16801 tggtgatgct gttgtttacc gaggtacaac aacttacaaa ttaaatgttg gtgattattt

16861 tgtgctgaca tcacatacag taatgccatt aagtgcacct acactagtgc cacaagagca

16921 ctatgttaga attactggct tatacccaac actcaatatc tcagatgagt tttctagcaa

16981 tgttgcaaat tatcaaaagg ttggtatgca aaagtattct acactccagg gaccacctgg

17041 tactggtaag agtcattttg ctattggcct agctctctac tacccttctg ctcgcatagt

17101 gtatacagct tgctctcatg ccgctgttga tgcactatgt gagaaggcat taaaatattt

17161 gcctatagat aaatgtagta gaattatacc tgcacgtgct cgtgtagagt gttttgataa

17221 attcaaagtg aattcaacat tagaacagta tgtcttttgt actgtaaatg cattgcctga

17281 gacgacagca gatatagttg tctttgatga aatttcaatg gccacaaatt atgatttgag

17341 tgttgtcaat gccagattac gtgctaagca ctatgtgtac attggcgacc ctgctcaatt

17401 acctgcacca cgcacattgc taactaaggg cacactagaa ccagaatatt tcaattcagt

17461 gtgtagactt atgaaaacta taggtccaga catgttcctc ggaacttgtc ggcgttgtcc

17521 tgctgaaatt gttgacactg tgagtgcttt ggtttatgat aataagctta aagcacataa

17581 agacaaatca gctcaatgct ttaaaatgtt ttataagggt gttatcacgc atgatgtttc

17641 atctgcaatt aacaggccac aaataggcgt ggtaagagaa ttccttacac gtaaccctgc

17701 ttggagaaaa gctgtcttta tttcacctta taattcacag aatgctgtag cctcaaagat

17761 tttgggacta ccaactcaaa ctgttgattc atcacagggc tcagaatatg actatgtcat

17821 attcactcaa accactgaaa cagctcactc ttgtaatgta aacagattta atgttgctat

17881 taccagagca aaagtaggca tactttgcat aatgtctgat agagaccttt atgacaagtt

17941 gcaatttaca agtcttgaaa ttccacgtag gaatgtggca actttacaag ctgaaaatgt

18001 aacaggactc tttaaagatt gtagtaaggt aatcactggg ttacatccta cacaggcacc

18061 tacacacctc agtgttgaca ctaaattcaa aactgaaggt ttatgtgttg acgtacctgg

18121 catacctaag gacatgacct atagaagact catctctatg atgggtttta aaatgaatta

18181 tcaagttaat ggttacccta acatgtttat cacccgcgaa gaagctataa gacatgtacg

18241 tgcatggatt ggcttcgatg tcgaggggtg tcatgctact agagaagctg ttggtaccaa

18301 tttaccttta cagctaggtt tttctacagg tgttaaccta gttgctgtac ctacaggtta

18361 tgttgataca cctaataata cagatttttc cagagttagt gctaaaccac cgcctggaga

18421 tcaatttaaa cacctcatac cacttatgta caaaggactt ccttggaatg tagtgcgtat

18481 aaagattgta caaatgttaa gtgacacact taaaaatctc tctgacagag tcgtatttgt

18541 cttatgggca catggctttg agttgacatc tatgaagtat tttgtgaaaa taggacctga

18601 gcgcacctgt tgtctatgtg atagacgtgc cacatgcttt tccactgctt cagacactta

18661 tgcctgttgg catcattcta ttggatttga ttacgtctat aatccgttta tgattgatgt

18721 tcaacaatgg ggttttacag gtaacctaca aagcaaccat gatctgtatt gtcaagtcca

18781 tggtaatgca catgtagcta gttgtgatgc aatcatgact aggtgtctag ctgtccacga

18841 gtgctttgtt aagcgtgttg actggactat tgaatatcct ataattggtg atgaactgaa

18901 gattaatgcg gcttgtagaa aggttcaaca catggttgtt aaagctgcat tattagcaga

18961 caaattccca gttcttcacg acattggtaa ccctaaagct attaagtgtg tacctcaagc

19021 tgatgtagaa tggaagttct atgatgcaca gccttgtagt gacaaagctt ataaaataga

19081 agaattattc tattcttatg ccacacattc tgacaaattc acagatggtg tatgcctatt

19141 ttggaattgc aatgtcgata gatatcctgc taattccatt gtttgtagat ttgacactag

19201 agtgctatct aaccttaact tgcctggttg tgatggtggc agtttgtatg taaataaaca

19261 tgcattccac acaccagctt ttgataaaag tgcttttgtt aatttaaaac aattaccatt

19321 tttctattac tctgacagtc catgtgagtc tcatggaaaa caagtagtgt cagatataga

19381 ttatgtacca ctaaagtctg ctacgtgtat aacacgttgc aatttaggtg gtgctgtctg

19441 tagacatcat gctaatgagt acagattgta tctcgatgct tataacatga tgatctcagc

19501 tggctttagc ttgtgggttt acaaacaatt tgatacttat aacctctgga acacttttac

19561 aagacttcag agtttagaaa atgtggcttt taatgttgta aataagggac actttgatgg

19621 acaacagggt gaagtaccag tttctatcat taataacact gtttacacaa aagttgatgg

19681 tgttgatgta gaattgtttg aaaataaaac aacattacct gttaatgtag catttgagct

19741 ttgggctaag cgcaacatta aaccagtacc agaggtgaaa atactcaata atttgggtgt

19801 ggacattgct gctaatactg tgatctggga ctacaaaaga gatgctccag cacatatatc

19861 tactattggt gtttgttcta tgactgacat agccaagaaa ccaactgaaa cgatttgtgc

19921 accactcact gtcttttttg atggtagagt tgatggtcaa gtagacttat ttagaaatgc

19981 ccgtaatggt gttcttatta cagaaggtag tgttaaaggt ttacaaccat ctgtaggtcc

20041 caaacaagct agtcttaatg gagtcacatt aattggagaa gccgtaaaaa cacagttcaa

20101 ttattataag aaagttgatg gtgttgtcca acaattacct gaaacttact ttactcagag

20161 tagaaattta caagaattta aacccaggag tcaaatggaa attgatttct tagaattagc

20221 tatggatgaa ttcattgaac ggtataaatt agaaggctat gccttcgaac atatcgttta

20281 tggagatttt agtcatagtc agttaggtgg tttacatcta ctgattggac tagctaaacg

20341 ttttaaggaa tcaccttttg aattagaaga ttttattcct atggacagta cagttaaaaa

20401 ctatttcata acagatgcgc aaacaggttc atctaagtgt gtgtgttctg ttattgattt

20461 attacttgat gattttgttg aaataataaa atcccaagat ttatctgtag tttctaaggt

20521 tgtcaaagtg actattgact atacagaaat ttcatttatg ctttggtgta aagatggcca

20581 tgtagaaaca ttttacccaa aattacaatc tagtcaagcg tggcaaccgg gtgttgctat

20641 gcctaatctt tacaaaatgc aaagaatgct attagaaaag tgtgaccttc aaaattatgg

20701 tgatagtgca acattaccta aaggcataat gatgaatgtc gcaaaatata ctcaactgtg

20761 tcaatattta aacacattaa cattagctgt accctataat atgagagtta tacattttgg

20821 tgctggttct gataaaggag ttgcaccagg tacagctgtt ttaagacagt ggttgcctac

20881 gggtacgctg cttgtcgatt cagatcttaa tgactttgtc tctgatgcag attcaacttt

20941 gattggtgat tgtgcaactg tacatacagc taataaatgg gatctcatta ttagtgatat

21001 gtacgaccct aagactaaaa atgttacaaa agaaaatgac tctaaagagg gttttttcac

21061 ttacatttgt gggtttatac aacaaaagct agctcttgga ggttccgtgg ctataaagat

21121 aacagaacat tcttggaatg ctgatcttta taagctcatg ggacacttcg catggtggac

21181 agcctttgtt actaatgtga atgcgtcatc atctgaagca tttttaattg gatgtaatta

21241 tcttggcaaa ccacgcgaac aaatagatgg ttatgtcatg catgcaaatt acatattttg

21301 gaggaataca aatccaattc agttgtcttc ctattcttta tttgacatga gtaaatttcc

21361 ccttaaatta aggggtactg ctgttatgtc tttaaaagaa ggtcaaatca atgatatgat

21421 tttatctctt cttagtaaag gtagacttat aattagagaa aacaacagag ttgttatttc

21481 tagtgatgtt cttgttaaca actaaacgaa caatgtttgt ttttcttgtt ttattgccac

21541 tagtctctag tcagtgtgtt aatcttacaa ccagaactca attaccccct gcatacacta

21601 attctttcac acgtggtgtt tattaccctg acaaagtttt cagatcctca gttttacatt

21661 caactcagga cttgttctta cctttctttt ccaatgttac ttggttccat gttatctctg

21721 ggaccaatgg tactaagagg tttgataacc ctgtcctacc atttaatgat ggtgtttatt

21781 ttgcttccat tgagaagtct aacataataa gaggctggat ttttggtact actttagatt

21841 cgaagaccca gtccctactt attgttaata acgctactaa tgttgttatt aaagtctgtg

21901 aatttcaatt ttgtaatgat ccatttttgg accacaaaaa caacaaaagt tggatggaaa

21961 gtgagttcag agtttattct agtgcgaata attgcacttt tgaatatgtc tctcagcctt

22021 ttcttatgga ccttgaagga aaacagggta atttcaaaaa tcttagggaa tttgtgttta

22081 agaatattga tggttatttt aaaatatatt ctaagcacac gcctattata gtgcgtgagc

22141 cagaagatct ccctcagggt ttttcggctt tagaaccatt ggtagatttg ccaataggta

22201 ttaacatcac taggtttcaa actttacttg ctttacatag aagttatttg actcctggtg

22261 attcttcttc aggttggaca gctggtgctg cagcttatta tgtgggttat cttcaaccta

22321 ggacttttct attaaaatat aatgaaaatg gaaccattac agatgctgta gactgtgcac

22381 ttgaccctct ctcagaaaca aagtgtacgt tgaaatcctt cactgtagaa aaaggaatct

22441 atcaaacttc taactttaga gtccaaccaa cagaatctat tgttagattt cctaatatta

22501 caaacttgtg cccttttgat gaagttttta acgccaccaa atttgcatct gtttatgctt

22561 ggaacaggaa gagaatcagc aactgtgttg ctgattattc tgtcctatat aatctcgcac

22621 catttttcac ttttaagtgt tatggagtgt ctcctactaa attaaatgat ctctgcttta

22681 ctaatgtcta tgcagattca tttgtaatta gaggtgatga agtcagacaa atcgctccag

22741 ggcaaactgg aaatattgct gattataatt ataaattacc agatgatttt acaggctgcg

22801 ttatagcttg gaattctaac aatcttgatt ctaaggttag tggtaattat aattacctgt

22861 atagattgtt taggaagtct aatctcaaac cttttgagag agatatttca actgaaatct

22921 atcaggccgg taacaaacct tgtaatggtg ttgcaggttt taattgttac tttcctttac

22981 gatcatatag tttccgaccc acttatggtg ttggtcacca accatacaga gtagtagtac

23041 tttcttttga acttctacat gcaccagcaa ctgtttgtgg acctaaaaag tctactaatt

23101 tggttaaaaa caaatgtgtc aatttcaact tcaatggttt aaaaggcaca ggtgttctta

23161 ctgagtctaa caaaaagttt ctgcctttcc aacaatttgg cagagacatt gctgacacta

23221 ctgatgctgt ccgtgatcca cagacacttg agattcttga cattacacca tgttcttttg

23281 gtggtgtcag tgttataaca ccaggaacaa atacttctaa ccaggttgct gttctttatc

23341 agggtgttaa ctgcacagaa gtccctgttg ctattcatgc agatcaactt actcctactt

23401 ggcgtgttta ttctacaggt tctaatgttt ttcaaacacg tgcaggctgt ttaatagggg

23461 ctgaatatgt caacaactca tatgagtgtg acatacccat tggtgcaggt atatgcgcta

23521 gttatcagac tcagactaag tctcatcggc gggcacgtag tgtagctagt caatccatca

23581 ttgcctacac tatgtcactt ggtgcagaaa attcagttgc ttactctaat aactctattg

23641 ccatacccac aaattttact attagtgtta ccacagaaat tctaccagtg tctatgacca

23701 agacatcagt agattgtaca atgtacattt gtggtgattc aactgaatgc agcaatcttt

23761 tgttgcaata tggcagtttt tgtacacaat taaaacgtgc tttaactgga atagctgttg

23821 aacaagacaa aaacacccaa gaagtttttg cacaagtcaa acaaatttac aaaacaccac

23881 caattaaata ttttggtggt tttaattttt cacaaatatt accagatcca tcaaaaccaa

23941 gcaagaggtc atttattgaa gatctacttt tcaacaaagt gacacttgca gatgctggct

24001 tcatcaaaca atatggtgat tgccttggtg atattgctgc tagagacctc atttgtgcac

24061 aaaagtttaa aggccttact gttttgccac ctttgctcac agatgaaatg attgctcaat

24121 acacttctgc actgttagcg ggtacaatca cttctggttg gacctttggt gcaggtgctg

24181 cattacaaat accatttgct atgcaaatgg cttataggtt taatggtatt ggagttacac

24241 agaatgttct ctatgagaac caaaaattga ttgccaacca atttaatagt gctattggca

24301 aaattcaaga ctcactttct tccacagcaa gtgcacttgg aaaacttcaa gatgtggtca

24361 accataatgc acaagcttta aacacgcttg ttaaacaact tagctccaaa tttggtgcaa

24421 tttcaagtgt tttaaatgat atcttttcac gtcttgacaa agttgaggct gaagtgcaaa

24481 ttgataggtt gatcacaggc agacttcaaa gtttgcagac atatgtgact caacaattaa

24541 ttagagctgc agaaatcaga gcttctgcta atcttgctgc tactaaaatg tcagagtgtg

24601 tacttggaca atcaaaaaga gttgattttt gtggaaaggg ctatcatctt atgtccttcc

24661 ctcagtcagc acctcatggt gtagtcttct tgcatgtgac ttatgtccct gcacaagaaa

24721 agaacttcac aactgctcct gccatttgtc atgatggaaa agcacacttt cctcgtgaag

24781 gtgtctttgt ttcaaatggc acacactggt ttgtaacaca aaggaatttt tatgaaccac

24841 aaatcattac tacagacaac acatttgtgt ctggtaactg tgatgttgta ataggaattg

24901 tcaacaacac agtttatgat cctttgcaac ctgaattaga ttcattcaag gaggagttag

24961 ataaatattt taagaatcat acatcaccag atgttgattt aggtgacatc tctggcatta

25021 atgcttcagt tgtaaacatt caaaaagaaa ttgaccgcct caatgaggtt gccaagaatt

25081 taaatgaatc tctcatcgat ctccaagaac ttggaaagta tgagcagtat ataaaatggc

25141 catggtacat ttggctaggt tttatagctg gcttgattgc catagtaatg gtgacaatta

25201 tgctttgctg tatgaccagt tgctgtagtt gtctcaaggg ctgttgttct tgtggatcct

25261 gctgcaaatt tgatgaagac gactctgagc cagtgctcaa aggagtcaaa ttacattaca

25321 cataaacgaa cttatggatt tgtttatgag aatcttcaca attggaactg taactttgaa

25381 gcaaggtgaa atcaaggatg ctactccttc agattttgtt cgcgctactg caacgatacc

25441 gatacaagcc tcactccctt tcggatggct tattgttggc gttgcacttc ttgctgtttt

25501 tcagagcgct tccaaaatca taactctcaa aaagagatgg caactagcac tctccaaggg

25561 tgttcacttt gtttgcaact tgctgttgtt gtttgtaaca gtttactcac accttttgct

25621 cgttgctgct ggccttgaag ccccttttct ctatctttat gctttagtct acttcttgca

25681 gagtataaac tttgtaagaa taataatgag gctttggctt tgctggaaat gccgttccaa

25741 aaacccatta ctttatgatg ccaactattt tctttgctgg catactaatt gttacgacta

25801 ttgtatacct tacaatagtg taacttcttc aattgtcatt acttcaggtg atggcacaac

25861 aagtcctatt tctgaacatg actaccagat tggtggttat actgaaaaat gggaatctgg

25921 agtaaaagac tgtgttgtat tacacagtta cttcacttca gactattacc agctgtactc

25981 aactcaattg agtacagaca ctggtgttga acatgttacc ttcttcatct acaataaaat

26041 tgttgatgag cctgaagaac atgtccaaat tcacacaatc gacggttcat ccggagttgt

26101 taatccagta atggaaccaa tttatgatga accgacgacg actactagcg tgcctttgta

26161 agcacaagct gatgagtacg aacttatgta ctcattcgtt tcggaagaga taggtacgtt

26221 aatagttaat agcgtacttc tttttcttgc tttcgtggta ttcttgctag ttacactagc

26281 catccttact gcgcttcgat tgtgtgcgta ctgctgcaat attgttaacg tgagtcttgt

26341 aaaaccttct ttttacgttt actctcgtgt taaaaatctg aattcttcta gagttcctga

26401 tcttctggtc taaacgaact aaatattata ttagtttttc tgtttggaac tttaatttta

26461 gctatggcag gttccaacgg tactattacc gttgaagagc ttaaaaagct ccttgaagaa

26521 tggaacctag taataggttt cctattcctt acatggattt gtcttctaca atttgcctat

26581 gccaacagga ataggttttt gtatataatt aagttaattt tcctctggct gttatggcca

26641 gtaactttaa cttgttttgt gcttgctgct gtttacagaa taaattggat caccggtgga

26701 attgctatcg caatggcttg tcttgtaggc ttgatgtggc tcagctactt cattgcttct

26761 ttcagactgt ttgcgcgtac gcgttccatg tggtcattca atccagaaac taacattctt

26821 ctcaacgtgc cactccatgg cactattctg accagaccgc ttctagaaag tgaactcgta

26881 atcggagctg tgatccttcg tggacatctt cgtattgctg gacaccatct aggacgctgt

26941 gacatcaagg acctgcctaa agaaatcact gttgctacat cacgaacgct ttcttattac

27001 aaattgggag cttcgcagcg tgtagcaggt gactcaggtt ttgctgcata cagtcgctac

27061 aggattggca actataaatt aaacacagac cattccagta gcagtgacaa tattgctttg

27121 cttgtacagt aagtgacaac agatgtttca tctcgttgac tttcaggtta ctatagcaga

27181 gatattacta attattatgc ggacttttaa agtttccatt tggaatcttg attacatcat

27241 aaacctcata attaaaaatt tatctaagtc actaactgag aataaatatt ctcaattaga

27301 tgaagagcaa ccaatggaga ttgattaaac gaacatgaaa attattcttt tcttggcact

27361 gataacactc gctacttgtg agctttatca ctaccaagag tgtgttagag gtacaacagt

27421 acttttaaaa gaaccttgct cttctggaac atacgagggc aattcaccat ttcatcctct

27481 agctgataac aaatttgcac tgacttgctt tagcactcaa tttgcttttg cttgtcctga

27541 cggcgtaaaa cacgtctatc agttacgtgc cagatcagtt tcacctaaac tgttcatcag

27601 acaagaggaa gttcaagaac tttactctcc aatttttctt attgttgcgg caatagtgtt

27661 tataacactt tgcttcacac tcaaaagaaa gacagaatga ttgaactttc attaattgac

27721 ttctatttgt gctttttagc ctttctgtta ttccttgttt taattatgct tattatcttt

27781 tggttctcac ttgaactgca agatcataat gaaacttgtc acgcctaaac gaacatgaaa

27841 tttcttgttt tcttaggaat catcacaact gtagctgcat ttcaccaaga atgtagttta

27901 cagtcatgta ctcaacatca accatatgta gttgatgacc cgtgtcctat tcacttctat

27961 tctaaatggt atattagagt aggagctaga aaatcagcac ctttaattga attgtgcgtg

28021 gatgaggctg gttctaaatc acccattcag tacatcgata tcggtaatta tacagtttcc

28081 tgtttacctt ttacaattaa ttgccaggaa cctaaattgg gtagtcttgt agtgcgttgt

28141 tcgttctatg aagacttttt agagtatcat gacgttcgtg ttgttttaga tttcatctaa

28201 acgaacaaac ttaaatgtct gataatggac cccaaaatca gcgaaatgca ctccgcatta

28261 cgtttggtgg accctcagat tcaactggca gtaaccagaa tggtggggcg cgatcaaaac

28321 aacgtcggcc ccaaggttta cccaataata ctgcgtcttg gttcaccgct ctcactcaac

28381 atggcaagga agaccttaaa ttccctcgag gacaaggcgt tccaattaac accaatagca

28441 gtccagatga ccaaattggc tactaccgaa gagctaccag acgaattcgt ggtggtgacg

28501 gtaaaatgaa agatctcagt ccaagatggt atttctacta cctaggaact gggccagaag

28561 ctggacttcc ctatggtgct aacaaagacg gcatcatatg ggttgcaact gagggagcct

28621 tgaatacacc aaaagatcac attggcaccc gcaatcctgc taacaatgct gcaatcgtgc

28681 tacaacttcc tcaaggaaca acattgccaa aaggcttcta cgcagaaggg agcagaggcg

28741 gcagtcaagc ctcttctcgt tcctcatcac gtagtcgcaa cagttcaaga aattcaactc

28801 caggcagcag taaacgaact tctcctgcta gaatggctgg caatggcggt gatgctgctc

28861 ttgctttgct gctgcttgac agattgaacc agcttgagag caaaatgtct ggtaaaggcc

28921 aacaacaaca aggccaaact gtcactaaga aatctgctgc tgaggcttct aagaagcctc

28981 ggcaaaaacg tactgccact aaagcataca atgtaacaca agctttcggc agacgtggtc

29041 cagaacaaac ccaaggaaat tttggggacc aggaactaat cagacaagga actgattaca

29101 aacattggcc gcaaattgca caatttgccc ccagcgcttc agcgttcttc ggaatgtcgc

29161 gcattggcat ggaagtcaca ccttcgggaa cgtggttgac ctacacaggt gccatcaaat

29221 tggatgacaa agatccaaat ttcaaagatc aagtcatttt gctgaataag catattgacg

29281 catacaaaac attcccacca acagagccta aaaaggacaa aaagaagaag gctgatgaaa

29341 ctcaagcctt accgcagaga cagaagaaac agcaaactgt gactcttctt cctgctgcag

29401 atttggatga tttctccaaa caattgcaac aatccatgag cagtgctgac tcaactcagg

29461 cctaaactca tgcagaccac acaaggcaga tgggctatat aaacgttttc gcttttccgt

29521 ttacgatata tagtctactc ttgtgcagaa tgaattctcg taactacata gcacaagtag

29581 atgtagttaa ctttaatctc acatagcaat ctttaatcag tgtgtaacat tagggaggac

29641 ttgaaagagc caccacattt tcaccgaggc cacgcggagt acgatcgagt gtacagtgaa

29701 caatgctagg gagagctgcc tatatggaag agccctaatg tgtaaaatta attttagtag

29761 tgctatccc

//