**Severe acute respiratory syndrome coronavirus 2 isolate SARS-CoV-2/human/USA/WI-CDC-LC0537966/2022 ORF1ab polyprotein (ORF1ab), ORF1a polyprotein (ORF1ab), surface glycoprotein (S), ORF3a protein (ORF3a), envelope protein (E), membrane glycoprotein (M), ORF6 p...**

GenBank: OM789835.1

[FASTA](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?report=fasta) [Graphics](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?report=graph)

[Go to:](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1" \l "goto2198557215_0)

LOCUS OM789835 29445 bp RNA linear VRL 23-FEB-2022

DEFINITION Severe acute respiratory syndrome coronavirus 2 isolate

SARS-CoV-2/human/USA/WI-CDC-LC0537966/2022 ORF1ab polyprotein

(ORF1ab), ORF1a polyprotein (ORF1ab), surface glycoprotein (S),

ORF3a protein (ORF3a), envelope protein (E), membrane glycoprotein

(M), ORF6 protein (ORF6), ORF7a protein (ORF7a), ORF7b (ORF7b),

ORF8 protein (ORF8), and nucleocapsid phosphoprotein (N) genes,

complete cds; and ORF10 protein (ORF10) gene, partial cds.

ACCESSION OM789835

VERSION OM789835.1

DBLINK BioProject: [PRJNA716984](https://www.ncbi.nlm.nih.gov/bioproject/PRJNA716984)

BioSample: [SAMN26143689](https://www.ncbi.nlm.nih.gov/biosample/SAMN26143689)

KEYWORDS purposeofsampling:baselinesurveillance.

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 29445)

AUTHORS Howard,D., Batra,D., Cook,P.W., Caravas,J., Rambo-Martin,B.,

Sammons,S., Unoarumhi,Y., Schmerer,M., Lacek,K.A., Kendall,T.,

Caban Figueroa,V., Morrison,S., Gulvick,C., Agarwal,M., Almasri,E.,

Boles,D., Burns,A., Charoensri,N., Cohen,O., Countryman,S.,

Cristobal,M.A., Croy,B., Dale,S., Deshmukh,H., Douglas,A.,

Drouillon,V., Eisenberg,M., Engler,H., Ghatti,R., Gupta,P.,

Hicks,S., Humphrey,J., Iyer,L., Pfefferle,L., Jain,M., Robinson,M.,

Kolli,M., Krueger,B., Kuphal,T., Letovsky,S., Levandoski,M.,

Lukasik,C., Meltzer,J., Norvell,B., Nye,M., Parker,S.,

Petropoulos,C., Pruitt,J., Ragan,S., Ryan,S., Sapeta,M.,

Schroth,J., Selvaraju,S.B., Stevovic,G., Suchanek,A., Throop,A.,

Tilson,L., Urban,T., Voshell,J., Wagner,K., Williams,J.,

Williamson,M., Zeng,Q., Zwiefelhofer,T., Paden,C.R. and

MacCannell,D.

TITLE CDC Sars CoV2 Sequencing Baseline Constellation

JOURNAL Unpublished

REFERENCE 2 (bases 1 to 29445)

AUTHORS Howard,D., Batra,D., Cook,P.W., Caravas,J., Rambo-Martin,B.,

Sammons,S., Unoarumhi,Y., Schmerer,M., Lacek,K.A., Kendall,T.,

Caban Figueroa,V., Morrison,S., Gulvick,C., Sula,E., Agarwal,M.,

Almasri,E., Boles,D., Burns,A., Charoensri,N., Cohen,O.,

Countryman,S., Cristobal,M.A., Croy,B., Dale,S., Deshmukh,H.,

Douglas,A., Drouillon,V., Eisenberg,M., Engler,H., Ghatti,R.,

Gupta,P., Hicks,S., Humphrey,J., Iyer,L., Pfefferle,L., Jain,M.,

Robinson,M., Kolli,M., Krueger,B., Kuphal,T., Letovsky,S.,

Levandoski,M., Lukasik,C., Meltzer,J., Norvell,B., Nye,M.,

Parker,S., Petropoulos,C., Pruitt,J., Ragan,S., Ryan,S., Sapeta,M.,

Schroth,J., Selvaraju,S.B., Stevovic,G., Suchanek,A., Throop,A.,

Tilson,L., Urban,T., Voshell,J., Wagner,K., Williams,J.,

Williamson,M., Zeng,Q., Zwiefelhofer,T., Paden,C.R. and

MacCannell,D.

TITLE Direct Submission

JOURNAL Submitted (22-FEB-2022) Respiratory Viruses Branch, Division of

Viral Diseases, Centers for Disease Control and Prevention, 1600

Clifton Rd, Atlanta, GA 30329, USA

COMMENT ##Assembly-Data-START##

Assembly Method :: CLC Genomics

Sequencing Technology :: PacBio Sequel II

##Assembly-Data-END##

FEATURES Location/Qualifiers

source 1..29445

/organism="Severe acute respiratory syndrome coronavirus

2"

/mol\_type="genomic RNA"

/isolate="SARS-CoV-2/human/USA/WI-CDC-LC0537966/2022"

/isolation\_source="Nasal Swabs"

/host="Homo sapiens"

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

/country="USA: Wisconsin"

/collection\_date="2022-02-11"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=131&to=21408) 131..21408

/gene="ORF1ab"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?location=131:13321,13321:21408) join(131..13321,13321..21408)

/gene="ORF1ab"

/ribosomal\_slippage

/codon\_start=1

/product="ORF1ab polyprotein"

/protein\_id="[ULP11127.1](https://www.ncbi.nlm.nih.gov/protein/2198557216)"

/translation="MESLVPGFNEKTHVQLSLPVLQVRDVLVRGFGDSVEEVLSEARQ

HLKDGTCGLVEVEKGVLPQLEQPYVFIKRSDARTAPHGHVMVELVAELEGIQYGRSGE

TLGVLVPHVGEIPVAYRKVLLRKNGNKGAGGHSYGADLKSFDLGDELGTDPYEDFQEN

WNTKHSSGVTRELMRELNGGAYTRYVDNNFCGPDGYPLECIKDLLARAGKASCTLSEQ

LDFIDTKRGVYCCREHEHEIAWYTERSEKSYELQTPFEIKLAKKFDTFNGECPNFVFP

LNSIIKTIQPRVEKKKLDGFMGRIRSVYPVASPNECNQMCLSTLMKCDHCGETSWQTG

DFVKATCEFCGTENLTKEGATTCGYLPQNAVVKIYCPACHNSEVGPEHSLAEYHNESG

LKTILRKGGRTIAFGGCVFSYVGCHNKCAYWVPRASANIGCNHTGVVGEGSEGLNDNL

LEILQKEKVNINIVGDFKLNEEIAIILASFSASTSAFVETVKGLDYKAFKQIVESCGN

FKVTKGKAKKGAWNIGEQKSILSPLYAFASEAARVVRSIFSRTLETAQNSVRVLQKAA

ITILDGISQYSLRLIDAMMFTSDLATNNLVVMAYITGGVVQLTSQWLTNIFGTVYEKL

KPVLDWLEEKFKEGVEFLRDGWEIVKFISTCACEIVGGQIVTCAKEIKESVQTFFKLV

NKFLALCADSIIIGGAKLKALNLGETFVTHSKGLYRKCVKSREETGLLMPLKAPKEII

FLEGETLPTEVLTEEVVLKTGDLQPLEQPTSEAVEAPLVGTPVCINGLMLLEIKDTEK

YCALAPNMMVTNNTFTLKGGAPTKVTFGDDTVIEVQGYKSVNITFELDERIDKVLNER

CSAYTVELGTEVNEFACVVADAVIKTLQPVSELLTPLGIDLDEWSMATYYLFDESGEF

KLASHMYCSFYPPDEDEEEGDCEEEEFEPSTQYEYGTEDDYQGKPLEFGATSAALQPE

EEQEEDWLDDDSQQTVGQQDGSEDNQTTTIQTIVEVQPQLEMELTPVVQTIEVNSFSG

YLKLTDNVYIKNADIVEEAKKVKPTVVVNAANVYLKHGGGVAGALNKATNNAMQVESD

DYIATNGPLKVGGSCVLSGHNLAKHCLHVVGPNVNKGEDIQLLKSAYENFNQHEVLLA

PLLSAGIFGADPIHSLRVCVDTVRTNVYLAVFDKNLYDKLVSSFLEMKSEKQVEQKIA

EIPKEEVKPFITESKPSVEQRKQDDKKIKACVEEVTTTLEETKFLTENLLLYIDINGN

LHPDSATLVSDIDITFLKKDAPYIVGDVVQEGVLTAVVIPTKKAGGTTEMLAKALRKV

PTDNYITTYPGQGLNGYTVEEAKTVLKKCKSAFYILPSIISNEKQEILGTVSWNLREM

LAHAEETRKLMPVCVETKAIVSTIQRKYKGIKIQEGVVDYGARFYFYTSKTTVASLIN

TLNDLNETLVTMPLGYVTHGLNLEEAARYMRSLKVPATVSVSSPDAVTAYNGYLTSSS

KTPEEHFIETISLAGSYKDWSYSGQSTQLGIEFLKRGDKSVYYTSNPTTFHLDGEVIT

FDNLKTLLSLREVRTIKVFTTVDNINLHTQVVDMSMTYGQQFGPTYLDGADVTKIKPH

NSHEGKTFYVLPNDDTLRVEAFEYYHTTDPSFLGRYMSALNHTKKWKYPQVNGLTSIK

WADNNCYLATALLTLQQIELKFNPPALQDAYYRARAGEAANFCALILAYCNKTVGELG

DVRETMSYLFQHANLDSCKRVLNVVCKTCGQQQTTLKGVEAVMYMGTLSYEQFKKGVQ

IPCTCGKQATKYLVQQESPFVMMSAPPAQYELKHGTFTCASEYTGNYQCGHYKHITSK

ETLYCIDGALLTKSSEYKGPITDVFYKENSYTTTIKPVTYKLDGVVCTEIDPKLDNYY

KKDNSYFTEQPIDLVPNQPYPNASFDNFKFVCDNIKFADDLNQLTGYKKPASRELKVT

FFPDLNGDVVAIDYKHYTPSFKKGAKLLHKPIVWHVNNATNKATYKPNTWCIRCLWST

KPVETSNSFDVLKSEDAQGMDNLAXXXXXPVSEEVVENPTIQKDVLECNVKTTEVVGD

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

DGARRVWTLMNVLTLVYKVYYGSALDQAISMWALIISVTSNYSGVVTTVMFLARGVVF

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

YADVFHLYLQYIRKLHDELTGHMLDMYSVMLTNDNTSRYWEPEFYEAMYTPHTVLQAV

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/ULP11127.1?from=1&to=180) 131..670

/gene="ORF1ab"

/product="leader protein"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=181&to=818) 671..2584

/gene="ORF1ab"

/product="nsp2"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=819&to=2762) 2585..8416

/gene="ORF1ab"

/product="nsp3"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=2763&to=3262) 8417..9916

/gene="ORF1ab"

/product="nsp4"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=3263&to=3568) 9917..10834

/gene="ORF1ab"

/product="3C-like proteinase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=3569&to=3855) 10835..11695

/gene="ORF1ab"

/product="nsp6"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=3856&to=3938) 11696..11944

/gene="ORF1ab"

/product="nsp7"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=3939&to=4136) 11945..12538

/gene="ORF1ab"

/product="nsp8"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=4137&to=4249) 12539..12877

/gene="ORF1ab"

/product="nsp9"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=4250&to=4388) 12878..13294

/gene="ORF1ab"

/product="nsp10"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=4389&to=5320) join(13295..13321,13321..16089)

/gene="ORF1ab"

/product="RNA-dependent RNA polymerase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=5321&to=5921) 16090..17892

/gene="ORF1ab"

/product="helicase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=5922&to=6448) 17893..19473

/gene="ORF1ab"

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

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=6449&to=6794) 19474..20511

/gene="ORF1ab"

/product="endoRNAse"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11127.1?from=6795&to=7092) 20512..21405

/gene="ORF1ab"

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

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=131&to=13336) 131..13336

/gene="ORF1ab"

/codon\_start=1

/product="ORF1a polyprotein"

/protein\_id="[ULP11128.1](https://www.ncbi.nlm.nih.gov/protein/2198557217)"

/translation="MESLVPGFNEKTHVQLSLPVLQVRDVLVRGFGDSVEEVLSEARQ

HLKDGTCGLVEVEKGVLPQLEQPYVFIKRSDARTAPHGHVMVELVAELEGIQYGRSGE

TLGVLVPHVGEIPVAYRKVLLRKNGNKGAGGHSYGADLKSFDLGDELGTDPYEDFQEN

WNTKHSSGVTRELMRELNGGAYTRYVDNNFCGPDGYPLECIKDLLARAGKASCTLSEQ

LDFIDTKRGVYCCREHEHEIAWYTERSEKSYELQTPFEIKLAKKFDTFNGECPNFVFP

LNSIIKTIQPRVEKKKLDGFMGRIRSVYPVASPNECNQMCLSTLMKCDHCGETSWQTG

DFVKATCEFCGTENLTKEGATTCGYLPQNAVVKIYCPACHNSEVGPEHSLAEYHNESG

LKTILRKGGRTIAFGGCVFSYVGCHNKCAYWVPRASANIGCNHTGVVGEGSEGLNDNL

LEILQKEKVNINIVGDFKLNEEIAIILASFSASTSAFVETVKGLDYKAFKQIVESCGN

FKVTKGKAKKGAWNIGEQKSILSPLYAFASEAARVVRSIFSRTLETAQNSVRVLQKAA

ITILDGISQYSLRLIDAMMFTSDLATNNLVVMAYITGGVVQLTSQWLTNIFGTVYEKL

KPVLDWLEEKFKEGVEFLRDGWEIVKFISTCACEIVGGQIVTCAKEIKESVQTFFKLV

NKFLALCADSIIIGGAKLKALNLGETFVTHSKGLYRKCVKSREETGLLMPLKAPKEII

FLEGETLPTEVLTEEVVLKTGDLQPLEQPTSEAVEAPLVGTPVCINGLMLLEIKDTEK

YCALAPNMMVTNNTFTLKGGAPTKVTFGDDTVIEVQGYKSVNITFELDERIDKVLNER

CSAYTVELGTEVNEFACVVADAVIKTLQPVSELLTPLGIDLDEWSMATYYLFDESGEF

KLASHMYCSFYPPDEDEEEGDCEEEEFEPSTQYEYGTEDDYQGKPLEFGATSAALQPE

EEQEEDWLDDDSQQTVGQQDGSEDNQTTTIQTIVEVQPQLEMELTPVVQTIEVNSFSG

YLKLTDNVYIKNADIVEEAKKVKPTVVVNAANVYLKHGGGVAGALNKATNNAMQVESD

DYIATNGPLKVGGSCVLSGHNLAKHCLHVVGPNVNKGEDIQLLKSAYENFNQHEVLLA

PLLSAGIFGADPIHSLRVCVDTVRTNVYLAVFDKNLYDKLVSSFLEMKSEKQVEQKIA

EIPKEEVKPFITESKPSVEQRKQDDKKIKACVEEVTTTLEETKFLTENLLLYIDINGN

LHPDSATLVSDIDITFLKKDAPYIVGDVVQEGVLTAVVIPTKKAGGTTEMLAKALRKV

PTDNYITTYPGQGLNGYTVEEAKTVLKKCKSAFYILPSIISNEKQEILGTVSWNLREM

LAHAEETRKLMPVCVETKAIVSTIQRKYKGIKIQEGVVDYGARFYFYTSKTTVASLIN

TLNDLNETLVTMPLGYVTHGLNLEEAARYMRSLKVPATVSVSSPDAVTAYNGYLTSSS

KTPEEHFIETISLAGSYKDWSYSGQSTQLGIEFLKRGDKSVYYTSNPTTFHLDGEVIT

FDNLKTLLSLREVRTIKVFTTVDNINLHTQVVDMSMTYGQQFGPTYLDGADVTKIKPH

NSHEGKTFYVLPNDDTLRVEAFEYYHTTDPSFLGRYMSALNHTKKWKYPQVNGLTSIK

WADNNCYLATALLTLQQIELKFNPPALQDAYYRARAGEAANFCALILAYCNKTVGELG

DVRETMSYLFQHANLDSCKRVLNVVCKTCGQQQTTLKGVEAVMYMGTLSYEQFKKGVQ

IPCTCGKQATKYLVQQESPFVMMSAPPAQYELKHGTFTCASEYTGNYQCGHYKHITSK

ETLYCIDGALLTKSSEYKGPITDVFYKENSYTTTIKPVTYKLDGVVCTEIDPKLDNYY

KKDNSYFTEQPIDLVPNQPYPNASFDNFKFVCDNIKFADDLNQLTGYKKPASRELKVT

FFPDLNGDVVAIDYKHYTPSFKKGAKLLHKPIVWHVNNATNKATYKPNTWCIRCLWST

KPVETSNSFDVLKSEDAQGMDNLAXXXXXPVSEEVVENPTIQKDVLECNVKTTEVVGD

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

DGARRVWTLMNVLTLVYKVYYGSALDQAISMWALIISVTSNYSGVVTTVMFLARGVVF

MCVEYCPIFFITGNTLQCIMLVYCFLGYFCTCYFGLFCLLNRYFRLTLGVYDYLVSTQ

EFRYMNSQGLLPPKNSIDAFKLNIKLLGVGGKPCIKVATVQSKMSDVKCTSVVLLSVL

QQLRVESSSKLWAQCVQLHNDILLAKDTTEAFEKMVSLLSVLLSMQGAVDINKLCEEM

LDNRATLQAIASEFSSLPSYAAFATAQEAYEQAVANGDSEVVLKKLKKSLNVAKSEFD

RDAAMQRKLEKMADQAMTQMYKQARSEDKRAKVTSAMQTMLFTMLRKLDNDALNNIIN

NARDGCVPLNIIPLTTAAKLMVVIPDYNTYKNTCDGTTFTYASALWEIQQVVDADSKI

VQLSEISMDNSPNLAWPLIVTALRANSAVKLQNNELSPVALRQMSCAAGTTQTACTDD

NALAYYNTTKGGRFVLALLSDLQDLKWARFPKSDGTGTIYTELEPPCRFVTDTPKGPK

VKYLYFIKGLNNLNRGMVLGSLAATVRLQAGNATEVPANSTVLSFCAFAVDAAKAYKD

YLASGGQPITNCVKMLCTHTGTGQAITVTPEANMDQESFGGASCCLYCRCHIDHPNPK

GFCDLKGKYVQIPTTCANDPVGFTLKNTVCTVCGMWKGYGCSCDQLREPMLQSADAQS

FLNGFAV"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=1&to=180) 131..670

/gene="ORF1ab"

/product="leader protein"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=181&to=818) 671..2584

/gene="ORF1ab"

/product="nsp2"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=819&to=2762) 2585..8416

/gene="ORF1ab"

/product="nsp3"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=2763&to=3262) 8417..9916

/gene="ORF1ab"

/product="nsp4"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=3263&to=3568) 9917..10834

/gene="ORF1ab"

/product="3C-like proteinase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=3569&to=3855) 10835..11695

/gene="ORF1ab"

/product="nsp6"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=3856&to=3938) 11696..11944

/gene="ORF1ab"

/product="nsp7"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=3939&to=4136) 11945..12538

/gene="ORF1ab"

/product="nsp8"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=4137&to=4249) 12539..12877

/gene="ORF1ab"

/product="nsp9"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=4250&to=4388) 12878..13294

/gene="ORF1ab"

/product="nsp10"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/ULP11128.1?from=4389&to=4401) 13295..13333

/gene="ORF1ab"

/product="nsp11"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=13329&to=13356) 13329..13356

/gene="ORF1ab"

/note="Coronavirus frameshifting stimulation element

stem-loop 1"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=13341&to=13395) 13341..13395

/gene="ORF1ab"

/note="Coronavirus frameshifting stimulation element

stem-loop 2"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=21416&to=25228) 21416..25228

/gene="S"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=21416&to=25228) 21416..25228

/gene="S"

/codon\_start=1

/product="surface glycoprotein"

/protein\_id="[ULP11129.1](https://www.ncbi.nlm.nih.gov/protein/2198557218)"

/translation="MFVFLVLLPLVSSQCVNLTTRTQLPPAYTNSFTRGVYYPDKVFR

SSVLHSTQDLFLPFFSNVTWFHAISGTNGTKRFDNPVLPFNDGVYFASIEKSNIIRGW

IFGTTLDSKTQSLLIVNNATNVVIKVCEFQFCNDPFLDHKNNKSWMESEFRVYSSANN

CTFEYVSQPFLMDLEGKQGNFKNLREFVFKNIDGYFKIYSKHTPIIVREPEDLPQGFS

ALEPLVDLPIGINITRFQTLLALHRSYLTPGDSSSGWTAGAAAYYVGYLQPRTFLLKY

NENGTITDAVDCALDPLSETKCTLKSFTVEKGIYQTSNFRVQPTESIVRFPNITNLCP

FDEVFNATRFASVYAWNRKRISNCVADYSVLYNLAPFFTFKCYGVSPTKLNDLCFTNV

YADSFVIRGDEVRQIAPGQTGNIADYNYKLPDDFTGCVIAWNSNKLDSKVSGNYNYLY

RLFRKSNLKPFERDISTEIYQAGNKPCNGVAGFNCYFPLRSYSFRPTYGVGHQPYRVV

VLSFELLHAPATVCGPKKSTNLVKNKCVNFNFNGLKGTGVLTESNKKFLPFQQFGRDI

ADTTDAVRDPQTLEILDITPCSFGGVSVITPGTNTSNQVAVLYQGVNCTEVPVAIHAD

QLTPTWRVYSTGSNVFQTRAGCLIGAEYVNNSYECDIPIGAGICASYQTQTKSHRRAR

SVASQSIIAYTMSLGAENSVAYSNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYIC

GDSTECSNLLLQYGSFCTQLKRALTGIAVEQDKNTQEVFAQVKQIYKTPPIKYFGGFN

FSQILPDPSKPSKRSFIEDLLFNKVTLADAGFIKQYGDCLGDIAARDLICAQKFKGLT

VLPPLLTDEMIAQYTSALLAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGVTQNVLY

ENQKLIANQFNSAIGKIQDSLSSTASALGKLQDVVNHNAQALNTLVKQLSSKFGAISS

VLNDIFSRLDKVEAEVQIDRLITGRLQSLQTYVTQQLIRAAEIRASANLAATKMSECV

LGQSKRVDFCGKGYHLMSFPQSAPHGVVFLHVTYVPAQEKNFTTAPAICHDGKAHFPR

EGVFVSNGTHWFVTQRNFYEPQIITTDNTFVSGNCDVVIGIVNNTVYDPLQPELDSFK

EELDKYFKNHTSPDVDLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDLQELGKYE

QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCCSCLKGCCSCGSCCKFDEDDSEPVL

KGVKLHYT"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=25237&to=26064) 25237..26064

/gene="ORF3a"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=25237&to=26064) 25237..26064

/gene="ORF3a"

/codon\_start=1

/product="ORF3a protein"

/protein\_id="[ULP11130.1](https://www.ncbi.nlm.nih.gov/protein/2198557219)"

/translation="MDLFMRIFTIGTVTLKQGEIKDATPSDFVRATATIPIQASLPFG

WLIVGVALLAVFQSASKIITLKKRWQLALSKGVHFVCNLLLLFVTVYSHLLLVAAGLE

APFLYLYALVYFLQSINFVRIIMRLWLCWKCRSKNPLLYDANYFLCWHTNCYDYCIPY

NSVTSSIVITSGDGTTSPISEHDYQIGGYTEKWESGVKDCVVLHSYFTSDYYQLYSTQ

LSTDTGVEHVTFFIYNKIVDEPEEHVQIHTIDGSSGVVNPVMEPIYDEPTTTTSVPL"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=26089&to=26316) 26089..26316

/gene="E"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=26089&to=26316) 26089..26316

/gene="E"

/codon\_start=1

/product="envelope protein"

/protein\_id="[ULP11131.1](https://www.ncbi.nlm.nih.gov/protein/2198557220)"

/translation="MYSFVSEEIGTLIVNSVLLFLAFVVFLLVTLAILTALRLCAYCC

NIVNVSLVKPSFYVYSRVKNLNSSRVPDLLV"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=26367&to=27035) 26367..27035

/gene="M"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=26367&to=27035) 26367..27035

/gene="M"

/codon\_start=1

/product="membrane glycoprotein"

/protein\_id="[ULP11132.1](https://www.ncbi.nlm.nih.gov/protein/2198557221)"

/translation="MAGSNGTITVEELKKLLEEWNLVIGFLFLTWICLLQFAYANRNR

FLYIIKLIFLWLLWPVTLTCFVLAAVYRINWITGGIAIAMACLVGLMWLSYFIASFRL

FARTRSMWSFNPETNILLNVPLHGTILTRPLLESELVIGAVILRGHLRIAGHHLGRCD

IKDLPKEITVATSRTLSYYKLGASQRVAGDSGFAAYSRYRIGNYKLNTDHSSSSDNIA

LLVQ"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27046&to=27231) 27046..27231

/gene="ORF6"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27046&to=27231) 27046..27231

/gene="ORF6"

/codon\_start=1

/product="ORF6 protein"

/protein\_id="[ULP11133.1](https://www.ncbi.nlm.nih.gov/protein/2198557222)"

/translation="MFHLVDFQVTIAEILLIIMRTFKVSIWNLDYIINLIIKNLSKSL

TENKYSQLDEEQPMEID"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27238&to=27603) 27238..27603

/gene="ORF7a"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27238&to=27603) 27238..27603

/gene="ORF7a"

/codon\_start=1

/product="ORF7a protein"

/protein\_id="[ULP11134.1](https://www.ncbi.nlm.nih.gov/protein/2198557223)"

/translation="MKIILFLALITLATCELYHYQECVRGTTVLLKEPCSSGTYEGNS

PFHPLADNKFALTCFSTQFAFACPDGVKHVYQLRARSVSPKLFIRQEEVQELYSPIFL

IVAAIVFITLCFTLKRKTE"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27600&to=27731) 27600..27731

/gene="ORF7b"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27600&to=27731) 27600..27731

/gene="ORF7b"

/codon\_start=1

/product="ORF7b"

/protein\_id="[ULP11135.1](https://www.ncbi.nlm.nih.gov/protein/2198557224)"

/translation="MIELSLIDFYLCFLAFLLFLVLIMLIIFWFSLELQDHNETCHA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27738&to=28103) 27738..28103

/gene="ORF8"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=27738&to=28103) 27738..28103

/gene="ORF8"

/codon\_start=1

/product="ORF8 protein"

/protein\_id="[ULP11136.1](https://www.ncbi.nlm.nih.gov/protein/2198557225)"

/translation="MKFLVFLGIITTVAAFHQECSLQSCTQHQPYVVDDPCPIHFYSK

WYIRVGARKSAPLIELCVDEAGSKSPIQYIDIGNYTVSCLPFTINCQEPKLGSLVVRC

SFYEDFLEYHDVRVVLDFI"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=28118&to=29368) 28118..29368

/gene="N"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=28118&to=29368) 28118..29368

/gene="N"

/codon\_start=1

/product="nucleocapsid phosphoprotein"

/protein\_id="[ULP11137.1](https://www.ncbi.nlm.nih.gov/protein/2198557226)"

/translation="MSDNGPQNQRNALRITFGGPSDSTGSNQNGGARSKQRRPQGLPN

NTASWFTALTQHGKEDLKFSRGQGVPINTNSSPDDQIGYYRRATRRIRGGDGKMKDLS

PRWYFYYLGTGPEAGLPYGANKDGIIWVATEGALNTPKDHIGTRNPANNAAIVLQLPQ

GTTLPKGFYAEGSRGGSQASSRSSSRSRNSSRNSTPGSSKRTSPARMAGNGGDAALAL

LLLDRLNQLESKMSGKGQQQQGQTVTKKSAAEASKKPRQKRTATKAYNVTQAFGRRGP

EQTQGNFGDQELIRQGTDYKHWPQIAQFAPSASAFFGMSRIGMEVTPSGTWLTYTGAI

KLDDKDPNFKDQVILLNKHIDAYKTFPPTEPKKDKKKKADETQALPQRQKKQQTVTLL

PAADLDDFSKQLQQSMSSADSTQA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=29393&to=29445) 29393..>29445

/gene="ORF10"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=29393&to=29445) 29393..>29445

/gene="ORF10"

/codon\_start=1

/product="ORF10 protein"

/protein\_id="[ULP11138.1](https://www.ncbi.nlm.nih.gov/protein/2198557227)"

/translation="MGYINVFAFPFTIYSLL"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM789835.1?from=29444&to=29445) 29444..>29445

/gene="ORF10"

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

ORIGIN

1 ataactaatt actgtcgttg acaggacacg agtaactcgt ctatcttctg caggctgctt

61 acggtttcgt ccgtgttgca gccgatcatc agcacatcta ggttttgtcc gggtgtgacc

121 gaaaggtaag atggagagcc ttgtccctgg tttcaacgag aaaacacacg tccaactcag

181 tttgcctgtt ttacaggttc gcgacgtgct cgtacgtggc tttggagact ccgtggagga

241 ggtcttatca gaggcacgtc aacatcttaa agatggcact tgtggcttag tagaagttga

301 aaaaggcgtt ttgcctcaac ttgaacagcc ctatgtgttc atcaaacgtt cggatgctcg

361 aactgcacct catggtcatg ttatggttga gctggtagca gaactcgaag gcattcagta

421 cggtcgtagt ggtgagacac ttggtgtcct tgtccctcat gtgggcgaaa taccagtggc

481 ttaccgcaag gttcttcttc gtaagaacgg taataaagga gctggtggcc atagttacgg

541 cgccgatcta aagtcatttg acttaggcga cgagcttggc actgatcctt atgaagattt

601 tcaagaaaac tggaacacta aacatagcag tggtgttacc cgtgaactca tgcgtgagct

661 taacggaggg gcatacactc gctatgtcga taacaacttc tgtggccctg atggctaccc

721 tcttgagtgc attaaagacc ttctagcacg tgctggtaaa gcttcatgca ctttgtccga

781 acaactggac tttattgaca ctaagagggg tgtatactgc tgccgtgaac atgagcatga

841 aattgcttgg tacacggaac gttctgaaaa gagctatgaa ttgcagacac cttttgaaat

901 taaattggca aagaaatttg acaccttcaa tggggaatgt ccaaattttg tatttccctt

961 aaattccata atcaagacta ttcaaccaag ggttgaaaag aaaaagcttg atggctttat

1021 gggtagaatt cgatctgtct atccagttgc gtcaccaaat gaatgcaacc aaatgtgcct

1081 ttcaactctc atgaagtgtg atcattgtgg tgaaacttca tggcagacgg gcgattttgt

1141 taaagccact tgcgaatttt gtggcactga gaatttgact aaagaaggtg ccactacttg

1201 tggttactta ccccaaaatg ctgttgttaa aatttattgt ccagcatgtc acaattcaga

1261 agtaggacct gagcatagtc ttgccgaata ccataatgaa tctggcttga aaaccattct

1321 tcgtaagggt ggtcgcacta ttgcctttgg aggctgtgtg ttctcttatg ttggttgcca

1381 taacaagtgt gcctattggg ttccacgtgc tagcgctaac ataggttgta accatacagg

1441 tgttgttgga gaaggttccg aaggtcttaa tgacaacctt cttgaaatac tccaaaaaga

1501 gaaagtcaac atcaatattg ttggtgactt taaacttaat gaagagatcg ccattatttt

1561 ggcatctttt tctgcttcca caagtgcttt tgtggaaact gtgaaaggtt tggattataa

1621 agcattcaaa caaattgttg aatcctgtgg taattttaaa gttacaaaag gaaaagctaa

1681 aaaaggtgcc tggaatattg gtgaacagaa atcaatactg agtcctcttt atgcatttgc

1741 atcagaggct gctcgtgttg tacgatcaat tttctcccgc actcttgaaa ctgctcaaaa

1801 ttctgtgcgt gttttacaga aggccgctat aacaatacta gatggaattt cacagtattc

1861 actgagactc attgatgcta tgatgttcac atctgatttg gctactaaca atctagttgt

1921 aatggcctac attacaggtg gtgttgttca gttgacttcg cagtggctaa ctaacatctt

1981 tggcactgtt tatgaaaaac tcaaacccgt ccttgattgg cttgaagaga agtttaagga

2041 aggtgtagag tttcttagag acggttggga aattgttaaa tttatctcaa cctgtgcttg

2101 tgaaattgtc ggtggacaaa ttgtcacctg tgcaaaggaa attaaggaga gtgttcagac

2161 attctttaag cttgtaaata aatttttggc tttgtgtgct gactctatca ttattggtgg

2221 agctaaactt aaagccttga atttaggtga aacatttgtc acgcactcaa agggattgta

2281 cagaaagtgt gttaaatcca gagaagaaac tggcctactc atgcctctaa aagccccaaa

2341 agaaattatc ttcttagagg gagaaacact tcccacagaa gtgttaacag aggaagttgt

2401 cttgaaaact ggtgatttac aaccattaga acaacctact agtgaagctg ttgaagctcc

2461 attggttggt acaccagttt gtattaacgg gcttatgttg ctcgaaatca aagacacaga

2521 aaagtactgt gcccttgcac ctaatatgat ggtaacaaac aataccttca cactcaaagg

2581 cggtgcacca acaaaggtta cttttggtga tgacactgtg atagaagtgc aaggttacaa

2641 gagtgtgaat atcacttttg aacttgatga aaggattgat aaagtactta atgagaggtg

2701 ctctgcctat acagttgaac tcggtacaga agtaaatgag ttcgcctgtg ttgtggcaga

2761 tgctgtcata aaaactttgc aaccagtatc tgaattactt acaccactgg gcattgattt

2821 agatgagtgg agtatggcta catactactt atttgatgag tctggtgagt ttaaattggc

2881 ttcacatatg tattgttctt tttaccctcc agatgaggat gaagaagaag gtgattgtga

2941 agaagaagag tttgagccat caactcaata tgagtatggt actgaagatg attaccaagg

3001 taaacctttg gaatttggtg ccacttctgc tgctcttcaa cctgaagaag agcaagaaga

3061 agattggtta gatgatgata gtcaacaaac tgttggtcaa caagacggca gtgaggacaa

3121 tcagacaact actattcaaa caattgttga ggttcaacct caattagaga tggaacttac

3181 accagttgtt cagactattg aagtgaatag ttttagtggt tatttaaaac ttactgacaa

3241 tgtatacatt aaaaatgcag acattgtgga agaagctaaa aaggtaaaac caacagtggt

3301 tgttaatgca gccaatgttt accttaaaca tggaggaggt gttgcaggag ccttaaataa

3361 ggctactaac aatgccatgc aagttgaatc tgatgattac atagctacta atggaccact

3421 taaagtgggt ggtagttgtg ttttaagcgg acacaatctt gctaaacact gtcttcatgt

3481 tgtcggccca aatgttaaca aaggtgaaga cattcaactt cttaagagtg cttatgaaaa

3541 ttttaatcag cacgaagttc tacttgcacc attattatca gctggtattt ttggtgctga

3601 ccctatacat tctttaagag tttgtgtaga tactgttcgc acaaatgtct acttagctgt

3661 ctttgataaa aatctctatg acaaacttgt ttcaagcttt ttggaaatga agagtgaaaa

3721 gcaagttgaa caaaagatcg ctgagattcc taaagaggaa gttaagccat ttataactga

3781 aagtaaacct tcagttgaac agagaaaaca agatgataag aaaatcaaag cttgtgttga

3841 agaagttaca acaactctgg aagaaactaa gttcctcaca gaaaacttgt tactttatat

3901 tgacattaat ggcaatcttc atccagattc tgccactctt gttagtgaca ttgacatcac

3961 tttcttaaag aaagatgctc catatatagt gggtgatgtt gttcaagagg gtgttttaac

4021 tgctgtggtt atacctacta aaaaggctgg tggcactact gaaatgctag cgaaagcttt

4081 gagaaaagtg ccaacagaca attatataac cacttacccg ggtcagggtt taaatggtta

4141 cactgtagag gaggcaaaga cagtgcttaa aaagtgtaaa agtgcctttt acattctacc

4201 atctattatc tctaatgaga agcaagaaat tcttggaact gtttcttgga atttgcgaga

4261 aatgcttgca catgcagaag aaacacgcaa attaatgcct gtctgtgtgg aaactaaagc

4321 catagtttca actatacagc gtaaatataa gggtattaaa atacaagagg gtgtggttga

4381 ttatggtgct agattttact tttacaccag taaaacaact gtagcgtcac ttatcaacac

4441 acttaacgat ctaaatgaaa ctcttgttac aatgccactt ggctatgtaa cacatggctt

4501 aaatttggaa gaagctgctc ggtatatgag atctctcaaa gtgccagcta cagtttctgt

4561 ttcttcacct gatgctgtta cagcgtataa tggttatctt acttcttctt ctaaaacacc

4621 tgaagaacat tttattgaaa ccatctcact tgctggttcc tataaagatt ggtcctattc

4681 tggacaatct acacaactag gtatagaatt tcttaagaga ggtgataaaa gtgtatatta

4741 cactagtaat cctaccacat tccacctaga tggtgaagtt atcacctttg acaatcttaa

4801 gacacttctt tctttgagag aagtgaggac tattaaggtg tttacaacag tagacaacat

4861 taacctccac acgcaagttg tggacatgtc aatgacatat ggacaacagt ttggtccaac

4921 ttatttggat ggagctgatg ttactaaaat aaaacctcat aattcacatg aaggtaaaac

4981 attttatgtt ttacctaatg atgacactct acgtgttgag gcttttgagt actaccacac

5041 aactgatcct agttttctgg gtaggtacat gtcagcatta aatcacacta aaaagtggaa

5101 atacccacaa gttaatggtt taacttctat taaatgggca gataacaact gttatcttgc

5161 cactgcattg ttaacactcc aacaaataga gttgaagttt aatccacctg ctctacaaga

5221 tgcttattac agagcaaggg ctggtgaagc ggctaacttt tgtgcactta tcttagccta

5281 ctgtaataag acagtaggtg agttaggtga tgttagagaa acaatgagtt acttgtttca

5341 acatgccaat ttagattctt gcaaaagagt cttgaacgtg gtgtgtaaaa cttgtggaca

5401 acagcagaca acccttaagg gtgtagaagc tgttatgtac atgggcacac tttcttatga

5461 acaatttaag aaaggtgttc agataccttg tacgtgtggt aaacaagcta caaaatatct

5521 agtacaacag gagtcacctt ttgttatgat gtcagcacca cctgctcagt atgaacttaa

5581 gcatggtaca tttacttgtg ctagtgagta cactggtaat taccagtgtg gtcactataa

5641 acatataact tctaaagaaa ctttgtattg catagacggt gctttactta caaagtcctc

5701 agaatacaaa ggtcctatta cggatgtttt ctacaaagaa aacagttaca caacaaccat

5761 aaaaccagtt acttataaat tggatggtgt tgtttgtaca gaaattgacc ctaagttgga

5821 caattattat aagaaagaca attcttattt cacagagcaa ccaattgatc ttgtaccaaa

5881 ccaaccatat ccaaacgcaa gcttcgataa ttttaagttt gtatgtgata atatcaaatt

5941 tgctgatgat ttaaaccagt taactggtta taagaaacct gcttcaagag agcttaaagt

6001 tacatttttc cctgacttaa atggtgatgt ggtggctatt gattataaac actacacacc

6061 ctcttttaag aaaggagcta aattgttaca taaacctatt gtttggcatg ttaacaatgc

6121 aactaataaa gccacgtata aaccaaatac ctggtgtata cgttgtcttt ggagcacaaa

6181 accagttgaa acatcaaatt cgtttgatgt actgaagtca gaggacgcgc agggaatgga

6241 taatcttgcc tnnnnnnnnn nnnnaccagt ctctgaagaa gtagtggaaa atcctaccat

6301 acagaaagac gttcttgagt gtaatgtgaa aactaccgaa gttgtaggag acattatact

6361 taaaccagca aataatataa aaattacaga agaggttggc cacacagatc taatggctgc

6421 ttatgtagac aattctagtc ttactattaa gaaacctaat gaattatcta gagtattagg

6481 tttgaaaacc cttgctactc atggtttagc tgctgttaat agtgtccctt gggatactat

6541 agctaattat gctaagcctt ttcttaacaa agttgttagt acaactacta acatagttac

6601 acggtgttta aaccgtgttt gtactaatta tatgccttat ttctttactt tattgctaca

6661 attgtgtact tttactagaa gtacaaattc tagaattaaa gcatctatgc cgactactat

6721 agcaaagaat actgttaaga gtgtcggtaa attttgtcta gaggcttcat ttaattattt

6781 gaagtcacct aatttttcta aactgataaa tattataatt tggtttttac tattaagtgt

6841 ttgcctaggt tctttaatct actcaaccgc tgctttaggt gttttaatgt ctaatttagg

6901 catgccttct tactgtactg gttacagaga aggctatttg aactctacta atgtcactat

6961 tgcaacctac tgtactggtt ctataccttg tagtgtttgt cttagtggtt tagattcttt

7021 agacacctat ccttctttag aaactataca aattaccatt tcatctttta aatgggattt

7081 aactgctttt ggcttagttg cagagtggtt tttggcatat attcttttca ctaggttttt

7141 ctatgtactt ggattggctg caatcatgca attgtttttc agctattttg cagtacattt

7201 tattagtaat tcttggctta tgtggttaat aattaatctt gtacaaatgg ccccgatttc

7261 agctatggtt agaatgtaca tcttctttgc atcattttat tatgtatgga aaagttatgt

7321 gcatgttgta gacggttgta attcatcaac ttgtatgatg tgttacaaac gtaatagagc

7381 aacaagagtc gaatgtacaa ctattgttaa tggtgttaga aggtcctttt atgtctatgc

7441 taatggaggt aaaggctttt gcaaactaca caattggaat tgtgttaatt gtgatacatt

7501 ctgtgctggt agtacattta ttagtgatga agttgcgaga gacttgtcac tacagtttaa

7561 aagaccaata aatcctactg accagtcttc ttacatcgtt gatagtgtta cagtgaagaa

7621 tggttccatc catctttact ttgataaagc tggtcaaaag acttatgaaa gacattctct

7681 ctctcatttt gttaacttag acaacctgag agctaataac actaaaggtt cattgcctat

7741 taatgttata gtttttgatg gtaaatcaaa atgtgaagaa tcatctgcaa aatcagcgtc

7801 tgtttactac agtcagctta tgtgtcaacc tatactgtta ctagatcagg cattagtgtc

7861 tgatgttggt gatagtgcgg aagttgcagt taaaatgttt gatgcttacg ttaatacgtt

7921 ttcatcaact tttaacgtac caatggaaaa actcaaaaca ctagttgcaa ctgcagaagc

7981 tgaacttgca aagaatgtgt ccttagacaa tgtcttatct acttttattt cagcagctcg

8041 gcaagggttt gttgattcag atgtagaaac taaagatgtt gttgaatgtc ttaaattgtc

8101 acatcaatct gacatagaag ttactggcga tagttgtaat aactatatgc tcacctataa

8161 caaagttgaa aacatgacac cccgtgacct tggtgcttgt attgactgta gtgcgcgtca

8221 tattaatgcg caggtagcaa aaagtcacaa cattactttg atatggaacg ttaaagattt

8281 catgtcattg tctgaacaac tacgaaaaca aatacgtagt gctgctaaaa agaataactt

8341 accttttaag ttgacatgtg caactactag acaagttgtt aatgttgtaa caacaaagat

8401 agcacttaag ggtggtaaaa ttgttaataa ttggttgaag cagttaatta aagttacact

8461 tgtgttcctt tttgttgctg ctatttttta tttaataaca cctgttcatg tcatgtctaa

8521 acatactgac ttttcaagtg aaatcatagg atacaaggct attgatggtg gtgtcactcg

8581 tgacatagca tctacagata cttgttttgc taacaaacat gctgattttg acacatggtt

8641 tagccagcgt ggtggtagtt atactaatga caaagcttgc ccattgattg ctgcagtcat

8701 aacaagagaa gtgggttttg tcgtgcctgg tttgcctggc acgatattac gcacaactaa

8761 tggtgacttt ttgcatttct tacctagagt ttttagtgca gttggtaaca tctgttacac

8821 accatcaaaa cttatagagt acactgactt tgcaacatca gcttgtgttt tggctgctga

8881 atgtacaatt tttaaagatg cttctggtaa gccagtacca tattgttatg ataccaatgt

8941 actagaaggt tctgttgctt atgaaagttt acgccctgac acacgttatg tgctcatgga

9001 tggctctatt attcaatttc ctaacaccta ccttgaaggt tctgttagag tggtaacaac

9061 ttttgattct gagtactgta ggcacggcac ttgtgaaaga tcagaagctg gtgtttgtgt

9121 atctactagt ggtagatggg tacttaacaa tgattattac agatctttac caggagtttt

9181 ctgtggtgta gatgctgtaa atttacttac taatatgttt acaccactaa ttcaacctat

9241 tggtgctttg gacatatcag catctatagt agctggtggt attgtagcta tcgtagtaac

9301 atgccttgcc tactatttta tgaggtttag aagagctttt ggtgaataca gtcatgtagt

9361 tgcctttaat actttactat tccttatgtc attcactgta ctctgtttaa caccagttta

9421 ctcattctta cctggtgttt attctgttat ttacttgtac ttgacatttt atcttactaa

9481 tgatgtttct tttttagcac atattcagtg gatggttatg ttcacacctt tagtaccttt

9541 ctggataaca attgcttata tcatttgtat ttccacaaag catttctatt ggttctttag

9601 taattaccta aagagacgtg tagtctttaa tggtgtttcc tttagtactt ttgaagaagc

9661 tgcgctgtgc acctttttgt taaataaaga aatgtatcta aagttgcgta gtgatgtgct

9721 attacctctt acgcaatata atagatactt agctctttat aataagtaca agtattttag

9781 tggagcaatg gatacaacta gctacagaga agctgcttgt tgtcatctcg caaaggctct

9841 caatgacttc agtaactcag gttctgatgt tctttaccaa ccaccacaaa tctctatcac

9901 ctcagctgtt ttgcagagtg gttttagaaa aatggcattc ccatctggta aagttgaggg

9961 ttgtatggta caagtaactt gtggtacaac tacacttaac ggtctttggc ttgatgacgt

10021 agtttactgt ccaagacatg tgatctgcac ctctgaagac atgcttaacc ctaattatga

10081 agatttactc attcgtaagt ctaatcataa tttcttggta caggctggta atgttcaact

10141 cagggttatt ggacattcta tgcaaaattg tgtacttaag cttaaggttg atacagccaa

10201 tcctaagaca cctaagtata agtttgttcg cattcaacca ggacagactt tttcagtgtt

10261 agcttgttac aatggttcac catctggtgt ttaccaatgt gctatgaggc acaatttcac

10321 tattaagggt tcattcctta atggttcatg tggtagtgtt ggttttaaca tagattatga

10381 ctgtgtctct ttttgttaca tgcaccatat ggaattacca actggagttc atgctggcac

10441 agacttagaa ggtaactttt atggaccttt tgttgacagg caaacagcac aagcagctgg

10501 tacggacaca actattacag ttaatgtttt agcttggttg tacgctgctg ttataaatgg

10561 agacaggtgg tttctcaatc gatttaccac aactcttaat gactttaacc ttgtggctat

10621 gaagtacaat tatgaacctc taacacaaga ccatgttgac atactaggac ctctttctgc

10681 tcaaactgga attgccgttt tagatatgtg tgcttcatta aaagaattac tgcaaaatgg

10741 tatgaatgga cgtaccatat tgggtagtgc tttattagaa gatgaattta caccttttga

10801 tgttgttaga caatgctcag gtgttacttt ccaaagtgca gtgaaaagaa caatcaaggg

10861 tacacaccac tggttgttac tcacaatttt gacttcactt ttagttttag tccagagtac

10921 tcaatggtct ttgttctttt ttttgtatga aaatgccttt ttaccttttg ctatgggtat

10981 tattgctatg tctgcttttg caatgatgtt tgtcaaacat aagcatgcat ttctctgttt

11041 gtttttgtta ccttctcttg ccactgtagc ttattttaat atggtctata tgcctgctag

11101 ttgggtgatg cgtattatga catggttgga tatggttgat actagtttta agctaaaaga

11161 ctgtgttatg tatgcatcag ctgtagtgtt actaatcctt atgacagcaa gaactgtgta

11221 tgatgatggt gctaggagag tgtggacact tatgaatgtc ttgacactcg tttataaagt

11281 ttattatggt agtgctttag atcaagccat ttccatgtgg gctcttataa tctctgttac

11341 ttctaactac tcaggtgtag ttacaactgt catgtttttg gccagaggtg ttgtttttat

11401 gtgtgttgag tattgcccta ttttcttcat aactggtaat acacttcagt gtataatgct

11461 agtttattgt ttcttaggct atttttgtac ttgttacttt ggcctctttt gtttactcaa

11521 ccgctacttt agactgactc ttggtgttta tgattactta gtttctacac aggagtttag

11581 atatatgaat tcacagggac tactcccacc caagaatagc atagatgcct tcaaactcaa

11641 cattaaattg ttgggtgttg gtggcaaacc ttgtatcaaa gtagccactg tacagtctaa

11701 aatgtcagat gtaaagtgca catcagtagt cttactctca gttttgcaac aactcagagt

11761 agaatcatca tctaaattgt gggctcaatg tgtccagtta cataatgaca ttctcttagc

11821 taaagatact actgaagcct ttgaaaaaat ggtttcacta ctttctgttt tgctttccat

11881 gcagggtgct gtagacataa acaagctttg tgaagaaatg ctggacaaca gggcaacctt

11941 acaagctata gcctcagagt ttagttccct tccatcatat gcagcttttg ctactgctca

12001 agaagcttat gagcaggctg ttgctaatgg tgattctgaa gttgttctta aaaagttgaa

12061 gaagtctttg aatgtggcta aatctgaatt tgaccgtgat gcagccatgc aacgtaagtt

12121 ggaaaagatg gctgatcaag ctatgaccca aatgtataaa caggctagat ctgaggacaa

12181 gagggcaaaa gttactagtg ctatgcagac aatgcttttc actatgctta gaaagttgga

12241 taatgatgca ctcaacaaca ttatcaacaa tgcaagagat ggttgtgttc ccttgaacat

12301 aatacctctt acaacagcag ccaaactaat ggttgtcata ccagactata acacatataa

12361 aaatacgtgt gatggtacaa catttactta tgcatcagca ttgtgggaaa tccaacaggt

12421 tgtagatgca gatagtaaaa ttgttcaact tagtgaaatt agtatggaca attcacctaa

12481 tttagcatgg cctcttattg taacagcttt aagggccaat tctgctgtca aattacagaa

12541 taatgagctt agtcctgttg cactacgaca gatgtcttgt gctgccggta ctacacaaac

12601 tgcttgcact gatgacaatg cgttagctta ctacaacaca acaaagggag gtaggtttgt

12661 acttgcactg ttatccgatt tacaggattt gaaatgggct agattcccta agagtgatgg

12721 aactggtact atctatacag aactggaacc accttgtagg tttgttacag acacacctaa

12781 aggtcctaaa gtgaagtatt tatactttat taaaggatta aacaacctaa atagaggtat

12841 ggtacttggt agtttagctg ccacagtacg tctacaagct ggtaatgcaa cagaagtgcc

12901 tgccaattca actgtattat ctttctgtgc ttttgctgta gatgctgcta aagcttacaa

12961 agattatcta gctagtgggg gacaaccaat cactaattgt gttaagatgt tgtgtacaca

13021 cactggtact ggtcaggcaa taacagtcac accggaagcc aatatggatc aagaatcctt

13081 tggtggtgca tcgtgttgtc tgtactgccg ttgccacata gatcatccaa atcctaaagg

13141 attttgtgac ttaaaaggta agtatgtaca aatacctaca acttgtgcta atgaccctgt

13201 gggttttaca cttaaaaaca cagtctgtac cgtctgcggt atgtggaaag gttatggctg

13261 tagttgtgat caactccgcg aacccatgct tcagtcagct gatgcacaat cgtttttaaa

13321 cgggtttgcg gtgtaagtgc agcccgtctt acaccgtgcg gcacaggcac tagtactgat

13381 gtcgtataca gggcttttga catctacaat gataaagtag ctggttttgc taaattccta

13441 aaaactaatt gttgtcgctt ccaagaaaag gacgaagatg acaatttaat tgattcttac

13501 tttgtagtta agagacacac tttctctaac taccaacatg aagaaacaat ttataattta

13561 cttaaggatt gtccagctgt tgctaaacat gacttcttta agtttagaat agacggtgac

13621 atggtaccac atatatcacg tcaacgtctt actaaataca caatggcaga cctcgtctat

13681 gctttaaggc attttgatga aggtaattgt gacacattaa aagaaatact tgtcacatac

13741 aattgttgtg atgatgatta tttcaataaa aaggactggt atgattttgt agaaaaccca

13801 gatatattac gcgtatacgc caacttaggt gaacgtgtac gccaagcttt gttaaaaaca

13861 gtacaattct gtgatgccat gcgaaatgct ggtattgttg gtgtactgac attagataat

13921 caagatctca atggtaactg gtatgatttc ggtgatttca tacaaaccac gccaggtagt

13981 ggagttcctg ttgtagattc ttattattca ttgttaatgc ctatattaac cttgaccagg

14041 gctttaactg cagagtcaca tgttgacact gacttaacaa agccttacat taagtgggat

14101 ttgttaaaat atgacttcac ggaagagagg ttaaaactct ttgaccgtta ttttaaatat

14161 tgggatcaga cataccaccc aaattgtgtt aactgtttgg atgacagatg cattctgcat

14221 tgtgcaaact ttaatgtttt attctctaca gtgttcccac ttacaagttt tggaccacta

14281 gtgagaaaaa tatttgttga tggtgttcca tttgtagttt caactggata ccacttcaga

14341 gagctaggtg ttgtacataa tcaggatgta aacttacata gctctagact tagttttaag

14401 gaattacttg tgtatgctgc tgaccctgct atgcacgctg cttctggtaa tctattacta

14461 gataaacgca ctacgtgctt ttcagtagct gcacttacta acaatgttgc ttttcaaact

14521 gtcaaacccg gtaattttaa caaagacttc tatgactttg ctgtgtctaa gggtttcttt

14581 aaggaaggaa gttctgttga attaaaacac ttcttctttg ctcaggatgg taatgctgct

14641 atcagcgatt atgactacta tcgttataat ctaccaacaa tgtgtgatat cagacaacta

14701 ctatttgtag ttgaagttgt tgataagtac tttgattgtt acgatggtgg ctgtattaat

14761 gctaaccaag tcatcgtcaa caacctagac aaatcagctg gttttccatt taataaatgg

14821 ggtaaggcta gactttatta tgattcaatg agttatgagg atcaagatgc acttttcgca

14881 tatacaaaac gtaatgtcat ccctactata actcaaatga atcttaagta tgccattagt

14941 gcaaagaata gagctcgcac cgtagctggt gtctctatct gtagtactat gaccaataga

15001 cagtttcatc aaaaattatt gaaatcaata gccgccacta gaggagctac tgtagtaatt

15061 ggaacaagca aattctatgg tggttggcac aatatgttaa aaactgttta tagtgatgta

15121 gaaaaccctc accttatggg ttgggattat cctaaatgtg atagagccat gcctaacatg

15181 cttagaatta tggcctcact tgttcttgct cgcaaacata caacgtgttg tagcttgtca

15241 caccgtttct atagattagc taatgagtgt gctcaagtat tgagtgaaat ggtcatgtgt

15301 ggcggttcac tatatgttaa accaggtgga acctcatcag gagatgccac aactgcttat

15361 gctaatagtg tttttaacat ttgtcaagct gtcacggcca atgttaatgc acttttatct

15421 actgatggta acaaaattgc cgataagtat gtccgcaatt tacaacacag actttatgag

15481 tgtctctata gaaatagaga tgttgacaca gactttgtga atgagtttta cgcatatttg

15541 cgtaaacatt tctcaatgat gatactctct gacgatgctg ttgtgtgttt caatagcact

15601 tatgcatctc aaggtctagt ggctagcata aagaacttta agtcagttct ttattatcaa

15661 aacaatgttt ttatgtctga agcaaaatgt tggactgaga ctgaccttac taaaggacct

15721 catgaatttt gctctcaaca tacaatgcta gttaaacagg gtgatgatta tgtgtacctt

15781 ccttacccag atccatcaag aatcctaggg gccggctgtt ttgtagatga tatcgtaaaa

15841 acagatggta cacttatgat tgaacggttc gtgtctttag ctatagatgc ttacccactt

15901 actaaacatc ctaatcagga gtatgctgat gtctttcatt tgtacttaca atacataaga

15961 aagctacatg atgagttaac aggacacatg ttagacatgt attctgttat gcttactaat

16021 gataacactt caaggtattg ggaacctgag ttttatgagg ctatgtacac accgcataca

16081 gtcttacagg ctgttggggc ttgtgttctt tgcaattcac agacttcatt aagatgtggt

16141 gcttgcatac gtagaccatt cttatgttgt aaatgctgtt acgaccatgt catatcaaca

16201 tcacataaat tagtcttgtc tgttaatccg tatgtttgca atgctccagg ttgtgatgtc

16261 acagatgtga ctcaacttta cttaggaggt atgagctatt attgtaaatc acataaacca

16321 cccattagtt ttccattgtg tgctaatgga caagtttttg gtttatataa aaatacatgt

16381 gttggtagcg ataatgttac tgactttaat gcaattgcaa catgtgactg gacaaatgct

16441 ggtgattaca ttttagctaa cacctgtact gaaagactca agctttttgc agcagaaacg

16501 ctcaaagcta ctgaggagac atttaaactg tcttatggta ttgctactgt acgtgaagtg

16561 ctgtctgaca gagaattaca tctttcatgg gaagttggta aacctagacc accacttaac

16621 cgaaattatg tctttactgg ttatcgtgta actaaaaaca gtaaagtaca aataggagag

16681 tacacctttg aaaaaggtga ctatggtgat gctgttgttt accgaggtac aacaacttac

16741 aaattaaatg ttggtgatta ttttgtgctg acatcacata cagtaatgcc attaagtgca

16801 cctacactag tgccacaaga gcactatgtt agaattactg gcttataccc aacactcaat

16861 atctcagatg agttttctag caatgttgca aattatcaaa aggttggtat gcaaaagtat

16921 tctacactcc agggaccacc tggtactggt aagagtcatt ttgctattgg cctagctctc

16981 tactaccctt ctgctcgcat agtgtataca gcttgctctc atgccgctgt tgatgcacta

17041 tgtgagaagg cattaaaata tttgcctata gataaatgta gtagaattat acctgcacgt

17101 gctcgtgtag agtgttttga taaattcaaa gtgaattcaa cattagaaca gtatgtcttt

17161 tgtactgtaa atgcattgcc tgagacgaca gcagatatag ttgtctttga tgaaatttca

17221 atggccacaa attatgattt gagtgttgtc aatgccagat tacgtgctaa gcactatgtg

17281 tacattggcg accctgctca attacctgca ccacgcacat tgctaactaa gggcacacta

17341 gaaccagaat atttcaattc agtgtgtaga cttatgaaaa ctataggtcc agacatgttc

17401 ctcggaactt gtcggcgttg tcctgctgaa attgttgaca ctgtgagtgc tttggtttat

17461 gataataagc ttaaagcaca taaagacaaa tcagctcaat gctttaaaat gttttataag

17521 ggtgttatca cgcatgatgt ttcatctgca attaacaggc cacaaatagg cgtggtaaga

17581 gaattcctta cacgtaaccc tgcttggaga aaagctgtct ttatttcacc ttataattca

17641 cagaatgctg tagcctcaaa gattttggga ctaccaactc aaactgttga ttcatcacag

17701 ggctcagaat atgactatgt catattcact caaaccactg aaacagctca ctcttgtaat

17761 gtaaacagat ttaatgttgc tattaccaga gcaaaagtag gcatactttg cataatgtct

17821 gatagagacc tttatgacaa gttgcaattt acaagtcttg aaattccacg taggaatgtg

17881 gcaactttac aagctgaaaa tgtaacagga ctctttaaag attgtagtaa ggtaatcact

17941 gggttacatc ctacacaggc acctacacac ctcagtgttg acactaaatt caaaactgaa

18001 ggtttatgtg ttgacgtacc tggcatacct aaggacatga cctatagaag actcatctct

18061 atgatgggtt ttaaaatgaa ttatcaagtt aatggttacc ctaacatgtt tatcacccgc

18121 gaagaagcta taagacatgt acgtgcatgg attggcttcg atgtcgaggg gtgtcatgct

18181 actagagaag ctgttggtac caatttacct ttacagctag gtttttctac aggtgttaac

18241 ctagttgctg tacctacagg ttatgttgat acacctaata atacagattt ttccagagtt

18301 agtgctaaac caccgcctgg agatcaattt aaacacctca taccacttat gtacaaagga

18361 cttccttgga atgtagtgcg tataaagatt gtacaaatgt taagtgacac acttaaaaat

18421 ctctctgaca gagtcgtatt tgtcttatgg gcacatggct ttgagttgac atctatgaag

18481 tattttgtga aaataggacc tgagcgcacc tgttgtctat gtgatagacg tgccacatgc

18541 ttttccactg cttcagacac ttatgcctgt tggcatcatt ctattggatt tgattacgtc

18601 tataatccgt ttatgattga tgttcaacaa tggggtttta caggtaacct acaaagcaac

18661 catgatctgt attgtcaagt ccatggtaat gcacatgtag ctagttgtga tgcaatcatg

18721 actaggtgtc tagctgtcca cgagtgcttt gttaagcgtg ttgactggac tattgaatat

18781 cctataattg gtgatgaact gaagattaat gcggcttgta gaaaggttca acacatggtt

18841 gttaaagctg cattattagc agacaaattc ccagttcttc acgacattgg taaccctaaa

18901 gctattaagt gtgtacctca agctgatgta gaatggaagt tctatgatgc acagccttgt

18961 agtgacaaag cttataaaat agaagaatta ttctattctt atgccacaca ttctgacaaa

19021 ttcacagatg gtgtatgcct attttggaat tgcaatgtcg atagatatcc tgctaattcc

19081 attgtttgta gatttgacac tagagtgcta tctaacctta acttgcctgg ttgtgatggt

19141 ggcagtttgt atgtaaataa acatgcattc cacacaccag cttttgataa aagtgctttt

19201 gttaatttaa aacaattacc atttttctat tactctgaca gtccatgtga gtctcatgga

19261 aaacaagtag tgtcagatat agattatgta ccactaaagt ctgctacgtg tataacacgt

19321 tgcaatttag gtggtgctgt ctgtagacat catgctaatg agtacagatt gtatctcgat

19381 gcttataaca tgatgatctc agctggcttt agcttgtggg tttacaaaca atttgatact

19441 tataacctct ggaacacttt tacaagactt cagagtttag aaaatgtggc ttttaatgtt

19501 gtaaataagg gacactttga tggacaacag ggtgaagtac cagtttctat cattaataac

19561 actgtttaca caaaagttga tggtgttgat gtagaattgt ttgaaaataa aacaacatta

19621 cctgttaatg tagcatttga gctttgggct aagcgcaaca ttaaaccagt accagaggtg

19681 aaaatactca ataatttggg tgtggacatt gctgctaata ctgtgatctg ggactacaaa

19741 agagatgctc cagcacatat atctactatt ggtgtttgtt ctatgactga catagccaag

19801 aaaccaactg aaacgatttg tgcaccactc actgtctttt ttgatggtag agttgatggt

19861 caagtagact tatttagaaa tgcccgtaat ggtgttctta ttacagaagg tagtgttaaa

19921 ggtttacaac catctgtagg tcccaaacaa gctagtctta atggagtcac attaattgga

19981 gaagccgtaa aaacacagtt caattattat aagaaagttg atggtgttgt ccaacaatta

20041 cctgaaactt actttactca gagtagaaat ttacaagaat ttaaacccag gagtcaaatg

20101 gaaattgatt tcttagaatt agctatggat gaattcattg aacggtataa attagaaggc

20161 tatgccttcg aacatatcgt ttatggagat tttagtcata gtcagttagg tggtttacat

20221 ctactgattg gactagctaa acgttttaag gaatcacctt ttgaattaga agattttatt

20281 cctatggaca gtacagttaa aaactatttc ataacagatg cgcaaacagg ttcatctaag

20341 tgtgtgtgtt ctgttattga tttattactt gatgattttg ttgaaataat aaaatcccaa

20401 gatttatctg tagtttctaa ggttgtcaaa gtgactattg actatacaga aatttcattt

20461 atgctttggt gtaaagatgg ccatgtagaa acattttacc caaaattaca atctagtcaa

20521 gcgtggcaac cgggtgttgc tatgcctaat ctttacaaaa tgcaaagaat gctattagaa

20581 aagtgtgacc ttcaaaatta tggtgatagt gcaacattac ctaaaggcat aatgatgaat

20641 gtcgcaaaat atactcaact gtgtcaatat ttaaacacat taacattagc tgtaccctat

20701 aatatgagag ttatacattt tggtgctggt tctgataaag gagttgcacc aggtacagct

20761 gttttaagac agtggttgcc tacgggtacg ctgcttgtcg attcagatct taatgacttt

20821 gtctctgatg cagattcaac tttgattggt gattgtgcaa ctgtacatac agctaataaa

20881 tgggatctca ttattagtga tatgtacgac cctaagacta aaaatgttac aaaagaaaat

20941 gactctaaag agggtttttt cacttacatt tgtgggttta tacaacaaaa gctagctctt

21001 ggaggttccg tggctataaa gataacagaa cattcttgga atgctgatct ttataagctc

21061 atgggacact tcgcatggtg gacagccttt gttactaatg tgaatgcgtc atcatctgaa

21121 gcatttttaa ttggatgtaa ttatcttggc aaaccacgcg aacaaataga tggttatgtc

21181 atgcatgcaa attacatatt ttggaggaat acaaatccaa ttcagttgtc ttcctattct

21241 ttatttgaca tgagtaaatt tccccttaaa ttaaggggta ctgctgttat gtctttaaaa

21301 gaaggtcaaa tcaatgatat gattttatct cttcttagta aaggtagact tataattaga

21361 gaaaacaaca gagttgttat ttctagtgat gttcttgtta acaactaaac gaacaatgtt

21421 tgtttttctt gttttattgc cactagtctc tagtcagtgt gttaatctta caaccagaac

21481 tcaattaccc cctgcataca ctaattcttt cacacgtggt gtttattacc ctgacaaagt

21541 tttcagatcc tcagttttac attcaactca ggacttgttc ttacctttct tttccaatgt

21601 tacttggttc catgctatct ctgggaccaa tggtactaag aggtttgata accctgtcct

21661 accatttaat gatggtgttt attttgcttc cattgagaag tctaacataa taagaggctg

21721 gatttttggt actactttag attcgaagac ccagtcccta cttattgtta ataacgctac

21781 taatgttgtt attaaagtct gtgaatttca attttgtaat gatccatttt tggaccacaa

21841 aaacaacaaa agttggatgg aaagtgagtt cagagtttat tctagtgcga ataattgcac

21901 ttttgaatat gtctctcagc cttttcttat ggaccttgaa ggaaaacagg gtaatttcaa

21961 aaatcttagg gaatttgtgt ttaagaatat tgatggttat tttaaaatat attctaagca

22021 cacgcctatt atagtgcgtg agccagaaga tctccctcag ggtttttcgg ctttagaacc

22081 attggtagat ttgccaatag gtattaacat cactaggttt caaactttac ttgctttaca

22141 tagaagttat ttgactcctg gtgattcttc ttcaggttgg acagctggtg ctgcagctta

22201 ttatgtgggt tatcttcaac ctaggacttt tctattaaaa tataatgaaa atggaaccat

22261 tacagatgct gtagactgtg cacttgaccc tctctcagaa acaaagtgta cgttgaaatc

22321 cttcactgta gaaaaaggaa tctatcaaac ttctaacttt agagtccaac caacagaatc

22381 tattgttaga tttcctaata ttacaaactt gtgccctttt gatgaagttt ttaacgccac

22441 cagatttgca tctgtttatg cttggaacag gaagagaatc agcaactgtg ttgctgatta

22501 ttctgtccta tataatctcg caccattttt cacttttaag tgttatggag tgtctcctac

22561 taaattaaat gatctctgct ttactaatgt ctatgcagat tcatttgtaa ttagaggtga

22621 tgaagtcaga caaatcgctc cagggcaaac tggaaatatt gctgattata attataaatt

22681 accagatgat tttacaggct gcgttatagc ttggaattct aacaagcttg attctaaggt

22741 tagtggtaat tataattacc tgtatagatt gtttaggaag tctaatctca aaccttttga

22801 gagagatatt tcaactgaaa tctatcaggc cggtaacaaa ccttgtaatg gtgttgcagg

22861 ttttaattgt tactttcctt tacgatcata tagtttccga cccacttatg gtgttggtca

22921 ccaaccatac agagtagtag tactttcttt tgaacttcta catgcaccag caactgtttg

22981 tggacctaaa aagtctacta atttggttaa aaacaaatgt gtcaatttca acttcaatgg

23041 tttaaaaggc acaggtgttc ttactgagtc taacaaaaag tttctgcctt tccaacaatt

23101 tggcagagac attgctgaca ctactgatgc tgtccgtgat ccacagacac ttgagattct

23161 tgacattaca ccatgttctt ttggtggtgt cagtgttata acaccaggaa caaatacttc

23221 taaccaggtt gctgttcttt atcagggtgt taactgcaca gaagtccctg ttgctattca

23281 tgcagatcaa cttactccta cttggcgtgt ttattctaca ggttctaatg tttttcaaac

23341 acgtgcaggc tgtttaatag gggctgaata tgtcaacaac tcatatgagt gtgacatacc

23401 cattggtgca ggtatatgcg ctagttatca gactcagact aagtctcatc ggcgggcacg

23461 tagtgtagct agtcaatcca tcattgccta cactatgtca cttggtgcag aaaattcagt

23521 tgcttactct aataactcta ttgccatacc cacaaatttt actattagtg ttaccacaga

23581 aattctacca gtgtctatga ccaagacatc agtagattgt acaatgtaca tttgtggtga

23641 ttcaactgaa tgcagcaatc ttttgttgca atatggcagt ttttgtacac aattaaaacg

23701 tgctttaact ggaatagctg ttgaacaaga caaaaacacc caagaagttt ttgcacaagt

23761 caaacaaatt tacaaaacac caccaattaa atattttggt ggttttaatt tttcacaaat

23821 attaccagat ccatcaaaac caagcaagag gtcatttatt gaagatctac ttttcaacaa

23881 agtgacactt gcagatgctg gcttcatcaa acaatatggt gattgccttg gtgatattgc

23941 tgctagagac ctcatttgtg cacaaaagtt taaaggcctt actgttttgc cacctttgct

24001 cacagatgaa atgattgctc aatacacttc tgcactgtta gcgggtacaa tcacttctgg

24061 ttggaccttt ggtgcaggtg ctgcattaca aataccattt gctatgcaaa tggcttatag

24121 gtttaatggt attggagtta cacagaatgt tctctatgag aaccaaaaat tgattgccaa

24181 ccaatttaat agtgctattg gcaaaattca agactcactt tcttccacag caagtgcact

24241 tggaaaactt caagatgtgg tcaaccataa tgcacaagct ttaaacacgc ttgttaaaca

24301 acttagctcc aaatttggtg caatttcaag tgttttaaat gatatctttt cacgtcttga

24361 caaagttgag gctgaagtgc aaattgatag gttgatcaca ggcagacttc aaagtttgca

24421 gacatatgtg actcaacaat taattagagc tgcagaaatc agagcttctg ctaatcttgc

24481 tgctactaaa atgtcagagt gtgtacttgg acaatcaaaa agagttgatt tttgtggaaa

24541 gggctatcat cttatgtcct tccctcagtc agcacctcat ggtgtagtct tcttgcatgt

24601 gacttatgtc cctgcacaag aaaagaactt cacaactgct cctgccattt gtcatgatgg

24661 aaaagcacac tttcctcgtg aaggtgtctt tgtttcaaat ggcacacact ggtttgtaac

24721 acaaaggaat ttttatgaac cacaaatcat tactacagac aacacatttg tgtctggtaa

24781 ctgtgatgtt gtaataggaa ttgtcaacaa cacagtttat gatcctttgc aacctgaatt

24841 agattcattc aaggaggagt tagataaata ttttaagaat catacatcac cagatgttga

24901 tttaggtgac atctctggca ttaatgcttc agttgtaaac attcaaaaag aaattgaccg

24961 cctcaatgag gttgccaaga atttaaatga atctctcatc gatctccaag aacttggaaa

25021 gtatgagcag tatataaaat ggccatggta catttggcta ggttttatag ctggcttgat

25081 tgccatagta atggtgacaa ttatgctttg ctgtatgacc agttgctgta gttgtctcaa

25141 gggctgttgt tcttgtggat cctgctgcaa atttgatgaa gacgactctg agccagtgct

25201 caaaggagtc aaattacatt acacataaac gaacttatgg atttgtttat gagaatcttc

25261 acaattggaa ctgtaacttt gaagcaaggt gaaatcaagg atgctactcc ttcagatttt

25321 gttcgcgcta ctgcaacgat accgatacaa gcctcactcc cttttggatg gcttattgtt

25381 ggcgttgcac ttcttgctgt ttttcagagc gcttccaaaa tcataactct caaaaagaga

25441 tggcaactag cactctccaa gggtgttcac tttgtttgca acttgctgtt gttgtttgta

25501 acagtttact cacacctttt gctcgttgct gctggccttg aagccccttt tctctatctt

25561 tatgctttag tctacttctt gcagagtata aactttgtaa gaataataat gaggctttgg

25621 ctttgctgga aatgccgttc caaaaaccca ttactttatg atgccaacta ttttctttgc

25681 tggcatacta attgttacga ctattgtata ccttacaata gtgtaacttc ttcaattgtc

25741 attacttcag gtgatggcac aacaagtcct atttctgaac atgactacca gattggtggt

25801 tatactgaaa aatgggaatc tggagtaaaa gactgtgttg tattacacag ttacttcact

25861 tcagactatt accagctgta ctcaactcaa ttgagtacag acactggtgt tgaacatgtt

25921 accttcttca tctacaataa aattgttgat gagcctgaag aacatgtcca aattcacaca

25981 atcgacggtt catccggagt tgttaatcca gtaatggaac caatttatga tgaaccgacg

26041 acgactacta gcgtgccttt gtaagcacaa gctgatgagt acgaacttat gtactcattc

26101 gtttcggaag agataggtac gttaatagtt aatagcgtac ttctttttct tgctttcgtg

26161 gtattcttgc tagttacact agccatcctt actgcgcttc gattgtgtgc gtactgctgc

26221 aatattgtta acgtgagtct tgtaaaacct tctttttacg tttactctcg tgttaaaaat

26281 ctgaattctt ctagagttcc tgatcttctg gtctaaacga actaaatatt atattagttt

26341 ttctgtttgg aactttaatt ttagccatgg caggttccaa cggtactatt accgttgaag

26401 agcttaaaaa gctccttgaa gaatggaacc tagtaatagg tttcctattc cttacatgga

26461 tttgtcttct acaatttgcc tatgccaaca ggaataggtt tttgtatata attaagttaa

26521 ttttcctctg gctgttatgg ccagtaactt taacttgttt tgtgcttgct gctgtttaca

26581 gaataaattg gatcaccggt ggaattgcta tcgcaatggc ttgtcttgta ggcttgatgt

26641 ggctcagcta cttcattgct tctttcagac tgtttgcgcg tacgcgttcc atgtggtcat

26701 tcaatccaga aactaacatt cttctcaacg tgccactcca tggcactatt ctgaccagac

26761 cgcttctaga aagtgaactc gtaatcggag ctgtgatcct tcgtggacat cttcgtattg

26821 ctggacacca tctaggacgc tgtgacatca aggacctgcc taaagaaatc actgttgcta

26881 catcacgaac gctttcttat tacaaattgg gagcttcgca gcgtgtagca ggtgactcag

26941 gttttgctgc atacagtcgc tacaggattg gcaactataa attaaacaca gaccattcca

27001 gtagcagtga caatattgct ttgcttgtac agtaagtgac aacagatgtt tcatctcgtt

27061 gactttcagg ttactatagc agagatatta ctaattatta tgcggacttt taaagtttcc

27121 atttggaatc ttgattacat cataaacctc ataattaaaa atttatctaa gtcactaact

27181 gagaataaat attctcaatt agatgaagag caaccaatgg agattgatta aacgaacatg

27241 aaaattattc ttttcttggc actgataaca ctcgctactt gtgagcttta tcactaccaa

27301 gagtgtgtta gaggtacaac agtactttta aaagaacctt gctcttctgg aacatacgag

27361 ggcaattcac catttcatcc tctagctgat aacaaatttg cactgacttg ctttagcact

27421 caatttgctt ttgcttgtcc tgacggcgta aaacacgtct atcagttacg tgccagatca

27481 gtttcaccta aactgttcat cagacaagag gaagttcaag aactttactc tccaattttt

27541 cttattgttg cggcaatagt gtttataaca ctttgcttca cactcaaaag aaagacagaa

27601 tgattgaact ttcattaatt gacttctatt tgtgcttttt agcctttctg ttattccttg

27661 ttttaattat gcttattatc ttttggttct cacttgaact gcaagatcat aatgaaactt

27721 gtcacgccta aacgaacatg aaatttcttg ttttcttagg aatcatcaca actgtagctg

27781 catttcacca agaatgtagt ttacagtcat gtactcaaca tcaaccatat gtagttgatg

27841 acccgtgtcc tattcacttc tattctaaat ggtatattag agtaggagct agaaaatcag

27901 cacctttaat tgaattgtgc gtggatgagg ctggttctaa atcacccatt cagtacatcg

27961 atatcggtaa ttatacagtt tcctgtttac cttttacaat taattgccag gaacctaaat

28021 tgggtagtct tgtagtgcgt tgttcgttct atgaagactt tttagagtat catgacgttc

28081 gtgttgtttt agatttcatc taaacgaaca aacttaaatg tctgataatg gaccccaaaa

28141 tcagcgaaat gcactccgca ttacgtttgg tggaccctca gattcaactg gcagtaacca

28201 gaatggtggg gcgcgatcaa aacaacgtcg gccccaaggt ttacccaata atactgcgtc

28261 ttggttcacc gctctcactc aacatggcaa ggaagacctt aaattctctc gaggacaagg

28321 cgttccaatt aacaccaata gcagtccaga tgaccaaatt ggctactacc gaagagctac

28381 cagacgaatt cgtggtggtg acggtaaaat gaaagatctc agtccaagat ggtatttcta

28441 ctacctagga actgggccag aagctggact tccctatggt gctaacaaag acggcatcat

28501 atgggttgca actgagggag ccttgaatac accaaaagat cacattggca cccgcaatcc

28561 tgctaacaat gctgcaatcg tgctacaact tcctcaagga acaacattgc caaaaggctt

28621 ctacgcagaa gggagcagag gcggcagtca agcctcttct cgttcctcat cacgtagtcg

28681 caacagttca agaaattcaa ctccaggcag cagtaaacga acttctcctg ctagaatggc

28741 tggcaatggc ggtgatgctg ctcttgcttt gctgctgctt gacagattga accagcttga

28801 gagcaaaatg tctggtaaag gccaacaaca acaaggccaa actgtcacta agaaatctgc

28861 tgctgaggct tctaagaagc ctcggcaaaa acgtactgcc actaaagcat acaatgtaac

28921 acaagctttc ggcagacgtg gtccagaaca aacccaagga aattttgggg accaggaact

28981 aatcagacaa ggaactgatt acaaacattg gccgcaaatt gcacaatttg cccccagcgc

29041 ttcagcgttc ttcggaatgt cgcgcattgg catggaagtc acaccttcgg gaacgtggtt

29101 gacctacaca ggtgccatca aattggatga caaagatcca aatttcaaag atcaagtcat

29161 tttgctgaat aagcatattg acgcatacaa aacattccca ccaacagagc ctaaaaagga

29221 caaaaagaag aaggctgatg aaactcaagc cttaccgcag agacagaaga aacagcaaac

29281 tgtgactctt cttcctgctg cagatttgga tgatttctcc aaacaattgc aacaatccat

29341 gagcagtgct gactcaactc aggcctaaac tcatgcagac cacacaaggc agatgggcta

29401 tataaacgtt ttcgcttttc cgtttacgat atatagtcta ctctt

//