**Severe acute respiratory syndrome coronavirus 2 isolate SARS-CoV-2/human/USA/AZ-CDC-LC0488280/2022, complete genome**

GenBank: OM429902.1

[FASTA](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?report=fasta) [Graphics](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?report=graph)

[Go to:](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1" \l "goto2184777555_0)

LOCUS OM429902 29686 bp RNA linear VRL 28-JAN-2022

DEFINITION Severe acute respiratory syndrome coronavirus 2 isolate

SARS-CoV-2/human/USA/AZ-CDC-LC0488280/2022, complete genome.

ACCESSION OM429902

VERSION OM429902.1

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

BioSample: [SAMN25349517](https://www.ncbi.nlm.nih.gov/biosample/SAMN25349517)

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 29686)

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JOURNAL Unpublished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 29686)

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 (28-JAN-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..29686

/organism="Severe acute respiratory syndrome coronavirus

2"

/mol\_type="genomic RNA"

/isolate="SARS-CoV-2/human/USA/AZ-CDC-LC0488280/2022"

/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: Arizona"

/collection\_date="2022-01-10"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=164&to=21441) 164..21441

/gene="ORF1ab"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?location=164:13354,13354:21441) join(164..13354,13354..21441)

/gene="ORF1ab"

/ribosomal\_slippage

/codon\_start=1

/product="ORF1ab polyprotein"

/protein\_id="[UJU61077.1](https://www.ncbi.nlm.nih.gov/protein/2184777556)"

/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

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

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/UJU61077.1?from=1&to=180) 164..703

/gene="ORF1ab"

/product="leader protein"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=181&to=818) 704..2617

/gene="ORF1ab"

/product="nsp2"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=819&to=2762) 2618..8449

/gene="ORF1ab"

/product="nsp3"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=2763&to=3262) 8450..9949

/gene="ORF1ab"

/product="nsp4"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=3263&to=3568) 9950..10867

/gene="ORF1ab"

/product="3C-like proteinase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=3569&to=3855) 10868..11728

/gene="ORF1ab"

/product="nsp6"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=3856&to=3938) 11729..11977

/gene="ORF1ab"

/product="nsp7"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=3939&to=4136) 11978..12571

/gene="ORF1ab"

/product="nsp8"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=4137&to=4249) 12572..12910

/gene="ORF1ab"

/product="nsp9"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=4250&to=4388) 12911..13327

/gene="ORF1ab"

/product="nsp10"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=4389&to=5320) join(13328..13354,13354..16122)

/gene="ORF1ab"

/product="RNA-dependent RNA polymerase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=5321&to=5921) 16123..17925

/gene="ORF1ab"

/product="helicase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=5922&to=6448) 17926..19506

/gene="ORF1ab"

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

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=6449&to=6794) 19507..20544

/gene="ORF1ab"

/product="endoRNAse"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61077.1?from=6795&to=7092) 20545..21438

/gene="ORF1ab"

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

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=164&to=13369) 164..13369

/gene="ORF1ab"

/codon\_start=1

/product="ORF1a polyprotein"

/protein\_id="[UJU61078.1](https://www.ncbi.nlm.nih.gov/protein/2184777557)"

/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

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/UJU61078.1?from=1&to=180) 164..703

/gene="ORF1ab"

/product="leader protein"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=181&to=818) 704..2617

/gene="ORF1ab"

/product="nsp2"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=819&to=2762) 2618..8449

/gene="ORF1ab"

/product="nsp3"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=2763&to=3262) 8450..9949

/gene="ORF1ab"

/product="nsp4"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=3263&to=3568) 9950..10867

/gene="ORF1ab"

/product="3C-like proteinase"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=3569&to=3855) 10868..11728

/gene="ORF1ab"

/product="nsp6"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=3856&to=3938) 11729..11977

/gene="ORF1ab"

/product="nsp7"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=3939&to=4136) 11978..12571

/gene="ORF1ab"

/product="nsp8"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=4137&to=4249) 12572..12910

/gene="ORF1ab"

/product="nsp9"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=4250&to=4388) 12911..13327

/gene="ORF1ab"

/product="nsp10"

[mat\_peptide](https://www.ncbi.nlm.nih.gov/protein/UJU61078.1?from=4389&to=4401) 13328..13366

/gene="ORF1ab"

/product="nsp11"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=13362&to=13389) 13362..13389

/gene="ORF1ab"

/note="Coronavirus frameshifting stimulation element

stem-loop 1"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=13374&to=13428) 13374..13428

/gene="ORF1ab"

/note="Coronavirus frameshifting stimulation element

stem-loop 2"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=21449&to=25261) 21449..25261

/gene="S"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=21449&to=25261) 21449..25261

/gene="S"

/codon\_start=1

/product="surface glycoprotein"

/protein\_id="[UJU61079.1](https://www.ncbi.nlm.nih.gov/protein/2184777558)"

/translation="MFVFLVLLPLVSSQCVNLITRTQLPPAYTNSFTRGVYYPDKVFR

SSVLHSTQDLFLPFFSNVTWFHVISGTNGTKRFDNPVLPFNDGVYFASIEKSNIIRGW

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/OM429902.1?from=25270&to=26097) 25270..26097

/gene="ORF3a"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=25270&to=26097) 25270..26097

/gene="ORF3a"

/codon\_start=1

/product="ORF3a protein"

/protein\_id="[UJU61080.1](https://www.ncbi.nlm.nih.gov/protein/2184777559)"

/translation="MDLFMRIFTIGTVTLKQGEIKDATPSDFVRATATIPIQASLPFG

WLIVGVALLAVFQSASKIITLKKRWQLALSKGVHFVCNLLLLFVTVYSHLLLVAAGLE

APFLYLYALVYFLQSINFVRIIMRLWLCWKCRSKNPLLYDANYFLCWHTNCYDYCIPY

NSVTSSIVITSGDGTTSPISEHDYQIGGYTEKWESGVKDCVVLHSYFTSDYYQLYSTQ

LSTDTGVEHVTFFIYNKIVDEPEEHVQIHTIDGSSGVVNPVMEPIYDEPTTTTSVPL"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=26122&to=26349) 26122..26349

/gene="E"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=26122&to=26349) 26122..26349

/gene="E"

/codon\_start=1

/product="envelope protein"

/protein\_id="[UJU61081.1](https://www.ncbi.nlm.nih.gov/protein/2184777560)"

/translation="MYSFVSEEIGTLIVNSVLLFLAFVVFLLVTLAILTALRLCAYCC

NIVNVSLVKPSFYVYSRVKNLNSSRVPDLLV"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=26400&to=27068) 26400..27068

/gene="M"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=26400&to=27068) 26400..27068

/gene="M"

/codon\_start=1

/product="membrane glycoprotein"

/protein\_id="[UJU61082.1](https://www.ncbi.nlm.nih.gov/protein/2184777561)"

/translation="MAGSNGTITVEELKKLLEEWNLVIGFLFLTWICLLQFAYANRNR

FLYIIKLIFLWLLWPVTLTCFVLAAVYRINWITGGIAIAMACLVGLMWLSYFIASFRL

FARTRSMWSFNPETNILLNVPLHGTILTRPLLESELVIGAVILRGHLRIAGHHLGRCD

IKDLPKEITVATSRTLSYYKLGASQRVAGDSGFAAYSRYRIGNYKLNTDHSSSSDNIA

LLVQ"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27079&to=27264) 27079..27264

/gene="ORF6"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27079&to=27264) 27079..27264

/gene="ORF6"

/codon\_start=1

/product="ORF6 protein"

/protein\_id="[UJU61083.1](https://www.ncbi.nlm.nih.gov/protein/2184777562)"

/translation="MFHLVDFQVTIAEILLIIMRTFKVSIWNLDYIINLIIKNLSKSL

TENKYSQLDEEQPMEID"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27271&to=27636) 27271..27636

/gene="ORF7a"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27271&to=27636) 27271..27636

/gene="ORF7a"

/codon\_start=1

/product="ORF7a protein"

/protein\_id="[UJU61084.1](https://www.ncbi.nlm.nih.gov/protein/2184777563)"

/translation="MKIILFLALITLATCELYHYQECVRGTTVLLKEPCSSGTYEGNS

PFHPLADNKFALTCFSTQFAFACPDGVKHVYQLRARSVSPKLFIRQEEVQELYSPIFL

IVAAIVFITLCFTLKRKTE"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27633&to=27764) 27633..27764

/gene="ORF7b"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27633&to=27764) 27633..27764

/gene="ORF7b"

/codon\_start=1

/product="ORF7b"

/protein\_id="[UJU61085.1](https://www.ncbi.nlm.nih.gov/protein/2184777564)"

/translation="MIELSLIDFYLCFLAFLLFLVLIMLIIFWFSLELQDHNETCHA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27771&to=28136) 27771..28136

/gene="ORF8"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=27771&to=28136) 27771..28136

/gene="ORF8"

/codon\_start=1

/product="ORF8 protein"

/protein\_id="[UJU61086.1](https://www.ncbi.nlm.nih.gov/protein/2184777565)"

/translation="MKFLVFLGIITTVAAFHQECSLQSCTQHQPYVVDDPCPIHFYSK

WYIRVGARKSAPLIELCVDEAGSKSPIQYIDIGNYTVSCLPFTINCQEPKLGSLVVRC

SFYEDFLEYHDVRVVLDFI"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=28151&to=29401) 28151..29401

/gene="N"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=28151&to=29401) 28151..29401

/gene="N"

/codon\_start=1

/product="nucleocapsid phosphoprotein"

/protein\_id="[UJU61087.1](https://www.ncbi.nlm.nih.gov/protein/2184777566)"

/translation="MSDNGPQNQRNALRITFGGPSDSTGSNQNGGARSKQRRPQGLPN

NTASWFTALTQHGKEDLKFSRGQGVPINTNSSPDDQIGYYRRATRRIRGGDGKMKDLS

PRWYFYYLGTGPEAGLPYGANKDGIIWVATEGALNTPKDHIGTRNPANNAAIVLQLPQ

GTTLPKGFYAEGSRGGSQASSRSSSRSRNSSRNSTPGSSKRTSPARMAGNGGDAALAL

LLLDRLNQLESKMSGKGQQQQGQTVTKKSAAEASKKPRQKRTATKAYNVTQAFGRRGP

EQTQGNFGDQELIRQGTDYKHWPQIAQFAPSASAFFGMSRIGMEVTPSGTWLTYTGAI

KLDDKDPNFKDQVILLNKHIDAYKTFPPTEPKKDKKKKADETQALPQRQKKQQTVTLL

PAADLDDFSKQLQQSMSSADSTQA"

[gene](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=29426&to=29542) 29426..29542

/gene="ORF10"

[CDS](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=29426&to=29542) 29426..29542

/gene="ORF10"

/codon\_start=1

/product="ORF10 protein"

/protein\_id="[UJU61088.1](https://www.ncbi.nlm.nih.gov/protein/2184777567)"

/translation="MGYINVFAFPFTIYSLLLCRMNSRNYIAQVDVVNFNLT"

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=29477&to=29512) 29477..29512

/gene="ORF10"

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

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=29497&to=29525) 29497..29525

/gene="ORF10"

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

[stem\_loop](https://www.ncbi.nlm.nih.gov/nuccore/OM429902.1?from=29596&to=29636) 29596..29636

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

ORIGIN

1 ctgcatgctt agtgcactca cgcagtataa ttaataacta attactgtcg ttgacaggac

61 acgagtaact cgtctatctt ctgcaggctg cttacggttt cgtccgtgtt gcagccgatc

121 atcagcacat ctaggttttg tccgggtgtg accgaaaggt aagatggaga gccttgtccc

181 tggtttcaac gagaaaacac acgtccaact cagtttgcct gttttacagg ttcgcgacgt

241 gctcgtacgt ggctttggag actccgtgga ggaggtctta tcagaggcac gtcaacatct

301 taaagatggc acttgtggct tagtagaagt tgaaaaaggc gttttgcctc aacttgaaca

361 gccctatgtg ttcatcaaac gttcggatgc tcgaactgca cctcatggtc atgttatggt

421 tgagctggta gcagaactcg aaggcattca gtacggtcgt agtggtgaga cacttggtgt

481 ccttgtccct catgtgggcg aaataccagt ggcttaccgc aaggttcttc ttcgtaagaa

541 cggtaataaa ggagctggtg gccatagtta cggcgccgat ctaaagtcat ttgacttagg

601 cgacgagctt ggcactgatc cttatgaaga ttttcaagaa aactggaaca ctaaacatag

661 cagtggtgtt acccgtgaac tcatgcgtga gcttaacgga ggggcataca ctcgctatgt

721 cgataacaac ttctgtggcc ctgatggcta ccctcttgag tgcattaaag accttctagc

781 acgtgctggt aaagcttcat gcactttgtc cgaacaactg gactttattg acactaagag

841 gggtgtatac tgctgccgtg aacatgagca tgaaattgct tggtacacgg aacgttctga

901 aaagagctat gaattgcaga caccttttga aattaaattg gcaaagaaat ttgacacctt

961 caatggggaa tgtccaaatt ttgtatttcc cttaaattcc ataatcaaga ctattcaacc

1021 aagggttgaa aagaaaaagc ttgatggctt tatgggtaga attcgatctg tctatccagt

1081 tgcgtcacca aatgaatgca accaaatgtg cctttcaact ctcatgaagt gtgatcattg

1141 tggtgaaact tcatggcaga cgggcgattt tgttaaagcc acttgcgaat tttgtggcac

1201 tgagaatttg actaaagaag gtgccactac ttgtggttac ttaccccaaa atgctgttgt

1261 taaaatttat tgtccagcat gtcacaattc agaagtagga cctgagcata gtcttgccga

1321 ataccataat gaatctggct tgaaaaccat tcttcgtaag ggtggtcgca ctattgcctt

1381 tggaggctgt gtgttctctt atgttggttg ccataacaag tgtgcctatt gggttccacg

1441 tgctagcgct aacataggtt gtaaccatac aggtgttgtt ggagaaggtt ccgaaggtct

1501 taatgacaac cttcttgaaa tactccaaaa agagaaagtc aacatcaata ttgttggtga

1561 ctttaaactt aatgaagaga tcgccattat tttggcatct ttttctgctt ccacaagtgc

1621 ttttgtggaa actgtgaaag gtttggatta taaagcattc aaacaaattg ttgaatcctg

1681 tggtaatttt aaagttacaa aaggaaaagc taaaaaaggt gcctggaata ttggtgaaca

1741 gaaatcaata ctgagtcctc tttatgcatt tgcatcagag gctgctcgtg ttgtacgatc

1801 aattttctcc cgcactcttg aaactgctca aaattctgtg cgtgttttac agaaggccgc

1861 tataacaata ctagatggaa tttcacagta ttcactgaga ctcattgatg ctatgatgtt

1921 cacatctgat ttggctacta acaatctagt tgtaatggcc tacattacag gtggtgttgt

1981 tcagttgact tcgcagtggc taactaacat ctttggcact gtttatgaaa aactcaaacc

2041 cgtccttgat tggcttgaag agaagtttaa ggaaggtgta gagtttctta gagacggttg

2101 ggaaattgtt aaatttatct caacctgtgc ttgtgaaatt gtcggtggac aaattgtcac

2161 ctgtgcaaag gaaattaagg agagtgttca gacattcttt aagcttgtaa ataaattttt

2221 ggctttgtgt gctgactcta tcattattgg tggagctaaa cttaaagcct tgaatttagg

2281 tgaaacattt gtcacgcact caaagggatt gtacagaaag tgtgttaaat ccagagaaga

2341 aactggccta ctcatgcctc taaaagcccc aaaagaaatt atcttcttag agggagaaac

2401 acttcccaca gaagtgttaa cagaggaagt tgtcttgaaa actggtgatt tacaaccatt

2461 agaacaacct actagtgaag ctgttgaagc tccattggtt ggtacaccag tttgtattaa

2521 cgggcttatg ttgctcgaaa tcaaagacac agaaaagtac tgtgcccttg cacctaatat

2581 gatggtaaca aacaatacct tcacactcaa aggcggtgca ccaacaaagg ttacttttgg

2641 tgatgacact gtgatagaag tgcaaggtta caagagtgtg aatatcactt ttgaacttga

2701 tgaaaggatt gataaagtac ttaatgagag gtgctctgcc tatacagttg aactcggtac

2761 agaagtaaat gagttcgcct gtgttgtggc agatgctgtc ataaaaactt tgcaaccagt

2821 atctgaatta cttacaccac tgggcattga tttagatgag tggagtatgg ctacatacta

2881 cttatttgat gagtctggtg agtttaaatt ggcttcacat atgtattgtt ctttttaccc

2941 tccagatgag gatgaagaag aaggtgattg tgaagaagaa gagtttgagc catcaactca

3001 atatgagtat ggtactgaag atgattacca aggtaaacct ttggaatttg gtgccacttc

3061 tgctgctctt caacctgaag aagagcaaga agaagattgg ttagatgatg atagtcaaca

3121 aactgttggt caacaagacg gcagtgagga caatcagaca actactattc aaacaattgt

3181 tgaggttcaa cctcaattag agatggaact tacaccagtt gttcagacta ttgaagtgaa

3241 tagttttagt ggttatttaa aacttactga caatgtatac attaaaaatg cagacattgt

3301 ggaagaagct aaaaaggtaa aaccaacagt ggttgttaat gcagccaatg tttaccttaa

3361 acatggagga ggtgttgcag gagccttaaa taaggctact aacaatgcca tgcaagttga

3421 atctgatgat tacatagcta ctaatggacc acttaaagtg ggtggtagtt gtgttttaag

3481 cggacacaat cttgctaaac actgtcttca tgttgtcggc ccaaatgtta acaaaggtga

3541 agacattcaa cttcttaaga gtgcttatga aaattttaat cagcacgaag ttctacttgc

3601 accattatta tcagctggta tttttggtgc tgaccctata cattctttaa gagtttgtgt

3661 agatactgtt cgcacaaatg tctacttagc tgtctttgat aaaaatctct atgacaaact

3721 tgtttcaagc tttttggaaa tgaagagtga aaagcaagtt gaacaaaaga tcgctgagat

3781 tcctaaagag gaagttaagc catttataac tgaaagtaaa ccttcagttg aacagagaaa

3841 acaagatgat aagaaaatca aagcttgtgt tgaagaagtt acaacaactc tggaagaaac

3901 taagttcctc acagaaaact tgttacttta tattgacatt aatggcaatc ttcatccaga

3961 ttctgccact cttgttagtg acattgacat cactttctta aagaaagatg ctccatatat

4021 agtgggtgat gttgttcaag agggtgtttt aactgctgtg gttataccta ctaaaaaggc

4081 tggtggcact actgaaatgc tagcgaaagc tttgagaaaa gtgccaacag acaattatat

4141 aaccacttac ccgggtcagg gtttaaatgg ttacactgta gaggaggcaa agacagtgct

4201 taaaaagtgt aaaagtgcct tttacattct accatctatt atctctaatg agaagcaaga

4261 aattcttgga actgtttctt ggaatttgcg agaaatgctt gcacatgcag aagaaacacg

4321 caaattaatg cctgtctgtg tggaaactaa agccatagtt tcaactatac agcgtaaata

4381 taagggtatt aaaatacaag agggtgtggt tgattatggt gctagatttt acttttacac

4441 cagtaaaaca actgtagcgt cacttatcaa cacacttaac gatctaaatg aaactcttgt

4501 tacaatgcca cttggctatg taacacatgg cttaaatttg gaagaagctg ctcggtatat

4561 gagatctctc aaagtgccag ctacagtttc tgtttcttca cctgatgctg ttacagcgta

4621 taatggttat cttacttctt cttctaaaac acctgaagaa cattttattg aaaccatctc

4681 acttgctggt tcctataaag attggtccta ttctggacaa tctacacaac taggtataga

4741 atttcttaag agaggtgata aaagtgtata ttacactagt aatcctacca cattccacct

4801 agatggtgaa gttatcacct ttgacaatct taagacactt ctttctttga gagaagtgag

4861 gactattaag gtgtttacaa cagtagacaa cattaacctc cacacgcaag ttgtggacat

4921 gtcaatgaca tatggacaac agtttggtcc aacttatttg gatggagctg atgttactaa

4981 aataaaacct cataattcac atgaaggtaa aacattttat gttttaccta atgatgacac

5041 tctacgtgtt gaggcttttg agtactacca cacaactgat cctagttttc tgggtaggta

5101 catgtcagca ttaaatcaca ctaaaaagtg gaaataccca caagttaatg gtttaacttc

5161 tattaaatgg gcagataaca actgttatct tgccactgca ttgttaacac tccaacaaat

5221 agagttgaag tttaatccac ctgctctaca agatgcttat tacagagcaa gggctggtga

5281 agcggctaac ttttgtgcac ttatcttagc ctactgtaat aagacagtag gtgagttagg

5341 tgatgttaga gaaacaatga gttacttgtt tcaacatgcc aatttagatt cttgcaaaag

5401 agtcttgaac gtggtgtgta aaacttgtgg acaacagcag acaaccctta agggtgtaga

5461 agctgttatg tacatgggca cactttctta tgaacaattt aagaaaggtg ttcagatacc

5521 ttgtacgtgt ggtaaacaag ctacaaaata tctagtacaa caggagtcac cttttgttat

5581 gatgtcagca ccacctgctc agtatgaact taagcatggt acatttactt gtgctagtga

5641 gtacactggt aattaccagt gtggtcacta taaacatata acttctaaag aaactttgta

5701 ttgcatagac ggtgctttac ttacaaagtc ctcagaatac aaaggtccta ttacggatgt

5761 tttctacaaa gaaaacagtt acacaacaac cataaaacca gttacttata aattggatgg

5821 tgttgtttgt acagaaattg accctaagtt ggacaattat tataagaaag acaattctta

5881 tttcacagag caaccaattg atcttgtacc aaaccaacca tatccaaacg caagcttcga

5941 taattttaag tttgtatgtg ataatatcaa atttgctgat gatttaaacc agttaactgg

6001 ttataagaaa cctgcttcaa gagagcttaa agttacattt ttccctgact taaatggtga

6061 tgtggtggct attgattata aacactacac accctctttt aagaaaggag ctaaattgtt

6121 acataaacct attgtttggc atgttaacaa tgcaactaat aaagccacgt ataaaccaaa

6181 tacctggtgt atacgttgtc tttggagcac aaaaccagtt gaaacatcaa attcgtttga

6241 tgtactgaag tcagaggacg cgcagggaat ggataatctt gcctgcgaag atctaaaacc

6301 agtctctgaa gaagtagtgg aaaatcctac catacagaaa gacgttcttg agtgtaatgt

6361 gaaaactacc gaagttgtag gagacattat acttaaacca gcaaataata taaaaattac

6421 agaagaggtt ggccacacag atctaatggc tgcttatgta gacaattcta gtcttactat

6481 taagaaacct aatgaattat ctagagtatt aggtttgaaa acccttgcta ctcatggttt

6541 agctgctgtt aatagtgtcc cttgggatac tatagctaat tatgctaagc cttttcttaa

6601 caaagttgtt agtacaacta ctaacatagt tacacggtgt ttaaaccgtg tttgtactaa

6661 ttatatgcct tatttcttta ctttattgct acaattgtgt acttttacta gaagtacaaa

6721 ttctagaatt aaagcatcta tgccgactac tatagcaaag aatactgtta agagtgtcgg

6781 taaattttgt ctagaggctt catttaatta tttgaagtca cctaattttt ctaaactgat

6841 aaatattata atttggtttt tactattaag tgtttgccta ggttctttaa tctactcaac

6901 cgctgcttta ggtgttttaa tgtctaattt aggcatgcct tcttactgta ctggttacag

6961 agaaggctat ttgaactcta ctaatgtcac tattgcaacc tactgtactg gttctatacc

7021 ttgtagtgtt tgtcttagtg gtttagattc tttagacacc tatccttctt tagaaactat

7081 acaaattacc atttcatctt ttaaatggga tttaactgct tttggcttag ttgcagagtg

7141 gtttttggca tatattcttt tcactaggtt tttctatgta cttggattgg ctgcaatcat

7201 gcaattgttt ttcagctatt ttgcagtaca ttttattagt aattcttggc ttatgtggtt

7261 aataattaat cttgtacaaa tggccccgat ttcagctatg gttagaatgt acatcttctt

7321 tgcatcattt tattatgtat ggaaaagtta tgtgcatgtt gtagacggtt gtaattcatc

7381 aacttgtatg atgtgttaca aacgtaatag agcaacaaga gtcgaatgta caactattgt

7441 taatggtgtt agaaggtcct tttatgtcta tgctaatgga ggtaaaggct tttgcaaact

7501 acacaattgg aattgtgtta attgtgatac attctgtgct ggtagtacat ttattagtga

7561 tgaagttgcg agagacttgt cactacagtt taaaagacca ataaatccta ctgaccagtc

7621 ttcttacatc gttgatagtg ttacagtgaa gaatggttcc atccatcttt actttgataa

7681 agctggtcaa aagacttatg aaagacattc tctctctcat tttgttaact tagacaacct

7741 gagagctaat aacactaaag gttcattgcc tattaatgtt atagtttttg atggtaaatc

7801 aaaatgtgaa gaatcatctg caaaatcagc gtctgtttac tacagtcagc ttatgtgtca

7861 acctatactg ttactagatc aggcattagt gtctgatgtt ggtgatagtg cggaagttgc

7921 agttaaaatg tttgatgctt acgttaatac gttttcatca acttttaacg taccaatgga

7981 aaaactcaaa acactagttg caactgcaga agctgaactt gcaaagaatg tgtccttaga

8041 caatgtctta tctactttta tttcagcagc tcggcaaggg tttgttgatt cagatgtaga

8101 aactaaagat gttgttgaat gtcttaaatt gtcacatcaa tctgacatag aagttactgg

8161 cgatagttgt aataactata tgctcaccta taacaaagtt gaaaacatga caccccgtga

8221 ccttggtgct tgtattgact gtagtgcgcg tcatattaat gcgcaggtag caaaaagtca

8281 caacattact ttgatatgga acgttaaaga tttcatgtca ttgtctgaac aactacgaaa

8341 acaaatacgt agtgctgcta aaaagaataa cttacctttt aagttgacat gtgcaactac

8401 tagacaagtt gttaatgttg taacaacaaa gatagcactt aagggtggta aaattgttaa

8461 taattggttg aagcagttaa ttaaagttac acttgtgttc ctttttgttg ctgctatttt

8521 ctatttaata acacctgttc atgtcatgtc taaacatact gacttttcaa gtgaaatcat

8581 aggatacaag gctattgatg gtggtgtcac tcgtgacata gcatctacag atacttgttt

8641 tgctaacaaa catgctgatt ttgacacatg gtttagccag cgtggtggta gttatactaa

8701 tgacaaagct tgcccattga ttgctgcagt cataacaaga gaagtgggtt ttgtcgtgcc

8761 tggtttgcct ggcacgatat tacgcacaac taatggtgac tttttgcatt tcttacctag

8821 agtttttagt gcagttggta acatctgtta cacaccatca aaacttatag agtacactga

8881 ctttgcaaca tcagcttgtg ttttggctgc tgaatgtaca atttttaaag atgcttctgg

8941 taagccagta ccatattgtt atgataccaa tgtactagaa ggttctgttg cttatgaaag

9001 tttacgccct gacacacgtt atgtgctcat ggatggctct attattcaat ttcctaacac

9061 ctaccttgaa ggttctgtta gagtggtaac aacttttgat tctgagtact gtaggcacgg

9121 cacttgtgaa agatcagaag ctggtgtttg tgtatctact agtggtagat gggtacttaa

9181 caatgattat tacagatctt taccaggagt tttctgtggt gtagatgctg taaatttact

9241 tactaatatg tttacaccac taattcaacc tattggtgct ttggacatat cagcatctat

9301 agtagctggt ggtattgtag ctatcgtagt aacatgcctt gcctactatt ttatgaggtt

9361 tagaagagct tttggtgaat acagtcatgt agttgccttt aatactttac tattccttat

9421 gtcattcact gtactctgtt taacaccagt ttactcattc ttacctggtg tttattctgt

9481 tatttacttg tacttgacat tttatcttac taatgatgtt tcttttttag cacatattca

9541 gtggatggtt atgttcacac ctttagtacc tttctggata acaattgctt atatcatttg

9601 tatttccaca aagcatttct attggttctt tagtaattac ctaaagagac gtgtagtctt

9661 taatggtgtt tcctttagta cttttgaaga agctgcgctg tgcacctttt tgttaaataa

9721 agaaatgtat ctaaagttgc gtagtgatgt gctattacct cttacgcaat ataatagata

9781 cttagctctt tataataagt acaagtattt tagtggagca atggatacaa ctagctacag

9841 agaagctgct tgttgtcatc tcgcaaaggc tctcaatgac ttcagtaact caggttctga

9901 tgttctttac caaccaccac aaatctctat cacctcagct gttttgcaga gtggttttag

9961 aaaaatggca ttcccatctg gtaaagttga gggttgtatg gtacaagtaa cttgtggtac

10021 aactacactt aacggtcttt ggcttgatga cgtagtttac tgtccaagac atgtgatctg

10081 cacctctgaa gacatgctta accctaatta tgaagattta ctcattcgta agtctaatca

10141 taatttcttg gtacaggctg gtaatgttca actcagggtt attggacatt ctatgcaaaa

10201 ttgtgtactt aagcttaagg ttgatacagc caatcctaag acacctaagt ataagtttgt

10261 tcgcattcaa ccaggacaga ctttttcagt gttagcttgt tacaatggtt caccatctgg

10321 tgtttaccaa tgtgctatga ggcacaattt cactattaag ggttcattcc ttaatggttc

10381 atgtggtagt gttggtttta acatagatta tgactgtgtc tctttttgtt acatgcacca

10441 tatggaatta ccaactggag ttcatgctgg cacagactta gaaggtaact tttatggacc

10501 ttttgttgac aggcaaacag cacaagcagc tggtacggac acaactatta cagttaatgt

10561 tttagcttgg ttgtacgctg ctgttataaa tggagacagg tggtttctca atcgatttac

10621 cacaactctt aatgacttta accttgtggc tatgaagtac aattatgaac ctctaacaca

10681 agaccatgtt gacatactag gacctctttc tgctcaaact ggaattgccg ttttagatat

10741 gtgtgcttca ttaaaagaat tactgcaaaa tggtatgaat ggacgtacca tattgggtag

10801 tgctttatta gaagatgaat ttacaccttt tgatgttgtt agacaatgct caggtgttac

10861 tttccaaagt gcagtgaaaa gaacaatcaa gggtacacac cactggttgt tactcacaat

10921 tttgacttca cttttagttt tagtccagag tactcaatgg tctttgttct tttttttgta

10981 tgaaaatgcc tttttacctt ttgctatggg tattattgct atgtctgctt ttgcaatgat

11041 gtttgtcaaa cataagcatg catttctctg tttgtttttg ttaccttctc ttgccactgt

11101 agcttatttt aatatggtct atatgcctgc tagttgggtg atgcgtatta tgacatggtt

11161 ggatatggtt gatactagtt ttaagctaaa agactgtgtt atgtatgcat cagctgtagt

11221 gttactaatc cttatgacag caagaactgt gtatgatgat ggtgctagga gagtgtggac

11281 acttatgaat gtcttgacac tcgtttataa agtttattat ggtaatgctt tagatcaagc

11341 catttccatg tgggctctta taatctctgt tacttctaac tactcaggtg tagttacaac

11401 tgtcatgttt ttggccagag gtgttgtttt tatgtgtgtt gagtattgcc ctattttctt

11461 cataactggt aatacacttc agtgtataat gctagtttat tgtttcttag gctatttttg

11521 tacttgttac tttggcctct tttgtttact caaccgctac tttagactga ctcttggtgt

11581 ttatgattac ttagtttcta cacaggagtt tagatatatg aattcacagg gactactccc

11641 acccaagaat agcatagatg ccttcaaact caacattaaa ttgttgggtg ttggtggcaa

11701 accttgtatc aaagtagcca ctgtacagtc taaaatgtca gatgtaaagt gcacatcagt

11761 agtcttactc tcagttttgc aacaactcag agtagaatca tcatctaaat tgtgggctca

11821 atgtgtccag ttacataatg acattctctt agctaaagat actactgaag cctttgaaaa

11881 aatggtttca ctactttctg ttttgctttc catgcagggt gctgtagaca taaacaagct

11941 ttgtgaagaa atgctggaca acagggcaac cttacaagct atagcctcag agtttagttc

12001 ccttccatca tatgcagctt ttgctactgc tcaagaagct tatgagcagg ctgttgctaa

12061 tggtgattct gaagttgttc ttaaaaagtt gaagaagtct ttgaatgtgg ctaaatctga

12121 atttgaccgt gatgcagcca tgcaacgtaa gttggaaaag atggctgatc aagctatgac

12181 ccaaatgtat aaacaggcta gatctgagga caagagggca aaagttacta gtgctatgca

12241 gacaatgctt ttcactatgc ttagaaagtt ggataatgat gcactcaaca acattatcaa

12301 caatgcaaga gatggttgtg ttcccttgaa cataatacct cttacaacag cagccaaact

12361 aatggttgtc ataccagact ataacacata taaaaatacg tgtgatggta caacatttac

12421 ttatgcatca gcattgtggg aaatccaaca ggttgtagat gcagatagta aaattgttca

12481 acttagtgaa attagtatgg acaattcacc taatttagca tggcctctta ttgtaacagc

12541 tttaagggcc aattctgctg tcaaattaca gaataatgag cttagtcctg ttgcactacg

12601 acagatgtct tgtgctgccg gtactacaca aactgcttgc actgatgaca atgcgttagc

12661 ttactacaac acaacaaagg gaggtaggtt tgtacttgca ctgttatccg atttacagga

12721 tttgaaatgg gctagattcc ctaagagtga tggaactggt actatctata cagaactgga

12781 accaccttgt aggtttgtta cagacacacc taaaggtcct aaagtgaagt atttatactt

12841 tattaaagga ttaaacaacc taaatagagg tatggtactt ggtagtttag ctgccacagt

12901 acgtctacaa gctggtaatg caacagaagt gcctgccaat tcaactgtat tatctttctg

12961 tgcttttgct gtagatgctg ctaaagctta caaagattat ctagctagtg ggggacaacc

13021 aatcactaat tgtgttaaga tgttgtgtac acacactggt actggtcagg caataacagt

13081 cacaccggaa gccaatatgg atcaagaatc ctttggtggt gcatcgtgtt gtctgtactg

13141 ccgttgccac atagatcatc caaatcctaa aggattttgt gacttaaaag gtaagtatgt

13201 acaaatacct acaacttgtg ctaatgaccc tgtgggtttt acacttaaaa acacagtctg

13261 taccgtctgc ggtatgtgga aaggttatgg ctgtagttgt gatcaactcc gcgaacccat

13321 gcttcagtca gctgatgcac aatcgttttt aaacgggttt gcggtgtaag tgcagcccgt

13381 cttacaccgt gcggcacagg cactagtact gatgtcgtat acagggcttt tgacatctac

13441 aatgataaag tagctggttt tgctaaattc ctaaaaacta attgttgtcg cttccaagaa

13501 aaggacgaag atgacaattt aattgattct tactttgtag ttaagagaca cactttctct

13561 aactaccaac atgaagaaac aatttataat ttacttaagg attgtccagc tgttgctaaa

13621 catgacttct ttaagtttag aatagacggt gacatggtac cacatatatc acgtcaacgt

13681 cttactaaat acacaatggc agacctcgtc tatgctttaa ggcattttga tgaaggtaat

13741 tgtgacacat taaaagaaat acttgtcaca tacaattgtt gtgatgatga ttatttcaat

13801 aaaaaggact ggtatgattt tgtagaaaac ccagatatat tacgcgtata cgccaactta

13861 ggtgaacgtg tacgccaagc tttgttaaaa acagtacaat tctgtgatgc catgcgaaat

13921 gctggtattg ttggtgtact gacattagat aatcaagatc tcaatggtaa ctggtatgat

13981 ttcggtgatt tcatacaaac cacgccaggt agtggagttc ctgttgtaga ttcttattat

14041 tcattgttaa tgcctatatt aaccttgacc agggctttaa ctgcagagtc acatgttgac

14101 actgacttaa caaagcctta cattaagtgg gatttgttaa aatatgactt cacggaagag

14161 aggttaaaac tctttgaccg ttattttaaa tattgggatc agacatacca cccaaattgt

14221 gttaactgtt tggatgacag atgcattctg cattgtgcaa actttaatgt tttattctct

14281 acagtgttcc cacttacaag ttttggacca ctagtgagaa aaatatttgt tgatggtgtt

14341 ccatttgtag tttcaactgg ataccacttc agagagctag gtgttgtaca taatcaggat

14401 gtaaacttac atagctctag acttagtttt aaggaattac ttgtgtatgc tgctgaccct

14461 gctatgcacg ctgcttctgg taatctatta ctagataaac gcactacgtg cttttcagta

14521 gctgcactta ctaacaatgt tgcttttcaa actgtcaaac ccggtaattt taacaaagac

14581 ttctatgact ttgctgtgtc taagggtttc tttaaggaag gaagttctgt tgaattaaaa

14641 cacttcttct ttgctcagga tggtaatgct gctatcagcg attatgacta ctatcgttat

14701 aatctaccaa caatgtgtga tatcagacaa ctactatttg tagttgaagt tgttgataag

14761 tactttgatt gttacgatgg tggctgtatt aatgctaacc aagtcatcgt caacaaccta

14821 gacaaatcag ctggttttcc atttaataaa tggggtaagg ctagacttta ttatgattca

14881 atgagttatg aggatcaaga tgcacttttc gcatatacaa aacgtaatgt catccctact

14941 ataactcaaa tgaatcttaa gtatgccatt agtgcaaaga atagagctcg caccgtagct

15001 ggtgtctcta tctgtagtac tatgaccaat agacagtttc atcaaaaatt attgaaatca

15061 atagccgcca ctagaggagc tactgtagta attggaacaa gcaaattcta tggtggttgg

15121 cacaatatgt taaaaactgt ttatagtgat gtagaaaacc ctcaccttat gggttgggat

15181 tatcctaaat gtgatagagc catgcctaac atgcttagaa ttatggcctc acttgttctt

15241 gctcgcaaac atacaacgtg ttgtagcttg tcacaccgtt tctatagatt agctaatgag

15301 tgtgctcaag tattgagtga aatggtcatg tgtggcggtt cactatatgt taaaccaggt

15361 ggaacctcat caggagatgc cacaactgct tatgctaata gtgtttttaa catttgtcaa

15421 gctgtcacgg ccaatgttaa tgcactttta tctactgatg gtaacaaaat tgccgataag

15481 tatgtccgca atttacaaca cagactttat gagtgtctct atagaaatag agatgttgac

15541 acagactttg tgaatgagtt ttacgcatat ttgcgtaaac atttctcaat gatgatactc

15601 tctgacgatg ctgttgtgtg tttcaatagc acttatgcat ctcaaggtct agtggctagc

15661 ataaagaact ttaagtcagt tctttattat caaaacaatg tttttatgtc tgaagcaaaa

15721 tgttggactg agactgacct tactaaagga cctcatgaat tttgctctca acatacaatg

15781 ctagttaaac agggtgatga ttatgtgtac cttccttacc cagatccatc aagaatccta

15841 ggggccggct gttttgtaga tgatatcgta aaaacagatg gtacacttat gattgaacgg

15901 ttcgtgtctt tagctataga tgcttaccca cttactaaac atcctaatca ggagtatgct

15961 gatgtctttc atttgtactt acaatacata agaaagctac atgatgagtt aacaggacac

16021 atgttagaca tgtattctgt tatgcttact aatgataaca cttcaaggta ttgggaacct

16081 gagttttatg aggctatgta cacaccgcat acagtcttac aggctgttgg ggcttgtgtt

16141 ctttgcaatt cacagacttc attaagatgt ggtgcttgca tacgtagacc attcttatgt

16201 tgtaaatgct gttacgacca tgtcatatca acatcacata aattagtctt gtctgttaat

16261 ccgtatgttt gcaatgctcc aggttgtgat gtcacagatg tgactcaact ttacttagga

16321 ggtatgagct attattgtaa atcacataaa ccacccatta gttttccatt gtgtgctaat

16381 ggacaagttt ttggtttata taaaaataca tgtgttggta gcgataatgt tactgacttt

16441 aatgcaattg caacatgtga ctggacaaat gctggtgatt acattttagc taacacctgt

16501 actgaaagac tcaagctttt tgcagcagaa acgctcaaag ctactgagga gacatttaaa

16561 ctgtcttatg gtattgctac tgtacgtgaa gtgctgtctg acagagaatt acatctttca

16621 tgggaagttg gtaaacctag accaccactt aaccgaaatt atgtctttac tggttatcgt

16681 gtaactaaaa acagtaaagt acaaatagga gagtacacct ttgaaaaagg tgactatggt

16741 gatgctgttg tttaccgagg tacaacaact tacaaattaa atgttggtga ttattttgtg

16801 ctgacatcac atacagtaat gccattaagt gcacctacac tagtgccaca agagcactat

16861 gttagaatta ctggcttata cccaacactc aatatctcag atgagttttc tagcaatgtt

16921 gcaaattatc aaaaggttgg tatgcaaaag tattctacac tccagggacc acctggtact

16981 ggtaagagtc attttgctat tggcctagct ctctactacc cttctgctcg catagtgtat

17041 acagcttgct ctcatgccgc tgttgatgca ctatgtgaga aggcattaaa atatttgcct

17101 atagataaat gtagtagaat tatacctgca cgtgctcgtg tagagtgttt tgataaattc

17161 aaagtgaatt caacattaga acagtatgtc ttttgtactg taaatgcatt gcctgagacg

17221 acagcagata tagttgtctt tgatgaaatt tcaatggcca caaattatga tttgagtgtt

17281 gtcaatgcca gattacgtgc taagcactat gtgtacattg gcgaccctgc tcaattacct

17341 gcaccacgca cattgctaac taagggcaca ctagaaccag aatatttcaa ttcagtgtgt

17401 agacttatga aaactatagg tccagacatg ttcctcggaa cttgtcggcg ttgtcctgct

17461 gaaattgttg acactgtgag tgctttggtt tatgataata agcttaaagc acataaagac

17521 aaatcagctc aatgctttaa aatgttttat aagggtgtta tcacgcatga tgtttcatct

17581 gcaattaaca ggccacaaat aggcgtggta agagaattcc ttacacgtaa ccctgcttgg

17641 agaaaagctg tctttatttc accttataat tcacagaatg ctgtagcctc aaagattttg

17701 ggactaccaa ctcaaactgt tgattcatca cagggctcag aatatgacta tgtcatattc

17761 actcaaacca ctgaaacagc tcactcttgt aatgtaaaca gatttaatgt tgctattacc

17821 agagcaaaag taggcatact ttgcataatg tctgatagag acctttatga caagttgcaa

17881 tttacaagtc ttgaaattcc acgtaggaat gtggcaactt tacaagctga aaatgtaaca

17941 ggactcttta aagattgtag taaggtaatc actgggttac atcctacaca ggcacctaca

18001 cacctcagtg ttgacactaa attcaaaact gaaggtttat gtgttgacgt acctggcata

18061 cctaaggaca tgacctatag aagactcatc tctatgatgg gttttaaaat gaattatcaa

18121 gttaatggtt accctaacat gtttatcacc cgcgaagaag ctataagaca tgtacgtgca

18181 tggattggct tcgatgtcga ggggtgtcat gctactagag aagctgttgg taccaattta

18241 cctttacagc taggtttttc tacaggtgtt aacctagttg ctgtacctac aggttatgtt

18301 gatacaccta ataatacaga tttttccaga gttagtgcta aaccaccgcc tggagatcaa

18361 tttaaacacc tcataccact tatgtacaaa ggacttcctt ggaatgtagt gcgtataaag

18421 attgtacaaa tgttaagtga cacacttaaa aatctctctg acagagtcgt atttgtctta

18481 tgggcacatg gctttgagtt gacatctatg aagtattttg tgaaaatagg acctgagcgc

18541 acctgttgtc tatgtgatag acgtgccaca tgcttttcca ctgcttcaga cacttatgcc

18601 tgttggcatc attctattgg atttgattac gtctataatc cgtttatgat tgatgttcaa

18661 caatggggtt ttacaggtaa cctacaaagc aaccatgatc tgtattgtca agtccatggt

18721 aatgcacatg tagctagttg tgatgcaatc atgactaggt gtctagctgt ccacgagtgc

18781 tttgttaagc gtgttgactg gactattgaa tatcctataa ttggtgatga actgaagatt

18841 aatgcggctt gtagaaaggt tcaacacatg gttgttaaag ctgcattatt agcagacaaa

18901 ttcccagttc ttcacgacat tggtaaccct aaagctatta agtgtgtacc tcaagctgat

18961 gtagaatgga agttctatga tgcacagcct tgtagtgaca aagcttataa aatagaagaa

19021 ttattctatt cttatgccac acattctgac aaattcacag atggtgtatg cctattttgg

19081 aattgcaatg tcgatagata tcctgctaat tccattgttt gtagatttga cactagagtg

19141 ctatctaacc ttaacttgcc tggttgtgat ggtggcagtt tgtatgtaaa taaacatgca

19201 ttccacacac cagcttttga taaaagtgct tttgttaatt taaaacaatt accatttttc

19261 tattactctg acagtccatg tgagtctcat ggaaaacaag tagtgtcaga tatagattat

19321 gtaccactaa agtctgctac gtgtataaca cgttgcaatt taggtggtgc tgtctgtaga

19381 catcatgcta atgagtacag attgtatctc gatgcttata acatgatgat ctcagctggc

19441 tttagcttgt gggtttacaa acaatttgat acttataacc tctggaacac ttttacaaga

19501 cttcagagtt tagaaaatgt ggcttttaat gttgtaaata agggacactt tgatggacaa

19561 cagggtgaag taccagtttc tatcattaat aacactgttt acacaaaagt tgatggtgtt

19621 gatgtagaat tgtttgaaaa taaaacaaca ttacctgtta atgtagcatt tgagctttgg

19681 gctaagcgca acattaaacc agtaccagag gtgaaaatac tcaataattt gggtgtggac

19741 attgctgcta atactgtgat ctgggactac aaaagagatg ctccagcaca tatatctact

19801 attggtgttt gttctatgac tgacatagcc aagaaaccaa ctgaaacgat ttgtgcacca

19861 ctcactgtct tttttgatgg tagagttgat ggtcaagtag acttatttag aaatgcccgt

19921 aatggtgttc ttattacaga aggtagtgtt aaaggtttac aaccatctgt aggtcccaaa

19981 caagctagtc ttaatggagt cacattaatt ggagaagccg taaaaacaca gttcaattat

20041 tataagaaag ttgatggtgt tgtccaacaa ttacctgaaa cttactttac tcagagtaga

20101 aatttacaag aatttaaacc caggagtcaa atggaaattg atttcttaga attagctatg

20161 gatgaattca ttgaacggta taaattagaa ggctatgcct tcgaacatat cgtttatgga

20221 gattttagtc atagtcagtt aggtggttta catctactga ttggactagc taaacgtttt

20281 aaggaatcac cttttgaatt agaagatttt attcctatgg acagtacagt taaaaactat

20341 ttcataacag atgcgcaaac aggttcatct aagtgtgtgt gttctgttat tgatttatta

20401 cttgatgatt ttgttgaaat aataaaatcc caagatttat ctgtagtttc taaggttgtc

20461 aaagtgacta ttgactatac agaaatttca tttatgcttt ggtgtaaaga tggccatgta

20521 gaaacatttt acccaaaatt acaatctagt caagcgtggc aaccgggtgt tgctatgcct

20581 aatctttaca aaatgcaaag aatgctatta gaaaagtgtg accttcaaaa ttatggtgat

20641 agtgcaacat tacctaaagg cataatgatg aatgtcgcaa aatatactca actgtgtcaa

20701 tatttaaaca cattaacatt agctgtaccc tataatatga gagttataca ttttggtgct

20761 ggttctgata aaggagttgc accaggtaca gctgttttaa gacagtggtt gcctacgggt

20821 acgctgcttg tcgattcaga tcttaatgac tttgtctctg atgcagattc aactttgatt

20881 ggtgattgtg caactgtaca tacagctaat aaatgggatc tcattattag tgatatgtac

20941 gaccctaaga ctaaaaatgt tacaaaagaa aatgactcta aagagggttt tttcacttac

21001 atttgtgggt ttatacaaca aaagctagct cttggaggtt ccgtggctat aaagataaca

21061 gaacattctt ggaatgctga tctttataag ctcatgggac acttcgcatg gtggacagcc

21121 tttgttacta atgtgaatgc gtcatcatct gaagcatttt taattggatg taattatctt

21181 ggcaaaccac gcgaacaaat agatggttat gtcatgcatg caaattacat attttggagg

21241 aatacaaatc caattcagtt gtcttcctat tctttatttg acatgagtaa atttcccctt

21301 aaattaaggg gtactgctgt tatgtcttta aaagaaggtc aaatcaatga tatgatttta

21361 tctcttctta gtaaaggtag acttataatt agagaaaaca acagagttgt tatttctagt

21421 gatgttcttg ttaacaacta aacgaacaat gtttgttttt cttgttttat tgccactagt

21481 ctctagtcag tgtgttaatc ttataaccag aactcaatta ccccctgcat acactaattc

21541 tttcacacgt ggtgtttatt accctgacaa agttttcaga tcctcagttt tacattcaac

21601 tcaggacttg ttcttacctt tcttttccaa tgttacttgg ttccatgtta tctctgggac

21661 caatggtact aagaggtttg ataaccctgt cctaccattt aatgatggtg tttattttgc

21721 ttccattgag aagtctaaca taataagagg ctggattttt ggtactactt tagattcgaa

21781 gacccagtcc ctacttattg ttaataacgc tactaatgtt gttattaaag tctgtgaatt

21841 tcaattttgt aatgatccat ttttggacca caaaaacaac aaaagttgga tggaaagtga

21901 gttcagagtt tattctagtg cgaataattg cacttttgaa tatgtctctc agccttttct

21961 tatggacctt gaaggaaaac agggtaattt caaaaatctt agggaatttg tgtttaagaa

22021 tattgatggt tattttaaaa tatattctaa gcacacgcct attatagtgc gtgagccaga

22081 agatctccct cagggttttt cggctttaga accattggta gatttgccaa taggtattaa

22141 catcactagg tttcaaactt tacttgcttt acatagaagt tatttgactc ctggtgattc

22201 ttcttcaggt tggacagctg gtgctgcagc ttattatgtg ggttatcttc aacctaggac

22261 ttttctatta aaatataatg aaaatggaac cattacagat gctgtagact gtgcacttga

22321 ccctctctca gaaacaaagt gtacgttgaa atccttcact gtagaaaaag gaatctatca

22381 aacttctaac tttagagtcc aaccaacaga atctattgtt agatttccta atattacaaa

22441 cttgtgccct tttgatgaag tttttaacgc caccagattt gcatctgttt atgcttggaa

22501 caggaagaga atcagcaact gtgttgctga ttattctgtc ctatataatc tcgcaccatt

22561 tttcactttt aagtgttatg gagtgtctcc tactaaatta aatgatctct gctttactaa

22621 tgtctatgca gattcatttg taattagagg tgatgaagtc agacaaatcg ctccagggca

22681 aactggaaat attgctgatt ataattataa attaccagat gattttacag gctgcgttat

22741 agcttggaat tctaacaagc ttgattctaa ggttagtggt aattataatt acctgtatag

22801 attgtttagg aagtctaatc tcaaaccttt tgagagagat atttcaactg aaatctatca

22861 ggccggtaac aaaccttgta atggtgttgc aggttttaat tgttactttc ctttacgatc

22921 atatagtttc cgacccactt atggtgttgg tcaccaacca tacagagtag tagtactttc

22981 ttttgaactt ctacatgcac cagcaactgt ttgtggacct aaaaagtcta ctaatttggt

23041 taaaaacaaa tgtgtcaatt tcaacttcaa tggtttaaaa ggcacaggtg ttcttactga

23101 gtctaacaaa aagtttctgc ctttccaaca atttggcaga gacattgctg acactactga

23161 tgctgtccgt gatccacaga cacttgagat tcttgacatt acaccatgtt cttttggtgg

23221 tgtcagtgtt ataacaccag gaacaaatac ttctaaccag gttgctgttc tttatcaggg

23281 tgttaactgc acagaagtcc ctgttgctat tcatgcagat caacttactc ctacttggcg

23341 tgtttattct acaggttcta atgtttttca aacacgtgca ggctgtttaa taggggctga

23401 atatgtcaac aactcatatg agtgtgacat acccattggt gcaggtatat gcgctagtta

23461 tcagactcag actaagtctc atcggcgggc acgtagtgta gctagtcaat ccatcattgc

23521 ctacactatg tcacttggtg cagaaaattc agttgcttac tctaataact ctattgccat

23581 acccacaaat tttactatta gtgttaccac agaaattcta ccagtgtcta tgaccaagac

23641 atcagtagat tgtacaatgt acatttgtgg tgattcaact gaatgcagca atcttttgtt

23701 gcaatatggc agtttttgta cacaattaaa acgtgcttta actggaatag ctgttgaaca

23761 agacaaaaac acccaagaag tttttgcaca agtcaaacaa atttacaaaa caccaccaat

23821 taaatatttt ggtggtttta atttttcaca aatattacca gatccatcaa aaccaagcaa

23881 gaggtcattt attgaagatc tacttttcaa caaagtgaca cttgcagatg ctggcttcat

23941 caaacaatat ggtgattgcc ttggtgatat tgctgctaga gacctcattt gtgcacaaaa

24001 gtttaaaggc cttactgttt tgccaccttt gctcacagat gaaatgattg ctcaatacac

24061 ttctgcactg ttagcgggta caatcacttc tggttggacc tttggtgcag gtgctgcatt

24121 acaaatacca tttgctatgc aaatggctta taggtttaat ggtattggag ttacacagaa

24181 tgttctctat gagaaccaaa aattgattgc caaccaattt aatagtgcta ttggcaaaat

24241 tcaagactca ctttcttcca cagcaagtgc acttggaaaa cttcaagatg tggtcaacca

24301 taatgcacaa gctttaaaca cgcttgttaa acaacttagc tccaaatttg gtgcaatttc

24361 aagtgtttta aatgatatct tttcacgtct tgacaaagtt gaggctgaag tgcaaattga

24421 taggttgatc acaggcagac ttcaaagttt gcagacatat gtgactcaac aattaattag

24481 agctgcagaa atcagagctt ctgctaatct tgctgctact aaaatgtcag agtgtgtact

24541 tggacaatca aaaagagttg atttttgtgg aaagggctat catcttatgt ccttccctca

24601 gtcagcacct catggtgtag tcttcttgca tgtgacttat gtccctgcac aagaaaagaa

24661 cttcacaact gctcctgcca tttgtcatga tggaaaagca cactttcctc gtgaaggtgt

24721 ctttgtttca aatggcacac actggtttgt aacacaaagg aatttttatg aaccacaaat

24781 cattactaca gacaacacat ttgtgtctgg taactgtgat gttgtaatag gaattgtcaa

24841 caacacagtt tatgatcctt tgcaacctga attagattca ttcaaggagg agttagataa

24901 atattttaag aatcatacat caccagatgt tgatttaggt gacatctctg gcattaatgc

24961 ttcagttgta aacattcaaa aagaaattga ccgcctcaat gaggttgcca agaatttaaa

25021 tgaatctctc atcgatctcc aagaacttgg aaagtatgag cagtatataa aatggccatg

25081 gtacatttgg ctaggtttta tagctggctt gattgccata gtaatggtga caattatgct

25141 ttgctgtatg accagttgct gtagttgtct caagggctgt tgttcttgtg gatcctgctg

25201 caaatttgat gaagacgact ctgagccagt gctcaaagga gtcaaattac attacacata

25261 aacgaactta tggatttgtt tatgagaatc ttcacaattg gaactgtaac tttgaagcaa

25321 ggtgaaatca aggatgctac tccttcagat tttgttcgcg ctactgcaac gataccgata

25381 caagcctcac tccctttcgg atggcttatt gttggcgttg cacttcttgc tgtttttcag

25441 agcgcttcca aaatcataac tctcaaaaag agatggcaac tagcactctc caagggtgtt

25501 cactttgttt gcaacttgct gttgttgttt gtaacagttt actcacacct tttgctcgtt

25561 gctgctggcc ttgaagcccc ttttctctat ctttatgctt tagtctactt cttgcagagt

25621 ataaactttg taagaataat aatgaggctt tggctttgct ggaaatgccg ttccaaaaac

25681 ccattacttt atgatgccaa ctattttctt tgctggcata ctaattgtta cgactattgt

25741 ataccttaca atagtgtaac ttcttcaatt gtcattactt caggtgatgg cacaacaagt

25801 cctatttctg aacatgacta ccagattggt ggttatactg aaaaatggga atctggagta

25861 aaagactgtg ttgtattaca cagttacttc acttcagact attaccagct gtactcaact

25921 caattgagta cagacactgg tgttgaacat gttaccttct tcatctacaa taaaattgtt

25981 gatgagcctg aagaacatgt ccaaattcac acaatcgacg gttcatccgg agttgttaat

26041 ccagtaatgg aaccaattta tgatgaaccg acgacgacta ctagcgtgcc tttgtaagca

26101 caagctgatg agtacgaact tatgtactca ttcgtttcgg aagagatagg tacgttaata

26161 gttaatagcg tacttctttt tcttgctttc gtggtattct tgctagttac actagccatc

26221 cttactgcgc ttcgattgtg tgcgtactgc tgcaatattg ttaacgtgag tcttgtaaaa

26281 ccttcttttt acgtttactc tcgtgttaaa aatctgaatt cttctagagt tcctgatctt

26341 ctggtctaaa cgaactaaat attatattag tttttctgtt tggaacttta attttagcca

26401 tggcaggttc caacggtact attaccgttg aagagcttaa aaagctcctt gaagaatgga

26461 acctagtaat aggtttccta ttccttacat ggatttgtct tctacaattt gcctatgcca

26521 acaggaatag gtttttgtat ataattaagt taattttcct ctggctgtta tggccagtaa

26581 ctttaacttg ttttgtgctt gctgctgttt acagaataaa ttggatcacc ggtggaattg

26641 ctatcgcaat ggcttgtctt gtaggcttga tgtggctcag ctacttcatt gcttctttca

26701 gactgtttgc gcgtacgcgt tccatgtggt cattcaatcc agaaactaac attcttctca

26761 acgtgccact ccatggcact attctgacca gaccgcttct agaaagtgaa ctcgtaatcg

26821 gagctgtgat ccttcgtgga catcttcgta ttgctggaca ccatctagga cgctgtgaca

26881 tcaaggacct gcctaaagaa atcactgttg ctacatcacg aacgctttct tattacaaat

26941 tgggagcttc gcagcgtgta gcaggtgact caggttttgc tgcatacagt cgctacagga

27001 ttggcaacta taaattaaac acagaccatt ccagtagcag tgacaatatt gctttgcttg

27061 tacagtaagt gacaacagat gtttcatctc gttgactttc aggttactat agcagagata

27121 ttactaatta ttatgcggac ttttaaagtt tccatttgga atcttgatta catcataaac

27181 ctcataatta aaaatttatc taagtcacta actgagaata aatattctca attagatgaa

27241 gagcaaccaa tggagattga ttaaacgaac atgaaaatta ttctcttctt ggcactgata

27301 acactcgcta cttgtgagct ttatcactac caagagtgtg ttagaggtac aacagtactt

27361 ttaaaagaac cttgctcttc tggaacatac gagggcaatt caccatttca tcctctagct

27421 gataacaaat ttgcactgac ttgctttagc actcaatttg cttttgcttg tcctgacggc

27481 gtaaaacacg tctatcagtt acgtgccaga tcagtttcac ctaaactgtt catcagacaa

27541 gaggaagttc aagaacttta ctctccaatt tttcttattg ttgcggcaat agtgtttata

27601 acactttgct tcacactcaa aagaaagaca gaatgattga actttcatta attgacttct

27661 atttgtgctt tttagccttt ctgttattcc ttgttttaat tatgcttatt atcttttggt

27721 tctcacttga actgcaagat cataatgaaa cttgtcacgc ctaaacgaac atgaaatttc

27781 ttgttttctt aggaatcatc acaactgtag ctgcatttca ccaagaatgt agtttacagt

27841 catgtactca acatcaacca tatgtagttg atgacccgtg tcctattcac ttctattcta

27901 aatggtatat tagagtagga gctagaaaat cagcaccttt aattgaattg tgcgtggatg

27961 aggctggttc taaatcaccc attcagtaca tcgatatcgg taattataca gtttcctgtt

28021 taccttttac aattaattgc caggaaccta aattgggtag tcttgtagtg cgttgttcgt

28081 tctatgaaga ctttttagag tatcatgacg ttcgtgttgt tttagatttc atctaaacga

28141 acaaacttaa atgtctgata atggacccca aaatcagcga aatgcactcc gcattacgtt

28201 tggtggaccc tcagattcaa ctggcagtaa ccagaatggt ggggcgcgat caaaacaacg

28261 tcggccccaa ggtttaccca ataatactgc gtcttggttc accgctctca ctcaacatgg

28321 caaggaagac cttaaattct ctcgaggaca aggcgttcca attaacacca atagcagtcc

28381 agatgaccaa attggctact accgaagagc taccagacga attcgtggtg gtgacggtaa

28441 aatgaaagat ctcagtccaa gatggtattt ctactaccta ggaactgggc cagaagctgg

28501 acttccctat ggtgctaaca aagacggcat catatgggtt gcaactgagg gagccttgaa

28561 tacaccaaaa gatcacattg gcacccgcaa tcctgctaac aatgctgcaa tcgtgctaca

28621 acttcctcaa ggaacaacat tgccaaaagg cttctacgca gaagggagca gaggcggcag

28681 tcaagcctct tctcgttcct catcacgtag tcgcaacagt tcaagaaatt caactccagg

28741 cagcagtaaa cgaacttctc ctgctagaat ggctggcaat ggcggtgatg ctgctcttgc

28801 tttgctgctg cttgacagat tgaaccagct tgagagcaaa atgtctggta aaggccaaca

28861 acaacaaggc caaactgtca ctaagaaatc tgctgctgag gcttctaaga agcctcggca

28921 aaaacgtact gccactaaag catacaatgt aacacaagct ttcggcagac gtggtccaga

28981 acaaacccaa ggaaattttg gggaccagga actaatcaga caaggaactg attacaaaca

29041 ttggccgcaa attgcacaat ttgcccccag cgcttcagcg ttcttcggaa tgtcgcgcat

29101 tggcatggaa gtcacacctt cgggaacgtg gttgacctac acaggtgcca tcaaattgga

29161 tgacaaagat ccaaatttca aagatcaagt cattttgctg aataagcata ttgacgcata

29221 caaaacattc ccaccaacag agcctaaaaa ggacaaaaag aagaaggctg atgaaactca

29281 agccttaccg cagagacaga agaaacagca aactgtgact cttcttcctg ctgcagattt

29341 ggatgatttc tccaaacaat tgcaacaatc catgagcagt gctgactcaa ctcaggccta

29401 aactcatgca gaccacacaa ggcagatggg ctatataaac gttttcgctt ttccgtttac

29461 gatatatagt ctactcttgt gcagaatgaa ttctcgtaac tacatagcac aagtagatgt

29521 agttaacttt aatctcacat agcaatcttt aatcagtgtg taacattagg gaggacttga

29581 aagagccacc acattttcac cgaggccacg cggagtacga tcgagtgtac agtgaacaat

29641 gctagggaga gctgcctata tggaagagcc ctaatgtgta aaatta

//