

Vibrio cholerae O139 RIMD 2214377 genes for O-antigen biosynthesis region, complete sequence

GenBank: LC594838.1

[FASTA Graphics](#)

[Go to:](#)

LOCUS LC594838 38074 bp DNA linear BCT 05-APR-2022

DEFINITION Vibrio cholerae O139 RIMD 2214377 genes for O-antigen biosynthesis

region, complete sequence.

ACCESSION LC594838

VERSION LC594838.1

DBLINK BioProject: [PRJDB8600](#)

BioSample: [SAMD00180516](#)

Sequence Read Archive: [DRR213393](#)

KEYWORDS .

SOURCE Vibrio cholerae O139

ORGANISM [Vibrio cholerae O139](#)

Bacteria; Proteobacteria; Gammaproteobacteria; Vibrionales;
Vibrionaceae; Vibrio.

REFERENCE 1

AUTHORS Murase,K., Morita,M., Izumiya,H., Arakawa,E. and Ohnishi,M.

TITLE Identification and classification of O-antigen biosynthetic locus
in Vibrio cholerae O-serogroup reference strains

JOURNAL Unpublished

REFERENCE 2 (bases 1 to 38074)

AUTHORS Murase,K., Morita,M., Arakawa,E. and Ohnishi,M.

TITLE Direct Submission

JOURNAL Submitted (18-NOV-2020) Contact:Kazunori Murase Kyoto University,
Department of Microbiology; Yoshida-Konoe-cho, Sakyo-ku, Kyoto,
Kyoto 606-8501, Japan

COMMENT Annotated using prokka 1.13.3 <https://github.com/tseemann/prokka>.

##Assembly-Data-START##

Assembly Method :: A5-miseq pipeline v. 20180625

Genome Coverage :: 178x

Sequencing Technology :: Illumina HiSeq2500; Sanger

##Assembly-Data-END##

FEATURES Location/Qualifiers

source 1..38074

/organism="Vibrio cholerae O139"

/mol_type="genomic DNA"

/strain="RIMD 2214377"

/serovar="O139"

/db_xref="taxon:[45888](#)"

[gene](#) complement (1..945)
/gene="gmhD"

[CDS](#) complement (1..945)
/gene="gmhD"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:P67911"
/note="SR0139LPS_010"
/codon_start=1
/transl_table=[11](#)
/product="ADP-L-glycero-D-manno-heptose-6-epimerase"
/protein_id="[BCN17721.1](#)"
/translation="MIIVTGGAGMIGSNI IKALNERGITDILVVDHLKNGRKFKNLVD
LQIADYMDRDDFLAQIMAGDDFGSIDAIFHEGACSATTEWDGKYVMLNNYEYSKELLH
YCLDREIPFLYASSAATYGETDTFIEEPQYEGALNVYGYSKQQFDNYVRRLWLDKQH
DETL SQITGFRYFNVYGPREQHKGSMASVAFHLNNQMNAGENPKL FAGSENFKRDFVY
VGDVAAVN LWFLDHGVSGIFNCGTGKAESFNEVAKAVIAFHGRGEVETIPFPDHLKGA
YQEFTEADLTKLRAAGCDVQFKSVAEGVAEYMALINRK"

[gene](#) complement (1059..2576)
/gene="wbfA"

[CDS](#) complement (1059..2576)
/gene="wbfA"
/inference="ab initio prediction:Prodigal:2.6"
/note="SR0139LPS_020"
/codon_start=1
/transl_table=[11](#)
/product="hypothetical protein"
/protein_id="[BCN17722.1](#)"
/translation="MHKPTISSVIALTLLGCGGGESGNSGNTTPPVKYFNVSFLDLDN
IAINTQTNCQIFGYNEDQTKKIVAYRSAPENNYQIVVHDEHGNFVRRYSNSTETNGLS
STFRFRQSDVPQNGYVSFVYSEGRDNFVSTYSKDFIPESFSIYAKNKNNSNCLSIGS
GNNSNPQTS DYKSFIHIPDENK LFFFSLNHFNQLSFEPTNKLGRDVS VNSRRGRPLLL
TAYER TNQDVIQNLFSFKFRATNALGSLGQEIDLDIIDQRDTPWTPSDVELSSAQLF
VDGKQFNAPYAYLWQSLNTSSEDKYSY NLINVDNYYLKLKGKEISPPSSPYWKQHV
SRGTSSITSHLSAENILDGFPNPEPPTLGICNDHNNTQCIKITH TQKTDNTILRLIID
SELTVP SGLPIFIKQTIYSPYHNELPVMKFDSPILDQELKEIKDFS VSWIKTPSSSIT
ETFLYQYQDLYKRTL GSELIDPSIDNIPL LKNISAQQDQQD L LKRQPYTWVWLEE"

[gene](#) complement (2657..4849)
/gene="wbfB"

[CDS](#) complement (2657..4849)
/gene="wbfB"
/inference="ab initio prediction:Prodigal:2.6"
/note="SR0139LPS_030"
/codon_start=1
/transl_table=[11](#)

```

/product="hypothetical protein"
/protein_id="BCN17723.1"
/translation="MKTGHRPLLNTSLSLGLVLISSALLTPRQAFADSEFSYPRLRHSQ
TDFGGTGLMQMPSARMLEEGELNLAITNDDYLHYAISLQLFPWLETTVRYTQVHELL
YSDQASFSGDTKYTDKSIDAKLRLWQESYWLPELSLGLRDIGGTGLFDGEYLVATKQV
GPLDFTLGFGWGYLGNRANLSGDKISSTDCGRDSNYGGNGGMLDLGRMFTGCTALFGG
IEYQTPLAPLRLQLEYDGNDRSDFPVTRGQPDAMPVTSFVNFGLTYALTDWADLRVS
YQRGNTLTAGLTFGTNLATLKPTWLDSPAPTYQPVPSKADLSDEEWQRLSQDVANIAG
YQPVEIYQEQDSVVIKGSQVKYRDREQAEHRAATLLANTGINARYYRIIETSQDQPLT
ETQLNSAAFKRIIDHDYPNARLSDAKQHTDPAPIHGDLKAARTERWKFGFSPVLQGSF
GGAEDFYLYAIGVNANASYKMGDHWQLSGTLYGNLIDNYDKFNYPVDPGTNLKRVRT
LSRQYFEEPLRISHLQLTYFDRWQHFTYQAYAGYLETMFAGVGSELLYRPLGKNWAVG
IDGNYVKQRDPSSAFGLYEHEHQYDVETGDNYRVQTGTLTGHATLYWQPQFWSLLDNT
LLKVSAGRYLTEDIGFTVDFSKQFASGVVAGAFATKTDLSAEFEGGSFTKGFYISIP
LDLMTVRPSTERNISWLPQLQDGGQMLSRQYGLYKMTDARSPWYERF"

gene      complement (4846..5712)
          /gene="wbfc"

CDS       complement (4846..5712)
          /gene="wbfc"
          /inference="ab initio prediction:Prodigal:2.6"
          /note="SR0139LPS_040"
          /codon_start=1
          /transl_table=11
          /product="hypothetical protein"
          /protein_id="BCN17724.1"
          /translation="MCQTDLLFRLRSPFKICRSPIKKRAWSFITSRGWLTAAAAISGH
SLCVAAPLATSLEVRVAHNNQAIHSTRLSFSEPMRLDSAVMQTLEQAGLNTQQVEWPS
AGLFDLSHAFLFKRDVLLKLADQQSSAPPTQQALWASLIAQLRQAEFAKRLFISVDPD
WTRIAPQHNRLNGSWLLTLNSKSTQVSVYGAVNQP GDVIWHNRLSAKDYAHAAGLID
EQISEIVVIQPDGIAQKHAVAYWNQDFNEVAPGAIVYVPLPLKRAFFDPTVTADLNQ
LVIELLRNRLPL"

gene      complement (5712..6356)
          /gene="wbfd"

CDS       complement (5712..6356)
          /gene="wbfd"
          /inference="ab initio prediction:Prodigal:2.6"
          /inference="similar to AA sequence:UniProtKB:P75884"
          /note="SR0139LPS_050"
          /codon_start=1
          /transl_table=11
          /product="putative lipoprotein"
          /protein_id="BCN17725.1"
          /translation="MGCSNSSQHLSETMQLAIFGTPAPVISPOKVAGIPYASLYIQQN
DNPLALMVLAWAEPTNRNRPALKWVSAGQEMLVTEGGRITKTLNLDGANLISLESDS

```

```

TDPLLLGLHRASTPREWHFYLSWQPGYHFRYLAHSQFITLGEQQKQLPNGESRTLLRI
DEQITIAALNQYHNQYWLEPSTGAVIASEQQ LAPGTHRYALAVAKSYLNQGGI"
gene      complement(6464..6697)
          /gene="vpg343"
CDS       complement(6464..6697)
          /gene="vpg343"
          /inference="ab initio prediction:Prodigal:2.6"
          /note="SR0139LPS_060"
          /codon_start=1
          /transl_table=11
          /product="hypothetical protein"
          /protein_id="BCN17726.1"
          /translation="MKNSALVLLSALLVSGFATATEETAASAGGSTASTAAVGTATTT
AVAVTAAAVAVVAIAASDSGTDSTSTSVSAAK"
gene      7112..7660
          /gene="wbfE"
CDS       7112..7660
          /gene="wbfE"
          /inference="ab initio prediction:Prodigal:2.6"
          /note="SR0139LPS_070"
          /codon_start=1
          /transl_table=11
          /product="hypothetical protein"
          /protein_id="BCN17727.1"
          /translation="MKTSPRLFSTPLCQCVALMTSSLLTSSLLVPSVAAEPYAGISLA
YTNAEYQPNHAASFTDGSP I AVALQGGYFFSDYLGLEARYSTSVQRSSGVNIDNLSAA
FVKLNLPM SAQVSLYGLAGYSYFSLDKQGVGSVDESGFSSGIGIHYALDSRSAIAFDF
INHANGDEARLNTVNLSFQLKF"
gene      7780..10515
          /gene="wbfF"
CDS       7780..10515
          /gene="wbfF"
          /inference="ab initio prediction:Prodigal:2.6"
          /note="SR0139LPS_080"
          /codon_start=1
          /transl_table=11
          /product="hypothetical protein"
          /protein_id="BCN17728.1"
          /translation="MTQGYILRTL SLVACL SLPVAMAQTPTPEQIQMFKNLPAAQQQA
LASKYGFALPSATNSASQYDNPEVMLPRQPNLENITAQPPLNGQDAPLERFGLSLFSG
SPSTFAPVGDVPVPSDYTVGAGDEIVIQLFGKDNQTHRLRVNRAGVINFP SLGPVQVA
GLKFSEVRQSLGQRVEEQMIGIRSDISLGELRTMQIFVMGDAYKPGAYTVSALT TLSQ
AIYYSGGFSQSGALRN IQLKREGQLVVQLDLYDLLLKGDNRNDRVRLMPGDVVVFIGAVD
NTVEIRGEVNRPAVYEVKSTETYQDI IKMAGGFTANAYRDKTEVKRYASDGIRKALT L

```

NLANEQGLQTKLNNGDAINV LKKTQALAHYVEIVGDVQHPGFIEWKPGLRVADV FQSV
DSAFNATADVNYALVVRQKNLQRDIEVQQINLANAILEPGSRDNLTLQSRDRLLIFNR
FNYDDFENTDLSKETENTAKTLEQQAQTQAKLEQEKQQQINNTVVRVNASALANPS
LPRNNSQLHPLSGGQSLEAHPEAKIQFAGQEMTLAEFEKLKQNTRRNLLAPILLQLYQ
QAQVGMSQPQIAEVVGEVKYPGRYPITAAMPVSALLEAAGGLTFNAYTLRAELARREID
PNHERVTTQISSLDLRQMLSEPSANRWTIQGMDKLVLEKPAAKIQQTVVLQGEVLFP
GTYTVRQGETLAELLKRAGGLTEFANPRGAIFTREALRLQEQLLNQYAADMRAETAK
KTRFRADTNLSSVISDPAKTLAFVEEASRSKALGRMVVQLSRIMRDEPGADFMLEDGDF
LFVPTFRNTISIMGEVQVPVITYLLDSGLNVDDYLNKAGGVKKQADADRIFVVRADGSV
YKPNSGYWFGNNKEKLQAGDTIVVPIDTDYRDALSTWTAATQILYQTGVAINALK"

[gene](#)

10620..11627

/gene="wzz"

[CDS](#)

10620..11627

/gene="wzz"

/inference="ab initio prediction:Prodigal:2.6"

/inference="protein motif:HAMAP:MF_02025"

/note="SR0139LPS_090"

/codon_start=1

/transl_table=[11](#)

/product="putative O-antigen chain length determinant
protein"

/protein_id="[BCN17729.1](#)"

/translation="MQEQKLTPPNYLTPAQPTAIGDDEIDLRELFRLWKGKWTIIA
ITLVFAIGSVIFAIMQPNIYKAEALIAPASEQQGGGLSALASQFGGLASLAGVNLGGK
GGVDKTQMAIEVLKSRQFTSEFIQQHNILADIMAAKKWDNSADQLIYDPALYNAQTHT
WVREAKAPFKPEPSMQEAYKVFSKLVTVNKA KDSGMVTI AVEHLSPTVAQQQVVTW LIE
DINKVMKERDVAEHRSTAF LNEQIALTNVADIRTVLYK LIEEQAKTIMFAEVRDEYV
FKTIDPALAPEEKAKPKRALICVLG TLLGGMLGVAIVLVRFAFRKAGKNHEHADVRET
A"

[gene](#)

11785..12912

/gene="tnp"

[CDS](#)

11785..12912

/gene="tnp"

/inference="ab initio prediction:Prodigal:2.6"

/inference="similar to AA sequence:ISfinder:IS1358"

/note="SR0139LPS_100"

/codon_start=1

/transl_table=[11](#)

/product="putative transposase"

/protein_id="[BCN17730.1](#)"

/translation="MSELINPFMHFQIIKDYRQESKVEHKLSDIILLTICGVLSCHDG
WDGIIDFGNARLDLFLKRYGHFEAGIP SADTL SRVMGMINPVALQRSFI AWMKNCHTLT
DGEVIAIDGKTLRGSYDRSKGKGTI HMVNAFATANGMSIGQLKVDSKSNEITAIPKLL
DLLDVKGCLITIDAMGCQKKIAQKIRDKEADYLLAVKGNQGMLEQAFDDYFRMDMLQD

```

FDGSSYSTQEKSHGRIETRVALVNRDLSVLGDIEHEWPGLKSMGIVASIRQESAVATE
QDVSIRYYICSKELEAQTLLEATRSHWGVVEVMHWSLDTAFCEDNSRIRADDRAEAFAR
IRQICLNLLKSETTFKGGIKRKRMCAMDEKYLSKVLESIT"

gene      13096..14214
          /gene="gmd"

CDS       13096..14214
          /gene="gmd"
          /inference="ab initio prediction:Prodigal:2.6"
          /inference="similar to AA sequence:UniProtKB:P0AC88"
          /note="SR0139LPS_110"
          /codon_start=1
          /transl_table=11
          /product="GDP-mannose 4,6-dehydratase"
          /protein_id="BCN17731.1"
          /translation="MKKKALITGVTGQDGSYLAEFLLAKGYEVHGIKRRASSFNTQRV
DHIYQDPHVDNASFILHYGDLTDSSNLTRILQEVKPDEVYNLGAQSHVAVSFESPEYT
ADVDMGTLRLLEAIRLLGLEKTTKFYQASTSELYGLVQETPQKETTPFYPRSPYAVA
KMYAYWIVVNYRESYGMACNGILFNHESPRRGETFVTRKITRGLANIAQGLEKCLYM
GNMDALRDWGHAKDYVRMQWMLQQDQPEDFVIATGVQYSVRQFIEWSAKELGVTTLTF
EGQGVDEKGIVTAIEGDKAPALKVGDVVVQIDPRYFRPAEVETLLGDPSKAKQKLQWT
PEITVQEMCAEMVMEDLKVAQRHALLKLHGHDPVPSVE"

gene      14249..15145
          /gene="fcl"

CDS       14249..15145
          /gene="fcl"
          /inference="ab initio prediction:Prodigal:2.6"
          /inference="similar to AA sequence:UniProtKB:G4WJD3"
          /note="SR0139LPS_120"
          /codon_start=1
          /transl_table=11
          /product="putative monosaccharide biosynthesis protein"
          /protein_id="BCN17732.1"
          /translation="MVGQNILSLAGEYEHEFLSPSSAQINLLDSNAVHDYIRIHKPDM
VIHAAGIVGGIQANMAQPVKFLVENMQMGLNILTVPNACGVSQFLNLSSSCMYPRDAH
NPLSEELILKGELEPTNEGYALAKVTSTRLCEYISKENPSQIYKTIIPCNLYGRFDKF
DPNHSHMIPAVIRKIHEAKKANLEEIDIWGDGEARREFMYAEDLAEFVFYAIDHFKEM
PQNLNVGLGTDYTYNEYQAVASVIGYTGRFKHDLSPVGMQRQKLIDDTKLKAFGWSH
STSLEAGIEKTYQFYLNEYGND"

gene      15138..16310
          /gene="wbfI"

CDS       15138..16310
          /gene="wbfI"
          /inference="ab initio prediction:Prodigal:2.6"
          /inference="similar to AA sequence:UniProtKB:G4WJD4"

```

```

/feature "note" "SRO139LPS_130"
/feature "codon_start" 1
/feature "transl_table" 11
/feature "product" "GDP-4-keto-6-deoxy-D-mannose 3-dehydratase"
/feature "protein_id" "BCN17733.1"
/feature "translation" "MINYSLASSTWDQNEYAAIQRVIESDMFTMGKEVAQYKDFATF
FGAQYALMVSSGSTANLLMIAALFFTKNAKYKLERGDEVIVPAVSWSTTYFPLQQYGL
KVKFVDIDRQTLNMDLDKLEAAITDNTRAILSVNLLGNPNDFARMKDIIADRDIFILE
DNCESMGATINGKQAGTFGVMGTFSSFFSHHIATMEGGCVVTDDEELYHILLCIRAHG
WTRNLPKFNKVTGEKSDDAFEESFKFVLPGYNVRPLEMSGALGIEQLKKLPNFIETR
KNAELFQSLFADHPFIEIQKETGESSWFGFSLILKENAPYSRAELVKKLVENGIECRP
IVTGNFLKNKEVLEFFDYEAGTLEGAEYLDENGLFVGNHQNDIEAEIKLLAKVLV"
gene 16310..16795
/feature "gene" "wbfJ"
CDS 16310..16795
/feature "gene" "wbfJ"
/feature "inference" "ab initio prediction:Prodigal:2.6"
/feature "inference" "similar to AA sequence:UniProtKB:P32056"
/feature "note" "SRO139LPS_140"
/feature "codon_start" 1
/feature "transl_table" 11
/feature "product" "GDP-mannose mannosyl hydrolase"
/feature "protein_id" "BCN17734.1"
/feature "translation" "MYLEKEDFRGLVQHGVLFSDLVVLDTONQILVGERVNRPAQGY
WFPVPGGRVYKNETLIKAERICLDELGQIFSYQDAKPLGLYDHFYNDVSFGDDISTHY
INAPHLIELSENTTLNLPSEQHRHYRWVRIGDLAYDESVHFYSKVFLDELKKRIAFTI
L"
gene 16852..18291
/feature "gene" "wzx"
CDS 16852..18291
/feature "gene" "wzx"
/feature "inference" "ab initio prediction:Prodigal:2.6"
/feature "note" "SRO139LPS_150"
/feature "codon_start" 1
/feature "transl_table" 11
/feature "product" "putative O-antigen flippase"
/feature "protein_id" "BCN17735.1"
/feature "translation" "MIINAFYRDFLILSIGKVLQVFIGLLTLRLITEMLSEEQVGIYY
ILLTVVSLLAFGFFNPLGQFYGRYLIHWQRKAELKTATNIMMLRGLTIPFALCLAIV
VFYMFYEQYFYSIAEYSVFIVSVIALIHGVLLNATNVLSRVKFTVYAVLTLFIGLI
FSVIFIQFKQTAMAWIYGLAFSQIFFSVILYNIITSEQEFSIVKIKSAFNKHYMKGVL
FFILPVTITLLQWGQTASFRLIVEDLYSAQILAFIAGMTLSGAIFSALESLSLSTQFY
MPLYLKKITNADQAMRTKAWNELADILLPVYIAVLIYVIALAPYLAKLLVAEKFQDAY
IYAMIGAFIEFFRVITNLVYLVSQSEVTKSTIMPYLGFMFMVIGLYSIDVSRSPWI

```

```

VPVILALSYLTTLSIMFYNMKKLLSIRFEFLNPAIASLLTLPLLMHLLSITPTLFNS
FLFSLLGGFYLLLIQYPFLKTKIKKMSAV"
gene      18288..19304
          /gene="wbfL"
CDS       18288..19304
          /gene="wbfL"
          /inference="ab initio prediction:Prodigal:2.6"
          /note="SRO139LPS_160"
          /codon_start=1
          /transl_table=11
          /product="putative glycosyltransferase"
          /protein_id="BCN17736.1"
          /translation="MKKACLVVNDYMLCNKVFDEKIFRDNINYYKIYIKLKFYERGYD
LSTQDINSISDSVVIYAADIPEKLPKRNEVKKSHLIWESEFISPENYNKVKHNSFN
KIFTWHDGLVDEKKYFKINFVHQFPNFINKNINKKKKLCITLIAGNKKPPHTSVGDLYA
EREKAIRWFEKNHPSDFDLYGVGWDRYRFSGSKIVRALNRVPLLPKWTQKITGRSYPS
YKGPIERKRPIMEKYKFSICYENVMDVPGYITEKIFDSFFSGCIPVYWGANNIETYIP
ENCFIDKRKFLSYEDLYSYMKEMSDEEYIGYINNIQAFLKSDLSSPFKAETFAEKVVS
EVLN"
gene      19304..20317
          /gene="wbfM"
CDS       19304..20317
          /gene="wbfM"
          /inference="ab initio prediction:Prodigal:2.6"
          /note="SRO139LPS_170"
          /codon_start=1
          /transl_table=11
          /product="putative glycosyltransferase"
          /protein_id="BCN17737.1"
          /translation="MIKRILYVAFKYEYGRKENGFALNYKAWFHGFEQLGYSIEGVFF
EDYDHKMLQTRIEKAMNSSIDIVFFILQKDQVDLDTLKYLSENNVTFTVGGFDDQWR
FDNWTSTIYAPYFSACITSDKFSIKKYKEIGQGNIIYSQWASLEPQKYHSAPYKYDISF
IGSANRYRKWFINFLEKKGIHVECFGYGWKNGRVSYEDMELIFLQSKINLNISNSISF
DFRFMMSSFRSFLSVVKSYSKYDGKNSSQTKARNFEIPVHGGFQITDYVPTLEEFYFI
GKEIVCYNTIDEVEKLIRFYLLINDYERECIKEAGTKRAREKHTYKARIKNFMVNIDKI
YDK"
gene      20307..21764
          /gene="wbfN"
CDS       20307..21764
          /gene="wbfN"
          /inference="ab initio prediction:Prodigal:2.6"
          /note="SRO139LPS_180"
          /codon_start=1
          /transl_table=11

```

```

/product="hypothetical protein"
/protein_id="BCN17738.1"
/translation="MISKIGISKLIEPHFFNELEFENYKVLTCNSRSLTNTFRDLAF
KLLYLEMIDKNVSFSKEAYKEHIRAFSLGGFKEPGQESKNSIEKFYDAFFETFNDISL
HGFDATKSLIPLSHNGSIANGAHRVASAIILDKDVSCVKLPVCDHLYDYKFFYSRSVS
CDLLDIAATKFVEYADNVYIAFVWPTAQGFDEEIERIIPNIIYRKNIKMTPNGAHNLL
SQIYFGEPWLGTVENNFRGSKNKVTECFKTFDFMRVIAFQADSLDSVLQIKENIRQIF
NVGKHSIHITDTKDEAIRMARMIFNDNSIHFLNYAYPNKYKSTHEKLAEFKKHIDVNC
IGSDDIILDSGMVLSTIYGLREASDIDYLSIKSLSEYKNEGLECHDKELEYHDEEKNEL
IYNPKYFFYFNGLKFIAFNQLYRMKSNRDEVKDRNDCKMMESLIENNQYKNIAKALKQ
SIYYEKIKLRKKITCLLSIGLYDLVKKIYKVVLK"

gene      21761..22774
          /gene="arnC"

CDS       21761..22774
          /gene="arnC"
          /inference="ab initio prediction:Prodigal:2.6"
          /inference="protein motif:HAMAP:MF_01164"
          /note="SR0139LPS_190"
          /codon_start=1
          /transl_table=11
          /product="putative glycosyltransferase"
          /protein_id="BCN17739.1"
          /translation="MSSPKISVVM SVYNGE KYLGEAIDSILKQTFSDFEFIIINDGST
DKTLEIIKSYMKKDDRIVLVSRENKGLIVSLNEGLDLAKGQYIARMDADDISIKSRFE
KQIEFLDSNPDIGVCGTWVEVFGENIKSKKWKMPQTQDPLKAKLTFSVPFAHPTVMIR
KKVIDKYKINYDLGYKDAEDYKFWVDFSKYTLFSNVPEILLRYRYHQESISRVADNKE
NKERFEIISKIQNEVLTSIGIVLTNEGAKNHFILSLNERIINNVTDCMDIRAHLLKIS
SSQIESSQFDSSAIERLMLKKYFIYLILSIRRDKDLSYLIKIFDLMFLKGAFLLKDKM
EQF"

gene      22777..23709
          /gene="wbfp"

CDS       22777..23709
          /gene="wbfp"
          /inference="ab initio prediction:Prodigal:2.6"
          /inference="protein motif:HAMAP:MF_01164"
          /note="SR0139LPS_200"
          /codon_start=1
          /transl_table=11
          /product="putative glycosyltransferase"
          /protein_id="BCN17740.1"
          /translation="MTLDISVVIPLYKNYSIVRCLNSVLYQTILPFEIIIVNDGSTD
DSLVLVDYYLKTISM RDVNIVHDQQNQGVSAARNNGIALAKSNYIALLDADDEWHPE
HIGKMTTLIEKYPRLPVYTCKHEVCENGYSFTPPQIFSELTTMGLIDNYFVRAGKYE
LVNSSKVVLKPIFESVGGFPIGAKLCEDLYLWARLAEVGCFAFTDYLGVTVHQEKDM

```

SRKARNYSQPYILEYYFNVSGSINSELHGYLWTVYRNHLRLSILNGNLSEFISRWKFG
SYYFKPKSYLIFLYALIPKKIMNIFKVIRRFLLR"

[gene](#)

23879..24769

/gene="wzy"

[CDS](#)

23879..24769

/gene="wzy"

/inference="ab initio prediction:Prodigal:2.6"

/note="SR0139LPS_210"

/codon_start=1

/transl_table=[11](#)

/product="putative O-antigen polymerase"

/protein_id="[BCN17741.1](#)"

/translation="MREFFFLFFISFLWIFLKNKNVFEYCLIIYFLFIVNVLHVLQSIIGYKIVYFYNFLDMLWLPGTARQTLVYSPGEFGTFFVLWFGLYFDRINVFIDEASTYAI
INFALSVFLISVSRKFAICFFAFSFFASMAKV FVILLPLFLFFNLLNFKFNRLIKLF
ILFVFVFIISYPFLINILVDLFFNGQIILDLSDSL SARVYWTWMISQGS SLWDLGEMS
LTNFAAFDGYVSKLAFFMGGLFSLLFVRQKIFALSLLFTLIASFQYGSVFFMGWLYYI
LLVSFNNITHLNRGA KRCAV"

[gene](#)

24757..26667

/gene="asnB"

[CDS](#)

24757..26667

/gene="asnB"

/inference="ab initio prediction:Prodigal:2.6"

/inference="similar to AA sequence:UniProtKB:P54420"

/note="SR0139LPS_220"

/codon_start=1

/transl_table=[11](#)

/product="asparagine synthetase [glutamine-hydrolyzing]"

/protein_id="[BCN17742.1](#)"

/translation="MCGVAGFISKRLSPVDCLTSMVESIMHRGPNDSGLWVDDDFGVC
LAHARLSIQDLSSAGHQPMHKSERYVMIFNGEIYNHLTLREELIEIVPSYWNHSDT
ETLLAGFEVWGIEQTIQKCVGMFAIVLWDKVLKQLILIRDRFGEKPLYYGWQRDTFLF
ASELKALKAHPSFEGSINRQALSHFFRLNYIPTPLSIYEGIFKLEPGVIAVFSHEGQL
LSKQTFWDASHAVSLQNFSDHDAVDKLDLQSIQDQALSDVPLGAFSLGGVDSSTV
VGILQSLSTRPVKTFITIGFDHADFNEASEASDVAKHLGTDHVELIVSAEDALAIINQL
PVMYDEPFADASQVPTFLVSKLAKKEVTVCLSGDGGDELFCGYNRYHYTAKVWSYLEK
IPFPIRKMLSVFLLTLSPSSWDVLSKTLGLNTRLPNLGNKIQKGAQALKARDIEDLYT
RVVSNWDLDEPLVKNTAVEKLPFLSDLTELSHLNDLEKMMLWDKQSYLMDDVLVKTD
ATMACSLEGRVPLLDHRIAFAASLPIHLKYRGGKGKWLLEVLRYVPKKLIERPKK
GFSLPIAEWLRGPKDWANVLLDSDRIDKEGFLSSELVQKKWREHLAGKRDWSSQLWS
VLMFQLWLEKNK"

[gene](#)

26664..27794

/gene="wbfs"

[CDS](#)

26664..27794

```

/gene="wbfs"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:Q0P9C9"
/note="SR0139LPS_230"
/codon_start=1
/transl_table=11
/product="putative glycosyltransferase"
/protein_id="BCN17743.1"
/translation="MNKIVFVVNNAAYFLSHRKPIGLALLSRGDEVHVIAPGECPV
SEAGFNYHSVEMSRKGMNPLAELSTIFALHRLFKTIQPDLVHLVTIKPYLYGGIAARS
AKVPSVVS AVAGLGILFSAQGLKNKVIKSILYPMYRFAFGHNNQAVIFQNTNDRDLLV
NWGVLQFKKSRLIRGAGADLSVYPYLPEPDGLPIISFAARLLKDKGVIEFVEASRIK
ARGIKARFWLIGDPDPGNSNTVTQEQLDQWQAEGLECLGYRTDIANLFSQSNI VSLP
SYYGEGLPKVLIEAACGRAVTTDHPGCRDAIEPDTGVLVSIK DSTALADAIERLIK
SPDLRKSMGLAGRKLAEA EFSIETVVNRHLEIYAE LTLKDDK"
gene 27791..29188
/gene="manC"
CDS 27791..29188
/gene="manC"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:P26404"
/note="SR0139LPS_240"
/codon_start=1
/transl_table=11
/product="mannose-1-phosphate guanylyltransferase"
/protein_id="BCN17744.1"
/translation="MKICPVVLSGGVGSRLWPLSREHFPKQCLNLTDLLSSLLQQTLV
RTNHLNVQSPLVVCNDDHRFLIAQQQLQDMGVKGAKVMLEPVGRNTAPAVALA AFEVLQ
SDNEDVLMVLVPADHVIRD TAAFEKAIAQAKVLA EAGGLVTFGITPMRAETGYGYIKA
GQDSCVEKFVEKPD LATAQSYLES GDYLWNSGMFLFQASQYLAELKQHRPAMYAAVES
AYGNRTEDLDFIRIGTEAFTACPSESIDYAIMEPTQNAKVVPYNGDWSDIGAWDALHD
YCEKDSNHNVLVGDM AESTTNSLVRAESRLVATVG VNNLVVIETADAVLIMDKDQSQ
DVKKIVSRIKAEGRQE HMHHTTVHRPWGTYQTVDLGDRHQVKRIMVKPGEKLSVQMHH
HRAEHVVVSGTAKVQNGEREILLTENESTYIPVGVVHALENPGKIPL ELIEVQSGSY
LGEDDIVRFS DRYGR"
gene 29319..30770
/gene="glmM"
CDS 29319..30770
/gene="glmM"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:P31120"
/note="SR0139LPS_250"
/codon_start=1
/transl_table=11

```

```

/product="phosphoglucosamine mutase"
/protein_id="BCN17745.1"
/translation="MTTLKELSIEQDVAFGTSGVRALVENLTPKLCYAYAQAFLQQIC
SNATQVAVAIIDLRPSSPDIAAMLKAAQDLNIDVVFCGALPTPALAYFAMQNAMPSIM
ITGSHIPFDRNGFKFYTTTGEITKADELSIQNAPVSESSDFCLAALPPVDLAASFLY
QKRYTDLFLSTALKGKRIGLYEHSGVGRDLITSILRQLGAEVISLDRDTEFVPIDTEA
VSEADQQKAFAWSKEWALDAIVSTDGDADRPLISDENGLWLRGDDVVGILVARFLQATH
VATPVNANTALELANPNMFTKRTRIGSPYVIEAMQALALQATTTTGS PKVVG YEANGG
FLVGNDMPCGLGMLNALPTRDAVLPILAVLCQSAQDGLPISQLVDGLPARYTYS DRIQ
QVPTEFSQRLIKQLKEDSQMQCFLEATGVEAPSVDTVDET DGLRIHLSNYEIVHLRP
SGNAPELRCYAESSEMNRAKQIVELALRYVQSI"

gene 30815..31780
/gene="gnu"

CDS 30815..31780
/gene="gnu"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:Q8X7P7"
/note="SR0139LPS_260"
/codon_start=1
/transl_table=11
/product="putative epimerase"
/protein_id="BCN17746.1"
/translation="MPKSILLTGSTGFVGTNLVKS LTKSDYIVKSAVRHAVNKDDGL
LFEVGDINASTDFELPLKNTTVVVHCAARAHVMDDKEAEPLTLYREVNTAGTVNLAKQ
AIDSGVKRFIFISSIKVNGEGTLVGCPFKTEDNHAPEDDYGLSKSEAEKQLVALAKDS
SMEVVIIRPTIVYGPVKANFASLMRLVSKGIPLPFGSITQNKRSLSINNLDLIVT
CIDHPKAANQVFLVSDHDVSTAEMVRELAIALDKPTWQLPVPIWCYKLF GKLF GKSD
IVDRLTGTLQVDISHTKETLGWKPPQTLQEGFKQTAQAFLQANNR"

gene 31780..32340
/gene="wbeW"

CDS 31780..32340
/gene="wbeW"
/inference="ab initio prediction:Prodigal:2.6"
/note="SR0139LPS_270"
/codon_start=1
/transl_table=11
/product="putative glycosyltransferase"
/protein_id="BCN17747.1"
/translation="MVKMIRLIDFLAAFLG LLLLWPVLLIVTIIIGLFDTGSPIFVQER
VGRNKKPFKLIKFR TMSVDTQSVASHLASTSSITKLGAFLRKTKIDELPQLINVLKGE
MSLVGPRPNLFNQEELIAERDALGVYDVLPGVTGLAQVQNIDMSTPRLLAQTDKKMID
TLTLKDYFRYIFMTATGSGAGDAVKK"

gene 32374..33540
/gene="wbfV"

```

[CDS](#)

```
32374..33540
/gene="wbfV"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:P76373"
/note="SR0139LPS_280"
/codon_start=1
/transl_table=11
/product="putative dehydrogenase"
/protein_id="BCN17748.1"
/translation="MKIAVAGTGYVGLSNAMLLAQHHQVIAVDIIAEKVAMLNKQSP
IVDQEIEYFLAHKTLDFQATLDKQSAYRNADFVIIATPTDYPDQTNYFNTTSVESVIK
EVMAINPQAVMVIKSTVPVGYTARIKEQLGCDNILFSPEFLREGKALHDNLHPSRIIV
GERSERAIEVFANLLVEGAVKKNIPVLFTDSTEAEAVKLFSNTYLAMRVAYFNELDSYA
EAHGLDARQIIIEGVGLDPRIGNHYNNPSFGYGGYCLPKDTKQLLANYSVFNIIIGAI
VEANRTRKDFVADSI IKRQPKVVGIIYRLIMKAGSDNFRASSIQGIMKRIKAKGIEVVV
YEPVLDEPEFFHSRVIKDLDEFKQTADVIVSNRMVEELADVADKVYTRDLFGSD"
```

[gene](#)

```
33609..34613
```

[CDS](#)

```
/gene="wbfW"
33609..34613
/gene="wbfW"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:Q7BJX9"
/note="SR0139LPS_290"
/codon_start=1
/transl_table=11
/product="putative epimerase"
/protein_id="BCN17749.1"
/translation="MKYLVGTGAAGFIGSATVKKLTEQGHHVVGIDNINDYYDVNLKHA
RLARIEHPLFHFLLKVDIADRAAMAQLFEQEKFERVIIHLAAQAGVRYSLNPHAYADSN
LVGHLNILEGCRQNKVGHVYASSSSVYGLNAKVPFATSDSDVHPVSLYAATKKSNEL
MAHSYSHLYDIPTTGLRFFTVYGSWGRPDMAFFIFTKKILAGEAIDINNHGDMWRDFT
HVDDIVEGVVRIADVLPTRNAAWTVESGTPATSSAPYAIYNIGHGSPINLMEFVKAIE
EQLGIEANKNFRSMQPGDVYQTYADTADLFAATGYKPKVGVRDGVSEFIAWYRDFYNQ
"
```

[gene](#)

```
34693..36633
```

[CDS](#)

```
/gene="wbeV"
34693..36633
/gene="wbeV"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:Q0P9D4"
/note="SR0139LPS_300"
/codon_start=1
/transl_table=11
/product="putative dehydratase"
```

```

/protein_id="BCN17750.1"
/translation="MARLNFIWNLSRVNKRIISVLDAFFIIISFYSAWVRVGNVEI
IHSDSIPYLLATVIVVTILSFTRLGLYRAILRYLTFHALAVVSVGTLISAASVAIAAF
YFDAPVPRSLPIIYGTFLCLLCGGSRLIVRVLVSGLNGKGRKVLIYAGSAGRQLAI
ALRNSENYKVAGFIDNDKTLENTVIMGMQVHDVSRAAYLVDKYDVTQILLAVPSASRA
RRKKILES LINLSAEVLTVPDMKDIVEGKASIDQLKDVAIEDLLGRDPVTPQQCLMES
NILGKVVMTGAGGSIGSELQRQIVRQKPKALVLFELSEFGLYQIDRELKQLMEAEGL
HVEIIPLLGSVQRINRLVVTMKSFKVQTVYHAAAYKHVPLVEYNVVEGVRNNVFGTTY
AAQAAIEAGVESFVLISTDKAVRPTNVMGTTKRMAELGLQALAEQENLKAKGTRFCMV
RFGNVLGSSGSVPLFKRQIEAGGPITVTHPDIIRYFMTIPEAAQLVIQAGAMGKGGD
VFVLDMGEPVRITDLAVNLIQLSGLEVKDEQHPYGDIAIEFTGLRPGEKLYEELLIGD
NVQKTAHERIMTANERYLPLAEFEQHLNELDKACHAFNHERIRELLEAPTDFNPTDG
IGDLVWQRTQDNQTQLEKQFVH"

gene 36758..38074
/gene="rjg"

CDS 36758..38074
/gene="rjg"
/inference="ab initio prediction:Prodigal:2.6"
/inference="similar to AA sequence:UniProtKB:Q5SLP1"
/note="SR0139LPS_310"
/codon_start=1
/transl_table=11
/product="putative ribonuclease"
/protein_id="BCN17751.1"
/translation="MEVVHHGKASVTGSCHELRADGQALLIDCGLFQGADERPLAVE
FALGHVDALILTHAHIDHIGRLPWLLAAGFKQPIYCTAATAELVPLMLEDGLKLQLGM
SPKQSERVLTEVRRLLRVQDYQKWFAVQPKCADSLWVRFQPAHGILGSAYVEIRRPNG
EUVVFSGDLGPSHTPLLPDPQSPERADYLFIEETTYGDKQHEDVQSRGQRLRAMIERSL
TDGGAILIPAFSVGRTQELLFDIEQLIFSQQIDANLPIILDSPMAQRVTRSYYRFRKQL
WGREAKARLQMRHPLAFEQCITVEDHRTHRLVNRLASTGEAAIVVAASGMCGGRI
MDYLKALLPDKRTDLILAGFQAEGTLGRSIQSGQPSVWIEGTEVEVNAHIHTMSGYSA
HADKADLLRFIAGIPEKPKQVHLIHGEASAKQAFAAELTQLGYSVL"

```

ORIGIN

```

1 ttacttacga ttaatcagcg ccatatattc agcgacacct tcagccacgc tcttgaactg
61 tacatcacag ccagcagcgc gaagtttggt aaggtcagcc tcagtgaact cttggttaagc
121 acctttaaga tggctctgga atggaatggt ttcgacttcg ccgcgaccat ggaatgcgat
181 caccgctttc gccacttcgt tgaacgattc cgctttacca gtaccacagt taaatatgcc
241 ggatacgcca tgatctaaaa accacaaatt gaccgcagcg acatcgccga cataaacgaa
301 atcacgtttg aagttctcgc tgccagcaaa caattttgga ttttcacccg cgttcatttg
361 attgttcaaa tgaaaggcaa ccgaagccat cgagccttta tgctgctcac gagggccgta
421 tacgttgaag taacgaaatc ccgttatattg cgataggggt tcgtcgtggt gttttgcatc
481 tagccatagg cggcgtagat agttatcaaa ttgctgcttc gaatagccgt aaacgttgag
541 tgcaccttcg tattgcggtt cttcaataaa ggtatcggtt tcaccataag tggctgctga
601 agaggcatag aggaagggta tttcacgata taaacagtag tgcagcagct ctttagagta

```

661 ttcatagttg ttgagcatga catatttgcc atcccactct gtggtcgcag agcaagcacc
721 ttcatggaaa atggcgtaaa tggacccgaa atcatcacca gccatgatct gagctaggaa
781 gtcattctga tccatatagt cagcgatctg taggtcaacc agatttttga acttacgacc
841 atttttcaaa tgatcaacga ccaaaatgtc tgtgataccg cgctcattaa gcgctttgat
901 aatattgctg ccaatcatgc cagcgccgccc agtgacgatg atcataacct gttctacctt
961 atgctaaaaa gtctcacaaa atagtagcag gaaagggggg ggtggggaag gtttaggaat
1021 ctaggaccta ggtcctagat tctagatccc tacttctttt attcttctaa ccatacccac
1081 gtataagggt ggcgtttcag caagtcttgt tgatcttgct gggcagagat gttttttagg
1141 agtgggatgt tatctataga aggatcaatt agttcagagc ctagagtctg cttatagaga
1201 tcttgatatt gatataaaaa agtttctggt atagaacttg acggtgtttt tatccaagaa
1261 actgaaaaat ctttaatctc ttttagttct tgatctaaga ttggactatc aaatttcata
1321 acaggtagct cgttatgata tggactatag atagtttggt ttataaatat gggcaatccg
1381 ctgggtacag ttaattctga atcaatgagt aaccttagaa ttgtattatc ggttttttga
1441 gtatgagtaa ttttaataca ttgtgtattg ttgtgatcat tacatatccc caatgttggt
1501 ggctctggat taggaaaacc atctagaata ttttcagcac ttaaatggct agtaattgaa
1561 cttgtccctc ttgagacatg ttgaaatttc caataagggg atgatggag agaaatttct
1621 tttcctttta gttttaagta atagttatct acattgatta agtttgagta actatattta
1681 tcttcagaag atgtatttaa tgattgccat aaataagcat aaggagcatt aaattgcttt
1741 ccatcaacaa atagttgagc tgatgataac tctacatcag aaggtagagt ccatggagtg
1801 tctctttgat caataatctc aaggtaatt tcttgcccaa ggcttcctaa tgcattggta
1861 gctctaaatt taaagctaaa aagattttgt ataacgtcct gatttggtcg ctcataagcg
1921 gttaataata gtggtctccc ccttctagaa ttcacagata catctctacc tagtttatta
1981 gtgggctcga aggataactg attaaagtga ttgagtgaga aaaagaaaag tttattttca
2041 tcagggatgt gaataaatga cttgtaatca cttgtttgcg ggttgctatt attgccggaa
2101 cctatagata aacagttaga gttattatct ttatttttgg cgtagataga aaaactttct
2161 ggaatgaaat ctttagaata tgtacttaca aaattatctc taccttctga gtagacaaaa
2221 cttacatctc cattttgtgg gacatcactt tgtcgaaaac ggaaagtga gcttagacca
2281 ttcgtttcag tgctattact ataacgacga acaaaatttc catgttctc atgaacaaca
2341 atttgataat tattttcagg ggcagagcga tatgccacga tctttttagt ttgatcttcg
2401 ttataaccaa agatttgaca gttagtttgt gtattgatag ctatattgtc taaatccaaa
2461 aagcttacat taaagtactt aaccggtggt gttgtgttgc ccgaattgcc gctttctcca
2521 ccgccgcagc ctaacagggt aagtgcgatt aactagaaa tggttggttt atgcatgatg
2581 taaagtccct gagtttgcca agttgagttt tgtatattgc tatgcaaaaa atgatcctaa
2641 agtgaaagtc tagaacctag aacctttcat accaagggt tctagcatcg gtcattttat
2701 acaatccata ctgacgggaa agcatttctc cgccatcgcg ttgcagtggg agccaagaaa
2761 tattaacccg ctgagtgctt gggcgaaccg tcatcaaata caatggaata gaaatataga
2821 agcctttctg gaagctgcct tcgccaaact cttctgctga gaggtcggtt ttggtggcaa
2881 atgcaccggc gacaacgccg ctgacaaact gttttgagaa atcaaccgta aagccaatat
2941 cctcggtcaa ataacgcca gcgctgactt tgagtagcgt attatccaga agcgacaaaa
3001 attgcggttg ccaatacagc gtggcggtgac cggtaagggt gccagtttgc acgcgataat
3061 tatcacctgt ttctacatcg tattgatgct cgtgctcata caagccaaag gctgagcttg
3121 ggtcacgttg tttaacatag ttaccatcaa tccccaccgc ccaatttttg ccaatggcc
3181 ggtacaatag ctactgccc acaccggcaa acatggtttc aagatatcca gcatatgctt
3241 gagtataaaa atgctgccat cgatcaaaat aggtcagttg caaatggctt atgcgtagcg

3301 gctcttcaaa atactggcgt gataaggttc ttactcgttt taaattggta ccgtcgggcg
3361 gtacgggtata attgaacttg tcgtagttgt cgattaggtt gccatacaag gtgccgaaaa
3421 gctgccaatg atcgcccatc ttgtaactgg cattggcatt gaccccgatc gcatagaggt
3481 aaaaatcttc tgcgccacca aatgattgtt gtaacactgg cgagaaacca aatttcacgc
3541 gctcgggtacg cgcggctttt aaatcaccat gaatcggcgc agggtcgggtg tgctgtttgg
3601 catccgacaa tcgagcatta ggataatcat gatcaataat acgtttgaac gcagcgctat
3661 tgagctgagt ttccgttagg ggttgatctt ggctagtttc aataattcga tagtagcgcg
3721 cattaattcc cgtattggca agtaatgtgg cggcgcggtg ctcggttgcg tcgcggtcgc
3781 ggtatttgac ttgagagccc ttaatcacca cgctgtcttg ctcttgataa atctcaaccg
3841 gttggtagcc ggcaatgttg gcaacatctt ggcttaagcg ttgccactct tcatcactga
3901 gatctgcttt actcggcact ggttggttaag ttggggcggg gctatcaagc caggtgggtt
3961 tgaggggtggc aagattagt ccaaaagtta aacctgcagt taaggattg ccacgctgat
4021 aactgacccg caaatcacgc cagtcggtca gtgcataagt aagcccaaag ttccatgggc
4081 tggtgaccgg cattgcatca ggctggccgc gtgttaccgg aaaatcactg cggtaatcat
4141 taccatcgta ttccagctgt aagcgcagtg gagcgagtgg ggtttggtat tcaatgccac
4201 caaatagggc agtacaacca gtgaacatcc gcccacaaatc aagcatgccg ccgttgccgc
4261 cgtagttact atcacgtccg cagtctgtgc tgctgatttt atcacgcta aggttggcgc
4321 gattacctag atagccccag ccaaaccta gggtaaaatc gagtgggtccc acttgtttag
4381 tcgcgaccag atattcacca tcaataatc cggtgccgcc gatatcacgc aagccaagcg
4441 aaagctctgg tagccaatag ctctcttgcc acaggcgagc cttggcatca attgatttat
4501 cgggtgattt ggtatcacca ctgaaactgg cttgatcgct gtacagtaat tcatgcactt
4561 gggataacg caccgtggtt tctagccatg gaaacagctg cagcgaaatt gcatagtgtg
4621 gataatcatc attattggtg atggcaagat ttagctcacc ttctctaac atccgggcac
4681 tgggcatttg cattaaccct gtgccgcaa agtcagtttg tgaatggcgc agccgtgggt
4741 agctaaactc atcggcaaaa gcttgccgtg gtgtgagtaa tgcgctgctt atcagtacgc
4801 cgagtaaaga cagcgaagta ttcaaaagag ggcggtggcc agttttcata agggtaatct
4861 atttctcagc agttcaatca ctaactgatt gaggtcagca tctgtcacgc taggggtcaa
4921 aaaagcacgc ttcagtggga gcggaacata cacgatggca cccggtgcc aattcgtaaa
4981 atcttggttc caatacgcga ccgctgctt ttgtgctatg ccatcgggtt gaatcacgac
5041 aatttcactt atttgctcat caattagtcc cgccgctgc gcgtaatctt tcgctgagag
5101 acggttatgc caaatcacgt cacctggttg atttaccgcg ccgtaaaccg aaacctgtgt
5161 tgactttgaa ttcagtgtca gtaaccacga accattgagg cgaggattgt gttgcggcgc
5221 gattcttgtc cagtctgggt cgaccgaaat aaataggcgc ttagcaaact cagcctggcg
5281 caattgtgcg ataagggaag cccaaagagc ttgctgggtt ggcggtgcgc tggattgttg
5341 atcggcta at ttcaataaaa catcgctttt aaataaaaaa gcatggctta aatcgaacaa
5401 tccagcgctt ggccattcca cttgctgggt gtttaagcca gcctgttcta aagtctgcat
5461 gactgcgcta tctagccgca tcggctcgga aaacgataat cgtgtgctat ggatcgcttg
5521 gttattgtgc gccactcgta cttcgagcga ggtcgccagc ggtgcggcaa cgcacagtga
5581 atgcccactg attgcagccg caagggtcag ccaacccgc gaggttatga atgaccaagc
5641 acgttttttg ataggtgatc tacatatctt aaacgggtgag cgtaagcgaa ataataagtc
5701 ggtttggcac attaaatacc cccttggttg aggttaagatt tcgcgaccgc cagtgcataa
5761 cgggtgggtgc cgggcgctaa ttgttggtcg cttagcgataa ctgcgccagt gcttggttcg
5821 agccagtatt gattgtgata ctgctggtt agcgtgcta tggttatttg ttcacgatg
5881 cgcagcaaag tacgcgactc accatttggc agttgttttt gctgctcgcc gagagtgata

5941 aattgagaat gcgctaaata gcgaaagtga taaccaggct gccagcttaa atagaagtgc
6001 cactcacgtg ggggtgctcg tcgatgtaac ccaagtaaca gcggatcggg tgaatccgat
6061 tcaaggctga ttaagtttgc accatctaag ttcaaggttt tagtaattcg cccaccttca
6121 gtgacgagca tttcttgccc tgctgaaacc cactttaacg ccggatgacg actattttctg
6181 gttggctctg cccaagctaa taccattaat gcgagagggt tgtcattttg ctgaatatat
6241 aaactagcgt aaggaatacc ggcgactttt tgtggggaaa taactggagc tggcgtgcc
6301 aaaatagcca attgcatcgt ttcagataaa tgctgtgagc tattgctgca tcccattatc
6361 aaaaataact gacaaaaagc taaataatag agtctatgca tttgagatcg atctaaaaat
6421 aagaataaaa caaccgcatg gcgcggttgt ttcaaaggta agactacttg gctgctgaaa
6481 cagaagttga agttgaagtg tctgtacctg agtcgctcgc cgctatggct actacggcta
6541 ctgcggcggc agtaacagca acagctgtgg tggtcgcggt gcctactgca gctgtactag
6601 cggttgaacc gcctgcactt gcggcagttt cctctgttgc cgtggcaaag cactcacga
6661 gcagtgcact gagtaatacg agtgctgaat ttttcattgt tatctccatg aaagatattt
6721 attacaccga tgtacattcg cctcgattca caaggcgaac ctgcaaaaaga tagacaggat
6781 cgcttttaat gtaaacaaaa ttaactgtgt taaacaaaaa aatgatgaat aacatttact
6841 atcactttcc atgattatcg ccaattggct ggtacaaaag gaataaactc atatccactt
6901 cacaaatata atcaagctcg gtatgattcc gcctcgaatt aagtgtattt agggacctag
6961 aacctagaac ctagaaccta gaacctagaa cctagaacct gaaaatctgc cttaccgcgt
7021 tggaggagcg acacctcagg gcggtagcgt atttaaataa tgtccattca tgtatcagtc
7081 aattcacgct tcattagcaa ggaatgtttt tgtgaaaacc tctccccgtc ttttctcaac
7141 accgttatgc cagtgtgtcg ctttgatgac gtcgagttaa ctaacatcga gtctgctcgt
7201 gccagtgtt gccgcagaac cttatgcggg gatttcgctg gcttacacca acgccgaata
7261 tcaacccaac catgcggcat cattcactga tggttcgccg attgccgtcg cgttacaagg
7321 cggctatttt ttctctgatt atctcggcct tgaagcacgt tatagtactt cggtagacg
7381 tagttcaggg gtcaatatcg ataatttgtc ggcagcgttt gttaaactca atttaccat
7441 gtccgcacaa gtttctctgt atggtttggc aggttactcc tatttttagct tagataaaca
7501 aggggtaggc agtgtggatg agtctggatt tagctccggc attggtattc attacgcact
7561 ggatagccga agtgctattg cgttcgattt tattaatcac gctaattggc atgaagcgcg
7621 tttaaatacg gttaatttga gttttcagtt gaagttttta ttgatgacct gttaactctg
7681 gttgttttaa cgaatagcca cgctcttaac caatcccatt cataatccca tgtattacgc
7741 tgattatttt cttattttgc ctaaaagcga agcaacctta tgaccaagg atatatctta
7801 cggacactta gcctagtggc ctgcttgagc ctaccggtag ccatggcaca aacgccaacc
7861 ccggaacaga tccaaatgtt taaaaattta ccggccgcgc agcaacaagc gtagcgagt
7921 aaatatggtt ttgccttacc ttctgcaacg aattcagcca gtcaatatga caatcctgag
7981 gtcagtctgc cgcggaacc taacttgaa aacataacg ctcaaccgcc gcttaatggc
8041 caagatgcgc cactggagcg gtttggctta tcgctatttt ctggctcgcc gagcacgttt
8101 gccccggtg gtgatgtgcc tgtaccttcg gattacaccg taggcgcagg tgatgaaatc
8161 gtgatccaat tatttggtta agacaaccaa actcaccgct taagagtga tgcgctggg
8221 gtcacatcaatt ttccatcgct agggccagtg caagtggcag gactgaaatt ttcggaggtg
8281 cgccaatcgc tcggtcagcg tgttgaagag caaatgatcg gaattcgcag cgatatttca
8341 ttgggtgaac tgcgcacat gcaattttt gtgatgggtg atgcctataa acccggcgc
8401 tataccgtga gtgcgttaac caccctttca caagcaattt attacagtgg tggttttagc
8461 caaagtgggt cgctgcgtaa cattcaacta aaacgtgaag gtcagtgggt ggtgcaactg
8521 gatctttatg atctcctact caagggggat aaccgtaac atgtgcgctt aatgcccggt

8581 gatgtggtat ttattggtgc ggtggataac acggtagaaa ttagaggtga agtgaatcgc
8641 cctgcagtgt atgaagtaaa aagtaccgaa acctatcaag atatcatcaa gatggcgggc
8701 ggttttacgg ccaatgccta tcgcgataaa acagaagtaa aacgttatgc gagtgatggg
8761 ataagaaaag cattaaccct gaatttggcc aatgagcaag gcttaciaaac caaactcaat
8821 aatggtgatg ccattaatgt attgaaaaag actcaagctt tggctcacta tgtagaaatt
8881 gtcggtgatg tgcagcacc aggttttatt gaatggaagc caggattacg ggttgctgat
8941 gtttttcaat cggtcgatag tgcatttaat gccacggcgg atgtgaatta tgcgcttgctc
9001 gtacgccaga aaaatttgca gcgtgatatt gaagtgcac aaattaatct tgctaagcgc
9061 atcttggagc cgggcagtcg tgataactta accctgcaat cgcgcgatcg cttgttgatc
9121 tttaatcgct ttaattatga tgattttgaa aataccgatc taagtataa agaaactgaa
9181 aacaccgcca aaacactaga gcaagccaa gctcaaactc aagccaagtt agagcaagaa
9241 aagcagcagc aaattaacaa tactgtacgc gttgttaacg ccagcgcgtt agccaatcct
9301 tctctgccgc gtaataattc gcaacttcat ccgttaagtg gcggccagtc tttggaagca
9361 catccagagg ctaaaattca gtttgctggc caagaaatga cgttggctga atttgaaaaa
9421 cttaaacaaa acaccgctc caatttgctg gcgccgattt tgttgcagtt gtaccagcaa
9481 gcgcaagtgg gcatgtcacc gcaaattgcc gaagtgggtg gcgaagtaaa atacctggc
9541 cgttatccta ttaccgctgc catgccggtt tccgctttgc tcgaagcagc ggggtggctta
9601 acgtttaacg cttataccct acgcgcagaa ctggcgcgcc gtgaaattga ccctaaccat
9661 gagcgagtga ctacccaaat atcctcactc gatttacgcc aaatgttgag tgagccttcg
9721 gctaactgat ggaccattca aggcattgat aaactcaacg tgctggaaaa accggcggcg
9781 aaaattcagc aaacagtcgt gctgcaaggg gaagtgttat ttcttggtac ttatacgtta
9841 cgccaaggag aaacgctggc ggaactctta aaacgcgccg gtggcttgac cgaattcgcc
9901 aatccgcgtg gggcgatttt caccgctgaa gctttgcgct tacaagagca aaaattgctt
9961 aatcaatacg cggcagatat gcgcgccgaa accgcaaaaa aaactttccg tgctgacacc
10021 aatctgagct cagtgatttc tgatccagca aaaaccttag cgtttgtgga agaagccagt
10081 cgcagtaaa gactagggcg catggttgga cagcttagcc gcattatgag agatgagccg
10141 ggtgcgggatt ttatgctgga agatggcgat tttctgtttg taccgacctt ccgtaacacg
10201 atatccatca tgggagaggt gcaggtgccg gtgacttatc tgctcgatag tggattgaat
10261 gtggatgatt acttaaataa agcgggtggc gtgaagaaac aagccgatgc tgaccgtatt
10321 tttgttgttc gcgctgacgg ctctgtttat aaaccgaact ctggttattg gtttggttaac
10381 aataaagaaa agctacaagc tggagatacc attgttgtgc cgattgacac tgattaccgc
10441 gatgcactca gcacttgac agccgcaacc cagatcttgt atcaaacggg tgtcgcaatt
10501 aatgccttga aatgatctag agcctagaat cgaaaacct gaacccattt taccgatcct
10561 attccttggt ccttgcttta ccaatgacca aggaccaagg acctaggacc taaaaaccaa
10621 tgcaagaaca gaaactaaca ccacctaat acttaactta tccagctcaa cccaccgcaa
10681 ttggcgatga tgaaatcgac ttacgcgagc tgtttcgcgc gctgtggaaa ggcaagtggg
10741 ccattattgc gataacgtta gtgtttgcga taggctcggg gatgtttgac attatgcagc
10801 ctaatattta caaagcagaa gctttgattg ctctgcctc ggaacaacaa ggtggcggct
10861 taagtgttt agcttcacag tttggcggct tagcgagctt ggccggggtc aatctaggcg
10921 gtaaagggtg ggtagataaa acgcaaattg cgattgaagt gctaaaatcg cgccaattta
10981 ccagtgaagt tatccagcaa cacaatatc ttggcgatat aatggctgct aaaaaatggg
11041 acaatagtgc tgatcagctc atttatgatc cagcccttta taacgcgcaa acccacactt
11101 ggggtgcgtg agccaaagcg ccatttaaac ctgaacctc gatgcaagaa gcgtataaag
11161 tgtttagcaa gctggtgacg gtcaacaaag ctaaagatag tggaatggtg acgattgcgg

11221 ttgagcattt atcgcccacc gttgcccaac agtgggttac atgggtcatt gaagacatca
11281 ataaagtaat gaaagagcgc gatgttgctg aagcgcaccg cagtaccgcg tttttaaatg
11341 aacaaattgc cttaaccaat gtggccgata ttgcactgt tttgtataaa cttattgaag
11401 agcaagccaa aaccatcatg tttgctgaag tacgtgacga atatgtgttt aaaactatcg
11461 accctgcctt agcccccgaa gaaaaagcca aacccaaacg tgccttaatt tgtgtgctcg
11521 gcaccttgct cggcggcatg ctgggtgttg ccattgtgtt ggtcaggttt gcgtttagaa
11581 aagcagggaa aaatcatgaa catgccgatg tcagggaac cgcatgaag tcgtcgatat
11641 ataagggctg cgggtgttgct tagaattagt taccaatgct tccttaatct cagttttttg
11701 atgtaacccg atgaaattta agatcacctt gtagatcatt tcagttgttt tgtaatagct
11761 cctagacaat ataggagcct aaatatgagc gagttaatca acccatttat gcatttccaa
11821 atcattaaag actatcgaca agaaagcaaa gtagaacaca aattatcaga cattattttg
11881 ctgacaattt gtgggtgttt gtcgtgtcac gatggctggg atggcattat cgattttggt
11941 aatgctcgct tagatttcct taaacgatat ggtcactttg aagctggaat tccttctgcg
12001 gatacgctgt ctgcgctgat gggtatgatt aatcctgtcg ctttgcaaag aagcttcatt
12061 gcctggatga agaactgcca taaactgacg gatgggtgaag tgattgccat cgacggtaaa
12121 acattacgcg gctcttacga ccgctcgaaa ggcaaaggaa cgatccatat ggtgaacgct
12181 tttgctacag caaatggaat gagcattggg caactgaag ttgattctaa gagtaacgag
12241 attaccgcga tccccagct acttgacttg ctagatgtaa aaggctgctt gattacgatt
12301 gatgccatgg gctgccaaaa gaaaatagcg cagaaaatcc gtgataaaga agcggattat
12361 ttattggcgg tcaaaggcaa tcagggaatg cttgagcaag cctttgatga ttattttcga
12421 atggacatgc ttcaagactt cgacggtagt tcttatagta ctcaagaaaa aagtcacgga
12481 agaatagaaa cgagagtggc tttagtgaat cgcgatttgt cggttttggg tgatattgaa
12541 catgaatggc ctgggcttaa atcaatgggc atcgtggctt caattcgaca agaatcggca
12601 gtagcaacag agcaagatgt gagtattcgt tactacatat gctctaaaga attggaagct
12661 caaacgttac ttgaagcgac acgttctcac tgggggtgtag aggtcatgca ttggtcactt
12721 gatactgcat tttgtgagga caattcgcgt attagagcgg acgatcgagc agaggctttt
12781 gcaaggatca ggcagatatg tttgaaccta ttaaagagcg aaaccacgtt taaaggtggt
12841 atcaaacgta aacggatgaa ctgcgcaatg gacgaaaagt acctaagtaa ggttcttgaa
12901 agccttacgt gacggtaatg ttcatgcggt ttccgtgacg tgacggtaat gttcatgcgg
12961 tttcgtgtt tccgtggatg ttatccggcg ttgaataaaa agacgagaaa cgcgacgctt
13021 gatttgaaaa taaaagtac gtttaactga attgctaatt gaattgaaat atcaaattaa
13081 aatggaatcg aaataatgaa gaaaaagcc cttatcactg gtgtaactgg tcaagacggt
13141 tcttatttag ccgagttttt gttagcaaaa ggctacgaag tgcatggtat taaacgtcgt
13201 gcgtcttctt ttaacactca gcgtgtggat cacatctatc aagatccgca tgtggataat
13261 gcgagtttta ttcttcatta tgggtgatttg actgactctt ctaatttgac gcgtattttg
13321 cagggaagtga aaccagatga agtgtacaac ctaggcgctc agtctcatgt ggctgtgtcg
13381 tttgaatctc ctgaatacac agcggatgtg gatgccatgg gcacactgcg tttgttgtaa
13441 gcgattcgtt tgctaggatt ggagaagacg accaagtttt atcaagcgtc gacgtctgag
13501 ctttacggtc ttgtgcaaga aaccaccaca aaagaaacca cgccatttta tcctcgctcc
13561 ccttatgcgg tggcgaaaaat gtacgcttac tggatcgtgg tgaattaccg tgaatcctat
13621 ggcattgtac cgtgcaacgg tattttgttt aaccatgaat cgccacgtcg tgggtgagacc
13681 tttgtgactc gtaagattac ccgtggttta gcgaacatcg ccaggggttt agagaagtgc
13741 ttgtacatgg gcaacatgga tgcgctacgt gactggggcc atgccaaaga ctatgttcgt
13801 atgcagtgga tgatgttgca acaagatcaa cctgaagact ttgttatcgc aacgggtgtg

13861 caatattccg tgcgtcagtt tattgaatgg tctgcaaaag agttgggtgt gaccttaaca
13921 ttcgaaggcc aaggcgtgga tgaaaaaggg attgttacgg caatcgaagg cgataaagcg
13981 ccagccctga aagtcggtga tgtggtagta cagatcgacc cacgttatnt ccgccctgcg
14041 gaagtggaaa ccttgtagg tgatccaagc aaagcgaaac agaagctagg ctggacacca
14101 gaaatcacag tacaagaaat gtgcgctgag atgggtgatgg aagatctgaa agtggcgcaa
14161 cgccatgcgc tattgaagct tcatggacat gatgtacctg tatcggtaga gtaaaaatat
14221 gaagattttt ttaacagggg cagcagggcat ggtggggcaa aacattttgt ccctagctgg
14281 tgagtatgag catgaatttt tgtctccag tagtgctcag cttaatcttt tggacagtaa
14341 cgctgttcat gattatatcc gcatacataa acccgacatg gtgatccatg ctgcagggat
14401 tgtgggtggg attcaggcca atatggctca gccagtgaag tttttggttg agaatatgca
14461 gatgggatta aatattctga cagtttccaa tgcgtgtggt gtgagtcaat ttctgaattt
14521 aagcagttct tgtatgtatc cgcgagatgc acacaacccc ttatcagaag agttgatttt
14581 gaagggcgag ttagagccga ccaatgaagg ctatgcgctg gcgaaagtca ccagtactcg
14641 tttgtgcgaa tacattagca aagaaaaccc aagccaaatc tataaaacga ttatcccgtg
14701 taacttgtat gggcgctttg ataagtttga tcctaatacat tctcatatga ttcccgcggt
14761 gattcgaaaa atacacgaag cgaaaaaagc gaacctagaa gagattgata tctggggaga
14821 cggtagggcg cgctgtgagt tcatgtacgc agaggatctt gcagagtttg tcttctatgc
14881 gatagatcat tttaaagaga tgcctcaaaa cctgaacggt ggtttgggaa cagactacac
14941 gattaatgag tattaccaag cggttgcgag cgatcatcgt tacacagggc gtttcaagca
15001 tgacttgagc aaacctgtcg gaatgaggca aaagctgatt gatgacacaa aactcaaagc
15061 gtttggtctg tctcacagca ccagcttaga agcgggtatc gaaaaaacct atcaatttta
15121 tttaaacgag tacggtaatg attaatattt ctttagcaag tagcacttgg gatcaaatg
15181 aatacgtctg gattcagaga gttattgaat ctgatatgtt taccatgggt aaggaagtgt
15241 cgcagtacga aaaagacttt gccacctttt ttggtgctca atatgcgctc atgggtgagtt
15301 ccggttcgac cgctaatttt ctgatgattg cggcggttatt ttttacgaag aatgctaaat
15361 acaaatgga gcgtggcgat gaagtgatcg ttcttgcggt atcttggtca acaacgtatt
15421 ttccgttaca acaatacggc ttaaaagtga agtttgtgga catcgatcgc caaacactca
15481 acatggattt agataaatta gaagcggcaa taaccgataa cagcagagcg attttgtctg
15541 ttaatttggt gggcaatcca aacgattttg ctgcaatgaa agacatcatt gctgatcgcg
15601 acatctttat attagaagat aattgcgaat cgatgggagc gaccatcaat ggtaagcaag
15661 cgggtacctt tgggtgtgat ggcacgttta gttcattttt ctgcgcatcac attgcgacga
15721 tggaaggtgg ctgtgtcgtg acagacgacg aagagcttta tcacatatta ttatgtattc
15781 gtgcccattg ctggactcgt aacctaccga agttcaataa ggtaacaggt gagaagagcg
15841 acgatgcgtt tgaagagtcg tttaaatttg tattgcctgg gtacaatgtt agaccactag
15901 aaatgagtgg agcattgggt atcgaaacgc tgaagaagtt gccaaacttt attgaaacac
15961 gtcgtaaaaa tgcggagcta ttccagtcac tatttgcgga tcaccctttc atagagattc
16021 aaaaggaaac gggtagagac agctgggttg gtttttcatt gatcctgaaa gagaacgcgc
16081 cgtatagccg agcagagtta gtgaaaaaac tcgtggaaaa tggatttgaa tgtcgacctc
16141 ttgtcacagg gaacttcttg aagaataaag aagtgttgga attttttgat tatgaagtag
16201 ccggcacact agagggggcg gaataccttg atgagaacgg gctgtttgta ggtaatcatc
16261 agaagatgat tgaagcagaa ataaaactgt tagcgaaagt tttagtgtaa tgtattttaga
16321 aaaagaagat tttagaggtc ttgttcagca tgggtgtattg ttttcaatag acctagttgt
16381 actggatact caaaatcaaa tatttagtggg ggaacgcggt aaccgcccgg cacaaggtta
16441 ctggtttgtg ccgggtggaa gagtgtacaa gaacgaaact ctgatcaag catttgagcg

16501 tattttgtttg gatgaattag gtcagatttt ttcttatcaa gatgcaaaac cattaggggtt
16561 atacgatcat ttttataatg acagtgtggt tggatgatgat atttcgacac attacatcaa
16621 tgcgccacat ttaattgaat tatctgaaaa tacaacgcta aatttacctt ctgaacaaca
16681 tcgacattat cgggtgggtaa ggataggtga tctggccttat gatgaatccg ttcattttta
16741 cagtaaagtt ttttttagat agctaaaaaa acgaatagct tttacaatat tatgaaaagc
16801 gttattttaag tgattttaat tcttagtgat attaatcgag agattaaaaa aatgataatt
16861 aatgcttttt acagagattt ttttaattctt tctataggta aagtgcctca ggtattttatt
16921 ggactactca cacttcgatt aattaccgaa atgttgagcg aggagcaggt tggtatattac
16981 tataattttat tgacagttgt aagtttactg gcatttggtt tttttaatcc acttggtcaa
17041 ttttatggta gatatttaat tcaactggcg agaaaggctg aactaaaaac tgcaacaaat
17101 atcatgctga tgttaagagg tctaacgata ccgtttgcat tgtgcttagc tatcgttgtc
17161 ttctatatgt ttcgttacga acaatacttt tcaattgctg aatactcggg gtttattggt
17221 gtttcgggtga ttgccttgat tcatgggtgtg cttctaaatg ctaccaacgt attagtaagc
17281 cgagtgaat ttacagttta tgctgtactg acattgttta taggggtgat tttttcagtc
17341 atttttatcc agtttaagca aactgcgatg gcttggtatt atgggttagc gttttcacag
17401 atttttttta gtgttatttt gtataacatt attacttctg aacaagagtt ttcaattgta
17461 aaaattaaat cagccttcaa taaacattat atgaaagggtg ttttattttt tattttgcc
17521 gtgaccatca cgttattatt gcaatggggg cagacggctt ctttctgtt aattgttgaa
17581 gattttatact ccgctcaaat attggctttc atcgctgttg gaatgacatt gagcgggtgca
17641 attttttcag ctcttgagag cttatctact cagttttaca tgccgcttta tttgaagaaa
17701 attaccaatg cagatcaggc tatgcgaacc aaggcatgga atgaattagc cgatatttta
17761 ttaccagttt acattgccgt gttaatttat gtgattgcct tagcgcctta tcttgcgaaa
17821 ttattagtgg ctgaaaaatt tcaagacgcc tatatttacg caatgattgg ggcttttatt
17881 gaatttttta gggatgatcac aaatcttggt tacttggttt cgcaatctga agtaaaaaa
17941 aaaagtacca ttatgcccta tctgattggt tttatgatga tggtaattgg cctttattct
18001 attgatgtat ccagatcgcc atggatagtg cctgtcatat tagcgttatc ctatttaaca
18061 actctttcta ttatgtttta taacatgaag aagttattat ctataagggt tgaatttttg
18121 aatcctgcga ttgcttcatt actgacatta ccgctattgg tcatgcatct cctatcaatt
18181 actccaacct tattcaactc attcctgttt tctcttttag gtggttttta cctactcctg
18241 attcaatatc cttttttgaa gacaaaaatt aaaaaaatga gcgccgatg aaaaaagcct
18301 gtttggtagt aaatgactat atgctttgta ataaagtctt tgatgaaaaa atatttcgag
18361 ataataataa ttataagtat ataaaactta aagaattatt ttatgaaaga ggttacgatc
18421 tttcaaccca agacataaat tcaatatcag actctgatgt tgttatctat gcagctgata
18481 taccagaaaa actaccgaaa cgtaatgagg ttaagaaatc tcatcttatt atttgggaaa
18541 gtgaatttat atctccagaa aattataata aggtaaaaca taattcattt aataaaattt
18601 ttacttgga tgatgggctt gttgacgaga aaaaatattt caaaataaat tttgttcacc
18661 aattccctaa ttttatcaat aaaaatatta ataaaaaaa gaagctttgc actctaattg
18721 ctggtaataa aaaaccccca catacctctg ttggatgatc ttatgctgag cgtgaaaaag
18781 ctataagatg gtttgaaaaa aatcacccat ctgattttga tttgtatggg gttggatggg
18841 atcggtatcg tttttccgga tcaaaaatag tccgagcttt aaatagagtt ccattattac
18901 caaatggac acaaaagatt acaggacgat cgtatccatc atacaaagga cctattgaac
18961 gaaaaagacc aattatggaa aaatacaaat tttccatttg ttacgaaaat gtcattgatg
19021 ttccagggta catcacgaa aaaatatttg atagtttttt ttctggctgt attccagttt
19081 actggggcgc aaataatata gaaacatata tacctgagaa ttgttttatt gataagcgga

19141 aattttctttc atacgaagat ttatatagtt atatgaaaga aatgagtgat gaagagtaca
19201 ttggatatat aaataatatt caagcttttc ttaagagtga cttgtcatct ccgtttaagg
19261 cagaaacttt tgctgaaaag gtagtgtctg aggtttttaa ctaatgatta aaagaatatt
19321 gtatgttgct tttaaatatg agtacggtag aaaagaaaac ggtttcgcac tgaattataa
19381 agcatggttt catggttttg aacagttggg ttattctatt gagggagttt tttttgagga
19441 ctatgatcat aaaatgcttc agactagaat tattgaaaag gctatgaata gttctataga
19501 tatagtattt tttattcttc aaaaagatca ggttgactta gatactttaa agtacttaag
19561 tgaaaataat gtttttactg tcggtttttt tggtgatgac caatggcgtt tcgataattg
19621 gacatccatc tatgctcctt atttttctgc gtgtataact tctgataagt ttagtataaa
19681 aaaatataaa gaaataggtc aagggaaatat aatatatagt cagtgggctt ctttagagcc
19741 ccaaaaatat cattcagcac cttataagta cgatataagt tttattggaa gtgcaaatcg
19801 ttatagaaaa tggttttatta attttttaga gaaaaaagg attcatgttg aatgttttgg
19861 gtatggctgg aaaaatggac gtgtgagtta tgaagatatg gaattgatat tcctacagtc
19921 taaaattaac ttgaatatTTT caaatagtat aagttttgat tttagattta tgatgagttc
19981 ttttagaagt tttttatctg tagtgaaatc gtattttaa tatgacggta agaatagtag
20041 tcagacaaag gcaagaaatt ttgaaatacc tgttcatggt ggttttcaaa taacagatta
20101 tgtgcctaca ttagaagagt acttcaaaat aggtaaagaa attgtgtgtt ataatactat
20161 tgatgagggt gagaaactga ttcgctttta tcttattaat gattatgaaa gagagtgtat
20221 aaaagaagca ggtactaaaa gagcacgtga aaagcataca tataaggcta ggatcaaaaa
20281 tttcatggtt aacatagata aaatatatga taagtaaaat tggcatttca aaacttatag
20341 agccccattt ttttaacgag ttggaatttg aaaattataa ggttctaaca tgtaattctc
20401 gttctttgtt gactaatacg cgttttgatc ttgcttttaa gttgctgtac cttgaaatga
20461 tagataaaaa tgtttctttt tcaaaagaag cttataaaga acacatacgt gcttttagtt
20521 tagggggggt taaagaacct ggtcaagaaa gtaagaactc aattgaaaaa ttctatgatg
20581 ctttttttga aacatttaac gatatcagcc tacacggttt tgatgcaaca aagtcactga
20641 taccactgtc tcacaatggc tctatcgcaa atggtgccca tcgtgttgct tctgcaataa
20701 ttttagacaa agatgtgagt tgtgttaagc tacctgtttg cgatcattta tatgattata
20761 aattttttta ttcaagaagt gtaagctgtg atctacttga tatagctgct actaagtttg
20821 ttgaatatgc tgataatgta tatattgcat ttgtctggcc gacagctcag gggtttgatg
20881 aagaaattga aagaatcatc ccaaatatta tttatcgtaa aaacatttaa atgacaccta
20941 atggcgcgca caatctatta tcacaaatat attttgagga accttggtta ggaactgtag
21001 aaaacaactt ccgtggttca aaaaataaag ttactgagtg ttttaaaaca tttgacttta
21061 tgcgagtcac tgcatttcaa gctgatagtt tagattctgt cctacaaata aaggaaaata
21121 ttaggcagat atttaatgta ggcaaacatt ctattcatat tacggatact aaagatgagg
21181 ctatccgtat ggcaagaatg atttttaatg ataatagtat acatttttta aattatgctt
21241 atcctaataa gtataaatcc acacatgaaa aattggcaga gtttaaaaaa catatcgatg
21301 ttaattgcat cggttcagat gatataattc ttgacagtgg catggttcct tctatttatg
21361 gtttgcgca agcgtcagat atcgattatt tatctattaa gtctttatca gaatataaaa
21421 atgaaggatt ggagtgtcat gataaagaat tggagtatca tgatgaagaa aaaaatgaac
21481 taatatacaa tccaaaatat tttttttatt tcaatgggct taaatttatt gcttttaac
21541 aactttatcg aatgaaaagt aatagagatg aagttaaaga tcgcaatgat tgcaaatga
21601 tggaaagcct gattgaaaat aatcagtaca aaaatataaa agccaaatta aaacagagta
21661 tttactacga aaaaattaag ctaagaaaaa aaattacatg tctgttgaaa agtataggtc
21721 tatatgatTTT agtaaaaaaa atatataagg tggtttttaa atgagttcac caaaaatc

21781 ggttgttatg tctgtttata atggtgaaaa atatcttgga gaagccatag atagtattct
21841 taagcaaaca ttttctgatt ttgaatttat tatcattaat gacgggttcga ctgataagac
21901 actagagata ataaagtcata atatgaagaa ggatgaccgt attgtattgg tttcaagaga
21961 aaacaaaggg ctaatagtaa gcctaaatga agggctagat ttagctaaag ggcaatacat
22021 tgctagaatg gatgcagatg atatttcaat aaagtcacgt tttgaaaagc aaattgagtt
22081 tttagatagt aatccagata ttggtgtatg tggtagctgg gttgaagttt ttggtgagaa
22141 cataaaatcc aaaaaatgga aaatgccaac ccaagatcca gacttaaagg caaaactcac
22201 tttctccgta ctttttgcat atcctactgt aatgattaga aagaaagtta ttgataaata
22261 taaaattaat tatgatttag gttataaaga tgccgaagac tataaatttt gggtcgattt
22321 ttcaaaatat acactttttt ctaatgttcc tgaaatattg ttgctgtata ggtatcatca
22381 agagagtata tcacgtgtag ctgataataa agaaaataaa gaaagatttg agatcatttc
22441 aaaaattcaa aatgaagtgc ttacatctat agggattgta ttgacaaatg aagggtgcgaa
22501 aaatcatttc attctttcac ttaatgagcg cattattaac aatgtaacag attgtgatat
22561 gataagagcg catcttttaa aaataagtag ttctcaaatt gaaagtagcc aatttgattc
22621 ttctgctata gaaaggctta tgtaaataaa atattttatt tatctgattt tatcgataag
22681 aagagataaa gatctgagtt atctaaagat atttgattta atgtttttaa aagggtgcctt
22741 tttattttta aaagataaaa tggagcagtt ttaataatga cgcttgatat ctgagttggt
22801 attcctctat ataataaaaa ctactctatt gtaagatggt tgaattctgt tttatatcaa
22861 actattttgc cttttgaaat aattattggt aatgacgggt cgactgatga tagtctcggt
22921 gtgctagatt attacctaaa aactatctct atgctgatg ttaatgttat tgttcatgat
22981 cagcagaatc aagggtgtatc ggctgcgcgt aacaatggca ttgctctcgc taagtcaaat
23041 tacattgcat tgttggtatc tgatgatgaa tggcatcctg agcatattgg gaaaatgacc
23101 acgttaattg aaaaatatcc acggttgctt gtttatacct gtaaacaatga agtctgtgaa
23161 aatgggttata gttttacacc acctcagatc tttagttcag agttaacaac catgggatta
23221 atcgataact attttgtaag agctggaaaa tatgaattag tcaacagttc taaagtagtt
23281 ctctacaaac ccatTTTTga gagtggtggt ggttttctta ttggtgctaa actgtgtgaa
23341 gatctatact tatgggagcg gcttgagaaa gtaggctggt ttgcttttac agattacctt
23401 ggagtaacgg ttcatcaaga aaaagatatg agtcgtaaag ctagaaacta ctctcaaccc
23461 tatatacttg agtattattt caacgtttca ggttcaatta attctgaatt acatggttat
23521 ttatggacgg tgtatcgtaa ccatTTaagg ctatcgatcc taaatggtaa tttaatgtaa
23581 tttatttctc gctggaaatt tggctcttac tatttcaagc caaaatctta cttaattttt
23641 ctttatgctc taatacctaa aaaaatcatg aatattttta aagtaattag acgatttttg
23701 ttaaggtgat ttttttgaaa tattttcttg ttttatcttt ctgttctctt ttcaggtctg
23761 ttaagctttc tgctaactgt gttgttgctg aagatttgat taaaacattt tttttgtttt
23821 tatattttct tttttttact tagcacttgt tagaaatggt tttttctcga tatggattgt
23881 gcgtgaattc ttttttttat tttttatttc atttttatgg atttttttaa aaaacaaaaa
23941 tgttttgcga tattgcctta tttattttct tttcattgta aatgtgcttc atgtattaca
24001 atctataata ggttacaaaa tagtttattt ttataatttt ttagatatgc tttggttacc
24061 aggcactgca cgtcagacat tagtttattc gccgggtgaa tttggtacat tttttgttct
24121 atgggttggt ctttattttg atagaataaa cgtttttatt gatgaggcat caacttacgc
24181 aatcatcaat tttgcactat cagttttttt gatttcagtt tcacgtcgta aatttgcaat
24241 atgtttcttt gcgttttctt tttttgcaag catggcaaag gtttttgtaa ttttattgcc
24301 attgtttttg ttttttaatc tattgaattt taaattcaat agattaatta agttgtttat
24361 tctgtttggt tttgttttta taataagcta tcccttctta ataaatattt tgggtgattt

24421 gttttttaat ggtcaaatta tattggattt aagcgattct ttgtctgcgc gtgtatatgt
 24481 gacatggatg attagccaag gtagttcatt gtgggattta ggtgagatgt ctctaacaaa
 24541 ttttgctgct tttgatggct atgtttctaa attggctttt tttatgggtg ggttggtttc
 24601 tttgttattt gtgaggcaga aaatatcgc tttatctttg ctttttacac ttatagcatc
 24661 ttttcagtat ggctctgtct tttttatggg gtggctatat tatattttac tagtaagttt
 24721 taataatatt acacatttaa atagagggtgc taaacgatgt gcggtgtagc gggttttatt
 24781 agtaagcgtt tatcgccggt cgactgttta acttccatgg tcgaaagtat tatgcatcgt
 24841 ggaccgaatg atagtgggtct atgggttgat gatgactttg gtgtctgttt agcgcacgca
 24901 cgcttatcaa tacaggattt aagttcagct gggcatcagc cgatgcattc aaaatctgag
 24961 cgctatgtta tgatttttta tggtgaaata tacaatcatt taacattgcg tgaagaactg
 25021 atcgagattg taccaagtta ctggaatggt cattcagata ccgaaacctt gttggctggt
 25081 tttgaagtgt ggggaataga acagaccata caaaaatgtg tcggtatggt tgctatcgtc
 25141 ctatgggata aagtacttaa acagttgatc ttgattcggg atcgatttgg tgagaagcct
 25201 ctttattacg ggtggcagcg cgatactttt ctgtttgctt ctgagttaaa agcgcttaaa
 25261 gctcatccca gttttgaagg cagcattaat cgtcaggcgt tatcgcatth ttttcgtttg
 25321 aattacatac caacgccctt atccatttat gaaggatatc tcaagttaga gccgggtggt
 25381 attgctgtct tttctcacga ggggcagttg ctctctaaac aaacattttg ggatgccagt
 25441 catgctgttt ctctgcaaaa tttttccgat catgatgccg ttgataaatt agatgactta
 25501 attaaagcag ctattcaaga tcaagcggtt tcggatgttc cgttaggggc ttttttatcc
 25561 ggagggggtg attcgtccac tgtggtgggt attttacaat ccctctctac tcgtccggtc
 25621 aaaaccttta cgatcgggtt tgaccacgcg gattttaatg aagcgagtga ggccctcagc
 25681 gttgcaaac acttaggaac ggatcatgtc gagttaattg tcagtgcaga agatgctcta
 25741 gcgattatta atcagttacc tgttatgtac gatgaacctt ttgctgacgc ctctcaagtg
 25801 cctacgtttt tggtttcgaa gctggctaaa aaagaggtca ctgtatgctt gtctgggtgat
 25861 gggggcgatg aactgttttg tggttataac cgctatcatt acactgctaa agtttggtcg
 25921 tattttagaaa aaattccctt tccaatccga aaaatgctct cagtcttttt gttgacgctt
 25981 tcgccatctt cttgggatgt tttaagtaaa acttttaggtt tgaataccag attaccaaat
 26041 ttaggcaata aaattcaaaa aggtgcccaa gctttaaagg caagagatat tgaagacctt
 26101 tatacacggg ttgtctccaa ctgggatcta gatgagcctt tggttaaaaa tactgcggtt
 26161 gagaaattac cgtttttgtc tgacttaaca gaactttccc atcttaatga cttagaaaaa
 26221 atgatgttgt gggataagca atcttatcta atggacgatg ttttagtgaa aacagatcgt
 26281 gctacgatgg cgtgttcatt agaagggcgg gttcccttgt tagaccaccg cattgctgag
 26341 tttgctgccg gtttgccgat ccatthgaaa taccgaggtg gaaagggaaa gtggctttta
 26401 cgagaagtac tgtatcgtta tgtacctaaa aaattaattg aaaggccaaa aaaagggttt
 26461 agttttaccca tcgctgaatg gttgagagga ccgctaaaag attgggcgaa tgttttgctg
 26521 gattctgatc gtattgataa agaaggcttt ttgtcgtctg aattggttca aaagaagtgg
 26581 cgtgaacatt tagcgggtaa acgagattgg tcgtcgcagt tgtggagcgt tctaattgtc
 26641 caattatggc ttgagaaaaa caaatgaata aaatagtttt tgtggttaat aatgccgctt
 26701 actttctatc gcacgcgaag ccaattggct tagctctgct ttctagaggt gatgaggtgc
 26761 atgttattgc gccgggtgag tgccctgttg aactttctga ggctgggttt aactatcatt
 26821 ctgtggaaat gtcgcgtaag ggcattgaacc ctcttgctga actgtctacg atttttgctt
 26881 tgcacgtttt atttaaaaca atacagccag atttagtgca tttggtgacg attaaacctt
 26941 atttgtatgg tggatttgca gcacgttcag cgaaagttcc ttcagttggt tctgcagttg
 27001 cagggttagg tattttgttt tcggctcaag gtttaaaaaa taagggtata aaatctattc

27061 tttaccctat gtatcgtttt gcttttggac ataacaacca agctgttatt tttcaaaata
27121 ctaacgatcg tgatttggtta gttaattggg ggggtgttgca gtttaaaaag tctcgtttga
27181 tacgtggtgc aggtgctgac ttatcggttt atccttactt accagaaccg gatgggtctgc
27241 caattatttc tttcgcgga aggtgtttaa aagacaaagg cgttattgag tttgtagaag
27301 cctcgcggat actaaaggcg cgtgggtatta aagctcgttt ttgggttaatt ggtgatccag
27361 accctggtaa tagcaatacg gtaacacaag aacagcttga tcaatggcaa gcggaaggat
27421 tagttgagt ccttggctat agaacggata tagccaatct tttttctcaa tctaacatag
27481 tgtctttgcc ttctatttat ggtgaaggat tgcctaaagt attgatagag gccgcggcat
27541 gtggtcgtgc tgtagtcacc actgatcatc caggctgtcg agacgccata gagcctgata
27601 cgggagtatt ggtatcaata aaagattcga ctgcattggc ggatgcaatt gagcgcctta
27661 ttaaaagtcc tgatttgcg aaatcaatgg gattagctgg tcgtaagctt gctgaagctg
27721 aatttagtat cgaaacagtt gtcaaccgcc atttagaaat atatgccgag ttaacttta
27781 aggatgataa atgaaaattt gccctgttgt gttgtctggt ggtgttggtta gccgcctctg
27841 gcctttatcc cgtgagcact ttcttaagca gtgcttgaat ctcacagatt tgttgtcttc
27901 tttattgcag caaacctag tgagaacgaa tcatcttaat gttcagtcgc cgcttgtggt
27961 gtgtaatgac gatcatcggt ttctcattgc ccagcagctt caggatatgg gtgtaaaagg
28021 cgctaaagt atgctggaac cagtagggcg caataccgcc ccagcagtgg cattagccgc
28081 ttttgaagt ttgcaatcag ataacgaaga cgttttgatg ttggttcttc ctgccgatca
28141 tgtgattcgt gatacggccg cgtttgaaaa agccattgcg caagccaaag tactagcggg
28201 agcaggcggc ttagtcacct ttggtatcac accaatgcgc gctgaaactg gctacggcta
28261 cataaaagca ggacaagatt cttgtgtgga aaaattcggt gaaaagccag acctagccac
28321 cgcgagctct tatttagaga gtggcgacta cctttggaac agcggtatgt ttctgtttca
28381 agctagccaa taccttgctg aacttaagca acaccgtccc gctatgtatg cggcggtaga
28441 atccgcttat ggtaaccgta cggaagactt ggattttatt cgtattggta ccgaggcggt
28501 taccgcatgc ccaagtgaat ccattgacta tgcgattatg gaaccaacac aaaatgcaa
28561 agtgggtgct tataatggcg attggagcga cattgggtgcg tgggatgcat tgcacgatta
28621 ctgcgaaaaa gacagtaacc acaatgtgct ggttgggtgat gtgatggcag agtcgacgac
28681 aaattccttg gttcgtgctg aatctcgttt ggttgcgact gttggcgta ataactagt
28741 ggtgatcgaa accgccgatg cggattgat catggacaaa gatcagtcac aagatgtgaa
28801 aaaaatcgct agtcgtatca aagccgaagg tcgccaagaa cacatgcac acactacagt
28861 gcacgcacct tgggttactt atcaaacagt tgatcttgggt gatcgtcac aggtgaaacg
28921 tatcatggta aaaccgggtg agaagttaag tgtgcaaag caccaccatc gcgccgaaca
28981 ctgggtggtc gtatctggta cagccaaagt tcaaaatggc gagcgtgaaa tactattaac
29041 cgagaatgaa tctacctaca ttctgttggg tgtggttcat gcgttagaaa acccaggtaa
29101 aattccatta gagttgatag aagtgaatc tggaagttac ttaggggaag atgacattgt
29161 acgttttagc gatcgttatg gtcgctaaat cattgcgagt atgattttag acaaaacgag
29221 gtttgtgcct cgttttgttt atttgttcta tttagtaaag agaacaata gaacaataga
29281 taaatacata aataataggt taatagagag cattggttat gacaaccctg aaagaactta
29341 gcatagagca agacgtggct tttggaacca gtgggtgtaag agcgttagtg gaaaacctga
29401 cacctaaatt gtgttacgcc tatgccaaag ctttcttgca acaaatatgt tcaaacgcc
29461 cgcagggtgc ggtcgctatc gacttgcgcc ccagtagccc agatattgct tgcgctatgt
29521 taaaagccgc tcaagactta aacatagacg ttgttttttg cggggcctta cccacccag
29581 cattggcgta ttttgccatg caaaacgcc tgccaagcat catgattacg ggtagccata
29641 ttccgtttga ccgtaacggc tttaagtttt acaccacgac cgggtgaaatt accaaagcgg

29701 acgagcttag catccaaaat gcgccagtaa gtgaacgcag tagcgatttt tgtttggctg
29761 cgttgccgcc agtcgattta gccgccagct ttttatatca aaaacgttat acggatttgt
29821 ttttatcgac tgccttaaag ggcaagcgca tcggtttata tgaacattct ggtgttggcc
29881 gtgaccttat tacatctata ttaagacaac tgggggctga ggtaattagt ctggatcgaa
29941 cagatacgtt tgtgccgatt gatactgaag ccgtttcaga agctgatcag caaaaagcct
30001 ttgcttggtc gaaagagtgg gcttttagatg ccattgtatc caccgatggc gatgcagatc
30061 gtcctttaat cagcgatgaa aatgggtcttt ggttgcggtg tgatgtcgtg ggtatttttg
30121 tggcgcgctt cttacaagcc acccacgtcg ctacgccagt gaatgccaat accgccttgg
30181 agctggctaa tccaatatg tttaccaagc gtacgcgaat tggttccct tatgttatag
30241 aagcgatgca agcgtttagc ctacaagcta caacgacaac cggtagtcct aaagtgttag
30301 gttacgaagc taatggcggg ttttttagtg gtaatgacat gccgtgtggg ctaggcatgc
30361 taaatgcctt gcctaccctg gatgcagtac tacctatttt ggctgtgctt tgtcagtcct
30421 ctcaagacgg tttaccaatc agccagttgg tagacggttt gcctgctcgt tatacttaca
30481 gtgatcgat tcaacaggtt ccgaccgaat ttagtcagag gttaattaaa caactaaaag
30541 aggatagtca gcagatgcaa tgcttttttg aagcaactgg tgtagaagca cccagtgttg
30601 acactgttga tgaaaccgac ggtctgcgta ttcacctaag caactatgaa atcgttcatc
30661 ttagaccctc tggcaatgcg cctgaattac gctgttatgc agaatcatca gaaatgaacc
30721 gtgctaaaca aatcgtagag ctggccttaa gatatgttca aagtatttaa aacggttaat
30781 ttgaaaaata cttatgtgta ctggggatag gaaaatgcct aagtcaattt tactgacagg
30841 ctcaacagga tttgttggtg ctaatctagt aaagtcactg acattgaagt cggattacat
30901 tgttaagtct gctgtgcgtc atgctgtaaa taaagatgat gggttattgt ttgaggttgg
30961 tgatatcaac gcttcaactg attttgagct tccctcaaa aatactacag ttgttgttca
31021 ctgtgctgca cgtgcccatg ttatggacga taaagaggca gagccattga cactttatcg
31081 cgagggtgaac acagcaggta ctgttaactt agccaagcaa gctattgatt cgggagttaa
31141 gcgctttatt tttatcagca gtataaaggc aaatggagag ggtacattag tgggttgccc
31201 attcaaaaaca gaagataatc acgcccctga agacgattac ggcttgtcta aatctgaagc
31261 agagaaacag ctagtagcgc tcgccaaaga ttctagtatg gaagtgggtc ttattcgccc
31321 tactatagtc tatggacctg gagtaaaagc aaattttgct tcattgatgc gcttggtttc
31381 taaagggatt ccattgcctt ttggctctat tactcagaat aagcgtagtc tagtctctat
31441 taataacctt gttgatttaa ttgtaacttg cattgaccac cctaaagcag caaatcaagt
31501 tttcttagtt tctgatgacc atgatgtttc gactgctgaa atgggtgcgtg aactggccat
31561 tgccctagat aaaccactt ggcagcttcc agtaccaatt tggtgctaca agttatttgg
31621 gaaactatth ggtaagtcag atatcgttga caggctaaca ggaacattac aagttgacat
31681 ttctcataca aaagaaaccc taggttgga gctcctcag actctgcagg aaggttttaa
31741 acaaacagcg caagctttcc ttcaagcaaa caatagataa tggtaaaaat gattcgctta
31801 attgattttc tcgcggcctt tttgggcttg cttcttttgt ggccagttct acttatcgtc
31861 accattattg gcttggtcga taccggatcg ccgatttttg tgcaagagcg tgttggaacg
31921 aacaaaaagc catttaagct cattaaattt cgcacatgt cggtggtatc ccagtcggtc
31981 gcctctcatc tagcaagtac cagctctata acaaaactcg gcgctttttt gcgtaaaact
32041 aagattgatg agctgccaca actcatcaat gtgctaaaag gggagatgag tttagtgggc
32101 cctcggccta acttatttaa tcaagaagaa ttgattgcag aacgtgatgc tctgggcgtt
32161 tatgatgttt tacctggcgt taccggtttg gcacaagtgc aaaatattga tatgtctacg
32221 ccaagacttc tagctcaaac cgataaaaag atgattgata ctctgactct taaagattat
32281 tttcgctaca tctttatgac cgctaccggt agtggtgcgg gtgatgcagt taaaaataa

32341 accatctaac aatatgaaca gttggaacta cctatgaaaa tcgcagttgc cggaaccgga
32401 tatgtcgggc tatccaatgc tatgctattg gctcagcatc atcaggttat cgcggtagat
32461 atcatcgctg aaaaagtagc aatgctgaac aataagcaat cgcccatagt tgaccaagaa
32521 atagagtatt tccttgcgca caagacgcta gattttcaag ctacgctgga taaacaaagt
32581 gcctatcgca atgcagactt tgatcatcgc gccaccccca ccgattacga tccgcaaaca
32641 aactatttta atacgacttc ggttgagtct gtgattaaag aggtaatggc gataaaccgc
32701 caagcgggta tggatgatcaa atgcaccgtg ccggtcgggt aactgctgcg gatcaaagag
32761 cagctagggt gcgataatat actgttttca cctgagttct tacgtgaagg gaaggcgtg
32821 catgataact tacaccctc acggattatt gtcggtgagc gcagtgaacg tgctgaagtg
32881 tttgccaatt tactgggtga aggcgcgcta aagaaaaata ttccggtgtt gtttaccgat
32941 tccaccgaag cggaagccgt caaactattt tctaatactt accttgcatg gcgagtggcg
33001 tattttaatg agctcgattc gtatgccgaa gcgcatggct tggatgctgc gcaaattatt
33061 gagggggtg gtttggtacc acgaattggt aaccattata acaacccttc ttttggttat
33121 ggtggttatt gtttgcccaa agataactaa cagttacttg ccaactacag cagtgtgccc
33181 aataacatta ttggtgcatg tgatgagggc aaccgtaccc gtaaagattt tgtggctgat
33241 tcaattatca agcgcgaacc aaaagtgggt ggtattttacc gtttgatcat gaaagcgggt
33301 tcagataact tccgcgcacg gagcattcaa ggcattatga aacggattaa ggctaaaggt
33361 attgaagtgg tgggtttacga gccggtactg gatgagccgg agttttttca ttcacgggtg
33421 attaaagatt tagacgagtt taaacaaacc gcggtatgta ttgtctctaa ccgtatgggt
33481 gaagagttgg cagatgttgc cgataaggct tacaccgag atttggttgg tagtgattag
33541 gttaaaaagg gtctagggaa aagcaaggac ctagaacctt actcaaccat tattttcgag
33601 acttaaacat gaaatatcta gttacagggt ccgctggctt tattggtagc gccaccgtaa
33661 aaaaattaac agaacaaggc catcatgtgg ttggcattga taacattaac gactattacg
33721 atgttaatat aaaacatgcc agactggcgc gtattgagca cccgctgttt cattttctta
33781 aagtagatat tgctgatcgc gctgccatgg cgcagctttt cgaacaagaa aaatttgagc
33841 gcgtgattca ccttgccgcg caggcagggg tacgttattc actcgaaaac cctcatgcgt
33901 acgccgattc aaacctagtc ggtcatttga atattcttga aggttgccga caaaataaag
33961 ttggccattt agtctacgct tcgtccagct cagtgtatgg cttaaagtcg aaagtgcct
34021 ttgcgacttc tgactcggtc gatcaccagc tttcgttgta tgccggccact aaaaaatcta
34081 atgagctaata ggcacacagt tattcgcacc tttatgatata tccgaccacg ggtttgcggt
34141 tttttaccgt gtatggttct tgggggcgtc ctgatattgc tccattttatc tttaccaaga
34201 agattttagc gggcgaagcc atagatatta ataaccatgg tgatatgtgg cgtgatttta
34261 cccatgttga tgatattgtg gagggcgtag tacgcattgc agatgtgcta ccaactcgta
34321 atgcagcttg gacggtagaa tctggcacgc cagcgaccag ctacagccct tacgcgattt
34381 ataatatcgg ccatggctcg ccaattaatt taatggaatt tgttaaagcg attgaagagc
34441 aactgggcat tgaagccaat aaaaacttcc gaagtatgca gcctggcgat gtttatcaaa
34501 cttacgctga tacggcagac ttatttgctg ctacaggcta taagccgaaa gttggagtaa
34561 gagacggagt atcggagttt atcgttggtg atagagattt ttataatcaa taatcaatca
34621 ttaataacgt tcctgttgca aggtctataa tgagttgaac tttgaataga ataacaatta
34681 aagacatata ttatggctag gctaaacttt atctggaatc tttcgcgtgt aaataagcgc
34741 atcatcagcg ttttggtgga tgcgtttttt atcattttct cattttacag tgcttactgg
34801 gttcagatcg ggaacgttga gattattcac tcagactcga taccttacct tcttgcaacg
34861 gttatcgttg ttacaatcct aagttttact cgacttgggt tgtacagagc tatcctacgc
34921 tacctcactt tccatgctct tgctgtgggt agtggttgta ccctgatttc tgctgcatca

34981 gtcgctattg ccgcttttcta ctttgatgcg ccagtgccac gttctttacc tatcatctat
35041 ggtacttttt tgtgcctggt atgtgggtggg tcgcggttga ttgtgcgtgt attgggtttct
35101 gggctcaatg gcaaaggctg taaagtcgtg ctgatttatg gtgcgggctc tgctgggcgt
35161 caacttgcca ttgcttttac taactcagaa aactacaagg tggcaggttt tattgataat
35221 gataaaaccc ttgagaacac agtgattatg ggcattgcagg tacatgatgt tagtcgtgct
35281 gcatacttgg ttgataaata cgatgttacc caaattttac ttgctgtgcc gagcgcttcg
35341 agagctcgta gaaagaaaat cctcgaatca ttaatcaatc tgtcggcgga agtgcttacg
35401 gttcctgata tgaaagatat cgttgaaggc aaggcatcca tcgatcagct gaaagatggt
35461 gcgattgaag acttactggg gcgcgatccg gtgacacctc agcaatgttt aatggaatcg
35521 aatatcttag gtaaggctgt catggtgact ggggctggtg gttctatcgg ctctgagctc
35581 tgtcgtcaga ttgtgcggca aaaacctaaa gcactagtgt tgtttgagct ttcagagttt
35641 gggttatatc aaatcgatag agaactcaaa caactgatgg aagccgaggg tctgcacggt
35701 gaaatcattc cgctattggg gtgcgtacag agaatcaatc gccttgtggt aacaatgaaa
35761 agcttcaagg ttcaaactgt gtatcatgct gctgcttata aacatgtacc tcttggtgag
35821 tacaatgtcg ttgaaggggt acgcaataac gtttttggca cttactacgc tgcgcaggcg
35881 gccattgaag caggtgttga atcggttgtt ctgatctcca ctgataaagc ggtgcgcccg
35941 accaatgtca tgggaaccac caagcgtatg gccgaactgg gtttgcaagc gcttgcgga
36001 caagaaaacc ttaaagccaa aggaactcgc ttttgtatgg tgcgttttgg taatgttttg
36061 ggctcatcgg gttctgtggt tccgctgttt aaacgtcaaa ttgaggcggg cggcccaatt
36121 acggtgacgc acccagacat tattcggtat ttcattgacca tccctgaagc ggcgcaactg
36181 gtgatccaag ccggagctat gggtaaagggt ggggatgtgt ttgtgcttga tatgggtgag
36241 cctgtgcgca tcaactgacct cgcggttaac cttattcagc tttctgggct ggaagtgaaa
36301 gatgagcagc atccttatgg ggatattgct attgagttca cagggttaag gccagggtgag
36361 aagctctatg aagaactgct gattggcgat aatgttcaaa aaacggctca tgagcgaatc
36421 atgacagcca atgaacgtta tttaccttta gcggagtttg aacagcatct taacgagcta
36481 gacaaagctt gtcatgcatt taaccatgag cgtatccgcg agctattgct tgaagcgccg
36541 accgatttta acccgacaga tggatttggt gacttagttt ggcagcgtac gcaagataac
36601 caaactcagc ttgaaaaaca gtttgtgcac taatgggtgtc gatttaagtt gaaaaaccgc
36661 ggtctctacc gcggtttttt taccctttcg attcatgctt gtgtgaaatc ggtatgatcc
36721 catcggttga ttaatgtact caggagtgga aaacaacatg gaagtgggtc atcacggagg
36781 gaaggcgagt gtcacgggtt catgccatga attgcgagcc gatgggcaag cgctgctgat
36841 tgattgcggc ttgtttcaag gggcggtatga acgcccgttg gcggtggagt ttgcgctggg
36901 gcatgtggat gctctgatct taaccatgc gcacatcgac catattggcc gtttgccttg
36961 gttattggca gccggtttta agcagccgat ttattgcacg gcggcaacgg cggagctggt
37021 gccattgatg ctggaagatg gtttaaagct gcagttaggg atgtctccca agcagagtga
37081 gcgtgtactt accgaggtgc gccgtttgct gcgggtgcaa gattaccaa agtggtttgc
37141 agtgcagcct aagtgtgctg attcgctctg ggtgcgcttt cagcctgcgg ggcataattt
37201 gggctcggcg tatgtggaat ttcggcgctc gaatgggtgag gtgggtggtt tttcagggga
37261 tttggggcca agccatacgc ctttgttgcc tgatccgcag tcgccagagc gggcagatta
37321 tctatttatt gaaaccactt atgggtgataa gcagcacgag gatgtgcaga gccgagggca
37381 gcggtgcgt gcgatgattg agcgctcact gactgacggc ggtgcgattt tgattccggc
37441 gttcagtgtc gggcgtaccc aagagctgct ctttgatatt gagcagctta tcttttctca
37501 gcaaatcgat gctaatttgc cgatcattct cgactcgccg atggcgagc gagtgacagc
37561 ttcttatcgt cgctttaagc agttatgggg acgagaagcc aaagcgcggc tgcaaatgca

37621 tcggcatccg ttggcgtttg agcagtgtat tacggtggaa gatcacgaa cccatgagcg
37681 cttggtcaac cgtttagcct caaccggaga ggcggcgatt gtggtggcgg cttcggggat
37741 gtgtcagggc ggcgcatta tggattattht aaaagcgctg ctgccggata agcggaccga
37801 tctgattttg gccggctttc aagcagaagg tacactcggg cgcagtattc aaagtgggtca
37861 accttcgggc tggattgagg ggactgaagt tgaagtcaat gcgcattatc atacgatgtc
37921 cggttattcc gccacgccg ataaagcgga tttgctgcgc tttattgccg gcattcctga
37981 aaagcccaag caagtgcacc tgatccacgg tgaagcctca gccaaagcaag cgttcgcggc
38041 tgagcttact caactcggat attcgggtgct ttga