

SEQUENCES

L.grayi mvaE:

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E. faecium mvaS:

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E. gallinarum mvaE:

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E. casseliflavus mvaS:

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E. faecalis mvaE:

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acagtgagcagaactgattatttggtagcaatggcgacagaagagccctcagttattgcggctttgagtaatgggtgcaaaaatagcacaaggatttaaacagtgatcaaa
caacgcttaatgcgtggacaaatcgtttttacgatgttgacatcccgagtcattgattgataaactacaagtaagagaagcgggaagttttcaacaagcagagtttaagt
ccatctatcgttaaacggggcgccggcttaagagatttgaatattcgtacttttgatgaatcatttgcgtcgtacttttagtagatgtaaggtgcaatgggggcaaatat
cgtaaacgctatgttgaaggtgtggccgagttgtccgtgaatgggttgcggagcaaaaagatttattcagttatttaagtaattatgccacggagtcgggtttacgatgaaa
acggctattccagtttcacgttaagtaaggggagcaatggccgggaaattgctgaaaaaattgttttagcttcacgctatgcttcattagatccttatcgggcagtcacgc
aacaagggaatcatgaatggcattgaagctgtagtttttagctacaggaatgatacacgcgctgttagcgttcttgcacgttgggaaggaagtcgctaccaag
gcttgactagtgtgacgctggatggcgaacaactaattggtgaaattcagttccgcttgccttagccacgggttggcgggtgccaaaaagcttacctaactcaagcagct
gctgattttagcagtgacggatgcaaaagaactaagtcgagtagtagcggctgttgggtttggcacaaaatttagcggcgttacggccttagtctctgaaggaaatcaaa
aaggacacatggctctacaagcacgttcttagcgtatgacggcggagctactgtaagaagttgaggcagtcgtcaacaattaaaacgtcaaaaaacgatgaacca
agaccgagccatggctattttaaatgatttaagaaaacaataa **SEQ ID NO:9**

E. faecalis mvaS:

Atgacaattgggattgataaaattagttttttgtgcccccttattatattgatatgacggcactggctgaagccagaatgtagaccctggaaaattcatattggtattggc
aagaccaaatggcggtaaccatcagccaagatattgtgacatttgcagccaatgccgcagaagcgtatctgaccaagaagataaagaggccattgatatggtgat
tgtcgggactgagtcagtatcagtagtcaaaagcggccgagttgtctfacatcgtttaatgggagttcaacctttcgtcgtctttcgaatcaagggaagcttgttacg
gagcaacagcaggcttacagttagctaagaatcacgtagccttacatccagataaaaaagcttggctgtagcggcagatattgcaaaatatggcttaattctggcgggtg
agcctacacaaggagctggggcgggttgcattgttagttgctagtgaaaccgcgcattttggctttaaagaggataatgtgatgctgacgcaagatatctatgacttttggc
tccaacagggccaccgtatctatgctgatggcttcttgcataaacgaaacctacatccaatctttgcccgaagctgggatgaacataaaaaacgaaccggctctgattttg
cagattatgatgcttttagcgttccatttcttacacaaaaatggcgaaaaaagccttattagcaaaaatctccgaccaactgaagcagaacagggaacgaatttttagcccg
ttatgaagaaagtatcgtctatagctgcgcgttaggaaactgtatacgggttcaatttattcgggactatttcccttttagaaaatgaacgactttaaccgcaggcaatcaa
attggtttattcagttatggttctggtcgtcgtgaatttttactggtgaatttagtagctgggtatcaaaatcatttacaagaagaactcatttagcactgctggataatcggga

cagaactttctatc gctgaatatgaagccatgtttgcagaacttttagacacagacattgatcaaacgttagaagatgaattaaaatatagttttctgtattaaataac
cgctgcgtcttatcgaactaa SEQ ID NO:10

E. gallinarum EG2 (mvaE) :

MEEVVIIDARRTPIGKYHGSGLKKFSAVALGTAVAKDMFERNQKIKEEIAQVIIGNVLQAGNGQNPARQVA
LQSGLSVDIPASTINEVCGSGLKAILMGMEQIQLGKAQVVLGAGGIESMTNAPSLSHYNKAEDTYSVPVSS
MTLDGLTDAFSSKPMGLTAENVAQRYGISREAQDQFAYQSOMKAAKAQAKENKFAKEIVPLAGETKTTITAD
EGIRSQTTMEKLASLKPVFKTDGTVTAGNASTINDGAALVLLASKTYCETNDIPYLATIKEIVEVGIDPE
IMGISPIKAIQTLLQNKVSLLEDIGVFEINEAFAASSIVVESELGLDPAKVNRYGGGISLGHAIATGAR
LATSLVYQMQEIQARYGIASLCVGGGLGLAMLLERPTIEKAKPTDKKFYELSPAERLQELNQQKISSET
KQQLSQMMLAEDTANHLIENQISEIELPMGVGMNLKVDGKAYVPMATEEPSVIAAMNGAKMAGEIHTQ
SKERLLRGQIVFSAKNPNEIEQRIENQALIFERAQSYPSIVKREGGLRRIALRHFPADSQQESADQST
FLSVOLFVDVKDAMGANIINAILEGVAALFREWFNPEEILFSILSNLATESLVTAVCEVPFSALS KRGGGA
TVAQKIVQASLFAKTDPRAVTHNKGIMNGVEAVMLATGNDTRAVSAACHGYAARTGSYQGLTNWTIESD
RLVGEITLPLAIATVGGATKVLPAQAAL EISDVHSSQELAAALASVGLVQNLALRALVSEGIQKGHMS
MQARSLAIAVGAEKAEIEQVAEKLQNPMPNQALRFLGEIREQ SEQ ID NO:11

E. gallinarum EG2 (mvaS) :

MNVGIDKINFFVPPYYLDMVDLAHAREVDPNKFTIGIGQDQMAVSKKTHDIVTFAASAAKEILEPEDLQA
IDMVIVGTESGIDESKASAVVLHRLLGVPFARSFEIKEACYGATAGIQFAKTHIQANPESKVLVIASDI
ARYGLRSGGEPTQGAGAVAMLLTANPRILTFENDNLMLTQDIYDFWRPLGHAYPMVDGHLNQQVYIDSFK
KVVQAHCEMNQASISDYAAISFHIPYTKMGKKALLAVFADEVETEQRVMARYEESIVYSRRIGNLYTGS
LYLGLISLLENSSHL SAGDRIGLFSYSGS GAVSEFFSGRLVAGYENQLNKEAHTQLLDQRQKLSIEEY EAI
FTDSLEIDQDAFSDDLPSIREIKNTIRYYKES SEQ ID NO:12

L. grayi (mvaE) :

MVKDIVIIDALRTPIGKYRGQLSKMTAVELGTAVTKALFEKNDQVKDHVEQVIFGNVLQAGNGQNPARQI
ALNSGLSAEIPASTINQVCGSGLKAI SMARQIILLGEAEVIVAGGIESMTNAPSITYNKEEDTLSKVPV
TMTFDGLTDAFSGKIMGLTAENVAEQVGSREAQDAFAYGSOMKAAKAQEQGIFAAEILPLEIGDEVITQ
DEGVQRQETTLKLSLLRTIFKEDGTVTAGNASTINDGASAVIIASKEFAETNQIPYLAIVHDITEIGIDP
SIMGIAPVSAINKLIDRNQISMEIEDLFEINEAFAASSVVQKELSIPEKINIGGSGIALGHPLGATGA
RIVTTLAHQLRKTHGRYGIASLCIGGGGLGLAILIEVPQEDQPVKKFYQLAREDRLARLQEQAVISPATK
VLAEMTLPEIDIADNLNLIENQISEMIEPLGVALNLRVNDKSYTIPLATEEPSVIAACNNGAKMANHLGGFQS
ELKDGFLRGQIVLMNVKEPATIEHTITA EKAALFRAAAQSHPSIVKRGGLKEIVVRTFDDDPFLSIDL
IVDTKDAMGANIINTILEGVAGFLREILTEEILFSILSNYATESIVTASCRIPYEALSKKGDGKRIAEKV
AAASKFAQLDPYRAATHNKGIMNGIEAVVLASGNDTRAVAAAAAHAYASRDQHYRGLSQWQVAEGALHGEI
SLPLALGSVGGAI EIVLPKAKAAFEIMGITEAKELAEVTAAGVLAQNLAALRALVSEGIQGGHMSLQARSL
ALS VGATGKEVEILA EKLQSSRMNQANAQTILAEIRSQKVEL SEQ ID NO:13

L. grayi (mvaS) :

MTMNVGIDKMSFFVPPYFVDMTDLAVARDVDPNKFLIGIGQDQMAVNPKTDIVTFATNAAKNILSAEDL
DKIDMVIVGTESGIDESKASAVVLHRLLGVIQKFARSFEIKEACYGGTAALQFAVNHIRNHPESKVLVVAS
DIAKYGLASGGEPTQGAGAVAMLVSTDPKIIAFNDDSLALTQDIYDFWRPVGHDYPMVDGPLSTETIYQS
FQTVWQEYTKRSQHALADFAALSFHIPYTKMGKKALLAILEGESEEAQNRI LAKYEKS IAYS RKAGNLYT
GSLYLGLISLLENAEDLKAGDLIGLFSYSGS GAVAEFFSGRLVEDYQEQLLKT KHAEQLAHRKQLTIEEYE
TMSDRDLVDKDAEYEDTLAYSISSVRNTVREYRS SEQ ID NO:14

E. faecium (mvaE) :

MKEVVMIDAARTPIGKYRGSLSPTTAVELGTLVTGKLLDKTKLKKDKIDQVIFGNVLQAGNGQNVARQIA
LNSGLPVDVPAMTINEVCGSGMKAVILARQLIQLGEAEV IAGGTESMSQAPMLKPYQSEITNEYGEPISS
MVNDGLTDAF SNAHMLTA EK VATQFSVSREEQDRYALSSQLKAAHAVEAGVFSEEIIPVKISDEDVLSE
DEAVRGNSTLEKLGTLRTVFSEEGTVTAGNASPLNDGASVILASKEYAENNNLPYLATIKEVAEVGIDP

SIMGIAPIKAIQKLTDRSGMNLSTIDLFEINEAFAASSIVVSQELQLDEEKVNIYGGAIALGHPIGASGA
RILTLTAYGLLREQKRYGIALSLCIGGGLGLAVLLEANMEQTHKDVQKKFYQLTPSERRSQLIEKNVLTQ
ETALIFQEQTLSEELSDHMIENQVSEVEIPMGIAQNFQINGKKKWIPMATEEPSVIAAASNGAKICGNIC
AETPQRLMRGQIVLSGKSEYQAVINAVNHRKEELILCANESYPSIVKRGGGVQDISTREFMGSFAYLSI
DFLVDVKDAMGANMINSILESVANKLREWFPEEEILFSILSNFATESLASACCEIPFERLGRNKEIGEIQI
AKKIQQAGEYAKLDPYRAATHNKGIMNGIEAVVAATGNDTRAVSASIHAYAARNGLYQGLTDWQIKGDKL
VGKLTVP LAVATVGGASNLPKAKASLAMLDDISAKELAQVIAAVGLAQNLAALRALVTEGIQKGHMGLQ
ARSLAISIGAIGEEIEQVAKKLREAEMNQQTAIQILEKIREK **SEQ ID NO:15**

E. faecium (mvaS)

MKIGIDRLSFFIPNLYLDMTELAESRGDDPAKYHIGIGQDQMAVNANEDIIITLGANAASKIVTEKDREL
IDMVIVGTESGIDHKSASAVIIHLLKIQSFARSFEVKEACYGGTAALHMAKEYVKNHPERKVLVIASDI
ARYGLASGGVETQGVGAVAMMITQNPRLSIEDDSVFLTEDIDYDFWRPDYSEFPVVDGPLSNSTYIESFO
KVWNHRKELSGRGLEDYQAI AFHPIPYTKMGKKALQSVLDQTDENQERLMARYEESIRYSRRIGNLYTGS
LYLGLTSLLENSKSLQPGDRIGLFSYSGGAVSEFFTGYLEENYQEYLFASHQEMLDSTRITVDEYETI
FSETLPEHGECAYTSDVPFSITKIENDIRYYKI **SEQ ID NO:16**

E. casseliflavus (mvaE) :

MEEVVIDALRTPIGKYHGSCLKDYTAVELGTVAAKALLARNQQAKEHIAQVIIGNVLQAGSGQNPGRQVS
LQSGLSSDIPASTINEVCGSGMKAILMGMEQIQLNKASVVLTTGGIESMTNAPLFSYYNKAEDQYSAPVST
MMHDGLTDAFSSKPMGLTAETVAERYGITRKEQDEFAYHSQMKAAQAQAKKFDQEIIVPLTEKSGTVLQD
EGIRAATTVEKLAELKTVFKDGTVTAGNASTINDGAAMVLIASKSYCEEHQIPYLAIVKEIVEVGFAPF
IMGISPIKAIDITLLKNQALTIEDIGIFEINEAFAASSIVVERELGLDPKKVNRYYGGGILGHAIGATGAR
IATTVAYQLKDTQERYGIALSLCVGGGLGLAMLENPSATASQTNFDEESASEKTEKKKFYALAPNERLAF
LEAQGAITAAETLVFQEMTLNKETANHLIENQISEVEIPLGVGLNLQVNGKAYNVPLATEEPSVIAAMSN
GAKMAGPITTTTQERLLRGQIVFMDVQDPEAILAKVESEQATIFAVANETYPYPSIVKRGGGLRRVIGRNF
PAESDLATAYVSIDLMDVKDAMGANIINSILEGVAELFRKWFPEEEILFSILSNLATESLVTATCSVPF
DKLSKTGNGRQVAGKIVHAADFADPYRAATHNKGIMNGVEALILATGNDTRAVSAACHGYAARNGRMQ
GLTSWTIIEDRLIGSITLPLAIATVGGATKILPKAQAALALTGVETASELASLAASVGLVQNLALRALV
SEGIQQGHMSMQARSLAISVGAKGTEIEQLAAKLRAATQMNQEQAQKFLTEIRN **SEQ ID NO:17**

E. casseliflavus (mvaS)

MNVGIDKINFFVPPYFIDMVDLAHAREVDPNKFITIGIGQDQMAVNKKTDIVTFAMHAAKDILTKEDLQA
IDMVIVGTESGIDESKASAVVLHRLLGIQPFARSFEIKEACYGATAGLQFAKAHVQANPQSKVLVVASDI
ARYGLASGGVETQGVGAVAMLI SADPAILQLENDNMLTQDIYDFWRPVGHQYPMVDGHLNSNAVYIDSEK
QVWQAHCEKNQRTAKDYAALSFIPIPYTKMGKKALLAVFAEEDETEQRMLMARYEESIVYSRRTGNLYTGS
LYLGLISLLENSSLQANDRIGLFSYSGGAVAEFFSGLLVPGYEKQLAQAAHQALLDDRQKLTIAEYEM
FNETIDIDQDQSFEDDLLYSIREIKNTIRYYNEENE **SEQ ID NO:18**

Acetoactyl-CoA-synthase:

MTDVRFRIGTGAYVPERIVSNDEVGAPAGVDDDWITRKTGIRQ
RRWAADDQATSDALATAAGRAALKAAGITPEQLTVIATSTPDRPQPPTAAYVQHHLG
ATGTAADFVNACSGTVFALSSVAGTLVYRGGYALVIGADLYSRILNPADRKTIVVLFG
DGAGAMVLGPTSTGTGPIVRRVALHTFGGLTDLIRVPAGGSRQPLDLDGLDAGLQYFA
MDGREVRRFVTEHLPQLIKGFLHEAGVDAADISHFVPHQANGVMLDEVFGELHLPRAT
MHRTVETYGNTGAASIPITMDAAVRAGSFRPGELVLLAGFGGMAASFALIEW **SEQ ID NO:19**

Isoprene synthase:

Atggaagctcgtcgttctgcgaactacgaacctaacagctgggactatgattacctgctgtctccgacacggacgagtcctcgaagtatacaaaagacaagcg
aaaaagctggaagccgaagtcgtcgcgagattaataacgaaaaagcagaattctgacctgctggaactgattgacaacgtccagcgccctggcggttacc

gtttcagagctgatalccggtggtgctggaicgttctgttccctccggcggcttcgaicgggtaaccaagacttccctgcacggtagggcactgtcttccgtctgtctg
 cgtcaacacgggtttgaggtttctcaggaagcgttcaagcggcttcaaa gaccnaaacggcaacttcttgaggaacctgaagggaatatacaagctatcttgagcct
 gtacgagggccagcttcttggtcttggaaggcgaacaacatcttgacgagggcganggttttgcaltcttcatctgaagaaactgtctgaagaaaaatcgggtanaa
 gaggctggcagaacagggaacctgacatgggaactgccactgcacgccgtactcagcgtctggaagcagta/ggtctatcgaaggccctacggtaaaaaggagga
 cgcgaatcaggttcttggtgagctggcaattctgattacaacatgaicccagctgtataccagcgtgaictgcgtgaacgtcccgttggtggcgtcgtgtgggtct
 ggcgaccnaaacgtgacttggctcgtgaccgocctgattgagagcttctactgggcccgtgggtgtgacaltcgaaccgcaatctccgactggcgttaactccgtcga
 aatgttttcttgaaccaltatcgaatatactacgaatatacggcaccctggacgaactggagctgtttactgaicaggttgagcgttgggagcgttaaacgccatc
 aacgacctgccggatatacagaactgtgcttcttggtcttgataaactataacgaatcgcctacgacaacctgaagataaaaggctgagaacaicctgccgtat
 ctgaccnaagcctgggctgacctgtgcaaacgttcttccgaagagccnaagtggtgtacaaacaaatctactccgaccttgacgactacttggcgaacgcatggga
 aatctcttcttgcccgtgcaactgtgttctgcttacttccgtgtcgtgcagaacattaaaaagggaagatcgaanaaccgtcnaaaataccatgacaccatctctc
 gtccttccatacttccgtctgtgcaalgaactggctagcgcgtcggaaattgcgcgtgggtgaacccgcaaatagcgtttctgttactgcgactaaaggat
 ctccgaagaaactgtgctaccgaagcgtgatgaactgtgaicgatgaacctggaaaaagatgaacaggaaaaactgggtgttagcctgttcgcgaacccgttcgt
 ggnaaccgcgaicacactggcaggtcaatctcactgcacttatcataacggcgacgcgcataacctctccggatgagctgacccgcaaacgcgttctgtctglaatca
 ctgaaccgattctgcccgttgaaagctaa

ispA:

atggactttccgcagaactcgaagccctgcgttaagcagggcaaccaggcgctgagccgtttatcgcctccactgccccttcaagaacactcccgtgttcgaaccca
 tgcagatggcgcaatattaggtgtaagccctgcgaccttctggtttatgccaccggctcatalgtttggcgttagcacaaacacgctggagcgcaccgctgctg
 ccgtgaggtatccagccttactaattatcatgatattaccggcgatggatgatgacgatc/gcgccgcgttgccgacctggcaltggaagtttgccgaagc
 aaacgcgaattctcgttgcgacgctttacaacgcctggcgttctgattcnaagcgaicccgatagccggaagtgtcggatcgcgacagaatttcga/gatttctga
 actggcgagcgccagcggatitgccgaatgtcgggtgtcaggcactagattagacgcgggaaggcaaacactgacctctggacgcgttgagcgtttatcag
 tcataaaaccggcgattgattcgcgccgcttgccttgggtgcaataagccggagataaaggcgtcgtgtcttgccagtagctgacaagtagcgaagagag
 caicggccttgccttccaggttcaagatgacalccctggatgttgtaggagatactgcaacgttgggaanaacgccagggtgcccgaacgaacttggtaaaagtiacc
 taccctgcacttctgggtcttgagcaagcccggaggaagcccggatcgtgacgacgatcccggtcagtcgtgaanaactggctgaacagtcactcgaacacct
 cggcactgggaagcgtagcggactacatcatcagcgtataaataaa

Amorphadiene synthase codon-optimized for *E. coli*:

ATGAGCCTGACCGAAGAAAAACCGATTCTGTCGGATTGCAAAATTTTCCGCCTAGCATTTGGGGTGAT
 CAGTTTCTGATTTATGAGAAAACAGGTTGAACAGGGCGTTGAGCAGATTGTTAATGATCTGAAAAA
 AGAAGTTCCGACGCTGCTGAAAAGAAGCACTGGATATCCGATGAAACATGCCAATCTGCTGAAAC
 TGATTGATGAAATTCAGCGTCTGGGTATCCCGTATCATTTTGAACGTGAAATTGATCATGCCCTGC
 AGTGCAATTTATGAAACCTATGGTGATAATTGGAATGGTGATCGTAGCAGCGCTGTGGTTTCGTCTGA
 TCGGTAACACAGGGTTATTATGTTACCTGCGACGTGTTTAACTATAAAGATAAAAAACGGTGCTT
 TTAACAGAGCCTGGCAAAATGATGTTGAAGTCTGCTGGAACCTGTATGAAGCAACACCATGCGT
 GTTCCGGGTGAAATTTCTGGAAGATGCACTGGGTTTTACCCGTAGCCGTCTGAGCATGATGATACC
 AAAGATGCAATTTAGCACCAATCCGGCACTGTTTACCAGAAATCCAGCGTGCACTGAAACAGCCGCT
 GTGGAAACGCTGCTGCTCGTATTGAAGCAGCACAGTATATCCGTTTTATCAGCAGCAGGATAGCCA
 TAACAAAACCCCTGCTGAAACTGGCAAAACTGGAATTTAATCTGCTGACAGAGCCTGCATAAAGAAAG
 AACTGAGCCACGTTTGTAAATGGTGGAAGCCTTCGACATCAAAAAAACCAGCACCCTGTCTGCGT
 GATCGATTGTTGAATGTTATTTTGGGGTCTGGGTAGCCGTTTTGAACCGCAGTATAGCCGTGCA
 CGTGTGTTTTTACCAAAGCAGTTGCAATTATACCTGATCGATGATACCTATGACGCATATGCG
 ACCTATGAGGAACGAAATCTTTACCGAAGCCGTTGAACGTTGGAGCATTACCTGTCTGGATACC
 CTGCCGGAATATATGAAACCGATCTATAAACTGTTTATGACACCTATACCGAGATGGAAGAATTT
 CTGGCAAAAGAAGGTCGTACCGACCTGTTAATTGGCGTAAAGAATTTGTGAAGAATTCGTGCGT
 AACCTGATGGTTGAAGCAAAATGGGCCAATGAAGGTCATATCCGACCACCGAAGAACATGATCC
 GGTGTGATTATTACCGGTGGTGCAAACTGCTGACCACCCTGTTATCTGGGTATGAGCGATAT
 TTTCACCAAGAAAGCGTTGAATGGGCAGTTAGCGCACCCGCTCTGTTTCGTTATAGCGGTATTCT
 GGGTCGTCTGTAACGATCTGATGACCCATAAAGCAGAACAAAGAA

Farnesene synthase codon-optimized for *E. coli*:

pMCM1223 - pCL-Ptrc-Upper_GcMM_161 (*Listeria grayi* DSM 20601):

195

cttacgaagcactgagtaaaaaaggatggtgtaaacgaatcgtgaaaaagtggtgctgcatcctaaattgccagttgatccttaccgagctgcaaccacacaacaaag
gtattatgaatggattgagccgtcgtttggcctcaggaaatgacacacggcggtcgcggcagccgcacatcggtatgcttcacgcgacagcactatcggggctta
agccagtgccaggttcagaaagcgcgttacacgggagatcagctaccacttgccacgcggcagcgttggcgggtgcaattgaggtcttgcctaaagcgaagcggc
attcgaatatcatgggagacagagggcgaaggagctggcagaagtcacagctcggtagggctggcgcaaaacctggcggtgaagagcgttggtaggaagga
atacagcaaggtcacatgtcgtccaggctcgtctcttgcatatcggtaggtgtacagggcaaggagttgaaatcctggccgaaaaattacagggctcctctatgaat
caggcgaacgctcagaccatactcgagagatcagatcgcaaaaagttgaattgtgatctagacgcactagaggatataccaatgacctgaacgttggaaatcgataa
aatgtcattcttggccaccttacttggacatgactgactggcagtagcacgggatgtcgtatcccaataagtttctgattggattggccagaccagatggcagttaat
ccgaaaaagcaggaattgtgacatttggcacaaatgctgcacaaaacatactgtcagctgaggaccttgataaaattgatattgtcatagtcggcaccgagagtggaatc
gatgaatccaaagcagtgccgtatgtgttcacaggttgcctggtatccagaagtttgcctcgtcttggaaatcaaaagacctgttatgggggtaccgcggctttacagt
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ctgccaggcatcaataaaacgaaaggctcagtcgaaagactggccttctgtttatctgttgttctgctggaacgctctcctgagtaggacaataccgcgggagcgg
atttgaacgttgcgaagcaacggccggaggggtggcggcaggacggccgcaataaactgccaggcatcaataaagcagaagggccatcctgacggatggcctttt
gcgtttctacaaactcttttcttatttcttaataacatcaaatatgatccgctcatgagacaataaccctgataaattgctcaataatctggcgtaatagcgaagagggccg
caccgatcggccttcccaacagtggcgagcctgaatggcggaatggcgctgatgggtatttctcttaccgatctgtgctgggtatttccaccgcatatgggtcacttca
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cgccaactattgcgataaacaagaaaaagccagccttctcatgatatctcccaatttgtgtaggccttattatgcacgcttaaaaaataaaagcagacttgacctgatagttt
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tcgcttttccagtagtgacaaaatttccaactgatctgcgcggagggcaagcgtatcttcttcttccaaagataagcctgtctagcttcaagtatgacggcgtgatactg
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