

This file contains trees for conserved proteins used for the concatenated tree shown on Figure 2 (namely, DNA polymerase, major capsid protein, and A18-like helicase), and trees for translation proteins found in Loki Castle virus (LCV) genomes.

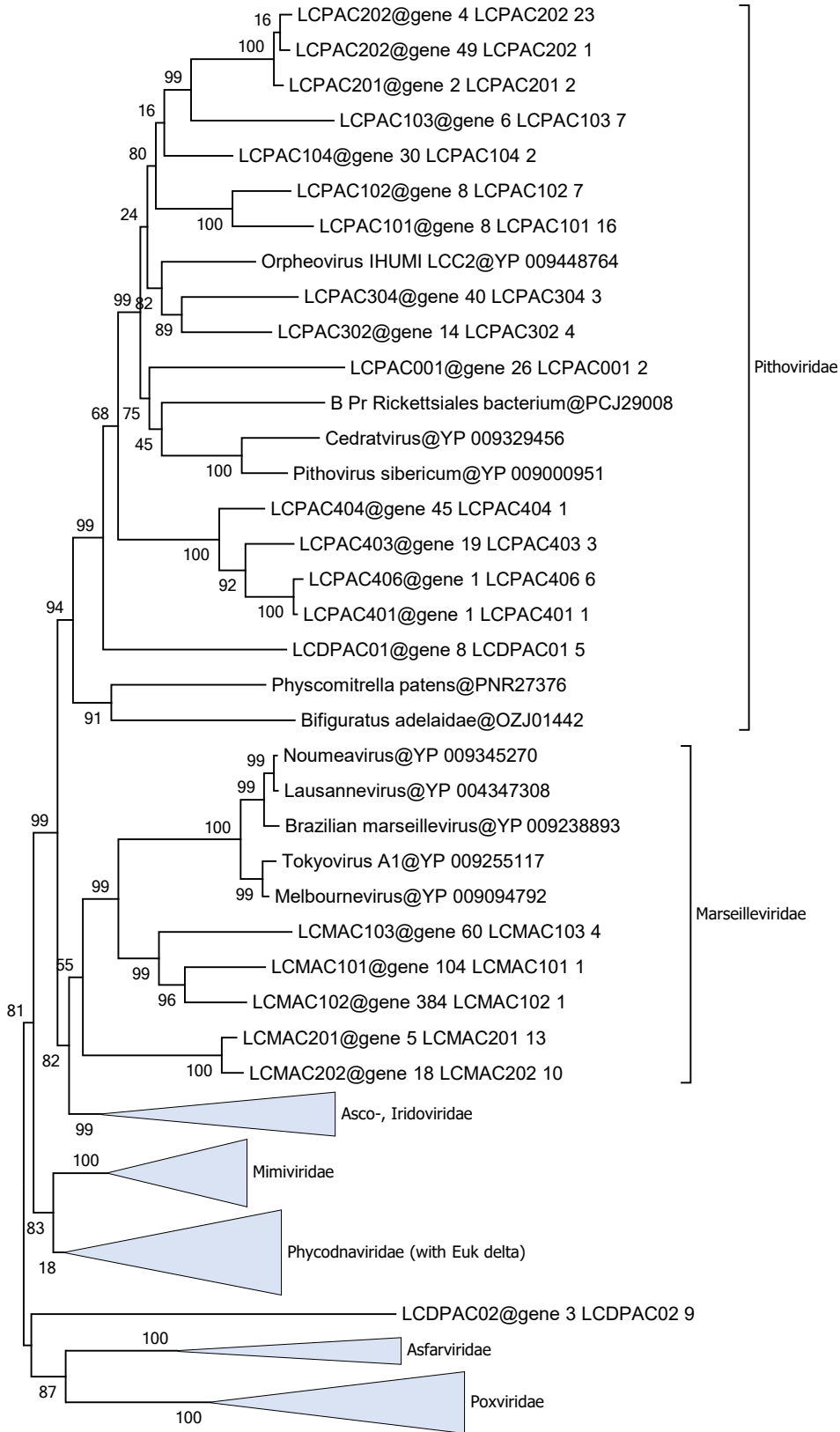
LCV translation proteins are marked with the star whenever at least one bona-fide NCLDV protein was found on the same contig as the translation protein (see the last two slides for the details).

The multiple sequence alignments and the trees in Newick format could be downloaded from here:

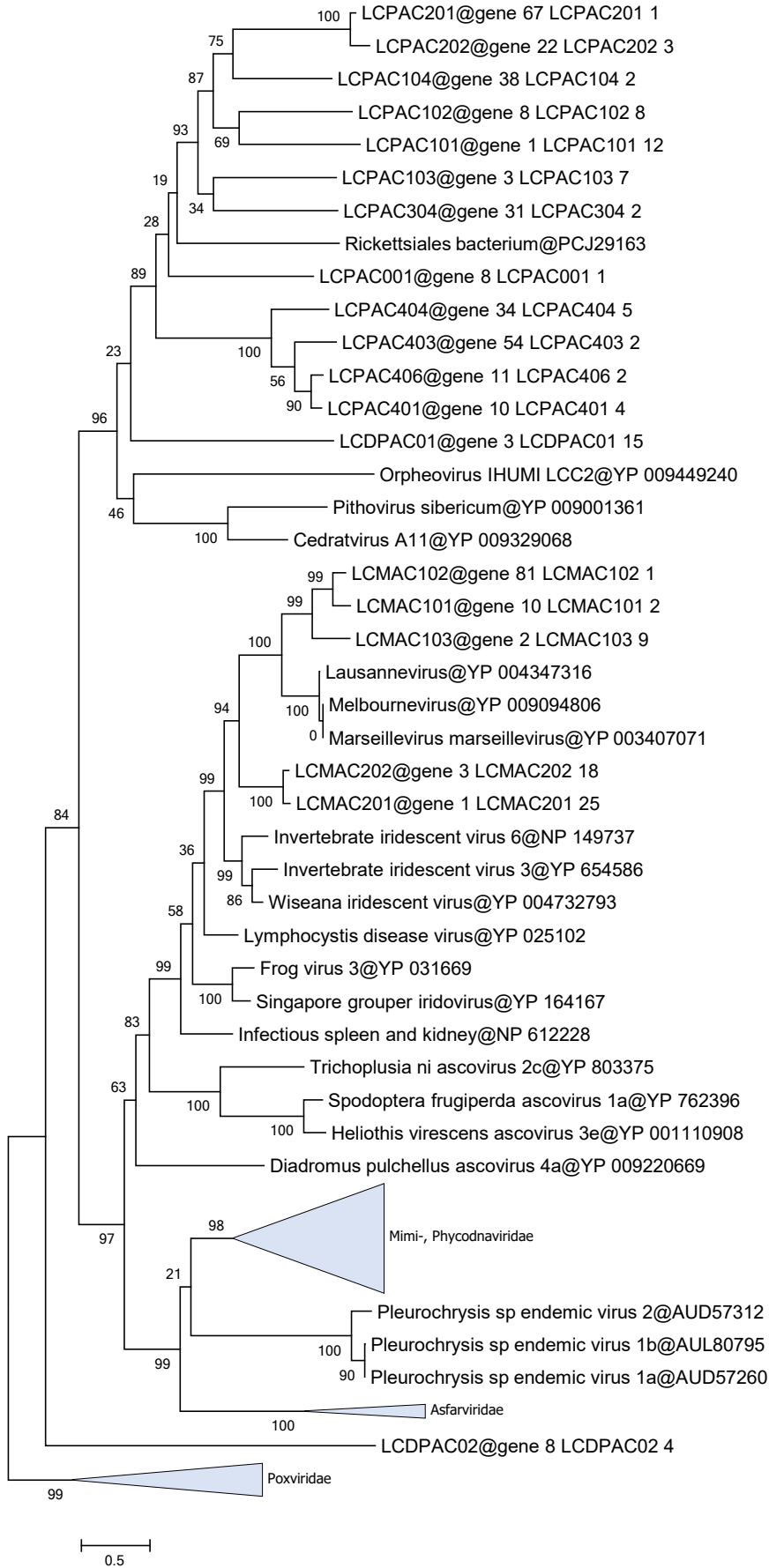
ftp://ftp.ncbi.nih.gov/pub/yutin/Loki_Castle_NCLDV_2018/MCP_DNAp_A18hel_aln_trees/

ftp://ftp.ncbi.nih.gov/pub/yutin/Loki_Castle_NCLDV_2018/trans_aln_trees/

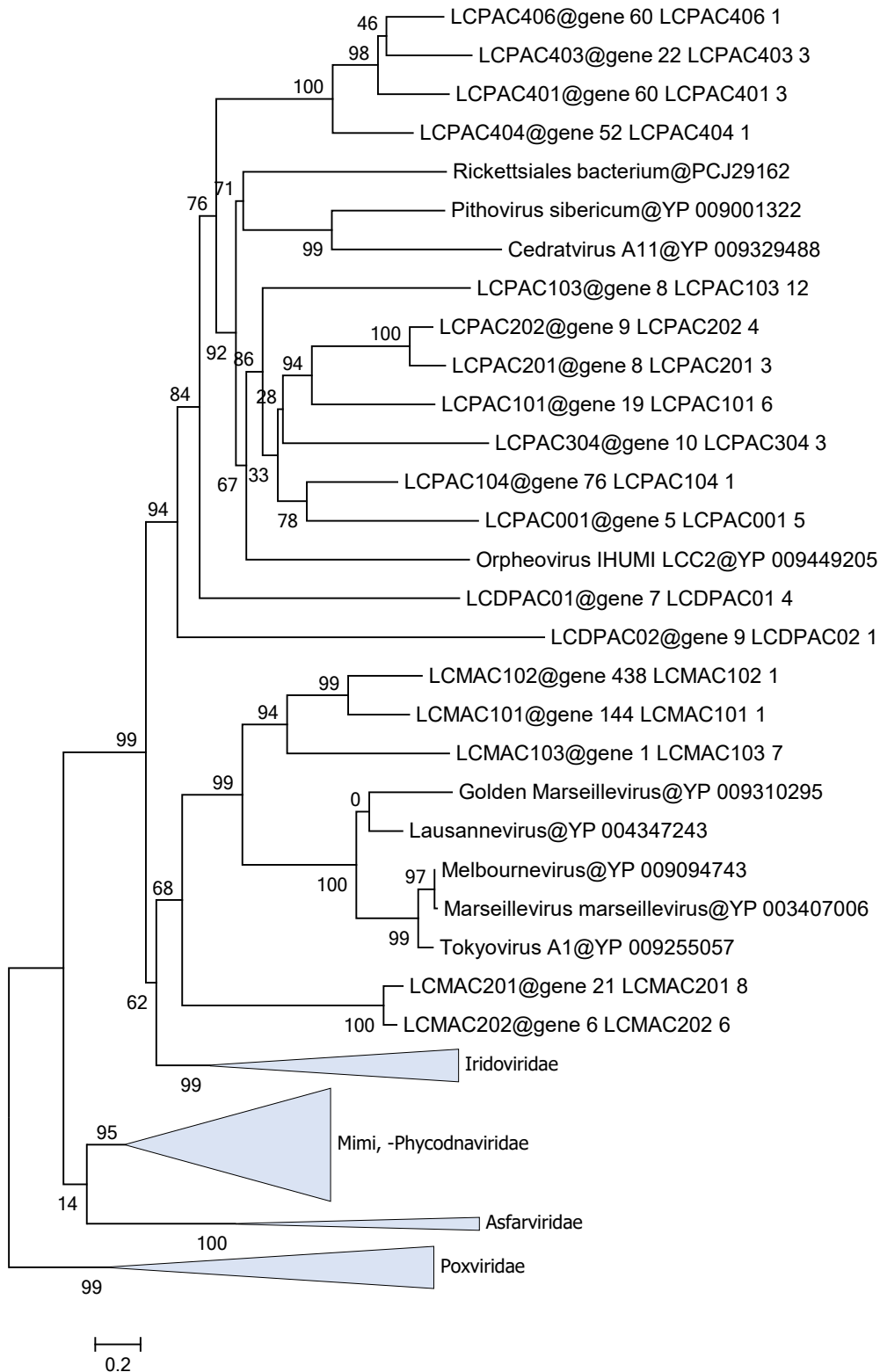
DNAp



MCP

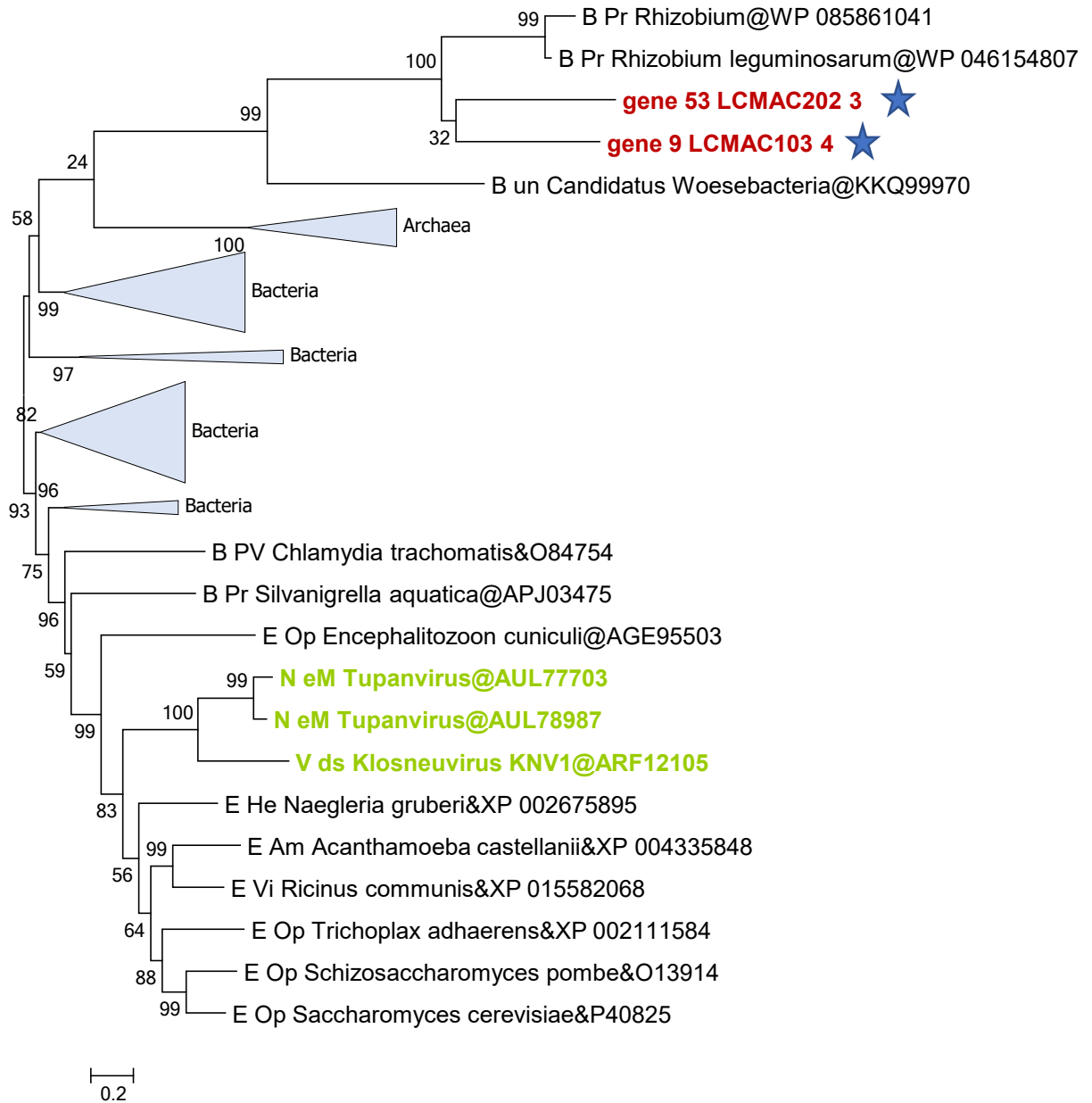


A18-like helicase

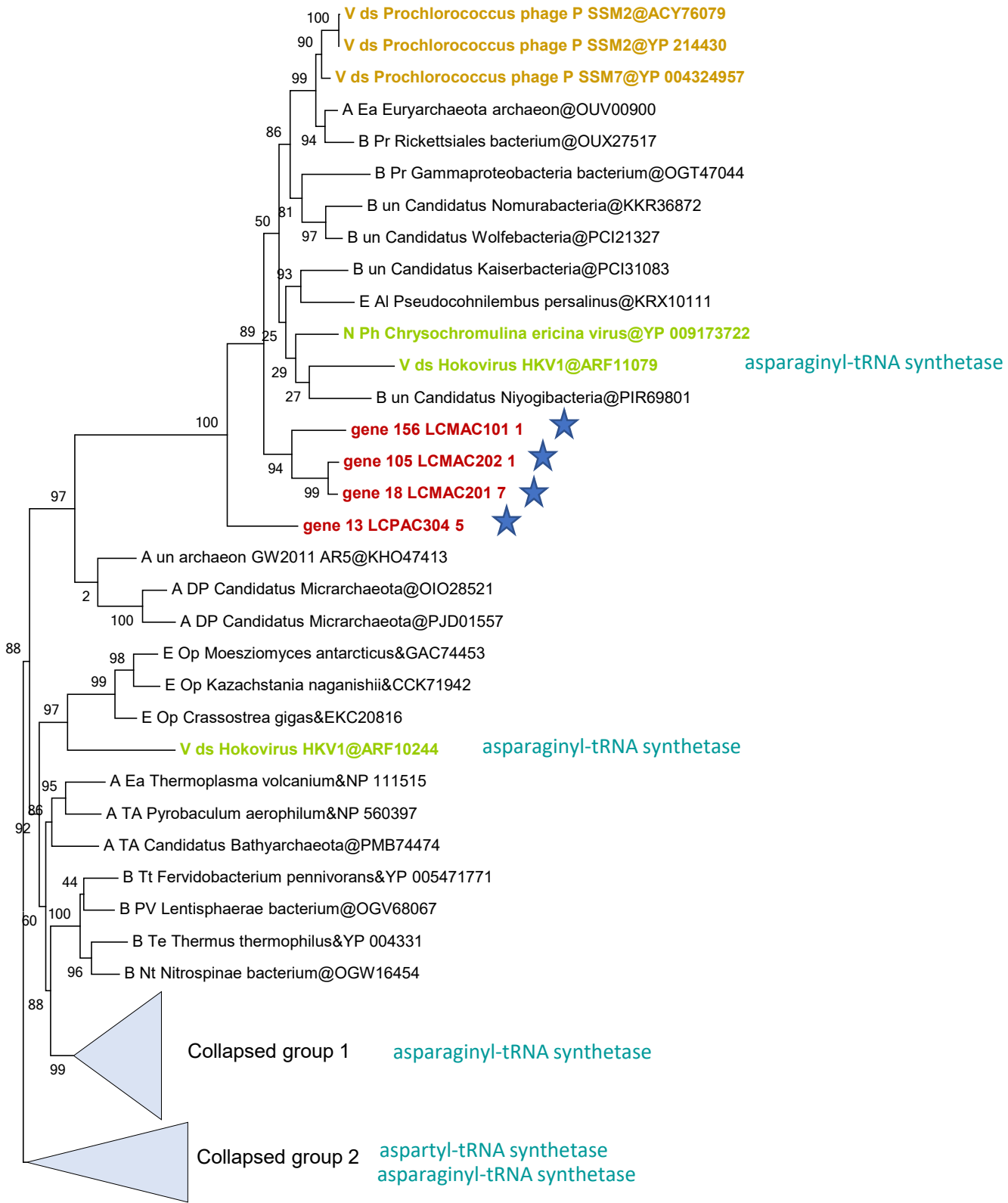


AlaS

Alanyl-tRNA synthetase

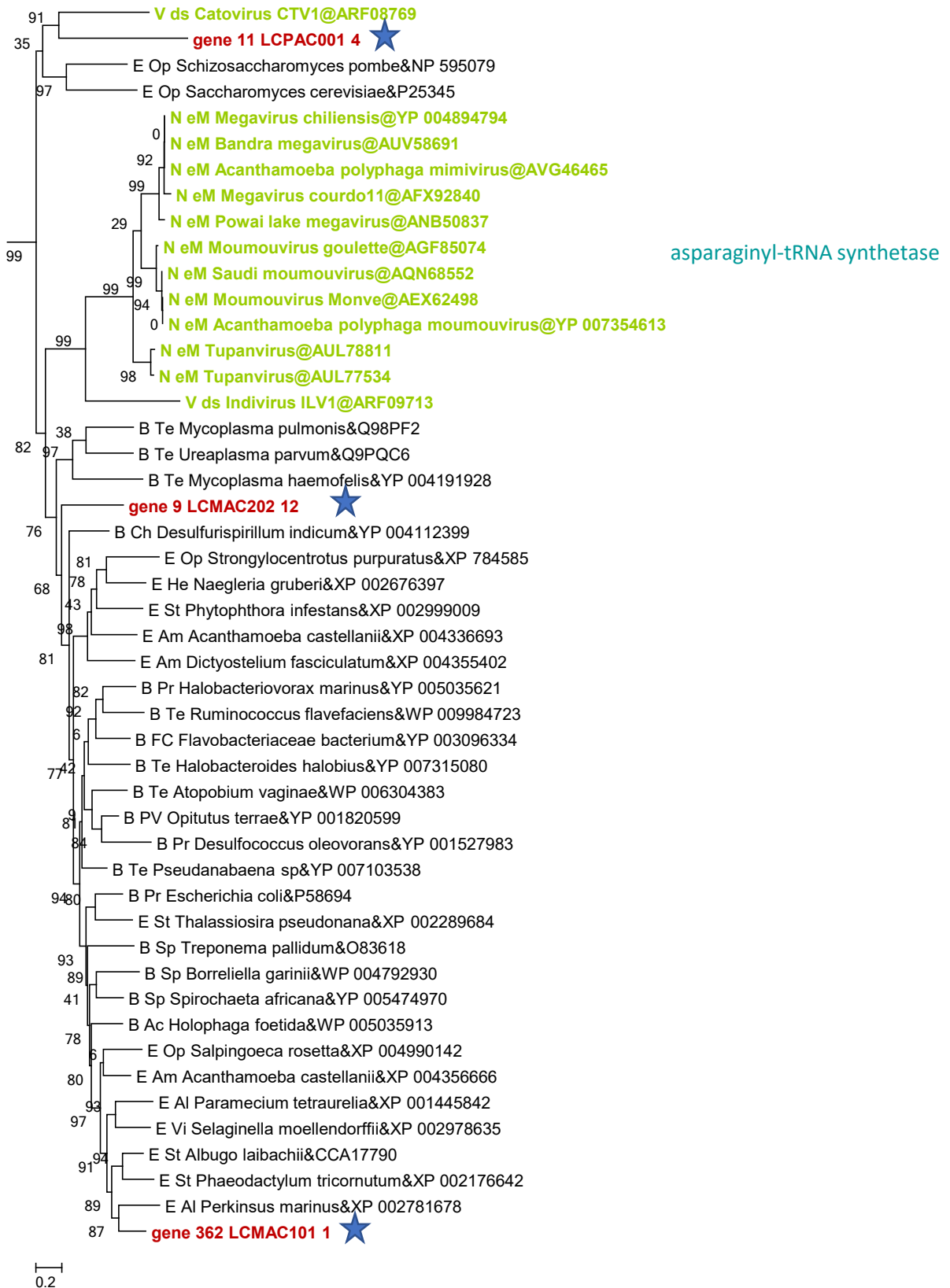


AsnS Aspartyl/asparaginyl-tRNA synthetase



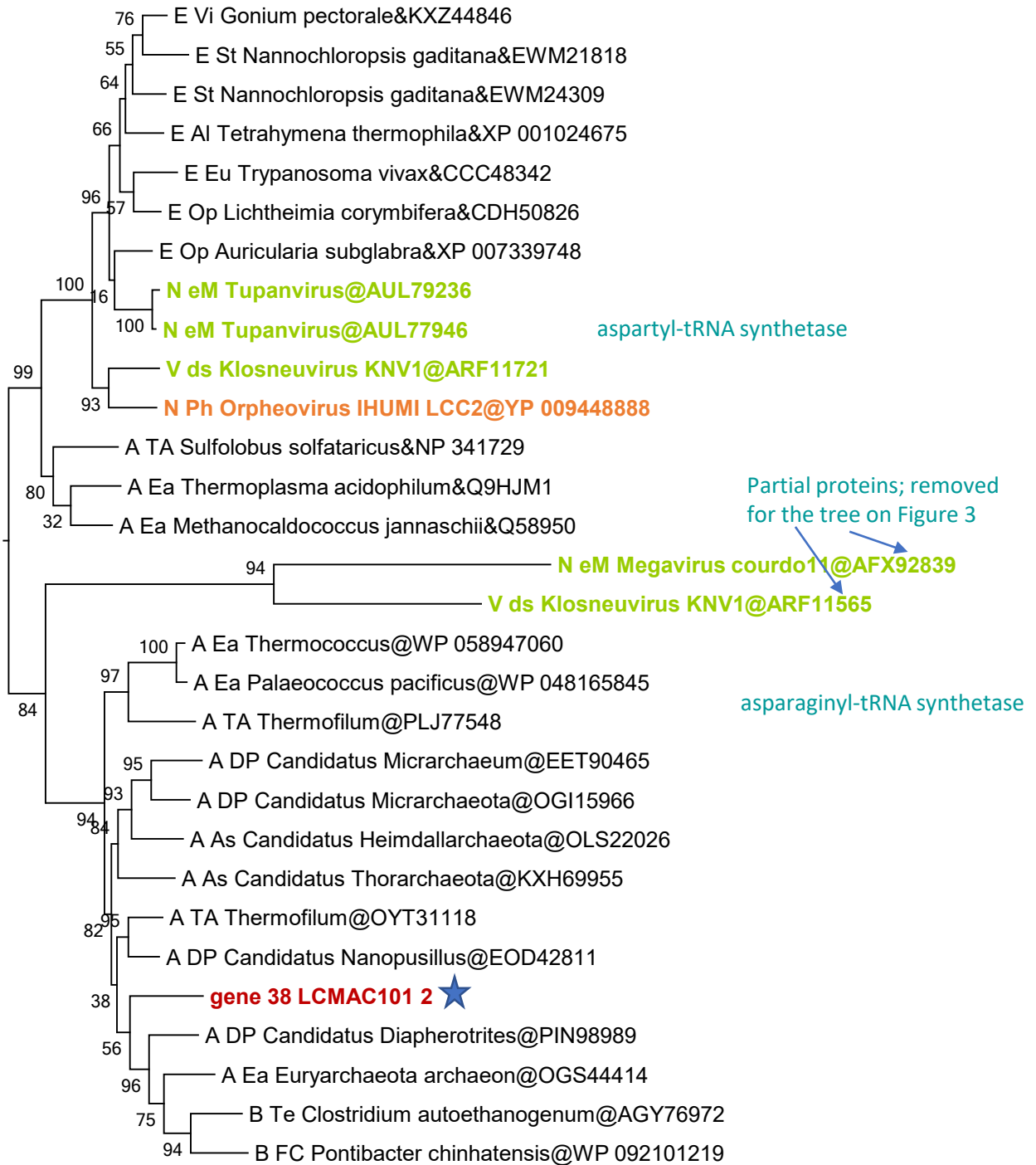
AsnS Aspartyl/asparaginyl-tRNA synthetase

Collapsed group 1



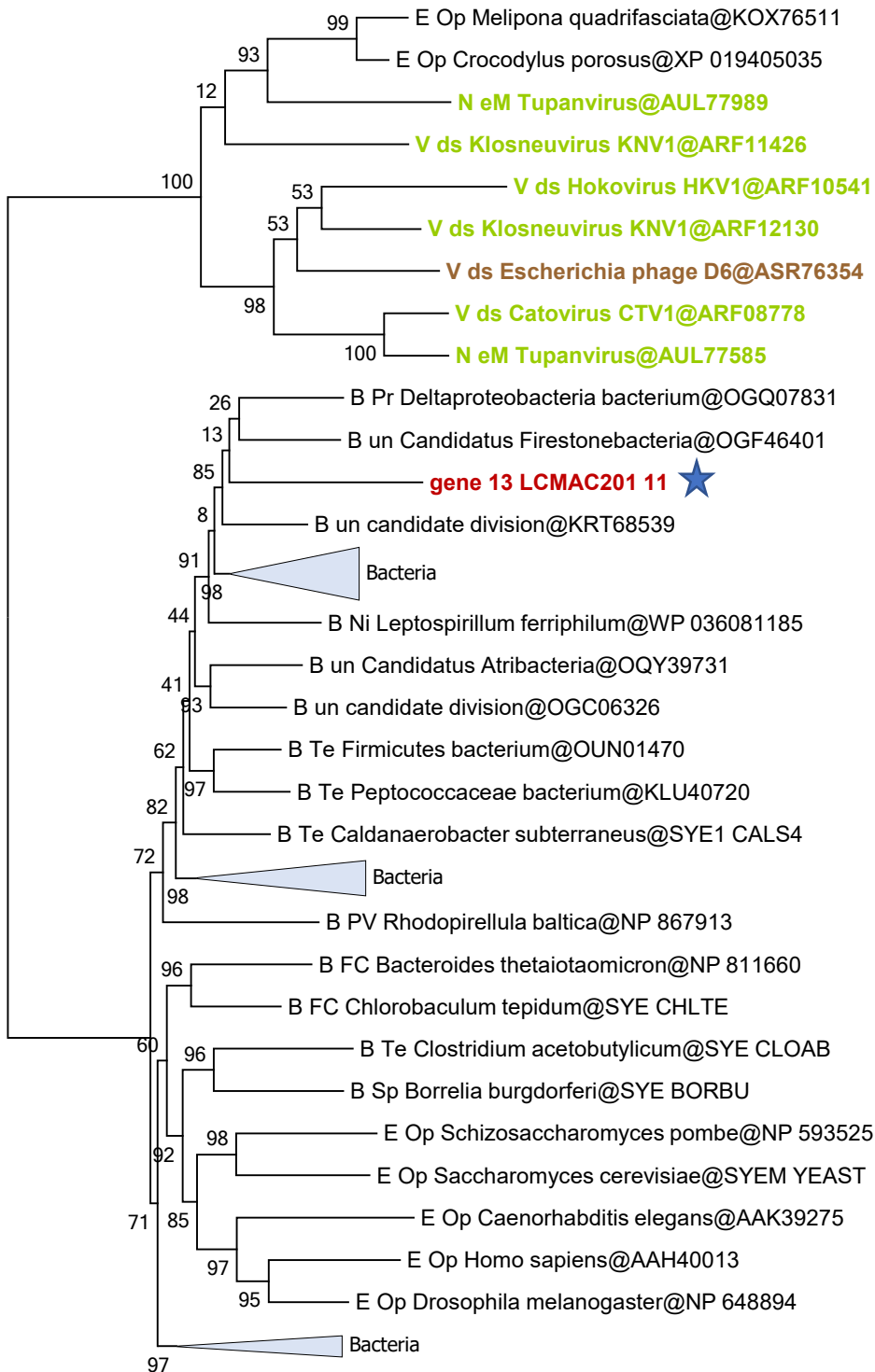
AsnS Aspartyl/asparaginyl-tRNA synthetase

Collapsed group 2



0.2

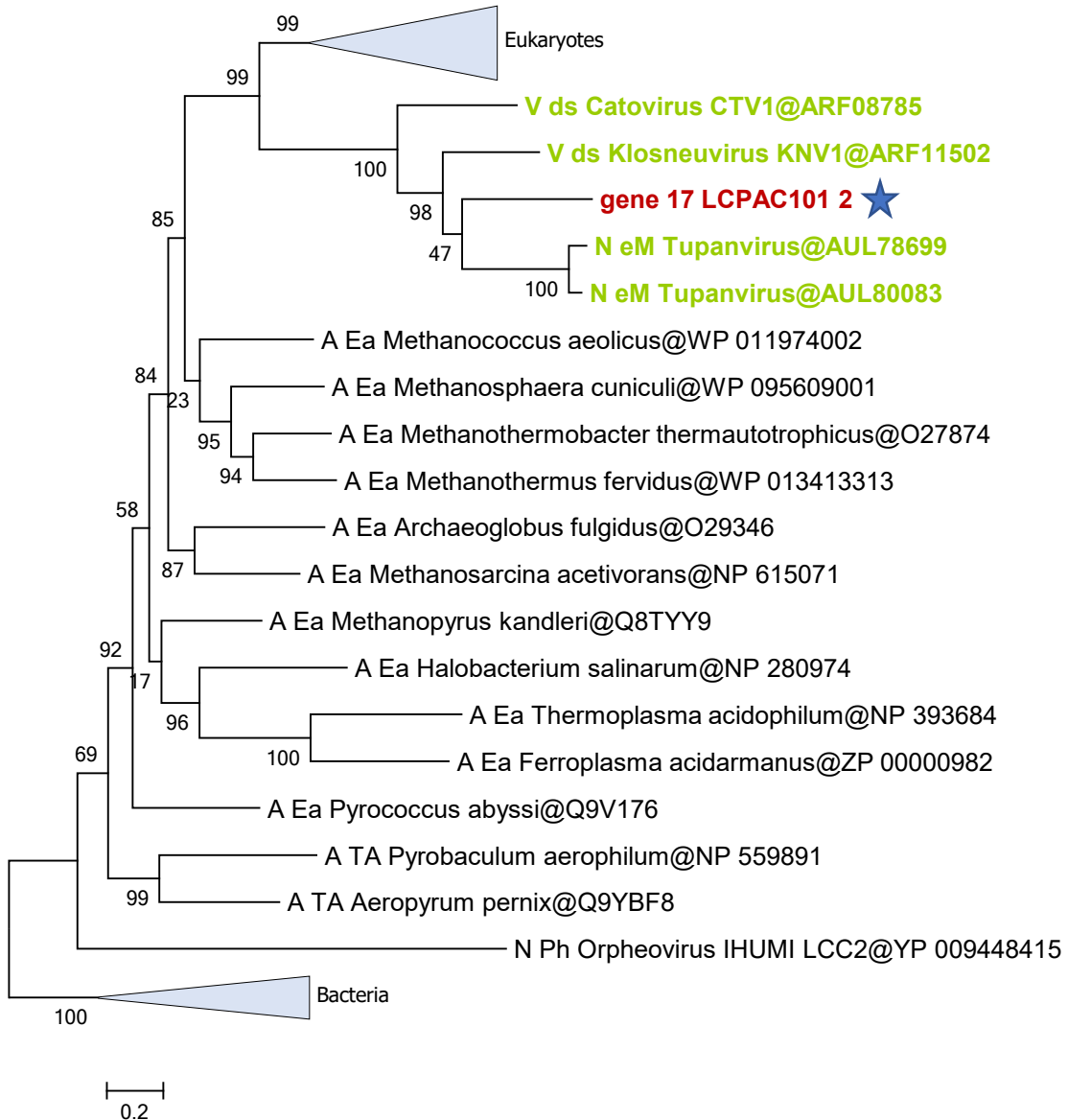
GlnS Glutamyl- or glutaminyl-tRNA synthetase



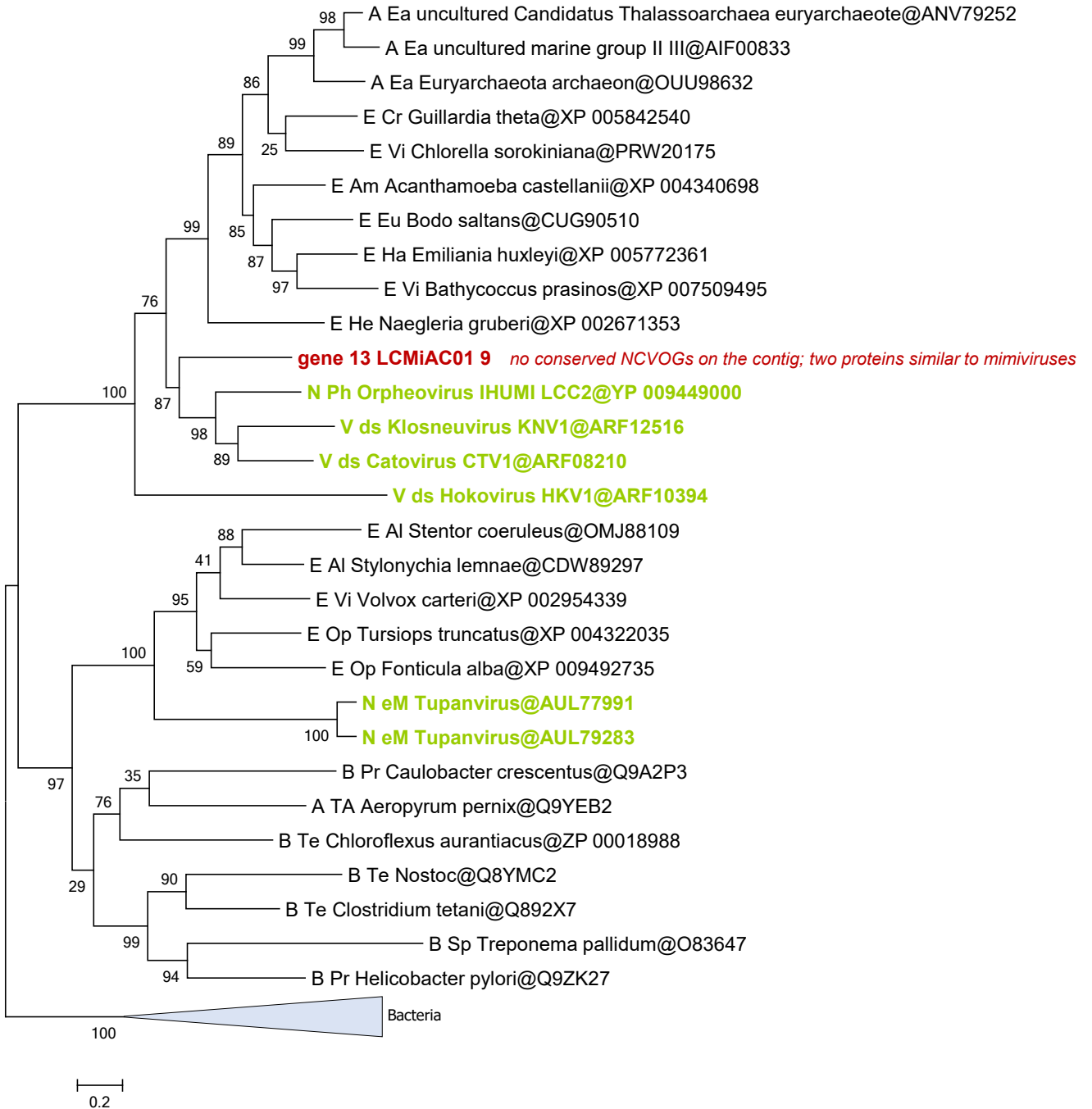
0.2

GRS1 Glycyl-tRNA synthetase (class II)

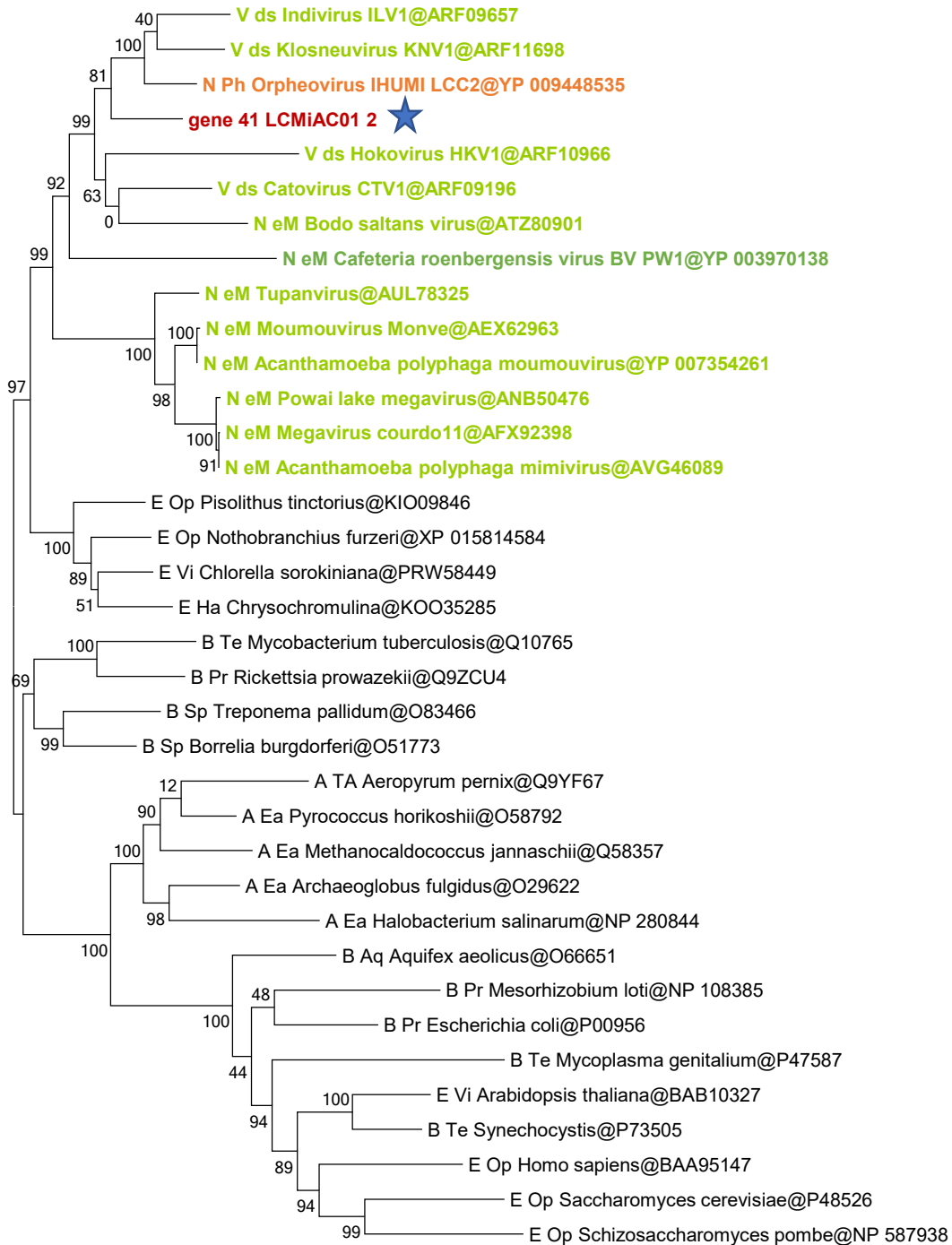
Also Orpheovirus YP_009448415



HisS Histidyl-tRNA synthetase

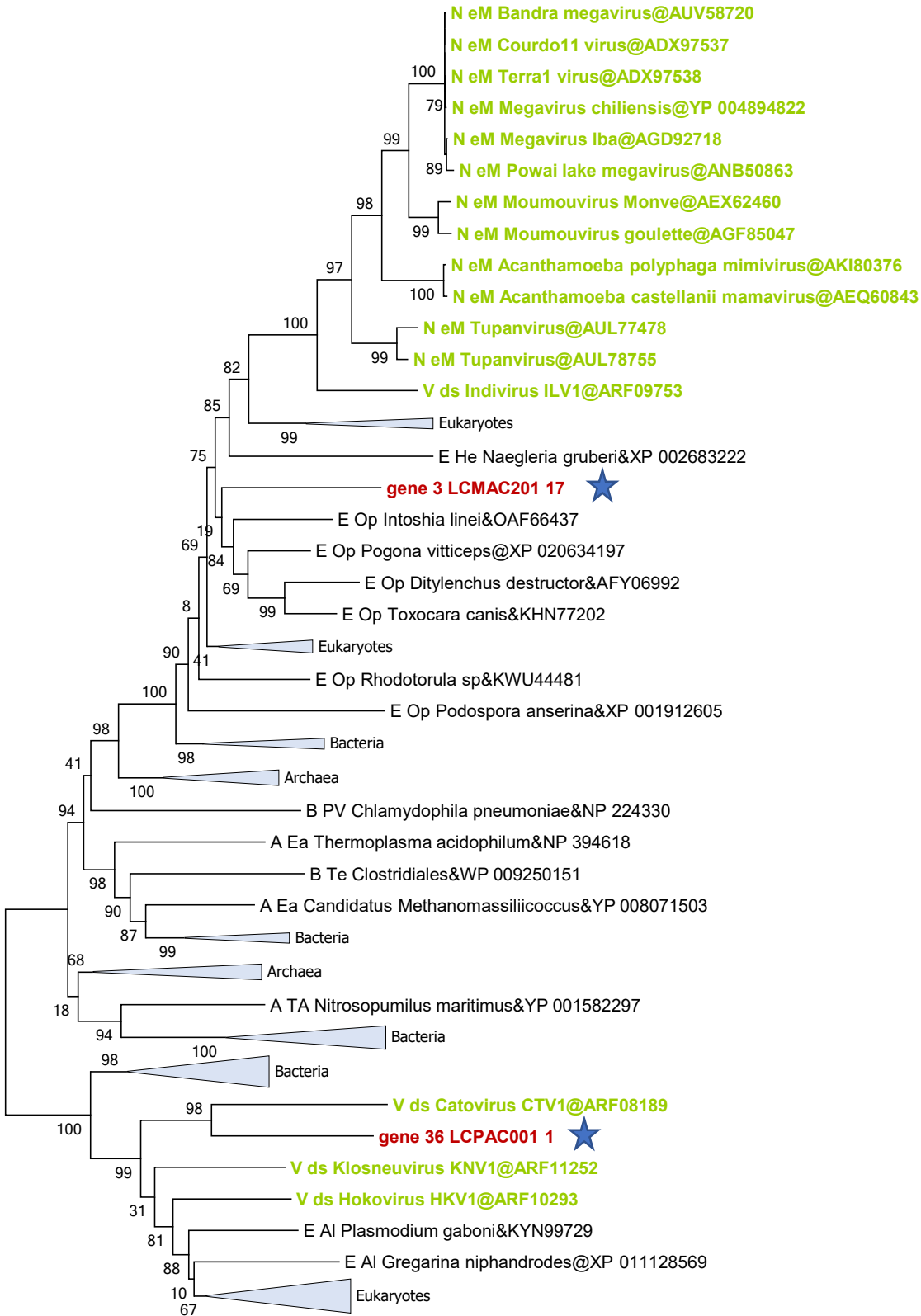


IleS Isoleucyl-tRNA synthetase



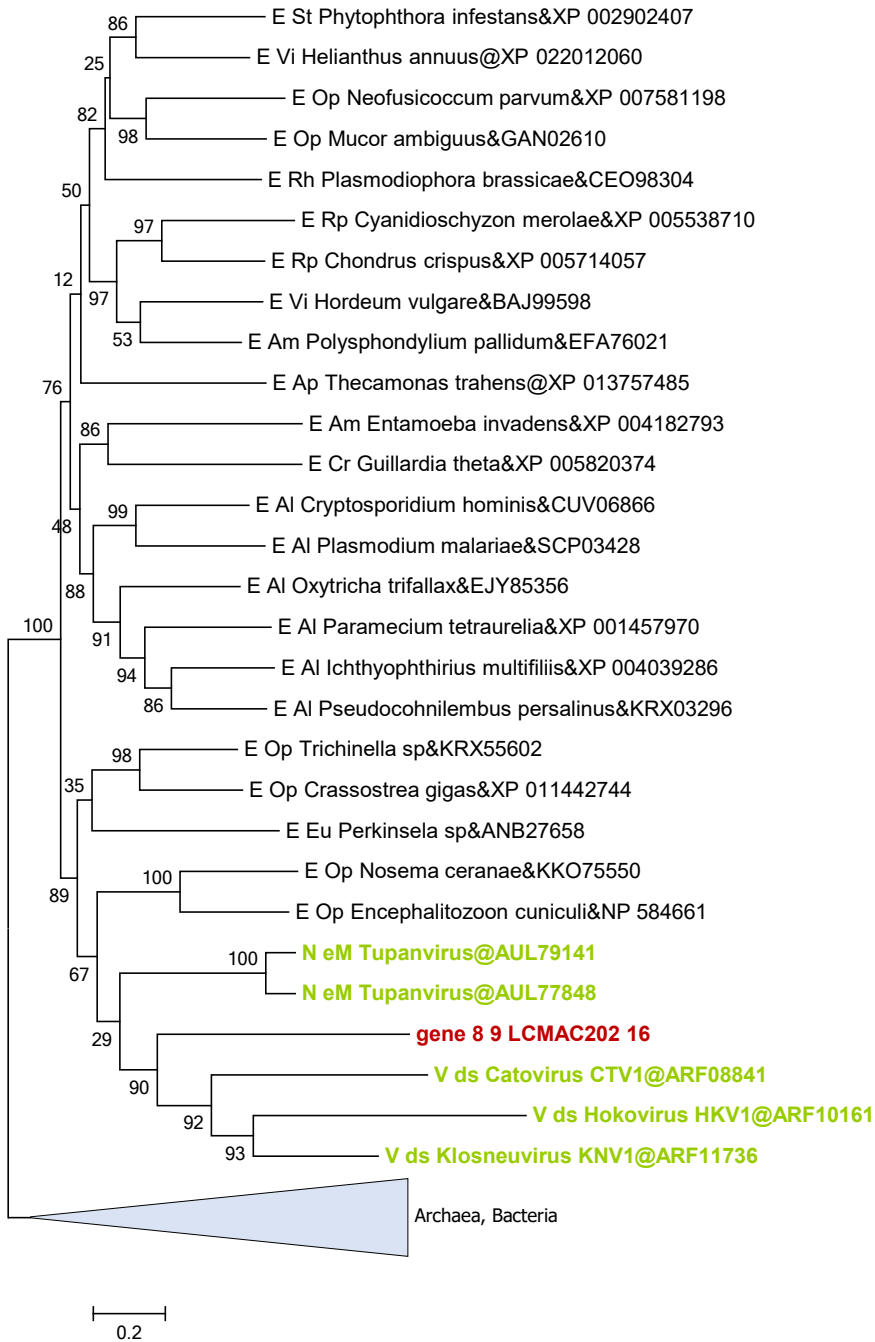
0.2

MetS Methionyl-tRNA synthetase

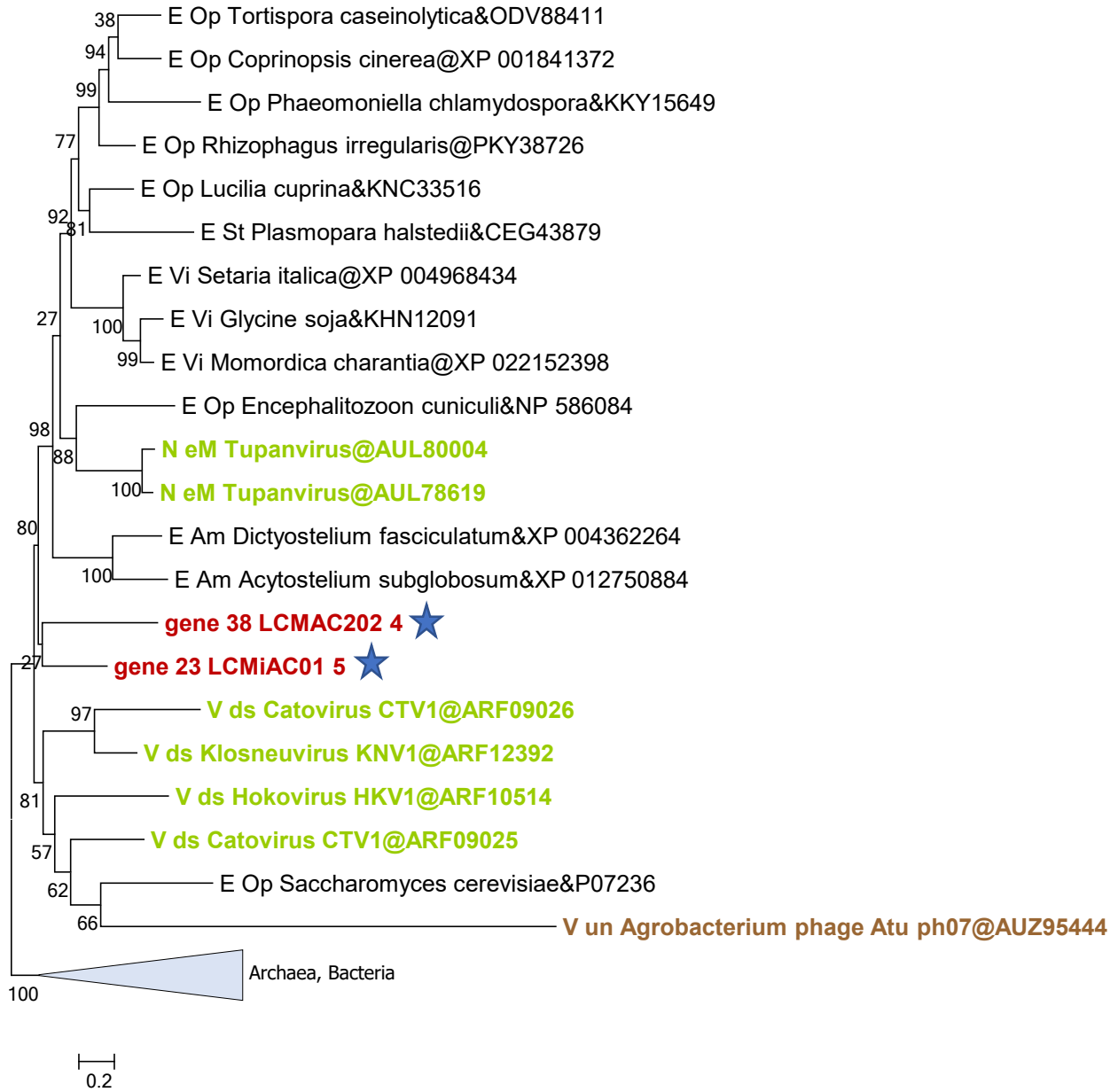


0.2

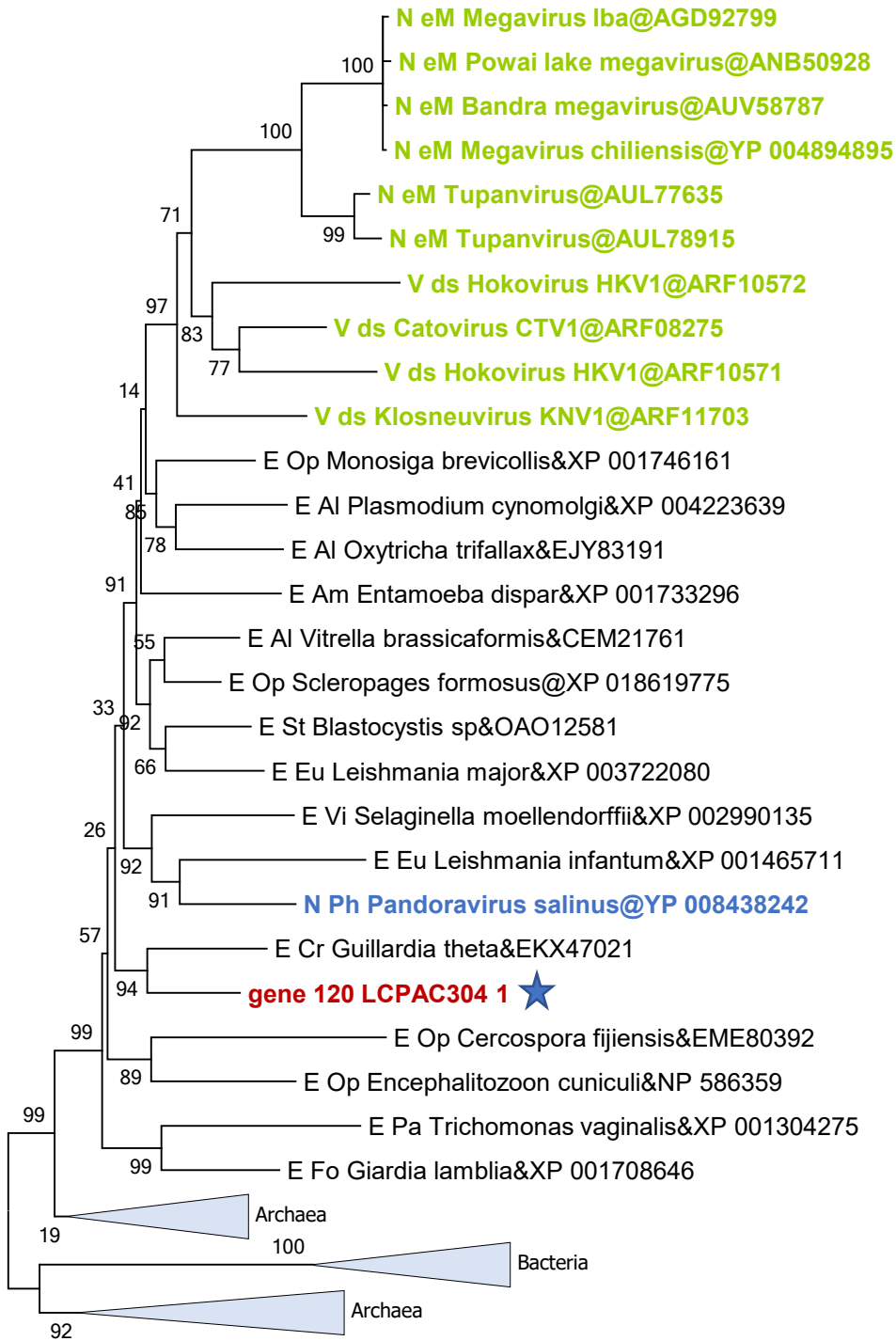
ProS Prolyl-tRNA synthetase



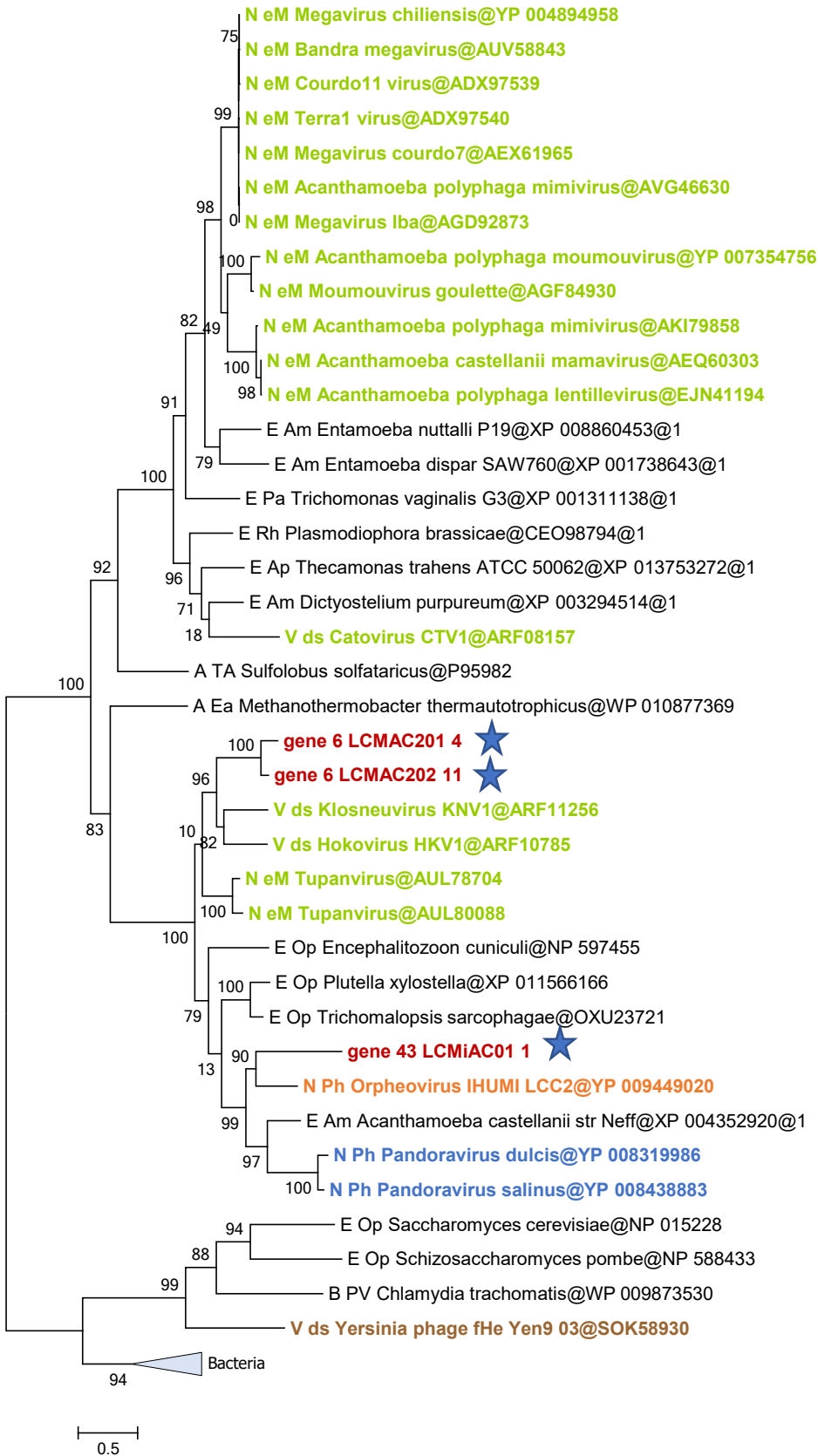
ThrS Threonyl-tRNA synthetase



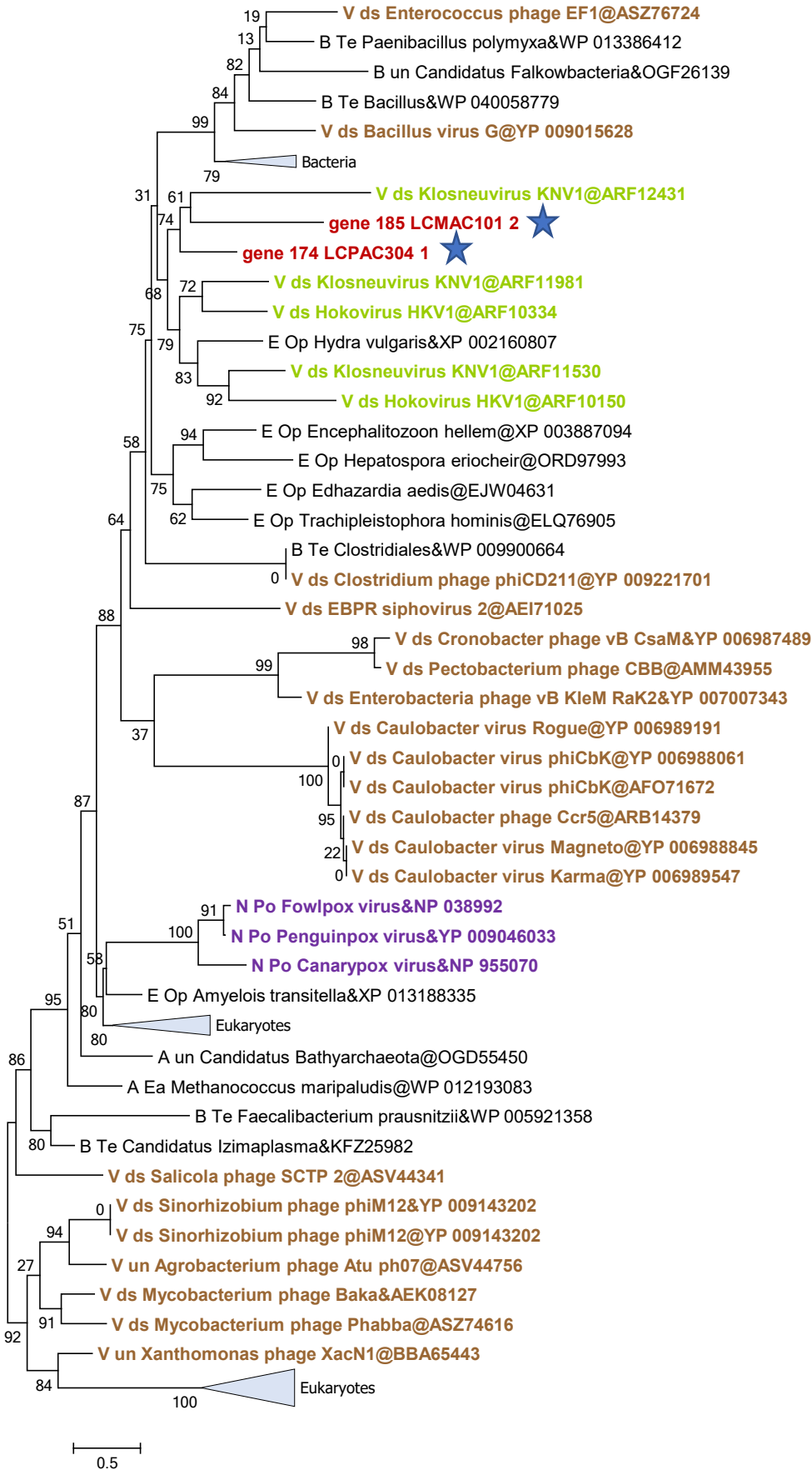
TrpS Tryptophanyl-tRNA synthetase



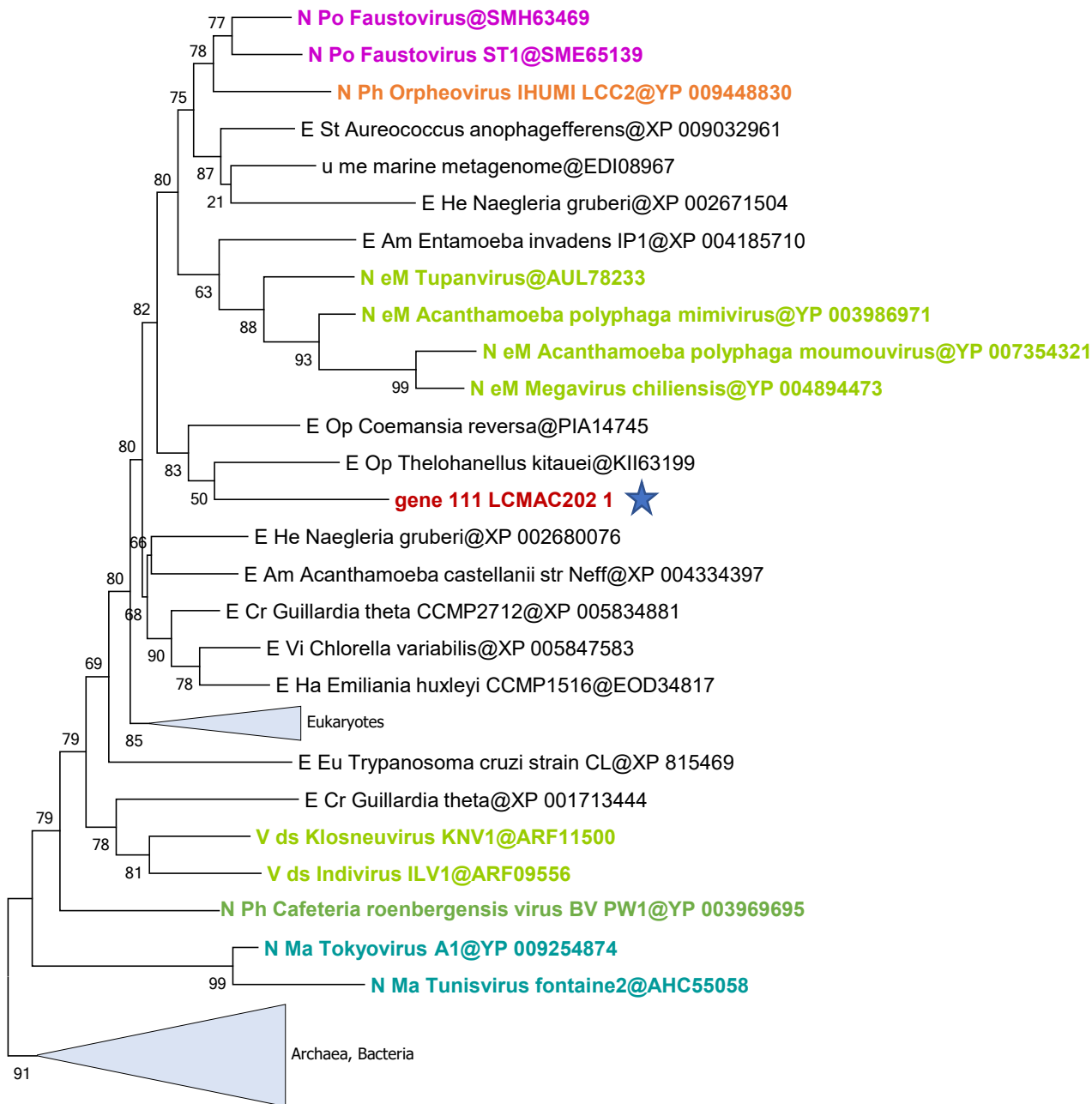
TyrS Tyrosyl-tRNA synthetase



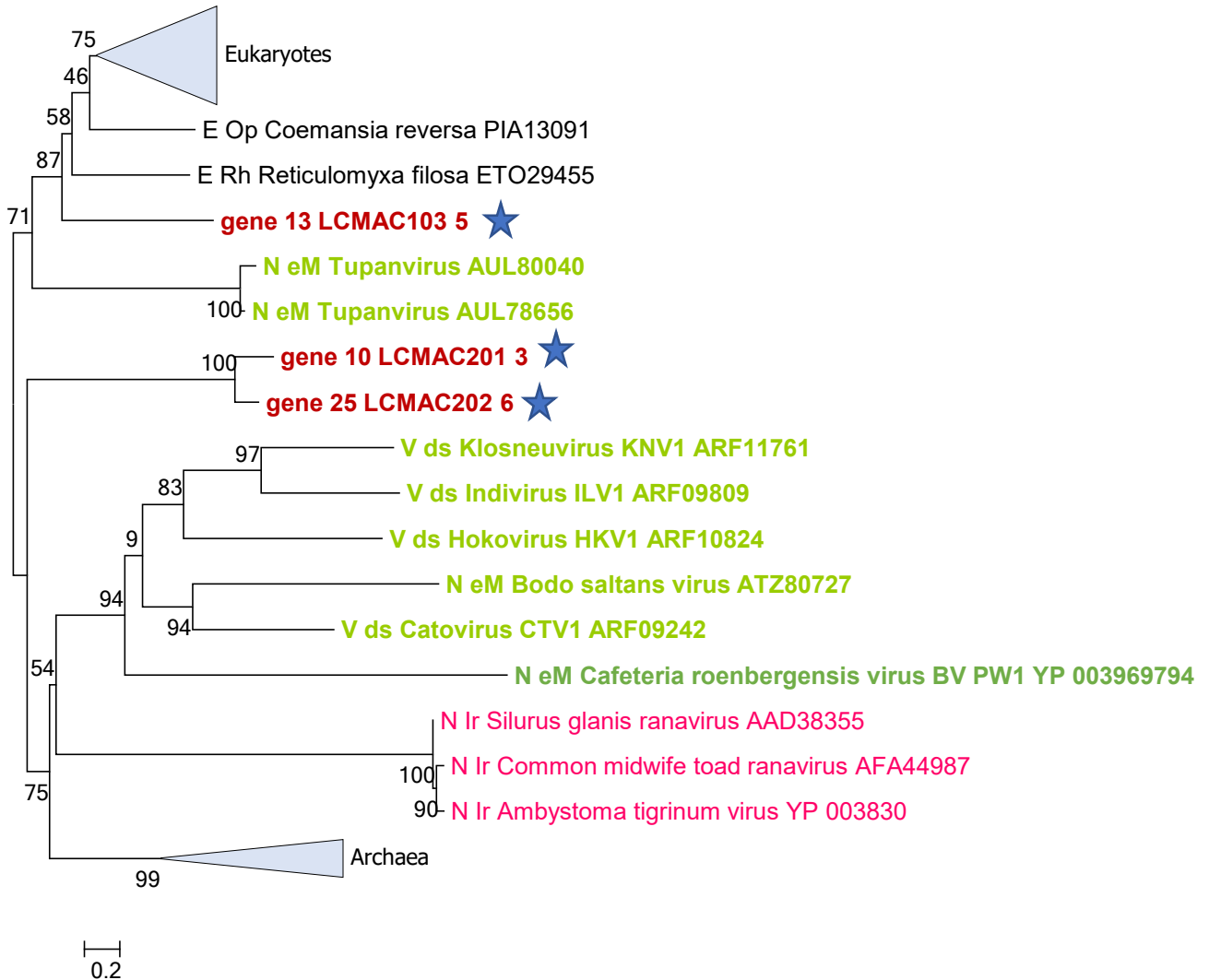
Pth2 Peptidyl-tRNA hydrolase



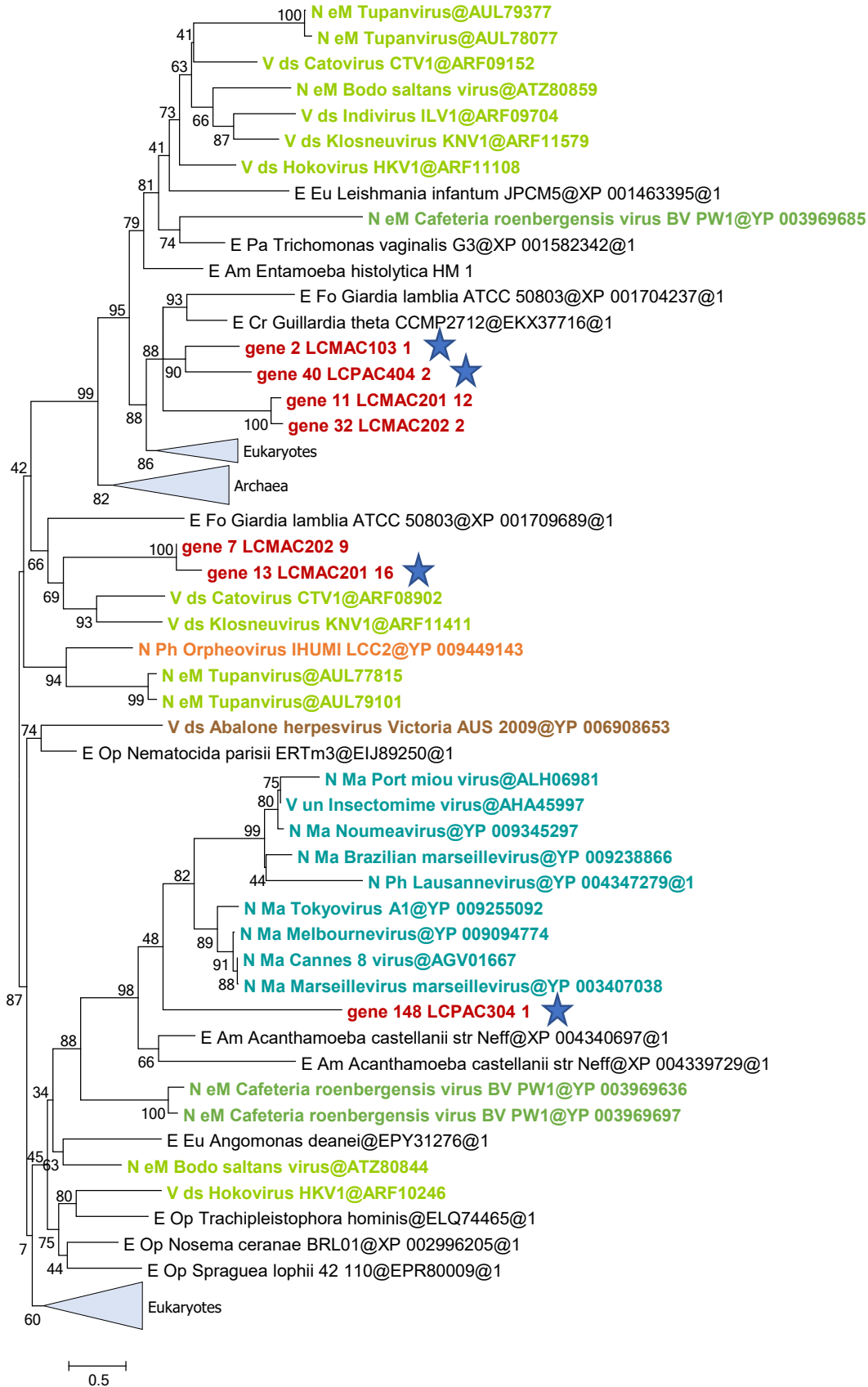
eIF1 Translation initiation factor 1 (eIF-1/SUI1)



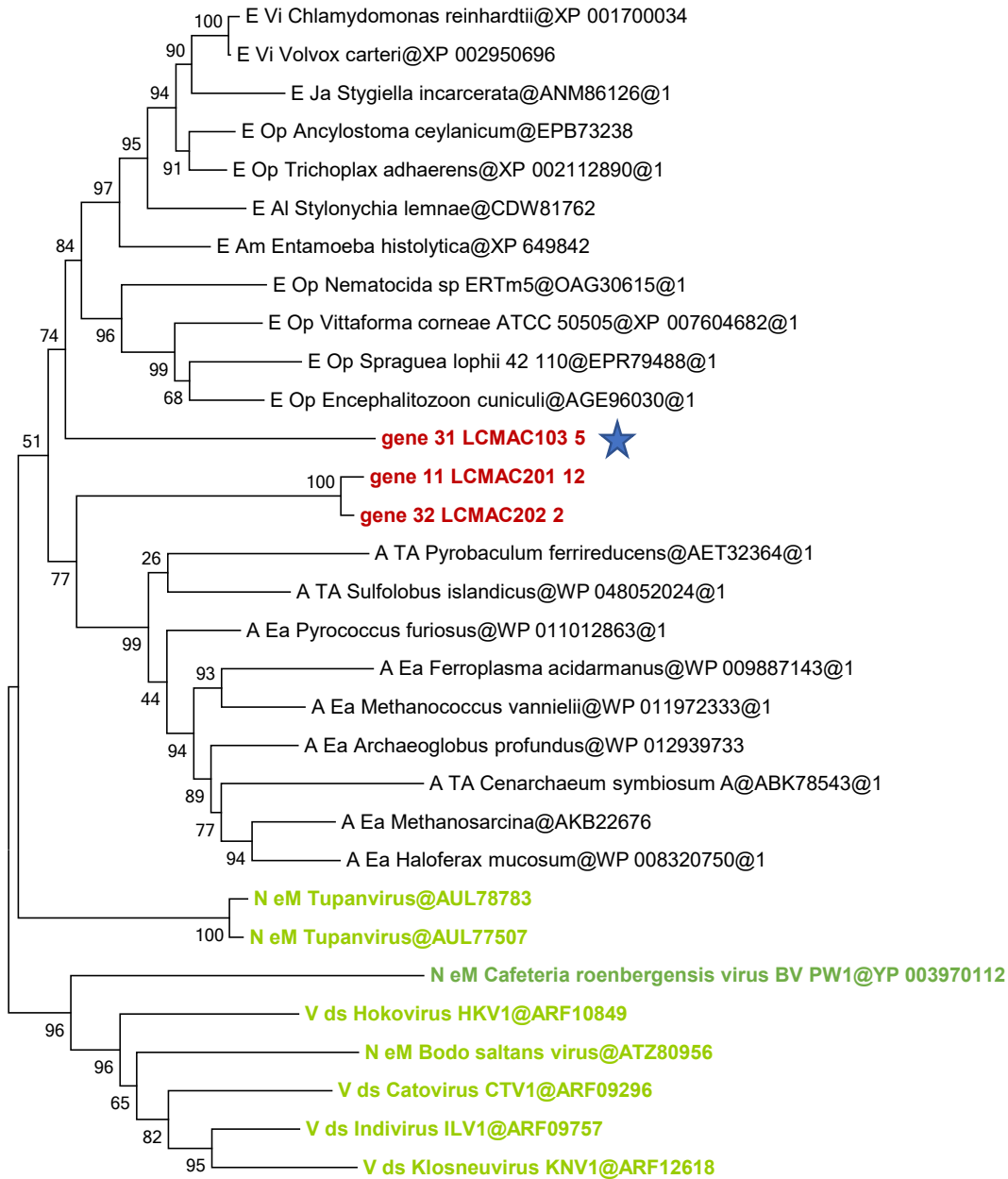
eIF2a Translation initiation factor 2, alpha subunit (eIF-2alpha)



eIF2b Translation initiation factor 2, beta subunit (eIF-2beta)/eIF-5 N-terminal domain

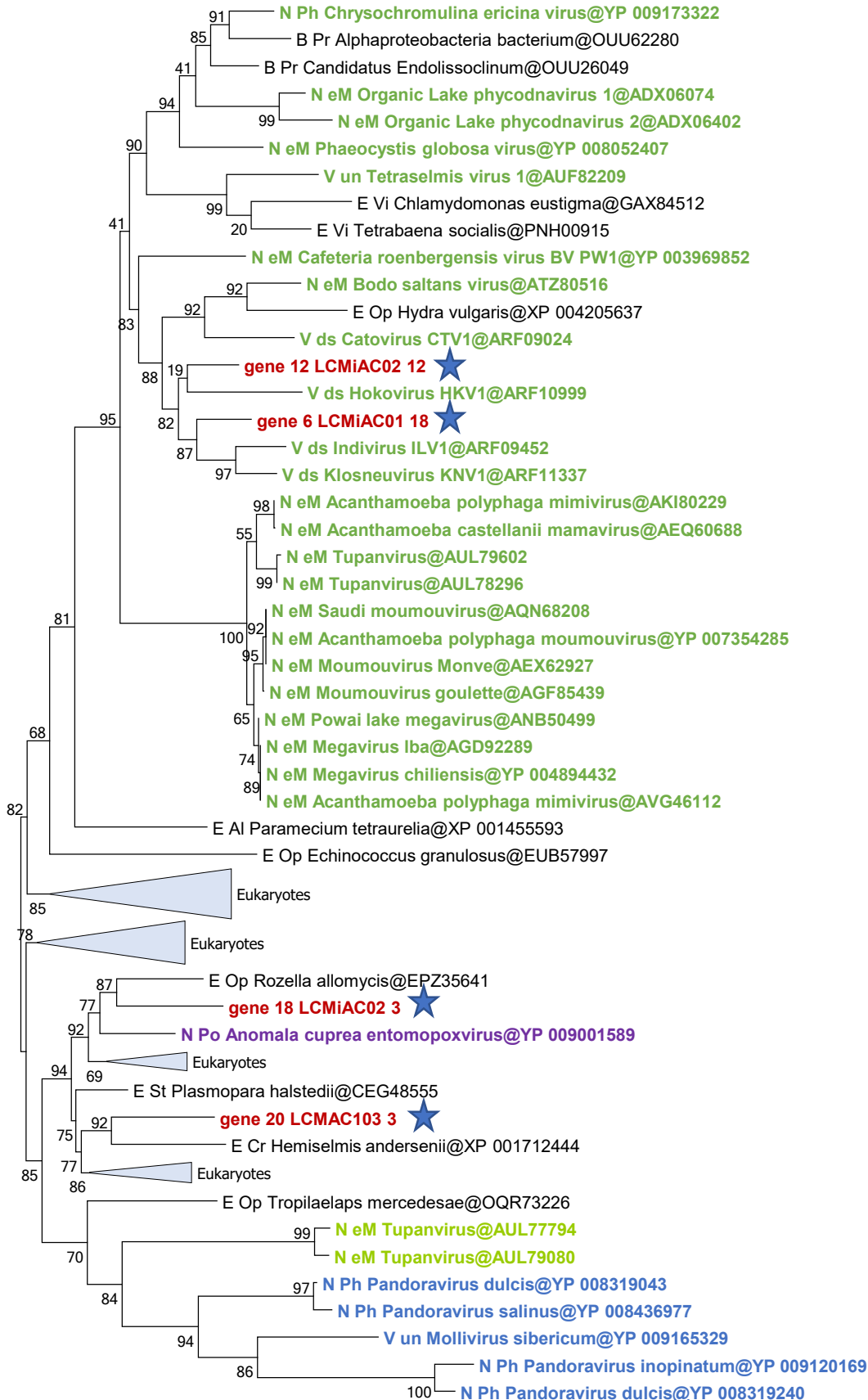


eIF2g Translation initiation factor 2, gamma subunit (eIF-2gamma; GTPase)



0.2

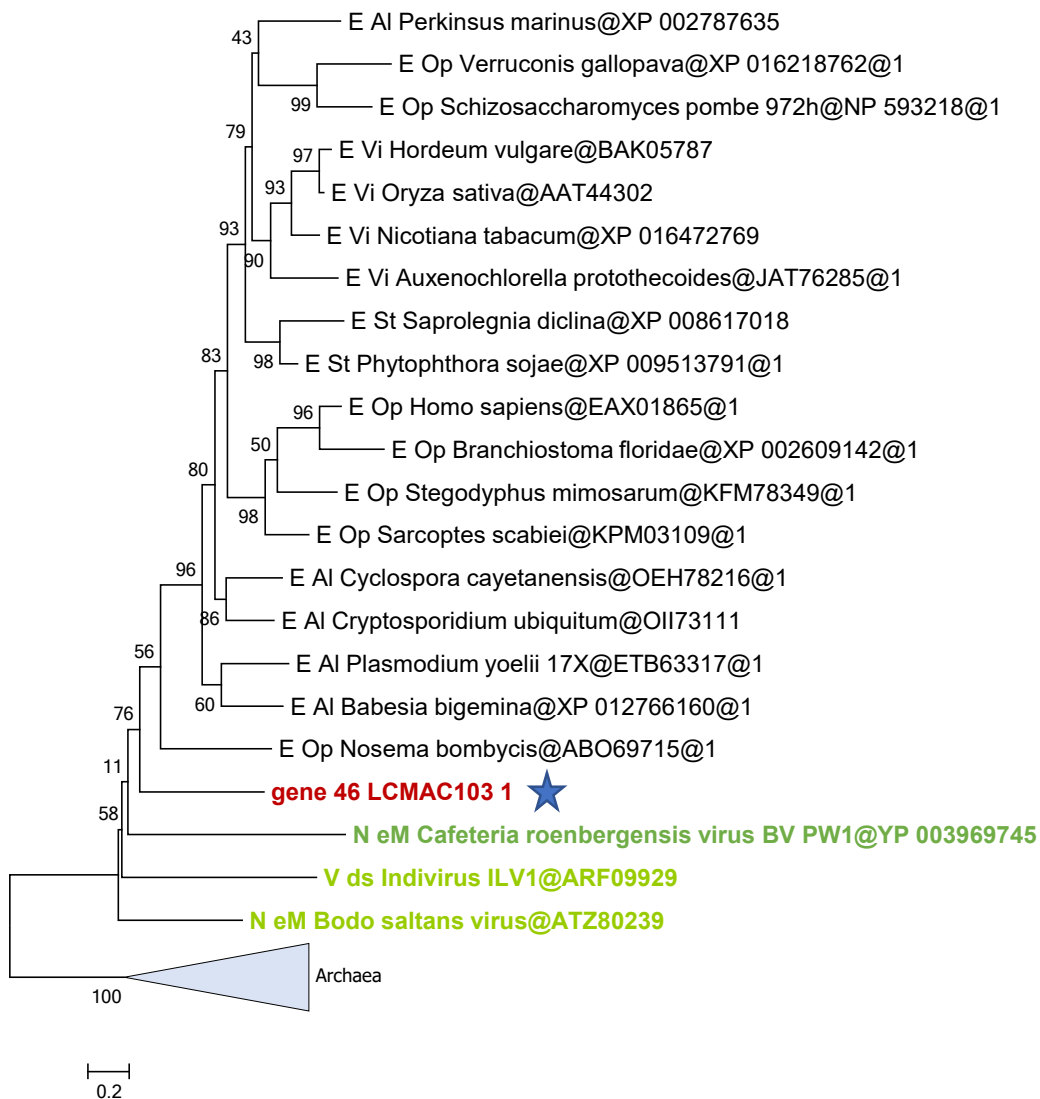
eIF4e Translation initiation factor 4E (eIF-4E)



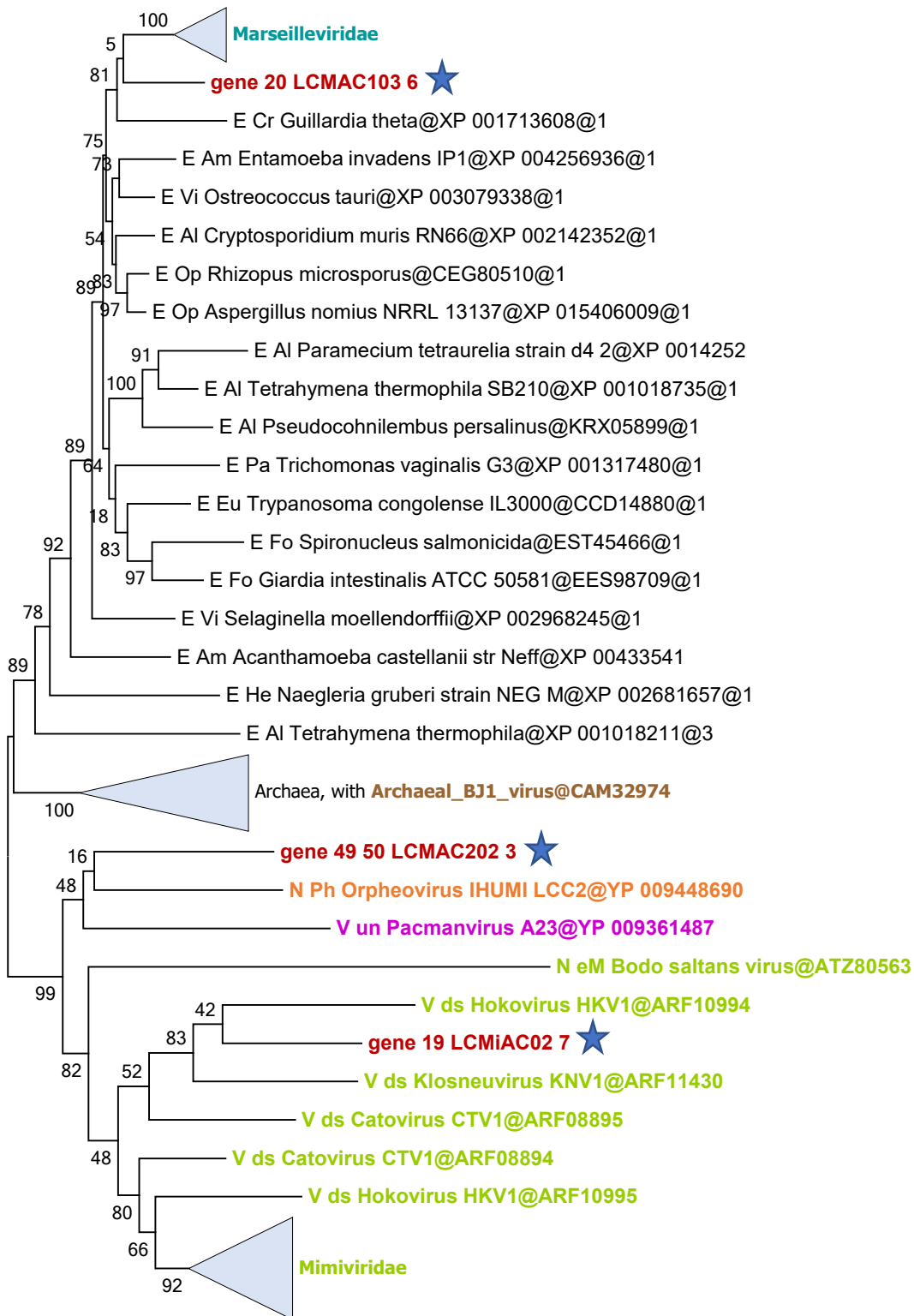
0.2

eIF5B / IF2 Translation initiation factor IF-2

Initiation Factor 2 (IF2) eukaryotic Initiation Factor 5B (eIF5B) family; IF2/eIF5B



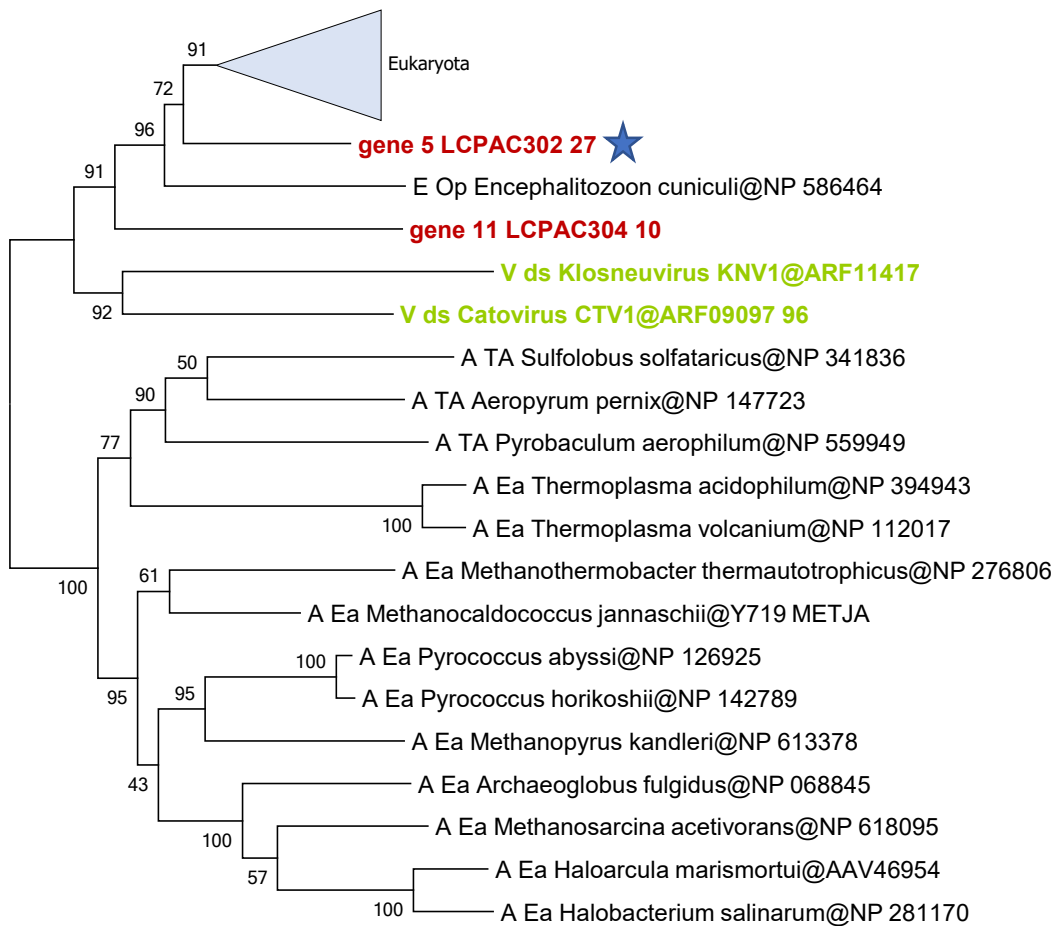
eRF1 Peptide chain release factor 1 (eRF1)



0.2

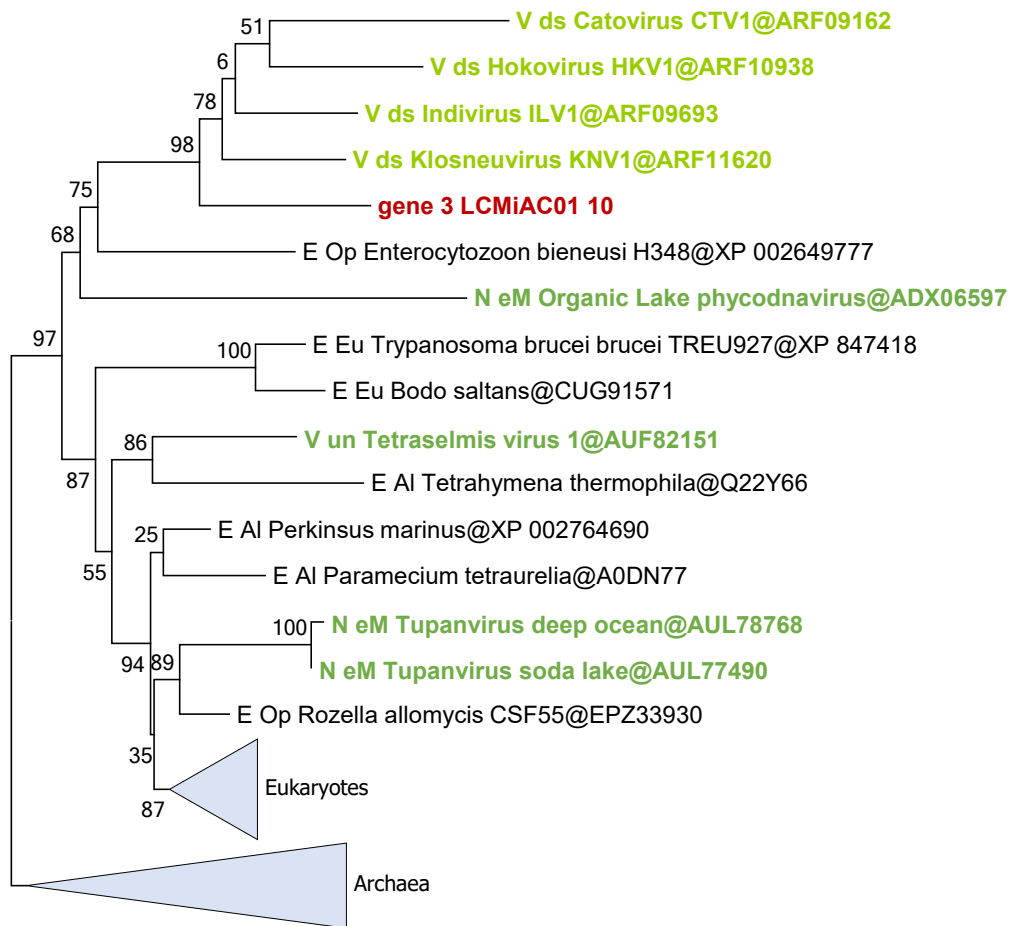
RLI1 Translation initiation factor RLI1

in Archaea: ribosome biogenesis/translation initiation ATPase RLI



0.1

eIF1a Translation initiation factor 1A / IF-1 (eIF-1A for eukaryotes)



LCV contigs containing a translation protein and a 'bona fide' NCLDV protein, as defined by PIM clusters

LCMAC101_1	pim0002,pim0003,pim0004,pim0007,pim0008,pim0011,pim0014,pim0022, pim0027,pim0030,pim0031,pim0053,pim0054,pim0136,pim0142,pim0144			
LCMAC101_2	pim0001,pim0005,pim0013			
LCMAC103_1	pim0011,pim0027,pim0054			
LCMAC103_3	pim0005,pim0142			
LCMAC103_4	pim0002,pim0003,pim0030			
LCPAC404_2	pim0004,pim0005,pim0011,pim0013			
LCMAC201_11	pim0004,pim0014			
LCMAC202_1	pim0004,pim0014,pim0022,pim0027,pim0144			
LCMAC202_10	pim0002,pim0031			
LCMAC202_18	pim0001,pim0013			
LCMAC202_3	pim0004,pim0014,pim0054			
LCMAC202_4	pim0007,pim0053,pim0136			
LCMAC202_6	pim0003,pim0008,pim0011,pim0030			
LCPAC001_1	pim0001,pim0016,pim0030,pim0136			
LCPAC001_11	pim0004,pim0019			
LCPAC101_2	pim0027,pim0030,pim0035			
LCMAC103_5	pim0004			
LCMAC201_16	pim0054			
LCMAC201_3	LCPAC103_3	pim0042	LCMAC202_12	pim0224
LCMAC201_4	LCMAC202_1	pim0042	LCMAC101_1	pim0224
LCPAC101_20	LCPAC202_5	pim0042	LCMAC103_6	pim0224
LCPAC101_21	LCPAC302_16	pim0042	LCDPAC01_16	pim0224
LCPAC304_1	LCPAC102_1	pim0042	LCPAC401_2	pim0015
LCPAC304_11	LCPAC201_4	pim0042	LCPAC403_1	pim0015
LCPAC304_5	LCMAC101_1	pim0042	LCPAC104_1	pim0015
LCPAC202_1	CPAC101_5	pim0042	LCMAC101_5	pim0015
LCPAC201_6	LCMAC102_1	pim0042	LCDPAC02_3	pim0015
LCPAC101_1	LCMAC201_17	pim0042	LCPAC202_1	pim0015
LCPAC302_27	LCPAC104_2	pim0042	LCPAC201_6	pim0015
LCPAC104_3	LCPAC304_2	pim0042	LCPAC304_7	pim0015
LCPAC103_11	LCMAC202_10	pim0071	LCPAC103_1	pim0015
LCPAC304_5	LCPAC202_1	pim0071	LCMAC201_4	pim0015
LCPAC201_3	LCMAC101_1	pim0071	LCIVAC01_1	pim0015
LCPAC202_4	LCPAC201_1	pim0071	LCPAC101_2	pim0015
LCPAC403_2	LCIVAC01_6	pim0071	LCMAC102_1	pim0015
LCPAC001_4	LCDPAC02_1	pim0071	LCPAC406_7	pim0015
LCPAC103_11	LCDPAC01_10	pim0071	LCPAC404_1	pim0015
LCPAC101_2	LCMAC201_7	pim0071	LCMAC103_8	pim0015
LCPAC401_3	LCPAC103_7	pim0071	LCMAC202_11	pim0015
LCPAC406_1	LCMAC201_10	pim0224	LCPAC001_6	pim0015
LCPAC001_4	LCMAC102_1	pim0224	LCPAC302_19	pim0015
LCDPAC01_7	LCPAC304_5	pim0224	LCDPAC01_8	pim0015

PIM cluster annotations

pim0001	NCLDV major capsid protein
pim0002	DNA polymerase elongation subunit family B
pim0003	packaging ATPase
pim0004	DNA-directed RNA polymerase subunit alpha
pim0005	DNA-directed RNA polymerase subunit beta
pim0007	DNA-directed RNA polymerase subunit 5
pim0008	A18-like helicase
pim0011	Flap endonuclease
pim0013	Poxvirus Late Transcription Factor VLTF3
pim0014	Erv1/Alr family disulfide (thiol) oxidoreductase
pim0015	DNA topoisomerase II
pim0016	YqaJ viral recombinase
pim0019	DNA primase
pim0022	D5-like helicase-primase
pim0027	mRNA capping enzyme
pim0030	T4 phage RNA ligase with polynucleotide kinase domain
pim0031	RuvC, Holliday junction resolvases (HJRs)
pim0035	FtsJ-like methyltransferase
pim0042	Ribonuclease III
pim0053	ribonucleoside diphosphate reductase, large subunit
pim0054	ribonucleoside diphosphate reductase, beta subunit
pim0071	deoxynucleotide monophosphate kinase
pim0116	pfam03003: Pox_G9-A16 ; Pox virus entry-fusion-complex G9/A16
pim0134	uncharacterized transmembrane protein conserved in pithoviruses
pim0136	Poxvirus early transcription factor (VETF), large subunit
pim0142	L1R_F9L; Lipid membrane protein of large eukaryotic DNA viruses
pim0144	transcription initiation factor IIB
pim0192	protein kinase conserved in pithoviruses
pim0224	thermonuclease/nuclease

LCV contigs containing a translation protein and a 'bona fide' NCLDV protein, as defined by NCVOG and/or top blastp hits

LCMiAC02_3	D5-like helicase-primase (NCVOG0023)
LCMiAC01_1	NCLDV major capsid protein (NCVOG0022)
LCMiAC02_12	DNA-directed RNA polymerase subunit alpha (NCVOG0274)
LCMiAC01_18	DNA-directed RNA polymerase subunit alpha (NCVOG0274)
LCMiAC01_2	mRNA capping enzyme (NCVOG1451)
LCMiAC01_5	Phosphoinositide 3-kinase (NCVOG0242)
LCMiAC01_9	gene_16_LCMiAC01_9 is similar to TROVE domain protein [Klosneuvirus KNV1]
LCMiAC02_7	polynucleotide kinase-3'-phosphatase (NCVOG0243)