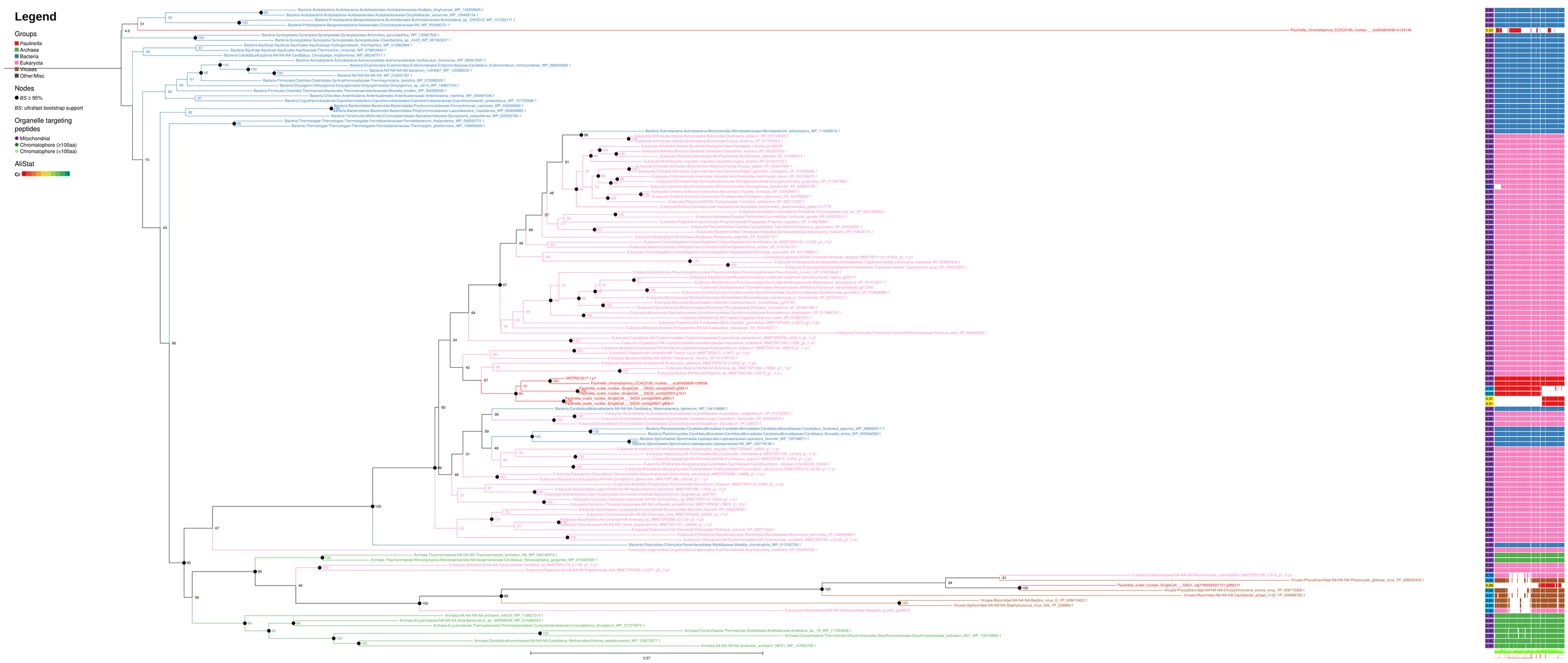
Legend
Groups
Paulinella
Archaea
Bacteria
Eukaryota
Viruses
Other/Misc
Nodes
BS ≥ 95%
BS: ultrafast bootstrap support
Organelle targeting peptides
Mitochondrial
Chromatophore (≥100aa)
Chromatophore (<100aa)
AliStat
Cr
Bacteria-Acidobacteria-Acidobacteria-Acidobacteriales-Acidobacteriaceae-Acidipila_dinghuensis_WP_129209849.1
Bacteria-Acidobacteria-Acidobacteria-Acidobacteriales-Acidobacteriaceae-Occallatibacter_savannae_WP_109489154.1
Bacteria-Proteobacteria-Betaproteobacteria-Burkholderiales-Burkholderiaceae-Burkholderia_sp._DHOD12_WP_137332171.1
Bacteria-Proteobacteria-Betaproteobacteria-Neisseriales-Chromobacteriaceae-NA_WP_054285701.1
Paulinella_chromatophora_CCAC0185_nuclear___scaffold24548-m124149
Bacteria-Synergistetes-Synergistia-Synergistales-Synergistaceae-Aminivibrio_pyruvatiphilus_WP_133957529.1
Bacteria-Synergistetes-Synergistia-Synergistales-Synergistaceae-Cloacibacillus_sp._Arc23_WP_087363237.1
Bacteria-Aquificae-Aquificae-Aquificales-Aquificaceae-Hydrogenobacter_thermophilus_WP_012962969.1
Bacteria-Aquificae-Aquificae-Aquificales-Aquificaceae-Thermocrinis_minervae_WP_079653449.1
Bacteria-CandidatusKryptonia-NA-NA-NA-Candidatus_Chrysopegis_kryptomonas_WP_092374517.1
Bacteria-Actinobacteria-Actinobacteria-Actinomycetales-Actinomycetaceae-Varibaculum_timonense_WP_080913587.1
Bacteria-Elusimicrobiota-Endomicrobia-Endomicrobiales-Endomicrobiaceae-Candidatus_Endomicrobium_trichonymphae_WP_096525900.1
Bacteria-NA-NA-NA-NA-bacterium_1xD4267_WP_120396535.1
Bacteria-NA-NA-NA-NA-NA_WP_016291787.1
Bacteria-Firmicutes-Clostridia-Clostridiales-Syntrophomonadaceae-Thermosyntropha_lipolytica_WP_073089529.1
Bacteria-Dictyoglomi-Dictyoglomia-Dictyoglomales-Dictyoglomaceae-Dictyoglomus_sp._ob14_WP_148807743.1
Bacteria-Firmicutes-Clostridia-Thermoanaerobacterales-Thermoanaerobacteraceae-Moorella_mulderi_WP_062285500.1
Bacteria-Chloroflexi-Ardenticatenia-Ardenticatenales-Ardenticatenaceae-Ardenticatena_maritima_WP_054491546.1
Bacteria-Coprothermobacteota-Coprothermobacteria-Coprothermobacterales-Coprothermobacteraceae-Coprothermobacter_proteolyticus_WP_107763666.1
Bacteria-Bacteroidetes-Bacteroidia-Bacteroidales-Porphyromonadaceae-Fermentimonas_caenicola_WP_045090640.1
Bacteria-Bacteroidetes-Bacteroidia-Bacteroidales-Porphyromonadaceae-Lascolabacillus_massiliensis_WP_053826885.1
Bacteria-Tenericutes-Mollicutes-Entomoplasmatales-Spiroplasmataceae-Spiroplasma_sabaudiense_WP_052525780.1
Bacteria-Thermotogae-Thermotogae-Thermotogales-Fervidobacteriaceae-Fervidobacterium_thailandense_WP_060293131.1
Bacteria-Thermotogae-Thermotogae-Thermotogales-Fervidobacteriaceae-Thermosipho_globiformans_WP_126993569.1
Bacteria-Actinobacteria-Actinobacteria-Micrococcales-Microbacteriaceae-Microbacterium_arborescens_WP_114598516.1
Eukaryota-Arthropoda-Insecta-Hymenoptera-Braconidae-Diachasma_alloeum_XP_015123628.1
Eukaryota-Arthropoda-Insecta-Hymenoptera-Braconidae-Fopius_arisanus_XP_011303503.1
Eukaryota-Annelida-Clitellata-Hirudinida-Glossiphoniidae-Helobdella_robusta_jgi188209
Eukaryota-Mollusca-Bivalvia-Ostreoida-Ostreidae-Crassostrea_virginica_XP_022317425.1
Eukaryota-Mollusca-Gastropoda-NA-Planorbidae-Biomphalaria_glabrata_XP_013065314.1
Eukaryota-Brachiopoda-Lingulata-Lingulida-Lingulidae-Lingula_anatina_XP_013423152.1
Eukaryota-Chordata-Actinopteri-Beloniformes-Adrianichthyidae-Oryzias_latipes_XP_023807934.1
Eukaryota-Chordata-Actinopteri-Cyprinodontiformes-Cyprinodontidae-Cyprinodon_variegatus_XP_015255456.1
Eukaryota-Echinodermata-Asteroidea-Valvatida-Acanthasteridae-Acanthaster_planci_XP_022108472.1
Eukaryota-Echinodermata-Echinoidea-Echinoida-Strongylocentrotidae-Strongylocentrotus_purpuratus_XP_011667956.1
Eukaryota-Hemichordata-Enteropneusta-NA-Harrimaniidae-Saccoglossus_kowalevskii_XP_006820706.1
Eukaryota-Cnidaria-Anthozoa-Scleractinia-Merulinidae-Orbicella_faveolata_XP_020629487.1
Eukaryota-Cnidaria-Anthozoa-Scleractinia-Pocillopora-Pocillopora_damicornis_XP_027058205.1
Eukaryota-Placozoa-NA-NA-Trichoplacidae-Trichoplax_adhaerens_XP_002112400.1
Eukaryota-Porifera-Demospongiae-Haplosclerida-Niphatidae-Amphimedon_queenslandica_jgiAqu1217776
Eukaryota-Nematoda-Chromadorea-Rhabditida-Onchocercidae-Loa_loa_XP_003136355.2
Eukaryota-Nematoda-Enoplea-Trichinellida-Trichinellidae-Trichinella_spiralis_XP_003375010.1
Eukaryota-Priapulida-Priapulimorpha-Priapulimorphida-Priapulidae-Priapulus_caudatus_XP_014667896.1
Eukaryota-Platyhelminthes-Cestoda-Cyclophyllidea-Taeniidae-Echinococcus_granulosus_XP_024352251.1
Eukaryota-Platyhelminthes-Trematoda-Strigeidida-Schistosomatidae-Schistosoma_mansoni_XP_018648174.1
Eukaryota-Streptophyta-NA-Myrtales-Myrtaceae-Rhodamnia_argentea_XP_030529773.1
Eukaryota-Choanoflagellata-Choanoflagellata-Choanoflagellata-NA-Acanthoeca_sp_MMETSP0105_c14750_g1_i1_p1
Eukaryota-Mesomycetozoea-Ichthyosporea-Ichthyophonida-NA-Sphaeroforma_arctica_XP_014150122.1
Eukaryota-Choanoflagellata-Choanoflagellata-Choanoflagellata-Salpingoecidae-Monosiga_brevicolla_XP_001749943.1
Eukaryota-Euglenida-NA-NA-Unranked-Neobodo_designis_MMETSP1114_c41854_g1_i1_p1
Eukaryota-Kinetoplastida-Kinetoplastida-Kinetoplastida-Trypanosomatidae-Leishmania_mexicana_XP_003874334.1
Eukaryota-Kinetoplastida-Kinetoplastida-Kinetoplastida-Trypanosomatidae-Trypanosoma_grayi_XP_009312907.1
Eukaryota-Ascomycota-Pneumocystidomycetes-Pneumocystidaceae-Pneumocystis_jirovecii_XP_018036643.1
Eukaryota-Basidiomycota-Microbotryomycetes-Undefined-Undefined-Sporobolomyces_roseus_jgi28117
Eukaryota-Basidiomycota-Pucciniomycetes-Pucciniales-Melampsoraceae-Melampsora_larici-populina_XP_007410271.1
Eukaryota-Chytridiomycota-Chytridiomycetes-Rhizophydiales-NA-Batrachochytrium_dendrobatidis_jgi12846
Eukaryota-Chytridiomycota-Chytridiomycetes-Spizellomycetales-Spizellomycetaceae-Spizellomyces_punctatus_XP_016608989.1
Eukaryota-Mucoromycota-Mortierellomycetes-Mortierellales-Mortierellaceae-Lobosporangium_transversale_XP_021876151.1
Eukaryota-Mucorales-Mucoraceae-Undefined-Undefined-Mucor_circinelloides_gw43749
Eukaryota-Mucoromycota-Mucoromycetes-Mucorales-Rhizopodaceae-Rhizopus_microsporus_XP_023461305.1
Eukaryota-Ascomycota-Saccharomycetes-Saccharomycetales-Saccharomycetaceae-Eremothecium_sinecaudum_XP_017989130.1
Eukaryota-Streptophyta-NA-Fagales-Fagaceae-Quercus_suber_XP_023527037.1
Eukaryota-Euglenida-NA-Eutreptiales-NA-Eutreptiella_gymnastica_MMETSP0039_c19372_g2_i1_p2
Eukaryota-Mesomycetozoea-Ichthyosporea-NA-NA-Capsaspora_owczarzaki_XP_004345327.1
Eukaryota-Fonticulida-Fonticulida-Fonticulida-Fonticulaceae-Fonticula_alba_XP_009493835.1
Eukaryota-Cryptophyta-NA-Cryptomonadales-Cryptomonadaceae-Cryptomonas_paramecium_MMETSP0038_c22813_g1_i1_p1
Eukaryota-Cryptophyta-NA-Cryptomonadales-Hemiselmidaceae-Hemiselmis_andersenii_MMETSP1043_c1685_g2_i1_p1
Eukaryota-Alveolata-Dinophyceae-Peridiniales-Kryptoperidiniaceae-Kryptoperidinium_foliaceum_MMETSP0120_c69975_g1_i1_p1
Eukaryota-Ciliophora-NA-Unranked-NA-Tiarina_fusus_MMETSP0472_c10871_g1_i1_p1
Eukaryota-Apusomonadidae-NA-NA-NA-Thecamonas_trahens_XP_013760733.1
Eukaryota-Ciliophora-NA-Unranked-NA-Protocruzia_adherens_MMETSP0216_c16332_g1_i1_p2
Eukaryota-Retaria-NA-NA-NA-Ammonia_sp_MMETSP1384_c18998_g1_i1_p1
Eukaryota-Retaria-NA-NA-NA-Resalina_sp_MMETSP0180_c14017_g1_i1_p1
MSTRG.5217.1.p1
Paulinella_chromatophora_CCAC0185_nuclear___scaffold3858-m38036
Paulinella_ovalis_nuclear_SingleCell___SAG3_contig00455.g583.t1
Paulinella_ovalis_nuclear_SingleCell___SAG5_contig00003.g16.t1
Paulinella_ovalis_nuclear_SingleCell___SAG3_contig00840.g895.t1
Paulinella_ovalis_nuclear_SingleCell___SAG5_contig00621.g866.t1
Bacteria-CandidatusMelainabacteria-NA-NA-NA-Candidatus_Melainabacteria_bacterium_WP_144104886.1
Eukaryota-Acytostelialeses-Acytostelialeses-Acytostelialeses-Acytostelialeaceae-Acytostelium_subglobosum_XP_012725937.1
Eukaryota-Acytostelialeses-Acytostelialeses-Acytostelialeses-Cavenderiaceae-Cavenderia_fasciculata_XP_004335521.1
Eukaryota-Dictyostelialeses-Dictyostelialeses-Dictyostelialeses-Dictyostelium_discoideum_XP_638973.1
Bacteria-Planctomycetes-CandidatusBrocadiae-CandidatusBrocadiales-CandidatusBrocadiaceae-Candidatus_Scalindua_japonica_WP_096894517.1
Bacteria-Planctomycetes-CandidatusBrocadiae-CandidatusBrocadiales-CandidatusBrocadiaceae-Candidatus_Brocadia_sinica_WP_052564009.1
Bacteria-Spirochaetes-Spirochaetia-Leptospirales-Leptospiraceae-Leptospira_bourretii_WP_135748571.1
Bacteria-Spirochaetes-Spirochaetia-Leptospirales-Leptospiraceae-NA_WP_100718146.1
Eukaryota-Amoebozoa-NA-NA-Paramoebidae-Stygamoeba_regulata_MMETSP0447_c8923_g1_i1_p1
Eukaryota-Haptophyta-NA-Prymnesiales-NA-Chrysoculter_rhomboideus_MMETSP1335_c10343_g1_i1_p1
Eukaryota-Haptophyta-NA-Prymnesiales-NA-Prymnesium_parvum_MMETSP0815_c7292_g1_i1_p1
Eukaryota-Rhodophyta-Bangiophyceae-Cyanidiales-Cyanidiaceae-Cyanidioschyzon_merolae_CmerSCOS_G3248.1
Eukaryota-Rhodophyta-Bangiophyceae-Porphyridiales-Porphyridiaceae-Porphyridium_aerugineum_MMETSP0313_c5769_g1_i1_p1
Eukaryota-Glaucophyta-Gloeochaetales-Gloeochaetaceae-Gloeochaete_witrockiana_MMETSP0268_c18896_g1_i1_p1
Eukaryota-Glaucophyta-Glaucophyta-NA-NA-Cyanoptyche_gloeocystis_MMETSP1086_c20105_g1_i1_p1
Eukaryota-Alveolata-Dinophyceae-NA-Unranked-Glenodinium_foliaceum_MMETSP0119_c5980_g1_i1_p2
Eukaryota-Stramenopiles-Labyrinthista-NA-NA-Aplanochytrium_stochinoi_MMETSP1346_c7934_g1_i1_p1
Eukaryota-Stramenopiles-Labyrinthulomycetes-Unranked-Unranked-Aplanochytrium_kerguelense_jgi47591
Eukaryota-Cercozoa-Chlorarachniophyceae-NA-NA-Gymnochlora_sp._MMETSP0110_c5464_g1_i1_p1
Eukaryota-Cercozoa-Chlorarachniophyceae-NA-NA-Lotharella_amoeboformis_MMETSP0042_c9803_g1_i2_p1
Eukaryota-Apicomplexa-Conoidasida-Eucoccidiorida-Sarcocystidae-Besnoitia_besnoiti_XP_029222528.1
Eukaryota-Chromerales-NA-NA-NA-Chromera_velia_MMETSP0290_c29293_g1_i1_p1
Eukaryota-Apicomplexa-NA-Unranked-NA-Alveolata_sp._MMETSP0288_c31130_g1_i1_p1
Eukaryota-Chromerales-NA-NA-NA-Vitrella_brassicaformis_MMETSP1451_c36946_g1_i1_p1
Eukaryota-Perkinsozoa-NA-Perkinsida-Perkinsidae-Perkinsus_marinus_XP_002771644.1
Eukaryota-Ciliophora-NA-Pyramimonadales-NA-Pyramimonas_simplex_MMETSP1081_c16122_g1_i1_p1
Eukaryota-Chlorophyta-Mamiellophyceae-Mamiellales-Mamiellaceae-Micromonas_commoda_XP_002504960.1
Bacteria-Chlamydiae-Chlamydiia-Parachlamydiales-Waddliaceae-Waddlia_chondrophila_WP_013182705.1
Eukaryota-Longamoebia-Longamoebia-Longamoebia-Acanthamoebidae-Acanthamoeba_castellanii_XP_004353733.1
Archaea-Thaumarchaeota-NA-NA-NA-Thaumarchaeota_archaeon_NA_WP_048194473.1
Archaea-Thaumarchaeota-Nitrososphaeria-Nitrososphaerales-Candidatus_Nitrososphaera_gargensis_WP_015020539.1
Eukaryota-Amoebozoa-NA-NA-Paramoebidae-Vexillifera_sp_MMETSP0173_c1130_g1_i1_p1
Eukaryota-Papilionomonas-NA-NA-NA-Papilionomonas_bilix_MMETSP0780_c12271_g1_i1_p1
Eukaryota-Heterolobosea-NA-NA-NA-Percolomonas_cosmopolitus_MMETSP0758_c1579_g1_i1_p1
Viruses-Phycodnaviridae-NA-NA-NA-Phaeocystis_globosa_virus_YP_008052403.1
Paulinella_ovalis_nuclear_SingleCell___SAG1_utig7180000021121.g9663.t1
Viruses-Phycodnaviridae-NA-NA-NA-Chrysochromulina_ericina_virus_YP_009173395.1
Viruses-Mycoviridae-NA-NA-NA-Cauldobacter_phage_CrJ0_YP_009098783.1
Viruses-Mycoviridae-NA-NA-NA-Bacillus_virus_G_YP_009015423.1
Viruses-Siphoviridae-NA-NA-NA-Staphylococcus_virus_42e_YP_239889.1
Eukaryota-Heterolobosea-NA-NA-Vahlkampfiidae-Naegleria_gruberi_gjs34674
Archaea-NA-NA-NA-NA-archaeon_AArcSI_WP_119821314.1
Archaea-Euryarchaeota-NA-NA-NA-Acidulprofundum_sp._MAR08339_WP_015283203.1
Archaea-Euryarchaeota-Thermoplasmata-Thermoplasmatales-Cuniculiplasmataceae-Cuniculiplasma_divulgatum_WP_077075975.1
Archaea-Crenarchaeota-Thermoprotei-Acidilobales-Acidilobaceae-Acidilobus_sp._7A_WP_117354628.1
Archaea-Crenarchaeota-Thermoprotei-Desulfurococcales-Desulfurococcaceae-Desulfurococcaceae_archaeon_AG1_WP_109159965.1
Archaea-CandidatusKorarchaeota-NA-NA-NA-Candidatus_Methanodesulfokores_washburnensis_WP_125572077.1
Archaea-NA-NA-NA-NA-anaerobic_archaeon_MKD1_WP_147664708.1
0.57