

The evolution of genomes, organelles and endosymbionts of free-living anaerobic protists

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Representatives of novel groups of free-living anaerobic protists are continuously being discovered. Long-read and short-read genomic technologies now make it relatively straightforward to characterize the genomes of these organisms along with many of the prokaryotes that grow in co-culture with them. Together with detailed morphological descriptions, these data allow us to rapidly determine the phylogenetic positions of these lineages in the eukaryote tree of life and characterize their novel forms of mitochondrion-related organelles. These data allow us to reconstruct, and experimentally test, the predicted metabolic interactions of these protists with the prokaryotes living within and around them. I will present our latest genomic, evolutionary and proteomic analyses of these protistan-prokaryote communities of a variety of novel anaerobic protists belonging to the Metamonada. These analyses provide insights into the forces shaping anaerobic protistan genomes and organelles as well as the role of endosymbionts in their evolutionary metabolic remodeling.