

Gene Transfer Accompanying the Secondary Endosymbiosis of Euglenid Plastid

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Autotrophic euglenids (Euglenozoa: Euglenophyceae) form a monophyletic group with secondary chloroplasts derived from a green alga (probably closely related to Pyramimonadales), which was most probably acquired by a common ancestor of autotrophic euglenids (plastid-late hypothesis). However, the acquisition of the plastid earlier in the evolution of euglenids lineage (plastid-early hypothesis) cannot be ruled out. The process of organelle acquisition is accompanied by the transfer of genes from the endosymbiont to host nucleus (EGT), the presence of such genes in euglenids provides a footprint of past endosymbioses. To test the plastid-early hypothesis and to learn more about the contribution of EGT to euglenid genomes, we are analyzing transcriptomes of three autotrophic and two osmotrophic euglenids for the amount of EGT derived genes. Using an automatic pipeline, we performed BLAST searches against custom database followed by phylogenetic analyses (using RAXML), which enable us to select transcripts of genes putatively related to algae (ARG). The contribution of green algal genes in autotrophic euglenids is higher than in primarily osmotrophic one slightly supporting the plastid-late hypothesis. Surprisingly we observed a high number of genes related to other algal groups in osmotrophic and autotrophic euglenids. We perform mapping of entries of ARG into the phylogeny of euglenids using orthoMCL. Astonishingly, we are not able to pinpoint a single endosymbiotic event in the history of euglenids.