**Differential expression of mycobionts and photobionts in *Peltigera britannica* photosymbiodemes**

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Lichen photosymbiodemes provide the valuable and unique opportunity to study the interactions of a mycobiont with two photobiont partners belonging to different kingdoms. The resulting patterns in gene expression should provide valuable information on the interaction between organisms. We collected *Peltigera britannica* photosymbiodemes containing cyanobacterial and tripartite lobes, and exposed these lichens to different temperatures representing benign and stressful conditions in an RNA-seq experiment to quantify gene expression. Differential expression analysis revealed many differentially expressed genes between morphs and between temperature treatments, and showed that the same mycobiont individual differs substantially in gene expression depending on its symbiosis partner. The findings have implications for the understanding of lichen symbiosis. Funding: Icelandic Research Funds, IRF (grant #174307-051).