

**Xiang, Q.** and Judelson, H. 2010. Gene regulation during asexual development in the oomycete *Phytophthora infestans*. *Phytopathology* 100:S140.

*Phytophthora infestans*, the causal agent of potato and tomato late blight, undergoes a series of distinct morphological differentiations during asexual reproduction. Our study focuses on identifying the genes involved in differentiation, and the transcription factors and cognate promoter binding sites that are responsible for the expression of these genes. Microarray studies revealed that thousands of genes were up-regulated in different stages of asexual reproduction. These genes encode proteins involved in flagellar function, vesicle transport, protein posttranslational modification, signaling and other activities that may be important in asexual development. Dissections of the promoters of several genes identified transcription factor binding sites required for their developmental regulation. One of the binding sites is CCGTTG, which is significantly enriched in promoters specifically active in sporulation. As CCGTTG is known to bind MYB transcription factors from animals and plants, we characterized the MYB transcription factor families from four sequenced oomycete genomes. Several groups of MYB proteins were predicted, with some resembling those found in plants and animals and others having oomycete-specific configurations of their DNA binding domains. Many of these myb genes are differentially expressed during asexual development based on RT-PCR. Gene silencing and over-expression experiments are being conducted to determine how MYB proteins regulate the spore cycle.