

## Functions of Homeobox and Mads-box Transcription Factors in *Phytophthora infestans*

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*Phytophthora infestans* is a plant pathogen which causes late blight mainly in potato and tomato. The Judelson laboratory is studying different aspects of development in this pathogen. Transcription factors like homeobox and MADS-box proteins are responsible for the expression of targeted developmental genes in many proteins. I have used bioinformatics analysis to identify homeo proteins in *P. infestans* and will silence them via RNA interference-based hairpin constructs to determine their functions. The process includes primer design, PCR amplification, gel electrophoresis, and molecular cloning in plasmids leading to bacterial and oomycete transformation. The effects of silencing will then be observed during the pathogen's many life stages. These stages include hyphae, spores, zoospores, germinated cysts, and cleaving sporangia. At this point in my research, I have successfully joined the sense, intron, and antisense strands of the MADS-box protein hairpin silencing construct in cloning vector pBluescript SK<sup>+</sup>. My next step will be to transform *P. infestans* using the pTOR vector containing this hairpin silencing construct. For five homeo domain proteins of interest, I have cloned the sense plus intron and the antisense strands separately and will be ligating all strands into cloning vector pBluescript SK<sup>+</sup>. Finally I will transform *P. infestans* with pTOR containing all homeo domain hairpin silencing constructs. This study will lead to further understanding of the roles of these proteins in growth, development, and pathogenesis.