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The Cloning and Characterization of *Phytophthora*-inducible *PRR* genes from Tomato

PAMP-triggered immunity (PTI) is one of two major disease resistance pathways present in the plant kingdom. This specific pathway involves pathogen associated molecular patterns (PAMPs), which are unique to the pathogens, and their detection by pattern recognition receptors (PRRs) in plants. PAMPs are specific to each class of microbe and required for a vital function, which prevents the microbe from quickly evolving to evade detection. Thus, the PRR-mediated resistance (PTI) is more durable than the resistance (R) gene-mediated disease (also call Effector-triggered immunity (ETI)). Fry lab at Cornell has recently found that 71 receptor-like kinase genes are induced during the tomato-*Phytophthora* interaction. Our further bioinformatics analysis indicated 17 of them contain extracellular LRR, transmembrane and kinase domain and thereby are putative *PRR* genes. Our research goal is to clone and over-express these PRR genes in tomato and potato plants and assess the possible altered resistance/susceptibility to *Phytophthora* accordingly. Of these 17 PRR's I have introduced 2 into multiple lines of tomato and potato, Solyc02g091840.2.1 (1840) and Solyc07g006110.2.1 (6110) through *Agrobacterium* transformation. In particular, 1840 was previously shown to be unstable and degraded by the ubiquitin-proteasome system (UPS) in plant cells, which suggests 1840 is fine-tuned on both transcriptional and post-translational levels. We have identified a c-terminal PEST domain responsible for the degradation and generated a truncated version of 1840 lacking the PEST domain (termed 1840ΔPEST), which appears stable and is currently undergoing tissue culture transformation. *Phytophthora* detached leaf assays will begin this week on the 2nd generation of 1840 and 6110 transgenic tomato lines.