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Characterization and analysis of antifungal proteins from *Phytophthora infestans* (late-blight)-resistant potato progenitors

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II. Progress Report

Through this project we have continued our investigations into the various antimicrobial proteins found in potato varieties that are resistant to the late blight fungus. Interestingly, a protein specific to the storage tubers (the potatoes), patatin, was found to account for this resistance, and through further studies we hope to find other antifungal proteins. In this project, we are also investigating antimicrobial proteins from other species, including tobacco, potato, and the highly-studied model plant, Arabidopsis. Currently, we are working to identify different types of antimicrobial proteins, such as ribosome-inactivating proteins (RIPs), and on cloning these RIPs in order to understand the how these proteins operate at the molecular level.

III. Impacts:

- The goals proposed in this project will allow the development of practical applications for disease management by developing transgenic plants using some of these antimicrobial genes.

IV. Publications:

1. Park, S-W., Vepachedu, R., Sharma, N., and Vivanco, J.M. (2004) Ribosome-inactivating proteins in plant biology. *Planta* 219:1093-1096
2. Sharma, N., Park, S. W., Vepachedu, R., Barbieri, L., Ciani, M., Stirpe, F, Savary, B.J., and Vivanco, J.M. (2004) Isolation and characterization of an RIP-like protein from *Nicotiana tabacum* with dual enzymatic activity. *Plant Physiology* 134:171-181
3. Sharma, N., Gruszewski, H.A., Park, S-W., Holm, D.G., and Vivanco, J.M. (2004) Purification and characterization of an isoform of patatin from late blight-resistant potatoes with antimicrobial activity against *Phytophthora infestans*. *Plant Physiology and Biochemistry* 42:647-655
4. Park, S-W., Vepachedu, R., Owens, R.A., and Vivanco, J.M. (2004) The N-glycosidase activity of the ribosome-inactivating protein ME1 targets single-stranded regions of nucleic acids independent of sequence or structural motifs. *Journal of Biological Chemistry* 279: 34165-34174
5. Bais, H.P., Prithiviraj, B., Jha, A.K., Ausubel, F.M., and Vivanco, J.M. (2005) Root exudation of antimicrobials mediates pathogen resistance. *Nature* 434:217-221