Rao, S.; El-Habbak, M.; Haudenshield, J.S.; Zheng, D.; Hartman, G.L.; Korban, S.S.; and Ghabrial, S.A. 2010. Over-expression of the calmodulin gene SCaM-4 in soybean enhances resistance to *Phytophthora sojae.* Phytopathology 100:S107.

Soybean is the major oilseed crop in the world with an annual value of 14 billion dollars in the United States. Plant pathogens inflict heavy losses on soybean yield. One of the most important pathogens is the oomycete, *Phytophthora sojae*, that causes Phytophthora root and stem rot. A set of resistance genes (*Rps*) was found to confer resistance to the pathogen. However, due to selection pressure, virulent races continue to evolve. Calmodulin, a Ca^2–binding protein, is implicated in plant defense responses in different plant species. The cellular level of SCaM-4 is known to increase rapidly in response to pathogen infection. Over-expression of *SCaM-4* in transgenic tobacco has been correlated with enhanced broad resistance to pathogens. We used the bean pod mottle virus-based vector for over-expression of *SCaM-4* in soybean, which was verified by RT-PCR. The *SCaM-4* over-expressing plants exhibited a distinct phenotype compared with control plants. Mock, vector control, and *SCaM4* over-expressing Harosoy plants were inoculated with *P. sojae* race 3 using stem wound inoculation. While mock and vector control plants showed expanding necrotic lesions at the infection sites and many plants died within 10 to 15 days post-inoculation, all *SCaM-4* over-expressing plants remained vigorous, and showed only superficial small lesions at infection sites. Experiments are underway to silence the *SCaM-4* gene in *P. sojae*- resistant soybean cultivars to determine whether such treatment would jeopardize the resistance response..