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Plant Agriculture and Arani Kajenthira, Guelph's Newest Rhodes Scholar

By Dr. Manish Raizada

My entire lab is thrilled and proud of Arani Kajenthira, Guelph's newest Rhodes Scholar. Arani was in my lab for three years, joining my lab after her first year at Guelph, twice receiving an NSERC Summer Scholarship.

What did Arani do while in Plant Agriculture? Briefly:

1. My lab is interested in isolating key genes responsible for adventitious (wound-induced, de novo) stem cells (meristems) in plants. There are a number of horticultural and agricultural applications of our research. We use Arabidopsis as a model system. Arani characterized the hormone responses of 60 ecotypes of Arabidopsis for stem cell regeneration. Her careful analysis contributed to a large mutant screen where we mutagenized 20,000 Arabidopsis seedlings, and isolated 10 "Shooting up" mutants that have enhanced stem cell regeneration capability. Arani has more characterized these mutants in terms of their responses to age, light levels and hormone levels. Based on our more recent analysis, we have now begun the process required to map these novel mutants in Arabidopsis.
2. My lab is interested in developing low-cost, effective technologies to assist breeders in Canada and the Developing World. Arani has contributed to the bioengineering of a bacterial biosensor, a tool to detect small metabolites quantitatively. This work was in collaboration with scientists at Princeton and Caltech, and employs a technology called directed evolution. The goal of this project is to develop a low-cost tool for breeders, to detect key primary and secondary metabolites by making simple plant extracts and exposing them to bacterial biosensors that emit a quantitative fluorescence in 96-well plates. If successful, this technology would be complementary to current approaches that require GC-MS or other expensive technologies.
3. Finally, Arani has been a Curator on the CropLink Global Database project, an initiative by my lab to link all of the world's agricultural researchers. The first module is now online at www.MaizeLink.org

“Arani has not only opened doors for herself, but the best quality she possesses is that she has the skill and goodwill to open doors for others. Arani possesses the dedication, intelligence and motivational skills to accomplish great things. This scholarship will give Arani the stature to help change the world, which she will. I am so tremendously proud of Arani, as I am of all the past and current members of my lab.”

Arani Kajenthira said in regards to her time in the Department of Plant Agriculture: “In terms of my time with the Department of Plant Agriculture, I can honestly say that

without the mentorship and encouragement I received from Manish throughout my university career I wouldn't have come this far. The RaizadaKasha lab was also phenomenal in their constant friendliness and support during my time there. From a research perspective, I originally began working in the Raizada lab on the role of hormones in wound-induced stem cell regeneration in *Arabidopsis thaliana*. Later on, I switched gears and moved into the field of protein engineering, spending some time working on the characterization of *E. coli* bacteria following specific induced mutation. My last project was a continuation of my previous work in hormones and involved the characterization of different *Arabidopsis* mutants under varying light, hormone and age conditions. My thanks go to the Plant Agriculture Department for their heartfelt welcome of an engineer, and for greatly enriching my time at Guelph.”