Searching for the RPS6 resistance gene in Arabidopsis
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Plants have several methods of protecting themselves against disease, the most effective of which is the gene-for-gene reaction. In order for a plant to show resistance using the gene-for-gene reaction, an effector protein from the bacteria and a disease resistance protein in the plant must both be present. When a plant containing a disease resistance protein is exposed to a pathogen, the protein specifically recognizes the effector protein from the bacteria, and a series of resistance responses is triggered in the plant. Working with Arabidopsis, we are currently trying to isolate the RPS6 resistance gene that specifies resistance to the hopPsyA gene from the bacterial pathogen Pseudomonas syringae pv. syringae. Possible RPS6 resistance genes have been narrowed down to seven candidate genes in the bottom of chromosome 5. Transformation of an RPS6 mutant with wild-type DNA encoding one of the seven candidate genes indicated complementation, but this result is very preliminary. Inoculation of T-DNA knock-outs in this gene will verify whether or not we have successfully found RPS6. If the plants are susceptible when infiltrated with Pseudomonas syringae with hopPsyA, we will know that we have located the RPS6 resistance gene. Our work contributes to the knowledge of plant immunity. Better understanding of the gene-for-gene reaction and its relation to disease resistance, along with further tests, will lead to the possibility of engineering plants. The engineering of plants with improved innate immunity will in turn reduce the need to use expensive and ecologically damaging pesticides.