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Differential in-gel electrophoresis (DIGE): The key to finding the 4936 factor?

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There are many species of plants that do not accept their own or closely related pollen. This self-incompatibility (SI), is seen in members of the genus *Nicotiana*. There are three proteins that are known to be required for SI to function in the pistil: S-RNase, 120K and HT-B. We discovered a mutation segregating in a population of otherwise SI plants that prevents SI from functioning in the pistil. Plants that display normal SI are called Rejectors (because they reject their own pollen), and mutants are called Acceptors (because they accept their own pollen). Acceptors show normal expression of S-RNase, 120K, and HT-B. The factor responsible for the mutation was named the 4936 Factor after the population in which it was first discovered. In order to Identify the 4936 Factor, I have used the DIGE method. Total protein extracts from Acceptor and Rejector pistils are stained with two different fluorophores and run in the same two-dimensional gel. By separating proteins both by size and isoelectric point, one can search for differences in the expression level or presence/absence of a particular protein. Therefore, a protein that is present in the rejector color, but not in the acceptor color, is a good candidate for further investigation as the 4936 Factor.