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# Functional Genomics of *Arabidopsis*

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| **Status** | Past |
| **Competition** | II |
| **Sector** | Agriculture |
| **Genome Centre** | Ontario Genomics Institute |
| **Project Leader** | John R. Coleman, N. Provart and P. McCourt |

## Project Description

Canadians depend on agricultural plants for food, trees for housing and paper products, and, increasingly, distillation products from many plants for energy. In the current competitive world, the ability of our agricultural and forestry industries to maintain an international lead depends more and more on genetic improvements to important kinds of plants. But there are so many different kinds of important plants; how can we choose the best ones to study? A tried and true answer to this question is to work with a simple plant that can represent all others. We and other plant researchers around the world have chosen one called *Arabidopsis*. This small plant is one of the best-studied, genetically, of all organisms and it has many similarities to important crops such as rice, wheat, corn and canola.

We set up some of the basic tools that will allow us and others worldwide to carry out genetic research on *Arabidopsis.* This will lead to a deep understanding of many aspects of plant growth that will be important for genetic improvements such as salt- and drought-tolerance, pest resistance, increased productivity, and enhanced protein content.

We established three kinds of experimental tools. First, we created over 10,000 different gene mutations using advanced genetic methods. We and many others will be using these to study how plant growth reacts to adverse environmental conditions and which genes are important for plant survival. Second, we set up a state-of-the-art technology called DNA micro-arrays that allows us to measure which plant genes are active under many different growth conditions. Third, we provided high-performance computers and specific software that allows us to deposit and analyze our genetic results. We make these three experimental tools available to plant researchers all over the world, speeding up research and putting Canada on the map for plant researchers everywhere to appreciate.

## Fast Facts

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| ***Highlighted outcome:*** | Creation of a worldwide resource for plant genomic research |
| ***Number of research personnel employed by the project:*** | 10 |
| ***Number of peer reviewed publications published:*** | 10 plus 9 indirectly |
| ***Resources generated:*** | 10,000 gene mutations and plants with potential new characteristics, DNA micro-array facility, high-speed computer capability, gene database, and analysis software |
| ***Number of public outreach events held:*** | Several references and appearances in newspapers and television news |
| ***Co-funders:*** | CFI, ORDCF, and our private sector partner, Performance Plants Inc. of Kingston Ontario – Canada's foremost plant biotechnology company |