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Stem Cell Genomics Project

Status	Past
Competition	II
Sector	Health
Genome Centre	Ontario Genomics Institute
Project Leader	Michael Rudnicki and Ronald Worton

Project Description

Stem cells have extraordinary potential to help in the treatment of some of our most intractable diseases—for example, diabetes, arthritis, stroke and neurological conditions such as Parkinson's and Alzheimer's. We are not yet able to apply stem cells to the treatment of these diseases because first we need to know a lot more about them. The full exploitation of the potential of stem cells requires us to understand the genetic factors that make stem-cells what they are, and how different kinds of cells and tissues in the body are specified.

We determine which genes are active in stem cells using new methods of detection and analysis called DNA micro-arraying, Serial Analysis of Gene Expression and protein studies (proteomics). We studied stem cells from the embryos of human and mouse, and from muscle, brain and bone-marrow tissues in adults. The cells were taken from laboratory mice and from human biopsy samples and maintained in the form of laboratory cell-cultures for use in our experiments.

We carried out 1,400 DNA micro-array and 11 Serial Analysis of Gene Expression experiments; we did protein analysis of almost 140 protein samples. We set up a data bank called *StemBase*, complete with new methods of graphical display and analysis. This is available publicly to stem-cell researchers all over the world. All together, twenty-five investigators from across Canada participated in our research project.

Fast Facts

<i>Highlighted outcome:</i>	<i>StemBase</i> , the largest stem-cell gene-expression database in the world.
<i>Number of research personnel employed by the project:</i>	45
<i>Number of peer reviewed publications published:</i>	11, plus two book chapters and 33 invited presentations
<i>Number of patents in process or obtained:</i>	3, plus 2 commercial licenses and 1 company
<i>Resources generated:</i>	<i>StemBase</i> database (six libraries of gene-expression products, 62 DNA micro-array experiments composed of 188 samples and 997 files deposited)
<i>Number of public outreach events held:</i>	8 technical seminars, 4 public lectures, 7 newspaper, magazine and TV articles, and 24 public laboratory tours
<i>Co-funders:</i>	Stem-cell network