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The Pathogenomics of Innate Immunity (PI²)

Status	Current
Competition	III
Sector	Health
Genome Centre	Genome British Columbia
Project Leaders	Robert Hancock & Lorne Babiuk

Project Description

Thanks to our “innate immunity” – a system which is part of our natural biological makeup – we are able to withstand a daily onslaught of tens of thousands of potentially pathogenic microbes in air, food and water, and in our interactions with other people and animals. But our innate immunity can sometimes get over-stimulated, leading to inflammation of tissue and even sepsis – a deadly infection of blood or tissue.

Dr. Robert Hancock, Professor of Microbiology and Immunology at UBC, and Dr. Lorne Babiuk, Professor of Veterinary Microbiology at the University of Saskatchewan, are project leaders of the Pathogenomics of Innate Immunity (or PI²).

Drawing on many of the unique research findings of a previous Genome Canada project, the Functional Pathogenomics of Mucosal Immunity Program, this project will advance our understanding of immune responses in humans and animals. Specific genes will be knocked out in mouse embryonic cells and in mice derived from these cells, and the cells and mice will then be challenged with the important human food-borne pathogen, *Salmonella*, which causes intestinal infections and diarrhea. A range of genes representing key pathways and decision points in innate immunity will be targeted for knocking out. Human and bovine cells will also be targeted using siRNA methods, which use a class of short (20-25 nucleotides long) RNA molecules that interfere with gene expression. By knocking out specific genes, the investigators will be able to determine their relevance in human and animal infections.

Bringing together a team of world-class scientists from Canada, the Wellcome Trust Sanger Institute in Britain, Trinity College Dublin and the National University of Singapore, Drs. Hancock and Babiuk aim to increase our knowledge about important infection-fighting mechanisms of immunity. At the same time, it is expected that the PI² project will provide the basis for new methods of fighting infections in humans and animals.