



BACKGROUND



The Canadian Pharmacogenomics Network for Drug Safety

The Canadian Pharmacogenomics Network for Drug Safety is a \$20.1-million national research network to improve drug safety. Led by B.C. researchers, it combines genetic research with clinical surveillance in hospitals across the country with the aim of developing saliva and blood tests that allow doctors to prescribe drugs based on a patient's genetic profile. Genes determine how the body absorbs, distributes, metabolizes and eliminates drugs, and whether a drug accumulates in the body in toxic amounts.

The network is based in all major children's hospitals across Canada. Researchers collect patient DNA samples and compare the reactions to various medications. The network also serves to improve national reporting of adverse drug reactions.

The network's initial priority is to find the genes behind reactions to three widely used drugs: the analgesic codeine and the lifesaving anticancer drugs cisplatin and anthracyclines. Codeine can be life-threatening to some infants when secreted as its morphine metabolite in the mother's breast milk, while cisplatin is associated with deafness and anthracyclines with heart failure. Recent discoveries by network researchers led to changed labelling on prescriptions containing codeine, which was previously thought to be compatible with breastfeeding. Network researchers are also beginning to work on adult psychiatric and cardiac medications.

Dr. Michael Hayden leads the network's pharmacogenomics research. He is director of the Centre for Molecular Medicine and Therapeutics (CMMT) at the Child & Family Research Institute (CFRI) and a University Killam professor in the Department of Medical Genetics at the University of British Columbia (UBC). He is a Canada Research Chair in Human Genetics and Molecular Medicine.

Dr. Bruce Carleton leads the network's recruitment, enrolment and clinical characterization of patients. He is a CFRI senior clinician scientist, UBC professor of Pediatrics, and director of the Pharmaceutical Outcomes Programme (POPi) at BC Children's Hospital and BC Women's Hospital & Health Centre, agencies of the Provincial Health Services Authority (PHSA).

Last year, PHSA, CMMT and UBC received a \$14-million federal grant from the Canadian Institutes of Health Research and the Canada Foundation for Innovation through the Research Hospital Fund to support the network's infrastructure and operating costs. An additional \$6.1 million came from CFRI, BC Children's Hospital Foundation, the CMMT, BC Mental Health & Addiction Research Institute, Pfizer and Lawson Health Research Institute in London, Ontario.

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The funding supports sophisticated technology, operations and training the next generation of drug safety experts: 10 graduate students, eight postdoctoral fellows and four junior researchers. The network's national hub is located on the 750-square-metres of lab space in the BC Mental Health & Addiction Research Institute co-located with CFRI.

In January 2009, Genome British Columbia announced a separate \$1.3-million grant to Dr. Hayden and Dr. Carleton to accelerate the transfer of these genetic discoveries into clinical practice. The grant is matched by additional funds for a total project value of \$3.9 million.

The network supports clinical personnel located in:

- IWK Health Centre, Halifax
- Sainte-Justine Hospital, Montreal
- Montreal Children's Hospital
- Children's Hospital of Eastern Ontario, Ottawa
- The Hospital for Sick Children, Toronto
- McMaster Children's Hospital, Hamilton
- Children's Hospital of Western Ontario, London
- Winnipeg Children's Hospital
- Stollery Children's Hospital, Edmonton
- Alberta Children's Hospital, Calgary
- BC Children's Hospital, Vancouver

Investigators with the network's research are located at BC Cancer Agency, BC Children's Hospital, BC Mental Health & Addiction Services (all agencies of PHSA), Montreal Heart Institute, Université de Montréal, University of Toronto and the University of Western Ontario.

The network builds on earlier work led by Dr. Michael Hayden and Dr. Bruce Carleton that was funded by Genome Canada, Genome British Columbia, UBC, the University of Western Ontario, CFRI, Canadian Gene Cure Foundation, Health Canada, Canadian Society of Clinical Pharmacology, Canadian Paediatric Society, C17 Research Network and Childhood Cancer Foundation – Candlelighters Canada, Merck Frosst, Janssen-Ortho, Illumina, IBM, Eli Lilly, Pfizer, MJR Dyad and the Canadian Genetic Diseases Network.

Partners:

- Provincial Health Services Authority (www.phsa.ca)
- The Centre for Molecular Medicine and Therapeutics (www.cmmt.ubc.ca)
- The University of British Columbia (www.ubc.ca)
- The Child & Family Research Institute (www.cfri.ca)
- BC Children's Hospital and Sunny Hill Health Centre for Children (www.bcchildrens.ca)
- BC Mental Health & Addiction Services (www.bcmhas.ca)

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