CHILD & FAMILY RESEARCH INSTITUTE

Science Making **Miracles**

2007/08 Annual Report

New research building facilitates collaboration and discovery

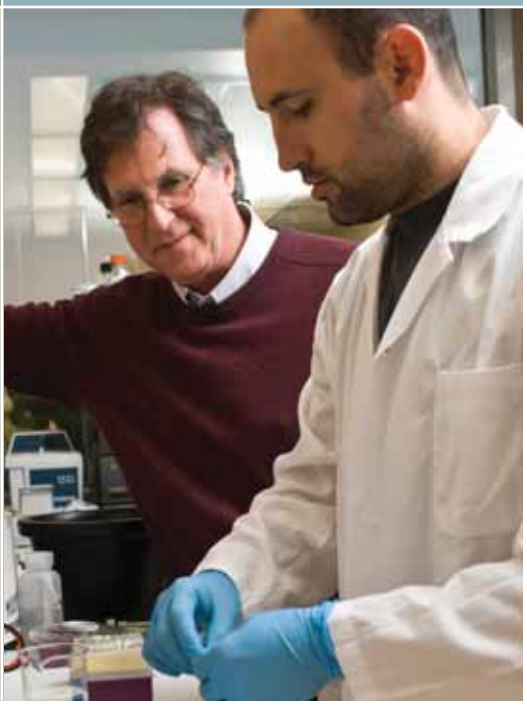
How **diet** can influence **baby's growth & development**

Why injuries are **dangerous yet under-recognized**

New recruits

Inflammatory bowel disease: rising rates & promising discoveries

Joining the campaign to Make Medicines Child Size



CHILD & FAMILY RESEARCH INSTITUTE

The Child & Family Research Institute (CFRI) conducts discovery research, clinical investigation, and applied health research to benefit the health of children and families. It is the largest research institute of its kind in Western Canada. CFRI works in close partnership with BC Children's Hospital and Sunny Hill Health Centre for Children, BC Women's Hospital & Health Centre, and BC Mental Health & Addiction Services, agencies of the Provincial Health Services Authority; BC Children's Hospital Foundation; and the University of British Columbia.

CFRI has additional highly valued partnerships with British Columbia's five regional health authorities and with B.C. academic institutions Simon Fraser University, the University of Victoria, the University of Northern British Columbia, and the British Columbia Institute of Technology.

Our Mission

Science Making Miracles

We passionately pursue discovery, knowing our achievements have the capacity to transform lives.

Our Values

We work in an environment that values:

- Integrity
- Excellence
- Transformation
- Interaction
- Openness

Our Programs

The Child & Family Research Institute is the largest research institute of its kind in Western Canada. More than 185 investigators are affiliated with CFRI, and approximately 200 trainees, including graduate students and post-doctoral fellows, work at the Institute.

Research is conducted in several program areas:

- Applied Health Research & Evaluation
- Community Child Health
- Diabetes
- Genetics
- Infectious, Inflammatory & Immunological Diseases
- Molecular Medicine & Therapeutics
- Neurobiology & Mental Health
- Nutrition & Metabolism
- Oncology
- Reproduction & Healthy Pregnancy

Mom's diet makes a difference

Researchers are studying how nutrition during pregnancy, breastfeeding, and early childhood influences growth and development, setting the stage for lifelong health

Above: Dr. Sheila Innis and Dr. Kevan Jacobson are collaborating on research projects to determine how maternal consumption of dietary fats plays a role in the development of inflammatory bowel disease (IBD) in children. Dr. Innis is head of the Nutrition & Metabolism Research Program and Dr. Jacobson is head of the IBD Research Program.

The typical North American diet—with lots of meat and not much fish—is deficient in omega-3 fatty acids and may pose a risk to infant neurological development, shows new research published this year in the *American Journal of Clinical Nutrition*. Omega-3 fatty acids are unsaturated fats found in some fish such as salmon and herring and in smaller amounts in eggs and chicken.

"Omega-3 fatty acids are important for the baby's developing eyes and brain," says Dr. Sheila Innis, the study's principal investigator, head of Nutrition & Metabolism program at the Child & Family Research Institute and Professor, Department of Pediatrics at the University of British Columbia.

"Fat consumed by the mom is transferred to the developing baby during pregnancy and in breast milk," says Dr. Innis.

For the study, researchers recruited 135 pregnant women and randomly assigned them to take an omega-3 fatty acid supplement or a placebo. All the women continued eating their regular diets. The supplement added the equivalent of two fatty fish meals per week, an amount that researchers estimated would prevent deficiency. The researchers measured the amount of omega-3 fatty acids in the mothers' blood at 16 and 36 weeks of pregnancy.

They found that women whose diet included a lot of meat but not much fish were deficient in a type of omega-3 fatty acid called DHA (docosahexaenoic acid) that's known to be important for brain and eye function. Their babies didn't do as well on eye tests as did babies from mothers who weren't deficient and the results were noticeable as early as two months of age. The study is ongoing as researchers are following the children's development until 18 months of age.

The finding is an important step towards developing dietary fat guidelines for pregnant and breastfeeding women. Further research is needed to identify recommended daily amounts of omega-3 fatty acids. Current dietary recommendations evolved from the 1950's emphasis on reducing saturated fat intake to lower the risk of cardiovascular disease.

How nutrition and genes interact

Research into the relationship between diet and gene expression and its influence on long-term health

The origins of many chronic health conditions such as diabetes, obesity, and cardiovascular disease often begin in early childhood. Dr. Angela Devlin is a Scientist at the Child & Family Research Institute, Assistant Professor of Pediatrics at the University of British Columbia, and an expert on how nutrition interacts with genes to influence long-term health. She uses a conceptual model in the lab to study how early diet predisposes children to developing chronic diseases later in life. Her current research projects are focused on the ways nutrition affects gene expression, how genes shape an individual's response to diet, and how the mother's metabolism and diet might disrupt the way her children's genes are expressed and affect health.

Dr. Devlin leveraged start-up funding that she received from CFRI to attract grants from the Canada Foundation for Innovation Leaders Opportunity Fund and the British Columbia Knowledge Development Fund. With additional support from BC Children's Hospital Foundation, the awards enabled Dr. Devlin to establish a nutritional epigenomics facility this year. It offers a special high-tech piece of equipment called a DNA Pyrosequencer (the PyroMark MD System) to the CFRI research community, enabling scientists to rapidly analyze changes in DNA and DNA methylation patterns. Using the new facility, Dr. Devlin can examine the impact of diet on DNA methylation, a process by which small molecules attach to DNA and affect gene expression.

Primer on Dietary Fats

SATURATED FATS are found primarily in animal products (for example: full-fat milk products, butter, and lard), fatty meats, and tropical oils (such as coconut and palm oils). Saturated fats tend to raise blood cholesterol.

TRANSFATS occur naturally in small amounts in dairy fats, beef and lamb, and in hydrogenated vegetable oils. Transfats also raise blood cholesterol.

MONOUNSATURATED FATS are found in vegetable oils such as olive, canola, and peanut oils as well as nuts, seeds, and avocados. Replacing saturated or transfats with monounsaturated fats helps lower blood cholesterol.

POLYUNSATURATED FATS include omega-3 fatty acids and omega-6 fatty acids. These fats are essential nutrients that the body needs and derives solely from diet. As the omega-3 and omega-6 fatty acids interact, the ratio of these fats in the diet is important. The increased use of vegetable oils (in salad dressing, margarines, cooking oils, baked goods, and other foods) and the accompanying decrease in the consumption of animal fats has changed the balance of fats in our diet. Researchers are studying the impact of this change on human health and development.

Omega-3 polyunsaturated fatty acids include:

- **Long-chain omega-3 fatty acids** are found mainly in fish and particularly fatty fish such as salmon and herring. Smaller amounts are found in eggs and poultry. Docosahexaenoic acid (DHA) is a long-chain omega-3 fatty acid that's present in high amounts in the brain and retina. It's available in fish and other animal fats, and our bodies convert small amounts of omega-3 fatty acids from vegetable fats into DHA. Higher intake of long-chain omega-3 fatty acids decreases blood triglycerides and the risk of cardiovascular disease.
- **Short-chain omega-3 fatty acids** are found in canola and soybean oils, flax seeds, walnuts, pecans, pine nuts, and figs.

Omega-6 polyunsaturated fatty acids are found in safflower, sunflower, soybean and corn oils, and in all foods containing these oils. Replacing saturated fats with omega-6 poyunsaturates also lowers blood cholesterol.

New research supports advice to eat complex carbs and avoid sugar

Too much sugar turns off gene that controls the effects of sex steroids

CFRI Scientific Director Dr. Geoffrey Hammond and post-doctoral fellow Dr. David Selva study the effect of diet on sex hormones.

Eating too much fructose and glucose can turn off the gene that regulates the levels of active testosterone and estrogen in the body, shows a new study published in the November 2007 issue of the *Journal of Clinical Investigation*. This discovery reinforces public health advice to avoid sugar and eat complex carbohydrates such as whole grain foods, fruits, and vegetables. Table sugar is made of glucose and fructose, while fructose is also commonly used in sweetened beverages, syrups, and low-fat food products.

Glucose and fructose are metabolized in the liver. When there's too much sugar in the diet, the liver converts it to lipid. Using a mouse model and human liver cell cultures, the scientists discovered that the increased production of lipid shut down a gene called SHBG (sex hormone binding globulin), reducing the amount of SHBG protein in the blood. SHBG protein plays a key role in controlling the amount of testosterone and estrogen that's available throughout the body. If there's less SHBG protein, then more testosterone and estrogen will be released throughout the body. In overweight women, this is associated with acne, infertility, polycystic ovary syndrome, and uterine cancer. Abnormal amounts of SHBG also disturb the delicate balance between estrogen and testosterone, which is associated with the development of cardiovascular disease.

"We discovered that low levels of SHBG in a person's blood means the liver's metabolic state is out of whack long before there are any disease symptoms," says Dr. Geoffrey Hammond, the study's principal investigator, the Child & Family Research Institute's Scientific Director and Professor in the Department of Obstetrics & Gynaecology at the University of British Columbia (UBC). Dr. Hammond is a Tier 1 Canada Research Chair in Reproductive Health.

"SHBG is a biomarker for monitoring liver function, well before any symptoms arise," says Dr. David Selva, post-doctoral fellow at CFRI and UBC and the paper's first author. "It shows when the liver is making too much lipid."

Global health

WHO makes medicines child size

A global campaign is underway to improve medicines for children. According to the World Health Organization (WHO), approximately six million children under the age of five die each year of treatable conditions. WHO launched the "Make Medicines Child Size" initiative last year and called for international research efforts to develop medications tailored for children targeting conditions prevalent in developing countries.

"Doing a better job on drug therapy would save millions of kids around the world each year," says Dr. Stuart MacLeod, Executive Director of the Child & Family Research Institute. An expert on pediatric drug research, Dr. MacLeod spoke at a news conference in London, U.K. when WHO announced the campaign in December 2007.

Because many medications were made and tested only in adults, they may be unsuitable for children, who metabolize drugs differently and need dosages appropriate for their age and size. Children also need to have medicines given in special formulations—for example, flavoured syrup, instead of big tablets—to make treatment more palatable. Research and development are needed to produce child-friendly drugs including antibiotics, asthma and pain medications, and combination pills for HIV/AIDS, tuberculosis, malaria, and a number of tropical diseases.

make medicines Child Size

"This is an international effort to advocate for better drugs for children," says Dr. MacLeod.

The head of Child Health BC and an expert in pediatric pharmacology, Dr. Robert Peterson, is also playing a key role in the WHO initiative as a member of the Subcommittee on Essential Medicines for Children. Both Drs. MacLeod and Peterson are members of the International Alliance for Better Medicines for Children and collaborating with the International Pediatric Association.

WHO has now released the first international List of Essential Medicines for Children, which currently identifies 206 medications that are safe for children and address priority health conditions. Products listed include vaccines, anesthetics, hormones, vitamins, and minerals, anti-HIV treatment, and anti-malaria drugs.

With input from Drs. MacLeod and Peterson, the WHO Subcommittee is now identifying new drug treatments required for children and highlighting future research priorities in this field.

National study launched to discover causes of asthma and allergy

Study aims to recruit 5000 pregnant women in Canada and 1500 in Vancouver

A new, multi-million dollar national study is recruiting 5000 pregnant women across the country and will follow their children as they grow up in an effort to understand what causes asthma and allergies. These illnesses affect one in three Canadian children and are a major reason for visits to an emergency department. Allergies occur when the immune system overreacts to triggers such as dust or insect stings and in severe cases, can cause anaphylaxis. Asthma symptoms include coughing and wheezing and can lead to respiratory arrest.

"Many of the factors that set kids up to have allergy and asthma appear to happen before one year of age," says Dr. Stuart Turvey, Clinician Scientist at the Child & Family Research Institute, Pediatric Immunologist and Rheumatologist at BC Children's Hospital, and Assistant Professor in the Division of Infectious and Immunological Diseases in the Department of Pediatrics at the University of British Columbia.

Dr. Turvey is leading the Vancouver portion of the study where researchers are seeking 1500 pregnant women. The women will be recruited through BC Women's Hospital & Health Centre and their children will be followed at BC Children's Hospital. Both hospitals are agencies of the Provincial Health Services Authority.

The study is led nationally from McMaster University in Ontario and additional study sites include Edmonton, Winnipeg, and Toronto. The Allergy, Genes and Environment Network and the Canadian Institutes of Health Research are investing $6 million each over six years into the study.

The researchers will interview the pregnant mothers about diet and stress levels. After birth, they'll study the baby's blood and DNA samples to understand which genetic factors may predispose the children to asthma and allergy. They'll collect the babies' first urine and fecal samples and study the intestinal bacteria, which may provide important clues. They'll analyze immune cells taken from the baby's umbilical cord blood at birth and from blood samples at three and five years of age. The researchers will track the children's health history, look at materials used to construct the family home, and collect dust samples from the babies' first beds, examine neighbourhood traffic patterns and use GPS to do pollution mapping.

"It's only through a long-term study like this one where we follow the kids from pregnancy that we'll be able to answer fundamental questions about how genes and the environment interact," says Dr. Turvey. "Asthma, food allergies, eczema, and hay fever share a common biology and affect different organ systems. If we know more about the causes, then we can figure out the right interventions to protect the kids."

Dr. Stuart Turvey, CFRI Clinician Scientist and Pediatrician, is analyzing blood samples from infants and mothers for a national study into the genetic and environmental causes of asthma and allergies.

National study of 5000 siblings to identify nature vs. nurture in Crohn's disease

Launched in early 2008 in major cities across Canada, a $5 million national study will follow 5000 siblings of people with Crohn's disease for five years in an effort to determine the roles of genetics, diet and bacteria in the development of inflammatory bowel disease (IBD). St. Michael's Hospital in Toronto is spearheading the study and the Vancouver lead is Dr. Kevan Jacobson, head of the IBD Research Program at the Child & Family Research Institute and Pediatric Gastroeneterologist at BC Children's Hospital.

Rising rates and promising discoveries

Dietary fats and the increased incidence of inflammatory bowel disease

British Columbia Premier Gordon Campbell meets with CFRI scientist Dr. Bruce Vallance and UBC doctoral student Andy Sham following a news conference held at the Child & Family Research Institute in May 2008. The Premier announced $12 million in funding for the CH.I.L.D. Foundation to support research into intestinal and liver disorders in children. Dr. Vallance's research team is studying the role of bacteria in inflammatory bowel disease.

The number of children in British Columbia with inflammatory bowel disease (IBD) tripled over the last twenty years, making the province home to one of the highest rates in the world.

IBD is a group of chronic disorders such as Crohn's disease and ulcerative colitis that involve inflammation of the gastrointestinal tract. Inflammation is the body's normal immune response to harmful bacteria and viruses, but in IBD, the immune response is overactive. The painful flare-ups associated with the disease can be debilitating. It can cause vitamin and mineral deficiencies and disturb children's growth and development.

From 1991–1994, BC Children's Hospital diagnosed 67 patients under the age of 16 with IBD. That number jumped to 242 new patients from 2001–2004. The increase was most noticeable among South Asian children with a rate nearly three times higher than non-South Asian children. "The increase in incidence among B.C. children happened over such a short period of time, which tells us that environmental factors such as diet, rather than genetic changes, are likely responsible," says Dr. Kevan Jacobson, who heads the IBD research program at the Child & Family Research Institute and is a Pediatric Gastroenterologist at BC Children's Hospital. He's an Associate Professor of Gastroenterology in the Department of Pediatrics at the University of British Columbia.

The number of new cases appears to have levelled off and today 50–75 children are diagnosed with IBD each year at the hospital's Gastroenterology Clinic, where between 350–400 IBD patients are seen annually. These findings were published in the May 2007 issue of *American Journal of Gastroenterology*.

It's thought that multiple causes contribute to IBD, including an underlying genetic susceptibility, dietary factors, and an immune deficiency. Treatment often includes steroids, antibiotics, and immunosuppressants to control symptoms. Current research efforts are focused on understanding the causes of IBD, preventing recurrences, and finding a cure.

"Over the past 50 years, we've increased the amount of vegetable oil in our diet, with the result that we're now consuming higher amounts of omega-6 fatty acids and less omega-3 fatty acids," says Dr. Jacobson. "The ratio of these fats within our diet has changed."

The human body needs both omega-6 fatty acids and omega-3 fatty acids, which are essential nutrients. As fatty acids interact with each other, the ratio of each within the diet is important. For example, a diet that's rich in omega-6 fatty acids and lacking omega-3 fatty acids may promote IBD and aggravate disease symptoms, says Dr. Jacobson.

Dr. Jacobson is collaborating with Dr. Sheila Innis, head of CFRI's Nutrition & Metabolism Research Program, to determine the effect of dietary fats on the development of IBD. In lab studies, they recently found that the ratio of omega-3 and omega-6 fatty acids in the diet of pregnant or lactating rats can significantly affect the offspring's intestinal lining and mucosa. The team is preparing an article about this finding for submission to a peer-reviewed scientific journal.

"This work has important clinical implications as it provides the first evidence that diet very early in life—even before birth—can predispose the offspring to IBD in later life," says Dr. Jacobson. "Further studies will be undertaken to better understand the mechanisms involved."

Preventing shaken baby syndrome

New program helps parents and caregivers understand the frustration of inconsolable crying

Dr. Ron Barr, head of Community Child Health Research, is an expert in infant crying.

All babies cry. It's a normal part of their development. Yet sadly it's the number one trigger for shaken baby syndrome, also known as abusive head trauma, which is the primary cause of non-accidental death in infants. One in four babies who are shaken dies as a result of their injuries. Children who do survive often face brain damage, blindness and deafness, fractures, paralysis, and cognitive and learning disabilities.

A new provincial initiative aims to prevent shaken baby syndrome by providing every new parent in British Columbia with education to help them understand that inconsolable crying is normal and to equip them with coping strategies. Called the *Period of PURPLE Crying®*, the program targets parents and caregivers before babies begin inconsolable crying at approximately two weeks of age. Hospital and community health nurses provide information, support, and advice to new parents and an educational DVD and booklet in English, Cantonese, Punjabi, Spanish, Korean, or French.

At a news conference held at the Child & Family Research Institute, the B.C. Children and Family Development Minister Tom Christensen announced the government's investment of $1.4 million over four years into the education and prevention program.

Husband and wife team Dr. Ronald Barr and Ms. Marilyn Barr led the research that validated the program. It involved a three-year clinical trial with 1800 mothers in the Vancouver area, which demonstrated effectiveness of the educational materials in changing caregiver knowledge and behaviours about crying relevant to the risks of shaking.

Dr. Barr heads Community Child Health Research at CFRI and is a Professor of Pediatrics at the University of British Columbia. Ms. Barr founded the National Center on Shaken Baby Syndrome in the United States.

"It's truly a community effort to apply the research into a practical program that can help families," says Ms. Barr. "More than a dozen donor organizations provided support for this program including translating materials and developing the website." Among the supporting organizations is BC Children's Hospital Foundation, which provided $60,000 in funding for the program.

"Within six months of launching the program in British Columbia, we'd already reached over 50 per cent of the province's mothers in both urban and rural areas," says Dr. Barr. "Over the next four years, we'll be evaluating the program to make sure it's working. We'll be looking at hospital admissions, injury rates, and statistics from Child Protection Services to see if these have decreased and whether the program has made a difference."

Birthing hospitals throughout Ontario, North Carolina, Washington, and Utah are presently implementing the *Period of PURPLE Crying®*.

Ms. Marilyn Barr founded the National Center on Shaken Baby Syndrome in the United States.

The Period of PURPLE Crying®

A new way for parents and caregivers to understand their babies' crying

The *Period of PURPLE Crying®* recommends the following actions for coping with infant crying:

1. **Increase carry, comfort, walk, and talk behaviours with your baby.** More direct contact can usually stop the crying (but not always). Although an action that works one day may not work the next, by having close contact with your baby, you can reduce the length of crying bouts by up to 50 per cent.

2. **If the crying is very, very frustrating and you need relief, it is OK to walk away.** Place the infant in a safe place and take a 5–10 minute break. This removes the caregiver from direct contact with the infant during times when the caregiver is most likely to shake or abuse.

3. **Never shake or hurt a baby.** Under no circumstances is it OK to shake or hurt an infant.

Source: Period of Purple Crying® (Prevent SBS British Columbia) www.dontshake.ca/information/information.php

At a news conference held at the Child & Family Research Institute, British Columbia Minister of Children and Family Development Tom Christensen announced the provincial launch of *The Period of PURPLE Crying®* program to prevent shaken baby syndrome. He also proclaimed April 11, 2008 as Child Abuse Prevention Day in B.C.

Injuries: a dangerous yet under-recognized health problem

Many see childhood injuries as a normal part of growing up. But unintentional injuries can result in more than just scrapes and bruises; they're the leading cause of death for Canadian kids, teens, and young adults

Although unintentional injury is the leading cause of death for Canadians under 45 years of age, it's an under-recognized health problem, says Dr. Ian Pike, head of the BC Injury Research and Prevention Unit (BCIRPU) based at the Child & Family Research Institute and BC Children's Hospital.

"If you give time and attention to preventing injury, then the life savings are both substantial and immediate," says Dr. Pike, CFRI Investigator and Assistant Professor in the Department of Pediatrics at the University of British Columbia.

The British Columbia Ministry of Health Services funds the Research Unit to collect and monitor injury statistics across the province. Based on trends and patterns, the researchers recommend public health policies and programs to the Ministry, health authorities, and other injury prevention organizations.

Motor vehicle crashes, drowning, choking and suffocating, fire and burns, cycling, and falls are the major causes of unintentional injury deaths among Canadian children under 14 years of age.

"Injury indicators tell us how kids are getting injured and where our efforts are needed," says Dr. Pike. "Then we look at how we can prevent injuries from occurring in the first place, and the indicators help us understand whether the prevention programs are working."

Dr. Pike says successful injury prevention combines education, engineering, and legislation. Many people fail to take precautions because they are unaware of the risks and/or believe injuries only happen to other people. For example, they jaywalk or don't wear bike helmets. Safety can be engineered by equipping products such as motor vehicles with seat belts, anti-lock braking systems, and side air bags, and by building rumble strips into highways. Implementing and enforcing laws is also critical, which is why in 2008 British Columbia made it mandatory for drivers to use car booster seats with children under age nine.

Dr. Pike says while reducing injuries is about taking sensible precautions and being safe, it isn't about avoiding activity.

"We want British Columbians to have full active and challenging lives and to take the necessary steps to reduce the risk of serious injury," he says.

Dr. Ian Pike is a CFRI investigator and head of the BC Injury Research and Prevention Unit. One of Dr. Pike's current projects is the development of a social marketing campaign to raise awareness about how serious injuries can be and how to prevent them.

Playing safer sports

Preventing head injuries with helmets and head guards

Wipeout tells the story of three young men who suffered traumatic brain injuries while snowboarding, skateboarding, and dirt biking. Dr. Shelina Babul-Wellar, BC Injury Research and Prevention Unit at CFRI, was a content advisor on the script. Produced by British Columbia's Knowledge Network, the film premiered at the 2008 DOXA Documentary Film Festival.

Preventing head injuries in sports and recreation is the focus of Dr. Shelina Babul-Wellar's research. She's currently applying for funding to study the value of soccer head guards in protecting against concussions and injuries caused when players hit their heads against the ball, another player, the ground, or soccer post.

"Younger children don't have the neck and muscular strength to head the ball and therefore the impact is greater to their heads," says Dr. Babul-Weller, who's the Associate Director and Sports Injury Specialist at the BC Injury Research and Prevention Unit at the Child & Family Research Institute and BC Children's Hospital, and Clinical Assistant Professor in the Department of Pediatrics at the University of British Columbia.

Supporting the study are the British Columbia Soccer Association and the North Shore Girls Soccer Club, which is the largest sports club in Western Canada with over 3500 players.

In another research project, Dr. Babul-Wellar is comparing education with legislation to determine which is more effective at encouraging skateboarders and in-line skaters to wear helmets.

She's also involved in a Vancouver-Toronto study to examine how city infrastructure such as traffic routes, speed bumps, intersections, and parked cars contribute to cycling injuries. Study results will help transportation planners design safer cycling routes in cities across Canada.

Reducing the risk of injuries in B.C.

A new surveillance program is providing First Nations communities in the Shuswap region of British Columbia with real-time data about the causes and types of injuries in their neighbourhoods.

"With these data, the communities can design injury prevention programs that address their priorities," says Dr. Mariana Brussoni, a newly recruited scientist at the Child & Family Research Institute who's evaluating the surveillance program on behalf of the communities. "Once they see a pattern, they can address it right away."

The communities decided to implement the surveillance program, which is partially funded by the First Nations and Inuit Health Branch, to gather data on local injuries instead of relying on provincial or federal statistics.

One neighbourhood might ask teachers to collect information about a particular schoolyard where children frequently fall, for example. Another community located by water might target drowning as an immediate danger.

The evaluation report will offer recommendations for both communities seeking to implement the surveillance program and for government partners facilitating injury surveillance in First Nations communities.

"We worked with the communities to identify a list of variables that are important for facilitating the program's implementation," says Dr. Brussoni. "For example, we talked to the data collectors and asked how much training they recommend. The evaluation process is also an opportunity for the community to celebrate its achievements in reducing the risk of injuries."

Dr. Brussoni is an Academic Scientist with the BC Injury Research & Prevention Unit at CFRI and BC Children's Hospital. She's Director of BC Children's Hospital Injury Reporting and Prevention Program and an Assistant Professor in the Department of Pediatrics at the University of British Columbia.

New Research Building

The Child & Family Research Institute's new translational research building brings together teams of experts to collaborate on a common concern: how to solve the health issues of children and families. Scientists examine genes, molecules, and cells to discover the mechanisms of disease. They analyze patterns of health and disease in different communities with a view to identifying population needs, trends, and risk factors.

Fast Facts:

Level 5: Infection, immunity, and inflammatory diseases research
Level 4: Diabetes research
Level 3: BC Mental Health & Addiction Services research
Level 2: Clinical trials unit, CFRI administration, BC Children's Hospital Foundation
Level 1: Mechanical, facilities, and building support services

- Translational research building construction costs: $44.1 million
- Total support from BC Children's Hospital Foundation (including Fishing for Kids Fundraising Tournament): $22.5 million
- Total contribution from the Government of Canada: $6.5 million
- Total contribution from the Government of British Columbia: $7.7 million
- New sources of funding obtained for laboratory fit out and equipment: $14 million

Funded by BC Children's Hospital Foundation (including Mining for Miracles), Canada Foundation for Innovation, British Columbia Knowledge Development Fund, Child & Family Research Institute, University of British Columbia, Canadian Diabetes Association, and other supporters for construction costs, laboratory fit out and equipment, and matching funds. The commitment of the Provincial Health Services Authority was instrumental in securing long-term funding for the project.

May 2006

The groundbreaking launches CFRI's major capital expansion project, making it the largest research institute of its kind in Western Canada in terms of people, productivity, funding, and size. The new building adds 70,000 square feet of new research and academic space. An expanded lobby and main entrance blends the new space with the existing buildings.

November 2006

The foundation has been laid and the walls are being erected to create the building's structure. The labs are planned so investigators working on related health problems are housed adjacent to each other, enhancing collaboration and teamwork. CFRI administration and BC Children's Hospital Foundation offices are located on the ground floor.

April 2007

The building shell is complete and the next step is to install the windows. Funded by the Canada Foundation for Innovation and the British Columbia Knowledge Development Fund, the Centre for Research on Childhood Diabetes on Level 4 offers sophisticated equipment for processing tissue samples, analyzing and imaging cells, and evaluating the function of immune cells.

July 2007

The interior work is underway, enabling occupancy of most areas in May 2008. Work continues on Level 5 for the Centre for Understanding and Preventing Infection in Children, funded by the Canada Foundation for Innovation and the British Columbia Knowledge Development Fund. It will be completed in 2009 along with the Vaccine Evaluation Centre. A containment lab will allow investigators to study infectious diseases such as tuberculosis.

Major Awards held at the Child & Family Research Institute

"We remain constant in supporting the work of our researchers and we are immensely proud of their accomplishments. We applaud them and their colleagues for their consistent and growing successes."

—Dr. Stuart MacLeod, Executive Director, CFRI

HIGHLIGHTS
of CFRI Team Awards:

These teams represent multiple disciplines working together to achieve a cross-fertilization of ideas and expertise, supported by technology resources and addressing issues identified by community partners.

Dr. Stuart Turvey

Dr. Rusung Tan

Dr. Bruce Verchere

Dr. David Speert

The New Emerging Team in Clinical Autoimmunity, led by Dr. Rusung Tan

The Canadian Institutes of Health Research awarded CFRI's team of basic and clinical researchers $2.4 million over five years to study common mechanisms in the development of type 2 diabetes and systemic lupus erythematosus (SLE). These autoimmune diseases arise when the immune system turns on itself. In diabetes, the beta cells in the pancreas, which produce insulin, are destroyed. In lupus, the immune system attacks different organs throughout the body.

The Asthma & Allergy Team, led by Dr. Stuart Turvey

The Michael Smith Foundation for Health Research granted a Team Start-Up Award to this group of investigators from CFRI, the University of British Columbia, Simon Fraser University, and the James Hogg iCAPTURE Centre for Cardiovascular and Pulmonary Research at St. Paul's Hospital. The Vancouver-based team is participating in a national research project that received $12 million in federal funding to explore the genetic and environmental factors influencing the development of asthma and allergies.

The BC Clinical Genomics Network, founded by Dr. Jan Friedman and Dr. Michael Hayden

A provincial initiative of the Michael Smith Foundation for Health Research, the Network is designed to link clinicians and clinician scientists with genomics researchers to discover the genetic basis of health disease and translate these findings into new treatments.

The Team in Child & Adolescent Healthy Body Weights: Towards Integrated, Successful & Targeted Approaches for Sustainable Health Outcomes (TWIST & SHOUT), led by Dr. Jean-Pierre Chanoine

This multidisciplinary group of basic, social, and clinician scientists received a Team Start-Up Award from the Michael Smith Foundation for Health Research to study factors influencing childhood and adolescent overweight at individual, family, community, and population levels and to develop interventions resulting in healthy body weights.

National Research Chairs:

- **Dr. Ronald Barr,** Canada Research Chair in Community Child Health Research
- **Dr. Adele Diamond,** Canada Research Chair in Developmental Cognitive Neuroscience
- **Dr. Daniel Goldowitz,** Canada Research Chair in Developmental Neurogenetics
- **Dr. Geoffrey Hammond,** Canada Research Chair in Reproductive Health
- **Dr. Michael Hayden,** Canada Research Chair in Human Genetics and Molecular Medicine
- **Dr. Elizabeth Saewyc,** Canadian Institutes of Health Research/Public Health Agency of Canada Chair in Applied Public Health Research
- **Dr. Elizabeth Simpson,** Canada Research Chair in Genetics and Behaviour
- **Dr. Glen Tibbits,** Canada Research Chair in Molecular Cardiac Physiology
- **Dr. Bruce Vallance,** Canada Research Chair in Pediatric Gastroenterology

BC Leading Edge Endowment Fund Leadership Research Chairs:

- **Dr. Urs Ribary,** BC Leadership Chair in Cognitive Neuroscience in Early Childhood Health and Development (Simon Fraser University)
- **Dr. Thomas Boyce,** Sunny Hill Health Centre BC Leadership Chair in Early Childhood Development

Major Awards from the Canada Foundation for Innovation and British Columbia Knowledge Development Fund:

- **Dr. David Speert,** Centre for Understanding and Preventing Infection in Children
- **Dr. Bruce Verchere,** Centre for Research on Childhood Diabetes

"Michael is one of the premier clinician scientists in Canada. His work in genetics and genomics has opened a myriad of possibilities for better treatment of patients with genetic diseases and other conditions such as adverse drug reactions."

—Dr. Stuart MacLeod, Executive Director, Child & Family Research Institute

Left: Dr. Michael Hayden

Prix Galien Canada (Research) 2007 awarded to Dr. Michael Hayden

Considered the Nobel Prize of the pharmaceutical industry, the Prix Galien Canada (Research) recognizes the outstanding contribution of a researcher or a research team to Canadian biopharmaceutical research. In 2007, it was awarded to Dr. Michael Hayden, Senior Scientist at the Child & Family Research Institute and Director of the Centre for Molecular Medicine and Therapeutics (CMMT).

A pioneer in the development of predictive testing for Huntington's disease, Dr. Hayden has made major contributions to understanding how changes in specific genes result in Huntington's disease, premature coronary artery disease, and diabetes. Recently, he provided the first evidence of a cure for Huntington's disease in a mouse model. He discovered the ABCA1 gene, which is the primary determinant of high density cholesterol levels, and he showed that the ABCA1 gene is involved in insulin secretion and the development of type 2 diabetes. He's also identified the genes for eight other disorders, including amyotrophic lateral sclerosis 2, high lipids, and pain. Dr. Hayden, along with Dr. Bruce Carleton, are supported by Genome BC and Genome Canada for the project: Genotype-specific Approaches to Drug Therapy in Childhood.

Dr. Hayden is Killam Professor of Medical Genetics at the University of British Columbia and Canada Research Chair in Human Genetics and Molecular Medicine. He has authored more than 400 peer-reviewed publications in high impact journals such as *Cell*, the *Nature* journals, *Proceedings of the National Academy of Science*, *New England Journal of Medicine*, and *The Lancet*. Additionally, he's co-founded three pharmaceutical companies: Xenon Pharmaceuticals, Aspreva Pharmaceuticals Inc., and NeuroVir.

PhD Graduate awarded Governor General's Gold Medal at UBC

Dr. Liam Brunham, an MD/PhD student working in Dr. Michael Hayden's lab at the Child & Family Research Institute, received the highest award for a graduating doctoral student at the University of British Columbia, the Governor General's Gold Medal. The gold medal is given to the student with the most outstanding academic record of the 300 doctoral candidates who graduate from UBC every year.

Dr. Brunham studied the role of the ABCA1 gene in regulating levels of HDL, or "good cholesterol," in different parts of the body. His work established the liver and the intestine as the major sites of HDL production, and identified a new link between cholesterol metabolism and risk of diabetes. Dr. Brunham also published a paper co-authored with Dr. Bruce Verchere and Dr. Hayden in the March 2007 issue of *Nature Medicine*.

Dr. Brunham will continue working in Dr. Hayden's lab during his residency in internal medicine.

Below: Dr. Liam Brunham

New Recruits at the Child & Family Research Institute

In 2007/2008 CFRI was delighted to welcome the following new recruits:

Dr. Mariana Brussoni, Scientist Level 1, BC Injury Research and Prevention Unit, Community Child Health

Dr. Brussoni is director of the Injury Reporting and Prevention Program at BC Children's Hospital and Assistant Professor in the Department of Pediatrics at the University of British Columbia.

Dr. Ran Goldman, Senior Associate Clinician Scientist, Applied Health Research & Evaluation

Dr. Goldman holds a secondary affiliation with Clinical Investigation, is Head and Medical Director in the Division of Pediatric Emergency Medicine at BC Children's Hospital and Associate Professor in the Department of Pediatrics the University of British Columbia.

Dr. Daniel Goldowitz, Scientist Level 3, Molecular Medicine and Therapeutics

Dr. Goldowitz has a secondary affiliation with Neurobiology and Mental Health and is Professor of Medical Genetics at the University of British Columbia. He is a Canada Research Chair in Developmental Neurogenetics. His research focuses on the role of genes in the development of the normal and abnormal central nervous system.

Dr. Bruce Lanphear, Scientist Level 3, Community Child Health Research

Dr. Lanphear is a Professor in the Faculty of Health Sciences at Simon Fraser University. His research seeks to quantify the impact of a variety of risk factors—from exposures to heavy metals and chemicals, maternal depression, poor house quality and poverty—to understand why some children develop learning problems, behavioural problems, injuries, or asthma.

Dr. Charles Larson, Director, Centre for International Child Health

Dr. Larson is Clinical Professor in the Department of Pediatrics at the University of British Columbia. His research is focused on the use of zinc as a treatment for childhood diarrhea and the development of strategies to prevent HIV infection among youth in developing countries.

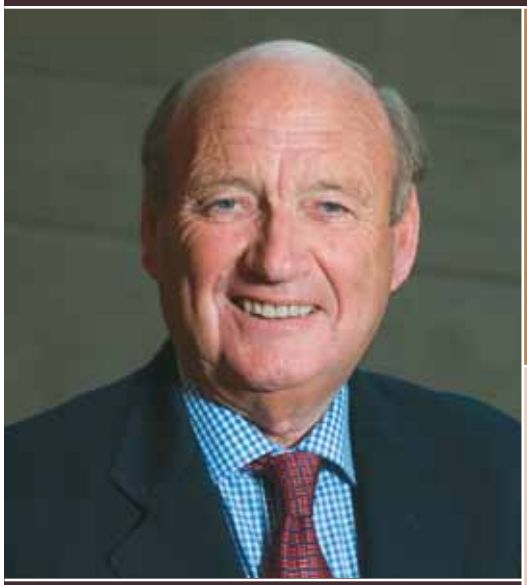
Dr. Urs Ribary, Consultant, Neurobiology and Mental Health

Dr. Ribary is a Professor and BC Leadership Chair in Cognitive Neuroscience in Early Childhood Health and Development at Simon Fraser University. His research focuses on cognitive neuroscience, brain imaging and brain network dynamics, and their relation to normal, altered and pathological brain functions.

Dr. Laura Sly, Scientist Level 1, Infectious and Inflammatory Diseases

Dr. Sly is Assistant Professor in the Department of Pediatrics at the University of British Columbia. Her research examines macrophages, specialized cells of the immune system, inflammatory bowel disease and innate immune responses.

Message from the Board Chair



Mr. Maurice Mourton, Chair, CFRI Board of Directors

"I've witnessed phenomenal growth and an amazing success story as the Child & Family Research Institute evolved to establish itself as the largest research institute of its kind in Western Canada."

On behalf of the Board of Directors, I'd like to congratulate the investigators, trainees, and staff of the Child & Family Research Institute on an exciting period of achievement. The progress made under the leadership of Dr. Stuart MacLeod and Dr. Geoff Hammond has put CFRI on the international map. CFRI's new translational research building is a tangible representation of the Institute's exponential growth in physical size, funding, number of investigators, and research discoveries. It's been rewarding to be a part of these successes.

I'd also like to thank BC Children's Hospital Foundation, without which CFRI would not exist. The Institute depends on funding from the Foundation and the community of philanthropists who support the Foundation. Each dollar they invest in research is returned four times by the talented investigators at CFRI.

The recently established CFRI Clinician Scientist Awards program, for example, enables recruitment of outstanding individuals and increases clinical research on the campus of BC Children's Hospital. Made possible by the generous support of the Foundation and the Hospital, these institutional awards allow researchers to obtain preliminary research data and strengthen their applications to provincial, federal, and international granting agencies.

The inaugural recipients of CFRI's Clinician Scientist Awards succeeded in receiving external salary awards and other research funding this past year—which speaks to the excellence of these investigators and the benefit of the awards program:

Clinical geneticist **Dr. William Gibson** received a Phase 2 Clinician Scientist Award from the Canadian Institutes of Health Research. He also received infrastructure funding from the Canada Foundation for Innovation Leaders Opportunity Fund / British Columbia Knowledge Development Fund, with which he established a lab for studying genetics, obesity, and metabolism.

For her work on type 2 diabetes in children among remote First Nations communities, endocrinologist **Dr. Dina Panagiotopoulos** received a Clinician Scientist Award from the Canadian Diabetes Association. She also received research funding from several provincial and national agencies.

Dr. Peter van den Elzen is a hematopathologist and an expert in the role of lipids in diseases such as diabetes, multiple sclerosis, and atherosclerosis. He received a Scholar Award from the Michael Smith Foundation for Health Research and both a Career Development Award and an operating grant from the Multiple Sclerosis Society of Canada.

The Clinician Scientist Awards program is only one of the many opportunities available at CFRI. The Institute's Research and Technology Development Office is extraordinarily successful in facilitating the applications of investigators and trainees to funding agencies. Through the support of BC Children's Hospital Foundation, CFRI provides new recruits joining the Institute with a generous start-up award that permits them to establish their labs and their research program. The highly recognized in-house trainee program supports undergraduates, graduates, and post-doctoral fellows in sharpening the professional skills required as a career scientist. In these and many other ways, CFRI advances research into the health issues facing children and families.

I've been associated with BC Children's Hospital for over 20 years in different roles: as Vice-Chair of the Children's Hospital Foundation, as Hospital Chair, and now as CFRI Board Chair. Over this period of time, I've witnessed phenomenal growth and an amazing success story as CFRI evolved to establish itself as the largest research institute of its kind in Western Canada. With the addition of the new translational research building and the new scientists joining the Institute, there is much to anticipate in the years ahead at CFRI.

Executive Comment

Guiding the future of the Child & Family Research Institute are clear road maps drawn by research funders and advocates, suggesting it's time to translate research advances in understanding the human genome into improved prediction of illness, disease prevention, diagnosis, and treatment.

Dr. Geoff Hammond,
Scientific Director, CFRI

Dr. Stuart MacLeod,
Executive Director, CFRI

The well-being of children and youth requires that we show agility in our planning as we move ahead with an agenda promoting transformative change in the diagnosis and treatment of disease and the promotion of better health. To achieve this, we need to anticipate the future and react in ways which will permit our research to achieve optimal impact.

This past year brought leadership changes with great bearing on the research community. In 2008, we welcomed new leaders at the Canadian Institutes of Health Research (Dr. Alain Beaudet), the Michael Smith Foundation for Research (Dr. John Challis), and BC Children's Hospital (Mr. Larry Gold). This year we will see changes at the top of BC Women's Hospital & Health Centre and BC Cancer Agency, and new research heads appointed at BC Cancer Research Centre and Vancouver Coastal Health.

It sometimes appears that change is the only constant. Guiding the future of the Child & Family Research Institute are clear road maps drawn by research funders and advocates, suggesting it's time to translate research advances in understanding the human genome into improved prediction of illness, disease prevention, diagnosis and treatment. It's this expanding translational science that will allow us to reap the benefits of investments made over the past 25 years in basic molecular science.

Thanks to the foresight of earlier leaders at the University of British Columbia and BC Children's Hospital, CFRI is ideally positioned in clinical and translational science. We are also recognized internationally for our strengths in medical genetics and molecular medicine and therapeutics.

With support from the Provincial Health Services Authority, BC Children's Hospital, and BC Children's Hospital Foundation, over the past five years we've made major steps to augment our capacity in clinical and population health research to support the work of translational into optimal practice.

A superb example of what may be achieved in this domain is the Canadian Pharmacogenomics Network for Drug Safety, led by Dr. Michael Hayden and Dr. Bruce Carleton. This groundbreaking venture started four years ago with support from Genome Canada and Genome BC, focused on improved understanding of adverse drug reactions in children. Now an expanded network is poised to tackle parallel issues in prediction of drug response, both beneficial and adverse, in cancer, mental health, communicable disease, and cardiovascular disease. The Network illustrates our preparedness to play on a broader stage with partners in Montreal, Toronto, London, and the United States.

No research enterprise can thrive without up-to-date facilities. At CFRI we are fortunate to have a new translational research building that's a tangible representation of what can be achieved through partnership that includes the Provincial Health Services Authority, BC Children's Hospital, the University of British Columbia (UBC), and the federal and provincial governments, along with exceptional leadership from BC Children's Hospital Foundation. The building holds a mixture of wet and dry labs, clinical research, and administrative facilities. Presently it's 65 per cent complete with funds now available to allow finishing and fit out of most remaining areas by the end of 2009.

The remaining challenge is to develop a phase II building, which will be situated on 28th Avenue in front of CFRI's existing buildings. The envisioned facilities will provide additional population health research space to support work on translational science. The contiguity of molecular research labs and evaluation science labs in a fully integrated environment will allow us to deliver a maximum contribution of research to inform decision making and meet our goals in improving child and youth health.

Most importantly, we want to underscore the importance of a partnership model for research on the Oak Street campus. CFRI has developed a close working relationship with academic partners at UBC, Simon Fraser University, University of Northern British Columbia, University of Victoria, and British Columbia Institute of Technology; and with health authority research institutes at Providence Health Care, Vancouver Coastal Health, and BC Cancer Agency. We will concentrate now on the development of a seamless integrated research environment with our Oak Street colleagues in mental health and women's health.

Together we will deliver the benefits of translational science to the people of British Columbia.

Interview with Larry Gold

In April 2008, Larry Gold became the new President of BC Children's Hospital and Sunny Hill Health Centre for Children and joined the Board of the Child & Family Research Institute

Mr. Larry Gold, President, BC Children's Hospital and Sunny Hill Health Centre for Children

Mr. Gold has an extensive clinical and administrative background, the majority of which has been in pediatric environments. He has provided consulting and advisory services to domestic and international pediatric acute care providers and related organizations, including the planning and commissioning phases of a state-of-the-art Children's Hospital in Cairo, Egypt that will be the largest pediatric cancer hospital in the world.

"I hope to strengthen ties between clinical and lab researchers, and to more quickly convey the value of research to undergraduates, medical students, and residents. All of this effort will advance our ability to help kids."

Prior to his consulting practice, Mr. Gold was President and CEO of the Connecticut Children's Medical Center, where he developed and expanded academic and residence programs and attained the highest nurse retention rate for any state acute care facility.

In this interview, Mr. Gold talks about first impressions, his vision for the hospital campus, and the role of research at a major children's hospital.

What were your first impressions as a new Member of CFRI's Board of Directors?
I was impressed by the research talent that resides on this campus. People are very committed and they've broken through traditional models of conducting research to create an environment of scholarly activity where research includes conversations over coffee.

We're not just talking about childhood diseases and investigating the molecular or genetic makeup of these diseases. We're also talking about understanding the developmental milestones of childhood, improving quality of life and children's ability to learn, progress, and become fully functional members of their communities, societies, and neighbourhoods.

What's your vision for the campus of BC Children's Hospital and CFRI?
The strengths of this campus include wonderful, state-of-the-art clinical care, incredible investments in research that are yielding results, and a real commitment to education and teaching. I hope to positively influence the three pieces of our mission statement—clinical care, research, and teaching—in working more closely together. I hope to strengthen ties between clinical and lab researchers, and to more quickly convey the value of research to undergraduates, medical students, and residents. All of this effort will advance our ability to help kids.

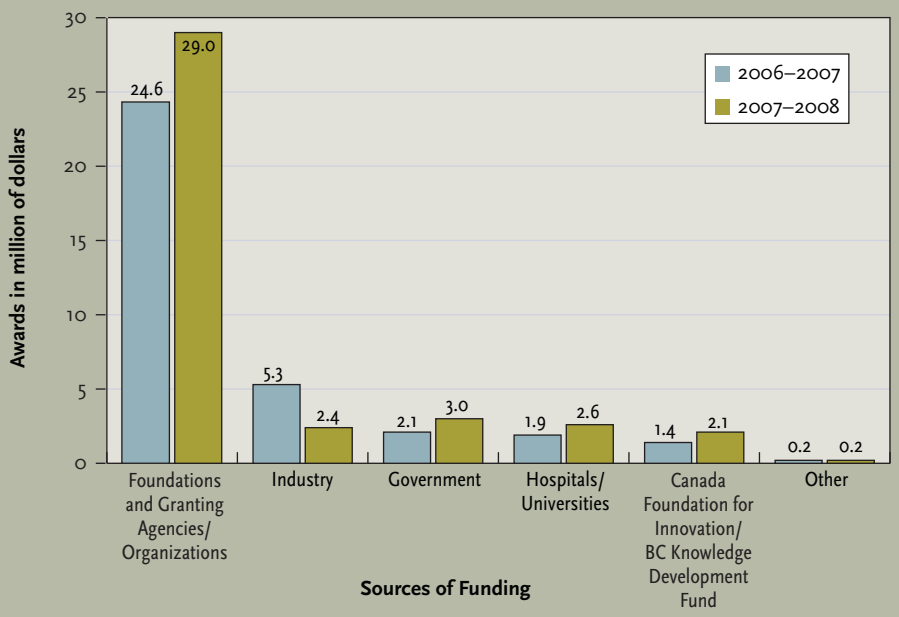
In the future, we need to strengthen even more the relationships and strategic ties between the campus entities of the hospitals and health centres, researchers, academic partners, and the foundations. Everybody brings expertise to the table and we're interdependent. That's the beauty of partnerships: when we come together, the whole is much stronger than the sum of the parts.

How do you view the role of research at a major children's hospital?
Although children's hospitals represent only about two per cent of hospitals in North America, they do a disproportionate amount of the research relevant to children and youth and that's vital to advancing clinical care. It's absolutely essential that children's hospitals embrace, garner, and grow the research commitments to the children they serve. The proximity of clinical activity to laboratory research is crucial for translating research into practice to benefit children and families not only at the bedside but also in their communities. That's one of the reasons why I was interested in the position of President at Children's and Sunny Hill: because of the commitment made to research, working hand in hand with our numerous partners.

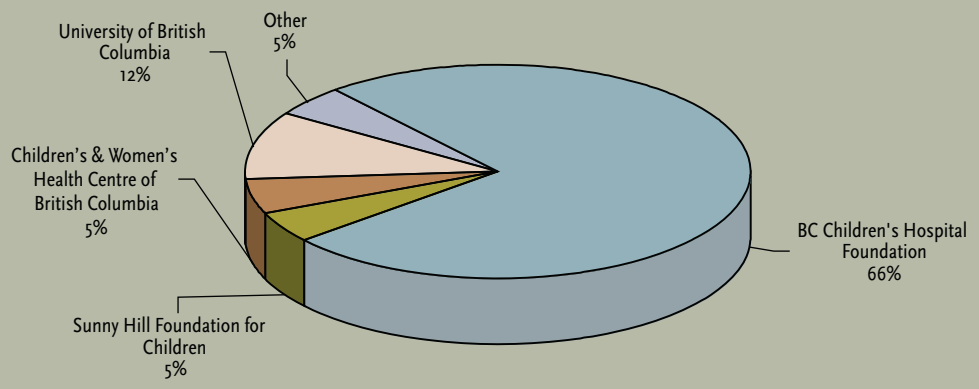
Financials

In 2007/2008, increased external funding was received from foundations, granting agencies and organizations, government contracts, hospitals, universities, Canada Foundation for Innovation and British Columbia Knowledge Development Fund. Approximately $11.8 million in internal funding was received from BC Children's Hospital Foundation, University of British Columbia, Sunny Hill Foundation for Children, and the Children's & Women's Health Centre of British Columbia, an agency of the Provincial Health Services Authority.

Comparison of External Funding Sources 2006/07 and 2007/08



2007–2008 Internal Revenue ($11.8 million)



Fast Facts 2007–2008

- The Child & Family Research Institute's overall success with Canadian granting agencies is close to 50 per cent—twice the national average
- CFRI faculty produced a total of 511 publications:
  - 484 journal articles (including 56 reviews)
  - 27 book chapters
- Invention disclosures involving CFRI faculty: 18
- Patent applications filed by CFRI investigators: 12
- Patents issued to CFRI faculty: 1
- The new research building adds approximately 70,000 square feet of new research/academic space to CFRI
- CFRI's 2007–2008 revenue was approximately $51.2 million, of which $39.4 million was external funding and approximately $11.8 million was internal funding
- Over 160 agencies contributed to CFRI's external funding

Research Funding

The Child & Family Research Institutute's 2007/2008 revenue was approximately $51.2 million, of which $39.4 million was external funding, including grants, contracts and agreements. More than 160 agencies contributed to external funding in 2007/2008 and these agencies are recognized below.

FOUNDATIONS AND GRANTING AGENCIES/ORGANIZATIONS

AllerGen NCE Inc. – Allergy, Genes and Environment Network
American Health Assistance Foundation
Arthritis Society
Association for Frontotemporal Dementias
BC Academic Health Council
BC Children's Hospital Foundation
BC Medical Services Foundation
British Columbia Ataxia Society
British Columbia Lung Association
Burroughs Wellcome Fund
Canada Foundation for Innovation
Canadian Council on Learning
Canadian Cystic Fibrosis Foundation
Canadian Diabetes Association
Canadian Foundation for Women's Health
Canadian Gene Cure Foundation
Canadian Institute for Advanced Research
Canadian Institutes of Health Research
Canadian Language and Literacy Research Network
Canadian Paediatric Society
Canadian Pain Society
Canadian Patient Safety Institute
Canadian Society for Mucopolysaccharide and Related Diseases Inc.
Cancer Research Society
Charles A. Dana Foundation
Children's Arthritis Foundation
Crohn's and Colitis Foundation of Canada
Genome British Columbia
Heart and Stroke Foundation of BC & Yukon
Heart and Stroke Foundation of Canada
High Q Foundation
Huntington Society of Canada
Huntington's Disease Society of America
International Pediatric Association
Juvenile Diabetes Research Foundation International
Kidney Foundation of Canada
Lawson Foundation
Lloyd Jones Collins Foundation
Lotte & John Hecht Memorial Foundation
March of Dimes Birth Defects Foundation (US)
Meningitis Research Foundation of Canada
Michael Smith Foundation for Health Research
Multiple Sclerosis Scientific Research Foundation
National Alliance for Autism Research
National Cancer Institute of Canada
National Institutes of Health
National Multiple Sclerosis Society (US)
National Ovarian Cancer Association
Natural Sciences and Engineering Research Council of Canada
North American Pediatric Renal Transplant Co-operative Study
Ontario Cancer Research Network
Prostate Cancer Research Foundation of Canada
Rethink Breast Cancer
SickKids Foundation
Social Sciences and Humanities Research Council of Canada
Spastic Paraplegia Foundation, Inc.
Sunny Hill Foundation for Children
TB Vets Charitable Foundation
The Blue Sky Foundation
The Children's Hospital Foundation of Manitoba Inc.
Thrasher Research Fund
United Way of the Lower Mainland
Washington State Developmental Disabilities Endowment Trust Fund
Wegener's Granulomatosis Association

GOVERNMENT

BC Ministry of Children and Family Development
BC Ministry of Economic Development
BC Ministry of Health Services
BC Academic Health Council
BC Mental Health & Addiction Services
British Columbia Knowledge Development Fund
Calgary Regional Health Authority
Delegation of the Commission for European Economic Communities
Government of Canada
Health Canada
Healthy Child Manitoba
Human Resources and Social Development Canada
Insurance Corporation of British Columbia
Interior Health Authority
North Shore – Long Island Jewish Health System
Public Health Agency of Canada
Southwest Pediatric Nephrology Study Group
US Department of Energy
United States Army
US Food and Drug Administration
Vancouver Coastal Health Authority
Vancouver Island Health Authority

HOSPITALS/UNIVERSITIES

BC Cancer Agency
BC Children's Hospital and Sunny Hill Health Centre for Children
BC Women's Hospital & Health Centre
Children's Hospital of Eastern Ontario
Stanford University
Sunnybrook Health Science Centre
The Hospital for Sick Children
The Hospital for Sick Children Research Institute
The University of British Columbia
UBC Department of Paediatrics
UBC Faculty of Medicine
UBC Institute of Mental Health
UBC Peter Wall Institute for Advanced Studies
UBC School of Nursing
UBC VPR Research Development Fund
University of Waterloo

INDUSTRY

Abbott Laboratories
Allergan Inc.
AMGEN Canada, Inc.
Aspreva Pharmaceuticals SA
AstraZeneca Canada Inc.
Bayer Schering Pharma AG
Berlex Biosciences
Bristol-Myers Squibb
Bristol-Myers Squibb Medical Imaging
Centocor Inc.
Chiron Corporation
Circa Dia BV
Codman & Shurtleff, Inc.
Concord Pacific Group Inc.
Edwards Lifesciences LLC
Eli Lilly Canada Inc.
Genzyme Corporation
GlaxoSmithKline Inc. (Canada)
GlaxoSmithKline UK Ltd.
Guidant Corporation
Hoffman-La Roche Limited
Hollis and Wright P.G.
IBM Canada Ltd.
Immunex Corporation
Inhibitex, Inc.
Mead Johnson Nutritional Group
MedImmune, Inc.
Merck Frosst Canada Inc.
Merck Frosst Canada Ltd.
Migenix Inc.
Novartis Pharmaceuticals Canada Inc.
Novartis Vaccines & Diagnostics, Inc.
Ohmeda Pharmaceutical Products Division, Inc.
Pfizer Canada Inc.
Pharmaxis Ltd.
Sanofi Pasteur Limited
Serono Canada, Inc.
Walter Lorenz Surgical, Inc.
Wyeth Pharmaceuticals
Wyeth-Ayerst Canada Inc.
Wyeth-Ayerst Research
Xenon Pharmaceuticals Inc.

Our People

The outstanding success of the Child & Family Research Institute is possible because of its community of committed investigators, trainees, support staff, and administration. Every effort has been made to be accurate; please accept our apologies for any errors or omissions.

INVESTIGATORS/ MEMBERS

Kourosh Afshar
Christine Alvarez
Mark Ansermino
Linlea Armstrong
Robert Armstrong
Nelly Auersperg
Jehannine Austin
Shelina Babul
Collin Barker
Ronald Barr
Julie Bettinger
Laird Birmingham
Geoffrey Blair
Cornelius F. Boerkoel
Mason Bond
Vagn Bonnevie-Nielsen
Thomas Boyce
Rollin Brant
Carolyn Brown
David Brown
John Brunstein
Mariana Brussoni
Helene Bruyere
David Burdge
David Cabral
Susan Cadell
Andrew Campbell
Bruce Carleton
Jean-Pierre Chanoine
Janet Chantler
Philippe Chessex
Keith K.C. Choi
Lorne Clarke
Sterling Clarren
David Cochrane
Jean-Paul Collet
Elizabeth Conibear
Marion Coulter-Mackie
Leanne Dahlgren
Jeffrey Davis
Betty Davies
Marie-France Delisle
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Adele Diamond
David Dix
Walter Duncan
Sandra Dunn
Jan Dutz
Mary Ensom
Kevin Farrell
Alexander Ferguson
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Ken Lim
Robert Liston
Jeffrey Ludemann
Judith Lynam
Sai Ma
Colin MacCalman
Ross T.A. MacGillvray
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Andrew Macnab
Ying MacNab
Andrew MacNeily
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Dina Panagiotopoulos
Millan Patel
Robert Peterson
Ian Pike
Jerilynn Prior
Sheila Pritchard
Evica Rajcan-Separovic
Shahrad Rassekh
Pratibha Reebye
Christopher Reilly
Urs Ribary
Wendy Robinson
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Paula Waters
Joanne Weinberg
Margaret Weiss
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Stephen Wellington
Janet Werker
Colin White
Michael Whitfield
Simon Whyte
John Wu

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Anita Chiu
Gurm Dhugga
Stephanie Dunn
Sandra Elias
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Maryam Ghafouri
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Claire Pook
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Dan Rurak
Angela Seldner
Nick Steel
Jordan Trask
Grace Valente

RESEARCH & TECHNOLOGY DEVELOPMENT OFFICE

Joel Livingston
Dawn McArthur

TRAINEES

Mohammad Abdullah
Elysia Adams
Abebech Demissie Aero
Salman Ali
Mai Al-Khatib
Lenka Allan
Sura Alwan
Arezoo Astanehe
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Jung-chien (Jordan) Cheng
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Cindi Ho
Greenly Hoe-Yan
Eui-Ju Hong
In Sun Hong
Qing (Jessica) Huang
Rebecca Hunt Newbury
Agatha Jassem
Angela Kaida
Martin Kang
Joanna Karasinska
Hagit Katzov

Our People

Mohammed Khan
Ki-Yon Kim
Gordon Kirkpatrick
Christian Klausen
Agnieska Klimek
Maryam Koochek
Janine Kruit
Andrew Kwon
Karen Lam
Fiona Lau
Pascal Lavoie
Cathy Lee
Andrew Lee
Linda Lee
Erica Lee
Nancy Levesque
Yvonn Lie
Hai Yan Lin
Yi Lin
Yuh-Huey (Angela) Liou
Sarka Lisonkova
Daniella Loeffler
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Benjamen Montpetit
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Hossain Najar
Dhananjay Namjoshi
Francisco Ng
Ginna Ng
York Ng
Ying-Fai (Tiffany) Ngai
Hehong Ni
Dave Nordstokke
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Paul Orban
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Song Ling Poon
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Ying Qiao
Dexin Qiu
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Nicole Quenneville
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Noemie Riendeau
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Jane Ryan
Lionel Samayawardhena
Jean-Francois Schmouth
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David Selva
Alicia Semaka
Andy Sham
Fengtao Shi
Prasad Shrawane
Roshni Singaraja
Penny Slack
Kinga Smolen
Wai-Kin So
Siddhartha Srivastava
Anna Stratford
Guobin Sun
Douglas Swanson
Harley Syyong
Odelia Tam
Steven Tang
Chris Taplin
Jenny Thiele
Marion Thomas
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RESEARCH SUPPORT STAFF

Tammie Adams
Noushin Akounsadeh
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The CFRI Board of Directors would like to acknowledge the contributions of Dr. Ron Woznow, who resigned from the Board in June, 2008.

Our Partners

The Child & Family Research Institute (CFRI) conducts discovery research, clinical investigation, and applied health research to benefit the health of children and families. CFRI works in close partnership with BC Children's Hospital and Sunny Hill Health Centre for Children, BC Women's Hospital & Health Centre, and BC Mental Health & Addiction Services, agencies of the Provincial Health Services Authority; BC Children's Hospital Foundation; and the University of British Columbia. CFRI has additional highly valued partnerships with B.C.'s five regional health authorities and with B.C. academic institutions Simon Fraser University, the University of Victoria, the University of Northern British Columbia, and the British Columbia Institute of Technology.

BC Children's Hospital Foundation
Since 1982, BC Children's Hospital Foundation has raised money to support the work of BC Children's Hospital, the province's only pediatric acute care hospital. The Foundation is united with its donors by a single, simple passion—to improve the health and the lives of the young people who enter BC Children's Hospital every day. The Foundation exists to provide financial support to BC Children's Hospital, Sunny Hill Health Centre for Children and the Child & Family Research Institute through accountability of contributions, stewardship of donors and advocacy to better accommodate sick and injured children and their families who live in all parts of the province.

University of British Columbia
The University of British Columbia is one of Canada's largest and most prestigious public research and teaching institutions and consistently ranks among the top 40 institutes in the world. It offers a range of innovative undergraduate, graduate and professional programs in the arts, sciences, medicine, law, commerce and other faculties. UBC has particular strengths in biotechnology, ranks in the top 10 universities in North America and number one in Canada for commercializing research and for its patent activity in the Life Sciences.

BC Children's Hospital and Sunny Hill Health Centre for Children
BC Children's is home to many specialized pediatric services available nowhere else in the province, including BC's trauma centre for children, neonatal intensive care, kidney and bone marrow transplants, open heart surgery, neurosurgery and cancer treatment. Sunny Hill is a provincial facility that offers specialized services to children and youth with developmental disabilities.

BC Women's Hospital & Health Centre
BC Women's is the province's only facility devoted exclusively to the health of women, newborns and families. It is one of the country's busiest and largest obstetrical centres. BC Women's supports women through all the phases of their lives—more than 20,000 women are seen annually through its specialized women's health programs, which include world-class services in breast health, substance dependency, osteoporosis, HIV/AIDS and reproductive health.

BC Mental Health & Addiction Services (BCMHAS) provides a diverse range of one-of-a-kind, specialized mental health services to people across the province. The assessment and treatment of addictions is an integral part of our programs, which comprise: Adult Tertiary Psychiatry and Geriatric Psychiatry Services, Forensic Psychiatric Services, Child and Adolescent Mental Health & Addiction Services located at BC Children's Hospital, and the Provincial Specialized Eating Disorders Program for youth and adults. The agency also makes significant contributions in the areas of research and knowledge exchange in the field of mental health.

Provincial Health Services Authority
The first authority of its kind in Canada, the Provincial Health Services Authority (PHSA) plans, manages and evaluates selected specialty and province-wide health care services across B.C., working with the five geographic health authorities to deliver province-wide solutions that improve the health of British Columbians. With more than 10,000 employees and an annual budget of over $1.2 billion, the PHSA operates provincial agencies like BC Children's Hospital, plans and in some instances funds specialized health care services like trauma, critical care and thoracic surgery, and delivers a variety of specialized programs and services throughout the province. PHSA is one of the largest academic health organizations in Canada, with about 2000 people involved in research activities supported by $150 million in research funding each year.

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950 West 28th Avenue, Vancouver, BC Canada V5Z 4H4
Phone: 604.875.3194 | Fax: 604.875.2496 www.cfri.ca