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An estimated 20,000 British Columbians will be diagnosed with cancer this year. MSFHR funding supports hundreds of BC cancer researchers who are striving for better treatments and healthier outcomes.

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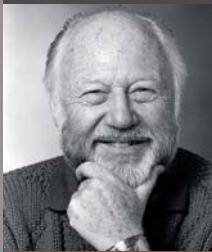
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Dr. Michael Smith

Funded by the Province of British Columbia, the Michael Smith Foundation for Health Research (MSFHR) is the provincial support agency for health research in British Columbia. MSFHR is an independent, third-party organization that works to develop BC as a leading force in health research, supporting improvements to health, health care and economic opportunity. We focus on:

- Supporting people with awards to attract the best and create an environment where they can excel.
- Demonstrating fairness, accountability and transparency in all our activities.
- Working across academic, health and government systems to foster collaborations that enhance health research productivity, competitiveness and impact.
- Building partnerships within BC and across Canada to leverage BC's health research potential and create better returns on research investment.

MSFHR was named to honour Nobel Laureate Dr. Michael Smith (1932-2000), a pre-eminent BC scientist with a long-standing personal commitment to ensuring support for researchers throughout their careers, and who believed that BC could and should be a leading centre for health research.

Reflections: The power of partnerships

Government and community key to MSFHR's success



Dr. Aubrey Tingle,
President and CEO

By Dr. Aubrey Tingle

In June, I will retire as President and CEO of the Michael Smith Foundation for Health Research. It has been a great honour and privilege to serve during such an exciting time in BC health research and to witness BC's growing momentum as the country's most rapidly expanding jurisdiction for health research activity and innovation.

In looking back on MSFHR's successes, I will remain forever grateful to the Foundation's many supporters: the Government of British Columbia, Dr. Michael Smith's family, the BC health research community, our peer agencies in other provinces, the members of our Board, our

staff and volunteers. It was our community that first rallied together to develop a blueprint for reversing a major downturn in BC health research. The plan required not only a significant funding commitment, but a multi-year timeframe for establishing a base of people and resources. The BC Government was enthusiastic in its support of this consensus plan, creating MSFHR with an upfront grant of \$110 million to implement a five-year strategy for restoring BC's competitiveness.

Within three years of rolling out our first personnel and infrastructure programs, BC's per capita share of national funding from the Canadian Institutes of Health Research increased from eight to 11 per cent, bringing home an additional \$52 million annually from this source alone.

I'm proud of MSFHR's role in revitalizing BC's health research environment. Our programs have helped BC organizations recruit, retain and train top talent. We have also supported researchers to coalesce in teams and networks to build critical mass and increase their competitiveness for national and international funding.

I am also proud of the role MSFHR has established as a catalyst and third-party convener, rallying stakeholders to identify and address provincial health research priorities. We have led provincial processes to explore harmonizing ethics review. We

have developed key technology and methodology research platforms as resources to be shared – not duplicated – across BC institutions. We have been entrusted and resourced by the provincial government to facilitate and lead numerous special initiatives. These include fast-tracking the development of a SARS vaccine, evaluating the newly-introduced HPV vaccine for prevention of cervical cancer, building capacity for practice-relevant research focused on nursing and other health system priorities, and the development of an inter-provincial research network on Fetal Alcohol Syndrome, to name a few.

I want to extend my personal thanks to MSFHR's senior management and staff for their dedication, hard work and creativity. I'd also like to acknowledge the tireless enthusiasm and support of our Board members, whose leadership has guided the direction of our organization.

I extend a warm welcome to Dr. John Challis, who will take on the role of MSFHR President and CEO in July 2008. To BC's health research community, I offer both my appreciation and a challenge to keep building on what we've achieved thus far. More than ever, BC is positioned to take health research to a new level, achieving better health, improved health care and increased economic opportunity for all British Columbians. It's a goal worth striving for. ■

In this issue: Cancer research

Between 2001 and 2007, MSFHR invested significant funding into building the base of researchers and resources to support innovative cancer research in BC:

43 Career Investigator Awards	\$18,955,487
135 Research Trainee Awards	\$7,012,409
8 Research Unit Awards	\$7,397,500
3 Team Planning Awards	\$100,000
Institutional Award to BC Cancer Agency	\$5,090,000
Match funding to Genome BC for Cancer Genomics at BC Cancer Agency	\$4,870,000
Total funding	\$43,425,396

Research Snippets

Dr. Babak Shadgan



Beijing bound

Sports physician Dr. Babak Shadgan is heading to the 2008 Summer Olympic Games in Beijing. As an Official Medical Officer for the games, Shadgan has been elected to supervise medical coverage and the doping control program for athletes participating in Freestyle, Greco-Roman and female wrestling.

Shadgan's interest in wrestling started in his home country of Iran, where it is one of the country's most popular sports. It's the second Olympic Games for the MSFHR-funded PhD student, whose research focus is early detection of muscle ischemic injuries in patients with lower limb fractures. "It's a great opportunity and something that is considered an ultimate success for every sports medicine specialist," he enthuses.

Mentorship program targets up-and-coming researchers

The MSFHR-funded BC Environmental and Occupational Health Research Network (BCEOHRN) has developed a new resource for students and junior researchers across British Columbia—a mentorship program for up-and-coming environmental and

occupational health researchers who want to benefit from the experience of more seasoned investigators.

To date, four Special Interest Groups have been formed: Geographic Information Systems; Injury Prevention; Water; and Student and New Professional. Groups meet via teleconference and web technologies to address issues of interest to members across the province.

For more information, visit the BCEOHRN website: <http://www.bceohrn.ca/bceohrnmentorshipprogram.html>



You read it here first

In the Fall/Winter 2007 issue of *Interactions*, we introduced MSFHR Post Doctoral Fellow Dr. Qingguo Li, an SFU engineer working with MSFHR Scholar Max Donelan on a biomechanical energy harvester (BEH). The novel human power harvesting device garnered international attention in February 2008, thanks to the research team's publication of a paper in the prestigious journal *Science*, and resulting media coverage. "Having our research published in *Science* was very exciting," says Li. "I look forward to contributing more to health-related research and the well-being of our society."

Resembling a leg brace, the BEH captures the mechanical power produced by muscles acting on the knee joint when the user is walking, and converts it into electrical energy. The BEH captures enough energy to power a range of portable medical devices, such as pacemakers and motorized prostheses.



Readers give thumbs up to Interactions

MSFHR is on the right track with its *Interactions* newsletter, according to 300 readers who responded to an online survey in December 2007.

Representing a broad range of stakeholders—including researchers and trainees, health authority employees, and government—our readership showed diversity in the publication's research topics that

interest them the most. They agreed on the quality of *Interactions*, rating the newsletter as good or excellent in terms of writing (95%), design (94%) and photography (93%). Three-quarters said their awareness of MSFHR's role in BC's health research community increased moderately or significantly as a result of reading the newsletter.

Readers are reminded that we also publish an online version of *Interactions*. There you will find expanded content, including additional research information.

Check it out at www.msfhr.org/sub-media-publications-interactions.htm

Family nurse practitioner Ranjit Lehal makes regular home visits to 96-year-old Coquitlam resident Erna Hillmann. Lehal is a member of the advisory council for the BC Nursing Research Initiative.



BC Nursing Research Initiative

The BC Nursing Research Initiative, with direction from a Nursing Research Advisory Council, will build partnerships between researchers and nurses to ensure a focus on practice-relevant health services research. As of spring 2008, the Advisory Council's two task forces had completed their foundational work, reviewing the current environment to develop recommendations for research priorities and capacity-building initiatives necessary to support the research. As part of the process, task force recommendations were posted on the MSFHR website for community feedback. Follow-up presentations are now in progress across the province.

The Advisory Council will meet in late May to determine high-level principles and funding allocations for specific programs to support the research and capacity building. Council recommendations will go to the MSFHR Board for approval in June.

"It's a highly consultative process," says Fraser Health nurse practitioner Ranjit Lehal, a member of the Advisory Council and the task force on research capacity. "A great deal of input was sought in the making of these recommendations, and nurses and researchers with varied experience and backgrounds will be able to see their perspectives reflected here."

New research initiative targets nursing practice in BC

Government-funded initiative engages broad spectrum of nursing expertise

Over the course of a wide-ranging nursing career, Ranjit Lehal has seen research projects come and go. Some were successful, generating relevant questions, keen participation and results that made a difference in the practice setting. In other cases the impact was less visible.

"I've always been interested in why some research works to improve practice and some doesn't," says Lehal, a Fraser Health nurse practitioner whose job takes her into homes of people who can't get out to visit doctors due to physical or mental health challenges.

An invitation to join the advisory council for the new BC Nursing Research Initiative (BCNRI), funded with \$8 million from the BC Ministry of Health and administered by MSFHR, gave Lehal the perfect opportunity to explore this interest and act on it. She and her fellow council members represent a spectrum of nursing experience and expertise, from practice to policy-making and academia.

"Research is vital to nursing practice," says Lehal, whose role as nurse practitioner allows an expanded scope of practice to order tests and prescribe medications. "But it needs to become an everyday activity rather

than something inaccessible that only academics do—I think the BCNRI will help move us in that direction."

The purpose of the BCNRI is to support practice-relevant health services research that informs nursing roles, recognizing that nurses perform their work as part of an inter-professional health services workforce. As a first step, two task forces were set up to identify research priorities and develop strategies for building capacity to do the research (see BC Nursing Research Initiative, left). The goal is to launch research funding programs and implement capacity-building strategies by early fall.

"For results to be practice-relevant, it must be a true partnership between nurses and researchers, with questions coming from staff and a research lead who is integrated into the team," says Lehal. "That's easier said than done, but the BCNRI process—which supports collaboration among a diverse group of nursing representatives—has given us good direction on how to get there." ■

For more information about the BC Nursing Research Initiative, visit: www.msfhr.org/sub-strategic-nursing.htm



MSFHR Scholar Dr. Catherine Poh screens Jackie Douglas for oral cancer at the Portland Community Dental Clinic in Vancouver's Downtown Eastside.

Focus on cancer research

Comprising more than 200 diseases, cancer is diagnosed in an estimated 20,000 British Columbians each year. While mortality rates overall are declining, there are still many unanswered questions about cancer prediction, prevention, treatment and outcomes.

BC is a magnet for world-class cancer researchers, thanks in part to the province's unique system for coordinating diagnosis, treatment and outcome tracking through the BC Cancer Agency. MSFHR is also a contributor: Since 2001 the Foundation has offered 190 awards to individuals, teams and organizations involved in cancer research, for a total commitment of more than \$43.4 million dollars.

Curbing oral cancer in the Downtown Eastside

MSFHR Scholar bridges laboratory and clinic to help an at-risk population

Each year in BC, one in every 10,000 individuals is diagnosed with oral cancer. In Vancouver's Downtown Eastside, the incidence jumps to one in 150.

Residents in the area are at increased risk for a number of reasons. Heavy use of tobacco and alcohol is prevalent. A high proportion of residents have compromised immune function, poor nutrition and poor oral hygiene. Typically, they also have limited access to health services, making early detection – key for

increasing oral cancer survival rates – even more challenging.

“At stage one or two, the survival rate for oral cancer can be as high as 80 per cent,” says Dr. Catherine Poh, an MSFHR scholar at the BC Cancer Agency. “But as soon as the cancer has progressed to stage three or four, the rate drops to less than 50 per cent.”

In 2004, Poh was instrumental in establishing a pilot oral cancer screening clinic at the Portland Community Dental Clinic in the Downtown Eastside. Launched as the first of its kind in a Canadian high-risk community, the program has since become a permanent part of the BC Cancer Agency's Oral Cancer Prevention Program.

Twice a month, Poh works with university trainees in the program to hold screening sessions at the clinic. Following

a neck and head exam, she uses a special blue dye and a blue light device to highlight precancerous and cancerous tissue. Back in the lab, Poh works with physicists to analyze collected cells for chromosomal alterations using computer microscopy imaging.

“We're trying to figure out the biology of the disease so we can identify lesions earlier and determine what markers indicate a higher risk for oral cancers and precancers,” she explains. “This information can help us in reducing the mortality and morbidity of the disease.”

Poh notes that raising awareness of oral cancer is still the best method of primary prevention. Information gathered through focus groups about the key barriers to screening has helped Poh and her team develop more effective intervention strategies to increase awareness. The pro-



Dr. Catherine Poh

gram holds educational sessions and multicultural health fairs and collaborates with other service providers, nurses and doctors working in the Downtown Eastside. Recently, the program added mobile screening clinics.

Ultimately, Poh hopes that the development of a successful screening strategy for this community will significantly improve early diagnosis and survival rates, eventually serving as a model for inclusion of such hard-to-reach communities within province-wide screening initiatives. ■

Dr. Catherine Poh,
cpoh@interchange.ubc.ca

- 2007 MSFHR Scholar Award
- Outreach leader, BC Oral Cancer Prevention Program, BC Cancer Agency
- Oral Pathologist and Assistant Professor, Dentistry, UBC

Unlocking a genetic mystery

The EGFR gene is implicated in a majority of lung cancers. Recent tests on a new drug designed to target the product of this gene have produced

astonishing results. While the drug didn't help the majority of patients, there was a dramatic improvement in non-smoking women of Asian descent.

PhD student Trevor Pugh is digging deeper into this puzzle, trying to determine why the drug works for this group and not for other patients. The answers lie somewhere in their tumours' genetic makeup. “We're looking for a common genetic trait that would explain the response,” he explains.

Using next-generation sequencing technologies unavailable even three years ago, Pugh is searching the whole genome to pinpoint specific genetic features shared by cancers that respond to this drug. “We use tumour samples that are vanishingly small – just a speck of tissue is enough for us to examine every gene expressed by these cancers.”

Pugh's research will reveal new information about the complex interactions between

genetics and the development, progression and treatment of lung cancer. Ultimately, his work could lead to new targeted cancer drugs, and better tests for predicting who will benefit from specific therapies.

Pugh received a 2007 MSFHR/BC Cancer Foundation Trainee Award as part of MSFHR's Trainee Partnership Program. Through the program, MSFHR partners with other BC non-profit organizations to jointly fund eligible applicants to its Research Trainee Program. ■

Trevor Pugh,
tpugh@bcgsc.ca

- 2007 MSFHR/BC Cancer Foundation Trainee Award
- PhD Student, BC Cancer Agency, Medicine/Medical Genetics, UBC
- Supervised by MSFHR Senior Scholar Dr. Marco Marra



Dr. Blake Gilks, leader of the MSFHR-funded OvCaRe Research Unit.

Dr. Blake Gilks,
blake.gilks@vch.ca

- 2007 MSFHR Research Unit Award
- Professor, Medicine/Pathology and Laboratory Medicine, UBC

OvCaRe: The evolution of a research unit

Patient with ovarian cancer inspires creation of team

Ask Dr. Blake Gilks about the creation of the Ovarian Cancer Research (OvCaRe) research unit, and he will tell you about Cheryl Brown. A patient with ovarian cancer, she was appalled at the dearth of ovarian cancer research in BC. Her determination and advocacy for change was the impetus for initial discussions between Gilks and colleagues Dr. Dianne Miller and Dr. David Huntsman.

“Her persistence made us think about the possibilities for improving ovarian cancer patient care and outcomes through research,” says Gilks, leader of the MSFHR-funded research unit. “If she hadn’t kept after us, OvCaRe might never have happened.”

What started in 2000 as a small, grassroots unit has since evolved into a multi-disciplinary team of 15 researchers representing multiple research institutions. Yet getting to this point was not without setbacks, including the rejection of

OvCaRe’s first proposal to MSFHR for infrastructure funding.

“Not qualifying for funding the first time around made us really focus on what we had to do,” Gilks says. “We were thankful for the opportunity to submit to an organization that wants to invest in people’s work, and uses external review processes and feedback to help applicants improve ideas and eliminate bad ones.” They paid close attention to reviewer comments in revising their submission for the next competition, and succeeded in netting team infrastructure funding of \$800,000 over four years.

OvCaRe researchers focus on three areas. A key thrust is

using genetic markers to develop better, faster methods of diagnosing tumours to ensure patients receive appropriate, timely treatment. They are also concentrating on translating laboratory breakthroughs into therapies that can help patients, and exploring ways of diagnosing and treating ovarian cancers that do not respond to current therapies.

It’s a bench-to-bedside approach that is supported throughout BC’s unique cancer care system. The BC Cancer Agency manages the treatment of every woman with ovarian cancer in BC, and maintains a cancer registry of patient treatment and outcomes for each case. This data is combined

with the more than 800 ovarian cancer tissue specimens provided by the Gynecology Tumour Group at Vancouver General Hospital. Researchers also rely on data provided by the Cheryl Brown Outcomes Unit, named in memory of the patient who first inspired OvCaRe.

With members spanning laboratory scientists to clinicians, OvCaRe has developed a truly translational research atmosphere. “It’s been really critical to have the clinicians involved,” Gilks says, noting their ability to change treatment, or roll out new management programs based on OvCaRe research. ■

Ovarian cancer by the numbers

Ovarian cancer is the fifth leading cause of death in women. Although most ovarian cancers respond to chemotherapy, they almost inevitably recur. Consequently, the life expectancy for women with ovarian cancer is, on average, less than three years following diagnosis. The disease claims 200 lives each year in BC.



MSFHR funding has enabled the Cancer Control Research Program to add critical research and technical personnel to support the program's team. Pictured (from left to right) are research coordinator Rozmin Janoo-Gilani, programmer Steve Sung and epidemiologist Amy MacArthur.

Well-timed success

Infrastructure support spurs growth and opportunity for Cancer Control Research group

Hard work and perseverance are the cornerstones of success in health research, but as Richard Gallagher explains, good timing can also play a key role.

Gallagher leads the Cancer Control Research (CCR) Program at the BC Cancer Agency. CCR researchers and staff focus on reducing cancer incidence and mortality in BC through a better understanding of a broad range of cancer risk factors and outcomes.

The CCR program has grown significantly since receiving an infrastructure award from the Foundation's inaugural Research Unit competition in 2003. The funding came at a pivotal time for the team, which was then developing

Richard Gallagher,
rgallagher@bccrc.ca

- 2003 MSFHR Research Unit Award
- Senior Scientist and Head, Cancer Control Research Program, BC Cancer Agency
- Clinical Professor, Medicine/Health Care and Epidemiology, UBC

a fledgling Genes, Environment, Occupation and Cancer (GEOC) program to focus on an emerging area of research. "We recognized huge opportunities in connecting population-based studies with fields such as genomics, proteomics and tissue banking," Gallagher remembers. "But we were working on a shoestring, collecting specimens for our studies with no funding support."

MSFHR funding enabled the CCR to hire research and technical personnel to set up new databases, process blood and DNA, analyze data and prepare manuscripts for publication. "From there, we were off and running," says Gallagher. Today, the GEOC program has more than 10 major studies underway on gene-environment interaction and cancer, and has attracted private funding to support its work.

MSFHR's infrastructure support also helped the CCR expand and launch other new initiatives that have grown into successful and well-funded programs in

"There's just so much potential for us to expand our knowledge about cancer risk over a person's lifetime and translate this into programs for the people of BC."

— Richard Gallagher

their own right. A cancer survivorship program, headed by Dr. Mary McBride, investigates the long-term outcomes for people after they have beaten cancer. Initially following a group of childhood cancer survivors, the program recently received national funding to expand the program and start looking at outcomes among young adult cancer survivors.

A new cancer health economics program was launched in 2005, led by the newly-recruited Dr. Stuart Peacock. The program brings an evidence-based approach to help the BC Cancer Agency rationalize how and where it spends its resources to achieve the best patient outcomes. The program now employs eight people, working on projects ranging from a human papillomavirus (HPV) screening trial to developing decision-making frameworks

for guiding priority setting within BC's cancer care system.

"Each of the programs is striking out in new directions, but they are all supported by MSFHR infrastructure in one way or another," says Gallagher.

With other multi-million dollar national research grants currently in the pipeline, Gallagher and CCR team members are preparing for another boost of productivity and innovation. "There's just so much potential for us to expand our knowledge about cancer risk over a person's lifetime and translate this into programs for the people of BC. In addition, our ability to contribute new knowledge about how to sustain and enhance cancer care through economics and survivorship research has added new dimensions to our work. It's very exciting." ■



Dr. Victor Ling, Dr. Aubrey Tingle and Dr. Bernie Bressler.

New horizons

Health research leaders contemplate the future of BC health research



Dr. Victor Ling is the former Vice President Discovery at the BC Cancer Agency. In October 2007, Ling was named the founding Scientific Director of the Canada-wide Terry Fox Research Institute. He remains a Senior Scientist at the BC Cancer Agency and Professor of Pathology and Laboratory Medicine at UBC. He is an authority on multi-drug resistance in cancer.



This June, **Dr. Bernie Bressler** will retire from his positions as Vice President, Research, Vancouver Coastal Health; Executive Director, Vancouver Coastal Health Research Institute; and Assistant Dean of Research at UBC's Faculty of Medicine. His research has focused on mechanisms of force production and the crossbridge model in skeletal muscle.



Dr. Aubrey Tingle is retiring in June 2008 as President and CEO of the Michael Smith Foundation for Health Research. A Professor of Pediatrics and Pathology and Laboratory Medicine at UBC, his research has focused on the role of rubella virus infections in the cause of arthritis, diabetes and other autoimmune diseases.

Q: What have been the most significant changes in health research in the past decade?

Dr. Victor Ling – In the past decade, there's been an enormous change in research technology. For example, the sequencing of the human genome had taught us that for "big science" and big questions, we really need to work together as a team. This is a change in culture because right now we're still struggling with that transition, from doing research as an individual to a team

approach. We are only starting to explore how to manage, stimulate and exploit team creativity. So, that's one area that I think is really exciting.

After decades of service, three of BC's top health research leaders are beginning a new chapter in their lives. Recently, MSFHR brought them together to weigh in on the status of BC's health research community: our progress so far, the opportunities that lie ahead, and the culture change required across the system to make health research more effective.

approach. We are only starting to explore how to manage, stimulate and exploit team creativity. So, that's one area that I think is really exciting.

Dr. Bernie Bressler – The biggest change that's affected all of society has really been the computer. What took three days before is now done in an hour. A researcher can characterize a protein, or the amino acid content of a protein, faster than you ever could before – days versus months. It's a huge impact. So the rapidity with which our knowledge comes out is great, and it makes the questions more intriguing, and of course more challenging. But we still don't have all the answers, because biology does not reveal her secrets very easily.

Dr. Aubrey Tingle – The shift for funding agencies has gone from a traditional granting council to the Gates Foundation model, where you use the financial resources of the foundation or the agency as an agent of change. That's a major shift and quite a different organizational framework. It requires a much more entrepreneurial spirit within the organization than was needed 10 years ago.

“If we do nothing, the health system is not sustainable in the current form. How can research support the activities to be more cost effective and reduce the burden of cost on the health system? That’s what health authorities are really focusing on.”

— Dr. Aubrey Tingle

“What we all refer to as knowledge translation ... is the biggest challenge for the system. And it’s a very big challenge for us as researchers; we have to keep our eye on that ball all the time.”

—Dr. Bernie Bressler

Q: What is the current situation for health research in Canada and in BC—both challenges and opportunities?

Ling—I think one of the biggest challenges in Canada is to have our health care system bring more innovation into the system. Without that cultural change, all the medical research we’re doing will be very difficult to translate. Governments and health authorities need to recognize that innovation is really necessary in order to be able to improve our health system. Without it, the costs to the system will continue to go up—we won’t be able to afford it, and we won’t get the best health care that science can provide us.

Bressler—I agree with Victor completely. What we all refer to as knowledge translation, which is really uptake by the health system, is the biggest challenge for the system. And it’s a very big challenge for us as researchers; we have to keep our eye on that ball all the time.

Tingle—From the viewpoint of a funding agency the question that we ask is what are the impediments to that? What are the strategies to break down the impediments? How do we use the funding resources available to us to catalyze that change?

Ling—I think the funding agency has that leverage, because you have the money to bring people together to cooperate.

Bressler—It also requires a much more entrepreneurial spirit among the investigators, who are the ones who make it happen. BC researchers are leaders in the scientific world because of their talent and their skills—the challenge is to manage and channel that energy.

Tingle—A key challenge within the health system is the human resource side. The pressures on the health system to meet crises and in return to meet the bottom line and to have annual budgets, have really forced a reactive stance in the health system. How do you create a receptivity and the ability both to use and develop best practice, evaluation and research within the health system?

Ling—I think the university could also lead in this area: to go entrepreneurial, recognizing the complexity of the modern world, where being a great team member is as important, or even more important, than being a single individual hero.

Tingle—But it’s a real challenge. Traditionally, the university system is designed as vertical and hierarchical, whereas health is a horizontal enterprise crossing departments and faculties. Couple that with the fact that research teams and research networks are expanding at a tremendous rate. Their strength is that they know no boundaries. So how do you deal with research teams, research networks and research institutes that are crossing all of these organizational lines? The funding situation, the academic recognition, the accountability frameworks need to change. It’s a significant adaptation that has to occur in the system, which I think is just beginning to happen.

Ling—We can lead if we recognize this change. You know, it’s not unusual for the West to lead in innovation. I think we have a huge opportunity to show leadership in this area.

Bressler—One of the things I do at the VGH site is when people come and look around, I take them to the Jack Bell research centre and point out that there are no walls in the laboratory. Stand on one end of the lab and you can look all the way down to the other end of room with no physical barriers, and nobody “owns” it. It is an environment that encourages collaboration and interdisciplinary research.

Tingle—It’s true. If you ask about the departmental and university affiliations of individuals or teams, increasingly what you see is a plethora of multiple faculties, multiple graduate student programs, multiple universities. The researchers are increasingly interacting across institutional and geographic boundaries, and so what is happening at the coal face is much more innovative than the support structure behind it.

Continued on page 12



“BC has the opportunity to work together with the universities in the province to actually try and change the academic culture so that it can more effectively impact the health culture to find solutions to real problems. That would be a huge win for us. Because I think if we were to do this we would lead, not only across the nation, but internationally.” — Dr. Victor Ling



Continued from 11

Bressler—That’s how change takes place. And that’s why we all went into research; it’s so you can effect change.

Tingle—If you go one step further, you need to recognize that health is not solely an issue for BC health authorities—they have the same issues in Toronto and Montreal and Halifax. We need to recognize that health system issues are complex, they require working together between geographic jurisdictions, and that many of these issues have a global significance and need a global approach.

Ling—In addition to that, the provinces have to reduce the barriers because health care is rolled out provincially and so there are provincial differences and red tape that prevent a lot of things from happening. I think there needs to be a will—a political will—that will come together to take advantage of all of that information.

Tingle—If we do nothing, the health system is not sustainable in the current form. How can research support the activities to be more cost effective and reduce the burden of cost on the health system? That’s what health authorities are really focusing on and they have really put the challenge out to the research community, saying, “How are you going to help us do that?”

Ling—But I think they need to take the next step and say, “This is a huge issue not just for BC, but for every province. So let’s put \$100 million out there and see if we come up with a solution.” I think it’s good to recognize the challenge and identify the problem. But that’s only the first step. The second step is to actually get people to work in this area.

Tingle—That’s where you need alignment between provincial systems and a federal system because that type of a call has to have federal and provincial direction. I absolutely support the direction that you’re saying, but it has to have a champion in order to bring those parties together.

Q: What role can BC play nationally for advancing health research?

Bressler—The potential for BC is great, and we not only have potential, we also have a lot of kinetic energy! We have a very vibrant health research community in BC, and it’s growing and we’re attracting very, very good people here all the time. But we do need a provincial strategic plan. We need a plan that sends a clear signal to researchers within BC that the various partners such as universities, health authorities, private sector and government are supportive and that signals to the world that we are both open for business and focused on competing in the global community.

Tingle—I think there’s an opportunity for BC to take a leadership role because it can be more nimble and quick. It hasn’t got as long a history or as many entrenched barriers, so I think it’s at an earlier stage in its development as a research jurisdiction. I can see a real opportunity for BC to reposition itself in a leadership capacity to drive some of the changes that we’re talking about.

Ling—I agree. We recognize that the world is more complex, we need more expertise to come together, more disciplines to come together to solve some of these problems and issues. I think BC has the opportunity to work together with the universities in the province to actually try and change the academic culture so that it can more effectively impact the health culture to find solutions to real problems. That would be a huge win for us. Because I think if we were to do this we would lead, not only across the nation, but internationally. ■



More than meets the eye

SFU researcher explores the molecules underpinning our daily cellular rhythms

Our great-grandparents may have been early to bed and early to rise, but today's global citizen lives in a non-stop world where day and night have little meaning. We work graveyard shifts, travel across time zones and keep our city lights blazing all night long.

Yet while the world's pace has changed, our body clocks have not. Human cells follow a near-24 hour cycle, synchronized to day and night. This fundamental trait called circadian rhythm—shared across bacteria, plants and other

animals—is involved in regulating our sleep-wake cycles, hormone levels, liver function, cell generation, heartbeat, blood pressure and body temperature.

“Basically, everyone follows a similar pattern, and that's no accident,” says MSFHR Scholar Dr. Melanie O'Neill. “We see it at the physiological level in our behaviour, at the cellular level in the daily oscillation of gene expression, right down to the molecular interactions across our proteins and DNA.”

Disruption of this finely-tuned system has a direct effect on our ability to function normally. Jetlag may be the most common example of an out-of-sync body clock, but chronic disruption of circadian rhythm has also been linked to serious illnesses such as sleep disorders, depression and cancer.

The key to circadian rhythm is light, which enters the eye and activates photoreceptors in the retina. Quite separate from our

Dr. Melanie O'Neill's research focuses on one molecular player in phototransduction: cryptochrome, a light-sensitive protein first discovered in plants.

visual system, the circadian system delivers light information into the brain through a complex chain of molecular events called phototransduction. And while researchers know a great deal about how we see, how light activates circadian rhythm largely remains a mystery.

“We know so much about vision, but circadian phototransduction is arguably more critical to human health than the ability to see,” declares O'Neill, an assistant professor at Simon Fraser University's Department of Chemistry.

O'Neill's research focuses on one molecular player in phototransduction: cryptochrome, a light-sensitive protein first discovered in plants. Cryptochromes have since been identified across many organisms and may be the light sensor in human and

other mammalian circadian rhythm. Cryptochromes undergo structural changes in response to light, initiated in one trillionth of a second. Work in O'Neill's laboratory aims to map these key, ultrafast molecular events that transform light signals into changes in gene expression.

“It's fascinating for me to see how life works, and how it stems from action at the molecular level,” says O'Neill, acknowledging the complementary efforts of biologists, geneticists and clinicians in understanding the complexities of circadian rhythm. Ultimately, she hopes her research will contribute to a body of work that rivals our knowledge about vision. ■

For a detailed description of Melanie O'Neill's research in circadian rhythm, visit www.msfhr.org/interactions/03

Dr. Melanie O'Neill,
maoneill@sfu.ca

- 2005 MSFHR Scholar Award
- Assistant Professor, Science/Chemistry, SFU
- Recruited to SFU in 2004 from the California State Institute of Technology



Dr. Greg Koski, former director of the United States Office for Human Research Protections, delivered a thought-provoking keynote address at MSFHR's invitational workshop on ethics review of research involving human subjects.

A collaborative approach

Stakeholders support joint efforts for ethics harmonization

"We don't want a centralized provincial Research Ethics Board ... but we're ready for collaboration and harmonization." That was the message from BC health research stakeholders regarding research ethics review across the province at an invitational workshop in November 2007.

The workshop was a key component of the BC Ethics Harmonization Initiative (BCEHI). Facilitated by MSFHR with guidance from a provincial Ethics Harmonization Task Force, the initiative encouraged discussion around whether a more coordinated approach to ethics approval processes could improve quality, access and capacity for ethics review in BC. (For background, see the Fall/Winter 2007 issue of *Interactions*.)

While stakeholders were generally not keen on a centralized approach, two key themes emerged. They supported the development of common processes and forms, shared information technology and reciprocal agreements to handle the review of multi-centre research. They also recognized that mutual trust and institutional leadership were essential to move forward.

A draft report of the workshop was reviewed by the Ethics Harmonization Task Force in January 2008. Despite the complexity and diversity of the research ethics review environment, Task Force members noted a sincere interest among key leaders and participants to work together to address shared concerns about ethics review. They recommended that the initiative continue and focus efforts in four areas:

- creating common forms (e.g. application forms, informed consent);
- developing a shared/common IT platform and tools accessible to researchers and institutions where human subject research is undertaken in BC;
- exploring how ethics review for multi-centre trials can be more efficient, consistent and timely, possibly with some degree of inter-institutional reciprocity; and
- developing common educational and training resources to be shared by Research Ethics Boards.

The Task Force requested that MSFHR continue to support and facilitate the next stage. The Task Force also suggested that

the work be phased, allowing for consultation with stakeholders and celebration of milestones and achievements along the way. The members anticipate that trust in and leadership for future phases of the BCEHI will evolve as stakeholders gain experience working closely together.

MSFHR has reviewed these recommendations with senior leaders across BC's research community. They enthusiastically confirmed their willingness to provide leadership and have endorsed their institutions' participation in future phases. Much work remains, but the BCEHI is off to an encouraging start. ■

For more details, visit www.msfhr.org/sub-strategic-ethics.htm



Animal planet

Unique research team explores issues from barnyard to bedside—and points in between—to shine new light on the connections between human and animal health

The ancient Greek physician Hippocrates wrote that to understand a patient's health, you must pay close attention to how the person lives—taking into account the season, the quality of his drinking water, and his proximity to a swamp.

It's a viewpoint that Dr. Craig Stephen believes still holds relevance today, especially concerning our relationship with animals. "Diseases like

Dr. Craig Stephen,
cch@mala.bc.ca

- 2003 MSFHR Research Unit Award
- Director, Centre for Coastal Health
- Clinical Associate Professor (Public Health), Medicine/Health Care and Epidemiology, UBC
- Associate member, UBC Centre for Disease Control
- Adjunct Professor, Western College of Veterinary Medicine (Large Animal Clinical Sciences), University of Saskatchewan, and Science/Biological Science, SFU

SARS, mad cow disease and avian influenza remind us that human well-being is embedded in the world around us. There's really no distinction between a healthy environment, the healthy use of animals and healthy communities."

Stephen is leader of the Animal Determinants of Emerging Disease (ADED) research unit, which received infrastructure funding from MSFHR in 2003. Part of the Nanaimo-based Centre for Coastal Health, the team's focus is broad, encompassing a host of issues related to zoonosis—the transmission of disease between animals and humans—and linking knowledge in human health, climate, habitat and biodiversity.

Stephen explains: "If you want to manage avian influenza, you can't just think about how to treat people in the hospital bed—you also have to think about how you look after chickens." Reflecting this broad

approach, members of the team hail from across Western Canada and include veterinarians and physicians, epidemiologists, microbiologists, public health specialists and geographers.

While many of its members work within universities, the centre itself is a non-profit organization that operates outside the traditional academic environment. "The unit acts as a lightning rod to gather diverse expertise for rapid response as new and potential health issues arise," says Stephen.

The research ranges from developing methods to monitor anthrax in bison roaming the Northwest Territories, to studying dogs and cats as carriers of the tropical fungus *Cryptococcus gattii* (a non-native fungus that recently appeared in BC, possibly due to global warming).

The research unit coordinates monthly teleconference rounds for researchers to share their

work. "On any given day, you'll hear about network theory, or molecular structure, or ecological history—it's become a really good resource," Stephen enthuses. "People are calling in from across North America to learn about what we're doing."

Their work is also becoming embedded in the world of public health practice. Students taking public health inspector training in Ontario pore over ADED publications to learn about zoonotic issues in public health, and the Public Health Agency of Canada has reviewed information from an ADED report to help inform its human resources planning.

Stephen is justifiably proud of the impact his team is having on detecting, monitoring and influencing policy and practice around emerging disease. "More than the number of publications or the amount of funding we receive, seeing how our findings are used proves the success of our model and our research." ■

Promise and potential

MSFHR recently announced the newest recipients of its Research Trainee Awards—a record-breaking 192 BC-based graduate students and post doctoral fellows whose progression as new researchers will be supported by the Foundation. Ten of the awards are part of MSFHR's Trainee Partnership Program, which enables other not-for-profit organizations to jointly fund awards with MSFHR. MSFHR's commitment to support this round of awards is \$8.5 million over the award terms.

More trainee profiles have been posted on the MSFHR website at www.msfhr.org/interactions/03.



Suze Berkhout

Medicine/Medicine
(Experimental Medicine), UBC, BC
Centre for Excellence in HIV/AIDS
Supervisors:

Dr. Mark Tyndall, UBC, BC Centre
for Excellence in HIV/AIDS
Dr. Scott Anderson, UBC

How to make care more appropriate for vulnerable women

Suze Berkhout looks past the stereotypes about women who engage in sex work as a means to survive. She knows them as individuals, observing and documenting what they're thinking about, worried about, and what's important to them.

Berkhout is working to unravel a paradox surrounding the health and well-being of vulnerable women. Research has shown that the majority of women in survival sex work do access various health and social services, such as clinics and needle exchange services. The use of condoms is also prevalent. Yet the rates of HIV

infection remain consistently high among sex workers, who are also less likely to be treated for HIV/AIDS and who face multiple barriers to continuity of care.

"This issue is not simply about access to care, but understanding what health trade-offs women may make in the context of their lives," Berkhout maintains. "Day-to-day issues such as housing, food or caring for others may take precedence over health concerns. We need to understand these dynamics so we can make care more appropriate for socially and economically disadvantaged women."



Josephine Hua

Social Sciences/Psychology, UVic
Supervisor:
Dr. Catherine Costigan, UVic

How translating for parents affects children's psychological health

Language barriers are a fact of life for many immigrant families living in BC. Often, children are relied upon to provide interpretation and translation for their non English-speaking parents.

Growing up in Richmond, Josephine Hua remembers friends who acted as language brokers for their parents in an English-speaking world. Now, Hua is digging deeper into the psychological implications for children who help family members navigate Canadian society.

Current research is divided on whether this role harms or supports the psychological health of children – reports cite outcomes that range from psychological distress and depression to pride and increased confidence. "I think children's

psychological health actually depends on underlying conditions and relationships within the family," Hua asserts. For example, a child who values fulfilling family obligations is more likely to benefit from this role.

Tapping into data gathered through a larger Intercultural Family Study at the University of Victoria, Hua is studying 180 immigrant Chinese families living in Victoria or Vancouver and examining the psychological implications of language brokering for both children and parents. "I'm interested in both the challenges and strengths found within immigrant families, and through my research, I hope to inform strategies to support healthy integration."

Ultra-tiny technologies for blood stem cell research

Véronique Lecault can see a world of possibilities in a single microscope slide. The biochemistry and chemical engineering graduate is testing a new technology to support bigger, faster and more efficient studies on hematopoietic stem cells ... by going miniature.

A small subset of cells found in bone marrow, hematopoietic stem cells have the astounding ability to self-renew and divide, and to differentiate into a variety of mature blood cells. They are often used to treat blood-related diseases or given after cancer treatment. However, researchers have yet to determine the optimal conditions for growing these rare and difficult-to-control cells in the lab.

Lecault is testing microfluidic technology, an engineering advance that allows thousands of different experiments to be performed in tandem upon a device the size of a microscope slide. Across rows and rows of miniature cell culture chambers, individual hematopoietic stem cells can each be exposed to different chemical conditions and tracked over time.

Lecault is excited to be part of a project that brings together engineers, physicists and biologists. "Being at the interface between engineering and biology is very appealing to me," she says.



Véronique Lecault

Applied Science/Chemical and Biological Engineering, UBC
Supervisors:
Dr. James Piret, UBC
Dr. Carl Hansen, UBC

The genetics behind healthy hearts among "super seniors"

Do people whose hearts remain healthy well into their 80s and 90s have especially good genes? Dr. Maziar Rahmani is studying more than a thousand residents in the Metro Vancouver area to find the answer.

"Advancing age is the biggest risk factor for cardiovascular disease," he says. However, a minority of people older than 85 – known as "super seniors" – seem resistant to the most common age-related diseases, including cardiovascular disease. "I want to identify and verify genetic variations that keep these people healthy into old age."

Rahmani will use cutting-edge technologies to scan the entire genome of each study participant. He will look across more than a million potential variances to

find genetic commonalities among super seniors in Vancouver, and compare these findings to other studies using European and other North American populations. Identifying and understanding genetic factors influencing resistance or susceptibility to heart problems could open the way for personalized, optimized disease prevention and treatment strategies.

Trained as a general practitioner in his native Iran, Rahmani says that his research education has made him view medicine differently. "As a physician, I followed existing knowledge," he says. "I'm now more curious and more discovery-oriented, and I care much more about disease prevention."



Dr. Maziar Rahmani

Medicine/Medical Genetics, UBC,
BC Cancer Agency
Supervisor:
Dr. Angela Brooks-Wilson, UBC,
BC Cancer Agency

The role of yoga therapy for supporting breast cancer survivors

Dr. Suzanne Slocum recalls her surprise and delight in learning that she had qualified for an MSFHR Post Doctoral Fellowship. "Knowing that complementary medicine research is typically hard to fund, I didn't really have my hopes up," she says.

A practicing yoga therapist with graduate degrees in measurement and psychometrics, Slocum is singularly qualified to bridge the worlds of complementary and alternative medicine with mainstream medicine. As a research scientist at the University of California Los Angeles Institute for Neuroscience and Human Behavior, Slocum introduced and evaluated yoga therapy for HIV/AIDS.

Slocum is now focusing on the feasibility of using yoga therapy as part of the BC Cancer Agency's (BCCA) health services for breast cancer survivors. Yoga is regarded as an effective therapy in helping cancer survivors manage the difficult physiological, emotional and psychological symptoms that often persist after cancer diagnosis and treatment – however, controlled trials are lacking.

Slocum will examine both the acceptability and sustainability of such a program within BCCA's mainstream health system as well as conduct a controlled pilot study to measure effectiveness of yoga over time. "I'm really excited about helping to define what constitutes valid and reliable research evidence in the integrative health field."



Dr. Suzanne Slocum

Medicine/Health Care and Epidemiology, UBC,
BC Cancer Agency
Supervisors:
Dr. Arminée Kazanjian, UBC
Richard Doll, SFU

Research Institutes

- BC Cancer Agency
- Child & Family Research Institute
- Providence Health Care Research Institute
- Vancouver Coastal Health Research Institute

Universities

- Simon Fraser University
- University of British Columbia
- University of Victoria
- University of Northern British Columbia

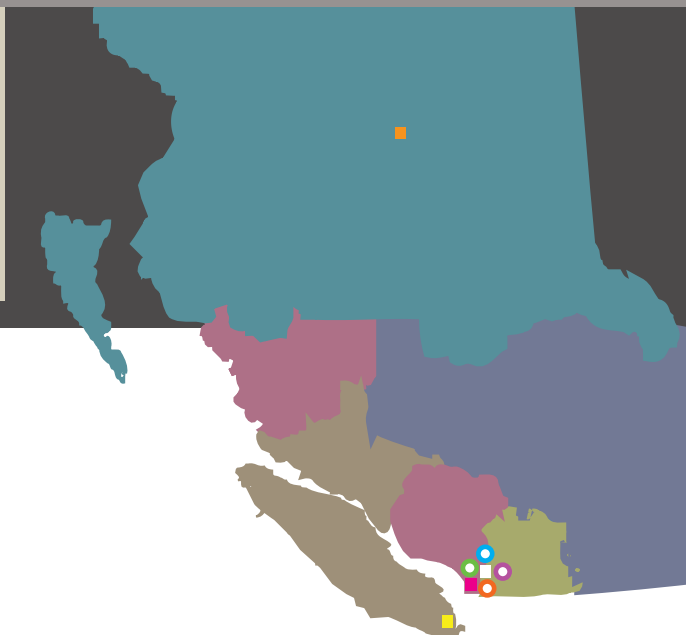
Health Authorities

Regional:

- Fraser Health
- Interior Health
- Northern Health
- Vancouver Coastal Health
- Vancouver Island Health Authority

Province-wide:

- Provincial Health Services Authority



New and improved

MSFHR's retooled Institutional Infrastructure Program will encourage more collaboration

MSFHR continues to promote a new way of doing business in BC health research, most recently by reshaping how it provides infrastructure funding to BC health research organizations.

Guided by recommendations from an external review panel (see Review of Infrastructure Programs, right) and echoing the Foundation Board's vision for advancing collaboration, MSFHR will unveil its new Institutional Infrastructure Award program later this year.

Two changes stand out as particularly significant. MSFHR is developing a single funding program to integrate and support both academic and health-delivery based research organizations. The Foundation is also introducing incentive funding to support strategic partnerships between institutions.

MSFHR's Institutional Infrastructure Program – originally supporting BC's eight major universities and health research institutions – will now add BC's six health authorities.

Previously, each health authority had received a one-time capacity-building grant through MSFHR's Health Services and Policy Research Support Network, which operates with restricted funding from the BC Ministry of Health.

The way in which MSFHR funds institutions will also change. "The review panel recommended that MSFHR should balance sustaining funding with enabling funding," explains Tim Murphy, Senior Vice-President, MSFHR Corporate Services and Programs. "The panel also suggested incentive funding to encourage applications for shared infrastructure support across institutions."

Based on these recommendations, two types of funding will now be available. Each of the universities, research institutes and health authorities will be invited to submit proposals for a reduced base grant to individually strengthen research infrastructure. They will also be eligible to apply for additional funding to support collaborative initiatives involving more than one organization.

Review of Infrastructure Programs

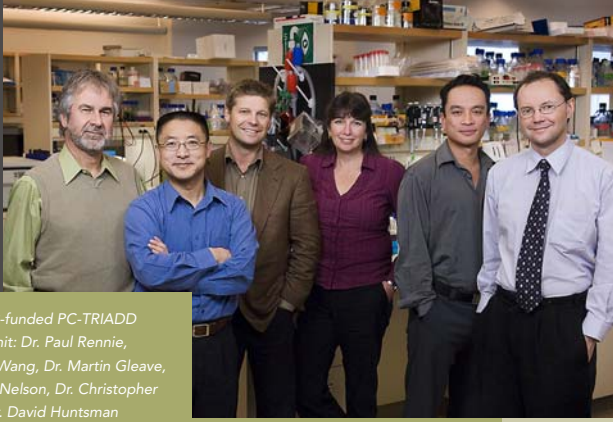
MSFHR's infrastructure programs provide funding for the key personnel and program resources that research teams, networks, platforms and institutions require to grow their health research activities and potential.

In 2006, MSFHR launched an external review of its core infrastructure funding programs and the infrastructure awards within its Health Services and Policy Research Support Network. The goal was to review and evaluate current infrastructure offerings, identify gaps and opportunities, and explore the risks and benefits of greater program integration.

MSFHR convened an expert external panel to review information about the Foundation's infrastructure programs, comprising data analysis, environmental scans and extensive stakeholder consultations.

The panel submitted 14 recommendations to MSFHR's Board of Directors. Several of these recommendations are embedded in infrastructure program changes that will be rolled out this year.

"These changes reflect the panel's recommendations, and they reflect the overall direction of the Foundation," notes Murphy. "We look forward to seeing these groups work together to build shared resources." ■



The MSFHR-funded PC-TRIADD Research Unit: Dr. Paul Rennie, Dr. Yuzhuo Wang, Dr. Martin Gleave, Dr. Colleen Nelson, Dr. Christopher Ong and Dr. David Huntsman

Positioning BC for national success

MSFHR congratulates the British Columbia health research community on competing successfully for three national Centres of Excellence for Commercialization and Research (CECR).

Through this Government of Canada program—part of its Science and Technology Strategy—11 Canadian centres were recently awarded \$14.95 million over five years. The CECR goal is to encourage more private sector investment in research and development.

MSFHR is proud to have helped develop three cutting-edge BC health research programs that succeeded in the competition:

The Prostate Centre's Translational Research Initiative for Accelerated Discovery and Development (PC-TRIADD)

This centre of excellence in prostate cancer research received a 2004 MSFHR Research Unit Award totaling \$1 million over four years.

The Centre for Drug Research and Development (CDRD)

This centre of excellence for the rapid commercialization of new therapeutics received a 2007 MSFHR Technology/Methodology Platform Award totaling \$1 million over two years.

The CECR in the Prevention of Epidemic Organ Failure (PROOF)

This centre is supported in part by the BC BioLibrary, a unique provincial resource for the effective and ethical collection, storage and use of biomedical specimens in health research. BC BioLibrary was created with a 2007 MSFHR Technology/Methodology Platform Award totaling \$1 million over two years.

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Michael Smith Foundation for Health Research

Suite 200
1285 West Broadway
Vancouver, BC V6H 3X8
Phone: 604-730-8322
Fax: 604-730-0524
info@msfhr.org

www.msfhr.org

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Michael Smith Foundation for Health Research



MSFHR Senior Scholar and Research Unit leader Dr. Bruce Verchere recently moved his diabetes laboratory into brand-new research facilities at the Child & Family Research Institute.

Climate change

Diabetes researcher finds BC's health research environment warm and inviting

By Dr. Bruce Verchere

As I drove down the I-5 in the summer of 1991 to start a post doctoral fellowship in Seattle, I entertained thoughts of returning to Vancouver in a couple of years and starting my own laboratory. I had a number of personal reasons for wanting to return. Besides the obvious—skiing, water, mild weather—my wife and I had family here. But in truth, I didn't think returning to a faculty position was likely, given the funding situation and job climate.

My time in Seattle reinforced these fears. While there was little support for health research in BC, things were getting much better in the US. So in 1997, when I accepted a position at the research institute at BC Children's Hospital (now the Child & Family Research Institute), some colleagues felt it was not a wise move.

In 2000, *BC Business* magazine wrote about BC's research brain drain. A photo of me looking morose ran with a caption that said "Goodbye, Bruce Verchere," suggesting that I was likely to take an offer from Alberta or Ontario where research pastures were considerably greener. It was tempting, but my family situation made leaving difficult. I was happy just to have a job, and fortunate to receive a \$65,000 national grant to get my lab started.

How quickly things changed. Within just a few years, the Canadian Institutes of Health Research and the Canada Foundation for Innovation were created. In BC, the new Michael Smith Foundation for Health Research was transforming health research across the province, and I benefited from being in the right place at the right time.

Since then, my laboratory has grown through MSFHR-funded trainees. MSFHR Research Unit funding has enhanced my collaborations with colleagues and allowed us to pursue new research directions that were not possible before. And salary support from an MSFHR Senior Scholar award has helped provide security and freedom so I can focus on research.

Now, when I tell my colleagues in the US and elsewhere in Canada about the health research environment in BC, they are envious. Some have even inquired about moving here.

When I returned to BC to pursue a career in diabetes research, Vancouver's inviting outdoor climate was a major factor. Thanks to MSFHR, BC's health research climate now ensures I wouldn't want to be anywhere else. Goodbye? No longer an option! ■

Dr. C. Bruce Verchere
verchere@interchange.ubc.ca

- 2006 MSFHR Scholar Award
- 2004 MSFHR Research Unit Award
- Associate Professor, Medicine/ Pathology and Laboratory Medicine, UBC
- Head, Diabetes Research Program, Child & Family Research Institute

We welcome submissions from MSFHR award recipients for our First Person feature. Email: info@msfhr.org