Health Research

SHRF
SASKATCHEWAN
HEALTH RESEARCH
FOUNDATION

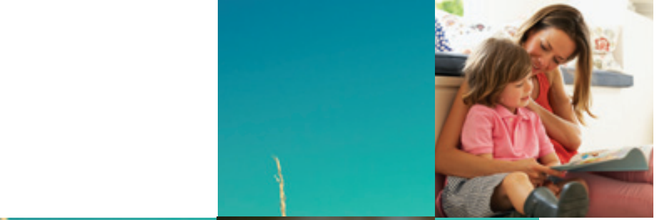
TEN YEARS OF INNOVATION AND EXCELLENCE: 2003 - 13

An investment in health research and innovation is an investment in people.

Their stories detail Saskatchewan's success and strength.

Saskatchewan is a leader in infectious disease research, agricultural biotechnology, community-based and population health research, and human growth and development research. For decades, we have been a leader in health care and continue to grow our health services research sector. Health research is a vital link to the heart of the health care system, translating knowledge from the bench to the bedside.

The 10 years of health research funding stories outlined in this book are just the beginning. . .



Over the past 10 years, the Saskatchewan Health Research Foundation (SHRF) has helped to build a foundation of health research success in Saskatchewan. On the following pages, are examples of notable success stories from the past decade.

These health researchers are builders. Their stories resonate with triumph and opportunity. Their contributions to the knowledge and understanding of health issues have strengthened Saskatchewan's health research enterprise.

It started 10 years ago, with SHRF being established in 2003 on the heels of a recommendation to the provincial government to strengthen health science education and health care by boosting its investment in health research. In his report "Caring for Medicare," Commissioner Ken Fyke recognized the strong link between a vital research sector and quality health care. He proposed an investment equivalent to one per cent of the health budget – about $25 million, or five times the investment at the time. As a result, the *Action Plan for Saskatchewan Health Care* promised an immediate increment, with other increases to come.

These changes brought a much broader responsibility to SHRF than its two predecessor organizations had carried. The expanded mandate remains today: to organize, manage and allocate most of the province's health research funding. *The SHRF Act* (2002) directs SHRF to share research knowledge with health professionals and the public, assist the Minister of Health in developing a provincial health research strategy, fund research accordingly, and seek new sources of revenue to advance research because of its importance to health and health care in the province.

Every day, SHRF funds the work of researchers, supports the efforts that grow the province's research enterprise, and promotes the knowledge that results from health research. SHRF is still strengthening the foundations of health research in Saskatchewan.

SHRF has a lot to celebrate from our first 10 years: the richness and diversity of individual researchers and research groups; the achievements of health researchers recognized through our annual Achievement Awards, the leadership and guidance of expert peer reviewers; the strength of our governance; and the lasting contributions of our employees. We celebrate all of these individuals in this book.

The work is not finished. SHRF remains a catalyst, supporting the work of individual researchers and research groups, as well as furthering initiatives to enhance and increase the capacity of our province's health research enterprise.

We are building a healthy Saskatchewan through health research.

Dr. Debra Morgan

Reaching Out to Saskatchewan's Seniors

In Saskatchewan, there is a high proportion of seniors living in smaller centres, such as towns, villages and recreational villages, compared to cities. Living in remote areas, those seniors have limited access to specialty services for dementia-related care. Dr. Debra Morgan has dedicated her career in research to addressing the needs of Saskatchewan's aging population.

Dr. Morgan, a researcher with the Canadian Centre for Health and Safety in Agriculture at the University of Saskatchewan, led a multidisciplinary research team in the design and evaluation of a special Rural and Remote Memory Clinic that uses videoconferencing and other innovations to improve access to diagnostic and treatment services for seniors living in rural areas. Since the clinic was launched in 2004, more than 300 people have been helped.

The clinic itself, housed adjacent to the Royal University Hospital at the University of Saskatchewan, can usually provide a diagnosis in a single day. Patients who are displaying dementia symptoms are referred by their family physicians or nurse practitioners. They spend a day at the clinic to be assessed by a team that includes a neurologist, neuropsychologist, nurse and physical therapist.

The family-centred approach also allows the clinical team to assess the psychological health and caregiver burden experienced by those supporting the patient. At the end of the full-day assessment, patients and family members meet with the neurologist

and neuropsychologist to discuss the probable diagnosis and consider recommendations for management and care.

The team follows up with the patients and families using telehealth, or two-way video conferencing, usually between the clinic and the local hospital or health centre, which eliminates the costly and lengthy trips back to the city. "On average, we're saving patients and their families over 400 kilometres per round trip by going to their telehealth in their home community versus coming all the way to Saskatoon for a follow-up appointment," says Dr. Morgan.

According to Dr. Morgan, health care providers have to be ready for the rising tide of new patients. To that end, the Alzheimer Society of Saskatchewan has started a telehealth support program for spouses to ease the load on the clinical team, adopting a model that was implemented and evaluated by the Rural and Remote Memory Clinic team. Also, Dr. Morgan has established the Rural Dementia Action Research (RaDAR) team to develop and implement a process to improve the health and quality of life of people with dementia and their families in rural and remote settings, through fostering brain health and the creation of dementia-friendly communities.

> "We've made a lot of progress over the last decade. The whole experience has been very transformative."
>
> – Dr. Morgan

Dr. Morgan sees her work as far from finished. Having been awarded an Applied Chair in Health Services and Policy Research, she is continuing to lead her team in developing even more strategies for increasing access to primary health care and specialized dementia care for Saskatchewan's seniors.

Dr. Debra Morgan (standing) and the Rural and Remote Memory Clinic team (2004).

Dr. Helen Nichol

Linking Molecular Biology to Synchrotron Science

Dr. Nichol leads the University of Saskatchewan's Gene Expression Mapping using Synchrotron Light (GEMS) research group. Over the past several years, this research group – which includes synchrotron experts Dean Chapman, Graham George and Ingrid Pickering, cancer researcher Svein Carlsen, clinicians Michael Kelly and Raphael Guzman, neuroscientists Bogdan Popescu and Valerie Verge, molecular biologists Bill Roesler and Helen Nichol, and research associate Ken Gagnon – conceived GEMS technology and are now working to build and test its potential.

GEMS uses the Canadian Light Source synchrotron to image tissues in two distinct ways. First is an approach that is unique to Saskatchewan: the GEMS technique of linking molecular biology to synchrotron medical imaging. The researchers insert DNA into cancer cells to make them take up iodine and since iodine is opaque to x-rays, the cells enriched in iodine become visible. This enables them to follow the migration of metastatic cancer cells that grow on the lung and potentially image the effect of chemotherapeutic drugs in living animals over the lifespan of the animal. Saskatchewan has metastatic cancer rates above the national average and developing more effective treatments for cancer is a priority for this group.

"The techniques we've developed at the synchrotron are particularly good at imaging the lung and high resolution imaging lets us count and measure

"The synchrotron used to be the purview of physicists and chemists, but health researchers are really taking over."

– Dr. Nichol

tiny tumors in an animal as small as a mouse," says Dr. Nichol. She believes that GEMS imaging will be applied to many diseases and will garner interest from pharmaceutical companies to make drug testing and development better and more cost effective by imaging the same animal over and over again.

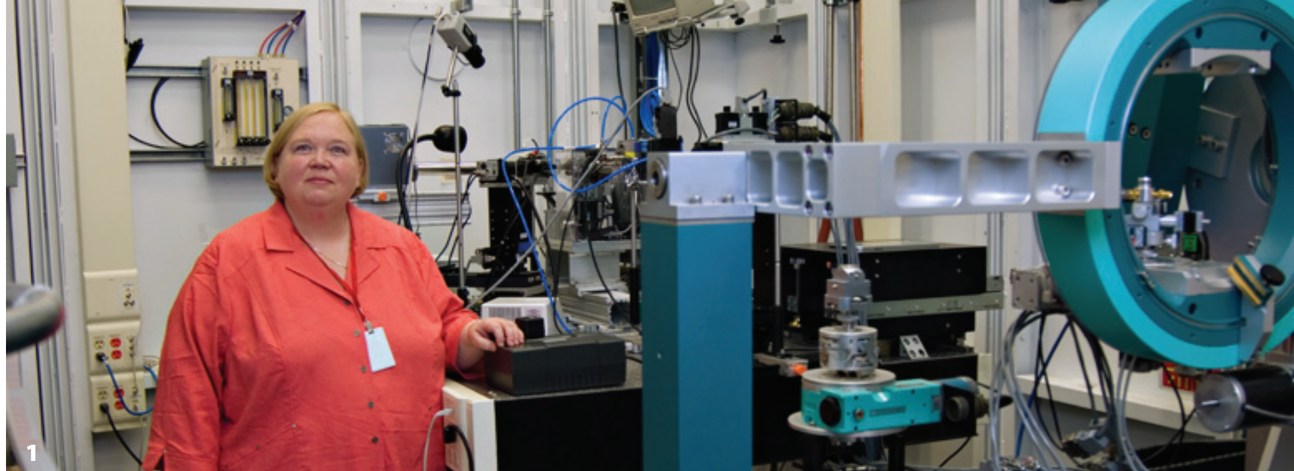
The second method of using the synchrotron to image tissues allows researchers to see what something looks like at the atomic level. Understanding how disease causes changes in the location and amount of elements helps researchers understand the underlying mechanisms and identify possible targets for treatment.

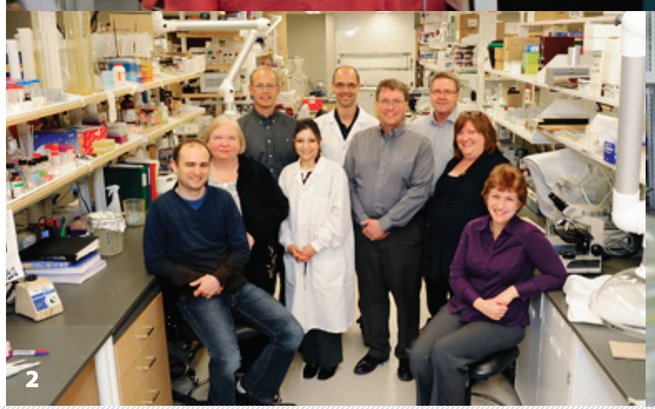
"The real advantage of the synchrotron is that it gives you a quantitative map showing where different elements are in whole tissues, without damaging the tissue. No other technique can do this," says Dr. Nichol. "Sometimes you'll see something really unexpected."

In the second arm of their research, members of the GEMS research group at the Cameco MS Neuroscience Research Center are using synchrotron elemental mapping to examine the effect that Multiple Sclerosis (MS) has on brain metals and linking these changes to the essential pathology of MS. In MS, the metals like iron and zinc that are normally found in the brain accumulate or become abnormally distributed. Abnormal accumulation of metals is also seen in Alzheimer's Disease and Parkinson's Disease, so this research has broad application.

The two techniques – iodine imaging of living animals and elemental mapping – are being linked together to investigate metal-based chemotherapeutics. While platinum (cis-platin) has been used for many years to treat cancer, there are other metal-based drugs that the GEMS research group is investigating at the anatomic and the atomic levels as potential new anti-cancer agents.

1. and 3. Dr. Helen Nichol at her synchrotron lab. // 2. The Gene Expression Mapping using Synchrotron Light (GEMS) research group (2010).





Dr. Jo-Ann Episkenew

Health Research with Help from the Community

Dr. Jo-Ann Episkenew is the Director of the Indigenous Peoples' Health Research Centre (IPHRC), a partnership between the University of Regina, First Nations University of Canada and the University of Saskatchewan. IPHRC focuses on building capacity in health research among Aboriginal people, communities and institutions through trainee support, and promoting research into areas of Aboriginal health.

"This is a key time for indigenous health research, especially in Saskatchewan with the booming indigenous population," says Dr. Episkenew. "There is a critical need to study indigenous health in innovative and culturally appropriate ways that can be translated into positive, real community impacts."

Dr. Episkenew's own research interests have contributed to the community focus of the IPHRC. She has a keen interest in arts-based approaches – drama, poetry, visual arts, dance and song – to knowledge translation. Arts-based methods of inquiry offer alternative ways of asking and answering questions, as well as disseminating research findings, opening up possibilities for deeper dialogue.

"Somehow in my brain, there was a connection between looking at health really holistically – mental, physical, emotional, spiritual – and the stories people tell," says Dr. Episkenew. "To understand the health of people, you have to understand their stories and those of their communities."

Since its creation in 2002, IPHRC has concentrated on community-based, transformative participatory research. All the research funded by IPHRC must have an authentic partnership with at least one Aboriginal community.

Dr. Episkenew provides an example: "In a current respiratory health project, we're working with two First Nations communities. They're part of every meeting. The respirologists may have expertise in that area of medicine, but they don't know the community."

At first, the centre faced the challenge of finding people who knew how to effectively forge a partnership with an Aboriginal community. There were also very few researchers with specialization in Aboriginal health in the province. As time progresses, those obstacles are being overcome.

A follow-up study of 14 graduate students funded from 2007 to 2010 found that they are now engaged in research on tuberculosis, health and wellness, Métis health, oral history,

> "There's no reason not to have community partners and a community voice in the research that we're doing, even in things that are clinical."
>
> – Dr. Episkenew

Aboriginal women's health and various other topics in physical and community health. Twelve of the students held academic-related employment in indigenous health studies.

To date, the centre has contributed over $3 million to indigenous health research across the province through funding and grants opportunities for students, communities and researchers. It has funded over 100 undergraduate and graduate students, 98 per cent of whom have been Aboriginal. The IPHRC is now considered the leader in indigenous health research in Saskatchewan.

"At a strategic planning level," says Dr. Episkenew, "our vision is to have healthy communities and we think research is the means to that end. We'd like to be the authority that the government consults when it comes to Aboriginal health and we'd like to be able to connect them to the appropriate people for policy planning."

Photo: Rick Collins - University of the Fraser Valley

Dr. Jo-Ann Episkenew gave the opening keynote address at the University of the Fraser Valley's Indigenizing the Academy conference

Dr. Adam Baxter-Jones

Making the Case for Physical Activity

In two of the longest-running studies in the world on the subject of exercise and diet in childhood development, researchers have shown how inactivity can adversely and irreparably alter a child's body for life. The leader of that group of researchers, Dr. Adam Baxter-Jones, says the reality is that more than half of Canadian children aged five to 17 aren't active enough for optimal health and development.

Dr. Baxter-Jones moved to Canada and the University of Saskatchewan in 2000 to lead the two long-running longitudinal studies. The first dates back to the 1960s and the second has followed approximately 200 children since 1991. It's one of the most comprehensive long-term databases in the world on bone development in the mid-childhood to early-adult years.

"With my move to the University of Saskatchewan," says Dr. Baxter-Jones, "I joined a team investigating the effects that exercise and diet have on a child's bone development. We further developed these studies to address the issues of how exercise and diet affect a child's soft tissue development. We are currently reassessing these children as they pass through early adult life."

The two studies are considered among the best datasets in the world. Current studies only compare the physical development of an active child with an inactive one of the same age. The children are typically followed for only a year or two, mainly because long-term studies are expensive and time-consuming.

Given how deeply the Saskatchewan studies reach into the past, the subjects of the first growth study are now in their 50s, and those from the bone study in their 30s. Dr. Baxter-Jones has found that subjects from as far away as Ottawa and New Zealand are still willing to participate. He hopes to keep bringing subjects back every five to 10 years.

According to Dr. Baxter-Jones, children have a window of opportunity for establishing bone mass for later life – a process he calls banking bone. "The more bone you can lay down in that period of time, the more bone you've banked," he says. "In theory, this should reduce the risk of osteoporosis later in life." His recent research indicates that active pre-teens and early teens have much greater bone mass when they reach the age of 25 to 27.

"I came here to take the great work that had already been done to a new level."
– Dr. Baxter-Jones

The studies have found that physical activity in childhood also lays the structural groundwork for strong muscles, tendons and ligaments later in life. Additionally, it can impact oxygen uptake and anaerobic capacity. "But it all works together," says Dr. Baxter-Jones. "The amount of muscle mass also affects a child's bone mass. Exercise causes build-up of the muscle and interacts with the adjacent bone, boosting bone density."

The research has also shown that active kids reduce their level of body fat as adults. It worries Dr. Baxter-Jones that 26 per cent of Canadian children aged two to 17 are considered overweight or obese, leading to concerns of an osteoporosis epidemic in middle-aged adults. "Our future work is probably more related to public awareness," he says. "People already know they have to be more active – now we have to convince them to change their behaviours."

1. Dr. Adam Baxter-Jones // 2. The Bone and Joint Imaging Research Group (BIG) (2009). // 3. The Bone and Joint Imaging Research Group (BIG) (2006).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Dr. Volker Gerdts

Improving the Immune Response of Newborns

Dr. Volker Gerdts first came to the Vaccine and Infectious Disease Organization (VIDO) at the University of Saskatchewan to complete a post-doctoral fellowship. Only two years after returning to his research position in Germany, he was back at VIDO because of the research opportunities it afforded. Today, Dr. Gerdts is VIDO's associate director of research and also manages the organization's Neonatal Immunization group, a collaborative of about 20 researchers with specialized interests in vaccine development for the neonate.

"We always talk about this research cluster," says Dr. Gerdts, who is also a professor in the Western College of Veterinary Medicine. "VIDO is next to veterinary medicine and the Canadian Light Source synchrotron facility, down the street from agriculture and bioresources, and just across the campus from medicine. For the purposes of our research, it is amazing the difference it makes to have all the colleges here."

While his initial training was in veterinary medicine at Hanover Veterinary School in Germany and the Federal Research Centre for Animal Health, Dr. Gerdts' work focuses as much on humans as it does on animals.

"Studying the immune responses of neonatal animals and infants has always been my area of specialization," he says, "and I came back because I felt the opportunities were better here. VIDO is probably one of the top five institutions for vaccines and vaccine development in the world."

Dr. Gerdts' career exemplifies the concept of "One Health" where the worlds of veterinary medicine, medicine and public health work in partnership. His research is conducted with an eye to all newborns – whether they are piglets, calves or human babies – and the serious health threats they face during the first months of their lives.

Because a newborn's immune system isn't fully developed, babies are currently immunized several times between two and six months of age. It isn't possible to wait until their immune systems are fully developed at six months because they need protection from diseases like whooping cough much earlier in their lives. They also face the challenges of chronic and food-borne diseases, as well as diseases for which there are no vaccines, both existing and emerging.

Under Dr. Gerdts' leadership, VIDO's Neonatal Immunization group is investigating three approaches to improving immune response. The first dispenses vaccines to the fetus during pregnancy. A second option applies a single multi-use vaccine early in the life of the newborn. The third approach is maternal immunization where the vaccinated mother transfers antibodies to her newborn through her breast milk.

The global impact of a vaccine platform that will work after a single immunization either before or shortly after birth will have a huge impact. "It may be 15 or 20 years away," says Dr. Gerdts, "but all our approaches have the potential to vaccinate against diseases like pertussis, respiratory syncytial virus (RSV), tuberculosis, hepatitis C, HIV, malaria, even the recent e-coli outbreak here in Canada."

"If you could give only one immunization rather than the five we do now, there would be a significant benefit."

– Dr. Gerdts

Photo caption
1. Postdoctoral Research Fellow Monica Salles with supervisor Dr. Volker Gerdts (2004). // 2. Dr. Volker Gerdts

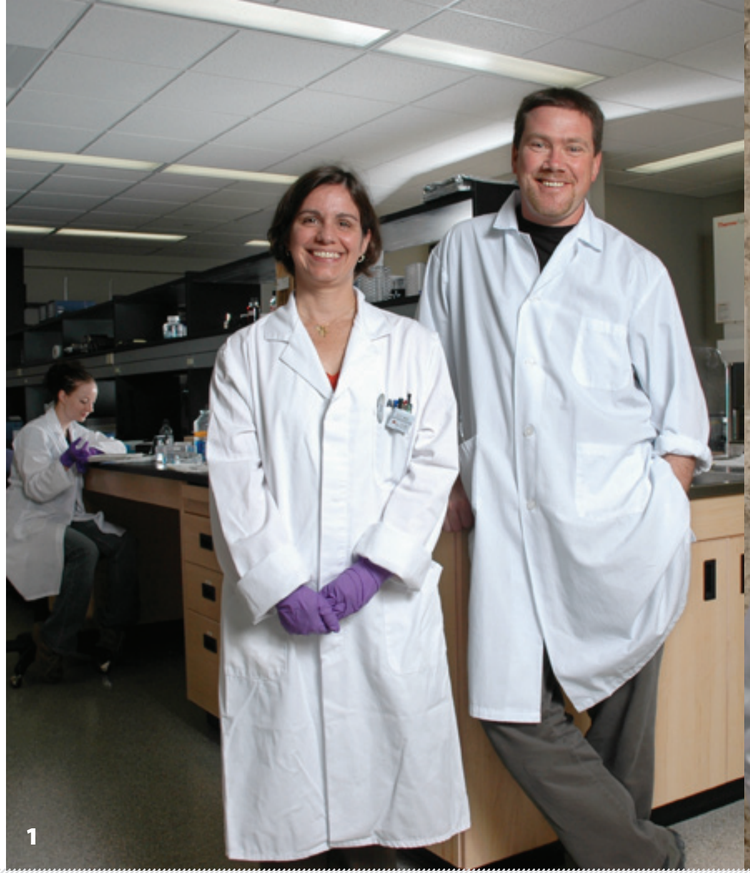
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Photo: University of Saskatchewan

Dr. Roger Pierson and Dr. Gregg Adams

Cross-Campus Relationship Contributes to Success

Drs. Roger Pierson and Gregg Adams co-direct the University of Saskatchewan Reproductive Science and Medicine Group. It includes scientists from the Western College of Veterinary Medicine and the College of Medicine, as well as faculty in the Colleges of Arts and Science, Agriculture and Engineering. Dr. Pierson is with the College of Medicine, while Dr. Adams works in Veterinary Biomedical Sciences.

Much of the group's work is foundational for many different areas of reproductive biology relating to fertility, infertility and contraception in both animals and humans. The implications are broad, influencing, among other things, breeding management of farmed livestock, recovery efforts for threatened species, population control for pets, contraceptive protocols and infertility treatments used in humans, and the health of the newborn.

According to Dr. Pierson, the cross-campus relationship is one thing that makes the group so unique and successful. "The bovine model often provides a basis for human research," he says. "We figure out the experimental designs on cows and then we come across campus and apply them to a human paradigm. It works well."

In 2003, the group uncovered evidence suggesting that the traditionally accepted model of the human menstrual cycle is wrong. They learned that up to 40 per cent of women experience two or three waves of dominant follicle growth per month, meaning there is no "safe" time to have intercourse. This discovery led to the design of new, safer and more effective contraception, and improved success with assisted reproductive technology for women who have trouble conceiving.

More recently, the group discovered that a protein in semen acts on the female brain to prompt ovulation, and is the same molecule that regulates the growth, maintenance and survival of nerve cells. The team named the protein ovulation-inducing factor (OIF) and they have found it in the semen of all species of mammal they have looked at so far, from llamas, cattle and koalas to pigs, rabbits, mice and humans. Just how it works, its role in various species, and its clinical relevance to human infertility are a few of the questions that remain to be answered.

"I think this is a perfect example of how two themes of research have come together," says Dr. Adams. "The idea that a substance in mammalian semen has a direct effect on the part of the female brain that controls the ovary is a new one. Marry that to our discovery that multiple follicular waves occur during the menstrual cycle, and it immediately raises some intriguing questions, not the least of which is: Can unprotected intercourse elicit unexpected ovulation?"

"We've solved some really big problems over the past 20 years, things that have been wondered about over the past 100 years or more."

- Dr. Pierson

The work has opened the doors to new approaches to diagnosis and treatment, in addition to a re-evaluation of the ways we look at controlling or promoting fertility. "It may lead to other forms of contraception, perhaps for the male, something you take once a month or even once a year," says Dr. Adams.

The pair of researchers can only speculate on the potential to expand on their past successes. "Just think," says Dr. Pierson, "how great it would be to give people the freedom to have their families when they choose, give them control over their own reproductive functions."


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1. Dr. Gregg Adams (left) and Dr. Roger Pierson (right) // 2. Dr. Roger Pierson with Postdoctoral Research Fellow Salma Hanna (2004). // 3. The Reproductive Science and Medicine Group (2004).

Dr. John DeCoteau and Dr. Ron Geyer

Engineering Antibodies to Attack Cancer

Drs. John DeCoteau and Ron Geyer co-direct the University of Saskatchewan's Translational Cancer Research cluster. Included within the cluster are the Cancer Stem Cell Research Group (CSRG), the Advanced Diagnostics Research Laboratory (ADRL) and Saskatchewan Therapeutic Antibody Resource (STAR). Dr. Geyer, a biochemist, and Dr. DeCoteau, a pathologist, are based at the University of Saskatchewan's College of Medicine.

"We began working together when we realized we were both studying the frequent failure of existing cancer therapies," says Dr. DeCoteau. Further investigation by researchers around the world revealed that while most cancer cells withered under the onslaught of medications, a few were resistant. These cells had the ability to self-renew and give rise to highly prolific daughter cells that could form all the different cell types in a tumour. They were, in effect, cancer stem cells.

"It became evident to us that in the cancers we were working on – leukemias – current therapies weren't curing the disease; they were simply suppressing it," Dr. Geyer says. "A lot of people were relapsing." The first challenge was to find out how cancer stem cells differ from other cells, then to explore how these differences may be exploited to develop new, effective therapies. The group successfully established a research program in leukemia biology and pioneered advances in protein engineering that created significant opportunities for commercialization.

The pair then established the first organization of the research cluster – the Cancer Stem Cell Initiative – to find out how cancer stem cells differ from normal stem cells, and how these differences might be exploited for new, more effective and less toxic treatments. A major part of the initiative included collaborating with researchers at the

Canadian Light Source synchrotron and the Canadian Centre for Nuclear Innovation to improve methods of imaging tumours and to help develop inhibitors that target cancer stem cells.

The Advanced Diagnostic Research Laboratory (ADRL) was created to capitalize on entrepreneurial opportunities by allowing innovations in leukemia biology, clinical diagnostics and protein engineering created by the Cancer Stem Cell Research Group to be rapidly translated into the clinical research and diagnostic arenas.

"There are no robust cures for cancer. Our main goal is to use antibody therapeutics to improve the cure rates in cancer"

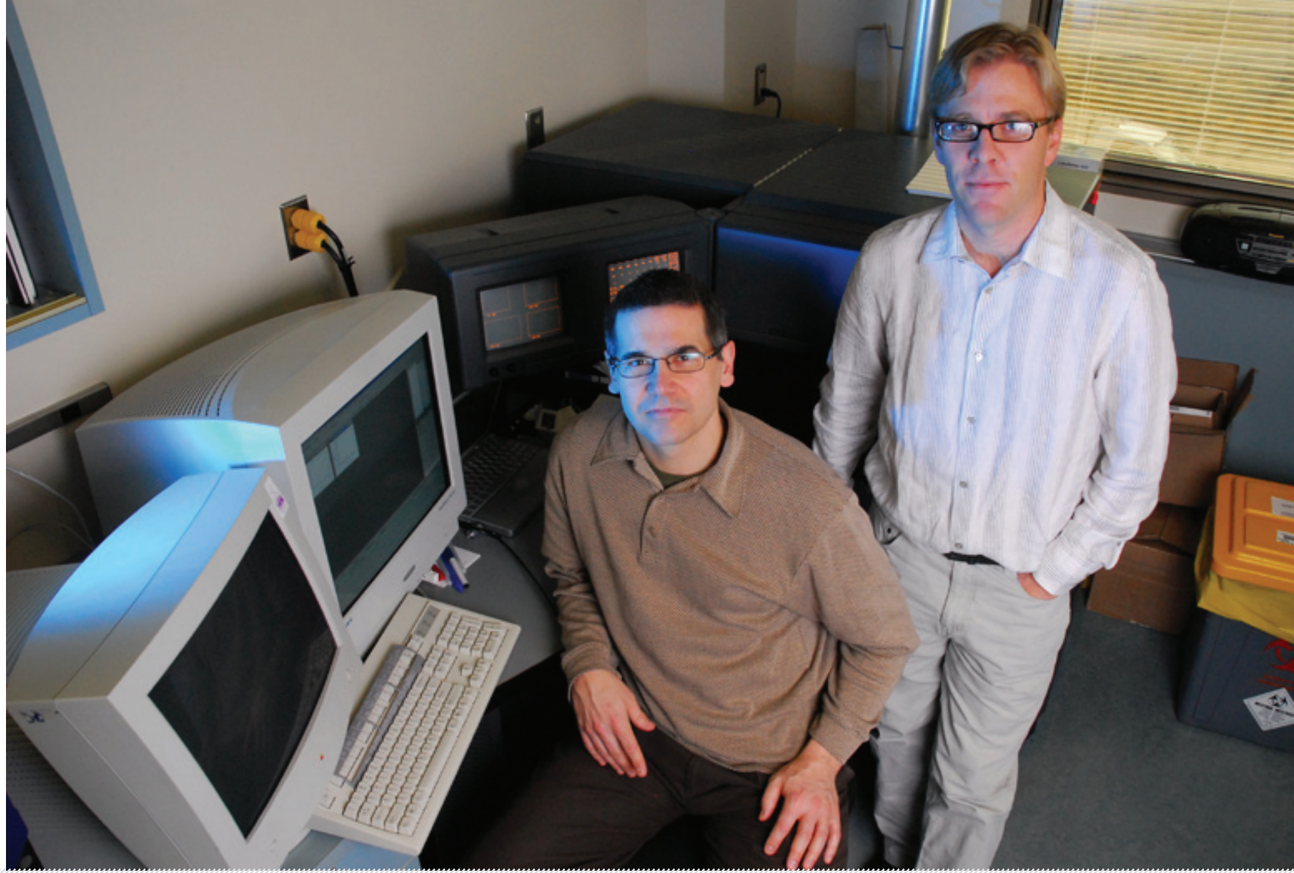
- Dr. Geyer

STAR was established as part of a consortium with the Toronto Recombinant Antibody Centre at the University of Toronto and is generating antibodies for researchers in Western Canada. Over the past decade, antibodies have become the major breakthrough for cancer treatment.

"Normally, the human body produces antibodies to fight off disease," explains Dr. Geyer. "They identify harmful cells as foreign and capture them so they can be removed by the immune system."

Dr. DeCoteau elaborates: "The problem with cancer is those cells are from us, so our bodies don't recognize them as foreign and are incapable of producing the antibodies."

Since our bodies do not recognize cancer cells as harmful, Dr. DeCoteau, Dr. Geyer and other scientists working with them are engineering antibodies to detect specific defects in cancer. They are producing literally billions of unique antibodies from which they are able to isolate those that are capable of recognizing a cancer cell.



Dr. John DeCoteau (left) and Dr. Ron Geyer (right).

Dr. Lalita Bharadwaj and Dr. Cheryl Waldner

Addressing the Water Quality Issue

Drs. Lalita Bharadwaj and Cheryl Waldner lead the Safe Water for Health Research Team (SWHRT) at the University of Saskatchewan. The goal of the team is to help develop sustainable water management strategies that promote the health of Indigenous, rural and remote populations, regionally and globally. Typically, it is the people living in these communities who are at the greatest risk from the health problems associated with drinking contaminated water.

"Much of the published research on water and health has been conducted in urban environments," says Dr. Waldner, an epidemiologist who is a joint faculty member at the U of S School of Public Health and the Western College of Veterinary Medicine. "There are a lot of people in this province who don't have the luxury of turning on the tap for a safe, clean drink of water. Many families that rely on private wells or cisterns have to treat or buy water for drinking and cooking, sometimes even for washing."

Provincial water regulations do not apply to First Nation communities on reserves. The responsibility for drinking water is shared by departments within the federal government, along with the Chief and Council of the First Nation who also oversee operations, training, maintenance and monitoring. As a result, uncertainties, inconsistencies and failed systems have been the norm. SWHRT works with the communities to gather baseline information on important issues related to drinking water access and safety.

"As a collaborative team, we identify the barriers to achieving effective regulation of First Nations water," says Dr. Bharadwaj, a toxicologist from the U of S School of Public Health. "We also explore how the challenges identified impact the well-being of First Nations and their communities."

The team recently conducted a survey of nearly a quarter of the rural municipalities in Saskatchewan that

"Safe, clean water is vital for public health and should be available to all people, wherever they live."

– Dr. Waldner

looks at the perceptions, concerns and practices around drinking water. The information provided by participants is being used to guide the next steps in understanding the link between water quality and health in Saskatchewan. "It's not about identifying that there is a problem," says Dr. Waldner, who spent 10 years working as an environmental consultant. "We've actually brought the people together who have the tools and the skills to work on the solutions."

One of the secrets of the team's success is their emphasis on the importance of participatory research, directly involving the community in the work from the beginning of the project. Community members are involved in gathering information through helping with surveys, interviews and focus groups. That information is reviewed by a diverse group of experts in microbiology, epidemiology, environmental toxicology, public health, veterinary medicine, environmental assessment and resource management, as well as community partners.

The approach fosters more public interest in the project and ensures the research is relevant to the needs of the community. "A huge goal from our perspective is working with the communities to build local water management capacity and develop strategies to inform governments and regulators of the issues," says Dr. Bharadwaj "A lot of the issues are local in nature, and working with the communities lends itself to empowerment and provides voice and ownership over the issue."

The Safe Water for Health Research Team (SWHRT).

Dr. Valerie Verge

How to Repair a Nervous System

Dr. Valerie Verge is, first, a neurobiologist. Her rationale is simple: "Who else makes a living asking the question: why?" While her career choice seems straightforward enough, it has led her down a variety of paths. She is also a professor of anatomy and cell biology at the University of Saskatchewan, Director of the Cameco MS Neuroscience Research Center at Saskatoon City Hospital, and a member of the GEMS group that examines Gene Expression Mapping using synchrotron technology at the Canadian Light Source.

"When you look at the scope of my work," says Dr. Verge, "it's all about how to repair an injured nervous system." The injuries come in many forms. Most are peripheral nerve injuries that occur as a result of trauma. Dr. Verge focuses on the sensory neurons (nerve cells) that are typically responsible for converting external environmental stimuli into internal stimuli. They are activated by sensory input such as light, sound and temperature. They then convey the sensory information into the central nervous system and on to the brain or spinal cord.

"One of our biggest insights to date," says Dr. Verge, "has been discovering how electrical stimulation of an injured nerve can actually help it to repair." Collaborating with Drs. Tessa Gordon (University of Alberta) and Tom Brushart (Johns Hopkins), they dramatically bolstered the inherent ability of the peripheral nerve to regenerate by electrically stimulating injured nerves at the time of repair. Dr. Verge's lab continues to examine what molecules are critical for this robust nerve regeneration. She is also

part of a dream-team of researchers that is exploring how this knowledge might be applied when there is a gap to bridge between the ends of injured nerves. Their goal is to create a specially designed nerve conduit that joins the two ends of the severed nerve together. Lining it with computer chips will deliver another form of electrical stimulation.

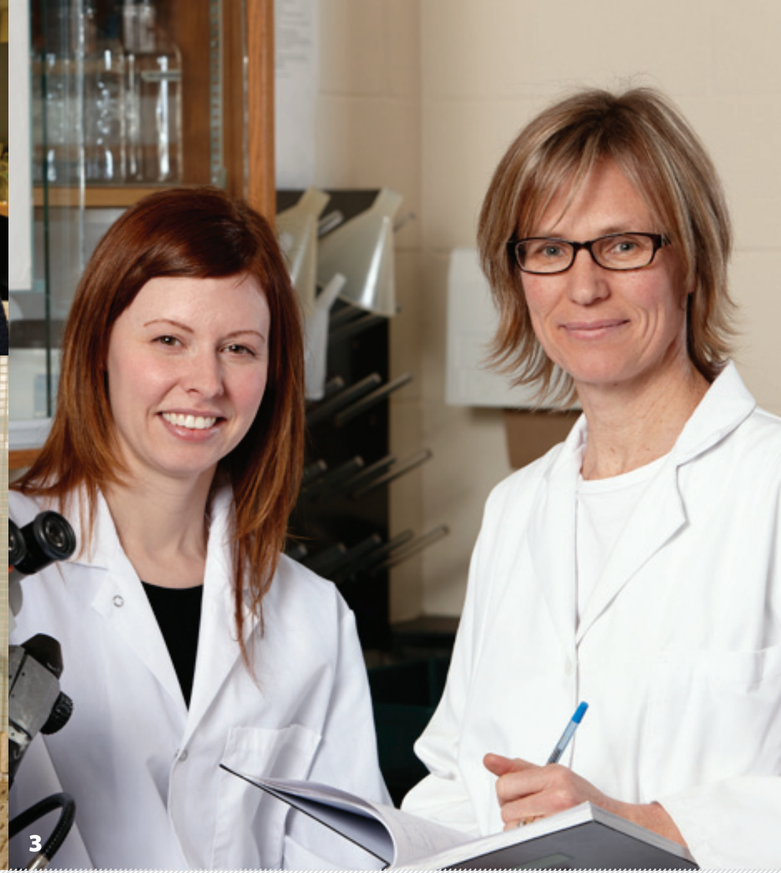
The research is beginning to find its way into human clinical trials for the treatment of conditions like carpal tunnel and other forms of nerve entrapment. "The clues we've found about how to repair the peripheral nervous system can be applied to so many different diseases of the nervous system," says Dr. Verge. "And the knowledge may lead to further discoveries with regard to central nervous system disorders such as spinal cord injury and multiple sclerosis."

"You do it because you really do want to find the answers and improve people's lives."

– Dr. Verge

Working with Dr. Gillian Muir, Dr. Verge is also studying spinal cord injuries or neck injuries that result in partial or total paralysis. They've found that acute intermittent hypoxia, or repeatedly breathing low oxygen levels for very short periods, improves breathing function in experimental animal models following this form of injury. Since the events leading to recovery in the regions of the spinal cord that control breathing also appear to occur in regions that control limb muscles, they're now investigating whether the same approach will aid in the recovery of limb function.

According to Dr. Verge, whether she's looking at electrical stimulation or acute intermittent hypoxia, "they're all geared at ramping up our own intrinsic repair programs. We all have an ability to repair ourselves albeit sometimes only to a limited degree. We're simply looking at ways to bolster that repair response."



1. Dr. Valerie Verge // 2. Dr. Valerie Verge with Postdoctoral Research Fellow Vaigundaragavendran Jegadeesan // 3. Postdoctoral Research Fellow Erin Prosser-Loose with Dr. Gillian Muir.

Photo: Roy Antal - Regina Leader-Post

Dr. Thomas Hadjistavropoulos

Managing Pain in Older Adults

Persistent pain affects more than half of seniors in the community and as many as 80 per cent of seniors in long-term care facilities. For people with dementia, the pain often goes undetected, leading to unnecessary suffering and sometimes death. Dr. Thomas Hadjistavropoulos is a University of Regina psychologist and authority on pain management in older adults.

Dr. Hadjistavropoulos leads a SHRF-funded team dedicated to addressing pain and other quality of life issues affecting older persons. His team involves researchers from Saskatchewan's universities and partnerships with the province's largest health regions.

Alongside former graduate student Shannon Fuchs-Lacelle, Dr. Hadjistavropoulos is credited for his development of the Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC). The checklist offers a quick and easy way for caregivers and clinicians to assess whether someone is in pain.

The checklist has attracted a tremendous amount of local, national and international attention. "To be honest," says Dr. Hadjistavropoulos, "it's been translated into more languages than I can remember." The PACSLAC has been ranked among the top three methods for evaluating pain among persons with dementia. Dr. Hadjistavropoulos says he has received requests to use the checklist at least two or three times every week over the last five years or so.

In a study designed to gauge the impact of the methods developed in Dr. Hadjistavropoulos's lab,

non-verbal patients with severe dementia were divided into two groups. Nurses used the pain-focused checklist for one group and a general checklist for the other. Among the patients whose nurses used the specialized checklist, Dr. Hadjistavropoulos' team recorded an increase in analgesic medication use and a reduction in pain behaviour. "Impressively, we also saw a reduction in the nurses' stress levels," says Dr. Hadjistavropoulos, "because the checklist reduced their uncertainty about whether the patient was in pain."

Another significant development, in 2007, was an international consensus paper on how to best assess pain in older adults, covering all domains including medical, physical and psychological. The authors – headed by Dr. Hadjistavropoulos – consisted of more than two dozen of the world's most prominent pain researchers and clinicians. That paper is probably the most widely cited publication on pain assessment in elderly persons.

> "I'm reasonably confident that we have, in Saskatchewan, the world's largest research program for pain assessment for people with dementia."
>
> – Dr. Hadjistavropoulos

According to Dr. Hadjistavropoulos, the paper was well received, but not well implemented. That led his group to come up with a second set of recommendations that takes both cost and policy into account. "It presents a model we feel anyone can use with minimal resources," he says.

Dr. Hadjistavropoulos and wife Heather, also a U of R psychologist, published another resource in the form of an edited book called Pain Management for Older Adults: A Self-Help Guide. This knowledge translation project is meant to help older adults become familiar with some of the most effective self-management procedures for pain. A subsequent video has been produced that is designed to train psychologists on how to help older adults with pain management.

In the future, Dr. Hadjistavropoulos is planning to work with health regions in Saskatchewan on a systematic implementation study that will look at how to establish a permanent practice standard in all facilities across the health regions.

1. Dr. Thomas Hadjistavropoulos, 2006 SHRF Achievement Award Winner. // 2. and 3. The Research and Community Alliance for Quality of Life in Long Term Care (QOL Team) (2008).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3

Achievement Award Winners

Since 2005, SHRF has honoured the following individuals in the health research community for their inspiring drive, leadership, ingenuity and achievement.

From basic science discoveries to visionary health policy, these Saskatchewan health researchers have contributed to the wellbeing of the people of this province, our nation and our world.

Nominated by their colleagues, they were selected by blue-ribbon panels of leaders in Canadian health research.

Dr. Adam Baxter-Jones

2012 ACHIEVEMENT AWARD WINNER

Dr. Adam Baxter-Jones is a leader in the field of childhood growth and development. He is an expert in the design and analysis of longitudinal growth studies and has trained numerous Masters and PhD students. Dr. Baxter-Jones' leadership in bone and joint imaging, including synchrotron imaging, has contributed significant knowledge to the treatment and management of bone and joint diseases such as osteoporosis and arthritis.

Dr. Dennis Johnson

2011 ACHIEVEMENT AWARD WINNER

Dr. Dennis Johnson is noted for his role in establishing some of the province's primary research facilities, such as the Cameco MS Neuroscience Research Centre, the Saskatchewan Drug Research Institute, and the Canadian Light Source. In 2004, Dr. Johnson became the Director of the Saskatchewan Synchrotron Institute, an organization that provided a million dollars in funding to train Saskatchewan researchers.

Dr. Heather Hadjistavropoulos

2010 ACHIEVEMENT AWARD WINNER

As a researcher, author, teacher, scientist and professor of psychology at the University of Regina, Dr. Heather Hadjistavropoulos is currently driving the movement toward Internet Cognitive Behaviour Therapy. She has made major contributions to improved health status by assessing the impact of anxiety on patients, leading to a more thorough assessment of the quality of patient care.

Dr. Nazeem Muhajarine

2009 ACHIEVEMENT AWARD WINNER

Dr. Nazeem Muhajarine is a champion of identifying what it is in a community that is essential to nurturing healthy children that grow up to be well-adjusted, productive citizens. He is professor and chair of the Department of Community Health and Epidemiology, and a research faculty member of the Saskatchewan Population Health and Evaluation Research Unit (SPHERU), where he leads the Healthy Children research team.

Dr. Gordon Asmundson

2008 ACHIEVEMENT AWARD WINNER

Dr. Gordon Asmundson is a professor of psychology at the University of Regina and an adjunct professor of psychiatry at the University of Saskatchewan. Over his career, he has established himself as an international authority in the fields of chronic pain and anxiety disorders. Notably, he determined that chronic pain can be worsened by anxiety and fear disorders such as post-traumatic stress disorder.

Dr. Donald Cockcroft

2006 ACHIEVEMENT AWARD WINNER,
CLINICAL RESEARCH

Dr. Donald Cockcroft is best known for his extensive research in respiratory health and is a highly respected expert on asthma. He was co-author of a paper that analyzed asthma medication use in Saskatchewan, which eventually led to the development of a warning system that flagged the potentially inappropriate use of bronchodilators in the province.

Dr. Thomas Hadjistavropoulos

2006 ACHIEVEMENT AWARD WINNER,
SOCIO-HEALTH RESEARCH

Dr. Thomas Hadjistavropoulos is internationally recognized as an expert on pain among seniors and a leading thinker on the ethics of pain management. One highlight of Hadjistavropoulos' career includes diagnosing pain among seniors suffering from dementia. His research in this area led to the development of a pain assessment checklist for seniors with a limited ability to communicate.

Dr. Lorne A. Babiuk

2005 ACHIEVEMENT AWARD WINNER,
BIOMEDICAL RESEARCH

After assembling and mentoring a team of researchers who developed the world's first genetically engineered vaccines for any animal species, Dr. Lorne Babiuk was named the Industrial Research Chair in Biotechnology by NSERC (Natural Sciences and Engineering Council of Canada). As head of VIDO (Vaccine and Infectious Disease Organization) at the U of S, he led development of novel approaches to vaccine design, working on with both animal and human models of immunology and vaccinology.

Dr. Jawahar (Jay) Kalra

2005 ACHIEVEMENT AWARD WINNER,
CLINICAL RESEARCH

Dr. Kalra is recognized for his many contributions as a clinical scientist, academic leader, and health system administrator. He led the establishment of a post-graduate program in pathology and played a key role in reorganizing laboratory medicine. His introduction of s-TSH as a first-line test for thyroid functioning was a first in Canada, reducing the need for more testing. Dr. Kalra collaborated on research advances in cardiac pharmacology and in understanding the role of oxygen radicals in disease.

Dr. James A. Dosman

2005 ACHIEVEMENT AWARD WINNER,
SOCIO-HEALTH RESEARCH

Dr. James Dosman is described as the "Father of Agricultural Medicine in Canada" for good reason. He established and led the Centre for Agricultural Medicine (now the Canadian Centre for Health and Safety in Agriculture) until just recently. Under his direction, this Centre became a world leader in research, teaching, extension and service. It connected with farm families and rural municipalities to identify, study and share knowledge about rural health issues, such as risks of working with grain dust.

Researchers funded by SHRF

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For more information about these researchers, their funding amounts and projects, please visit shrf.ca/funding/recipients.

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2011 - present
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**2012 - present
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2012 - present
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2003 - 06
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Odnokon, Patrick
2007 - present
Richman-Monar, Trina
2009 - present
Riffel, Pamela
2008 - present
Robin, Michael
2007 - 10
Schell, Kara
2007 - 08
Skorobohach, Tanya
2011 - present
Wailing, Sherry
2003 - 08
Winkel, James
2004 -07
Ziegler, Valerie
2003 - 08

Current SHRF Staff

Left To Right: **Irene Blum**, Accountant; **Karen Glazebrook**, Funding Programs Manager; **Pamela Riffel**, Administrative Assistant, Information Systems; **Lynn Nastiuk**, Executive Assistant to the CEO; **Trina Richman-Monar**, Facilitator, Special Initiatives; **Tanya Skorobohach**, Administrative Assistant, Funding Programs; **Patrick Odnokon**, Director of Impact and Evaluation; **Rodney Antonichuk**, Director of Partnerships
Front: **June M. Bold**, Chief Executive Officer
Missing: **Shaz Azam**, Director of Finance

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