

2005-2006

GRANTS & AWARDS

MANITOBA HEALTH RESEARCH COUNCIL

GRANTS & AWARDS



# INTRODUCTION

The MANITOBA HEALTH RESEARCH COUNCIL is pleased to announce the recipients of the grants and awards for the 2005/06 competition. With the funds available Council was able to approve funding for 7 operating grants, 3 establishment grants, 5 postdoctoral fellowships and 24 studentship awards for a total of \$1,042,316 in newly committed funds for the 2005–2006 fiscal year. Total funding for fiscal 2005–2006, including funds previously committed for renewal of grants and awards from prior competitions, is \$2,114,875.

A record number of applications were received for this competition. In total 34 operating grants, 17 establishment grants, 26 postdoctoral fellowships and 102 graduate studentship applications were received. Our 3 scientific review committees, comprising 31 wonderfully dedicated volunteers, had a heavy workload this year with a large number of truly outstanding applications to assess.

## 2005 NEW POSTDOCTORAL FELLOWSHIPS

- Dr. Alison Elliott**, Department of Biochemistry & Medical Genetics, (Drs. M. Reed & Jane Evans)  
**Dr. Linda Larcombe**, Department of Medical Microbiology, (Dr. Pam Orr)  
**Dr. Kimberley O'Hara**, Faculty of Pharmacy, (Dr. Brian Hasinoff)  
**Dr. Caroline Pampolina**, National Centre for AgriFood Research in Medicine, (Dr. Hope D.I. Anderson)  
**Dr. Guqi Wang** Department of Human Anatomy & Cell Science, (Dr. Judy Anderson)

## STUDENTSHIPS

- Boutillier, Julie** Department of Medical Microbiology, (Dr. Michael Carpenter)  
**Card, Catherine** Department of Medical Microbiology, (Dr. Keith Fowke)  
**de Melo, Jimmy** Manitoba Institute of Cell Biology, (Dr. David Eisenstat)  
**Douville, Renee** Department of Immunology, (Dr. Kent T. HayGlass)  
**Dragon, Stephane** Department of Immunology, (Dr. Abdelilah Soussi Gounni)  
**Espino, Paula** Department of Biochemistry & Medical Genetics, (Dr. James R. Davie)  
**Fediuk, Daryl** Faculty of Pharmacy, (Dr. Xiachen Gu)  
**Gallant, Meghan** Department of Chemistry, (Dr. Kathleen Gough)  
**Jiao, Lei** Department of Medical Microbiology, (Dr. Xi Yang)  
**Lafreniere-Roula, Myriam** Department of Physiology, (Dr. David McCrea)  
**Li, Hongzhao** Department of Physiology, (Dr. Jiuyong Xie)  
**Louis, Sherif**, CancerCare Manitoba, (Dr. Sabine Mai)  
**Maddika, Subbareddy** CancerCare Manitoba, (Dr. Marek Los)  
**Magoon, Jennifer** Department of Community Health Sciences, (Dr. Patricia Martens)  
**Potrebko, Peter** CancerCare Manitoba, (Dr. Boyd McCurdy)  
**Power, Kevin** Department of Physiology, (Dr. Brent Fedirchuk)  
**Raymond, Colette** Department of Community Health Sciences, (Dr. Anita Kozyrskyj)  
**Rawas-Qaliji** Mutasem, Faculty of Pharmacy, (Dr. Keith Simons)  
**Schurek, Kristen** Department of Medical Microbiology, (Dr. George Zhanel)  
**Tao, Liang** Department of Zoology, (Dr. Gunnar Valdimarsson)  
**Tiede, Heather** Department of Psychology, (Dr. Jason P. Leboe)  
**Tonn, Nadine**, Department of Community Health Sciences, (Dr. Sharon Bruce)  
**Venugopal, Niranjana** CancerCare Manitoba, (Dr. Lawrence Ryner)  
**Woo, Wai Hong** Department of Physiology, (Dr. Karmin O)



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## OPERATING AND ESTABLISHMENT GRANTS



### DR. CAROLYN DE COSTER

**The impact of cataracts and cataract surgery on the use of healthcare for injuries, falls, fractures and dependence.**

Visual impairment has been associated with increases in the use of healthcare services for falls, fractures and long-term care. A major cause of correctable visual impairment in older adults is cataract. Hence, the timely provision of cataract surgery should yield major benefits to older adults by reducing the incidence of injurious falls, fracture and dependence. In Manitoba in 1999/2000, mean waits for cataract surgery were 27 weeks. It is not known if patients waiting for cataract surgery have a higher incidence of falls and fractures, or if they use long-term care services like home care or nursing homes more often. MHRC has awarded Dr. De Coster a one-year operating grant to help answer these questions. This research will combine the powerful resources of the Population Health Research Data Repository housed at the Manitoba Centre for Health Policy with data from the Manitoba Cataract Waiting List Program to bring new evidence to bear on this important issue. From the Cataract Waiting List Program, Dr. De Coster will identify a cohort of patients who received first-eye cataract surgery in 1999/2000. The Repository will be used to define an age-sex matched control group who have never had cataract surgery. The rate of healthcare used for falls, fractures and long-term care will be tracked and compared between groups from 1997/98 up to two years following surgery. Data from the Cataract registry will be used to explore the relationship between these outcomes and visual impairment. This research will provide policy-relevant evidence of the impact of long waits for cataract surgery on the use of healthcare resources, and will thus help to inform national decisions on benchmark waiting times.

Dr. Carolyn De Coster received her RN from St. Boniface Hospital, Winnipeg and then went on to complete an MBA at the University of Manitoba. Following several years as a researcher and communications co-ordinator at the Manitoba Centre for Health Policy, Dr. De Coster was awarded a PhD by the Department of Community Health Sciences, University of Manitoba, where she has been an Assistant Professor since April 2003.



### DR. PABLO FORTE

**Role of puberty, blood pressure and age on body nitric oxide synthesis in healthy children.**

Cardiovascular disease is generally thought of as a disease of older individuals, but recent studies suggest that the disease process starts in childhood. However, young women have a lower incidence of cardiovascular disease compared to young men. Dr. Pablo Forte has previously demonstrated that women produce more nitric oxide than men do and this may contribute to the protection that women have with respect to cardiovascular disease. Nitric oxide is a gas substance constantly produced by our bodies exerting important functions in health and disease including regulating our blood pressure, memory, lung and gastrointestinal functions, and also has anti-microbial properties. Little is known about the regulation of nitric oxide production before and after natural puberty in children and so to address this issue MHRC has awarded Dr. Pablo Forte a one-year operating grant to explore the role of puberty, blood pressure and age on body nitric oxide production in healthy children. Fifty-six healthy children, aged from 4 to 8 years (14 girls/14 boys) and 15 to 18 years (14 girls/14 boys) will be studied. Understanding the role of puberty, blood pressure and age on body nitric oxide production in children will help us develop strategies for early prevention of cardiovascular disease in young adults. In addition, it will provide valuable information for future studies in children with hypertension and obesity.

Dr. Pablo Forte has been an Assistant Professor in the Department of Pharmacology and Therapeutics, University of Manitoba since January 2003. Dr. Forte received his MD from the University Central in Venezuela and then undertook training in clinical pharmacology at the masters and PhD level at the Universities of Aberdeen and London respectively. Following postdoctoral training at the William Harvey Research Institute in London, UK Dr. Forte worked in the pharmaceutical industry for a brief spell prior to being recruited to Manitoba.



### DR. THOMAS KLONISCH

**Thyroid cancer research.**

Thyroid cancer is the most common tumour of endocrine organs and the four major types of thyroid carcinoma vary markedly with respect to clinical outcome. In previous work by Dr. Klonisch the peptide hormone INSL3 (a member of the insulin like family of hormones) was first shown to be exclusively expressed in hyperactive and neoplastic human thyroid cells and the INSL3 receptor is present in human thyroid cancer cells suggesting a functional role for INSL3 hormone in thyroid cancer. Preliminary data revealed that INSL3 induces the expression of a transcription factor named Inhibitor of differentiation (Id) Id-2. The small family of four Id factors are known to inhibit DNA gene activation by blocking the actions of other transcription factors in the nucleus. MHRC has awarded Dr. Klonisch a three-year establishment grant to determine the INSL3-mediated molecular pathways which lead to the induction and activation of Id transcription factors in human thyroid tumour cells. Dr. Klonisch will also determine the functional consequences of Id-2 actions and identify proteins which can interact with Id-2 in human thyroid carcinoma cells at different stages of malignancy. This project will provide unique sets of data on the role of INSL3 as a regulator and Id-2 as an executioner in human thyroid tumours and open up a whole new area for development of potential therapeutics for this disease.

Dr. Thomas Klonisch received his MD and PhD from Justus-Liebig University, Giessen, Germany. Following post-doctoral training at the University of Mainz, University of Guelph and University College, London, UK, Dr. Klonisch returned to Germany to take up a faculty position at Martin Luther University, Halle-Wittenberg. Dr. Klonisch was awarded his Habilitation in Anatomy and Reproductive Medicine from the same institution. Dr. Klonisch was recruited to the Department of Anatomy and Cell Science, University of Manitoba as Professor and Head in August 2004.

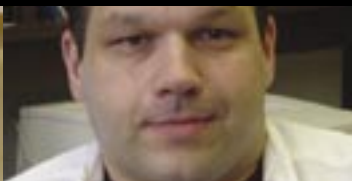


### DR. SAM KUNG

**Directing natural killer cells to recognize HIV-1 infected cells.**

Induction of immune responses is essential for our body to fight off invasions of foreign entities such as bacteria and viruses. However, some viruses such as HIV-1 (the virus responsible for AIDS) have also developed specific mechanisms to escape detection by our immune system. It is therefore desirable if we can develop ways to teach our immune system to efficiently recognize the virus infections, and stop the spread of the virus inside our body. Dr. Kung is interested in defining the parameters that control the activity of a subset of blood cells, called natural killer (NK) cells. As their name suggests, natural killer cells play an important role in protecting the body from invading pathogens and are thought to play a vital role in protecting against HIV infection. MHRC has awarded Dr. Kung a two-year operating grant to investigate the mechanisms responsible for natural killer cell recognition of HIV infected cells. The results obtained in the study will allow us to manipulate the "on-and-off" switch of NK cells, which in turn will lead to a novel therapeutic procedure in the control of HIV-1 infections.

Dr. Sam Kung completed his BSc and MSc studies at the University of Hong Kong. Dr. Kung received his PhD in immunology from the University of Toronto and then undertook postdoctoral training at the University of California, Los Angeles. Dr. Kung was recruited to the department of immunology, University of Manitoba where he has been an Assistant Professor since July 2004.



### DR. LISA LIX

#### **Analysing multidimensional longitudinal data: Applications to health-related quality of life.**

In many medical studies, the effectiveness of a treatment is measured using objective or “hard” criteria such as death, or clinical signs of the recurrence or spread of a disease. However, researchers are increasingly recognizing the importance of measuring more subjective or “soft” criteria, such as indicators of health-related quality of life (HRQoL), particularly in studies of patients with chronic illnesses or cancer. HRQoL includes factors like psychological, physical, and social wellbeing.

A lot of research has been devoted to developing tools which can be used to effectively measure HRQoL; much less research has been focused on the statistical methods that can be used to analyze HRQoL measures, particularly in studies where individuals are followed over time. In these longitudinal studies, researchers often want to answer questions like “Is the change over time in HRQoL the same for two or more groups of individuals?” These groups might be defined on the basis of severity of illness or the type of medical treatment that they receive.

MHRC has awarded Dr. Lix a two-year operating grant for a study that will provide medical researchers with better statistical methods to measure HRQoL, which will ultimately help them to improve the quality of life of individuals.

Dr. Lisa Lix received a BScHec from the University of Saskatchewan and MSc and PhD degrees from the University of Manitoba. Following one year as a lecturer in Human Ecology at the University of Manitoba and four years as a researcher with Saskatchewan Health, Dr. Lix returned to Manitoba as a researcher at the Manitoba Centre for Health Policy. Dr. Lix was appointed Assistant Professor in the department of Community Health Sciences, University of Manitoba in December 2002.

### DR. JONATHAN MAROTTA

#### **Understanding mechanisms related to the function of the human parietal cortex, an area of the brain thought to play an important role in the integration of sensory and motor information.**

Normally, if you need something, like a cup of coffee, it is a simple matter to look where you remember leaving it, reach out, and accurately pick it up. Is it really that simple? Think about how complicated that process actually is, and how remarkably well you do it. When you reach out to pick up the cup of coffee, not only do you direct your arm towards the cup, but the posture of your hand and fingers anticipates the size, shape, and orientation of the cup well before contact is made. One of the things that make this possible is your keen sense of vision.

MHRC has awarded Dr. Jonathan Marotta a three-year establishment grant to study how vision is used to control action. Dr. Marotta at the University uses specialized motion tracking systems to follow the movements of an individual’s fingers, hand, arm and eyes during a reach. Comparing the performance of intact individuals and patients with brain damage, provides important insights into how information from the visual system is used to control this important human behaviour. Insights from this research will help in the development of sophisticated diagnostic tools and more theoretically-motivated approaches to rehabilitation. This research will also assist in the development of more efficient control systems for robotics, particularly where the relevant features of a goal object or task have to be specified without assistance from the operator (i.e. devices for the blind or physically impaired).

Dr. Jonathan Marotta received a BScH from Queen’s University and his MSc and PhD in neuroscience from the University of Western Ontario. Following postdoctoral training at Carnegie Mellon University in Pittsburg and a senior research fellowship at York University, Dr. Marotta was recruited to the University of Manitoba as an Assistant Professor in the Department of Psychology in July 2004.

### DR. DAVID MERZ

#### **Hyaluronidase and glycosaminoglycans in *C. elegans*.**

The glue that holds the body together. Maybe that is the best way to think of a variety of chemical compounds known as glycosaminoglycans. These compounds, which include chondroitin and hyaluronan, reside on the surface of cells and also make up the matrix that fills the space between cells.

They play critical roles in the formation and maintenance of tissue structures in development, and are of increasing importance in biotechnology, in vitro fertilization, drug delivery, and the preparation of biomaterials to aid in wound healing and tissue repair. Chondroitin and hyaluronan are degraded by hyaluronidase enzymes, and their regulated turnover is thought to play important roles in cellular behaviours including differentiation and migration. Despite the importance of glycosaminoglycans, there are many unresolved issues related to their regulation and turnover in an intact animal. MHRC has awarded Dr. Merz a two-year operating grant to study the role of hyaluronidases in glycosaminoglycan turnover in the model organism *Caenorhabditis elegans*, a small nematode (a type of microscopic worm), using a combination of genetic and biochemical approaches.

The ultimate goal of these studies is an enhanced ability to manipulate the glycosaminoglycan composition of artificial and endogenous tissues. This will open new avenues in the development of techniques for the promotion of tissue repair and for the targeted delivery of pharmacological agents.

Dr. David Merz completed his BSc and PhD degrees at McGill University in Montreal and went on to postdoctoral training at the Mount Sinai Hospital, Samuel Lunenfeld Research Institute at the University of Toronto. Dr. Merz was recruited to the department of Biochemistry and medical genetics, University of Manitoba in July 2001 where he is currently an Assistant Professor.



### **DR. TOORU MIZUNO**

To clarify the physiological mechanisms that lead to metabolic disorders, and to develop new strategies for treating obesity and improve individual's health.

Half the Canadian population is now overweight or obese. Obesity is a significant risk factor for several serious medical problems including diabetes, heart diseases, and some forms of cancer. The hypothalamus, an area of the brain, plays a critical role in regulating body weight. Recent intensive studies suggest that brain cells, or neurons, which produce the substance from the gene called POMC (proopiomelanocortin), may play an important role in maintaining healthy body weight. Reduced POMC gene expression is often associated with obesity, and experimentally elevated POMC gene expression is effective in reversing obesity. Since POMC gene expression is regulated by nutritional factors, it is assumed that the failure of POMC-expressing neurons to respond appropriately to nutritional signals which reflect body weight may cause obesity. However, it is poorly understood how these POMC-expressing neurons are regulated under different nutritional conditions, partly due to the lack of appropriate experimental tools. To overcome this limitation, MHRC has awarded Dr. Mizuno a three-year Establishment Grant to establish an experimental system with which he can assess the regulatory mechanisms of POMC-expressing neurons. It is expected that the identification of such regulatory mechanisms will facilitate the development of therapies to treat obesity and improve the clinical outlook of patients with obesity or obesity-related impairments.

Dr. Tooru Mizuno received his PhD from Yokohama City University, Japan. Following postdoctoral training at Mount Sinai School of Medicine in New York, Dr. Mizuno accepted a position as Instructor at the same institution. Dr. Mizuno briefly held a position as Instructor at the Beth Israel Deaconess Medical Center in Boston prior to being recruited as a Canada Research Chair, Tier 2 (Molecular Endocrinology of Diabetes and Metabolic Control) and Assistant Professor in the Department of Physiology, University of Manitoba in August 2004.

### **DR. JULIA REMPEL**

IFN-alpha responsiveness in Aboriginals and Caucasians.

When compared to Caucasians, Canadian Aboriginals have a higher incidence of acute Hepatitis C Virus (HCV) infection, but may clear HCV more effectively and do better when treated for chronic HCV infection. Previous work by Dr. Rempel indicates that HCV has more difficulty altering immune responses from Aboriginal cells than from Caucasian cells. MHRC has awarded Dr. Rempel a two-year operating grant to investigate how ethnicity influences the ability of cells to respond to interferon-alpha (IFNa). Responses to IFNa are important elements in the body's attempts to fight the infection. The way cells respond to IFNa is also important because IFNa is used to treat chronic HCV and other diseases. This study will also examine cell responses from Aboriginals and Caucasians taking IFNa treatment for chronic HCV infection. The results will; increase the understanding of how the immune system can clear HCV infection; provide insight into the treatment of HCV in Aboriginals and the management of side effects; and uncover vital information regarding the ability of HCV to change how cells can respond to IFNa.

Dr. Julia Rempel received her BSc from the University of Calgary and her PhD from the University of Manitoba. Following postdoctoral training at the Scripps Research Institute in San Diego, California Dr. Rempel was recruited back to the University of Manitoba in July 2002 as an Assistant Professor in the departments of Medicine and Immunology.

### **DR. SHETUAN ZHANG**

The role of Ikr/HERG in cardiac arrhythmias in heart failure.

The American Heart Association estimates that 4.7 million Americans have congestive heart failure (CHF) and that 400,000 new cases are diagnosed each year. In Canada, heart failure is also the leading cause for hospitalization. Since the 1970s, heart failure has been on the increase because the number of people aged 65 or older has grown. Congestive heart failure occurs when the heart is unable to pump blood throughout the body. The single greatest cause of death in heart failure is actually not contractile failure but rather sudden death due to cardiac arrhythmias. MHRC has awarded Dr. Shetuan Zhang a two-year operating grant to study the mechanism of cardiac arrhythmias in heart failure. Dr. Zhang will focus on an important cell membrane ion channel protein that passes potassium ions across the cell membrane to generate an ionic current called Kr. Malfunction of IKr, which is known to cause cardiac arrhythmias. Until now, isolation of Ikr from other ionic currents in the heart tissue is a very difficult task, which has hampered the understanding of its role in cardiac arrhythmias in heart failure. In the present research, Dr. Zhang proposes a novel way to isolate the Kr current by Cs+ (a metal with similar properties to K+) permeation. By using this novel technique, Dr. Zhang will study the changes of IKr amplitude and its responses to hormones and drugs in a rat heart failure model. The project will provide significant insight into the mechanisms of sudden death in heart failure patients and will be useful in designing new strategies and therapies for heart failure patients.

Dr. Shetaun Zhang received MD and MS (physiology) degrees from Xi'an Medical University in China. Dr. Zhang was awarded a PhD in physiology from Tokyo Medical and Dental University. In July 2003, following postdoctoral training at the University of Wisconsin and the University of British Columbia, Dr. Zhang was recruited as an Assistant Professor in the Department of Physiology, University of Manitoba and as a Principal Investigator, Institute for Cardiovascular Sciences, St. Boniface General Hospital Research Centre.

## OPERATING & ESTABLISHMENT GRANTS SCIENTIFIC REVIEW COMMITTEE



From left to right: Dr. Lizann Bolinger, Dr. Harold Aukema, Dr. Etienne Leygue, Dr. Abdelilah Soussi Gounni, Dr. Larry Hryshko, Dr. Jeff Wigle, Dr. James Gilchrist (Chair), Dr. Teresa Dekievit, Dr. Valerie Kupriyanov, Dr. Archie McNicol and Dr. Jingxin Cao

## PERSONNEL AWARDS SCIENTIFIC REVIEW COMMITTEE



From left to right: Dr. Keith Fowke, Dr. Rotimi Aluko, Dr. David Merz, Dr. Fiona Parkinson, Dr. Jim House, Dr. David Eisenstat, Dr. Gary Glavin (Chair), Dr. Kevin Coombs, Dr. Kathleen Gough, and Dr. Karmin O. (missing Dr. Janice Dodd)

## SOCIAL/POPULATION HEALTH SCIENTIFIC REVIEW COMMITTEE



From left to right: Dr. Yoshi Iwasaki, Dr. Xikui Wang, Dr. Pamela Hawranik, Dr. Emily Etcheverry (Chair), Dr. Andrea Kilgour, Dr. Judy Chipperfield, Dr. John Bond, Dr. Anita Kozyrskij, Dr. Diana Clarke, and Dr. Joe Kaufert.

# SCIENTIFIC REVIEW COMMITTEES

Conducting a grants and awards programs would be impossible without the invaluable contribution of time and effort by our review committee members and external reviewers. Council is extremely grateful to the 32 researchers who volunteered their services to serve on the three review committees. Given the very high quality of the applications received this was no easy task. Most of the members of the review committees have previously received funding from MHRC either as students, fellows or independent investigators (or in some cases throughout many stages of their careers). It is truly gratifying to see them "pay back" to the system that supported them. Finally, Council owes a great debt to the large number of external reviewers from outside of the province, or in many cases outside of the country, who provided constructive criticism to the newly independent investigators, that the reviewers took their task seriously dedicating significant time and effort to it.



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