Alzheimer Society
CANADA

Alzheimer Society Research Program
Accountability Report 2011

Hope.
Courage.
Progress.

Forget Me Not

Ne m'oubliez pas

Table of Contents

Alzheimer Society

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Message from CEO - Debbie Benczkowski

"Research is our best hope for dementia. The Alzheimer Society is the largest non-government funder of dementia research in Canada."

Help for Today. *Hope for Tomorrow...*® This tagline summarizes the Alzheimer Society's mission to alleviate the personal and social consequences of Alzheimer's disease and other dementias and to promote the search for the causes, treatments and a cure.

Research is our best hope for dementia. The Alzheimer Society is the largest non-government funder of dementia research in Canada. Our Alzheimer Society Research Program (ASRP) is a successful collaboration of our Federation, within which all provincial Alzheimer Societies, the Alzheimer Society of Canada, partners and donors rally together to support research directed at both finding a cure for dementia and improving the lives of those affected.

In 2008, we evaluated our Program to determine how we could further strengthen it and concluded that we needed to support more research students. We are pleased, therefore, to announce that in this 22nd anniversary year of the Alzheimer Society Research Program, we have funded an increased number of trainees, and would like to acknowledge and thank our partners in these awards:

- Canadian Institutes of Health Research/Instituts de recherche en santé du Canada (CIHR/IRSC)
- Fonds de recherche du Québec-Santé
- The Canadian Dementia Knowledge Translation Network
- Mrs. Pauline Spatz

We would also like to extend our sincere gratitude to our provincial Alzheimer Societies, who contribute so generously to the ASRP each year, and especially to our donors for their unwavering commitment.

This year, with the signing of a Memorandum of Understanding with the CIHR-IRSC, we will explore other partnership opportunities so we can remain at the forefront of research discoveries. At the same time, we will forge ahead to seek new opportunities with other national as well as international organizations.

In these pages we celebrate some of the progress and momentum that research is already delivering, but our work will not be done until our dream of "a world without Alzheimer's disease" becomes a reality. We invite you to meet our research recipients and discover for yourself what a difference the Alzheimer Society Research Program is making.

Message from Scientific Director - Dr. Jack Diamond

The world of Alzheimer's research has never been so active, as evidenced by the record number of international conferences devoted to dementia studies worldwide, and by the enthusiasm of record numbers of young new investigators to undertake Alzheimer's research. The Alzheimer Society Research Program (ASRP) is unique internationally in the number of awards it makes annually, to enable promising new researchers to enter and compete successfully for grants in the field of Alzheimer's disease, its causes and its cure.

As the leading source of non-government funds dedicated exclusively to research into Alzheimer's disease and other dementias in Canada, the ASRP has contributed approximately $32 million to research in Canada since its inception 21 years ago. In 2010, the Society and its partners funded 30 new grants and training awards, amounting to $2.9 million, to speed up the search for the causes and cure and to improve the lives of those affected. In 2011, we are expecting to fund more trainees and young investigators, a record we are very proud of.

Canadian researchers supported by the ASRP have made major advances, including discoveries related to genetic causes of the disease. The Society places equal importance on biomedical research that provides insights into the causes and potential cure and on quality of life research that leads to improvements in care. The ASRP peer review program is impressive, drawing the praise of international researchers recruited to our review panels. The rigorous review process ensures that every dollar contributed to the ASRP funds trainees and research projects that have been reviewed by national and international experts for scientific merit and excellence.

From the Canadian perspective, we are pleased that all the new exciting areas of Alzheimer's disease research, and especially the new directions that are revealing the therapeutic promise of behavioural strategies – cognitive rehabilitation – are being actively pursued by Canadian researchers, many of whom are funded by ASRP.

As I travel the country and speak to individuals and their families living with Alzheimer's disease – and among them potential donors to our cause (always in lay language that needs no knowledge of science or medicine!) – I am constantly reminded of the value of our program and our work. Our commitment to this community so affected by the disease is unwavering, and our commitment to finding a cure ever hopeful.

"Canadian researchers supported by the Alzheimer Society have made major advances, including discoveries related to genetic causes of the disease."

Jack Diamond

Dr. Serge Gauthier, Chair, Research Policy Committee

Dr. Gauthier is a pre-eminent, internationally recognized Alzheimer researcher and medical practitioner who has benefitted from ASRP funding to advance his early research. He is Director, Alzheimer's Disease Research Unit at McGill University in Montreal and also teaches in the departments of Neurology & Neurosurgery, Psychiatry and Medicine. Dr. Gauthier is an associate member of McGill's School of Physical & Occupational Therapy in the department of Pharmacology and Therapeutics.

Dr. Gauthier's area of research focus has been the etiology and treatment of Alzheimer's. He has worked on the development of consensus guidelines on the approval and use of anti-dementia drugs and has championed the rights of persons with dementia to participate in research.

We are fortunate to have the commitment, experience, dedication and strong leadership that Dr. Gauthier brings to the Research Policy Committee.

"In supporting both biomedical and psychosocial research, with particular emphasis on bringing new investigators into this field, we are making progress in our understanding of the disease and helping persons with symptoms or at risk."

The Alzheimer Society Research Program

"ASC has supported me in three ways. First, the support has allowed my laboratory to conduct highly promising but riskier Alzheimer's disease projects that are not likely to be immediately funded by CIHR. Second, my laboratory has attracted highly talented graduate students and post-doctoral fellows, and above all, ASC support has given a morale boost to our fight against Alzheimer's disease."

- Dr. Hemant Paudel

HIGHLIGHTS

- Canadian researchers are among world leaders in dementia research.
- The Alzheimer Society Research Program funds peer-reviewed research that may not otherwise be funded and helps nurture the careers of Canada's next generation of researchers.
- The Alzheimer Society welcomes and provides reviews of new and potential breakthroughs.
- Each new scientific discovery expands our knowledge of dementia and draws us closer to understanding its causes, improving prevention and diagnosis, as well as developing more effective treatments to delay, halt or reverse the disease process.

Launched in 1989, the Alzheimer Society Research Program is a collaboration of the Alzheimer Societies in Canada, the provincial Alzheimer Societies and their generous donors. The Program funds research to better understand, diagnose, treat and prevent Alzheimer's disease and other dementias, while finding improved ways of enhancing the quality of life of those affected. Research applications are rated by peer-review committees representing eminent scientists from multiple research backgrounds.

ASRP also seeks strategic partnerships with other agencies and organizations, such as the Canadian Institutes of Health Research (CIHR). Since its inception, the Program has invested $32 million in dementia research that has helped lead to critical discoveries and shape dementia research around the world. More importantly, it has brought help and hope to people living with the disease. Canadian researchers are among the world leaders in dementia research and ASRP funds studies that may not otherwise be funded, helping to nurture Canada's next generation of researchers.

The ASRP focuses on two research streams: Quality of Life and Biomedical. Quality of Life is concerned with aspects of the disease relating to behavioural and cognitive changes, environmental support and caregiving issues. Biomedical provides funding for research into basic biological mechanisms related to brain changes associated with the disease and into the identification of therapeutic agents to combat the disease.

The ASRP provides Research Training Awards (doctoral and post-doctoral), Research Grants, and Young Investor Grants with the objective of supporting Canadian studies that promise new insights into causes, prevention, diagnosis, treatment and management of Alzheimer's disease and other dementias.

Doctoral Studentships are for students in Canadian university programs leading to a PhD degree and are $20,530/year including a $500/year research allowance.

Post-doctoral Fellowships are for graduates with a PhD or MD who want additional research experience and are within one year of obtaining their PhD degree. The value is $40,500/year for PhDs and $50,000/year for MDs including a $2,500/year research allowance.

Young Investigators Grants help launch the careers of outstanding young researchers who have completed their post-doctoral training and are entering their first phase of an academic appointment. These are worth $60,000/year for a maximum of three years in the Quality of Life stream and a maximum of $75,000/year for a maximum of three years in the Biomedical stream.

Research Grants fund established researchers. The maximum amount awarded is $60,000/year for a maximum of two years for applications in the Quality of Life stream and $75,000/year for a maximum of two years for applications in the Biomedical stream.

"Despite having only 0.5% of the world population, Canada produces 5% of the world's new knowledge in Alzheimer's disease and other dementias, and over the past four years, 15% of the most influential publications."

- CIHR February 2011

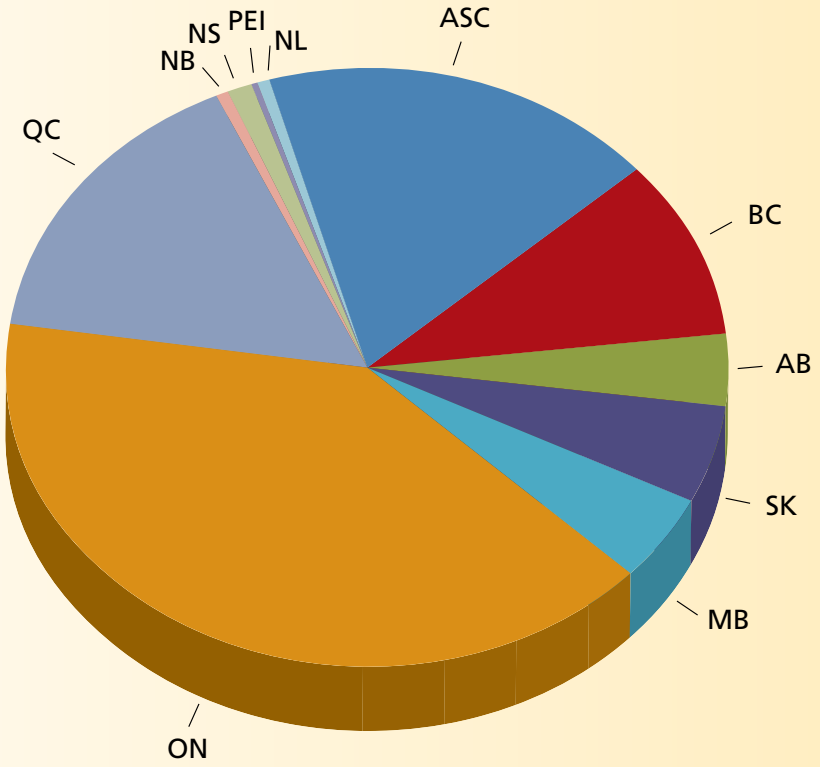
Some of the Thousands of Donors Across Canada who Support Research

These funds help attract new talent to the field of dementia research including those featured in this report. It is their ideas today that could become the therapies or cure of tomorrow.

Federation Member Contributions

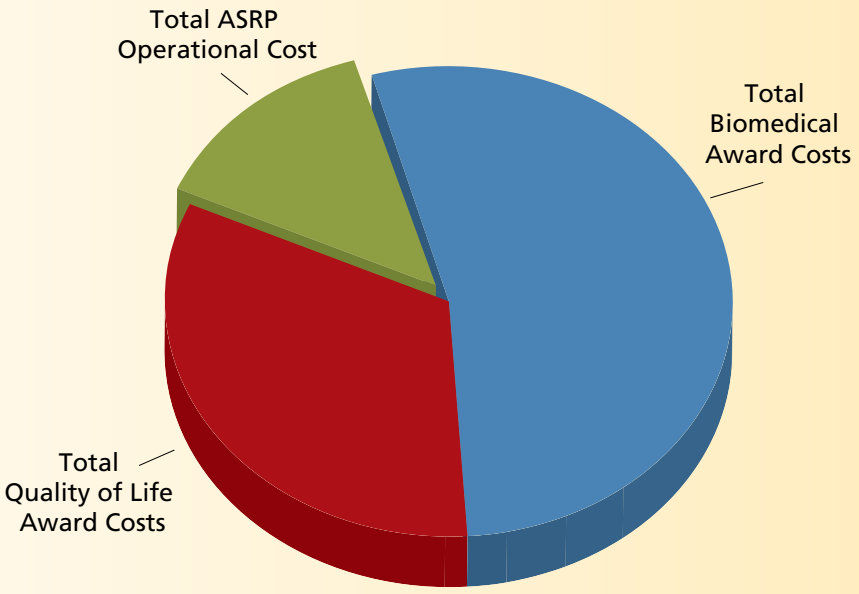
ASC*	$694,738
BC	$315,747
AB	$127,191
SK	$167,314
MB	$148,868
ON	$1,295,511
QC	$500,877
NB	$20,959
NS	$35,160
PEI	$10,114
NL	$11,242
Total	$3,327,721

*Alzheimer Society of Canada

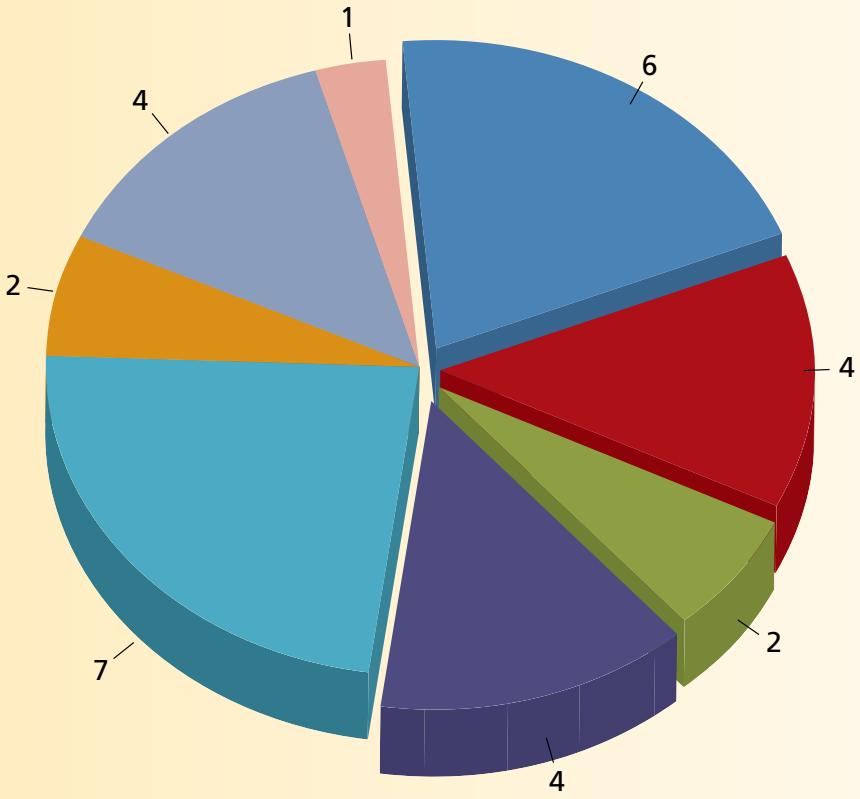


Expenditures 2010-2011

Total Biomedical Award Costs	$1,765,040
Total Quality of Life Award Costs	$1,116,727
Total ASRP Operational Cost	$445,954
Total	$3,327,721

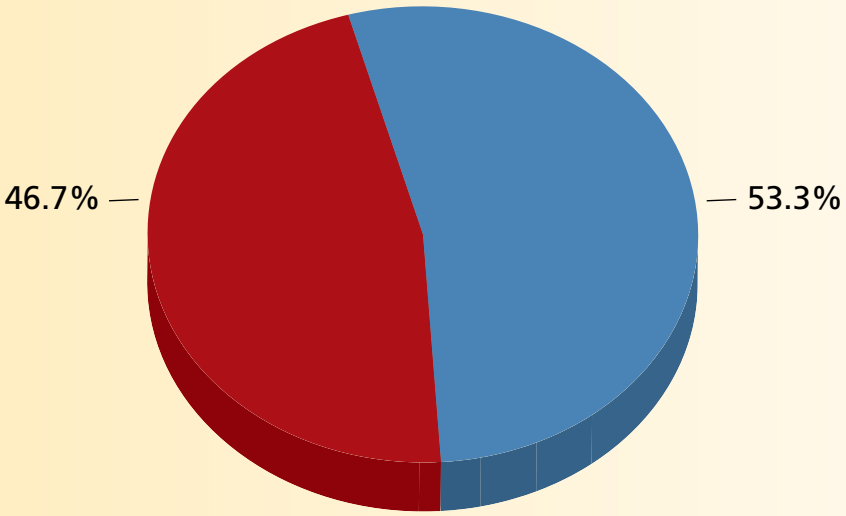


Distribution of Grants 2010-2011



Doctoral Grant	Biomedical
Post-Doctoral Grant	Biomedical
Young Investigator Grant	Biomedical
Research Grant	Biomedical
Doctoral Grant	Quality of Life
Post-Doctoral Grant	Quality of Life
Research Grant	Quality of Life
Young Investigator Grant	Quality of Life

Distribution of Grants by Research Stream



- Biomedical
- Quality of Life

Canadian National Population Health Study of Neurological Conditions

As founding members of Neurological Health Charities Canada (NHCC), Alzheimer Society of Canada (ASC) and Alzheimer Society Ontario (ASO) came together with other health charities to voice the need for a Canadian study to gather data and information to understand the impact of neurological conditions on our population. As a result of the NHCC's advocacy, the federal government recognized the importance of this kind of research and committed $15 million to fund Canada's first-ever National Population Health Study of Neurological Conditions (NPHSNC).

Initiated in 2009, the NPHSNC is jointly led by the NHCC and the Public Health Agency of Canada. The four year study encompasses a suite of research projects including 13 independent research projects, a micro-simulation model, the addition of neurological conditions to Canadian Chronic Disease Surveillance System and three surveys through Statistics Canada. ASC is engaged in the governance of the study as a member of the Implementation Committee.

While ASC and ASO do not directly fund the NPHSNC, Alzheimer's disease and dementia are included in a number of components of the NPHSNC and our membership in Neurological Health Charities Canada gives us a valuable opportunity to contribute to social health research planning on a national scale and will provide critical information to further advance the knowledge of the disease and its causes.

Thank you Canada

Your contributions and creative ways to fundraise have made all the difference toward the $3 million we have been able to dedicate to our research projects introduced in the next section. On pages 11-25 you can meet the researchers who are advancing the knowledge of Alzheimer's disease and improving the lives of those living with dementia.

"Funding from the ASRP allows me to conduct my research and go to scientific conferences to present the results. This is a huge benefit for my career as I can publicize my results and meet with other researchers interested in Alzheimer's disease."

Jana Baranyaiova Frtusova

Doctoral award
Quality of Life
$61,590
Concordia University, QC

Face me when you speak, I can understand you better

Jana Baranyaiova Frtusova was born in Slovakia and came to Canada in 2004 by way of London, England. She first became involved in research in Alzheimer's disease during her undergraduate studies at York University. Her honours thesis, under the supervision of Dr. Josée Rivest, involved research on mild cognitive impairment (MCI). She is now conducting her doctoral research at Concordia University, under the supervision of Dr. Natalie Phillips.

Auditory-visual (AV) speech perception involves both hearing and seeing the speaker, allowing us to use lip movements to help us comprehend. Although AV speech increases our ability to understand speech, brain imaging research has shown that people use fewer brain resources to process it than auditory only. Thus, it seems that people "save" brain resources when able to hear and see the speaker. Jana's master's thesis showed that AV speech improves working memory performance, and that processing resources can be used toward better memory. This is important, because brain resources are limited, especially in individuals with MCI or Alzheimer's disease.

Jana's doctoral research is a brain imaging study that records electrical brain signals and tracks responses from when speech is first heard to later intellectual processing. She and her team examine working memory in people with MCI and Alzheimer's disease under the visual, auditory, and AV conditions, to investigate whether performance improves under the AV condition. They hope to determine whether people with cognitive impairment can benefit from AV presentation, freeing up resources for other tasks such as working memory. This could mean improved quality of life for Alzheimer's patients, their families and caregivers, who could help by making simple changes such as facing people with Alzheimer's disease when talking to them.

"The help of this organization gives me access to the resources I need to realize my full potential and to contribute actively to the advancement of knowledge in Alzheimer's disease."

Veronique Boudreault

Doctoral award
Quality of Life
$61,590
Laval University, QC

Setting standards to assess the clinical importance of change

Veronique Boudreault witnessed the impact of Alzheimer's disease through the experiences of her grandmother as well as many personal testimonies from friends in Psychology at Laval University, where she worked as a volunteer in the clinical psycho-gerontology research laboratory.

Veronique is currently engaged in her doctoral studies in the Department of Social and Preventive Medicine in the School of Psychology at Laval, under the supervision of Dr. Philippe Landreville. She received a scholarship from the Fonds de recherche en santé du Québec for a project concerning barriers to the implementation of practice guidelines for the management of behavioural symptoms of dementia in nursing homes.

Behavioural and psychological symptoms of dementia are a widespread phenomenon. They contribute to reduced quality of life, reduced ability to perform activities of daily living, premature institutionalization, caregiver and family burden, and increased costs of care. Evaluating effective treatments to reduce these symptoms can enhance daily living. To do so, it is important to assess the clinical importance of change (CIC), and the social importance and acceptability of treatment goals, procedures and outcomes. Currently, methods to assess CIC are inadequate, and work in this area would advance research and clinical practice.

Veronique and her colleagues are attempting to establish standards to assess the CIC of treatment for the management of behavioural symptoms of dementia. Standards will be derived from nursing home caregivers and family caregivers. Veronique hopes this will allow clinicians and researchers to rely on valid standards in determining the clinical improvement in these patients, which will contribute to improving the well-being of people with Alzheimer's disease, their families and caregivers.

"The ASRP through the research project funded, and with financial support to my graduate students, played a critical role in fostering the next generation of Canadian scientists to work on finding solutions to Alzheimer's disease."

Frédéric Calon

Research grant
Biomedical
$150,000
Laval University, QC

Does protein TDP-43 play a role in Alzheimer's disease? – Let's find out

Dr. Frédéric Calon has always been fascinated by the brain, but it was not until his post-doctoral studies that he began to focus his research on Alzheimer's disease. As a pharmacist, Dr. Calon witnessed a lack of effective treatments for this disease and recognized the incomparable need for research. In a sad irony, one of his mentors today lives with the disease. Consequently, Dr. Calon is more committed than ever to learning how to slow or stop the development of the disease.

Dr. Calon completed his BSc in Biochemistry and his MSc in Pharmacy at Laval University, where he also earned his PhD in Pharmacy, under the supervision of Drs. Thérèse Di Paolo and Paul Bédard. He is a professor in the Faculty of Pharmacy at Laval University, and his laboratory is in the Centre hospitalier universitaire de Quebéc in Quebec City.

Dr. Calon and his team are trying to understand the underlying molecular mechanisms leading to Alzheimer's disease and attempting to develop new treatments. Their latest project is to better understand the role of a new protein called TDP-43, which scientists recently discovered forms aggregates in neurons of people with frontotemporal lobar degeneration and amyotrophic lateral sclerosis. They now need to determine whether it also plays a decisive role in Alzheimer's disease.

In their current project, preliminary data suggest that TDP-43 accumulates early in the brains of individuals with mild cognitive impairment and Alzheimer's disease. They also detected more TDP-43 in the brains of aged 3xTg-AD mice, a well-accepted animal model of the disease. Dr. Calon hopes that his research will contribute to the development of drugs that target molecular mechanisms associated with TDP-43, to slow or stop the progression of Alzheimer's disease.

"The ASRP has contributed to my research programs that involve investigating the basic nature of Alzheimer's disease."

Avijit Chakrabartty

David G. Dewar Research grant
Biomedical
$200,000
University of Toronto, ON

How to stay vital and avoid neurodegeneration

Dr. Avi Chakrabartty obtained his BSc from the University of Alberta, and his PhD from the University of Toronto. After completing a post-doctoral fellowship at Stanford University, he took up his position as assistant professor in the Department of Medical Biophysics at the University of Toronto, where he was then promoted to full professor in the Departments of Medical Biophysics and Biochemistry. In 2002, Dr. Chakrabartty received the Government of Ontario's Premier's Research Excellence Award for his research on Alzheimer's disease.

In the late 1990s, Dr. Chakrabartty recognized that aging populations were prone to certain diseases such as Alzheimer's disease. This type of susceptibility suggested that normal human physiology was by nature prone to certain neurodegenerative disease mechanisms that involve protein misfolding. Consequently, he is focusing his research on diseases of protein misfolding that result in neurodegeneration. In this way, he hopes his research will indicate healthy ways of aging that avoid diseases of the elderly and enable their vitality.

In patients with Alzheimer's and Parkinson's disease, as well as amyotrophic lateral sclerosis, clumps of aggregated proteins called inclusion bodies accumulate within diseased neurons of the brain and spinal cord. Identifying the proteins that form these inclusion bodies help us understand the development of these conditions, and can suggest new strategies for treatment. These inclusion bodies are difficult to isolate, and Dr. Chakrabartty and his team are proposing the use of light-activated chemical tags to separate them from other proteins, and identify them. He believes that their identification will lead to new strategies for diagnosis and treatment, the immediate impact of which would be to ensure the identification of specific drug targets of the causes and symptoms of Alzheimer's disease.

"I feel extremely fortunate to be a recipient of the ASRP. Financial support for this research has given me more time and thus freedom to devote to my work and training."

Sarah Chan

Doctoral award
Quality of Life
$61,590
University of Regina, SK

Pain assessment tool development for improved management of those with dementia

Throughout her studies, Sarah Chan has had an interest in research on aging and well-being. It was through her graduate work, however, that she began focusing specifically on research related to Alzheimer's disease and other dementias.

Sarah completed her undergraduate studies in Psychology at the University of British Columbia, and her MA in Clinical Psychology at the University of Regina. She is currently working toward a doctorate in Clinical Psychology at the University of Regina, under the supervision of Dr. Thomas Hadjistavropoulos, who was also her master's thesis supervisor.

The under-management of pain in older adults with dementia is a significant problem for those living and working in long-term care (LTC). As verbal capacity declines, the ability to self-report pain also diminishes, placing greater responsibility on staff to observe and identify pain. Under-detection of pain not only leads to lack of or a reduction in pain intervention, but also increases disruptive and aggressive behaviours in residents, as well as stress in care staff.

Sarah and her colleagues are studying a continuation of the Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC), one of the most valid and reliable tools to address this challenge. The study involves the integration of current findings on pain in individuals with limited ability to communicate. The revised and original versions will be compared based on assessments of LTC residents with dementia who are undergoing injections and uncomfortable movements as part of routine care. The two versions will also be piloted, to gather qualitative feedback and preliminary data. This project has significant practical implications for developing an empirically-supported and clinically useful pain assessment tool for managing pain in older adults with dementia.

"Thanks to this fellowship I could participate in very interesting scientific meetings, where I could share my findings with leading scientists in the Alzheimer's field."

Charlotte Delay

Post-doctoral award
Biomedical
$81,000.00
Laval University, QC

Understanding a disease is crucial to curing it

Charlotte Delay became interested in Alzheimer's research during her graduate studies, when she investigated a number of neurodegenerative disorders, including Alzheimer's and Parkinson's disease. Charlotte completed her bachelor's and master's degrees in biomedical sciences at Katholieke Universiteit Leuven in Belgium. She holds two doctoral degrees, one in biology from the same university and the other in medicine, with a specialty in neurosciences, from Université de Lille 2, in France. She is currently immersed in a post-doctoral fellowship at Laval University, in the psychiatry/neuroscience department.

Charlotte believes that understanding a disease is crucial to curing it, and consequently has been working in the area of fundamental research related to Alzheimer's, toward developing disease-modifying drugs. Recent studies performed on humans support the hypothesis that changes in miRNA expression profiles can contribute significantly to risk for major neurodegenerative diseases such as Alzheimer's. miRNA research seems to be particularly promising in understanding the very prevalent and poorly understood sporadic forms of neurodegenerative disorders like Alzheimer's.

In her current study, Charlotte and her colleagues are focusing on the protein tau, which is directly involved in Alzheimer's disease. Several factors can regulate tau mRNA alternative splicing, one of which Charlotte and her team believe to be MicroRNAs (miRNAs). Given the increasing evidence that miRNAs are major regulators of gene expression, they reason that loss of the fine-tuning of this network, for instance during aging, could be relevant for disorders such as Alzheimer's disease. Charlotte and her colleagues hope to contribute to the full understanding of Alzheimer's disease, and in so doing help to cure or prevent the disease.

"ASRP funding has opened up a new aspect to my research interests, with more important implications to neuroscience and behavioural science."

Nicole Gallo-Payet

Research grant
Biomedical
$150,000
University of Sherbrooke, QC

What is the link between obesity, hypertension and developing Alzheimer's?

Dr. Nicole Gallo-Payet's interest in Alzheimer's research has developed over the past three years, but represents a logical extension of her career research interests, which have included cell biology of neuronal differentiation and the intracellular signalling pathways involved in that process. She and her team hope to explain the link between obesity, hypertension and the development of Alzheimer's disease.

Dr. Gallo-Payet completed her MSc in Biology at the University of Montreal and her PhD in Cellular Biology at the University of Sherbrooke. She is working on her post-doctoral studies, also at the University of Sherbrooke, where she is a professor in the Faculty of Medicine and Health Sciences. Dr. Gallo-Payet holds the Canada Research Chair in Endocrinology of the Adrenal Gland and is a member of the Canadian Academy of Health Sciences. In October 2009, she received the Award of Excellence for Research at the University of Sherbrooke.

Lifestyle-related disorders such as hypertension, obesity and type 2 diabetes are risk factors for Alzheimer's disease. Dr. Gallo-Payet and her team have found that angiotensin II may have protective effects against the progression of the disease. Recent findings have shown that angiotensin receptor blockers, normally used to control high blood pressure, reduce the learning and memory deficits associated with Alzheimer's disease. They have developed a new molecule, C21/M24, that can selectively reproduce the beneficial effects of angiotensin II. Dr. Gallo-Payet's current study aims to establish whether treatment with C21/M24 can improve cognitive performance in mouse models mimicking Alzheimer's disease. Animals will also be submitted to a high fat/high fructose diet to determine any impact on cognitive impairments. C21/M24 may thus represent a new therapeutic avenue to prevent cognitive deficits in Alzheimer's disease and other neurological disorders.

"I feel privileged to be amongst the few students who have the chance to get funding from the ASRP. Academic study requires a lot of time and devotion, and this funding provides me the support I need to pursue my career and, most of all, to enjoy what I am doing."

Geneviève Gaudreau

Doctoral award
Quality of Life
$61,590.00
Laval University, QC

How irony comprehension is affected in those with mild cognitive impairment

Geneviève Gaudreau became interested in Alzheimer's research during her first year of graduate studies, when she heard Dr. Carol Hudon speak about his research projects. Geneviève completed her undergraduate studies in psychology at Laval University in Quebec City, where she is currently in her fourth year of her PhD in psychology, under the supervision of Drs. Carol Hudon and Laura Monetta.

Geneviève's aunt recently passed away from Alzheimer's disease and this, along with her experiences in research, has allowed her to witness the impact of the disease on both people living with Alzheimer's and their caregivers. She brings these sentiments to her academic study and her research projects.

Geneviève became interested specifically in the prodromal (early) phase of the disease and the potential that studying this phase has for diminishing the incidence of Alzheimer's. Study of the prodromal symptoms of Alzheimer's disease is an effective way to gain a better understanding of its evolution. Individuals with mild cognitive impairment (MCI) have greater cognitive difficulties (e.g. memory loss) than healthy individuals of the same age; however, they are not functionaly impaired. Geneviève and her colleagues are seeking to better characterize MCI, particularly the non-literal language area of cognition (the capacity to understand language in its context, e.g. jokes, irony or metaphors). The project will evaluate irony comprehension as well as the impact of depressive symptoms on irony comprehension.

Because it targets the prodromal phase of the disease specifically, this research will not directly impact persons currently living with Alzheimer's disease; however, Geneviève is hopeful that it will help identify those at risk, thereby leading to more prompt treatment and a better quality of life.

"Without earlier funding by ASRP, we would not have been able to keep one of our primary research lines open at all, during a time of reduced research funding. The current grant from ASRP has allowed us to make a breakthrough in the relationship between diabetes, insulin, and brain health."

Gordon Glazner

Alzheimer Society of Manitoba
Research grant
Biomedical
$150,000
University of Manitoba, MB

A breakthrough in the relationship between diabetes, insulin, and brain health

Dr. Gordon Glazner's interest in Alzheimer research began during his time in college when his grandfather was diagnosed with the disease that eventually took his life. Originally planning to go to medical school, Dr. Glazner entered the medical research field and is currently an Associate Professor in the Department of Pharmacology and Therapeutics at the University of Manitoba.

Alzheimer's disease is characterized by the accumulation of amyloid plaques, formed primarily from amyloid beta 1-42 peptides. Ab peptides, in the form of individual free molecules, are referred to as monomers (Abm), meaning "one." When these monomers aggregate, they form larger molecules called Ab oligomers (Abo), oligo meaning "many." It has become apparent that it is Abo, and not Abm, that are the more toxic form. When added to neurons grown in cell culture, Abo cause damage and death, similar to that seen in the brains of human Alzheimer patients. Abm, on the other hand, have sometimes been reported to be protective of cultured neurons. Therefore, it may be that Abm are produced as a protective substance, but become toxic when they aggregate. In recent reports, and in Dr. Glazner's preliminary studies, Abm appears to exert a relatively potent protective response by activating the brain insulin pathway. In diabetics, this brain insulin pathway is disrupted. So too with Alzheimer patients, leading many to call Alzheimer's disease, "type 3 diabetes."

Dr. Glazner and his team plan to test whether Abm produced in the brain can stimulate the insulin pathway. They have discovered that one of the proteins that plays a role in the development of Alzheimer's disease can also stimulate the insulin pathway, moving rapidly to find a way to exploit this relationship. They want to develop a clinical treatment that, by increasing the insulin "pro-health" effect, will protect the brain from dementia. In addition, this new pathway may explain how diet and exercise specifically protects people from dementia in addition to the general health effects of healthy lifestyle. Dr. Glazner and his team may be able to develop regimens of clinical treatments, diet and activity that together would be maximally protective.

"The ASRP Young Investigator award had an important impact on my career as a new researcher in a fast-growing but still mostly unexplored area of research in Canada."

Sébastien Hébert

Alzheimer Society of Saskatchewan
Young Investigator grant
Biomedical
$180,000
Laval University, QC

Do mutations involving miRNAs affect the risk of developing Alzheimer's?

Born in 1974 in Montreal, Quebec, Sébastien Hébert completed his PhD in molecular and cellular biology at Laval University in 2004, under the supervision of Dr. Georges Lévesque. His post-doctoral training, between 2005 and 2009 in Leuven, Belgium, was under the supervision of Professor Bart De Strooper. Since 2009, he has been assistant professor at Laval University in the Faculty of Medicine, Department of Psychiatry and Neurosciences. Dr. Hébert's personal experience with Alzheimer's disease came with the diagnosis and eventual death of his great-grandmother, which left an indelible impression on him.

Dr. Hébert's laboratory is focused on the involvement of miRNAs in Alzheimer's disease development. miRNAs regulate protein levels in the cell, play a role in brain function and memory, and are altered in patients with Alzheimer's disease. A number of Alzheimer-specific mutations located in two genes critically involved in amyloid-beta peptides, and which accumulate in the brains of Alzheimer's patients may be toxic for neurons. Interestingly, changes in one of these cause genetic (hereditary) Alzheimer's disease, while the other is often observed in sporadic (more common) forms of the disease.

Dr. Hébert's goal is to determine whether these mutations contribute significantly to the risk of developing Alzheimer's disease. This also opens the door for identifying other mutations located in disease-related genes. This line of research provides, for the first time, an in-depth analysis of the functional role of 3'UTR polymorphisms in genes associated with neurodegenerative diseases. In this way, anticipated data will help focus future association studies on identifying risk factors for Alzheimer's disease, and miRNA function may turn out to be a major cause of sporadic Alzheimer's disease, which accounts for more than 99% of all cases.

"This funding has allowed me to attend conferences that are specifically related to neurodegeneration and Alzheimer's disease. Hearing about new research, and interacting with other researchers in the field, has been very helpful in moving my own research forward."

Michael Jones

Doctoral award
Biomedical
$61,590
Simon Fraser University, BC

Can dysregulated metals be a target in developing therapeutics?

While Michael Jones has no direct family connection to Alzheimer's disease, through his graduate study work at Simon Fraser University he has become acutely aware of the burden of the disease on the health-care system, and on the families who care for people with the disease. This recognition continues to motivate him toward developing a treatment. Michael was born in Charlottetown, Prince Edward Island, where he completed his BSc with honours in Chemistry at the University of Prince Edward Island. He is currently in his second year of graduate studies at Simon Fraser University, British Columbia.

Michael's keen interest in medicinal research, and his interest in applying his undergraduate degree to medicine, led him to the laboratory of Dr. Tim Storr in the Department of Chemistry at Simon Fraser University. Working with Dr. Storr and in collaboration with Dr. Ahmad Salehi at the Stanford University Medical School, has allowed Michael to investigate the role metal ions play in Alzheimer's disease.

Michael is part of a team hoping to determine whether dysregulated metals can be a target in developing therapeutics for Alzheimer's disease. The increased incidence of the disease, and the lack of effective treatment strategies, underscore the pressing need for research into the causes, and development of new therapeutic options. Michael is currently investigating amyloid-beta plaque deposits in the brain as sites that can be used for the generation of diagnostic and/or therapeutic molecules. He is developing a new class of therapeutics designed to sequester metal ions specifically associated with Alzheimer's disease. Recognizing that much work needs to be done, Michael anticipates that this research will provide a mechanism to detect and treat Alzheimer's disease.

"At a time when research grants from national research agencies are very competitive, particularly for young investigators beginning their career, funding from ASRP has acted as important leverage for launching my career, first by providing me the opportunity to carry out my research program and second by allowing me to establish myself as an expert in this particular field of research."

Sven Joubert

Research grant
Quality of Life
$112,551
University of Montreal, QC

What can semantic impairments tell us about early stages of the disease?

Dr. Sven Joubert graduated from Université de Montréal with a PhD in Neuropsychology. He carried out his post-doctoral fellowship in the Neurology and Neuropsychology unit at the Timone Hospital in Marseille, France, under the supervision of Dr. Michel Poncet. Dr. Joubert is currently a junior scientist in the Centre de recherche de l'Institut universitaire de gériatrie de Montréal (CRIUGM) and professor in the Psychology Department at Université de Montréal.

Dr. Joubert has seen first-hand the impact of Alzheimer's disease, and appreciates on a personal level its effects on people with the disease, their families and caregivers. Dr. Joubert's clinical work in his post-doctoral fellowship led him to deal with the cognitive and psychological changes of the disease. This experience inspired him to devote his research to the study of memory impairment in Alzheimer's disease and its associated underlying brain changes. His research may contribute to the development of new targeted pharmacological treatments and cognitive intervention programs aimed at delaying cognitive decline.

Recent evidence suggests that, in addition to difficulties in learning and remembering new information, semantic memory – general knowledge about the world and comprehension of our environment – may also be affected early in the disease. Thus, semantic impairments may be a useful diagnostic marker of preclinical Alzheimer's disease. The purpose of Dr. Joubert's research is to gain a more in-depth understanding of the nature of the semantic breakdown and the associated changes in the brain in early stages of the disease. By identifying early clinical markers, Dr. Joubert's team may contribute to the development of early therapeutic perspectives, which may help reduce the severity and progression of memory deficits and reduce their impact on people with Alzheimer's disease and their caregivers.

"The financial support of the Alzheimer Society has allowed me to participate in national and international scientific meetings, which are the best opportunities to build a knowledge network with colleagues from all around the country and the world."

Carl Julien

Alzheimer Society of Saskatchewan
Post-doctoral award
Biomedical
$90,000
Laval Unversity, Quebec

Effect of type 2 diabetes on the in vivo pathogenesis of tau

Dr. Carl Julien completed his bachelor of science in microbiology at Laval University. He continued with his graduate work at Laval under the supervision of Dr. Frédéric Calon—the first of Dr. Calon's graduate students. Dr. Julien was supported by the Fond de soutien à la recherche from the faculty of pharmacy at Laval University, the Fonds de la recherche en santé du Québec and the Alzheimer Society. He is currently engaged in his post-doctoral training with Dr. Emmanuel Planel, focusing on type 2 diabetes and tau pathology.

The multiplicity of factors that could modulate the onset and development of Alzheimer's disease, as well as the lack of a cure to date, represented for Dr. Julien a tremendous scientific challenge and a real personal motivation. A treatment that could slow down the progression from five to 10 years would have a colossal socioeconomic impact.

Diabetes mellitus is one of the environmental factors that may be associated with an increased risk of Alzheimer's disease. However, the consequences of diabetes mellitus remain unknown. The challenge is therefore to better understand the mechanisms of Alzheimer's pathology and how they are affected by diabetes. In this context, understanding the effects of diabetes on tau pathogenesis is important and relevant, since tau pathology shows a strong relationship to dementia in Alzheimer's disease, and to memory loss in normal aging and mild cognitive impairment. Dr. Julien and his colleagues hope to assist in the development of treatments or lifestyle strategies designed to check the progression of the disease, and thereby positively impact the lives of both those diagnosed with Alzheimer's disease and their caregivers.

"The funding I have received from the Alzheimer Society is essential since it has come at a critical time of starting up my own lab and has opened the door for me and my team to begin new studies in the fight against Alzheimer's disease."

Diane Lagace

Young Investigator grant
Biomedical
$225,000
University of Ottawa, ON

Can newly born cells in adult brains form new neurons to help recovery from Alzheimer's?

Dr. Diane (Bird) Lagace was born and raised in Toronto. She completed her BSc in Psychology at McMaster University and went on to graduate studies at Dalhousie University, where she earned an MSc and PhD in the Department of Pharmacology. Dr. Lagace then trained as a Canadian Institute of Health Research – funded post-doctoral fellow with Dr. Amelia Eisch at the University of Texas Southwestern Medical Center. She is currently an assistant professor at the University of Ottawa in the Department of Cellular and Molecular Medicine.

Dr. Lagace first became interested in Alzheimer's research during her graduate studies, when she witnessed the strength of those battling the disease. At the University of Ottawa, she collaborated with Dr. Jie Shen, a world-renowned expert on Alzheimer's disease. Dr. Lagace continues to be fascinated by the study of the brain, in particular, how newly born cells in the adult brain form functionally new neurons that could aid in the recovery from Alzheimer's disease.

In spite of the lack of currently available treatment to reverse the loss of neurons, there is new hope for such treatments, since the discovery that the adult brain creates new neurons through adult neurogenesis. The new neurons are important for learning and memory, suggesting that enhancing neurogenesis could aid in restoring cognitive function. To harness the therapeutic potential of these cells, Dr. Lagace and her team are attempting to determine how to enhance the birth and survival of new neurons. Presenilins have been identified as one of the main causes of early-onset familial Alzheimer's disease, and also as playing an essential role in the development of neurons. They hope to identify the cells that could be potential clinical therapeutic targets in the battle to treat or delay onset of Alzheimer's disease.

"My Alzheimer Society doctoral fellowship has given me confidence and allowed for Dr. Paudel to put money toward my research techniques and methodology that would not have been possible otherwise."

Ryen MacDonald

Doctoral award
Biomedical
$61,590
McGill University, QC

Unravelling neurofibrillary tangles

Ryen MacDonald's interest in Alzheimer's disease and other dementias began when she volunteered with elderly people during high school in Easthampton, Massachusetts. She developed a special relationship with these people, many of whom had Alzheimer's disease. During her undergraduate studies at Northeastern University, this interest was rekindled when she majored in Behavioural Neuroscience. Her fascination with the complexity of the brain and the mechanisms underlying neurodegeneration led her to focus her studies on neurodegenerative disease. Ryen embarked on her graduate studies at McGill University in 2009, where she is currently engaged in doctoral research under the supervision of Dr. Hemant Paudel, at the Lady Davis Institute for Medical Research at the Jewish General Hospital in Montreal.

Early Growth Response 1 (Egr-1) is a gene product that binds to specific DNA sequences and controls the conversion, or transcription, of DNA to mRNA—a class of RNA molecules. Egr-1 is a transcription factor that regulates multiple genes involved in several physiological processes, many of which have been implicated in Alzheimer's disease. Importantly, an increase in Egr-1 levels in the brain is correlated with the progression of the disease. Ryen's research team recently showed that increased Egr-1 causes an increase in the number of phosphates on the brain's tau protein, making tau toxic and helping convert it to neurofibrillary tangles (NFTs) in the brain. Ryen and her team are investigating the role of Egr-1 in the transcriptional processes of other genes involved in Alzheimer's disease. They hope to identify some of these genes and the mechanisms that regulate them. This project represents an important starting point for new research and for generating hope for the future of Alzheimer's disease therapeutics.

"Funding from ASRP has made a huge impact on my career. In addition to providing financial support so that I can make my research my top priority, it is wonderful to know that my research is part of a broader collective of researchers working to find a cure."

Rachel Mixer

Doctoral award
Biomedical
$61,590
University of Western Ontario, ON

Effect of aging, Alzheimer's disease and related neurological disorders on brain cells

Born and raised in Guelph, Ontario, Rachel Mixer completed her undergraduate degree in biomedical sciences at the University of Guelph, where she went on to earn her master's in biomedical science, studying gene expression as it relates to Alzheimer's disease. Rachel is currently in her third year of a PhD program at the University of Western Ontario, in the department of physiology and pharmacology.

Witnessing her grandmother suffering from Parkinson's disease and already interested in biological sciences, Rachel decided to pursue research in neurodegenerative diseases. She chose Alzheimer's research after recognizing the growing need for advancement in the field. Rachel is motivated by the thought that what she and her colleagues discover might help prevent or delay the progression of Alzheimer's disease, and it is this belief that carries her through her research.

Alzheimer's disease results in a loss of cholinergic neurons, the neurons in the brain responsible for personality, memory, and attentional processing, among other functions. Cholinergic neurons use the neurotransmitter acetylcholine, produced by the enzyme choline acetyltransferase (ChAT), to transmit signals. Rachel and her colleagues have discovered that ChAT seems to be involved in regulating gene expression, and that the amount of ChAT found within neurons, as well as its location, appears to change with age and with the progression of mild cognitive impairment and Alzheimer's disease. Rachel's research focuses on understanding how ChAT appears to be regulated within the cell, specifically by the "small ubiquitin-like modifier" (SUMO). In this way, Rachel and her colleagues hope to gain a better understanding of how Alzheimer's disease develops, in order to prevent it in the future, and/or slow the progression of the disease in those already affected.

"With the ASRP scholarship, I now feel myself a part of the big family dedicated to research in Alzheimer's disease. The sense of pride as well as responsibility from this recognition is a constant motivation for me to further my career as a neuroscientist."

Dhananjay Namjoshi

Doctoral award
Biomedical
$61,590
University of British Columbia, BC

Exploring connections between brain injuries and dementia

Dhananjay Namjoshi grew up in Mumbai, India, where he completed his bachelor's and masters' degrees in Pharmaceutical Sciences at the University of Mumbai. He earned another master's degree at the University of British Columbia, where he is currently working toward his PhD under the supervision of Dr. Cheryl Wellington.

Dhananjay was intrigued by the complex nature of Alzheimer's disease pathology and the challenge associated with discovering therapeutic strategies. He was particularly interested in the integration of the pathology and pharmacology of traumatic brain injury (TBI) and Alzheimer's disease. Although the two are different, Dhananjay and his colleagues hope to prove that they share some common pathological mechanisms, thus opening up the possibility of investigating common pharmacological treatments.

Many studies suggest that brain injuries substantially increase the risk of developing dementia, particularly Alzheimer's disease, in later life. How this occurs is not fully understood; we do know that traumatized brains produce large quantities of amyloid beta peptides and often show deposits similar to those found in the brains of Alzheimer's patients. Dhananjay is studying whether eliminating the amyloid beta peptides more quickly improves immediate recovery and decreases the risk of cognitive dysfunction.

The brain is the most cholesterol-rich organ in the body and has its own special cholesterol handling system. Many studies have shown that this system is crucial in preventing the development of amyloid plaques. Dhananjay and his colleagues believe that this system is adversly affected following TBI and hope to identify the therapeutic use of drugs toward regulating it, a process Dhananjay describes as "greasing the wheels" for the removal of amyloid plaques immediately after brain injury, to prevent the onset of Alzheimer's disease later.

"Without this funding I would be forced to supplement my income with other jobs, and as a result, the scope of the research would be significantly reduced and the high level of detail used in behavioural analysis would not be possible."

Timothy O'Leary

Doctoral award
Biomedical
$41,060
Dalhousie University, NS

Which areas of the brain determine cognitive impairment?

Timothy O'Leary completed his BSc and MSc in Experimental Psychology at Dalhousie University, where he is currently completing his PhD in Psychology/Neuroscience under the supervision of Dr. Richard Brown. He became involved in Alzheimer's research as part of his doctoral studies. Using his skills and knowledge in behavioural analysis, Timothy is examining age-related changes in behaviour and neuropathology in the 5XFAD mouse model of Alzheimer's disease. How certain factors interact to influence the development of the impairment, as well as the correlation between behavioural changes and changes in the brain, drive him to continue to investigate potential areas in the brain that determine cognitive impairment.

Transgenic mice show many of the brain pathologies and cognitive impairments observed in humans with the disease. They rapidly develop amyloid plaques and show degeneration within the brain. The focus of Timothy's research is to characterize the cognitive, sensorimotor and neural phenotypes of the 5XFAD mouse to determine the onset and rate of cognitive decline and neurodegeneration. Timothy and his colleagues will also examine how sex differences and background strain genetic factors influence the expression of the Alzheimer-related changes in the mice. He is completing research in collaboration with Dr. Donald Weaver that will determine the ability of drugs to delay the onset and rate of cognitive decline and neurodegeneration in the mouse model of Alzheimer's disease.

Timothy and his colleagues are hopeful that the results of this study will lead to research that can assess the efficacy of novel therapeutic drugs in ameliorating the Alzheimer's-related symptoms in this mouse model. These drugs may eventually be used to slow the progression of the disease, and increase the quality of life of people living with it.

"Graduate students are required to obtain their own funding to support their research, and the market for federal and private funding is highly competitive. Funding from the ASRP has made a huge impact on my career as a doctoral student."

Terri Petkau

Alzheimer Society of British Columbia Doctoral award
Biomedical
$69,090
University of British Columbia, BC

Contributing a knowledge base to clinical trials – eventually finding more effective treatments

Terri Petkau grew up in Prince George, British Columbia. She completed her BSc in Zoology at the University of Calgary and, after travelling and working abroad, moved to Vancouver to pursue a career in science and research. Terri is currently a doctoral candidate through the Centre for Molecular Medicine and Therapeutics at the University of British Columbia, under the supervision of Dr. Blair Leavitt.

Although Terri did not set out to study dementia or participate in research related to Alzheimer's disease, following her undergraduate studies, she found herself working in a lab focused on the study of neurodegenerative disorders. She is now immersed in a field that she finds both interesting and important.

Frontotemporal dementia (FTD) causes profound changes in behaviour, personality, and language, and ultimately leads to death. Mutations in a gene called progranulin were discovered as a common cause of familial FTD. Terri and her team have created a mouse model of the human disease, which is necessary for performing pre-clinical therapeutic trials, and, ultimately, new treatments for patients. Terri's research aims to characterize progranulin-deficient mice, evaluating factors such as anxiety, motor coordination, depression, social interactions, and activity levels. The underlying structure and functioning of the brain will be evaluated to determine whether cell loss and other hallmarks of FTD in humans are present in the mice.

Recent evidence suggests that progranulin function may be involved in Alzheimer's disease as well, so this information is critical for the improved treatment of human dementia. The hope is that new drug targets can be identified quickly and targeted efficiently in an animal model, work that will form the basis for new clinical trials and, hopefully, effective treatments for patients.

"Funding from the ASRP has allowed me to support and train really terrific clinical research students, who will be the next generation of researchers in Alzheimer's disease."

Natalie Phillips

Research grant
Quality of Life
$118,630.00
Concordia University, QC

What is the link between executive dysfunction and brain disconnection?

Natalie Phillips has a large extended family that fostered her interest in aging and led to her research in Alzheimer's disease. Natalie continues to find her research both rewarding and informative. Dr. Phillips completed her university training at Dalhousie University, including a doctorate in clinical psychology with a specialization in neuropsychology. After finishing her clinical training in neuropsychology at the Foothills Hospital in Calgary, she joined the Concordia University faculty, where she currently teaches in the areas of neuropsychological assessment and human neuropsychology. She has two nationally funded research laboratories, one at the Loyola campus of Concordia University and the other in the Department of Clinical Neurosciences at the Jewish General Hospital in Montreal.

Alzheimer's disease affects many aspects of brain functioning, including memory, language, and the performance of complex tasks, or executive functioning. Executive functions decline in early and even preclinical Alzheimer's disease, but the underlying cause of this deficit remains unclear. Identifying how executive functions decline, as well as the brain mechanisms associated with this early decline, may help in early diagnosis and treatment. Thus, it is important to study mild cognitive impairment (MCI), which is often a transitional stage between normal aging and Alzheimer's disease.

Dr. Phillips and her team are seeking to understand the relationship between executive dysfunction and brain disconnection in Alzheimer's disease and MCI, using electroencephalography (EEG) coherence, with the hope that it can be used to predict conversion to dementia in MCI patients. They also seek to develop more sensitive and reliable measures to determine who is going to develop Alzheimer's disease when people first come to her clinic with MCI. And they will use EEG coherence as an objective way of measuring improvement after cognitive training.

"I knew how to develop technology as an engineer, but with this award I am learning how to evaluate the factors that will lead to better adoption of new technology."

Lou Pino

Post-doctoral award
Quality of Life
$81,000
University of Western Ontario, ON

Where health care and technology intersect – creating a new electronic memory test

Lou Pino's grandmother had dementia, and his father has mild Parkinson's dementia; however it is through his post-doctoral work at the Ivey Centre for Health Innovation and Leadership that he has immersed himself in research in neurodegenerative diseases.

Lou completed his BASc in Electrical Engineering at the University of Waterloo and his MEng at McGill University. He holds a PhD in Systems Design Engineering from the University of Waterloo. Lou has done post-doctoral work with the Schulich Medical School at the University of Western Ontario and his current research at the Ivey Centre is under the supervision of Drs. Anne Snowdon and Vladimir Hachinski. In addition to his academic accomplishments, Lou has twenty years of engineering research and product development with Bell Canada and Nortel Networks.

The partnership between health care and engineering is what Lou finds the most interesting aspect of his work. He believes that technology should be moulded to the needs of patients and clinicians, and that these stakeholders should give their input at the design stage so that the technology is more likely used.

Lou and his team are creating a new electronic version of a memory test that will be easy to use, be accessible to a larger population, help doctors measure memory more easily, and make it possible to diagnose memory problems sooner. Early cognitive screening offers the potential to detect very early changes in brain health that may be sensitive to early, preventive treatment such as blood pressure management through exercise, diet and medication. Early detection can mean better quality of life for patients and, in the case of vascular dementia, may result in treatment that slows its onset.

"Funding from ASRP has opened to me an excellent network of connections and new opportunities to meet administrators and members of the Alzheimer Societies. In particular, meeting the many dedicated volunteers and family members at this year's Annual General Meeting inspired me to become more involved with the Alzheimer Society and to take on more of an advocacy role. As the tide continues to rise, it will be increasingly important that students and researchers help to raise awareness of the disease."

Jocelyn Poock

Doctoral award
Quality of Life
$20,530
University of Saskatchewan, SK

Steady as she goes!

Jocelyn Poock saw first-hand the impact of Alzheimer's disease on families during her time at the Rural and Remote Memory Clinic at the University of Saskatchewan. While completing her honours thesis, Jocelyn examined the suggestion that gait impairments were becoming important diagnostic criteria for the disease. Collaborating with a physiotherapist, she investigated divided attention in Alzheimer's disease and normal aging. As a graduate student, she has extended this to further understand the relationship between higher brain functions and walking, in individuals affected by Alzheimer's disease.

Jocelyn received her BA from the University of Saskatchewan, prior to enrolling in the clinical program under the supervision of Dr. Margaret Crossley. She is now a fifth-year doctoral student in the Graduate Program in Clinical Psychology. Jocelyn will move to Regina this fall to complete her pre-doctoral internship with the Regina Qu'Appelle Health Region.

Investigating the relationship between gait and higher brain functions in Alzheimer's disease is a relatively recent area of research. The disease is understood to primarily affect cognition; however, it appears that gait abnormalities are often observed in individuals with early onset Alzheimer's disease. Similarly, studies have suggested that intact cognitive functioning, specifically divided attention, is necessary for normal, adequate control of walking and other motor functions.

Jocelyn and her colleagues will use "talking while walking" dual-task methodology, clinical gait assessment, and other neuropsychological measures to examine the links between gait and cognition, while also exploring the associations between gait impairment and falls, which are more frequent in individuals with Alzheimer's disease than in healthy normal older adults. They hope their research will provide important information concerning the risk assessment and possible prevention of falls for older adults with cognitive impairment.

"The funding from ASC has provided an important opportunity to assess and guide physician decision-making in this difficult area."

Mark Rapoport

Research grant
Quality of Life
$78,870
University of Toronto, ON

Safe driving guidelines

Mark Rapoport's work with people with Alzheimer's disease and other dementias is driven largely by his capacity as a geriatric neuropsychiatrist at the University of Toronto. Dr. Rapoport became interested in physicians' ability to assess driving competency in people with Alzheimer's disease as well as clinical experiences with drivers who become unsafe due to neuropsychiatric illnesses.

Dr. Rapoport is an associate professor in the Department of Psychiatry at the University of Toronto, and a clinical scientist at Sunnybrook Health Sciences Centre. He is also a member of the Canadian Driving Research Initiative for Vehicular Safety in the Elderly (CanDRIVE). He received his medical degree from McMaster University in 1995, and completed his residency and fellowship in psychiatry at the University of Toronto. He has been a board member of the Canadian Academy of Geriatric Psychiatry (CAGP) since 2006.

Drivers with moderate or severe dementia are clearly dangerous on the road, and physicians must report them to the Ministry of Transportation. Determining the driving safety of patients with mild Alzheimer's disease is more difficult. Many physicians are reluctant to report them because it negatively affects their relationship and potentially robs patients of their autonomy; however, their driving can pose substantial risk to society. Dr. Rapoport's research aims to establish consensus among experts in dementia on how to apply the legislation with adults with mild dementia. Twenty such expert physicians will be convened to make judgments on case scenarios around reporting such drivers. Guidelines will be published for use by Canadian physicians. These guidelines will make it easier for physicians to help ensure that safe drivers continue driving and potentially unsafe drivers know the risks to themselves and others.

"I am thankful for the funding received from the Alzheimer Society. It has enabled me to conduct this research on person-centred mealtime care and to continue developing my skills as a researcher."

Holly Reimer

Doctoral award co-funded by Canadian Dementia Knowledge Translation Network (CDKTN)
Quality of Life
$10,265
University of Guelph , ON

More enjoyment at mealtimes

Holly Reimer's connection to Alzheimer's disease began when she worked in a small personal care home during her studies to become a registered dietitian. Her interest continued into her graduate studies at the University of Guelph, where she was a research assistant on the Eating Together Study, also partly funded by Alzheimer Society Canada. Holly is originally from Lemberg, Saskatchewan, and has been living and studying in Guelph, Ontario, for the past five years. She is a PhD candidate in the Department of Family Relations and Applied Nutrition at the University of Guelph, under the supervision of Dr. Heather Keller.

Poor food intake is a common problem in long-term care, especially among residents with Alzheimer's disease and related dementias. Dietary strategies need to be augmented by person-centred mealtime care practices to improve residents' mealtime experiences and foster good nutrition. This involves providing residents with food choices and preferences, supporting their independence, showing respect, and promoting the social side of eating. The objectives of Holly's research are to describe current implementation of person-centred mealtime care practices, explain what influences this implementation, and identify practical steps for improvement. The needs that emerged from her research include knowing the residents, having a mental toolbox of strategies, having flexibility to optimize care, building a strong team, and working together.

Holly hopes this research will help improve the quality of mealtime care and thereby quality of life for residents of long-term cares homes living with Alzheimer's disease and other dementias. She hopes it will also be used to help staff in long-term care homes provide person-centred mealtime care, by developing tools for in-service training and providing recommendations to administrators for better planned mealtime experiences.

"Having never had a close family member diagnosed with the disease, experience is vital for helping me gain a better understanding of Alzheimer's disease on a personal level. The funds allowed me to attend the 26th International Conference on Alzheimer Disease in Toronto, and I volunteer weekly at an art therapy group for the Alzheimer Society of Montreal. In turn, I have a much greater sense of responsibility and greater motivation to pursue this research."

Carlos Roncero

Doctoral award
Quality of life
$41,060
Concordia University, QC

Help me understand …

Carlos Roncero was born and raised in Cambridge, Ontario, to parents who had come to Canada from Spain. This bilingual upbringing gave Carlos an appreciation for language not merely as a means of communication, but rather as a complex brain system that draws on a diverse set of mental capacities to function properly. Consequently, Carlos focused his early research on language, specifically metaphors.

He obtained his BSc (Honours) from the University of Toronto, where he studied Psychology, Linguistics, and French. He is currently completing his doctoral studies at Concordia University, under the supervision of Dr. Roberto de Almeida. His initial foray into Alzheimer's research came when Dr. de Almeida suggested that Carlos explore Alzheimer's disease as a means of advancing his research beyond its theoretical focus.

Although it is well known that individuals with Alzheimer's disease have difficulty understanding the meaning of metaphors, the nature of these difficulties is not well understood. Carlos and his colleagues are examining the brain waves produced by people with Alzheimer's disease while reading metaphors. He believes that this will help identify whether the observed deficit in figurative language comprehension originates from difficulties with reasoning, abstract thinking, or mental control.

Thus far, the research suggests that individuals with Alzheimer's disease are better at interpreting similes ("lawyers are like sharks") than metaphors ("lawyers are sharks"). Interestingly, only the word "like" differentiates these sentences, and yet there is a measurable difference in comprehension, which suggests that even minor changes in wording can help individuals with Alzheimer's disease understand language. Carlos believes that his research project may generate further research dedicated to understanding the complex nature of figurative language comprehension and its role in Alzheimer's disease.

"Funding from the ASRP has allowed me to pursue my post-doctoral training in one of the best globally recognized laboratories in the field of learning and memory. It has therefore given me the opportunity to gain the necessary skills to become a productive independent investigator."

Derya Sargin

Post-doctoral award
Biomedical
$81,000
University of Toronto, ON

How does TORC1 function in the brain – how can we improve that to reduce memory loss?

Derya Sargin has been interested in memory and its disorders throughout her life in research. This has led her to focus on the most common chronic memory disorder, Alzheimer's disease. Derya's primary research interest is to understand the molecular mechanisms of memory in the healthy brain in order to develop novel treatment approaches for the diseased brain. She hopes to one day provide a cure for the most devastating neurological disorders.

Derya earned her BSc in Molecular Biology and Genetics from Bogazici University in Istanbul, Turkey. She completed her doctoral studies in Neurosciences in the Division of Clinical Neuroscience at the Max Planck Institute of Experimental Medicine, under the supervision of Dr. Hannelore Ehrenreich. She is currently engaged in post-doctoral study in the Department of Neurosciences & Mental Health at the Hospital for Sick Children, under the supervision of Dr. Sheena Josselyn.

The precise cause of brain degeneration is unknown; however, evidence suggests that an overproduction/accumulation of βamyloid (Aβ plays a major role. Memory impairment is the core feature of Alzheimer's disease and begins long before the onset of clear brain pathology. This suggests that increased Aβ production in the early stages may disrupt molecular and cellular processes that mediate normal memory formation. Derya and her team are investigating the role of TORC1, the brain-specific isoform, in memory. The results of these experiments might offer novel treatment strategies based on enhancing TORC1 function. Memory loss in Alzheimer's disease exerts a substantial burden on patients and their families. Treatment that reduces cognitive decline will increase their quality of life and reduce their dependence on others. Derya and her team hope to open the way for the development of such effective treatments.

"The funding I have received from the ASRP has allowed me to start up a very productive lab soon after beginning my independent research career."

Vanessa Taler

Young Investigator grant
Quality of Life
$159,532
University of Montreal, QC

Development and testing of story telling tools to measure memory

Vanessa Taler grew up in Auckland, New Zealand. She completed her undergraduate degree in Linguistics at the University of Auckland and then moved to Montreal to complete a master's in the same discipline at McGill University. She went on to do her PhD in Biomedical Sciences at the Université de Montréal, followed by post-doctoral fellowships at the Lady Davis Institute (funded by the ASRP) and in Indiana. Vanessa is an assistant professor in the School of Psychology at the University of Ottawa, with a cross-appointment at the Élisabeth Bruyère Research Institute.

Vanessa began working with people with Alzheimer's disease when she started her doctoral work in 1999. Through this work, she made a commitment to further Alzheimer's research and make a real difference in people's lives. The goal of her research study is to develop a set of story materials as measures of memory function in adults with memory impairment. Participants listen to short passages and then recall them, immediately and 20 minutes later. Participants include young and older adults with either mild cognitive impairment (MCI) or Alzheimer's disease. Vanessa and her team have developed 12 stories that are equivalent in terms of the amount of material that healthy adults recall under both conditions. This research will assist clinical neuropsychologists in their assessments of patients with memory disorders, by providing a set of normed, equivalent parallel forms for verbal recall.

Vanessa hopes this research will lead to improvements in early diagnosis and staging of MCI and Alzheimer's disease and provide guidance for clinicians in developing and implementing pharmacologic and social interventions. The eventual outcome will be improved quality of life for people with Alzheimer's disease and their caregivers.

"Funding from the ASRP allowed us to be the first in Canada to examine the feasibility of a computerized cognitive assessment tool"

Mary Tierney

Research grant
Quality of Life
$107,928
University of Toronto, ON

Quick and easy tools for family doctors to diagnose early stage Alzheimer's

Mary Tierney became interested in research related to Alzheimer's disease in the early 1980s, when, as a clinical neuropsychologist, she started working with patients with Alzheimer's disease and other dementias. She quickly realized how little was known about the disease, particularly how to diagnose it, distinguish it from other forms of cognitive impairment or recognize the symptoms early in the course of the disease.

Dr. Tierney completed her PhD in Psychology at the University of Windsor. She is currently a professor in Family and Community Medicine at the University of Toronto, a Senior Scientist and Director of the Geriatric Research Unit, and Co-Director of the Primary Care Research Unit at Sunnybrook Health Sciences Centre, as well as a Clinical Neuropsychologist in the Veterans Centre at Sunnybrook.

While family practitioners (FPs) believe that cognitive assessment is important in the primary care setting, there is limited time to complete these assessments. Additionally, many tests lack accuracy for mild cognitive impairment and do not provide a valid indication of performance in different cognitive domains. Long wait times accompany referrals to specialists, so it is essential that FPs have tools to quickly and easily assess their patients' cognitive functioning.

Dr. Tierney and her team are investigating the use of a promising multi-domain computer-administered cognitive test in family medicine. If the results indicate that the battery is feasible and valid, it will have potential for clinical use in family medicine and primary care research. Dr. Tierney and her team hope the assessments will lead to early recognition, thereby allowing FPs to recommend care strategies that compensate for self-care deficits due to cognitive impairment and to prescribe new drugs for mild cognitive impairment, when they become available.

"The ASRP award allows me to work in an ideal environment at the University of Ottawa, supported by high-profile researchers who share their technical expertise, but also help me to design original and worth while research projects."

Renaud Vandenbosch

Post-doctoral award
Biomedical
$81,000
University of Ottawa, ON

Finding ways for the brain to repair itself

Renaud Vandenbosch received his BA in Biomedical Sciences as well as a master's degree in Neuroscience, both from the University of Liège in Belgium. He completed his PhD from the same institution in the Developmental Neurobiology Unit, under the supervision of Drs. Brigitte Malgrange and Shibeshih Belachew. Renaud is currently engaged in his post-doctoral studies in the laboratory of Dr. Ruth Slack at the University of Ottawa.

Renaud became interested in brain-related research, and specifically neurodegenerative diseases, when he saw several of his close relatives affected by age- or disease-related dementia. With the increased life expectancy in western countries, the number of patients suffering from age-related neurodegenerative diseases, including Alzheimer's disease, will increase significantly. In light of this, Renaud is committed to finding ways to cure or slow down the course of these diseases. He is convinced that improving knowledge of the brain's ability to heal itself is of critical importance.

Although we don't yet know what starts the process, we do know that Alzheimer's disease results from damage to neurons. Little by little, the damaging process spreads to the hippocampus, which is essential in forming memories, thereby causing memory deficits. An ideal means of recovery would enable the brain to grow new neurons to replace the damaged or destroyed ones. This might be achieved with the use of stem cells, which can develop in particular regions of the brain like the hippocampus. The result of Renaud's research should be a precisely targeted therapy, restoring capacity in the brain exactly where it has been lost. In this way, people living with Alzheimer's disease could participate in therapy that helps the brain to repair itself.

"Funding from the ASRP has provided a major benefit to my career, enabling me to extend my period of post-doctoral training and integrate my cognitive neuroscience training with my interests in Alzheimer's disease and other age-related neurodegenerative processes."

Susan Vandermorris

Alzheimer Society of BC
Post-doctoral award
Quality of Life
$90,000
University of Toronto, ON

How to help those with mild cognitive impairment continue to function at a practical level

It was when Susan Vandermorris completed her undergraduate studies in Psychology—Behavioural Neuroscience at Yale University that she first became interested in cognitive aging and brain/behaviour relations. She went on to complete an MA and PhD in Clinical Neuropsychology at the University of Victoria. During her graduate studies, Susan participated as a Research Coordinator and Clinical Neuropsychology Practicum Student at the Boston University Alzheimer's Disease Center. She is currently completing a post-doctoral fellowship in Cognitive Neuroscience at the Rotman Research Institute, supported by the ASRP and Alzheimer Society of British Columbia. Susan wants to expand the toolbox available to support and treat individuals and families affected by dementia.

Mild cognitive impairment (MCI) is characterized by the presence of some memory loss and/or other cognitive difficulties not severe enough to interfere with day-to-day functioning; however, individuals with MCI are at increased risk of functional decline. There are often subtle declines in performance of complex daily activities (e.g. cooking, transportation) in MCI. These declines are likely related to declines in the ability to solve everyday problems.

Susan and her colleagues are examining the nature of problem-solving abilities in people with MCI with memory problems, those with executive function (e.g. planning, organization, etc.) problems, and a group of older adults without cognitive impairment. They will investigate the relationship between problem-solving and measures of cognitive functioning, neuroimaging measures of brain integrity, and measures of everyday functioning. The project could guide future research on the development of educational and behavioural interventions that target preservation of functional ability in MCI, and may help delay or prevent the onset of a dementia syndrome associated with Alzheimer's disease.

An electronic version of this report is available at www.alzheimer.ca.

To request copies of this report please contact: research@alzheimer.ca.

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Web: alzheimerns.ca

Alzheimer Society of Prince Edward Island
Toll-free: 1-866-628-2257
Web: www.alzpei.ca

Alzheimer Society of Newfoundland and Labrador, Inc.
Toll-free: 1-877-776-0608
Web: www.alzheimernl.org

The Alzheimer Society is the leading nationwide health charity for people living with Alzheimer's disease and other dementias. Active in more than 150 communities across Canada, the Society

- offers information, support and education programs for people with dementia, their families and caregivers
- funds research to find a cure and improve the care of people with dementia
- promotes public education and awareness of Alzheimer's disease and other dementias to ensure people know where to turn for help
- influences policy and decision-making to address the needs of people with Alzheimer's and their caregivers.

Research: The Key to Better Health Care

Scientific discovery continues to make enormous contributions to Canadian society. Research leads to innovation and in terms of health care, it leads to new medicines and treatments that help Canadians live healthier, longer and more productive lives than ever before.

The Alzheimer Society is an important contributor to Canada's world-renowned scientific community. The Society, its partners and its generous donors have continued to identify research as a priority investment to improve the quality of life for all Canadians living with Alzheimer's disease today, and with the hope that fewer and fewer Canadians will have to live with dementia in the future.

The 50 member companies of Rx&D, Canada's Research-Based Pharmaceutical Companies, share this commitment and this hope for the future. Our members invest $1.5 billion each year to better understand how disease works and how to stop it. This process of discovery is costly and it never moves as quickly as we would like, but it is our collective promise to continue to search for better ways to help Canadians live their highest quality of life.

Our members also work to ensure that Canada remains an active hub of research excellence. One of the ways we do this is by encouraging governments to embrace policy that makes Canada an attractive destination for researchers and research investment. Right now, we're keenly interested in the trade negotiations between Canada and the European Union. We believe that the proposed Comprehensive Economic and Trade Agreement (CETA) provides tremendous opportunity for Canadians and for Canada's life sciences sector. Specifically, we believe that strengthening safeguards on research findings, called Intellectual Property, will lead to more research and more innovative treatments for Canadians. We appreciate the support of the Alzheimer Society of Canada in this work, and for helping spread this important message. For more information about CETA, please visit www.ceta-aecg.ca.

Better, sustainable health care requires us to work together – governments, corporations, and stakeholder groups. As research leads to innovation, ensuring that Canadians have access to the best medicine, at the right time, within an affordable person-centred public health system is critical. Rx&D's members are eager to work with government and stakeholder partners to find the best way forward for Canada and Canadians.

Congratulations to all of the donors, researchers, volunteers and staff who bring the Society's research program to life. This is important work. We celebrate your dedication to research excellence and we are pleased and proud to support this work.

R&D

Canada's Research-Based Pharmaceutical Companies

Les compagnies de recherche pharmaceutique du Canada

President
Rx&D, Canada's Research-Based Pharmaceutical Companies

Do you believe

that Canada can be a world leader in generating jobs and investment in life sciences and the knowledge economy?

To do this, we need Canada to be one of the leading places where more new medicines and vaccines are developed to treat and prevent cancer, diabetes, Alzheimer's, heart disease and other conditions.

We need better tools, including world-class intellectual property protection that can help us turn innovative ideas into the next generation of new life saving or life enhancing medicine. These new cutting edge medicines will also help by reducing surgery, hospital visits and other health costs.

Canada is currently negotiating a comprehensive trade agreement with the European Union (EU) that would put us in the unique position of being the only country in the world to have favoured trading status with both the Europeans and the U.S.

An internationally competitive intellectual protection regime for Canada is part of the discussions. A deal with the EU will preserve and create jobs in life sciences and provide a $12 billion boost to the Canadian economy while increasing our bilateral trade by 20 %.*

By opening the doors to innovation, we improve the quality of life of all Canadians.

www.protecthealthcare.ca

We do.

*http://www.international.gc.ca/media_commerce/comm/news-communiques/2009/386908.aspx?lang=eng

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