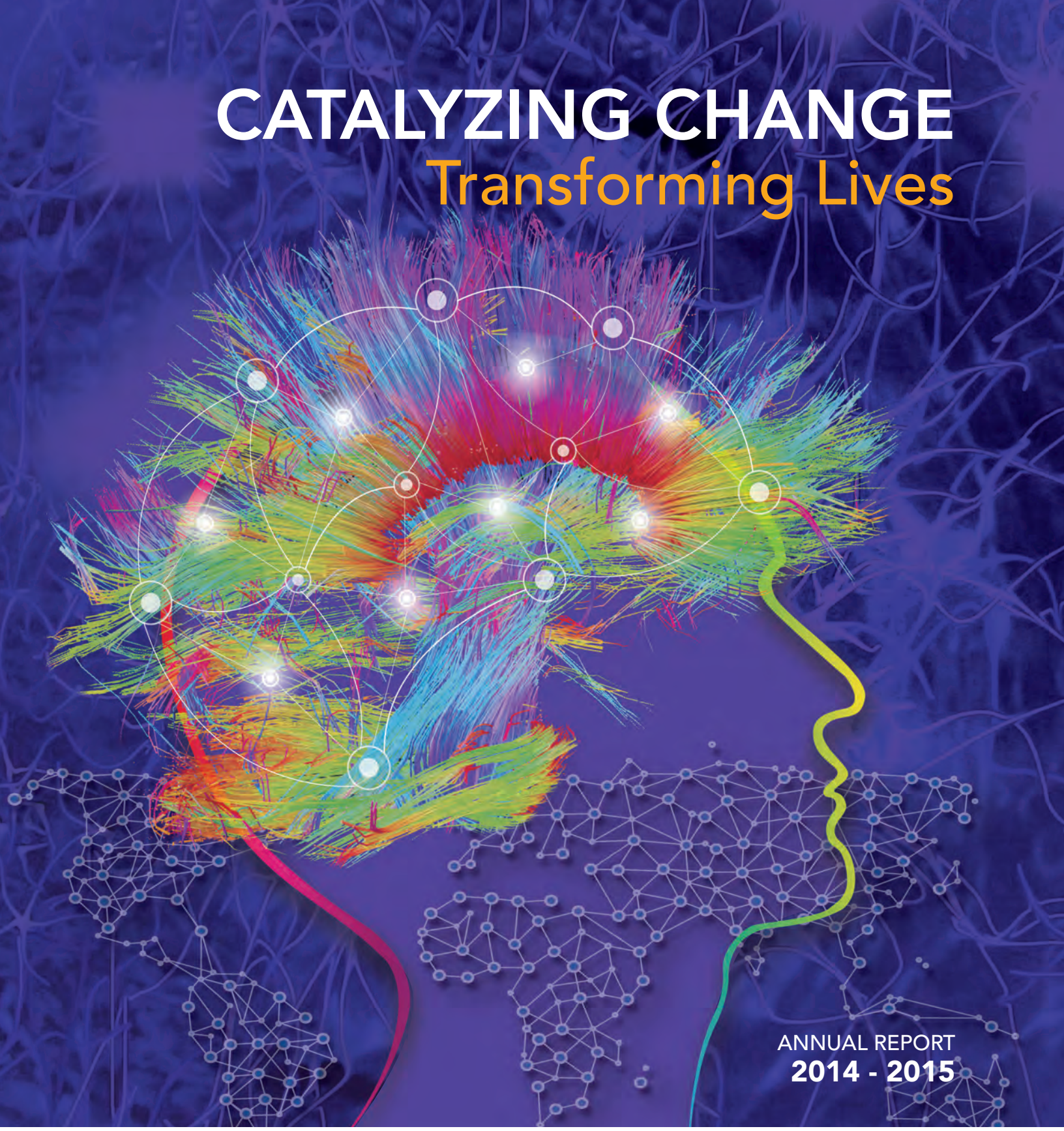
CATALYZING CHANGE
Transforming Lives



ANNUAL REPORT
2014 - 2015

THE ROYAL'S INSTITUTE OF MENTAL HEALTH RESEARCH
proudly affiliated with the University of Ottawa

The | Le Royal
Mental Health - Care & Research
Santé mentale - Soins et recherche

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IMHR

At A Glance

The Royal's Institute of Mental Health Research (IMHR) was established in 1990 by the Royal Ottawa Health Care Group and the University of Ottawa. IMHR transitioned from the virtual entity to a functional institute in 2002. As a leading academic health science centre, we are developing leading-edge multidisciplinary research and training programs with the ultimate goal of fostering innovative ways of treating mental illness.

Mission

To create scientific knowledge to improve mental health and well-being locally and globally.

Vision

To be a premier research institute with national and international centre of excellence status that continuously improves mental health and well-being through leadership, collaborative discoveries and innovation in research, patient care and education.

Values

Excellence, collaboration, integrity, respect, compassion, wellness and equity.

Message from IMHR's President and CEO and Chair of the Board of Directors

In the previous annual report, we shared our vision of transforming mental health research and care through technology and innovation. This year marks a giant step forward towards the implemention of that vision. In addition to sharing a number of significant developments that have taken place, this is also an opportune time to provide a rear-view glimpse of key milestones that have been achieved along the way.

BRAIN IMAGING CENTRE: A MILESTONE ACHIEVEMENT

Thanks to the generous contributions of many donors, we are now in the process of creating a Brain Imaging Centre at The Royal. The core of this Centre — the PET-MR machine — will give our leading-edge researchers and clinicians the ability to peer into the living human brain in real-time. Rather than "imagining" which brain circuits may be going awry to give rise to the symptoms of mental illness, we will be "imaging" the brain to identify and eventually "fix" those rogue circuits. We hope to make the invisible visible and set the groundwork for personalized, precise interventions. Bottom line: our goal is to get people better faster.

Do you ever wonder what is it that makes you, you? Some of the world's top neuroscientists might say that "you are your connectome." The connectome refers to the exquisitely interconnected network of neurons (nerve cells) in your brain. Like the genome, the effort to map the connectome and decipher the electrical signals that zap through it to generate your thoughts, feelings, and behaviours have become possible through the development of powerful new tools and technologies like the PET-MR. We will now join the global movement to decipher the connectome as it pertains to mental illness and recovery.

Akin to the brain connectome (which translates thoughts into actions), The Royal's Institute of Mental Health Research (IMHR) is organized into "nuclei" or foci of expertise. These nuclei are interconnected throughout our Institute, transforming research ideas into clinical studies that test concepts and translate discoveries into innovative care. Highlighted below are some of our recent achievements and infrastructure developments.

RESEARCH PERFORMANCE

In terms of research performance, The Royal was recognized in the 2014 Canada's Top 40 Research Hospitals. In fact, the Royal's research ranked 5th in the Top 10 research hospitals as gauged by its growth over the previous year.

CENTRAL CANADA DEPRESSION RESEARCH HUB

The pan-Canadian Depression Research & Intervention Network (CDRIN) now consists of six depression Hubs distributed across Canada. The Central Canada Depression (CCD) Hub, which is based at The Royal, houses the secretariat for CDRIN and provides leadership for the network. The CCD Hub is linked with the Centre for Addiction and Mental Health (CAMH; University of Toronto) and the London Health Sciences Centre (Western University). Integral to this development is IMHR's ongoing commitment to training and mentoring the next generation of researchers. As well, the involvement of persons with 'lived experience' (for example, persons suffering from mental illness, families and caregivers) in research approaches is part of the fabric at our Institute. Working collaboratively, the Hubs will share new discoveries and identify intervention models that have the greatest potential impact. In this way, local research will have a national footprint.

NATO'S FIRST RESEARCH CHAIR IN MILITARY MENTAL HEALTH

The Canadian Armed Forces recently established the Canadian Forces Brigadier Jonathan C. Meakins Chair in Military Mental Health. The Chair will bridge military and civilian research, and leverage national and international research partnerships. Ground-breaking research and transformational discoveries will lead to improved diagnostics and clinical care for soldiers and veterans suffering from psychological injuries, in partnership with The Royal's Operation Stress Injury Clinic.

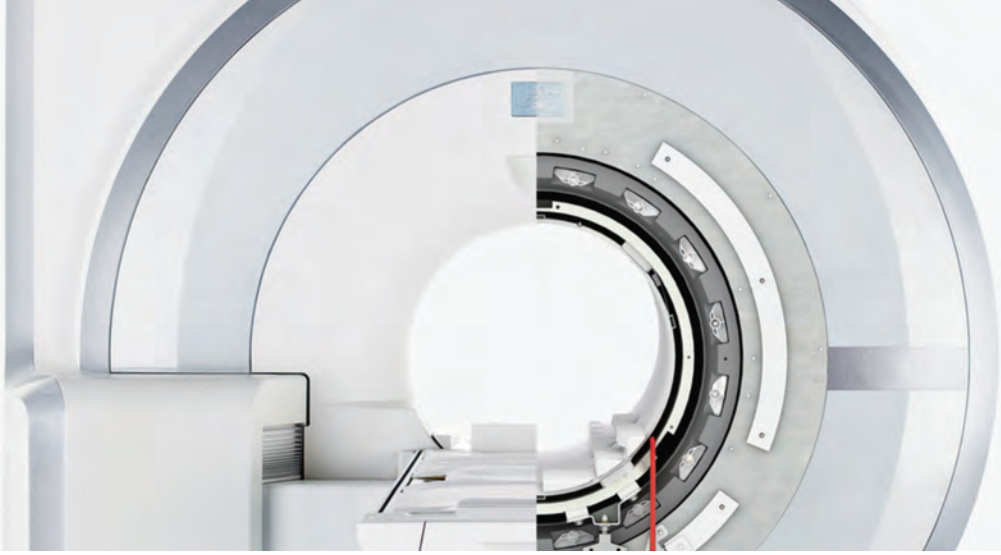
DIFD MACH-GAENSSLEN CHAIR IN SUICIDE PREVENTION RESEARCH

A generous contribution of $2 million by DIFD (The Daron Fund) and the Mach-Gaensslen Foundation of Canada helped to create a Chair in Suicide Prevention Research. The Chair will build knowledge and develop best practices aimed at reducing the number of suicide attempts and completed suicides in Canada and beyond.

The year 2014 culminated in the launch of many exciting new ventures and developments. Over the coming year, the IMHR will continue to work toward its goal to get people better faster. Our team of experts and over 100 trainees is dedicated to making a difference.

Zul Merali
President and CEO

Roxanne L. Anderson
Chair



PET-fMRI scanner: Leveraging the new bold vision

The Royal's IMHR is poised to become one of Canada's first to have a PET-MR scanner dedicated to mental health research.

This has generated a lot of excitement amongst the scientific and clinical communities, amongst people who suffer from mental illness (including families, colleagues and friends) and among the philanthropic community and federal and provincial partners, who want to invest in high-tech innovative research to better understand and treat mental illness – as is the case for heart disease and cancer.

Having this imaging tool will not only put cutting edge technology in the hands of our clinical researchers, who currently have to travel to other cities and continents to beg, borrow or buy time on the imaging machines, but will also enable IMHR to build capacity by recruiting some of the world-leading scientists to Ottawa.

Dr. Northoff, Canada Research Chair and Director of the Mind, Brain Imaging and Neuroethics Clinical Research Unit, explains: "In psychiatry, diagnosis is still very much subjective. We don't yet know the physiology underlining disorders such as schizophrenia, depression, bipolar disorder and so on. Consequently, because we don't have a full understanding of the mechanisms at play in the brain, we are not able to specifically target individualized treatments to get positive desired outcomes."

Things are about to change when the new scanner (the latest and best in class) makes its debut at The Royal.

The new scanner combines two technologies — PET (positron emission tomography) and fMRI (functional magnetic resonance imaging) — which will help researchers map an individual's neuronal and biochemical activities, identify malfunctioning brain circuits for each type of disorder or symptom, and analyze the brain's responses to specific interventions (e.g. drugs, rTMS, cognitive therapy, etc.).

Data gleaned from a large-scale, multi-year research project already under way with the U.S.-based National Institutes of Health will help to advance IMHR's knowledge of the role biology plays in psychiatric disorders. Called the Human Connectome Project, this initiative involves studying the brain circuitry of 1,000 people. "Essentially, we're mapping all the highways in the brain — the anatomical structures — and looking at how the cognitive functions are "navigating" those highways," says Dr. Northoff.

IMHR is also engaged in a joint research project with the University of Ottawa Heart Institute (Heart Institute), studying the link between depression and heart disease. Depression not only affects your brain and behaviour, it also affects your entire body. "When people are depressed," says Dr. Blier, Director of the Mood Disorders Clinical Research Unit and the Canada Research Chair in Psychopharmacology, "there

Dr. Thomas Insel, Director, National Institute of Mental Health, Bethesda, Maryland

"Like the National Institute of Mental Health (NIMH), the IMHR is dedicated to creating the knowledge we need to understand, treat and prevent mental illness. Amplifying our research effort is the part we play in the NIMH's Human Connectome Project, which aims to map the wiring circuit of the entire human brain. By using powerful technologies like MRI, this project's goal is to map the circuits and learn more about brain dysfunctions in mental health disorders. Our Institute very much looks forward to learning about the findings of the IMHR's PET-MRI imaging unit with its ability to see how interventions are working in the living brain in real time. This unique technology has tremendous potential for monitoring brain health and vulnerabilities, and developing treatment and preventive strategies for diseases ranging from depression to dementia."

is a high risk of heart disease. This is because the chemicals in our body that damage the brain can also damage the heart and cardiovascular system. The two are interconnected. In fact, the lives of many people who are suffering from a major psychiatric disorder are shortened not because of suicide but because of cardiac consequences."

Research into the connection between the heart and the brain excites Dr. Peter Liu, Chief Scientific Officer and Vice-President at the Heart Institute: "There is certainly a brain–heart axis, where patients after a heart attack will often experience depression or anxiety, and people with depression, PTSD or anxiety disorder are much more prone to heart disease. This isn't that surprising since the heart is actually the "seat" of emotion even though emotion all comes from the brain. Indeed, the manifestation of emotional stress or trauma is often expressed through the heart. When you get excited or are stressed, your heart races and your blood pressure increases."

Both Dr. Liu and Dr. Blier welcome the leveraging punch that the combined PET-fMRI scanner will make for their respective organizations — the Heart Institute and the IMHR.

"This machine will be a catalyst for us in so many ways," says Dr. Blier. "It will be a magnet for imaging expertise; it will open the door to specialized projects like that with the Heart Institute; it will enable us to solicit more research grants; and, most importantly, it will lead to more robust therapeutic interventions for patients."

THE BRAIN–HEART CONNECTION

Dr. Peter Liu

"People think of the brain and heart separately, but one manifests the other. The brain is actually where the heart resides in terms of the thinking process, mental process and emotional process. It also regulates the cardiovascular system," says Dr. Peter Liu of the Heart Institute.

Researchers at both the Heart Institute and the IMHR are eager to explore in-depth the connection between the brain and the heart, and the direct link between mental disorders and cardiovascular disease, when the PET-fMRI scanner comes onboard the end of the year. "Looking together at this brain–heart axis, we hope to understand more the cardiac consequences for patients with severe mental challenges as well as map the brain activities of patients with heart issues — and ultimately identify unique biomarkers for both sets of patients, and then devise treatments tailored to patients," Dr. Liu explains.

This partnership presents a wonderful opportunity for two specialty groups to work together on an important biological connection in humans.

"It is time for us to open a whole new window on the brain–heart connection. It is a whole new day in terms of doing innovative research and bringing in the expertise we have in Ottawa for the benefit of patients," adds Dr. Liu.

DR. JENNIFER PHILLIPS: MULTI-MODAL SCANNER WILL OPEN UP NEW POSSIBILITIES

For young PhD graduates like Dr. Jennifer Phillips, news that The Royal will soon have a PET-fMRI imaging machine is exciting indeed.

Dr. Phillips used magnetic resonance imaging (MRI) in her PhD studies, examining how brain structure changes over time in patients who suffer from major depression that has been resistant to treatment. Her research showed that in the brain volume decreases with depression and this loss reverses in patients who responded to treatment. However, in those who did not respond continued to experience a loss in brain volume.

The state-of-the-art brain imaging machine will enable researchers and clinicians to use multi-modal imaging — thereby providing a more complete picture of a patient's brain and how that patient is responding to a particular treatment. "It will accelerate the search for better predictors of treatment response in patients," she says.

Beyond opening up new avenues of research, which will lead to more research and clinical opportunities for young researchers, the imaging machine "will attract more expertise to the region."

Dr. Phillips began working at the IMHR 10 years ago as a research coordinator in the former Schizophrenia Research Unit. For the last few years she had been a graduate student in Dr. Blier's Mood Disorders Clinical Research Unit. Dr. Phillips recently earned her PhD in neuroscience in the department of cellular and molecular medicine at the University of Ottawa. She is teaching an undergraduate neuroimaging class at Carleton University, and continues to work on two research projects with Dr. Blier.

Chair in Military Mental Health: Moving the yardstick forward

Brigadier-General Jean-Robert Bernier, Surgeon General / Medicin general, Dr. Zul Merali, Colonel Rakesh Jetly

Colonel Rakesh Jetly, the Canadian Armed Forces (CAF) senior psychiatrist and mental health advisor to the Surgeon General, describes his new role as the first Canadian Forces Brigadier Jonathan C. Meakins, CBe, RCAMC Chair in Military Mental Health as a "sacred trust" — one that will enable him to advance his work in military mental health.

"Military life is inherently stressful and at time dangerous which can lead to psychological consequences for Canada's brave women and men in uniform who work in theatres of operations and high-stress environments, said Colonel Jetly. "Members are often deprived of sleep and are dehydrated while enduring other physical and emotional hardships. The impact of these biological stressors can be dramatic including raising cortisol, known as the stress hormone. These stressors while working in a war zone, most assuredly can lead to real or perceived trauma." Trauma often translates into depression, post-traumatic stress disorder (PTSD) and even suicide.

"Investing in technology and research is essential to better understanding mental illness, improving the recognition, diagnosis and treatment of mental illness, and improving the care and treatment of injured combat personnel."
– Colonel Rakesh Jetly

While progress is being made to raise awareness, to improve preventative measures, and to develop best clinical practices related to mental illness in Canada's military community, Colonel Jetly acknowledges the need for more research and collaboration. The establishment of the Chair — created in late 2014 as a joint venture between the CAF and the Department of National Defence and The Royal's IMHR — represents a tremendous opportunity to move the yardstick even further. The Chair participates in education and research activities at The Royal and pursues opportunities to advance military-related mental health research.

As the first-ever research chair in military mental health, Colonel Jetly is excited and honoured to have been named to such a prestigious position. "To be working closely with leading-edge researchers and clinicians at The Royal in an effort to treat soldiers and veterans suffering from PTSD and other operational stress injuries represents the pinnacle of my career."

Over the course of his three-year term, Colonel Jetly will be focusing on three key areas: conducting research on unique aspects of military and veteran mental health issues; collaborating on best practices in mental health with scientific experts in academic, government, research and private sectors; and ensuring that knowledge gained from leading-edge clinical research translates rapidly into innovative clinical care.

"My focus will be forward-looking — building on the work that has already taken place over the past decade or so to support military personnel who suffer from mental health conditions. The Canadian Armed Forces has made tremendous strides in recent years in the search for better treatments," he says. "Working in partnership with IMHR, one of the country's foremost mental health care and academic health science centres, will help us in the Canadian Armed Forces build on the work we are doing in military mental health."

The brain imaging centre being established at The Royal, plus the IMHR's research and clinical expertise, will help augment these efforts. "By understanding the biology and physiology behind PTSD, we will be able to tailor our treatments," says Colonel Jetly, particularly with respect to pinpointing the biological markers associated with PTSD and other mental health disorders.

"It is exciting to be creating something from the ground up," he says. "I hope that at the end of three years, I will be able to hand over to my successor a mature model or approach to military mental health — where treatment is based on a soldier's unique biological profile."

Brigadier-General, Jean-Robert Bernier, Surgeon General / Medicin general

"The Canadian Armed Forces are very proud to announce their partnership with The Royal and the IMHR in the creation of a Chair in Military Mental Health. As one of Canada's foremost mental health care and academic health science centres, The Royal's IMHR will be an able partner in our efforts to help more Armed Forces members recover from severe psychological injuries, including depression and PTSD. Fittingly, the new Chair is named for one of the world's first researchers in post-traumatic stress disorder during the First World War — Canadian Forces Brigadier Jonathan C. Meakins. The Canadian Armed Forces look forward to joining forces in research through this Chair, which will develop a better understanding of the risk and resiliency factors and the promotion of innovative preventative and treatment interventions. These preventive measures will benefit not only Forces members and their families, but all Canadians. "


George Weber and Joanne Lowe

Chair in Suicide Prevention Research: Mobilizing solutions through research

The recently created Chair in Suicide Prevention Research at The Royal, namely the DIFD Mach-Gaensslen Chair in Suicide Prevention Research, is one more critical piece of the puzzle when it comes to moving the yardstick forward on preventing suicide. It also exemplifies the positive things that can happen when community and research efforts come together — thanks to a collective $2 million in funding support from the community-driven Do It For Daron (DIFD) campaign and the Mach-Gaensslen Foundation of Canada, which supports clinical research in psychiatry.

The chair will help to "accelerate our knowledge around clinical best practices to help doctors, community organizations and families reduce the number of suicide attempts and loss of life by suicide in Canada," says George Weber, President and CEO of The Royal and a founder/co-chair of the Ottawa Community Suicide Prevention Network.

The work that the research chair undertakes — a worldwide search is underway to fill this position — will also dovetail with other initiatives. These include a suicide prevention strategy that is being spearheaded by the federal government in conjunction with the Mental Health Commission of Canada.

"The research protocols that the research chair is expected to develop will add to our strategies in reducing the suicide rate," says George.

Both George and Joanne Lowe, the Network's other co-chair and the Executive Director of the Youth Services Bureau of Ottawa, commend the collaborative nature of the Network in helping to drive real, concrete activities that are addressing the issue of suicide and mental illness.

Since its inception, the Network recognized the importance and value in involving and collaborating with youth and families — and in focusing much of its work on improving the youth and family's experience. "Fundamentally, if it will make a positive difference in the lives of young people and their families," says Joanne, "it will be a priority for the Network."

Beyond the Network's focus on supporting youth and families through local initiatives such as training sessions for teachers, parents and service providers and the school-based Sources of Strength program, Joanne recognizes the importance of gathering solid data about the current state of mental illness in the community. "Collaborating with our partners in the community, including The Royal, is key to developing longer-term strategies to prevent suicide," she says.

Just as the Network has brought together a wide range of people and organizations to work on suicide prevention at the community level, so too is there an opportunity to build on this work by creating linkages on the research side. Joanne explains: "By combining research and practice, we can gain a greater understanding of suicidal youth and emerging adults, and how to better support them."

"Through this position, additional resources and energy will be poured into trying to solve an important societal issue."

THE DIFD CONNECTION

"Suicide and mental illness know no boundaries. They do not differentiate between gender, age or race," says Stephanie Richardson, the mother of Daron, who lost her life to suicide. She and her husband, Luke, are the public faces behind DIFD, a fundraising and awareness campaign they launched with The Royal Ottawa Foundation for Mental Health.

DIFD is also one-half of the funding partners for the Chair in Suicide Prevention Research, contributing $1 million over the next 10 years.

This latest endeavour by The Royal is a natural progression of the groundswell of community support, and work, that has taken place to "create a united front in breaking down the barriers surrounding suicide." In speaking at the event that announced the creation of the research chair, Stephanie commented on the tremendous strides that have been made to tackle what was once a taboo subject — "one that was whispered about."

The Richardson's view the new position as a giant step forward in helping to combat mental illness. "Hopefully, we are one step closer to getting rid of the barriers that stop so many from receiving the help they need," says Stephanie.

The DIFD Mach-Gaensslen Chair in Suicide Prevention Research

"***As parents who lost a beloved daughter to suicide***, we wholeheartedly welcome the creation of the DIFD Mach-Gaensslen Chair in Suicide Prevention Research at The Royal. The fact that this Chair is dedicated solely to building knowledge on suicide prevention brings us tremendous hope that other families can avoid the horrific despair of losing a loved one to suicide. We are delighted that the campaign founded in our daughter Daron's name raised $1 million towards this Chair's creation."

"***As Chair of the Mach-Gaensslen Foundation***, I want to say how proud we are to contribute a $1 million donation to establish this enormously important Chair. Mental health has been a funding interest of Mr. Mach the foundation founder. We have chosen to work with The Royal because of its leadership in depression research at the national level and its proven ability to translate scientific breakthroughs into mental health care practices that benefit all Canadians."

Dr. Zul Merali, Stephanie and Luke Richardson, DIFD, Dr. Chris Carruthers, Mach-Gaensslen Foundation of Canada

Dr. Pierre Blier, Dr. Zul Merali, Dr. Verner Knott

Connecting the research dots

There is the old cliché that two heads are better than one. In the research world, more is to be gained by working together in collaborative partnerships than in independent silos.

At IMHR, collaborations between laboratories and the clinical world may be complex, but scientists and clinicians find that working together is helping to move the research yardstick forward, faster and with better results. New technologies that have come on board are bringing value to these cross-disciplinary linkages.

"Our researchers are gifted scientists with unique skills — they are world experts in mental health research. When you bring those skill sets together across the Institute, you multiply your research capacity," says Dr. Zul Merali, President and CEO of IMHR.

A perfect example of such collaborative synergy is IMHR's research into the benefits of ketamine for some people who are severely depressed and suicidal.

THE KETAMINE EFFECT

Dr. Pierre Blier, Director, Mood Disorders Research Unit, is seeing astounding results with ketamine. In about 70 per cent of people whose depression has not been alleviated with traditional antidepressants, Dr. Blier is finding that ketamine is providing relief. Not only that, the treatment response is extremely rapid; instead of weeks for traditional antidepressants, ketamine works within hours! Another unique feature of this drug is its effect on suicide ideation: ketamine's effect on suicidal ideation is rapid and relatively long lasting.

Through ground-breaking preclinical experiments, Dr. Blier is now investigating how ketamine works in the brain; which transmitters in the brain respond positively to an infusion of ketamine. "We have been able to tie the changes that happen in the brain to specific neurotransmitters — for example, the glutamate system, the dopamine system and the norepinephrine system," he says.

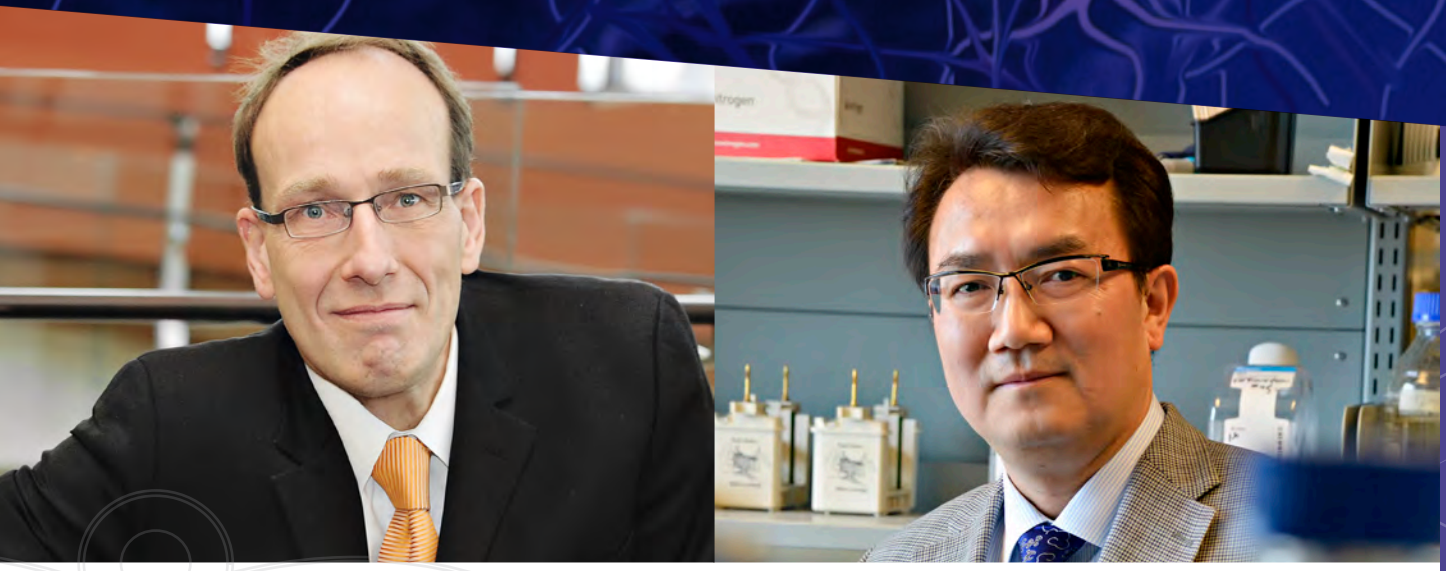
STUDYING CELLS

Cells are the fundamental unit of life, composed of billions of molecules such as DNA, proteins and small molecules that define biological activities. Understanding the basic mechanisms that define a living cell is crucial to understanding the underlying mechanisms of human disease, including mood disorders such as depression — thereby clearing the way to identify new therapeutic targets responsible for the disease and laying the foundation for the development of novel therapies.

This is where Dr. Xia Zhang's work comes in on neurochemical processes in depression, in preclinical animal models of depression. In animal model tests that involve studying the molecular mechanisms in the brains of animals that are prone to depression, Dr. Zhang, head of IMHR's Translational Neuroscience Laboratory, has been able to identify chemicals that can produce rapid and long-lasting antidepressant

Rona Ambrose, Minister of Health Canada

"There is no doubt that investing in mental health and depression research is good public policy. Depression diminishes individual's ability to contribute in the workplace and at home as caring and supportive family members. For this reason, the Government of Canada works with a range of partners in the mental health sector and makes significant investments in mental health research to prevent suicide and promote better mental health. Our Government has invested $5.2 million in the Canadian Depression Research and Intervention Network. This investment, combined with nearly $1 billion in mental health initiatives, demonstrates a continued commitment to improving the mental health of Canadians. Finding effective treatments for depression will support Canadians living with mental illness so these individuals can fully participate in and contribute to our society and economy. I applaud the efforts of The Royal's Institute of Mental Health Research (IMHR) in working towards this goal."



Dr. Georg Northoff and Dr. Xia Zhang

effects without severe side effects. Dr. Zhang hopes further research into this ketamine-like action — ketamine works very well, and rapidly, in some severely depressed patients who have resisted other types of treatments — will help pinpoint how the receptors responsible for this ketamine effect are involved in depression.

From the neuronal level to the clinical level — Dr. Zhang's molecular research feeds directly into the clinicalwork being undertaken by Drs. Pierre Blier, Georg Northoff and Verner Knott.

STUDYING BRAIN ACTIVITY

In his electrophysiology research, Dr. Knott and his team are looking at the relationship between the brain's circuits and mood disorders such as depression. With healthy human volunteers, Dr. Knott is tracking how ketamine positively affects early cognitive processing, millisecond by millisecond. "We're looking at how the networks or circuits in the brain are activated, first and foremost, by an infusion of ketamine, and how electrical (EEG) activity is altered by ketamine," says Dr. Knott, Director, Clinical Neuroelectrophysiology and Cognitive Research Laboratory. "In other words, we are expanding our knowledge about how the brain state changes from an ill brain to a healthy brain. With this information, we hope to pinpoint which patients will respond well and go into remission, and which ones will not respond."

"Given that EEG technology is relatively inexpensive to use," says Dr. Knott – there is an opportunity down the road to use small portable EEG units routinely in a community setting. "If we can define early predictors of treatment response using EEG, we will have an objective, upfront indicator that clinicians can use."

LINKING LAB RESEARCH TO DIAGNOSIS AND TREATMENT

Given that not everyone responds to ketamine, "it is very important to compare the brains of ketamine responders and non-responders, in order to decipher the reason behind this response difference," says Dr. Blier.

Researchers at IMHR are set to conduct more research into just how ketamine acts on transmitters in the brain. Knowing this will build understanding about the neural underpinnings of suicide ideation and the benefits of ketamine on alleviating suicidal ideation. "Once we learn more about ketamine's effects, we will be mere steps away from actually using it in a clinical setting," says Dr. Blier.

At a preclinical level, what happens biochemically in the brain will be informed both by Dr. Zhang's work at the molecular level and the measurement studies being undertaken by Dr. Knott. This will be complemented by brain imaging studies. The new PET-fMRI scanner at The Royal will be used by Dr. Northoff to map an individual's responses.

Although the symptoms of depression may look similar, the underlying cause of each person's depression may be different. Because of this difference, ketamine may work on one person but not another," explains Dr. Northoff, Director, Mind, Brain Imaging and Neuroethics Clinical Research Unit. "The goal of our work is to be able to make better therapeutic predictions and provide better therapy for patients, based on an accurate knowledge of a person's biochemical function and structures."

From the cellular/molecular level, to the electrophysiological, to the clinical setting, the scientific team at IMHR is in lock-step, working together to understand the living human brain; pinpoint the biological components of various mental disorders; and link specific drugs such as ketamine to individuals based on their unique genetic makeup.

"Wouldn't it be nice to be able to more precisely select treatment that works from the outset?" asks Dr. Merali. By connecting the dots between pure scientific work on animals and the clinical world, IMHR's leading-edge scientists are poised to do just that.

Connecting IMHR to local and global communities

ACADEMIC RESEARCH PARTNERSHIPS LEAD TO INNOVATION

"At the IMHR, we value our strong partnerships with various universities across Canada and around the world. We are convinced that engaging our academic partners in leading-edge multidisciplinary research programs will lead to collaborative discoveries into brain mechanisms contributing to depression and suicide ideation. This is necessary to develop personalized or precision interventions."

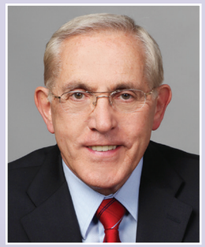
Dr. Zul Merali

BUILDING NEW CONNECTIONS THROUGH CDRIN

Building new connections through CDRIN

"CDRIN is truly a new way of collaborative discoveries. By building new connections and cohesion among Canada's mental health research community, service providers and persons living with depression (and related illnesses), we will open new approaches to detect, prevent and treat depression and other mood disorders."

Dr. Zul Merali, founding scientific director, Canadian Depression Research and Intervention Network (CDRIN)



Bob Chiarelli, MPP for Ottawa West–Nepean and Minister of Energy, Government of Ontario

"The Government of Ontario is committed to innovations in mental health care. We know how crucial the development of effective treatments is for individuals suffering from illnesses like depression, schizophrenia and bipolar disorder so that they can once again enjoy fulfilling lives. The top-flight research carried out by The Royal's Institute of Mental Health Research (IMHR) will go far in bringing light and hope to people now dealing with the daily anguish of mental disorders. By supporting ground-breaking technology that "opens a window to the brain", we are helping the world-renowned scientists at the IMHR access the tools they need to discover new and unparalleled ways to detect, prevent and treat mental illness. As a longtime resident of Eastern Ontario, I am immensely proud that we have such a superb, life-changing centre of excellence in our region, whose findings reach round the globe."

THE PROMISE OF PET-MRI

"Cutting-edge neuroimaging tools and technologies like PET-fMRI show tremendous promise in their ability to develop biomarkers that will optimize treatment selection for individuals who suffer from depression at all levels of severity."

Dr. Helen Mayberg, Professor, Psychiatry, Neurology and Radiology, Emory University School of Medicine, Georgia; pioneer in deep brain stimulation

BETTER THERAPY FROM rTMS

"The imaging guided, robotically positioned rTMS technology offers a precise way to stimulate specific regions of the brain —

without side effects often encountered with drugs, and without the need for hospitalization. The results will lead to better and quicker therapy for patients."

Dr. Verner Knott, Research Unit Director of the Clinical Neuroelectrophysiology and Cognitive Research Laboratory

ACCELERATING KNOWLEDGE AROUND SUICIDE

"The Chair in Suicide Prevention Research will help galvanize knowledge acquisition and synthesis around clinical best practices to help doctors, community organizations and families reduce suicide acts in Canada."

George Weber, President and CEO, The Royal; Founder/Co-Chair of the Ottawa Community Suicide Prevention Network

CONNECTING WITH THE BEST RESEARCH MINDS AROUND THE WORLD

"Reaching out and connecting with the best minds throughout Canada (through leading institutions like the IMHR and the Canadian Depression Research and Intervention Network), the United States (through the Michigan Depression Center and the National Network of Depression Centers in the U.S.), and through international counterparts such as the European Alliance Against Depression is critical to turning research findings into globally impactful clinical care."

Dr. John Greden, Founding Chair, National Network of Depression Centers; Executive Director, University of Michigan Comprehensive Depression Center; Rachel Upjohn Professor of Psychiatry and Clinical Neurosciences, Department of Psychiatry, University of Michigan, Chicago

MAXIMIZING YOUNG RESEARCHERS' POTENTIAL

"By providing opportunities for trainees from various disciplines to collaborate, exchange knowledge and bring together novel perspectives, IMHR enables and encourages young researchers to focus on breakthroughs in mental health research, innovations and treatment."

Danielle Impey, PhD student in psychology, University of Ottawa; conducting research in Dr. Knott's Clinical Neuroelectrophysiology and Cognitive Research Laboratory

LEADING-EDGE CLINICAL RESEARCH EQUALS IMPROVED CLINICAL CARE

"The Canadian military has led many of the technological advances in our field. We are of the view that investment in new technologies and research is necessary to improve the detection, diagnosis and treatment of mental illness. The Chair of Military Mental Health will help to ensure that knowledge gained from leading-edge civilian and military research translates rapidly into improved mental health care for military personnel."

Colonel Rakesh Jetly, Senior Psychiatrist and Mental Health Advisor to the Surgeon General; inaugural Canadian Forces Brigadier Jonathan C. Meakins, CBe, RCAMC Chair in Military Mental Health Community Suicide Prevention Network

FROM RESEARCH IN THE LAB TO CARE IN THE COMMUNITY

From the neuron to the neighbourhood — IMHR's multi-pronged basic science and clinical research approach looks at mental illness on a continuum, spanning basic biology that ultimately translates into mental health care in the community."

Dr. Zul Merali

BUILDING INTERNATIONAL PARTNERSHIPS IN THE FIGHT AGAINST DEPRESSION

"Only through concerted global research commitments will we find effective cures for depression, which is a leading cause of disability worldwide. International partnership networks will help to further all of our goals — to optimize treatments for people suffering from depression and to pursue research that targets both depression and suicide prevention."

Dr. Zou Liyao, National Science Foundation of China, and **Dr. Ulrich Hegerl**, President of the European Alliance Against Depression

Dr. Mehran Talebinejad, Dr. Lisa McMurray, Dr. Verner Knott

rTMS: A game-changing robotically guided intervention

Imagine you suffer from depression and conventional treatments are not helping you. Now imagine getting non-invasive, non-drug treatment for your depression that works differently and takes about as much time as it takes to drink your morning coffee. That's what rTMS — repetitive Transcranial Magnetic Stimulation — soon to be offered to patients at The Royal.

"Our robotic rTMS technology promises to be a game-changer — offering targeted and precise stimulation of the depressed brain, to produce better remission outcomes."
– Dr. Mehran Talebinejad

While rTMS is relatively new in Canada, it has been used successfully in Europe and is considered the first line of treatment for depression in Germany and Japan. What is new is that the system the IMHR has acquired is far more advanced than the first generation rTMS technology.

Not only is IMHR now able to offer a new way to treat depression, but this innovative technology also promises better and faster results than the standard rTMS technology — and to be as effective as drug treatments.

Here is how the state-of-the-art rTMS system works. Traditional technology involves manually placing a coil on the patient's scalp, through which small electromagnetic currents stimulate the brain. The new technology is far more precise: as it is guided by brain images (scans) and coils precisely positioned using robotics provides far more precision and accuracy. The magnetic field that is generated penetrates deeper into the brain for increased stimulation. "With the figure eight coil, you can only stimulate up to 2.5 cm inside the brain, depending on the patient and the shape of the skull," explains Dr. Mehran Talebinejad, founder and CEO of NeuroQore, the company that invented the robotic rTMS system. "Our new coils have the ability to stimulate deep areas of the brain (up to 7 cm inside)."

Stimulating specific circuits of the brain has been shown to alleviate symptoms of depression in many individuals.

"This is a huge leap in terms of technology," says Dr. Talebinejad. "Non-invasive, rapid depression therapy has many benefits. You are looking at therapy without side effects, without hospitalization — where patients can come in for 10 to 15 minutes, receive treatment and then drive back to work."

The technology not only has the potential to treat depression, but may be effective for other neurological disorders, from Parkinson's, to post-traumatic stress disorder, to Alzheimer's. It is also a good alternative for two different age cohorts, who at times cannot take antidepressants, namely the elderly and youth. It is a viable treatment choice for the many people reluctant to undergo electroconvulsive (shock) therapy, which is far more invasive.

Studies under way will help determine which brain targets, magnetic fields and coil characteristics are most effective at treating depression. The results will lead to better therapy for all.

When it comes to the fight against depression, "we need all the help we can get," says Dr. Zul Merali, IMHR's president and CEO. "rTMS is a wonderful addition to our toolbox."

PILOT STUDY SET TO BEGIN IN JUNE

The Royal's IMHR is set to begin its first clinical trial of the robotic repetitive Transcranial Magnetic Stimulation (rTMS) technology in June 2015. Forty patients will be participating in the double-blind study, which will be overseen by Dr. Verner Knott, Director of the Clinical Neuroelectrophysiology and Cognitive Research Laboratory. Assisting him will be Dr. Lisa McMurray, a geriatric psychiatrist and clinical lead of The Royal's electroconvulsive therapy service.

Using rTMS, Dr. Knott hopes to validate new stimulation pulses, with the goal to shorten the length of treatment for patients — to about as much time as it takes to drink your morning coffee.

Both Dr. Knott and Dr. McMurray are eager to get started. The pilot study is currently awaiting approval from Health Canada.

"It is important to offer the full range of neuro-stimulation therapies here at The Royal," says Dr. McMurray. "ECT is very invasive. Patients who do not respond to or do not want to try ECT may do well with rTMS."

For his part, Dr. Knott is eager to see what positive results can be achieved using this robotic form of rTMS, which enables clinicians to stimulate deeper regions of the brain beyond the 2 cm that manual rTMS technology offers. "It's quite exciting."

It is time for mental health; it is time for celebrating the heroes

Our community is full of heroes, men and women who reach out to family, friends and strangers through a selfless act of giving. They do not do this for the headlines for their generosity, but with every donation they make to the Royal Ottawa Foundation for Mental Health they are improving and saving lives. From the grassroots to the corporate boardroom, these heroes are pooling their resources in support of leading-edge, multidisciplinary research programs that will lead to innovative and improved ways of diagnosing and treating mental illness.

And as this heroic movement grows, The Royal's Institute of Mental Health Research (IMHR) is taking its place as a global centre of excellence for mental health research and patient care.

One of the very first Foundation heroes was the mother of a child with a mental illness, who donated $40. The mental health movement has been slowly gaining momentum since then, but today, the Foundation — which raises funds to support the Royal Ottawa Mental Health Centre, the Brockville Mental Health Centre, and the IMHR — could be on the threshold of a philanthropic boom.

Thanks to a number of successful nationwide anti-stigma and advocacy campaigns, mental illness is no longer the elephant in the room. People are not only acknowledging disorders like depression, anxiety and post-traumatic stress disorder; they are also talking openly about them.

"Our hospital was one of the first to launch an anti-stigma campaign in 2003 with You Know Who I Am," says Andrée Steel, President and CEO of the Foundation. "That outreach resonated very strongly in this community and across eastern Ontario. As a result, people are more aware of the impact mental illness can have in their own lives and we have seen a lot more interest in philanthropic giving."

The Foundation is delighted that it has received ten gifts of more than $1 million toward its five-year $25-million Campaign for Mental Health, with its cornerstone priorities of The Royal's depression research centre and brain imaging. This is compared to just $2-million-plus gifts in the previous campaign that built the new hospital on Carling Avenue — "a beacon of hope to so many people in the community," and a measure of just how far out of the closet the issue of mental health has come in just over a decade.

"This is the largest philanthropic initiative in our history," says Andrée, "and it is one that is asking for transformational giving from the community. Mental health has not always been the charity that attracts the largest gifts and we are beginning to see a transition. People are stepping forward to say that it's time for mental health."

"When community leaders step up to support the philanthropic objectives of The Royal, it means they believe in the priorities we have set for ourselves on behalf of our community. They trust that the end result of their generosity will be better care and better outcomes for people affected by mental illness."
– Andrée Steel

This 'transformational philanthropy' will change the face of mental illness in Canada. Three-quarters of the funds raised in the Campaign for Mental Health will be used to support the IMHR's Depression Research Centre at the Royal Ottawa. This will include one of the world's only PET-fMRI machines dedicated to brain and mental health research. This technology that will allow neuroscientists to study the living brain at the molecular level, leading to deeper understanding of disease and the ability to discover, in real-time, how the brain is affected by mental disorders and by treatments. (See section on Brain Imaging for further details)

"There are many causes that are worthy of support," says Andrée. "We are so grateful that our philanthropic leaders are recognizing the importance of mental health and thankful they are standing by our side as we create this centre of excellence." It's a gift that works on two levels. Not only does their donation help the foundation to reach its $25-million target, but it also rallies the troops. "By leading with their philanthropy, they are encouraging others to follow in their footsteps and do the same."

The tide is turning in favour of awareness, openness and support regarding mental illness. "But we still have a ways to go," Andrée says. "There has definitely been a shift, and I hope it continues. The need is great."

It is time for mental health. It is time for heroes.


Andrée Steel

OUR $1-MILLION DONORS FOR RESEARCH:

- Barbara Crook and Dan Greenberg
- John and Jennifer Ruddy
- Elizabeth Graham and the Graham Family Foundation
- Homestead Landholdings
- Mach-Gaensslen Foundation of Canada
- DIFD (The Daron Fund)
- Ottawa Construction Association; Paul McCarney; Kathleen Grimes and Ersin Ozerdinc, Site Preparation Limited
- Great-West Life Assurance Company

Margaret Trudeau

"I know what it is like to have the light disappear from your life. For many years, I was subject to extreme mood swings that made it very hard for me to see clearly and make the right decisions. It wasn't until 1978 that I learned I was suffering from bipolar disorder, but once I had the diagnosis and the correct treatment, I was able to regain a sense of balance and know happiness again. This is why I believe so strongly in the importance of ongoing research into depression and bipolar disorder, like the dedicated and inspiring work conducted at the IMHR. I am extremely grateful that I have the opportunity to be a spokesperson for mental health so that I can connect with others who may be suffering as I was, and encourage them to reach out for help."

New approach to classifying psychiatric drugs

Scientific understanding and knowledge in the field of mental health has come a long way since the 1950s. But the classification of drugs used to treat psychiatric disorders has not changed much — until now.

Thanks to a new naming system called Nb Nomenclature (short for neuroscience-based nomenclature), this is about to change. And Dr. Pierre Blier, Director of the Mood Disorders Research Unit at The Royal's Institute of Mental Health Research and holder of the Canada Research Chair in Psychopharmacology, is playing a key role.

"Nb Nomenclature is getting universal acceptance and will be used worldwide within the next two years." – Dr. Pierre Blier

Dr. Blier is part of a nine-member international team — representing the European College of Neuro-psychopharmacology (the lead on the project), the American College of Neuro-psychopharmacology, the Asian College of Neuropsychopharmacology, and the International College of Neuropsychopharmacology. The team members worked diligently behind the scenes for more than three years to develop the new naming system. The system is based on classifying drugs in terms of the many far-reaching effects they can have versus a specific illness they may have been originally intended to treat.

Consider anti-psychotics as a case in point: although traditionally these drugs are quite effective in treating psychotic disorders (e.g. schizophrenia) at a different dose range, they can also be quite useful for helping a patient sleep at night; and, at another dosage they may be effective in treating anxiety. Under this new system, a doctor would be able to see all of the uses for a specific anti-psychotic medication, and not just its traditional, limiting use in treating a psychosis. Let's take a closer look.

Example under old nomenclature: The terms 'anti-psychotic' and 'anti-depressant' were coined in the 1950s, in line with their intended clinical use at the time. But advances in knowledge among the scientific community have shown that some anti-psychotics are quite useful to treat both depression and anxiety disorders. Patients suffering from depression or anxiety may be alarmed when their physician prescribes an anti-psychotic, when they clearly do not have psychosis and therefore may choose to refuse to take the medication.

Example under new nomenclature: Medications are now classified by their mechanism of action (for example, serotonin reuptake inhibitor; dopamine receptor blocker). Take a dopamine receptor blocker, which is the basic mechanism of an anti-psychotic. The drug has an effect on the specific dopamine receptor and restores normal functioning not only in psychosis but for other illnesses as well where dopamine may be involved. When prescribing a medication for a patient, a doctor would think about the underlying mechanism of action — what is it that needs to be addressed — and use the new system to determine which medication will be most effective.

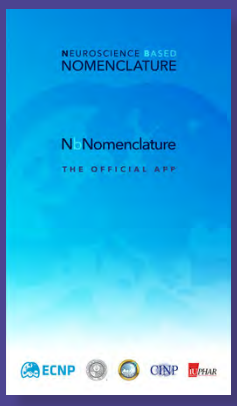
The international taskforce developed a four-axis template to classify psychiatric medications: 1) Pharmacological Target and Mode of Action; 2) Approved Indications; 3) Efficacy and Side Effects 4) Neurobiology

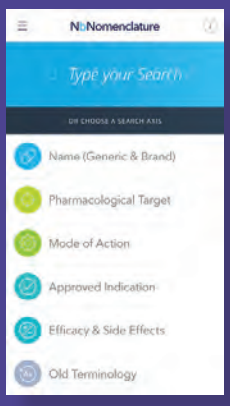
"What do you call a medication that has a totally different indication but yet it is the same pill or same molecule? For psychiatrists and clinicians, this new naming system involves classifying drugs by what they can do depending on the dosage," explains Dr. Blier, who provided his expertise on over 38 anti-depressant medications. "The system will help clinicians select the best medication for their patient and clear up any confusion for patients who have been prescribed a drug with a different description compared to their identified diagnosis — and thereby reduce stigma."

Bottom line, says Dr. Blier, the new nomenclature turns the old system upside down — and in the process improves upon an antiquated system that confounded doctors and confused patients.

THE NB NOMENCLATURE HAS BEEN PUBLISHED IN BOOK FORM UNDER THE TITLE NEUROSCIENCE BASED NOMENCLATURE

A mobile application has also been developed, making it possible to update the nomenclature easily as new drugs come onto the market. The app can be downloaded for free at the iOS App Store (for those using an iPhone) or the Google Play Store (for those using a Blackberry). Doctors, patients, clinical researchers and others will be able to search using their mobile phones, for information on a drug in a variety of ways — by brand or generic name, name of the neurotransmitter, by syndrome or disorder, by symptom and so on.





Screen shots of the app in action.
The app will be updated twice a year.

Dr. Ulrich Hegerl, Dr. Zul Merali, Dr. John Greden

CDRIN: A powerhouse of national connections

The Canadian Depression Research and Intervention Network (CDRIN) is ground-breaking on many fronts — bringing to bear the kind of changes only imagined before.

First and foremost, this pan-Canadian network of depression hubs links the best scientific and clinical minds working in depression and related mental health conditions. Second, by establishing collaborative and networking opportunities, CDRIN not only enhances the ability to share knowledge and findings, but is also the national catalyst for large-scale clinical trials aimed at testing and implementing innovative interventions for depression and related mental and physical health disorders. Third, CDRIN creates sustainability through education and training programs for the next generation of mental health researchers and providers. And last but certainly not least, CDRIN brings care providers and people with depression to the research table.

"CDRIN is a wonderful collaboration that not only shares but also stimulates life-transforming discoveries," says Louise Bradley, President and CEO of the Mental Health Commission of Canada, which is a founding member of CDRIN, along with the Mood Disorders Society of Canada and The Royal's Institute of Mental Health Research (IMHR).

"The kinds of changes this network aims to generate are unprecedented," adds Dr. Zul Merali, CDRIN's founding scientific director and President and CEO of IMHR.

"CDRIN is a large tent under which the best and the brightest minds in the field of depression are working together and sharing knowledge. That tent is reaching out and connecting with the best minds in the United States, through the National Network of Depression Centers, and researchers working in Europe and Asia."
– Dr. Zul Merali

Incorporating the diverse expertise of people who live and work with mental health issues into the design and implementation of research frameworks and service-delivery models is a cornerstone of the CDRIN concept.

The Canadian mental health research and care communities have been mobilized through six newly created regional hubs that span from British Columbia to the Maritimes. Each hub shares some common expertise and some unique attributes. Each hub has specific areas of research focus, regional partners, stakeholders, community-based organizations and people with lived experience, to enhance its research and clinical work.

In addition to pan-Canadian linkages, international partnerships with U.S and European depression networks now give CDRIN a more global footprint.

Sharing knowledge; allowing the best researchers to collaborate, innovate and initiate change; engaging the patient community for better understanding; turning research findings into impactful clinical care; identifying and addressing research gaps; and bringing Canada to the forefront of the next generation of research: these are the tools needed to help people with depression recover and live productive lives.

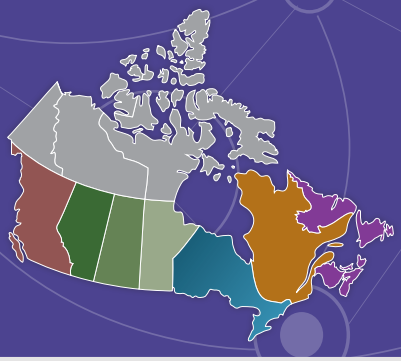
INNOVATION + COLLABORATION = TRANSFORMATION: CDRIN'S 2nd ANNUAL CONFERENCE

CDRIN's second annual conference, held February 24–25 in Ottawa, provided a rich experience for all who attended. From offering emerging ideas and issues, to encouraging collaboration and information exchange, the conference enabled the best minds in depression research and people with lived experience to meet, network and contribute.

Sessions covered a wide range of topics, including:

- PTSD in military and first responder communities
- Depression and co-morbidities
- Using big data to improve depression care
- Diagnostic challenges and new hopes
- Broadening access to mental health care using technology
- Breakthroughs in the treatment of depression
- Major depression in youth

As well, attendees took in presentations from young researchers; heard about innovative approaches for funding depression research; and learned about emerging international partnerships and collaborations.



Dr. Ulrich Hegerl, President of the European Alliance Against Depression and Dr. Zou Liyao, National Science Foundation of China

The European Alliance Against Depression is also dedicated to building international partnership networks beyond Europe to further our goals: optimizing treatments for people suffering from depressive disorders, and pursuing research targeting depression and suicide prevention. In this connection, we were very pleased to welcome CDRIN, represented by Dr. Zul Merali, as a member of our Alliance."

"The National Science Foundation of China is forging international connections in all fields of science, including mental health research. Our Foundation supports the aim of international partners joining forces to combat the scourge of depression and its overwhelming impact globally. It is only through concerted global research commitments that we will find effective cures for this illness, which, according to the World Health Organization, now affects over 350 million people, making depression a leading cause of disability worldwide.

THE ROYAL-MACH-GAENSSLEN PRIZE FOR MENTAL HEALTH RESEARCH

Mental health research has received a huge boost — as have early-career researchers working in the field of mental health.

Thanks to the Mach-Gaensslen Foundation, each year for 10 years, one outstanding researcher or a team of up to three people will be selected to receive $100,000. The Royal-Mach-Gaensslen Prize for Mental Health Research will be awarded to an applicant who demonstrates a track record in research and excellence in scientific rigour. Other criteria include innovative thinking, imagination and originality, and a clear ability to work in partnership with other disciplines or research teams

Early career Canadian researchers (under the age of 45 years) can obtain details at: http://www.theroyal.ca/research/

Young Investigator Awards

A conference held by young researchers, for young researchers. Every year, more than 200 post-graduate students working in the fields of psychology, psychiatry, neuroscience, social work and nursing, come to the Young Researchers' Conference to network and learn from each other and from renowned researchers and scientists.

The one-day gathering — part of the IMHR's Young Researchers' Forum that promotes knowledge exchange and collaboration among young researchers studying in the field of mental health — attracted peers from Ontario and Quebec with a keen interest in mental illness. This year's theme was *Comorbidity Matters: Dealing with Co-occurrence of Mental and Other Medical Conditions*.

The students heard keynote presentations by:

- **Dr. François Lespérance**, a Research Associate Professor in the Department of Psychiatry, Faculty of Medicine at the Université de Montréal and Head of the Department of Psychiatry at the Centre hospitalier de l'Université de Montréal
- **Dr. Martin Lepage**, a Researcher and Clinical Psychologist at the Douglas Institute, a Professor in the Department of Psychiatry and an Adjunct Professor in the Department of Psychology, McGill University
- **Dr. Kim Corace**, Clinical Health Psychologist; Director, Program Development and Research, Substance Use and Concurrent Disorders Program at The Royal; and Clinical Investigator at The Royal's Institute of Mental Health Research

Another highlight of the day was the ever-popular 'my story.' Claude Lurette, a 2009 Inspiration Award winner, a tireless "voice of the community" and a dedicated Royal volunteer, spoke about his personal struggle with alcohol addiction and bipolar disorder.

Andrée Steele, Ben James, Melissa Kruyne, Mohammad Ebrahimzadeh, JD Lees, Kristin Delcellier, John Waddington, Pamela Waddington, David Lees, Dr. Zul Merali

The excitement of the next generation of researchers in training

They are the future of mental health research. They are engaged and enthusiastic about the work they are doing to make a difference in the lives of people who suffer from depression and other mental disorders. And guess what? They are making a significant difference.

More than 100 young researchers at The Royal's Institute of Mental Health Research (IMHR) work alongside some of the world's leading scientists, helping to transform the way we detect, prevent and treat mental illness. Their efforts, and the work of other bright minds focused on mental health and wellness, are rewarded in numerous ways, including three distinguished award programs: the IMHR Graduate Student Research Award; the Royal Ottawa Foundation for Mental Health Young Researcher Inspiration Award; and the IMHR Young Researchers' Conference's Young Investigator Awards.

One of the most prestigious endowments presented annually by the IMHR is the Graduate Student Research Award. Each year, two promising young graduate students who are focusing on depression research are selected for the award, which is supported by the Jennie James Depression Research Fund, the Allison Lees Depression Research Fund and the Louise-Helen Waddington Research Fund.

For their studies in the area of anti-depressant medications, Kristin Delcellier and Mohammad Ebrahimzadeh were recipients of the second annual Graduate Student Research Award in 2014.

Kristin, a Master's student with the Department of Neuroscience at Carleton University, works in Dr. Zul Merali's lab, testing the potential of a botanical product — an extract blend of the South American vine Souroubea sympetala and Sycamore bark (Platanus occidentalis) — to prevent the onset of depression. "Although it is typically used as an anti-anxiety medication," says Kristin, "I believe this product could be useful for people at risk of developing depression, especially those who suffer from prolonged and chronic exposure to stress."

Mohammad, a PhD student with the Department of Neuroscience at the University of Ottawa, works in Dr. Pierre Blier's lab. He is investigating the potential of bupropion and aripiprazole as new antidepressant drugs that can take effect more quickly than those currently on the market. "The majority of our antidepressant drugs target the serotonergic system, but most have delayed onset of action, because receptors on the surface of serotonergic cells counteract efforts to boost serotonin neurotransmission," says Mohammad. "If we can determine whether altering these receptors or reducing their numbers can work to our advantage, we can design drugs that take this into account."

Dr. Kim Corace: Young Researcher Inspiration Award Winner

Every year, the Royal Ottawa Foundation for Mental Health recognizes a young researcher who is making a mark in mental health research. This year's winner epitomizes a scientist whose work is improving the quality of life for clients and their families.

On March 6, 2015, the Foundation bestowed the Young Researcher Inspiration Award — one of six presented in five categories at the 12th Annual Inspiration Awards evening — to Dr. Kim Corace.

Over the course of her career, Dr. Corace has built an outstanding track record in building research and clinical collaborations across sectors — all designed to destigmatize mental illness and addiction. In breaking down barriers, she has made an enormous impact as a researcher, a clinician, a teacher and an advocate.

Her work has led to substantial and sustainable improvements in mental health and addiction care — benefitting thousands of people, including those living on the margins of society.

Her work is a credit to The Royal, where she is the Director of Research and Program Development in the Substance Use and Concurrent Disorders program, and to the IMHR, where she works as a Clinical Investigator.

Our Partners

At the IMHR we value our strong partnerships. Engaging our partners in leading-edge multidisciplinary research programs helps us foster innovative ways of diagnosing, treating and preventing mental illness.

In today's world, we need to collaborate to compete. We believe that by working together, we will integrate basic discoveries and clinical research into a pipeline for innovation; providing patients suffering from mental illness with the very highest quality care.

CORPORATE PARTNERS:

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Royal Ottawa Foundation for Mental Health
University of Ottawa

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Mental Health Commission of Canada
Mood Disorders Society of Canada
Ontario Provincial Police
Public Health Ontario
Royal Canadian Mounted Police
The Champlain Centre for Health Care Ethics
Veterans Affairs Canada
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Brock University
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Children's Hospital of Eastern Ontario Research Institute
Dalhousie University
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McGill University
McMaster University
Montreal Neurological Institute
Ontario Brain Institute
Ontario Centre of Excellence for Child and Youth Mental Health
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University of Toronto
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Western University

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International Academic Centres

A partial list of international organizations with whom the IMHR has significant partnerships.

Australia: University of Sydney, University of Newcastle

Austria: University of Vienna, University of Salzburg

Brazil: Pontifical Catholic University, Ponto Alegre

China: Chinese Academy of Science, Fourth Military Medical University, Hangzhou Normal University, Huazhong University of Science and Technology, National Science Foundation of China, Peking University, Shaanxi Normal University, University of Hangzhou, Shanghai University, Taipei Medical University, University of Hong Kong, University of Science and Technology of China, West China Hospital Sichuan University

Costa Rica: Universidad Nacional, Heredia

France: INSERM University Bordeaux, University of Paris VI, University of Paris VII, University of Paris Ouest, Université Claude-Bernard, Université René Descartes

Germany: Free University of Berlin/Charite, University of Bonn, University of Dusseldorf, University of Gottingen, University of Munich

Hungary: Hungarian Academy of Sciences, Semmelweis University

Italy: University of Bologna, University of Chieti, University of Genova, University of Rome, University of Torino,

Iran: University of Tehran

Portugal: University of Porto

Spain: University of the Basque Country, Universidad de Castilla-La Mancha

Sweden: Karolinska Institutet

Switzerland: University Hospital of Psychiatry Zurich, University of Zurich

Taiwan: National University of Taiwan

United Kingdom: City University, London; University of Chester

United States: Columbia University, Johns Hopkins University, Medical College of Wisconsin, Medical University of South Carolina, National Center for Missing and Exploited Children, National Institute of Mental Health (NIMH), University of Maryland, University of Miami, University of Michigan, University of South Carolina, University of Texas

International Research Centres & Networks

European Alliance Against Depression
National Network of Depression Centers
University of Michigan Depression Center

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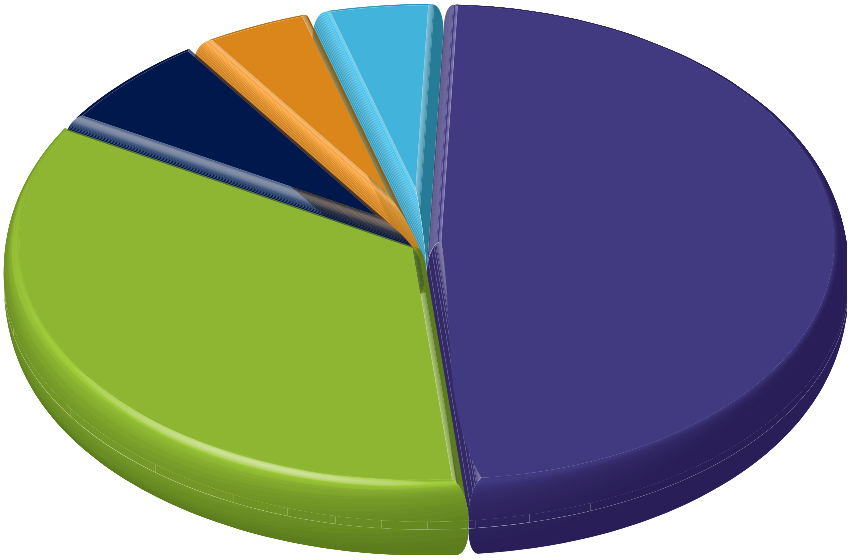
The Year in Numbers

REVENUE DISTRIBUTION



48%	External Grants/Contracts/Salary Awards
35%	Royal Ottawa Health Care Group
7%	University of Ottawa
5%	Royal Ottawa Foundation for Mental Health
5%	Investment Income

Researchers (Senior Scientists, Scientists, Associate Scientists, Clinical Investigators)	**52**
Adjunct Scientists and Visiting Scholars	**18**
Research Trainees	**110**
Research Support Staff	**63**
Volunteers	**73**
Peer Reviewed Publications	**135**
Books and Chapters	**18**
Research Grants and Contracts	**103**
Research Space:	
Finished Research Space	23,000 sq. ft.
Future Brain Imaging Suite (shell)	4,400 sq. ft.
Clinical research projects during reporting year	**97**
Basic research projects during reporting year	**32**

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Mental Health - Care & Research
Santé mentale - Soins et recherche

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Credits: Content and Concept Development: The Melbourne Group • Design: cgm^2 • Photography: Valberg Imaging