

Centre for Addiction and Mental Health  
Research Report 2007–2008



**camh**  
Centre for Addiction and Mental Health  
Centre de toxicomanie et de santé mentale

**MISSION:** Improving the lives of those affected by addiction and mental health problems and promoting the health of people in Ontario and beyond.

**VISION:** Strong and healthy communities, in which people with addiction and mental health problems can access appropriate and effective services and live as full participants.

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## LETTER FROM THE VICE-PRESIDENT OF RESEARCH

CAMH research has much to be proud of. From neurons to neighbourhoods, from cells to clinical care, CAMH has remarkable depth and breadth of scientific work and scientific achievement. As you read through these pages that highlight some of our accomplishments this past year, you'll get a sense of just how vast our scientific scope really is and how far we've come in transforming the lives of people impacted by mental illness and addiction. We are already the leading mental health and addiction research facility in Canada, and there are only new heights of achievement to come from this extraordinary group of scientists, scientific staff, administrators, students and volunteers.

It is our commitment to research excellence, which translates into improved care, that has made us a leader in mental health and addiction research. Working together, we will nurture this compassionate approach to science and promote synergies among the diverse disciplines and paradigms within our research program, within other CAMH programs and within the community. The emerging urban village at our redeveloping Queen Street site will further promote an environment that will greatly increase our opportunities to work together to generate timely, relevant research.

Our dedication to discovery with a human impact means that CAMH science now stands as a beacon of hope to clients and families in our community, throughout the province and around the world. Our work, today or 10 years from today, changes how we understand mental illness and addiction, enabling CAMH to improve diagnosis, prevention, intervention, treatment and public policy initiatives.



Excellence is only possible when a dedicated group works together to achieve the same goal. It is thanks to the hard work and dedication of all Research program staff, the support of our CAMH colleagues, the CAMH Foundation and our local, national and international community partners that we are truly transforming lives.

Bruce G. Pollock, MD, PhD, FRCPC  
*Vice-President, Research*

## DISCOVERIES 2007–2008

### UNDERSTANDING THE LINKS BETWEEN STRESS, MENTAL ILLNESS, PHYSICAL CONDITIONS AND ABILITY TO WORK

Drs. **Carolyn Dewa** and **Elizabeth Lin** explored how factors such as workplace stress and mental illness, experienced either alone or in combination, affect an employee's ability to work. The researchers found that these factors interact in a more complex way than previously reported, and showed that chronic workplace stress may exacerbate the reduced capacity for work associated with psychiatric disorders and with chronic physical conditions. Drs. Dewa and Lin suggest that physicians and employers work collaboratively on interventions that go beyond typical clinical or occupational health considerations.

### HELPING PEOPLE WITH DEPRESSION REGAIN PERSONAL MEMORIES

One hallmark of depression is a reduced ability to recall specific personal memories, a cognitive feature referred to as “overgeneral memory.” Instead, when asked to remember a particular event that occurred at a particular time, people with depression typically recall more general memories of repeated experiences or whole periods in their lives. Drs. **Carolina McBride** and **Zindel Segal** and their colleagues showed that, contrary to their hypothesis, cognitive behavioural therapy and medication were equally effective at targeting and changing this common cognitive symptom. This discovery may lead to a decrease in the risk of recurring depression.

### THE LINK BETWEEN ROAD RAGE AND COLLISIONS

Dr. **Robert Mann** and a team of CAMH scientists and staff investigated the correlation between driving behaviours and experiencing a traffic collision. In the first study of investigating how being both a victim and a perpetrator of road rage affects the chance of being in a collision, they found that the almost 13 per cent of drivers interviewed who had been both victims and perpetrators had a significantly higher risk of being in a collision than those without any road rage experience. The study also found that collisions related to road rage behaviour were highest among those aged between 18 and 35.

### RESEARCH ON HOMELESS YOUTH LEADS TO A MULTI-DIMENSIONAL PICTURE OF LIFE ON THE STREET

The Youth Pathways Project's (YPP) initial results provided much-needed data on street-involved youth. Led by Dr. **Pat Erickson**, this study focused on issues of ethnic and sexual diversity, substance use and mental health. Eighty per cent of the lesbian, gay, bisexual, transgender and transsexual [LGBT] street-involved youth reported being dependent on three or more illegal drugs, a rate significantly higher than that for their heterosexual counterparts. In addition, 60 per cent of street-involved young women reported having been pregnant at least once. This critical information is useful for informing policy related to service needs, substance use treatment, child protection, mental health promotion and violence prevention for street-involved youth.

Using this data, Dr. Erickson and her team created the website Toronto Youth Street Stories (TYSS), which shares study results and showcases the experiences of street-involved youth through poetry, prose and visual arts. Visit [www.tyss.org](http://www.tyss.org) for more information on both the YPP and TYSS.

### HYPERTHERMIA AND ECSTASY: NEW CASE STUDY OFFERS POSSIBLE CLUE TO ECSTASY-CAUSED DEATHS

The numbers of deaths caused by ecstasy (MDMA) are very small in relation to the number of people who use the drug. And it is not known why some people are especially susceptible to a fatal reaction to ecstasy, though these deaths often involve severe hyperthermia (increased body temperature). Dr. **Stephen Kish**'s case study pointed to pre-existing hyperthyroidism (overactive thyroid)—a defect affecting temperature regulation—as one factor that might contribute to some ecstasy deaths. The study results are consistent with other data showing that experimental animal models with hyperthyroidism are more likely to die when exposed to ecstasy, and supports what many scientists previously suspected.

### SOCIAL PHOBIA AND OLDER ADULTS

Dr. **John Cairney** examined the prevalence and nature of social phobia in adults aged 55 and older. He found that 1.3 per cent reported symptoms of social phobia, of whom 31 per cent also experienced depression and 12 per cent experienced panic disorder. In these older adults, social phobia was equally common among men and women, while in the general population it affects women more often than men. Similarly, while low educational level is a risk factor for social phobia in the general population, it does not appear to be among older adults. These findings can help identify service needs and give physicians the tools to recognize symptoms of social phobia in this age group. They may also help researchers understand the underlying causes of the disorder.

#### ANTIDEPRESSANT SHOWS EARLY PROMISE IN TREATING AGITATION AND PSYCHOTIC SYMPTOMS OF DEMENTIA

Drs. **Benoit Mulsant** and **Bruce Pollock** found that, surprisingly, an antidepressant (citalopram) was almost as effective as a commonly prescribed antipsychotic (risperidone) in reducing symptoms of psychosis and agitation in people with dementia. Overall, there was a 32 per cent reduction of symptoms with citalopram and a 35 per cent reduction with risperidone. In addition, citalopram was associated with fewer of the side-effects, such as sedation, tension and apathy, that occurred with risperidone. This study is believed to be the first head-to-head comparison in this population of a selective serotonin reuptake inhibitor (SSRI) antidepressant with a commonly prescribed second-generation antipsychotic. These findings raise the possibility of a new direction in drug treatment for psychotic disorders related to dementia in older adults.

#### NEW GENETIC RESEARCH MAY LEAD TO PERSONALIZED SMOKING TREATMENT

Dr. **Rachel Tyndale** showed that a common genetic variation appears to affect the outcome of treatment to help people stop smoking. The variant in the CYP2B6 gene is present in between a quarter and a half of the world's population. Forty-five per cent of people with the identified variant benefited from treatment with bupropion (a medication that reduces the severity of nicotine cravings and withdrawal symptoms), and 32.5 per cent maintained abstinence (compared to a 14.3 per cent abstinence rate among those who received a placebo). In contrast, among people with a different variant of the gene, 55 per cent maintained abstinence on placebo and gained no additional benefit from bupropion. While the study results need to be replicated, this finding is a step toward individualized smoking cessation treatment.

#### INTERIM STOP STUDY DATA SHOW PROMISING RESULTS

The groundbreaking Smoking Treatment for Ontario Patients (STOP) Study is evaluating both the effectiveness of providing nicotine replacement therapy (NRT) to Ontarians who smoke and the method of distributing NRT. Led by Dr. **Peter Selby**, STOP reported encouraging interim results. One out of every 13 participants has remained smoke-free for 12 months, indicating that people who have access to effective counselling and NRT are up to four times more likely to quit. The program has reached more than 42,000 smokers in its first two-and-a-half years, representing almost a quarter of the estimated 175,000 Ontarians eligible to participate.

#### ONLINE TOOLS HELP REDUCE SUBSTANCE USE

Dr. **John Cunningham** develops Internet-based tools that allow people to evaluate their substance use and other addictive behaviours, and to decide if they need to change their behaviour. Building on the success of a personalized feedback program for heavy drinking, Dr. Cunningham worked with community partners on two new programs that were released this year, one for cannabis use (available at [www.checkyourcannabis.net](http://www.checkyourcannabis.net)) and one for gambling ([www.checkyourgambling.net](http://www.checkyourgambling.net)). A randomized controlled trial is generating positive results on the heavy drinking program's effectiveness in helping people to reduce their alcohol use, and Dr. Cunningham is hopeful that the new tools will offer the same support for cannabis use and gambling.

#### TREATING INSOMNIA IN OLDER ADULTS

Dr. **Usoa Busto** and her team investigated the potential benefits of using an over-the-counter antihistamine (diphenhydramine) to treat insomnia in older adults, as an alternative to benzodiazepines (a family of prescription sedative medications). Contrary to the team's hypothesis, a benzodiazepine was more effective than the antihistamine, particularly for helping people get to sleep more quickly and extending total sleep time. Sleeping problems are common among people who experience depression, and Dr. Busto's finding may help psychiatrists to treat this issue more effectively by prescribing medication based on the best available evidence.

#### STUDYING CHANGES IN OUR COMMUNITY MENTAL HEALTH SYSTEM

The System Enhancement Evaluation Initiative (seei), led by Dr. **Paula Goering**, has brought together researchers, service providers, decision makers, clients and family members to explore the system impact of new mental health funding in Ontario through nine research studies. In June 2007, an interim report entitled Seeing a Difference was published (available at [www.ehealthontario.ca](http://www.ehealthontario.ca)). Preliminary findings, including those from Dr. **Carolyn Dewa's** Matryoska Project and Drs. **Janet Durbin** and **Elizabeth Lin's** impact study, suggest that the additional \$142 million Ontario has invested in community mental health since 2004 is having a positive effect on programs, services and staff. During 2008, the project's final year, the team will analyze and interpret the final data and share their findings.

## RESEARCH IN THE NEWS

CAMH scientists made headlines this year with pioneering discoveries that signalled positive change, and used their expertise to focus public attention on key mental health and substance use issues. Efforts such as these helped CAMH research generate more than 1,200 media mentions—a program record.

Here are a few highlights of our 2007–2008 media coverage.

### ALCOHOL AND CANCER: IS DRINKING THE NEW SMOKING?

Dr. **Jürgen Rehm** clarified the link between alcohol consumption and the risk of head and neck cancers, showing that people who stop drinking can significantly reduce their cancer risk.

Dr. Rehm's analysis of research conducted between 1966 and 2006 showed the following:

- The risk of esophageal cancer nearly doubled in the first two years after people stopped drinking, a sharp increase that may be due to the fact that some people stop drinking only when they are already experiencing disease symptoms. However, after longer periods of abstinence, risk decreased rapidly and significantly.
- In general, the risk of head and neck cancers did not drop significantly until 10 years after people stopped alcohol use.
- After more than 20 years of abstinence from alcohol, the risks for both cancers were similar to those in people who had never drunk alcohol.

Media outlets including the *National Post*, the *Vancouver Sun*, and CTV.ca covered these results, which have important implications for tailoring alcohol policies and prevention strategies to at-risk groups, especially people with a family risk of cancer.

### YOUR FAMILY DOCTOR MAY BE THE KEY TO QUITTING SMOKING

Drs. **Bernard Le Foll** and **Tony George** highlighted the surprisingly important role physicians can play in helping people quit smoking. They noted that advising a patient to quit, even just once, and giving a short intervention of three minutes or less, can increase the person's motivation to quit and can significantly increase quit rates.

This comprehensive summary of tobacco use, causes of nicotine dependence, and advances in treatment and intervention garnered attention from publications such as *Scientific American* and *Canadian Business*.

### PEDOPHILIA MAY BE THE RESULT OF FAULTY BRAIN WIRING

Pedophilia might be the result of faulty connections in the brain, according to research by Dr. **James Cantor**. His MRI study revealed that pedophiles had significantly less of a substance called "white matter," which is responsible for wiring the different parts of the brain together.

This finding challenges the commonly held belief that pedophilia is caused by childhood trauma or abuse, and it is the strongest evidence yet that pedophilia is instead the result of a problem in brain development. The discovery suggests that more research attention should be paid to how the brain governs sexual interests. Such information could potentially yield strategies for preventing the development of pedophilia.

Dr. Cantor emphasizes that the research does not imply pedophiles shouldn't be held criminally responsible for their actions, and stresses that being unable to choose one's sexual interests is different from being unable to choose how one acts.

This story was covered by national and international media, including the BBC news, the *Telegraph* (U.K. and India), the *Ottawa Citizen*, the *Winnipeg Free Press* and the *Toronto Star*.

## CANADA'S LONGEST-RUNNING SCHOOL SURVEY REVEALS SURPRISING DATA ON YOUTH SUBSTANCE USE

The 2007 Ontario Student Drug Use and Health Survey (OSDUHS)—the longest running school survey of adolescents in Canada—revealed the latest statistics on substance use among Ontario teens. The use of alcohol, and of cannabis and other illegal drugs, remained stable or decreased, but the misuse of prescription opioid drugs may be a cause for concern.

Led by Dr. **Ed Adlaf**, OSDUHS found that 21 per cent of Ontario students in grades 7 to 12 reported using prescription opioid pain relievers such as Tylenol No. 3, Percocet and OxyContin for non-medical purposes; and more than 70 per cent reported obtaining the drugs from home. In addition, among all drugs asked about, OxyContin was the only drug to show a significant, though small, increase in non-medical use since the last survey (two per cent of students reported using it in 2007, representing about 18,100 students, versus one per cent in 2005).

The *Globe and Mail*, CBC News, the *Windsor Star*, the *Vancouver Sun*, 680 News, Canoe.ca, the *Toronto Sun* and many other media outlets covered these data, which were the first comprehensive Canadian survey results on non-medical use of prescription opioid pain relievers.

## EPIGENETIC CHANGES IN MAJOR PSYCHOSIS OFFER NEW CLUES TO THE MYSTERIES OF MENTAL ILLNESS

The *Globe and Mail*, CTV.ca, CBCNews.ca and others covered Dr. **Art Petronis**'s discovery of epigenetic changes—chemical changes to a gene that do not alter the DNA sequence—in people with mental illness. Dr. Petronis showed that in people with major psychosis, about one in every 200 genes showed an epigenetic difference.

This “proof of principle” study is the first epigenetic investigation in psychiatric research to study every human gene, and the first demonstration of what CAMH epigeneticists have hypothesized for the last 10 years. These results may be the missing link in understanding what causes complex illnesses.

## IN SUPPORT OF LONE MOTHERS

In a thought-provoking feature column in the *Toronto Star*, Dr. **John Cairney** asked: Are lone mothers less healthy because of poverty? Or do pre-existing health concerns lead to lone parenthood and its ensuing problems such as poverty? Existing research suggests both statements are correct, reflecting the complex association between social factors and health outcomes.

However, Dr. Cairney cautioned readers not to assume that all single mothers are the same. While there are real social problems faced by lone mothers and their children, we should remind ourselves not to take a uniformly negative view of their experiences. The article pointed to the need for more research that clarifies this complex problem and offers meaningful interventions for lone mothers who are at risk.

## SCHIZOPHRENIA: A DISORDER IN DISGUISE

How do you distinguish the beginnings of schizophrenia from normal adolescent turmoil? This is the question the *Globe and Mail* explored in an in-depth article on schizophrenia research at CAMH.

The article profiled Drs. **Jean Addington** and **James Kennedy**, two world-renowned experts who are studying young people at imminent risk of developing a psychotic illness, and using genetic research to minimize negative side-effects of antipsychotic drugs. The article's positive stories of recovery, told by CAMH clients, highlighted how these scientists' research is changing outcomes for people affected by schizophrenia.

## CLINICAL RESEARCH

Clinician scientists bridge the dual roles of researcher and health care provider. Their in-depth awareness and knowledge of clients' illness experience allows them to conduct research that expands on what we have learned from the laboratory as well as investigating new areas of interest. Their findings from this client-based research can then be used to improve how we diagnose and care for people affected by mental health and substance use problems.

This department is also actively involved in sharing this new or improved treatment knowledge with other clinicians and the community, through publications, presentations and workshops.

In recent years there have been growing concerns about increased negative side-effects and even increased risk of death associated with the use of antipsychotic drugs. It is perhaps surprising then that the literature on antipsychotic treatment of older adults with schizophrenia is almost non-existent. With this population expected to double in size over the next two decades, there is an urgent need to identify a minimal effective dose of antipsychotic medication for older people that maintains wellness while minimizing the risk of adverse effects.

Dr. **David Mamo** and colleagues are looking for a solution to this growing problem. Building upon previous work conducted with younger people with schizophrenia, this year they completed the first known positron emission tomography (PET) study of elderly people with schizophrenia. Through PET, a form of brain scan, they investigated the extent to which antipsychotic drugs bind to brain receptors (specialized brain cells that receive a chemical message from the drug). The researchers found that older adults experienced side-effects when the medication bound to 60 per cent of their brain receptors, while younger people typically do not have side-effects unless the medication binds to at least 80 per cent of receptors. These initial results offer the first clear evidence that sensitivity to antipsychotic drugs may be directly connected to age-related changes in the brain. The findings may lead to changes in clinical practice, with doctors calculating the dose of antipsychotic drugs according to a person's age.

Dr. Mamo is currently recruiting participants for a new longitudinal study to further investigate this groundbreaking finding. He will also continue examining the mechanisms through which people with schizophrenia become more sensitive to antipsychotic medication as they grow older. The initial findings suggest that this increased sensitivity is not related simply to increased levels of the drug in a person's blood, nor due to increased availability of the drug to the brain because of changes in the "blood-brain barrier." Instead, the increased sensitivity seems due to an age-related decline in the number of available receptors. Dr. Mamo's goal is to translate these observations from brain imaging into improved personalized treatment for older people with schizophrenia.

More than half the people diagnosed with clinical depression will at some point experience a recurrence of their symptoms. Yet researchers have historically paid little attention to finding strategies for reducing this risk. Dr. **Zindel Segal** saw evidence of this shocking trend in his clinical work and scientific analyses, and has worked with colleagues from the Universities of Cambridge and Oxford

to develop an innovative treatment program.

Mindfulness-Based Cognitive Therapy (MBCT) combines the practice and clinical application of mindfulness meditation—a technique that involves focusing without self-judgment on one’s present thoughts and actions—with the tools of cognitive therapy. This unique program gives people the means to address the factors that make recurrence of depression more likely, and to live a more independent life.

Over the past year, Dr. Segal has continued building on this successful program. When he’s not conducting eight-week MBCT sessions at CAMH or educating clinicians around the world, he is evaluating the effectiveness of MBCT and drug therapy to learn how these treatments can best be sequenced to ensure people’s sustained recovery from depression.

Dr. Segal’s program is gaining increasing clinical and scientific recognition worldwide. The National Institute for Clinical Excellence (NICE) in the U.K., an international leader in best practice guidance, recommends MBCT to help prevent the recurrence of depression. At the same time, other scientists are noting MBCT’s effectiveness through independent randomized controlled trials.

**T**his year CAMH built the Biobehavioural Addictions and Concurrent Disorders Research Laboratory, Canada’s first human research laboratory devoted to understanding concurrent psychiatric and substance use problems. In this lab, clinical neuroscientists will turn state-of-the-art assessments into better addiction treatment for people with a range of mental illnesses, such as schizophrenia and mood and anxiety disorders.

Deficits in cognitive function and changes in people’s motivation and reward systems are often associated with mental illness. Dr. **Tony George** will lead a team of scientists in researching how, for people with concurrent disorders, these deficits and changes contribute to the development and continuation of addictive behaviours. They will use this information to investigate how serious mental illness affects the basic processes of addiction.

The research will focus initially on tobacco addiction. For example, scientists will be able to monitor people with schizophrenia to see if their illness creates a heightened “reward system” in the brain, putting them at higher risk for failure to quit smoking. With this new knowledge, CAMH scientists can design personalized treatments to improve quit rates among people with mental illness.

As the lab grows, Dr. George and his team will broaden their investigations to include other substances such as alcohol, stimulants and marijuana.

#### CLINICAL RESEARCH

**R. Michael Bagby**, *Director*

##### ADDICTIONS PROGRAM

Tony George, *Head*

##### CENTRALIZED ASSESSMENT, TRIAGE AND SUPPORT (CATS) PROGRAM

Paul Kurdyak, *Head*

##### CHILD, YOUTH AND FAMILY PROGRAM

Ken Zucker, *Head*

##### DUAL DIAGNOSIS PROGRAM

Yona Lunsky, *Head*

##### GERIATRIC MENTAL HEALTH PROGRAM

Benoit Mulsant, *Head*

##### LAW AND MENTAL HEALTH PROGRAM

Ray Blanchard, *Head*

##### MOOD AND ANXIETY PROGRAM

Robert Levitan, *Head*

##### SCHIZOPHRENIA PROGRAM

Jeff Daskalakis, *Head*

##### COMMUNITY SUPPORT AND RESEARCH UNIT

Joan Nandlal, *Head*

##### DUAL DIAGNOSIS PROGRAM

Yona Lunsky, *Head*

##### WOMEN'S PROGRAM

Donna Akman, *Head*

Dr. Daniel J. Mueller



Neuroscience research at CAMH applies a comprehensive strategy of innovation to improve our understanding and treatment of mental illness and addiction. Weaving together expertise in molecular medicine, clinical and behavioural neuroscience, and psychiatric genetics, neuroscientists are making important discoveries that build our basic understanding of how mental illness and addiction works, and transforming these discoveries into improved treatment response.

## NEUROSCIENCE

Every day physicians face the dilemma of determining the best type and dose of medication with which to treat a particular patient. Training and experience teaches physicians some important considerations (for example, the patient's age, sex and ethnicity), but there continue to be many people who experience adverse side-effects or who get no relief from their symptoms. Both these outcomes can mean that people don't get well.

CAMH's new pharmacogenetics clinic, opening in 2008, is the first of its kind dedicated to understanding the genetics of people's response to psychiatric medication and side-effects they experience. The clinic provides an opportunity to leave behind the dark ages of prescribing by trial and error, and to move into a new era of precise, personalized prescription based on a person's genes.

As a first step, Dr. **Daniel J. Mueller**—the recently recruited clinic head—and an expert team of CAMH's pharmacogeneticists will measure variations in clients' CYP2D6 and CYP2C19 genes, which break down commonly used antidepressant and antipsychotic medications in the liver. These variations determine how well a person breaks down, or metabolizes, the medication: whether the person is a poor, intermediate, extensive or ultrarapid metabolizer. This information will help give physicians a prescription road map for each patient, helping them gauge what medication, and what dose, will be most effective and will have the fewest side-effects.

The pharmacogenetics clinic will also use genetic information to help pinpoint people who have a higher risk for tardive dyskinesia—a debilitating side-effect of some antipsychotic drugs—and to provide clients with critical information on side-effects.

Nicotine, the key addictive component of tobacco, keeps people hooked on smoking by activating specialized brain cells called receptors. Through "in vitro" studies, Dr. **Fang Liu** discovered an interaction between two brain receptors that increases the "reward" the brain gets from nicotine, and may be the root cause of nicotine addiction.

From this groundbreaking discovery, Dr. Liu developed a protein peptide that blocks the interaction between these two receptors—potentially a new way of treating nicotine addiction, and one with fewer side-effects than existing approaches.

This year, BioDiscovery Toronto—an organization that helps Toronto's major biomedical research institutions commercialize their research findings—supported Dr. Liu's ongoing work, ranking her research first overall in its grant competition. This critical support allows Dr. Liu, in collaboration with Dr. **Anh Dzung Lê**, to move her research forward with "in vivo" studies.

### NEUROSCIENCE

**James Kennedy**, *Director*

**BIOPSYCHOLOGY**  
Paul Fletcher, *Head*

**CLINICAL NEUROSCIENCE**  
Usoa Busto, *Head*

**HUMAN NEUROCHEMICAL  
PATHOLOGY LABORATORY**  
Stephen Kish, *Head*

**THE KREMBIL FAMILY  
EPIGENETICS LABORATORY**  
Art Petronis, *Head*

**LABORATORY OF CELLULAR  
AND MOLECULAR  
PATHOPHYSIOLOGY**  
Jerry Warsh, *Head*

**MOLECULAR  
NEUROSCIENCE**  
Fang Liu, *Head*

**MOLECULAR  
PHARMACOLOGY**  
Susan George and  
Brian O'Dowd, *Heads*

**NEUROBIOLOGY  
OF ALCOHOL**  
Anh Dzung Lê, *Head*

**NEUROIMAGING**  
José Nobrega, *Head*

**PHARMACOGENETICS**  
Rachel Tyndale, *Head*

**PSYCHIATRIC  
NEUROGENETICS**  
James Kennedy, *Head*

**TRANSLATIONAL  
ADDICTION RESEARCH  
LABORATORY**  
Bernard Le Foll, *Head*



## PET CENTRE

In the past year, the PET Centre has made further inroads in applying PET to mental illness and addiction. Radiochemists Drs. **Alan Wilson** and **Neil Vasdev** continued their work in developing radiotracers, the radioactive chemical agents used in PET imaging. Two of these agents, [C-11]-DASB and [C-11]-PHNO, have gained further acceptance by other leading PET research teams worldwide, and by the pharmaceutical industry, as the best radiotracers to use in studying, respectively, the serotonin transporter and the D<sub>2</sub> and D<sub>3</sub> receptors for dopamine.

Radiotracers and PET methods developed at CAMH are having an increasing impact on the early phases of drug development. Pharmaceutical companies from Europe and the United States have used CAMH's PET facilities to carry out initial studies of potential new psychiatric drugs. The results of these studies have been pivotal in helping the companies decide whether to continue developing the drugs.

Drs. **Jeff Meyer** and **Julia Sacher** have begun a groundbreaking PET study of postpartum depression, the most common complication of childbearing. The preliminary results provide the hope that the study will bring new understanding of this debilitating condition, and may potentially improve treatment.

The Ontario Ministry of Research and Innovation matched the Canada Foundation for Innovation's \$2.2 million grant for expanding the University of Toronto Functional Imaging Research Network (FIRN). Dr. **Sylvain Houle** and his team are using this investment to buy a new cyclotron (a particle accelerator that produces the radioactively tagged material used in PET imaging).

Finally, PET studies in collaboration with scientists from Baycrest—a leading centre for geriatric health care and research—and the Sunnybrook Health Sciences Centre have provided new knowledge about Alzheimer's disease; while Dr. **Antonio Strafella**, a neurologist with joint appointment at CAMH and the University Health Network, has been continuing his PET investigation of the role the chemical messenger dopamine plays in problem gambling.

Research in CAMH's PET Centre, led by Director Sylvain Houle, is part of the road map to improved treatment for mental health and substance use problems. Using positron emission tomography (PET), an advanced brain imaging method, scientists study how brain chemistry is altered in mental illness and addiction and how it is modified by treatment. Their work identifies important brain changes in disease, optimizes the effectiveness of existing treatments and contributes to the discovery of new therapies.

Dr. Brian Rush and Karen Urbanoski



## SOCIAL, PREVENTION AND HEALTH POLICY RESEARCH

**R**esearch has shown that bisexual people have higher rates of mental health problems than do heterosexuals, gay men or lesbians. Why is this so, and how can we improve mental health services for bisexual people in Ontario? These are the questions Dr. **Lori Ross** is addressing in a research project, “Understanding the Context of Bisexual Mental Health,” funded by CAMH’s Community Research Capacity Enhancement Program.

Working in partnership with Sherbourne Health Centre, a community organization focused on LGBT health, Dr. Ross and her team have conducted focus groups and interviews with 55 bisexual people across Ontario. The initial results point to a need for training for service providers, public education about bisexuality, inclusive sex education in schools, additional services and resources, and more research about bisexuality and mental health.

The team took a participatory approach to the project, engaging both Sherbourne Health Centre and members of the bisexual community in all aspects of the research, including defining the problem, collecting data and interpreting the results. This model ensures that knowledge and skills are shared with all participants, creating the potential for turning the knowledge from this project into real social change for the bisexual community.

**M**ental health and addiction care in Canada is experiencing a renaissance, and it is starting with CAMH’s innovative Alternate Milieu (AM) units at the redeveloped Queen Street site. This new model is a shift toward recovery-based care that focuses on wellness, health and hope. The units are designed to foster clients’ independence, autonomy and sense of empowerment, and to create a caring and respectful atmosphere.

CAMH’s AM units have the potential to be a benchmark for mental health care, so it is crucial that we evaluate them thoroughly. **Karen Urbanoski** and Dr. **Brian Rush** are leading a three-year evaluation project in which they will compare processes and clients’ outcomes before and after the units were opened. The research team is actively gathering quantitative and qualitative data from clients and staff on admission characteristics (for example, wait times, patterns of referral), treatment process, and short-term outcomes such as clients’ quality of life and their perceived level of empowerment. Findings to date on staff opinions have highlighted several positive expectations for the alternative approach, as well as areas of concern, which will be valuable for future study.

Once completed in 2010, the evaluation will provide invaluable information on program implementation, early successes and potential areas for

This department addresses mental health and addiction issues from a social, policy and prevention perspective—not only in Ontario, but across Canada and globally. This dynamic group of scientists works on a wide range of research, spanning studies of substance use and abuse in subpopulations and in the general population; studies investigating potential benefits to particular communities of changes in alcohol policy; the development of prevention approaches for particular groups; and the evaluation of the effectiveness of mental health services. This research influences government direction and policies in ways that better meet clients’ and family members’ needs, and leads to more effective treatment and prevention programs.

improvement, and may guide government decisions on introducing similar units across the province.

**I**n 2006, Dr. **David DeWit** received almost \$2 million in funding to examine the impact of Big Brothers Big Sisters of Canada (BBBSC) programs on the health of Canadian children. Since then Dr. DeWit and his team, including co-principal investigator Dr. Ellen Lipman of McMaster University, have been recruiting participants for the first in-depth study of BBBSC since its inception in 1913. The researchers hope to recruit 950 families from 20 BBBSC agencies nationwide.

The findings so far have revealed that children who apply for an adult mentor typically come from families with low incomes headed by a lone female parent. Lone mothers head the majority of families (85 per cent), one in three families relies on government social assistance, and 42 per cent report an annual gross household income of less than \$20,000. Existing research tells us that poverty and the absence of a second parent places children in these families at greater risk for health problems.

This evaluation study will reveal the benefits of the program, how mentoring works, the demographic groups for whom positive change is most likely to occur, and the settings in which change is most likely. Dr. DeWit expects the study results to translate into better health for children who are at risk.

In 2002, alcohol accounted for almost \$15 billion of direct health care costs in Canada, and global trends for alcohol-related disease and death are equally startling. CAMH is working with the World Health Organization (WHO) to develop better public policy, treatment and prevention initiatives to curb this booming public health problem.

Under the direction of Dr. **Louis Gliksman**, CAMH has managed the Global Information System on Alcohol and Health (GISAH) for the past three years. This sophisticated, interactive database is a source of information on worldwide alcohol use, production, consumption harms and consequences, policies and control measures (for example, taxation). It also tracks trends in alcohol use and related mortality since 1961. International leaders in the field use the GISAH to turn global trends into community and policy action that benefits the health and well-being of people around the world.

CAMH now manages all technical aspects of the database, and has revised the database to make it more compatible with WHO guidelines for monitoring alcohol use and related harms. Dr. Gliksman and his team also field questions from users of the database. A key role is gathering new information for the GISAH by contacting national agencies and other sources about the data they have available, and conducting worldwide surveys on alcohol-related policies and health. The second such survey will be carried out in 2008.

The GISAH website is at [www.who.int/globalatlas](http://www.who.int/globalatlas).

#### **SOCIAL, PREVENTION AND HEALTH POLICY RESEARCH**

**Louis Gliksman**, *Director*

HEALTH SYSTEMS  
RESEARCH AND  
CONSULTING UNIT:  
Paula Goering, *Head*

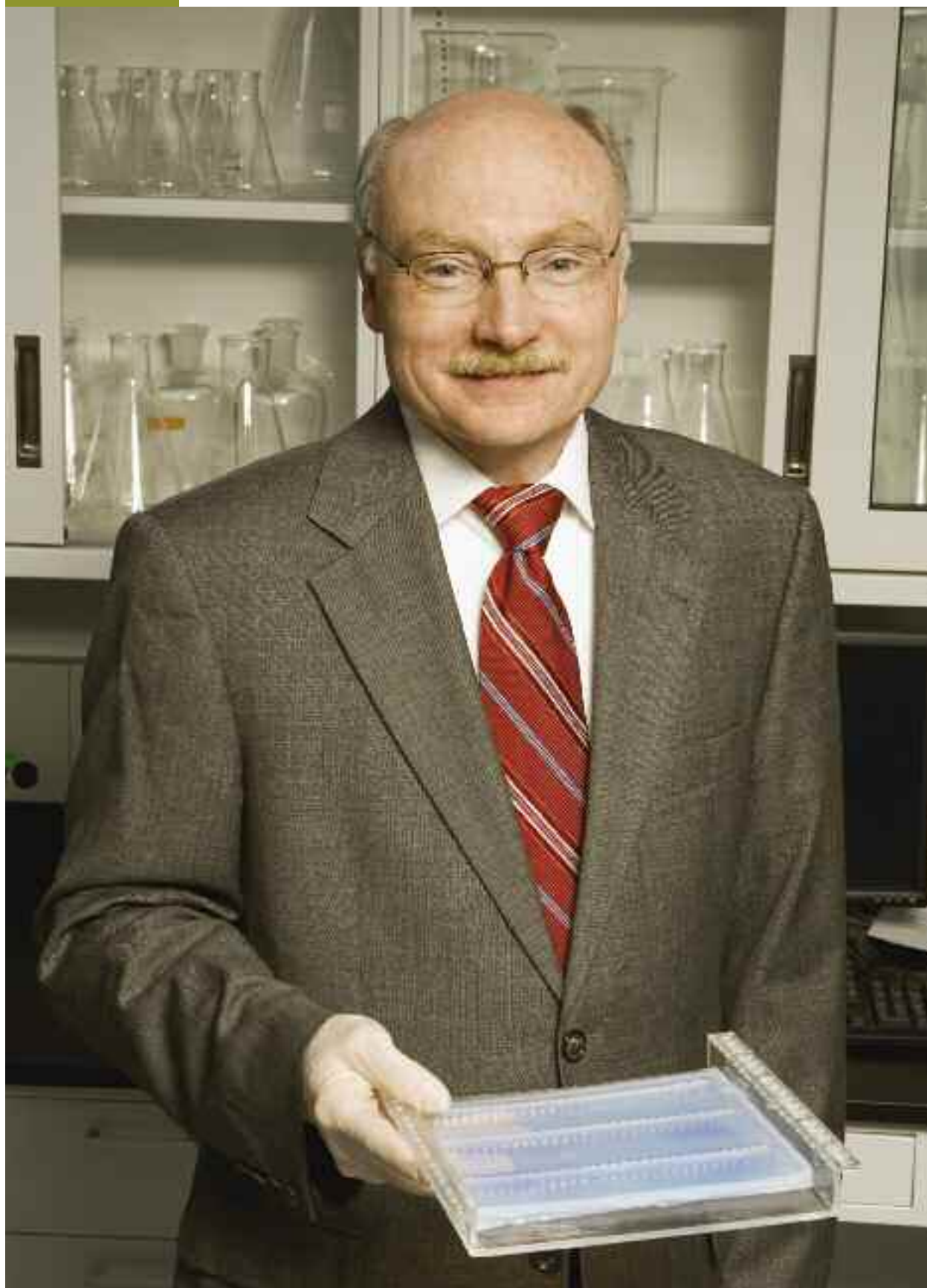
PUBLIC HEALTH AND  
REGULATORY POLICIES:  
Jürgen Rehm and  
Edward Adlaf, *Heads*

SOCIAL AND COMMUNITY  
PREVENTION RESEARCH:  
Kathryn Graham, *Head*

SOCIAL EQUITY AND  
HEALTH:  
Samuel Noh and  
Brenda Toner, *Heads*

THE DEPARTMENT ALSO  
HOUSES THE **ONTARIO  
TOBACCO RESEARCH UNIT**  
Roberta Ferrence, *Head*

Dr. James Kennedy



## TRANSLATING RESEARCH INTO COMMERCIAL APPLICATIONS

**CAMH's** Technology Transfer Office (TTO) is a key component of our efforts to translate discoveries from laboratories into real-world applications that benefit the public. The TTO protects CAMH's intellectual property rights—for 23 new technologies to date, 17 of which are in the area of neurogenetics. This year the office filed eight patent applications, established important connections with industry partners, licensed two new CAMH-developed technologies and signed an option agreement for another.

One licence agreement, with a U.S.-based company, is for a variant of the gene that encodes the D<sub>3</sub> dopamine receptor. This CAMH discovery, by Drs. **James Kennedy** and **Clement Zai**, is a critical component of the diagnostic kit for tardive dyskinesia (TD) that this company is developing. People with schizophrenia who have this gene variant—present in about 25 per cent of the population—are at higher risk of developing TD, a side-effect of some antipsychotic drugs. Doctors can use the information from the diagnostic kit to more confidently prescribe medication that will effectively treat schizophrenia symptoms while minimizing health risks and debilitating side-effects. Another new technology from CAMH, which the same U.S.-based company is assessing under an option agreement, can test whether a person with schizophrenia is likely to respond to drug treatment with clozapine.

CAMH has also signed a licence agreement with TheraGenetics Ltd. for an antidepressant-induced mania test. This test—also developed in Dr. Kennedy's lab—helps identify people who are at higher risk for developing manic symptoms as a side-effect of taking common antidepressant medications.

Other roles for the TTO are to guide CAMH scientists' early-stage discoveries through the novel technology developmental process, and to help researchers obtain vital "proof-of-principle" (POP) funding to validate and expand on new discoveries. One example of this is the development of a new drug for treating schizophrenia, made possible by POP funding from the Ministry for Research and Innovation's Ontario Research Commercialization Program (ORCP). This discovery has attracted the interest of a major pharmaceutical company, where the drug is now being tested at the pre-clinical stage. The TTO was also instrumental in obtaining ORCP funds for two other early-stage drug development projects that are investigating treatment for stroke and for nicotine addiction.

The Technology Transfer Office enables inventions to be translated into practical applications by identifying new discoveries that have potential for commercial interest, protecting this work with patents, licensing to industrial partners or establishing spin-off companies. This strategic leadership is a bridge connecting scientific discoveries to real-world tools that help us understand, diagnose and treat mental health and substance use problems.

## RESEARCH TRAINING

Dr. Yuko Hirata



*“It is very difficult for foreign medical investigators to get funding in Canada, and I deeply appreciate the opportunity to be able to continue my training and research at CAMH thanks to the Postdoctoral Fellowship Award.*

*During my time here, I’ve learned that neither basic nor clinical research alone is enough to provide effective answers. CAMH has strength and breadth in basic research, genetics and clinical expertise, making it an ideal place to carry out my training.”*

—Yuko Hirata, MD, PhD, two-time consecutive Postdoctoral Fellowship Award recipient

**A** high-quality training experience is essential for CAMH graduate students and fellows, as these emerging leaders use their education to boost our research excellence.

This year Dr. **Allan Kaplan**, who was recently appointed Director of Research Training, introduced new initiatives focused on improving training experiences and the quality of our internal information-gathering process and procedures. Dr. Kaplan:

- oversaw the development of a database that provides key information about all current research trainees
- began developing a formal evaluation process for research supervisors
- joined a new committee in the University of Toronto’s Faculty of Medicine, consisting of all the directors of research training for Toronto-area teaching hospitals; this committee ensures that CAMH has a voice in Faculty decisions that may affect the funding of research positions, and provides a way to share information with other hospitals about research training
- started establishing an office of Research Training with dedicated administrative support to oversee registering all research trainees at CAMH.

In addition, Dr. Kaplan will continue to explore more funding options to support our growing training efforts.

**A** vital part of research training at CAMH is our annual postdoctoral fellowship program. By contributing to an existing research project, or developing an original project with a senior scientist, fellows receive comprehensive guidance and education about research techniques and about working in the mental health and addiction field. This mentorship helps produce the research leaders of tomorrow.

**T**he following fellows received a **2007–2008 CAMH Postdoctoral Fellowship Award** to help fund their study:

**Lisa Burckell**

SUPERVISOR: Dr. Shelley McMain

PROJECT TITLE: The role of the therapeutic alliance in dialectical behaviour therapy: Impact on process and outcome

**Yuko Hirata**

SUPERVISOR: Dr. James L. Kennedy

PROJECT TITLE: Gene-environment interaction risk factors in childhood aggression

**Shupeng Li**

SUPERVISOR: Dr. Fang Liu

PROJECT TITLE: Uncoupling  $\alpha 4\beta 2$  nicotinic acetylcholine interaction with dopamine D1 receptors: Implication in the treatment of nicotine addiction

**Gabriela Pereira de Souza Favalli**

SUPERVISOR: Dr. Jeff Daskalakis

PROJECT TITLE: Repetitive transcranial magnetic stimulation (rTMS) for the treatment of refractory schizophrenia.

**T**he recipients of the **2008–2009 Postdoctoral Fellowship Awards** have also been announced.

This year's competition was the most successful to date, with a record-breaking 20 applicants vying for just eight awards. The following recipients will continue CAMH's tradition of turning outstanding trainees into very influential contributors to the mental health and addiction fields:

**Ingrid Bacher** (Joint fellowship with TUSP, the strategic training program in Tobacco Use in Special Populations)

**Daniel Blumberger**

**Amy Lykins**

**Yuko Hirata**

**Daniela Lobo** (Joint fellowship with Addiction Program)

**Dominique Morrisano**

**Gabriela Novak** (Joint fellowship with TUSP, the strategic training program in Tobacco Use in Special Populations)

**Stephanie Penney.**

## AWARDS AND RECOGNITION

CAMH researchers are continually recognized for their scientific expertise and achievements. Here are just a few examples of our 2007–2008 honours.

**Michael Bagby** was awarded a Senior Research Fellowship from the Ontario Mental Health Foundation.

**Ray Blanchard** was the inaugural recipient of the CAMH Research Training Award.

**Carolyn Dewa** received an Applied Public Health Chair from the Canadian Institutes of Health Research (CIHR) Institute of Public and Population Health and the Public Health Agency of Canada. Dr. Dewa also received the Research Mentor Award from the International Center for Mental Health Policy and Economics and the World Psychiatric Association.

**Rohan Ganguli** received a Tier 1 Canada Research Chair.

**Susan George** received the Women's Initiative Group Scholar's Award from the Medical University of South Carolina. Also, Dr. George was the only Canadian speaker at the Dopamine 50 Years symposium in Sweden.

**Norman Giesbrecht** received the 2007 Lifetime Achievement Award from the American Public Health Association, in recognition of his leadership and distinguished service in substance

abuse research and application. Also, Dr. Giesbrecht co-chaired the Alcohol, Cancer and Public Policy seminar. This one-day event was attended by about 85 people, and included presentations by senior scholars and community authorities.

**Paula Goering** received the Distinguished Nurse Alumnae Award from the University of Kansas.

**Hayley Hamilton** was co-principal investigator on a study selected for Honourable Mention for the Community Based Research Award of Merit, sponsored by the Centre for Urban Health Initiatives, the Wellesley Institute, and University College at the University of Toronto.

**James Kennedy** was the top-ranking candidate worldwide among those elected to the board of the International Society of Psychiatric Genetics, an organization that strives for the highest ethical standards in genetic research and the application of findings from genetic research in clinical psychiatric practice.

**Paul Kurdyak** received the CIHR Institute of Health Services and Policy Research Rising Star Award. This distinguished

honour recognizes excellence in knowledge translation or research carried out by graduate students and postdoctoral fellows. Dr. Kurdyak received the award in recognition of his article in the April 2007 edition of the *American Journal of Public Health*, entitled "The effect of antidepressant warnings on prescribing trends in Ontario, Canada."

**Bernard Le Foll** received an Early Research Award from the Ontario Ministry of Research and Innovation. Dr. Le Foll received this honour for his scientific and academic contributions, and for the importance of his proposed project "An Integrated Approach to Develop New Treatment for Tobacco Smokers."

**Fang Liu** was recognized with a Heart and Stroke Career Scientist Award from the Heart and Stroke Foundation of Canada.

**Yona Lunsky** received a New Investigator Award from the CIHR. Dr. Lunsky was also an executive board member of the Canadian Association for Research and Education in Intellectual Disabilities, the only national organization representing intellectual disabilities in Canada.

## A MAINSTAY OF RECOGNITION IN RESEARCH: 2007 CORE AWARDS A SUCCESS

Each year the Research Program recognizes and celebrates staff and students who have made exceptional contributions toward the pursuit of research excellence. At the third annual CORE (CAMH Outstanding Research Employee) Awards, the 2007 recipients were honoured for their extraordinary commitment to CAMH research.

All 25 nominations, from each of the four Research departments, were filled with overwhelming praise

and countless examples of the talents, innovation and integrity of the nominees. From this distinguished group, the 2007 recipients were chosen:

### STAFF

Lise Anglin  
Penny Barsoum  
Debbie Chiodo  
Mary Jean Costello  
Anca Ialomiteanu

### STUDENT

Kari Ala-leppilampi

Congratulations also to all this year's nominees:

### STAFF

Sharon Bernards  
Thomas Blak  
Melissa Daigle  
Joseph De Leo  
Patricia Donoghue  
Rosely Flam-Zalcman  
Nina Flora  
Carolyn Gracey  
Sarwar Hussain  
Kathryn Knight  
Sheila LaCroix  
Julia Lecce  
Gloria Leo

Heidi Marcon  
Martha McKay  
Winston Stableford

### STUDENTS

Satya Mohapatra  
Tarek Rajji  
Julia Sacher

We extend our thanks to all who took the time to submit nominations, and to the 2007 CORE Awards committee for pulling together another wonderful event.

## AWARDS AND RECOGNITION, continued

**David Mamo** received a Canadian Psychiatric Research Foundation Award for his project “Antipsychotic Polypharmacy in Schizophrenia.” Dr. Mamo also received a Junior Investigator Award from the International College of Geriatric Psychoneuropharmacology.

**Shelley McMain** was an invited member of the International Society for Psychotherapy Research steering committee. Dr. McMain was also an invited participant at an international strategic planning meeting for experts in dialectical behavioural therapy.

**CAMH’s Social Equity and Health (SEH)** research unit was named a co-hub for the World Health Organization’s Employment Conditions Knowledge Network (EMCONET). SEH co-ordinates EMCONET’s activities, and uses its extensive expertise to contribute to knowledge in this area of research. Co-chaired by **Carles Muntaner** and **Joan Banach**, EMCONET helps develop models and measures to clarify how workers’ health is affected by different types of jobs, conditions of underemployment

and the threat of becoming unemployed. The group’s first report, entitled *Employment Conditions and Health Inequalities*, was released in 2007.

**Brian O’Dowd** was an invited presenter at meetings in Australia, California and Montreal for his lab’s groundbreaking work in examining the structures and interactions involved in G protein-coupled receptors (GPCRs)—proteins on a cell’s surface that can interact with the environment both inside and outside the cell. Dr. O’Dowd reported that we can analyze the behaviour of GPCRs in living cells following the disruption of either coupled receptor in the compound. This process is important as it determines what occurs at the cell surface when the cells are treated with drugs.

**Bruce G. Pollock** was elected president of the American Association for Geriatric Psychiatry. Dr. Pollock will use his expertise to guide priorities in the safety and efficacy of psychiatric medications for older adults, and in access to quality mental health care for older adults.

**Jürgen Rehm** served as executive vice-president of the Jellinek Fund, and as a member of the fund’s board. Dr. Rehm was also a member of the Swiss Federal Office of Public Health’s expert consulting group for tobacco prevention, and a member of an expert advisory committee on supervised injection site research.

**Zindel Segal** was recognized with a Hope Award from the Mood Disorders Association of Ontario. Dr. Segal also received a Senior Research Fellowship from the Ontario Mental Health Foundation.

**John Strauss** received a NARSAD Young Investigator Award and a New Investigator Award from the Sick Kids Foundation.

**Rachel Tyndale** became an associate editor for *Clinical Pharmacology and Therapeutics*. One of the Nature journals, this is a leading pharmacology and pharmacy periodical that publishes primary research.

## ADDRESSING MENTAL HEALTH AND ADDICTION CHALLENGES WITH COMMUNITY PARTNERS

The Community Research Capacity Enhancement Program (CRCEP) funds research collaborations with partner organizations in the community, and builds research capacity among these organizations.

In 2007–2008, the program funded the following projects: Dr. **Benedikt Fischer** (CAMH) and **Lorie Steer**, **Kate Mason** and **Michelle Firestone** (Street Health) for their project “Prescription Opioid Injection among Street Drug Users in Toronto”

Dr. **Carles Muntaner** (CAMH) and **Sonja Nerad** (Access Alliance Multicultural Community Health Centre) for their project “Mental Health Experiences of Government Assisted Refugees”

Dr. **Samuel Noh** (CAMH) and **John Philip Melville** (Ottawa Community Immigrant Services Organization) for their project “Transnational Research on Refugee Youth Coping Strategy: Capacity Development.”

## CAMH RESEARCH BY THE NUMBERS

In 2007–2008, the Research Program continued improving diagnosis, prevention, intervention, treatment and public policy initiatives across our four diverse areas of research. In the past year, we:

- received 264 contracts and grants
- mentored 166 trainees
- generated more than 44,000 web hits on the Research section of camh.net
- employed more than 100 full-time scientists and 500 staff
- celebrated the 22 scientists who are in the top one per cent for their field, based on the Essential Science Indicators data on the most highly cited scientists
- issued 16 science-focused press releases, including eight published on EurekAlert, an online, global news service, which had more than 34,000 viewings
- garnered 1,269 media mentions
- filed eight patent applications; licensed two new, CAMH-developed technologies; and executed one option agreement for a CAMH-developed technology.

## CAMH LIBRARY AND ARCHIVES

**Sydney Jones**, *Director*, Library Services

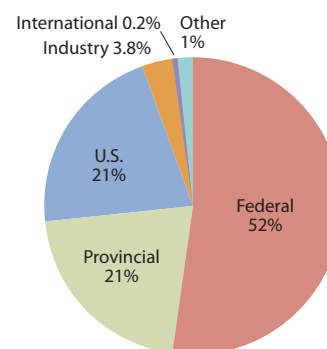
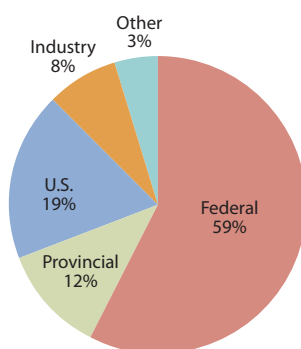
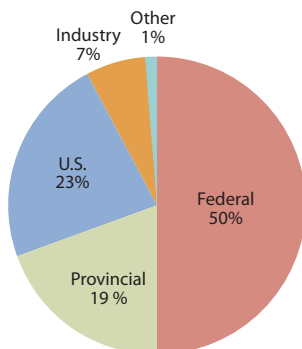
- home to 40,000 monographs, 277 current print journals, and 4,884 electronic journals
- more than 25,000 full text articles downloaded annually from the Virtual Library
- almost 7,000 database search sessions recorded annually

The CAMH Library's business is knowledge translation. It is our main vehicle for collecting and sharing information so that staff, clients and the public can continually learn. This vital resource builds and maintains Canada's largest collection of mental health and addiction materials. The Library's collections support CAMH's multidisciplinary research programs and the ongoing educational needs of all CAMH staff. Electronic resources are available on the Virtual Library around the clock, from any location. In addition, selected services are offered to health care professionals and the public throughout Ontario. The Library also plays a role in co-operative programs and takes a leadership role in local, national and international information exchange activities.

The CAMH Archives collects and describes CAMH's historical records and makes them available for study. The collection also includes extensive and unique materials on the history and development of psychiatry and other mental health and addiction services in Canada. Historical researchers from CAMH, and from universities and other research centres worldwide, regularly consult CAMH's archival resources.

## BREAKDOWN OF FUNDING BY SOURCE

2007–2008	\$	2006–2007	\$	2005–2006	\$
Federal	19,447,781	Federal	22,957,633	Federal	19,813,269
Provincial	7,543,342	Provincial	4,647,147	Provincial	8,043,810
U.S.	8,753,525	U.S.	7,280,838	U.S.	7,994,415
Industry	2,656,230	Industry	3,079,084	Industry	1,444,628
International	—	International	—	International	55,502
Other*	313,031	Other*	1,181,279	Other*	527,832
<b>Total</b>	<b>38,713,909</b>	<b>Total</b>	<b>39,146,000</b>	<b>Total</b>	<b>37,879,456</b>



\*"Other" includes all grants from Canadian universities and private (non-profit) foundations.

## SOURCES OF FUNDING, 2007–2008

Abbott Laboratories  
 Across Boundaries  
 American Foundation for Suicide Prevention  
 Aspect Medical Systems Inc.  
 AstraZeneca Canada Inc.  
 Autism Speaks  
 Auto21 Networks of Centres of Excellence  
 B.C. Mental Health and Addiction Services  
 British Columbia Ministry of Public Safety and Solicitor General  
 Canadian Council on Learning  
 Canadian Diabetes Association  
 Canadian Foundation for Innovation  
 Canadian Institutes of Health Research  
 Canadian Lung Association  
 Canadian Psychiatric Research Foundation  
 Canadian Tobacco Control Research Initiative  
 Cancer Care Ontario  
 Cascade Therapeutics Inc.  
 Eli Lilly and Company  
 Four Counties Addiction Services  
 GlaxoSmithKline Research & Development Limited  
 Government of Australia  
 Health Canada  
 Heart and Stroke Foundation of Canada

Indian Health Service  
 Institute of Environmental Science and Research  
 Johnson and Johnson Inc.  
 Lundbeck Canada Inc.  
 McLaughlin Centre for Molecular Medicine  
 Ontario Ministry of Community and Social Services  
 Ontario Ministry of Community Safety and Correctional Services  
 Ontario Ministry of Health and Long-Term Care  
 Ontario Ministry of Health Promotion  
 Ontario Ministry of Research and Innovation  
 Ministry of the Attorney General  
 NARSAD  
 National Cancer Institute of Canada  
 National Institutes of Health  
 Natural Sciences and Engineering Research Council of Canada  
 Northeast Mental Health Centre  
 Obsessive Compulsive Foundation  
 Ontario Genomics Institute  
 Ontario HIV Treatment Network  
 Ontario Mental Health Foundation  
 Ontario Problem Gambling Research Centre

Ontario Tobacco Research Unit  
 Organon Canada Ltd.  
 Parkinson Society of Canada  
 Public Health Agency of Canada  
 Quinte Health Care Corporation  
 Rett Syndrome Research Foundation  
 Schering-Plough Canada  
 SickKids Foundation  
 Simon Fraser University  
 Social Sciences and Humanities Research Council of Canada  
 South African Medical Research Council  
 Statistics Canada  
 The Provincial Centre of Excellence for Child and Youth Mental Health at CHEO  
 The Scottish Rite Charitable Foundation of Canada  
 Tourette Syndrome Association, Inc.  
 University of Toronto

Special thanks to the CAMH Foundation donors for their ongoing support for research at CAMH. The mission of the CAMH Foundation is to raise funds to support the work of CAMH, which includes not only research, but also clinical care, education, health promotion and public policy.

To make a donation, call 416 535-8501 ext. 4093, or donate online at [www.supportcamh.net](http://www.supportcamh.net).

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**MISSION:** Improving the lives of those affected by addiction and mental health problems and promoting the health of people in Ontario and beyond.

**VISION:** Strong and healthy communities, in which people with addiction and mental health problems can access appropriate and effective services and live as full participants.

COVER IMAGE: Photo courtesy of Dr. Jeffrey Meyer, Head, and Laura Miler, RA II, Neurochemical Imaging Program in Mood Disorders, PET Centre, CAMH

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E-mail: [foundation@camh.net](mailto:foundation@camh.net)

If you have questions, concerns or compliments about services at CAMH, please contact Client Relations Services:  
Tel.: 416 535-8501 ext. 2028 or 2078

For information on addiction and mental health issues or other resources, please contact CAMH McLaughlin Information Centre:  
Ontario toll-free: 1 800 463-6273  
Toronto: 416 595-6111

Website: [www.camh.net](http://www.camh.net)



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