

Lady Davis Institute Research Newsletter



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Claudia Kleinman receives Canadian Cancer Society Award for Excellence

Dr. Claudia Kleinman was recognized by the Canadian Cancer Society (CCS) with a 2020 Award for Excellence for bold leadership and trailblazing contributions to cancer research. She received the Bernard and Francine Dorval Prize for her work mapping the development of the human brain at the single cell level to identify when and where different childhood brain tumours arise. These findings have changed how some tumours are classified and identified new potential treatments for others.

"Dr. Kleinman is truly a one-of-a-kind researcher who possesses a rare combination of expertise in both computer science and molecular biology," says Dr. Stuart Edmonds, Executive Vice-President, Mission, Research and Advocacy at the CCS. "With this unique skillset, she has uncovered critical insights into how childhood brain tumours arise."

The Bernard and Francine Dorval Prize is given to an early career investigator whose outstanding contributions to basic biomedical research have the potential to lead, or have already led, to improved understanding of cancer treatments and/or cures.

"I am extremely grateful to the Canadian Cancer Society for this recognition of our work, which reinforces our conviction that this is the area to focus all our efforts," said Dr. Kleinman. "Childhood brain tumours remain an important challenge. We hope that by harnessing the power of computer science and high resolution technologies to profile cancer cells, we will be able to tackle the complexity and get one step closer to improve the outcome of these deadly tumours."



McGill Awards in honour of Pierre Pluye

Dr. Pierre Pluye's research program aims to improve the impact of online health information.

"Information is a fantastic tool, for family physicians and the public to be able to know at any time what a word, a diagnosis, a drug or a treatment means. The right to information is one of the pillars of our democracies. Of course, misleading information undermines this right and our societies," says Dr. Pluye, a Professor in McGill's Department of Family Medicine.

Since he joined the Department in 2005, Dr. Pluye's training has attracted more than 1,800 students from a wide variety of disciplines in Canada and abroad. He has the most prolific scholarly output of articles, reviews and book chapters (in all scientific disciplines) with "mixed methods or reviews" (in French or English) in the title, abstract and keywords.

Dr. Pluye received the 2021 Northeastern Association of Graduate Schools (NAGS) Doctoral Teaching Award, recognizing excellence and creativity in teaching doctoral students, as well as innovation in the development and implementation of graduate programs.

To celebrate Dr. Pluye's original and influential contribution to the advancement of mixed methods research, and mixed studies reviews in general, the McGill Family Medicine Education Research Group (FMER) announced a sponsorship of "The Pierre Pluye International Mixed Methods Thesis

and Dissertations Awards in Family Medicine."
These awards are aimed to distinguish the work of promising new researchers committed to the advancement of science in family medicine education research around the world.



Investigators awarded CIHR Funding

Eight investigators from the Lady Davis Institute were awarded support from the Canadian Institutes of Health Research (CIHR) in its latest round of funding. The successful applicants were:

- Volker Blank, who received \$685,000 over five years for "Cytokine dependent regulatory networks in myometrial cells - link to preterm labor."
- Mark Eisenberg, who received \$1.8 million over five years to conduct the study, "Aggressive Smoking Cessation Therapy Post-Acute Coronary Syndrome: The Aggressive Smoking Cessation Therapy Post-Acute Coronary Syndrome (ASAP) Trial."
- Kristian Filion received \$138,000 over two years to investigate the "Comparative Effectiveness and Safety of Long-acting Insulins and Neutral Protamine Hagedorn (NPH) Insulin among Patients with Type 2 Diabetes."
- Rongtuan Lin received \$830,000 over five years for "Investigating the role of TRAF7 in regulating antiviral immune response."
- Soham Rej received \$600,000 over four years for "Mindfulness-Based Cognitive Therapy (MBCT) vs. Health Enhancement Program (HEP) Active Control for the Treatment of Late-Life Depression: A Randomized Controlled Trial"
- Ivan Topisirovic received \$1.1 million over five years for "The role of CK2 in translational reprogramming in cancer."

Two bridge funds, of \$100,000 each, were awarded to: **Uri Saragovi** for "Innovation of a Proprietary Liquid Biopsy Strategy for Diagnosis of Early Stage Ovarian Cancer;" and **Brett Thombs** for "The DEPRESSION Screening Data (DEPRESSD) Project: Continuous Updating of Databases for Individual Participant Data Meta-analyses of Depression Screening Test Accuracy."

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FRQS Salary Award Recipients

Ten researchers from the LDI and Jewish General Hospital received salary support awards from the Fonds de recherche Quebec - Santé (FRQS):

- Jonathan Afilalo Chercheur clinicien Senior.
- Michael Joseph Goldfarb Chercheur clinicien Junior 1.
- Arezu Jahani-Asl Chercheure boursiere Junior 2.
- Tricia Peters Chercheure clinicienne Junior 1.
- Soham Rej Chercheur clinicien Junior 2.
- April Rose Chercheure clinicienne Junior 1.
- Isabelle Vedel Chercheure clinicienne Junior 2.
- Michael Witcher Chercheur bourcier Senior.
- Stéphanie Wong Chercheure clinicienne Junior 1.

Brent Richards was among only five scientists in the province to receive the Chercheur-boursier de mérite, the most prestigious salary award given by the FRQS.

A paper written by a group led by **Dr. Christel Renoux** (Francesco Giorgianni, Pierre Ernst, Sophie **Dell'Aniello, Samy Suissa**), "Beta 2 agonists and the incidence of Parkinson's disease," has been selected by the editors of the *American Journal of Epidemiology* and the Society for Epidemiologic Research as one of the 2020 Articles of the Year for 2020, which "represent scholarship that is truly distinguished."

The paper used the UK Clinical Practice Research Datalink to explore the mechanisms that might explain an association between a decreased risk of Parkinson disease (PD) and the $\beta 2$ adrenergic agonist ($\beta 2$ -agonist) salbutamol. The authors discovered that the association

was limited to early shortterm use and was no longer observed after more than two years of cumulative use. They, therefore, concluded that the apparent association of salbutamol with a decreased risk of PD is likely the result of reverse causality rather than a biological effect of these drugs.



Appealing to altruism to encourage wide-spread COVID-19 vaccination

Reluctance to be vaccinated against COVID-19 is a significant obstacle to bringing the pandemic under control. Failing to vaccinate enough people to achieve herd immunity - the point at which the virus is unable to find enough hosts to spread, roughly between 70% and 80% of the population - will compound the current crisis.

Dr. Zeev Rosberger and his colleagues, Drs. Samara Perez and Ovidiu Tatar, have received a grant from the McGill Interdisciplinary Initiative in Infection and Immunity (MI4) to study whether eliciting and encouraging altruistic behaviour can have a significant impact on encouraging vaccination in the 20-to-39-year old age group.

"Simply trying to correct misinformation with fact has not proven effective in changing intentions to accept vaccines," points out Dr. Rosberger. "We intend to test the considerably less researched approach of eliciting prosocial behavior (altruism), i.e., the desire to help others without expecting personal benefit."

Because younger adults generally experience less severe disease, many conclude that COVID-19 may not be a danger to themselves. However, as potentially asymptomatic carriers, they are prone to be unknowing spreaders. Thus, it is essential that they be vaccinated in large numbers to protect more vulnerable populations and to arrest widespread infection. That nearly 45% of younger adult Canadians may not be willing to accept a COVID-19 vaccine is a grave concern.

Dr. Rosberger's team will develop a brief video to promote the vaccine's effectiveness in protecting others (altruism) as a means of increasing younger adults' willingness to be vaccinated. More than 2,200 younger adults will be recruited to complete a short online survey before and after viewing the video. The team is partnering with key agencies, including the Public Health Agency of Canada (PHAC), National Advisory Committee on Immunization (NACI), and the Institut National de Santé Publique du Québec (INSPQ) to help communicate its findings within six months and provide real and actionable insight that can improve Canada's vaccination program this year and help bring an end to the pandemic.

MI4 grants are supported by the fundraising efforts of the McGill University Health Centre (MUHC) Foundation, McGill University Advancement, and the Jewish General Hospital Foundation.

Online mental health intervention for groups vulnerable to COVID-19

A study led by **Dr. Brett Thombs**, published in *Lancet Rheumatology*, undertook an evaluation of a unique intervention developed with and for people with the rare disease scleroderma to help alleviate anxiety during the pandemic. Dr. Thombs and his team randomized 172 patients from 12 countries to videoconference-based education and support groups, led jointly by health professionals and trained patient group leaders, or to a waitlist control. They found that anxiety and depressive symptoms were reduced somewhat, although not significantly, at the end of the 4-week program, but six weeks later, they were significantly better among those who received the intervention.

"Long before COVID-19 made tele-health common, we established the Scleroderma Patient-centred Intervention Network (SPIN) to create an international support system for people with scleroderma," said Dr. Thombs. "It was natural for us to build upon this platform to address mental health in the pandemic with our COVID-19 Homeisolation Activities Together (SPIN-CHAT) Program. We worked with patient partners to develop the right approach. Then, patients who previously underwent support group leader training with us facilitated the groups along with health care professionals. It really was a case of patients coming together to help patients."

People with scleroderma are among those most vulnerable to COVID-19 because many experience significant lung symptoms, are frail, and take immunosuppressant therapies. As a result, their level of social isolation has been among the most extreme.

The SPIN-CHAT Program is four weeks long and involves twelve sessions. Participants are educated about, and participate in, exercises that include staying connected, managing worry and stress, relaxation, physical activity, and social support. Although developed for people with scleroderma, the core program elements are applicable to other vulnerable populations coping with stress and isolation brought on by COVID-19.

"As the length of the pandemic extends with no end in sight, the mental health needs of the public and how to address them is an increasingly important challenge. Multi-faceted programs similar to SPIN-CHAT may be attractive options because they represent a relatively low-resource option that provides skills and support to up to 10 people at a time," argued the study's authors.

Child psychiatry day treatment program proves its effectiveness

A careful assessment has shown that the intensive multi-faceted treatment program offered by the Early Childhood Disorders Psychiatric Day Hospital at the Institute for Child and Family Psychiatry is extremely effective at improving the behaviour and academic performance of its young participants.

"We treat children who have really reached the outer limits of what the regular educational system can provide," said **Dr. Ashley Wazana**, Co-Director of the Day Hospital. "In order for them to improve and manage their behaviours and integrate into the mainstream academic environment, they need to be accurately diagnosed and receive dedicated treatment for which the schools are just not equipped."

The assessment, published in *The Canadian Journal of Psychiatry*, reviewed six years of data (2013-2019) for 261 children between the ages of five and twelve who attended the Day Hospital. Based upon reporting from parents and teachers, the children showed significant improvement in aggression control, emotional outbursts, attention and ability to focus, and became less disruptive in a classroom setting. The children exhibited functional improvement at home and in school, with peers, and in pursuing hobbies. Children with more severe difficulties showed the most improvement. Family functioning did not predict treatment outcomes, meaning that even children with difficult home situations experienced improvements.

"Once we diagnose the underlying causes for the behaviour, we map out a specific treatment plan for each child," said Dr. Wazana. "We provide, and reinforce, the social skills they will need to solve problems, manage their emotions, and control disruptive impulses in real-world settings. Once they return full-time to the regular school system, they continue to receive between six months and a year of follow-up to ensure a smooth transition.

"Our program gives children the opportunity to improve in an environment where they are understood," Dr. Wazana goes on, "where they can see that other kids have similar challenges and they don't feel like they don't fit in. There are opportunities to learn from their individual therapy, as well as in a group setting and from observing how interventions work with others."

Association between certain infections and Alzheimer's disease

A large-scale population-based study led by **Dr. Paul Brassard** discovered an association between infectious disease burden and the risk of Alzheimer's disease (AD). The results are published in the <u>Journal</u> of Alzheimer's Disease.

"As we look for fresh approaches to understanding how and why Alzheimer's disease takes hold of the brain, interest has grown in the hypothesis that infection is somehow linked with the disease," said Dr. Brassard. "Since we did establish an association between this factor and AD, the clinical take-away is that prevention and treatment of certain infectious diseases over the course of a person's life may serve to lessen the risk of eventually developing Alzheimer's."

The research team employed the United Kingdom Clinical Practice Research Datalink, one of the largest medical databases in the world. They included all dementia-free subjects over the age of 50 between January 1988 and December 2017. The cohort included 4,262,092 individuals (whose mean age at cohort entry was just over 60; 52% were female). During a median follow-up of 10.5 years, 40,455 cases of AD were matched to 1,610,502 controls. Among the infections included in the analysis were: herpes labialis or genitalis, cytomegalovirus related hepatitis, retinitis, or colitis, mononucleosis, Lyme disease, gingivitis, urinary tract infections, gastritis, pneumonia, and candidiasis, all of which are caused by pathogens that have been linked to AD in the past.

Compared with having no burden of infectious disease, having a burden of infectious disease was associated with an increase in the risk of AD (OR, 1.05; 95% CI, 1.02 to 1.08). The risk increased over time since the first infection, peaking after 12 to 30 years (OR, 1.11; 95% CI, 1.05 to 1.17). The risk, however, did not increase with cumulative number of infections.

"Since we only looked at individuals who were over 50 years of age, we encourage research to determine whether infections earlier in life hold any association with the eventual emergence of AD," said Dr. Antonios Douros, the paper's first author. "Also, whether vaccination or treatment against certain pathogens linked to AD puts people at less risk. While it is extremely difficult to avoid common infections throughout the course of one's life, the argument for early intervention would certainly be strengthened if it is shown to protect against this terrible fate later on."

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