

## \$10 million gift strengthens brain research at Ludmer Centre

The \$10 million Ludmer Heritage Fund established by the Irving Ludmer Family Foundation will expand the [Ludmer Centre for Neuroinformatics & Mental Health](#)'s internationally renowned role in brain research. It establishes a Global Brain Consortium that will focus on sharing research methodologies and results, with the goal of accelerating discovery of novel and ground-breaking solutions to mental health and neuro-degenerative diseases. It will also advance a big-data approach to brain research and boost the work of emerging young researchers at the Centre. The gift brings the Ludmer Family Foundation's total support of the Centre to \$18 million.

"The Ludmer Centre Heritage Fund will help expedite results for patients by facilitating collaboration between our researchers and other leading scientists and institutions, and allowing health care providers to put clinical innovations into practice more quickly," said Suzanne Fortier, McGill's Principal and Vice-Chancellor.

The Ludmer Centre was first established in 2013 as a partnership between the Montreal Neurological Institute and Hospital, the Douglas Mental Health University Institute, and the Lady Davis Institute to improve the prevention, diagnosis and treatment of mental disorders through innovative research.

"Today the world is ready to do things for those struggling with mental health and neurodegenerative disorders. There isn't a family that hasn't been touched by this issue," said Irving Ludmer, President of the Irving Ludmer Family Foundation. "Through our philanthropy, my family and I want to help broaden input to the Ludmer Centre and also

share its research with scientists around the world who are working toward the same goals. The power of computers is growing exponentially and the Ludmer Centre has the tools and expertise to leverage that potential for the benefit of patients."

An expert in quantitative life sciences statistics, Dr. Celia Greenwood, a senior investigator at the LDI and Professor in the Gerald Bronfman Department of Oncology, jointly appointed to Epidemiology, Biostatistics & Occupational Health, at McGill, is a scientific director at the Ludmer Centre.

"This gift will allow us to build strong collaborative research teams with constant input from many perspectives to ensure the work is realistic, grounded, necessary, and innovative," said Dr. Greenwood. "The creative, risk-taking ideas of young researchers will be supported through the Ludmer Family Foundation gift, allowing these ideas to be tested and to develop."

Irving Ludmer, President of the Irving Ludmer Family Foundation



## Quebec-wide collaboration to invest in seniors' care

The [Centre for Aging + Brain Health Innovation \(CABHI\)](#) is collaborating with four Quebec academic centres to bolster the development, testing and adoption of aging and brain health innovations in seniors' care for Quebecers.

CABHI will fund up to \$400,000, with the [RUIS McGill Centre of Excellence on Longevity](#), [Centre de Recherche de l'Institut Universitaire de Gériatrie de Montréal](#), [Centre de recherche sur le vieillissement de Sherbrooke](#) and [Centre d'excellence sur le vieillissement de Québec](#) each allocating up to \$100,000 to accelerate the translation of research into products, services and practices that address the needs and challenges of Quebec's aging population.

"This partnership will help to accelerate the pace of innovation in our province and beyond. Through the Quebec Researcher-Clinician Partnership Program, teams of researchers and clinicians will have an opportunity to access funding and resources that can be used to test, validate, and refine their aging and brain health innovations for the benefit of the aging population," says **Dr. Olivier Beauchet**, Director of RUIS McGill Centre of Excellence on Longevity, Senior Investigator at the LDI, neurologist and geriatrician at the Jewish General Hospital, Professor at McGill University and holder of the Joseph Kaufmann Chair in geriatric medicine.

The total investment of up to \$800,000 will support aging and brain health solutions associated with dementia and other neurodegenerative diseases, with particular attention on projects focusing on aging in place, cognitive health, caregiver support, and care coordination and navigation. The program is open to researcher and clinician teams based in Quebec. Projects cannot exceed 15 months in duration.

Prepared by the Research Communications Office, Lady Davis Institute at the Jewish General Hospital. Any suggestions with respect to content are welcome. Not to be reproduced without attribution.

To submit information or for media enquiries, contact:  
 Tod Hoffman at: [thoffman@jgh.mcgill.ca](mailto:thoffman@jgh.mcgill.ca);  
 514-340-8222, ext. 28661

## Applying AI to cancer diagnosis

Under the direction of **Dr. Reza Forghani**, a pioneering research program at the Segal Cancer Centre is incorporating advanced artificial intelligence and radiomics with existing imaging technology to improve diagnostic accuracy and to ensure that patients are offered the most effective treatments in as timely a fashion as possible. The use of these advanced procedures also has the potential to reduce the need for invasive biopsies, which are expensive, time-consuming, and uncomfortable for the patient.

"In preliminary studies, the algorithms we are formulating in radiomics allow us to elucidate molecular features of the tumor with great precision, providing information beyond what the most skilled physician can accomplish with the naked eye," said Dr. Forghani, a radiologist and clinician-scientist who was just named a FRQS Chercheur-clinicien boursier. "We believe that these models may enable us to better predict those treatments to which the tumor will best respond."

Artificial intelligence is employed to exploit the capacity that machines have for learning. With dynamic algorithms, new data can be assimilated on top of existing data to continuously refine knowledge and improve diagnostic accuracy. AI functions as a clinical assistant to the physician, similar to sophisticated computers supporting a pilot to ensure optimal performance and maximal safety in aviation.

"AI is very exciting because it is becoming increasingly difficult, if not impossible, for an individual physician to integrate the large amount of information available in a patient's medical chart and scans in a way that is tailored to the individual patient's care," said Dr. Forghani. "Machine learning will offer the opportunity to compare information derived from one patient's tumor against all the data accumulated from a vast array of tumors, in order for us to predict how a comparable tumor is likely to progress."

Eventually, the JGH should serve as a hub for radiomics and other medical applications of machine intelligence, in collaboration with other academic institutions inside and outside Quebec. Indeed, although the current focus of this program is on cancer diagnosis, many of the AI tools developed in this process have potential for broader applications extending to quality, safety, and cost-effective utilization of health resources where the JGH can play a pioneering role, as well.

**Dr. Lysanne Campeau** was awarded the Career Development Award for Research from the Canadian Urological Association Scholarship Foundation. The Award recognizes the recipient for their potential to become an international leader within their field of urology.

Dr. Campeau has identified the need for new therapeutic targets for diabetic voiding dysfunction (DVD), a condition that affects up to 80% of people with diabetes. In its early stages, DVD causes bladder overactivity and, later on, impaired detrusor activity. It leads to debilitating urinary incontinence and recurrent urinary tract infections. There are currently no effective preventive or curative strategies.

Her research will examine the role of nerve growth factor (NGF), a soluble protein considered a bladder overactivity biomarker. Its precursor, proNGF, binds exclusively p75<sup>NTR</sup>, and can build up in diabetics.

The effect of p75<sup>NTR</sup> receptor activation in the bladder by proNGF is unknown in DVD. Dr. Campeau will address three specific issues:

- 1) To characterize the expression pattern and the role of proNGF/p75<sup>NTR</sup> interaction in the regulation of bladder urothelial and smooth muscle cells;

- 2) To determine how targeting the proNGF/p75<sup>NTR</sup> interaction modulates bladder function in pre-clinical models of DVD;

- 3) To assess the tissue specific role of p75<sup>NTR</sup> in bladder remodeling in the context of DVD.



In recognition of teaching and research excellence, **Dr. Brent Richards** has been promoted to Full Professor in the Department of Medicine by McGill University.

**Gilla Shapiro** (left), a PhD candidate in the Department of Psychology at McGill University under the supervision of Dr. Zeev Rosberger, was presented with a 2018 Rising Star Award from the Institute of Health Services and Policy Research of the CIHR, for the paper, "A Multiple Streams analysis of the decisions to fund gender-neutral HPV vaccination in Canada," published in *Preventive Medicine*. Her study applied a theoretical policy model to assess the factors behind the decision to fund the HPV vaccine for boys as well as girls in Canada. Though there has been concern about the cost-effectiveness of vaccinating boys, providing vaccinations for all adolescents would provide better and more equitable access to cancer prevention.

Today, Canada is an international leader, with every jurisdiction offering HPV vaccination to boys and girls.

"HPV vaccination is an important cancer prevention issue," she explains. "If we can get boys vaccinated as well as girls, we can have a significant impact on reducing cervical, oropharyngeal, anal, and penile cancers."



#### SAVE THE DATE

**3rd International Conference on Stem cells, Development and Cancer, Montreal, October 18-19<sup>th</sup>, 2018**

Cancer progression, embryo development and tissue regeneration share a strong dependency on stem and progenitor cells. Which characteristics are shared, and which are unique to embryonic, cancer and adult stem cells remain open questions. Are cancer stem cells derived from adult stem cells or differentiated cancer cells that have acquired stem cell properties? What determines the potency of embryonic and adult stem cells? These questions and many others await a better understanding of stem and progenitor cell properties within different biological contexts.

The conference on "Stem Cells, Development and Cancer," co-hosted by **Dr. Colin Crist**, will highlight novel approaches to address the important challenges associated with stem cell biology and therapeutics.

[Click here for more information](#)

## World's largest social network app for cancer patients

Not surprisingly, as many as 40% of individuals with cancer report suffering significant emotional distress in connection with their diagnosis. **Dr. Carmen Loiselle** and her team at the Segal Cancer Centre are determined to improve the overall experience of cancer and care. They have partnered with an Israeli tech firm, [Belongtail](#), to explore the potential contributions of BELONG, a mobile app that seeks to assist people in meeting their information and emotional support needs, promote communication and guide treatment decisions, track their cancer journey, and help them through the complexities of the health care system.

"Patients are increasingly turning to the internet for answers, but often without any filtering for credibility of sources," said Dr. Loiselle, voicing a common concern. "BELONG is a comprehensive open platform where patients can communicate with one another, discuss concerns with oncologists and nurses, and co-ordinate tasks such as arranging rides to appointments. It has been embraced by many because it is, at once, responsive and supportive."

"This combination of interactive community and professional advice in one place makes BELONG a promising tool," said Saima Ahmed, a graduate student in Dr. Loiselle's lab. "Patients are interested in sharing their experiences with a community of patients with similar diagnoses. They take advantage of asking oncologists as a way of confirming treatment recommendations."

Belongtail approached Dr. Loiselle, co-director of the Segal Cancer Centre, Christine and Herschel Victor/ Hope and Cope Chair in Psychosocial Oncology and Director of the McGill University Psychosocial Oncology and Cancer Nursing Programs, for her expertise in adapting and testing e-health tools. She and Dr. Walter Gotlieb oversee [a pilot project](#) to test Belong among women with gynecological cancer.

Dr. Loiselle's work on BELONG has been awarded a grant from the Quebec Ministry of International Affairs that funds innovative joint initiatives between Quebec and Israel. Ms. Ahmed will be presenting on the project at the "Machine Learning for Health Care" conference in August at Stanford University and the World Congress of the International Psycho-Oncology Society in Hong Kong in October.

## Caspase-6: a selective cause of memory impairment

Despite experimental evidence suggesting that activation of Caspase-6 (Casp6), is an early pathogenic event in Huntington disease, a genetic disorder that causes the progressive breakdown of nerve cells in the brain and for which the prognosis is grim, the role of Casp6 is still disputed.

**Dr. Andréa LeBlanc's** lab, which has extensive expertise in Caspase-6 based on groundbreaking research into its role in Alzheimer disease, explored how the protein impacts distinct types of neurons. In a paper published recently in [Cell Death & Differentiation](#), Dr. LeBlanc demonstrated that activation of Caspase-6, alone, is not sufficient to initiate neurodegeneration in the striatum. The presence of the particular genetic mutation that characterizes the disease is the key factor. Moreover, it reveals that Caspase-6 activation does not affect all neurons in the same way.

"Not all neurons exposed to active Caspase-6 will degenerate," Dr. LeBlanc points out, "only certain neuronal cells, which happen to be the ones involved in Alzheimer disease. When Caspase-6 is activated in hippocampal or cortical neurons, it impairs memory, induces inflammation, neuronal dysfunction and neurodegeneration. Whereas, Caspase-6 activation in striatal neurons, those which are associated with HD, is not deleterious."

Thus, even if Caspase-6 is activated downstream of the genetic defect that causes HD, there are many other caspase proteins active in Huntington, so inhibiting only one is unlikely to prove definitive in treating the disease. Whereas in Alzheimer, by comparison, Caspase-6 is the only caspase activated.

Anastasia Noël, a postdoctoral fellow who is the lead author of the paper, concludes, "It is essential to carefully consider the right neuronal subtype when investigating underlying molecular mechanisms of human neurodegenerative diseases and establishing therapeutic targets."

The lesson is that targeting must be exquisitely refined, focusing on the precise cell type of the appropriate brain region in order to assure that a prospective drug is able to hone in on the biological process responsible for a particular form of neurodegenerative disease.



## Selected Bibliography of Papers from the Lady Davis Institute (May—June 2018):

### CANCER

[Impact of lower uterine segment involvement in type II endometrial cancer and the unique mutational profile of serous tumors](#). Kogan L, Oceau D, Amajoud Z, Abitbol J, Laskov I, Ferenczy A, Pelmus M, Eisenberg N, Kessous R, Lau S, Yasmeeen A, Gotlieb WH, **Salvador S**. Gynecol Oncol Rep. 2018 Mar 19;24:43-47. doi: 10.1016/j.gore.2018.03.004.

[MRMAssayDB: an integrated resource for validated targeted proteomics assays](#). Bhowmick P, Mohammed Y, **Borchers CH**. Bioinformatics. 2018 May 14. doi: 10.1093/bioinformatics/bty385.

[Signaling Pathways Involved in the Regulation of mRNA Translation](#). Roux PP, **Topisirovic I**. Mol Cell Biol. 2018 May 29;38(12). pii: e00070-18. doi: 10.1128/MCB.00070-18.

[DICER1 Mutations Are Frequent in Adolescent-Onset Papillary Thyroid Carcinoma](#). Wasserman JD, Sabbaghian N, Fahiminiya S, Chami R, Mete O, Acker M, Wu MK, Shlien A, de Kock L, **Foulkes WD**. J Clin Endocrinol Metab. 2018 May 1;103(5):2009-2015. doi: 10.1210/jc.2017-02698.

[Mechanistic Insights into MicroRNA-Mediated Gene Silencing](#). Duchaine TF, **Fabian MR**. Cold Spring Harb Perspect Biol. 2018 Jun 29. pii: a032771. doi: 10.1101/cshperspect.a032771.

[Revisiting pleuropulmonary blastoma and atypical choroid plexus in a young child: DICER1 syndrome or not?](#) Chong AS, Fahiminiya S, Strother D, Priest J, Albrecht S, Rivera B, **Foulkes WD**. Pediatr Blood Cancer. 2018 Jun 26:e27294. doi: 10.1002/pbc.27294.

[Physiological culture conditions alter myotube morphology and responses to atrophy treatments: implications for in vitro research on muscle wasting](#). Archer-Lahlou E, Lan C, **Jagoe RT**. Physiol Rep. 2018 Jun;6(12):e13726. doi: 10.14814/phy2.13726.

[Interplay between ShcA signaling and PGC-1 \$\alpha\$  triggers targetable metabolic vulnerabilities in breast cancer](#). Im YK, Najyb O, Gravel SP, McGuirk S, Ahn R, Avizonis D, Chénard V, Sabourin V, Hudson J, Pawson T, Topisirovic I, Pollak MN, St-Pierre J, **Ursini-Siegel J**. Cancer Res. 2018 Jun 21. pii: canres.3696.2017. doi: 10.1158/0008-5472.CAN-17-3696.

[The route of administration influences the therapeutic index of an anti-proNGF neutralizing mAb for experimental treatment of Diabetic Retinopathy](#). Barcelona PF, Galan A, Nedev H, Jian Y, Sarunic MV, **Saragovi HU**. PLoS One. 2018 Jun 21;13(6):e0199079. doi: 10.1371/journal.pone.0199079. eCollection 2018.

[Detecting post-translational modification signatures as potential biomarkers in clinical mass spectrometry](#). Mnatsakanyan R, Shema G, Basik M, Batist G, Borchers CH, Sickmann A, **Zahedi RP**. Expert Rev Proteomics. 2018 Jun 12. doi: 10.1080/14789450.2018.1483340.

[Cytology cell blocks are suitable for immunohistochemical testing for PD-L1 in lung cancer](#). Wang H, Agulnik J, Kasymjanova G, Wang A, Jiménez P, Cohen V, Small D, Pepe C, Sakr L, Fiset PO, Auger M, Camilleri-Broet S, Alam El Din M, Chong G, van Kempen L, **Spatz A**. Ann Oncol. 2018 Jun 1;29(6):1417-1422. doi: 10.1093/annonc/mdy126.

[chromswitch: a flexible method to detect chromatin state switches](#). Jessa S, **Kleinman CL**. Bioinformatics. 2018 Jul 1;34(13):2286-2288. doi: 10.1093/bioinformatics/bty075.

## Epidemiology

[How I treat the postthrombotic syndrome](#). Rabinovich A, Kahn SR. *Blood*. 2018 May 17;131(20):2215-2222. doi: 10.1182/blood-2018-01-785956.

[The effect of anti-acid therapy on survival in idiopathic pulmonary fibrosis: a methodological review of observational studies](#). Tran T, **Suissa S**. *Eur Respir J*. 2018 Jun 21;51(6). pii: 1800376. doi: 10.1183/13993003.00376-2018.

[Synthesizing Risk from Summary Evidence Across Multiple Risk Factors](#). **Shrier I**, Colditz GA, **Steele RJ**. *Epidemiology*. 2018 Jul;29(4):533-535. doi: 10.1097/EDE.0000000000000820.

## Molecular & Regenerative Medicine

[Brain Structure Covariance Associated with Gait Control in Aging](#). Allali G, Montembeault M, Brambati SM, Bherer L, Blumen HM, Launay CP, Liu-Ambrose T, Helbostad JL, Verghese J, **Beauchet O**. *J Gerontol A Biol Sci Med Sci*. 2018 May 26. doi: 10.1093/gerona/gly123.

[Age effect on the prediction of risk of prolonged length hospital stay in older patients visiting the emergency department: results from a large prospective geriatric cohort study](#). Launay CP, Kabeshova A, Lanoé A, Chabot J, Levinoff EJ, **Beauchet O**. *BMC Geriatr*. 2018 May 30;18(1):127. doi: 10.1186/s12877-018-0820-5.

[CXCL1-CXCR2 lead monocytes to the heart of the matter](#). Paradis P, **Schiffrin EL**. *Eur Heart J*. 2018 May 21;39(20):1832-1834. doi: 10.1093/eurheartj/ehy114.

[The RNA surveillance proteins UPF1, UPF2 and SMG6 affect HIV-1 reactivation at a post-transcriptional level](#). Rao S, Amorim R, Niu M, Temzi A, **Mouland AJ**. *Retrovirology*. 2018 Jun 28;15(1):42. doi: 10.1186/s12977-018-0425-2.

[Role of Immune Cells in Hypertension](#). Caillon A, Paradis P, **Schiffrin EL**. *Br J Pharmacol*. 2018 Jun 27. doi: 10.1111/bph.14427.

[The role of MxB in interferon- \$\alpha\$  mediated inhibition of HIV-1 infection](#). Xu B, Pan Q, **Liang C**. *J Virol*. 2018 Jun 20. pii: JVI.00422-18. doi: 10.1128/JVI.00422-18.

[Durable suppression of HIV-1 with resistance mutations to integrase inhibitors by dolutegravir following drug washout](#). Osman N, Mesplède T, Oliveira M, Hassounah S, Wainberg MA, **Brenner BG**. *AIDS*. 2018 Jun 11. doi: 10.1097/QAD.0000000000001903.

[Muscle Mass and Mortality After Cardiac Transplantation](#). Bibas L, Saleh E, Al-Kharji S, Chetrit J, Mullie L, Cantarovich M, Cecere R, Giannetti N, **Afilalo J**. *Transplantation*. 2018 Jun 6. doi: 10.1097/TP.0000000000002311.

## Psychosocial Aspects of Disease

["It's Totally Okay to Be Sad, but Never Lose Hope": Content Analysis of Infertility-Related Videos on YouTube in Relation to Viewer Preferences](#). Kelly-Hedrick M, Grunberg PH, Brochu F, **Zelkowitz P**. *J Med Internet Res*. 2018 May 23;20(5):e10199. doi: 10.2196/10199.

[Evidence for the use of complementary and alternative medicines during fertility treatment: a scoping review](#). Miner SA, Robins S, Zhu YJ, Keeren K, Gu V, Read SC, **Zelkowitz P**. *BMC Complement Altern Med*. 2018 May 15;18(1):158. doi: 10.1186/s12906-018-2224-7.

[Screening for impaired vision in community-dwelling adults aged 65 years and older in primary care settings](#). Wilson BJ, Courage S, Bacchus M, Dickinson JA, Klarenbach S, Jaramillo Garcia A, Sims-Jones N, **Thombs BD**; Canadian Task Force on Preventive Health Care. CMAJ. 2018 May 14;190(19):E588-E594. doi: 10.1503/cmaj.171430.

[Challenges and strategies for coping with scleroderma: implications for a scleroderma-specific self-management program](#). Millette K, Thombs BD, Maiorino K, Nielson WR, Körner A, **Peláez S**. Disabil Rehabil. 2018 May 9:1-10. doi: 10.1080/09638288.2018.1470263.

[Probability of major depression diagnostic classification using semi-structured versus fully structured diagnostic interviews](#). Levis B, Benedetti A, Riehm KE, Saadat N, Levis AW, Azar M, Rice DB, Chiovitti MJ, Sanchez TA, Cuijpers P, Gilbody S, Ioannidis JPA, Kloda LA, McMillan D, Patten SB, Shrier I, Steele RJ, Ziegelstein RC, Akena DH, Arroll B, Ayalon L, Baradaran HR, Baron M, Beraldi A, Bombardier CH, Butterworth P, Carter G, Chagas MH, Chan JCN, Cholera R, Chowdhary N, Clover K, Conwell Y, de Man-van Ginkel JM, Delgadillo J, Fann JR, Fischer FH, Fischer B, Fung D, Gelaye B, Goodyear-Smith F, Greeno CG, Hall BJ, Hambridge J, Harrison PA, Hegerl U, Hides L, Hobfoll SE, Hudson M, Hyphantis T, Inagaki M, Ismail K, Jetté N, Khamseh ME, Kiely KM, Lamers F, Liu SI, Lotrakul M, Loureiro SR, Löwe B, Marsh L, McGuire A, Mohd Sidik S, Munhoz TN, Muramatsu K, Osório FL, Patel V, Pence BW, Persoons P, Picardi A, Rooney AG, Santos IS, Shaaban J, Sidebottom A, Simning A, Stafford L, Sung S, Tan PLL, Turner A, van der Feltz-Cornelis CM, van Weert HC, Vöhringer PA, White J, Whooley MA, Winkley K, Yamada M, Zhang Y, **Thombs BD**. Br J Psychiatry. 2018 Jun;212(6):377-385. doi: 10.1192/bjp.2018.54.

[Acceptability and feasibility of an interprofessional end-of-life/palliative care educational intervention in the intensive care unit: A mixed-methods study](#). Graham R, Lepage C, Boitor M, Petizian S, Fillion L, **Gélinas C**. Intensive Crit Care Nurs. 2018 Jun 21. pii: S0964-3397(17)30383-X. doi: 10.1016/j.iccn.2018.04.011.

