UNIVERSITY OF CALGARY

MEETING THE CANCER CHALLENGE

Charbonneau Cancer Institute

2017-2018 Annual Report

CHARBONNEAU CANCER INSTITUTE

Mission: To meet the cancer challenge.

Goal: To decrease cancer in the population, improve cancer treatment, and improve the patient experience by conducting biomedical, clinical, health systems, and population health research, from prevention to life after cancer.

Objectives:

- To foster relationships with academic, health services, and industry partners;
- To secure philanthropy for research initiatives with significant potential;
- To increase the competitiveness of the Institute for external funding;
- To build modern infrastructure that will enable our researchers to discover;
- To provide exceptional education and learning opportunities for trainees;
- To recruit, support, and retain the best and brightest cancer researchers; and
- To facilitate transformative national and international collaborations.

Message from the Director

In 2018, the Cancer Institute marked its 15th anniversary. Initially known as the Southern Alberta Cancer Research Institute, we became Charbonneau in 2014, a change that marked a commitment to develop a research institute of significance at the University of Calgary. This inaugural annual research report highlights several significant achievements over the past twelve months, including the opening of the new Childhood Cancer and Blood Disorders Laboratories and rapidly increasing success in tri-council funding. Again the Institute has supported its research centres and programs at the Cumming School of Medicine, Calgary's teaching hospitals, and the Tom Baker Cancer Centre by recruiting top research talent from across the globe and building key infrastructure. This report celebrates our scientists, donors, partners, and staff for their dedication to research aimed at meeting the cancer challenge and improving cancer treatment, decreasing cancer in the population, and improving the patient experience.

J. Gregory Cairncross, MD
Director, Charbonneau Cancer Institute
Professor, Clinical Neurosciences
University of Calgary

Decreasing Cancer in the Population

Early Cancer Detection

EXOSOME-BASED DEVICE FOR BLADDER CANCER

Drs. Amir Sanati Nezhad and **Don Morris** and their team have developed a point-of-care device to collect and analyze exosomes (components of the cell that are released into the blood and have tumour-specific characteristics). The device can accurately detect changes in exosomes that are predictive of cancer, with an initial application in bladder cancer. The team is now refining the device and clinically testing its use.

METABOLOMIC TEST FOR COLORECTAL CANCER

Dr. Oliver Bathe and team (**Drs. Hans Vogel, Robert Hilsden,** and **Karen Kopciuk**) have developed a new metabolomic test to detect colon cancer. Current approaches, such as FIT testing, are effective but not widely adopted, due to their inconvenience. Dr. Bathe's metabolomic test is convenient, less invasive, and was highly accurate in early phase testing. Further testing and validation of the test are now underway.

Cancer Prevention & Epidemiology

Dr. Christine Friedenreich, an Adjunct Professor with the Department of Oncology and Scientific Director of the Department of Cancer Epidemiology and Prevention Research (AHS), is leading the Canadian population attributable risk of cancer (ComPARe) study, which aims to estimate how many cancer cases can be prevented in Canada through the year 2042. In collaboration with **Dr. Darren Brenner** and several Ontario- and Quebec-based investigators, the team is examining cancer risk factors, such as tobacco, diet, energy imbalance, infectious diseases, hormonal therapies, and environmental factors (i.e., air pollution and residential radon). The results of this study will inform cancer prevention and public health initiatives, as well as public policy.

Above: Dr. Amir Nezhad (top); Dr. Oliver Bathe (bottom); **Right:** Dr. Christine Friedenreich and Dr. Darren Brenner

EVICT RADON

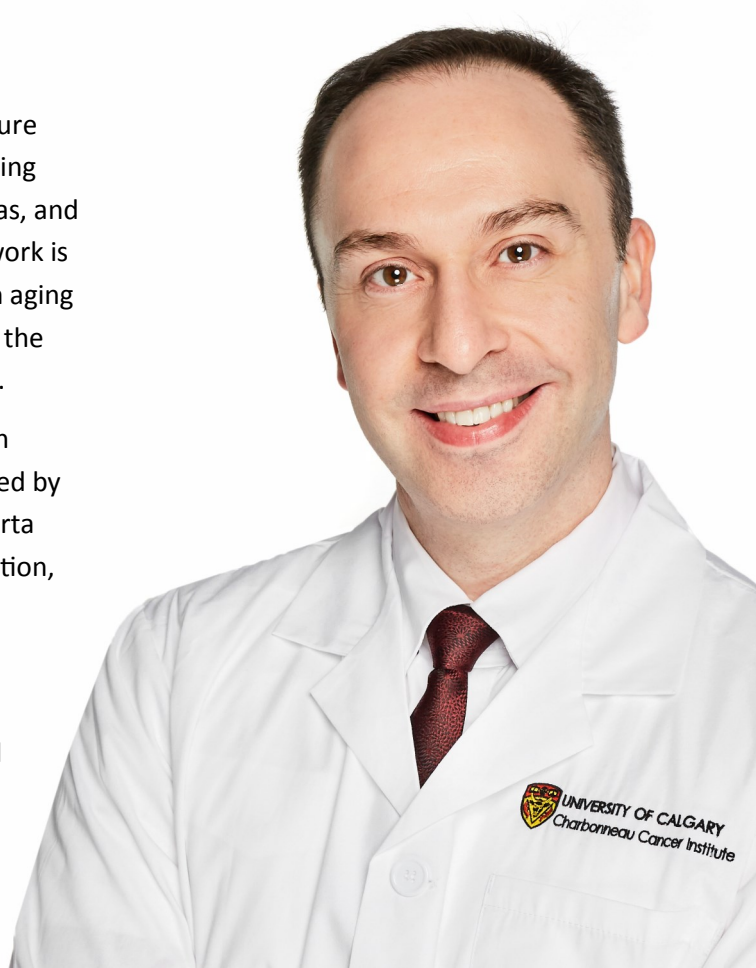
Radon emits radiation that damages your DNA, **leading to cancer**

Evict Radon

Dr. Aaron Goodarzi, Canada Research Chair for Radiation Exposure Disease and member of the **Robson DNA Science Centre**, is studying ionizing radiation, such as the alpha particles emitted by radon gas, and how this type of radiation impacts DNA damage and repair. His work is improving our knowledge of cancer development and the human aging process, as well as informing efforts to educate the public about the harms of ionizing radiation and how to avoid or reduce exposure.

Radon is the leading cause of lung cancer in non-smokers and can further increase the risk of lung cancer in smokers. Work published by Dr. Goodarzi in 2017 revealed that 1 in 8 homes in southern Alberta have cancer-causing levels of radon. Yet, with appropriate mitigation, radon can be eliminated in homes.

Dr. Goodarzi now leads a grass-roots, citizen science initiative, **Evict Radon**, to increase awareness about radon testing and mitigation. The Evict Radon campaign has evolved into a national research initiative to test thousands of homes across Canada for radon. Learn more at www.evictradon.ca.

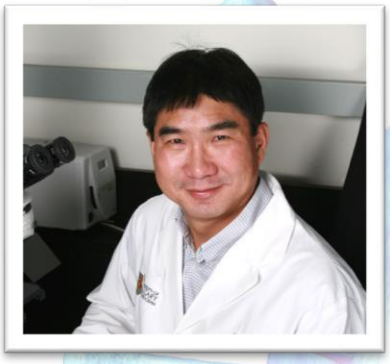


Right: Dr. Aaron Goodarzi

Improving Cancer Treatment

Brain Tumour Biology and Therapeutics

Clark Smith Brain Tumour Centre scientists and clinician researchers have made notable contributions to the understanding and treatment of brain cancer.



Dr. V. Wee Yong spearheaded a brain immunotherapy program and has shown that immune cells in brain tumours can be activated by the off-label use of existing drugs, such as the antifungal drug amphotericin B, to suppress cancer growth in animal model systems. He is leading a CIHR-funded trial, *Mobilizing anti-tumor microglia/macrophages with niacin to improve the prognosis of glioblastoma*, which will study the role of niacin (vitamin B3), a more tolerable drug than amphotericin B, in boosting immune cells within the brain to suppress tumour growth in patients with glioblastoma.

Drs. Donna Senger and **Steve Robbins** have shown how brain tumour cells are able to influence the adjacent brain environment to ensure their own growth and survival. Using patient-derived brain tumour models, they are working to identify ways to exploit the active interplay between tumour cells, the surrounding normal cells, and the extracellular matrix within the brain to mitigate tumour proliferation, invasion, and therapeutic resistance. Through their work on the Terry Fox Research Institute Translational Cancer Research Project, *Modeling and therapeutic targeting of the clinical and genetic diversity of glioblastoma*, they identified a specific subset of immune cells that could be targetable in patients with glioblastoma.

Dr. Marco Gallo, Canada Research Chair in Brain Cancer Epigenomics, is interested in the epigenome of brain cancer stem cells. He and his team have generated high resolution 3D genome maps using glioblastoma cells from three patients. These 3D maps have been integrated with epigenetic and transcriptional profiles to understand how individual genes are regulated in different patients. He has also shown that cancer stem cells from glioblastoma activate a group of immune-related genes that allow them to escape the immune system. The protein product of one of these genes is targetable using an experimental compound to which glioblastoma cancer stem cells are especially sensitive.

Above: Dr. V. Wee Yong (top); Dr. Donna Senger (middle); Dr. Marco Gallo (bottom)

Precision Oncology in Multiple Myeloma

Drs. Paola Neri and **Nizar Bahlis** are conducting genomic studies to identify novel drug targets for multiple myeloma (MM), based on the individual genetic profile of the patient's tumour cells. Using this approach, they are able to deliver personalized and tailored therapeutics for patients with MM and define mechanisms of drug resistance to novel anti-MM agents. By performing single cell immune profiling in patients treated with immunotherapy, they have found that the expansion of central memory T-cells is important to achieve deep and durable responses in patients. Moreover, by analyzing the repertoire of T-cells through single cell sequencing, they are working to design efficient CAR-T cells targeting MM-specific neo-antigens.

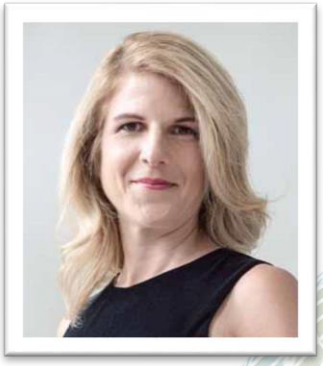
Above: Dr. Paola Neri (left); Dr. Doug Mahoney (right)

Oncolytic Virus Therapy

Dr. Douglas Mahoney and colleagues published a paper in *Nature Communications* in 2017, which showed that oncolytic rhabdoviruses and smac (second mitochondrial activator of caspase) mimetic compounds work synergistically to promote anticancer immunity by driving anticancer T-cell activity and reinvigorating exhausted T-cells in immuno-suppressed tumour microenvironments.

Building on his expertise designing therapeutic viruses and engineering immune cells, Dr. Mahoney is collaborating with **Dr. Jennifer Chan** on a new CAR-T cell program in cancer immunotherapy. The **ACTION (Advanced Cellular Therapy & Immune Oncology) Initiative** will include the identification of new immunotherapy targets, the development of innovative CAR T-cell technologies, preclinical studies in patient-derived and genetically-engineered mouse models, and an innovative clinical trials component at the Alberta Children's Hospital. ACTION strives to position Calgary as a Canadian hub for CAR-T cell innovation and enhance access in Alberta to these new immune-based cancer therapies.

Improving the Patient Experience



Improving Social Adjustment in Survivors of Childhood Cancer

Dr. Fiona Schulte is an Assistant Professor in the Division of Psychosocial Oncology and a psychologist in the Hematology, Oncology and Transplant program at the Alberta Children's Hospital (AHS). Her work has broadly explored psychological outcomes in survivors of pediatric cancers and specifically social adjustment in children who were treated for brain cancer. Her research has provided evidence for the negative impact of treatments directed at the brain, such as cranial radiation therapy, on social adjustment and cognitive impairment. She recently received funding from Alex's Lemonade Stand Foundation that will allow her and her team to use peer data, multi-informant assessments, and neuroimaging to examine these relationships further. Dr. Schulte's future research will focus on children with acute lymphoblastic leukemia, the most common form of childhood cancer, to examine factors associated with poor social adjustment in this vulnerable population

National Impact: Improving Cancer Related Sexual Dysfunction

Dr. Lauren Walker, an Adjunct Assistant Professor within the Division of Psychosocial Oncology and psychologist at the Tom Baker Cancer Centre (AHS), has identified how to recognize and treat sexual dysfunction within the context of cancer. Over the course of about 10 years, Dr. Walker's research has transformed the way patients with cancer-related sexual dysfunction are supported, including the development of integrated intimacy work-shops, as part of routine care for prostate cancer. She has collaborated to develop a national sexual recovery e-clinic and health care provider training program based on her research. Dr. Walker's team developed a one-of-a-kind educational program for patients receiving androgen deprivation therapy for prostate cancer. It consists of a professionally facilitated class and a book she co-authored, titled Androgen Deprivation Therapy: An Essential Guide for Prostate Cancer Patients and Their Loved Ones. The program is available online and has been disseminated internationally, with 14 sites having served over 1000 patient/partner participants to date. Ultimately, Dr. Walker hopes that her work will help patients who tend to get overlooked, whether it's those who don't respond to traditional sexual medicine treatments or those who experiencing side effects that no one likes to talk about.

Above: Dr. Fiona Schulte (top); Dr. Lauren Walker (bottom)

Improving Care Delivery

Toward Better Care: CHORD Consortium

Dr. Winson Cheung, an Associate Professor in the Department of Oncology and the Medical Director of Health Services Research at CancerControl Alberta (AHS), chairs the Cancer Health Outcomes Research Database (CHORD) Consortium, a pan-Canadian collaboration to develop a national cancer data repository for rectal cancer and other malignancies. Having demonstrated the feasibility of a national data sharing collaboration, Dr. Cheung led a study to examine whether adjuvant chemotherapy, which is associated with toxicity and increased healthcare costs, improves outcomes in patients with early stage rectal cancer. The study included patients from several provinces, including Newfoundland, Ontario, Alberta, and British Columbia. Published in the *American Journal of Clinical Oncology* in 2018, his study showed that post-surgical chemotherapy does not improve outcomes and its use should be carefully considered. By reducing the use of post-surgical chemotherapy, patients may be able avoid some unnecessary toxicity and long-term side effects from treatment.

Palliative Care Early and Systematic (PaCES Study)

In 2018, **Drs. Jessica Simon** and **Aynharan Sinnarajah** (Tom Baker Cancer Centre, AHS) were awarded a grant from CIHR and Alberta Health to develop, implement, and evaluate the impact of an early, systematic and integrated palliative care pathway for advanced colorectal cancer on patient, caregiver, and health system outcomes. The PaCES Study seeks to increase the number of patients with advanced colorectal cancer who receive integrated palliative care and, in doing so, improve both patient-reported and health system outcomes. Initial PaCES activities focused on understanding why palliative care services are accessed late and the challenges that are associated with integrating palliative care into clinical practice. The team discovered that health care providers and patients perceive benefit in receiving palliative care at the same time as cancer-modifying treatments, but both are challenged by misperceptions that palliative care means that end of life is imminent. They also found that healthcare providers believe that a palliative care approach is part of their role as clinicians but struggle with knowing how best to provide it.

The team is now working to close these gaps through the routine identification of those likely to benefit; improved patient-clinician communication about care preferences; ensuring the essential components of palliative care are provided in a systematic way; on-going liaising between specialists, family doctors, and palliative care providers; and more timely access to palliative care.

Above: Dr. Winson Cheung; **Right:** Drs. Jessica Simon and Aynharan Sinnarajah

New Childhood Cancer and Blood Disorders Collaborative Research Laboratories

Thanks to generous gifts from the Alberta Children's Hospital Foundation and Kids Cancer Care Foundation, in January 2018 the Institute opened its new **Childhood Cancer and Blood Disorders Collaborative Research Laboratories** in the Heritage Medical Research Building. This modern, open-concept facility was designed to enable the sharing of equipment and research staff and provide collision space for researchers to share new ideas and plan future research endeavours. The facility was planned and overseen by **Dr. Jennifer Chan** and now accommodates nine principal investigators (**Drs. Faisal Khan, Jan Storek, Aru Narendran, Marco Gallo, Paola Neri, Nizar Bahlis, Sorana Morrissy, Edwin Wang, and Jennifer Chan**) and their trainees and staff.

The facility supports research to: understand the cellular and molecular basis for childhood cancer initiation and progression, innovate and test new therapeutic approaches for the treatment of childhood cancers, and increase the availability of patient-derived samples and experimental models of childhood cancer. It also features a hematology translational laboratory (**Drs. Faisal Khan and Jan Storek**), which was accredited by the College of Physicians and Surgeons of Alberta to provide clinical testing for patients across the province undergoing bone marrow transplant, including Next-Generation Sequencing-based somatic variant results.

Below: Dr. Jennifer Chan in the Childhood Cancer and Blood Disorders Collaborative Research Laboratories (Photo credit: Riley Brandt)

Tri-Council Grant Recipients (2017-2018)

Natural Sciences and Engineering Research Council of Canada:

Dr. Shirin Bonni

Dr. Sarah Childs

Dr. Jennifer Cobb

Dr. Jason de Koning

Dr. Darren Derksen

Dr. Marco Gallo

Dr. Aaron Goodarzi

Dr. Savraj Grewal

Dr. Ebba Kurz

Dr. Haocheng Li

Dr. Jonathan Lytton

Dr. Gregory Moorhead

Dr. Derrick Rancourt

Dr. Karl Riabowol

Dr. Kristina Rinker

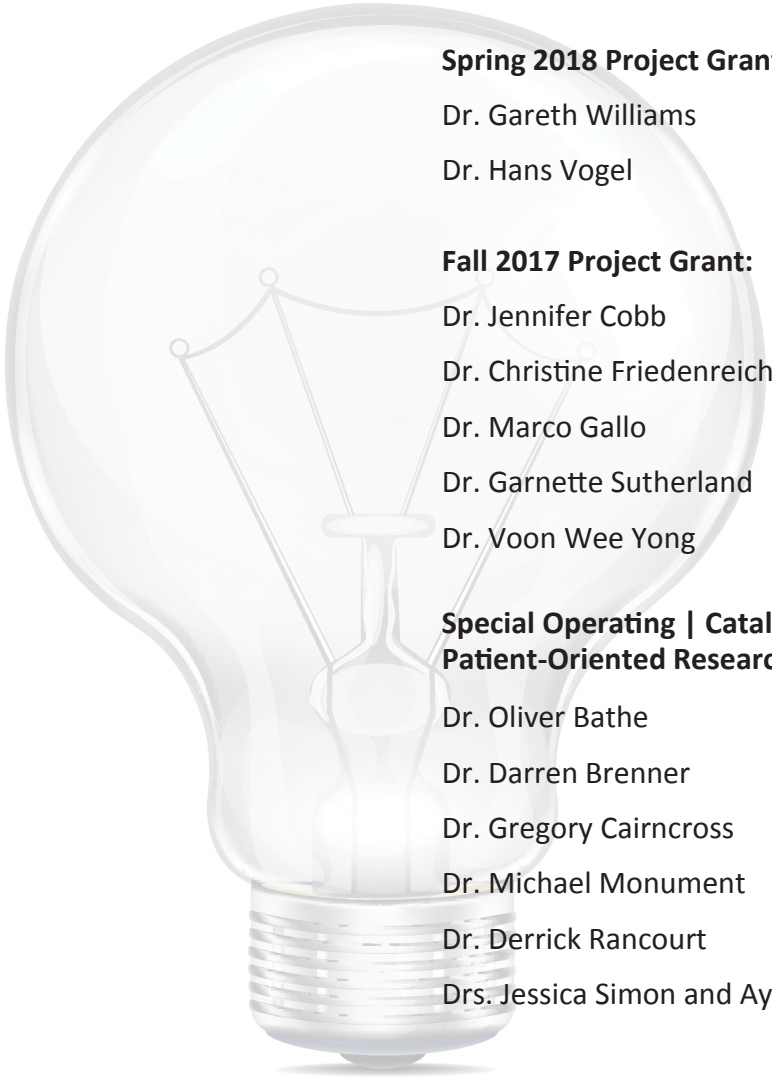
Dr. Amir Sanati Nezhad

Dr. David Schriemer

Dr. Hans Vogel

Dr. Edwin Wang

Dr. Gareth Williams



Canadian Institutes of Health Research (CIHR):

Spring 2018 Project Grant:

Dr. Gareth Williams

Dr. Hans Vogel

Fall 2017 Project Grant:

Dr. Jennifer Cobb

Dr. Christine Friedenreich

Dr. Marco Gallo

Dr. Garnette Sutherland

Dr. Voon Wee Yong

Special Operating | Catalyst | Supporting Patient-Oriented Research | Other Grants:

Dr. Oliver Bathe

Dr. Darren Brenner

Dr. Gregory Cairncross

Dr. Michael Monument

Dr. Derrick Rancourt

Drs. Jessica Simon and Aynharan Sinnarajah

Noteworthy Publications by Institute Members (2017-2018)

nature COMMUNICATIONS

DOI: 10.1038/s41467-017-00324-x OPEN

Smac mimetics and oncolytic viruses synergize in driving anticancer T-cell responses through complementary mechanisms

Dae-Sun Kim[1,2,3], Himika Dastidar[1,2,3], Chunfen Zhang[1,2], Franz J. Zemp[1,2,3], Keith Lau[1,2,3,4], Matthias Ernst[1,2], Andrea Rakic[1,2,5], Saif Sikdar[1,2,3], Jahanara Rajwani[1,2], Victor Naumenko[1,2,3,4], Dale R. Balce[6], Ben W. Ewanchuk[7], Pankaj Tailor[6], Robin M. Yates[6,7], Craig Jenne[3,4], Chris Gafuik[1,2,3] & Douglas J. Mahoney[1,2,3,7]

DOI: 10.1038/s41467-018-05427-7 OPEN

Identification of nine new susceptibility loci for endometrial cancer

Tracy A. O'Mara et al.[#] (Christine Friedenreich)

DOI: 10.1038/s41467-018-03014-4 OPEN

Identification of the fungal ligand triggering cytotoxic PRR-mediated NK cell killing of *Cryptococcus* and *Candida*

Shu Shun Li[1,2], Henry Ogbomo[1,2], Michael K. Mansour[3], Richard F. Xiang[1,2], Lian Szabo[4], Fay Munro[5], Priyanka Mukherjee[5], Roy A. Mariuzza[6], Matthias Amrein[5], Jatin M. Vyas[3], Stephen M. Robbins[7,8] & Christopher H. Mody[1,2,4]

DOI: 10.1038/s41467-018-04743-2 OPEN

Quantitative in vivo whole genome motility screen reveals novel therapeutic targets to block cancer metastasis

Konstantin Stoletov[1], Lian Willetts[1], Robert J. Paproski[1], David J. Bond[1], Srijan Raha[1], Juan Jovel[2,3], Benjamin Adam[4], Amy E. Robertson[1], Francis Wong[1], Emma Woolner[1], Deborah L. Sosnowski[1], Tarek A. Bismar[5], Gane Ka-Shu Wong[2,3,6], Andries Zijlstra[7] & John D. Lewis[1]

DOI: 10.1038/s41467-018-06654-8 OPEN

TGF-β-associated extracellular matrix genes link cancer-associated fibroblasts to immune evasion and immunotherapy failure

Ankur Chakravarthy[1,2], Lubaba Khan[3,4,5], Nathan Peter Bensler[3,4,5], Pinaki Bose[3,4,5,6] & Daniel D. De Carvalho[1,2]

nature

Nature. 2017 September 14; 549(7671): 227–232. doi:10.1038/nature23666.

Fate mapping of human glioblastoma reveals an invariant stem cell hierarchy

Xiaoyang Lan[1,2,3], David J. Jörg[4,5], Florence M. G. Cavalli[1,2], Laura M. Richards[12,13], Long V. Nguyen[7], Robert J. Vanner[1,2,3], Paul Guilhamon[12,13,14], Lilian Lee[1,2], Michelle Kushida[1,2], Davide Pellacani[7,8], Nicole I. Park[1,2,3], Fiona J. Coutinho[1,2,3], Heather Whetstone[1,2], Hayden J. Selvadurai[1,2], Clare Che[1,2], Betty Luu[1,2], Annaick Carles[9], Michelle Moksa[9], Naghmeh Rastegar[1,2], Renee Head[1,2], Sonam Dolma[1,2,11], Panagiotis Prinos[13,20], Michael D. Cusimano[17,18], Sunit Das[17,18], Mark Bernstein[16,18], Cheryl H. Arrowsmith[13,20], Andrew J. Mungall[10], Richard A. Moore[10], Yussanne Ma[10], Marco Gallo[19], Mathieu Lupien[12,13,14], Trevor J. Pugh[12,13], Michael D. Taylor[1,2,11,15,18], Martin Hirst[9,10], Connie J. Eaves[7,8], Benjamin D. Simons[4,5,6,*], and Peter B. Dirks[1,2,3,15,18,*]

nature medicine

Article | Published: 11 September 2017

A mouse model for embryonal tumors with multilayered rosettes uncovers the therapeutic potential of Sonic-hedgehog inhibitors

Julia E Neumann, Annika K Wefers, Sander Lambo, Edoardo Bianchi, Marie Bockstaller, Mario M Dorostkar, Valerie Meister, Pia Schindler, Andrey Korshunov, Katja von Hoff, Johannes Nowak, Monika Warmuth-Metz, Marlon R Schneider, Ingrid Renner-Müller, Daniel J Merk, Mehdi Shakarami, Tanvi Sharma, Lukas Chavez, Rainer Glass, Jennifer A Chan, M Mark Taketo, Philipp Neumann, Marcel Kool & Ulrich Schüller

ARTICLES

https://doi.org/10.1038/s41590-017-0030-x

nature immunology

Aged polymorphonuclear leukocytes cause fibrotic interstitial lung disease in the absence of regulation by B cells

Jung Hwan Kim[1,2], John Podstawka[1,2], Yuefei Lou[1,2], Lu Li[1,2], Esther K. S. Lee[1,2], Maziar Divangahi[3], Björn Petri[4,5], Frank R. Jirik[6], Margaret M. Kelly[1,7] and Bryan G. Yipp[1,2*]

nature REVIEWS ENDOCRINOLOGY

Review Article | Published: 31 March 2017

Molecular profiling of thyroid nodule fine-needle aspiration cytology

Markus Eszlinger, Lorraine Lau, Sana Ghaznavi, Christopher Symonds, Shamir P. Chandarana, Moosa Khalil & Ralf Paschke

Nature Reviews Endocrinology **13**, 415–424 (2017)

nature
structural &
molecular biology

Nat Struct Mol Biol. 2018 June ; 25(6): 482–487. doi:10.1038/s41594-018-0065-1.

Dissection of DNA double-strand break repair using novel single-molecule forceps

Jing L. Wang[1,*], Camille Duboc[1,*], Qian Wu[2,*], Takashi Ochi[2,&], Shikang Liang[2], Susan E. Tsutakawa[3], Susan P. Lees-Miller[4], Marc Nadal[1], John A. Tainer[3,5], Tom L. Blundell[2], and Terence R. Strick[1,6,7,†]

nature
genetics

Nat Genet. 2017 May ; 49(5): 680–691. doi:10.1038/ng.3826.

Identification of twelve new susceptibility loci for different histotypes of epithelial ovarian cancer

A full list of authors and affiliations appears at the end of the article. (Martin Kobel)

nature
nanotechnology

Nat Nanotechnol. 2017 Jul;12(7):701-710. doi: 10.1038/nnano.2017.56. Epub 2017 Apr 24.

Peptide-MHC-based nanomedicines for autoimmunity function as T-cell receptor microclustering devices.

Singha S[1], Shao K[1], Yang Y[1,2], Clemente-Casares X[1], Solé P[3], Clemente A[3], Blanco J[3], Dai Q[4], Song F[4], Liu SW[5], Yamanouchi J[1], Umeshappa CS[1], Nanjundappa RH[1], Detampel P[6], Amrein M[6], Fandos C[3], Tanguay R[7], Newbigging S[8], Serra P[3], Khadra A[5], Chan WCW[4], Santamaria P[1,3].

Cell

A Hematogenous Route for Medulloblastoma Leptomeningeal Metastases

Livia Garzia, Noriyuki Kijima, A. Sorana Morrissy, Pasqualino De Antonellis, Ana Guerreiro-Stucklin, Borja L. Holgado, Xiaochong Wu, Xin Wang, Michael Parsons, Kory Zayne, Alex Manno, Claudia Kuzan-Fischer, Carolina Nor, Laura K. Donovan, Jessica Liu, Lei Qin, Alexandra Garancher, Kun-Wei Liu, Sheila Mansouri, Betty Luu, Yuan Yao Thompson, Vijay Ramaswamy, John Peacock, Hamza Farooq, Patryk Skowron, David J.H. Shih, Angela Li, Sherine Ensan, Clinton S. Robbins, Myron Cybulsky, Siddhartha Mitra, Yussanne Ma, Richard Moore, Andy Mungall, Yoon-Jae Cho, William A. Weiss, Jennifer A. Chan, Cynthia E. Hawkins, Maura Massimino, Nada Jabado, Michal Zapotocky, David Sumerauer, Eric Bouffet, Peter Dirks, Uri Tabori, Poul H.B. Sorensen, Priscilla K. Brastianos, Kenneth Aldape, Steven J.M. Jones, Marco A. Marra, James R. Woodgett, Robert J. Wechsler-Reya, Daniel W. Fults, and Michael D. Taylor*

Cancer Cell

Comparative Molecular Analysis of Gastrointestinal Adenocarcinomas

Yang Liu,[1,2,22] Nilay S. Sethi,[1,2,22] Toshinori Hinoue,[3,22] Barbara G. Schneider,[4,22] Andrew D. Cherniack,[1,2] Francisco Sanchez-Vega,[5] Jose A. Seoane,[6] Farshad Farshidfar,[7] Reanne Bowlby,[8] Mirazul Islam,[1,2] Jaegil Kim,[1] Walid Chatila,[9] Rehan Akbani,[10] Rupa S. Kanchi,[10] Charles S. Rabkin,[11] Joseph E. Willis,[12] Kenneth K. Wang,[13] Shannon J. McCall,[14] Lopa Mishra,[15] Akinyemi I. Ojesina,[16,21] Susan Bullman,[2] Chandra Sekhar Pedamallu,[2] Alexander J. Lazar,[17] Ryo Sakai,[18] The Cancer Genome Atlas Research Network, Vésteinn Thorsson,[19,23,*] Adam J. Bass,[1,2,20,23,*] and Peter W. Laird[3,23,24,*]

Cancer Cell. 2017 August 14; 32(2): 185–203.e13. doi:10.1016/j.ccell.2017.07.007.

Integrated Genomic Characterization of Pancreatic Ductal Adenocarcinoma

The Cancer Genome Atlas Research Network* (Oliver Bathe)

The NEW ENGLAND JOURNAL of MEDICINE

Overall Survival with Palbociclib and Fulvestrant in Advanced Breast Cancer

N.C. Turner, D.J. Slamon, J. Ro, I. Bondarenko, S.-A. Im, N. Masuda, M. Colleoni, A. DeMichele, S. Loi, S. Verma, H. Iwata, N. Harbeck, S. Loibl, F. André, K. Puyana Theall, X. Huang, C. Giorgetti, C. Huang Bartlett, and M. Cristofanilli

Venetoclax–Rituximab in Relapsed or Refractory Chronic Lymphocytic Leukemia

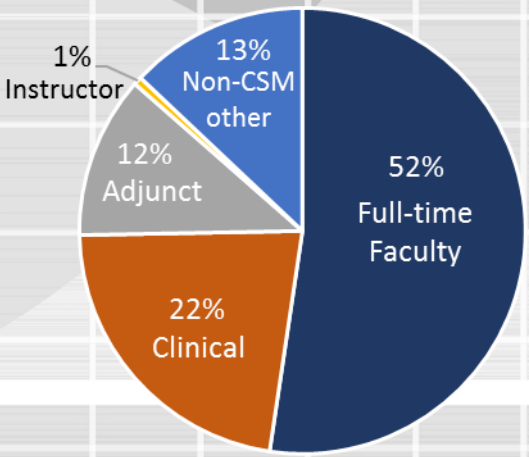
J.F. Seymour, T.J. Kipps, B. Eichhorst, P. Hillmen, J. D'Rozario, S. Assouline, C. Owen, J. Gerecitano, T. Robak, J. De la Serna, U. Jaeger, G. Cartron, M. Montillo, R. Humerickhouse, E.A. Punnoose, Y. Li, M. Boyer, K. Humphrey, M. Mobasher, and A.P. Kater

Obinutuzumab for the First-Line Treatment of Follicular Lymphoma

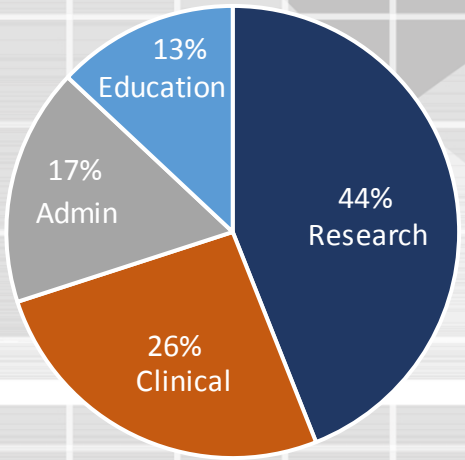
R. Marcus, A. Davies, K. Ando, W. Klapper, S. Opat, C. Owen, E. Phillips, R. Sangha, R. Schlag, J.F. Seymour, W. Townsend, M. Trněný, M. Wenger, G. Fingerle-Rowson, K. Rufibach, T. Moore, M. Herold, and W. Hiddemann

Institute Metrics

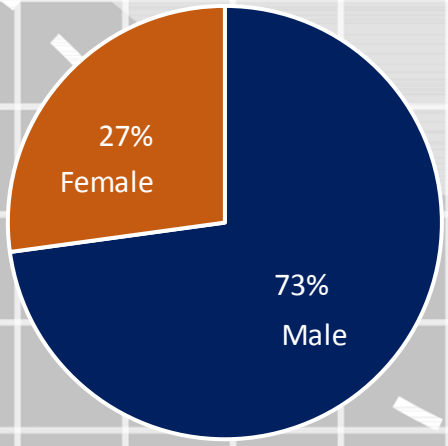
Appointments



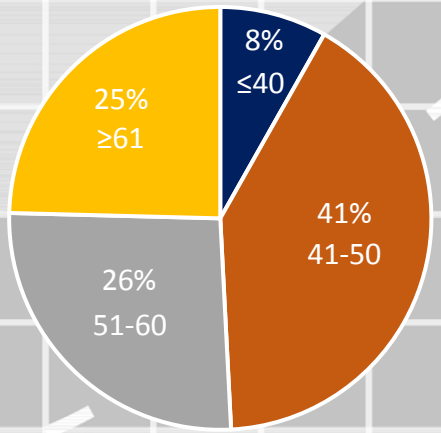
Activity Profile of Full Members (Full-Time Faculty)



Gender

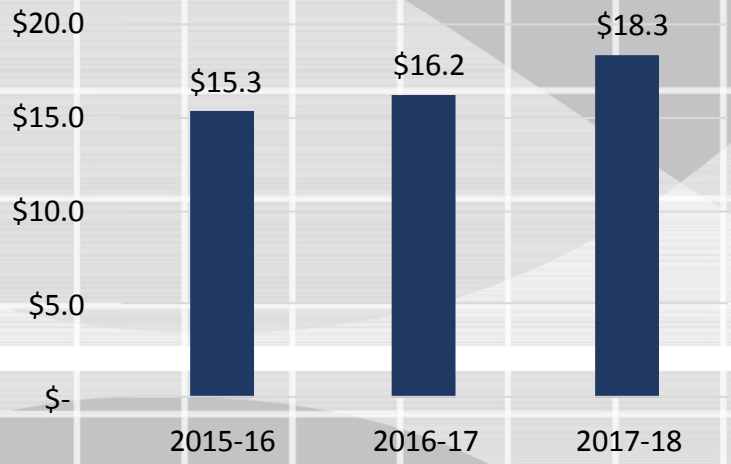


Age

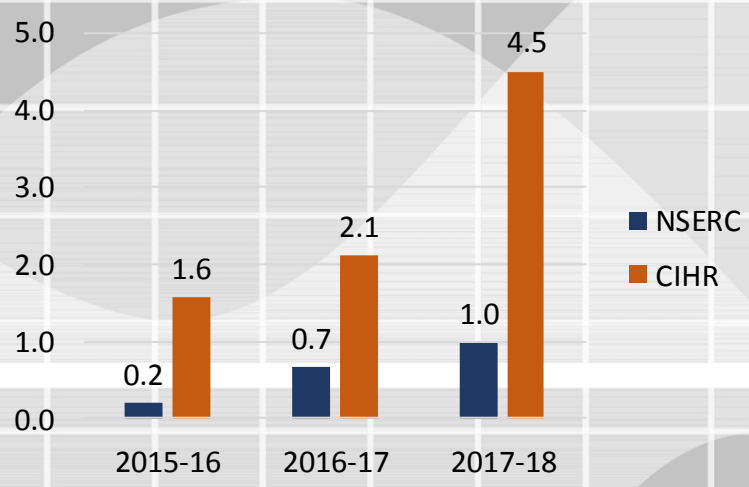


Source: Office of Faculty Analytics, Cumming School of Medicine; Charbonneau Cancer Institute internal administrative data

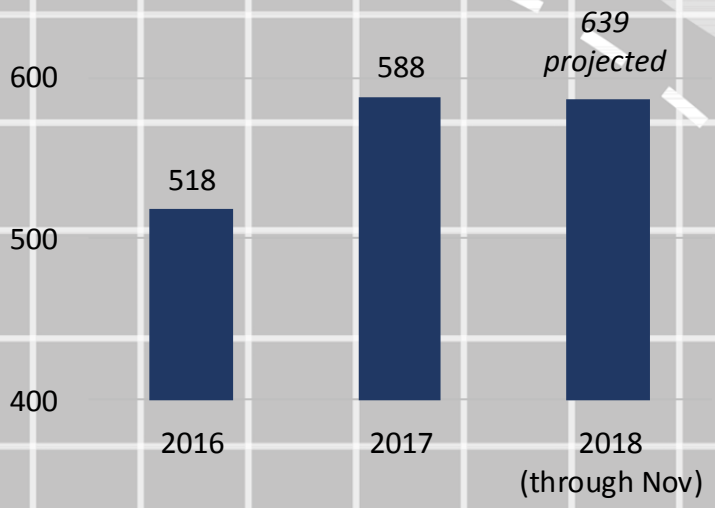
Total Research Revenue ($ millions)



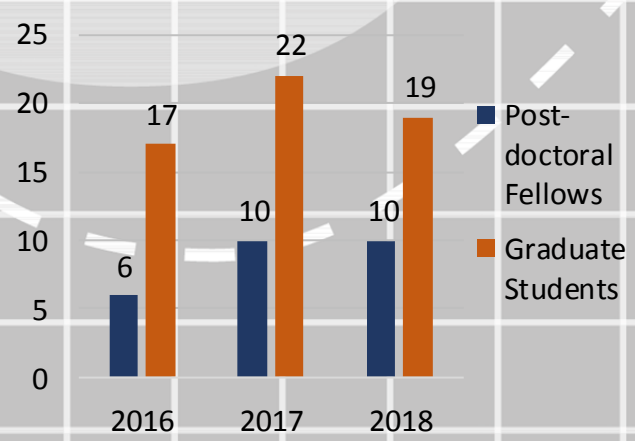
Tri-Council (Federal) Revenue ($ millions)



Number of Publications (All Members)



Annual Enrolment of New Trainees



Notes: Total research revenue includes grants, gifts, and donations received by Institute members; Tri-Council (Federal) revenue, as a portion of the total research revenue, includes grants from the Canadian Institutes of Health Research (CIHR) and the Natural Sciences and Engineering Research Council (NSERC).

Institute Gifts and Financials

Fundraising efforts over the past year (2017-2018) have generated several new gifts, including:

- $2,087,000 for childhood cancer research;
- $500,000 for health services research;
- $500,000 for radon science (Evict Radon campaign);
- $200,000 for precision oncology focused on oropharyngeal cancers;
- $70,000 for cancer prevention research; and
- several smaller gifts for Institute programs and researchers.

Over $50 million of the $150 million cancer target has been raised for the University's Energize Campaign.

Statement of Operations	2017-18 Actuals	2018-19 Budget	2019-20 Forecast
Revenue			
Charbonneau endowment and restricted gifts	$1,561,934	$1,763,484	$1,188,123
Expenses			
Research	$813,679	$1,258,526	$652,523
Education	$76,055	$118,500	$118,500
Administration	$473,910	$462,000	$427,000
Excess revenue over expenses	$198,290	($75,542)	($9,900)

Institute Members

Full Members

Amrein, Matthias
Anderson, Ronald
Bahlis, Nizar
Barbera, Lisa
Bathe, Oliver
Beattie, Tara
Beaudry, Paul
Bebb, Gwyn
Bismar, Tarek
Bonni, Shirin
Bose, Pinaki
Brenner, Darren
Brown, Chris
Bultz, Barry
Cairncross, J. Gregory
Campbell, Tavis
Card, Cynthia
Carlson, Linda
Chan, Jennifer
Cheng, Tina
Cheung, Winson
Cobb, Jennifer
Craighead, Peter
Demetrick, Douglas
Doll, Corinne M
Donnelly, Bryan
Dort, Joseph
Dowden, Scot
Duggan, Maire
Friedenreich, Christine
Fujita, Don
Gallo, Marco
Ghatage, Prafull
Giese-Davis, Janine
Goodarzi, Aaron
Grewal, Savraj
Hamilton, Mark
Hao, Desirée
Hilsden, Robert
Johnston, Randal
Kelly, John
Khan, Faisal M.
Koebel, Martin
Kopciuk, Karen
Kurz, Ebba
Lau, Harold
Lee, Ki-Young
Lees-Miller, Susan
Lewis, Victor
Mahoney, Douglas
Monument, Michael
Morris, Don
Morrissy, Sorana
Moules, Nancy
Narendran, Aru
Nelson, Gregg
Neri, Paola
Olivotto, Ivo A
Owen, Carolyn
Paschke, Ralf
Peters, Cheryl
Quan, May Lynn
Rancourt, Derrick
Riabowol, Karl
Rinker, Kristina
Robbins, Stephen
Robinson, John W
Ruether, Dean
Schriemer, David C
Schulte, Fiona
Senger, Donna
Simon, Jessica
Sinclair, Shane
Smith, Wendy
Stewart, Douglas
Storek, Jan
Sutherland, Garnette
Tang, Patricia
Temple-Oberle, Claire
Tremblay, Alain
Trpkov, Kiril
Truong, Tony
Verma, Sunil
Vogel, Hans
Wang, Edwin
Williams, Gareth
Yong, V Wee
Zhang, Qingrun

Associate Members

Arcellana-Panlilio, Mayi
Balogh, Alexander
Brenn, Thomas
Chandarana, Shamir
Chary, Srini
Childs, Sarah
Chu, Pamela
Cribb, Alastair
Crump, Trafford
Culos-Reed, Nicole
Daly, Andrew
de Groot, Janet
de Koning, Jason
Derksen, Darren
Dickinson, James
Dixon, Elijah
Eszlinger, Markus
Fear, Elise
Gailer, Juergen
Golsteyn, Roy
Gotto, Geoffrey
Guilcher, Greg
Heng, Daniel
Heyne, Belinda
Hollenberg, Morley
Husain, Siraj
Jenkins, Deirdre
Jirik, Frank
Kerba, Marc
Kovalchuk, Olga
Kurien, Elizabeth
Laing, Catherine
Larsen, Erik
Lategan, Johannes
Lim, Gerald
Ling, Chang-Chun
Liu, Hongwei
Luchman, Artee
Lupichuk, Sasha
Lysack, John
Lytton, Jonathan
MacKinnon, John
MacLean, Anthony
Mahe, Etienne
Mansoor, Adnan
Marr, Hubert Kin-Ming
Matthews, Jennifer
McDonough, Meghan
Mew, Daphne
Minoo, Parham
Moorhead, Gregory
Nation, Jill
Naugler, Christopher
Nezhad, Amir Sanati
Nguyen, Minh
Okoniewski, Michal
Paterson, Alexander
Pelletier, Guy
Ploquin, Nicolas
Poon, Man-Chiu
Prenner, Elmar
Savoie, Lynn
Shafey, Mona
Shemanko, Carrie
Sinclair, Gary
Sinha, Richie
Sinnarajah, Aynharan
Skarsgard, David
Spencer, David
Spice, Ron
Strother, Douglas
Sutherland, Francis
Tam, Vincent
Tay, Jason
Temple, Walley
Thakor, Nehal
Thirukkumaran, Chandini
Thomas, Bejoy
Tsang, Roger
Vallance, Jeff
Weiss, Samuel
Wu, Jackson
Zheng, Xi-Long

Institute Oversight

Administration

Director:
Dr. Gregory Cairncross

Deputy Director:
Dr. Jennifer Chan

Research and Mentorship Lead:
Dr. Savraj Grewal

Education and Microscopy Lead:
Dr. Aaron Goodarzi

Business and Operations:
Ms. Donna Wray

Research Strategy and Partnerships:
Ms. Melissa Shea-Budgell

Communications:
Ms. Carmen Coelho

Administrative Support:
Ms. Lisa Willms

Strategic Advisory Board

Chair:
Ms. Gail O'Brien

Members:
Ms. Heather Culbert
Dr. Chen Fong
Mr. Keith MacPhail
Mr. Marvin Romanow
Mr. Allan Ross
Ms. Sharon Siebens
Mr. Tony Smith
Dr. Sunil Verma
Dr. Gerald Zamponi
Ms. Marg Semel
Dr. Gregory Cairncross
Dr. Jennifer Chan

External Advisory Board

Internal Chair:
Dr. Savraj Grewal, Research and Mentorship Lead, Charbonneau Cancer Institute

External Members:
Dr. Samuel Aparicio, BC Cancer Agency

Dr. Cheryl Arrowsmith, Princess Margaret Cancer Centre

Dr. Eduardo Franco, McGill University

Dr. Donald William Parsons, Baylor College of Medicine

Dr. Geoff Porter, Dalhousie University

Dr. Julia Rowland, (formerly) National Cancer Institute

Mr. Patrick Sullivan, Team Finn Foundation

In Memory of Mr. Arnie Charbonneau and Mr. Dave Robson

Arnie Charbonneau Cancer Institute

Health Research Innovation Centre

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